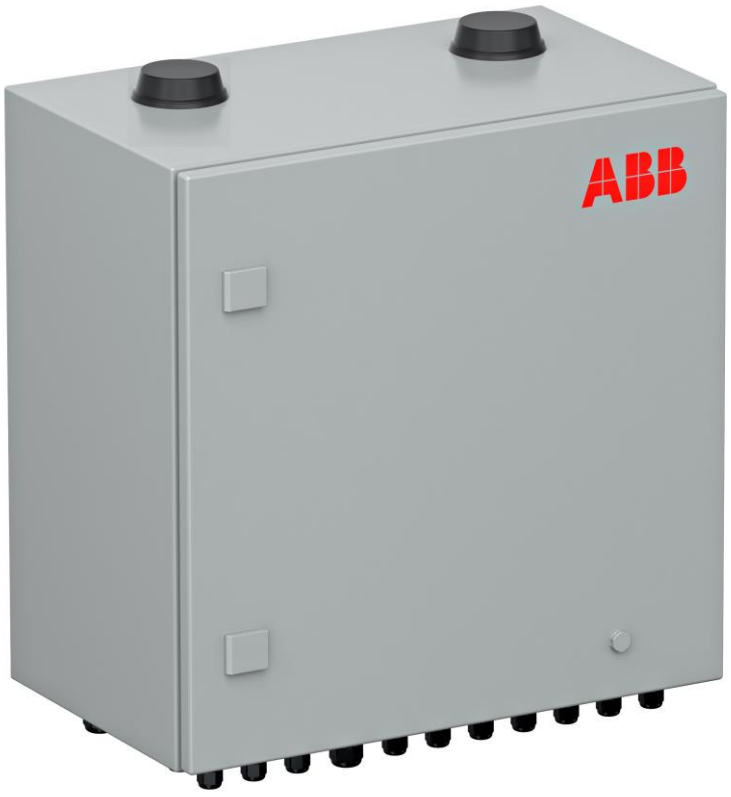
INSTALLATION GUIDE

EV Site Solutions Control 100

Version 1.2



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Version control

Version	Date	Remarks
1.0	11-08-2020	Commercial release
1.1	29-09-2020	Power measurement device added to the installation description.
1.2	01-02-2021	Updated due to enclosure change. Add instruction for 24 V DC supply for external power measurement unit.

Table of Contents

Glossary

4G
Is the fourth generation of broadband cellular network technology, succeeding 3G. A 4G system must provide capabilities defined by ITU in IMT Advanced.

AC
Alternating Current.

CCS (Combo)
Combined Charging System (also called Combo) is the charging protocol for North America and European OEMs.

CHAdeMO
CHAdeMO is a trade name of a quick charging method for electric vehicles and a charging protocol standard by the CHAdeMO Association.

Contractor
Entity hired by the owner / site operator to do engineering, civil and electrical installation work.

DC
Direct Current.

EMO
Emergency Off.

EVSS
Electric Vehicle Site Solutions

HMI
Human Machine Interface; external screen that can be connected to the EVSS Control.

HP CHARGER
High Power Charger.

LVS
Low Voltage Side, the grid connection on which the Charge system is connected.

Terra 54
DC fast chargers for electric Vehicles that provides 50 kW of DC power.

Terra HP 175
Power cabinet that provides 160 kW (175 kW peak) of DC power to a Charge Post. Gets its power from a power distribution board.

MCB
Mechanical Circuit Breaker.

OCPP
Open Charge Point Protocol, is an application protocol for communication between Electric vehicle (EV), charging stations and a central management system

OPC UA
Open Platform Communications United Architecture; is a data exchange standard for industrial communication (machine-to-machine or PC-to-machine communication).

Owner
The legal owner of the charger.

PE
Protective Earth.

PPE
Personal Protective Equipment. Equipment such as safety shoes, helmet, glasses, gloves.

RCD
Residual-Current Device.

Site operator
The entity is responsible for the day to day control of the charger. The site operator can be the owner, but not necessarily.

1. Introduction

1.1. Preface

This guide describes the physical installation of the EV Site Solutions Control 100 at its location.

The EV Site Solutions Control 100 (EVSS Control) provides 4G connectivity via a modem setup to connected chargers and provides site power management.
It is not permitted to use the EVSS Control for any other purposes as indicated above. The installation must be planned carefully, and must be done by certified personnel only (according to local standards[1]).

Before installing the EV Site Solutions Control, read this Installation Guide carefully and attentively. Follow the instructions in this Installation Guide. ABB is not responsible for any damage that has been caused by not or incorrectly following and executing the instruction described in this manual.

1.2. Intended document users

This document is intended to be used by the contractors who are responsible for site preparation and/or installation of the EVSS Control.

1.3. Signs

The following signs are used on the equipment and in this manual:

	**DANGER** **Hazardous voltage** Identifies a hazard that could result in severe injury or death through electrocution.
	**WARNING** **Various** Identifies a hazard that could result in severe injury or death.
	**WARNING** **Rotating parts** Identifies a hazard that could result in injury due to the presence of rotating or moving parts.
	**WARNING** **Pinch Hazard** Identifies a hazard that could result in injuries in which some body parts are pinched or crushed.

[1] Local regulations shall take precedence if they list different installation requirements than prescribed in this Installation Manual.

	**WARNING** **Fall Hazard** Identifies a hazard that could result in injury due unsafe work at height.
	**CAUTION** **Various** Identifies a hazard that could result in damage to the machine, other equipment, and/or environmental pollution.
	**CAUTION** **Environmental damage** Identifies a special indications as well as biddings and prohibitions to avoid damages in the environment. This sign refer to present national regulation according the environment.
	**NOTICE** Contains remarks, suggestions or advice.

1.4. Safety regulations

1.4.1. Owner responsibilities

The owner and site operator are required:

- To operate the EVSS Control with the protective devices installed and to make sure all protective devices are correctly installed after carrying out installation or maintenance.
- To prepare the site where the EVSS Control will be installed, according to the requirements described in this guide.
- To make sure that there is enough space around the EVSS Control to carry out maintenance work.
- All works have to be carried out from qualified personnel.
- You are not allowed to modify the EVSS Control without the permission of ABB. Any modifications not explicitly approved by ABB void the warranty immediately.
- Neither ABB nor its affiliates shall be liable to the purchaser of this product or third parties for damages, losses, costs or expenses incurred by purchaser or third parties as a result of: an accident, misuse or abuse of this product or unauthorized modifications, repairs or alterations to this product, or failure to strictly comply ABB operating and maintenance instructions.

1.4.2. Electric hazards

	**DANGER** **Hazardous voltage** The grid terminals on the internal components may carry hazardous voltages, even if all circuit breakers are switched off.

1.4.3. Installation safety

	**WARNING** **Personal safety (PPE)** Always wear a safety helmet, safety gloves and safety shoes when you do the lifting and tilting work.
	**WARNING** Visually examine the package for damage. See section *Unpack the EVSS Control* on Page 17. If there is damage, do not install the system.
	**DANGER** **Hazardous voltage** Instructions: 1. Always switch off the external group switch and the main switch in the cabinet, before performing any installation, disassembly, repair or replacement of components. 2. Do a voltage check and make sure that the electrical power is disconnected from the system. 3. Only ABB certified technicians are permitted to commission the EVSS Control. 4. When the system is in an open or dangerous condition, do not allow unqualified persons to go near it. Instruct and warn people about the potential harmful voltages. 5. Always connect the Protective Earth (PE) first, before connecting the neutral (N) and Phase (P) wiring. 6. Correctly lock the door after installation or service operations.
	**CAUTION** **Warranty** Installation and commissioning work must be carried out by certified personnel. The warranty will be void if any work carried out by non-certified personnel.

1.5. Environment and disposal of waste

	**CAUTION**
	Always observe the local rules and regulations with respect to processing (non-reusable) parts of the EVSS Control.

1.6. Cyber Security Disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is customer's sole responsibility to provide and continuously ensure a secure connection between the product and customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.
ABB Ltd and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

1.7. Contact information

ABB in your country
Please contact ABB in your country for delivery and service information.

ABB EV Infrastructure global
ABB EV Infrastructure

Address Heertjeslaan 6
2629 JG Delft
The Netherlands

Telephone +31 88 440 46 00

Mail info.evi@nl.abb.com

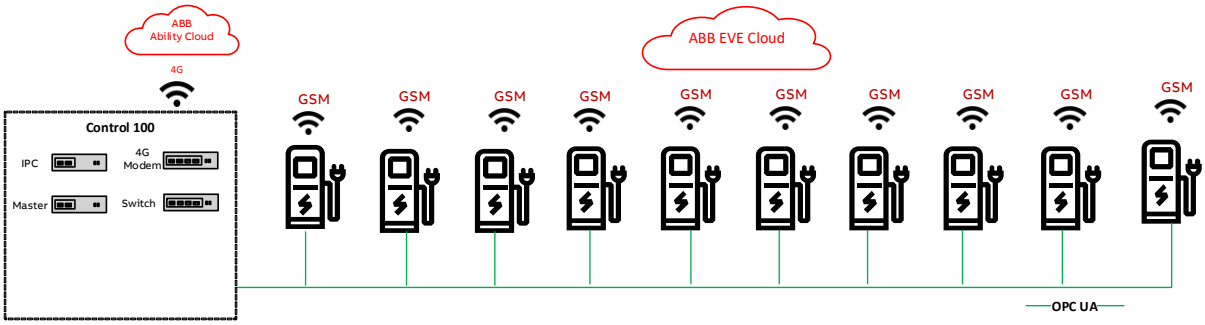
Write down here your local ABB contact details:

2. Description of the product

The EVSS Control is an energy management control for EV Charging site with ABB chargers. The EVSS Control must work together with a mandatory power measurement device, which is not included with the EVSS Control delivery (see for more information about the power measurement device section *Power measurement device* on page 15). The EVSS Control contains the following functions:

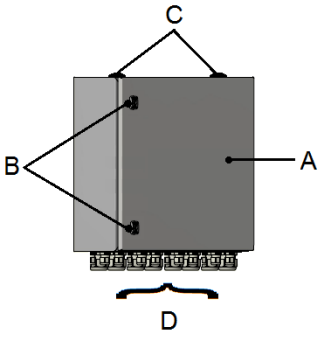
- Energy management for a limited grid connection for up to ten ABB chargers, interfaced through OPC UA.
    - Supported load management algorithms: First In First Out (FIFO), Equal Share
    - Focus of energy management is only on Low Voltage Side (LVS) i.e. below transformer.
    - Chargers are part of dynamic energy management, Auxiliary loads are configured as constant value based on the rating of the auxiliaries supply breaker.
- A Human Machine Interface (HMI) is available through a web server application for visualization of the status and monitoring of the system. This HMI application enables configuration of the energy management algorithm used by the EVSS Control. No hardware is foreseen for HMI.
- The external emergency button (EMO) can generate trip signals to the main breaker in the LVS.

The figure below depicts the connectivity between all components and the cloud links to the different backends customer and ABB.



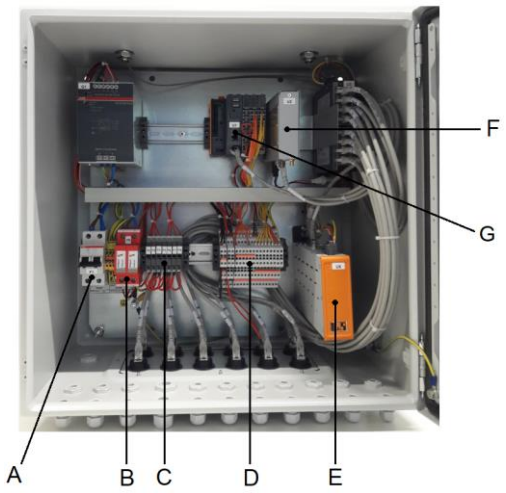
The local network between chargers and EVSS Control is connected via ethernet cables in a star connection i.e. each charger has its own ethernet cable to the EVSS Control.

2.1. Outside view of the EVSS Control



A Door
B Locks
C 4G Antennas
D Entrance for in- and output cables

2.2. Inside view of the EVSS Control



A 240 V AC Power connection
B Over Voltage Protection (OVP)
C Fuse holders (including fuse)
D Connector terminals
E Industrial PC
F 4G Modem
G Master controller (PLC)

2.3. Electrical connection

The EVSS Control can be connected directly to the electrical grid or to an existing customer low voltage power distribution cabinet. In both cases a 16 A, 230 V AC, 50 Hz, 1P+N+PE connection to the EVSS Control is necessary that meets the following requirements:

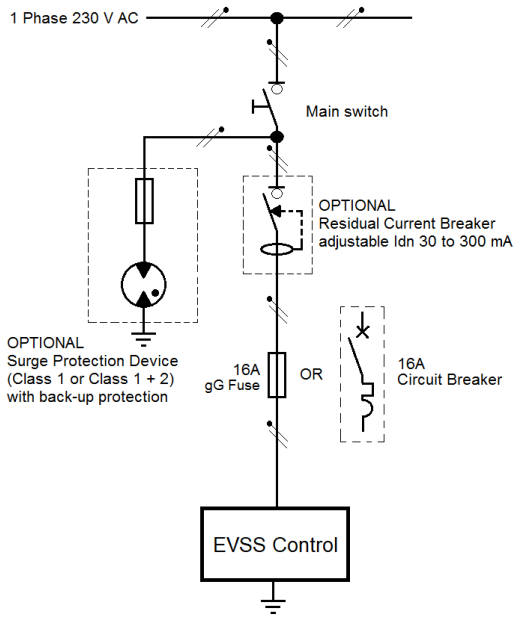
- Fuse (gG type) 16 A AC or 16 A AC circuit breaker.
- Main switch (load separator).
- PE connected to the main PE rail.
- A TN-S or TT earthing system.
- Specifications of the following parts must be determined by your electrical engineer. They depend on local laws, safety and electrical regulations:
  - Adjustable RCD in the range of 30 mA up to 300 mA.
  - Class 1 Surge Protection Device (SPD).

The electrical connection to the EVSS Control must be designed considering also the protection against indirect contact in order to meet the requirements of local electrical standards.

When a TT installation is used, always have an RCD as its first isolator.

The EVSS Control is intended for installation where the maximum short circuit current is not higher than 20 kA, given that the internal circuit breaker has a breaking capacity of 20 kA (I_{cu} = 20 kA according to EN 60947-2).

An example single line diagram for the electrical connection to the EVSS Control is shown in the figure that follows.



2.4. Internet access

The EVSS Control requires a connection to the internet. This connection is used for serviceability, remote access by ABB Service department (ABB Cloud).
A wireless 4G network is required at the location. A 4G modem with active SIM card is included within the EVSS Control (a customer SIM card is not required).

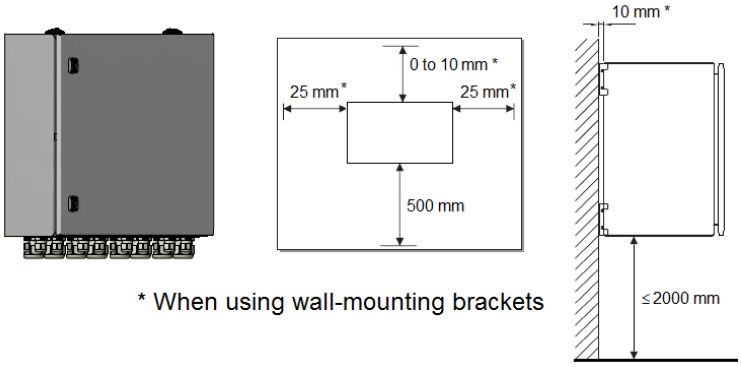
2.5. Location requirements

The location of the EVSS Control must meet the following requirements:

- The EVSS Control must be placed in a non-public area.
- The height is not more than 2000 m above sea level.
- Maximum mounting distance with respect to the ground must not be more than 2 m.
- Maximum distance between EVSS Control and the Charge systems must not be more than 90 m.
- The EVSS Control must not be immersed in water, or any other fluid.
- Do not place the EVSS Control above a heat source.
- Do not place the EVSS Control in a metal house (Faraday cage) that blocks or disturbed the 4G wireless communication.
- The operational temperature of the EVSS Control is between -25 ºC and +40 ºC.
    - For locations where the EVSS Control will be exposed to direct sunlight and high ambient temperatures for most of the day, it is recommended to install protection from direct sunlight. Otherwise the temperature inside the cabinet might exceed the maximum temperature.
- The protection rating of the housing of the EVSS Control is IP54 and designed for in- and outdoor use.

The EVSS Control requires a minimum space of 500 x 800 mm (W x D). This space is calculated as follows:

- A cabinet footprint of 500 x 300 mm (W x D).
- The following free space:
    - 0 mm to 10 mm (when using the wall-mounted brackets) at the rear side when the EVSS Control is mounted on a wall.
    - 25 mm at the left and right side when using the wall-mounting brackets.
    - 500 mm at the front side in order to open the door.

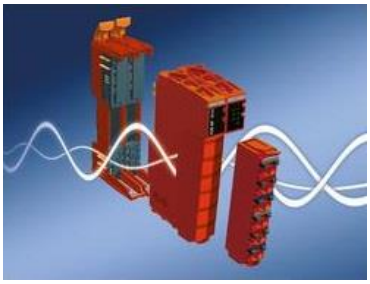


2.6. Accessories

The specified components are recommended by ABB.

2.6.1. Power measurement device (mandatory)

For the power measurement device there are two options, which is depending on the customer grid connection power rating on site.



Option 1: current transformer with 1 A secondary output.

Amount	Part number	Description
1	X20BB80	X20 bus base (B&R)
1	X20BC008U	X20 bus controller (B&R)
1	X20PS9400	X20 power supply module (B&R)
1	X20TB12	X20 terminal block (B&R)
1	X20AP3121	X20 energy measurement module, (1 A) (B&R)
1	X20BM32	X20 bus module (B&R)
1	X20TB32	X20 terminal block (B&R)

Option 2: current transformer with 5 A secondary output.

Amount	Part number	Description
1	X20BB80	X20 bus base (B&R)
1	X20BC008U	X20 bus controller (B&R)
1	X20PS9400	X20 power supply module (B&R)
1	X20TB12	X20 terminal block (B&R)
1	X20AP3131	X20 energy measurement module, (5 A) (B&R)
1	X20BM32	X20 bus module (B&R)
1	X20TB32	X20 terminal block (B&R)

The current transformer selection is up to the system integrator, however there have two minimum requirements:

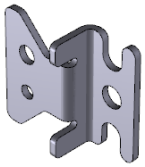
- The accuracy shall guarantee at least 0.5% or better of the current rating;
- Bandwidth shall cover 50 Hz.

For the X20BS9400 there is needed an external AC/DC power supply: 24 V DC output with a minimum output current of 1 A. If the EVSS Control is maximum 2 m away from the power measurement the 24 V DC can be taken from internal 24 V DC connection within the EVSS Control, see section *Connect the 24 V DC cable (optional)* on Page 27.

The following accessories are optional to use. The specified components are recommended by ABB when the option is needed.

2.6.2. Wall-mounting brackets for safe wall fixing

The EVSS Control can be easily mounted at the installation site without any need for internal access. This item is included within the packaging of the EVSS Control.



Amount	Part number	Description
1*	SZ 2508.100	Wall-mounting brackets (Rittal)

(*) pack quantity is 4

2.6.3. Emergency unit (optional)

Amount	Part number	Description
1	1SFA611523R1001	MPET4-10R Emergency Stop (ABB)
1	1SFA611605R1100	MCBH-00 Contact Block Holder (ABB)
1	1SFA611610R1010	MCB-01 Contact Block (ABB)
1	1SFA611821R1000	MEPY1-0 Enclosure 1-POS (ABB)
1	1SFA616915R1038	KTC15-1038 Legend Plate (ABB)

3. Mechanical Installation

3.1. Unpack the EVSS Control

3.1.1. Before unpacking

	CAUTION
	Do not pollute the environment with plastic and cardboard packing. Depollute these things according the regional applicable regulations as well as environment-friendly.

Preconditions:

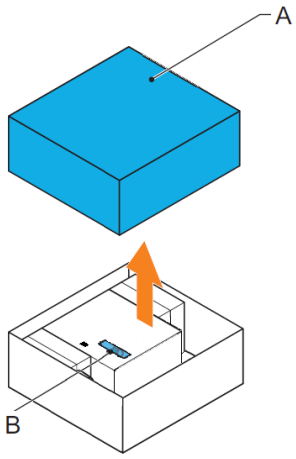
- All construction work is completed.
- The product is delivered by a transport company at the confirmed date of delivery.

1. Check the box for damages.

3.1.2. Remove packaging

Preconditions:

- The installation work must be carried out by at least two persons.



1. Remove the cover (A) from the packaging.
2. Remove the bag (B) which contain the key.
3. Lift the EVSS Control out of the box.

	WARNING
	Make sure that personnel cannot be crushed or become trapped while moving the EVSS Control out of the box.
	CAUTION
	**Warranty** Damage due to moving the EVSS Control out of the box is not covered by the warranty.

4. Place the EVSS Control on the ground with its top facing up.
5. Remove all protective foam from the EVSS Control.

3.2. Wall mounting instructions

The EVSS Control could be installed both in- or outdoors and must be mounted on a solid wall.

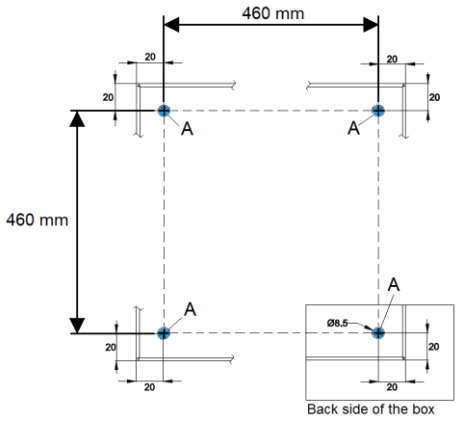
	CAUTION
	Attach the EVSS Control to a solid wall or support structure that can support the weight (= 26.2 kg) of the EVSS Control. Also the mounting points within the wall or support structure must withstand at least 3 to 4 times the weight of the EVSS Control.

Preconditions:

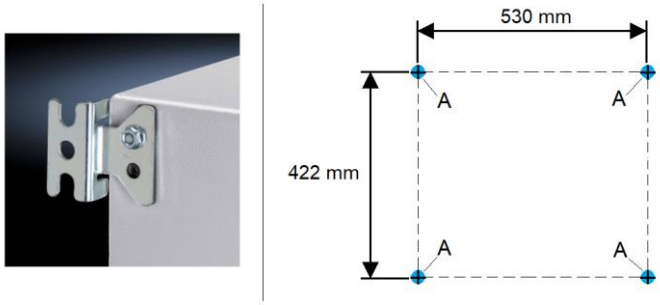
- Find a suitable location on a wall.
- Make sure that the correct power supply is available (see section *Electrical connection* on Page 13).
- All packaging material is removed from the EVSS Control.
- A minimum of two persons is required.
- Tools: mark tools, level tool, drilling machine, drill bit (Ø10 mm or Ø7.5 mm), 4x wall plugs (Ø10 mm, L = 50 mm), spanner (size 10 and 13).

There are two options to mount the EVSS Control on a wall:

- Using the internal holes of the box itself on the back side.



- Using external wall-mounting brackets, see section *Wall-mounting brackets for safe wall fixing* on Page 16.

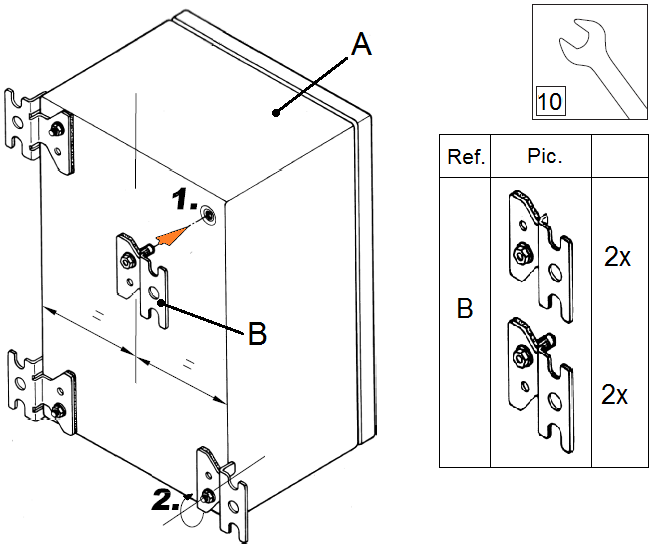


1. Mark the location for the mounting holes at the indicated positions (A) of one of the chosen mounting options (see pictures above). Check that the holes are leveled.
2. Drill holes in the wall at the indicated positions (A). For a concrete or stony wall, the holes must be suitable for a wall plug with a diameter of 10 mm. For a wooden wall, the holes must be suitable for wood-wire-bolt size M8.
3. In case of a concrete or stony wall, insert wall-plugs (4x) in to the holes.

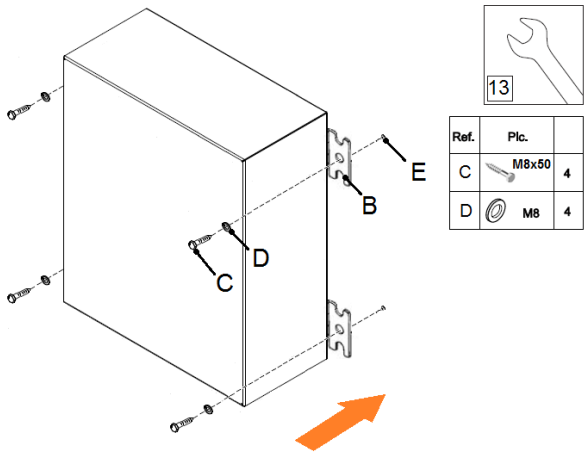
	NOTICE
	The activities of installing cable ducts, for the supply of cables for the EVSS Control, are entirely dependent of the location, and may differ per location. Due to this reason, the installation of those cable ducts our out of the scope of this Installation Guide. It is the responsibility of the contractor to setup a routing plan for the cable ducts, and installing this cable ducts on location.

3.2.1. Using the wall-mounting brackets

The EVSS Control can be easily mounted by using the wall-mounting brackets, see *Wall-mounting brackets for safe wall fixing* on Page 16.



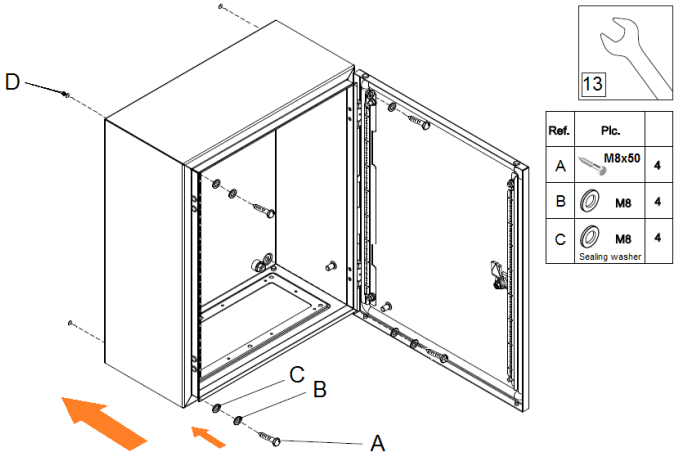
1. Insert the expandable dowel of the wall-mounting brackets (B) (4x) into the housing hole from the outside of the EVSS Control (A).
2. Screw-fasten the bolts with a tightening torque of 6 N·m.



3. Carefully place the EVSS Control against the wall.
4. Make sure that the EVSS Control is aligned with the drilled holes (E) in the wall (see section *Wall mounting instructions* on Page 18).
5. Insert the M8 wood-wire-bolts (C) fitted with the washers (D) into the holes of the wall-mounting brackets (B) (4x).
6. Tighten the wood-wire-bolts with a tightening torque of 10 – 15 N·m.

3.2.2. Direct wall mounting

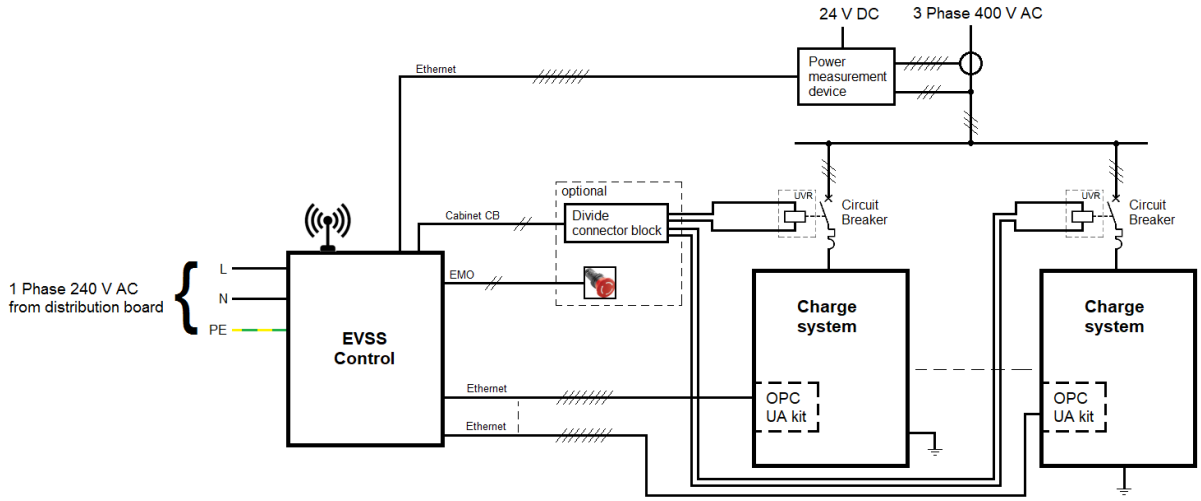
1. Open the door of the EVSS Control.



2. Carefully place the EVSS Control against the wall.
3. Make sure that the EVSS Control is aligned with the drilled holes (D) in the wall (see section *Wall mounting instructions* on Page 18).
4. Insert the M8 wood-wire-bolts (A) fitted with the washers (B) and sealing washers (C) into the holes (4x).
5. Tighten the wood-wire-bolts with a tightening torque of 10 – 15 N·m.
6. Close the door of the EVSS Control.

4. Electrical installation

4.1. Cabling



Overview electrical connections

The installation of the power measurement device shall be as close to the main grid connection.

	NOTICE
	There are many different network configurations on side. Therefore, ABB strongly advises to read the datasheet of the X20AP31x1 energy measurement module carefully before starting the installation of the power measurement device.

The power measurement device will be connected to the EVSS Control via an ethernet cable.

The EVSS Control has the option to connect an external emergency button (EMO) that can trip the circuit breaker, via a UVR (Under Voltage Release), in the LVS Grid connection of a charge system. The control from the EVSS Control for this trip signal (Cabinet CB) is a two wire system. To control multiple circuit breakers, an external divide connector block must be installed (see Appendix B *Signal connection diagram for UVR control* as an example).

Tables below provides general specifications for the needed cables. Use these tables to select cables, taking into considering local installation conditions, cable length, cable temperature rating and local regulations.

Supply power cable

Functional description	AC input cable	24 V DC cable*
Number of cores	3	3
Cross section range	2.5 mm^2	0.75 – 2.5 mm^2
Min – Max external diameter to fit through gland	4 – 10 mm	3.5 – 7 mm
Shielding	No	No
Conductor	Bare copper, fine wired, bunch stranded acc. to VDE 0295 Cl.5/IEC Cl.5	Bare copper, fine wired, bunch stranded acc. to VDE 0295 Cl.5/IEC Cl.5
Insulation	Special PVC (outdoor use, UV-protected, oil resistant)	Special PVC (outdoor use, UV-protected, oil resistant)
Minimum Nominal Voltage Uo/U	450/750 Vac	450/750 Vac
Minimum Test Voltage [AC]	4 kV	1.5 kV
Ambient Temperature range	-40ºC to 80ºC	-40ºC to 80ºC
Core identification	Acc. to IEC 60446	Acc. to IEC 60446

* see section *Power measurement device (mandatory)* on Page 15.

Data cables

Functional description	Digital I/O cable	EMO & Cabinet CB cable *(optional)*	Ethernet (S/FTP, CAT6a)
Number of cores	2	2	8
Number of (twisted) pairs	1	*inapplicable*	4 x 2
Cross section range	0.75 – 2.5 mm^2	0.75 – 2.5 mm^2	0.25 – 0.75 mm^2
Min – Max external diameter to fit through gland	3.5 – 7 mm	4 – 10 mm	4 – 8 mm
Shielding	Yes (tinned copper braid)	No	Yes (tinned copper braid)
Conductor	Fine strand copper wire	Fine strand copper wire	Fine strand copper wire
Insulation	PVC or other material that can be used outdoor and are UV-protected	PVC or other material that can be used outdoor and are UV-protected	PVC or other material that can be used outdoor and are UV-protected
Characteristic impedance			100 Ω
Minimum Test Voltage [AC]	1.5 kV	1.5 kV	700 V
Ambient Temperature range	-40ºC to 70ºC	-40ºC to 70ºC	-40ºC to 70ºC
Core identification	Numbering or color	Numbering or color	TIA/EIA-568-B.1-2001 T568A

- Important: all cables must be resistant to being placed in the ground, submerged in conduit.
- All cables must have and isolation that are self-extinguishing and flame retardant according to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1-2.
- All cables must be corresponds to the VDE, CE and EAC Low Voltage Directive and must meet the RoHS compliance.
- To identify each cable it recommended to mark the cables every 2000 mm and at both ends.

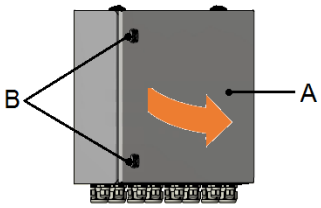
4.2. Installation of the cables inside EVSS Control

	DANGER
	Make sure that the main switch of the power supply group for the product is set to the OFF position. Do a voltage check to make sure that the electrical power is disconnected from the system. Secure against resetting.

4.2.1. Open the door of the EVSS Control

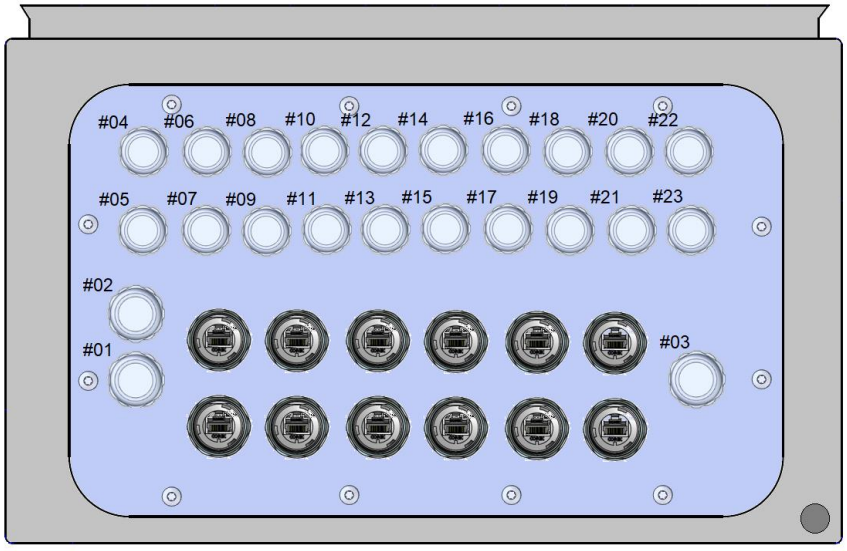
Preconditions:

- Key that was removed from the EVSS Control.



1. Unlock the lock (B)
2. Open the door (A).

4.2.2. Route cables through glands



Bottom view

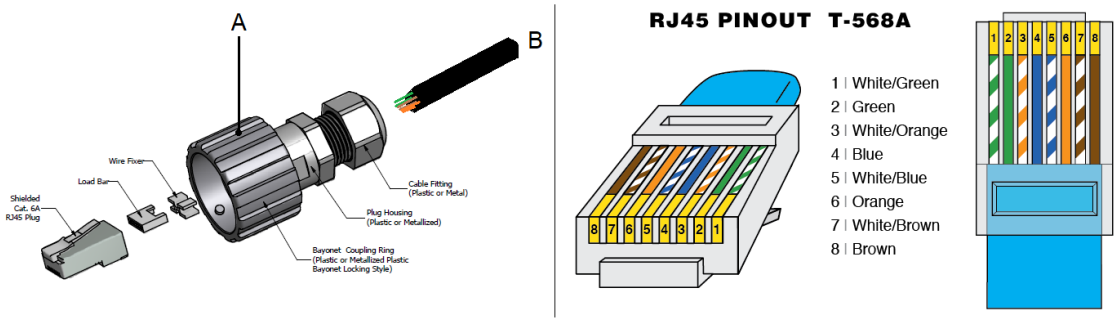
Gland#	Clamping range ØF	Cable
01	4 – 10 mm	AC input cable
02	4 – 10 mm	EMO cable *(optional)*
03	4 – 10 mm	*Not used*
04 – 09	3.5 – 7 mm	*Not used*
10 – 15	3.5 – 7 mm	Digital Input cable *(for future use)*
16 – 21	3.5 – 7 mm	Digital Output cable *(for future use)*
22	3.5 – 7 mm	*Not used*
23	3.5 – 7 mm	24 V DC cable *(optional)*

1. Loosen and remove all the cable gland's nuts.
2. Route the cables through the right gland (see picture above).
3. Make sure that there is sufficient cable length to reach the connectors inside the EVSS Control.
4. Slide the cable gland's nut over each cable.
5. Tighten all the cable gland's nuts to secure the cables.

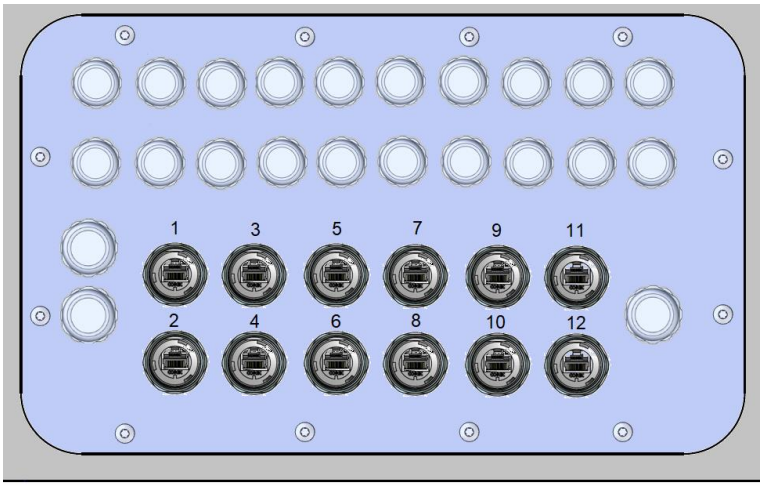
4.2.3. Connect the Ethernet cables

Preconditions:

- Parts: 12x Ethernet plug RJ45 (17-150234, Conec)
- Tools: wire cutter, wire stripper pliers, network cable pliers.



1. Cut the Ethernet cable to the correct length to reach the bottom side of the EVSS Control. Do not make the cable routing too tight, or too loose.
2. Slide the Ethernet plug's (A) gland over the Ethernet cable (B).
3. Strip 25 mm insulation from the Ethernet cable (B).
4. Fit an RJ45 connector to the Ethernet cable (B). Use network cable pliers.
5. Insert the RJ45 connector into the Ethernet plug (A).
6. Tighten the cable gland's nut to secure the Ethernet cable.



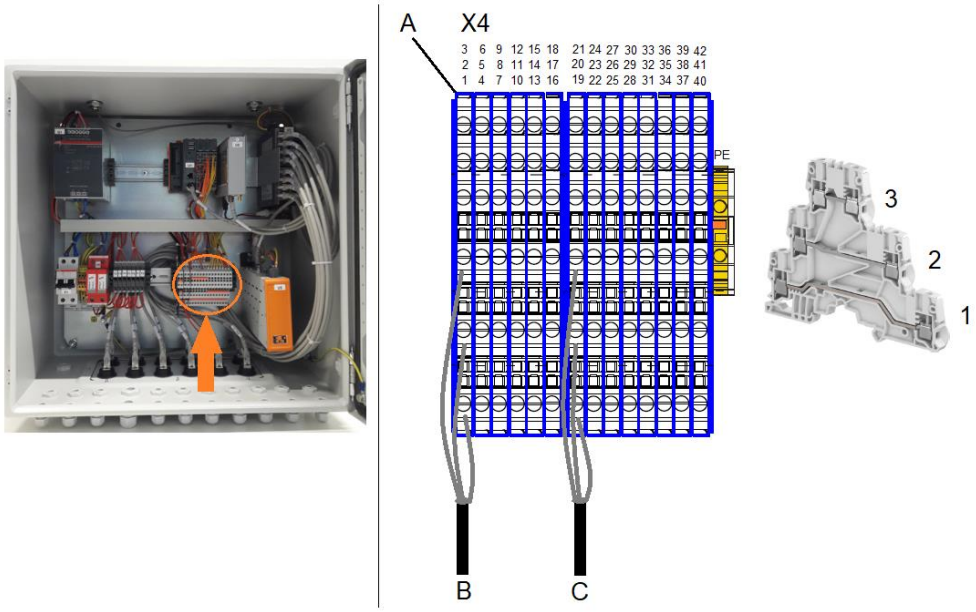
Bottom view

7. Remove the cover cap from the Ethernet connector at the bottom side of the EVSS Control.
8. Insert the Ethernet plug (A) into the right Ethernet connector (see picture above).

4.2.4. Connect the Digital I/O cables (future use)

Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.



1. Cut the Digital Input cable (B) and Digital Output cable (C) to the correct lengths to reach the connector block (A). Do not make the wire routing too tight, or too loose.
2. Strip the insulation from the Digital I/O cables (B and C).
3. Cut the wires of the Digital I/O cables to the correct lengths to reach the connectors.
4. Strip 11 mm of the insulation from the ends of the wires.
5. Crimp a ferrule onto the end of each wire.
6. Loosen the connector screws.
7. Insert the wires into the connectors, see table below:

Functional description	Connector	Wire number
GND	X4-1	Shield
Digital 1 In	X4-2	1
Digital 1 +	X4-3	2
GND	X4-4	Shield
Digital 2 In	X4-5	1
Digital 2 +	X4-6	2
GND	X4-7	Shield
Digital 3 In	X4-8	1
Digital 3 +	X4-9	2
GND	X4-10	Shield
Digital 4 In	X4-11	1
Digital 4 +	X4-12	2
GND	X4-13	Shield
Digital 5 In	X4-14	1
Digital 5 +	X4-15	2
GND	X4-16	Shield
Digital 6 In	X4-17	1
Digital 6 +	X4-18	2
GND	X4-19	Shield
Digital 1 Out	X4-20	1
Digital 1 -	X4-21	2
GND	X4-22	Shield
Digital 2 Out	X4-23	1
Digital 2 -	X4-24	2

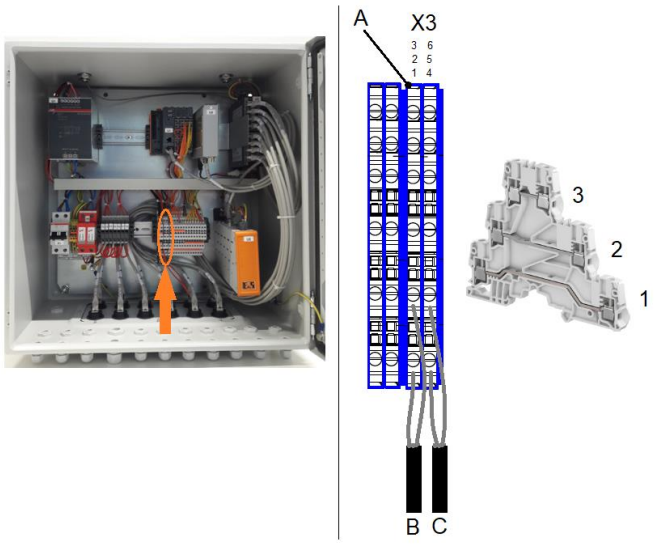
GND	X4-25	Shield
Digital 3 Out	X4-26	1
Digital 3 -	X4-27	2
GND	X4-28	Shield
Digital 4 Out	X4-29	1
Digital 4 -	X4-30	2
GND	X4-31	Shield
Digital 5 Out	X4-32	1
Digital 5 -	X4-33	2
GND	X4-34	Shield
Digital 6 Out	X4-35	1
Digital 6 -	X4-36	2

8. Tighten the connector screws of connector block (A) with a tightening torque of 1.3 N·m.

4.2.5. Connect the EMO and Cabinet CB cable (optional)

Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.



1. Remove the wire-bridge between connector X3-1 and X3-2 of connector block (A).
2. Cut the EMO cable (B) and Cabinet CB cable (C) to the correct lengths to reach the connector block (A). Do not make the wire routing too tight, or too loose.
3. Strip the insulation from the EMO cable (B) and Cabinet CB cable (C).
4. Cut the wires to the correct lengths to reach the connectors.
5. Strip 11 mm of the insulation from the ends of the wires.
6. Crimp a ferrule onto the end of each wire.
7. Loosen the connector screws.
8. Insert the wires into the connectors, see table below:

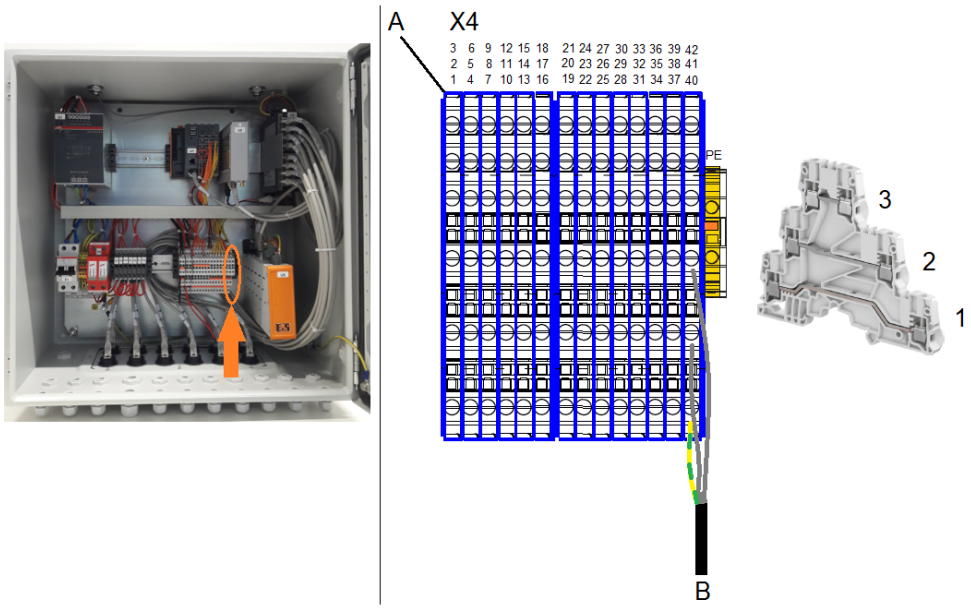
Functional description	Connector	Wire number
EMO S1 V+	X3-1	1
EMO S1 Return	X3-2	2
CB-UVR-V+	X3-4	1
CB-UVR-GND	X3-5	2

9. Tighten the connector screws of connector block (A) with a tightening torque of 0.6 N·m.

4.2.6. Connect the 24 V DC cable (optional)

Preconditions:

- Only use the 24 V DC connection for the external power measurement unit X20BS9400 when the distance between the EVSS Control and the power measurement unit is maximum 2 m.
- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.



1. Cut the 24 V DC cables (B) to the correct lengths to reach the connector block (A). Do not make the wire routing too tight, or too loose.
2. Strip the insulation from the 24 V DC cables (B).
3. Cut the wires of the 24 V DC cables (B) to the correct lengths to reach the connectors.
4. Strip 11 mm of the insulation from the ends of the wires.
5. Crimp a ferrule onto the end of each wire.
6. Loosen the connector screws.
7. Insert the wires into the connectors, see table below:

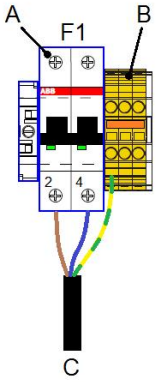
Functional description	Connector	Wire number
+24 V DC supply	X4-42	1
0 V DC supply	X4-41	2
GND supply	X4-PE	GND

8. Tighten the connector screws of connector block (A) with a tightening torque of 1.3 N·m.

4.2.7. Connect the AC Power Supply cable

Preconditions:

- Tools: wire cutter, wire stripper pliers, screwdriver, ferrules, crimp pliers.

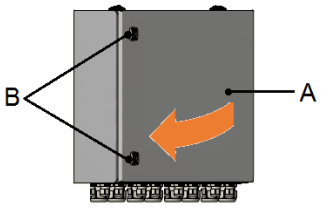


1. Strip the insulation from the AC power supply cable (C).
2. Cut the wires of the AC power supply cable (C) to the correct lengths to reach the connectors. Make sure the PE wire is longer than the other wires (it is recommended to make a loop in the PE wire).
3. Strip 11 mm of the insulation from the ends of the wires.
4. Crimp a ferrule onto the end of the wire.
5. Loosen the connector screws.
6. Insert the PE wire (green/yellow) into the one of the free connectors of connector block (B).
7. Tighten the connector screw of connector block (B).
8. Insert the other 2 wires into the connectors of circuit breaker (A):
   L (brown) => F1-2
   N (blue) => F1-4
9. Tighten the connector screws of circuit breaker (A) with a tightening torque of 1.3 N·m.

4.2.8. Close the door of the EVSS Control

Preconditions:

- Key that was removed from the EVSS Control.



1. Close the door (A)
2. Lock the lock (B).

5. Commissioning

The commissioning of the EVSS Control need to be performed by a certified ABB service engineer. The service engineer will need the support from the local contractor.

A commissioning cannot be started before installation completed of all charge systems, including the OPC UA kits installed in the chargers.

Before the service engineer can start, the following conditions must be met:

- All installation work is done.
- Grid power is available.
- A local technician is present for assistance and to switch the power on.

	CAUTION
	**Warranty** It is not permitted to move the whole or parts of the EVSS Control after the commissioning. If the whole or parts of the EVSS Control is moved without contacting the ABB Service department, the warranty will be considered void.

6. Service and Maintenance

Maintenance must be performed at regular intervals depending on use and ambient conditions, at least once annually and documented accordingly.

6.1. Service of the EVSS Control

To reduce the risk of fire, electric shock, or injury:

- Ensure that the appliance is fully assembled in line with the instructions before use.
- Do not operate any appliance with a damaged cable or plug. Discard the appliance or return to an authorized service facility for examination and/or repair. If the supply cable is damaged it must be replaced by ABB, its service agent or similarly qualified persons in order to avoid a hazard.
- If the appliance is not working as it should, has received a sharp blow, has been dropped, damaged, or dropped into water, do not use and contact ABB (see section *Contact information* on Page 10).

6.2. Cleaning of the cabinet

The triple surface protection of the EVSS Control enclosures provides optimum protection against corrosion and is resistant to mineral oils, lubricants, processing emulsions and solvents used for cleaning purposes, for example.

Nature and extent of the work to be performed:

- The door hinges are checked for ease of movement and sprayed with a suitable, water-free lubricant.
- The lock is checked for ease of movement. All moving closure parts are sprayed with a suitable, water-free lubricant.
- Gaskets in the contact edge area must be replaced completely if damaged. If the gasket is damaged outside the contact edges, the sealing effect is still sufficient as a rule.
- Common agents such as talcum, vaseline or wax can be used to prevent damage due to gaskets freezing because of low temperatures. All components and surfaces are examined for external damage.
- Steel enclosures are also inspected for traces of corrosion. Any damage is repaired as follows:
    - Damage to small areas that affect only a part of the surface (e.g. scratches): Lightly sand off the surface at the damaged place and remove all traces of corrosion as well as all contamination. Depending on the degree of damage, apply the Rittal touchup paint either with a paint stick, a brush or a spray paint can (alternative: 2K-PUR acrylic paint).
    - Large area damage: Sand off the surface uniformly and clean with white spirit; then paint over the entire surface with Rittal touch-up paint (alternative: 2K-PUR acrylic paint).

When cleaning is needed:

- Apply a neutral or weak alkaline cleaning solution and let it soak.
- Remove dirt by hand with a non-woven nylon hand pad.
- Do a check on the coating for damage.

	**CAUTION**
	Do not apply high-pressure water jets. Water may leak into the EVSS Control. - Only use cleaning agents with a pH value between 6 and 8. - Do not use cleaning agents with abrasive components. - Do not use abrasive tools.

7. Technical Specification

Data at T_a = 25 ºC, U_{in} = 230 V AC and rated values, unless otherwise indicated.

7.1. Electrical specification

Input	
Supply voltage	1-phase: PE, L, N
Input voltage range	230 V AC ± 10%
Input frequency range	47 - 63 Hz
Typical input current	1.55 A at 230 V AC
Typical power consumption	270 W
Power factor correction	0.75
Inrush current limiting	60 A (max. 5 ms) at 230 V AC
Internal input circuit breaker	10 A, Tripping Characteristic D
Rated Short-Circuit Capacity (I_{cn})	6 kA
Rated Ultimate Short-Circuit Breaking Capacity (I_{cu})	20 kA at 230 V AC
Digital Input	
Number of inputs	6
Connection type	1-wire connections
Nominal input voltage	24 V DC
Input characteristics per EN 61131-2	Type 1
Typical input current	3.75 mA at 24 V DC
Input circuit	Sink
Input filter	Hardware: ≤ 100 µs Software: default 1 ms, configurable between 0 and 25 ms in 0.2 ms intervals
Typical input resistance	6.4 kΩ
Switching threshold	Low: < 5 V DC High: > 15 V DC
Digital Output	
Number of outputs	6
Connection type	1-wire connections
Nominal output voltage	24 V DC
Switching voltage	24 V DC -15% / +20%
Nominal output current	0.5 A
Total nominal current	6 A
Output circuit	Source
Diagnostic status	Output monitoring with 10 ms delay
Leakage current when switched off	5 µA
$R_{DS(ON)}$	210 mΩ
Peak short-circuit current	< 12 A
Switch-on in the event of overload shutdown or short-circuit shutdown	Approx. 10 ms
Switching delay	0 → 1: < 300 µs at ≤ 1 kΩ 1 → 0: < 300 µs at ≤ 1 kΩ
Switching frequency	Max. 500 Hz at ≤ 1 kΩ resistive load
Braking voltage when switching off inductive loads	Typ. 50 V DC
Ethernet Interfaces	
Number of ports	12 RJ45
Transfer speed	10 / 100 Mbit/s
Transfer conditions	Twisted Pair, Cat 6
Transfer length	100 m
Switching technology	Store and Forward
Supported standards	IEEE 802.3
Frame Size	2000 bytes
MAC table size	8k entries
Packet buffer size	2 Mbit
Ethernet IP comparable	Yes
Wireless Interfaces	
Cellular interface	4G: 698-960 MHz, 1710–2690 MHz, 3400–3800 MHz
Transfer Rate (max)	21 Mbps down, 5.76 Mbs up

Gain	3.5 dBi at 2100 MHz
Polarization	Linear vertical
VSWR	< 2 : 1 at 2100 MHz
Approvals	PTCRB, Vodafone
SIM slots	Mini-SIM (2FF)

7.2. Mechanical specification

Dimensions (H x W x D)	583.0 x 500.0 x 306.0 mm
Weight	26.2 kg
Volume	0.084 m^3
Dimensions including packaging (H x W x D)	
Weight including packing	
Mechanical impact protection	IK08
Housing	Lacquered sheet steel 1.4301 (AISI 304)

7.3. Environment

Ingression protection	IP54
Temperature range – Operation	-25 ºC to +40 ºC
Temperature range – Storage	-40 ºC to +60 ºC
Humidity	5 % to 95 %, RH – non-condensing
Air pressure	2000 m (795 hPa)
Storage conditions	Indoors, dry

CAUTION

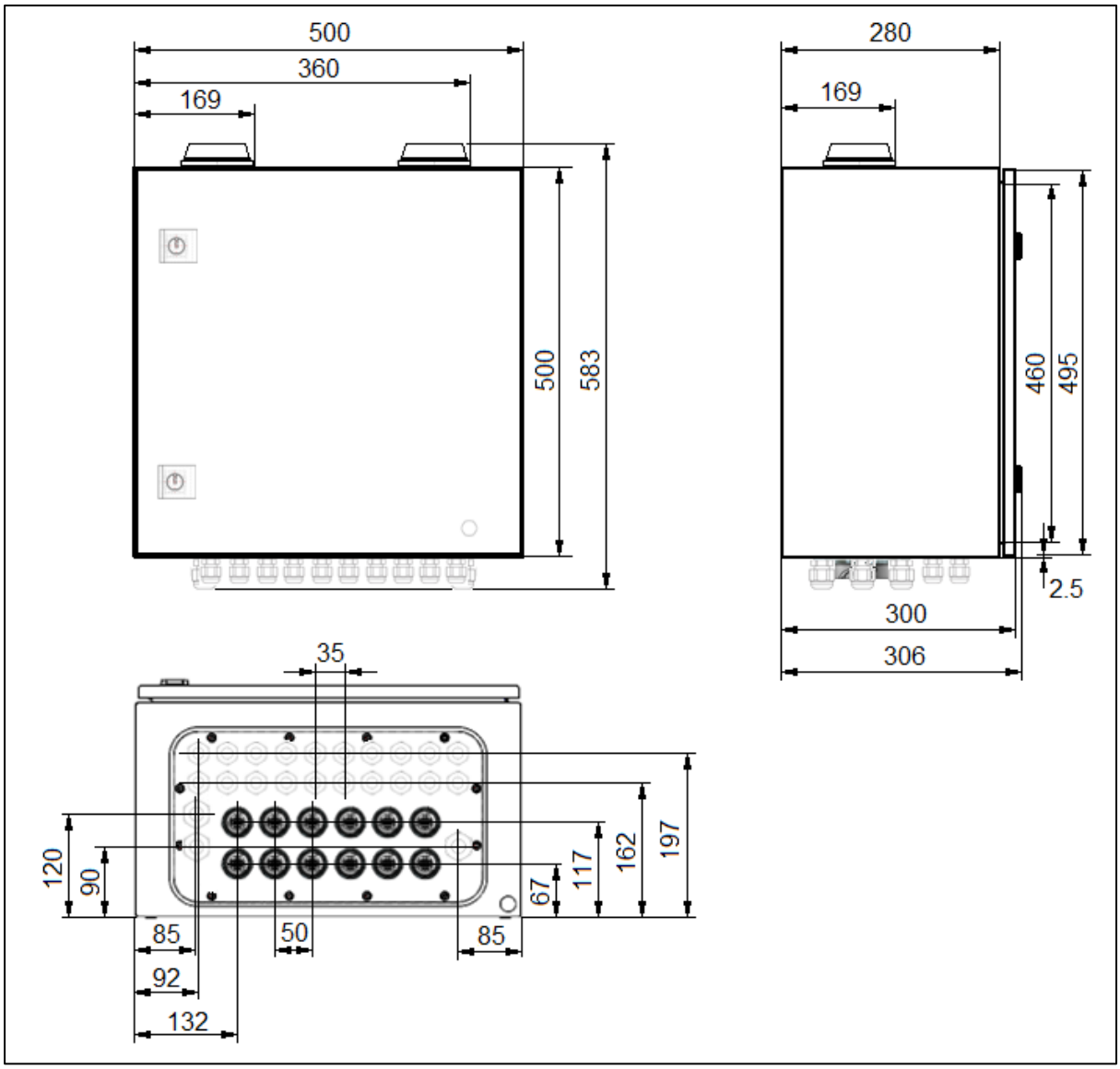
Warranty
Warranty will be considered void when the EVSS Control is damaged while badly stored at the customer's location.

7.4. Certifications

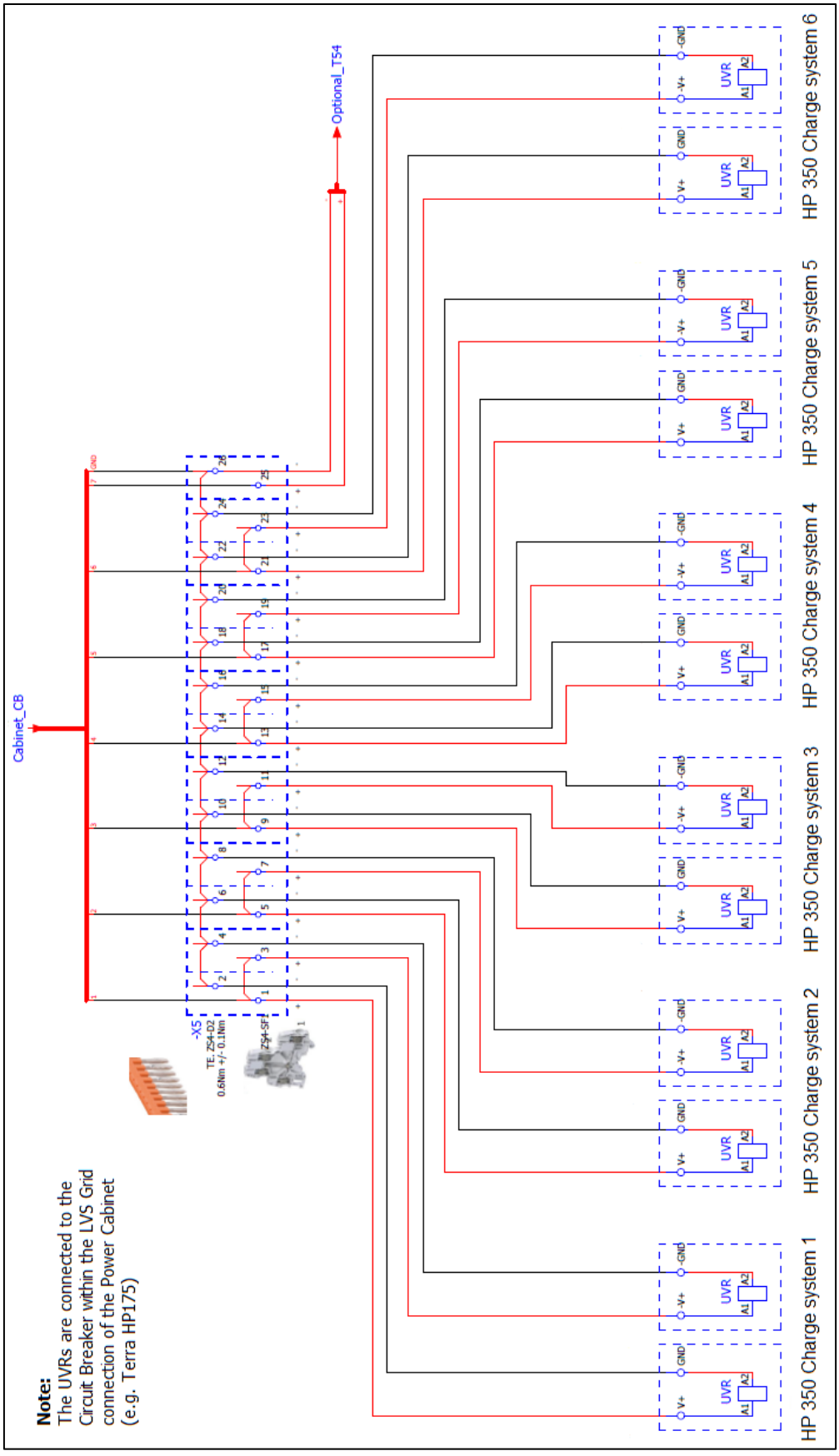
CE	EN-IEC 62368-1:2014 + AC:2015 + A11:2017 + AC:2017
	EN-60950-22 1:2006 + A11:2008 + AC:2009
Class of protection	1 with PE connection

8. **Appendix**

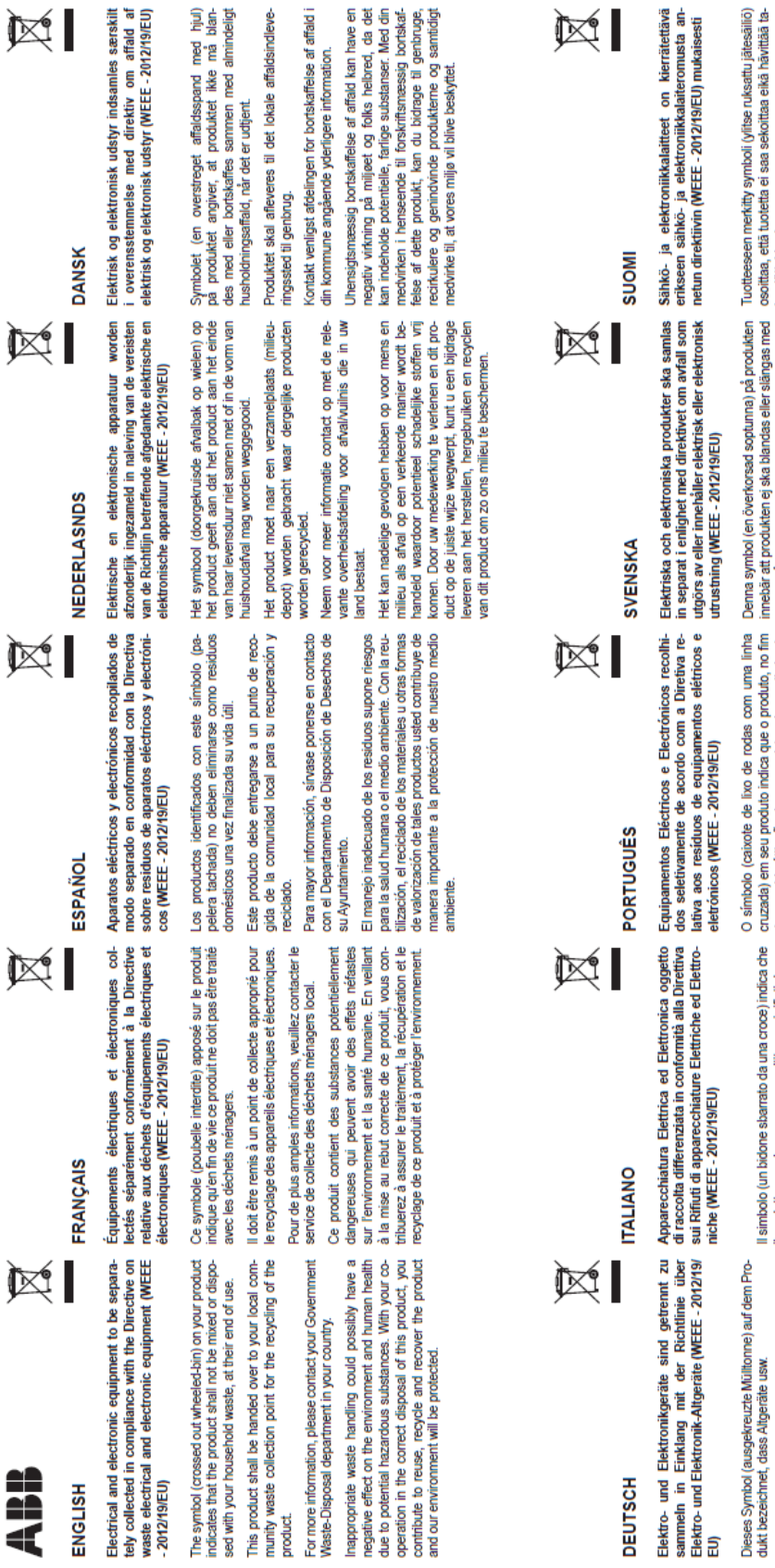
A. Dimensions EVSS Control



B. Signal connection diagram for UVR control



C. WEEE disposal – 2012-19/EU



ENGLISH

Electrical and electronic equipment to be separately collected in compliance with the Directive on waste electrical and electronic equipment (WEEE - 2012/19/EU)

The symbol (crossed out wheeled-bin) on your product indicates that the product shall not be mixed or disposed with your household waste, at their end of use.

This product shall be handed over to your local community waste collection point for the recycling of the product.

For more information, please contact your Government Waste-Disposal department in your country.

Inappropriate waste handling could possibly have a negative effect on the environment and human health due to potential hazardous substances. With your cooperation in the correct disposal of this product, you contribute to reuse, recycle and recover the product and our environment will be protected.

FRANÇAIS

Équipements électriques et électroniques collectés séparément conformément à la Directive relative aux déchets d'équipements électriques et électroniques (WEEE - 2012/19/EU)

Ce symbole (poubelle interdite) apposé sur le produit indique qu'en fin de vie ce produit ne doit pas être traité avec les déchets ménagers.

Il doit être remis à un point de collecte approprié pour le recyclage des appareils électriques et électroniques.

Pour de plus amples informations, veuillez contacter le service de collecte des déchets ménagers local.

Ce produit contient des substances potentiellement dangereuses qui peuvent avoir des effets néfastes sur l'environnement et la santé humaine. En veillant à la mise au rebut correcte de ce produit, vous contribuerez à assurer le traitement, la récupération et le recyclage de ce produit et à protéger l'environnement.

ESPAÑOL

Aparatos eléctricos y electrónicos recopilados de modo separado en conformidad con la Directiva sobre residuos de aparatos eléctricos y electrónicos (WEEE - 2012/19/EU)

Los productos identificados con este símbolo (papelera tachada) no deben eliminarse como residuos domésticos una vez finalizada su vida útil.

Este producto debe entregarse a un punto de recogida de la comunidad local para su recuperación y reciclado.

Para mayor información, sírvase ponerse en contacto con el Departamento de Disposición de Desechos de su Ayuntamiento.

El manejo inadecuado de los residuos supone riesgos para la salud humana o el medio ambiente. Con la reutilización, el reciclado de los materiales u otras formas de valorización de tales productos usted contribuye de manera importante a la protección de nuestro medio ambiente.

NEDERLANSDS

Elektrische en elektronische apparatuur worden afzonderlijk ingezameld in naleving van de vereisten van de Richtlijn betreffende afgedankte elektrische en elektronische apparatuur (WEEE - 2012/19/EU)

Het symbool (doorgekruiste afvalbak op wielen) op het product geeft aan dat het product aan het einde van haar levensduur niet samen met of in de vorm van huishoudafval mag worden weggegooid.

Het product moet naar een verzamelplaats (milieudepot) worden gebracht waar dergelijke producten worden gerecycled.

Neem voor meer informatie contact op met de relevante overheidsafdeling voor afval/vuilnis die in uw land bestaat.

Het kan nadelige gevolgen hebben op voor mens en milieu als afval op een verkeerde manier wordt behandeld waardoor potentieel schadelijke stoffen vrij komen. Door uw medewerking te verlenen en dit product op de juiste wijze weg werpt, kunt u een bijdrage leveren aan het herstellen, hergebruiken en recyclen van dit product om zo ons milieu te beschermen.

DANSK

Elektrisk og elektronisk udstyr indsamles særskilt i overensstemmelse med direktiv om affald af elektrisk og elektronisk udstyr (WEEE - 2012/19/EU)

Symbolet (en overstreget affaldsspand med hjul) på produktet angiver, at produktet ikke må bland-des med eller bortskaffes sammen med almindeligt husholdningsaffald, når det er udtjent.

Produktet skal afleveres til det lokale affaldsindleveringssted til genbrug.

Kontakt venligst afdelingen for bortskaffelse af affald i din kommune angående yderligere information.

Uhensigtsmæssig bortskaffelse af affald kan have en negativ virkning på miljøet og folks helbred, da det kan indeholde potentielle, farlige substanser. Med din medvirken i henseende til forskriftsmæssig bortskaffelse af dette produkt, kan du bidrage til genbruge, recirkulere og genindvinde produkterne og samtidigt medvirke til, at vores miljø vil blive beskyttet.

DEUTSCH

Elektro- und Elektronikgeräte sind getrennt zu sammeln in Einklang mit der Richtlinie über Elektro- und Elektronik-Altgeräte (WEEE - 2012/19/EU)

Dieses Symbol (ausgekreuzte Mülltonne) auf dem Produkt bezeichnet, dass Altgeräte usw.

nicht wie normaler Haushaltsabfall in den Müll gegeben werden dürfen, sondern zum Recycling an einer hierfür vorgesehenen Annahmestelle abzugeben ist.

Für nähere Informationen wenden Sie sich bitte an die für Müllentsorgung zuständigen örtlichen Behörden.

Bei unsachgemäßer Entsorgung besteht das Risiko nachteiliger Auswirkungen auf Umwelt und Gesundheit durch potentiell gefährliche Substanzen. Durch Ihre Kooperation zur ordnungsgemäßen Entsorgung fördern Sie die Wiederverwendung, das Recycling und die Rückgewinnung von Stoffen und tragen zum Umweltschutz bei.

ITALIANO

Apparecchiatura Elettrica ed Elettronica oggetto di raccolta differenziata in conformità alla Direttiva sui Rifiuti di apparecchiature Elettriche ed Elettroniche (WEEE - 2012/19/EU)

Il simbolo (un bidone sbarrato da una croce) indica che il prodotto non deve essere smaltito con i rifiuti domestici, alla fine della sua vita.

Questo prodotto deve essere consegnato al punto di raccolta rifiuti della propria comunità locale per il suo riciclaggio.

Per ulteriori informazioni, rivolgersi all'organo statale preposto allo smaltimento dei rifiuti nel proprio paese.

Uno smaltimento dei rifiuti inappropriato può avere effetti negativi sull'ambiente e sulla salute umana a causa di sostanze potenzialmente pericolose. Collaborando allo smaltimento corretto di questo prodotto, si contribuisce al nutilizzo, al riciclaggio e al recupero del prodotto, e alla protezione del nostro ambiente.

PORTUGUÊS

Equipamentos Eléctricos e Electrónicos recolhidos seletivamente de acordo com a Diretiva relativa aos resíduos de equipamentos elétricos e eletrónicos (WEEE - 2012/19/EU)

O símbolo (caixote de lixo de rodas com uma linha cruzada) em seu produto indica que o produto, no fim da sua vida útil, não deve ser misturado ou eliminado com o lixo doméstico comum.

Este produto deverá ser entregue a uma estação de recolha de lixo da comunidade local para a reciclagem do produto.

Para mais informações, entre em contacto com o Departamento de Tratamento de Lixo do Governo do seu país.

O tratamento de lixo incorrecto poderia provocar um efeito negativo no meio ambiente e saúde humana devido a substâncias potencialmente perigosas. Com a sua cooperação para a eliminação correcta deste produto, contribuirá para a reutilização, reciclagem e recuperação do produto, e nosso meio ambiente será protegido.

SVENSKA

Elektriska och elektroniska produkter ska samlas in separat i enlighet med direktivet om avfall som utgörs av eller innehåller elektrisk eller elektronisk utrustning (WEEE - 2012/19/EU)

Denna symbol (en överkorsad soptunna) på produkten innebär att produkten ej ska blandas eller slängas med ditt hushållsavfall när den är förbrukad.

Produkten ska lämnas till en lokal insamlingsplats för denna slags produkter för återvinning.Kontakta kommunkontoret för närmare detaljer om var du finner sådana insamlingsplatser.

Olämplig avfallshantering kan få negativa effekter på miljön och på mänsklig hälsa då en produkt kan innehålla farliga ämnen.

Vi ber om ditt samarbeta i bortskaffningen av denna produkt för att bidra till återvinning, återanvändning och en hälsosammare miljö.

SUOMI

Sähkö- ja elektroniikkalaitteet on kierrätettävä erikseen sähkö- ja elektroniikkalaiteromusta annetun direktiivin (WEEE - 2012/19/EU) mukaisesti

Tuotteeseen merkitty symboli (yritse ruksattu jätesäiliö) osoittaa, että tuotetta ei saa sekoittaa eikä hävittää talousjätteiden kanssa.

Tuote on luovutettava sopivaan tällaisten laitteiden kierrätyksestä huolehtivaan keräyspisteeseen.

Pyydä lisätietoja jäteasioista vastaavilta paikallisilta viranomaisilta.

Tämän tuotteen asianmukaisen hävittämisen varmistamisella autetaan estämään sen mahdolliset ympäristöön ja terveyteen kohdistuvat haittavaikutukset, jotka voi aiheutua muussa tapauksessa tämän tuotteen epäasianmukaisesta käsittelystä. Hävittämällä tuotteen asianmukaisesti autat varmistamaan, että tuote uudelleenkäytetään, kierrätetään ja kerätään ja ympäristöä suojellaan.

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NOTES