ABB Kabeldon grid connection of EV charger

Installation of Kabeldon outdoor distribution board and charger in Glumslöv, Sweden.

Customer gets in contact with contractor and ABB to install a new charger

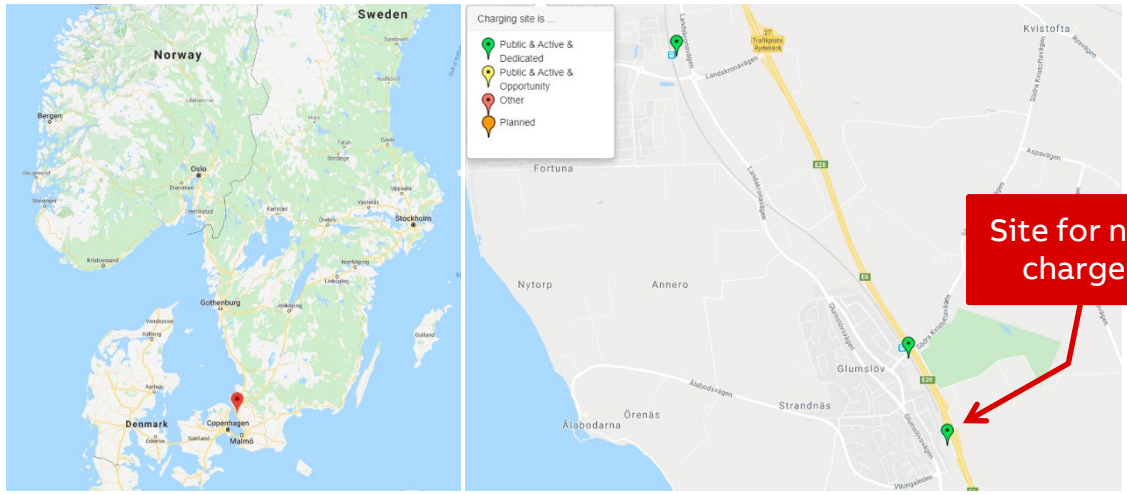
The owner of a petrol station together with EV-charger service provider (referred to as customer in this case) have identified a business potential by installing an EV charger along the highway.

The customer gets in contact with contractor who gets in contact with ABB for advice on products to use.

One charger is requested to begin with. However in future there might be a need for more so the solution should allow expansion.

A 50kW DC fast charger is selected as the most suitable charger.

- Selection guide available on new.abb.com/ev-charging



Public and commercial EV Charging			
AC destination	DC destination	DC (and AC) Fast	DC High Power
3-22 kW	20-25 kW	Up to 50 kW	150 to 350 kW+
4-16 hours	1-3 hours	20-90 min	10-20 min
			
– Office, workplace – Home – Multi-family housing – Hotel and hospitality – Overnight fleet – Supplement at DC charging sites for PHEVs	– Office, workplace – Hotel and hospitality – Parking structures – Dealerships – Urban fleets – Public or private campus – Sensitive grid applications	– Retail, grocery, mall, big box, restaurant – High turnover parking – Convenience fueling stations – Highway truck stops and travel plazas – OEM R&D	– Highway corridor travel – Metro “charge and go” – Highway rest stops – Petrol station areas – City ring service stations – OEM R&D

Site investigation

There is an existing CSS approximately 50m from the new charger location. The CSS is today feeding the restaurant and gas station.

The CSS is owned by the utility in the area. The customer, the future owner of the charger, gets in contact with the utility to verify that there are still capacity to feed a new 50kW charger.

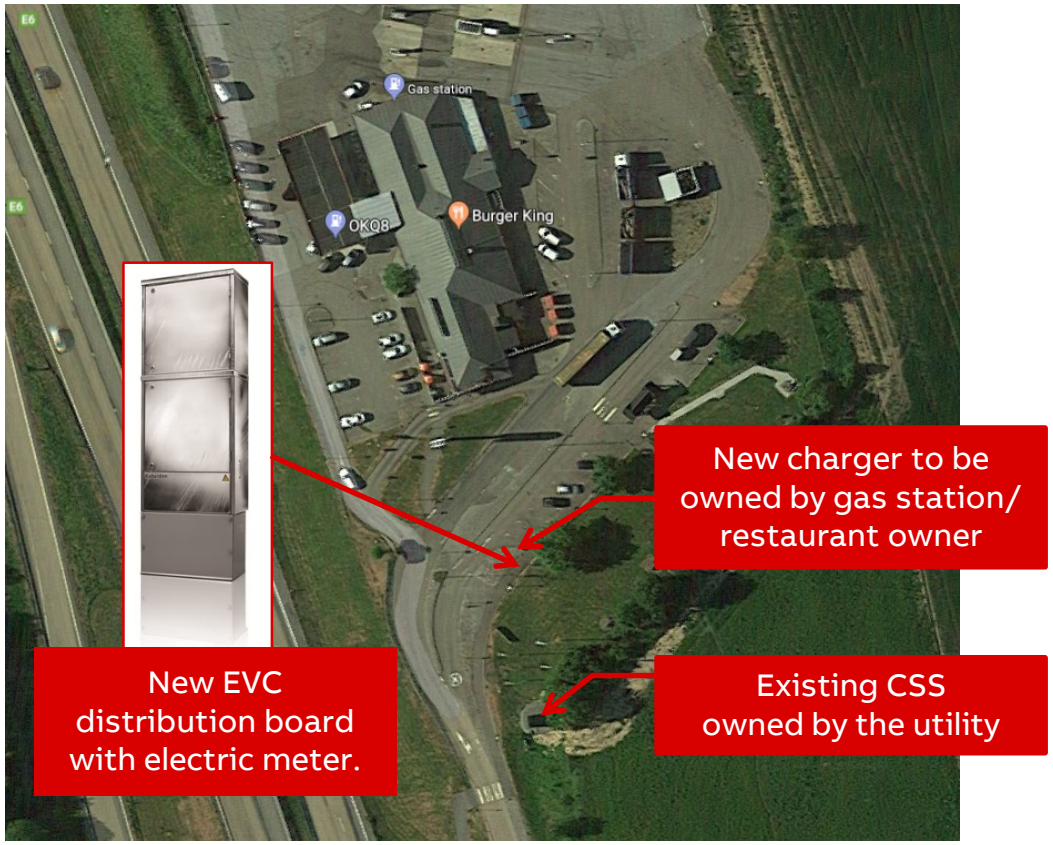
EVC distribution board installed to enable utility prescription and placement for electric meter

The charger power consumption needs to be measured by the utility.

- **The easiest solution** is to install an ABB Kabeldon outdoor distribution board beside the charger with a new main switch and a new electric meter.
- **An alternative** could be to connect the charger downstream to an existing electrical meter in the gas station. However that would require:
  - Access to the buildings
  - New bigger main switch
  - Long cables and digging across the road

The ownership defines the solution

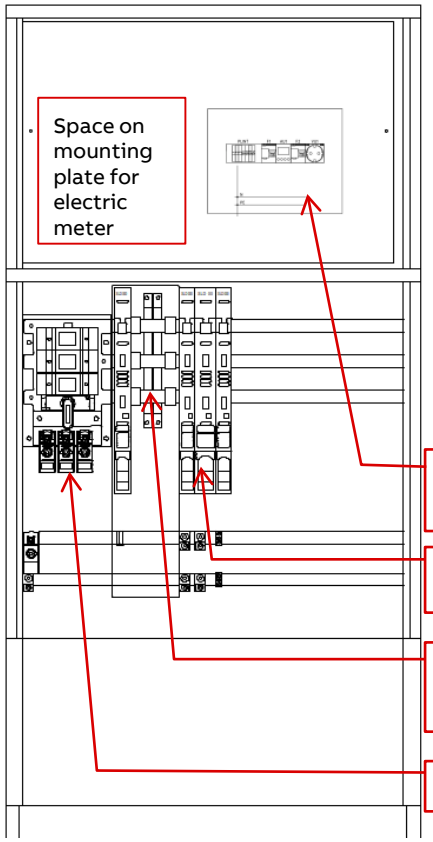
- To connect the charger directly to the CSS is not an option since the customer who will own the charger and the main switch board is not allowed to enter the CSS, owned by the utility.
- The delivery point from utility to customer will be at the main switch terminals in the distribution board.
- The cable from the CSS to the distribution board will be installed and owned by the utility.



Designing the ABB Kabeldon outdoor distribution board

ConnectIT software is used to make the planning and generate bill of material, front sketch and single line diagram for the Kabeldon distribution board. The software is available for free, link.

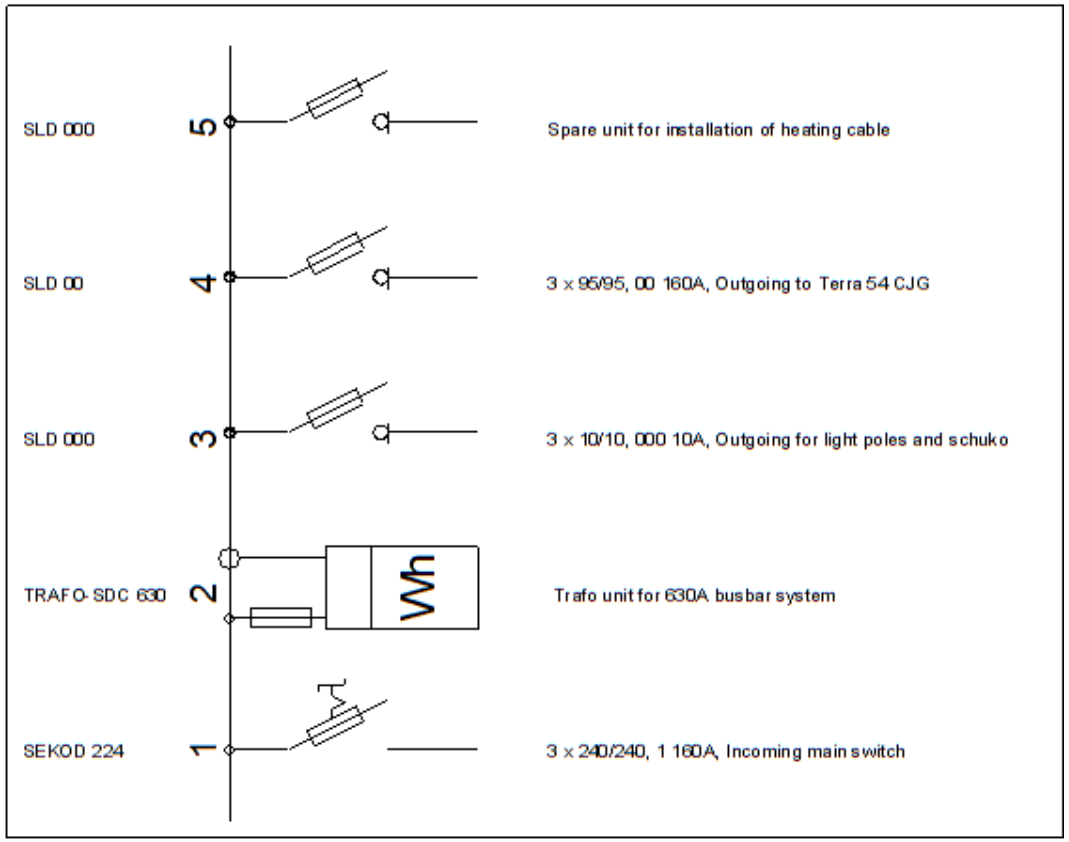
- The selected charger is a Terra 54 CJG. Maximum required current is specified in the data sheet to 143A.
- On the Swedish market it is required to use a main switch with independent manual operation in a service enclosure. For this ABB Kabeldon has an adapter to mount OS-switch to the Kabeldon busbar system.
- The customer wants a feeder for light poles and an advertising sign beside the charger. This should be controlled by an astronomical time switch and protected by an RCB (Residual Current Breaker). A 230V schuko socket is also wanted in the distribution board. This equipment is installed in an enclosure mounted in the upper compartment of the distribution board.
- Empty space is left on the right side of the cabinet for possible future installation of more chargers.



Bill of material	Data sheet
Enclosure w. 400A busbars	SDCM 473
Main switch 224A	SEKOD 224
Trafo unit	TRAFO-SD 630
Outgoing max 100A NH 000	SLD 000
Outgoing max 160A NH 00	SLD 00
Insulated terminal 50-300mm2	ADI 300
Uninsulated terminal 6-95mm2	ADU 95

Technical details of the distribution board

1. Incoming cable from CSS is 3x240/240mm^2 connected to main switch SEKOD 224 with independent manual operation.
2. The busbars are cut and prepared for the utility CTs for the electrical meter, TRAFO-SDC 630 is used.
3. SLD 000 with 10A fuse is used to feed the street light and schuko socket in the upper compartment of the enclosure.
4. SLD 00, with 160A fuse is used to feed the Terra 54 charger. The cable used is an AL 3x95/95.
5. One spare SLD 000 is installed. In some cases this is used for installation of heating cable.

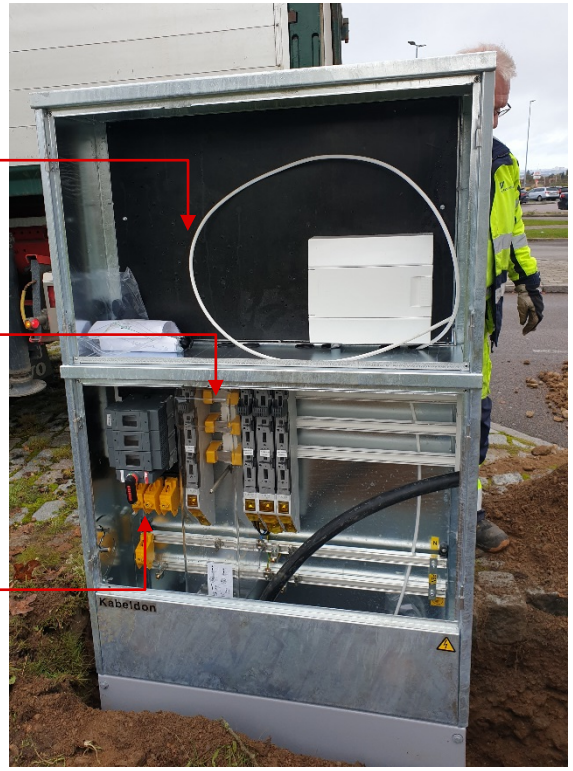


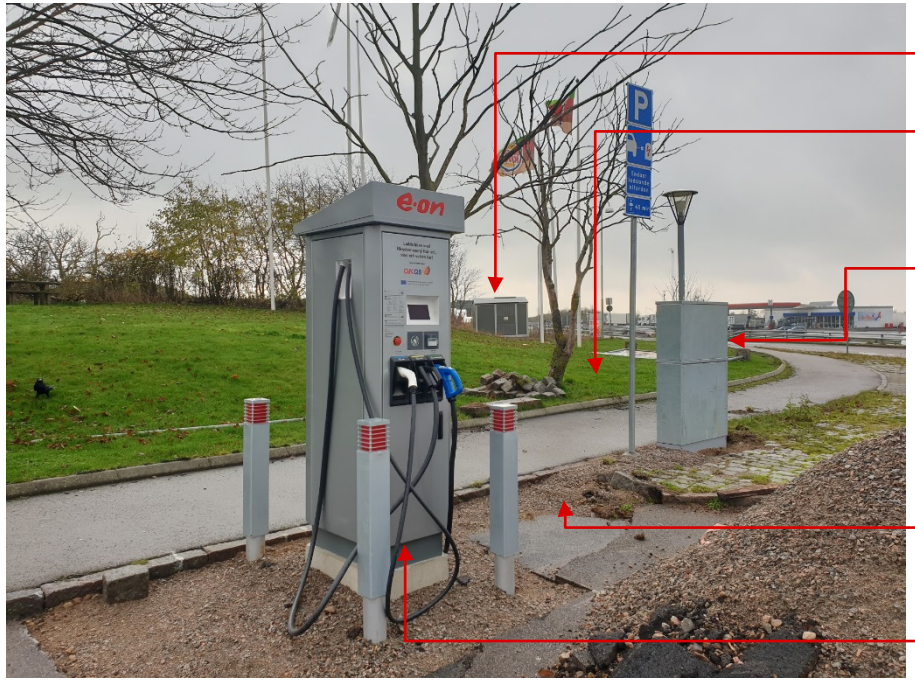
The distribution board is owned by the charger customer.
The hand over point for the utility is at the main switch terminals.

Place for utility electrical meter

Place for utility CTs

Main switch terminals. Hand over point from utility to customer.





Utility CSS

Utility cable

Customer distribution board

Customer cable

Customer EV-charger

Installation on site

Installation procedure

1. The Kabeldon distribution board is delivered to contractor pre-mounted from factory
2. Putting charger and distribution board in place
    1) Contractor arrives with the charger, charger foundation, distribution board and machinery for lifting and digging
    2) Digging the ground for charger, distribution board and cables between them
    3) Lifting the equipment in place
    4) Closing the ground
3. Electrician does the electrical installation in charger, light poles and distribution board
4. Digging the cable from CSS to distribution board
5. Utility electrician does the connection in the CSS
6. ABB service does the charger configuration and final check

Installation on site

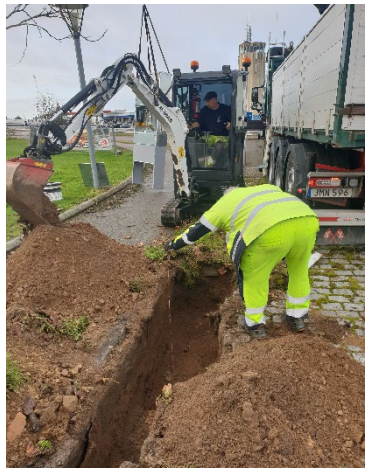


ABB Kabeldon standardized outdoor distribution boards

ABB Kabeldon standardized outdoor distribution boards

Most EV charger sites have the same requirement for power distribution. ABB Kabeldon have therefore standardized and pre-mounted a distribution board for each type of charger.

The distribution board is delivered with main switch fuse, transformer kit for CTs and mounting plate for electrical meter installed from factory.

All you need to do is to install the electrical meter with CTs and add the right number of outgoing Kabeldon fuse switch disconnectors for the number of chargers to be installed.

This makes it safe, quick and easy for the installer.

Read more on our web page for EV charger distribution boards, link.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