

# ENGINEERING AND SAFETY

Agreements regarding the technical functioning of charging stations, e.g. grounding and data connection.

Sub-category	ID	Subject description	Guideline description	Required; Desired*	Priority**	Comments
Grounding	TV1	Overcurrent and short-circuit protection	Each charging station is protected against overcurrent and short circuit. This protection is selective with that of the grid connection.	Required	Include	
Grounding	TV2	Grounding	The charging station and all accompanying components, including the door, are visibly grounded. In the event that the door needs to be removed, enough wire has been used to get the door out of the way. In consultation with the grid operator, it is possible to connect the ground of the charging station to the zero of the electricity grid; however, in all cases, the responsibility for installing the charging station lies with the contractor. The contractor shall therefore decide for itself whether an earthing electrode is required.	Required	Include	If an earthing electrode is driven, the following conditions and regulations apply: <ol style="list-style-type: none"> <li>1. The resistance of the earthing electrode must not exceed 167 ohms (in accordance with NEN 1010).</li> <li>2. The earthing electrode is connected to the charging station using a ground wire.</li> <li>3. Results of the earth measurement are recorded in the handover document.</li> <li>4. The earthing electrode must be driven as close to the charging station as possible.</li> <li>5. The KLIC report is used to determine the position of the ground connection pin. If cables or pipelines are struck when driving the earthing electrode, the contractor shall be responsible for any consequences of this; this includes handling any damages and compensating any costs. In addition, such a situation must be reported immediately to the client.</li> </ol>
Charging	TV3	The charging station communicates active status changes	The charging station communicates active status changes of errors that occur in at least the following components (more components are allowed): <ul style="list-style-type: none"> <li>- RCD (earth leakage protection);</li> <li>- Excess current protection;</li> <li>- Relay;</li> <li>- kWh-meter;</li> <li>- Plug lock;</li> <li>- RFID Reader.</li> </ul>	Desired	Include	

For \* and \*\*: definitions on page 7.

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Sub-category	ID	Subject description	Guideline description	Required; Desired*	Priority**	Comments
Technology	TV4	Charging area possible	The charging station is prepared for any potential future inclusion in a charging area arrangement. In such an arrangement, several charging stations of the same type use one and the same grid connection. The distance between the charging stations must be at least 10 metres.	Desired	Recommended	Future guideline.
Technology	TV5	Loss of communication connection	Upon losing the communication connection, the charging station shall actively try to restore it; for example, by resetting the modem. As long as there is no connection, the charging station will continue to repeat these recovery attempts.	Desired	Recommended	Future guideline.
Technology	TV6	Communication history	In the event of a data connection failure between the charging station and the back office system, for whatever reason this may occur, all transaction-related events should be saved locally and sent to the back office system when the connection is restored, with the time stamp of when the event took place.	Desired	Recommended	Future guideline.
Technology	TV7	Offline history	Transactions that take place during the absence of a data connection between charging station and the back office system should be checked for legality as soon as the connection is restored. Should it appear that an illegal transaction is taking place (such as with a blocked debit or credit card), charging will terminate as soon as the data communication is restored. (The transaction can remain open and the cable should be locked in place until the user logs out; after this, the transaction will be closed.)	Desired	Recommended	Future guideline.
Technology	TV8	Date and time	In the event of a power failure or loss of communication, the charging point keeps track of the time and date for a minimum of seven days.	Desired	Recommended	Future guideline.
Technology	TV9	Unique charging object number	Each charging station has a unique charging station number.	Required	Include	

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Sub-category	ID	Subject description	Guideline description	Required; Desired*	Priority**	Comments
Safety	TV10	PWM coordination	The charging station never gives a PWM duty cycle that implies a higher charge current than the maximum charge current permitted by general safety, the grid connection and the charge cable being used.	Desired	Recommended	Future guideline.
Safety	TV11	NEN 1010 standard earth-leakage circuit breakers	Earth-leakage circuit breakers shall comply with the NEN 1010 standard.	Required	Include	To ensure that all types of car models can be charged, this must be taken into account when selecting the earth-leakage circuit breaker.
Safety	TV12	Earth leakage protection	Every charging station is equipped with an individual 4-pole 30 mA earth leakage protection system of at least Type A, which only turns off the live parts of the relevant charging point in the case of undesired leakage currents.	Required	Include	
Safety	TV13	Detection and deactivation of direct current feedback	Within each charging point, detection and shut-off of direct current return takes place when it is greater than 6 mA (not necessarily through an RCD Type B).	Required	Include	
Safety	TV14	Testing and certification of charging stations	Charging stations should be tested and, if available, certified before installation.	Desired	Include	Charging stations are tested by Elaad, among others. Certification is not yet available at this time.
Safety	TV15	New technological developments	If new technological developments become available, it must be possible to include this as a change in the agreements with the contractor.	Desired	Include	
Safety	TV16	Interruption of a transaction in the case of incorrect power consumption	The charging station measures/reads the current drawn by the vehicle per phase. If the power exceeds the value as indicated by the PWM signal by more than 10%, the charging station turns the power off, or tries to adjust the consumed power using PWM modulation. The charging process can also be restarted within the same transaction.	Required	Recommended	Advice: try X times (e.g. 3) to reduce power or restart charging session. Future guideline.
Property rights	TV17	Free from property rights	All charging systems and their associated systems are free from property rights as regards both hardware and software.	Desired	Include	

For \* and \*\*: definitions on page 7.