Installation and Operating Manual
FENECON Industrial L

Fully-equipped variant

(Item no.: ILK 7101/ILK 7111)

Table of contents

1. Information on these operating instructions

These operating instructions are an integral part of the Battery energy storage system and must be kept in its immediate vicinity and accessible to personnel at all times. Furthermore, all documents listed in the appendix to these operating instructions and the operating instructions of the component manufacturers must be observed.

Personnel must have carefully read and understood these operating instructions before starting any work.

1.1. Manufacturer

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1.2. Formelles zur Betriebsanleitung

1.3. Version/revision of the operating instructions

Version/revision	Change to installation and service instructions	Date	Name
V0	First draft	23.05.2023	FENECON GmbH
V20240209	Release	09.02.2024	FENECON GmbH
V20241001	Publication on docs.fenecon.de	30.09.2024	FENECON PM
V20241128	Supplement to the fire detection system, construction status AA5 and the fully-equipped delivery variant	28.11.2024	FENECON MR

Table 1. Version/revision

1.4. Darstellungskonventionen

Representation	Description
"Hervorhebung"	Hervorhebung besonderer Begriffe im Text
[Taster]	Bedien- und Anzeigeelement (z. B. Taster, Signalleuchte)
>>Schaltfläche<<	Schaltfläche und Visualisierung (z. B. Taster, Signalleuchte)
→	Verweis auf Kapitel/Abschnitte dieser Anleitung oder auf Mitgeltende Dokumente (→ Kapitel [Technische Daten])

Table 2. Darstellungskonventionen

	This signal word indicates an imminent danger. If this danger is not avoided, it will result in death or serious injury.
	This signal word indicates a possible danger. If this danger is not avoided, it can lead to death or serious injury.
	This signal word indicates a potentially dangerous situation. If this dangerous situation is not avoided, it may result in minor or moderate injury.
	This signal word indicates actions to prevent damage to property. Observing these instructions prevents damage to or destruction of the system.
	Supplementary information

Table 3. Symbol conventions — Signal words

1.5. Structure of warning notices

If observed, warnings protect against possible personal injury and damage to property and use the signal word to classify the magnitude of the danger.

Warnings are structured according to the SAFE method:

Signal word	Meaning
S	Signal word (DANGER, WARNING, CAUTION or NOTE)
A	Type and source of danger Description of the hazard and the cause of the hazard
F	Consequence Description of the possible consequences for humans, animals and the environment that may result from the hazard
E	Escape Recommendations on how hazards can be avoided

Table 4. SAFE method

Quelle der Gefahr
Mögliche Folgen bei Nichtbeachtung.

- Maßnahmen zur Vermeidung/Verbote.

1.6. Terms and abbreviations

The following terms and abbreviations are used in the installation and service instructions:

Term/Abbreviation	Meaning
AC	Alternating Current
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
Slide-in battery modules	Steel frame in which 3 battery modules are installed and wired.
BMS	Battery Management System
FACP	Fire alarm control panel
CMB	Current Measurement Board
CSC	Cell Supervisor Circuit
DC	Direct Current
EMS	Energy Management System
FEMS	FENECON Energiemanagementsystem
IBN	Commissioning
MCB	Circuit breaker
GCP	Grid Connection Point
NC	Normally Closed (NC) — normally closed/ normally closed contact
NMC	Nickel-Manganese-Cobalt
PE	Protective conductor
PV	Photovoltaic
RCD	Residual Current Device — Residual current device
RTE	Round-Trip-Efficiency — System efficiency Ratio of discharged to charged energy.
SoC	State of Charge — State of Charge The available capacity in a battery, expressed as a percentage of the nominal capacity.
VDE	German Association for Electrical, Electronic & Information Technologies e. V.
Widget	Component of Online Monitoring

Table 5. Terms and abbreviations

1.7. Anhang zu diesem Dokument

Alle im Anhang dieser Betriebsanleitung aufgelisteten Dokumente sind zu beachten.
Vgl. Abschnitt: Mitgeltende Dokumente.

1.8. Availability

Der Betreiber bewahrt diese Betriebsanleitung bzw. relevante Teile davon griffbereit in unmittelbarer Nähe zum Produkt auf.

Bei der Abgabe des Produktes an eine andere Person gibt der Betreiber diese Betriebsanleitung an diese Person weiter.

1.9. Scope of delivery

Pos.	Component	Number	Comment
1	Container incl. climate control unit + cabling and optional fire detection system	1	
2	Inverter — KACO bp 92.0 TL3-S	8	
3	Inverter rack	1	
4	Transport rail	2	Back to FENECON
Variant — Fully equipped			
7	Help	4	Return to FENECON

Table 6. Scope of delivery

Further instructions for individual components of the storage system (e. g. inverters) can be found on the FENECON website in the Download Center.

2. Security

2.1. Any other use is not an intended use

The FENECON Industrial L is an industrial energy storage system consisting of various modules. In particular, these include efficient inverters, the FENECON Energy Management System (FEMS) and slide-in battery modules including a BMS. The FENECON Energiemanagementsystem large-scale Industrial L system is offered with an inverter output of 736 kVA and a capacity of 1288 kWh. The energy storage system is used to store and supply electrical energy and is intended for connection to the 400 V/50 Hz low-voltage grid.

Any other use is not an intended use.

2.2. Field of application

The product is intended exclusively for use in the following areas of application:

- Industrial sector

Any other use is not in accordance with the intended use.

2.3. Qualification of the staff

Qualified personnel must be deployed for the intended use, installation and maintenance of the system. The area of responsibility, competence and supervision of the personnel must be precisely regulated by the operator.

2.3.1. Elektro-Fachpersonal

Zu Elektro-Fachpersonal zählen Personen, die:

- are able to carry out work on electrical systems due to their technical training, experience and knowledge of the relevant standards and regulations.
- have been commissioned and trained by the operator to carry out work on electrical systems and equipment of the battery system.
- are familiar with how the battery system works.
- recognize hazards and prevent them by taking appropriate protective measures.
- Have access to all maintenance information.

2.3.2. Service staff

Work that goes beyond connecting the system may only be carried out by the manufacturer’s specialist personnel. Other personnel are not authorized to carry out this work.

Service personnel includes: Manufacturer personnel or specialist personnel instructed and authorized by FENECON GmbH who must be requested by the operator to work on the electrical energy storage system (e. g. assembly, repair, maintenance, work on the batteries, etc.).

2.4. Safety and protective equipment

The safety devices must not be bypassed or switched off. Operating the electrical energy storage system without or with defective protective devices is prohibited. The safety devices must always be kept within easy reach and checked regularly.

2.4.1. Sheet metal covers

All access points to the electrical energy storage are closed with sheet metal covers. Access is only possible with tools. Only authorized specialist personnel must open the housing. During operation, only the sheet metal cover with the inscription "control cabinet" must be opened by personnel authorized by the manufacturer.

2.4.2. Emergency stop switch for the HV battery

Der Stromspeicher ist mit einem HV-Batterie Not-Aus-Schalter ausgestattet. Der HV-Batterie Not-Aus-Schalter befindet sich im Innenraum des Stromspeichers. Falls es seitens des Betreibers erforderlich sein sollte, besteht die Option einen externen HV-Batterie Not-Aus-Schalter zu installieren. Weitere Informationen sind im Abschnitt Control Cabinet enthalten. In Notsituationen können die Batterien über den HV-Batterie Not-Aus-Schalter abgeschaltet werden. Der HV-Batterie Not-Aus-Schalter darf nicht zum ordnungsgemäßen Ausschalten der Batterien verwendet werden.

Pressing the emergency stop button

Pressing the emergency stop button triggers the following reaction:

- Die HV-Schütze in allen Batterien werden zwangsgeöffnet. Dadurch wird die Batteriespannung vom Zwischenkreis getrennt.

Once the emergency situation has been rectified, the emergency stop button must be unlocked before the system is switched on again.

Unlocking the emergency stop button

The emergency stop button must be unlocked before switching back on after an emergency stop has been triggered:

Acknowledge emergency stop

The emergency stop is acknowledged at the acknowledge button on the emergency stop switch.

Des Weiteren besteht die Option einen externen Quittier-Taster zu installieren, weitere Informationen sind im Abschnitt [Anschlussbelegung — Kommunikationsanschlussbox] enthalten.

2.4.3. Equipotential bonding inside/outside

Der Stromspeicher verfügt über vier Potentialausgleichsanschlüsse, die sich unten an den vier Ecken befinden. Zudem befinden sich im Inneren des Speichers definierte Anschlussbolzen, an denen der Potentialausgleich der Komponenten hergestellt werden muss. Für weitere Infos beachten Sie bitte den Abschnitt [Montage].

2.4.4. Optional fire alarm system

The FENECON Industrial L is available with a built-in and checked, optional fire alarm system. Maintenance and service work on the fire alarm system must only be carried out by authorized specialist personnel.

In the event of an alarm or fault, contact the FENECON service personnel.

To restart the system after a false alarm/fault, the fire detection system must be acknowledged on site.

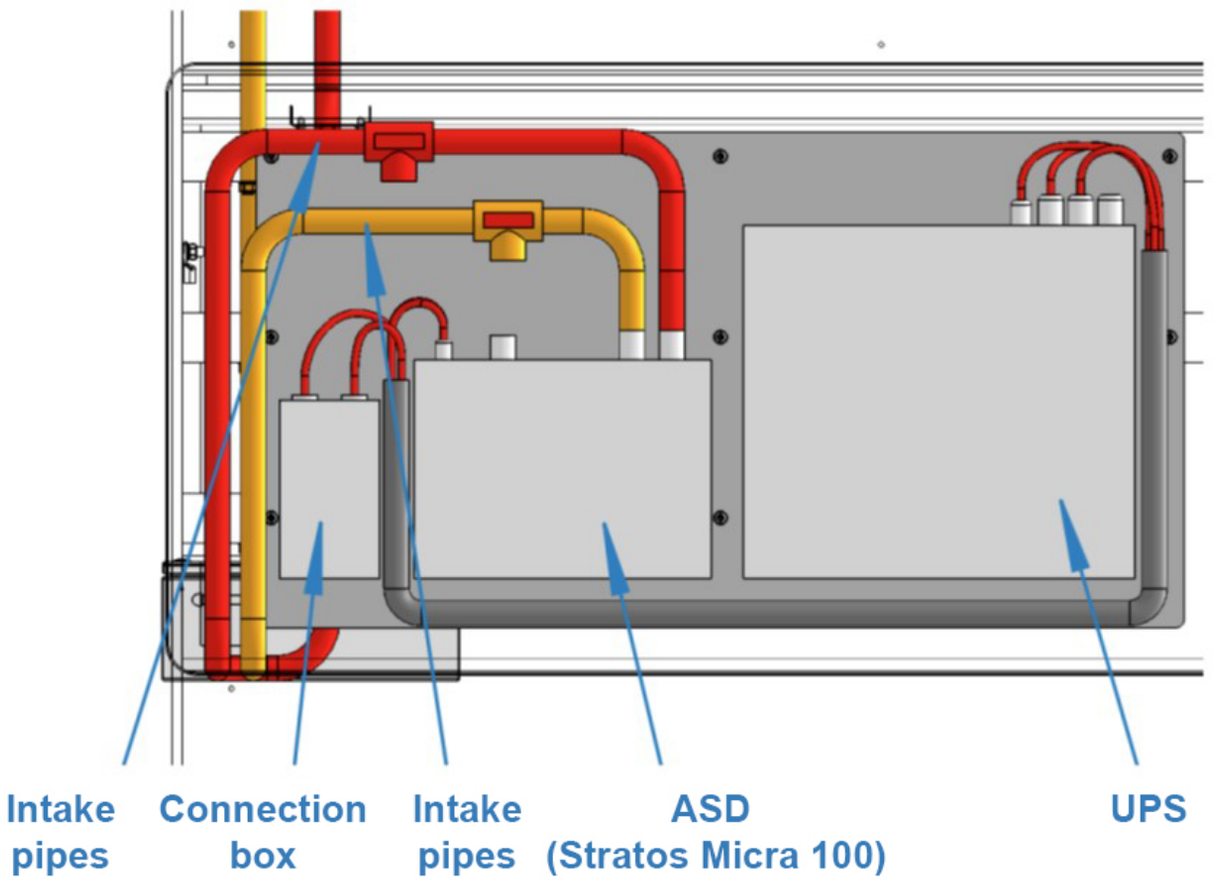


Figure 1. Optional fire alarm system

Im Alarmfall:

- NC contact of the fire detection system triggers
- Emergency off of the electrical energy storage triggers
- Fault report in Online Monitoring
- Blitzleuchte: Akustisches und optisches Signal
- When connecting the customer's own/external alarm system: Alarm signal goes to the customer's external FACP via potential-free contact

Anbindung an Brandmeldezentrale (BMZ):

The fire detection system can be connected to an external fire alarm control panel. The connection allows alarm

and fault signals to be transmitted to an operator FACP.

Es stehen potentialfreie Kontakte zum Anschluss an eine externe Meldestelle zur Verfügung:

- 1 x Trigger/alarm
- 1 x Malfunction of the fire alarm system

Diese sind in der Anschlussbox auf der Rückseite des Industrial L zu finden:

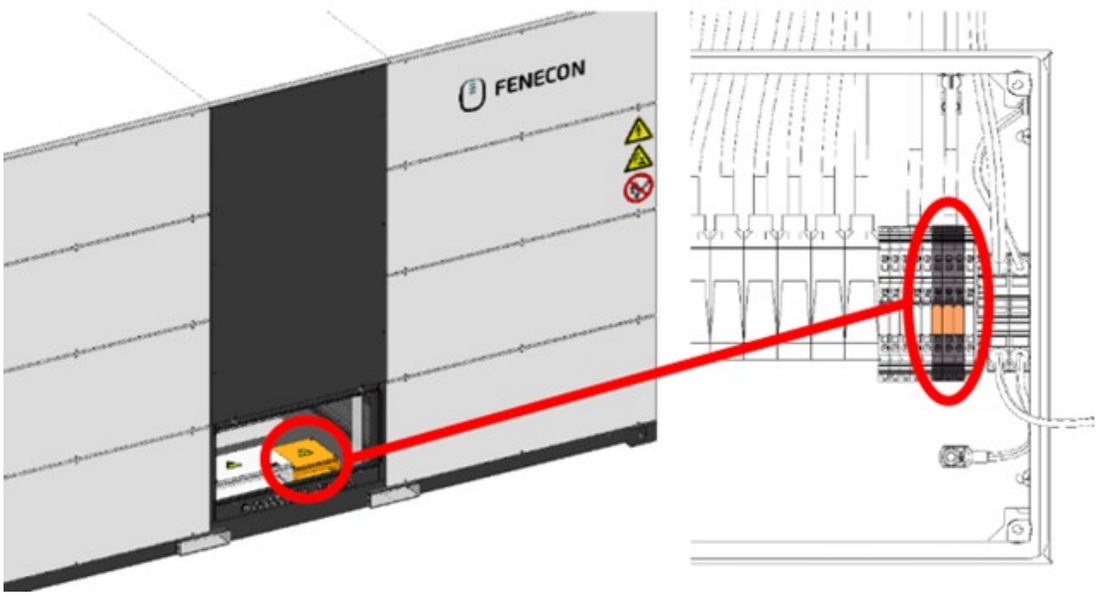


Figure 2. Connection to external FACP

Pos.	= MEMORY + AKD - FA6
1	Terminal 1 → Fire alarm system: Relay alarm NO
2	Terminal 2 → Fire alarm system: Relay alarm NC

Pos.	= MEMORY + AKD - FA7
1	Terminal 1 → Fire alarm system: Relay fault C
2	Terminal 2 → Fire alarm system: Relay alarm C

Pos.	= MEMORY + AKD - FA8
1	Terminal 1 → Fire alarm system: Relay fault NO
2	Terminal 2 → Fire alarm system: relay fault NC

Anschlussquerschnitt (feindrähtig, eindrähtig), Min. 0,5 mm^2 (AWG 26), Max. 1,5 mm^2 (AWG 16).
Weitere Informationen finden Sie unter den Abschnitten [Anschlussbereich — Wechselrichter] und [Anschlussbelegung — Kommunikationsanschlussbox].

2.5. Residual risks

The product is manufactured in accordance with the current state of the art and recognized safety principles, taking into account the relevant legal regulations.
Nevertheless, there may be hazards to persons and/or the environment when handling the product.

No access for unauthorized persons!

Risk of death or serious injury from unexpected incidents in the entire danger zone.

- Do not enter the danger zone.
- Stop all hazardous movements before entering the danger zones and secure against restarting.
- Only authorized personnel are permitted to enter hazardous areas.

Ensure that no unauthorized persons are present in the areas.

Danger of electric shock

Contact with live components can result in death or serious injury.

- Stromführende Komponenten nicht berühren.

Work on live components may only be carried out by a qualified electrician.

Verbrennungsgefahr

An heißen Leitungen sowie Gehäuseoberflächen besteht Verbrennungsgefahr bei direktem Kontakt mit unisolierten Oberflächen sowie heißen Medien. Die Gefahrenstellen sind mit entsprechenden Piktogrammen gekennzeichnet.

- Do not touch the danger zone.

Note This signal word indicates actions to prevent property damage. Observing these instructions prevents damage to or destruction of the system.

2.6. Safety instructions

2.6.1. General information on the FENECON Industrial L electrical energy storage system

- The battery modules must only be removed or replaced by service personnel. Transports are considered a consignment of dangerous goods.
- The current laws, regulations and standards must be observed when transporting the battery energy storage system (e. g. Dangerous Goods Transportation Act (GGBefG, ADR).
- Das Stromspeichersystem darf nur unter den bestimmten Lade-/Entladebedingungen benutzt werden (vgl. Abschnitt [Technische Daten]).
- Only use the battery modules as intended. Improper use can lead to overheating, explosion or fire of the battery modules.
- Do not wet the area around the electrical equipment and batteries and avoid contact with water.
- Prevent the ingress of water when working on the power storage system.
- Abstand zu Wasserquellen halten.
- Do not crush, throw, drop or attempt to open the battery modules.
- Switch off dropped battery module immediately and do no longer use them.
- Modifications to the battery modules are prohibited.
- Set up/store the battery modules in cool places.
- The power storage system may only be operated under the specified environmental conditions.
- Do not use the battery modules if changes in color or mechanical damage are detected during assembly, charging, normal operation and/or storage.
- Keep the power storage system away from children and animals.
- Eye and skin contact with leaked electrolyte solution must be avoided. After contact with eyes or skin, rinse/clean immediately with water and seek medical attention. Delayed treatment can cause serious damage to health.
- Do not short-circuit/bridge the slide-in battery modules.
- Do not touch the battery module connectors (+) and (-) directly with a wire or metal object (e.g. metal chain, hairpin). In the event of a short circuit, excessive current can be generated, which can lead to overheating, explosion or fire of the battery modules.
- Do not apply mechanical force to the battery modules. The battery modules could be damaged and short circuits could occur, which can lead to overheating, explosion or fire of the battery modules.
- No soldering work must be carried out on the battery modules. Heat introduced during soldering can damage the insulator and the safety venting mechanism and lead to overheating, explosion or fire of the battery modules.
- The battery modules must not be dismantled or modified. The battery modules integrate a safety mechanism and a protective device; damage to which can lead to overheating, explosion and/or fire of the battery modules.

- A battery module that exhibits odors and/or temperature increases, changes color and/or shape, leaks electrolyte solution or exhibits other abnormalities must be reported immediately to authorized service personnel and removed from the battery rack by them only, otherwise the battery module may overheat, explode and/or catch fire.
- Do not charge the battery modules in an external charger.
- Read the instructions for installation and operation to avoid damage due to incorrect installation/operation.
- The battery modules may have insufficient cell voltage after a long storage period.
- Do not expose the battery modules to high voltages.
- Set up the electricity storage system on a level and load-bearing surface.
- Do not place any objects on the battery modules.
- Do not step on the battery modules.
- The floor condition is the responsibility of the operator.

2.6.2. Installation, operation and maintenance

Always observe the following safety instructions when installing, operating or maintaining the battery modules:

- Installation/maintenance work on the battery modules and the electrical energy storage system and the establishment of cable connections may only be carried out by authorized qualified electricians.
- During assembly and maintenance work on the battery rack, stand on dry insulating objects and do not wear any metal objects (e. g. watches, rings and necklaces) during maintenance work/operation.
- Use insulated tools and wear personal protective equipment.
- The battery modules can cause electric shock and burns due to short-circuit currents.
- Do not touch two charged contacts with a potential difference.
- Measure the battery voltage with a multimeter and ensure that the output voltage is 0 V in OFF mode.
- If an anomaly is detected, the emergency-off must be activated (if directly accessible).
- Do not continue the maintenance work until the cause of the fault has been rectified.

2.6.3. Fire protection

- The heat can cause insulation to melt and the safety ventilation to be damaged, which can lead to overheating, explosion or fire on the battery modules.
- Do not heat the battery modules.
- Do not expose the battery modules to direct sunlight.
- Do not expose the battery modules to open fire.
- Avoid contact between the battery modules and conductive objects (e. g. wires).
- Do not install or use the battery modules near open flames, heaters or high-temperature sources.
- Keep the battery modules away from sources of heat and fire, flammable, explosive and chemical materials.
- Do not dispose of the battery modules in a fire due to the risk of explosion.
- Im Container keine brennbaren Materialien lagern.
- Nur schwer entflammbare Betriebs- und Kühlmittel verwenden.
- Ent- und Belüftungsanlagen regelmäßig reinigen.
- Verschmutzte Filterelemente wechseln.
- Freiräume um den Speicher wahren.
- Feuer, offenes Licht und Rauchen im Aufstellbereich des Speichers ist untersagt.
- Bei optionaler BMA: Reinigen der Ansaugrohre der Brandmeldeanlage, Warten der Anlage durch autorisiertes Personal.

2.7. Behavior in emergency situations

Proceed as follows in emergency situations:

1. Disconnect the electrical energy storage system from the grid.
2. Remove from the danger zone.
3. Secure the danger zone.
4. The responsible persons inform.
5. Alert a doctor if necessary.

2.8. Reasonably foreseeable misuse

All applications that do not fall within the scope of the intended use are considered misuse.
Work on live parts is generally not permitted. Electrical work may only be carried out by qualified electricians.
The following safety rules must be observed for all work on electrical components:

1. Disconnect.
2. Secure against restarting.
3. Spannungsfreiheit feststellen.
4. Earthing and short-circuiting.
5. Benachbarte und unter Spannung stehende Teile abdecken oder abschranken.

Non-compliance with safety rules is considered a reasonably foreseeable misuse.

Other misapplications include in particular:

- improper transportation, installation, assembly, trial operation or operation that may damage the product,
- Changes to the specified performance data, including the individual components,
- Change or deviation of the specified connected loads,
- functional or structural changes,
- Operating the product in a faulty or defective condition,
- improper repairs,
- Use by untrained persons (instruction in accordance with the installation and service instructions is provided by the operator),
- operation without safety devices or with defective safety devices,
- Disregarding the information in the original operating instructions,
- unauthorized access via the control unit or the network,
- Fire, open light and smoking in the vicinity of the storage system,
- inadequate ventilation,
- Unauthorized changes and actions to the storage system,
- Private use,
- Use as mobile energy storage,
- Direkter Einsatz in einem PV-System (Nur eine AC-seitige Einspeisung möglich).

2.9. Pictograms

Pictograms on the system indicate dangers, prohibitions and instructions. Illegible or missing pictograms must be replaced by new ones.

Pictogram	Meaning	Position
	Pictogram warning of dangerous voltage	Pictogram on the enclosure, and marking of components which do not clearly indicate that they contain electrical equipment which may be the cause of a risk of electric shock.
	Warning against corrosive substances	On the battery modules
	Before using grounding	In the area of the grounding connections (e. g. on the container)
	Separate collection of electrical and electronic equipment	At the battery modules
	Warning against hand injuries	
	Hot surface warning	
	General warning sign	
	Warning about the dangers of charging batteries	

Table 7. Pictograms

Pictogram	Meaning	Position
	General prohibition sign	
	No open flames; fire, sources of ignition and smoking prohibited	
	No access for persons with pacemakers or implanted defibrillators	
	Access prohibited for unauthorized persons	
	Please follow instructions	
	Use protective headgear	
	Use protective footwear	
	Use protective gloves	

2.10. Operating materials/equipment

2.10.1. Electrolyte solution of the battery modules

- Electrolyte solution is used in the battery modules (NMC).
- The electrolyte solution in the battery modules is a clear liquid and has a characteristic odor of organic solvents.
- The electrolyte solution is flammable.
- The electrolyte solution in the battery modules is corrosive.
- Contact with electrolyte solution can cause severe burns to the skin and damage to the eyes.
- Do not inhale the vapors.
- If the electrolyte solution is swallowed, induce vomiting.
- Leave the contaminated area immediately after inhaling the vapors.

- After contact with skin, wash thoroughly with soap and water.
- After contact with eyes, rinse as soon as possible with running water for 15 minutes.
  → Consult a doctor immediately.

Further information on the electrolyte solution can be found in the manufacturer's safety data sheet.

2.10.2. Refrigerant of the cooling system

- Contains pressurized gas, may explode when heated.
- Protect from sunlight and store in a well-ventilated place.
- Rapid evaporation of the liquid can cause frostbite.
- Misuse or intentional inhalation can be fatal without alarming symptoms due to effects on the heart.
- May cause cardiac arrhythmia.

The coolant used in the integrated air conditioning unit is R410a.

2.10.3. Electrical equipment

- Work on electrical equipment may only be carried out by qualified electricians.
- Maintenance work may only be carried out by trained specialist personnel (service personnel).
- Before starting work on the power storage system, carry out visual checks for insulation and housing damage.
- Regular checks for insulation and housing damage must be carried out.
- The system must never be operated with faulty or non-operational electrical connections.
- To avoid damage, lay supply lines without crushing and shearing points.
- Zur Instandhaltung dürfen an unisolierten Leitern und Anschlussklemmen nur isolierte Werkzeuge verwendet werden.
- Switch cabinets (e. g. inverter housing) must always be kept locked. Only authorized personnel with appropriate training and safety instructions (e. g. service personnel) should be allowed access.
- The inspection and maintenance intervals for electrical components specified by the manufacturer must be observed.
- To avoid damage, lay supply lines without crushing and shearing points.
- If the power supply is disconnected, specially marked external circuits may still be live!
- Dangerous residual voltages may still be present on some equipment (e. g. inverters) with an electrical intermediate circuit for a certain period of time after disconnection. Check that there is no voltage on these systems before starting work.

2.11. Notes on occupational health and safety

The obligations arising from occupational health and safety must be implemented by the operator of the low-voltage equipment.

Operator obligations related to the use of the product:

- Making these installation and service instructions or extracts thereof available to persons who perform tasks with or in connection with the product.
- Make the applicable documents available to these persons.
- Instruction of persons with regard to the intended use as well as the prohibited use.
- Instruction of persons with regard to safety devices and supplementary protective devices.
- Instruction of persons with regard to all residual risks.

2.12. Personal protective equipment

Depending on the work on the system, personal protective equipment must be worn:

- Sicherheitsschuhe.
- Schutzhandschuhe, gegebenenfalls schnittfest.
- Schutzbrille.
- Schutzhelm.

2.13. Ersatz- und Verschleißteile

The use of spare and wear parts from third-party manufacturers can lead to risks. Only original parts or spare and wear parts approved by the manufacturer may be used. The instructions for spare parts must be observed.

Further information must be requested from the manufacturer.

2.14. IT security

FENECON-Speichersysteme und deren Anwendungen kommunizieren und agieren ohne Internetverbindung. Die einzelnen Systemkomponenten (Wechselrichter, Batterien etc.) sind nicht direkt mit dem Internet verbunden oder aus dem Internet erreichbar. Sensible Kommunikationen über das Internet werden ausschließlich über zertifikatbasierte TLS-Verschlüsselungen verarbeitet.

- Access to the programming levels is not barrier-free and is accessible at different levels depending on the qualifications of the operating personnel. Safety-relevant program changes require additional verification.
- FENECON processes energy data of European customers exclusively on servers in Germany and these are subject to the data protection regulations applicable in this country.
- The software used is checked using automated tools and processes established during development in order to keep it up to date and to rectify security-relevant vulnerabilities at short notice. Updates for FEMS are provided free of charge for life.

3. Technical data

3.1. Allgemein

Figure 3. FENECON Industrial L with inverter rack

The FENECON Industrial L is an industrial energy storage system consisting of various modules. In particular, these include efficient inverters, the FENECON Energiemanagementsystem (FEMS) and slide-in battery modules including BMS. The large-scale FENECON Industrial L system is offered with a maximum apparent power of 736 kVA and a nominal DC capacity of 1288 kWh. The energy storage system is used to store and supply electrical energy and is intended exclusively for connection to the 400 V/50 Hz low-voltage grid.

3.2. System overview

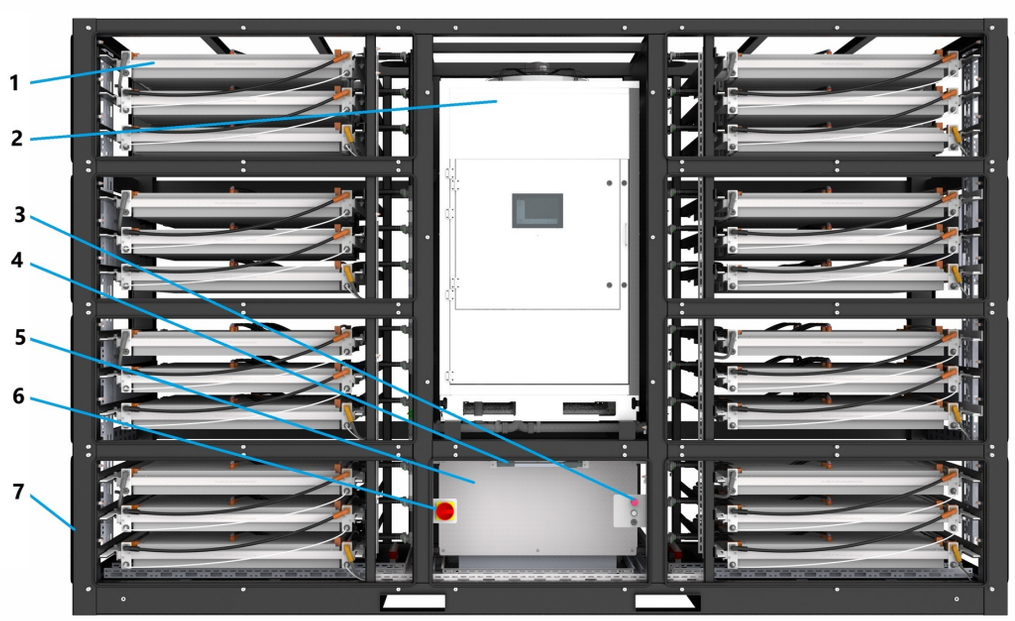


Figure 4. Components — Front view

Position	Component	Comment
1	Slide-in battery module	
2	Climate control unit	

Position	Component	Comment
3	HV battery emergency stop plate	HV battery emergency stop/Acknowledgement key/RJ-45 service port
4	Control cabinet lighting with 230 V socket for e. g. service laptop	
5	Control cabinet	
6	Main switch	
7	Location: Optional fire detection system	

Figure 5. Components — Rear view

Position	Komponente	Bemerkung
1	BMS-Box	
2	Wasserabfluss	inkl. Abflusssieb
3	Kommunikationsanschlussbox	
4	AC-/DC-Anschlussbox	
5	Kabelverschraubungsplatte	

3.3. Container including climate control unit and cabling

3.3.1. Dimensions

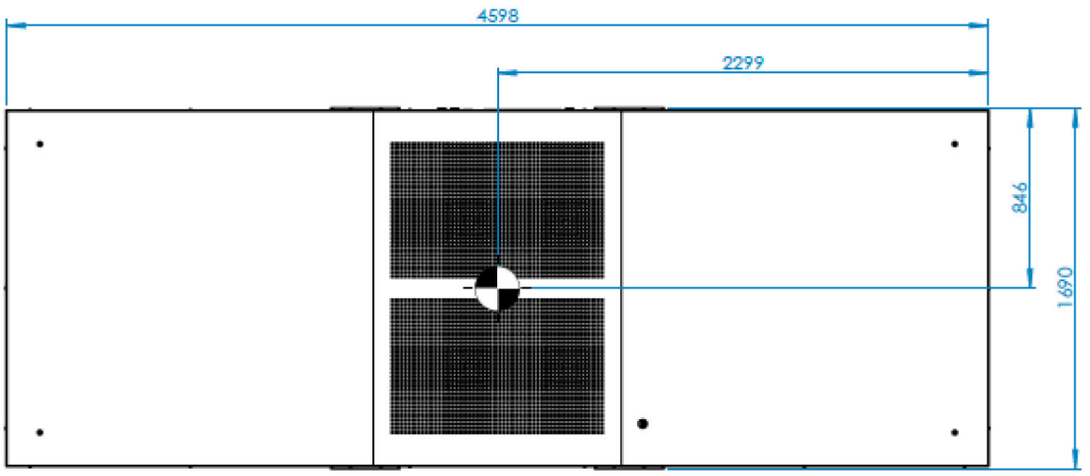


Figure 6. Top view with dimensions and position of the center of gravity [in mm]

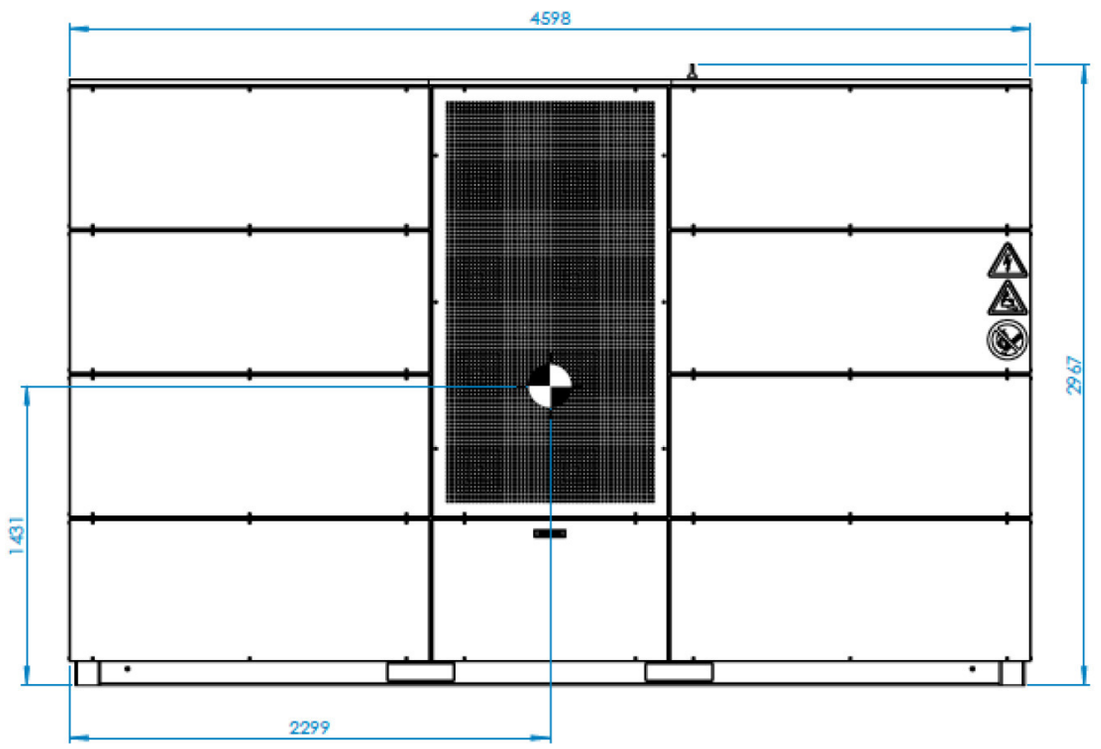


Figure 7. Front view with dimensions and center of gravity [in mm]

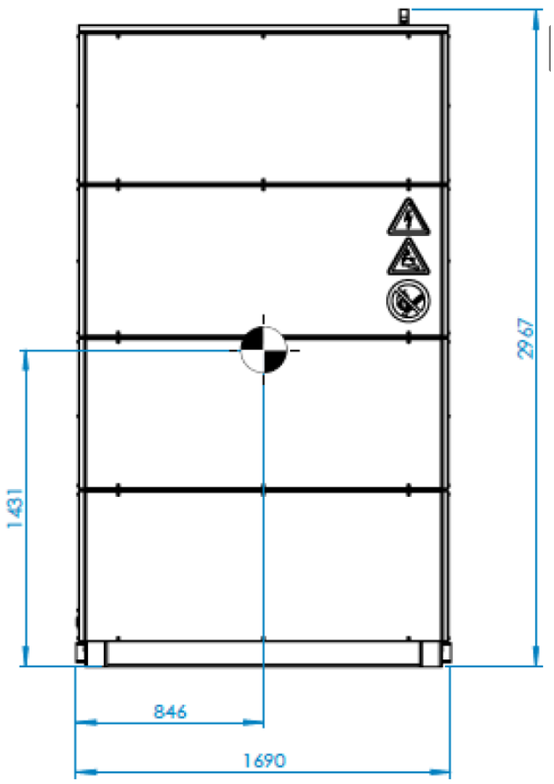


Figure 8. View from left with dimensions and center of gravity [in mm]

3.3.2. Mass

Container weight, fully-equipped	10,600 kg
Total lifting weight with lifting device	11,000 kg

Table 8. Mass of the electrical energy storage

3.3.3. Power supply

Electrical supply	3~/N/PE, 400 V, 50 Hz

Table 9. Energy supply

3.3.4. Apparent power data

The apparent power of the electrical energy storage corresponds to max. 8 x 92 kVA plus 1 x 44 kVA. This results in a total of 780 kVA maximum apparent power at full load operation. The usable output is 736 kVA.

Fuse protection per control cabinet	63 A
DC fuse protection per inverter	160 A

Table 10. Power consumption

3.3.5. Control Cabinet

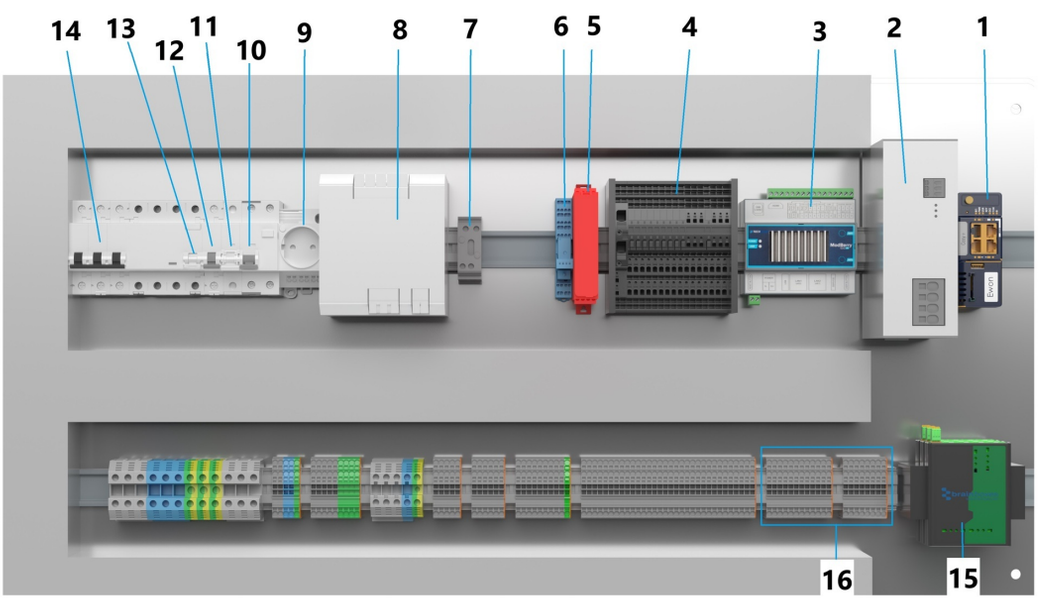


Figure 9. Components — Control cabinet

Position	Komponente	Bemerkung
1	LTE-Router	SIM-Karte nicht im Lieferumfang; Unbegrenztes Datenvolumen notwendig
2	DC-Puffer (kapazitive USV)	
3	FEMS	
4	DC-Sicherungseinheit und Verteilung	
5	Sicherheitsrelais	
6	Relais HV-Batterie Not-Aus-Rückstellung	Remote
7	Trennklemme	
8	DC-Netzteil	
9	Service-Steckdose	inkl. Schaltschrankbeleuchtung
10	Fehlerstrom-Schutzschalter Service-Steckdose	
11	Sicherung Schaltschranklüfter	

Position	Komponente	Bemerkung
12	Sicherung DC-Netzteil	
13	Fehlerstrom-Schutzschalter Klimagerät	
14	Sicherung Klimaanlage	
15	Ethernet-Switch	
16	Anschluss-Klemmen optionale BMA	

Figure 10. Main switch/emergency stop plate

The following components are located on two offset panels in front of the control components:

Left:

- Main switch

Right:

- HV battery emergency stop push-button
- Acknowledge button
- Service port

3.4. Inverter KACO blueplanet gridsave 92.0 — TL3-S

3.4.1. Battery Connection (DC) — Battery

Description	Value/dimension
Battery charging and discharging voltage	668 V to 1315 V
DC input current, max.	145 A

Table 11. DC voltage and current range of battery and inverter

3.4.2. AC Grid connection

Naming	Value/dimension
Rated power	92,000 VA
Rated voltage (Ph-Ph)	400 V
Rated voltage (Ph-N)	230 V
Voltage range (Ph-Ph)	300 V to 580 V
Rated frequency	50 Hz/60 Hz
Rated current AC	3 x 132.3 A

Table 12. Inverter — AC connection

3.4.3. Allgemein

Description	Value/dimension
Efficiency, max.	Charging: 98.5 %; discharging: 98.7 %
Reactive power/cos phi	0-100 % Smax/0.30 ind. to 0.30 cap
Emergency power capable	No
Width | Depth | Height, approx.	699 mm | 450 mm | 719 mm
Operating temperature	-20 °C to + 60 °C
IP classification	IP66/NEMA 4X
Installation altitude above sea level	3000 m
Humidity	0-100 %
Weight	80 kg
Noise emission	< 60 db (A)
Installation	Wall assembly

Table 13. Inverters — General

3.4.4. Dimensions — Inverter

Figure 11. Dimensions — Inverter

3.4.5. Connection area — Inverter

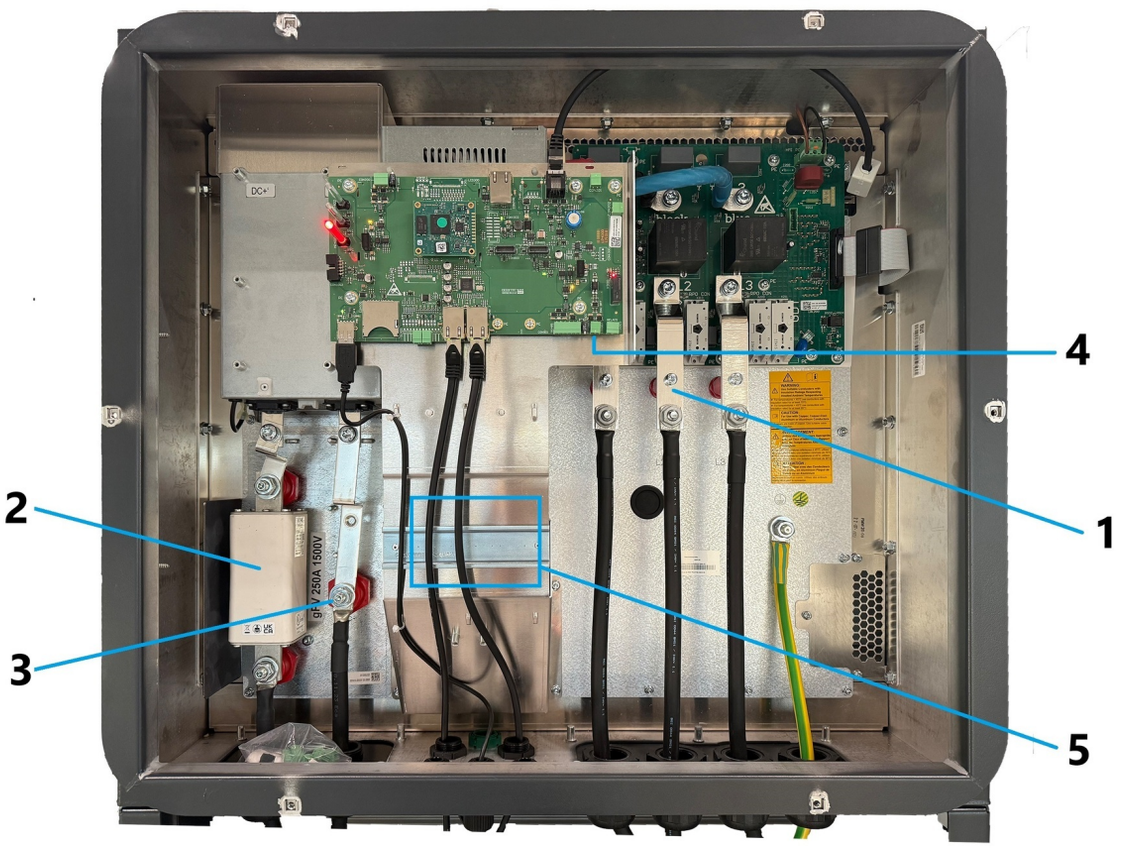


Figure 12. Connection area — Inverter

Pos.	Description
1	AC connection terminal
2	DC fuse with connection terminal
3	DC connection terminal
4	INV OFF connection for remote control unit — used for the optional fire detection system
5	Place for connection area of the optional fire detection system (2 three-wire feed-through terminals, 2.5 mm^2, 24 A, gray)

Table 14. Designations of the inverter connection area

3.5. AC/DC connection box

The AC/DC connection box is located at the rear of the container, behind the cable glands. It is used to connect both the AC grid feed-in and the DC cables to the inverters.

The AC/DC connection box contains:

1. AC-Überspannungsschutz.
2. AC-Anschlussklemmen (3 Phasen/N/PE).
3. DC-Anschlussklemmen.

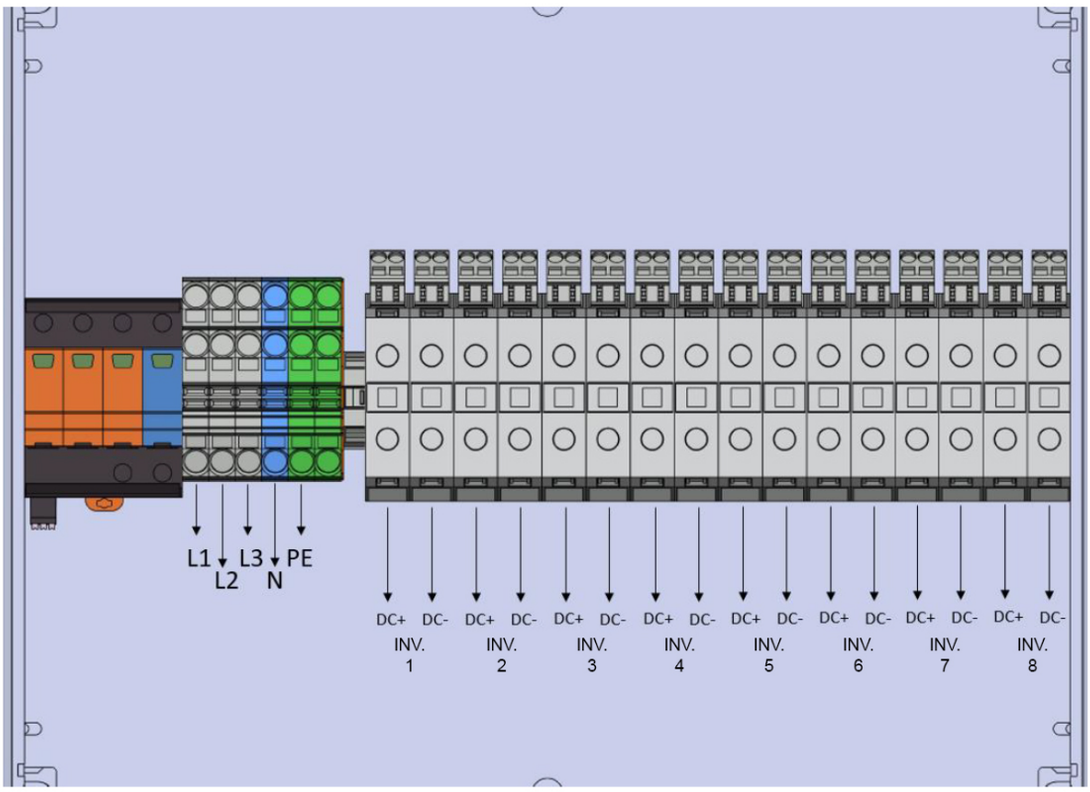


Figure 13. Components in DC/AC connection box

3.5.1. Terminal assignment — AC/DC connection box

Pos.	Description
L1	outer conductor 1
L2	Outer conductor 2
L3	Outer conductor 3
N	Neutral
PE	Protective earth conductor
DC+ WR1	DC+ for WR1 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR1	DC- for WR1 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC+ WR2	DC+ for WR2 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR2	DC- for WR2 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC+ WR3	DC+ for WR3 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR3	DC- for WR3 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC+ WR4	DC+ for WR4 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR4	DC- for WR4 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC+ WR5	DC+ for WR5 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR5	DC- for WR5 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC+ WR6	DC+ for WR6 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR6	DC- for WR6 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)

Pos.	Description
DC+ WR7	DC+ for WR7 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR7	DC- for WR7 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC+ WR8	DC+ for WR8 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)
DC- WR8	DC- for WR8 (max. cable diameter: AA1-3: 17 mm; AA4: 20.5 mm)

Table 15. Terminal assignment — AC/DC connection box

3.6. Communication connection box

Die Kommunikationsanschlussbox befindet sich auf der Rückseite des Containers, siehe Abbildung Komponenten — Rückansicht. In ihr wird sowohl die Kommunikationsschnittstelle zu den Wechselrichtern als auch die Kundenschnittstelle bereitgestellt.

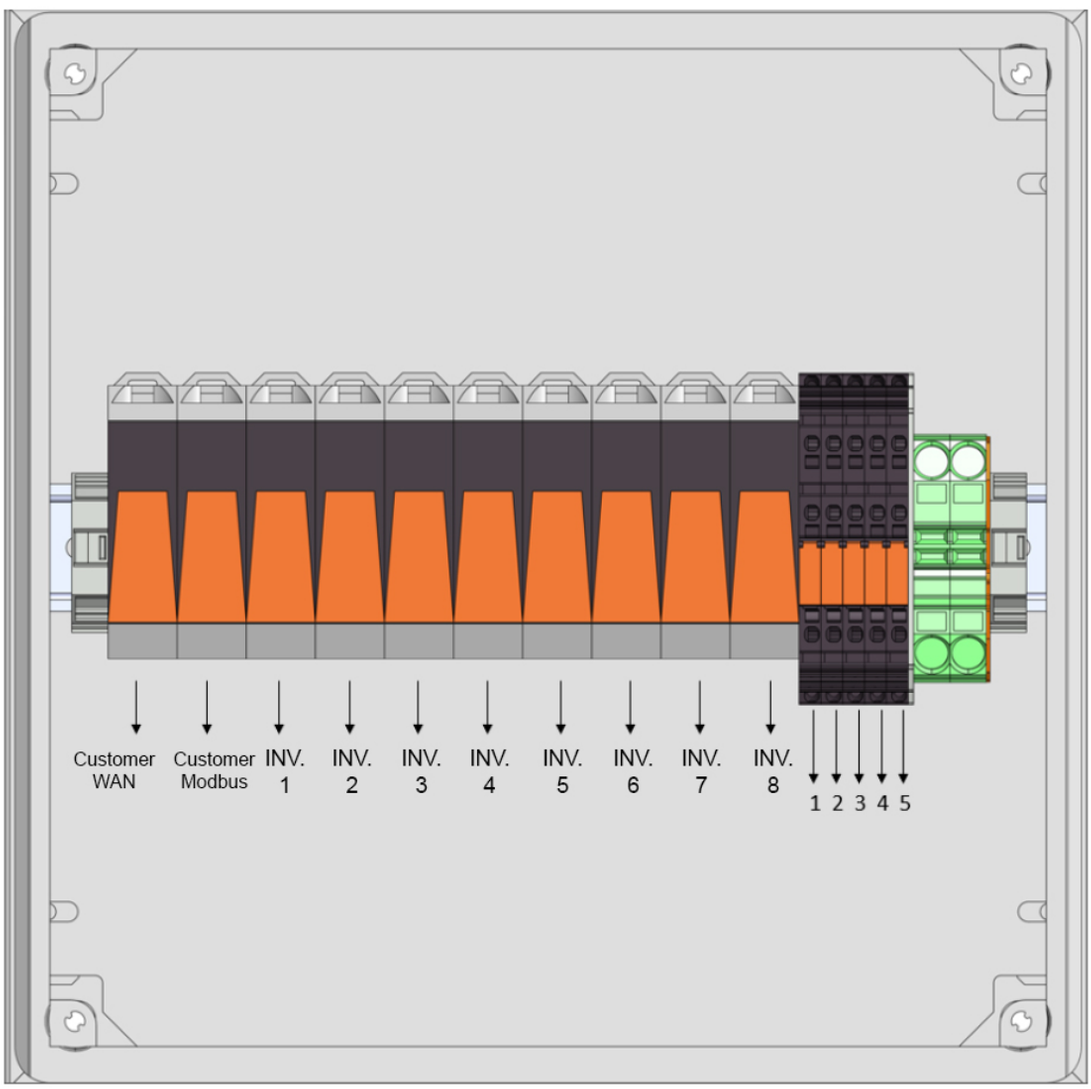


Figure 14. Communication connection box

3.6.1. Terminal assignment — Communication connection box

Pos.	Description
WAN (customer)	Overvoltage protection & interface to the customer WAN (optional) Default: Weidmüller RJ-45 plug no.: 2703390000
Modbus customer	Overvoltage protection & interface for Modbus customer communication Default: Weidmüller RJ-45 plug no.: 2703390000
WR1	Overvoltage protection & interface network cable inverter 1 Default: Weidmüller RJ-45 plug no.: 2703390000
WR2	Surge protection & interface network cable inverter 2 Default: Weidmüller RJ-45 plug no.: 2703390000
WR3	Overvoltage protection & interface network cable inverter 3 Specification: Weidmüller RJ-45 plug no.: 2703390000
WR4	Surge protection & interface network cable inverter 4 Specification: Weidmüller RJ-45 plug no.: 2703390000
WR5	Surge protection & interface network cable inverter 5 Specification: Weidmüller RJ-45 plug no.: 2703390000
WR6	Surge protection & interface network cable inverter 6 Specification: Weidmüller RJ-45 plug no.: 2703390000
WR7	Surge protection & interface network cable inverter 7 Specification: Weidmüller RJ-45 plug no.: 2703390000
WR8	Surge protection & interface network cable inverter 8 Default: Weidmüller RJ-45 plug no.: 2703390000
1	Emergency stop acknowledgement interface (optional)
2	Emergency stop loop 24V interface (optional)
3	GND emergency stop loop interface (optional)
4	Emergency stop lighting interface (not wired!) (optional)
5	Modbus RTU interface (RS485) (optional)
6	Fire detection system relay alarm NC/NO interface (optional)
7	Fire detection system supply voltage relay alarm/fault interface (optional)
8	Fire detection system relay fault NC/NO interface (optional)
9	Fire detection system inverter release (optional) interface

Table 16. Terminal assignment — Communication connection box

3.7. Slide-in battery module (EB311 modules)

Lagerung/Nicht-Beladung der Batterien länger als 6 Monate
Mögliche Folgen: Tiefentladung der Zellen → Defekt der Batterieschublade.

- Externe Beladung der Batteriemodule auf Nennspannung — es muss eine Zwangsbeladung durchgeführt werden, welche über das FEMS gesteuert wird.

Dies darf nur durch den Hersteller oder durch ein vom Hersteller beauftragtes Unternehmen durchgeführt werden.

Description	Value/dimension
Cell chemistry Nickel-manganese-cobalt	Cell capacity
188 Ah	Cell configuration
26s2p	Nominal DC capacity
53.7 kWh	Nominal slide-in module voltage
286.2 V	Voltage range
218.4 V to 327.6 V	Maximum charge/discharge current
400 A < 15 sec @ 23 °C, 50 % SoC	Communication
TPL	Environmental temperature
-20°C to +40°C	Relative humidity (operation/storage)
50% non-condensing (up to 90% permissible for short periods)	Length | Width | Height
1270 mm | 1260 mm | 120 mm	Weight, approx. 250 kg
Capacity guarantee	see warranty conditions
UN transport test standard	UN38.3

Table 17. Slide-in battery module — Technical data

3.8. Cable gland plate

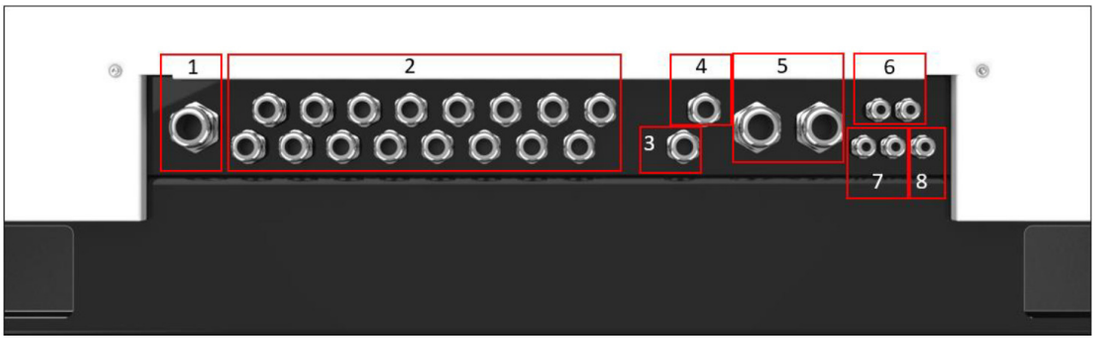


Figure 15. Feed-throughs — Cable gland plate

Pos.	Beschreibung	Verschraubung	Klemmbereich (in mm)	Mind. Kabelquerschnitt
1	1 x Kabelverschraubung AC-Versorgung	M40	21-30	5 x 16 mm^2
2	16 x Kabelverschraubung DC-Inverter	M25	12,5-20,5	1 x 50 mm^2
3	1 x Kabelverschraubung ModbusTCP Kundenschnittstelle	M25	9-17	1 x 2 x 0,32 mm^2
4	1 x Kabelverschraubung Internet	M25	9-17	Cat6
5	2 x Kabelverschraubung ModbusTCP für Inverter (Mehrfacheinsatz für je 4 Kabel)	M40	18-25	Cat6
6	2 x Kabelverschraubung Notaus extern	M16	4,5-10	2 x 1 mm^2
7	2 x Kabelverschraubung BMA (optional) Alarm- & Störungsrelais	M16	4,5-10	2 Stück 2 x 2 x 0,8 mm^2
8	1 x Kabelverschraubung ModbusRTU extern	M16	4,5-10	1 x 2 x 0,32 mm^2

Table 18. Cable gland plate — Feed-throughs

4. Assembly preparation

Residual risks:

	Fehlbetrieb Fehlbetrieb kann zu schweren Verletzungen oder Tod führen. Vor dem Einschalten der Einzelkomponenten die Vorgaben und Anweisungen aus der Betriebs-/Montageanleitung des jeweiligen Herstellers beachten.
	Fehlbetrieb kann zu Sachschäden führen. Vor dem Einschalten der Anlage vergewissern, dass

- all safety devices are fitted,
- there are no persons in the danger zone.

4.1. Scope of delivery

The read and write access application is included as standard. Further software licenses for operating the system are not included in the standard scope of delivery. Furthermore, the applications Self-Consumption Optimization, Peak Shaving (phase-accurate) and Peak Load Window are optionally purchasable and can be installed both retroactively or directly during commissioning.
The instructions for FEMS applications for the electrical energy storage system can be found at docs.fenecon.de.

4.1.1. Container including climate control unit and cabling

The battery storage system is delivered fully pre-wired. In addition to the cables, the container also contains the climate control unit, the control components and the connection boxes. In addition, the two profiles for securing the load and, in the case of a fully-equipped delivery, a lifting aid for crane transport in addition to the batteries are included in the scope of delivery.

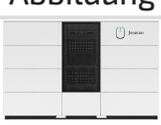
Abbildung	Anzahl	Bezeichnung
	1	*Variante fertig bestückt*: • Container • Klimagerät • Verkabelung • Batterien
	2	Transportsicherungen **Muss im Anschluss zurück an die Firma FENECON geliefert werden.**
	1	*Variante fertig bestückt*: Bodenrahmen **Muss im Anschluss zurück an die Firma FENECON geliefert werden.**

Table 19. Lieferumfang — Batteriespeicher

4.1.2. Inverter KACO blueplanet gridsave 92.0 — TL3-S

Abbildung	Anzahl	Bezeichnung
	8	Wechselrichter KACO blueplanet gridsave 92.0 — TLS-3
Handbuch	1	Digitales Handbuch zur korrekten Montage der Wechselrichter Vgl. Abschnitt: Mitgeltende Dokumente.

Table 20. Scope of delivery — Inverter

4.1.3. Slide-in battery module (EB311 modules)

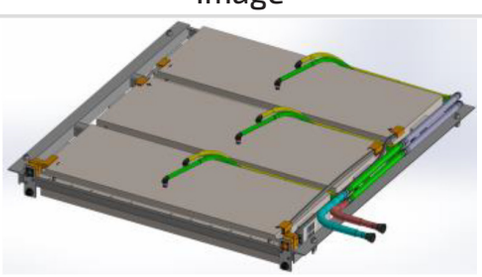
Image	Amount	Description
	24	*Fully-equipped variant*: Already installed in the container, just needs to be connected on site.

Table 21. Lieferumfang — Batterieschublade

4.1.4. Accessories box

Abbildung	Anzahl	Bezeichnung
	1	Anleitungen • Wechselrichter-Handbuch • Montageanleitung Wechselrichter-Gestell • Betriebsanleitung FENECON Industrial L
	1	Touch-Pen Teleskop-Stab zum Bedienen der Klimaanlage durch das Gitterblech.

Table 22. Lieferumfang — Zubehör-Box

4.2. Tools / machines required

Zur Montage der Komponenten der Anlage wird folgendes Werkzeug benötigt:

Tool	Comment
Crane	*Fully-equipped variant*: Crane with lifting beam and lifting device (container weight 11 t) Observe lifting instructions.
Multimeter	
Socket wrench set/ratchet box	
Set of Allen keys	
Electrician’s toolbox	

Table 23. Tools required

5. Assembly

The AC connections and inverters are assembled and installed by the operator. Please make an appointment in advance with your contact person at FENECON for the subsequent commissioning.

FENECON GmbH
Gewerbepark 6
94547 Iggensbach
+49 (0) 9903 6280 0
aftersales.industrial@fenecon.de

Residual risks:

Misoperation
Incorrect operation can lead to serious injury or death.
Before switching on the individual components, observe the specifications and instructions in the operating/assembly instructions of the respective manufacturer.

Incorrect operation can lead to material damage. Before switching on the system, make sure that

- alle Sicherheitseinrichtungen angebracht sind,
- there are no persons in the danger zone.

Property damage due to condensation

When the container is opened, moisture can enter the interior via the openings in the sheet metal covers. The condensate that forms can cause damage to the system.
Only remove the sheet metal covers shortly before assembly and close them again as soon as possible.
If condensation occurs, please contact FENECON Service.

Note down or photograph the serial numbers of the individual slide-in battery modules before assembly, as these must be documented later during commissioning (IBN protocol or IBN wizard).

The following components must be installed or connected by the operator:

- Container
- Inverter rack (optional) and inverter

Before installation, carefully check whether the products are damaged and whether all accessories listed in the scope of delivery are included. If a part is missing or damaged, contact the manufacturer/dealer.

5.1. Select installation location

Conditions at the installation site

- The storage system must be installed outdoors.
- Dirt and dust must be avoided during assembly.
- Do not install the electrical energy storage system in an area that is at risk of flooding.
- Das Speichersystem nicht dort installieren, wo die Umgebungsbedingungen außerhalb der Betriebsanforderungen liegen (Abschnitt: [Technische Daten]).
- Keep the slide-in battery modules away from heat sources and fire.
- The electrical energy storage system must be set up in such a way that only authorized personnel have access to it.

Der Betreiber der Anlage ist für die Auswahl und Vorbereitung eines geeigneten Aufstellortes für das Energiespeichersystem verantwortlich. Es ist dafür zu sorgen, dass der Untergrund für den Einsatz eines Kranes vorgesehen ist. Für die Auslegung des Kranes und die Festlegung der Hebehilfen ist die Hebeanweisung im Abschnitt zu beachten. Zudem muss auf genügend Abstand vor dem Container geachtet werden.

Der Industriespeicher FENECON Industrial L muss im Außenbereich installiert und betrieben werden.

5.1.1. Container

- A minimum distance of 5 meters must be maintained at the front in order to have enough space to install the slide-in battery modules via forklift truck.
- A minimum distance of 1 meter must be maintained at the rear to allow sufficient space for connecting the cables.
- A distance of 1 meter must be maintained at the front to ensure access to the components at the side.

Before the container is unloaded, the correct foundations must be laid.

The substrate must have a suitable load-bearing capacity to ensure that the energy storage system stands securely (e. g. point foundation, strip foundation, etc.).

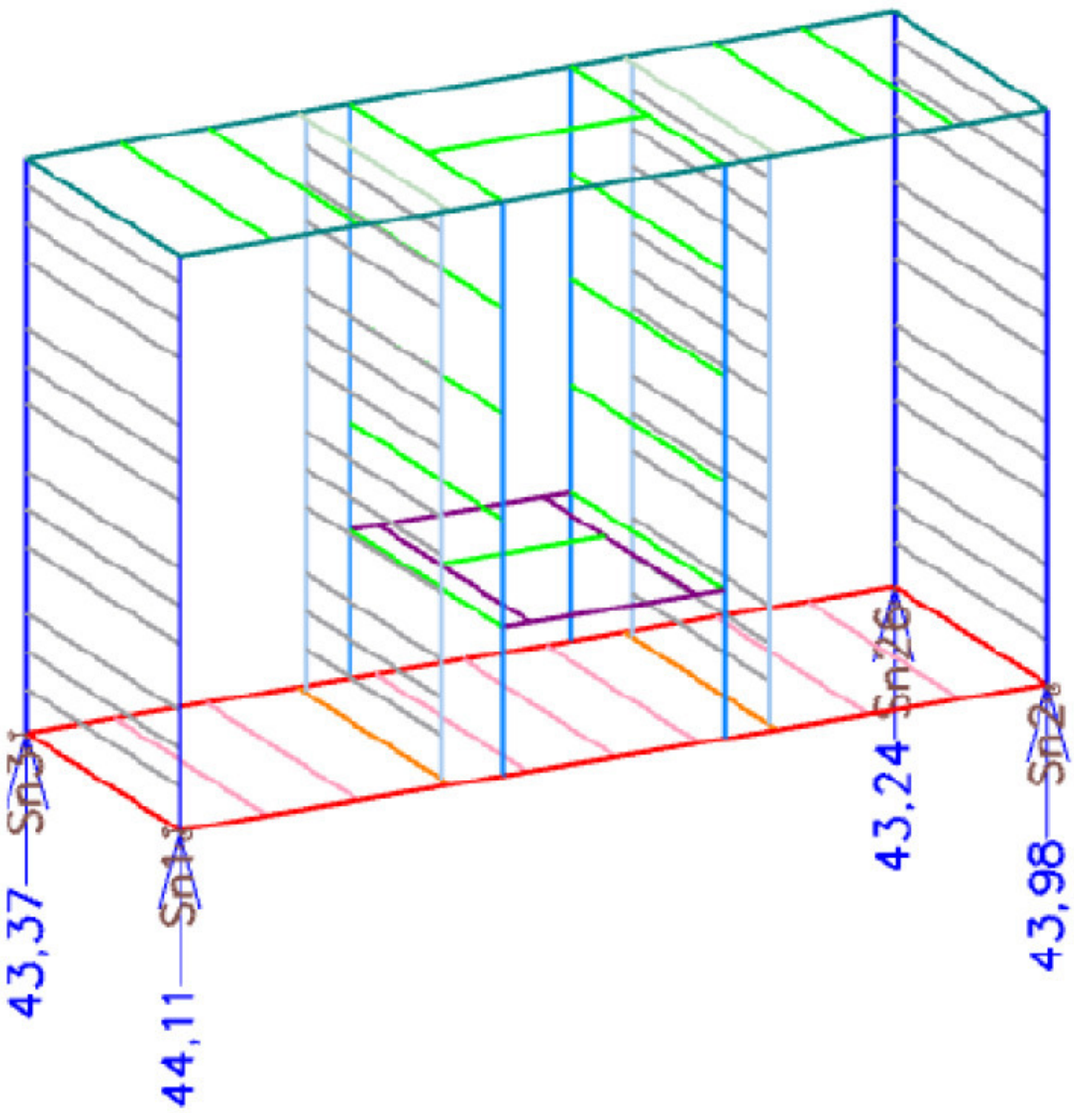


Figure 16. Auflagerreaktionen — Container

There must also be an air gap between the base and housing to prevent corrosion.
Anti-slip mats (approx. 25 mm final height) at the corners under the electrical energy storage unit are suitable for this.

Dies ist auch nötig, um die Hebevorrichtung einfach wieder demontieren zu können.

The cable glands are located on the back of the container. The cables are fed out of the container through these.

5.1.2. Inverter

The manual on the KACO New Energy website must be consulted when selecting the installation location for the inverters. In addition to these instructions, a minimum distance of 1 meter must be maintained in front of the inverters to ensure assembly, commissioning and service.

Link KACO: https://kaco-newenergy.com/de/produkte/blueplanet-gridsave-920-137-tl3-s.

5.2. Installation — Container

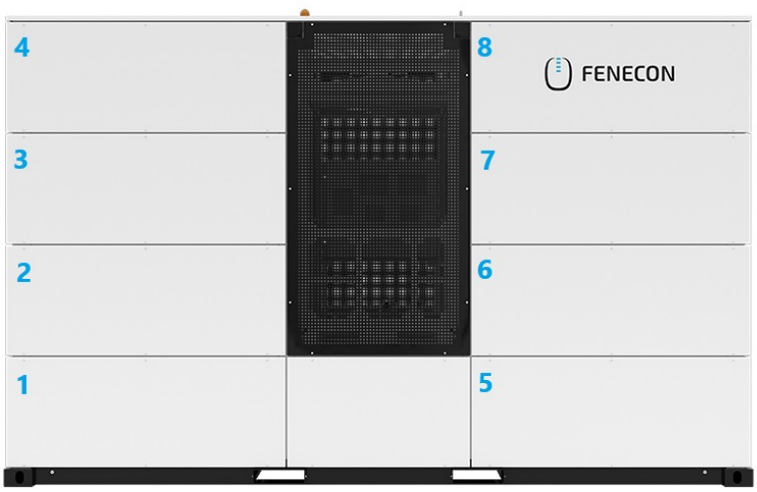


Figure 17. Container — Front

Das Speichersystem mit den Batterieschubladen ist für die Verwendung im Außenbereich konstruiert. Im Allgemeinen ist bei der Wahl des Installationsortes der Abschnitt [Aufstellort wählen] zu beachten.

5.2.1. Transport rail of the container (fully-equipped)

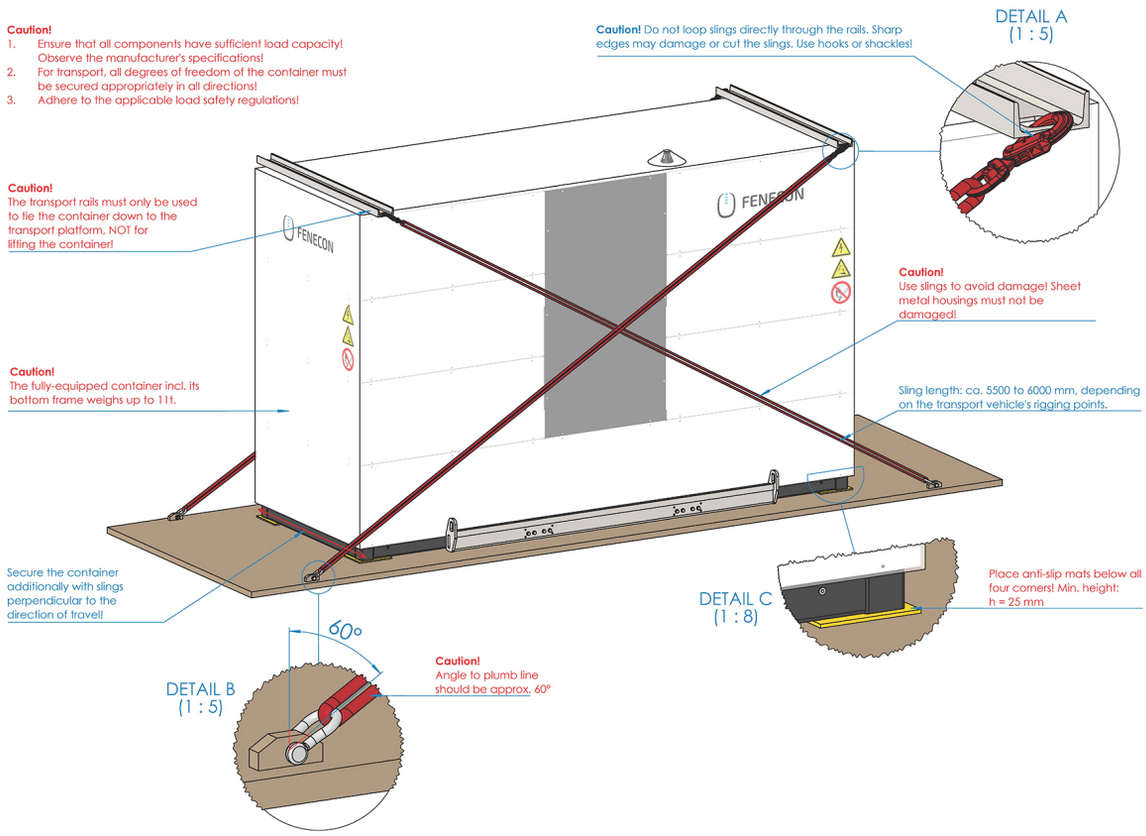


Figure 18. Transport rail for fully-equipped variant

5.2.2. Unloading the container (fully-equipped)

Fully-equipped delivery variant:

A crane is **necessary** to unload the container. The lifting instructions must be strictly adhered to! When setting down the container, suitable anti-slip mats must be placed under all four corners (min. 25 mm final thickness).

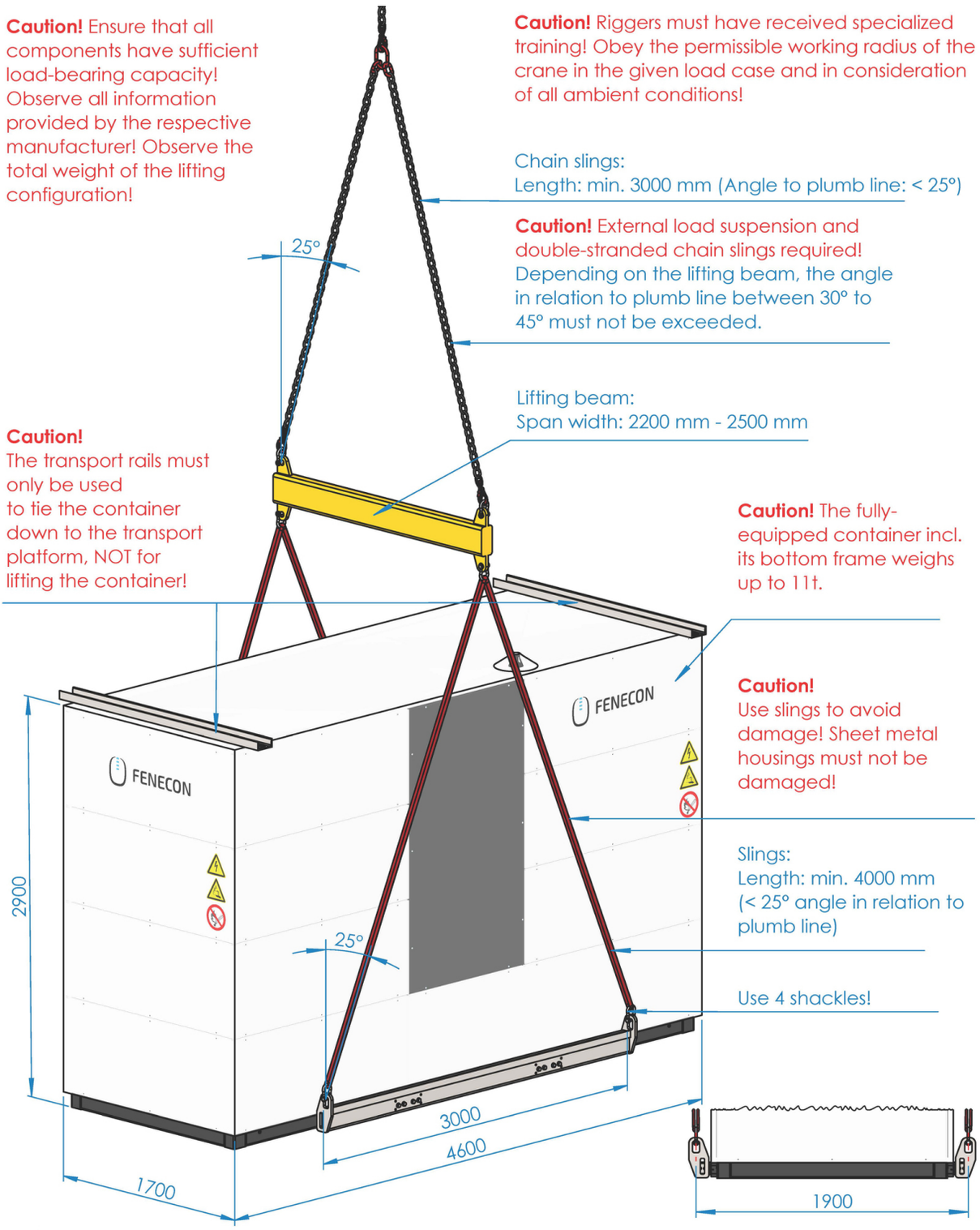


Figure 19. Lifting instructions for fully-equipped variant

5.2.3. Remove transport rail

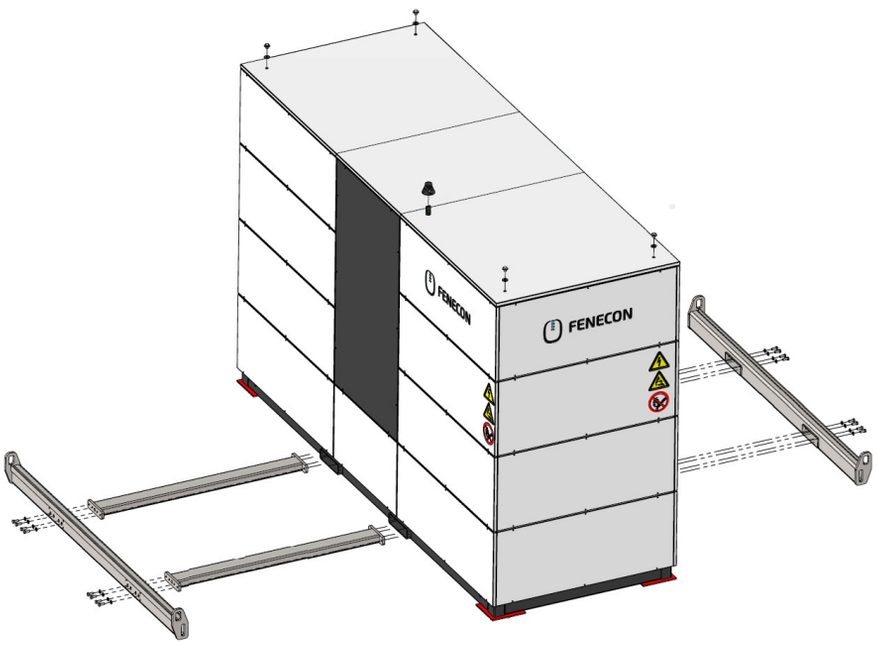


Figure 20. Removing the lifting device

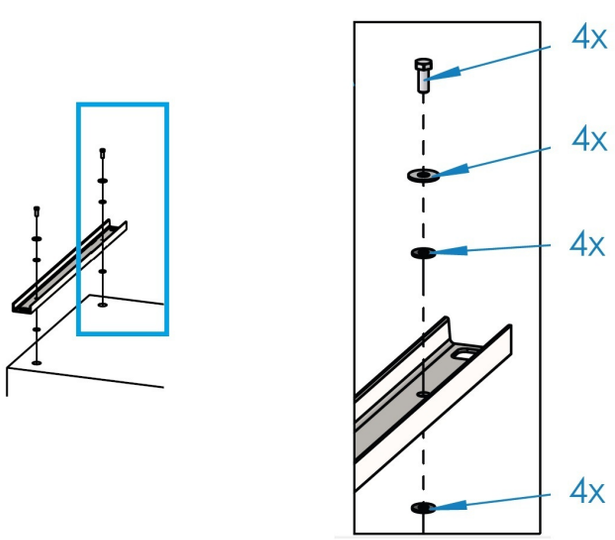


Figure 21. Removing the transport rails

After the transport rails have been removed, the protective film must be removed. Care must be taken to ensure that it is not damaged, as it remains the property of the manufacturer and must be returned.

The seals must then be fastened at their positions. Be sure to apply a ceramic paste (e. g. WEKEM WS600) and tighten the bolts with a torque of 50 Nm.

The protective cap for the LTE antenna must also be removed.

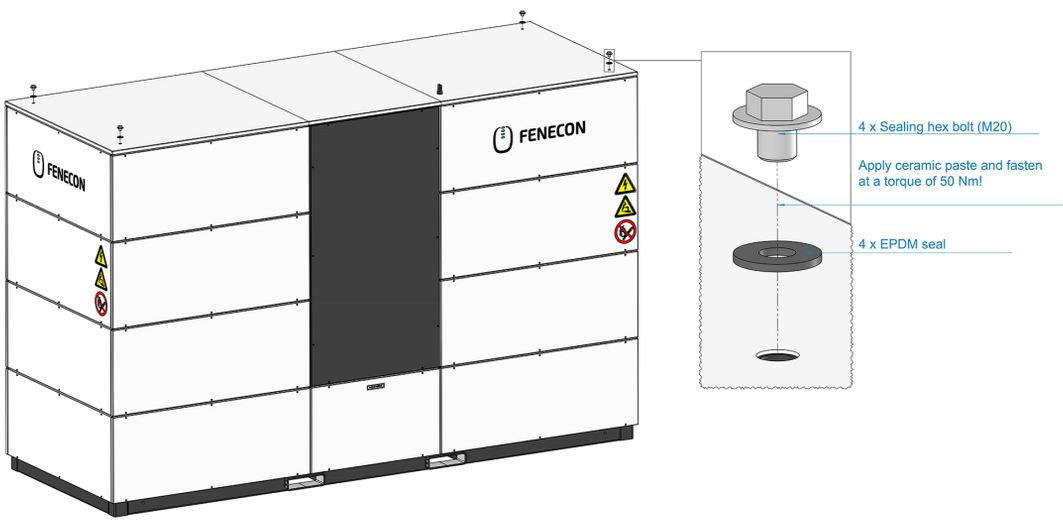


Figure 22. Placement of the seals

5.2.4. Disassembly — Sheet metal covers

The electrical energy storage tank is delivered completely sealed. The corresponding sheet metal covers must be removed for the connection work.

Remove the following sheet metal covers:

- Connection/IBN: 2 x the small sheet metal covers under the climate control unit on both sides
- 8 x front on both sides of the climate control unit

→ The threads must be greased before reassembly of the plates to ensure long-term accessibility of the bolt connection.
→ All positions of the sheet metal covers are numbered on both sides (on the system itself and on the sheet metal) to prevent them from being mixed up during assembly. All sheet metal covers must be earthed with the prepared earthing connection.

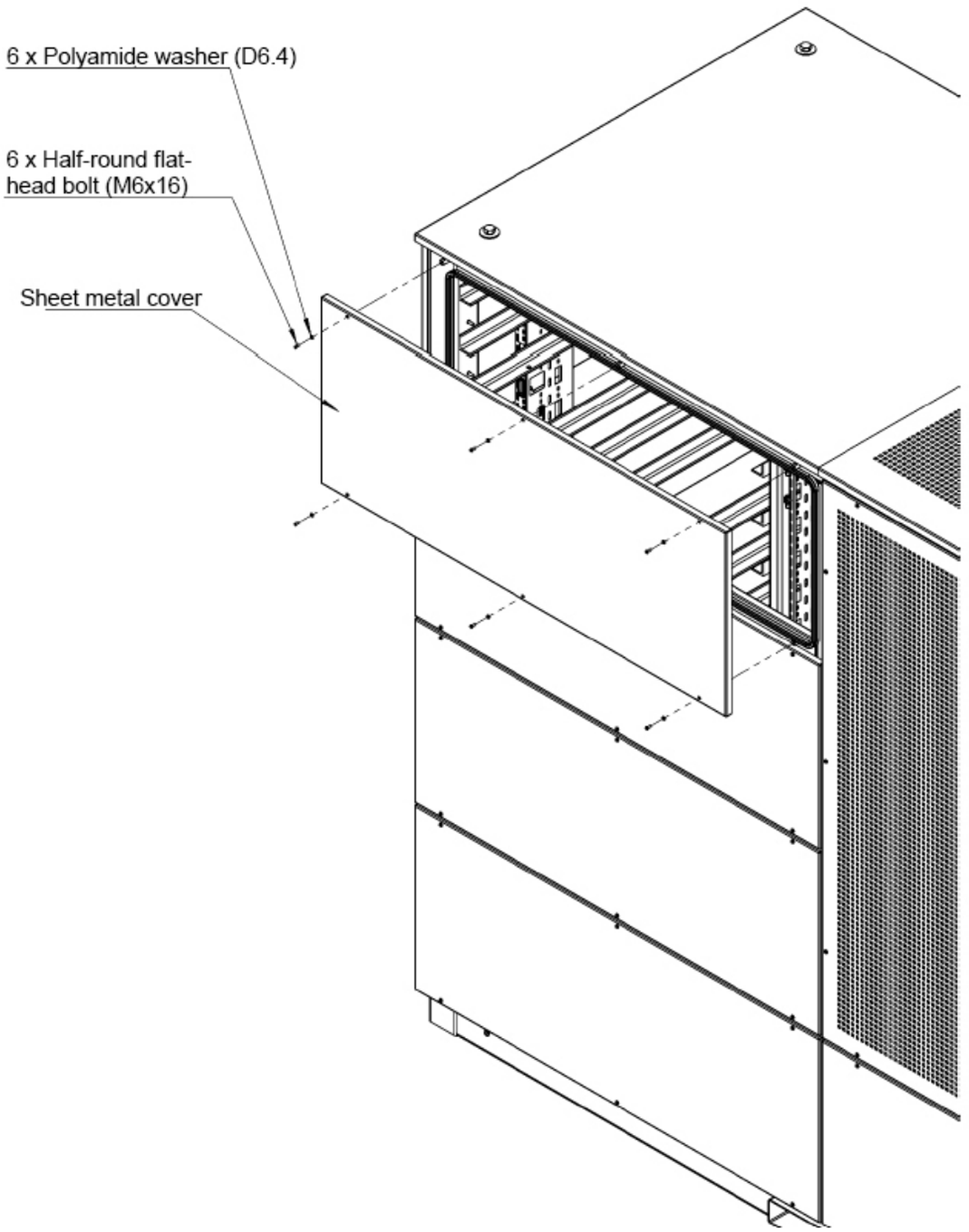


Figure 23. Disassembly — Sheet metal covers

5.2.5. Installing the equipotential bonding of the container

Figure 24. M10 nut for fastening the equipotential bonding

It is possible to connect equipotential bonding at each corner of the electrical energy storage system. The electrical energy storage system must be integrated into the on-site lightning protection concept.

5.3. Assembly — Inverter rack (optional)

The inverter rack is included in the scope of delivery. The use of the inverter rack is optional. The inverters can be installed in all locations permitted for use.
To assemble the inverter rack, please follow the assembly instructions provided for this purpose.

5.4. Installation — Inverter(s)

For the safety instructions, assembly and installation location of the inverters, please refer to the following manual:

KACO blueplanet gridsave 92.0-137 TL3-S

5.5. Installation — Slide-in battery modules

In the fully-equipped variant, the batteries are assembled in the factory and connected on site exclusively by FENECON specialist personnel.

5.5.1. Wiring of the AC/DC connection box

The supply lines from the inverters to the container and the AC supply of the container must be designed by the customer, depending on the installation location of the inverters, and are therefore not included in the scope of delivery.

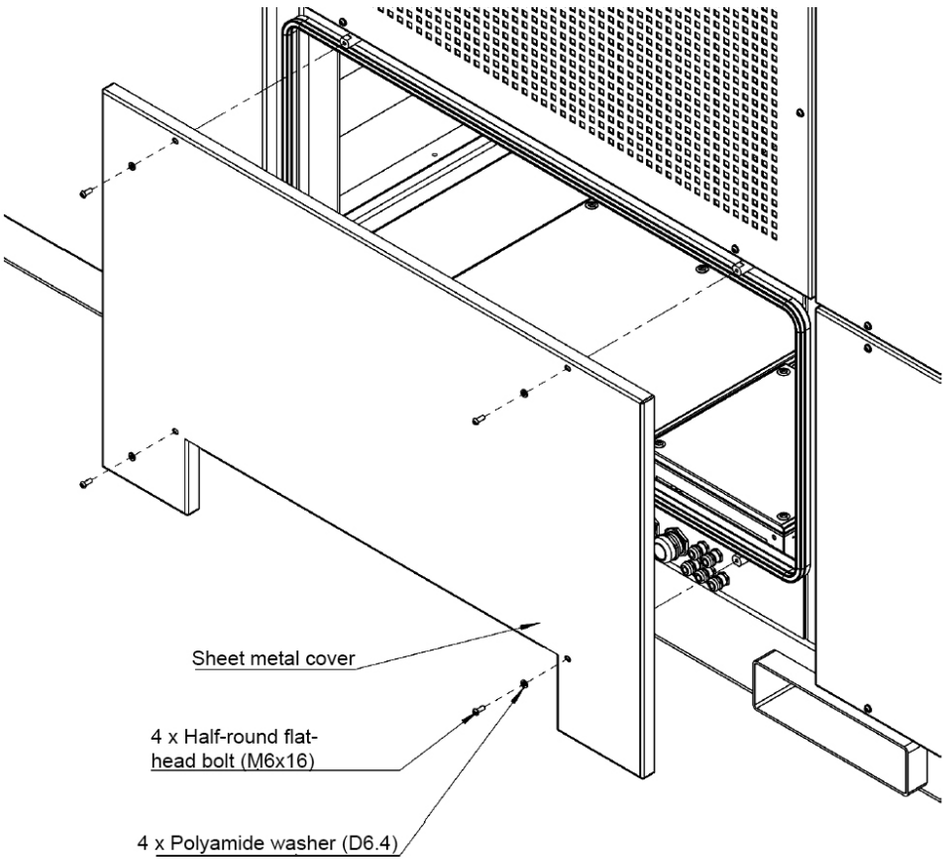


Figure 25. Disassembly — Sheet metal cover with notch for cable connections

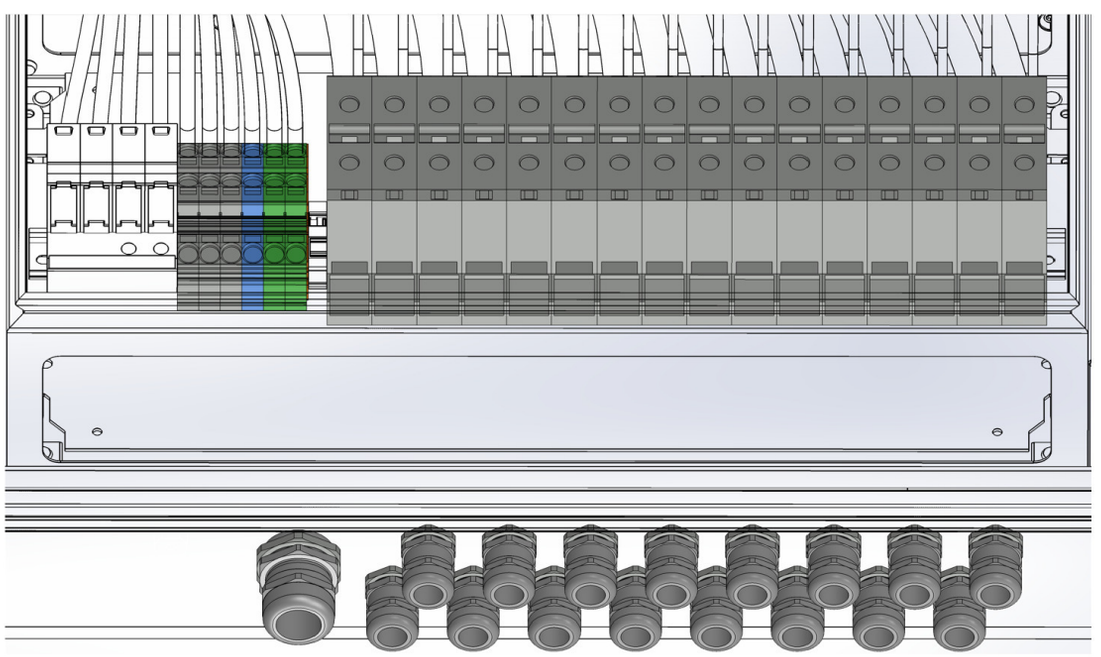


Figure 26. AC/DC connection area

Sowohl die AC-Kabel für die Versorgung des Klimageräts als auch die von den Wechselrichtern kommenden DC-Leitungen werden durch die Kabelverschraubungen gemäß des Abschnittes [Kabelverschraubungsplatte] in den Container eingeführt.

Im Anschluss werden sie an die Klemmen gemäß der Abbildung im Abschnitt [AC-/DC-Anschlussbox] angeschlossen.

5.5.2. Wiring of the communication connection box

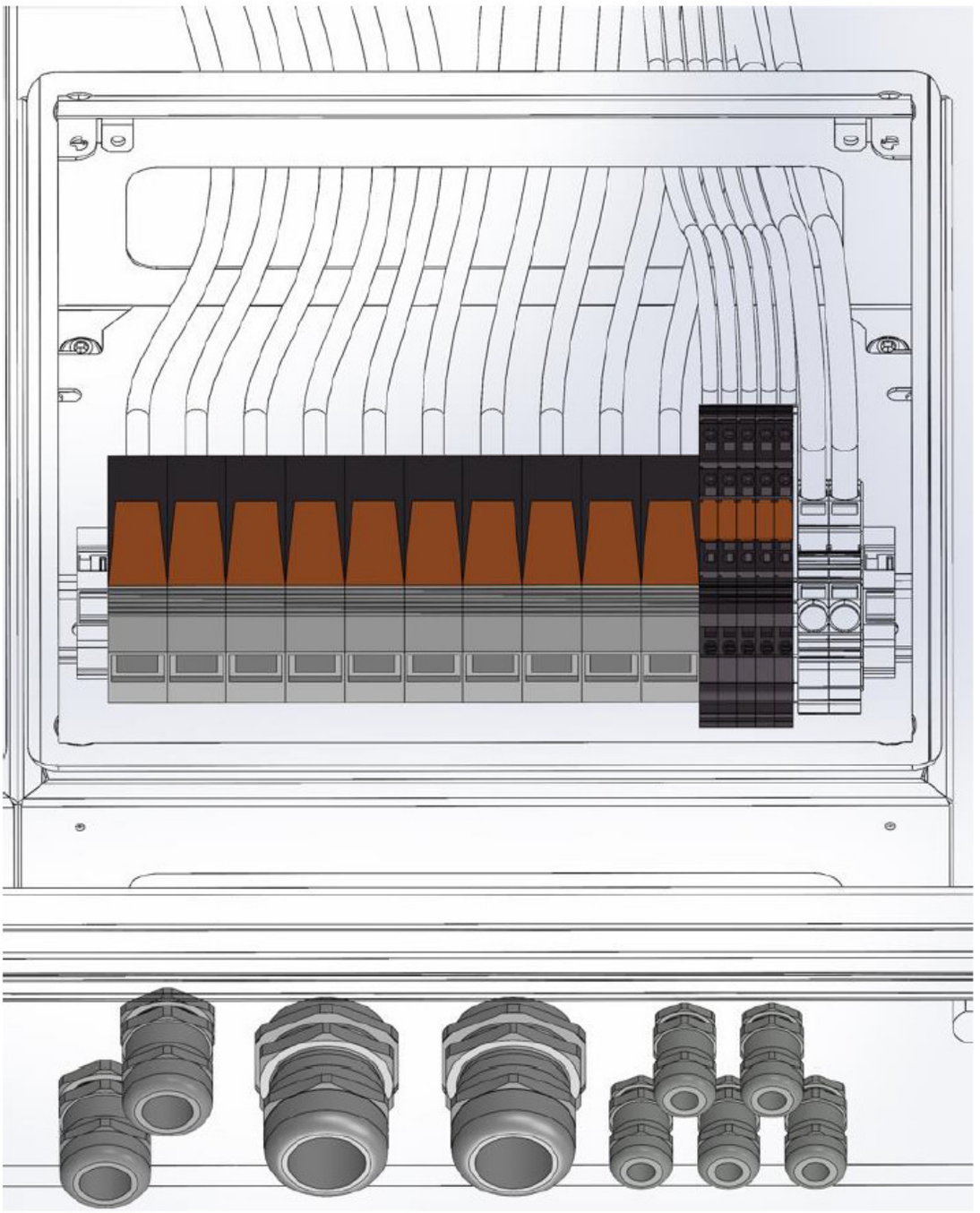


Figure 27. Communication cabling

Die von den Wechselrichtern kommenden LAN-Kabel durch die Kabelverschraubungen gemäß Abschnitt [Kabelverschraubungsplatte] in den Container einführen.

Im Anschluss werden diese gemäß Abschnitt [Kommunikationsanschlussbox] in die Buchsen gesteckt.

- Internet connection: To ensure a permanent data connection, an unlimited data volume tariff is required.

Optional:

- External Modbus communication

5.6. Montage — Abdeckbleche

5.6.1. Install equipotential bonding

Protective conductor cables are already pre-assembled in the electrical energy storage unit and only need to be connected to the sheet metal covers at the marked points.

- A protective conductor must be fitted to each sheet metal cover:

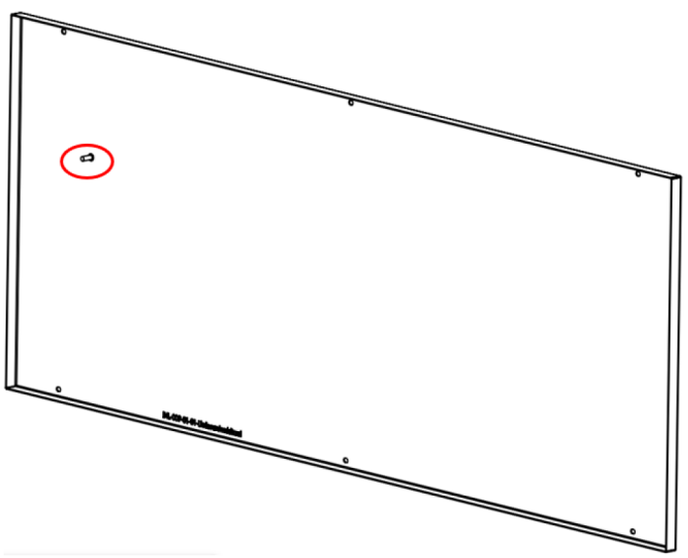


Figure 28. Bolts for attaching the equipotential bonding to the sheet metal covers

5.6.2. Installing the sheet metal covers

Refit the removed sheet metal covers using the bolts previously removed.

- Pay attention to the alignment of the sheet metal covers during installation.

6. Initial commissioning

The initial commissioning is carried out by FENECON GmbH. Please arrange an appointment for commissioning in advance with your contact at FENECON GmbH.

FENECON GmbH
Gewerbepark 6
94547 Iggensbach
+49 (0) 9903 6280 0
aftersales.industrial@fenecon.de

Residual risks:

Misoperation
Incorrect operation can lead to serious injury or death.
Before switching on the individual components, observe the specifications and instructions in the operating/assembly instructions of the respective manufacturer.

Incorrect operation can lead to material damage. Before switching on the system, make sure that

- alle Sicherheitseinrichtungen angebracht sind,
- there are no persons in the danger zone.

7. FEMS — FENECON Energiemanagementsystem

7.1. Technical documentation — FEMS

The technical documentation of FEMS must be observed; this can also be found on the FENECON website at: www.docs.fenecon.de.

1. Internetanbindung
   Eine dauerhafte Internetanbindung für das FEMS wird empfohlen und ist für die Inbetriebnahme notwendig. Grundsätzlich ist auch ein Offline-Betrieb möglich. In diesem Fall können jedoch u.a. folgende Funktionen nicht genutzt werden:
   Remote-Inbetriebnahme, Systemupdates, Installation von neuen FEMS-Apps, Übertragung von Messdaten an FENECON-Server für Remote-Zugriff, Nutzung des Online-Monitorings über den FENECON-Portalzugang (z. B. für unterwegs via Smartphone), Wartungszugang für FENECON-Service-Mitarbeiter, Nutzung von FEMS-Apps mit Third-Party-Diensten über Internet (z. B. zeitvariable Stromtarife).

2. Netzwerkkonfiguration
   FEMS bezieht in der Standard-Konfiguration die IP-Adresse über einen DHCP-Server (z. B. FritzBox). Die Netzwerkkonfiguration kann im Online Monitoring zusätzlich unter Einstellungen à Netzwerkkonfiguration angepasst werden. Mehr Informationen finden Sie hier.

3. System-Update
   Das System wird regelmäßig im Rahmen von Softwareupdates aktualisiert. Diese Updates können über den Reiter Einstellungen & FEMS-Systemupdate installiert werden.

7.2. Online-Monitoring

The FEMS Online Monitoring is used to visualize all energy flows in the system. The energy monitor shows live data on grid consumption or grid feed-in, PV production, charging/discharging of the battery storage system and electricity consumption. Other widgets show the percentage of self-sufficiency and self-consumption. In addition, the individual widgets offer a detailed view, which can also be used to view the performance values with phase accuracy.

In addition to the pure information display, Online Monitoring also lists all additionally purchased FEMS extensions, such as phase-accurate Peak Shaving, self-consumption optimization, Peak Load Window. Their functionality can be controlled via the corresponding widget and the integration of a PV system or other generators is also possible with the FEM112 package.

Zusätzlich zur Live-Ansicht bietet die Historie die Möglichkeit, selbstgewählte Zeiträume für das Online-Monitoring auszuwählen.
Über das Info-Symbol kann der Status des Gesamtsystems als auch der einzelnen Komponenten zu jedem Zeitpunkt überwacht werden.

The technical documentation of the FEMS must be observed; this can also be found on the FENECON website at: www.docs.fenecon.de/.

7.3. Access data

Der Zugang zum FEMS-Online-Monitoring ist nach Endkunden und Installateur getrennt.

7.4. Overview

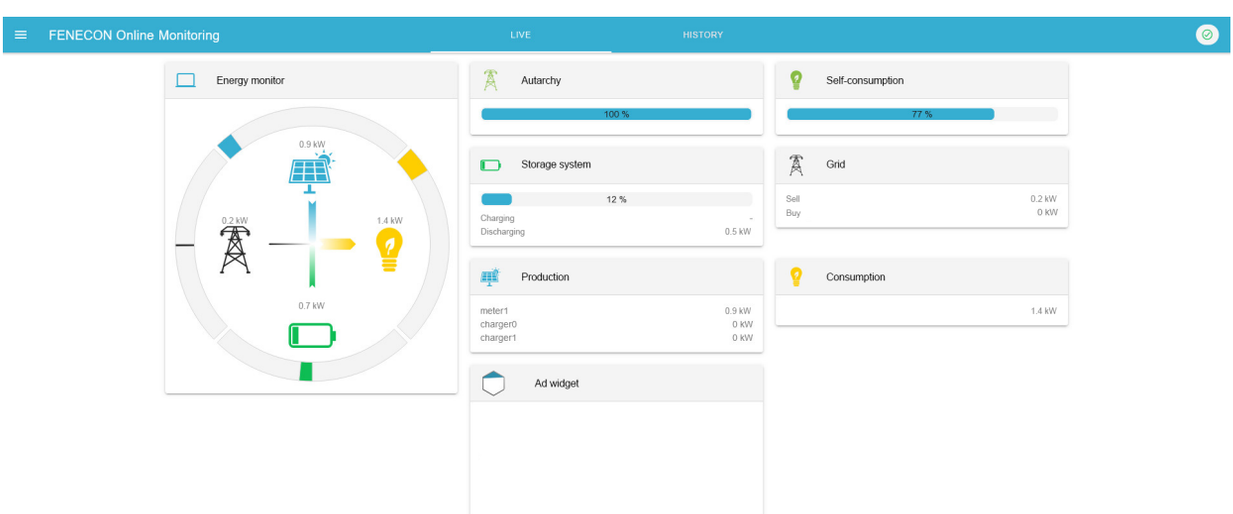


Figure 29. FEMS-Online-Monitoring

8. Troubleshooting

Residual risks:

If a fault is present and is not displayed in the fault message list, please contact customer service.

Unbekannte Störmeldungen

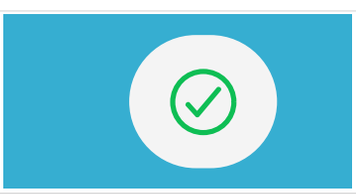
Unbekannte Störung und der Versuch der Behebung können zu Schäden am Produkt führen.

- Sollte eine Störung vorhanden sein und nicht in der Störmeldeliste angezeigt werden, Kundendienst informieren.

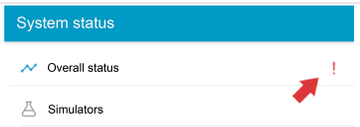
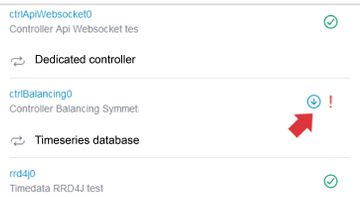
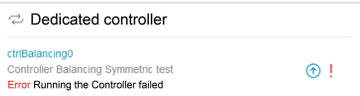
8.1. FEMS-Online-Monitoring

The system status can be checked after logging in at the top right using the color of the icon.

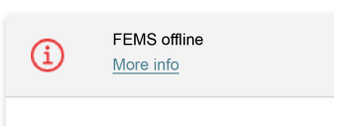
8.1.1. Fault display

	**System status**: Everything is OK
	**System status**: Warning
	**System status**: Error (Fault)

8.1.2. Troubleshooting

	For a detailed overview of an existing warning or error, click on the exclamation mark in the top right-hand corner.
	You can use the scroll bar to examine the origin of the warning or error in more detail. In this example, the error lies with the controller used.
	Clicking on the icon (down arrow) displays a more detailed error description depending on the error.

In the example above, an incorrect reference for the network meter was intentionally entered for test purposes, which is why the controller execution fails.
The FENECON service must be contacted to rectify errors.

	Under certain circumstances, the FEMS may not be accessible and the adjacent error message may appear.

If the FEMS is offline, follow the steps displayed below the message.

8.2. FENECON Service

These installation and service instructions only contain work that can be carried out without specialist knowledge of the manufacturer.

Work that is not described may only be carried out by authorized service personnel. Contact customer service to change parameters and programs.

If the energy storage system malfunctions, contact FENECON service:

Phone: +49 (0) 9903 6280 0
E-mail: aftersales.industrial@fenecon.de

8.2.1. Details for the FENECON service

The following information must be provided for the FENECON service:

- Gerätetyp/Konfiguration.
- FEMS-Nummer.
- Seriennummer.
- Aktuell installierte Softwareversion.
- Ticketnummer von vorherigen Störungen (falls vorhanden).
- Fehlercode Wechselrichter (falls vorhanden).

The information can be found on the type plate and in the system profile in online monitoring.

8.2.2. Servicezeiten

Monday to Thursday:	08:00 a.m. to 12:00 p.m. | 1:00 p.m. to 5:00 p.m.
Friday:	08:00 a.m. to 12:00 p.m. | 1:00 p.m. to 3:00 p.m.

9. Technical maintenance

9.1. Tests and inspections

Residual risks:

When carrying out inspection work, ensure that the product is in a safe condition. Improperly performed inspections can have serious consequences for people, the environment and the product itself.

Inspektionsarbeiten sind ausschließlich von ausgebildeten und befähigten Fachkräften durchzuführen.

The maintenance instructions for all individual components must be observed by authorized electricians.

Kontrollieren Sie das Produkt und die Leitungen regelmäßig auf äußerlich sichtbare Beschädigungen. Bei defekten Komponenten kontaktieren Sie den FENECON-Service. Reparaturen dürfen nur von der Elektrofachkraft vorgenommen werden.

9.2. Cleaning

Cleaning agents

The use of cleaning agents can damage the electrical energy storage system and its parts.

- Only clean the electrical energy storage system and all its parts with a cloth moistened with clean water.

9.3. Wartungsarbeiten

Residual risks:

During maintenance work, troubleshooting and assembly activities, ensure that the product is switched off in a safe manner and secured against being switched on again. Improperly performed maintenance and servicing activities can have serious consequences for people, the environment and the product itself.

Before carrying out maintenance work on systems which could be under pressure or in which very hot/hazardous substances could still be present:

1. switch off the system.
2. secure the system against being switched on again.
3. wear personal protective equipment against scalding/burns.
4. disconnect all loads from the system.
5. allow the system to cool down.
6. check whether hazardous substances are still in the system.

The product must only be serviced by persons who have attended a detailed training course on the subject.

The frequency of use and environmental conditions may make it necessary to vary the intervals between the activities described below.

- Unterweisen Sie die für die Wartung des Produktes verantwortlichen Personen.
- Change the maintenance intervals in this documentation after consulting the manufacturer.

Maintenance work may only be carried out by trained and qualified specialists.

For maintenance of the inverters and the climate control unit, please refer to the documentation of the individual manufacturers and the FENECON maintenance instructions.

9.4. Repairs

The FENECON service must be contacted in the event of defective components.

10. Storage

Storage longer than 6 months

Possible consequences: Deep discharge of the cells and defect of the slide-in battery module.

- Externe Beladung der Batteriemodule auf Nennspannung — es muss eine Zwangsbeladung durchgeführt werden, welche über das FEMS gesteuert wird.

Dies darf nur durch den Hersteller, oder durch ein vom Hersteller beauftragtes Unternehmen durchgeführt werden.

- Do not store the energy storage system with flammable or toxic objects.
- Store energy storage systems with safety defects separately from undamaged ones.
- Der SoC der einzelnen Batterieschubladen des Energiespeichersystems beträgt bei Auslieferung ≥ 25 % SoC.
- Nach 90 Tagen muss der SoC geprüft werden, dieser sollte in einem Bereich von 15 bis 35 % SoC liegen. Ist dies nicht gegeben, muss eine Be- bzw. Entladung durchgeführt werden.
- Eine Nachladung der Batterieschubladen wird ab 20 % SoC empfohlen.

Storage area: Fireproof indoors/outdoors with suitable weather protection

- Air temperature: -20 °C to 40 °C.
- Relative humidity: max. 50 % at +40 °C.

11. Utilization load

The service life of the product depends on the service life and maintenance intervals carried out by specialist personnel. The service life is particularly influenced by preventive maintenance and servicing. Timely replacement of wearing parts and appropriate documentation of each activity is therefore crucial for the availability of the product.

All functional safety elements must be replaced in good time before the calculated or specified service life in accordance with the number of operating cycles or operating time specified by the manufacturer. However, all functional safety components should be completely overhauled after 20 years at the latest, in accordance with the applicable standard(s).

12. Transport (*fully-equipped variant*)

This section contains information on external and internal transportation of the product.

Transportation is the movement of the product by manual or technical means.

- Only use suitable and tested lifting gear and hoists for transportation!
- The product must only be transported using the means of transport specified by the manufacturer.

Residual risks

	Risk due to lifted heavy loads! Do not stand below suspended loads! Ensure that all components have sufficient load-bearing capacity! Observe all specifications of the respective manufacturer! The transport rails must only be used for clamping down the container. Do not use for lifting! Do not use the transport rails for lifting!
	The transport is carried out by a hazardous transport. The transportation of lithium-ion batteries "UN3536" is subject to the regulations of the ADR. A dangerous goods label must be affixed to all sides of the container during shipment. When transporting batteries, the current laws, regulations and standards must be observed (e. g. Dangerous Goods Transportation Act — GGBefG).
	Ensure that the parts and the outer packaging are in perfect condition.
	Ensure that • alle Teile fest verschraubt sind, • die Transportsicherung ordnungsgemäß befestigt wurde, • you wear personal protective equipment.

Legal regulations

The off-site transportation of the product is carried out in accordance with the legal regulations of the country in which the product is transported off-site.

12.1. Safety instructions

- Transportation is carried out by a hazardous goods carrier.
- When transporting batteries, the current laws, regulations and standards must be observed (e. g. German Dangerous Goods Transportation Act (GGBefG)).
- Upon receipt of the delivery, it must be checked immediately for completeness and transport damage.
- Use personal protective equipment (depending on the boundary conditions) (minimum requirement: protective headgear and footwear).
- The electrical connections must be disconnected before transportation.

- Before lifting, check that the attachment points and lifting gear are correctly seated.
- The container should only be transported with an SoC of at least 25 %.
- Für den korrekten Transport die ausführliche Hebeanweisung (Abschnitt: Montage — Container) beachten.
- Die Tragkraft muss so dimensioniert sein, dass die Masse des Produktes sicher aufgenommen werden kann (vgl. Abschnitt: [Masse]).
- The size of the transport surface must be dimensioned so that the product can be safely placed and secured on the transport surface.

12.2. Change of location

There are no plans to relocate the electrical energy storage facility after commissioning.

If a change of location is planned, consult FENECON GmbH in advance.

When changing location, use a suitable industrial truck or hoist to transport the dismantled container.

The FENECON Industrial L, fully equipped with battery modules, weighs 11,000 kg.

12.3. Transportation process

Means of transportation

A means of transport that meets the following requirements is needed for safe off-site transportation:

- The load capacity must be dimensioned so that the mass of the product can be safely accommodated.
- The size of the transport surface must be such that the product can be placed safely on the transport surface without falling.

Required aids

The following aids are required for safe off-site transportation:

- Loading and unloading: with the aid of a forklift truck or crane.
- Transportation: only by motor vehicle for road transport.

Lifting instructions

The fully-equipped electrical energy storage must only be transported with a special lifting device, which does not remain with the customer and is the property of FENECON.

- A forklift with a minimum load capacity of 11 metric tons is required to transport a fully-equipped Industrial L (via forklift pockets).
- Für das korrekte Heben eines fertig bestückten Speichers können die Informationen aus dem Abschnitt [Abladen des Containers (fertig bestückt)] entnommen werden.

- Informationen zu Gewicht, Schwerpunkt und Abmessungen können den Abschnitten [Dimensionen] und [Masse] entnommen werden.

13. Dismantling and disposal

Residual risks:

	Misoperation Incorrect operation can lead to serious injury or death. Before switching off the individual components, observe the specifications and instructions in the operating/assembly instructions of the respective manufacturer.
	Incorrect operation can lead to material damage. **Before switching off the system, make sure that there are no unauthorized persons in the danger zone.**

13.1. Safety instructions

- The following suitable personal protective equipment must be worn for all work:
  - Sicherheitsschuhe.
  - Schutzhandschuhe, gegebenenfalls schnittfest.
  - Schutzbrille.
- The storage system may only be dismantled by authorized electricians.
- Dismantling work may only be carried out when the system has been taken out of operation.
- Before starting disassembly, all components to be removed must be secured against falling, tipping over or moving.
- Dismantling work may only be carried out when the system is shut down and only by service personnel.
- Transport aids must be used. The existing attachment points must be used for the system parts to be transported.
- Die Demontagehinweise der Komponentenhersteller (Anhang, Mitgeltende Dokumente) sind zu beachten.
- The slide-in battery modules are removed by service personnel and transported as hazardous goods transport.
- When transporting the battery modules, the current laws, regulations and standards must be observed (e. g. Hazardous Goods Transportation Act — GGBefG).

13.2. Prerequisites

Sharp and pointed edges

Injuries to the body or limbs due to sharp edges and points on parts of the system.

- Always wear suitable protective equipment (cut-resistant protective gloves, protective footwear, protective eyewear) when working on the machine/electrical energy storage!

- The power supply to the storage system is interrupted and secured against being switched on again.

13.3. Waste disposal

- Zur Entsorgung von Hilfs- und Betriebsstoffen sind die örtlichen Vorschriften und Angaben aus den Sicherheitsdatenblättern zu beachten.
- For disposal, also observe the information in the individual operating instructions for the respective components.
- If in doubt about the disposal method, contact the manufacturer or the local waste disposal company.

After proper disassembly, the dismantled individual parts must be recycled:

- The storage system must not be disposed of with normal household waste.
- Scrap metallic material residues.
- Have plastic elements recycled.
- Dispose of the remaining components sorted according to material properties.

Electrical waste, electronic components, lubricants and other auxiliary materials are subject to hazardous waste treatment and may only be disposed of by authorized specialist companies.

The following points must also be observed when disposing of the electrical energy storage system or its components as well as the operating and auxiliary materials:

- Nationale Bestimmungen vor Ort einhalten.
- Firmenspezifische Vorgaben beachten.
- Betriebs- und Hilfsstoffe entsprechend den jeweils geltenden Sicherheitsdatenblättern entsorgen.
- The packaging material must be disposed of in an environmentally friendly manner.

Batteries

- Do not expose the battery modules to high temperatures or direct sunlight.
- Do not expose the battery modules to high humidity or corrosive atmospheres.
- Please contact the FENECON service for special instructions on the disposal of used batteries.

14. Declaration of Conformity

EU-Konformitätserklärung

Hersteller FENECON GmbH
Brunnwiesenstraße 4
94469 Deggendorf

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Produktbezeichnung:	**Industriespeicher**
Typennummer:	**Industrial L**

Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsvorschriften der Union, einschließlich derer zum Zeitpunkt dieser Erklärung gültigen Änderungen:

2014/35/EU	RICHTLINIE 2014/35/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES von 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Mark
2014/30/EU	RICHTLINIE 2014/30/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit
2011/65/EU	RICHTLINIE 2011/65/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 8. Juni 2011 zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten

Die folgenden harmonisierten Normen wurden angewandt:

Richtlinie	Harmonisierte Norm
2014/35/EU (Niederspannungsrichtlinie)	EN 60204-1:2018 EN 62109-1:2010 EN IEC 61439-1:2021

Andere technische Spezifikationen und Vorschriften:

EN IEC 62485-1:2018, EN IEC 62485-2:2018

Die in der Gemeinschaft ansässige Person, die für die Zusammenstellung der technischen Unterlagen bevollmächtigt ist, unterzeichnet für und im Namen von:

Name Ludwig Asen, Brunnwiesenstraße 4, 94469 Deggendorf

Deggendorf, den 19. April 2023 ppa. L. Y.

Ort, Datum

Ludwig Asen
CPO

15. Register

15.1. Applicable documents

- Find all supplier documentation in the item parts list.

No.	Component	Manufacturer documentation
1	KACO blueplanet gridsave 92.0 kVa	Available online: https://kaco-newenergy.com/de/produkte/blueplanet-gridsave-920-137-tl3-s Manual: https://kaco-newenergy.com/index.php?eID=dumpFile&t=f&f=11094&token=6de997407a90130deee1fd8bc80e13072d331341
2	Envicool climate control unit	Available online: https://www.envicool.net/product/detail150.html
3	EWON Cosy Router	Available online: https://www.wachendorff-prozesstechnik.de/downloads/fernwartung-und-fernwirken/

15.2. List of figures

15.3. List of tables