FENECON Home 6, 10 & 15 Assembly and Operating Instructions

Version:2025.11.01

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1. Information on these instructions

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

1.1. Manufacturer

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1.2. Formal information on installation and service instructions

1.3. Version/revision

Version/Revision	Change	Date	Name
2024.06.1	Draft creation	10/06/2024	FENECON GW
2024.11.1	Completion	14/11/2024	FENECON MR
2024.11.2	Update - Illustrations	20/11/2024	FENECON MR
2024.11.3	Update - Scope of delivery	29/11/2024	FENECON MR
2025.1.1	Integration fire department notice	27/01/2025	FENECON PM
2025.8.1	Integration split base	01/08/2025	FENECON TK/MR
2025.11.1	Integration flood warning	03/11/2025	FENECON PM

Table 1. Version/revision

1.4. Symbol conventions

	This symbol indicates an imminent danger. If this danger is not avoided, it can lead to death or serious injury.
	This symbol indicates a potentially dangerous situation. If this dangerous situation is not avoided, it may result in minor or moderate injury.
	This symbol indicates a warning. Failure to observe this warning may result in damage and/or destruction of the system.
	This symbol indicates a note. It is recommended that the note be observed.

Table 2. Symbol conventions

1.5. Structure of warning notices

Warning notices protect against possible personal injury and damage to property if observed and classify the magnitude of the danger by means of the signal word.

Source of the danger
Possible consequences of non-compliance

- Measures for avoidance/prohibitions

Danger sign
The danger sign indicates warnings that warn of personal injury.

Source of danger
The source of danger indicates the cause of the hazard.

Possible consequences of non-compliance
The possible consequences of ignoring the warning are e. g. crushing, burns or other serious injuries.

Measures/prohibitions
Measures/prohibitions include actions that must be taken to avoid a hazard (e. g. stop the drive) or that are prohibited to avoid a hazard.

1.6. Terms and abbreviations

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

Term/abbreviation	Meaning
AC	Alternating Current
CHP	Combined heat and power plant (CHP)
BMS	Battery Management System
DC	Direct Current
EMS	Energy Management System
Energy meter	Electricity meter for the inverter at the grid connection point
FEMS	FENECON Energy Management System
Commissioning	Commissioning
MPPT	Maximum Power Point Tracking Finder for the maximum power point
GCP	grid connection point
PE	Protective conductor
PV	Photovoltaics
RTE	Round-Trip-Efficiency (RTE) System efficiency — ratio of discharged to charged energy quantity
SG-Ready	Smart-Grid-Ready — Preparation of the heat pump for external control
SoC	State of Charge State of charge The available capacity in a battery, expressed as a percentage of the nominal capacity.
SoH	State of Health — State of ageing
VDE	German Association for Electrical, Electronic & Information Technologies e. V.
Widget	Component of Online Monitoring

Table 3. Terms and abbreviations

1.7. Scope of delivery

Item	Component	Amount	Comment
1	FENECON Home 6, 10 & 15 inverter	1	Model is system-dependent (6, 10 or 15 kW)
2	FENECON Home 6, 10 & 15 EMS box	1	FENECON Energy Management System incl.
3	FENECON Home 6, 10 & 15 Parallel box	1	optional for second FENECON Home 6, 10 & 15 battery tower
4	FENECON Home 6, 10 & 15 Extension box	1	optional for third and fourth FENECON Home 6, 10 & 15 battery tower
5	FENECON Home 6, 10 & 15 BMS box	1	per FENECON Home 6, 10 & 15 battery tower
6	FENECON Home 6, 10 & 15 battery module		depending on the capacity ordered
7	FENECON Home 6, 10 & 15 base	1	per FENECON Home 6, 10 & 15 battery tower

Table 4. Scope of delivery

Component	Comment
Installation and service instructions	Instructions for the installer
Quick start guide FENECON Home 6, 10 & 15	Quick start guide for the installer

Table 5. Documents

1.8. Applicable documents

All documents listed in the appendix to these installation and service instructions must be observed. See 15.1 Applicable documents.

1.9. Availability

The operator must keep these installation and service instructions or relevant parts of them within easy reach in the immediate vicinity of the product.

If the product is handed over to another person, the operator passes these installation and service instructions on to that person.

2. Safety

2.1. Intended use

The FENECON electrical energy storage system is used to store electrical energy in rechargeable lithium iron phosphate battery modules (charging) and to provide electrical energy (discharging). This charging and discharging process takes place via a connected inverter. The system must only be used in compliance with the permissible technical data (see section Technical data).

FENECON power storage systems consist of various modules. In particular, these include a BMS (battery management system), the FENECON Energy Management System (FEMS), battery modules and bases. All processes of the electricity storage system are monitored and controlled by the FEMS.

Any other use is not an intended use.

2.2. 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 must 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. Check that there is no voltage.
4. Earth and short-circuit.
5. Cover or shield neighboring live parts.

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

Other misuses include in particular:

- improper transportation, installation or assembly at a location, trial operation or operation that could damage the system.
- change in the specified technical characteristics, including the individual components.
- change or deviation of the connected load.
- functional or structural changes.
- operating the product in a faulty or defective condition.

- improper repairs.
- operation without protective devices or with defective protective devices.
- disregarding the information in the original installation and service instructions.
- unauthorized access via the control unit or the network.
- the installation of firmware updates that were not obtained via FENECON.
- fire, open light and smoking in the vicinity of the storage system.
- insufficient ventilation at the installation site.
- unauthorized changes and actions to the electrical energy storage system.
- use as mobile energy storage.
- direct use in a PV system (integration via an AC-coupled grid is possible).

2.3. Area of application — Electromagnetic compatibility (EMC)

The low-voltage equipment is intended for use in the following areas of application:

- General public (public)

Use in other areas of application is not in accordance with the intended use.

2.4. 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.

2.4.1. Trained electricians

Trained electricians include persons who:

1. are able to carry out work on electrical systems due to their technical training, knowledge and experience as well as knowledge of the relevant standards and regulations.
2. have been commissioned and trained by the operator to carry out work on electrical systems and equipment of the battery system.
3. are familiar with how the battery system works.
4. recognize hazards and prevent them by taking appropriate protective measures.

2.4.2. Service staff

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

2.5. General information on the FENECON system

The product must be positioned in such a way that sufficient room for movement can be guaranteed for service and maintenance personnel in every phase of the product's life. The service life of the product depends on the service life and maintenance intervals carried out by qualified personnel. The service life is particularly influenced by preventive maintenance and servicing.

- The battery modules must only be installed and the cable connections made by trained electricians.
- The electrical energy storage system must only be used under the specified charging/discharging conditions (see section Technical data).
- Keep the electrical energy storage system away from children and animals.
- Do not connect the plug contacts of the BMS box in reverse.
- Do not short-circuit battery modules.
- Only use the battery modules as intended.

  Improper use can lead to overheating, explosion or fire of the battery modules.
- Read the instructions for installation and operation to avoid damage due to incorrect operation.
- The battery modules may have insufficient cell voltage after a long storage period. If this is the case, please contact the service department
- Do not expose the battery modules to high voltages.
- Place the battery modules on level surfaces.
- Do not place any objects on the FENECON battery towers.

2.5.1. Environmental influences

- Keep the electrical energy storage system away from water sources.
- Do not immerse the electrical energy storage system in water, moisten it or touch it with wet hands.
- Set up/store the electrical energy storage system in a cool place.
- Do not heat the electrical energy storage system.
- Do not expose the electrical energy storage system to open fire.
- Do not set up or use the electrical energy storage system near open fires, heaters or high-temperature sources.

  The heat can cause insulation to melt and the safety ventilation to be damaged. This can lead to overheating, explosion or fire on the battery modules.
- No soldering work must be carried out on the electrical energy storage system. Heat introduced

during soldering can damage the insulator and the safety venting mechanism and lead to overheating, explosion or fire of the battery modules.

2.5.2. Mechanical influences

- The battery modules must not be dismantled or modified. The battery modules contain a safety mechanism and a protective device, damage to which can lead to overheating, explosion or fire of the battery modules.
- Do not step on the electrical energy storage system.
- Do not attempt to crush or open battery modules.
- Do not apply any mechanical force to the electrical energy storage system.

  The battery modules can be damaged and short circuits can occur, which can lead to overheating, explosion or fire of the battery modules.
- Do not throw or drop parts of the power storage system.

  Do not use defective or dropped battery modules.
- Do not use the electrical energy storage system if changes in color or mechanical damage are detected during assembly, charging, normal operation and/or storage.
- If the protective devices are damaged, abnormal charging currents and voltages can cause a chemical reaction in the battery modules, which can lead to overheating, explosion or even fire in the battery modules.

2.5.3. Installation, operation and maintenance

When carrying out maintenance, servicing and cleaning work, ensure that the product is switched off in a safe manner and secured against being switched on again. In addition, all instructions in these installation and service instructions must be followed.

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

- Installation/maintenance work and making cable connections must only be carried out by qualified personnel (trained electricians).
- During maintenance work, 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.
- 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, switch off the battery tower immediately.
- Only continue the maintenance work after the causes of the anomaly have been eliminated.
- The battery modules can cause electric shock and burns due to high short-circuit currents.
- Do not touch the battery module connectors (+) and (-) directly with a wire or metal object (e. g. metal chain, hairpin). Excessive current can be generated in the event of a short circuit, which can lead to overheating, explosion or fire of the battery modules.

2.5.4. Fire protection

- Do not expose the electrical energy storage system to direct sunlight.
- Avoid contact with conductive objects (e. g. wires).
- Keep heat and fire sources, flammable, explosive and chemical materials away from the electrical energy storage system.
- Explosion hazard: Do not dispose of battery modules in a fire!

2.5.5. Storage

- Area: Fireproof indoors/outdoors with suitable weather protection.
- Air temperature: -20 °C to 40 °C.
- Relative humidity: max. 50 % at +40 °C.
- Do not store battery modules (lithium iron phosphate batteries) with flammable or toxic objects.
- Store battery modules with safety defects separately from undamaged battery modules.

Storage longer than 12 months
Possible consequences: Deep discharge of the cells/defective battery.

- External charging of the battery modules to nominal voltage — forced charging must be carried out, which is controlled via the FEMS. This must only be carried out by the manufacturer or by a company commissioned by the manufacturer.

2.5.6. Charging

- Keep the SoC of the battery module below 30% for shipping and charge the battery module if it has been stored for more than 12 months.

2.6. Operating resources

2.6.1. Electrolyte solution of the battery modules

- Electrolyte solution is used in the battery modules (lithium iron phosphate).
- 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.
- Do not inhale the vapors.
- If the electrolyte solution is swallowed, induce vomiting.
- Leave the contaminated area immediately after inhaling the vapors.
- Eye and skin contact with leaked electrolyte solution must be avoided.
- Contact with electrolyte solution can cause severe burns to the skin and damage to the eyes.

  After skin contact: Immediately wash skin thoroughly with neutralizing soap and consult a doctor if skin irritation persists.

  After eye contact: Immediately flush eye(s) with running water for 15 minutes and seek medical advice.

Delayed treatment can cause serious damage to health.

2.7. Residual risk

Warning of electrical voltage

Work on electrical equipment may only be carried out by qualified electricians from the manufacturer or by specially authorized, trained electricians and in compliance with the safety regulations.
Maintenance work must not be carried out for 5 minutes after the power supply has been disconnected.
The customer must provide a mains disconnection device for the electrical power supply.

Unknown fault messages

Unknown faults and attempts to rectify them can lead to damage to the product.
If there is a fault that is not included in the fault list, inform customer service.

All doors, emergency exits and areas around the electrical energy storage system must remain clear; do not obstruct escape routes!

The condition of the floor outside the storage system is the responsibility of the user. However, the housing is sealed so that no electrolyte can escape.

2.8. Behavior in emergency situations

Proceed as follows in emergency situations:

1. Disconnect the electrical energy storage system from the grid.
2. Leave the zone of danger immediately.
3. Secure the area.
4. Inform those responsible.
5. Call a doctor if necessary.

2.9. Pictograms

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

Pictogram	Meaning	Description
	Warning of dangerous electrical 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.
	General warning sign	
	Battery charging hazard warning	Pictogram on enclosure and marking of components not clearly identified as containing electrical equipment that may give rise to a battery charging hazard.
	No naked flames; fire, naked source of ignition and smoking prohibited	Pictogram on the enclosure and marking of components that do not clearly indicate that they contain electrical equipment that may present a risk of naked flames, fire, naked sources of ignition and smoking.
	Protective earthing symbol	
	Separate collection of electrical and electronic equipment	
	Note instructions	
	Use protective headgear	
	Use protective footwear	

Pictogram	Meaning	Description
	Use protective gloves	
	CE mark	
	Product is recyclable.	

Table 6. Pictograms

2.10. Operating materials/equipment

2.10.1. Electrolyte solution of the battery modules

- Electrolyte solution is used in the battery modules (lithium iron phosphate).
- 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.
- Eye and skin contact with leaked electrolyte solution must be avoided.

  After skin contact: Immediately wash skin thoroughly with neutralizing soap and consult a doctor if skin irritation persists.

  After eye contact: Immediately flush eye(s) with running water for 15 minutes and seek medical advice.

Delayed treatment can cause serious damage to health.

2.10.2. Electrical equipment

- Work on electrical equipment must only be carried out by qualified electricians.
- The five safety rules must be observed for all work on electrical components:
  1. Disconnect.
  2. Secure against restarting.
  3. Check that there is no voltage.
  4. Earth and short-circuit.
  5. Cover or shield neighboring live parts.
- Maintenance work must only be carried out by trained specialist personnel (service personnel).
- Before starting work, carry out visual checks for insulation and housing damage.
- The system must never be operated with faulty or non-operational electrical connections.
- To avoid damage, lay supply lines without crushing and shearing points.
- Only insulated tools must be used for maintenance on uninsulated conductors and terminals.

- Control 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!
- Some equipment (e. g. inverters) with an electrical intermediate circuit may still carry dangerous residual voltages for a certain period of time after disconnection. Before starting work on these systems, check that they are de-energized.

2.11. Personal protective equipment

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

- Protective footwear
- Protective gloves, cut-resistant if necessary
- Protective eyewear
- Protective headgear

2.12. Spare and wear parts

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 must be used. The instructions for spare parts must be observed. Further information can be found in the wiring diagram.

Further information must be requested from the manufacturer.

2.13. IT security

FENECON systems and their applications communicate and operate without an internet connection. The individual system components (inverters, batteries, etc.) are not directly connected to the internet or accessible from the Internet. Sensitive communications via the internet are processed exclusively via certificate-based TLS encryption.

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. General

Description		Value/dimension
Installation/environmental conditions	Ingress protection	IP55
	Operating altitude above sea level	≤ 2,000 m
	Installation/operating temperature	-35 °C to +60 °C
	Relative humidity (operation/storage)	50 % non-condensing (up to 90 % permissible for short periods)
	Battery operating temperature	-20 °C to +55 °C
	Optimal operating temperature of the battery	+15 °C to +30 °C
	Cooling	Natural convection
	Noise level	< 30 dB
	Max. grid connection	120 A
Certification/Directive	Complete system	CE
	Inverter	VDE 4105:2018-11 TOR generator type A 1.1
	Battery	UN38.3 VDE 2510-50

Table 7. Technical data — General

3.2. Technical data — Inverter

Description		Value/dimension		
Inverter model		**FINV-6-2-DAH**	**FINV-10-2-DAH**	**FINV-15-2-DAH**
DC-PV connection	Max. DC input power	9 kW_p	15 kW_p	22.5 kW_p
	MPP tracker	2	3	3
	Number of inputs per MPPT	1 (MC4)	1 (MC4)	1(MC4)
	Start voltage	150 V	150 V	150 V
	Max. DC input voltage in V	1000 V	1000 V	1000 V
	MPPT voltage range	120 V to 850 V	120 V to 850 V	120 V to 850 V
	Nominal input voltage in V	620 V	620 V	620 V
	Max. Input current per MPPT	16 A	16 A	16 A
	Max. Short-circuit current per MPPT	24 A	24 A	24 A
AC connection	Grid connection	400/380 V, 3L/N/PE, 50/60 Hz	400/380 V, 3L/N/PE, 50/60 Hz	400/380 V, 3L/N/PE, 50/60 Hz
	Max. Output current	8.7 A	14.5 A	21.7 A
	Max. Input Current	15.7 A	26.1 A	26.1 A
	Nominal Apparent Power Output	6,000 VA	10,000 VA	15,000 VA
	Max. Apparent power output	6,000 VA	10,000 VA	15,000 VA
	Max. Apparent power from the grid	7,200 VA	12,000 VA	18,000 VA
	Cos(φ)	-0.8 to +0.8	-0.8 to +0.8	-0.8 to +0.8
Back-up power	Back-up power capable	Yes	Yes	Yes
	Network configuration	400/380 V, 3L/N/PE, 50/60 Hz	400/380 V, 3L/N/PE, 50/60 Hz	400/380 V, 3L/N/PE, 50/60 Hz
	Loads supplied with back-up power (per phase)	6,000 VA (2,000 VA)*	10,000 VA (3,333 VA)*	15,000 VA (5,000 VA)*
	Unbalanced load	2,000 VA	3,333 VA	5,000 VA
	Black start	Yes	Yes	Yes
	Solar recharging	Yes	Yes	Yes
Efficiency	Max. Efficiency	98.2 %	98.2 %	98.2 %
	European efficiency	97.2 %	97.5 %	97.5 %
General	Width | Depth | Height	497 mm | 221 mm | 461 mm	497 mm | 221 mm | 461 mm	497 mm | 221 mm | 461 mm
	Weight	23 kg	25 kg	25 kg
	Topology	non-insulated	non-insulated	non-insulated

Table 8. Technical data — Inverter

*also in parallel mains operation

3.2.1. Dimensions

The dimensions are given in mm.

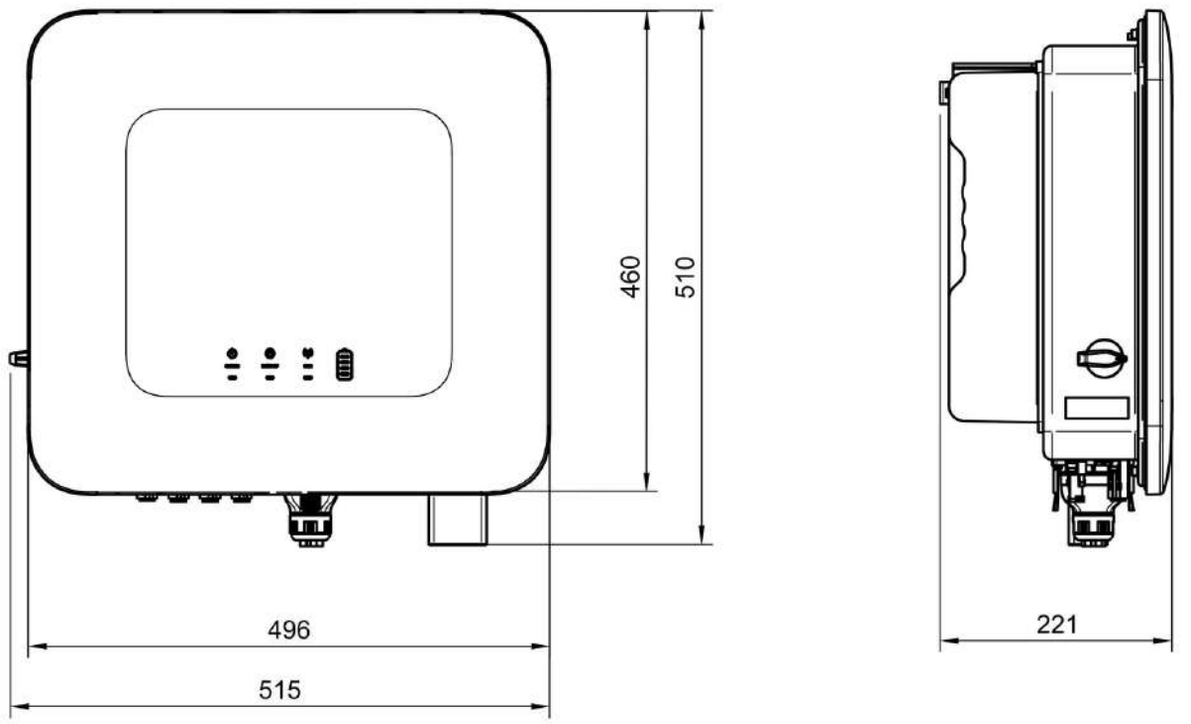


Illustration 1. Dimensions — Inverter

3.3. Technical data — FENECON EMS box

Description	Value/dimension
DC operating voltage	224 V to 672 V
Max. current (battery)	50 A
Operating temperature	-10 °C to 50 °C
Protection specification	IP55 (plugged)
Input voltage	100 V to 240 V/1.8 A/50 Hz to 60 Hz
Width | Depth | Height	506 mm | 401 mm | 157 mm
Weight	12 kg
Installation	stackable

Table 9. Technical data — FENECON EMS box

3.3.1. Dimensions

The dimensions are given in mm.

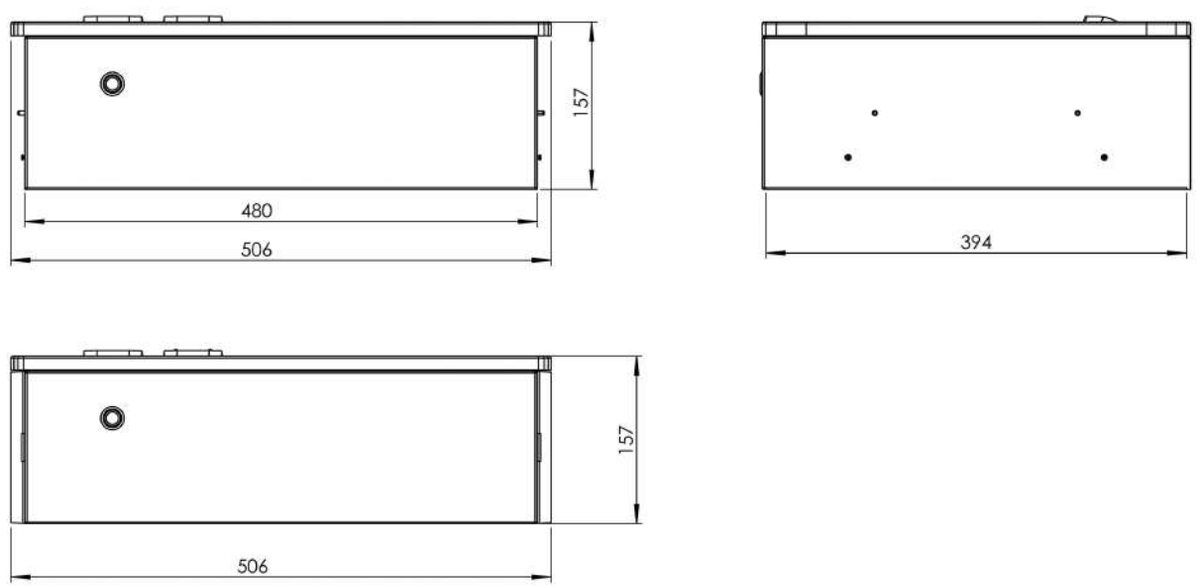


Illustration 2. Dimensions — EMS box

3.3.2. EMS box — Terminal assignment

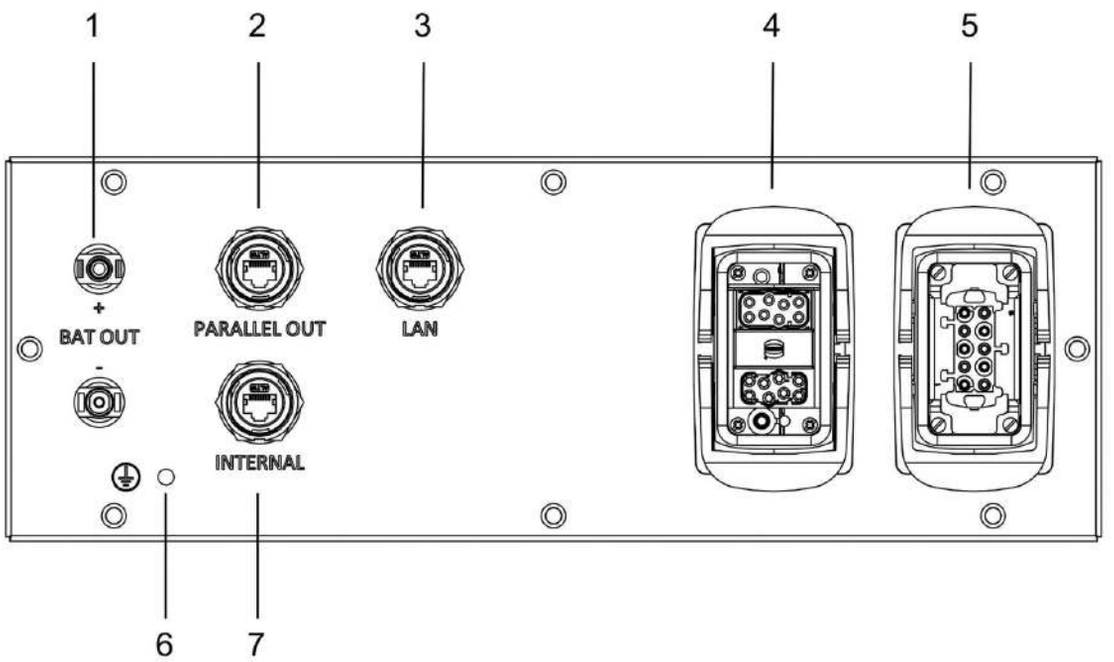


Illustration 3. Terminal assignment — EMS box

List item	Description
1	Battery connection to the inverter (MC4-Evo stor)
2	Communication output for parallel connection of several batteries
3	Customer network connection (LAN) RJ45 (network cable not included in scope of delivery)
4	Communication inverter, relay outputs; digital inputs (16-pin connector)
5	Power supply FEMS box; potential-free contacts (max. 10 A, measured) (10-pin plug)
6	Earthing connection
7	For future applications (not assigned)

Table 10. Terminal assignment — EMS box

3.4. Technical data — FENECON Parallel Box (optional)

Description	Value/dimension
DC operating voltage	224 V to 672 V
Max. Current (battery)	50 A
Operating temperature	-10 °C ~ 50 °C
Protection specification	IP55 (plugged in)
Width | Depth | Height	506 mm |401 mm |157 mm
Weight	10 kg
Installation	stackable

Table 11. Technical data — Parallel box

3.4.1. Dimensions

The dimensions are given in mm.

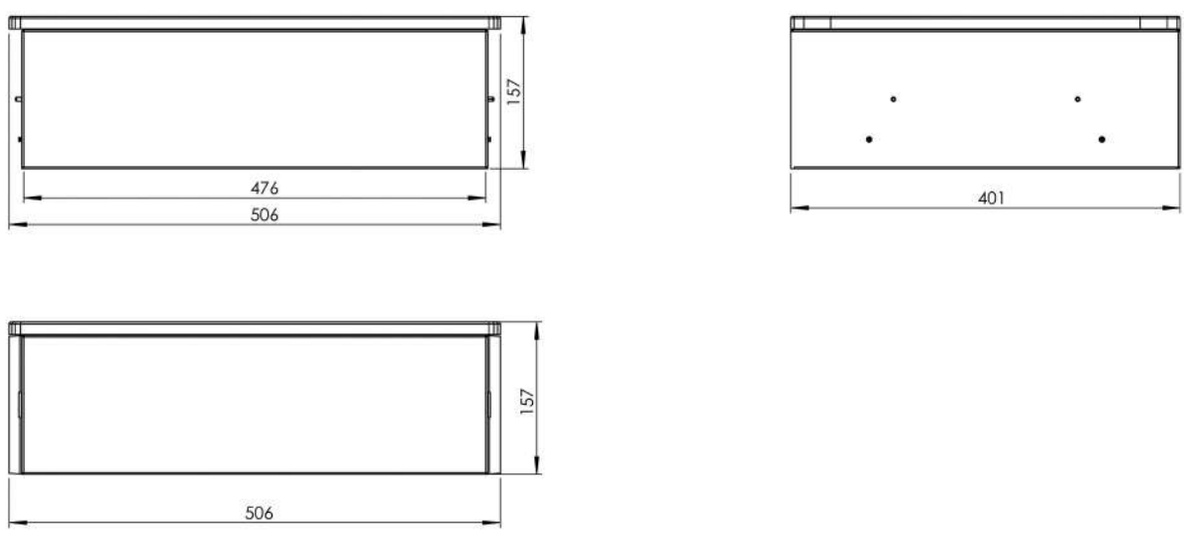


Illustration 4. Dimensions — Parallel Box

3.4.2. Parallel box — Terminal assignment

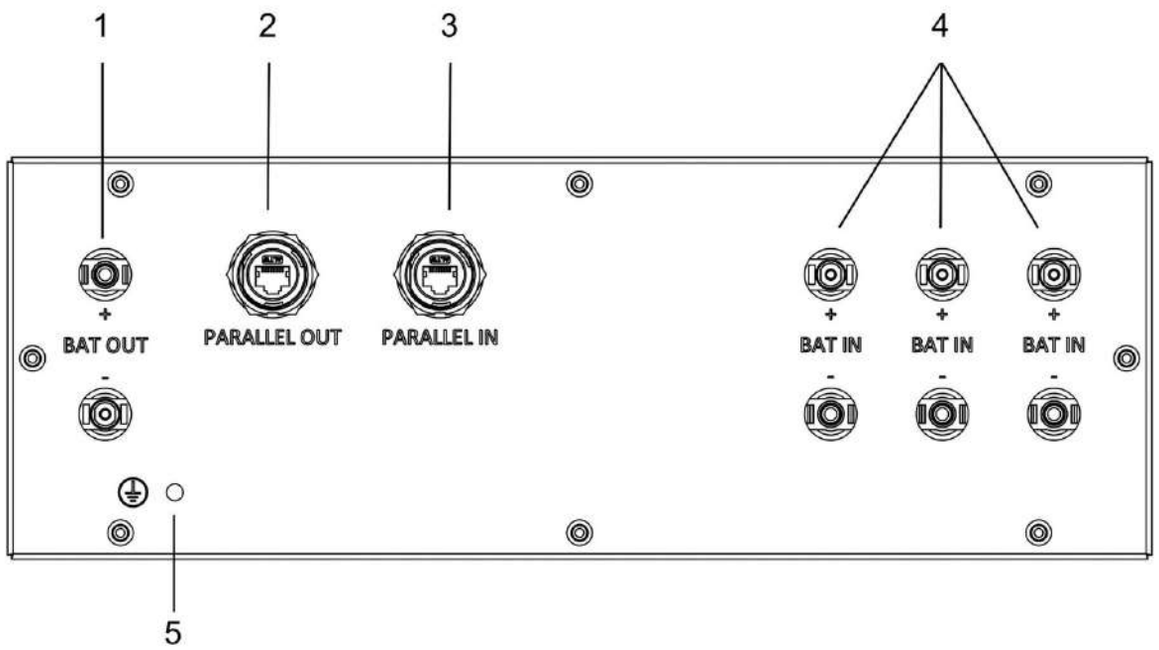


Illustration 5. Terminal assignment — Parallel box

List item	Description
1	Battery connection to the inverter (MC4-Evo stor)
2	Communication output for parallel connection of several battery towers
3	Communication input for parallel connection of several battery towers
4	Battery connection for additional battery towers (MC4-Evo stor)
5	Earthing connection

Table 12. Terminal assignment — Parallel box

3.5. Technical data — FENECON Extension box (optional)

Description	Value/dimension
DC operating voltage	224 V to 672 V
Max. current (battery)	50 A
Operating temperature	-10 °C ~ 50 °C
Protection specification	IP55 (plugged in)
Width | Depth | Height	506 mm | 401 mm | 157 mm
Weight	9 kg
Installation	stackable

Table 13. Extension box (optional) — Technical data

3.5.1. Dimensions

The dimensions are given in mm.

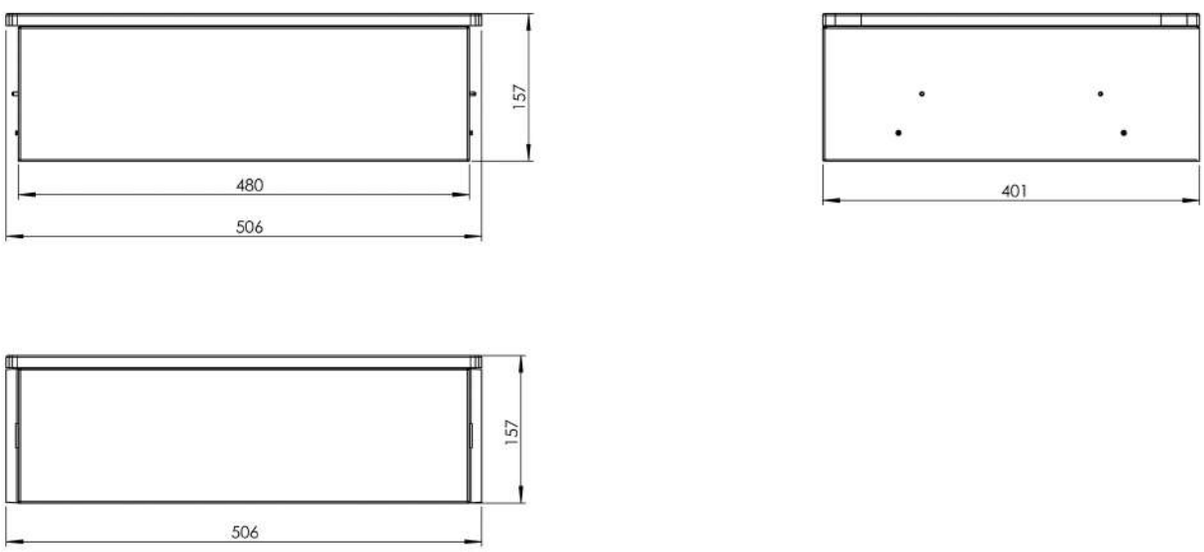


Illustration 6. Dimensions — Extension box

3.5.2. Extension box — Terminal assignment

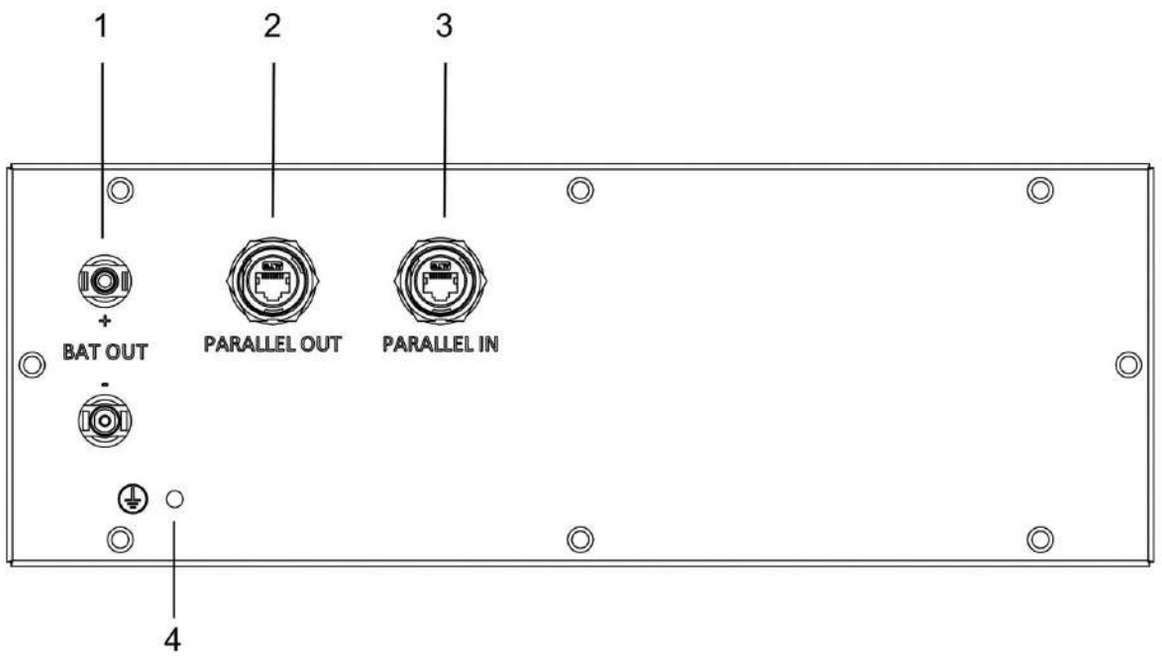


Illustration 7. Terminal assignment — Extension box

List item	Description
1	Battery connection to EMS box in parallel (MC4-Evo stor)
2	Communication output for parallel connection of several battery towers
3	Communication input for parallel connection of several battery towers
4	Earthing connection

Table 14. Terminal assignment — Extension box

3.6. Technical data — FENECON BMS box

Description	Value/dimension
Maximum operating voltage range	224 V to 672 V
Maximum output/input current	50 A
Optimal operating temperature	15 °C to 30 °C
Operating temperature range	-20 °C to 55 °C
Protection specification	IP55 (plugged in)
Width (incl. side panel) | Depth | Height	506 mm |401 mm |143 mm
Weight	13 kg
Installation	stackable/wall mounting

Table 15. Technical data — BMS box

3.6.1. Dimensions

The dimensions are given in mm.

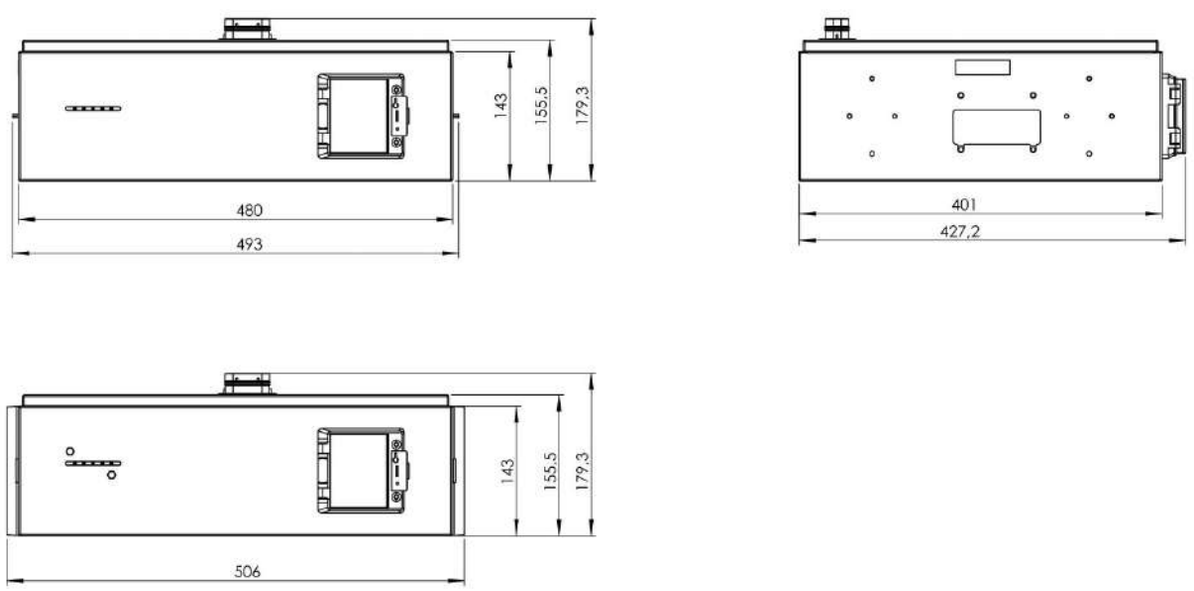


Illustration 8. Dimensions — BMS box

3.7. Technical data — FENECON battery module

Designation	Value/dimension
Usable capacity	62.4 Ah/2.80 kWh
Rated voltage	44.8 V
Output voltage range	39.2 V to 50.4 V
Battery operating temperature range	-20 °C to +55 °C
Storage temperature range (over 7 days)	-30 °C to +60 °C
Storage temperature range (over 30 days)	-20 °C to +55 °C
Storage temperature range (cumulative up to 270 days)	-10 °C to +45 °C
Protection specification	IP55 (plugged in)
Weight	30 kg
Installation	stackable
Parallel connection	4 battery towers in parallel
Cooling	natural cooling
Shipping capacity	< 30 % SoC
Module safety certification	VDE 2510/IEC62619
UN transport test standard	UN38.3
Relative humidity during storage	5 % to 95 %

Table 16. Technical data — Battery module

Storage longer than 12 months
Possible consequences: Deep discharge of the cells, defect of the battery module.

- External charging of the battery modules to nominal voltage. This must only be carried out by the manufacturer or a company commissioned by the manufacturer.

3.7.1. Dimensions

The dimensions are given in mm.

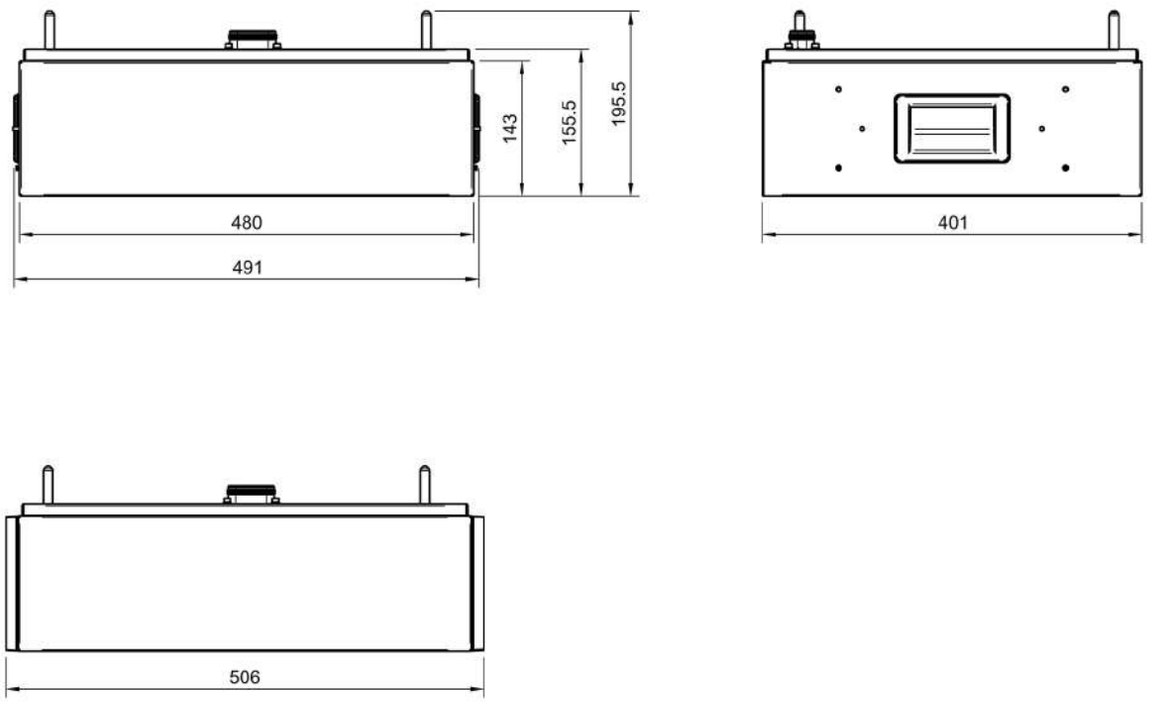


Illustration 9. Dimensions — Battery module

3.7.2. Electrical parameters of the battery modules

For amounts of battery modules from 3 to 6

Parameter	Value/dimension			
No. of modules	**3S**	**4S**	**5S**	**6S**
Nominal capacity in kWh	8.6	11.4	14.3	17.2
Usable capacity in kWh	8.4	11.2	14.0	16.8
Width incl. side panel in mm	506			
Depth in mm	401			
Height in mm	834	977	1120	1263
Weight in kg	127	157	187	217
Nominal voltage in V	134.4	179.2	224.0	268.8
Output voltage range in V	117.6 ~ 151.2	156.8 ~ 201.6	196 ~ 252	235.2 ~ 302.4
Maximum continuous charging/discharging power in kW				
Inverter with 6 kW	4.03	5.38	6.00	6.00
Inverter with 10 kW	5.38	7.17	8.96	10.00
Inverter with 15 kW	5.38	7.17	8.96	10.75

Table 17. Electrical parameters — Amount of battery modules 3S to 6S (3 to 6 modules in series)

For battery modules 8 to 11

Parameter	Value/dimension			
Modules	**8S**	**9S**	**10S**	**11S**
Nominal capacity in kWh	22.9	25.8	28.7	31.5
Usable capacity in kWh	22.4	25.2	28.0	30.8
Width incl. side panel in mm	506			
Depth in mm	401			
Height in mm	1549	1692	1835	1978
Weight in kg	277	307	337	367
Rated voltage in V	358.4	403.2	448.0	492.8
Output voltage range in V	313.6 ~ 403.2	352.8 ~ 453.6	392.0 ~ 504.0	431.2 ~ 554.4
Maximum continuous charging/discharging power in kW				
Inverter with 6 kW	6.00	6.00	6.00	6.00
Inverter with 10 kW	10.00	10.00	10.00	10.00
Inverter with 15 kW	12.54	14.34	15.00	15.00

Table 18. Electrical parameters — Number of battery modules 8S to 11S (8 to 11 modules in series)

For battery modules 12 to 14

Parameter	Value/dimension		
Modules	**12S**	**13S**	**14S**
Nominal capacity in kWh	34.4	37.3	40.1
Usable capacity in kWh	33.6	36.4	39.2
Width incl. side panel in mm	506		
Depth in mm	401		
Height in mm	2121	2264	2407
Weight in kg	397	427	457
Rated voltage in V	537.6	582.4	627.2
Output voltage range in V	470.4 ~ 604.8	509.6 ~ 655.2	548.8 ~ 705.6
Maximum continuous charging/discharging power in kW			
Inverter with 6 kW	6.00	6.00	6.00
Inverter with 10 kW	10.00	10.00	10.00
Inverter with 15 kW	15.00	15.00	15.00

Table 19. Electrical parameters — Amount of battery modules 12S to 14S (12 to 14 modules in series)

The specified capacity values refer to one battery tower and are rounded to one decimal place.

3.8. Technical data — Base

Designation	Value/dimension
Width (incl. side panel) | Depth | Height	506 | 401 | 84 mm
Weight	6 kg
Protection specification	IP55 (plugged in)
Installation	stackable

Table 20. Technical data — Base

3.8.1. Dimensions — Base

The dimensions are given in mm.

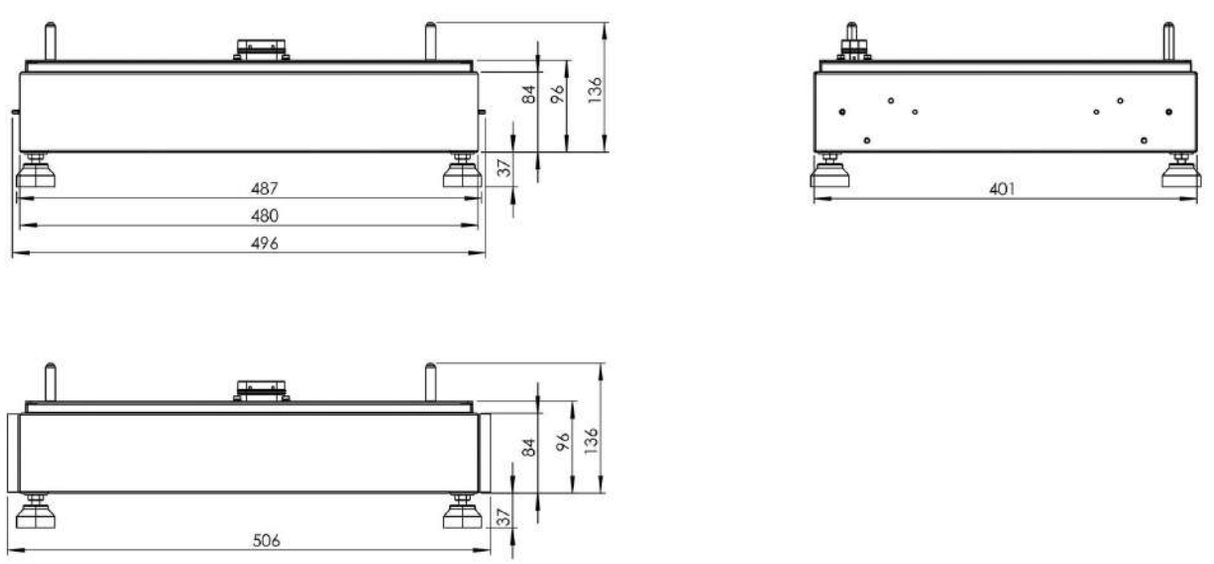


Illustration 10. Dimensions — Base

3.9. Technical data — Split base (optional)

Designation	Value/dimension
Width (incl. side panel) | Depth | Height	1312 | 401 | 84 mm
Weight	11 kg
Protection specification	IP55 (plugged in)
Installation	stackable

Table 21. Technical data — Split base

3.9.1. Dimensions — Split base

The dimensions are given in mm.

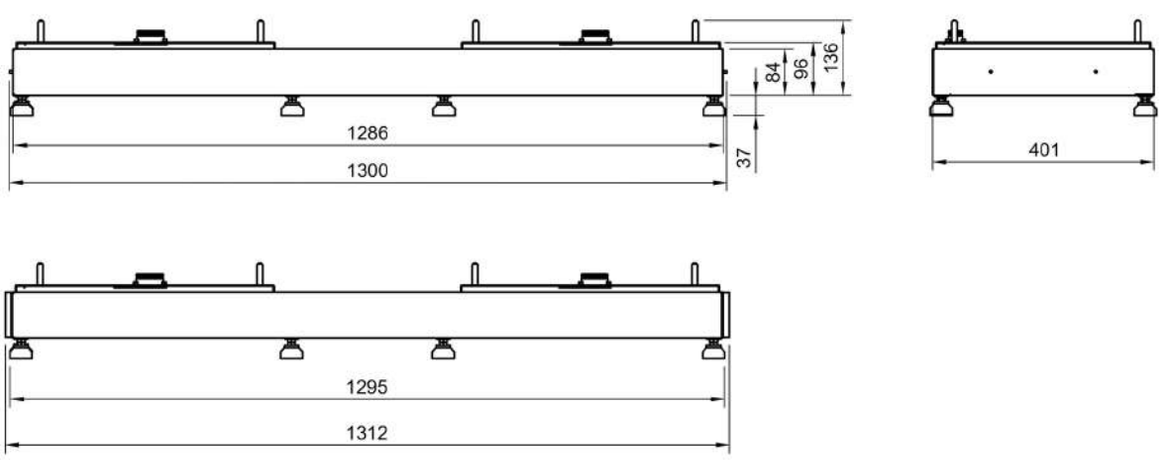


Illustration 11. Dimensions — Split base

3.10. Technical data — Top box (with option: split base)

Description	Value/dimension
Width (incl. side panel) | Depth | Height	506 | 401 | 157 mm
Weight	9 kg
Protection specification	IP55 (plugged in)
Installation	stackable

Table 22. Technical data — Top box

3.10.1. Dimensions — Top box

The dimensions are given in mm.

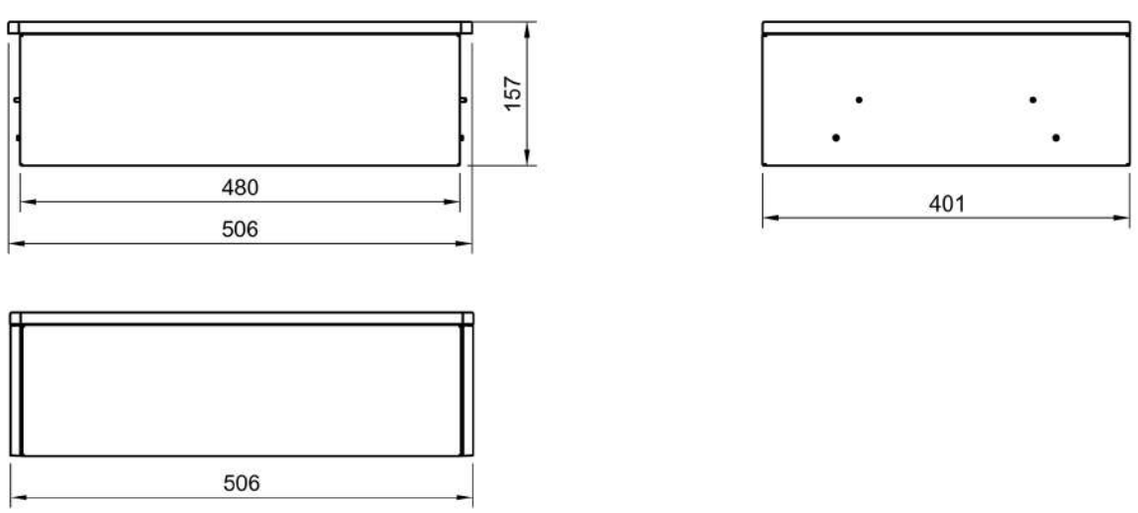


Illustration 12. Dimensions — Top box

4. General description

FENECON Home 6, 10 & 15 is an emergency-power-capable electrical energy storage system that can build its own household power grid. Lithium iron phosphate batteries (LiFePO4) are used in this modular system for storing electrical energy.

4.1. System configuration — General overview

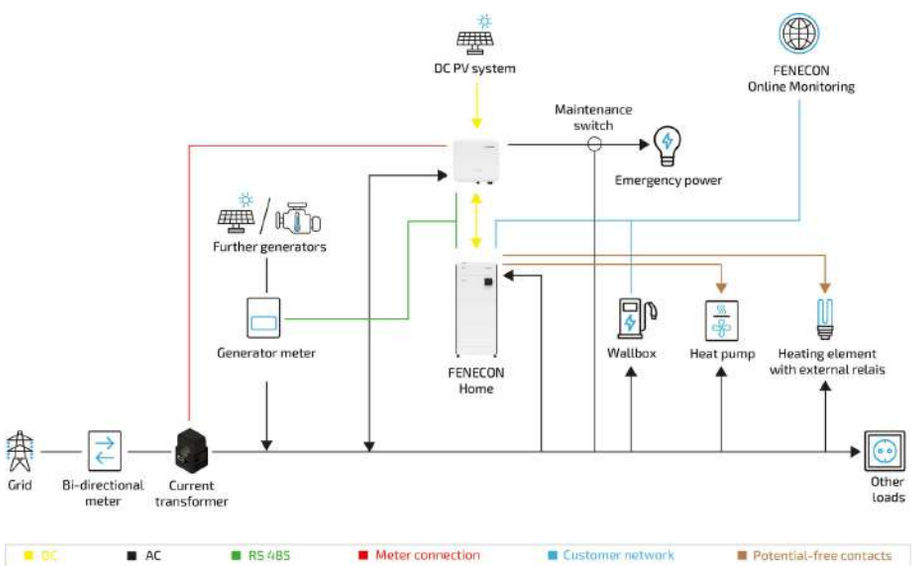


Illustration 13. System — schematic diagram with optional components (shown without protective device)

4.2. System structure: Variants with emergency power

4.2.1. Standard setup with back-up power

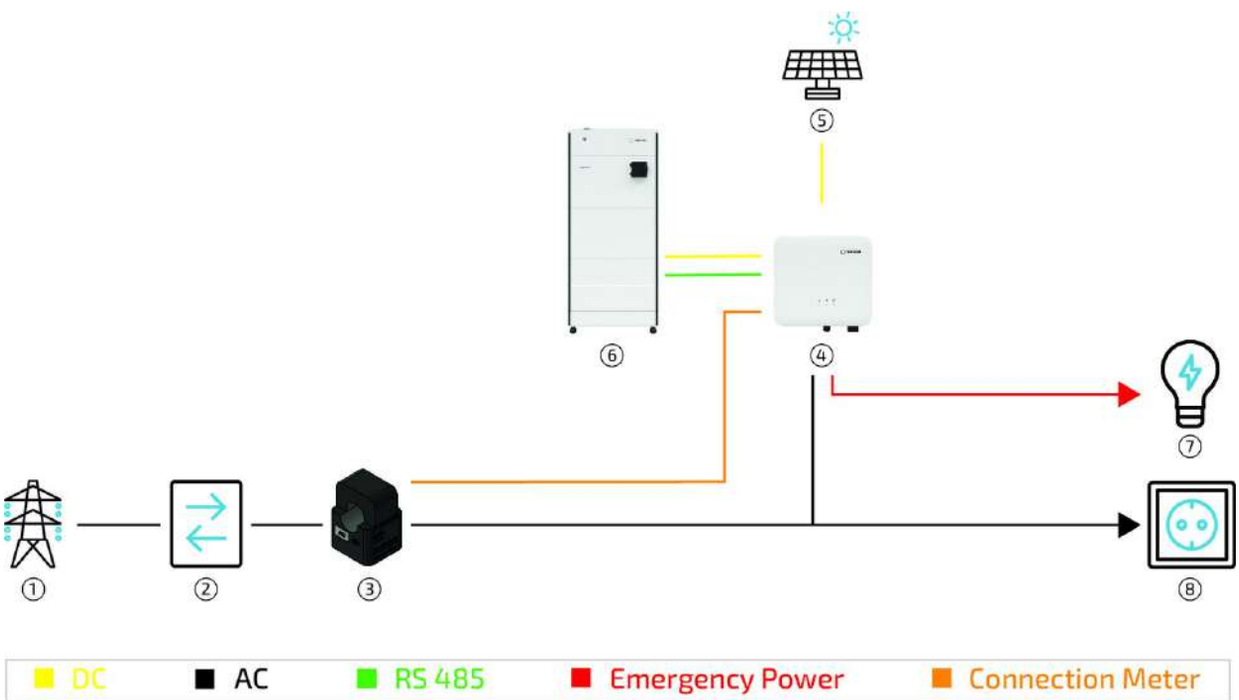


Illustration 14. Standard setup with emergency power (shown without protective device)

List item	Description
1	Grid
2	Bi-directional meter
3	Current transformer
4	Inverter
5	PV system
6	Electrical energy storage
7	Consumer load (supplied with emergency power)
8	Consumer load (not supplied with emergency power)

Table 23. Standard setup with back-up power

Within the back-up power function, the inverter acts as its own grid former and sets up its own 3-phase system for the separate emergency power branch (see Technical data). Compared to the public grid system, the network configuration of the emergency power mode has a lower "buffer effect" with regard to load peaks, starting currents, DC components and strongly fluctuating loads. Due to the limited power of the inverter, such loads are only possible within certain limits.

> The manufacturer is not responsible for the domestic installation.

4.2.2. System structure with additional PV producer

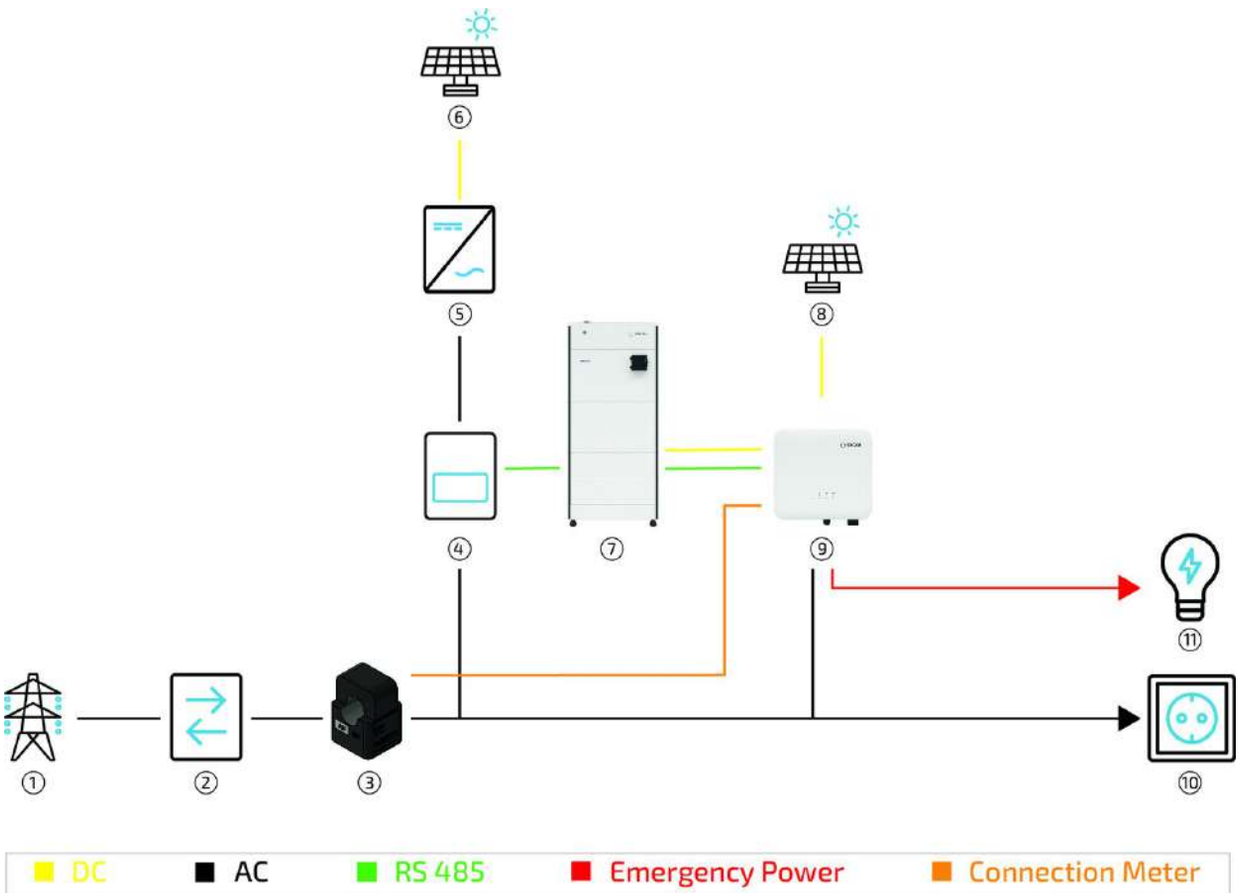


Illustration 15. System structure with additional PV producer (shown without protective device)

List item	Description
1	Grid
2	Bi-directional meter
3	Current transformer
4	3-phase sensor or with PV inverter app
5	PV inverter
6	Additional PV system
7	Electrical energy storage
8	PV system
9	Inverter
10	Consumer load (supplied with emergency power)
11	Consumer load (not supplied with emergency power)

Table 24. System structure with additional PV producer

4.2.3. AC system diagram

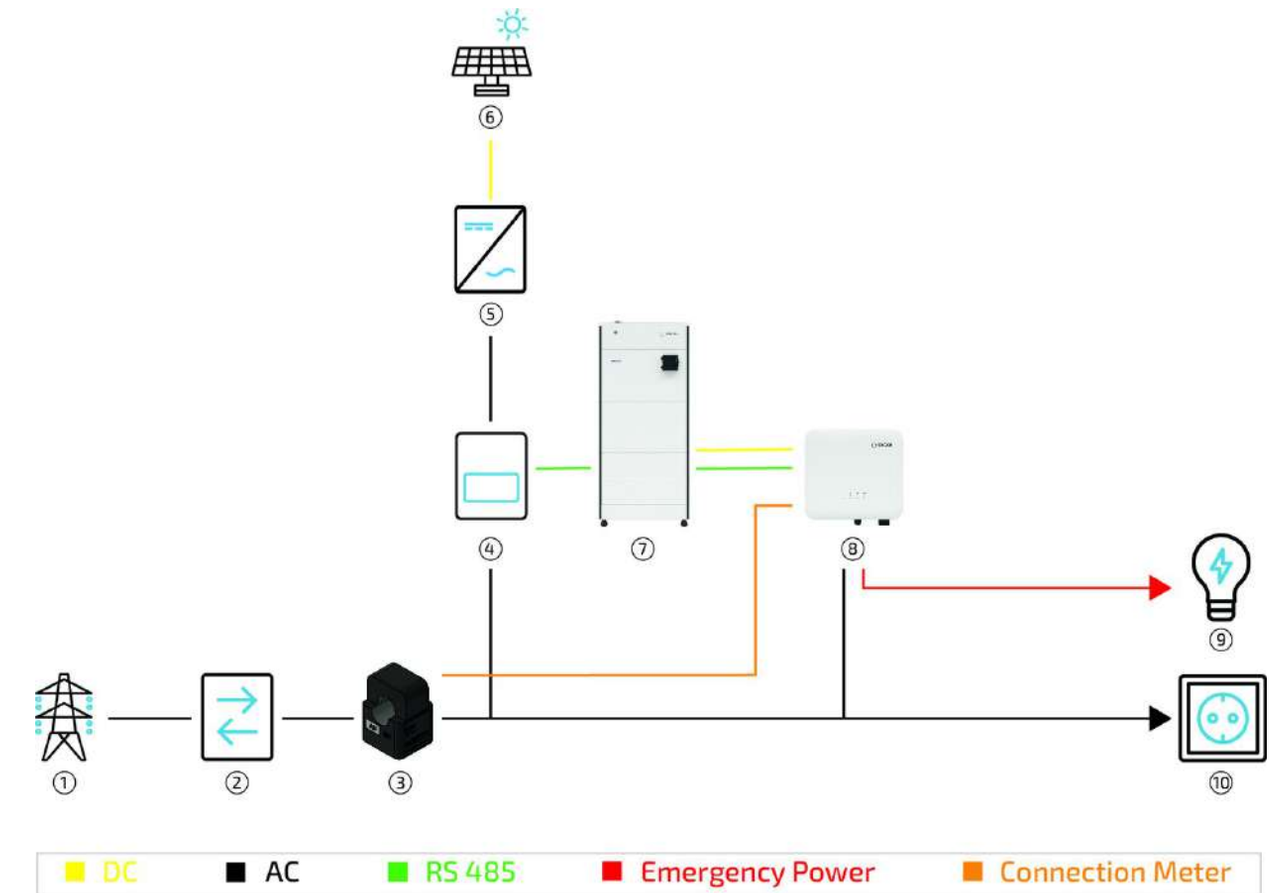


Illustration 16. AC system diagram (shown without protective device)

List item	Description
1	Grid
2	Bi-directional meter
3	Current transformer
4	3-phase sensor or with PV inverter app
5	PV inverter
6	PV system
7	Electrical energy storage
8	Inverter
9	Consumer load (supplied with emergency power)
10	Consumer load (not supplied with emergency power)

Table 25. AC system diagram

4.2.4. System with manual emergency power changeover

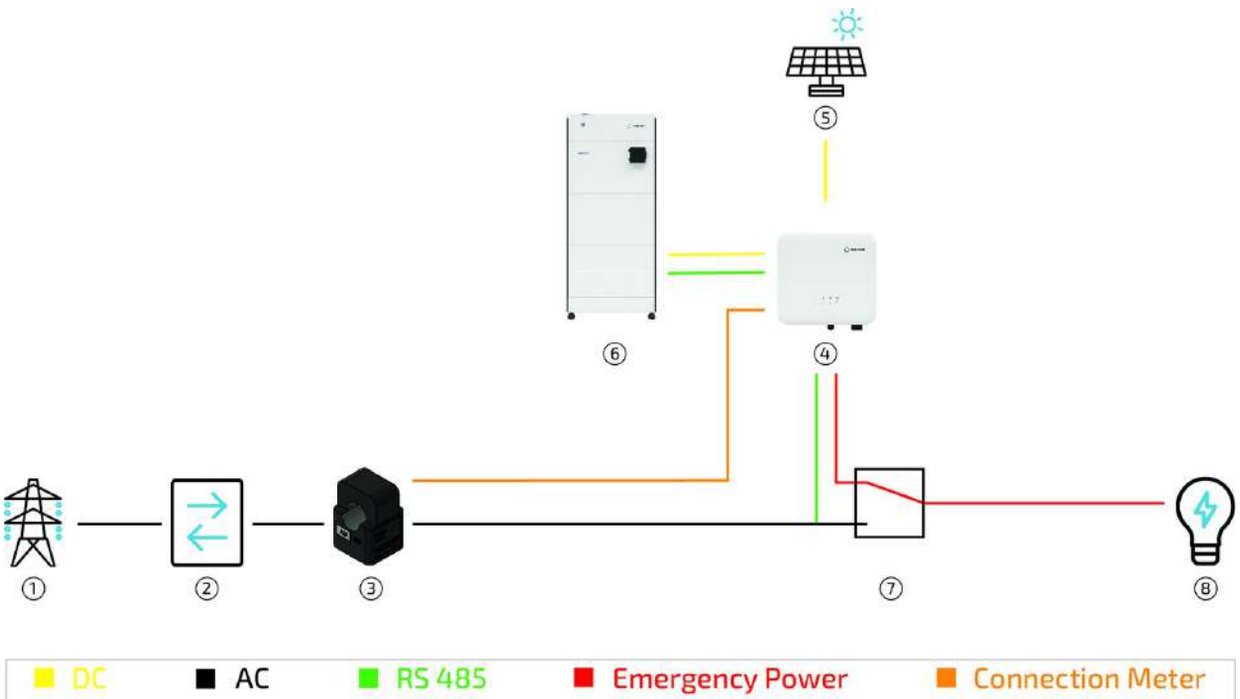


Illustration 17. System with manual emergency power switchover (shown without protective device)

List item	Description
1	Grid
2	Bi-directional meter
3	Current transformer
4	Inverter
5	PV system
6	Electrical energy storage
7	Manual emergency power switch
8	Consumer load (supplied with emergency power)

Table 26. System with manual emergency power changeover

4.2.5. System setup with automatic off-grid switch (FENECON AVU) — FENECON Home 6 & 10

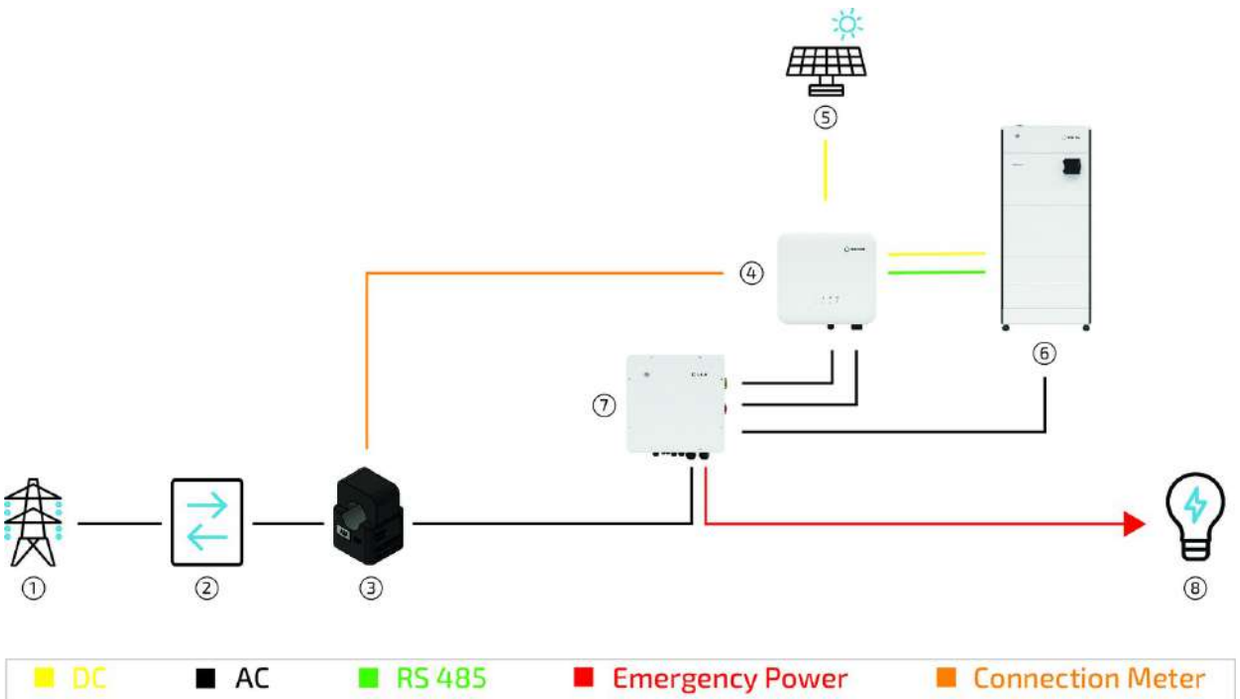


Illustration 18. System setup with automatic off-grid switch (AVU)

List item	Description
1	Grid
2	Bi-directional meter
3	Smartmeter
4	Inverter
5	PV system
6	FENECON Home 6 or Home 10
7	Automatic consumer switch (AVU) *
8	Consumer load

Table 27. System setup with automatic off-grid switch (AVU)

*To install the automatic off-grid switch, use the associated assembly and operating instructions.

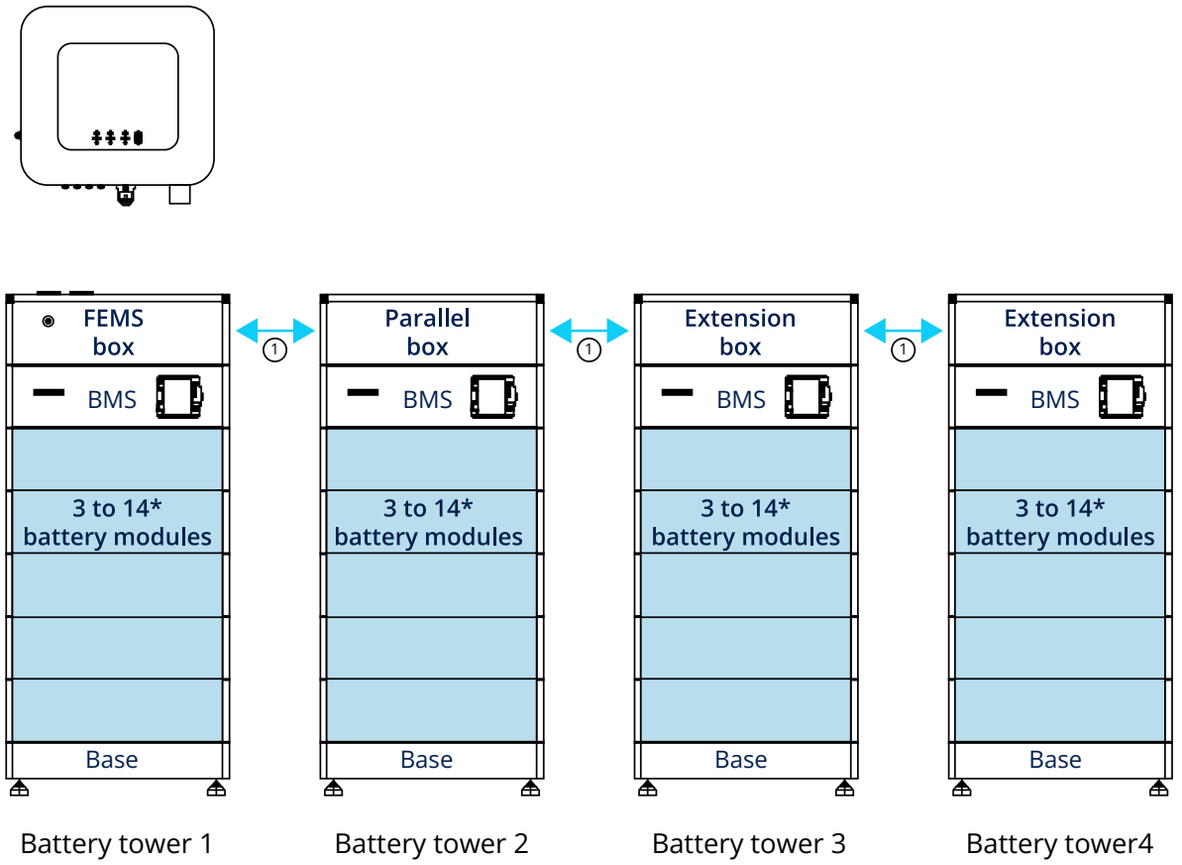
The automatic off-grid switch is only compatible with Home 6 and Home 10 systems.

4.2.6. Required components

Depending on the system configuration, a maximum of the following components is required. When connecting up to four battery towers in parallel, ensure that the same number of battery modules is installed in each battery tower.

Amount of battery towers	Amount of battery modules max.	BMS box (per tower)	EMS Box	Parallel Box	Extension Box
1	14	1	1	-	-
2	28	1	1	1	-
3	42	1	1	1	1
4	56	1	1	1	2

Table 28. System configuration — Required components



① Cable connection between battery towers

*Parallel connection of several towers:
> 2 towers with 8 modules each
> 3 towers with 11 modules each
> 4 towers with 12 modules each

Illustration 19. FENECON Home 6, 10 & 15 electrical energy storage system setup with four battery towers

5. Assembly preparation

5.1. Scope of delivery

5.1.1. FENECON Home 6, 10 & 15-Inverter — Variants A & B

There are two variants of the inverter in circulation. The functions and technical data of the two variants are exactly the same. The junction box of the communication lines and the current transformers differ minimally. For this reason, the instructions in the relevant sections always list a *Variant A* and a *Variant B*.

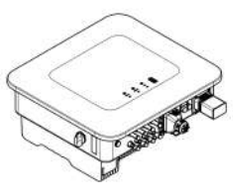
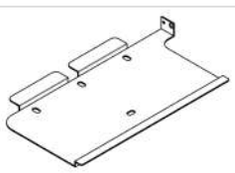
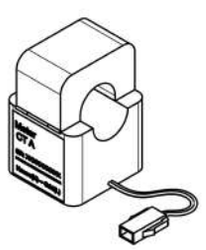
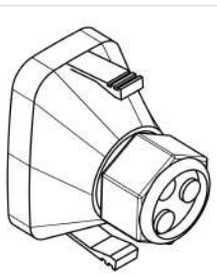
Image	Amount	Description	Item no.
	1	FENECON Home 6, 10 & 15-inverter	
	2	Tools for PV and battery plugs	Part of complete set FEH063
	1	Wall mount	FEH064
	1	Split-core CT communication cable	
	3	Split-core CT	
	1	Cover — communication port	FEH066

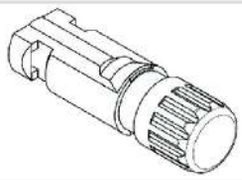
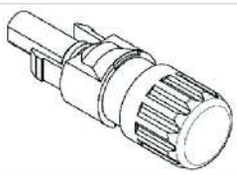
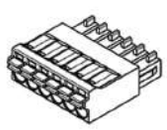
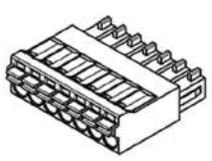
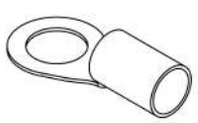
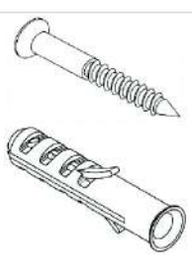
Image	Amount	Description	Item no.
	2(3)	MC4 plug	Part of complete set FEH063
	2(3)	MC4 socket	Part of complete set FEH063
	1	FEMS-cable	FEH068
	1	2-pin push-in connector	Part of complete set FEH063
	1	4-pin push-in connector	Part of complete set FEH063
	2	6-pin push-in connector	Part of complete set FEH063
	1	PE cable lug	Part of complete set FEH063
	4	Screw with anchor	Part of complete set FEH063
	1	AC connection cover	FEH065

Image	Amount	Description	Item no.
	1	M5 bolt for earthing	Part of complete set FEH063

Table 29. Scope of delivery — FENECON Home 6, 10 & 15 — Inverter — Variant A

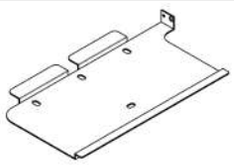
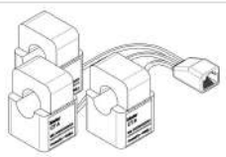
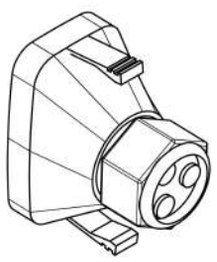
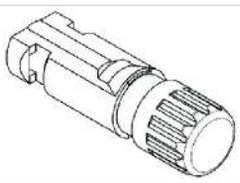
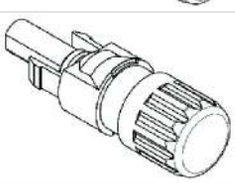
Image	Amount	Description	Item no.
	1	FENECON Home 6, 10 & 15-inverter	FEH031, FEH033 and FEH034
	2	Tools for PV and battery plugs	Part of complete set FEH063
	1	Wall mount	FEH064
	1	Split-core CT	FEH067
	1	Cover — Communication port	FEH066
	2(3)	MC4 plug	Part of complete set FEH063
	2(3)	MC4 socket	Part of complete set FEH063
	1	FEMS-cable	FEH068

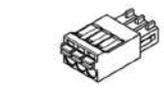
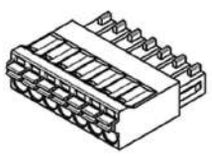
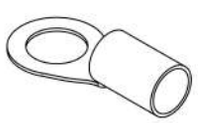
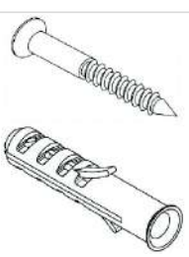
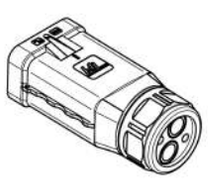
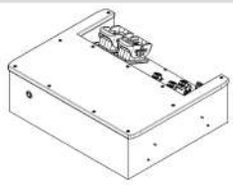
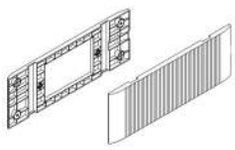
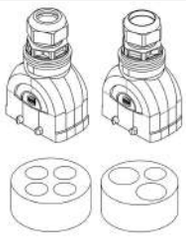
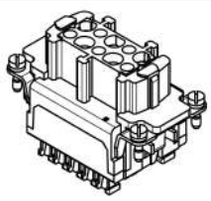
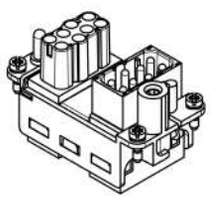
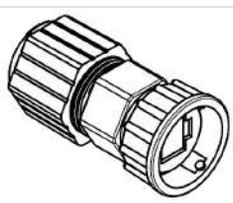
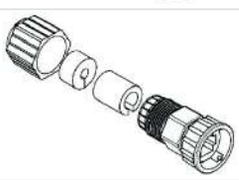
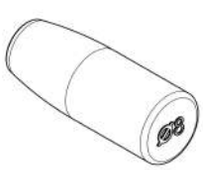
Image	Amount	Description	Item no.
	1	2-pin push-in connector	Part of complete set FEH063
	3	4-pin push-in connector	Part of complete set FEH063
	1	6-pin push-in connector	Part of complete set FEH063
	1	PE cable lug	Part of complete set FEH063
	4	Screw with anchor	Part of complete set FEH063
	1	AC connection cover	FEH065
	1	M5 bolt for earthing	Part of complete set FEH063

Table 30. Scope of delivery — FENECON Home 6, 10 & 15 — Inverter — Variant B

5.1.2. FENECON EMS box

Image	Amount	Description	Item no.
	1	FENECON-EMS box	FEH013
	2	Side panel	Part of complete set FEH050
	2	Harting housing with cable gland (13-21 mm), multi-hole seal (4 x 8 mm) Harting housing with cable gland (19-25 mm), multi-hole seal (2 x 10 & 1 x 8 mm)	Part of complete set FEH050
	1	Harting socket, 10-pin	Part of complete set FEH050
	1	Harting insert, 16-pin (assembled)	Part of complete set FEH050
	1	jumper plug	part of complete set FEH050
	2	Network connector housing	Part of complete set FEH050
	5	Filler plug, 8 mm	Part of complete set FEH050

5.1. Scope of delivery

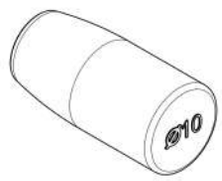
Image	Amount	Description	Item no.
	2	Filler plug, 10 mm	Part of complete set FEH050
	1	Battery cable set, 3 m	Part of complete set FEH050
	1	Installation and service instructions (for the installer (QR code))	
	1	Quick start guide (for the installer)	
	1	Operating instructions (for the end customer (QR code))	

Table 31. Scope of delivery — FENECON EMS box

5.1.3. FENECON Parallel Box (optional)

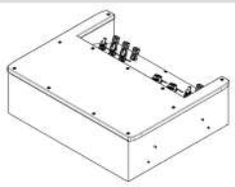
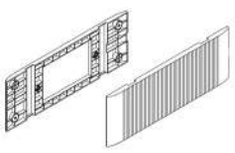
Image	Amount	Description	Item no.
	1	FENECON-Parallel box	FEH011
	2	side panel	Part of complete set FEH059
	2	Two DC cables per set, 2 m	Part of complete set FEH059
	1	Communication cable — parallel connection, 2 m	part of complete set FEH059

Table 32. Scope of delivery — Parallel Box

5.1.4. FENECON — Extension box (optional)

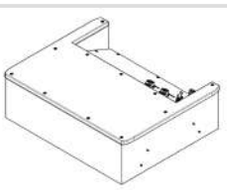
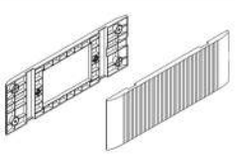
Image	Amount	Description	Item no.
	1	FENECON-Extension box	FEH012
	2	Side panel	Part of complete set FEH059
	2	two DC cables per set, 2 m	Part of complete set FEH059
	1	communication cable, 2 m	Part of complete set FEH059

Table 33. Scope of delivery — Extension box

5.1.5. FENECON BMS box/base

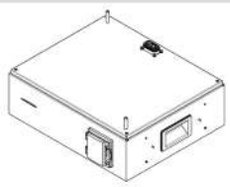
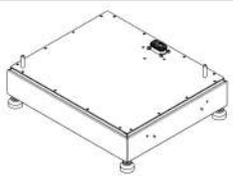
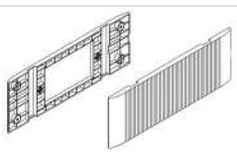
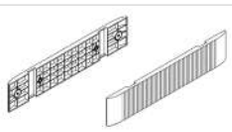
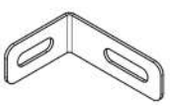
Image	Amount	Description	Item no.
	1	FENECON-BMS box	FEH000
	1	Base	
	2	Side panel (FENECON-BMS box)	FEH051
	2	Side panel (base)	
	4	Wall mounting — Mounting bracket (FENECON-BMS box part)	Part of connection set FEH052
	4	wall mounting — mounting bracket (wall part)	part of connection set FEH052
	4	Bolts M4 x 10	Part of connection set FEH052
	4	bolts M6	part of connection set FH0052

Table 34. Scope of delivery — BMS module/base

5.1.6. BMS box/split base (optional)

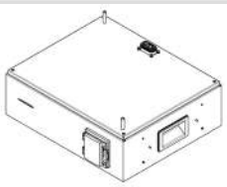
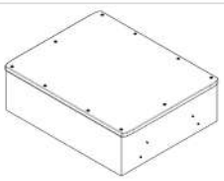
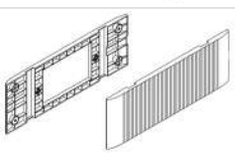
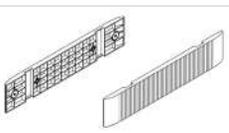
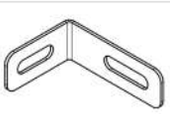
Image	Amount	Description
	1	BMS box for split base
	1	Top box for split base
	1	Split base
	4	Side panel (BMS box)
	2	Side panel (split base)
	4	Wall mounting — Mounting bracket
	4	Wall mounting — Mounting bracket (wall part)
	4	Bolts, M4 x 10
	2	Bolts for wall mounting, M6 x 12

Table 35. Scope of delivery — BMS box/split base (optional)

5.1.7. FENECON battery module

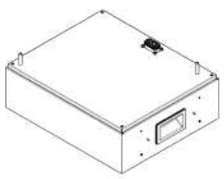
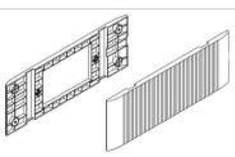
Image	Amount	Description	Item no.
	1	Battery module	FEH020
	2	Side panel	FEH051
	2	Fixing plates	Part of connection set FEH053
	4	Bolts M4 x 10	Part of connection set FEH053

Table 36. Scope of delivery — Battery module

5.2. Tools required

The following tools are required for assembly of the system components:

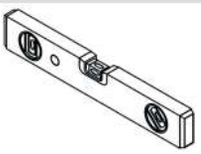
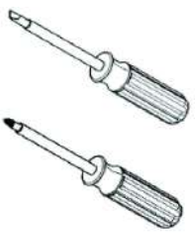
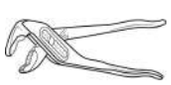
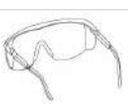
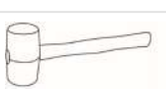
Image	Description	Image	Description
	Pencil		Spirit level
	Impact drill or cordless screwdriver		Screwdriver set
	Meter stick		Side cutter
	Allen key, 3 mm		Set of flat spanners
	Crimping tool		Multimeter
	Pliers for cable glands		Protective eyewear
	Safety footwear		Dust mask
	Rubber mallet		Vacuum cleaner
	Wire stripper		Protective gloves
	Torque wrench		Stripping knife

Table 37. Tools required

6. Assembly

- Do not damage any cables and make sure that nobody steps on the cables or plugs! Damage can lead to serious malfunctions!
- If cables are fed in from the front, the customer must use suitable covers to protect the cables against the risk of tripping.

- Ensure that all devices in the same network and the battery modules are integrated into the existing surge protection.

- When drilling holes, avoid the water pipes and cables laid in the wall.
- Wear protective eyewear and a dust mask when drilling to prevent dust from being inhaled or getting into your eyes when drilling holes.
- Make sure that the inverter is securely installed.
- An adequate DC switch lock should be prepared by the customer. The diameter of the lock is 5 mm. The lock may not be installed if the size is inappropriate. Please refer to the supplier documentation of the inverter.

Suitable protective covers must be fitted!
All local accident prevention regulations must be observed.

The following components must be installed:

- Inverter
- Battery tower with base, battery modules, BMS box and FENECON EMS box
- Optional:

  Battery tower with base, battery modules, BMS box and parallel box
- Optional:

  Battery tower with base, battery modules, BMS box and Extension box

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

6.1. Inverter assembly

6.1.1. Safety instructions

Electric shock from live parts
Death or serious injury to the body and limbs from electric shock when touching live DC cables connected to the electrical energy storage system.

- Before starting work, de-energize the inverter, the BMS box and the battery modules and secure them against being switched on again.
- Wait at least 5 minutes after switching off before starting work on the inverter.
- Observe the Safety instructions of FENECON GmbH.
- Do not touch any exposed live parts or cables.
- Do not pull the terminal strip with connected DC conductors out of the slot under consumer load.
- Wear suitable personal protective equipment for all work.

Electric shock in the absence of overvoltage protection
Death or serious injury to the body and limbs from electric shock due to overvoltage (e. g. lightning strike) transmitted via the network cables or other data cables into the building and to other connected devices in the same network due to a lack of overvoltage protection.

- Ensure that all devices in the same network and the battery modules are integrated into the existing surge protection
- When laying network cables or other data cables outdoors, ensure that suitable overvoltage protection is in place when the cables from the inverter or battery tower (battery modules) pass from the outdoor area into a building.
- The Ethernet interface of the inverter is classified as "TNV-1" and offers contactor protection against overvoltages of up to 1.5 kV.

Fire and explosion
Death or serious injury to body and limbs due to fire or explosion; in the event of a fault, an ignitable gas mixture may be produced inside the inverter. Switching operations in this condition can cause a fire inside the product or tripped an explosion.

- In the event of a fault, do not carry out any direct actions on the electrical energy storage system.
- Ensure that unauthorized persons do not have access to the electrical energy storage system.
- Disconnect the battery modules from the inverter via the DC fuse on the battery tower.
- Switch off the AC miniature circuit breaker or, if it has already tripped, leave it switched off and secure it against being switched on again.
- Only carry out work on the inverter (e.g. troubleshooting, repair work) with personal protective equipment for handling hazardous substances (e. g. protective gloves, eye and face protection and respiratory protection).

Fire and explosion with deeply discharged battery modules
Death or serious injury to body and limbs from fire or explosion due to incorrect charging of deeply discharged battery modules

- Before commissioning the system, ensure that the battery modules are not deeply discharged.
- Do not operate the system if the battery modules are deeply discharged.
- If the battery modules are deeply discharged, contact Service
- Only charge deeply discharged battery modules as instructed by the Service.

Toxic substances, gases and dusts

Damage to electronic components can result in toxic substances, gases and dusts inside the inverter. Touching toxic substances and inhaling toxic gases and dusts can cause skin irritation, chemical burns, breathing difficulties and nausea.

- Only carry out work on the inverter (e.g. troubleshooting, repair work) with personal protective equipment for handling hazardous substances (e.g. protective gloves, eye and face protection and respiratory protection).
- Ensure that unauthorized persons do not have access to the inverter.

Arcs due to short-circuit currents

Death or serious injury to the body and limbs due to burns caused by heat development and electric arcs due to short-circuit currents from the battery modules.

- Before carrying out any work on the battery modules, de-energize the battery modules.
- Comply with all safety instructions from the battery manufacturer

Destruction of a measuring device due to overvoltage

Death or serious injury to the body and limbs due to electric shock when touching a live meter housing: An overvoltage can damage a meter and lead to a voltage being applied to the meter housing.

- Only use measuring devices with a DC input voltage range of at least 600 V or higher.

Hot surfaces
Injuries to the body and limbs due to burning on hot surfaces: The surface of the inverter can become very hot.

- Mount the inverter in such a way that it cannot be touched accidentally.
- Do not touch hot surfaces.
- Before starting work, wait 30 minutes until the surface has cooled down sufficiently.
- Observe the warning notices on the inverter

Weight of the inverter
Injuries to the body and limbs due to crushing when falling during transportation or assembly of the inverter

- Transport and lift the Inverter carefully.
- Note the weight of the Inverter and its center of gravity
- Wear suitable personal protective equipment when working on the inverter.

Sand, dust and moisture
Ingress of sand, dust and moisture can damage the inverter and impair its function.

Electrostatic charge
Touching electronic components can damage or destroy the inverter via electrostatic discharge.

- Ground yourself before touching a component.

Cleaning agents
The use of cleaning agents can damage the inverter and parts of the inverter.

- Only clean the inverter and all its parts with a cloth moistened with clean water.

6.1.2. Installation conditions and clearances at the installation site

Indoor or outdoor installation
We recommend installing the FENECON Home 6, 10 & 15 battery towers in a well-ventilated room without external heat sources. However, the battery tower(s) can also be installed outdoors protected from the weather (e. g. garage).

Installation at and above 2000 m above sea level and in unventilated locations is not permitted.

Also inadmissible installation sites:

- those with an explosive atmosphere.
- Places where flammable or oxidizing substances are stored.
- Wet rooms.
- Places where salty moisture, ammonia, corrosive vapors or acid can penetrate the system.

The electrical energy storage system should also be inaccessible to children and animals.

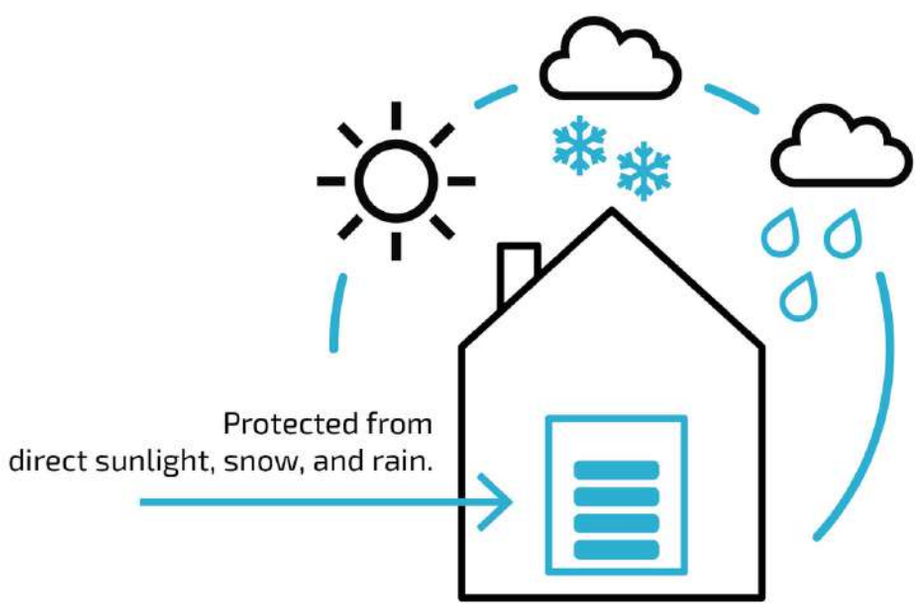


Illustration 20. Installation conditions

- The inverter must be installed away from direct sunlight and protected from direct rain and snow.
- In conditions outside the optimum temperature range, the performance of the batteries is reduced. (optimum temperature range: +15 °C to +30 °C)

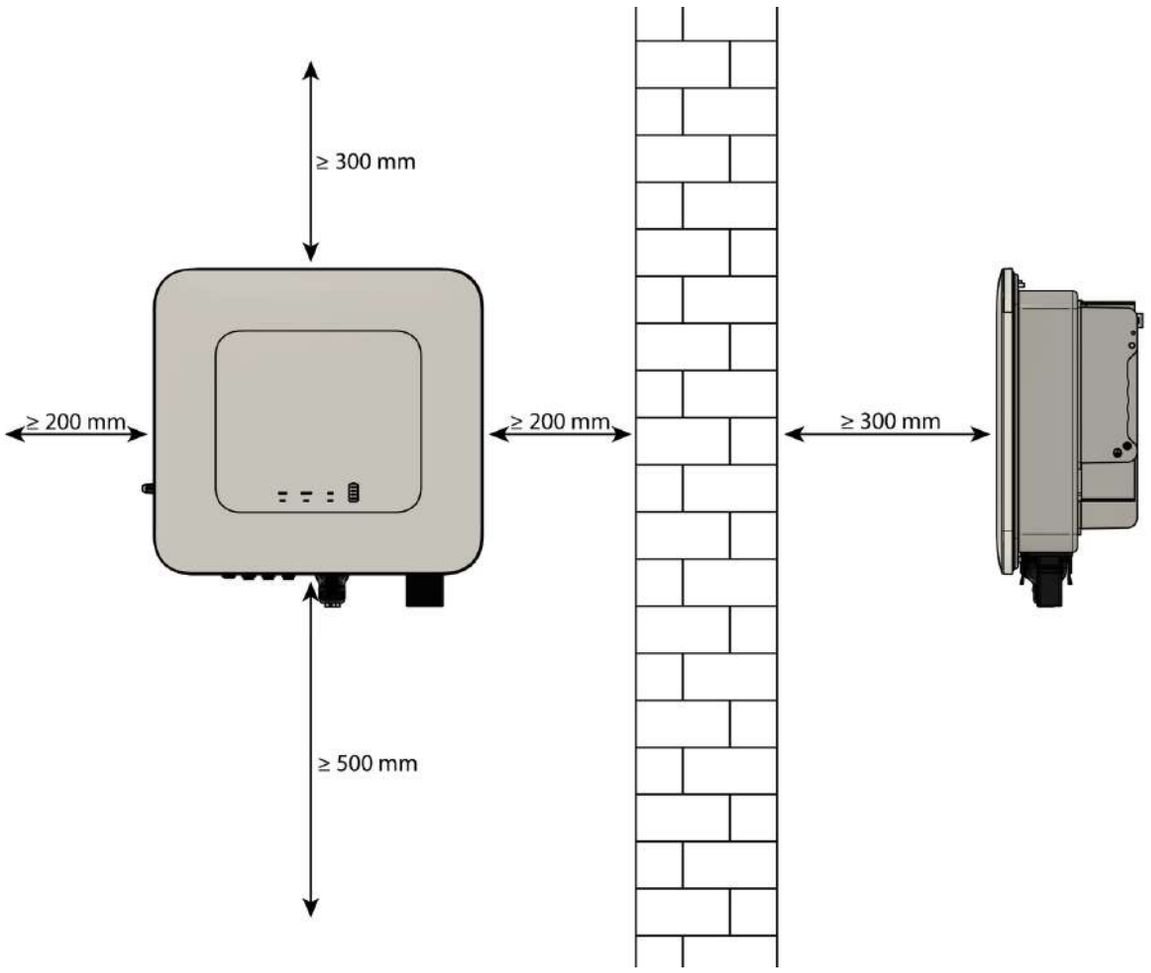


Illustration 21. Recommended distances at the installation site

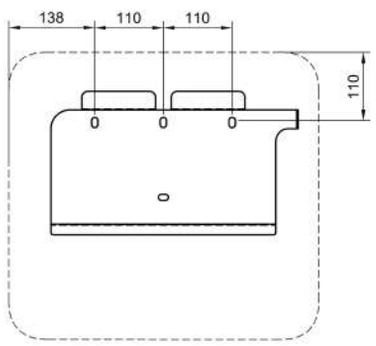
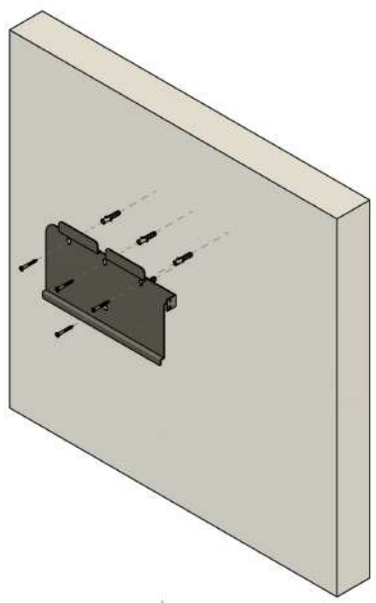
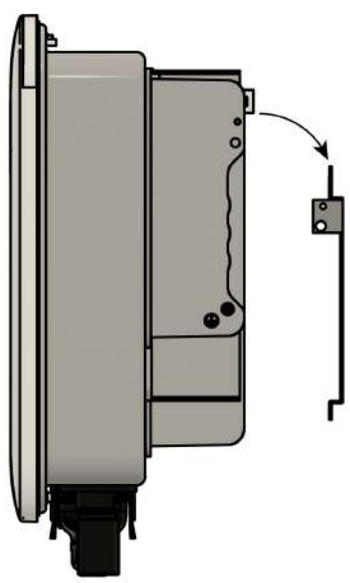
Installation conditions

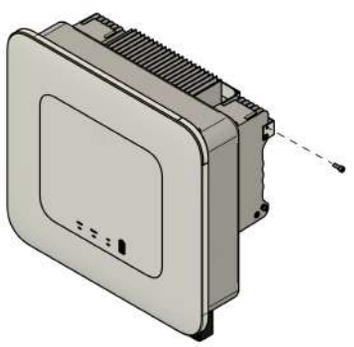
- The wall must be stable enough for mounting the Inverter and must not be flammable.
- Maintain a distance of at least 300 mm above the inverter.
- Keep a distance of at least 500 mm below the inverter (cable ducts are not measured here).
- Keep a distance of at least 300 mm from the front of the inverter.
- Laterally (keep a distance of at least 200 mm to the left of the inverter and at least 200 mm to the right.
- The maximum distance between the inverter and the installation location of the meter should be based on the cable supplied (10 m).
- The pre-installed current transformers must not be shortened or extended.
- Install the inverter vertically on the wall and not rotated.

6.1.3. Assembly

To install the FENECON Home 6, 10 & 15 inverter on the wall, proceed as follows:

Assembly of the wall bracket

	1. Mark and drill holes for wall bracket (Ø 8 mm, depth 80 mm) 2. Observe minimum clearances.
	3. Mount the wall bracket on the wall. Always check the condition of the wall to see whether the screw anchors can be used.
	4. Hook the inverter into the wall mount at the top and bottom (remove using the handles).



5. Then secure on the right-hand side using the enclosed bolt.

6.2. Assembly of battery tower 1 with FEMS box

6.2.1. Safety instructions

Electric shock from live parts
Death or serious injury to the body and limbs due to electric shock when touching live DC cables connected to the electrical energy storage system

- Before starting work, de-energize the inverter, the BMS box and the battery modules and secure them against being switched on again.
- Wait at least 5 minutes after switching off before starting work on the inverter.
- Observe all Safety instructions of the manufacturer.
- Do not touch any exposed live parts or cables.
- Do not pull the terminal strip with connected DC conductors out of the slot under consumer load.
- Wear suitable personal protective equipment for all work.

Electric shock in the absence of overvoltage protection
Death or serious injury to the body and limbs from electric shock due to overvoltage (e. g. lightning strike) transmitted via the network cables or other data cables into the building and to other connected devices in the same network due to a lack of overvoltage protection

- Ensure that all devices in the same network and the battery modules are integrated into the existing surge protection system
- When laying network cables or other data cables outdoors, ensure that suitable surge protection is in place when the cables from the inverter or the battery tower (battery modules) pass from the outdoor area into a building
- The Ethernet interface of the inverter is classified as "TNV-1" and offers protection against overvoltages of up to 1.5 kV.

Fire and explosion
Death or serious injury to the body and limbs due to fire or explosion; in the event of a fault, an ignitable gas mixture may be produced inside the battery module. Switching operations in this condition can cause a fire inside the product or tripped an explosion.

- In the event of a fault, do not carry out any direct actions on the electrical energy storage system.
- Ensure that unauthorized persons do not have access to the electrical energy storage system.
- Disconnect the battery modules from the Inverter via an external disconnecting device.
- Switch off the AC miniature circuit breaker or, if it has already tripped, leave it switched off and secure it against being switched on again.
- Only carry out work on the inverter (e.g. troubleshooting, repair work) with personal protective equipment for handling hazardous substances (e.g. protective gloves, eye and face protection and respiratory protection).

Fire and explosion with deeply discharged battery modules
Death or serious injury to the body and limbs due to electric shock when touching a live meter housing: Overvoltage can damage a meter and lead to a voltage being applied to the meter housing.

- Before commissioning the system, ensure that the battery modules are not deeply discharged.
- Do not operate the system if the battery modules are deeply discharged.
- If the battery modules are deeply discharged, contact Service
- Only charge deeply discharged battery modules as instructed by the Service.

Toxic substances, gases and dusts
Damage to electronic components can result in toxic substances, gases and dusts inside the inverter. Touching toxic substances and inhaling toxic gases and dusts can cause skin irritation, chemical burns, breathing difficulties and nausea.

- Only carry out work on the inverter (e.g. troubleshooting, repair work) with personal protective equipment for handling hazardous substances (e.g. protective gloves, eye and face protection and respiratory protection).
- Ensure that unauthorized persons do not have access to the inverter.

Arcs due to short-circuit currents
Death or serious injury to the body and limbs due to burns, heat development and electric arcs due to short-circuit currents from the battery modules.

- Before carrying out any work on the battery modules, de-energize the battery modules.
- Comply with all safety instructions from the battery manufacturer.

Destruction of a measuring device due to overvoltage
Death or serious injury to the body and limbs due to electric shock when touching a live housing of a measuring device. An overvoltage can damage a measuring device and lead to a voltage being applied to the housing of the measuring device.

- Only use measuring devices with a DC input voltage range of at least 600 V or higher.

Hot surfaces
Injuries to the body and limbs due to burning on hot surfaces: The surface of the inverter can become very hot.

- Mount the inverter in such a way that it cannot be touched accidentally.
- Do not touch hot surfaces.
- Before starting work, wait 30 minutes until the surface has cooled down sufficiently.
- Observe the warning notices on the inverter.

Weight of the battery modules
Injuries to the body and limbs due to crushing if dropped during transportation or assembly of the battery modules.

- Carefully transport and lift the battery modules.
- Note the weight of the battery modules and its center of gravity.
- Wear suitable personal protective equipment when working on the battery modules.

Sand, dust and moisture
Ingress of sand, dust and moisture can damage the inverter and impair its function.

- Only set up the battery tower where the humidity is within the limit values and the environment is free of sand and dust.

Electrostatic charging
Touching electronic components can damage or destroy the battery tower via electrostatic discharge.

- Ground yourself before touching a component.

Cleaning agents
The use of cleaning agents can damage the inverter and parts of the inverter.

- Clean the battery tower and all parts of the inverter exclusively with a damp cloth moistened with clear water.

Installation site

- It is recommended to install the battery tower indoors.
- If installed outdoors, weather protection (sun and precipitation protection) must be provided.
- Avoid dirt and dust during assembly.
- Do not place the battery tower in an area prone to flooding.
- Do not install the battery tower in very damp areas (e.g. bathrooms).
- Do not install the battery tower where the ambient conditions are outside the permissible values (section: Technical data).
- Keep the battery tower away from heat sources and fire.
- Ensure direct contact between the battery module housing and the ambient air and do not cover or shield the battery module.

Installation

- Wear protective eyewear, insulating gloves and protective footwear when assembling the battery modules.
- Remove all conductive jewelry (e.g. watches, bracelets, rings).

6.2.2. Conditions at the installation site

Indoor or outdoor installation
We recommend installing the FENECON Home 6, 10 & 15 battery tower indoors. However, the battery tower can also be installed outdoors protected from the weather (e. g. garage).

6.2.3. Installation conditions and clearances at the installation site

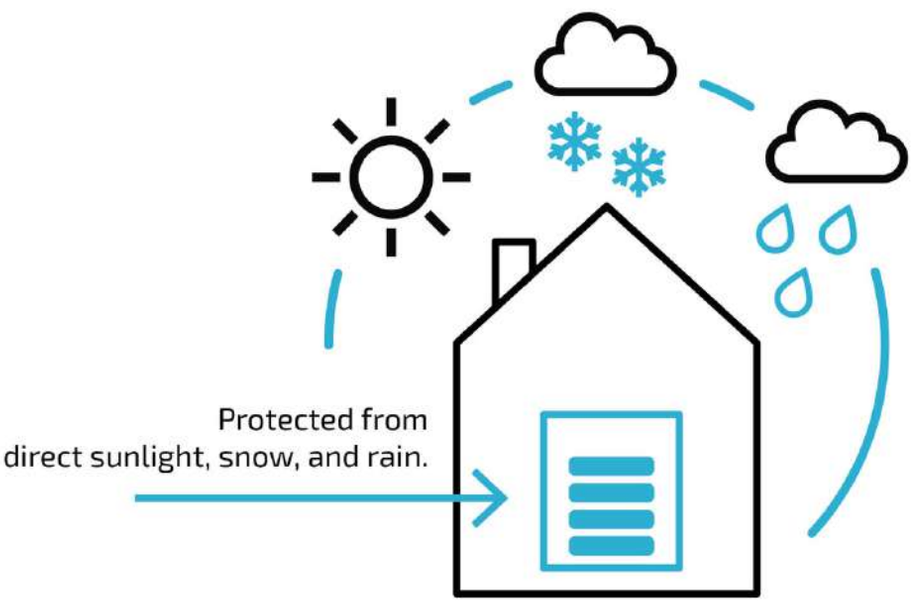


Illustration 22. Installation conditions.

- The battery tower must be installed protected from direct sunlight, rain and snow.
- In conditions outside the optimum temperature range, the performance of the battery is reduced. (optimum temperature range +15 °C to +30 °C)

6.2. Assembly of battery tower 1 with FEMS box

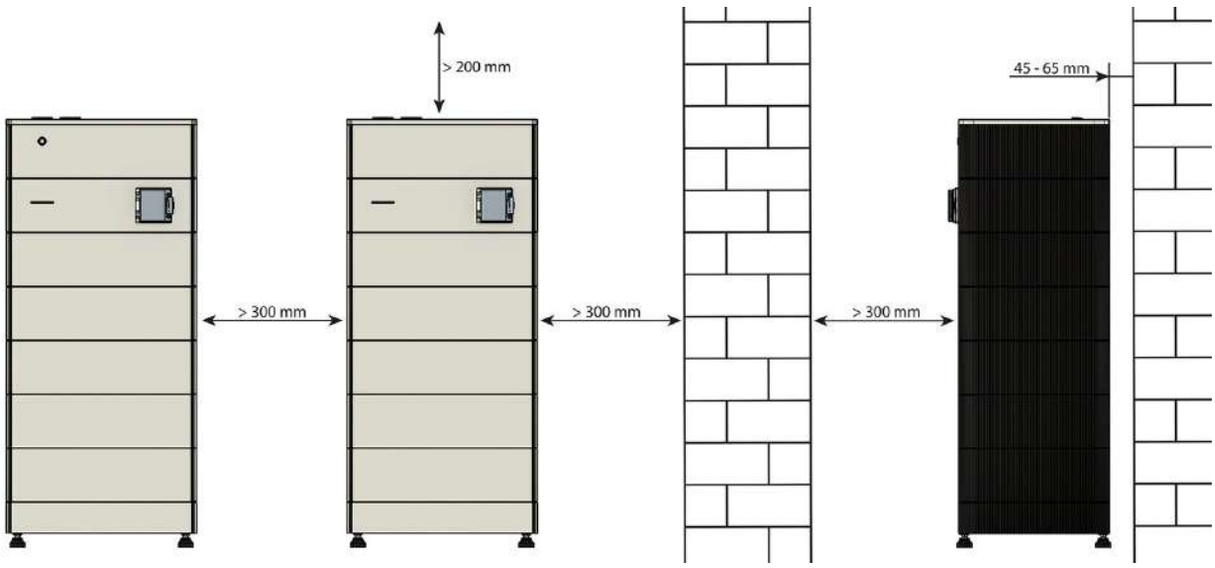


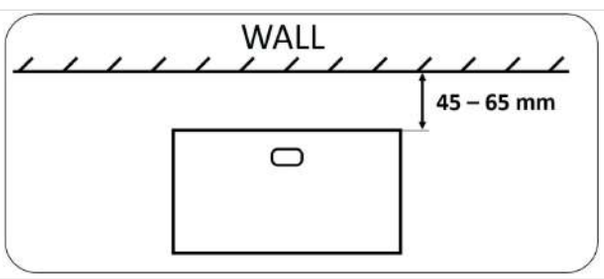
Illustration 23. Clearances at the installation site

- A lateral clearance of 300 mm from a wall and 300 mm between two battery towers is recommended.
- Clearances of 300 mm from a wall are recommended at the front.
- The FENECON Home 6, 10 & 15 battery tower and inverter should be installed/mounted on top of each other. If there is not enough space above, the battery tower and inverter can also be installed next to each other.
- A distance of 200 mm from the ceiling is recommended.

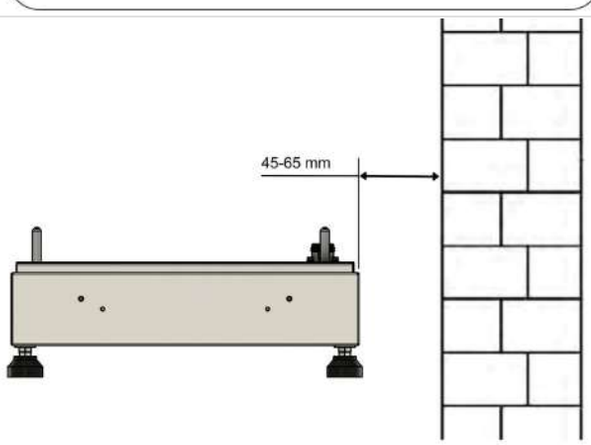
If the recommended distances are not observed, installation may be more difficult and derating may occur earlier.

6.2.4. Assembly of battery tower 1 with FEMS box

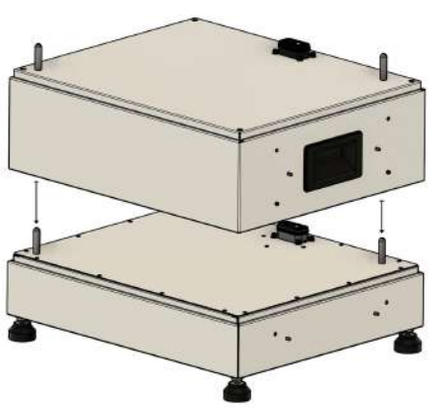
Proceed as follows to set up the battery tower:



1. The battery tower is installed stackable in front of a wall on a solid and level floor.
2. The clearance to the wall must be 40 to 65 mm so that the wall bracket can be attached correctly.



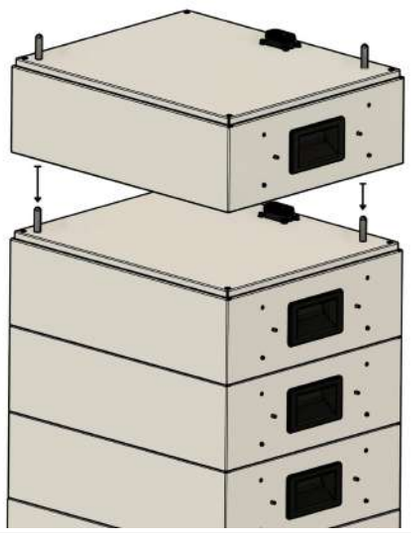
3. Place the base on the feet at the installation location (maintain a clearance of 40 to 65 mm from a wall).



4. Place a FENECON battery module on the base, paying attention to the plug-in bolts and positioning holes.
5. Black protective film may cover the battery's plug connections. If present, remove before making a connection.

6.2. Assembly of battery tower 1 with FEMS box

Stack a maximum of 14 FENECON battery modules on one base.

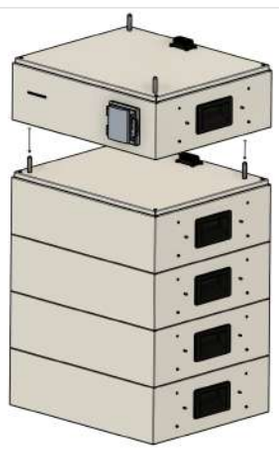


6. Mount all remaining FENECON battery modules in the same way.
   Between 3 and 14 battery modules can be stacked.

Electric shock

Death or serious injury to the body and limbs due to electric shock.

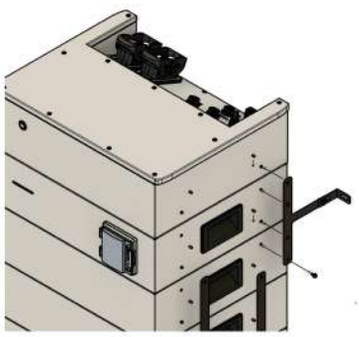
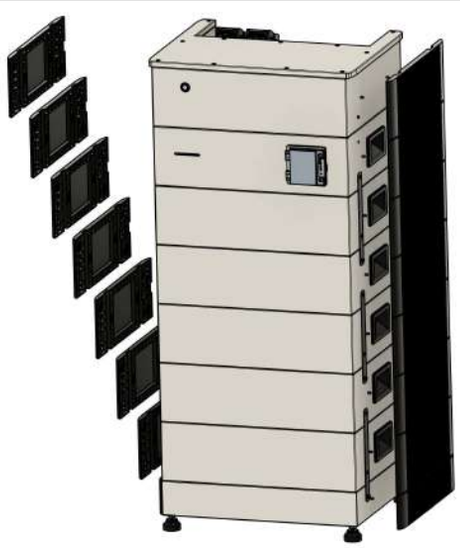
- Ensure that the circuit breaker of the BMS box is switched off before installing the BMS box.



7. Place the FENECON-BMS box on the last battery.

8. Attach FENECON EMS box.

6.2. Assembly of battery tower 1 with FEMS box

	9. Mount the T-piece and the bracket with the enclosed M6 bolt.
	10. Hook in the mounting rails of the EMS box (wall side) and mark the holes for the wall bracket on the wall. (see previous picture) 11. Drill the holes and screw the wall bracket to the wall. 12. Hook in all other rails alternately left/right one module lower and screw on with the enclosed bolts. 13. The following bracket arrangement is recommended for mounting the battery towers. **From 10 battery modules, two holders must be used per side.**
	14. Insert the side panels of the base, the battery modules, the BMS box and the EMS box.

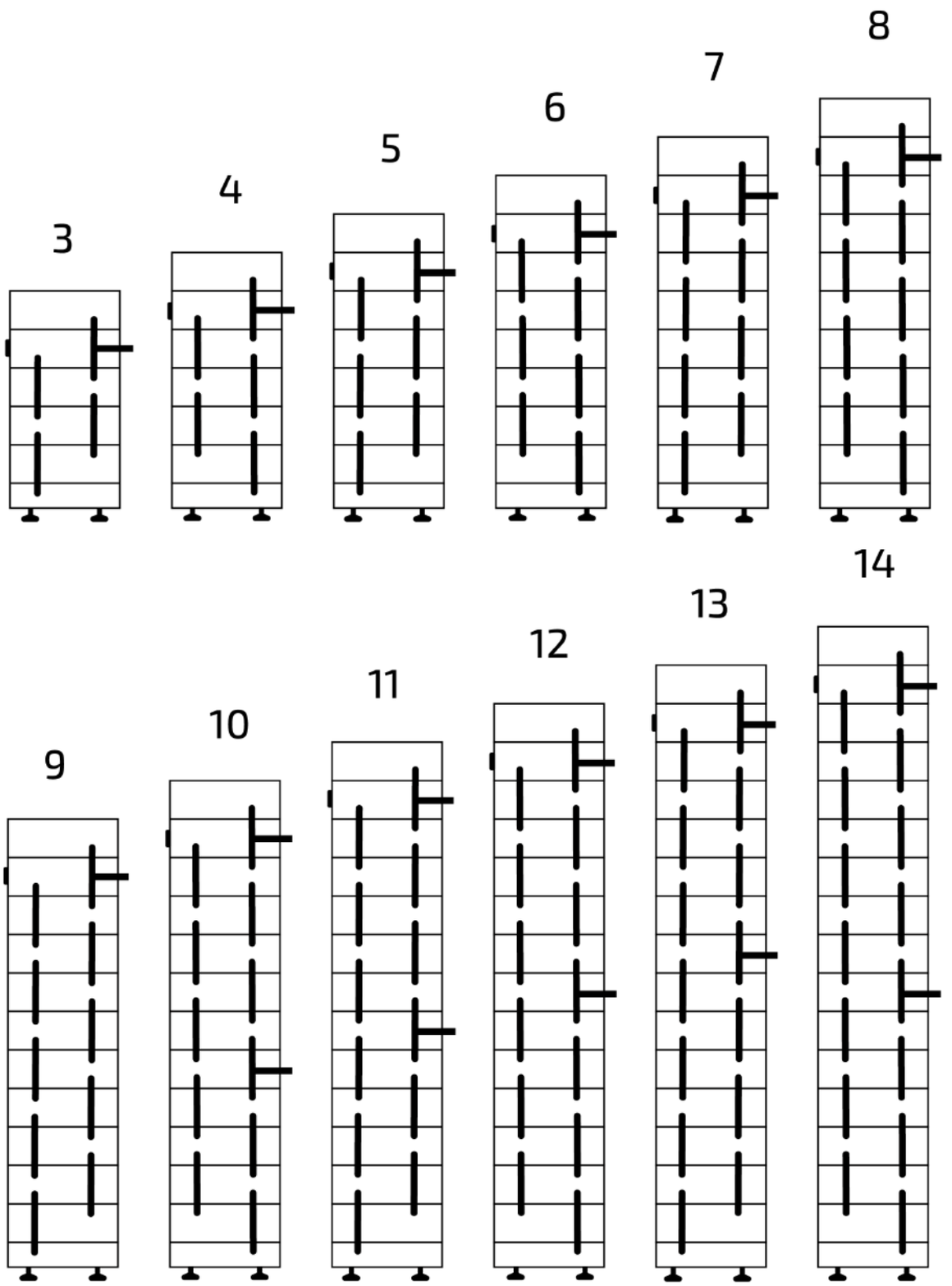


Illustration 24. Arrangement of the module fastening

You will find the installation instructions for 2 or 3 battery towers in the section

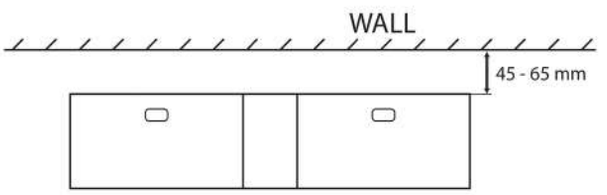
> Electrical installation of additional battery towers.

6.3. Installation — Battery tower on split base

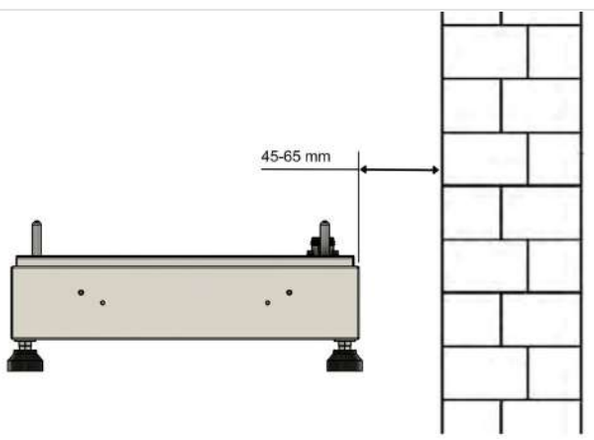
The split base can only be used with battery modules with item number FEH021.

The split base is used for a larger footprint installation **of a battery tower**, which reduces its height and enables installation in rooms with low ceilings.

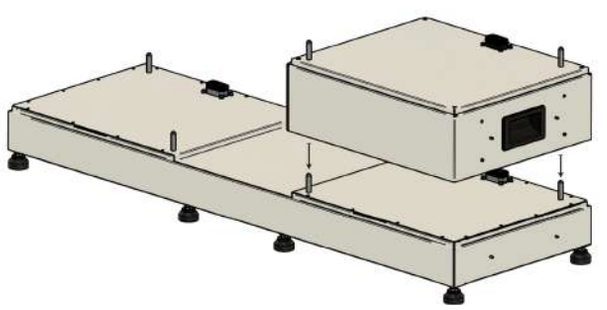
Proceed as follows to set up a battery tower with a split base:



1. The battery tower is installed stackable in front of a wall on a solid and level floor.
2. The clearance to the wall must be 40 to 65 mm so that the wall bracket can be fitted correctly.

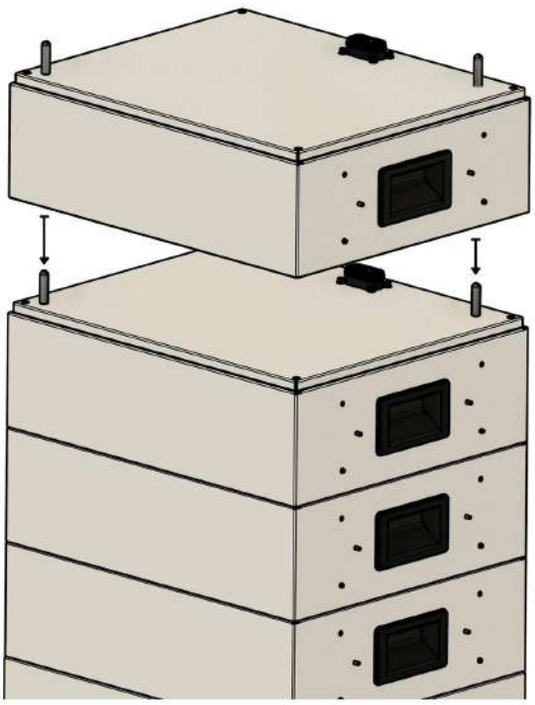


3. Place the base on the feet at the installation location (maintain a clearance of 40 to 65 mm from a wall).



4. Place a battery module on the base, paying attention to the plug-in bolts and positioning holes.
5. A black protective film may be stuck to the electrical connectors of the battery. If present, remove this before plugging together.

- A maximum of 15 battery modules can be mounted on one split base.
- Ensure that the modules are evenly distributed on both sides of the split base.
- The difference in tower height must not exceed 5 modules.
  If this cannot be complied with, a maximum of 10 battery modules must be stacked on one side of the system.

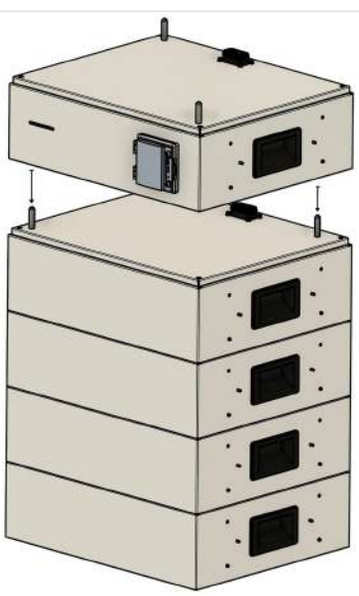


6. Install all remaining battery modules in the same way.

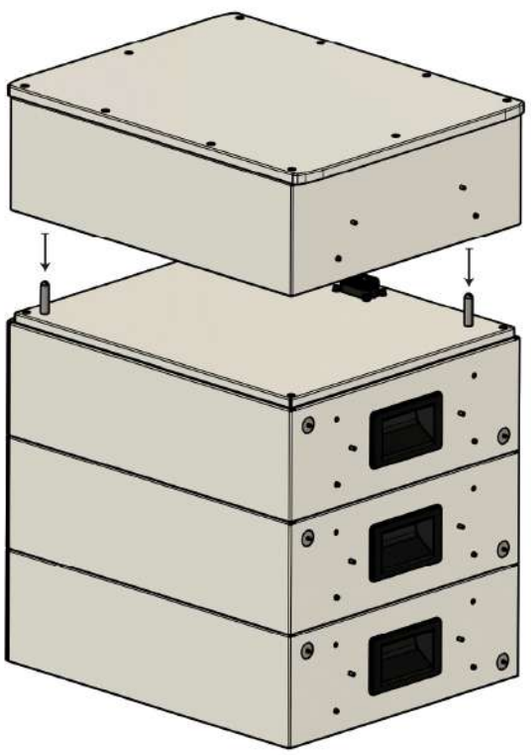
Electric shock

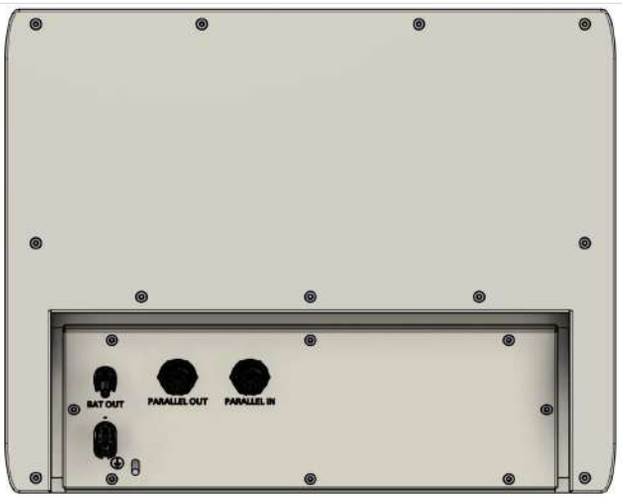
Death or serious injury to the body and limbs due to electric shock.

- Ensure that the circuit breaker of the BMS box is switched off before installing the BMS box.



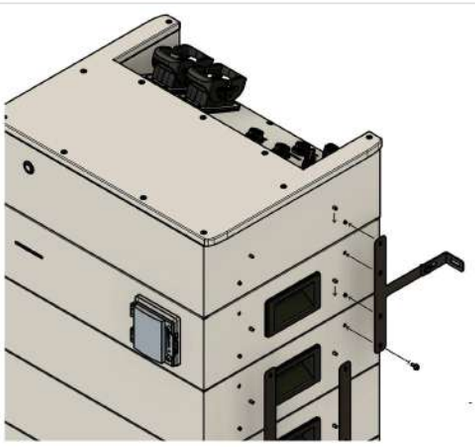
7. Place the FENECON BMS box on the last battery. It does not matter which of the two towers on the split base the FENECON BMS box is placed on.

	8. Attach the FENECON EMS box to the BMS box.
	9. Place the Top box on the second tower.



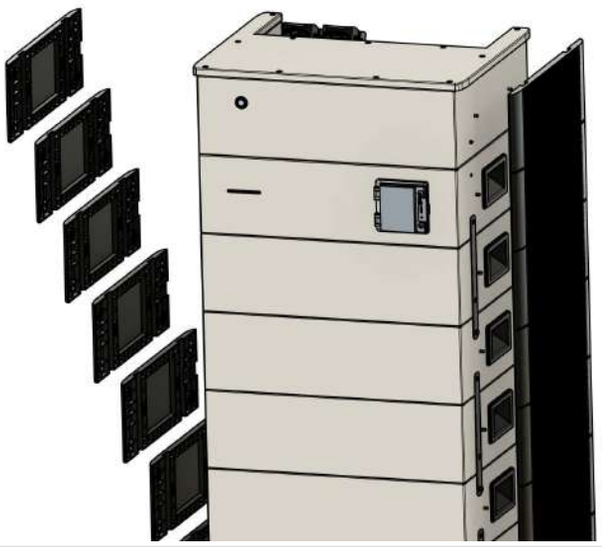
10. Place the FENECON extension box on the top of all other split sockets.

11. Fit the T-piece and the bracket with the enclosed M6 bolt.



12. Hook in the fixing rails of the EMS box and the Top box (wall side) and mark the holes for the wall bracket on the wall.
13. Drill the holes and screw the wall bracket to the wall.
14. Hook in all other rails alternately left/right one module lower and fasten with the enclosed bolts.
15. The arrangement of the mounting brackets shown here is recommended for attaching the battery towers.

See graphic Arrangement of module mounting — Split base for installation details.



16. Attach the side panels of the split base, the battery modules, the BMS box, the EMS box and the Top box.

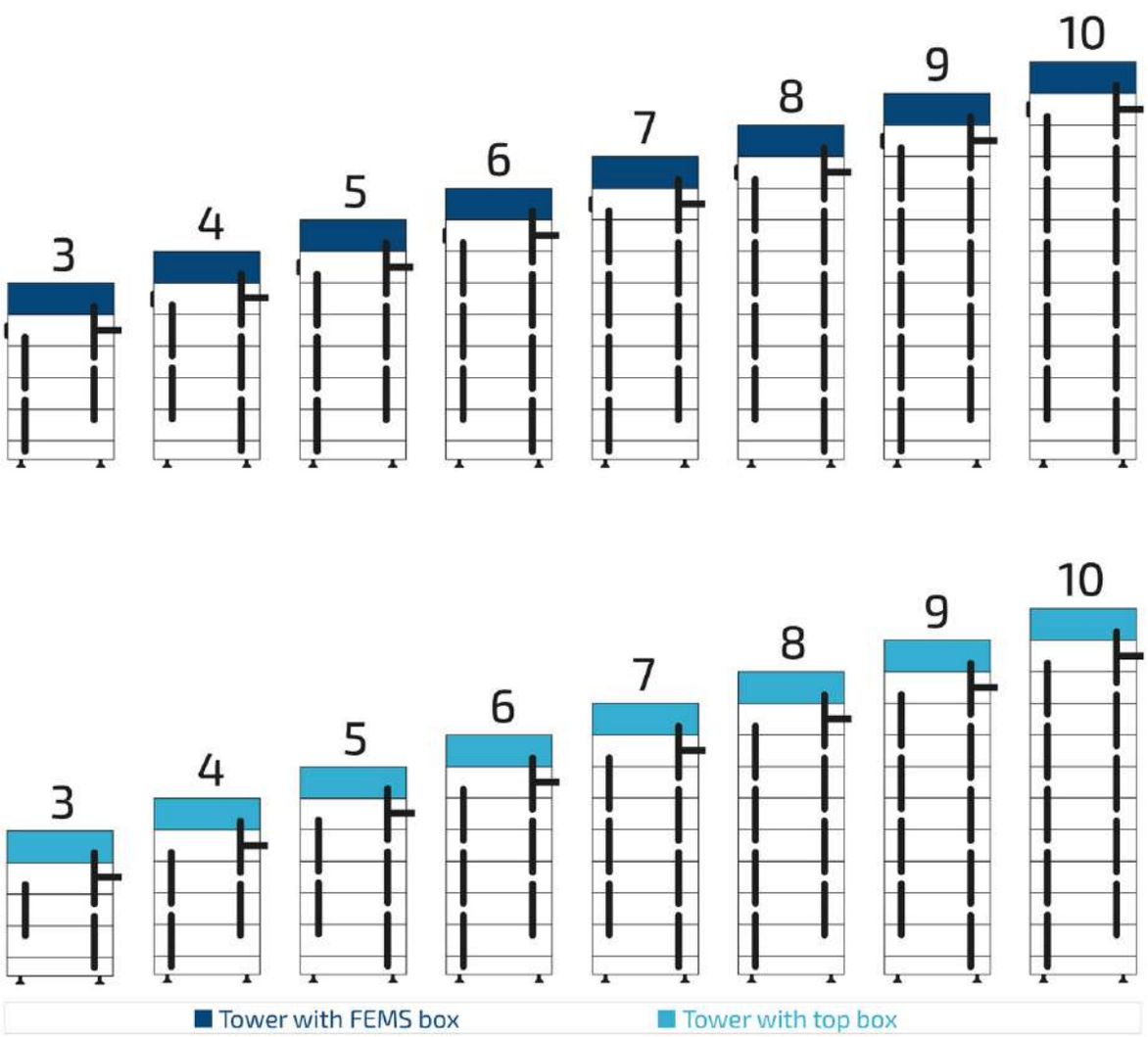
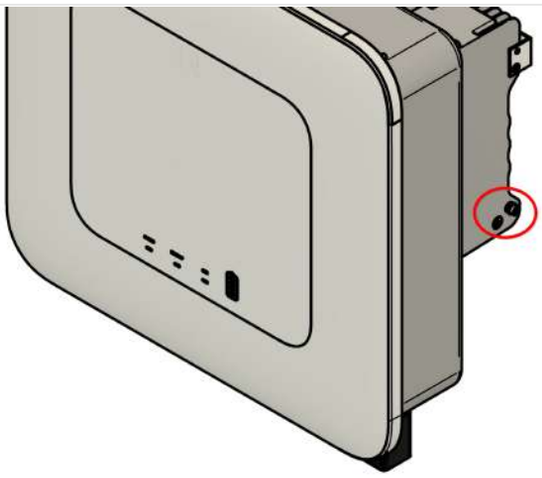


Illustration 25. Module mounting arrangement — Split base

6.4. Electrical installation

6.4.1. Earthing the inverter and the battery tower



1. The inverter must be grounded directly to the earth circuit connector.
2. At least a 10 mm^2 grounding cable must be used.
3. To do this, attach the grounding cable to the inverter at the bottom right using the enclosed screw (red).

4. The battery tower must be grounded directly to the earth circuit connector.
5. At least a 10 mm^2 grounding cable must be used.
6. To do this, attach the grounding cable of the EMS box to the grounding bolt (red).

7. Each additional battery tower (Parallel Box or Extension Box) must be grounded directly to the earth circuit connector.
8. At least a 10 mm^2 grounding cable must be used.
9. To do this, attach the grounding cable of the parallel or Extension box to the grounding bolt (red).

The grounding cable requires a cross-section of at least 10 mm^2.
The inverter and the battery towers must be grounded individually to the equipotential bonding.

6.5. Approved grid shapes for connecting the FENECON Home 6, 10 & 15

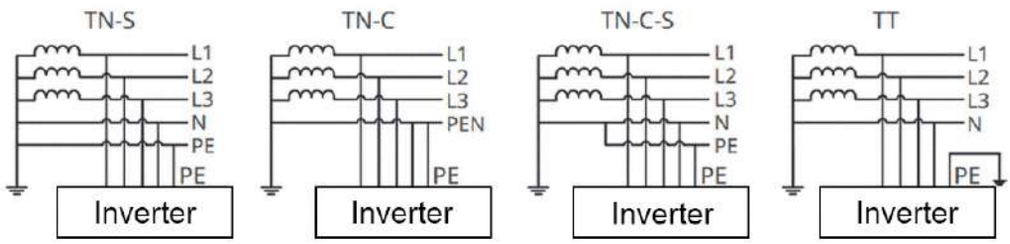


Illustration 26. Approved grid shapes for connecting the FENECON Home 6, 10 & 15

6.5.1. Connection and wiring of the AC circuit

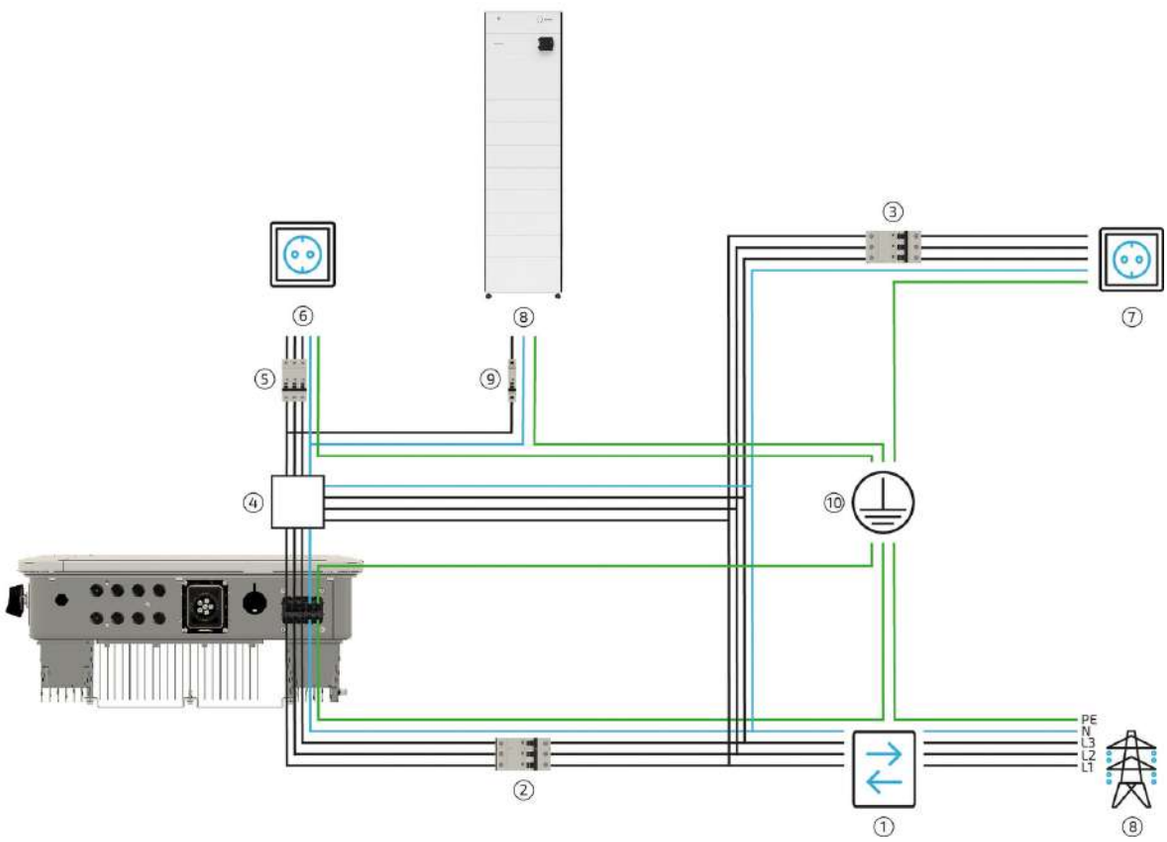


Illustration 27. General information AC connection

List item	Description
1	Bi-directional meter from the energy supplier
2	3-pole inverter fuse protection (6 kW — 20 A; 10/15 kW — 32 A).*
3	Fuse protection of the consumer loads (no emergency power) with RCD type A and suitable MCBs.
4	Service switch for switching the emergency power loads to the mains (recommended).
5	Consumer loads protected by suitable MCBs and RCD type A 30 mA.**
6	Consumer loads — emergency power supply maximum 6/10/15 kW — 2 kW/3.333kW/5 kW per phase (also applies in normal operation if grid available!); no other AC generators permitted
7	Consumer loads (not supplied with emergency power)
8	AC supply of the EMS box (if consumer loads are connected to the emergency power outlet).
9	Fuse protection maximum C6 or C10 1-pole.
10	Earth circuit connector

Table 38. Components for AC connection (not included in the scope of delivery)

* In addition, the currently valid national regulations and the specifications of the relevant grid operator must be observed. (If an RCD is required by the grid operator, an RCD type A with a tripping current of 300 mA is recommended; at 30 mA, unwanted shutdowns may occur).

** The currently valid national regulations, the specifications of the associated grid operator and the manufacturer's specifications must be observed.

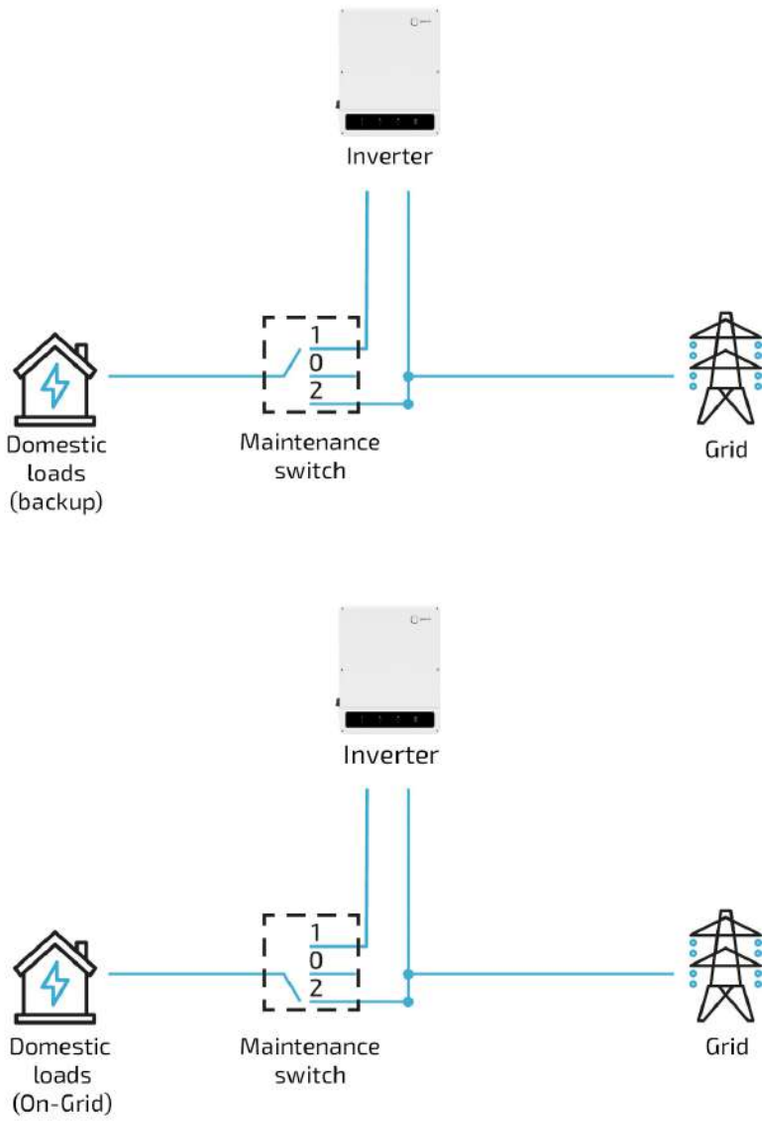


Illustration 28. Recommended maintenance switch for emergency power outlet

List item	Description
1	Emergency power consumers are supplied with emergency power via inverter (normal position)
2	Emergency power consumers are disconnected from the inverter and grid
3	Emergency power consumers are supplied from the grid

Table 39. Description of the switch positions of the maintenance switch (not included in the scope of delivery)

The automatic emergency power switchover is not affected by the maintenance switch.

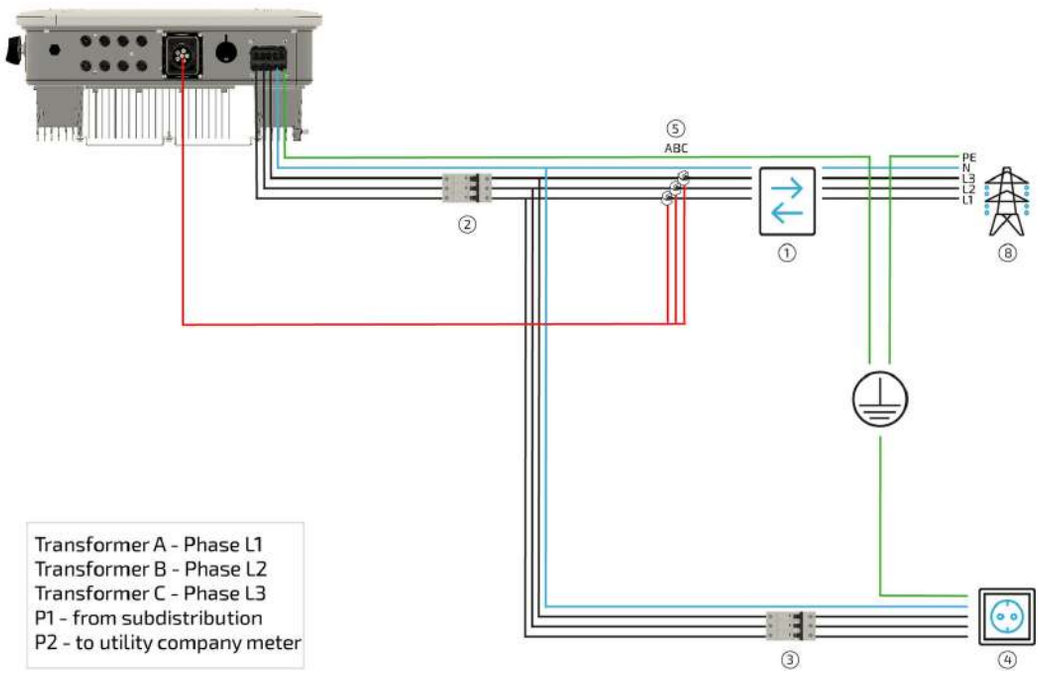


Illustration 29. AC connection Energy meter

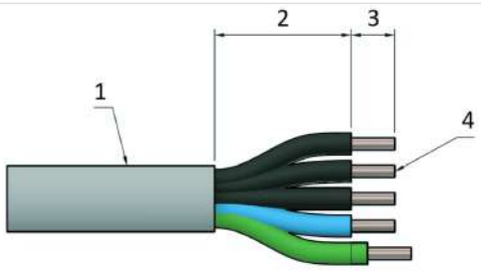
List item	Description
1	Bi-directional meter from energy supplier
2	Inverter fuse protection C20/C32 3-pole*
3	Fuse protection of the consumer loads (no emergency power) with RCD type A and suitable MCBs
4	Consumer loads, not supplied with emergency power
5	Split-core CT (directly behind grid operator meter) Connection to inverter

Table 40. Components for AC connection

* In addition, the currently valid national regulations and the specifications of the relevant grid operator must be observed. (If an RCD is required by the grid operator, an RCD type A with a tripping current of 300 mA is recommended; at 30 mA, unwanted shutdowns may occur).

1. Insert the inverter supply cable and the cable for the emergency power outlet into the cable gland.

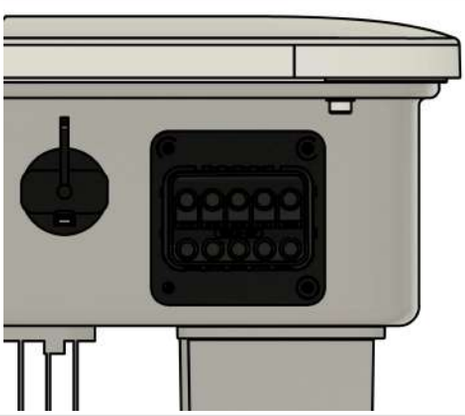
6.5. Approved grid shapes for connecting the FENECON Home 6, 10 & 15



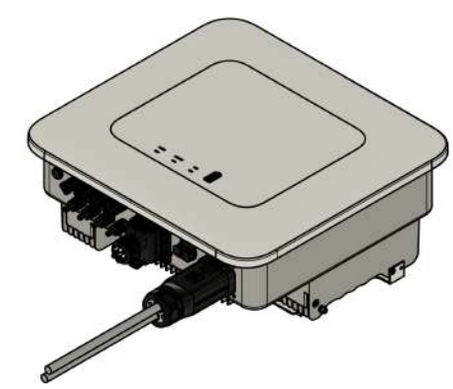
2. Strip off the cores
3. Make sure that the PE is slightly longer than the other cores.

Section	Description	Dimensions
1	Outer diameter	18 mm
2	Length of stripped cable	BACKUP: 75 mm ON-GRID: 55 mm
3	Length of stripped conductor	Approx. 12 mm^2 *
4	Conductor cross-section	Home 6: 2.5 mm^2 * Home 6 with automatic off-grid switch: 6 mm^2 * Home 10/15: 6 mm^2 *

4. Press the enclosed wire ferrules onto the cores. Alternatively, use other suitable wire ferrules.



5. Connect the cables to the connections provided (ON-GRID/OFF-GRID).
6. Ensure that a clockwise rotating field is connected.
7. The inverter must be pre-fused with a C20/32 MCB.



8. Attach the cable gland to the inverter. This snaps into place with an audible click.

[*]Select the cable cross-section, fuse type and fuse value according to the following general conditions: Country-specific installation standards, power class of the device, cable length, type of cable routing, local temperatures

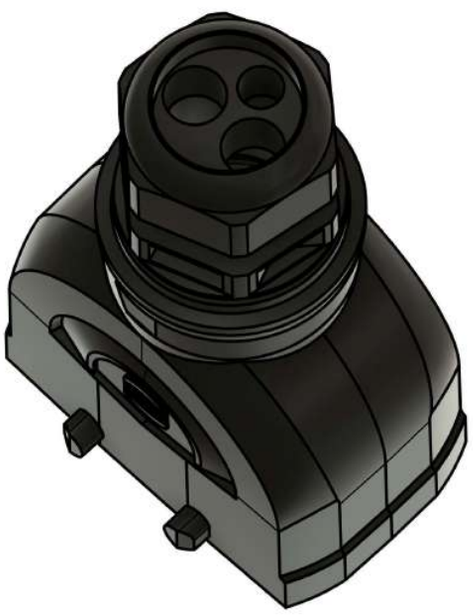
If flexible conductors are involved, wire ferrules must be used accordingly.

A 4-pole maintenance switch is recommended. Care must be taken to ensure that no neutral displacement can occur during switching. The correct maintenance switch must be selected by a specialist company, taking into account the conditions on site.

6.5.2. AC connection of the FENECON EMS box

An external 230 V power supply is required to supply the FENECON EMS box.

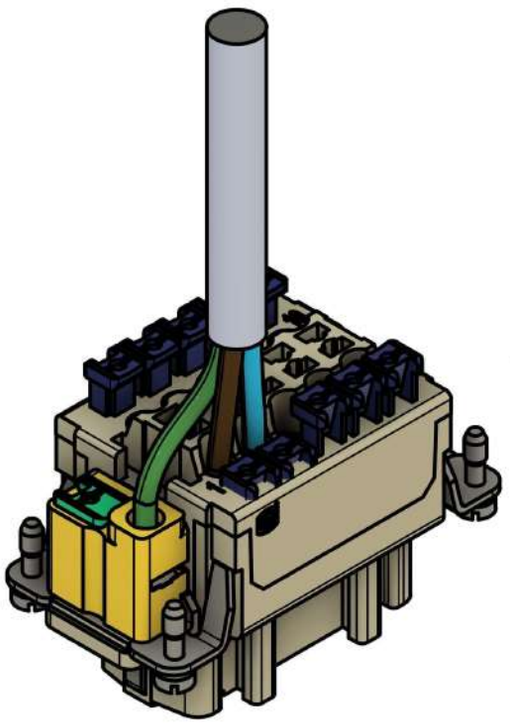
The purpose of this is to avoid loading the empty battery with additional consumer loads. This can occur particularly in winter when there is no sunshine or when there is snow on the PV system.



1. Feed the cable through the smaller hole of the multi-hole seal.
   A cross-section of 3 x 1.5 mm^2 is recommended.
2. Make sure that the housing with the 3-hole seal is used. The other housing will be needed later._

3. Insert the cable through the bolt connection and the multi-hole seal into the Harting housing.

6.5. Approved grid shapes for connecting the FENECON Home 6, 10 & 15



4. Harting socket insert, 10-pin, with cable.

   Place L on 1

   Place N on 2

   Connect PE to PE

	5. The other pins are for the integrated relay contacts. If these are not assigned, the socket can be bolted into the housing. 6. Close the remaining feedthroughs of the multi-hole seal with the enclosed filler plugs (10 mm) and tighten the bolt connection.
	7. Connect the plug to the FEMS. 8. Lock the plug at the top and bottom through the holders.

6.6. Explanation of the "zero feed-in" function

Connection and operation of electrical energy storage systems on the low-voltage grid in accordance with **VDE-FNN Note 07/2024** — Requirements for the energy flow direction sensor EnFluRi (section 4.3) and zero feed-in (section 4.4).

FENECON GmbH hereby declares that the inverters listed in the following table in combination with the respective energy meters specified fulfill the above requirements:

Inverter	Description	Internal Energy Meter	Home Energy Meter (FHM-120-C)*	3-phase sensor without current transformer at the grid connection point (FHM-C)**
Home 6	FINV-6-2-DAH	✅	✅ (optional)	❌
Home 10 (Gen. 1)	FHI-10-DAH	❌	✅	❌
Home 10 (Gen. 1)	FHI-10-DAH 16A	❌	✅	❌
Home 10	FINV-10-2-DAH	✅	✅ (optional)	❌
Home 15	FINV-15-2-DAH	✅	✅ (optional)	❌
Home 20	FHI-20-DAH	❌	✅	✅ (optional)
Home 30	FHI-29,9-DAH	❌	✅	✅ (optional)
Commercial 50 (Gen. 3)	FINV-50-1-DAH	❌	❌	✅
Commercial 100	FINV-100-1-DAH	❌	❌	✅

*Item no.: FHO055
**Item no.: FEH040

6.6.1. Configuration for zero feed-in via the FENECON Energy Management System

The inverters listed above can be configured via the FENECON Energy Management System so that the PV energy generated is used entirely by the user and is not fed-in to the public grid.
To do this, the **Maximum feed-in power** setting in the commissioning wizard must be set to **0 watts**.

6.6.2. Notes on the zero feed-in function:

- If FENECON inverters are used, deviations of < 1 % per phase may occur.
- The accuracy of the zero feed-in depends on the power factor of the connected consumer loads.
- A high proportion of reactive power, especially in the form of harmonics, can negatively affect the accuracy of the active power measurement.

- With zero feed-in, devices that regulate to PV surplus no longer work, as there is no longer a grid feed-in to which they can regulate.

6.6.3. Validity of the declaration:

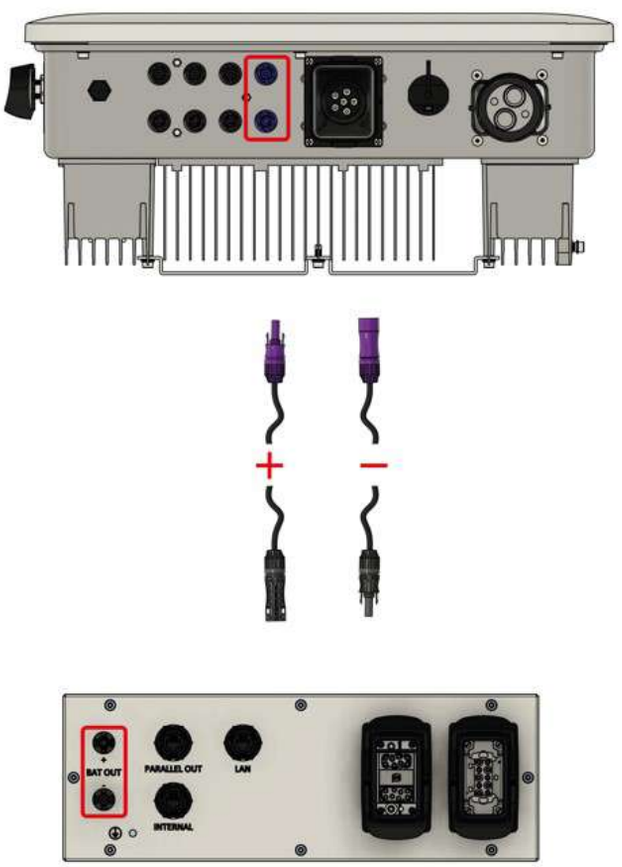
This declaration applies to all identical inverters. It loses its validity if:

- changes have been made to the device,
- the connection is made improperly,
- the installation was not carried out in accordance with the installation and service instructions, or
- the inverter is operated with an external generator.

6.6.4. DC cable from the battery tower to the inverter

This section can be skipped if there are several battery towers.

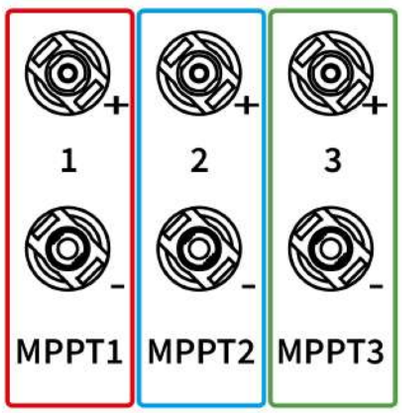
You will find the installation instructions for 2 or 3 battery towers in the section Electrical installation of additional battery towers.



1. Use the enclosed DC cable (3 m) for the compound of battery tower and inverter.
2. Connect the cables to the battery (BAT OUT) and to the inverter (BAT).
3. Connect plus (+) to plus (+) and minus (-) to minus (-).
4. If the DC cables supplied are not long enough, please contact your sales partner.

The DC plugs used on the battery side are not compatible with standard MC4 plugs.

6.6.5. Connection and cabling of PV system

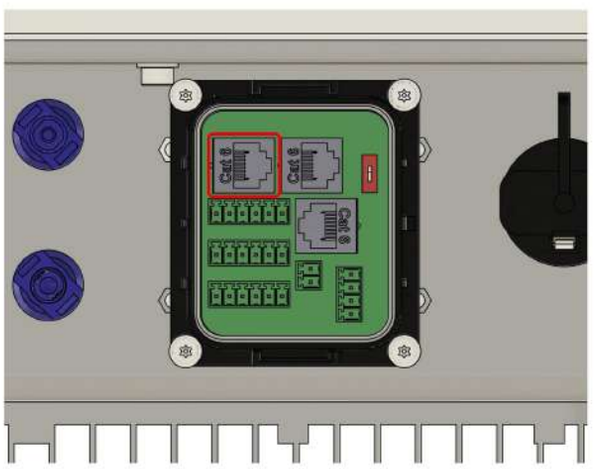


The various PV strings can be connected directly to the PV inputs on the inverter. The 6 kW variant has 2 MPPTs, each with one input (red; blue). For the 10 kW and 15 kW variants, 3 MPPTs are available, each with one input (red; blue; green)

Type 2 overvoltage protection is integrated in the inverter.

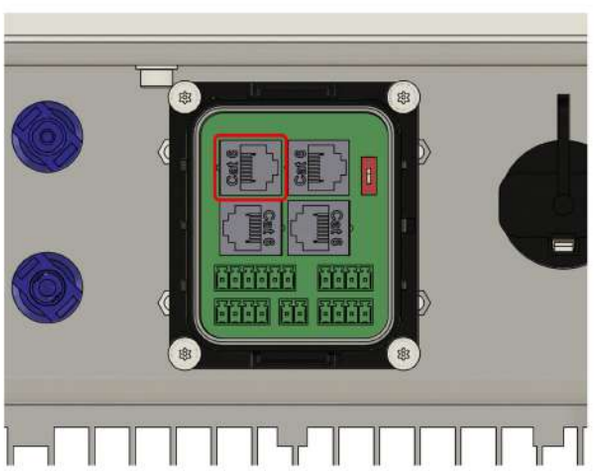
6.6.6. Communication between inverter and EMS box

1. Feed the enclosed communication cable (3 m network cable with open end) through one of the holes in the multi-hole seal of the communication port cover.
2. Leave the other openings of the multi-hole seal closed.



Variant A

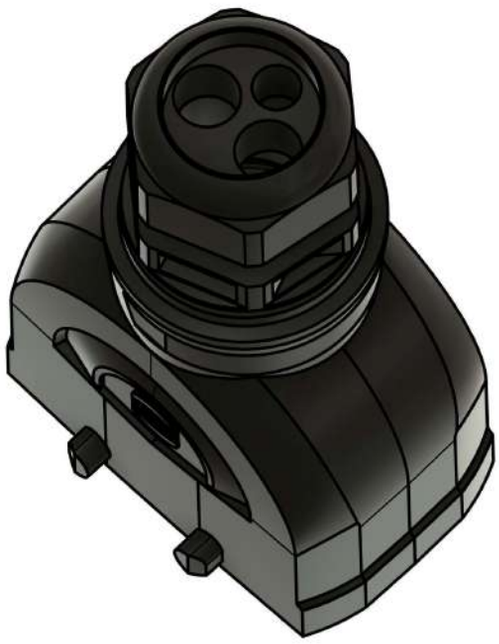
3. A) Connect the plug of the communication cable to the inverter.



Variant B

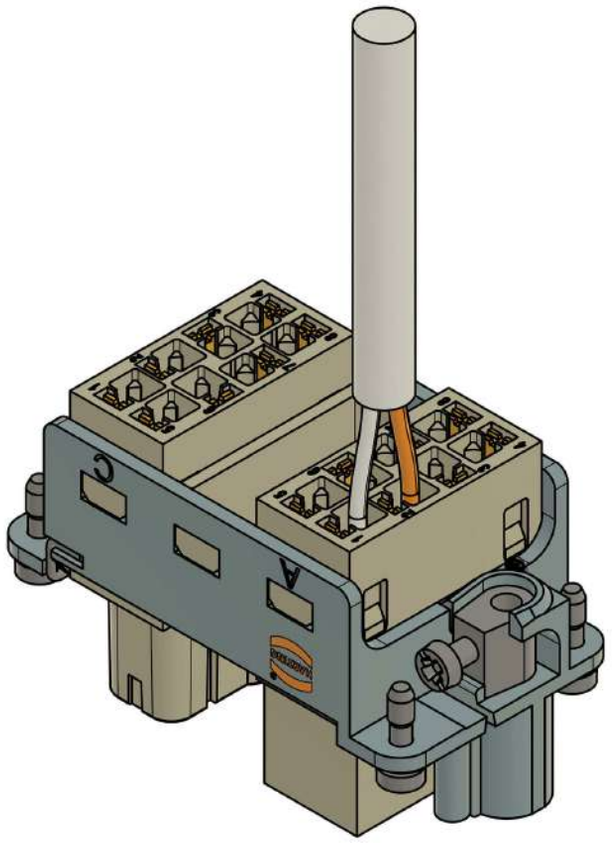
3. B) Connect the plug of the communication cable to the inverter.

4. Attach the cover to the inverter and tighten the bolt connection.



5. Feedthroughs the cable through one of the four holes in the multi-hole seal.

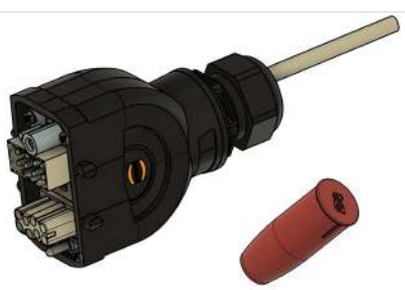
6. Insert the cable through the bolt connection and the multi-hole seal into the Harting housing.



7. The other end with two open pins must be connected to terminal 1/2 on the Harting plug (16-pin — A).
8. Connect the white core to terminal 1.
9. Connect the orange core to terminal 2.

If controllable consumer loads have been installed and one of the following FEMS extensions has been purchased, the following two steps can be neglected for the time being.

- FEMS App "SG-Ready" Heat Pump
- FEMS App Heating element
- FEMS App CHP



10. Then screw the socket into the Harting housing.
11. Close the other openings in the screw connection with the enclosed 8 mm filler plugs.
12. Provide strain relief for the cable by tightening the bolt connection.

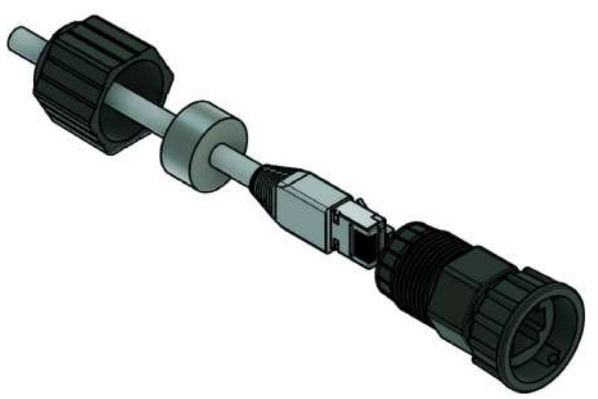
13. Close the remaining feedthroughs of the multi-hole seal with the enclosed filler plugs (8 mm) and tighten the bolt connection.
14. Lock the plug at the top and bottom through the holders.

6.6.7. Communication from a battery tower

If only one battery tower is installed, the jumper plug (supplied) must be plugged into the PARALLEL OUT connection and locked by turning the underside.

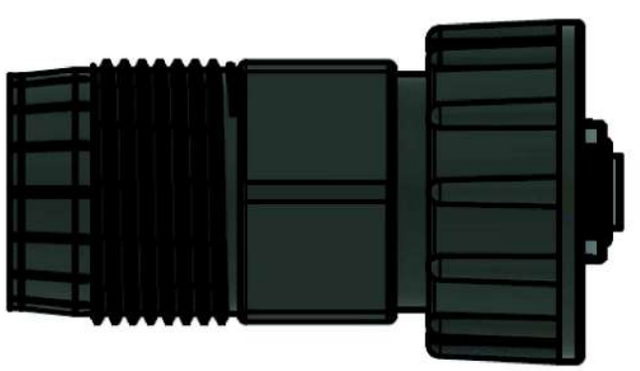
You will find the installation instructions for 2 or 3 battery towers in the section Electrical installation of additional battery towers.

6.6.8. Communication with the customer network



1. To seal the network connections, insert the cable into the connector and bolt connection.
   Only the multi-hole seal and the bolt connection are required.

If the battery tower is installed indoors, this point can be skipped and the network cable can be connected directly.



2. Make sure that the network connector protrudes approx. 3 mm above the bayonet catch at the front.
3. For example, the jumper plug of the battery can serve as a reference for the position of the network connector.

6.6. Explanation of the "zero feed-in" function

4. For internet connection and system configuration, connect the network cable to the LAN port of the battery and the other end of the cable to the customer’s network.

The electrical energy storage system does not offer WiFi functionality.

6.7. Connection and wiring of the system's measuring device

6.7.1. Standard split-core CT

Three split-core CTs with a 10 m long cable are included with the system as standard. No additional measuring device needs to be installed in the meter cabinet. The required voltage data is measured directly at the inverter.

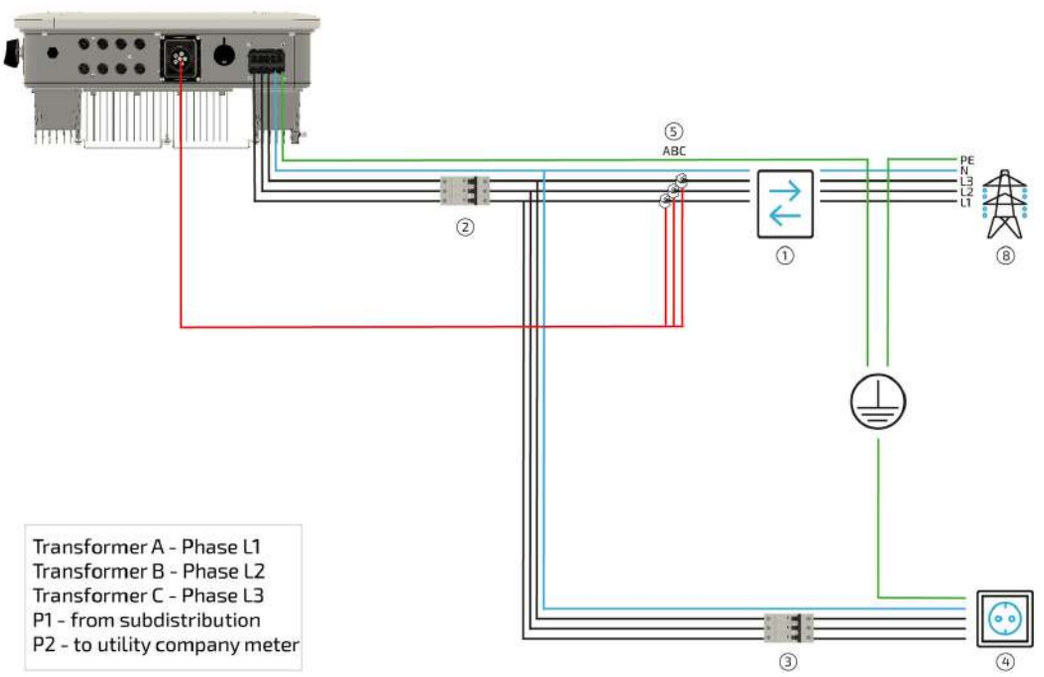


Illustration 30. AC connection of a standard split-core CT

List item	Description
1	Bi-directional meter from energy supplier
2	Inverter fuse protection C20/C32 3-pole*
3	Fuse protection of the consumer loads (no emergency power) with RCD type A and suitable MCBs
4	Consumer loads not supplied with emergency power
5	Split-core CT (directly behind grid operator meter), connection to inverter

Table 41. Components for AC connection (not included in the scope of delivery)

In addition, the currently valid national regulations and the specifications of the relevant grid operator must be observed. (If an RCD is required by the grid operator, an RCD type A with a tripping current of 300 mA is recommended; at 30 mA, unwanted shutdowns may occur).

6.7.2. Connection — Split-core CT variant A

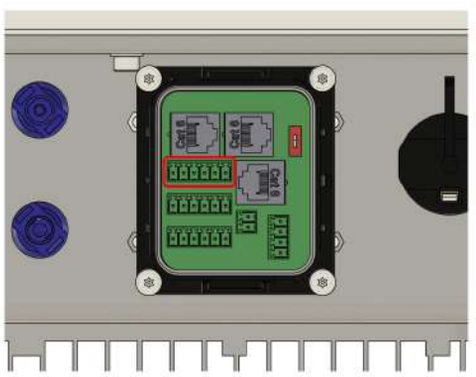
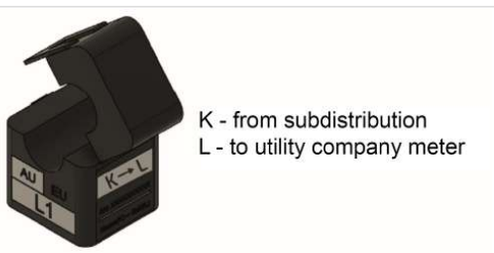
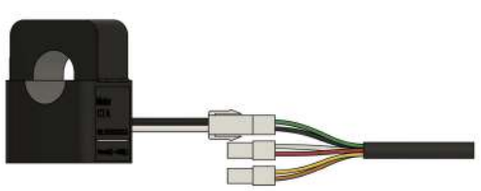
	1. Feed the end with the three plugs for the transformers through the cover and its multi-hole seal insert.
	2. Connect the green plug to the inverter.
	3. Check the junction box of the split-core CTs. 4. Connect the transformer in the sub-distribution board directly behind the grid operator’s meter. 5. To do this, fold the respective transformer around phase L1 — L3 and close until the lock audibly engages.
	6. Connect the split-core CTs according to the labeling on the transformers and the plugs of the enclosed communication cable. CT1 — L1 CT2 — L2 CT3 — L3

Table 42. Standard folding transformer — Variant A

6.7.3. Connection — Split-core CT variant B

For variant B, a network cable (min. CAT5e) of the appropriate length is required. The maximum length is limited to 25 m.

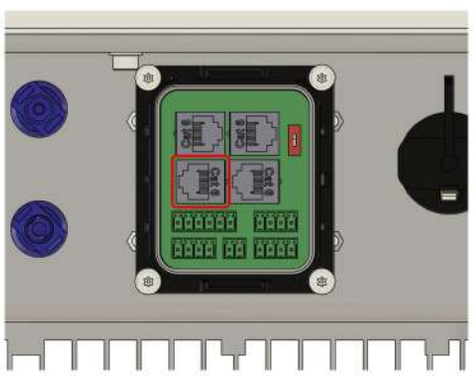
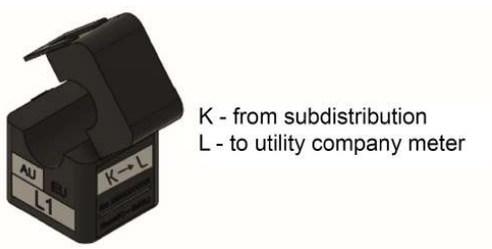
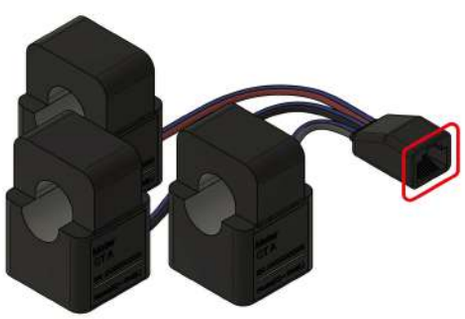
	1. Guide the network cable plug through the cover and its multi-hole seal insert.
	2. Plug into the correct network socket (CT).
	3. Check the junction box of the split-core CTs. 4. Connect the transformer in the sub-distribution board directly behind the grid operator's meter. 5. To do this, fold the respective transformer(s) around phases L1 to L3 and close until the lock audibly engages. K — from the sub-distribution board L — to the grid operator's meter (grid connection)
	6. Connect the split-core CT plug to the network cable.

Table 43. Standard folding transformer — Variant B

6.7. Connection and wiring of the system's measuring device

The maximum current carrying capacity is 120 A per phase.
K — from the sub-distribution board
L — to the grid operator's meter (grid connection)
_The labeling K L can be found on the underside of the split-core CT.
The cable between the transformer and the energy meter must not be shortened or extended.
The inner diameter of the split-core CTs is 16 mm.
The transformers and the meter cannot be replaced by other types.
Make sure that phase L1 is also phase L1 on the inverter.

6.7.4. Optional split-core CTs with external measuring device

If the cable (10 m) of the standard split-core CTs is too short, an external measuring device with already connected split-core CTs can be installed as an option. A maximum cable length of 100 m is possible between the measuring device and the inverter.

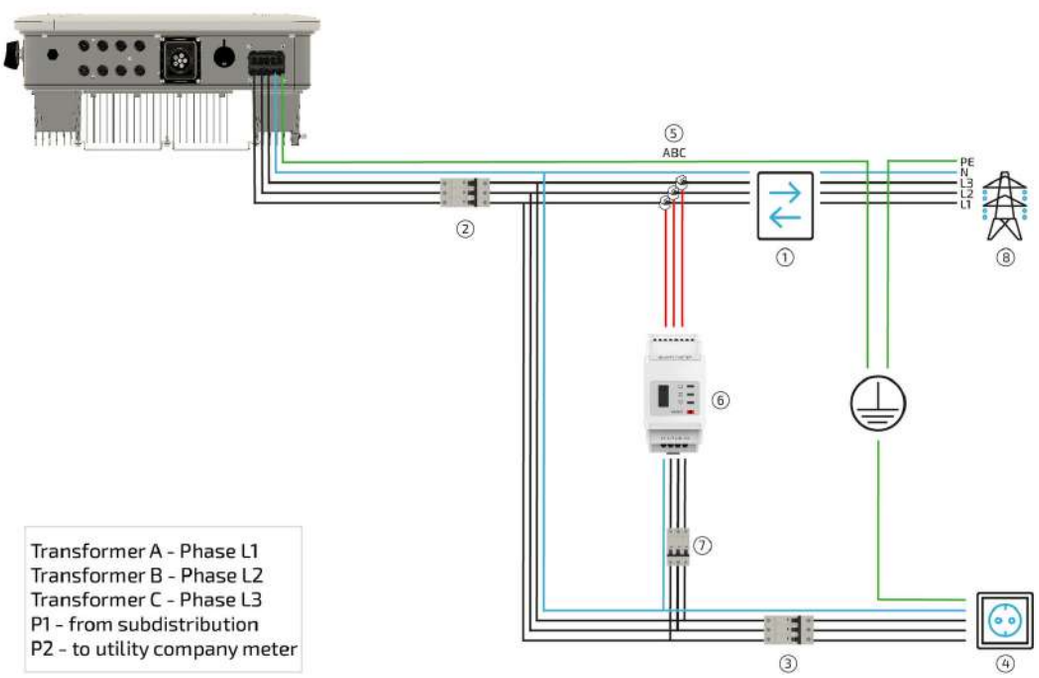


Illustration 31. AC connection of optional split-core CTs with external measuring device

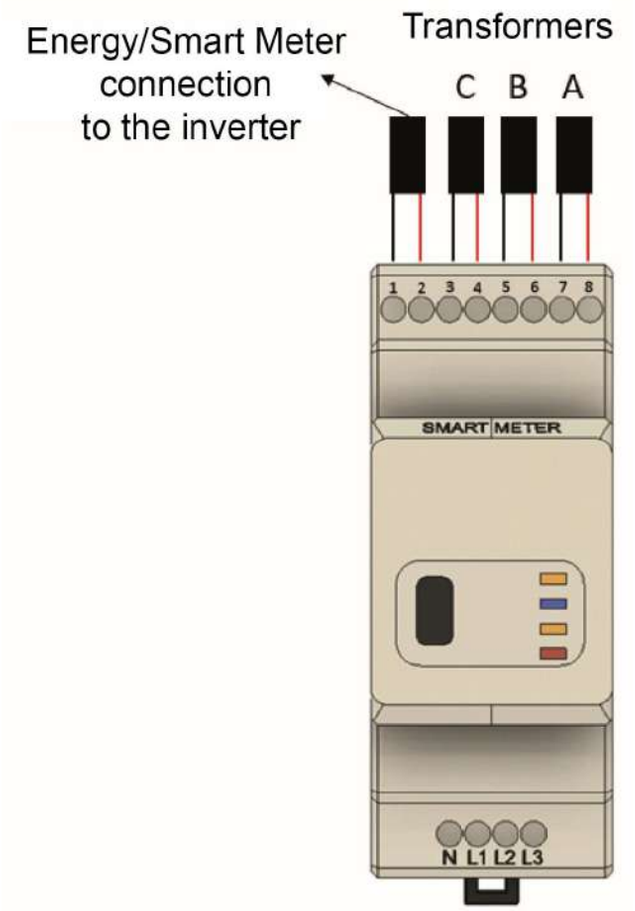
List item	Description
1	Bi-directional meter from energy supplier
2	Inverter fuse protection C20/C32 3-pole*
3	Fuse protection of the consumer loads (no emergency power) with RCD type A and suitable MCBs
4	Consumer loads not supplied with emergency power
5	Split-core CT (directly behind grid operator meter), connection to inverter
6	Energy meter
7	Fuse protection of the energy meter (recommended) B6 3-pole

Table 44. Components for AC connection (not included in the scope of delivery)

In addition, the currently valid national regulations and the specifications of the relevant grid operator must be observed. (If an RCD is required by the grid operator, an RCD type A with a tripping current of 300 mA is recommended; at 30 mA, unwanted shutdowns may occur).

6.7. Connection and wiring of the system's measuring device

1. Check the junction box of the split-core CTs.
2. Connect the transformer in the sub-distribution board directly behind the grid operator's meter.
3. To do this, fold the respective transformers around the phases L1 to L3 and close them until the lock audibly engages.

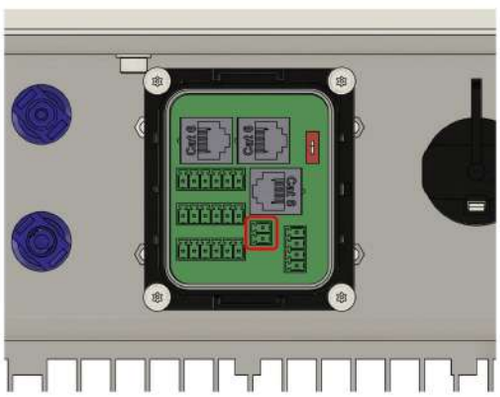


4. Establish and fuse the voltage tap (C6A 3-pole).
5. Connect the three phases and the neutral as labeled on the measuring device.

For the following step, a standard CAT6 network cable or installation cable with crimped-on plug can be used.

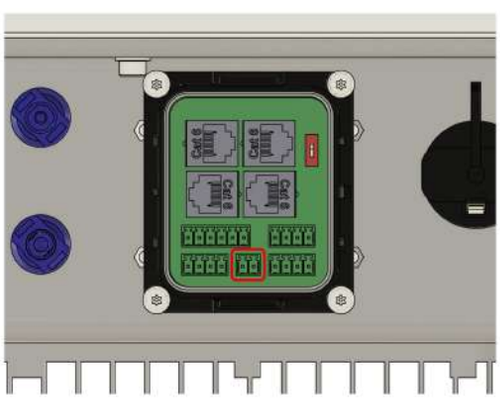
6. Feed the network cable through the cover and its multi-hole seal insert.

7. Connect the open end with the brown and brown/white core to the plug.



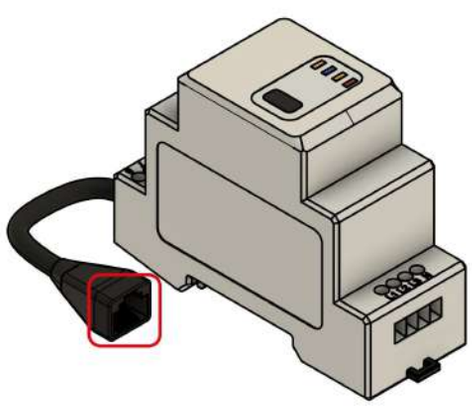
Variant A

8. A) Connect the plug to the inverter.



Variant B

8. B) Connect the plug to the inverter.



9. Connect the other end to the measuring device.

The maximum current carrying capacity is 120 A per phase.
K — from the sub-distribution board
L — to the grid operator's meter (grid connection)

The labeling K L can be found on the underside of the split-core CT.
The cable between the transformer and the energy meter (optional) must not be shortened or extended.
The inner diameter of the split-core CTs is 16 mm.
The transformers and the meter cannot be replaced by other types.
Make sure that phase L1 is also phase L1 on the inverter.

6.7.5. Cover for the internal input (optional)

Optionally, a network connector housing with filler plug (included in the scope of delivery) can be used as a cover for the internal connection.
The network connector housing and the filler plug must be installed beforehand.

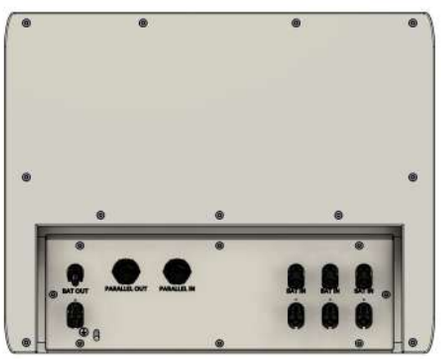
An IP classification is only guaranteed if the corresponding plugs are locked on all connections.

7. Parallel connection of several battery towers

7.1. Assembly of further battery towers

7.1.1. Assembly of battery tower 2 with FENECON Parallel Box

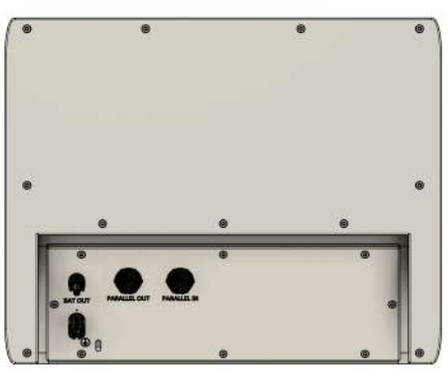
If a second battery tower is available, the Parallel Box is plugged onto the second battery tower instead of the EMS box.



To do this, repeat the steps from the section Assembly of battery tower 1 with FEMS box. In step 8, attach the FENECON Parallel Box instead of the FENECON EMS box.

7.1.2. Assembly of battery tower(s) 3 to 4 with FENECON Extension box

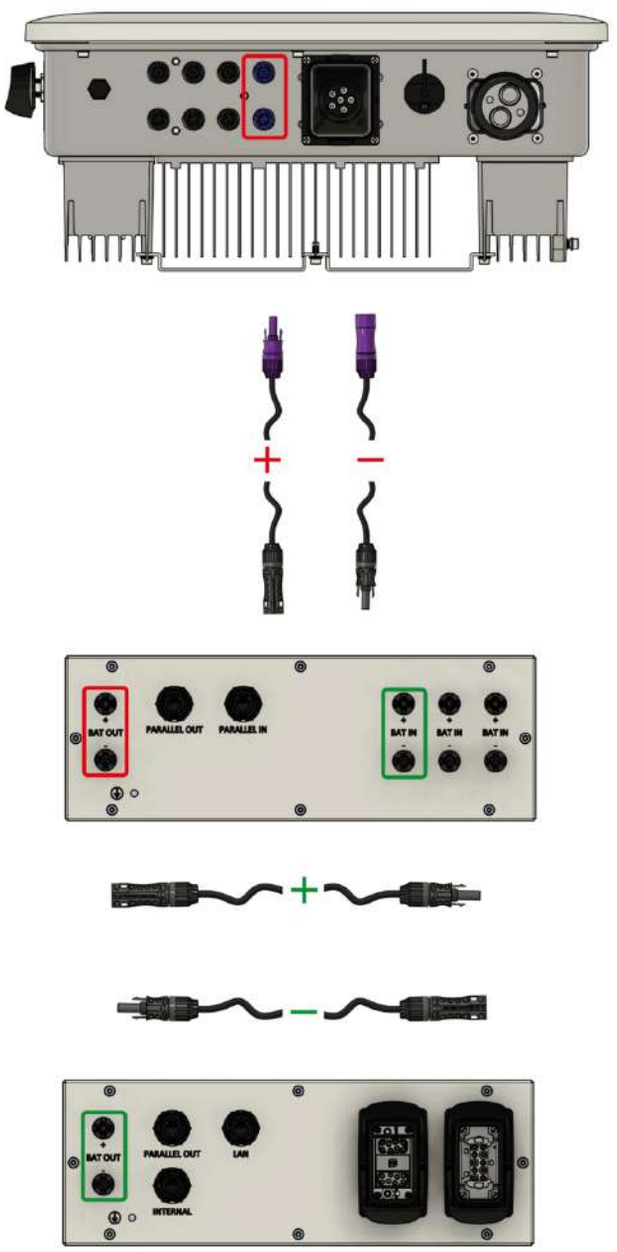
If there is a third to fourth battery tower, an Extension box is attached to the third to fourth battery tower instead of the EMS box.



To do this, repeat the steps from the section Assembly of battery tower 1 with FEMS box. In step 8, attach the FENECON extension box instead of the FENECON EMS box.

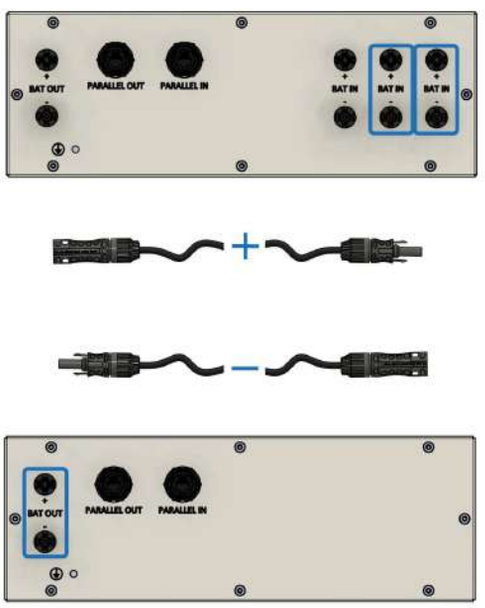
7.2. Electrical installation of additional battery towers

7.2.1. DC cable between two battery towers and the Inverter



1. Use the enclosed DC cable (3 m) for the t-shaped connector from the second battery tower with the plugged-on Parallel Box to the inverter.
2. If the length of the DC battery cables is not sufficient, one of the enclosed sets of DC cables (2 m) can be used to extend them.
3. Connect the cables to the second battery tower (Parallel Box) (BAT OUT) and the inverter (BAT). (red)
4. Connect plus (+) to plus (+) and minus (-) to minus (-).
5. The two battery towers are connected to each other using the second set of cables supplied with the Parallel Box.
6. To do this, connect the two cables to the first battery (EMS box) (BAT OUT) and to the second battery (parallel box) (BAT IN) (green).

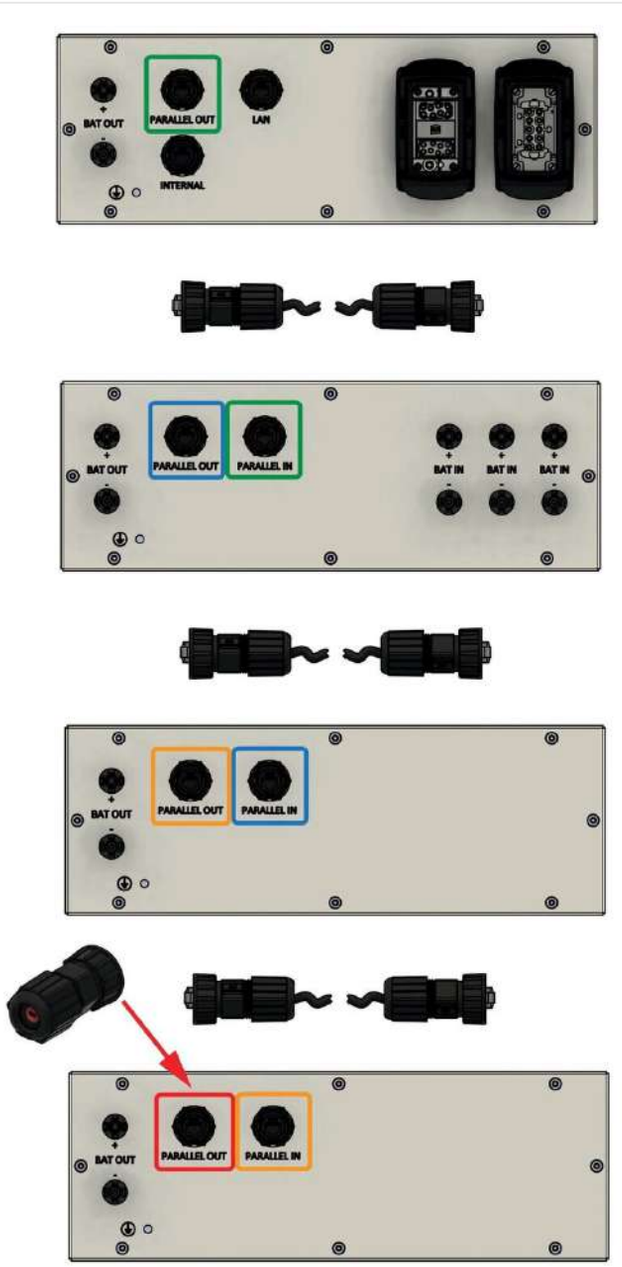
7.2.2. DC cable between the third to fourth battery tower and Parallel Box



1. The third and fourth battery towers are connected to the Parallel Box. Depending on the distance, a 2-meter cable set is sufficient, if not, the two enclosed cable sets can be connected and thus extended to 4 m.
2. To do this, connect the two cables between the Extension box (BAT OUT) and the Parallel Box (BAT IN).

7.3. Communication of further battery towers

7.3.1. Communication between two to four battery towers



1. If several battery towers are operated in parallel, the network cable supplied with the parallel box and Extension box must be used between the towers (green).
2. The network cable must be plugged in and locked between the EMS box (PARALLEL OUT) and the Parallel Box (PARALLEL IN).
3. Likewise on all other towers, always between PARALLEL OUT and PARALLEL IN (blue/orange).
4. At the last tower, plug the jumper plug into PARALLEL OUT (red).

8. Initial commissioning

8.1. Checking the installation, connections and cabling

Check the system as follows before initial commissioning:

- All components (clearances, environment, mounting) are installed correctly.
- All internal wiring is complete and properly connected.
- All external supply lines (power supply, communication cable) are properly connected.
- All connected loads are matched to the system and the necessary settings have been made.
- All necessary tests of the system were carried out in accordance with the standards.

Commissioning must only be carried out by trained specialist personnel.

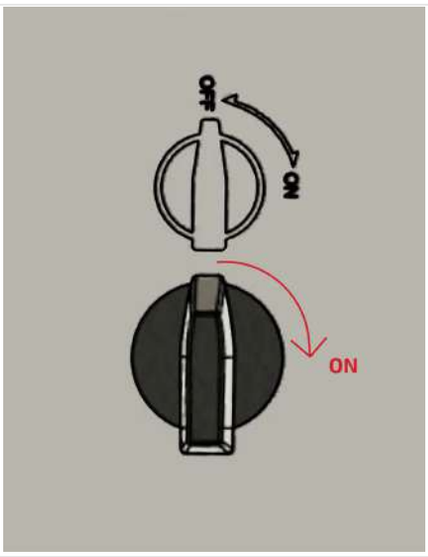
- It is forbidden to disconnect the electrical connectors while they are live. Disconnect the power supply.
- Batteries must not be connected or disconnected when a current is flowing.
- Opening batteries is prohibited.
- Before commissioning the system, ensure that the battery modules are not deeply discharged.
- If the battery modules are deeply discharged, contact FENECON Service
- Only charge deeply discharged battery modules as instructed by the FENECON Service.

This is indicated in the installation and service instructions:

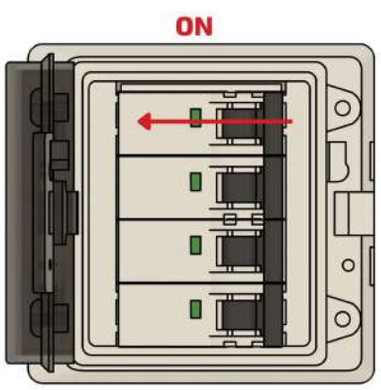
- that an appropriate cooling down period must be observed before starting work on the devices,
- or that the risk of burns is prevented by wearing suitable protective gloves.

8.2. Switching the system on/off

8.2.1. Switching on the system



1. Rack in the EMS box (sub-distribution board or socket).
2. Rack in the inverter (sub-distribution board, grid and emergency power side).
3. If available, switch on the PV system with the DC switch on the inverter (left side of the inverter).



4. Racking in the battery tower (front battery tower).
5. If there are several battery towers, all towers must be racked in.

6. If commissioning has already been completed, the battery will start and the LED bar should flash after approx. 60 seconds.
7. The system is now ready for use.
8. If commissioning has not yet been completed, the battery will not start.
   Configuration via commissioning wizard.

The system is restarted by pressing the push-button on the front of the EMS box. Restarting the system can take up to three minutes.

If the system has not yet been configured, the battery goes into error mode or switches off.
This can also happen during configuration. It is therefore recommended that you only switch on the battery when you are prompted to do so during the configuration process.

The inverter only starts after configuration and only then synchronizes with the grid.

8.2.2. FEMS push-button and LED ring

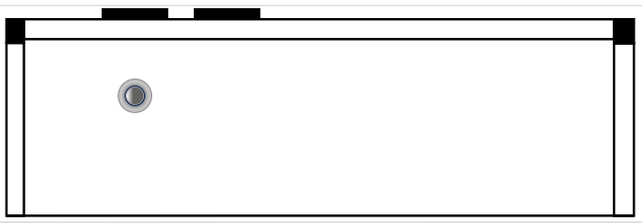
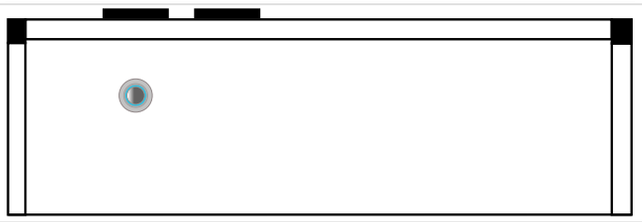
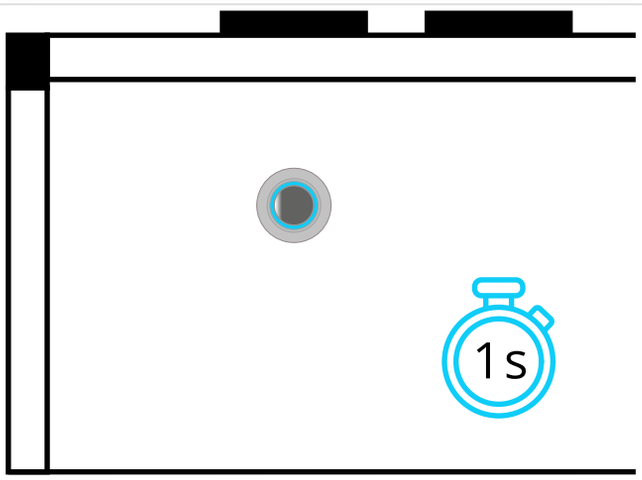
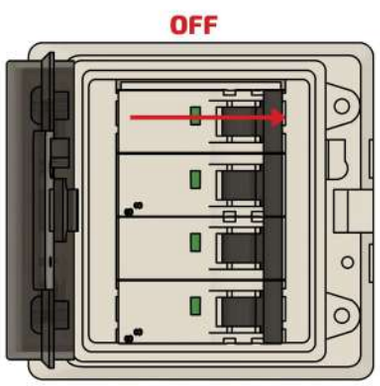
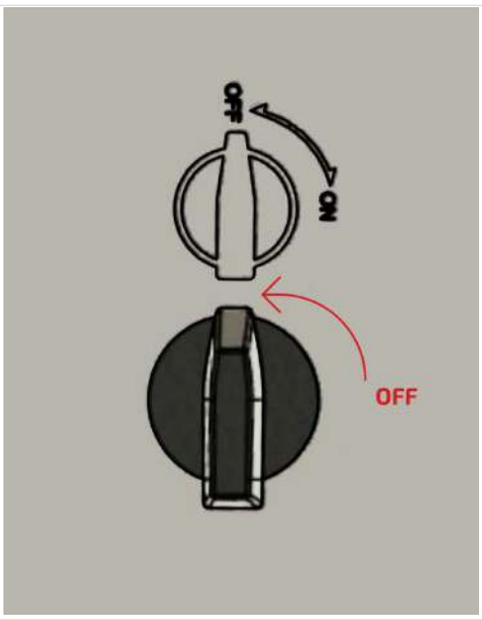
	If the blue LED ring of the push-button does not light up, the FEMS box is not supplied with power or the FEMS box is switched off.
	If there is an internet connection to the FENECON server, the blue LED ring of the push-button lights up permanently.
	If the blue LED ring of the push-button flashes with an interval of 1 second, there is no internet connection to the FENECON server.

Table 45. Status of the LED ring on the FEMS box

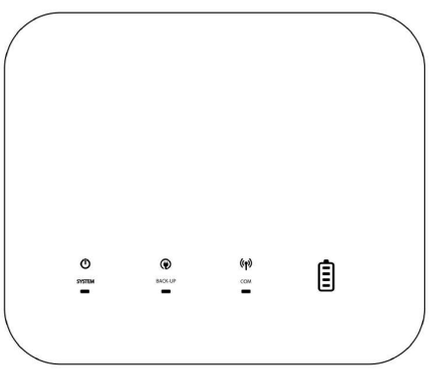
Pressing the push-button restarts the FEMS.

8.2.3. Switching off

	1. Racking out the battery tower (front battery tower). 2. If there are several battery towers, all towers must be fused.



3. If present, switch off the PV system using the DC switch on the inverter.
4. Rack out the inverter. (sub-distribution board, grid and emergency power side).
5. Rack out the EMS box (sub-distribution board or socket).



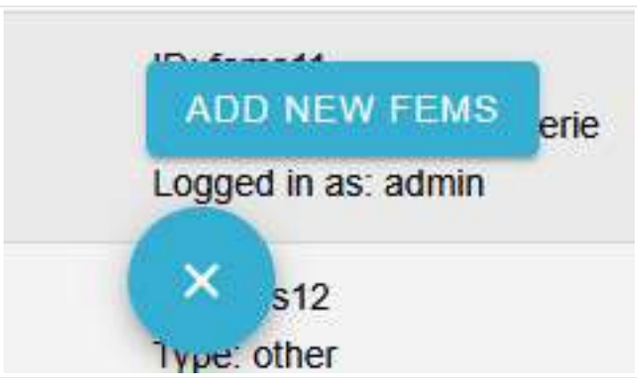
6. The system is only completely switched off when all LEDs on the inverter and the battery are no longer lit. This can take approx. 30 seconds.
7. The inverter remains on if one of the three energy sources is not switched off.

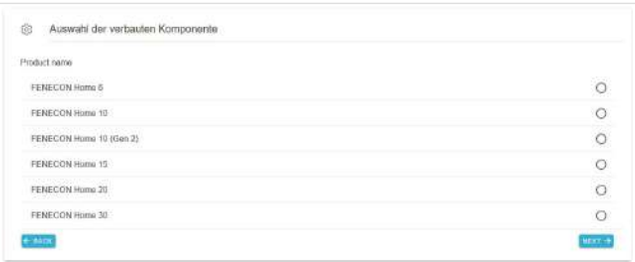
8.3. Configuration via commissioning wizard

Open www.fenecon.de and click on the login to FENECON Online Monitoring"FEMS-Login" in the top right-hand corner. Alternatively, you can use the QR code below or the link to access the page.

	1. https://portal.fenecon.de

If you do not yet have an installer account, learn how to create one here.

	After logging in, you will be taken to this screen. Click on the plus symbol at the bottom center and then on *ADD NEW FEMS*. TIP: If you cannot access this screen directly, please click on the ☰ burger menu at the top left and then on *All systems*.
	1. Enter the installer key. You can find this on the sticker on the inverter or on the FEMS box.
	2. Carry out a software update if necessary.
	3. Select the attachment type, in this case: FENECON Home.

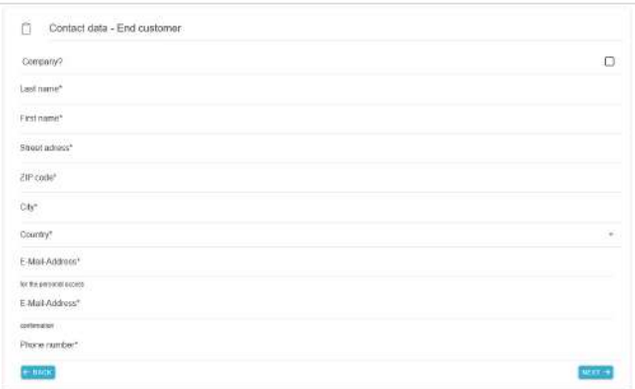


4. Select the system.

> The product names are based on the output of the respective inverter.

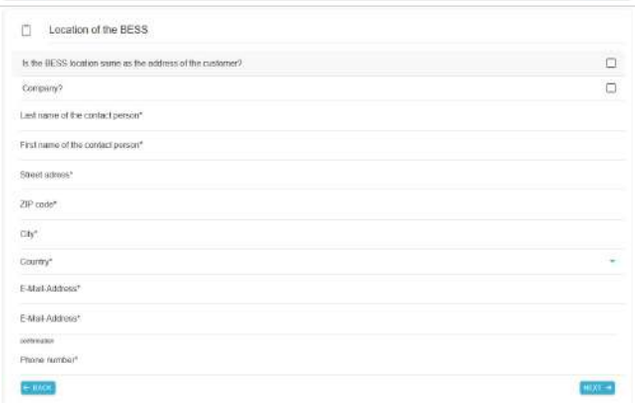
5. If it is a system with a 6 kW or 10 kW inverter, select here whether an automatic off-grid switch is installed. If yes, the serial number must be entered here manually.

6. The contact details of the installer account are automatically transferred.



7. Enter the end customer’s contact details here.

> The end customer account is created with the e-mail address entered here. The end customer commissioning report is also sent to this address. Both the installer and the end customer will receive a commissioning report by email.



8. Enter the location of the storage system here if the system location differs from the customer address (for service purposes).

9. Click on *VALIDATE*.

   Then select the address found from the list.

   The location coordinates are checked here to ensure the functions of location-dependent applications (e. g. weather data).

10. If dimming is required at the system location in accordance with § 14a EnWG, you can set this here.

11. This is where you activate the emergency power function and, if necessary, the emergency power reserve.

    The emergency power reserve can be configured by the end customer at any time afterwards. However, the general emergency power function CANNOT.

12. Select the energy flow direction meter ("EnFluRi") here:

    For **Home 6, 10 & 15**: Here you can select whether the internal one built into the inverter (standard) is selected, or whether the "small" energy meter is selected if the application requires cables longer than 15 meters. Optional accessories can also be selected here.

    Explicitly for Home 20 & 30: The standard scope of delivery *or* the optionally available, FENECON meter for higher currents is selected here.

13. Select the pre-fuse of the house connection meter here.

    Specified in amperes (A).

14. The connections of the MPP trackers are displayed here for checking purposes.
    Check whether the connections of the MPPT used have been made correctly and confirm that the connections have been checked.

15. Configure shade management according to MPP trackers here.

    If PV optimizers are used, shade management must be switched off.

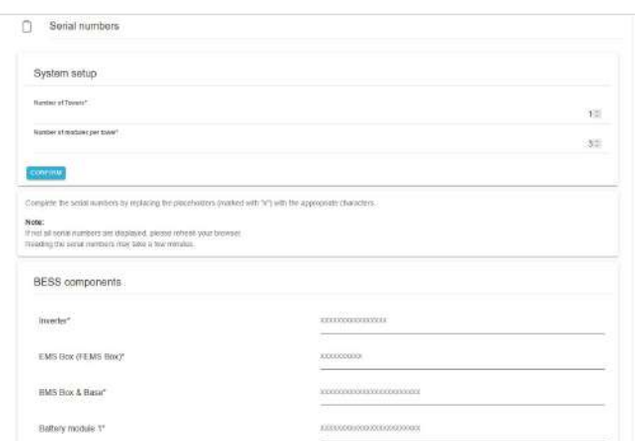
16. Configure Feed-in management according to the grid operator's specifications.

17. Check the information you have previously entered and confirm the terms and conditions and warranty conditions.

    The battery and inverter must also be switched on.

18. After clicking on ▶ *START CONFIGURATION* the configuration of the system begins.

    Leave the battery and inverter switched on during the entire configuration process.



19. Select the number of battery towers and modules.

    Confirm the displayed serial numbers of the system components.

    The readout may take a few minutes.

    In rare cases, serial numbers must be added manually.

20. This completes the configuration via the commissioning wizard.

    The system is now ready for operation.

    You can now continue with the installation of FEMS Apps by clicking on *APP CENTER*.

- You will receive an e-mail with a commissioning report attached for your records.
- The customer also receives an e-mail with the personal access data for end customer monitoring.

9. FEMS Online Monitoring

The FEMS Online Monitoring is used to visualize all energy flows in your system. The Energy Monitor shows live data on grid withdrawal or feed-in, PV production, charging/discharging of the battery energy storage system and power 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, all additionally purchased FEMS extensions, such as for integrating a heat pump, Heating element, combined heat and power plant (CHP), are also listed in Online Monitoring. Their functionality can be controlled via the corresponding widget.

In addition to the live view, the history offers the option of selecting self-selected time periods for Online Monitoring. The status of the entire system and the individual components can be monitored at any time using the info symbol.

9.1. Access data

Access to FEMS Online Monitoring is separated according to end customer and installer.

9.1.1. Access for the end customer

Access for the end customer is automatically generated once commissioning is complete and sent to the end customer by e-mail.
The terms and conditions still need to be confirmed here, then the monitoring is available without restrictions.

If additional users want to access the system, they must create their own user account. This is done as described in the section Configuration via commissioning wizard, but here "USER" must be selected in the header.

After successfully creating an additional user account, all we need is an email to service@fenecon.de with the email address used and the FEMS number concerned, we will create the link and other users can use the Online Monitoring of a system.

9.1.2. Access for the installer

The installer account can be created as described in the section Configuration via commissioning wizard on the FENECON homepage. Access is required for successful commissioning.

10. Capacity expansion of the system

The capacity can also be expanded at a later date; there is no time limit here.

The maximum capacity is not reached with additional new battery modules, as new modules are equal to the old modules.

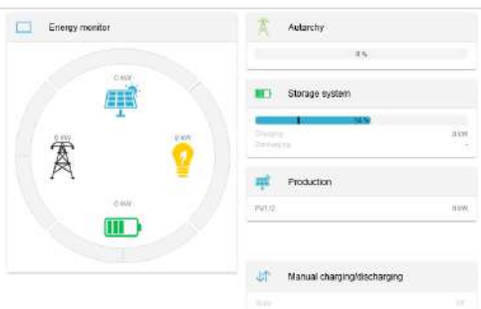
10.1. Capacity expansion of the battery tower by one or more battery modules

The battery tower can be expanded to up to 14 battery modules in one battery tower.

If the electrical energy storage system is expanded with additional battery modules after commissioning, proceed as follows:

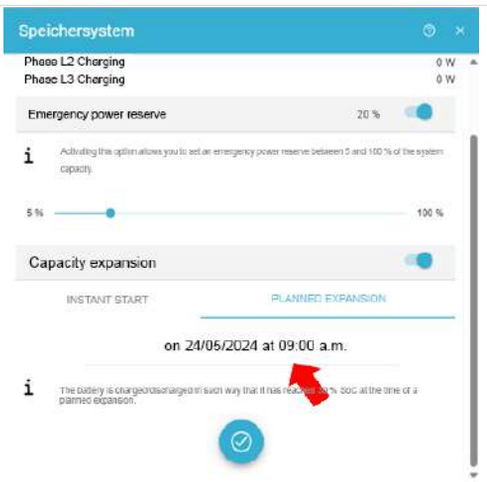
After a capacity expansion, the commissioning wizard must be carried out again.

1. Open the Online Monitoring.
2. In order for the new modules to synchronize faster with the existing modules, an equal state of charge is required (30 % SoC). The electrical energy storage system automatically prepares itself if the state of charge does not have the same SoC.



3. Click on the "Electrical energy storage system" widget in Online Monitoring.

4. Activate the "Capacity expansion" function in Online Monitoring under Electrical energy storage system. The "Capacity expansion" is activated when the blue bar is displayed.
5. You can now choose between "Immediate start" and "Planned extension". With the two options, the battery is charged or discharged to 30 %.
6. When the state of charge is reached, charging/discharging is stopped and the charge level of 30 % is maintained.



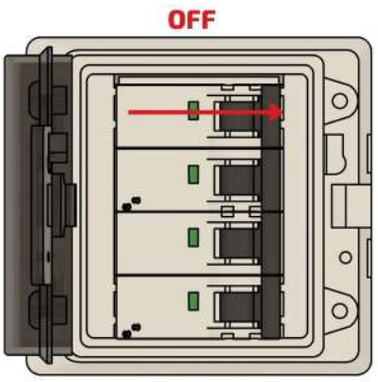
7. If you select "Planned extension", you can specify the planned day and time. In this example, 24.05.2024 and the time of 09:00 were selected. At this time, the battery is expected to be charged or discharged to reach 30 % for the "Planned extension".

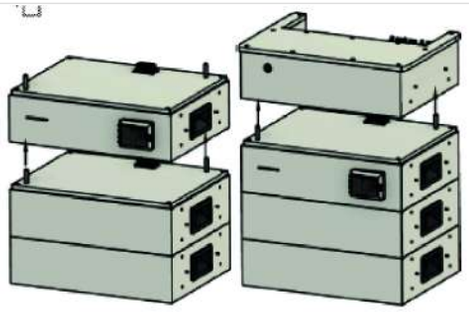
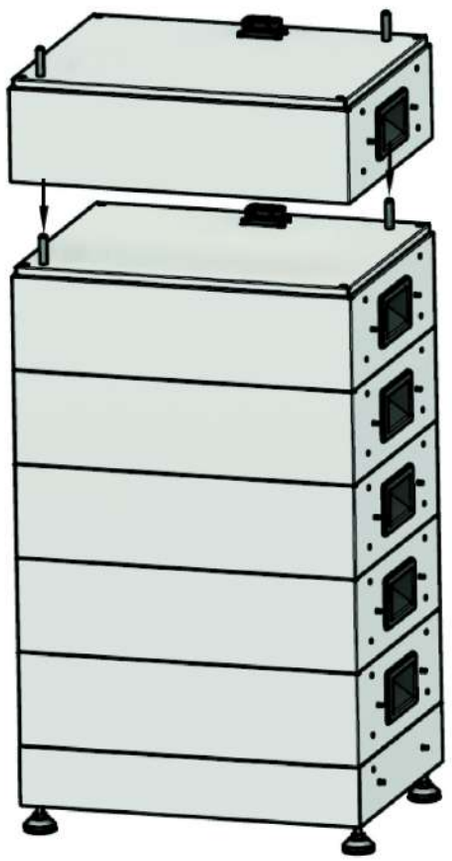
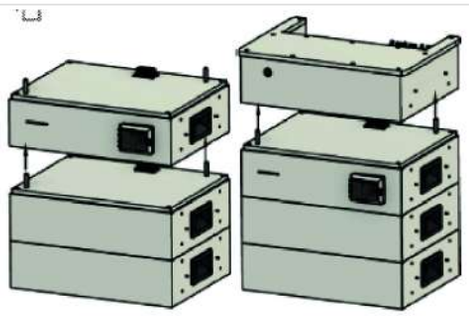
8. You must then confirm your desired settings by clicking on the blue tick. The desired extension will be saved and, depending on the option selected, implemented immediately or later at a specific time.

9. Then run the commissioning wizard again.

The capacity can also be extended at a later date; there is no time limit here. You will not reach the full capacity with the new battery module, as the new module will equalize with the old modules.

If the battery tower is extended by additional battery modules after several weeks or months, the following procedure must be followed:

29-30 % SoC	1. Charge/discharge the system to a charge level of 29-30 %; then switch off.
	2. Switch off the entire system. The exact procedure is described in the section Switching off. Set the battery fuse switch to OFF. DC switch of the inverter to OFF. AC fuse on the grid and emergency power side to OFF.
	3. Remove the top three side panels on each side. 4. Remove the latch up to the first battery module on both sides.

	5. Remove the FEMS box and BMS box and place them on their side. To do this, screw the wall bracket of the BMS box from the wall.
	6. Attach new battery module.
	7. Proceed as described in section [Assembly — Battery tower 1 with FEMS box], step 8. Attach the FENECON BMS box. Attach the FEMS box. Attach the locks. Attach the side covers.

- If the exact voltage value of the old and new battery modules has not been matched, SoC jumps will occur when the battery is charged and discharged. This means that the full capacity is temporarily not available.
- The greater the voltage difference between the "old" and "new" batteries, the longer it can take until there are no more SoC jumps and the full capacity is available.

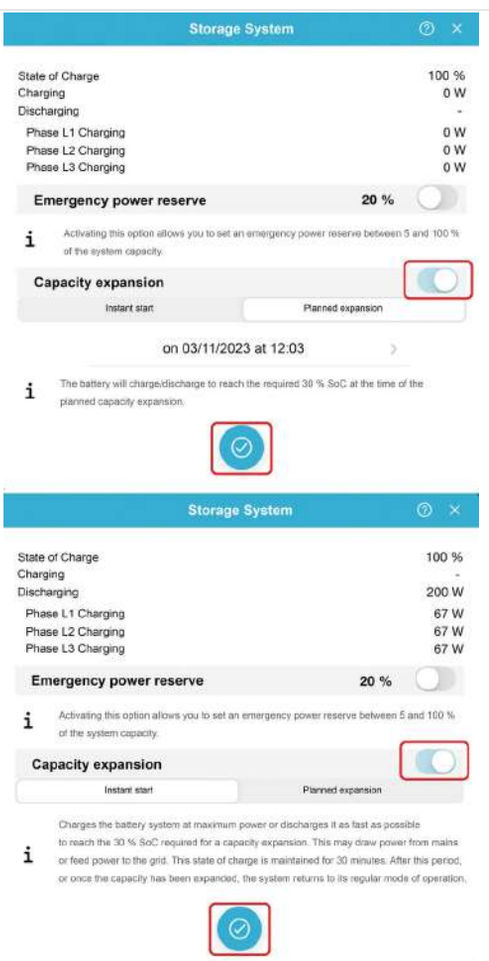
10.2. Capacity expansion of the system by one or more battery towers

The capacity of the system can be subsequently expanded by one or more battery towers with the same capacity. There is no time limit here.

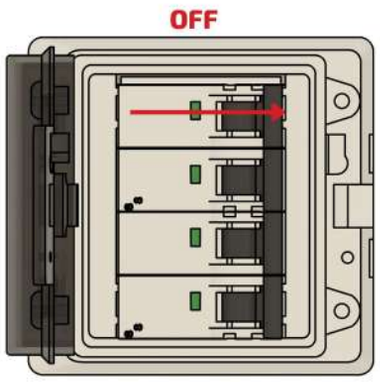
> The maximum expansion of the FENECON Home 6, 10 & 15 system comprises up to 4 battery towers, each with 3 to 14 battery modules and a maximum of 156.8 kWh.

The full capacity is not achieved with new battery modules, as the new modules become similar to the old modules.

Proceed as follows before the extension:



1. Activate the "Capacity expansion" function in Online Monitoring under Electrical energy storage system.
2. The battery is charged/discharged to 30 %. When the state of charge is reached, charging/discharging is stopped and the charge level is maintained.



3. Switch off the entire system. The exact procedure is described in detail in the section Switching off.
   Fuse switch of the battery to OFF.
   AC fuse of the inverter to OFF.

4. Assembly of the new battery towers as described from section Assembly — Battery tower 1 with FEMS box and section Initial commissioning.
5. Everything can then be switched on again as described in the Switching on the system section.

6. Run the commissioning wizard again.

- If the exact voltage value of the old and new battery towers has not been matched, the new batteries will not be connected.
- This is not displayed as an error, but it can happen that the SoC displays of the individual battery towers show different charge levels.
- When the charge levels have equalized after a charging cycle, the last battery towers also switch on.
- The battery towers work independently, so the flashing frequency of the

different towers may vary. The SoC display of the individual towers may also differ briefly.

11. FEMS extensions

For the following FEMS extensions, the integrated relays can be used directly on the (first) battery tower.
Various pins on the Harting plugs are provided for this purpose.

- Harting plug 10-pin: 3 x free relay channels (max.: 230 V; 10 A)
- Harting plug 16-pin: 2 x control contacts (max.: 24 V; 1 A)

  3 x digital input

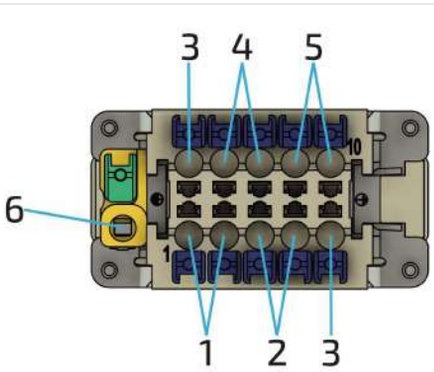
  1 x digital input for § 14a

  1 x analog output (0-10 V)

It may not be possible to connect and operate all apps at the same time.
For more information on the following apps, please visit our homepage.

https://www.fenecon.de/fems-apps/

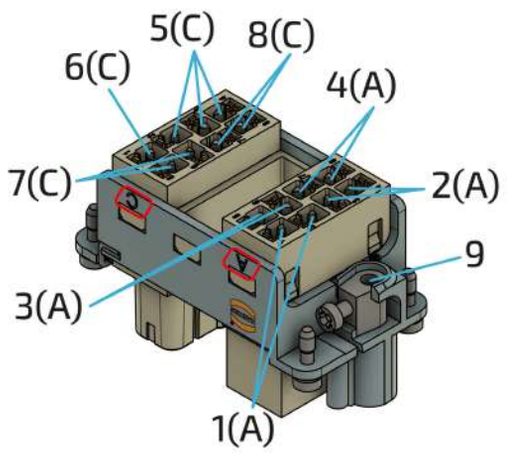
If the integrated relays are not sufficient, an external 8-channel relay board can be connected via Ethernet.



The pin assignment of the Harting plug (10-pin) is shown in detail below.

Item	Description
1	230 V supply for internal components
2	Relay 1 (230 V; 10 A)
3	Relay 2 (230 V; 10 A)
4	Relay 3 (230 V; 10 A)
5	Neutral conductor connection (required for integrated meter)
6	PE connection

Table 46. Connector — Pin assignment — Power connector



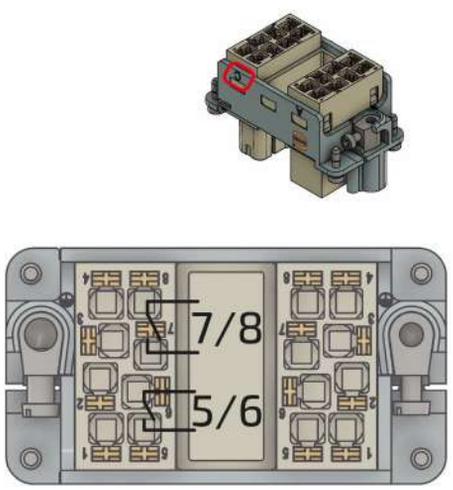
The pin assignment of the Harting plug (16-pin) is shown in detail below.

Item	Description
1	RS485 connection — Inverter
2	RS485 connection — External devices
3	Analog output (0 to 10 V)
4	12 V DC (12 V; GND)
5	3 x digital inputs
6	Digital input for § 14a
7	Relay 5 (24 V; 1 A)
8	Relay 6 (24 V; 1 A)
9	PE connection

Table 47. Connector — Pin assignment: Control connector

11.1. Connection of a heat pump via "SG-Ready"

The integration of an "SG-Ready" (Smart Grid-ready) heat pump is an advanced form of sector coupling of electricity and heat - often also referred to as a "power-to-heat" application. The control system ensures that the heat pump slightly overheats the thermal energy storage system at times when cheap (solar) electricity is available in order to save electrical energy at times when there is no cheap surplus electricity.



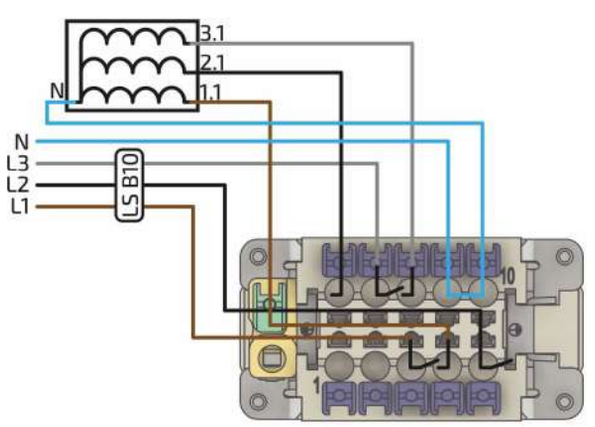
1. The internal relay contacts 5 and 6 can be connected via pins 5/6 and 7/8 on the Harting plug (16-pin — C).
2. For detailed information on connecting the heat pump, please refer to the manufacturer's installation instructions.

After installing the components, the app still needs to be installed.
To do this, proceed as described in the section Activation of the app in the FEMS App Center.

11.2. Connection of a heating element with a maximum of 6 kW

The integration of an electric heating element is the simplest and cheapest form of sector coupling of electricity and heat — often also called a "power-to-heat" application.

If the capacity of the electrical energy storage system is exhausted, self-generated energy must be fed into the public grid with low remuneration. In these cases, it often makes sense to use the surplus current for water heating (e. g. for hot water buffer tanks, pool heating, etc.). This way, other energy sources (e. g. wood or oil) can be saved.



1. So that each phase of the heating element can be controlled separately, each phase must be connected individually to a relay.
2. To do this, connect phase 1 (brown) to pin 3 on the Harting plug (10-pin). Continue from pin 4 to the heating element. Use pins 5/6 and 7/8 for phase 2 (black) and phase 3 (gray).
3. Loop through the neutral conductor N via pin 9/10.
4. A cable (5G1.5) from the sub-distribution board to the Harting plug and a cable (5G1.5) from the Harting plug to the heating element are recommended.
5. For detailed information on connecting the heating element, please refer to the manufacturer's installation instructions.

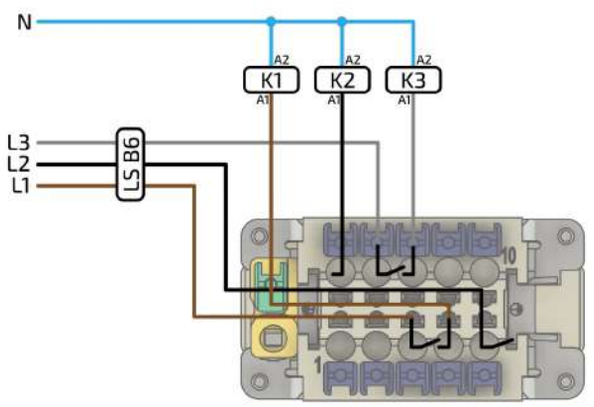
Ensure that three different phases are used. If only one phase is used, damage may occur.

After installing the components, the app still needs to be installed.
To do this, proceed as described in the section Activation of the app in the FEMS App Center.

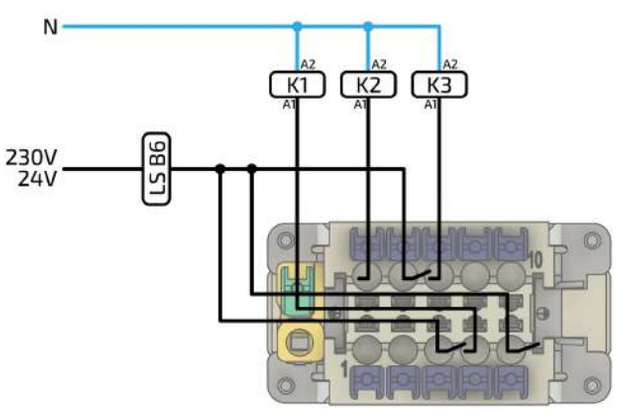
Manual mode is only suitable for temporary operation. For permanent operation, the external relay control must be used.

11.3. Control of a heating element greater than 6 kW (control via external relay)

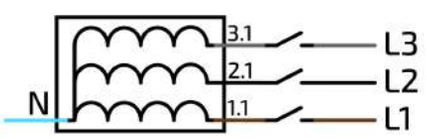
The externally installed relays must be laid out according to the power of the installed heating element.



1. So that each phase of the heating element can be controlled separately, each phase must be connected individually to the internal relay via an additional external relay.
2. Connect L1 to pin 3 via a MCB B6 fused. Route phase L1 from pin 4 to the external relay and connect to A1. A2 must be connected to neutral.
3. Proceed in the same way as step 2 with the other two phases. Connect K2 and K3 via pins 5/6 and 7/8.



4. As an alternative to L2/L3, L1 can of course also be looped through, or:
5. Alternatively, control the contactors/relays with 24 V. If another voltage source is used, do not connect A2 to N.



6. The power supply of the heating element must then be connected to the switching contacts of the relays.
7. For detailed information on connecting the heating element, please refer to the manufacturer's installation instructions.

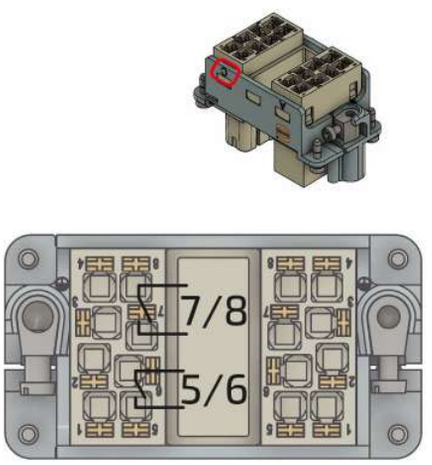
After installing the components, the app still needs to be installed.
To do this, proceed as described in the section Activation of the app in the FEMS App Center.

11.4. Controlling a CHP unit

The integration of a combined heat and power plant (CHP) into electrical energy management is an advanced form of sector coupling of electricity and heat.

This allows using the CHP as an electrical generator that is independent of the time of day and weather conditions. When the state of charge of the electrical energy storage system is low, the CHP is given a switch-on signal to produce electricity. This is useful, for example, if the battery capacity is not sufficient to cover electricity consumption at night. This avoids the need to purchase expensive current from the grid.

When the battery is charging, this signal is stopped again to prevent the CHP's current from being fed into the grid unnecessarily.

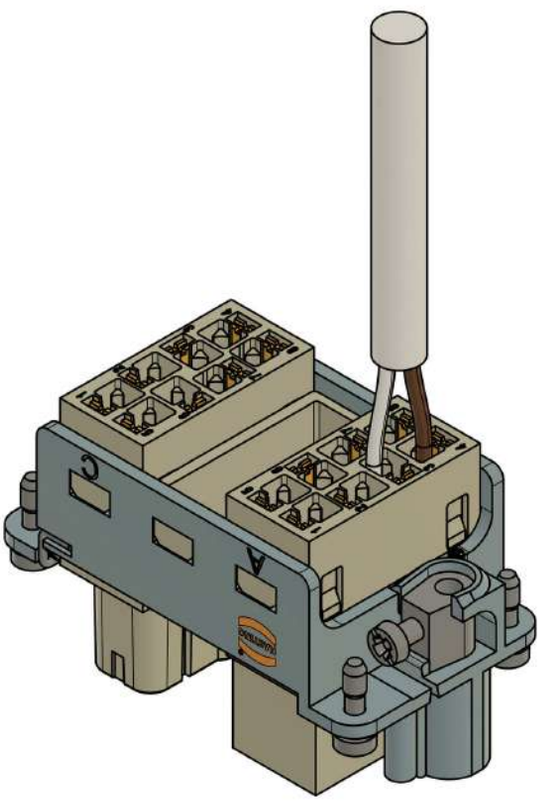


1. The enable signal for starting the CHP can be connected to pins 5/6 via the Harting plug (16-pin — C).
2. For detailed information on connecting the CHP, please refer to the manufacturer's installation instructions.

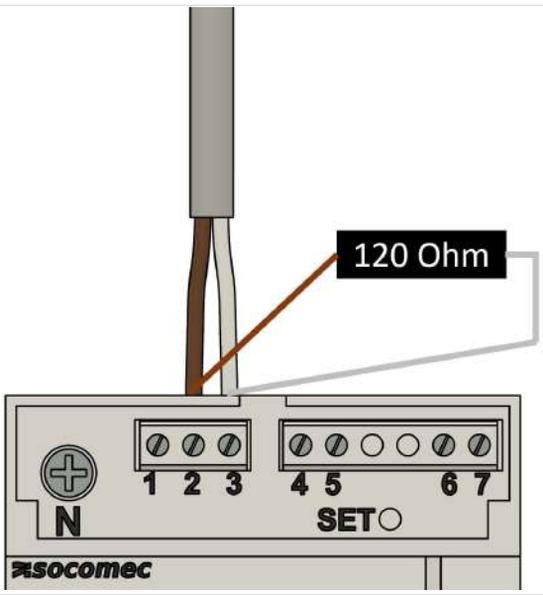
After installing the components, the app still needs to be installed.
To do this, proceed as described in the section Activation of the app in the FEMS App Center.

11.5. Additional AC meter

- If additional meters have been installed for monitoring other consumer loads or generators, these must be integrated into the circuit in accordance with the manufacturer's instructions.
- The communicative integration is shown below using a 3-phase sensor without a current transformer as an example.
- Only meters approved by FENECON can be integrated.
- The first production meter is always integrated with Modbus ID 6. All others in ascending order. The baud rate is 9600.

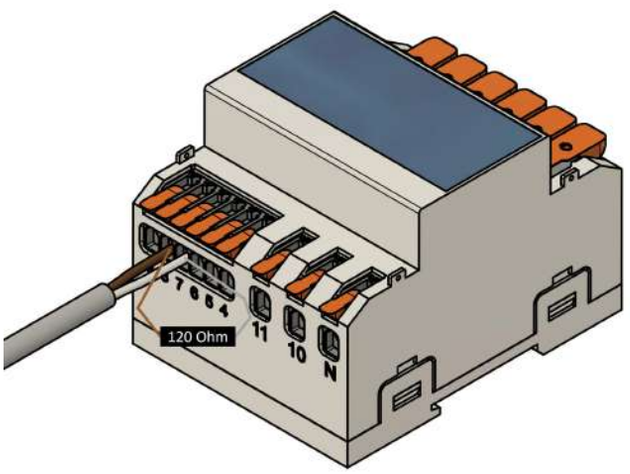


1. Connect the cores to pin 3/4 on the Harting plug (16-pin — A).
2. Connect the white core (alternative color possible) to terminal 3.
3. Connect the brown core (alternative color possible) to terminal 4.



For example SOCOMEC E24

4. The brown wire (alternative color possible) is connected to the meter at connection point 2 and the white core (alternative color possible) is then connected to 3.
5. A terminal resistor with 120 Ω must be installed between (+) and (-) (A/B) on the last bus device.



For example KDK 4PU

6. The brown wire (alternative color possible) is connected to the meter at connection point 8 and the white core (alternative color possible) is then connected to 7.
7. A terminal resistor with 120 Ω must be installed between (+) and (-) (A/B) on the last bus device.

If several meters are to be installed, they can be connected in series for communication purposes. For this purpose, the first meter can be bridged to the second, etc. The Modbus address must be set in ascending order.
Link to the overview page of the installation and configuration instructions for energy meters

Once the components have been installed, the app still needs to be installed.

- To do this, proceed as described in the section Activation of the app in the FEMS App Center.

11.6. Activation of the app in the FEMS App Center

After installing the hardware FEMS App extension, it still needs to be activated in the App Center. To do this, proceed as follows:

	1. https://portal.fenecon.de
	2. Log in with your installer account.

First check whether updates are available for the FEMS.

12. Updating the FEMS

To be able to use all FEMS Apps extensively and in the latest version, carry out a system update to the latest version.

1. Open the ☰ burger menu at the top left of FENECON Online Monitoring.

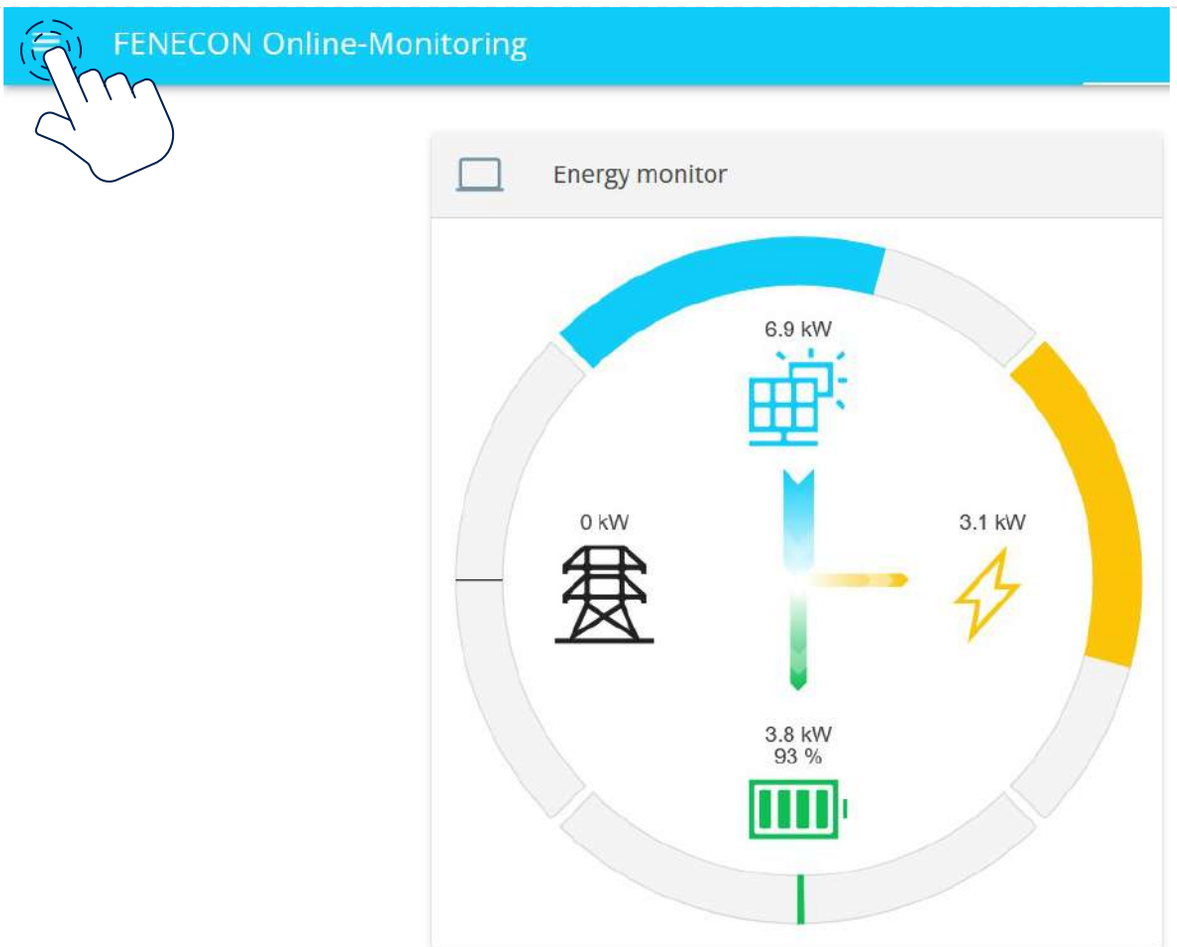


Illustration 32. Burger to side menu — System update — Step 1

2. Select *Settings*.

Illustration 33. Side menu — System update — Step 2

3. Select *FEMS System*.

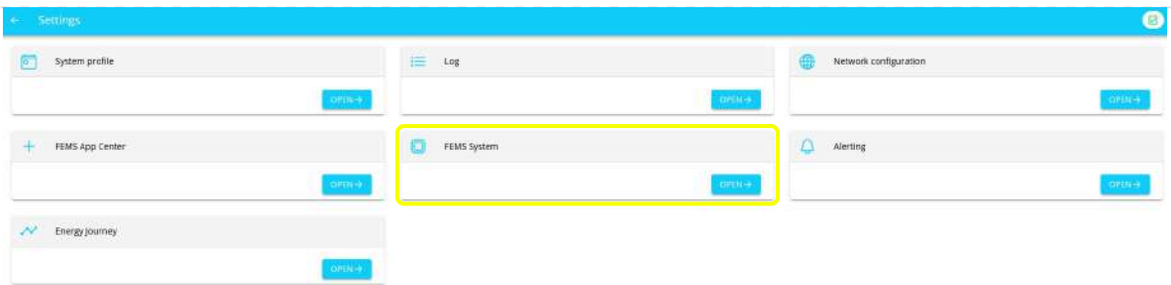


Illustration 34. App Center — System update — Step 3

4. Click on *INSTALL LATEST VERSION* to update the system. If the latest version is already installed, you do not need to do anything else.

Illustration 35. App Center — System update — Step 4

To return to the settings menu after the FEMS system update:
Click on the arrow ← at the top left. This applies to all submenus in the **Settings** area.

Illustration 36. Back to the Settings menu

13. Starting point: FEMS App Center

1. After you have performed a system update, open the *FEMS App Center*.
   a. Alternatively, go to the *FEMS App Center* via the ☰ top left burger menu in the FENECON Monitoring.

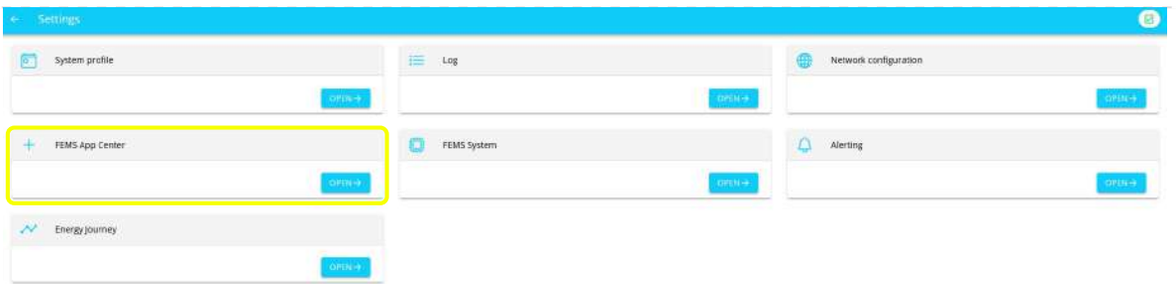


Illustration 37. App Center — Step 1

2. You are now in the App Center. From here you can redeem and register licence keys for apps, install new apps and edit or subsequently configure apps that are already installed.

Illustration 38. App Center — Step 2

13.1. Installation of further FEMS Apps

The following instructions show an example of how to install an FEMS App PV inverter.

There are two ways to install an FEMS App via the App Center.

13.1.1. Installation after redeeming a licence key

After a licence key has been redeemed, a selection of available apps that can be installed is displayed.

The App Center offers a search bar and a filter option to get to the desired app more quickly:

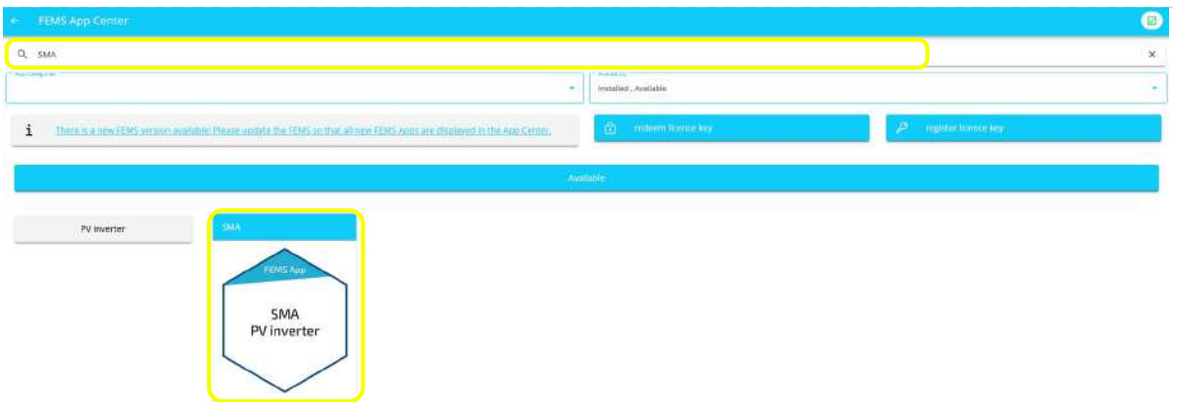


Illustration 39. Search for a specific app in the App Center

In the example, the **FEMS App SMA PV Inverter** was searched for. This app is selected by clicking or tapping on the tile.

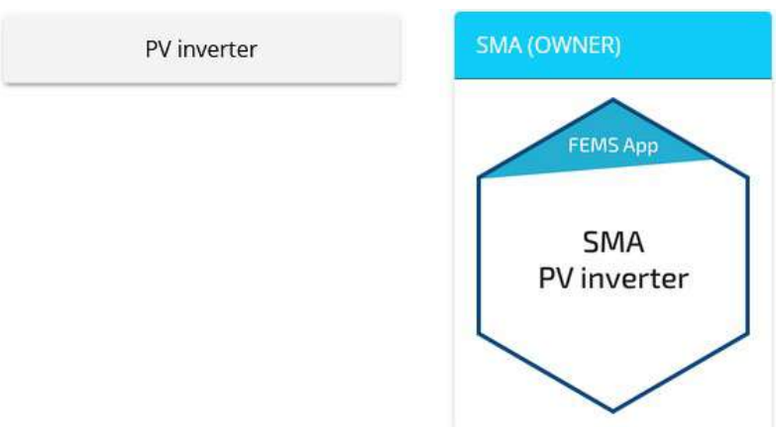


Illustration 40. App installation — Variant 1 — Step 1

You will then be taken to the app overview:

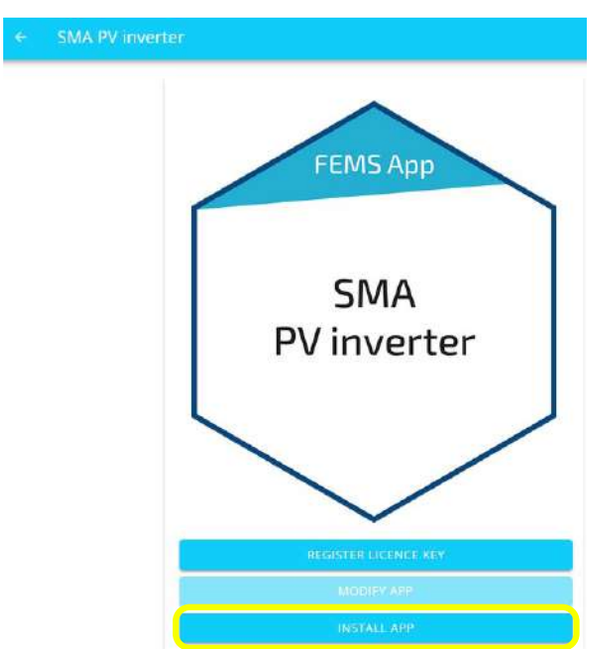


Illustration 41. App installation — Variant 1 — Step 2

Select the *INSTALL APP* button.

You will then be taken to the installation wizard for the respective app:

Illustration 42. App installation — Variant 1 — Step 3

Some of the input fields are pre-filled. Nevertheless, enter your data if it differs from the default values (e. g. IP address). Otherwise, the default values can be retained (e. g. port, Modbus unit ID).

Mandatory fields are marked with (*)

Check your entries and make sure that they are correct. Otherwise the respective app will not work properly!

Select the *INSTALL APP* button again.

Once the installation process has been successfully completed, the new app will appear in the App Center overview in the **Installed** category.

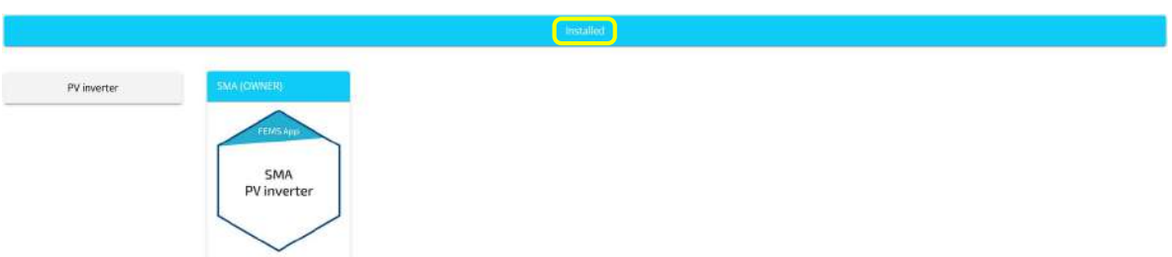


Illustration 43. App installation — Variant 1 — Step 4

13.1.2. Direct installation

You can also install an app directly. To do this, go to the App Center overview and search for the desired app.

Only apps from the "Available" category can be installed.

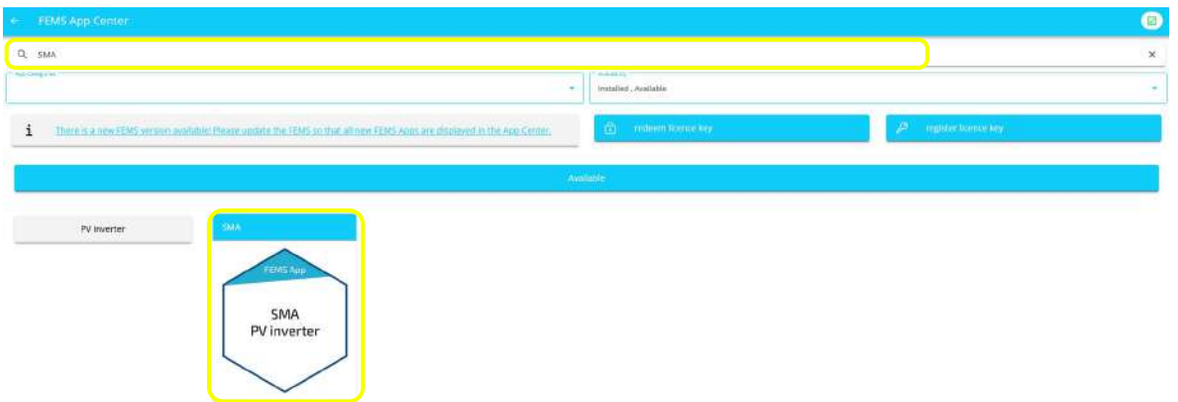


Illustration 44. Search for a specific app in the App Center

In the example, the **FEMS App SMA PV Inverter** was searched for. This app is selected by clicking or tapping on the tile.

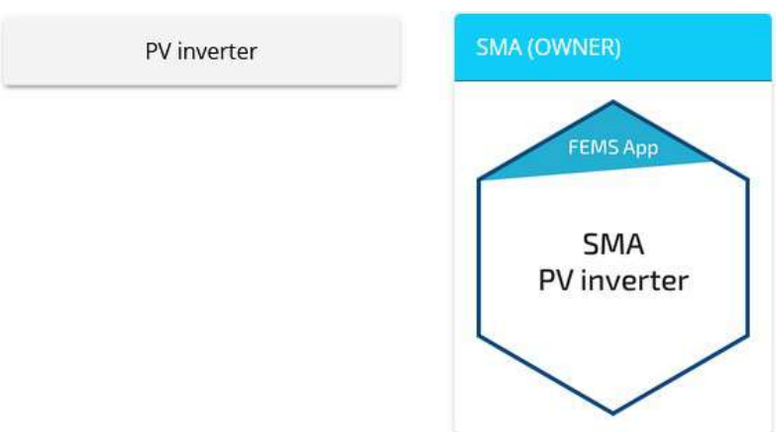


Illustration 45. App installation — Variant 2 — Step 1

You will then be taken to the individual view of the app:

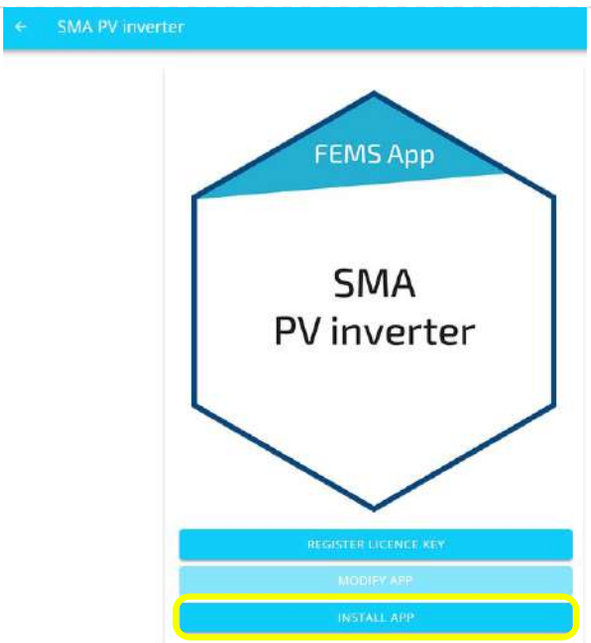


Illustration 46. App installation — Variant 2 — Step 2

Select the *INSTALL APP* button.

An input mask for redeeming a licence key appears:

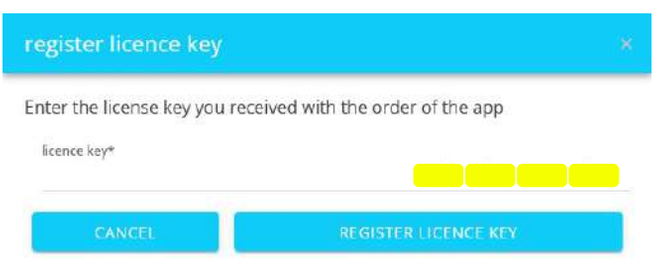


Illustration 47. App installation — Variant 2 — Step 3

You have two options here:

Redeem a new licence key directly

If you have not yet registered a licence key or wish to redeem a new licence key, enter the 16-digit key in the corresponding field and then click on *VALIDATE LICENCE KEY*.

The entered licence key is then checked for validity.

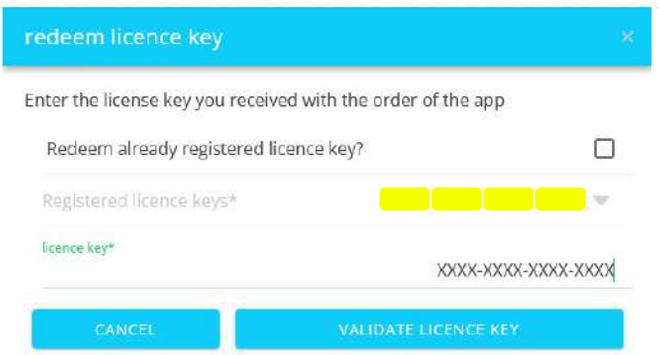


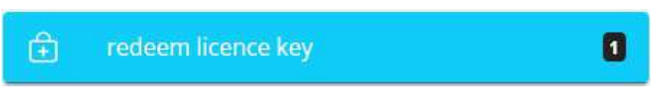
Illustration 48. Redeem new licence key directly

If the licence key is valid, it can be registered by clicking on the button of the same name. *REDEEM LICENCE KEY*

If the licence key is invalid, please check your entry and try again.

Redeem an already registered licence key

In this case, the button in the App Center looks like this:



If you want to redeem an already registered licence key, check the corresponding box ☑ and select the appropriate, already registered licence key via ▾ drop-down menu.

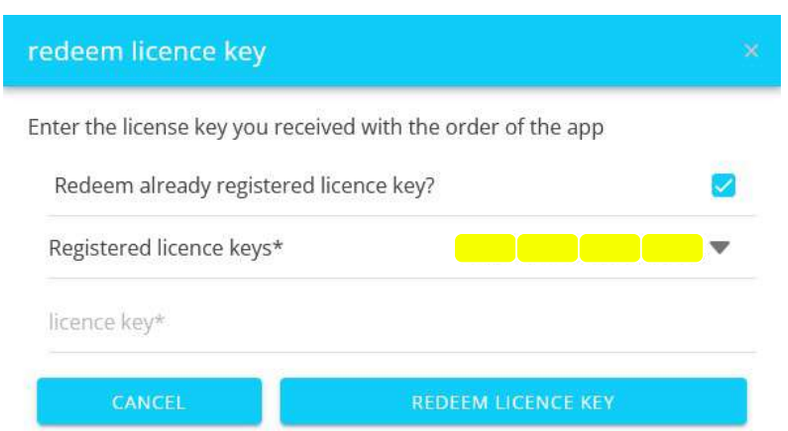


Illustration 49. Redeem already registered licence key

Then click on the *REDEEM LICENCE KEY* button.

You will then be taken to the installation wizard for the respective app.

Illustration 50. App installation — Variant 2 — Step 4

Some of the input fields are pre-filled. Nevertheless, enter your data if it differs from the default values (e. g. IP address). Otherwise, the default values can be retained (e. g. port, Modbus unit ID).

Mandatory fields are marked with (*)

Check your entries and make sure that they are correct. Otherwise the respective app will not work properly!

Select the *INSTALL APP* button again.

Once the installation process is complete, the new app will appear in the App Center overview in the **Installed** category.

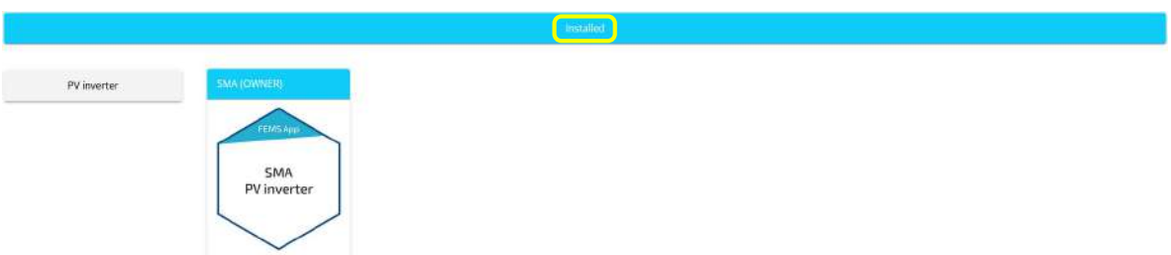


Illustration 51. App installation — Variant 2 — Step 5

14. External control of the inverter

There are various ways to override the inverter from external devices.

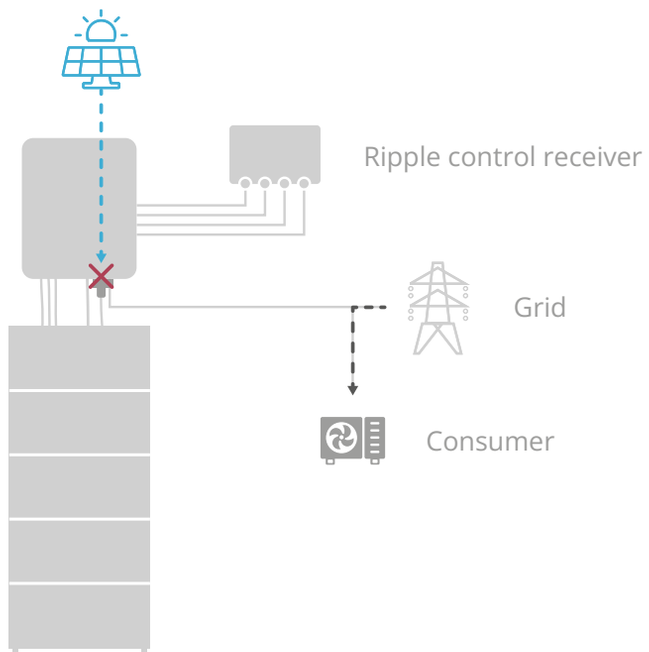
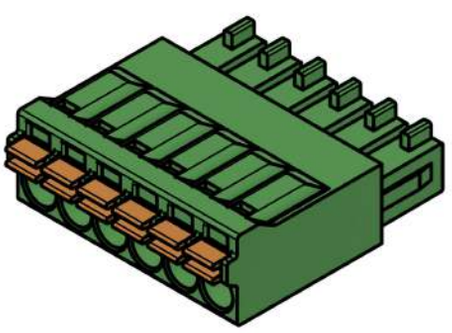


Illustration 52. Connection — Curtailment via ripple control receiver

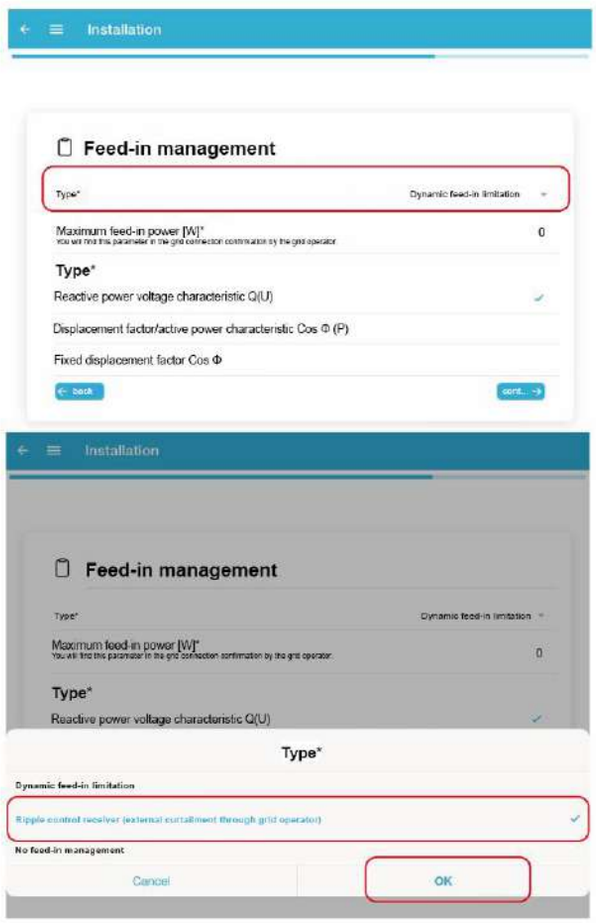
14.1. Ripple control receiver at the AC output

The inverter can be controlled directly via a ripple control receiver. The following plugs supplied with the inverter are required for this.



1. The inverter's small parts box contains several plugs that can be connected to the underside of the inverter.
2. Two 6-pin plugs are required for the ripple control receiver to function.
3. The plugs are numbered consecutively.

14.1. Ripple control receiver at the AC output



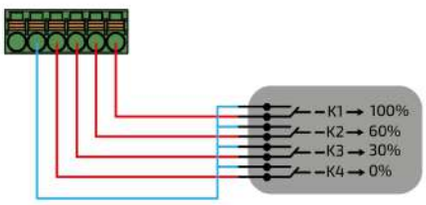
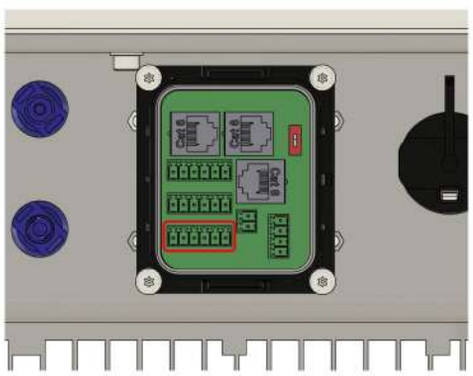
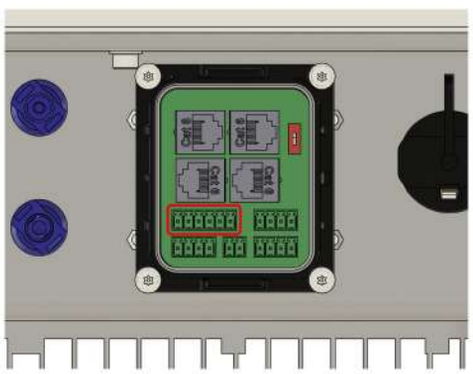
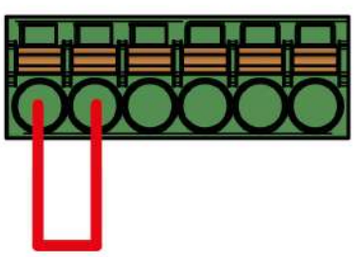
4. In order for the functions to be activated, the ripple control receiver must be activated during commissioning.
5. Then confirm with OK.

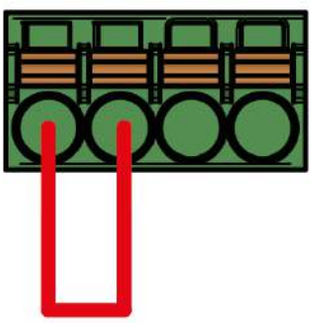
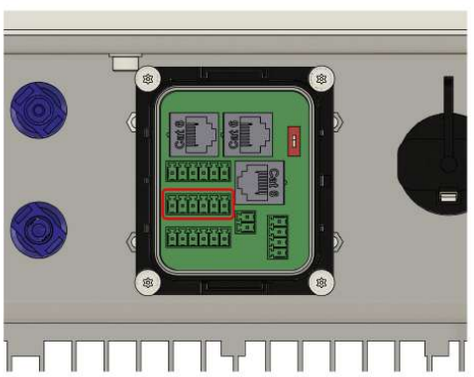
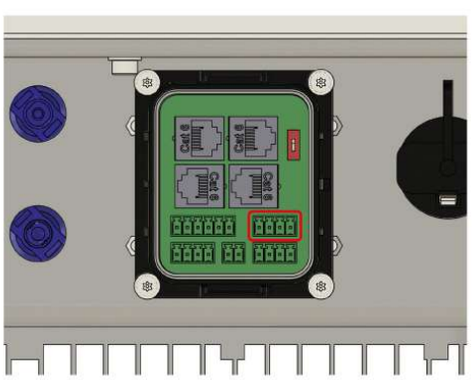
The active power of the inverter can be controlled directly by the grid operator via a ripple control receiver.
The behavior of the inverter in the various control stages is described as follows:

- 100 % Standard signal, inverter works without restrictions.
- 60 % Inverter output power is reduced to 60 %.
- 30 % Inverter output power is reduced to 30 %.
- 0 % Inverter output power is reduced to 0 %.

If other inverters are used, these must also be connected separately to the RCR; how exactly depends on the grid operator and the RCR used.

In the event of a curtailment to 0 %, the grid feed-in of the inverter is stopped completely, i.e. the consumer loads are supplied completely from the grid. Only the battery continues to be charged.

	1. A cable with at least 5 cores with a cross-section of 0.34 mm^2 to 0.75 mm^2 is recommended. 2. Feed the cable through one of the holes of the multi-hole seal. 3. *Caution:* One feedthrough is already blocked by the communication cable between the inverter and EMS. 4. Leave the other openings of the multi-hole seal closed.
	5. Connect the cores of the control cable as shown in the picture. 6. A core with a cross-section of 0.34 mm^2 to 0.75 mm^2 is recommended.
	*Variant A* 7. A) Plug in the 6-pin connector.
	*Variant B* 7. B) Plug in the 6-pin connector.
	*Variant A* 8. A) In order for the inverter to synchronize to the grid, a jumper must be inserted between pin 1 and pin 2 of the second 6-pin connector. 9. A) A core with a cross-section of 0.34 mm^2 to 0.75 mm^2 is recommended.

	*Variant B* 8. B) In order for the inverter to synchronize to the grid, a jumper must be inserted between pin 1 and pin 2 of the 4-pin connector. 9. B) A core with a cross-section of 0.34 mm^2 to 0.75 mm^2 is recommended.
	*Variant A* 10. A) Connect the plug with the jumper to the underside of the inverter.
	*Variant B* 10. B) Connect the plug with the jumper to the underside of the inverter.
	11. Attach the cover to the inverter and tighten the bolt connection.

14.2. Ripple control receiver on grid connection point

The system can be controlled directly via the ripple control receiver (RCR).

Observe the specifications of your grid operator when connecting the external radio ripple control receiver.

If other inverters are used, these must also be connected separately to the RCR; how exactly depends on the grid operator and the RCR used.

The behavior of the inverter in the various control stages can be described as follows:

- 100 % standard signal, inverter works without restrictions (6/10/15 kW).
- 60 % Feed-in power at the grid connection point is reduced to 60 % (3.6/6/9 kW).
- 30 % Feed-in power at the grid connection point is reduced to 30 % (1.8/3/4.5 kW).
- 0 % Feed-in power at the grid connection point is reduced to 0 % (0/0/0 kW).

When connecting to the FEMS box, the following contacts must be connected in the Harting connector:

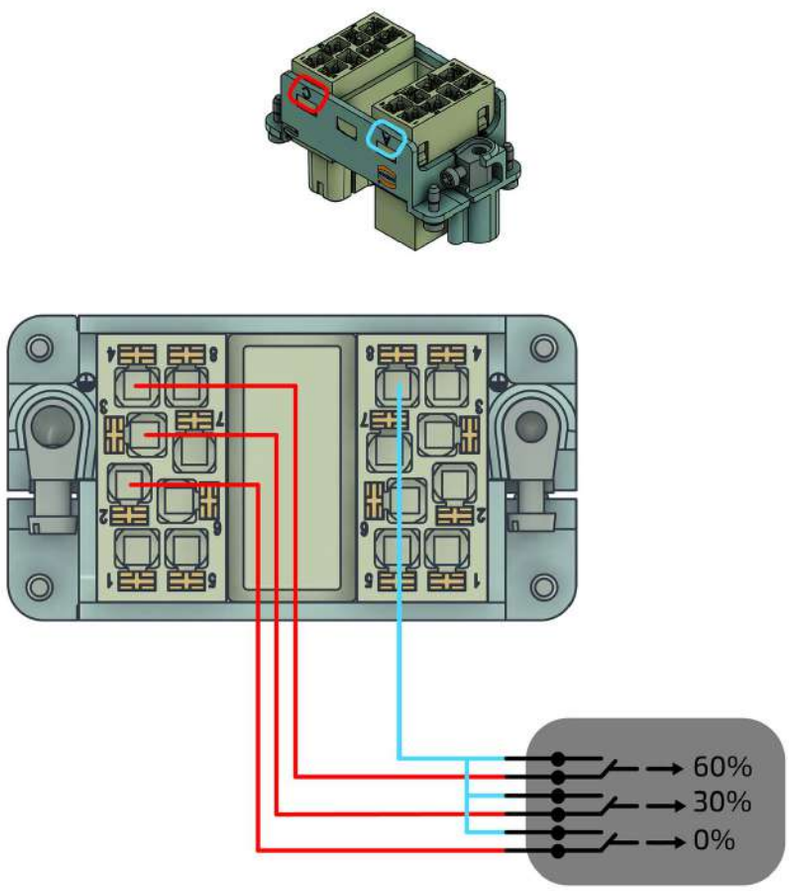
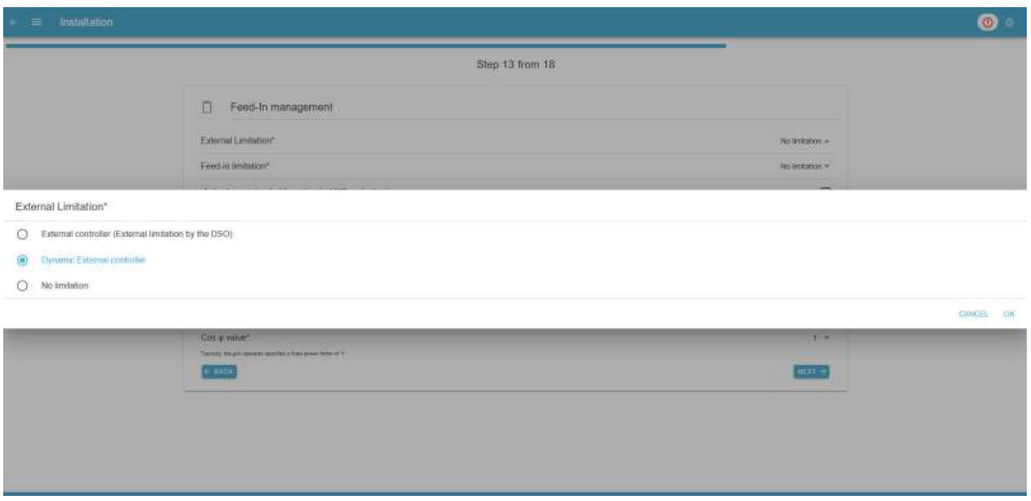


Illustration 53. Connection — Ripple control receiver to GCP — Home 6, 10 & 15

During commissioning, the **dynamic ripple control receiver** must be selected under *External limitations*:



The ripple control receiver now regulates the grid limitation to the grid connection point and no longer to the AC output. This means that it is also possible to charge the battery and supply the consumer loads with PV production in the event of grid limitation.

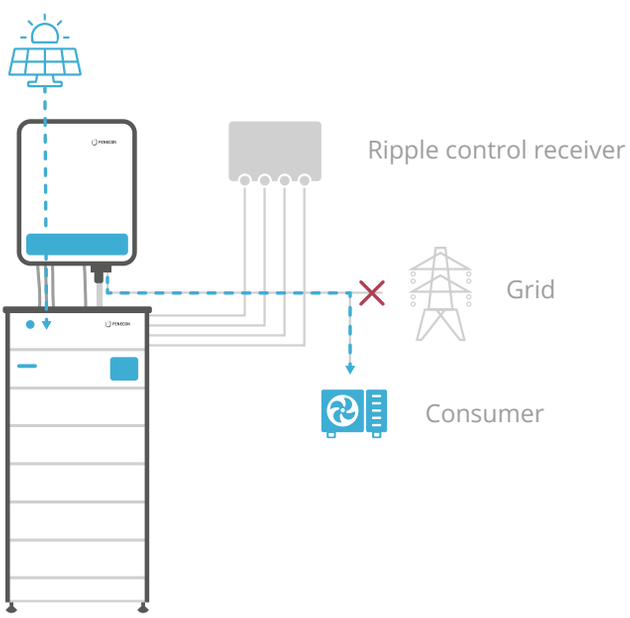
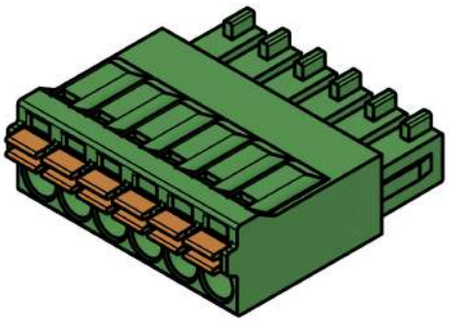


Illustration 54. Connection — Curtailment via ripple control receiver

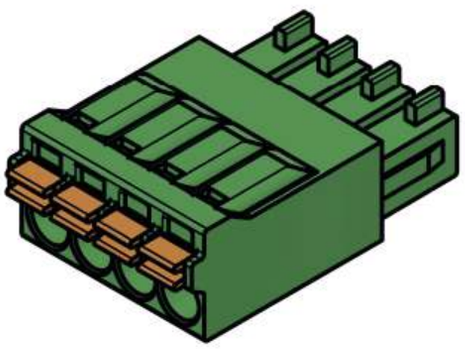
14.3. Remote shutdown

The inverter can be disconnected from the grid when remote disconnection is activated, e. g. via a central grid and plant protection. One of the following plugs supplied with the inverter is required for this.



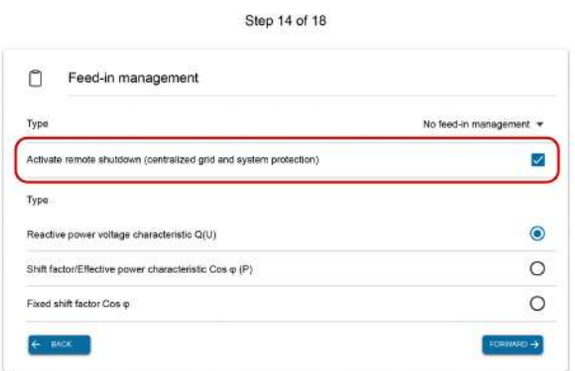
Variant A

1. A) The small parts box of the inverter is supplied with plugs that can be connected to the underside of the inverter.
   A 6-pin plug is required for Variant A.



Variant B

1. B) The small parts box of the inverter is supplied with plugs that can be connected to the underside of the inverter.
   A 4-pin plug is required for Variant B.

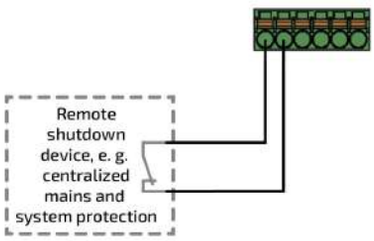


2. In order for the functions to be activated, the remote switch-off must be activated during commissioning.
3. Then confirm with *OK*.
4. Continue to the next step with *Next*.

The emergency power output is still active (if activated) and supplies the emergency power to the consumer loads.

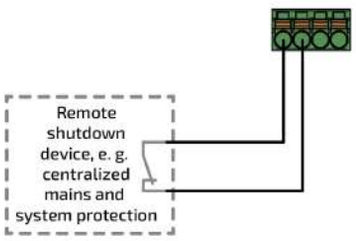
1. A cable with 2 cores and a cross-section of 0.34 mm^2 to 0.75 mm^2 is recommended.
2. Feed the cable through one of the holes in the multi-hole seal of the cover.
3. Attention: One feedthrough is already blocked by the communication cable between the inverter and EMS.
4. Leave the other openings of the multi-hole seal closed.

14.3. Remote shutdown



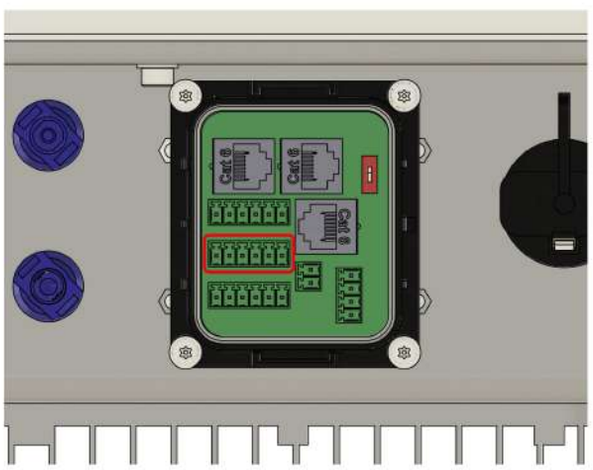
Variant A

5. A) To disconnect the inverter from the grid, the core from the disconnection device must be connected to pin 1 and pin 2.
6. A) The switch-off device must be equipped with a break contact
   In normal operation, pins 1 and 2 must be bridged via the switch-off device.



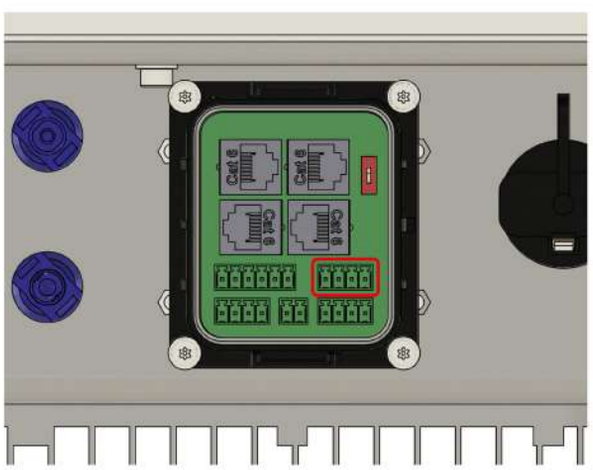
Variant B

5. B) To disconnect the inverter from the grid, the core from the disconnection device must be connected to pin 1 and pin 2.
6. B) The switch-off device must be equipped with a break contact
   In normal operation, pins 1 and 2 must be bridged via the switch-off device.



Variant A

7. A) Plug in the 6-pin connector on the underside of the inverter.



Variant B

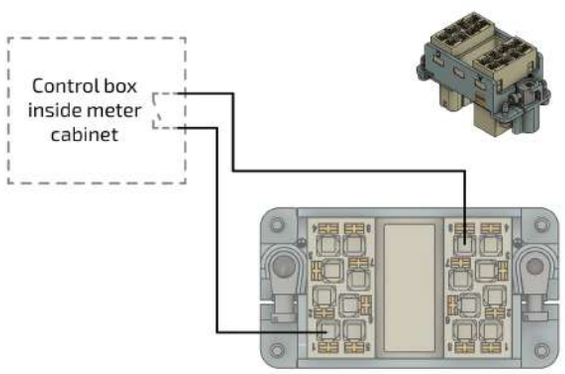
7. B) Connect the 4-pin plug to the underside of the inverter.

8. Attach the cover to the inverter and tighten the bolt connection.

This method can also be used to connect *P,ave monitoring*.

14.4. Section 14a of the Energy Industry Act (EnWG)

The inverter can be limited to a maximum reference power of 4.2 kW. The digital input of the EMS must be assigned for this.



1. The signal can be connected to pins 1 (C) and 8 (A) via the Harting plug (16-pin — A & C).
2. For detailed information on connecting the FNN control box, please refer to the manufacturer's installation instructions.

15. Troubleshooting

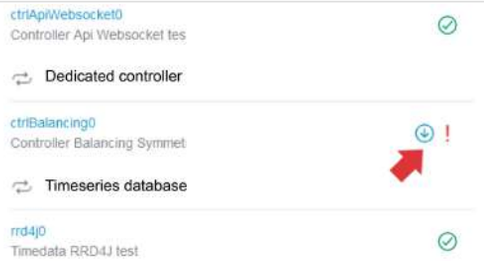
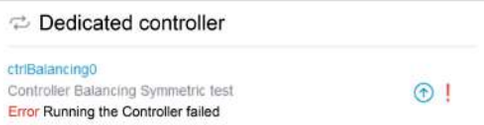
15.1. Errors in Online Monitoring

The system status can be checked after logging in at the top right using the color of the icon. A green tick indicates that everything is OK, an orange exclamation mark indicates a warning (*Warning*) and a red exclamation mark indicates an error (*Fault*).

15.1.1. Fault display

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

15.1.2. Troubleshooting

	You can get a detailed overview of an existing warning or error by clicking on the exclamation mark in the top right-hand corner.
	The scroll bar can be used 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 grid meter was intentionally entered for test purposes, which is why the controller execution fails.

	Under certain circumstances, it may happen that the FEMS is not accessible and the error message opposite appears.

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

15.2. FENECON Home 6, 10 & 15 inverter

15.2.1. Fault display

Faults are indicated by a red LED next to "SYSTEM".

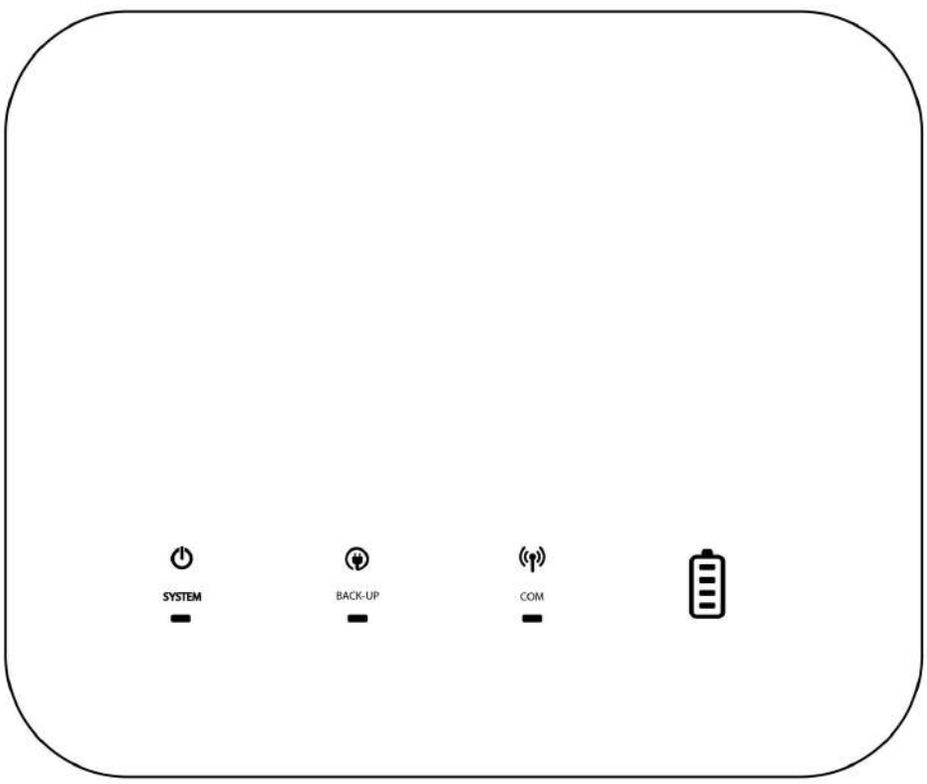


Illustration 55. Fault display on the FENECON Home 6, 10 & 15 inverter

Rotary field of the grid connection

- Check whether a clockwise rotating field is present at the grid connection.
- Otherwise, contact the FENECON Service. The contact details can be found in the Service section. The LEDs display further information on the status of the inverter.

Display	Status	Description
		The inverter is switched on and in standby mode.
		The inverter is starting and is in self-test mode.
		The inverter is running normally in grid-parallel or stand-alone mode.
		Overloading of the RESERVE output.
		An error has occurred.
		The inverter is switched off.
		The grid is abnormal and the inverter is in stand-alone mode.
		The grid is normal and the inverter is in parallel mains operation.
		RESERVE is switched off.
		The inverter is not connected to the internet. Communication takes place via the EMS box. Therefore, there is no LED indication here.

Table 48. LED status displays — Inverter

15.3. Battery tower

15.3.1. Fault display

Faults are displayed on the BMS box via a red LED.

The various errors are indicated by LED codes.

System status	System information	LEDs					
		blue/red		1	2	3	4
Bootloader		★		★	★	★	★
Start	Master/Slave	●		★	★	★	★
	Parallel Box	●					★
	Extension Box	●				★	
Check mode	Individual or parallel connection	★					
				SoC display			
Charging	0 % to 25.0 % SoC	●		■			
	25.1 % to 50.0 % SoC	●		■	■		
	50.1 % to 75.0 % SoC	●		■	■	■	
	75.1 % to 99.9 % SoC	●		■	■	■	■
	100 % SoC	●		●	●	●	●
Discharging and standby	100 % to 75.1 %	●		●	●	●	●
	75.0 % to 50.1 %	●		●	●	●	
	50.0 % to 25.1 %	●		●	●		
	25.0 % to 0 %	●		●			
Error	Overvoltage	●					●
	Undervoltage	●				●	
	Overtemperature	●				●	●
	Undertemperature	●			●		
	Overcurrent	●			●		
	SoH too low	●			●	●	
	Int. communication	●			●	●	●
	Ext. communication	●		●			
	Parallel address error	●		●			●
	Module address error	●		●		●	
	BMS box fuse	●		●		●	●
	Module fuse	●		●	●		
	Contact error	●		●	●		●
	Insulation error	●		●	●	●	
	BMS error	●		●	●	●	●

●	Blue permanently on
■	Blinking blue
★	Blue flashing quickly
●	Red permanently on

15.3.2. Troubleshooting

If faults cannot be rectified or in the event of faults that are not included in the fault list, contact FENECON Service. Cf. Service.

15.4. Fault list

Component	Error/fault	Measure
Battery module	The battery module has become wet	Do not touch Contact FENECON Service immediately for technical support
Battery module	The battery module is damaged	A damaged battery module is dangerous and must be handled with the utmost care. Damaged battery modules must no longer be used. If you suspect that the battery module is damaged, stop operation and contact FENECON Service

Table 49. Troubleshooting

15.5. Service

If the system malfunctions, contact the FENECON Service:

Phone: +49 (0) 9903 6280-0

E-mail: service@fenecon.de

Our service hours:
Mon.-Thurs. 08:00 to 12:00 | 13:00 to 17:00
Fri. 08:00 to 12:00 | 13:00 to 15:00

16. Technical maintenance

16.1. Tests and inspections

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.

Inspection work must only be carried out by trained and qualified specialists.

The maintenance instructions of the component manufacturer must be observed for all individual components.

Check the product and the cables regularly for visible external damage. In the event of defective components, contact FENECON Service. Repairs must only be carried out by a qualified electrician.

16.2. Cleaning

Cleaning agents: The use of cleaning agents can damage the electrical energy storage unit and its parts.
It is recommended that the electrical energy storage unit and all its parts are only cleaned with a cloth moistened with clean water.

The entire product must be cleaned regularly. Only appropriate cleaning agents must be used for this purpose.
The cleaning agents must be free of chlorine, bromine, iodine or their salts. Steel wool, spatulas and the like must not be used for cleaning under any circumstances. The use of unsuitable cleaning agents can lead to external corrosion.

16.3. Maintenance work

No regular maintenance work needs to be carried out on the system. Nevertheless, check the status of your electrical energy storage system regularly.

Regular re-referencing of the electrical energy storage system is recommended, i.e. it must be completely discharged (SoC = 0 %) and then fully charged again (SoC = 100 %), as otherwise capacity may be lost.

16.4. Repairs

In the event of defective components, contact FENECON Service.

16.5. Warranty cases

Warranty claims must be reported to FENECON in text form (e. g. by e-mail) within the warranty period. The notification must be made within a cut-off period of 8 weeks after the end customer has become aware of the warranty claim or could have become aware of it without gross negligence.

17. Advice for fire departments when dealing with FENECON Home & Commercial systems

The FENECON Home and Commercial systems operate in the low-voltage range, which means that they are operated with voltages of less than 1,500 volts direct current (DC) and less than 1,000 volts alternating current (AC).

It may be useful to install an additional switch that disconnects the building from the emergency power supply. This makes it easier for the fire department to act safely and quickly in an emergency.

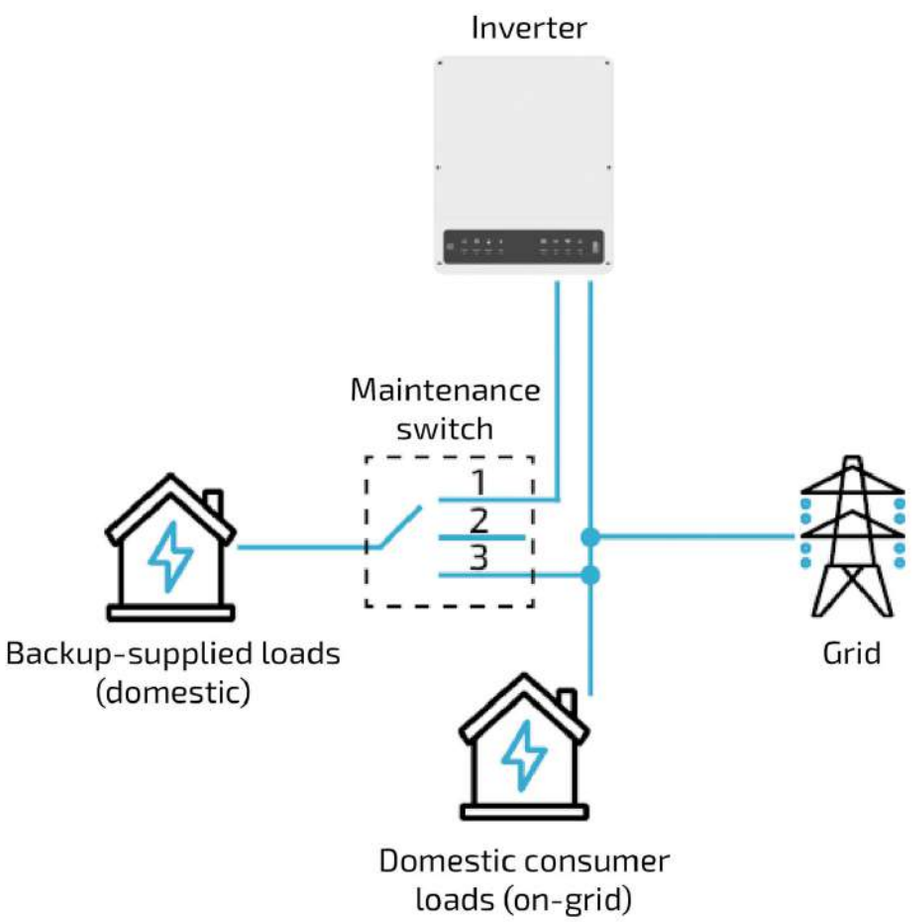


Illustration 56. Installation — Maintenance switch using the example of Home 20/30

For a precise procedure for emergency services, it is recommended to ask the relevant fire academies and request the corresponding information sheets and pocket cards for battery energy storage systems.

18. Flood safety measures FENECON Home & Commercial

First steps after the water has receded

Even if your battery energy storage system looks undamaged on the outside:

- Do not put the system back into operation yourself.
- Ventilate the room well before entering (open windows from the outside if possible).
- Avoid sparks (no smoking, no lighters).

Why a review is important:

Even though LFP batteries are very safe, water or moisture can:

- Cause short circuits in the electronics.
- Trigger corrosion of electrical connections.
- Create isolation problems that only become apparent later.

These problems do not have to occur immediately, but can develop over weeks.

Commission a professional inspection

Please contact:

- Your installer or a qualified electrician with experience in battery energy storage systems.
- FENECON, the manufacturer of your system.
- Your insurance company — document the damage with photos.

The qualified specialist will check:

- Whether water has entered the system.
- Whether electronic components have been damaged.
- Whether a recommissioning is safely possible or a replacement is necessary.

No recommissioning without approval

Battery energy storage systems that have come into contact with water must only be put back into operation after a professional inspection and express approval by a qualified specialist. This is for your safety and is often also a prerequisite for your insurance cover.

When replacement is necessary

If your electrical energy storage system needs to be replaced:

- The disposal of the defective system must be carried out professionally by specialized companies.
- Your installer will usually organize the removal and disposal.
- Do not attempt to transport damaged batteries yourself

Storage disposal until collection

If damaged battery modules cannot be collected immediately:

- Store them well ventilated outdoors with sufficient clearance from flammable materials. Storage in a

  Sand bed.

  Fireproof container, not gas-tight, ventilated.

  Water bath, e. g. metal tub, completely covered with water.
- Keep children and pets away.

Status: October 2025
Source: According to Specifications of the German Energy Storage Systems Association (BVES) e.V..

19. Handover to the operator

19.1. Information for the operator

The following information must be provided to the operator:

Component	Information/Document	Comment
System	FEMS number	
System	Login data for Online Monitoring	
System	Operating instructions	

Table 50. Information for the operator

20. Transport

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!

Risk due to lifted loads!
Standing under suspended loads is prohibited!

Check that the parts and outer packaging are in perfect condition.

Check that

- all screw and bolt connections are tightened firmly,
- the transport rail has been properly attached,
- you wear personal protective equipment (PPE).

- Ensure that nobody is on or near the product during transportation. Do not use people as counterweights.
- Ensure that nobody is below suspended loads.

Notes:

- The batteries are removed or replaced by specialist personnel and transported by a hazardous goods carrier.
- When transporting the batteries, observe the current laws, regulations and standards, e. g. the Hazardous Goods Transportation Act (GGBefG).

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

21. Dismantling and disposal

21.1. Prerequisites

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

Sharp and pointed edges
Injuries to the body or limbs caused by sharp and pointed edges.

- Always wear suitable protective equipment (cut-resistant protective gloves, protective footwear, protective eyewear) when working on the product!

21.2. Dismantling

- The electrical energy storage system may only be dismantled by authorized qualified electricians.
- Dismantling work must only be carried out when the system has been taken out of operation.
- Before starting disassembly, secure all components to be removed against falling, tipping over or moving.
- Dismantling work must only be carried out when the system is shut down and only by service personnel.
- The dismantling instructions of the component manufacturer (Appendix, Applicable documents) must be observed.
- When transporting the battery modules, the current laws, regulations and standards must be observed (e. g. Dangerous Goods Transportation Act — GGBefG).

21.3. Disposal

- The FENECON electrical energy storage system must not be disposed of with normal household waste.
- The FENECON electrical energy storage system is RoHS and REACH compliant.
- Disposal of the product must comply with local regulations for disposal.
- Avoid exposing the battery modules to high temperatures or direct sunlight.
- Avoid exposing the battery modules to high humidity or corrosive atmospheres.
- Dispose of the electrical energy storage system and the batteries it contains in an environmentally friendly manner.
- Contact FENECON GmbH to dispose of the used batteries.

- For the disposal of all components, the usual procedures at the site and the applicable environmental protection regulations must be applied!
- For the disposal of auxiliary and operating materials, observe the local regulations and information from the safety data sheets.
- For disposal, please 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.

22. Index

22.1. List of images

22.2. List of tables