



fenecon

FENECON Energy Storage Systems

Product catalogue



Battery energy storage systems for the 100% energy transition

Contents

FENECON Energy Storage Systems

Product groups - overview	3
---------------------------------	---

Home Storage System

FENECON Home 10	4
FENECON AVU - Automatic off-grid switch	5
FENECON Home 20 & 30	6

Commercial Storage System

FENECON Commercial 30	7
FENECON Commercial 50	9

Industrial Storage System

FENECON Industrial S	10
FENECON Industrial M	11
FENECON Industrial L	12

Energy Management System

Hardware	14
FEMS Apps for monitoring	15
FEMS App for power-to-heat application	16
FEMS Apps for e-mobility	16
FEMS App for time-of-use tariff	17
FEMS Apps for load control	17
FEMS Apps for storage control	18
FEMS Apps for grid services	19

Marketing & Service

Sales support	20
Start-up packages	21
Service flat fees	21

FENECON Energy Storage Systems

Product groups - overview

Home Storage System

- A solution for new and existing PV systems
- 10 - 30 kW | 8.8 - 168 kWh

For more information, see page 4 or go to:
fenecon.de/en/fenecon-home-10
fenecon.de/en/fenecon-avu
fenecon.de/en/fenecon-home-20-30



Commercial Storage System

- Perfect fit for agriculture and EV charging parks
- 30 - 250 kW | 31.5 - 1,400 kWh

For more information, see page 7 or go to:
fenecon.de/en/fenecon-commercial-30
fenecon.de/en/fenecon-commercial-50



Industrial Storage System

- Large battery energy storage systems for industry, EV charging infrastructure and grid operators
- 88 - 736 kW | 82 - 1,300 kWh

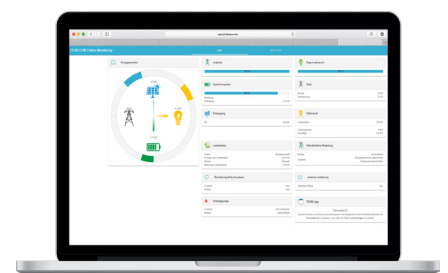
For more information, see page 10 or go to:
fenecon.de/en/fenecon-industrial-s
fenecon.de/en/fenecon-industrial-m
fenecon.de/en/fenecon-industrial-l



Energy Management System

- OpenEMS-based FENECON Energy Management System (FEMS)
- Online monitoring with intuitive user interface
- Easy extension through FEMS Apps

For more information, see page 14 or go to:
fenecon.de/en/fenecon-fems



Home Storage System

FENECON Home 10



The smart storage system for single and multi-family houses

A complete system

FENECON Home 10 hybrid inverter (max. 10 kW)

- 2 PV inputs (max. 15 kWp)
- Integrated grid disconnection point & emergency power supply with solar recharging
- 3-phase-sensor for continuous monitoring of the grid connection point including current transformer max. 120 A
- Integrated DC overvoltage protection Type 2

FENECON Home 10 high-voltage battery

- Nominal charging and discharging power (max. 10 kW)
- Nominal capacity from 9.3 up to 69.9 kWh
- Usable capacity from 8.8 up to 66.0 kWh
- Integrated BMS box with voltage and temperature monitoring at the cell level

With integrated FENECON Energy Management System (FEMS)

Inputs

- 4 x potential free contacts

Outputs

- 3 x load switch contacts (10 A per channel)

Prefabricated cable set with connectors

System includes FEMS App grid-optimized charging with prediction-based load strategy to avoid PV power reduction

An additional sensor or a FEMS compatible inverter is required to present the data of AC sources correctly

FENECON warranty included

- 10 years product guarantee
- 12 years capacity guarantee or 6,000 cycles

Home Storage System

FENECON AVU - Automatic off-grid switch



FENECON AVU represents an extension to the existing emergency power capability of FENECON Home 10

Ready-to-connect design

Manual switch accessible from outside

Uninterrupted power supply in grid parallel operation up to 43 kW/63 A

Secure supply without high installation effort, even in case of grid failure (switching time approx. 3 seconds)

Including integrated protection for inverter and FEMS box

Home Storage System

FENECON Home 20 & 30



The smart storage system for single and multi-family houses, agriculture and small businesses

A complete system

FENECON Home 20 & 30 hybrid inverter (max. 20/29.9 kW)

- Up to 3 PV inputs (max. 45 kWp)
- Integrated grid disconnection point & emergency power supply with solar recharging
- 3-phase-sensor for continuous monitoring of the grid connection point including current transformer max. 120 A
- Integrated DC overvoltage protection Type 2

FENECON Home 20 & 30 high-voltage battery

- Nominal charging and discharging power (max. 30 kW)
- Nominal capacity from 14.34 up to 172.03 kWh
- Usable capacity from 14.0 up to 168.0 kWh
- Integrated BMS box with voltage- and temperature monitoring at the cell level

With integrated FENECON Energy Management System (FEMS)

Inputs

- 3 x potential free contacts

Outputs

- 3 x load switch contacts (10 A per channel)
- 2 x potential-free switch contacts (max. 24V)
- 1 x analogue output (0 to 10 V)

Prefabricated cable set with connectors

System includes FEMS App grid-optimized charging with prediction-based load strategy to avoid PV power reduction

An additional sensor or a FEMS compatible inverter is required to present the data of AC sources correctly

FENECON warranty included

- 10 years product guarantee
- 12 years capacity guarantee or 6,000 cycles

Commercial Storage System

FENECON Commercial 30



A battery energy storage system with emergency power supply for hotels, agriculture and e-mobility

A complete system

Efficient inverter

- 30 kW power
- 3-phase power output 400 V

Powerful battery

- Capacity from 31.5 up to 119.0 kWh

With integrated FENECON Energy Management System (FEMS)

Output

- 5 x load switch contacts (10 A per channel)

Emergency power (requires additional hardware and software)

Including 3-phase sensor for the grid-connection point

An additional sensor or a FEMS compatible inverter is required to present the data of AC sources correctly

FENECON warranty included

- 5 years product guarantee
- 12 years capacity guarantee or 6,000 cycles

Commercial Storage System

FENECON Commercial 30

Accessories & Options



**Plexiglas cover
for 35 or 24.5 kWh**
ZUB000 | ZUB010

- 3 mm plexiglas cover for indoor Commercial 30 battery rack
- Spacers and screws included



**FENECON Commercial 30
grid disconnection unit 100 A
incl. emergency power**
ZUB001

- Grid disconnection unit for automatic or manual emergency power operation of the FENECON Commercial 30
- Up to 100 A throughput current for emergency power
- Emergency power supply up to 30 kW of power
- Complete galvanic separation from the grid
- Emergency power reserve adjustable in FEMS
- Replaces FEMS connection box Commercial

Commercial Storage System

FENECON Commercial 50



The outdoor capable battery energy storage system for industry, EV charging parks and grid operators

A complete system

Efficient inverter

- 50 - 250 kW power
- 3-phase power output 400 V
- Medium-voltage certification

Powerful battery

- Capacity from 70 up to 1,400 kWh

With integrated FENECON Energy Management System (FEMS)

Output

- 3 x load switch contacts (10 A per channel)

Outdoor capable in combination with outdoor rack

Including 3-phase sensor for the grid-connection point

An additional sensor or a FEMS compatible inverter is required to present the data of AC sources correctly

FENECON warranty included

- 5 years product guarantee
- 12 years capacity guarantee or 6,000 cycles

Accessories & Options



Outdoor rack for FENECON Commercial Battery (70 kWh)
ZUB002

- Alternative to indoor housing (extra charge)
- Up to 20 battery modules = max. 70 kWh
- Including air conditioning: 2 x 0.6 kW
- Including lighting and door sensors
- Galvanised sheet steel, thermally insulated



Plexiglas cover for 70 kWh
ZUB000

- 3 mm plexiglas cover for indoor Commercial 50 battery rack with up to 20 modules
- Spacers and screws included

Industrial Storage System

FENECON Industrial S



The compact battery energy storage system

A complete system

Efficient inverter

- 92 - 184 kW power
- 3-phase power output 400 V
- Medium-voltage certification

Automotive battery

- 82 - 164 kWh capacity

Including active thermal management for the batteries

With integrated FENECON Energy Management System (FEMS)

Including 3-phase sensor for the grid-connection point

An additional sensor or a FEMS compatible inverter is required to present the data of AC sources correctly

Fully pre-wired

Ready for manipulation with forklift and crane

FENECON warranty included

- 10 years product guarantee
- 10 years capacity guarantee or 5,000 cycles

Industrial Storage System

FENECON Industrial M



The modular industrial storage system

A complete system

- Variation PRAMAC
704 kW power, 656 kWh capacity
- Variation KACO
552 kW power, 492 kWh capacity

Including active thermal management for the batteries

With integrated FENECON Energy Management System (FEMS)

With standard app write access

All-in-one energy storage container

Suitable for industrial and grid service applications

Fully pre-wired

Ready for manipulation with forklift and crane

FENECON warranty included

- 10 years product guarantee
- 10 years capacity guarantee or 5,000 cycles

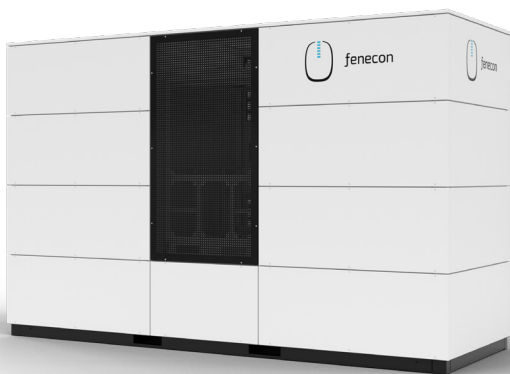
Accessories & Options

Fire alarm system
ZUB201

- Fire alarm system including smoke extraction system, flashing light and horn
- For 10 foot container

Industrial Storage System

FENECON Industrial L



The sustainable industrial storage system

A complete system

Efficient string-inverter at the external inverter assembly

- 736 kW power

Automotive battery

- 1,288 kWh capacity

Including active thermal management for the batteries

With integrated FENECON Energy Management System (FEMS)

With standard app write access

High capacity, scalable up to multi-MWh range

Ready for manipulation with forklift and crane

FENECON warranty included

- 10 years product guarantee
- 10 years capacity guarantee or 5,000 cycles



Energy Management System

FEMS - based on OpenEMS



FEMS is a smart system software for the energy transition

OpenEMS is based on the leading standard for multifunctional energy management

Online monitoring with intuitive user interface

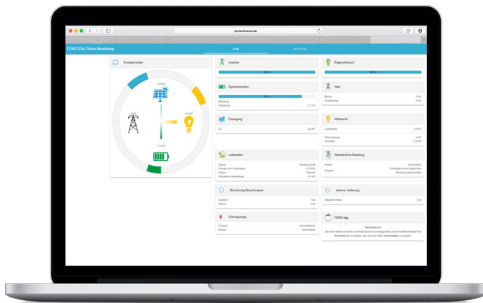
A range of functions for residential-, commercial- and industrial storage systems

Pay once - free updates for life

Safe and future-oriented

Grows with the requirements of the users

New FEMS Apps automatically interact with the existing ecosystem



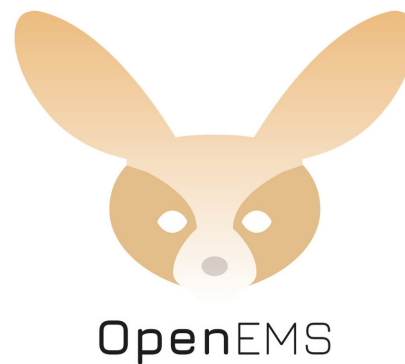
Energy Management System

Intelligence for the energy transition

On initiative of FENECON from 15th of November 2018, the energy and storage industry took a major step forwards: The "OpenEMS Association e.V." was founded in Deggendorf as a charitable organisation by big energy suppliers, network operators, energy storage manufacturers and software companies. The association coordinates further development of OpenEMS as "operating system for energy transition". In doing so, the energy industry is following a path that many other industries successfully demonstrated - for example, the mobile phone industry with its smartphones.

FENECON commits itself to using and developing OpenEMS as open-source-system in order to enable the greatest possible variety of functions and benefits for users of our products.

For information on FEMS and OpenEMS, see: fenecon.de/en/fenecon-fems/ and openems.io



Hardware



FEMS relay board
8-channel TCP
FEM010

- The low-priced variant for the control of 8 digital- or relay outputs
- Top-hat rail mounting
- Including 24 V rail power
- Switching capacity: 12 VDC | 15 A, 24 VDC | 15 A, 125 VAC | 15 A, 250 VAC | 10 A
- Usable either as closer or opener contact
- Control via network
- FEMS Apps must be purchased separately

Energy Management System

FEMS Apps for the integration of electrical generators, consumers, PV inverters and meters



**FEMS App
PV inverter
FEM130**

- Direct readout of PV inverter via FEMS
- Following manufacturers are currently supported: KACO, SMA, Kostal, Fronius and SolarEdge



**FEMS App
Production and
consumption meter
FEM131**

- Direct readout of production and consumption meter via FEMS
- Following manufacturers are currently supported: SOCOMEC, KDK, Janitza, Carlo Gavazzi and Discovery

Hardware



**FEMS package
3-phase sensor 65 A
FEM111**

- Active energy meter, 3-phase, direct measurement
- 10 m data cable included as connection to FEMS
- Optional for recording operators and consumers within the online monitoring
- FEMS App production and consumption meter included



**FEMS package
3-phase sensor without
current transformer
FEM112**

- Active energy meter, 3-phase, converter measurement
- 10 m data cable included as connection to FEMS
- Optional for recording operators and consumers within the online monitoring
- FEMS App production and consumption meter included

Energy Management System

FEMS App for power-to-heat application



FEMS App
Power-to-Heat
FEM100

- Control algorithm to connect following power to heat applications
 - Heating element:** level regulated, three-phase, neutral conductor, requires three free relay outputs
 - SG-Ready heat pump:** Implementation of the four operating states according to SG-Ready (barrier, standard operation, switch-on recommendation, switch-on command) requires two free relay outputs
 - Combined heat and power plant (CHP):** Integration as an AC generation system, requires one free relay output

FEMS Apps for e-mobility



FEMS App
AC charging station
FEM331

- FEMS algorithm for the control of a AC charging station
- Manual control of the charging station as well as the evaluation of performance and energy data via online monitoring
- Charging the electric car with surplus electricity
- Dynamic adaption of the charging power to current generation and consumption
- Following manufacturers are currently supported: KEBA and eCharge Hardy Barth



FEMS App
DC charging station
FEM332

- FEMS algorithm for the control of a DC charging station
- Manual control of the charging station as well as the evaluation of performance and energy data via online monitoring
- Charging the electric car with surplus electricity
- Dynamic adaption of the charging power to current generation and consumption
- Following manufacturers are currently supported: IES Keywatt and Alpitronic

Energy Management System

FEMS App for time-of-use tariff



FEMS App
Time-of-use tariff
FEM818

- Optimization of storage discharge through the use of a forecasting algorithm for PV power generation and consumption as well as price signal from the tariff provider
- The following tariffs are currently supported: Awattar HOURLY, Tibber, STROMDAO Corrently and ENTSO-E

FEMS Apps for load control



FEMS App
Manual relay control
FEM513

- Manual switching of a channel of the relay board via online-monitoring including confirmation message
- App requires one free relay output

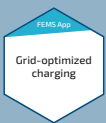


FEMS App
Threshold control
FEM512

- Control algorithm for switching one or more channels of the relay board depending on an adjustable threshold of generation, supply, purchase or state of charge
- App requires at least one free relay output

Energy Management System

FEMS Apps for storage control



FEMS App
Grid-optimized charging
FEM209

- Control algorithms to avoid midday peak regulation of PV systems by using free battery capacity
- Consideration of current weather conditions
- Adaption to the duration of sunshine
- Automatically includes free battery capacity



FEMS App
High peak load
FEM413

- Control algorithm for capping peak loads at the grid connection point according to grid operator's high peak load
- Reactive power provision according to cos-phi specification



FEMS App
Peak shaving
FEM414

- Control algorithm for peak shaving at the grid connection point
- Reactive power provision according to cos-phi specification



FEMS App
Phase accurate peak shaving
FEM415

- Control algorithm for accurate peak shaving that prevents total power as well as phase power from exceeding the limits

Energy Management System

FEMS Apps for grid services



FEMS App
Write access
residential storage
FEM713

- Interface for remote control of a residential storage system
- The following interfaces are currently supported: Modbus/TCP und REST/JSON



FEMS App
Write access
commercial storage
FEM714

- Interface for remote control of a commercial storage system
- The following interfaces are currently supported: Modbus/TCP und REST/JSON



FEMS App
Write access
industrial storage
FEM715

- Interface for remote control of an industrial storage system
- The following interfaces are currently supported: Modbus/TCP und REST/JSON

Marketing & Service

Sales support

Marketing accessories

Dimensions of roll ups 1.2 x 1 x 0.4 m (H W D)	German	English
■ FENECON Product range	MAR003	MAR1036
■ FENECON Home	MAR1020	MAR1025
■ FENECON Home 10	MAR017	MAR1026
■ FENECON Home 20 & 30	MAR1001	MAR1027
■ FENECON Commercial	MAR019	MAR1028
■ FENECON Commercial 30	MAR1021	MAR1029
■ FENECON Commercial 50	MAR1022	MAR1030
■ FENECON Industrial	MAR020	MAR1031
■ FENECON Industrial S	MAR1023	MAR1032
■ FENECON Industrial M	MAR1024	MAR1033
■ FENECON Industrial L	MAR1009	MAR1034
■ FENECON FEMS	MAR044	MAR1035

Product sheets

	German	English
■ FENECON Home 10	MAR038	MAR039
■ FENECON Home 20 & 30	MAR072	MAR073
■ FENECON Commercial 30	MAR030	MAR031
■ FENECON Commercial 50	MAR032	MAR033
■ FENECON Industrial S	MAR051	MAR053
■ FENECON Industrial M	MAR034	MAR035
■ FENECON Industrial L	MAR052	MAR054
■ FENECON FEMS	MAR036	MAR037

Starter package

FENECON Home 10 Dummy	MAR074	MAR075
	DUM101	



WiPo tool

Support with storage dimensioning & profitability calculation

- Self-consumption optimization
- Peak load capping
- E-mobility
- Atypical grid usage
- Marketing

Marketing & Service

Startup package

Startup support and on-site training
FENECON Commercial
FENECON Industrial
 DIE007 | DIE008

- Commissioning Support for Fenecon battery energy storage systems
- Does not include system installation or electrical connection
- Training execution and certificate issuance if required
- Operational training for customers

Service fees

Engineering project planning and trainings
 DIE009

- Hour rate of the specialist
- Travel expenses
- Accomodation costs at actual expense
- Travel time rate: 50 %

Service operation
 DIE010

- Hour rate of the specialist
- Travel expenses
- Accomodation costs at actual expense
- Travel time rate: 50 %

Travel expenses service
 DIE011

- Lump sum per kilometer driven, plus travel time (50% of the hourly rate)

FENECON GmbH
Brunnwiesenstr. 4
94469 Deggendorf
Germany

Phone +49 9903 628 00
Fax +49 9903 628 909
Web www.fenecon.de/en/
Email international@fenecon.de



Klimaneutral gedruckt