AEG

POWER SOLUTIONS

CONVERTSC FLEX

Bi-directional Storage Converter

On-grid & off-grid versions
up to 1000 kVA

Outstanding conversion efficiency
ConvertSC FLEX is a bi-directional power converter from AEG Power Solutions with IGBT technology. The converter is the core element of any battery energy storage system as it charges and discharges batteries to store or provide active and reactive power according to the application requirement (frequency control, peak shaving, energy shifting or voltage control).

Critical applications
New challenges are appearing in the energy sector due to the ongoing shift from base-load fossil power plants towards volatile renewable energy sources, such as wind and photovoltaic. Among these challenges are voltage and frequency stabilization, as well as an increasing demand for balanced power and peak shaving. The majority of these problems can be solved with battery storage solutions.

While the battery system solely provides the storage capacity, it is the Storage Converter that ultimately transforms the chemically stored energy into a grid service by supplying power according to the application requirement.

FEATURES

- Up to 1000 kVA @ 50 °C conversion power
- Highest efficiency for charging and discharging
- Fully grid code compliant: VDE & others
- Wide DC input range for various battery technologies
- Black start capability
- Seamless transition between on- and off-grid
- Fast and easy maintenance thanks to low cabinet depth of 600 mm
- Initial charge function
- Highest power density
- Optional: back-up power for control & communication
- Simple utility scale installations thanks to modular design

BENEFITS

ConvertSC FLEX provides an outstanding conversion efficiency factor for both the charging and discharging phases. Thanks to its wide DC input range, it may be used with any state of the art battery technology currently available.

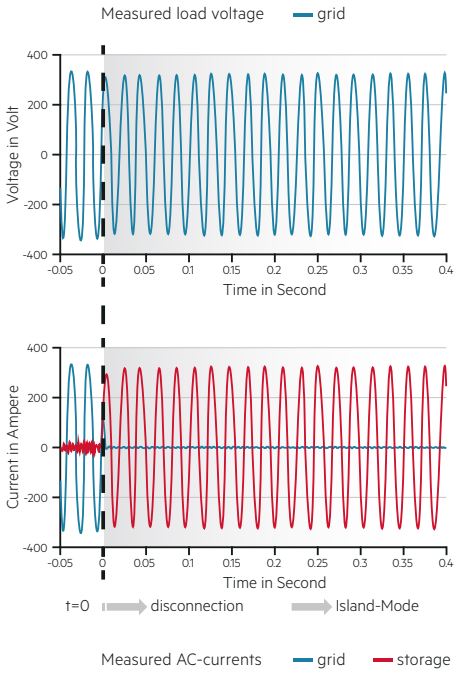
The latest option available features a seamless transition between on-grid and off-grid mode. This extends the battery energy storage system's usage beyond its core functions to back-up in the event of a black-out. The system can also be provided as a solution including all equipment that is needed to connect the battery to an AC network.

Voltage control mode
A very useful feature to allow battery storage investments for future business models.

- Seamless on-grid/off-grid transition allows usage of energy storage similar to a traditional UPS as it transfers between off-grid and on-grid without interruption and with only a limited distortion to the voltage. Battery Energy Storage Solutions (BESS) dedicated to peak shaving will serve at the same time as a back-up power system (replacement of gensets).

- Voltage control mode allows to use the ConvertSC FLEX as the grid forming and stabilizing element in any kind of microgrid. Paralleling of several energy sources is possible and allows the implementation of a stable power supply to remote areas.

- Blackstart capability will allow to re-build the microgrid without any other source of energy.



Sampling of References

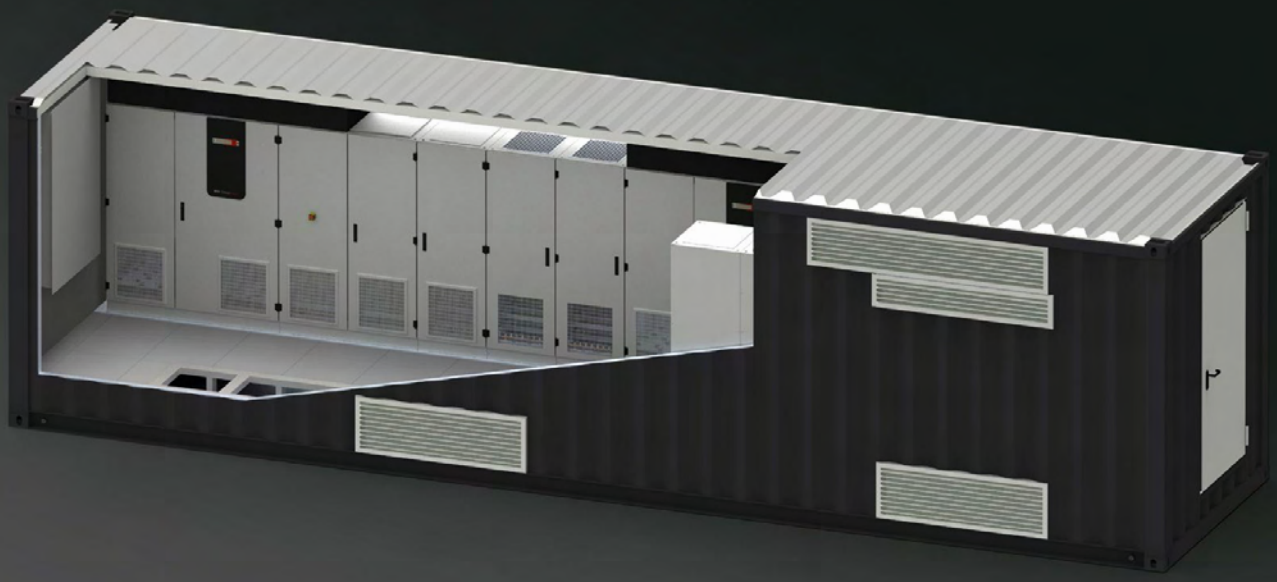
- **Belgium**
  1 x ConvertSC FLEX V (On-/off-grid) supply of voltage for microgrid; connected to flow battery

- **Nigeria**
  7 x ConvertSC FLEX V (Off-grid) supply of voltage for microgrid; option of auxiliary power from connected battery

- **Germany**
  1 x ConvertSC FLEX V (On-/off-grid) USP functionality including resynchronization with public grid

The demand for micro grid solutions is growing fast, further projects in Germany, Greece, Mexico, South Africa, ... are all in preparation.

STORAGE SOLUTION



Hybrid Storage Solution
AEG Power Solutions' response to the growing challenges posed by the transition to alternative forms of energy is an innovative concept and a new business model for various applications especially for providing primary control power. It is combining battery energy storage and power-to-heat systems. This principle idea of coupling different energy sectors significantly reduces investments.

Cost reducing synergy
This hybrid option is currently patent pending. Its specificity is to allow all AC components of the system (distributions & transformers & converters) to be used both for battery and thermal storage. The core element of the hybrid option is a DC switching device that is directly controlled by the converter.

Storage Converter functionality
ConvertSC FLEX is based on the highly successful Protect PV solar inverter platform. A power stack with advanced design, measuring and control technology forms the heart of the Storage Converter. The IGBT based converter technology is inherently bi-directional and allows a four quadrant operation. The converter provides an outstanding conversion efficiency factor during inverter and rectifier operation.

Thanks to its wide DC input range ConvertSC FLEX is also ready for use with any state of the art battery technology currently available.

Remote control of the Storage Converter through an Energy Management System (EMS) is possible when integrated into a smart grid. AEG PS' Storage Converter supports multiple communication protocols such as Modbus TCP, Modbus RTU and RS485. Data recording of the Storage Converter is available 24/7 and is accessible anywhere in the world.

swb Erzeugung AG & Co. KG (swb)
A Bremen-based German utility chose AEG PS' hybrid storage system's energy storage for its primary-frequency control power operations. This service is provided to grid-operators to stabilize the grid and is increasingly needed as renewable sources are integrated.

AEG PS has engineered the complete solution, providing swb with 24 storage converters ConvertSC FLEX integrated into ISO-metal sheet containers together with a hybrid storage option, low voltage distribution cabinets, auxiliary power supply as well as medium voltage transformers and a heating system in separate enclosures.

Specifications

DC INPUT PARAMETERS	
DC voltage range	530 – 1000 V
Max. charging voltage	970 V
Min. discharge voltage	530 V
Max. permissible DC current (charging and discharging)	1400 A
Compatible battery type	Lead acid, Li-Io, Redox Flow and other
AC OUTPUT VALUES (DEPENDING ON BATTERY VOLTAGE)	
Nominal AC apparent power @ 25 °C / @ 50 °C	500 – 1050 kVA / 480 – 1000 kVA
Max. AC real power @ 25 °C during charging and discharging	500 – 1050 kW
Max. AC reactive power inductive and capacitive	320 – 450 kVAr
Nominal AC voltage	380 – 420 V
Nominal AC current @ 25 °C / @ 50 °C	1500 A / 1400 A
AC mains frequency	50 / 60 Hz
System configuration	IT
Mains current THD	THDI <3 % at nominal output
Operation Mode	Current source Voltage source
Efficiency	Max. 98.72 % when charging Max. 98.85 % when discharging
GENERAL UNIT DATA	
Country of installation	IEC related countries
Ambient temperature	-20 °C to +50 °C
Relative air humidity	15 to 95 %, non-condensing
Air quality (minimum requirements)	Class 3S2
Type of cooling	Forced air cooling via two separate cooling circuits
Necessary airflow stack / cabinet	3000 m³/h / 4500 m³/h
Installation altitude (above sea level)	Up to 1500 m / up to 3000 m with derating
Max. thermal output to be dissipated	<18000 W
Internal consumption during operation / standby	<2000 W / <250 W
External auxiliary supply voltage	TN-S, 230 V, 50 / 60 Hz
Maximum dimensions (incl. fan-cover and emergency push button) H x W x D	2070 mm x 2700 mm x 690 mm
Weight of unit	~1700 kg
Anti-condensation heater	installed as standard
Communication interfaces	Modbus RTU, Modbus TCP
Connection points AC / DC	4 per phase
Codes and standards	CE, EN 62109-1, EN 62477-1, EN 61000-6-2, EN 61000-6-4, EN 60529, EN 60721-3-3
OPTIONS	
Upon request	Isolation monitoring Aux. power using central battery AC- / DC-distribution boards Outdoor enclosure AC parallel operation Black-start capability LV- / MV-transformer Containerized solution