SINACON
Hybrid Converter
Converting energy into efficiency –
the flexible and easy-to-use converter
for innovative grids

www.siemens.com/sinacon-hc
The growing distributed energy market is challenging grid operation and calling for new concepts

Power generation using renewable energy sources is growing fast, and the demand for more grid support from power electronics is the trend.

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Grid and source availability
Distribution and transmission lines can only absorb generated renewable power according to the load demand. To keep the grids stable, the available renewable electrical power can sometimes not be fed into the grid. This reduces overall system efficiency.

Distributed energy generation and storage
Distributed and renewable energy sources are participating more and more in power generation. Grid operation is more complex and grid stability is becoming more important than in the past. The demand for energy safety and energy availability requires new technologies to avoid unplanned outages and to ensure energy safety for all consumers.

Non-continuous/non-demanded energy generation
Since renewable energy sources generate power depending on the availability of natural sources and not on power demand, achieving an energy balance between fossil energy generation and renewable energy generation is very important.
Rely on SINACON HC – the efficient all-round converter for innovative grid applications

SINACON HC is a ready-to-run grid converter with all required grid functionalities. This converter combines renewable energy source and storage within one unit for diverse applications. The innovative product concept with its high operation flexibility gives the user optimization benefits for on-grid and off-grid operation.

The SINACON HC converter’s universal capability combined with its high-performance architecture and advanced control features provides Siemens’ answer to the challenges of a rapidly growing distributed energy market.

Impressive functions that make your decision easier

Hybrid converter concept with different DC sources
- Independent operation of different energy sources in one converter
- Scalable and flexible power for AC and DC power ports
- New operation features for renewable energy sources, for example, PV participating in grid support
- System advantages in dimensioning and engineering

Wide DC voltage range (100 – 1150 V DC)
- Flexible for any kind of battery technology, such as lithium ion, Redox Flow
- No limitation on battery voltage range according to the AC voltage
- Wider PV voltage utilization for improved solar park output
- Best fit to combine any source with any voltage range

Microgrid capability
- One product for on-grid and off-grid applications
- Complete island operation, also as a single source
- Black-start capability to ramp up an island grid
- Reduced diesel costs by increasing renewable content

Optimized infeed technology
- Excellent power quality

Certified in accordance with local grid codes (like BDEW, UL1741, TAB HV)
- All the necessary approvals for operating in public grids

Type-approved cabinet system that’s ready to connect
- Proven Siemens quality with guaranteed performance and maximum reliability

Global service platform and remote control
- Optimized serviceability and maximum availability
One for all – use SINACON HC in a wide variety of application areas

Residential and industrial infrastructure

Power source and storage

Battery storage

Storage

All kind of batteries

Power sources

Power source and storage

Battery

Fuel cell
Grid stabilization with energy storage

Frequency stabilization is a big challenge to operate a public grid. Frequency changes in the grid requires fast reaction to supply active power into the grid or take power out of the grid. Different energy sources are interesting for this application to provide support for a dedicated time.

Core functionalities

• Voltage stabilization
• Frequency stabilization

Microgrid operation

Microgrid operation requires always a stable voltage and frequency control for the connected loads.

Some microgrid applications are grid-connected and use the public grid as a power source, to create out of it a stable microgrid. Complete off-grid applications (island grid) are mostly supplied by diesel generators. Microgrid converters need a parallel operation capability with existing diesel generators. Beside of this, black-start capability is a very important feature. To improve functionality and efficiency, a combination e.g. of PV and battery storage is favorable.

Core functionalities

• Parallel operation with diesel generator in island grid
• Grid-connected microgrid operations

Grid stabilization with energy storage

Frequency stabilization is a big challenge to operate a public grid. Frequency changes in the grid require fast reaction to supply active power into the grid or take power out of the grid. Different energy sources are interesting for this application to provide support for a dedicated time.

Core functionalities

• Voltage stabilization
• Frequency stabilization

Hybrid power supply in public grids

Sources of renewable energy combined with battery storage increase system efficiency and operation flexibility. Use cases will be primarily PV plus storage and in a few applications fuel cell plus battery. In its existing product configuration, this application is available only for DC sources.

Core functionalities

• Combining DC sources in the DC link for on-grid or off-grid applications

Storage applications

The version with one or multiple DC sources:

Hybrid power applications, e.g. PV+storage

Hybrid power applications, e.g. PV+storage
Equipped with greater efficiency – technical features of SINACON HC

Flexible configuration
Based on 250-A, 500-A and 1000-A building blocks that can be used in various configurations. Each block can be used as a DC interface or three times for an AC interface, and is always ready to connect with fuses and contactor or circuit breaker.

Certified to local grid codes (such as BDEW, UL1741, TAB HV), necessary approvals to be installed and operated in medium-voltage grids.

Highest DC input voltage range (100 to 1150 V DC) independent of the AC voltage offers optimal flexibility in operation and system optimization.

High dynamic control
Reacts fast to the demand and changes from inductive to capacitive operation in less than 20 msec.

Global Siemens guarantee
Services, availability, spare parts, application support.
Closed-loop internal liquid cooling with air-water heat exchanger. Benefits of a liquid-cooled system: easy implementation of a high protection type, low maintenance (very few auxiliary fan and filter mats)
Superior reliability was confirmed by a rigorous type test in accordance with Siemens quality standards.
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*For article numbers, see [www.siemens.com/sinacon-hc](http://www.siemens.com/sinacon-hc)*
SINACON HC is an all-in-one converter with flexibility for diverse operations and applications.