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## **PCS100 ESS**

High Performance inverter for micro-grid application



# PCS100 ESS: The interface for Energy Storage Systems

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01 For larger systems  
+4MVA multiple PCS100  
ESS systems can be  
installed in parallel.

ABB's PCS100 ESS converter is a grid connect interface for energy storage systems that allows energy to be stored or accessed exactly when it is required. Able to connect to any battery type or energy storage medium, the PCS100 ESS brings together decades of grid inter-connection experience and leadership in power conversion to provide seamless system integration and battery control.

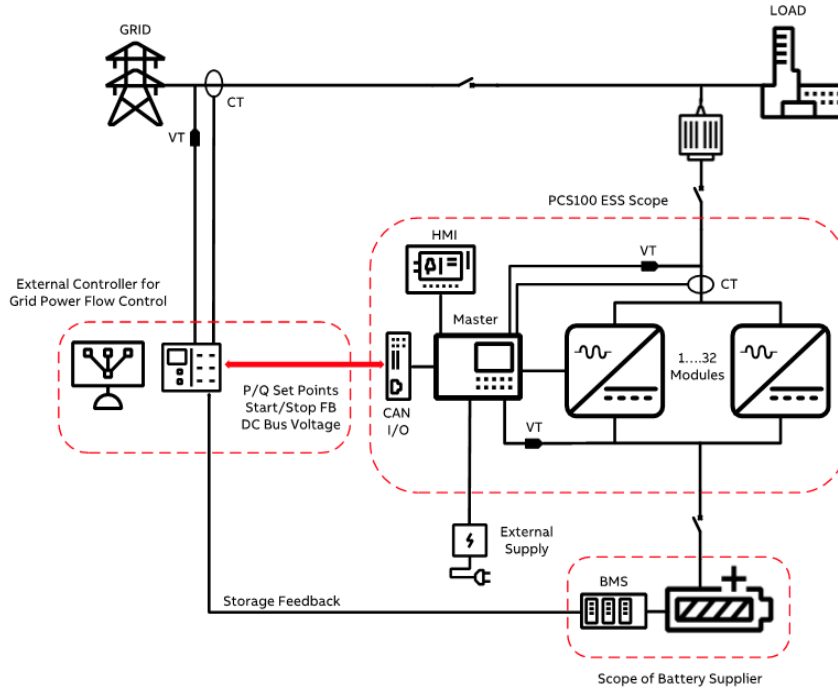
The PCS100 ESS' modular design and advanced control maximize the availability, value and performance of both large and small energy storage systems in a variety of applications. With this optimized use of the energy storage system, the PCS100 ESS helps to deliver exceptional returns on investment.

The PCS100 ESS allows control of both real power (P) and reactive power (Q), enabling it to cover a wide range of system requirements. Moreover, advanced control features in the Virtual Generator mode of operation allow this storage system to emulate generator behavior and thus act as a true power system component.

With these advanced features the PCS100 ESS is the perfect solution for applications requiring power system load levelling, grid stabilization, grid loss detection, grid compliance for renewable and generation systems and power quality improvement.

# Functional view and customer values

## Functional diagram



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02  
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02. Functional  
diagram

## Customer Values



**Grid Forming Inverter** – Proven Grid forming inverter with flexible operating mode allowing micro-grid application in remote or islanded grids.



**Flexible On-Grid/Off-Grid Operation** – flexible functional state with no hard state change for seamless on-grid/off-grid transfer, including built in anti-islanding



**Built in Black Start** – Micro-Grid priming application capable enabling control and protection system start-up without a secondary source



**Synthetic Inertia** – Synchronous machine emulation providing system voltage stability with dynamic system response.



**Flexible Energy Source** – Configurable for Lithium, VRLA, Kinetic or Fuel Cell as energy source allowing a range of applications.



**Hi Overload Capability**- 200%/2sec & 150%/30sec overload capability from 75% preloaded operation. Allows support of dynamic loads during off-grid application.



**Scalable Modularity** - 125kVA inverter module size scalable up to 4000kVA single system and more than 30MVA proven at a system level with parallel blocks.





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## Key features

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03. Providing highly efficient solutions for the grid

### Features and benefits

- Modular design providing high reliability and short mean time to repair (MTTR)
- Grid fault detection
- Islanding and anti-islanding options
- Ratings from 100 kVA to 4000 kVA and voltages from 150 Vac to 480 Vac
- Allows a range of energy storage devices to be coupled to the grid
- Dynamic real power control (P)
- Dynamic reactive power control (Q)
- Generator emulating control mode
- Grid stabilization features including synthetic inertia and active damping
- Low voltage ride through (LVRT)
- Voltage and frequency dynamic envelope/regulation functions

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“The PCS100 ESS is proven ABB inverter technology developed for critical load protection, providing a highly efficient and flexible solution for both on Grid and off Grid energy storage applications with more than 2GW installed base globally.”

# PCS100 ESS Technical Specification

<b>General data</b>	
AC Rating	150A – 4800A D-type module 105A – 3360A C-type module
<b>Utility Side (AC)</b>	
Rated voltage	150 - 480 V +/- 10%
Nominal frequency	50 Hz or 60 Hz +/- 5%
Power System	3-phase center ground referenced (TN-S) - coupling transformer required; 3-phase floating system (IT) - insulation monitoring required <sub>2</sub>
Oversvoltage category	III – 4kV (IEC 60664)
Fault capacity	25 kA (cabinet), 65 kA (rack)
Achievable efficiency	98 %
Overload capability	200 % for 2 seconds <sub>1</sub> 150 % for 30 seconds 120 % for 600 seconds <sub>1</sub>
Circuit protection	Circuit breaker or fuse (not included)
Voltage harmonic compatibility	IEC 61000-2-4 Class 2 (Utility THDv < 8%)
Power module voltage harmonic distortion	THDv < 2.5% for linear loads
<b>Energy Storage Side (DC)</b>	
Rated voltage	+/- 125Vdc up to +/- 560Vdc (250 up to 1120 Vdc) for C-type +/- 125Vdc up to +/- 410Vdc (250 up to 820 Vdc) for D-type
Supply earth referencing	DC center referenced
Oversvoltage category	II (IEC 60664) 4kV D-type module 6kV C-type module
Maximum voltage to ground	+/- 600Vdc
Circuit protection	Circuit breaker or fuse (not included)
<b>Environmental</b>	
Operating temperature range	0 °C to 50 °C
Temperature derating	Above 40 °C, derate at 2 % load per °C
Operating altitude	< 1000 m without derating
Capacity derating with altitude	1 % every 100 m above 1000 m, 2000 m maximum
Inverter cooling	Forced ventilation
Humidity	< 95 %, non-condensing
Pollution degree rating	2
Noise	< 85 dBA @ 2 m
Seismic rating	Designed to UBC zone 4 (rack only)
<b>Protection rating</b>	
Rack/Cabinet rating	IP20 / NEMA 1

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