

Bi-directional inverters linking batteries to the grid



Eaton's Power Xpert™ Storage grid-connect inverter offers reliable high-performance energy storage and conversion for utility-scale grid-connect battery applications. High performance is realized with a wide end-of-charge to full-charge voltage window, which allows full battery storage potential to be achieved. Conservatively rated magnetics, liquid-cooled power modules with over 7 million hours mean time between failure (MTBF), and a rugged enclosure for the toughest environments make the Power Xpert Storage the most dependable energy storage grid-connect inverter on the market.

A bankable, trustworthy partner

With over 100 years of experience in the electrical space, Eaton brings a solid and proven product portfolio with world-class engineering and manufacturing.

A robust and diversified balance sheet guarantees that warranty and financial commitments will be honored for the long term.

Eaton also offers turnkey solutions and balance of system equipment, making it a one-stop shop for designers and developers.

Available ratings

500 kW, 1000 kW, 2000 kW

High efficiency

Transformerless design, proprietary control strategies and filter design result in over 98% peak power efficiency, which also accounts for all auxiliary losses in the inverter.

Grid support

Grid support from utility-scale distributed generation is a requirement of many energy storage applications. Eaton's grid-connect inverters, in conjunction with a system supervisory controller, offer the following energy storage grid support features:

- Low, zero and high voltage ride through (LVRT, ZVRT and HVRT)
- Frequency ride through (FRT)
- Standalone operation
- Islanding detection
- Utility communication
- Full four quadrant operation

Energy storage maximization

A wide voltage range (750 to 1250 Vdc) maximizes battery operating range for optimum energy storage.

Configurable interface

A configurable interface enables communications and control of the inverter via a variety of links. Links to the system supervisory controller give the transmission provider the capability to send instructions and receive data.

Rugged construction

Providing equipment for wind, nuclear utility and heavy industrial power applications necessitates a rugged design. The enclosure is designed to meet a seismic zone 4 rating and is available as outdoor rated. The dust-tight section protects the liquid-cooled converter and control components from harsh and dusty environments, while the vented section houses robust air-cooled magnetics. Monitoring of IGBT junction temperatures provides additional robust protection.

Ride-through selectivity

Eaton's ride-through capabilities meet the requirements of North American and European standards FERC, BDEW and E-ION. These standards compliance settings are field selectable to meet site requirements.

Minimizes installation cost

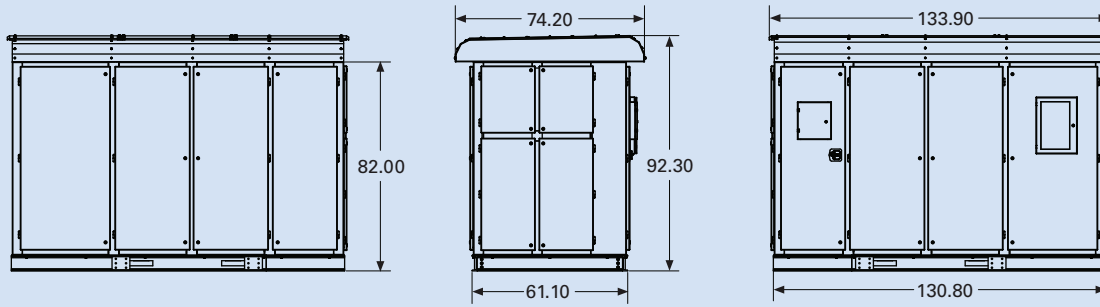
A large power block inverter reduces the pieces of equipment that need to be installed, reduces field wiring, and also reduces transportation and handling costs.

Power Xpert Storage also enables "skidless" inverter stations. Through a close-coupled connection to the step-up transformer, several benefits are realized such as smaller pad sizes, dramatic weight reduction and easier inverter placement.

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Powering Business Worldwide

Approximate Dimensions in Inches



Four Quadrant Inverters for Battery Charge/Discharge

Ratings (kW / kVA)	500	1000	2000
Battery Power			
Voltage	750 to 1250 Vdc	750 to 1250 Vdc	750 to 1250 Vdc
Maximum DC current	660A	1320A	2700A
DC isolating switch	Optional, fused, motorized or manual	Optional, fused, motorized or manual	Optional, fused, motorized or manual
Line Power			
Output voltage range (L-L)	480 Vac nominal three-phase	480 Vac nominal three-phase	480 Vac nominal three-phase
Output frequency	60 Hz nominal ± 0.5 Hz (50 Hz optional)	60 Hz nominal ± 0.5 Hz	60 Hz nominal ± 0.5 Hz (50 Hz optional)
Line power factor	Full four-quadrant controllable from supervisory controller	Full four-quadrant controllable from supervisory controller	Full four-quadrant controllable from supervisory controller
Harmonic distortion	<5% (I _{ac}) at nominal power	<5% (I _{ac}) at nominal power	<5% (I _{ac}) at nominal power
Line disconnect and protection	Electrically operated breaker	Electrically operated breaker	Electrically operated breaker
Isolation transformer	Optional (external)	Optional (external)	Optional (external)
Nominal line current at 50°C	600A	1200A	2400A
Maximum five-second line current	800A	1600A	3200A
Peak efficiency	Over 98.0%	Over 98.0%	Over 98.0%
Communication and Control Interface			
Communication	Modbus® TCP, others configurable on request; data acquisition and collection configurable	Modbus TCP, others configurable on request; data acquisition and collection configurable	Modbus TCP, others configurable on request; data acquisition and collection configurable
Control interface	HMI screen, I/O configurable on request	HMI screen, I/O configurable on request	HMI screen, I/O configurable on request
Grid Support			
Features	<ul style="list-style-type: none"> • Frequency ride through (FRT) • Low voltage ride through (LVRT) • High voltage ride through (HVRT) • Zero voltage ride through (ZVRT) • Field selectable FERC, BDEW and E-ION standards settings • Islanding detection 	<ul style="list-style-type: none"> • Frequency ride through (FRT) • Low voltage ride through (LVRT) • High voltage ride through (HVRT) • Zero voltage ride through (ZVRT) • Field selectable FERC, BDEW and E-ION standards settings • Islanding detection 	<ul style="list-style-type: none"> • Frequency ride through (FRT) • Low voltage ride through (LVRT) • High voltage ride through (HVRT) • Zero voltage ride through (ZVRT) • Field selectable FERC, BDEW and E-ION standards settings • Islanding detection
Enclosure			
Protection	NEMA® 4 for power electronics and controls equipment; NEMA 3R for magnetics and switchgear	NEMA 4 for power electronics and controls equipment; NEMA 3R for magnetics and switchgear	NEMA 4 for power electronics and controls equipment; NEMA 3R for magnetics and switchgear
Enclosure construction	Powder-coated steel with stainless hardware and fittings	Powder-coated steel with stainless hardware and fittings	Powder-coated steel with stainless hardware and fittings
Inverter mounting	Pad or skid mount	Pad or skid mount	Pad or skid mount
Cabinet dimensions in inches H x W x D	92.30 x 92.00 x 61.10	92.30 x 112.00 x 61.10	92.30 x 130.80 x 61.10
Cabinet weight lbs	6000	8400	11,500
Seismic rating	Zone 4	Zone 4	Zone 4
Cooling system	Independent, self-contained, closed-loop liquid cooling and air forced convection	Independent, self-contained, closed-loop liquid cooling and air forced convection	Independent, self-contained, closed-loop liquid cooling and air forced convection
Environmental			
Operating temperature	-20°C to 50°C, cold weather option to -40°C	-20°C to 50°C, cold weather option to -40°C	-20°C to 45°C, cold weather option to -40°C
Relative humidity	0-100% condensing	0-100% condensing	0-100% condensing
Maximum elevation ASL	3300 ft (higher altitudes possible with derating)	3300 ft (higher altitudes possible with derating)	3300 ft (higher altitudes possible with derating)

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 Printed in USA
 Publication No. PA08303002E / Z12945
 November 2012

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