Harvest the power of the sun



The Eaton Power Xpert[™] Solar 1500 kW and 1650 kW inverters are the largest in the utility-scale class. A robust, reliable, efficient and fault-tolerant design minimizes the plant levelized cost of electricity, while meeting stringent grid requirements.

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.



The best solution to ensure the lowest LCOE (Levelized Cost of Electricity)

The Power Xpert Solar is specifically designed to lower the LCOE. It reduces installation and upfront costs, and boosts plant reliability, minimizing maintenance expenses. Energy harvest is increased through world-class efficiency and a unique fault-tolerant design.

Energy harvest maximization

A proprietary control strategy coupled with an optimized filter design yields a CEC efficiency level of 98 percent, which also accounts for all auxiliary losses in the inverter.

A wide MPPT voltage range (500–1000 Vdc) maximizes inverter operation time. It boosts energy harvest and ensures that the unit will not trip under high-irradiance and cold weather conditions, especially in installations designed with a high DC/AC ratio.

Highly reliable and available

The Power Xpert Solar is a complete fault-tolerant design, allowing for maximum plant availability. Fault tolerance is achieved by a segmented inverter design—3 x 500 kW (550 kW) stacks compose the unit. Each stack can be independently isolated, so that the system runs at partial power in the case of faults.

Reliability is also a key component for the utilityscale inverter. The Power Xpert Solar is made up of conservatively designed critical components (magnetics, IGBTs, capacitors, and the like) and a liquid-cooled design, allowing power electronics and controls equipment to be enclosed in a dust- and water-free environment.

Minimizes installation cost

A large power block inverter (1.5 MW and 1.65 MW) reduces the pieces of equipment that need to be installed, reduces field wiring, and also reduces transportation and handling costs.

Power Xpert Solar 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.

In plants where VAR support is needed, the Power Xpert Solar sustains a power factor range of ± 0.91 without power derating, that is, the inverter runs at full MW while supporting a ± 0.91 power factor range.

Grid management features

The Power Xpert Solar ensures that stringent grid interconnection requirements are achieved. Proprietary control algorithms allow for true zero voltage ride-through and compliance of the following grid requirements:

- Low and high voltage ridethrough (LVRT and HVRT)
- Frequency ride-through (FRT)
- Voltage control—VAR support during grid disturbances
- Frequency droop control
- · Power ramp control
- Islanding detection

Approximate Dimensions in Inches







Utility-Scale—Power Xpert Solar Inverter

	Rating	
Description	1500 kW	1650 kW
AC Output Specifications		
Nominal apparent power AC at 50°C	1650 kVA	1815 kVA
Rated output power AC at 50°C	1500 kW	1650 kW
Maximum continuous output current at 50°C	3000A	
Nominal operating voltage	320 Vac	352 Vac
Operating voltage range (withstand)	±10%	
Nominal operating frequency	60 Hz	
Operating frequency range	57–63 Hz	
Total harmonic distortion at rated power	Per IEEE® 1547, <5% TDD	
Power factor at rated power	±0.91 adjustable power factor	
AC configuration	Delta 3-wire	
DC Input Specifications		
Number of DC inputs	Customer-specified fuse arrangement (16–24 input pairs)	
Maximum input voltage open circuit, $V_{\rm oc}$	1000 Vdc	
MPPT input DC voltage range	500-1000 Vdc	550-1000 Vdc
MPPT DC voltage range for full power production	500-1000 Vdc	550-1000 Vdc
Nominal DC operating current	3100A DC	
PV array grounding	Negative and positive (optional)	
DC monitoring	Optional current sensors on each DC input	
Efficiency and Losses O		
Weighted efficiency (CEC)	98%	
Protection		
AC disconnect	AC circuit breaker with LOTO	
AC surge suppression	Yes, monitored by inverter SCADA	
DC disconnect	Switch disconnect with LOTO	
DC surge suppression	Yes, monitored by inverter SCADA	
Ground fault monitoring	Yes, monitored by inverter SCADA	
Insulation monitoring	Optional	

Description	Rating	
Communications and Controls		
Communications with	Modbus® TCP	
plant central controller	Optical fiber connection optional	
Power metering	Optional power metering device	
Power quality analysis	Optional grid monitoring relay with capability for waveform and event capture	
HMI	Color TFT device provides real-time and historic inverter and array parameters	
Mechanical Specifications		
Operating temperature range full power	-20° to 50°C	
Operating temperature range at reduced power	50° to 60°C	
Optional extended temperature range (cold weather package)	-40° to 50°C	
Storage temperature range	-30° to 70°C	
Enclosure protection	NEMA [®] 4 for power electronics and controls equipment; NEMA 3R for magnetics and switchgear	
Application	Outdoor	
Enclosure construction	Powder coated galvanized steel with stainless hardware and fittings	
Relative humidity	0-100% condensing	
Inverter mounting	Pad or skid mount	
Cooling	Independent, self-contained, closed-loop liquid cooling and air forced convection	
Maximum operating altitude	3300 ft (higher altitudes possible with derating)	
Inverter dimensions in inches (H x W x D)	92.3 x 130.8 x 61.1	
Standards and Compliance		
Safety	UL® 508c, UL 1741 (in process)	
Grid management	FERC 661, BDEW	
Design Features		
Grid management features	LVRT HVRT ZVRT FRT Ramp control Frequency droop Grid management features adjustable to meet FERC, WECC and ERCOT requirements Optional anti-islanding detection	

Preliminary



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