Solar inverters

ABB central inverters
ULTRA-750/1100/1500
750kW to 1560kW

*

ABB's utility-scale ULTRA inverters combine high efficiency with a wide input-voltage range and multiple maximum power point trackers (MPPT).

The inverters can be configured with up to four independent, high-speed MPPT.
Each precise MPPT accommodates one of the widest input-voltage ranges in the market (470 to 900Vdc) to generate more energy and maximize the return on investment.

The ULTRA inverter is a flexible and efficient platform.
Modular design increases uptime and reduces service and maintenance costs. The low cost of ownership, higher energy production and ease of maintenance combine to make the ULTRA inverter the ideal choice for utility-scale solar projects.

ULTRA inverters are rugged.
The liquid-cooled, corrosion-resistant ULTRA inverters are certified by CSA to UL50E type 4X (meets NEMA 4X) and ideally suited for any environmental condition.

ULTRA inverters are durable for long life.
ABB ULTRA inverters utilize an advanced closed-loop liquid cooling system that limits both component temperatures and temperature cycling. ULTRA inverter film capacitors have longer life expectancy than traditional electrolytic capacitors. Generous component derating guidelines are followed. The combination of design and ABB commitment to service ensures the inverter will provide a long-term return on investment.

Highlights:
- The ULTRA inverter operates at high efficiency (98.4 percent peak, up to 98 percent CEC).
- The wide input voltage range maximizes energy production.
- Liquid cooling increases reliability of critical components.
- ULTRA inverters are compatible with all types of PV technologies.
- The enclosure is certified to UL50E type 4X (NEMA 4X).
- The inverter output is 690 Vac, three-phase, DELTA configuration.
- The ULTRA inverter operates with up to four MPPT connections.
- ULTRA inverters are certified by CSA to UL 1741.

*Inverter shown with optional sunshade and louvers.

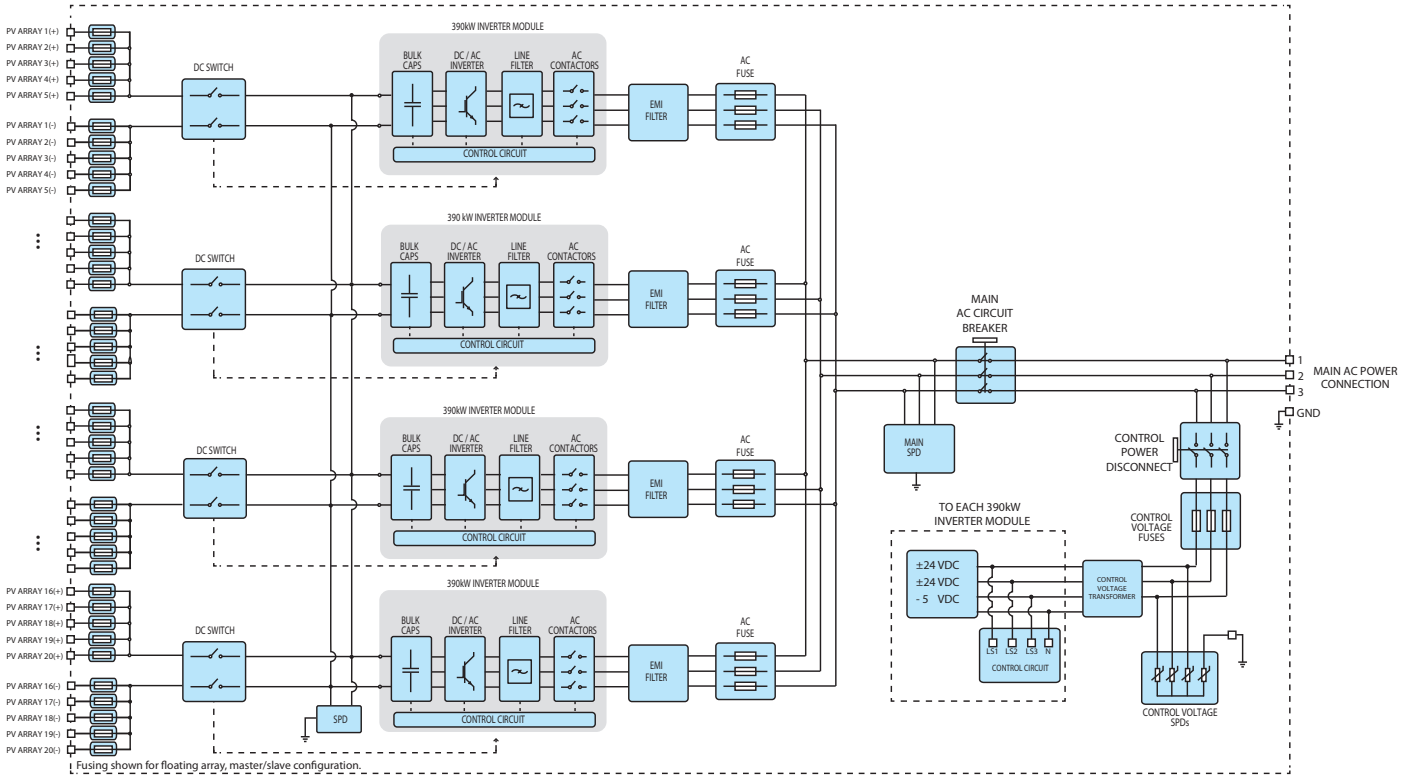
Power and productivity
for a better world™

Technical data and types

Type code	ULTRA-750-TL-OUTD-X-US-690				ULTRA-1100-TL-OUTD-X-US-690				ULTRA-1500-TL-OUTD-X-US-690			
X =	-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4
Rated output power (Pac) (active)	780kW	750kW	780kW	750kW	1170kW	1000kW	1170kW	1000kW	1560kW	1500kW	1560kW	1500kW
Rated output power (apparent)	780kVA				1170 kVA	1115 kVA	1170 kVA	1115 kVA	1560kVA			
Input side (DC)												
Absolute maximum voltage	1000Vdc											
MPPT voltage range	470-900Vdc											
MPPT range at full power (89°F/ 30°C)	585-850Vdc				585-850 Vdc	540-850 Vdc	585-850 Vdc	540-850 Vdc	585-850Vdc			
MPPT range at full power (120°F/50°C)	650-850Vdc											
Maximum current per 390kW inverter module	700A											
Maximum combined current	1400A				2100A				2800A			
Number of independent MPPT (multi-master)	2				3				4			
Number of independent MPPT (master-slave)	1				1				1			
Number of DC inputs	10				15				20			
DC connections (Cu or Al)	**Cu**; 1 x1000 MCM or 2 x 300 MCM, max. **Al**; 1 x 1000 MCM or 2 x 400 MCM, max.											
Array grounding	Negative or positive											
DC cable entry	Bottom											
Inverter output side (AC)												
Rated voltage	690Vac (3 Phase / 3 Wire)											
Operating range[1]	607-759Vac (3 Phase / 3 Wire)											
Grid frequency (adjustment range)	59.3-60.5Hz (57-63Hz)											
Maximum output current	655A				983A	932A	983A	932A	1310A			
Power factor control range	1.0 Nominal (adjust ±0.90 to ±0.99)											
Total harmonic distortion (@ rated output power)	<3%											
AC cable size (Cu or Al)	Up to 6 cables per phase (maximum 1000 MCM), 90°C terminals, 3/8“ threaded stud											
AC cable entry	Bottom											
Input protection devices												
Reverse polarity protection	Yes											
Overvoltage protection type	SPD (Class II)											
DC switch per 390kW inverter	1000A / 1000V											
Fuse size on each input	(125-400A) / 1000V											
PV array isolation control	According to NEC											
Output protection devices												
Anti-islanding protection	IEEE 1547											
Overvoltage protection	SPD (Class II)											
AC fuse per 390kW inverter module	Yes											
AC circuit breaker (adjustable)	800				1200				1600			
Nighttime disconnect	Automatic											

1. The active / reactive power output varies as a function of output voltage

Block diagram of ULTRA-1500 -TL-OUTD

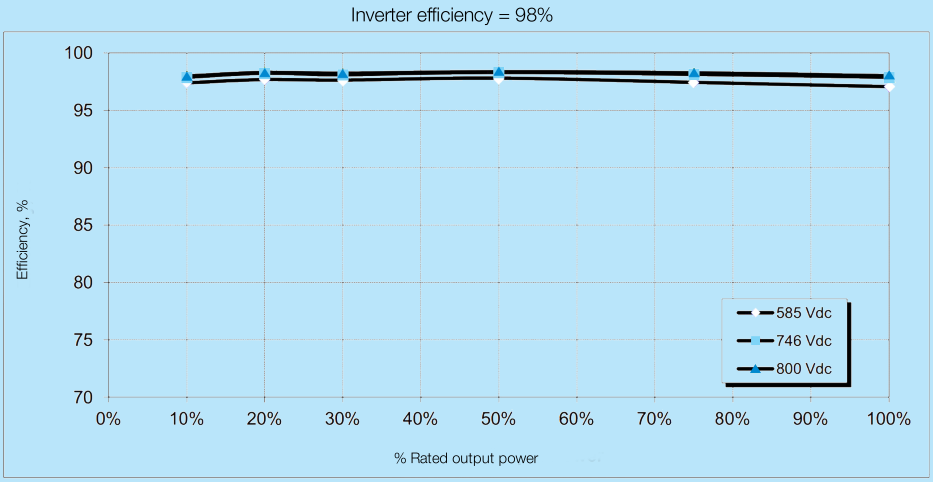


Technical data and types

Type code	ULTRA-750-TL-OUTD-X-US-690				ULTRA-1100-TL-OUTD-X-US-690				ULTRA-1500-TL-OUTD-X-US-690			
X=	-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4
Efficiency												
CEC efficiency	97.5%	97.5%	98.0%	98.0%	97.5%	97.5%	98.0%	98.0%	97.5%	97.5%	98.0%	98.0%
Maximum efficiency	98.4%											
Operating performance												
Stand-by consumption/nighttime power loss	302W	302W	347W	347W	329W	329W	382W	382W	374W	374W	430W	430W
Auxiliary power supply connection type	690Vac / 3 Phase											
Inverter internal power consumption	<0.50%				<0.40%				<0.50%			
Environmental												
Ambient air operating temperature range	-4°F to 140°F (-20°C to 60°C) with derating above 122°F (50°C)											
Noise emission level at 1m (EN62109)	<78dBA											
Maximum operating altitude without derating	6560ft (2000m)											
Relative humidity	0-100%, condensing											
Communication												
Communication protocol	RS-485, Modbus RTU, Modbus TCP (optional), Ethernet IP (optional)											
User-interface	5.7" touchscreen LCD											
Monitoring system	AURORA Universal, PVI-AEC-EVO											
Mechanical specifications												
Environmental protection rating	UL50E Type 4X (NEMA 4X)											
Seismic	IBC 2012 (ASCE 7-10), Sds = 2.0g, Risk Category I and II											
Cooling	Liquid cooled with on-board heat exchanger											
Dimension H x W x D	115in x 118in x 58in (2912mm x 3003mm x 1470mm)				115in x 146in x 58in (2912mm x 3703mm x 1470mm)				115in x 173in x 58in (2912mm x 4403mm x 1470mm)			
Approximate unite weight	9000lb (4100kg)				10500lb (4800kg)				12000lb (5500kg)			
Swappable 390kW power conversion module weight	>121lb (55kg)											
Safety												
Marking	$_{C}$CSA$_{US}$											
Safety and EMC standards	UL1741											
Utility interconnect standards	IEEE 1547, IEEE1547.1, NERC PRC-024-1, WECC, BDEW											
Warranty												
Standard warranty	5 years											
Extended warranty	10, 15, 20 years											

1. The active / reactive power output varies as a function of output voltage

Maximize yields with high efficiency and advanced grid support



Maximum energy and return on investment

ABB ULTRA inverters have industry-leading peak and weighted efficiencies. Optimized and accurate system control, an industry-leading MPPT algorithm, and a high-efficiency power converter design ensure that maximum energy is delivered to the power distribution network from the PV modules. For plant owners this translates into a high rate of return.

Proven components

The inverters comprise proven and reliable components, with a long track record of performance in demanding applications and harsh environments. Equipped with extensive electrical and mechanical protection, the inverters operate reliably for the life of the plant.

Multi-stage modular design

ULTRA inverters have a two-stage modular architecture for maximum design flexibility. The two-stage topology results in a wide MPPT window and a high (690Vac) output voltage. The modular design (390kW blocks) enables the integrator to choose an inverter with a master-slave or multimaster configuration. This enables integrators to optimize production for each site and reduces installation and service times.

Effective connectivity to the power distribution network

ABB's transformerless ULTRA inverters enable system integrators to design a PV power plant using the optimum combination of different inverter power ratings. Inverters are connected to the medium voltage (MV) power distribution network either centrally or in a distributed architecture, depending on the plant design and size.

Advanced grid support features

ABB ULTRA inverters include all the latest grid support and monitoring features including active/reactive power curtailment, low/high voltage ride through, power factor and reactive power control.
All these features can be accessed through a supervisory control and data acquisition (SCADA) system. Voltage and frequency droop functions can be enabled for specific applications.

High total performance

- High efficiency (CEC listed)
- Wide MPPT operating range
- Efficient maximum power point tracking
- Liquid-cooled design for a 20-year life

Modular architecture

- Higher up time
- Compact and easy to service
- All front-accessible components
- Integrated and flexible DC input cabinet
- Integrated station design available

Full grid support functionality

- Power factor operation, Q priority mode
- Voltage regulation, active power curtailment
- Droop control functions, VRT, FRT

Extensive protection

- AC output circuit breaker with remote operation
- DC and AC fuses for redundant protection
- DC and AC surge protection standard

Grid code compatibility

- IEEE1547 and NERC PRC-024-1 (CSA-approved)
- Country-specific grid code compliance
- Adjustability to various local utility requirements
- Meets international utility requirements

Proven technology

- Based on ABB‘s market-leading ULTRA technology designed for utility scale PV
- NEMA 4X design with closed-loop liquid cooling
- Zone 4 seismic design

Life cycle service and support

- ABB‘s extensive global service network
- Extended warranties
- Service contracts
- Technical support throughout the product life

Communication

- Modbus RTU, Modbus TCP, Ethernet IP communication interfaces available
- Optional remote monitoring and SCADA reporting

Model configurations

Product line	Model	No isolation transformer	For outdoor use	Power option	North American model*	690Vac 3-Phase delta	Standard options
ULTRA	-750	-TL	OUTD	-1	-US	-690	-ABCDE-FGHJKL
	-1100			-2			
	-1500			-3			
				-4			

Model	Description
-750	750 or 780kW active power
-1100	1100 or 1170kW active power
-1500	1500 or 1560kW active power

Power option	Description
-1	active power = apparent power
-2	reduced active power compared to apparent power
-3	increased efficiency, active power = apparent power
-4	increased efficiency, reduced active power compared to apparent power

Standard options	Description	Available options		
A	MPPT	S = Single Master/Slave	M = Multiple MPPT**	
B	Grounding	S = Solid	R = Resistive	
C	Array configuration	N = Negative gnd	P = Positive gnd	
D	Fuse block (max fuse size)	2 = 200 Amps	4 = 400 Amps	
E	Communication	R = Modbus RTU	T = Modbus TCP	I = Ethernet IP
F	Zone level monitoring	1=Yes	0 = No	
G	Programmable MPPT sweep	1=Yes	0 = No	
H	IR window	1=Yes	0 = No	
J	Leakage current monitor	1=Yes***	0 = No	
K	Array ground insulation monitor	1=Yes	0 = No	
L	Cable glands	1=Yes	0 = No	

*CE-marked, 50Hz inverter also available
**Resistive grounding only.
***Solid and resistive-grounded inverters only

Support and service

ABB supports its customers with a dedicated, global service organization in more than 60 countries, with strong regional and national technical partner networks providing a complete range of life cycle services.

For more information please contact your local ABB representative or visit:

www.abb.com/solarinverters

www.abb.com

9AKK106103A5770 REV 0.1 EN 03.05.2015 #16634

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