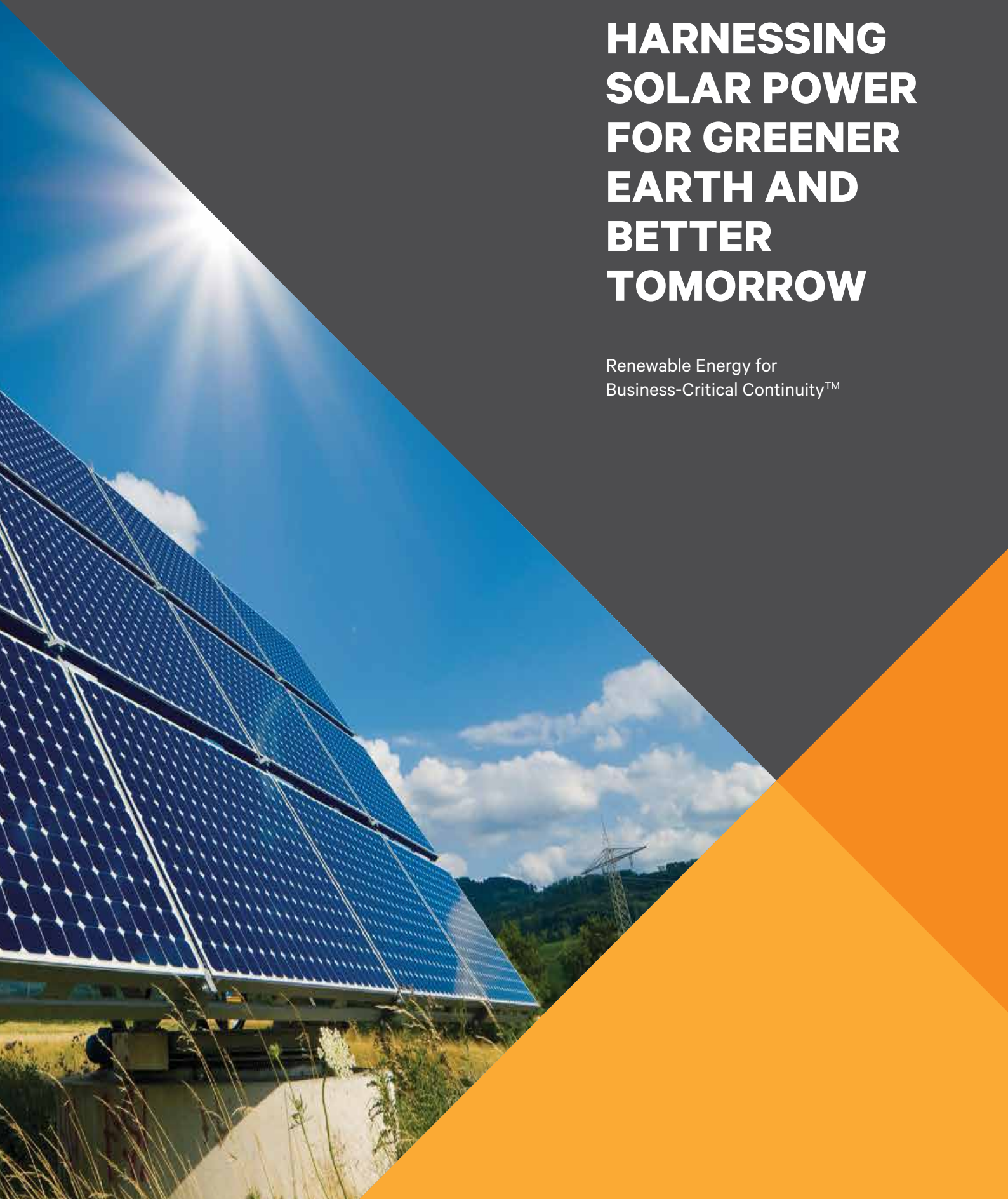




Liebert®

HARNESSING SOLAR POWER FOR GREENER EARTH AND BETTER TOMORROW

Renewable Energy for
Business-Critical Continuity™





Enabling Tomorrow's **CRITICAL EDGE INFRASTRUCTURE**

We helped some of the largest names in the industry bring new capacity online faster and at a lower cost when search and social media increased demand for storage and computing.



We were the first to introduce an integrated enclosure system to distributed networks.



Our portfolio spans power, thermal and infrastructure management products, software and solutions.

Protecting your critical technologies takes more than just great software and equipment. It takes a level of experience that only comes from years of finding solutions when the industry needed them most. We were the first to protect mainframes with precision cooling systems.



And now as challenges and demands grow, we continue to find better ways to help you strengthen your most vital applications. Formerly the Network Power business of Emerson, we've brought together the most trusted and experienced names in critical infrastructure.



Complemented by a network of nearly 250 service centers worldwide. It's a combination of experience and resources that allow us to better adapt to what's needed, anticipate what's next and continue to find solutions in ways other companies simply can't.





VERTIV SOLAR SOLUTIONS

We bring the best suitable solution for your PV Application, ranging from Rooftop Grid-Tie Systems to Decentralized Plants. With Best-in Class Technology and reliable design, our Solar inverters usher in an era of innovative Solar Energy Harnessing, for Self-consumptions as well as for Exporting to Grid.

We cover a complete range of On-Grid and Off-Grid solar inverters of every size. Our technology focuses on providing Energy Reliability, Energy Bill reduction and maximized Earning through Selling.

Our Technology also enables integration of different energy sources.

We provide comprehensive System Monitoring and unmatched service to keep the systems moving.

Energy Export Units:

- Liebert EEU: 10KW to 250 KW
- Liebert EEU+ : 2KW to 50 KW

Energy Storage Units

- Liebert ESU : 10 KW to 100 KW
- Liebert ESU+ : 1KW to 10 KW



Liebert EEU +

(Energy Export Units)

Reliable On-Grid Inverter - 2kW,3kW & 5kW



FEATURES

- Transformer-less design and compact in size
- IP65 protection class
- Firmware is upgradable via RS232 port
- Parallel up to 50 units via RS485 port
- Optional DC switch available
- Comply with latest VDE AR N4105 standard
- MPPT efficiency > 99.9%
- Maximum efficiency > 96.9%
- LCD display
- Versatile communication interface options, standard RS485 port and external WiFi & Ethernet devices
- Monitoring software offers operational status and electricity generated data

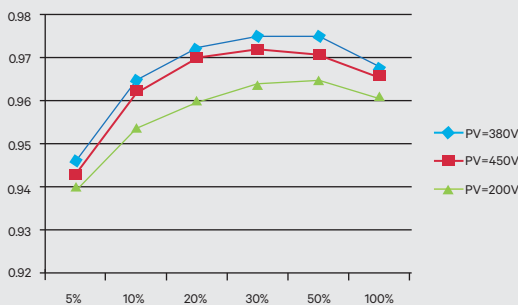


APPLICATIONS

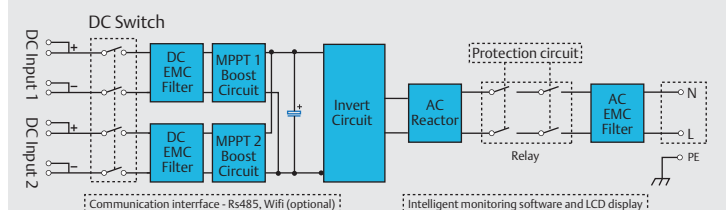
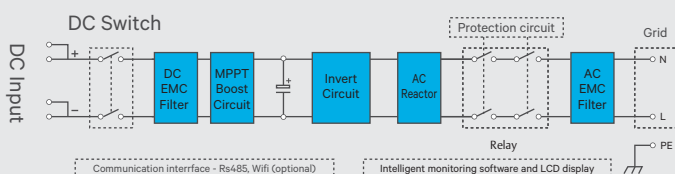
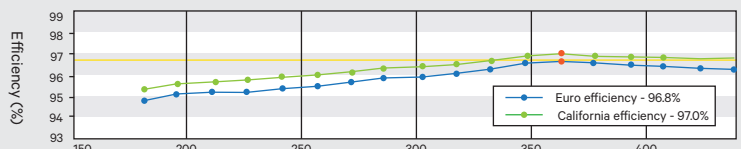
- Residential Grid Export
- Commercial Grid Export
- Decentralised Power Plants



EEU+ 2,3 KW



EEU+ 5 KW



Liebert EEU +

(Energy Export Units)

Reliable On-Grid Inverter - 2kW,3kW & 5kW



Specifications

TECHNICAL CHARACTERISTICS			
Model	EEU+ 2KW	EEU+ 3KW	EEU+ 5KW
Input(DC)			
Maximun input power	2100	3100W	5200W
Maximun input voltage		500V	
MPPT working range		100 ~490V	
Full load MPPT range	190~400V	240~400V	200~400V
Norminal input voltage		360V	
Start Voltage/ Initial Feeding Voltage		120V / 150V	
MPP trackers	1	1	2
Strings / tracker		1	
Maximun input power/tracker	2100W	3100W	3100W
Maximun input current/tracker	11A	13A	13A
DC switch		optional	
Output (AC)			
Norminal output power	2000W	3000W	5000W
Maximun output power	2000W	3000W	5000W
Norminal AC voltage		230Vac	
AC voltage range		187~270V	
Norminal AC frequency		50/ 60Hz	
AC frequency range		48~50.5Hz	
Max. AC output current	9A	13A	22A
Power factor		1	
THDI@full load		<3%	
AC grid		single phase	
Topology		Transformerless	
Efficiency			
Max. conversion efficiency	96.90%	97.30%	97.40%
Euro efficiency	96.40%	96.90%	97.00%
MPPT efficiency		99.90%	
Loss at standby / loss at night loss		<5W / <0W	
Protective device			
RCMU		yes	
Output short protection		yes	
Input insulation detection		yes	
General data			
Size (W/ L/ D) mm		330/ 465/ 150	
Weight	13kg	14.5kg	14.5kg
Operating temperature range		-20 °C +60 °C	
Noise emisiion		<25dB	
Cooling concept		Natrual	
Outdoor installation		yes	
Degree of protection		IP65	
Feature			
Display		LCD 1604	
Communications		RS232 (RS485 / WiFi optional)	
Potential free contactor		YES	

Product specifications are subject to change without further notice

Liebert EEU +

(Energy Export Units)

Reliable On-Grid Inverter - 10kW-20kW



FEATURES

- MPPT efficiency > 99.9%
- Maximum efficiency > 98.0%
- Two independent MPP tracking gains optimal energy harvesting
- Low sensitivity to grid disturbances to avoid undesired disconnection from the grid
- Wide range of input voltage and operation environment
- Wide DC input range from 250V up to 950V
- Wide operating temperature range -25°C to +60°C
- IP65 harshest industrial protection for indoors & outdoors
- RS232/RS485/WiFi Interfaces
- Easy-to-read LCD display with all operational status and monitored data

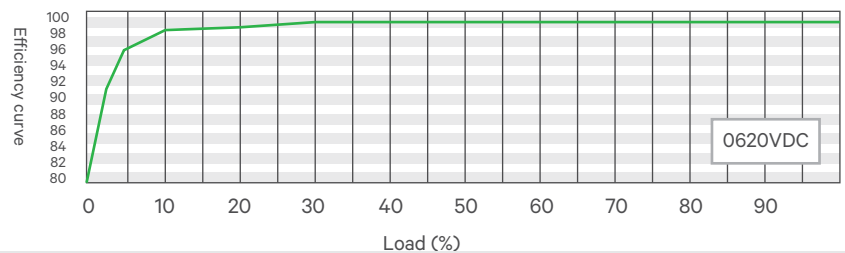


APPLICATIONS

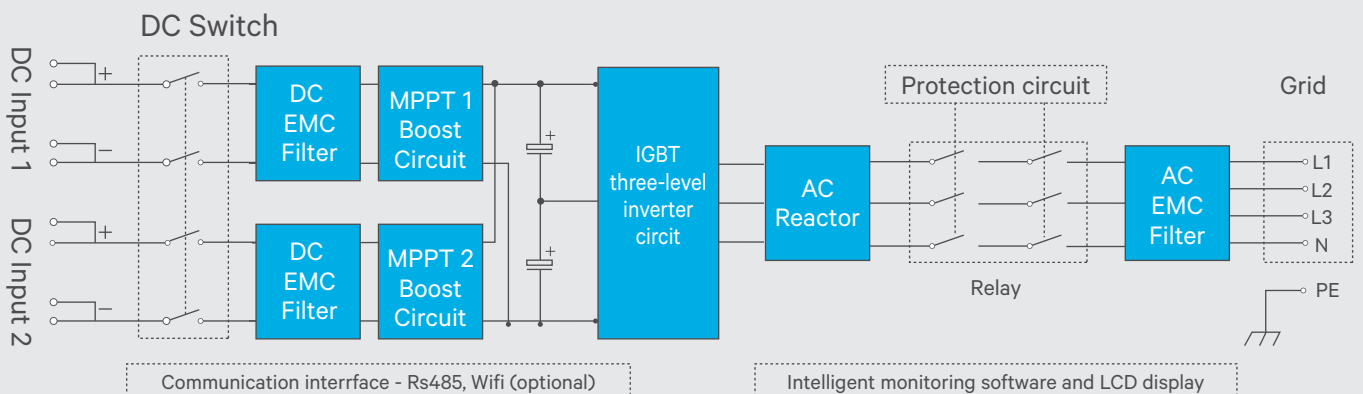
- Residential Grid Export
- Commercial Grid Export
- Decentralised Power Plants



Efficiency curve



Circuit diagram



Liebert EEU +

(Energy Export Units)

Reliable On-Grid Inverter - 10kW-20kW



Specifications

TECHNICAL CHARACTERISTICS

Model Specifications	EEU+ 10KW	EEU+ 20KW
Input(DC)		
Max. DC power	11KW	22 KW
Max. DC voltage	1000V	
MPPT voltage range	250-950V	
Full load voltage range	480-800V	
Normal DC voltage	620V	
Min./start DC voltage	200 / 250V	
Number of MPP trackers	2	
Strings per MPP tracker	1	2
Max. DC power per MPP tracker	6KW	12KW
DC Switch	yes	
Max. input current per MPP tracker	13A/ 13A	21A/ 21A
Output (AC)		
Normal AC output Power	10KW	20KW
Max. AC output Power	11KW	22KW
Normal AC voltage	400V	
AC voltage range	400V +/-20%	
Normal AC grid frequency	50/ 60Hz	
AC grid frequency range	±5Hz	
Max. output current	17A	32A
Phase shift (cos (p))	0.8leading- 0.8laging	
THDI	<3%	
AC connection	Three phase	
Topology	Transformerless	
Efficiency		
Max. efficiency	98.0%	
Euro-eta	97.5%	97.7%
MPPT efficiency	99.9%	
Consumption: standby / night	<10W/<2W	<15W/< 2W
Protection devices		
All-pole fault current monitoring unit	yes	
AC short-circuit protection	yes	
Ground fault monitoring	yes	
Mechanism Data		
Dimensions (W/ L/ D) in mm	550/ 700/ 250	
Weight	35Kg	40Kg
Environment Data		
Operating temperature range	-25°C... +60°C	
Noise emission (typical)	<40 dB	
Cooling concept	Natural	
Installation	Indoors / Outdoors	
Protection rating	IP65	
Features		
LCD display	yes	
Interfaces	RS485 / Optional (SN M P / WiFi)	

Product specifications are subject to change without further notice

Liebert EEU +

(Energy Export Units)

Reliable On-Grid Inverter - 30kW-50kW



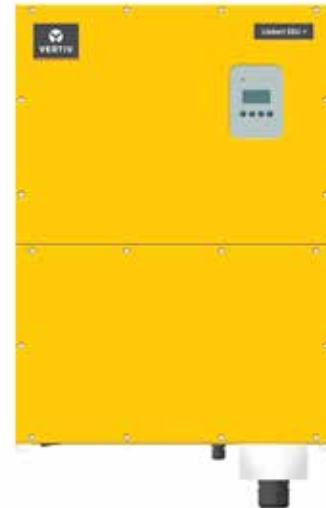
FEATURES

- MPPT efficiency > 99.9%
- Maximum efficiency > 98.3%
- Three independent MPP tracking gains optimal energy harvesting
- Low sensitivity to grid disturbances to avoid undesired disconnection from the grid
- Wide range of input voltage and operation environment
- Wide DC input range from 250V up to 950V
- Wide operating temperature range -25°C to +60°C
- IP65 harshest industrial protection for indoors & outdoors
- RS232/RS485/WiFi Interfaces
- Easy-to-read LCD display with all operational status and monitored data

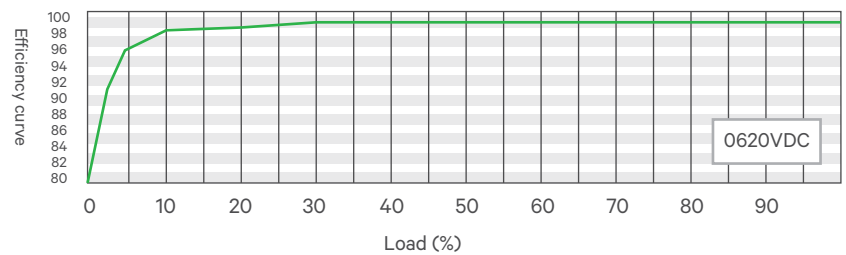


APPLICATIONS

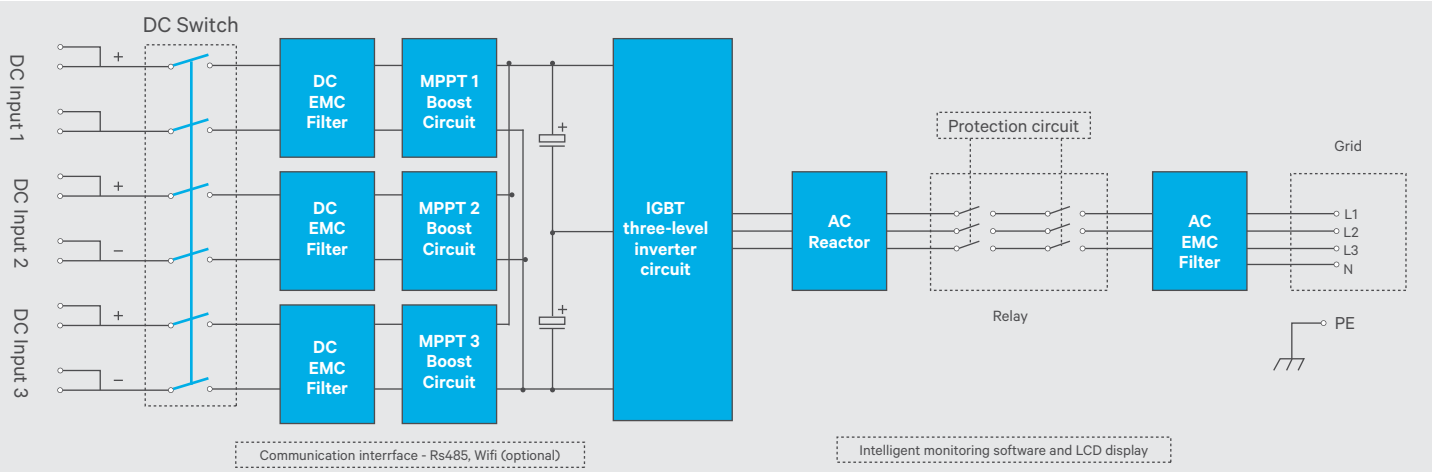
- Residential Grid Export
- Commercial Grid Export
- Decentralised Power Plants



Efficiency curve



Circuit diagram



Liebert EEU +

(Energy Export Units)

Reliable On-Grid Inverter - 30kW-50kW



SPECIFICATIONS

TECHNICAL CHARACTERISTICS		
Model Specifications	EEU+ 30KW	EEU+ 50KW
Input(DC)		
Max. DC power	35KW	67 KW
Max. DC voltage	1000V	
MPPT voltage range	250-950V	
Full load mppt voltage range	480-800V	
Normal DC voltage	620V	
Min./start DC voltage	200V/ 250V	
Number of MPP trackers	3	
Strings per MPP tracker	2	4
BUS.V	620V	
DC Switch	yes	
Max. input current per MPP tracker	26A/26A/26A	36A/36A/36A
Output (AC)		
Normal AC output Power	30KW	80KW
Max. AC output Power	33KW	55KW
AC voltage range	400V +/-20%	
AC grid frequency range	50/60Hz +/- 5 Hz	
Rated. output current	44A	72A
Max. output current	48A	80A
Phase shift (cos (p))	+/-0.8	
THDI	<3%	
AC connection	3W I N I PE	
Topology	Transformerless	
Efficiency		
Max. efficiency	98.3%	98.6%
Euro-eta	98.0%	98.2%
MPPT efficiency	99.9%	
Consumption: standby/night	<15W/ <2W	
Protection devices		
All-pole fault current monitoring unit	yes	
AC short-circuit protection	yes	
Ground fault monitoring	yes	
Mechanism Data		
Dimensions (W/ L/ D) in mm	636/ 958/ 260	
Weight	61 Kg	68Kg
Environment Data		
Operating temperature range	-25°C...+60°C	
Noise emission (typical)	<40dB	<60dB
Cooling concept	Natural	Fans
Protection rating	IP65	
Features		
LCD display	yes	
Interfaces	RS485	

Liebert ESU

(Energy Export Units)

10kW to 100kW OFF Grid Solar Inverter



FEATURES

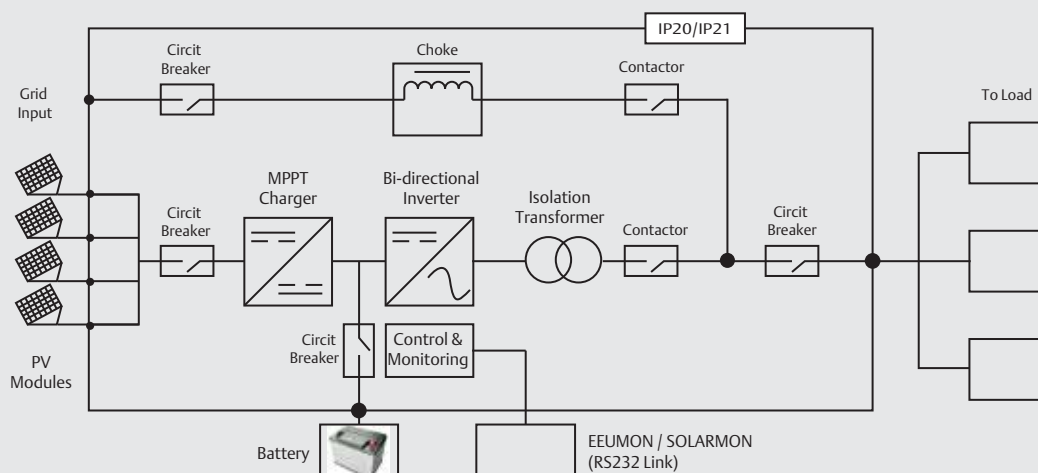
- Micro processor based design
- Bi-directional Solar Inverter with MPPT charge controller
- High Efficiency & Reliability
- 20 years design life. Tropicalised design
- Hybrid inverter Operation with Wind I 06
- Inbuilt LCD display
- Sophisticated local & remote monitoring system(Optional)
- Built in output isolation transformer
- Compliance to test standards
- "During insufficient Solar Power, Grid shares with solar to cater constant load. This avoid battery discharge. (optional)"
- "ESU three phase models - paralleling (max 3 nos. in standalone mode) (Optional)"

APPLICATIONS

- Rooftops with Storage as well as Export
- Solar Hybrid Systems
- Commercial Grid-Interactive with Storage
- Remote Community Electrification

Liebert ESU is single/three phase output bi-directional inverter system. ESU operates in parallel with the grid utility. Solar Photovoltaic panels convert solar energy into electrical energy as DC power. This DC power is used to charge the batteries through a charge controller and also used for the load through inverter. Additional energy is exported to the grid.

Optional Feature - For the ESU rating. During insufficient SolarPower, Grid shares with solar to cater constant Load. This avoid battery discharge.



Liebert ESU

(Energy Export Units)

10kW to 100kW OFF Grid Solar Inverter



Specifications

PARAMETERS	10 kW (1-phase)	10 kW (3 phase)	20 kW	30 kW	50 kW	100 kW
INVERTER MODEL	Liebert ESU: 10-100 kW, 3 Phase					
INPUT						
Maximum Solar Array Input (KWp)	12kWp	12kWp	24kWp	36kWp	60kWp	120kWp
Array Input Current	66Amp	66Amp	67Amp	100Amp	167Amp	335Amp
Array Voltage Range	100 - 220 VDC	100 - 220 VDC	200 - 440 VDC			
Max. open circuit voltage	220 VDC	220 VDC	440 VDC			
MPPT voltage range	140 TO 170 VDC	140 TO 170 VDC	280 TO 340 VDC			
CHARGER CONTROLLER	MPPT					
BATTERY						
Voltage	120 VDC	120 VDC	240 VDC			
Max. Grid Charging Current ⁽⁵⁾	60A	60A	60A	90A	177A	354A
Type	SMF1 Lead Acid Wet Cell					
OUTPUT						
Power Capacity	10kW	10kW	20kW	30kW	50kW	100kW
Voltage / Frequency	415 Vac, Three Phase, 50 HZ					
Load Power Factor	0.8 Lag to Unity					
Regulation	+/- 2%					
Voltage Distortion	<2% at Linear load & <5% at Non Linear load					
Grid tracking voltage) frequency	415 Vac +/-10% /50 Hz (+/- 3 Hz)					
Over Load	125% for 10 Minutes and 150% for 1 Minute					
Peak Efficiency	>=91%	>=91%	>=91%	>=92%	>=93%	>=93%
OPERATING MODES	1.Stand alone 2.Grid Interactive					
ENVIRONMENTAL						
Operating Temperature ⁽²⁾	0 to 45°C	0 to 45°C	0 - 45°C			
Storage Temperature	-10 to +55°C					
Relative Humidity	Upto 95% RH Non Condensing					
Acoustics Noise ⁽²⁾	< 62 dB	< 62 dB	<62 dB	< 62 dB	< 72 dB	<72 dB
Altitude)<	<1000 meter above Sea Level					
MECHANICAL						
IP	IP 20					
Cooling	Forced Cool					
Dimensions Wx Dx H in mm	400 x 800 x 950		550x 900 x 1300		1000x 900x 1900	1200 x 1000x2050
Weight in kg. (approx.)	240	250	400	800	1115	
LCD DISPLAY	Inbuilt					
MONITORING (Optional)	RS232 / RS 485 / HTTP I MODBUS / MODEM,S / W ESUMON / RMON / WEBMON					
STANDARD	IEC 62040 -3, Self Certifications					

Liebert ESU +

(Energy Storage Units)

On-Grid Inverter with Energy Storage

1kW-2kW-3kW-5kW



SPECIFICATIONS

MODEL	ESU+ 1K-12	ESU+ 2K-24	ESU+ 3K-48	ESU+ 5K-48
Max. PV Array Power	1000W	2000W	4000W	6000W
Rated Output Power	1000W	2000W	3000W	5000W
Maximum PV Array Open Circuit Voltage	145 VDC	145 VDC	145 VDC	145 VDC
MPPT Range	15 VDC — 115 VDC	30 VDC — 115 VDC	60 VDC — 115 VDC	60 VDC — 115 VDC
Number	1	1	1	2
GRID-TIE OPERATION				
GRID OUTPUT (AC)				
Nominal Output Voltage	220/230/240 VAC			
Output Voltage Range	184 - 264.5 VAC			
Nominal Output Current	4.3 A	8.7 A	13 A	21.7 A
Power Factor	> 0.99			
EFFICIENCY				
Maximum Conversion Efficiency (DC/AC)	90%			
OFF-GRID, HYBRID OPERATION				
GRID INPUT				
AC Start-up Voltage / Auto Restart Voltage	120-140 VAC / 180 VAC			
Acceptable Up Voltage Range	170 -280 VAC			
Maximum AC Input Current	30A		40A"	
BATTERY MODE OUTPUT (AC)				
Nominal Output Voltage	202/208/220/230/240 VAC			
Output Waveform	Pure sine wave			
Efficiency (DC to AC)	93%			
BATTERY & CHARGER				
Nominal DC Voltage	12 VDC	24 VDC	48 VDC	48 VDC
Maximum Solar Charge Current	80 A	80 A	80 A	120 A
Maximum AC Charge Current	60 A			
Maximum Charge Current	140 A	140 A	40 A	180 A
GENERAL				
PHYSICAL				
Dimension, D x W x H (mm)	100 x 300 x 450	100 x 300 x 450	120 x 295 x 468	194 x 295 x 455
Net Weight (kgs)	8	8	11	16
INTERFACE				
Parallel Function	NA	NA	Yes	Yes
External Safety Box	Yes (Optional)			
Communication	USB/Dry contact			
ENVIRONMENT				
Humidity	0 — 90% RH (No condensing)			
Operating Temperature	0 to 50°C			

Product specifications are subject to change without further notice

Specifications

Technical Characteristics

MODEL	ESU+ Three Phase 10KW
PHASE	3-phase in / 3-phase out
RATED OUTPUT POWER	10000 W
MAXIMUM CHARGING POWER	9600 W
GRID-TIE OPERATION	
PV INPUT (DC)	
Maximum PV Input Power	14850W
Nominal DC Voltage / Maximum DC Voltage	720 VDC / 900 VDC
Start-up Voltage / Initial Feeding Voltage	320 VDC / 350 VDC
MPP Voltage Range	350 VDC ~ 850 VDC / 400 VDC ~ 800 VDC
Number of MPP Trackers / Maximum Input Current	2 / 2x 18.6 A
GRID OUTPUT (AC)	
Nominal Output Voltage	230 VAC (P-N) / 400 VAC (P-P)
Output Voltage Range	184 - 265 VAC per phase
Nominal Output Current	14.5 A per phase
Power Factor	> 0.99
EFFICIENCY	
Maximum Conversion Efficiency (DC/AC)	96%
European Efficiency@ Vnominal	95%
OFF-GRID OPERATION	
AC INPUT	
AC Start-up Voltage/Auto Restart Voltage	120 - 140 VAC per phase / 180 VAC per phase
Acceptable Input Voltage Range	170 - 280 VAC per phase
Maximum AC Input Current	40 A
PV INPUT (DC)	
Maximum DC Voltage	900 VDC
MPP Voltage Range	350 VDC ~ 850 VDC / 400 VDC ~ 800 VDC
Number of MPP Trackers / Maximum Input Current	2 / 2x 18.6 A
BATTERY MODE OUTPUT (AC)	
Nominal Output Voltage	230 VAC (P-N) / 400 VAC (P-P)
Output Waveform	Pure Sinewave
Efficiency (DC to AC)	91%
HYBRID OPERATION	
PV INPUT (DC)	
Nominal DC Voltage / Maximum DC Voltage	720 VDC / 900 VDC
Start-up Voltage / Initial Feeding Voltage	320 VDC / 350 VDC
MPP Voltage Range	350 VDC ~ 850 VDC / 400 VDC ~ 800 VDC
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Acceptable Input Voltage Range	170 - 280 VAC per phase
Maximum AC Input Current	40 A
BATTERY MODE OUTPUT (AC)	
Nominal Output Voltage	230 VAC (P-N) / 400 VAC (P-P)
Efficiency (DC to AC)	91%
BATTERY & CHARGER	
Nominal DC Voltage	48 VDC
Maximum Charging Current	Default 60A, 10A - 200A (Adjustable)
GENERAL	
PHYSICAL	
Dimension, D X W X H (mm)	550 x 438 x 120
Net Weight (kgs)	16
INTERFACE	
Communication Port	RS-232/USB
Intelligent Slot	Optional SNMP, Modbus, and AS-400 cards available
ENVIRONMENT	
Humidity	0 ~ 90% RH (No condensing)
Operating Temperature	-10 to 55°C
Altitude	0 ~ 1000 m*



