



## MERU

### Solar Off-Grid Inverters

- 3 kW/ 5 kW/ 10 kW Off-Grid Solar Inverters with LCD and LED displays
- 48 VDC battery versions for 3kW, 120 VDC battery for 5kW and 240 VDC for 10 kW
- Pure Sine wave with highest efficiency
- Fully configurable (PV / Grid priority modes)
- Digital Signal Processor (DSP) based system
- State of Art Technology with efficient MPPT algorithm
- Fully protected against various faults
- Optional RS-485 / GPRS / GSM
- Battery & PV panel are galvanically isolated from O/P
- Automatic Voltage Regulator (AVR) in Grid mode
- Plug & Play: tools-free wiring and hassle-free bypass
- Easy wall-mount installation resulting in reduced floor space

## 1.0 MERU Product Family

The MERU product-line consists of 3kW/ 5kW/ 10kW feature-rich, high performance, pure sine wave, solar off-grid Power Conditioning Units (PCU). It is a wall mounted system with IP-21 ingress protection and is designed for global markets.

### The key features of the PCU are:

- High power conversion efficiency (up to 90% in inverter mode and greater than 97% for charge controller)
- MPPT algorithm to maximize energy harvesting efficiency (greater than 98%)
- Fully protected against various installation related mistakes and operational faults
- LCD and LED indications for status monitoring and faults
- Designed for long operational life (3year warranty plus two year extended warranty)
- Advanced energy management algorithm to maximize return on investment
- Plug & play and tool-less installation (easy access to all connections without a need to open the unit)

## 2.0 Applications

- Conditioned and stored power for residential & commercial setups
- Emergency AC power for disaster management
- Nano-grid for rural setups

## 3.0 Specifications

3.1 Model and Power Rating:	3 kW – 48 V I/P	5 kW – 120 V I/P	10 kW – 240 V I/P
Inverter Model	MERU 3K-48	MERU 5K-48	MERU 10K-240
Power rating	3000 VA / 2400 W	5000 VA / 5000 W	10000 VA / 10000 W

3.2 Charge Controller:	3 kW – 48 V I/P	5 kW – 120 V I/P	10 kW – 240 V I/P
Max PV Input power	3000 W	5000 W	10000 W
DC-DC Efficiency	> 97%	> 97%	> 97%
Max Charging current	60 A	40 A	40 A
Max DC I/P voltage	200 VDC	300 VDC	600 VDC
MPPT DC voltage range	48 to 200 VDC	120 to 300 VDC	240 to 600 VDC
Charging current configuration	Settable using front panel keys		
DC input connector			

3.3 Input AC Power:	3 kW – 48 V I/P	5 kW – 120 V I/P	10 kW – 240 V I/P
AC charging current	20 A	10 A	10 A
Input AC Voltage range	165 V to 275 VAC		
Input frequency	47 - 53 Hz / 57 to 63 Hz		
AC Input connector			

3.4 Output AC Power:	3 kW - 48 V I/P	5 kW - 120 V I/P	10 kW - 240 V I/P
Maximum AC O/P Power	3000 VA / 3000 W	5000 VA / 5000 W	10000 VA / 10000 W
Voltage	230 VAC +/-5%, 1-Phase		
Frequency	50 Hz or 60 Hz (+/- 0.5 Hz) in Inverter Mode		
AC output connector	Terminal Block		
Output waveform / THD	Pure sine wave / <3% THD For Linear Loads		
Isolation Type	Line Frequency Transformer		
Load Power Factor	0.8 lag to Unity		
Typical transfer time	Less than 10 ms		
Load reconnection	Automatic		

3.5 Battery	3 kW - 48 V I/P	5 kW - 120 V I/P	5 kW - 240 V I/P
Voltage	48 VDC	120 VDC	240 VDC
Suggested Battery Ah capacity	12V, 150 Ah x 4 Nos.	12V, 150 Ah x 10 Nos.	12V, 150 Ah x 12 Nos.
Max Charge current	40 A	40 A	40 A
Max Discharge current	80 A	50 A	50 A
Battery LVD cut off	43 +/- 0.2V	107.5 +/- 0.2V	215 +/- 0.2V
Charging Priority	Solar priority / grid priority		
Power saving recovery time	5 secs		

3.6 Energy Management (for all models):	
Scenario #1: Solar Priority 1. Full battery 2. PV present <sup>1</sup> 3. Grid present	PV will charge battery and supply power to load. Grid will be in standby mode. If PV power is inadequate, battery will also feed the load. Once battery reaches a preset lower limit, Grid will feed the load. PV will continue charging the battery using MPPT algorithm.
Scenario #2: Solar Priority 1. Full battery 2. PV not present <sup>2</sup> 3. Grid present	Battery will feed the load until it discharges to a preset lower limit. Then on, Grid will feed the load and charge the battery up to a preset upper limit.
Scenario #3: Grid Priority 1. Full / low battery 2. PV not present 3. Grid present	Grid will feed the load and also charge the battery if required. Upon grid failure <sup>3</sup> , the load will be transferred to the battery in inverter mode till grid resumes or the battery is fully discharged.
Scenario #4: Grid Priority 1. Low battery 2. PV present 3. Grid present	Grid will feed the load, and PV will charge the battery using MPPT algorithm. Upon grid failure, the load will be fed by PV & battery till grid resumes.
Solar & Grid Priority setting	Settable using front panel keys

## Notes:

1. Bright day and sufficient PV energy can be harnessed
2. Early mornings, evenings, partially and fully cloudy days with insufficient PV energy
3. Grid failure means: grid over voltage, under voltage, over frequency, under frequency and grid outage.

3.7 Efficiency & Overload:	3 kW - 48 V I/P	5 kW - 120 V I/P	10 kW - 240 V I/P
Inverter Peak Efficiency	90%	92%	93%
Inverter Overload	110 % for 1 min., 300 % for 0.1 s		
Internal power consumption during operations	~ 40 Watts	~ 50 Watts	~ 100 Watts

**3.8 Safety & Protection (for all models):**

Battery, PV, AC & Others	Battery Low	Battery High	Battery reverse polarity
	PV reverse Polarity	PV Reverse Current flow	Input Over Voltage
	Input Under Voltage	Input High/Low Frequency	Input Surge Voltage
	Over Load	Over Charge	Over Temperature
	Fuse for battery short circuit protection	Circuit breaker for AC overload	AC O/P short circuit

**3.9 Environmental (for all models):**

Operating temperature	0 to 50 deg C
Storage temperature	-10 to 60 deg C
Relative Humidity	Up to 95% Non-condensing
Noise level	< 50 dBA
Altitude	< 2000 meter above sea level

<b>3.10 Mechanical:</b>	<b>3 kW – 48 V I/P</b>	<b>5 kW – 120 V I/P</b>	<b>10 kW –240 V I/P</b>
Weight in kg	50	71	100
Ingress protection	IP 21		
Cooling	Temperature / Load dependent forced Air cooling		
Dimensions (W x D x H) in mm	316.3 x 501.3 x 507	316.3 x 501.3 x 507	(316.3 x 501.3 x 507) x 2

**3.11 Monitoring (for all models):**

LED Indicators	Mains Input ON	Battery (Normal)	Bypass
	Inverter ON	PV ON	Over Load
LCD Display	PV Array Voltage	Mains Voltage	Inverter Voltage
	PV Array Current	Mains Current	Inverter Current
	PV Array Watts	Mains Watts	Inverter Watts
	PV Array kWh	Mains kWh	Inverter kWh
	Battery Voltage	Batt. Chg. Status in %	Date & Time
		System fault status	
	Internal unit temperature		
Internal RTC	Yes & settable		

**3.12 Data Communication (for all models):**

Interface options	RS 485 / GPRS / GSM
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**4.0 Reliability**

With 2 years extended warranty

All Specifications are subject to change without notice