

By Ohmium



MERU

Solar Off-Grid Inverters

- 1 kW / 2 kW / 3 kVA Off-Grid Solar Inverters with LCD and LED displays
- 24 VDC battery versions for 1 kW and 48 VDC for 2 kW / 3kVA
- 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
- Ingress protection category: IP-21

1.0 MERU Product Family

The MERU product-line consists of 1kW/ 2kW/ 3kVA 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 92% 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: | 1 kW - 24 V I/P | 2 kW - 48 V I/P | 3 kVA - 48 V I/P |
|-----------------------------|------------------|------------------|------------------|
| Inverter Model | MERU 1K-24 | MERU 2K-48 | MERU 2.4K-48 |
| Power rating | 1200 VA / 1000 W | 2400 VA / 2000 W | 3000 VA / 2400 W |

| 3.2 Charge Controller: | 1 kW - 24 V I/P | 2 kW - 48 V I/P | 3 kVA - 48 V I/P |
|--------------------------------|---------------------------------|-----------------|------------------|
| Max PV Input power | 1000 W | 2000 W | 2000 W |
| DC-DC Efficiency | > 97% | > 97% | > 97% |
| Max Charging current | 40 A | 40 A | 40 A |
| Max PV I/P voltage | 45 VDC | 90 VDC | 90 VDC |
| MPPT DC voltage range | 23 to 45 VD | 46 to 90 VDC | 46 to 90 VDC |
| Charging current configuration | Settable using front panel keys | | |
| PV input connector | MC4 | | |

| 3.3 Input AC Power: | 1 kW - 24 V I/P | 2 kW - 48 V I/P | 3 kVA - 48 V I/P |
|------------------------|--------------------------|-----------------|------------------|
| AC charging current | 20 A | 20 A | 20 A |
| Input AC Voltage range | 165 V to 275 VAC | | |
| Input frequency | 47 - 53 Hz / 57 to 63 Hz | | |
| AC Input connector | IEC Connector | | |

| 3.4 Output AC Power: | 1 kW - 24 V I/P | 1 kW - 24 V I/P | 3 kVA - 48 V I/P |
|-----------------------|--|------------------|------------------|
| Maximum AC O/P Power | 1200 VA / 1000 W | 2400 VA / 2000 W | 3000 VA / 2400 W |
| Voltage | 230 VAC +/-5%, 1-Phase | | |
| Frequency | 50 Hz or 60 Hz (+/- 0.5 Hz) in Inverter Mode | | |
| AC output connector | IEC Connector | | |
| 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 | 1 kW - 24 V I/P | 2 kW - 48 V I/P | 3 kVA - 48 V I/P |
|-------------------------------|--------------------------------|----------------------|----------------------|
| Voltage | 24 VDC | 48 VDC | 48 VDC |
| Suggested Battery Ah capacity | 12V, 200 Ah x 2 Nos. | 12V, 150 Ah x 4 Nos. | 12V, 150 Ah x 4 Nos. |
| Max Charge current | 0.2C, limited to 40A | 0.2C, limited to 40A | 0.2C, limited to 40A |
| Max Discharge current | 53 A | 53 A | 62 A |
| Battery LVD cut off | 21.5 +/- 0.2V | 43 +/- 0.2V | 43 +/- 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 ¹ 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 ² 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 ³ , 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:

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

| 3.7 Efficiency & Overload: | 1 kW - 24 V I/P | 2 kW - 48 V I/P | 3 kVA - 48 V I/P |
|--|---------------------|-----------------|------------------|
| Inverter Peak Efficiency | 92% | 92% | 92% |
| Inverter Overload | 100 - 150 % for 30s | | |
| Internal power consumption during operations | ~ 20 Watts | ~ 30 Watts | ~ 40 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 | < 40 dBA |
| Altitude | < 2000 meter above sea level |

| | | | |
|------------------------------|---|------------------------|-------------------------|
| 3.10 Mechanical: | 1 kW - 24 V I/P | 2 kW - 48 V I/P | 3 kVA - 48 V I/P |
| Weight in kg | 19 | 29 | 29 |
| Ingress protection | IP 21 | | |
| Cooling | Temperature / Load dependent forced Air cooling | | |
| Dimensions (W x D x H) in mm | 352 x 150 x 462 | | |

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 |
|-------------------|---------------------|

4.0 Reliability

With 2 years extended warranty

All Specifications are subject to change without notice