



POWERING **PROGRESS,**  
ENERGIZING **LIVES**



**TELECOM**





# TELECOM SOLUTIONS

**Hybrid SMPS**

**Rectifier Module**

**Solar Module**

**Telecom**

**Battery Pack : 48V50Ah**

**Battery Pack : 48V100Ah**

**Controller**



## Telecom

With our advanced telecom energy solutions, we empower communication infrastructure through high-performance lithium battery systems, intelligent power management, and reliable backup solutions, ensuring seamless network operation and maximum up time.



### Key Features



#### **Built for 5G & Telecom Infrastructure**

Specially designed for telecom towers, BTS sites, data communication hubs, and critical backup applications.



#### **Maximizing Energy Efficiency**

With our super high-efficiency rectifiers, we significantly reduce power losses, ensuring lower energy costs and more sustainable network operations.



#### **Streamlining Network Deployment**

Our Telecom Power Solutions simplify the process of telecom site solarization, enabling quick integration of renewable energy for scalable infrastructure growth and reducing reliability on grid power.



#### **Enhancing System Intelligence**

Advanced monitoring and control tools enable real-time insights, optimizing the management of solar-powered telecom sites and efficient energy use.



#### **Driving Future-Ready Networks**

We empower telecom providers with sustainable, energy-efficient solutions like solarization and high-efficiency rectifiers, helping create resilient systems for tomorrow's connectivity.



#### **Ensuring Uninterrupted Operations**

Our all-time power solutions, including reliable backup systems powered by lithium-ion batteries, ensure consistent network performance, even during power outages.

## Hybrid SMPS

A Switch Mode-Power Supply system uses a switching regulator to transfer electrical power from a source — usually an AC outlet — to a DC device effectively. Our super highly efficient SMPS systems hold a unique position in the market for their overall performance, cost-effectiveness, customization possibilities and more.

| Model No                      | CLN-9KHR                                                                                                                                                | CLN-24KHR                        | CLN-36KHR                                            |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------------------------|
| AC Input Distribution         |                                                                                                                                                         |                                  |                                                      |
| Input Mode                    | 220 VAC Single Phase                                                                                                                                    |                                  | 380 VAC Three Phase                                  |
| Input Capacity                | 63A/2Px1                                                                                                                                                | 63A/4Px1                         | 125A/4Px1                                            |
| Input Frequency               | 45 to 66 Hz, rated value, 50 to 60 Hz                                                                                                                   |                                  |                                                      |
| SPD                           | 20kA/40kA, 8/20 μs                                                                                                                                      |                                  |                                                      |
| DC Input Distribution         |                                                                                                                                                         |                                  |                                                      |
| Input Mode                    | 120VDC to 425VDC                                                                                                                                        |                                  |                                                      |
| Input Capacity                | 63A/2Px5                                                                                                                                                | 63A/2Px3                         | 63A/2Px6                                             |
| SPD                           | 20kA/40kA, 8/20 μs                                                                                                                                      |                                  |                                                      |
| Rectifier Output Distribution |                                                                                                                                                         |                                  |                                                      |
| O/P Voltage                   | -42 to -58 VDC, rated value: -53.5VDC                                                                                                                   |                                  |                                                      |
| Battery Breakers              | 125A/2P                                                                                                                                                 | 125A/1PNx6                       | 250A/1Px3(125A/3Px3)                                 |
| Load Breakers                 | Llvd: 32A/1P x 1 + 10A/1P x 5,                                                                                                                          | Llvd: 125A/1PN x 1 + 63A/1PN x 3 | Llvd: 125A/1P x 2 + 25A/1P x 1                       |
|                               | Blvd: 32A/1P x 2, 10A/1Px5                                                                                                                              | Blvd: 32A/1PN x 3, 16A/1Px3      | Blvd: 125A/1P x 2, 6A/1Px2                           |
| DC SPD                        | 10kA/40kA, 8/20 μs                                                                                                                                      |                                  |                                                      |
| Solar Output Distribution     |                                                                                                                                                         |                                  |                                                      |
| O/P Voltage                   | -42 to -58 VDC, rated value: -54.5VDC                                                                                                                   |                                  |                                                      |
| Battery Breakers              | 125A/2P                                                                                                                                                 | 125A/1PNx6                       | 250A/1Px3(125A/3Px3)                                 |
| Load Breakers                 | Llvd: 32A/1P x 1 + 10A/1P x 5,                                                                                                                          | Llvd: 125A/1PN x 1 + 63A/1PN x 3 | Llvd: 125A/1P x 2 + 25A/1P x 1                       |
|                               | Blvd: 32A/1P x 2, 10A/1Px5                                                                                                                              | Blvd: 32A/1PN x 3, 16A/1Px3      | Blvd: 125A/1P x 2, 6A/1Px2                           |
| SPD                           | 10kA/40kA, 8/20 μs                                                                                                                                      |                                  |                                                      |
| Rectifier Module              |                                                                                                                                                         |                                  |                                                      |
| Input Voltage                 | 85 to 290VAC, rated 220VAC                                                                                                                              |                                  |                                                      |
| Efficiency                    | >96%                                                                                                                                                    |                                  |                                                      |
| Rated Power                   | 3000W (176 to 290VAC)                                                                                                                                   |                                  |                                                      |
| Working Temperature           | -10°C to +75°C                                                                                                                                          |                                  |                                                      |
|                               | (fully output below 55°C)                                                                                                                               |                                  |                                                      |
| Solar Module                  |                                                                                                                                                         |                                  |                                                      |
| Input Voltage                 | 120 to 425VDC, rated 340VDC                                                                                                                             |                                  |                                                      |
| Efficiency                    | >96%                                                                                                                                                    |                                  |                                                      |
| Rated Power                   | 3000W (200 to 425VDC)                                                                                                                                   |                                  |                                                      |
| Working Temperature           | -10°C to +75°C                                                                                                                                          |                                  |                                                      |
|                               | (fully output below 50°C)                                                                                                                               |                                  |                                                      |
| Controller                    |                                                                                                                                                         |                                  |                                                      |
| Signal Input                  | 3A, (2 battery temp, 1 ambient temp.), 2 RS 485, 7 D                                                                                                    |                                  | 4A, (2 battery temp, 1 ambient temp.), 2 RS 485, 7 D |
| Alarm Output                  | 6 dry Contact                                                                                                                                           |                                  | 7 dry Contact                                        |
| Communication Port            | RS 485, SNMP                                                                                                                                            |                                  |                                                      |
| Display Mode                  | LCD                                                                                                                                                     |                                  |                                                      |
| System                        |                                                                                                                                                         |                                  |                                                      |
| Cooling Mode                  | Natural cooling                                                                                                                                         |                                  |                                                      |
| Maintenance Mode              | Front maintenance                                                                                                                                       |                                  |                                                      |
| Protection Level              | IP 20                                                                                                                                                   |                                  |                                                      |
| Environment                   |                                                                                                                                                         |                                  |                                                      |
| Operating Temperature         | -10°C to +50°C                                                                                                                                          |                                  |                                                      |
| Operating Humidity            | 5% to 95%(non-condensing)                                                                                                                               |                                  |                                                      |
| Altitude                      | 0 to 4000m (if the altitude is within the range of 3000m to 4000m, the maximum operating temperature decreases by 1°C as the altitude increase by 200m) |                                  |                                                      |

## Rectifier Module:

Modular rectifiers with advanced functionality and steady power adapted to the innovation of telecom power supplies.

| Model No                | CLN483000RM                                           | CLN484000RM                                                  |
|-------------------------|-------------------------------------------------------|--------------------------------------------------------------|
| AC Input                |                                                       |                                                              |
| Input Voltage (Nominal) | 110 to 220VAC                                         | 110 to 220VAC                                                |
| Input Voltage Range     | 85 to 290VAC                                          | 85 to 290VAC                                                 |
| Maximum Input Current   | 16A                                                   | 26A                                                          |
| Input Frequency         | 45 to 65Hz                                            | 45 to 65Hz                                                   |
| Power Factor            | $\geq 0.99$<br>(220VAC @ 50% to 100% load)            | $\geq 0.99$<br>(220VAC @ 20% to 100% load)                   |
| DC Output               |                                                       |                                                              |
| Output Voltage          | -42 to -58VDC, rated: -53.5VDC                        | -42 to -58VDC, rated: -53.5VDC                               |
| Peak Efficiency         | 98 $\pm$ 0.1%                                         | 97 $\pm$ 0.1%                                                |
| Maximum Capacity        | 3000W                                                 | 4350W                                                        |
| Max Output Current      | 62.5A                                                 | 81.3A                                                        |
| THD                     | $\leq 5\%$ @ 50% to 100% load (220VAC)                | $\leq 3\%$ @ 50% load (220VAC)                               |
| Control and Monitor     |                                                       |                                                              |
| Communication Protocol  | CAN                                                   | CAN                                                          |
| LED                     | Green-Normal; Yellow-Alarm; Red-Fault                 | Green-Normal; Yellow-Alarm; Red-Fault                        |
| Environment             |                                                       |                                                              |
| EMC                     | EN55032 Class B                                       | EN55032 Class B;<br>EN55035; IEC61000-3-11;<br>IEC61000-3-12 |
| Safety                  | CE, UL, TUV, UL-CB, UL 62368-1, EN62368-1, IEC62368-1 | UL 62368-1, EN62368-1, IEC62368-1                            |

## Solar Module:

CLN Energy Telecom Solar Module is a high-efficiency photovoltaic solution specifically designed to provide reliable and sustainable power for telecom infrastructure. Built to withstand harsh environmental conditions, these modules deliver consistent energy output, ensuring uninterrupted operation of telecom towers, base stations, and remote communication networks. With advanced cell technology and robust construction, CLN Energy Solar Modules offer maximum energy generation, long-term durability, and reduced operational costs.

| Model No               | CLN483000SM                                                                       | CLN484000SM                           |
|------------------------|-----------------------------------------------------------------------------------|---------------------------------------|
| PV Input               |                                                                                   |                                       |
| Input Voltage Range    | 120 to 425VDC, rated 340VDC                                                       | 120 to 425VDC, rated 340VDC           |
| MPPT Voltage Range     | 120 to 340VDC                                                                     | 120 to 340VDC                         |
| Max Input Current      | 17A                                                                               | 24A                                   |
| MPPT Accuracy          | $\geq 0.99$ @ load $\geq 400W$                                                    | 0.99 @ load 500W                      |
| DC Output              |                                                                                   |                                       |
| Output Voltage         | -43.2 to -58VDC, rated: -54VDC                                                    | -43.2 to -58VDC, rated: -54VDC        |
| Peak Efficiency        | $>96\%$                                                                           | $>96.5\%$                             |
| Maximum Capacity       | 3000W                                                                             | 4350W                                 |
| Max Output Current     | 62.5A                                                                             | 81.3A                                 |
| Control and Monitor    |                                                                                   |                                       |
| Communication Protocol | CAN                                                                               | CAN                                   |
| LED                    | Green-Normal; Yellow-Alarm; Red-Fault                                             | Green-Normal; Yellow-Alarm; Red-Fault |
| Environment            |                                                                                   |                                       |
| EMC                    | EN55032 CE Class A; RE Class B; EN55035; IEC61000-3-2; IEC61000-3-3; IEC61000-4-5 |                                       |
| Safety                 | EN62368-1; IEC62368-1                                                             | EN62368-1; IEC62368-1                 |

## Battery Pack – 48V50Ah

| Parameter                                     | Value                                            |
|-----------------------------------------------|--------------------------------------------------|
| <b>Nominal</b>                                |                                                  |
| Voltage                                       | 48.0 VDC                                         |
| Nominal Capacity (25°C)                       | 50 Ah (Capacity is measured under 0.5C / 25°C)   |
| Cell Type and Chemistry                       | Prismatic, LFP                                   |
| Cell Make                                     | 3.2V / 50Ah                                      |
| <b>Energy</b>                                 |                                                  |
| Nominal Energy (25°C, 0.5C)                   | 2400 Wh (Capacity is measured under 0.5C / 25°C) |
| <b>Standard Discharge (25°C)</b>              |                                                  |
| Recommended Discharging Current               | 25 A                                             |
| Maximum Continuous Discharge Current          | 50 A                                             |
| Low Voltage Cut-off                           | 42 VDC                                           |
| <b>Standard Charge (25°C)</b>                 |                                                  |
| Recommended Charging Current                  | 25 A                                             |
| Maximum Continuous Charging Current           | 30 A                                             |
| High Voltage Cut-off                          | 54 VDC                                           |
| Charge Current Limit Function                 | Yes                                              |
| <b>Environmental</b>                          |                                                  |
| Calendar Life (25°C)                          | 5 years                                          |
| Cycle Life (0.5C, DOD 80%, 25°C)              | 3500 cycles                                      |
| Operating Temperature                         | -10 to +60°C (De-rating from 35°C)               |
| Storage Temperature                           | 10 to 35°C                                       |
| <b>Certification</b>                          |                                                  |
| Battery Safety Standard                       | IEC 62619                                        |
| Cell Safety Standard                          | IEC 62133-2:2017                                 |
| Electrostatic Discharge (ESD) Immunity Limits | IEC 61000-4-2                                    |
| Environmental                                 | QM333                                            |
| <b>Others</b>                                 |                                                  |
| Pre-Charge Protection                         | Yes                                              |
| Data Storage Available                        | Yes                                              |
| Dimensions (W × H × D)                        | 450 × 442 × 133 mm                               |
| Mounting Design                               | 19 Inch Rack Based                               |
| Module IP Protection                          | IP20                                             |
| Weight                                        | Approx. 32 ± 1 kg                                |



## Battery Pack – 48V100Ah

| Parameter                                     | Value                                            |
|-----------------------------------------------|--------------------------------------------------|
| <b>Nominal</b>                                |                                                  |
| Voltage                                       | 48.0 VDC                                         |
| Nominal Capacity (25°C)                       | 100 Ah (Capacity is measured under 0.5C / 25°C)  |
| Cell Type and Chemistry                       | Prismatic, LFP                                   |
| Cell Make                                     | 3.2V / 100Ah                                     |
| Max Battery Module Parallel                   | 16 No's                                          |
| <b>Energy</b>                                 |                                                  |
| Nominal Energy (25°C, 0.5C)                   | 4800 Wh (Capacity is measured under 0.5C / 25°C) |
| <b>Standard Discharge (25°C)</b>              |                                                  |
| Recommended Discharging Current               | 50 A                                             |
| Maximum Continuous Discharge Current          | 100 A                                            |
| Low Voltage Cut-off                           | 42 VDC                                           |
| <b>Standard Charge (25°C)</b>                 |                                                  |
| Recommended Charging Current                  | 30 A                                             |
| Maximum Continuous Charging Current           | 50 A                                             |
| High Voltage Cut-off                          | 54 VDC                                           |
| Charge Current Limit Function                 | Yes                                              |
| <b>Environmental</b>                          |                                                  |
| Calendar Life (25°C)                          | 5 years                                          |
| Cycle Life (0.5C, DOD 80%, 25°C)              | 3500 cycles                                      |
| Operating Temperature                         | -10 to +60°C (De-rating from 35°C)               |
| Storage Temperature                           | 10 to 35°C                                       |
| <b>Certification</b>                          |                                                  |
| Battery Safety Standard                       | IEC 62619                                        |
| Cell Safety Standard                          | IEC 62133-2:2017                                 |
| Electrostatic Discharge (ESD) Immunity Limits | IEC 61000-4-2                                    |
| Environmental                                 | QM333                                            |
| <b>Others</b>                                 |                                                  |
| Pre-Charge Protection                         | Yes                                              |
| Data Storage Available                        | Yes                                              |
| Dimensions (W × H × D)                        | 475x482x133.3mm                                  |
| Mounting Design                               | 19 Inch Rack Based                               |
| Module IP Protection                          | IP20                                             |
| Weight                                        | Approx. 48 ± 1 kg                                |
| Max Quantity of Battery Parallel Connection   | 16 No's in parallel system.                      |

## Controller

Smart Controller is a monitoring and control unit used as the vital nerve center of the power plant. One can operate the whole system from the elegant front panel as well as using three front keys and the LED display.

| Section                                   | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model No</b>                           | CLN2900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Measurement</b>                        | 22 × Analog & 12 × digital input readings including: system voltage, load current, battery current, battery temperature, ambient temperature, ambient humidity, 12VBI, +8VD, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Communication</b>                      | The controller communicates with the host computer in 2 modes: RS485 and Ethernet (TCP/IP, UDP, https and SNMP). Setting and editing operational parameters, downloading operational history and alarm history are available via WEB browser. Communication between the controller and the rectifiers and the solar modules utilizes CAN communication. SNMP protocol supports GET, SET and TRAP. 4 × RS485 ports for battery BMS, DG or extension function boards.                                                                                                                                                                                                                                                                                                                                           |
| <b>Alarm History Log</b>                  | 20000 history alarms and 100000 history events                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>System Starts Log</b>                  | 5000 battery test logs, 5000 battery charge logs, 5000 battery discharge logs, 5000 DG running logs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>LCD &amp; LED</b>                      | 128 × 160 LCD screen display to access current operating conditions, alarms, user settings; green/yellow/red LEDs indicate operation status and alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Collection and Management</b>          | <ol style="list-style-type: none"> <li>1. Rectifier, solar module, wind module, DC/DC module, DC/AC module, HVDC module data</li> <li>2. Lithium battery of any modulus/YDT-1363 protocol based on RS485 or CAN interface</li> <li>3. Smart AC meter or self-developed AC metering board data collection</li> <li>4. Smart DC meter data collection</li> <li>5. Smart DG data collection and management</li> <li>6. Climate data collection and management</li> <li>7. Smart CB data collection and management</li> </ol>                                                                                                                                                                                                                                                                                     |
| <b>Battery Management</b>                 | Boot and float management, Charge current limit management, Temperature compensation, LVD, Battery test, Midpoint voltage, Capacity calculation, Peak cut, Lithium battery management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>DC Management</b>                      | Switch according to battery capacity, Switch according to battery voltage, DG test, Remaining fuel calculation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Energy Optimization and Management</b> | Energy input priority management, Rectifier energy saving management, Rectifier rotation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Alarms/Events</b>                      | SPD alarm, Digital input alarm, Load fuse alarm, Manual mode alarm, Current imbalance, Ambient temperature alarm, Load disconnect, AC power failure, Battery fuse alarm, Battery discharge, Battery test fail, Battery imbalance, Battery disconnect, Battery temperature sensor fault, Battery temperature alarm, BMS communication fail, Rectifier AC input failure, Rectifier fault, Rectifier fan fault, Rectifier protection activated, Rectifier on/off status, Rectifier communication fail, System energy-saving mode, Energy-saving mode interruption, Solar module communication fail, Solar module fault, Solar module fan fault, Solar module protection activated, Solar module on/off status, Solar module input failure, AC over voltage and under voltage, DC over voltage and under voltage. |

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