

Rating: 5kVA ~ 40kVA | Ph 1-1

# SOLAR HYBRID PCU

SUNMAGIC REeFI SERIES



# SunMagic REefi Reliable & Performing PCU for your Energy conversion needs !



## About Us

EnerTech® UPS Pvt. Ltd is Industry leading Solar and power electronic product designer and manufacturer since over 30Years.

The EnerTech® products cover main application :

- Industrial and commercial energy storage with renewable integration Solar PCU.
- BESS.
- Industrial UPS.
- Battery Charger.
- Static Frequency Converter.

EnerTech® Products are designed with 100 % indigenous technology. EnerTech® has its own RnD setup for constant development in features and new products.

30 + years experience in developing user friendly products with self diagnostic LCD messages enabling users to be independent and not rely on engineer visits, strive for constant success in leveraging technological innovation are manufactured at our Pune India



30+ Years Experience In Manufacturing and Development In Cutting Edge Inverter Technology.



30+ years  
R&D Experience.



IGBT and Zero Change  
Over Time in PCS.



120MW  
Delivery Power.



NO.1  
BESS Products  
Manufacture.



30000+  
Installations Across Globe.



500+  
Partners.



75+ Team.

# SunMagic REefi Reliable & Performing PCU for your Energy conversion needs !



## Feature-Loaded PCU

We have analysed customers needs of minimum service engineer visit and waiting time. We have upgraded these features POST COVID of zero dependence on field engineers.

SunMagic REefi PCU offers you more value of power and you will find that the EnerTech® REefi offers unique features of that address the needs for your energy conservation needs.

New features of Sunmagic enable maximum use of solar power and use it judiciously, and avoid dependence on Mains availability.

## Reliability & Performance | Safety & Protection | Monitoring & Control

### DG Compatibility & Control

Compatibility and controls available.  
Double of Inverter rating.

### No break changeover time\*

No time delay during changeover from Solar to Battery or Grid and vice-versa making it suitable for running critical loads without any interruption.

### Contactors & Relays less Design\*

Eliminates mechanical coil based components, improve the response time, performance and product life.

### Graphic Display

Realtime SLD logic for easy understanding for the operation team.

### IOT based Remote Monitoring & Control

Allow the customer to change or modify and configure parameters to improve the performance, resolution & plant uptime.

### Anti-Islanding

Prevention Of Grid Isolation.

### Integration with Lithium\*

BMS of battery can be software integrated with PCU logic.

### Smoke Detection\*

PCU will shut down in case of fire /smoke and protects the connected loads and the system.

### Redundant power supply\*

Design with the twin Power supply to improve the availability of power for the operation of PCU.

### Reverse Polarity PV Panels & Batteries\*

added feature to safeguard against reverse polarity due to human error.

### Temperature Controlled Fan Operation\*

Fan speeds inside the PCU will change base on the temperature and improve internal power consumption & performance.



**Note: \* means optional feature and cost will be vary.**

# SunMagic REefi Reliable & Performing PCU for your Energy conversion needs !

## Benefit Your Renewable Energy Needs With Our REefi PCU

EnerTech® SunMagic REefi Hybrid Solar PCU is the most Innovative Circuit Design. It store renewable energy in the battery as well as export any excess solar power generated, to the grid through net meter, resulting in improved savings at consumer end.

### The Next generation Solar Hybrid Inverter technologies !



### Built Investment Protection

- Protection Against Fire / Smoke\*.
- Protection Against Reverse Polarity. Auto Correction At PV Panels\*.
- Standard Potential Free Contact.
- Temperature-compensated Battery Charging\*.
- Algorithm To Improve Battery Life.

**Note: \* Means optional feature and cost will vary.**

## Features To Protect Your Investment

### 1) Highest Availability of Power

- Fully Digital, DSP Controlled.
- Design With The Twin Power Supply\*.
- Bidirectional seamless operation for changing over from Mains to Inverter and Batteries + vice versa operation.
- Inbuilt Isolation Transformer.
- DG Compatibility And Control.
- Anti-islanding: Prevention Of Grid Isolation.

### 2) High Electrical Performances

- Near Unity Input Power Factor.
- DG Synchronization.
- No-break Changeover\*.
- Higher Loading Of MPPT Up To 120%.
- 4-stage Charging Algorithm\*.
- Battery Charging Through Grid Up To 100% Of Inverter Capacity.

### 3) Flexibility

- 4-modes Of Operation.
- Configured To Handle Multiple Sources Intelligently.
- Battery Less Operation\*.
- Battery Less & Grid Less Feature To Work With Only Solar Power (Optional)\*.

### 4) Monitoring

- Large Graphic LCD Display.
- IOT Based Remote Monitoring & Control\*.

# SunMagic REefi Reliable & Performing PCU for your Energy conversion needs !



## Utmost Reliable Power Conversion Unit for your energy conservation Needs !!



SunMagic REefi offers a reliable, performing and user-friendly solution to ensure availability of Power to various critical applications.

Its digital architecture and the wide range of options of Utilizing the renewable sources in the best way to meet for your Energy conversion needs.

### Applications

- Stand-alone PCU - Using Solar, Grid, DG & Storage.
- Off-Grid PCU - Storing electricity to provides power backup.
- Battery-less PCU.
- PCU - Grid less using Solar and Storage to power the load.
- PCU - Configurable to handle multiple Input Sources: Solar Power, Wind, Energy Storage, DG.



Residential Power I  
demand management



Industrial and commercial  
demand management



Industrial Automation  
Demand Management



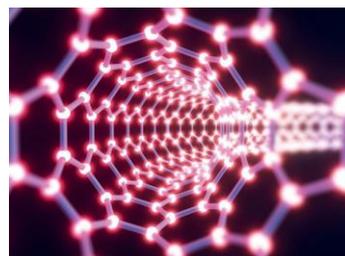
Power Availability  
Oil dispensing station



Power Availability  
Cold storage



Telecom Tower



Mico Grid



DC-DC booster and PCU  
with H2O Fuel cell

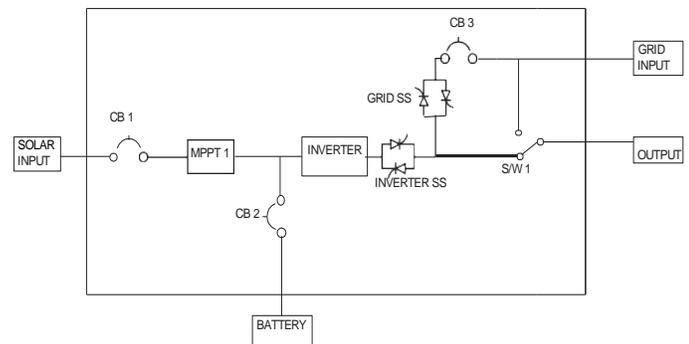
## Key Design Differentiating Features for Maximum Performance & Reliability

SunMagic REefi Solar Hybrid Inverter (PCU) design with Technology delivers the Highest Reliabilities and performance in the industry to go along with the quality that the user are accustomed to when specifying PCU.

### Bidirectional Power Technology

The heart of the system includes an Active-Front-End based Bi-directional inverter which can perform AC-DC as well as DC-AC conversion and also synchronize with Grid or DG set. The convertor can import/ export power from Grid/DG depending upon the mode of operation.

1. Its Vector Modulated Inverter Control design ensures highest level of customization to perform charge/discharge functions.
2. The Bi-directional convertor can act as an inverter under normal mode of operation such that it converts PV and Battery power into the connected loads.
3. The same convertor acts as a grid charger to charge the batteries using grid supply whenever required
4. The inverter section has inbuilt galvanic isolation using power transformer of rated capacity which implements rugged design under extremely fluctuating and impure grid conditions. It also provides isolation between the DC and AC sides.



### Maximum Power Point Tracker (MPPT) Solar Power Conversion Technology.

It is an electronic system which balance the voltage at which the Photovoltaic (PV) modules can produce maximum power.

REefi PCU is having single Or multi MPPT-based Solar Charge Controllers to convert PV power into usable DC power as per battery and load requirements.

The MPPT charger is buck type convertor such that PV voltage (under all circumstances) should be higher than the maximum battery voltage.

Custom Size MPPT capacity availability & higher loading of MPPT up to 120%

Hence, the series-parallel arrangement of PV array is very critical for maximum power generation. The number of charge controllers depends on the rating of the system.

# SunMagic REefi Reliable & Performing PCU for your Energy conversion needs !

## IOT based Remote Monitoring & Control on the go & at your Desk !!!

### REMOTE MONITORING UNIT.



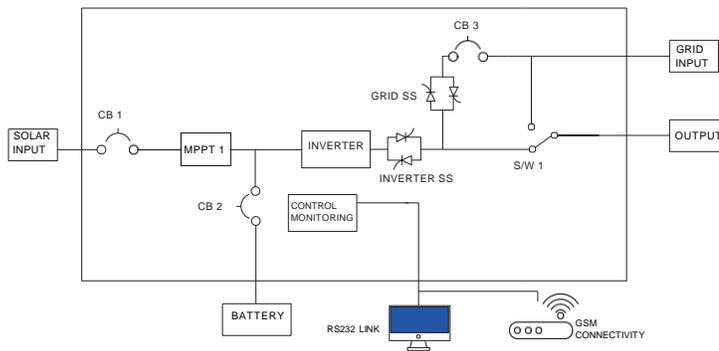
EnerTech SunMagic REefi Series Hybrid Inverter IOT based monitoring system- enable the customer to monitor critical PCU systems at their desk or phone. By using remote monitoring equipment at your sites, you'll now have the visibility to monitor and control your REefi PCU.

### Scheduling Features

1. Allow the customer to change or modify and configure parameters to improve the performance, resolution time.
2. Controlled scheduling via keypad Battery charging according to TOD Programmable night saving mode.

### Remote Operation Overview

1. All PCU systems in a facility is connected to EnerTech® RMS Interface to suitable protocol: MODBUS/RS-485.
2. Collect data and transfer to network system / cloud to process data.
3. Remote PC, Mobile is configured with RMS software. In this mode of Remote operation, the entire control of the REefi PCU will be given to the External master controller.
4. The Remote master will control the operation by sending command to the REefi PCU over MODBUS; RTU and the PCU will start operate accordingly.
5. The External master can even disable or enable the setting of PCU Operation mode. Ex. if Grid charger ON command received, system will charge battery from Grid subjected to grid availability.



### Read Facility

- Continuous PCU Monitoring, And Access Data.
- Data On Power Failures In A Day / Week / Month.
- Daily/Weekly/Monthly Reports.
- 24x7 Remote Monitoring – Peace Of Mind.
- Connectivity Via GSM.
- Manage Device.
- Product Information.
- Input Group.
- Solar Group.
- Output Group.
- Battery Group.
- Alarm Group

### Control Facility

- Inverter ON/OFF.
- DG ON/OFF.
- Emergency ON/OFF.
- Inverter Mode Change.
- MPPT ON/OFF.
- Grid Charging ON/OFF.
- Export ON/OFF.
- Export Power Limit Settable.
- Battery Voltage / Current Parameter Settable.
- Battery Float / Boost.
- MPPT Mode Selection.
- Auto Restart Enable / Disable.

# SunMagic REefi

## Reliable & Performing PCU for your Energy conversion needs !



## Flexibility in PCU Operating Mode

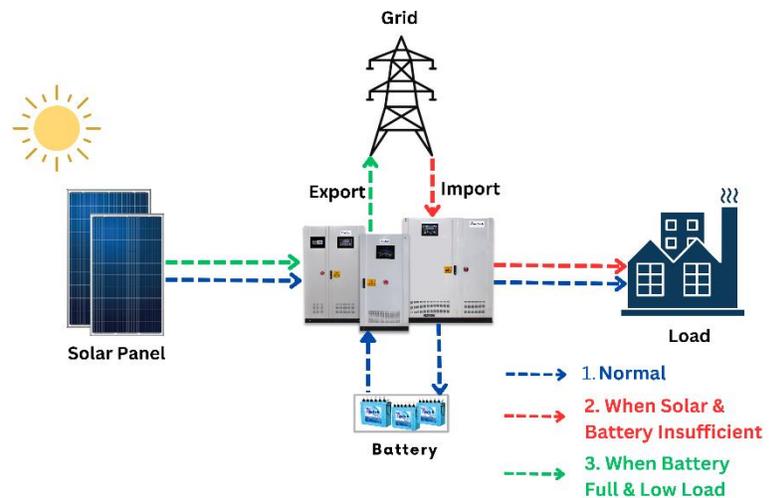
EnerTech® SunMagic REefi Hybrid PCU design is providing customer the flexibility in choosing the PCU Operation Mode to the best suited to your site requirement .

Customer just needs to defined it while selecting for its REefi PCU.

### Mode 1 : Power Saving

PCU will utilize maximum solar power and allow customer to Reduce Grid electricity consumption. PCU will operate in the following priority

1. Will feed Solar power to the load first. if Solar is not sufficiently then battery and solar power will feed the load
2. This mode also provides facility to export power to Grid when solar Power is available and batteries are fully charged and load is less.
3. Export function can be Enabled / Disabled.
4. If both Grid & solar Power is not available then batteries will feed the load until battery low cutoff condition.
5. We can disable the function of PCU using grid power to charger batteries & feed to load for non availability of sufficient Solar & Battery power.



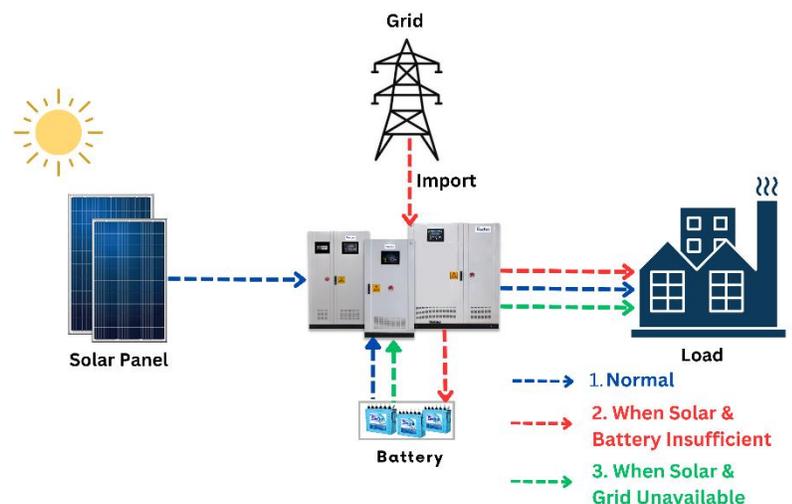
PCU will not use Grid for Battery charging if function is enabled.

It is also possible to disable Grid charging at certain time period to save demand penalty( Example 6am to 9am).

### Mode 2 : Backup

PCU will utilize the Grid supply with highest priority

1. Load will be feed by the Grid Power and available Solar Power will charge the batteries
2. If Grid charger is enabled otherwise only solar will charge the batteries.
3. When grid power fails, solar power and battery power will feed the load.
4. If both Grid & Solar Power is not available ,Batteries will feed the load until battery low cut-off.

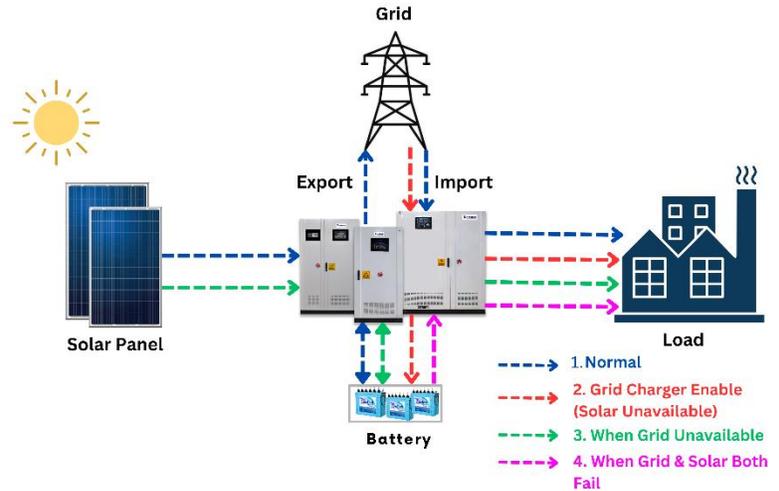


# SunMagic REefi Reliable & Performing PCU for your Energy conversion needs !

## Mode 3 : Export

PCU will export solar and battery power to Grid, if Grid is available

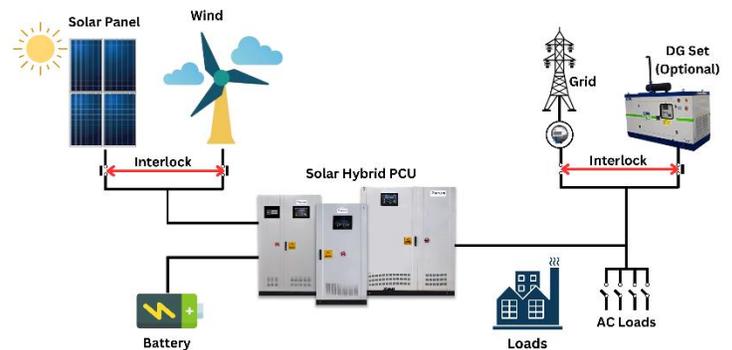
1. If Grid is not available, solar power will charge the batteries and feed the load. If solar power is not sufficient, then both solar and battery power will feed the load.
2. Batteries will not charge from Grid.
3. If Grid is failed and solar is absent then batteries will feed the load until battery low cutoff condition reached.



## Flexible Compatibility\*

REefi Hybrid PCU is the ultimate combination of streamlined flexibility availability & sustainability to provide the solution through Single PCU.

1. Solar Hybrid PCU can be configured to handle multiple charging sources intelligently.
2. Can be AC coupled with wind, hydro and other sources as well Seamless synchronisation with DG Sets.



## Product Application



Home and farm house



Institution



Dairy Farm



Hospitals



Gov Offices



Admin



Petrol Pump



Microgrid



Rural and Regional Bank



Cold Storage



Railways



Industries

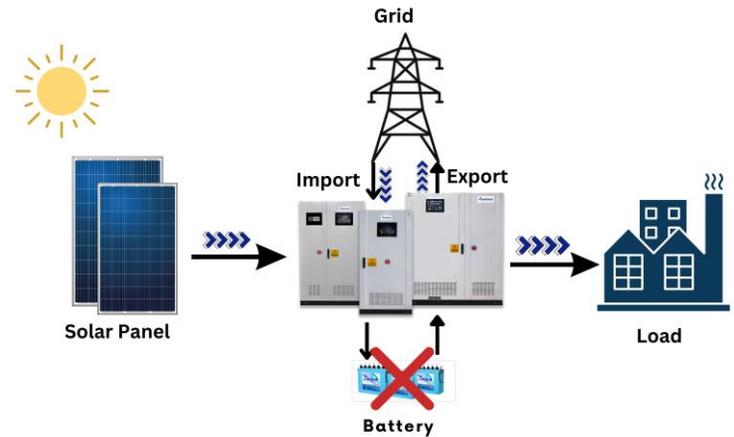
# SunMagic REefi Reliable & Performing PCU for your Energy conversion needs !

## Mode 4 : Battery Less Operation\*

REefi PCU is having a unique Innovative optional feature to operate the Solar PCU without Batteries.

1. In Battery-less Mode PCU will get sync with Solar power Or Grid supply completely,
2. Supply the stable power to the load and It also exports the excess power to the grid.
3. If the solar energy is sufficient then total output load will operate on PCU using Solar Power.
4. When the solar energy is weak then the PCU will take balance power from AC source grid/DG and supply to load. In this mode PCU is also treated as a grid tie inverter.

Battery less Mode operation is factory settable mode and not possible to configure PCU at site. However in future, it is possible Battery less mode feature can be disable at site and connected with energy storage system.



Note:

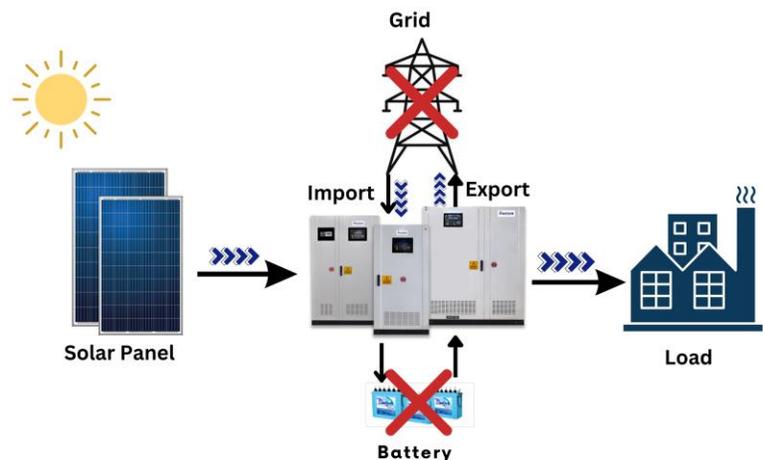
PV Generation is Higher than Demand or Load when Grid/Mains is Off.

## Battery-Less & Grid-Less Operation\*

REefi PCU is having a unique Innovative optional feature to operate only Solar without Batteries and Grid.

1. In Battery-less and Grid-less Mode PCU will get sync with Solar power only.
2. Supply the stable power to the load.
3. If the solar energy is sufficient then total output load will operate on PCU using Solar Power.
4. Any time, there is a facility to upgrade the unit with Battery and Grid.

Battery-less and Grid-less Mode operation is factory settable mode and not possible to configure PCU at site. However in future, it is possible Battery-less or Grid-less mode feature can be disable at site and connected with energy storage system.



Note : \* These features are factory settable and available in selected models at extra cost.

Extra hardware/ software modules are required to implement these features.

# Specifications (SUNMAGIC-REeFI | Single Phase | 5kVA - 40kVA)

MODEL	SUNMAGIC - REeFi									
MODEL & INVERTER CAPACITY (kVA)	SPU-5	SPU-6	SPU-8	SPU-10	SPU-12.5	SPU-15	SPU-20	SPU-25	SPU-30	SPU-40
<b>INPUT</b>										
Input Voltage Range	170 V to 260 V, 1 Phase									
Nominal Frequency	50 Hz (± 6%)									
Input Fault Level	10 kA									
Self-consumption	Upto 4%									
DG / Grid Compatibility	YES (Double of Inverter Capacity)									
<b>SOLAR</b>										
Charger Type	MPPT									
Max PV Voltage (VOC)	200V	200V	200V/250V	250V	250V	250V/500V	500V	500V	500V	500V
MPPT Voltage Range	120-184V For 96VDC   165-250V For 120V   290-450V For 240V									
Batteryless MPPT Voltage Range	120-180V For 96VDC   165-200V For 120V   290-400V For 240V									
MPPT Modes Available	2 (Selectable)									
No. Of Channel	1									
Max I/P Amps Per Channel(Amps)	52	63	83/66	83	104	125/63	83	104	125	166
Panel Reverse Protection	Yes									
Solar Charger Efficiency	Upto 95%									
<b>BATTERY</b>										
Nominal Battery Voltage (VDC)	96	96	96/120	120	120	120/240	240	240	240	240
Grid Charging Current	Selectable as 5A Steps									
Input Power Factor (Grid Charging)	Near to Unity									
Battery Charging Voltage	Selectable from LCD Display									
Type & No. Of Cells	Lead Acid / VRLA / Ni-Cd / (Lithium)#									
<b>OUTPUT</b>										
Output Current (Amps)	17.5	21	28	34	44	52	70	87	105	139
Load Power Factor	0.8 Lag									
Output Voltage (Inverter Mode)	230V AC ± 2 %									
Voltage Regulation	± 2 %									
Output Frequency (Free Running)	50 Hz ± 0.5%									
Output Waveform	Pure Sine wave									
Peak Inverter Efficiency (Full Load)	Upto 92%									
Total Harmonic Distortion	≤ 3% at Linear Load									
Overload Capacity	125% for 60Sec, 150% for 5 Sec									
Changeover Time (Full Load)	No Break Change Over Time #									
DC To AC Isolation	In built Isolation Transformer at Inverter Output									
Anti Islanding Function	Available, In Compliance with IEC 62116									
Duty	Continuous									
<b>CONFIGURATION</b>										
Modes Available	Hybrid, Grid Export, Standalone, Batteryless									
Battery Buffer Setting	Selectable Through LCD									
GRID Feed Mode	Enable / Disable option Available									
Power Export To Grid	Enable / Disable option Available									
Power Import From Grid	Enable / Disable option Available									
<b>ENVIRONMENTAL</b>										
Acoustic Noise Level From 1m Distance( Ref : ISO 3746)	≤ 65 dB									
Operating Temperature	0 to 40 Deg C Dust Free, Cool & Dry Environment*									
Storage Temperature	-10 Deg C to 55 Deg C									
Relative Humidity	Up to 95 % (Non Condensing)									
Altitude	Upto 1000 & (1000 to 3000 Deviation)** & 3000 Above***									
<b>PHYSICAL</b>										
Enclosure Protection Grade	IP 20 Compatible to IEC 60529:2001-02- As per MNRE Requirement									
Enclosure Thickness	As Per Industrial Standard									
Cooling	Forced Air									
Colour	5KVA to 25KVA: RAL 7032 & 30KVA to 40KVA: RAL 9016									
Cable Entry	Bottom									

\*: 1.6% per degree centigrade | \*\*: 1% Derating Per 100 M | \*\*\*: 1.5% Derating Per 100 M | #: Optional Features

**Imp Note:** Batteryless mode don't consider Max PV Voltage (VOC) Range.

General Group	System Rating, Date & Time, Current Status, Configuration, Fault Log
Input Group	Input Voltage, Input Current, Input Frequency, Input KVA, KW, PF
Output Group	Output Voltage, Output Frequency
Battery Group	Battery Voltage, Amp, Battery Status, Battery Float/Boost
Solar Group	Solar Voltage, Solar Current, Solar Power(KW), Solar Energy(KWh), Day(sum)
Fault Log	Recent 10 Fault Log Since Last Time, Time, Date
Inverter Group	Voltage, Current, Frequency, KVA, Total KVA, Load in Percentage
Configuration	SBG, GSB, GFM, Inverter Mode, Batteryless
Indication Of Minic	Fault, PV On, Grid On, Load On Mains, Inverter On, Charger On, Load On Battery
Message Display On LCD	Output Under Voltage, Output Over Voltage, Output Over Load, Short Circuit, Standby Mode, Battery Low
Reset	Buzzer Reset (Manual), Overload, Short Circuit, Battery Low

**PROTECTION**

Input Group	Input MCB/MCCB, Input Under Voltage, Input Over Voltage, Change Over Voltage, Surge
Output Group	Output High, Output Low, Temperature, Over Load, Short Circuit
Battery Group	Battery MCB/MCCB, Battery Low, Battery Over Voltage
Solar Group	Solar MCB/MCCB, Solar Fuse, Surge

**CONNECTIVITY**

Communication	Modbus RS485, GSM Connectivity – Optional*
Monitoring	Remote Monitoring Solution – Optional*
Testing Standard	IEC -61683:1999, IEC- 60068-2-1, IEC-60068-2-2, IEC-60068-2-14, IEC-60068-2-30- As per MNRE Requirement
Safety Factor	1 for Electronic Devices, 1 for Electrical
Earthing Connection (Ref. Is 3043)	Earth Stud

**DIMENSIONS (STANDARD / OPTIONAL)**

Dimensions (in mm) Tentative Dimension	(Approx.)									
kVA Rating	5	6	8	10	12.5	15	20	25	30	40
Width (W)	380	450	450	450	450	450	450	450	450	450
Depth (D)	580	800	800	800	800	800	800	800	900	900
Height (H)	520	800	800	800	800	800	800	800	800	800
Weight (Kg)	84	125	165	175	200	220	296	320	350	350

# Specification are Subject to Change Without Prior Notice | ## Not for Life Support & Mission Critical Application

Note: **In Batteryless System, We need 230V AC Supply through UPS**

**Updated on 28 Nov 2024**



# EnerCube e-Storage

## Plug & Play Battery Energy Storage System

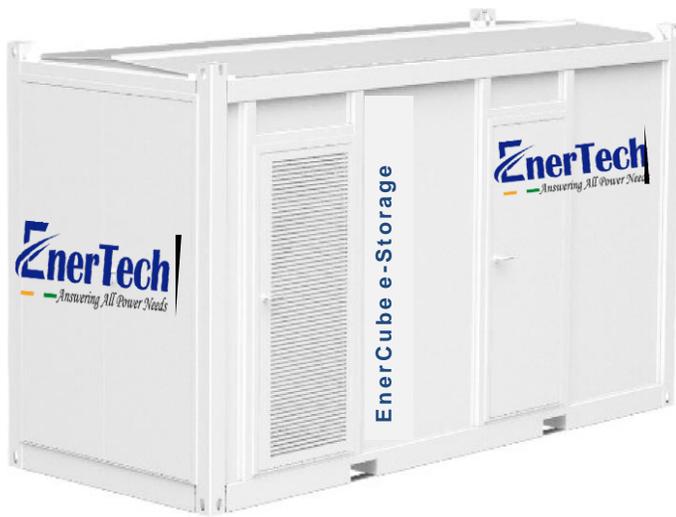
### 5 kWh - MWh



## Fully Integrated Energy Storage System

**EnerCube e-Storage** is an intelligent equipment integrating battery, PCS and Energy Management system.

Fully integrated pre-engineered energy storage system is designed to maximize the return of investment. The solution is optimized for functionality usage. Digital programming intelligence improves solution performance and operating costs.



**EnerCube e-Storage outside view**



### Plug-and-play

Provides all required batteries, power conversion, coupling transformer, safety features, cooling, and protection and controls.



### Factory tested

Factory built solution integrates comprehensive safety features that bring extensive quality control for the highest level of safety.



### Pre-engineered

Designed with careful equipment selection, catering for a long lifespan in all conditions.



### Digitally enabled

Critical power operations digitally controlled for fastest response time with embedded energy management software

## Benefits



Manage Energy Cost



Demand/Peak Charge Reduction



Improve Power Quality



RE Energy Maximization



Backup Power / Storing energy

EnerTech® has made products( Post COVID) which do not used field support. The LCD is user friendly & programable which any user can handle after preliminary hands on training (max 60 minute).

We however have provided following processes for field support:

- ❑ Manual & Youtube Available For Immediate Solution.
- ❑ 24x7 Helpline For Support Team.
- ❑ Installation Video & Guidance Onsite
- ❑ Videos On Commonly Reported Symptoms.
- ❑ Factory & On-site Training.



30+ Service Personnel Pan-India



Pan-India Spare Parts Available



Wide Repair Network

Please call for Technical Support



+91 93733 36340,  
9822407189

## Customers

Who We Work With

Just a few examples of customers that rely on EnerTech Product and services for the highest levels of Load uptime



Over 30,000+ Customer & exported our products to Saudi, Bahrain, UAE, Kuwait, Oman, Qatar, Senegal, Egypt, Thailand, Philippines, Myanmar, Bangladesh, Yemen, Lebanon, Dubai, Singapore, Zambia, Tanzania, Uganda, US and Nigeria.





## Market & Sales by

### ENERTECH UPS PVT. LTD.

S. No. 399/1-2, Bhare, P. O. Ghotawade,  
Near Pirangut, Taluka- Mulshi,  
Dist.- Pune – 412115 India

### Contact

+91 9370659050, +91 93733 36340,  
+91 9822407189

## Manufactured By

### ENERTECH UPS PVT. LTD

S. No. 399/1-2, Bhare, P. O. Ghotawade, Near Pirangut, Taluka- Mulshi, Dist.- Pune – 412115 India

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