

# PORTABLE MICRO INVERTER OF 150 W FOR RURAL APPLICATIONS

In India, inverters are mostly available in 650 VA. Even the inverters of lesser capacities that are available, they retain the same size and specifications of 650 VA inverter, with the exception that power is limited to lesser capacity. Most people in rural households need power up to 100–150 W (watts) for lighting and television requirements, which could be met with 150 VA of inverter with 60 Watt solar panel. While, these users are left with no choice but to buy inverters of 650 VA capacities of power rating, which require 60Ah of battery and 60 watts of solar panels. All of this leads to additional cost on inverter, batteries and solar panels so as to match the specifications of the inverter.

## PROJECT PARTNER

CLEAN has collaborated with Emsys Electronics, a Bangalore-based company, and has developed a portable micro (P-Micro) inverter.

## SALIENT FEATURES OF P-MICRO INVERTER

- Portable and modular
- In-built PWM charge controller
- Weight >500 grams
- 12 V DC to 230 V AC
- Low battery voltage cut-off protection
- Overload protection
- Short-circuit protection
- Thermal shutdown and auto restarting

## TESTING OF P-MICRO INVERTER

The P-Micro inverter is being tested in the lab with a load of 150 W using two incandescent bulbs of 100 W and 60 W. Input voltage of 12 V DC is given to the inverter from the regulated power source. The test is carried out for 24 hours to check the performance in terms of loading and consistency. Parameters such as input voltage range and output voltage regulation have been checked thoroughly during this process. Protections such as overload, short circuit, thermal shut-down, and battery reverse are also being tested.

## TECHNICAL PERFORMANCE DURING LAB TESTING

Parameter tested	Value
Input voltage range	11.5 V DC
Output voltage range	222 V AC
Maximum wattage at output	150 W
Overload protection	Yes
Short-circuit protection	Yes

Field testing of P-Micro inverter was carried out at Eastern Envo Business Solution, Guwahati, Assam, and Manganal Solutions, Imphal, Meghalaya.

## TECHNICAL PERFORMANCE DURING FIELD TESTING

Parameter	Guwahati	Imphal
Solar panel rating	100 W	140 W
Battery rating	100 Ah	120 Ah
Load rating	90 W	120 W
List of devices connected	Television (60 W), two LED bulbs (5 W each), two charging points (3 W each)	Television (80 W), three LED bulbs (5 W each), two charging points (3 W each)

## COMPARISON BETWEEN EXISTING INVERTER AND P-MICRO INVERTER

The P-Micro inverter scores over the existing inverter on many parameters. The main advantages are listed below.

- It is considerably lighter than the existing inverter.
- Its size is half of the existing one, making it easier to carry.
- It costs less than half the price of the existing one.

Parameters for comparison	Existing inverter	P-Micro inverter
Size	31 × 28 cm	15 × 14 cm
Weight	3000 g	500 g
Cost	INR 4600	INR 1900
Portability	No	Yes

## APPLICATIONS OF P-MICRO INVERTER

P-Micro inverter finds its application in almost every walk of life. A few examples are listed below.

- Home lighting kit
- Laptop and desktop charging and printing
- Portable battery-based appliances charging (tyre inflator and angle grinder)



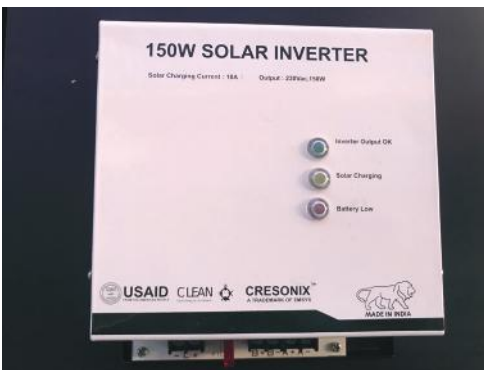
Already existing micro inverter (150 VA) in the market



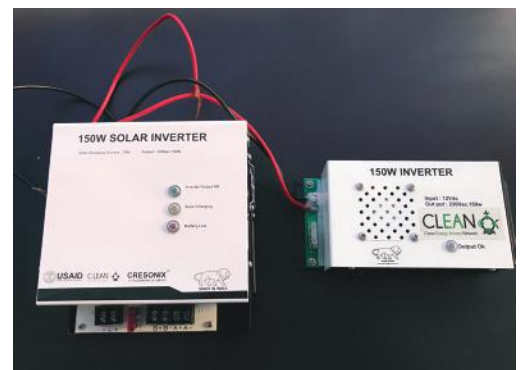
PWM inverter (150 W) without charge controller



Microinverter in Garo hills



PWM (pulse width modulation) inverter (150 W) with charge controller



Both versions of PWM inverter (150 W)

### EXPECTED IMPACT

The product has already triggered interest from entrepreneurs who are working in remote areas. Eastern Envo Business from Assam, Mangaal Solutions from Mainpur, Mukti Solar (Solar Puncture Solutions) from Odisha, and Po\_lite from Bangalore have already successfully tested this product commercially.

As the product is compact, modular, and portable as compared to the existing inverter, which are available in 650 VA range and above, it helps people in rural areas to have optimised system configuration with AC connected loads at a reasonable cost.

### Partners:



For more details, please contact:



### Clean Energy Access Network

2nd floor, A-23, Near Green Park Church, Aurobindo Marg, New Delhi – 110 016

p: +91-11-41601543

w: [www.thecleannetwork.org](http://www.thecleannetwork.org), e-mail: [info@thecleannetwork.org](mailto:info@thecleannetwork.org)