



Renewable Energy Fundamentals by Labtech

REFERENCE SHEET - Launch Code: AP134

Landing page

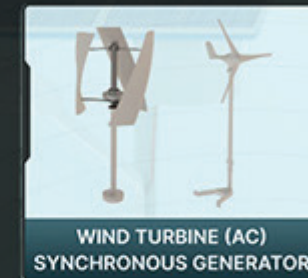
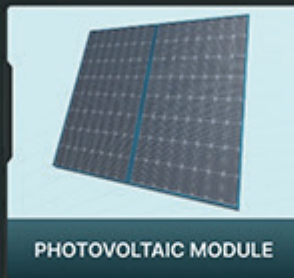
Course topic areas

Select one topic of interest

Version 2.1

RENEWABLE ENERGY FUNDAMENTALS

The Labtech Renewable Energy Fundamentals is the first set in a series of courses that will take the student on a learning journey to understand the basics of Renewable Energy systems. It is aimed at building the knowledge that a student will need to develop employable skills for this exciting and important area. The course will cover the fundamentals of the processes, the science involved, and then proceed to develop an understanding of key components and systems. This first course will deal with Renewable Energy Fundamentals and the next upcoming courses will go more in-depth into Supporting Technologies Components and Green Technology System.





Renewable Energy Fundamentals by Labtech

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OFF GRID INVERTER

Component Identification

Component Name

Course Title

Learning Element Title

AC Output Terminal

AC Output Fuse Holder

DC Input Terminal

Earth Terminal

Mosfet

Gate Driver

Step Up Transformer

Reset position

Reposition

Background Theory

Background Area Content

LAB TECH

OFF GRID INVERTER

Background Theory

Off-Grid Inverter

INTRODUCTION

In a period characterized by heightened environmental awareness and an increasing desire for dependable energy sources, off-grid solar inverters have arisen as vital elements within sustainable energy solutions. These inventive tools assume a central role in enabling the effective harnessing of solar power for independent systems, where access to the traditional electrical grid is either unworkable or unavailable. Off-grid solar inverters facilitate the transformation of the direct current (DC) electrical output produced by solar panels into alternating current (AC) electricity, which proves suitable for energizing diverse appliances, machinery, and even entire households situated in distant or secluded areas.

LABTECH 1

NEXT



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OFF GRID INVERTER

Formative Assessment

6 of 20

QUESTION

What is the function of the transformer in the inverter?

☐ Switching

☐ Increase voltage

☐ Energy storage

☐ Rectifier

Technical Simulation

DESCRIPTION OF SIMULATION

Simulation area

Descriptions

The heart of the inverter is the full-bridge circuit, also known as an H-bridge. This circuit consists of four switches (usually using MOSFETs or IGBTs) that control the flow of current to the load. By toggling these switches in a specific sequence, the full-bridge inverter generates an AC output waveform.

The voltage level of the AC output waveform is decided by the DC voltage level supply for the H-Bridge. The DC voltage level is simulated and controlled using the Voltage slider.

The frequency of the AC output waveform is controlled by the DC pulse signals that drive the MOSFETs in the H-Bridge circuit. Use the frequency slider to vary the AC waveform output of the H-bridge.

Formative Assessment

Question Area

Answer Choice

LAB TECH

OFF GRID INVERTER

Principle Simulation

INVERTER



Reset Instructions Pause Test Point A Show Graph