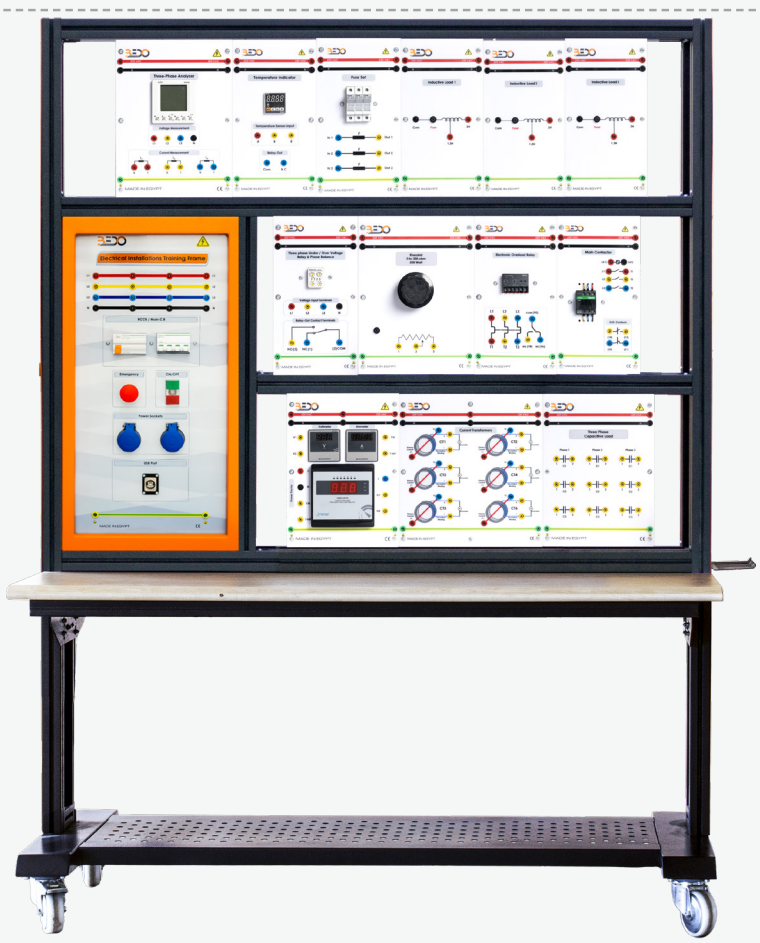
PS108

Electric Transformers Training Kit

Overview

The Smart Grid Wind Power Plant model is an advanced educational and research-oriented setup that enables detailed study and analysis of modern wind energy systems integrated into smart grids. One of its key features is the use of Double-Fed Induction Generators (DFIGs), which are widely employed in commercial wind turbines due to their efficiency, controllability, and cost-effectiveness.



Specifications

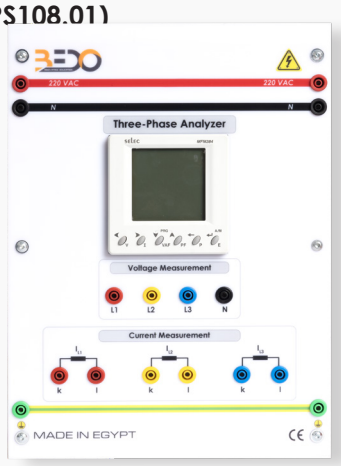
- The training kit consists of more than 6 modules which can be mixed and matched to carryout various transformers experiments.
- All of the modules contain power supply terminals and earthing terminals to receive power from the main frame.
- Using this kit, trainees will acquire knowledge regarding electrical wiring and transformers circuit designing and forming.
- The kit includes three-phase analyzer module which can perform several measurements such as line to line voltage,

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line to neutral voltage, active power,

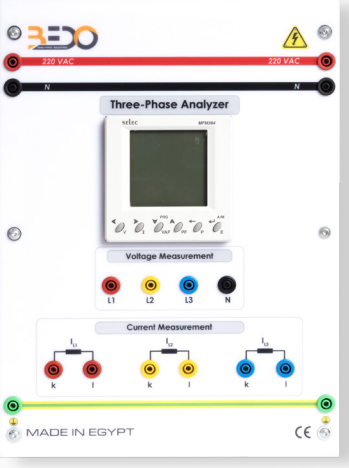
- Reactive power, apparent power and load power.
- Single phase analyzer module is included which contains three meters one for measuring AC voltage while the other two are intended for measuring AC current and load power factor
- Single phase transformer with tertiary winding module is included. This module has six terminals. Two terminals for the primary voltage side, two terminals for the secondary side and two terminals for the tertiary winding
- Three modules of inductive load are included. This module can give two values of inductance
- Three phase capacitive load module is supplied. The module is divided into three phases. Each phase contains three capacitors. The capacitors can be connected in parallel to increase capacitance per phase or be connected in series to decrease capacitance value.
- Single phase rheostat load can be varied allowing trainees to test with different load values.
- Six current transformers are included in one module which is called current transformer. The transformer terminals consist of primary and secondary side.
- This trainer comes with three protection relays: temperature controller, under/ over voltage and phase relay, as well as overload relay.
- The temperature controller makes sure that the transformer core is operating at a safe temperature.
- The multi-function voltage relay can monitor the undervoltage condition, over voltage condition and can indicate whether the voltage sequence is a positive or negative sequence.
- The overload relay senses overloading of motor and interrupts the power flow to the motor, thus protecting it from overheating and winding damages.
- The modules are well protected in a provided kit to protect against wear and deterioration.

Three Phase Analyzer (Smart Grid Power Generation tender)
Code: (PS108.01)



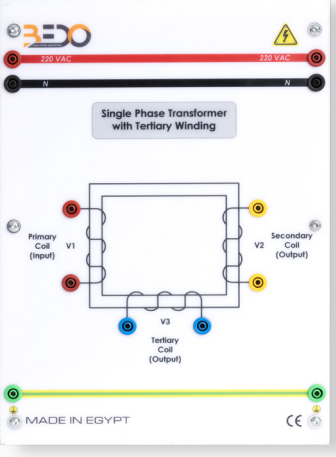
» Maximum current: 5 A

Single Phase Analyzer
Code: (PS108.02)



» Maximum line voltage: 220 VAC
» Maximum input current: 25 A

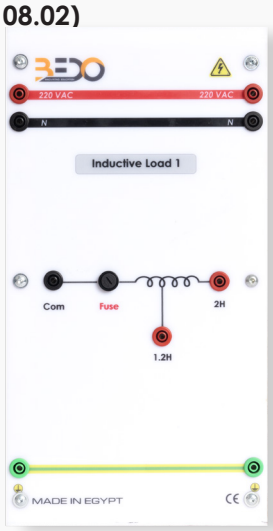
Single Phase Transformer with Tertiary Winding
Code: (PS108.03)



» Primary voltage: 380 VAC
» Secondary and tertiary voltage: 220 VAC

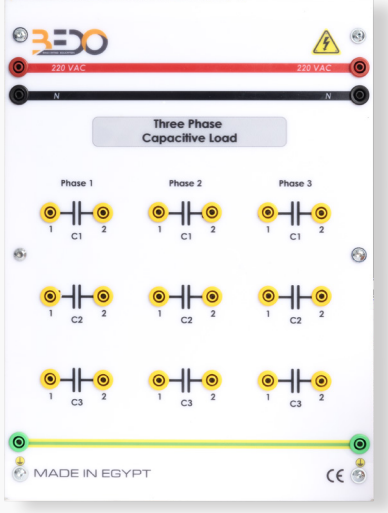
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Inductive load
Code: (PS108.02)



- » Middle terminal inductance value: 1.2 H
- » End terminal inductance value: 2 H
- » Maximum applied voltage across the coil is 380V AC

Three Phase Capacitive Load
Code: (PS108.02)



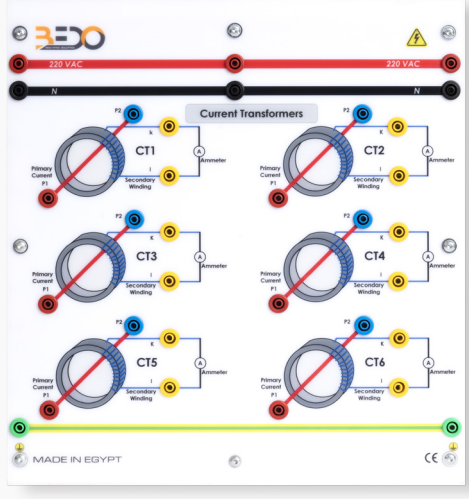
- » 5 microfarads per each capacitor
- » Each capacitor can handle up to 400 VAC

Single-phase rheostat load
Code: (PS108.02)



- » Variable resistor rated 500Watts
- » The resistance can be varied from 0 to 200 ohms
- » Rated current: 1.5 A

Current transformer
Code: (PS108.02)



- » Each CT is rated 5/5A

Experiments

- Effect of power factor on line currents & compensation using capacitive bank
- Relationship between line current and phase current in the case of star connected symmetric resistive load
- Relation between line current and phase current for delta connected resistive load
- Relation between line current and phase current under unbalanced three-phase load

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- Relation between active power, reactive power, apparent power and power factor
- Significance of tertiary winding under three-phase unbalanced load condition
- Controlling power flow direction using shift transformers

Scope of Delivery

- Electric Transformers Training Kit (PS108)
- Hard copy user manual

Options

- Digital content (BI01)
- Storage unit (BI03)

Required for Operation

- Electrical Installations Training Frame (EL301)

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