PS220

Single-Phase Transformers

A set of three single-phase multi-tapped transformers for a wide range of single-phase or three-phase experiments

- Open and flexible design for wide variety of experiments
- Robust and durable for long life
- For use in single-phase or any common three-phase configuration, including star, delta, interstar and others
- Supplied with mobile frame for easy mobility
- One-volt-per-turn winding design for easy demonstration of transformer principles
- Coloured, shrouded sockets for improved laboratory safety
- Includes thermocouples for core and winding temperature measurements
- Multiple tappings for selection of output voltages
- Extra tertiary windings for accurate matching in parallel transformer tests

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An ISO 9001 certified company

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Description

The Single-Phase Transformers is an essential tool for experiments and demonstrations of transformer theory. It is made up of three identical transformers (except for the tertiary windings). Each transformer is inside a separate steel enclosure and all fit onto a frame which has small wheels for ease of mobility.

Each transformer has a selection of high-voltage (primary) and low-voltage (secondary) tappings to select a range of input and output voltages. They also have extra tertiary windings. The tertiary windings help compensate for any slight differences in the transformers when used in parallel. The transformers are separate units and will work as three individual single-phase transformers, or can connect to be a single three-phase transformer.

All tappings are accessible, so students may link the windings to suit any of the common single and three-phase connections. All tappings connect to coloured, shrouded sockets for safety.

To show transformer principles clearly, the transformers operate as one volt each turn. This means that the no-load output voltage is the same as the number of turns on the secondary.

Thermocouples measure the temperatures of the primary windings, the secondary windings and the core of one of the transformers.

The thermocouples help to show the temperature changes in the transformers in open and short-circuit conditions. The readings help the student to understand the temperature specification for materials used in transformers.

Supplied with a detailed user guide, including theory and experiments.

Standard Features

- Supplied with comprehensive user guide
- Two-year warranty
- Manufactured in accordance with the latest European Union directives

Experiments

- Single-phase and three-phase experiments
- Open and short-circuit tests
- Harmonics and unbalanced loading
- Star-star connected transformers
- Delta-delta connected transformers
- Star-delta and delta-star connected transformers
- Interstar connection

Recommended Ancillaries

- Portable Resistive Load Bank (PS231)
- Portable Capacitive Load Bank (PS232)
- Portable Inductive Load Bank (PS233)

Operating Conditions

Operating environment:
Laboratory environment

Storage temperature range:
–25°C to +55°C (when packed for transport)

Operating temperature range:
+5°C to +40°C

Operating relative humidity range:
80% at temperatures < 31°C decreasing linearly to 50% at 40°C

Sound Levels

Less than 70 dB(A)

Specifications

Nett dimensions and weight (each transformer):
350 mm x 340 mm x 280 mm and 33 kg each

Nett dimensions and weight (transformers on mobile frame):
960 mm x 540 mm x 400 mm and 121 kg

Packed weight and volume (total with mobile frame):
200 kg and 0.35 m^3

Transformers:
1 kVA nominal (each transformer)

Single-phase double-wound transformers. Each primary has two sections with tappings at 0 V, 104 V, 120 V and 138 V. Each secondary has two sections with tappings at 0 V, 52 V, and 60 V. Each transformer has different tertiary tappings:

- one transformer has 0 V, 28 V, 50 V and 52 V
- the second has 0 V, 47 V, 50 V and 52 V
- the third has 0 V, 48 V, 50 V and 52 V

Thermocouples:
Three K-type thermocouples, one fitted to the primary, the second to the secondary and the third to the core of one transformer. Each thermocouple connects to sockets on the connection plate of the transformer.

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