



PSL80

## THREE-PHASE MOBILE TRANSFORMER

A mobile 3 kVA three-phase multi-tapped transformer for a wide range of single-phase or three-phase experiments



### KEY FEATURES

- For use in single-phase or any three-phase configuration, including star, delta, interstar and others
- Mobile, for easy use
- One-volt-per-turn winding design for easy demonstration of transformer principles
- Supplied with a set of loadbanks for a complete range of tests
- Includes thermocouples for core and winding temperature measurements
- Multiple tapplings for selection of input and output voltages

### LEARNING OUTCOMES

- Single-phase and three-phase experiments
- Open and short-circuit tests to find iron and copper losses
- Harmonics and unbalanced loading
- Star-star, star-delta, delta-delta and delta-star connected transformers
- Interconnected star (interstar or zig-zag) connection

### KEY SPECIFICATIONS

- One-volt-per-turn windings
- Three thermocouples
- Three transformers on a common core
- Total 3 kVA (1 kVA per phase)

# THREE-PHASE MOBILE TRANSFORMER

## DESCRIPTION

The Three-phase Mobile Transformer is an essential tool for experiments and demonstrations of transformer theory. It consists of three identical transformers on a common core to create a three-limb, three-phase transformer. The transformer is inside a steel enclosure, which has small wheels for ease of mobility.

The transformer has a selection of high-voltage (primary) and low-voltage (secondary) tapplings to select a range of input and output voltages.

All tapplings are accessible, so students may link the windings to suit any of the common three-phase connections. All tapplings 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.

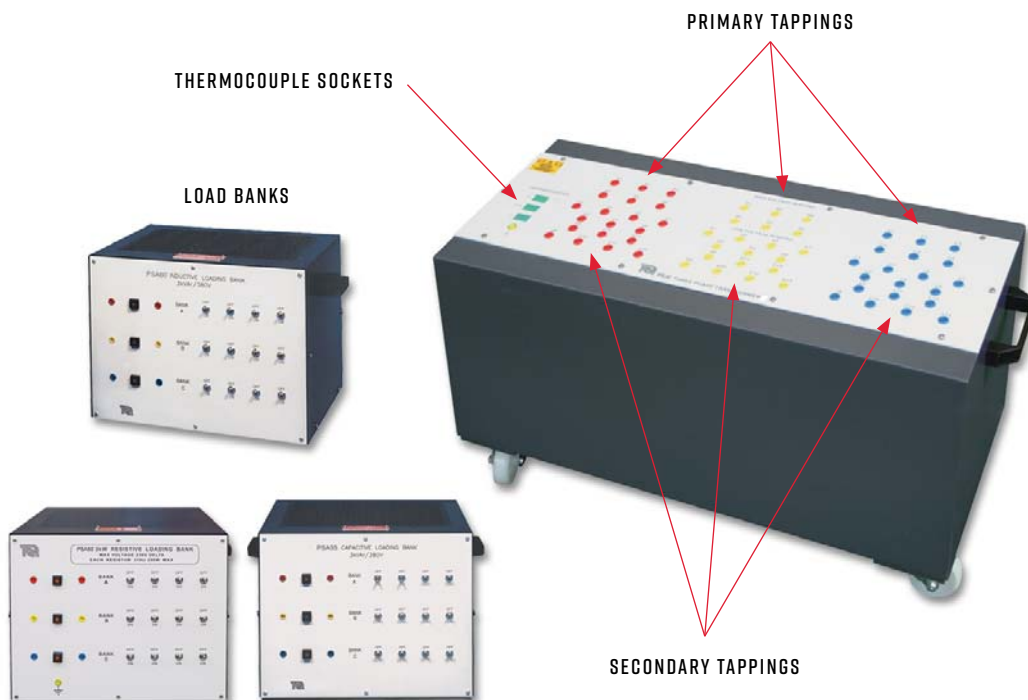
For a typical test, students connect the primary and secondary winding to suit their experiments. They then connect a suitable variable supply to the primary windings and measure the output voltages, with or without loads - determined by the experiment.

Thermocouples help to measure temperatures on the primary windings, the secondary windings and the core of one of the phases. The readings help the student to understand the temperature specification for materials used in transformers. Note: you need a suitable K-type measuring instrument (not supplied) to measure the outputs of the thermocouples.

To allow a complete range of tests, TecEquipment supply this product with three load banks; one resistive, one capacitive and one inductive (PSA50, PSA55 and PSA60).

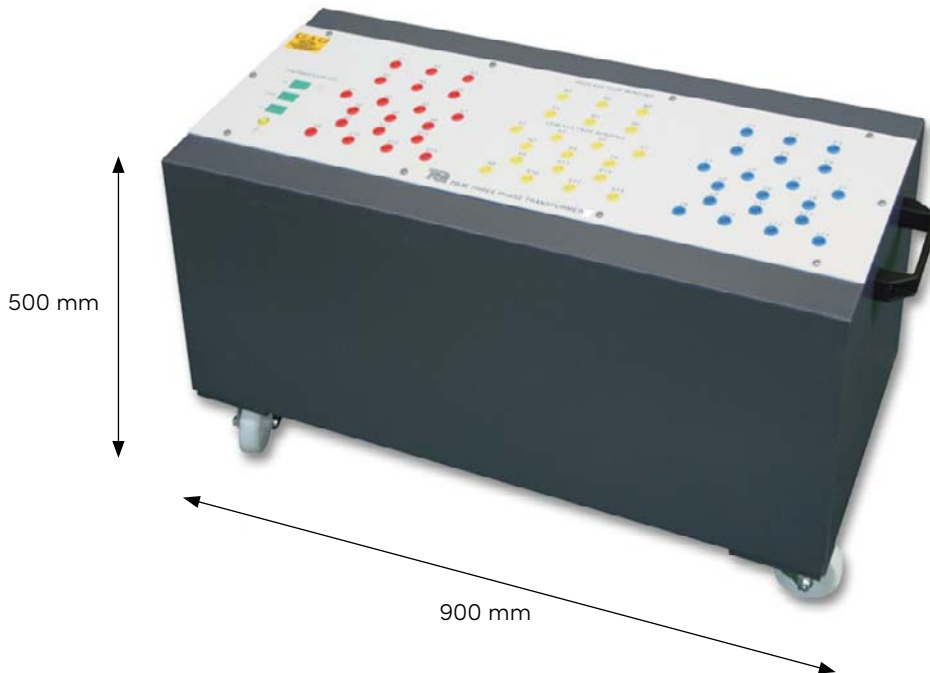
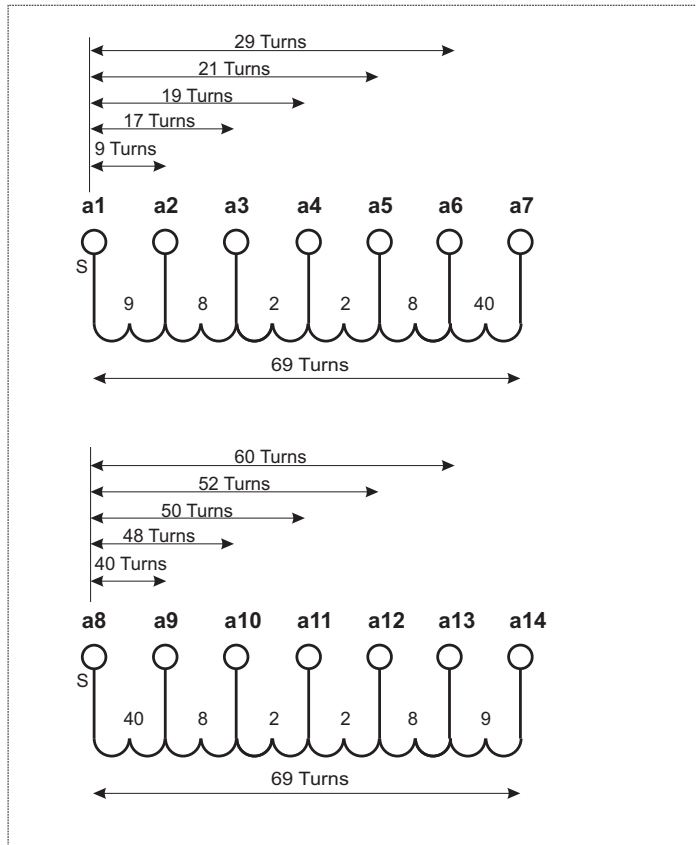
## STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Manufactured in accordance with the latest European Union directives
- ISO9001 certified manufacturer



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Low Voltage  
(Secondary)  
Windings

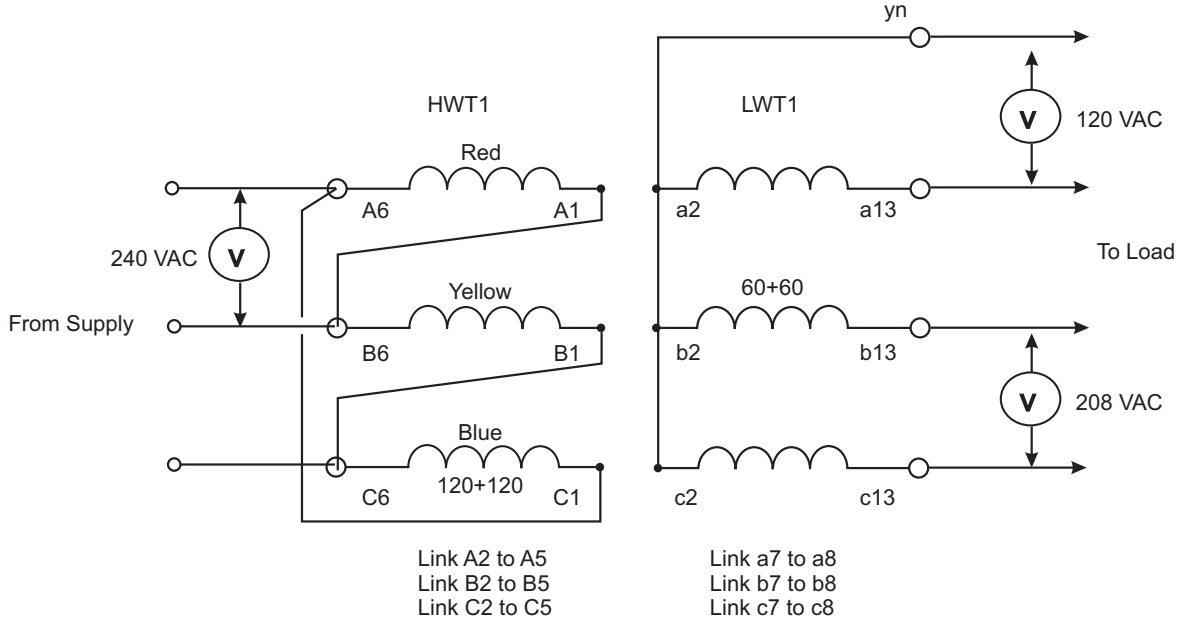


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## TYPICAL WORK ASSIGNMENTS

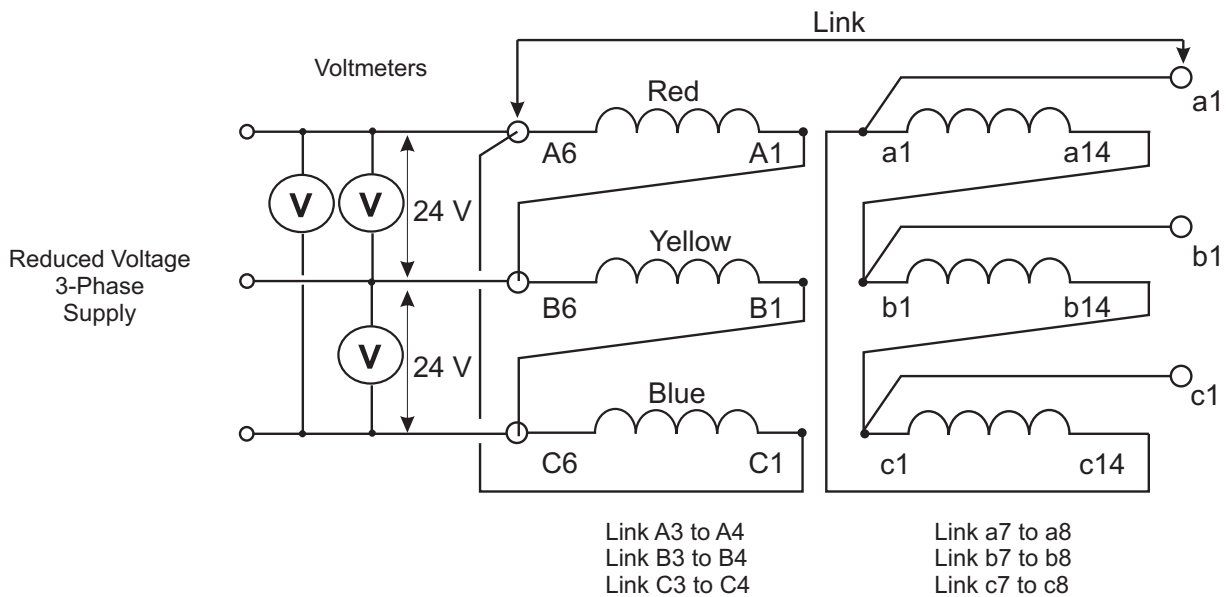
### VOLTAGE REGULATION TEST (UNITY POWER FACTOR)

This test measures the full load voltage with a resistive load and compares it with the rated voltage to find the voltage regulation of the transformer.



### DELTA-DELTA CONNECTED TRANSFORMERS - DD6 CONNECTION

This test connects the primary and secondaries in delta-delta. Students measure the voltages and produce a phasor diagram.



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## DETAILED SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

### NETT DIMENSIONS AND WEIGHT (PSL80):

340 mm wide x 900 mm long x 500 mm high and 100 kg

### APPROXIMATE PACKED WEIGHT AND VOLUME (PSL80):

200 kg and 0.3 m<sup>3</sup>

### NETT AND PACKED DIMENSIONS OF LOADBANKS :

Refer to separate datasheets (PSA50, PSA55 and PSA60).

### TRANSFORMERS:

- 3 kVA nominal (1 kVA each phase)
- Three-limb three-phase double-wound transformer
- Each primary has two sections, one with tapplings at 18 V and 138 V. The other is mirrored at 120 V and 138 V.
- Each secondary has two sections, one with tapplings at 40 V, 48 V, 50 V, 52 V, 60 V, and 69 V. The other is mirrored at 9 V, 17 V, 19 V, 21 V, 29 V and 69 V.

### THERMOCOUPLES:

Three K-type thermocouples, each fitted to the primary, secondary and core of phase B transformer. Each thermocouple connects to K-type sockets on the connection plate of the transformer.

## OPERATING CONDITIONS

### OPERATING ENVIRONMENT:

Laboratory

### 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

## ESSENTIAL SERVICES

### ELECTRICAL SUPPLY:

Fused and protected laboratory supply

Variable 0 to 400 VAC line to line at 5 A and

Variable 0 to 208 VAC line to line at 10 A

50 Hz or 60 Hz - determined by order

**NOTE:** Not for direct connection to a mains supply.

## SOUND LEVELS

Less than 70 dB(A)