

### ELECTRICAL MACHINE & TRANSFORMER TRAINER



#### DESCRIPTION

The TM-150 Trainer is a combination of the DM -100 E Electrical Machine Trainer and the TR-101 Transformer Trainer.

It consists of the following components:

- Ø A steel-framed safety enclosure, which houses the 4 transformers. The ultra high impact (UHI) acrylic front panel of this enclosure serves both as a mounting matrix for the plug-in component modules and as a mimic panel representing the terminations of the transformer, which are brought out via polyamide binding post terminals.
- Ø A 3 phase power supply, 0-230v variable, AC and DC with ammeter and voltmeter, MCB, emergency stop, keyed selector switch, tachometer, is contained in a steel enclosure which bolts alongside the transformer enclosure. All outputs are via polyamide terminals. The power supply is overload-protected by thermal relays.

# ELECTRICAL MACHINE & TRANSFORMER TRAINER

- Ø A robust, lockable, wooden cabinet with a hardwearing work surface supports the transformer/power supply assembly. It is fitted with adjustable feet and provides storage for loose components, leads and manuals.
- Ø Demountable electrical machine components which are easily assembled to form a variety of machines, rated at 375 Watts, 80 Frame. These are enough electrical machine parts to assemble two complete machines, which can be coupled to each other or to the eddy current brake.
- Ø 4 x transformers, rated at 300VA:
  - Single phase -230V/2 x 115V
  - Three phase (3 x single phase-ganged) 230V/2 x 115V
  - Auto-230V/110, 115, 230V;
  - Toroidal-230V/2 x 115V
- Ø A range of plug-in component modules, including ammeters (x 3); voltmeters (x 3); resistive load; capacitive load; load resistor (250 Watt, 50 ohm, 4 taps); triple lamp module; switch (DPDT); and multimeter module.
- Ø Set of 4mm stackable banana plug connecting leads
- Ø Comprehensive user/experiment manuals and resource information manuals.

## EXPERIMENTAL CAPABILITY

- a. Electrical Machines - various methods of starting, controlling, reversing and loading:

### Single Phase Cage Motor

Demonstrating:

- Ø No capacitor
- Ø Capacitor starting
- Ø Capacitor start, capacitor run
- Ø 2 value capacitor start & run
- Ø Changing rotational direction in each case

### Shaded Pole Induction Motor

Demonstrating:

- Ø Starting & running

### Synchronous Motor

Demonstrating:

- Ø Starting & running
- Ø Reversal of rotation
- Ø Star & delta connections

### Direct Current Motor

Demonstrating:

- Ø Starting & running
- Ø Series configuration
- Ø Shunt configuration
- Ø Compound configuration
- Ø Reversal of rotation in each of the above

### Single Phase Alternator

Demonstrating:

- Ø Generation of an AC voltage

### Split Phase Cage Motor

Demonstrating:

- Ø Starting & running
- Ø Reversal of rotation

### Three Phase Cage Motor

Demonstrating:

- Ø Starting & running
- Ø Reversal of rotation
- Ø Star connections
- Ø Delta connections

### Slipping Motor

Demonstrating:

- Ø Starting & running
- Ø Reversal of rotation
- Ø Star & delta connections

### Universal Motor

Demonstrating:

- Ø Starting & running on AC & DC supplies
- Ø Series configuration
- Ø Shunt configuration
- Ø Reversal of rotation

### Eddy Current Brake

This provides a load for motors & measures the speed of rotation, as well as torque readout in Newton metres.

### ELECTRICAL MACHINE & TRANSFORMER TRAINER

#### b. Single and Three Phase Transformer Trainer

- Ø Static tests and derived data, machining terminal identification, winding resistance, open and short circuit tests
- Ø Turns ratio
- Ø Polarity of winding
- Ø Input and output waveforms
- Ø Resistive and capacitive loading
- Ø Phasing of secondary windings (star/star, star/delta, delta/star and delta/delta)
- Ø Efficiency

The experimental capability of the TM- 150 may be increased by using ADDITIONAL electrical machine components and plug-in component modules, which are available on request.

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AMRON reserves the right to amend these specification in the interest of product improvement