



Introduction

The Single Phase Induction Motor Training System is an advanced and comprehensive educational setup designed for electrical laboratories. It provides complete learning concepts of a single-phase capacitor start-induction run motor.

Separate terminals are provided for the main winding, starting winding, and capacitor, enabling students to clearly understand the function of each component and the role of the capacitor in motor operation.

The system demonstrates key phenomena such as excitation, running, and reversing of the motor. It also allows evaluation of equivalent circuit parameters, power factor, and performance characteristics including the speed-torque relationship.

All panel connections are designed in a simplified manner, allowing students to perform wiring independently and gain hands-on experience.

Note: Shown image is for illustration purposes only. Actual product may vary.

Training Objectives

- To understand the construction and working of single-phase induction motors
- To study capacitor start and capacitor run mechanisms
- To analyze starting and running windings
- To perform no-load, block-rotor, and load tests
- To determine equivalent circuit parameters and power factor
- To study speed-torque (load) characteristics of the motor
- To observe motor operation including starting and reversing

Key Features

- Digital microcontroller-based measuring instruments with high accuracy and resolution
- Built-in single-phase autotransformer (Variac)

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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- Screen-printed circuit diagrams and symbols for easy understanding
- Standard BS-10 terminals with patch cords for safe connections
- Copper-wound machine for long service life
- Class "F" insulation for improved thermal endurance
- Standard mechanical loading arrangement
- Heavy-duty MS channel base with provision for concrete mounting
- Brake drum/pulley with internal heat suppression facility
- Contact-type digital speed measurement system
- Supply indication lamp for operational status

System Components

Single Phase Induction Motor

- Type : Capacitor Start – Capacitor Run
- Power Rating : 1 HP
- Voltage Rating : 220 V AC $\pm 10\%$, 50 Hz
- Current Rating : As per standard
- Speed : 1440 RPM $\pm 10\%$
- Insulation : Class 'F'

Loading Arrangement

- Type : Mechanical loading
- Brake Drum / Pulley : MS / Aluminum cast with heat suppression facility
- Spring Balance : 2 Nos. (Salter make)

Machine Base

- Material : MS "C" Channel
- Construction : Heavy-duty with suitable interconnections

Measuring Instruments

- **AC Wattmeter** : 1000 W
- **AC Voltmeter** : 0 – 500 V
- **AC Ammeter** : 0 – 10 A

Single Phase Variac (Autotransformer)

- Primary Voltage : 220 V AC $\pm 10\%$, 50 Hz
- Secondary Voltage : 0 – 220 V AC $\pm 10\%$, 50 Hz

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Digital Tachometer

- Range : Up to 19,999 RPM
- Type : Contact / Non-contact

Protection Devices

- MCB (DP) : 16 A
- Glass Fuse : 10 A

Technical Specifications**Mains Supply**

- Voltage : 220 V AC $\pm 10\%$
- Frequency : 50 Hz

Scope of Learning / Experiments

- Study of single-phase capacitor start-capacitor run motor
- Understanding operational principles and fundamentals
- Study of starting capacitor and starting winding
- Observation of running and reversing phenomena
- No-load test performance analysis
- Block-rotor test
- Load test performance
- Determination of power factor and efficiency
- Plotting speed-torque characteristics

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