



Introduction

The Three Phase Squirrel Cage Induction Motor Training System with V/F Drive is an advanced and adaptable educational setup designed for electrical laboratories. It enables students to understand the construction, working principles, and speed control techniques of a three-phase squirrel cage induction motor.

The system is equipped with a built-in Variable Frequency (V/F) Drive, allowing precise control of motor speed by varying voltage and frequency. The panel is designed with a simple layout and clear markings, enabling students to perform connections independently and safely while gaining practical exposure to modern motor control techniques.

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

Training Objectives

- To understand the construction and working of three-phase induction motors
- To study the principle of V/F (Volts per Hertz) control
- To control and analyze motor speed using VFD
- To observe motor behavior under varying frequency conditions
- To study forward and reverse operation of motor
- To understand industrial applications of variable speed drives

Key Features

- Integrated control with built-in V/F Drive (VFD)
- Digital microcontroller-based measuring instruments
- Screen-printed symbols, circuit diagrams, and graphics for easy understanding
- Standard BS-10 terminals with patch cords for electrical safety
- Copper-wound motor for long operational life
- Class "F" insulation for enhanced durability
- Standard mechanical loading arrangement

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



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- Tabular spring balance arrangement for load measurement
- Heavy-duty MS channel base with provision for concrete mounting
- Brake drum/pulley with internal heat suppression facility
- Equipped with supply indication lamps
- Smooth and precise speed control capability

System Components

Three Phase Induction Motor

- Type : Squirrel Cage
- Power Rating : 1 HP
- Voltage Rating : 415 V AC $\pm 10\%$, 50 Hz
- Current Rating : As per standard
- Speed : 1440 RPM $\pm 10\%$
- Insulation : Class 'F'

V/F Drive (VFD Unit)

- Power Rating : 1 HP
- Make : Siemens / Delta / Sunfar
- Input Voltage : 380 V AC $\pm 10\%$, 50 Hz
- Output Voltage : 0 – 415 V AC $\pm 10\%$
- Output Frequency : 0 – 60 Hz
- Overload Capacity : 110% rated current (continuous duty)
- Control Method : V/F Control (Open Loop)
- Direction Control : Forward / Reverse (CW & CCW)

Loading Arrangement

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

Machine Base

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

Measuring Instruments

- **AC Voltmeter** : 0 – 500 V

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- **AC Ammeter** : 0 – 10 A

Technical Specifications

Mains Supply

- Voltage : 415 V AC $\pm 10\%$
- Frequency : 50 Hz

Protection Devices

- MCB (TPN) : 10 A
- Glass Fuse : 10 A

Scope of Learning / Experiments

- Study of three-phase squirrel cage induction motor
- Understanding fundamentals and working principles of V/F Drive
- Speed control of induction motor using VFD
- Observation of motor performance under varying frequency
- Forward and reverse operation of motor
- Analysis of voltage-frequency relationship

Supporting Accessories Supplied

- Patch cords with different color schemes
- Single-phase and three-phase mains cords
- Extra glass fuses
- Learning material manual (soft copy)

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