

# ELECTRIC MOTOR CONTROL LEARNING SYSTEM 85-MT5



The model 85-MT5 Electric Motor Control Learning System teaches electric relay control of AC electric motors found in industrial, commercial, and residential applications. Students learn industry-relevant skills including how to: operate, install, design, and troubleshoot AC electric motor control circuits for various applications.

## Learning Topics:

- Motor Safety
- Lockout / Tagout
- Troubleshooting Methods
- Interpreting Schematics
- System Design
- Component Operation
- Installation
- Motor Control Applications
- Motor Start / Stop Circuits
- Motor Sequence Control
- Reversing Motor Control
- Motor Jogging
- Safety Interlocks

The 85-MT5 includes a bench top-mount control workstation, motor workstation, AC induction motor, control component panels, multi-meter, lead set, student learning materials for both theory and lab, and teacher's guide. It uses industrial quality components to help students become better prepared for what they will encounter on the job.

The 85-MT5 Learning System teaches students how to troubleshoot motor control circuits under realistic conditions. Circuit faults can be introduced using either the manual fault insertion, supplied as a standard, or the optional 890-FTS-1 Computer-Based Fault Insertion System.

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# DESIGNED FOR LEARNING

**Industrial Standard Components** - The 85-MT5's electric motor and control components are off-the-shelf industrial standard units that provide students with real world experience in installation and control of industrial motors. The motor is rated at 1/3 Hp and uses industrial standard T-number wiring terminology. Units are connected to load devices through an industrial standard flexible coupling that provides for learning of shaft alignment techniques.



1/3 Hp Industrial Motors

**Heavy Duty Workstation with Storage** - The 85-MT5's Control Workstation's welded-steel construction provides a sturdy work surface for mounting control components. Each component is mounted directly on an individual heavy-duty steel panel, which easily slides into the workstation and locks in place, allowing students to quickly set up a variety of circuit applications. Additional panels are stored on its opposite side of the workstation.



Welded Steel Construction and Motor Base

**Unique Safety Features** - Safety is emphasized throughout the student learning materials and in the hardware design. Safety devices include a lockout/tagout system and grounded connections for individual components in the system. Students use these safety devices each time they set up a circuit.

**Troubleshooting Emphasis** - The circuits students create on 85-MT5 System can be faulted to teach real world troubleshooting of motor control circuits. Faults can be introduced using either the manual fault insertion, supplied as a standard, or the optional 890-FTS-1 Computer-Based Fault Insertion System. The computer-based fault insertion system provides the advantage of allowing the students to learn troubleshooting on an individual basis without the instructor standing by



890-FTS-1 Computerized Fault Insertion System

The motor and load components mount separately to a steel plate base unit that rigidly supports the motor during operation so students can safely load the system and perform precision shaft alignment.



Grounded Panels with lockout / tagout

## TECHNICAL DATA

### Control Workstation

- Heavy Duty Steel Frame
- Dimensions: 36 in. H x 20 in. W x 46.5 in. L (910 mm H x 510 mm W x 1180 mm L)
- Double-Sided Component Mounting
- Slide-in Panel Mounting
- Safety Switch Power Station
  - Fused 3-phase safety switch
  - Lockout/Tagout System
  - Pre-attached power cord (4 pole, 5 wire)
  - Fault Module with (2) faults

### Control Station Panel General Features

- 11 Gauge Steel Panels
- Slide-in Panel Mounting
- Panel Locking Device
- 5-way binding post (ground)
- 120VAC/ 60 Hz Control Power
- Banana Jack Ground Lead

### Operator Station Panel

- Green flush push button (1 N.O., 1 N.C.)
- Black flush push button (1 N.O., 1 N.C.)
- Red mushroom push button (1 N.O., 1 N.C.)
- Three position selector switch (2 N.O.)
- Fault Module with (5) faults

### Indicator Lamp Station Panel

- Green indicator lamp
- Push to test red indicator lamp
- Yellow indicator lamp
- Fault Module with five (5) faults

### Control Transformer Station Panel

- 80 VA control transformer with protective cover
- Dual fuse block with protective cover
- 1-AMP class CC fuses (2 installed, 2 loose)
- Fault Module with three (3) faults

### Reversing Contactor Station Panel

- 4-pole contactors (2)
- Mechanical/electrical interlock
- Fault Module with (5) faults

### Overload Relay Station Panel

- A-B overload relay
- Fault Module with (3) faults

### Manual Motor Starter Station Panel

- Manual starter

### Multifunction Timer Station Panel

- Multi-function timer with on delay, off delay timing, interval, single shot timing, repeat cycle timing, pulse timing
- Fault Module with (4) faults

### Drum Switch Station Panel

- Three phase reversing drum switch

### Limit Switch Station Panel

- Industrial grade limit switch (SPDT) (2)
- Fault Module with (3) faults

### Control Relay Station Panel

- Four pole relays (2 N.O. / 2 N.C.) (2)
- Fault Module with (5) faults

### Pressure/Float Switch Station Panel

- Pressure switch (SPDT)
- Float switch (N.O. or N.C.)

### Motor Connection Station

- Multi-pin industrial motor connector
- Fault Module with (3) faults

### Hand-Held Digital Multi-Meter

### Stackable Banana Lead Set

- 50 Leads Three
- Phase AC Motor
- Squirrel Cage Induction Type
- 115 VAC/60 Hz
- 1/3 Hp Rating
- Nema 56 Frame
- 1750 RPM
- Windings Accessible from multi-pin connector

### 17401 Student Learning Activity Packets

### 17400 Teacher's Guide

### Motor Mounting Frame

- Heavy duty steel frame construction
- Pre-drilled holes for mounting of two motors, prony brake, electric brake, and flywheel.
- Dimensions: 4.0-in H x 12-in W x 27-in L (100 mm x 304 mm x 685 mm)
- Mounting Surface. 125-in steel plate
- Required Items
  - Amatrol Model 613-43 Prony Brake
  - Hand Tool Set
  - Amatrol workstation or equivalent: models 82-609, 82-610, or 82-611

### Power Requirements

- Electrical Power: 3-Phase, 208 VAC, 5 Wire, 60 Hz, 12 Amps