



Description

The Three Phase AC Drives with Frequency Inverter Trainer is a comprehensive, modular training system designed for in-depth study of AC motor drives, power electronics, and industrial drive control using SCADA/RTU. All plug-in modules are interconnected using 19 mm bridging plug sets and 4 mm stackable safety test leads, allowing flexible configuration of control circuits for a wide range of laboratory experiments.

Training Objectives & Functional Coverage

A. Fundamentals of AC Motors

- Types of AC motors
- Construction of asynchronous motors
- Basic operating principles of AC motors

B. Electric Drives

- Motor operation under varying torque and speed conditions
- Electric drive characteristics
- Torque–speed and current–speed characteristics

C. Voltage Control & Inverters

- Voltage control techniques in inverters
- Pulse Width Control (PWC)
- Pulse Width Modulation (PWM)

D. Speed Control by Variable Stator Voltage

- Speed control of squirrel cage induction motors using variable stator voltage

E. Current-Fed and Voltage-Fed Inverters

- Speed control using variable frequency
- Function of self-commutated inverters
- Voltage-fed and current-fed inverter terminology and operation

- Applications in substation and distribution systems

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



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F. Advanced Motor Control Techniques

- Comparison of different motor speed control methods
- Cycloconverter-based control using power electronics experiment modules

Experiment Modules – Electrical Machines

1. Three-phase induction motor
2. Three-phase slip ring machine
3. Three-phase synchronous machine
4. DC shunt-wound machine
5. Three-phase induction motor (750 W)
6. Three-phase AC generator brake (750 W)
7. Single-phase capacitor start motor
8. Single-phase capacitor start & run motor
9. Torque sensor module
10. Torque management software
11. Torque–speed measuring module
12. Digital DC voltmeter
13. Digital DC ammeter
14. Digital AC voltmeter (2 units)
15. Digital AC ammeter
16. Single-phase power analysis meter
17. Three-phase power quality meter with SCADA/RTU
18. Power management software
19. Resistive load unit
20. Star-delta starting switch module
21. Rotation reversing switch module
22. Universal AC & DC power supply
23. Universal AC/DC power supply
24. Three-phase power supply module
25. Current limit protection module (3 units)
26. Circuit breaker module (3-pole)
27. Pilot lamp module
28. Fuse module
29. Magnetic contactor module (3 units)
30. Timer module
31. Push button switch module (Type I)

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- 32.Selector switch module
- 33.Push button switch module (Type II)
- 34.Coupling hub with nylon sleeve and safety guard
- 35.Tachometer
- 36.Rotor resistance starter unit
- 37.AC variable frequency drive (VFD)
- 38.Power drive – soft starter module
- 39.Field rheostat module

Experiment Modules – Power Electronics

1. Diode module group
2. SCR module group (2 units)
3. TRIAC module
4. Power MOSFET module
5. Darlington transistor module
6. IGBT chopper / inverter module
7. Two-pulse controller (2 units)
8. Six-pulse controller
9. PWM controller
- 10.Duty-cycle phase controller
- 11.Resistive load module (Type I)
- 12.Inductive load module
- 13.Capacitor load module
- 14.Resistive load module (Type II)
- 15.DC power supply module
- 16.Connecting safety test lead set
- 17.Three-phase AC power supply
- 18.Experimental table (2 units)
- 19.Experiment panel frame (2 units)

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