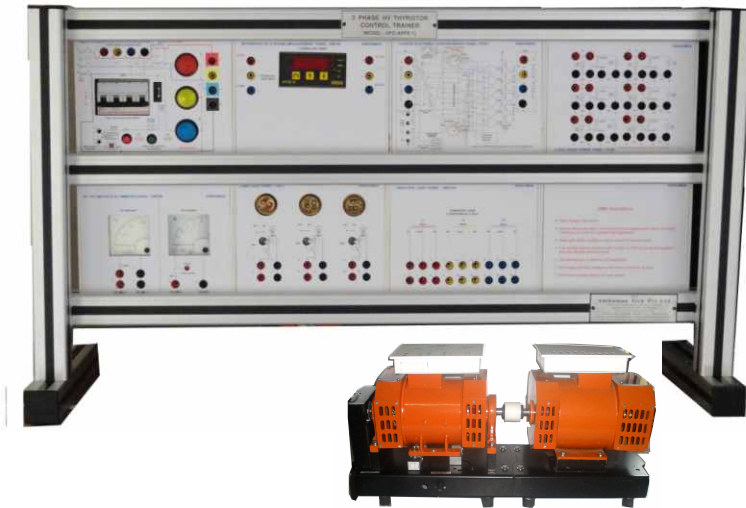


# 3 $\phi$ INDUCTION MOTOR SPEED CONTROL USING STATIC KRAMER DRIVE TRAINER (XPO - SKD)



## SALIENT FEATURES

- ◆ Easy and safe wiring by students due to 4mm sturdy shrouded banana patch cords and shrouded socket arrangement for high voltage circuits.
- ◆ Facilitates easy learning about slip power recovery by cascading two torque motors.
- ◆ Each panel has ABS molded plastic sturdy enclosure, and colorful screw less overlays showing circuit diagram & its connection tag numbers for easy understanding and connections.
- ◆ Set of Instructor Guide & Student Workbook.
- ◆ CNC manufactured chasis mounted coupled motor set 3 ph. AC & DC.

## TECHNICAL SPECIFICATIONS

A] Aluminum profile flat demo panel system (table top), carrying various high voltage components housed in plastic enclosures (panel) to minimize shock possibility.

- ◆ **Input 3 phase DOL Starter panel (EMT1)**  
(10 Shrouded Banana)
  - 4 pole MCB of 415 V/4A.
  - DOL 9A Contactor with 230V / 50 Hz / 11VA COIL.
  - Bimetallic thermal O/L relay with range 1.4A - 2.3A.
- ◆ **FWD-OFF-REV switch panel (EMT 4A)**  
(6 Shrouded Banana)
  - FWD/REV, 3 pole 3 way switch with centre OFF, 6A/440V.
- ◆ **DC voltmeter and DC ammeter panel (EMT 6B) x 2 Nos.**  
(14 Shrouded Banana)
  - a) DC voltmeter(0-300V)
  - b) DC Ammeter (0-5A) with polarity protection diode
  - c) Field failure relay to control Armature supply. (optionally)
- ◆ **Variable AC / DC Supply Panel (EMT23)**  
(8 Shrouded Banana)
  - a) Variable OP AC/270V/3A
  - b) Variable OP DC/250V/3A
- ◆ **3 Ph. Bidirectional power cum Energy meter panel (EMT 34)**  
(8 shrouded Banana)
  - Bidirectional Multifunction Meter
  - 3 Phase 3/4 wire, 415V CT Input 5A
  - LCD/LED display, Aux supply 230V, 45-65 Hz, 5W
  - V.I., Hz, Pf, KVA, KW, KWH
  - Modbus RTU RS 485 (optional)
- ◆ **3 phase SCR Firing/Synchronizing Panel(PE4A)**  
(8 Shrouded Banana)
  - Cosine firing scheme to facilitate linear control for better harmonic ripple control.
  - Cyclo converter frequency generator 25 Hz / 125 Hz
- ◆ **6 SCR/Diode Power Module(PE4B)**  
(36 Shrouded Banana)
  - Consist of 6 SCR [Anode to body type] with PIV rating 1000V / 25A.
  - 6 diode with PIV rating of 1000V/6Amp
  - 6 No. of Snubbers for protection of thyristors consisting of capacitor 0.1 $\mu$ F/1000V and 0.1E/5W ceramic resistors.
- ◆ **Resistor Load (EMT14B)**  
DC Resistors= 750E/600E/300E/212E/162E/ 125E/ 112E/100E/400W /8 taps + OFF + separate 60E tap for DC series Gen.
- ◆ **3 Ph. AC Integrated Machine :**
  - **Voltage :** 415VAC, 50Hz
  - **Capacity/RPM /Terminals :** 300W/4 Pole m/c / 1500RPM 10 terminals
  - **Rotor Construction :** Star connected, four terminals including star point brought out on 4 slip rings mounted on shaft.
  - **Stator construction :** Six terminals to be brought out to start the machine using STAR-DELTA starter.
  - **Winding Temp. :** A embedded Thermistor brought out on 2 eyelets mounted on terminal box for monitoring winding temperature.
  - **Frame/ Mounting Shaft dia :** 100 Frame, Chasis mounted 19mm dia. With easily swappable gear coupling
- ◆ **DC Integrated Machine :**
  - **Voltage :** Varm= 180V Vfield = 180V
  - **Capacity/RPM /Terminals :** 300W/2 Pole m/c / 1500RPM 6 terminals
  - **Rotor Construction:** Standard commutator / brush arrangement with laminated stack, brought out on 2 terminals
  - **Stator construction :** Separately excited field winding with laminated solid yoke 2 pole and series winding brought out on 4 terminals.
  - **Winding Temp.:** A embedded Thermistor brought out on 2 eyelets mounted on terminal box for monitoring winding temperature.
  - **Frame/ Mounting Shaft dia :** 90 Frame, Chasis mounted.
- ◆ **List of Experiment :**
  - To perform experiment on slip power recovery for 3 phase slip ring induction motor
  - To perform experiment for speed control of 3 phase slip ring induction motor using Static Kramer Drive.
- ◆ **Mechanical Dimension(mm):**  
1170 (L) x 300 (W) x 990 (H)
- ◆ **Net Weight :** 33 kg, Each motor = 40Kg.