

SALIENT FEATURES :

- 01 Facilitates easy and safe wiring by students due to use of 4mm sturdy Shrouded banana patch cords & shrouded socket arrangements.
- 02 All machines are mounted on finely painted sturdy base frame with easy machine interchangeability. Use of gear coupling facilitates screwless coupling. interchangeability. Use of gear coupling facilitates screwless coupling.
- 03 With due emphasis on student safety machines operate upto 300W power levels and upto 1500 RPM, without compromising on didactic use. Able to draw all graphs.
- 04 Trunnion mounted DC Integrated machine is used as Dynamometer for loading other machines (Motors / generators both); unlike magnetic powder brake or eddy current brake which can load only coupled Motors and not generators, with facility to measure shaft power using electronic torque / speed Measurement

SYNCHRONIZATION / PARALLELING OF TWO THREE PHASE ALTERNATOR TRAINER

Name of Experiments

- | | |
|----------------|---|
| Experiment -1 | speed torque curve of DC shunt motor with 3 phase AC integrated motor |
| Experiment -2 | speed torque curve of DC series motor with 3 phase AC integrated motor |
| Experiment -3 | Speed torque curve of separately excited DC motor with 3 phase AC integrated motor |
| Experiment -4 | Speed torque of DC compound motor with 3 phase AC integrated motor |
| Experiment -5 | v-i efficiency curve for DC shunt generator with 3 phase AC integrated motor |
| Experiment -6 | v-i efficiency curve for DC series generator with 3 phase AC integrated motor |
| Experiment -7 | v-i efficiency curve for DC separately excited generator with 3 phase AC integrated motor |
| Experiment -8 | v-i efficiency curve for DC compound generator with 3 phase AC integrated motor |
| Experiment -9 | v-i efficiency curve for occ of shunt generator with 3 phase AC integrated motor |
| Experiment -10 | Speed torque curve of wound rotor induction motor with rotor shorted and with different Rotor resistance. |
| Experiment -11 | DOL/Star-delta starter, rotor resistance starter. |
| Experiment -12 | Application of sync. Motor as pf improvement device-V curve. |
| Experiment -13 | Synchronous generator V-I curves. |
| Experiment -14 | Dark lamp method[all lamps are dark] |
| Experiment -15 | Bright lamp method[all lamps are bright] |
| Experiment -16 | 1 Dark 2 Bright lamp method. |

Note: Specifications are subject to change.

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PANELS PROVIDED

- 01 Aluminum Machine trainer Rack
- 02 Input 3 phase DOL Starter panel
- 03 Multifunction Meter (Single Phase/Three Phase AC 50Hz) - Qty.2
- 04 FWD/REV, Star-Delta starter panel
- 05 Rotor Resistor Cum 3Phase Synchronous Motor Control
- 06 DC voltmeter & Ammeter and Torque Measurement Meter - Qty.2
- 07 Variable DC Power Supply - Qty.2
- 08 Input Single Phase DOL Starter Panel AC DC Fix / Variable Supply - Qty.2
- 09 AC Load Resistor
- 10 DC Load Resistor
- 11 Synchroscope / 3 Phase Alternator Synchronizer
- 12 Extension Board


MOTORS PROVIDED

- 01 DC Integrated (Trunion Mounted) Motor - Qty.2
- 02 3 Phase AC Integrated Motor - Qty.2


ACCESSORIES PROVIDED

- 01 Hand held digital Tachometer
- 02 Shrouded connecting leads 4mm 50 / 100cm assorted Red & Black

Technical Specification of Motors




DC INTEGRATED (TRUNION MOUNTED) MOTOR - (2Nos.)
Voltage : $V_{arm} = 180V$ $V_{field} = 180V$
Capacity - 300W/2 Pole m/c, **RPM - 1500, Shrouded Socket - 12**
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.
Toque characteristic: Provision of load cells 6Kg. 2No. assembly to measure the




3 PHASE AC INTEGRATED MOTOR - (2Nos.)
Voltage : 415VAC, 50Hz
Capacity - 300W/4 Pole m/c, **RPM - 1500, Shrouded Socket - 18**
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 motor using STAR-DELTA starter.

Technical Specification of Panels



INPUT 3 PHASE DOL STARTER PANEL

- 1 MCB 4 pole 4Amp.
- 2 DOL 9A Contactor with 415V / 50 Hz / 11VA COIL .
- 3 RYB Indicator
- 4 Emergency Switch
- 5 Shrouded socket 8Nos.
- 6 Push button switch for Stop/Start



MULTIFUNCTION METER (Single Phase/ Three Phase AC 50Hz)


- 1 Bidirectional Multifunction Meter
- 2 3 Phase 4 wire, 440V, Current 5A
- 3 LED display,
- 4 Aux supply 230V, 45-65Hz, 5W
- 5 To measure parameters ie Voltage Current., KVA, Frequency, Power factor, Active Power (W), Reactive Power (vary) etc.
- 6 Shrouded socket 08Nos. etc.

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Technical Specification of Panels




FWD/REV AND STAR-DELTA STARTER PANEL

- 1 FWD/REV, 3 pole 3 way Switch with centre OFF, 10A/440V.
- 2 Star/Delta switch 3 pole, 3 way with centre OFF, 10A/440V.
- 3 Shrouded socket 12Nos.




AC LOAD RESISTOR

- 1 AC Resistors 10K/5K/3.5K/2.5K/2K/1.5K/OFF 200W x 3 phases/ 6 taps
- 2 Load Resistance switch 3 POL 7 Way/10Amp.
- 3 Cooling Fan size 4" 230V Operated
- 4 Shrouded socket 12Nos.




ROTOR RESISTOR CUM 3PHASE SYNCHRONOUS MOTOR CONTROL

- 1 Rotor resistors of 30E/5A with 3 taps of 15E, 21E, 30E each - 3 Nos.
- 2 Rotor resistor selector switch, 3 pole. 6 Way 10A/440V.
- 3 DC Rotor excitation with circuit breaker (3Amp)
- 4 Shrouded socket 8Nos.



DC LOAD RESISTOR

- 1 750E/600E/300E/212E/162E/125E/112E/100E/400W /8 taps + OFF + separate 60E tap For DC series Gen.
- 2 Load Resistance switch 3 POL 7 Way/10Amp.
- 3 Cooling Fan size 4" 230V Operated
- 4 Shrouded socket 6Nos.




DC VOLTMETER & AMMETER WITH TORQUE MEASUREMENT METER

- 1 TWO DPM DC voltmeter (0-1000V)
- 2 TWO DPM DC Ammeter (0-20A)
- 3 Torque Measurement Meter
- 4 Shrouded socket 16Nos.



SYNCHROSCOPE /3 PH. ALTERNATORS SYNCHRONIZING

- 01 Synchroscope:- Rotating light meter with 28 LED on a circular scale and a zero voltage differential indication with 2 LED
- 02 3 Phase Alternator Synchronizing
- 03 Synchronization indication for




VARIABLE DC POWER SUPPLY

- 1 Half bridge SCR based 0V-200V / 3Amp. cosine firing with linear characteristics, 3 Nos. Switch SPDT to On/Off with indication
- 2 Three Nos. of these supplies required for DC Armature, DC motor field and AC generator field.
- 3 Shrouded socket 8Nos.

EXTENSION BOARD

- 1 Operating Voltage 230VAC \pm 10% at 50Hz
- 2 ON OFF Switch with indicator
- 3 Eight Nos. five pin 5 Amp Electrical Sockets




INPUT SINGLE PHASE DOL STARTER PANEL AC DC FIX / VARIABLE SUPPLY

- 1 MCB 2 pole 10A with indicator
- 2 Emergency Switch
- 3 Push button switch for Stop/Start
- 4 DOL 9A Contractor with 230V / 50 Hz / 11VA Coil .
- 5 Shrouded socket 4Nos.

Variable AC Supply (0-200V)

- 1 Shrouded socket 6Nos.



ALUMINUM FRAME - MODULAR

Electrical motor trainer rack made up aluminium profile size 40x40mm, foldable and light in weight 10 panel setup can be interchange conveniently to perform experiments. Dimension Length 1100xHeight 1000xDepth 350mm.

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