







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. Contact factory for 3 HP EMT Trainer.
- 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

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 1 Phase Motor, Alternator & Sync. Motor
- 07 DC voltmeter & Ammeter and Torque Measurement Meter Qty.2
- 08 Variable DC Power Supply Qty.2
- 09 Input Single Phase DOL Starter Panel AC DC Fix / Variable Supply Qty.2
- 10 AC Load Resistor
- 11 DC Load Resistor
- 12 AC Load Inductor
- 13 Capacitive © Load
- 14 Lamp Load
- 15 Synchroscope / 3 Phase Alternator Synchronizer
- 16 Extension Board

Motors Provided

- 01 DC Integrated (Trunion Mounted) Motor Qty.2
- 02 3 Phase AC Integrated Motor Qty.2
- 03 3 Phase Salient Pole Alternator
- 04 1 Phase. Synchronous Motor
- 05 1 Phase AC Integrated Motor
- 06 Universal Motor
- 07 DC Integrated (Foot mounted) Motor
- 08 1 Phase AC Integrated Motor with loading arrangement
- 09 3 Phase AC Integrated Motor with loading arrangement
- 10 3 Phase Squirrel Cage Induction Motor with loading arrangement
- 11 Repulsion Motor with loading arrangement

Accessories Provided

- 01Hand held digital Tachometer.0102Shrouded connecting leads 4mm 50cm Red.2003Shrouded connecting leads 4mm 50cm Black.2004Shrouded connecting leads 4mm 100cm Red.20
- 05 Shrouded connecting leads 4mm 100cm Black.....20

DC MOTOR COUPLED 3PH. AC MOTOR TRAINER (46801)

- Experiment 01 speed torque curve of DC shunt motor with 3 phase AC integrated motor
- Experiment 02 speed torque curve of DC series motor with 3 phase AC integrated motor
- Experiment 03 speed torque curve of separately excited DC motor with 3 phase AC integrated motor
- Experiment 04 speed torque curve of DC compound motor with 3 phase AC integrated motor
- Experiment 05 v-i efficiency curve of DC shunt generator with 3 phase AC integrated motor
- Experiment 06 v-i efficiency curve of DC series generator with 3 phase AC integrated motor
- Experiment 07 v-i efficiency curve of separately excited DC generator with 3 phase AC integrated motor
- Experiment 08 v-i efficiency curve of DC compound generator with 3 phase AC integrated motor
- Experiment 09 v-i efficiency curve of occ of shunt generator with 3 phase AC integrated motor
- Experiment 10 speed torque curve of would rotor induction motor with rotor shorted and with Different rotor resistance
- Experiment 11 DOL starter
- Experiment 12 Star delta starter
- Experiment 13 Rotor resistance starter
- Experiment 14 Application of synchronous motor as pf improvement device-v curves
- Experiment 15 Synchronous generator v-I curves

DC MOTOR COUPLED 3PH. SALIENT MOTOR TRAINER (46802)

Experiment – 16 speed torque curve of DC shunt motor with 3 phase salient motor Experiment – 17 speed torque curve of DC series motor with 3 phase salient motor Note: Specifications are subject to change.

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- Experiment 18 Speed torque curve of separately excited DC motor with 3 phase salient motor
- Experiment 19 Speed torque of DC compound motor with 3 phase salient motor
- Experiment 20 v-i efficiency curve of DC shunt generator with 3 phase salient motor
- Experiment 21 v-i efficiency curve of DC series generator with 3 phase salient motor
- Experiment 22 v-i efficiency curve of DC separately excited generator with 3 phase salient motor
- Experiment 23 v-i efficiency curve of DC compound generator with 3 phase salient motor
- Experiment 24 v-i efficiency curve of occ of shunt generator with 3 phase salient motor
- Experiment 25 Speed torque of 3ph. synchronous motor
- Experiment 26 Efficiency and input power factor measurement 3ph. synch. motor
- Experiment 27 Study of 'v' curve and inverted 'v' curve
- Experiment 28 output volt amp charACteristics of synchronous generator
- Experiment 29 Efficiency of synchronous generator
- Experiment 30 Performance of R, L, and Cload

DC MOTOR COUPLED 1PH. AC MOTOR TRAINER (46803)

- Experiment 31 speed torque curve of DC shunt motor with 1 phase AC integrated motor
- Experiment 32 speed torque curve of DC series motor with 1 phase AC integrated motor
- Experiment 33 Speed torque curve of separately excited DC motor with 1 phase AC integrated motor
- Experiment 34 Speed torque of DC compound motor with 1 phase AC integrated motor
- Experiment 35 v-i efficiency curve of DC shunt generator with 1 phase AC integrated motor
- Experiment 36 v-i efficiency curve of DC series generator with 1 phase AC integrated motor
- Experiment 37 v-i efficiency curve of DC separately excited generator with 1 phase AC integrated motor
- Experiment 38 v-i efficiency curve of DC compound generator with 1 phase AC integrated motor
- Experiment 39 v-i efficiency curve of occ of shunt generator with 1 phase AC integrated motor
- Experiment 40 speed torque curve of split phase induction motor
- Experiment 41 speed torque curve for CSIR
- Experiment 42 Speed torque curve of CSCR

DC MOTOR COUPLED 1PH. SYNCH. MOTOR TRAINER (46804)

- Experiment 43 speed torque curve of DC shunt motor with 1 phase synchronous motor
- Experiment 44 speed torque curve of DC series motor with 1 phase synchronous motor
- Experiment 45 Speed torque curve of separately excited DC motor with 1 phase synchronous motor
- Experiment 46 Speed torque of DC compound motor with 1 phase synchronous motor
- Experiment 47 v-i efficiency curve for DC shunt generator with 1 phase synchronous motor
- Experiment 48 v-i efficiency curve for DC series generator with 1 phase synchronous motor
- Experiment 49 v-i efficiency curve for DC separately excited generator with 1 phase synchronous motor
- Experiment 50 v-i efficiency curve for DC compound generator with 1 phase synchronous motor
- Experiment 51 v-i efficiency curve for occ of shunt generator with 1 phase synchronous motor
- Experiment 52 Speed torque curve of synchronous motor
- Experiment 53 Efficiency and input power factor measurement of 1ph. synch. Motor.
- Experiment 54 Study of 'V' curve of 1ph. synch. Motor.
- Experiment 55 Out volt-amp charACteristics of synchronous motor
- Experiment 56 Efficiency of synchronous generator.
- Experiment 57 Performance with R, L and C load.

DC MOTOR COUPLED WITH UNIVERSAL MOTOR TRAINER (46805)

- Experiment 58 speed torque curve of DC shunt motor with universal motor
- Experiment 59 speed torque curve of DC series motor with universal motor
- Experiment 60 Speed torque curve of separately excited DC motor with universal motor
- Experiment 61 Speed torque of DC compound motor with universal motor
- Experiment 62 v-i efficiency curve for DC shunt generator with universal motor
- Experiment 63 v-i efficiency curve for DC series generator with universal motor
- Experiment 64 v-i efficiency curve for DC separately excited generator with universal motor
- Experiment 65 v-i efficiency curve for DC compound generator with universal motor
- Experiment 66 v-i efficiency curve for occ of shunt generator with universal motor
- Experiment 67 Speed torque curve of universal motor when operated with 180VDC
- Experiment 68 Study of efficiency of universal motor for various loading condition.

Note: Specifications are subject to change.

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DC MOTOR COUPLED WITH DC MOTOR TRAINER (46806)

- Experiment 69 Speed torque curve and efficiency of DC shunt motor with DC motor
- Experiment 70 Speed torque curve and efficiency of DC series motor with DC motor
- Experiment 71 Speed torque curve and efficiency of separately excited DC motor with DC motor
- Experiment 72 Speed torque curve and efficiency of DC compound motor with DC motor
- Experiment 73 Output volt-amp characteristics of DC shunt generator with DC motor
- Efficiency of DC shunt generator with DC motor
 - Output volt-amp characteristics of DC separately excited generator with DC motor
- Experiment 74 Experiment 75 Experiment 76 Experiment 77 Efficiency of DC separately excited generator with DC motor
- Output volt-amp characteristics of DC series generator with DC motor

SYNCHRONIZATION/PARALLELING OF 2 THREE PHASE ALTERNATOR TRAINER (46807)

- Experiment 78 speed torque curve of DC shunt motor with 3 phase AC integrated motor
- Experiment 79 speed torque curve of DC series motor with 3 phase AC integrated motor
- Experiment 80 Speed torque curve of separately excited DC motor with 3 phase AC integrated motor
- Speed torque of DC compound motor with 3 phase AC integrated motor Experiment - 81
- Experiment 82 v-i efficiency curve for DC shunt generator with 3 phase AC integrated motor
- Experiment 83 v-i efficiency curve for DC series generator with 3 phase AC integrated motor
- Experiment 84 v-i efficiency curve for DC separately excited generator with 3 phase AC integrated motor
- Experiment 85 v-i efficiency curve for DC compound generator with 3 phase AC integrated motor
- Experiment 86 v-i efficiency curve for occ of shunt generator with 3 phase AC integrated motorExperiment -8 7 Speed torque curve of wound rotor induction motor with rotor shorted and with
 - different Rotor resistance.
- DOL/Star-delta starter, rotor resistance starter. Experiment - 88
- Experiment 89 Application of sync. Motor as pf improvement device-V curve.
- Experiment 90 Synchronous generator V-I curves.
- Experiment 91 Dark lamp method[all lamps are dark]
- Experiment 92 Bright lamp method[all lamps are bright]
- Experiment 93 1 Dark 2 Bright lamp method.

1 PHASE AC INDUCTION MOTOR TRAINER (46808)

- Study of speed-torque characteristics of single phase induction motor (split phase type). Experiment - 94
- Experiment 95 Study of efficiency and input power factor of 1phase induction motor (split phase type) for various loading conditions.
- Experiment 96 Study of speed-torque characteristics of single phase induction motor (capacitor start type).
- Experiment 97 Study of efficiency and input power factor of 1phase induction motor (capacitor start type) for various loading conditions.
- Study of speed-torque characteristics of single phase induction motor Experiment - 98 (capacitor start-run Type).
- Experiment 99 Study of efficiency and input power factor of 1 phase induction motor (capacitor start-run type) for various loading conditions.
- Experiment 100 Study of "No Load Test" and "Blocked Rotor Test". on 1 phase Induction Motor.

3 PHASE AC SLIP RING INDUCTION MOTOR TRAINER (46809)

- Experiment 101 Speed torque characteristics of 3 ph. wound rotor induction motor with variable rotor Resistance.
- Experiment 102 Efficiency of input power factor measurement of 3 ph. wound rotor induction motor.
- Experiment 103 Speed torque characteristics of 3 ph. short-circuited rotor induction motor.
- Experiment 104 Efficiency of input power factor measurement of 3 ph.short-circuited rotor Inductions motor.
- Experiment 105 Speed torque charACteristics of 3 ph. synchronous motor.
- Experiment 106 Efficiency of input power factor measurement of 3 ph. synchronous motor.
- Experiment 107 Use of synchronous motor as power factor improvement device. study of 'v' curves
- Experiment 108 Study of Direct On Line (DOL) starter for three phase induction motor.
- Experiment 109 Study of star delta-starter for 3 ph. induction motor.
- Experiment 110 Study of rotor resistance starter for three phase wound rotor induction motor.

Note: Specifications are subject to change.

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Experiment – 111 Study of direction of reversal for 3 phase induction motor.

3 PHASE SQUIRREL CAGE INDUCTION MOTOR TRAINER (46810)

Experiment – 112 Speed torque charACteristics of 3 phase squirrel cage induction motor.

- Experiment 113 Efficiency, % slip and input power factor measurement of 3 phase squirrel cage induction motor.
- Experiment 114 Speed control of squirrel cage induction motor by pole changing method.
- Experiment 115 'No Load Test' & 'Blocked Rotor Test' on 3 ph. squirrel cage induction motor.

REPLUTION MOTOR TRAINER (46811)

Experiment – 116 Study of speed torque characteristics of Repulsion motor.

- Experiment 117 Study of efficiency and input power factor measurement of single phase Repulsion motor.
- Experiment 118 Speed control and reversal of direction of rotation of repulsion motor.

Note: Specifications are subject to change.

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Technical Specification of Panels



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Technical Specification of Panels AC VOLTMETER & AC AMMETER AND REVERSING AC LOAD INDUCTOR SWITCH 1 Inductive load Two Digital AC Voltmeter 31/2 Digit 1 =0.15H/0.3H/ Having Dual range of 0-200V /600V 0.45H/0.6H/0.75H/1.5H/3H/ 2 TwoDigital AC Ammeter 31/2 Digit 400mA X 3Nos. having Dual range of 0-2A / 20A Load inductor switch 3 Pole З Four DPDT Switches for Dual DPM 7 Way/10Amp. **Reversing Switch** 4 3 Shrouded socket 12Nos. Power socket for AC I/P 5 Power on off Switch 6 Shrouded socket 20Nos 7 **DIGITAL WATTMETER** TwoDigital Wattmeter having range 1 **CAPACITIVE (C) LOAD** of 0-250V, 0-5Amp. = 1250W Capacitive load =1.25mF 1 Aux. supply 230V. /2.5mF/5mF/440VX 3Nos 2 Power socket for AC I/P 2 Shrouded socket 18Nos. Power on off Switch 3 4 Shrouded socket 12Nos **PHASE SEQUENCE & VIF / PF METER** Phase Sequence meter 1 LAMP LOAD Operating Voltage $110v \pm 20\%$ 1 3 Nos. Lamp 100W 2 Digital Power factor mater (VIF / PF) with Holder 230V 5Amp. & switch 3 Power socket for AC I/P 2 Shrouded socket 3 Power on off Switch 12Nos. 4 Shrouded socket 9 Nos SYNCHROSCOPE /3 PH. **ALUMINUM FRAME - MODULAR ALTERNATORS SYNCHRONIZING** PANELS 01 Synchronoscope:- Rotating light Electrical motor trainer rack madeup meter with 28 LED on a circular aluminium profile size 40×40mm, scale and a zero voltage differential foldable and light in weight 10 panel Indication with 2 LED setup can be interchange convidently to 02 3 Phase Alternator Synchronizing perform experiments. Dimention 03 Synchronization indication for Length1100×Hieght 1000×Depth 350mm. qualitative indication of the phase relationship between mains and voltage of the generator **EXTENSION BOARD** 1 Operating Voltage 230VAC ± 10% at 50Hz 2 ON OFF Switch with indicator 3 Eight Nos. five pin 5 Amp Electrical Sockets

Note: Specifications are subject to change.

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Technical Specification of Motors



DC INTEGRATED (TRUNION MOUNTED) MOTOR

Voltage : Varm = 180V Vfield = 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 6 Kg. 2 No. assembly to measure the torque .



3 PHASE AC INTEGRATED MOTOR

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.



3 PHASE SALIENT POLE ALTERNATOR

Voltage: 415VAC, 50Hz

Capacity - 300W/4 Pole m/c, **RPM** - 1500, **Shrouded Socket** - 12 **Rotor Construction :** Star connected, four terminals including star point brought out on 4 slip rings mounted on shaft.

Stator construction : Separately excited field winding with laminated solid yoke, 4 pole brought out on 2 terminals



1 PHASE. SYNCHRONOUS MOTOR

Voltage : 230 VAC, 50Hz Capacity -300W/4 Pole m/c, RPM - 1500, Shrouded Socket - 8 Rotor Construction : Single phase wound rotor with terminals brought out on two slip rings mounted on shaft.

Stator construction : One winding will be used to configure synchronous motor & Alternator output when used as single phase generators.



1 PHASE AC INTEGRATED MOTOR

Voltage : 230 VAC, 50Hz Capacity -300W/4 Pole m/c, RPM - 1500 Shrouded Socket - 18 Rotor Construction : Diecast Squirrel cage motor Stator construction : Two windings brought out on 4 terminals for main and auxilliary. These will be used to configure different motors Split phase, CSCR, CSIR.

Note: Specifications are subject to change.

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UNIVERSAL MOTOR

Voltage : 230 VAC, 50Hz / 150VDC Capacity - 300W/4 Pole m/c, RPM - 1500, Shrouded Socket - 8 Rotor Construction : Standard commutator brush arrangement brought out on

4 terminals Stator construction : Stator brought out on 4 terminals to facilitate AC/DC

operation and direction change. Built in compensating winding to minimize AR and sparking.



REPULSION MOTOR

Voltage : 230 VAC, 50Hz Capacity - 300W/4 Pole m/c, RPM - 1500, Shrouded Socket - 4 Rotor Construction : Standard commulator brush but short circuited. Stator construction : Stator brought out on 4 terminals. Settable handle to rotate brush position w.r.t. Neutral axis.



3 PHASE SQUIRREL CAGE INDUCTION MOTOR

Voltage : 415 VAC, 50Hz Capacity - 300W/4 Pole m/c, RPM - 1500, Shrouded Socket - 12 Rotor Construction : Diecast Squirrel cage motor Stator construction : 6x2 terminals brought out to run machine at two speeds using pole changing method (Dahellander Winding)



DC INTEGRATED (FOOT MOUNTED) MACHINE

Voltage : Varm = 180V Vfield = 180V Capacity - 300W/4 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 2 terminals.



1 PHASE AC INTEGRATED MOTOR with loading arrangement

3 PHASE AC INTEGRATED MOTOR with loading arrangement

3 PHASE SQUIRREL CAGE INDUCTION MOTOR with loading arrangement

REPULSION MOTOR with loading arrangement

UNIVERSAL MOTOR with loading arrangement

Note: Specifications are subject to change.

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