



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 Trunion 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 |

Continues-3/3

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- 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.

Panels Provided

- | | |
|--|-------------|
| 01 Aluminum Machine trainer Rack..... | 20300 Qty.1 |
| 02 Input 3 phase DOL Starter panel..... | 20301 Qty.1 |
| 03 Multifunction Meter (Single Phase/Three Phase AC 50Hz)..... | 20302 Qty.2 |
| 04 FWD/REV, Star-Delta starter panel..... | 20303 Qty.1 |
| 05 Rotor Resistor Cum 3Phase Synchronous Motor Control..... | 20304 Qty.1 |
| 06 DC voltmeter & Ammeter and Torque Measurement Meter..... | 20306 Qty.2 |
| 07 Variable DC Power Supply..... | 20307 Qty.2 |
| 08 Input Single Phase DOL Starter Panel AC DC Fix / Variable Supply..... | 20308 Qty.2 |
| 09 AC Load Resistor..... | 20309 Qty.1 |
| 10 DC Load Resistor..... | 20310 Qty.1 |
| 11 Synchroscope / 3 Phase Alternator Synchronizer..... | 20314 Qty.1 |
| 12 Extension Board..... | 20315 Qty.1 |



Motors Provided

- | | |
|---|-------------|
| 01 DC Integrated (Trunion Mounted) Motor..... | 20501 Qty.2 |
| 02 3 Phase AC Integrated Motor..... | 20502 Qty.2 |

Accessories Provided

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

Technical Specification of Motors

	<p>DC INTEGRATED (TRUNION MOUNTED) MOTOR - TYPE-20 501 (2Nos.) 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 6Kg. 2No. assembly to measure the</p>
	<p>3 PHASE AC INTEGRATED MOTOR - TYPE-20 502 (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.</p>

Continues-3/3


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**SYNCHRONIZATION / PARALLELING
OF TWO THREE PHASE
ALTERNATOR TRAINER**


OMEGA TYPE -20 607

Technical Specification of Panels




**INPUT 3 PHASE DOL STARTER
PANEL
TYPE-20 301**

- 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



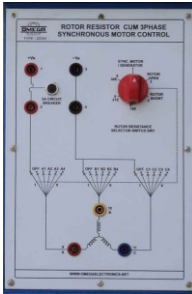
**MULTIFUNCTION METER (Single
Phase/ Three Phase AC 50Hz)
TYPE-20 302 (2Nos.)**

- 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.



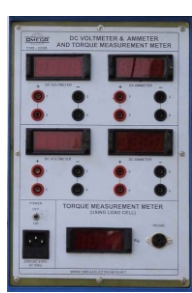
**FWD/REV AND STAR-DELTA
STARTER PANEL
TYPE-20 303**

- 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.




**ROTOR RESISTOR CUM 3PHASE
SYNCHRONOUS MOTOR
CONTROL
TYPE-20 304**

- 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 VOLTMETER & AMMETER
WITH TORQUE MEASUREMENT
METER
TYPE-20 306 (2 Nos)**

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



**VARIABLE DC POWER SUPPLY
TYPE-20 307 (2 Nos)**

- 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.




**INPUT SINGLE PHASE DOL STARTER
PANEL AC DC FIX / VARIABLE
SUPPLY
TYPE-20 308 (2 Nos)**

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

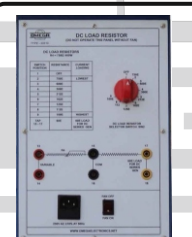
Variable AC Supply (0-200V)

- 1 Shrouded socket 6Nos.




**AC LOAD RESISTOR
TYPE-20 309**

- 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.



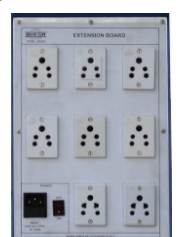
**DC LOAD RESISTOR
TYPE-20 310**

- 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.



**SYNCHROSCOPE /3 PH. ALTERNATORS
SYNCHRONIZING
TYPE-20 314**

- 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 qualitative indication of the phase relationship between mains and voltage of the generator



**EXTENSION BOARD
TYPE-20 315.**

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

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