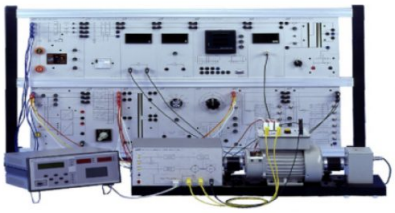
Electrical Machine Trainer

Category: Electrical Engineering · Model reference: MZM-4003



SPECIFICATIONS

The Standard Lab has been designed for experimental and testing in electrical machines in education. The machines are basically industrial models, self protect kind, with coupling half-joint, especially equipped to be suitable for student training in laboratory. For this purpose the winding ends are connected to 4 mm safety socket in a metal housing on top of which a clear synoptic diagrams as educational terminal board. The student can easily understand operation and winding connection. Also most of accessories and instruments designed in Panel System A4 high in standard. The machines powers are 350W and 750W selectable, as the supply requirement for the system operation requires 240/415V, 50Hz.
- Modularized design providing the most flexible requirement of this experimental equipment.
- Each Module panel height compatible with DIN A4 standard.
- Using 4 mm safety sockets and plugs.
- Each DC/AC power supply equipped with overload protection.
- Rotary machine and brake with over-heating protection.
- Adopting digitized and microprocessor-based measuring instrument to provide high-accuracy measurement.
- Electromagnetic & DC Generator Brake with constant speed/constant torque function, easy to operate.
- 750W designed equipment suitable for learning the theory and characteristics of electrical machines.

Scope

The equipment be:
- Workstation rack
- Variable AC 1 phase power supply
- Variable DC power supply
- AC squirrel case induction motor
- AC generator
- DC wound motor
- DC generator
- AC speed controller unit
- DC speed controller unit
- Tachometer
- AC VA display module 1 phase
- AC VA display module 3 phase
- DC VA display module
- Transformer 3 phase
- Transformer 1 phase
- Digital Power Meter
- Connecting lead wire
- Connecting lead holder
- Accessories

1. Universal AC/DC Power Supply
- Power Input Requirement: Three Phase 240V/415V, 50Hz
- Connection: 3P+N+PE Output terminations by using 4mm terminals socket.
- Input fed with AC 5 pin plug 32A AC Plug and Socket.
- Pilot lamps provided to indicate all live supplies. With On/Off Switch Fuse Protection.
- Fixed Single Phase AC Power Supply: 3 x 240V
- AC; 8A AC (Phase To Neutral; R-N, B-N, Y-N)
- Fixed Three Phase AC Power Supply: 3 x 450V
- AC; 8A AC (Phase To Phase; R-Y, Y-B, B-R)
- Adjustable Single Phase & Three Phase AC /
- DC Power Supply (Simultaneously):
- 3 x 0 ~ 450VAC; 8A AC (Phase To Phase)
- 3 x 0 ~ 240V AC; 8A AC (Phase To Neutral)
- 1 x 0 ~ 450VDC; 8A DC (DC Output)
- Three Phase 5 Pin AC Plug 32A with 1.5m length 5 core power cable.

2. Three Phase Squirrel Cage Motor
- Nominal Power: 350W (1/2HP)
- Nominal Voltage: 240 / 415V (Delta/Star)
- Nominal Current: 2.50 / 1.50A (Delta/Star)
- Nominal Speed: 1500 rpm
- Frequency: 50Hz
- Power Factor: 0.78
- Winding Poles: 4
- Cooling Method: Self Cooling
- Terminals: 4mm Safety Socket MZM
- Base Plate: Attachable To Break Load Unit

3. Three Phase Slip Ring Motor
- Nominal Power: 350W (1/2HP)
- Nominal Voltage: 240 / 415V (Delta/Star)
- Nominal Current: 4.5 / 4.0A (Delta/Star)
- Nominal Speed: 1500 rpm.
- Frequency: 50Hz
- Cooling Method: Self Cooling
- Terminals: 4mm Safety Socket MZM
- Base Plate: Attachable To Break Load Unit

4. Three Phase Synchronous Machine
- Nominal Power: 350W (1/2HP)
- Nominal Voltage: 240 / 415 V (Delta/Star)
- Nominal Current: 1.85 / 2.85 A (Delta/Star)
- Nominal Speed: 3000 rpm
- Frequency: 50 Hz
- Excitation Voltage: 0 ~ 110 VDC
- Excitation Current: 0.25 A
- Winding Poles: 2
- Cooling Method: Self Cooling
- Terminals: 4mm Safety Socket MZM
- Base Plate: Attachable To Break Load Unit

6. AC/DC Universal Motor
- Nominal Power: 350W (AC/DC)
- Nominal Voltage: 240 V (AC/DC)
- Nominal Current: 3.0 A
- Nominal Speed: 3000 rpm.
- Frequency: 50 Hz
- Terminals: 4mm Safety Socket MZM
- Base Plate: Attachable To Break Load Unit

7. Three Phase AC Generator Brake
- Nominal Power: 750W (1HP)
- Nominal Voltage: 415AC
- Nominal Current: 2.5A
- Nominal Speed: 1500 rpm.
- Frequency: 50 Hz
- Excitation: Permanent Magnet
- Cooling Method: Self Cooling
- Terminals: 4mm Safety Socket MZM
- Base Plate: Attachable To Motor Unit

8. Single Phase Induction Motor
- Nominal Power: 375W
- Nominal Voltage: 240VAC
- Nominal Current: 2.5A
- Nominal Speed: 1500rpm
- Frequency: 50Hz
- Power Factor: 0.78
- Winding Poles: 4
- Terminals: 4mm Safety Socket MZM
- Base Plate: Attachable To Break Load Unit

9. Digital RPM Meter With Speed Sensor
- Modular design
- Display: 5 Digits
- Measurement Range: 0-99999 rpm
- Accuracy: ±0.1% ± 1 Digit
- Power source : 240VAC, 50Hz
- Unit Type : Panel H1 MZM
- Terminals: 4mm Safety Sockets
- Speed Sensor: Inductive Type MZM

10. Single Phase Power Factor Meter
- Modular design
- Measurement range : -0.50 ~ 1.00 ~ +0.50 (240 V/ 5 A)
- Display : 3 ½ digits 14.2 mm LED
- Accuracy : ± 1% ± 1 digit
- Resolution : 0.01V
- Input impedance : 1MΩ
- Power source : 220Vac, 50/60 Hz
- Terminals : 4 mm safety sockets MZM

11. Digital DC Ammeter
- Modular design
- Measurement range : DC 0 ~ 10A
- Display : 3 ½ digits 14.2 mm LED
- Accuracy : ± 0.3% ± 1 digit
- Resolution : 0.01 A
- Input impedance : < 0.1Ω
- Power source : 220Vac, 50/60 Hz
- Unit Type : Panel H1 MZM
- Terminals: 4mm Safety Sockets

12. Digital DC Voltmeter
- Modular design
- Measurement range : DC 0 ~ 600V
- Display : 3 ½ digits 14.2 mm LED
- Accuracy : ± 0.2% ± 1 digit
- Resolution : 1V
- Input impedance : 1MΩ
- Power source : 220Vac, 50/60 Hz
- Unit Type : Panel H1 MZM
- Terminals: 4mm Safety Sockets

13. Tachometer
- Range: 5 to 99,999 RPM
- Resolution:
- 0.1RPM <1000RPM
- 1RPM>1000RPM
- Display: 5 Digits, 10mm (0.4")LCD
- Accuracy: ±0.05%+1 Digits
- Photo Detection Distance: 50 to 150mm
- Battery: 1.5V AA x 4 pcs
- Memory: Last Value, Max. Value, Min. Value

14. Digital AC Voltmeter
- Modular design
- Measurement range : AC 0 ~ 600V
- Display : 3 ½ digits 14.2 mm LED
- Accuracy : ± 0.2% ± 1 digit
- Resolution : 1V
- Input impedance : 1MΩ
- Power source : 220Vac, 50/60 Hz
- Unit Type : Panel H1 MZM
- Terminals: 4mm Safety Sockets

15. Digital AC Ammeter
- Modular design
- Measurement range : AC 0 ~ 5A
- Display : 3 ½ digits 14.2 mm LED
- Accuracy : ± 0.3% ± 1 digit
- Resolution : 0.01 A
- Input impedance : < 0.1Ω
- Power source : 220Vac, 50/60 Hz
- Unit Type : Panel H1 MZM
- Terminals: 4mm Safety Sockets MZM

16. AC Frequency Inverter
- Type: 1.5KW (2 HP)
- Power Supply: 1 phase 240V, 50Hz
- Output: 6.5A
- Overload : 150% min
- Machine Control Module
- AC Machine Control Terminals : 1 color coded
- 4mm safety socket (U1, V1 & W1)
- AC Line Voltage Terminals (230VAC, 50Hz) :
- 2 color coded 4mm safety socket (L1 & L2)
- System Ground Terminal : 1 color coded
- 4mm safety socket (GND)
- Thermal Switch Terminal : 1 Color Coded
- 4mm Safety Socket MZM

17. Three Phase Power Analysis Meter
- Modular design
- Display Type: Digital LED Display
- Measuring Function:
- Voltage V
- Current A
- Active Power KWH
- Reactive Power VAR
- Apparent Power VA
- Power Factor PF
- Frequency Hz
- Measuring Range :
- Voltage : 0 ~ 450V
- Current : 0 ~ 5A
- Analog Output: 4 ~ 20mA
- Alarm Output: Two Alarm Free Setting NC, NO
- Communication : RS485, MODBUS RTU
- Protocol
- Accuracy: ±0.5%
- Protection: Fuse
- Power Supply: AC240VAC, 50Hz
- Terminals: 4mm Safety Socket MZM
- Unit Type : Panel H2 MZM

18. Synchronous Machine Exciter Module
- Variable isolating transformers as exciter range from0 to 240V for field excitation of DC, synchronous and multi-function machines.
- Modular Design
- Voltage Supply: 240VAC, 50Hz
- Output Voltage:
- AC 0 ~ 240VAC, 1A
- DC 0 ~ 240VAC, 1A
- Terminals : 4 mm safety sockets MZM

19. Three Phase Power Quality Meter
- Modular design
- Display Type: LCD Display
- Real-Time Measurement
- Phase voltage: V1, V2, V3, Vlnavg Line voltage: V12, V23, V31,
- Vllavg Current: I1, I2, I3, Iavg, In
- Active power: per phase and total active power
- Reactive power: per phase and total reactive power
- Apparent power: per phase and total apparent power
- Power factor: per phase and total power factor
- Total frequency
- Energy And Demand
- Four quadrant active energy: Import, Export, Total, Net
- Four quadrant reactive energy: Import, Export, Total, Net Active, Reactive, Apparent demand Statistics
- Multiple real-time max measured values (with time stamp) Multiple realtime min measured values (with time stamp)
- Various demand peak
- Power Quality Analysis
- Voltage unbalance Current unbalance
- Voltage THD (Total harmonic distortion), Odd-even harmonic distortion
- Voltage individual harmonics, Crest factor Current THD, Odd-even harmonic distortion Current individual harmonics, K factor
- MODBUS RTU communication protocol
- Remote Control
- 2 digital output
- Trend Logging
- Phase voltage Line voltage Current
- Active power
- Reactive power
- Apparent power
- Power factor Frequency Three phase unbalance
- Active energy
- Reactive energy
- Apparent energy Phase
- Settable Logging Interval
- Logging from 1min to 60min, interval settable
- Power Meter Management Software
- Accuracy: ±0.5%
- Protection: Fuse
- Power Supply: AC240VAC, 50Hz
- Terminals: 4mm Safety Socket MZM
- Unit Type : Panel H2 MZM

Laboratory Table
- Dimensions: 1800(W) X 900(D) X 780(H)mm _+ %5

Experiment Frame
- The Experimental frames described below are suitable for setting up of test circuit and for demonstration purpose

Connecting Lead Holder
- Anodized aluminum connecting lead holder for a laboratory cables
- Ensure all cables are keep neatly and in order.
- Mobile type , with 5-foot tubular steel base, with five casters,
- Height :1400mm ,chipboard suitable with 20 connecting leads slots

Connecting Lead Set
- 4MM safety Plug With Leads
- Max. Rating Current : 19A
- 25Cm(R,Y,B)
- 50Cm(R,Y,B)
- 100Cm(R,Y,B)
- 150Cm(R,Y,B)
- 100Cm(G)
- 150Cm(B)

Accessories: Please Specify

Equipment that come with these package
1. Coupling
2. Coupling Guard
3. Shaft End Guard
4. Connecting Leads Set
5. Safety Bridging Plugs Set

Training Manual
- Practice handbook

Operation And Maintenance Manual
- 3 set of operation and maintenance manual

Teach Ware Book
- Introduction of electrical machine
- Machine feature and function
- Content
- Introduction of electrical machine
- DC machine feature and function
- AC machine feature and function
- Motor RPM and control
- AC power and DC Power

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