VERITAS Engineering

Catalog
Of

Electrical Machine Lab Trainer

Brand: VERITAS

Model: VEMLT-001

Technical Specifications

DC Motor/ Generator with the facility of Separate/ Compound/Series Excitation (01 No.)

- Power: Min.300 W
- Voltage (Armature): Min.220 Vdc
- Voltage (Separate Excitation): Min.220 Vdc
- Rpm.: Min.3000
- DC motor operation should also be performed by this unit
- Should be IM B3 form of construction
- Should have IP 22 protection
- Should be included with thermal protector in this unit

3-Phase Cage Motor Asynchronous Type (01 No.)

- Power: Min.500 W
- Voltage: Min.230/400V, 50Hz
- Rpm.: Min.2850 for 2 poles
- Should have Delta-star connection
- Should be IM B3 form of construction
- Should have IP 44 protection
- Should be included with thermal protector in this unit

3-Phase Wound Rotor Motor Asynchronous Type (01 No.)

- Power: Min.500 W
- Voltage: Min.230/400V, 50 Hz
- Rpm.: Min.2900 for 2 poles
- Voltage (Rotor): Min.400V
- Should have Delta-star connection
- Should be IM B3 form of construction
- Should have IP 22 protection
- Should be included with thermal protector in this unit

3-Phase Motor/ Generator Synchronous Type with Starting Function Asynchronous Type (01 No.)

- Power: Min.350 VA
- Voltage: Min.230/400V, 50 Hz
- Rpm.: Min.3000 for 2 poles
- Voltage (Excitation): Min.220 Vdc
- Synchronous motor operation should also be performed by this unit
- Should have Delta-star connection
- Should be IM B3 form of construction
- Should have IP 22 protection
- Should be included with thermal protector in this unit

1-Phase Motor Asynchronous Type with Starting Capacitor (01 No.)

- Power: Min.300 W
- Voltage: Min.230V, 50 Hz
- Rpm.: Min.2900 for 2 poles
- Should be IM B3 form of construction
- Should have IP 44 protection
- Should be included with thermal protector in this unit

AC/DC Motor Universal Type (01 No.)

- Power: Min.260/330 W
- Voltage: Min.230 Vac, 50 Hz / 230 Vdc
- Rpm.: 3000
- Should be IM B3 form of construction
- Should have IP 22 protection
- Should be included with thermal protector in this unit

Variable Resistive Load (01 No.)

- Should have 3 separate resistive sectors
- Should have 21 values of DC or single-phase active power
- Should have 7 values of three-phase active power
- Should have safety terminals and protection by fuses
- Power supply (AC): Min.230/400V
- Power supply (DC): Min.220V
- Active power: Max.460W

Power Supply Unit Tabletop Type (01 Set)

- For general electric measurements and of measurements on electric machines
- Power Supply: 3ph, Neutral, Protective Earth, 50-60 Hz

Variable Inductive Load (01 No.)

- Should have 3 separate inductive sectors
- Should have 21 values of single-phase reactive power
- Should have 7 values of three-phase reactive power
- Should have safety terminals and protection by fuses
- Power supply: Min.230/400V, 50 Hz
- Apparent power: Max.460 VA

Variable Capacitive Load (01 No.)

- Should have 3 separate capacitive sectors
- Should have 21 values of single-phase reactive power
- Should have 7 values of three-phase reactive power
- Should have safety terminals and protection by fuses
- Power supply: Min.230/400V, 50 Hz
- Apparent power: Max.460VA

Transformer 1-Phase (01 No.)

- Power: Min.760 VA
- Voltage (primary winding): Min.230V, 50 Hz
- Voltage (secondary winding 1): Min.0-53-200-400V
- Voltage (secondary winding 2): Min.0-115-230V
- Should have IP 22 Protection
- Should be included with thermal protector in this unit

Tachogenerator (01 No.)

- Can be used to measure the speed of rotation of “M” and “M-B” electric machines
- The output signal can be converted into rpm by tachometer voltmeter
- Can be used for DC motor drive in closed-loop Configurations
- Output voltage: Min.0.06 V per revolution
- Rpm.: Max.5000
- Output voltage 1: Min.300 Vdc at 5000 rpm.
- Output voltage 2: Min.10 Vdc at 5000 rpm.
- Should have IP 44 Protection

DC Starting Rheostat Rotor Starting Stator Starting (01 No.)

- Linear rheostat
- Power: Min.3 x 500 W
- Current: Min.3 x 3.16 A
- Resistance value: Min.3 x 50Ω
- Terminals: Min.9

Shunt Field Rheostat Generator (01 No.)

- Linear rheostat
- Power: Min.500W
- Current: Min.0.31A
- Resistance value: Min.5000Ω
- Terminals: Min.3

Shunt Field Rheostat Motor (01 No.)

- Linear rheostat
- Power: Min.500 W
- Current: Min.1.55A
- Resistance value: Min.200Ω
- Terminals: Min.3

Series Field Rheostat Motor (01 No.)

- Linear rheostat
- Power: Min.500 W
- Current: Min.3.16 A
- Resistance value: Min.50Ω
- Terminals: Min.3

Electrical Measurements Modules (01 Set) Set of devices:

- 2 Modules: 1 three-pole power switch
- 1 Module: 1 phase sequence indicator with lamps
- 1 Module: 1 synchronization device for parallel connection of three phase lines or generators

Set of digital instruments:

- 1 Module:1 tachometer Min.240 Vdc @ 4000 RPM Auxiliary power Min.110-240 VAC –50/60 Hz
- 2 Modules (Each module includes): Current Measurement: Max.5A. Should include 3 CT 5/5A. The range can be expanded with 3 external CT x/5A; THD Total Harmonic Distortion for currents;
- Over current: Min.50A for 1 sec.; Current Accuracy: Min.0.5%
- Voltage Measurement: Min.3-ph + N.; 400 V phase to N and 690 V ph. to phase, 45-66 Hz; Voltage Accuracy: Min.0.5%; THD Total Harmonic Distortion for voltage
- Frequency: Min.45-66 Hz.
- Power Measurement: Min.3.5 kVA / kW / kVAr
- Other parameters measured: Power factor, Voltage Asymmetry, Energies meter: kWh /kVAh / kVArh

Other features:

- Auxiliary power Min.110-240 VAC – 50/60 Hz
- Graphic LCD display, 128 x 80 pixel, backlit, with 4 grey levels
- Four keys for parameters visualizing and settings
- Possibility to create up to 4 programmable pages, each with 4 selectable measures among the measured parameters.
- Two programmable relays with max/min alarm functions, selectable among the measured parameters
- Graphical Menu and Messages in 5 languages: English, Italian, Spanish, French and Portuguese
- Communication port: RS485 for data networking
- All connections are provided with safety plugs (Ø 4 mm)

Module (Each module includes):

- 2 multifunction instruments, with the following features:
- VDC max.: 600 V; precision: ± 0.2 %
- IDC max.: 20 A; precision: ± 0.5 %; overload 2 x 20 A (3 min)
- Power DC max.: 10 kW
- Displays: visualize V, I, W. LCD, backlit, 3 lines, 4 digit per line
- Automatic decimal point. Five levels of illumination.
- All connections 4 mm Ø safety terminal

Multifunction Measuring Instrument (01 No.)

- Multifunction Instrument in an isolating table-top box;
- Connections from front and sides, with electrical international symbols;
- Power connections should be carried out with 4mm safety terminals;
- Programmable connections with dia. 2mm connectors;
- It should measure 1-phase / 3-phase electrical parameters. More than 300 TRMS parameters, such as: voltages, currents, active, reactive and apparent powers, power factor, frequency, V and I harmonic analysis up to 31° harmonic;
- Measurements of imported/exported total and partial active energy, inductive/capacitive reactive energy, total and partial apparent energy;
- Measurements class for voltages and currents: 0.2% and currents up to 10A;
- Auxiliary power: 110/250VAC, 50/60Hz
- Graphic LCD display, 128 x 80 pixel, backlit with 4 grey levels;
- Four keys for parameters visualizing and settings;
- Possibility to create up to 4 programmable pages, each with 4 selectable measures among the instrument measures;
- It should include a module with 2 relay outputs for local/remote alarms;

Software for Multifunction Measuring Instrument (01 No.)

The software should allow to visualize the measurements from the instruments as “virtual instruments” Sample the user-defined measurements and save them in different formats like MS-Access, ASCII text and MS-Excel

Tabletop Vertical Frame (01 No):

Tabletop Vertical Frame for the Modules of Electrical Measurements

Cables (01 Set): Set of 40 Cables

Safety Terminals, Ø4mm, Different Lengths and Colors

Cable Holder (01 No)

Should be lightweight unit made of structural aluminium profile

The cable should support (both sides) are to be made of plastic grids, so to avoid damaging the cables insulation.

Cabinet (01 No): Cabinet made of SS & Powder Coating

List of Experiments:

Induction motor

- Starting experiment of the 3 phase induction motor
- Y-Δ starting of three phase squirrel cage induction motor
- Forward / Reverse operation of three phase induction motor
- Slip measurement of the three phase induction motor
- Load experiment of the three phase induction motor
- Forward / Reverse operation of the single phase induction motor
- Characteristic experiment of the single induction motor
- Operation of universal motor
- Power factor of the three phase induction motor
- Rotor characteristic of the three phase wound-rotor motor

Synchronous machine

- Non-load experiment of the synchronous generator
- Load experiment of the synchronous generator
- Starting method of the synchronous motor
- Phase and load characteristic experiment of the synchronous generator

DC Motor

- Starting method of the DC shunt motor
- Non-load experiment of the DC shunt generator
- Load experiment of the DC shunt & compound generator
- Load experiment of the DC shunt & compound motor
- Efficiency measurement of DC shunt motor by loss separation method
- Forward / Reverse operation method of DC motor

1 Phase Transformer

- Measuring Coil Resistance of Transformer
- Measuring Coil Resistance of Transformer
- Impedance of Transformer Current Ratio and Impedance of Transformer
- Voltage Regulation Curve of Transformer
- Polarity of Transformer
- No-Load & Load Experiment of a 1 Phase Transformer
- Short Experiment of a 1 Phase Transformer
- Parallel Operation of a 1 Phase Transformer