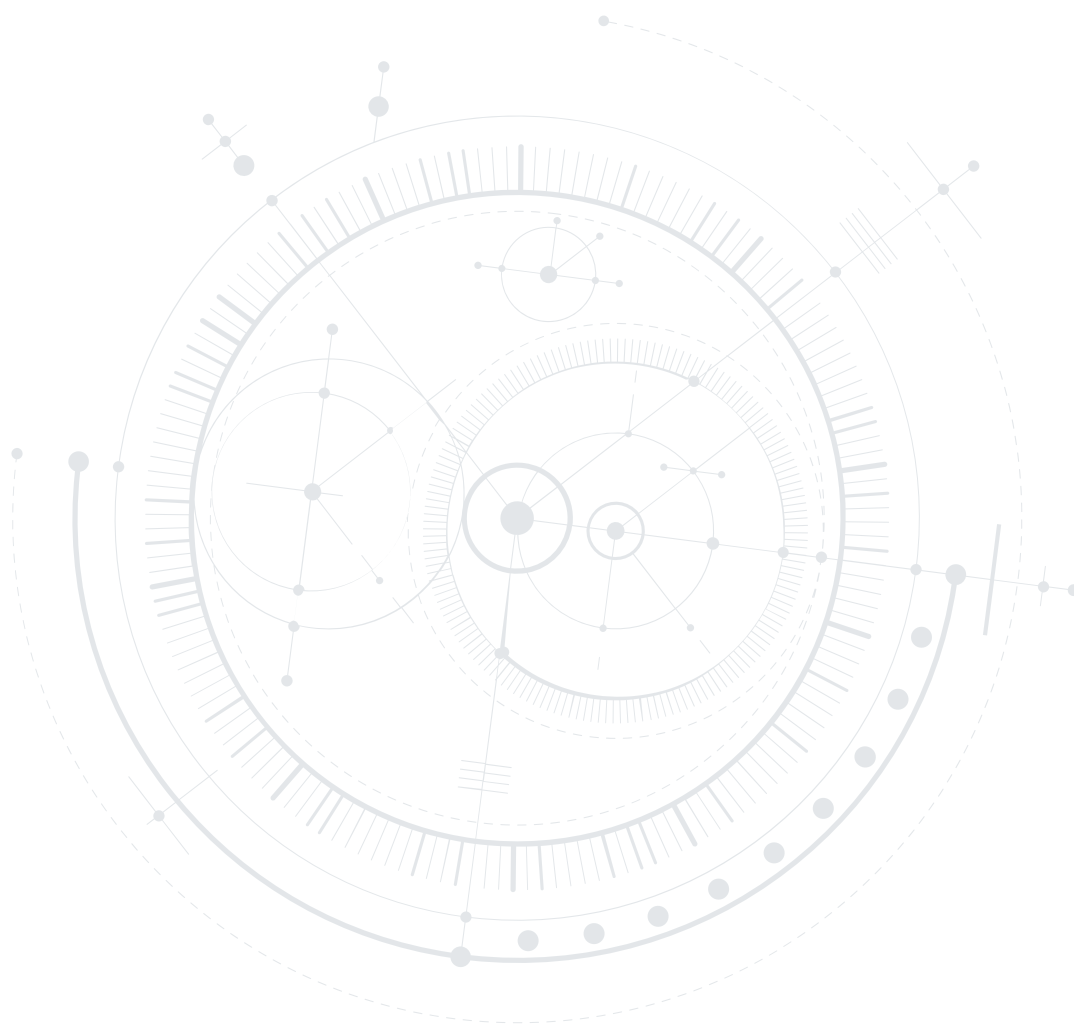


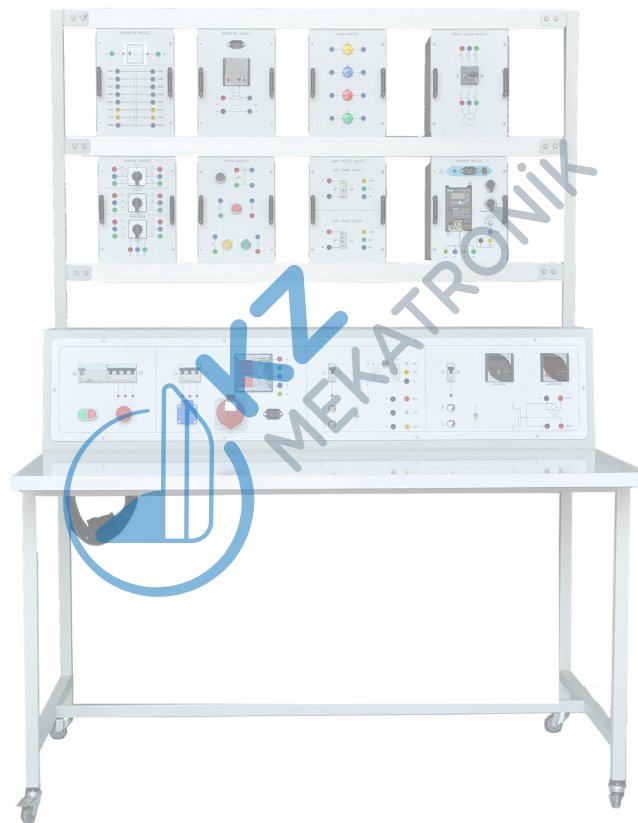


ELECTRICAL MACHINERY AND CONTROL TRAINING SET



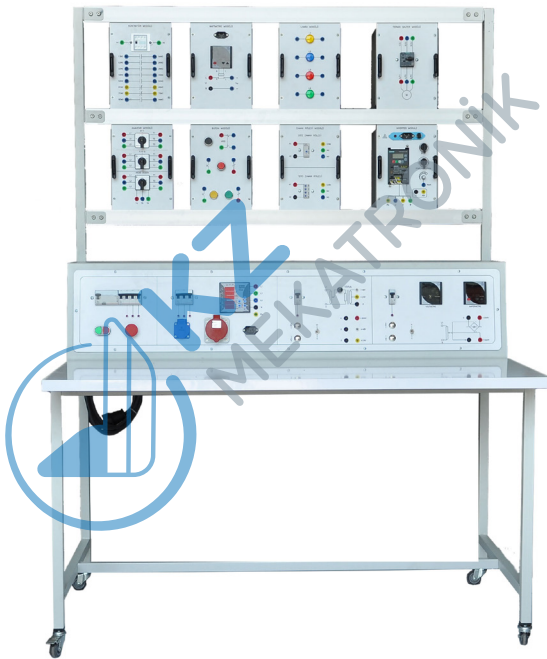


The Electric Machinery and Controller Training Set is designed in accordance with the curricula of all institutions requiring technical education, such as universities and technical high schools. The content of the training set is applicable for advanced technical training as well as basic training. The training set has a modular structure. The modules are made of 4mm compact laminate. In compliance with regulations, the training set prioritizes user safety. Electrostatic powder coating has been applied to module boxes which are made of sheet metal. Laser technology has been used to engrave symbols and instructions on the modules. UV press technology has been used to engrave technical properties. The training set is made of durable materials. It features a rail system to mount the modules. Power supply and measuring instruments are mounted on the table.



TRANINIG SET

TRAINING SET MODULES

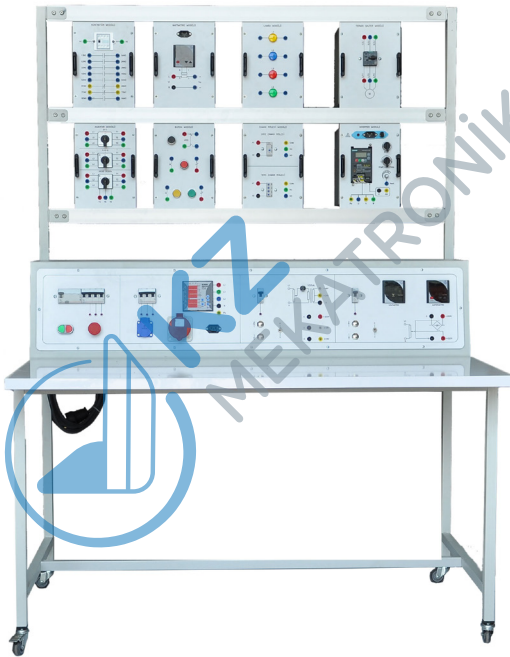


- The table features two rows of rail to carry the modules
- The table features adjustable legs
- All power inputs - outputs on the table are protected by a fuse
- All inputs-outputs on the unit are double insulated, with 4mm banana connectors
- Power unit
- Start/stop, emergency stop buttons
- 30mA leakage current
- Fuse protection
- Signal lamp
- AC power measurement unit
- Fuse protection

- Signal lamp
- AC power measurement unit
- Fuse protection
- 1-3 phase socket
- 4mm born screws used for 3-phase power outputs
- Power analyzer
- On the power unit designed for controller experiments
- All outputs have fuse protection
- 0 - 250V adjustable, 0-24V, 0-48V AC power supply
- 0-24V, 0-48V and 0-200V DC power supply
- The DC Power Unit Features
- 0 – 220V adjustable
- 3-phase control, load cell, torque reset, encoder, inputs-outputs and a computer connection terminal to connect the power analyzer to a computer, and a USB socket for connection
- 200V stable DC, power supplies with fuse protection
- 7" touchscreen for control and monitoring
- Torque measurement input, encoder input (optional), USB connection terminal and Analog controlled devices
- 0-10V output connector
- Computer connection through the USB port



TRANINIG SET

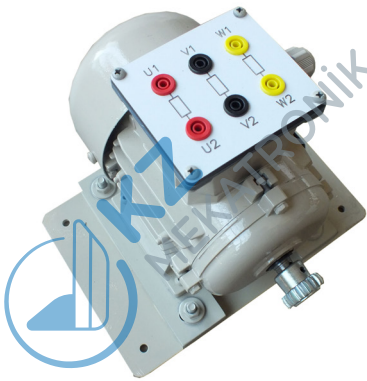


TRAINING SET MODULES

- Cosφmeter Module
- Contactor Module
- Time Relay Module
- Data Capture Card Module
- Dual Dial Frequency Meter Module
- Insulated Measurement Module
- Dc Power Supply Module
- Led Display Synchronoscope Module
- Dc Measurement Module
- Analog Ac / Dc Ammeter Module
- Analog Ac / Dc Voltmeter Module
- Ac Measurement Module
- Digital Voltmeter Commitator Module
- Analog Voltmeter Commitator Module
- Phase Sequence Display Module
- Resistive Load Unit
- Resistance Module
- Potentiometer Module
- Inductive Load Unit
- Connection Cables
- Software



3-PHASE ASYNCHRONOUS MOTOR



- 400V – 690V AC
- Power 0.37kW, frequency 50Hz
- Engine speed 1500rpm
- Inputs-outputs are double insulated, 4mm banana socket
- Connections with insulating panel, star coupling

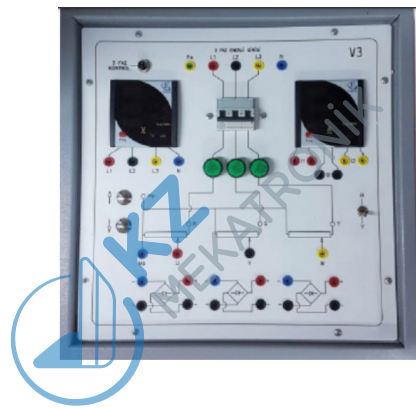
DC COMPOUND MOTOR



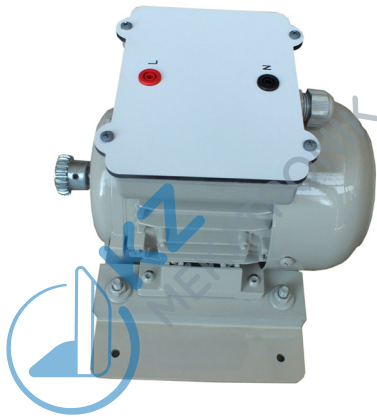
- Motor armature and excitation voltage: 200V DC
- Power: 0,55kW
- RPM: 1500 rpm
- Inputs-outputs are double isolated, with 4mm banana connectors
- Connections feature insulation panels and star couplings

**DC STAGE COMPOUND
 MACHINE**

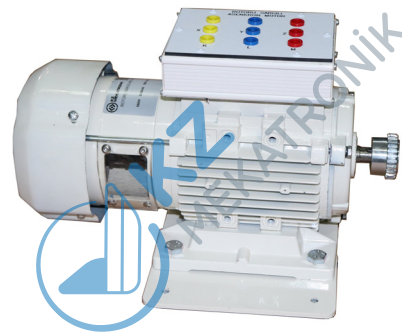

- Design with transparent window, where the engine structure is observed with 4 pulse sensors
- On-panel circuit diagram
- All inputs - outputs are double insulated, 4mm banana sockets
- Armature: 200V DC
- Excitation : 200V DC
- Power : 0.55kW
- Speed : 1500 rpm

**THREE-PHASE POWER
 UNIT**


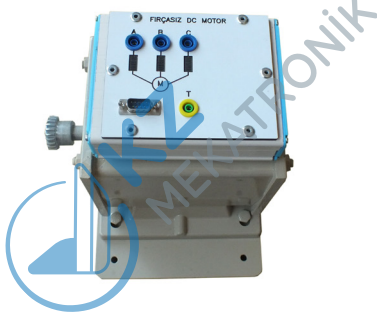
- 3-phase ammeter
- 3-phase voltmeter
- Output voltage can be selected via a switch and then adjusted coarsely or precisely using up-down buttons
- The outputs have fuse protection as well as current and voltage measurement
- AC Power output 3 x 1kVA, 3 x 380V, 50Hz
- All inputs-outputs on the unit are double isolated, with
- 4mm banana connectors

**1-PHASE ASYNCHRONOUS
MOTOR**

- Supply voltage: 220V – 240V AC
- Power: 0,37kW, Frequency: 50Hz
- Motor RPM: 2760 rpm
- Inputs-outputs are double insulated, with
- 4mm banana connectors
- Connections feature insulation panels and star couplings

**3-PHASE ROTOR WINDING
ASYNCHRONOUS MOTOR**

- Supply voltage: Δ 220V AC / λ 380V AC
- Power: 0,55kW, Frequency: 50Hz
- Motor Rpm: 3000rpm
- Inputs-outputs are double insulated, with
- 4mm banana connectors
- Connections feature insulation panels and star couplings

**BRUSHLESS DC MOTOR**

- Supply voltage AC 48V
- Power 120W
- RPM 1500rpm, torque 2Nm
- Inputs-outputs are double insulated, 4mm banana socket
- Connections with insulating panel, star coupling

ELECTROMAGNETIC FUCOLT BRAKE

- Brake connections with metal box, insulating panel, star coupling
- All inputs - outputs are double insulated, 4mm banana sockets
- Brake : 78V-100VDC
- Fan : 220V - 240V AC, 50 / 60Hz

**DC SERIES MOTOR**

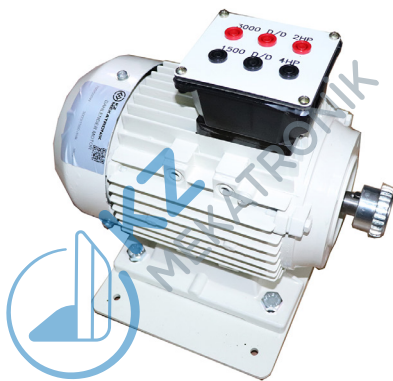
- Engine power: 0.55kW,
- Terminal voltage 80V-100V
- Speed: 2500rpm
- All inputs and outputs on the motor are double insulated, with 4mm banana sockets.

DC SHUNT MOTOR

- Motor Power: 0.55 kW
- Terminal Voltage: 200 V
- Excitation Voltage: 200V
- Engine Speed: 1400 rpm
- All inputs and outputs on the motor are double insulated, with 4mm banana sockets.

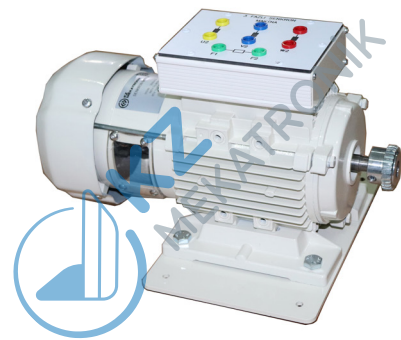


DAHLENDER MOTOR



- Voltage : λ 380V AC, 3~, 50Hz
- 700/500Watts
- Revolution: 3000/1500 rpm
- All inputs - outputs are double insulated, 4mm banana sockets

3 PHASE ASYNCHRONOUS MOTOR



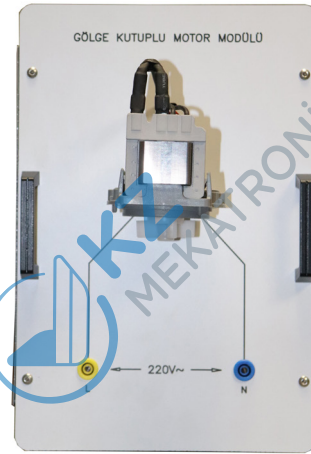
- Engine Power: 0.55kW
- Engine Speed : 3000 rpm
- Terminal Voltage: 380V
- Excitation Voltage: 85V
- All inputs and outputs on the motor are double insulated, with 4mm banana sockets.

MAGNETIC DUST BRAKE MODULE



- 0-24V DC supply voltage
- 220V AC / 50 Hz Fan Supply
- Engine Speed : 3000 rpm
- Force Arm: 105mm
- Inputs-outputs are double insulated, 4mm banana socket

SHADOW POLE ENGINE MODULE



- On-panel circuit diagram
- All inputs - outputs are double insulated, 4mm banana sockets
- Shadow Pole: 8 - 10W, 0.18A, 220V, 50 / 60Hz, 1000 rpm

UNIVERSAL (AC/DC) ENGINE



- Universal (Series): 10W, 220V, 50Hz, 20000 rpm
- 18V DC
- Motor Diameter 38mm length 87mm (Including Shaft)
- Output power reaches 1 Horsepower (HP).

AC MOTOR DRIVE MODULE



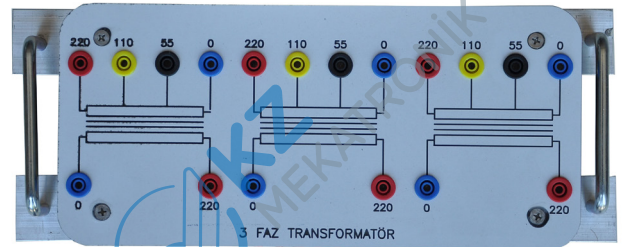
- Supply voltage 220V - 240V AC, 50 / 60Hz 1~
- Output voltage 200V - 240V AC, 3 Phase
- Drive parameters are entered from the keypad
- All parameter values can be observed from the LCD
- Speed, torque, motion, brake control on the driver
- Inputs-outputs are double insulated, 4mm banana socket

STEP MOTOR and DRIVE MODULE



- 12V DC Stepper motor
- Speed control pod
- Right-Left direction of rotation control
- Stepper motor, energizing coil LED display
- All inputs-outputs are double isolated, with 4mm banana connectors

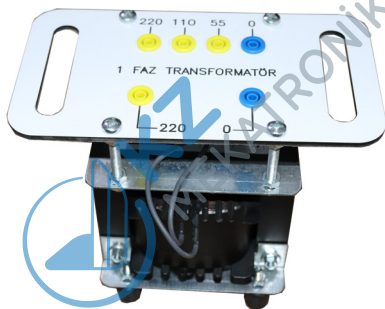
3 PHASE TRANSFORMER MODULE



- Transformer power: 300VA
- Input Voltage: 3x380V AC, 50/60Hz
- Output Voltage: 3x (55V, 110V, 220V) AC, 50/60Hz
- Outputs are double isolated, with 4mm banana connectors



1 PHASE 55V / 110V / 220V OUTPUT TRANSFORMER MODULE



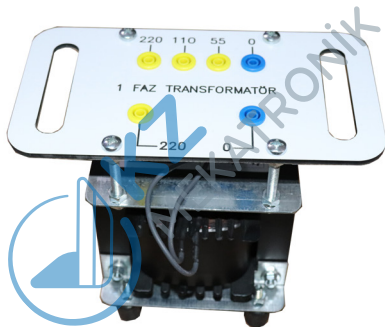
- Module with insulation panels
- Transformer power: 300VA
- Input Voltage: 380V AC, 50/60Hz
- Output Voltage: 55V, 110V, 220V AC, 50/60Hz
- All inputs-outputs are double insulated, with 4mm banana connectors

AUTO TRANSFORMER



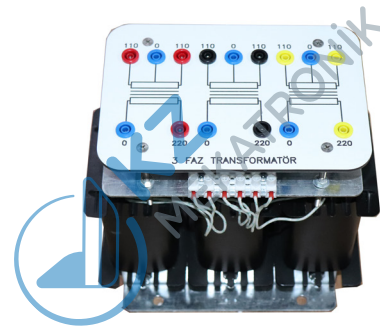
- Transformer power: 1000VA
- Input Voltage: 3x380V AC, 50/60Hz
- Output Voltage: 3x (55V, 110V, 220V) AC, 50/60Hz
- All inputs-outputs are double insulated, with 4mm banana connectors

1 PHASE TRANSFORMER MODULE

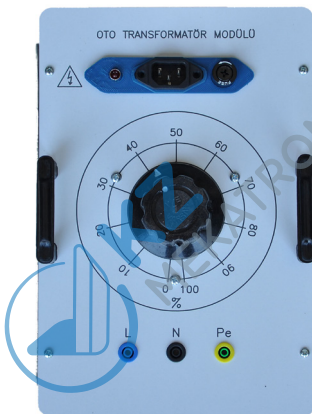


- Transformer power: 300VA
- Input Voltage: 220V – 380V AC, 50/60Hz
- Output Voltage: 12V, 24V, 36V AC, 50/60Hz
- All inputs-outputs are double isolated, with 4mm banana connectors

3 PHASE 2X110V OUTPUT TRANSFORMER MODULE



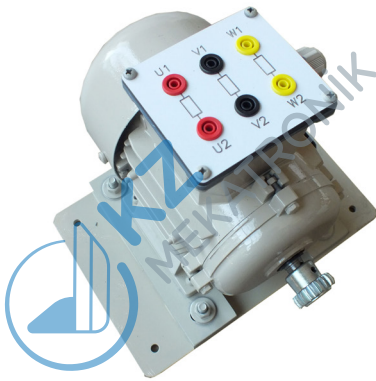
- Transformer power: 300VA
- Input Voltage: 3x380V AC, 50/60Hz
- Output Voltage: 3x (2x110V) AC, 50/60Hz
- All inputs-outputs on the module are doubleisolated, with 4mm banana connectors

**AUTO TRANSFORMER MODULE**

- Supply voltage: 220V AC, 50Hz
- 0 – 220V adjustable voltage output
- Output power up to 1KVA
- Inputs-outputs are double isolated, with 4mm banana connectors

**DC MOTOR
DRIVE MODULE**

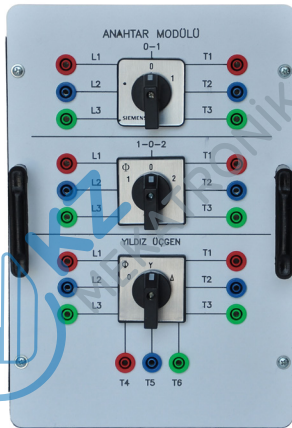
- Suitable for speed-torque control as well as for operating field wound DC motors with permanent magnets
- Supply voltage: 220V - 240V AC, 50 / 60Hz
- Motor power: 1.8kW
- Output Voltage: 0 - 200V DC
- Armature current limit: 10A
- Excitation current limit: 2A
- Excitation voltage: 90 - 180V DC
- External rpm adjustment
- Digital control panel
- PI filter for speed and torque control by means of controlling the phase angle
- External start - stop

**BRUSHLESS DC MOTOR
DRIVE MODULE**

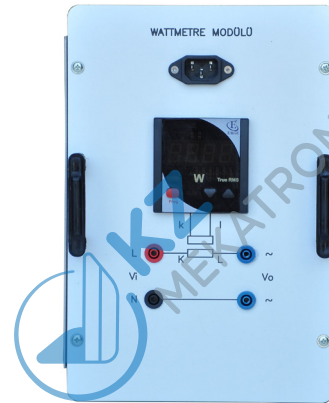
- 230V single phase supply and 200W / 400W
- Rated Output Current for Constant Torque: 1.5A/2.5A
- Rated Input Current: 4.9A /6.5A
- Frequency Tolerance: 50/60Hz $\pm 5\%$ (47 ~ 63Hz)
- Rated Output Capacity (KVA): 0.6 / 1.0
- Carrier Frequency (kHz): 10 kHz
- Output Frequency (Hz): 0.00 ~ 120.00Hz
- Torque limit : Maximum 200% torque current

BUTTON MODULE

- 1 jog button
- 1 double contact (NO, NC) button
- 1 NO button
- 1 NC button
- Inputs-outputs are double insulated, with 4mm banana connectors

SWITCH MODULE

- 3-Phase 0-1 20A cam switch
- 3-Phase 1-0-2 20A cam switch
- 3-Phase λ / Δ 20A starting switch
- Inputs-outputs are double insulated, with 4mm banana connectors

WATTMETER MODULE

- Operating voltage: 220V AC, 50 Hz
- 0-5A measuring range
- Inputs-outputs are double isolated, with 4mm banana connectors

ENERGY DISTRIBUTION MODULE

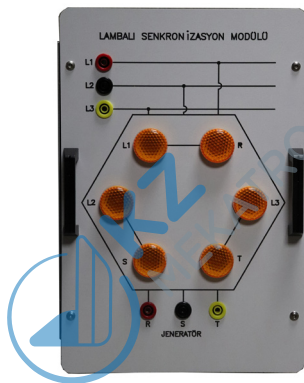


- 4 IEC sockets
- 2 grounding plugs
- Outputs are double isolated, with 4mm banana connectors

AC ENERGY ANALYZER MODULE



- Supply voltage: 220V AC, 50Hz
- Three-phase measurement capability
- Direct measurement for currents between 0-5A
- Inputs-outputs are double isolated, with 4mm banana connectors

**LAMP SYNCHRONIZATION
MODULE**

- 3 sets of lamps comprising 2 series lamps each
- Dark lamp synchronization
- Lamp flasher synchronization
- All inputs-outputs are double isolated, with 4mm banana connectors

**AC/DC
MEASUREMENT MODULE**

- Metal box with insulation panels
- Supply voltage: 220V - 240V AC, 50 / 60Hz
- 2 3½-digit digital displays with 1% accuracy
- 0-15A AC/DC current measuring range
- 0-750V AC/DC voltage measuring range
- Inputs-outputs are double isolated, with 4mm banana connectors

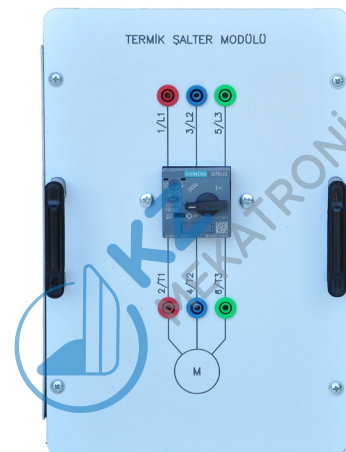


LAMP MODULE



- Metal box with insulation panels
- 4 indicator lamps in different colors
- Inputs-outputs are double isolated, with 4mm banana connectors

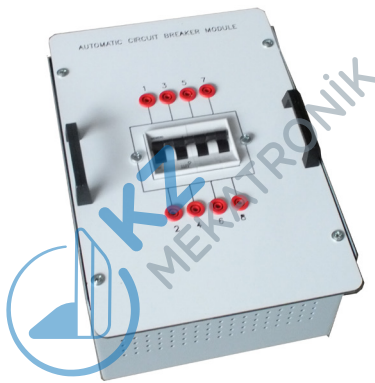
THERMAL SWITCH MODULE



- Metal box with insulation panels
- Adjustable current value (in 3 stages)
- 3 open contacts
- Inputs-outputs are double isolated, with 4mm banana connectors



AUTOMATIC CIRCUIT BREAKER MODULE



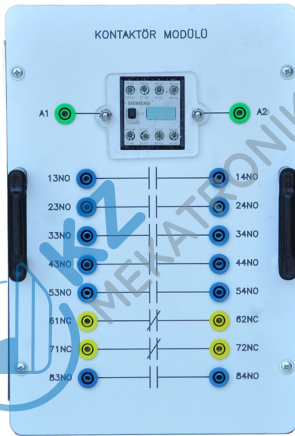
- 4 overcurrent protection circuits
- Outputs are double insulated, with 4mm banana connectors

COS ϕ METER MODULE



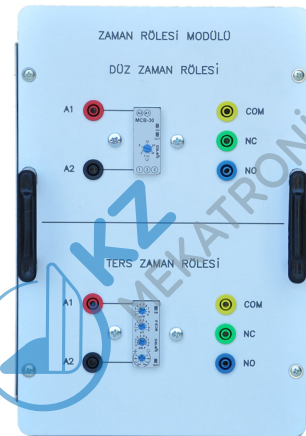
- Supply voltage: 220V - 240V AC, 50 / 60Hz, (with an IEC plug)
- Cos ϕ meter measuring range: 0.00 - 0.99 (Inductive - Capacitive)
- 50 - 300V AC
- All inputs-outputs are double isolated, with 4mm banana connectors

CONTACTOR MODULE



- Metal box with insulation panels
- Supply voltage: 220V - 240V AC, 50 / 60Hz
- 6 open, 2 closed contacts
- Contact currents 10A
- Inputs-outputs are double isolated, with 4mm banana connectors

TIMER MODULE



- Metal box with insulation panels
- One timer on delay, one timer off delay
- Supply voltage: 220V - 240V AC, 50 / 60Hz
- Operating voltage of the module: 250V AC, 5A
- 24V AC/DC One open, one closed contact
- The module features pull-in and drop-out delay function as well as the blinker operation function.
- Inputs-outputs are double isolated, with 4mm banana connectors

DATA CAPTURE CARD MODULE



- 4 differential analog inputs
- At least 2 digital channels which can be adjusted as input/output
- Signals ranging between 0-10V can be measured via the analog inputs
- USB communication

DOUBLE DIAL FREQUENCY METER EMODUL



- Features a metal box, insulation panels, and a handle
- Supply voltage: 220V - 240V AC, 50 / 60Hz
- Analog double frequency meter
- Mains measurement: L-N, Generator measurement: L-N
- Operating voltage of the module: 0 – 300V AC
- Measuring range of the module: 2x 45 – 55Hz
- All inputs-outputs are double insulated, with 4mm banana connectors

INSULATED MEASUREMENT MODULE



- Supply voltage: 220V AC, 50Hz
- It is used to safely observe high-voltage or high-current signals via an oscilloscope or data capture cards through two independent channels
- 0-500V / 0-5A AC/DC measurement
- 2 channels, each channel features a voltage and a current input
- X1, X0.1, X0.01 voltage scale

DC POWER SUPPLY MODULE



- Supply voltage: 220V AC, 50Hz
- Adjustable between 0-30V
- Current supply capacity up to 5A
- Current, voltage adjustment via the digital panel
- Overcurrent and short circuit protection
- Outputs are double isolated, with 4mm banana connectors



LED DISPLAY SYNCHRONOSCOPE MODULE



- Mains measurement: L-N, Generator measurement: L-N
- The LED display on the front panel allows the user to observe the operation of the synchronoscope
- Mains - Generator supply with LED display
- Red LED display for small differences
- Green LED display for moment of synchronization
- Relay contact output for moment of synchronization

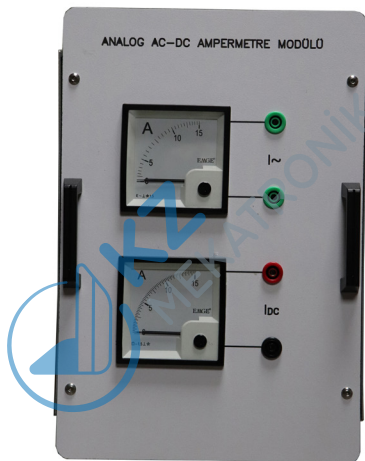
DC MEASUREMENT MODULE



- Supply voltage: 220V - 240V AC, 50 / 60Hz, (with an IEC plug)
- The screen features 2 (two) separate digital displays, 3 digits
- Ammeter current measuring range: 0 - 15A DC
- Voltmeter voltage measuring range: 0 - 750V D
- All inputs-outputs are double isolated, with 4mm banana connectors



ANALOGUE AC / DC AMMETER MODULE

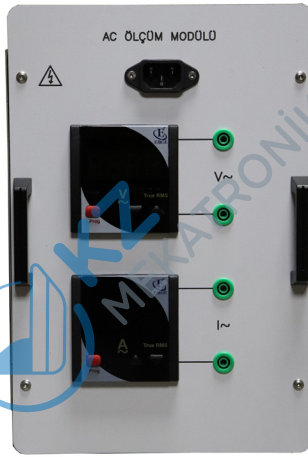


- Ammeter current measuring range:
0 - 15A AC / DC
- The screen features an analog display
- All inputs-outputs are double isolated, with
4mm

ANALOGUE AC / DC VOLTMETER MODULE



- Voltmeter voltage measuring range:
0 - 500V AC / DC
- The screen features an analogue display,
accuracy: 1%
- All inputs-outputs are double isolated, with
4mm banana connectors

**AC MEASUREMENT MODULE**

- Supply voltage: 220V - 240V AC, 50 / 60Hz, (with an IEC plug)
- The screen features 2 (two) 3-digit digital displays, accuracy: 1%
- Ammeter current measuring range: 0 - 15A AC
- Voltmeter voltage measuring range: 0 - 750V AC
- All inputs-outputs are double isolated, with 4mm banana connectors

**DIGITAL VOLTMETER
COMMITATOR MODULE**

- Supply voltage: 220V - 240V AC, 50 / 60Hz, (with an IEC plug)
- Voltmeter voltage measuring range: 0-750V AC
- The screen features a 3½-digit digital display, accuracy: 1%

**ANALOG VOLTMETER
COMMITATOR MODULE**

- Voltmeter voltage measuring range: 0 - 500V AC
- The screen features an analog display
- 7-throw voltmeter commutator
- All inputs-outputs are double isolated, with 4mm banana connectors

**PHASE SEQUENCE
DISPLAY MODULE**

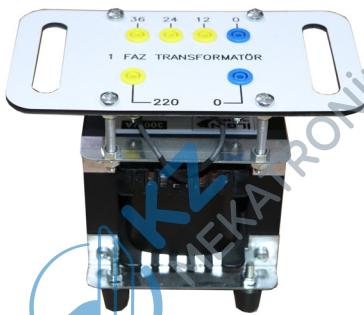
- Circular direction indicator for phase sequence
- Operating voltage: 90V - 600V, Operating frequency: 45Hz - 100Hz
- When phase sequence is entered as L1,L2, L3, the lamp will be turned on in a circular clockwise motion
- When phase sequence is entered in reverse order as L1,L2, L3, the lamp will be turned on in a circular counterclockwise motion
- All inputs-outputs are double isolated, with 4mm banana connectors

RESISTIVE LOAD UNIT**RESISTANCE MODULE**

- Supply voltage: 220V - 240V AC, 50 / 60Hz
- 5 x 500W incremental resistive load in each phase
- Each phase has a 0 - 5 cam stepping switch, 20A
- 3-phase resistive load
- 1 x 2A fuse protection, cooling fan
- Inputs-outputs are double insulated, with 4mm banana connectors



- 3 1000hm 150W resistances
- Terminals are double isolated, with 4mm banana connectors

**1 PHASE 12V / 24V / 36V OUTPUT
TRANSFORMER MODULE**

- Power of transformer : 300VA
- Input Voltage 220V – 380V AC, 50/60Hz
- Output voltage 12V, 24V, 36V AC, 50/60Hz
- All inputs - outputs are double insulated, 4mm banana sockets

POTENTIOMETER MODULE

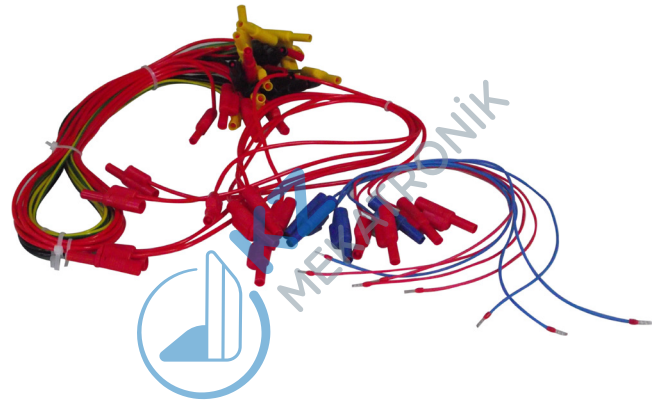
- 1 kilo ohm (± 5) potentiometer
- Power: 500W
- All tips are moved out of the module
- Inputs-outputs are double isolated, with 4mm banana connectors

INDUCTIVE LOAD UNIT



- Supply voltage: 220V - 240V AC, 50 / 60Hz
- 3-phase adjustable inductive load
- 1 x 2A fuse protection
- Inputs-outputs are double isolated, with 4mm banana connectors

CONNECTION CABLES



- Isolated wires suitable for 4mm born screws
- Wire length: 50 cm and 100 cm yalıtkanlı, 4mm banana soketli

SOFTWARE



- The software enables the user to control and observe the signals via computer
- It can be used to control the power supplies located on the main unit
- It enables the user to observe the current, voltage, torque - speed signals via computer