

Product Name :
Power Electronics and Motor Control Experimental
Equipment

Product Code :
CHINAVLABM11940001



Description :

Power Electronics and Motor Control Experimental Equipment China Engineering Lab Training System Suppliers

Technical Specification :

Modular structure design, many kinds of power electronics devices, thyristor firing circuits and controller are available.

Full protections: voltage and current mode leakage protection device; monitoring and short-circuit protection for the power supply output; timer & alarm recorder for students examining.

Abundant lab exercises

Phase loss/over-voltage indication and phase sequence check

The indicator lamp lights up if there is any phase loss and it alarms if the voltage exceeds 250V.

AC power supply (with over-current protection)

3-phase power supply 200V@3A for DC speed regulation

3-phase power supply 240V@3A for AC speed regulation

High-voltage DC power supply

Excitation power: DC 220V @0.5A with short-circuit protection

Digital instruments

AC digital voltmeter: accuracy: class 1.0, used for 3-phase power grid voltage measurement;

One RMS value AC digital voltmeter: measuring range: 0~500V, auto ranging, accuracy: class 0.5, 3 and 1/2 -digit

display, used for voltage indication;

One RMS value AC digital ammeter: measuring range: 0~5A, auto ranging, accuracy: class 0.5, 3 and 1/2 -digit display,

with function of over-range alarming & indication and power cutting off, used for current indication;
 One DC digital voltmeter: measuring range: 0~300V, input impedance: 10M Ω , accuracy: class 0.5, 3 and 1/2 -digit display, used for voltage indication;
 One DC digital ammeter: measuring range: 0~5A, accuracy: class 0.5, 3 and 1/2 -digit display, with function of over-range alarming & indication and power cutting off, used for current indication.
Safety
 Isolated transformer: there are RCCB, key switch, contactor, isolated transformer for isolating from the power grid for safety;
 Voltage-mode leakage protector 1: leakage protection on the circuit before isolated transformer, cutting off the power if there is leakage;
 Voltage-mode leakage protector 2: leakage protection on the circuits after isolated transformer and experimental connection, cutting off the power if there is leakage, and alarming;
 Current-mode leakage protector: cutting off power if the leakage current exceeding the threshold value;
 Fully shrouded connections for protection against hazard of electric shock
 Timer/alarm recorder
 Functions of lab service supervision including lab time set, alarming at expire time and faults history are provided
Additional facilities
 12-way, 10-way, 4-way and 3-way sockets for power supply to application units; single-phase and 3-phase outlet on both sides.

Kit	The kit consists of rotations encode and a digit-displayed rotations speed meter. All components are easy machine coupling on a slide-rail base.
3-phase variable resistor	Three banks Used for loading purpose
Thyristor bridge	Anti-parallel 3-phase bridges with over current/voltage protection. Firing interface, inductive load, voltmeter and ammeter are provided.
Firing circuit of 3-phase bridge	Used with Thyristor bridge
SCR firing circuits (single/3-phase)	Containing firing circuits of UJT, sin wave synchronous phasing, saw-tooth phasing.
DC Motor control system (1)	Containing modules: set up (G), current feedback and over current protection (FBC+FA), speed conversion (FBS), inversion (AR), isolation (TVD) and controller (1/2); Observing effects of controller's parameters on system performance
DC Motor control system (2)	Containing modules: torque polarity (DPT), logic controller (DLC), zeroing detector (DPZ), carrying out the experiment of reversible DC motor speed control without circulating current.
DC chopper	Comprises chopper and firing circuit
Components	Including reference, over voltage protection resistors (Delta connected), diodes.
Power devices	Containing SCR, MOSFET, IGBT, GTR. It's used with DJK06 for test of characteristics for test of device drives.
Variable resistors, capacitors	For configuration of current/speed controllers
Single-phase	Comprises a single-phase variable autotransformer (0~250V/0.5kVA), a rectifying filtering

AC power supply & variable load	circuit and 0~180V/1.3A (series) or 0~45V/2.6A (parallel) regulable resistance
3-phase transformer and 3-phase uncontrolled rectification circuit	Comprises a 3-phase core-transformer (primary coil voltage 127V, secondary coils voltages are 63.6V and 31.8V), 3-phase uncontrollable rectifying circuit
DC generator	220W/200V 1600n/min insulated level E
DC shunt motor	185W/220V 1600n/min insulated level E
3-phase wound-rotor induction motor	120W/220V(Y) 1380n/min insulated level E
Additions to wound rotor induction motor	Used together with 3-phase wound-rotor induction motor.
Connection leads	For connections between control panel mounted application units, the leads are fitted with Shrouded connectors and made from soft isolated cable.

Lab exercises:

Power electronics technology

1. Unijunction transistor firing circuit
2. Sine wave synchronous phase-shift firing circuit
3. Saw-tooth wave synchronous phase-shift firing circuit
4. Siemens TCA785
5. Single-phase half wave controlled rectification
6. Single-phase half-controlled rectification bridge
7. Single-phase bridge full-controlled rectification and active inversion circuits
8. 3-phase half wave controlled rectification
9. 3-phase bridge half-controlled rectification
10. 3-phase half wave active inversion circuits
11. 3-phase bridge full-controlled rectification and active inversion circuits
12. Single-phase AC voltage control
13. 3-phase AC voltage control
14. DC chopper circuits
15. SCR characteristics

16. Gate-Turn-off Thyristor (GTO) characteristics
17. Power MOSFET characteristics
18. Giant transistor (GTR) characteristics
19. Insulated-gate bipolar transistor (IGBT) characteristics

DC motor speed control

20. Parameters and characteristics test of the Thyristor-controlled DC motor drive system
21. Commissioning of the control blocks (SCR) of Thyristor-controlled DC motor drive system
22. Single-loop non-reversible DC motor drive system with speed/current/voltage feedback
23. Double-loop non-reversible DC motor drive system
24. Reversible Thyristor-controlled DC motor drive system with non-circulating current

AC motor speed control

25. Voltage/speed control system of double closed-loop 3-phase induction motor
 26. Cascade speed control system of double closed-loop 3-phase induction motor
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|------------------------------------|---|
| AC power supply | 3-phase DC 200V/3A |
| DC power supply | 3-phase AC 240V/3A
220V/0.5A, with output short-circuit protection |
| AC digital voltmeter | Power mains input line voltage can be registered, the accuracy is 1.0% |
| TRMS AC digital voltmeter | Measuring range: 0~500V, auto switching, accuracy 0.5%, 3 and 1/2-digit displayed |
| TRMS AC digital ammeter | Measuring range: 0~5A, auto switching, accuracy 0.5%, 3 and 1/2-digit displayed, with over-ranging alarm, indicating and power supply cutoff protections. |
| DC digital voltmeter | Measuring range: 0~300V, 3 and 1/2-digit displayed, input impedance: 10M Ω , accuracy: 0.5% |
| DC digital ammeter | Measuring range: 0~5A, accuracy 0.5%, 3 and 1/2-digit displayed, with over-ranging alarm, indicating and power supply cutoff protections. |
| 3 and 1/2-digit digital multimeter | <ol style="list-style-type: none"> 1. DC voltage: 200mV/2V/20V/200V/1000V $\pm(0.5\%+3)$ 2. AC voltage: 2V/20V/200V/750V $\pm(0.8\%+5)$ 3. DC current: 20μA/2mA/200mA/20A $\pm(1.5\%+3)$ 4. AC current: 2mA/20mA/20A $\pm(1.5\%+5)$ 5. resistance: 200Ω/2kΩ/20kΩ/200kΩ/2MΩ/20MΩ $\pm(0.8\%+5)$ 6. conductance: (0.1-100)nS $\pm(1.0\%+30)$ 7. capacitance: 20nF/200nF/20μF/200μF $\pm(4.0\%+10)$ |

25M two-
channel digital
oscilloscope

8. frequency: 20kHz $\pm(1.5\%+25)$ temperature: -40oC-1000oC $\pm(0.75\%+3)$
9. Special function: diode test, triode test, on/off alarm, low-voltage display, data hold, self-turning off, functional protection, self-recovery insurance, shakeproof, 10M Ω input impedance, 3 times/s sample rate, 40-400Hz AC frequency response, manual operation and the maximum display is 1999.
 1. Homochromy LCD, two-channel
 2. 250 MSa/s real-time sampling rate, effective sampling rate: 50 GSa/s, Waveforms capture rate 1000/s
 3. Digital filter and waveforms recording
 4. Cursor measurement including manual mode, follow mode and auto measurement mode
 5. 10-group waveforms, 10-group set, storage and reappearance
 6. Waveforms operation
 7. Edge, video, pulse and delay triggering functions
 8. Embedded FFT frequency spectrum analysis
 9. Automatic calibration function



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