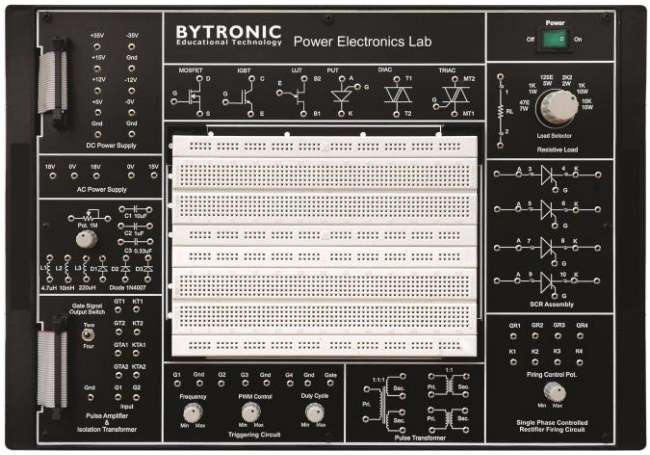
PEL – Power Electronics Lab



Key Features:

- Functional blocks indicated with on board mimic
- Pulse generator with frequency and duty cycle control
- Single phase rectifier firing circuit with firing angle control
- Pulse amplifier and isolation transformer
- Breadboard for circuit experimentation

The Power Electronics Lab is used to perform power electronics circuit experiments. Student studying the characteristics of power electronics devices and the applications of power devices will find this an essential piece of equipment. The applications of power devices are in alarm circuit, lamp flasher, rectifiers, choppers, inverters and also commutation circuits.

Experiments

- The characteristics of SCR
- The characteristics of UJT
- The characteristics of MOSFET
- The characteristics of IGBT
- The characteristics of DIAC
- The characteristics of TRIAC
- The characteristics of PUT
- The class B commutation circuit
- The class C commutation circuit
- The class D commutation circuit
- The class F commutation circuit
- Resistor triggering circuit
- Resistor-Capacitor triggering circuit (half-wave)
- Resistor-Capacitor triggering circuit (full-wave)
- The SCR triggered by UJT
- The SCR triggered by 555IC
- The SCR triggered by Op-Amp 741IC
- Ramp and pedestal triggering circuit using anti-parallel SCR in AC load
- The UJT relaxation oscillator
- The voltage commutated chopper
- The Bedford inverter
- The single phase PWM inverter using MOSFET and IGBT
- The half-wave controlled rectifier with resistive load
- The full wave controlled rectifier (mid-point) with resistive load
- The fully controlled bridge rectifier with load

Specification

Size of Breadboard	172.5 mm × 128.5 mm
DC Power Supply on board	+ 5 V, - 5 V 500 mA, + 12 V, -12 V 500 mA + 15 V, 250 mA + 35 V, -35 V, 250 mA
AC Power Supply on Board	18 V - 0 V - 18 V, 0V-15V, On board firing circuits
Frequency range: Amplitude:	30Hz to 900Hz Variable 12V. PWM control of G1, G2, G3 and G4. Duty cycle control of "Gate" Signal is 0 to 100%.
SCR Assembly	4 SCRs 2P4M, 400V, 2A
Power Devices	IGBT-G4BC20S, MOSFET-IRFZ44N, UJT-2N2646, DIAC-DB3, TRIAC-BT136, PUT-2N6027
Circuit Components on Board	Electrolytic Capacitor 10uF, 63V Electrolytic Capacitor 1uF, 63V Met. Capacitor 0.33uF, 63V Diode 1N4007, Inductor 220uH, 4.7uH, 10mH
Pulse transformer on Board	2 nos. PT4502 1:1 and one is PT4503 1:1:1
Load selector	6 load resistances - 47E/7W, 1K/1W, 1K/10W, 10K/10W, 120E/5W, 2K2/2W.
Test points	10 nos.
Power requirement	110V/220V, 50/60 Hz
Experiment Boards:	1. Characteristics of UJT 2. Characteristics of MOSFET 3. Characteristics of IGBT 4. Characteristics of DIAC 5. Characteristics of TRIAC 6. Characteristics of PUT 7. SCR triggered by IC74121 8. SCR triggered by Op-Amp 7411C 9. UJT realisation oscillator 10. SCR triggered by UJT 11. SCR triggered by IC555 12. SCR triggered by PUT 13. Operation of lamp flasher using SCR 14. Operation of SCR alarm circuit 15. SCR characteristics 16. SCR Triggering Circuits 17. Ramp and Pedestal Triggering 18. SCR triggered by LDR 19. Series Inverter 20. Single Phase PWM Inverter

Ordering Information

Model Number:	**PEL**
Consists of:	Power Electronics Board with breadboard 20 x Experiment Boards Manual Set Connecting Cables

Notes.

1. Specification is subject to change without notice.

2. All dimensions are in mm unless otherwise stated

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