

## Light Intensity Control Using SCR's

ME 791



- **Designed to study light dimmer circuit using SCR & TRIAC.**

### Technical Specifications

- 220VAC/ 50Hz operated circuit.
- SCR 2P 4M, Triac BT 136 is used in circuit
- On board control for intensity.
- On board lamp holder.
- Circuit diagram printed on front panel & test points brought out on front panel.

### Standard Accessories

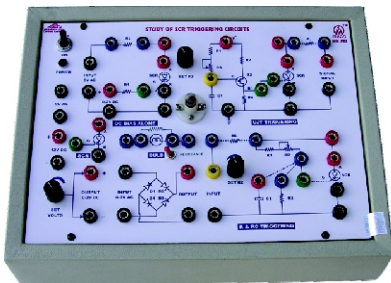
- Power requirement : 230 VAC  $\pm$ 10%, 50Hz.

### Optional Accessories

- 220 Volt / 40W Bulb, Patch Chords & Instruction Manual.

## SCR Firing Circuit

ME 792



- **SCR Firing Circuit designed to study various type of firing circuit & observe waveforms on CRO.**

### Technical Specifications

- Firing circuits used.
  - R type triggering circuit .
  - RC type triggering.
  - UJT triggering.
  - DC bias triggering.
- In built IC based DC regulated fixed power supply + 12VDC/150mA & 9VAC.
- One variable power supply 0-2VDC /150mA for DC triggering.
- SCR 2P4M based circuit. .
- On board lamp holder.
- Circuit diagram printed on front panel & important test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$  10% . 50Hz.

### Standard Accessories

- 6 Volt / 1/4 W lamp, Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020). • Digital Multimeter (VC-97).

## SCR Commutation Techniques

ME 793



- **SCR Commutation kit designed to study various commutation techniques & observe outputs on LED**

### Technical Specifications

- Commutation Techniques used .
 

i) Class A	ii) Class B
iii) Class C	iv) Class D
v) Class E	vi) Class F
- In built IC based DC regulated fixed power supply +12VDC/300mA & 6VAC/ 300mA
- Circuit diagram printed on front panel & test points brought out on front panel. SCR 2P4M based circuit.

### Standard Accessories

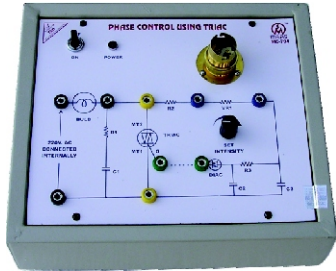
- Power requirement: 230 VAC  $\pm$ 10%, 50Hz.
- 6 Volt / 1/4 W lamp, Patch Chords & Instruction Manual.

### Optional Accessories

- Patch Chords & Instruction Manual

## Phase Control using Triac

ME 794



- To control phase angle by Triac & observe the wave form on CRO.

### Technical Specifications

- In built Sine wave Oscillator of 15V pp/ 1KHz
- On board control for phase angle.
- TRIAC BT 136 used.
- Circuit diagram printed on front panel & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$  10%, 50Hz.

### Standard Accessories

- Patch Cords, Instruction Manual

### Optional Accessories

- CRO 20MHz (ME 3020).

## Switching Action of a BJT

ME 795



- To Study the Switching of Action of a BJT & Observe the output on LED.

### Technical Specifications

- In built fixed power supply  $\pm$  18VDC/200mA
- Two NPN transistor BC 547 used.
- One dual range analog voltmeter (0-1/10VDC)
- 8.2V zener diode used .
- Circuit diagram printed on front panel & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$  10%, 50Hz.

### Standard Accessories

- Patch cords & Instruction Manual

### Optional Accessories

- Digital Multimeter (VC - 97)
- 6 Volt / 1/4 W lamp, Patch Chords & Instruction Manual.
- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).

## UJT Controlled SCR Time Delay

ME 796



- Thyristor Firing Circuit Kit Design to introduce time delay using UJT & Observe output on LED

### Technical Specifications

- In built fixed power supply  $\pm$  12VDC/250mA
- UJT 2646, SCR 2P4M based circuit.
- For variable time delay following resistance & capacitance values provided:-
- i) Resistance-10K, 50K, 100K, 200K, 300K, 400K, 500K,
- ii) Capacitance - 1mF, 47mF, 1mF, 10mF, 100mF, 220mF, 470mF
- Circuit diagram printed on front panel & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$  10%, 50Hz.

### Standard Accessories

- Patch Cords, Instruction Manual

### Optional Accessories

- CRO 20MHz (ME 3020)

## Step Up Chopper

ME 798



- **Step up Chopper designed to study stepping up of voltage by change in duty cycle of the pulse at the gate of mosfet.**

### Technical Specifications

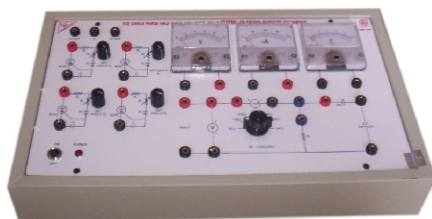
- Stepping up voltage up to 10 times of input voltage.
- In built fixed power supply of +20VDC/ 5A.
- In built IC based DC regulated power supply  $\pm 12\text{VDC}/300\text{mA}$  and  $+5\text{VDC}/300\text{mA}$  for the driving circuit.
- Op-amp.(OP 07) and power transistor (2N 6292) based driver circuit.
- On board frequency and duty cycle control of triggering pulse
- On board lamp holder.
- Circuit diagram printed, Mosfet 'IRFP 250N' & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm 10\%$ , 50Hz.

### Standard Accessories

- 230 Volt / 40W Bulb, Power Chord, Patch Chords & Instruction Manual.

## SCR Single Phase Rectifier Kit

ME 799



- **SCR Single Phase Half wave, Full wave , Fully Controlled Bridge Rectifier / Converter design to study to controlled rectifier & observe wave form on CRO.**

### Technical Specifications

- 4 SCR's 2P4M used
- 3 Analog meters provided of range in built power supply 10-0-10 PC, 0 - 200mA, 0-6VAC/ 10-0-10VAC in built power supply.
- Load Resistance -50ohms, 100ohms, 200ohms, 300ohms, 400ohms, 500ohms.
- On board controls for phase angle.
- Circuit diagram printed, & test points brought out on front panel.

### Standard Accessories

- Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).

## DC Motor Control using SCR's

ME 800

- **Designed to Control Speed of DC Motor using SCR**

### Technical Specifications

- One analog voltmeter (0-150VAC) & one analog Ammeter (0-500mA DC) provided on front panel.
- Isolation transformer for input voltage .
- On board DC motor
- On board control for phase angle to control speed of DC motor
- Circuit diagram printed, SCR 2P4M & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm 10\%$ , 50Hz.

### Standard Accessories

- Techometer, Patch chords, & Instruction Manual

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- 230 Volt / 25W lamp, Power Chord, Patch Chords & Instruction Manual.
- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).

## 3 Phase Half Controlled Bridge Rectifier

### ME 801

- **Three Phase Half Controlled Bridge Rectifier designed to observe controlled outputs on CRO by line commutation principle.**

#### Technical Specifications

- SCR's above 500V /8A rated used with Dv/Dt protection
- Ammeter 0-5A for load current measurement.
- Voltmeter 0-230V DC voltmeter for output DC voltage measurement.
- Provision for varying of output DC smoothly. Facility for observation of attenuated output waveform on CRO.
- Important test points on the side panel.
- Lamp bank static load provided with the equipment.
- Facilities to start delta connections.
- Acrylic top fitted for observation and identification of different blocks by the student Isolation transformer for input voltage .

#### Standard Accessories

- Patch Chords & Instruction Manual.

#### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).

## 3 Phase Fully Controlled Converter

### ME 802

- **Three Phase Fully Controlled designed to study controlled outputs and drive DC motor.**

#### Technical Specifications

- Voltmeter 0-230VDC for output DC voltage.
- Ammeter 0-3A for load current measurement.
- Input 440V 3 phase , 50Hz. 4 wire is step down with the help of 3 No of transformers to form a 150V 3 phase system with current capacity of 4Amp.
- The system includes elaborate triggering circuit arrangement for a six thyristor fully controlled bridge converter with various test points and soft start facility and ammeter and voltmeter . 1 HP. 230V DC motor can be driven from the out put of this fully converter.
- Thyristor above 600 V/8A ratings used mounted on heat sinks with dv/dt protection.
- Power requirement: 440 VAC, 3 phase 50Hz.

#### Standard Accessories

- Patch Chords & Instruction Manual.

#### Optional Accessories

- 1HP/230V DC Motor, Dual Trace CRO 20MHz (ME 3020), Digital Multimeter (VC-97).

## 3 Phase Induction Motor Speed Controller

### ME 803

- **Three phase Induction Motor Speed Controller to designed demonstrate speed variation of induction motor.**

#### Technical Specifications

- 1 KW induction motor slip ring type coupled with DC generator 1 Hp.
- Supplied along with the set up, for demonstration of speed variation of induction motor provided to load DC generator smoothly,
- Ammeter , voltmeter provided along with the setup.
- Electronic controller includes power supply, firing, circuit., Contactor, SCR bridge inverter and 6 diodes bridge converter for rotor side.
- Dv/Dt protection for tyristor included.
- Power requirement: 440 VAC, 3 phase 50Hz.

#### Standard Accessories

- Techometer, Patch chords, & Instruction Manual

#### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- 230 Volt / 25W lamp, Power Chord, Patch Chords & Instruction Manual.
- Dual Trace CRO 20MHz (ME 3020). • Digital Multimeter (VC-97).

## Single Phase Cyclometer

ME 804



- **Designed to convert line frequency to 1/2, 1/3 & 1/4 of its value & observe the wave form on CRO.**

### Technical Specifications

- Power supply +9volt DC for reference.
- In built IC based DC regulated power supply +5VDC.
- Three separate supplies V1, V2 and V3 of +5Volt DC each for opto isolators (MCT2E).
- Built in clock generator.
- Four number of SCR's (TYN 612).
- Frequency selection switch for selecting frequencies of 25Hz, 16.66 & 12.5Hz.
- On board lamp holder.
- Circuit diagram printed on front panel & four thyristors 'TYN 612' & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$ 10%, 50Hz.

### Standard Accessories

- 230 Volt / 25W lamp, Power Chord, Patch Chords & Instruction Manual.

## Chopper Motor Converter

ME 805

- **Chopper Motor Controller with Chopper to designed .**

### Technical Specifications

- This is a DC Chopper circuit for getting a variable DC voltage by using on time control and frequency control to feed a 110V Load.
- Circuit demonstrate the use of smooth speed variation with the help of chopper circuit.
- Ammeter, voltmeter and test points are provided.
- Jhone's chopper principle used for operation.
- 1/4 HP, 110V, DC series motor mounted on rigid base, 360(L)x 250 (H) mm dimension approx.
- Box type panel supplied lamp load optional.
- Anodized & Printed alluminium plate on the front panel.

### Standard Accessories

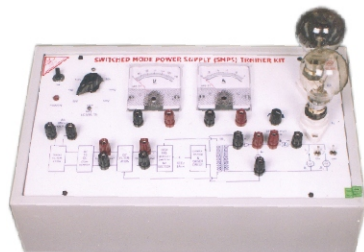
- Patch Chords & Instruction Manual.

### Optional Accessories

- Digital Multimeter (VC-97).

## SMPS Trainer Kit

ME 806



- Switched Mode Power Supply (SMPS) using high frequency transformer & high switching transistor has been designed to study the line and load regulation characteristics of SMPS power supplies.
- Study of AC to DC Converter.
- Measurement of DC output using multimeter.
- Study of DC filtration.
- Measurement of filtered DC output.
- Study of control of output DC voltage.

### Technical Specifications

- Rotary switch for selections of different input voltage & linearity coil for AC filtrations
- Bridge rectifier to convert AC into DC
- DC filtrations circuit is given to filter the impurities i.e. AC components.
- High frequency transformer and high frequency transistor (BU 508) for switching action.
- Feed back/ comparator circuit to maintain output voltage constant i.e.  $\pm 10\%$  on load.
- Two meters are provided on the front panel to measure the DC voltage & current.
- Two bulb holder are mounted on the front panel to connect resistive (Bulb) load across the output.
- Block diagram printed on front panel & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm 10\%$ , 50Hz.

### Standard Accessories

Patch Chords & Instruction Manual.

### Optional Accessories

Digital Multimeter (VC-97).

## Jone's Chopper

ME 807



- To study the working Jone's Chopper & observe various waveforms on CRO.

### Technical Specifications

- Power supply of +25VDC.
- On board frequency and duty cycle controls.
- On board lamp holder.
- Circuit diagram printed on front panel & thyristors "TYN 612" & "2P4M" & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$  10%, 50Hz.

### Standard Accessories

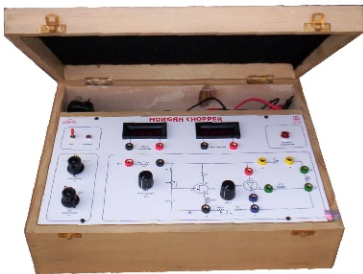
- 24 Volt / 30W Bulb, Power Chord, Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).

## Morgan Chopper

ME 808



- To Study the Working of Morgan Chopper & Observe various waveforms on CRO.

### Technical Specifications

- In built power supply of range +15V DC / 200mA.
- One number of Digital Panel Meter for voltage measurement of range 0-20V.
- One number of Digital Panel Meter for current measurement of range 0-2A.
- Selector Switch for selecting capacitance of different values i.e. 10mF, 20mF and 30mF.
- Selector switch for selecting inductance of different values i.e. 10mH, 15mH and 20mH.
- Variable load 50 Ohm to 550 Ohm .
- On board frequency controls.
- Circuit diagram printed on front panel & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$  10%, 50Hz.

### Standard Accessories

- Power Chord, Patch Chords & Instruction Manual.

## Series Inverter using SCR's

ME 809



- To Study the Conversion of DC To AC by use of Series Inverter

### Technical Specifications

- Power supply of +40VDC/3Amps.
- On board frequency controls.
- On board lamp holder.
- Circuit diagram printed on front panel & two thyristors "TYN 612" & one UJT "2646" & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$  10%, 50Hz.

### Standard Accessories

- 230 Volt / 25W Bulb, Power Chord, Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).

## Parallel Inverter using SCR's

ME 810



- To study the Conversion of DC to AC by using Parallel Inverter.

### Technical Specifications

- Power supply of +18VDC/3A
  - In built IC based DC regulated power supply +12VDC/500mA
  - Triggering Circuit contains astable multivibrator using Transistor (CL100) & two nos. of UJT (2646).
  - On board lamp holder.
  - Circuit diagram printed on front panel & two thyristors "TYN 612" & test points brought out on front panel.
- Power requirement: 230 VAC  $\pm$ 10%, 50Hz.

### Standard Accessories

- 230 Volt / 15W Bulb, Power Chord, Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020). Digital Multimeter (VC-97).

## Universal AC/DC Motor Controller

ME 811

- Universal AC/DC Motor Controller designed to control speed of AC/DC motor off load & on load & observe wave forms on CRO.

### Technical Specifications

- This unit comes with 1/4 HP, 110V DC series motor which can be controlled from 230V AC mains.
- The firing circuit produces +ve and negative voltage depending on the setting of speed control knob and this setting can also control direction of rotation of the motor in a single control.
- Appropriate test points are provided.
- 1/4 HP, 110V DC series motor with loading arrangement, alongwith triac controller.
- Panel board model Triac used to achieve the variable voltage control for series (A.C./D.C) motor.
- Built in facility for DC control voltage.
- Balance and gain adjust pots provided. Ammeter 0-2Amp. For measurement of load current.

### Standard Accessories

- 230 Volt / 15W Bulb, Power Chord, Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).

## Single Phase Inverter

ME 812

- Single Phase Inverter (using power mosfet in bridge configuration)

### Technical Specifications

- Power mosfet in bridge configuration 4No. Of power MOSFET's are connected to the DC source (built in) and necessary circuitry is provided to get a square wave AC source with variable frequency.
- Selection of low frequency and high frequency can be made.
- Low frequency AC. O/P is stepped up by an O/P transformer, to drive a 40W, 230V lamp load.
- For higher frequency operation only resistive load is provided,
- All the required test points are provided.
- The system is laid out on a neatly labeled poly carbonate panel with clear marketing of the various components. Model size 60x40x15 cms approx.

### Standard Accessories

- 230 Volt / 15W Bulb, Power Chord, Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).



## Chopper Circuit

ME 813

- **The system demonstrates the application of power mosfet to generate a variable DC voltage in two ranges:-**  
**The system demonstrates the application of power mosfet to generate a variable DC voltage in two ranges:-**  
i) 3 to 24 V , ii) 10 to 100V typically.

### Technical Specifications

- The chopper frequency can be varied in the range of 30Hz to 300Hz with duty cycle varied for 10% to 90% typically.
- The O/P can drive a 24V/30W lamp or 1/4 HP 110 V DC series motor or 110V/60W bulb.
- Provision is made for all the three loads.
- You may connect a portable power tool for demonstration.
- All the components are neatly laid out on an anodised panel with block schematic printed on it with various points.

### Standard Accessories

- 230 Volt / 15W Bulb, Power Chord, Patch Chords & Instruction Manual.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).

## DC Drive Trainer

ME 814

- **This system makes use of an industrial version of DC drive using dual converter thereby facilitating motor speed control in both the directions from a single potentiometer.**

### Technical Specifications

- The drive also has built in PID controller for speed regulations.
- DC motor 1/2 HP 200 volts, 1500RPM with loading arrangement is provided and dynamic braking of the motor also can be demonstrated.
- Over current protection is provided.  
The units comes with appropriate test points and an ammeter.  
It has neatly labeled front anodised panel with block schematic clear view of the system

### Standard Accessories

- 230 Volt / 15W Bulb, Power Chord, Patch Chords & Instruction Manual. Model size 50x80x22cms.

### Optional Accessories

- Dual Trace CRO 20MHz (ME 3020).
- Digital Multimeter (VC-97).