

**Specifications:**

- Input 3 Phase Dolstarter Panel

**Lamp Load (12 Shrouded Banana)**

- 230v /15/40/60/100W X 3 Bulbs With Individual On/Off Using 6atoggle Switch.

**Resistor Load Panel (18 Shrouded Banana)**

- AC Resistors : 10k / 5k / 3.5k / 2.5k / 2k / 1.5k / Off 200w X 3 Phases / 6 Taps.
- DC Resistors : 750E / 600E / 300E / 212E / 162E / 125E/ 112E / 100E / 400w /8 Taps + Off + Separate 60E Tap For DC Series Gen.

**LC Load Panel (30 Shrouded Banana)**

- Inductive Load : 0.15h/0.3h/0.45h/0.6h/0.75h/1.5h/ 3h/400max 3nos.
- Capacitive Load : 1.25u /2.5u/5u/415VX 3nos

**Single Phase Input MCB Panel (10 Shrouded Banana)**

- 1 Ph.MCBs Of 4A/1.6A 2nos

**Integrated AC (3/1 Phase) Measurement Panel (8 Shrouded Banana)**

- Digital Meter (96X96mm) For Measurement Of 3 $\phi$  & 1 $\phi$
- Parameters.
- Voltage Line To Line & Line To Neutral.

*Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.*



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- Current For All 3 $\phi$  Up To 5A.
- Power Factor, Frequency, Watts, VAR, Vaand Energy In kWhr.

**Integrated AC (1phase) Measurement Panel (8 Shrouded Banana) - 2 Nos.**

- Consist Of 2 Nos Of (48X96mm) Digital Meters For 1 Phase Measures V, I, PF (0.2 Lag Unity 0.2 Lead), Hz. Hence Separate Analog Wattmeters Are Not Needed.
- Current Specs = 1A/5A for 1 $\phi$  Meter (170-250V)

**Variable AC Voltage & Current Injector Panel (16 Shrouded Banana)**

- Variable AC Voltage O/P: 0-270V/0.75A
- Variable AC Current O/P: 0-12 Amp

**Potential Transformer [PT] Panel (33 Shrouded Banana)**

- Consists Of 2 Nos. Of Pts (230V:24V Secondary), 200va With Both Primary &secondary Terminated At Shrouded 4mm Sockets.
- Null Detection & Balancing Components- 2 Capacitors (100pF, 0.001uF) & 47k, 33k Resistors & 470k Pot

**Current Transformer [CT] Panel (39 Shrouded Banana)**

- Consists Of 2 Nos. Of Ei Core Cts (5A:1Asecondary) And 1 No. Of Ferrite Ct (40A: 0.4A Sec.) With Both Primary & Secondary Terminated At Shrouded 4mm Sockets.
- Null Detection & Balancing Components- 3 Capacitors (10uF, 1uF, 0.1uF) & 100E / 0.25W, 0.1E, 0.01E 5W Resistors, 500E Pot.

**List of Experiment :**

- Current transformer (CT) testing
- Potential transformer (PT) testing
- Calibration of single phase energy meter
- Measurement of 3  $\phi$  power by 2 Wattmeter method
- Measurement of 3  $\phi$  power by 1 & 3 Wattmeter method
- Measurement of power in a 1 $\phi$  AC circuit using 3 Ammeter method
- Measurement of power in a 1 $\phi$  AC circuit using 3 Voltmeter method
- Find out filament resistance at cold and hot condition.

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- Power factor improvement technique using shunt capacitor
- Study of testing of phase shifting Transformer (optional)
- Study effect of grounding of the neutral point in a 3 ph. system.
- Solidly grounded neutral
- Resistance grounded neutral
- Floating neutral (ungrounded)
- Plot the magnetization curve of measurement CT & Protection CT & determine knee point voltage.
- Iron Loss Measurement in a X'mer using Lloyd fisher square method (optional).
- Self and mutual inductance measurement of PT



### **Built In Power Supply**

- DC Supply : 5V / 1A &  $\pm 12V$ , 1A. 0 To 15V DC (Variable), 100 mA (Isolated), 0 To 30V DC (Variable), 100 mA (Isolated), High Volt DC 15V To 110V, 100mA
- AC Supply : 12-0-12V AC, 150 MA. Short Circuit Protected

### **Built In Function Generator**

- O/P Waveform : Sine, Triangle & TTL O/Ps Output Frequency : 1 Hz To 1mhz In 6 Ranges, With Amplitude & Frequency Control Pots. O/P Voltage 20VP-P Max. (Sin/Trg)
- Modulation I/P : AM : - I/P Voltage + 5v (100% Modulation) O/P - For 0v (MIN), + 5v (MAX.) - 5V (Phase Reversal Of O/P) FM : I/P Voltage  $\pm 400mV$  ( + 50% Modulation)

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- Clock Generator : 10 Mhz TTL Clock.
- Data Switches (10 No.) & Bi-Colour Led Status Indicators 10x2 Nos, For High/Low Indication.
- Pulser Switches (2 Nos.) With Four Debounced Outputs - 2no.
- BNC To 2 Channel Banana Adapter - 2no
- Logic Probe To Detect High/Low Level Pulses Upto 1Mhz, With Bi-Colour Leds To Indicate Status.
- 2 / 4 Digit 7 Segment Display With BCD To 7 Segment Decoder.

**Onboard Dpms Provided With Mode/Range Selection.**

- Dc Volt : 2v/200v - 1no.
- Dc Current : 2ma/200ma - 1no.
- Dc Volts/Current : 20v/200ma - 1no

**Onboard Moving Iron Meters Provided For**

- Accurrent : 1 Amp - 1no.
- Ac Voltage : 15V - 1no.
- Onboard Speaker : 8 Ohms, 0.5 Watt (1nO.)
- Onboard Pots : 1k - 1no. ,1m - 1no.

**Mechanical Dimensions**

- Master Unit : 460mm(W), 160mm(H), 350mm(D) Approx
- Panel : 215mm(W), 165mm(H), 40mm(D) Net Weight : 700 Gm Approx.
- Operating Voltage: 220/240VAC Switch Settable  $\pm 10\%$ , 50hz/60VA.
- Salient Features : Aesthetically Designed Injection Molded Electronic Desk (master Unit)
- Carrying Useful Experiment Resources Variable Power Supplies / Status / Pulsar / Function Generator, Dpms Etc. While The Central Slot Will Carry Replaceable Experiment Panel Secured In An Abs Molded Plastic Sturdy Enclosure, And Has Colorful Screw Less Overlay Showing Circuit & Its Connection Tag Numbers For Easy Connectivity. Connection Through Sturdy 4mm Banana Sockets & Patch Cords. Hands On Learning By Constructing Circuits Using Built In Power Board Panel As Well As

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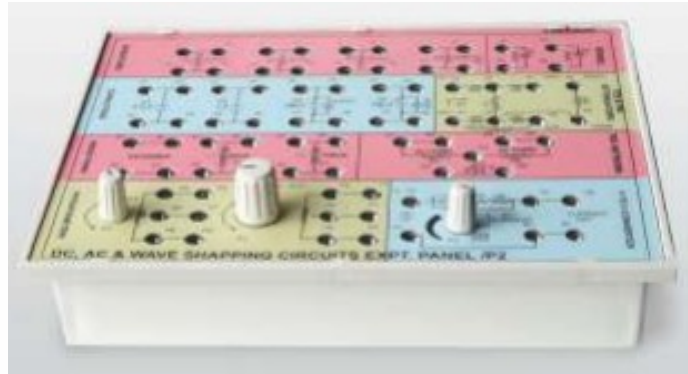


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Optionally Using Discrete Component Panel. Set Of Users Guide Provided With Each Unit. Order 10 Master Units & Multiples Of 10 Or More Panels Set.



### **DC, AC & Wave Shaping Circuit Experiment Panel (Provided With 81 Banana Tags)**

- **DC** : Resistance, Current And Voltage Measurements, Loading Of Potentiometer, Ohm's Law, Power DC Circuits, Series, Parallel And Mixed Circuits, Kirchoff's Law, Superposition Theorem, Thevenin's & Norton's Theorems, Reciprocity, Compensation, Tellegen, Millman Theorems & Maximum Power Transfer Theorem, Voltage Distribution Of Capacitors In Series & Parallel, Total Capacitance Of Capacitors In Series And Parallel, Charging And Discharging Of Capacitor Through Resistance & Time Constant, Wheatstone's Bridge, 2 Port Network Y, Z,H, ABCD Parameters & Star Delta Network, T& PI Attenuators.
- **AC** : AC Voltage & Current Measurements - R-L Series, R-C Series, R-L-C Series Circuit (Series Resonance). R - Lparallel, R#C Parallel, R-L-C Parallel(Parallel Resonance), Active, Reactive Power & Power Factor(Vector Diagram), Average & Rms Value Measurement.
- **Wave Shaping**: Differentiator, Integrator, Clipping, Clamping, Passive Filters LC / RC, LPF/ HPF
- Table (1220 (L) x 610 (W), 760 H ) Approx Consisting Of Fine Vineer Top, MS Tubular Frame, 2 Drawers With Key Lock, 1 PC Keyboard Drawer, Writing Pad Drawer, 4 Castor Wheels Etc.

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