VASTEK

Product Catalogue

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Cordially Welcome to VASTEK Engineering Technologies Pvt. Ltd.

Your Trusted Partner in Rugged Computing & Industrial Solutions

Established in 2017 by a team of experienced technocrats, VASTEK Engineering Technologies Pvt. Ltd. has swiftly emerged as a reliable provider of innovative solutions in the field of rugged computing systems, active and passive components, electronic test and measuring instruments, power supplies, electronic loads, EMI/EMC test solutions, and industrial automation sensors.

Over the years, we have earned a strong reputation for delivering high-quality and dependable solutions to a diverse clientele, including defense establishments, space agencies, marine organizations, telecommunications companies, corporate enterprises, and public sector units (PSUs). Our product range encompasses digital oscilloscopes, programmable DC power supplies, spectrum analyzers, function generators, RF signal generators, digital multimeters, LCR meters, and vector network analyzers, among many other advanced solutions.

We also designs, manufactures, and services a wide range of advanced laboratory equipment—such as drone technology systems, 3D printers, fiber-optic setups, transformer Workbench, and electrical lab equipment and many more. These solutions support educational institutions, research centers, and industrial clients. Despite our compact team, we place great value on employee engagement, celebrating innovation and performance, encouraging teamwork, and nurturing a culture of continuous improvement.

At VASTEK, quality is our identity. We are a quality-conscious organization that ensures every product adheres to international standards and exceeds customer expectations. Backed by a dedicated team of experienced engineers, we are committed to offering excellent service, timely support, and tailor-made solutions.

We don't just deliver products — we deliver performance, precision, and partnerships. We look forward to being a part of your growth and contributing to your journey toward technical excellence.

"Unlocking the Future of Technology"

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1. VASTEK-V1701 Electrical Vehicle Work Bench-I

The proposed integrated workbench is specifically designed to facilitate student learning and experimentation with electric vehicle components. Its design combines an instrument panel and working table to optimize accessibility and functionality.

The workbench is equipped with various testing and measuring instruments essential for conducting experiments and analysis on electric vehicle components. These instruments are strategically placed within the instrument panel and working table, ensuring easy accessibility while maintaining a clutter-free workspace.

Structure Specifications

Workbench Dimensions

- Depth of bench (900 mm).
- Width of bench (1200 mm).
- Height of bench is (1800 mm).
- 40mm x 40mm SS pipes with (1.2mm) thickness of wall.
- User working area of bench (19mm) thick plywood & (1.8mm) off white colour mica.
- Single movable MS Drawer with 3 separate compartment.

- Dimension of separate drawer.
- Width of drawer (340mm)
- Depth of drawer (375mm)
- Height of drawer (150 mm)
- Wall thickness of separate drawer is (1.2mm).
- Separate lock with Handle for each drawer.

Electrical Details of Bench

- 2-Pole MCB with 16A capacity for power ON/OFF.
- We provide some Brands of MCB Siemens/Anchor/Havells.
- Power Cable with Plug and extra switch with Socket on the work bench.
- Line Input Voltage (230V AC).

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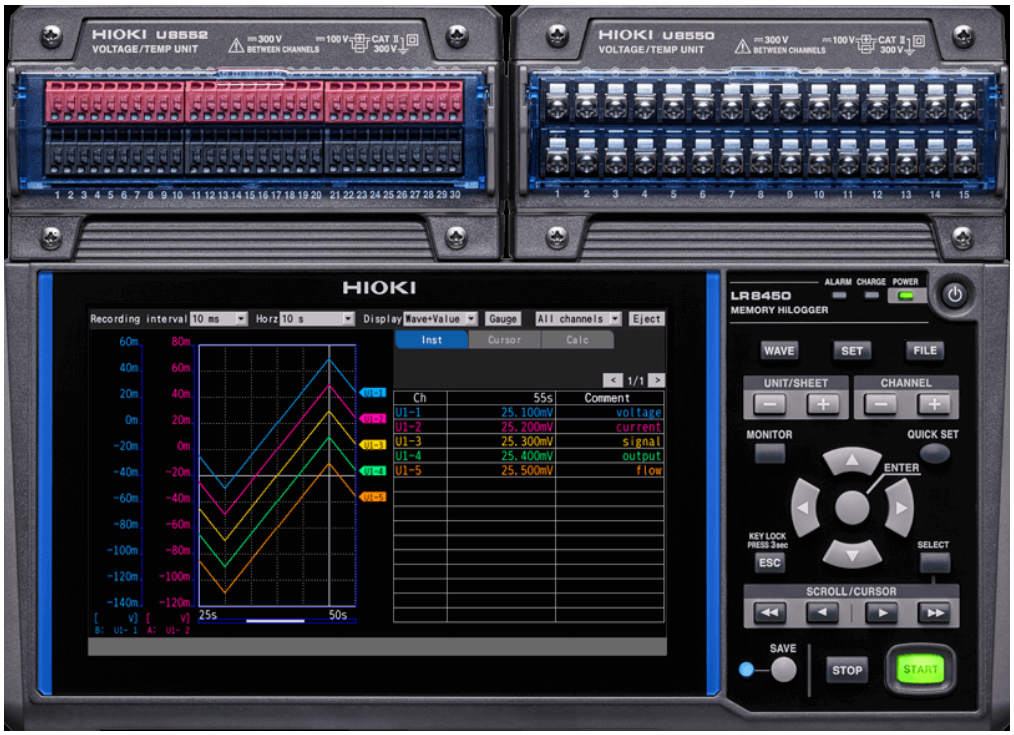
1. Memory Hi-Logger



1. Max. number of connectable modules	:	4 plug-in modules
2. Display of Instrument	:	7-inch TFT color LCD
3. No. of measurement channels	:	120 channels with plug-in input modules
4. Internal memory (buffer)	:	(a) Volatile memory (b) 256 M-words
5. Display resolution (with waveform display selected)	:	Max. 20 divisions (horizontal axis) × 10 divisions (vertical axis) (1 division = 36 dots [horizontal axis] × 36 dots [vertical axis])
6. Recording Mode	:	Normal
7. Recording intervals	:	1 ms, 2 ms, 5 ms, 10 ms, 20 ms, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min., 2 min., 5 min., 10 min., 20 min., 30 min., 1 h
8. Repeat recording	:	On/off (user-selectable)
9. Waveform recording	:	Last 256 mega-data-points are saved in internal buffer memory. Scroll through & view data stored in internal buffer memory. Alarm source data recording can be toggled on & off.
10. Data refresh interval	:	(a) Automatically (b) User-selected value per module
11. USB interface (host)	:	(a) Standard compliance: USB 2.0 compliant (b) Connectors: Series A receptacle × 2 © Guaranteed-operation options: USB drive (16 GB) (d) File system: FAT16, FAT32 (e) Connectable devices: keyboard, mouse, hub (1 layer), USB drive (1 port only)

12. USB interface (function) :
(a) USB standard: USB 2.0 compliant
(b) Connector : series mini-B receptacle
(c) USB functionality : data acquisition, condition settings used with the Logger Utility software (bundled) Configuring settings & ontrolling recording using communications commands.
(d)USB drive mode: transferring data from a connected SD memory card to a computer.

13. SD card slot
(a)Standard compliance: SD standard-compliant slot × 1 (with SD memory card/SDHC memory card support).
(b)File system: FAT16, FAT32

14. Waveform display
(a) Time-axis waveform display: simultaneous display of gages & settings (channel settings & display settings).
(b) Simultaneous display of time-axis waveforms & values: instantaneous values, cursor values, or numerical calculation values (user-switchable).
(c) Numerical display: simultaneous display of instantaneous values & statistical values.
(d) Alarm display: display of alarm status & alarm history

15. Display format :(a) Time-axis waveform display: 1 screen
(b) X-Y waveform display: 1 screen

16. X-Y composite : Composite waveforms (up to 8)

17. Numerical display format : SI units, decimal, or exponent (user-selectable) When decimal is selected, number of decimal places to display can be set (values will then be rounded to set number of places)

18. Zooming in & out on the waveform display: (a) Horizontal axis: 2ms to 1 day/division.
(b) Vertical axis: Number of divisions per screen: 10 Setting method Select position or upper & lower limits for each channel. (Waveform calculation channels: upper and lower limits only) When setting by position: set zoom factor & zero position. Zoom factor: 1/2 ×, 1 ×, 2 ×, 5 ×, 10 ×, 20 ×, 50 ×, 100 × Zero position: −50% to 150% (with a zoom factor of 1 ×)

19. Waveform scrolling : Display can be scrolled left & right both during recording & while recording is stopped (during waveform rendering only)

20. Monitor display : Check instantaneous values and waveforms without recording data to memory (values & waveforms can be displayed while waiting for a trigger)

21. Auto saving files : (a) Waveform data (real-time saving): off, binary format, text format, or MDF format (user-selectable)
(b)Numerical calculation results (saved after recording): off or text format (user-selectable)
(c)When text format is selected, choose whether to save all calculations in one file or to save each calculation in its own file

22. Accessories.
(i) SD Memory Card 2GB
(ii) Universal Unit-2 nos. (Memory Hi logger),
(iii) Battery Pack-(2 nos.)

2. Power Analyzer

S. No. Parameter		Specification
1.I/P method of Voltage	:	Isolated input, resistor voltage division
2.I/P method of Current	:	Isolated input from current sensor
3.Measurement of DC frequency band	:	0.1 Hz to 1 MHz
4.Temperature coefficient	:	0.01%/°C
5. Accuracy for 50/60 Hz power	:	± (0.02% of reading + 0.05% of range)
6. DC power Accuracy	:	± (0.02% of reading + 0.05% of range)
7. Accuracy (10 kHz power)	:	± (0.2% of reading + 0.05% of range)
8. Accuracy (50 kHz power)	:	± (0.4% of reading + 0.1% of range)
9. Power measurement channels	:	1 to 8 channels
10.Voltage, current ADC sampling	:	16-bit, 2.5 MHz
11.Range of Voltage	:	6 V, 15 V, 30 V, 60 V, 150 V, 300 V, 600 V, 1500 V
12.Range of Current	:	Probe 1: 100 mA to 2000 A (6 ranges, based on sensor) Probe 2: 100 mV, 200 mV, 500 mV, 1 V, 2 V, 5 V
13.Display	:	10.1-Inch WVGA TFT color LCD, touch screen
14.Common-mode voltage rejection ratio	:	(CMRR) 50/60 Hz: 100 dB or greater 100 kHz: 80 dB typical
15.External current sensor I/P	:	ME15W, BNC
16.Data update rate	:	10 ms, 50 ms, 200 ms
17. Max. I/P voltage	:	(a)1000 V AC (b) 1500 V DC (c)±2000 V peak
18. Max. rated line-to-ground voltage	:	(a) 600 V AC (b) 1000 V DC CAT III 1000 V AC (c)1500 V DC CAT II
19.Motor analysis channels	:	Max. 4-motors
20.Motor analysis I/P format	:	(a) Frequency (b) Pulse (c) Analog DC
21.Calculation of Current sensor phase shift	:	Yes (auto)
22. Harmonics measurement	:	Yes (8, for each channel)
23.Max. harmonics analysis order	:	500th
24.Range of Harmonics synchronization frequency	:	0.1 Hz to 1 MHz
25.Accessories	:	(i) Voltage Cord-(2 nos.) (ii) 2.5MS/S Input Unit-(8 nos.) (iii) AC/DC Current Probe-(8 nos.)

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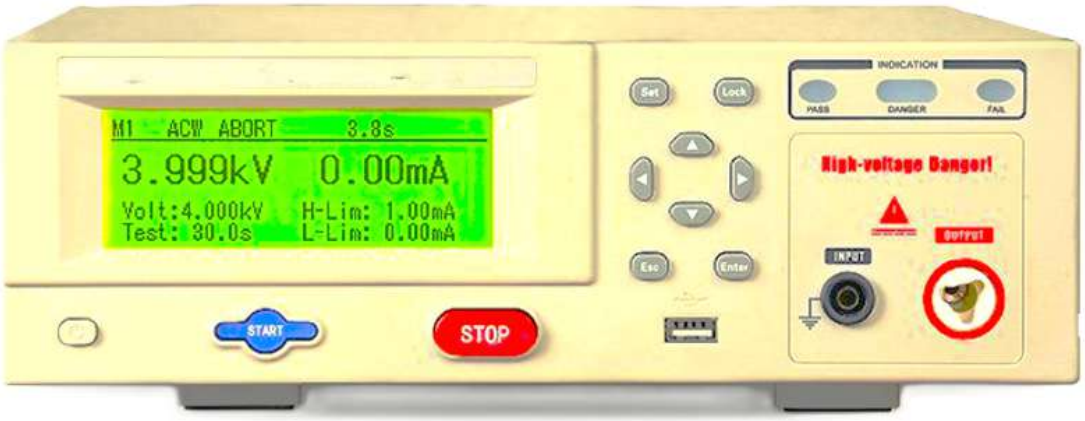
3. LCR Meter

S.no.	Parameter		Required
1.	Frequency Measurement	:	4Hz to 8MHz (5digits setting resolution, min. resolution10mHz)
2.	Modes of Measurement	:	Continuous testing (Continuous measurement under saved conditions),LCR (Measurement with single condition).
3.	Measurement parameters	:	Rp, Rs (ESR), Rdc (DC resistance), Cs, Cp, Ls, Lp, Z, Y, θ, X, G, B,Q, D (tanδ), σ, ε
4.	Measurable range	:	100 mΩ to 100 MΩ, 10 ranges (All parameters are determined according to Z)
5.	Range of Display	:	Z: (0.00 m to 9.99999 GΩ), Y: (0.000 n to 9.99999 GS) θ: ± (0.000° to 180.000°), Q: ± (0.00 to 9999.99) Rdc: ± (0.00 m to 9.99999 GΩ), D: ± (0.00000 to 9.99999) Δ%: ± (0.000 % to 999.999 %), or other
6.	Basic accuracy	:	Z ±0.05% rdg. θ: ±0.03° (representative value, Measurable range: 1 mΩ to 200 MΩ)
7.	Interfaces	:	EXT. I/O (HANDLER) USB, USB flash drive, LAN, GP-IB, RS-232C, BCD Standard supply.

8. Measurement signal level	
[Normal mode : CC mode]	
4 Hz to 1.0000 MHz	: 10 µA to 50 mArms (max. 5 Vrms)
1.0001 MHz to 10 MHz	: 10 µA to 10 mArms (max. 1 Vrms)
[Normal mode: V mode/CV mode]	
4 Hz to 1.0000 MHz	: 10 mV to 5 Vrms (maximum 50 mArms)
1.0001 MHz to 10 MHz	: 10 mV to 1 Vrms (max. 10mArms)
[Low impedance high accuracy mode	: CC mode]
4 Hz to 1.0000 MHz	: 10 µA to 100 mArms (maximum 1 Vrms)
[Low impedance high accuracy mode	: V mode/CV mode]
4 Hz to 1.0000 MHz	: 10 mV to 1 Vrms (maximum 100 mArms)
[DC resistance measurement]	
Measurement signal level	: Fixed at 1 V
9. DC bias measurement	: DC voltage 0 V to 2.5 V (10 mV resolution) Built In
10. Power supply	: 100 to 240 V AC, 50/60 Hz, 50 VA max.
11. Dimensions & mass	: 330 mm (12.99 in) W × 119mm (4.69 in) H × 230mm (9.06 in) D, less then 4.5 kg
12.Output impedance	: (a) Normal mode: 100 Ω (b) Low impedance high accuracy mode: 10 Ω
13.Display	: (a) 5.7-inch color TFT displaying 4 Parameters with Settings (b) Touch Screen Enabled
14.Functions	: Comparator, Open/short compensation, BIN measurement (10 categories for 2 measurement parameters), Trigger function, Contact check, Panel loading/saving, Memory function
15.Accessories	: (i) Power cord (ii) Instruction manual (iii)Application Software to control the equipment as well as save data in PC or Laptop in .csv format, txt. format using the application software (iv) 4Terminal Probe (freq.supporting up to 8MHz) 3 meter long

4.Automatic Insulation / Withstand Hi-Tester



S.no.	Parameter	Specification
Voltage Withstand Testing		
1.	**Output voltage**	0.20 kV to 5.00 kV
2.	**Output current**	100 mA
3.	**Voltmeter**	**(a) Digital:** 0.00 to 5.00 kV (full scale) Accuracy: ±1.5% f.s. **(b) Analog:** 0 to 5 kV (full scale) Accuracy: ±5% f.s.
4.	**Current measurement range**	**(a) AC:** 0.01 mA to 100.0 mA **(b) DC:** 0.01 mA to 10.0 mA
5. ss	**Voltage output method**	PWM switching method
6.	**Voltage adjustment method**	Digital setting (0.01 kV setting resolution)
7.	**Output voltage accuracy**	±1.5% of setting voltage ±2 dgt.
8.	**Fluctuation rate**	**(a) AC:** ±7% or less (max. 5 kV at 100 mA → no load: Resistance load) **(b) DC:** ±16% or less (max. 5 kV at 10 mA → no load: Resistance Load)
9.	**AC Voltage waveform**	Sine wave (5% or less distortion, unloaded)
10.	**AC Voltage frequency**	50 Hz/60 Hz, ±0.2%
11.	**Output ripple DC voltage**	6% of output voltage or less (at 5 kV DC, 10 mA, resistive load)
12.	**Measurement resolution**	0.00 to 10.00 or 0.01 mA (10 -mA range) 10.1 to 100.0 or 0.1 mA (100 -mA range, AC only)
13.	**Current measurement accuracy**	± (2% rdg. + 5 dgt.) common to each range

Insulation Resistance Testing		
1.	**Test voltage**	**(a) Output voltage:** Positi ve polarity 50 V to 1200 V DC. **(b) Voltage adjustment method:** Digital setting (1 V resolution) . **(c) Output voltage accuracy:** ±1.5% ±2 dgt. of setting level .
2.	**Rated measurement current**	1 mA
3.	**Short -circuit current**	200 mA or less
4.	**Voltmeter**	**Average display** **(a) Digital:** 0 to 1200 V DC (full scale) Accuracy: ±1.5% rdg. ±2 dgt. **(b) Analog:** 0 to 1200 V DC Accuracy: ±5% f.s. (5 kV full scale)
5.	**Measurement range/ accuracy**	0.100 MΩ to 1.049 MΩ 1.05 MΩ to 10.49 MΩ 10.5 MΩ to 104.9 MΩ 105 MΩ to 9999 MΩ Fundamental accuracy: ±4% rdg.

General Specification		
1.	**Decision results**	**(a) PASS:** Measured current (insulation resistance value) was between the specified upper and lower bounds du ring the specified time elapsed. **(b) UPPER -FAIL:** Measured current (insulation resistance value) exceeded the specified upper bound. **(c) LOWER -FAIL:** Measured current (insulation resistance value) was less than the specified lower bound
2.	**Decision processing**	For each decision result, the beeper sound, output the display portion, and EXT I/O signal
3.	**Specification ranges**	**(a) Voltage withstand testing:** **AC V:** 0.1 mA to 100 mA (upper bound) / 0.1 mA to 99 mA (lower bound) **DC V:** 0.1 mA to 10 mA (upper bound) / 0.1 mA to 9.9 mA (lower bound) **(b) Insulation testing:** 0.10 MΩ to 9999 MΩ (same upper/lower bounds)
4.	**Specification resolution**	**(a) Voltage withstand testing:** 0.1 mA (0.1 mA to 9.9 mA), 1 mA (10 mA to 100 mA) **(b) Insulation testing:** 0.01 MΩ (0.10 MΩ to 9.99 MΩ), 0.1 MΩ (10.0 MΩ to 99.9 MΩ), 1 MΩ (100 MΩ to 9999 MΩ)
5.	**Ramp timer (withstand test time)**	**(a) Setting range:** 0.1 s to 99.9 s ramp -up and -down specified separa tely. **(b)** Setting resolution/accuracy: 0.1 s, ±0.5% of specified value
6.	**Delay timer (insulation resistance test time)**	**(a) Setting range:** 0.1 s to 99.9 s **(b) Setting resolution/accuracy:** 0.1 s, ±0.5% of specified value . **(c) Action:** specify a delay time after testing is set to begin to inhibit decisions during that time
7.	**Monitor functions**	(a) Detected current (b) Output voltage (c) Measured resistance
8.	**Accessories**	High Voltage Lead 3 meter long

5. Impulse winding Tester

S. No.	Parameter	Specification
1.	**Applied voltage**	100 V to 4200 V (resolution set in 10 V steps)
2.	**Voltage detection accuracy**	**(a) DC accuracy:** ±5% of setting **(b) AC band:** 100 kHz, ±1 dB **(c) Accuracy guarantee conditions:** 23°C ±5°C, 80% RH or less
3.	**Testable inductance range**	10 µH to 100 mH
4.	**Sampling speed**	200 MHz / 100 MHz / 50 MHz / 20 MHz /10 MHz
5.	**Sampling resolution**	12 bit
6.	**Number of samples**	1001 to 8001 points (set in 1000 point steps)
7.	**Judgment method**	
	LC/RC value judgment	LC/RC value judgment (LCRC AREA)
	Waveform judgment	(a) Waveform area comparison judgment (AREA) . (b) Waveform differential area comparison judgment (DIFF -AREA) . (c) Waveform flutt er detection judgment (FLUTTER). (d) Waveform second derivative detection judgment (LAPLACIAN)
8.	**Discharge detection**	Discharge detection (DISCHARGE)
9.	**Test duration**	Approx. 60 ms (reference value when tester is configured for 3000 V, 1 pulse, detection off)
10.	**No. of test condition tables**	255 (test condition settings, detection condition settings, master waveforms)
11.	**Insulation breakdown voltage testing mode**	The work piece is subjected to impulse testing while gradually raising the applied voltage to determine the voltage at which the insulation breaks down. Waveform area judgment, discharge judgment, and LC/RC value judgment ar e used to judge insulation breakdown.
12.	**Display**	**(a) Touch screen display:** 8.4-inch SVGA color TFT LCD (800 × 600 dots). **(b) Functionality for changing the background color:** 4 colors available
13.	**Safety functionality**	(a) Interlock (b) Key lock (c) Double -action design (to prevent erroneous operation when starting testing)
14.	**General Specification**	
15.	**Standards compliance**	(a) Safety: EN 61010 (b) EMC: EN 61326 Class A
16.	**Accessories**	(a) Discharge Detection Upgrade (b) Clip Type Lead 3 meter long

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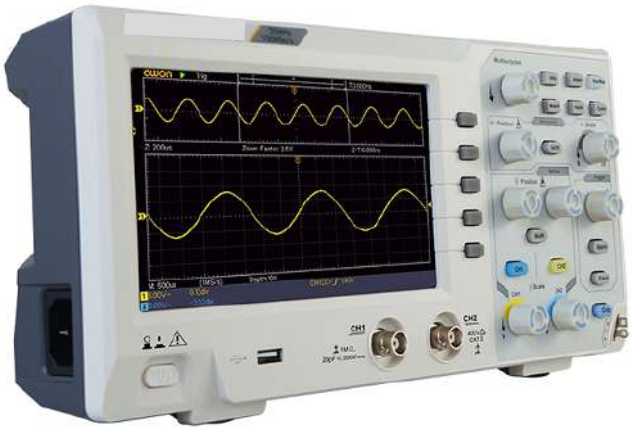
BLDC (Brushless DC) Trainer V502

S. No.	Parameter	Specification
Trainer		
1.	**DC Voltmeter Range**	0-300V DC
2.	**DC Ammeter Range**	0-20A
3.	**RPM Meter**	0 to 9999Count
4.	**Motor Speed Control**	PWM Method
5.	**Interconnection**	4mm Banana Patch Cord
6.	**BLDC Motor Controlle r**	Inside the trainer
7.	**SMPS (Power Supply)**	24V, 12A
8.	**Electronics Breaks**	Inside the trainer
9.	**Frame with Table & Drawer**	
Motor Assembly		
10.	**BLDC Motor**	24V/220W, 10A
11.	**RPM**	2500 rpm
12.	**Spring Balance**	25Kg X 100g

6. Digital Storage Oscilloscope



S.no	Parameter	Required
1.	Signal Bandwidth	100MHz, Analog Channels 2
2.	Real Time Sampling	1GS/s Each Channel
3.	Waveform Capture Rate	More than 150,000 wfms/sec
4.	Vertical Resolution	8 bits
5.	Coupling	AC-DC-GND
6.	Triggering Decode	Hardware Based Decoding RS232, I2C, SPI
	Trigger	Edge, Slope, Pulse RS232,I2C,SPI
	Memory	50Mpts Each Channel
7.	Vertical Sensitivity	1mV/div to 20 V/div
8.	Time Base Range	2 ns/div to 1000 s/div
9.	MathFunction	Logical AND, OR, NOT, EXOR, A+B, A-B, AxB, A/B, FFT, Intg, Diff, Sqrt,
10	Display	7-inch TFT
11	I/O Interface	USB Host & Device, LAN
12	Independent vertical scale & position control knobs for each channel.	
13	32 parameters of automatic measurement	
14	Unique Digital Filter & Waveform recorder function	
15	Advanced cursor modes: Manual, Auto & Track	
16	Waveform Intensity & Grid Brightness can be adjusted	
17	PASS / FAIL detection, PASS/FAIL output	
18	Built-in 6-bit frequency counter	

Suitable software for the operation of the above relevant equipment is included in the package.

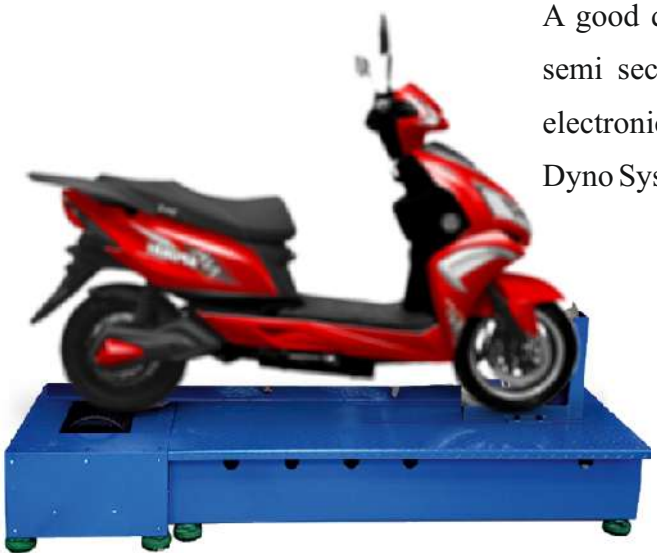
Electrical Vehicle Training System V501

S. No.	Parameter	Specification
Trainer		
1.	**DC Voltmeter**	0 to 500V DC
2.	**DC Ammeter**	0 to 20A
3.	**AC Voltmeter**	0 to 500V AC
4.	**AC Ammeter**	0 to 30A
5.	**RPM Meter**	0 to 9999Count
6.	**Motor Speed Control**	PWM Method
7.	**Interconnection**	4mm Banana Patch Cord
8.	**Battery Capacity Di splay**	Yes
9.	**LiFePo4 Battery Pack**	48V, 12Ah
10.	**BMS**	In-built in battery
11.	**Hub Motor controller**	Inside the trainer
Motor Assembly		
12.	**Hub Motor**	12-Inch, 48V/1000W
13.	**Spring Balance**	25Kgx100g
14.	**Mechanical Motor Assembly**	Throttle, Electrical Breaks, Mechanical Breaks.
15.	**Smart Battery Charger**	

PMDC Machine Trainer V503

S. No.	Parameter	Specification
Trainer		
1.	**DC Voltmeter Range**	0-500V DC
2.	**DC Ammeter Range**	0-20A
3.	**RPM Meter**	0-9999Count
4.	**Motor Speed Control**	PWM Method
5.	**Interconnection**	4mm Banana Patch Cord
6.	**PMDC Motor Controller**	DC Drive (Fitted Inside of Trainer)
7.	**DC Drive**	100VDC -240VDC
8.	**Electronics Breaks**	Inside the trainer
Motor Assembly		
9.	**PMDC Motor**	1.5HP
10.	**RPM**	1500 rpm
11.	**Spring Balance**	25Kg X 100g

Semi Dyno System V505



A good quality fully functioning two-wheel electric vehicle with semi section body for easy understanding of wiring harness & electronic assembly come along with two wheeler chassis Semi Dyno System.

Parameter Specification

Type	-Two wheeler Chassis Semi Dyno System
Display	-Yes
Semi Dyno System	-Allow for any two wheeler electric vehicle
RPM & Torque	-Yes

Two Wheeler Electric Vehicle Test Type

(a) Load Test

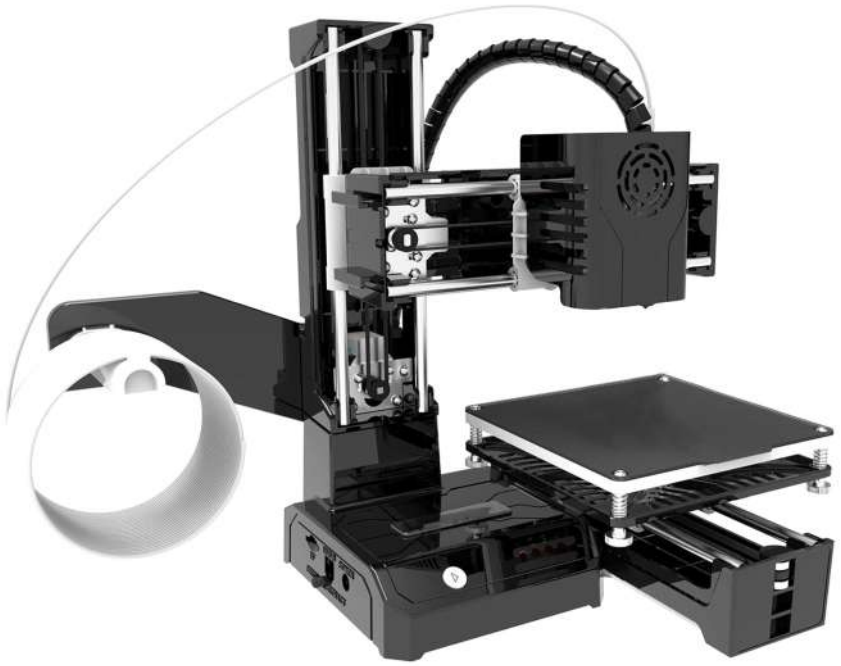
(b) Speed Test

(c) Speed & Torque (N-T) Characteristics

Experiments

1.Study of running, reversing & braking of HUB motor in two wheeler vehicle.
2.Study the types of motors used in EV.
3.Study of speed control of HUB motor using PWM method.
4.Study of Hall Sensor.
5.Study of Motor Driver Controller in EV.
6.Study the N-T (Speed -Torque) characteristic of HUB Motor.
7.Study the different Sensors of EV.
8.Study of working of HUB motor and Hall sensor with real time waveform analysis.
9.Study the N-T (Speed -Torque) characteristic of BLDC Motor.
10.Study of running, reversing of BLDC motor
11.Evaluating BLDC Motor Efficiency and Loss.
12.Study the N-T (Speed -Torque) characteristic of PMDC motor
13.Study of running, reversing of PMDC motor
14.Evaluating PMDC Motor Efficiency and Loss.
15.Measuring Motor and Winding Insulation Resistance and Withstand Voltage by insulation tester.
16.Measuring Winding Resistance
17.Measuring Motor Coil Inductance

2. VASTEK-V1707 Mini FDM Based 3D Printer



Mini FDM (Fused Deposition Modelling) 3D printers **VASTEK-V1707 Mini FDM Based 3D Printer** are compact and versatile machines designed for hobbyists, educators, and small-scale prototyping. They work by extruding melted filament through a nozzle to build up objects layer by layer. Here are some key points to consider if you're looking at a mini FDM printer:

Components: -

1. Frame
2. Print Bed (Build Platform)
3. Hot-end (Extruder Assembly)
4. Extruder
5. Stepper Motors
6. Linear Rails and Guides
7. Heated Bed
8. Power Supply
9. Control Board (Motherboard)
10. Display Screen
11. Cooling Fans
12. End-stops (Limit Switches)
13. Filament Holder (Spool Holder)
14. Wiring and Cabling
15. Frame Assembly
16. Cooling System
17. Auto-Levelling Sensor (Optional)
18. Enclosure (Optional)

Dimensions: -

Device Size	:	L (533 mm) x W (499 mm) x H (605 mm)
Printing Size	:	L (200mm) x W (200 mm) x H (200 mm)

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Technical Specifications: -

3D printer type	:	FDM
Nozzle	:	1Nos., < 260°C Temp.
Materials printed	:	PLA, ABS, Wood Fills, PVA, PP, PA-666, PET G, Carbon Fiber, Metal Fills. (5KG PLA material supplied along with system)
Heated bed	:	Provided
Filament spool	:	1Nos.
Printing Precision	:	0.1-0.2 mm
Printing Thickness	:	0.1-0.4 mm
Build Plate Temperature (Highest)	:	< 100°C Temp.
Camera	:	Build-in 3D Printer
Bed type	:	Removable Heat bed with tempered glass.
Function	:	Automatic filament loading and unloading function
Display	:	Touch Screen

Features: -

1. Turbo fan
2. Removal nozzle
3. Air Chamber Exchange
4. Touch Panel
5. Bed Level Guide
6. Mesh Bed Feature
7. Bowden Extruder
8. Core XY H-Bot
9. Filament Detection Sensor
10. Print Resume Feature
11. Ultra Silent Motors

Accessories: -

1.Build Platform (Print Bed)
2.Resin Vat (for resin-based printers)
3.Hot-end (Extruder Assembly)
4.Extruder
5.Cooling Fans
6.End-stops (Limit Switches)
7.Filament Holder (Spool Holder)
8.Cleaning and Post-Processing Tools
9.Protective Gloves
10.Safety Glasses

3. VASTEK-V1708 FDM Based 3D Printer

VASTEK-V1708 FDM Based 3D Printer are a popular type of 3D printer that create objects by extruding molten thermoplastic material layer by layer. The process involves heating a filament until it becomes liquid, then depositing it through a nozzle onto a build platform. The material solidifies as it cools, forming the final object. FDM printers are valued for their affordability, ease of use, and versatility, making them ideal for prototyping, educational purposes, and customized manufacturing.

Components: -

1. Frame
2. Print Bed (Build Platform)
3. Hot-end (Extruder Assembly)
4. Extruder
5. Stepper Motors
6. Linear Rails and Guides
7. Heated Bed
8. Power Supply
9. Control Board (Motherboard)
10. Display Screen
11. Cooling Fans
12. End-stops (Limit Switches)
13. Filament Holder (Spool Holder)
14. Wiring and Cabling
15. Cooling System
16. Build Plate Alignment Tools
17. Maintenance Tools
18. Filament

Technical Specifications: -

3D printer type	:	FDM
Nozzle	:	1Nos., with < 260°C Temp.
Materials printed	:	PLA / ABS / PETG / TPU (5KG PLA material supplied along with system)
Heated bed	:	Provided
Bed Levelling	:	Auto Bed Levelling
Ultra silent printing	:	40-50 DB Silent Speed
Speed	:	100 to 300 mm per second
Extruder	:	Direct Driver Extruder
Input format	:	STL, OBJ
Bed	:	Heatable & Carborundum glass
Function	:	Smooth and silent printer, touch screen for make it easy.
Connection mode	:	SD card

Dimensions: -

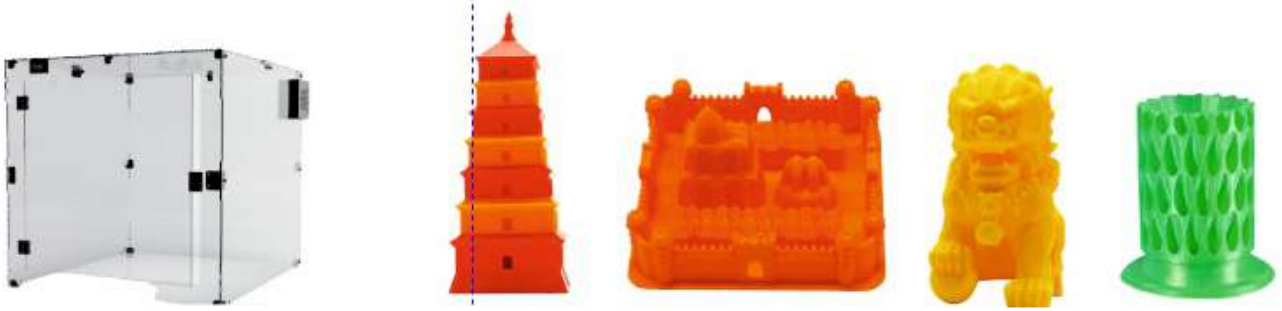
Printing Size : L (400 mm) x W (400 mm) x H (400 mm)

Features: -

1. Affordable
2. Wide Material Compatibility
3. User-Friendly
4. Scalable
5. Layer-by-Layer Printing
6. Heated Bed
7. Modular Design
8. Large Build Volume
9. High Resolution
10. Rapid Prototyping
11. Customization
12. Support for Dual Extrusion (Optional)
13. Open Source and Community Support
14. Automatic Bed Levelling (Optional)
15. Low Maintenance
16. Enclosures (Optional)
17. Fast Print Speeds
18. Interchangeable Nozzles
19. Built-In Safety Features
20. Compatibility with Software
21. Belt tensioner
22. Cartesian Gantry
23. BL Touch
24. Metal Geared Extruder

Accessories: -

1. **Build Platform Accessories: -**
   Build Surface (Print Surface): Includes materials like glass plates, PEI sheets, & magnetic build plates.
   Build Plate Adhesives: Adhesive sprays, glue sticks, & tapes to help filament stick to the print bed.
2. **Filament Accessories:** - Filament Spool Holder, Filament Dry Box, Filament Filter
3. **Nozzles and Extruder Components:** - Replacement Nozzles, Extruder Gear.
4. **Calibration and Maintenance Tools:** - Bed Levelling Tools, Cleaning Brushes, Lubricants.
5. **Post-Processing Tools:** - Spatulas, Needle Files, Sandpaper.
6. **Cooling and Enclosure Accessories:** - Cooling Fans, Enclosures.
7. **Maintenance and Adjustment Tools:** - Wrenches and Screwdrivers, Calibration Tools.
8. **Safety and Handling Accessories:** - Protective Gloves, Safety Glasses.
9. **Software and Calibration Accessories:** - Slicing Software: Programs for preparing 3D models for printing, such as Cura, PrusaSlicer, & Matter Control.
   Calibration Cards: Cards used for bed levelling by adjusting the distance between the nozzle & the build plate.
10. **Power Cable**
11. **USB Cable**
12. **Sample Filament**
13. **User manual**



4. VASTEK-V1720 Triaxle PCB Engraving Machine

A **VASTEK-V1720 Triaxle PCB Engraving Machine** is a specialized type of CNC machine designed for the precise engraving and etching of printed circuit boards (PCBs). Unlike traditional milling machines, which are often used for a wide range of materials and applications, a triaxle PCB engraving machine is tailored specifically to the needs of electronics manufacturing. Here's an overview of its features and functionality:

• Axes Movement:

- X-Axis: - Moves the PCB or engraving tool horizontally from left to right.
- Y-Axis: - Moves the PCB or engraving tool horizontally from front to back.
- Z-Axis: - Moves the engraving tool vertically up and down.

• Components:

- Spindle or Engraving Tool: The rotating part that holds and moves the engraving bit or cutter.
- Work Table: The surface where the PCB is mounted. It typically has clamps or a vacuum system to hold the PCB in place during the engraving process.
- Control System: A computer or integrated system that manages the machine's movements and operations.
- Vacuum System: Some machines have a vacuum system to secure the PCB and remove debris created during the engraving process.

Dimensions:-

Working / Engraving Area	:	L (200 mm) x W (200 mm) x H (40 mm)
Maximum job height	:	<= 40 mm

Technical Specifications: -

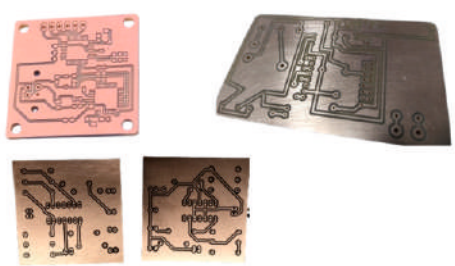
Spindle RPM	:	3000rpm
Z-Axis Stroke	:	40 mm
Transmission unit	:	Lead Screw
Theoretical Resolution Per Step	:	0.002 mm
Material of Machine	:	Aluminium Alloy

Application: -

- Engraving
- Cutting & Drilling for Wood
- PCB
- Plastics etc.
- Able to Engrave Copper & Aluminium.
- **Features: -**
- Three Axis Movement: - X, Y and Z Axis.
- High Precision Spindle: - Spindle: A high-speed rotating component that holds the engraving bit or cutter.
- Work table: - Adjustable Table: Often equipped with adjustable clamps or a vacuum system to securely hold the PCB in place.
- Advanced Control System: - Software Integration: software to convert PCB designs into precise machine instructions.
- High Resolution Positioning: - Stepper Motors: Used for precise control of the X, Y, and Z axes, enabling accurate positioning & movement.
- Depth Control: - Depth Adjustment: Allows for precise control over the depth of engraving, which is crucial for creating the correct trace
- width & spacing.
- Tooling Options: - Interchangeable Tools: Ability to use various types of engraving bits or cutters depending on the required trace width & detail.
- Automatic Tool Change: Some advanced models feature automatic tool changers for different tasks.
- Dust Collection: - Dust Extraction: Integrated dust collection systems or vacuum attachments to remove debris & keep the work area clean.
- User Interface: - Touchscreen Controls: Modern machines often come with intuitive touchscreen interfaces for easy operation & setup.
- Remote Monitoring: Some machines offer remote monitoring and control capabilities via network connections or dedicated software.
- Safety Features: - Safety Shields: Protective shields or enclosures to protect operators from moving parts & debris.
- Emergency Stop: An emergency stop button to quickly halt the machine in case of a problem.
- Material Compatibility: - Versatile Material Handling: Designed to handle various PCB substrates, including FR4, phenolic, & other
- composite materials used in PCB manufacturing.
- Automation Capabilities: - Automatic Positioning: Some models offer automatic positioning systems for faster & more accurate setup.
- Batch Processing: Capable of processing multiple PCBs in a single setup, improving efficiency for small to medium production runs.

Accessories: -

- Power Cable
- USB Cable
- Bit Set (Engraving, Drill & Cutting Bit)
- User manual



Engraving Bit Set

Drill & Cutting Bit Set

User manual

Cable

USB Cable

5. VASTEK-V1803-E Transformer Work Bench

The Transformer Workbench is a specialized workspace designed for students to learn & perform testing & soldering of electronic components. It features an instrument panel & a spacious working table, with all instruments internally connected & mounted on the bench for easy access via the front panel & necessary interfaces. The workbench is equipped with locking caster wheels for easy mobility, allowing it to be moved with convenience. For added safety, an MCB is included to protect the AC supply, ensuring a secure environment for hands-on learning and experimentation.

Features:

- Locking Caster Wheels - Enables easy mobility of the workbench.
- Two-Pole MCB - Provides safety by protecting the AC supply.

Fitted instruments

1. DSO
2. Function Generator
3. DC Power Supply
4. Impulse Winding Tester
5. LCR Meter
6. 4½ Digit Digital Multi-meter

On Bench instruments

1. Soldering & De-Soldering Station
2. Transformer Oil Test Kit
3. Insulation Tester

Specifications of workbench:

- Material - Stainless Steel and MS
- Chassis - 40mm x 40mm x 1.2 mm Stainless Steel pipes for sturdiness.
- Table Top - Plywood (thickness - 18mm), MICA (thickness - 1mm)
- Dimensions in mm - (1275W x 900D x 1625H) approx.

Drawers

- Drawer - 1qty.
- Sub Drawers - 3qty.
- Dimensions in mm - (400W x 450D x 710H) approx.
- Wall Thickness - 1mm
- Handle & Lockers - Separate lock & Handle
- Material - MS

1.DSO 100MHz

A Digital Storage Oscilloscope (DSO) is an electronic instrument that captures, stores, and displays electrical signals in digital format, unlike its analog predecessors which rely on phosphorescent displays. DSOs digitize waveforms using an Analog-to-Digital Converter (ADC), store them in memory, and then reconstruct them for display on a digital screen. This allows for detailed analysis of signals, capturing transient events, and even long-term storage of waveforms.

Technical Specifications:-

- Signal Bandwidth100MHz
- Analog Channels 4
- Display 7" TFT LCD
- Real-Time Sample Rate:2GSa/s (for Single channel), 1GSa/s (for Dual channel), 500MSa/Sec (for all channel)
- Rise Time ≤3.5ns
- Memory Depth 24Mpts (for Single channel), 12Mpt (for Dual channel), 6Mpt (for all channel)
- Vertical range 1mV/div to 10V/div
- Horizontal range 2ns/div to 1000s/div
- Waveform capture rate 500,000wfms/s
- Input impedance - (1MΩ± 2%) || (16 pF± 2 pF)
- Triggering - RS232/UART, I2C, SPI, Edge, Pulse, Window, Slope
- Triggering decode - RS232, I2C, SPI
- Vertical scale 500µV/div-20 V/div
- Low base noise <100µVrms
- Math Functions FFT, AND, OR, NOT, A+B, A-B, AxB & A/B
- Interface USB Host & Device and LAN
- Maximum storage depth up to 56Mpts
- The hardware can be continuous waveform recording 120,000 frame in real time
- Automatic measurement of 36 waveform parameters
- Supports 7 digits hardware frequency meter measurement
- 6 bit hardware counter & built in DVM
- DVM supports AC/DC TRMS measurement
- Waveform calculation function (FFT, add, subtract, multiply, divide, digital filter, logical operation & advanced operation)
- 1M sampling points to enhance FFT function, it supports frequency setting, waterfall curve, demodulation mode & marker measurement
- Interface USB Host & Device & LAN
- Included Accessories: Power cord, USB2.0 printing cable, Passive probe 100MHz * 4(UT-P04)

2.Function Generator

A function generator is an electronic instrument that produces a variety of electrical waveforms, such as sine waves, square waves, and triangular waves. It's a versatile tool used in electronics for testing, designing, and analyzing circuits and systems. Function generators are essential for simulating real-world signals and conditions, allowing engineers to evaluate the performance of electronic devices and circuits.

Features

- 2 channel
- Frequency 25 MHz
- Vertical Resolution 14bits
- Sampling Rate 200MSa/Sec
- Display 4" TFT LCD
- Memory 4kpt
- Built-in 6-digit Frequency Counter 100mHz - 100MHz
- Interface USB Host & Device
- Amplitude in to (50 Ohms) < 10MHz, 10mVpp to 10 Vpp & < 30MHz 10mVpp to 5Vpp
- DC offset range (AC+DC): +5V (50 Ohm); +10V (high Z)
- Impedance 50 Ohm/High Z
- Power 100~240VAC, 50Hz/60Hz

Frequency Range:

- Sine Wave 1µHz – 25 MHz,
- Square Wave 1µHz – 15 MHz,
- Pulse 1µHz – 15 MHz,
- Ramp 1µHz – 400 KHz,
- Arbitrary 1µHz – 10MHz
- Resolution 1µHz

Waveforms

- Sine, Square, Pulse, Ramp, Noise, DC, Arbitrary
- Built in waveforms like Sinc, Exponential, ECG etc.
- Modulation AM, FM, PM, FSK, Sweep
- Sweep modes Logarithmic & linear

3.Digital DC Power Supply (Multi Output)

A DC power supply converts AC power from a standard outlet into a stable DC power source. This regulated direct current is then used to power a device, module or component. DC power supplies come in varying levels of input and output voltage, output current and power rating.

Features

- 3 Channel
  CH1 O/P voltage & Current 0 - 32V, 0 ~ 5A
  CH2 O/P voltage & Current 0 - 32V, 0 ~5A
  CH3 O/P voltage & Current 5V, 3A
- O/P Power 335W
- Resolution - 10mV, 1mA (<mArms)
- Ripple - CV <1mVrms, CC <3mArms
- Load Regulation - CV Mode: ≤0.01%+3mV
  CC Mode ≤0.2%+3mA
- Display - 4 Digit Voltage & Current dual display
- Modes CH1 & CH2 Series/Parallel, Dual Tracking
- Constant Voltage (CV), Constant Current (CC)
- Operating Power 220V AC 50Hz

4.Impulse Winding Tester

- Applied voltage 100 V to 4200 V (Setting resolution 10 V steps)
- Quantification (LC value, RC value) of the response waveform obtained when impulse voltage is applied, pass / fail judgment
- Waveform judgment using AREA value, Flutter, Laplacian etc.
- Equipped with dielectric breakdown voltage test function
- Maximum applied energy approx. 88 mJ
- Testable inductance ranges 10 µH to 100 mH
- Sampling Speed 200MHz/ 100MHz/ 50MHz/ 20MHz/ 10 Mhz
- Sampling Resolution 12 bits
- Number of Samples 1001 to 8001 points (set in 1000 point steps)

Judgment method

- LC/RC value judgment (LCRC AREA)

Waveform Judgment

- Waveform area comparison judgment (AREA)
- Waveform differential area comparison judgment (DIFF-AREA)
- Waveform flutter detection judgment (FLUTTER)
- Waveform second derivative detection judgment (LAPLACIAN)
- Discharge detection: Discharge detection (DISCHARGE)
- Insulation breakdown voltage testing mode: The work piece is subjected to impulse testing while gradually raising the applied voltage to determine the voltage at which the insulation breaks down. Waveform area judgment, discharge judgment, and LC/RC value judgment are used to judge insulation breakdown.
- Voltage detection accuracy (DC accuracy) ± 5% of setting, AC band 100 kHz: ± 1 dB accuracy guarantee conditions: 23°C+5°C, 80% RH or less
- Determination method: LC · RC value judgment, waveform judgment, discharge judgment (when incorporating the St9000)
- Number of test condition tables: 255 (test condition setting, (detection) judgment condition setting, master waveform)
- Test time: Approx. 60ms (reference value when tester is configured for 3000V, 1Pulse detection OFF)
- Display: 8.4" SVGA color TFT LCD (800 × 600 dots), touch panel (4 background colour available)
- Interface Standard EXT.I/O, USB host (memory), USB device (communication), LAN
- Optional RS-232C (Z3001), GP-IB (Z3000)
- Power supply: 100 V to 240 V AC, 50/60 Hz, 80 VA max.
- Safety functionality: Key lock, interlock, double-action design (to prevent erroneous operation when starting testing)

Specification

- Standards compliance: Safety: EN61010, EMC 61326 Class A

Accessories:

- Power cord 1no.
- Instruction Manual 1no.
- Clip Type Lead (L2250) -1no.
- Three Phase Transformer
- Discharge Detection Upgrade (ST9000) -1no.

VASTEK

5.LCR Meter

Features

- Display 2.8" TFT true color LCD
- Test speed- Slow speed 350ms, Medium speed 170ms, Fast 30ms
- The fastest test speed is 33 times/s
- Automatic LCR measurement function
- Highest measurement accuracy 0.1%
- Multiple measuring frequency range 100Hz, 120Hz, 1kHz, 10kHz, (with accuracy 0.02%)
- The main & auxiliary parameters can be matched freely, with total 42 combinations.

Technical Specifications

- AC level - Voltage range: 0.1V,0.3V, IV
  Accuracy ±10% * set value
- Internal resistance of AC source
- Resistance 30ohm / 100ohm
- Main parameters- Cp, Cs, Lp, Ls, Z, R, G, Y
- Secondary parameters: D, Q, X, B, Rp, Rs, θr, θd

Display range

- R, X, |Z| : 0.00001 Ohm - 99.9999 MOhm
- G, B, |Y| : 0.00001 uS - 999.999 S
- L - 0.00001 uH - 9.99999 kH
- C - 0.00001 pF - 999.999 mF
- D - 0.00001 - 9.99999
- Q - 0.00001 - 99999.9
- θd -179.999°-179.999°
- θr - 3.14159 - 3.14159

Vertical resolution

- C: 0.1% (1+ Cx /Cmax+ Cmin/Cx)(1+Dx)(1+ks+kv+kf)ke
- L: 0.1% (1+ Lx/Lmax+ Lmin/Lx)(1+1/Qx)(1+ks+kv+kf)ke
- Z: 0.1% (1+ Zx/ Zmax+ Zmin/Zx)(1+ks+kv+kf)ke
- R: 0.1%(1+ Rx/Rmax+ Rmin/Rx)(1+Qx)(1+ks+kv+kf)ke
- D: 0.0010(1+ Zx/Zmax+ Zmin/Zx)(1+Dx+Dx2)(1+ks+kv+kf)ke
- 0: 0.0015(1+ Zx/ Zmax+ Zmin/ Zx)(Qx+1/Qx)(1+ks+kv+kf)ke
- Test end configuration - Open circuit, short circuit
- Equivalent mode - Series, parallel
- Range mode Hold, auto
- Trigger mode - Internal, manual, external, bus
- Comparator- Para A 4-gear sorting, BIN1-BIN3, NG, Para B 2-gear sorting, AUX, NG, front panel LCD display
- Interface RS232* HANDLER
- Power: 110V/220V 50/60Hz 20W-30W
- Display: 2.8'TFT LCD 240x320

6. 4 ½ Digit Digital Multimeter

A digital multimeter (DMM) is a versatile electronic device used to measure various electrical properties, including voltage, current, and resistance. The device displays the measurements on a digital screen, making it easy to read and understand the results accurately.

Features

- 4 ½ -Digit maximum reading upto 59999
- Display - 4.3" full color display
- Manual selection range
- Data record 20000 groups
- LPF low pass filter function
- Support global mains voltage
- DC, AC current Range upto 20A
- ACV frequency response 100kHz
- Frequency response 100KHz
- Voltage measurement up to -1000VDC & 750V AC
- Frequency measurement range 60Hz— 60MHz
- Resistance range: 600Q — 60MQ
- Capacitance range 6nF~60mF
- Conductivity range 60ns
- Duty cycle measurement range 10%~90%
- Frequency, Resistance, Capacitance measurement, Diode check & Continuity Test
- Interface USB device
- Power supply 220V/ 110V AC

Top Workbench instruments
7.Soldering & De-Soldering Station

A soldering station features adjustable temperature settings and multiple tools for various soldering tasks, thus offering enhanced control and flexibility. It acts as an all-in-one solution, equipping users with everything necessary for soldering projects.

- Input Voltage :180-240VAC, 50Hz
- Fuse : 3.15A
- Soldering : 24VAC,70Watt
- De-soldering : 24VAC,80Watt
- De-sold pump : 24VDC, 80Watt
- Vacuum Pressure : 12000 RPM, 500 to 600mm/hg
- Tip Leakage Current : < 2 mA
- Temperature control Stability +/- 1°C
- Tip to Ground Resistance : < 2 Ohms
- Tip to Ground Leakage Voltage : < 2 mV
- Microprocessor based power control unit with built in vacuum pump.
- Temp Range : 180° to 480°C
- Temperature control accuracy +/- 1°C
- Stand with cleaning sponge & Cellulose tip cleaning sponge
- De-soldering iron & Soldering iron
- Power cord & Tool box - Fiber filters 20 Nos.,
- Solder collector glass tube 1Nos.,
- Tip replace Spanner 1Nos.,
- Cleaning Accessories

8.Transformer Oil Test Kit

- Type- Motor operated to uniformly increase the output voltage between 0 to 0 to 50KV ‘or’ 60KV ‘or’ 70KV ‘or’ 75KV ‘or’ 80KV ‘or’ 90KV ‘or’ 100KV ‘or’ 120KV with the help of continuously variable Auto Transformer at 2KV/Sec. approx.
- Duty - Intermittent duty cycle
- Input - 230/240V AC 50Hz single phase AC supply.
- Output - 0-50KV ‘or’ 60KV ‘or’ 70KV ‘or’ 75KV ‘or’ 80KV ‘or’ 90KV ‘or’ 100KV ‘or’ 120KV ‘or’ with centre tap earthed infinitely variable.
- Capacity - 500VA ‘or’ 600VA ‘or’ 700VA ‘or’ 750VA ‘or’ 800VA ‘or’ 900VA ‘or’ 1000VA ‘or’ 1200VA intermittent depending on the output voltage.
- Nature of cooling - The transformer is cast resin type air cooled.

9.Insulation Tester

- Testing voltage (DC)/ Effective maximum indicated value
  - 50 V /100 MΩ
  - 125 V /250 MΩ
  - 250 V /500 MΩ
  - 500 V /2000 MΩ
  - 1000 V /4000 MΩ
- Accuracy/1st effective measuring range MΩ
  - ±2 % rdg. ±2 dgt. /0.200 - 10.00
  - ±2 % rdg. ±2 dgt. /0.200 - 25.0
  - ±2 % rdg. ±2 dgt. /0.200 - 50.0
  - ±2 % rdg. ±2 dgt. /0.200 - 500
  - ±2 % rdg. ±2 dgt. /0.200 – 1000

- Overload protection 600 V AC (10s), 660 V AC (10s)
- Lower limit resistance: 0.05 MΩ, 0.125 MΩ, 0.25 MΩ, 0.5 MΩ, 1 MΩ
- AC voltage range:420 V (0.1 V resolution) / 600 V (1 V resolution), 2 ranges, 50/60 Hz, Accuracy: ±2.3% rdg. ±8 dgt., Input resistance: 100 kΩ or higher, Average rectifier
- DC voltage range:4.2 V (0.001 V resolution) to 600 V (1 V resolution), 4 ranges, Accuracy: ±1.3 % rdg. ±4 dgt., Input resistance: 100 kΩ or higher
- Low resistance range- For checking the continuity of ground wiring, 10 Ω (0.01 Ω resolution) to 1000 Ω (1 Ω resolution), 3 ranges, Basic accuracy: ±3 % rdg. ±2 dgt.

Testing current: 200 mA or more (at 6 Ω or less)

- Display Semi-trans missive FSTN LCD with back lighting, bar-graph indicator
- Response time- Approx. 0.8 second for PASS/FAIL decision (based on in-house testing)
- Power supply: LR6 (AA) alkaline batteries 4no., Continuous use: 20 hours (Comparator off, backlight off, 500 V range, no load)
- Number of measurements: 1000 times (at 5s ON, 25s OFF cycle, insulation measurement of lower limit resistance value to maintain nominal O/P voltage)
- Other function- Live circuit indicator, Automatic electric discharge, Automatic DC/AC detection, Comparator, Drop proof, Auto power save

6. VT-08 Single Phase Transformer Trainer

A Single-Phase Transformer Trainer is an educational device used to demonstrate and teach the principles of single-phase transformers. It allows users to explore how transformers step up or step down voltage, observe their behavior under different loads, and measure key electrical parameters like voltage, current, and power. Commonly used in technical schools and training centers, it provides hands-on experience with transformers, helping learners understand their operation and applications in real-world electrical systems.

Features

- Inbuilt Single Phase Variac
- Equipped with Supply Indication Lamp
- Facility to use Fixed and Variable Load
- Terminals provided to use the optional externally
- Flexibility to configure Step-up, Step-down and Isolation Transformer

Practical

- Polarity Test of Transformer.
- Transformation ratio and Turns Ratio.
- Open Circuit Test of Transformer.
- Short Circuit Test of Transformer.
- Measurement of Efficiency and Regulation by Load Test of Transformer.

Product Specifications

Single Phase Transformer (1kVA)

- Voltage - 0-230V (Primary)
- Voltage- 0-115V (Secondary)

Single Phase Auto Transformer

- Voltage -230V (Primary)
- Voltage- 0-270V (Secondary)
- Rated Current-15A

Meters

- 2nos AC Voltmeter- 300V
- 1nos AC Ammeter -5A & 10A
- 1500W Wattmeter

Lamp Load 1Phase/3Phase

6A MCB (SPN)

Supply- Single Phase, 230V AC ±10%, 50Hz

Accessories


Mains Cord


Patch Cord

Operating Manual

7. VT-12 Three Phase Transformer Trainer

The Three Phase Transformer Trainer is a versatile training system for electrical laboratories, designed to help students understand the basic concepts and operation of three-phase transformers. It allows for the study of various transformer configurations, including Star-Star, Star-Delta, Delta-Star, and Delta-Delta. The trainer also enables measurement of different losses, and helps determine efficiency and voltage regulation under various load conditions, providing a comprehensive learning experience.

Product Features

- Provided Three Phase Multifunction meter for primary secondary measurement
- Standalone operation
- Flexibility to use in star and delta configuration
- Equipped with Supply Indication Lamps
- Facility to display entire parameter
- Designed by Considering All the Safety Standards

Accessories

Mains Cord

Patch Cord

Operating Manual

Technical Specifications

- Mains Supply: 415V ±10%, 50Hz
- 6A MCB (TPN)
- Lamp Load 3nos.

Three Phase Transformer Specifications

- Power Rating: 3kVA
- Voltage: 415V (Primary)
- Voltage: 230V (Secondary)
- Digital Meter: Multifunction Meter
- Measuring Parameter: Line Voltage Phase Voltage, Line Current Phase Current, Power
- W=630, D=350, H =480 (approx.) (Dimension (in mm)
- Optional : Three Phase Variac 4A/12A
- Three Phase Resistor Load 4A (per phase)

Practical

- Three Phase Transformer Connection (Star & Delta)
- Open Circuit Test in a Three Phase Transformer
- Short Circuit Test in a Three Phase Transformer
- Load Test & correspondingly determine the Efficiency and Voltage Regulation in a Three Phase Transformer

8. VT-16 Sumpner's Test of Transformer

The Sumpner's Test of Transformer is an educational tool designed for electrical engineering students. It allows them to perform heat run tests using two single-phase transformers, helping them determine efficiency, voltage regulation, and understand polarity phenomena. The trainer provides hands- on experience, enhancing the understanding of basic transformer testing concepts.

Product Features

- Built in Temperature meter
- Two Identical Single Phase Transformer
- Inbuilt Single Phase Variac
- Equipped with supply indication lamps
- Designed by considering all the safety standards
- Flexibility to configure Step - up to Step - down and isolation transformer

Product Specifications

- Mains Supply: Single Phase, 230V±10%, 50Hz

2 nos Single Phase Transformers (1kVA)

- Voltage: 0-230V (Primary)
- Voltage: 0-115V (Secondary)

Single Phase Auto Transformer 2nos.

- Voltage: 230V (Primary)
- Voltage: 0-270V (Secondary)
- 15A Rated Current
- 16AMCB (SPN)

Meters

- 2nos AC Voltmeter- 300V
- 1nos AC Ammeter- 5A & 10A
- 2nos Wattmeter- 230V, 5A & 115V, 10A

Practical

- The Polarity Test of Two Single Phase Transformers
- Sumpner's Test by:
  a) Open Circuit Test of Transformer b) Short Circuit Test of Transformer
- Calculation of Efficiency and regulation of Two Single Phase Transformers

Accessories

Mains Cord

Patch Cord

Operating Manual

VASTEK

9.VT-21 AC Power Supply

AC Power Supply is a highly versatile and reliable instrument, thoughtfully designed to cater to the diverse requirements of electrical and electronic engineering laboratories. This power supply serves as an essential tool for performing a wide range of experiments on AC circuits, making it ideal for both academic and industrial training environments.

The unit offers a variable AC output ranging from 0 to 220V, allowing users to precisely adjust the voltage level according to the needs of the experiment or application. This adjustable output enables students and engineers to study the behavior of different electrical components and circuits under varying voltage conditions, enhancing their practical understanding of theoretical concepts.

In addition to the variable output, the AC power supply is equipped with fixed step-down AC voltage outputs of 6V-0-6V and 12V-0-12V. These center-tapped outputs are especially useful for experiments requiring symmetrical voltage sources, such as those involving transformers, rectifiers, or other AC-powered electronic circuits.

Features

- Works independently, no external equipment needed
- Smooth variable AC output via single-phase auto transformer
- Accurate digital voltmeter and ammeter
- Strong and durable design
- Built-in over-current and short-circuit protection
- Power indicator lamps for easy status check

Technical Specifications

Input Mains	: 230V AC ±10%, 50Hz
AC Variable O/P	
Voltage	: 0 to 220V ±10%
Current	: 2A
AC Step Down Output	
Voltage	: 6V - 0 - 6V ±10%,
	:12V - 0 - 12V ± 10%
Current	: 2A

Digital Meters

AC Voltmeter (for AC variable output) : 300V
AC Ammeter : 10A
Single Phase Switches : 2 nos. (2Amp)

Learning's

- Understanding how to generate and control variable AC voltage
- Learning the function and application of single-phase auto transformers
- Gaining hands-on experience in measuring AC voltage and current using digital instruments
- Exploring the use of center-tapped step-down transformers (6V-0-6V & 12V-0-12V) in AC circuits
- Learning about protection schemes like over-current and short-circuit protection in power systems

10. VT-28 Scott Connection Trainer

The Scott Connection Trainer is an essential electrical laboratory kit designed to provide hands-on experience for students studying the fundamentals of Scott Connection. It offers all the necessary inputs and connections to explore key concepts such as the role of the Mains Transformer, Teaser Transformer, Three-Phase to Two-Phase Conversion, and waveform observation. This unique, standalone device enables student to thoroughly understand and experiment with the basic principles and functioning of Scott Connection.

Features:

- Digital Panel Meters
- On board Safety Terminal for Connections
- Equipped with supply indication lamps
- Provided with bulb holder to use load externally
- Designed by considering all the safety standards
- Diagrammatic representation for the ease of connections
- Main & Teaser Transformer are shown separately Two Phase Step down Outputs for Waveform Observation

Accessories


Mains Cord


Patch Cord

Operating Manual

Technical Specifications

Main Transformer (Center tapped)

- Primary Winding : 200-0-200Volt ±10%, 50Hz
- Secondary Winding : 0-230Volt ±10%, 50Hz

Teaser Transformer

- Primary Winding : 0-115.6Volt (28.9%) ±10%, 50Hz, 346.4Volt (86.6%) ±10%,50Hz 400Volt ±10%, 50Hz
- Secondary Winding :. 0-230Volt ±10%, 50Hz

Step down Transformers (2 No.)

- Primary Winding : 0-230 Volt ±10%, 50Hz
- Secondary Winding : 0-18 Volt ±10%, 50Hz

Digital Meters

- AC Voltmeter : 500 Volt (2 nos.)
- AC Ammeter : 5A (2 nos.)
- Input Line Voltage : Three Phase, 415 Volt AC, ± 10%, 50Hz

Learning's

- Study the Basic of Mains Transformer
- Study the Basic of Teaser Transformer
- Study the Three Phase to Two Phase Conversion by Scott Connection.

11. VT-28A DC Series Machine

The DC Series Machine is an essential & thoughtfully designed educational product tailored for electrical engineering laboratories. DC machines form a crucial part of the electrical engineering curriculum, & this training panel enables students to gain hands-on experience & practical understanding of their operating principles.

This system offers comprehensive learning resources to help students explore & master the fundamental concepts of DC series machines. It supports practical experiments such as studying the operating characteristics and speed control methods of DC series motors. Through these experiments, students can understand various techniques to regulate motor speed effectively.

Features

- Equipped with a mechanical loading system for practical testing
- Comes with a digital tachometer for precise speed measurement
- Control panel built from high-quality FRP for maximum user safety
- Motor designed with Class "B" insulation for reliable operation
- Mounted on a sturdy heavy-duty base or channel frame
- Brake drum or pulley includes heat dissipation features to prevent overheating
- Engineered to meet all essential safety norms and standards
- Clear circuit diagrams provided to simplify wiring and connections
- Compact and space-saving design with a unique appearance
- Access to online tutorials for guided learning and operation

Learning's:

- Understanding the construction and working principles of a DC series motor
- Observation of torque vs. speed characteristics under different load conditions
- Hands-on practice in measuring speed, voltage, current, and power accurately
- Studying the effect of mechanical loading on motor performance
- Learning how to safely connect and operate DC motors in laboratory setups
- Familiarity with the role of field winding and armature winding in controlling speed and torque
- Gaining experience with brake drum/pulley loading systems to simulate real-world mechanical loads
- Interpreting and analyzing performance curves and characteristic graphs
- Exploring practical applications of DC series motors in industry (e.g., traction, cranes, hoists)
- Understanding the importance of insulation classes, safety measures, and heat management in motor design

Technical Specifications

DC Machine		
Type	:	Series
Rating	:	1HP
Voltage rating	:	220V ± 10%
(Please refer specification on machine)		
Speed	:	1500 RPM ± 5%
Insulation	:	Class 'B'
Loading Arrangement	:	Mechanical
Brake Drum/Pulley	:	Aluminum Casted
Digital Meters used		
DC Voltmeter	:	300V
DC Ammeter	:	5A (2 Nos.)
Digital Tachometer	:	20,000 RPM

12. VT-31 Parallel operation of Two Single Phase Transformer

The Parallel Operation of Two Single Phase Transformer Trainer is specifically designed to demonstrate and teach the fundamental concepts involved in connecting two or more single-phase transformers in parallel. This training system allows students to practically load the transformers beyond their individual ratings, enabling them to analyze and observe how parallel operation helps share the load efficiently and ensures continuity of supply in case of transformer failure.

Through this trainer, students can gain a deeper understanding of critical aspects such as transformer polarity, load sharing, and conditions necessary for successful parallel operation. It also helps them explore the impact of different voltage ratios and impedance on load division between transformers.

By combining theoretical study with practical experimentation, the trainer makes learning more interactive and engaging, building students' confidence to apply these concepts in real-world electrical systems. This hands-on approach not only clarifies the working of single-phase transformers but also highlights their importance in reliable power distribution networks.

Features

- Two identical single-phase transformers
- Fixed and variable load options
- Supply indication lamp
- Built with safety standards in mind
- Diagrammatic representation for easy connections
- On-board digital meter for accurate measurement of voltage, current, & power
- Terminals provided for quick and secure wiring during experiments
- Flexible configuration to demonstrate load sharing in parallel operation
- Compact and sturdy panel design suitable for repeated laboratory use
- Clear labelling of inputs and outputs to reduce wiring errors
- High-quality insulated terminals ensuring user safety
- Supports practical testing of transformer polarity & phase relationship

Learning's

- Study of polarity test under two single phase transformers.
- Study of parallel operation of two single phase transformers with equal voltage ratio.
- Study of parallel operation of two single phase transformers with unequal voltage ratio.
- Understand the conditions required for successful parallel operation.
- Analyze load sharing between transformers based on impedance and voltage ratio
- Measure and compare the current contribution of each transformer under load
- Observe the effects of unequal voltage ratios on load division and system performance
- Gain hands-on experience in safely wiring and testing transformers in parallel
- Develop troubleshooting skills by identifying incorrect connections and imbalances
- Interpret readings from digital meters to evaluate transformer performance

Technical Specifications

- Mains supply Single Phase, 230V±10%, 50Hz
- Single Phase Transformer (2 nos.)
- Rating 1kVA
- Primary Voltage 0-230V
- Secondary Voltage 0-200-230V
- Digital Meters Used
  - AC Voltmeter 450V (2 nos.)
  - AC Ammeter 10A (2 nos.)
- MCB (SP) 16A
- Lamp Load 4A/12A

Accessories

Mains Cord

Patch Cord

Operating Manual

13. VT-51 Transformer Coil Winding Machine

The Transformer Coil Winding Machine with a Heavy Duty Working Bench is a robust tool used to create transformer coils by winding copper or aluminum wire around a core. It ensures high accuracy and efficiency in coil production. The heavy-duty bench provides solid support, maintaining machine stability during operation. Designed for large-scale industrial production, it can handle heavy workloads while delivering reliable and consistent performance.

Features

- Layer stop- Programmable
- Maintain Speed low/high
- Production Check
- RPM Display
- Traverse Setting

Technical Specifications

Display	:	16 x 2 Line LCD
Wire Diameter (Single Wire)	:	0.02mm - 0.60mm
Winding Width	:	90mm
Bobin Swing Dia	:	99mm
Power rating	:	300Watt
Main supply	:	230Volt/50Hz
Wire Cut Sensor	:	Self Detecting
Winding Speed (max.)	:	7000RPM
Memory	:	499 Programs
Acceleration	:	Variable
Deceleration	:	Variable
Total Taps	:	8 Taps
Turn Accuracy	:	+/-1.0 turn
Wire Cut Detector	:	Yes
Disc Brake	:	Electromagnetic

- **Included Accessories**
- Tool Kit
- Spool Container
- Power Cord
- Wire Cut Sensor
- De-Reeler cum Tensioner
- Core of Transformer (3 different num) in KG -6
- Bobin of Transformer (3 different value)-60
- Insulation paper (in KG) -2
- Seperator (PVC) in KG-2
- Slue Packet (1mm,2mm,3mm)-3
- Terminal Clamp of Winding (3 Value)-30
- Lugs Packet (200Nos.)-1
- Copper Wire in Different Gauge (in KG)- 3
- Flexible Cable 90Meter Roll - 6
- Varnish in Liter - 3

14.VT-57 3 Single Phase to 3 Phase Transformer Trainer

The Three Single Phase to Three Phase Transformer Trainer is an important educational tool for electrical engineering students. It helps students understand key concepts related to the conversion from three single-phase transformers to a three-phase system. The trainer enables the conduction of heat run tests, determination of efficiency, voltage regulation, and the study of polarity phenomena. It provides hands-on experience, helping students fully grasp the functioning and testing of transformers.

Features

- Two identical single-phase transformers
- Fixed and variable load options
- Supply indication lamp
- Safety standard compliance
- Easy connection diagram

Technical Specifications

- Single Phase Transformers (3 nos.)
- Rating 1kVA
- Digital Voltmeter and Ammeter (2nos each)
- Lamp Load 2 nos.
- MCB Switch
- 3 Phase Power supply

Accessories

3 phase auto transformer | Mains Cord | Patch Cord | Operating Manual

Learning's

- Perform Various Connections on 3 Phase Transformer

Work Bench

Features:

- High-Quality Benchtop: Choose between durable plywood or granite for a smooth, stable work surface.
- Heavy-Duty Structure: Designed with a robust MS pipe frame for enhanced stability and minimal vibrations.
- Comfortable Stool: Includes a suitable stool for comfort & support during long work sessions.

Specifications

- Material - Mild Steel
- Length = 1200mm, Depth = 700 mm, Height = 800 mm (Dimensions in mm) [approx.]
- Table Top - Plywood/Granite

15.VT-78 Universal Motor training system

The Universal Motor Training System is a valuable and engaging educational tool specially designed for use in electrical engineering laboratories. It offers comprehensive learning resources that help students thoroughly grasp the fundamental principles and working of universal motors.

This training system enables learners to explore how universal motors operate on both AC and DC supplies, understand their construction, and analyze their performance under various conditions. By combining theoretical concepts with practical experiments, it creates an interactive and hands-on learning experience.

Universal motors themselves are known for their ability to run at very high speeds while delivering relatively low torque, making them suitable for a range of everyday applications. Common examples include portable electric drills, grinders, blowers, hair dryers, and various kitchen appliances, where compact size and high-speed operation are essential.

Through this training system, students not only study the basic operating characteristics and internal structure of universal motors but also gain insights into their real-world uses, speed control methods, and safety considerations. This helps bridge the gap between classroom theory and practical, application-oriented knowledge, making it an indispensable part of electrical and electronics education.

Features

- Operates independently without the need for additional equipment
- Control panel made from premium FRP for maximum user safety
- Uses BS-standard terminals and patch cords to ensure secure and safe connections
- Fitted with high-precision, reliable measuring instruments
- Equipped with a motor featuring Class 'F' insulation for better thermal endurance
- Includes a standard mechanical loading system for practical experimentation
- External terminals provided to connect optional accessories if needed
- Engineered to meet comprehensive safety standards for laboratory use
- Clear circuit diagrams displayed to simplify wiring and understanding
- Supplied with detailed and high-quality instructional material for guided learning

Product Specifications

Mains Supply	:	Single Phase, 230V ±10%, 50Hz
Single Phase Machine		
Type	:	Universal Motor
Rating	:	1HP
Voltage rating	:	230VDC & AC ± 10%
Rated speed	:	1500RPM ± 10%
Insulation	:	Class 'F'
Loading arrangement	:	Mechanical
Brake drum/pulley	:	Aluminum Casted
Digital tachometer	:	20,000 rpm

Digital meters used

DC Voltmeter	:	300V
DC Ammeter	:	10A
AC Voltmeter	:	500V
AC Ammeter	:	10A
MCB	:	10A

Practical

- Study of Universal Motor operation under DC supply and analysis of its performance characteristics
- Study of Universal Motor operation under AC supply and observation of its performance characteristics
- Comparison of speed–torque behavior in AC vs. DC configurations
- Understanding the construction and internal parts of a universal motor
- Exploration of applications where high speed and low torque are required
- Practical training in connecting and measuring motor parameters like voltage, current, and speed
- Learning about the effects of load variation on motor speed and performance
- Developing safe handling practices and correct wiring techniques for universal motors
- Gaining insight into why universal motors can run on both AC and DC supplies

16. VT-79 Ward Leonard System Trainer

The Ward Leonard Method of DC Machine is a specialized and advanced training system designed for use in electrical engineering laboratories. This trainer helps learners develop a thorough understanding of the fundamental concepts and practical operation of DC machines.

With this system, users can study and demonstrate the Ward Leonard method, which allows for smooth and precise speed control of a DC motor in both forward and reverse directions — all without requiring a dedicated DC power supply.

To facilitate hands-on experimentation, the trainer features separate terminals for the armature and field windings, clearly brought out on a terminal box mounted on the motor. This design makes it easy to make individual connections to the control panel, allowing users to explore different configurations and control techniques.

Overall, this training system offers an effective and interactive way to gain in-depth knowledge of DC motor speed control and the classic Ward Leonard method, making it an invaluable asset for teaching and learning in electrical labs.

Features

- Compact and specially designed unit for efficient use of space
- Includes an electrical loading system for practical experiments
- Flexible coupling arrangement for smooth mechanical connection
- Comes with a digital tachometer for accurate speed measurement
- Motor built with Class “B” insulation for reliable thermal protection
- Mounted on a sturdy, heavy-duty base or channel for stability
- Fitted with power indicator lamps to show supply status clearly
- External terminals available to connect optional devices if needed
- Designed to meet all relevant safety standards for user protection
- Features clear circuit diagrams to simplify wiring and experimentation
- Access to an online tutorial for guided learning and support

Practical

- Observe the relationship between voltage, speed, and torque
- Learn about reversing the direction of the motor using field or armature reversal
- Measure efficiency, line current, and power factor
- Analyze dynamic response and stability

Technical Specifications

Mains Supply	:	Three Phase, 415V, ±10%, 50Hz
Machines Specification (2 Nos.)		
Both the Machines are flexibly coupled and mounted on a M.S. channel base acts as a Motor Generator set		
Three Phase Induction Motor acts as a Prime Mover		
Type	:	Squirrel Cage
Rating	:	1 HP (also available with 2HP and 3HP)
Voltage Rating	:	415V
RPM	:	1440 (No Load)
Insulation	:	Class 'B'
DC Machine		
Type	:	Shunt
Rating	:	1HP
Voltage Rating	:	200V
RPM	:	1500 (No Load)
Insulation	:	Class 'B' Extra DC Machine for which the speed can be Controlled using Motor

Generator set.

Type	:	Shunt
Rating	:	1/2 HP
Voltage Rating	:	200V
RPM	:	1500 (No Load)
Insulation	:	Class 'B'

Meters used

Voltmeter (MC)	:	1 No.
Ammeter (MC)	:	2 Nos.
Dimensions	:	W 600 x D 450 x H 600 (Control Panel) W 600 x D 450 x H 600 (MG set) W 600 x D 450 x H 600 (Motor)

Weight

Panel	:	18kg (approximate)
MG Set	:	40kg (approximate)
Motor	:	23kg (approximate)

17. 4½ Digital Multimeter

Technical Specifications

Basic Function	Range	Accuracy
DC Voltage	200mV/2V/20V/200V/1000V	±(0.1%+5)
AC Voltage	200mV/2V/20V/200V/750V	±(0.8%+25)
DC Current	200uA/2mA/200mA/20A	±(0.5%+4)
AC Current	200mA/20A	±(1.5%+25)
Resistance	200Ω/2kΩ/20kΩ/200kΩ/2MΩ /200MΩ	±(0.4%+5)
Conductance	(0.1~100)nS	±(1.0%+30)
Capacitance	2nF/2uF/200uF	±(4.5%+50)
Frequency	20kHz/200kHz	±(1.5%+25)

Special Functions	
Diode	Yes
Transistor test	Yes
Continuity buzzer	Yes
Low battery indication	Yes
Data Hold	Yes
Auto power off	Yes
Backlight	Yes
Function protection	Yes
Shockproof protection	Yes
True RMS	Yes
Input impedance	10MΩ
Sampling rate	2 times/s
AC Frequency response	40~400Hz
Operation way	Manual range
Max. Display	19999
LCD size	70×50mm
Battery	9V (6F22)

18. Advanced Fiber Optic Communication Trainer

An Advanced Fiber Optic Communication Trainer is an educational and experimental tool designed to help students and professionals learn about fiber optic communication systems. These systems are widely used in telecommunications, internet connections, and other high-speed data transmission applications due to their high bandwidth and low signal degradation over long distances.

Features & Technical Specifications

***Component Visibility & Design:**

1. All components must be clearly visible on the PCB (Printed Circuit Board).
2. A circuit diagram should be provided in the manual to assist in identifying and tracing components on the PCB.
3. Functional blocks for connections should be isolated in separate areas of the PCB to prevent any damage to the electronic components.

***Manual & Documentation:**

1. An interactive e-manual will be included on a CD, featuring detailed theory, circuit diagrams, & animations to support learning and troubleshooting.

***Transmitter Specifications:**

a. The transmitter will contain two Siemens fiber optics LEDs:
   1. Red visible LED (SFH756V): Emission wavelength range from 600nm to 660nm.
   2. Infrared LED (SFH450V): Emission wavelength range from 900nm to 950nm.

b. LED Housing: Both LEDs and detectors are housed to ensure correct alignment of the plastic fiber with the components.

***Receiver Specifications:**

- The receiver will feature two photodetectors:
- PIN Photodiode (SFH250V) with a responsivity of 0.3 µA.
- Photo Detector with TTL Logic Output (SFH551V).
- Photo Transistor (SFH350V) with a responsivity of 80µA/µW.

***Pulse Code Modulation (PCM):**

- PCM will be implemented using a CODEC chip for digital communication.
- Manchester Encoding/Decoding will be utilized for data transmission.

***Digital Communication and Encoding:**

- Motorola MC145502 CODEC chip will be used for PCM with Manchester encoding and decoding techniques.

***Noise and Signal Generators:**

- White Noise Generator: Output amplitude ranging from 0 to 5Vpp.
- PRBS Generator: 16-bit, with switch-selectable clock options of 32 kHz, 64 kHz, or 128 kHz.

***Error Rate & Measurement:**

- A 10-bit counter with LED indication will be used to measure bit error rates, with a count of up to 255.

***Multiplexing and Data Channels:**

- Time Division Multiplexing (TDM) supports 16 channels with a data rate of 64 Kbits/sec.
- User-selectable markers Two 8-bit markers are available in alternate frames.

*The system supports a 1.024 Mbit/sec data rate & two channels for voice PCM using telephone handsets (A Law)

*** Fiber Optics:**

- Plastic Optical Cable (Step index, multimode) is used.
- Available fiber lengths 1 meter and 3 meters.

*** Testing & Fault Simulation:**

- Switch Faults: 6-8 switch faults are included on the board for studying their impact on the circuit.
- Test Points: 40-45 test points are provided to observe intermediate signals in the circuit.

*** Interconnection and Power Supply:**

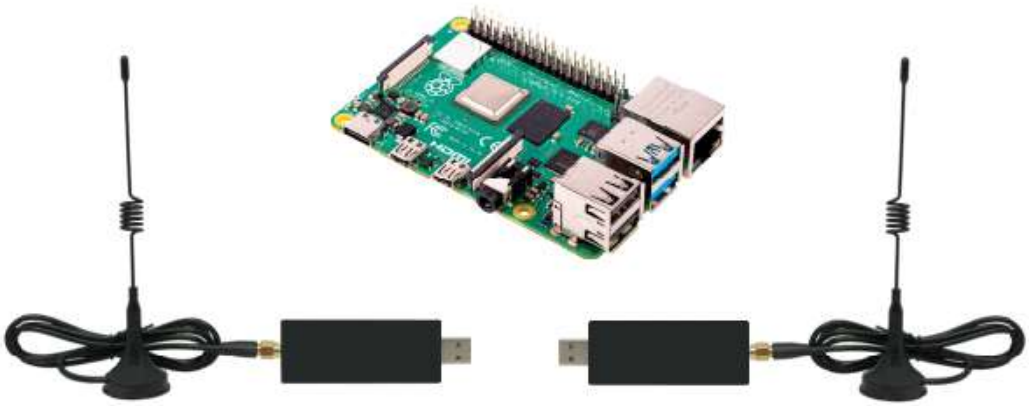
- 2mm banana sockets are included for interconnections.
- Power supply options: GND, +5V, +12V, and -12V.

Experiments

1. PCM Voice Coding & Frequency Response:
   - Study of PCM voice coding using the CODEC chip and analyzing its frequency response.
2. LEDs and Photo Detectors:
   - Investigating the characteristics of LEDs and photo detectors used in fiber optic communication.
3. Time Division Multiplexing (TDM):
   - Study of TDM with 16 data channels and its application in multiplexing.
4. Framing in TDM:
   - Exploration of framing techniques in synchronous time division multiplexing.
5. Manchester Coding & Decoding:
   - Understanding the process of Manchester coding and decoding for digital transmission.
6. Optical Fiber Loss Measurements:
   - Measurement of propagation and bending losses in optical fibers.
7. Numerical Aperture Measurement:
   - Measurement of the numerical aperture of optical glass fibers in various types.
8. PC-to-PC Communication via Fiber Optics:
   - Experimenting with fiber optic communication between two Pcs.

19. Flexible SDR Trainer

The Flexible SDR Trainer enables hands-on learning of software-defined radio (SDR) concepts, focusing on modern wireless technologies like 5G. It supports real-time signal generation, modulation, demodulation, and spectrum analysis,allowing students to explore key aspects of communication systems such as OFDM, MIMO, and 5G NR. The kit is compatible with GNU Radio, offering flexibility in configuring and testing various radio protocols. It is an essential tool for understanding SDR-based signal processing, network design, and wireless communication principles.



Features:

- Software-Defined Radio (SDR) Platform
- Wide Frequency Range
- Modulation and Demodulation

Experimentation:

- Signal Processing and Analysis
- Real-Time Signal Visualization
- Hands-On Practical Learning

Technical specs:

- Operating Frequency Range: 70 MHz to 6 GHz
- Transceiver Type: Half-duplex, allowing either transmission or reception at any given time.
- Sampling Rate: Capable of up to 20 million samples per second for high-speed processing.
- Signal Representation: 8-bit quadrature samples (both in-phase and quadrature components, 8-bit I and Q).
- GNU Radio Compatibility: Works seamlessly with the GNU Radio software framework for signal processing.
- Adjustable Settings: Software-based control for receiver (RX) and transmitter (TX) gain, along with baseband filter adjustments.
- Antenna Connection: Equipped with SMA female antenna connectors for easy integration.
- Synchronization: Includes SMA female clock input/output for synchronization with other devices.
- Power Supply: Powered via USB, ensuring convenience and portability.

Advantages of this trainer:

- Practical Communication Skills: Enhances hands-on experience with real-world wireless systems, fostering technical competence.
- Signal Processing Expertise: Develops in-depth knowledge in signal modulation, analysis, and RF communication techniques.
- Troubleshooting Proficiency: Builds strong problem-solving abilities through real-time network diagnostics and fault analysis.
- Custom System Design: Provides experience in designing, modifying, and testing communication systems, enhancing creativity and technical skills.

Experiments:

- Fundamental Spectrum Scanning: Scanning the frequency spectrum to observe signal distribution and identify active channels.
- 5G NR Carrier Detection: Detecting and analyzing 5G NR (New Radio) carrier signals.
- OFDM Signal Generation and Evaluation: Creation and analysis of Orthogonal Frequency Division Multiplexing (OFDM) signals, commonly used in 5G systems.
- Modulation and Demodulation Techniques (QPSK/16-QAM) in a 5G Context: Hands-on experiments with QPSK (Quadrature Phase Shift Keying) and 16-QAM (Quadrature Amplitude Modulation) as used in 5G systems.
- Channel Sounding and Power Measurement: Measuring and analyzing the behavior of wireless channels in terms of signal strength and propagation.
- 5G NR Synchronization and PBCH Detection: Understanding 5G NR synchronization and detecting the Physical Broadcast Channel (PBCH) for network access.
- Basic MIMO Concepts with SDR: Exploring Multiple Input Multiple Output (MIMO) principles to enhance communication system capacity.
- 5G Protocol Stack Exploration: Investigating the layers of the 5G protocol stack and how data flows through a 5G network.
- Packet Capture and Decoding: Capturing and analyzing 5G packets for insight into network behavior and protocol design.
- 5G Interference Analysis: Studying the effects of interference in 5G communication systems and methods to mitigate it.

20. 5G Mobile Phone Trainer

The 5G Mobile Phone Trainer is an educational tool designed to help users understand the inner workings of a mobile phone, with a specific focus on 5G technology. It allows users to explore the components that make up a mobile phone, how these components work together, and the principles behind their operation. The trainer also includes a fault simulation feature that enhances troubleshooting and diagnostic skills, providing hands-on experience with real-time 5G smart mobile phones. Users can observe test points and learn how faults affect mobile phone functions.

Features:

- Real-Time 5G Smart Mobile: Provides a functional 5G mobile phone for practical study and experimentation.
- Network Compatibility: Supports 5G, 4G, 3G, and 2G network types for comprehensive study of mobile communication systems.
- 5G Dual SIM Study: Allows in-depth study of the operation and troubleshooting of a 5G Dual SIM smartphone, including fault creation and signal observation.
- Block Diagram and Test Points: Includes a detailed block diagram of a 5G smartphone on the board, with test points and the ability to simulate faults.
- Sectional Breakdown: Components and sections of the phone are clearly identified and explored for easy learning and understanding.
- Fault Creation and Troubleshooting: Switchable faults in various sections of the phone enable users to learn how to identify and resolve issues.
- Measurement and Observation: Test points provide valuable insight into the functioning of different mobile phone sections, such as power supply, charging, and audio components.

List of Experiments:

- Power Management: Study the power supplies & power management unit used in different sections of mobile phone.
- Battery & Charging: Explore the built-in battery charger, battery, & battery charging circuit for mobile phones.
- Components of a Smart Mobile Phone: Examine components such as the buzzer, vibrator, microphone/speaker, & hands-free functionality.
- Dual SIM Section: Learn about the Dual SIM section & the SIM card detection process.
- Touch Screen Display: Study the operation & functioning of the mobile phone's touch screen.
- Fault Creation and Effects: Understand how faults are created in various phone sections & observe their effects on the phone's operation.

Technical Specifications:

- Interconnection: Connections are made through 2mm sockets and patch cords for flexibility in setup.
- Dimensions: Approximately 430mm (Length) x 320mm (Width) x 85mm (Height).
- Power Supply: Requires 220V AC ±10%, 50Hz for operation.
- Standard Accessories: Includes patch cords & an instruction manual for easy setup & usage.
- Optional Accessories: A multimeter & Digital Storage Oscilloscope (DSO) are optional for advanced testing & measurements.

21.Biomedical Sensor Interface Trainer

Biomedical Sensor Interface Trainer, the plug-and-play design that makes it easy for connections and helps Students, hobbyists, enthusiasts and professionals to make custom biomedical application projects. Biomedical Sensor interface Trainer Kit equipped with on board Io's, Temperature, SPO2, Heart Rate sensor, ECG, EMG sensors interfaces and peripherals. It's used in many educational institutions and R&D labs across the world.

Features

- Plug & Play Interface Connectivity.
- Professional EMI/RFI Complaint PCB Layout Design.
- Modular Block design makes Easy access & quick Prototyping.
- FRC connectivity features minimize the connection Error.
- ROHS Compliant High Quality Grade PCB.
- Supported DC 12V Power Supply.
- Wooden Enclosure - Go green initiative.
- Optical SPO2 with heart rate Sensor - MAX30100.
- Optical Temp Sensor - MLX90614.
- ECG Sensor - Ad8232.
- EMG Sensor - Ad8226.
- All sensors are working on low power.
- Open-source Hardware ESP32 dual-core 32-bit up to 240 MHz, Flash 16 MB.
- Supported most of the open-source platforms for Custom Programming.
- The device offers multiple industrial protocols like MODBUS RTU, MODBUS TCP, JSON, MQTT and FTP and supports secure communication SSL.
- Supported most of the cloud platforms including Microsoft Azure & AWS etc.
- OTA Firmware upgrade supported.
- On Board Programming.
- Supported communication over USB, Wi-Fi & Bluetooth.

Application

- Generic Low power IoT Sensor Hub.
- Generic Low Power IoT Data logger.
- Wearable Electronics.
- Health Care.
- Human Machine interface.
- Muscle-Computer Interface (MUCI).
- Human Robot Interface.
- Exoskeleton.
- Robotics Artificial Actuators.

Specification

MCU

- ESP32-DOWD-V3 embedded, Xtensa® dual-core 32-bit LX6 microprocessor, up to 240 Mhz
- 448 KB ROM for booting and core functions.
- 520 KB SRAM for data and instructions.
- 16 KB SRAM in RTC.
- 16 MB SPI flash.

Bluetooth® / BLE

- Bluetooth V4.2 BR/EDR and Bluetooth LE Specification.
- Class-1, Class-2 and Class-3 Transmitter.
- AFH.
- CVSD and SBC.

Wi-Fi

- 802.11b/g/n.
- Bit Rate: 802.11n up to 150 Mbps.
- A-MPDU and A-MSDU Aggregation.
- 0.4 µs Guard interval support.
- Centre frequency range of operating channel: 2412 ~ 2484 MH.

Hardware

- Interfaces: SD Card, UART, SPI, SDIO, I2C, LED PWM, Motor PWM, I2S, IR, Pulse Counter, GPIO, Capacitive Touch Sensor, ADC, DAC, Two-Wire Automotive Interface.
- Communication Interface: RS232, USB, SPI & I2C.

Display Interface

- OLED 1.5.
- Driver: SSD1327.
- Interface: I2C.
- Display color: White.
- Grayscale: 16.
- Resolution: 128×128.
- Viewing angle: >160°.
- Operating voltage: 3.3V / 5V.
- Power supplied through battery for EMG & ECG Sensor.
- On board battery low indicator.

Real Time Clock (RTC)

- RTC Ds1307

Keypad Interface

- 4X4 Hex Keypad.
- Seven Segment Display.

Memory Interface

- SD Card Interface
- EEPROM AT24C08

Buzzer

- Buzzer

On Board Sensor, Testing Input Pot & Switches

- 1X Temperature Sensor Lm35.
- 3X Analog Test POT.
- 8X Selection DIP Switch.
- Optical SPO2 with heart rate Sensor - MAX30100.
- Optical Temp Sensor - MLX90614.
- ECG Sensor - Ad8232.
- EMG Sensor - Ad8226.

Voltage Level Converter

- 3.5V to 5V Level Converter.

Supply Voltage

- Supply Input Voltage DC 12V / 24V.
- Permissible Range, Lower Limit (DC) 9V.

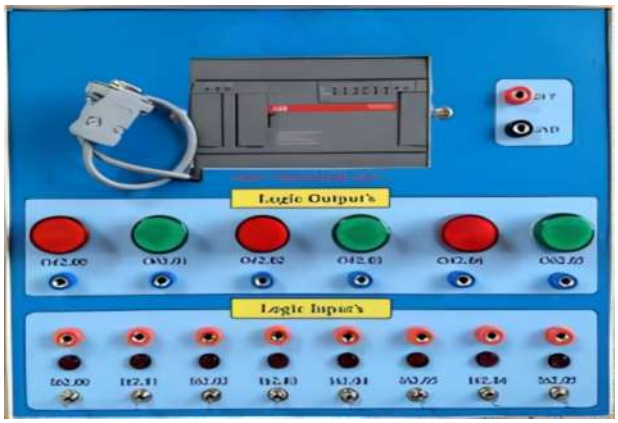
Dimension

- Wooden Box : 247mm X 170mm X 60mm.

Experiments

- Interface the SPO2 Sensor - MAX30100 and Display the SPO2 and Heart rate
- Interface the Optical Temperature sensor - MLX90614 and display the body Temp
- Interface the ECG Sensor -AD82324 and observe the ECG waveform at the terminal.
- Interface the EMG AD8226 Sensor & make the muscular movement & control the LED
- Interface the EMG Sensor and display the text on display based on muscle movement.
- Interface the EMG Sensor and control the Mouse activities on the computer.
- Log the time series data ECG , Temp , SPO2 Sensor data in to SD Card
- Build Snake Game using muscular sensor EMG Ad8226
- Sending ECG, Temperature, and SPO2 sensor data via MQTT protocol to AWS, AZURE & Thing speak cloud.
- Create an Android application with Bluetooth to display data from the SPO2 sensor, temperature, and ECG.

22. PLC Trainer



A PLC (Programmable Logic Controller) is an industrial digital computer specifically designed to control and automate machinery, processes, and systems in real-time. It is widely used in manufacturing plants, power stations, water treatment systems, and many other industrial environments.

Key Features of a PLC

- Programmable : Instructions (called ladder logic or function blocks) can be written, changed & updated as needed.
- Reliable & Rugged : Built to work in harsh environments (dust, temperature, vibrations).
- Real-Time Control : Executes logic within milliseconds for precise process control.
- Modular Design : Can be expanded with I/O modules, communication ports, and HMIs.

Learning

- Wiring of Inputs and Outputs
- Connecting sensors (IR, proximity) to inputs
- Connecting LEDs, buzzers, and relays to outputs
- Ladder Logic Programming
- Creating programs to control devices using timers, counters, AND/OR/NOT logic
- Basic Projects Implemented
- Start/Stop motor control using push buttons
- Automatic lamp control with sensor input
- Traffic light simulation using timers and outputs
- Water tank level control using float sensors and logic conditions

Technical Specifications

Parameter	Specification
PLC Type	Compact / Modular type
Number of Inputs	8 Digital Inputs (24V DC)
Number of Outputs	6 Digital Outputs (Relay or Transistor type)
Input Type	Sink/Source selectable
Output Type	Relay or Transistor (as per configuration)
Power Supply to PLC	24V DC (through SMPS or Adapter)
Programming Language	Ladder Logic / Function Block Diagram
Programming Interface	USB / RS232 / Ethernet
Scan Time	Typically < 1ms (depends on model)
Memory	~4–64KB user program memory
Operating Voltage	220V AC, 50Hz input (to SMPS)

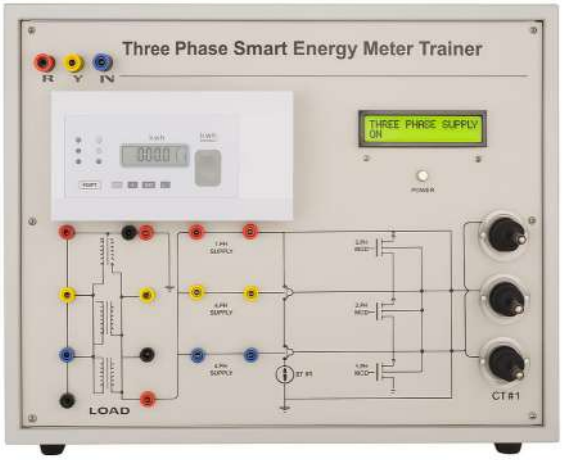
Accessories

- Power Supply Cable (SMPS)
- Patch code cable
- User guidance manual

23. Three Phase Smart Energy Meter Training System_

Three Phase Smart Energy Meter Training System is designed to deliver the practical knowledge of measurement of electricity consumption in a real world with smart technology. A Smart meter is an electronic device that record information such as consumption of three phase electric energy, voltage, current, power factor, frequency, etc. Smart meter system helps to reduce energy wastage, improves communication between consumers and power supply companies.

a platform for remote monitoring of appliances, keep track of their energy usage and give alerts when faults occur due to any abnormal condition. There is graphical LCD to measure all the three phase parameters in a single frame. All the measured parameters are displayed on the mobile too for further monitoring. User can simulate different faults in energy meter and observe its consequences and get an opportunity to rectify these faults with practical approach.



Features

- Compact and rugged design.
- Full smart functionality.
- Remote monitoring of necessary parameters through Wi-Fi.
- Equipped with supply indicators.
- Graphical LCD to measure all the three phase parameters.
- Tamper alerts provided.
- Facility to simulate various faults with alert indications.
- Diagrammatic representation for the ease of connections.

Scope of Learning

- Study of operational working of three phase smart energy meter and its applications.
- Study of various faults simulations and protections such as
- Tampering Indication of enclosure.
- Magnetic Interferences.
- Different protections schemes such as under voltage, over voltage, over current

Technical Specifications

Mains voltage	:	415VAC ±10%, 50Hz
Smart energy meter		
Connection	:	3 Phase 4 wires
Rated current	:	10A
Voltage variation	:	415VAC ±10%, 50Hz ±5%
Communication topology	:	Wi - Fi
Measurement parameters	:	Voltage, current, power, power factor, energy, frequency, etc.

Optional

3.5KW resistive load

24. Understanding Calibration of Energy Meter

Energy meter calibration equipment is designed to deliver the practical knowledge of measurement of electricity consumption in a real world. Today electricity is a vital element for human society. The rapid growth in electric appliance usage has contributed to an explosive growth in electrification around the world. To use electricity better, it is required to have a deep knowledge of Electricity measurements Energy meter calibration equipment provides in-depth knowledge of Energy meter measurements and its calibration using Voltmeter, Ammeter, and Wattmeter. It has two displays, one is Standard and another is Energy-meter. The on-board LCD display works as Standard meter for calibration of Energy-meter and display value of Voltage, Current, and Watt. The display provides energy consumption details. The facility to connect external Wattmeter or Voltmeter and Ammeter is also provided.

Understanding Calibration of Energy meter is an ideal platform to enhance education, training, skills & development among our young minds.

Technical Specifications

Auxiliary Power Supply	:	90 - 270V ±10%, 50Hz
Voltmeter Minimum/Maximum	:	10/300V
Ammeter Minimum /Maximum	:	0.1/5A
Watt meter Minimum/Maximum	:	10/1500W
Energy meter Display Resolution	:	0.001kWh
Frequency	:	50Hz
Fuse	:	250mA (2 Nos.) 5A (4 Nos.)
Dimension (mm)	:	W 350 x D 280 x H 55

Optional-

Watt Meter, Voltmeter & Ammeter 726 AC/DC Load

Product Features

- Single phase kWh Energy meter
- Inbuilt Voltmeter, Ammeter, Wattmeter as Standard meter for calibration
- Big font LCD (16 x 2)
- Separate Seven Segment Display
- Digital Calibration/ Operation using Keypad
- Sockets are provided to Connect External Voltmeter, Ammeter and Wattmeter for Calibration
- Default and User Calibration modes are provided to avoid errors during Operation
- 5 LED Operation Indicators

Scope of Learning

- Study the connection of Voltmeter, Ammeter & Wattmeter for Power measurement of load in Transmission line
- Study the connection of Energy meter in Transmission line
- Measurement of Energy in kWh
- Calibration using inbuilt Wattmeter, Voltmeter & Ammeter, Analog Wattmeter, Analog Voltmeter & Ammeter
- Experiments on effect of wrong Calibration on Energy meter.

25. Workbench (Heavy Duty)

Workbench

Features:

- High-Quality Benchtop: Choose between durable plywood or granite for a smooth, stable work surface.
- Heavy-Duty Structure: Designed with a robust MS pipe frame for enhanced stability and minimal vibrations.
- Comfortable Stool: Includes a suitable stool for comfort & support during long work sessions.
- Integrated footrest on the bench frame for extra comfort while seated.
- Protective edge banding on the tabletop to reduce wear and prevent chipping.
- Spacious work area suitable for assembling, soldering, and testing electronic circuits.
- Lockable caster wheels for effortless mobility and secure positioning in the lab.
- Powder-coated finish on the metal frame to resist corrosion and extend durability.
- Rounded corners on the tabletop to enhance safety during use.
- Easy-to-clean work surface to maintain a professional and organized workspace.

Specifications

- Material - Mild Steel
- Length = 1200mm, Depth = 700 mm, Height = 800 mm (approx.)
- Table Top - Plywood/Granite

26. Work Bench

Work Bench Features:

- Workbench with four AC plug sockets, each having an individual ON/OFF switch for independent control.
- Ability to connect multiple work tables electrically in series.
- Each work table comes with its own power cable & three-pin AC plug for connectivity.
- Comfortable stool provided with each work table, ensuring suitable height for work.
- Sturdy and spacious table top for convenient placement of tools & equipment.
- Durable frame structure made of stainless steel and MS for long-lasting use.
- Integrated MCB protection to safeguard against overloads & short circuits.
- Neatly arranged instrument panel for organized and efficient workspace.
- Smooth laminated surface for easy cleaning and maintenance.
- Ergonomic design to enhance comfort & reduce fatigue during extended work sessions.

Specifications:

- Width=1200, Depth=700, Height=1120 (Dimensions in mm) {Approx.}
- Material Stainless Steel
- Plywood Table - (Thickness- 18mm) MICA (Thickness- 1mm)

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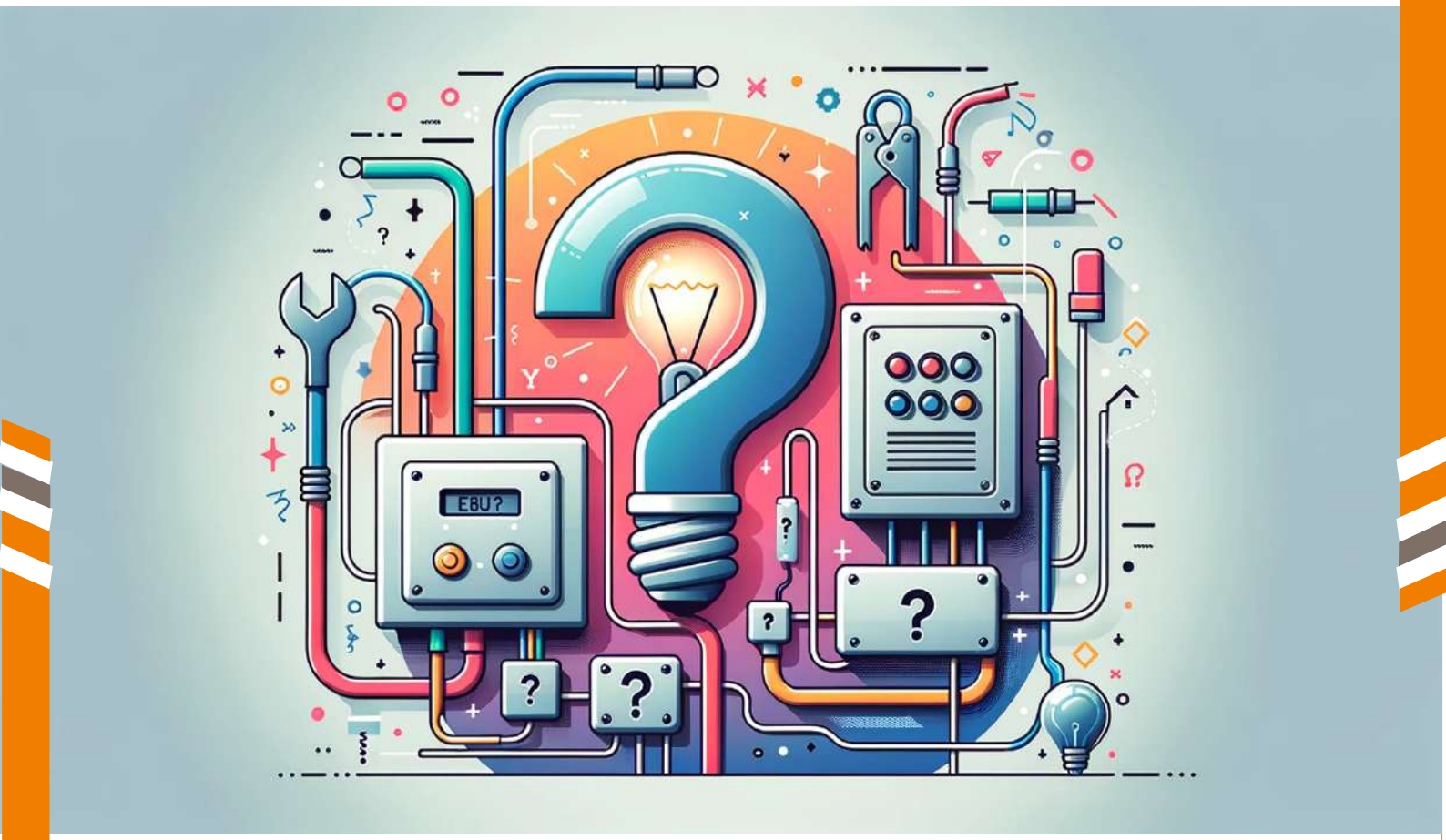

Solution Provides for

- Electrical and Electronics Lab
- Industrial Solutions

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