Electrical Vehicle Work bench - II

MI-EVW02

Trainer kit Required along with Work Bench

Battery Characteristics Trainer

Battery Management System Trainer

Fitted Instruments in Bench

Battery Impedance Analyzer

Variable DC Power Suppl

DSO

Battery Tester

Electrical Vehicle Work bench - II
MI-EVW02

The electric vehicle industry in India is picking pace, new manufacturing hubs, and increased push to improving charging infrastructure Battery- and car makers are already spending billions of dollars on reducing the costs of manufacturing and recycling electric-vehicle (EV) batteries-spurred in part by government incentives and the expectation of forthcoming regulations.

This work bench provide facility to test various parameter in Different types of batteries used in electric vehicle.

Features

- Design by considering all safety standards.
- Fabricated on Stainless Steel Frame.
- MCB is provided with AC supply for safety purpose
- Detachable Block Drawer
- Locking Wheels
- Top covered by Anti Static Mate
- Shocked Proof design
- All instruments are fitted inside of workbench
- Easy accessible Interface

Electrical Vehicle Work bench - II
MI-EVW02

Technical Specifications

Dimensions (in mm):

Length	:	950mm
Width	:	1200 mm
Height	:	1550 mm
Material	:	Stainless Steel
Chassis	:	38mm x 38mm x 1.5 mm Stainless Steel pipes for sturdiness.
Side Walls	:	Stainless Steel (1.5mm)
Table Top	:	Plywood (thickness : 18mm)
		MICA (thickness : 1mm)

MS drawers

Drawer Qty	:	03
Width	:	275 mm
Depth	:	375 mm
Height	:	100 mm
Wall Thickness	:	1.2mm
Handle & Lockers	:	Separate lock & Handle
MCB	:	Two Pole MCB (16/32A – Havells / Siemens) is provided for safety

Note: Dimension of workbench may be vary depend upon ease of use. Electric Vehicle Model's shape and color as shown in
Image may be vary.

Battery Impedance Analyzer

Make -HIOKI BT4560

Parameter		Specifications
Measured signals	:	Impedance, voltage, temperature
Impedance Measurement		
Measurement parameters	:	R resistance, X reactance, Z impedance, θ phase angle
Measurement frequency	:	0.1 Hz to 1050 Hz
Measurement ranges	:	30 mΩ, 300 mΩ, 3 Ω
Voltage Measurement		
Measurement range	:	20V
Temperature Measurement		
Display range	:	-10.0°C to 60.0°C
Resolution	:	0.1°C
Measurement time	:	2.3 s

General Specification

Measurement functions	:	(R, X, V, T); (Z, θ, V, T); (R, X, T); (Z, θ, T); (V, T)
Interface	:	RS-232C/USB (virtual COM port) * Cannot be used simultaneously Transmission speed: 9,600 bps/19,200 bps/38,400 bps
EXT. I/O	:	TRIG, LOAD, Hi, IN, Lo, and others (NPN/PNP can be switched)
Power supplies	:	Rated supply voltage: 100 to 240 V AC Rated supply frequency: 50/60 Hz
Rated power	:	80 VA

Accessories : Pin type Probe(Make - Hioki L2003)-1Nos

Battery Tester

Make: HIOKI BT3563A

Parameter		Specifications
Measurement method	:	AC four-terminal method
Measurement frequency	:	1 kHz ±0.2 Hz
Rated input voltage	:	±300 V DC
Maximum rated voltage to earth	:	±300 V DC

Accessories : Pin Type Lead Hioki L2100 – 1 Nos

Electrical Vehicle Work bench - II
MI-EVW02

Variable DC Power Supply

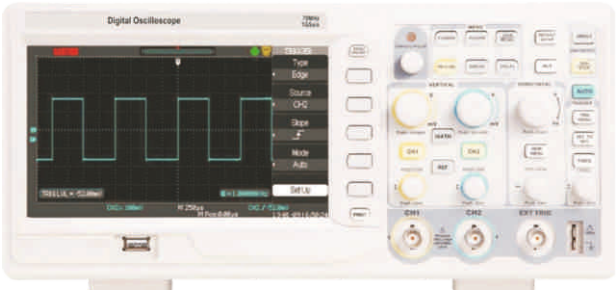
Make: MINE MI-PS3302

Technical Specifications

Variable DC Outputs	:	0 to 30V/2A, 0 to ±15V/1A Tracking : 0 - 5V/5A
Setting Resolution Voltage	:	10 mV , Current : 10mA
Output Terminal	:	4mm Banana Socket
Terminal Isolation	:	<=10M Ohm
Load Regulation	:	<= (0.1 % + 10mV)
Line Regulation	:	<= (0.1 % + 10mV)
Temp Coefficient	:	<= (0.1 % + 5mV/ C)
Ripple & Noise	:	<= (1mVrms)
Earth terminal	:	1 no
Recovery Time	:	< 50mS
Current Limit adjustment	:	100 mA to Amax.
Display	:	$3^{1/2}$ Digit Digital Display
Accuracy	:	± (1% +1digit).
Input Line Voltage	:	230V AC ± 10%, 50Hz
General Information	:	Built-in overheat, over load protections

Digital Storage Oscilloscope

Signal Bandwidth	:	70 MHz
No. Of Channels	:	2-Channel
Real time sampling	:	Max 1 GSa/s
Memory Depth	:	2 Mpts



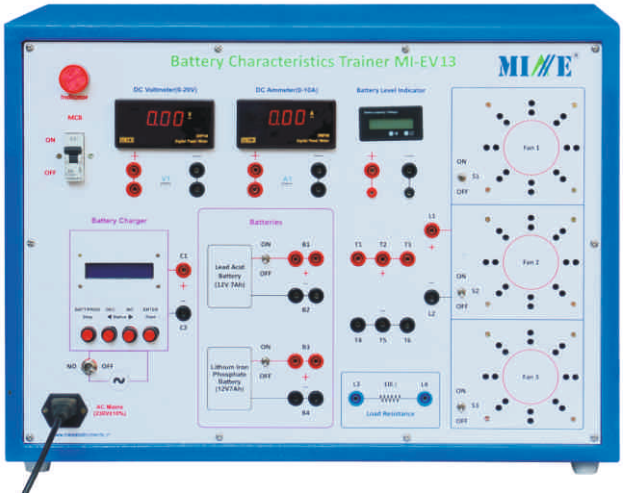
Suitable software to operation of relevant instruments fitted in bench.

Electrical Vehicle Work bench - II
MI-EVW02

Battery Characteristics Trainer

Energy storage is becoming increasingly important for improving the efficiency, reliability and price-competitiveness of power utilities and Electric Vehicles, and to achieve deeper integration with intermittent renewable energies. Battery is an energy storage device consisting of two or more electrochemical cells that convert stored chemical energy into electrical energy and used as a source of power. As an energy storage device, the use of the battery is increasing day by day such as in automobiles, inverter , UPS, off- grid renewable energy sources.

Mine EV14 Battery Characteristics Trainer introduce students to the operation of Lead-Acid and Li-ion batteries. Hands-on experiments cover the charging and discharging characteristics of lead-acid and Li-ion batteries.



Features

- Models for study of battery characteristics of Lead-Acid and Li-iron Phosphate batteries.
- Real time and interactive training setup.
- DC Power source and charge controller.
- Meters and battery level indicator for analysis.
- Designed with all safety standards.

Experiments

- Study about Battery Construction.
- Study of about Different type of Battery.
- Evaluation of charging characteristics of Battery.
- Evaluation of discharging characteristics of Battery.

Technical Specifications

Battery 1		
Type	:	Li-iron Phosphate (Inbuilt BMS)
Voltage	:	12V
Current Capacity	:	6-8 Ah
Battery 2		
Type	:	Lead Acid
Voltage	:	12V
Current Capacity	:	6 Ah approx
Battery Charger	:	1 no. (Suitable for both)
DC Voltmeter	:	0-20V
DC Ammeter	:	0-10Amp
Interconnection	:	4mm Patch cord
Digital Battery Level Indicator	:	1 nos.

Accessories

- Operating Manual-1nos.
- Patch Cord-10 nos.
- Wall poster with attractive study content - 2Qty.

Electrical Vehicle Work bench - II
MI-EVW02

MI-EV05 Battery Management System Trainer

Features

- Temperature measurement
- Cell balancing
- Onboard thermistor for temperature measurement
- Suitable for testing of for 3 to 6 Series Lithium-Ion Cells.
- Voltage measurement
- Current measurement
- Motor Assembly Mechanical Arrangement for Experiments

Technical Specifications

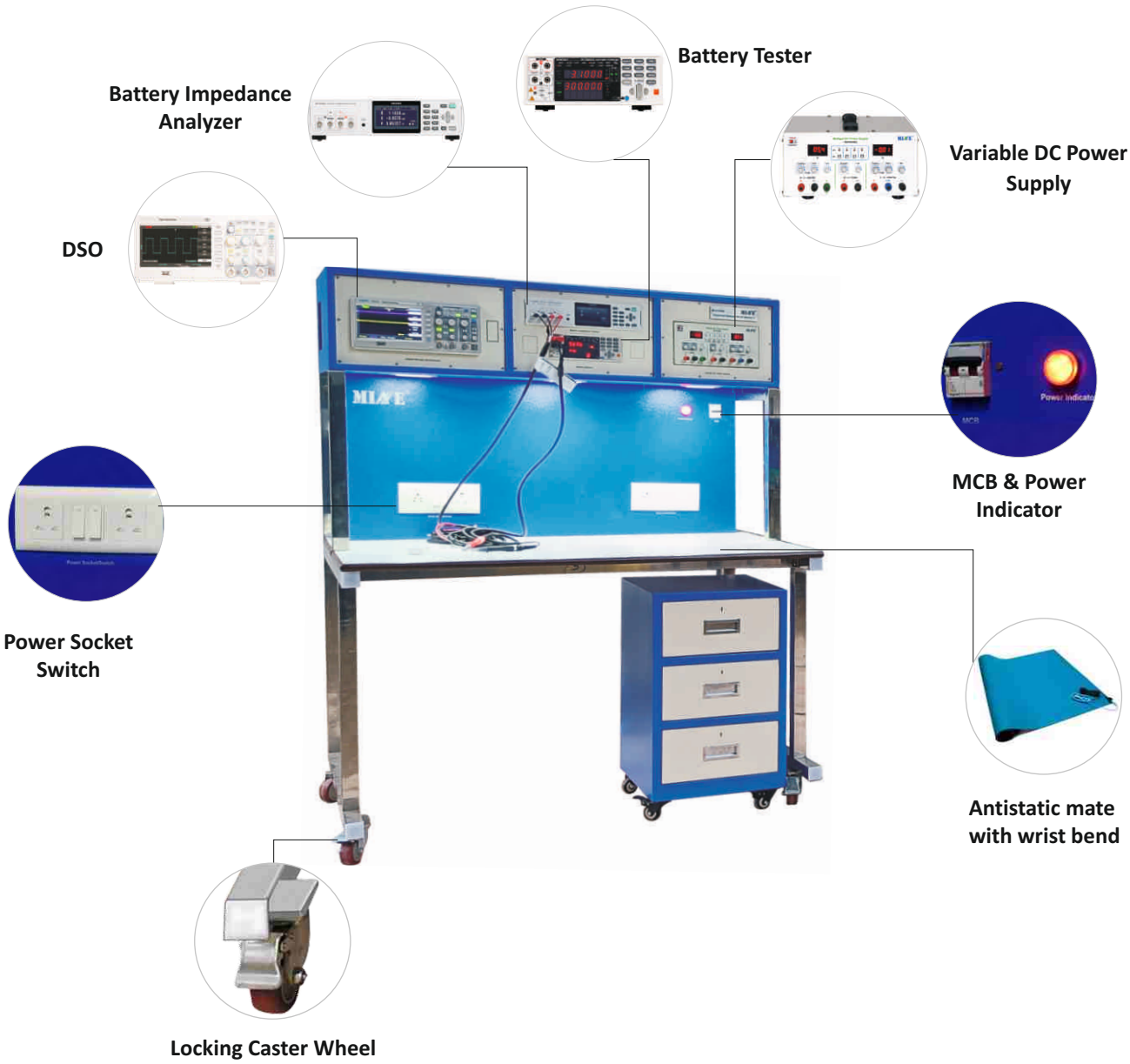
Machine Type	:	BLDC Motor
Rating	:	100 Watt approx.
Voltage Rating	:	24V
Current	:	5 Amp.
Speed	:	2500 rpm ±10%
Motor Speed Control	:	PWM
Loading arrangement	:	Mechanical
Brake Drum/Pulley	:	Aluminum casted
Power supply	:	24V, 10Amp.
Meters		
DC Voltmeter	:	0-300V
DC Ammeter	:	0-10A
Digital RPM Meter	:	0-9999 rpm
Spring Balance (6nos)	:	25Kg x 100g
Mains Supply	:	Single Phase, 230V ±10%, 50Hz
Interconnection	:	4mm Patch cord
Battery for Source	:	Fitted in to trainer
Battery Charger	:	Power Supply Source for Battery Charging

Inbuilt BMS with onboard demonstration on mimic

Electrical Vehicle Work bench - II
MI-EVW02

Learning's

1. Evaluation of charging characteristics of Battery by Battery Charger
2. Evaluation of discharging characteristics of Battery by BLDC Motor
3. Evaluation of Charging/Discharging of Battery while charging/discharging with different C-rate
4. Evaluation of Battery Charging/Discharging characteristics at different Batteries
5. Testing batteries and Comparison performance of different Batteries Using Testing equipment's
   i. No-load voltage by Voltmeter.
   ii. Measuring internal Resistance
   iii. impedance measurement of batteries



Electrical Vehicle Work bench - II
MI-EVW02

List of Instruments Fitted/Onbench in Workbench

- HIOKI BT4560 Battery Impedance Analyzer -1nos
- HIOKI BT3563A Battery Tester -1nos
- Digital Storage Oscilloscope -1nos
- Variable DC Power Supply -1nos

List of Modules along with Workbench

MI-PS3302 Variable DC Power Supply

Electrical Vehicle Workbench - II MI-EVW02

MI-EVW01_Mine_Standard.pdf

MI-EV05 Battery Management System Trainer

MI-EV02 Battery Characteristics Trainer

Included Standard Accessories & Suitable Software

Mine Instruments Pvt. Ltd. An ISO 9001:2015 Certified Company

67-B, First Floor, Electronic Complex, Pardeshipura, Indore-452010 (M.P.) India

e-mail: info@mineinstruments.com; sales@mineinstruments.com

www.mineinstruments.com; www.mineinstruments.in, +91-731-4246503 +91-6262603222

MAKE IN INDIA

Regional Emails- **East :** +91-6262601000, east@mineinstruments.com | **West :** +91-6262603777 west@mineinstruments.com | **North :** +91-6262609000 north@mineinstruments.com | **South :** +91-6262608000 south@mineinstruments.com