MI/E®
You Think, We will make it.

Hybrid Energy Sytem Trainer

MI-RE04

The synergy of wind & solar power in renewable hybrid energy systems embodies the promise of sustainable energy generation. Harnessing the complementary strengths of these sources, such systems offer reliability, efficiency, & resilience in the transition towards a greener energy future. This introduction sets the foundation for exploring the dynamic integration of wind & solar power, driving innovation & progress in renewable energy solutions.

Hybrid Energy System (MI-RE04) offers two types of power generation (solar & wind) technics, student can learn various concepts related to renewable energy system.

Features

- Provided with meters for analysis of parameters.
- Provided with all safety protections.
- Connector Sheathed Shock proof type.
- A Hybrid system for power generation & learning concepts.
- DC Voltmeter & DC Ammeter.
- Multi Function Meter.

Learning's

- Experimentation of Power Generation such as.
  1. Wind Power Generation
  2. Solar Power Generation
- Open circuit voltage (Voc) of Solar PV module.
- Short circuit current (Isc) of Solar PV module.
- I-V characteristics of PV Module.
- P-V characteristics of PV Module.
- Determine Fill Factor of Solar Panel.
- Series combination of Solar PV modules.
- Parallel combination of Solar PV modules
- Installation of solar power system.
- Installation of wind power system.
- Installation of wind-solar(Hybrid)power system.
- Analysis of power generation at different tilt angles.
- Effect of shadow on Solar PV system.

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Prospective Image

Technical Specifications

Solar Panel Type 1 (for outdoor use only)

Cell Type	:Poly (multi) crystalline
Peak Power	:170W(approx.)
Voc	:23V
Isc	:7.75A
Quantity	:2Nos.

Solar Panel Type 2 (for indoor use only)

Cell Type	: Poly (multi) crystalline
Peak Power	: 20W(approx.)
Quantity	: 2Nos.

Inverter

Capacity	: 1500VA
DC Input voltage	: 24V
Input Voltage	: 190~260V AC
O/P Voltage	: 180~265V (on UPS mode)
O/P Voltage	: 85~290V (on ECO mode)
Change over time	: <20 (Milli Sec)
Battery	: 12A Charging Current
Efficiency	: >80% at full load
Technology	: Sine Wave Technology
LED Indication	: Mains , UPS , Low Battery, Charging & Over load
Batteries Supported	: 2Nos.

Wind Turbine

Wind Turbine	: 300 watt (Design specification)
Power Source	: Wind Powered
Charging Current	: 0.2 - 0.4A
Generator voltage	: 24V approx.
Actual O/P Power	: 10W - 15W.
Blades	: 3nos.
Rotor	: Three FRP blades along with standard steel nut-bolts
Structure	: 5ft, with floor stand

Air Blower

Motor	: 1HP
Blades	: 3nos.
Rotor	: Three FRP blades along with standard steel nut-bolts
Structure	: coverd by fancings for safety

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Technical Specifications

Charge Controller

Charge controller type	:	Max. Power Point Tracking (MPPT) charging technology
MPPT technology	:	Dual channel interleaved buck-converter
Display Type	:	16 x 2 LCD digital display with backlight
Battery Voltage	:	12V / 24V (auto-select)
Max. solar panel voltage	:	70V (150V Optional)
Max. power point voltage	:	(MPP) Battery voltage to 70V
Charging method	:	4 stage battery charging – Deep discharge/Boost/Absorption/Trickle mode
Max Charging Current	:	20A / 40A DC @ 12V or 24V (at 25° C)
Efficiency (%)	:	Up to 98.8%

Battery

Make	:	Exide Solar Tubular
Capacity	:	100Ah
Type	:	C10
Quantity	:	2 Nos.

Meters

AC Multi Function Meter:		Voltage-10-230V
	:	Current-100mA-5A
	:	Watt-10-1200W
	:	Frequency-50Hz
AC Voltmeter	:	500V
AC Ammeter	:	10A
DC Voltmeter	:	300V(1Nos.),500V(1Nos.)
DC Ammeter	:	20A(1Nos.),40A(1Nos.)

Hybrid charge controller

Quantity	:	1nos.
Voltage	:	24V
Protection	:	Overload & low-battery protection
Terminals	:	BS10 type for safety purpose

Structure for Solar Panel

Material	:	MS
Tracking Type	:	Manual
Assembly	:	Detachable & easy to install
Quantity	:	1 sets.
Helognes	:	4 Nos.

Accessories

Patch Cords	:	20 Nos.
Fuse	:	2 Nos.
Mains Cords	:	2 Nos.
Wires	:	2.5 Square mm havells
	:	Red – 30 meters
	:	Black – 30 meters
Gravity Hydrometer	:	1 Nos.
BNC to BNC cable	:	1 Nos.
Glass Fuse 10Amp.	:	10 Nos.
Rheostat 50Ω/15Amp	:	1 Nos.(Optional)

Note: Solar panel must be placed in direct contact of sunlight for getting better output power.

Safety & Protection

MCB (DC)	:	10Amp. for solar panels batteries (4 Nos.)
MCB (AC)	:	16 Amp.(2Nos.), 10A(3Nos.)
Fuse	:	10 Amp. for Individual protection of solar panel & battery, 4Nos.
Terminals	:	Banana Terminals 10 Amp. & 20 Amp. (shock proof connections)

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