Moola

Technical Data

MD 500

A Reliable and Promising Energy Storage Solution for a Smart Grid

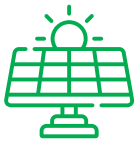
01 SPECIFICATIONS :

- **Applications :**

Commercial & Industrial

E-Mobility

Agriculture



Renewable Energy

Biogas plant

Utilities

SYSTEM	MOOLA MD-500

GENERAL SPECIFICATIONS

Model No.	Model No. MD- 500 **(500 kWh battery storage system)**
System Application	Grid Energy Storage Container
Battery Type	Lead Ultra Carbon Battery
DOD	C / 10 @ 70%
EMS	Integrated Energy Management System
Rated Capacity	500 kW @ 50% DoD 350 kW @ 70% DoD
Output Voltage	350 / 400 / 480V (3 Phase) 208 / 230 / 240V (Single phase)
Output Frequency	50 Hz (±1%)
Pre-Sales Project Design	Yes
Installation Support	Yes
Technical Support	Yes
Storage Type	**20FT Container** for Outdoor Installation with IP54 protection

SPECIFICATIONS (Continued) :

SYSTEM	MOOLA MD-500
Feature	Industrial Battery Storage System
Product Name	500 kWh Hybrid Grid Storage Solution
Transport Package	Container Specification (L 20ft x W 8.6ft x H 8ft) 2200 Kg, Roof 2mm, Side wall 1.6mm with wooden sheet flooring, Inverters, Battery and other associated materials
Trademark	Moola, Origin : India
HS Code	8501320000
Production Capacity	100 sets / year
Product Description	MD-500, a 20FT containerized Industrial Battery Storage System
Energy Storage System	500 kWh
Battery	12V, 165 Ah (1.98 kWh) Lead Ultra Carbon Battery
Battery Combiner Box	518 mm (L) × 275 mm (W) × 250 mm (H), Poly-propylene material
Battery Module	250 units
Controller 500V 300A	**1 pc** High Voltage Controller Box
PCS	**PCS 500** – 500 kW Battery Inverter
Bypass	**Bypass 500** – Switch between on-grid and off-grid modes
Energy Log	**1 pc** Monitoring data logger
20FT Container	**1 pc** For outdoor installation, with IP54 shield, including lighting, fire-resistance system, battery racks, natural air circulation cooler

02 TECHNICAL DATASHEET :

SYSTEM	MOOLA MD-500

GENERAL DATA

Nominal Load Power at U.P.F	250 KW
Max. Battery Charging Power	250 KW
Max. Input Battery Capacity at C10 Charging	500 kWh

AC INPUT / GRID

Nominal Input Voltage	340 V to 500 V for 3 Phase
Voltage Tolerance	Less than 3 %
Input Frequency	50 Hz (±1%)
Maximum Input Current	580 Amp

OUTPUT

Nominal Rated Output Voltage	340 V to 500 V (3 Phase) | 208 V / 230 V / 240 V (Single phase)
Output Frequency	50 Hz (±1%)
Output Rated Current (In)	336 Amp
Output Protection	Yes
Transfer Time From Generator ↔ Battery ↔ Grid	10 ms

TECHNICAL DATASHEET (Continued) :

SYSTEM	MOOLA MD-500

BATTERY

Nominal Battery Voltage Range	12 V
Operating Battery Voltage Range	12.6 V
Battery Type	Lead Ultra Carbon Battery, 12 V, 165 Ah
Maximum Charging Current	25 A
Battery Protection	Yes
Temperature De rating	No
Recommended Altitude	2000 m
Altitude De rating	No
Audible Noise At **1m** From The Front With 100% Load	< 70 dB

ELECTRICAL / MECHANICAL

Degree Of Protection	IP31 / IP65
Cable-Entry	Bottom
Color	Ral7035
Graphical Touchscreen HMI	Graphical Touchscreen Display For Control & Monitoring
Communication Protocol	Modbus
Weight, Dimensions (mm)	1500 Kg, 2900 X 1900 X 850
Exhaust Fan	Yes

SAFETY & SURVEILLANCE

Camera	Yes / Made by Honeywell
Smoke Sensor	Yes
Fire Extinguisher	Yes
Remote Monitoring Solution	Yes (Optional) With GSM / Ethernet Adapter
Embedded NVR	Yes

03 INVERTER SPECIFICATIONS :

SYSTEM	MOOLA MD-500

STANDARD SPECIFICATION SMART STORAGE SOLAR INVERTER SUN MAGIC+ REeF1	
Model & Capacity (kVA)	SPU-250

CONFIGURATION	
Modes Available	Grid Saving, Battery Backup, Export
Power Export To Grid	Enable / Disable Option Available
Power Import From Grid	Enable / Disable Option Available

GRID	
Input Wiring	3 Phase Five Wire (3 PH + N + E)
Input Neutral Requirement	Yes
Nominal Voltage	340 V to 500 V for 3PH
Grid Frequency Sync Range	50 Hz (±1%)
Unity Power Factor for Grid Charging	Near to Unity
Operating Condition	Continuous
Input Fault Level	≥10 kA
Self Consumption	Up to 4%
Charger Peak Efficiency	Up to 95%
DG Compatibility	Yes (Double The Inverter Capacity)
Grid Compatibility	Yes (Same As Inverter Capacity)
Input Voltage Distortion Allowed	Less Than 3%
Grid Charger Capacity	50 % Of kVA Rating

INVERTER SPECIFICATIONS (Continued) :

SYSTEM	MOOLA MD-500

BATTERY

Nominal Battery Voltage (VDC)	480 / 600
Battery Buffer Setting	DC Voltage Selectable Through Keypad
Grid Charging Current	Settable Through Keypad
Temperature Compensated Charging	Yes
Battery Charging Voltage	Selectable From LCD Display
Type & No. Of Cells	Lead Acid / Flooded, **6 cells**
BMS Compatible	Yes

OUTPUT

Output Voltage (Inverter Mode)	415V AC ± 2%
Output Frequency (Free Running)	50 Hz ± 1%
Output Waveform	Pure Sine Wave
Peak Inverter Efficiency (Full Load)	Up to 90%
Total Harmonic Distortion	Up to 3% At Linear Load
Overload Capacity	25% For 60 sec, 150% For 5 sec
Changeover Time (Full Load)	No Break Changeover Time
DC To AC Galvanic Isolation	In-built Isolation Transformer At Inverter Output
Anti-Islanding Function	In Compliance With IEC 62116
Auto Bypass Feature	Yes
Unbalance Load Handling Capacity	Yes
Duty	Continuous

INVERTER SPECIFICATIONS (Continued) :

SYSTEM	MOOLA MD-500

ENVIRONMENTAL

Acoustic Noise Level From 1 M	≤ 65 dB
Operating Temperature	0 To 40 °C (Dust Free Cooled And Dry Environment)
Storage Temperature	-10 °C To 55 °C
Relative Humidity	Up To 95 % (Non-Condensing)
Altitude	Up to 1000 Meters (derating from 1000 to 3000 Meters) & Above 3000 Meters

PHYSICAL

Enclosure Protection Grade	IP20 Compatible with IEC 60529:2001-02 – As Per MNRE Requirement
Enclosure Thickness	As Per Industrial Standard
Cooling	Forced Air
Cooler	Up to 25 kVA: RAL 7032
Cable Entry	Bottom

INVERTER SPECIFICATIONS (Continued) :

SYSTEM	MOOLA MD-500

PARAMETERS DISPLAYED ON LCD

Mains Group	**1.** Voltage, **2.** Current, **3.** Frequency, **4.** kW, **5.** kVA, **6.** Import kWh, **7.** Export kWh, **8.** PF
Inverter Group	**1.** Voltage, **2.** Current, **3.** Frequency, **4.** kVA
Output Group	**1.** Voltage, **2.** Frequency
Battery Group	**1.** Voltage, **2.** Current, **3.** SOC

PROTECTIONS

Electrical Protections	Circuit Breaker And Fuse

ELECTRONIC PROTECTIONS

Alarm Group	Alarms Available For Fault Condition
Input Group	**1.** Input Under Voltage, **2.** Input Over Voltage, **3.** Charger Over Voltage, **4.** Under / Over Frequency
Inverter Group	**1.** Output Under Voltage, **2.** Output Over Voltage, **3.** Overload, **4.** Output Short Circuit, **5.** Inverter Over Temperature
Battery Group	**1.** Battery Low, **2.** Battery Over Charge, **3.** Battery Charging Current Limit

INVERTER SPECIFICATIONS (Continued) :

SYSTEM	MOOLA MD-500

CONNECTIVITY

Communication	RS - 485			
Protocol	Modbus RTU			
LCD With Backlight & Tactile Keypad Interface	Yes			
Testing Standard	IEC -61683:1999, IEC- 60068-2-1, IEC-60068-2-2, IEC-60068-2-14, IEC-60068-2-30			
Safety Factor	**1** For Electronic Devices, **1** For Electrical Devices			
Earthing Connection (Ref. IS 3043)	Earth Terminal Block	**25 - 40 kVA : 3 X 25 mm** GI / Aluminium (Earth Busbar Running along the Panel)	**45 - 150 kVA : 6 X 50 mm** GI / Aluminium (Earth Busbar Running along the Panel)	**200 - 300k VA : 6 X 50 mm** GI / Aluminium (Earth Busbar Running along the Panel)
Illumination Lamp	**Available** | 11 W CFL			
Gland Plate	**Available** | 3 MM MS C.R.C.A.			
Utility Socket	**Available** | 5 A / 230 VAC			

BATTERY

kVA Rating	250
Width (W)	2900
Depth (D)	850
Height (H)	1900
Weight (Kg) APPROX.	1500
Add On **Accessories** (Not Standard Part Of Inverter)	
Optional Feature	**1)** GSM-Based Remote Monitoring, **2)** Modbus RS - 485, **3)** Radiation Sensor (Pyranometer), **4)** Smoke Detector, **5)** Above IP 20 Enclosure, **6)** Manual Bypass

04 LEAD ULTRA CARBON BATTERY :

MOOLA MD-500

JUMBO TUBULAR (12 V 165 Ah @10)

Nominal Voltage	Rated Capacity @10 Hr.	Dimensions in mm			Battery Gross Weight (kg)
		Length	Width	Height	
12	165	518	275	249	58

ELECTRICAL PARAMETERS

Battery Specified Capacity Test @ 27°C			
C10 @ 10.8 V	C5 @ 10.8 V	C3 @ 10.8 V	C1 @ 10.8 V
165	137.5	118.3	82.5

Ah & Wh EFFICIENCY

Ah Efficiency	< 93 %	Wh Efficiency	80 %
Charging Method (CC / CV)		Backup @ 400 W load +/- 3%	
Max Current	50 A	3 Hours 30 Minutes	
Cyclic Use	14.5 V		
Float Use	13.5 V		

UNIQUE FEATURES

1	Lower temperature at peak loads
2	No smoke. Silent and instant switchover
3	Consistent back-up under deep-discharge application
4	Higher charge acceptance with lower maintenance
5	Efficiency increases under higher current load

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