



Technical Data

MD 300



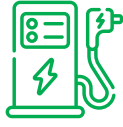
A Reliable and Promising Energy Storage Solution for a Smart Grid

01 SPECIFICATIONS :

● Applications :



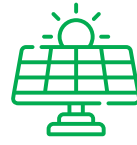
Commercial
& Industrial



E-Mobility



Agriculture



Renewable
Energy



Biogas plant



Utilities

SYSTEM

MOOLA MD-300

GENERAL SPECIFICATIONS

Model No.	Model No. MD- 300
System Application	Grid / Solar / Wind Energy Storage Container
Battery Type	Lead Ultra Carbon Battery
DOD	C / 10 @ 70%
EMS	Integrated Energy Management System
Rated Capacity	300 kW @ 50% DoD 240 kW @ 70% DoD
Output Voltage	208 / 480V (3 Phase) 120 / 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-300
Feature	Industrial Battery Storage System
Product Name	300 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-300, a 20FT containerized Industrial Battery Storage System
Energy Storage System	300 kWh
Battery	12 V, 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	200 units in a 40 × 5 array
Controller 500V 300	1 pc High Voltage Controller Box
Charge Controller	PBD 300 – 100 kW MPPT Solar Charge Controller
PCS	PCS 300 – 300 kW Battery Inverter
Bypass	Bypass 300 – 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-300

GENERAL DATA

Nominal Load Power at U.P.F	100 KW
Max. Recommended PV Input Power	80 KW
Max. Rated PV Output Power	100 KW
Max. Battery Charging Power	100 KW
Max. Input Battery Capacity at C10 Charging	300 kWh

DC INPUT / SOLAR / WIND

MPPT Operating Range	480 - 800 V
Max. PV Input Dc Voltage	500 - 900 V
No. of Independent MPPT	2
No. of DC Input Pairs/MPPT	2

AC INPUT / GRID

Nominal Input Voltage	208 V to 480 V for 3 Phase
Voltage Tolerance	Less than 3 %
Input Frequency	50 Hz ($\pm 1\%$)
Maximum Input Current	580 Amp

OUTPUT

Nominal Rated Output Voltage	208 / 480 V (3 Phase) 120 / 240 V (Single phase)
Output Frequency	50 Hz ($\pm 1\%$)
Output Rated Current (In)	300 Amp
Output Protection	Yes
Transfer Time From Generator ↔ Battery ↔ Grid	10 mS

TECHNICAL DATASHEET (Continued) :

SYSTEM

MOOLA MD-300

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)	900 Kg, 1100 X 1900 X 800
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-300

STANDARD SPECIFICATION SMART STORAGE SOLAR INVERTER SUN MAGIC+ REeFI

Model & Capacity (kVA)	SPU-100
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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	330 V to 450 V for 3 Phase
Grid Frequency Sync Range	50 Hz (±1%)
Unity Power Factor for Grid Charging	Near 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-300

SOLAR

Charger Type	MPPT
Max PV Connection (kWp)	100
Max PV Voltage (Voc)	500 / 680 / 900 V
MPPT Voltage Range	90–450 V (240 VDC) 240–620 V (360 VDC) 600–800 V (480 VDC)
Battery-less MPPT Voltage Range	290–400 V (240 VDC) 400–500 V (360 VDC) 550–700 V (480 VDC)
MPPT Modes Available	3 (Selectable)
No. of MPPT Channels	2
Max I/P Amps per Channel	208 138 104
Panel Reverse Protection	Yes
Solar Charger Efficiency	Up to 95%

BATTERY

Nominal Battery Voltage (VDC)	240 / 360 / 480
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

INVERTER SPECIFICATIONS (Continued) :

SYSTEM

MOOLA MD-300

OUTPUT

Max Current Per Phase	33
Output Voltage (Inverter Mode)	415V AC \pm 2%
Output Frequency (Free Running)	50 Hz \pm 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

ENVIRONMENTAL

Acoustic Noise Level From 1 m	\leq 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

INVERTER SPECIFICATIONS (Continued) :

SYSTEM	MOOLA MD-300
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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

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
Solar Group	1. Solar Voltage, 2. Solar Current, 3. Power (kW), 4. Solar Energy (kWh)
Battery Group	1. Voltage, 2. Current, 3. SOC

PROTECTIONS

Electrical Protections	Circuit Breaker And Fuse
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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
Solar Group	1. Surge Protection, 2. Reverse PV Panel Protection
Battery Group	1. Battery Low, 2. Battery Over Charge, 3. Battery Charging Current Limit

INVERTER SPECIFICATIONS (Continued) :

SYSTEM	MOOLA MD-300
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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 - 300 kVA: 6 X 50 mm GI / Aluminium (Earth Busbar Running along the Panel)
Illumination Lamp	N.A. 11 W CFL			
Gland Plate	N.A. 3 MM MS C.R.C.A.			
Utility Socket	N.A. 5 A / 230 VAC			

BATTERY

kVA Rating	100
Width (W)	1100
Depth (D)	800
Height (H)	1900
Weight (Kg) APPROX.	900
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-300

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

Muladhara Energy Systems Pvt Ltd


CIN: U28162KA2024PTC189342

 +91 99000 19269

 41/7, 3rd floor, 15th cross, Malleswaram Road,
Bengaluru, Karnataka, India.

 www.moolaenergy.com

Pin - 560003

 Sales@moolaenergy.com

 Moola

