

MENARA PACK SERIES




Romeo Power's proprietary pack family exhibits application flexibility and is capable of powering a range of commercial vehicles spanning from Class 3 delivery vehicles to the largest, long-haul Class 8 vehicles. A nod to native Malaysian trees, Romeo Power's tower pack series is called MENARA – which translates to “tower” in Malay

FEATURES:

- ◆ Heavy-duty, weatherproof structure for direct integration (IPX6K, IPX7 and IPX9K)
- ◆ Single cell fault tolerance per UL 2580
- ◆ Designed to Comply with ISO 26262, Cyber Security and ASPICE (Available 2022)
- ◆ Scalable and configurable system design
- ◆ Internal BMS Master can support up to 6P configuration
- ◆ External BMS Master can support up to 16P configuration
- ◆ Serviceable junction box
- ◆ Integrated manifolds for Superior thermal performance
- ◆ Integrated BMS with SOC, SOH and SOP estimations, cell and pack protections, precharge, contactor control, CAN communication (J1939 and UDS), isolation resistance monitoring, and cell balancing

DESIGNED TO

- ◆ ISAE J2380 / 2464
- ◆ ECE R100
- ◆ UN 38.3
- ◆ UL 2580
- ◆ GTR 20
- ◆ DNV

			
MENARA-30	200+ Wh/l Volumetric Energy Density	165+ Wh/kg Gravimetric Energy Density	180+ kWh Complete 6P System
MENARA-80	200+ Wh/l Volumetric Energy Density	160+ Wh/kg Gravimetric Energy Density	735+ kWh Complete 9P System

Pack Specification¹

Electrical Specification	Menara 30	Menara 80 (800V)	Menara 80 (750V) (Available Q3 2022)
Pack Configuration	Configurable up to 6 P	Configurable up to 16 P	Configurable up to 16 P
Pack Capacity ²	Total: 86 Ah, 30 kWh Usable : 75 Ah, 26 kWh	Total: 115 Ah, 81 kWh Usable : 99 Ah, 70 kWh	Total: 115 Ah, 78 kWh Usable : 99 Ah, 67 kWh
Pack Voltage Operating (min, max, nom)	240 V, 403 V, 354 V	480 V, 806 V, 708 V	460 V, 773 V, 679 V
Discharge Capability (1.5C) ³	46 kW	122 kW	117 kW
Normal Charge Capability (0.3C) ²	9 kW	24 kW	23 kW
Fast Charge Capability (0.5 C) ²	15 kW	40 kW	39 kW
Cell Cycle Life	>2000 (use case dependent)		
Precharge	Configurable based on Vehicle Precharge Load.		
Mechanical Specification			
Pack Dimensions L x W x H	994mm x 459mm x 335mm	900mm x 637mm x 715mm	900mm x 637mm x 715mm
Estimated Pack Weight	185 Kg	510 kg	~500 kg
Pack Configuration	3 (3S1P)	8 (8S1P)	8 (8S1P)
Module Cell Configuration	576 (32S18P)	576 (24S24P)	552 (23S24P)
Thermal Specification			
Type of cooling	Liquid, 50/50 Water Ethylene Glycol		
Coolant Pressure	Operational : 30 PSI Maximum : 40 PSI Pressure drop : ~3 psi @ 12 LPM	Operational : 30 PSI Maximum : 40 PSI Pressure drop : ~3 psi @ 24 LPM	Operational : 30 PSI Maximum : 40 PSI Pressure drop : ~3 psi @ 24 LPM
Operational temperature range	Discharge Temperature range : -20°C to 60°C Charge temperature range : 0°C to 45°C* *Packs allowed to be heated with external power source between -20°C to 0°C		
BMS specification			
BMS Control	Internal Master / External Master Wake-up Source : CAN		
BMS Power	Input Supply : 24V / 12V Current Consumption : Operating – Peak (12V/24V) : 3.4 A / 1.65 A Sleep : 70 mA		
Firmware	Configurable according to specific application		
CAN Channel	Vehicle CAN : J1939-71 (Internal)/ Romeo Power Proprietary (External), 250 Kbps / 500 Kbps Diagnostic CAN : Romeo Power Proprietary, 500 Kbps Battery CAN : Romeo Power Proprietary, 500 kbps (Only for Internal)		
Safety Features			
Voltage	Over Voltage Protection, Under Voltage Protection, Cell balancing		
Current/short circuit	Overcurrent Protection		
Temperature	Over Temperature Protection, Under Temperature Protection		
Communication	Loss of Heartbeat, BMB Communication Fault		
Internal Leakage Detection	Flood Detection		
Isolation	Isolation Measurement and Protection		
Service related	Manual Service Disconnect, High Voltage Interlock Loop check		

1 - Pack Specifications are subject to change 2 - Estimated a beginning of life conditions and depends on temperature and discharge rate.

3 - Depends on SOC, temperature, battery age and user profile.

BATTERY MANAGEMENT SYSTEM

