

Summary of the Battery pack specifications for L38E

April 2011

Technical Specifications of the battery pack

Item			Requirement
Configuration of the battery pack	Contents of the battery pack		The battery pack contains following components: -Li-ion battery cell (or module or block) -Electrical connection inter cells -Battery management system (BMS) -Junction Box -Service Disconnect Switch (SD/SW) -Fuse -Integrated Quick Drop connector (HV and 14V) -Pack structural parts, frames -Quick Drop locking system -Pack outer casing -Interface for external cooling air inlet and outlet
	Battery cell	Type	Lithium-ion, flat laminated pouch type
		Capacity	32,5 +/-1Ah (25°C, 1C, BOL)
		Voltage	2.5 V ~ 4,2 V (min ~ max), 3.75 V (nominal)
	Battery module configuration		4 cells per module 2 in parallel, 2 in series
	Battery pack configuration		3 stacks of 16 modules connected in series (total 48 modules, 192 cells in 2P 96S)
	Pack Weight		290 kg
	Over all dimensions		764 x 1288 x 832 mm (L W H)
	Vehicle installation		The battery pack will be installed just behind the rear seats with the "Quick Drop" system.
Performance	Voltage range		240 ~ 403 V
	Usable Energy		22 kWh (25°C, BOL)
	Energy at low temperature		19 kWh at 0°C 11,5 kWh at -20°C
	Max peak discharge power		> 85 kW 10 sec, 25°C, SOC 20 %
	Max peak charge power		35 kW max Following BMS limitations
	Power derating		Max discharge and charge power can be reduced when the battery temperature is too high. (at 48°C 100% → at 60°C 0%)
	Max power at low temperature		> 85 kW 10 sec, 25°C, SOC 20 %
	Quick charge at the QD station		The battery can be charged at 20kW in nominal conditions. 35kW charge rate is acceptable when battery temperature is below 33°C. The quick charge power shall be supplied by the QD station. The quick charge requires the cooling air specified hereafter.
	Life		5 years or 30MWh or 150000 km following warranty conditions
	Self-discharge		< 5 % in 3 months at 30°C

Battery management system	Battery management system (BMS) has following functions: -Battery state measurements (voltage, current, temperature) -SOC calculation -Max discharge power calculation -Max charge power calculation -SOH (state of health) estimation -Battery cell over voltage, under voltage detection -Battery cells SOC balancing -Diagnosis of the battery pack and BMS itself -CAN communication with the vehicle system -CAN communication with the Diagnostic tool
Junction box	Battery junction box includes: -Main relays for both positive and negative outputs -Pre-charge relay and resistor in parallel with the positive side main relay
Service disconnect switch	A manual disconnection in case of maintenance of the vehicle system A fuse is integrated in the SD/SW
Battery cooling	External cooling system is applied to cool down the battery temperature during charge. Normal charge: on board air cooling system using Peltier devices. No disconnection from the grid is allowed when the Peltier device is switched On. Quick charge: external air cooling system at the QD station Requirements for the cooling air from the QD station for quick charge : Air flow rate: 500 kg/h Air temperature: 5 °C Air need to be filtered to avoid any dust and too much humidity.
Quick Drop	The quick drop locking system is integrated into the pack case.
Connection	The connection/disconnection of HV network as well as 14V lines is done automatically when the battery replaced with the “Quick Drop” system. Specific quick drop connector is integrated into the pack.
Pack outer casing	The battery pack is protected from the water, dust and human access at the degree of IP67B (connection, SD/SW open), IP67D (connection, SD/SW closed), at the vehicle level. (battery mounted on the vehicle)
Reliability of the pack	Requirements for the Renault’s vehicle environment are fulfilled - vibration - thermal cycling - impact, vehicle crash - humidity
Environmental temperature range	Operating temperature range: -25°C ~ 60°C Storage temperature range: -25°C ~ 25°C (more than 30°C storage can significantly accelerate the degradation of the battery)
Safety of the pack	Comply with existing Standards and Regulations for Li-ion battery and high voltage system. No fire / No explosion under the considerable conditions in the vehicle.