Summary of the Battery pack specifications for L38E

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## Technical Specifications of the battery pack

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<th>Item</th>
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| Configuration of the battery pack Contents of the battery pack | The battery pack contains the 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 |
| Battery cell Capacity                     | 32.5 +/-1Ah (25°C, 1C, BOL) |
| Battery cell 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. |