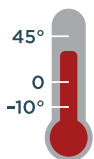
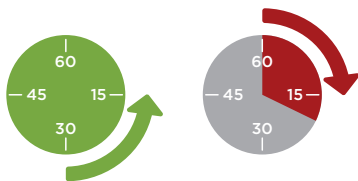
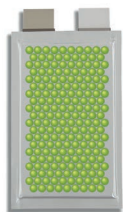
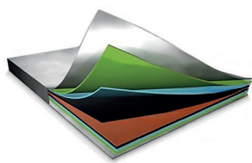


Energy M2 Modules (G-NMC)



Leclanché is a Swiss-German company with 110 years of experience providing battery systems and energy storage solutions with high precision and reliability.

The Lithium-Ion Graphite/NMC Series (G-NMC)



The heart of any storage system is the cell. Its quality determines the performance of the entire storage system. Leclanché's Li-Ion G-NMC cells are made of the highest quality materials, with a robust bi-cell construction, using unique, state-of-the-art processes to maximise safety and cycle life.

■ Industry Leading Safety and Reliability

Unique features such as the bi-cell laminate design, integrated with a ceramic separator, make Leclanché's G-NMC cells capable of withstanding abuse without catastrophic, thermal runaway occurring.

■ High Energy Density

The G-NMC technology used by Leclanché provides a 25% energy density advantage over LFP chemistries allowing a greater payload or a longer range.

■ 6,400 Cycles

With 6,400 charge/discharge cycles at 80% DoD, Leclanché's G-NMC cell typically quadruples the cycle life of most competitors and is ideal for long term investments and low-maintenance energy storage systems.

■ 1C Charge and 3C Discharge

The design and quality of the G-NMC cells permit a constant discharge of up to 3C and 1C charging. The cells are capable of 5C for a 10 second pulsed discharge.

■ Up to 100% Depth of Discharge

The Leclanché G-NMC cells can be operated at up to 100% Depth of Discharge (DoD). If the battery is depleted completely through each cycle, the lifetime will be 3,600 cycles.

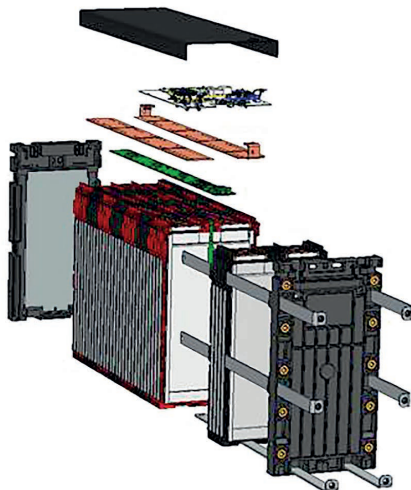
■ Wide Temperature Range (-10°C* to 45°C)

The Leclanché G-NMC cells perform well across a broad range of temperatures (-10°C to 45°C). The G-NMC cells out perform LFP at lower temperatures.

* -10°C in discharge only, lower temperature limit for charge is 0°C

With industry leading lithium-ion technology, we customize battery solutions for power and energy intensive applications.

The M2 Modules



Leclanché pouch cells represent the highest quality, safety and cycle life. The M2 modules give convenient access to the good performance of the cells while providing :

- Rugged and resilient (50g acc. and 4kV isolation tested) housing for high quality pouch cells.
- Faster pack assembly - Less time connecting individual cells and integrating battery management.
- Choice of capacity, voltage and size.
- Better thermal management - Each module is designed using careful thermal analysis to ensure even temperature distribution and heat sinking across all cells in the module.
- All modules have built-in battery management electronics to simplify installation.

There are 37 separate G-NMC configurations based on 14 module sizes (see table). Parallel string connections are also supported for higher pack capacities. Modules can be liquid cooled with conductive cooling plates or force air cooled.

The Advanced Battery Manufacturing Facilities



- Annual production capability of >1 million large format, prismatic pouch cells - up to 185 MWh.
- External testing and certification performed by renowned laboratories, including VTT Technical Research Centre of Finland, ENEL, TÜV Rheinland and Landshut University of Applied Sciences.
- ISO14001 environmental certification underscoring Leclanché's commitment to the environment and its protection.
- Unique water based* cell manufacturing process providing improved cell longevity with lower environmental impact

*Solvent free manufacturing using unique waterbased slurry process

The Leclanché Advantage

Engineered to rigorous standards in Switzerland, our cells are manufactured in a state-of-the-art production facility in Germany. Our modules, packs and racks are produced in Switzerland. Leclanché battery products offer unrivalled safety, quality and durability.

The Leclanché Philosophy: Provide customers with the highest possible quality, reliability and service.

The Energy M2 Battery Module for Mobility (G-NMC)

Battery System

Cell chemistry
Cell voltages
Nominal cell capacity
Specified cycles
(1C/1C @23°C at 80% DoD)
Specified cycles
(1C/1C @23°C at 100% DoD)
Maximum calendar lifespan (@23°C)

G-NMC
3.7V nominal
55 Ah
6,400 cycles
3,600 cycles
10 years

Battery Management

Integrated Battery Management System (BMS)
Max. voltage
External communications (from BCU)
Isolation monitoring
Multi string configurations

Yes (CE, e, DNV-GL cert.)
1,000 V
2x CAN bus
Yes
Supported with external PLC



Module type	# of cells	Nominal Capacity	Nominal Energy	Max. Voltage	Nominal Voltage	Min. Voltage	Width	Height	Length	Weight
11s3p	33	165 Ah	6.3 kWh	45,10 V	40,15 V	34,10 V	175mm	334mm	537mm	49,5 kg
16s2p	32	110 Ah	6.1 kWh	65,60 V	58,40 V	49,60 V	175mm	334mm	522mm	48,2 kg
8s4p	32	220 Ah	6.1 kWh	32,80 V	29,20 V	24,80 V	175mm	334mm	522mm	48,2 kg
4s8p	32	440 Ah	6.1 kWh	16,40 V	14,60 V	12,40 V	175mm	334mm	522mm	48,2 kg
15s2p	30	110 Ah	5.7 kWh	61,50 V	54,75 V	46,50 V	175mm	334mm	493mm	45,5 kg
6s5p	30	275 Ah	5.7 kWh	24,60 V	21,90 V	18,60 V	175mm	334mm	493mm	45,5 kg
5s6p	30	330 Ah	5.7 kWh	20,50 V	18,25 V	15,50 V	175mm	334mm	493mm	45,5 kg
14s2p	28	110 Ah	5.4 kWh	57,40 V	51,10 V	43,40 V	175mm	334mm	463mm	42,7 kg
7s4p	28	220 Ah	5.4 kWh	28,70 V	25,55 V	21,70 V	175mm	334mm	463mm	42,7 kg
4s7p	28	385 Ah	5.4 kWh	16,40 V	14,60 V	12,40 V	175mm	334mm	463mm	42,7 kg
24s1p	24	55 Ah	4.6 kWh	98,40 V	87,60 V	74,40 V	175mm	334mm	404mm	37,3 kg
12s2p	24	110 Ah	4.6 kWh	49,20 V	43,80 V	37,20 V	175mm	334mm	404mm	37,3 kg
3s8p	24	440 Ah	4.6 kWh	12,30 V	10,95 V	9,30 V	175mm	334mm	404mm	37,3 kg
8s3p	24	165 Ah	4.6 kWh	32,80 V	29,20 V	24,80 V	175mm	334mm	404mm	37,3 kg
6s4p	24	220 Ah	4.6 kWh	24,60 V	21,90 V	18,60 V	175mm	334mm	404mm	37,3 kg
4s6p	24	330 Ah	4.6 kWh	16,40 V	14,60 V	12,40 V	175mm	334mm	404mm	37,3 kg
22s1p	22	55 Ah	4.2 kWh	90,20 V	80,30 V	68,20 V	175mm	334mm	375mm	34,6 kg
11s2p	22	110 Ah	4.2 kWh	45,10 V	40,15 V	34,10 V	175mm	334mm	375mm	34,6 kg
7s3p	21	165 Ah	4.0 kWh	28,70 V	25,55 V	21,70 V	175mm	334mm	360mm	33,2 kg
3s7p	21	385 Ah	4.0 kWh	12,30 V	10,95 V	9,30 V	175mm	334mm	360mm	33,2 kg
20s1p	20	55 Ah	3.8 kWh	82,00 V	73,00 V	62,00 V	175mm	334mm	345mm	31,9 kg
10s2p	20	110 Ah	3.8 kWh	41,00 V	36,50 V	31,00 V	175mm	334mm	345mm	31,9 kg
5s4p	20	220 Ah	3.8 kWh	20,50 V	18,25 V	15,50 V	175mm	334mm	345mm	31,9 kg
4s5p	20	275 Ah	3.8 kWh	16,40 V	14,60 V	12,40 V	175mm	334mm	345mm	31,9 kg
16s1p	16	55 Ah	3.1 kWh	65,60 V	58,40 V	49,60 V	175mm	334mm	286mm	26,4 kg
8s2p	16	110 Ah	3.1 kWh	32,80 V	29,20 V	24,80 V	175mm	334mm	286mm	26,4 kg
4s4p	16	220 Ah	3.1 kWh	16,40 V	14,60 V	12,40 V	175mm	334mm	286mm	26,4 kg
14s1p	14	55 Ah	2.7 kWh	57,40 V	51,10 V	43,40 V	175mm	334mm	257mm	23,7 kg
7s2p	14	110 Ah	2.7 kWh	28,70 V	25,55 V	21,70 V	175mm	334mm	257mm	23,7 kg
12s1p	12	55 Ah	2.3 kWh	49,20 V	43,80 V	37,20 V	175mm	334mm	227mm	21,0 kg
6s2p	12	110 Ah	2.3 kWh	24,60 V	21,90 V	18,60 V	175mm	334mm	227mm	21,0 kg
4s3p	12	165 Ah	2.3 kWh	16,40 V	14,60 V	12,40 V	175mm	334mm	227mm	21,0 kg
3s4p	12	220 Ah	2.3 kWh	12,30 V	10,95 V	9,30 V	175mm	334mm	227mm	21,0 kg
11s1p	11	55 Ah	2.1 kWh	45,10 V	40,15 V	34,10 V	175mm	334mm	212mm	19,6 kg
10s1p	10	55 Ah	1.9 kWh	41,00 V	36,50 V	31,00 V	175mm	334mm	198mm	18,3 kg
5s2p	10	110 Ah	1.9 kWh	20,50 V	18,25 V	15,50 V	175mm	334mm	198mm	18,3 kg
8s1p	8	55 Ah	1.5 kWh	32,80 V	29,20 V	24,80 V	175mm	334mm	168mm	15,5 kg
4s2p	8	110 Ah	1.5 kWh	16,40 V	14,60 V	12,40 V	175mm	334mm	168mm	15,5 kg

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