

FLEX 7 energy & power battery module

High autonomy or opportunity charging system for all electric transport

Transport is going all-electric, pushing the boundaries of battery systems' autonomy and power.

Based on NMC pouch cells, the Flex 7 lithium-ion battery system provides a good balance of energy and power for full-day autonomy or opportunity charging.

SYSTEM HIGHLIGHTS

Li-ion battery system with high-power-to-energy ratio

- + Powerful in charge and discharge: 2,5 C continuous, 3,5 C peak
- + Scalable: modular system based on 7 kWh modules connected both in series and in parallel
- + Liquid thermal management
- + Best-in-class proprietary BMS technology
- + Certification R-100-2



A complete battery system is made of:

- + 1 to 8 modules of 7 kWh each: 90 V to 800 V nominal
- + Battery Management Controller (BMC)
- + Power Distribution Unit (PDU)
- + Master BMS to manage several strings in parallel (100 kWh to several MWh)

BENEFITS

- + Robust and long-life span: up to 15 years
- + Homogeneous performance in all climate conditions
- + Compliant with automotive safety standards
- + Great safety and reliability
- + Optimized weight and volume for high vehicle's capacity

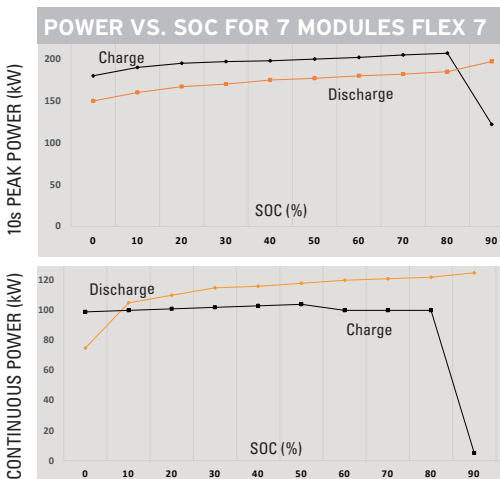
- + Designed to be easily integrated in various vehicles and geometries:



Flex 7 energy & power Li-ion NMC battery system

PHYSICAL SPECIFICATIONS	CONDITIONS	UNIT	# MODULES							
			1	2	3	4	5	6	7	8
VOLTAGE										
Minimal	-	V	65	130	194	259	324	389	454	519
Nominal	-	V	89	178	266	355	444	533	622	711
End of charge	-	V	98	197	295	394	492	590	689	787
Maximum (Regeneration)	-	V	101	202	302	403	504	605	706	807
ENERGY / CAPACITY										
Embedded energy	C/2, BOL	kWh	7.1	14.2	21.3	28.4	35.5	42.6	49.7	56.8
Self discharge	BOL	%	< 1.54% per month							
System capacity	BOL		80 Ah - two cells of 40 Ah in parallel							
POWER										
Max. continuous power in discharge	SOC 50%	kW	18	36	53	71	89	107	124	142
Peak power in discharge (30 s)	SOC 50%	kW	27	53	80	107	133	160	186	213
Max. continuous power in charge	SOC 50%	kW	18	36	53	71	89	107	124	142
Peak power in charge (30 s)	SOC 50%	kW	27	53	80	107	133	160	186	213
CURRENT										
Maximum continuous current in discharge	-	A	200 (2.5 C)							
Peak current in discharge (30 s)	SOC 50%	A	300 (3.5 C)							
Maximum continuous current in charge*	-	A	200 (2.5 C)							
Peak current in charge (10 s)	SOC 50%	A	300 (3.5 C)							
DENSITY										
Specific energy	BOL	Wh/kg	88							
Energy density	BOL	Wh/L	130							
Power density	BOL	kW/kg	219							
CYCLE LIFE										
Cycle life	80% DOD, 1C/1C		> 10,000 cycles							
MECHANICAL CHARACTERISTICS										
Weight without water		kg	81	162	243	324	405	486	567	648
Weight with water		kg	83	166	249	332	415	498	581	664
Volume		Liter	55	-	-	-	-	-	-	-
Height		mm	274	-	-	-	-	-	-	-
Width		mm	280	-	-	-	-	-	-	-
Depth without connectors		mm	670	-	-	-	-	-	-	-
Depth with connectors		mm	713	-	-	-	-	-	-	-

@ 25°C | * to maximize lifetime, 1C charge is recommended | SOC: State Of Charge | SOH: State Of Health | DOD: Depth of Discharge | BOL: Beginning Of Life



SYSTEM VALIDATIONS & CERTIFICATIONS	
Electrical regulation	R-100-2
Transport certification (altitude / thermal / vibration / shock / external short circuit)	UN DOT 3480
Safety test (penetration / immersion / drop)	Ellicert
Humidity / thermal & mechanical shocks / vibrations	ISO 12405-2
High & low temperature / salt spray / corrosion resistance	EN 60068-2
Thermal cycling	ISO 12405-2
Immersion / high pressure sealing	ISO 20653
IP class (IEC 60529)	IP 67
EMC	ISO 7637 ISO 11452-2 EN62040-2:2006