

ZEN 4 high-energy battery module

High-autonomy system for full-day operations

Transport is going all-electric, pushing the boundaries of battery systems' autonomy. Based on NMC pouch cells, Forsee Power teams have specifically developed the Zen 4 lithium-ion battery system to provide high energy for a complete day of operations with minimum weight.

SYSTEM HIGHLIGHTS

Li-ion battery system with unique energy density

- + Energy density: 140 Wh/kg - 220 Wh/L at module level
- + Scalable: modular system based on 4 kWh modules connected both in series and in parallel
- + Air cooling system
- + Best-in-class proprietary BMS technology



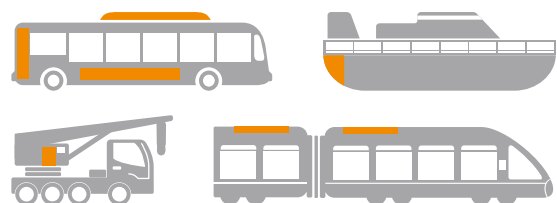
A complete battery system is made of:

- + 1 to 48 modules of 4 kWh each : 14,6 V to 701 V nominal
- + Battery Management Controller (BMC)
- + Power Distribution Unit (PDU)
- + Master BMS to manage several strings in parallel

BENEFITS

- + Robust and long-life span: up to 10 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:



Zen 4 high-energy Li-ion NMC battery system

PHYSICAL SPECIFICATIONS	CONDITIONS	UNIT	MODULE	STRING EXAMPLES # modules / string				SYSTEM EXAMPLES # strings / system (44 modules / string)		
				...	42	44	46	...	1	2
VOLTAGE										
Minimal		V	12.0	504	528	552			528	
Nominal		V	14.6	613	642	672			642	
End of charge		V	16.4	689	722	754			722	
ENERGY / CAPACITY										
Energy	C/3, BOL	kWh	3.9	166	173	181		173	347	520
Capacity	C/3, BOL	Ah	270		270			270	540	810
POWER										
Max continuous power in charge / discharge	SOC 50%	kW	0.8	33	35	36		35	62	94
Peak power in charge / discharge	SOC 50%	kW	3.9	166	173	181		270	312	468
CURRENT										
Max continuous current in charge / discharge	SOC 50%	A	54 (C/5)		54			54	97	146
Peak current in charge / discharge	SOC 50%	A	270 (1C)		270			270	486	729
ENERGY										
Specific energy	-	Wh/kg						140		
Energy density	-	Wh/L						220		
Power density	-	W/kg						30		
MECHANICAL CHARACTERISTICS										
Volume		Liter	18	756	792	828		792	1 584	2 376
Weight		kg	28	1 176	1 232	1 288		1 232	2 464	3 696
Height		mm	304	-	-	-		-	-	-
Width		mm	180	-	-	-		-	-	-
Depth		mm	330	-	-	-		-	-	-

@ 25°C | BOL: Beginning Of Life | SOC: State Of Charge

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