Modul'ion®-12 Energy

Super-Phosphate™ (SLFP) 20 V or 40 V module

High Energy in a versatile module for battery systems.
Designed for industrial vehicles and railway applications.

Its modular design allows engineering of different battery configurations, meeting customers' application requirements, in one high performance system.

The battery system, comes equipped with Saft battery management electronics, thermal management (when application requires it), safety, communication, and control interfaces to the host vehicle.

Applications

- Electric and hybrid vehicles
- Railway applications

Module features

- High energy density
- Quick recharge capabilities (e.g. regenerative braking application)
- High life cycle performance
- Robust construction withstanding onboard vehicle shocks and vibrations
- Liquid cooling/heating system
- CAN BUS communication

Benefits

- Facilitates on time vehicle development and integration thanks to its modular architecture
- Improves vehicle's driving range and reduces CO_2 footprint

Battery system features

- Modular system approach
- Scalable (series or parallel configurations) up to 1000 V or 200 kWh
- Saft Battery Management System (SOC, SOH, protection devices, current sensor)
- Active or passive thermal management

	Modul'ion®-12 Energy	
	40.43 EFe	20.86 EFe
Nominal characteristics at + 25°C / + 77°F		
Nominal voltage (V)	39.6	19.8
Rated capacity (C/5) (Ah)	41	82
Typical capacity (C/5) (Ah)	43	86
Typical energy (C/5) (Wh)	1703	1703
Volumetric energy (Wh/l)	148	148
Gravimetric energy (Wh/kg)	111	111
Mechanical characteristics		
Width (mm)	375	375
Height (mm)	270	270
Depth (mm)	114	114
Weight (kg)	15.4	15.4
Thermal management	Liquid cooled /heated	Liquid cooled /heated
Electrical characteristics at + 25°C / + 77°F		
Voltage window (V)	45.6 to 30	22.8 to 15
Max. continuous discharge current (A)	100	200
Max. continuous charge current (A)	41	81
Max. pulse discharge current in 10 s (A)	225	450
Max. pulse charge current in 10 s (A)	90	180
Power peaks in 10 s (kW)	8.9	8.9

Data are typical value, please consult Saft for battery sizing

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Safety

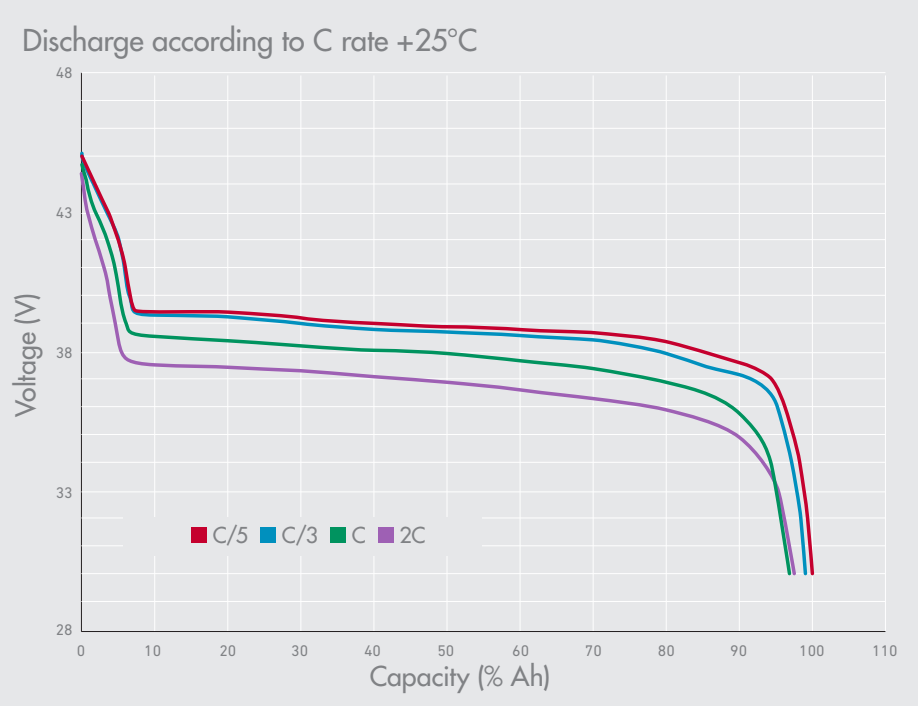
Safety driven design for cells, modules and systems guarantees safe behavior in case of abuse usage or component failure. This includes:

- Stringent design rules and qualification
- Implementation of redundant safety features
  - at cell level (e.g. shutdown effect separator and mechanical vent)
  - at module level (e.g. electronic board, voltage and temperature monitoring, balancing)
  - at battery level (e.g. electronic board, power switch and current sensor)

Operating conditions	
Operating temperature	-25°C to +60°C (-13°F to 140°F)
Calendar lifetime (+25°C/+77°F)	20 years
Recommended temperature for transport and storage	+10°C to +30°C (50°F to 86°F)
Allowable temperature for transport and storage	-40°C to +70°C (-40°F to 158°F)
Storage time for self-discharge	6 months
Design to comply with	
Cell safety	UL 1642
Transport qualification	UN 3480, class 9 (group II)
Marking	CE
Fire and smoke	NFF 16-101/102 (cat. A1) NFPA 130
Shock and vibration	IEC 61373
Directives / Regulations	REACH*, Voluntary RoHS**

**REACH: The Saft group has adopted internal procedures to ensure conformity with the European REACH Regulation*

***RoHS: Also batteries are not within the scope of the RoHS Directive, Saft has taken voluntary measures to ensure that the substances forbidden by RoHS are not present in the battery, with the exception of the electrochemical core.*



Contact Technical Support for the performance of your specific configuration

Data are typical value, please consult Saft for battery sizing upon specific profile

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Doc No.: 21931-0815-2
Edition: August 2015