

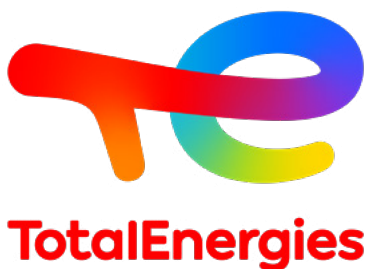


SAFT



Intensium[®] max Energy storage systems

Maximizing the value of energy storage
assets through battery-centered AC solution
designs



Battery expertise at the heart of every ESS

We have more than 100 years of experience in the design and manufacture of battery systems for high end industrial applications. That's why we understand the critical, value generating nature of the battery component at the heart of any energy storage system (ESS).

Saft AC-ESS solutions integrate high-performance Intensium® Max Li-ion batteries with our own advanced in-house control algorithms and fully qualified PCS, control and protection equipment. Scalability up to 100's of MW is achieved with modular, containerized AC and DC building blocks tested in our factories.

We select the specific components and functionalities to optimize the revenue generating opportunities for each and every ESS application, based on a decade of cooperative experience with over 20 PCS brands.

Benefits at a glance



Secure Revenue

Our designs ensure optimal AC system availability, operability and maintainability.



Secure Service

We provide a single point of responsibility for design, supply and services, supporting our customers through long-term partnerships.



Secure project start

We deliver fast, de-risked installation and commissioning thanks to standardized building blocks that support a set of robust architectures.

Features

State-of-the art Power Conversion

- Large units up to 4MW, for optimized system footprint and ease of installation
- Supporting all on-grid and off-grid functions
- High efficiency even at partial load
- High availability
- Suitable for harsh environments

Power Management and SCADA

- Scalable from 1MW to 100 MW multiples
- Consistent DC and AC control chain: system control and user interface integrates seamlessly with high resolution battery data and control algorithms
- Optimizes power dispatch with high accuracy of SOC (state of charge) indication, even in systems with massive string paralleling
- DC and AC operation data available in real-time with high granularity, through local and cloud-based data logging and data management
- High cybersecurity level: IEC 62443-4-2 compliance SL-2

Scope

Basic scope of supply

- Intensium Max Li-ion 20-foot battery containers, 1500 V DC
- DC/AC power conversion systems (PCS)
- Power management system (PMS) and SCADA

Optional scope of supply

- Energy management system (EMS)
- LV/MV and MV/HV transformers
- MV and HV switchgear
- Auxiliary transformer

Customers benefit from

Extended product warranties
Performance guarantees for

1. Capacity degradation
2. Roundtrip efficiency
3. Uptime

► Covering the full AC system up to the POC

Examples of Li-Ion LFP ESS configurations to illustrate possible architecture

	Typical configuration	Single container Single PCS - 1C	Single container Single PCS - 0.5C	Two containers Single PCS - 0.5C or 0,25C	Multiple containers Single PCS - 0.25C	
	Nominal discharge duration	1 hour	2 hours	2 or 4 hours	4 hours	
	AC power at MV level	2.3 MW	1.2 MW	2.3 or 1.2 MW	4 MW	
	PCS AC voltage	480 V - 720 V				
	DC battery energy	2.3 MWh	2.3 MWh	4.6 MWh	Up to 18 MWh	
	MV grid connection	Up to 36 kV				
	Operational temperature range	-20°C to 50°C options down to -40°C available				
	Altitude	2000 m - higher altitudes with power de-rating				
General data	Packaging	2 containers 20 ft	2 containers 20 ft	2 containers 20 ft	Up to 9 containers 20 ft	
	Typical DC+AC footprint	~ 190 m ²	~ 190 m ²	~ 320 m ²	~ 500 m ²	
	Power factor range	-1.0 to 1.0				
	Power conversion efficiency	98.50%				
	Maximum current AC	Different products up to 6200 A				
	Response time	< 150 ms				
	Compliance	PCS: UL 1741/-SA, UL/IEC62109-1		Battery: UN3536 UL 1973 IEC 62619, IEC 62477, UL 9540A System: UL 9540		
	System integration	Standard full system factory integration and testing prior to shipment to site				
		Segment / application	Grid connected ancillary services (e.g. frequency response)	PV time shifting, microgrid	Energy arbitrage and time shifting	Energy arbitrage and time shifting
	Typical usage	Daily operating profile	Shallow cycling	Up to 95% DoD cycle	Up to 95% DoD cycle	Up to 95% DoD cycle
Project life		Up to 20 years				
AC/AC system roundtrip efficiency		87% for typical usage (application dependent)				
Functions	Grid forming	Yes	n.a.	Yes	Yes	
	Blackstart	Yes	n.a.	Yes	n.a.	
	Islanding	Yes	n.a.	Yes	Yes	
	Reactive power control	Yes				
Optional services	Augmentation	Available				
	Uptime guarantee	Yes				
	Performance guarantee	Yes				
After-sales services	Preventive / Corrective maintenance	Yes				
	Spare parts management	Yes				
Battery details	Battery management system	Saft proprietary BMS				
	Container parallelling	Saft CUBE: master / slaver container control units				
	Remote control	Remote operation monitoring and reporting. Parameter update. Software upgrade				

We energize
the world.
On land,
at sea,
in the air
and in space.

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