

Intensium® Max+ 20P

High power lithium-ion container 2.5 MW / 2.8 MW

Intensium® Max is Saft's ready to install containerized Energy Storage System (ESS) designed for grid applications requiring both energy and power combined with high efficiency and long life

Built with latest generation of NMC/NCA Li-ion technology, Intensium® Max+ 20P is a fully integrated storage system, combining high operational reliability with outstanding power capability. It enables dynamic cycling at high power in charge and discharge, with a high daily energy throughput of up to 800% of its installed nominal capacity.

Its modular design based on up to 18 parallel strings of 30 Synerion 24P modules allows a power rating of 2.5 MW on one single power outlet, or 2.8 MW on two power outlets.

Applications

- Integration of variable renewables: smoothing and ramp control
- Ancillary services: frequency regulation, spinning reserves, voltage regulation, black-start
- Microgrids: diesel bridging & spinning reserve

Features

- Latest generation NMC/NCA Li-ion technology
- Advanced industrial design offering highest safety and robustness
- 20 years design life with 60 daily cycles at 10% depth of discharge
- Proven architecture for high availability
 - Modularity with one Battery Management Module (BMM) per string
 - Master Battery Management Module (MBMM) for global management
 - One PLC for external communication and remote monitoring
- Sophisticated battery management for enhanced operability in grid applications
 - Monitoring and control of voltage and temperature at cell level
 - Real time supervision of charge and discharge current limits
 - Real time indication of State of Charge (SOC)
 - Balancing of State of Charge (SOC) between cells and strings
 - Alarms and faults management (contactor opening rules)
 - Indication of State of Health (SOH) integrating cycling and calendar aging
 - Black box registering alarms and number of cycles



	1 power output	2 power outputs
Nominal characteristics at + 25°C/+ 77°F		
Voltage (V)	771	771
Capacity (C/5) (Ah)	1021	908
Rated energy (C/5) (kWh)	780	700
Continuous discharge power (kW)	2500	2800
Continuous charge power (kW)	2600	2900
Mechanical characteristics		
Length (mm)	6058	6058
Width (mm)	2438	2438
Height w/o HVAC (mm)	2896	2896
Height incl HVAC (mm)	3820	3820
Weight (tonnes)	19.5	19
Electrical characteristics at + 25°C/+ 77°F		
Minimum Voltage (V)	630	630
Maximum Voltage (V)	867	867
Maximum continuous discharge current (A)	3380	3760
Maximum continuous recharge current (A)	3380	3610
Discharge time at nominal power (h)	0.3	0.25
Time to full recharge (h)	0.3	0.25
Insulation resistance (1kVdc - 0C)	> 10mΩ	> 10mΩ
Dielectric	2.5kVdc	2.5kVdc
Operating conditions		
Operating temperature	-20°C/+55°C	-20°C/+55°C
Cycle efficiency (DC roundtrip, 1C)	96%	96%
Self-discharge	<5% / month	<5% / month
Calendar life at 25°C / +77°F	> 25 years	> 25 years
Cycle life at 25°C / +77°F, 1C/1C, 80% DOD (*)	6000	6000

(*) 20% capacity loss



SAFT

- Advanced thermal management system based on air conditioning unit and controllable fans
 - High cooling efficiency
 - Temperature homogeneity
- Safety management system with smoke detection, fire suppression system and alarms

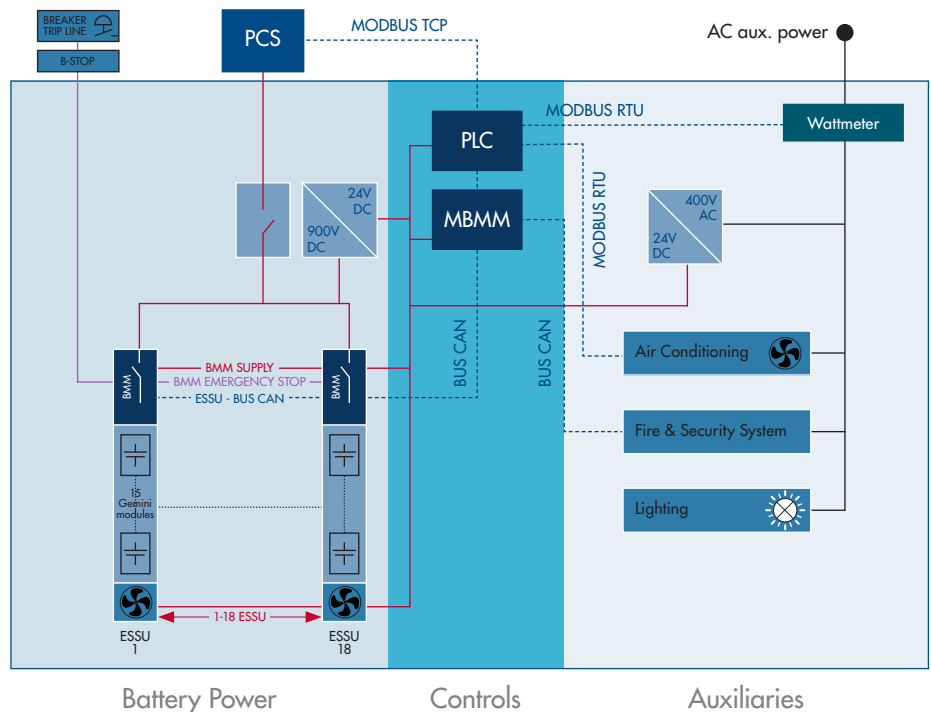
Benefits

- Lowest Total Cost of Ownership in high power applications with demanding operation profiles
 - high level of system power reducing number of container installations
 - high energy throughput with minimum auxiliary consumption
 - long cycle life and calendar life despite increased temperatures
- Quick and cost effective installation, with containers delivered « plug and play » ex factories due to ready to deploy solution fully assembled ex factory, plug and play
- Easy system integration: compatible with most power conversion systems in the market
- Excellent flexibility: optimum configuration of strings/containers and power interfaces for each project
- High availability and serviceability due to parallel connection of strings
- Low maintenance - diagnostic interface available
- Remote supervision capability

Safety

- Safety driven design guarantees safe behavior in case of abuse usage or cell thermal runaway.
 - cell level: mechanical venting to release gases, materials selected for high temperature resistance
 - module level: electronic board for cell monitoring and balancing; structural protection to avoid thermal runaway propagation
 - string level: BMM to manage short-circuits, over-currents, overtemperature and over-voltages
 - container level: emergency push buttons, DC disconnect switch to perform maintenance, ground fault detection and fire suppression system
- Fire suppression system performs the following action in case of smoke detection:
 - Release of inert gases (nitrogen or argon) to stop combustion
 - Contactor opening
 - Information on external displays and with audible alarms
 - Stop of air conditioning unit and fans
 - Sending alarm to control system

Storage conditions	
Storage temperature	- 20°C/+ 55°C (- 4°F to + 131°F)
Storage time	6 months
Maximum altitude	3000 m above sea level
Maximum relative humidity	100% (controlled inside at 60%)
Compliance to standards	
Cell safety	UL 1642, IEC 62619
Module safety	EN 50178 / IEC 60950
Container safety	IEC 61508 (SIL1)
EMC	IEC 62 040-2 Cat C1 and C3
Container protection class (operation)	IP 33
Container dimension and transport	ISO668
Container corrosion protection	ISO 12944 Level C5I
Seismic	Eurocode zone 5 / IEEE 693 high level
Environment	IEC 60721 (dust, chemical / biological pollution, wind, precipitation, fire exposure)
Transport classification	UN 3480 - Class 9
Transport regulation compliance	UN 3480 - ST/SG/AC.10/11 Rev 5 § 38.3
Marking	CE
Directives	ROHS, REACH, WEEE
Manufacturing plants	ISO 9001, QS 9000, ISO 14000
Noise	56 dB at 2 m



Battery System Architecture

- 16 to 18 Energy Storage System Units (ESSU)
 - 30 Synerion modules in series
 - One Battery Management Module (BMM)
- One or two distribution cabinets for DC power output
 - 1 x 2.5 MW or 2 x 1.4 MW
 - Communication interface via MODBUS TCP (other protocols are optional)
- Disconnect switch
- Master Battery Management Module (MBMM)
- Programmable Logic Controller (PLC)
- Two auxiliary power supplies
 - 400V AC for HVAC, FSS, lighting
 - 24V DC for electronics and fans, internal DC self-supply available
- Ground fault detection function (optional)
- External emergency stop



Saft

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