# Synerion® 48M

## Medium power lithium-ion module 48 V – 2 kWh

Saft's Synerion 48M **medium power capability** module is designed to meet the needs of centralised distributed power and data centers, and demanding UPS applications.

The Synerion 48M module provides high power, high energy density, maintenance-free operation using Saft's proven lithium-ion technology, and can be adapted for hundreds of kW to meet particular battery system requirements.

Combined with high operational reliability over thousands of cycles, and with outstanding energy efficiency, its modular design adapts through series or series/parallel connection to supply medium power discharge characteristics.


### Applications

- Distributed Power Central Office (DPCO)
- Central Offices (CO)
- Data Centers
- UPS

### Features

- Rack-mount ETSI format
- Adapted for discharge times of 15 min and more
- Compact module integrating SAFT VL M Li-ion cells, module supervision and cell balancing
- Advanced industrial design offering highest reliability and robustness
- 20 years design life
- 2 C power capability enabling highly dynamic charge/discharge profiles from any state of charge
- State of charge and state of health indication through BMM (Battery Management Module)

### Benefits

- Four to eight times lighter than VRLA
- Increased energy in given space
- Easy system integration and up-scaling (19")
- High operational reliability
- Very long life time
- Preventive but not premature replacement at end of life
- Minimum maintenance throughout life time
- Low total cost of ownership

| Nominal characteristics at + 25°C/+ 77°F | |
|---|---|
| Nominal Voltage (V) | 48 |
| Capacity (C/5) (Ah) | 42 |
| Rated energy (C/5) (Wh) | 2 000 |
| Volumetric energy density (Wh/l) | 118 |
| Gravimetric energy density (Wh/kg) | 104 |
| **Mechanical characteristics** | |
| Width (mm) | 448 |
| Height (mm) | 131 |
| Depth (mm) | 293 |
| Weight (kg) | 19 |
| **Electrical characteristics at + 25°C/+ 77°F** | |
| Voltage (V) | 42 to 56 |
| Maximum continuous discharge current (A) | 150 |
| Peak discharge current in 10 sec (A) | 185 |
| Maximum continuous recharge current (A) | 41 |
| Maximum continuous recharge current at high rate (A) | 56 |
| Recharge time (h) | As fast as 30 min |
| Module consumption (active mode) | 5 V – 0.45 W |
| Insulation resistance (1000 V – OC) | >100 MΩ |
| Dielectric | 3 kV rms |
| **Maximum power (in W)** | |
| 15 min | 7 000 |
| 30 min | 4 000 |
| 45 min | 2 700 |
| 1 h | 2 000 |
| **Operating conditions** | |
| Operating temperature | – 20°C/+ 60°C (– 4°F to + 140°F) |
| Cycle efficiency | 96% to 99% |
| Self-discharge | <5% per month |
| Calendar lifetime at + 25°C/+ 77°F | >20 years |
| Cooling | Natural convection |

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## System capability

- Saft BMM (Battery Management Module) included in any system configuration
- Series connection of up to 12 modules plus one BMM for string management and interfacing
- Multi-string paralleling through MBMM (Master Battery Management Module)

## Functional characteristics

Medium power lithium-ion battery system contains VL M cells with advanced nickel-based lithium-ion technology:

- Outstanding calendar and cycle life and reliability
- Stable internal resistance
- High energy density cells

## Mechanical & electrical interface

- Vertical or horizontal implementation
- Stackable up to 8 modules
- Optional 3 U rack-mount brackets
- Power connectors on the front panel
- Installation in dedicated cabinets or containers with adequate mechanical design and ventilation

## BMM communication

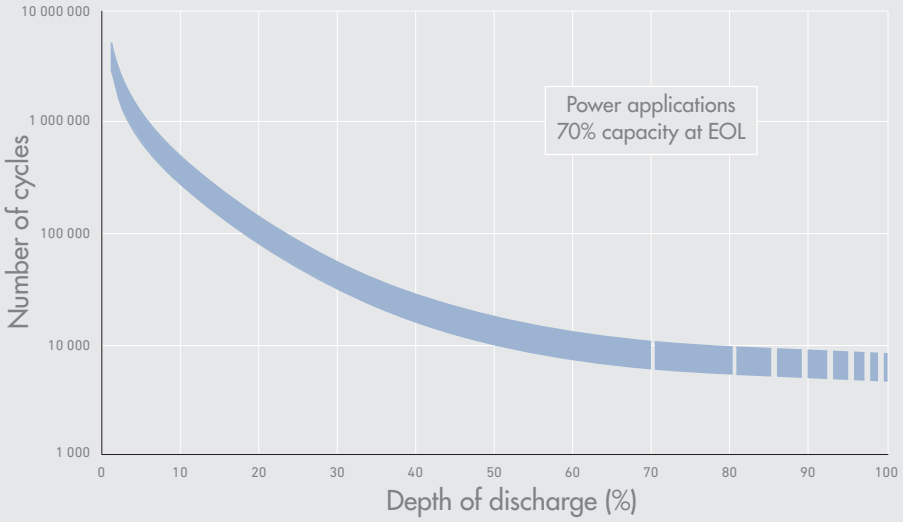
- 2 communication connectors on front panel
- CAN Open bus communication protocol carrying:
  - State of charge (SOC)
  - State of health (SOH)
  - Alarms
  - Operating conditions (voltage, temperature, identification number)
  - Operating limits (maximum voltage and current values in charge and discharge)
- Black box registering alarms (overcurrent, overvoltage, high temperature etc.) and the number of charge and discharge cycles.

| Storage conditions | |
|---|---|
| Storage temperature | – 30°C/+ 70°C (– 22°F to + 158°F) |
| Storage duration | 12 months (no electric maintenance) |
| Maximum altitude | 3000 m above sea level |
| Maximum relative humidity | 95% (non condensing) |
| **Compliance to standards** | |
| Cell safety | UL 1642 |
| Module safety | EN 50178 / IEC 60950 / CSAus 60950 |
| EMC (module in cabinet) | IEC 62 040-2 Cat C1 and C3 |
| Protection class | IP 20 (indoor controlled conditions) |
| Environment | IEC 62093 (indoor controlled conditions) |
| Transport classification | UN 3480 – Class 9 |
| Transport regulation compliance | UN 3480 - ST/SG/AC.10/11 Rev 5 § 38.3 |
| Directives | RoHS, Reach, WEEE |

The Synerion 48M module has been developed and qualified along IEC 61508/SIL2 standards to suit the demanding requirements of performance and operational reliability of our customers, who are manufacturing or operating high-value, long life equipment.

Manufacturing plants comply with the legislation in force in each country and with international quality and environment standards (ISO 9001, QS 9000, ISO 14000).

Energy storage module
Cycle life at + 25°C/+ 77°F




*Cycle life depends on both depth of discharge (DOD) and charging rates. The above results are based on testing at a fixed DOD and varying charging rates. The end of life (EOL) is reached when the remaining capacity is 70% of the initial capacity.*

## Safety

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

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