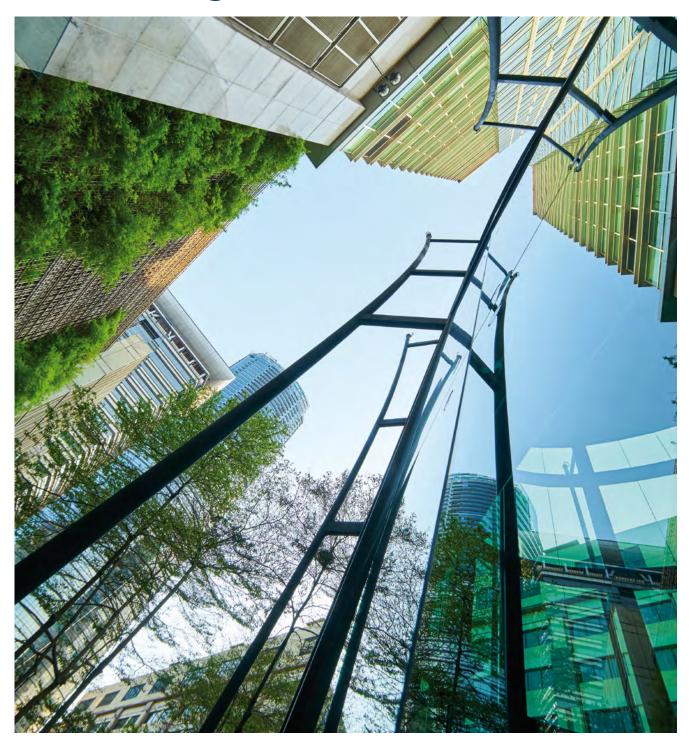


# Innovation that charges the world



## **A leading** energy storage provider who empowers the world

**Sunlight Group Energy Storage Systems** is a world-leading technology company and provider of integrated and innovative energy storage solutions. Our expertise lies in the development, production, and distribution of leadacid and lithium-ion batteries and energy storage systems for industrial, offroad, commercial, and advanced applications.

With over 30 years of knowledge and experience in the energy sector, guided by a clear vision and forward-looking strategy, we are driven by technological innovation and passion for excellence.



production unit
Greece

5.3**G**Wh

cell annual production capacity

1GWh

battery assembly capacity



recycling unit 50,000tn

annual recycling capacity of lead-acid batteries



assembly hubs U.S.A

2GWh

capacity

Italy

2GWh

capacity



1350+
our people
across facilities

### **Our vision**

Our vision is to power the world through knowledge and become a source of empowerment.

## **Our mission**

Our mission is to tirelessly pursue knowledge through data and insights. We turn those into innovation which serves our customers and improves the lives of people who belong to our ecosystem.

### **Our values**



#### **Innovation**

Is at the heart of everything we believe in and do. It's the mindset that allows us to imagine a better future for all.



#### **Integrity**

We treat our partners and people with transparency and openness, and the decisions we make are beneficial to our company, the institutions and society.



Our aim is to become a knowledge-based organization. We accumulate insights and information to create better products and improve people's lives. Always driven by respect and care for all.



#### **Agility**

Drives our way of working across all parts of the organization and optimizes the products we make.

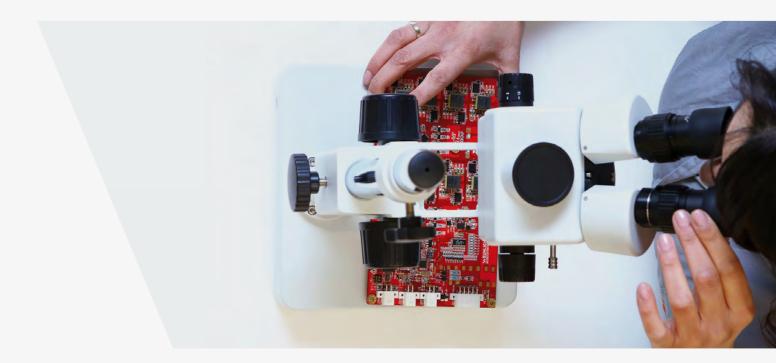


#### **Value Creation**

We create value for our customers, who use our products to realize their ambitions. For our shareholders, who are helping fuel our business. For every employee within the organization, who should always feel valued. For the society that allows us to thrive.

## Innovation for a sustainable world

As an industry leader, we strive to accelerate the transition to a net-zero future. We acknowledge the responsibility we carry as a company and join forces with peers and institutions to conserve and sustain the finite natural resources. Thus, we are here to create and set the benchmark for the energy sector, promoting our unique circular economy model – thanks to which we cover over 50% of our production needs in lead, by using material from our own lead recycling facility. With respect and care, we can ensure a better future for all!



## We focus on our customers

We are a technology-agnostic company, combining data-driven insights and Industry 4.0 tools, such as cloud computing and analytics, Al and Machine Learning. We are proud of developing innovative products and applications that power the world, electrify cities, and drive off-road mobility.

Our goal is to create products that serve our customers and improve people's lives.

## **Contents**

## 7 POWER TO MOVE

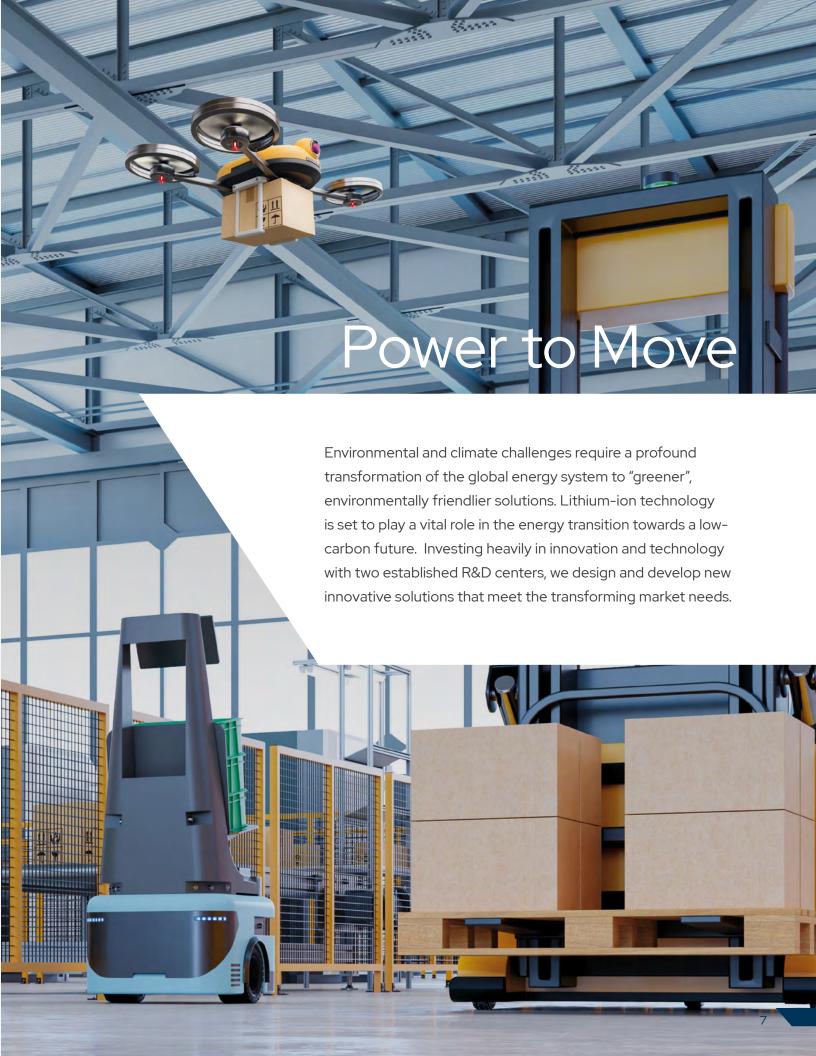
- 8 Li.ON FORCE
- 9 ElectroLiFe
- **11** BCI
- **12** Xtreme Force
- 13 Motion Gel
- 14 SLT/SLT Gel

## **27** POWER TO CONNECT

- 28 GLocal
- 29 KnoWi
- **30** Aqua Filling/Airlift System/Blinky
- **32** Chargers

## 15 POWER TO CHANGE

- 16 Li.ON ESS
- 18 OPzS/OPzV
- 19 RES OPzS/ RES OPzV
- 20 RES SOPzS/RES SOPzV
- 21 RES SLT/RES SLT GEL
- 22 AccuForce S
- 23 SPA/AccuForce
- 24 SPB/SPG
- 25 SPHR/STB FA
- **26** SVT







#### A revolutionary "smart" battery solution developed to exceed customer needs on a product, safety, and communication level.

Sunlight Li.ON FORCE is the synonym for reliability and safety. A lithium-ion battery that can effectively support the increasing demands of the material handling and logistics industry, as well as the diversity of applications for modern forklifts and/or trucks – i.e., industrial vehicles and machinery that require batteries capable to operate under extreme conditions and run longer.

Fully charged in under 90 minutes, allows a 3-shift operation without changing batteries in the middle of the workday. Thanks to its robust and innovative design, helps to cut downtime thus contributing to more productive and profitable operations.

Sunlight Li.ON FORCE is the first product in the market with cloud access, allowing warehouse managers to remotely connect and communicate bi-directionally via the GLocal App.

A turnkey solution that helps you make the leap towards lithium-ion technology, as it retrofits in conventional trays of lead-acid powered forklifts.



#### **Applications**



Forklifts



Automated guided vehicles (AGVs)



Floor cleaning equipment



Aerial work platforms

















Fast opportunity charging

Active balancing

Stable performance under harsh operating conditions

Protection of battery and cells

Charging time: 1~1,5h

24/ / Operability Connection to GLocal, Sunlight's Cloud platform







#### **Applications**



Golf carts



Marine use



Recreational vehicles



Aerial work platforms



Material handling equipment



Floor cleaning equipment

## High-quality plug & play lithium-ion batteries for semi-traction applications.

From lifestyle to off-road expeditions, Sunlight ElectroLiFe offers reliable lithium power and energy efficiency that can take you anywhere with its lightweight and robust design.

Our lightweight lithium-ion batteries are built to meet the power and energy requirements of semi-traction applications with long run time per cycle, zero maintenance, fast charging, and low-self-discharge.

At the same time, Sunlight ElectroLiFe creates a unique customer experience with user-friendly features and accessories. With a plug & play, tool-less installation with press-to-release terminals offering full protection and ultimate safety during connection of batteries and operation. The SoC indicator on the vehicle dashboard allows the user to monitor the battery state of charge without opening the battery compartment. For customers looking for high-capacity battery systems, the multiple parallel connections give the solution.



Plug & play installation



Scalable parallel connection



SoC indicator on the dashboard

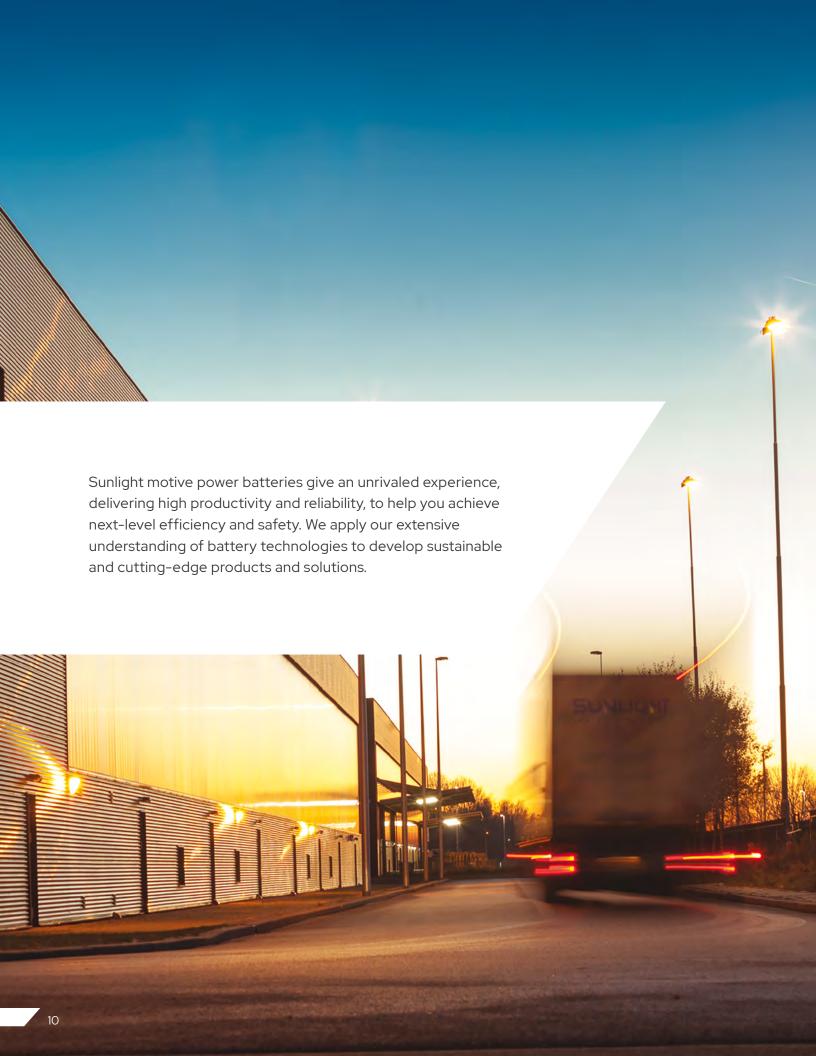


Complete voltage range 25.6V – 38.4V – 51.2V



Connection to GLocal, Sunlight's Cloud platform







**Tubular plate** for long cycle life, endurance and high power density

**Red Lead** produced by 99.99% pure lead for high performance

#### **Bottom Bar**

Ultrasonic welding of bottom bar with adequate space to absorb growth of spine







#### **Applications**



Forklifts



Floor cleaning equipment



Electric pallet jacks



Lifting platforms



Automated guided vehicles (AGVs)

Sunlight BCI battery range is a proven solution with excellent performance, reliability and long service life for the majority of traction applications.

Sunlight BCI batteries feature tubular plates with 99.99% purity Red Lead produced in-house, through our dry filling process for maximum durability, superior quality, and homogeneity. Through uniform filling of all tubes across the entire length, they have extremely low mass shedding.

The tubular shape of the BCI plate provides increased surface resulting to higher power density, less corrosion and greater endurance than flat plates.

Sunlight BCI batteries reach their full capacity within the first 3-5 cycles, twice faster than conventional batteries. They provide high capacity throughout their service life time giving you peace of mind while keeping your business running.

\* Sunlight BCI traction batteries are designed according to US standards.



Ultrasonic welding to the

gauntlet and advanced

designed bottom bars



Terminals with innovative conical design for perfect sealing



Enveloped separator preventing short-circuits



Fully recyclable product



Available with the unique and innovative BMS transforming your data into actionable intelligence





#### Copper grid

in the negative plates for

- higher currents for heavy-duty applications,
- fast & opportunity charging





## **XtremeForce**

An ideal choice for operations under extreme conditions. Xtreme Force offers a longer operating time and fast charging for multi-shift applications.

Sunlight Xtreme Force batteries can support 2-shift operation through fast and opportunity charging, fully charged in only 4 hours, thus increasing operating time. They can operate with higher currents and serve heavy-duty and demanding applications.

By using a copper grid in the negative plates, we can achieve reduced internal resistance and higher performance, compared to conventional lead-acid batteries.

One Xtreme Force battery can be the optimum solution for your business as it can replace two conventional lead-acid batteries, helping you increase productivity and reduce TCO.



#### **Applications**



Heavy-duty applications



Cold storage Outdoor applications



Forklifts operating in high rack facilities requiring more lifting



Seasonal business



Standard DIN size – high energy capacity and content useful in high rack facilities and heavy-duty operations



Fast and opportunity charging



Multiple shift operations



Available with the unique and innovative BMS transforming your data into actionable intelligence







#### **Applications**



Forklift



Floor cleaning equipment



Off-road electric vehicles



Electric pallet jacks

Maintenance-free sealed-type GEL battery ideal for food, pharmaceutical, and chemical industries where hygiene standards are essential.

The supreme solution for hygiene-sensitive product storage facilities, where gas emissions must be minimum and liquid acid must be absent. Ideal for storage areas with limited charging space or where maintenance is difficult. The GEL batteries have zero maintenance costs as they don't require any water topping up.

The bayonet design of the valve ensures better sealing of cells. Lids with increased thickness ensure the robustness of the cell against the developed operating pressure. Vacuum GEL Filling process ensures that no gas is trapped between and inside the plates.







Low ventilation requirements



No water topping up required



Cost/Time savings



Minimum gas emissions



Available with the unique and innovative BMS transforming your data into actionable intelligence







Robust design with powerful tubular plates that offers long service life and high cyclical resistance.

SLT are vented technology batteries with liquid electrolyte and tubular plate technology.

They are characterized by robust design with powerful tubular plates and a special alloy that offers long service life and high cyclical resistance



## Robustness, versatility of application, and maintenance-free design.

SLT GEL are valve-regulated batteries with GEL electrolyte. They are characterized by their robustness, versatility of application, and maintenance-free design.



#### **Applications**



Golf carts



Floor cleaning equipment



Power scooters/chairs



Lifting platforms



Marine use







High-capacity performance



Increased endurance even in cases of poor charging conditions



Maximum lifetime value and excellent quality







## Intelligent energy storage solution that reduces carbon footprint.

Sunlight Li.ON ESS delivers reliable energy supply by storing larger amounts of energy than conventional lead-acid batteries, expanding the integration of renewable energy sources, and reducing the carbon footprint of energy production. Its modular design makes it suitable for a wide range of applications, from commercial and industrial, up to complete grid-supporting storage solutions.

Sunlight Li.ON ESS solution ensures protection, safety, and reliability of supply against disturbances in the power grid due to the intermittent nature of renewable energy sources. Lithiumion technology permits high efficiency during the charging and discharging processes and higher energy density, while minimizing maintenance costs.

The LiON ESS battery is connected to Sunlight GLocal, a cloud-based platform, that allows remote access, monitoring and serviceability even in the most isolated installations.



#### **Applications**



Solar Power



Wind Power



Smart Home



Smart Buildings



Data Centers



Telecommunications



E-Mobility Charging Facilities













Modularity / Expandability

Inverter compatibility

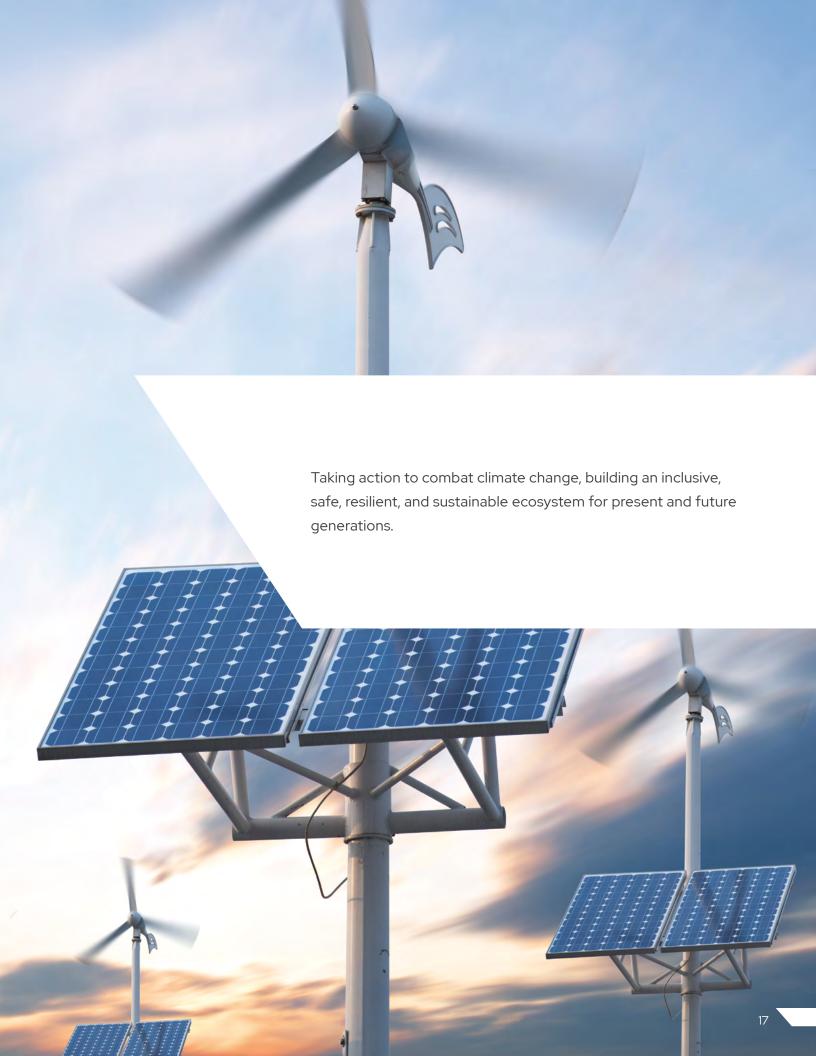
Maintenance-free

Uninterrupted power supply

Peak saving

Connection to GLocal, Sunlight's Cloud platform









**OPzS** 

**OPzV** 

A reliable partner that is ready to act on your behalf to provide power when needed.

Sunlight OPzS/OPzV cells and blocks are a reliable backup power source, safeguarding the uninterrupted supply of energy and connectivity that our modern world needs.

They keep people, equipment, and data safe from unexpected and volatile power shortages. Sunlight OPzS and OPzV product range provides power and peace of mind for standby applications that require a high level of reliability, combining excellent capacity performance with a long-lasting life up to 20 years for Sunlight OPzS and 18 years for OPzV, respectively.

The OPzV premium series employ VRLA GEL technology making this range the preferred solution for critical environments, where maintenance cost and gas emissions must be minimized. They permit high flexibility in installation overcoming any floorspace constraints as the available product variants can be installed vertically or horizontally.

A great advantage of Sunlight batteries is the in-house production of Red Lead that guarantees 99.99% pure lead. It significantly extends the service life and enables full capacity availability within the first 3-5 cycles. The OPzS/OPzV are fully recyclable products further enhancing the circular economy model.

Available as 2V cells and 6V/ 12V blocks, covering a wide capacity range to empower every customer need.

- \*OPzS are vented lead-acid batteries with tubular plates for standby applications
- \*OPzV are maintenance-free valve-regulated lead-acid batteries with tubular plates and GEL electrolyte for standby applications



#### **Applications**



**Telecommunications** 



**UPS** systems

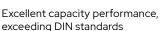


Grid



Power generation







Experienced pre-sales and after sales support



Product variants available for both vertical and horizontal installation for OPzV series



Fully recyclable product











Making energy from renewable sources available at anytime.



#### **Applications**



Solar Power



Wind farms



**Telecommunications** 



Smart-Grids



Residential installations



Traffic signaling systems

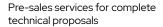
Sunlight RES OPzS/ RES OPzV cells and blocks store energy from renewable energy sources (RES), making clean energy available at the right time. They contribute to the expansion of sustainable energy, by giving permanent solutions to the potential volatility of RES. They balance the customers' generation and demand profiles, and support the transition towards sustainable energy.

The RES OPzS/ RES OPzV empower the continuous supply of energy, giving flexibility and the opportunity to optimize your energy cost in grid connected applications. They bring energy to off-grid systems and remote sites, electrifying the local communities and improving their quality of life.

Sunlight RES OPzS / RES OPzV are developed for demanding mid and large-size cyclic applications, where high cycling capability is the primary requirement, as they offer a long cycle life up to 2800/3000 cycles at 50% DoD.

The RES OPzV allows high flexibility in installation overcoming any floorspace constraints as the product variants can be installed either vertically or horizontally. Their VRLA GEL technology makes Sunlight RES OPzV ideally suited for remote storage systems where minimum maintenance, maximum operational safety, and reliability are equally essential.







**Excellent capacity** performance



Product variants available for both vertical and horizontal installation for RES OPzV series



Fully recyclable product





#### Looking for the perfect balance between long cycle life and low cost for your small and mid-size applications?

RES SOPzS is an advanced cost-effective solution, ideal for energy storage applications, that demand long cycle life and increased watering intervals.

RES SOPzV is an exceptional combination of benefits for autonomous systems where there is demand for no water refilling.

Available as stand-alone 2V cells as well as complete system solutions in 12V, 24V, and 48V configurations, with specially designed metallic trays for trouble-free installation.

\*SOPzS are vented lead-acid batteries with tubular plates for energy storage applications

\*SOPzV are valve-regulated lead-acid batteries with tubular plates and GEL electrolyte for energy storage applications



#### **Applications**



Residential installations



Off-grid power systems



Infrastructure PV systems



Remote telecom stations



Water pumping systems



Traffic signaling systems



Road lighting



Long cycle life up to 2400 cycles at 50% DoD



High capacity performance



Minimum maintenance



Modular solution, complete system installation available as option











#### **Applications**



Residential installations



Traffic signaling systems

Designed for demanding daily cycling operations, offering significant benefits in terms of cost per cycle and performance.

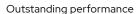
RES SLT / RES SLT GEL is a quality range of batteries with ease of handling, designed for daily cycling operation, and offering significant benefits in terms of cost per cycle. Their premium grade separators contribute to an outstanding performance that suits ideally the demanding renewable energy storage applications.

- \*RES SLT are vented lead-acid batteries with tubular plates for renewable energy storage applications
- \*RES SLT GEL are valve Regulated lead-acid batteries with GEL electrolyte for renewable energy storage applications



Long cycle life







Ease of handling





AccuForce S

A sealed, maintenance-free energy storage solution that offers significant benefits in terms of performance, reliability & cost per cycle.

AccuForce S batteries developed for solar and stand-by applications permit regular deep cyclic use.

Valve Regulated AGM Batteries for cyclic applications.



#### **Applications**



Off-grid power systems



Residential installations



Traffic systems (signaling and lighting)



**UPS** systems



Long life according to Eurobat 2015 classification



Maintenance-free







#### **Applications**



**UPS** systems



Electronic apparatus and equipment



Communication power supplies



Transportation signalling

Quality battery series for general purposes, designed to provide reliable performance in a wide field of standby applications.

The SPA and AccuForce series offer competitive solutions to the demanding market requirements, with specifications focused on high quality and reliability. The valve-regulated lead-acid (VRLA) AGM batteries are designed with a safety valve, which allows the internal pressure to be released in case of overcharge. This battery type is maintenance-free as there is no need for topping up during the entire battery service life.

- \* SPA batteries are available in 4V/6V/8V/12V, for capacities up to 28Ah.
- \* AccuForce batteries are available in 6V/12V, covering capacities from 33 up to 200Ah.

Valve regulated AGM Batteries for standby applications



Maintenance-free



Wide range of dimension and terminal options



Optional flame retardant material (UL94 V-0 rating)



Leak and spill proof container





Premium battery series offering competitive solutions to demanding market requirements, focusing on high quality and reliability.

The SPB range offers a long life AGM VRLA solution to the demanding market requirements, whereas the SPG range is an equally durable offering if your operations require a GEL electrolyte battery with a wide temperature range.

These batteries are maintenance-free, as there is no need for topping up during the entire battery service life.

SPB batteries are available in 6V/12V, with a capacity from 33 up to 200Ah.

SPG batteries are available in 12V, with a capacity from 23 up to 250Ah.



#### **Applications**



**UPS** systems



Telecommunications



Emergency power supply



Automation & Measuring systems



Long design Life up to 12 years



High performance



Maintenance-free



Leak and spill-proof container



Optional flame retardant material (UL94 V-0 rating)

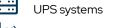






High Rate batteries specially developed to provide high power output to demanding UPS systems for short discharge times.

Sunlight SPHR can give the extra boost to the available power thanks to advanced product design that offers high current performance for the most demanding UPS applications.





**Telecommunications** 

**Applications** 



Power generation



Traffic signaling systems



Low internal resistance for high power output



High energy density



Maintenance-free



Optional flame retardant material (UL94 V-0 rating)





Easy installation and maintenance, specially designed for the needs of the Telecom Industry.

Sunlight STB FA is a front access (front terminal) AGM VRLA series for easy installation and maintenance, specially designed for the needs of the Telecom Industry.

Designed to fit in the market's most common telecom cabinets (19"/21"/23"), in 48V string arrangements. Maintaining a high level of security by having a flame retardant ABS case material (UL 94 V-O rating) for increased safety.



#### **Applications**



**UPS** systems



Telecommunications



Power generation



Traffic signaling systems



Fast and easy installation



Wide operating temperature range



High energy density



Flame retardant material (UL94 V-0 rating)





Sunlight SVT range offers very long design life, covering requirements across a very wide capacity range.

A valve-regulated AGM battery for standby and cyclic applications Available in 2V cells that cover a very wide capacity range.



#### **Applications**



UPS systems



Telecommunications



Power generation



**Emergency lighting** 



Security systems







Wide capacity range

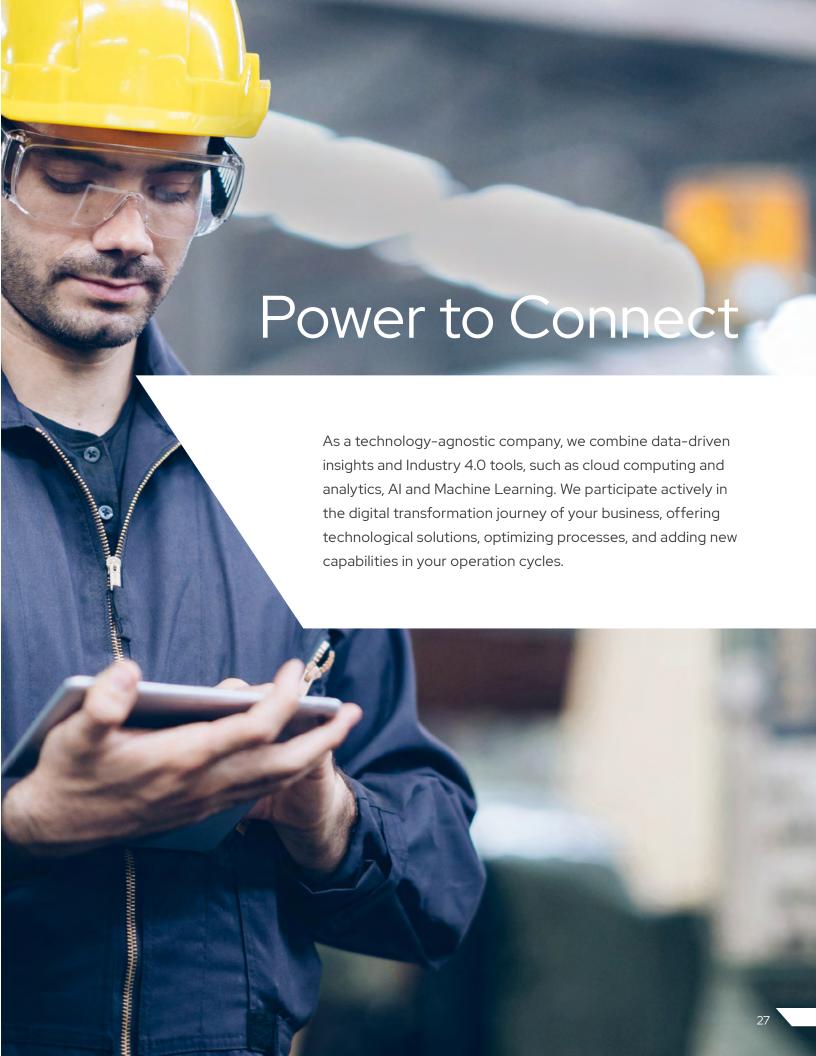


Maintenance-free



Optional flame retardant material (UL94 V-0 rating)









When your demanding operations require a system to monitor and manage your batteries remotely, you can trust GLocal, the Sunlight cloud-based Battery Management System (BMS).

From basic monitoring to highly sophisticated fleet management and first level maintenance, GLocal offers bi-directional communication for Sunlight batteries:



**Real-time monitoring:** Monitor your batteries and forklift fleet status from anywhere in the world



**Live alarms:** Early warning signs to avoid battery failure and lost productivity.



**Alerts:** Identifying potential issues between batteries because of misusage or high temperatures



**Serviceability:** 24/7 Absolute control. Up to 90% of issues repaired via GLocal.



**User-friendly:** Easy and enhanced communication. Effective fleet management. Enhanced productivity.



Tracking & Monitoring: Battery data & events



## The unique and innovative Sunlight Battery Monitoring System (BMS) for traction lead-acid batteries.

Taking absolute control over the battery and forklift performance status, KnoWi empowers you to make confident, data-driven decisions about the most suitable power solution for your forklifts.

KnoWi enables your battery operation to achieve and sustain high productivity and profitability goals initiating the transformation of your whole fleet. It is here to help you make the leap to the future, moving forward your business with Sunlight Lithium-ion batteries. With its advanced Al and Machine Learning algorithms, KnoWi will automatically become one of your most valued partners.



**Real-time monitoring:** Monitor your batteries and forklift fleet status from anywhere in the world



**Battery critical parameters:** Reduce downtime and service, while protecting your investment and equipment



**Cost control:** Make confident and data-driven decisions and achieve high productivity



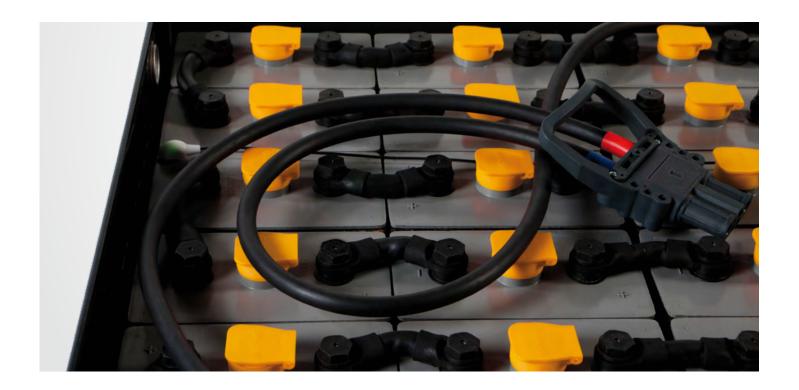
**Live alarms**: Pro-actively amend procedures avoiding unnoticed threats that would reduce your battery performance and lifespan



**Fleet transformation:** Transform your lead-acid battery fleet with the most suitable and innovative Sunlight Lithium-ion batteries



**Integration:** Records are automatically captured and uploaded in Sunlight's GLocal cloud platform



#### AQUA FILLING SYSTEM

A centralized piping system permanently fixed on the battery quickly distributes the necessary water quantity to all the battery cells, ensuring optimum electrolyte level and density.

#### AIRLIFT SYSTEM

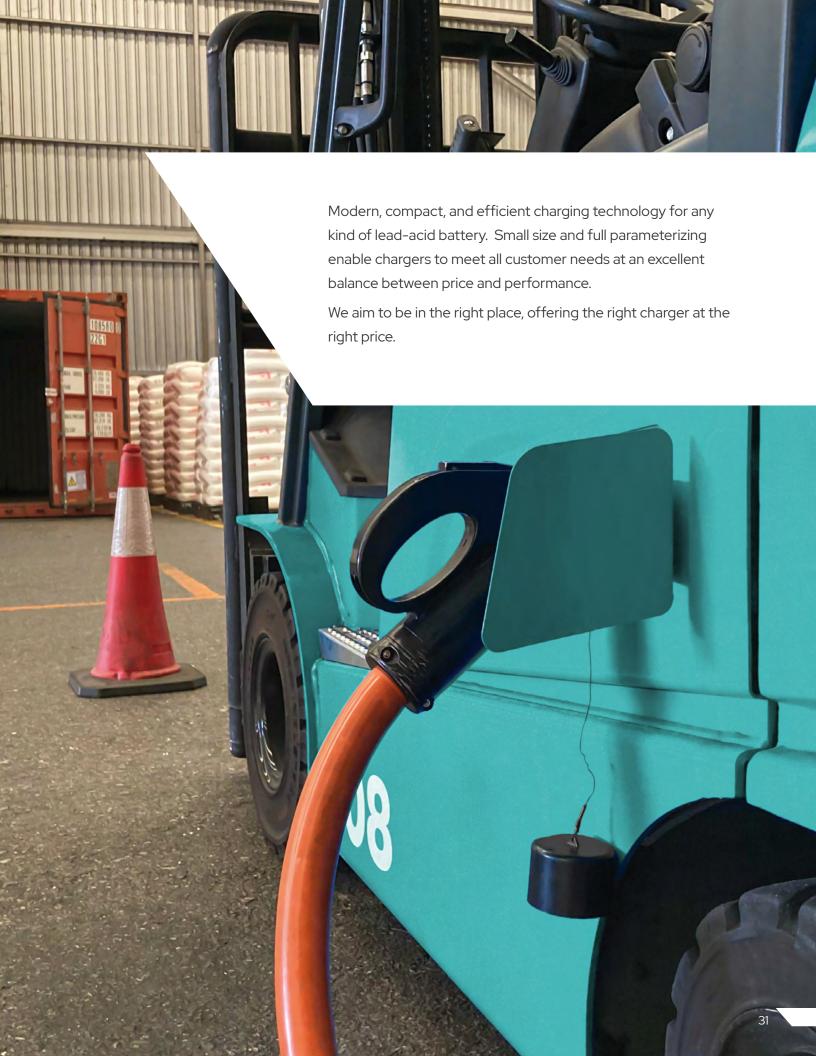
A centralized piping system is permanently fixed on the battery cells and delivers to them low-pressure air (requires an airlift configured charger). This air is mixing the electrolyte resulting in significant benefits:

- Lower recharge times
- Lower water consumption
- Lower battery temperatures during recharge
- Lower overall energy costs

#### BLINKY

#### (Electrolyte Level Indicator)

Sunlight's electrolyte Indicators greatly improve the battery maintenance procedure by intelligently alerting personnel when a battery needs watering. Blinky and Smart Blinky Monitors reduce labor costs and increase battery service life by ensuring that the batteries are properly maintained.





#### SLH (High-Frequency chargers)

#### Highlights

- Selectable charging profiles
- Operating temperature: -10 to +45°C (14 °F 113 °F)
- Efficiency up to 95%
- LCD display option available
- Active PFC
- Wall mounting ready
- Energy savings
- Easy care
- High protection of electronic components
- Selectable autostart

#### SLC (Conventional 50Hz chargers)

#### **Highlights**

- Battery charger with Wa profile for charging time 10-12h
- Pulse profile charging for charging time 7-8h
- Automatic equalizing function with pulses packet and weekend maintenance
- Automatic detection of battery posting and auto power-off
- ▼ 800 cycles charge memory
- Availability of external accessories like AIR PUMP, top-up and remote signal
- Tropicalized stray-flux transformer, high-quality windings with double enamel insulation, class H, impregnated with non-toxic resins, kiln-dried
- Overload cutout on transformer
- Rectifier bridge equipped with DC output fuse

## **Appendix**

#### Power to Move







**SUNLIGHT ElectroLiFe** 



SUNLIGHT BCI



SUNLIGHT XtremeForce



SUNLIGHT MotionGel



SUNLIGHT SLT SUNLIGHT SLT GEL

#### Power to Change







SUNLIGHT OPZS

SUNLIGHT OPzV



SUNLIGHT RES OPZS SUNLIGHT RES OPZV



SUNLIGHT RES SOPZS SUNLIGHT RES SOPZV



SUNLIGHT RES SLT SUNLIGHT RES SLT GEL



SUNLIGHT
AccuForce S



SPA

AccuForce



SPB

SPG



SPHR

STB FA



SVT

#### Power to Connect





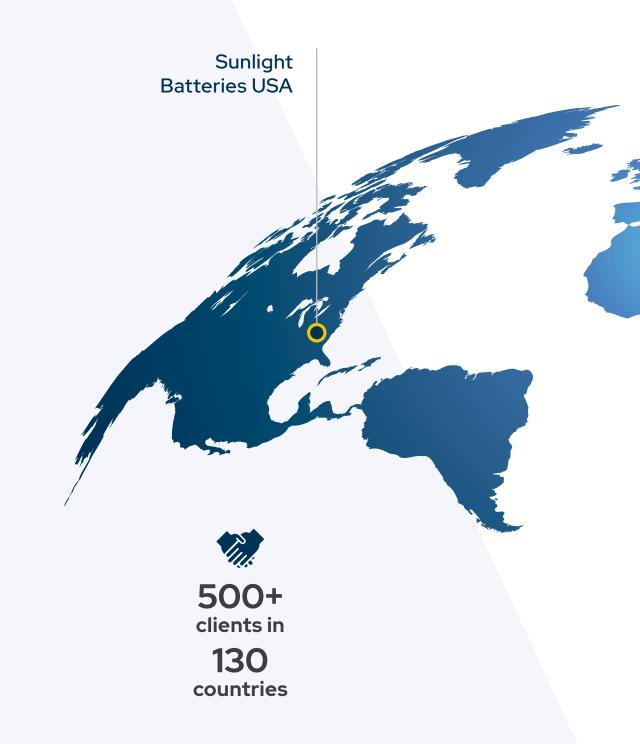
SUNLIGHT WI

#### Chargers



SUNLIGHT PowerBox

# Growing our presence to serve the world



## Sunlight European Batteries Assembly (SEBA) & Sunlight Italy



Sunlight Group Energy Storage Systems is a world-leading technology company and provider of integrated and innovative energy storage solutions, with over 30 years of knowledge and experience. It exports to over 100 countries and operates state-of-the-art industrial units in Greece, Italy, and USA. Sunlight's clear vision and forward-facing strategy are driven and underpinned by a commitment to technological innovation and passion for excellence that supports sustainability and transition to a carbon-free future.



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