TPS POWER STORAGE

The all-rounder for grid networks and industry

Built to last 30 years • 1C charging speed • The safest cell technology
WE HAVE A „THEN“ FOR ANY „WHEN“.

Our battery storage system can be optimally adapted to suit every application.

Whether for emergency power or to cut peak loads, whether on- or off-grid, whether in the desert or the arctic circle – with the TPS system, TESVOLT offers an industrial storage solution for every application. The TPS system is not only flexible, with a size and output that can be adapted to suit any need, it is also one of the most advanced and cost-efficient storage systems. It is extremely robust and is therefore well-suited to the hardest tasks. High-end battery cells from the automotive industry and innovative technologies such as the Active Battery Optimizer guarantee a long lifespan and maximum efficiency. This way, the self consumption of a storage rack on standby is reduced to a mere 5W (without cooling).

Maximum safety
Prismatic battery cells are incredibly durable, safe and powerful – particularly in comparison to round cells. Tesvolt uses cells from Samsung SDI and offers a 10-year performance warranty on the entire storage system.

Long service life
The service life of a battery has a huge impact on its economic efficiency. Our storage system features outstanding performance data: All components are built to last 8,000 cycles and offer a 30-year service life.

High-performance without compromise
TPS storage systems can store energy very quickly, and release it again even faster. The ongoing output is 1C for charging and discharging, and thus enables professional use in industry and for grid services.

Flexibility now and in the future
Our TPS storage systems do not only offer flexible configuration options at the moment of purchase – thanks to the innovative Active Battery Optimizer technology, the battery modules can also be retrofitted or exchanged even years later.

The TPS system has a full modular structure, from battery modules to the container. It is therefore easily customised and extremely efficient, thanks to its long service life.

Samsung SDI cell

Battery module

Battery shelves

The TPS container module

DC distribution

Battery shelves

Air conditioning
**AREAS OF APPLICATION**

**On-grid – Grid system services**

- **Q(U) on demand** – flexible reactive power supply (through the inverter)
- **Balancing power** – offsetting fluctuations in the grid
- **Ramp Rate Control** – balancing out irregularities in power output

- **P(f) on demand** – frequency-dependent active power control for grid support, e.g. frequency response
- **Peak load capping** – offsetting peaks in demand (load shifting and load shedding)

**Off-grid**

*TESVOLT TPS systems* can be used in combination with suitable battery inverters (such as SMA SCS) in off-grid networks, e.g. for optimising diesel hybrid systems (Genset optimisation control). This enables a reduction in fuel consumption.
CONTAINER

Technical data and equipment

- Partially integrated, ready-to-connect air-conditioning to ensure total temperature control of the interior and optimise the operating temperature
- Shelving system or TS battery racks
- Optional: integrated DC main distribution board for combining the battery racks

Transportation
- Standardised HC container transport overland by HGV
- Optional: CSC certification, international transport possibilities via ISO container sea freight

Installation
- External temperature range for operation -20 °C to +45 °C
- Optional: External temperature range for operation -40 °C to +55 °C

SMA – SUNNY CENTRAL STORAGE

- Compatible with TESVOLT storage systems
- Stand-alone system power outputs from 500 kW to 2,200 kW
- Power levels (kW):
  500 / 630 / 720 / 800 / 850 / 900 / 1000 / 2200
  2x 630 / 2x 720 / 2x 800 / 2x 850 / 2x 900 / 2x 1000

- Available up to 40kV as a container solution: MVPS – Medium Voltage Power Station (SCS with integrated medium voltage transformer and switchgear)
- Full functionality for providing grid system services
- Parallel combined grid mode

SMA SUNNY CENTRAL STORAGE SCS 2200/2500-EV

In addition to an SCS, the SMA MV Power Station also comprises a transformer and a switchgear.
MONITORING AND SERVICE AROUND THE GLOBE

With our storage monitoring system, you can keep an eye on the state of charge and condition of each individual battery cell at all times.

This way, you can monitor and analyse the storage system both on site and remotely.

We also offer installation and maintenance support services worldwide.

MODULAR SYSTEM PRINCIPLE

TPS systems are flexibly adaptable to suit your operating purpose:

- **TPS storage systems** can be installed in systems with a voltage of up to 950 V DC
- **TPS storage systems** are available from 200 kWh
- Three different sizes of containers (20 ft, 40 ft and 45 ft) can be used as housing
- The containers can be fitted with racks holding up to 8 or 10 battery modules

SYSTEM CONFIGURATIONS

The table below shows the potential capacity depending on the output and container design.

<table>
<thead>
<tr>
<th>Container</th>
<th>Energy Output</th>
<th>500 kW</th>
<th>630 kW</th>
<th>720 kW</th>
<th>850 kW</th>
<th>1,000 kW</th>
<th>1,260 kW</th>
<th>1,600 kW</th>
<th>1,800 kW</th>
<th>2,000 kW</th>
<th>4,000 kW</th>
<th>8,000 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 ft</td>
<td>350 kW</td>
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<td>300 kW</td>
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<td>40 ft</td>
<td>1,100 kW</td>
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<td></td>
<td>1,250 kW</td>
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<td>1,400 kW</td>
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<td>1,550 kW</td>
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<tr>
<td></td>
<td>1,700 kW</td>
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<tr>
<td>45 ft</td>
<td>1,700 kW</td>
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<tr>
<td></td>
<td>1,950 kW</td>
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<tr>
<td></td>
<td>2,000 kW</td>
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<td>2,000 kW</td>
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</tr>
</tbody>
</table>

*SMA, SMA SCS, and SMA MV Power Station are registered trademarks of SMA Solar Technology AG in many countries worldwide.*
Technical data TESVOLT battery

- **C-rate**: 1C
- **Cells**: Lithium NMC prismatic (Samsung SDI)
- **Cell balancing**: Active Battery Optimizer
- **Cycles**
  - 100% DOD | 70% EOL | 23°C ± 5°C: 1C/1C - 6,000 cycles
  - 100% DOD | 70% EOL | 23°C ± 5°C: 0.5C/0.5C - 8,000 cycles
- **Efficiency (battery)**: up to 98%
- **Maximum system voltage**: 627 V up to 930 V DC
- **Self consumption (without cooling/heating)**: 5 W (without battery inverter)
- **System coupling**: up to 99 systems in parallel
- **Communication interface**: CAN 2.0, Modbus TCP/IP
- **Certificates/norms**
  - Cell: IEC 62619, UL 1642, UN 38.3
- **Warranty**: 10-year capacity guarantee, 5-year system guarantee
- **Recycling**: TESVOLT offers free return of batteries from Germany

### Container system

<table>
<thead>
<tr>
<th>Size</th>
<th>20 ft</th>
<th>40 ft</th>
<th>45 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy (max.)</td>
<td>864 kWh</td>
<td>1728 kWh</td>
<td>2016 kWh</td>
</tr>
<tr>
<td>Number of storage systems</td>
<td>up to 12</td>
<td>up to 24</td>
<td>up to 28</td>
</tr>
<tr>
<td>Integrated DC main distribution board</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>External temperature range for operation</td>
<td>-20°C to 45°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 85% (non-condensing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altitude of installation site</td>
<td>&lt;2000 m above sea level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply circuit</td>
<td>3~N 400 V, 16 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions (L x W x H)</td>
<td>6.06 m x 2.44 m x 2.90 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optional extras</td>
<td>Fire alarm unit, fire extinguisher unit, CSC certification, extended operating temperature range</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Example SMA SCS configuration

<table>
<thead>
<tr>
<th>SMA product</th>
<th>SCS 500</th>
<th>SCS 720</th>
<th>SCS 1000</th>
<th>SCS 2200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal power at 40 °C</td>
<td>500 kW</td>
<td>720 kW</td>
<td>1000 kW</td>
<td>2000 kW</td>
</tr>
</tbody>
</table>

### Battery system

<table>
<thead>
<tr>
<th>Voltage range (battery)</th>
<th>627,2 bis 813,4 V</th>
<th>627,2 bis 813,4 V</th>
<th>672 bis 871,5 V</th>
<th>714 bis 870 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>1C</td>
<td>8 systems at 76,8 kWh each</td>
<td>10 systems at 76,8 kWh each</td>
<td>14 systems at 76,8 kWh each</td>
<td>28 systems at 76,8 kWh each</td>
</tr>
<tr>
<td>Energy</td>
<td>614,4 kWh</td>
<td>768,0 kWh</td>
<td>1075 kWh</td>
<td>2150 kWh</td>
</tr>
<tr>
<td>Product (container)</td>
<td>TPS 500 (20 ft)</td>
<td>TPS 650 (20 ft)</td>
<td>TPS 1000 (40 ft)</td>
<td>TPS 2000 (45 ft)</td>
</tr>
<tr>
<td>0.5C</td>
<td>16 systems at 76,8 kWh each</td>
<td>20 systems at 76,8 kWh each</td>
<td>28 systems at 76,8 kWh each</td>
<td>56 systems at 76,8 kWh each</td>
</tr>
<tr>
<td>Energy</td>
<td>1 228,8 kWh</td>
<td>1 536,0 kWh</td>
<td>2 150 kWh</td>
<td>2 x 2150 kWh</td>
</tr>
<tr>
<td>Product (container)</td>
<td>TPS 1000 (40 ft)</td>
<td>TPS 1400 (40 ft)</td>
<td>TPS 2 000 (45 ft)</td>
<td>2 x TPS 2000 (45 ft)</td>
</tr>
</tbody>
</table>

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