



Installation Manual

TESVÖLT

TS 48 Volt



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Installation Manual

TESVOLT TS 48 Volt

incl. connection of the TS Series to SMA products



TS 25

TS 40

TS 50

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1 About this document

Explanation of used symbols:



Scope of validity:

This document applies to the following storage systems from TESVOLT GmbH:

TS system in connection with Sunny Island (48V)

Target groups:

This document is intended exclusively for qualified technical specialists. The instructions and actions specified in this document may only be carried out by appropriately qualified personnel:



WARNING!

This document applies to TESVOLT storage systems. It provides qualified individuals with support during the installation process. It does not replace the complete instructions provided by the manufacturer SMA, which must still be observed. The TESVOLT storage system may only be used as intended.

The following battery inverters may be used:

Manufacturer	Type
SMA Solar Technology AG	Sunny Island 4.4M
SMA Solar Technology AG	Sunny Island 6.0H
SMA Solar Technology AG	Sunny Island 8.0H

Useful installation and planning information is available at SMA website (www.sma.de).

We recommend the following documents:

- ▶ System Description – SMA flexible Storage System – Increased self-consumption with Sunny Island
- ▶ System Description – SMA flexible Storage System – with Battery Backup function
- ▶ System Description – SMA flexible Storage System – Off-Grid Systems
- ▶ Operating Manual – Sunny Island 4.4M / 6.0H / 8.0H

SMA, SUNNY ISLAND and SUNNYPORTAL are registered trademarks of SMA Solar Technology AG in many countries.

2 Safety

2.1 Qualification of the technical specialists

The instructions in this document may only be performed by appropriately qualified technical specialists. The technical specialists must possess the following qualifications:

- Training in dealing with the hazards associated with the installation and operation of electrical equipment and batteries
- Training in the installation and commissioning of electrical equipment
- Knowledge of, and adherence to the locally applicable connection requirements, standards and directives
- Knowledge of the handling procedures and hazard sources associated with transporting, storing and disposing of Lithium-Ion batteries
- Knowledge of, and adherence to this document and the associated product documentation, including all safety instructions
- Participation in TESVOLT certification trainings TS 48 Volt

2.2 Safety information



WARNING!

Lethal electric shock from damaged components or pole short-circuits:

Bridging the battery poles causes a short-circuit resulting in a large flow of electrical current. This short-circuit must be avoided at all costs.

- ▶ Use insulated tools
- ▶ Never place tools or metal components on the battery
- ▶ Always remove watches, rings and all other metal jewellery when working on the batteries
- ▶ Never install or operate the battery pack in potentially explosive environments or areas with relatively high humidity levels
- ▶ Always first switch off the charge controller and then switch off all voltage supplies to the battery before commencing work on the storage system



WARNING!

Acid burns and poisoning from the battery electrolyte or poisonous gases:

Electrolyte or poisonous gases cannot escape from the battery pack under normal operating conditions. Despite careful design and manufacture, damage to the battery pack resulting from fault can result in escaping electrolyte or low concentrations of poisonous gases, organic solvent gases and hydrogen fluoride acids.

Store the battery pack in a dry place and within the temperature range specified in the datasheet.

- ▶ Do not allow the battery pack to fall down
- ▶ Do not open the battery pack
- ▶ Never install or operate the battery pack in potentially explosive environments or areas with relatively high humidity levels
- ▶ In the case of contact with electrolyte, immediately wash the affected area with water and seek medical advice

3 Needed tools

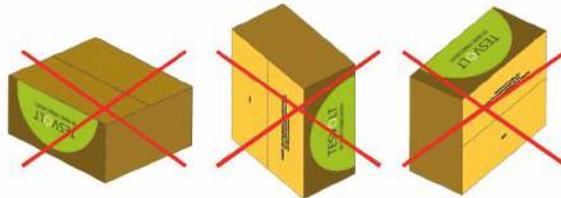
Needed Tools	Description	
Torque wrench	13 mm attachment for the battery poles and APU connections	Battery
Cross-head screwdriver	For fixing the battery modules and APU in the battery cabinet	
8 mm hex key	Optional: For removing the cover of the battery rack	
TX 25 Torx screwdriver	Optional: For moving the cable entry on the cover of the battery rack	
TX 30 Torx screwdriver	Optional: For removing the side panels of the battery rack	
Slot-head screwdriver	For connecting the control and measuring cables to the Sunny Island terminal	Sunny Island
Power drill and drill bits	For mounting the Sunny Island wall bracket	
5 mm hex key	For removing the cover of the Sunny Island	
50 to 120 sq. mm crimping pliers	For crimping the lugs of the DC cable	
Ferrule crimper	For crimping the wire end ferrules	Battery+ Sunny Island
Voltage measuring device	For measuring the grid and battery voltage (operating voltage up to 60 V (DC) for TS 48 V)	

4 Transport at end-customer site

The individual components of the TS series can weigh up to 120 kg and therefore should not be transported by a single person. It is recommended that the system is installed by at least two people. The assistance of a hand truck is helpful. No more than 5 battery modules should be stored on top of one another.



Right



Wrong



WARNING!

Battery modules are heavy (36kg). Please ensure safe installation. Use suitable means of transport only!

5 Installation location

The battery cabinet functions in temperatures from -10°C to 50°C and at a maximum humidity of 85%. Rooms that do not provide these conditions must be air-conditioned. The battery cabinet may **not be exposed to corrosive atmospheres**. If the battery cabinet is to be used in coastal areas or on farms, appropriate structural modifications to the installation room must be made to ensure hazard-free operation of the storage system.

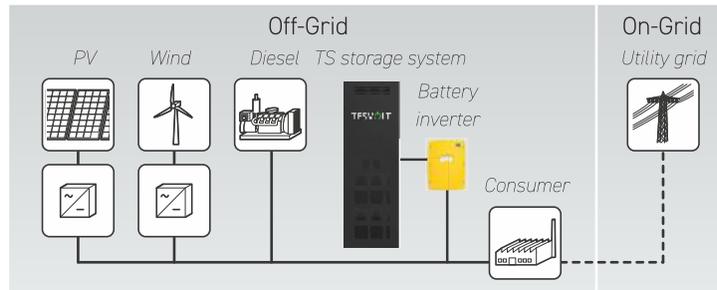
The battery cabinet must **not be exposed to direct sunlight**. It should also not be placed in the direct vicinity of **heat sources, such as an oven or a fireplace**.

In **areas prone to flooding**, the battery cabinet must always be installed in an elevated location where it cannot be reached by flooding. The storage system should be installed in a **fire-proof room** that is free of fire loads and is sealed with a **class F30 fire door**.

6 Technical Datasheet

OFF-GRID or ON-GRID

TS storage systems can be integrated into stand-alone grids and can also be connected to the utility grid. They can be flexibly combined with any sort of energy generator, including photovoltaics, bioenergy, wind power and diesel generators.



Technical specifications TESVOLT battery module

Module energy	4.8 kWh
C-rate	1C (4C max. 20 sec.)
Cells	Lithium NMC prismatic (Samsung SDI)
Max. charging, discharging current	900 A
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
Efficiency (battery)	up to 98%
Operating voltage	44.8 to 58.1V
Operating temperature	-10 to 50°C
Humidity	0 to 85% (non condensing)
Weight	36 kg
Dimensions (HxWxD)	163x490x480 mm
Certificates/Norms	Cells: IEC 62619, UL 1642, UN 38.3 Product: CE, UN 38.3, IEC 61000-6-3, BattG 2006/66/EG
Warranty	10-year performance warranty, 5-year product warranty
Recycling	free take-back scheme from TESVOLT

Complete system

Number of battery modules	3	4	5	6	7	8	9	10
TS 25 (3-5 modules) 1300x600x600 mm (HxWxD)	•	•	•					
TS 40 (6-8 modules) 1900x600x600 mm (HxWxD)				•	•	•		
TS 50 (9-10 modules) 2300x600x600 mm (HxWxD)							•	•
TS Flex (energy as required)	Flexibly configure your system according to your requirements.							
Energy [kWh]	14.4	19.2	24.0	28.8	33.6	38.4	43.2	48.0
Capacity [Ah]	282	376	470	564	658	752	846	940
Maximum output power	1C (4C max. 20 sec.)							
Selfconsumption (standby)	1 watt (complete system TS)							
Weight [kg]	228	264	300	386	422	458	514	550
System	1-phase, 3-phase							
Protection class	IP 20 (indoor use)							
System compatibility	Sunny Island (SMA Solar Technology AG)							

7 Battery storage TS

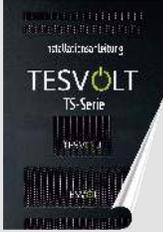
7.1 Schematic sketch

The battery modules (ABO) and the Active Power Unit (APU) are delivered in cartons on pallets separate from the battery rack. The scope of delivery should be checked against the delivery note and the requirements under point 4 "Transport at end-customer site" and point 5 "Installation location" must be observed.

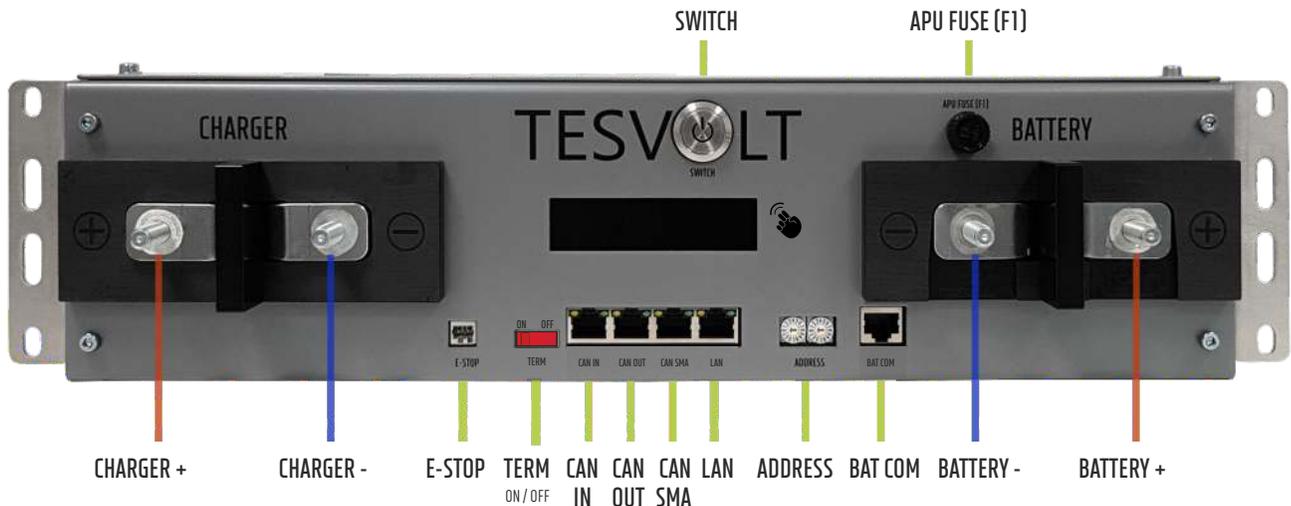


7.2 Scope of delivery

The delivered goods must always be checked for completeness and visible signs of damage.

Position	Components	Description
A		Battery module incl. Active Battery Optimizer (ABO)
B		Active Power Unit (APU) incl. Cable connection set to the APU to 1st Battery module
C		Installation instructions
D		48 V Cable connection set (included 2x Copper bars, 1x Patch cabel, 2x Rack Balancing Plug)
E		TS 25, TS 40 or TS 50 Rack
F		Ground cable including fixing material for connection on the provided grounding studs
G		Optional: Cable connection set for connecting the battery to the Sunny Island

7.3 Connecting Active Power Unit (APU) to SMA Sunny Island



Labeling	Description
Charger +	DC connection for the positive pole of the Sunny Island
Charger -	DC connection for the negative pole of the Sunny Island
Battery +	DC connection for the positive pole of the 1st battery module
Battery -	DC connection for the negative pole of the 1st battery module
Switch	On/off switch for the battery
E-Stop	Two-pin plug for the optional connection of an emergency off switch.
TERM	CAN bus termination. TERM must be activated (ON) for the last CAN bus participant.
APU Fuse (F1)	Fuse element to protect the APU (2a time-delay fuse (T) 5x20 mm, in accordance with DIN 41571-2, type 521.000 from ESKA, 250 VAC)
CAN IN	APU Master / Slave Communication
CAN OUT	APU Master / Slave Communication
CAN SMA	CAN port for communication between the battery and the Sunny Island. Connection to the Sunny Island (master) ComSyncIn (single-cluster) or connection to the Sunny Island (slave 2) ComSyncOut (multi-cluster)
LAN	When connecting to an existing network with DHCP, the battery can be monitored using BatMon. The master/slave communication occurs over the LAN connection.
Address	Rotary switch for adjusting the battery's master/slave connections. Further information can be found under point 11.2
BAT COM	Communication link to the battery module. Connect the BAT COM of the APU to the BAT COM IN of the first battery module.

7.4 Installation steps

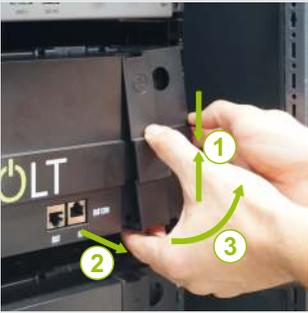


WARNING!

Installation and servicing may only be performed by qualified personnel. Only authorised TESVOLT personnel are permitted to open the APU-Unit. Improper use or incorrect configuration may damage the APU-Unit. Opening the APU voids the warranty.

Step	View	Description/Note
1		Position the battery cabinet in the installation location, taking into account the requirements listed under point 5
2		Open the door to the battery cabinet using the included control cabinet key, which can be found on the outside of the door.
3		Connect the earth to the battery cabinet at one of the earthing bolts provided.
4		Mount the APU on the upper slide rail and use screws to fix it in place at the four fastening points. The two-pin plug for the e-stop connection to the APU must be plugged in upon delivery. Until this is plugged in, the APU remains inactive. Further information on the e-stop can be found under 7.5 on page 14 of this Installation Manual.

>>

Step	View	Description/Note
5		<p>Insert the battery modules into the provided slide rails. From top to bottom.</p>
6		<p>Remove the side covers of the ABO from the battery module as follows:</p> <ul style="list-style-type: none"> 1 = loosen the clamp 2 = pull slightly downwards 3 = over the outer wall of the cabinet
7		<p>Gently break out the intended breaking areas for the copper tracks at the top of the cover (+). A combination drill can be used to help.</p>
8		<p>The cover is prepared for a re-assembly after uncovered passage for the copper rails to be mounted.</p>
9		<p>Connect the DC copper rails, always bearing in mind that in the 48 V variation, the positive pole must touch the positive pole and the negative pole must touch the negative pole. Tighten the 13 mm screws using 12 nm of torque.</p> <p style="text-align: right;">>></p>

Step	View	Description/Note
10		<p>Mount the ABO side covers on the battery modules.</p>
11		<p>Lay the communication cable for the BAT COM using the included patch cable. Start by running the cable from the APU (BAT COM) to the BAT COM IN of the battery module installed below the APU. From there, run the cable from the BAT COM OUT to the BAT COM IN of the next module, etc.</p>
12		<p>Plug in the rack balancing plugs (unless these were already plugged in upon delivery). The plug with an internal bridge from 1 to 4 is plugged into Rack Balancing In. The plug with an internal bridge from 1 to 2 is plugged into Rack Balancing Out.</p>
13		<p>Connect the DC cable from the Sunny Island to the APU (CHARGER). If you do not use pre-assembled cables from TESVOLT, it is important that an earth leakage and short-circuit protected cable (such as NSGAFöU) be used.</p>
14		<p>Connect the communication cable from the Sunny Island (ComSynIn) to the APU (CAN SMA)</p>
		<p>Installation completed!</p>

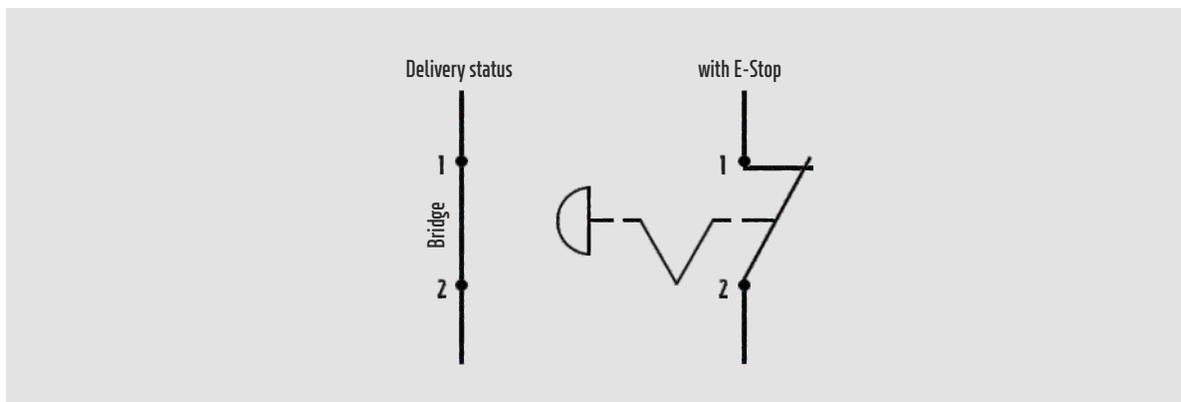
7.5 E-Stop-Contact

The e-stop (emergency stop) allows for an **emergency stop button** to be integrated into the storage system so that this emergency switch can shut down the battery and thus also the complete storage system. Upon delivery, a bridge will be found in this two-pin plug. In order to implement an external emergency off switch, this bridge must be removed and the emergency off switch connected.

Unless this contact is closed, the battery will remain inactive.



Circuit diagram E-Stop



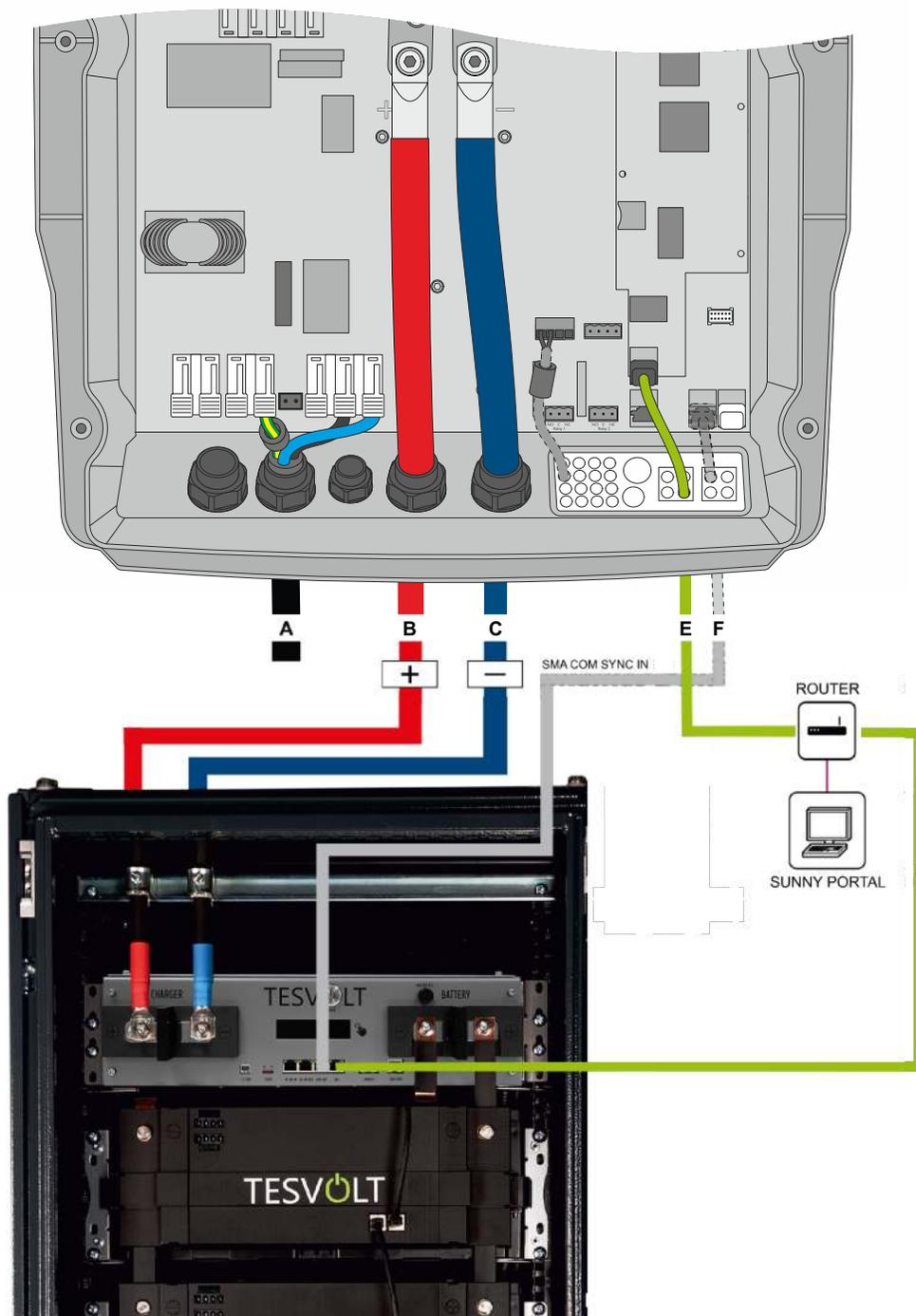
8 Sunny Island connection



INFORMATION on charging procedure

Compatible battery inverters charge automatically based on the parameters stored for the battery and charging infrastructure. Helpful installation and planning information can be found on the homepage of the manufacturer SMA.

Anschluss Sunny Island



Position	Designation	Description/note
A	AC power cable	Connection to AC2 Gen/Grid Terminals L, NTT and PE Connection to the public mains grid via a 3-core cable Conductor cross-section: 6 mm ² ... 16 mm ²
B	cabel DC +	Battery connection: Conductor cross-section: 50 mm ² ... 120 mm ² Cable diameter: 14 mm ... 25 mm Tightening torque: 12 Nm
C	cabel DC -	
E	Speedwire network cable	Connection ComETH
F	Data cable to Lithium-Ion battery	ComSync In connection Connection for the Lithium Ion Battery Management System The communication bus must be connected to the Lithium-Ion battery and the termination resistor must be plugged into the ComSync Out connection.

9 Commissioning



WARNING!

Battery damage may occur due to incorrect configuration. The parameter settings influence the charging behaviour of the Sunny Islands. It is therefore important to make the correct settings before commissioning the system.

Prerequisites:

- ▶ The SMA Flexible Storage system must be installed according to the interconnection diagram specified by SMA
- ▶ The Sunny Island power circuit breaker in the distribution system must be open
- ▶ In a 3-phase system, the Sunny Remote Control must be connected to the Master

Procedure:

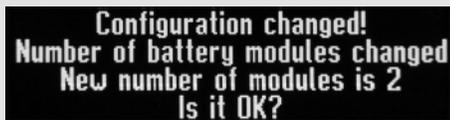
Check the wiring of the SMA and battery. See the Sunny Island Installation Instructions from SMA



Close all components. This protects all live components from accidental contact.
Close the DC fuse in the **Bat Fuse** (if used).



Press the on/off switch on the APU. The battery's initiation mode (INIT) will commence. Tap the screen on the battery to activate the display. The number of recognized battery modules will be displayed on the screen. If this is correct, confirm by tapping twice. Otherwise check the BAT COM cabling.



Once the number of battery modules has been confirmed, the light on the switch will begin to flash. The battery is now in pre-charge mode (PRECHG). Once pre-charging has completed, the light on the switch will remain on. On the battery display, the status will be indicated as OK. Now the battery is ready for use.

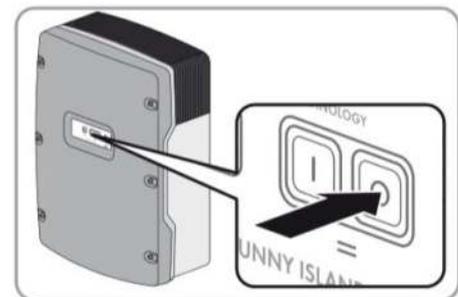
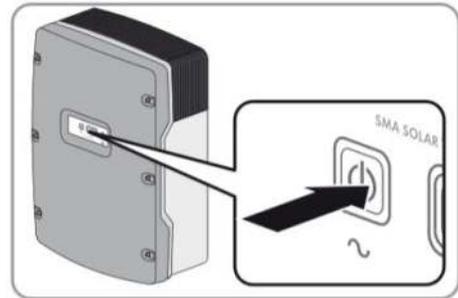
Status	INIT	Power	0.0 KW	Status	PRECH.	Power	0.0 KW	Status	OK	Power	0.0 KW
Voltage	50.7 V	Current	0.0 A	Voltage	50.7 V	Current	0.0 A	Voltage	50.7 V	Current	0.0 A
SOC	20 %	SOH	100 %	SOC	20 %	SOH	100 %	SOC	20 %	SOH	100 %
Bat Temp	22 °C	APU Temp	23 °C	Bat Temp	22 °C	APU Temp	23 °C	Bat Temp	22 °C	APU Temp	23 °C



For systems with one Sunny Island, press the power button. For systems with three Sunny Islands, press and hold the power button on the master until you hear a signal tone.

10 Decommissioning

1. Stop the Sunny Island (press and hold the Start/Stop button on the Sunny Island until the inverter LED lights up orange).
2. Switch off the Sunny Island (press and hold the Switch-off button on the Sunny Island until an audio signal tone is emitted).
3. Switch off the battery (press the green illuminated pushbutton switch on the door of the battery cabinet, the green LED must go out).



WARNING!

Risk of electric shock, due to the auto-scheduled discharge of the energy storage system. Please wait 15 minutes after switching off the storage system.

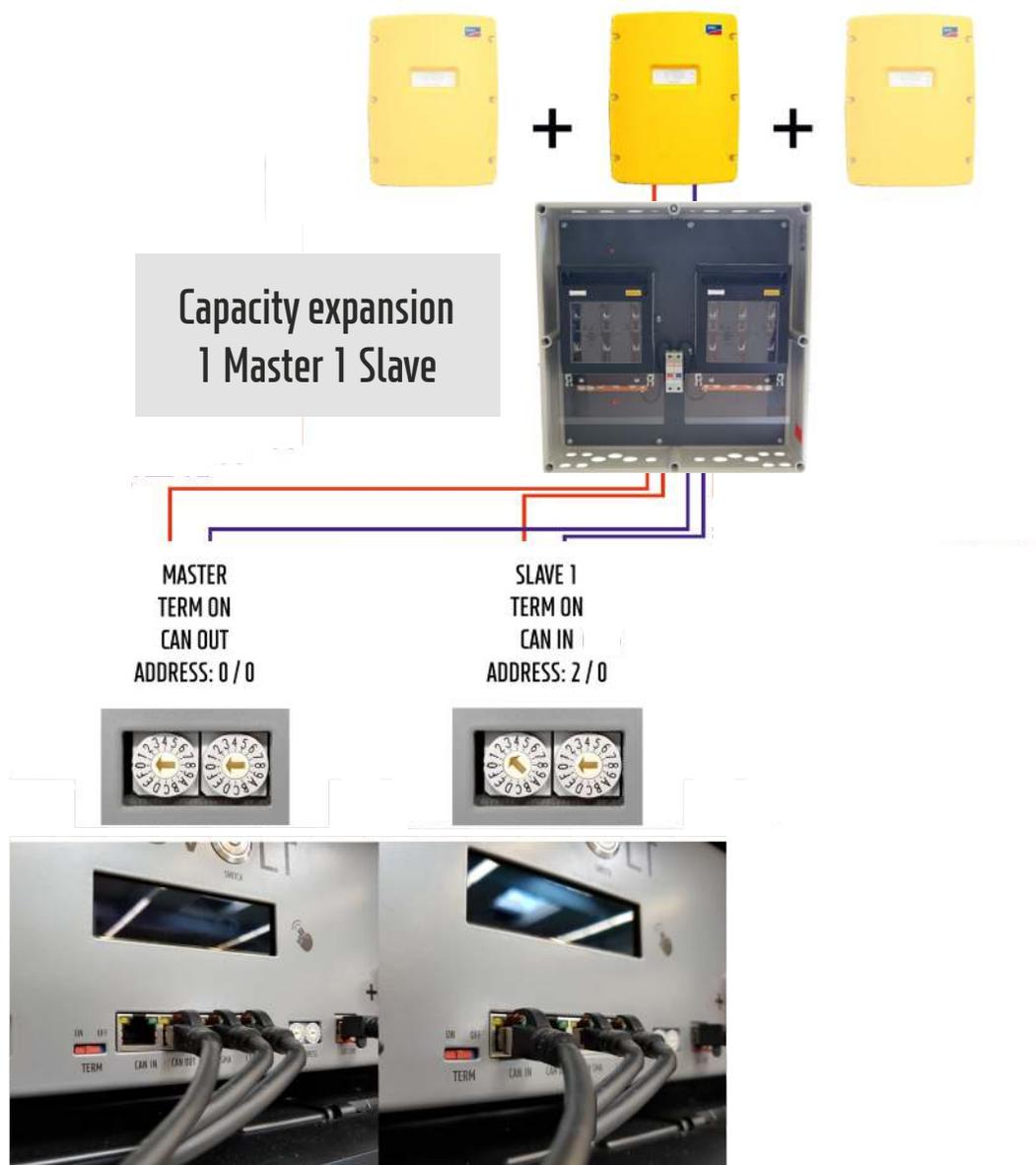


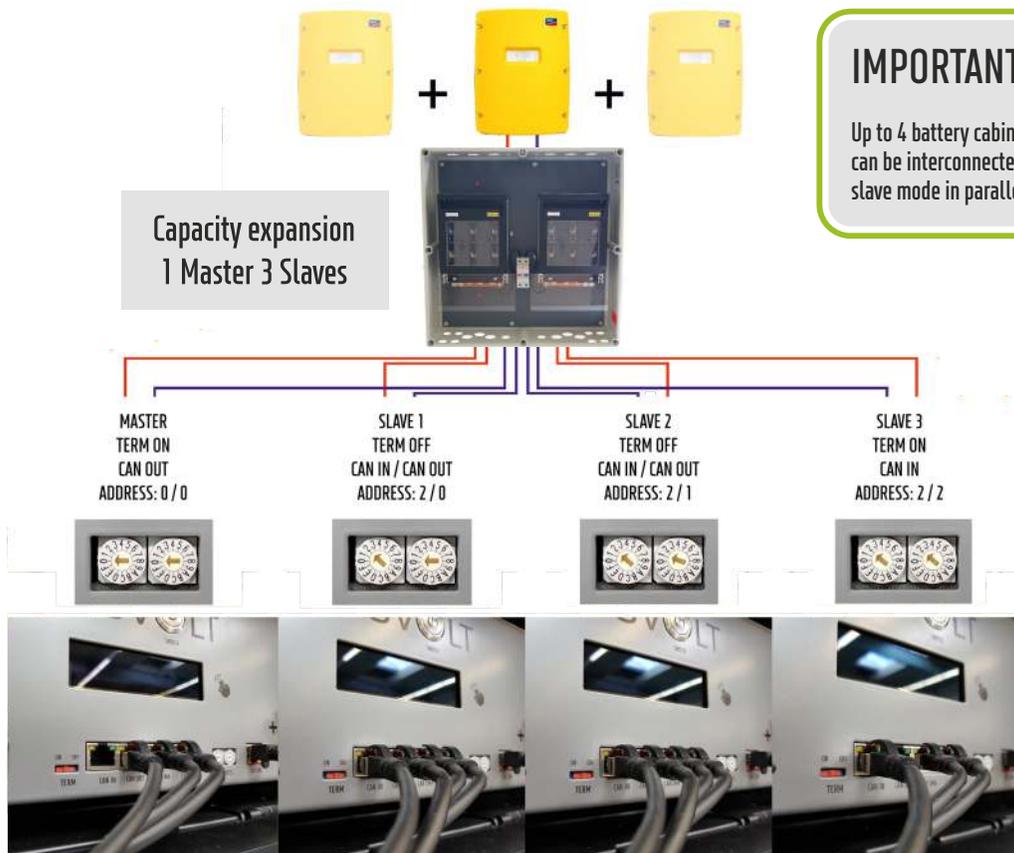
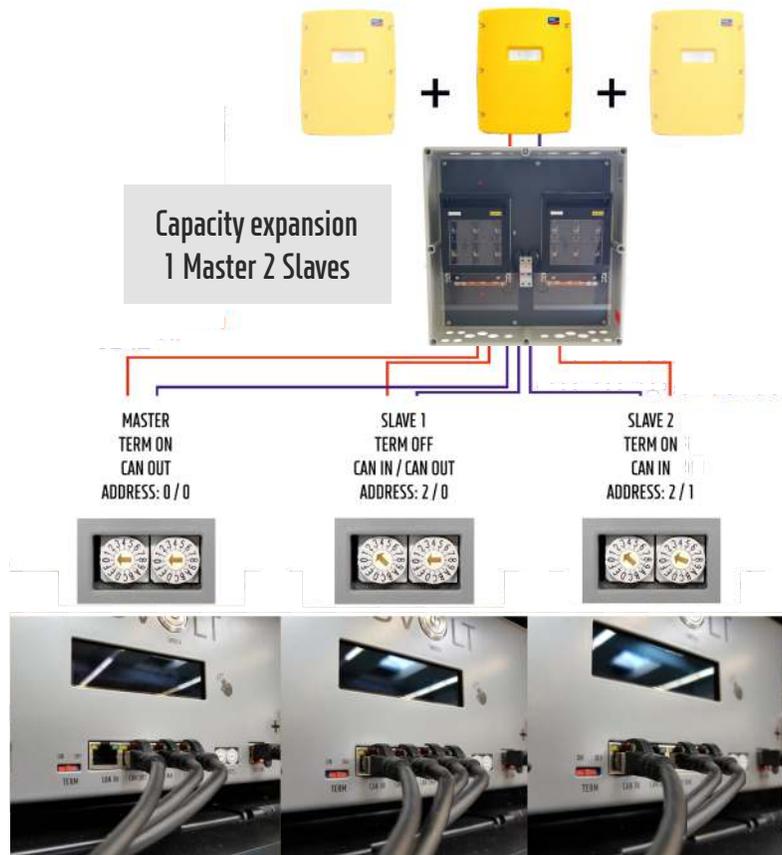
11 Storage system expansion

The capacity and the charging and discharging power of TESVOLT battery systems can be expanded.

11.1 Capacity expansion using the TESVOLT battery storage system

New battery modules are delivered with a state of charge (SoC) of 20%. In order to integrate a new battery module into an existing battery system, the existing system must also be brought to a state of charge of 20%. Only then the new battery modules can be installed in the existing system and put into operation. When the system is restarted, the APU will call up on the display the number of modules now recognized. If this is correct, confirm by tapping the display twice. The battery's new capacity must also be updated in the Sunny Islands. To do this, run the Sunny Island QCG and enter the updated capacity (Ah).





IMPORTANT!
Up to 4 battery cabinets per cluster can be interconnected in the master / slave mode in parallel.

11.2 Properly installing the addressing switch of the Active Power Unit (APU)



Left rotary switch	Right rotary switch	Description	IP-Adresse
0	0	Master	Cluster 1 IP-ADRESSE: XXX.XXX.XXX.100
2	0	Slave 1 (from Master 1)	
2	1	Slave 2 (from M1)	
2	2	Slave 3 (from M1)	
0	1	Master	Cluster 2 IP-ADRESSE: XXX.XXX.XXX.101
2	0	Slave 1 (from Master 2)	
2	1	Slave 2 (from M2)	
2	2	Slave 3 (from M2)	
0	2	Master	Cluster 3 IP-ADRESSE: XXX.XXX.XXX.102
2	0	Slave 1 (from Master 3)	
2	1	Slave 2 (from M3)	
2	2	Slave 3 (from M3)	
0	3	Master	Cluster 4 IP-ADRESSE: XXX.XXX.XXX.103
2	0	Slave 1 (from Master 4)	
2	1	Slave 2 (from M4)	
2	2	Slave 3 (from M4)	

11.3 Power expansion by SMA battery inverter

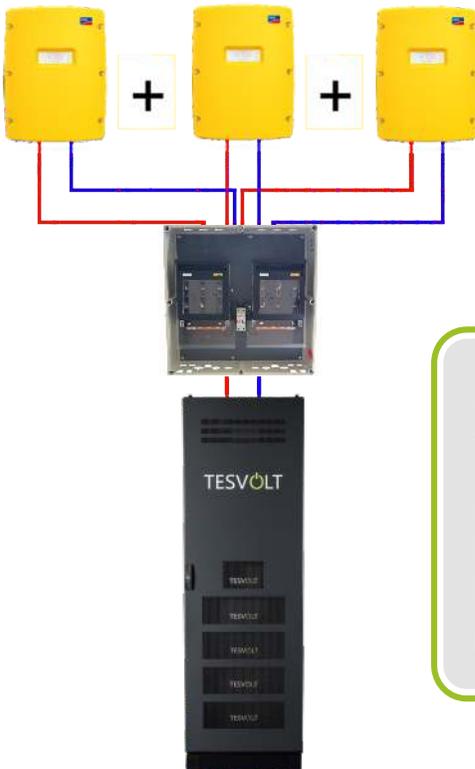
System with **one** Sunny Island [single-phase]



Charge/Discharge power per Cluster

Max. 3.3 kW → 1 x SI 4.4M
 Max. 4.6 kW → 1 x SI 6.0H
 Max. 4.6 kW → 1 x SI 8.0H

System with **three** Sunny Islands (3-phase)



Charge/Discharge power per Cluster

Max. 9.9 kW → 3 x SI 4.4M
 Max. 13.8 kW → 3 x SI 6.0H
 Max. 18.0 kW → 3 x SI 8.0H

On-Grid expandable up to 4 clusters.

The charging and discharging capacity can be increased by increasing the number of Sunny Islands. The number of Sunny Islands is increased in steps of 3. 1, 3, 6, 9 and 12 Sunny Islands can be operated in grid-parallel mode.

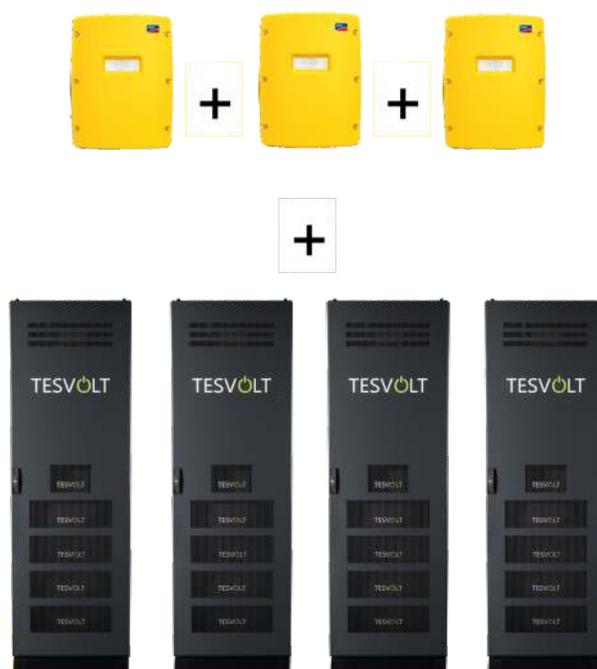
If more than one Sunny Island is connected to the battery, a battery fuse unit (**Bat Fuse**) must be connected between the Sunny Islands and the battery. This ensures that electricity is distributed to the Sunny Islands via fuse elements. In a cluster comprising three Sunny Islands, one Sunny Island will serve as the Master, which will control the other two Sunny Islands as Slave 1 and Slave 2.

Example with 2 different clusters:

Cluster 1: 3 x Sunny Island 6.0H (13.8 kW) with TS 40 Battery (up to 38.4 kWh)



Cluster 2: 3 x Sunny Island 8.0H (18.0 kW) with 4 x TS 40 Battery (up to 153.6 kWh)



12 TESVOLT Battery Monitoring (BatMon) software

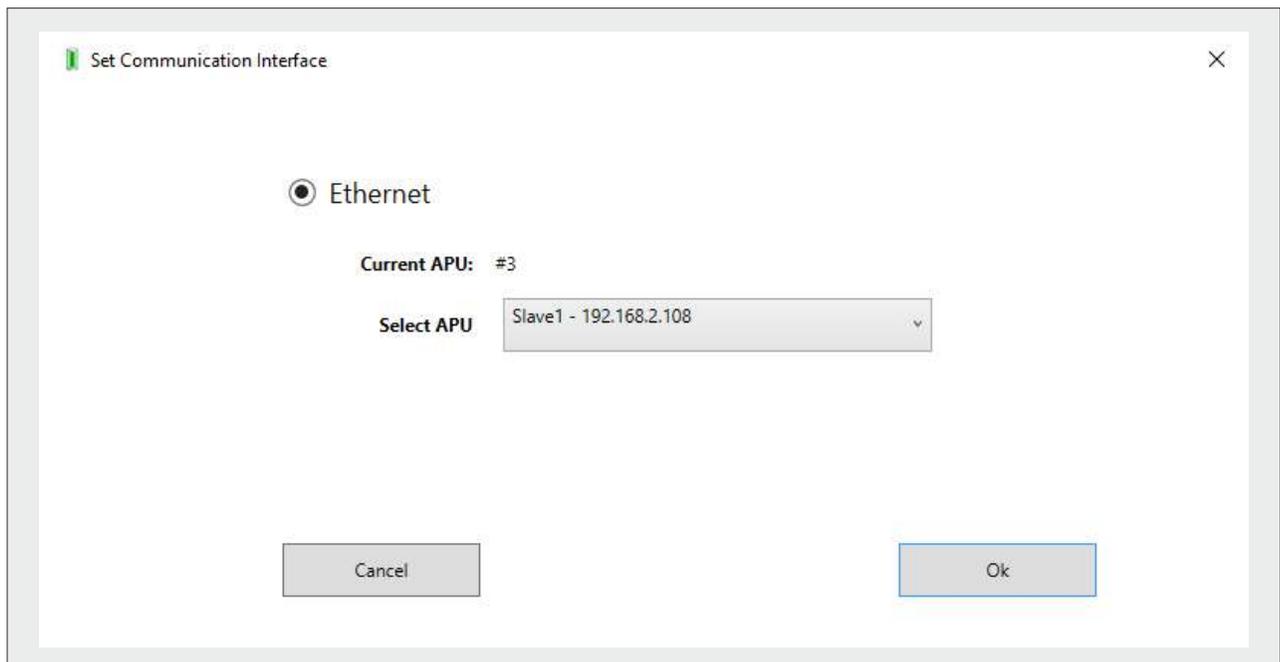
12.1 Views and features of TESVOLT Battery Monitoring (BatMon) software

TESVOLT BatMon is a software program that can be used to analyze and visualize the battery at the cell level.

The software is provided on the USB stick included with delivery and must be installed in a writable folder, e.g. on drive "C:", before starting.

In order to use the BatMon software to gain insight into the battery, the LAN port on the APU must be connected to the DHCP network. Once installation is complete, run the "BatMon.exe" file. The "Communication Port" button can be found in the bottom section of the BatMon interface under the menu item "System". Ethernet communication must be configured here and the number of the APU must be entered subsequently under "Select APU". The APU number can be found on a sticker affixed to the underside of the APU.

If Ethernet communication has been properly configured and the connection to the battery is successful, a green spinning circle will appear in the lower right corner of the BatMon interface alongside the indicator "online".



Battery
Cells
Events
Parameter
System
Exit

4,2 kW

State of Charge	75%	Charging Cycle [kWh]	1243.4
Battery Voltage [V]	54,39	Discharging Cycle [kWh]	1231.8
Battery Current [A]	-77.5		
Temperature [°C]	26.9	SoH	100
Temp. Static Switch [°C]	26.9	Balancing Mode	OK

Event

● online #3

Battery
Cells
Events
Parameter
System
Exit

Module 1 2 3 4

5 6 7 8
9 10 11 12
13 14 15 16

String Current [A] -77,8

Vcellmin [V] 3,884 #1

Vcellmax [V] 3,889 #8

Tcellmin [°C] 26,9 #3

Tcellmax [°C] 26,9 #1

SoCCellmin [%] 75

SoCCellmax [%] 75

SoHCellmin [%] 100

SoHCellmax [%] 100

Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6	Cell 7
Voltage	3,884 V	3,885 V	3,886 V	3,887 V	3,888 V	3,887 V
Temperature	26,9 °C					
SoH	100 %	100 %	100 %	100 %	100 %	100 %

Cell 8	Cell 9	Cell 10	Cell 11	Cell 12	Cell 13	Cell 14
Voltage	3,889 V	3,888 V	3,888 V	3,889 V	3,888 V	3,888 V
Temperature	26,9 °C					
SoH	100 %	100 %	100 %	100 %	100 %	100 %

Event

● online #3

12.2 Menu structure TESVOLT Battery Monitoring (BatMon)

Battery	Output
	Battery voltage
	Charge/Discharge
	Battery temperature
	Balancingmode
	Charging cycle (kWh)
	SoC (state of charge)
	SoH (Health)
	Warning - Time
Cells	Cell voltage
	Cell temperature
	SoC (cell)
	SoH (cell)
Events	Event Logbuch
Parameter	Battery
System	Current errors
	Firmware Update
	Serial Port

The battery parameters are password protected. Since these parameters directly affect the battery, only TESVOLT **certified technical specialists** are permitted to configure these parameters. You can obtain the password by directly requesting it from TESVOLT GmbH.

SOC – State of Charge

The value indicates the percentage to which the battery has been charged. 100% refers to a fully charged battery. SoCs above 100% may occur since the batteries have higher capacities upon delivery. The APU-Unit can use the measured parameters to determine the state of charge of a single cell, or cell stack, and stop the charging process if necessary. This prevents overcharging. The software also has the same functions for monitoring the discharge process in order to prevent unnecessary discharging of the cells. The system stops discharging of the battery when a defined minimum state of charge is reached.

SOH – State of Health

This value indicates the health of a cell. Precise monitoring allows the system to detect performance differences between individual cells and thus detected damaged/defective cells. The system switches off if necessary and notifies the Sunny Island.

13 Battery system error and warning messages

In the case of persistent errors please contact the TESVOLT Service Line.

Event	Description	Fault correction
-	Storage system fails to start	Check the functionality of the 4 A BMS Fuse (F1) microfuse mounted on the front side of the APU-Unit and replace it if necessary.
W920 / W936 General	General errors in the Battery	Restart the APU-Unit by actuating the On/Off pushbutton. Check the Sunny Island parameter settings.
F921/W937 - Battery High Voltage	Overvoltage of a single cell	The active battery management system equalises the cell voltages. The battery undervoltage system allows detection of defective cells. If dangerous voltages are reached then the battery system opens the DC relay and safety disconnects from the Sunny Island. If the APU-Unit shows lower voltages than are actually present at the batteries then check the white fuses on the pole circuit boards. For this, please measure the white fuse on each respective pole circuit board. The supplied circuit diagram shows the location of each respective cell in the cell block.
F922/W938 - Battery Low Voltage	Undervoltage of a single cell	
F923/W939 Battery High Temperature	Upper temperature limit of a cell has been reached	Switch off the battery and allow it to cool down to at least 25°C. Check the screwed connection at the pole of the affected cell. If temperatures of 195°C are displayed this indicates a defect in the cables or the pole circuit boards. Please check the respective connections for loose contacts.
F924/W940 Battery Low Temperature	Lower temperature limit of a cell has been reached	Switch off the battery and increase the ambient temperature to min. 5°C.
F925/W 941 Battery High Temperature Charge	Upper temperature limit for charging the battery has been reached	Switch off the battery and increase the ambient temperature to min. 5°C.
F926/W 942 Battery Low Temperature Charge	Lower temperature limit for charging the battery has been reached	Switch off the battery and allow it to cool down to at least 25°C. Check the screwed connection at the pole of the affected cell.
F927/W943 - Battery High Current	Charging current too high	Switch off the battery and check the battery parameters and the Sunny Island parameters. Restart the battery.
F928/W944 Battery High Current Charge	Excessive charging current when charging the battery	Switch off the battery and check the battery parameters and the Sunny Island parameters. Restart the battery.
F929 / W945 Switch Contactor	Faulty DC contactor	Restart the battery.
W 947 BMC internal	Faulty Internal Controller	Restart the battery.
F933/W 949 Static Switch Temperature High	Upper temperature limit for Static Switch	Switch off the battery and allow it to cool down to at least 25°C.

14 Maintenance and storage

The Lithium-Ion cells used by TESVOLT are maintenance-free. However, to ensure hazard-free operation, qualified specialists should check all connections and screws and tighten them if necessary since temperature fluctuations may loosen the screws.

Check the tightening torque of the following screws:

Battery pole: 12 Nm

APU connection "Battery" and "Charger": 12 Nm

DC Battery connection Sunny Island: 12 Nm

Using the BatMon software, check the SoC, SoH, cell voltages and cell stack temperatures for irregularities.

Please use a mist-dampened cleaning cloth for cleaning the battery cabinet. Prevent any moisture from coming into contact with the battery connections.

WARNING!

Carry out 'Decommissioning' steps on page 38 before any maintenance work.



Clean the Sunny Island ventilator and remove dust from its casing and other components. Check the Sunny Island connections (AC1, AC2, DC cables).

INFORMATION!

Please consult SMA Sunny Island operating instructions for cleaning and maintenance of the SMA.



15 Information on handling lithium batteries

- ▶ Do not open, dismantle, drill through or drop battery cells
- ▶ Do not expose battery cells to high temperatures
- ▶ Do not throw battery cells into fire
- ▶ Do not short-circuit battery cells
- ▶ Do not expose battery cells to rain or immerse in liquids
- ▶ Do not expose battery cells to corrosive atmospheres (e.g. ammonia, salt)
- ▶ Do not use defected or damaged batteries
- ▶ Do not use any charge controllers other than SMA Sunny Island
- ▶ Use class D fire extinguishers (dry powder)
- ▶ Commission storage systems within 6 months of delivery

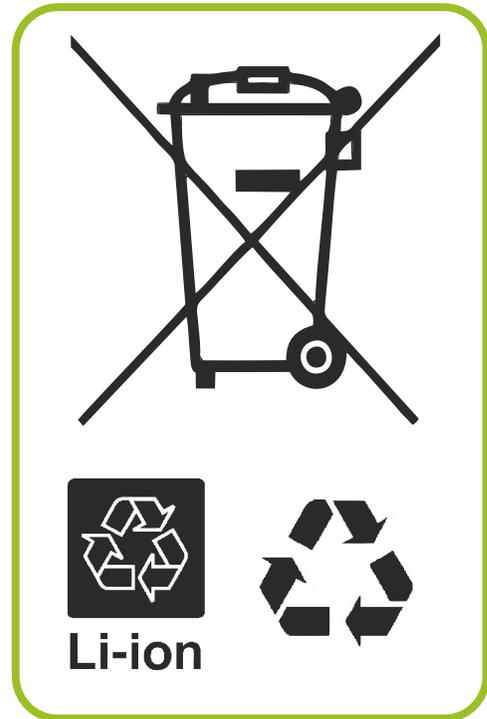
16 Disposal

TESVOLT products are integrated in a free of charge disposal return system. Please contact TESHVOLT in this regard. The batteries may only be disposed of in accordance with the disposal regulations for old batteries applicable at the time of disposal.

Immediately take any damaged batteries out of service and first contact your installer or sales partner before disposal.

Ensure that the battery is not subjected to moisture or direct sunlight. Organise quick removal by your installer or TESHVOLT.

Do not dispose in household waste!



17 Contact

We are happy to support you in all questions related to warning signs or error messages. Please contact us and have the following information ready:

- ▶ Serial number of the TESHVOLT product
- ▶ The error or warning messages shown in the display

Contact data:

TESVOLT GmbH ▶ Am Alten Bahnhof 10 ▶ 06886 Lutherstadt Wittenberg ▶ Germany

tel.: +49 (0) 3491 87 97 - 100 ▶ email: support@tesvolt.com

WE HAVE A THEN FOR ANY WHEN

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