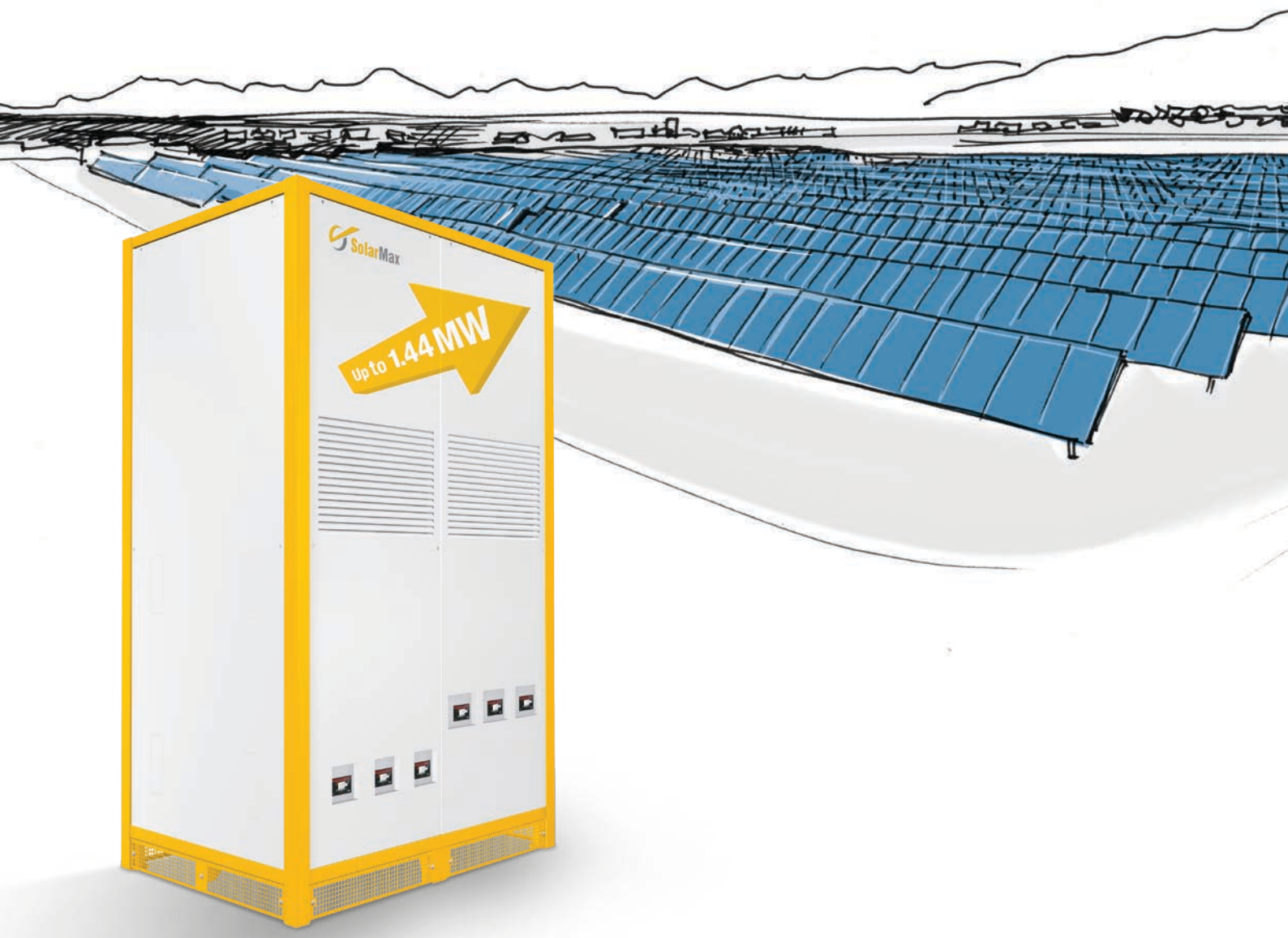
SolarMax 330TS-SV / 360TS-SV

The all-round solution for large-scale PV installations.



More than
20 years Swiss Quality
and Experience

SolarMax®
SWISS QUALITY

Modular and flexible

The SolarMax TS-SV inverters that can be directly connected to the medium-voltage grid are the best choice for PV power plants. Depending on the size of your system, an inverter system consists of up to four SolarMax TS-SV inverters (up to 1.44 MW), a master control unit, and a medium-voltage transformer. The TS-SV inverters meet both current and future requirements applicable to modern PV inverters and they are attractive because of their great flexibility, maximum energy yields, and excellent services such as the MaxControl service package.

Maximum pay-back

The TS-SV inverters are manufactured to a high standard of quality and the consistent use of film capacitors and intelligent monitoring of the power semiconductors make them especially durable and dependable. With a Euro efficiency of up to 97.4 % and an MPP efficiency of 99.9%, the TS-SV inverters maximise the yield of any solar installation. Our competent technical support team looks forward to helping you develop the best layout for your PV power plant.

Swiss Quality

For us, quality has always had the highest priority: all TS-SV series inverters are tested in compliance with current product safety standards and bear the TÜV mark “Type Approved”. The development, the production, and all quality controls of the TS-SV inverters are conducted in Switzerland. This is something you can rely on.

Components

TS-SV Master Control Unit

The Master Control Unit (MCU), the central control and operation unit equipped with a display, enables as many as four TS-SV inverters to be controlled and monitored. As an option the MCU can be fitted with a MaxWeb data logger to easily integrate the installation into a MaxComm network.

Generator connection boxes

MaxConnect plus

The MaxConnect series devices are generator terminal boxes for SolarMax central inverters. They are designed for combining the individual cables of your solar generator. Thanks to single-cable monitoring the devices can detect defects and shadings prematurely.

With integrated cable protections and over-voltage conductors, as well as an integrated high-performance circuit breaker the MaxConnect plus is comprehensively secure. Connection is implemented using terminal clamps.

MaxConnect plus p

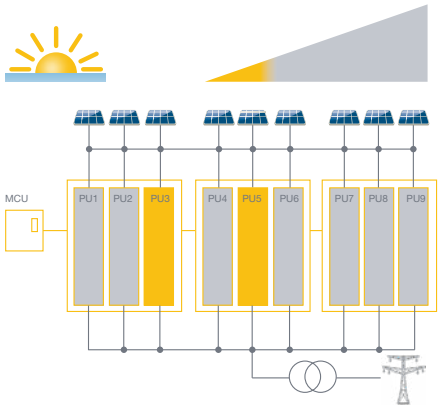
With its housing made of plastic and the MC4 plug-and-socket connections for connecting the cables, the MaxConnect plus p meets the requirements of protection class II and does not require any earthing. The device meets the French UTE standard specifying this protection class for components on the direct current side of PV power plants.

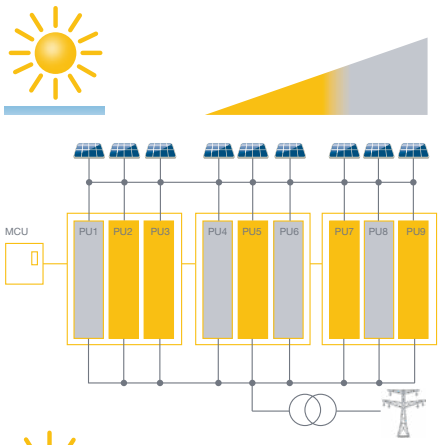
Application

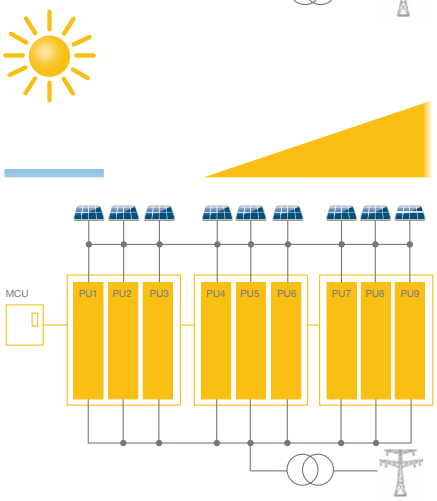
The powerful TS-SV central inverters can be operated either with an MPP tracker (single-MPPT with partial-load optimisation and error management) or with three independent MPP trackers (multi-MPPT).

Single MPPT

Regarding homogeneous module fields, single-MPPT operation optimises the yield during periods of partial load by adding power units in response to power output. The parallel wiring of the PV generators and the redundant wiring of the power units increase operational reliability.

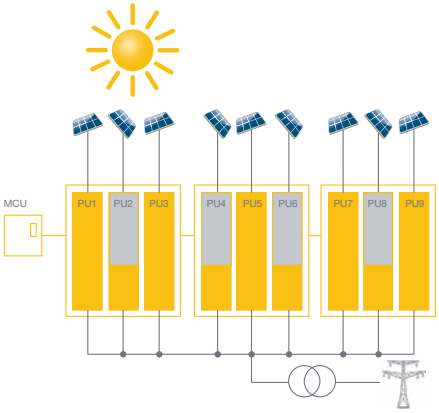




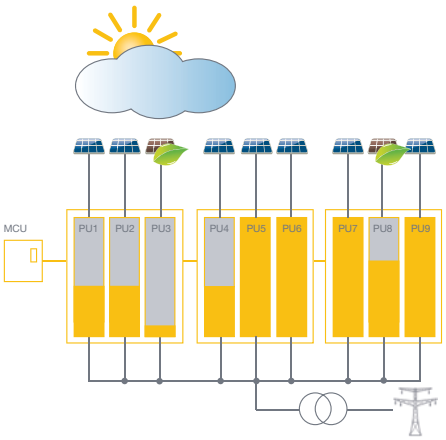


Multi MPPT

Multi-MPPT operation maximises the yield of each partial generator. Thanks to multi-tracking, each of the three power units per inverter always works at the best possible operation point - all partial generators are optimally used even if the surfaces face in different directions. For multi-MPPT operation, no DC fusing is required, additionally reducing the system costs.



Different orientation



Shading / soiling

PU = Power unit

Casing

The best choice for large-scale PV installations directly connected to the medium-voltage grid is the SolarMax Power Station and the SolarMax TS-SV Compact Station. The TS-SV inverters are the heart of the stations in this case and can be operated either in single- or in multi-MPPT mode, and have a total joint PV output of up to 1.44 MW. The Power Station's and the TS-SV Compact Station's high degree of efficiency, reliability, and durability maximise the yields.

Power Station

A SolarMax Power Station consists of as many as four TS-SV inverters, an MCU, a medium-voltage transformer, and medium-voltage switchgear. The installation of the Power Station into a container is made possible by the co-operation with our proven partners on site. This allows us to address your individual needs and meet local requirements. The complete solution is delivered completely assembled – the Power Station only needs to be connected.

TS-SV Compact Station

In a SolarMax TS-SV Compact Station, two TS-SV inverters can be accommodated, including MCU. A SolarMax 660TS-SV Compact Station delivers a rated output power of 660kW (2 x 330TS-SV), a 720TS-SV Compact Station delivers a rated output power of 720kW (2 x 360TS-SV). They are equipped with a light-weight, compact casing (2.2 x 2.9 x 2.0 m), and have a weight of approx. three tons with all equipment attached. Due to their low weight, the TS-SV Compact Station can be transported and installed easily. It is connected easily to a medium-voltage compact station via plug&play.

Data logger - MaxWeb NX pro

The MaxWeb NX pro data logger is the centre of location-independent monitoring of a photovoltaic power plant. It records current readings, yield data, and events and transmits these to the MaxWeb portal.

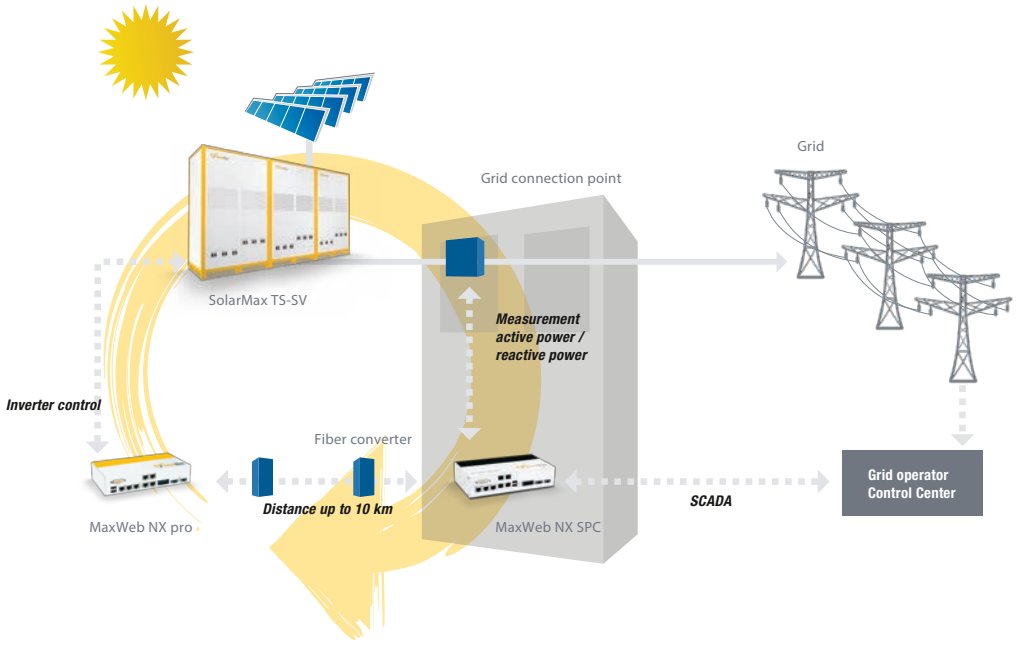
MaxWeb NX pro permanently monitors all connected devices. Automatic alarms are sent via email or SMS to up to three recipients.

MaxWeb NX pro offers the highest reliability even in the most difficult conditions, is maintenance-free, and designed for continuous operation. Thanks to processor performance and diverse interfaces, functionality can be extended easily so that future requirements can be implemented quickly as well.

Solar plant controller - MaxWeb NX SPC

In combination with the MaxWeb NX pro data logger, the MaxWeb NX SPC solar plant controller allows for the active and reactive powers to be controlled directly at the grid feed point. In this way, solar power plants can easily provide the contribution to grid stabilisation required by law.

Connection to the control room of the grid operator can be executed via a SCADA protocol (e.g. IEC 60870-5-101/104) or other digital and analogue interfaces.
MaxWeb NX SPC uses these to obtain the required TARGET specifications of the grid operator and compares these to the ACTUAL values at the grid feed point. Then, MaxWeb NX SPC controls the inverters of the plant so that these feed into the public power grid according the the specifications.



Smart operation and communication

All important data and settings are readable on the master control unit (MCU). The integrated data logger saves statistics on yields, peak outputs, and operating hours for as long as ten years. The inverters can be connected into the MaxComm communications system via the RS485 or Ethernet interfaces. Contacts for remote-controlled shut-downs and status messages have also been integrated. The AC and DC circuit breakers, which are accessible from the outside, allow easy disconnection from the PV generator and from the grid.

Grid management

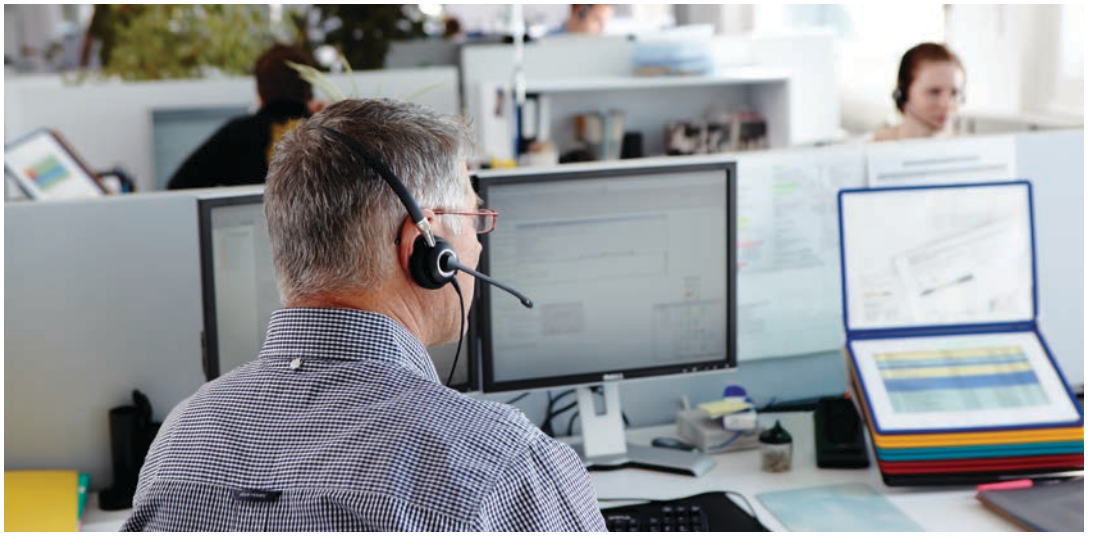
The TS-SV inverters meet the requirements of the BDEW medium-voltage guideline. They are capable of supporting the grid actively with reactive power and of remaining on-line in case of short-term grid failures. The web based MaxWeb data logger facilitates comfortable inverter monitoring and remote control (e.g. to reduce the inverter output).

Comprehensive warranty

The central inverters of the TS-SV series are characterised by a two-year standard warranty that can be extended to five years at no charge by registering on our website. Altogether, you can take the warranty and the all-round carefree package MaxControl for up to 25 years. MaxControl (alarm system, device and system monitoring, data analysis) includes an availability guarantee: if the availability of the inverter (per year) is lower than 97%, we will provide you with a flat yield loss payment.

Competent after-sales service

And if a TS-SV inverter should at any time fail to operate as usual, our Service Centre will provide straight-forward and competent assistance. If the solution cannot be found quickly, our service technicians will come to the site right away. We also support our partners by providing them with practical training at regular intervals.



Specifications

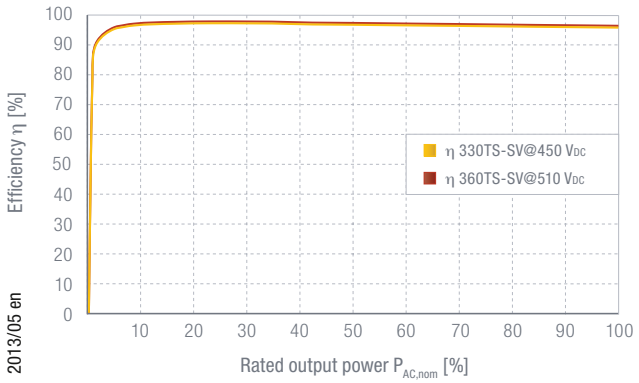
		SolarMax 330/660/990/1320 TS-SV	SolarMax 360/720/1080/1440 TS-SV
Input values	MPP voltage range	450 V...800 V	510…800V
	Maximum DC voltage	900 V	900 V
	Maximum DC current	720/1440/2160/2880 A	720/1440/2160/2880 A
	Number of MPP-Trackers	1 or 3/6/9/12	1 or 3/6/9/12
	Connection type	threaded bolts M8	
	Overvoltage Category	2	
Output values	Rated output power	330/660/990/1320kW [1]	360/720/1080/1440kW [2]
	Maximum apparent output power	340/680/1020/1360 kVA	370/740/1110/1480 kVA
	Nominal mains voltage	3 x 280 V	3 x 320 V
	Maximum AC current	700/1400/2100/2800 A	666/1332/1998/2664 A
	Mains nominal frequency / range	50 Hz / 45 Hz...55 Hz	
	Power factor cos(φ)	Adjustable from 0.8 overexcited to 0.8 underexcited	
	Distortion factor at rated output power	< 3%	
	Connection type	3 x 3 threaded bolts M8	
	Grid connection	Three-phase (without a neutral conductor)	
	Overvoltage Category	2	
Efficiency	Max. efficiency	98%	98%
	European efficiency [3]	97.2%	97.4%
Power input	Own consumption (night)	< 7/14/21/28 W	
Ambient conditions	Protection type compliant with EN 60529	IP20	
	Ambient temperature range	-20 °C...+50 °C	
	Ambient temperature range for rated power output	-20 °C...+45 °C	
	Relative humidity	0...98% (no condensation)	
	Maximum altitude above sea level	2000m (without derating)	
	Noise emissions	< 65dBA	
	Degree of soiling	PD2	
Configuration	Display (in MCU)	Graphic LC display with backlight and status LED	
	Data logger (in MCU)	Data logger for energy yield, peak output, and operating duration for the last 31 days, 12 months, and 10 years	
	Galvanic insulation	No galvanic isolation: direct connection to MV transformer	
Standards & guidelines	EMC	EN 61000-6-2/EN 61000-6-4	
	Standard / guideline compliance	G59/2 / BDEW MV Guideline / PPC Guide / RD 661 / Allegato A70	G59/2/BDEW Medium-Voltage Guideline/ PPC Guide/RD 661
	Device safety	TÜV “Type approved” compliant with IEC/EN 62109-1	
Interfaces	Data communication (in MCU)	RS485 / Ethernet via two RJ45 sockets	
	Status signalling contact (in MCU)	Potential-free terminal contact pair (configurable function)	
	Alarm input (in MCU)	Terminal contact pair for connection to MaxConnect plus	
	Inverter shut-off 1	Two terminal contact pairs (can be chain-linked via several SolarMax TS-SV)	
	Inverter shut-off 2 (in MCU)	Terminal contact pair	
Weight & dimensions	Weight	990/1980/2970/3960 kg	
	Dimensions in mm (W x H x D)	1/2/3/4 x 1200 x 1970 x 800 mm	
Warranty	Standard warranty	2 years (free extension to 5 years after registration)	
	Warranty extensions	to 10, 15, 20, or 25 years	

[1] at cos(φ) = 1, UAC = 280 V

[2] at cos(φ) = 1, UAC = 320 V

[3] in single-MPPT operation with active partial load optimisation (see operating instructions parameter configuration with MaxTalk 2 Pro)

Efficiency SolarMax TS-SV [3]



2013/05 en

SolarMax®
www.solarmax.com