

# SUNWAY TG 610 1000V TE

Indoor / outdoor

Solar Inverter



*(Layout of Outdoor Version)*

The inverters of the **SUNWAY TG** series are full-digital photovoltaic inverters optimized for utility scale applications.

Designed and manufactured in Italy by the technicians of Elettronica Santerno S.p.A., they feature the most advanced electronics technology. The Sunway TG range ensures maximum flexibility with top in class performance.

## **BENEFITS**

- Very high conversion efficiency with a single power conversion stage, optimized for minimum losses
- Modular construction and cabinet industrialization for maximum reliability and easy access to all components for maintainability and ease of service on site
- Grid Code integrated features (LVRT, Reactive Power Control, Frequency and Voltage control) in compliance with the most advanced European and WW standards
- Remote monitoring possibility with SunwayPortal and REMOTE SUNWAY™ software both for a single device and a multi-inverter installation
- Integrated DC-side protection with on load breaker with automatic disconnection
- Integrated miswiring protection on DC side
- Up to 10 fuse-protected integrated DC inputs, up to 20 with external DC parallel (option)
- Integrated AC-side protection with on load breaker with automatic disconnection
- Integrated active monitoring of DC isolation
- Integrated Modbus on RS485 and TCP-IP on Ethernet data connection
- Integrated inputs for environmental sensors
- Diagnostic messages on alphanumeric display that allow quick setting of parameters during start up and realtime monitoring during operation
- Possible use of photovoltaic modules that require an earthed pole, both positive and negative pole
- Thorough manufacturing with first class materials, all Made in Italy

<b>Caratteristiche generali / Main features</b>	
Model	SUNWAY TG 610 1000V TE
PV field voltage range	550-820 V(dc)
Open-circuit voltage	1000 V(dc)
Output voltage	340 V(ac) $\pm$ 10%
Output frequency	50 Hz / 60 HZ (up to -3 Hz / +2 Hz)
Default Cos $\varphi$ - Min Cos $\varphi$	1 - 0.9 lead/lag
Operating temperature range	-20 °C +50 °C (-4 °F to 122 °F) without derating
Degree of protection	IP20/NEMA 1 (indoor version) IP54/NEMA 3R (outdoor version)

<b>Valori di ingresso /Input Ratings</b>	
Suggested Peak Power <sup>(1)</sup>	600 kWp <sup>(1)</sup>
Rated DC input power	527 kW
Rated input current	900 A (dc)
Maximum short circuit PV input current	1100 A (dc)
PV voltage ripple	<1%
<b>Valori di uscita BT /LV Output Ratings</b>	
Max AC output power <sup>(2)</sup>	560 kW
Max AC output power <sup>(3)</sup>	560 kW
Rated AC total power	540 kVA
Rated AC output power	510 kW
Rated output current	866 A
Power Threshold	1% of Rated AC output power
Total AC current distortion	$\leq$ 3%
<b>Rendimento Inverters / Inverter efficiency</b>	
Maximum Efficiency	98.5 %
European Efficiency	98.1 %
<b>Dimensioni / Dimensions</b>	
Inverter dimensions (WxHxD)	2606x2150x806 mm (indoor version) 2766x2303x1006 mm (outdoor version)
Inverter Weight (kg) Indoor   Outdoor	2000 kg (indoor version) 2100 kg (outdoor version)
<b>Assorbimenti ausiliari / Auxiliary Consumption</b>	
Fan Losses	1775 W (indoor version) 2095 W (outdoor version)
Losses when stopped/Night losses	45 W / 45 W
Max auxiliary power consumption	1820 W (indoor version) 2140 W (outdoor version)
Anticondensation heater power consumption <sup>(4)</sup>	1kW

Elettronica Santerno reserves the right to make any technical changes to this document without prior notice.

NOTE

<sup>(1)</sup> Suggested Peak Power is a reference value and is not to be used as a final power dimensioning criterion.

<sup>(2)</sup> @ Vac +10% Vac rated

<sup>(3)</sup> @ Vac rated, Tamb < 35 °C (95 °F)

<sup>(4)</sup> Option recommended for Outdoor configuration in medium/cold climate environment

<b>Informazioni aggiuntive / Additional information</b>	
<i>Protection against overvoltage (SPD)</i>	<b>DC: yes – AC: optional</b>
<i>Relative humidity</i>	<b>95% non condensing</b>
<i>Cooling system</i>	<b>Forced air</b>
<i>Airflow</i>	<b>9000 m3/h (indoor version) 12000 m3/h (outdoor version)</b>
<i>Thermal protection</i>	<b>Integrated, 5 sensors, both on cabinet and power stack</b>
<i>Environmental Sensors</i>	<b>6 embedded inputs</b>
<i>Digital Communication Channels</i>	<b>2xRS485 with Modbus + Ethernet with TCP/IP</b>

## Operating description

Daily operation is completely automated and the inverter working point is continuously adapted to the PV generator characteristic in order to extract and convert the maximum available power. A digital DSP control ensures perfect synchronization with the grid voltage and phase, with the best power quality and a factory calibrated  $\cos\phi = 1$ .

Utility Interactive Features are embedded, software controlled, completely configurable based on the applicable grid code.

Best reliability is ensured by design. All electronics PCBs are coated for best protection against harsh environment. Moreover, redundant protection systems and auto-diagnostic functions are implemented.

Auxiliary power and LVRT are self-supplied, neither external power nor UPS is needed, but it is possible to connect an external source, if desired.

## Optional accessories

**Integrated DC Fuse Bar:** optionally SUNWAY TG TE inverters can be provided with an integrated input DC Parallel bar, that extends the number of connectable DC inputs and ensure additional protection of each DC Input by means of fuses installed in series on both poles of PV Field (each fuse state is monitored by a fuse blown signalling contact). Fuse number and size must be chosen depending on the number of DC cables and current ratings. Santerno catalogue offers a wide set of fuses.

Max Number of Inputs: 10

**External DC Fuse Bar (Sunway DC Parallel):** having the same function as the integrated DC Fuse Bar, the Sunway DC Parallel external cabinet enables wiring and parallel-connecting up to 20 inputs with fuse protection on both poles.

Number of Inputs: up to 20

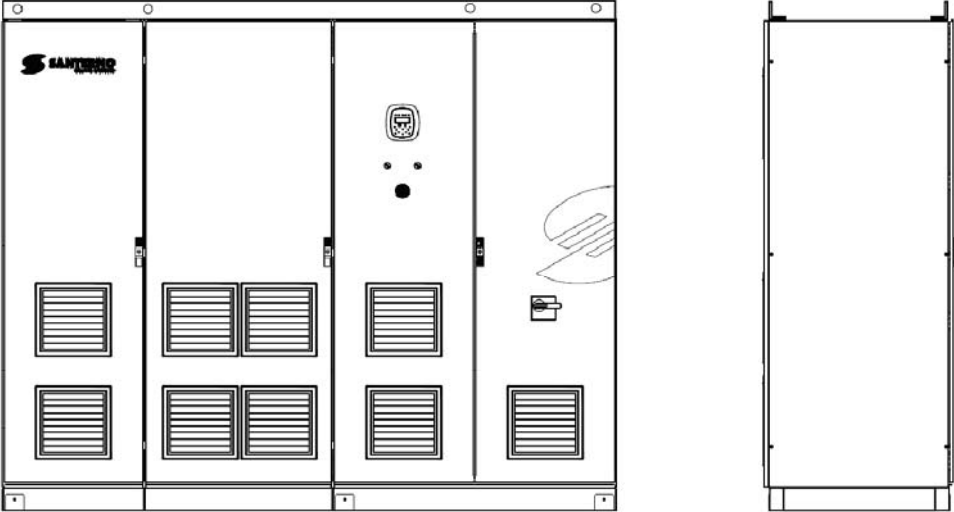
**Earth connection:** optionally, the SUNWAY TG TE inverters can be provided with positive- or negative- ground connection of the PV field. That option must be defined while ordering the equipment and it is made internally, with a monitored fuse connected to ground.

When using modules sensitive to the PID (potentially induced degradation) it is suggested to properly configure the PV field with ground connection.

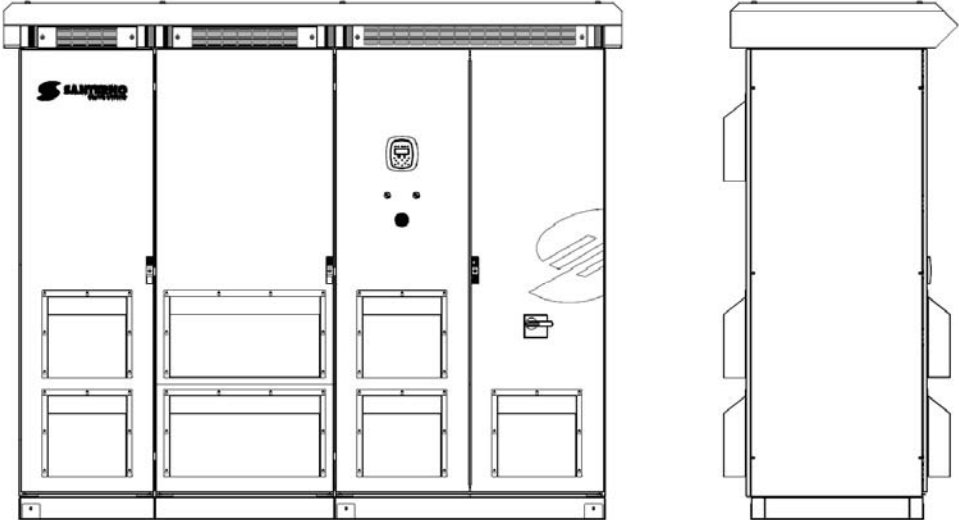
**Included accessories**

All inverters are supplied with user manuals, technical documentation complying with the regulations in force, keys and lifting hooks, dedicated pallets for easy and safe transport.

**Indoor Layout**



**Outdoor Layout**



## Main normative references

The SUNWAY TG inverters have been developed, designed and manufactured in accordance with the requirements of the low voltage directives and the electromagnetic compatibility directives.

<b>Standards</b>	
<i>EMC / Model</i>	<b>61000-6-2</b>
<i>Safety</i>	<b>IEC 62109-1, IEC 62109-2</b>
<i>Harmonics</i>	<b>61000-3-4, 61000-3-12</b>
<i>Immunity</i>	<b>EN61000-4-2, EN61000-4-4, EN61000-4-5 EN55011 group 1 class B</b>
<i>Insulation voltage to ground and between input and output</i>	<b>2.5 kV to 50Hz for 60 sec.</b>
<i>Grid connection</i>	<b>CEI 0-21, CEI 0-16 (Italy) BDEW (Germany) CQC (China) UL 1741 and IEEE 1547 (USA)</b>