

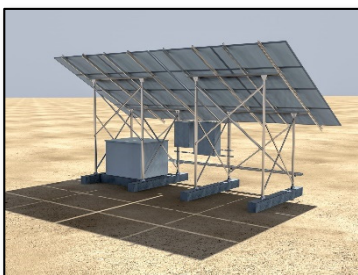
infinitem Solar Hybrid Energy Solutions

A sustainable versatile modular power energy system without cooling or moving parts. Trustworthy 24/7 running system.



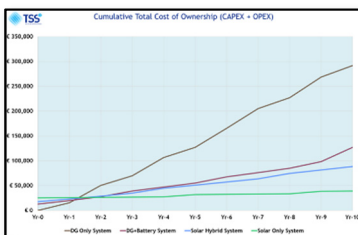
TSS - Solar System Integrator

- +35 Years' experience in design and supply of off-grid Solar Energy Systems for harsh environments
- In-house innovation with intensive field and lab testing
- A sustainable versatile modular power energy system, upgradable at any time
- Designed, engineered and manufactured in the Netherlands, Europe



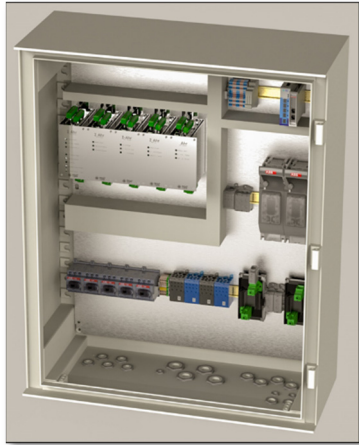
infinitem - Art of No Cooling

- 24/7 Running hybrid control system, without cooling
- No cooling or fans required for batteries and MPPT charge controllers
- No energy loss for cooling, all captured energy flows to the loads
- Suitable for ambient temperatures up to 60°C
- No moving parts, no wear & tear



infinitem - TCO Software Tool

- Total Cost of Ownership in-house developed software tool
- Defining TCO and CO₂ reduction for various hybrid solutions
- Calculating & defining the battery lifetime expectancy
- Calculating various uptime solutions / days without load



infinitem S2/S5 Control Box

- Modular, plug & play, upgradable anywhere, anytime
- Hybrid solution with capability to control multiple energy sources with only one unit (less components - more reliability)
- Includes TSS Σ -Ahr MPPT controller provided with two independent array inputs
- Passive cooling / no ventilators, up to 85°C enclosure temperature
- Two outputs possible (essential and non-essential loads)
- Four different remote monitoring solutions available
- Old and new hybrid systems and old and new batteries can be combined, due to the TSS smart diodes, without compromising on reliability & lifetime
- Dual & triple system set-up, resulting in continuous 24/7 uptime



infinitem E2 Rectifier Box

- TSS AC/DC rectifier optimized for battery charging
- Modular set-up: 5kW/10kW
- Adjustable power output to maximize fuel efficiency
- Savings on fuel consumption
- 440Vac-3 phase input



infinitem X6/X8 Support Structure

- Modular, mounting of various PV sizes, in tilt angles of 10, 20, 30 or 40°
- Environmentally friendly, high-quality carbon steel with outstanding corrosion resistance >31 years according ISO 12944-2 C4
- Designed for 102 km/h wind speeds with double bolt connection
- Compact packed for ease of transport
- Ready for mounting enclosures and cable trays
- Space saver for battery boxes and telecom equipment underneath

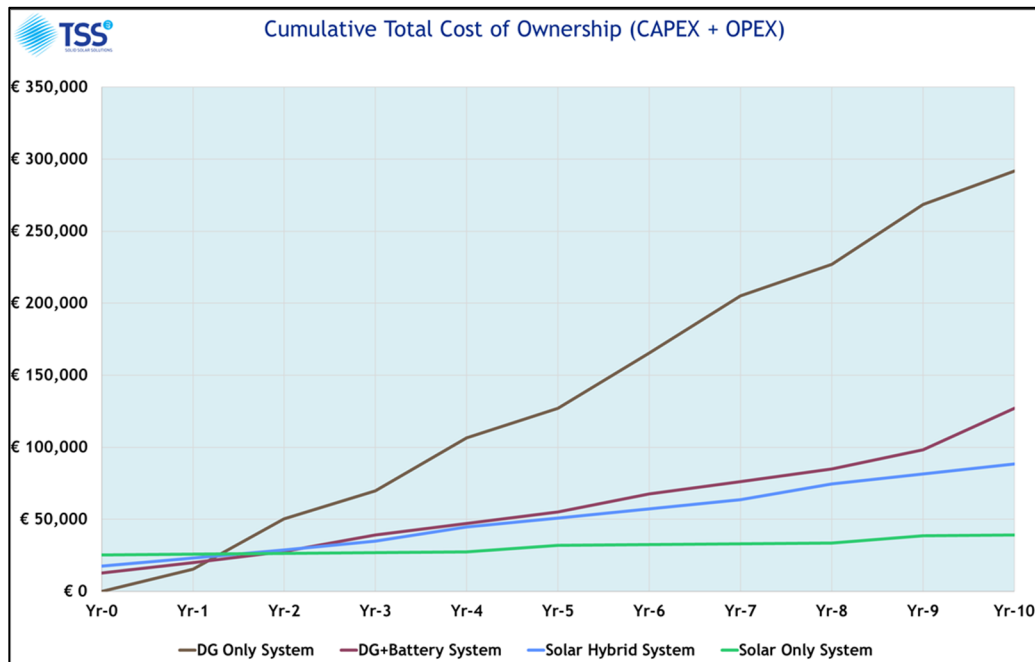
infinitem OPEX and CO₂ savings

With the TSS infinitem control system and the TSS infinitem TCO software tool various diesel hybrid and solar only solutions can be provided. In below table we show the various cost and CO₂ reductions you can achieve.

Item	Diesel generator only system	Diesel generator & battery system	Solar hybrid system (50% solar)	Solar only system
Break-even point	-	1 - 2 year	1 - 2.5 year	1 - 2.5 year
TCO savings	-	50 - 60%	60 - 70%	80 - 90%
CO ₂ emission reduction	-	50 - 60%	70 - 80%	100%

The above results are equal for VRLA or Lithium-Ion batteries.

The TCO calculation TSS provide is taking into account the cost for maintenance and fuel. Transport of diesel and maintenance crew is not taking into account as this is depending on the location where the system will be installed. Each location requires a different solution resulting in a project specific TCO as shown below.



TCO example

infinitum X6/X8 support structure

Modular stand-alone solution for solar only and solar hybrid energy systems. Rigid, easy to install and extendable, ensuring a solid foundation for your system. The smart design and the use of pre-coated zinc-aluminium-magnesium steel contributes to an extremely reliable, durable basement for your stand-alone energy system.

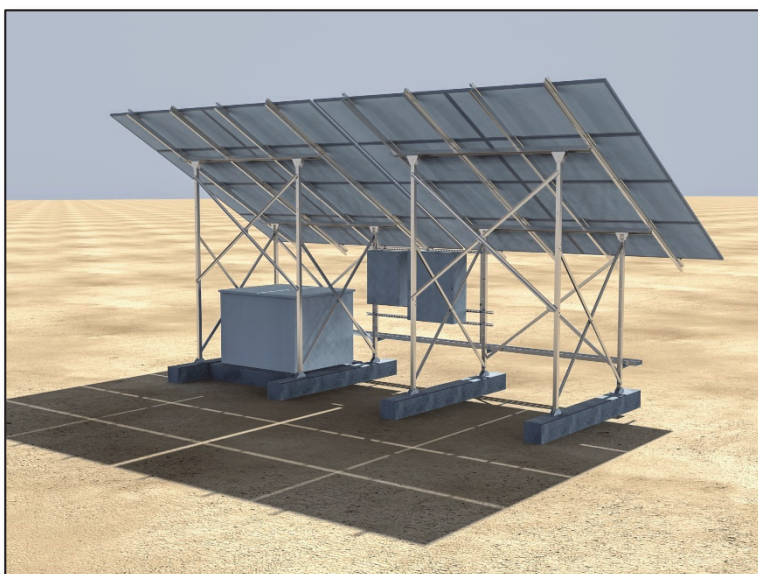


Modular set-up

Modular design for 6 or 8 PV solar modules. Suitable for different size of PV modules due to its' smart slide/clamp construction. Available for tilt angles of 10°, 20°, 30° or 40°.

Extremely reliable and durable

Pre-coated zinc-aluminium-magnesium steel. With an expected long-lasting lifetime of up to 31 years in an industrial and coastal environment. Extremely stable and stiff innovative design due to double bolt connections in combination with cold-formed profiles.



Reducing cost

Integrated facilities for mounting enclosures for control/telecom equipment and cable trays. Saving cost and space due to eliminating the need for separate control racks and facilities for attaching cables minimizing cable lengths.

The support structure and PV modules act as a sunshade for all equipment underneath, protecting against direct sunlight.

infinitum X6/X8 support structure

Characteristics	
Minimum PV module size (LxWxH)	1505 x 958 x 30-42 mm
Maximum PV module size (LxWxH)	2120 x 1118 x 30-42 mm
Amount of PV modules	6 (X6) or 8 (X8)
Material	Magnelis S250GD-ZM310 or equal
Mounting material	Zinc Flake 8.8 isometric bolts, nuts and washers
Environmental classification according ISO 12944-2	C4: suitable for industrial and coastal environments
Durability @ C4	Up to 31 years (*)
Available tilt angles	10°, 20°, 30° or 40°
Maximum allowable wind speed	102 km/hr @ 40°

(*) as a comparison hot dipped galvanized steel has a durability up to 22 years

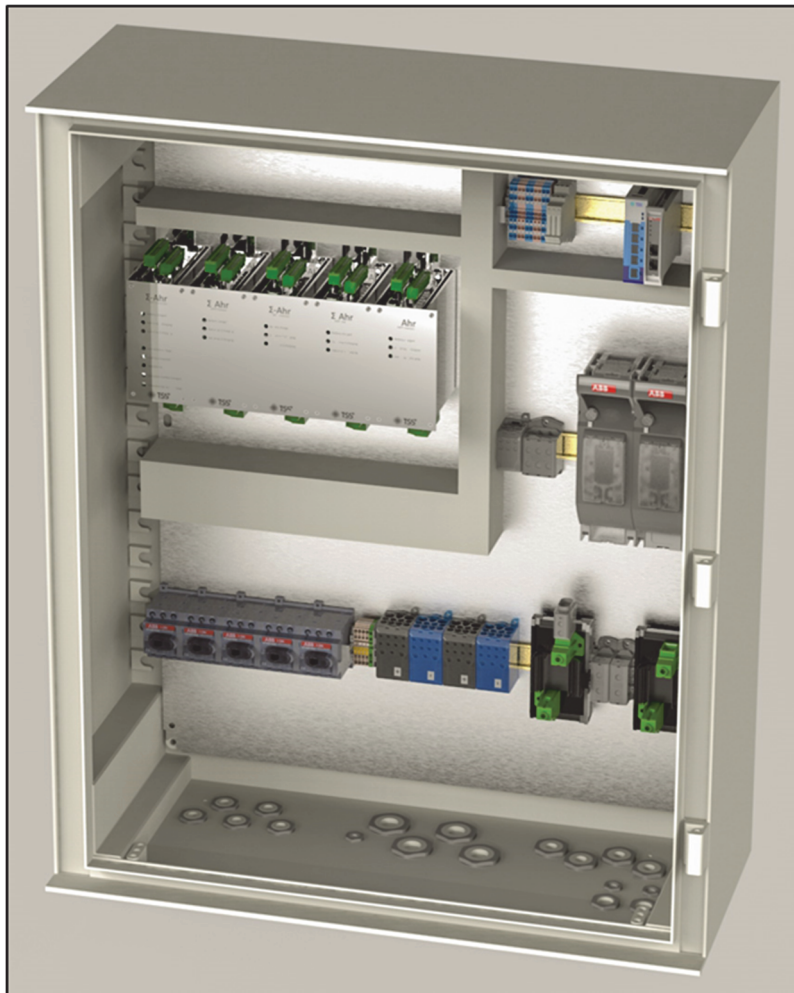
Additional data	
Max. length of profiles	3 m.
Fixation to foundation	2x M12 bolts per foot plate
Earth bolt connection	2x M8 bolt

Dimensions and weight	
For X6 support structure, 10° tilt (max. size PV module)	
Dimensions (LxWxH)	Approx. 4.20 x 2.74 x 3.45 m.
Weight (excl. PV modules)	193 kg.
For X8 support structure, 10° tilt (max. size PV module)	
Dimensions (LxWxH)	Approx. 4.20 x 2.93 x 4.56 m.
Weight (excl. PV solar modules)	206 kg.

Options	
Cable tray, including brackets	
Anti-theft bolts (for PV modules)	
Construction for mounting enclosures	

infinitum S2/S5 Control Box

With 35+ year experience in the design and supply of off-grid Solar Energy Systems TSS has developed a sustainable modular, upgradable solar hybrid control box. The perfect solution combining solar energy with the ability to control multiple energy sources. Always maximum uptime, high reduction and a solar only solution eliminating the CO₂ footprint. Ultimate reliability for powering a multitude of appliances for Oil & Gas, Telecom, Water treatment, etc.



Multi battery and solar module

Suitable for Lead Acid, Li-Ion or NiCad batteries and various type of solar modules. With optimized battery charging regime for any battery type.

Small and large systems

Modular design allowing future expansion. Marrying the correct capacity to your requirement at any time.

Combining old and new systems

Modular sub-system approach allows combining old and new systems. No matter the age of existing systems without compromising on reliability.

Ultimate reliability

Eliminating single point of failure with multi solar input, multiple energy sources and independent sub-systems.

Remote Monitoring

Via Modbus TCP/IP, SNMP or any other interface. Or our cloud-based platform ensuring real-time and historic data for your preventive maintenance program.

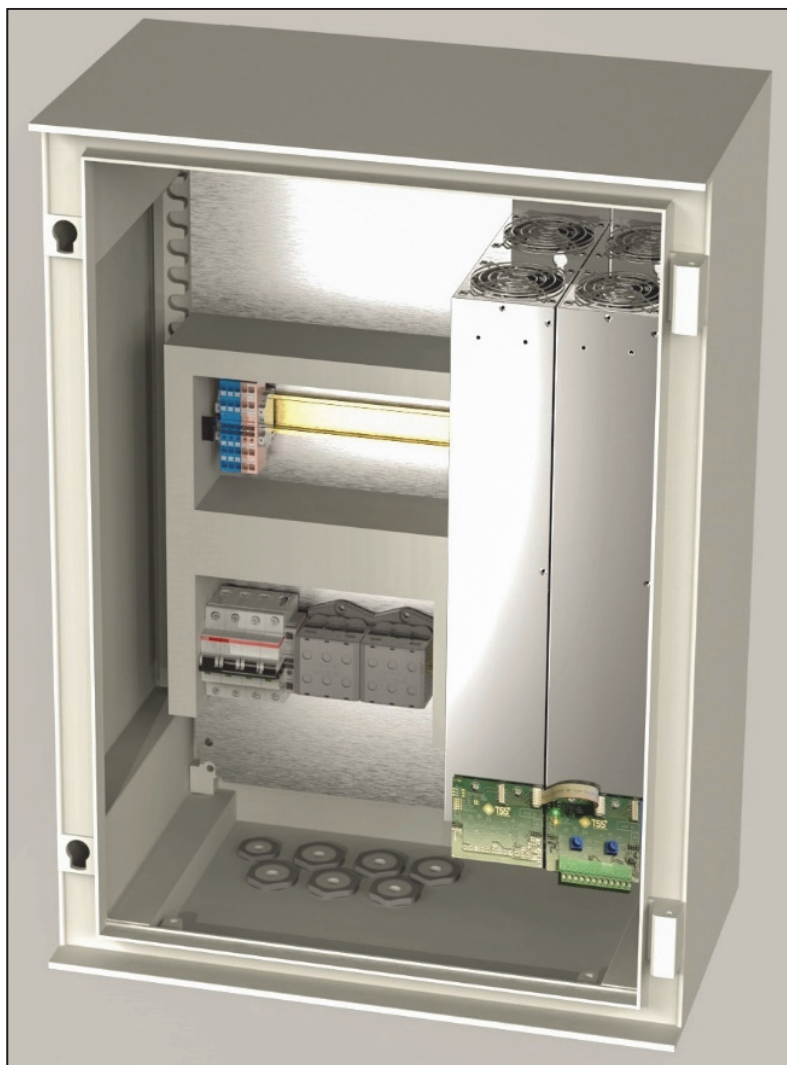
infinitem S2/S5 Control Box

Electrical characteristics	Infinitem S2 Control Box	Infinitem S5 Control Box
Nominal system voltage	48 Vdc	48 Vdc
Quantity MPPT Charge Controller	1 - 2	3 - 5
Independent solar array inputs	2 - 4	6 - 10
Max. array input current each	12 Adc	12 Adc
Array input voltage	120-350 Vdc	120-350 Vdc
Max. array input power	4x 1800 Wp (total 7.2 kWp)	10x 1800 Wp (total 18 kWp)
Operating efficiency solar input	97 %	97 %
Nominal output current to load	140 A (*)	200 A
Maximum output current to load	240 A (1 minute) (*)	360 A (1 minute)
Peak output current to load	360 A (10 seconds) (*)	540 A (10 seconds)
Additional components		
Max. output fuse	160 A (NH00)	200 A (NH1)
Max. generator fuse	N.A.	250 A (NH1)
Battery fuse switch (for inside battery box)	Max. 250 A (NH1)	Max. 500 A (NH3)
Voltage/temperature sensor	✓	✓
Voltage free contact alarm (NO/NC)	3	3
Output diode + shunt 200 A	Optional	Optional
Rectifier diode + shunt 200 A	Optional	Optional
Cloud based platform	Optional	Optional
Modbus TCP/IP to SNMP converter	Optional	Optional
Cable entry		
Solar module cable	2x M25 (4x 4 mm ²)	5x M25 (4x 4 mm ²)
Voltage/temperature sensor	1x M16	1x M16
Battery cable	2x M40 (35-150 mm ²)	4x M40 (35-120 mm ²)
Generator cable	2x M32 (35-70 mm ²)	2x M32 (35-70 mm ²)
Output cable	2x M32 (1.5-70 mm ²)	2x M32 (1.5-70 mm ²)
Blind plug	2x M16, 2x M25	2x M16, 2x M25
General specifications		
Operating temperature	-20° C to +60° C	-20° C to +60° C
Storage temperature	-30° C to +85° C	-30° C to +85° C
Enclosure material	GRP	GRP
Dimensions (H x W x D)	747 x 536 x 300 mm	1056 x 852 x 350 mm
Unit weight	25 kg	50 kg
Mounting	Indoor and outdoor	
IP degree	IP66	
Approvals	CE	
Standards	IEC 61000-6-2, IEC 61000-6-4, IEC 60950-1	

(*) with two Σ -Ahr MPPT Controllers, output current with one Σ -Ahr MPPT controller: 90 A nom. / 120A max. / 180A peak

infinitem E2 Rectifier Box

With 35+ year experience in the design and supply of off-grid Solar Energy Systems TSS has developed a modular, upgradable rectifier box. As part of the infinitem range, it manages the multiple energy sources.



Cost effective battery charging

Customizable design with adjustable output voltage, current and power. 3-Phase AC input and scalable output up to 10kW.

Small and large rectifier

Modular design allowing future expansion. Adapting the correct capacity to your requirement at any time.

Protections

Protecting short circuit, overload, over-voltage, over- temperature and fan failure.

infinitum E2 Rectifier Box

Electrical characteristics	
Supply voltage 3ph+N	340 - 530 Vac
Frequency	47 - 63 Hz
Maximum efficiency	91 %
Nominal output voltage	48 Vdc
Maximum output current	105/210 Adc
Maximum output power	5,040/10,080 W
Incoming MCB	25A-4ph
Protections	Short circuit Overload Over voltage Over temperature Fan fail

Monitoring and control	
Voltage control range	48.0 - 57.6 Vdc
Current control range	20 - 100 %
Remote control	On/Off
Alarm output (over temperature - fan failure - AC input failure)	NO relay contact & LED indication
DC output OK	NO relay contact & LED indication
NO relay contact	30 Vdc / 1A

Cable entry	
Input power cable	1x M25
Output power cable	6x M32

General specifications	
Operating temperature	-20° C to +60° C
Storage temperature	-30° C to +85° C
Enclosure material	GRP
Dimensions (H x W x D)	747 x 536 x 300 mm
Unit weight	25 kg
Mounting	Indoor and outdoor
IP degree	IP55
Approvals	CE
Standards	IEC 61000-6-2, EN 55024 EN 55032 (CISPR32)