NOVI LIGURE

Provincia

ALESSANDRIA







IMPIANTO SOLARE AGRIVOLTAICO "NOVI LIGURE SOLAR 1"

Progetto

IMPIANTO FOTOVOLTAICO A TERRA PER LA PRODUZIONE DI ENERGIA ELETTRICA SITO NEL COMUNE DI NOVI LIGURE (AL)

Istanza di valutazione di impatto ambientale per la costruzione e l'esercizio di impianti di produzione di energia elettrica alimentati da fonti rinnovabili ai sensi degli artt. 23, 24-24bis e 25 del D.Lgs.152/2006

PROGETTO DEFINITIVO

Oggetto

A-RELAZIONI

Schede tecniche materiali

Aggiornamenti

Rev.	Data	Descrizione
	29/06/2022	Emissione

Committente

ELLOMAY SOLAR ITALY SIXTEEN S.r.l Via Sebastian Altmann, 9 - Bolzano (BZ)

Data Scala Tavola

A.07_00

Progettista





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Jltra V Pro Plus

HALF-CELL N-TOPCon BIFACIAL MODULE

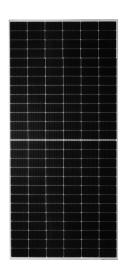
TYPE: STPXXXS - C78/Nmh+

POWER OUTPUT

MAX EFFICIENCY

600-620W

22.4%



Features



High module conversion efficiency

Module efficiency up to 22.4% achieved through advanced cell technology and manufacturing process



Lower operating temperature

Lower operating temperature and temperature coefficient increases the power output



Suntech current sorting process

Up to 2% power loss caused by current mismatch could be diminished by current sorting technique to maximize system power output



Extended wind and snow load tests

Module certified to withstand extreme wind (2400 Pascal) and snow loads (5400 Pascal) *



Excellent weak light performance

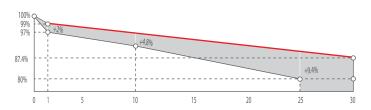
More power output in weak light condition, such as cloudy, morning



Withstanding harsh environment

Reliable quality leads to a better sustainability even in harsh environment like desert, farm and coastline

Industry-leading Warranty **



- ◆ First year power degradation: 1%
- ◆ Annual degradation: 0.40%
- ◆ Product warranty: 12 years
- ♦ linear warranty: 30 years

Certifications and Standards

IEC 61730 IEC 61215 SA 8000 Social Responsibility Standards ISO 9001 Quality Management System ISO 14001 Environment Management System ISO 45001 Occupational Henlth and Safety IEC TS 62941 Guideline for module design qualification and type approval













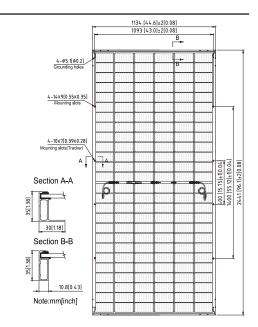
Please refer to Suntech Standard Module Installation Manual for details.
Please refer to Suntech Limited Warranty for details.



Ultra V Pro STPXXXS - C78/Nmh+ 600-620W

Mechanical Characteristics

N-type Monocrystalline silicon 182 mm
156 (6 × 26)
2441 × 1134 × 35 mm (96.1 × 44.6 × 1.4 inches)
35.1 kgs (77.4 lbs.)
2.0+2.0 mm (0.079+ 0.079inches) semi-tempered glass
4.0 mm², (-) 350 mm and (+) 160 mm in length or customized length
IP68 rated (3 bypass diodes)
-40 °C to +85 °C
1500 V DC (IEC)
25 A
0/+5 W
(80 ± 5)%
Packaging box dimensions (mm): 2470×1130×1269 Packaging box weight (kg): 1163 31 Pieces per pallet 558 Pieces per container / 40 ′ HC



Electrical Characteristics STC: Irradiance 1000 W/m², module temperature 25 °C, AM=1.5; NMOT: Irradiance 800 W/m², ambient temperature 20 °C, AM=1.5, wind speed 1 m/s; Tolerance of Pmax is within +/- 3%; Tolera

Module Type	STP 620 S-	C78/Nmh+	STP 615 S-0	C78/Nmh+	STP 610 S-	C78/Nmh+	STP 605 S-0	C78/Nmh+	STP 600 S-0	C78/Nmh+
Testing Condition	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum Power (Pmax/W)	620	473.2	615	469.3	610	465.6	605	461.6	600	457.8
Optimum Operating Voltage (Vmp/V)	46.43	43.0	46.25	42.8	46.07	42.6	45.89	42.4	45.71	42.3
Optimum Operating Current (Imp/A)	13.36	11.02	13.30	10.97	13.25	10.93	13.19	10.88	13.13	10.83
Open Circuit Voltage (Voc/V)	54.86	51.9	54.68	51.7	54.50	51.5	54.32	51.4	54.14	51.2
Short Circuit Current (Isc/A)	14.37	11.59	14.31	11.54	14.25	11.50	14.19	11.45	14.13	11.40
Module Efficiency (%)	2	2.4	22	2.2	22	2.0	21	1.9	21	1.7

For tracker installation, please turn to Suntech for mechanical load information.

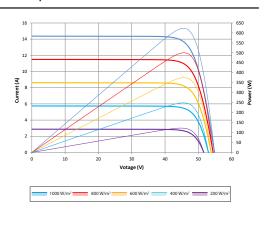
Different Rearside Power Gain Reference to 6105 Front

Rearside Power Gain	5%	15%	25%
Maximum Power at STC (Pmax)	640.5	701.5	762.5
Optimum Operating Voltage (Vmp/V)	46.1	46.1	46.2
Optimum Operating Current (Imp/A)	13.91	15.24	16.56
Open Circuit Voltage (Voc/V)	54.5	54.5	54.6
Short Circuit Current (Isc/A)	14.96	16.39	17.81
Module Efficiency (%)	23.1	25.3	27.5

Temperature Characteristics

Nominal Module Operating Temperature (NMOT)	42 ± 2 ℃
Temperature Coefficient of Pmax	-0.320%/°C
Temperature Coefficient of Voc	-0.260%/°C
Temperature Coefficient of Isc	0.046%/℃

Graphs Current-Voltage & Power-Voltage (620S)



Information on how to install and operate this product is available in the installation instruction. All values indicated in this data sheet are subject to change without prior announcement. The specifications may vary slightly. All specifications are in accordance with standard EN 50380. Color differences of the modules relative to the figures as well as discolorations of/in the modules which do not impair their proper functioning are possible and do not constitute a deviation from the specification.

INGECON SUN PowerStation



20 and 40-feet MV turnkey solutions, customised up to 5000 kVA with 1500 V Outdoor Inverters

Ingeteam





From 830 to 5000 kVA

The complete turnkey solution, customized up to 5 MW. 20 or 40 ft. container with natural air cooling system for adverse environmental conditions

Thanks to its CSC approval for overseas shipment, the INGECON® SUN Power-Station CON20 and CON40 can be marketed and installed everywhere in the world. They are fully equipped containers with five or four separate compartments, central inverters, Medium Voltage switchgear and LV / MV transformer (up to 5,000 kVA).

Robust and long-lasting design

The INGECON® SUN PowerStation CON20 and CON40 are standard solutions specifically designed to maximise the compactness and costeffectiveness of the overall equipment. Thus, the transformer is naturally aircooled, as it is located in an outdoor compartment. The switchgear and communications panels are installed in an IP55 compartment to ensure their maximum protection. The sandwich panels of this compartment are made of galvanized painted steel, filled with a 40 mm layer of rigid fire proof polyurethane foam, ensuring perfect waterproofness over time and efficient thermal insulation.

Equipped with everything necessary

High efficiency inverters, auxiliary services switchgear, Medium Voltage cubicle and LV / MV transformer. Available with high-speed Ethernet / Fiber Optic communication infrastructure for Plug & Play connection to PV Plant Controller, monitoring and SCADA systems.

Complete accessibility

Thanks to its innovative design, all devices are readily accessible. The use of outdoor central inverters provides full access and the possibility of maintenance for all the equipment from the external part of the inverter station.

Ideal for adverse environments

The INGECON® SUN PowerStation CON20 and CON40 are standard solutions able to withstand adverse environmental conditions without any loss of performance.

Maximum power density

This INGECON® SUN PowerStation CON20 or CON40 feature two or three B Series PowerMax PV inverters, Ingeteam's most compact PV inverter, as it provides more power per cubic foot. This makes it possible to achieve up to 3,300 kVA in only 20-feet and up to 5,000 kVA in only 40-feet inverter station.

Grid support

The INGECON® SUN PowerMax PV inverters have been designed to comply with the most demanding international grid codes, contributing to the quality and stability of the electric system. Low voltage ride-through capability, reactive power deliverance and active power control are just some of their main features.



CON20 NA / NA / FA up to 3300 kVA



CON40 NA / NA / FA up to 5000 kVA

MAIN FEATURES

- Output power up to 5,000 kVA.
- Equipped with IP54 protection degree central inverters. ⁽¹⁾
- Available with oil immersed hermetically sealed LV / MV transformer (up to 5,000 kVA / 36 kV) in IP21 compartment.
- Available with IP55 compartment for MV Switchgear and LV equipment.
- Rated power up to 50 °C ambient temperature. (1)
- Protected against direct solar radiation.
- CSC certification for container shipping.
- Plug & Play solution.
- Maximum reliability, higher safety and reduced maintenance.
- Installation Altitude: 3,000 m above sea level. (1)
- (1) Refer to Technical Characteristics tables for

ELECTRICAL PROTECTIONS

- Reverse polarity.
- Output short-circuits and overloads.
- DC fuses.
- Motorized DC switches with door control.
- AC thermal-magnetic breakers with door control.
- DC and AC overvoltage suppressors.
- Anti-islanding monitoring system with automatic disconnection.
- Insulation monitoring system.
- Automatic disconnection system in case of LV / MV transformer overheat.
- Emergency disconnection button, accessible from outside.
- DGPT2 protection relay included in the transformer.
- MV protection with fuse or circuit breaker protections.

STANDARD EQUIPMENT

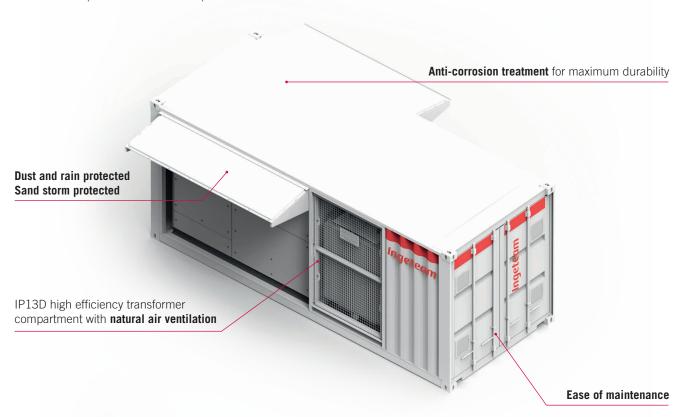
- LV / MV transformer with reduced power losses.
- One, two or three INGECON® SUN PowerMax B Series central PV inverters.
- MV switchgear (1P-0L, 1P-1L, 1P-2L configuration).
- Auxiliary power outlet.
- Fully equipped auxiliary services panel.
- Internal and emergency lighting systems.
- Fire detection system with automatic disconnection (both DC and AC sides).
- Medium Voltage safety kit.
- First aid kit and safety signals.

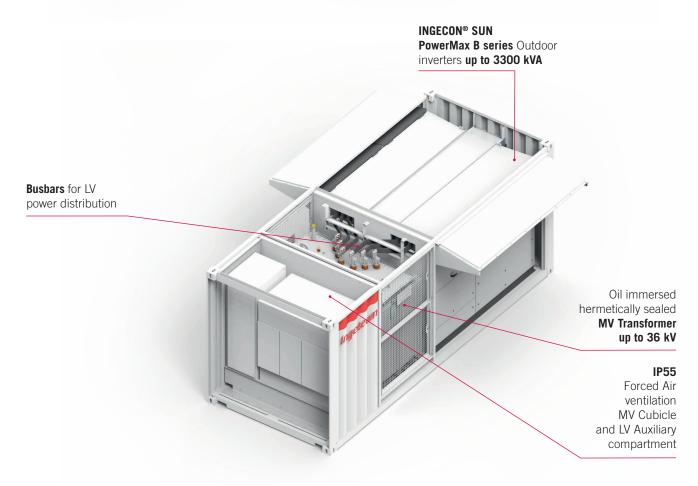
OPTIONAL EQUIPMENT

In addition to the standard equipment, the INGECON® SUN PowerStation can be supplied with the following options:

- LV / LV transformer for the power supply to the auxiliary services panel.
- Power losses reduction according to EU 548/2014.
- Auxiliary services feeder kit.
- UPS for auxiliary services.
- High-speed Ethernet / Fiber Optic communication infrastructure for Plug & Play connection to Power Plant Controller and / or SCADA systems.
- INGECON® SUN StringControl 16 / 24 / 32 channels intelligent or passive string combiner boxes.
- INGECON® SUN SCADA supervision, control and data acquisition system.
- INGECON® EMS Plant Controller compliant with the most widely international Grid Codes.
- Gateway for monitoring and control of the PV Plant by the Grid Operator using standard protocols (like IEC 61850, IEC 60870-5-101/104, DNP 3.0, etc.).
- Sand trap kit.
- Meteo station.
- HV surge arresters.
- Anti-rodent system.
- Human intrusion detection system.
- Internal and / or external lighting.
- Oil retention tank (separately supplied).
- Energy meter for auxiliary services and / or energy production.
- Insulation Monitoring Relay for continuous monitoring of IT systems insulation.
- Three-phase Capacitors with blocking inductances for Power Factor correction.
- DC and AC cable terminals.
- Reactive power regulation with no PV array power.
- Ground connection of the PV array.
- Painted with specific RAL upon request.

Solution up to 3300 kVA (Up to 2 PV inverters)





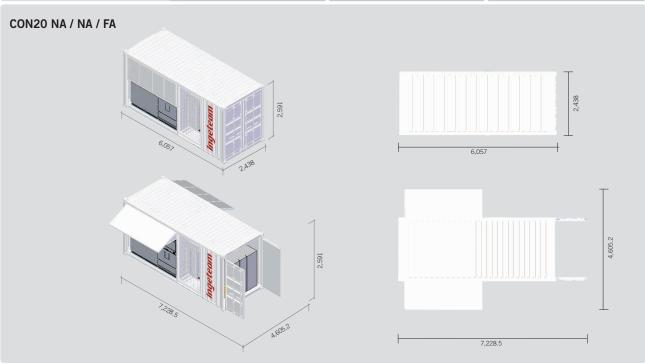
^{*} Illustrative image. It might not correspond with the basic configuration.



	CON20 NA / NA / FA			
General Information				
	Cooling system	Natural air ventilation (forced air ventilation inside the inverters)		
	Max. power consumption	8.5 kVA		
	Protection degree	Outdoor PV inverters (IP54)		
Inverter Compartment	Max. power @ 1,000 Vdc	2,550 kVA @ 35 °C 2,346 kVA @ 50 °C (with 2 inverters)		
	Max. power @ 1,500 Vdc	3,280 kVA @ 30 °C 2,950 kVA @ 50 °C (with 2 inverters)		
	Cooling system	Natural air ventilation		
LV / MV Transformer compartment(1)	Air extraction / Air intake	Protective metal grids		
LV / WV Transformer compartments	Max. power consumption	0 W		
	Protection degree	IP13D (outdoor transformer)		
	Cooling system	Forced air with temperature control		
MV Cubicle compartment ⁽²⁾	Air extraction / Air intake	Filtered anti-rain grids		
wiv Cubicle compartment—	Max. power consumption	65 W		
	Protection degree	IP55 / NEMA 3R		
Operating temperature range		-20 °C to +55 °C(3)		
Relative humidity (non-condensing)		0-100%		
nstallation altitude ⁽⁴⁾		3,000 m above sea level		
Equipment				
Inverter version		B series		
Auxiliary Services Switchgear		Standard version (Full version and high-speed communication infrastructure optional)		
LV / MV Transformer		Oil immersed hermetically sealed		
MV Switchgear		0L1P, 1L1P or 2L1P cells with either fuses or circuit breaker protection		
Mechanical Information				
Structure Material		Steel		
MV Switchgear insulation grade		Sandwich panels containing a rigid fire-proof polyurethane foam filling		

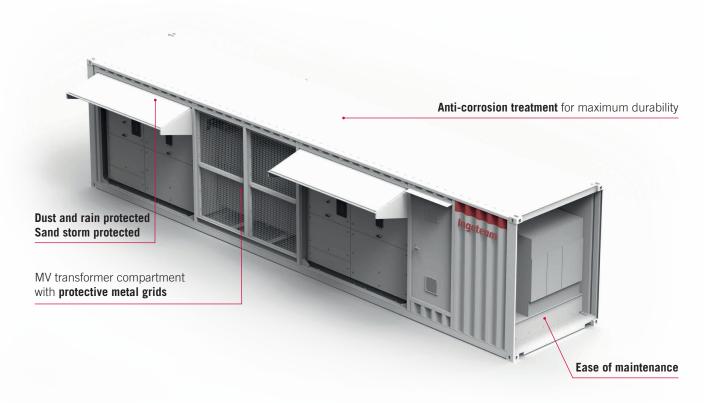
Notes: (1) Including instrumentation, auxiliary services switchgear, monitoring systems (2) Equipped with oil immersed hermetically sealed LV / MV transformer (4) -30 °C with optional kit (4) Please contact Ingeteam for altitudes higher than 1,000 m.

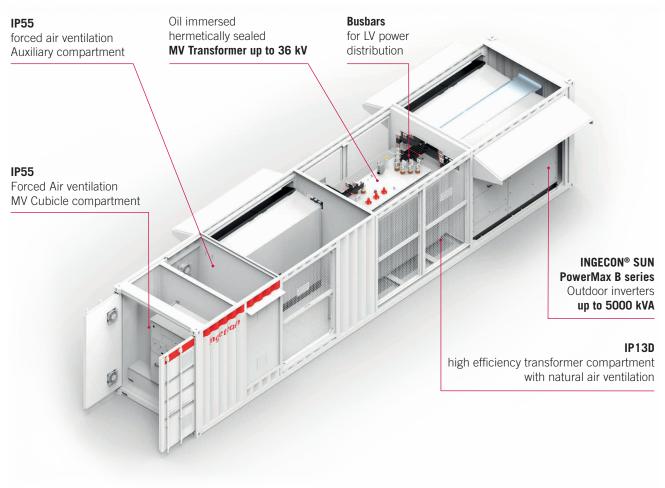
	Length	Width	Height
Size (mm)			
Body dimensions	6,057	2,438	2,591
Overall dimensions with all doors open	7,228.5	4,605.2	2,591
Foundation dimensions	8,000	5,000	300





Solution up to 5000 kVA (Up to 3 PV inverters)



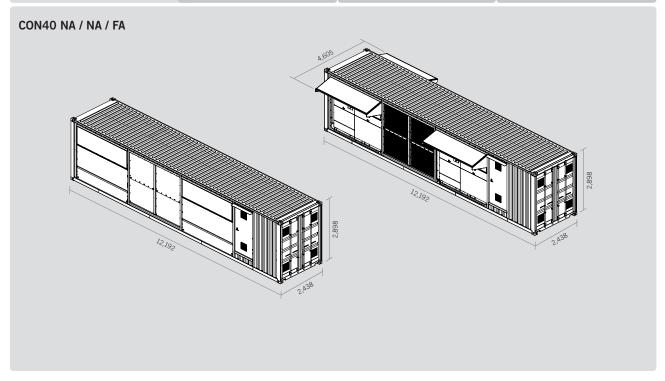


^{*} Illustrative image. It might not correspond with the basic configuration.

	CON40 NA / NA / FA			
General Information				
	Cooling system	Natural air ventilation (forced air ventilation inside the inverters)		
	Max. power consumption	12.75 kVA		
	Protection degree	Outdoor PV inverters (IP54)		
Inverter Compartment	Max. power @ 1,000 Vdc	3,825 kVA @ 35 °C 3,519 kVA @ 50 °C (with 3 inverters)		
	Max. power @ 1,500 Vdc	4,920 kVA @ 30 °C 4,420 kVA @ 50 °C (with 3 inverters)		
	Cooling system	Natural air ventilation		
LV / MV Transformer compartment(1)	Air extraction / Air intake	Protective metal grids		
LV / WV Transformer compartment.	Max. power consumption	0 W		
	Protection degree	IP13D		
	Cooling system	Forced air with temperature control		
MV Switchgear compartment(2)	Air extraction / Air intake	Filtered anti-rain grids		
in Switchgear Compartment	Max. power consumption	65 W		
	Protection degree	IP55		
Operating temperature range -20 °C to +55 °C(3)		-20 °C to +55 °C ⁽³⁾		
Relative humidity (non-condensing)		0-100%		
Installation altitude ⁽⁴⁾		3,000 m above sea level		
Equipment				
Inverter version		B series		
Auxiliary Services Switchgear		Standard version (Full version and high-speed communication infrastructure optional)		
LV / MV Transformer		Oil immersed hermetically sealed		
MV Switchgear	OL1A, 1L1A or 2L1A cells with circuit breaker protection			
Mechanical Information				
Structure Material		Steel		
Insulation		Sandwich panels containing a rigid fire-proof polyurethane foam filling		

Notes: (1) Equipped with oil immersed hermetically sealed LV / MV transformer (2) Including instrumentation, auxiliary services switchgear, monitoring systems (3) -30 °C with optional kit (4) Please contact Ingeteam for altitudes higher than 1000 m.

	Length	Width	Height
Size (mm)			
Body dimensions	12,192	2,438	2,898
Overall dimensions with all doors open	13,452	4,605	2,898
Foundation dimensions	13,500	4,450	300



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Ingeteam

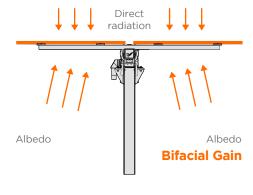


Bifacial Yield Boost

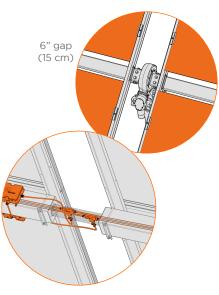
The SF7 standard configuration enables cost-effective installation, operation, and innovation such as the bifacial tracking solution.

No Shading

Two-up portrait module mounting: no backside shading from torque tube.



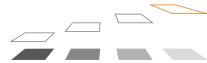
Eliminates hanging wires and manages cable through the torque tube, reducing the total wire up to 83% and installation labor up to 75%.





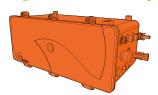
Only 7 piles per every 90 modules and no dampers, minimizing the number of objects shading the rear side of the modules. 46% fewer piles per MW.

Taller Tracker



Bifacial performance is increased by height of installation, reducing shadow intensity projection.

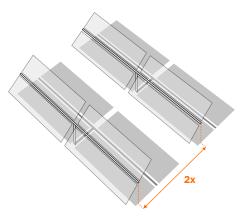
Highest Power Density



SF7 is **Self-Powered PV Series** and does not require an extra module. More PV active area per tracker for better land-use.

2x Wider Aisles

Maximize reflected solar energy (albedo) while improve O&M accessibility for modules washing and vegetation control.





Single-Axis Tracker

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B&V Bankability report DNV GL Technology Review available RWDI WIND TUNNEL TESTED

2 year background industrial operation

