Tarifário de Ciclo Semanal opcional MT			
Potência Contratada		1192	kW
Energia ativa	Vazio Normal	0,046200	€/kWh
Energia ativa	Ponta	0,059100	€/kWh
Energia ativa	Cheia	0,053700	€/kWh
Energia ativa	Super Vazio	0,039300	€/kWh
Tarifa acesso	Pot PO	0,21470	€/kW por dia
Tarifa acesso	Contratada	0,03490	€/kW por dia
Tarifa acesso energia II e III	Ponta	0,04870	€/kWh
Tarifa acesso energia II e III	Cheia	0,04100	€/kWh
Tarifa acesso energia II e III	Vazio Normal	0,02200	€/kWh
Tarifa acesso energia II e III	Super Vazio	0,02150	€/kWh
Tarifa acesso energia I e IV	Ponta	0,04900	€/kWh
Tarifa acesso energia I e IV	Cheia	0,04130	€/kWh
Tarifa acesso energia I e IV	Vazio Normal	0,02210	€/kWh
Tarifa acesso energia I e IV	Super Vazio	0,02140	€/kWh
ISP		0,00100	€/kWh

Período I – de 1 de Janeiro a 31 de Março;

Período II – de 1 de Abril a 30 de Junho;

Período III – de 1 de Julho a 30 de Setembro;

Período IV – de 1 de Outubro a 31 de Dezembro.

Ciclo semanal opcional para os clientes em MT

Hora legal de Inverno		**Hora legal de Verão**	
Segunda-feira a sexta-feira		**Segunda-feira a sexta-feira**	
Ponta:	17.00/22.00 h	Ponta:	14.00/17.00 h
Cheias:	00.00/00.30 h	Cheias:	00.00/00.30 h
	07.30/17.00 h		07.30/14.00 h
	22.00/24.00 h		17.00/24.00 h
Super vazio:	02.00/06.00 h	Super vazio:	02.00/06.00 h
Vazio normal:	00.30/02.00 h	Vazio normal:	00.30/02.00 h
	06.00/07.30 h		06.00/07.30 h
Sábado		**Sábado**	
Cheias:	10.30/12.30 h	Cheias:	10.00/13.30 h
	17.30/22.30 h		19.30/23.00 h
Super vazio:	03.00/07.00 h	Super vazio:	03.30/07.30 h
Vazio normal:	00.00/03.00 h	Vazio normal:	00.00/03.30 h
	07.00/10.30 h		07.30/10.00 h
	12.30/17.30 h		13.30/19.30 h
	22.30/24.00 h		23.00/24.00 h
Domingo		**Domingo**	
Super vazio:	04.00/08.00 h	Super vazio:	04.00/08.00 h
Vazio normal:	00.00/04.00 h	Vazio normal:	00.00/04.00 h
	08.00/24.00 h		08.00/24.00 h

Cumprimento de Cabo DC a usar entre o Painel Fotovoltaico e Inversor, dividido por String													Total (m)	
B1	**string 1**	2,39	6	2,36	6	2,36	6	2,93	8	4,16	4	12,21	56,41	303,08
	string 2	15,63	12	2,38	16	5,6	4	16,94					72,55	
	string 3	22,03	10	2,36	16	5,73	6	18,91					81,03	
	string 4	18,91	6,84	8	2,91	8	7,19	8	2,94	6	24,3		93,09	
B2	**string 1**	8,77	6	2,36	8	7,24	16	2,91	8,03				59,31	297,22
	string 2	6,03	3,42	12	2,36	16	5,6	6	11,56				62,97	
	string 3	11,56	6,84	8	2,35	16	7,19	8	16,31				76,25	
	string 4	16,31	8,55	6	2,35	16	15,53	13,75	20,2				98,69	
B3	**string 1**	3,69	6	7,23	10	7,24	18	7,9					60,06	270,91
	string 2	10,25	18	2,36	18	12,63							61,24	
	string 3	14,97	18	2,36	18	17,34							70,67	
	string 4	4,18	16,53	18	2,36	12	3,81	22,06					78,94	
B4	**string 1**	11,2	8	4,7	8	16	2,35	9,14					59,39	227,62
	string 2	3	18	2,35	18	5,32							46,67	
	string 3	7,67	18	2,35	18	10,03							56,05	
	string 4	12,41	18	2,35	18	14,75							65,51	
H	**string 1**	3,53	4,3	38	32,45	4,3	3,53						86,11	326,38
	string 2	3,53	10,82	4,2	1,61	3,53	2,24	28	22,31				76,24	
	string 3	22,31	22	2	14	2	30,68						92,99	
	string 4	28,8	2	36	2	2,24							71,04	
J	**string 1**	3,18	24	7,21	6,84	6,84	4,52	6	1,73				60,32	229,16
	string 2	6,72	6,72	2,28	2,28	18	18						54	
	string 3	6,72	2,28	2,28	18	2,28	18	2,28	6,72				58,56	
	string 4	6,72	2,28	18	18	2,28	2,28	6,72					56,28	
M	**string 1**	5,6	34	9,08	30,74	5,6							85,02	249,7
	string 2	3,64	34,16	38	3,64								79,44	
	string 3	6,54	34,16	38	6,54								85,24	
B5	**string 1**	4,87	6	2.41	6	7,21	10	2,41	10	12,03			58,52	352,33
	string 2	12,03	10,26	6	2,41	18	8,89	10	16,84				84,43	
	string 3	16,84	10,26	6	2,41	18	8,89	10	21,66				94,06	
	string 4	21,66	10,26	6	2,41	18	17,23	10	8,1	21,66			115,32	
	string 1	8,9	2,42	6	2,41	6	7,22	12	2,96	6	5,68		59,59	

B6	**string 2**	5,68	6,84	8	2,41	16	7,26	8	10,35				64,54	296,94
	string 3	10,35	8,55	6	2,41	16	8,89	10	15,12				77,32	
	string 4	15,12	10,26	4	2,41	16	13,89	10	3,81	20			95,49	
													2553,3 m	

Cumprimento de Cabo AC a usar entre o Inversor e o Posto de Transformação																**total (m)**
PT1	2,35	35,65	9,5	9,5	8,15	27,86	7	4,12	25,97	27,86	56,6	20	59,88	12	40	346,44
PT2	9,5	2,25	25,05	7,37	28,3	10	29,94	6	75	37						230,41
PT3	32	3	25	5,1	26	33	25	9	90	33	25					306,1
																882,95 m

			nº Paineis by Skellion	nº Paineis	Paineis p/Strings	Strings	P String (kW)	P DC (kW)	P AC (kW)	Tensão DC String (V)
PT1	B1	Area 1	76	76	19	4	5,7	22,8	20	579,88
	B2	Area 2	80	80	20	4	6	24	25	610,4
	B3	Area 3	81	80	20	4	6	24	25	610,4
	B4	Area 4	94	80	20	4	6	24	25	610,4
PT3	B5	Area 5	82	80	20	4	6	24	25	610,4
	B6	Area 6	76	76	19	4	5,7	22,8	20	579,88
PT2	H	Area 7	54	80	20	4	6	24	20	610,4
	J	Area 8	89	80	20	4	6	24	25	610,4
	M	Area 9	63	60	20	3	6	18	20	610,4
			695	**692**		35				

Performance of grid-connected PV

PVGIS-5 estimates of solar electricity generation:

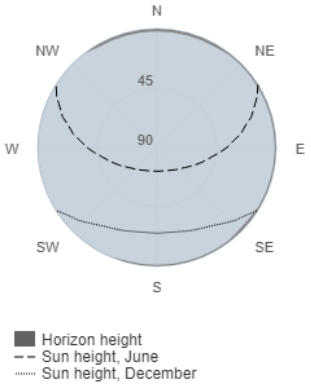
Provided inputs:

Latitude/Longitude:	41.178, -8.595
Horizon:	Calculated
Database used:	PVGIS-CMSAF
PV technology:	Crystalline silicon
PV installed:	1 kWp
System loss:	14 %

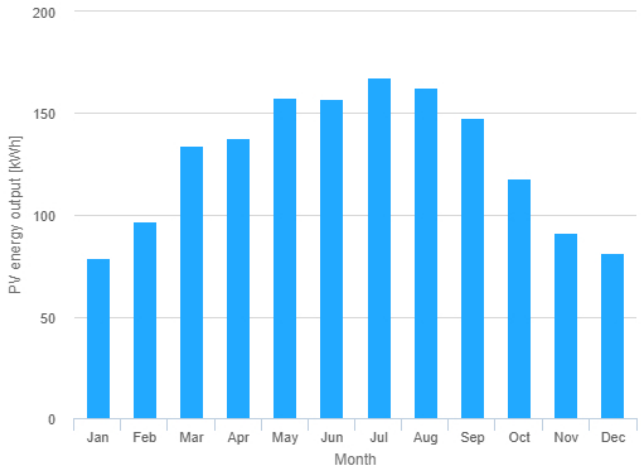
Simulation outputs

Slope angle:	35 °
Azimuth angle:	12 °
Yearly PV energy production:	1530 kWh
Yearly in-plane irradiation:	1940 kWh/m²
Year to year variability:	57.40 %
Changes in output due to:	
Angle of incidence:	-2.6 %
Spectral effects:	0.8 %
Temperature and low irradiance:	-6.7 %
Total loss:	-21.2 %

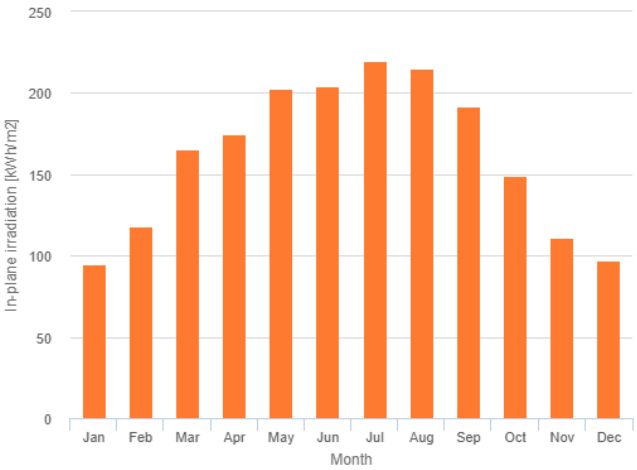
Outline of horizon at chosen location:



Monthly energy output from fix-angle PV system:



Monthly in-plane irradiation for fixed-angle:



Monthly PV energy and solar irradiation

Month	Em	Hm	SDm
January	78.7	94.6	19.6
February	96.8	118	22.2
March	134	165	19.2
April	138	175	11.9
May	158	203	12.4
June	157	204	8.82
July	168	220	7.54
August	163	215	9.03
September	148	192	9.4
October	118	149	16.1
November	91.1	111	19.9
December	81.3	97.4	10.9

Em: Average monthly electricity production from the given system [kWh].

Hm: Average monthly sum of global irradiation per square meter received by the modules of the given system [kWh/m²].

SDm: Standard deviation of the monthly electricity production due to year-to-year variation [kWh].

Joint Research Centre

Report generated on 2018/11/13

powered by Q.ANTUM

Q.PEAK-G4.1 290-305

Q.ANTUM SOLAR MODULE

The new high-performance module Q.PEAK-G4.1 is the ideal solution for residential buildings thanks to its innovative cell technology Q.ANTUM. The world-record cell design was developed to achieve the best performance under real conditions – even with low radiation intensity and on clear, hot summer days.

Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY

Higher yield per surface area and lower BOS costs and higher power classes and an efficiency rate of up to 18.6 %.

INNOVATIVE ALL-WEATHER TECHNOLOGY

Optimal yields, whatever the weather with excellent low-light and temperature behaviour.

ENDURING HIGH PERFORMANCE

Long-term yield security with Anti LID Technology, Anti-PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING

High-tech aluminium alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

MAXIMUM COST REDUCTIONS

Up to 10 % lower logistics costs due to higher module capacity per box.

A RELIABLE INVESTMENT

Inclusive 12-year product warranty and 25-year linear performance warranty[2].

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2016

Q CELLS YIELD SECURITY
- ANTI PID TECHNOLOGY (APT)
- HOT-SPOT PROTECT (HSP)
- TRACEABLE QUALITY (TRA.Q™)
- ANTI LID TECHNOLOGY (ALT)

VDE Quality Tested
- high reliability
- low degradation
- frequent product surveillance

ID. 40032587

Photon
Q CELLS
Best polycrystalline solar module 2014
Q.PRO-G2 235
174 modules tested

[1] APT test conditions: Cells at -1500 V against grounded, with conductive metal foil covered module surface, 25 °C, 168 h

[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

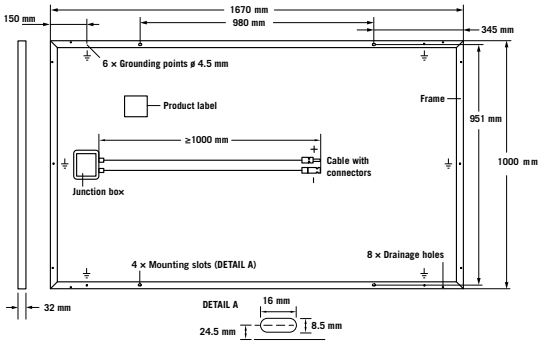
Rooftop arrays on residential buildings

Engineered in **Germany**

Q CELLS

MECHANICAL SPECIFICATION

Format	1670 mm × 1000 mm × 32 mm (including frame)
Weight	18.8 kg
Front Cover	3.2 mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodised aluminium
Cell	6 × 10 monocrystalline Q.ANTUM solar cells
Junction box	66-77 mm × 115-90 mm × 15-19 mm Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) 1000 mm, (-) 1000 mm
Connector	Multi-Contact MC4 or MC4 intermateable, IP68

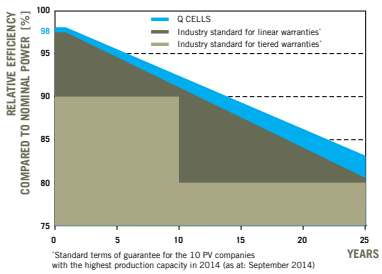


ELECTRICAL CHARACTERISTICS

POWER CLASS				290	295	300	305
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / -0 W)							
Minimum	Power at MPP[2]	P_{MPP}	[W]	290	295	300	305
	Short Circuit Current*	I_{SC}	[A]	9.63	9.70	9.77	9.84
	Open Circuit Voltage*	V_{OC}	[V]	39.19	39.48	39.76	40.05
	Current at MPP*	I_{MPP}	[A]	9.07	9.17	9.26	9.35
	Voltage at MPP*	V_{MPP}	[V]	31.96	32.19	32.41	32.62
	Efficiency[2]	η	[%]	≥17.4	≥17.7	≥18.0	≥18.3
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NOC[3]							
Minimum	Power at MPP[2]	P_{MPP}	[W]	214.6	218.3	222.0	225.7
	Short Circuit Current*	I_{SC}	[A]	7.77	7.82	7.88	7.94
	Open Circuit Voltage*	V_{OC}	[V]	36.65	36.92	37.19	37.46
	Current at MPP*	I_{MPP}	[A]	7.12	7.20	7.27	7.35
	Voltage at MPP*	V_{MPP}	[V]	30.14	30.33	30.52	30.70

[1] 1000 W/m², 25 °C, spectrum AM 1.5 G [2] Measurement tolerances STC ±3 %; NOC ±5 % [3] 800 W/m², NOCT, spectrum AM 1.5 G * typical values, actual values may differ

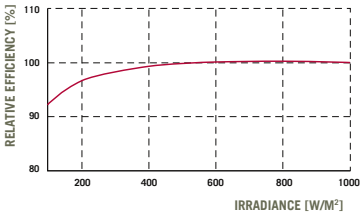
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.6 % degradation per year.
At least 92.6 % of nominal power up to 10 years.
At least 83.6 % of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	**Temperature Coefficient of V_{OC}**	β	[%/K]	−0.28
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.39	**Normal Operating Cell Temperature**	NOCT	[°C]	45

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage	V_{SYS}	[V]	1000	**Safety Class**	II
Maximum Reverse Current	I_R	[A]	20	**Fire Rating**	C
Wind/Snow Load (Test-load in accordance with IEC 61215)		[Pa]	4000/5400	**Permitted Module Temperature On Continuous Duty**	-40 °C up to +85 °C

QUALIFICATIONS AND CERTIFICATES

VDE Quality Tested, IEC 61215 (Ed. 2); IEC 61730 (Ed. 1), Application class A
This data sheet complies with DIN EN 50380.

PARTNER

NOTE: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS GmbH
Sonnenallee 17-21, 06766 Bitterfeld-Wolfen, Germany | **TEL** +49 (0)3494 66 99-23444 | **FAX** +49 (0)3494 66 99-23000 | **EMAIL** sales@q-cells.com | **WEB** www.q-cells.com

Engineered in **Germany**

Efficient
- Maximum efficiency of 98.4%

Safe
- DC surge arrester (SPD type II) can be integrated

Flexible
- DC input voltage of up to 1000 V
- Multistring capability for optimum system design
- Optional display

Innovative
- Cutting-edge grid management functions with Integrated Plant Control
- Reactive power available 24/7 (Q on Demand 24/7)

SUNNY TRIPOWER 15000TL / 20000TL / 25000TL

The versatile specialist for large-scale commercial plants and solar power plants

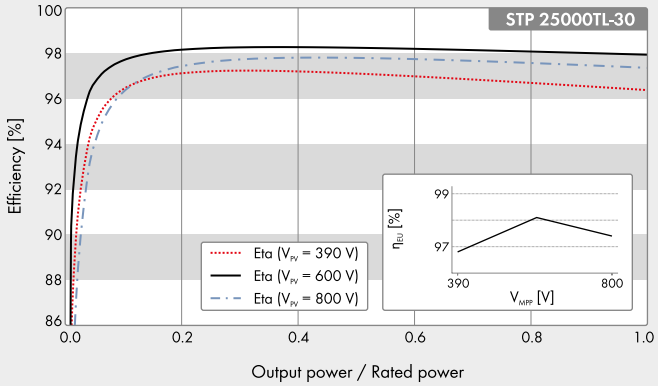
The Sunny Tripower is the ideal inverter for large-scale commercial and industrial plants. Not only does it deliver extraordinary high yields with an efficiency of 98.4%, but it also offers enormous design flexibility and compatibility with many PV modules thanks to its multistring capabilities and wide input voltage range.

The future is now: the Sunny Tripower comes with cutting-edge grid management functions such as Integrated Plant Control, which allows the inverter to regulate reactive power at the point of common coupling. Separate controllers are no longer needed, lowering system costs. Another new feature—reactive power provision on demand (Q on Demand 24/7).

SUNNY TRIPOWER
15000TL / 20000TL / 25000TL

Technical Data	Sunny Tripower 15000TL
Input (DC)	
Max. DC power (at cos φ = 1) / DC rated power	15330 W / 15330 W
Max. input voltage	1000 V
MPP voltage range / rated input voltage	240 V to 800 V / 600 V
Min. input voltage / start input voltage	150 V / 188 V
Max. input current input A / input B	33 A / 33 A
Number of independent MPP inputs / strings per MPP input	2 / A:3; B:3
Output (AC)	
Rated power (at 230 V, 50 Hz)	15000 W
Max. AC apparent power	15000 VA
AC nominal voltage	3 / N / PE; 220 V / 380 V 3 / N / PE; 230 V / 400 V 3 / N / PE; 240 V / 415 V
AC voltage range	180 V to 280 V
AC grid frequency / range	50 Hz / 44 Hz to 55 Hz 60 Hz / 54 Hz to 65 Hz
Rated power frequency / rated grid voltage	50 Hz / 230 V
Max. output current / Rated output current	29 A / 21.7 A
Power factor at rated power / Adjustable displacement power factor	1 / 0 overexcited to 0 underexcited
THD	≤ 3%
Feed-in phases / connection phases	3 / 3
Efficiency	
Max. efficiency / European Efficiency	98.4% / 98.0%
Protective devices	
DC-side disconnection device	●
Ground fault monitoring / grid monitoring	● / ●
DC surge arrester (Type II) can be integrated	○
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –
All-pole sensitive residual-current monitoring unit	●
Protection class (according to IEC 62109-1) / overvoltage category (according to IEC 62109-1)	I / AC: III; DC: II
General data	
Dimensions (W / H / D)	661 / 682 / 264 mm (26.0 / 26.9 / 10.4 inch)
Weight	61 kg (134.48 lb)
Operating temperature range	–25 °C to +60 °C (–13 °F to +140 °F)
Noise emission (typical)	51 dB(A)
Self-consumption (at night)	1 W
Topology / cooling concept	Transformerless / Opticool
Degree of protection (as per IEC 60529)	IP65
Climatic category (according to IEC 60721-3-4)	4K4H
Maximum permissible value for relative humidity (non-condensing)	100%
Features / function / Accessories	
DC connection / AC connection	SUNCLIX / spring-cage terminal
Display	○
Interface: RS485, Speedwire/Webconnect	○ / ●
Data interface: SMA Modbus / SunSpec Modbus	● / ●
Multifunction relay / Power Control Module	○ / ○
OptiTrack Global Peak / Integrated Plant Control / Q on Demand 24/7	● / ● / ●
Off-Grid capable / SMA Fuel Save Controller compatible	● / ●
Guarantee: 5 / 10 / 15 / 20 years	● / ○ / ○ / ○
Planned certificates and permits * Does not apply to all national appendices of EN 50438	ANRE 30, AS 4777, BDEW 2008, C10/11:2012, CE, CEI 0-16, CEI 0-21, EN 50438:2013*, G59/3, IEC 60068-2-x, IEC 61727, IEC 62109-1/2, IEC 62116, NBR 16149, NEN EN 50438, NRS 097-2-1, PPC, RD 1699/413, RD 661/2007, Res. n°7:2013, SI4777, TOR D4, TR 3.2.2, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105, VFR 2014
Type designation	STP 15000TL-30

Efficiency Curve



Output power / Rated power

Accessory


RS485 interface
DM-485CB-10


Power Control Module
PWCMOD-10


DC surge arrester Typ II, inputs A and B
DCSPD KIT3-10


Multifunction relay
MFR01-10

● Standard features ○ Optional features – Not available
Data at nominal conditions
Status: May 2016

Technical Data	Sunny Tripower 20000TL	Sunny Tripower 25000TL
Input (DC)		
Max. DC power (at cos φ = 1) / DC rated power	20440 W / 20440 W	25550 W / 25550 W
Max. input voltage	1000 V	1000 V
MPP voltage range / rated input voltage	320 V to 800 V / 600 V	390 V to 800 V / 600 V
Min. input voltage / start input voltage	150 V / 188 V	150 V / 188 V
Max. input current input A / input B	33 A / 33 A	33 A / 33 A
Number of independent MPP inputs / strings per MPP input	2 / A:3; B:3	2 / A:3; B:3
Output (AC)		
Rated power (at 230 V, 50 Hz)	20000 W	25000 W
Max. AC apparent power	20000 VA	25000 VA
AC nominal voltage	3 / N / PE; 220 V / 380 V 3 / N / PE; 230 V / 400 V 3 / N / PE; 240 V / 415 V	
AC voltage range	180 V to 280 V	
AC grid frequency / range	50 Hz / 44 Hz to 55 Hz 60 Hz / 54 Hz to 65 Hz	
Rated power frequency / rated grid voltage	50 Hz / 230 V	
Max. output current / Rated output current	29 A / 29 A	36.2 A / 36.2 A
Power factor at rated power / Adjustable displacement power factor	1 / 0 overexcited to 0 underexcited	
THD	≤ 3%	
Feed-in phases / connection phases	3 / 3	
Efficiency		
Max. efficiency / European Efficiency	98.4% / 98.0%	98.3% / 98.1%
Protective devices		
DC-side disconnection device	●	
Ground fault monitoring / grid monitoring	● / ●	
DC surge arrester (Type II) can be integrated	○	
DC reverse polarity protection / AC short-circuit current capability / galvanically isolated	● / ● / –	
All-pole sensitive residual-current monitoring unit	●	
Protection class (according to IEC 62109-1) / overvoltage category (according to IEC 62109-1)	I / AC: III; DC: II	
General data		
Dimensions (W / H / D)	661 / 682 / 264 mm (26.0 / 26.9 / 10.4 inch)	
Weight	61 kg (134.48 lb)	
Operating temperature range	–25 °C to +60 °C (–13 °F to +140 °F)	
Noise emission (typical)	51 dB(A)	
Self-consumption (at night)	1 W	
Topology / cooling concept	Transformerless / Opticool	
Degree of protection (as per IEC 60529)	IP65	
Climatic category (according to IEC 60721-3-4)	4K4H	
Maximum permissible value for relative humidity (non-condensing)	100%	
Features / function / Accessories		
DC connection / AC connection	SUNCLIX / spring-cage terminal	
Display	○	
Interface: RS485, Speedwire/Webconnect	○ / ●	
Data interface: SMA Modbus / SunSpec Modbus	● / ●	
Multifunction relay / Power Control Module	○ / ○	
OptiTrack Global Peak / Integrated Plant Control / Q on Demand 24/7	● / ● / ●	
Off-Grid capable / SMA Fuel Save Controller compatible	● / ●	
Guarantee: 5 / 10 / 15 / 20 years	● / ○ / ○ / ○	
Certificates and permits (more available on request) * Does not apply to all national appendices of EN 50438	ANRE 30, AS 4777, BDEW 2008, C10/11:2012, CE, CEI 0-16, CEI 0-21, EN 50438:2013*, G59/3, IEC 60068-2-x, IEC 61727, IEC 62109-1/2, IEC 62116, MEA 2013, NBR 16149, NEN EN 50438, NRS 097-2-1, PEA 2013, PPC, RD 1699/413, RD 661/2007, Res. n°7:2013, SI4777, TOR D4, TR 3.2.2, UTE C15-712-1, VDE 0126-1-1, VDE-AR-N 4105, VFR 2014	
Type designation	STP 20000TL-30	STP 25000TL-30

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TOP SOLAR PV ZZ-F (AS)

1. Object.

This document defines the design and manufacturing characteristics of the cables type TOP SOLAR PV ZZ-F (AS) manufactured by Top Cable.

2. Design.

This type of cables are designed, manufactured and tested according to the latest revision of the specification EA 0038 (AENOR - Electric cables for use in circuits of photovoltaic systems), TÜV 2 PfG 1169/08.2007 standard and UTE C-32 502 standard.

3. Applications.

Flexible cables suitable for mobile and fixed installation. Suitable for connection between photovoltaic panels, and photovoltaic panels to the AC inverter. High security cable (AS): no fire propagation, low smoke emissions and halogen-free. Suitable for indoor and outdoor use. These cables meet the HD 605/A1 weather-UV test.

The materials used in the construction of these cables exceed the thermal endurance test specified in the standard UNE-EN 60216 for +120 ºC (temperature index). Compliance with this test provides that, with proper installation, operation and maintenance, the estimated life of the cable is 30 years at 90 °C.

4. Characteristics.

Nominal voltage: 1,8 kV DC.

Ambient temperature range: -40 °C to + 90 ºC.

Range service temperature: -40 °C to + 120 ºC.

Maximum short-circuit temperature: 250 °C (maximum 5 s).

Minimum bending radius (fixed): 5 x cable Ø.

No flame propagation: IEC 60332-1-2.

No fire propagation: category C (according to EN 50266 / IEC 60332-3).

Halogen free: HCl content < 0,5%.
pH > 4,3 ; conductivity < 10 µS/mm.

Smoke density: light transmitance > 60% (according to IEC 61034).

TOP SOLAR PV ZZ-F (AS)

5. General make-up of the cable.

5.1 Conductor.

Electrolytic annealed tinned copper conductor, class 5 according to EN 60228 / IEC 60228.

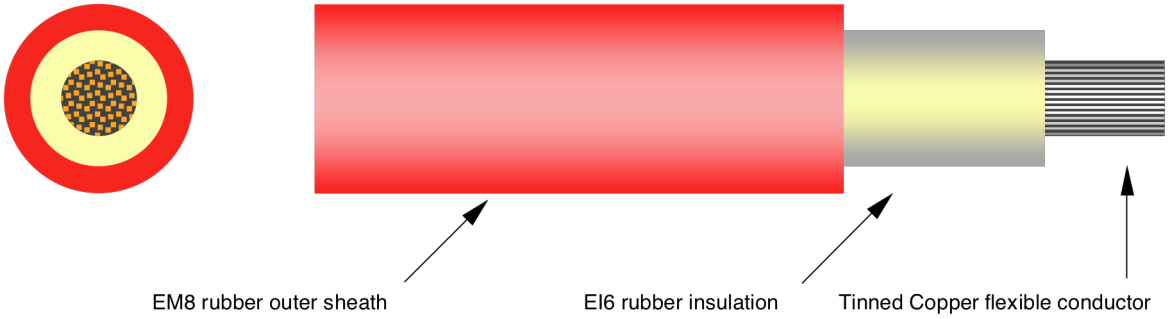
5.2 Insulation.

Halogen free thermosetting rubber insulation, type EI6 according to EN 50363-1.

5.3 Outer sheath.

Halogen free thermosetting rubber outer sheath, type EM8 according to EN 50363-1. Red or black color.

5.4 Diagram representation.



6. Current-carrying capacities.

6.1 Nominal current-carrying capacities.

Table 1 show the current-carrying capacities and electric parameters detailed for every cable.

Current-carrying capacities, in ampers, are calculated according to EA 0038 and for the following conditions:

- Open air installation: one single-core cable and ambient temperature of 60 °C; with adequate ventilation (supported by cleats and hangers or on perforated tray).
- Adjacent surface installation: one single-core cable directly on a wall with low thermal conductivity; ambient temperature of 60 °C.
- In all cases it is supossed a direct current circuit.

TOP SOLAR PV ZZ-F (AS)

Voltage drop is calculated with conductor temperature of 120 ºC.

For conditions other than this apply the adequate correction factors (point 6.2).

Cross-section mm^2	Open air A	Surface A	Voltage drop V/A·km
1 x 2,5	41	33	23,0
1 x 4	55	44	14,3
1 x 6	70	57	9,49
1 x 10	98	79	5,46
1 x 16	132	107	3,47
1 x 25	176	142	2,23
1 x 35	218	176	1,58

Table 1

6.2 Correction factors.

The current-carrying capacities must be multiplied with the adequate correction factor when the installation conditions differs from point 6.1

Correction factors for air temperatures other than 60°C.

Air Temp. (ºC)	50	55	60	65	70	75	80	85	90
Factor	1,08	1,04	**1**	0,96	0,91	0,87	0,82	0,76	0,71

Table 2

TOP SOLAR PV ZZ-F (AS)

7. Dimensions.

Table 3 show diameters and weight detailed for every cable.

Cross-section mm^2	Outer Ø mm	Weight kg/km
1 x 2,5	5,6	52
1 x 4	6,1	68
1 x 6	6,7	89
1 x 10	7,8	136
1 x 16	8,8	193
1 x 25	10,8	294
1 x 35	11,9	390

Table 3