The Little Green Energy Company Ltd
Hopsack House
Pattenden Lane
Marden
TN12 9QJ
p. 01622 832834
e. info@littlegreenenergycompany.co.uk
w. www.littlegreenenergycompany.co.uk

TECHNICAL SUBMITTAL

Amirilan
25B & 25C Frognal Lane (Arkwright Road Houses)
Q03634.2

Please find below our list of documents that make up the submittal of TLGEC's materials and design for the battery installation at the above address:

Contents:

Regards,

The Little Green Energy Company

24-Month Installation Warranty

What is Covered by the Warranty

The installing contractor warrants that all work related to the installation of the PV System (the "Products") substantially conforms to the manufacturer's recommendations for installation and follows Industry Standards and quality guidelines. For a period of two (2) years from the date of substantial completion of the installation, upon notice to the Installer, the Installer will repair or re-install the Product, in the Installers sole discretion, in the event the installation is shown to have been inconsistent with Industry Standards. Excluded is any defect that was apparent or ascertainable at the time of the original installation. The owner agrees to accept a reasonable Product match in the event of such a repair if the original Product is no longer available. In the event additional Product is needed, the customer shall supply all necessary materials, including replacement Product.

What is Not Covered

This Limited Warranty does not cover the
following items:
A. Damage resulting from fires, storms, electrical malfunctions (unrelated to the Product), accidents, floods, sub-grade moisture conditions, or acts of God;
B. Damage from moisture of any kind;
C. Damage from alterations, misuse, or abuse of the covered items by any person;
D. Damage from the owner's failure to observe any instructions furnished by the installer and/or manufacturer for specific product recommendations including failure to control humidity and temperature levels within the home;
E. Damage resulting from a malfunction of equipment or lines of the telephone, gas, power, alarm systems or water companies;
F. Any items listed as non-warrantable conditions; and
G. Any item furnished by the owner.
H. Products already under manufacturers warranty (ie. solar panels & inverters) at the time of purchase.

Remedies and Limitations

A. The owner understands that the sole remedies under this Limited Warranty agreements are for repair or re-installation as set forth herein to be completed by the original installer whenever possible.
B. With respect to any claim whatsoever asserted by the owner against the installer, the owner understands that the owner will have no right to recover or request compensation for, and the installer shall not be liable for, any of the following items:
1. Incidental, consequential, secondary, or
punitive damages;
2. Damages for aggravation, mental anguish, emotional distress, or pain and suffering; or
3. Attorney's fees or costs.
C. The installer herby limits the duration of all express and implied warranties, including but not limited to, the warranty of workmanship (and fitness for particular purpose if materials supplied by the installer), to two (2) years from the date of installation or substantial completion of the installation, whichever period is shorter.
D. These limitations shall be enforceable to the extent permitted by law.

How to Obtain Service

If a problem with the installation develops during the warranty period, the owner should notify the Installer in writing of the specific problem. The written statement of the problem should include the owner's name, address, telephone numbers and a description of the nature of the problem. The Installer will investigate the claim promptly. Repair work will be done during normal working hours except where delay will cause additional damage. The owner agrees to provide access to the house and to make available during the work a responsible adult with the authority to approve the repair and sign and acceptance of
repair ticket upon completion of the repair.

Specific Legal Rights

This Limited Warranty gives the owner specific legal rights.

Where to Get Help

If the owner wants he/she should contact The Little Green Energy Company on 01622 832834 or by email at info@littlegreenenergycompany.co.uk.

The Only Warranty Given by the Installer

The owner acknowledges (a) that the owner has thoroughly examined the installation (b) the owner has read and understands the Limited Warranty, and (c) the installer and the Installer have made no guarantees, warranties, understandings, or representations (nor have any been made by any representatives thereof) that are not set forth in this document.

SOLIS INVERTER WARRANTY

Ginlong(Ningbo) Technologies Co., Ltd.

No. 57 Jintong Road, Binhai Industrial Park, Xiangshan, Ningbo, Zhejiang 315712, China
Tel: (+86) 574 6578 1806 Email: sales@ginlong.com

Solis Inverter are manufactured by Ginlong (Ningbo) Technologies Co., Ltd. (The Company) (refered to as Ginlong) provides the following Warranty to the purchaser (The Customer) of the Inverter (The Goods). (The Customer is deemed to be the owner of the installed Goods at first sale.

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1. Warranty Terms

The Company warrants all Goods to be free from defects in material or workmanship under normal use and service for a period of 5 years from the date of sale to the Customer.

The Warranty covers the cost of repairs or replacement parts. The Goods must be returned to the Company for inspection.

The company may repair or replace faulty components at its discretion.

This warranty extends the Customer's statutory rights and cannot be construed so as to diminish such statutory rights.

2. Warranty Extension

The purchaser may apply for a warranty extension within 12 months of purchase by providing the serial number of the unit along with proof of purchase. An extended warranty can be purchased for a further 5 years (Total 10 years).

3. Warranty Limitations

The Warranty is valid only for Goods purchased either directly from the Company or from an authorized reseller of the company.

The Warranty is not transferable and applies to brand new Goods only.

Defective parts replaced under Warranty become the property of the Company.

The Warranty does not cover:

(a) Access or transport costs;

(b) Consequential damages including but not limited to loss of revenue;

(c) Claims by third parties other than the Customer;

(d) Defects of installation. (Except where the installation is performed by the Company);

(e) Goods damaged as a consequence of incorrect installation. (Except where the installation is performed by the Company);

(f) Items ancillary to installation not supplied by the Company;

(g) Duties, import/export fees or costs and other general administrative costs;

(h) Damage to Goods caused by misuse, improper handling or unauthorized modification;

(i) Loss or damage occurring whilst in transit;

(j) Accidental or willful damage;

(k) Any Goods described in a quotation or delivery note as 'ex-display' or 'reconditioned'. (A separate Warranty extension may have been issued to cover such Goods.)

Labour, travel and delivery (to and from customer) will be charged if goods returned found to be not faulty following a warranty claim.

4. Warranty Claims Procedure

To make a warranty claim the following information needs to be provided:

- Completed RTM Inspection Form
- Product Model (ie. Solis 1.5kW) and Product Serial Number (ie. A1110011)
- Copy of the invoice for the inverter
- Copy of the installation report and MCS installation certificate

The authorised reseller will liaise with the Company regarding repair or replacement. The cost of repair or replacement will be borne by the Company provided the Warranty has been validated and the Warranty period has not expired.

Where repairs must be effected at the Company's headquarters, the Company will endeavor to minimize the down time for the Goods.

Form C: Type Test Verification Report

Type Approval and **Manufacturer** declaration of compliance with the requirements of G98.

This form should be used when making a Type Test submission to the Energy Networks Association (ENA).

If the **Micro-generator** is **FullyType Tested** and already registered with the ENA **Type Test Verification Report** Register, the **Installation Document** should include the **Manufacturer**'s Reference Number (the Product ID), and this form does not need to be submitted.

Where the **Micro-generator** is not registered with the ENA **Type Test Verification Report** Register this form needs to be completed and provided to the **DNO**, to confirm that the **Micro-generator** has been tested to satisfy the requirements of this EREC G98.

Manufacturer's reference number	DQ190118
Micro-generator technology	Solis-mini-3600-4G
Manufacturer name	Ningbo Ginlong Technologies Co., Ltd.
Address	No. 57 Jintong Road, Seafront (Binhai) Industrial Park, Xiangshan, Ningbo, Zhejiang, 315712,P.R.China

Tel	(+86) 574 6580 3377	Fax	(+86) 574 6578 1606
E-mail	kun.zhang@ginlong.com	Web site	www.ginlong.com

Registered Capacity, use separate sheet if more than one connection option.	Connection Option	
	3.6	kW single phase, single, split or three phase system
		kW three phase
		kW two phases in three phase system
		kW two phases split phase system

ManufacturerType Test declaration. - I certify that all products supplied by the company with the above **Type Tested** reference number will be manufactured and tested to ensure that they perform as stated in this document, prior to shipment to site and that no site modifications are required to ensure that the product meets all the requirements of EREC G98.

Signed	Zhang Kun 04.January.2019	On behalf of Manufacturer stamp	宁波锦浪新能源科技有限公司 NINGBO GINLONG TECHNOLOGIES CO., LTD.

Note that testing can be done by the **Manufacturer** of an individual component or by an external test house.

Where parts of the testing are carried out by persons or organisations other than the **Manufacturer** then that person or organisation shall keep copies of all test records and results supplied to them to verify that the testing has been carried out by people with sufficient technical competency to carry out the tests.

Operating Range: This test should be carried out as specified in EN 50438 D.3.1.

Active Power shall be recorded every second. The tests will verify that the **Micro-generator** can operate

within the required ranges for the specified period of time. The **Interface Protection** shall be disabled during the tests. In case of a PV **Micro-generator**the PV primary source may be replaced by a **DC** source. In case of a full converter **Micro-generator**(eg wind) the primary source and the prime mover **Inverter**/rectifier may be replaced by a **DC** source. In case of a DFIG **Micro-generator**the mechanical drive system may be replaced by a test bench motor.	
Test 1 Voltage = 85% of nominal (195.5 V) Frequency = 47.5 Hz Power factor = 1 Period of test 90 minutes	Tested with the specified conditions,in the 90 minutes period of time,the inverters operate normally
Test 2 Voltage = 110% of nominal (253 V). Frequency = 51.5 Hz Power factor = 1 Period of test 90 minutes	Tested with the specified conditions,in the 90 minutes period of time,the inverters operate normally
Test 3 Voltage = 110% of nominal (253 V). Frequency = 52.0 Hz Power factor = 1 Period of test 15 minutes	Tested with the specified conditions,in the 15 minutes period of time,the inverters operate normally

Power Quality – Harmonics: These tests should be carried out as specified in BS EN 61000-3-2. The chosen test should be undertaken with a fixed source of energy at two power levels a) between 45 and 55% and b) at 100% of Registered Capacity. The test requirements are specified in Annex A1A.1.3.1 (Inverter connected) or Annex A2 A.2.3.1 (Synchronous).

Micro-generator tested to BS EN 61000-3-2

Micro-generator rating per phase (rpp)			3.6	kW	NV=MV*3.68/rpp	
Harmonic	At 45-55% of **Registered Capacity**		100% of **Registered Capacity**			
	Measured Value MV in Amps	Normalised Value (NV) in Amps	Measured Value MV in Amps	Normalised Value (NV) in Amps	Limit in BS EN 61000-3-2 in Amps	Higher limit for odd harmonics 21 and above
2	0.019	0.019	0.046	0.047	1.080	
3	0.076	0.077	0.265	0.271	2.300	
4	0.011	0.011	0.026	0.026	0.430	

5	0.059	0.061	0.136	0.139	1.140	
6	0.019	0.020	0.018	0.019	0.300	
7	0.045	0.046	0.095	0.097	0.770	
8	0.012	0.013	0.019	0.019	0.230	
9	0.038	0.039	0.062	0.063	0.400	
10	0.011	0.011	0.018	0.019	0.184	
11	0.030	0.031	0.060	0.061	0.330	
12	0.009	0.009	0.021	0.022	0.153	
13	0.024	0.024	0.042	0.043	0.210	
14	0.007	0.007	0.022	0.022	0.131	
15	0.027	0.027	0.027	0.028	0.150	
16	0.013	0.013	0.012	0.012	0.115	
17	0.007	0.007	0.029	0.030	0.132	
18	0.016	0.016	0.013	0.014	0.102	
19	0.024	0.025	0.029	0.029	0.118	
20	0.007	0.008	0.021	0.022	0.092	
21	0.011	0.011	0.017	0.017	0.107	0.160
22	0.008	0.008	0.022	0.022	0.084	
23	0.006	0.006	0.022	0.022	0.098	0.147
24	0.016	0.017	0.019	0.019	0.077	
25	0.017	0.018	0.010	0.010	0.090	0.135
26	0.002	0.002	0.027	0.028	0.071	
27	0.009	0.010	0.024	0.024	0.083	0.124
28	0.011	0.011	0.021	0.021	0.066	
29	0.011	0.011	0.013	0.014	0.078	0.117
30	0.009	0.009	0.019	0.020	0.061	
31	0.009	0.009	0.032	0.033	0.073	0.109
32	0.023	0.023	0.043	0.044	0.058	
33	0.020	0.021	0.011	0.011	0.068	0.102
34	0.003	0.003	0.035	0.036	0.054	
35	0.009	0.009	0.020	0.021	0.064	0.096
36	0.010	0.010	0.019	0.020	0.051	
37	0.007	0.007	0.006	0.006	0.061	0.091
38	0.010	0.011	0.027	0.027	0.048	
39	0.021	0.022	0.029	0.029	0.058	0.087
40	0.004	0.004	0.008	0.009	0.046	

Note the higher limits for odd harmonics 21 and above are only allowable under certain conditions, if these higher limits are utilised please state the exemption used as detailed in part 6.2.3.4 of BS EN 61000-3-2 in the box below.

Power Quality – Voltage fluctuations and Flicker: These tests should be undertaken in accordance with EREC G98 Annex A1 A.1.3.3 (**Inverter** connected) or Annex A2 A.2.3.3 (Synchronous).

	Starting			Stopping			Running	
	d max	d c	d(t)	d max	d c	d(t)	P_{st}	P_{lt} 2 hours
Measured Values at test impedance	0.42	0.36	0	0.37	0	0	0.05	0.07

Normalised to standard impedance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Normalised to required maximum impedance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Limits set under BS EN 61000-3-11	4%	3.3%	3.3%	4%	3.3%	3.3%	1.0	0.65

Test Impedance	R		Ω	X		Ω
Standard Impedance	R	0.24 * 0.4 ^	Ω	X	0.15 * 0.25 ^	Ω
Maximum Impedance	R		Ω	X		Ω

Applies to three phase and split single phase **Micro-generators**.

^ Applies to single phase **Micro-generators** and **Micro-generators** using two phases on a three phase system.

For voltage change and flicker measurements the following formula is to be used to convert the measured values to the normalised values where the power factor of the generation output is 0.98 or above.

Normalised value = Measured value*reference source resistance/measured source resistance at test point.

Single phase units reference source resistance is 0.4 Ω

Two phase units in a three phase system reference source resistance is 0.4 Ω.

Two phase units in a split phase system reference source resistance is 0.24 Ω.

Three phase units reference source resistance is 0.24 Ω.

Where the power factor of the output is under 0.98 then the X to R ratio of the test impedance should be close to that of the Standard Impedance.

The stopping test should be a trip from full load operation.

The duration of these tests need to conform to the particular requirements set out in the testing notes for the technology under test. Dates and location of the test need to be noted below.

Test start date	1.December.2018	Test end date	7.December.2018
Test location	Ningbo Ginlong electrical R&D LAB		

Power quality – DC injection: This test should be carried out in accordance with EN 50438 Annex D.3.10

Test power level	20%	50%	75%	100%
Recorded value in Amps	15.2mA	13.3mA	16.4mA	15.8mA
as % of rated AC current	0.095%	0.083%	0.103%	0.099%
Limit	0.25%	0.25%	0.25%	0.25%

Power Quality – Power factor: This test shall be carried out in accordance with EN 50538 Annex D.3.4.1 but with nominal voltage -6% and +10%. Voltage to be maintained within ±1.5% of the stated level during the test.

	216.2 V	230 V	253 V
20% of **Registered Capacity**	0.950	0.954	0.952
50% of **Registered Capacity**	0.980	0.985	0.981
75% of **Registered Capacity**	0.993	0.994	0.993
100% of **Registered Capacity**	0.998	0.999	0.998
Limit	>0.95	>0.95	>0.95

Protection – Frequency tests: These tests should be carried out in accordance with EN 50438 Annex D.2.4 and the notes in EREC G98 Annex A1 A.1.2.3 (**Inverter** connected) or Annex A2 A.2.2.3 (Synchronous)

Function	Setting		Trip test		"No trip tests"	
	Frequency	Time delay	Frequency	Time delay	Frequency /time	Confirm no trip
U/F stage 1	47.5 Hz	20 s	47.47Hz	20.045s	47.7 Hz 25.3s	Yes
U/F stage 2	47 Hz	0.5 s	46.95Hz	0.542s	47.2 Hz 19.98 s	Yes
					46.8 Hz 0.48 s	Yes
O/F stage 1	52 Hz	0.5 s	52.03Hz	0.537s	51.8 Hz 89.98 s	Yes
					52.2 Hz 0.48 s	Yes

Note. For frequency trip tests the frequency required to trip is the setting ± 0.1 Hz. In order to measure the time delay a larger deviation than the minimum required to operate the projection can be used. The "No trip tests" need to be carried out at the setting ± 0.2 Hz and for the relevant times as shown in the table above to ensure that the protection will not trip in error.

Protection – Voltage tests: These tests should be carried out in accordance with EN 50438 Annex D.2.3 and the notes in EREC G98 Annex A1 A.1.2.2 (**Inverter** connected) or Annex A2 A.2.2.2 (Synchronous)

Function	Setting		Trip test		"No trip tests"	
	Voltage	Time delay	Voltage	Time delay	Voltage /time	Confirm no trip
U/V	184 V	2.5 s	183.5 V	2.534s	186 V 3.60 s	Yes
					182 V 2.48 s	Yes
O/V stage 1	262.2 V	1.0 s	262.5 V	1.048 s	260.2 V 2.0 s	Yes
O/V stage 2	273.7 V	0.5 s	274.0 V	0.546 s	269.7 V 0.98 s	Yes
					277.7 V 0.48 s	Yes

Note for Voltage tests the Voltage required to trip is the setting ±3.45 V. The time delay can be measured at a larger deviation than the minimum required to operate the protection. The No trip tests need to be carried out at the setting ±4 V and for the relevant times as shown in the table above to ensure that the protection will not trip in error.

Protection – Loss of Mains test: For PV Inverters shall be tested in accordance with BS EN 62116. Other Inverters should be tested in accordance with EN 50438 Annex D.2.5 at 10%, 55% and 100% of rated power.

To be carried out at three output power levels with a tolerance of plus or minus 5% in Test Power levels.

Test Power	10%	55%	100%	10%	55%	100%
Balancing load on islanded network	95% of **Registered Capacity**	95% of **Registered Capacity**	95% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**
Trip time. Limit is 0.5 s	0.28s	0.37s	0.16s	0.41s	0.26s	0.36s

For Multi phase**Micro-generators** confirm that the device shuts down correctly after the removal of a single fuse as well as operation of all phases.

Test Power	10%	55%	100%	10%	55%	100%
Balancing load on islanded network	95% of **Registered Capacity**	95% of **Registered Capacity**	95% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**
Trip time. Ph1 fuse removed						
Test Power	10%	55%	100%	10%	55%	100%
Balancing load on islanded network	95% of **Registered Capacity**	95% of **Registered Capacity**	95% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**
Trip time. Ph2 fuse removed						

Test Power	10%	55%	100%	10%	55%	100%
Balancing load on islanded network	95% of **Registered Capacity**	95% of **Registered Capacity**	95% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**	105% of **Registered Capacity**
Trip time. Ph3 fuse removed						

Note for technologies which have a substantial shut down time this can be added to the 0.5 s in establishing that the trip occurred in less than 0.5 s. Maximum shut down time could therefore be up to 1.0 s for these technologies.

Indicate additional shut down time included in above results.	ms

For **Inverters** tested to BS EN 62116 the following sub set of tests should be recorded in the following table.

Test Power and imbalance	33%-5% Q Test 22	66%-5% Q Test 12	100%-5% P Test 5	33%+5% Q Test 31	66%+5% Q Test 21	100%+5% P Test 10
Trip time. Limit is 0.5 s	0.30s	0.36s	0.25s	0.30s	0.25s	0.34s

Protection – Frequency change, Vector Shift Stability test: This test should be carried out in accordance with EREC G98 Annex A1 A.1.2.6 (**Inverter** connected) or Annex A2 A.2.2.6 (Synchronous).

	Start Frequency	Change	Confirm no trip
Positive Vector Shift	49.0 Hz	+50 degrees	Yes
Negative Vector Shift	50.0 Hz	- 50 degrees	Yes

Protection – Frequency change, RoCoF Stability test: The requirement is specified in section 11.3, test procedure in Annex A.1.2.6(**Inverter** connected) or Annex A2 A.2.2.6 (Synchronous).

Ramp range	Test frequency ramp:	Test Duration	Confirm no trip
49.0 Hz to 51.0 Hz	+0.95 Hzs^{-1}	2.1 s	Yes
51.0 Hz to 49.0 Hz	-0.95 Hzs^{-1}	2.1 s	Yes

Limited Frequency Sensitive Mode – Overfrequency test: This test should be carried out in accordance with EN 50438 Annex D.3.3 Power response to over- frequency. The test should be carried out using the specific threshold frequency of 50.4 Hz and **Droop** of 10%.

Test sequence at **Registered Capacity**>80%	Measured **Active Power**Output	Frequency	Primary Power Source	**Active Power** Gradient

Step a) 50.00 Hz ±0.01 Hz	3600.56	50.01		100.00%
Step b) 50.45 Hz ±0.05 Hz	3564.51	50.46		99.00%
Step c) 50.70 Hz ±0.10 Hz	3384.49	50.71		94.00%
Step d) 51.15 Hz ±0.05 Hz	3060.44	51.16		85.00%
Step e) 50.70 Hz ±0.10 Hz	3384.49	50.71		94.00%
Step f) 50.45 Hz ±0.05 Hz	3564.51	50.46		99.00%
Step g) 50.00 Hz ±0.01 Hz	3600.95	50.01		100.00%
Test sequence at **Registered Capacity**40% - 60%	Measured **Active Power**Output	Frequency	Primary Power Source	**Active Power** Gradient
Step a) 50.00 Hz ±0.01 Hz	1800.90	50.01		50.00%
Step b) 50.45 Hz ±0.05 Hz	1782.52	50.46		49.50%
Step c) 50.70 Hz ±0.10 Hz	1692.50	50.71		47.00%
Step d) 51.15 Hz ±0.05 Hz	1530.45	51.16		42.50%
Step e) 50.70 Hz ±0.10 Hz	1692.50	50.71		47.00%
Step f) 50.45 Hz ±0.05 Hz	1782.52	50.46		49.50%
Step g) 50.00 Hz ±0.01 Hz	1800.81	50.01		50.00%
Steps as defined in EN 50438				
Power output with falling frequency test: This test should be carried out in accordance with EN 50438 Annex D.3.2 active power feed-in at under-frequency.				
Test sequence	Measured **Active Power**Output	Frequency	Primary power source	
Test a) 50 Hz ± 0.01 Hz				
Test b) Point between 49.5 Hz and 49.6 Hz				
Test c) Point between 47.5 Hz and 47.6 Hz				
NOTE: The operating point in Test (b) and (c) shall be maintained for at least 5 minutes				
Re-connection timer.				
Test should prove that the reconnection sequence starts after a minimum delay of 20 s for restoration of				

voltage and frequency to within the stage 1 settings of Table 2.						
Time delay setting	Measured delay		Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 2.			
30s	32s		At 266.2 V	At 196.1 V	At 47.4 Hz	At 52.1 Hz
Confirmation that the **Micro-generator** does not re-connect.			Yes	Yes	Yes	Yes

Fault level contribution: These tests shall be carried out in accordance with EREC G98 Annex A1 A.1.3.5 (**Inverter** connected) and Annex A2 A.2.3.4 (Synchronous).

For machines with electro-magnetic output			For **Inverter** output		
Parameter	Symbol	Value	Time after fault	Volts	Amps
Peak Short Circuit current	i_p	--	20 ms	3.41V	24Apeak
Initial Value of aperiodic current	A	--	100 ms	0	0
Initial symmetrical short-circuit current*	I_k	--	250 ms	0	0
Decaying (aperiodic) component of short circuit current*	i_{DC}	--	500 ms	0	0
Reactance/Resistance Ratio of source*	$^X/_R$	--	Time to trip	<20ms	In seconds

For rotating machines and linear piston machines the test should produce a 0 s – 2 s plot of the short circuit current as seen at the **Micro-generator** terminals.

* Values for these parameters should be provided where the short circuit duration is sufficiently long to enable interpolation of the plot

Logic Interface.	Yes
Self-Monitoring solid state switching: No specified test requirements. Refer to EREC G98 Annex A1 A.1.3.6 (**Inverter** connected).	Yes/or NA
It has been verified that in the event of the solid state switching device failing to disconnect the **Micro-generator**, the voltage on the output side of the switching device is reduced to a value below 50 V within 0.5 s.	NA
Additional comments	


solis

Mini 4G

700W
-
3600W

4G
All NEW Solis Series

Solis Mini 4G Series Inverter

- All new MINI series - Extended to 3600W
- High frequency switching technology - Smaller, smarter
- DRM integrated, fully comply with AS4777.2:2015
- Compact and lightweight
- 50V-600V input voltage range- ultra low startup
- Over 97.5% Max.efficiency
- Precise MPPT algorithm
- IP65 rated for external installation
- RS485, WiFi/GPRS (optional) interface
- Multiple protections levels
- WiFi monitoring available – iphone and android app available
- 5 years standard warranty, 20 years optional upgrade

Model:

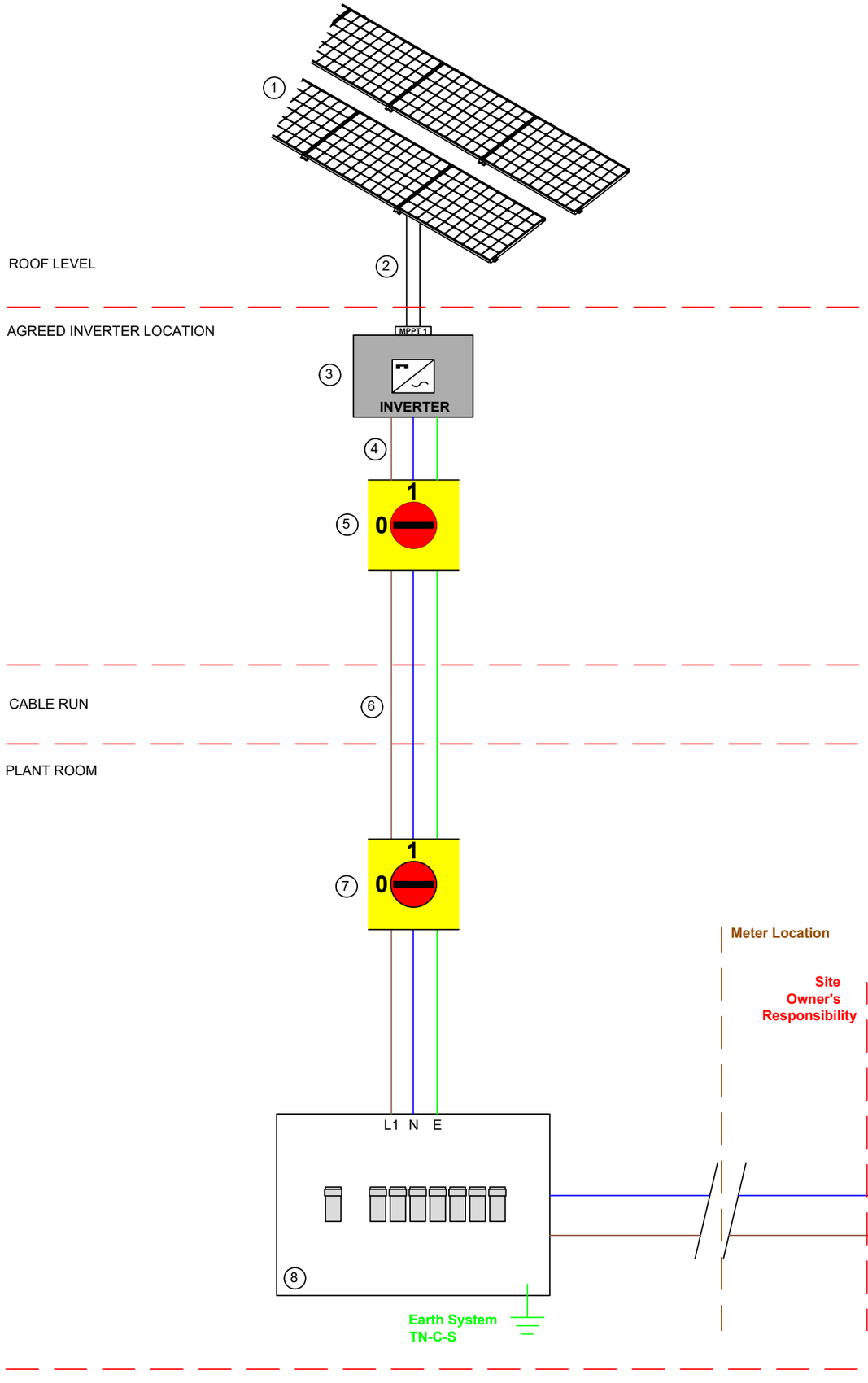
Solis-mini-700-4G
Solis-mini-1000-4G
Solis-mini-1500-4G
Solis-mini-2000-4G
Solis-mini-2500-4G
Solis-mini-3000-4G
Solis-mini-3600-4G

Features:

EPM	HF SWITCH	WiFi/GPRS	60V		Weight
Export power manager	High switch frequency	Real time monitoring	Start-up Voltage	Available on the iPhone App Store / Available on the iPhone App Store	7.4kg

Datasheet

Model	Solis-mini-700-4G	Solis-mini-1000-4G	Solis-mini-1500-4G	Solis-mini-2000-4G	Solis-mini-2500-4G	Solis-mini-3000-4G	Solis-mini-3600-4G
Energy Source	PV						
Input Side(DC)							
Max. DC input power(kW)	0.9	1.2	1.8	2.3	3	3.5	4
Max. DC input voltage(V)	600						
Start-up voltage(V)	60			90			
MPPT voltage range(V)	50–500			80–500			
Max. input current(A)	11A						20A
MPPT number/Max input strings number	1/1						1/2
Output Side (AC)							
Rated output power(kW)	0.7	1	1.5	2	2.5	3	3.6
Max. apparent output power(kVA)	0.8	1.1	1.7	2.2	2.8	3.3	3.6
Max. output power(kW)	0.8	1.1	1.7	2.2	2.8	3.3	3.6
Rated grid voltage(V)	230						
Grid voltage range(V)	160-285						
Rated grid frequency(Hz)	50/60						
Operation phase	Single						
Rated grid output current(A)	3.0	4.3	6.5	8.7	10.9	13	16
Max. output current(A)	4.4	5.2	8.1	10.5	13.3	15.7	16
Power Factor (at rated output power)	0.8…1…0.8						
THDi (at rated output power)	<1.5%						
DC injection current(mA)	<20						
Grid frequency range(Hz)	47–52 or 57–62						
Efficiency							
Max.efficiency	97.2%				97.5%		
EU efficiency	96.5%				96.8%		
MPPTefficiency	≥99.5%						
Protection							
DC reverse-polarity protection	Yes						
Short circuit protection	Yes						
Output over current protection	Yes						
Output over voltage protection	Yes						
Insulation resistance monitoring	Yes						
Residual current detection	Yes						
Surge protection	Yes						
Islanding protection	Yes						
temperature protection	Yes						
Integrated DC switch	Optional						
General Data							
Dimensins(mm)	310W*373H*160D (mm)						
Weight(kg)	7.4				7.7		
Topology	Transformerless						
Self consumption (night)	<1W(Night)						
Operating ambient temperature range	-25~60℃						
Ingress protection	IP65						
Noise emission{typical}	<20 dBA						
Cooling concept	Natural convection						
Max.operation altitude	4000m						
Designed lifetime	>20years						
Grid connection standard	EN50438, G83/2, AS4777.2:2015, VDE0126-1-1, IEC61727, VDE N4105						
Relative humidity	0~100%						
Safty/EMC standard	IEC62109-1/-2, NB/T 32004,EN61000-6-1, EN61000-6-3						
Features							
DC connection	MC-4mateable						
AC connection	IP67rated plug						
Display	LCD,2×20 Z.						
Communication connections	4 pins RS485 connector						
Warranty	5 years standard (extend to 20 years)						



LEGEND	SPECIFICATION	RESPONSIBILITY
1	10no. 380W PV MODULES TRINA VERTEX TSM-DE09.05	SUPPLIED & FIT BY TLGEC
2	DC HIK 4mm LENGTH TBC SEE BELOW FOR STRINGS	SUPPLIED & FIT BY TLGEC
3	PV AC/DC INVERTER SEE BELOW FOR SPECIFICATION	SUPPLIED & FIT BY TLGEC
4	3 CORE FLEX - 1 METER MAXIMUM DISTANCE	SUPPLIED & FIT BY TLGEC
5	LOCKABLE AC ISOLATOR 20A 1 PHASE	SUPPLIED & FIT BY ELECTRICAL CONTRACTOR
6	3 CORE SWA - <1% VOLT DROP	SUPPLIED & FIT BY ELECTRICAL CONTRACTOR
7	LOCKABLE AC ISOLATOR 20A 1 PHASE	SUPPLIED & FIT BY ELECTRICAL CONTRACTOR
8	MAIN DISTRIBUTION BOARD 20A 1 PHASE MCB TYPE B	SUPPLIED & FIT BY ELECTRICAL CONTRACTOR
9	UTILITY METER	SUPPLIED & FIT BY ELECTRICAL CONTRACTOR
10	DNO's FUSED CUT-OUT	EXISTING

INVERTER DETAILS

SOLIS-MINI-3600	
MPPT 1	1 STRING OF 10

the little green energy company

a breath of fresh air

NOTES:

THE CABLE SIZES SPECIFIED ARE BASED ON DEDICATED WIRE RUNS FROM MAIN INCOMER TO THE INVERTER POSITION

IF THE INVERTER IS SERVED FROM A LOCAL DISTRIBUTION BOARD THE OVERALL CABLE LENGTHS MUST BE SUITABLY SIZED BACK TO THE MAIN INCOMER

ALL AC REQUIREMENTS ARE A MINIMUM REQUIREMENT FOR THE PV SYSTEM TO WORK EFFICIENTLY AND ARE NOT AN INSTRUCTION TO INSTALL THE EXACT EQUIPMENT. LARGER EQUIPMENT MAY BE REQUIRED AND USED AT THE ELECTRICAL CONTRACTORS DISCRETION. TLGEC TAKE NO RESPONSIBILITY FOR UNDER-SPECED AC EQUIPMENT SUCH AS CABLE SIZING THAT ARE THE WORKS OF OTHERS. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO APPROPRIATELY SIZE THE REQUIRED EQUIPMENT.

ELECTRICAL CONTRACTOR TO PROVIDE SPARE CABLE TO ALLOW FOR GENERATION METER INSTALLATION.

INSTALLATION NOTES

WHERE APPLICAPLE

DRAFT

VER	DESCRIPTION	DATE	BY	AUTH
1.0	FIRST ISSUE	12/07/21	BC	BC

CLIENT

Amirilan

PROJECT

25 Frognal Lane

DRAWING TITLE

TLGEC Electrical Schematic

DATE	12/07/2021
SCALE	NTS
DRAWN	BC
DRAWING NUMBER	1.0
VERSION	1.0

PRODUCT DATA SHEET

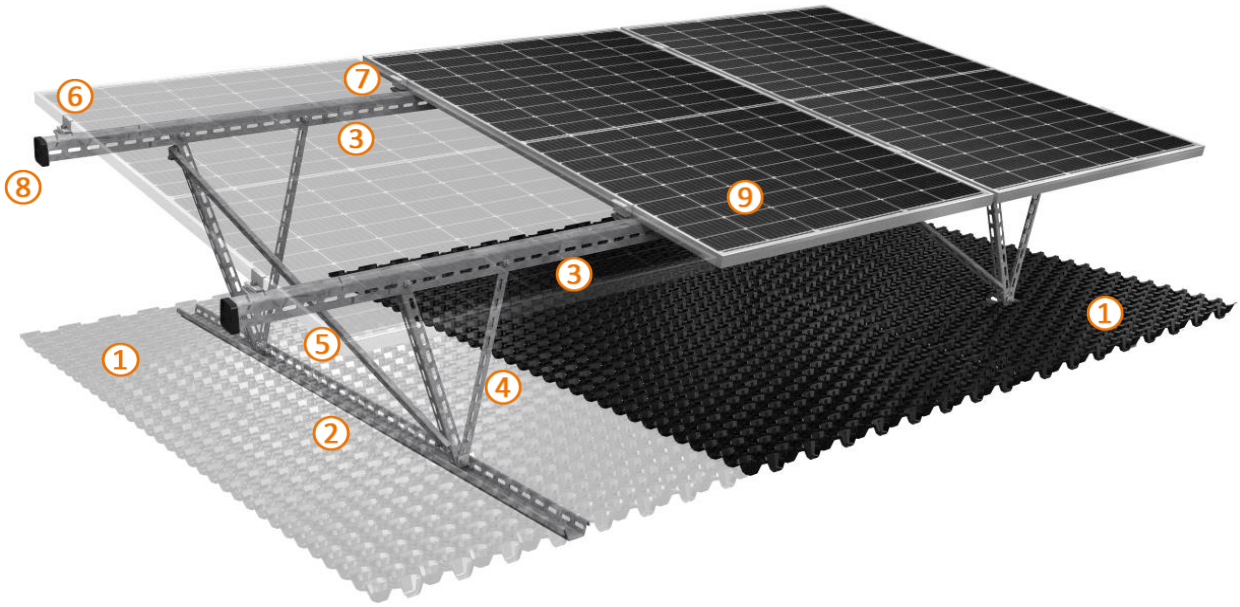
Bauder BioSolar G2 Solar PV Mounting System

Bauder BioSOLAR G2 is an integrated solar PV mounting system specifically for Bauder biodiverse or extensive green roofs.

Intended Use

Bauder BioSOLAR G2 is designed for applications where both a green roof and solar PV solution are required together to meet project requirements. The green roof substrate and vegetation provide the ballast mechanism for the entire solution which removes the need for additional ballast or penetrating the waterproofing to secure the units to the roof and maximises the available area for vegetation.

Bauder Biosolar should be used in conjunction with our BauderFlora 3 seedmix which contains both drought and shade tolerant herb and wildflower species and is suitable for roofs with a fall of up to 5°.



	Part	Unit	Value
1	**DSE 40 Anchor Board**		Pre-cored Bauder DSE 40 Drainage Board
	Material		HDPE, black
	Weight (dry)	kg/m2	1.8
	Material nominal thickness	mm	1.8
	Depth	mm	40
	Water storage capacity	l/m2	13.5
	Filling capacity (for mineral drain etc)	l/m2	21.0
	Support surface underside	%	42
	Compressive strength	Kpa	80
	Dimensions	mm	1040 x 2030
	Ballast	kg/m2	BS EN 1991 Eurocode 1 + DIN EN 1991-1-1/ related load calculation for wind protection

UNITED KINGDOM
Bauder Ltd
70 Landseer Road, Ipswich, Suffolk IP3 0DH
T: +44 (0)1473 257671 E: info@bauder.co.uk W: bauder.co.uk

IRELAND
Bauder Ltd
O'Duffy Centre, Carrickmacross, Co. Monaghan
T: +353 (0)42 9692 333 E: info@bauder.ie W: bauder.ie

	Part	Unit	Value
	Profile rails		
2	**Base rail**		
	Material		Powder coated steel - FVZS420GD+ZM310AC (Zinc Magnesium)
	Dimensions (L x W x H)	mm	3994 (long) or 1994 (short) x 36 x 72.2; Thickness 3
	Weight	kg/unit	13.06/6.52
3	**Module carrier rail**		
	Material		Powder coated steel - FVZS420GD+ZM310AC (Zinc Magnesium)
	Weight	kg/unit	15.59
	Dimensions (L x W x H)	mm	6194 x 61.9 x 47.5; Thickness 3
4	**V-beams**		
	Material		L- Profiles: Powder coated steel FVZS250GD+ZM310AC (Zinc-Magnesium), including Adapter + Screw
	Dimensions (Pre-assembled L x W x H)		Long v-beam - 749 x 399 x 54 Short v-beam – 550 x 343 x 54 Thickness 2
	Weight	kg	Long -1.50 Short - 1.15
5	**Diagonal profile**		
	Material		Powder coated steel - S250GD+ Z275 (Zinc)
	Dimensions (L x W x H)		1245 x 30 x 15; Thickness 1.5
	Weight	kg	0.952
	Accessories		
6 & 7	**Module Clamp Set**	Piece	Module clamping hooks with thread (zincmagnelis- coating) pre-assembled
8	**Module carrier rail end cap**	Piece	Polypropylene

PRODUCT INFORMATION AND TECHNICAL PERFORMANCE			
Characteristic	**Test method**	**Unit**	**Value**
Weight	EN 1848-1	Kg/m²	176kg/m²*

*Includes weight of Bauder BTRS roof system with 160mm PIR insulation and saturated Biodiverse green roof based on a substrate depth of 100mm

UNITED KINGDOM
Bauder Ltd
70 Landseer Road, Ipswich, Suffolk IP3 0DH
T: +44 (0)1473 257671 E: info@bauder.co.uk W: bauder.co.uk

IRELAND
Bauder Ltd
O'Duffy Centre, Carrickmacross, Co. Monaghan
T: +353 (0)42 9692 333 E: info@bauder.ie W: bauder.ie

CERTIFICATION AND ENVIRONMENTAL INFORMATION	
International Standards Organisation (ISO)	ISO 9001:2015 Quality Management Certificates EN1271 (UK) and 70499/03-15_e (Germany). ISO 14001:2015 Environmental Management Certificates A10552 (UK) and 70499/03-15_d (Germany). ISO 50001 :2011 Energy Management Certificate 70499/03-15_c (Germany)

INSTALLATION GUIDANCE

Bauder Biosolar G2 is designed to be installed by a Bauder approved and trained contractor only. Please see Bauder Biosolar installation guidelines for a full breakdown of the system installation methodology.

The number of mounts and fixings required will vary from project to project. Please contact Bauder for a project specific technical report for further information. Windload and snowload calculations will also be provided on a project specific basis and will determine ballast requirements and substrate depths.

Bauder Biosolar G2 can be installed on slopes of up to 5° and is intended to be used with Bauder Biodiverse and substrate based extensive green roofs only.

UNITED KINGDOM
Bauder Ltd
70 Landseer Road, Ipswich, Suffolk IP3 0DH
T: +44 (0)1473 257671 E: info@bauder.co.uk W: bauder.co.uk

IRELAND
Bauder Ltd
O'Duffy Centre, Carrickmacross, Co. Monaghan
T: +353 (0)42 9692 333 E: info@bauder.ie W: bauder.ie

Global Limited Warranty

Trina Solar Co., Ltd ("Trina Solar") hereby grants the following Global Limited Warranty to the first customer installing (for its own use) (the "Buyer") any of the specified (and no other) brand models listed below (the "Products"):

1) Warranted Products

This Global Limited Warranty shall only apply to the following Products:

a) P-type Poly of Back Sheet Glass Products

(i) TSM-***PA03, TSM-***PA05, TSM-***PA05.05, TSM-***PA05.08, TSM-***PA05A, TSM-***PA05A.05, TSM-***PA05A.08, TSM-***PA14, TSM-***PA14A, TSM-***PA05.002, TSM-***PA05.052, TSM-***PA05.082;TSM-***PC03, TSM-***PC05, TSM-***PC05.01, TSM-***PC05.05, TSM-***PC05.08, TSM-***PC05A, TSM-***PC05A.05, TSM-***PC05A.08, TSM-***PC05B, TSM-***PC05B.05, TSM-***PC05B.08, TSM-***PC14, TSM-***PC14.08, TSM-***PC14A, TSM-***PC05A.002, TSM-***PC05A.052, TSM-***PC05A.082, TSM-***PC05A.003, TSM-***PC14.002, TSM-***PC14.082, TSM-***PC06, TSM-***PC06.08,TSM-***PC05A.08(II), TSM-***PC14(II), TSM-***PC14.08(II), TSM-***PC05A.002(II), TSM-***PC05A.052(II), TSM-***PC05A.082(II), TSM-***PC14.002(II), TSM-***PC14.082(II);TSM-***PD05, TSM-***PD05.05, TSM-***PD05.08, TSM-***PD05.50, TSM-***PD05.002, TSM-***PD05.052, TSM-***PD05.082, TSM-***PD14, TSM-***PD14.08, TSM-***PD14.002, TSM-***PD05(II), TSM-***PD05.05(II), TSM-***PD05.08(II), TSM-***PD14(II), TSM-***PD14.08(II); TSM-***PD05.00S, TSM-***PD05.05S, TSM-***PD05.08S, TSM-***PD05.05U, TSM-***PD05.08U, TSM-***PD05.00C, TSM-***PD05.05C, TSM-***PD05.08C, TSM-***PD05.00D, TSM-***PD05.05D, TSM-***PD05.08D, TSM-***PD14.00C, TSM-***PE05A, TSM-***PE05A.08, TSM-***PE14A, TSM-***PE14A.08, TSM-***PE05A(II), TSM-***PE05A.08(II), TSM-***PE14A(II), TSM-***PE14A.08(II),TSM-***PE05H, TSM-***PE05H.08, TSM-***PE14H, TSM-***PE14H.08, TSM-***PD05H, TSM-***PD14H, TSM-***PD05HB.09,TSM-***PE15H, TSM-***PE15H.08, TSM-***PE15H.09, TSM-***PE06H, TSM-***PE06H.08, TSM-***PE06H.09, TSM-***PE15A, TSM-***PE15A.08, TSM-***PE15A.09, TSM-***PE06A, TSM-***PE06A.08, TSM-***PE06A.09, TSM-***PD06H, TSM-***PD06H.05, TSM-***PD06H.08, TSM-***PD06H.09, TSM-***PD15H, TSM-***PD15H.08, TSM-***PD15H.09, TSM-***PC06A;

(ii) TSM-***PA05.10, TSM-***PA05.15, TSM-***PA05.18, TSM-***PA05A.10, TSM-***PA05A.15, TSM-***PA05A.18;TSM-***PC05.10, TSM-***PC05.15, TSM-***PC05.18, TSM-***PC05A.10, TSM-***PC05A.15, TSM-***PC05A.18, TSM-***PC05A.10(II), TSM-***PC05A.15 (II), TSM-***PC05A.18 (II);TSM-***PD05.T0, T TSM-***PD05.T8, TSM-***PD05.10, TSM-***PD05.15, TSM-***PD05.18, TSM-***PD14.T0, TSM-***PD14.T8, TSM-***PD14.10, TSM-***PD14.15, TSM-***PD14.18, TSM-***PD05.T0(II), TSM-***PD05.T8(II), TSM-***PD14.T0(II), TSM-***PD14.T8(II); TSM-***PE05A.T0, TSM-***PE05A.T8, TSM-***PE05A.T9, TSM-***PE14A.T0, TSM-***PE14A.T8, TSM-***PE14A.T9, TSM-***PE14B.T0, TSM-***PE14B.T8, TSM-***PE14B.T9, TSM-***PE14B.T0(II), TSM-***PE14B.T8(II), TSM-***PE14B.T9(II), TSM-***PE14HB.T0, TSM-***PE14HB.T8, TSM-***PE14HB.T9, TSM-***PE14HB.T0(II), TSM-***PE14HB.T8(II), TSM-***PE14HB.T9(II), TSM-***PE05A.T0(II), TSM-***PE05A.T8(II), TSM-***PE05A.T9(II), TSM-***PE14A.T0(II), TSM-***PE14A.T8(II), TSM-***PE14A.T9(II), TSM-***PE05H.T0, TSM-***PE05H.T8, TSM-***PE05H.T9, TSM-***PE05H.T0(II), TSM-***PE05H.T8(II), TSM-***PE05H.T9(II), TSM-***PE14H.T0, TSM-***PE14H.T8, TSM-

Address: No.2 Trina Road, Trina PV Industrial Park, New District, Changzhou, Jiangsu, P.R. China, 213031
http://www.trinasolar.com Trina Customer Service Portal: http://customerservice.trinasolar.com Tel: 0086-519-85485801, Fax: 0086-519-85485936

PD05H.T0, TSM-PD05H.T8, TSM-***PD14H.T0, TSM-***PD14H.T8, TSM-***PD05HB.T9, TSM-***PE15H.T0, TSM-***PE15H.T8, TSM-***PE15H.T9, TSM-***PE06H.T0, TSM-***PE06H.T8, TSM-***PE06H.T9, TSM-***PE06H.T0(II), TSM-***PE06H.T8(II), TSM-***PE06H.T9(II), TSM-***PE15A.T0, TSM-***PE15A.T8, TSM-***PE15A.T9, TSM-***PE06A.T0, TSM-***PE06A.T0, TSM-***PE06A.T8, TSM-***PE06A.T9, TSM-***PD06H.T0, TSM-***PD06H.T8, TSM-***PD06H.T9, TSM-***PD15H.T0, TSM-***PD15H.T8, TSM-***PD15H.T9.

b) P-type Mono PERC of Back Sheet Glass Products

(i) TSM-***DA01, TSM-***DA01.05, TSM-***DA01A, TSM-***DA01A.05, TSM-***DA01A.08, TSM-***DA03, TSM-***DA05, TSM- ***DA01A.002, TSM-***DA01A.052, TSM-***DA01A.082;TSM-***DC01, TSM-***DC01.01, TSM-***DC01.05, TSM-***DC01A, TSM-***DC01A.05, TSM-DC01A.08, TSM-***DC03, TSM-***DC05, TSM-***DC80, TSM-***DC80.08, TSM-***DC01A.002, TSM-***DC01A.052, TSM-***DC01A.082, TSM-***DC05A, TSM-***DC05A.05, TSM-***DC05A.08, TSM-***DC05A.002, TSM-***DC05A.052, TSM***DC05A.082; TSM-***DC06, TSM- ***DC06.08, TSM-***DC03A(II), TSM-***DC03A.05(II), TSM-***DC03A.08(II), TSM-***DC05A(II), TSM-***DC05A.05(II), TSM-***DC05A.08(II), TSM-***DC05A.002(II), TSM-***DC05A.052(II), TSM- ***DC05A.082(II), TSM-***DC06.08(II);TSM-***DD05A(II), TSM-***DD05A.05(II), TSM-***DD05A.08(II), TSM-***DD14A(II), TSM-***DD14A.08(II), TSM-***DD05A.052(II), TSM-***DD05A.082(II), TSM-***DD05A.05S(II), TSM-***DD05A.08S(II), TSM-***DD05A.05U(II), TSM-***DD05A.08U(II), TSM-***DE05A (II), TSM-***DE05A.08(II), TSM-***DE14A(II), TSM-***DE14A.08(II),TSM-***DE05H(II), TSM-***DE05H.08(II), TSM-***DE14H(II), TSM-***DE14H.08(II), TSM-***DD05H(II), TSM-***DD14H(II);TSM-***DE06H(II), TSM-***DE06H.08(II), TSM-***DE06H.09(II), TSM-***DE06M(II), TSM-***DE06M.09(II), TSM-***DE15H(II), TSM-***DE15H.08(II), TSM-***DE15H.09(II), TSM-***DE15M(II), TSM-***DE15M.08(II), TSM-***DE15M.09(II), TSM-***DE06A(II), TSM-***DE06A.08(II), TSM-***DE06A.09(II), TSM-***DE15A(II), TSM-***DE15A.08(II), TSM-***DE15A.09(II), TSM-***DD15M (II), TSM-***DD15M.08 (II), TSM-***DD15M.09 (II), TSM-***DD06M (II), TSM-***DD06H (II), TSM-***DD06H.05 (II),TSM-***DD06H.08 (II), TSM-***DD15H (II), TSM-***DD15H.05 (II), TSM-***DD15H.08 (II) , TSM-***DE15X(II), TSM-***PE15H(II), TSM-***PE06H(II), TSM-***PE15M(II), TSM-***PE06M(II), TSM-***PE17H(II), TSM-***PE08H(II), TSM-***PE17M(II), TSM-***PE08M(II);

(ii) TSM-***DA01A.10, TM-***DA01A.15, TSM-***DA01A.18, TSM-***DC01A.10, TSM- ***DC01A.15, TSM-***DC01A.18, TSM-***DD05A.T0(II), TSM-***DD05A.T8(II), TSM-***DD14A.T0(II), TSM-***DD14A.T8(II), TSM-***DE05A.T0(II), TSM-***DE05A.T8(II), TSM-***DE05A.T9(II), TSM-***DE14A.T0(II), TSM-***DE14A.T8(II), TSM-***DE14A.T9(II), TSM-***DE14B.T0(II), TSM-***DE14B.T8(II), TSM-***DE14B.T9(II),TSM-***DE05H.T0(II), TSM-***DE05H.T8(II), TSM-***DE14H.T0(II), TSM-***DE14H.T8(II), TSM-***DE14H.T9(II), TSM-***DD05H.T0(II), TSM-***DD05H.T8(II), TSM-***DD14H.T0(II), TSM-***DD14H.T8(II),TSM-***DE06H.T0(II), TSM-***DE06H.T8(II), TSM-***DE06H.T9(II), TSM-***DE06H.18(II),TSM-***DE06M.T0(II), TSM-***DE06M.T8(II), TSM-***DE06M.T9(II),TSM-***DD06M.T8(II), TSM-***DE15H.T0(II), TSM-***DE15H.T8(II), TSM-***DE15H.T9(II), TSM-***DE15M.T0(II), TSM-***DE15M.T8(II), TSM-***DE15M.T9(II), TSM-***DE06A.T0(II), TSM-***DE06A.T8(II), TSM-***DE06A.T9(II), TSM-***DE15A.T0(II), TSM-***DE15A.T8(II), TSM-***DE15A.T9(II), TSM-***DE15B.T0(II), TSM-***DE15B.T8(II), TSM-***DE15B.T9(II), TSM-***DD15M.T0(II), TSM-***DD15M.T8(II), TSM-***DD15M.T9(II), TSM-***DD06M.18(II), TSM-***DD06M.T0(II), TSM-***DD06M.T8(II), TSM-***DD06M.T9(II), TSM-***DD06H.T0(II), TSM-***DD06H.T9(II), TSM-***DD06H.T8(II), TSM-

Address: No.2 Trina Road, Trina PV Industrial Park, New District, Changzhou, Jiangsu, P.R. China, 213031
http://www.trinasolar.com Trina Customer Service Portal: http://customerservice.trinasolar.com Tel: 0086-519-85485801, Fax: 0086-519-85485936

DD06H.18(II), TSM-DD06A.T0(II), TSM-***DD06A.T8(II), TSM-***DD06A.T9(II), TSM-***DD15A.T0(II), TSM-***DD15A.T8(II), TSM-***DD15A.T9(II), TSM-***PE15H.T0(II), TSM-***PE06H.T0(II), TSM-***PE15M.T0(II), TSM-***PE06M.T0(II), TSM-***PE17H.T0(II), TSM-***PE08H.T0(II), TSM-***PE17M.T0(II), TSM-***PE08M.T0(II);

(iii) TSM-***DD06M.05(II), TSM-***DE06M.05(II),TSM-***DE06X.05(II), TSM-***DD06X.05(II), TSM-***DE09.05, TSM-***DD09.05,

(iv) TSM-***DE08M(II), TSM-***DD08M(II), TSM-***DE17M(II), TSM-***DD17M(II), TSM-***DE17M.08(II), TSM-***DD17M.08(II), TSM-***DE18M(II) , TSM-***DD18M(II), TSM-***DE18M.08(II) , TSM-***DD18M.08(II), TSM-***DE21, TSM-*** DE21.08, TSM-***DD21, TSM-***DD21.08, TSM-*** DE19, TSM-*** DE19.08, TSM-***DD19, TSM-***DD19.08, TSM-***DE20, TSM-*** DE20.08, TSM-*** DD20, TSM-***DD20.08, TSM-*** DE18, TSM-*** DE18.08, TSM-***DD18, TSM-***DD18.08 , TSM-***DD09, TSM-*** DE15V(II), TSM-*** DE09, TSM-*** DE15MB(II)，TSM-***DE171H，TSM-***DC082H;

(v) TSM-***DE08M.T0(II), TSM-***DE17M.T0(II), TSM-***DD08M.T0(II), TSM-***DD17M.T0(II), TSM-***DE08M.T8(II), TSM-***DE17M.T8(II), TSM-***DD08M.T8(II), TSM-***DD17M.T8(II), TSM-***DE18M.T0(II) , TSM-***DD18M.T0(II), TSM-***DE18M.T8(II) , TSM-***DD18M.T8(II).

(vi) TSM-***DE06XC.08(II), TSM-***DD06XC.08(II), TSM-***DE09.08, TSM-*** DD09.08, TSM-*** DD08M.08(II), TSM-***DE08M.08(II), TSM-*** DD06M.08(II), TSM-*** DE06M.08(II)

c) P-type Polycrystalline of Duomax Products

(i) TSM-***PDG5, TSM-***PDG5.07, TSM-***PDG5.50, TSM-***PEG5, TSM-***PEG5.07, TSM-***PEG5.50, TSM-***PEG14, TSM-***PEG14(II), TSM-***PEG40.40, TSM-***PEG40.47, TSM-***PEG40.07,TSM-***PEG5.40, TSM-***PEG5.47, TSM-***PEG14.40, TSM-***PEG14.47, TSM-***PEG5H, TSM-***PEG14H, TSM-***PEG5H.40,TSM-***PEG5H.07,TSM-***PEG5H.47,TSM-***PEG14H.40,TSM-**PEG14H.07,TSM-***PEG14H.47, TSM-***PEG5H(II),TSM-***PEG5H.40(II), TSM-***PEG5H.07(II),TSM-***PEG5H.47(II), TSM-***PEG14H(II), TSM-***PEG14H.40(II), TSM-***PEG14H.07(II), TSM-***PEG14H.47(II), TSM-***PEG15H, TSM-***PEG15, TSM-***PEG15H(II), TSM-***PEG15(II), TSM-***PEG6H, TSM-***PEG6, TSM-***PEG6(II), TSM-***PEG15M (II), TSM-***PEG6M (II);

(ii) TSM-***PEG5.20, TSM-***PEG5.27, TSM-***PEG14.20, TSM-**PEG5H.20, TSM-***PEG5H.27, TSM-***PEG14H.20,TSM-***PEG14H.27, TSM-***PEG5H.20(II),TSM-***PEG5H.27(II), TSM-***PEG14H.20(II), TSM-***PEG14H.27((II), TSM-***PEG15H.20, TSM-***PEG15.20, TSM-***PEG15H.20(II), TSM-***PEG15.20(II), TSM-***PEG6H.20, TSM-***PEG6.20, TSM-***PEG6.20(II).

d) P-type Mono PERC of Duomax Products

(i) TSM-***DEG40.07(II),TSM-***DEG5(II),TSM-***DEG5.07(II),TSM-***DEG14(II),TSM-**DEG14.07(II), TSM-***DEG40.47(II), TSM-***DEG5.40(II), TSM-***DEG5.47(II), TSM-***DEG14.40(II), TSM-***DEG14.47(II), TSM-***DEG5H(II), TSM-***DEG14H(II), TSM-***DEG5H(II), TSM-*** DEG5H.40(II), TSM-***DEG5H.07(II), TSM-***DEG5H.47(II), TSM-***DEG14H(II), TSM-***DEG14H.40(II), TSM-***DEG14H.07(II), TSM-***DEG14H.47(II), TSM-***DEG6H(II), TSM-***DEG6M(II), TSM-***DDG6M(II), TSM-***DEG15H(II), TSM-***DEG15M(II), TSM-***DDG6H(II), TSM-***DEG6(II), TSM-***DEG15(II);

(ii) TSM-***DEG14.20(II), TSM-***DEG5.20(II),TSM-***DEG5.27(II), TSM-***DEG5H.20(II), TSM-***DEG5H.27(II), TSM-*** DEG14H.20(II), TSM-***DEG14H.27(II), TSM-***DEG6H.20(II), TSM-

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DEG6M.20(II), TSM-DEG15H.20(II), TSM-***DEG15M.20(II), TSM-***DDG6M.20(II), TSM-***DDG6H.20(II), TSM-***DEG6.20(II), TSM-***DEG15.20(II);

(iii) TSM-***DEG8M.20(II), TSM-***DEG17M.20 (II), TSM-***DEG18M.20 (II),

e) P-type Mono PERC of Duomax Twin Products

(i) TSM-***DEG5C.07(II), TSM-***DEG14C.07(II), TSM-***DEG5C(II), TSM-***DEG14C(II), TSM-***DEG5HC(II), TSM-***DEG5HC.07(II), TSM-***DEG14HC(II), TSM-*** DEG14HC.07(II), TSM-***DEG15HC(II), TSM-***DEG15MC(II), TSM-***DEG6HC(II), TSM-***DEG6MC(II), TSM-***DEG15C(II), TSM-***DEG15C.07(II);

(ii) TSM-***DEG5C.27(II), TSM-***DEG14C.27(II), TSM-***DEG5C.20(II), TSM-***DEG14C.20(II), TSM-***DEG5HC.20(II), TSM-***DEG5HC.27(II), TSM-***DEG14HC.20(II), TSM-***DEG14HC.27(II), TSM-***DEG15HC.20(II), TSM-***DEG15MC.20(II), TSM-***DEG6HC.20(II), TSM-***DEG6MC.20(II), TSM-***DEG6C.20(II), TSM-***DEG6C.20(II), TSM-***DEG15C(II), TSM-***DEG15C.20(II), TSM-***DEG15MC.27(II);

(iii) TSM-***DEG8MC.20 (II),TSM-***DEG17MC.20(II) , TSM-***DEG18MC.20 (II), TSM-*** DEG21C.20, TSM-***DEG21C.28, TSM-***DDG21C.20, TSM-***DDG21C.28, TSM-***DEG19C.20, TSM-*** DEG19C.28, TSM-***DDG19C.20, TSM-***DDG19C.28, TSM-***DEG20C.20, TSM-***DEG20C.28, TSM-***DDG20C.20, TSM-***DDG20C.28, TSM-***DEG15VC.20(II);

f) N-type Mono of Duomax Twin Products

(i) TSM-***NEG16MC(II), TSM-***NEG7MC(II);

(ii) TSM-***NEG15MC.20(II), TSM-***NEG16MC.20(II), TSM-***NEG7MC.20(II), TSM-***NEG15XC.20(II).

Note: The "***" placeholder stands in each case for the power indication set out in the relevant Product Data Sheet (for example "TSM-285PE06H").

2) Rules of use and application for Products listed under Sec. 1)

Trina Solar has set out certain rules of use and application for the Products (please see Appendix: "Rules of application for climatic modules") to ensure the functionality, durability and performance under different climatic circumstances.

Only for Products listed under Sec. 1) c), d), e), f) can be installed on water surface floating systems;

For Products not used in accordance with the rules determined in this Appendix, Trina Solar will not undertake this limited Warranty. Any consequences, risks, losses or damages caused by any violations of the Buyer to the "Rules of application for climatic modules" shall be borne by the Buyer solely.

	Environment	Temperature	Relative Humidity	Irradiance kwh/m2

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1)	**High temperature and high humidity area**	Annual average temperature ＞ 23℃ Monthly minimum temperature ＞ 18℃	Annual average RH ＞ 70% Monthly minimum average RH ＞ 60%	/
2)	**High temperature difference and high irradiation area**	Desert and gobi region	/	＞1800
3)	**Gelid area（Low irradiation）**	＜-10℃（Monthly minimum temperature）	/	＜1400
4)	**Normal**	Not listed in Nr. 1 to 3 before		

3) Warranty

a) 10 Year Limited Product Warranty

For the Products listed under Sec. 1) c) (i), d) (i), e) (i), f) (i) Trina Solar warrants that for a period of ten years commencing on the Warranty Start Date (as defined in Sec. 4)) there will be no defects in material workmanship or manufacture that materially impede the power generation functioning of the Products.

This Limited Product Warranty covers glass breakage provided that there was no external cause of breakage (i.e. only breakage caused by the glass itself or the module is covered).

Any deterioration in the appearance of the Products (including, without limitation, any scratches, stains, mechanical wear, rust, mold, deformation or discoloration) or any other changes to the Products which occur after delivery (Incoterms 2020) to the Buyer, do not constitute a defect under this Limited Product Warranty.

b) 12 Year Limited Product Warranty

For the Products listed under Sec.1) a), b)(i),(ii),(iv),(v), c) (ii), d) (ii), (iii), e) (ii), (iii), f) (ii) Trina Solar warrants that for a period of twelve years commencing on the Warranty Start Date (as defined in Sec. 4)) there will be no defects in material, workmanship or manufacture that materially impede the power generation functioning of the Products.

This Limited Product Warranty covers glass breakage provided that there was no external cause of breakage (i.e. only breakage caused by the glass itself or the module is covered).

Any deterioration in the appearance of the Products (including, without limitation, any scratches, stains, mechanical wear, rust , mold, deformation or discoloration) or any other changes to the Products which occur after delivery (Incoterms 2020) to the Buyer, do not constitute a defect under this Limited Product Warranty.

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c) 15 Year Limited Product Warranty

For the Products listed under Sec.1) b) (iii),(vi) Trina Solar warrants that for a period of fifteen years commencing on the Warranty Start Date (as defined in Sec. 4)) there will be no defects in material, workmanship or manufacture that materially impede the power generation functioning of the Products.

This Limited Product Warranty covers glass breakage provided that there was no external cause of breakage (i.e. only breakage caused by the glass itself or the module is covered).

Any deterioration in the appearance of the Products (including, without limitation, any scratches, stains, mechanical wear, rust , mold, deformation or discoloration) or any other changes to the Products which occur after delivery (Incoterms 2020) to the Buyer, do not constitute a defect under this Limited Product Warranty.

d) 25 Year Limited Power Output Warranty for Back Sheet Glass Products

In addition, for the Products listed under Sec.1) a), b) Trina Solar warrants that for a period of twenty-five years commencing on the Warranty Start Date (as defined in Sec. 4)) the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts Pmax(Wp) plus Peak Power Watts Pmax(Wp) multiplied by the lower limit of the Power Output Tolerance Pmax(%) – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC: irradiation 1000w/m², temperature 25°C, AM 1.5) for the Products shall not exceed and measurement shall either be carried out by Trina Solar or by a third-party testing institute recognized by Trina Solar and the Buyer:

- for P-type Poly Products (as defined in Sec. 1) a)): 2.5% in the first year; from the 2nd year to the 25th year, the average annual power decline will be no more than 0.65%; by the end of the 25th year, the actual power output will be no less than 81.9%;
- for P-type Mono PERC Products (as defined in Sec. 1) b) (i), (ii), (iii)): 2.5% in the first year; from the 2nd year to the 25th year, the average annual power decline will be no more than 0.6%; by the end of the 25th year, the actual power output will be no less than 83.1%.
- for P-type Mono PERC Products (as defined in Sec. 1) b) (iv), (v)): 2 % in the first year; from the 2nd year to the 25th year, the average annual power decline will be no more than 0.55 %; by the end of the 25th year, the actual power output will be no less than 84.8 %;

(Remark: According to STC, measurement system uncertainty should be included in all actual power output measurements.)

e) 30 Year Limited Power Output Warranty for Dual Glass Products

aa) Frontside:

In addition, for the Products listed under Sec.1) c), d) and the front side (without J-Box) of the Products listed under Sec. 1) e), f) Trina Solar warrants that for a period of thirty years commencing on the

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Warranty Start Date (as defined in Sec. 4)) the loss of power output relating to the initial guaranteed power which is defined as Peak Power Watts Pmax(Wp) plus Peak Power Watts Pmax(Wp) multiplied by the lower limit of the Power Output Tolerance Pmax(%) – as specified in the relevant Product Data Sheet and measured at Standard Test Conditions (STC: irradiation 1000w/m², temperature 25°C, AM 1.5) for the Products shall not exceed and measurement shall either be carried out by Trina Solar or by a third-party testing institute recognized by Trina Solar and the Buyer:

- for P-type Poly Duomax Products (as defined in Sec. 1) c),for P-type Mono PERC Duomax Products (as defined in Sec. 1) d) (i), (ii), for the front side (without J-Box) of P-type Mono PERC Duomax Twin Products (as defined in Sec.1) e) (i) (ii)): 2.5 % in the first year; from the 2nd year to the 30th year, the average annual power decline will be no more than 0.5%; by the end of the 30th year, the actual power output will be no less than 83%;

- for P-type Mono PERC Duomax Products (as defined in Sec. 1) d) (iii), for the front side (without J-Box) of P-type Mono PERC Duomax Twin Products (as defined in Sec.1) e) (iii)): 2 % in the first year; from the 2nd year to the 30th year, the average annual power decline will be no more than 0.45 %; by the end of the 30th year, the actual power output will be no less than 85 %;

- for the front side (without J-Box) of N-type Mono Duomax Twin Products (as defined in Sec.1) f)): 1.5% in the first year; from the 2nd year to the 30th year, the average annual power decline will be no more than 0.5%; by the end of the 30th year, the actual power output will be no less than 84%.

bb) Backside

For P-type Mono PERC Duomax Twin Products (as defined in Sec.1) e) (iii)), Trina Solar warrants that for a period of thirty years commencing on the Warranty Start Date (as defined in Sec. 4)) the loss of the power on the backside of the product (with junction box) as follows

- From the 1st year to the 10th year, the power degradation will be no more than Initial backside power P multiplied by 15%

- From 11th to 30th year, the power degradation will be no more than Initial backside power P multiplied 30%.

For definition purposes only: Initial backside power P = nameplate power (module front side power)* specified bifaciality (as specified lower limit of the bifaciality in the relevant Product Data Sheet).

(Remark: According to STC, measurement system uncertainty should be included in all actual power output measurements.)

4) Warranty Start Date

The Warranty Start Date is the date of installation of the Products or three months after the delivery (Incoterms 2020) of the Products to the Buyer, whichever date is earlier.

5) Exclusions and Limitations

This Global Limited Warranty does not apply to any Products which have been subject to:

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a) Failure to pay the purchase price towards Trina Solar or its subsidiaries which have put the module on the market even though (i) the payment was due and (ii) the direct customer who has obtained the module from Trina Solar or its subsidiary („Direct Customer“) is not entitled to withhold the purchase price or parts of the purchase price. Trina Solar must inform the Buyer about the non-payment and provide the name and the full address of the Direct Customer which has failed to pay the module. In case that Trina Solar can reject the claims under this Global Limited Warranty based on this provision, the Buyer can deposit the amount not paid in order to trigger the Global Limited Warranty claims;
b) Failure to provide proof of purchase or product information;
c) Failure to comply with the requirements of Trina Solar's user manual or rules of use and application for the Products (as defined in Sec. 2) and Appendix;
d) Failure to carry out proper operation and maintenance (including but not limited to operation and maintenance requirements requested by Trina Solar's applicable user manual or other applicable local laws and regulations of the place of installation);
e) Service by service technicians who are not qualified under the relevant law and/or applicable regulations at the place of installation;
f) Change, erasure or illegible-made of the Product's type, nameplate or serial number (other than by any act or omission of Trina Solar);
g) Installation on mobile units (except photovoltaic tracking system), such as vehicles, ships or offshore-structures(except water surface floating systems pursuant to Sec 2) ;
h) Exposure to voltage in excess to the maximum system voltage or power surges;
i) defective components in the construction on which the module is mounted;
j) Exposure to mold discoloration or similar external effects;
k) unauthorized modifications:
i) Operation/maintenance by use of unauthorized spare parts;
ii) Application under extreme environmental conditions or rapid changes in such environments resulting in corrosion, oxidation, or affected by chemical products;
iii) Other acts beyond Trina Solar`s reasonable control (including direct or indirect damage by war, fire, flood, hurricane, volcanic eruption, surface collapse, debris flow, lightning, earthquake, heavy snowfall, hailstone, strong breeze etc.);
l) Use of the Products in such a manner as to infringe Trina Solar's or any third party`s intellectual property rights (including but not limited to patents, trademarks, etc.);
m) Any subsequent sale of the Products from a country where Trina Solar was first marketed to another country without the consent of Trina Solar ("Prohibition of Parallel Import"). But the Prohibition of Parallel Import does not apply to the sales within the European Union ("EU"), where the sale of Products from one EU country to another does not require the consent of Trina Solar. However, the consent of Trina Solar must be obtained for the sale of Products from outside the EU to an EU country or from an EU country to outside the EU.
n) only for Buyers located in Australia applies: This Global Limited Warranty is only valid for Products from authorized Australian resellers. Buyers may contact the Customer Support office in their region (as detailed in Sec. 8)) for details of authorized Australian resellers.
o) only for Buyers located in the US applies: This Global Limited Warranty is only valid for Products from authorized US resellers. Buyers may contact the Customer Support office in their region (as detailed in Sec. 8)) for details of authorized US resellers.
p) only for Buyers located in Japan applies: This Global Limited Warranty is only valid for Products from authorized Japanese resellers. Buyers may contact the Customer Support office in their region (as detailed in Sec. 8)) for details of authorized Japanese resellers.

6) Repair, Replacement or Refund Remedy

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a) As Buyer's sole and exclusive remedy under this Global Limited Warranty (though the Buyer should note Sec. 6) d) regarding the potential existence of other statutory rights and Sec. 6 e) for Australian Buyers) Trina Solar will, at its sole discretion, either, with regard to the applicable Products:

(i) determine a maintenance plan and repair the defective Products; or
(ii) refund the difference value between the actual STC power and the warranty power of the defective products (Difference value = The market price at the moment of raising Global Limited Warranty claims (per watt) * (sum of the remaining theoretical warranty power according to Sec. 3) d), e) - sum of STC power actually measured according to Sec. 3) d), e)); or
(iii) refund the salvage value of the defective Products. For purposes of this Global Limited Warranty salvage value = The market price at the moment of raising warranty claim (unit price per watt) * the original guaranteed nameplate power * remaining warranty period (year) / original total warranty period by Trina Solar; or
(iv) provide free Products to make up for the difference between the actual STC power of defective Products and the warranty power (Difference power = sum of the remaining theoretical warranty power according to Sec. 3) d), e) - sum of STC power actually measured according to Sec. 3) d), e)); or
(v) replace the defective Products or part thereof by new or remanufactured Products at no charge. The total nominal power of the replaced Products shall not be less than the total remaining theoretical warranty power of the defective Products. Trina Solar reserves the right to provide similar Products in replacement of the defective Products if the defective Products are discontinued or otherwise unavailable.

During the warranty period of Sec. 3) a), b) and c), in the event that Trina Solar opts for option under Sec. 6) a) (i), Trina Solar shall bear the costs for repairing and all reasonable insurance and transportation charges (except air freight), customs clearance and any other reasonable costs for shipping the repaired Products to the Buyer (the Buyer may claim reimbursement by Trina Solar for these charges by providing an invoice from the relevant service provider to Trina Solar that these charges were incurred). The costs and other related expenses for the removal, repack, installation or reinstallation shall remain with the Buyer. Beyond the warranty period of Sec. 3) a), b) and c), Buyer shall bear all reasonable costs of materials, labor, freight, clearance, removal, repack, installation or reinstallation whatsoever related to repairing.

In the event that Trina Solar opts for option under Sec. 6) a) (iv), (v), Trina Solar shall bear all reasonable insurance and transportation charges (except air freight), customs clearance and any other reasonable costs for shipping the replaced Products to the Buyer (the Buyer may claim reimbursement by Trina Solar for these charges by providing an invoice from the relevant service provider to Trina Solar that these charges were incurred). The costs and other related expenses for the removal, repack, installation or reinstallation shall remain with the Buyer.

Defect Products or end of lifetime Products shall be disposed if legally permissable by the Buyer in accordance with local applicable laws or regulations, unless Trina Solar agrees or where legally mandatory takes them back. If Trina Solar decides or where legally mandatory takes the defective products back, the goods property of these products shall belong to Trina Solar without any limitation.

b) The Global Limited Warranty periods as defined in Sec. 3) a), b), c), d), e) shall not extend or renew upon the repair or replacement of defective Products by Trina Solar. The Global Limited Warranty period for replaced or repaired Products is the remainder of the Global Limited Warranty period on the original new Products.

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http://www.trinasolar.com Trina Customer Service Portal: http://customerservice.trinasolar.com Tel: 0086-519-85485801, Fax: 0086-519-85485936

c) All other claims under this Global Limited Warranty against Trina Solar shall be excluded. Under this limited Warranty, Trina Solar is not responsible for any special, incidental or consequential damages (including loss of profits, business interruption, loss of power generation, harm to goodwill or business reputation, or delay damages) whether such claims are based in contract, warranty, negligence or strict tort. This exclusion applies to the extent permissible by law, and even if the remedies set forth below herein are deemed to have failed of their essential purpose.

d) YOU MAY HAVE SPECIFIC LEGAL RIGHTS OUTSIDE THIS LIMITED WARRANTY, AND YOU MAY ALSO HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE. THIS GLOBAL LIMITED WARRANTY DOES NOT AFFECT ANY ADDITIONAL RIGHTS YOU HAVE UNDER LAWS IN YOUR JURISDICTION GOVERNING THE SALE OF CONSUMER GOODS, INCLUDING WITHOUT LIMITATION, NATIONAL LAWS IMPLEMENTING EC DIRECTIVE 99/44 OR PURSUANT TO THE MAGNUSON MOSS WARRANTY ACT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE LIMITATIONS OR EXCLUSIONS IN THIS GLOBAL LIMITED WARRANTY STATEMENT MAY NOT APPLY.

e) The following statement applies to Buyers that are "Consumers" within the meaning of the Australian Consumer Law:

"Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure."

7) Rights and Remedies against Third Parties

This Global Limited Warranty shall be construed as a separate warranty and independent from any other contractual arrangement with third parties relating to the Products. It shall not affect any rights, obligations and remedies of the Buyer, if any, with regard to third parties for defects or non-conformity or non-compliance of the Products, notwithstanding its legal basis. The rights and remedies provided hereunder are in addition to any other rights and remedies against third parties to which the Buyer may be entitled by agreements with such third parties or by law.

8) Claims Procedure, Notice Periods, Expiration of Global Limited Warranty Claims and Limitations.

a) The Buyer shall notify Trina Solar under this Global Limited Warranty using Trina Solar's Customer Service Portal at the web address http://customerservice.trinasolar.com; alternatively by letter or facsimile. The notification shall specify the claim and, without limitation, include proof for the purchase (purchasing invoices indicating purchase date, Products, serial numbers) and for the defect or malfunction (i.e. related to transport, storage, installation and operation) of the Products. The contact customer support center for the regions are:

Europe Customer Support
Trina Solar (Schweiz) AG
Birkenweg 4
8304 Wallisellen, Switzerland
T +41 43 299 68 00
F +41 43 299 68 10
http://customerservice.trinasolar.com

Americas Customer Support
Trina Solar (U.S.), Inc.
100 Century Center, Suite 501,
San Jose CA 95112, USA
T +1 800 696 7114
F +1 800 696 0166
http://customerservice.trinasolar.com

Address: No.2 Trina Road, Trina PV Industrial Park, New District, Changzhou, Jiangsu, P.R. China, 213031
http://www.trinasolar.com Trina Customer Service Portal: http://customerservice.trinasolar.com Tel: 0086-519-85485801, Fax: 0086-519-85485936

Australia and New Zealand Customer Support
Trina Solar (Australia) Pty Ltd
Suite 44.05, Level 44, Governor Philip Tower
1 Farrer Place Sydney NSW 2000 , Australia
T 1300 874 627
Mail
Australiaservice@trinasolar.comhttp://customerservice.trinasolar.com

Japan Customer Support
Trina Solar (Japan) Limited
World Trade Center Building 21F
4-1, Hamamatsu-cho, 2-chome,
Minato-ku, Tokyo, Japan, 105-6121
T +81-3-6435-9008
F +81-3-3437-7001
Mail Japanservice@trinasolar.com
http://customerservice.trinasolar.com

China Customer Support
Trina Solar Co.,Ltd
No. 2 Trina Road, Trina PV Industrial Park,
New District, Changzhou, Jiangsu,
P.R. China, 213031
T +86 519 8548 2008
F +86 519 8517 6021
http://customerservice.trinasolar.com

Rest of World (ROW) Customer Support
Trina Solar Energy Development Pte Ltd
600 North Bridge Road, #12-01 Parkview Square,
Singapore 188778
T: +65 5808 1111
Mail: apmea@trinasolae.com

Middle East Customer Service
Trina Solar Middle East & Africa
6th Floor, One JLT,
Dubai – United Arab Emirates
Tel: +971 4 429 5872
Mail: MEAservice@trinasolar.com

India Customer Support
Trina Solar (India) Regional Sales Office
Unit No- 824, 8th Floor, DLF Tower-B, Jasola District Center, New Delhi -110025, India
T: +91 11 45852200, +91 11 35852207
Mail: salesindia@trinasolae.com

b) Any dispute on technical facts relating to claims brought under this Global Limited Warranty for defects of Products shall be determined by expert determination. Trina Solar and the Buyer will, at the Buyer's or Trina Solar's request, jointly appoint as independent expert and appraiser a reputable researcher from a first-class test-institute such as Fraunhofer ISE in Freiburg, TÜV Rheinland, TÜV SUD or ASU Arizona State University, and so on ("Technical Expert"). The determination by such Technical Expert shall be final, conclusive, binding and enforceable in any proceeding brought hereunder. The Technical Expert shall (i) act as an expert recognized by Trina Solar; (ii) allow the parties a reasonable opportunity to make representations and counter-representations; (iii) take those representations and counter-representations into account; and (iv) if required by either party give written reasons for his or her determination.

c) Any claim for breach of this Global Limited Warranty must be brought within two (2) months after discovery of the breach.

d) The return of any defective Products will not be accepted unless prior written authorization has been given by Trina Solar.

9) Force Majeure

Trina Solar shall not be responsible or liable in any way to the Buyer for any non-performance or delay in Trina Solar's performance under this Global Limited Warranty due to occurrences of force majeure such as war, riots, strikes, unavailability of suitable and sufficient labor, material, or capacity or technical or yield failures and any unforeseen event beyond its control, including, without limitation, any technological or physical event or condition which is not reasonably known or understood at the time of the sale of the defective Products or the notification of the relevant Global Limited Warranty claim under this limited Warranty.

10) Warranty Assignment

This Global Limited Warranty is transferrable when the Products remain installed in their original installation location.

11) Validity

This Global Limited Warranty shall apply to Products delivered to the Buyer on or after 1st of November 2020 (Incoterms 2020). This Global Limited Warranty shall be valid until a new revision is issued by Trina Solar.

12) Geographical Validity

This Global Limited Warranty does apply to all countries with the exception of Germany and Turkey where country specific limited warranties apply.

13) No Other Express Warranty

Except as otherwise provided by applicable statutory law (cf. Sec. 6) d) and 6 e)) or unless modified in writing and signed by an officer of Trina Solar, the Global Limited Warranty set forth herein is the only express warranty (whether written or oral) by Trina Solar applicable to the Products and no one is authorized to restrict, expand or otherwise modify this limited Warranty.

14) Miscellaneous

If any provision of this Global Limited Warranty is held invalid, unenforceable or contrary to law then the validity of the remaining provisions of this Global Limited Warranty shall remain in full force and effect.

15) Limitation of Liability

To the maximum extent permitted by applicable law, Trina Solar's aggregate liability according to this Global Limited Warranty shall not exceed the purchase price paid by the Buyer for the defective Products in the case of a Global Limited Warranty claim. The Buyer acknowledges that the foregoing limitation of liability is an essential element of this Global Limited Warranty and that in the absence of such limitations the purchase price of the Products would be significantly higher.

16) Applicable Law and Jurisdiction

The validity of this limited Warranty, the construction of its terms and the interpretation and enforcement of the rights and duties of the Buyer and Trina Solar shall be governed by the laws of the country of the original installation location of the Products, to the exclusion of that country's conflicts of law rules as well as of the United Nations Convention on the International Sale of Goods dated 11 April 1980 (CISG) and of any other uniform law.

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All disputes arising out of or in connection with this Global Limited Warranty shall be finally settled before the ordinary courts of the country of the original installation location of the Products.

Note
The installation and operation of photovoltaic modules requires professional skills and should only be performed by qualified professionals. Please read the safety and installation instructions before using and operating the Products (http://www.trinasolar.com/en-glb/resources/downloads).

Appendix: "Rules of application for Trina modules"
If the place of the installed Products is not listed in the following list of countries, states and provinces, please contact the competent contact customer support center (as stated in Sec. 8) a)) which shall timely feedback to Trina Solar headquarters PM. Then, Trina Solar headquarters PM shall work with engineering center and quality control team to confirm the corresponding product or material type and update the database.

Region	SN	Country/state/province	Climate type	Applicable Products listed under Sec. 1
Africa	1	Ghana	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	2	Mauritius	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	3	Nigeria	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	4	Sierra Leone	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	5	Central African Republic	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	6	Namibia	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	7	Algeria	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	8	Tunisia	Normally	(a), (b), (c), (d), (e), (f)
	9	Egypt	Normally	(a), (b), (c), (d), (e), (f)
	10	Djibouti	Normally	(a), (b), (c), (d), (e), (f)
	11	Kenya	Normally	(a), (b), (c), (d), (e), (f)
	12	Morocco	Normally	(a), (b), (c), (d), (e), (f)
	13	South Africa	Normally	(a), (b), (c), (d), (e), (f)
	14	Senegal	Normally	(a), (b), (c), (d), (e), (f)
	15	Tanzania	Normally	(a), (b), (c), (d), (e), (f)

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	16	Malawi	Normally	(a), (b), (c), (d), (e), (f)
	17	Zimbabwe	Normally	(a), (b), (c), (d), (e), (f)
	18	Ethiopia	Normally	(a), (b), (c), (d), (e), (f)
	19	Zambia	Normally	(a), (b), (c), (d), (e), (f)
	20	Eritrea	Normally	(a), (b), (c), (d), (e), (f)
	21	Burkina Faso	Normally	(a), (b), (c), (d), (e), (f)
	22	Rwanda	Normally	(a), (b), (c), (d), (e), (f)
	23	Mozambique	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	24	Botswana	Normally	(a), (b), (c), (d), (e), (f)
	25	Angola	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	26	Mali	Normally	(a), (b), (c), (d), (e), (f)
	27	Uganda	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	28	Chad	Normally	(a), (b), (c), (d), (e), (f)
	29	Mauritania	Normally	(a), (b), (c), (d), (e), (f)
	30	Cote d'Ivoire	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	31	Guinea	Normally	(a), (b), (c), (d), (e), (f)
	32	Niger	Normally	(a), (b), (c), (d), (e), (f)
	33	Madagascar	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	34	Burundi	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	35	Liberia	Normally	(a), (b), (c), (d), (e), (f)
	36	Guinea-Bissau	Normally	(a), (b), (c), (d), (e), (f)
	37	Benin	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	38	Togo	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	39	Swaziland	Normally	(a), (b), (c), (d), (e), (f)
	40	Libya	Normally	(a), (b), (c), (d), (e), (f)
	41	Lesotho	Normally	(a), (b), (c), (d), (e), (f)
	42	Cape Verde	High temperature and high humidity	(a), (b), (c), (d), (e), (f)

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	43	Seychelles	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	44	Gambia	Normally	(a), (b), (c), (d), (e), (f)
	45	Comoros	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	46	Sudan	Normally	(a), (b), (c), (d), (e), (f)
	47	Somalia	Normally	(a), (b), (c), (d), (e), (f)
	48	Sao Tome and Principe	Normally	(a), (b), (c), (d), (e), (f)
	49	Democratic Republic of Congo	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	50	Congo	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	51	South Sudan	Normally	(a), (b), (c), (d), (e), (f)
	52	Equatorial Guinea	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	53	Gabon	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
ROA	01	Philippines	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	02	Cambodia	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	03	Maldives	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	04	Malaysia	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	05	Myanmar	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	06	Sri Lanka	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	07	Solomon Islands	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	08	Thailand	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	09	Singapore	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	10	Indonesia	High temperature and high humidity	(a), (b), (c), (d), (e), (f)

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	11	Viet Nam	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	12	Bengal	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	13	Pakistan	Normally	(a), (b), (c), (d), (e), (f)
	14	Korea, Republic of	Normally	(a), (b), (c), (d), (e), (f)
	15	Mongolia	Normally	(a), (b), (c), (d), (e), (f)
	16	Nepal	Normally	(a), (b), (c), (d), (e), (f)
	17	New Zealand	Normally	(a), (b), (c), (d), (e), (f)
	18	Hong Kong	Normally	(a), (b), (c), (d), (e), (f)
	19	Brunei	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
ME	01	United Arab Emirates	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	02	Oman	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	03	Bahrain	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	04	Saudi Arabia	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	05	Yemen	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	06	Iraq	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	07	Israel	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	08	Lebanon	Normally	(a), (b), (c), (d), (e), (f)
	09	Palestine	Normally	(a), (b), (c), (d), (e), (f)
	10	Jordan	Normally	(a), (b), (c), (d), (e), (f)
	11	Kuwait	Normally	(a), (b), (c), (d), (e), (f)
	12	Qatar	Normally	(a), (b), (c), (d), (e), (f)
Aus	01	North coast of Australia	High temperature and high humidity	(a), (b), (c), (d), (e), (f)

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	02	Queensland	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	03	the State of Victoria	Normally	(a), (b), (c), (d), (e), (f)
	04	Australian capital territory	Normally	(a), (b), (c), (d), (e), (f)
	05	New South Wales	Normally	(a), (b), (c), (d), (e), (f)
	06	western australia	Normally	(a), (b), (c), (d), (e), (f)
	07	Tasmania	Normally	(a), (b), (c), (d), (e), (f)
	08	South Australia	Normally	(a), (b), (c), (d), (e), (f)
EU	01	Norway	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
	02	Sweden	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
	03	Finland	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
	04	Denmark	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
	05	Ukraine	Normally	(a), (b), (c), (d), (e), (f)
	06	Germany	Normally	(a), (b), (c), (d), (e), (f)
	07	France	Normally	(a), (b), (c), (d), (e), (f)
	08	Georgia	Normally	(a), (b), (c), (d), (e), (f)
	09	Netherlands	Normally	(a), (b), (c), (d), (e), (f)
	10	Netherlands Antilles	Normally	(a), (b), (c), (d), (e), (f)
	11	Portugal	Normally	(a), (b), (c), (d), (e), (f)
	12	Switzerland	Normally	(a), (b), (c), (d), (e), (f)
	13	Turkey	Normally	(a), (b), (c), (d), (e), (f)
	14	Spain	Normally	(a), (b), (c), (d), (e), (f)
	15	Greece	Normally	(a), (b), (c), (d), (e), (f)
	16	Slovakia	Normally	(a), (b), (c), (d), (e), (f)
	17	Hungary	Normally	(a), (b), (c), (d), (e), (f)
	18	Luxembourg	Normally	(a), (b), (c), (d), (e), (f)
	19	Malta	Normally	(a), (b), (c), (d), (e), (f)
	20	Czech Republic	Normally	(a), (b), (c), (d), (e), (f)
	21	Poland	Normally	(a), (b), (c), (d), (e), (f)
	22	Bosnia and Herzegovina	Normally	(a), (b), (c), (d), (e), (f)
	23	Belgium	Normally	(a), (b), (c), (d), (e), (f)
	24	Austria	Normally	(a), (b), (c), (d), (e), (f)

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	25	Estonia	Normally	(a), (b), (c), (d), (e), (f)
	26	Ireland	Normally	(a), (b), (c), (d), (e), (f)
	27	New Caledonia	Normally	(a), (b), (c), (d), (e), (f)
	28	United Kingdom	Normally	(a), (b), (c), (d), (e), (f)
	29	Italy	Normally	(a), (b), (c), (d), (e), (f)
	30	Curacao Island	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	31	Bulgaria	Normally	(a), (b), (c), (d), (e), (f)
	32	Uzbekistan	Normally	(a), (b), (c), (d), (e), (f)
	33	Kazakhstan	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
India	01	Calcutta	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	02	Telangana	Normally	(a), (b), (c), (d), (e), (f)
	03	Andhra pradesh	Normally	(a), (b), (c), (d), (e), (f)
	04	Tripura	Normally	(a), (b), (c), (d), (e), (f)
	05	Kerala	Normally	(a), (b), (c), (d), (e), (f)
	06	Rajasthan	Normally	(a), (b), (c), (d), (e), (f)
	07	West Bengal	Normally	(a), (b), (c), (d), (e), (f)
	08	maharashtra	Normally	(a), (b), (c), (d), (e), (f)
	09	uttar pradesh	Normally	(a), (b), (c), (d), (e), (f)
	10	Tamil Nadu	Normally	(a), (b), (c), (d), (e), (f)
	11	Gujarat	Normally	(a), (b), (c), (d), (e), (f)
	12	karnataka	Normally	(a), (b), (c), (d), (e), (f)
	13	Madhya pradesh	Normally	(a), (b), (c), (d), (e), (f)
	14	Punjab	Normally	(a), (b), (c), (d), (e), (f)
	15	Haryana	Normally	(a), (b), (c), (d), (e), (f)
	16	Delhi	Normally	(a), (b), (c), (d), (e), (f)
	17	Bihar	Normally	(a), (b), (c), (d), (e), (f)
	18	Orissa	Normally	(a), (b), (c), (d), (e), (f)
	19	Jharkhand	Normally	(a), (b), (c), (d), (e), (f)
	20	Chhattisgarh	Normally	(a), (b), (c), (d), (e), (f)

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	21	state of Jammu &Kash-mir	Normally	(a), (b), (c), (d), (e), (f)
	22	Uttarakhand	Normally	(a), (b), (c), (d), (e), (f)
	23	Himachal pradesh	Normally	(a), (b), (c), (d), (e), (f)
	24	Goa	Normally	(a), (b), (c), (d), (e), (f)
	25	Manipur	Normally	(a), (b), (c), (d), (e), (f)
	26	Meghalaya	Normally	(a), (b), (c), (d), (e), (f)
	27	Nagaland	Normally	(a), (b), (c), (d), (e), (f)
	28	Mizoram	Normally	(a), (b), (c), (d), (e), (f)
	29	The state of punjab	Normally	(a), (b), (c), (d), (e), (f)
JPN	01	Hokkaido	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
	02	Except Hokkaido	Normally	(a), (b), (c), (d), (e), (f)
LAC	01	Barbados	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	02	Panama	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	03	Tropical rainforest area of northern Brazil	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	04	Dominican Republic	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	05	Colombia	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	06	Costa Rica	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	07	Guyana	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	08	Haiti	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	09	Honduras	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	10	Martinique	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	11	Peru	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	12	Argentina	Normally	(a), (b), (c), (d), (e), (f)
	13	Mexico	Normally	(a), (b), (c), (d), (e), (f)

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	14	Nicaragua	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	15	El Salvador	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	16	Uruguay	Normally	(a), (b), (c), (d), (e), (f)
	17	Jamaica	Normally	(a), (b), (c), (d), (e), (f)
	18	Chile	Normally	(a), (b), (c), (d), (e), (f)
	19	Brazil(Except tropical rainforest area of northern)	Normally	(a), (b), (c), (d), (e), (f)
	20	La Joya	Normally	(a), (b), (c), (d), (e), (f)
	21	Bolivia	Normally	(a), (b), (c), (d), (e), (f)
	22	The Republic of Guatemala	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	23	Saint Lucia	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	24	Bahamas	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	25	Puerto Rico	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	26	Paraguay	Normally	(a), (b), (c), (d), (e), (f)
	27	Caribbean Islands	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
CHN	01	Hainan	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	02	Inner Mongolia	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
	03	Sinkiang	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	04	Tibet	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	05	Golmud	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	06	Gansu	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	07	Heilongjiang	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)

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	08	Jilin	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
	09	Anhui	Normally	(a), (b), (c), (d), (e), (f)
	10	Hebei	Normally	(a), (b), (c), (d), (e), (f)
	11	Jiangsu	Normally	(a), (b), (c), (d), (e), (f)
	12	Fujian	Normally	(a), (b), (c), (d), (e), (f)
	13	Yunnan	Normally	(a), (b), (c), (d), (e), (f)
	14	Szechwan	Normally	(a), (b), (c), (d), (e), (f)
	15	Ningxia	Normally	(a), (b), (c), (d), (e), (f)
	16	Guizhou	Normally	(a), (b), (c), (d), (e), (f)
	17	Shanxi	Normally	(a), (b), (c), (d), (e), (f)
	18	Henan	Normally	(a), (b), (c), (d), (e), (f)
	19	Hubei	Normally	(a), (b), (c), (d), (e), (f)
	20	Hunan	Normally	(a), (b), (c), (d), (e), (f)
	21	Guangdong	Normally	(a), (b), (c), (d), (e), (f)
	22	Guangxi	Normally	(a), (b), (c), (d), (e), (f)
	23	Liaoning	Normally	(a), (b), (c), (d), (e), (f)
	24	Shanghai	Normally	(a), (b), (c), (d), (e), (f)
	25	Tianjin	Normally	(a), (b), (c), (d), (e), (f)
	26	Jiangxi	Normally	(a), (b), (c), (d), (e), (f)
	27	Shaanxi	Normally	(a), (b), (c), (d), (e), (f)
	28	Shandong	Normally	(a), (b), (c), (d), (e), (f)
	29	Chongqing	Normally	(a), (b), (c), (d), (e), (f)
	30	Beijing	Normally	(a), (b), (c), (d), (e), (f)
	31	Zhejiang	Normally	(a), (b), (c), (d), (e), (f)
USA	01	Florida	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	02	California	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	03	Arizona	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	04	Texas	High temperature difference and high irradiation	(a), (b), (c), (d), (e), (f)
	05	Alaska	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)

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	06	Massachusetts	Normally	(a), (b), (c), (d), (e), (f)
	07	New Jersey	Normally	(a), (b), (c), (d), (e), (f)
	08	North Carolina	Normally	(a), (b), (c), (d), (e), (f)
	09	New Canaan	Normally	(a), (b), (c), (d), (e), (f)
	10	New York	Normally	(a), (b), (c), (d), (e), (f)
	11	Hawaii	High temperature and high humidity	(a), (b), (c), (d), (e), (f)
	12	Montana	Normally	(a), (b), (c), (d), (e), (f)
	13	Nebraska	Normally	(a), (b), (c), (d), (e), (f)
	14	Nevada	Normally	(a), (b), (c), (d), (e), (f)
	15	New Hampshire	Normally	(a), (b), (c), (d), (e), (f)
	16	New Mexico	Normally	(a), (b), (c), (d), (e), (f)
	17	North Dakota	Normally	(a), (b), (c), (d), (e), (f)
	18	Ohio	Normally	(a), (b), (c), (d), (e), (f)
	19	Oklahoma	Normally	(a), (b), (c), (d), (e), (f)
	20	Oregon	Normally	(a), (b), (c), (d), (e), (f)
	21	Pennsylvania	Normally	(a), (b), (c), (d), (e), (f)
	22	Rhode Island	Normally	(a), (b), (c), (d), (e), (f)
	23	South Dakota	Normally	(a), (b), (c), (d), (e), (f)
	24	Tennessee	Normally	(a), (b), (c), (d), (e), (f)
	25	Utah	Normally	(a), (b), (c), (d), (e), (f)
	26	Vermont	Normally	(a), (b), (c), (d), (e), (f)
	27	Virginia	Normally	(a), (b), (c), (d), (e), (f)
	28	Washington	Normally	(a), (b), (c), (d), (e), (f)
	29	West Virginia	Normally	(a), (b), (c), (d), (e), (f)
	30	Wisconsin	Normally	(a), (b), (c), (d), (e), (f)
	31	Wyoming	Normally	(a), (b), (c), (d), (e), (f)
	32	Alabama	Normally	(a), (b), (c), (d), (e), (f)
	33	Arkansas	Normally	(a), (b), (c), (d), (e), (f)
	34	Colorado	Normally	(a), (b), (c), (d), (e), (f)
	35	Connecticut	Normally	(a), (b), (c), (d), (e), (f)
	36	Delaware	Normally	(a), (b), (c), (d), (e), (f)
	37	Georgia state	Normally	(a), (b), (c), (d), (e), (f)

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	38	Idaho	Normally	(a), (b), (c), (d), (e), (f)
	39	Illinois	Normally	(a), (b), (c), (d), (e), (f)
	40	Indiana	Normally	(a), (b), (c), (d), (e), (f)
	41	Iowa	Normally	(a), (b), (c), (d), (e), (f)
	42	Kansas	Normally	(a), (b), (c), (d), (e), (f)
	43	Kentucky	Normally	(a), (b), (c), (d), (e), (f)
	44	Lousiana	Normally	(a), (b), (c), (d), (e), (f)
	45	Maine	Normally	(a), (b), (c), (d), (e), (f)
	46	Maryland	Normally	(a), (b), (c), (d), (e), (f)
	47	Michigan	Normally	(a), (b), (c), (d), (e), (f)
	48	Minnesota	Normally	(a), (b), (c), (d), (e), (f)
	49	Mississippi	Normally	(a), (b), (c), (d), (e), (f)
	50	Missouri	Normally	(a), (b), (c), (d), (e), (f)
Canada	01	Canada	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
Russia	01	Russia	Gelid (Low irradiation)	(a), (b), (c), (d), (e), (f)
Armenia	01	Yerevan	Normally	(a), (b), (c), (d), (e), (f)

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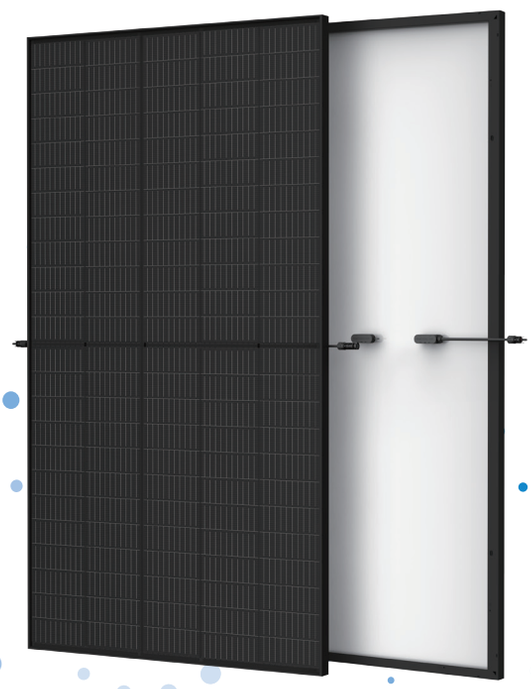
Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09.05

PRODUCT RANGE: 380-395W

395W+	0~+5W	20.5%
MAXIMUM POWER OUTPUT	POSITIVE POWER TOLERANCE	MAXIMUM EFFICIENCY



Outstanding Visual Appearance

- Designed with aesthetics in mind
- Excellent cell color control by dedicated cell blackening treatment and machine selection.
- Thinner wires that appear all black at a distance

Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space.
- Up to 395W, 20.5% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection
- Reduce installation cost with higher power bin and efficieny
- Boost performance in warm weather lower temperature coefficient (-0.34%) and operating temperature

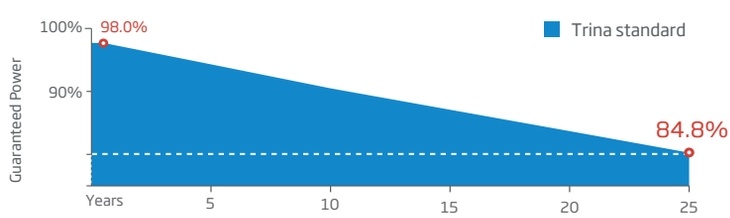
Universal solution for residential and C&I rooftops

- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment

High Reliability

- 15 year product warranty
- 25 year performance warranty with lowest degradation;
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Mechanical performance up to 6000 Pa positive load and 4000 Pa negative load

Trina Solar's Backsheet Performance Warranty



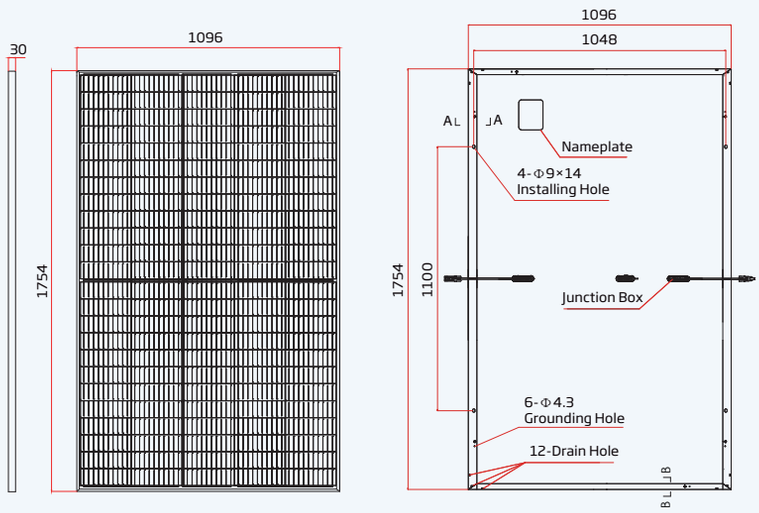
Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System

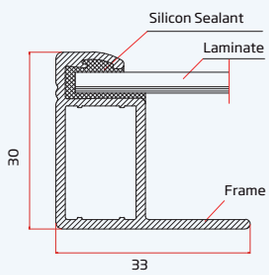
Trinasolar

Vertex S BACKSHEET MONOCRYSTALLINE MODULE

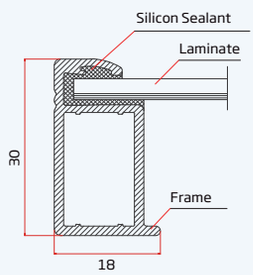
DIMENSIONS OF PV MODULE(mm)



Front View

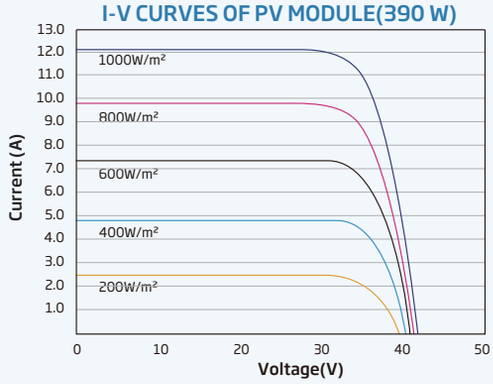


A-A

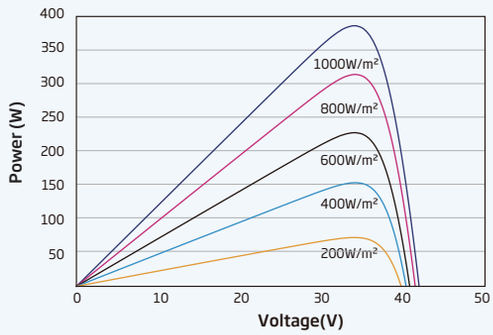


B-B

I-V CURVES OF PV MODULE(390 W)



P-V CURVES OF PV MODULE(390W)



ELECTRICAL DATA (STC)

Peak Power Watts-PMAX (Wp)*	380	385	390	395
Power Tolerance-PMAX (W)	0 ~ +5			
Maximum Power Voltage-VMPP (V)	33.4	33.6	33.8	34.0
Maximum Power Current-IMPP (A)	11.38	11.46	11.54	11.62
Open Circuit Voltage-VOC (V)	40.4	40.6	40.8	41.0
Short Circuit Current-ISC (A)	12.00	12.07	12.14	12.21
Module Efficiency η m (%)	19.8	20.0	20.3	20.5

STC: Irrdiance 1000W/m2, Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)

Maximum Power-PMAX (Wp)	286	290	294	298
Maximum Power Voltage-VMPP (V)	31.4	31.6	31.8	31.9
Maximum Power Current-IMPP (A)	9.12	9.18	9.24	9.32
Open Circuit Voltage-VOC (V)	38.0	38.2	38.4	38.6
Short Circuit Current-ISC (A)	9.67	9.73	9.78	9.84

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	120 cells
Module Dimensions	1754×1096×30 mm (69.06×43.15×1.18 inches)
Weight	21.0 kg (46.3 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Backsheet	Black-White
Frame	30mm(1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²), Portrait: 280/280 mm(11.02/11.02 inches) Landscape: 1100/1100 mm(43.31/43.31 inches)
Connector	MC4 EVO2 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of PMAX	- 0.34%/°C
Temperature Coefficient of VOC	- 0.25%/°C
Temperature Coefficient of ISC	0.04%/°C

MAXIMUMRATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

WARRANTY

15 year Product Workmanship Warranty

25 year Power Warranty

2% first year degradation

0.55% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGUREATION

Modules per box: 36 pieces

Modules per 40' container: 936 pieces

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

Version number: TSM_EN_2020_PA3

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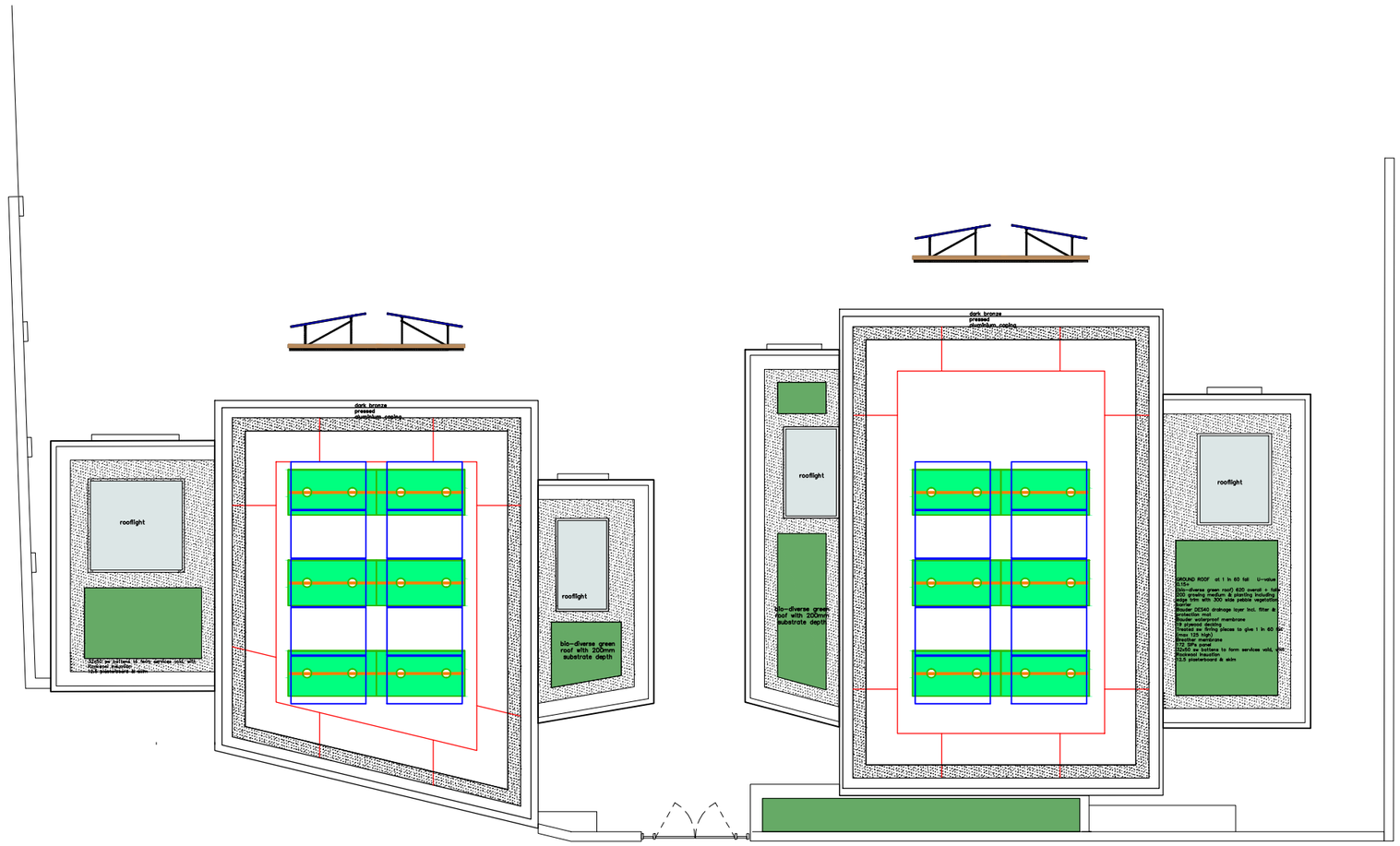

Bauder Bio Solar G2 Key:

= Solar Panel @ 10 Degrees.

= DSE40 Board - Shade Denotes Ballast Requiements.

= Base Rail (Long)

= Base Rail (Short)

Design Information - Bauder Bio Solar G2	
DSE40 Anchor Boards:	12
Module Rails:	8 (6.194m Lengths)
Base Rails Short:	0 (1.994m Lengths)
Base Rails Long:	6 (3.994m Lengths)
Type of Inverter:	SOL-3.6-MINI-5G x2
	N/A
Type of Optimizer:	N/A
Area of PV Panels:	38.44m2

Required Ballast in kg/m²

110

N

General Information	
Total power DC	7.60 kWp
BAUDER System type	Bauder Bio Solar G2
Module type	TSM-380-DE09-05 (380wp)
Module amount	20 Units
Azimuth	59 Degrees SE & 121 Degrees SW

This Layout is based on the given information. For a more detailed engineering, more information about the roof and nearby objects are necessary.

BAUDER Ltd.
70 Landseer Road
Ipswich, IP3 0DH
Tel.:+44 (0)1473 257671 Fax:+44 (0)1743 230761 Internet: www.bauder.co.uk

	Date	Name
Drawn	02.07.21	Darren Mitchell
Changed		
Checked		

Drawing No.:
B212673PV - 20210702

File Name: B212673PV - 20210702.dwg

Scale:

Client:
Square Feet Architects Ltd

Project:
Frognal, 25
London, NW3 6AR

Drawing Title: PV Layout Plan
PV Design Layout

Planning Period:

Format
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