Prüfbericht-Nr.: *Test Report No.*:	CN21W3HK 001	**Auftrags-Nr.:** *Order No.*:	244343127	Seite 1 von 34 *Page 1 of 34*
Kunden-Referenz-Nr.: *Client Reference No.*:	1344616	**Auftragsdatum:** *Order date*:	30.06.2021	
Auftraggeber: *Client*:	SolaX Power Network Technology (Zhe jiang) Co., Ltd. No.288 Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province, China.			
Prüfgegenstand: *Test item*:	Grid tied inverter with storage system			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	X3-Hybrid-x-y X3-Fit-v-z (x=5.0, 6.0, 8.0, 10.0, 12.0, 15.0; v=6.0, 8.0, 10.0, 15.0; y=D or M; z=M or W)			
Auftrags-Inhalt: *Order content*:	AK certificate			
Prüfgrundlage: *Test specification*:	PPDS:2020			

Wareneingangsdatum: *Date of receipt*:	01.12.2020
Prüfmuster-Nr.: *Test sample No.*:	A002973475 - 003
Prüfzeitraum: *Testing period*:	18.01.2021 – 22.01.2021
Ort der Prüfung: *Place of testing*:	TÜV Rheinland (Shanghai) Co., Ltd.
Prüflaboratorium: *Testing laboratory*:	TÜV Rheinland (Shanghai) Co., Ltd.
Prüfergebnis*: *Test result**:	Pass

geprüft von / *tested by*:

20.07.2021 Jingge Pan / PE

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*:

20.07.2021 Tobias Yang / Reviewer

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m test specification(s)		*F(ail) = failed a.m test specification(s)*	*N/A = not applicable*	*N/T = not tested*

V04

Produktbeschreibung
Product description

GENERAL INFORMATION:

Client/License holder: (name & address)	SolaX Power Network Technology (Zhe jiang) Co., Ltd./ No.288 Shizhu Road, Tonglu Economic Development Zone, Tonglu City, Zhejiang Province, China.
Manufacturer: (name & address)	Same as above
Factory(ies): (name & address)	Same as above

List of Appendix

- Appendix 1 – Marking plate
- Appendix 2 – General product information
- Appendix 3 – Photo documentation

GENERAL PRODUCT INFORMATION:

Product:	Grid tied inverter with storage system
Model/Type reference:	X3-Hybrid-x-y X3-Fit-v-z (x=5.0, 6.0, 8.0, 10.0, 12.0, 15.0; v=6.0, 8.0, 10.0, 15.0; y=D or M; z=M or W)
Trademark:	SOLAX POWER
Ratings:	See appendix 2
Protection Class:	I
Type of distribution network	Low-voltage (LV), three phase system
Type of power-generating plant	Non Small power-generating plant
Type of power-generating module	Type A

Copy of marking plate:
See Appendix 1

Model difference: (in case, series model used)
See Appendix 2

Produktbeschreibung
Product description

Summary of testing

Tests performed (name of test and test clause):

Testing location:

The laboratory described on page 2.

Clause in EN 50549-1:2019	Clause in PPDS:2020	Test description	Remark
☐ 4.4.2, 4.4.3, 4.4.4	9.1.1, 9.3.2	Normal operating range	1)
☐ 4.8	11.1	Voltage fluctuations	1)
☐ 4.8	11.1	Voltage fluctuations	1)
☐ 4.8	11.2	Harmonics current	1)
☐ 4.8	--	Harmonics, Inter-harmonics, and Higher frequency harmonics	1)
☐ 4.8	11.1	DC Injection	1)
☐ 4.8	10.2	Imbalance	1)
☐ 4.5.3, 4.5.4, 4.7.4	9.2.2	Fault Voltage-Ride Through	1)
☐ 4.6.1	9.3.1	Power response to over-frequency	1)
☐ 4.6.2	9.3.2	Power response to under-frequency	1)
☐ 4.7.2.2	9.2.1	Capabilities	1)
☐ 4.7.2.3.2	9.4.1	Setpoint control modes	1)
☒ 4.7.2.3.3	9.4.2	Voltage related control mode	See appendix
☐ 4.7.2.3.4	9.4.1	Power related control mode	1)
☐ 4.7.3	9.3.3	Voltage related active power reduction	1)
☒ 4.10	9.5	Connection and starting to generate electrical power	See appendix
☐ 4.11	9.3.4	Ceasing and reduction of active power on set point	1)
☐ 4.5.2	9.1.1	Rate of change of frequency immunity	1)
☒ 4.9.3 4.9.3.2, 4.9.3.3	8.1, 8.2	Requirements on voltage and frequency protection	See appendix
☐ 4.9.3.4	8.1, 8.2	Maximum voltage 10 min mean protection according to EN 50160	1)
☒ 4.9.3.5, 4.9.3.6	8.1, 8.2	Under/over frequency protection	See appendix
☐ 4.9.4	8	Means to detect island situation (According to IEC 62116: 2014)	1)
☐ 4.12	5.1	Remote information exchange (Remote control)	1)

Produktbeschreibung
Product description

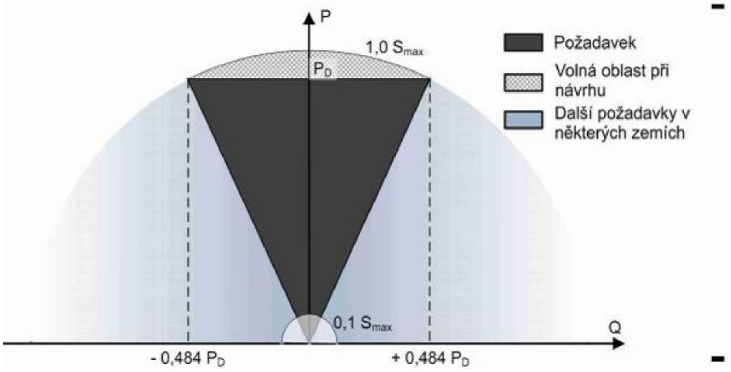
Remark:
Tested according to the requirements of type A generation units.
1) Measurement result refered to EN 50549-1 report, No. CN21ZTNH 001

<table>
<tr><td colspan="4">PPDS:2020</td></tr>
<tr><th>Clause</th><th>Requirement – Test</th><th>Result - Remark</th><th>Verdict</th></tr>
<tr><td>5</td><td>NETWORK CONNECTION</td><td></td><td>P</td></tr>
<tr><td>5.1</td><td>REMOTE CONTROL AND DATA EXCHANGE</td><td></td><td>P</td></tr>
<tr><td></td><td>For safe operation it is necessary:
a) Electricity generators with VM categories A1, A2 and B1 must be equipped with a logic interface (input port) according to Article 13.6 of the RfG so that it is possible to interrupt within 5 s of receiving an instruction on the input port (eg via HDO) supply of active power at the output.</td><td>Refer to EN 50549-1 report, No. CN21ZTNH 001</td><td>P</td></tr>
<tr><td>8</td><td>PROTECTION</td><td></td><td>P</td></tr>
<tr><td>8.1</td><td>MICRO RESOURCES</td><td></td><td>P</td></tr>
<tr><td></td><td>The following table applies to protections for plants with phase currents up to 16 A operated in parallel with the LV distribution network to which it applies.
<table>
<tr><th>Parameter</th><th>Maximum switch-off time [s]</th><th>Shutdown settings</th></tr>
<tr><td>overvoltage 1st degree (1)</td><td>3</td><td>230 V + 10 %</td></tr>
<tr><td>overvoltage 2nd degree</td><td>0,2 (1)</td><td>230 V + 15 %</td></tr>
<tr><td>overvoltage 3rd degree</td><td>0,1</td><td>230 V + 20%</td></tr>
<tr><td>undervoltage</td><td>1,5</td><td>230 V - 15 %</td></tr>
<tr><td>overfrequency</td><td>0,5</td><td>52 Hz</td></tr>
<tr><td>underfrequency</td><td>0,5</td><td>47,5 Hz</td></tr>
</table></td><td>See appendix for detail.</td><td>P</td></tr>
<tr><td>8.2</td><td>GENERAL ELECTRICITY WITH PHASE1TM CURRENT OVER 16 AND IN LV NETWORKS AND GENERATORS CONNECTED TO MV AND 110 KV NETWORKS (VM A2, B1, B2, C, D)</td><td></td><td>N/A</td></tr>
<tr><td></td><td>TAB. 5 Protection of production site with modules (VM (A2), B1, B2, C)
<table>
<tr><th>Function</th><th>Setting range</th><th colspan="2">Recommended protection settings</th></tr>
<tr><td>Overvoltage 3. Grade U >></td><td>1,00 – 1,30 Un</td><td>1,25 Un</td><td>0,1 s</td></tr>
<tr><td>Overvoltage 3. Grade U >></td><td>1,00 – 1,30 Un</td><td>1,2 Un</td><td>delay (5s)</td></tr>
<tr><td>Overvoltage 3. Grade U >></td><td>1,00 – 1,30 Un</td><td>1,15 Un (1)</td><td>≤ 60 s</td></tr>
<tr><td>Undervoltage 1st degree U <</td><td>0,10 – 1,00 Un</td><td>0,7 Un</td><td>0 – 2,7 s 1)</td></tr>
</table></td><td>Phase currents less than 16 A</td><td>N/A</td></tr>
</table>

Produktbeschreibung
Product description

	Undervoltage 1st degree U < | 0,10 – 1,00 Un | 0,3 Un (0,45 Un)(2) | ≥ 0,15 s Overfrequency f > | 50 – 52 Hz | 51,5 Hz | ≤ 100 ms Underfrequency f< | 47,5 – 50 Hz | 47,5 Hz (4) | ≤ 100 ms Reactive power / undervoltage (Q • & U <) | 0,70 – 1,00 Un | 0,85 Un | t1 = 0,5 s		
9	NETWORK BEHAVIOR		P
9.1	NORMAL OPERATING CONDITIONS		P
9.1.1	Operating frequency range of productions in low voltage, high voltage and 110 kv networks		P
	TAB.6 Operating frequency range of productions in low voltage, high voltage and 110 kV networks Frequency | Range duration 47 – 47,5 Hz | 20 s 47,5 – 48,5 Hz | 30 min* 48,5 – 49 Hz | 90 min* 49 – 51 Hz | neomezeně 51 – 51,5 Hz | 30 min Production modules A1, A2, B1, B2, C and D must not be disconnected in the event of a time change of the network frequency (RoCoF) up to +/- 2 Hz / s, where RoCoF is measured as the mean value of the frequency derivative in the time interval 500 ms (RfG Art. 13 1. b,) . TAB.6 also applies to plants up to 800 W, but RoCoF is not mandatory.	Refer to EN 50549-1 report, No. CN21ZTNH 001	P
9.1.2	Range of continuous operating voltage		P
9.1.2.1	Electricity generation connected to the low voltage network		P
	Electricity plants up to 800 W according to [20] and plants with VM A1, A2 must be able to operate continuously if the voltage at the connection point remains in the range Un -15% to Un + 10%. If the voltage is lower than Un, a reduction of the input power corresponding to the relative voltage change (Un-U) / Un is allowed.		P
9.1.2.2	Electricity generation connected to the HV and 110 kV network	Connected to the low voltage network	N/A
9.2	PRINCIPLES OF NETWORK SUPPORT		P
9.2.1	Static voltage control		P
9.2.1.1	Voltage support using reactive power sources in low voltage network		P
		Refer to EN 50549-1 report, No. CN21ZTNH 001	P

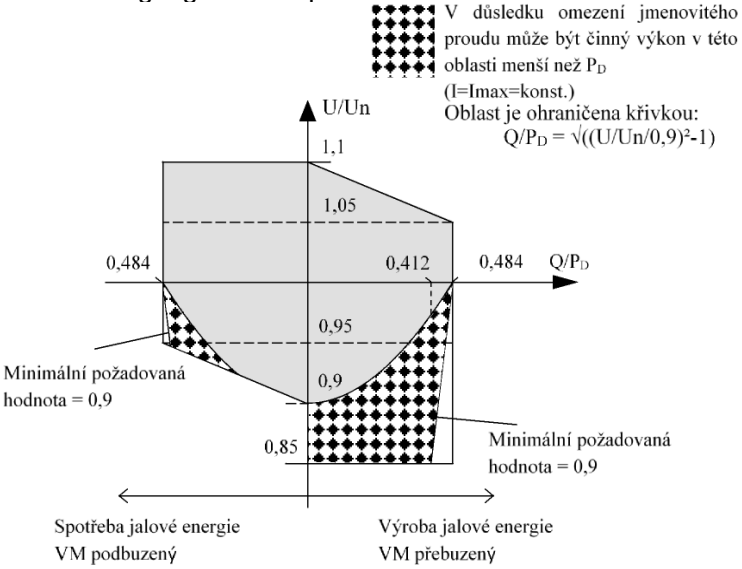
Produktbeschreibung
Product description



Giant. 1 Requirements for supply / consumption of reactive power at Un

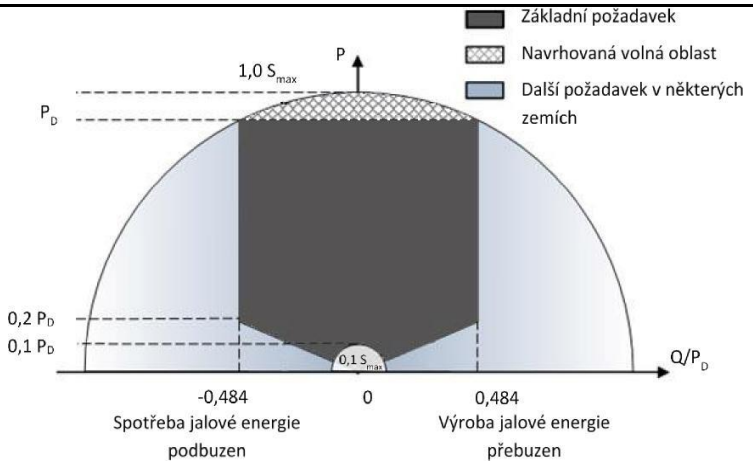
For plants up to 800 W according to [20], the power factor of the microgenerator under normal steady-state operating conditions in the prescribed tolerance range of the rated voltage must be higher than 0.95, provided that the input active in The power of the microgenerator is higher than 20% of the rated output power of the unit. An output power lower than 20% of the rated power of the microgenerator must not cause a reactive power greater than 10% of its rated active power.

For voltages other than the nominal one, but within the voltage range for continuous operation, the limits for the minimum requirements for the following Fig. 2 are kept.



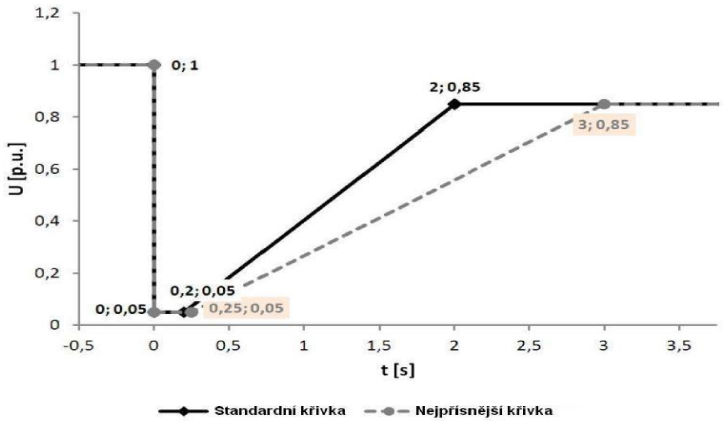
9.2.1.2	Voltage support using reactive power VM A2, B1, B2, C and D		P
			P

Produktbeschreibung
Product description



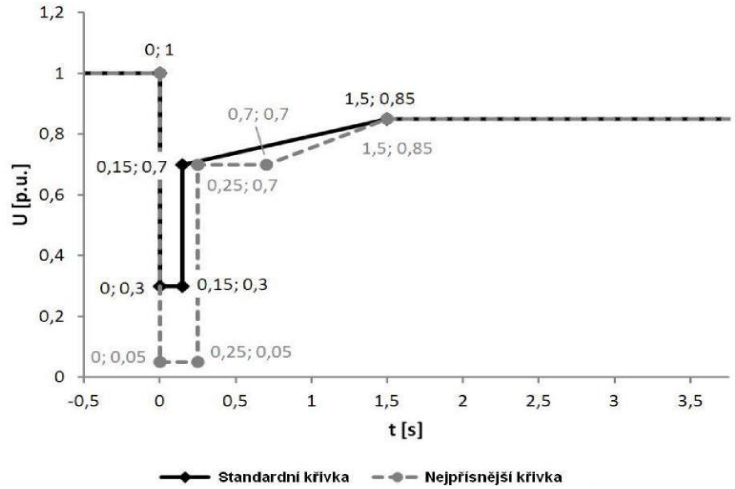
Giant. 3 Reactive power VM A2, B1, B2 and C at rated voltage

9.2.2	Dynamic network support		P
9.2.2.1	Low voltage ride through (LVRT) fault bridging		P



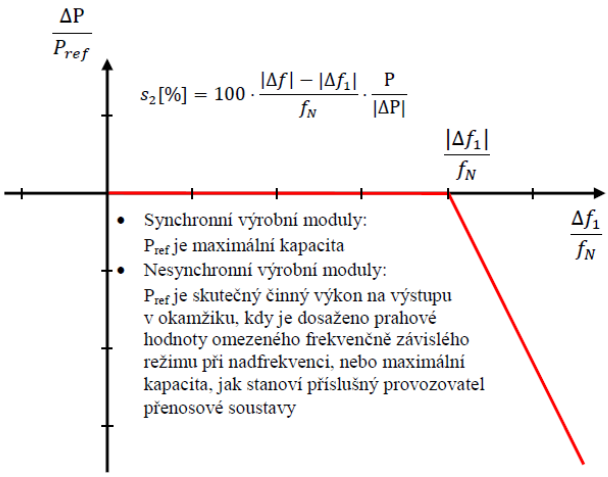
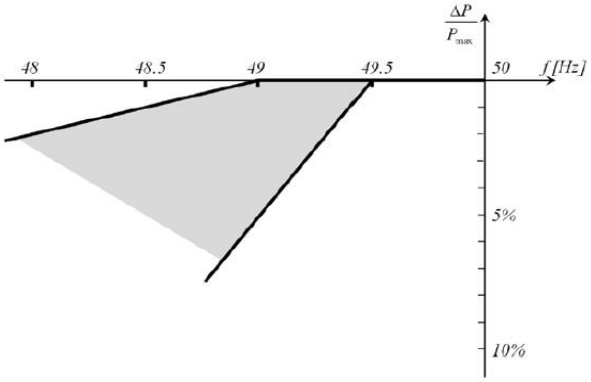
Refer to EN 50549-1 report, No. CN21ZTNH 001

Giant. 7 Fault bridging capability for factory with inverter at the output Directly connected factory

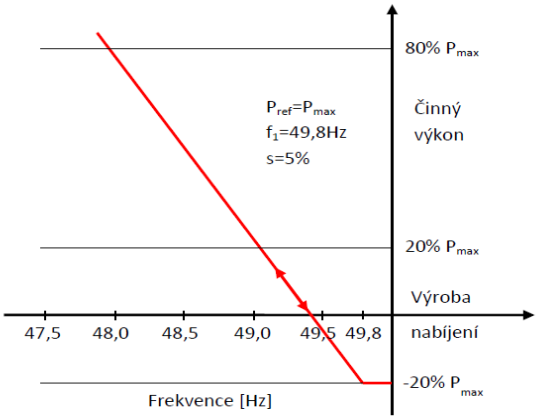
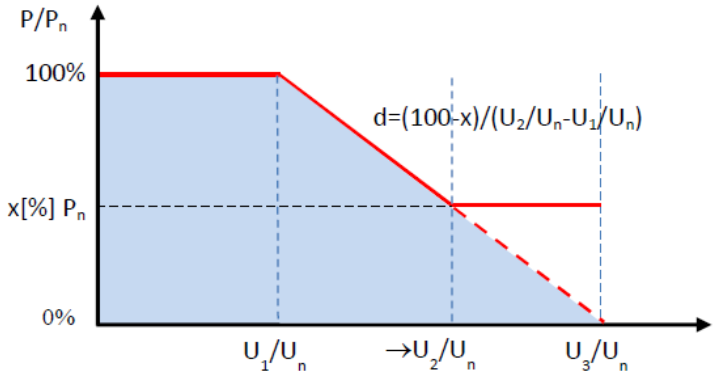


Giant. 8 - Ability to bridge the fault of directly connected generators

Produktbeschreibung
Product description

9.2.2.2	Short-circuit overvoltage fault bridging (HVRT)		P
9.2.2.3	Short-circuit current requirements for asynchronous VMs		P
9.3	ADJUSTMENT OF ACTIVE PERFORMANCE		P
9.3.1	Reduction of a single voltage at overfrequency		P
	 Giant. 10 Frequency response capability of active power for production modules in limited frequency-dependent mode at overfrequency The frequency threshold must be between 50.2 Hz and 50.5 Hz; The statics setting must be between 2% and 12%; Default threshold frequency v (R is 50.2 Hz, statics s2 = 5%)	Refer to EN 50549-1 report, No. CN21ZTNH 001	P
9.3.2	Reduction of active power at underfrequency		P
	 Giant. 11 Maximum reduction of active power with decreasing frequency	Refer to EN 50549-1 report, No. CN21ZTNH 001	P
9.3.2.1	Frequency response of the active power of the storage device at underfrequency		P
	The active power response to the underfrequency must be provided at a programmable frequency range, at least between 49.8 and 49.5 inclusive, with a programmable statics in the range of at least 2% to 12%. The reference power Pref is Pmax. The production module must be able to activate the frequency response of the active power at the underfrequency as fast as technically possible with its own delay up to 2 s and a response of a maximum of 30 s. The additional delay must be programmable to set the delay to a value between	Refer to EN 50549-1 report, No. CN21ZTNH 001	P

Produktbeschreibung
Product description

	internal delay and 2 s. After activation, the active power frequency response must use the current frequency value and respond to its increase or decrease according to the programmed statics with an accuracy of ± 10% of the rated power. Frequency measurement inaccuracy must be up to +/- 10 mHz.  Giant. 12 Frequency response of the active power to the underfrequency of the storage device.		
9.3.2.2	Voltage-dependent reduction of active power - function P (U)		P
	 Giant. 13 Characteristics of the P (U) function	Refer to EN 50549-1 report, No. CN21ZTNH 001	P
9.3.4	Control of active power depending on operating conditions		P
	The permissible deviation of the actual active power from the required value is ± 5%. Minimum and maximum limits on the rate of change of active power According to Art. 15.6e) RfG, production modules must be able to increase the power with a gradient of at least 2% Pn / min, but not faster than 40% Pn / min. Production modules must be able to reduce power with a gradient of at least -2% Pn / min, but not faster than -40% Pn / min.	Refer to EN 50549-1 report, No. CN21ZTNH 001	P
9.4	REACTIVE POWER MANAGEMENT DEPENDING ON OPERATING CONDITIONS		P
9.4.1	Methods of reactive power control		P
	The reactive power of the factory must be controllable from the	Refer to EN	P

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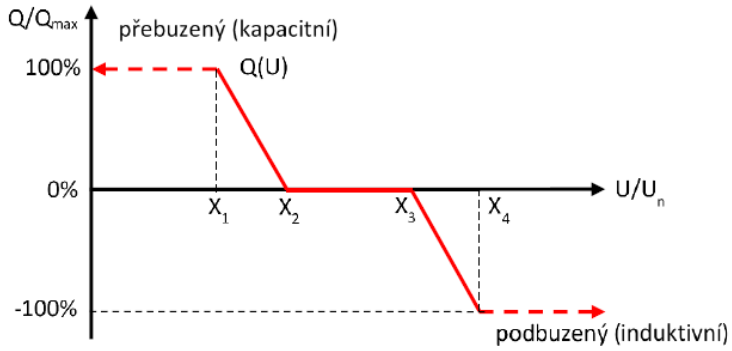
	installed power of 100 kVA. Reactive power control in the power factor range between 0.90 capacitive and 0.90 inductive is part of maintaining power quality and must be usable at any time. Reactive power management outside the specified power factor range of the factory may be contractually agreed with the manufacturer within the provision of the DSO support service. • To characterize cos q = f (P) 10 s • For the characteristic Q (U) is adjustable between 10 seconds and one minute (grasses PDS) Nonsynchronous modules B2, C and D must under Art 21 RFG. 3d) execute the change of reactive v'konu to 90% of the desired value without a delay, but no later than t1 = 4s by standardizing parameters in definovan'ch RFG Article 21, paragraph 3 d) to t2 = 30s. Like voted 'governance, as well as setpoint entered PDS to the needs of network traffic for each individual v'robnu electricity. When entering, the DSO is also based on the technical possibilities of the given factory. Entering b't can either: · Agreement on the value or the schedule or · On-line entering	50549-1 report, No. CN21ZTNH 001	
9.4.2	Voltage-dependent reactive power - Q (U) function		P
	X1=0,94:1; X2=0,97:0; X3=1,05:0; X4=1,08:-1  Giant. 14 Characteristics of the Q (U) function After a step change in voltage, the asynchronous generation module must be able to achieve 90% of the change in reactive power at the input by time t1, determined by the relevant system operator within 1 to 5 seconds, and must stabilize at the value specified by means of a slope up to time t2 set by the relevant system operator in the range of 5 to 60 seconds with a permissible deviation of the steady-state reactive power of not more than 5% of the maximum reactive power. The time values are set by the relevant system operator.	See appendix for detail.	
9.5	AUTOMATIC RECONNECTION OF FACTORIES		P
	1. Voltage and frequency are for 300 sec (5 min) within a. Voltage - 85 - 110% of nominal value b. Frequency - 47.5 - 50.05 Hz 2. - Gradual approach to power from zero with a gradient of maximum 10% Pn per minute	See appendix for detail.	P
10	CONDITIONS FOR CONNECTION		P
10.1	INCREASE IN VOLTAGE		P

Produktbeschreibung
Product description

<table>
<tr><td>10.2</td><td>VOLTAGE UNSYMMETRY IN LV NETWORKS</td><td></td><td>P</td></tr>
<tr><td></td><td>Single-phase plants (especially photovoltaics) affect the symmetry of (phase) voltages similarly to single-phase loads. PNE 33 3430-0 sets the permissible limit value of the voltage of the return component du2 ≤ 0.7% of the nominal voltage of the low-voltage network for individual samples. According to ČSN EN 50160 Ed.3 [3], the total permissible value of voltage asymmetry in the LV network is up to 2%.</td><td></td><td>P</td></tr>
<tr><td>11</td><td>RETURN EFFECTS ON THE POWER SUPPLY</td><td></td><td>P</td></tr>
<tr><td>11.1</td><td>VOLTAGE CHANGE</td><td></td><td>P</td></tr>
<tr><td></td><td>AU voltage change <3% Un (for common supply point in LV network)
AU <2% Un (for common supply point in MV and 110 kV network - see also section 10).
Flicker
LONG-TERM FLICKER
In order to assess one or more plants in one transfer point, it is necessary to observe the limit value in the common supply point nn and vn with regard to the fluctuations of the voltage causing flicker
Plt 0.46.
at the common supply point 110 kV limit value
Plt 0.37.</td><td>Refer to EN 50549-1 report, No. CN21ZTNH 001</td><td></td></tr>
<tr><td>11.2</td><td>HARMONIC CURRENTS</td><td></td><td>P</td></tr>
<tr><td>11.2.1</td><td>Production plants in low voltage network</td><td></td><td>P</td></tr>
<tr><td></td><td>
<table>
<tr><th>Rád harmonických ν, μ</th><th>Přípustný vztažný proud $i_{\nu,\mu}$ [A/MVA]</th></tr>
<tr><td>3</td><td>3</td></tr>
<tr><td>5</td><td>1,5</td></tr>
<tr><td>7</td><td>1</td></tr>
<tr><td>9</td><td>0,7</td></tr>
<tr><td>11</td><td>0,5</td></tr>
<tr><td>13</td><td>0,4</td></tr>
<tr><td>17</td><td>0,3</td></tr>
<tr><td>19</td><td>0,25</td></tr>
<tr><td>23</td><td>0,2</td></tr>
<tr><td>25</td><td>0,15</td></tr>
<tr><td>25 < ν < 40</td><td>0,15 · 25/ν</td></tr>
<tr><td>μ < 40[a]</td><td>0,15 · 25/ν</td></tr>
<tr><td>sudé</td><td>1,5/ν</td></tr>
<tr><td>μ < 40</td><td>1,5/ν</td></tr>
<tr><td>42 <μ, ν < 178[b]</td><td>4,5/ν</td></tr>
<tr><td colspan="2">a liché.
b Celočíselné a neceločíselné v pásmu šířky 200 Hz od střední frekvence υ
Měření podle ČSN EN 61000-4-7</td></tr>
</table>
TAB. 11 Permissible reference current of harmonic sources in the LV network</td><td>Refer to EN 50549-1 report, No. CN21ZTNH 001</td><td>P</td></tr>
<tr><td>11.2.2</td><td>Production in the MV network</td><td></td><td>N/A</td></tr>
<tr><td></td><td></td><td>LV network</td><td>N/A</td></tr>
</table>

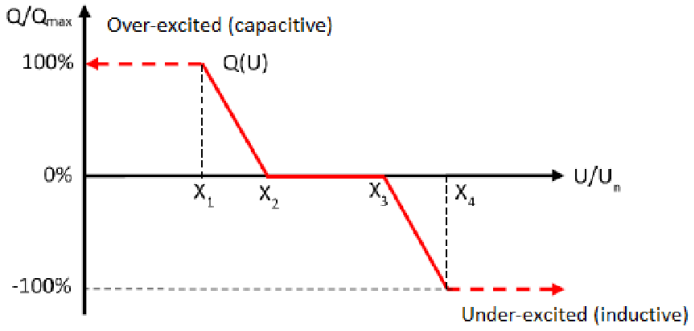
Produktbeschreibung
Product description

	<table><tr><th rowspan="2">Řád harmonické μ,ν</th><th colspan="3">Přípustný vztažný proud harmonických $i_{\mu,\nu př}$ [A/MVA]</th></tr><tr><th>síť 10 kV</th><th>síť 22 kV</th><th>síť 35 kV</th></tr><tr><td>5</td><td>0,115</td><td>0,058</td><td>0,033</td></tr><tr><td>7</td><td>0,082</td><td>0,041</td><td>0,023</td></tr><tr><td>11</td><td>0,052</td><td>0,026</td><td>0,015</td></tr><tr><td>13</td><td>0,038</td><td>0,019</td><td>0,011</td></tr><tr><td>17</td><td>0,022</td><td>0,011</td><td>0,006</td></tr><tr><td>19</td><td>0,016</td><td>0,009</td><td>0,005</td></tr><tr><td>23</td><td>0,012</td><td>0,006</td><td>0,003</td></tr><tr><td>25</td><td>0,01</td><td>0,005</td><td>0,003</td></tr><tr><td>>25 nebo sudé</td><td>0,06/ν</td><td>0,03/ν</td><td>0,017/ν</td></tr><tr><td>μ < 40</td><td>0,06/μ</td><td>0,03/μ</td><td>0,017/μ</td></tr><tr><td>μ > 40</td><td>0,16/μ</td><td>0,09/μ</td><td>0,046/μ</td></tr></table> TAB. 12 Permissible reference current of harmonic sources in the MV network		
11.2.3	Production plants in the 110 kV network		N/A
	<table><tr><th>Řád ν,μ</th><th>Přípustný vztažný proud harmonických $i_{\nu,\mu zul}$ v A/GVA</th></tr><tr><td>5</td><td>2,6</td></tr><tr><td>7</td><td>3,75</td></tr><tr><td>11</td><td>2,4</td></tr><tr><td>13</td><td>1,6</td></tr><tr><td>17</td><td>0,92</td></tr><tr><td>19</td><td>0,70</td></tr><tr><td>23</td><td>0,46</td></tr><tr><td>25</td><td>0,32</td></tr><tr><td>> 25 nebo sudé</td><td>5,25 /ν</td></tr><tr><td>μ < 40</td><td>5,25 / μ</td></tr><tr><td>μ > 40[10]</td><td>16 /μ</td></tr></table> **TAB. 13** Přípustný vztažný proud harmonických zdroj' v síti 110 kV	LV network	N/A

Produktbeschreibung
Product description

Measurement result

4.7.2.3.3	TABLE: Voltage related control mode (Q(U) curve)	P



Q(U) curve settings:	Set point	X_1	X_2	X_3	X_4
	U/U_n	94%	97%	105%	108%
	Q	100%Q_{max}	0	0	-100%Q_{max}

Test procedure for accuracy					
Q(U) curve settings:	Set points	X1	X2	X3	X4
	U/Un	94%	97%	105%	108%
	Q/Pn*	43.6%	0	0	-43.6%

Test Conditions		Measurements		Target Value	Δ	Δ Limits
U/Un	P/Pn	Q/Pmax	U/Un	Q/Pmax	ΔQ/Qmax	ΔQ/Qmax
104%	50%	1.20%	104.2%	0%	0.32%	≤ ±5%
106%	50%	-14.75%	105.9%	-14.5%	1.03%	
107%	50%	-29.36%	106.9%	-29.1%	1.80%	
108%	50%	-43.53%	108.2%	-43.6%	0.61%	
109%	50%	-43.52%	109.2%	-43.6%	0.63%	
104%	50%	1.21%	104.2%	0%	0.25%	

Test Conditions		Measurements		Target Value	Δ	Δ Limits
U/Un	P/Pn	Q/Pmax	U/Un	Q/Pmax	ΔQ/Qmax	ΔQ/Qmax
98%	50%	1.21%	98%	0%	0.00%	≤ ±5%
96%	50%	14.55%	96%	14.5%	0.00%	
95%	50%	28.45%	95%	29.1%	0.00%	
94%	50%	43.76%	94%	43.6%	0.00%	

Produktbeschreibung
Product description

93%	50%	43.90%	93%	43.6%	0.00%	
98%	50%	1.20%	98%	0%	0.00%	

4.9	**TABLE: Interface protection (For type A and type B)**	
4.9.3	**Requirements on voltage and frequency protection**	**P**

4.9.3.2, 4.9.3.3	TABLE: Under/over voltage protection (OV/UV)				P
Condition	Setting	Measurement			Limitation
		Trip value [V]			
		L1	L2	L3	
U>>	120%Un	275.8	276.8	276.0	± 1% of U_n
		276.2	276.9	276.0	
		276.3	276.8	276.0	
U>	115%Un	264. 5	264.2	263.3	
		264. 5	264.5	264.4	
		264. 4	264.2	264.5	
U<	85%Un	195. 4	195. 4	195. 3	
		195. 5	195. 3	195. 2	
		195. 5	185. 5	195. 3	
Condition	Setting [ms]	Measurement			Limitation
		Trip time			
		L1	L2	L3	
U>>	100	82.0	83. 0	80. 0	100
		81.0	82. 4	78. 4	
		80.0	80. 0	77. 6	
U>	1000	194. 0	196. 0	196. 0	1000
		198. 0	194. 0	194. 0	
		197. 0	193. 0	195. 0	
U<	1500	1478. 0	1496. 0	1470. 0	1500
		1482. 0	1494. 0	1466. 0	
		1486. 0	1492. 0	1486. 0	
Note(s):					

Produktbeschreibung
Product description

4.9.3.5, 4.9.3.6	TABLE: Under/over frequency protection (OF/UF)		P
Condition	Setting	Measurement	Limitation
		Trip value [Hz]	
F>	52.0Hz	52.00	
		52.00	
		52.00	
F<	47.5Hz	47.50	
		47.50	
		47.50	
Condition	Setting [ms]	Measurement	Limitation
		Trip time	
F>	500	470.0	500
		468.0	
		472.0	
F<	500	482.0	500
		476.0	
		474.0	
Note(s):			

4.10	**TABLE: Connection and starting to generate electrical power**						P
Test:							
Test condition					**Connect / Reconnection Time [s]**	**Active power increase gradient [%P_n/min.]**	**Acceptability criteria**
U/U_n [V]	**Limit [V]**	**f [Hz]**	**Limits [Hz]**	**Input P [%]**			
Start-up for UV:							
83%	U < 85%	50.0	47.5 Hz < f < 50.05 Hz	100%	No connection	--	No connection
87%	85% <U< 110%	50.0	47.5 Hz < f < 50.05 Hz	100%	325. 0	--	Delay for connection ≥ 300 s; Gradient: No requires.
78%	U<UV1	50.0	47.5 Hz < f < 50.05 Hz	Disconnect			
Re-connected for UV:							
83%	U < 85%	50.0	47.5 Hz < f < 50.05 Hz	100%	No reconnection	--	No connection

Produktbeschreibung
Product description

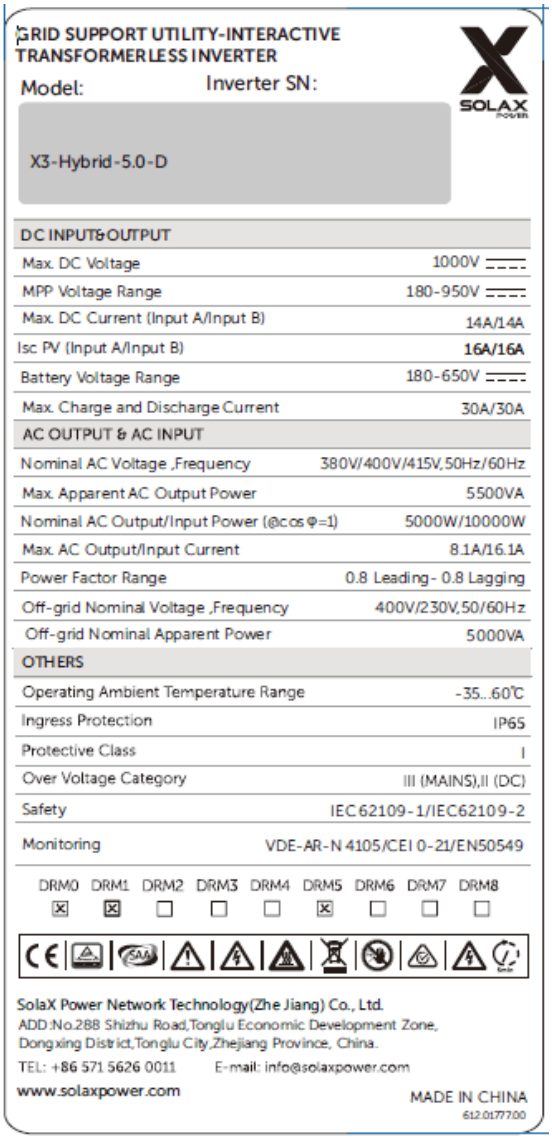
87%	85% <U< 110%	50.0	47.5 Hz < f < 50.05 Hz	100%	310. 0	8. 71	Delay for reconnection ≥ 300 s; Gradient:10%P_n/min.
Start-up for OV:							
112%	U>110 %	50.0	47.5 Hz < f < 50.05 Hz	100%	No connection	--	No connection
108%	85% <U< 110%	50.0	47.5 Hz < f < 50.05 Hz	100%	312. 0	--	Delay for connection ≥ 300 s; Gradient: No requires.
117%	U>OV1	50.0	47.5 Hz < f < 50.05 Hz	Disconnect			
Re-connected for OV:							
112%	U>110 %	50.0	47.5 Hz < f < 50.05 Hz	100 %	No reconnection	--	No connection
108%	85% <U< 110%	50.0	47.5 Hz < f < 50.05 Hz	100 %	310. 0	8. 88	Delay for reconnection ≥ 300 s; Gradient:10%P_{max}/min.
Start-up for UF:							
100%	85% <U< 110%	47.4	f < 47.5Hz	100 %	No connection	--	No connection
100%	85% <U< 110%	47.6	47.5 Hz < f < 50.05 Hz	100 %	302. 5	--	Delay for connection ≥ 300 s; Gradient: No requires.
100%	85% <U< 110%	47.3	f < UF	Disconnect			
Re-connected for UF:							
100%	85% <U< 110%	47.4	f < 47.5Hz	100 %	No reconnection	--	No connection
100%	85% <U< 110%	47.6	47.5 Hz < f < 50.05 Hz	100 %	305. 0	9. 08	Delay for reconnection ≥ 300 s; Gradient:10%P_{max}/min.
Start-up for OF:							
100%	85% <U< 110%	50.1	f > 50.05Hz	100 %	No connection	--	No connection
100%	85% <U<	50.0	47.5 Hz < f <	100 %	318.4	--	Delay for connection ≥ 300 s;

	110%		50.05 Hz				Gradient: No requires.
100%	85% <U< 110%	52.5	f > 52.0Hz	Disconnect			
Re-connected for OF:							
100%	85% <U< 110%	50.1	f > 50.05Hz	100 %	No reconnection	--	No connection
100%	85% <U< 110%	50.0	47.5 Hz < f < 50.05 Hz	100 %	310. 0	8. 89	Delay for reconnection ≥ 300 s; Gradient:10%P_{max}/min.

--End of Test Report--

Produktbeschreibung
Product description

Appendix 1 – Marking plate



GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Hybrid-5.0-D

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	14A/14A
Isc PV (Input A/Input B)	16A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	5500VA
Nominal AC Output/Input Power (@cosΦ=1)	5000W/10000W
Max. AC Output/Input Current	8.1A/16.1A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	5000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
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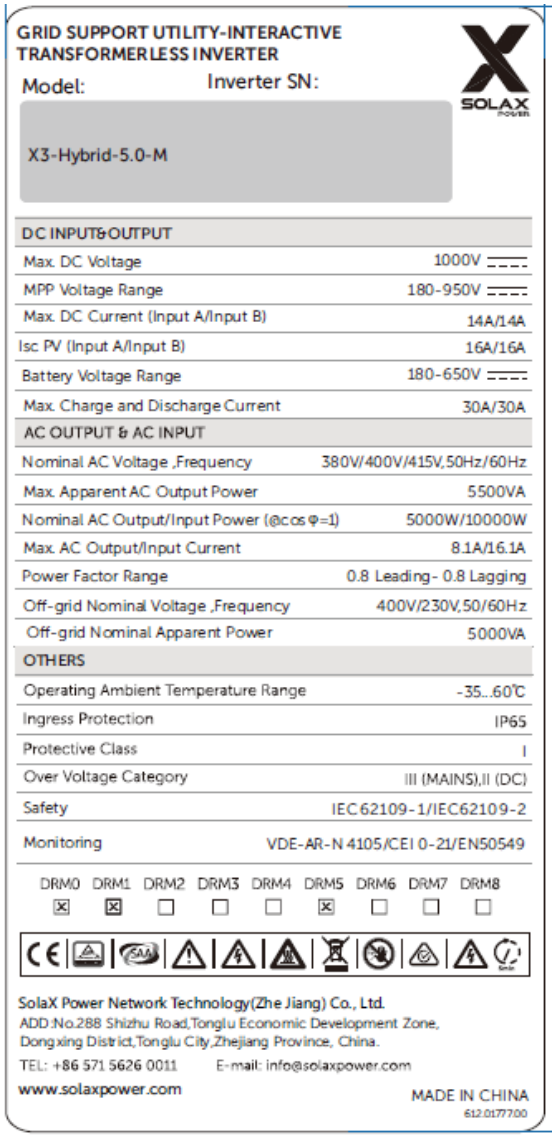

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Hybrid-5.0-M

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	14A/14A
Isc PV (Input A/Input B)	16A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	5500VA
Nominal AC Output/Input Power (@cosΦ=1)	5000W/10000W
Max. AC Output/Input Current	8.1A/16.1A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	5000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
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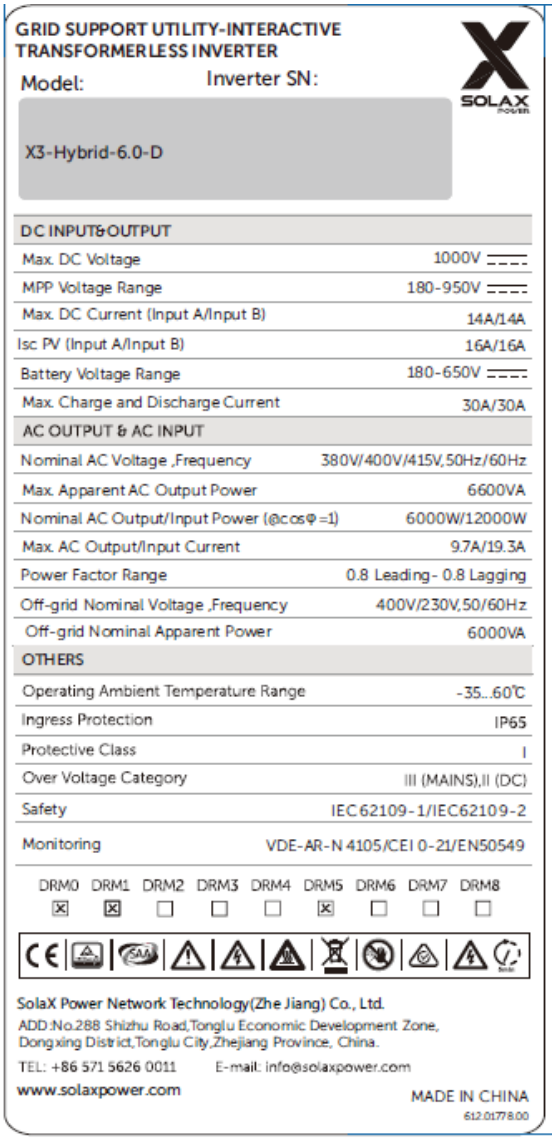
Product description



GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-6.0-D

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	14A/14A
Isc PV (Input A/Input B)	16A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	6600VA
Nominal AC Output/Input Power (@cosΦ=1)	6000W/12000W
Max. AC Output/Input Current	9.7A/19.3A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	6000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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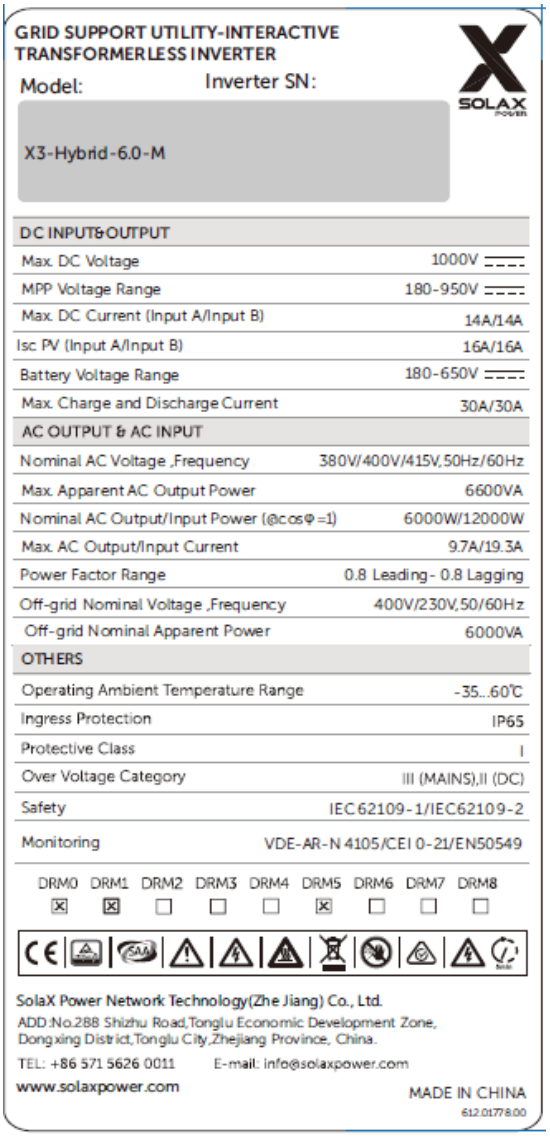

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-6.0-M

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	14A/14A
Isc PV (Input A/Input B)	16A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	6600VA
Nominal AC Output/Input Power (@cosΦ=1)	6000W/12000W
Max. AC Output/Input Current	9.7A/19.3A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	6000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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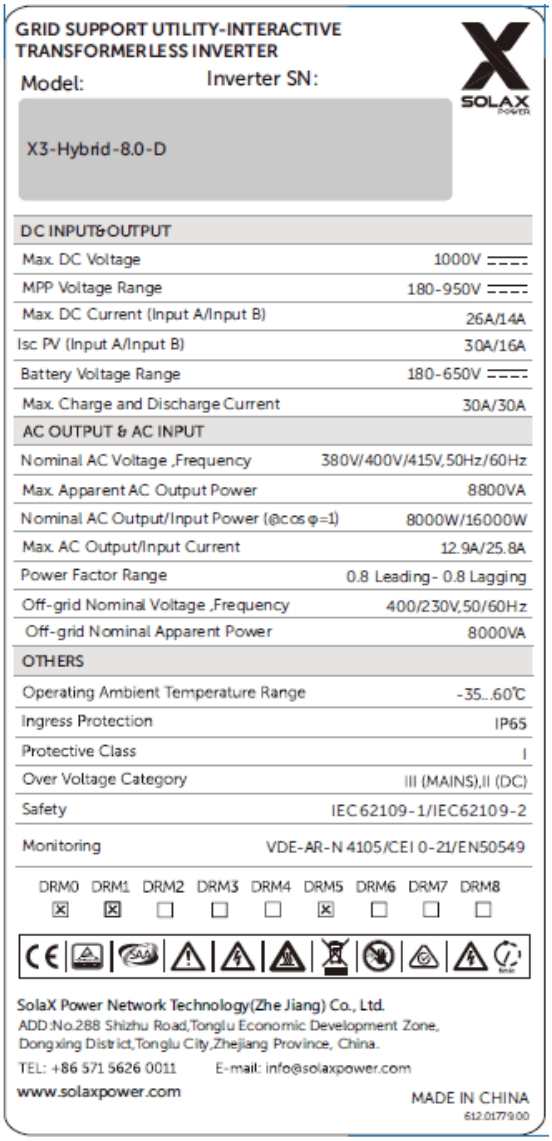
Produktbeschreibung
Product description



GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-8.0-D

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	8800VA
Nominal AC Output/Input Power (@cosφ=1)	8000W/16000W
Max. AC Output/Input Current	12.9A/25.8A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	8000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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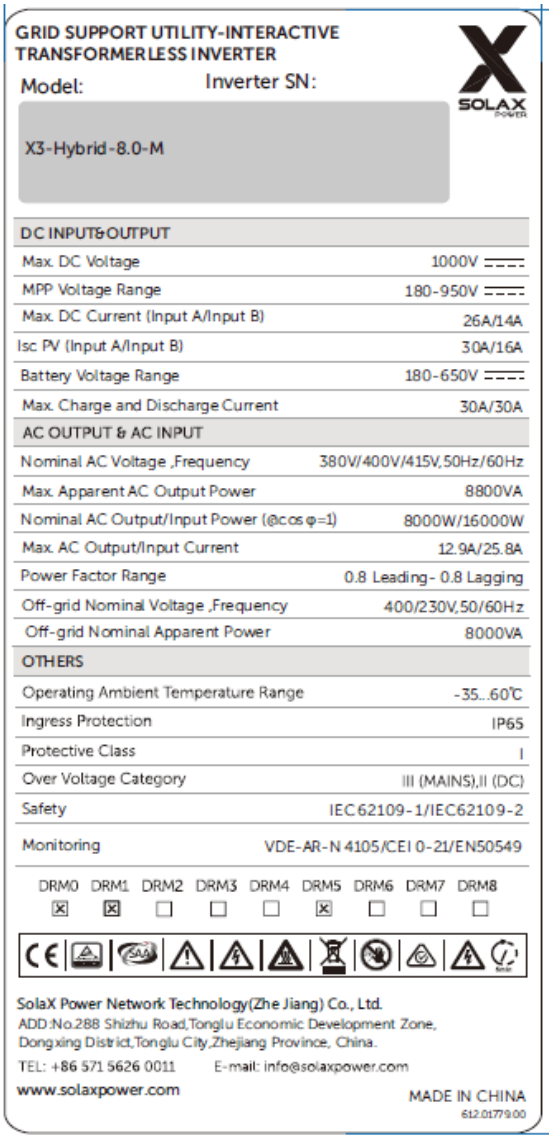

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-8.0-M

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	8800VA
Nominal AC Output/Input Power (@cosφ=1)	8000W/16000W
Max. AC Output/Input Current	12.9A/25.8A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	8000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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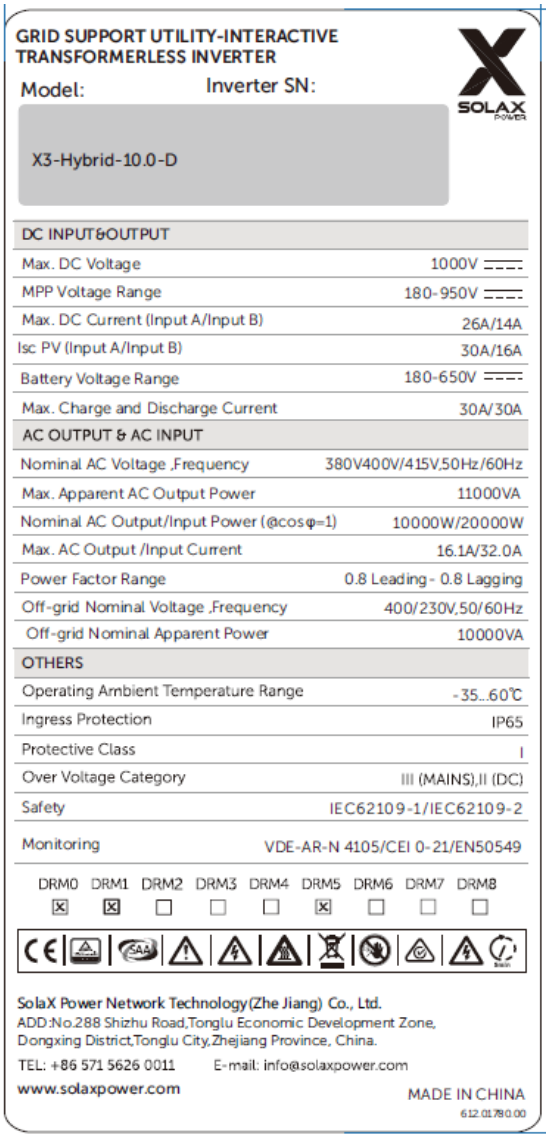
Produktbeschreibung
Product description



GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-10.0-D

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	11000VA
Nominal AC Output/Input Power (@cosφ=1)	10000W/20000W
Max. AC Output /Input Current	16.1A/32.0A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	10000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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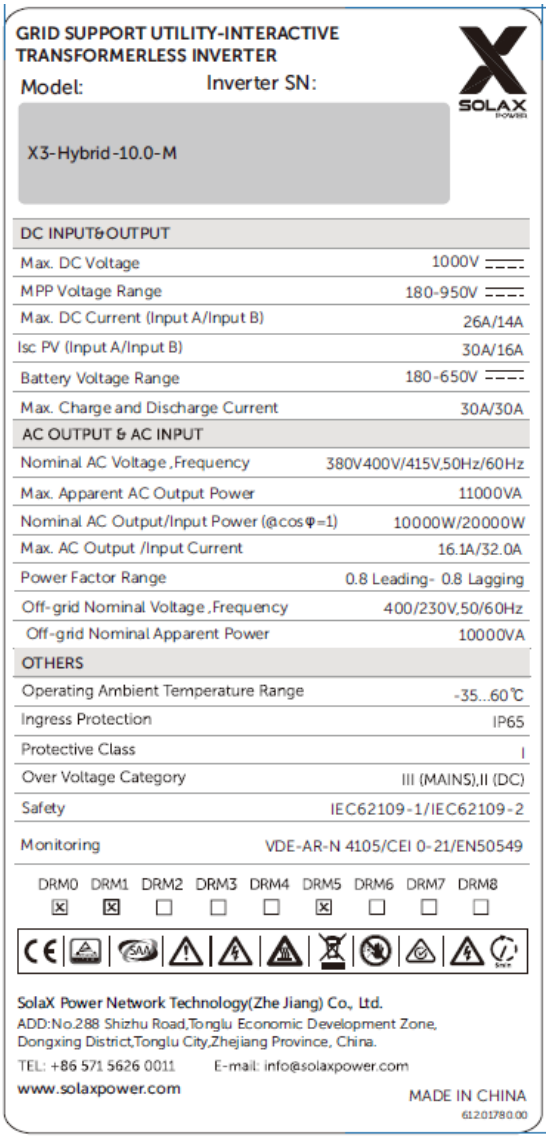

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-10.0-M

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	11000VA
Nominal AC Output/Input Power (@cosΦ=1)	10000W/20000W
Max. AC Output /Input Current	16.1A/32.0A
Power Factor Range	0.8 Leading - 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	10000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

SolaX Power Network Technology(Zhe Jiang) Co., Ltd.
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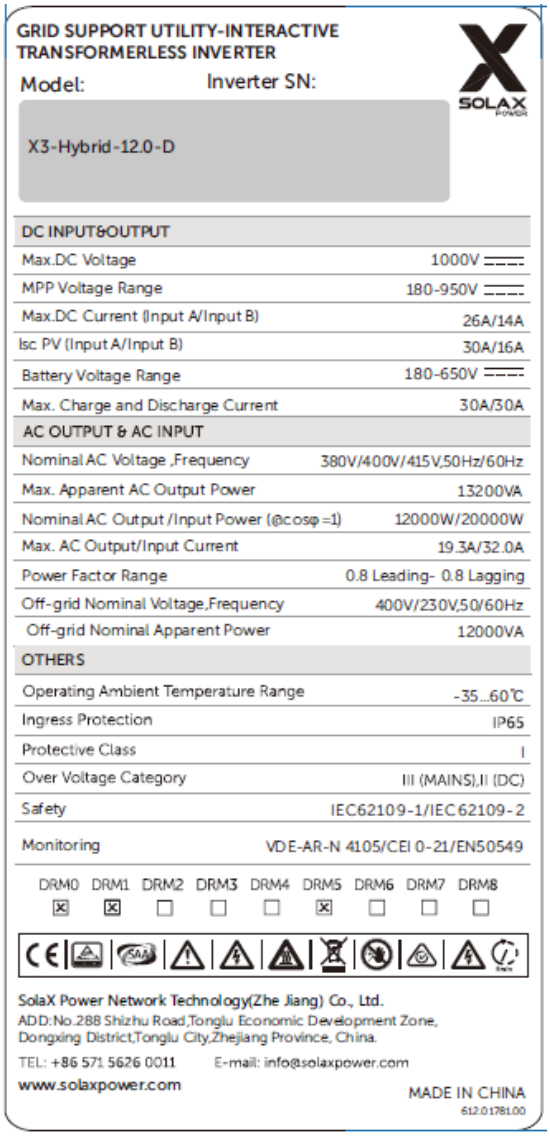
Produktbeschreibung
Product description



GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-12.0-D

DC INPUT&OUTPUT	
Max.DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max.DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	13200VA
Nominal AC Output /Input Power (@cosφ =1)	12000W/20000W
Max. AC Output/Input Current	19.3A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	12000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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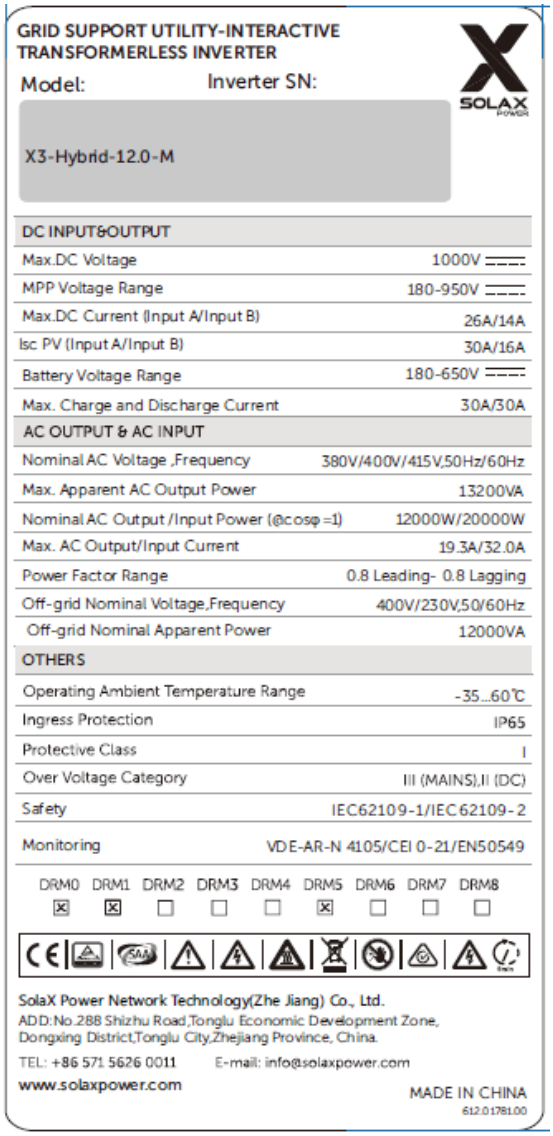

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-12.0-M

DC INPUT&OUTPUT	
Max.DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max.DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	13200VA
Nominal AC Output /Input Power (@cosφ =1)	12000W/20000W
Max. AC Output/Input Current	19.3A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	12000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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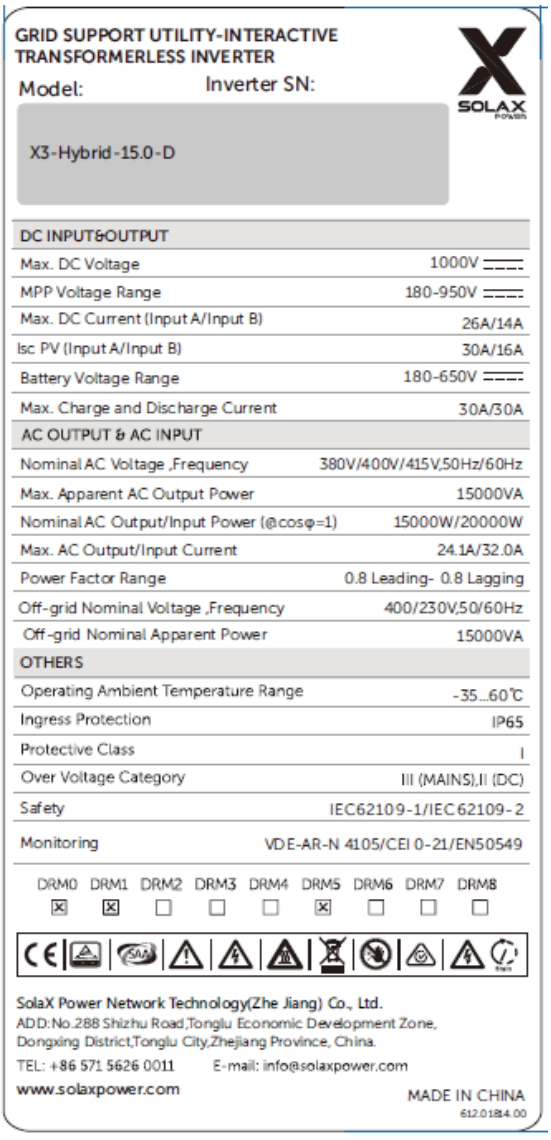
Produktbeschreibung
Product description



GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-15.0-D

SOLAX POWER

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	15000VA
Nominal AC Output/Input Power (@cosφ=1)	15000W/20000W
Max. AC Output/Input Current	24.1A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	15000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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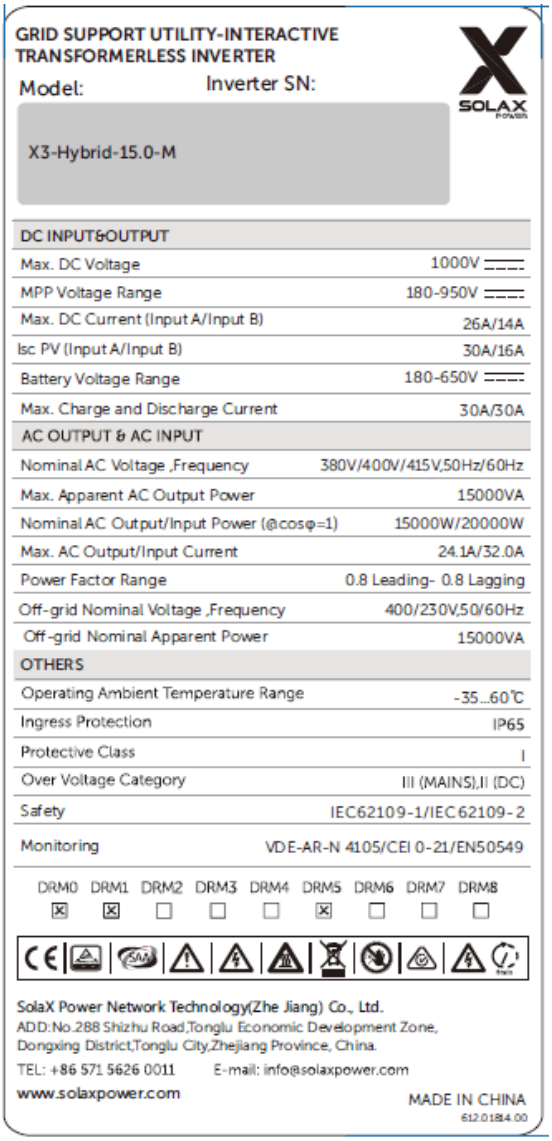

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: Inverter SN:

X3-Hybrid-15.0-M

SOLAX POWER

DC INPUT&OUTPUT	
Max. DC Voltage	1000V ⎓
MPP Voltage Range	180-950V ⎓
Max. DC Current (Input A/Input B)	26A/14A
Isc PV (Input A/Input B)	30A/16A
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	15000VA
Nominal AC Output/Input Power (@cosφ=1)	15000W/20000W
Max. AC Output/Input Current	24.1A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	15000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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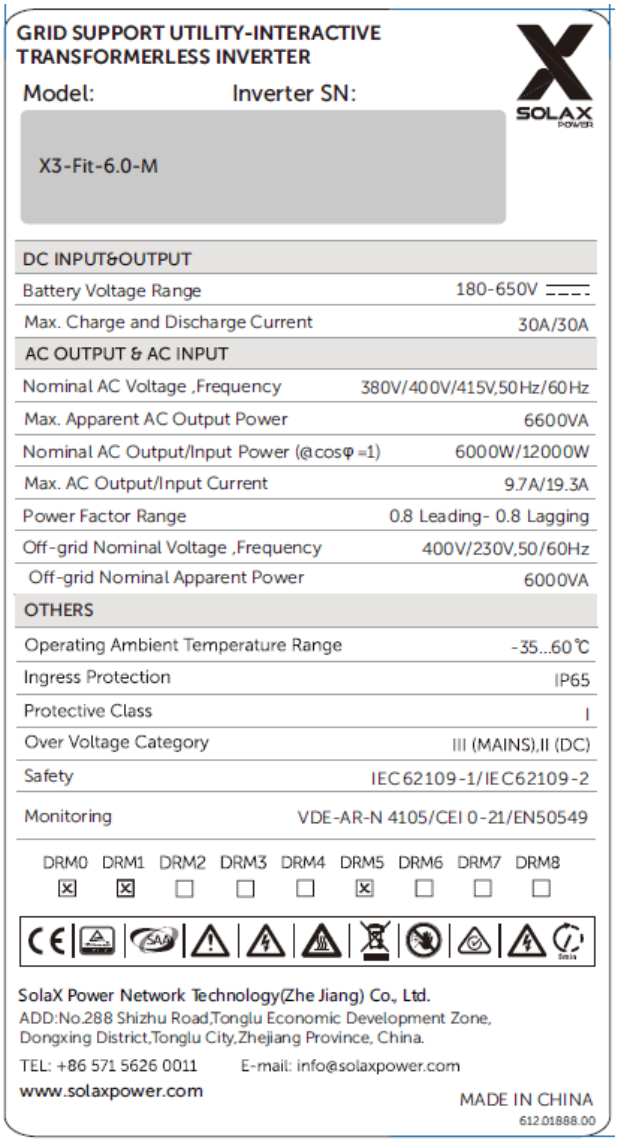
Produktbeschreibung
Product description



GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-6.0-M

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	6600VA
Nominal AC Output/Input Power (@cosφ=1)	6000W/12000W
Max. AC Output/Input Current	9.7A/19.3A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	6000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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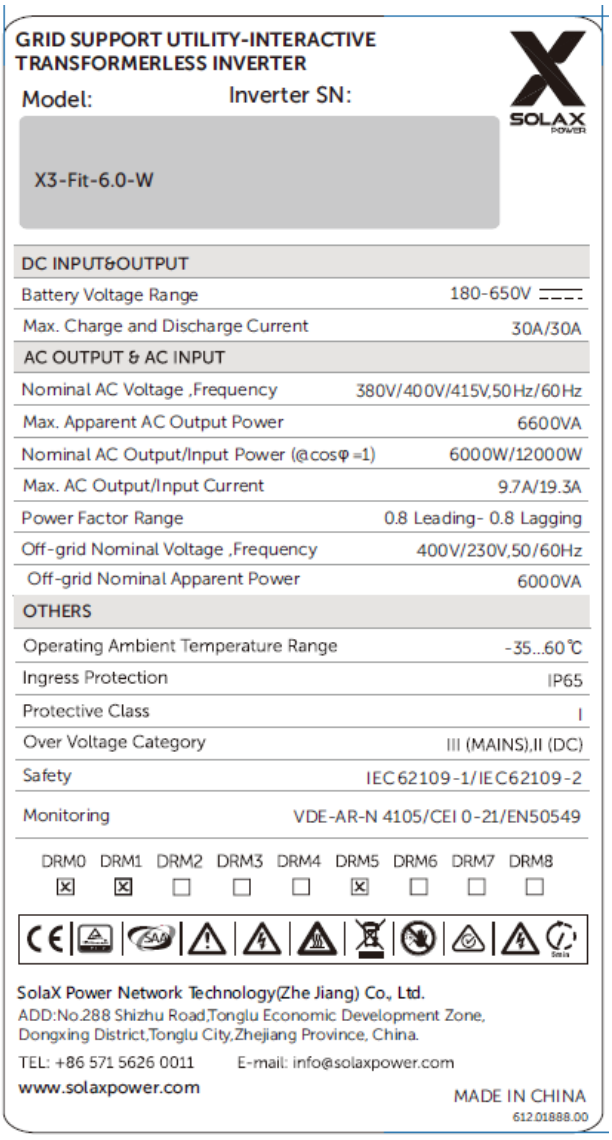

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-6.0-W

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	6600VA
Nominal AC Output/Input Power (@cosφ=1)	6000W/12000W
Max. AC Output/Input Current	9.7A/19.3A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400V/230V,50/60Hz
Off-grid Nominal Apparent Power	6000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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Produktbeschreibung
Product description

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-8.0-M

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	8800VA
Nominal AC Output/Input Power (@cosφ=1)	8000W/16000W
Max. AC Output/Input Current	12.9A/25.8A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	8000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
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GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-8.0-W

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	8800VA
Nominal AC Output/Input Power (@cosφ=1)	8000W/16000W
Max. AC Output/Input Current	12.9A/25.8A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	8000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/CEI 0-21/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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Produktbeschreibung
Product description

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-10.0-M

Inverter SN:

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	11000VA
Nominal AC Output/Input Power (@cosφ=1)	10000W/20000W
Max. AC Output /Input Current	16.1A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	10000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
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GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-10.0-W

Inverter SN:

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	11000VA
Nominal AC Output/Input Power (@cosφ=1)	10000W/20000W
Max. AC Output /Input Current	16.1A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage, Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	10000VA
OTHERS	
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
☒	☒	☐	☐	☐	☒	☐	☐	☐

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Produktbeschreibung
Product description

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-15.0-M

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	15000VA
Nominal AC Output/Input Power (@cosφ=1)	15000W/20000W
Max. AC Output/Input Current	24.1A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	15000VA
OTHERS	
Battery Type	Li-ion/Lead-acid
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
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612.01891.00

GRID SUPPORT UTILITY-INTERACTIVE TRANSFORMERLESS INVERTER

Model: X3-Fit-15.0-W

Inverter SN:

SOLAX POWER

DC INPUT&OUTPUT	
Battery Voltage Range	180-650V ⎓
Max. Charge and Discharge Current	30A/30A
AC OUTPUT & AC INPUT	
Nominal AC Voltage ,Frequency	380V/400V/415V,50Hz/60Hz
Max. Apparent AC Output Power	15000VA
Nominal AC Output/Input Power (@cosφ=1)	15000W/20000W
Max. AC Output/Input Current	24.1A/32.0A
Power Factor Range	0.8 Leading- 0.8 Lagging
Off-grid Nominal Voltage ,Frequency	400/230V,50/60Hz
Off-grid Nominal Apparent Power	15000VA
OTHERS	
Battery Type	Li-ion/Lead-acid
Operating Ambient Temperature Range	-35...60℃
Ingress Protection	IP65
Protective Class	I
Over Voltage Category	III (MAINS),II (DC)
Safety	IEC62109-1/IEC62109-2
Monitoring	VDE-AR-N 4105/EN50549

DRM0	DRM1	DRM2	DRM3	DRM4	DRM5	DRM6	DRM7	DRM8
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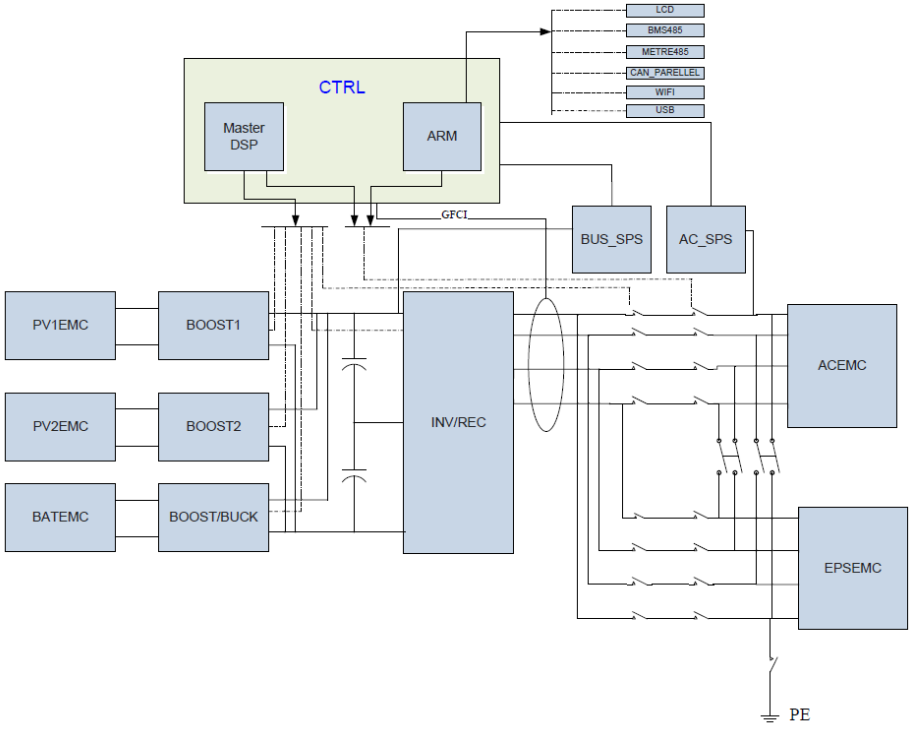
Produktbeschreibung
Product description

Appendix 2 – General product information

Brief description:

The PCE under test is a Inverter which utilizes the advanced power electronics conversion components such as MOSFET, IGBT to convert the variable DC power generated from the photovoltaic (PV) arrays as well as batteries to the stable utility AC power which can be fed into the commercial electrical grid. The battery port is able to be charged by the energy from either PV port or AC grid port. The PCE under test is also able to work in stand-alone mode while the grid voltage is not present.

When the off-grid function is enabled, the product only join in dynamic grid supporting during the transition period from on-grid mode switching to off-grid mode. When the off-grid function is disabled, the dynamic grid supporting would be entriely joined.



Block Diagram

Integrated interface protection and control device device disconnect from grid network in case any one of following faults occurred:

1. PV array insulation resistance fault
2. Residual current fault
3. Over & under grid voltage
4. Over & under grid frequecny
5. Islanding operation
6. Over DC injection current

Produktbeschreibung
Product description

Differences of the models:

All hybrid series models are identical in hardware as well as software, except for electrical ratings and the suffix:
"D"- Product with DC Switch
"M"- Product with external accessory of Mate box for full load off-grid operation.

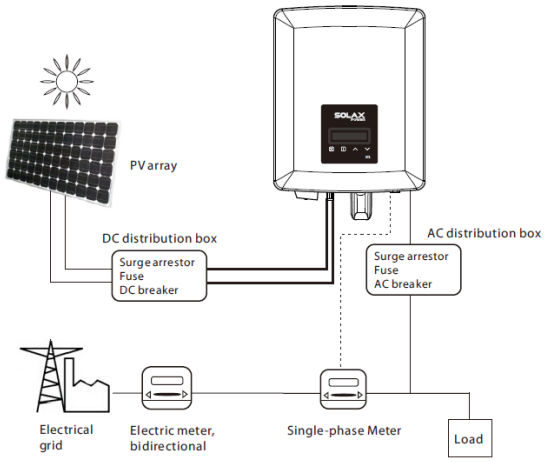
All FIT series models are identical in hardware as well as software, except for electrical ratings and the suffix:
"M"- Product with external accessory of Mate box for full load off-grid operation.
"W"- Product without external accessory of Mate box for full load off-grid operation.

The Hybrid series and FIT series are equivalent in construction and identical in control. In FIT series products, the PV strings have been removed.

Unless otherwise specified, all tests were performed on the model X3-Hybrid-15.0-D to represent other family models.

Remote control:

The product provides RS485 for remote control, network security management and logical port tests are conducted on RS485 port.



The product was tested on:
Software version: DSP1: 2.07, DSP2: 2.01, ARM: 2.03

Test condition:
Temperature: 25°C
Relative humidity: 65%

Produktbeschreibung
Product description

Model list:

MODELS LIST	X3-Hybrid-5.0-D/M	X3-Hybrid-6.0-D/M	X3-Hybrid-8.0-D/M	X3-Hybrid-10.0-D/M	X3-Hybrid-12.0-D/M	X3-Hybrid-15.0-D/M
INPUT PV						
Max.recommended DC power[M]	A:4000/B:4000	A:5000/B:5000	A:7000/B:5000	A:9000/B:6000	A:11000/B:7000	A:11000/B:7000
Max.DC voltage[V]	1000					
Norminal DC operating voltage[V]	630					
Max. input current(input A/input B)[A]	A:14/B:14	A:14/B:14	A:26/B:14	A:26/B:14	A:26/B:14	A:26/B:14
Max. short circuit current(input A/input B)[A]	A:16/B:16	A:16/B:16	A:30/B:16	A:30/B:16	A:30/B:16	A:30/B:16
MPPT voltage range[V]	180-950	180-950	180-950	180-950	180-950	180-950
MPPT voltage range[V](fall load)	330-800	330-800	330-800	330-800	330-800	380-800
Start input voltage[V]	160	160	160	160	160	160
Start output voltage[V]	200	200	200	200	200	200
Shut down input voltage[V]	150	150	150	150	150	150
No. of MPP trackers	2	2	2	2	2	2
Strings per MPP tracker	A:1/B:1	A:1/B:1	A:2/B:1	A:2/B:1	A:2/B:1	A:2/B:2
OUTPUT AC						
Norminal AC power[VA]	5000	6000	8000	10000	12000	15000
Max. apparent AC power[VA]	5500	6600	8800	11000	13200	15000
Rated grid voltage(AC voltage range)[V]	400/380					
Rated grid Frequency[Hz]	50/60					
Norminal AC current[A]	7.2	8.7	11.6	14.5	17.5	21.8
Max. AC current[A]	8.1	9.7	12.9	16.1	19.3	24.1
Displacement power factor	~1（Adjustable from 0.8 leading to 0.8 lagging）					
Total harmonic distortion(THDi, rated power)	<3%					
INPUT AC						
Norminal AC power[VA]	10000	12000	16000	20000	20000	20000
Norminal AC current[A]（E Version & C Version)	14.5	17.5	23.2	29.0	29.0	29.0
Max. AC current[A]（E Version & C Version)	16.1	19.3	25.8	32.0	32.0	32.0
Rated grid voltage(AC voltage range)[V]	415/400/380					
Rated grid Frequency[Hz]	50/60					
Power factor	~1（Adjustable from 0.8 leading to 0.8 lagging）					
BATTERY						
Battery voltage range[V]	180-650					
Recommended battery voltage[V]	400VDC					
Max.charge/discharge power[W]	5000/5500	6000/6500	8000/8500	10000/10500	12000/12500	15000/15500
Max.charge/discharge current[A]	30A					
Peak charge/discharge current[A]	30A					

Produktbeschreibung
Product description

Communication interfaces	CAN/ RS485					
Reverse connect protection	YES					
Off-grid Output(WITH BATTERY)						
Off-grid MAX power[VA]	5000	6000	8000	10000	12000	15000
Off-grid rated power[VA]	5000	6000	8000	10000	12000	15000
Off-grid rated voltage[V],Frequency[Hz]	400V/230VAC,50/60					
Off-grid rated current[A]	7.2	8.7	11.6	14.5	17.5	21.8
Off-grid peak power[W]	7500,60s	9000, 60S	12000,60S	15000, 60S	15000, 60S	16500, 60S
Switch time[s]	<20ms					
Total harmonic distortion(THDv, linear Load)	<3%					
POWER CONSUMPTION						
Internal consumption(night)[W]	＜20W for hot standby,＜ 3W for cold standby					
Idle mode	YES					
ENVIRONMENT LIMIT						
Protection class	IP65					
Operating temperature range[℃]	- 35℃...60℃ (derating at +45℃，charge derating at +35℃)					
Humidity[%]	0～100 (non-condensing)					
Altitude[m]	≤3000					
Storage temperature[℃]	- 35℃...60℃					
Noise emission(typical)[dB]	<40				<50	
Over voltage category	III(electric supply side), II(PV side)					
GENERAL						
Demensions(WxHxD) [mm]	503*199*503					
Weight [kg]	30					
Cooling concept	Nature Convection				Fan	
Topology	Transformerless					
LCD display	Bcaklight 20*4 character					

MODELS LIST	**X3-Fit-6.0-M/W**	**X3-Fit-8.0-M/W**	**X3-Fit-10.0-M/W**	**X3-Fit-15.0-M/W**
OUTPUT AC				
Norminal AC power[VA]	6000	8000	10000	15000
Max. apparent AC power[VA]	6600	8800	11000	15000
Rated grid voltage(AC voltage range)[V]	400/380			
Rated grid Frequency[Hz]	50/60			
Norminal AC current[A]	8.7	11.6	14.5	21.8
Max. AC current[A]	9.7	12.9	16.1	24.1
Displacement power factor	~1（Adjustable from 0.8 leading to 0.8 lagging）			
Total harmonic distortion(THDi, rated power)	<3%			
INPUT AC				

Produktbeschreibung
Product description

Norminal AC power[VA]	12000	16000	20000	20000
Norminal AC current[A]（E Version & C Version)	17.5	23.2	29.0	29.0
Max. AC current[A]（E Version & C Version)	19.3	25.8	32.0	32.0
Rated grid voltage(AC voltage range)[V]	415/400/380			
Rated grid Frequency[Hz]	50/60			
Power factor	~1（Adjustable from 0.8 leading to 0.8 lagging）			
BATTERY				
Battery voltage range[V]	180-650			
Recommended battery voltage[V]	400VDC			
Max.charge/discharge power[W]	6000/6500	8000/8500	10000/10500	15000/15500
Max.charge/discharge current[A]	30A			
Peak charge/discharge current[A]	30A			
Communication interfaces	CAN/ RS485			
Reverse connect protection	YES			
Off-grid Output(WITH BATTERY)				
Off-grid MAX power[VA]	6000	8000	10000	15000
Off-grid rated power[VA]	6000	8000	10000	15000
Off-grid rated voltage[V],Frequency[Hz]	400V/230VAC,50/60			
Off-grid rated current[A]	8.7	11.6	14.5	21.8
Off-grid peak power[W]	9000, 60S	12000,60S	15000, 60S	16500, 60S
Switch time[s]	<20ms			
Total harmonic distortion(THDv, linear Load)	<3%			
POWER CONSUMPTION				
Internal consumption(night)[W]	＜20W for hot standby,＜ 3W for cold standby			
Idle mode	YES			
ENVIRONMENT LIMIT				
Protection class	IP65			
Operating temperature range[℃]	- 35℃...60℃ (derating at +45℃，charge derating at +35℃)			
Humidity[%]	0～100 (non-condensing)			
Altitude[m]	≤3000			
Storage temperature[℃]	- 35℃...60℃			
Noise emission(typical)[dB]	<40			<50
Over voltage category	III(electric supply side), II(PV side)			
GENERAL				
Demensions(WxHxD) [mm]	503*199*503			
Weight [kg]	30			
Cooling concept	Nature Convection			Fan
Topology	Transformerless			
LCD display	Bcaklight 20*4 character			

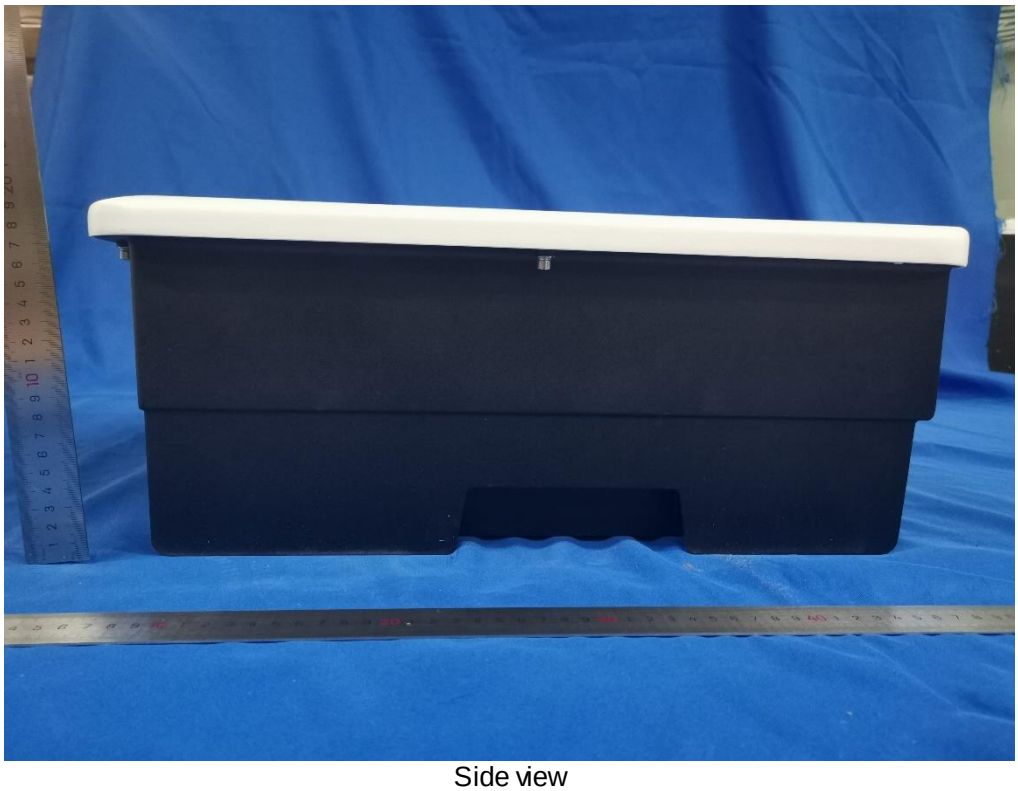
Produktbeschreibung
Product description

Appendix 3 – Photo documentation

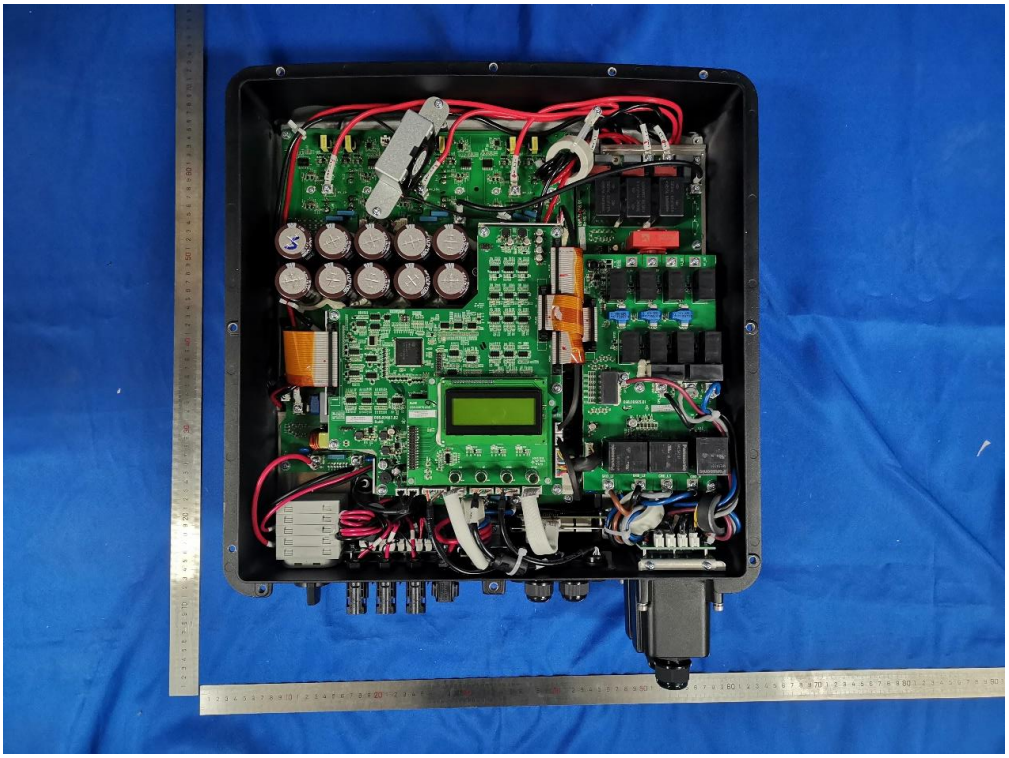
Front view

Buttom view

Produktbeschreibung
Product description



Side view



Internal view