

**Test Certificate No.: 9912301525**

In accordance with Clause 12 of the Standards Law – 1953

Details of order:

Name of customer	: Zucchetti Centro Sistemi SpA
Address	: Via Lungarno 305/A, 52028 Terranuova Bracciolini (AR), Partita IVA 01262190513
Date of order	: 10/01/2019

Description of sample:

Solar Inverter	
Models	: SOFAR 50000TL, SOFAR 60000TL, SOFAR 70000TL-HV
Manufacturer	: Shenzhen SOFAR SOLAR Co., Ltd.
Country of origin	: P.R. China
(see additional product information on pages 2-12)	

Sampling details:

No sample required

Nature of test:

Review of test reports: Ref. No.: 50160856 001 dated 29/06/2018, issued by TÜV Rheinland (Shanghai) Co., Ltd. for the above-specified solar inverter models according to the following standards: IEC/EN 62109-1: 2010 – Safety of power converters for use in photovoltaic power system – Part 1: General requirements IEC/EN 62109-2: 2011 – Safety of power converters for use in photovoltaic power system – Part 2: Particular requirements for inverters
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This document contains 12 pages and may be used only in full.	The test results in this report refer only to the item tested.	This document alone is not sufficient for the release of goods from customs.
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Test Conclusions:

Based on the information provided in the above mentioned test reports, the above-specified solar inverter models comply with the Israeli requirements for grid-tied photovoltaic inverters. The models referred in this document employ an integrative residual current device (RCD) for protection of the DC line. When installed in Israel, the inverter shall be adjusted according to Israeli requirements for grid-tied photovoltaic inverters regarding overvoltage/undervoltage, overfrequency/underfrequency protection.

Anatoly Oimatov
Product Safety Engineer
Electrical Safety Branch
Electronics and Telematics Laboratory
The Standards Institution of Israel
Date: 16/01/2019

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Senior Product Safety Engineer
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The Standards Institution of Israel
Date: 16/01/2019

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ADDITIONAL PRODUCT INFORMATION
Electrical Ratings

MODEL LIST		SOFAR 50000TL	SOFAR 60000TL
INPUT	V_{MAX} PV [Vdc]	1000	1000
	I_{SC} PV [A]	48/36/36	48/48/48
	MPP Voltage Range V_{MPP} [Vdc]	250-960	250-960
	Max. Input Current I_{max} [A]	40/30/30	40/40/40
	MPP Full Power Voltage Range [Vdc]	530-800	530-800
	Start PV Voltage [Vdc]	350	350
	Stop PV Voltage [Vdc] (PCE Shutdown)	960V	960V
	Backfeed Current [A]	0	
	Overvoltage Category (OVC)	II	
OUTPUT	Rated Output Voltage U_r [Vac]	3/N/PE 230/400V	
	Normal Operating Voltage Range U_n [Vac]	310-480	310-480
	Rated Output Frequency F_{NETZ} [Hz]	50/60	
	Normal Operating Frequency Range F_n [Hz]	44-55 / 54-66	
	Rated Output Power P_E [W]	50000	60000
	Max. Output Power $P_{E_{max}}$ [W]	50000	60000
	Max. Output Current I_{max} [A]	80	90
	Power Factor $\cos\phi$ [λ]	[-0.8, +0.8]	
	Efficiency max. η_{max} [%]	98.5	98.6
	Night Power Consumption [W]	<1	
	THD [\sqrt{I}] (100% full power)	<3%	
	Acoustic Noise [dB]	<60	<60
	Overvoltage Category (OVC)	III	

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MODEL LIST		SOFAR 70000TL-HV
INPUT	V _{MAX} PV [Vdc]	1000
	I _{SC} PV [A]	48/48/48
	MPP Voltage Range V _{MPP} [Vdc]	250-960
	Max. Input Current I _{max} [A]	40/40/40
	MPP Full Power Voltage Range [Vdc]	660-800
	Start PV Voltage [Vdc]	350
	Stop PV Voltage [Vdc] (PCE Shutdown)	960V
	Backfeed Current [A]	0
	Overvoltage Category (OVC)	II
OUTPUT	Rated Output Voltage U _r [Vac]	3/N/PE ' 3/PE 277/480V
	Normal Operating Voltage Range U _n [Vac]	422-528
	Rated Output Frequency F _{NETZ} [Hz]	50/60
	Normal Operating Frequency Range F _n [Hz]	44-55 / 54-66
	Rated Output Power P _E [W]	70000
	Max. Output Power P _{Emax} [W]	75000
	Max. Output Current I _{max} [A]	90
	Power Factor cosφ [λ]	[-0.8, +0.8]
	Efficiency max. η _{max} [%]	98.6
	Night Power Consumption [W]	<1
	THD [V-/ I] (100% full power)	<3%
	Acoustic Noise [dB]	<60
	Overvoltage Category (OVC)	III

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APPENDIX
List of Critical Components
(8 pages attached)

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Critical Components
Material: e.g. external enclosure, PCB, closed-end connector, sleeves, cord anchorage etc.
Components with winding: e.g. motor, transformer, magnetic coil etc.
Other components: e.g. switch, thermostat, heater, plug, internal wire, capacitor, relay, varistor etc.

Object/part No.	ManuFacterer/ Trademark	Type/ model	Technical data	Standard	Mark(s) of conformity
DC Input Connector	Stäubli (Hangzhou) Mechatronic Co., Ltd.	MC4 Series	1000Vdc, 39A, Max. 90°C, IP68	EN 50521 UL 6703	TUV R60028286 R60087448 E343181
	Amphenol Industrial Operations	Helios H4 Series	1000Vdc, 40A, Max. 90°C, IP68	EN 50521 UL 6703	TUV R 50157783 UL E339277
AC Wiring Connector (020.00200018-0)	SCED Electronics Co., Ltd.	TR100-01 (600V 100A)	600V 100A	UL1059	E313040
DC Switch (011.00200010-0)	Santon International B.V	XBHP3610-2-D	1000VDC/20A, 500Vdc/4 5A/6POLE	DEKRA IEC60947-3 CCC GB14048.3-2008	2184962.01A 201501030277587 2
	Bremas Bremas Erscce SpA	DK10016220BMMVU 6	1000VDC16A/600V40A/6 POLE	CCC GB14048.3-2008	201601030292426 1
	ProJoy Electric Co., Ltd.	PEDS150R-HM40-6	1000VDC20A/600V40A/6 POLE	TUV EN60947-3 2009 SAA IEC60947-3	R50321787 SAA152354
PV Terminal	Stäubli (Hangzhou) Mechatronic Co., Ltd.	PV-ADBP4-S2/6-UR	1000V dc, 39 A 90 ° C , IP65	DIN V VDE V 0126-3/12.2006	TUV R60028286 R60087448 UL E343181
		PV-ADSP4-S2/6-UR	1000V dc, 39 A 90 ° C , IP65	DIN V VDE V 0126-3/12.2006	TUV R60028286 R60087448 UL E343181
PCB Material	SHANTOU LUCKY STAR PCB CO LTD	WS888	130° C, V-0, CTI: min. 175	UL796	UL E301869

Constructional Data Form (CDF) for Electrical Appliances

	Shenzhen Glorysky electronics CO LTD	GS-M	130° C, V-0, CTI: min. 175	UL796	E257384
Gas Discharge Tube (GASB1)	SHENZHEN BENCENT ELECTRONIC CO LTD	B8G1500M	1200-1800Vdc, -40-90 ° C	UL 1449	UL E337906
Output on-grid Relay (RY1, RY2, RY3, RY4 , RY5, RY6)	Xiamen Hongfa Electroacoustic Co., Ltd.	HF167F	90A 320VAC, Resistive, 1k cycles, 85°C	TUV EN61810-1 2005	TUV R50360703
	Panasonic Industrial Devices Sales (China) Co., Ltd.	HE1aN-W-DC12V- Y6	90A/ 277V AC/ -50° C~+85° C	UL60947-4-1	UL E43028
	Churod Electronics Co., Ltd	CHAR-112A100	100A 277V ac -40° C ~+85° C	UL60947-4-1 TUV:EN61810-1 2008	UL E341422 TUV R50316974
	Zettler Relay (Xiamen) Co., Ltd	AZSR190-1A-12D	90A 480Vac -40° C~ +85° C	UL60947-4-1 TUV:EN61810-1 2008	UL : E365652 TUV : B17098879300 8
Current Sensor (HCTB1, HCTB2, HCT B3)	VACUUMSCHMELZE GmbH & Co. KG	T60404-N4646- X461	100A/5V/-40° C~+85 ° C	UL:508	UL E317483
	tamurash shanghai electronics ltd	F23P100S05	100A/5V/-40° C~+85 ° C	UL508	E243511
(Y Capacitor) (CF1, CF2, CF3, CF4 , CF5, CF6, CF7, CF	SONGTIAN ENTERPRISE Co., LTD	CD	4700PF, 400Vac, 125 ° C	IEC/EN 60384- 14 UL60384-14	UL E208107, VDE 40025754 CQC06001018610

Constructional Data Form (CDF) for Electrical Appliances

8, CF17, CF18, CF27, CF28, CF37, CF38, CF47, CF48, CF49, CF50, CF51, CF52, CF58, CF65, CF70, CF72, CA10, CA11, CA16, CA17, CA18, CA19, CA25, CA26, CA34, CA35, CA40, CA41)	Vishay Electronic GmbH	VY1	4700PF, 500Vac, 125 ° C	IEC/EN 60384-14 UL60384-14	UL E183844, VDE 40012673
Voltage Dependent Resistor (MOV B1, MOV B2, MOV B3, MOV B4)	Littelfuse, Inc	V1000LA160BP	1000Vac, 1200Vdc, 85 ° C	UL 1414 IEC/EN 61051-1, IEC/EN 61051-2.	UL E320116 VDE 116895
	THINKING ELECTRONIC INDUSTRIAL CO., LTD.	TVR20561KSY	1000Vac, 85 ° C	UL 1414	UL E314979
Input Common-mode Inductor (LA1, LA2, LA3)	Huizhou baohui electronics technology co., ltd	115-17-019A	580uH/M12K	NB/T 32004-2013	Together with machine
	Yindate electronics Huizhou ltd	115-17-019A	580uH/M12K	NB/T 32004-2013	Together with machine
IGBT Module	Infineon Electronic GmbH	DS_F3L200R12W2H3_B11_ENG_1_1_d e-en	200A/1200V/Easy 2B	---	---
	Vincotech Electronic GmbH	10-xY12NMA160SH01-M820F18x-D2-14-1	160A/1200V/Flow1	---	---
	Vincotech Electronic GmbH	30-FT12NMA160SH02-M669F28-PM	160A/1200V/Flow2	---	---
SiC MOS (QD1, QD2, QD3, QD12, QD13, QD14, QD8, QD9, QD10)	ROHM Co., Ltd.	SCT2080KE	NMOS/28A/1200V/T0247	---	---
	Cree, Inc.	C2M0080120D	NMOS/20A/1200V/T0247-3	---	---
SiC	Cree, Inc.	C4D15120D	24A/1200V/T0-247	---	---

Constructional Data Form (CDF) for Electrical Appliances

Diode (DD14, DD15, DD20, DD21, DD29, DD30)	Cree, Inc.	C4D20120D	32A/1200V/T0-247	---	---
	ROHM Co., Ltd.	SCS230KE2C	30A/1200V/T0-247	---	---
Bus Capacitor (CD13, CD14, CD15, CD17, CD18, CD19, CD21, CD22, CD24, CD25, CD26, CD72)	KEMET Electronics Italia S.r.l.	C4AELBW6110A3NK	500V110uF at 85°C, 2.5mOhm	NB/T 32004-2013	Together with machine
	Panasonic Industrial Devices Sales (China) Co., Ltd.	EZPE55117MTA	500V110uF at 85°C, 4.4mOhm	NB/T 32004-2013	Together with machine
	Xiamen faratronic co, ltd	C3D1U117JMOAC00	600V 110uF at 85°C 3.8m Ohm	NB/T 32004-2013	Together with machine
	HUAJUNG COMPONENTS CO., LTD.	EPB-117K0600DB152B-FF	600V 110uF at 85°C 4m Ohm	NB/T 32004-2013	Together with machine
	Cree, Inc.	DMJ-PS110UF500V	500V110uF at 85°C, 4.4mOhm	NB/T 32004-2013	Together with machine
Bus Electrolytic Capacitor (ECD1, ECD2, ECD3, ECD4, ECD5, ECD6, ECD7, ECD8, ECD9, ECD10, ECD11, ECD12, ECD13, ECD14, ECD15, ECD16)	Nichicon corporation	LGX2H471MELC58	470uF/500V/Φ 35*58/5000H	NB/T 32004-2013	Together with machine
	UNICON corporation	LLN2H471M3560	470uF/500V/Φ35*60/5000H	NB/T 32004-2013	Together with machine
	Man Yue Electronics Company Limited	EEP477V2HQ50SW* *P	470uF/500V/Φ35*50/5000H	NB/T 32004-2013	Together with machine
small chip inductor (LB5, LC6, LC11, LC13, LC20, LC21, LT1, LF2)	Huizhou baohui electronics technology co., ltd	SH-L006	39uH, DR10*5.4RB K38 /RI10*3.4*8.2 K38, 130°C	NB/T 32004-2013	Together with machine
optical-coupler	Toshiba Corporation	TLP785F(D4GRT7.F(C	Isolation voltage: 5000Vrms 85°C	UL1577	UL E67349

Constructional Data Form (CDF) for Electrical Appliances

(UC11, UC12, UC63, UC64, UC67, UC68, UC70, UC71, UF4, UF6, UF7)	LITE-ON TECHNOLOGY CORPORATION	LTV816S2TPB-V	Isolation voltage: 5000Vrms 110 ° C	DIN EN 60747- 5-5	VDE 40015248
Driver Transformer (TV1)	Huizhou baohui electronics technology co., ltd	SH-T002	Class B, 130° C	NB/T 32004- 2013	Together with machine
	boluodaxin electronics	SH-T002	Class B, 130° C	NB/T 32004- 2013	Together with machine
X Capacitor (CB1, CB2, CB3)	Xiamen faratronic co, ltd	C42Q2475MBFC000	X2/4.7uF/305VAC/± 20%/32*14*28, P=27.5m m/MKP62	UL-CUL (UL60384- 14:2014)	E186600
	TDK China Co Ltd	B32924D3475K000	X2/4.7uF/305VAC/± 10%/21*31*31.5/2pin	UL 1414 / UL 1283	E97863 / E157153
	SONGTIAN ENTERPRISE Co., LTD	MPX	X2, 2.2uF, 305Vac	UL 60384-14 IEC 60384-14	UL E208107 VDE 40034679
Y Capacitor (CYB1, CYB2, CYB3, CYB4, CYB5, CYB6, CYB7)	SONGTIAN ENTERPRISE Co., LTD	CE	Y2, 250Vac, 10000pF, 125° C	UL 60384-14, IEC 60384-14	UL E208107 VDE 40025748 CQC07001019906
	Xiamen faratronic co, ltd	C43Q1103M40C000	Y2/10nF/300VAC/13*12 *6.0	UL/CUL: 60384- 14,	UL E186600
ISO Relay (RYA1, RYA2)	Fujitsu Component Limited	NA5W-K	2A/220VDC/5VDC/2C	UL508	UL E45026
	Xiamen Hongfa Electroacoustic Co., Ltd.	HFD3/5	5Vdc/2A/30Vdc	---	---

Constructional Data Form (CDF) for Electrical Appliances

Input Current Sensor (HCTA1, HCTA2, HCTA3)	LEM Electronics (China) Co. Ltd	HXN 50-P	50A/± 12V/1%/19x15x20mm	UL508	UL E189713
	tamurash shanghai electronics ltd	L18P050 D15-0P	50A/± 12V/1%/17x15x17.5mm	UL508	UL E243511
Output Common-mode Inductor (LB2)	tamurash shanghai electronics ltd	CF501900-H00TS	50-70KW Common-mode Inductor /0.50mH/90A	NB/T 32004-2013	Together with machine
	Huizhou baohui electronics technology co., ltd	115-17-031A	50-70KW, Output three-winding common-mode inductance/90A/490UH	NB/T 32004-2013	Together with machine
Boost Inductor (60K, 70K)	Huizhou baohui electronics technology co., ltd	DCL40A244uH	DCL40A244uH at 40A	NB/T 32004-2013	Together with machine
	HeFei ECU-TAMURA Electric Co., Ltd		DCL40A244uH at 40A	NB/T 32004-2013	Together with machine
	yunlu Qingdao green energy ltd		DCL40A244uH at 40A	NB/T 32004-2013	Together with machine
	tamurash shanghai electronics ltd		DCL40A244uH at 40A	NB/T 32004-2013	Together with machine
Boost Inductor (50K)	Huizhou baohui electronics technology co., ltd	DCL30A287uH	DCL30A287uH	NB/T 32004-2013	Together with machine
	HeFei ECU-TAMURA Electric Co., Ltd	DCL30A287uH	DCL30A287uH	NB/T 32004-2013	Together with machine

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	yunlu Qingdao green energy ltd		DCL30A287uH	NB/T 32004-2013	Together with machine
	tamurash shanghai electronics ltd		DCL30A287uH	NB/T 32004-2013	Together with machine
Inverter Inductor (60K, 70K)	HeFei ECU-TAMURA Electric Co., Ltd	ACL90A120uH	120.3 uH min@128.6A Class B	NB/T 32004-2013	Together with machine
	Huizhou baohui electronics technology co., ltd		120.3 uH min@128.6A Class B	NB/T 32004-2013	Together with machine
	yunlu Qingdao green energy ltd	ACL90A120uH	120.3 uH min@128.6A Class B	NB/T 32004-2013	Together with machine
	tamurash shanghai electronics ltd		120.3 uH min@128.6A Class B	NB/T 32004-2013	Together with machine
Inverter Inductor (50K)	HeFei ECU-TAMURA Electric Co., Ltd	ACL76A160uH	L=160uH at 107A , Class B	NB/T 32004-2013	Together with machine
	Huizhou baohui electronics technology co., ltd		L=160uH at 107A , Class B	NB/T 32004-2013	Together with machine
	yunlu Qingdao green energy ltd		L=160uH at 107A , Class B	NB/T 32004-2013	Together with machine
	tamurash shanghai electronics ltd		L=160uH at 107A , Class B	NB/T 32004-2013	Together with machine

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Auxiliary Power Transformer	Huizhou baohui electronics technology co., ltd	SH-T002	3. 3mH/ETD39H/PC40/ Horizontal	NB/T 32004-2013	Together with machine
	yingdate Huizhou electronics		3. 3mH/ETD39H/PC40/ Horizontal	NB/T 32004-2013	Together with machine
GFCI Transformer	Huizhou baohui electronics technology co., ltd	115-17-020A	MP2303-4AS/HITACHI	NB/T 32004-2013	Together with machine
	yingdate Huizhou electronics		MP2303-4AS/HITACHI	NB/T 32004-2013	Together with machine
	NAMIN TECHNOLOGY		MP2303-4AS/HITACHI	NB/T 32004-2013	Together with machine
Internal Fan	MinebeaMitsumi Inc.	4710KL-04W-B29-E51	12VDC/2. 28W/120*120*25	UL UL507 VDE EN60950-1	UL E89936 VDE 1507300
External Fan	MinebeaMitsumi Inc.	08025VE12PGLD1	08025VE12PGLD1/12V/0. 57A/6. 84W/80*80*25	cULus File No. UL507 VDE File No EN60950-1	UL E89936 VDE 1507300
	MinebeaMitsumi Inc.	08025VE-12M-CTD-1	08025VE-12M-CTD-1/12V/0. 23A, /2. 76W/80*80*25	cULus File No. UL507 VDE File No EN60950-1	UL E89936 VDE 1507300

Note(s): An asterisk indicates a mark that assures the agreed level of surveillance.