

1.0 Reference and Address			
Report Number	2309A1337SHA-001	Original Issued: 24-Jan-2024	Revised: 25-Mar-2025
Standard(s)	Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3+R:19May2023]		
	Grid Support Utility Interactive Inverters and Converters Based Upon IEEE 1547:2018 & IEEE 1547.1:2020 - Supplement SB to UL 1741:2021 Ed.3 - Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3 (Supplement SB)]		
	Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4+U1]		
	IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces [IEEE 1547:2018]		
	IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces [IEEE 1547.1:2020]		
	Photovoltaic (PV) DC Arc-Fault Circuit Protection [UL 1699B:2018 Ed.1+R:18May2021]		
Applicant	SRNE Solar Co., Ltd	Manufacturer	SRNE Solar Co., Ltd
Address	4-5F,13A Wutong Island,Neihuan Rd, Xixiang, Bao`an, SHENZHEN Guangdong 518100	Address	Room 301, Building 5, Fuxing Road, No. 36, Chang'an Town, Dongguan City, Guangdong
Country	China	Country	China
Contact	Xiao tong	Contact	Xiao tong
Phone	18665930846	Phone	18665930846
FAX	--	FAX	--
Email	xiaotong@szshuori.com	Email	xiaotong@szshuori.com

2.0 Product Description	
Product	Solar Hybrid Inverter(Grid Support Utility Interactive Inverter)
Brand name	SRNE
Description	The products covered by this report are outdoors, split-phase or three-phase, Non-isolated, Hybrid inverter with Grid Support Utility Interactive Inverter. The unit does not provide galvanic separation from input to output (transformerless). The output is switched off redundant by the high power switching bridge and two relays. This assures that the opening of the output circuit can operate in case of one error. The installation should be in pollution II environment and accordance with the National Electrical Code, NFPA 70 and and the Canadian Electrical Code
Models	HESP followed by 4880, 48100 or 48120; followed by U200-H. SEI- followed by 8K, 10K or 12K; followed by -UP. HEBP followed by 4880, 48100 or 48120; followed by U200-H. SBK- followed by 8K, 10K or 12K; followed by -UP. HEBP followed by 4880, 48100,48114 or 48120; followed by U240-Pro. SEI- followed by 8K, 10K,11.4k or 12K; followed by -UPRO.
Model Similarity	SEI-8K-UP is same with HESP 4880U200-H except model name. SEI-10K-UP is same with HESP 48100U200-H except model name. SEI-12K-UP is same with HESP 48120U200-H except model name. All models have same hardware and software except for the different power, controled by software and inverter inductor. 48 stands for 48V battery voltage. 80 or 8K stands for output power 8.8kW, 100 or 10K stands for output power 10kW, 120 or 12K stands for output power 12kW. 200 stands for charging current 200A. H stand for PV voltage 550V. P stands for Parallel communicaiton board. SBK-8K-UP is same with HEBP 4880U200-H except model name. SBK-10K-UP is same with HEBP 48100U200-H except model name. SBK-12K-UP is same with HEBP 48120U200-H except model name. HEBP48100U200-H is the same as the original certified model HESP48100U200-H except for the model number, the size of enclosure, and the position of the terminal.The product principle, internal structure, internal topology, and PCB used are the same as the original certified model HESP48100U200-H. SEI-8K-UPRO is same with HEBP 4880U240-Pro except model name. SEI-10K-UPRO is same with HEBP 48100U240-Pro except model name. SEI-11.4K-UPRO is same with HEBP 48114U240-Pro except model name. SEI-12K-UPRO is same with HEBP 48120U240-Pro except model name. HEBP48100U240-Pro is the same as the original certified model HESP48100U200-H except for the model number, the size of enclosure, the position of the terminal, and the power.The product principle, internal structure, internal topology, and PCB used are the same as the original certified model HESP48100U200-H.
Ratings	Refer to section 7 Illustration 2,2a - Ratings
Other Ratings	These units with Grid support fuctions and complied correspond to relevant SRD: SRD1 of IEEE 1547-2018 and IEEE 1547.1-2020. SRD2 of Electric Rule No.21 clause Hh. for Smart Inverter. And in conjunction with UL1741 Supplement SB. SRD3 of Hawaiian Electric IEEE 1547.1-2020 Standard Source Requirements Document Version 2.0 [HECO SRD-IEEE-1547.1:2020 Ed.2.0].

3.0 Product Photographs

Photo 1 - External view

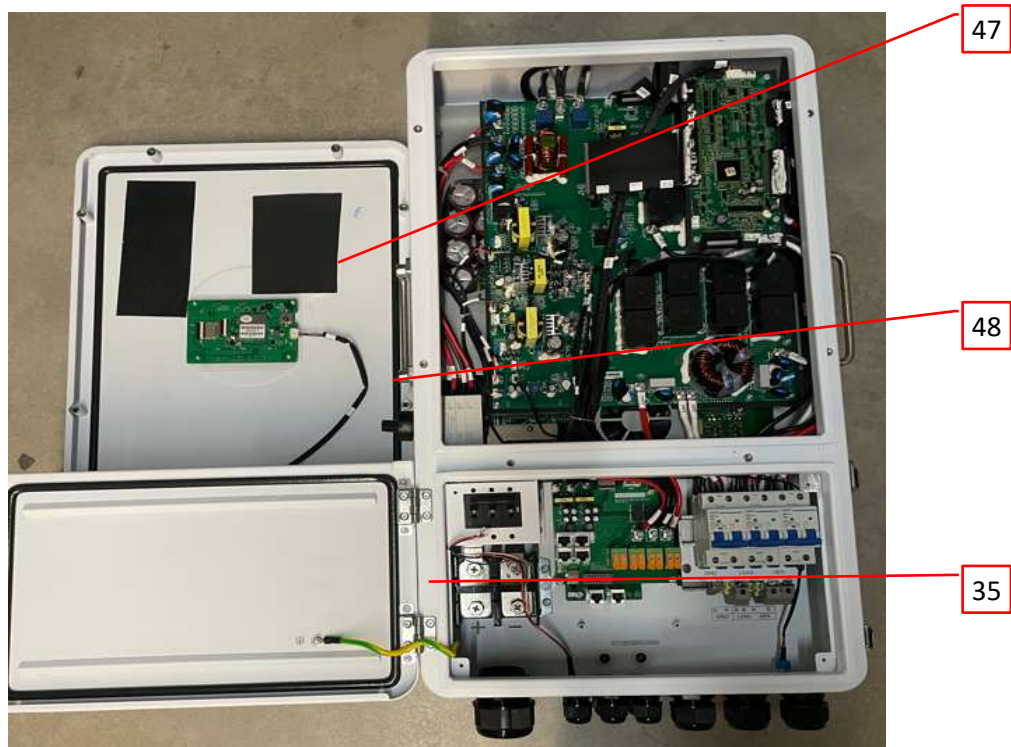


Photo 2 - External view



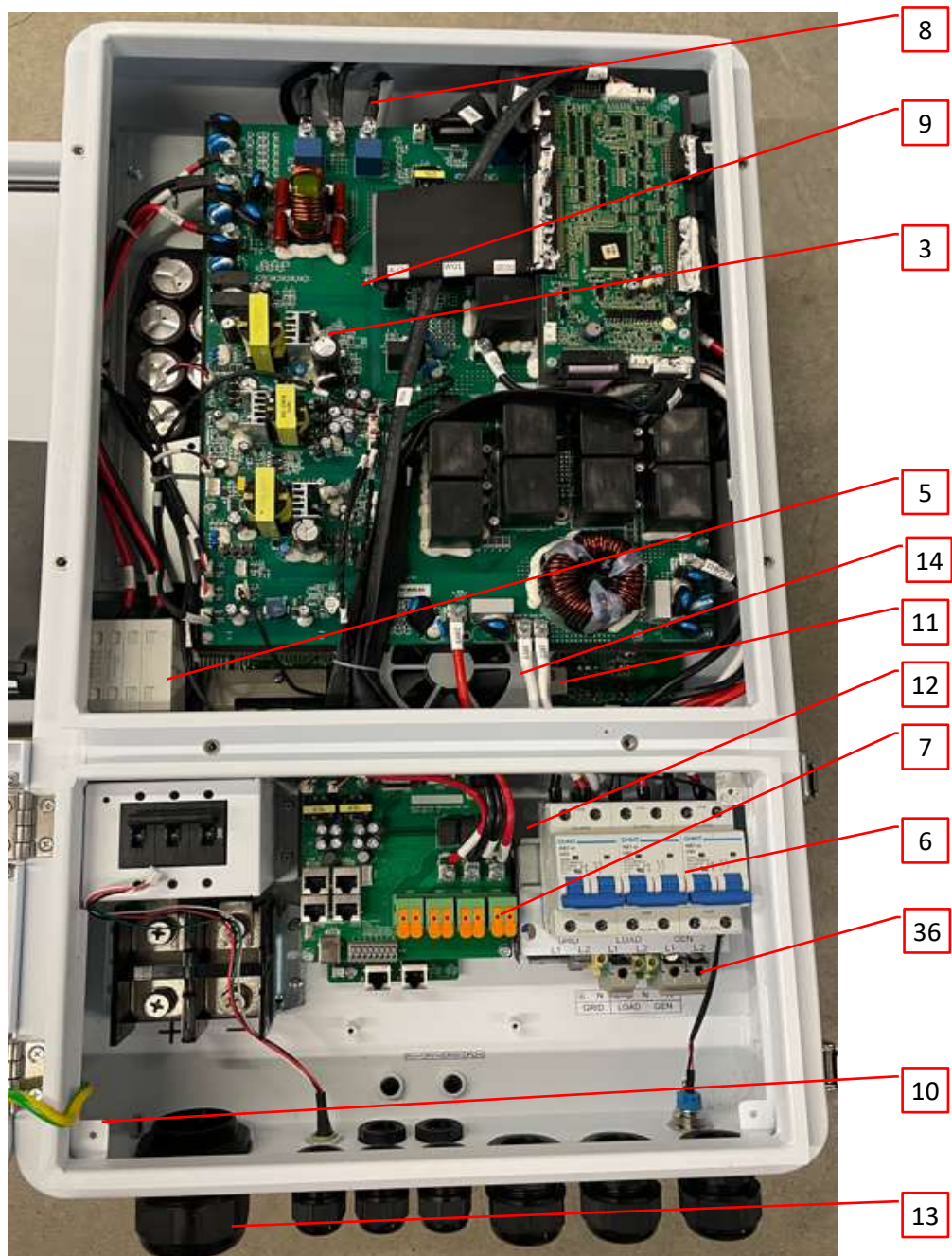
3.0 Product Photographs

Photo 3 - internal view



3.0 Product Photographs

Photo 4 - internal view



3.0 Product Photographs

Photo 5 - AC board

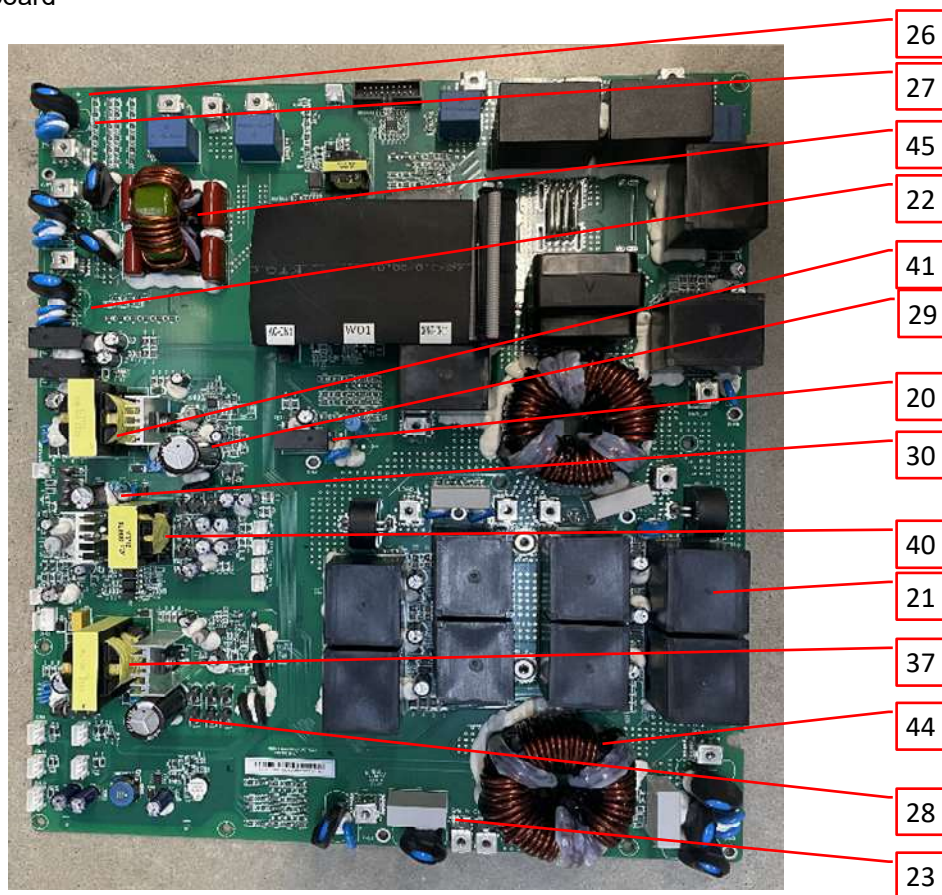
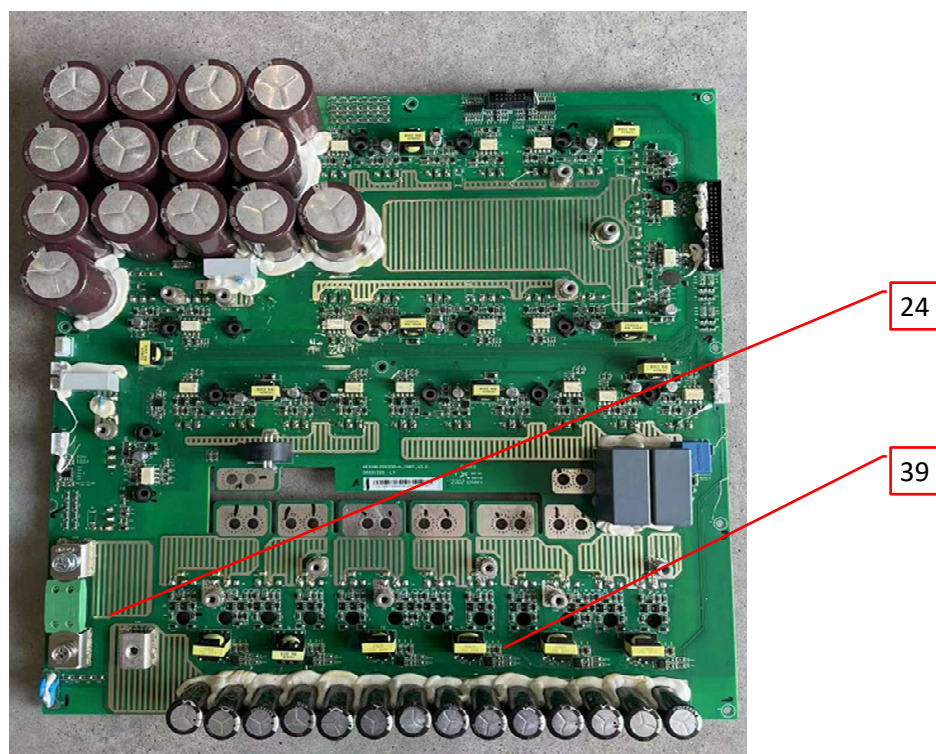
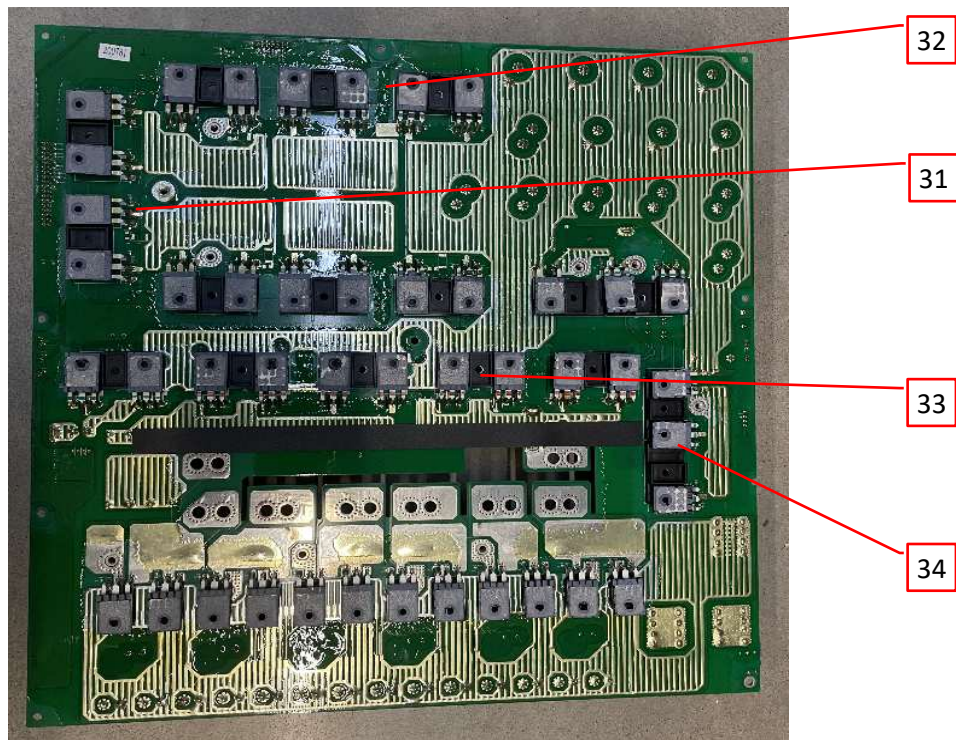


Photo 6 - IGBT board



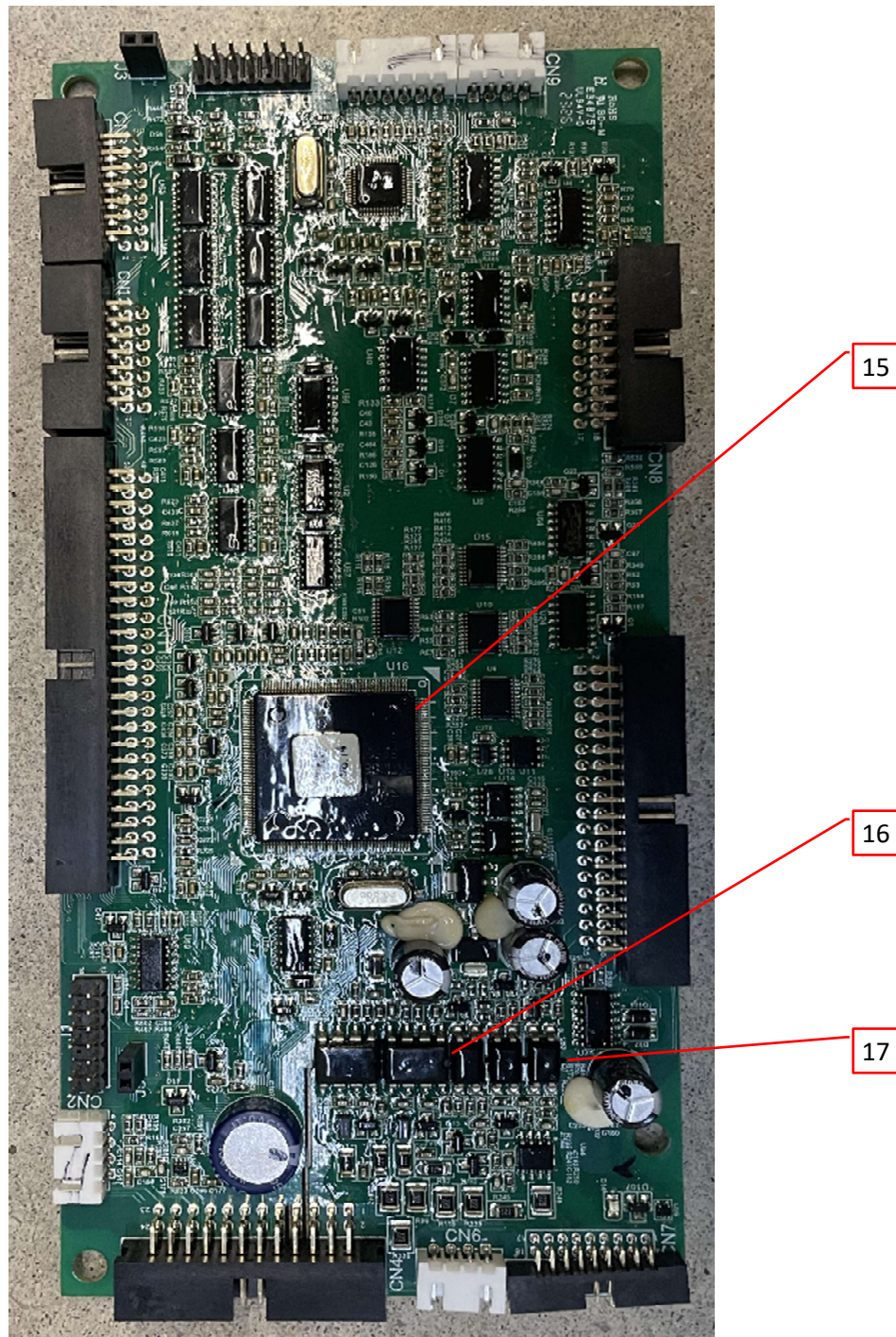
3.0 Product Photographs

Photo 7 - IGBT board



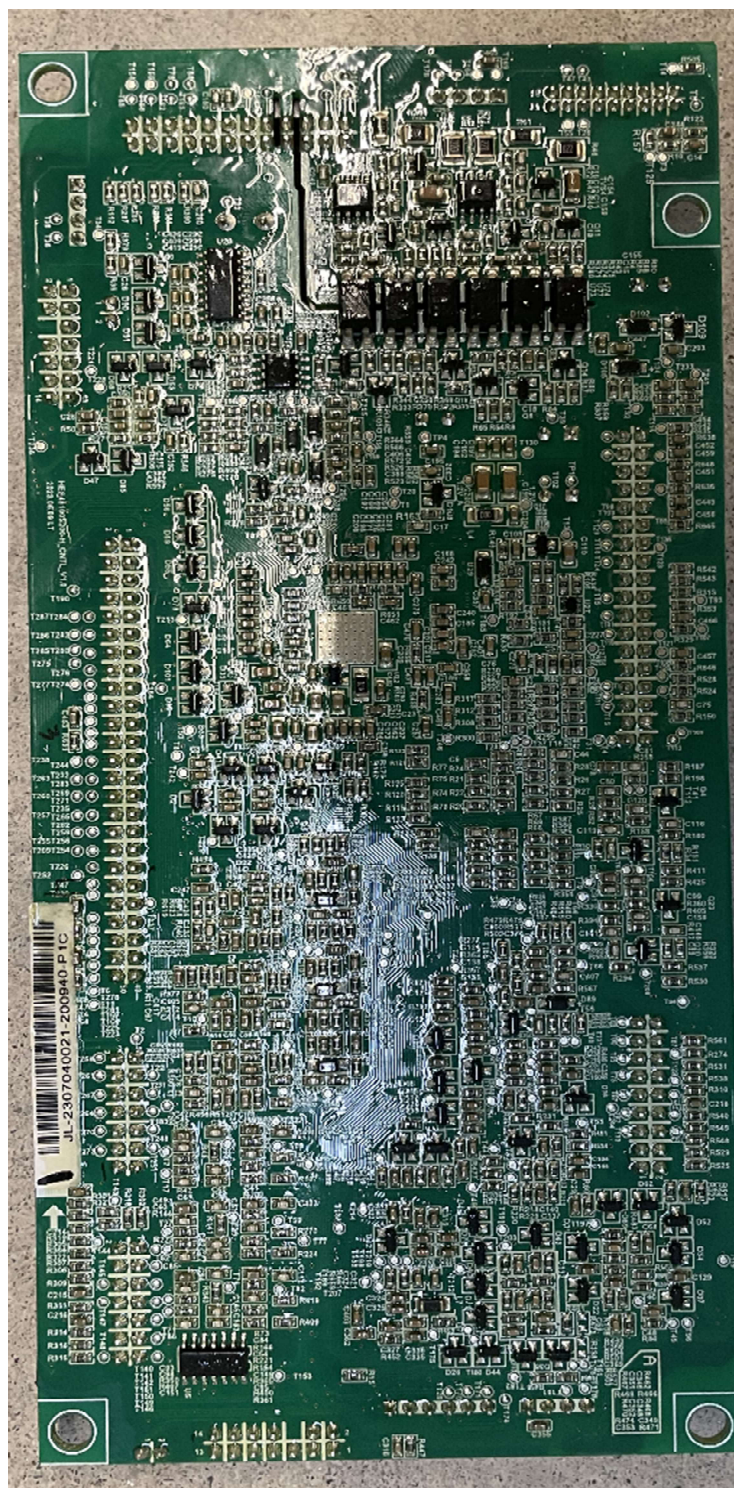
3.0 Product Photographs

Photo 8 - CNTL board



3.0 Product Photographs

Photo 9 - CNLT board



3.0 Product Photographs

Photo 10 - COM board

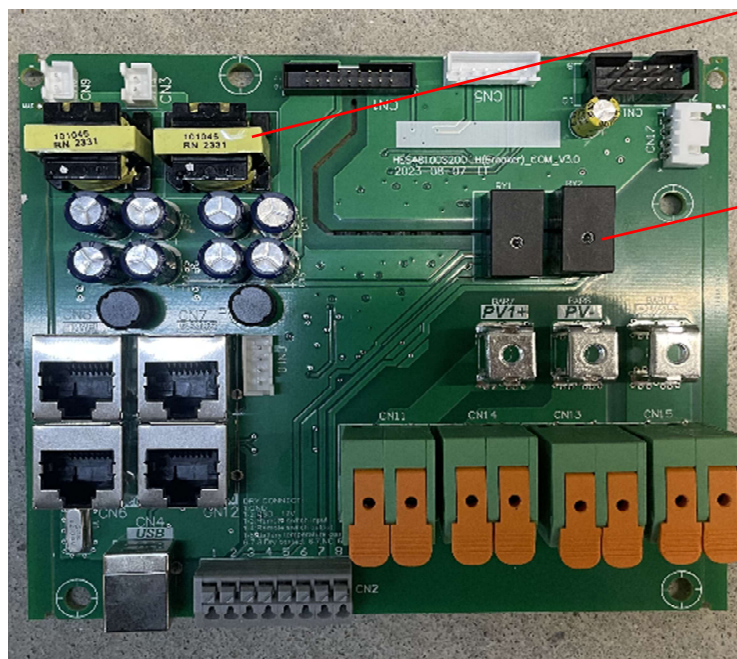
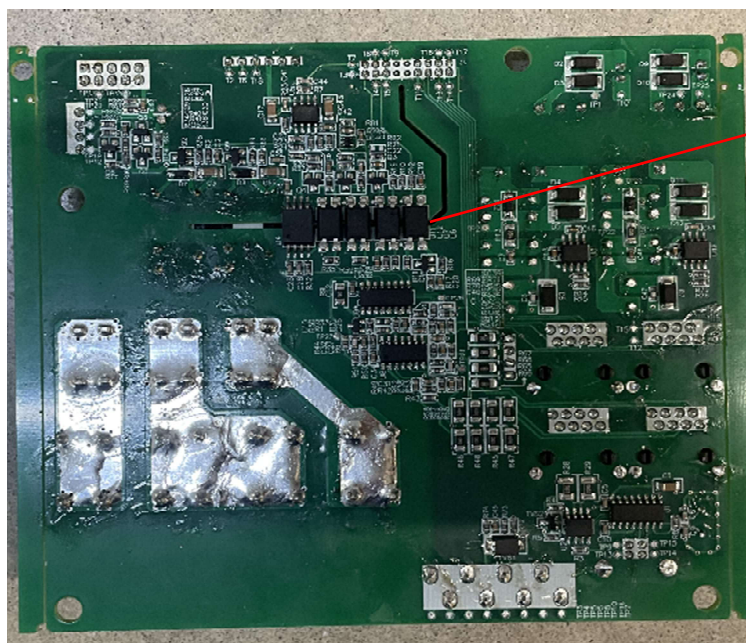


Photo 11 - COM board

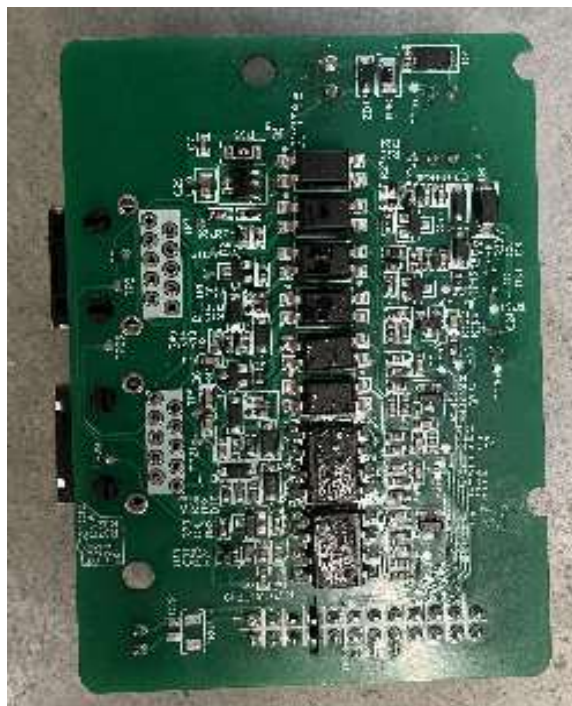


3.0 Product Photographs

Photo 12 - Parallel com board

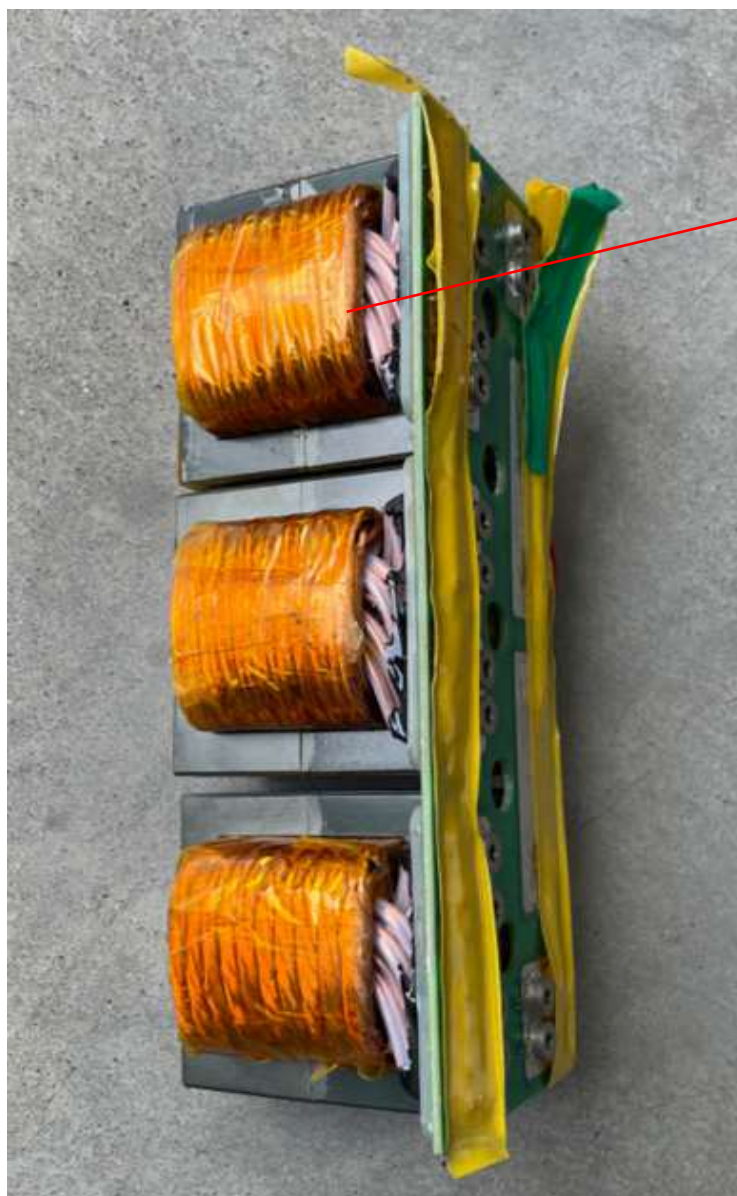


Photo 13 - Parallel com board



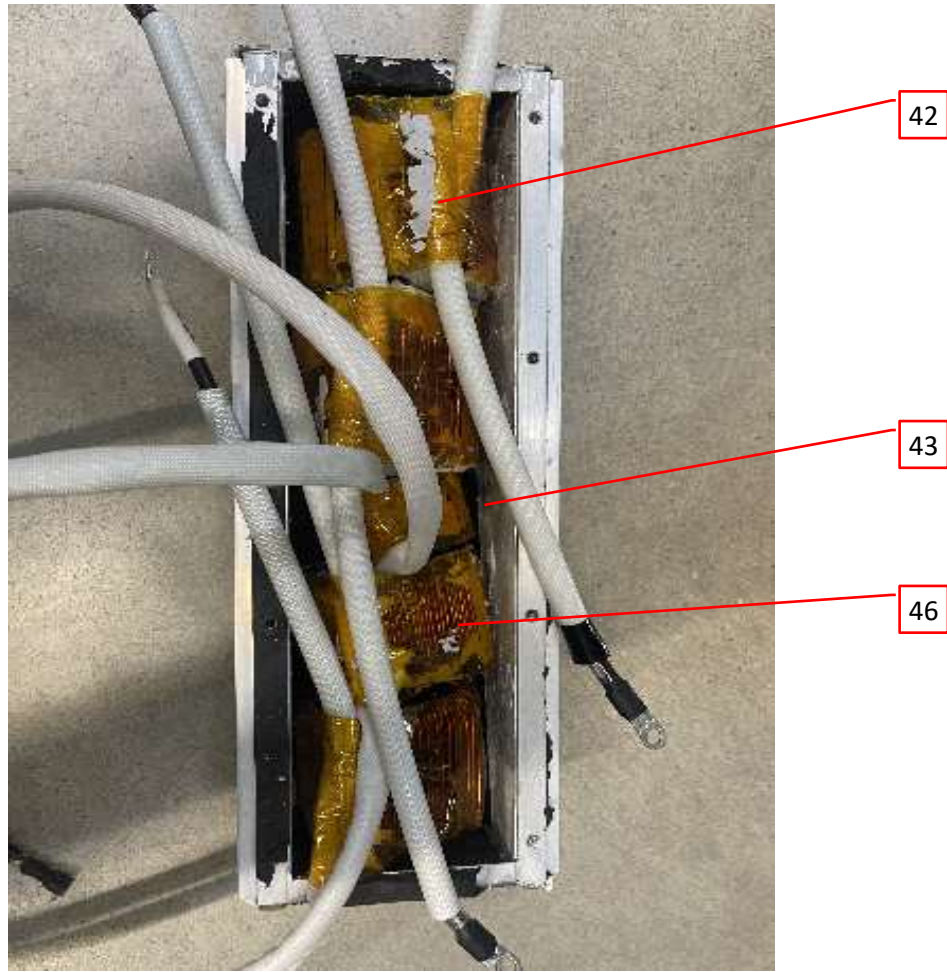
3.0 Product Photographs

Photo 14 - Transformer EE7031*2P



3.0 Product Photographs

Photo 15 - inductor



3.0 Product Photographs

Photo 16 - external view of HEBP48100U200-H



3.0 Product Photographs

Photo 17 - external view of HEBP48100U200-H



3.0 Product Photographs

Photo 18 - external view of HEBP48100U240-Pro



3.0 Product Photographs

Photo 19 - external view of HEBP48100U240-Pro



3.0 Product Photographs

Photo 20 - external view of HEBP48100U240-Pro



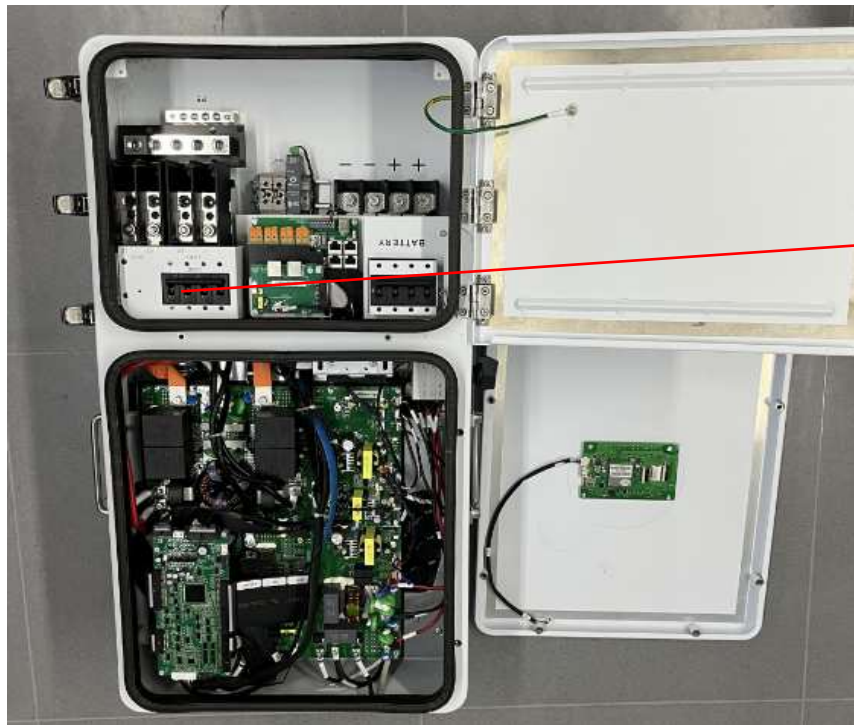
3.0 Product Photographs

Photo 21 - external view of HEBP48100U240-Pro



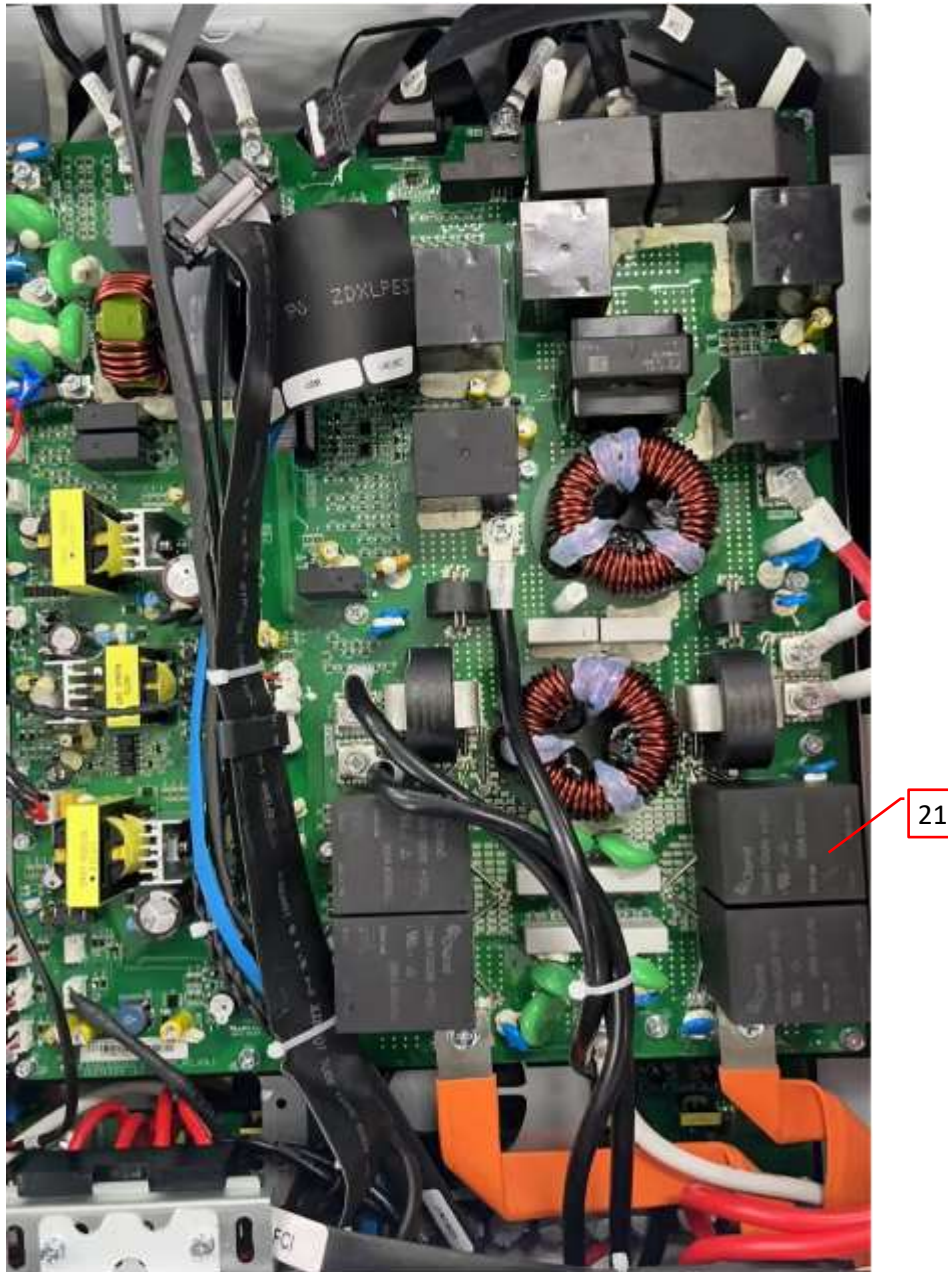
3.0 Product Photographs

Photo 22 - internal view of HEBP48100U240-Pro



3.0 Product Photographs

Photo 23 - AC board of HEBP48100U240-Pro



4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
1	1	Enclosure	NanGongHuiLi Technology Co.Ltd	HESP4880U200H	750x440x240mm thickness:1.2mm. made of aluminum	NR
			NanGongHuiLi Technology Co.Ltd	HEBP48100U200-H	840x440x260mm thickness:2.0mm. made of aluminum	NR
			FoShanShi KeTu WuJiZhiPin Co., Ltd.	HESP4880U200H	750x440x240mm thickness:1.2mm. made of aluminum	NR
			HuiZhou DeHai WuJiZhiPin Co., Ltd.	HESP4880U200H	750x440x240mm thickness:1.2mm. made of aluminum	NR
			DongGuan DiYe WuJinZhiZao Co., Ltd.	HESP4880U200H	750x440x240mm thickness:1.2mm. made of aluminum	NR
			Shenzhen Weiyute Communication Equipment Co.,	HEBP48100U240-Pro	840*440*284 thickness:2.0mm. made of aluminum	NR
2	2	Heat-sink	Dongguan Hailiang Precision Hardware Co., Ltd.	DC heat-sink 48V	378*365*88mm made of aluminum 6063.	NR
			ZhongShanShi Hongfu LvYe Co., Ltd.	DC heat-sink 48V	378*365*88mm made of aluminum 6063.	NR
			ShenZhen ZhengQin WuJinZhiPin Co., Ltd.	DC heat-sink 48V	378*365*88mm made of aluminum 6063.	NR
			DongGuan World JiXie Co., Ltd.	DC heat-sink 48V	378*365*88mm made of aluminum 6063.	NR
4	3	Heat-sink	Dongguan Hailiang Precision Hardware Co., Ltd.	heat-sink	23.5*16*35mm made of aluminum 6063. HS-Q84, HS-Q68,H-Q34	NR
			ZhongShanShi Hongfu LvYe Co., Ltd.	heat-sink	23.5*16*35mm made of aluminum 6063. HS-Q84, HS-Q68,H-Q34	NR
			ShenZhen ZhengQin WuJinZhiPin Co., Ltd.	heat-sink	23.5*16*35mm made of aluminum 6063. HS-Q84, HS-Q68 H-Q34	NR
			DongGuan World JiXie Co., Ltd.	heat-sink	23.5*16*35mm made of aluminum 6063. HS-Q84, HS-Q68,H-Q34	NR
2	4	Adhesive-Type Label (not shown)	Various	Various	Adhesive-Type, Min. 80°C, outdoor use, fully comply with UL969	cURus

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
4	5	DC Switch	Projoy Electric Co., Ltd (UL E489584)	PEDS150-HM32-4	1500V, 32A, 85°C	cURus
			Projoy Electric Co., Ltd (E489584)	PEDS150H-HM50-4F	1500V, 50A, 85°C	cURus
4	6	AC input current breaker	ZhengTai electric Co., Ltd. (UL E218757)	NB1-63-C63	277Vac, 63A, 5kA, -35-+70°C	cURus
4	7	PV terminal	NINGBO DEGSON ELECTRICAL CO.,LTD. (UL E228872)	DG2206R_7.5_2P	600Vac 41A, 105 °C	cURus
4	8	heat shrink tube	Various	Various	600V ,125°C, VW-1	cURus
4	9	All PCB	Various	Various	V-0 or better, 135°C. 2.0mm min,CTI: 175-400, totally covered with coating. Fully comply with UL94V-0	cURus
4	10	Grouding wire	Shenzhen Mingmou Technology Co., Ltd (UL E474910)	1015	10AWG 600V 105°C	cURus
4	11	AC wire	Shenzhen Mingmou Technology Co., Ltd (UL E474910)	1015	10AWG 600V 105°C	cURus
4	12	PV wire	Shenzhen Mingmou Technology Co., Ltd (UL E474910)	1015	10AWG 600V 105°C	cURus
4	13	connector	AHAHI KASEI CORP (UL E48285)	FR370	UL94V-0, 130°C Film	cURus
4	14	Fan	Ningbo ShengJiu Technology Co Ltd (UL E471112)	GPWV2	DC12V, 3W, 5300RPM, 80*80*25mm, -25~70°C	cURus
			MinebeaMitsumi Inc (UL E89936)	08025VE-12M-CLD-2	DC12V, 2.76W 5000RPM, 80*80*25mm, -25~70°C	cURus
8	15	CPU 1 on control board	Texas Instrument	TMS320F28377 SPTPT	200MHz,3.3V, -40~125°C U16	NR

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
8	16	Optocoupler on control board	NOVOSENSE (UL E500602)	NSi1050-DDBR_DUB-8	Viso: 5000Vrms, CI 6.5mm, Cr 6.5m, 125°C U8,U25	cURus
			TI (UL E181974)	ISO1050DUBR_DUB-8	Viso: 5000Vrms, CI 6.1mm, Cr 6.8m, 105°C U8,U25	cURus
8	17	Optocoupler on control board	Renesas Electronics Corporation (UL E72422)	SMT PS256 1L-1-V-F3-A-L	Viso: 5000Vrms, CI 7.0mm, Cr 7.0mm,100°C U32, U33, U35, U36, U37, U39, U73, U74, U77	cURus
			COSMO ELECTRONICS CORP (UL E169586)	K10104CTLD	Viso: 5000Vrms, CI 7.5mm, Cr 7.5mm,115°C U32, U33, U35, U36, U37, U39, U73, U74, U77	cURus
			LITEON (UL E113898)	LTV-816S-TP	Viso: 5000Vrms, CI 7.0mm, Cr 7.0mm,100°C U32, U33, U35, U36, U37, U39, U73, U74, U77	cURus
			EVERLIGHT (UL E214129)	EL817(S1)(C)(T U)-FG	Viso: 5000Vrms, CI 7.6mm, Cr 7.6mm,110°C U32, U33, U35, U36, U37, U39, U73, U74, U77	cURus
11	18	Optocoupler on com board	lite-on technology corporation (UL E113898)	LTV-816S-TP-C	Viso: 5000Vrms, CI 6.5mm, Cr 7.5mm,110°C U6, U7,U11,U12	cURus
			Renesas Electronics Corporation (UL E72422)	SMT PS256 1L-1-V-F3-A-L	Viso: 5000Vrms, CI 7.0mm, Cr 7.0mm,100°C U6, U7,U11,U12	cURus
			EVERLIGHT (UL E214129)	EL817(S1)(C)(T U)-FG	Viso: 5000Vrms, CI 7.6mm, Cr 7.6mm,110°C U6, U7,U11,U12	cURus
			COSMO ELECTRONICS CORP (UL E169586)	K10104CTLD	Viso: 5000Vrms, CI 7.5mm, Cr 7.5mm,115°C U6, U7,U11,U12	cURus
10	19	Relay on com board	Xiamen Hongfa Electroacoustic Co.,Ltd. (UL E133481)	HF32FA-005-ZS2	250Vac, 5A, 5000Vac,85°C RY1,RY2	cURus
			Panasonic Industrial Devices Sales (China) Co., Ltd (UL E43028)	DSP2a-DC5V	250Vac, 5A, 5000Vac,85°C RY1,RY2	cURus
5	20	Relay on AC board	Xiamen Hongfa Electroacoustic Co.,Ltd. (UL E134517)	HF36F/012-HST	125V 10A, 70°C,2500VA RLY5	cURus
			Panasonic Industrial Devices Sales (China) Co., Ltd (UL E43028)	ALQ312	125V 10A, 70°C,1250VA RLY5	cURus

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
5,2 3	21	Relay on AC board	Xiamen Hongfa Electroacoustic Co.,Ltd. (UL E133481)	HF167F-12-HT	400Vac 90A, 85°C,2000V RLY1,RLY2,RLY6,RLY8,RLY9,RLY10,RLY22,RLY23, RLY24,RLY25,RLY26,RLY27,RLY28,RLY29	cURus
			Panasonic Industrial Devices Sales (China) Co., Ltd. (UL E43028)	HE1aN-W-DC12V-Y6H	800Vac 90A, 85°C,2000V RLY1,RLY2,RLY6,RLY8,RLY9,RLY10,RLY22,RLY23, RLY24,RLY25,RLY26,RLY27,RLY28,RLY29	cURus
			Dong Guan Churod Electronics Co.,Ltd. (UL E341422)	CHAR-112A200	830Vac,200A,85°C, 6000V RLY2,RLY4,RLY6,RLY8	cURus
			GD-R Corporation (UL E321783)	G95-7-12DSF	830Vac,200A,85°C, 5000V RLY2,RLY4,RLY6,RLY8	cURus
5	22	Y capacitor on AC board	SHENZHEN SHI HONGSHUNYUAN TECHNOLOGY CO LTD (UL E481614)	CE	Y2:300VAC, 10nF -25~125°C C7, C8, C18, C21, C28, C29 ,C92, C93, C97, C98, C112 , C113,C84,C83	cURus
5	23	X Capacitor on AC board	SHENZHEN SHI HONGSHUNYUAN TECHNOLOGY CO LTD (UL E484578)	HMKP474K310 NFAD	X2, 470nF, 310Vac, -40-110°C C95, C96, C106, C110	cURus
			DONG GUAN HONGFARAD ELECTRONICS CO LTD (UL E484578)	HMKP474K310 NFAD	X2, 470nF, 310Vac, -40-110°C C95, C96, C106, C110	cURus
6	24	Fuse- battery for 48V series	ADLER Elektrotechnik Xi'an Co. Ltd (UL E485737)	AEY3250900	70V 300A, interrupting 2500A, 125°C	cURus
			ADLER Elektrotechnik Xi'an Co. Ltd. (E485737)	AEY3300900	70V 300A, interrupting 2500A, 125°C	cURus
			Zhejiang DongYa Electronic Co.,LTD (UL E357198)	BCPS4DS400-22401	80V,400A,interrupting 5000A,85°C	cURus
5	25	FUSE for MOV (not shown)	Xiamen SET Electronics Co.,Ltd. (UL E214712)	CAH0412501	5A/250Vac,7.0*2.7*6.6,125°C F1,F2,F3,F4,F5	cURus
5	26	MOV on AC board	Brightking (UL E327997)	102KD20	1000VDC, 6.5kA,-40°C ~ 105°C MOV1, MOV2, MOV3, MOV4, MOV5,MOV6, MOV7, MOV8, MOV9, MOV10	cURus
			Xiamen SET Electronics Co., Ltd. (UL E322662)	MOV20D102KT	1000V, 10KA ,-40°C ~ 85°C MOV1, MOV2, MOV3, MOV4, MOV5,MOV6, MOV7, MOV8, MOV9, MOV10	cURus

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
			Brightking (E327997)	821KM(E.N)20	820V 10KA -40~85°C MOV1, MOV2, MOV3, MOV4,MOV5,MOV6, MOV7, MOV8,MOV9, MOV10	cURus
5	27	capability	SamYoung Electronics Co.,Ltd.	TDC400VS1000M	400V,1000uF, -25-105°C C6, C7, C8, C10, C21, C22,C28, C51, C56, C57, C60, C109, C110, C113	NR
			AISHI	ELH2GM102R500T	400V,1000uF, -25-105°C C6, C7, C8, C10, C21, C22,C28, C51, C56, C57, C60, C109, C110, C113	NR
			JiangHai	ECS2GSF102M350060	400V,1000uF, -40-105°C C6, C7, C8, C10, C21, C22,C28, C51, C56, C57, C60, C109, C110, C113	NR
5	28	capability	SamYoung Electronics Co.,Ltd.	NFA450VB100M	450V,100uF, -25-105°C C90	NR
			AISHI	EWB2WM101M350T	450V,100uF, -25-105°C C90	NR
			JiangHai	ECR2WQX101M180040	450V,100uF, -40-105°C C90	NR
5	29	capability	HUNAN AIHUA GROUP CO.,LTD.	EHL2JM680M400T	68uF, 550V, -25°C-105°C C248	NR
5	30	capability	SamYoung Electronics Co., Ltd.	NXA100VBSN220M	220uF, 100V, -20-105°C C200	NR
			AISHI	EWB1KM102M400T	220uF, 100V, -20-105°C C200	NR
			JiangHai	ECR2ANH221M180035	220uF, 100V, -20-105°C C200	NR
7	31	IGBT- INV Circuit	Wuxi NCE Power Co., Ltd	NCE60TD65BT	650V, 60A, 1.7V -55~+175°C (Q15,Q16,Q28,Q29,Q42,Q43,Q44,Q46)	NR
			HuaRunWei Electronics Co., Ltd	CRG60T60AK3HD	600V, 60A, 1.85V -40~+175°C (Q15,Q16,Q28,Q29,Q42,Q43,Q44,Q46)	NR
			ST	STGWA60H65DFB	650V, 60A, 1.6V -40~+175°C (Q15,Q16,Q28,Q29,Q42,Q43,Q44,Q46)	NR
			Onsemi	NGTB60N65FL2	650V, 60A, 1.64V -40~+175°C (Q15,Q16,Q28,Q29,Q42,Q43,Q44,Q46)	NR
			ROHM Co., Ltd.	RGWSX2TS65D	650V, 60A, 1.60V -40~+175°C (Q15,Q16,Q28,Q29,Q42,Q43,Q44,Q46)	NR

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
			Infineon	IKW75N65EH5	650V, 75A, 1.65V -40~+175°C (Q15,Q16,Q28,Q29,Q42,Q43,Q44,Q46)	NR
7	32	IGBT- INV Circuit	Wuxi NCE Power Co., Ltd	NCE50TD120VT	1200V, 50A, 1.7V -55~+175°C Q19,Q20,Q32,Q33,Q47,Q48,Q55,Q56	NR
			Onsemi	NGTB50N120FL	1200V, 50A, 2.2V -55~+175°C Q19,Q20,Q32,Q33,Q47,Q48,Q55,Q56	NR
			HuaRunWei Electronics Co., Ltd	CRG50T120AX3	1200V, 50A, 1.92V -55~+175°C Q19,Q20,Q32,Q33,Q47,Q48,Q55,Q56	NR
			Infineon	IKQ50N120CH3	1200V, 50A 2V -40~+175°C Q19,Q20,Q32,Q33,Q47,Q48,Q55,Q56	NR
			ST	STGYA50M120D	1200V, 50A, 1.7V -55~+175°C Q19,Q20,Q32,Q33,Q47,Q48,Q55,Q56	NR
7	33	IGBT- DC Circuit	Wuxi NCE Power Co., Ltd	NCE40TD120VT	1200V, 40A, 1.85V -40~+175°C (Q1, Q2, Q3, Q4, Q8, Q9, Q10, Q11)	NR
			ST	STGWA40H120DF	1200V, 40A, 2.1V -55~+175°C (Q1, Q2, Q3, Q4, Q8, Q9, Q10, Q11)	NR
			HuaRunWei Electronics Co., Ltd	CRG40T120AK3	1200V, 40A, 1.9V -40~+175°C (Q1, Q2, Q3, Q4, Q8, Q9, Q10, Q11)	NR
			ROHM Co., Ltd.	RGS80TSX2DHF	1200V, 40A, 1.7V -40~+175°C (Q1, Q2, Q3, Q4, Q8, Q9, Q10, Q11)	NR
			Onsemi	FGH40T120SMD	1200V, 40A, 1.8V -55~+175°C (Q1, Q2, Q3, Q4, Q8, Q9, Q10, Q11)	NR
			Infineon	IKW40N120H3	1200V, 40A, 2.05V -40~+175°C (Q1, Q2, Q3, Q4, Q8, Q9, Q10, Q11)	NR

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
7	34	IGBT- DC Circuit	Wuxi NCE Power Co., Ltd	NCE40TD120V T	1200V, 25A, 1.7V -55~+175°C Q5, Q12, Q6, Q7, Q21, Q22	NR
			Onsemi	NGTB25N120FL	1200V, 25A, 1.5V -55~+175°C Q5, Q12, Q6, Q7, Q21, Q22	NR
			ROHM Co., Ltd.	RGS50TSX2DHI	1200V, 25A, 1.7V -40~+175°C Q5, Q12, Q6, Q7, Q21, Q22	NR
			Infineon	IKW25N120H3	1200V, 25A, 2.05V -40~+175°C Q5, Q12, Q6, Q7, Q21, Q22	NR
			Infineon	IKW40N120H3	1200V, 40A, 1.7V -40~+175°C Q5, Q12, Q6, Q7, Q21, Q22	NR
			ST	STGW25H120D F2	1200V, 25A, 2.1V -55~+175°C Q5, Q12, Q6, Q7, Q21, Q22	NR
			HuaRunWei Electronics Co., Ltd	STGWA25H120I	1200V, 25A, 2.1V -55~+175°C Q5, Q12, Q6, Q7, Q21, Q22	NR
3	35	gasket	SAND PROFILE (SUZHOU) CO LTD (UL MH49297)	S6074	EPDM,Suitable for UL 50E Type 4X	cURus
4	36	terminal	SHENZHEN CONNECTION ELECTRONIC CO LTD (UL E304128)	DRTB35、 DRT B6	800V,125A,18~2AWG,-40~120°C	cURus
5	37	Transformer on AC board	RUINUO Electronic Technology Co., Ltd	ER3542	37.5*29*45mm,180uH_±5%,105°C T5	See 5.0
14	38	Transformer on Transformer board	RUINUO Electronic Technology Co., Ltd	EE7031	61*72*73.5mm,475uH_0%,105°C T1, T2,T3	See 5.0
6	39	Transformer on IGBT board	RUINUO Electronic Technology Co., Ltd	EE16	17.5*14.5*17.5mm,950uH_±0%,105°C T7, T8, T10, T11, T14, T15	See 5.0
5	40	Transformer on AC board	RUINUO Electronic Technology Co., Ltd	EC28-T9	31*23.5*36.5mm,26uH_±5%,105°C T9	See 5.0
5	41	Transformer on AC board	RUINUO Electronic Technology Co., Ltd	ER3542-PV	31*23.5*36.5mm,220uH_±10%,105°C T12	See 5.0
15	42	Inductor-INV	RUINUO Electronic Technology Co., Ltd	NPF226060	302uH,180°C	NR

4.0 Critical Components						
Photo #	Item no. ¹	Name	Manufacturer/ trademark ²	Type / model ²	Technical data and securement means	Mark(s) of conformity ³
15	43	Inductor-BUS	RUINUO Electronic Technology Co., Ltd	NPF158060	881.5uH,180°C	NR
5	44	Inductor on AC board	RUINUO Electronic Technology Co., Ltd	ZHBAYT5002M DDNPF158060	2800uH,180°C	NR
5	45	Inductor on AC board	RUINUO Electronic Technology Co., Ltd	LuHuan T24*24*16	410uH,180°C	NR
15	46	Inductor-PV	RUINUO Electronic Technology Co., Ltd	NPH226060	1095uH,180°C	NR
3	47	insulation paper	SHENZHEN BORN SUN INDUSTRIAL CO LTD (UL E256822)	BN-ZD16, BN-ZD19	Min Thk 0.25mm, V-0, 115°C	cURus
3	48	flat cable	Yong Hao Electrical Industry Co., Ltd (UL 240426)	UL1007	24AWG,300V,80°C	cURus
			SHENZHEN YIMEITE ELECTRIC CABLE CO LTD (UL E318342)	UL1007	24AWG,300V,80°C	cURus
			ShenZhen Dingyu Electrical Technology Co Ltd (UL E365432)	UL1007	24AWG,300V,80°C	cURus
			SHENZHEN SHU NJIA ELECTRICAL TECHNOLOGY CO LTD	UL1007	24AWG,300V,80°C	cURus
22	49	AC Side Switch	Zhejiang DongYa Electronic Co.,LTD (UL E357198)	BCPS2AM200-22403	240V,400A,interrupting 5000A,85°C	cURus

NOTES:

1) Not all item numbers are indicated (called out) in the photos, as their location is obvious.

2) "Various" means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used.

3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and only visual examination is necessary. "See 5.0" indicates Unlisted components or assemblies to be evaluated periodically refer to section 5.0 for details.

5.0 Critical Unlisted CEC Components

INSULATED COIL

Photo #	Item no.	Name	Manufacturer/Trademark	Type / model
5	37	Transformer on AC board	RUINUO Electronic Technology Co., Ltd	ER3542

Electrical Rating:	--	Insulation class	105
--------------------	----	------------------	-----

Component Standard used: Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3+R:19May2023]
Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4+U1]

MATERIALS LIST (refer to illustration 5 for assembly drawing)

Component	Manufacturer	Type/model	Dimensions/thickness/assembly information
Core	SHENZHEN JISHENG MAGNETIC MATERIAL CO LTD	ER3644	PC44
Bobbin	EIDUPONTDENE MOURS&COINC (UL E69578)	PET FR530L(f1)	130°C
Wire	SHENGANG(SHANTOU)ELECTRIC AL INDUSTRIAL CO.,LTD (UL E239508)	UEW	155°C
Insulation tape	JINGJIANG YAHUA ELECTRONICS TECHNOLOGY CO LTD (UL E165111)	PF-301	180°C
Varnish	ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD (UL E335405)	E962	130°C
Glue	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD (UL E218090)	E-500	130°C

5.0 Critical Unlisted CEC Components

Tube	DONGGUAN LING FREE HARDWARE PLASTICS PRODUCT CO LTD (UL E352366)	LING FREE PTFE	300V,200°C
Shield	SHENZHEN JINDONG RUNFA TECHNOLGY CO., LTD	COPPER	180°C

WINDING(S) RESISTANCE

Winding Designation	Wire Size (mm ²)	Wire Type	Turns	Volts	Amps	DC resistance (Ω) +/- 10%:
N1	Ø0.5*4P	2UEW-F	14	--	--	--
N2	Ø0.5*2P	2UEW-F	6	--	--	--
N3	Ø0.5*5P	2UEW-F	22	--	--	--
N4	Ø0.5*1P	2UEW-F	32	--	--	--
N5	Ø0.5*4P	2UEW-F	14	--	--	--

VERIFICATION PROCESS

Frequency: Annual	Test Site: CEC	Number of samples to test: 1	
Test Name	Test Parameters		
Winding resistance	See resistance per winding above.		
Dielectric Strength	Apply voltage Between	Test Voltage	Test Time
	Primary to core	1480V	60S
	Primary to secondary	1480V	60S
	Secondary to core	500V	60S

INSULATED COIL

Photo #	Item no.	Name	Manufacturer/Trademark	Type / model
14	38	Transformer on Transformer board	RUINUO Electronic Technology Co., Ltd	EE7031
Electrical Rating: --			Insulation class 105	

Component Standard used: Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3+R:19May2023]
Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4+U1]

MATERIALS LIST (refer to illustration 5a & 5b for assembly drawing)

Component	Manufacturer	Type/model	Dimensions/thickness/assembly information
Core	NANJING NEW CONDA MAGNETIC INDUSTRIAL CO LTD	EE7031	PC44
Wire	SHENGANG(SHANTOU)ELECTRIC AL INDUSTRIAL CO.,LTD (UL E239508)	UEW	155°C

5.0 Critical Unlisted CEC Components

Insulation tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD (UL E188295)	JY312#	155°C
Margen tape	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD (UL E246950)	WF310(A)	130°C
Varnish	ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD (UL E335405)	E962	130°C
Glue	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD (UL E218090)	E-500	130°C
Tube	DONGGUAN LING FREE HARDWARE PLASTICS PRODUCT CO LTD (UL E352366)	LING FREE PTFE	300V,200°C

WINDING(S) RESISTANCE

Winding Designation	Wire Size (mm ²)	Wire Type	Turns	Volts	Amps	DC resistance (Ω) +/- 10%:
N1	ø0.30*42*3P	copper foil	3	--	--	--
N2	ø0.2*200P*2	UEW	10	--	--	--

5.0 Critical Unlisted CEC Components			
VERIFICATION PROCESS			
Frequency: Annual	Test Site: CEC		Number of samples to test: 1
Test Name	Test Parameters		
Winding resistance	See resistance per winding above.		
Dielectric Strength	Apply voltage Between	Test Voltage	Test Time
	Primary to core	2100V	60S
	Primary to secondary	2100V	60S
	Secondary to core	500V	60S

INSULATED COIL				
Photo #	Item no.	Name	Manufacturer/Trademark	Type / model
6	39	Transformer on IGBT board	RUINUO Electronic Technology Co., Ltd	EE16
Electrical Rating: --				Insulation class 105
Component Standard used: Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3+R:19May2023] Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4+U1]				

MATERIALS LIST (refer to illustration 5c for assembly drawing)			
Component	Manufacturer	Type/model	Dimensions/thickness/assembly information
Core	SHENZHEN JISHENG MAGNETIC MATERIAL CO LTD	EE16	PC40
Bobbin	CHANG CHUN PLASTICS CO LTD (UL E59481)	T375J	150°C
Wire	SHENGANG(SHANTOU)ELECTRIC AL INDUSTRIAL CO.,LTD (UL E239508)	UEW	155°C
Insulation tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD (UL E188295)	JY313#	130°C
	XINYU SHENGDAFENG ELECTRIC MATERIAL CO LTD (UL E317896)	SDF-312	130°C

5.0 Critical Unlisted CEC Components

Margen tape	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD (UL E246950)	WF310(A)	130°C
Varnish	ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD (UL E335405)	E962	130°C
Glue	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD (UL E218090)	E-500	130°C

WINDING(S) RESISTANCE

Winding Designation	Wire Size (mm ²)	Wire Type	Turns	Volts	Amps	DC resistance (Ω) +/- 10%:
N1	Ø0.3*1P	UEW	35	--	--	--
N2	Ø0.3*1P	UEW	35	--	--	--
N3	Ø0.3*1P	UEW	35	--	--	--

VERIFICATION PROCESS

Frequency: Annual	Test Site: CEC	Number of samples to test: 1	
Test Name	Test Parameters		
Winding resistance	See resistance per winding above.		
Dielectric Strength	Apply voltage Between	Test Voltage	Test Time
	Primary to core	500V	60S
	Primary to secondary	500V	60S
	Secondary to core	500V	60S

INSULATED COIL

Photo #	Item no.	Name	Manufacturer/Trademark	Type / model
5	40	Transformer on AC board	RUINUO Electronic Technology Co., Ltd	EC28-T9
Electrical Rating: --				Insulation class 105

Component Standard used: Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3+R:19May2023]
Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4+U1]

MATERIALS LIST (refer to illustration 5d & 5e for assembly drawing)

Component	Manufacturer	Type/model	Dimensions/thickness/assembly information
Core	SHENZHEN JISHENG MAGNETIC MATERIAL CO LTD	ER2834	PC44

5.0 Critical Unlisted CEC Components			
Bobbin	CHANG CHUN PLASTICS CO LTD (UL E59481)	T375J	150°C
Wire	SHENGANG(SHA NTOU)ELECTRIC AL INDUSTRIAL CO.,LTD (UL E239508)	UEW	155°C
Insulation tape	SUZHOU MAILADUONA ELECTRIC MATERIAL CO LTD (UL E188295)	JY313#	130°C
	XINYU SHENGDAFENG ELECTRIC MATERIAL CO LTD (UL E317896)	SDF-312	130°C
Margen tape	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD (UL E246950)	WF310(A)	130°C

5.0 Critical Unlisted CEC Components

Tube	DONGGUAN LING FREE HARDWARE PLASTICS PRODUCT CO LTD (UL E352366)	LING FREE PTFE	300V,200°C
------	--	----------------	------------

WINDING(S) RESISTANCE

Winding Designation	Wire Size (mm ²)	Wire Type	Turns	Volts	Amps	DC resistance (Ω) +/- 10%:
N1	Ø0.5*4P	2UEW-F	7	--	--	--
N2	Ø0.5*4P	2UEW-F	7	--	--	--
N3	Ø0.5*4P	2UEW-F	3	--	--	--
N4	Ø0.5*3P	2UEW-F	4	--	--	--
N5	Ø0.3*1P	2UEW-F	7	--	--	--
N6	Ø0.15*4P	2UEW-F	7	--	--	--
N7	Ø0.5*4P	2UEW-F	7	--	--	--

VERIFICATION PROCESS

Frequency: Annual	Test Site: CEC	Number of samples to test: 1	
Test Name	Test Parameters		
Winding resistance	See resistance per winding above.		
Dielectric Strength	Apply voltage Between	Test Voltage	Test Time
	Primary to core	500V	60S
	Primary to secondary	500V	60S
	Secondary to core	500V	60S

INSULATED COIL

Photo #	Item no.	Name	Manufacturer/Trademark	Type / model
5	41	Transformer on AC board	RUINUO Electronic Technology Co., Ltd	ER3542-PV
Electrical Rating: --			Insulation class 105	

Component Standard used: Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3+R:19May2023]
Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4+U1]

MATERIALS LIST (refer to illustration 5f & 5G for assembly drawing)

Component	Manufacturer	Type/model	Dimensions/thickness/assembly information
Core	SHENZHEN JISHENG MAGNETIC MATERIAL CO LTD	ER3542	PC44
Bobbin	EIDUPONTDENE MOURS&COINC (UL E69578)	PET FR30L(f1)	130°C
Wire	SHENGANG(SHA NTOU)ELECTRIC AL INDUSTRIAL CO.,LTD (UL E239508)	UEW	155°C

5.0 Critical Unlisted CEC Components

Insulation tape	JINGJIANG YAHUA ELECTRONICS TECHNOLOGY CO LTD (UL E165111)	PF-301	180°C
Margen tape	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD (UL E246950)	WF310(A)	130°C
Varnish	ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD (UL E335405)	E962	130°C
Glue	DONGGUAN EATTO ELECTRONIC MATERIAL CO LTD (UL E218090)	E-500	130°C
Tube	DONGGUAN LING FREE HARDWARE PLASTICS PRODUCT CO LTD (UL E352366)	LING FREE PTFE	300V,200°C
Shield	SHENZHEN JINDONG RUNFA TECHNOLGY CO., LTD	COPPER	180°C

WINDING(S) RESISTANCE

Winding Designation	Wire Size (mm ²)	Wire Type	Turns	Volts	Amps	DC resistance (Ω) +/- 10%:
N1	ø0.5*4P	2UEW-F	15	--	--	--
N2	ø0.5*2P	2UEW-F	7	--	--	--
N3	ø0.5*5P	2UEW-F	26	--	--	--
N4	ø0.5*4P	2UEW-F	15	--	--	--

5.0 Critical Unlisted CEC Components			
VERIFICATION PROCESS			
Frequency: Annual	Test Site: CEC		Number of samples to test: 1
Test Name	Test Parameters		
Winding resistance	See resistance per winding above.		
Dielectric Strength	Apply voltage Between	Test Voltage	Test Time
	Primary to core	2100V	60S
	Primary to secondary	2100V	60S
	Secondary to core	500V	60S

6.0 Critical Features

Recognized Component - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.

Listed Component - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.

Unlisted Component - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.

Critical Features/Components - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.

Construction Details - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.

1. **Spacing** - between uninsulated live parts and the walls of the metal enclosure is 12.7 mm through air and 12.7 mm over surfaces
Spacing - between a) uninsulated live parts of opposite polarity; b) uninsulated live parts and low voltage isolated circuits, uninsulated grounded parts other than the enclosure- 9.5 mm minimum spacing are maintained through air and 12.7 mm minimum spacing at field wiring terminals.
Spacing - between a) uninsulated live parts of opposite polarity; b) uninsulated live parts and low voltage isolated circuits, uninsulated grounded parts other than the enclosure and field wiring terminals- 3.0 mm minimum spacing are maintained through air and 5.0 mm minimum spacing
Spacing-between uninsulated live parts and low voltage isolated circuits, uninsulated grounded parts other than the enclosure on PCB is 3.0 mm minimum spacing are maintained through air, 3.0 mm minimum spacing are maintained over surfaces
2. **Mechanical Assembly** - Components such as switches, fuseholders, connectors, wiring terminals and display lamps are mounted and prevented from shifting or rotating by the use of lockwashers, starwashers, or other mounting format that prevents turning of the component.
3. **Corrosion Protection** - All ferrous metal parts are protected against corrosion by painting, plating or the equivalent.
4. **Accessibility of Live Parts** - All uninsulated live parts in primary circuitry are housed within a metal enclosure constructed with no openings other than those specifically described in Sections 4 and 5.
5. **Grounding** - All exposed dead-metal parts and all dead-metal parts within the enclosure that are exposed are connected to the the equipment grounding terminal.
6. **Internal Wiring** - Internal wiring is routed away from sharp or moving parts. Internal wiring leads terminating in soldered connections are made mechanically secure prior to soldering. Recognized Component separable (quick disconnect) connectors of the positive detent type, closed loop connectors, or other types specifically described in the text of this report are also acceptable as internal wiring terminals. At points where internal wiring passes through metal walls or partitions, the wiring insulation is protected against abrasion or damage by plastic bushings or grommets. All wiring is minimum 24 AWG, with a minimum rating of 300V, 80°C.
7. **Schematics** - Refer to Illustration No.3 to No.3c. for schematics requiring verification during Field Representative Inspection Audits.
8. **PCB layout** - Refer to Illustration No.4 to No.4c for PCB layout requiring verification during Field Representative Inspection Audits.
9. **Markings** - The product is marked on a labeling system as described in item no.4 of Section 4.0 or by molding into polymeric enclosure as follows:
Applicant's name or brand name
Product name(Grid Support Utility Interactive Inverter)
Model number
electrical ratings
date of manufacturer: (the manufacturing date be included in series number, for example SR-2401030049-301504-T01. From Fourth to ninth bit, the 24 denotes the year,01 denotes the month,03 denotes the day.
Note: The contents within brackets are the explanation only and need not be marked on the product.
10. **Cautionary Markings** - The following are required: refer to Illustration No.1 for details.

6.0 Critical Features

11. Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the manufacturer. Refer to Illustration No. 6 to 6g for details.
12. Software in Programmable Components - The software was evaluated and complies with the standard UL1998 Software in Programmable Components.
Firmware information as below:
main CPU:
TI TMS320F28377S, softwareID: HESP48120U200H_V8.32,
Checksum:0xA491, release date: 2023-12-07.

Secondary CPU:
TMS320F28027, softwareID: HESP48120U200H_Aux_1.05,
Checksum: 0xB457, release date:2023-04-03.

7.0 Illustrations

Illustration 1 - Markings of English and French

CAUTION!  The product is indoor and outdoor product, The machine has strong electricity, and non professionals are forbidden to touch.	ATTENTION !  Le produit est produit d'intérieur et extérieur, La machine contient de l'électricité puissante, et il est interdit aux non-professionnels de la toucher.
CAUTION!  Hot surfaces – To reduce the risk of burns. Do not touch.	ATTENTION !  Surfaces chaudes - Pour réduire le risque de brûlures. Ne pas le toucher.
CAUTION!  Risk of electric shock from energy stored in capacitor. Do not remove cover until 5 minutes after disconnecting all sources of supply.	ATTENTION !  Risque de choc électrique dû à l'énergie stockée dans le condensateur. Ne pas retirer le couvercle dans les 5 minutes suivant la déconnexion de toutes les sources d'alimentation.
WARMING: Risk Of Electric Shock – Both ac and dc voltage sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing and when the photovoltaic array is exposed to light, it supplies a dc voltage to this equipment.	AVERTISSEMENT : Risque de choc électrique - Toutes les sources d'alimentation CA et CC sont terminées à l'intérieur de cet équipement. Chaque circuit doit être déconnecté individuellement avant l'entretien et lorsque le générateur photovoltaïque est exposé à la lumière, il fournit une tension continue à cet équipement.
 The product is indoor and outdoor product The machine has strong electricity, and non professionals are forbidden to touch	 Le produit est un produit intérieur et extérieur La machine a une forte électricité, et il est interdit aux non professionnels de toucher

7.0 Illustrations

Illustration 2- rating

Specifications table			
Model	HESP4880U200-H SEI-8K-UP HEBP4880U200-H SBK-8K-UP	HESP48100U200-H SEI-10K-UP HEBP48100U200-H SBK-10K-UP	HESP48120U200-H SEI-12K-UP HEBP48120U200-H SBK-12K-UP
PV input			
Vmax PV (Vdc) (absolute Max.)	550Vdc	550Vdc	550Vdc
Isc PV (absolute Max.) (A)	37*2	37*2	37*2
Max. PV input current / strings (A)	25A *2	25A *2	25A *2
Number MPP trackers	2	2	2
Number input strings	1+1	1+1	1+1
MPPT voltage range (Vdc)	125~450Vdc	125~450Vdc	125~450Vdc
Vdc range @ full power (Vdc)	275-450 Vdc	275-450 Vdc	275-450 Vdc
P pv Max(kW)	5500W/5500W	5500W/5500W	6600W/6600W
Battery (charge/discharge)			
Battery type	Li-ion/Lead-acid		
Battery Norma Voltage (Range) (Vdc)	48V (40-60V)		
Max discharge Current(A)	230	230	270
Max charge Current(A)	200	200	200
Max charge/discharge Power(kW)	11/10.5	11/12	11/14
AC Grid (input and output)			
Normal AC Voltage (VAC)	120/240 Vac (Split Phase) 120/208Vac(Three phase)		
Frequency (Hz)	60Hz		
Max. cont. input/output current (Aac)	@240V 36.6 @208V 42.3	@240V 41.7 @208V 48.1	50
Max. cont. input/output Power (kW)	8.8	10	@240V 12 @208V 10.4
Max. cont. Apparent Power (kVA)	8.8	10	@240V 12 @208V 10.4
Power factor(adjustable)	1.0(-0.8~ +0.8)		
AC Load output (stand alone)			
Normal Voltage (L-L) (VAC)	240/208 Vac	240/208 Vac	240/208 Vac
Normal Voltage (L-O) (VAC)	120 Vac	120Vac	120Vac
Frequency (Hz)	60	60	60
Nominal Current(A)	@240V 36.6 @208V 42.3	@240V 41.7 @208V 48.1	50
Max. cont. Power (kW)	8.8	10	@240V 12 @208V 10.4
Max. cont. Apparent Power (kVA)	8.8	10	@240V 12 @208V 10.4
Power factor(adjustable)	1.0		
Others			
Ingress protection (IP)	NEMA 4X IP65		
Protective class	Class I		
Temperature (°C)	-25°C to +60°C (Derating 45°C)		
Inverter Isolation	☒ Non-isolated PV- battery- AC ☐ High frequency isolated		
Overvoltage category	OVC III (AC Main), OVC II (PV)		

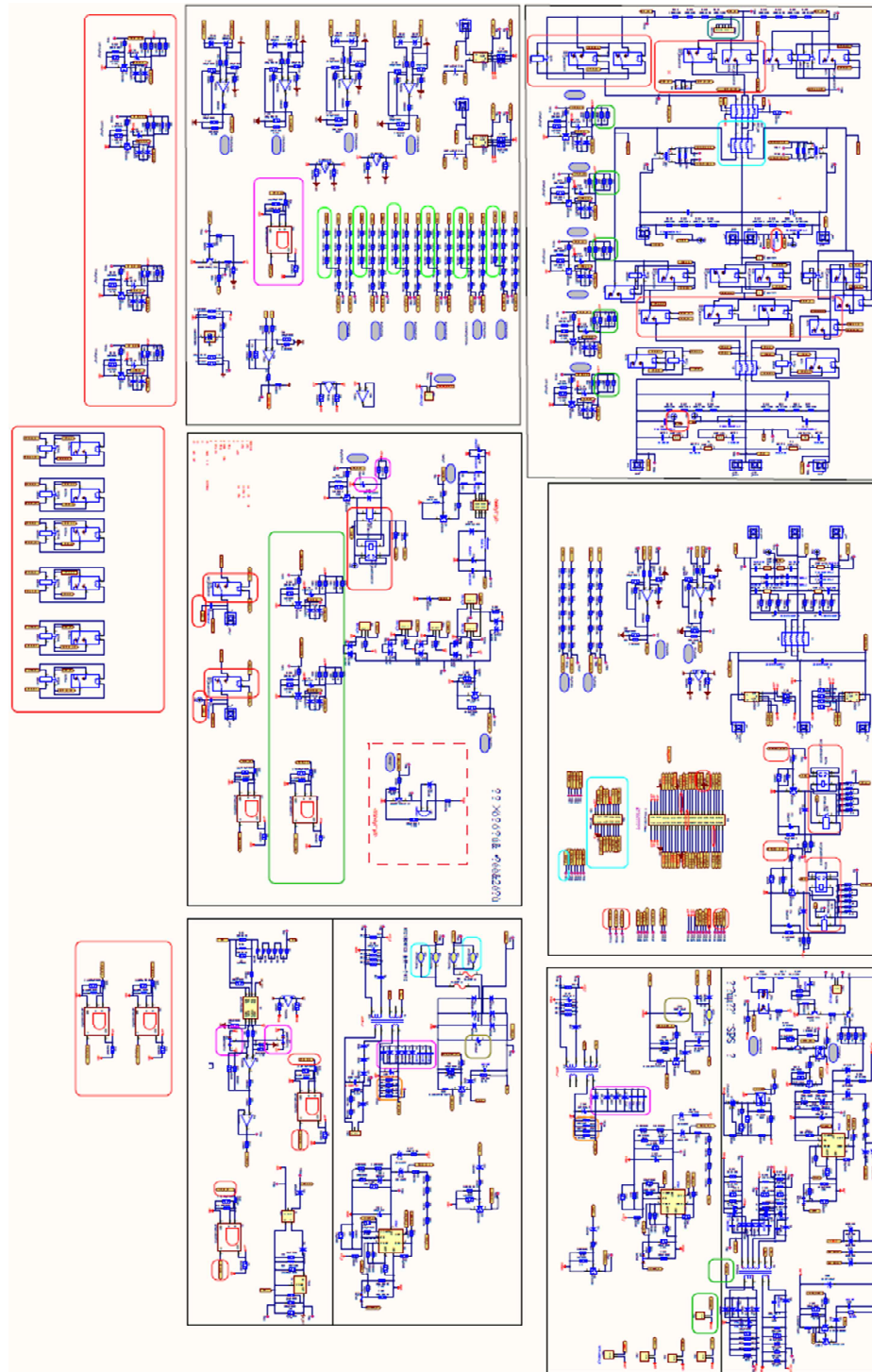
7.0 Illustrations

Illustration 2a- rating

Specifications table				
Model	HEBP4880U240-Pro SEI-8K-UPRO	HEBP48100U240-Pro SEI-10K-UPRO	HEBP48114U240-Pro SEI-11.4K-UPRO	HEBP48120U240-Pro SEI-12K-UPRO
PV input				
Vmax PV (Vdc) (absolute Max.)	550Vdc	550Vdc	550Vdc	550Vdc
Isc PV (absolute Max.) (A)	40*2	40*2	40*2	40*2
Max. PV input current / strings (A)	32A *2	32A *2	32A *2	32A *2
Number MPP trackers	2	2	2	2
Number input strings	1+1	1+1	1+1	1+1
MPPT voltage range (Vdc)	125~450Vdc	125~450Vdc	125~450Vdc	125~450Vdc
Vdc range @ full power (Vdc)	275-450 Vdc	275-450 Vdc	275-450 Vdc	275-450 Vdc
P pv Max(kW)	6.6KW/6.6KW	7.5KW/7.5KW	8.55KW/8.55KW	9KW/9KW
Battery (charge/discharge)				
Battery type	Li-ion/Lead-acid			
Battery Norma Voltage (Range) (Vdc)	48V (40-60V)			
Max discharge Current(A)	230	230	250	270
Max charge Current(A)	240	240	240	240
Max charge/discharge Power(kW)	13/10.5	13/12	13/12	13/14
AC Grid (input and output)				
Normal AC Voltage (VAC)	120/240 Vac (Split Phase) 120/208Vac(Three phase)			
Frequency (Hz)	60Hz			
Max. cont. input/output current (Aac)	@240V 36.6	@240V 41.7	@240V 47.5A	50
	@208V 42.3	@208V 48.1	@208V 50A	
Max. cont. input/output Power (kW)	8.8	10	@240V 11.4	@240V 12
			@208V 10.4	@208V 10.4
Max. cont. Apparent Power (kVA)	8.8	10	@240V 11.4	@240V 12
			@208V 10.4	@208V 10.4
Power factor(adjustable)	1.0(-0.8~ +0.8)			
AC Load output (stand alone)				
Normal Voltage (L-L) (VAC)	240/208 Vac	240/208 Vac	240/208 Vac	240/208 Vac
Normal Voltage (L-N) (VAC)	120 Vac	120Vac	120Vac	120Vac
Frequency (Hz)	60	60	60	60
Nominal Current(A)	@240V 36.6	@240V 41.7	@240V 47.5A	50
	@208V 42.3	@208V 48.1	@208V 50A	
Max. cont. Power (kW)	8.8	10	@240V 11.4	@240V 12
			@208V 10.4	@208V 10.4
Max. cont. Apparent Power (kVA)	8.8	10	@240V 11.4	@240V 12
			@208V 10.4	@208V 10.4
Power factor(adjustable)	1			
Others				
Ingress protection (IP)	NEMA 4X IP65			
Protective class	Class I			
Temperature (℃)	-25℃ to +60℃ (Derating 45℃)			
Inverter Isolation	Non-isolated PV- battery- AC High frequency isolated			
Overvoltage category	OVC III (AC Main), OVC II (PV)			

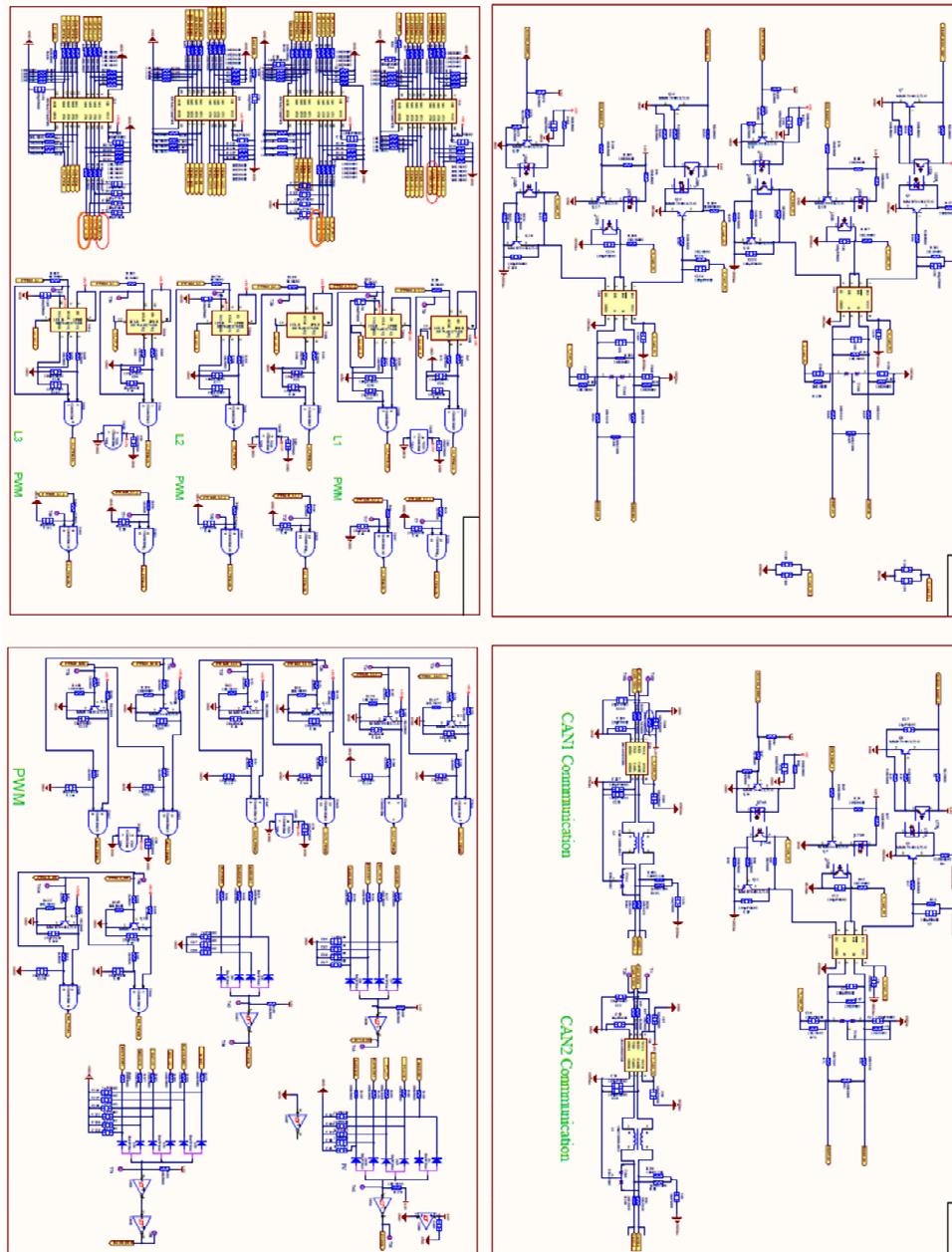
7.0 Illustrations

Illustration 3 - Schematics - AC board



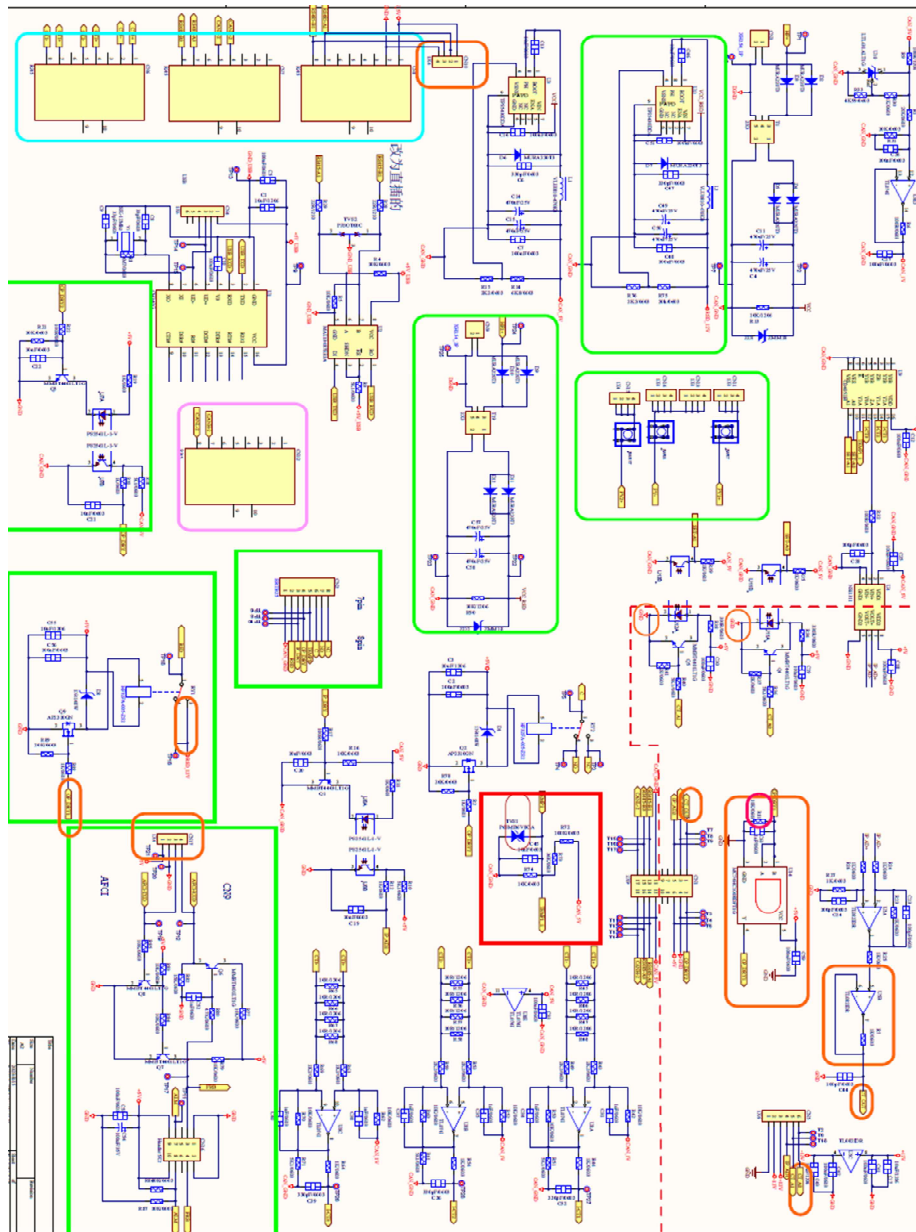
7.0 Illustrations

Illustration 3a - Schematics - Control board



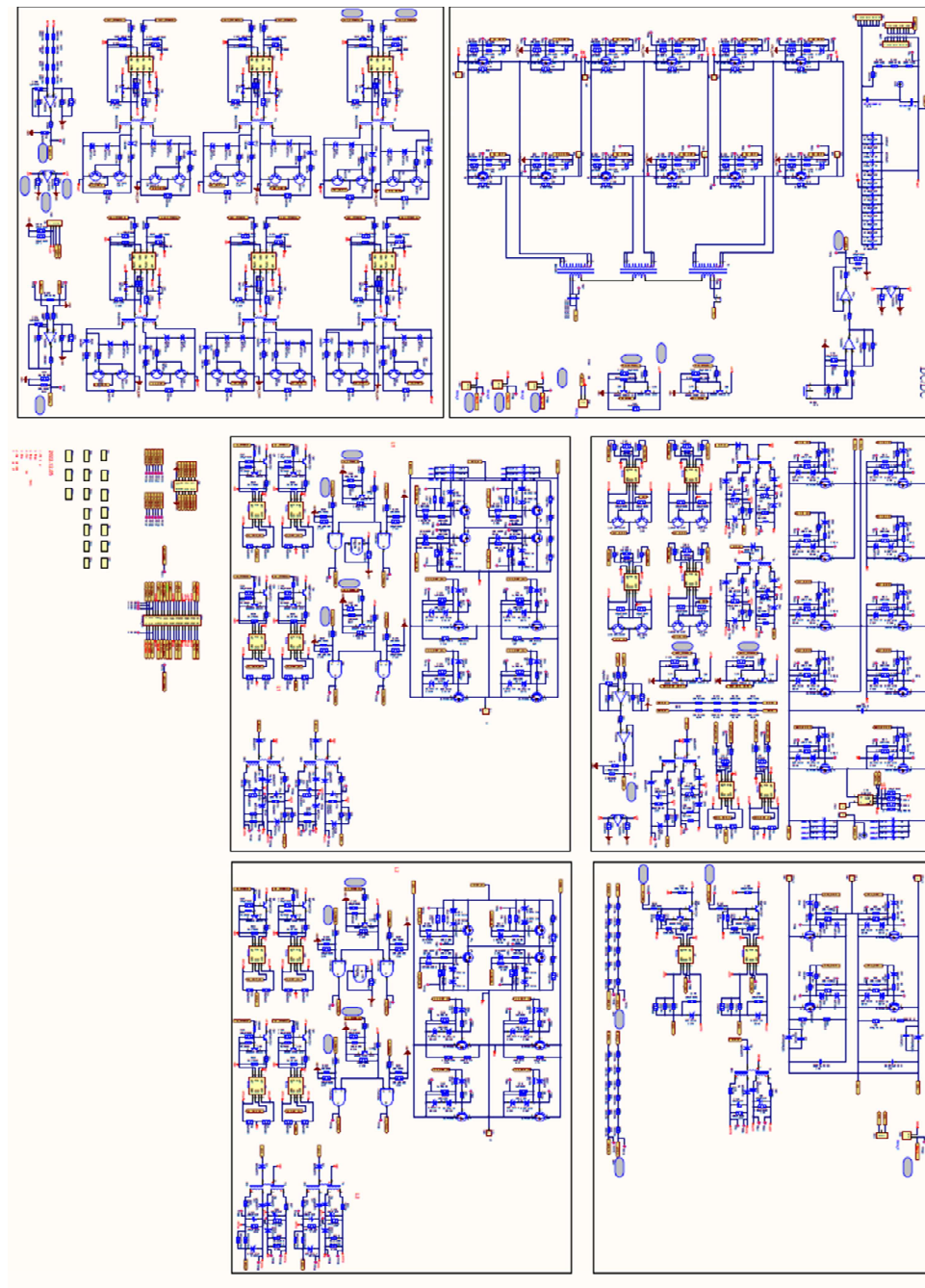
7.0 Illustrations

Illustration 3b - Schematics - Com board



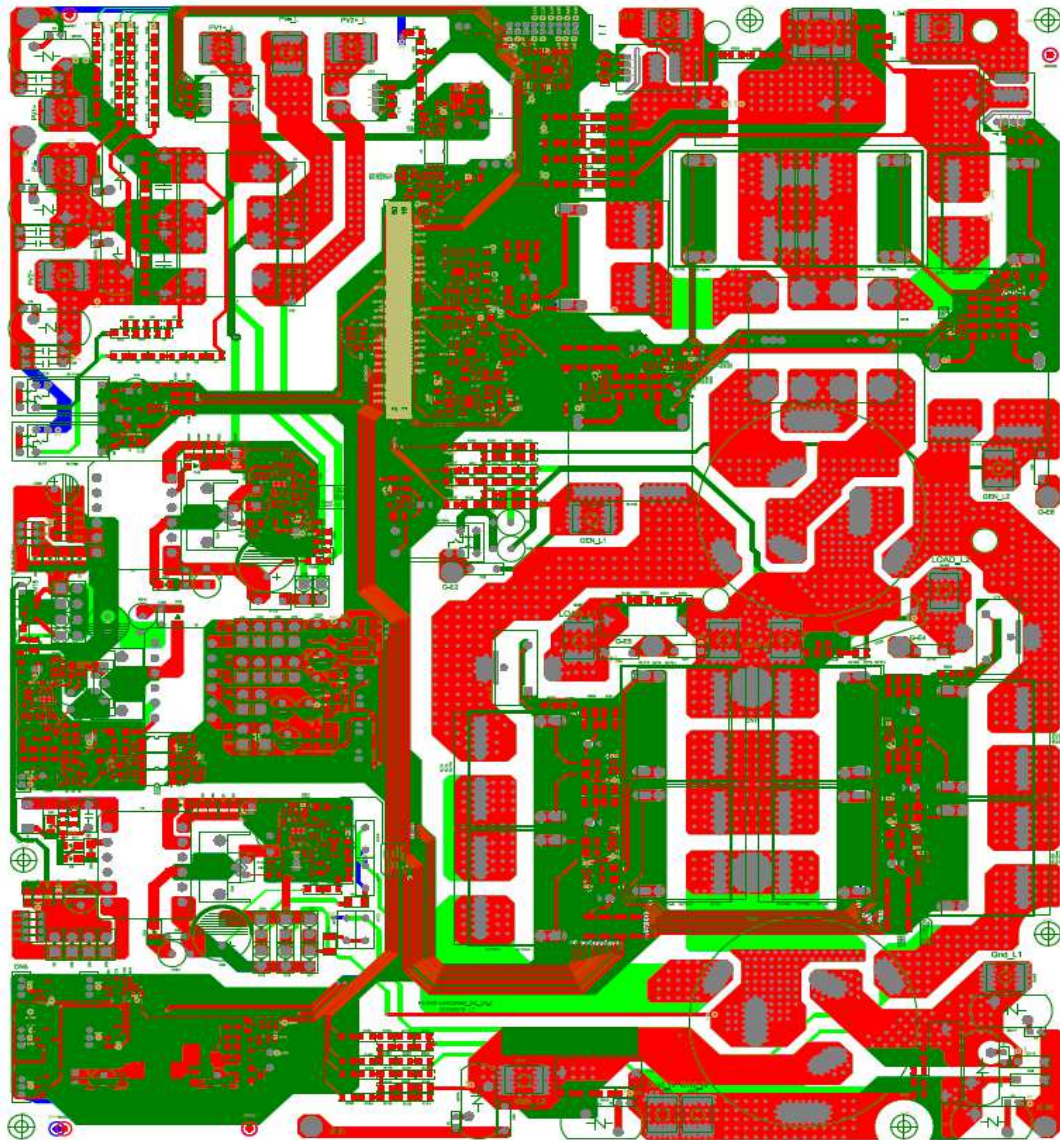
7.0 Illustrations

Illustration 3c - Schematics - IGBT board



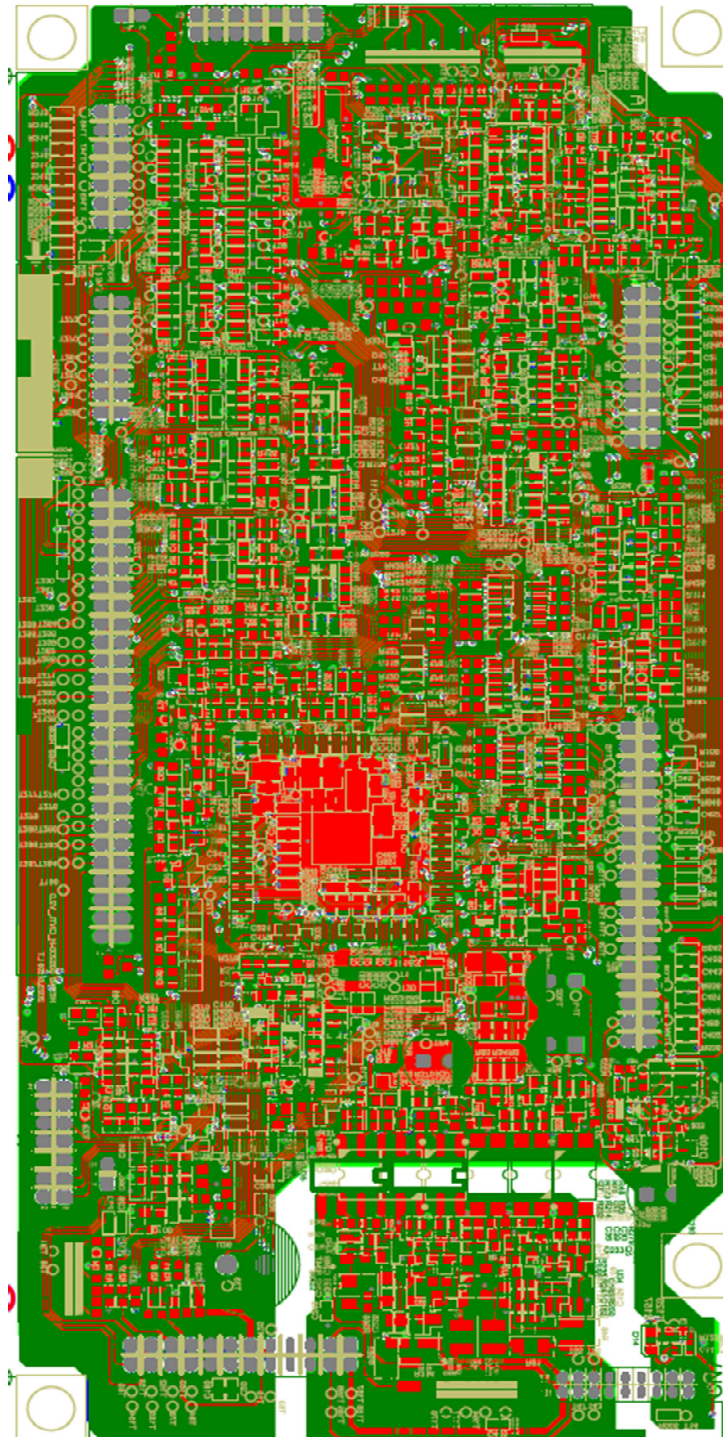
7.0 Illustrations

Illustration 4 - PCB - AC board



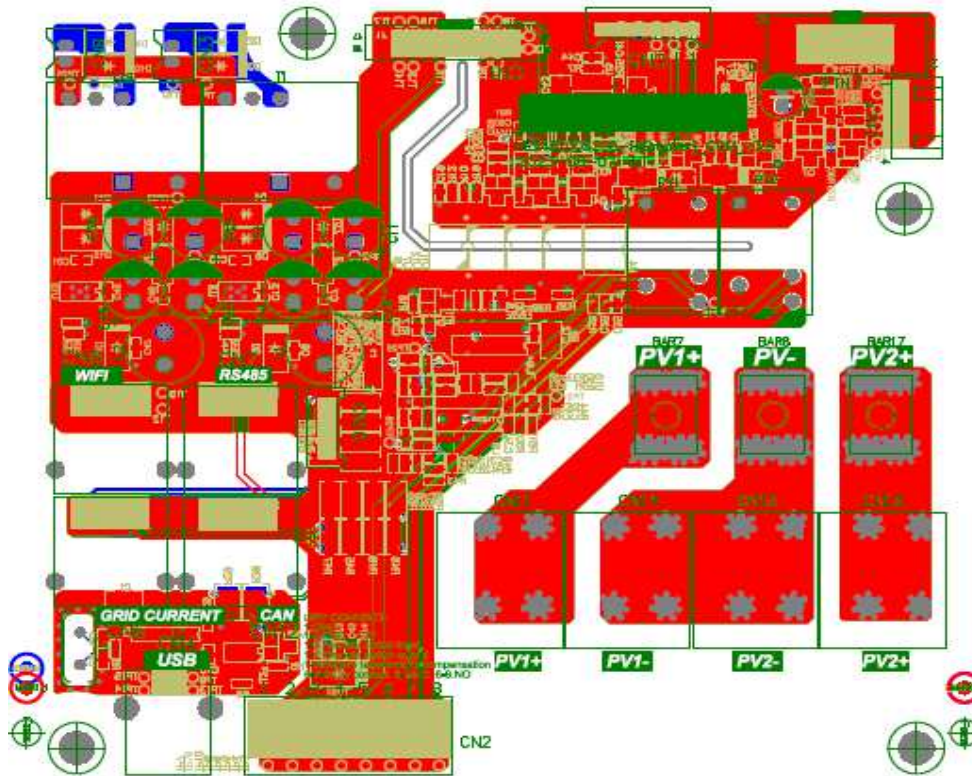
7.0 Illustrations

Illustration 4a - PCB - control board



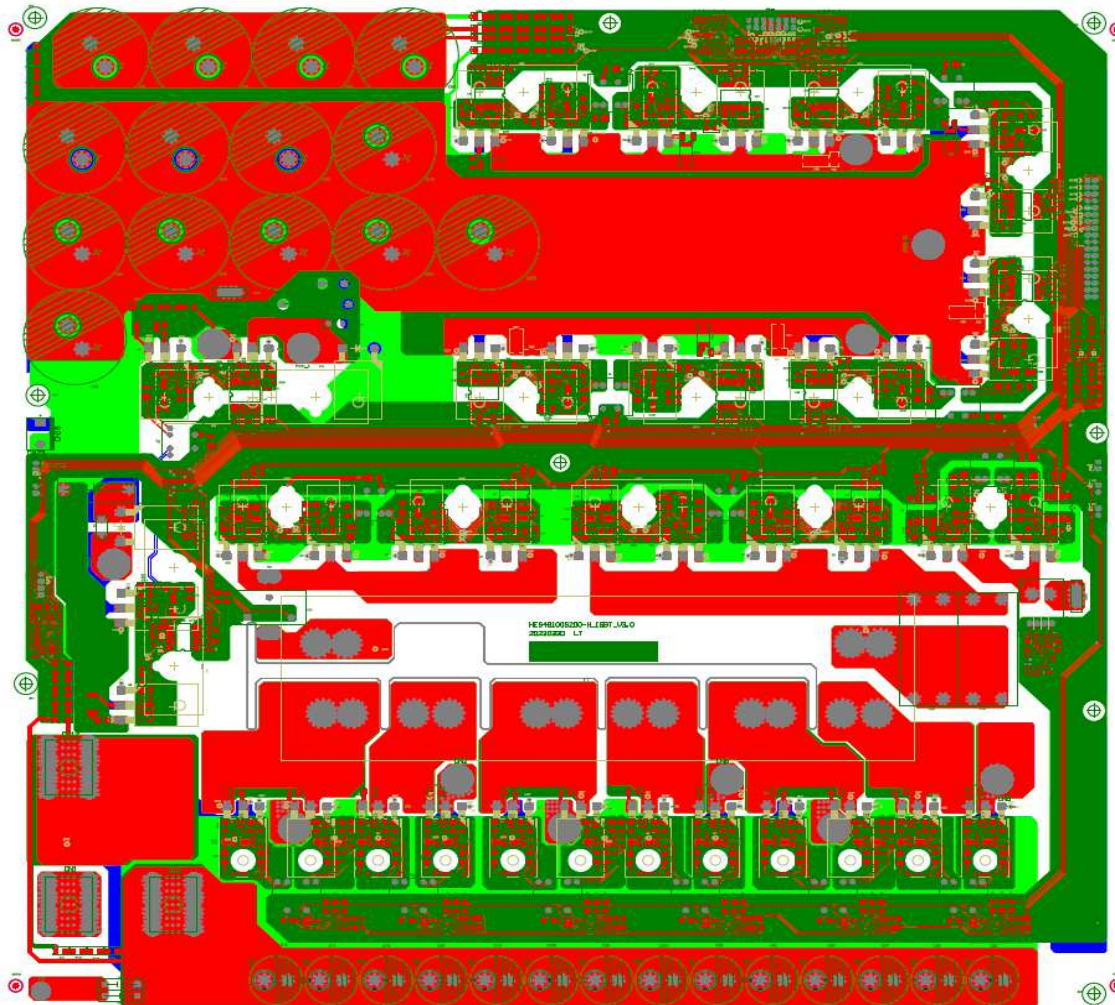
7.0 Illustrations

Illustration 4b - PCB - com board



7.0 Illustrations

Illustration 4c - PCB - IGBT board



7.0 Illustrations

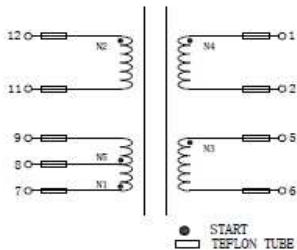
Illustration 5 - Transformer-ER3542-AC

1. 外观 (机械) 图及尺寸: CONFIGURATION&DIMENSIONS (UNIT:mm)

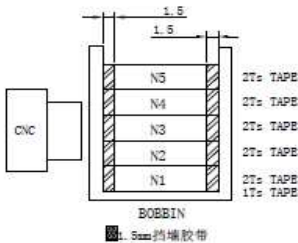
- NOTE:
- 1) 骨架针脚为全脚, PIN朝右顺时针绕制, 所有胶带为淡黄色胶带;
 - 2) 磁芯开气隙, 磁芯中柱点胶, 包3圈胶带固定;
 - 3) 产品需真空含浸, 烘干, 无铅制程, 所有材料符合ROHS要求;
 - 4) 产品磁芯顶部居中贴标签20*8, 字底朝1脚-5脚, 透明底黑字, YYWW: 年份周期。

107714
RUINUO YYWW

2. 电气原理图/SCHEMATIC



3. 绕组结构图/WINDING



4. 绕线结构表/WINDING STRUCTURE

WDG	TERMINAL	WIRE SIZE	TURN	TAPE	MARGIN TAPE		REMARKS
		打底	*	1	*	*	*****
N1	7-8	2UEW-F $\phi 0.5 \times 4P$	14	2	1.5	1.5	密绕
N2	12-11	2UEW-F $\phi 0.5 \times 2P$	6	2	1.5	1.5	疏绕
N3	5-6	2UEW-F $\phi 0.5 \times 5P$	22	2	1.5	1.5	密绕
N4	1-2	2UEW-F $\phi 0.5 \times 1P$	32	2	1.5	1.5	密绕+疏绕
N5	8-9	2UEW-F $\phi 0.5 \times 4P$	14	2	1.5	1.5	密绕+疏绕

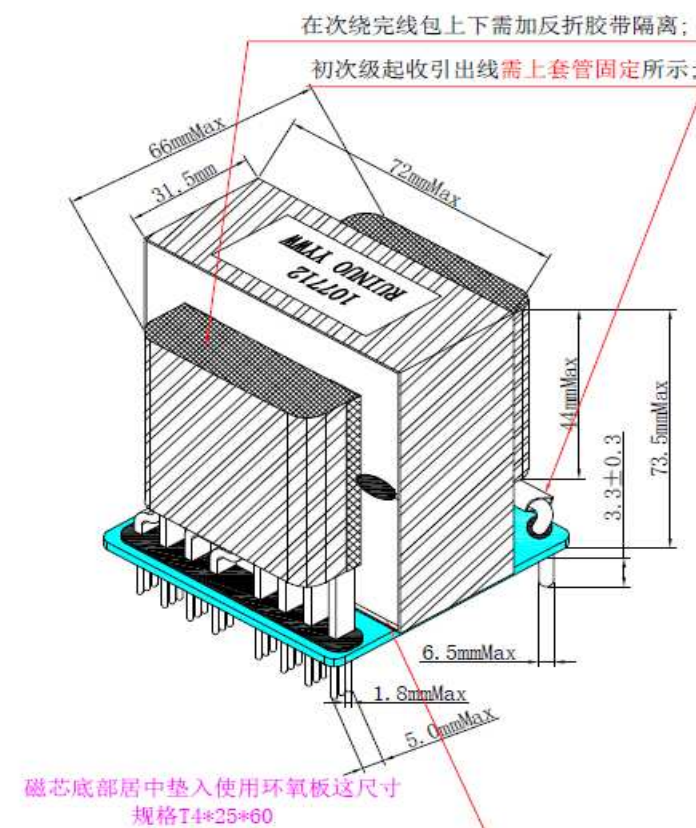
5. 电气特性/ELECTRICAL CHARACTERISTICS

NO.	ITEMS	SPEC	TESTING CONDITIONS	MEASURE
1	电感量 INDUCTANCE	$L(7-9)=180\mu H \pm 10\%$	1KHz 1.0V	1062
2	漏感 LEAKAGE INDUCTANCE	$LK(7-9)=15\mu H \text{ MAX}$ 短路其它绕组	1KHz 1.0V	
3	耐压测试 HI-POT TEST	PRI TO SEC AC 3700V P/S TO CORE AC 1000V	AC 50Hz 5mA/3S	CH CWI -903
4	直流电阻 DC RESISTANCE	7-9-52m Ω MAX 12-11-21m Ω MAX 5-6-32m Ω MAX 1-2-259m Ω MAX	@25℃	520 BC
5	绝缘电阻 INSULATION RESISTANCE	COIL-COIL COIL-CORE	DC500V 100M Ω MIN	CH 19053
6	匝间测试 INTERTURN TEST	N1/N3/N4/N5=600V 脉冲3个		2X2818
7	温度 TEMPERATURE	CLASS F		

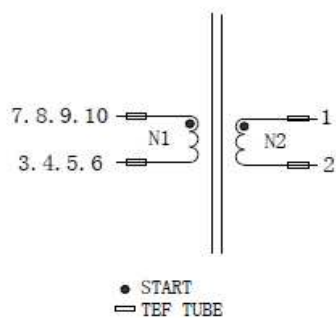
7.0 Illustrations

Illustration 5a - Transformer-EE7031

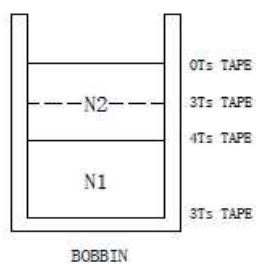
1. 外观 (机械) 图及尺寸: CONFIGURATION & DIMENSIONS (UNIT: mm)



2. 电气原理图/SCHEMATIC



3. 绕组结构图/WINDING



7.0 Illustrations

Illustration 5b - Transformer-EE7031

4. 绕线结构表/WINDING STRUCTURE

序号 NO.	开始-结束 START-FINISH	线材规格 WIRE SIZE	圈数 TURNS	胶带 TAPE	套管 TEFLON TUBE		挡墙 MARGIN TAPE		备注 REMARKS
					开始	结束	TOP	PIN.	
		白色复合T0. 2*42		1. 1					
N1	7. 8. 9. 10 -3. 4. 5. 6	背胶铜箔 T0. 30*42*3P	3	4	√	√			并绕
N2	1-2	2UEW-F # 0. 2*200P*2条/绞合线	10	3	√	√			密绕

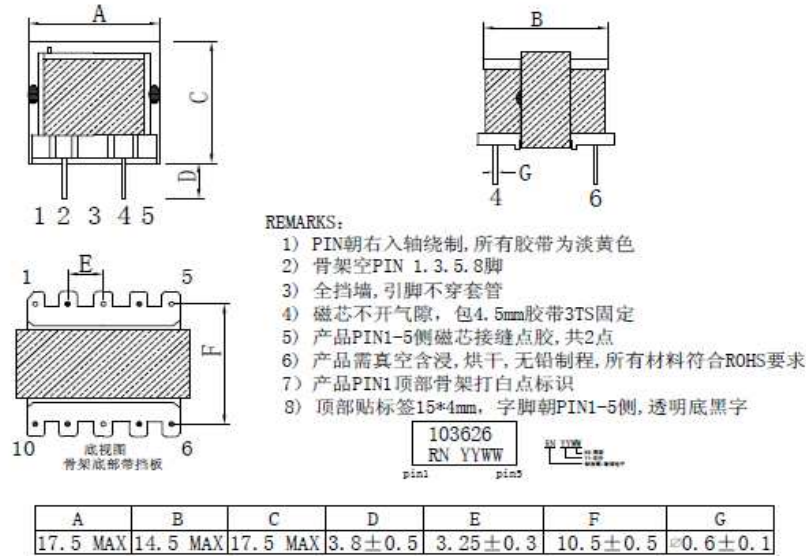
5. 电气特性/ELECTRICAL CHARACTERISTICS

NO.	ITEMS	SPEC	TESTING CONDITIONS	MEASURE
1	电感量 INDUCTANCE	L (1-2)=450uH-500uH	10KHZ 0. 3V	CH3250
2	漏感 LEAKAGE INDUCTANCE	LK (1-2)=5uH MAX	10KHZ 0. 3V	
3	耐压测试 HI-POT TEST	PRI-SEC AC2500V	AC/50Hz 5mA/3S	CJ9071A
		P/S-CORE AC1000V		
4	直流电阻 DC RESISTANCE	1-2=3. 3m Ω MAX 7. 8. 9. 10-3. 4. 5. 6=1. 2m Ω MAX	AT 25℃	CH-BC502
5	绝缘电阻 INSULATION RESISTANCE	COIL-COIL	DC500V 100M Ω MIN	CH 19053
		COIL-CORE		
6	绝缘等级 INSULATION CLASS	CLASS F		

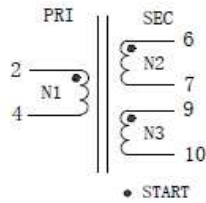
7.0 Illustrations

Illustration 5c - Transformer-EE16

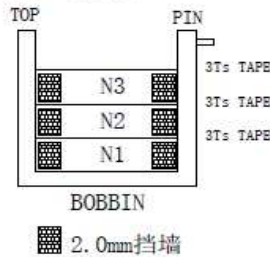
1. 外观(机械)图及尺寸: CONFIGURATION&DIMENSIONS (UNIT:mm)



2. 电气原理图/SCHEMATIC



3. 绕组结构图/WINDING



4. 绕线结构表/WINDING STRUCTURE: PIN朝右入轴绕制, 全挡墙, 引脚不穿套管

WDG	TERMINAL	WIRE SIZE	TURNS	TAPE	MARGIN TOP端	TAPE PIN端	REMARKS
N1	2-4	UEW/155℃ ∅0.30mm*1P	35	3	1.0mm	1.0mm	密绕
N2	6-7	UEW/155℃ ∅0.30mm*1P	35	3	1.0mm	1.0mm	密绕
N3	9-10	UEW/155℃ ∅0.30mm*1P	35	3	1.0mm	1.0mm	密绕

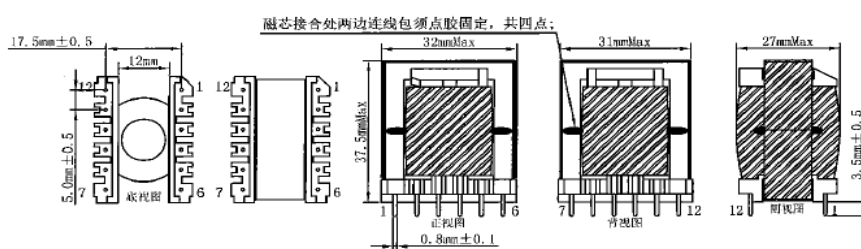
5. 电气特性/ELECTRICAL CHARACTERISTICS

NO.	ITEMS	SPEC	TESTING CONDITIONS	MEASURE
1	电感量 INDUCTANCE	L (2-4)=980uH MIN	1KHZ 1V	CH 1062
2	漏感 LEAKAGE INDUCTANCE	LK (2-4)=10uH MAX	10KHZ 1V 短路其它脚	
3	耐压测试 HI-POT TEST	PRI-SEC AC1500V PRI-CORE AC1500V SEC-CORE AC1500V	AC/50Hz 5mA/3S	CJ9071A
4	直流电阻 DC RESISTANCE	2-4=240m Ω MAX 6-7=286m Ω MAX 9-10=330m Ω MAX	AT 25℃	CH-BC502
5	绝缘电阻 INSULATION RESISTANCE	COIL-COIL COIL-CORE	DC500V 100M Ω MIN	CH 19053
6	温度 TEMPERATURE	CLASS B		

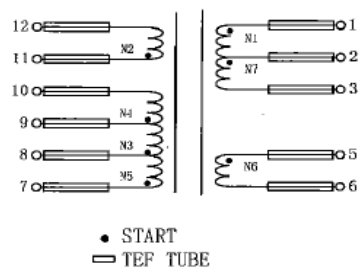
7.0 Illustrations

Illustration 5d - Transformer-EC28-T9

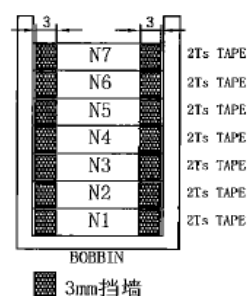
1. 外观 (机械) 图及尺寸: CONFIGURATION & DIMENSIONS (UNIT: mm)



2. 电气原理图/SCHEMATIC



3. 绕组结构图/WINDING



7.0 Illustrations

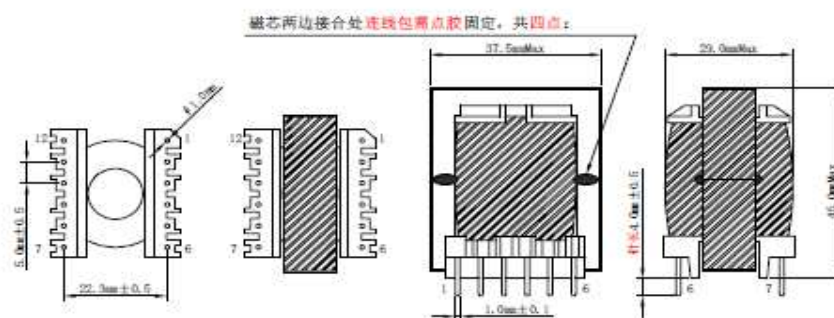
Illustration 5e - Transformer-EC28-T9

4. 绕线结构表/WINDING STRUCTURE									
序号 NO.	开始-结束 START-FINISH	线材规格 WIRE SIZE	圈数 TURNS	胶带 TAPE	套管 TEFLON TUBE		挡墙 MARGIN TAPE		备注 REMARKS
					开始	结束	TOP	PIN	
N1	1-2	2UEW-F $\varnothing 0.5*4P$	7	2	√	√	3	3	密绕
N2	11-12	2UEW-F $\varnothing 0.5*4P$	7	2	√	√	3	3	密绕
N3	8-9	2UEW-F $\varnothing 0.5*4P$	3	2	√	√	3	3	疏绕
N4	9-10	2UEW-F $\varnothing 0.5*3P$	4	2	√	√	3	3	疏绕
N5	7-8	2UEW-F $\varnothing 0.3*1P$	7	2	√	√	3	3	疏绕
N6	5-6	2UEW-F $\varnothing 0.15*1P$	7	2	√	√	3	3	疏绕
N7	2-3	2UEW-F $\varnothing 0.5*4P$	7	2	√	√	3	3	密绕
5. 电气特性/ELECTRICAL CHARACTERISTICS									
NO.	ITEMS	SPEC			TESTING CONDITIONS				MEASURE
1	电感量 INDUCTANCE	L(1-3)=26uH $\pm$ 5%			1KHZ 1V				CH 1062
2	漏感 LEAKAGE INDUCTANCE	LK(1-3)=5uH MAX			1KHZ 1V				
3	耐压测试 HI-POT TEST	PRI-SEC		AC3750V	AC/50Hz 5mA/10S				CJ9071A
		P/S-CORE		AC1500V					
4	直流电阻 DC RESISTANCE	1-2=21m Ω MAX 11-12=10m Ω MAX 8-9=5.5m Ω MAX 9-10=9.1m Ω MAX 7-8=12.4m Ω MAX 5-6=540m Ω MAX			AT 25℃				CH-BC502
5	绝缘电阻 INSULATION RESISTANCE	COIL-COIL			DC500V 100M Ω MIN				CH 19053
		COIL-CORE							
6	温度 TEMPERATURE	CLASS B							

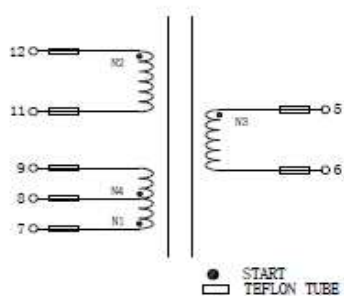
7.0 Illustrations

Illustration 5f - Transformer-ER3542-PV

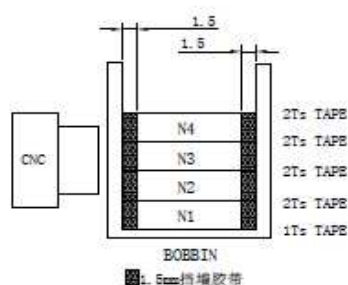
1. 外观 (机械) 图及尺寸: CONFIGURATION & DIMENSIONS (UNIT: mm)



2. 电气原理图/SCHEMATIC



3. 绕组结构图/WINDING



7.0 Illustrations

Illustration 5g - Transformer-ER3542-PV

4. 绕线结构表/WINDING STRUCTURE

WDG	TERMINAL	WIRE SIZE	TURNS	TAPE	MARGIN	TAPE	REMARKS
			*	1	*	*	打底
N1	7-8	2UEW-F $\phi 0.5 \times 4P$	15	2	1.5	1.5	密绕
N2	12-11	2UEW-F $\phi 0.5 \times 2P$	7	2	1.5	1.5	疏绕接 N1
N3	5-6	2UEW-F $\phi 0.5 \times 5P$	26	2	1.5	1.5	密绕
N4	8-9	2UEW-F $\phi 0.5 \times 4P$	15	2	1.5	1.5	密绕+疏绕

5. 电气特性/ELECTRICAL CHARACTERISTICS

NO.	ITEMS	SPEC	TESTING CONDITIONS	MEASURE
1	电感量 INDUCTANCE	L(7-9)=220uH $\pm$ 10%	1KHz 1.0V	1062
2	漏感 LEAKAGE INDUCTANCE	LK(7-9)=15uH MAX 短路其它绕组	1KHz 1.0V	
3	耐压测试 HI-POT TEST	PRI TO SEC AC 3700V P/S TO CORE AC 1000V	AC 50Hz 5mA/10S	CH CWI -903
4	直流电阻 DC RESISTANCE	7-9=56m Ω MAX 12-11=22m Ω MAX 5-6=31m Ω MAX	@25 $^{\circ}$ C	520 BC
5	绝缘电阻 INSULATION RESISTANCE	COIL-COIL COIL-CORE	DC500V 100M Ω MIN	CH 19053
6	匝间测试 INTERTURN TEST	N1/N3/N4/N5=600V 脉冲3个		ZX2618
7	温度 TEMPERATURE	CLASS F		

7.0 Illustrations

Illustration 6 - English manual



File version: V1.0

Solar Hybrid Inverter

User Manual



Product Models

HESP4880U200-H/ SEI-8K-UP
HESP48100U200-H/ SEI-10K-UP
HESP48120U200-H/ SEI-12K-UP

7.0 Illustrations

Illustration 6a - French manual



Version du fichier:
version 1.0

Inverseur hybride solaire

Manuel de l'utilisateur



Modèle de produit

HESP4880U200-H/SEI-8K-UP

HESP48100U200-H/SEI-10K-UP

HESP48120U200-H/SEI-12K-UP

7.0 Illustrations

Illustration 6b - English manual

File version: V1.0

USER MANUAL



Solar Hybrid Inverter

HEBP4880U200-H / SBK-8K-UP

HEBP48100U200-H / SBK-10K-UP

HEBP48120U200-H / SBK-12K-UP

7.0 Illustrations

Illustration 6c - French manual

Version du fichier : V1.0

MANUEL DE L'UTILISATEUR



Onduleur solaire hybride

HEBP4880U200-H / SBK-8K-UP

HEBP48100U200-H / SBK-10K-UP

HEBP48120U200-H / SBK-12K-UP

7.0 Illustrations

Illustration 6d - English manual

File version: V1.0

USER MANUAL



Solar Hybrid Inverter

HEBP4880U240-Pro
HEBP48100U240-Pro
HEBP48114U240-Pro
HEBP48120U240-Pro

7.0 Illustrations

Illustration 6e- French manual

Version du fichier : V1.0:

Manuel de l'utilisateur



Onduleur hybride solaire

HEBP4880U240-Pro
HEBP48100U240-Pro
HEBP48114U240-Pro
HEBP48120U240-Pro

7.0 Illustrations

Illustration 6f - English manual

File version: V1.0

USER MANUAL



Solar Hybrid Inverter

SEI-8K-UPRO
SEI-10K-UPRO
SEI-11.4K-UPRO
SEI-12K-UPRO

7.0 Illustrations

Illustration 6g- French manual

Version du fichier : V1.0:

Manuel de l'utilisateur



Onduleur hybride solaire

SEI-8K-UPRO
SEI-10K-UPRO
SEI-11.4K-UPRO
SEI-12K-UPRO

8.0 Test Summary					
Evaluation Period	2023-09-25 to 2024-01-10			Project No.	2309A1337SHA
Sample Rec. Date	22-Sep-2023	Condition	Prototype	Sample ID.	A230922-20 - 001~008
Test Location	Intertek Testing Services Shanghai				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.					
The following tests were performed:					
Test Description	UL 1741:2021 Ed.3+R:19May2023 UL 1741:2021 Ed.3 (Supplement SB) Clause		CSA C22.2#107.1:2016 Ed.4+U1 Clause	UL 50E:2020 Ed.3 Clause	
Maximum-Voltage Measurements	45		-	-	
Temperature	46		6.3	-	
Dielectric Voltage-Withstand Test	47		6.5	-	
Output Power Characteristics - Output Rating	48.2		6.2	-	
Output Power Characteristics - Input Range	48.3		6.2	-	
Utility Compatibility	49		-	-	
Abnormal Tests - Output Overload Test	50.2		6.6	-	
Abnormal Tests - Short Circuit Test	50.3		6.6	-	
Abnormal Tests - DC Input Miswiring Test	50.4		6.6	-	
Abnormal Tests - Ventilation test	50.5		6.6	-	
Abnormal Tests - Component Short and Open Circuit	50.6		6.6	-	
Abnormal Tests - Loss of Control Circuit	50.8		6.6	-	
Grounding Impedance Tests	51		4.23	-	
Strain Relief Test	53		6.17	-	
Stability	61		-	-	
Compression test	63		6.9	-	
Rain and Sprinkler	64		-	-	
Supplement SB-GRID SUPPORT UTILITY-INTERACTIVE INVERTERS AND CONVERTERS BASED UPON IEEE 1547-2018 and IEEE 1547.1-2020	SB		-	-	
Resistance to impact	-		6.12	-	
Securement of components	-		6.16	-	
Utility voltage and frequency variation test	-		14.3.4	-	
Hosedown test	-			8.6	
Test Description	IEEE 1547:2018 IEEE 1547.1:2020		Hawaiian SRD 2.0		
Priority of responses	5.2		-	-	
Temperature stability	5.3		-	-	
Test for response to voltage disturbances	5.4		-	-	
Test for response to frequency disturbances	5.5		5.5	-	
Enter service	5.6		5.6	-	
Interconnection integrity	5.8		-	-	
Limitation of dc injection for inverters	5.9		-	-	
Balanced generation to load unintentional islanding test	5.10.2		-	-	
Open phase	5.11		-	-	
Current distortion	5.12		-	-	
Limit active power	5.13		-	-	

8.0 Test Summary			
Voltage regulation	5.14	-	-
Frequency support	5.15	5.15	-
Test for prioritization of DER responses	5.16	-	-
Ground fault overvoltage (GFOV) test	5.17.1	-	-
Persistence of DER parameter settings	5.19	-	-
SunSpec Modbus usage (Interoperability tests)	6.8.1	-	-

Evaluation Period	2024-05-09 to 2024-06-26			Project No.	240600403SHA
Sample Rec. Date	9-May-2024	Condition	Prototype	Sample ID.	A230922-20 - 001~008
Test Location	Intertek Testing Services Shanghai				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and					
The following tests were performed:					
Test Description	UL 1699B:2018 Ed.1+R:18May2021 Clause				
Humidity	25		-	-	
Voltage Surge Test	27		-	-	
Environmental Test Sequence	28		-	-	
Arc Fault Detection Tests	29		-	-	
Unwanted Tripping Tests	30		-	-	
Dielectric Voltage-Withstand Test	35		-	-	
Corrosion Test	38		-	-	
Surge Current Test	39		-	-	
Supplemental Voltage Surge Immunity Test	41		-	-	
Resistance to Environmental Noise Test	42		-	-	
Voltage Surge Test	55		-	-	

Evaluation Period	2024-07-21 to 2024-07-28			Project No.	240600363SHA
Sample Rec. Date	21-Jun-2024	Condition	Prototype	Sample ID.	A240721-19
Test Location	Intertek Testing Services Shanghai				
Test Procedure	Testing Lab				
Determination of the result includes consideration of measurement uncertainty from the test equipment and					
The following tests were performed:					
Test Description	UL 1741:2021 Ed.3+R:19May2023 UL 1741:2021 Ed.3 (Supplement SB) Clause		CSA C22.2#107.1:2016 Ed.4+U1 Clause	UL 50E:2020 Ed.3 Clause	
Dielectric Voltage-Withstand Test	47		6.5	-	
Grounding Impedance Tests	51		4.23	-	
Static Load	62		--	--	
Hosedown test	-		-	8.6	
Test Description - Functional Safety					
Functional Safety Clauses 15A Interlocking of Medium	NA				
Functional Safety Clauses 97 PVRSS and PVRSE	NA				
Functional Safety Clauses 99 Functional Safety	NA				

8.0 Test Summary			
Evaluation Period	2025-02-08 to 2025-02-19		Project No. 2501B1836SHA
Sample Rec. Date	8-Feb-2025	Condition	Prototype
Sample ID	A250208-09		
Test Location	Intertek Testing Services (Shanghai FTZ) Co., Ltd.		
Test Procedure	Testing Lab		
Determination of the result includes consideration of measurement uncertainty from the test equipment and			
The following tests were performed:			
Test Description	UL 1741:2021 Ed.3+R:19May20 23 Clause	CSA C22.2#107.1:20 16 Ed.4+U1 Clause	--
Temperature	46	6.3	-
Dielectric Voltage-Withstand Test	47	6.5	-
Abnormal Tests - Output Overload Test	50.2	6.6	-
Abnormal Tests - Short Circuit Test	50.3	6.6	-
Abnormal Tests - DC Input Miswiring Test	50.4	6.6	-
Abnormal Tests - Component Short and Open Circuit	50.6	6.6	-
Test Description	Functional Safety		
Functional Safety Clause: 15A Interlocking of Medium	N/A	-	-
Functional Safety Clause: 97 PVRSS and PVRSE	N/A	-	-
Functional Safety Clause: 99 Functional Safety	N/A	-	-
Functional Safety Clause:1699B Functional Safety	N/A	-	-
8.1 Signatures			
A representative sample of the product covered by this report has been evaluated and found to comply with the			
Completed by:	Eddie Xu	Reviewed by:	Sleif Sui
Title:	Engineer	Title:	Review
Signature:	Eddie Xu	Signature:	Sleif Sui

9.0 Correlation Page For Multiple Listings

The following products, which are identical to those identified in this report except for model number and Listee name, are authorized to bear the ETL label under provisions of the Intertek Multiple Listing Program.

BASIC LISTEE	SRNE Solar Co., Ltd
Address	4-5F,13A Wutong Island,Neihuan Rd, Xixiang, Bao`an, SHENZHEN Guangdong 518100
Country	China
Product	Solar Hybrid Inverter(Grid Support Utility Interactive Inverter)

MULTIPLE LISTEE 1	Bluesun Solar Co., Ltd
Address	1499 Zhenxing Road, Shushan District Hefei City, Anhui Province, 230031
Country	China
Brand Name	BLUESUN

ASSOCIATED MANUFACTURER	SRNE Solar Co., Ltd
Address	Room 301, Building 5, Fuxing Road No.36, Chang'an Town, Dongguan City, Guangdong
Country	China

MULTIPLE LISTEE 1 MODELS	BASIC LISTEE MODELS
BSE8KLNA BSE10KLNA BSE12KLNA	SEI-8K-UP SEI-10K-UP SEI-12K-UP

MULTIPLE LISTEE 2	None
Address	
Country	
Brand Name	

ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 2 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 3	None
Address	
Country	
Brand Name	

ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 3 MODELS	BASIC LISTEE MODELS

10.0 General Information

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the requirements of this Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate parts, components or materials.

COMPONENTS

Components used shall be those itemized in this Intertek report covering the product, including any amendments

LISTING MARK

The ETL Listing mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the mark is subject to the control of Intertek.

The mark must include the following four items:

- 1) applicable country identifiers "US" and/or "C" or "US", "C" and "EU"
- 2) the word "Listed" or "Classified" or "Recognized Component" (whichever is appropriate)
- 3) a control number issued by Intertek
- 4) a product descriptor that identifies the standards used for certification. Example:

For US standards, the words, "Conforms to" shall appear with the standard number along with the word, "Standard" or "Std." Example: "Conforms to ANSI/UL Std. XX."

For Canadian standards, the words "Certified to CAN/CSA Standard CXX No. XX." shall be used, or abbreviated, "Cert. to CAN/CSA Std. CXX No. XX."

Can be used together when both standards are used.

If all standards on the ATM have the same standard title, the shared title or its abbreviation may be used in place of the examples above. Example: "Medical Electrical Equipment" or "MEE"; "Information Technology Equipment" or "ITE"; "Audio/Video Information And Communication Technology Equipment" or "A/V ICTE".

Note: A facsimile must be submitted to Intertek, Attn: Follow-up Services for approval prior to use.

The facsimile need not have a control number. A control number will be issued **after signed Certification Agreements** have been received by the Follow-up Services office, approval of the facsimile of your proposed Listing Mark, satisfactory completion of the Listing Report, and scheduling of a factory assessment in your facility.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW-UP SERVICE

Periodic unannounced audits of the manufacturing facility (and any locations authorized to apply the mark) shall be scheduled by Intertek. An audit report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the ETL mark with the requirements of this Report and the Certification Agreement.
3. Manufacturing changes.
4. Performance of specified Manufacturing and Production Tests.

In the event that the Intertek representative identifies non-conformance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the ETL Mark from non-conforming product.
3. Contact the issuing product safety evaluation center for instructions.

10.1 Evaluation of Unlisted Components

Because Unlisted Components are uncontrolled, and they do not fall under a third party follow up program, Intertek may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process. The Unlisted Components in Section 5.0 require testing and/or evaluation as indicated.

The Applicant will be notified, in writing, via the applicable contact methods, as defined in Section 1.0, when these components must be selected and sent to Component Evaluation Center (CEC) for re-evaluation.

Due to particular testing requirements, some components may be requested to be shipped to specific labs. Thus, specific shipment destination(s) for each sample will be provided in the written notification.

Managing CEC Location:

Intertek Testing Services (Shanghai FTZ) Co., Ltd

ETL Component Evaluation Center

Building No. 86, 1198 Qinzhou Road (North)

Shanghai 200233, China

Attn: Ms. Emiliana Zhou

Sample Disposition: Due to the destructive nature of the testing, all samples will be discarded at the conclusion of testing unless, the manufacturer specifically requests the return of the samples. The request for return must accompany the initial component shipment.

11.0 Manufacturing and Production Tests

The manufacturer agrees to conduct the following Manufacturing and Production Tests as specified:

Required Tests

Dielectric Voltage Withstand Test

Utility Voltage and Frequency Variation Test.

Manufacturing and Production Line Testing for Grid Support Utility Interactive Inverters

11.1 Dielectric Voltage Withstand Test

Method

One hundred percent of production of the products covered by this Report shall be subjected to a routine production line dielectric withstand test.

The test shall be conducted on products, which are fully assembled. Prior to applying the test potential, all switches, contactors, relays, etc., should be closed so that all primary circuits are energized by the test potential. If all primary circuits cannot be tested at one time, then separate applications of the test potential shall be made.

The test voltage specified below shall be applied between primary circuits and accessible dead-metal parts. The test voltage may be gradually increased to the specified value but must be maintained at the specified value for one second or one minute as required.

Test Equipment

The test equipment shall incorporate a transformer with an essentially sinusoidal output, a means to indicate the applied test potential, and an audible and/or visual indicator of dielectric breakdown.

The test equipment shall incorporate a voltmeter in the output circuit to indicate directly the applied test potential if the rated output of the test equipment is less than 500VA.

If the rated output of the test equipment is 500VA or more, the applied test potential may be indicated by either:

- 1 - a voltmeter in the primary circuit;
- 2 - a selector switch marked to indicate the test potential; or
- 3 - a marking in a readily visible location to indicate the test potential for test equipment having a single test potential output.

In cases 2 and 3, the test equipment shall include a lamp or other visual means to indicate that the test potential is present at the test equipment output. All test equipment shall be maintained in current calibration.

Products Requiring Dielectric Voltage Withstand Test:

<u>Product</u>	<u>Test Voltage</u>	<u>Test Time</u>
All products covered by this Report.		
Between PV to battery & AC & communication part	1770Vac	60s
Among AC, battery and communication part	1000Vac	60s

11.2 Utility Voltage and Frequency Variation Test

Method

Each Utility-Interactive inverter initially exporting power within its normal operating range shall cease to export the products shall be tested at convenient load. For Category III

Specification for Interconnection system response to abnormal voltages

Voltage range (% of 120 or 240 VAC)	Clearing time(s)
$V < 50$	2
$50 \leq V < 88$	21
$110 \leq V < 120$	13
$V \geq 120$	0.16

Specification for Interconnection system response to abnormal frequencies

Tests must be performed at 60Hz +/- 5%

Frequency range (Hz)	Clearing time(s)
< 56.5	0.16
< 58.5	300
> 61.2	300
> 62	0.16

Products Requiring Utility Voltage and Frequency Variation Test:

All products covered by this Report.

11.3 Manufacturing and Production Line Testing for Grid Support Utility Interactive Inverters

Method

validate inverter firmware version(s) and default settings

Remark: default settings is UL208 or UL240 for different output voltage. The Grid Support function is disable

firmware version(s)_ Main MCU	V8.32
firmware version(s)_Secondary MCU	V1.05
	120V/240V
default settings	IEEE1547&UL1741

Products Requiring Utility Voltage and Frequency Variation Test:

All products covered by this Report.

12.0 Revision Summary				
The following changes are in compliance with the declaration of Section 8.1:				
Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change
27-Jun-2024	Eddie Xu	1	-	Add the standard(s) "Photovoltaic (PV) DC Arc-Fault Circuit Protection [UL 1699B:2018 Ed.1+R:18May2021]"
240600403SHA	Sleif Sui	8	-	Add the standard's test item "UL 1699B:2018 Ed.1+R:18May2021 Clause"
		8	-	Add a new test block with signatures
		8	-	List the performed test items
1-Aug-2024	Eddie Xu	2	-	add model name HEBP followed by 4880, 48100 or 48120; followed by U200-H. SBK- followed by 8K, 10K or 12K; followed by -UP.
240600363SHA	Sleif Sui	2	-	Add "SBK-8K-UP is same with HEBP 4880U200-H except model name. SBK-10K-UP is same with HEBP 48100U200-H except model name. SBK-12K-UP is same with HEBP 48120U200-H except model name." and "HEBP48100U200-H and the original certified model HESP48100U200-H are the same as the original certified model HESP48100U200-H except for the model number, the size of enclosure, and the position of the terminal.The product principle, internal structure, internal topology, and PCB used are the same as the original certified model HESP48100U200-H." in Model Similarity
		3	16,17	Add photo about External view of HEBP48100U200-H
		4	1	Add Enclosure, manufacturer:NanGongHuiLi Technology Co.Ltd, Type / model2:HEBP48100U200-H 840x440x260mm thickness:2.0mm. made of aluminum
		7	2	add model "HEBP followed by 4880, 48100 or 48120; followed by U200-H. SBK- followed by 8K, 10K or 12K; followed by -UP" in parameter table
		7	6b,6c	add English and french manual of model name HEBP followed by 4880, 48100 or 48120; followed by U200-H. SBK- followed by 8K, 10K or 12K; followed by -UP.
		8	-	Add a new test block with signatures
		8	-	List the performed test items.

12.0 Revision Summary				
The following changes are in compliance with the declaration of Section 8.1:				
Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change
7-Nov-2024	Eddie Xu	4	5	Add DC Switch,manufacturer Projoy Electric Co., Ltd, PEDS150H-HM50-4F, 1500V, 50A, 85°C No evaluation to the standards needed
2411B0377SHA	Sleif Sui	4	14	Add Fan,manufacturer MinebeaMitsumi Inc,DC12V, 2.76W 5000RPM, 80*80*25mm, -25~70°C No evaluation to the standards needed
		4	24	Add Fuse- battery for 48V series,manufacturer ADLER Elektrotechnik Xi'an Co. Ltd., AEY3300900, 70V 300A, interrupting 2500A, 125°C No evaluation to the standards needed
		4	26	Add MOV on AC board,manufacturer Brightking, 820V 10KA -40~85°C MOV1, MOV2, MOV3, MOV4,MOV5,MOV6, MOV7, MOV8,MOV9, MOV10 No evaluation to the standards needed
17-Jan-2025	Zheng Li	9	ML1	Added new Multiple Listee as follow: MULTIPLE LISTEE 1 "Bluesun Solar Co., Ltd"; Address "1499 Zhenxing Road, Shushan District Hefei City, Anhui Province, 230031"; Country "China"; Brand Name "BLUESUN"; ASSOCIATED MANUFACTURER "SRNE Solar Co., Ltd"; Address "Room 301, Building 5, Fuxing Road No.36, Chang'an Town, Dongguan City, Guangdong"; Country "China"; MULTIPLE LISTEE 1 MODELS "BSE8KLNA, BSE10KLNA, BSE12KLNA"; BASIC LISTEE MODELS "SEI-8K-UP, SEI-10K-UP, SEI-12K- UP".
2412B1915SHA	Sleif Sui			
25-Mar-2025	Eddie Xu <i>Eddie Xu</i>	2	-	add model name HEBP followed by 4880, 48100,48114 or 48120; followed by U240-Pro. SEI- followed by 8K, 10K,11.4K or 12K; followed by -UPRO.
2501B1836SHA	Sleif Sui <i>Sleif Sui</i>	2	-	Add "SEI-8K-UPRO is same with HEBP 4880U240-Pro except model name. SEI-10K-UPRO is same with HEBP 48100U240-Pro except model name. SEI-11.4K-UPRO is same with HEBP 48114U240-Pro except model name. SEI-12K-UPRO is same with HEBP 48120U240-Pro except model name. HEBP48100U240-Pro is the same as the original certified model HESP48100U200-H except for the model number, the size of enclosure, the position of the terminal, and the power.The product principle, internal structure, internal topology, and PCB used are the same as the original certified model HESP48100U200-H." in model similarity.
		2	-	Change product name from "Grid Support Utility Interactive Inverter (Non-Isolated inverter)" to "Solar Hybrid Inverter(Grid Support Utility Interactive Inverter)"

12.0 Revision Summary				
The following changes are in compliance with the declaration of Section 8.1:				
Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change
		3	18,19, 20,21, 22,23	Add photo about External view and Internal view of HEBP48100U240-Pro
		4	1	Add Enclosure, manufacturer:Shenzhen Weiyute Communication Equipment Co., Ltd, Type / model:HEBP48100U240-Pro 840*440*284 thickness:2.0mm. made of aluminum
		4	21	Add Relay on AC board, manufacturer:Dong Guan Churod Electronics Co.,Ltd, Type / model:CHAR-112A200 830Vac,200A,85°C, 6000V RLY2,RLY4,RLY6,RLY8
		4	21	Add Relay on AC board, manufacturer:GD-R Corporation, Type / model:G95-7-12DSF 830Vac,200A,85°C, 5000V RLY2,RLY4,RLY6,RLY8
		4	24	Add Fuse- battery for 48V series, manufacturer:Zhejiang DongYa Electronic Co.,LTD , Type / model:BCPS2AM200-22401 80,400A,interrupting 5000A,85°C
		4	49	Add AC Side Switch, manufacturer:Zhejiang DongYa Electronic Co.,LTD , Type / model:BCPS2AM200-22403 240V,400A,interrupting 5000A,85°C
		7	2a	add model "HEBP followed by 4880, 48100 or 48120; followed by U240-Pro. SEI- followed by 8K, 10K or 12K; followed by -UPRO." in parameter table
		7	6d,6e, 6f,6g	add English and french manual of model name HEBP followed by 4880, 48100 or 48120; followed by U240-Pro. SEI- followed by 8K, 10K or 12K; followed by -UPRO.
		8	-	Add a new test block with signatures
		8	-	List the performed test items.