

Prüfbericht-Nr.: Test report no.:	CN22OWHX 002	Auftrags-Nr.: Order no.:	168531297	Seite 1 von 58 Page 1 of 58
Kunden-Referenz-Nr.: Client reference no.:	2026754	Auftragsdatum: Order date:	2025-01-17	
Auftraggeber: Client:	Guangzhou Sanjing Electric Co., Ltd. No.9, Lizhishan Road, Science City, Guangzhou High-tech Zone, Guangdong P.R. China			
Prüfgegenstand: Test item:	Grid-connected PV inverter			
Bezeichnung / Typ-Nr.: Identification / Type no.:	C6-75K-T6, C6-100K-T9, C6-110K-T12, C6-125K-T12 C6-75K-T6-40, C6-100K-T9-40, C6-110K-T12-40, C6-125K-T12-40			
Auftrags-Inhalt: Order content:	TÜV Rheinland AK Approval			
Prüfgrundlage: Test specification:	IEC 61683: 1999, IEC 60068-2-1: 2007 IEC 60068-2-2: 2007, IEC 60068-2-14: 2009 IEC 60068-2-30: 2005			
Wareneingangsdatum: Date of sample receipt:	2025-01-17			
Prüfmuster-Nr.: Test sample no.:	A003912789			
Prüfzeitraum: Testing period:	2025-01-17-2025-01-19			
Ort der Prüfung: Place of testing:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: created by:	Yancy Ji.		genehmigt von: authorized by:	Zhiwei Yan
Datum: Date:	2025-01-20	Yancy Ji	Ausstellungsdatum: Issue date:	2025-01-20 Zhiwei Yan
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert
Sonstiges / Other:	1.This report is based on CN22OWHX 001, add models C6-75K-T6-40, C6-100K-T9-40, C6-110K-T12-40, C6-125K-T12-40. Details see the report. All test data is derived from original report CN22OWHX 001. The changes have no effect on the tests of the original report. 2.This report does not evidence compliance of the provided sample with the relevant standards but only with the referred tests. This test report documents the findings of examination conducted on the delivered product mentioned above only. This report does not entitle the applicant to carry any safety mark on this or similar products. Further for sales or other application purposes of the tested product, any reference to TÜV Rheinland or a test through TÜV Rheinland is only permissible with prior written consent of TÜV Rheinland.			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* Legend:	P(ass) = passed a.m. test specification(s)	F(ail) = failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

Prüfbericht-Nr.: CN22OWHX 002
Test report no.:

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Page 2 of 58

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. <i>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. <i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. <i>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</i>



TEST REPORT **IEC 61683** **Photovoltaic Systems – Power Conditioners –** **Procedure for Measuring Efficiency**

Report Number.:	CN22OWHX 002
Date of issue:	See cover page
Total number of pages:	See cover page
Testing Laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.
Address:	1-5F, Block 5, No. 1100, Huanli Road, Yungu Community, Xinhua Street, Guangming District, Shenzhen, Guangdong Province
Applicant's name:	Guangzhou Sanjing Electric Co., Ltd.
Address:	No.9, Lizhishan Road, Science City, Guangzhou High-tech Zone, Guangdong, P.R. China.
Test specification:	
Standard:	IEC 61683: 1999
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC 61683_A
Test Report Form(s) Originator.....:	TÜV Rheinland Group
Master TRF	Dated 2013-12
Test item description	Grid-connected PV inverter
Trade Mark	
Manufacturer	As applicant
Model/Type reference.....:	See cover page
Ratings	See model list

Testing procedure and testing location:		
☒	Testing Laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.
Testing location/ address		1-5F, Block 5, No. 1100, Huanli Road, Yungu Community, Xinhua Street, Guangming District, Shenzhen, Guangdong Province
☐	Associated Laboratory:	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
☐	Testing procedure: TMP	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
☐	Testing procedure: WMT	
Testing location/ address		
Tested by (name + signature).....:		
Witnessed by (name + signature) ..:		
Approved by (name + signature) ..:		
☐	Testing procedure: SMT	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
Supervised by (name + signature) :		
☐	Testing procedure: RMT	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
Supervised by (name + signature) :		

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 Guangzhou Sanjing Electric Co., Ltd. Tel: +86 20 66608588 Fax: +86 20 66608589 Web: www.saj-electric.com E-mail: service@saj-electric.com	
PV Grid-connected Inverter Model: C6-75K-T6	
PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	6*30A
Short Circuit Current	6*45A
AC Output	
Rated Output Voltage	3L+N+PE /3L+PE 230/400V
Rated Output Current	3*108.3A
Max. Output Current	3*119.1A
Rated Output Frequency	50/60Hz
Rated Output Power	75000W
Max. Apparent Power	82500VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30℃~60℃ Protective Class: I Overvoltage Category: II (DC), III (AC) Ingress protection: IP66 Inverter Topology: Non-isolated EN 50549-2, IEC/EN62109-1/2, EN61000-6-2/4, PPDS, RD1669, RD413, UNE217001 IEC 62116, IEC61727, G99, CEI 0-16, C10/11	
	
	
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PV Grid-connected Inverter Model: C6-100K-T9	
PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	9*30A
Short Circuit Current	9*45A
AC Output	
Rated Output Voltage	3L+N+PE /3L+PE 230/400V
Rated Output Current	3*144.3A
Max. Output Current	3*158.8A
Rated Output Frequency	50/60Hz
Rated Output Power	100000W
Max. Apparent Power	110000VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30℃~60℃ Protective Class: I Overvoltage Category: II (DC), III (AC) Ingress protection: IP66 Inverter Topology: Non-isolated EN 50549-2, IEC/EN62109-1/2, EN61000-6-2/4, PPDS, RD1669, RD413, UNE217001 IEC 62116, IEC61727, G99, CEI 0-16, C10/11	
	
	
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PV Grid-connected Inverter	
Model: C6-110K-T12	
PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	12*30A
Short Circuit Current	12*45A
AC Output	
Rated Output Voltage	3L+N+PE /3L+PE 230/400V
Rated Output Current	3*158.8A
Max. Output Current	3*174.6A
Rated Output Frequency	50/60Hz
Rated Output Power	110000W
Max. Apparent Power	121000VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30℃~60℃	
Protective Class: I	
Overvoltage Category: II (DC), III (AC)	
Ingress protection: IP66	
Inverter Topology: Non-isolated	
EN 50549-2, IEC/EN62109-1/2, EN61000-6-2/4, PPDS, RD1669, RD413, UNE217001	
IEC 62116, IEC61727, G99, CEI 0-16, C10/11	
	
	
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PV Grid-connected Inverter	
Model: C6-125K-T12	
PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	12*30A
Short Circuit Current	12*45A
AC Output	
Rated Output Voltage	3L+N+PE /3L+PE 230/400V
Rated Output Current	3*180.4A
Max. Output Current	3*180.4A
Rated Output Frequency	50/60Hz
Rated Output Power	125000W
Max. Apparent Power	125000VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30℃~60℃	
Protective Class: I	
Overvoltage Category: II (DC), III (AC)	
Ingress protection: IP66	
Inverter Topology: Non-isolated	
EN 50549-2, IEC/EN62109-1/2, EN61000-6-2/4, PPDS, RD1669, RD413, UNE217001	
IEC 62116, IEC61727, G99, CEI 0-16, C10/11	
	
	
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PV Grid-connected Inverter

Model: C6-75K-T6-40

PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	6*40A
Short Circuit Current	6*50A
AC Output	
Rated Output Voltage	3/N/PE 230/400V
Rated Output Current	3*108.3A
Max. Output Current	3*119.1A
Rated Output Frequency	50/60Hz
Rated Output Power	75000W
Max. Apparent Power	82500VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30°C~60°C	
Protective Class: I	
Overvoltage Category: II (DC), III (AC)	
Ingress protection: IP66	
Inverter Topology: Non-isolated	
EN 50549-2, IEC/EN 62109-1/2, EN 61000-6-2/4, PPDS, RD1669, RD413, UNE 217001	
IEC 62116, IEC 61727, G99, CEI 0-16, C10/11	



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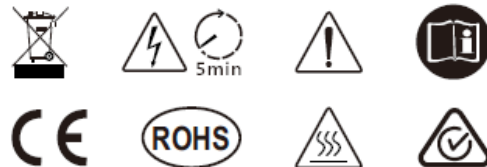
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PV Grid-connected Inverter

Model: C6-100K-T9-40

PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	9*40A
Short Circuit Current	9*50A
AC Output	
Rated Output Voltage	3/N/PE 230/400V
Rated Output Current	3*144.3A
Max. Output Current	3*158.8A
Rated Output Frequency	50/60Hz
Rated Output Power	100000W
Max. Apparent Power	110000VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30°C~60°C	
Protective Class: I	
Overvoltage Category: II (DC), III (AC)	
Ingress protection: IP66	
Inverter Topology: Non-isolated	
EN 50549-2, IEC/EN 62109-1/2, EN 61000-6-2/4, PPDS, RD1669, RD413, UNE 217001	
IEC 62116, IEC 61727, G99, CEI 0-16, C10/11	



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PV Grid-connected Inverter

Model: C6-110K-T12-40

PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	12*40A
Short Circuit Current	12*50A
AC Output	
Rated Output Voltage	3/N/PE 230/400V
Rated Output Current	3*158.8A
Max. Output Current	3*174.6A
Rated Output Frequency	50/60Hz
Rated Output Power	110000W
Max. Apparent Power	121000VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30°C~60°C	
Protective Class: I	
Overvoltage Category: II (DC), III (AC)	
Ingress protection: IP66	
Inverter Topology: Non-isolated	
EN 50549-2, IEC/EN62109-1/2, EN61000-6-2/4, PPDS, RD1669, RD413, UNE217001	
IEC 62116, IEC61727, G99, CEI 0-16, C10/11	



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PV Grid-connected Inverter

Model: C6-125K-T12-40

PV Input	
Max. Input Voltage	1100V
MPPT Voltage Range	180-1000V
Max. Input Current	12*40A
Short Circuit Current	12*50A
AC Output	
Rated Output Voltage	3/N/PE 230/400V
Rated Output Current	3*180.4A
Max. Output Current	3*180.4A
Rated Output Frequency	50/60Hz
Rated Output Power	125000W
Max. Apparent Power	125000VA
Power Factor Range	0.8 Leading...0.8 Lagging
Operating Temperature Range: -30°C~60°C	
Protective Class: I	
Overvoltage Category: II (DC), III (AC)	
Ingress protection: IP66	
Inverter Topology: Non-isolated	
EN 50549-2, IEC/EN62109-1/2, EN61000-6-2/4, PPDS, RD1669, RD413, UNE217001	
IEC 62116, IEC61727, G99, CEI 0-16, C10/11	



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Test item particulars
Possible test case verdicts: - test case does not apply to the test object..... : N/A - test object does meet the requirement : P (Pass) - test object does not meet the requirement..... : F (Fail)
Testing Date of receipt of test item : See cover page Date (s) of performance of tests : See cover page
General remarks: The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator. Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.

General product information:
Brief description:

The equipment with model names C6-75K-T6, C6-100K-T9, C6-110K-T12, C6-125K-T12, C6-75K-T6-40, C6-100K-T9-40, C6-110K-T12-40, C6-125K-T12-40 are a three-phase public interactive photovoltaic inverter, which will be installed and connected to the grid after installation.

It contains filters for smoothing output voltage and EMC, switching and control circuits. Electronic circuits are mounted on multiple PCBs interconnected by appropriate connectors and wires.

The power board including the electronic components is mounted on the radiator and grounded through metal screws and spring washers.

Communication ports include USB, and RS485, which are connected to a monitor to monitor the status of the inverter through proprietary software.

PV input combiner with 6, 9 or 12 MPPT tracers, and each MPPT tracer includes 4 PV input terminals (2 PV+ and 2PV-).

The AC output is directly connected to the power grid, and the protective grounding is provided by a dedicated grounding terminal.

The grid-connected protection combines the two series of relays as a redundant construction to ensure that the inverter can independently disconnect from the grid when the relay fails.

In the case of a fault defined in this standard, after the DSP receives an abnormal signal from the relevant protection detection circuit, the relay will act to automatically disconnect the active circuit of the photovoltaic inverter from the grid, when any grid fault occurs, the master DSP and the slave DSP have the ability to disconnect from the grid independently.

History of amendments and modifications:

Report No.: CN22OWHX 001, dated 2022-08-17 (original)

Report No.: CN22OWHX 002, dated 2025-01-20 (Add new models)

Description of change(s):

The report is based on the report CN22OWHX 001 to make the following changes:

1. Add new models: C6-75K-T6-40, C6-100K-T9-40, C6-110K-T12-40, C6-125K-T12-40.

C6-75K-T6-40 is identical to the original model: C6-75K-T6,

C6-100K-T9-40 is identical to the original model: C6-100K-T9,

C6-110K-T12-40 is identical to the original model: C6-110K-T12,

C6-125K-T12-40 is identical to the original model: C6-125K-T12,

except the model number, Max. Input Current and PV Input Short Circuit Current mentioned above.

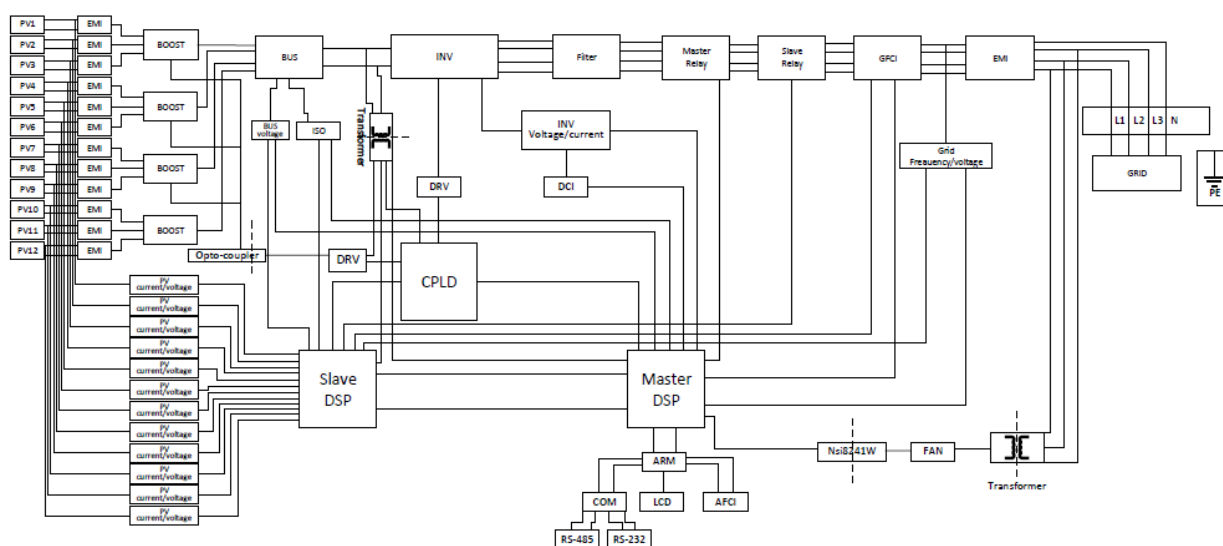
Change	Testing	Comment
1	N/A	Add new models, no additional test for necessary.

Model difference:

The models C6-75K-T6, C6-100K-T9, C6-110K-T12, C6-125K-T12, C6-75K-T6-40, C6-100K-T9-40, C6-110K-T12-40, C6-125K-T12-40 are same as the construction and hardware excepted the different as below table and the output power are different with adjusted by software. C6-75K-T6-40 is identical to the original model: C6-75K-T6, C6-100K-T9-40 is identical to the original model: C6-100K-T9, C6-110K-T12-40 is identical to the original model: C6-110K-T12, C6-125K-T12-40 is identical to the original model: C6-125K-T12, except the model number, Max. Input Current and PV Input Short Circuit Current mentioned above. Details can be found below:

Model	C6-75K-T6	C6-75K-T6-40	C6-100K-T9	C6-100K-T9-40	C6-110K-T12	C6-110K-T12-40	C6-125K-T12	C6-125K-T12-40
Power board version	C6.212100-212136.MPB-I1 V1.0				C6.212100-212136.MPB-V V1.0			
Number of strings	2							
MPPT Chase number of trails	6		9		12		12	
INV IGBT	F3L400R07W3S5_B59				30-FT07NIA450S51-PD68F58/ NXH450N65L4Q2F2S1G			
Boost IGBT	IKW40N120H3/ IKW40N120CS7/ SGT40U120FDR1P7/ JT040K120WED/ CRG40T120AK3SD/ MBQ40T120QESTH				10-PG123BA080SH11-LN68L33T/ 10-PG123BA080SH21-LN68L18T			
Max Output Current [A]	119.1		158.8		174.6		180.4	
Rated Output Power [kW]	75		100		110		125	
Max. Input Current[A]	30	40	30	40	30	40	30	40
PV Input Short Circuit[A]	45	50	45	50	45	50	45	50

The system diagram block is shown as below:



Block diagram

Model list:

MODELS LIST		C6-75K-T6	C6-100K-T9	C6-110K-T12	C6-125K-T12
PV INPUT	V _{MAX} PV [Vdc]	1100			
	I _{SC} PV [A]	6*45	9*45	12*45	
	MPPT Voltage Range V _{MPP} [Vdc]	180-1000			
	Max. Input Current I _{MAX} [A] (A/B) (each MPPT if more than 1)	6*30	9*30	12*30	
	Number of MPPT	2			
	Overvoltage Category (OVC)	II			
AC Side	Rated Output Voltage Ur [Vac]	3L+N+PE/3L+PE, 230/400			
	Rated Output Frequency F _{NETZ} [Hz]	50/60			
	Rated Output Power P _E [W]	75	100	110	125
	Max. Output Power P _E [VA]	82.5	110	121	125
	Max. Output Current I _{max} [A]	119.1	158.8	174.6	180.4
	Power Factor cosφ [λ]	0.8 leading~0.8 lagging			
	THD [V / I] (100% full power)	<3%			
	Acoustic Noise [dB]	<60			
	Overvoltage Category (OVC)	III			
CONSTRUCTION	Type of inverter	Non-isolated			
	Type of NS Protection	Integrated			
	Separated by	Transformerless			
	Hardware [Version]	Control board:V1.2, IO board:V1.0, Main power board:V1.0, Boost drive board:V1.0, INV drive board:V1.0 ARM board:V1.4, PV Input board:V1.2, AC output board:V1.4, Electric capacity board:V1.0,			

		Lightning protection broad:V1.0, Communication broad: V1.1, Display broad:V1.3		
	Firmware [Version]	V0.082		
	Protective Class	Class I		
	Enclosure Protection (IP)	IP66		
	Operating Temperature Range [°C]	-30°C to +60°C(>45 derating)		
	Pollution degree (PD)	PD3		
	Altitude [m]	4000m(>3000m derating)		
	Size [mm]	1045*660*364		
	Weight [kg]	93	98	
Notes:				

MODELS LIST		C6-75K-T6-40	C6-100K-T9-40	C6-110K-T12-40	C6-125K-T12-40
PV INPUT	VMAX PV [Vdc]	1100			
	ISC PV [A]	6*50	9*50	12*50	
	MPPT Voltage Range VMPP [Vdc]	180-1000			
	Max. Input Current IMAX [A] (A/B) (each MPPT if more than 1)	6*40	9*40	12*40	
	Number of MPPT	2			
	Overvoltage Category (OVC)	II			
AC Side	Rated Output Voltage Ur [Vac]	3L+N+PE, 230/400			
	Rated Output Frequency FNETZ [Hz]	50/60			
	Rated Output Power PE [kW]	75	100	110	125
	Max. Output Power PE [kVA]	82.5	110	121	125
	Rated Output Current Ir [A]	108.3	144.3	158.8	180.4

	Max. Output Current I _{max} [A]	119.1	158.8	174.6	180.4
	Power Factor cosφ [λ]	0.8 leading~0.8 lagging			
	THD [V / I] (100% full power)	<3%			
	Acoustic Noise [dB]	<60			
	Overvoltage Category (OVC)	III			
CONSTRUCTION	Type of inverter	Non-isolated			
	Type of NS Protection	Integrated			
	Separated by	Transformerless			
	Hardware [Version]	Control board:V1.2, IO board:V1.2, Main power board:V1.0, Boost drive board:V1.0, INV drive board:V1.0 ARM board:V1.4, PV Input board:V1.4, AC output board:V1.4, Electric capacity board:V1.2, Lightning protection board:V1.3, Communication board: V1.1, Display board:V1.3			
	Firmware [Version]	V0.082			
	Protective Class	Class I			
	Enclosure Protection (IP)	IP66			
	Operating Temperature Range [°C]	-30°C to +60°C(>45 derating)			
	Pollution degree (PD)	PD3			
	Altitude [m]	4000m(>3000m derating)			
	Size [mm]	1045*660*364			
	Weight [kg]	93		98	
Notes:					

IEC 61683:1999			
Clause	Requirement - Test	Result - Remark	Verdict
4	Efficiency measurement conditions		P
	Efficiency shall be measured under the matrix of conditions as described in the following clauses and table 1. Specific conditions may be excluded by mutual agreement when those conditions are outside the manufacturer's allowable operating range. The resulting data shall be presented in tabular form and may also be presented graphically.	(See test data record)	P
4.1	DC power source for testing		P
	For power conditioners operating with fixed input voltage, the d.c. power source shall be a storage battery or constant voltage power source to maintain the input voltage.		N/A
	For power conditioners that employ maximum power point tracking (MPPT) and shunt-type power conditioners, either a photovoltaic array or a photovoltaic array simulator shall be utilized.	PV array simulator used.	P
4.2	Temperature		P
	All measurements are to be made at an ambient temperature of $25\text{ °C} \pm 2\text{ °C}$. Other ambient temperatures may be allowed by mutual agreement. However, the temperature used must be clearly stated in all documentation.	(See test data record)	P
4.3	Output voltage and frequency		P
	The output voltage and frequency shall be maintained at the manufacturer's stated nominal values.	(See test data record)	P
4.4	Input voltage		P
	Measurements performed in each of the following tests shall be repeated at three power conditioner input voltages:		P
	a) manufacturer's minimum rated input voltage;	(See test data record)	P
	b) the inverter's nominal voltage or the average of its rated input range;	(See test data record)	P
	c) 90 % of the inverter's maximum input voltage.	(See test data record)	P
	In the case where a power conditioner is to be connected with a battery at its input terminals, only the nominal or rated input voltage may be applied.		N/A
4.5	Ripple and distortion		P
	Record input voltage and current ripple for each measurement. Also record output voltage and current distortion (if a.c.) or ripple (if d.c.). Ensure that these measurements remain within the manufacturer's specified values. Note that ripple and distortion may not be specified at low power levels, but readings shall be recorded.		P
4.6	Resistive loads/utility grid		P

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Clause	Requirement - Test	Result - Remark	Verdict
	At unity power factor, or at the intrinsic power factor of grid-connected inverters without power factor adjustment, measure the efficiency for power levels of 10 %, 25 %, 50 %, 75 %, 100 % and 120 % of the inverter's rating. Stand-alone inverters shall also be measured at a power level of 5 % of rated. The power conditioner test should be conducted with a specified resistive and reactive grid impedance.	(See test data record)	P
4.7	Reactive loads		N/A
	For stand-alone inverters, measure the efficiency with a load which provides a power factor equal to the manufacturer's specified minimum level (or 0,25, whichever is greater) and at power levels of 25 %, 50 % and 100 % of rated VA. Repeat for power factors of 0,5 and 0,75 (do not go below the manufacturer's specified minimum PF) and power levels of 25 %, 50 %, and 100 % of rated VA.	Only utility grid inverter.	N/A
4.8	Resistive plus non-linear loads		N/A
	For stand-alone inverters, measure the efficiency with a fixed non-linear load (total harmonic distortion (THD) = $(80 \pm 5) \%$) equal to $(25 \pm 5) \%$ of the inverter's rated VA plus sufficient resistive load in parallel to achieve a total load of 25 %, 50 % and 100 % of rated VA. Repeat the measurements with a fixed non-linear load equivalent to $(50 \pm 5) \%$ of the inverter's rated VA plus sufficient resistive load in parallel to achieve a total load of 50 % and 100 % of rated VA. The type of non-linear load must be clearly stated in all documentation.		N/A
4.9	Complex loads		N/A
	When a non-linear plus a sufficient reactive load condition is specified for stand-alone inverters, measure the efficiency with a fixed non-linear load (THD = $(80 \pm 5) \%$) equal to $(50 \pm 5) \%$ of the inverter's rated VA plus a sufficient reactive load (PF = 0, 5) in parallel to achieve a total load of 50 % and 100 % of rated VA. The type of complex load shall be clearly stated in all documentation.		N/A
5	Efficiency calculations		P
5.1	Rated output efficiency		P
	Rated output efficiency shall be calculated from measured data as follows: $\eta_R = (P_o / P_i) \times 100$	(See test data record)	P
5.2	Partial output efficiency		P

IEC 61683:1999			
Clause	Requirement - Test	Result - Remark	Verdict
	Partial output efficiency shall be calculated from measured data as follows: $\eta_{par} = (P_{op} / P_{ip}) \times 100$	(See test data record)	P
5.3	Energy efficiency		P
	Energy efficiency shall be calculated from measured data as follows: $\eta_E = (W_o / W_i) \times 100$	(See test data record)	P
5.4	Efficiency tolerances		P
	When an efficiency value has been guaranteed, the tolerance of this value shall be within the value at rated conditions indicated in table 2.		P
6	Efficiency test circuits		P
6.1	Test circuits		P
	Figure 1 shows recommended test circuits for power conditioners which have a single-phase a.c. output or d.c. output. It can as well be regarded as a single-phase representation of a test set-up for multiphase power conditioners.		P
	Figures 1a and 1b shall be applied to stand-alone and utility-interactive power conditioners respectively.		P
	The proposed test circuits in figure 1 are not mandatory, but together with the test descriptions, are intended to establish a base for mutual agreement between user and manufacturer.		P
	The type of power source shall be indicated on all tests and shall adhere to the requirements of 4.1.		P
6.2	Measurement procedure		P
	a) Efficiency is calculated with equation (1) or (2) using measured P_i , P_o or P_{ip} , P_{op} . DC input power P_i , P_{ip} can be measured by wattmeter W1, or determined by multiplying the d.c. voltmeter V1 and d.c. ammeter A1 readings. Output power P_o , P_{op} is measured with wattmeter W2.		P
	b) DC input voltage, which is measured by d.c. voltmeter V1, shall be varied in the defined range where the output current, which is measured with a.c. ammeter A2, is varied from low output to the rated output.		P
	c) An average indicating instrument shall be used for the d.c. voltmeter and d.c. ammeter. A true r.m.s. type of indicating instrument shall be used for the a.c. voltmeter and a.c. ammeter. The d.c. wattmeter W1 shall be a d.c. measuring type. The wattmeter W2 shall be an a.c. or d.c. measuring type according to the output.		P

IEC 61683:1999			
Clause	Requirement - Test	Result - Remark	Verdict
	d) Power factor (<i>PF</i> in per cent) can be measured by a power factor meter <i>PF</i> , or calculated from the readings of <i>V2</i> , <i>A2</i> , <i>W2</i> and as follows: $PF = (W2 / (V2 \times A2)) \times 100$		P
	e) Each meter may be an analogue type or a digital type. The measurement accuracy shall be better than $\pm 0,5\%$ of the full-scale value for each power measured. Digital power instruments for <i>W1</i> and <i>W2</i> are also recommended.		P
	f) An MPPT dynamically adjusts the input voltage so as to maximize the output power. In principle, the monitoring equipment shall sample all of the electrical parameters, such as input voltage and current, output power and current, within the update period of the MPPT. If the MPPT and input source (PV array or PV array simulator) interact in such a way that the input voltage varies by less than 5% , then averaging of readings is acceptable. The averaging period shall be 30 s or longer.		P
7	Loss measurement		P
7.1	No-load loss		N/A
	No-load loss shall be measured as follows.		N/A
	If the power conditioner is a stand-alone type, the reading of d.c. input voltage, output voltage and frequency is given with meters <i>V1</i> , <i>V2</i> and <i>F</i> respectively in figure 1a, and shall be adjusted to the rated values.		N/A
	The no-load loss is thus the indicated value of d.c. input wattmeter, <i>W1</i> , when the load is disconnected from the power conditioner.		N/A
	If the power conditioner is a utility-interactive type, the reading of d.c. input voltmeter <i>V1</i> , a.c. output voltmeter <i>V2</i> and frequency meter <i>F</i> in figure 1b shall be adjusted to meet the specified voltages and frequency.		N/A
	No-load loss is thus the indicated value of d.c. input wattmeter, <i>W1</i> , when a.c. wattmeter, <i>W2</i> , indicates a zero value. For the measurement, allow the power conditioner time to transfer to its no-load operating state, if applicable.		N/A
7.2	Standby loss		P
	Standby loss shall be measured as follows.		P
	If the power conditioner is a utility-interactive type, standby loss is defined as the consumption of utility power when the power conditioner is not operating but is under standby condition. Standby loss is indicated with a.c. wattmeter, <i>W2</i> in figure 1b at the rated a.c. output voltage.		P

IEC 61683:1999			
Clause	Requirement - Test	Result - Remark	Verdict
	If the power conditioner is a stand-alone type, standby loss is defined as the consumption from the d.c. source when the power conditioner is not operating but is under standby condition. Standby loss is indicated with d.c. wattmeter, W1 in figure 1a (without a.c. or d.c. output voltage).		P
Annex A	Power conditioner description		P
	A power conditioner is defined in IEC 61277.		P
	Some types of photovoltaic system configurations relate to their purpose and size. Figure A.1 shows the generic system configuration proposed in IEC 61277. In figure A.1, the power conditioner (PC) is inside the dotted line. The power conditioner may consist of one or more of the following: d.c. conditioner, d.c./d.c. interface, inverter, a.c./a.c. interface, a.c. utility interface, and a part of master control and monitoring (MCM) subsystem. The power flows are indicated by the arrows. When a PV system has a d.c. storage subsystem, it is assumed that the storage is connected to the input of the power conditioner in parallel with the array (see figures A.2 and A.3).		P
	Under normal conditions, the power conditioner a.c. output voltage and frequency are constant value when the system is connected to the utility grid (in a utility-interactive type) or to the a.c. loads (in a stand-alone type). However, when a.c. loads consist of pumps or blowers with variable speed induction motors, the a.c. voltage and frequency may be variable.		P
	In this standard, systems with a constant a.c. output voltage and frequency as well as systems with a d.c. output are discussed. Figures A.2 and A.3 show the configuration of the PV system and the power conditioner described in this standard.		P
Annex B	Power efficiency and conversion factor		P

IEC 61683:1999			
Clause	Requirement - Test	Result - Remark	Verdict
	There are two types of efficiencies shown in IEC 60146-2; one is a power efficiency, the other is a conversion factor. Power efficiency is defined as the ratio of active output power and active input power. Conversion factor is the ratio between output and input fundamental power levels. The formulae for these two parameters: $\eta_P = (P_{aAC}/P_{aDC}) \times 100 \quad (\%)$ $\eta_C = (P_{fAC}/P_{fDC}) \times 100 \quad (\%)$ η_P is the power efficiency; P_{aAC} is the a.c. active power; P_{aDC} is the d.c. active power; η_C is the conversion factor; P_{fAC} is the a.c. fundamental power; P_{fDC} is the d.c. mean power (mean voltage $\times$ mean current).	(See test data record)	P
	Active power P_a is calculated as $P_a = \frac{1}{T} \int_0^T v(t)i(t)dt \quad \text{or} \quad = \frac{1}{T} \int_0^T p(t)dt$	(See test data record)	P
	The difference between the above two efficiencies is due to the evaluation of the harmonic components. IEC 60146 unifies them into power efficiency. Their differences depend on their voltage and current waveforms as shown in table B.1 and are only meaningful in case 5. Considering the purpose of IEC standards and the illustration in table B.1, the power efficiency is used as the efficiency of power conditioners.		P
	As shown in table B.1, case 1 or case 4, the difference between η_C and η_P is only 0,1% when the d.c. voltage and current ripple are 10 %pp, or when a.c. 5th r.m.s. voltage content is 2 % and the 5th current content is 5 %. This means that the conversion factor is practically the same as the power efficiency. It shall, however, be noted that in the case of a square wave, as in case 5, the power efficiency shall be used because the difference is large, i.e., $\eta_C/\eta_P = 0,81$.		P
	The integration time (duration of one cycle) T shall be 30 s or more and the resultant mean power efficiency value shall be used as the efficiency of the power conditioner.		P
Annex C	Weighted-average energy efficiency		P
	The energy of a power conditioner depends on both the irradiance profile and the load profile. The energy efficiency of a power conditioner shall be calculated by the ratio of the output to the input energy actually measured over a certain period (such as a month or a year).		P

IEC 61683:1999			
Clause	Requirement - Test	Result - Remark	Verdict
	For reference, a method of estimating the energy efficiency using a weighted-average energy efficiency is described.		P
	The weighted-average energy efficiency, η_{WT} , is calculated as the sum of the products of each power level efficiency and related weighting coefficient.		P
	When the system is a utility-interactive type without a storage subsystem, the weighting coefficients depend on a regional irradiance duration curve.		P
	When the system is a stand-alone type with a storage subsystem, the weighting coefficients depend on the load duration curve.		P
	Clauses C.1 and C.2 show the calculation procedures for η_{WT} for utility-interactive systems and stand-alone systems.		P
C.1	η_{WT} of power conditioner for utility-interactive PV systems		P
	Utility-interactive PV systems, which have no storage and for which reverse-power flow is accepted, are described. In this case, d.c. power generated by the PV array is supplied direct into the power conditioner (PC). Almost all of the input power to the PC is converted to a.c. power. A part of it is dissipated as the PC loss.		P
	The weighted-average energy efficiency, η_{WT} , is an index to evaluate annual energy efficiency in which a weighting coefficient, K_i , is used for each input power level. Here, the irradiance is divided into several discrete levels. By using a duration time T_i , d.c. input power level, P_{li} , output power level, P_{oi} , and PC efficiency, η_i , for each level i , η_{WT} is defined as follows: $\eta_{WT} = \frac{\sum P_{oi} \cdot T_i}{\sum P_{li} \cdot T_i} = \frac{P_{o1} \cdot \eta_1 \cdot T_1 + \dots + P_{on} \cdot \eta_n \cdot T_n}{P_{l1} \cdot T_1 + \dots + P_{ln} \cdot T_n}$ $= K_1 \cdot \eta_1 + K_2 \cdot \eta_2 + \dots + K_n \cdot \eta_n$		P
	If the irradiance duration curve is given as shown in figure C.1, equation (C.1) can be rewritten as follows: $\eta_{WT} = \frac{1T_1}{T_{WT}} \eta_{1/4} + \frac{2T_2}{T_{WT}} \eta_{2/4} + \frac{3T_3}{T_{WT}} \eta_{3/4} + \frac{4T_4}{T_{WT}} \eta_{4/4} \geq \eta_{ER}$ $T_{WT} = 1T_1 + 2T_2 + 3T_3 + 4T_4$		P
C.2	η_{WT} of power conditioner for stand-alone PV systems	Non stand-alone PV systems	N/A
	In stand-alone PV systems with a storage subsystem, power generated from the PV array is stored and stabilized by the batteries. DC power is converted into regulated d.c. power or constant-voltage and constant-frequency a.c. power by a power conditioner (PC) and supplied to the load. In this case, some fraction of the generated power is dissipated as a loss in the batteries and power conditioner.		N/A

IEC 61683:1999			
Clause	Requirement - Test	Result - Remark	Verdict
	The calculation of the weighted-average energy efficiency, $\pm WT$, for stand-alone PV systems requires weighting coefficients for respective load levels.		N/A
	By using a load duration time T_i, d.c. input power P_{li}, a.c. output power P_{oi} and PC efficiency for respective load level $\pm i$, $\pm WT$ is defined as follows: $\eta_{WT} = \frac{\sum P_{oi} \cdot T_i}{\sum P_{li} \cdot T_i} = \frac{\sum P_{oi} \cdot T_i + \dots + P_{on} \cdot T_n}{P_{l0} \cdot T_0 + P_{o1} \cdot T_1 / \eta_1 + P_{on} \cdot T_n / \eta_n}$ $= \frac{1}{K_0 + K_1 / \eta_1 + \dots + K_n / \eta_n}$ $K_0 = P_{l0} \cdot T_0 / \sum (P_{oi} \cdot T_i)$ $K_i = P_{oi} \cdot T_i / \sum (P_{oi} \cdot T_i), \sum K_i = 1$		N/A
	If the load profile and its duration curve are given as shown in figures C.2 and C.3, equation (C.3) can be rewritten as follows: $\eta_{WT} = \frac{1}{K_0 + 1T_1 / T_{WT} / \eta_{1/4} + 2T_2 / T_{WT} / \eta_{2/4} + 3T_3 / T_{WT} / \eta_{3/4} + 4T_4 / T_{WT} / \eta_{4/4}} \geq \eta_{ER}$		N/A
Annex D	Derivation of efficiency tolerance		P

Table 1		Efficiency measurement Before the environment test*)						P	
C6-75K-T6, C6-75K-T6-40									
Ambient temperature: 25°C									
Standby loss power: 30W									
Total load,% of rated VA		5	10	20	30	50	75	100	
V _{mppmax}	P _{ac} /P _{ac,r} [%]		5.069	10.068	20.038	30.015	50.113	75.286	101.076
	Output efficiency								
	V _{ac} [V]	L1	230.14	230.14	230.19	230.33	230.48	230.63	230.83
		L2	230.08	230.07	230.10	230.23	230.43	230.54	230.74
		L3	230.24	230.23	230.26	230.40	230.55	230.77	230.99
	I _{ac} [A]	L1	6.951	11.671	22.211	32.969	54.734	81.977	109.931
		L2	7.063	11.836	22.358	33.152	54.859	82.019	109.824
		L3	6.860	11.502	21.863	32.543	54.247	81.496	109.275
	P _{op} [W]		3904.75	7603.37	15055.24	22530.13	37604.20	56622.10	75956.78
	PF		0.974	0.993	0.998	0.999	0.999	0.997	0.998
	V _{dc} [V]		843.42	848.45	846.61	848.30	849.90	847.18	847.94
	I _{dc} [A]		5.243	9.493	9.225	13.675	15.086	22.910	30.683
	P _{ip} [W]		4421.79	8054.22	15534.21	23125.85	38463.85	58227.46	78052.17
	η _{par} [%]		88.31	94.40	96.92	97.42	97.77	97.24	97.32
	Power efficiency								
	P _{aAC} [W]		3801.45	7550.93	15028.39	22511.51	37584.95	56464.46	75806.79
	P _{aDC} [W]		4304.32	8008.69	15534.21	23125.85	38466.36	57944.91	77753.27
	η _P [%]		88.32	94.28	96.74	97.34	97.71	97.45	97.50
	Conversion factor								
	P _{fAC} [W]		3792.77	7542.63	15019.87	22501.77	37571.30	56450.54	75790.31
	P _{fDC} [VA]		4304.32	8008.69	15534.21	23125.85	38464.45	57941.30	77750.96
	η _C [%]		88.12	94.18	96.69	97.30	97.68	97.43	97.48
	Energy efficiency								
	W _o [Wh](3min.)		190.072	377.560	751.419	1125.575	1879.247	2823.219	3790.350
	W _i [Wh] (3min.)		215.215	400.447	776.710	1156.291	1923.318	2897.237	3887.670
	η _E =(W _o /W _i)×100		88.32	94.28	96.74	97.34	97.71	97.45	97.50
Total load,% of rated VA		5	10	20	30	50	75	100	
V _{dc, nominal}	P _{ac} /P _{ac,r} [%]		5.035	10.012	20.073	30.069	50.064	75.273	100.157
	Output efficiency								
	V _{ac} [V]	L1	230.10	230.13	230.19	230.36	230.49	230.60	230.79
		L2	230.04	230.07	230.14	230.30	230.43	230.55	230.72
		L3	230.17	230.20	230.26	230.43	230.56	230.75	230.96
	I _{ac} [A]	L1	6.061	11.419	22.214	32.974	54.594	81.881	108.848
		L2	6.136	11.408	22.333	33.149	54.767	81.973	108.807
		L3	5.940	11.151	21.817	32.494	54.106	81.414	108.219
	P _{op} [W]		3791.85	7513.00	15098.75	22582.40	37566.74	56566.28	75220.00
	PF		0.996	0.999	0.997	0.999	0.999	0.998	0.999

	V _{dc} [V]	600.61	600.70	600.75	600.30	600.33	598.81	598.83
	I _{dc} [A]	6.653	4.330	8.579	12.834	21.328	32.311	42.980
	P _{ip} [W]	3995.84	7803.03	15462.35	23111.95	38411.04	58047.03	77216.65
	η _{par} [%]	94.89	96.28	97.65	97.71	97.80	97.45	97.41
	Power efficiency							
	P _{aAC} [W]	3775.91	7508.73	15054.64	22551.89	37547.71	56455.04	75117.57
	P _{aDC} [W]	3995.72	7803.03	15463.02	23111.66	38410.71	57761.63	76976.11
	η _P [%]	94.50	96.23	97.36	97.58	97.75	97.74	97.59
	Conversion factor							
	P _{fAC} [W]	3772.33	7502.23	15047.67	22544.10	37538.87	56445.20	75106.09
	P _{fDC} [VA]	4002.16	7802.46	15462.32	23111.72	38411.35	57760.28	76975.66
	η _C [%]	94.26	96.15	97.32	97.54	97.73	97.72	97.57
	Energy efficiency							
	W _o [W _h](3min.)	188.795	375.436	752.732	1127.594	1877.386	2822.751	3755.890
	W _i [W _h] (3min.)	199.786	390.152	773.151	1155.583	1920.536	2888.086	3848.798
	η _E =(W _o /W _i)×100	94.50	96.23	97.36	97.58	97.75	97.74	97.59
	Total load,% of rated VA	5	10	20	30	50	75	100
	P _{ac} /P _{ac,r} [%]	5.028	10.026	20.057	30.090	50.099	74.995	99.928
V _{mppmin}	Output efficiency							
	V _{ac} [V]	L1	230.11	230.14	230.21	230.37	230.50	230.76
		L2	230.07	230.10	230.17	230.32	230.45	230.71
		L3	230.19	230.22	230.28	230.44	230.56	230.81
	I _{ac} [A]	L1	6.187	11.494	22.223	33.021	54.633	81.566
		L2	6.254	11.491	22.352	33.201	54.824	81.659
		L3	6.087	11.219	21.824	32.548	54.172	81.055
	P _{op} [W]	3787.61	7523.89	15087.04	22598.31	37593.20	56259.31	74956.43
	PF	0.996	0.999	0.997	0.999	0.999	1.000	1.000
	V _{dc} [V]	521.01	521.04	520.81	520.64	520.82	520.91	520.87
	I _{dc} [A]	7.705	15.048	10.002	14.923	24.723	36.961	49.248
	P _{ip} [W]	4014.58	7838.19	15627.23	23308.02	38627.94	57759.59	76955.11
	η _{par} [%]	94.35	95.99	96.54	96.96	97.32	97.40	97.40
	Power efficiency							
	P _{aAC} [W]	3770.94	7519.70	15042.91	22567.83	37574.21	56246.28	74945.88
	P _{aDC} [W]	4012.55	7838.19	15624.15	23303.79	38623.44	57754.82	76949.60
	η _P [%]	93.98	95.94	96.28	96.84	97.28	97.39	97.40
	Conversion factor							
	P _{fAC} [W]	3765.73	7512.25	15034.71	22558.88	37563.32	56233.44	74931.14
	P _{fDC} [VA]	4014.66	7840.58	15627.02	23308.25	38627.77	57759.31	76955.10
	η _C [%]	93.80	95.81	96.21	96.78	97.24	97.36	97.37
	Energy efficiency							

	W _o [W _h](3min.)		188.547	375.986	752.145	1128.391	1878.711	2812.313	3747.290
	W _i [W _h] (3min.)		200.628	392.280	781.206	1165.189	1931.172	2887.740	3847.490
	η _E =(W _o /W _i)×100		93.98	95.85	96.28	96.84	97.28	97.39	97.40
C6-100K-T9, C6-100K-T9-40									
Ambient temperature: 25°C									
Standby loss power: 30W									
Total load,% of rated VA			5	10	20	30	50	75	100
V _{mppmax}	P _{ac} /P _{ac,r} [%]		5.020	10.099	19.961	40.031	50.202	75.859	100.993
	Output efficiency								
	V _{ac} [V]	L1	230.14	230.17	230.34	230.54	230.63	230.86	231.18
		L2	230.08	230.10	230.25	230.46	230.57	230.82	231.20
		L3	230.22	230.26	230.41	230.55	230.74	231.01	231.36
	I _{ac} [A]	L1	8.386	15.123	29.306	43.751	72.921	109.990	147.149
		L2	8.529	15.360	29.460	43.890	72.955	109.853	145.983
		L3	8.283	14.934	28.883	43.368	72.467	109.339	144.292
	P _{op} [W]		5081.39	10130.91	19977.53	30037.76	50359.76	76007.29	101152.33
	PF		0.988	0.997	0.999	1.000	0.997	0.998	0.998
	V _{dc} [V]		844.62	848.00	848.01	849.84	832.86	843.89	846.32
	I _{dc} [A]		6.659	4.469	24.241	12.069	20.764	30.823	40.909
	P _{ip} [W]		5538.25	10563.53	20530.84	30770.56	51880.76	78034.20	103868.70
	η _{par} [%]		91.75	95.90	97.30	97.62	97.07	97.40	97.38
	Power efficiency								
	P _{aAC} [W]		5019.78	10099.00	19960.96	30023.31	50201.97	75858.92	100992.58
	P _{aDC} [W]		5529.91	10563.53	20530.84	30771.49	51606.09	77725.87	103550.48
	η _P [%]		90.78	95.60	97.22	97.57	97.28	97.60	97.53
	Conversion factor								
	P _{fAC} [W]		5010.33	10090.87	19951.59	30013.46	50179.50	75842.27	100972.78
	P _{fDC} [VA]		5529.91	10563.53	20530.84	30770.59	51599.89	77723.11	103548.00
	η _C [%]		90.60	95.53	97.18	97.54	97.25	97.58	97.51
	Energy efficiency								
	W _o [W _h](3min.)		250.990	504.949	998.044	1501.166	2510.092	3792.960	5049.640
	W _i [W _h] (3min.)		276.496	528.177	1026.540	1538.574	2580.294	3886.313	5177.520
	η _E =(W _o /W _i)×100		90.78	95.60	97.22	97.57	97.28	97.60	97.53
Total load,% of rated VA			5	10	20	30	50	75	100
V _{dc, nominal}	P _{ac} /P _{ac,r} [%]		5.005	10.030	20.037	30.028	50.517	75.685	100.300
	Output efficiency								
	V _{ac} [V]	L1	230.17	230.21	230.40	230.49	230.59	230.82	231.14
		L2	230.12	230.14	230.32	230.42	230.52	230.76	231.09
		L3	230.25	230.29	230.46	230.55	230.71	230.97	231.37
	I _{ac} [A]	L1	7.908	14.966	29.303	43.701	73.286	109.656	146.007

		L2	7.872	14.973	29.446	43.838	73.415	109.615	145.011
		L3	7.778	14.687	28.892	43.291	72.858	109.023	143.283
	P _{op} [W]		5065.62	10061.16	20054.03	30040.01	50631.70	75787.37	100410.19
	PF		0.988	0.997	0.999	1.000	0.998	0.999	0.999
	V _{dc} [V]		600.66	600.77	600.83	600.87	599.80	598.77	598.89
	I _{dc} [A]		8.722	5.747	11.385	17.034	28.932	43.306	57.451
	P _{ip} [W]		5239.10	10357.89	20522.06	30706.46	52061.12	77793.09	103226.02
	η _{par} [%]		96.69	97.14	97.72	97.83	97.25	97.42	97.27
	Power efficiency								
	P _{aAC} [W]		5005.14	10030.06	20037.31	30028.41	50517.35	75684.55	100299.71
	P _{aDC} [W]		5239.02	10357.89	20522.31	30706.72	51751.94	77564.28	103013.14
	η _P [%]		95.54	96.83	97.64	97.79	97.61	97.58	97.37
	Conversion factor								
	P _{fAC} [W]		5000.58	10024.28	20031.33	30021.02	50508.73	75672.80	100285.93
	P _{fDC} [VA]		5239.16	10357.29	20522.65	30706.43	51751.04	77563.53	103011.77
	η _C [%]		95.45	96.78	97.61	97.77	97.60	97.56	97.35
	Energy efficiency								
	W _o [W _h](3min.)		250.257	501.503	1001.866	1501.419	2525.863	3784.220	5015.000
W _i [W _h] (3min.)		261.951	517.895	1026.116	1535.336	2587.593	3878.224	5150.650	
η _E =(W _o /W _i)×100		95.54	96.83	97.64	97.79	97.61	97.58	97.37	
Total load,% of rated VA			5	10	20	30	50	75	100
V _{mppmin}	P _{ac} /P _{ac,r} [%]		5.025	10.011	20.026	30.056	50.068	75.097	100.047
	Output efficiency								
	V _{ac} [V]	L1	230.17	230.21	230.41	230.50	230.77	231.08	231.49
		L2	230.15	230.19	230.39	230.50	230.76	231.07	231.51
		L3	230.27	230.32	230.49	230.56	230.82	231.12	231.50
	I _{ac} [A]	L1	7.902	14.946	29.279	43.737	72.598	108.729	145.506
		L2	7.816	14.965	29.394	43.847	72.638	108.552	144.316
		L3	7.766	14.659	28.923	43.352	72.182	108.111	142.796
	P _{op} [W]		5030.95	10049.96	20047.33	30069.86	50077.56	75104.06	100065.86
	PF		0.999	0.996	0.999	1.000	1.000	1.000	1.000
	V _{dc} [V]		521.13	521.12	521.14	520.93	520.92	520.88	520.81
	I _{dc} [A]		3.379	6.635	13.148	19.769	32.876	49.384	65.930
	P _{ip} [W]		5274.62	10373.82	20555.87	30894.37	51378.27	77169.47	103011.24
	η _{par} [%]		95.38	96.88	97.53	97.33	97.47	97.32	97.14
	Power efficiency								
	P _{aAC} [W]		5024.88	10010.67	20026.28	30055.51	50068.30	75096.99	100047.01
	P _{aDC} [W]		5272.51	10373.82	20555.75	30890.27	51373.97	77164.34	103004.41
	η _P [%]		95.30	96.50	97.42	97.30	97.46	97.32	97.13
Conversion factor									

	P_{fAC} [W]	5019.85	10004.88	20019.98	30047.97	50059.86	75086.14	100033.95
	P_{fDC} [VA]	5274.63	10373.50	20555.81	30894.10	51377.88	77169.17	103011.17
	η_C [%]	95.17	96.45	97.39	97.26	97.43	97.30	97.11
	Energy efficiency							
	W_o [Wh](3min.)	251.244	500.534	1001.315	1502.776	2503.414	3754.840	5002.350
	W_i [Wh] (3min.)	263.625	518.692	1027.787	1544.515	2568.698	3858.220	5150.230
	$\eta_E = (W_o/W_i) \times 100$	95.30	96.50	97.42	97.30	97.46	97.32	97.13
C6-110K-T12, C6-110K-T12-40								
Ambient temperature: 25°C								
Standby loss power: 30W								
Total load,% of rated VA		5	10	20	30	50	75	100
V_{mppmax}	$P_{ac}/P_{ac,r}$ [%]	5.032	10.016	20.039	30.028	50.005	75.024	100.514
	Output efficiency							
	V_{ac} [V]	L1	230.18	230.23	230.42	230.51	230.80	231.60
		L2	230.09	230.14	230.32	230.42	230.70	231.52
		L3	230.25	230.29	230.48	230.56	230.84	231.55
	I_{ac} [A]	L1	8.982	16.390	32.287	48.103	79.791	119.654
		L2	9.101	16.668	32.423	48.229	79.857	119.278
		L3	8.895	16.229	31.892	47.688	79.341	118.606
	P_{op} [W]	5579.12	11054.31	22061.66	33041.67	55012.35	82534.70	110593.06
	PF	0.992	0.997	0.999	1.000	1.000	1.000	1.000
	V_{dc} [V]	849.65	849.73	849.86	849.38	849.40	849.39	850.74
	I_{dc} [A]	2.356	4.512	8.886	13.278	22.090	33.193	44.480
	P_{ip} [W]	5992.67	11501.78	22655.59	33834.01	56289.64	84580.74	113522.28
	η_{par} [%]	93.10	96.11	97.38	97.66	97.73	97.58	97.42
	Power efficiency							
	P_{aAC} [W]	5535.55	11017.64	22042.72	33031.11	55005.55	82526.67	110565.47
	P_{aDC} [W]	5992.82	11501.78	22656.84	33834.59	56290.34	84581.61	113522.21
	η_P [%]	92.37	95.79	97.29	97.63	97.72	97.57	97.40
	Conversion factor							
	P_{fAC} [W]	5527.34	11009.38	22033.32	33020.41	54992.55	82510.16	110545.51
	P_{fDC} [VA]	5992.68	11501.66	22655.84	33834.32	56289.40	84580.60	113522.30
	η_C [%]	92.23	95.72	97.25	97.59	97.70	97.55	97.38
	Energy efficiency							
	W_o [Wh](3min.)	276.777	550.882	1102.136	1651.556	2750.277	4126.340	5528.270
	W_i [Wh] (3min.)	299.641	575.090	1132.842	1691.730	2814.516	4229.080	5676.100
	$\eta_E = (W_o/W_i) \times 100$	92.37	95.79	97.29	97.63	97.72	97.57	97.40
Total load,% of rated VA		5	10	20	30	50	75	100
	$P_{ac}/P_{ac,r}$ [%]	5.012	10.014	20.028	30.059	50.197	75.442	100.462
	Output efficiency							

V _{dc, nominal}	V _{ac} [V]	L1	230.17	230.21	230.41	230.51	230.64	231.01	231.27
		L2	230.10	230.14	230.32	230.42	230.58	230.99	231.29
		L3	230.24	230.29	230.47	230.56	230.60	230.92	231.12
	I _{ac} [A]	L1	8.639	16.374	32.160	48.092	80.092	120.372	161.406
		L2	8.602	16.423	32.348	48.220	80.113	119.943	159.575
		L3	8.494	16.085	31.763	47.670	79.704	119.405	157.473
	P _{op} [W]		5582.54	11051.64	22050.36	33077.71	55325.13	83086.00	110632.04
	PF		0.988	0.997	0.999	1.000	0.998	0.999	0.999
	V _{dc} [V]		600.74	600.81	600.82	600.33	598.55	598.58	593.46
	I _{dc} [A]		3.204	6.310	12.505	18.787	31.629	47.533	64.126
	P _{ip} [W]		5818.77	11370.28	22538.70	33835.51	56794.69	85357.52	114165.67
	η _{par} [%]		95.94	97.20	97.83	97.76	97.41	97.34	96.90
	Power efficiency								
	P _{aAC} [W]		5512.79	11015.84	22031.20	33064.38	55216.22	82985.83	110508.28
	P _{aDC} [W]		5765.78	11370.28	22539.38	33835.22	56486.73	85120.79	113494.91
	η _P [%]		95.61	96.88	97.75	97.72	97.75	97.49	97.37
	Conversion factor								
	P _{fAC} [W]		5507.80	11009.69	22024.16	33056.48	55206.91	82972.99	110485.05
	P _{fDC} [VA]		5772.99	11364.79	22538.72	33835.19	56486.69	85120.13	113493.69
	η _C [%]		95.41	96.88	97.72	97.70	97.73	97.48	97.35
	Energy efficiency								
	W _o [W _h](3min.)		275.640	550.792	1101.560	1653.219	2760.815	4149.290	5525.410
	W _i [W _h] (3min.)		288.289	568.514	1126.969	1691.761	2824.341	4256.040	5674.850
	η _E =(W _o /W _i)×100		95.61	96.88	97.75	97.72	97.75	97.49	97.37
Total load,% of rated VA		5	10	20	30	50	75	100	
V _{mppmin}	P _{ac} /P _{ac,r} [%]		5.015	10.032	20.039	30.051	50.041	75.031	100.191
	Output efficiency								
	V _{ac} [V]	L1	230.19	230.25	230.45	230.55	230.84	231.28	231.62
		L2	230.13	230.18	230.39	230.50	230.79	231.24	231.59
		L3	230.27	230.32	230.51	230.62	230.89	231.30	231.61
	I _{ac} [A]	L1	8.639	16.400	32.182	48.061	79.756	119.573	160.603
		L2	8.573	16.417	32.310	48.172	79.811	119.133	158.989
		L3	8.481	16.115	31.796	47.668	79.339	118.567	156.754
	P _{op} [W]		5570.26	11063.37	22058.12	33067.26	55051.63	82541.43	110235.91
	PF		0.990	0.997	0.999	1.000	1.000	1.000	1.000
	V _{dc} [V]		521.01	521.11	520.89	520.92	520.91	520.86	520.76
	I _{dc} [A]		11.083	7.300	14.545	21.727	36.147	54.313	72.691
	P _{ip} [W]		5780.82	11411.51	22729.13	33953.64	56488.51	84868.82	113563.64
	η _{par} [%]		96.36	96.95	97.05	97.39	97.46	97.26	97.07
	Power efficiency								

	P _{aAC} [W]	5516.03	11035.34	22043.05	33056.61	55044.85	82533.89	110210.44	
	P _{aDC} [W]	5772.19	11411.51	22725.11	33949.55	56484.03	84863.25	113555.83	
	η _P [%]	95.56	96.70	97.00	97.37	97.45	97.26	97.05	
	Conversion factor								
	P _{fAC} [W]	5510.99	11029.33	22036.57	33049.01	55035.91	82522.40	110196.21	
	P _{fDC} [VA]	5774.33	11411.60	22729.33	33953.54	56488.71	84868.93	113564.12	
	η _C [%]	95.44	96.65	96.95	97.34	97.43	97.24	97.03	
	Energy efficiency								
	W _o [W _h](3min.)	275.802	551.767	1102.152	1652.830	2752.243	4126.700	5510.520	
	W _i [W _h] (3min.)	288.610	570.576	1136.256	1697.477	2824.202	4243.170	5677.780	
η _E =(W _o /W _i)×100	95.56	96.70	97.00	97.37	97.45	97.26	97.05		
C6-125K-T12, C6-125K-T12-40									
Ambient temperature: 25°C									
Standby loss power: 30W									
Total load,% of rated VA		5	10	20	30	50	75	100	
V _{mppmax}	P _{ac} /P _{ac,r} [%]		5.019	9.678	20.022	30.038	50.200	75.030	98.665
	Output efficiency								
	V _{ac} [V]	L1	230.17	230.18	230.41	230.52	230.80	231.11	231.37
		L2	230.11	230.13	230.37	230.48	230.67	230.96	231.24
		L3	230.26	230.27	230.50	230.60	230.82	231.08	231.41
	I _{ac} [A]	L1	9.881	17.963	36.573	54.650	90.996	136.468	177.474
		L2	10.007	18.174	36.695	54.714	91.021	135.663	178.118
		L3	9.770	17.708	36.172	54.201	90.534	134.423	177.914
	P _{op} [W]		6274.84	12130.57	25040.75	37556.48	62757.60	93803.24	123332.89
	PF		1.000	0.997	0.999	1.000	1.000	1.000	1.000
	V _{dc} [V]		826.01	848.14	849.96	850.00	836.91	843.03	853.26
	I _{dc} [A]		8.179	14.841	10.069	15.068	25.768	38.227	49.673
	P _{ip} [W]		6755.99	12555.61	25675.00	38423.62	64382.42	96271.46	126663.50
	η _{par} [%]		92.88	96.61	97.53	97.74	97.48	97.44	97.37
	Power efficiency								
	P _{aAC} [W]		6274.18	12097.06	25027.22	37546.91	62749.95	93788.08	123331.50
	P _{aDC} [W]		6755.87	12555.61	25676.90	38425.64	64382.42	96271.46	126663.50
	η _P [%]		92.87	96.35	97.47	97.71	97.46	97.42	97.37
	Conversion factor								
	P _{fAC} [W]		6265.59	12089.09	25017.50	37535.68	62736.36	93770.35	123323.32
	P _{fDC} [VA]		6756.06	12555.61	25675.50	38423.53	64382.42	96271.46	126663.50
	η _C [%]		92.74	96.28	97.44	97.69	97.44	97.40	97.36
	Energy efficiency								
	W _o [W _h](3min.)		313.710	604.849	1251.360	1877.346	3137.490	4689.410	6166.580
	W _i [W _h] (3min.)		337.795	627.779	1283.844	1921.281	3219.130	4813.570	6333.180

	$\eta_E = (W_o/W_i) \times 100$	92.87	96.35	97.47	97.71	97.46	97.42	97.37
Total load, % of rated VA		5	10	20	30	50	75	100
V _{dc, nominal}	P _{ac} /P _{ac,r} [%]	5.047	10.028	20.031	30.111	50.320	75.253	100.599
	Output efficiency							
	V _{ac} [V]	L1	230.16	230.19	230.40	230.45	230.77	231.03
		L2	230.11	230.16	230.38	230.42	230.73	230.99
		L3	230.27	230.30	230.49	230.55	230.91	231.19
	I _{ac} [A]	L1	9.728	18.541	36.504	54.699	91.130	136.768
		L2	9.684	18.590	36.647	54.837	91.194	136.044
		L3	9.539	18.206	36.099	54.312	90.667	134.734
	P _{op} [W]	6370.85	12559.39	25052.68	37762.15	63007.78	94171.36	125750.44
	PF	0.990	0.998	0.999	0.997	0.998	0.999	1.000
	V _{dc} [V]	598.50	600.85	600.42	598.87	598.11	597.85	597.59
	I _{dc} [A]	10.961	7.156	14.239	21.634	35.981	53.926	72.078
	P _{ip} [W]	6604.79	12899.41	25647.75	38669.34	64564.28	96721.64	129105.30
	η_{par} [%]	96.46	97.36	97.68	97.65	97.59	97.36	97.40
	Power efficiency							
	P _{aAC} [W]	6309.20	12534.38	25039.17	37638.19	62899.95	94066.00	125749.10
	P _{aDC} [W]	6559.92	12899.41	25647.32	38483.97	64300.78	96492.93	129105.30
	η_P [%]	96.18	97.17	97.63	97.80	97.82	97.48	97.40
	Conversion factor							
	P _{fAC} [W]	6304.18	12528.16	25032.27	37628.71	62888.28	94051.63	125744.30
	P _{fDC} [VA]	6560.16	12899.27	25647.75	38481.90	64298.93	96491.24	129105.30
	η_C [%]	96.10	97.12	97.60	97.78	97.81	97.47	97.40
	Energy efficiency							
	W _o [Wh] (3min.)	315.460	626.719	1251.959	1881.911	3145.000	4703.300	6287.450
	W _i [Wh] (3min.)	327.996	644.971	1282.366	1924.196	3215.045	4824.660	6455.260
	$\eta_E = (W_o/W_i) \times 100$	96.18	97.17	97.63	97.80	97.82	97.48	97.40
Total load, % of rated VA		5	10	20	30	50	75	100
V _{mppmin}	P _{ac} /P _{ac,r} [%]	5.005	10.010	20.039	30.041	49.962	75.014	100.367
	Output efficiency							
	V _{ac} [V]	L1	230.13	230.19	230.41	230.52	230.94	231.35
		L2	230.10	230.17	230.39	230.51	230.93	231.34
		L3	230.25	230.32	230.51	230.61	231.02	231.39
	I _{ac} [A]	L1	9.672	18.534	36.546	54.577	90.455	136.219
		L2	9.609	18.593	36.682	54.701	90.453	135.320
		L3	9.489	18.216	36.133	54.152	89.956	134.175
	P _{op} [W]	6269.48	12544.08	25066.46	37563.83	62460.13	93782.04	125460.46
	PF	0.998	0.997	0.999	1.000	1.000	1.000	1.000
	V _{dc} [V]	520.11	520.09	519.85	519.82	519.71	518.97	518.10

	I _{dc} [A]	4.200	8.293	16.561	24.740	41.094	62.021	83.853
	P _{ip} [W]	6544.22	12939.84	25827.92	38581.20	64070.75	96561.18	129675.38
	η _{par} [%]	95.80	96.94	97.05	97.36	97.49	97.12	96.75
	Power efficiency							
	P _{aAC} [W]	6256.25	12511.95	25049.29	37551.77	62452.40	93768.04	125459.16
	P _{aDC} [W]	6541.97	12939.84	25823.65	38576.60	64065.48	96553.55	129675.38
	η _P [%]	95.63	96.69	97.00	97.34	97.48	97.12	96.75
	Conversion factor							
	P _{fAC} [W]	6250.32	12505.46	25041.59	37542.63	62442.18	93756.17	125454.66
	P _{fDC} [VA]	6544.24	12939.67	25828.09	38581.22	64071.15	96561.96	129675.38
	η _c [%]	95.51	96.64	96.95	97.31	97.46	97.09	96.75
	Energy efficiency							
	W _o [W _h] (3min.)	312.812	625.598	1252.465	1877.588	3122.610	4688.400	6272.960
	W _i [W _h] (3min.)	327.098	646.992	1291.183	1928.830	3203.270	4827.690	6483.760
	η _E =(W _o /W _i)×100	95.63	96.69	97.00	97.34	97.48	97.11	96.75
Note: η _R is the rated output efficiency. η _{par} is the partial output efficiency. η _E is the energy efficiency. *) see test report CN22OWHX 002 attachment 1								

Table 2		Efficiency measurement After the environment test*).						P	
C6-75K-T6, C6-75K-T6-40									
Ambient temperature: 25°C									
Standby loss power: 30W									
Total load,% of rated VA		5	10	20	30	50	75	100	
V _{mppmax}	P _{ac} /P _{ac,r} [%]		5.067	10.055	20.114	30.092	49.444	75.374	100.909
	Output efficiency								
	V _{ac} [V]	L1	230.14	230.15	230.20	230.34	230.43	230.63	230.83
		L2	230.08	230.10	230.12	230.25	230.34	230.55	230.74
		L3	230.24	230.24	230.27	230.41	230.54	230.77	230.99
	I _{ac} [A]	L1	6.959	11.651	22.312	33.073	54.003	82.073	109.753
		L2	7.072	11.815	22.425	33.215	54.092	82.114	109.641
		L3	6.867	11.497	21.968	32.647	53.570	81.589	109.089
	P _{op} [W]		3903.27	7594.16	15111.92	22587.84	37254.10	56688.19	75830.83
	PF		0.974	0.993	0.998	0.999	0.995	0.997	0.998
	V _{dc} [V]		845.16	848.94	847.39	848.33	847.68	847.86	844.95
	I _{dc} [A]		5.237	9.478	18.432	13.726	15.137	22.910	30.744
	P _{ip} [W]		4425.77	8046.42	15618.87	23188.44	38493.68	58274.66	77931.13
	η _{par} [%]		88.19	94.38	96.75	97.41	96.78	97.28	97.30
	Power efficiency								
	P _{aAC} [W]		3800.03	7541.45	15085.14	22569.22	37083.14	56530.75	75681.58
	P _{aDC} [W]		4307.94	8000.04	15587.00	23188.44	38177.77	57992.59	77636.16
	η _P [%]		88.21	94.27	96.78	97.33	97.13	97.48	97.48
	Conversion factor								
	P _{fAC} [W]		3791.29	7533.37	15076.90	22559.84	37071.68	56517.09	75665.38
	P _{fDC} [VA]		4307.94	8000.04	15587.00	23188.44	38174.61	57990.14	77633.73
	η _C [%]		88.01	94.17	96.73	97.29	97.11	97.46	97.46
	Energy efficiency								
	W _o [Wh](3min.)		190.002	377.071	754.257	1128.466	1854.151	2826.533	3784.080
	W _i [Wh] (3min.)		215.397	400.000	779.351	1159.427	1908.887	2899.615	3881.794
	η _E =(W _o /W _i)×100		88.21	94.27	96.78	97.33	97.13	97.48	97.48
Total load,% of rated VA		5	10	20	30	50	75	100	
V _{dc} , nominal	P _{ac} /P _{ac,r} [%]		5.006	10.005	20.042	30.055	50.045	75.299	100.124
	Output efficiency								
	V _{ac} [V]	L1	230.10	230.13	230.21	230.37	230.50	230.60	230.79
		L2	230.05	230.08	230.15	230.31	230.44	230.55	230.73
		L3	230.18	230.21	230.27	230.43	230.56	230.75	230.96
	I _{ac} [A]	L1	6.029	11.414	22.193	32.960	54.567	81.912	108.809
		L2	6.109	11.403	22.315	33.137	54.738	81.997	108.769
		L3	5.908	11.134	21.792	32.492	54.105	81.440	108.188

	P _{op} [W]	3770.38	7508.29	15083.65	22577.18	37556.00	56585.86	75195.38
	PF	0.996	0.999	0.997	0.998	0.999	0.998	0.999
	V _{dc} [V]	600.70	600.76	600.74	600.29	600.32	598.79	598.81
	I _{dc} [A]	6.612	12.962	8.567	12.829	21.325	32.320	42.963
	P _{ip} [W]	3970.97	7793.75	15440.28	23103.37	38404.96	58062.39	77184.80
	η _{par} [%]	94.95	96.34	97.69	97.72	97.79	97.46	97.42
	Power efficiency							
	P _{aAC} [W]	3754.21	7504.07	15031.64	22541.22	37533.61	56474.55	75093.18
	P _{aDC} [W]	3970.78	7793.75	15440.97	23103.09	38404.66	57777.27	76943.78
	η _P [%]	94.55	96.28	97.35	97.57	97.73	97.75	97.59
	Conversion factor							
	P _{fAC} [W]	3750.76	7497.77	15024.24	22533.28	37523.99	56464.62	75081.93
	P _{fDC} [VA]	3977.13	7788.23	15440.19	23103.03	38404.90	57776.52	76943.28
	η _C [%]	94.31	96.27	97.31	97.53	97.71	97.73	97.58
	Energy efficiency							
	W _o [W _h](3min.)	187.711	375.203	751.582	1127.061	1876.680	2823.729	3754.660
	W _i [W _h] (3min.)	198.539	389.688	772.048	1155.155	1920.232	2888.864	3847.174
	η _E =(W _o /W _i)×100	94.55	96.28	97.35	97.57	97.73	97.75	97.60
	Total load,% of rated VA	5	10	20	30	50	75	100
V _{mppmin}	P _{ac} /P _{ac,r} [%]	5.016	10.026	20.029	30.072	50.047	75.042	100.073
	Output efficiency							
	V _{ac} [V]	L1	230.10	230.13	230.20	230.36	230.49	231.01
		L2	230.05	230.08	230.15	230.32	230.45	230.98
		L3	230.18	230.21	230.27	230.43	230.56	231.05
	I _{ac} [A]	L1	6.070	11.450	22.168	32.995	54.585	108.717
		L2	6.125	11.422	22.296	33.154	54.733	108.613
		L3	5.945	11.158	21.781	32.507	54.106	108.035
	P _{op} [W]	3778.59	7523.63	15073.80	22590.14	37557.87	56296.53	75066.69
	PF	0.996	0.999	0.997	0.998	0.999	1.000	1.000
	V _{dc} [V]	521.12	521.10	520.74	520.90	520.93	520.89	520.83
	I _{dc} [A]	2.558	5.021	9.960	14.875	24.656	36.969	49.364
	P _{ip} [W]	3992.68	7849.76	15559.43	23245.06	38531.77	57769.55	77130.72
	η _{par} [%]	94.64	95.85	96.88	97.18	97.47	97.45	97.32
	Power efficiency							
	P _{aAC} [W]	3761.99	7519.39	15021.55	22554.11	37535.41	56281.44	75054.49
	P _{aDC} [W]	3990.69	7849.76	15556.43	23240.97	38527.45	57764.71	77125.31
	η _P [%]	94.27	95.79	96.56	97.04	97.43	97.43	97.32
	Conversion factor							
	P _{fAC} [W]	3758.08	7512.83	15014.69	22546.24	37525.82	56269.78	75040.50
	P _{fDC} [VA]	3997.97	7849.65	15559.76	23245.14	38532.04	57769.70	77130.85

	η_c [%]		94.00	95.71	96.50	96.99	97.39	97.40	97.29
	Energy efficiency								
	W_o [W _h](3min.)		188.100	375.969	751.077	1127.705	1876.771	2814.072	3752.730
	W_i [W _h] (3min.)		199.535	392.488	777.822	1162.048	1926.373	2888.234	3856.270
	$\eta_E=(W_o/W_i)\times 100$		94.27	95.79	96.56	97.04	97.43	97.43	97.32
C6-100K-T9, C6-100K-T9-40									
Ambient temperature: 25°C									
Standby loss power: 30W									
Total load,% of rated VA			5	10	20	30	50	75	100
V _{mppmax}	$P_{ac}/P_{ac,r}$ [%]		5.034	9.987	19.993	29.999	50.302	75.668	100.564
	Output efficiency								
	V _{ac} [V]	L1	230.15	230.18	230.35	230.42	230.63	230.86	231.19
		L2	230.10	230.11	230.26	230.33	230.48	230.82	231.18
		L3	230.23	230.27	230.42	230.48	230.70	231.01	231.36
	I _{ac} [A]	L1	8.358	14.980	29.359	43.744	73.056	109.717	146.498
		L2	8.489	15.209	29.506	43.920	73.180	109.569	145.381
		L3	8.250	14.800	28.952	43.334	72.574	109.067	143.699
	P _{op} [W]		5111.90	10027.79	20014.13	30013.08	50311.07	75815.42	100723.46
	PF		0.985	0.996	0.999	1.000	1.000	0.998	0.998
	V _{dc} [V]		848.40	848.42	849.07	848.93	842.09	839.43	846.81
	I _{dc} [A]		6.547	12.351	24.260	18.165	20.438	30.919	40.806
	P _{ip} [W]		5488.22	10442.34	20564.59	30762.56	51455.82	77862.40	103661.74
	η_{par} [%]		93.14	96.03	97.32	97.56	97.78	97.37	97.17
	Power efficiency								
	P _{aAC} [W]		5034.33	9986.97	19993.33	29998.62	50301.71	75668.22	100564.02
	P _{aDC} [W]		5488.22	10442.34	20564.59	30762.56	51455.82	77538.97	103332.61
	η_P [%]		91.73	95.64	97.22	97.52	97.76	97.59	97.32
	Conversion factor								
	P _{fAC} [W]		5026.18	9978.70	19984.09	29988.68	50289.76	75652.61	100544.01
	P _{fDC} [VA]		5488.22	10442.34	20564.59	30762.56	51455.82	77538.33	103331.34
	η_c [%]		91.58	95.56	97.18	97.48	97.73	97.57	97.30
	Energy efficiency								
	W_o [W _h](3min.)		251.718	499.347	999.686	1499.927	2503.905	3783.400	5028.180
	W_i [W _h] (3min.)		274.413	522.115	1028.250	1538.124	2561.360	3876.932	5166.600
	$\eta_E=(W_o/W_i)\times 100$		91.73	95.64	97.22	97.52	97.76	97.59	97.32
Total load,% of rated VA			5	10	20	30	50	75	100
V _{dc} , nominal	$P_{ac}/P_{ac,r}$ [%]		5.008	10.030	20.031	30.128	50.519	75.677	100.258
	Output efficiency								
	V _{ac} [V]	L1	230.17	230.22	230.41	230.50	230.59	230.82	231.16

		L2	230.13	230.16	230.36	230.44	230.52	230.77	231.13
		L3	230.25	230.30	230.49	230.57	230.71	230.97	231.33
	I _{ac} [A]	L1	7.854	14.963	29.282	43.843	73.291	109.654	145.941
		L2	7.799	14.971	29.436	43.977	73.413	109.597	144.941
		L3	7.727	14.686	28.881	43.429	72.862	109.010	143.226
	P _{op} [W]		5014.51	10061.33	20047.23	30139.86	50632.80	75780.03	100367.99
	PF		0.999	0.997	0.999	1.000	0.998	0.999	0.999
	V _{dc} [V]		600.66	600.78	600.83	600.38	599.75	598.75	598.78
	I _{dc} [A]		8.728	5.747	11.382	17.115	28.916	43.315	57.434
	P _{ip} [W]		5242.85	10357.92	20515.23	30826.05	52030.17	77807.38	103174.43
	η _{par} [%]		95.64	97.14	97.72	97.77	97.31	97.39	97.28
	Power efficiency								
	P _{aAC} [W]		5008.14	10030.30	20030.54	30128.31	50518.52	75677.32	100257.52
	P _{aDC} [W]		5242.76	10357.92	20515.49	30825.75	51723.91	77574.40	102960.43
	η _P [%]		95.52	96.84	97.64	97.74	97.67	97.55	97.37
	Conversion factor								
	P _{fAC} [W]		5003.36	10024.64	20024.27	30121.04	50510.42	75665.60	100243.90
	P _{fDC} [VA]		5249.82	10357.57	20515.18	30825.78	51722.32	77573.56	102960.04
	η _C [%]		95.31	96.79	97.61	97.71	97.66	97.54	97.36
	Energy efficiency								
	W _o [W _h](3min.)		250.407	501.516	1001.527	1506.417	2525.928	3783.860	5012.870
	W _i [W _h] (3min.)		262.138	517.897	1025.775	1541.289	2586.189	3878.714	5148.000
	η _E =(W _o /W _i)×100		95.52	96.84	97.64	97.74	97.67	97.55	97.38
Total load,% of rated VA		5	10	20	30	50	75	100	
V _{mppmin}	P _{ac} /P _{ac,r} [%]		5.014	10.021	20.023	30.039	50.044	75.059	100.088
	Output efficiency								
	V _{ac} [V]	L1	230.18	230.23	230.42	230.51	230.78	231.10	231.51
		L2	230.16	230.19	230.37	230.47	230.75	231.07	231.51
		L3	230.27	230.32	230.50	230.59	230.85	231.14	231.53
	I _{ac} [A]	L1	7.885	14.960	29.272	43.701	72.547	108.649	145.577
		L2	7.809	14.941	29.410	43.822	72.588	108.473	144.354
		L3	7.753	14.694	28.883	43.330	72.163	108.074	142.830
	P _{op} [W]		5019.63	10051.19	20039.17	30050.33	50051.62	75064.47	100105.81
	PF		0.999	0.997	0.999	1.000	1.000	1.000	1.000
	V _{dc} [V]		520.98	521.08	521.10	520.87	520.85	520.78	520.71
	I _{dc} [A]		10.109	6.641	13.149	19.763	32.871	49.366	65.971
	P _{ip} [W]		5266.82	10381.71	20555.32	30881.67	51362.37	77127.56	103056.50
	η _{par} [%]		95.31	96.82	97.49	97.31	97.45	97.33	97.14
	Power efficiency								
	P _{aAC} [W]		5013.59	10020.54	20022.66	30039.00	50044.25	75058.68	100088.45

	P _{aDC} [W]		5264.66	10381.71	20555.22	30877.69	51358.09	77122.46	103049.65
	η _P [%]		95.23	96.52	97.41	97.28	97.44	97.32	97.13
	Conversion factor								
	P _{fAC} [W]		5008.55	10014.91	20016.35	30031.84	50035.81	75048.06	100075.23
	P _{fDC} [VA]		5266.82	10381.79	20555.29	30881.85	51362.44	77127.75	103056.28
	η _C [%]		95.10	96.47	97.38	97.25	97.42	97.30	97.11
	Energy efficiency								
	W _o [W _h](3min.)		250.680	501.026	1001.132	1501.950	2502.213	3752.940	5004.430
	W _i [W _h] (3min.)		263.233	519.085	1027.761	1543.883	2567.905	3856.120	5152.480
	η _E =(W _o /W _i)×100		95.23	96.52	97.41	97.28	97.44	97.32	97.13
C6-110K-T12, C6-110K-T12-40									
Ambient temperature: 25°C									
Standby loss power: 30W									
Total load,% of rated VA			5	10	20	30	50	75	100
V _{mppmax}	P _{ac} /P _{ac,r} [%]		5.006	9.764	19.760	30.075	50.012	74.888	100.499
	Output efficiency								
	V _{ac} [V]	L1	230.14	230.16	230.33	230.39	230.65	231.04	231.32
		L2	230.08	230.09	230.26	230.28	230.56	230.93	231.16
		L3	230.23	230.24	230.38	230.46	230.68	231.04	231.27
	I _{ac} [A]	L1	9.026	16.070	31.879	48.212	79.871	119.511	161.525
		L2	9.167	16.255	31.968	48.385	79.930	119.194	159.767
		L3	8.903	15.849	31.468	47.772	79.395	118.517	157.478
	P _{op} [W]		5578.12	11087.80	21953.34	33095.52	55021.53	82385.50	110578.60
	PF		0.987	0.969	0.990	1.000	1.000	1.000	1.000
	V _{dc} [V]		845.23	852.39	847.76	848.03	847.63	845.12	850.57
	I _{dc} [A]		7.218	4.625	9.077	20.027	22.250	33.423	44.672
	P _{ip} [W]		6010.09	11827.27	23084.46	33888.69	56288.01	84422.42	113506.85
	η _{par} [%]		92.81	93.75	95.10	97.66	97.75	97.59	97.42
	Power efficiency								
	P _{aAC} [W]		5506.41	10740.23	21735.50	33082.18	55012.87	82376.39	110549.42
	P _{aDC} [W]		6010.09	11390.91	22675.72	33888.69	56288.01	84422.42	113506.85
	η _P [%]		91.62	94.29	95.85	97.62	97.73	97.58	97.39
	Conversion factor								
	P _{fAC} [W]		5498.02	10731.81	21727.29	33071.76	55000.61	82360.77	110529.96
	P _{fDC} [VA]		6010.09	11390.91	22677.67	33888.69	56288.01	84422.42	113506.85
	η _C [%]		91.48	94.21	95.81	97.59	97.71	97.56	97.38
	Energy efficiency								
	W _o [W _h](3min.)		273.791	537.035	1086.772	1654.109	2750.647	4118.810	5527.470
	W _i [W _h] (3min.)		298.835	569.571	1133.784	1694.434	2814.403	4221.111	5675.350
	η _E =(W _o /W _i)×100		91.62	94.29	95.85	97.62	97.73	97.58	97.39

Total load,% of rated VA		5	10	20	30	50	75	100
V _{dc} , nominal	P _{ac} /P _{ac,r} [%]	5.005	10.011	20.047	30.015	50.206	75.443	100.100
	Output efficiency							
	V _{ac} [V]	L1	230.18	230.22	230.41	230.51	230.64	231.58
		L2	230.14	230.13	230.32	230.41	230.58	231.52
		L3	230.27	230.29	230.47	230.56	230.61	231.56
	I _{ac} [A]	L1	8.602	16.367	32.205	48.007	80.109	160.512
		L2	8.545	16.406	32.352	48.163	80.133	158.910
		L3	8.451	16.068	31.797	47.606	79.712	156.609
	P _{op} [W]	5575.24	11048.02	22070.47	33029.59	55335.28	83087.59	110138.16
	PF	0.987	0.997	0.999	1.000	0.998	0.999	1.000
	V _{dc} [V]	599.42	600.80	600.32	600.35	598.52	598.57	600.49
	I _{dc} [A]	3.198	6.309	12.554	18.758	31.630	47.533	62.839
	P _{ip} [W]	5791.02	11369.47	22609.25	33784.89	56792.99	85355.27	113201.54
	η _{par} [%]	96.27	97.17	97.62	97.76	97.43	97.34	97.29
	Power efficiency							
	P _{aAC} [W]	5505.21	11012.17	22051.35	33016.21	55226.41	82987.81	110110.38
	P _{aDC} [W]	5742.98	11369.47	22608.95	33784.61	56485.96	85118.20	113201.06
	η _P [%]	95.86	96.86	97.53	97.73	97.77	97.50	97.27
	Conversion factor							
	P _{fAC} [W]	5500.34	11006.23	22044.51	33008.31	55216.37	82975.57	110096.96
	P _{fDC} [VA]	5748.98	11363.86	22609.24	33784.97	56485.98	85117.80	113201.56
	η _C [%]	95.68	96.85	97.50	97.70	97.75	97.48	97.26
	Energy efficiency							
	W _o [Wh](3min.)	275.260	550.607	1102.567	1650.811	2761.320	4149.380	5505.520
	W _i [Wh] (3min.)	287.148	568.473	1130.447	1689.230	2824.306	4255.910	5660.050
	η _E =(W _o /W _i)×100	95.86	96.86	97.53	97.73	97.77	97.50	97.27
Total load,% of rated VA		5	10	20	30	50	75	100
V _{mppmin}	P _{ac} /P _{ac,r} [%]	5.001	10.035	20.058	30.018	50.037	75.045	99.436
	Output efficiency							
	V _{ac} [V]	L1	230.14	230.22	230.42	230.51	230.81	231.58
		L2	230.10	230.14	230.33	230.42	230.71	231.53
		L3	230.25	230.30	230.47	230.56	230.85	231.58
	I _{ac} [A]	L1	8.534	16.405	32.220	48.017	79.744	159.370
		L2	8.472	16.437	32.363	48.151	79.860	157.836
		L3	8.387	16.089	31.814	47.614	79.343	155.638
	P _{op} [W]	5503.64	11066.36	22079.20	33030.40	55047.59	82557.38	109404.70
	PF	0.999	0.997	0.999	1.000	1.000	1.000	1.000
	V _{dc} [V]	519.23	521.10	520.86	520.91	520.89	520.82	520.73
	I _{dc} [A]	3.699	7.304	14.557	21.702	36.150	54.330	72.148

	P _{ip} [W]		5753.60	11418.29	22746.72	33914.29	56490.15	84888.91	112707.71
	η _{par} [%]		95.66	96.92	97.07	97.39	97.45	97.25	97.07
	Power efficiency								
	P _{aAC} [W]		5500.62	11038.50	22064.20	33019.78	55040.88	82549.81	109379.75
	P _{aDC} [W]		5751.37	11418.29	22742.67	33910.06	56485.70	84883.39	112700.02
	η _P [%]		95.64	96.67	97.02	97.37	97.44	97.25	97.05
	Conversion factor								
	P _{fAC} [W]		5495.61	11032.80	22057.66	33012.49	55032.22	82538.36	109365.74
	P _{fDC} [VA]		5758.98	11418.04	22746.93	33914.53	56490.68	84888.92	112707.46
	η _C [%]		95.43	96.63	96.97	97.34	97.42	97.23	97.04
	Energy efficiency								
	W _o [W _h](3min.)		275.057	551.926	1103.209	1650.989	2752.044	4127.490	5468.980
	W _i [W _h] (3min.)		287.595	570.915	1137.133	1695.503	2824.286	4244.170	5635.000
	η _E =(W _o /W _i)×100		95.64	96.67	97.02	97.37	97.44	97.25	97.05
C6-125K-T12, C6-125K-T12-40									
Ambient temperature: 25°C									
Standby loss power: 30W									
Total load,% of rated VA			5	10	20	30	50	75	100
V _{mppmax}	P _{ac} /P _{ac,r} [%]		5.045	9.674	20.165	30.086	50.132	74.989	98.662
	Output efficiency								
	V _{ac} [V]	L1	230.15	230.18	230.36	230.44	230.81	231.32	231.38
		L2	230.09	230.12	230.27	230.33	230.70	231.32	231.25
		L3	230.26	230.26	230.42	230.49	230.83	231.36	231.41
	I _{ac} [A]	L1	10.046	17.963	36.852	54.742	90.885	136.270	177.471
		L2	10.194	18.174	37.007	54.871	90.883	135.370	178.097
		L3	9.907	17.710	36.442	54.325	90.409	134.187	177.900
	P _{op} [W]		6369.85	12126.53	25222.89	37619.90	62672.33	93749.93	123328.48
	PF		0.990	0.997	0.999	1.000	1.000	1.000	1.000
	V _{dc} [V]		841.54	848.19	846.85	848.82	844.38	850.18	854.36
	I _{dc} [A]		8.179	14.841	15.371	15.216	25.552	37.701	49.610
	P _{ip} [W]		6805.13	12554.22	25938.32	38632.72	64387.02	96157.75	126667.27
	η _{par} [%]		93.60	96.59	97.24	97.38	97.34	97.50	97.36
	Power efficiency								
	P _{aAC} [W]		6305.95	12093.05	25206.01	37607.98	62664.68	93736.49	123327.04
	P _{aDC} [W]		6805.13	12554.22	25938.32	38632.72	64387.02	96159.49	126667.27
	η _P [%]		92.66	96.33	97.18	97.35	97.33	97.48	97.36
	Conversion factor								
	P _{fAC} [W]		6297.42	12085.07	25196.19	37596.55	62651.36	93718.51	123318.68
	P _{fDC} [VA]		6805.13	12554.22	25938.32	38632.72	64387.02	96157.88	126667.27
	η _C [%]		92.54	96.26	97.14	97.32	97.30	97.46	97.36

	Energy efficiency							
	W _o [W _h](3min.)	315.297	604.650	1260.309	1880.398	3133.240	4686.830	6166.350
	W _i [W _h] (3min.)	340.257	627.709	1296.909	1931.639	3219.340	4807.980	6333.360
	$\eta_E = (W_o/W_i) \times 100$	92.66	96.33	97.18	97.35	97.33	97.48	97.36
Total load,% of rated VA		5	10	20	30	50	75	100
V _{dc} , nominal	P _{ac} /P _{ac,r} [%]							
	Output efficiency							
	V _{ac} [V]	L1	230.13	230.22	230.39	230.44	230.77	231.03
		L2	230.10	230.18	230.34	230.42	230.74	231.01
		L3	230.24	230.31	230.50	230.55	230.91	231.20
	I _{ac} [A]	L1	9.603	18.585	36.590	54.709	91.138	136.727
		L2	9.527	18.605	36.732	54.833	91.193	136.024
		L3	9.416	18.230	36.168	54.314	90.669	134.716
	P _{op} [W]		6249.24	12759.80	25227.38	37763.85	63010.55	94158.64
	PF		1.000	0.983	0.994	0.997	0.998	0.999
	V _{dc} [V]		600.86	598.35	598.91	598.86	597.88	597.86
	I _{dc} [A]		3.617	7.335	14.692	21.652	35.986	53.908
	P _{ip} [W]		6510.17	13166.82	26097.96	38900.51	64547.58	96691.54
	η_{par} [%]		95.99	96.91	96.66	97.08	97.62	97.38
	Power efficiency							
	P _{aAC} [W]		6248.78	12540.12	25079.85	37640.16	62902.71	94053.00
	P _{aDC} [W]		6510.03	12919.03	25872.94	38508.98	64283.07	96464.01
	η_P [%]		95.99	97.07	96.93	97.74	97.85	97.50
	Conversion factor							
	P _{fAC} [W]		6243.32	12534.31	25072.96	37631.21	62891.14	94038.38
	P _{fDC} [VA]		6510.15	12918.33	25872.89	38508.16	64281.28	96462.31
	η_C [%]		95.90	97.03	96.91	97.72	97.84	97.49
	Energy efficiency							
	W _o [W _h](3min.)		312.440	627.004	1253.994	1882.006	3145.140	4702.650
	W _i [W _h] (3min.)		325.502	645.950	1293.655	1925.453	3214.159	4823.210
	$\eta_E = (W_o/W_i) \times 100$		95.99	97.07	96.93	97.74	97.85	97.50
Total load,% of rated VA		5	10	20	30	50	75	100
V _{mppmin}	P _{ac} /P _{ac,r} [%]							
	Output efficiency							
	V _{ac} [V]	L1	230.13	230.20	230.41	230.52	230.94	230.61
		L2	230.10	230.17	230.39	230.50	230.92	230.57
		L3	230.24	230.31	230.51	230.60	231.01	230.75
	I _{ac} [A]	L1	9.609	18.508	36.536	54.558	90.600	81.864
		L2	9.542	18.567	36.675	54.670	90.589	81.966
		L3	9.429	18.196	36.125	54.129	90.124	81.412

	P _{op} [W]	6255.83	12546.08	25072.88	37554.19	62565.90	56562.85	75852.57
	PF	1.000	0.997	0.999	1.000	1.000	0.998	0.999
	V _{dc} [V]	519.91	520.13	519.71	519.70	519.71	519.28	519.27
	I _{dc} [A]	12.558	8.279	16.538	24.711	41.195	38.114	50.801
	P _{ip} [W]	6529.10	12918.23	25785.16	38526.56	64228.12	58077.39	77994.70
	η _{par} [%]	95.81	97.12	97.24	97.48	97.41	97.39	97.25
	Power efficiency							
	P _{aAC} [W]	6255.37	12514.34	25055.67	37542.13	62558.26	56452.75	75751.46
	P _{aDC} [W]	6526.90	12918.23	25781.01	38522.19	64223.09	57960.92	77897.41
	η _P [%]	95.84	96.87	97.19	97.46	97.41	97.40	97.25
	Conversion factor							
	P _{fAC} [W]	6249.90	12508.46	25048.86	37534.37	62548.61	56443.40	75740.72
	P _{fDC} [VA]	6528.97	12917.99	25785.35	38526.72	64228.06	57961.93	77898.43
	η _C [%]	95.73	96.83	97.14	97.42	97.39	97.38	97.23
	Energy efficiency							
	W _o [W _h] (3min.)	312.769	625.717	1252.785	1877.106	3127.910	2822.637	3787.570
	W _i [W _h] (3min.)	326.345	645.911	1289.052	1926.111	3211.160	2898.046	3894.875
	η _E =(W _o /W _i)×100	95.84	96.87	97.19	97.46	97.41	97.40	97.24
Note: η_R is the rated output efficiency. η_{par} is the partial output efficiency. η_E is the energy efficiency. *) see test report CN22OWHX 002 attachment 1								

Test Report issued under the responsibility of:



TEST REPORT IEC 60068 Environmental Testing	
Report Number.:	CN22OWHX 002
Date of issue:	See cover page
Total number of pages	See cover page
Testing Laboratory	See cover page
Address	See cover page
Applicant's name.....:	See cover page
Address	See cover page
Test specification:	
Standard	IEC 60068-2-1: 2007 IEC 60068-2-2: 2007 IEC 60068-2-14: 2009 IEC 60068-2-30: 2005
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC 60068_A
Test Report Form(s) Originator.....:	TÜV Rheinland Group
Master TRF	Dated 2013-12
Test item description	
Trade Mark	See above.
Manufacturer	See above.
Model/Type reference	See above.
Ratings	See above.

Testing procedure and testing location:		
☒	Testing Laboratory:	See above.
Testing location/ address		See above.
☐	Associated Laboratory:	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
☐	Testing procedure: TMP	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
☒	Testing procedure: WMT	
Testing location/ address		
See report CN22OWHX 001		
Witnessed by (name + signature) ..:		See above.
Approved by (name + signature) ..:		See above.
☐	Testing procedure: SMT	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
Supervised by (name + signature):		
☐	Testing procedure: RMT	
Testing location/ address		
Tested by (name + signature).....:		
Approved by (name + signature) ..:		
Supervised by (name + signature):		

Copy of marking plate

See above.

Test item particulars
Classification of installation and use
Supply Connection.....
.....
Possible test case verdicts: - test case does not apply to the test object..... : N/A - test object does meet the requirement : P (Pass) - test object does not meet the requirement..... : F (Fail)
Testing
Date of receipt of test item : See cover page
Date (s) of performance of tests..... : See cover page
General remarks: The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a ☐ comma / ☒ point is used as the decimal separator. Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods.

General product information:

See above.

Summary of test:

See above.

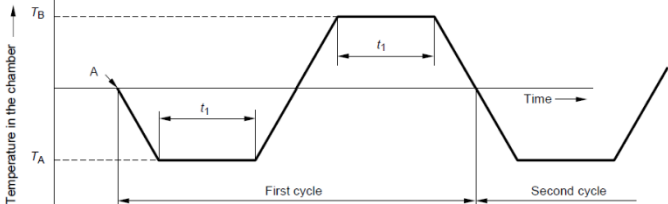
IEC 60068-2-1				
Clause	Requirement - Test		Result - Remark	Verdict
5	Test description			P
5.1	General Tests Ab, Ad, and Ae are similar. Differences are noted in 5.2.2, 5.3.2 and 5.4.2. All other portions of the test are the same, starting with Clause 6.			P
5.2	Test Ab: Cold for non heat-dissipating specimens with gradual change of temperature			N/A
5.3	Test Ad: Cold for heat-dissipating specimens with gradual change of temperature that are powered after initial temperature stabilization			N/A
5.4	Test Ae: Cold for heat-dissipating specimens with gradual change of temperature that are required to be powered throughout the test			P
6	Test procedure			P
6.1	Confirmation of performance IEC 60068-3-5 provides guidance for the confirmation of performance of temperature test chambers.			P
6.2	Working space The dimensions of the test sample shall be such that it is entirely within the working space of the test chamber. The temperature of incident air delivered to the test specimen shall be within ± 2 K of test severity temperature during the steady-state condition. The air temperature in the working space shall be measured in accordance with 4.5.			P
6.3	Thermal radiation The ability of the specimen to transfer heat by thermal radiation shall be minimized.			P
6.4	Specimen with artificial cooling The relevant specification shall define the characteristics of the coolant supplied to the specimen. When the coolant is air, care shall be taken that the air is not contaminated by oil and dry enough to avoid moisture problems.			P
6.5	Mounting Thermal conduction and other relevant characteristics of the mounting and connections of the test specimen should be specified in the relevant specification. When the test specimen is intended for use with specific mounting devices, these shall be used for testing.			P
6.6	Severities 6.6.1 Temperature		-40°C	P
	- 65 °C	- 40 °C	- 20 °C	+ 5 °C
	- 55 °C	- 33 °C	- 10 °C	
	- 50 °C	- 25 °C	- 5 °C	

IEC 60068-2-1								
Clause	Requirement - Test		Result - Remark	Verdict				
	6.6.2 Duration <table border="1"><tr><td>2 h</td><td>72 h</td></tr><tr><td>16 h</td><td>96 h</td></tr></table>		2 h	72 h	16 h	96 h	16 h	P
2 h	72 h							
16 h	96 h							
6.7	Preconditioning			P				
6.8	Initial measurements The initial state of the specimen shall be known. This may be achieved by visual inspection, and/or functional tests as required by the relevant specification.`		Test according IEC 61683 was performed before the environment test, see test data table.	P				
6.9	Conditioning The specimen shall be exposed to the low temperature conditions for the duration, as detailed in the relevant specification.			P				
6.10	Intermediate measurements The relevant specification may call for loading and/or measurements during or at the end of conditioning while the specimen is still in the chamber.			P				
6.11	Final temperature ramp If the specimen remains in operating or loaded condition during the test, it shall be switched off or unloaded before the temperature is raised with the exception of Test Ae in which the specimen shall remain operational throughout the recovery period.			P				
6.12	Recovery The specimen shall be subjected to the recovery procedure in the chamber or otherwise, as deemed suitable. Appropriate steps may be taken to remove droplets of water, as required, without damaging the specimen.			P				
6.13	Final measurements The specimen shall be visually inspected and such performance checks made as are required by the relevant specification.		Test according IEC 61683 was performed after the environment test, see test data table.	P				

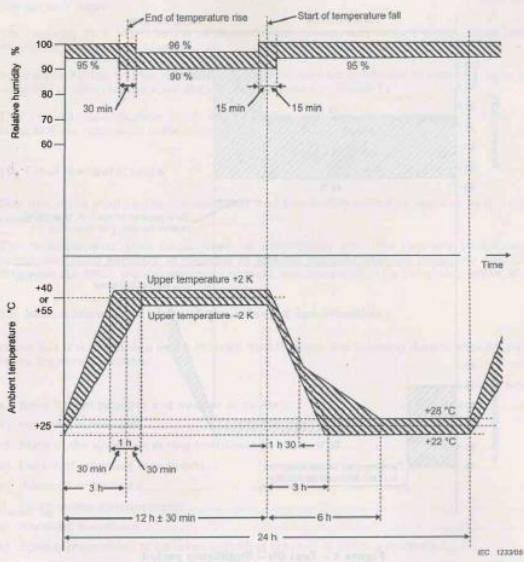
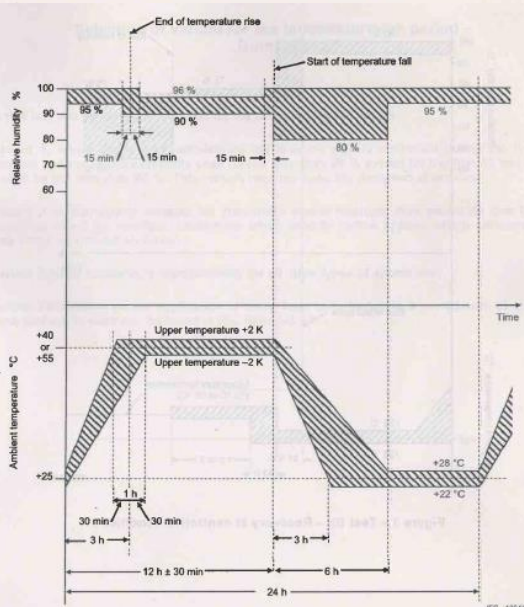
IEC 60068-2-2			
Clause	Requirement - Test	Result - Remark	Verdict
5	Test description		P
5.1	General Tests Bb, Bd, and Be are similar. Differences are noted in 5.2.2, 5.3.2 and 5.4.2. All other portions of the test are the same, starting with Clause 6.		P
5.2	Test Bb: Dry heat for non heat-dissipating specimens with gradual change of temperature		N/A
5.3	Test Bd: Dry heat for heat-dissipating specimens with gradual change of temperature that are not powered during the conditioning period		N/A
5.4	Test Be: Dry heat for heat-dissipating specimens with gradual change of temperature that are required to be powered throughout the test		P
6	Test procedure		P
6.1	Confirmation of performance IEC 60068-3-5 provides guidance for the confirmation of performance of temperature test chambers.		P
6.2	Working space The dimensions of the test sample shall be such that it is entirely within the working space of the test chamber. The temperature of incident air delivered to the test specimen shall be within ± 2 K of test severity temperature during the steady-state condition. The air temperature in the working space shall be measured in accordance with 4.5.		P
6.3	Thermal radiation The ability of the specimen to transfer heat by thermal radiation shall be minimized.		P
6.4	Mounting Thermal conduction and other relevant characteristics of the mounting and connections of the test specimen should be specified in the relevant specification. When the test specimen is intended for use with specific mounting devices, these shall be used for testing.		P
6.5	Severities 6.5.2 Temperature +1 000 °C +250 °C +85 °C +45 °C +800 °C +200 °C +70 °C +40 °C +630 °C +175 °C +65 °C +35 °C +500 °C +155 °C +60 °C +30 °C +400 °C +125 °C +55 °C +315 °C +100 °C +50 °C	+60°C	P
	6.5.3 Duration 2 h 72 h 168 h 336 h 16 h 96 h 240 h 1 000 h	16 h	P
6.6	Preconditioning		P

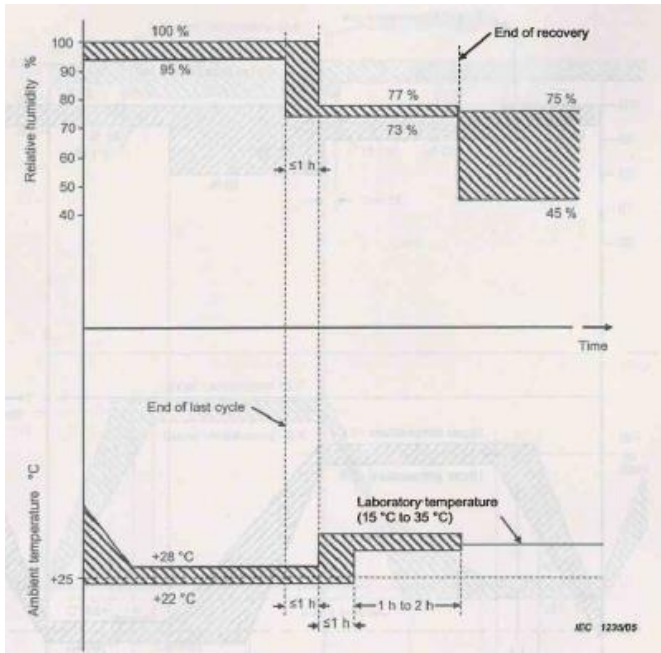
IEC 60068-2-2			
Clause	Requirement - Test	Result - Remark	Verdict
6.7	Initial measurements The initial state of the specimen shall be known. This may be achieved by visual inspection, and/or functional tests as required by the relevant specification.	Test according IEC 61683 was performed before the environment test, see test data table.	P
6.8	Conditioning 6.8.1 Steady state conditions The specimen shall then be exposed to the high temperature conditions for the duration as detailed in the relevant specification.		P
	6.8.2 Absolute humidity The absolute humidity shall not exceed 20 g of water vapour per cubic metre of air (corresponding to approximately 50 % relative humidity at 35 °C) the relative humidity shall not exceed 50 %.		P
6.9	Intermediate measurements The relevant specification may call for loading and/or measurements during or at the end of conditioning while the specimen is still in the chamber.		P
6.10	Final temperature ramp If the specimen remains in operating or loaded condition during the test, it shall be switched off or unloaded before the temperature is raised with the exception of Test Ae in which the specimen shall remain operational throughout the recovery period.		P
6.11	Recovery The specimen shall be subjected to the recovery procedure in the chamber or otherwise, as deemed suitable. Appropriate steps may be taken to remove droplets of water, as required, without damaging the specimen.		P
6.12	Final measurements The specimen shall be visually inspected and such performance checks made as are required by the relevant specification.	Test according IEC 61683 was performed after the environment test, see test data table.	P

IEC 60068-2-14			
Clause	Requirement - Test	Result - Remark	Verdict
8	Test Nb: Change of temperature with specified rate of change		P
8.1	General description of the test This test determines the ability of components, equipment or other articles to withstand and/or function during changes of ambient temperature.		P
8.2	Testing procedure		P
8.2.1	Testing chamber The chamber for this test shall be so designed that in the working space where the specimen under test is placed a temperature cycle can be performed in such a manner that: a) the low temperature required for the test can be maintained, b) the high temperature required for the test can be maintained, c) the change rate required for the test from low temperature to high temperature or vice versa can be performed at the required rate of change.		P
8.2.2	Mounting or supporting of the test specimen Unless otherwise specified in the relevant specification, the thermal conduction of the mounting or support shall be low, such that for practical purposes the specimen is thermally isolated.		P
8.2.3	Severities The severity of the test is defined by the combination of the two temperatures, the rate of temperature change, the exposure time of the specimen and the number of cycles.		P
	The lower temperature TA shall be specified in the relevant specification and should be chosen from the test temperatures of IEC 60068-2-1 and IEC 60068-2-2.	-40°C	P
	The higher temperature TB shall be specified in the relevant specification and should be chosen from the test temperatures of IEC 60068-2-1 and IEC 60068-2-2.	+60°C	P
	The air temperature shall be lowered or raised between 90 % and 10 % of $D = T_B - T_A$ within a tolerance of 20 % of the temperature change rate. Preferred values are (1 ± 0,2) K/min, (3 ± 0,6) K/min, (5 ± 1) K/min, (10 ± 2) K/min, or (15 ± 3) K/min,	1 K/min	P
	The exposure time, t1, to each of the two temperatures depends upon the heat capacity of the specimen. It may be 3 h, 2 h, 1 h, 30 min, or 10 min, or as specified in the relevant specification.	1 h	P

IEC 60068-2-14			
Clause	Requirement - Test	Result - Remark	Verdict
8.2.4	Conditioning The specimen and the temperature in test chamber shall be at the ambient temperature of the laboratory, +25 °C ±5 K. If required by the relevant specification, the specimen shall be brought into operating condition.		P
8.2.5	Test cycle 		P

IEC 60068-2-30			
Clause	Requirement - Test	Result - Remark	Verdict
3	General description This test comprises one or more temperature cycles in which the relative humidity is maintained at high level.		P
4	Testing chamber-Construction requirements		P
4.1	The temperature can be varied cyclically between 25°C +/- 3 K and the appropriate upper temperature specified with the tolerance and rate of change specified in 7.3 and Figures 2a or 2b, as applicable.		P
4.2	The relative humidity in the working space can be maintained within the limits given in 7.3 and in Figures 2a or 2b, as applicable.		P
4.3	Care shall be taken to ensure that the conditions prevailing at any point in the working space are uniform and are as similar as possible to those prevailing in the immediate vicinity of suitably located temperature and humidity sensing devices. The chamber shall meet the performance criteria as detailed in IEC 60068-3-6.		P
4.4	The specimens under test shall not be subjected to radiant heat from the chamber conditioning processes.		P
4.5	Water used for the maintenance of chamber humidity shall have a resistivity of not less than 500mΩ.		P
4.6	The dimensions, properties and/or electrical loading of the specimens under test shall not appreciably influence conditions within the chamber.		P
5	Severities The severity shall be chosen from the following: a) Upper temperature: 40°C Number of cycles: 2, 6, 12, 21, 56; b) Upper temperature: 55°C Number of cycles: 1, 2, 6	55°C, 2 cycle	P
6	Initial measurements The specimens shall be visually inspected, and functionally tested, as required by the relevant specification.		P

IEC 60068-2-30			
Clause	Requirement - Test	Result - Remark	Verdict
7	Conditioning The specimens shall be introduced into the chamber either in the unpacked, switched-off, ready-for-use state, or as otherwise specified in the relevant specification.  Figure 2a – Test Db – Test cycle – Variant 1  Figure 2b – Test Db – Test cycle – Variant 2 Figure 2 – Test Db – Test cycle – Variants 1 and 2	Variant 1 was used.	P
8	Intermediate measurements The relevant specification may require functional tests during the conditioning programmer.		P

IEC 60068-2-30			
Clause	Requirement - Test	Result - Remark	Verdict
9	Recovery The relevant specification shall prescribe whether recovery shall be made at standard atmospheric conditions for testing, or at controlled recovery conditions. If controlled recovery conditions are required (see Figure 3), the specimen may be transferred to another chamber for this recovery period or may remain in the damp heat chamber.  Figure 3 – Test Db – Recovery at controlled conditions		P
10	Final measurements The specimens shall be visually inspected, and functionally tested as required by the relevant specification.	Test according IEC 61683 was performed after the environment test, see test data table.	P

Part 2-1	TABLE : Cold test (Test A)		P
	Condition:.....:	working	—
IEC 60068-2-1: 2007 Environmental testing - Part 2-1: Tests - Test A: Cold			
Specimen type:		heat dissipating, powered throughout	
Temperature change:		gradual	
Specimen cooling type:		without artificial cooling	
Air circulation:		forced air	
Measured temperature:		-40 °C	
Duration:		16 h	
Preconditioning: Verification of correct device functionality			
Initial measurement: Verification of correct device functionality , see test report CN22OWHX 002			
Intermediate measurement: Verification of correct device functionality			
Final measurement (after thermal cycle): Verification of correct device functionality , see test report CN22OWHX 002			
Particular test condition: Device operative (powered)			

Part 2-2	TABLE: Dry Heat		P
	Condition:.....:	working	—
IEC 60068-2-2: 2007 Environmental testing - Part 2-2: Tests - Test B: Dry heat			
Specimen type:		heat dissipating, powered throughout	
Temperature change:		gradual	
Specimen cooling type:		without artificial cooling	
Air circulation:		forced air	
Measured temperature:		60 °C	
Duration:		16 h	
Preconditioning: Verification of correct device functionality			
Initial measurement: Verification of correct device functionality , see test report CN22OWHX 002			
Intermediate measurement: Verification of correct device functionality			
Final measurement (after thermal cycle): Verification of correct device functionality , see test report CN22OWHX 002			
Particular test condition: Device operative (powered)			

Part 2-14	TABLE : Change of temperature		P
	Condition:.....:	working	—
IEC 60068-2-14: 2007 Part 2-14: Tests – Test N: Change of temperature			
Suffix letter		Nb	
Variant 1 or Variant 2		1	
Specimen type:		heat dissipating, powered throughout	
Temperature change:		gradual	
Specimen cooling type:		without artificial cooling	
Air circulation:		forced air	
Temperature measured TA and TB:		-40 °C and 60 °C	
Rate of change of temperature:		1°C /min	
Duration t1:		1 h	
Cycle		2 cycle	
Preconditioning: Verification of correct device functionality			
Initial measurement: Verification of correct device functionality , see test report CN22OWHX 002			
Intermediate measurement: Verification of correct device functionality			
Final measurement (after thermal cycle): Verification of correct device functionality , see test report CN22OWHX 002			
Particular test condition: Device operative (powered)			

Part 2-30	TABLE : Damp heat, cycle		P
	Condition:.....:	working	—
IEC 60068-2-30: 2005 Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12h +12h cycle)			
Suffix letter		Db	
Variant 1 or Variant 2		1	
Specimen type:		heat dissipating, powered throughout	
Temperature change:		gradual	
Specimen cooling type:		without artificial cooling	
Air circulation:		forced air	
Temperature measured:		55 °C	
Humidity measure:		95 %	
Duration:		24 h	
Cycle		2 cycle	
Preconditioning: Verification of correct device functionality			
Initial measurement: Verification of correct device functionality , see test report CN22OWHX 002			
Intermediate measurement: Verification of correct device functionality			
Final measurement (after thermal cycle): Verification of correct device functionality , see test report CN22OWHX 002			
Particular test condition: Device operative (powered)			

-End of report-

PHOTO DOCUMENTATION

CN22OWHX 002 attachment 1

for

Grid-connected PV inverter

C6-75K-T6, C6-100K-T9, C6-110K-T12, C6-125K-T12
C6-75K-T6-40, C6-100K-T9-40, C6-110K-T12-40,
C6-125K-T12-40

Guangzhou Sanjing Electric Co., Ltd.



This documentation consists of 16 pages (excluding this cover page)



Figure 1. Front view



Figure 2. Right view



Figure 3. Top view

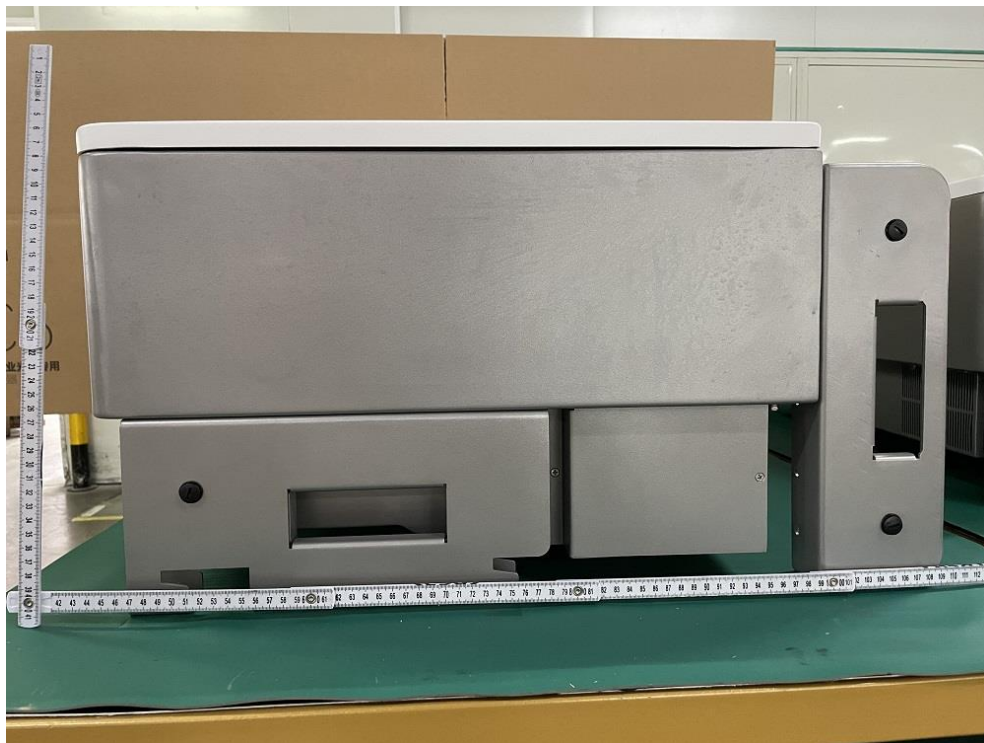


Figure 4. Left view

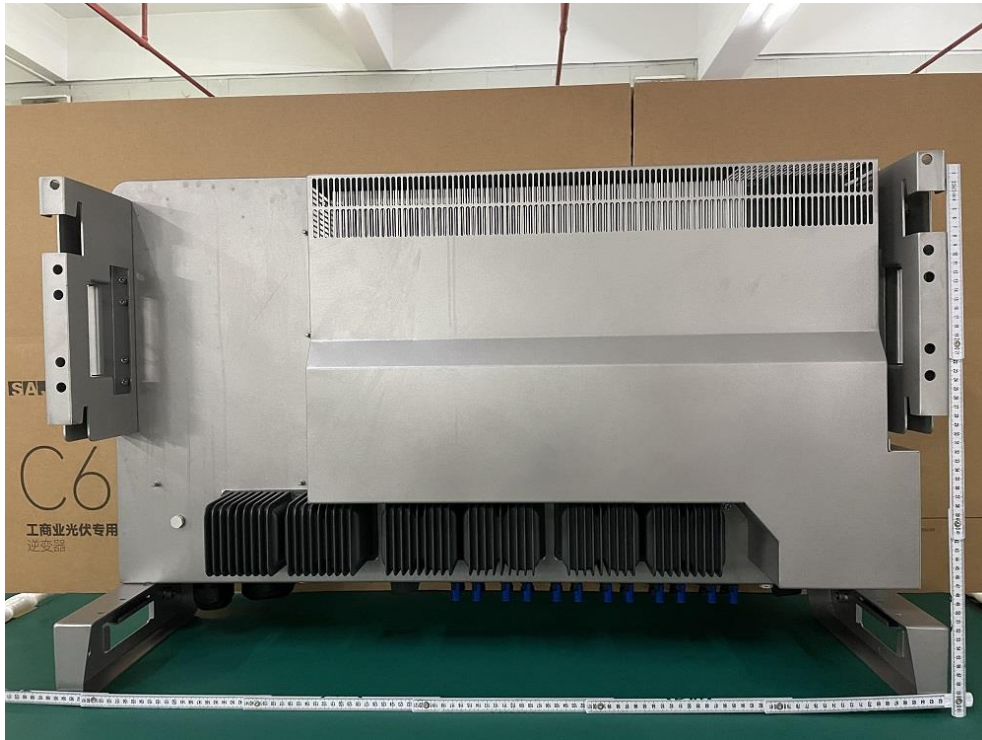


Figure 5. Bottom view



Figure 6. Connection view of models

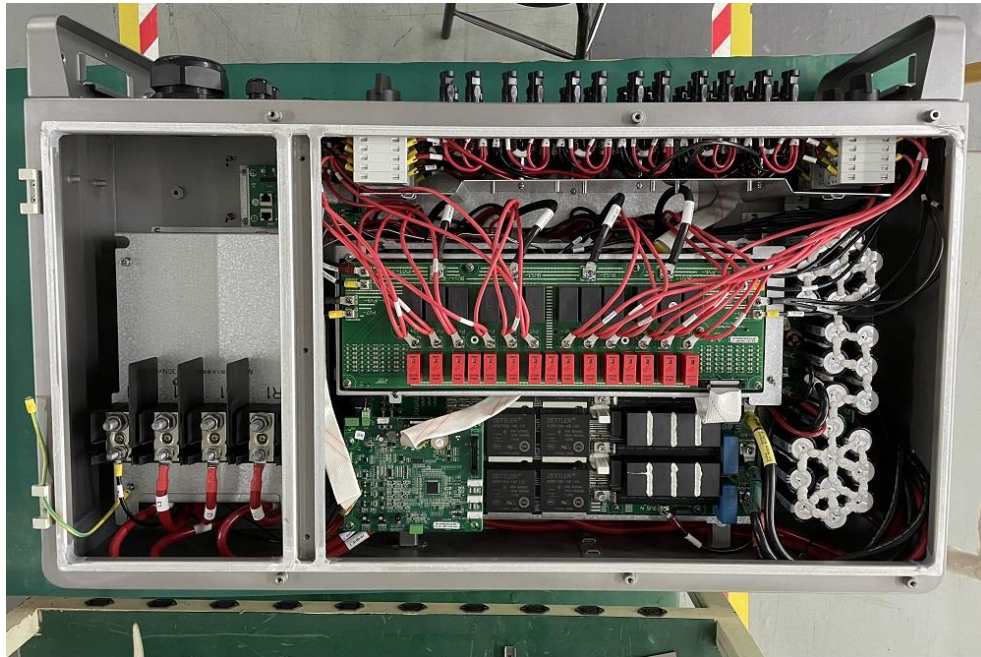


Figure 7. Internal view

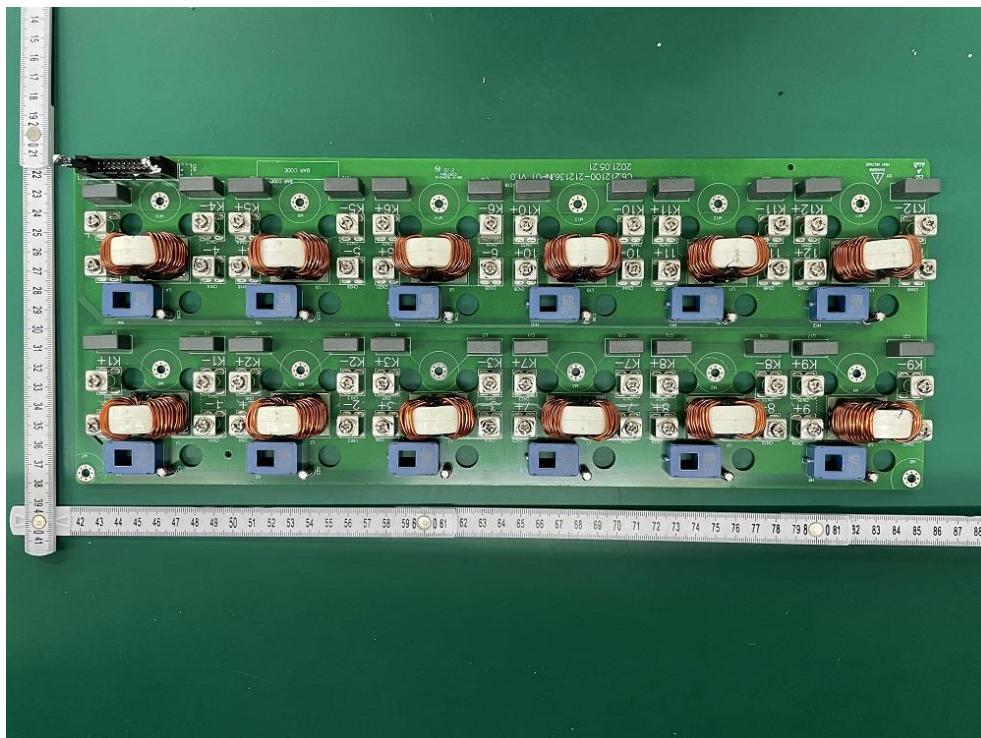


Figure 8. Front view of PV Input board

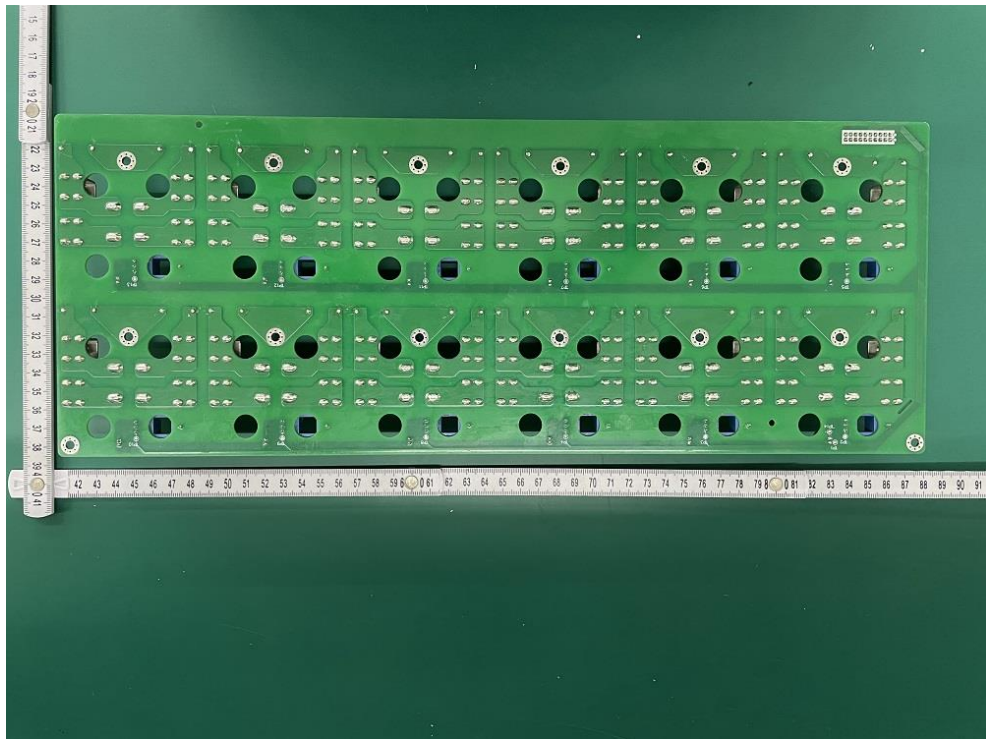


Figure 9. Back view of PV Input board

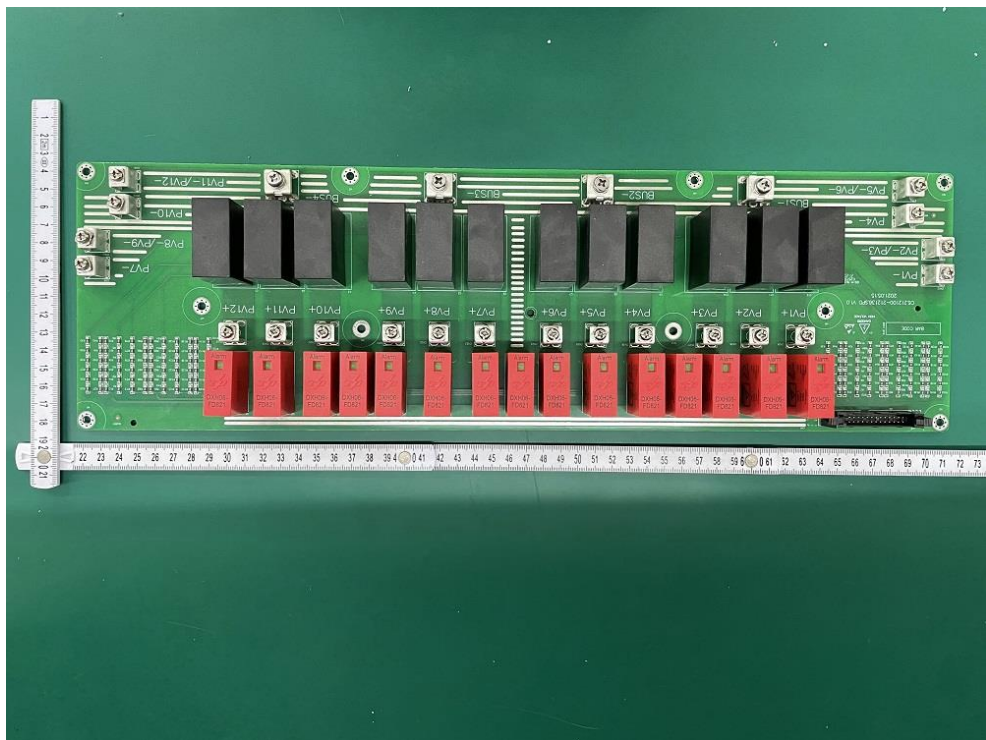


Figure 10. Front view of Lightning protection board

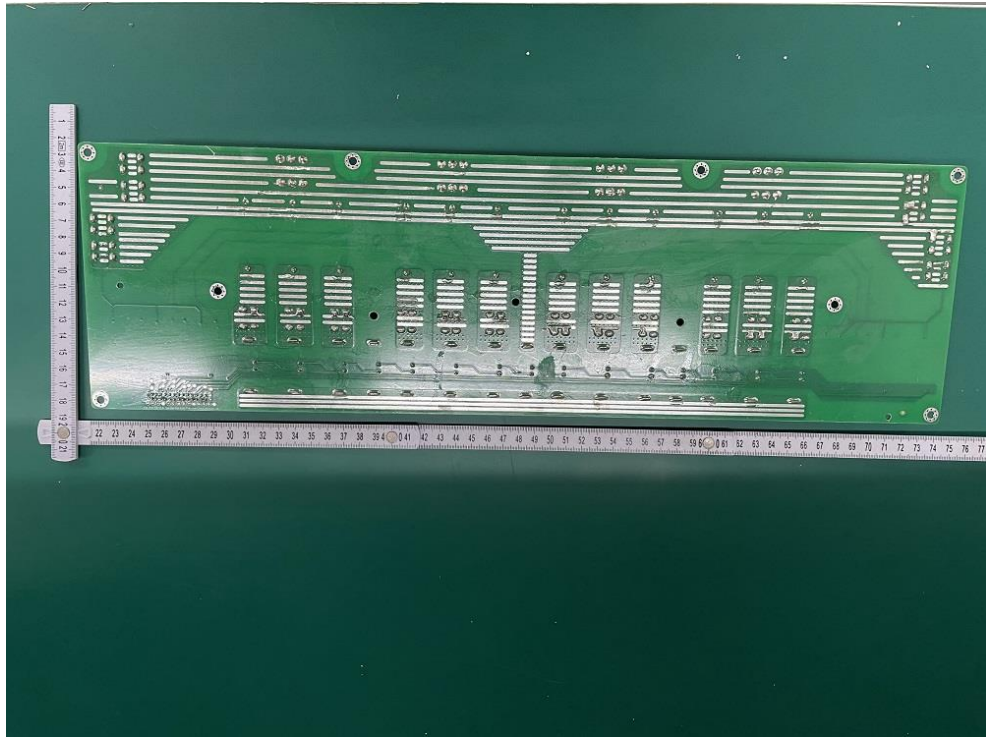


Figure 11. Back view of Lightning protection board



Figure 12. Front view of Bus cap board

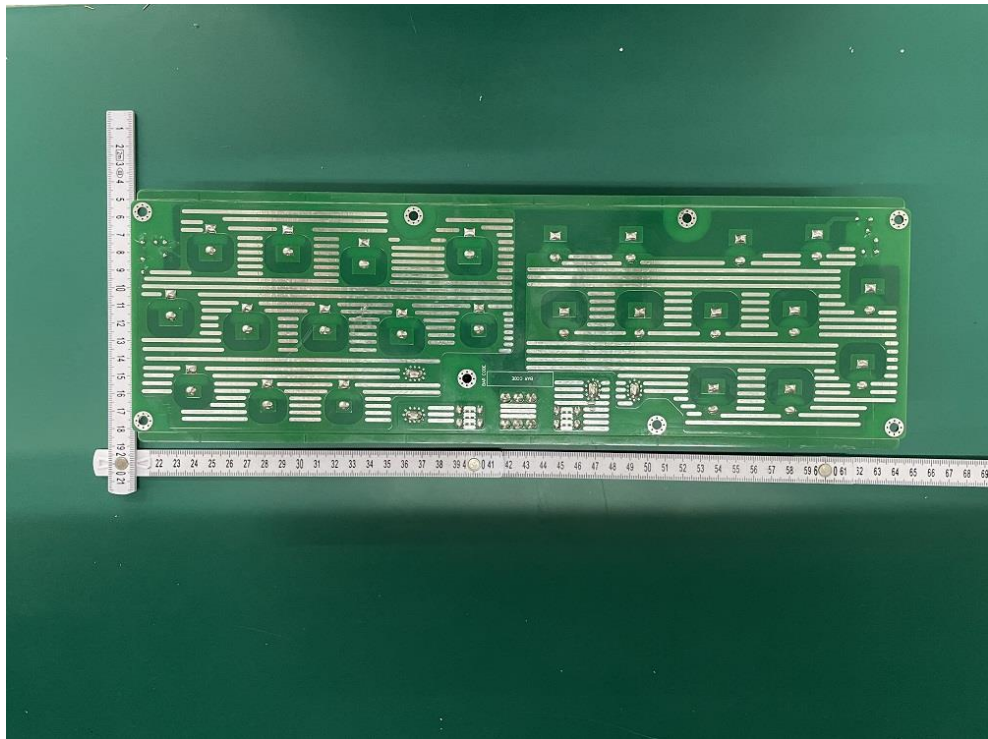


Figure 13. Back view of Bus cap board

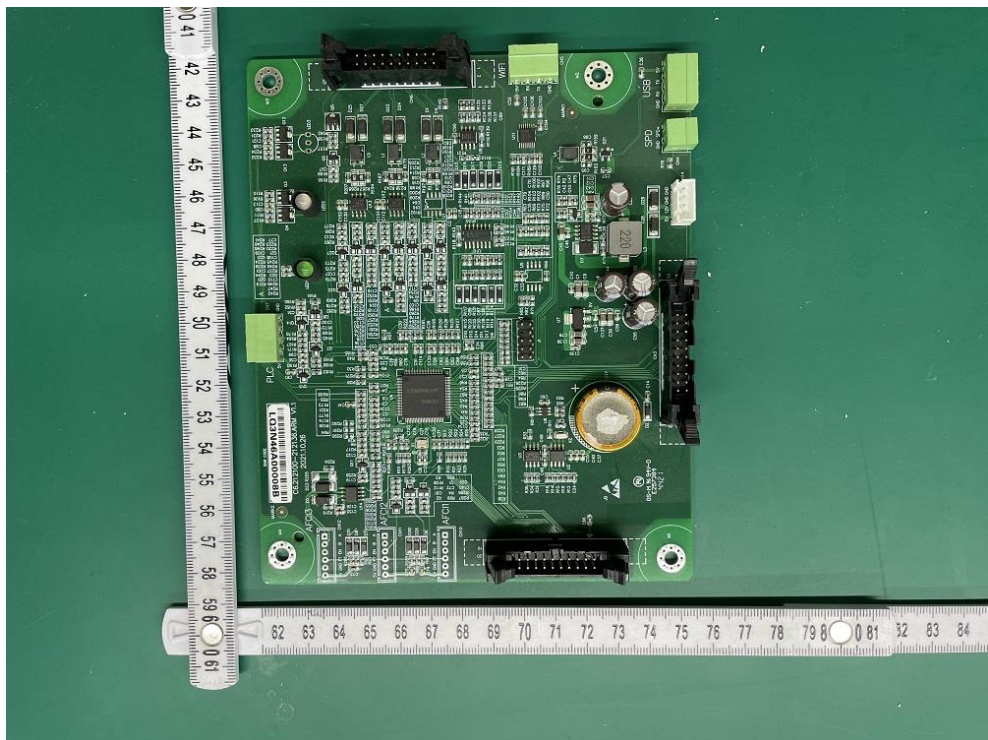


Figure 14. Front view of ARM board

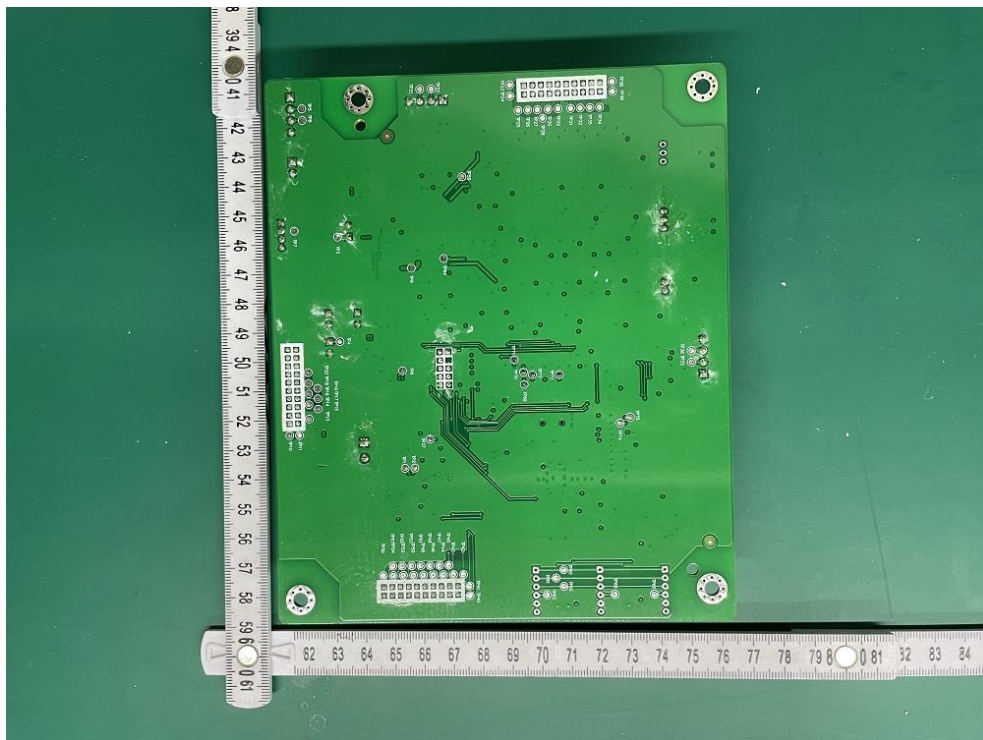


Figure 15. Back view of ARM board

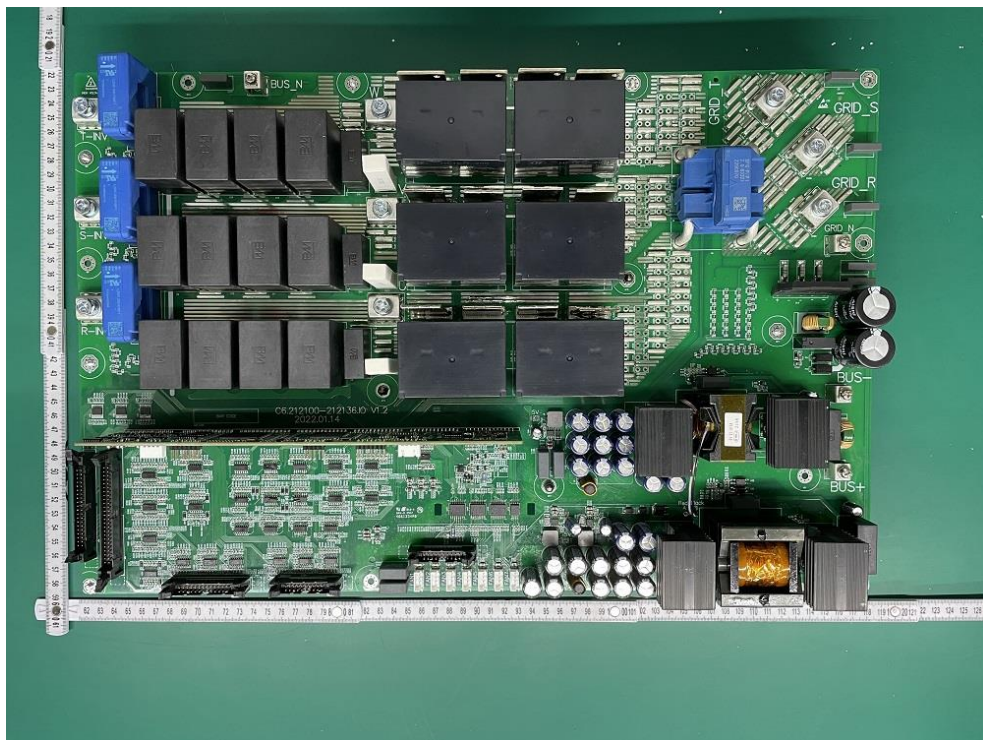


Figure 16. Front view of I/O board

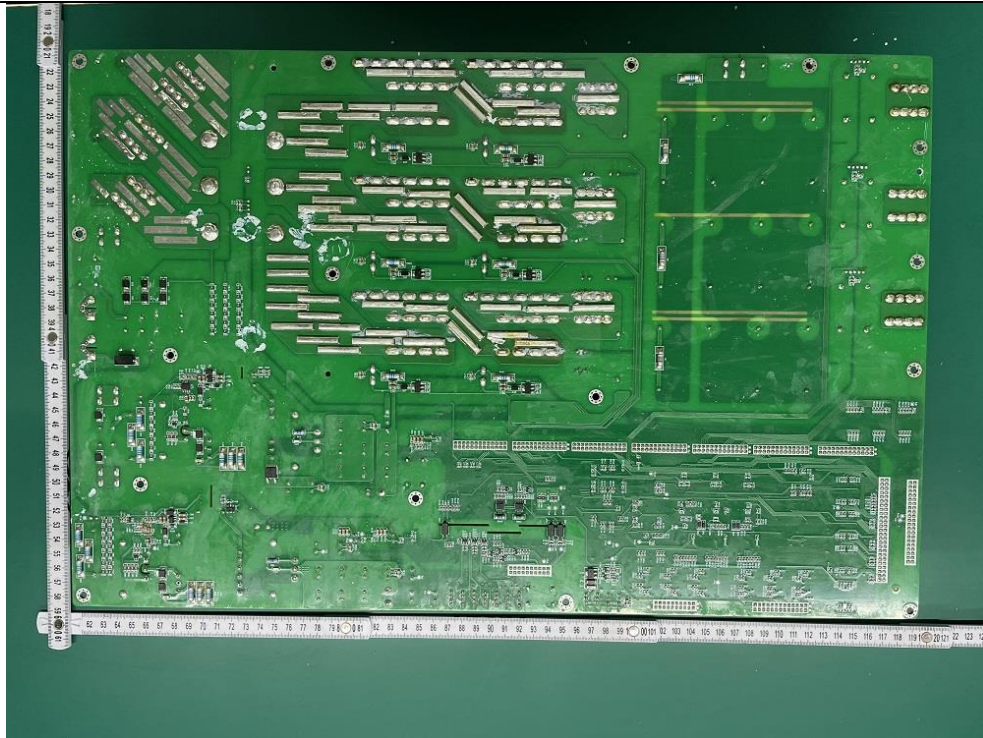


Figure 17. Back view of I/O board

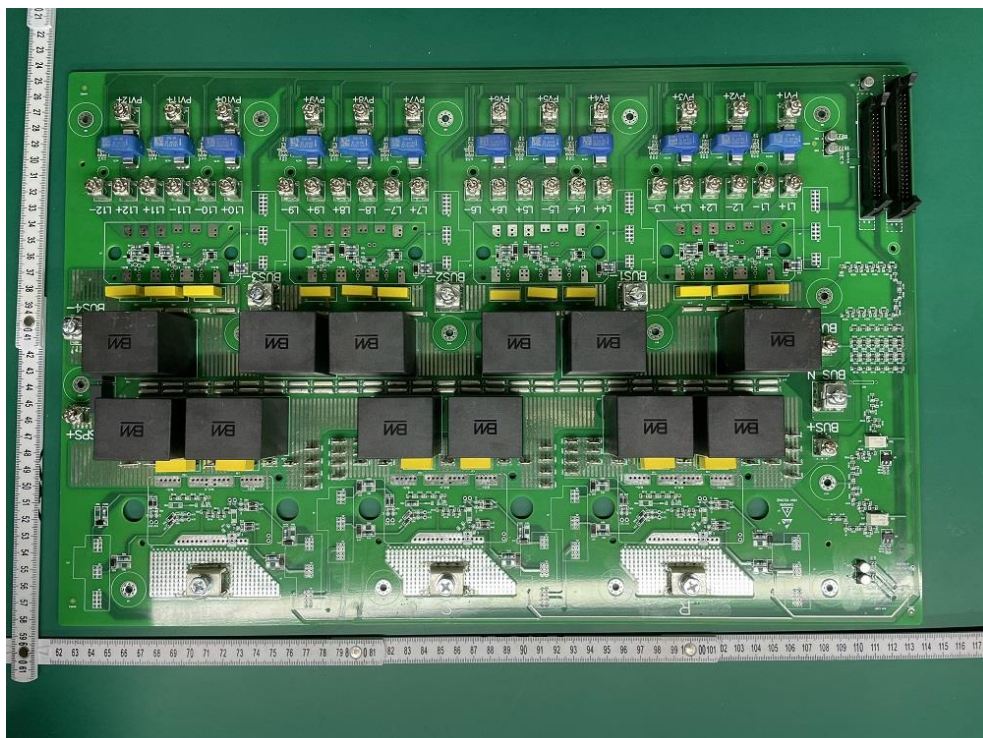


Figure 18. Front view of Main power board
(C6-110K-T12, C6-125K-T12, C6-110K-T12-40, C6-125K-T12-40)

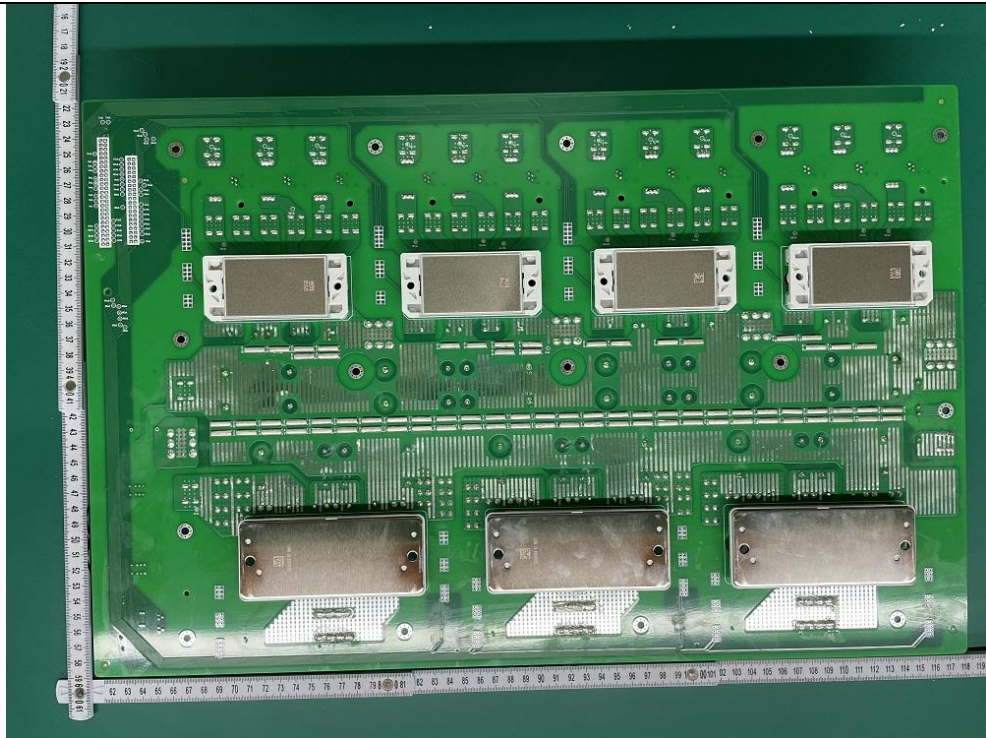


Figure 19. Back view of Main power board
(C6-110K-T12, C6-125K-T12, C6-110K-T12-40, C6-125K-T12-40)

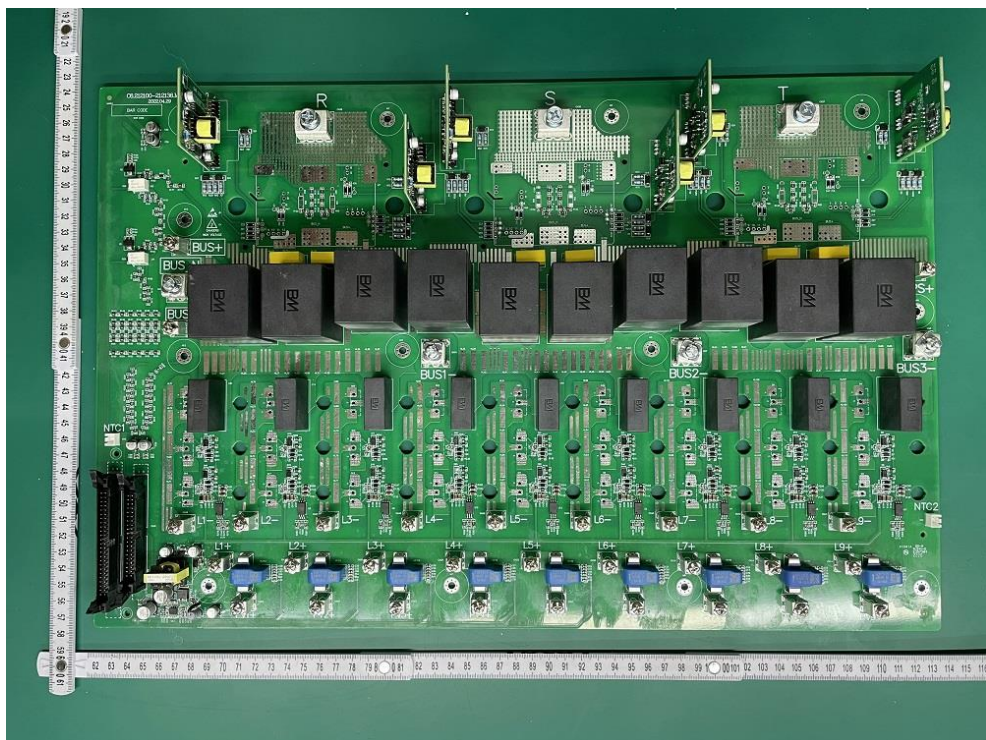


Figure 20. Front view of Main power board
(C6-75K-T6, C6-100K-T9, C6-75K-T6-40, C6-100K-T9-40)

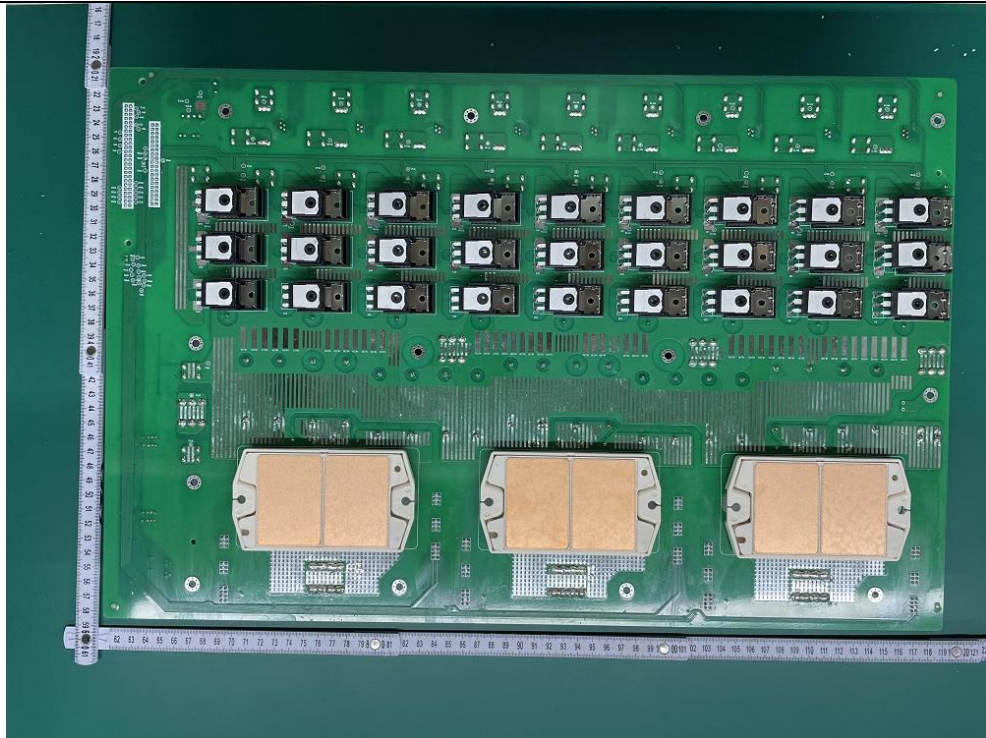


Figure 21. Back view of Main power board
(C6-75K-T6, C6-100K-T9, C6-75K-T6-40, C6-100K-T9-40)

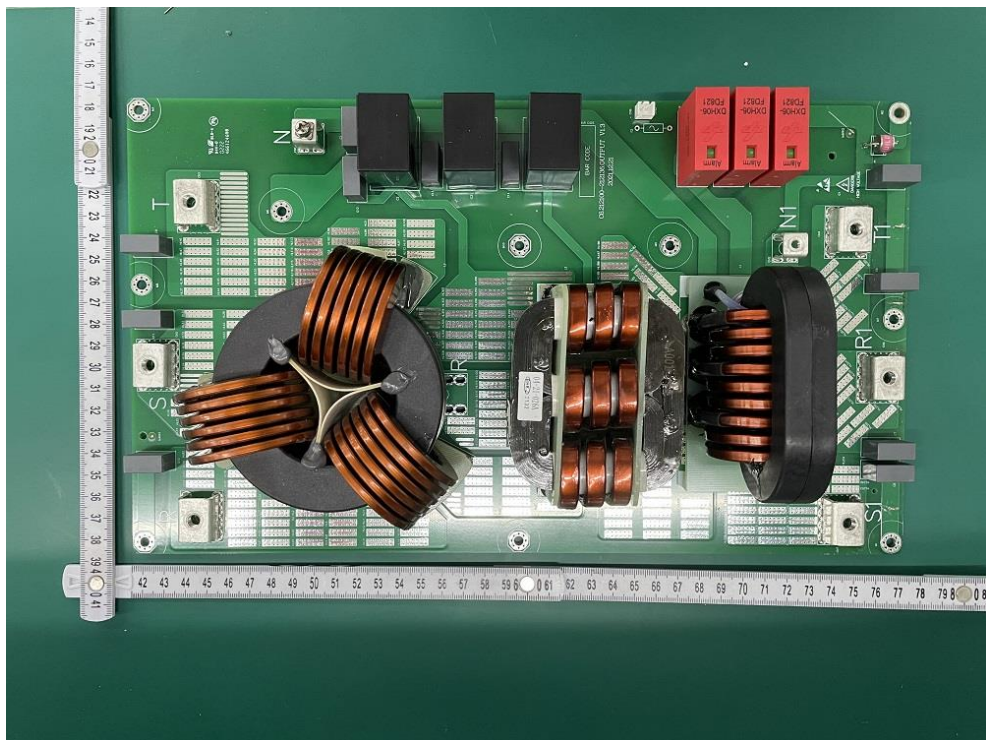


Figure 22. Front view of AC output board

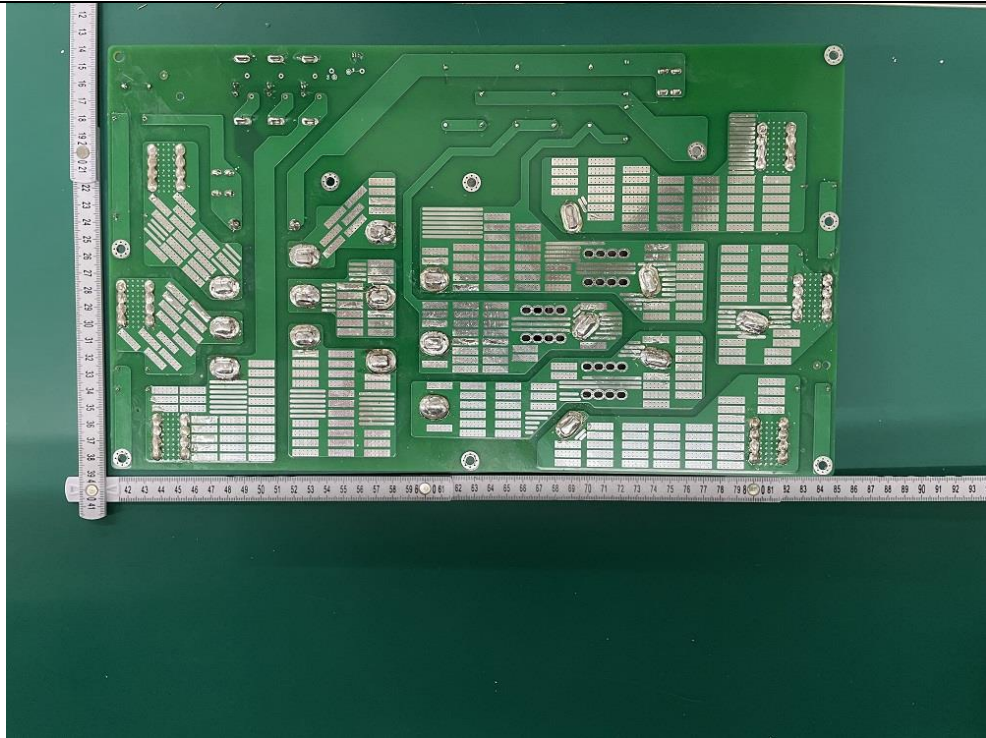


Figure 23. Back view of AC output board

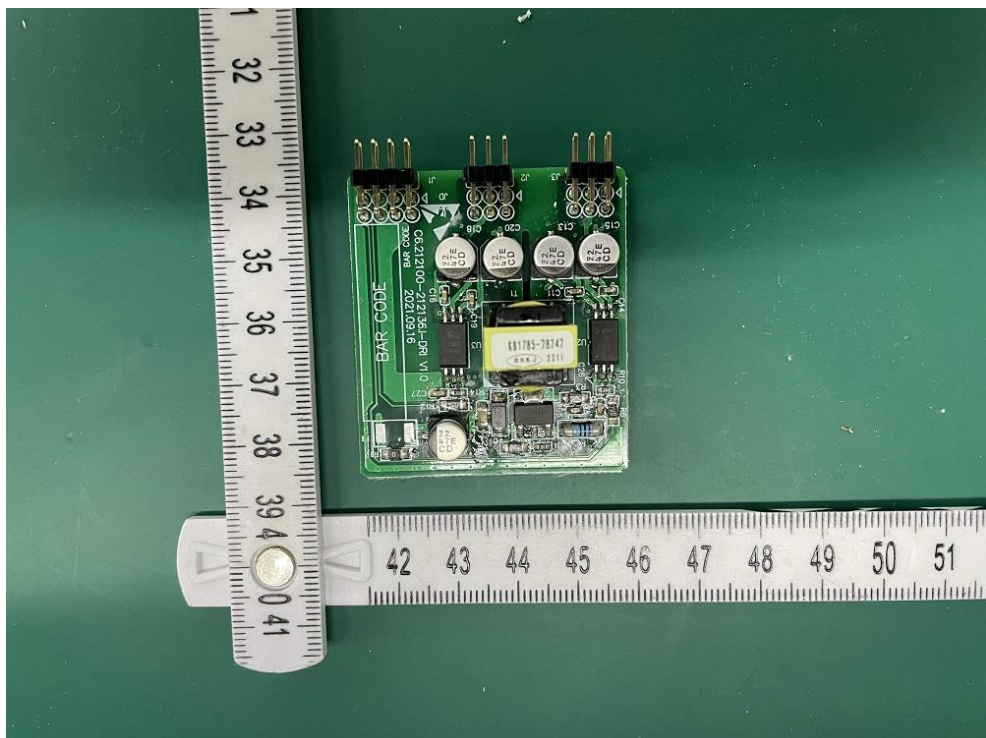


Figure 24. Front view of INV board

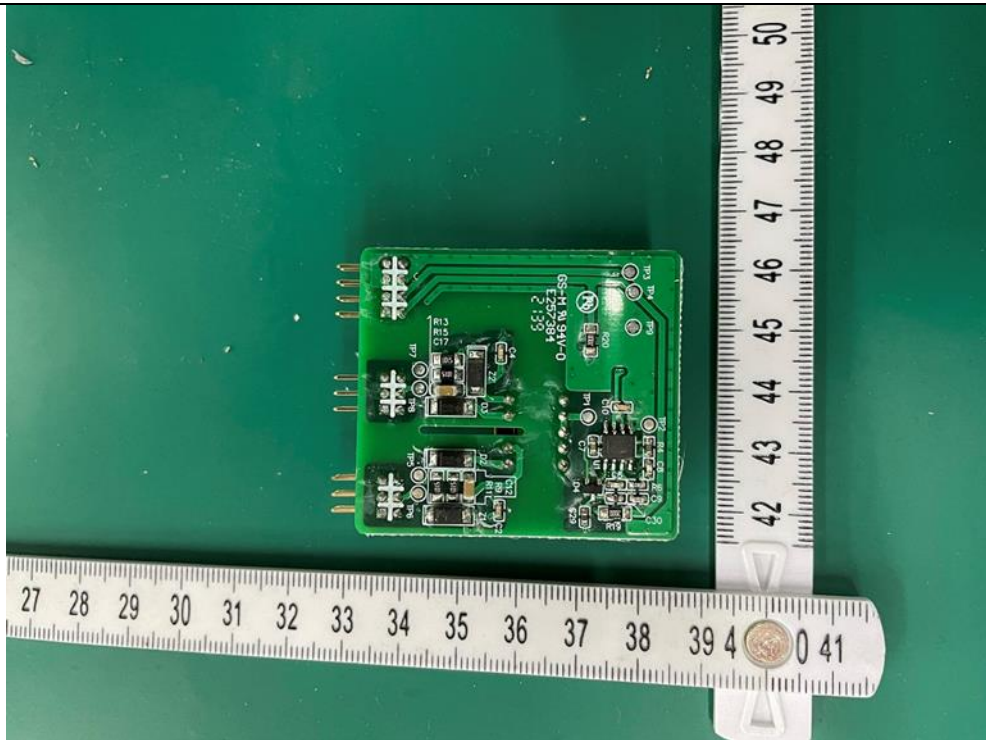


Figure 25. Back view of INV board

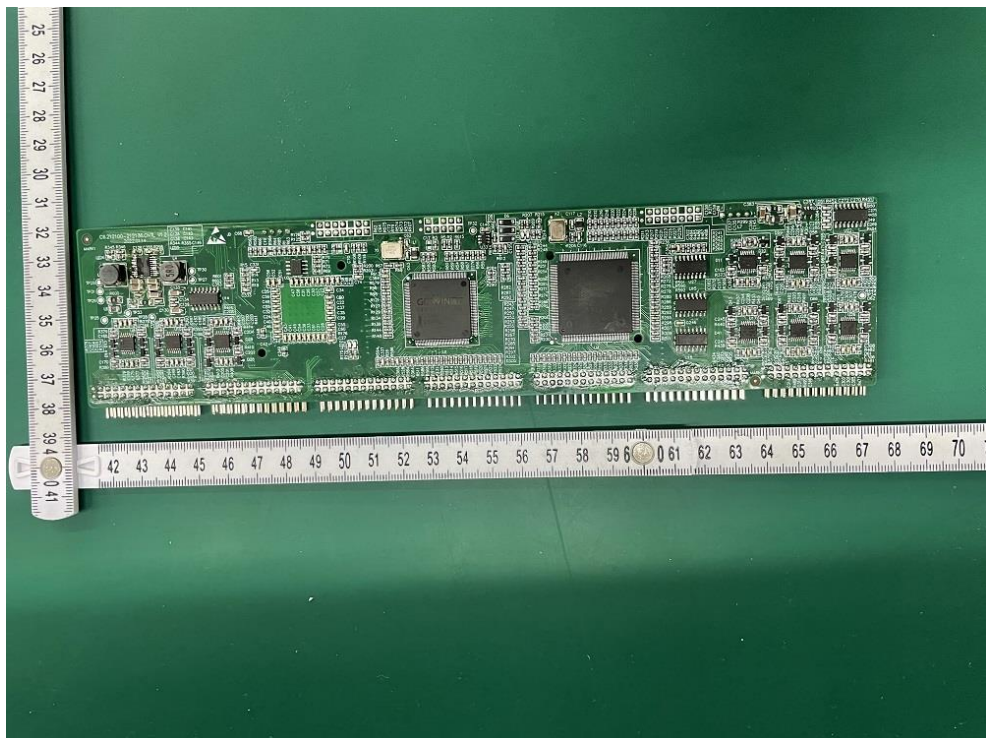


Figure 26. Front view of Control board



Figure 27. Back view of Control board

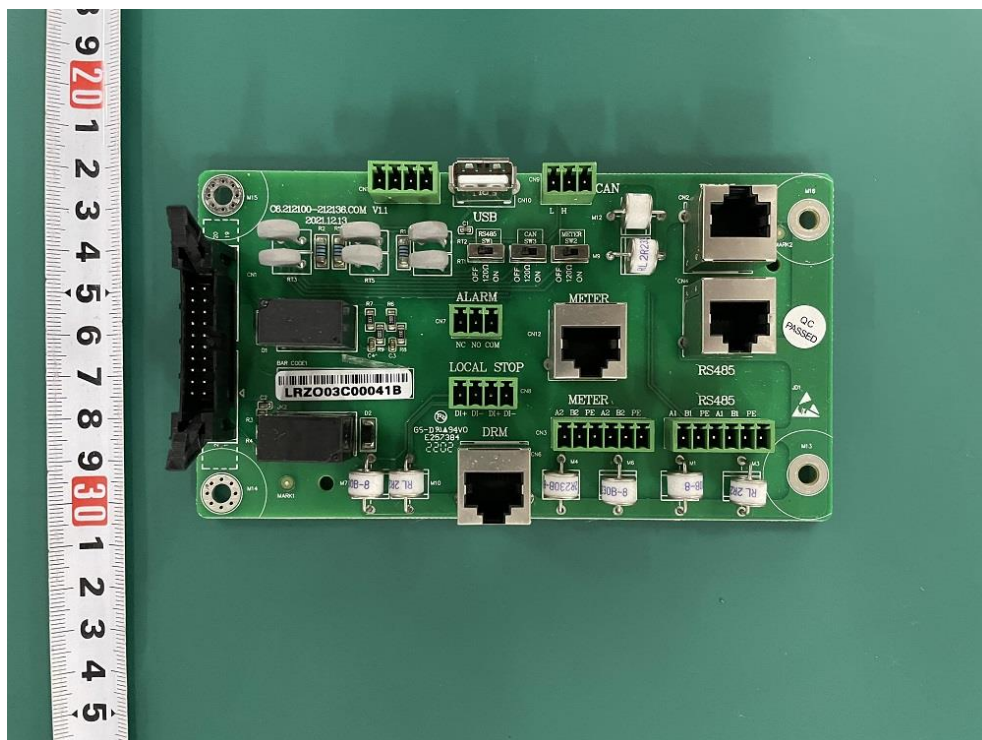


Figure 28. Front view of Communication board

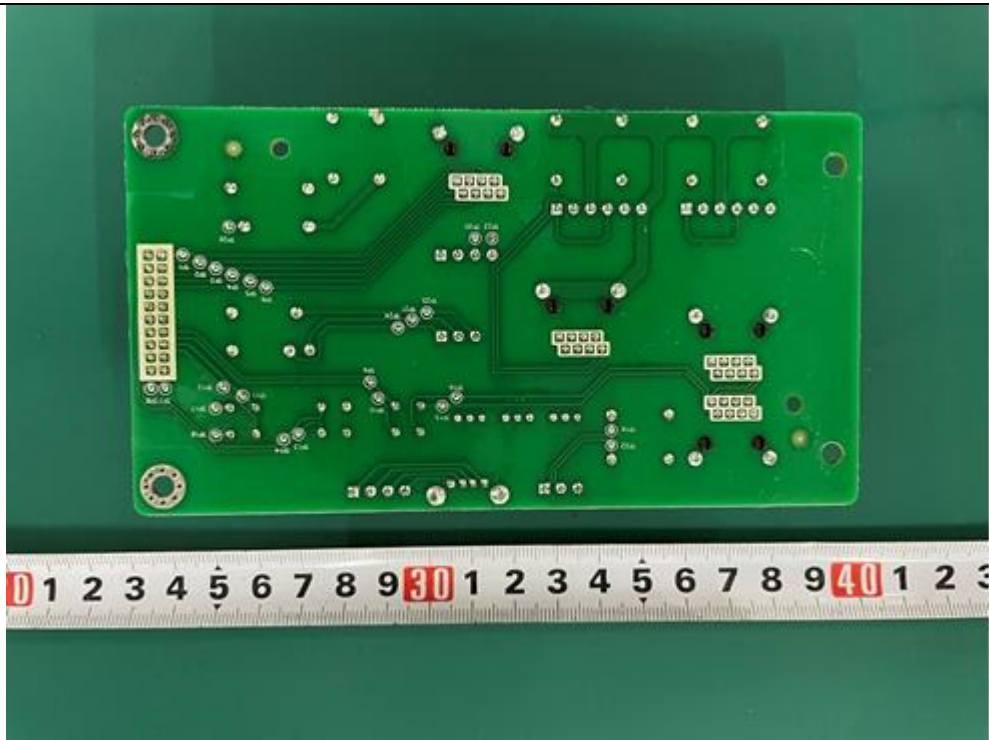


Figure 29. Back view of Communication board

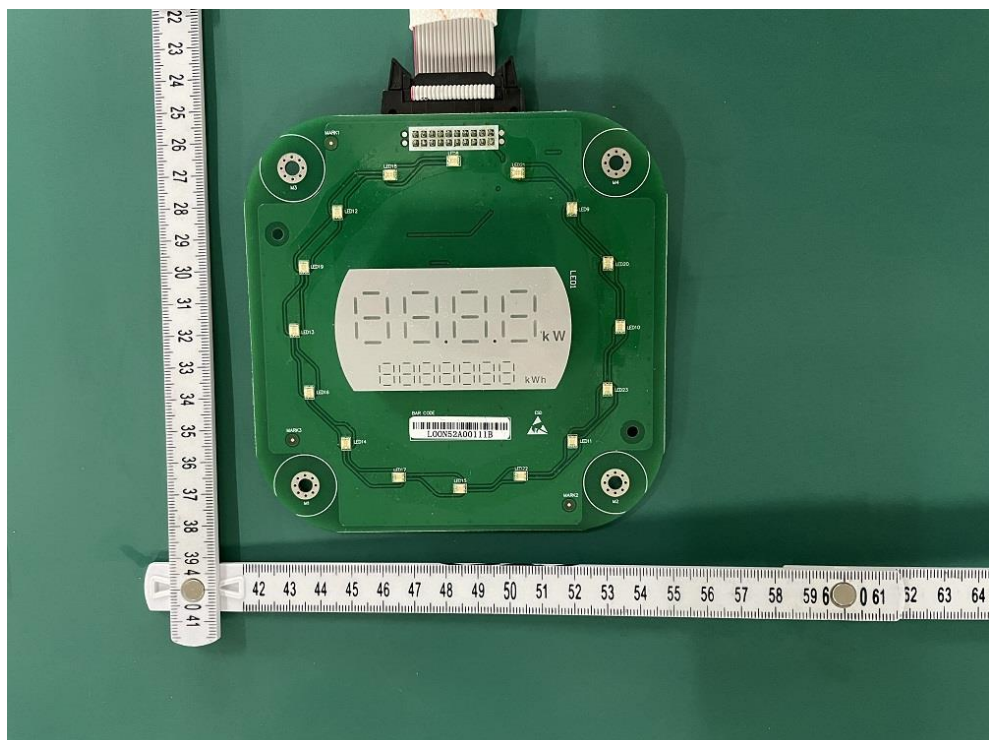


Figure 30. Front view of Display board



Figure 31. Back view of Display board