Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT
IEC 62368-1
Audio/video, information and communication technology equipment
Part 1: Safety requirements

Report Number. .....:	IT256XNU 001
Date of issue .....:	2026/05/19
Total number of pages.....:	156 (including Attachments)
Name of CBTesting Laboratory preparing the Report.....:	**TÜV RHEINLAND ITALIA S.r.l.** Via Mattei, 3 – 20005 Pogliano Milanese (MI) - Italy
Applicant's name.....:	Clayton Power A/S
Address .....:	Parkhusgården 42-48, 5000 Odense C, Denmark
Test specification:	
Standard.....:	IEC 62368-1:2023
Test procedure .....:	TÜV Scheme
Non-standard test method .....:	N/A
TRF template used .....:	IECEE OD-2020-F1:2024, Ed.1.7
Test Report Form No.....:	IEC62368_1F
Test Report Form(s) Originator ....:	UL Solutions (US)
Master TRF .....:	Dated 2025-06-13

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved IECEE Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

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 NCB. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

est item description ..... :	Rechargeable Lion battery system
Trademark(s) ..... :	Clayton Power A/S Parkhusgården 42-48, 5000 Odense C, Denmark
Manufacturer ..... :	Clayton Power A/S Middlefartvej 9g, 5000 Odense C, Denmark
Model/Type reference ..... :	Tested model: **LPS II - 3000** (CL2113) Derived models: **LPS II - 1500** (CL2101/CL2111) **LPS II SE - 1500** (CL2204/CL2214); **LPS II SE – 1500 CH** (CL2224) **LPS II - 2000** (CL2205/CL2215); **LPS II – 2000 CH** (CL2225) **LPS II - 2500** (CL2102/CL2112); **LPS II – 2500 CH** (CL2122) **LPS II - 3000** (CL2103/CL2113); **LPS II – 3000 CH** (CL2123)
Ratings ..... :	Tested model: **LPS II 3000:** Battery Capacity: 160Ah 2048Wh; AC Input: 230V 50Hz 13A; AC Output: 230V 50Hz Inverter Mode: 13A Charger Mode: 13A; DC In-/Output: 12V- 45/180A; Solar Input: 50V 15A; Power Factor: 0,77 Derived models: **LPS II 1500:** Battery Capacity: 100Ah 1280Wh; AC Input: 230V 50Hz 13A; AC Output: 230V 50Hz Inverter Mode: 6A Charger Mode: 13A; DC In-/Output: 12V- 45/180A; Solar Input: 50V 15A; Power Factor: 0,77 **LPS II SE – 1500:** Battery Capacity: 100Ah 1280Wh; AC Input: 230V 50Hz 10A; AC Output: 230V 50Hz Inverter Mode: 6A Charger Mode: 10A; DC In-/Output: 12V- 25/180A; Power Factor: 0,77 **LPS II SE – 1500 CH:** Battery Capacity: 160Ah 2048Wh; AC Input: 230V 50Hz 10A; AC Output: 230V 50Hz Inverter Mode: 6A Charger Mode: 10A; DC In-/Output: 12V- 25/180A; Power Factor: 0,77 **LPS II – 2000:** Battery Capacity: 100Ah 1280Wh; AC Input: 230V 50Hz 13A; AC Output: 230V 50Hz Inverter Mode: 8A Charger Mode: 10A; DC In-/Output: 12V- 45/180A; Solar Input: 50V 15A; Power Factor: 0,77 **LPS II – 2000 CH:** Battery Capacity: 160Ah 2048Wh; AC Input: 230V 50Hz 13A; AC Output: 230V 50Hz Inverter Mode: 8A Charger Mode: 10A; DC In-/Output: 12V- 45/180A; Solar Input: 50V 15A; Power Factor: 0,77 **LPS II – 2500:** Battery Capacity: 100Ah 1280Wh; AC Input: 230V 50Hz 13A; AC Output: 230V 50Hz Inverter Mode: 10A Charger Mode: 13A; DC In-/Output: 12V- 45/180A; Solar Input: 50V 15A; Power Factor: 0,77 **LPS II – 2500 CH:** Battery Capacity: 160Ah 2048Wh; AC Input: 230V 50Hz 13A; AC Output: 230V 50Hz Inverter Mode: 10A Charger Mode: 13A; DC In-/Output: 12V- 45/180A; Solar Input: 50V 15A; Power Factor: 0,77 **LPS II – 3000, LPS II – 3000 CH:** Battery Capacity: 160Ah 2048Wh; AC Input: 230V 50Hz 13A; AC Output: 230V 50Hz Inverter Mode: 13A Charger Mode: 13A; DC In-/Output: 12V- 45/180A; Solar Input: 50V 15A; Power Factor: 0,77

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	TÜV Rheinland Italia S.r.l.	
Testing location/ address.....:		Via Mattei, 3 – 20005 Pogliano Milanese (MI) - Italy	
Tested by (name, function, signature).....:		Verga Gianluigi (tester)	Gianluigi Verga Firmato digitalmente da Gianluigi Verga
Approved by (name, function, signature)...:		Fabio Zapparata (reviewer)	Fabio Zapparata Firmato digitalmente da Fabio Zapparata
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:		N/A	
Tested by (name, function, signature).....:		N/A	
Approved by (name, function, signature)...:		N/A	
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:		N/A	
Tested by (name + signature) .....:		N/A	
Witnessed by (name, function, signature) .:		N/A	
Approved by (name, function, signature)...:		N/A	
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address.....:		N/A	
Tested by (name, function, signature).....:		N/A	
Witnessed by (name, function, signature) .:		N/A	
Approved by (name, function, signature)...:		N/A	
Supervised by (name, function, signature) :		N/A	

List of Attachments (including a total number of pages in each attachment):

Attachment I:	EUROPEAN GROUP DIFFERENCES AND EUROPEAN NATIONAL DIFFERENCES	(30 pages)
Attachment II:	Power Sources of the system	(01 page)
Attachment III:	Chokes and Transformers	(10 pages)
Attachment IV:	Photo documentation	(24 pages)

Summary of testing:

The test results presented in this report relate only to the object tested, as it was received by TUV Rheinland Italia

As applicable, the devices mentioned in the report fully ☒ comply / ☐ partially, with the requirements of the standards indicated on the first page.

TUV Rheinland Italia is responsible for the information present in the test report except when such information has been provided by the manufacturer.

TUV Rheinland Italia is not responsible for the information provided by the manufacturer, when such information impacts on the test results.

Throughout this report the ($) is used to specify as “information provided by the manufacturer”.

RELEASE CONTROL RECORD (projects history)			
Release number	**Test report number**	**Scope of review and sections modified**	**Date of issue**
1	IT256XNU 001	Original release	2026/05/19
The latest releases cancel and replaces the previous version.			

Tests performed (name of test, test clause and date test performed):	**Testing location: (CBTL, SPTL, CTF, Subcontractor)**
Allegato B - Prove in condizione di funzionamento normale, condizione di funzionamento anormale e condizione di guasto singolo/Normal operating condition tests, abnormal operating condition tests and single fault condition tests, Allegato D - Generatori di prova/Test generators, Allegato E - Condizioni di prova per le apparecchiature contenenti amplificatori audio/Test conditions for equipment containing audio amplifiers, Allegato F - Marcature, istruzioni e salvaguardie di istruzione delle apparecchiature/Equipment markings, instructions, and instructional safeguards, Allegato G - Componenti/Components, Allegato K - Interblocchi di sicurezza/Safety interlocks,	**TÜV Rheinland Italia S.r.l.** Via E. Mattei, 3 – 20005 Pogliano Milanese (MI) - Italy

Allegato L - Dispositivi di sezionamento/Disconnect devices, Allegato M - Apparecchiature contenenti batterie e relativi circuiti di protezione/Equipment containing batteries and their protection circuits, Allegato N – Potenziali elettrochimici/Electrochemical potentials (V), Allegato O - Misure di distanze superficiali e in aria/Measurement of creepage distances and clearances, Allegato P - Salvaguardie contro gli oggetti conduttori/Safeguards against conductive objects, Allegato Q - Circuiti destinati all'interconnessione con il cablaggio dell'edificio/Circuits intended for interconnection with building wiring, Allegato S - Prove di resistenza al calore e al fuoco/Tests for resistance to heat and fire, Allegato T - Prove di resistenza meccanica/Mechanical strength tests, Allegato V - Determinazione delle parti accessibili/Determination of accessible parts, Allegato X - Metodo alternativo per determinare le distanze per l'isolamento nei circuiti collegati a una rete non superiore a 420 V di picco (300 V RMS)/Alternative method for determining clearances for insulation in circuits connected to an AC mains not exceeding 420 V peak (300 V RMS), Allegato Y - Requisiti costruttivi per involucri da esterno/Construction requirements for outdoor enclosures, Par 04 – Prescrizioni generali/General requirements, Par 05 - Lesioni per cause elettriche/Electrically-caused injury, Par 06 - Incendio per cause elettriche/Electrically-caused fire, Par 07 - Lesioni causate da sostanze pericolose/Injury caused by hazardous substances, Par 08 - Lesioni per cause meccaniche/Mechanically-caused injury, Par 09 Lesioni da ustioni termica/Thermal burn injury - escluso/except Par - 5.4.1.10.2, 8.5.5.2, 9.6; Annex D.3, G.1, G.2, G.3, G.6, G.7.1, G.8, G9, G10, G.11, G.12, G14, G15, G16, M.7, M.8, S.3, S.5, Y.2, Y.3, Y.4, Y.5.4 Equipment used for testing is recorded and saved into the company archive as instruments file n° P02027917AB. It will be made available on request.	

Summary of compliance with National Differences

- IECEE Member countries that are also CENELEC members
  Compliance with Group Differences evaluated ☒ **yes** ☐ **No** ☐ N/A

- IECEE Member countries with published National Differences which were evaluated:

EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES

Differences according to : EN IEC 62368-1:2024 + A11:2024

Attachment Form No. : EU_GD_IEC62368_1F

- IECEE Member countries that did not publish any National Differences:
  N/A

To support compliance with published National Differences, attach a compilation of relevant ND and/or GD TRFs to the CB Test Report

Use of uncertainty of measurement for decisions on conformity (decision rule) :

☒ No decision rule is specified by the IEC standard, when comparing the measurement result with the applicable limit according to the specification in that standard. The decisions on conformity are made without applying the measurement uncertainty ("simple acceptance" decision rule, previously known as "accuracy method").

☐ Other: … (to be specified, for example when required by the standard or client, or if national accreditation requirements apply)

Information on uncertainty of measurement:
The uncertainties of measurement are calculated by the laboratory based on application of criteria given by OD-5014 for test equipment and application of test methods, decision sheets and operational procedures of IECEE.
IEC Guide 115 provides guidance on the application of measurement uncertainty principles and applying the decision rule when reporting test results within IECEE scheme, noting that the reporting of the measurement uncertainty for measurements is not necessary unless required by the test standard or customer.

Calculations leading to the reported values are on file with the NCB and testing laboratory that conducted the testing.

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Derived models:


LPS II – 3000
CL2103 160Ah
Battery Capacity: 160Ah 2048Wh
AC Input: 230V/50Hz 13A
AC Output: 230V/50Hz
Inverter Mode: 13A
Charger Mode: 13A
DC In–/Output: 12V–45/180A
Solar Input: 50V–15A
Power Factor: 0.77
4IFpP55/175/154 IP20
Serial No.: 313001–2395
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II – 3000
HW Rev.: 00:00
Serial No.: 313001–2395
E5 10R – 06 0488
LPS II – 3000
CL2113 160Ah
Battery Capacity: 160Ah 2048Wh
AC Input: 230V/50Hz 13A
AC Output: 230V/50Hz
Inverter Mode: 13A
Charger Mode: 13A
DC In–/Output: 12V–45/180A
Solar Input: 50V–15A
Power Factor: 0.77
4IFpP55/175/154 IP20
Serial No.: 313001–2396
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II – 3000
HW Rev.: 00:00
Serial No.: 313001–2396
E5 10R – 06 0488
LPS II – 3000 CH
CL2123 FOR USE IN SWITZERLAND ONLY 160Ah
Battery Capacity: 160Ah 2048Wh
AC Input: 230V/50Hz 13A
AC Output: 230V/50Hz
Inverter Mode: 13A
Charger Mode: 13A
DC In–/Output: 12V–45/180A
Solar Input: 50V–15A
Power Factor: 0.77
4IFpP55/175/154 IP20
Serial No.: 313001–2397
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II – 3000 CH
HW Rev.: 00:00
Serial No.: 313001–2397
E5 10R – 06 0488
LPS II SE – 1500
CL2204 100Ah
Battery Capacity: 100Ah 1280Wh
AC Input: 230V/50Hz 10A
AC Output: 230V/50Hz
Inverter Mode: 6A
Charger Mode: 10A
DC In–/Output: 12V–25/180A
Power Factor: 0.77
4IFpP51/161/119 IP20
Serial No.: 314000–3053
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II SE – 1500
HW Rev.: 00:00
Serial No.: 314000–3053
E5 10R – 06 0488
LPS II SE – 1500
CL2214 100Ah
Battery Capacity: 100Ah 1280Wh
AC Input: 230V/50Hz 10A
AC Output: 230V/50Hz
Inverter Mode: 6A
Charger Mode: 10A
DC In–/Output: 12V–25/180A
Power Factor: 0.77
4IFpP51/161/119 IP20
Serial No.: 314000–3055
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II SE – 1500
HW Rev.: 00:00
Serial No.: 314000–3055
E5 10R – 06 0488
LPS II SE – 1500 CH
CL2224 FOR USE IN SWITZERLAND ONLY 100Ah
Battery Capacity: 160Ah 2048Wh
AC Input: 230V/50Hz 10A
AC Output: 230V/50Hz
Inverter Mode: 6A
Charger Mode: 10A
DC In–/Output: 12V–25/180A
Power Factor: 0.77
4IFpP51/161/119 IP20
Serial No.: 314000–3056
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II SE – 1500 CH
HW Rev.: 00:00
Serial No.: 314000–3056
E5 10R – 06 0488
LPS II – 2000
CL2205 100Ah
Battery Capacity: 100Ah 1280Wh
AC Input: 230V/50Hz 13A
AC Output: 230V/50Hz
Inverter Mode: 8A
Charger Mode: 10A
DC In–/Output: 12V–45/180A
Solar Input: 50V–15A
Power Factor: 0.77
4IFpP51/161/119 IP20
Serial No.: 316000–5089
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II – 2000
HW Rev.: 00:00
Serial No.: 316000–5089
E5 10R – 06 0488
LPS II – 2000
CL2215 100Ah
Battery Capacity: 100Ah 1280Wh
AC Input: 230V/50Hz 13A
AC Output: 230V/50Hz
Inverter Mode: 8A
Charger Mode: 10A
DC In–/Output: 12V–45/180A
Solar Input: 50V–15A
Power Factor: 0.77
4IFpP51/161/119 IP20
Serial No.: 316000–5091
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II – 2000
HW Rev.: 00:00
Serial No.: 316000–5091
E5 10R – 06 0488
LPS II – 2000 CH
CL2225 FOR USE IN SWITZERLAND ONLY 100Ah
Battery Capacity: 160Ah 2048Wh
AC Input: 230V/50Hz 13A
AC Output: 230V/50Hz
Inverter Mode: 8A
Charger Mode: 10A
DC In–/Output: 12V–45/180A
Solar Input: 50V–15A
Power Factor: 0.77
4IFpP51/161/119 IP20
Serial No.: 316000–5092
HW Rev.: 00:00
Prod Date: 20251201
CLAYTON POWER
Palhusgården 42–48, 5000 Odense C, Denmark
LPS II – 2000 CH
HW Rev.: 00:00
Serial No.: 316000–5092
E5 10R – 06 0488

Test item particulars:	
Product group .....:	**end product** / built-in component
Classification of use by .....:	**Ordinary person** / **Children likely present** / **Instructed person** (for installation) / **Skilled person** (for installation)
Supply connection.....:	**AC mains** / **DC mains** not mains connected: **ES1** / ES2 / **ES3**
Supply tolerance .....:	**+10%/-10%** +20%/-15% +_____%/ -_____% None
Supply connection – type .....:	pluggable equipment type A non-detachable supply cord / appliance coupler / direct plug-in pluggable equipment type B non-detachable supply cord / appliance coupler permanent connection / **mating connector** (NAC3 FCA, NAC3 FCB) other: _____
Considered current rating of protective device... :	__**13**___ A; Location: building / **equipment** N/A
Equipment mobility..... :	Movable / hand-held / transportable / direct plug-in / **stationary** / for building-in / wall/ceiling-mounted / SRME/rack-mounted / other: _____
Overvoltage category (OVC) ..... :	OVC I / **OVC II** / OVC III / OVC IV / _____
Class of equipment ..... :	**Class I** / Class II / Class II with functional earthing / Class III / Not classified / _____
Special installation location ..... :	**N/A** / restricted access area / outdoor location / _____
Pollution degree (PD) ..... :	PD 1 / **PD 2** / PD 3
Manufacturer's specified T_{ma}..... :	_**40**_ °C / Outdoor: minimum _____ °C
IP protection class ..... :	**IPX0** / IP_____
Power systems ..... :	TN / **TT** / IT - _____ V_{L-L} not AC mains
Altitude during operation (m) ..... :	2000 m or less / **4500**_m
Altitude of test laboratory (m) ..... :	2000 m or less / _**164**____ m
Mass of equipment (kg) ..... :	_**27,5**____ kg

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 .....: 2025-07-02

(sampling performed by customer storage number A004034416-002; sample tested as received)

Date (s) of performance of tests.....: From 2025-11-05 up to 2025-11-20

General remarks:

The system is considered (only) for the conditions of network environment 0 (see CEI CLC/TR 62102:2006). No overvoltage from telecommunication network possible, no subject to transient over voltages due to atmospheric discharges and faults in power distribution systems.

"(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.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies).....: N/A

General product information and other remarks:

The Lithium Power Supply (LPS) is classified as Class 9 dangerous goods according to UN3480, a power source with high energy density and hazardous materials in a sealed metal cabinet.
Installation must follow national safety regulations in accordance with the requirements for enclosure, installation, creepage, clearance, marking and segregation requirements for the end-use application. We recommend that installations are performed by authorised professionals. Switch off the system and check for hazardous voltages before changing any connections!
The Lithium Power Supply must only be serviced by trained personnel.
The lowest ingress protection rating for specific LPS parts is IP20. Ensure that the installation of the Lithium Power Supply complies with IP20 requirements.
This is a Class I product. Connect only 230 VAC from a source connected to protective electrical earth, including all extension cords between source and the device.
Observe the following:
When connected to 230 VAC input, voltage is present at 230 VAC output, even when the device is

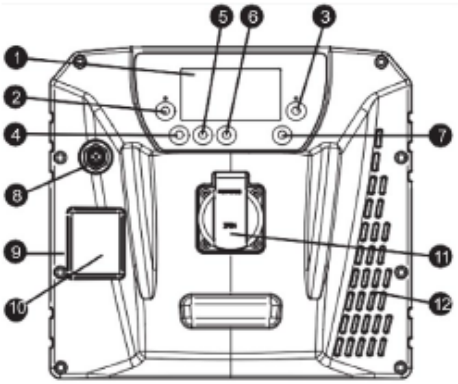
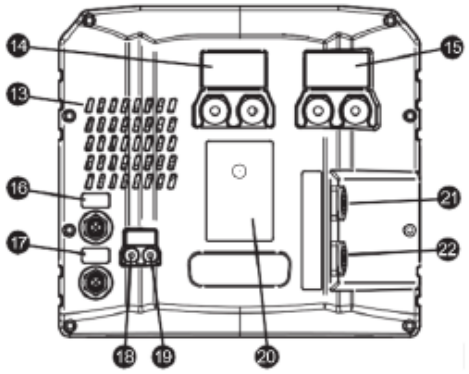
switched off.
Do not open the LPS.
Do not discharge a new LPS until it has been fully charged.
Charge only within the specified limits.
Make sure the LPS is switched off when it is moved and during installing.
Do not mount the LPS upside down or on its side.
Check if the LPS has been damaged during transport.
Do not series- or parallel-connect the 230 VAC output of the LPS.
Do not leave outside exposed to the elements.
Do not use at altitudes above 4500 metres (14765 feet)
Do not cover or block the fan or air intake to ensure that the battery does not overheat.
Do not allow children or animals to come in contact with the device or connected power supplies.
Solar Connection
Solar connection must not exceed the maximum voltage of 50 V.
Danger in case of fire:
Danger of explosion with dust particles.
Decomposition due to fire or heat development emits toxic and corrosive gases.
Combustion gases which strongly irritate the eyes and respiratory organs.
General precautions the driver should observe if these hazards occur:
Switch off the motor.
Place a warning sign on the road to warn others.
Inform others of the dangers and advise them to stay away from the wind direction.
Contact the police and fire brigade immediately and inform them that there are lithium batteries (UN3480) onboard.
Instruction for fire extinguishing:
Extinguish fire with water. If possible, submerge the LPS completely in water.
Extinguishing with water produces fluoride, phosphate, fluoride-oxide and carbon monoxide.
Alternatively, extinguish with a CO2 fire extinguisher.

1. GETTING STARTED

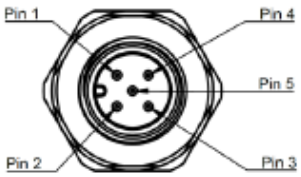
1.1 Product Box Contents

Quantity	Description
1	LPS II
1	AC charging cable (Neutrik – NAC3 FCA)
1	AC output connector (Neutrik – NAC3 FCB)
4	Cap for M8 bolt
4	M8 bolt
2	M4 bolt
4	Rubber foot

1.2 Product Details

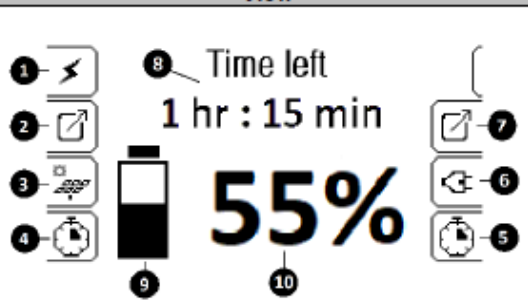
Front View	Rear View
	

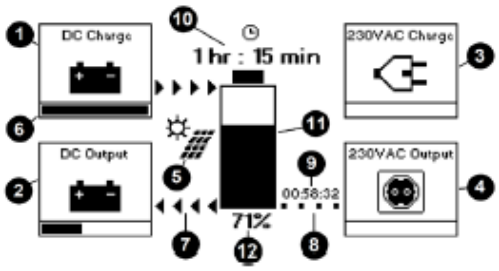
#	Description	#	Description
1	Display	13	Ventilation
2	12 VDC button	14	DC output terminals
3	230 VAC button	15	DC input terminals
4	Navigation button - Down	16	M12 – Data/Remote connector
5	Navigation button - Up	17	M12 – Data/IO connector
6	Navigation button - Ok	18	C1 (D+/Ignition Signal)
7	Navigation button - Return	19	C2 (Solar +) IO terminal
8	M12 – Data/IO connector	20	Type plate
9	Serial number	21	230 VAC output port (NAC3 FCB)
10	RCBO	22	230 VAC input port (NAC3 FCA)
11	230 VAC output port		
12	Ventilation/Fan		

M12 - IO PINOUT		
#	Function	Front View
1	Single Wire (Communication)	
2	I/O Signal	
3	GND	
4	CAN High (Communication)	
5	CAN Low (Communication)	

NOTE: PIN 2 in the M12 connector labeled "REMOTE" is designed to supply power to the LPS Remote. The LPS Remote is not included and can be purchased separately.

The display provides information on the unit operation status and allows for advanced unit configuration. The display features two home screens - a simple view and an advanced view. It is possible to switch between the screens using the UP and DOWN navigation buttons.

DISPLAY – SIMPLE VIEW		
#	Description	View
1	DC input active – Charging from DC source	
2	DC output active – I/O activated	
3	Solar input active – Charging from solar panel	
4	DC output energy saver timer active	
5	AC output energy saver timer active	
6	AC input active – Charging from grid	
7	AC output active – I/O activated	
8	Remaining operation time or time to charge (not shown with Capacity Extension)	
9	Graphical indication of state-of-charge	
10	Numeric indication of state-of-charge	

DISPLAY - ADVANCED VIEW		
#	Description	View
1	DC input functionality	
2	DC output functionality	
3	AC input functionality	
4	AC output functionality	
5	Solar input active – Charging from solar panel	
6	Power bar for indicating utilization of function	
7	Functionality is active and a transfer of energy is in process	
8	Functionality is active but there is no energy transfer	
9	AC output energy saver timer active	
10	Remaining operation time or charge time (not shown with Capacity Extension)	
11	Graphical indication of state-of-charge	
12	Numeric indication of state-of-charge	

NOTE: Interface and product features might vary depending on the model.

2. PRODUCT USAGE

All installations must be carried out by trained and qualified installers.
This document is intended as a general guide for installations and not as a comprehensive, step-by-step manual.
Local rules and regulations must always be followed and take precedence over any instructions provided in this guide.

WARNING: Connecting the device with incorrect voltage or battery polarity will damage the device and is not covered by the warranty.

WARNING: Do not connect the AC outputs in parallel or serial. It will damage the device and is not covered by the warranty.

WARNING: Do not connect the output of a generator or AC mains to the output. It will damage the device and is not covered by the warranty.

It is recommended to perform a full battery cycle prior to the initial use.
To do this charge the LPS II fully, then do a full discharge and then charging it overnight using the 230 VAC input.

When the LPS II is installed in a vehicle and that vehicle is not being used, it is recommended to have the LPS II connected to an AC mains supply.

The LPS II is a compact power supply designed to provide power for a variety of 230 VAC and 12 VDC applications. It comes with built-in:

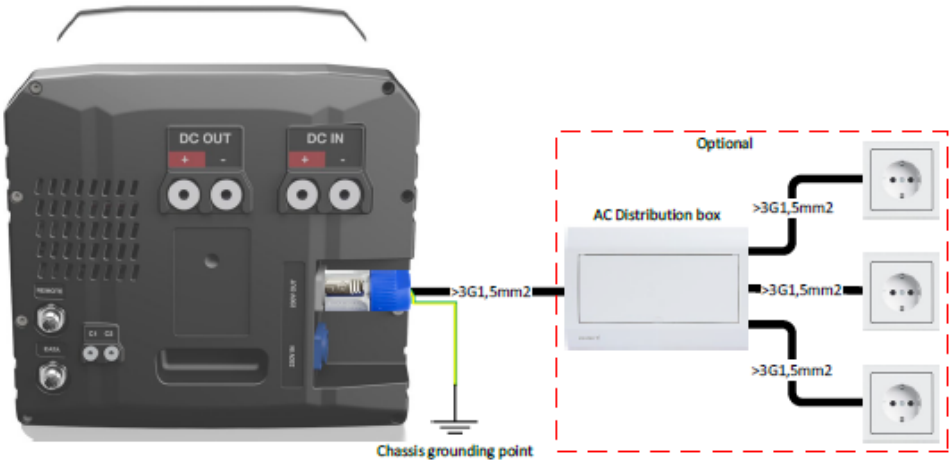
- LiFePO4 battery.
- 230 VAC Output – For supplying 230 VAC applications.
- 230 VAC Input – For charging from mains.
- 12 VDC Output – High power DC output for supplying 12 VDC applications.
- 12 VDC/24 VDC Input – Bidirectional DC-DC converter for 12 VDC/24 VDC applications like:
  - Vehicle jumpstart
  - Charging from alternator.
- Solar Charging – Integrated MPPT for charging from solar panel.
- CANbus communication and I/O interface for interaction with auxiliary equipment and remote control.

2.1 230VAC Output

The LPS II features two AC output ports, one on the front (CEE 7) and one on the back (NAC3 FCB), which can be used simultaneously. Both ports are protected against overload and short circuits and are equipped with RCDO for safety.

Press the 230V button to activate the AC output function. The green LED will light up to confirm activation. The output will automatically switch off after 1 hour if the power demand is below 20 W (Default setting).

The following diagram illustrates how to connect to an LPS II for this configuration.



WARNING: A connection from the Neutrik 230 VAC Out connector to Chassis MUST be made for protective grounding.

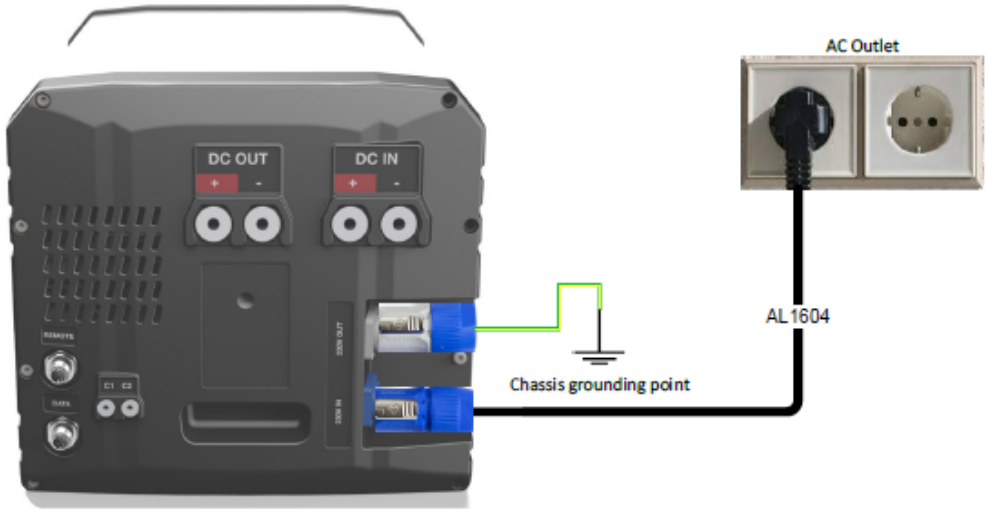
NOTE: The earth pin in the input and output AC connections are internally connected, so chassis connection can be done on either one.

NOTE: If there is no 230 VAC output when the output is turned ON, check RCBO.

2.2 230VAC Charging

To charge the LPS II from a power outlet, use the provided power cord with the NAC3 FCA connector. When connected to mains, the unit will begin charging automatically and redirect the mains to the AC output ports. During charging, the green 230V LED will flash.
If a load is connected to the AC output, this will be prioritized over the internal charging, possibly reducing the power being used for charging.

The following diagram illustrates how to connect to an LPS II for this configuration.



WARNING: 230 VAC will always be present on the AC output ports during AC charging.

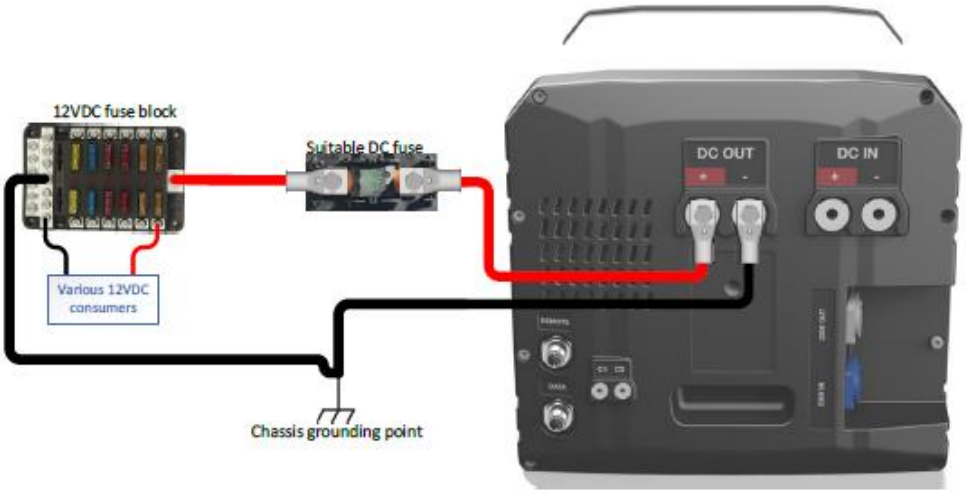
WARNING: A connection from the Neutrik 230 VAC Out connector to Chassis MUST be made for protective grounding.

NOTE: The earth pin in the input and output AC connections are internally connected, so chassis connection can be done on either one.

2.3 12VDC Output

The LPS II has a 12 VDC port for providing power to DC applications. To activate the 12 VDC output, press the 12V button. A green LED will light up, indicating that the functionality is active.

The following diagram illustrates how to connect to an LPS II for this configuration.
Connect the positive DC output terminal of the LPS II to the positive input of the load through an appropriate fuse.



WARNING: Output fuse and cable size, including the grounding cable, should be rated according to the load being used.

WARNING: Using the wrong cable size or a bad cable connection can cause overheating and a short circuit.

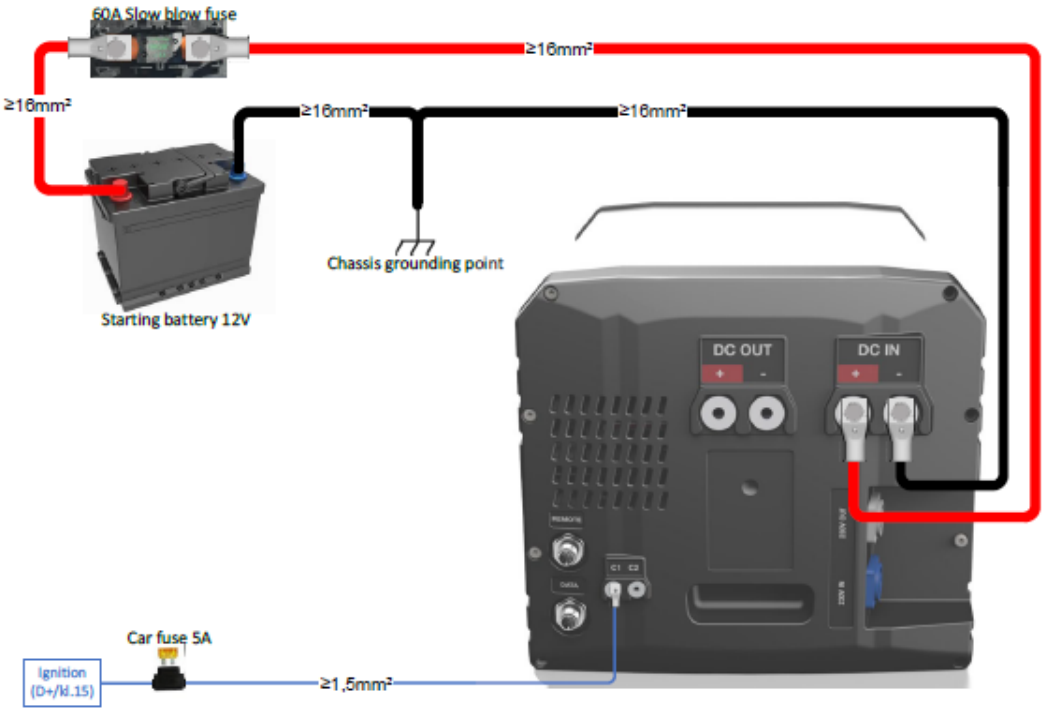
WARNING: Place a fuse as close as possible to the LPS to prevent high current short-circuits.

NOTE: The DC- connection on IN and OUT terminals are internally connected together. Therefore, the chassis earth point can be on either connection.

2.4 12VDC/24VDC Input

The LPS II can be charged using the built-in DC-DC converter when the DC IN port voltage is within the operational range and a wakeup signal is detected on C1.

The following diagram illustrates how to connect to an LPS II for this configuration.
Connect the DC positive from the battery through a fuse to the positive DC input terminal on the LPS II.



WARNING: Using the wrong cable size or a bad cable connection can cause overheating and a short circuit.

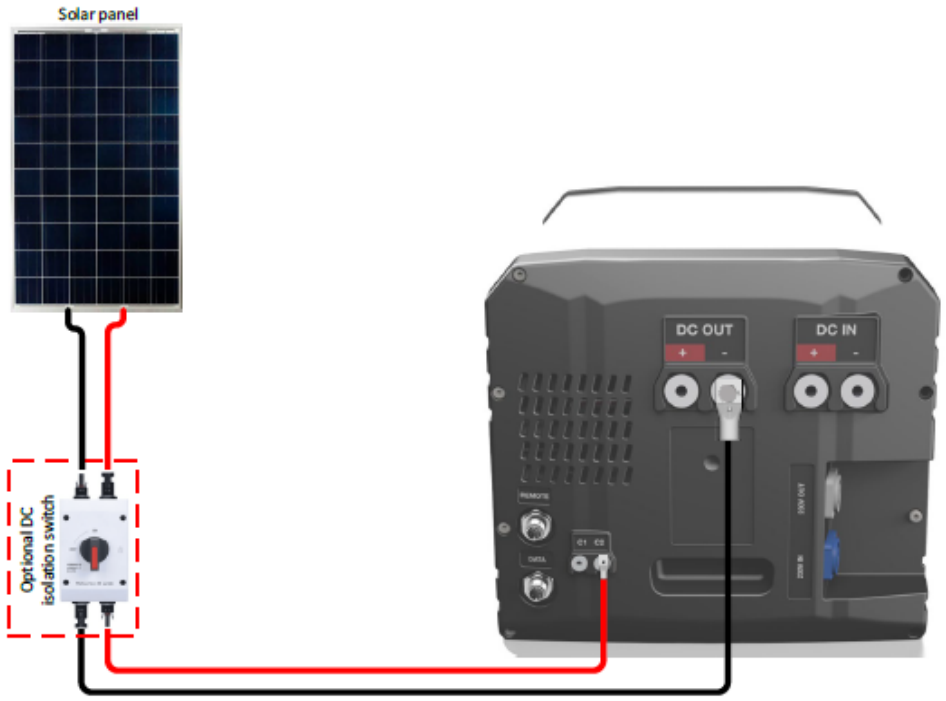
WARNING: Place a fuse as close as possible to the power source to prevent high current short-circuits.

NOTE: The DC- connection on IN and OUT terminals are internally connected together. Therefore, the chassis earth point can be on either connection.

2.5 Solar Charging

If the solar panels generate enough power (> 5 W), the LPS II will automatically charge using the integrated MPPT.

The following diagram illustrates how to connect to an LPS II for this configuration.
Connect the solar positive input to the C2 terminal on the LPS.



WARNING: Never exceed 50 Voc between DC Input minus and C2 from solar. Exceeding may cause damage to the unit.

WARNING: Cable size should be rated according how much current can be draw from the solar panel as specified in the datasheet of the solar panel used.

WARNING: Always follow the Solar panel manufacturers safety manual and recommended installation instructions.

WARNING: For two or more parallel installed solar panels, a fuse is recommended for each panel connection if the combined short circuit current for all panels is higher than the maximum reverse current of a single panel.

NOTE: The DC- connection on the LPS II IN and OUT terminals are internally connected together.

NOTE: Not available in LPS 1500 SE variant.

NOTE: The LPS will charge with a maximum of 400 W from the solar panel. If a higher wattage panel has been fitted, the panel and LPS II will regulate this together and not be damaged.

NOTE: We advise to fit an isolation switch, but this is optional. This allows the power from the panel to be switched off if you need to work on the LPS for any reason.

3. TIPS AND TRICKS

3.1 Limit AC/DC charging power

If the power source has limited output, the AC and DC charging can be limited. The below display menu setting will also limit the AC output in the LPS while connected to the mains.

LIMITING AC CHARGING POWER	
Menu Path	**Description**
Main Menu > 230VAC Charging > Maximum current	To set the maximum allowable current for AC charging, enter the menu and navigate using the up and down arrows. Press "OK" to confirm your selection. This setting will take effect immediately.

NOTE: If 230 V charge is limited, the 230V output in the LPS is also limited while connected to the mains.

LIMITING DC CHARGING POWER	
Menu Path	**Description**
Main Menu > DC Charging > Set current	To set the maximum allowable current for DC charging, enter the menu and navigate using the up and down arrows. Press "OK" to confirm your selection. This setting will take effect immediately.

3.2 Activate Jumpstart

The LPS II has an integrated jumpstart feature that can charge the starter battery if depleted. To use this feature, the LPS must be connected to the starter battery via the DCIN terminal according to section 2.4.

The jumpstart is activated through the display menu or the remote. Once activated, the jumpstart will charge the starter battery for 5 min with 40 A.

ACTIVATE JUMP-START	
Menu Path	**Description**
Main Menu > DC Charging > Jumpstart	To activate the jumpstart function, enter the menu and use the up and down arrow to select "Active" and press "OK" to confirm.

3.3 Battery maintenance

To ensure optimal battery performance, fully recharge the battery every month (100 %).

NOTE: If the battery has not been fully charged for a long period, maintenance charge can be prolonged to 3 days.

UNIT MUST BE CHARGED EVERY 6 MONTHS IF NOT USED

4. TROUBLESHOOTING

4.1 Error list

If the solutions provided below are unable to resolve the error or if the error code is not listed, contact your retailer.

ERROR	DESCRIPTION	SOLUTION
Product Temperature		
4, 5, 56, 57, 123	Unit temperature too low	Let the device warm up or move it to a place with a higher ambient temperature
6, 7, 58, 59	Unit temperature too high	Let the device cool down or move it to a place with a lower ambient temperature
I/O and Communication		
11, 12, 13	M12 connector is overloaded or has short circuited	Disconnect connector and check connector or cable for damage
14	I/O Terminal is overloaded or has short circuited	Disconnect connector and check connector or cable for damage
121	Communication Error	Verify cable connections on M12 connectors
Battery		
51, 52, 53, 60	Battery/Cell voltage low	Recharge the battery
Solar		
70	Solar input voltage too high	Check the installation and max. voltage from solar panel (50V)
DC Input		
90, 92	The DC Input voltage too low	Provide a higher 12 VDC or 24 VDC voltage
91, 124, 125	The DC Input voltage too high	Provide a lower 12 VDC or 24 VDC voltage
DC Output		
96	DC Output charge current too high	Remove or adjust the power source
97	DC Output discharge current too high	The 12VDC Output load is drawing too much current. Remove the load
AC Output		
150, 151, 152, 203	230VAC Output is overloaded	Remove load on the 230 VAC Output
157	SOC cut-off limit	Recharge the unit
AC Input		
206	230VAC mains is too low	Check supply cables or try another outlet socket
207	230VAC mains too high	Mains too high, verify outlet socket voltage

4.2 No 230VAC output

Make sure that the Residual Current Circuit Breaker with Overload protection (RCBO) is switched on (see section 1.2 - #10) and check your AC cables.

5. SPECIFICATIONS

PARAMETER	LPS II 1500 W 1 kWh SE	LPS II 2000 1 kWh	LPS II 2500 1 kWh	LPS II 3000 2 kWh
General				
Model no.	CL2204/CL2214/ CL2224	CL2205/CL2215/ CL2225	CL2102/CL2112/ CL2122	CL2103/CL2113/ CL2123
Cooling	Forced air			
Ambient temperature discharge	-20 – 40 °C			
Ambient tem-perature charge	0 – 40 °C			
IP classification	20			
Protection class	I			
Maximum altitude	4500 m			
Product weight	22.5 kg		23.5 kg	27.5 kg
Product size (H x W x L)	256 x 277 x 409 mm			
Gross weight	25.5 kg		26.5 kg	30.5 kg
Package size (H x W x L)	320 x 372 x 480 mm			
Battery				
Type	Rechargeable Lion battery system			
Chemistry	LiFePO4			
Capacity	100 Ah (1280 Wh)			160 Ah (2048Wh)
Available capacity	80 Ah (1020 Wh)			136 Ah (1740Wh)
Cycles	2000			3500
Self-discharge rate per month	< 45 mA			
Marking (IEC 61960)	4IFpP51/161/119			4IFpP55/175/154
Marking (IEC 62620)	IFpP/51/161/119/[4S]M/-20+60/90			IFpP/55/175/154/[4S]M/-30+60/90
AC Input				
Voltage	207-253 V			
Frequency	45-65 Hz			
Power	550 W	720 W		
Connector type	NAC3 FCA			
AC Output				
Voltage (+- 10 %)	230 V pure sine wave			
Frequency	50 Hz			
Power - continuous (@ 25 °C)	1300 W	1500 W	2000 W	2300 W
Power - 10 min.	1500 W	2000 W	2500 W	3000 W
Power Peak - 10 s	3000 W	4000 W	5000 W	6000 W
Power – AC in connected	2300 W		3000 W	
Supported peak inrush power	13000 W			
Efficiency (1,000 W)	94 %			
Power factor	0.77			
Idle consumption	20 W			
Fault current (rms)	30 mA			
Connector type	NAC3 FCB, Schuko (EU), BS1363 (UK), T23 (CH)			
DC Input				
Voltage	11.5-32 V			

Current	25 A	45 A
Jumpstart	25 A/5 min.	40 A/5 min.
Connector type	Terminal – M8	
DC Output		
Voltage	10-14.4 V	
Discharge current - continuous	180 A	
Discharge current - 1 min.	270 A	
Idle consumption	< 1 W	
Charging current – continuous	90 A	
Connector type	Terminal – M8	
Solar (Input)		
Voltage	N/A	15-50 V
Charging power (max.)	N/A	400 W
Charging current (max.)	N/A	15 A
Short circuit current (Isc)	N/A	30 A
I/O		
Input ports (Analog)	C1, C2, M12	C1, C2, M12 x 3
Input (Voltage – M12)	0-36 V	
Input (Voltage – C1, C2)	0-50 V	
Output ports (Digital)	C2 and M12	C2 and M12 x 3
Output (Voltage)	0 or 12 V	
Output (Current)	400 mA (Overcurrent protected)	
Connector type (M12)	Type A – 5-way	
Connector type (C1/C2)	Terminal – M4	

WARNING: If the temperature gets below -20 °C, the unit will lock and must be returned to Clayton Power for resetting, at the customer's expense.

NOTE: The LPSII will not charge at temperatures below 0 °C.

7. CERTIFICATIONS AND COMPLIANCE

Low Voltage Directive 2014/35/EU
EN62368-1, EN62133

RoHS Directive 2011/65/EU
EN 63000

EMC 2014/30/EU
EN61000-6-2, EN61000-6-3

E-Marking
UN-ECE Regulation 10, E5 10R – 06 0488

8. SAFETY AND FUSES

The following measures ensure the safe and secure operation of the electrical system.
Not following these measures can result in dangerous situations causing harm to the user and the equipment.

7.1 Internal Measures

- 230 VAC input protected with 16 A fuse.
- 230 VAC output protected by a Residual Current Circuit Breaker with Overload protection (RCBO) 30 mA/13 A.
- DC input protected with 50 A fuse.
- L/N relay hardware protection against hazards.
- PE/N relay hardware protection against hazards.
- Solar panels 20 A fuse.

Fuses cannot be replaced by the user and require service.

ATTENTION: The MPPT/Solar may be permanently damaged if the input voltage exceeds 50 V.

ATTENTION: The device is equipped with a Residual Current Circuit Breaker with Overload protection (RCBO). To ensure its proper operation, it is important to regularly test the RCBO.

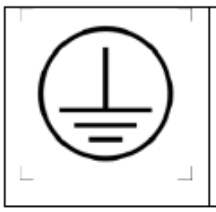
Procedure:

- Ensure that 230 VAC is present.
- Locate the button marked 'T' on the RCBO.
- Press the 'T' button.
- Observe the RCBO to ensure that it trips during the test.

If the RCBO becomes disabled, all 230 AC output ports will be disconnected. This is a safety feature to protect the device and those using it. Regular testing of the RCBO ensures that it is functioning properly.

A yearly full RCBO test with a suitable test tool is also recommended, but is not a requirements.

ATTENTION: Protective Earth - The device must have protective earth connected.



It is mandatory to install a Protective Earth (PE) connection in accordance with the requirements specified in IEC 62109-1. The PE connection provides a safe route for electrical fault current to flow, reducing the risk of electric shock and fire. Proper installation of the PE connection is essential for ensuring the safety of users and the equipment. Make sure that the PE connection is installed using appropriate materials and methods, in accordance with the relevant national and local regulations.

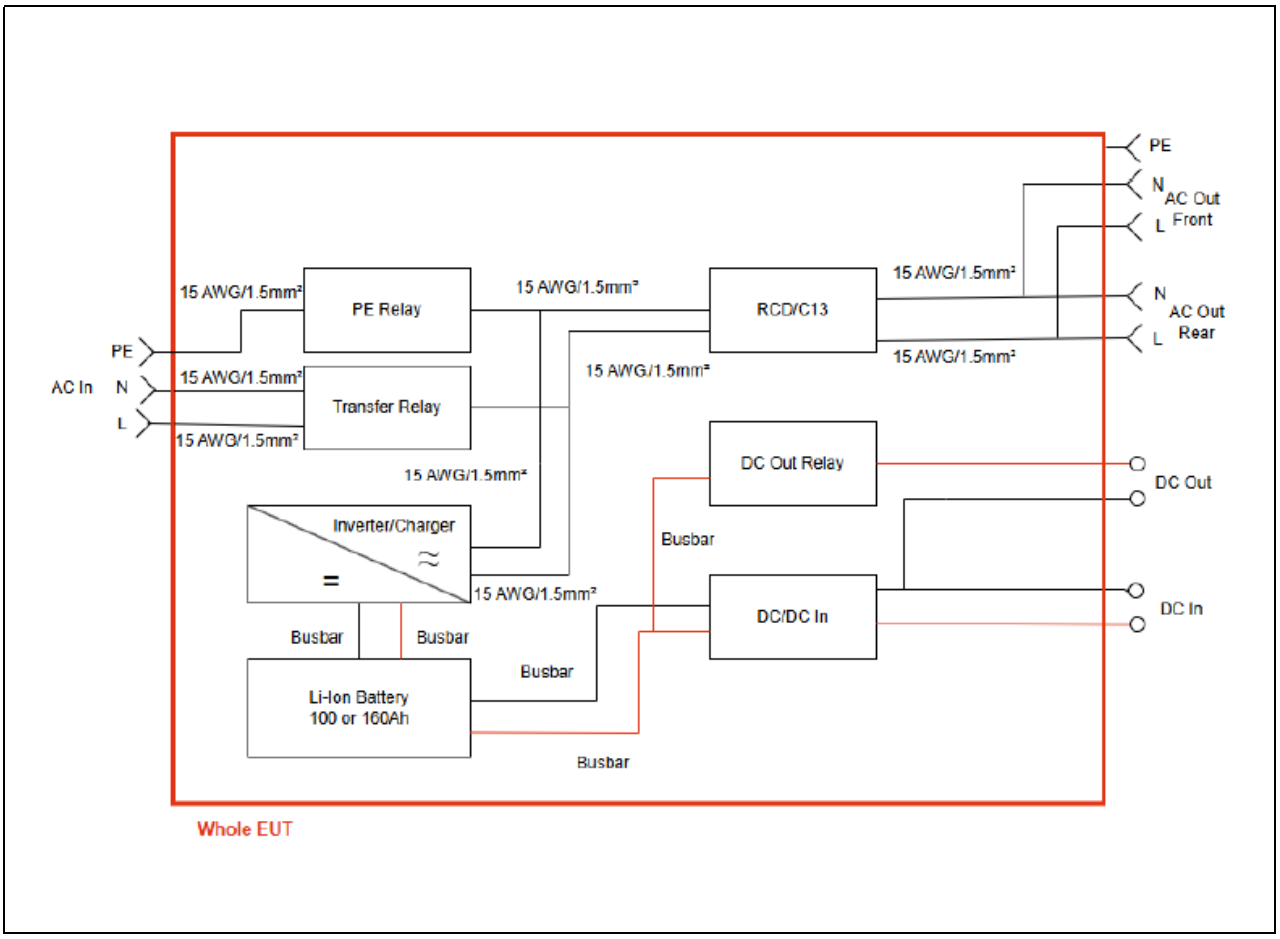
ATTENTION: Do not connect the CAN Bus to the vehicle's CAN communication system.

7.2 External Fuses

- All fuses must be installed as close to the power source as possible.
  - Measures must be taken to ensure the cable located between the fuse and the power source is laid out in a short-circuit-proof manner.
- Fuses should be clearly marked with their name and size.
- It is important to use fuses rated for DC voltages.
- MEGA fuses (recommended fuse type) should be mounted in holders.

7.3 Cables

- Cables needs to be flexible.
  - Cables are rated in different classes related to flexibility.
  - Cables with classification 5 or 6 needs to be used (This cable type is also referred to as HIGH-FLEX).
  - The supplied AC input cable is not for a fixed installation in a leisure vehicle.
- Cables are dimensioned according to the fuse size.
- Always use the designated connection points in the vehicle for chassis and DC connections (if available/indicated).
- Always route cables the shortest way possible.
- Cables should always be secured along the routing to ensure that it does not move unintentionally.
- Cable must be kept away from moving parts.
- When passing through bulkheads or other surfaces the cable needs to be guarded against chamfering.
  - This can be done by grinding the hole to eliminate sharp edges, using a rubber grommet within the hole and using conduit or tubing to shield the cable.
- Cable terminals should be used for the right cable cross section as they are made for.
- It is important to choose cable terminals for the right cable classification.
  - This means that classification 5 cables need a classification 5 terminal.
- When connecting the cable remember to use the right torque.
  - M8 bolts must be torqued to 12 Nm
  - M4 bolts must be torqued to 2.5 Nm
- When connecting the cable remember to use both spring and straight washer.


PE
N
AC Out
L
Front
N
AC Out
L
Rear
15 AWG/1.5mm²
PE Relay
15 AWG/1.5mm²
RCD/C13
15 AWG/1.5mm²
15 AWG/1.5mm²
PE
AC In
N
L
15 AWG/1.5mm²
Transfer Relay
15 AWG/1.5mm²
15 AWG/1.5mm²
DC Out Relay
DC Out
Inverter/Charger
≈
=
Busbar
15 AWG/1.5mm²
DC/DC In
DC In
Busbar
Busbar
Busbar
Li-Ion Battery
100 or 160Ah
Busbar
Whole EUT

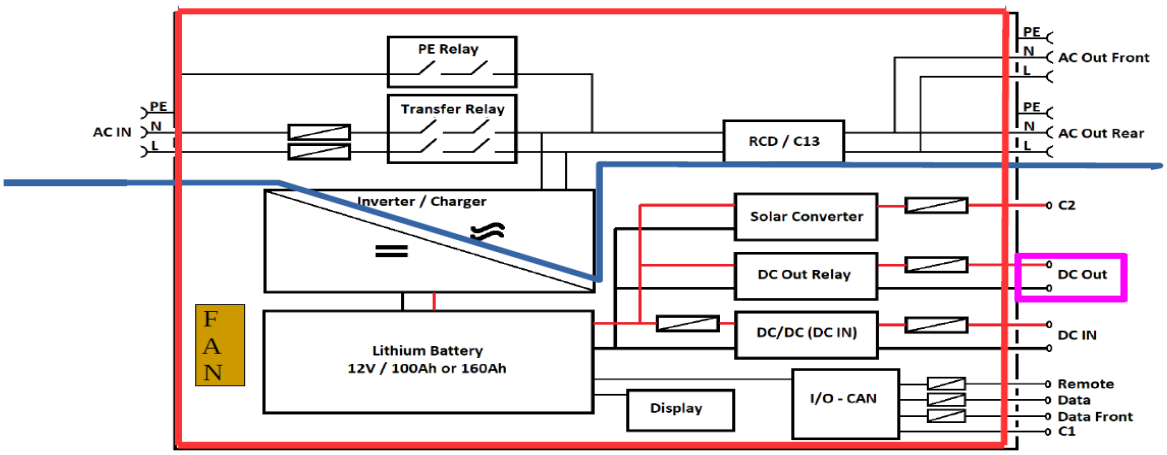
OVERVIEW OF ENERGY SOURCES AND SAFEGUARDS				
Clause	**Possible Hazard**			
5	Electrically-caused injury			
Class and Energy Source (e.g. ES3: Primary circuit)	Body Part (e.g. Ordinary)	Safeguards		
		B	S	R
230 V 50Hz (Input mains supply); ES3	V.1; V.2; Ordinary	P	P	P
230 V 50 Hz (Front/Rear output mains supply); ES3	V.1; V.2; Ordinary	P	P	P
Secondary circuits: DC Input 32 VDC (max); ES1	V.1; V.2; Ordinary	N/A	N/A	N/A
Secondary circuits: DC Output 14,4 VDC (max); ES1	V.1; V.2; Ordinary	N/A	N/A	N/A
Secondary circuits: Solar Input 50,0 VDC (max); ES1	V.1; V.2; Ordinary	N/A	N/A	N/A
Secondary circuits: I/O terminals Input 50,0 VDC (max); ES1	V.1; V.2; Ordinary	N/A	N/A	N/A
6	Electrically-caused fire			
Class and Energy Source (e.g. PS2: 100 Watt circuit)	Material part (e.g. Printed board)	Safeguards		
		B	1st S	2nd S
720 W (Input mains supply); PS3	ENCLOSURE, PCB	P	P	P
3000 W (Front/Rear output mains supply); PS3	ENCLOSURE, PCB	P	P	P
Secondary circuits: DC Input 45 A (max); PS3	ENCLOSURE, PCB	P	P	P
Secondary circuits: DC Output 2,6 kW; PS3	ENCLOSURE, PCB	P	P	P
Secondary circuits: Solar Input 400 W; PS3	ENCLOSURE, PCB	P	P	P
Secondary circuits: I/O terminals Input 15 W; PS1	ENCLOSURE, PCB	P	N/A	N/A
7	Injury caused by hazardous substances			
Class and Energy Source (e.g. Ozone)	Body Part (e.g., Skilled)	Safeguards		
		B	S	R
No hazardous substances	V.1; V.2; Ordinary	N/A	N/A	N/A
8	Mechanically-caused injury			
Class and Energy Source	Body Part	Safeguards		

(e.g. MS3: Plastic fan blades)	(e.g. Ordinary)	B	S	R
Line 1, Sharp edges and corners; MS1	V.1; V.2; Ordinary	N/A	N/A	N/A
Line 5 Equipment mass: 27,5Kg; MS3	V.1; V.2; Ordinary	P	P	N/A
9	Thermal burn			
Class and Energy Source (e.g. TS1: Keyboard caps)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
Enclosure accessible parts; TS1	V.1; V.2; Ordinary	N/A	N/A	N/A
DC Out; TS2	V.1; V.2; Ordinary	P	N/A	N/A
10	Radiation			
Class and Energy Source (e.g. RS1: PMP sound output)	Body Part (e.g., Ordinary)	Safeguards		
		B	S	R
Lamps and systems (including LEDs), Display, Exempt Group	V.1; V.2; Ordinary	N/A	N/A	N/A
Supplementary Information: “B” – Basic Safeguard; “S” – Supplementary Safeguard; “R” – Reinforced Safeguard				

ENERGY SOURCE DIAGRAM
Optional. Manufacturers are to provide the energy sources diagram identify declared energy sources and identifying the demarcations are between power sources. Recommend diagram be provided included in power supply and multipart systems. Insert diagram below. Example diagram designs are; Block diagrams; image(s) with layered data; mechanical drawings

ES3 above blue line
ES1 below blue line
PS3: whole EUT

MS1: fan
MS3: EUT due to weight
TS2: DC output



☒ ES ☒ PS ☒ MS ☒ TS ☒ RS

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	**GENERAL REQUIREMENTS**		P
4.1.1	Acceptance of materials, components and subassemblies		P
4.1.2	Use of components		P
4.1.3	Equipment design and construction		P
4.1.4	Specified ambient temperature for outdoor use (°C) ..... :	Only indoor use	N/A
4.1.5	Constructions and components not specifically covered		P
4.1.8	Liquids, refrigerants and liquid filled components (LFCs)	(See Clause G.15)	N/A
4.1.15	Markings and instructions	(See Annex F)	P
4.4.3	Safeguard robustness		P
4.4.3.1	General		P
4.4.3.2	Steady force tests	(See Clause T.3, T.4, T.5) 250N	P
4.4.3.3	Drop tests	(See Clause T.7)	N/A
4.4.3.4	Impact tests	(See Clause T.6)	P
4.4.3.5	Internal accessible safeguard tests	(See Clause T.3)	N/A
4.4.3.6	Glass impact tests	(See Clause T.9)	N/A
4.4.3.7	Glass fixation test		N/A
	Glass impact test (1J)	(See Clause T.9)	N/A
	Push/pull test (10 N)		N/A
4.4.3.8	Thermoplastic material tests	(See Clause T.8)	P
4.4.3.9	Air comprising a safeguard		P
4.4.3.10	Accessibility, glass, safeguard effectiveness		P
4.4.4	Displacement of a safeguard by an insulating liquid		N/A
4.4.5	Safety interlocks	(See Annex K)	N/A
4.5	**Explosion**		P
4.5.1	General	(See Annex M for batteries)	P
4.5.2	No explosion during normal/abnormal operating conditions	(See Clause B.2, B.3)	N/A
	No harm by explosion during single fault conditions	(See Clause B.4)	N/A
4.6	**Fixing of conductors and conductive parts**		P
	Fix conductors and conductive parts not to defeat a safeguard		P
	Compliance is checked by test ..... :	(See Clause T.2)	P

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.7	**Equipment for direct insertion into mains socket–outlets**		N/A
4.7.2	Mains plug part complies with relevant standard ... :		N/A
4.7.3	Torque (Nm) ..... :		N/A
4.8	**Equipment containing coin or button cell batteries**		N/A
4.8.1	General		N/A
4.8.2	Instructional safeguard ..... :		N/A
4.8.3	Coin or button cell battery compartment, door or cover construction		N/A
	Open torque test		N/A
4.8.4.2	Stress relief test	(See Clause T.8)	N/A
4.8.4.3	Battery replacement test		N/A
4.8.4.4	Drop test	(See Clause T.7)	N/A
4.8.4.5	Impact test	(See Clause T.6)	N/A
4.8.4.6	Crush test		N/A
4.8.5	Compliance		N/A
	30N force test with test probe		N/A
	20N force test with test hook		N/A
4.9	**Likelihood of fire or shock due to entry of conductive object**		P
4.10	**Component requirements**		P
4.10.1	Disconnect device	(See Annex L)	P
4.10.2	Switches and relays	(See Annex G)	P
4.10.3	Mains power supply cords	(See Clause G.7)	N/A
4.10.4	Batteries and their protection circuits	(See Annex M)	P

5	**ELECTRICALLY-CAUSED INJURY**		P
5.2	**Classification and limits of electrical energy sources**		P
5.2.2	ES1 and ES2 limits		P
5.2.2.2	Steady-state voltage and current limits ..... :	(See appended table 5.2)	P
5.2.2.3	Capacitance limits ..... :	(See appended table 5.2)	N/A
5.2.2.4	Single pulse limits ..... :	(See appended table 5.2)	N/A
5.2.2.5	Limits for repetitive pulses ..... :	(See appended table 5.2)	N/A
5.2.2.6	Ringing signals	(See Annex H)	N/A
5.2.2.7	Audio signals	(See Clause E.1)	N/A
5.3	**Protection against electrical energy sources**		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	instructed and skilled persons for installation	P
5.3.1 a)	ES2/ES3 circuits that are not ES2/ES3 mains	230 VAC Output Front (CEE7) BACK (NAC3 FCB) are considered ES3 mains	N/A
5.3.1 b)	Skilled persons not unintentional contact ES3 bare conductors		P
5.3.2.1	Accessibility to electrical energy sources and safeguards		P
	Accessibility to outdoor equipment bare parts		N/A
5.3.2.2	Contact requirements		P
	Test with test probe from Annex V..... :	V1, V2,	—
5.3.2.2 a)	Air gap – electric strength test potential (V)..... :	(See appended table 5.4.9) 500Vpk, 500Vrms;	P
5.3.2.2 b)	Air gap – distance (mm) ..... :	>0,26	P
5.3.2.3	Compliance		P
5.3.2.4	Terminals for connecting stripped wire	Only skilled persons	N/A
5.4	**Insulation materials and requirements**		P
5.4.1.2	Properties of insulating material		P
5.4.1.3	Compliance		P
	Non-hygroscopic materials		P
5.4.1.4	Maximum operating temperature for insulating materials ..... :	(See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
5.4.1.5	Pollution degrees..... :	2	—
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	Separately approved components	N/A
5.4.1.5.3	Thermal cycling test		N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage ..... :	(See appended table 5.4.1.8)	P
5.4.1.9	Insulating surfaces		P
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted		P
5.4.1.10.2	Vicat test ..... :	(See appended table 5.4.1.10.2)	N/A
5.4.1.10.3	Ball pressure test..... :	(See appended table 5.4.1.10.3) Separately approved components	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.2	Clearances		P
5.4.2.1	General requirements		P
	Clearances in circuits connected to AC Mains, Alternative method	(See Annex X)	N/A
5.4.2.2	Procedure 1 for determining clearance		N/A
	Temporary overvoltage ..... :		—
5.4.2.3	Procedure 2 for determining clearance		P
5.4.2.3.2.2	AC mains transient voltages ..... :	2500	—
5.4.2.3.2.3	DC mains transient voltages ..... :		—
5.4.2.3.2.4	External circuit transient voltages ..... :		—
5.4.2.3.2.5	Transient voltage determined by measurement..... :		—
5.4.2.3.3	Exceptions of determining required withstand voltage ..... :		N/A
5.4.2.3.4	Determining clearances using required withstand voltage ..... :	(See appended table 5.4.2, 5.4.3)	N/A
5.4.2.4	Determining the adequacy of a clearance using an electric strength test ..... :	(See appended table 5.4.2, 5.4.3)	N/A
5.4.2.5	Multiplication factors for clearances and test voltages..... :	4500 m; CL 1,39; Streng voltage 1,20	—
5.4.2.6	Clearance measurement..... :	(See appended table 5.4.2, 5.4.3)	P
5.4.3	Creepage distances		P
5.4.3.1	General		P
5.4.3.3	Material group and CTI..... :	IIIb	—
5.4.3.4	Creepage distances measurement..... :	(See appended table 5.4.2, 5.4.3)	P
5.4.4	Solid insulation		P
5.4.4.1	General requirements		P
5.4.4.2	Minimum distance through insulation ..... :	(See appended table 5.4.4.2)	P
5.4.4.3	Insulating compound forming solid insulation	Separately approved components	P
5.4.4.4	Solid insulation in semiconductor devices	Separately approved components	P
5.4.4.5	Insulating compound forming cemented joints	Into separately approved components	P
5.4.4.6	Thin sheet material		P
5.4.4.6.1	General requirements		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.4.6.2	Separable thin sheet material	(See appended table 5.4.9) Into separately approved components	P
	Number of layers (pcs) ..... :		N/A
5.4.4.6.3	Non-separable thin sheet material		N/A
	Number of layers (pcs) ..... :		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material ..... :	(See appended table 5.4.9)	N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		N/A
5.4.4.9	Solid insulation at frequencies >30 kHz, E_P, K_R, d, V_{PW} (V) ..... :	(See appended table 5.4.4.9)	N/A
	Alternative by electric strength test, tested voltage (V), K_R ..... :	(See appended tables 5.4.4.9 and 5.4.9)	N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
5.4.5.3	Insulation resistance (MΩ) ..... :		N/A
	Electric strength test ..... :	(See appended table 5.4.9)	N/A
5.4.6	Insulation of internal wire as part of supplementary safeguard	Separately approved components	P
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		P
	Relative humidity (%), temperature (°C), duration (h) ..... :	93,25,48	—
5.4.9	Electric strength test	(See appended table 5.4.9)	P
5.4.10	Safeguards against transient voltages from external circuits		N/A
5.4.10.1	Parts and circuits separated from external circuits		N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A
5.4.10.2.2	Impulse test ..... :		N/A
5.4.10.2.3	Steady-state test..... :	(See appended table 5.4.9)	N/A
5.4.10.3	Verification for insulation breakdown..... :		N/A
5.4.11	Separation between external circuits and earth		N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.4.11.2	Requirements		N/A
	Surge suppressors bridge separation between external circuit and earth		N/A
	Rated operating voltage U_{op} (V)..... :		—
	Nominal voltage U_{peak} (V)..... :		—
	Max increase due to variation ΔU_{sp} ..... :		—
	Max increase due to ageing ΔU_{sa} ..... :		—
5.4.11.3	Test method and compliance ..... :	(See appended table 5.4.9)	N/A
	Test voltage (V) of additional test..... :		—
	Measured current (mA) of additional test ..... :		N/A
5.4.12	Insulating liquid		N/A
5.4.12.1	General requirements		N/A
5.4.12.2	Electric strength of an insulating liquid ..... :	(See appended table 5.4.9)	N/A
5.4.12.3	Compatibility of an insulating liquid		N/A
	Thermal classification of IEC 60085..... :		—
5.4.12.4	Container for insulating liquid		N/A
5.5	**Components as safeguards**		P
5.5.1	General		P
5.5.2	Capacitors and RC units	C1, C2, C3, C4 (IO_EMC_BACK v77); C2, C3 (IO_EMC_FRONT v44); C1, C3, C7, C13, C6, C12 (R027-02 LPS_ACEMC) Separately approved components	P
5.5.2.1	General requirement		P
5.5.2.2	Capacitor discharge after disconnection of a connector..... :	(See appended table 5.5.2.2)	P
5.5.3	Transformers	(See Clause G.5.3)	P
5.5.4	Optocouplers	(See Clause 5.4 or Clause G.12)	
5.5.5	Relays	(See Clause 5.4) K1, K2 (R027-02 LPS_ACEMC) Separately approved components	P
5.5.6	Resistors	(See Clause G.10)	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Application type of resistors ..... :	R1 (AC-EMC-Mini); R1 (R027-02 LPS_ACEMC) Separately approved components	—
5.5.7	Surge suppressors	(See Clause G.8)	P
	GDT……..:	C2 on AC EMC, separately approved	P
5.5.8	Insulation between the mains and an external circuit consisting of a coaxial cable ..... :		N/A
	Insulation resistance (MΩ) ..... :		N/A
	Electric strength test..... :	(See appended table 5.4.9)	N/A
5.5.9	Safeguards for socket-outlets in outdoor equipment	Only Indoor equipment	N/A
	RCD rated residual operating current (mA)..... :		—
5.6	**Protective conductor**		P
5.6.2	Requirements for protective conductors		P
5.6.2.1	General requirements		P
5.6.2.2	Colour of insulation		P
5.6.3	Requirements for protective earthing conductors	Not supplied by manufacturer	N/A
	Protective earthing conductor size (mm^2) ..... :	15AWG/1,5 mm^2	—
	Protective earthing conductor serving as a reinforced safeguard		N/A
	Protective earthing conductor serving as a double safeguard		N/A
5.6.4	Requirements for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		P
	Protective bonding conductor size (mm^2). ..... :	13 A; required 1,0 mm^2	—
5.6.4.2	Protective current rating (A) ..... :	13 A (RCB0)	—
5.6.5	Terminals for protective conductors		P
5.6.5.1	Terminal size for connecting protective earthing conductors (mm)..... :	Mains Connector (NAC3 FCA)	P
	Terminal size for connecting protective bonding conductors (mm)..... :		P
	Relevant IEC standard ..... :		P
5.6.5.2	Corrosion		P
5.6.6	Resistance of the protective bonding system		P
5.6.6.1	Requirements		P
5.6.6.2	Test method..... :	(See appended table 5.6.6)	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.6.6.3	Resistance (Ω) or voltage drop ..... :	(See appended table 5.6.6)	P
5.6.7	Reliable connection of a protective earthing conductor		P
5.6.8	Functional earthing		N/A
	Conductor size (mm^2) ..... :		N/A
	Class II with functional earthing marking ..... :		N/A
	Appliance inlet cl & cr (mm)..... :		N/A
5.7	**Prospective touch voltage, touch current and protective conductor current**		P
5.7.2	Measuring devices and networks		P
5.7.2.1	Measurement of touch current		P
5.7.2.2	Measurement of voltage		P
5.7.3	Equipment set-up, supply connections and earth connections		P
5.7.4	Unearthed accessible parts..... :	(See appended table 5.7.4)	P
5.7.5	Earthed accessible conductive parts..... :	(See appended table 5.7.5)	P
5.7.6	Requirements when touch current exceeds ES2 limits		N/A
	Protective conductor current (mA)..... :		N/A
	Instructional Safeguard ..... :		N/A
5.7.7	Prospective touch voltage and touch current associated with external circuits		N/A
5.7.7.1	Touch current from coaxial cables		N/A
5.7.7.2	Prospective touch voltage and touch current associated with paired conductor cables		N/A
5.7.8	Summation of touch currents from external circuits		N/A
	a) Equipment connected to an earthed external circuit, current (mA) ..... :		N/A
	b) Equipment connected to an unearthed external circuit, current (mA) ..... :		N/A
5.8	**Backfeed safeguard in battery backed up supplies**		N/A
	Mains terminal ES ..... :	(See appended table 5.8)	N/A
	Air gap (mm)..... :	(See appended table 5.4.2, 5.4.3)	N/A

6	**ELECTRICALLY- CAUSED FIRE**		P
6.2	**Classification of power sources and potential ignition sources**		P
6.2.2	Power source circuit classifications ..... :	(See appended table 6.2.2)	P

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Clause	Requirement + Test	Result - Remark	Verdict
6.2.3	Classification of potential ignition sources		P
6.2.3.1	Arcing PIS ..... :	(See appended table 6.2.3.1)	P
6.2.3.2	Resistive PIS ..... :	(See appended table 6.2.3.2)	P
6.3	**Safeguards against fire under normal operating and abnormal operating conditions**		P
6.3.1	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 °C for unknown materials ..... :	(See appended table 5.4.1.4, 9.3, B.1.5 and B.2.6)	P
	Combustible materials not inside a fire enclosure.... :		N/A
6.4	**Safeguards against fire under single fault conditions**		P
6.4.1	Safeguard method ..... :	6.4.4	—
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		N/A
6.4.3.1	Supplementary safeguards		N/A
6.4.3.2	Single fault conditions ..... :	(See appended table B.4)	N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		P
6.4.5	Control of fire spread in PS2 circuits		N/A
6.4.5.2	Supplementary safeguards		N/A
6.4.6	Control of fire spread in PS3 circuits		P
6.4.7	Separation of combustible materials from a PIS		P
6.4.7.2	Separation by distance		P
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers		P
6.4.8.2	Fire enclosure and fire barrier material properties		P
6.4.8.2.1	Requirements for a fire barrier	PCB, V-0 class	P
6.4.8.2.2	Requirements for a fire enclosure		P
6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		P
6.4.8.3.1	Fire enclosure and fire barrier openings		P
6.4.8.3.2	Fire barrier dimensions		P
6.4.8.3.3	Top openings and properties		N/A
	Openings dimensions (mm) ..... :	No openings	N/A
	Flammability tests for the top of a fire enclosure	(See Clause S.2)	N/A
6.4.8.3.4	Bottom openings and properties		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Openings dimensions (mm) ..... :	No openings	N/A
	Flammability tests for the bottom of a fire enclosure	(See Clause S.3)	N/A
	Instructional Safeguard ..... :		N/A
6.4.8.3.5	Side openings and properties		P
	Openings dimensions (mm) ..... :		P
6.4.8.3.6	Integrity of a fire enclosure, condition met: a), b) or c)..... :	Not these parts	N/A
6.4.8.4	Separation of a PIS from a fire enclosure and a fire barrier distance (mm) or flammability rating..... :	Metal enclosure for fire enclosure	N/A
6.4.9	Flammability of insulating liquid		N/A
	Auto ignition temperature (°C)..... :		N/A
	Flashpoint temperature (°C)..... :		N/A
6.5	**Internal and external wiring**		P
6.5.1	General requirements		P
6.5.2	Requirements for interconnection to building wiring ..... :		N/A
6.5.3	Internal wiring size (mm^2) for socket-outlets ..... :	13 A; required 1,50 mm^2; 15 AWG/1,5mm^2 used	P
6.6	**Safeguards against fire due to the connection to additional equipment**		N/A

7	**INJURY CAUSED BY HAZARDOUS SUBSTANCES**		N/A
7.2	**Reduction of exposure to hazardous substances**		N/A
7.3	**Ozone exposure**		N/A
7.4	**Use of personal safeguards or personal protective equipment (PPE)**		N/A
	Personal safeguards and instructions ..... :		—
7.5	**Use of instructional safeguards and instructions**		N/A
	Instructional safeguard (ISO 7010) ..... :		—

8	**MECHANICALLY-CAUSED INJURY**		P
8.2	**Mechanical energy source classifications**		P
8.3	**Safeguards against mechanical energy sources**		P
8.4	**Safeguards against parts with sharp edges and corners**		P
8.4.1	Requirements		P
	Instructional Safeguard ..... :	MS1	N/A
8.4.2	Compliance criteria		P
8.5	**Safeguards against moving parts**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.1	Requirements		N/A
	Fingers, jewellery, clothing, hair, etc., contact with MS2 or MS3 parts	Air fans blades aren't accessible.	N/A
	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
	A manually activated stopping device for moving MS3		N/A
	Moving MS3 parts only accessible to skilled person		N/A
8.5.2	Instructional safeguard ..... :		N/A
8.5.4	Special categories of equipment containing moving parts		N/A
8.5.4.1	General		N/A
8.5.4.2	Equipment containing work cells with MS3 parts		N/A
8.5.4.2.1	Protection of persons in the work cell		N/A
8.5.4.2.2	Access protection override		N/A
8.5.4.2.2.1	Override system		N/A
8.5.4.2.2.2	Visual indicator		N/A
8.5.4.2.3	Emergency stop system		N/A
	Maximum stopping distance from the point of activation (m) ..... :		N/A
	Space between end point and nearest fixed mechanical part (mm)..... :		N/A
8.5.4.2.4	Endurance requirements		N/A
	Mechanical system subjected to 100 000 cycles of operation		N/A
	- Mechanical function check and visual inspection		N/A
	- Cable assembly..... :		N/A
8.5.4.3	Equipment having electromechanical device for destruction of media		N/A
8.5.4.3.1	Equipment safeguards		N/A
8.5.4.3.2	Instructional safeguards against moving parts ..... :		N/A
8.5.4.3.3	Disconnection from the supply		N/A
8.5.4.3.4	Cut type and test force (N) ..... :		N/A
8.5.4.3.5	Compliance		N/A
8.5.5	High pressure lamps		N/A
	Explosion test ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.5.5.3	Glass particles dimensions (mm)..... :		N/A
8.6	**Stability of equipment**		P
8.6.1	Requirements		P
	Instructional safeguard for MS2 and MS3 television sets..... :		N/A
8.6.2	Static stability		P
8.6.2.2	Static stability test..... :	10°; tilted	P
8.6.2.3	Downward force test		N/A
8.6.3	Relocation stability		N/A
	Wheels diameter (mm)..... :		—
	Tilt test		N/A
8.6.4	Glass slide test		P
8.6.5	Horizontal force test..... :	15°; tilt up to	P
8.7	**Equipment mounted to wall, ceiling or other structure**		N/A
8.7.1	Requirements		N/A
	Mount means type..... :		N/A
8.7.2	Test methods		N/A
	Test 1, additional downwards force (N)..... :		N/A
	Horizontal force to a wall or another structure		N/A
	Test 2, number of attachment points and test force (N)..... :		N/A
	Test 3, nominal diameter (mm) and applied torque (Nm)..... :		N/A
8.8	**Handles strength**		N/A
8.8.1	General		N/A
8.8.2	Handle strength test		N/A
	Number of handles..... :		—
	Weight applied (kg)..... :		—
8.9	**Wheels or casters attachment requirements**		N/A
8.9.2	Pull test		N/A
8.10	**Carts, stands and similar carriers**		N/A
8.10.1	General		N/A
8.10.2	Marking and instructions..... :		N/A
8.10.3	Cart, stand or carrier loading test		N/A
	Loading force applied (N)..... :		N/A
8.10.4	Cart, stand or carrier impact test	(See Clause T.6)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Loading force applied (N) on each supporting surface ..... :		N/A
8.10.5	Mechanical stability		N/A
	Force applied (N)..... :		N/A
8.10.6	Thermoplastic temperature stability	(See Clause T.8)	N/A
8.11	**Mounting means for slide-rail mounted equipment (SRME)**		N/A
8.11.1	General		N/A
8.11.2	Requirements		N/A
	Instructional Safeguard ..... :		N/A
8.11.3	Mechanical strength test		N/A
8.11.3.1	Downward force test, force applied (N) ..... :		N/A
8.11.3.2	Lateral push force test		N/A
8.11.3.3	Integrity of slide rail end stops		N/A
8.11.4	Compliance criteria		N/A
8.12	**Telescoping or rod antennas**		N/A
	No sharp edges or points		N/A
	Button/ball diameter (mm)..... :		N/A
9	**THERMAL BURN INJURY**		P
9.2	**Thermal energy source classifications**		P
9.3	**Touch temperature limits**		P
9.3.1	Touch temperatures of accessible parts..... :	(See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
9.3.2	Test method and compliance	TS1	P
9.4	**Safeguards against thermal energy sources**		P
9.5	**Requirements for safeguards**		P
9.5.1	Equipment safeguard		P
9.5.2	Instructional safeguard ..... :	TS2, Instructional safeguard	P
9.6	**Requirements for wireless power transmitters**		N/A
9.6.1	General		N/A
9.6.2	Specification of the foreign objects		N/A
9.6.3	Test method and compliance criteria..... :	(See appended table 9.6)	N/A
10	**RADIATION**		P
10.2	**Radiation energy source classifications**		P

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Clause	Requirement + Test	Result - Remark	Verdict
10.2.1	General classification		P
	Lasers ..... :		—
	Lamps and lamp systems ..... :	DISPLAY, Exempt Group, indicating lights.	—
	Image projectors ..... :		—
	X-Ray ..... :		—
	Personal music player ..... :		—
10.3	**Safeguards against laser radiation**		N/A
	The standard(s) equipment containing laser(s) comply ..... :		N/A
10.4	**Safeguards against optical radiation from lamps and lamp systems (including LED types)**		N/A
10.4.1	General requirements		N/A
	Instructional safeguard provided for accessible radiation level needs to exceed		N/A
	Risk group marking and location ..... :		N/A
	Information for safe operation and installation		N/A
10.4.2	Requirements for equipment safeguards		N/A
	UV radiation exposure ..... :	(See Annex C)	N/A
10.4.3	Instructional safeguard ..... :		N/A
10.5	**Safeguards against X-radiation**		N/A
10.5.1	Requirements		N/A
	Instructional safeguard for skilled persons ..... :		N/A
10.5.3	Maximum radiation (pA/kg) ..... :	(See appended tables B.3 & B.4)	N/A
10.6	**Safeguards against acoustic energy sources**		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output $L_{Aeq,T}$, dB(A) ..... :		N/A
	Unweighted RMS output voltage (mV) ..... :		N/A
	Digital output signal (dBFS) ..... :		N/A
10.6.3	Requirements for dose-based systems		N/A
10.6.3.1	General requirements		N/A
10.6.3.2	Dose-based warning and automatic decrease		N/A
10.6.3.3	Exposure-based warning and requirements		N/A
	30 s integrated exposure level (MEL30) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Warning for MEL ≥ 100 dB(A)..... :		N/A
10.6.4	Measurement methods		N/A
10.6.5	Protection of persons		N/A
	Instructional safeguards ..... :		N/A
10.6.6	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.6.1	Corded listening devices with analogue input		N/A
	Listening device input voltage (mV) ..... :		N/A
10.6.6.2	Corded listening devices with digital input		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A) ..... :		N/A
10.6.6.3	Cordless listening devices		N/A
	Max. acoustic output $L_{Aeq,T}$, dB(A) ..... :		N/A
B	**NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS**		P
B.1	**General**		P
B.1.5	Temperature measurement conditions	(See appended table 5.4.1.4, 9.3, B.1.5, B.2.6)	P
B.1.6	Specific output conditions		P
B.2	**Normal operating conditions**		P
B.2.1	General requirements..... :	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment containing an audio amplifiers ..... :	(See Annex E)	N/A
B.2.3	Supply voltage and tolerances		P
B.2.5	Input test..... :	(See appended table B.2.5) (See Clause E.3 for audio amplifier)	P
B.2.6.4	Equipment intended for building-in or rack-mounting		N/A
B.3	**Simulated abnormal operating conditions**		P
B.3.1	General		P
B.3.2	Covering of ventilation openings		P
	Instructional safeguard ..... :	See safety instructions - UN3480	P
B.3.3	DC mains polarity test	Installation only instructed or skilled person	N/A
B.3.4	Setting of voltage selector		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
B.3.5	Maximum load at output terminals		P
B.3.6	Reverse battery polarity	No replaceable battery to Ordinary person	N/A
B.3.7	Audio amplifier abnormal operating conditions	(See Clause E.3.2)	N/A
B.3.8	Safeguards functional during and after abnormal operating conditions ..... :	(See appended table B.3, B.4)	P
B.4	**Simulated single fault conditions**		P
B.4.1	General		P
B.4.2	Temperature controlling device		N/A
B.4.3	Blocked motor test	DC Fan motor	P
B.4.4	Functional insulation		P
B.4.4.1	Short circuit of clearances for functional insulation		P
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short-circuit and interruption of electrodes in tubes and semiconductors		P
B.4.6	Short circuit or disconnection of passive components		P
B.4.7	Continuous operation of components	Relay	P
B.4.8	Compliance criteria during and after single fault conditions ..... :	(See appended table B.3, B.4)	P
B.4.9	Battery charging and discharging under single fault conditions	(See Annex M)	P
C	**UV RADIATION**		N/A
C.1	**Protection of materials in equipment from UV radiation**		N/A
C.1.2	Requirements		N/A
C.1.3	Test method and compliance criteria		N/A
C.2	**UV light conditioning test**		N/A
C.2.1	Test apparatus..... :		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure test		N/A
C.2.4	Xenon-arc light-exposure test		N/A
D	**TEST GENERATORS**		N/A
D.1	**Impulse test generators**		N/A
D.2	**Antenna interface test generator**		N/A
D.3	**Electronic pulse generator**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
E	**TEST CONDITIONS FOR EQUIPMENT INTENDED TO AMPLIFY AUDIO SIGNALS**		N/A
E.1	**Electrical energy source classification for audio signals**		N/A
	Maximum non-clipped output power (W) ..... :		—
	Rated load impedance (Ω) ..... :		—
	Open-circuit output voltage (V)..... :		—
	Instructional safeguard ..... :		—
E.2	**Audio signals used during test**		N/A
E.2.1	Pink noise test signal		N/A
E.2.2	Sine-wave signal		N/A
E.3	**Operating conditions of equipment containing an audio amplifier**		N/A
E.3.1	Normal operating conditions	(See appended table B.2.5, E.3.1)	N/A
E.3.2	Abnormal operating conditions	(See appended table B.3, B.4)	N/A
E.3.3	Audio equipment temperature measurement conditions……:		N/A
F	**EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS**		P
F.1	**General**		P
	Language ..... :	EN, DE, FR	—
F.2	**Letter symbols and graphical symbols**		P
F.2.1	Letter symbols according to IEC 60027-1		P
F.2.2	Graphic symbols according to IEC, ISO or manufacturer specific		P
F.3	**Equipment markings**		P
F.3.1	Equipment marking locations		P
F.3.2	Equipment identification markings		P
F.3.2.1	Manufacturer identification ..... :	CLAYTON POWER	P
F.3.2.2	Model identification ..... :	LPS II - 3000	P
F.3.3	Equipment rating markings		P
F.3.3.1	Equipment with direct connection to mains		P
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of the supply voltage..... :	AC; DC; Internal Battery; Solar	P
F.3.3.4	Rated voltage ..... :	230V (AC In); 12V (DC In, Internal Battery); 50V (Solar)	P
F.3.3.5	Rated frequency ..... :	50Hz (AC In); DC (DC In, Internal Battery, Solar)	P

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Clause	Requirement + Test	Result - Remark	Verdict
F.3.3.6	Rated current or rated power ..... :	13 A (AC In); 45 A (DC In); 160 Ah 2048 Wh (Internal Battery); 15 A (Solar)	P
F.3.3.7	Equipment with multiple supply connections		P
F.3.4	Voltage setting device		N/A
F.3.5	Markings on terminals and operating devices		P
F.3.5.1	Mains appliance outlet and socket-outlet markings :	AC Output port front; 230V AC (NAC3 FCB) Output port rear	P
F.3.5.2	Switch position identification marking..... :		N/A
F.3.5.3	Replacement fuse identification and rating markings ..... :		N/A
	Instructional safeguards for neutral fuse ..... :		N/A
F.3.5.4	Replacement battery identification marking ..... :	(See Clause M.10)	N/A
F.3.5.5	Neutral conductor terminal		N/A
F.3.5.6	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		P
F.3.6.1	Class I equipment		P
F.3.6.1.1	Protective earthing conductor terminal..... :	IEC 60417-5019	P
F.3.6.1.2	Protective bonding conductor terminals ..... :		N/A
F.3.6.2	Equipment class marking ..... :		N/A
F.3.6.3	Functional earthing terminal marking ..... :		N/A
F.3.7	Equipment IP rating marking..... :	IP 20	N/A
F.3.8	External power supply unit output marking ..... :		P
F.3.9	Durability, legibility and permanence of markings		P
F.3.10	Test for permanence of markings		P
F.4	**Instructions**		P
	– Information prior to installation and initial use		P
	– Equipment for use in locations where children not likely to be present		N/A
	– Instructions for installation and interconnection		P
	– Equipment intended for use only in restricted access area		N/A
	– Equipment intended to be fastened in place		N/A
	– Instructions for audio equipment terminals		N/A
	– Protective earthing used as a safeguard		P
	– Protective conductor current exceeding ES2 limits		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	– Graphic symbols used on equipment		P
	– Permanently connected equipment not provided with all-pole mains switch		N/A
	– Replaceable components or modules providing safeguard function	No replaceable components	N/A
	– Equipment containing insulating liquid	No insulating liquid	N/A
	– Installation instructions for outdoor equipment	Indoor equipment	N/A
F.5	Instructional safeguards		P
G	**COMPONENTS**		P
G.1	**Switches**		N/A
G.1.1	General		N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.1.3	Test method and compliance criteria		N/A
G.2	**Relays**		P
G.2.1	Requirements and compliance criteria	Separately approved, IEC 61810-1	P
G.2.2	Overload test		P
G.2.3	Relay controlling connectors supplying power to other equipment		P
G.2.4	Test method and compliance criteria		P
G.3	**Protective devices**		P
G.3.1	Thermal cut-offs		N/A
	Thermal cut-outs separately approved according to IEC 60730-1 with conditions indicated in a) & b)		N/A
	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Test method and compliance criteria		N/A
G.3.2	Thermal links		N/A
G.3.2.1	a) Thermal links tested separately according to IEC 60691 with specifics		N/A
	b) Thermal links tested as part of the equipment		N/A
G.3.2.2	Test method and compliance criteria		N/A
G.3.3	PTC thermistors	NTC used	P
G.3.4	Overcurrent protection devices		P
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.4		P
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.3.5.2	Single faults conditions ..... :	(See appended table B.3, B.4)	N/A
G.4	**Connectors**		P
G.4.1	Spacings		P
G.4.2	Mains connectors configuration ..... :		P
G.4.3	Plug is shaped that insertion into mains socket-outlets or appliance coupler is unlikely		P
G.5	**Wound components**		P
G.5.1	Wire insulation in wound components		P
G.5.1.2	Protection against mechanical stress		P
G.5.2	Endurance test		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Test time (days per cycle) ..... :		—
	Test temperature (°C) ..... :		—
G.5.2.3	Wound components supplied from the mains		P
G.5.2.4	Compliance criteria		P
G.5.3	Transformers		P
G.5.3.1	General		P
	Compliance method ..... :		P
G.5.3.2	Insulation		P
	Protection from displacement of windings ..... :		—
G.5.3.3	Transformer overload tests		P
G.5.3.3.1	Test conditions		P
	Position ..... :		P
	Method of protection ..... :		P
G.5.3.3.2	Winding temperatures		P
G.5.3.3.3	Winding temperatures - alternative test method		N/A
G.5.3.4	Transformers using FIW	T2, On LPS II Power Board 027-200700 HW_10_90. It's a safety component, and it was tested with the unit. B2021170_LVD_Clayton Power LPSII_EN 62368-1 - 2021-12-07.pdf; Clay_LPS II _22PP655-01_0 (Final).pdf (IEC 62133)	P
G.5.3.4.1	General		P
	FIW wire nominal diameter ..... :	1,3mm	—
G.5.3.4.2	Transformers with basic insulation only		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.5.3.4.3	Transformers with double insulation or reinforced insulation ..... :	Double insulated	P
G.5.3.4.4	Transformers with FIW wound on metal or ferrite core	Ferrite Core	P
G.5.3.4.5	Thermal cycling test and compliance		N/A
G.5.3.4.6	Partial discharge test		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
G.5.4.2	Motor overload test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4	Locked-rotor overload test		N/A
	Test duration (days) ..... :		—
	Electric strength test ..... :	(See appended table 5.4.9)	N/A
G.5.4.5	Running overload test for DC motors		N/A
G.5.4.5.2	Tested in the unit		N/A
	Electric strength test ..... :	(See appended table 5.4.9)	N/A
G.5.4.5.3	Alternative method		N/A
	Electric strength test ..... :	(See appended table 5.4.9)	N/A
G.5.4.6	Locked-rotor overload test for DC motors		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature (°C) ..... :		N/A
	Electric strength test ..... :	(See appended table 5.4.9)	N/A
G.5.4.6.3	Alternative method		N/A
	Electric strength test ..... :	(See appended table 5.4.9)	N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage (V) ..... :		—
G.6	**Wire Insulation**		P
G.6.1	General		P
G.6.2	Enamelled winding wire insulation		P
G.7	**Mains power supply cords and interconnection cables**		N/A
G.7.1	General requirements		N/A
	Type ..... :		—
G.7.2	Cross sectional area (mm^2 or AWG) ..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.7.3	Cord anchorages and strain relief		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N) ..... :		N/A
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm)..... :		N/A
G.7.3.2.4	Strain relief and cord anchorage material		N/A
G.7.4	Cord Entry		N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Test method and compliance criteria		N/A
	Overall diameter or minor overall dimension, *D* (mm) ..... :		—
	Radius of curvature after test (mm)..... :		—
G.7.6	Supply wiring space		N/A
G.7.6.1	General requirements		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Requirements		N/A
G.7.6.2.2	Test with 8 mm strand		N/A
G.8	**Varistors**		P
G.8.1	General requirements		P
G.8.2	Safeguards against fire		N/A
G.8.2.1	General		N/A
G.8.2.2	Varistor overload test		N/A
G.8.2.3	Temporary overvoltage test		N/A
G.9	**Integrated circuit (IC) current limiters**		N/A
G.9.1	Requirements		N/A
	IC limiter output current (max. 5A) ..... :		—
	Manufacturers' defined drift ..... :		—
G.9.2	Test Program		N/A
G.9.3	Compliance criteria		N/A
G.10	**Resistors**		N/A
G.10.1	General		N/A
G.10.2	Conditioning		N/A
G.10.3	Resistor test		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Changes of resistance (%) ..... :		N/A
	Measured current with the lowest resistance value :		N/A
G.10.4	Voltage surge test		N/A
	Changes of resistance (%) ..... :		N/A
G.10.5	Impulse test		N/A
	Changes of resistance (%) ..... :		N/A
G.10.6	Overload test		N/A
	Changes of resistance (%) ..... :		N/A
G.11	**Capacitors and RC units**		P
G.11.1	General requirements	Separately approved components	P
G.11.2	Conditioning of capacitors and RC units		P
G.11.3	Rules for selecting capacitors		P
G.12	**Optocouplers**		P
	Optocouplers comply with IEC 60747-5-5 with specifics	Separately approved components	P
	Type test voltage $V_{ini,a}$ ..... :		—
	Routine test voltage, $V_{ini,b}$ ..... :		—
G.13	**Printed boards**		P
G.13.1	General requirements		P
G.13.2	Uncoated printed boards		P
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		P
G.13.5	Insulation between conductors on different surfaces		P
	Distance through insulation ..... :	1,6 mm	P
	Number of insulation layers (pcs) ..... :	Two layer	—
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2	Test method and compliance criteria		N/A
G.14	**Coating on components terminals**		N/A
G.14.1	Requirements ..... :	(See Clause G.13)	N/A
G.15	**Pressurized liquid filled components or LFC assemblies**		N/A
G.15.1	Requirements		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
G.15.2	Test methods and compliance criteria for self-contained LFC		N/A
G.15.2.1	Hydrostatic pressure test, applied test pressure .... :		N/A
G.15.2.2	Creep resistance test		N/A
G.15.2.3	Tubing and fittings compatibility test, the change of tensile strength (%)..... :		N/A
G.15.2.4	Vibration test		N/A
G.15.2.5	Thermal cycling test, test temperature (°C)..... :		N/A
G.15.2.6	Force test		N/A
G.15.2.7	Compliance criteria		N/A
G.15.3	Test methods and compliance for a modular LFC		N/A
G.15.3.2	Hydrostatic pressure test, applied test pressure .... :		N/A
G.15.3.3	Creep resistance test		N/A
G.15.3.4	Tubing and fittings compatibility test, the change of tensile strength (%)..... :		N/A
G.15.3.5	Thermal cycle test, test temperature (°C) ..... :		N/A
G.15.3.6	Force test		N/A
G.15.3.7	Compliance criteria		N/A
G.16	**IC including capacitor discharge function (ICX)**		N/A
G.16.1	Condition for fault tested is not required		N/A
	ICX with associated circuitry tested in equipment		N/A
	ICX tested separately		N/A
G.16.2	Tests		N/A
	Smallest capacitance and smallest resistance specified by ICX manufacturer for impulse test..... :		—
	Mains voltage that impulses to be superimposed on..... :		—
	Largest capacitance and smallest resistance for ICX tested by itself for 10000 cycles test ..... :		—
G.16.3	Capacitor discharge test..... :	(See appended table 5.5.2.2)	N/A
H	**CRITERIA FOR TELEPHONE RINGING SIGNALS**		N/A
H.1	**General**		N/A
H.2	**Method A**		N/A
H.3	**Method B**		N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz) ..... :		—
H.3.1.2	Voltage (V) ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
H.3.1.3	Cadence; time (s) and voltage (V) ..... :		—
H.3.1.4	Single fault condition current (mA): ..... :		—
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V) ..... :		N/A
J	**INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION**		N/A
J.1	**General**		N/A
	Winding wire insulation..... :		—
	Solid round winding wire, diameter (mm)..... :		N/A
	Solid square and rectangular (flatwise bending) winding wire, cross-sectional area (mm^2)..... :		N/A
J.2/J.3	Tests and Manufacturing	(See separate test report)	—
K	**SAFETY INTERLOCKS**		N/A
K.1	**General requirements**		N/A
	Instructional safeguard ..... :		N/A
K.2	**Components of safety interlock safeguard mechanism**		N/A
K.3	**Inadvertent change of operating mode**		N/A
K.4	**Interlock safeguard override**		N/A
K.5	**Fail-safe**		N/A
K.5.1	Under single fault condition		N/A
K.6	**Mechanically operated safety interlocks**		N/A
K.6.1	Endurance requirement		N/A
K.7	**Interlock circuit isolation**		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements		N/A
	In circuit connected to mains, separation distance for contact gaps (mm)..... :		N/A
	In circuit isolated from mains, separation distance for contact gaps (mm)..... :		N/A
	Electric strength test before and after the test of K.7.2 ..... :	(See appended table 5.4.9)	N/A
K.7.2	Overload test, Current (A) ..... :		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test	(See appended table 5.4.9)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
L	**DISCONNECT DEVICES**		P
L.1	**General requirements**		P
L.2	**Permanently connected equipment**		N/A
	Instructions for permanently connected equipment		N/A
L.3	**Parts that remain energized**		N/A
L.4	**Single-phase equipment**		N/A
	Instructions for single pole disconnect device		N/A
L.5	**Three-phase equipment**		N/A
L.6	**Switches as disconnect devices**		P
L.7	**Plugs as disconnect devices**		P
	Instructions for pluggable equipment		—
L.8	**Multiple power sources**		P
	Instructional safeguard ..... :	See Manual and safety Instructions rev.7.00	P
M	**EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS**		P
M.1	**General requirements**		P
M.2	**Safety of batteries and their cells**		P
M.2.1	Batteries and their cells comply with relevant IEC standards..... :	Cells LF160 and LF100M separately approve components, IEC 62619	P
M.3	**Protection circuits for batteries provided within the equipment**		P
M.3.1	Requirements		P
M.3.2	Test method		P
	Overcharging of a rechargeable battery		P
	Excessive discharging		P
	Unintentional charging of a non-rechargeable battery		N/A
	Reverse charging of a rechargeable battery		N/A
M.3.3	Compliance criteria	(See appended table M.3)	P
M.4	**Additional safeguards for equipment containing a secondary lithium battery**		P
M.4.1	General		P
	IEC 62133-2 batteries used for sub-system power powering application..... :	Cells LF160 and LF100M separately approve components, IEC 62619. Eut with fire enclosure.	P
M.4.2	Charging safeguards		P
M.4.2.1	Requirements		P

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Clause	Requirement + Test	Result - Remark	Verdict
M.4.2.2	Test		P
M.4.2.2.1	General		P
M.4.2.2.2	Abnormal operating conditions		P
M.4.2.2.3	Single fault conditions		P
M.4.2.3	Compliance criteria..... :	(See appended table M.4.2)	P
M.4.3	Fire enclosure..... :	Battery separately approved. EUT with fire enclosure.	P
M.4.4	Drop test of equipment containing a secondary lithium battery	Stationary equipment	N/A
M.4.4.2	Preparation and procedure for the drop test		N/A
M.4.4.3	Drop, Voltage on reference and dropped batteries (V); voltage difference during 24 h period (%): ..... :		N/A
M.4.4.4	Check of the charge/discharge function		N/A
M.4.4.5	Charge / discharge cycle test		N/A
M.4.4.6	Compliance criteria		N/A
M.5	**Risk of burn due to short-circuit during carrying**		P
M.5.1	Requirement		P
M.5.2	Test method and compliance criteria		P
M.6	**Safeguards against short-circuits**		P
M.6.1	External and internal faults	Required external fuse 60A between DC IN and Starter batter. Required external fuse max 200A between DC OUT and DC load. See Manual and safety Instructions rev.7.00	P
M.6.2	Compliance criteria		P
M.7	**Risk of explosion from lead acid and NiCd batteries**		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
	Calculated hydrogen generation rate ..... :		N/A
M.7.2	Test method and compliance criteria		N/A
	Minimum air flow rate, Q (m^3/h)..... :		N/A
M.7.3	Ventilation tests		N/A
M.7.3.1	General		N/A
M.7.3.2	Ventilation test – alternative 1		N/A
	Hydrogen gas concentration (%)..... :		N/A
M.7.3.3	Ventilation test – alternative 2		N/A
	Obtained hydrogen generation rate..... :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
M.7.3.4	Ventilation test – alternative 3		N/A
	Hydrogen gas concentration (%) ..... :		N/A
M.7.4	Marking ..... :		N/A
M.8	**Protection against internal ignition from external spark sources of rechargeable batteries with aqueous electrolyte**		N/A
M.8.1	General		N/A
M.8.2	Test method		N/A
M.8.2.1	General		N/A
M.8.2.2	Estimation of hypothetical volume V_Z (m^3/s) ..... :		—
M.8.2.3	Correction factors ..... :		—
M.8.2.4	Calculation of distance *d* (mm) ..... :		—
M.9	**Preventing electrolyte spillage**		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	**Instructions to prevent reasonably foreseeable misuse**		N/A
	Instructional safeguard ..... :		N/A
N	**ELECTROCHEMICAL POTENTIALS**		P
	Material(s) used ..... :	0,6 V	—
O	**MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES**		P
	Value of *X* (mm) ..... :	1,00	—
P	**SAFEGUARDS AGAINST CONDUCTIVE OBJECTS**		P
P.1	**General**		P
P.2	**Safeguards against entry or consequences of entry of a foreign object**		P
P.2.1	General		P
	Location and Dimensions (mm) ..... :	Front and Rear side. Holes (La) 4,7 mm x (H)14,8 mm; Thickness 3,3 mm. Required opening (y) < 36,3 mm	—
P.2.2	Safeguard requirements		P
	The ES3 and PS3 keep-out volume in Figure P.4 not applicable to transportable equipment		P
	Transportable equipment with metalized plastic parts ..... :	Stationary equipment	N/A
P.2.3	Consequence of entry test ..... :		N/A
P.3	**Safeguards against spillage of internal liquids**		N/A
P.3.1	General		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Compliance criteria		N/A
P.4	**Metallized coatings and adhesives securing parts**		N/A
P.4.1	General		N/A
P.4.2	Tests		N/A
	Conditioning, T_C (°C) ..... :		—
	Duration (weeks) ..... :		—
Q	**CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING**		N/A
Q.1	**Limited power sources**		N/A
Q.1.1	Requirements		N/A
	a) Inherently limited output		N/A
	b) Impedance limited output		N/A
	c) Regulating network limited output		N/A
	d) Overcurrent protective device limited output		N/A
	e) IC current limiter complying with G.9		N/A
Q.1.2	Test method and compliance criteria ..... :	(See appended table Q.1)	N/A
	Current rating of overcurrent protective device (A) :		N/A
Q.2	**Test for external circuits – paired conductor cable**		N/A
	Maximum output current (A) ..... :		N/A
	Current limiting method ..... :		—
R	**LIMITED SHORT CIRCUIT TEST**		N/A
R.1	**General**		N/A
R.2	**Test setup**		N/A
	Overcurrent protective device for test ..... :		—
R.3	**Test method**		N/A
	Cord/cable used for test ..... :		—
R.4	**Compliance criteria**		N/A
S	**TESTS FOR RESISTANCE TO HEAT AND FIRE**		N/A
S.1	**Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W**		N/A
	Samples, material..... :	Plastic enclosure, Lexan 500R, separately approved.	—
	Wall thickness (mm) ..... :		—
	Conditioning (°C) ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	**Flammability test for fire enclosure and fire barrier integrity**		N/A
	Samples, material ..... :		—
	Wall thickness (mm) ..... :		—
	Conditioning (°C) ..... :		—
	- Material did not show any additional holes for combustible materials		N/A
	- Cheesecloth did not ignite for top openings		N/A
S.3	**Flammability test for the bottom of a fire enclosure**		N/A
S.3.1	Mounting of samples		N/A
S.3.2	Test method and compliance criteria		N/A
	Mounting of samples ..... :		—
	Wall thickness (mm) ..... :		—
	Cheesecloth did not ignite		N/A
S.4	**Flammability classification of materials**		N/A
S.5	**Flammability test for fire enclosure materials of equipment with a steady state power exceeding 4 000 W**		N/A
	Samples, material ..... :		—
	Wall thickness (mm) ..... :		—
	Conditioning (°C) ..... :		—
S.6	**Grille covering material, cloth, and reticulated foam**		N/A
	Samples, material ..... :		—
	Measured distance from the centre of the fuel tablet (mm)……:		N/A
T	**MECHANICAL STRENGTH TESTS**		P
T.1	**General**		P
T.2	**Steady force test, 10 N ..... :**	(See appended table T.2, T.3, T.4, T.5)	N/A
T.3	**Steady force test, 30 N ..... :**	(See appended table T.2, T.3, T.4, T.5)	N/A
T.4	**Steady force test, 100 N ..... :**	(See appended table T.2, T.3, T.4, T.5)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
T.5	**Steady force test, 250 N ..... :**	(See appended table T.2, T.3, T.4, T.5)	P
T.6	**Enclosure impact test**	(See appended table T.6, T.9)	P
	Fall test		P
	Swing test		N/A
T.7	**Drop test ..... :**	(See appended table T.7)	N/A
T.8	**Stress relief test..... :**	(See appended table T.8)	P
T.9	**Glass Impact Test..... :**	(See appended table T.6, T.9)	N/A
T.10	**Glass fragmentation test**		N/A
	Number of particles counted ..... :		N/A
T.11	**Test for telescoping or rod antennas**		N/A
	Torque value (Nm) ..... :		N/A
U	**MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION**		N/A
U.1	**General**		N/A
	Instructional safeguard**..... :**		N/A
U.2	**Test method and compliance for non-intrinsically protected CRTs**		N/A
U.3	**Protective screen**		N/A
V	**DETERMINATION OF ACCESSIBLE PARTS**		P
V.1	**Accessible parts of equipment**		P
V.1.1	General		P
V.1.2	Surfaces and openings tested with jointed test probes		P
V.1.3	Openings tested with straight unjointed test probes		P
V.1.4	Plugs, jacks, connectors tested with blunt probe		P
V.1.5	Slot openings tested with wedge probe		N/A
V.1.6	Terminals tested with rigid test wire		N/A
V.2	**Accessible part criterion**		P
X	**ALTERNATIVE METHOD FOR DETERMINING CLEARANCES FOR INSULATION IN CIRCUITS CONNECTED TO AN AC MAINS NOT EXCEEDING 420 V PEAK (300 V RMS)**		N/A
	Clearance..... :	(See appended table X)	N/A
Y	**CONSTRUCTION REQUIREMENTS FOR OUTDOOR ENCLOSURES**		N/A
Y.1	**General**		N/A
Y.2	**Resistance to UV radiation**		N/A
Y.3	**Resistance to corrosion**		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
Y.3.1	Metallic parts of outdoor enclosures are resistant to effects of water-borne contaminants by ..... :		N/A
Y.3.2	Test apparatus		N/A
Y.3.3	Water – saturated sulphur dioxide atmosphere		N/A
Y.3.4	Test procedure ..... :		N/A
Y.3.5	Compliance criteria		N/A
Y.4	**Gaskets**		N/A
Y.4.1	General		N/A
Y.4.2	Gasket tests		N/A
Y.4.3	Tensile strength and elongation tests, changes of tensile strength and elongation ..... :		N/A
	Alternative test methods ..... :		N/A
Y.4.4	Compression test		N/A
Y.4.5	Oil resistance, change of swell / shrink (%)..... :		N/A
Y.4.6	Securing means	(See Clause P.4)	N/A
Y.5	**Protection of equipment within an outdoor enclosure**		N/A
Y.5.1	General		N/A
Y.5.2	Protection from moisture		N/A
	Relevant tests of IEC 60529 or Y.5.3 ..... :		N/A
Y.5.3	Water spray test		N/A
Y.5.4	Protection from plants and vermin		N/A
Y.5.5	Protection from excessive dust		N/A
Y.5.5.1	General		N/A
	Relevant tests of IEC 60529 or Y.5.5.2 or Y.5.5.3 . :		N/A
Y.5.5.2	IP5X equipment		N/A
Y.5.5.3	IP6X equipment		N/A
Y.6	**Mechanical strength of enclosures**		N/A
Y.6.1	General		N/A
Y.6.2	Impact test ..... :	(See appended table T.6, T.9)	N/A

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.2	TABLE: Classification of electrical energy sources						P
Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters				ES Class
			U (V)	I (mA)	Type[1)]	Additional Info [2)]	
Mains supply	Mains	Fixed text	230,0	13000	SS	50	ES3
Secondary circuits	DC 12V	Fixed text	12,0	45000/180000	SS	DC	ES1
Supplementary information:							
1) Type: Steady state (SS), Capacitance (CP), Single pulse (SP), Repetitive pulses (RP), etc. 2) Additional Info: Frequency, Pulse duration, Pulse off time, Capacitance value, etc.							

5.4.1.8	TABLE: Working voltage measurement			P
Location	Peak voltage (V)	RMS voltage (V)	Frequency (Hz)	Comments
Mains	325,0	230,0	50	
DC 12V IN/OUT	12,0	-	DC	
POWER BOARD, Low Voltage to High Voltage	500,0	-	DC	
Supplementary information:				

5.4.1.10.2	TABLE: Vicat softening temperature of thermoplastics			N/A
Method ..... :		ISO 306 / B50		—
Object/ Part No./Material	Manufacturer/trademark	Thickness (mm)	T softening (°C)	
Supplementary information:				

5.4.1.10.3	TABLE: Ball pressure test of thermoplastics				N/A
Allowed impression diameter (mm) ..... :		≤ 2 mm			—
Object/Part No./Material	Manufacturer/trademark	Thickness (mm)	Test temperature (°C)	Impression diameter (mm)	

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:
NAC3 FCB, NAC3 FCA and 230 VAC OUTPUT PORT connectors are separately approved components.

5.4.2, 5.4.3	**TABLE: Minimum Clearances/Creepage distance**							P
Clearance (cl) and creepage distance (cr) at/of/between:	U_p (V)	U_{rms} (V)	Freq [1)] (Hz)	Required cl (mm)	cl (mm)	E.S. [2)] (V)	Required cr (mm)	cr (mm)
AC-EMC board								
A) N – Control Board	325	230	50	(3,0 x 1,39) 4,17	6,70	-	5,0	6,70
B) N – PE (split insulation)	325	230	50	(1,5 x 1,39) 2,09	2,50	-	2,5	2,50
C) N – PE (split insulation)	325	230	50	2,09	2,50	-	2,5	2,50
D) N – Control Circuit	325	230	50	4,17	8,20	-	5,0	8,20
E) PE – N/L	325	230	50	2,09	5,10	-	2,5	5,10
F) PE - L	325	230	50	2,09	7,20	-	2,5	7,20
G) PE - L	325	230	50	2,09	7,20	-	2,5	7,20
H) PE - L	325	230	50	2,09	7,20	-	2,5	7,20
I) N – Control Circuit	325	230	50	4,17	5.20	-	5,0	5,20
IO EMC Front								
A) N - PE	325	230	50	2,09	5,70	-	2,5	5,70
B) N - PE	325	230	50	2,09	5,30	-	2,5	5,30
C) N - PE	325	230	50	2,09	5,50	-	2,5	5,50
D) L - PE	325	230	50	2,09	5,50	-	2,5	5,50
E) L - PE	325	230	50	2,09	5,30	-	2,5	5,30
F) L - PE	325	230	50	2,09	5,60	-	2,5	5,60
G) N - PE	325	230	50	2,09	5,20	-	2,5	5,20
IO EMC Back								
A) N - PE	325	230	50	2,09	5,30	-	2,5	5,30
B) N - PE	325	230	50	2,09	5,40	-	2,5	5,40
C) N - PE	325	230	50	2,09	5,20	-	2,5	5,20
D) N - PE	325	230	50	2,09	5,10	-	2,5	5,10
E) N - PE	325	230	50	2,09	5,40	-	2,5	5,40
F) N - PE	325	230	50	2,09	5,20	-	2,5	5,20
G) L - PE	325	230	50	2,09	5,20	-	2,5	5,20
H) L - PE	325	230	50	2,09	5,50	-	2,5	5,50
I) L - PE	325	230	50	2,09	5,40	-	2,5	5,40
J) L - PE	325	230	50	2,09	5,70	-	2,5	5,70

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Clause	Requirement + Test	Result - Remark	Verdict

Power Board								
A) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
B) Low Voltage to High Voltage	500	-	DC	3,0	6,10	-	5,0	6,10
C) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
D) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
E) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
F) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
G) Low Voltage to High Voltage	500	-	DC	3,0	7,00	-	5,0	>7,00
H) Low Voltage to High Voltage	500	-	DC	3,0	5,90	-	5,0	5,90
I) Low Voltage to High Voltage	500	-	DC	3,0	5,30	-	5,0	5,30
J) Low Voltage to High Voltage	500	-	DC	3,0	6,60	-	5,0	6,60
K) Low Voltage to High Voltage	500	-	DC	3,0	5,90	-	5,0	5,90
L) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
M) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
N) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
O) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
P) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00
Q) Low Voltage to High Voltage	500	-	DC	3,0	6,10	-	5,0	6,10
R) Low Voltage to High Voltage	500	-	DC	3,0	5,90	-	5,0	5,90
S) Low Voltage to High Voltage	500	-	DC	3,0	6,00	-	5,0	6,00

Supplementary information:

The Clearances are determined by using the distance method with the required factor 1,39

The distances on the “Power board” also are considered according to Basic Insulation.

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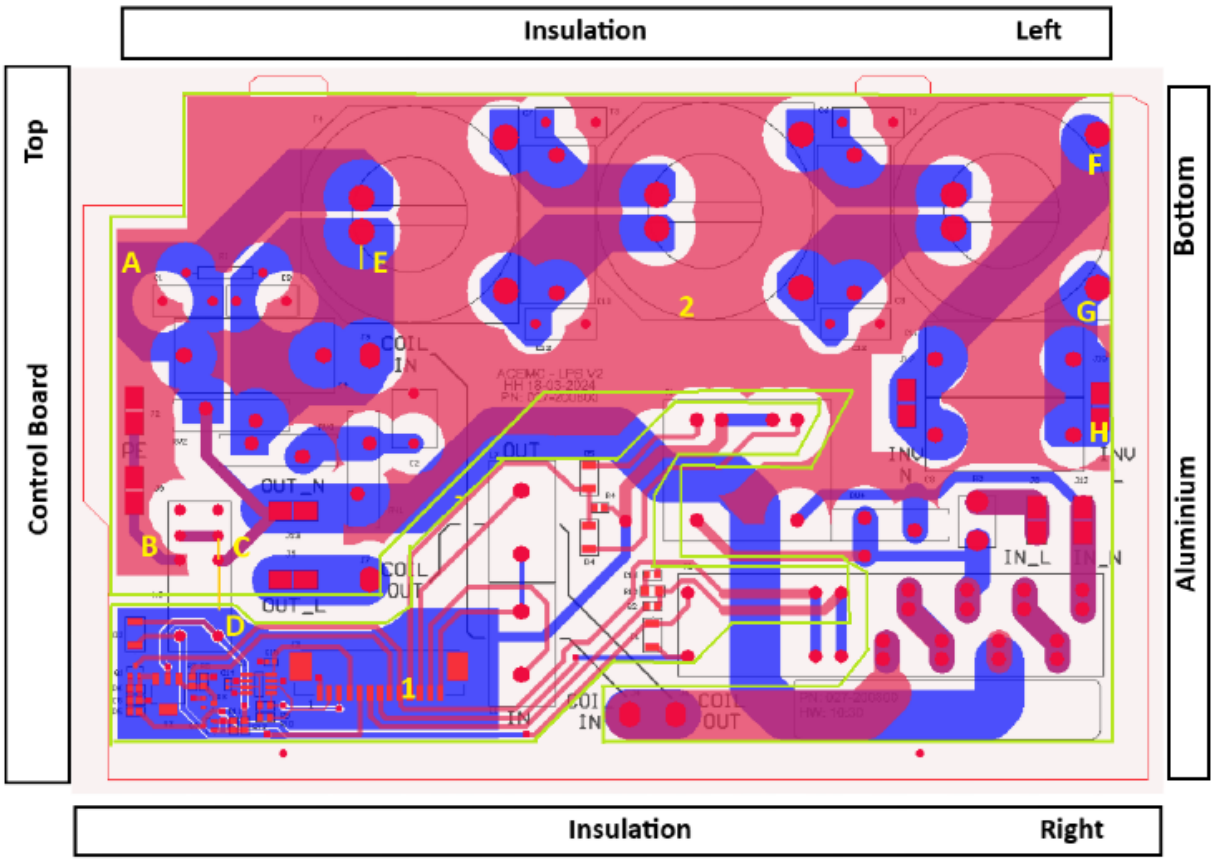
Clause	Requirement + Test	Result - Remark	Verdict

1) Only for frequency above 30 kHz

2) Complete Electric Strength voltage (E.S. (V) when 5.4.2.4 applied)

AC-EMC board:



PCB Stack up: From top to bottom Insulation 1,5 mm

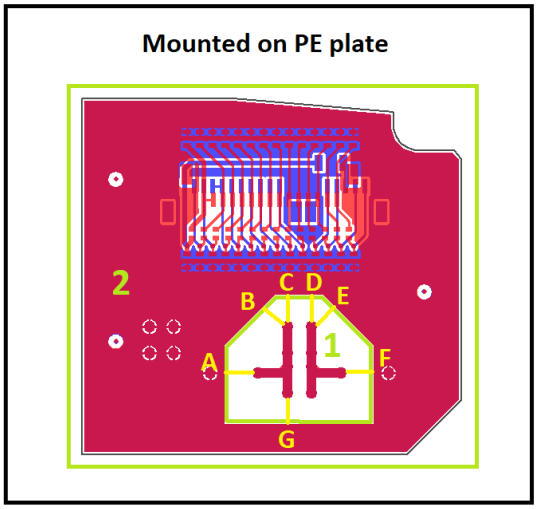
Area 1 is low voltage circuits (<60V).

Area 2 is high voltage circuits (>60V).

There is no rule set for creepage to the edge of the board. Insulation is added on two sides of the board (left and right). Top side has contact to another board (control board) but there is a measurable creepage/clearance of 6,7mm. Bottom side has contact to the enclosure of the product which is used as EMI shield and there is a clearance 2,7mm.

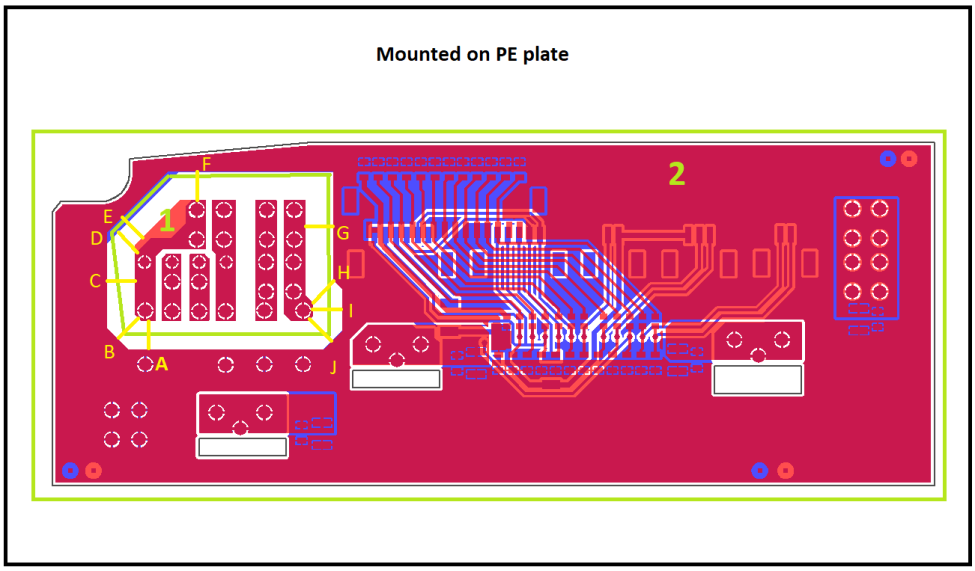
IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

IO EMC Front



PCB Stack up: From top to bottom Insulation 1,5 mm
Area 1 is high voltage circuits (>60V).
Area 2 is low voltage circuits (<60V).

IO EMC Back



PCB Stack up: From top to bottom Insulation 1,5 mm
Area 1 is high voltage circuits (>60V).
Area 2 is low voltage circuits (<60V).

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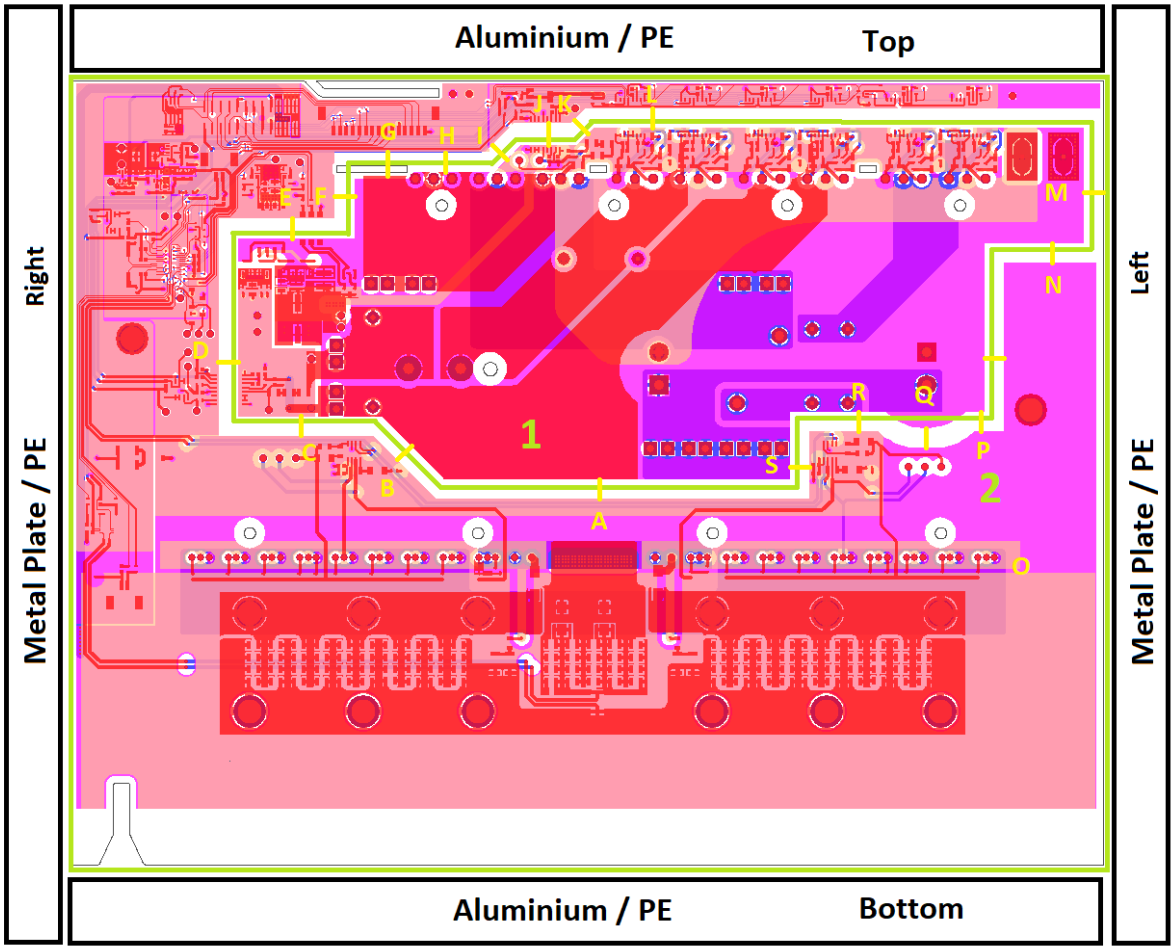
Clause	Requirement + Test	Result - Remark	Verdict

Power Board

PCB Stack up: From layer 1 to layer 2 Insulation 0,2 mm; From layer 2 to layer 3 Insulation 1,0 mm; From layer 3 to layer 4 Insulation 0,2 mm

Area 1 is high voltage circuits (>60V).

Area 2 is low voltage circuits (<60V).



IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.4.4.2	TABLE: Minimum distance through insulation			P
Distance through insulation (DTI) at/of	Peak voltage (V)	Insulation	Required DTI (mm)	Measured DTI (mm)
Primary ES3 to Secondary ES1	325	Reinforced	0,4	>0,40
Secondary ES3 to Secondary ES1	500	Reinforced	0,4	>0,40
Supplementary information:				

5.4.4.9	TABLE: Solid insulation at frequencies >30 kHz					N/A
Insulation material	E_P	Frequency (kHz)	K_R	Thickness d (mm)	Insulation	V_{PW} (Vpk)
Supplementary information:						

5.4.9	TABLE: Electric strength tests		P
Test voltage applied between:	Voltage shape (Surge, Impulse, AC, DC, etc.)	Test voltage (V)	Breakdown Yes / No
EUT, mains F/N before T1	DC	2,5KVpk	No
EUT, Mains circuit (230 V AC input port) to earthed circuits/parts.	DC	2,5KVpk	No
EUT, Mains circuit (230 V AC input port) to accessible unearthed circuits/parts. Connectors: Dat, Remote; Terminals C1-C2, DC IN, DC OUT, Display, Plastic Enclosure	DC	4,0KVpk	No
Supplementary information:			
The 230V AC OUTPUT port (front and rear) have connected the N to GND. Before the test it is needs to be done removing the earth PE wire on PN:027-200500 HW: 01:30 IO_EMC_FRONT board with GDT (C2) mounted.			

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.5.2.2	TABLE: Stored discharge on capacitors				P
Location	Supply voltage (V)	Operating and fault condition [1)]	Switch position	Measured voltage (Vpk)	ES Class
EUT, mains F/N	230	Normal operation	On	≤ 5,0	ES1
Supplementary information:					
X-capacitors installed for testing: [ ] bleeding resistor rating: [ ] ICX: 1) Normal operating condition (e.g., normal operation), SC= short circuit, OC= open circuit					

5.6.6	TABLE: Resistance of protective conductors and terminations			P
Location	Test current (A)	Duration (min)	Voltage drop (V)	Resistance (Ω)
230V IN (rear) to Earthed metal enclosure	26	2	1,63	0,078
230V IN (rear) to 230V OUT (front)	26	2	1,82	0,071
230V IN (rear) to 230V OUT (rear)	26	2	1,77	0,069
Supplementary information:				
Internal protective nominal current (RCBO) rating 13A used. Mains detachable cord 1,0 mm^2 length 190cm				

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

5.7.4	TABLE: Unearthed accessible parts					P
Location	Operating and fault conditions	Supply Voltage (V)	Parameters			ES class
			Voltage (V_{rms} or V_{pk})	Current (A_{rms} or A_{pk})	Freq. (Hz)	
IN Battery/Out Battery terminals; C1/C2 terminals; Data/Remote connector	Normal	253	23,5 mV rms	0,10 mA rms	50	ES1
Display /RCBO/ Plastic enclosure	Normal	253	0,4 mV rms	0,001 mA rms	50	ES1
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit The worst case result was considered.						

5.7.5	TABLE: Earthed accessible conductive part			P
Supply voltage (V).....:	253 V 50Hz			—
Phase(s) .....:	[x] Single Phase; [ ] Three Phase: [ ] Delta [ ] Wye			
Power Distribution System .....:	[ ] TN [x]TT [ ] IT			
Location	Fault Condition No in IEC 60990 clause 6.2.2	Touch current (mA)	Comment	
Enclosure Earthed parts	Fault condition No. 1	2,0	No hazard	
Supplementary Information:				

5.8	TABLE: Backfeed safeguard in battery backed up supplies					N/A
Location	Supply voltage (V)	Operating and fault condition	Time (s)	Open-circuit voltage (V)	Touch current (A)	ES Class
Supplementary information:						
Abbreviation: SC= short circuit, OC= open circuit The worst case result was considered.						

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

6.2.2	TABLE: Power source circuit classifications					P
Location	Operating and fault condition	Voltage (V)	Current (A)	Max. Power[1)] (W)	Time (S)	PS class
Mains circuit	Normal, SC/OC	230 rms	3	720	5	PS3
Secondary circuit_ DC Input	Normal, SC/OC	32,0 dc	45	1440	5	PS3
Secondary circuit_ DC Output	Normal, SC/OC	14,4 dc	270	3888	5	PS3
Secondary circuit_ Solar input	Normal, SC/OC	50,0 dc	15	400	5	PS3
Secondary Lion battery system	Normal, SC/OC	12 dc	2048 Wh	160 Ah	5	PS3
Secondary circuit_ I/O	Normal, SC/OC	50,0 dc	0,4	20	5	PS2
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit 1) Measured after 3 s for PS1 and measured after 5 s for PS2 and PS3.						

6.2.3.1	TABLE: Determination of Arcing PIS			P
Location	Open circuit voltage after 3 s (Vpk)	Measured r.m.s current (A)	Calculated value	Arcing PIS? Yes / No
Mains circuit	325	3,0	975 W	Yes
Supplementary information:				

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

6.2.3.2	**TABLE: Determination of resistive PIS**		P
Location	Operating and fault condition	Dissipate power (W)	Resistive PIS? Yes / No
Mains circuit	Normal, OC	>20	Yes
Secondary circuit_ DC Input	Normal, OC	>20	Yes
Secondary circuit_ DC Output	Normal, OC	>20	Yes
Secondary circuit_ Solar input	Normal, OC	>20	Yes
Secondary Lion battery system	Normal, OC	>20	Yes
Supplementary information:			
Abbreviation: SC= short circuit; OC= open circuit			

8.5.5	**TABLE: High pressure lamp**			N/A
Lamp manufacturer	Lamp type	Explosion method	Longest axis of glass particle (mm)	Particle found beyond 1 m Yes / No
Supplementary information:				

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

9.6	**TABLE: Temperature measurements for wireless power transmitters**	N/A
Supply voltage (V) .....:		—
Max. transmitting power (W).....:		—

Part A [1)]

Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)
Steel disc								
Aluminium ring								
Aluminium foil								
Measurement temperature T of part/at:	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)

Part B [2)]

Foreign objects	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)	Object (°C)	Ambient (°C)
Steel disc								
Aluminium ring								
Aluminium foil								
Measurement temperature T of part/at:	w/o receiver and direct contact		with receiver and direct contact		with receiver and at distance of 2 mm		with receiver and at distance of 5 mm	
	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)	T (°C)	Ambient (°C)

Supplementary information:

1) The test is performed by powering up the transmitter and then placing each of the foreign objects specified in 9.6.2 in direct contact with the transmitter.

2) The test is performed by first placing each of the foreign objects specified in 9.6.2 in direct contact with the transmitter and then powering up transmitter.

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Clause	Requirement + Test	Result - Remark	Verdict

5.4.1.4, 9.3, B.1.5, B.2.6	**TABLE: Temperature measurements**	P

Supply voltage (V) ..... :	253,0				—
Ambient temperature during test T_{amb} (°C) .... :	25,0				—
Maximum measured temperature *T* of part/at:	*T* (°C)				Allowed T_{max} (°C)
AC wire 230Vout port	39,9				90
Socket 230V outport (body)	45,3				For reference
PCB 027-200500 IO-EMC-FRONT	43,4				115
Key- Display	30,0				60 (2)
RCBO (body)	45,3				For reference
Relay K1 (body)	89,3				For reference
Transformer T1 (body)	65,9				95
Toroid T3 (body)	74,0				115
Relay K2 (body)	57,6				For reference
PCB 027-200800	62,4				115
INLINE FILTER 027-201000					
Choke Filter L1	61,5				75
PCB 027-201000	58,3				115
DC/DC CONVERTER					
DT19510-9 component	29,5				75
PCB Fono00016G	51,8				115
CONTROL BOARD LPS V2 (EVE) 027-200900					
DT19510-9 component	50,0				75
PCB 027-200900	50,1				115
Li ION BATTERY (body) Ta (min.) 55°C	54,2				For reference
NAC3 FCA connector (body)	48,1				For reference
PCB 027-200600 IO-EMC-BACK	52,9				115
T1 under Heatsink	56,3				75
T2 under Heatsink	61,5				75

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Clause	Requirement + Test	Result - Remark	Verdict

POWER BOARD 027-200700					
Transformer T1	51,7				75
Toroid Ø 20 mm	60,8				75
Electrolytic capacitor 1500 µF 105°C	59,2				90
Choke (up caution area 400VDC)	58,4				75
Optocoupler U5	54,5				85
PCB Power board 027 200700	66,2				115
Metal Enclosure (bottom side)	47,7				70 (2)
Plastic Enclosure (rear side)	48,2				60 (2)
Metal Enclosure (up side)	39,7				70 (2)

Temperature T of winding:	t_1 (°C)	R_1 (Ω)	t_2 (°C)	R_2 (Ω)	T (°C)	Allowed T_{max} (°C)	Insulation class

Supplementary information:

(1) *The Allowed Tmax (°C) limit value is ajusted to 40°C ambient temperature.*

The Allowed T_{max} (°C) temperature is: Tmax+Tamb-Tma
Tmax is the maximum temperature specified for components/parts
Tma is the maximum ambient temperature specified by the manufacturer: 40°C
Tamb is the ambient temperature during test: 25°C

(2) *The Allowed Tmax (°C) limit value is to 25°C ambient temperature (see Table 38).*

T(°C) is the measured components/parts temperature during the test.

The worst case of the temperature result was considered in charger and discharge conditions.

The batteries has a management circuit. The charge is stopped when the temperature of battery exceeds 60°C.

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.2.5	**TABLE: Input test**							P
U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Condition/status
230	50	3,87	13	801	-	RCBO	13	Charge battery/No load
Supplementary information:								

B.2.5, E.3.1	**TABLE: Input test for equipment containing audio amplifiers**			N/A
Operation Condition:	Signal type	Frequency (Hz)	Output loads (Ω)	Load setup
A1	Sine wave input	1000		All channels driven, (maximum) non-clipped output power
A2	Peak response frequency			All channels driven, (maximum) non-clipped output power
B1	Sine wave input	1000		All channels driven, 1/8 non-clipped output power
B2	Peak response frequency			All channels driven, 1/8 non-clipped output power
C	Band-limited pink noise signal	N/A		All channels driven, 1/8 non-clipped output power
D				

Input									Amplifier Output			
Cond.	U (V)	Hz	I (A)	I rated (A)	P (W)	P rated (W)	Fuse No	I fuse (A)	Ch.	U (V)	P (W)	Load (Ω)
Supplementary information:												

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

B.3, B.4	TABLE: Abnormal operating and fault condition tests						P
Ambient temperature T_{amb} (°C) ..... :					25		—
Power source for EUT: Manufacturer, model/type, outputrating .. :					Mcb elettronica SMM Single-phase Power Supply 230V 50Hz		—
Component No.	Condition	Supply voltage (V)	Test time	Fuse no.	Fuse current (A)	Observation	
SMD components mounted on class V-0 boards	Any	253	60s	RCD Breaker (on front)	13	Comply with the requirements of B.4.8 (Class V0 used). No hazard, no risk of fire.	
Creepage distances on pcb	Short circuit	253	60s	RCD Breaker (on front)	13	Comply with the requirements of B.4.8 (Class V0 used). No hazard, no risk of fire.	
Clearance distances on pcb	Short circuit	253	60s	RCD Breaker (on front)	13	Comply with the requirements of B.4.8 (Class V0 used). No hazard, no risk of fire.	
Supplementary information:							

M.3	TABLE: Protection circuits for batteries provided within the equipment							P
Is it possible to install the battery in a reverse polarity position? ..... :					No			—
Equipment Specification	Charging							
	Voltage (V)				Current (A)			
	207-253 VAC; 11,5-32 VDC				13 A (AC); 45 A (DC-IN) 90 A (DC-OUT)			
Manufacturer/type	Battery specification							
	Non-rechargeable batteries		Rechargeable batteries					
	Discharging current (A)	Unintentional charging current (A)	Charging			Discharging current (A)	Reverse charging current (A)	
			Voltage (V)	Current (A)				
EVE POWER CO.LTD/LI-ION	N/A	N/A	14,0-14,6 V	32 A 80 A max		Max 200 A	N/A	
Note: The tests of M.3.2 are applicable only when above appropriate data is not available.								
Specified battery temperature (°C) ..... :								
Component No.	Fault condition	Charge/ discharge mode	Test time	Temp. (°C)	Current (A)	Voltage (V)	Observation	
-	-	-	-	-	-	-	-	
Supplementary information:								
Abbreviation: SC= short circuit; OC= open circuit NL= no chemical leakage; NS= no spillage of liquid; NE= no explosion; NF= no emission of flame or expulsion of molten metal.								

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

M.4.2	**TABLE: Charging safeguards for equipment containing a secondary lithium battery**					P
Maximum specified charging voltage (V) ..... :				14,6		—
Maximum specified charging current (A) ..... :				80		—
Highest specified charging temperature (°C) ..... :				60°C		
Lowest specified charging temperature (°C) ..... :				-20 °C		
Battery manufacturer/type	Operating and fault condition	Measurement			Observation	
		Charging voltage (V)	Charging current (A)	Temp. (°C)		
EVE POWER CO.LTD/LI-ION	Normal, SC	V_LOW= 9 V-HIGH= 14,6 V	200 A	54,2	No hazards	
Supplementary information:						
Abbreviation: SC= short circuit; OC= open circuit; MSCV= maximum specified charging voltage; MSCC= maximum specified charging current; HSCT= highest specified charging temperature; LSCT= lowest specified charging temperature						

Q.1	**TABLE: Circuits intended for interconnection with building wiring (LPS)**							N/A
Output Circuit	Condition	U_{oc} (V)	Time (s)	I_{sc} (A)		S (VA)		
				Meas.	Limit	Meas.	Limit	
Supplementary Information:								

T.2, T.3, T.4, T.5	**TABLE: Steady force test**					P
Location/Part	Material	Thickness (mm)	Probe	Force (N)	Test Duration (s)	Observation
EUT, (External enclosure) metal	See table 4.1.2	4	Ø 30 mm	250	5	No hazard
EUT, (External enclosure) plastic	See table 4.1.2	4	Ø 30 mm	250	5	No hazard
Supplementary information:						

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

T.6, T.9	TABLE: Impact test				P
Location/Part	Material	Thickness (mm)	Height (mm)	Observation	
EUT, (External enclosure) metal	See table 4.1.2	4	1300 mm	No hazard	
EUT, (External enclosure) plastic	See table 4.1.2	4	1300 mm	No hazard	
Supplementary information:					

T.7	TABLE: Drop test				N/A
Location/Part	Material	Thickness (mm)	Height (mm)	Observation	
Supplementary information:					

T.8	TABLE: Stress relief test					P
Location/Part	Material	Thickness (mm)	Oven Temperature (°C)	Duration (h)	Observation	
Plastic enclosure	See table 4.1.2	4,0	70	7	No hazard	
Supplementary information:						
EUT with screws and metal enclosure.						

X	TABLE: Alternative method for determining minimum clearances distances			N/A
Clearance distanced between:	Peak of working voltage (V)	Required cl (mm)	Measured cl (mm)	
Supplementary information:				

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

4.1.2	TABLE: Critical components information				P
Object / part No.	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
- Description:					
Enclosure					
Enclosure-Aluminium (Top, Right Side and Left Side) DWG No 000415-001 000415-002 000415-003 000415-004 000415-005	Hydro	Aluzic	Max 315^{0}C 100g/ m^2 Min Thickness: 2.5 mm	IEC 62133-2; EN 62368-1	Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Enclosure- Front and Back plastic part	Sabic	Lexan 500R	V-@ 1.5 mm 5VA@ 3 mm Glow Wire Flammability Index 960^0 C	UL94	IEC 60695-2-12
Front and back plastic part	Sabic	500R “Lexan”	V-0 for 1,5 mm thickness 5 VA for 3 mm thickness Glow wire Flammability Index 960 °C	IEC 60695-11-10	UL E45329
Relay					
Relay, AC (K2 on AC EMC)	Finder	40.62	Tamb: -40 °C to +85 °C 250 VAC; 10 A; 2500 VA reinforced insulation 4000 V	ANSI/UL 61810-1	cURus E511393
Relay, AC (K2 on AC EMC)	Elesta	SIP 422	Tamb: -40 °C to +70 °C 250 VDC/480 V AC; 16 A; 4000 W/VA; reinforced insulation 4000 V; between output contacts: 5000 V; UL 94V-0	ANSI/UL 508	cURus E188953

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Relay, DC (rear)	NCR Industrial	NRL710-12-s-180	12 V; Tamb: -40 °C to +70 °C. 250 VAC, 180 A. 45000 VA. reinforced insulation 4000 V IEC 62109-1 IEC 62109-2	EN IEC 62368-1	Tested in the appliance
PCB					
PCB - (LPS II Power board - ACEMC – LPS V2 - Inline Filter – LPS V2 - IO_EMC_BACK)	Shenzhen Wanhexing Electronics Co LTD	WHX-M1 WHX-D1	thickness 1,60 mm max.: 130 °C; 94V-0	UL 796	cURus E339171
PCB (IO_EMC_FRO NT)	Shenzhenshi Joint Creatianto Profit Co LTD	LCZY-2	Thickness 1,6 mm; max.: 130 °C; 94V-0	UL 94 UL 796 UL 796F UL 746A	UL E356847
Fan (rear cover)	Sunon	EE80252B1-000U-A99	80 x 80 x 25 mm; PBT 94V-0. 12VDC/0,17 A -10 °C to+70 °C. 41 CFM	CSA-C22.2 No. 113 „Fans and Ventilators”	cURus E77551
Fan (rear cover) ALTERNATIVE	Back Porch International DBA CUI Devices	CFM-8025	80 x 80 x 20 mm; 12VDC/0,24 A 62,20 CFM Flammability V- 2 -40 °C to +70 °C	CSA-C22.2 No. 113 „Fans and Ventilators” UL 507 EN 62368-1 EN 61000-6-3:2007+A1 EN 61000-6-1:2007	cUR us E48 0829 TÜV 50485867
Fan (rear cover) ALTERNATIVE	Sanyo Denki America Inc.	109R0812G401	12 VDC/0,37 A; 80x80x25 mm; -20 °C to +60 °C; PTB UL 94V-0; 53 CFM.	ANSI/UL 817	cURus E187810
Heatsink					
Heat sink (H2- H3 at Power board MOSFETs)	Sapa Extrusion Denmark	LPS_001_014 MOSF	Material: 6060 T6; 140x67x21,72 cm IEC 62109-1 IEC 62109-2	EN IEC 62368-1	Tested in the appliance
Heat sink (H1 at Power Board IGBT´s)	Sapa Extrusion Denmark	LPS_001_015 MOSF	Material: 6060 T6 212x68x21,72 cm IEC 62109-1 IEC 62109-2	EN IEC 62368-1	Tested in the appliance
Optocoupler					
Optocoupler (U16-U21 on Power Board)	Analog Devices	ADuM4190	-40 °C to +100 °C 5000 Vrms Cr/Cl>7 mm distance trough insulation ≥ 0,5 mm	UL 1577	UL E214100

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Clause	Requirement + Test	Result - Remark	Verdict

Optocoupler (U5 on Power Board)	Fairchild	4N35	-40 °C to +100 °C 5000 Vrms Cr/Cl>7 mm distance trough insulation ≥ 0,5 mm	UL 1577	cURus E90700
Optocoupler (U16-U21 on Power Board)	Avago	HCPL-316J	-40 °C to +100 °C 5000 Vrms Cr/Cl>7 mm distance trough insulation ≥ 0,5 mm	UL1577	cURus E55361
Capacitors					
Capacitor (C58, C59 at 230 V AC on Power Board)	TDK	B32523Q3225K	2,2 µF 250 V X2 UL 94 V-0 max temp 125 °C IEC 62109-1 IEC 62109-2	EN IEC 62368-1	Tested in the appliance
Capacitor (C93 at 230 V AC on Power Board)	Vishay	BFC237363474	470 nF; 630 VAC IEC 62109-1 IEC 62109-2	EN IEC 62368-1	Tested in the appliance
Capacitor (C1, C3, C6, C7, C12, C13 on AC EMC)	Kemet Electronics Corp	C901U102MVV DBA7317	1 nF; 400 VAC;Y1 flammability category C	EN 60384-14	VDE 40036417 UL E356389
Capacitor (C4, C8, C9, C10, C11 on AC EMC C60 at 230 V AC on Power Board)	Würth Elektronik	X2-Safety Class Capacitor THB; MKP	1,5 µF; 250 VAC; X2 -40 °C to +110 °C	EN 60384-14	cULus Approval E345659 [UL 60384-14&CSA E60384-1&CSA E60384-14]
Capacitor (C1, C2, C3, C4 on IO EMC Back. C2, C3 on IO EMC Front)	Vishay	VY1102M29Y5 VQ63TV0	1 nF; 500 V; Y1 -40 °C to +125 °C	EN 60384-14	cURus E183844
Capacitor (C56, C57 at 230 VAC on Power Board	Yageo	LH250M1500BP F-3545	1500 µF 250 VAC IEC 62109-1 IEC 62109-2	EN IEC 62368-1	Tested in the appliance
Capacitor (C1, C3 on inline filter board)	KEMET	R46	2,2 µF; 310 V; X2 -40 °C to +110 °C UL 94 V-0	IEC 60384-14 CAN/CSA-E60384-1 CAN/CSA-E60384-14	cURus E97797
Capacitor (C1, C3 on inline filter board) ALTERNATIVE	Würth Elektronik eiSos GmbH & Co. KG EMC & Inducive Solutions	WCAP-FTXX Film Capacitors	2,2 µF; 310 V; X2 -40 °C to +105 °C UL 94 V-0	IEC 60384-14 CAN/CSA-E60384-1 CAN/CSA-E60384-14	cURus E345659
Isolation on board of AC EMC board	Sabic Innovative Plastics US L L C	Lexan FR700	50 kV/mm 0,25 mm thick Flammability V- 0 max 130 °C	IEC 60695-11-10 IEC 60695-11-20 ISO 9773 UL 746A UL 746B	cURus E121562

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Clause	Requirement + Test	Result - Remark	Verdict

Varistor (RV1-RV4 on AC EMC)	TDK (Zhuhai FTZ) Co., Ltd.	S20K300	I rating = 430 V T rating = 85°C Flammability V- 0 Current 8 kA @ 8/20 µs	EN 61051 UL 1449	cURus E321126
GDT (C2 on AC EMC)	Bourns INC	2049-40-BT1LF	DC sparkover voltage: 400 V Current 15 kA @ 8/20 µs Trating = 85 °C	UL 497B IEC 61643-311	cURus E153537
Fuse and Breakers					
50a midi fuse – DCDC converter	Littel fuse INC	0498050	32 Vdc rated current 50 A Interrupting rating 2000 A @32 Vdc 125 °C	UL 248-1	cURus E71611
Resettable fuse/PTC (F1, F2 on I/O back F2 on I/O front)	Newark Corp.	MC36232	24 Vdc 100 A Rmin 0,04 ohm Rmax 0,12 ohm 85 °C	CSA-C22.2 No. 72 CAN/CSA-E60730-1 CAN/CSA-E60730-2-9	cURus E345437
0697H9160 (F3, F4, I/O Back)	Bel Fuse	0697H9160	16A; Voltage Rating – AC 350 V Voltage Rating - DC 72 V	R 50404484 IEC 60127-1: 2006+A1+A2 IEC 60127-7: 2016	E506667;
MC36207 (F1, Control Board / F1, DC-DC)	Multicomp	MC36207	30 VDC;Trip current: 400 mA Current rating max: 100A, Holding Current: 200 mA	rohsCert_1861187.pdf	rohsCert_1861187
RCD Breaker (on front)	Zhejiang Chint Electrics Co.,Ltd CHINT	Product number: NB1L1PN30MAA13C Product order number: NB1L1PN30MAA13C Manufacturer's product number: 203018	1P+N Ue:220/230/240 Vac, 50/60 Hz In: 2,4,6,10,**13**,16,20,25,32,40 A, B and C type I∆n: **30**, 100, 300 mA type A and C without time-delay Ics=4,5kA/ 6kA/ 7,5 kA, Icn= 4,5kA/ 6kA/ 7,5kA,Icn= 4,5 kA/ 6kA/ 10 kA I∆m=3kA	IEC 61009-1:2010. IEC61009-1:2010/AMD1:2012, IEC 61009-1:2010/AMD2:2013 and IEC 61009-2-1:1991	CB Ref. Certif.No. NL-106848 VDE 40020219
NTC (R3 on AC EMC)	TDK	B57364S0259M054	R25=2,5 ohm 11 A 175 °C	IEC 60539-1 UL 1434	VDE UL (E338929)

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Clause	Requirement + Test	Result - Remark	Verdict

Chokes					
Choke (L3 on power board)	Motocraft	MTC T106 (MTC10602-BR4-12B)	Urating = 250V Irating = 12 A insulation class / Trating = 130 °C 8,4 µH IEC 62109-1 IEC 62109-2 IEC 62133-2 Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170	EN IEC 62368-1	Tested in the appliance
Choke (L4 on power board)	Motocraft	MTC69230B	931 µH 85 mΩ Insulation Test Voltage 500 Vrms Urating = 250 V Irating = 4,5 V Insulation class/Trating = 130 °C 3,5 µH IEC 62109-1 IEC 62109-2 IEC 62133-2 Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170	EN IEC 62368-1	Tested in the appliance
Transformer filter coil (T2, T3, T4 on AC EMC board)	Motocraft	YIMO00003DR	2x36T 1,5 mm Urating = 250 V Irating = 10 A Insulation class 155 °C IEC 62109-1 IEC 62109-2 IEC 62133-2 Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170	EN IEC 62368-1	Tested in the appliance
Connectors					
AC connector EMC – BLUE	Neutrik AG	NAC3MPA-1	Rated voltage 250 Vac rated current 20 Arms Temperature range –30 °C to +80 °C Flammability V- 0	EN 61984	VDE UL E135070
AC connector EMC – GREY	Neutrik AG	NAC3MPB-1	Rated voltage 250 Vac rated current 20 Arms Temperature range –30 °C to +80 °C Flammability V- 0	EN 61984	VDE UL E135070

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Clause	Requirement + Test	Result - Remark	Verdict

AC connector, output Accessory – GREY	Neutrik AG	NAC3FCB	Rated voltage 250 Vac rated current 20 Arms Temperature range –30 °C to +80 °C Flammability V- 0	EN 61984	VDE UL E135070
AC connector Output	Mennekes	11032	Rated voltage 230 Vac rated current 16 Arms Temperature range –25 °C to +40 °C IP54	VDE 0620	VDE 40014754
Transformers					
Transformer (T1 on AC EMC)	Hahn GmbH & Co. KG	BV EI 306 3364	Vin = 230 Vac Vout = 2x9 Vac 2,8 VA 70°C short-circuit proof safety isolating transformer class B	EN 61558-2-6 UL5085-1/-2	cURus E98173
Transformer (T1 on Power Board)	Motocraft	MTC69220.pdf	Vin 14 Vac Vout 9 and 20.5 Vac 5.9 W Hi-pot pri-sec: 2500 V 85°C	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Transformer (T2, T3 on Power board)	Clayton Power	LPS 2 Trafo (Trafo_Assy1 Drawing v27)	Open type construction with overall dimension 55 by 80 by by 150 mm reinforced insulation for a working voltage 400 Vdc IEC 62109-1	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
(Wire)	Dahren Group AB	Dasol 155	Polyrethane MW 79-C; temp class 155	ANSI/UL 1446	URus E101843
(Wire) ALTERNATIVE	Dahren Group AB	Dasol 180	Polyrethane MW 82C; temp class 180	ANSI/UL 1446	URus E101843
Isolation					
(Isolation tube)	Synflex Elektro GmbH	F/GS UL	Polyurethance coated fiberglass sleeving; VW-1 130°C	UL 1441 UL 224 UL 746 A UL 746B	URus E363755
(Isolation tape)	Dupont Teijin Films USLP	Mylar A	PET, temp class 105 VTM-2	ANSI/UL 94 UL 746 A UL 746B	cURus E93687
(Border tape)	Saint-Gobain Performance Plastics h-old S.p.A.	PT.25	PET, temp class 130 4,8 kV	CAN/UL 510A	cURus E178430
Cells					

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Battery Cells LF160	EVE Energy Co., Ltd	Rechargeable Li-ion Cell	3,22V 160Ah Charging Temperature 0°C to 60°C Discharging Temperature -30°C to 60°C	IEC 62619:2022	TÜV certification mark (SÜD)
Battery Cells LF100M	EVE Energy Co., Ltd	Rechargeable Li-ion Cell	3,2V 100Ah Charging Temperature 0°C to 55°C Discharging Temperature -20°C to 55°C	IEC 62619:2017	TÜV certification mark (SÜD)
Current transformer	Motocraft	MTC150180-E	Dielectric withstanding voltage 2500 Vrms	EN IEC 62368-1	Tested in the appliance
Choke	Motocraft	MTC3715-H06-E	2x 14,2 mH W1 To W2 insulation Test voltage 1500 Vrms	EN IEC 62368-1	Tested in the appliance
Inline Filter Choke	WURTH ELEKTRONIK	7448680140	230 µH 16 A -40 °C up to +60 °C Insulation Test Voltage 1500 Vrms	EN IEC 62368-1	Tested in the appliance
Power board Choke	Clayton Power	17919_YIMO00007DR_MB	8,4 µH 10mΩ 12 A Insulation Test Voltage 500 Vrms	EN IEC 62368-1	Tested in the appliance
Internal Main Conductors					
All the internal main conductors	DongGuan YuanYue Electronic CO., LTD.	Style UL1015	VW-1 600 Vrms / 750 Vdc 105 °C Insulation PVC: Avg thick 0,76 mm; min. thick 0,65 mm Over diameter 3,1±0,15 mm Horizontal flame	EN IEC 62368-1 UL758	Tested in the appliance UL E214500 CSA LL210593

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Back Cover - EMC Board to AC Neutrik Out Rev1101	Clayton Power	R027-01-05 (027-301400)	Neutrik PowerCON, Chassis connector, power-in, 3/16" flat tab terminals, Gray; TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm²; TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm²; Heat Shrink, Black, 12 mm; Wire, 16 AWG/1.5mm², Brown/Blue, 200 mm; Wire, 16 AWG/1.5mm², Green/Yellow, 175 mm UL1015 Temperature rating : 105 °C; RH Cylindrical Ferrite, OD = 16 mm, ID = 8 mm, L = 28.5 mm, Z@100Mhz = 160Ω	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Back Cover - EMC Board to AC Neutrik IN Rev1101	Clayton Power	R027-01-05 (027-301500)	Neutrik PowerCON, Chassis connector, power-in, 3/16" flat tab terminals, Blue; TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm²; TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm²; Heat Shrink, Black, 12 mm; Wire, 16 AWG/1.5mm², Brown/Blue, 200 mm; Wire, 16 AWG/1.5mm², Green/Yellow, 175 mm UL1015 Temperature rating: 105 °C; RH Cylindrical Ferrite, OD = 16 mm, ID = 8 mm, L = 28.5 mm, Z@100Mhz = 160Ω	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
RCD to Front Cover - EMC Board AC Socket - Live Rev1101	Clayton Power	R027-01-05 (027-302701)	TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm²; Wires, 16 AWG/1.5 mm², Brown, 150 mm, UL1015	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
RCD to Front Cover - EMC Board AC Socket - Neutral Rev1101	Clayton Power	R027-01-05 (027-302702)	TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm²;Wires, 16 AWG/1.5 mm², Blue, 150 mm, UL1015	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Front Cover - EMC Board to AC Socket FC - AC Wires Rev1101	Clayton Power	R027-01-05 (027-301301)	TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm²;Wires, 16 AWG/1.5 mm², Brown/Blue, 150 mm, UL1015; RH Cylindrical Ferrite, OD = 16 mm, ID = 8 mm, L = 28.5 mm, Z@100Mhz = 160Ω	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Back Cover - EMC Board AC OUT to RCD - Live Rev1101	Clayton Power	R027-01-05 (027-302401)	TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), Wires, 16 AWG/1.5 mm², Brown, 150 mm, UL1015	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Back Cover - EMC Board AC OUT to RCD - Neutral Rev1101	Clayton Power	R027-01-05 (027-302402)	TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), Wires, 16 AWG/1.5 mm², Blue, 150 mm, UL1015	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
AC-EMC Board to RCD - Live Rev1101	Clayton Power	R027-01-05 (027-301201)	TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm²; TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm²; Heat Shrink, Black, 12 mm; Wires, 16 AWG/1.5 mm², Brown, 150 mm, UL1015	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

AC-EMC Board to RCD - Neutral Rev1101	Clayton Power	R027-01-05 (027-301202)	TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm²; TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm²; Heat Shrink, Black, 12 mm; Wires, 16 AWG/1.5 mm², Blue, 150 mm, UL1015	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
AC-EMC Board to Power Board Rev 1101	Clayton Power	R027-01-05 (027-300200)	TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm²; Heat Shrink, Black, 12 mm; Wire, 16 AWG/1.5mm², Brown, 360 mm, UL1015; Wire, 16 AWG/1.5mm², Blue, 360 mm, UL1015; RH Cylindrical Ferrite, OD = 16 mm, ID = 8 mm, L = 28.5 mm,Z@100Mhz = 160Ω	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Back Cover - EMC Board AC IN to AC-Inline filter - Live Rev1101	Clayton Power	R027-01-05 (027-303001)	TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm², Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm², Blue Sleeve, Heat Shrink, Black, 12 mm, Wire,16AWG/1.5mm², Brown	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170

IEC 62368-1					
Clause	Requirement + Test		Result - Remark		Verdict
Back Cover - EMC Board AC IN to AC-Inline filter - Neutral Rev1101	Clayton Power	R027-01-05 (027-303002)	TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm², Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1), 16 AWG/1.5 mm², Blue Sleeve, Heat Shrink, Black, 12 mm, Wire, 16 AWG/1.5mm², Blue	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
AC-Inline Filter to AC-EMC Board AC IN - Live Rev1101	Clayton Power	R027-01-05 (027-303101)	TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm², Heat Shrink, Black, 12 mm, Wire, 16 AWG/1.5mm², Brown	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
AC-Inline Filter to AC-EMC Board AC IN - Neutral Rev1101	Clayton Power	R027-01-05 (027-303102)	TE Connectivity Quick disconnect terminal, with lock, 16 AWG/1.5mm², Heat Shrink, Black, 12 mm, Wire, 16 AWG/1.5mm², Blue	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
ES1 Conductors					
Control Board to Back Cover - EMC Board Solar + Rev1101	Clayton Power	R027-01-05 (027-300100)	Isolated Ring Terminal, M4, 16AWG/1.5mm², T = 1.0 mm;; TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 2),16 AWG/1.5 mm²; Wire, 16AWG/1.5mm², Red	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Power Board to Transformer Temp Sensor Rev1101	Clayton Power	R027-01-05 (027-300300-1)	DuraClik Wire-to-Board Receptacle Housing, Single Row, 2 Circuits, Natural, DuraClik Crimp Terminal, Female, 22-26 AWG, Tin, Isolated Ring Terminals for Temp Sensor, M4, T = 1.0 mm (See Note 2), NTC Thermistor Assembly, See enclosed Temp Sensor Assembly Drawing, Wire, Red, 22AWG, 50mm	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Control Board to DC Out Shunt cable Rev1101	Clayton Power	R027-01-05 (027-302100)	DuraClik ISL Wire-to-Board Receptacle Housing, Single Row, 2 Circuits, Blue, DuraClik ISL Crimp Terminal, Female, 22-26 AWG, Tin Isolated Ring Terminals, M3, Constantan, T = 1.0 mm (See note 1) Constantan wire, 22 AWG, Red, 215 mm Constantan wire, 22 AWG, Black, 215 mm	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Back Cover - EMC Board to Solar+ Terminal Rev1101	Clayton Power	R027-01-05 (027-302500)	Isolated Ring Terminal, M4, 16AWG/1.5mm², T = 1.0 mm (See Note 1) 1-966 067-3 TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 2),16 AWG/1.5 mm²,Wire,16 AWG/1.5mm², Red	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Internal Earth Conductors					

IEC 62368-1			
Clause	Requirement + Test	Result - Remark	Verdict

Front Cover - EMC Board to AC Socket FC - PE Rev1101	Clayton Power	R027-01-05 (027-301302)	TE Connectivity Isolated Wire End Ferrule, L = 10 mm, D = 3.5 mm (See Note 1),16 AWG/1.5 mm²;Wires, 16 AWG/1.5 mm², Yellow/Green, 150 mm, UL1015; RH Cylindrical Ferrite, OD = 16 mm, ID = 8 mm, L = 28.5 mm,Z@100Mhz = 160Ω	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
AC-EMC Board to PE (Earth) Rev 1101	Clayton Power	R027-01-05 (027-302200)	TE Connectivity Quick disconnect terminal, with lock,16AWG/1.5 mm²;Isolated Ring Terminal, M4, T = 1.0 mm (See Note 2) 16 AWG/1.5mm²; Wire,16AWG/1.5 mm², Green/Yellow, 80mm,UL1015; Heat shink, Black, 12 mm	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170 Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
GND CONNECTION (Protective earthed connection)	Tyco Electronics AMP	Positive Lock receptacle MKI Drawing C-160773	WIRE SIZE 0,5 to 1,5 mm² INS.RANGE 2,33 to 3,3 mm dia 16 AWG/1.5mm²	EN IEC 62368-1 IEC 62133-2; EN 62368-1	Tested in the appliance Test done by: KIWA, Report No.: 22pP655-01_0; Test done by: Bolls, Report No.: B2021170
Supplementary information: 1) Provided evidence ensures the agreed level of compliance. See OD-2039.					

Attachment I: Report No.: **IT256XNU 001**

ATTACHMENT to IEC 62368-1:2023			
Clause	Requirement + Test	Result - Remark	Verdict
ATTACHMENT TO TEST REPORT **IEC 62368-1:2023** **EUROPEAN GROUP DIFFERENCES AND EUROPEAN NATIONAL DIFFERENCES** (AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT PART 1: SAFETY REQUIREMENTS)			
Differences according to.....:	EN IEC 62368-1:2024 / A11:2024		
TRF template used .....:	IECEE OD-2020-F2:2024, Ed. 2		
Attachment Form No.....:	EU_GD_IEC62368_1F		
Attachment Originator .....:	UL Solutions (Demko)		
Master Attachment.....:	2025-08-29		

Clause	Requirement + Test	Result - Remark	Verdict
	CENELEC COMMON MODIFICATIONS		P
	Clause numbers in the cells that are shaded light grey are clause references in EN IEC 62368-1:2024+A11:2024. All other clause numbers in that column, except for those in the paragraph below, refers to IEC 62368-1:2023. Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62368-1:2023 are prefixed “Z”.		P
	Add the following annexes: Annex ZA (normative) Normative references to international publications with their corresponding European publications Annex ZB (normative) Special national conditions Annex ZC (informative) A-deviations Annex ZD (informative) IEC and CENELEC code designations for flexible cords		P

<table>
<tr><th>Clause</th><th>Requirement + Test</th><th>Result - Remark</th><th>Verdict</th></tr>
<tr><td>1</td><td colspan="2">MODIFICATION to the whole document</td><td></td></tr>
<tr><td></td><td colspan="2">Delete all the “country” notes in the reference document according to the following list:
<table>
<tr><td>0.2.1</td><td>Note 1 and Note 2</td><td>1</td><td>Note 4 and Note 5</td><td>3.3.8.1</td><td>Note 2</td></tr>
<tr><td>3.3.8.3</td><td>Note 1</td><td>4.1.15</td><td>Note</td><td>4.7.3</td><td>Note 1 and Note 2</td></tr>
<tr><td>5.4.2.3.2.2 Table 12</td><td>Note c</td><td>5.4.2.3.2.4</td><td>Note 1 and Note 3</td><td>5.4.2.3.2.4 Table 13</td><td>Note 2</td></tr>
<tr><td>5.4.2.5</td><td>Note 2</td><td>5.4.5.1</td><td>Note</td><td>5.4.10.2.1</td><td>Note</td></tr>
<tr><td>5.4.10.2.2</td><td>Note</td><td>5.4.10.2.3</td><td>Note</td><td></td><td></td></tr>
<tr><td>5.5.2.1</td><td>Note</td><td>5.5.6</td><td>Note</td><td>5.6.4.2.1</td><td>Note 2 and Note 3 and Note 4</td></tr>
<tr><td>5.6.8</td><td>Note 2</td><td>5.7.7.1</td><td>Note 1 and Note 2</td><td>8.5.4.2.3</td><td>Note</td></tr>
<tr><td>10.2.1 Table 39</td><td>Note 3 and Note 4 and Note 5</td><td>10.5.3</td><td>Note 2</td><td>10.6.1</td><td>Note 3</td></tr>
<tr><td>F.3.3.4</td><td>Note 2</td><td>F.3.3.6</td><td>Note 3</td><td>Y.4.1</td><td>Note</td></tr>
<tr><td>Y.4.5</td><td>Note</td><td></td><td></td><td></td><td></td></tr>
</table></td><td></td><td>P</td></tr>
<tr><td>2</td><td colspan="2">Modification to Clause 1</td><td></td></tr>
<tr><td>1</td><td>Add the following note at the end of Clause 1:

“NOTE Z1 The use of certain substances in electrical and electronic equipment is restricted within the EU: see Directive 2011/65/EU.”

Add the following paragraph and note after Note 5:

“This document is a type test standard.

NOTE Z2 Routine tests of complete equipment, sub-assemblies or components are covered by EN 62911.”</td><td></td><td>P</td></tr>
</table>

Clause	Requirement + Test	Result - Remark	Verdict
3	**Modification to Clause 2**		
2	Add the following references: EN 71-1:2014+A1:2018, Safety of toys - Part 1: Mechanical and physical properties EN 50332-1:2013, Sound system equipment: Headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 1: General method for "one package equipment" EN 50332-2:2013, Sound system equipment: Headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 2: Matching of sets with headphones if either or both are offered separately, or are offered as one package equipment but with standardised connectors between the two allowing to combine components of different manufacturers or different design EN 50332-3:2017, Sound system equipment: headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 3: Measurement method for sound dose management IEC/TR 62471-2, Photobiological safety of lamps and lamp systems - Part 2: Guidance on manufacturing requirements relating to non-laser optical radiation safety		N/A

Clause	Requirement + Test	Result - Remark	Verdict
4	**Modification to Clause 4**		
4.Z1	Add the following new subclause 4.Z1 after subclause 4.9: "For compliance with B.3 and B.4 in circuits connected to an AC mains, protective devices shall be provided, subject to the following: - for pluggable equipment type A, the protective devices shall be included as parts of the equipment, with the exception of components in series with the mains input to the equipment such as the supply cord, appliance coupler, r.f.i. filter and switch, for which the building installation shall be regarded as providing protection in accordance with the rating of the wall socket outlet; - for pluggable equipment type B or permanently connected equipment, the protection may be the dedicated overcurrent and short-circuit protection in the building installation, provided that the means of protection, for example a fuse or circuit breaker, is fully specified in the installation instructions. Where protective devices are required within the equipment, the protective devices within the equipment shall operate before or at the same time the expected building installation protection will operate. For earth faults in single-phase equipment, it is not necessary to provide 2 protective devices. It is expected that the building installation will protect against earth faults. This applies also in countries where an IT power distribution system is used."		P
5	**Modification to subclause 4.1.9**		

Clause	Requirement + Test	Result - Remark	Verdict
4.1.9	Add the following paragraph at the end of this subclause: “Products need to comply with the requirements of this document with appropriate measurement uncertainty. NOTE Z1 See also the RED ADCO position on ‘Measurement uncertainty in published harmonized standards’.”		P
6	**Modification to subclause 5.4.9.1**		
5.4.9.1	Add the following note after the 5th paragraph: “NOTE Z1 For guidance on the use of high voltage source, see IEC 60060-1, Clause 8 of IEC 60243-1 and IEC 61180.”		P
7	**Modification to subclause 5.4.2.3.2.4**		
5.4.2.3.2.4	Add the following at the end of this subclause: “The requirement for interconnection with external circuit in a HBES/BACS network is in addition given in EN IEC 63044-3:2018.”		P
8	**Modification to subclause 5.6.6.2**		
5.6.6.2	Replace item d) with the following: “d) For equipment powered from a DC mains, if the protective current rating of the circuit under test exceeds 25 A, the test current shall be minimum as required in item a), unless the manufacturer specifies a higher value.”		P
9	**Modification to subclause 9.3.1**		

Clause	Requirement + Test	Result - Remark	Verdict
9.3.1	Replace the second paragraph with the following: “An accessible part that, while in contact with the body, is likely to drop in temperature upon touch can be evaluated under the limits of Annex A of IEC Guide 117:2010 using the test method of 4.5 of IEC Guide 117.”		P
10	**Modification to subclause 10.2.1**		
10.2.1	Add the following to c) and d) in Table 38: “For additional requirements, see 10.5.1.”		P
11	**Modification to subclause 10.4.1**		

Clause	Requirement + Test	Result - Remark	Verdict
10.4.1	Replace the second paragraph of 10.4.1 with: “Electronic light effect equipment does not have to comply with the requirements of 10.4. However, 114 IEC/TR 62471-2 shall be considered and proper installation instructions shall be provided.” Replace the ninth paragraph of 10.4.1 with: “The following information shall be provided in the user manual for safe operation and installation. This information shall also be provided for safe operation by a skilled person who may be exposed to Risk Group 3 energy levels. Adequate instructions for proper assembly, installation, maintenance and safe use, including clear warnings concerning precautions to avoid possible exposure to hazardous optical radiation; and Advice on safe operating procedures and warnings concerning reasonably foreseeable misuse, malfunctions and hazardous failure modes. Where servicing and maintenance procedures are detailed, they shall include explicit instructions on safe procedures to be followed; and The marking on the equipment shall be reproduced in the user manual. A yellow background is not required in the user manual.”		N/A
12	**Modification to subclause 10.4.4**		
10.4.4	Replace the last paragraph of 10.4.4 with: “Compliance against material degradation from UV radiation is checked by the applicable tests of Annex C.”		N/A
13	**Modification to subclause 10.5.1**		

Clause	Requirement + Test	Result - Remark	Verdict
10.5.1	Add the following after the first paragraph: “For RS1 compliance is checked by measurement under the following conditions: In addition to the normal operating conditions, all controls adjustable from the outside of the equipment by hand, by any object such as a tool or a coin, and those internal adjustments or pre-sets which are not locked in a reliable manner, are adjusted so as to give maximum radiation whilst maintaining an intelligible picture for 1 h, at the end of which the measurement is made. NOTE Z1 Soldered joints and paint lockings are examples of adequate locking. The dose-rate is determined by means of a radiation monitor with an effective area of 10 cm2, at any point at a distance of 10 cm from the outer surface of the equipment. Moreover, the measurement shall be made under fault conditions causing an increase of the high-voltage, provided an intelligible picture is maintained for 1 h, at the end of which the measurement is made. For RS1, the dose-rate shall not exceed 1 µSv/h taking account of the background level. NOTE Z2 These values appear in Directive 2013/59/Euratom of 5 December 2013.”		N/A
14	**Modification to subclause 10.5.3**		
10.5.3	Replace the second paragraph of 10.5.3 with: “The amount of radiation is determined by means of a radiation monitor of the ionizing chamber type with an effective area of 1 000 mm2 ± 10 mm2 or by measuring equipment of other types giving equivalent results.”		N/A

Clause	Requirement + Test	Result - Remark	Verdict
15	**Modification to Clause 10**		
	Replace 10.6 with the following:		N/A
10.6	**Safeguards against acoustic energy sources**		N/A
10.6.1	**General**		N/A
10.6.1.1	Introduction Safeguard requirements for protection against long-term exposure to excessive sound pressure levels from personal music players closely coupled to the ear are specified below. Requirements for earphones and headphones intended for use with personal music players are also covered. A personal music player is a portable equipment intended for use by an ordinary person, that: - is designed to allow the user to listen to audio or audiovisual content / material; and - uses a listening device, such as headphones or earphones that can be worn in or on or around the ears; and - has a player that can be body worn (of a size suitable to be carried in a clothing pocket) and is intended for the user to walk around with while in continuous use (for example, on a street, in a subway, at an airport, etc.). EXAMPLES Portable CD players, MP3 audio players, mobile phones with MP3 type features, PDAs or similar equipment. Personal music players shall comply with the requirements of either 10.6.2 or 10.6.3. NOTE 1 Protection against acoustic energy sources from telecom applications is referenced to ITU-T P.360. NOTE 2 It is the intention of the Committee to allow the alternative methods for now, but to only use the dose measurement method as given in 10.6.5 in future. Therefore, manufacturers are encouraged to implement 10.6.5 as soon as possible.		N/A

	Listening devices sold separately shall comply with the requirements of 10.6.6. These requirements are valid for music or video mode only. The requirements do not apply to: - professional equipment; NOTE 3 Professional equipment is equipment sold through special sales channels. All products sold through normal electronics stores or general public sales channels are considered not to be professional equipment. - hearing aid equipment and other devices for assistive listening; - the following type of analogue personal music players: - long distance radio receiver (for example, a multiband radio receiver or world band radio receiver, an AM radio receiver), and - cassette player/recorder; NOTE 4 This exemption has been allowed because this technology is falling out of use and it is expected that within a few years it will no longer exist. This exemption will not be extended to other technologies. - a player while connected to an external amplifier that does not allow the user to walk around while in use; - hearing protection devices (HPD) that comply with EN 352-8 For equipment that is clearly designed or intended primarily for use by children, the limits of the relevant toy standards may apply. The relevant requirements are given in EN 71-1:2014+A1:2018, 4.20 and the related tests methods and measurement distances apply.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
10.6.2	**Classification of devices without the capacity to estimate sound dose**		
10.6.2.1	General This standard is transitioning from short-term based (30 s) requirements to long-term based (40 h) requirements. These clauses remain in effect only for devices that do not comply with sound dose estimation as stipulated in EN 50332-3:2017. For classifying the acoustic output *L*Aeq,*T*, measurements are based on the A-weighted equivalent sound pressure level over a 30 s period. For music where the average sound pressure (long term *L*Aeq,*T*) measured over the duration of the song is lower than the average produced by the programme simulation noise, measurements may be done over the duration of the complete song. In this case, *T* becomes the duration of the song. NOTE Classical music, acoustic music and broadcast typically has an average sound pressure (long term *L*Aeq,*T*) which is much lower than the average programme simulation noise. Therefore, if the player is capable to analyse the content and compare it with the programme simulation noise, the warning does not need to be given as long as the average sound pressure of the song does not exceed the required limit. For example, if the player is set with the programme simulation noise to 85 dB, but the average music level of the song is only 65 dB, there is no need to give a warning or ask an acknowledgement as long as the average sound level of the song is not above the basic limit of 85 dB.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
10.6.2.2	RS1 limits (to be superseded, see 10.6.3.2) RS1 is a class 1 acoustic energy source that does not exceed the following: - for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the *L*Aeq,*T* acoustic output shall be ≤ 85 dB when playing the fixed “programme simulation noise” described in EN 50332-1:2013; - for equipment provided with a standardized connector (for example, a 3,5 mm headphone/earphone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 27 mV (analogue interface) or −25 dBFS (digital interface) when playing the fixed 214 “programme simulation noise” described in EN 50332-1:2013. The RS1 limits will be updated for all devices as per 10.6.3.2.		N/A
10.6.2.3	RS2 limits (to be superseded, see 10.6.3.3) RS2 is a class 2 acoustic energy source that does not exceed the following: - for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or when the combination of player and listening device is known by other means such as setting or automatic detection, the LAeq,T acoustic output shall be ≤ 100 dB(A) when playing the fixed “programme simulation noise” as described in EN 50332-1:2013: - for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 150 mV (analogue interface) or −10 dBFS (digital interface) when playing the fixed “programme simulation noise” as described in EN 50332-1:2013.		N/A
10.6.2.4	RS3 limits RS3 is a class 3 acoustic energy source that exceeds RS2 limits.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
10.6.3	**Classification of devices (new)**		N/A
10.6.3.1	General Previous limits (10.6.2) created abundant false negative and false positive PMP sound level warnings. New limits, compliant with The Commission Decision 2009/490/EC of 23 June 2009, are given below.		N/A
10.6.3.2	RS1 limits (new) RS1 is a class 1 acoustic energy source that does not exceed the following: - for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the LAeq,T acoustic output shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in EN 50332-1:2013; - for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output voltage shall be ≤ 15 mV (analogue interface) or −30 dBFS (digital interface) when playing the fixed “programme simulation noise” described in EN 50332-1:2013.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
10.6.3.3	RS2 limits (new) RS2 is a class 2 acoustic energy source that does not exceed the following: - for equipment provided as a package (player with its listening device), and with a proprietary connector between the player and its listening device, or where the combination of player and listening device is known by other means such as setting or automatic detection, the weekly sound exposure level, as described in EN 50332-3:2017, shall be ≤ 80 dB when playing the fixed “programme simulation noise” described in 249 EN 50332-1:2013; - for equipment provided with a standardized connector (for example, a 3,5 phone jack) that allows connection to a listening device for general use, the unweighted r.m.s. output level, integrated over one week, as described in EN 50332-3:2017, shall be ≤ 15 mV (analogue interface) or −30 dBFS when playing the fixed “programme simulation noise” described in EN 50332-1:2013.		N/A
10.6.4	**Requirements for maximum sound exposure**		N/A
10.6.4.1	Measurement methods All volume controls shall be turned to maximum during tests. Measurements shall be made in accordance with EN 50332-1:2013 or EN 50332-2:2013 as applicable.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
10.6.4.2	Protection of persons Except as given below, protection requirements for parts accessible to ordinary persons, instructed persons and skilled persons are given in 4.3. NOTE 1 Volume control is not considered to be a safeguard. Between RS2 and an ordinary person, the basic safeguard may be replaced by an instructional safeguard in accordance with Clause F.5, except that the instructional safeguard shall be placed on the equipment, or on the packaging, or in the instruction manual. Alternatively, the instructional safeguard may be given through the equipment display during use. The elements of the instructional safeguard shall be as follows: - element 1a: the symbol  , IEC 60417-6044 (2011–01) - element 2: “High sound pressure” or equivalent text - element 3: “Hearing damage risk” or equivalent text - element 4: “Do not listen at high volume levels for long periods.” or equivalent text An equipment safeguard shall prevent exposure of an ordinary person to an RS2 source without intentional physical action from the ordinary person and shall automatically return to an output level not exceeding what is specified for an RS1 source when the power is switched off. The equipment shall provide a means to actively inform the user of the increased sound level when the equipment is operated with an output level exceeding RS1 limits. Any means used shall be acknowledged by the user before activating a mode of operation which allows for an output level exceeding RS1 limits. The acknowledgement does not need to be repeated more than once every 20 h of cumulative listening time.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
	NOTE 2 Examples of means include visual or audible signals. Action from the user is always needed. NOTE 3 The 20 h listening time is the accumulative listening time, independent of how often and how long the personal music player has been switched off. A skilled person shall not be unintentionally exposed to RS3.		N/A
10.6.5	**Requirements for dose-based systems**		N/A
10.6.5.1	General requirements Personal music players shall give the warnings as provided below when tested according to EN 50332-3:2017, using the limits from this clause. The manufacturer may offer optional settings to allow the users to modify when and how they wish to receive the notifications and warnings to promote a better user experience without defeating the safeguards. This allows the users to be informed in a method that best meets their physical capabilities and device usage needs. If such optional settings are offered, an administrator (for example, parental restrictions, business/educational administrators, etc.) shall be able to lock any optional settings into a specific configuration. The personal music player shall be supplied with easy to understand explanation to the user of the dose management system, the risks involved, and how to use the system safely. The user shall be made aware that other sources may significantly contribute to their sound exposure, for example work, transportation, concerts, clubs, cinema, car races, etc.		N/A
10.6.5.2	Dose-based warning and requirements When a dose of 100 % CSD is reached, and at least at every 100 % further increase of CSD, the device shall warn the user and require an acknowledgement. In case the user does not acknowledge, the output level shall automatically decrease to a level in compliance with class RS1 limits. The warning shall at least clearly indicate that listening above 100 % CSD leads to the risk of hearing damage or loss.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
10.6.5.3	Exposure-based requirements With only dose-based requirements, cause and effect could be far separated in time, defying the purpose of educating users about safe listening practice. In addition to dose-based requirements, a PMP shall therefore also put a limit to the short-term sound level a user can listen at. The exposure-based limiter (EL) shall automatically reduce the sound level not to exceed 100 dB(A) or 150 mV integrated over the past 180 s, based on methodology defined in EN 50332-3:2017. The EL settling time (time from starting level reduction to reaching target output level) shall be 10 s or less. Test of EL functionality is conducted according to EN 50332-3:2017, using the limits from this clause. For equipment provided as a package (player with its listening device), the level integrated over 180 s shall be 100 dB or lower. For equipment provided with a standardized connector, the un-weighted level integrated over 180 s shall be no more than 150 mV for an analogue interface and no more than −10 dBFS for a digital interface. In case the source is known not to be music (or test signal), the EL may be disabled.		N/A
10.6.6	**Requirements for listening devices (headphones, earphones, etc.)**		N/A
10.6.6.1	Corded listening devices with analogue input With 94 dB *L*Aeq acoustic pressure output of the listening device, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximizes the measured acoustic output level, the input voltage of the listening device when playing the fixed “programme simulation noise” as described in EN 50332-1:2013 shall be ≥ 75 mV. NOTE The values of 94 dB and 75 mV correspond with 85 dB and 27 mV in 10.6.2.2. or 100 dB and 150 mV in 10.6.2.3.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
10.6.6.2	Corded listening devices with digital input With any playing device playing the fixed “programme simulation noise” described in EN 50332-1:2013, and with the volume and sound settings in the listening device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of −10 dBFS.		N/A
10.6.6.3	Cordless listening devices In cordless mode, with any playing and transmitting device playing the fixed programme simulation noise described in EN 50332-1:2013; and respecting the cordless transmission standards, where an air interface standard exists that specifies the equivalent acoustic level; and with volume and sound settings in the receiving device (for example, built-in volume level control, additional sound features like equalization, etc.) set to the combination of positions that maximize the measured acoustic output for the above mentioned programme simulation noise, the *L*Aeq,*T* acoustic output of the listening device shall be ≤ 100 dB with an input signal of −10 dBFS.		N/A
10.6.6.4	Measurement method Measurements shall be made in accordance with EN 50332-2:2013 as applicable.”		N/A
16	**Modification to subclause G.3.1.2**		
G.3.1.2	Add the following note after the first paragraph: “NOTE Z1 An IEC 60730 series standard is considered relevant if the component in question falls within its scope.”		N/A
17	**Modification to subclause G.7.1**		

Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	Add the following note at the end of the subclause: “NOTE Z1 The harmonized code designations corresponding to the IEC cable types are given in Annex ZD.”		N/A
18	**Modification to subclause M.2**		

Clause	Requirement + Test	Result - Remark	Verdict
M.2	Add the following paragraph after the first paragraph: “The size of the battery compartment shall be designed taking into account the battery compartment recommendations of the relevant battery standard. NOTE For general guidance on the design of the battery compartment, see Clause 8 of IEC 62485-4.”		P
19	**Modification to Bibliography**		

Clause	Requirement + Test	Result - Remark	Verdict
	Add the following references: EN 60060-1, High-voltage test techniques – Part 1: General definitions and test requirements EN 60898-1, Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation EN 62911, Audio, video and information technology equipment – Routine electrical safety testing in production ADCO RED Position on 'Measurement uncertainty in published harmonized standards' – https:// ec.europa .eu/ docsroom/ documents/ 32381 Add the following notes for the standards indicated: IEC 60060-1 NOTE Harmonized as EN 60060-1. IEC 60130-9 NOTE Harmonized as EN 60130-9. IEC 60204-1 NOTE Harmonized as EN IEC 60204-1. IEC 60204-11 NOTE Harmonized as EN IEC 60204-11. IEC 60243-1 NOTE Harmonized as EN 60243-1. IEC 60269-2 NOTE Harmonized as HD 60269-2. IEC 60309-1 NOTE Harmonized as EN 60309-1. IEC 60364 NOTE some parts harmonized in HD 384/HD 60364 series. IEC 60601-2-4 NOTE Harmonized as EN 60601-2-4. IEC 60664-5:2005 NOTE Harmonized as EN 60664-5:2007. IEC 60721-3-4 NOTE Harmonized as EN IEC 60721-3-4. IEC 61032:1997 NOTE Harmonized as EN 61032:1998 (not modified). IEC 61180 NOTE Harmonized as EN 61180.		P

	IEC 61508-1	NOTE	Harmonized as EN 61508-1.	P
	IEC 61558-2-1	NOTE	Harmonized as EN 61558-2-1.	
	IEC 61558-2-4	NOTE	Harmonized as EN 61558-2-4.	
	IEC 61558-2-6	NOTE	Harmonized as EN 61558-2-6.	
	IEC 61643-21	NOTE	Harmonized as EN 61643-21.	
	IEC 61643-311	NOTE	Harmonized as EN 61643-311.	
	IEC 61643-321	NOTE	Harmonized as EN 61643-321.	
	IEC 61643-331	NOTE	Harmonized as EN IEC 61643-331.	
	IEC 61140:2016	NOTE	Harmonized as EN 61140:2016.	
	IEC 61439-5:2014	NOTE	Harmonized as EN 61439-5:2015.	
	IEC 61969-3	NOTE	Harmonized as EN 61969-3.	
	IEC 62040:2017	NOTE	Harmonized as EN IEC 62040:2019.	
	IEC 62305-1	NOTE	Harmonized as EN 62305-1.	
	IEC 62368-3	NOTE	Harmonized as EN 62368-3.	
	IEC 62485-4	NOTE	Harmonized as EN IEC 62485-4.	
	ISO 10218-1	NOTE	Harmonized as EN ISO 10218-1.	
	ISO 10218-2	NOTE	Harmonized as EN ISO 10218-2.	
	ISO 13482	NOTE	Harmonized as EN ISO 13482.	
	ISO 13850	NOTE	Harmonized as EN ISO 13850.	

Clause	Requirement + Test	Result - Remark	Verdict
20	**Addition of annexes**		
ZB	**ANNEX ZB, SPECIAL NATIONAL CONDITIONS**		P
4.1.15	Finland, Norway and Sweden To the end of the subclause the following is added: Class I pluggable equipment type A intended for connection to other equipment or a network shall, if safety relies on connection to reliable earthing or if surge suppressors are connected between the network terminals and accessible parts, have a marking stating that the equipment shall be connected to an earthed mains socket-outlet. The marking text in the applicable countries shall be as follows: In Finland: “Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan” In Norway: “Apparatet må tilkoples jordet stikkontakt” In Sweden: “Apparaten skall anslutas till jordat uttag”	Only EN, DE, FR	N/A
4.7.3	United Kingdom To the end of the subclause the following is added: The torque test is performed using a socket-outlet complying with BS 1363, and the plug part shall be assessed to the relevant clauses of BS 1363. Also see Annex G.4.2 of this annex.		N/A
5.4.11.1 and Annex G	Finland and Sweden To the end of the subclause the following is added: For separation of the telecommunication network from earth the following is applicable: If this insulation is solid, including insulation forming part of a component, it shall at least consist of either - two layers of thin sheet material, each of which shall pass the electric strength test below, or - one layer having a distance through insulation of at least 0,4 mm, which shall pass the electric strength test below.		N/A

Clause	Requirement + Test	Result - Remark	Verdict
	If this insulation forms part of a semiconductor component (e.g. an optocoupler), there is no distance through insulation requirement for the insulation consisting of an insulating compound completely filling the casing, so that clearances and creepage distances do not exist, if the component passes the electric strength test in accordance with the compliance clause below and in addition - passes the tests and inspection criteria of 5.4.7 with an electric strength test of 1,5 kV multiplied by 1,6 (the electric strength test of 5.4.9 shall be performed using 1,5 kV), and - is subject to routine testing for electric strength during manufacturing, using a test voltage of 1,5 kV. It is permitted to bridge this insulation with a capacitor complying with EN 60384-14, subclass Y2. A capacitor classified Y3 according to EN 60384-14, may bridge this insulation under the following conditions: - the insulation requirements are satisfied by having a capacitor classified Y3 as defined by EN 60384-14, which in addition to the Y3 testing, is tested with an impulse test of 2,5 kV defined in 5.4.10; - the additional testing shall be performed on all the test specimens as described in EN 60384-14; - the impulse test of 2,5 kV is to be performed before the endurance test in EN 60384-14, in the sequence of tests as described in EN 60384-14.		
5.5.2.1	Norway After the 3rd paragraph the following is added: Due to the IT power distribution system used, capacitors are required to be rated for the applicable line-to-line voltage (230 V).		P

Clause	Requirement + Test	Result - Remark	Verdict
5.5.6	Finland, Norway and Sweden To the end of the subclause the following is added: Resistors used as basic safeguard or bridging basic insulation in class I pluggable equipment type A shall comply with G.10.1 and the test of G.10.3.		N/A
5.6.4.2.1	Ireland and United Kingdom After the indent for pluggable equipment type A, the following is added: - the protective current rating is taken to be 13 A, this being the largest rating of fuse used in the mains plug.		N/A
5.6.4.2.1	France After the indent for pluggable equipment type A, the following is added: - in certain cases, the protective current rating of the circuit supplied from the mains is taken as 20 A instead of 16 A. *Justification:* In France, according to NF C15-100 standard, in certain cases, the maximum rated current of the protective device circuit-breaker is 20 A.		N/A
5.6.5.1	Ireland and United Kingdom To the second paragraph the following is added: The range of conductor sizes of flexible cords to be accepted by terminals for equipment with a rated current over 10 A and up to and including 13 A is: 1,25 mm2 to 1,5 mm2 in cross-sectional area.		N/A
5.6.8	Norway To the end of the subclause the following is added: Equipment connected with an earthed mains plug is classified as class I equipment. See the Norway marking requirement in 4.1.15. The symbol IEC 60417-6092, as specified in F.3.6.2, is accepted.		P

Clause	Requirement + Test	Result - Remark	Verdict
5.7.7.1	Norway and Sweden To the end of the subclause the following is added: The screen of the television distribution system is normally not earthed at the entrance of the building and there is normally no equipotential bonding system within the building. Therefore the protective earthing of the building installation needs to be isolated from the screen of a cable distribution system. It is however accepted to provide the insulation external to the equipment by an adapter or an interconnection cable with galvanic isolator, which may be provided by a retailer, for example. The user manual shall then have the following or similar information in Norwegian and Swedish language respectively, depending on in what country the equipment is intended to be used in: “Apparatus connected to the protective earthing of the building installation through the mains connection or through other apparatus with a connection to protective earthing – and to a television distribution system using coaxial cable, may in some circumstances create a fire hazard. Connection to a television distribution system therefore has to be provided through a device providing electrical isolation below a certain frequency range (galvanic isolator, see EN 60728-11)” NOTE In Norway, due to regulation for CATV-installations, and in Sweden, a galvanic isolator shall provide electrical insulation below 5 MHz. The insulation shall withstand a dielectric strength of 1,5 kV RMS, 50 Hz or 60 Hz, for 1 min. Translation to Norwegian (the Swedish text will also be accepted in Norway): “Apparater som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkoplet utstyr – og er tilkoplet et koaksialbasert kabel-TV nett, kan forårsake brannfare. For å unngå dette skal det ved tilkopling av apparater til kabel-TV nett installeres en galvanisk isolator mellom apparatet og kabel-TV nettet.”		N/A

Clause	Requirement + Test	Result - Remark	Verdict
	Translation to Swedish: ”Apparater som är kopplad till skyddsjord via jordat vägguttag och/eller via annan utrustning och samtidigt är kopplad till kabel-TV nät kan i vissa fall medföra risk för brand. För att undvika detta skall vid anslutning av apparaten till kabel-TV nät galvanisk isolator finnas mellan apparaten och kabel-TV nätet.”.		
8.5.4.2.3	United Kingdom Add the following after the 2nd dash bullet in 3rd paragraph: An emergency stop system complying with the requirements of EN IEC 60204-1 and EN ISO 13850 is required where there is a risk of personal injury.		N/A
B.3.1 and B.4	Ireland and United Kingdom The following is applicable: To protect against excessive currents and short-circuits in the primary circuit of direct plug-in equipment, tests according to Annexes B.3.1 and B.4 shall be conducted using an external miniature circuit breaker complying with EN 60898-1, Type B, rated 32A. If the equipment does not pass these tests, suitable protective devices shall be included as an integral part of the direct plug-in equipment, until the requirements of Annexes B.3.1 and B.4 are met		N/A
G.4.2	United Kingdom To the end of the subclause the following is added: The plug part of direct plug-in equipment shall be assessed to BS 1363: Part 1, 12.1, 12.2, 12.3, 12.9, 12.11, 12.12, 12.13, 12.16, and 12.17, except that the test of 12.17 is performed at not less than 125 °C. Where the metal earth pin is replaced by an Insulated Shutter Opening Device (ISOD), the requirements of clauses 22.2 and 23 also apply.		P

Clause	Requirement + Test	Result - Remark	Verdict
G.7.1	United Kingdom To the first paragraph the following is added: Equipment which is fitted with a flexible cable or cord and is designed to be connected to a mains socket conforming to BS 1363 by means of that flexible cable or cord shall be fitted with a 'standard plug' in accordance with the Plugs and Sockets etc. (Safety) Regulations 1994, Statutory Instrument 1994 No. 1768, unless exempted by those regulations. NOTE "Standard plug" is defined in SI 1768:1994 and essentially means an approved plug conforming to BS 1363 or an approved conversion plug.		N/A
G.7.1	Ireland To the first paragraph the following is added: Apparatus which is fitted with a flexible cable or cord shall be provided with a plug in accordance with Statutory Instrument 525: 1997, "13 A Plugs and Conversion Adapters for Domestic Use Regulations: 1997. S.I. 525 provides for the recognition of a standard of another Member State which is equivalent to the relevant Irish Standard		N/A
G.7.2	Ireland and United Kingdom To the first paragraph the following is added: A power supply cord with a conductor of 1,25 mm^2 is allowed for equipment which is rated over 10 A and up to and including 13 A.	NAC3 FCB, Schuko (EU), BS1363 (UK), T23 (CH)	P

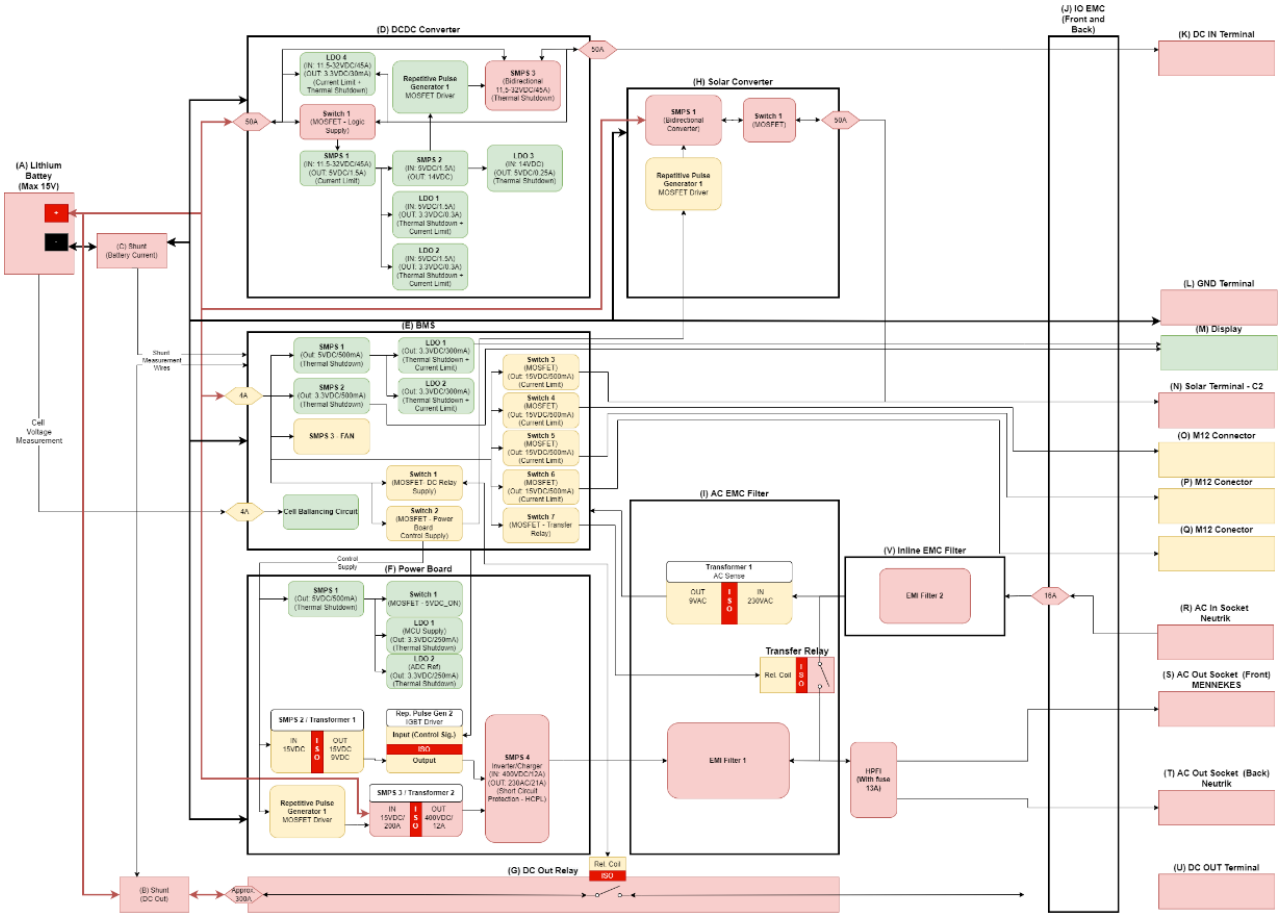
Clause	Requirement + Test	Result - Remark	Verdict
ZC	**ANNEX ZC, NATIONAL DEVIATIONS**		
10.5.2	Germany The following requirement applies: For the operation of any cathode ray tube intended for the display of visual images operating at an acceleration voltage exceeding 40 kV, authorization is required, or application of type approval (Bauartzulassung) and marking. *Justification*: German ministerial decree against ionizing radiation (Röntgenverordnung), in force since 2002-07-01, implementing the European Directive 96/29/EURATOM. NOTE Contact address: Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig, Tel.: Int+49–531–592–6320, Internet: http://www.ptb.de		N/A

Clause	Requirement + Test	Result - Remark	Verdict
ZD	**IEC and CENELEC CODE DESIGNATIONS FOR FLEXIBLE CORDS**		

P

Type of flexible cord	Code designations	
	IEC	CENELEC
PVC insulated cords		
Flat twin tinsel cord	60227 IEC 41	H03VH-Y
Light polyvinyl chloride sheathed flexible cord	60227 IEC 52	H03VV-F H03VVH2-F
Ordinary polyvinyl chloride sheathed flexible cord	60227 IEC 53	H05VV-F H05VVH2-F
Rubber insulated cords		
Braided cord	60245 IEC 51	H03RT-F
Ordinary tough rubber sheathed flexible cord	60245 IEC 53	H05RR-F
Ordinary polychloroprene sheathed flexible cord	60245 IEC 57	H05RN-F
Heavy polychloroprene sheathed flexible cord	60245 IEC 66	H07RN-F
Cords having high flexibility		
Rubber insulated and sheathed cord	60245 IEC 86	H03RR-H
Rubber insulated, crosslinked PVC sheathed cord	60245 IEC 87	H03RV4-H
Crosslinked PVC insulated and sheathed cord	60245 IEC 88	H03V4V4-H
Cords insulated and sheathed with halogen-free thermoplastic compounds		
Light halogen-free thermoplastic insulated and sheathed flexible cords		H03Z1Z1-F H03Z1Z1H2-F
Ordinary halogen-free thermoplastic insulated and sheathed flexible cords		H05Z1Z1-F H05Z1Z1H2-F

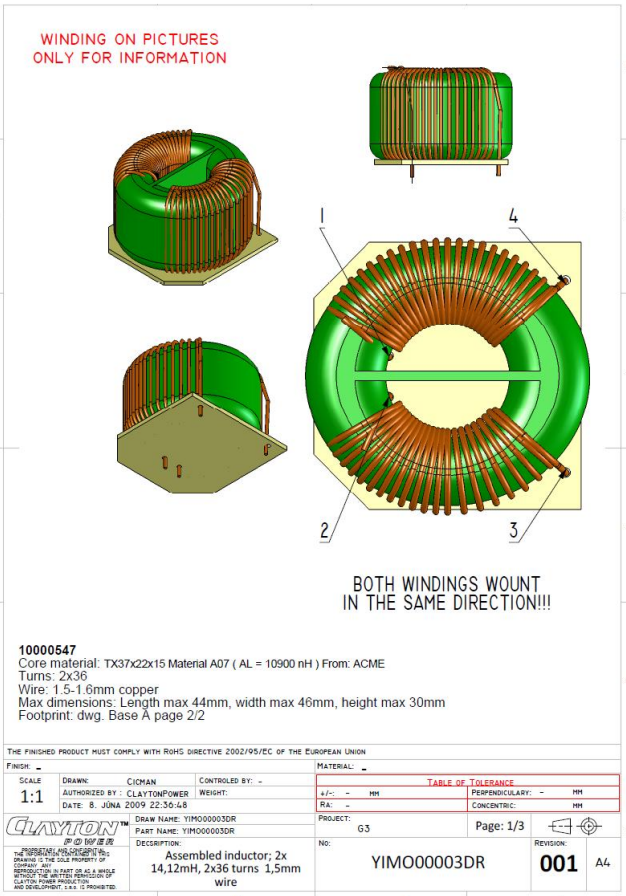
Attachment II: Power Sources of the system

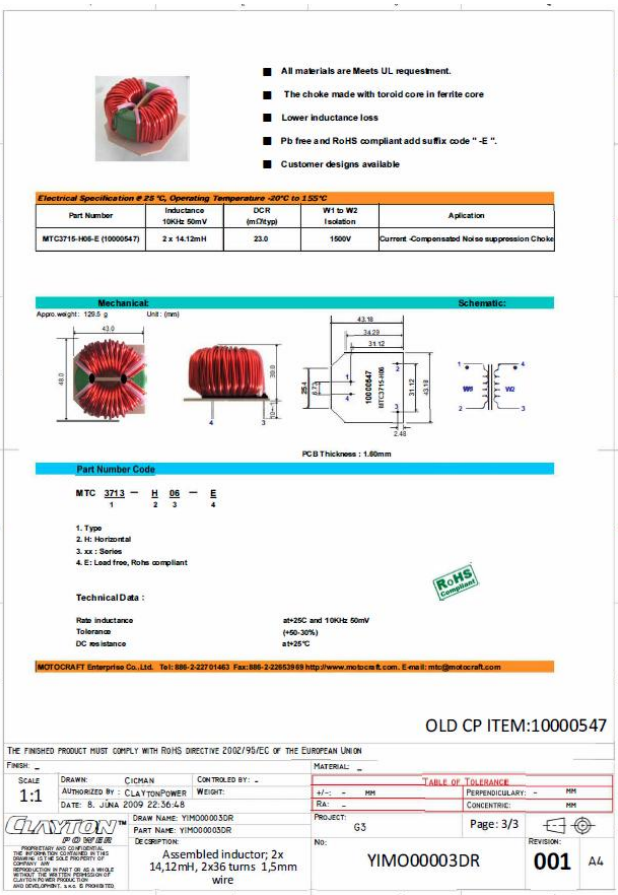


Attachment III: Chokes and Transformers

Transformer filter coil (T2, T3, T4 on AC EMC board)

YIMO00003DR

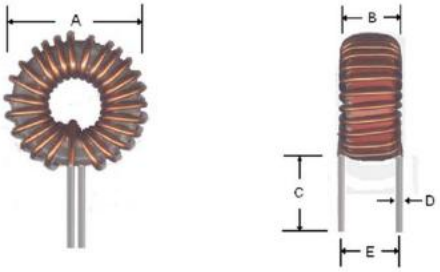




Power board Choke

17919_YIMO00007DR_MB

Order#: MTC10602-BR4-12B



Unit : (mm) **A:** 31.0 **B:** 15.0 **C:** 26.0 +-1 **D:** 1.5

1. Electrical Characteristics :

1-1. Inductance at 25 °C and 10KHZ 0.25V with DC Bais 5A	8.4μH+-10%
1-2. DCR at 25 °C	10mΩ typ.
1-3. Insulation test:: AC 0.5KV min / 5mA 1sec, between coil to core.	
1-3. Rate current	12 A DC

2.Components List: all materials should be RoHs compliant and lead-free before 2006.
2-1. Core: T102-6 Iron powder core, Micrometals Inc..
2-2. Wire: 1.5mm Ø PEW 180°C magnet wire, PACIFIC Electric wire & Cable CO.,LTD. UL:E84081(S) or equ.

2-3. Varnish : TS2414S or equ.
2-4. Solder: lead-free solder bar.

3.Winding Instruction:
3-1.Wire: 1.5mm Ø PEW 180°C magnet wire winding 25 turns.+-0 (inside winding turn)

4.Impregnation: Varnish.

5.Marking: None.

6.Test data:
Inductance: 8.4, 8.0
DCR: 10.0, 10.1

OLD CP ITEM: 10000448

THE FINISHED PRODUCT MUST COMPLY WITH ROHS DIRECTIVE 2002/95/EC OF THE EUROPEAN UNION

FINISH: _		MATERIAL: _	
SCALE 1:1	DRAWN: CICMAN	CONTROLED BY: _	TABLE OF TOLERANCE
	AUTHORIZED BY : CLAYTONPOWER	WEIGHT:	+/-: - MM / PERPENDICULARY: - MM
	DATE: 9. JÚNA 2009 18:26:12		RA: - / CONCENTRIC: MM
CLAYTON POWER	DRAW NAME: YIMO00007DR	PROJECT: G3	Page: 1/1
	PART NAME: YIMO00007DR		
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CLAYTON POWER. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF CLAYTON POWER IS PROHIBITED.	DESCRIPTION: Assembled inductor; 8,4 mH; 25 turns, 1,5 mm wire, core, 12 A, core Iron powder T106-2	NO: YIMO00007DR	REVISION: 001 A4

Transformer MTC69220

Motocraft *EP type Push-Pull Transformer 5.9W*

ISO 9001

Features :

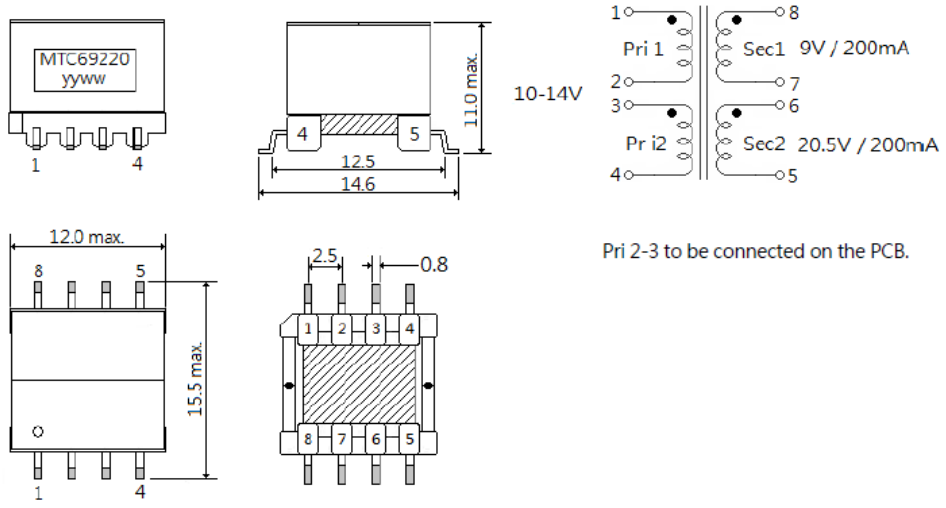
- Made with EP ferrite type core
- Pb free and RoHS compliant
- Customer designs available
- Ambient temperature: -40℃ to 85℃
- Storage temperature: -40℃ to 85℃

Electrical Specification @ 25 °C

Part Number	Pri L: (1-2) (3-4) 10KHz 0.25V	LK 100KHz 0.25V	Turns Ratio Pri : Sec 1: Sec 2	DCR (max.)			
				Pri 1	Pri 2	Sec 1	Sec 2
MTC69220	90uH +/- 30%	3.0uH max.	1 : 0.777 : 1.8	59mohm	59mohm	87mohm	178mohm

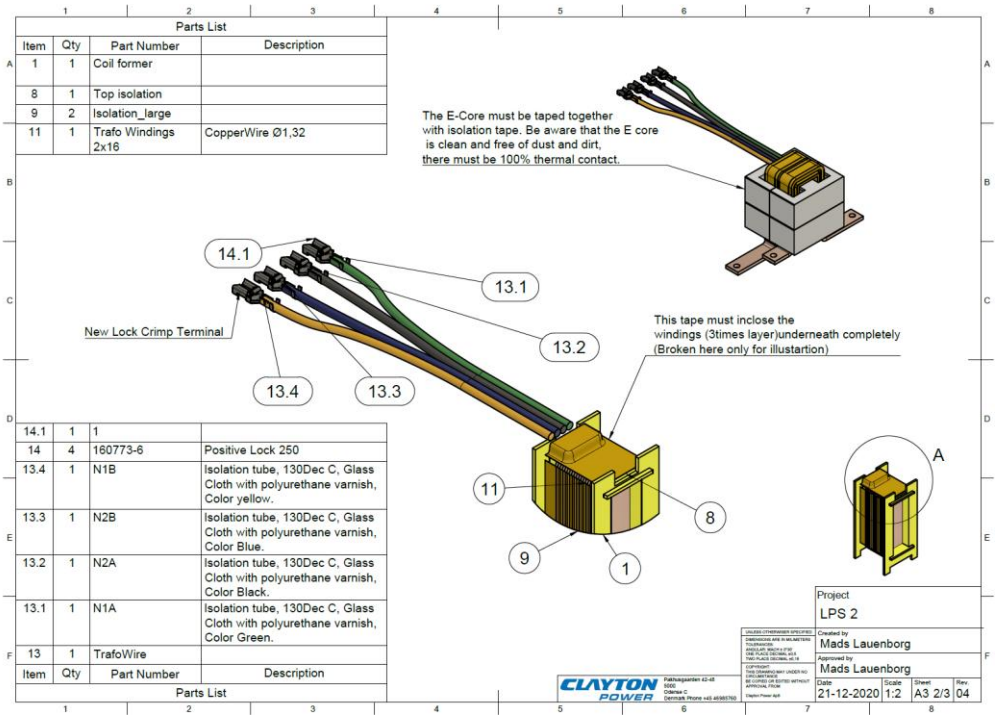
- LK : Test 1-4 (2-3 shorted) , other windings shorted.
- Hi-Pot Test : Pri to Sec 2500V

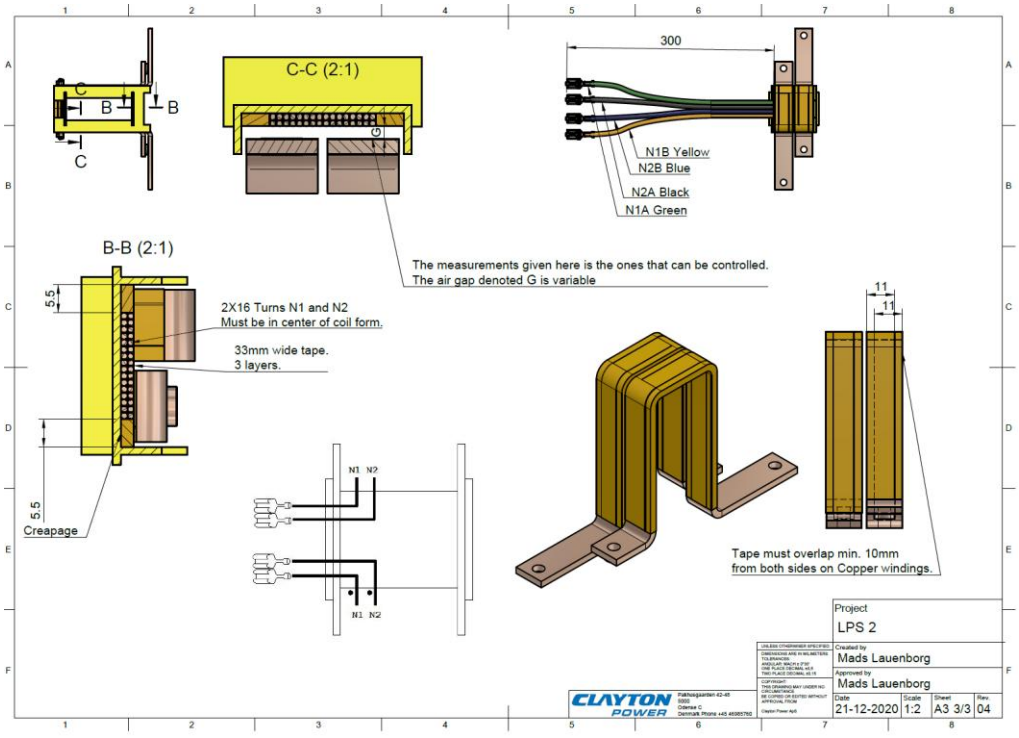
Mechanical / Schematic:



Part Number : MTC69220	Version	Note: RoHS Compliant	Drawing by Tony Kang 2020.07.07
EP type Push-Pull Transformer 5.9W		Unit : (mm)	Customer approved
		Appro.weight : g	

Transformer (T2, T3 on Power board): LPS 2 Trafo





Choke (L4 on power board): MTC69230B

Motocraft *Power Factor Choke 465uH / 20A*

Features :

- Large Current and Low DCR
- Low loss, low temperature
- Pb free and RoHS compliant
- Customer designs available
- Operating temperature range of -20°C to +105°C

Urating (rated voltage) : 250V
Irating (rated current) : 20A
Insulation class / Trating (temperature rating) : G2 / F:155°C

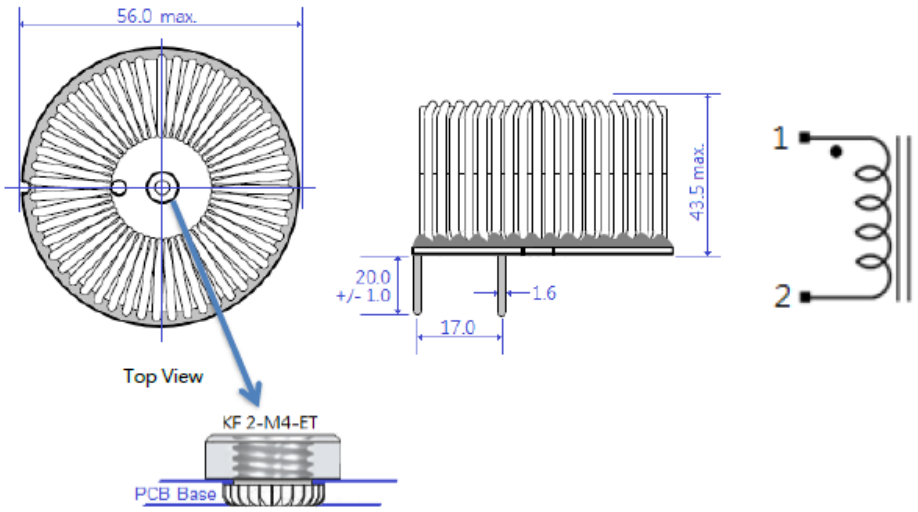
Aplication :

- Amplifiers. Copying Machine, Display Monitor, Power supply applications ,
  Microwave Oven and Car , PFC , Lighting , Solar energy supply, Air Conditioner, Refrigerator…….

Electrical Specification @ 25 °C

Part Number	Test frequency	Inductance 0A	Inductance with 10A	Inductance with 20A	DCR (max.)	Wire to Core Isolation
MTC69230B	10KHz 0.25V	931uH +/- 10%	763uH min	557uH min	85mohm	500V

Mechanical:



Schematic:

Part Number : MTC69230B	Version	Note: RoHS Compliant	Drawing by Joe Huang
Power Factor Choke 465uH / 20A		Appro.weight : 347g	2025.12.08

MTC3715-H06-E

Motocraft *Common Mode Choke 2 x 14.2mH*

Features :

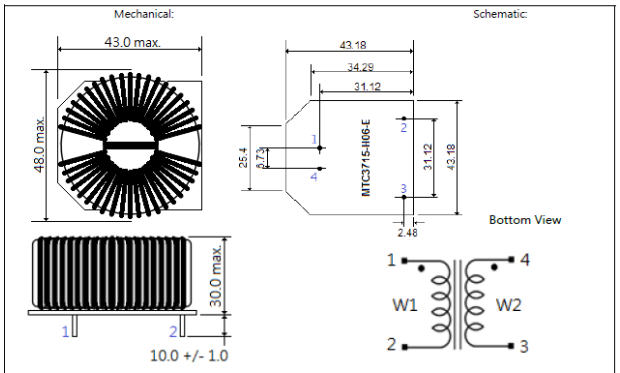
- Large Current and Low DCR
- Low loss, low temperature
- Pb free and RoHS compliant
- Customer designs available

Aplication :

- Prevention of common mode noise.

Electrical Specification @ 25 °C

Part Number	Test Frequency	Inductance	DCR (max)	W1 to W2 Isolation
MTC3715-H06-E	10KHz 50mV	14.2mH +50 / -30%	2 x 27.6mohm	1500V



Part Number : MTC3715-H06-E	Version	Note: RoHS Compliant	Drawing by Joe Huang
Common Mode Choke 2 x 14.2mH 10000547		Unit : (mm)	2025/4/11
		Appro.weight : 130g	

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MTC150180-E

Motocraft *Current Transformer*

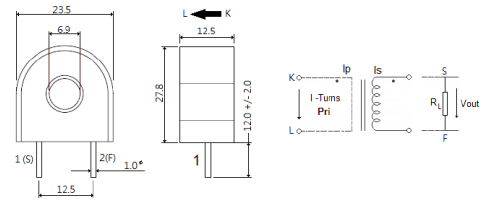
Features :

- The choke made with toroid type core
- Pb free and RoHS compliant
- Customer designs available

Electrical Specification :

- Part Number MTC150180-E
- Rated Primary Current 50/60Hz 0.5~50A, 60Arms max
- Dielectric withstanding Voltage (Hi-Pot) 2500Vrms
- Voltage out 6.5min
- D.C.Resistance Max at 20 ℃ 25~31Ω
- Primary current (A rms) | 0.5 | 5 | 10 | 50 | 60
  Secondary Output voltage for 50ohm load V out (V) | 0.025 | 0.25 | 0.50 | 2.50 | 3.00
- Storage temp. -25 < Tc < +80 insulation resistance – 100mΩ max

- Mechanical Dimensions(unit:mm)

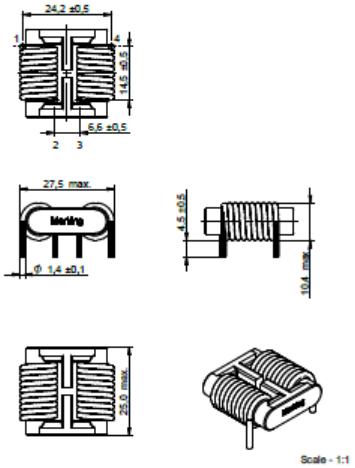


Part Number : MTC150180-E	Version	Note: RoHS Compliant	Drawing by Tony Kung 2019.09.03
Current Transformer		Unit : (mm)	Customer approved
		Appro.weight : 20.0g	

MOTOCRAFT Enterprise Co.,Ltd. http://www.motocraft.com E-mail: sales@motocraft.com

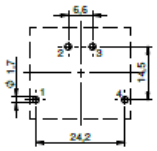
Inline Filter: Choke: 7448680140

Dimensions: [mm]



Scale - 1:1

Recommended Land Pattern: [mm]



Scale - 1:1

Electrical Properties:

Properties		Test conditions	Value	Unit	Tol.
Number of windings	N		2		
Inductance	L	10 kHz / 100 mV	230	µH	±40%
Leakage Inductance	L_S	10 kHz / 100 mV	8.7	µH	typ.
Rated Current	I_R	@ 60 °C	16	A	max.
DC Resistance	R_{DC}	@ 20 °C	3.6	mΩ	max.
Rated Voltage	V_R	50 Hz	250	V (AC)	max.
Insulation Test Voltage	V_T	50 Hz/ 5 mV/ 2 sec.	1500	V (AC)	

Certification:

RoHS Approval	Compliant [2011/65/EU&2015/863]
REACh Approval	Conform or declared [(EC)1907/2006]
Halogen Free	Conform [JEDEC JS709B]
Halogen Free	Conform [IEC 61249-2-21]

General Information:

It is recommended that the temperature of the component does not exceed +115°C under worst case conditions	
Ambient Temperature	-40 °C up to +60 °C
Operating Temperature	-40 °C up to +115 °C
Storage Conditions (in original packaging)	up to 40 °C; < 75 % rH
Moisture Sensitivity Level (MSL)	1

Product Marking:

Marking	7448680140
Date-Code	YYWW

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

WE-LPCC Common Mode Power Line Choke

7448680140

Attachment IV: Photo documentation

Pictures_1 _ EUT_VIEW

Pictures_2 _ EUT_VIEW


Pictures_3 _ EUT_VIEW

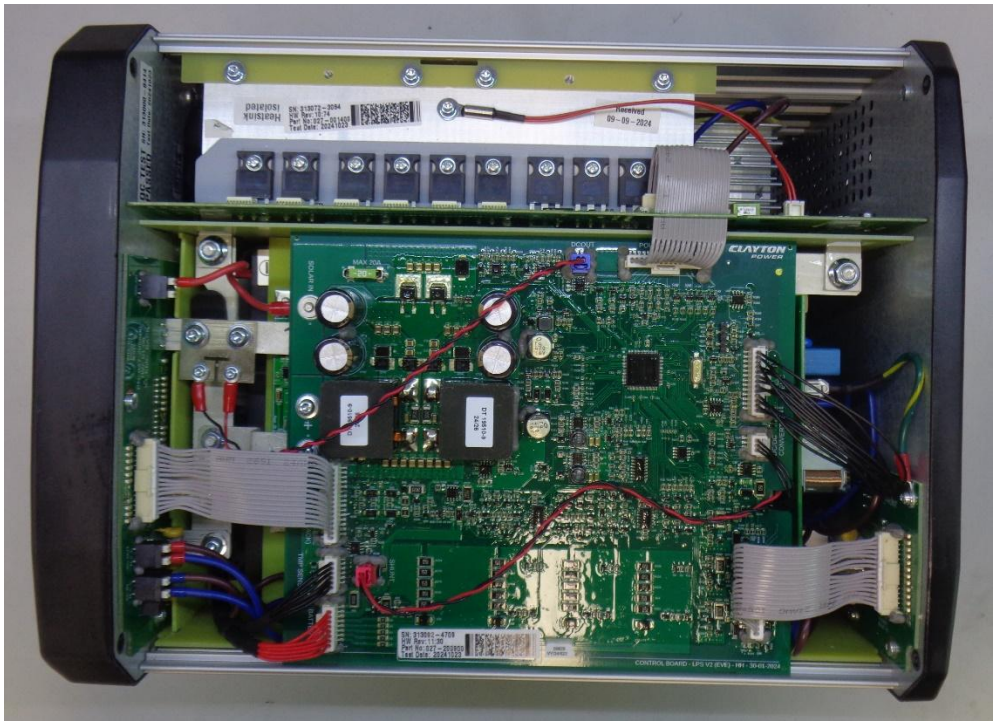
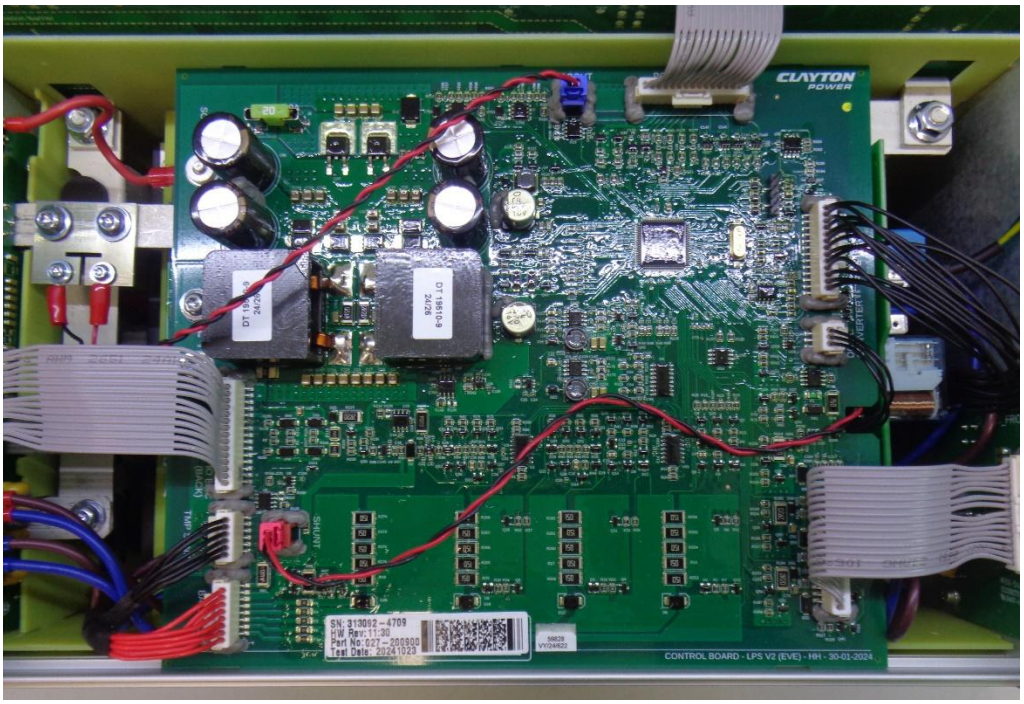
Pictures_4 _ EUT_VIEW


Pictures_5 _ EUT_VIEW

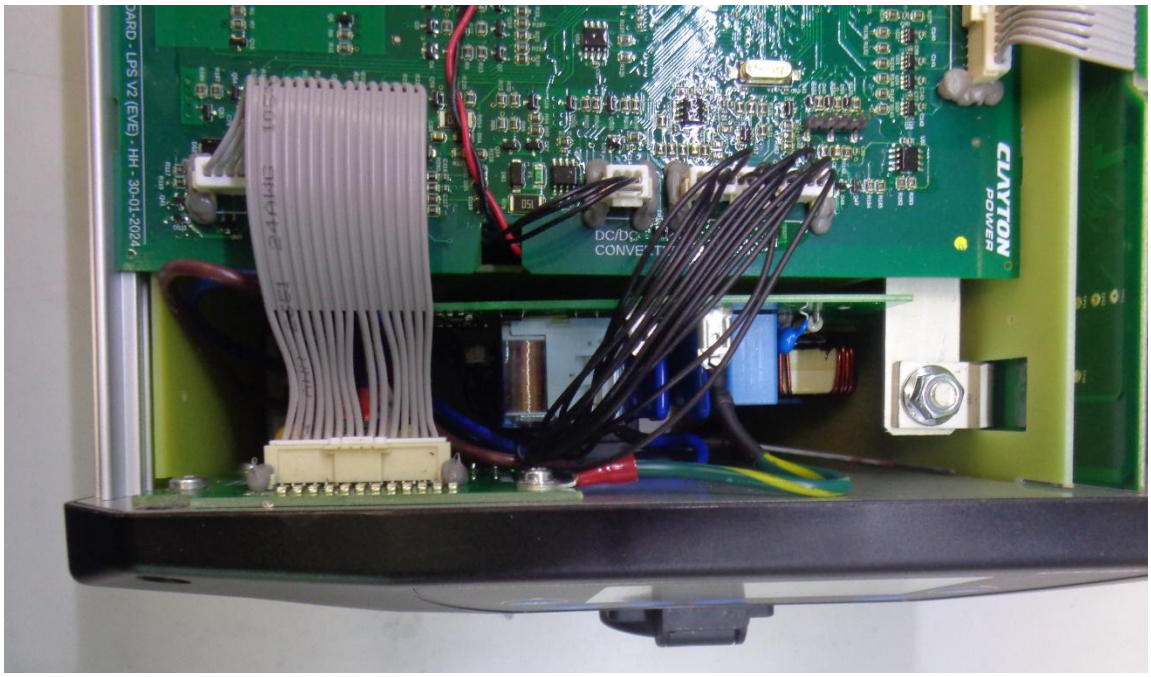
Pictures_6 _ EUT_VIEW


Pictures_7 _ EUT_VIEW

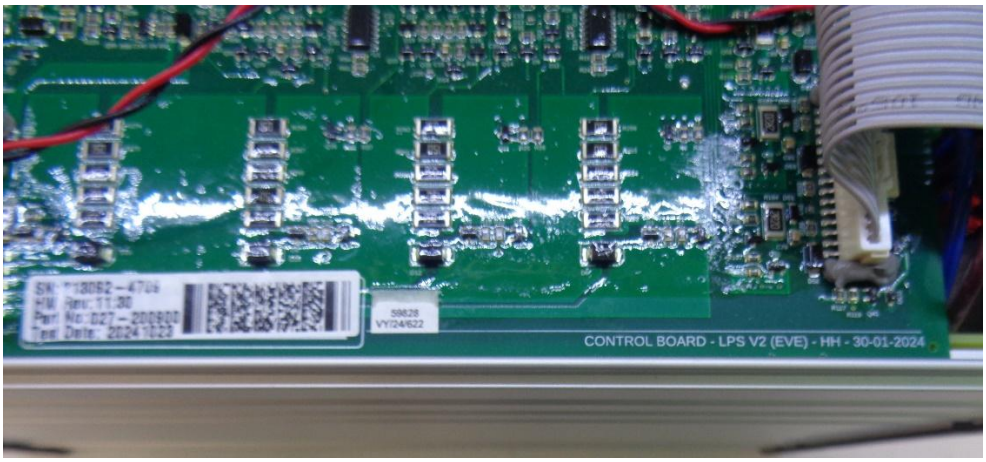
Pictures_8 _ EUT _230V OUTPUT PORT (NAC3 FCB)

Pictures_9 _EUT_INTERNAL VIEW

Pictures_10 _ EUT_INTERNAL VIEW

Note: ES3 cables are double insulated.

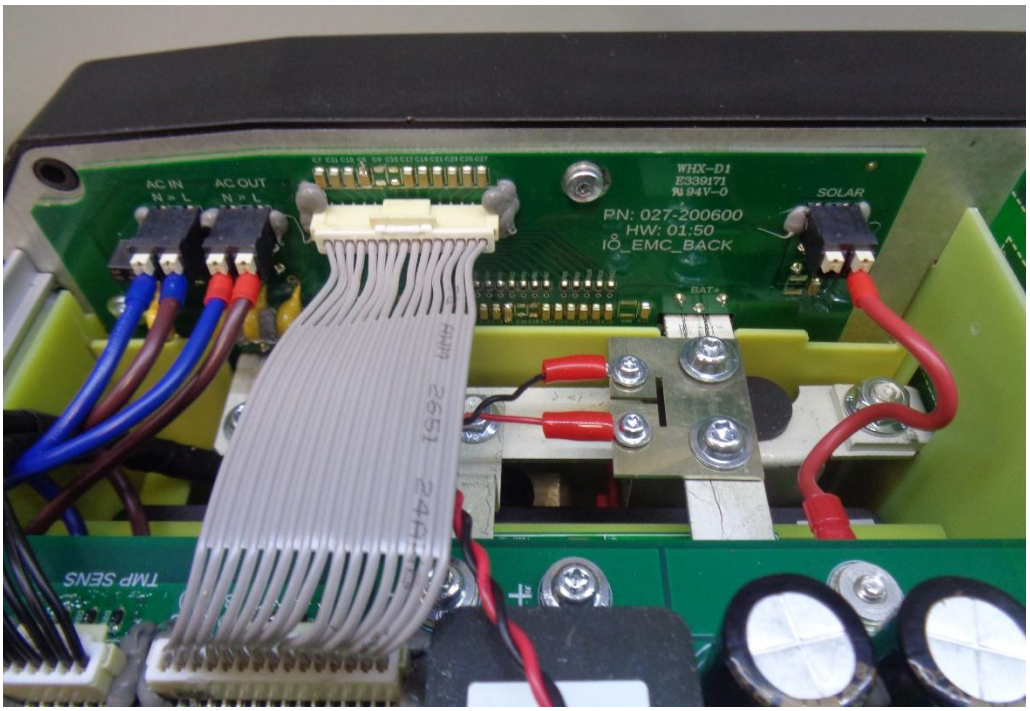
Pictures_11 _ EUT_INTERNAL VIEW



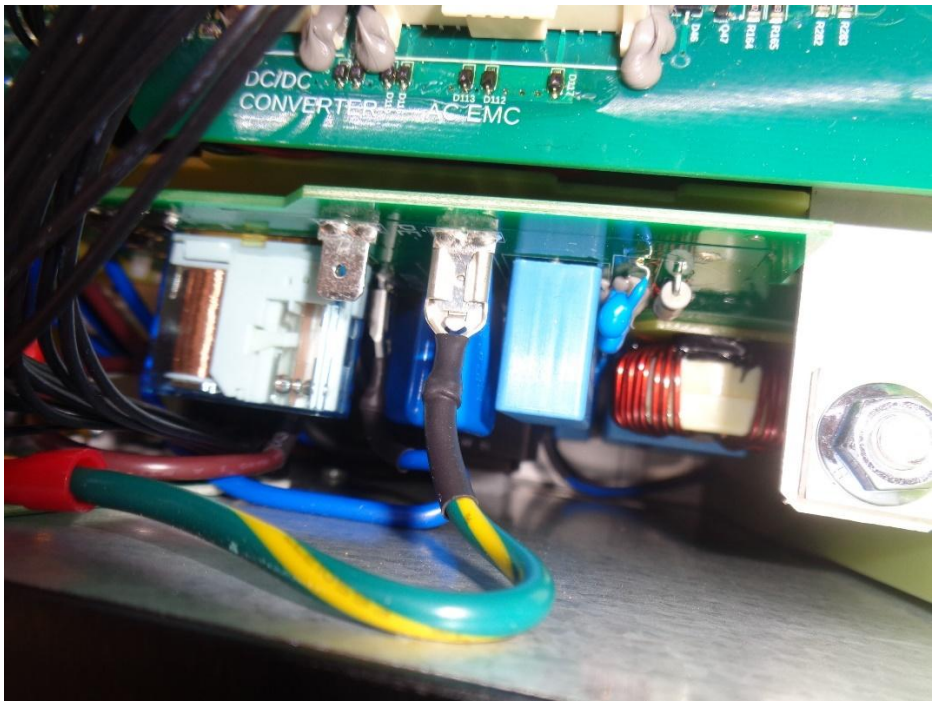
Pictures_12 _EUT _ PCB



Pictures_13 _EUT _ PCB



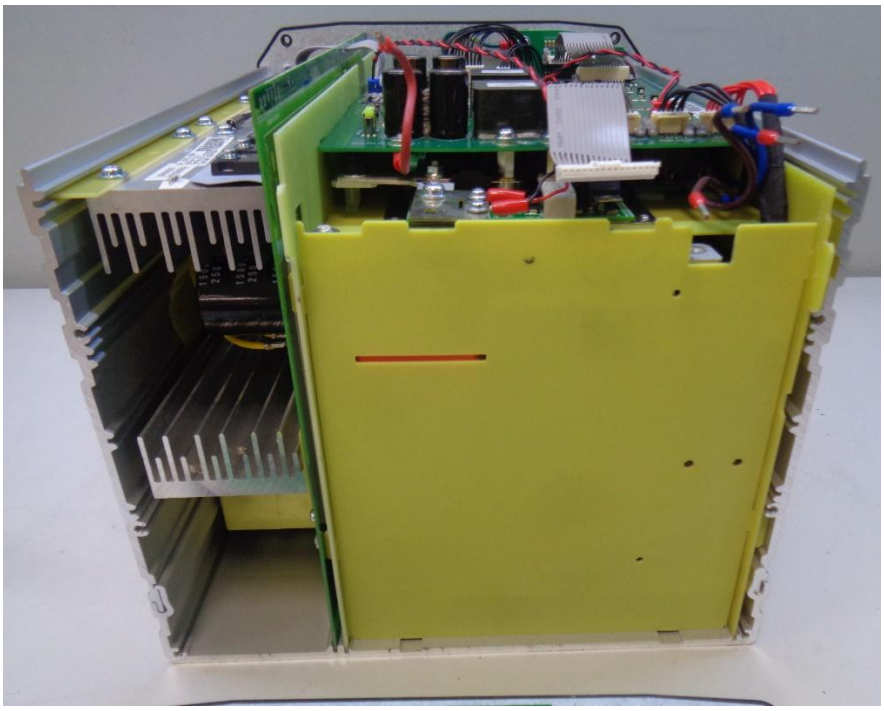
Pictures_14 _ EUT_INTERNAL VIEW



Pictures_15 _ EUT_INTERNAL VIEW

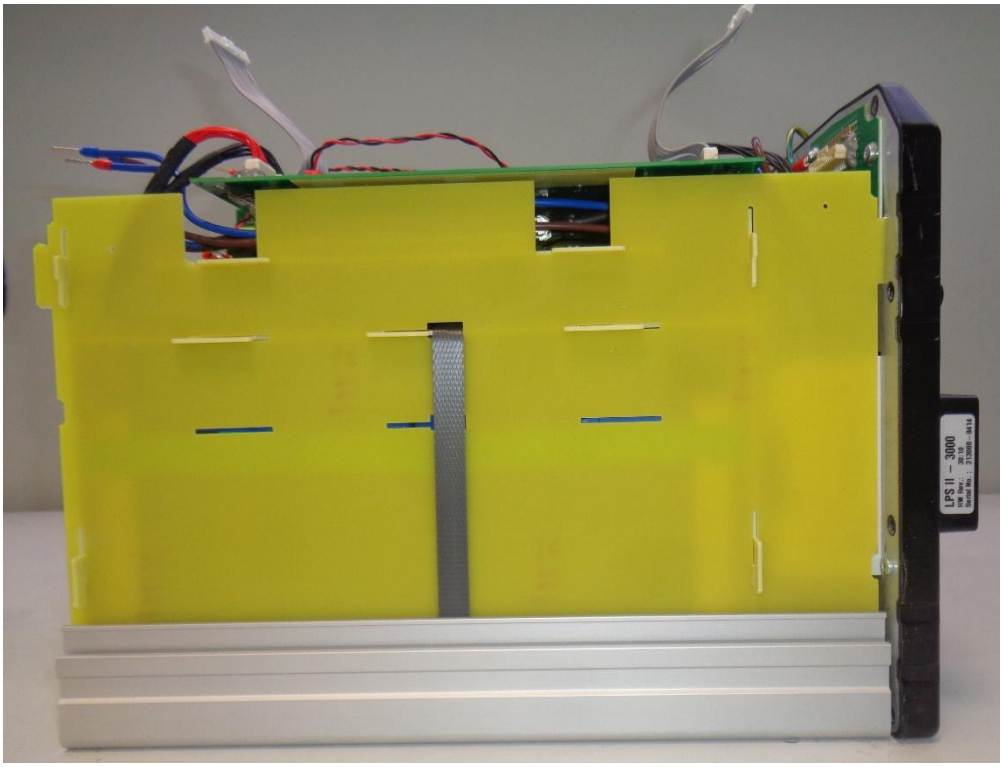
Pictures_16 _ EUT_INTERNAL VIEW

Pictures_17 _ EUT_INTERNAL VIEW

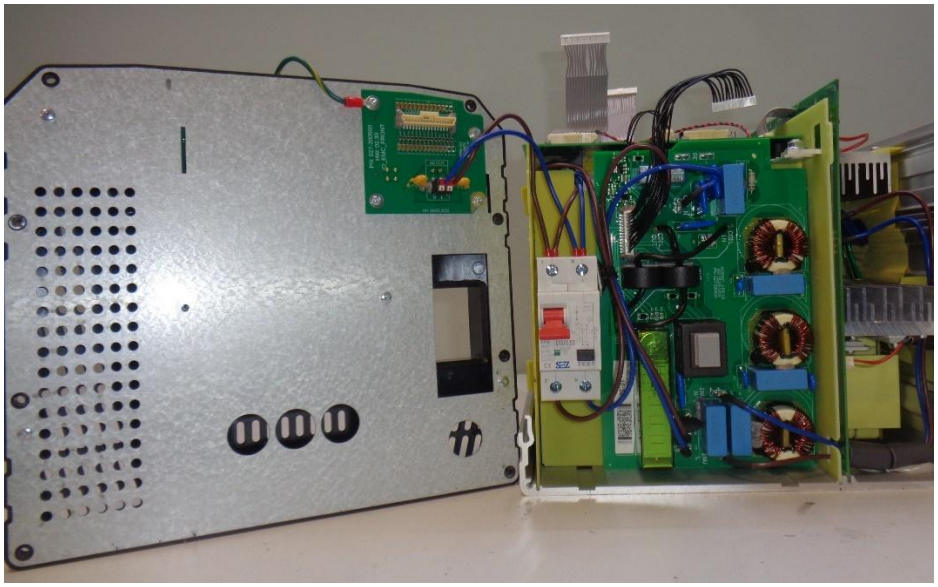


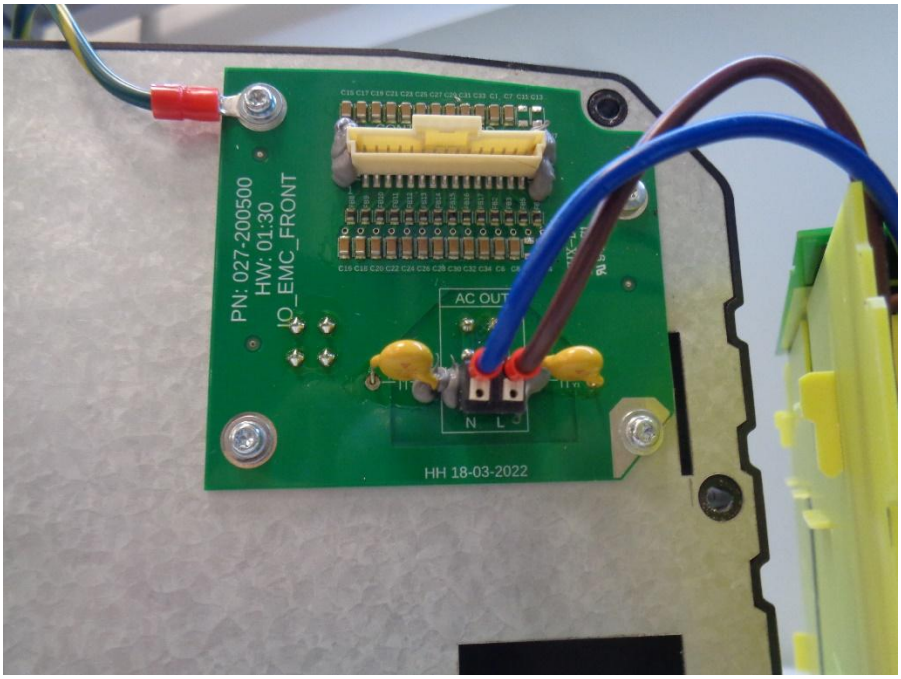
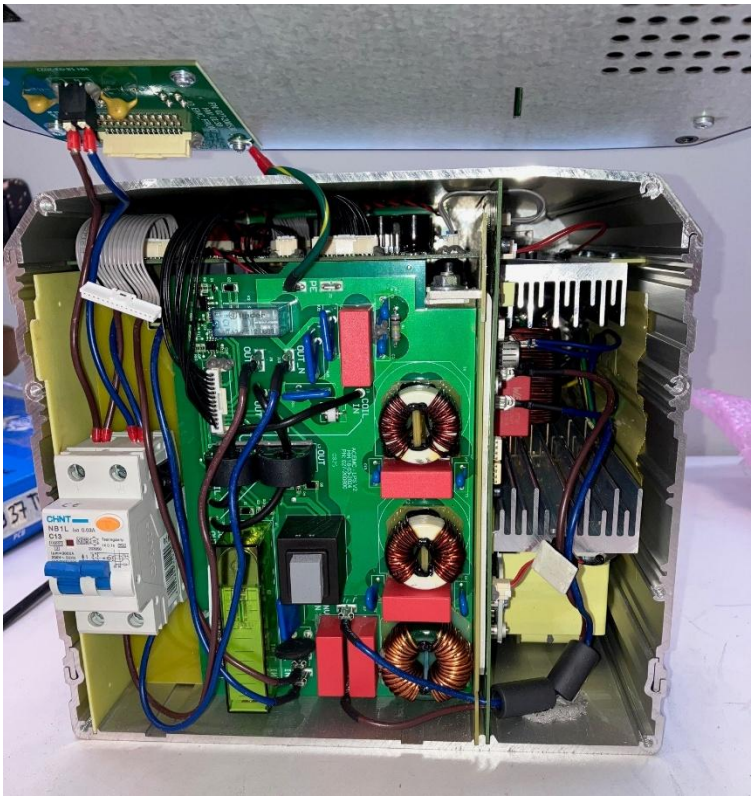
Pictures_18 _ EUT_INTERNAL VIEW

Pictures_19 _ EUT_INTERNAL VIEW

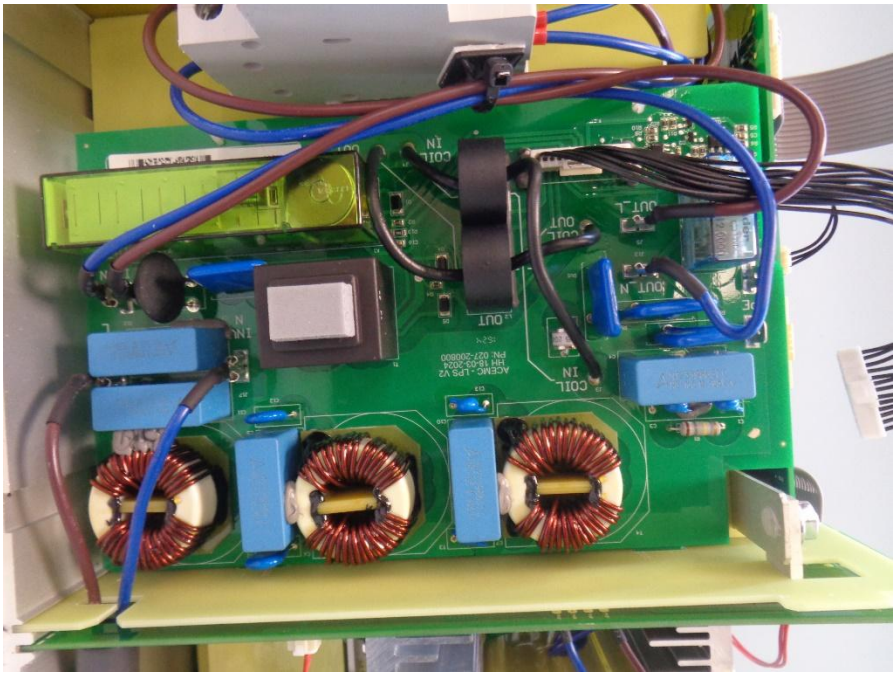


Pictures_20 _ EUT_INTERNAL VIEW

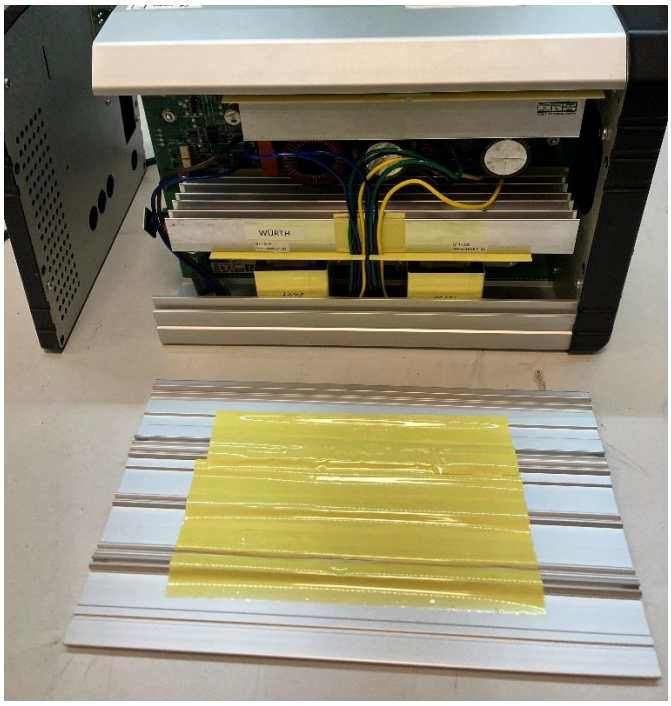


Pictures_21 _EUT _ PCB

Pictures_22 _ EUT_INTERNAL VIEW


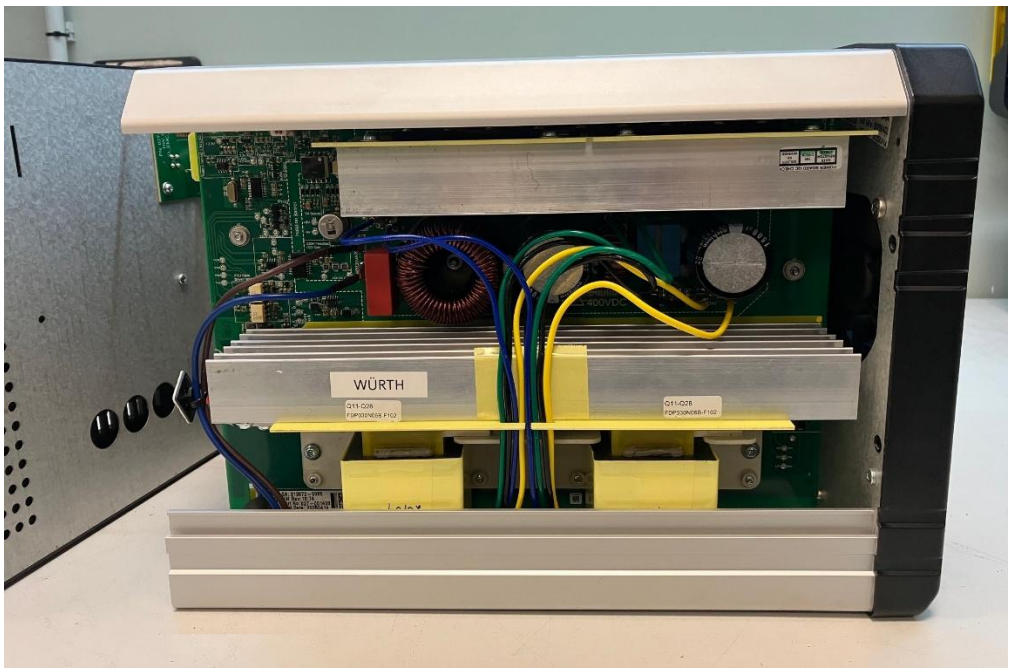
Pictures_23 _ EUT_INTERNAL VIEW

Pictures_24 _ EUT_INTERNAL VIEW


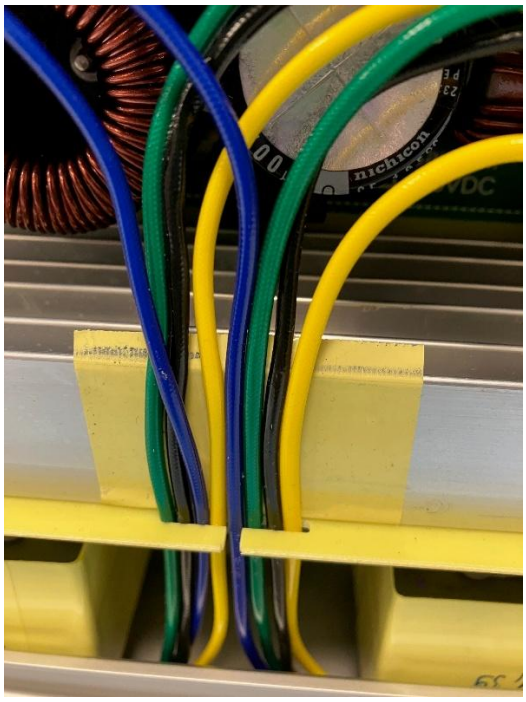
Pictures_25 _EUT _ INTERNAL METAL ENCLOSURE



Pictures_26 _ EUT_INTERNAL VIEW

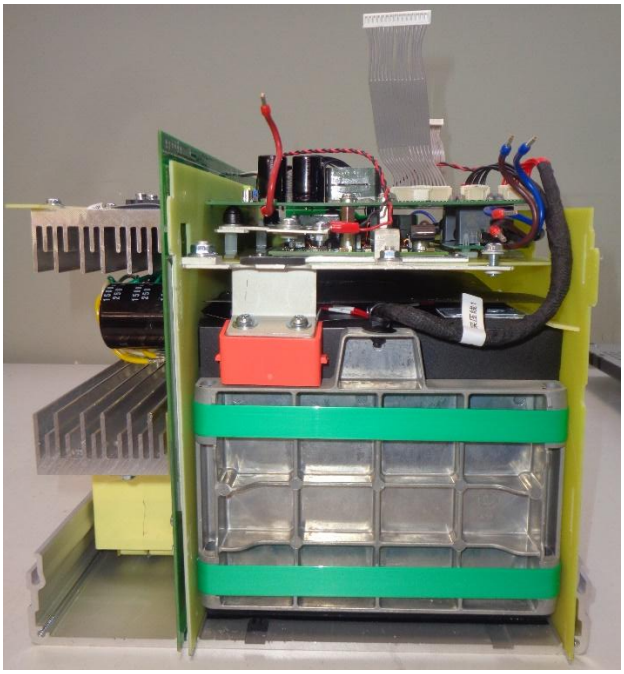


Pictures_27 _ EUT_INTERNAL VIEW

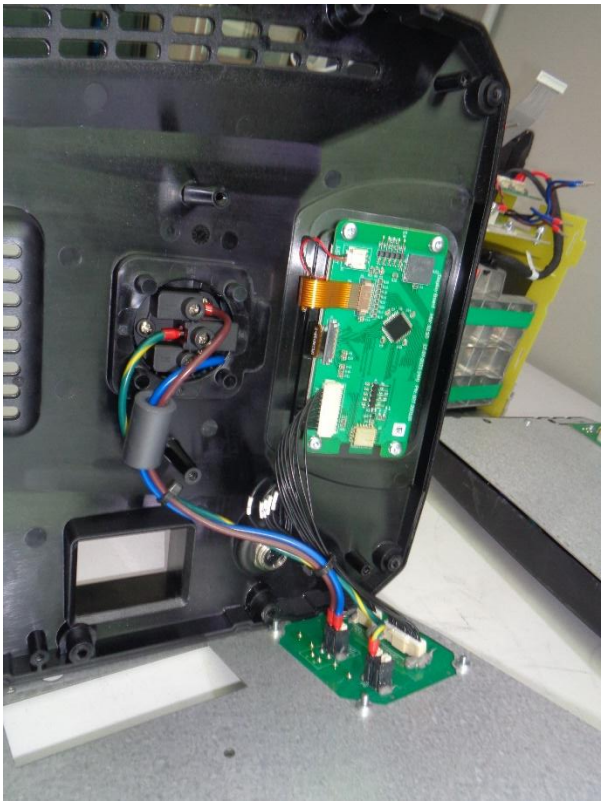


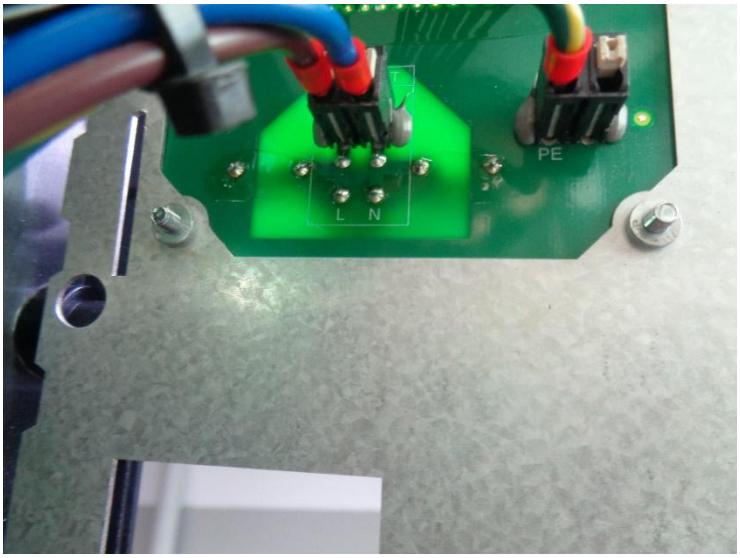
Pictures_28 _ EUT_INTERNAL VIEW

Pictures_29 _ EUT_INTERNAL VIEW_BATTERY



Pictures_30 _EUT _ INTERNAL VIEW



Pictures_31 _EUT _ PCB


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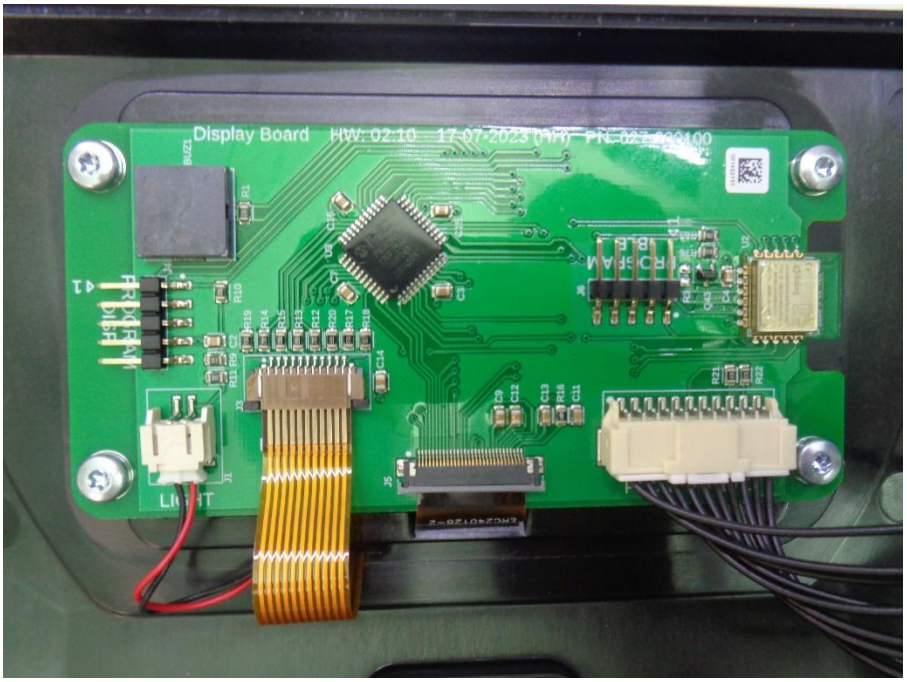
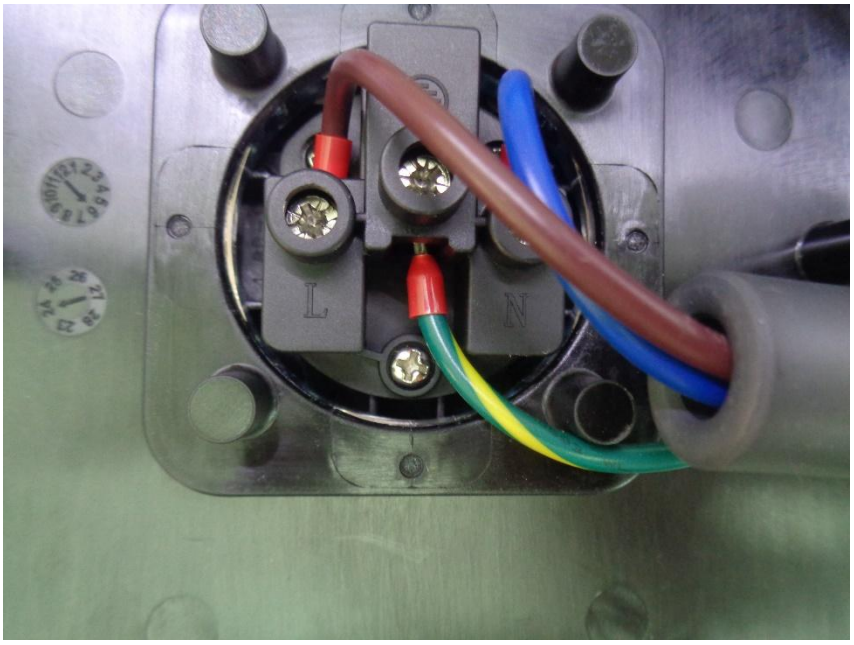
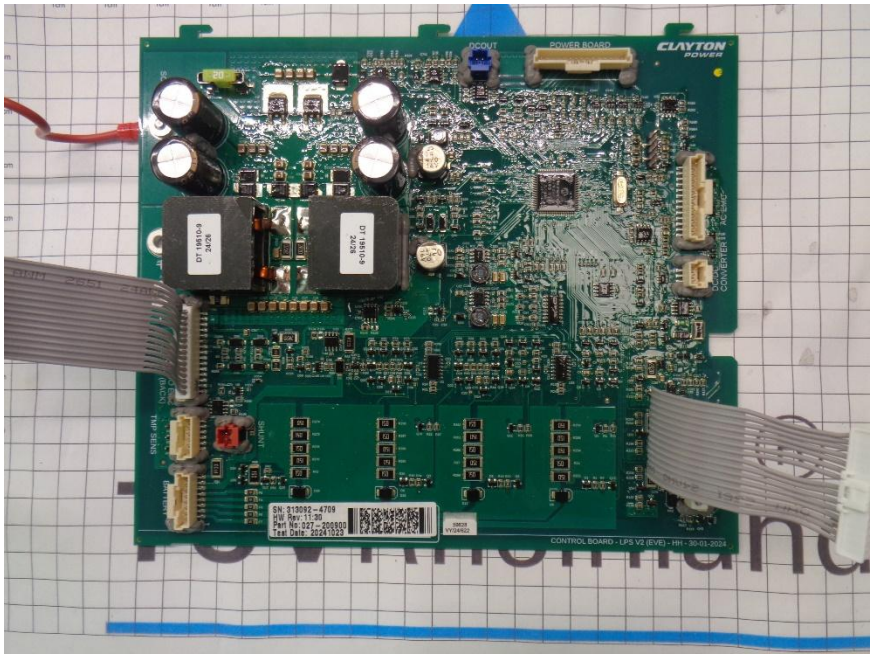
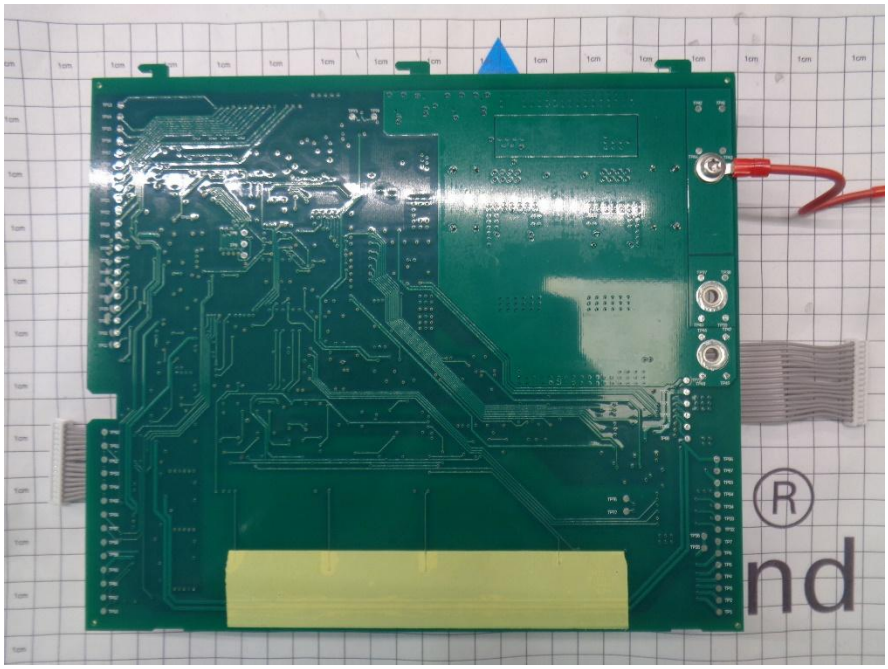
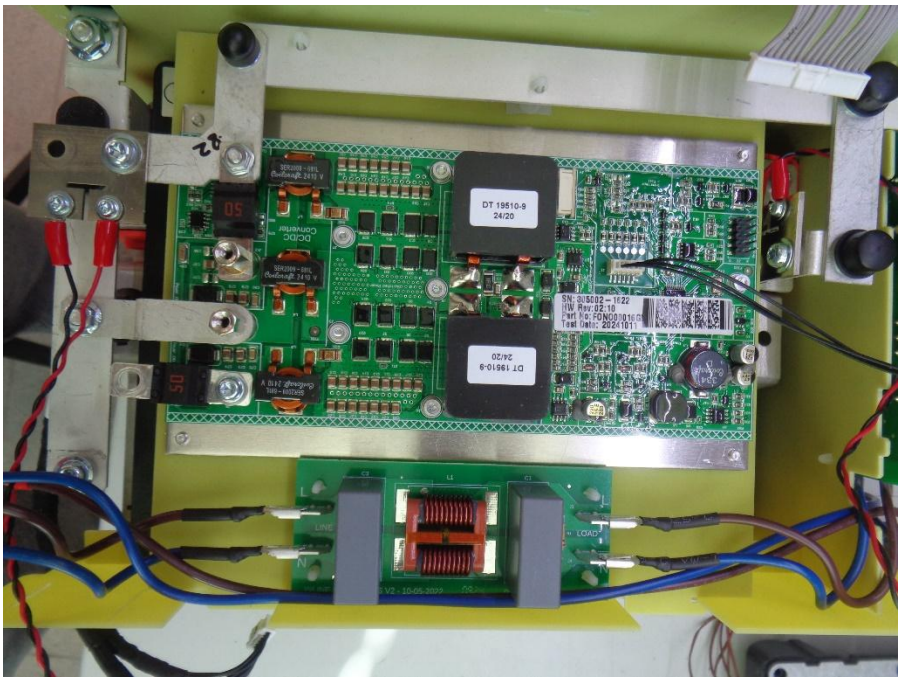


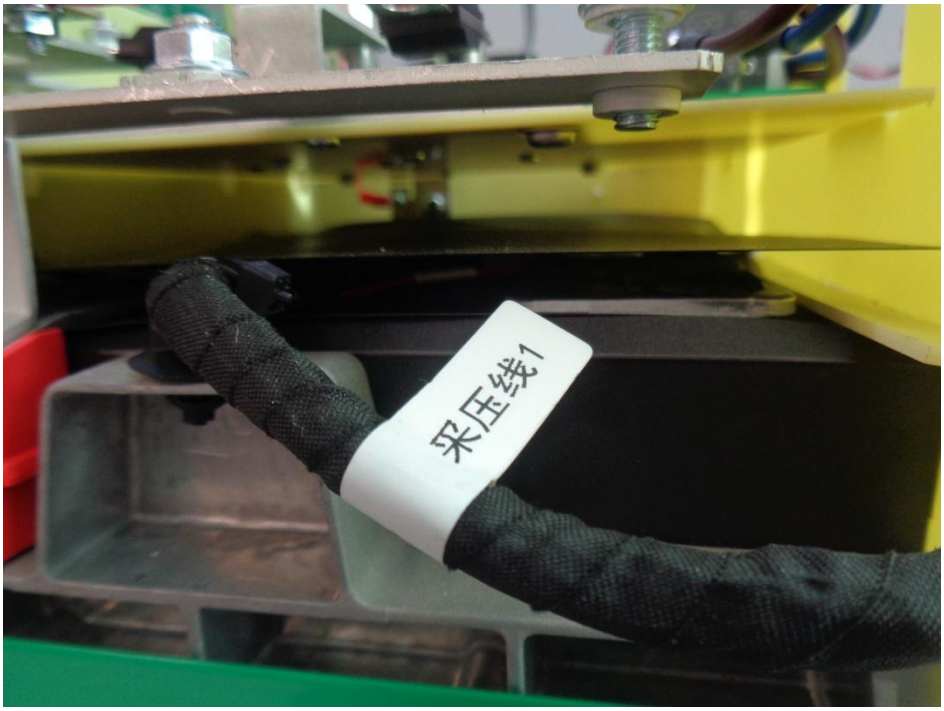
Pictures_33 _EUT _ 230V OUTPUT PORT (NAC3 FCB) _internal view

Pictures_34 _EUT _ PCB


Pictures_35 _EUT _ PCB

Pictures_36 _EUT _ PCB


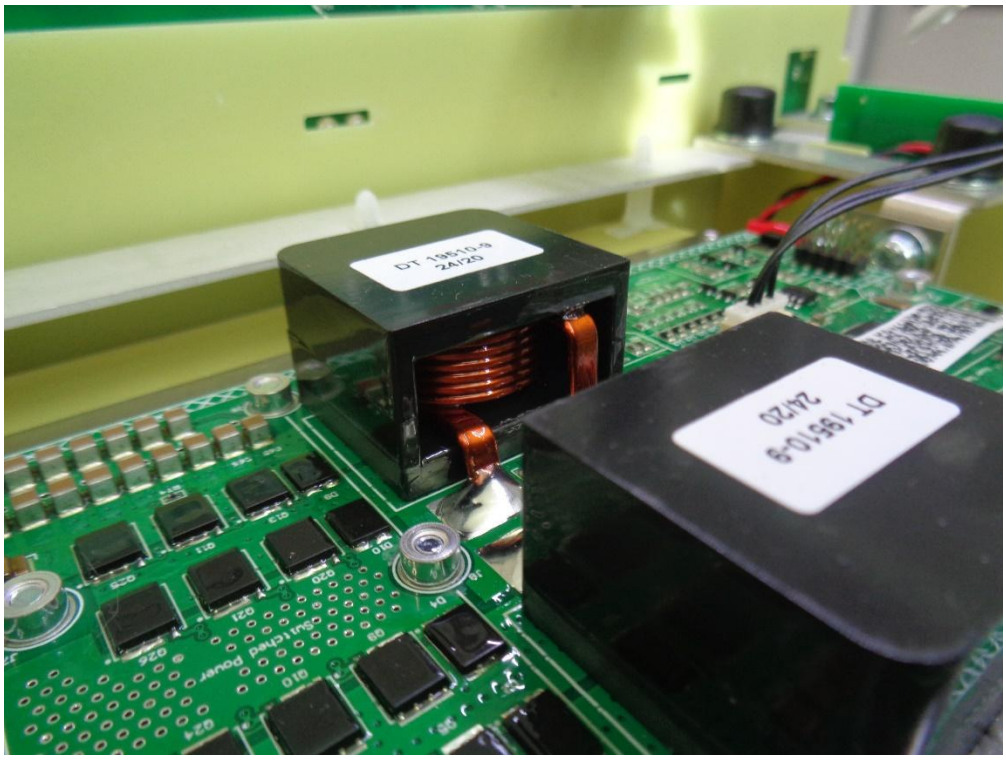
Pictures_37 _EUT _ PCB



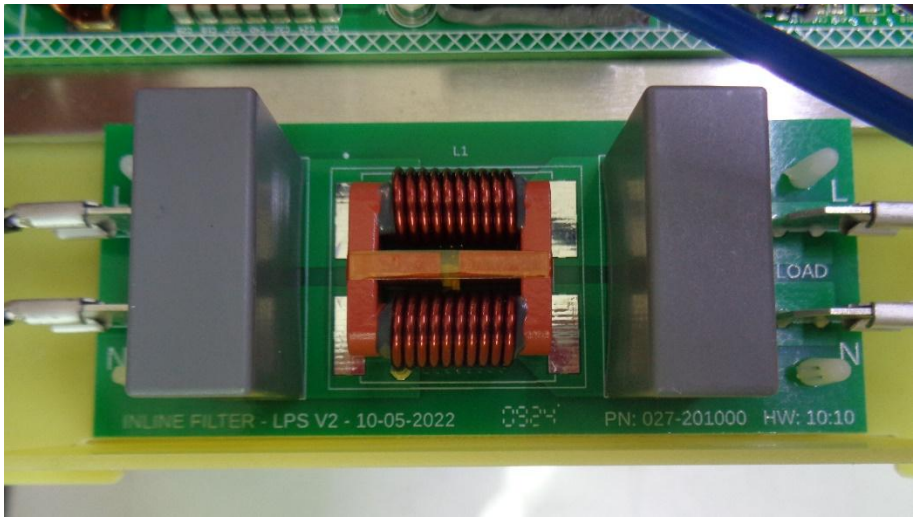
Pictures_38 _EUT _ SECONDARY LION BATTERY

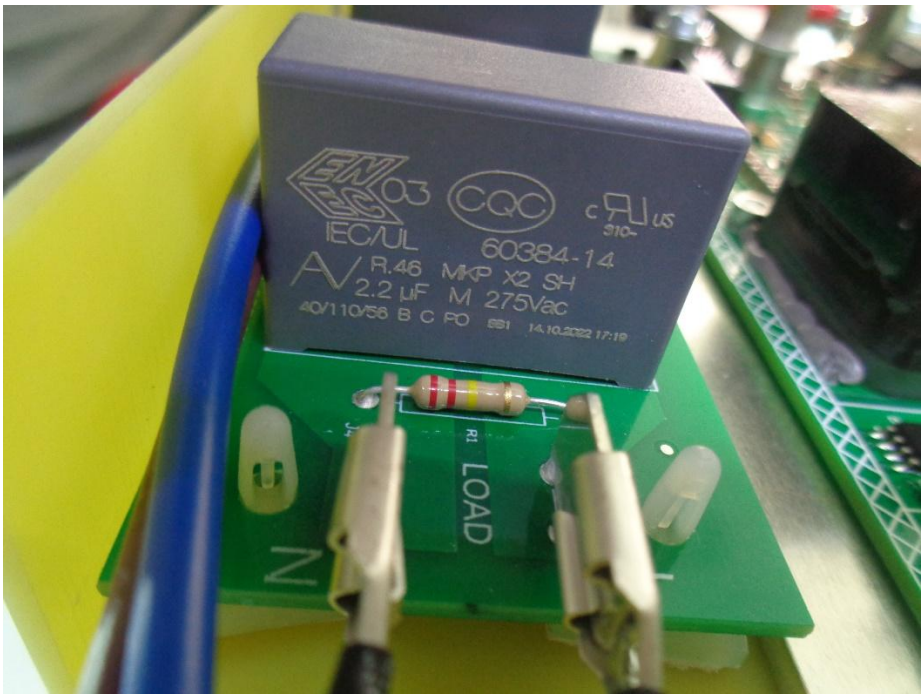
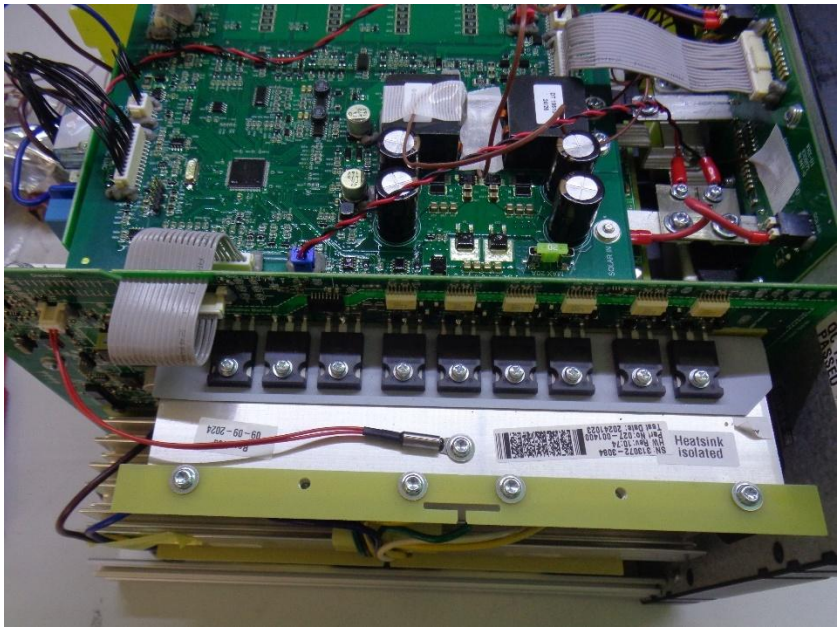


Pictures_39 _EUT _

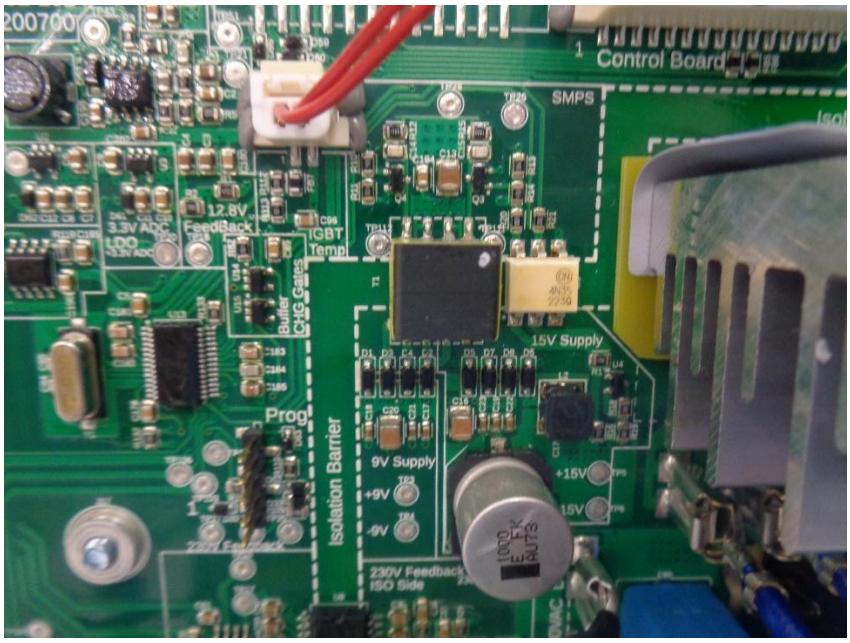


Pictures_40 _EUT _ AC-EMC-Mini board

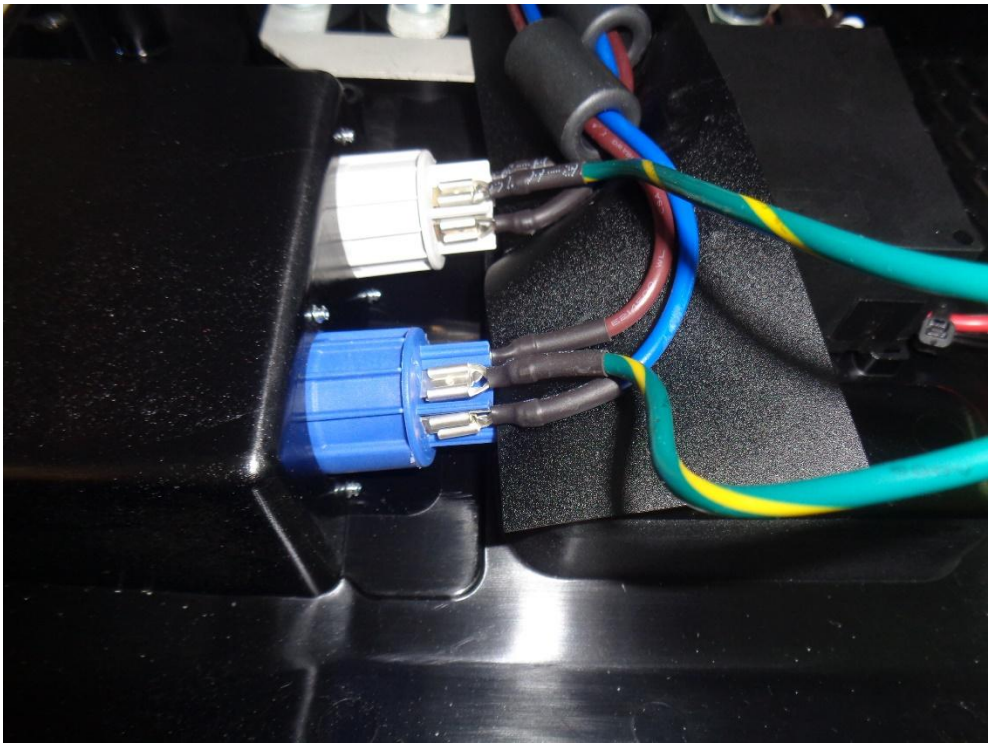


Pictures_41 _EUT _ AC-EMC-Mini board capacitor

Pictures_42 _EUT _ PCB


Pictures_43 _EUT _ PCB

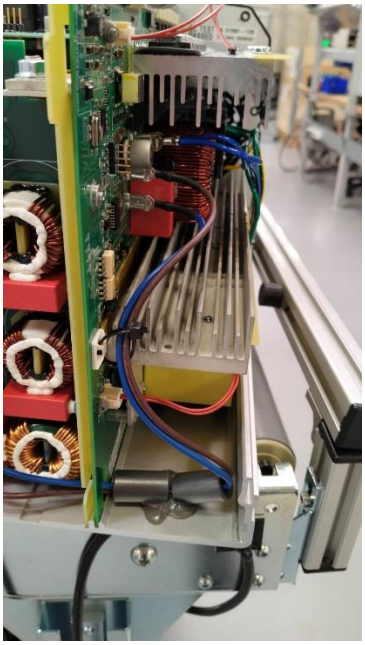


Pictures_44 _EUT _ 230V output/input port (NAC3 FCB/FCA)



Pictures_45 _ cable fixing

Pictures_46_ cable fixing


Pictures_47 _ cable fixing

Pictures_48_
Blank

- END OF TEST REPORT -