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File Number **21/36403425**

TEST REPORT
Electromagnetic Compatibility

Petitioner's Reference: SALICRU			
Customer Address:	Avda de la Serra, 100 08460 Palautordera – Barcelona Spain		
Equipment: CUBE4 series UPS			
Brand:	SALICRU	Model:	SLC-80-CUBE4
S/N:	0000448743	Internal Id:	10950/1
Internal Id:	10950/1		
Result: complies			

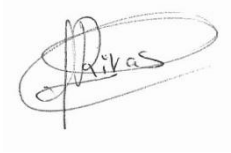
It has been tested and complies the standard specifications Applicable / s.
See specifications applied on page 13.

Applicable Standards

The tests / inspections marked with * are not covered by the accreditation of ENAC

Emission/Immunity standard/s:	***UNE-EN 62040-2:2018** Uninterruptible power systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements. **CISPR 11:2015/A1:2016** **IEC 61000-3-11:2017** **IEC 61000-3-12:2011** ***IEC 61000-2-2:2002** **IEC 61000-4-2:2008** **IEC 61000-4-3:2006/ISH1:2008** **IEC 61000-4-4:2012** **IEC 61000-4-5:2014/Amd1:2017** **IEC 61000-4-6 2013/Corr1:2015** **IEC 61000-4-8:2009** ***IEC 61000-4-13:2002/Ams:2015**

Date of issue: Bellaterra, October 7, 2021



Fernando Rivas Fernández
Technical Manager
Electrical and Electronics
LGAI Technological Center S.A.

The results refer only and exclusively to the sample, product or material delivered for testing in "Received Material" section above.
The equipment has been tested under conditions stipulated by standard(s) quoted in this document.
The document will not be reproduced otherwise than in full.
This is the first page of the document, which consists of 46 pages.

LGAI Technological center, S.A. Inscrita en el Registro Mercantil de Barcelona, Tomo 35.803, Folio1, Hoja NºB-266.627 Inscripción 1ª. C.I.F. A-63207492

INDEX

1. EQUIPMENT RECEIVED AND TESTED

Equipment: CUBE4 series UPS			
Brand:	SALICRU	**Model:**	SLC-80-CUBE4
S/N:	0000448743	**Power Supply:**	400 V 3ph 50/60 Hz
SW:	--	**HW:**	--

DUT information:
(Information declared by the manufacturer, Applus + is not responsible).

UPS classified as C3 according product standard, intended for second environment and industrial areas. Internal batteries supplied.

SLC-50-CUBE4, SLC-60-CUBE4 and SLC-80-CUBE4 have same structure and format.

SLC-50÷80-CUBE4

Test product reception:	May 10, 2021
Test initial date:	May 10, 2021
Test final date:	June 18, 2021

1.1. Test configuration

Power Supply:	400 V 3ph 50 Hz.
Set-up:	Floor standing.
Test exercise:	Equipment continuously working. DC Output voltage and current measured and operation mode checked on display.
Equipment size:	560 mm x 1665 mm x 920 mm Note: According product standard, C3 equipment classified for second environment.

1.2. Auxiliary and control equipment

The equipment under test does not have any auxiliary or control equipment.

1.3. Input/output wires

-Battery cable < 3m length
-AC Output cable
-AC Input cable

2. APPLICABLE STANDARDS

2.1. EMISSIONS TEST APPLICABLE STANDARDS

Test Plan Summary:	
Basic standard: CISPR 11:2015/A1:2016	
☒ Radio-frequency radiated emissions (30 MHz-1000 MHz)	Class: C3
Basic standard: CISPR 11:2015/A1:2016	
☒ Continuous conducted emissions (0.15-30 MHz) Note: AC input and Output port.	Class: C3
Basic standard: IEC 61000-3-11:2017	
☒ Voltage fluctuations emissions	Pst 1<, Plt 0,65<, Tmax 500 mS @3 %, dc 3,3 %, dmax
Basic standard: IEC 61000-3-12:2011 , *IEC 61000-2-2:2002	
☒ Harmonic current emissions	Class: A

2.1.1. Acceptance criteria for the emissions test

According to standard	***UNE-EN 62040-2:2018**
Limit	Table 2 for conducted emissions. Table 3 for radiated emissions

Table 2 – Limits of mains terminal and network port disturbance voltage for category C3 UPS in the frequency range 0,15 MHz to 30 MHz

UPS rated output current	Frequency range	Limits dB (μV)			
		Mains terminal		Network port	
A	MHz	Quasi-peak	Average	Quasi-peak	Average
> 16 to 100	0,15 to 0,50[b]	100	90	110 to 100[a]	94 to 84[a]
	0,50 to 5,0[b]	86	76	100	84
	5,0 to 30,0	90 to 73[a]	80 to 60[a]		
> 100	0,15 to 0,50[b]	130	120	110 to 100[a]	94 to 84[a]
	0,50 to 5,0[b]	125	115	100	84
	5,0 to 30,0	115	105		

[a] The limits decrease linearly with the logarithm of the frequency.
[b] The lower limit shall apply at the transition frequency.

Table 3 – Limits of radiated emission in the frequency range 30 MHz to 1 000 MHz

Frequency range MHz	Quasi-peak limits dB (μV/m)		
	Category C1 UPS	Category C2 UPS	Category C3 UPS
30 to 230[a]	30	40	50
230 to 1 000	37	47	60
[a] The lower limit shall apply at the transition frequency.			

According to standard **IEC 61000-3-12:2011**

Limit Table 3

Table 3 – Current emission limits for balanced three-phase equipment

Minimum R_{sce}	Admissible individual harmonic current I_h/I_{ref} [a] %				Admissible harmonic parameters %	
	I_5	I_7	I_{11}	I_{13}	THC/I_{ref}	$PWHC/I_{ref}$
33	10,7	7,2	3,1	2	13	22
66	14	9	5	3	16	25
120	19	12	7	4	22	28
250	31	20	12	7	37	38
≥350	40	25	15	10	48	46
The relative values of even harmonics up to order 12 shall not exceed 16/h %. Even harmonics above order 12 are taken into account in THC and $PWHC$ in the same way as odd order harmonics. Linear interpolation between successive R_{sce} values is permitted.						
[a] I_{ref} = reference current; I_h = harmonic current component.						

According to standard **IEC 61000-3-11:2017**

Limit Paragraph 5

Pst 1<, Plt 0,65<, Tmax 500mS @3%, dc 3,3%, dmax

2.2. IMMUNITY TESTS APPLICABLE STANDARDS

Test Plan Summary:	
Basic standard: IEC-61000-4-2:2008	
☒ Electrostatic discharge immunity	Level AC: ±8 kV Level DC ±4 kV
Basic standard: IEC 61000-4-3:2006/ISH1:2008	
☒ Electromagnetic field immunity.	Frequency range: 80 MHz-1000 MHz Severity: 10 V/m Modulation: 80% AM 1 kHz
Basic standard: IEC 61000-4-4:2012	
☒ Fast transients in burst immunity.	
☐ Severity level in signal and control ports	Severity: ±2 kV 5 kHz
☒ Severity level in ground terminal	Severity: ±2 kV 5 kHz
☒ Severity level in I/O port of AC power Supply	Severity: ±2 kV 5 kHz
Basic standard: IEC 61000-4-5:2014/Amd1:2017	
☒ Surge transients immunity.	
☐ Communications port if cable length >30m.	Common mode severity: ± 1 kV Differential mode severity: --
☒ AC supply ports.	Common mode severity: ±2 kV Differential mode severity: ±1 kV
Basic standard: IEC 61000-4-6:2013/Corr1:2015	
☒ Current injections immunity.	
☐ Signal and control ports.	Severity: 10 V RMS
☒ AC Supply and access by ground terminal.	Severity: 10 V RMS
Basic standard: IEC 61000-4-8:2009	
☒ Magnetic field immunity	50 Hz 30 A/m
Basic standard: *IEC 61000-4-13:2002/Ams:2015, *IEC 61000-2-2:2002	
☒ Harmonics and inter-harmonics including mains signalling at A.C. power port, low frequency immunity tests	Class: 10 V between 140-360 Hz
According Table 1 of IEC 61000-2-2 Compatibility levels (applying level 3 of IEC 61000-4-3, all levels and frequencies are covered).	

2.2.1. Acceptance criteria for the immunity test

According to standard	***UNE-EN 62040-2:2018**
Section	6.2, table 4

Table 4 – Performance criteria for immunity tests

	Criterion A	Criterion B
External and internal indications and metering	Change only during test	Change only during test
Control signals to external devices	No change	Change only temporarily in consistency with the actual UPS mode of operation
Mode of operation[a]	No change	Change only temporarily
[a] At all times, the UPS shall remain within the performance classification as declared by the UPS manufacturer (see IEC 62040-3:2011).		

The tests shall be made with the UPS in the following conditions:

a) rated input voltage;

b) normal mode(s) of operation;

c) linear load at rated active output power or at light load according to IEC 62040-3:2011.

The UPS shall be specified with the proper level in case of different levels of performance criteria.

2.3. Measuring uncertainties	
Radio-frequency radiated emissions:	± 4.3 dB
Continuous conducted emissions:	± 2.1 dB
Electrostatic discharges immunity:	± 1.65 dB
Electromagnetic field immunity:	± 2.45 dB
Fast transients in burst immunity:	± 1.3 dB
Surge transients immunity:	± 1.3 dB
Current injections immunity:	± 1.7 dB
Low frequency magnetic field immunity	± 1.,01 dB
Inter-harmonics immunity	± 0.8 dB

Expanded uncertainty measurement is obtained multiplying the typical uncertainty measurement with a coverage factor k=2, which corresponds to a confidence level of 95% for a normal distribution.

2.4. USED EQUIPMENT

RADIO-FREQUENCY RADIATED EMISSIONS			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESU 40	1041155
TRILOG ANTENNA	SCHWARZBECK	VULB 9165	104375
ATTENUATOR 3dB	HUBER+SUHNER	6803.17.B	1042016
RF CABLE (Ferrites Cable)	ER+SUHNER	CLR67 NANA 10000 P01 FR	1042114
RF PREAMPLIFIER	BONN ELEKTRONIK	BLNA 0110-01N	1041351
DC BLOCK	WEINSCHEL	WA6043	1042486
RF CABLE (Short Cable)	REDISLOGAR	SF104	1042328
RF CABLE (Wall panel)	-	-	1041305
RF CABLE (Control Room)	HUBER+SUHNER	SF103/11N/16N/4000MM	1041911
SEMIANECHOIC CHAMBER SAC0	TDK	TC0	104380
TEST SOFTWARE	ROHDE & SCHWARZ	EMC32 v.10.50.00	104624
MAST-TABLE CONTROLLER	MATURO	NCD/052/8931211	1041952
ANTENNA TOWER	MATURO	-	--
TURNABLE	MATURO	--	--

CONTINUOUS CONDUCTED EMISSIONS			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
EMI RECEIVER	RHODE & SCHWARZ	ESCS30	104952
LISN	RHODE & SCHWARZ	NNLK 8121	104025
TRANSIENT LIMITER	SCHWARZBECK	VTSD 9561-F	1042102
SEMIANECHOIC CHAMBER SAC0	TDK	TC0	104380
TEST SOFTWARE	ROHDE & SCHWARZ	EMC32 v.10.50.00	104624

ELECTROSTATIC DISCHARGE IMMUNITY			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
ESD GENERATOR	HAEFLEY	ONIX	1041978

ELECTROMAGNETIC FIELD IMMUNITY			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
SEMIANECHOIC CHAMBER	TDK	TC0 TEST CHAMBER	104380
POWER AMPLIFIER	AR	1000W1000M12	104151
SIGNAL GENERATOR	ROHDE & SCHWARZ	SMB-100A	1041117
POWER METER	ROHDE & SCHWARZ	NRP2	1041240
POWER METER SENSOR	ROHDE & SCHWARZ	NRP-Z91	1041116
POWER METER SENSOR	ROHDE & SCHWARZ	NRP-Z91	1041115
OPEN SWITCH AND CONTROL UNIT	ROHDE & SCHWARZ	0SP220	--
DIRECTIONAL COUPLER	ROHDE & SCHWARZ	DDC25-BC60	1042393
LOG PERIODIC ANTENNA	EMC AUTOMATION	LPD80	104457
TEST SOTFWARE	ROHDE & SCHWARZ	EMC32 v.10.50.00	104624
COMPUTER SYSTEM (CONTROLER)	HP	HP-ProBook 640 G2	6921
TURN TABLE	HD	DT 470	104379
TURN TABLE CONTROLLER	MATURO	NCD/052/8931211	--
RF CABLE	SPANTECH	TRU-14221-39 mfd 1911	1042324
E-FIELD PROBE	NARDA	EP601	1041797

FAST TRANSIENTS IN BURST IMMUNITY			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
FAST TRANSIENT/BURST GENERATOR	SCHAFFNER	NSG 2025	104019
COUPLING CLAMP	SCHAFFNER	CDN 126	104043

SURGE TRANSIENTS IMMUNITY (1,2/50)			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
IMPULSE SURGE PLATFORM	HAEFELY TECHNOLOGY	PSurge 8000 + PIM 100	104888
CDN	HAEFELY TECHNOLOGY	PCD 130	104889

SURGE TRANSIENTS IMMUNITY (1,2/50)			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
IMPULSE SURGE PLATFORM	HAEFELY TECHNOLOGY	PSURGE800+PIM100	104888
CDN	HAEFELY TECHNOLOGY	PDC 130	104889
CDN	HAEFELY TECHNOLOGY	PCD 126	104908

CURRENT INJECTIONS IMMUNITY			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
SIGNAL GENERATOR	R&S	SMB100A	1041781
ATTENUATOR	BIRD	150-A-MFN-06	1041645
AMPLIFIER	EMC AUTOMATION	EA4937	104124
CLAMP	LÜTHI	EM101	1041244
POWER METER	R&S	NRP	1041114
TEST SOFTWARE	ROHDE & SCHWARZ	EMC32 v.10.50.00	104624

VOLTAGE VARIATIONS IMMUNITY, HARMONIC EMISSIONS, FLICKER EMISSSIONS			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
AIP (Line Impedance Simulation Net)	SPITZENBERGER & SPIES	AIP 75/3/P/JK	1041157
FUENTE DE ALIMENTACIÓN	SPITZENBERGER & SPIES	PAS 45000	--
TEST SOFTWARE	SPS EMC	4.1.1	--

MAGNETIC FIELD IMMUNITY			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
MAGNETIC FIELD PROBE	COMBINOVA	MFM 10	104023
AC Power supply	SCHAFFNER	PACIFIC	101933
INDUCTION COIL	SCHAFFNER	888-0239	05-ER-355

AUXILIARY EQUIPMENT			
INSTRUMENT	**BRAND**	**MODEL**	**NUMBER**
THERMOHIGROMETER	PCE	THB 40	1042022
MULTIMETER*	FLUKE	115	1041346

2.5. Environmental conditions

See results sheets.

3. RESULT

PRODUCT: CUBE4 series UPS			
Brand:	SALICRU	**Model:**	SLC-80-CUBE4
S/N:	0000448743	**Power Supply:**	400 V 3ph 50 Hz

EMISSION TESTING	RESULTS	NOTES
Radio-frequency radiated emissions.	Pass	Note: 4
Continuous conducted emissions.	Pass	Note: 4
Harmonic current emissions	Pass	Note: 4
Flicker emissions	Pass	Note: 4

The criteria to give conformity in those cases where it is not implicit in the standard or specification will be, for EMC emissions tests, a non-simple binary decision rule will be followed with a safety zone equal to the value of the uncertainty (w = U).
In this case, the upper limit of the value of the probability of false acceptance, according to ILAC G8, is 2.5% and the criteria notes are:

1: The measured results are above the upper limit, even considering the uncertainty interval**.**
2: The measured results are above the specified limits, but within the uncertainty interval. It is therefore not possible to state compliance based on the 95% level of confidence. However, the results indicate that non-compliance is more probable than compliance
3: The measured results are below the specified limits, but within the uncertainty interval. It is therefore not possible to state compliance based on the 95% level of confidence. However, the results indicate that compliance is more probable than non-compliance
4: The measured results are within the limits, including the uncertainty interval.

IMMUNITY TESTING	RESULTS	REQUIRED CRITERIA
Electrostatic discharges immunity.	Pass (A)	Criteria: B
Electromagnetic field immunity.	Pass (A)	Criteria: A
Fast transients in burst immunity.	Pass (A)	Criteria: B
Surge transients immunity.	Pass (A)	Criteria: B
Current injections immunity.	Pass (A)	Criteria: A
Voltage variations immunity.	Pass (A)	Criteria: A
Inter harmonics immunity	Pass (A)	Criteria: A
Magnetic fied immunity	Pass (A)	Criteria: A

The criteria to give conformity in those cases where it is not implicit in the standard or specification will be, for EMC immunity tests, a simple binary decision rule will be followed where the upper limit of the value of the probability of false acceptance or false rejection, according to ILAC G8, is 50%.

Service Quality Assurance

Applus+, guarantees that this work has been made in accordance with our Quality and Sustainability System, fulfilling the contractual conditions and legal norms.

Within our improvement program we would be grateful if you would send us any commentary that you consider opportune, to the person in charge who signs this document, or to the Quality Manager of Applus+, in the following e-mail address: satisfaccion.cliente@applus.com

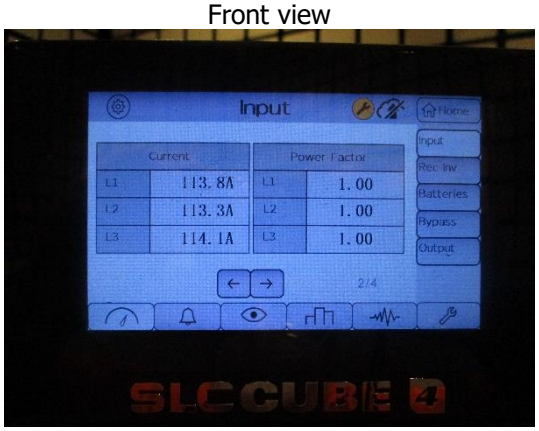
4. ANNEXES

4.1. Identification pictures

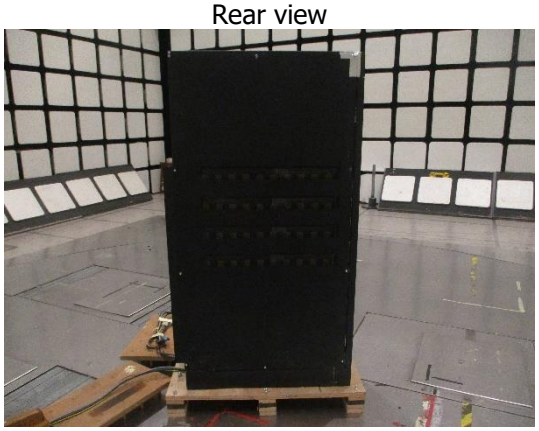
General view

Front view

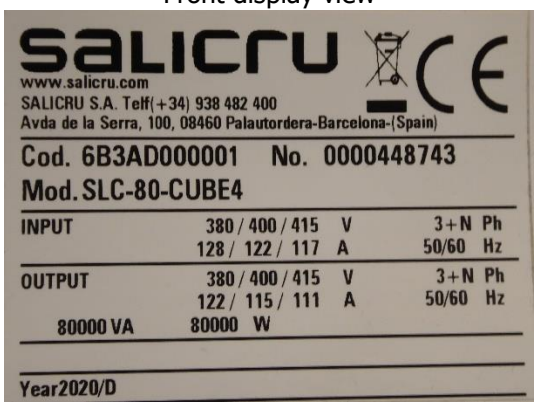
Rear view



Front display view



Lateral view



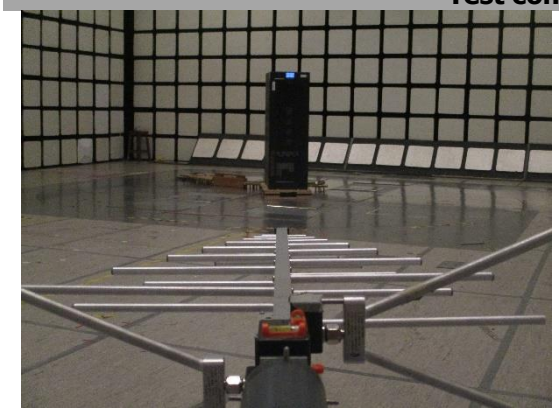
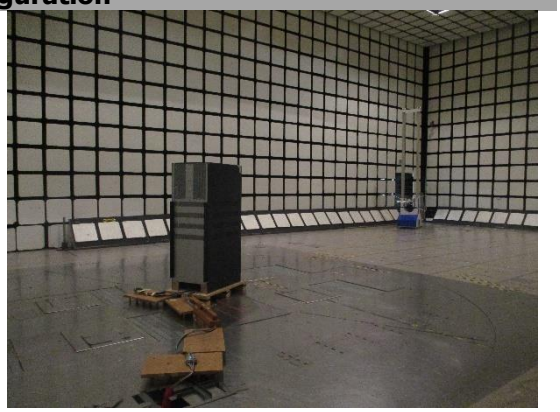
Applus identifier label (definitive label model)

Factory Identifier label (tested equipment)

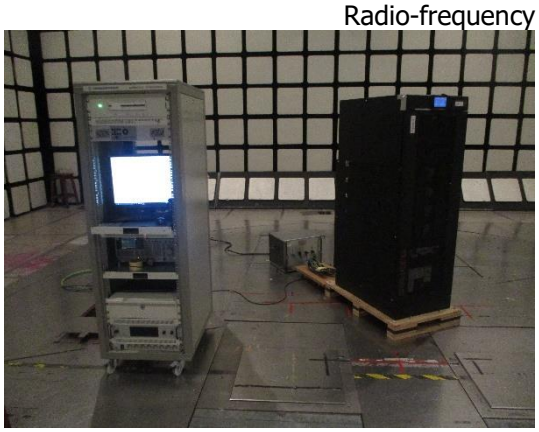
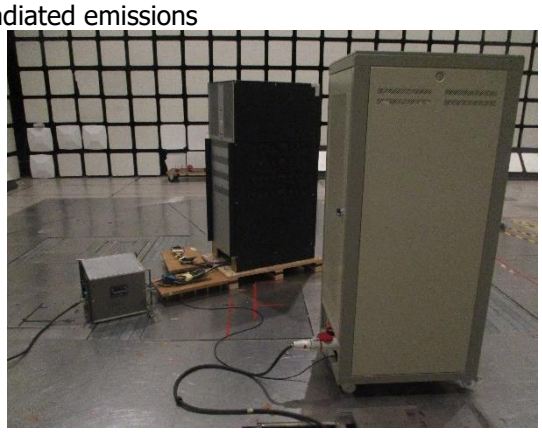
ID: 10950/1
Cliente: SALICRU
SLC CUBE4 3/3 80kVA+291820C03344
Fecha de entrada
2021-05-10

Applus identifier label

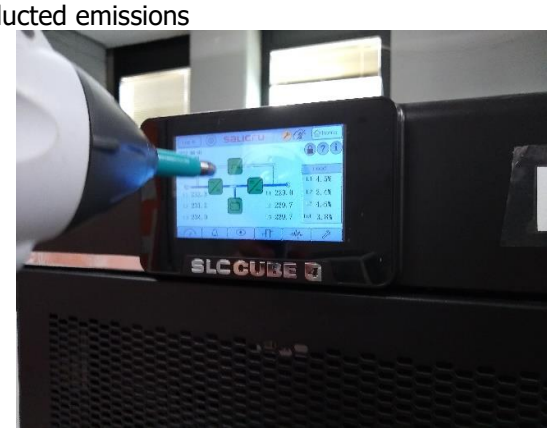
Test configuration

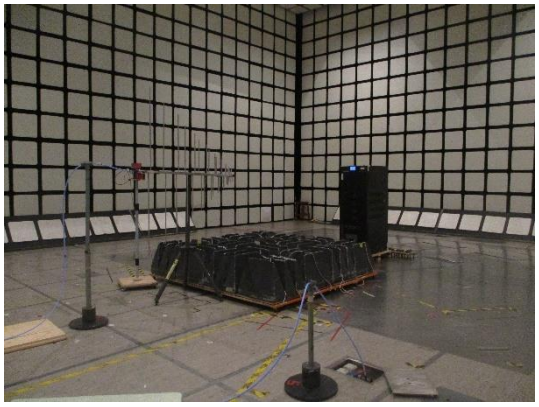
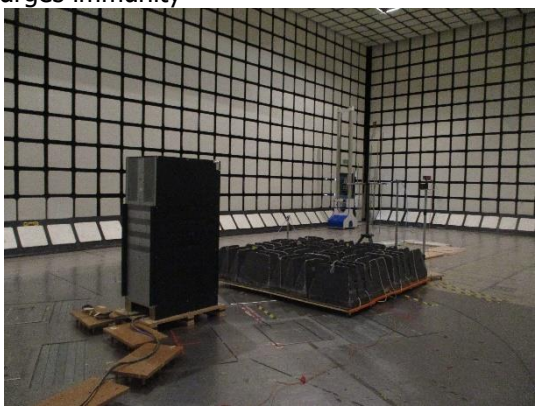
Radio-frequency radiated emissions

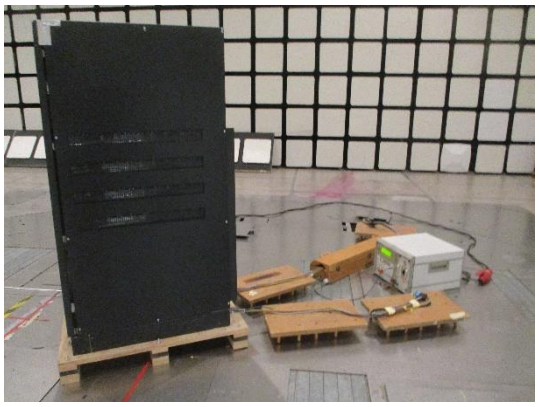
Continuous conducted emissions

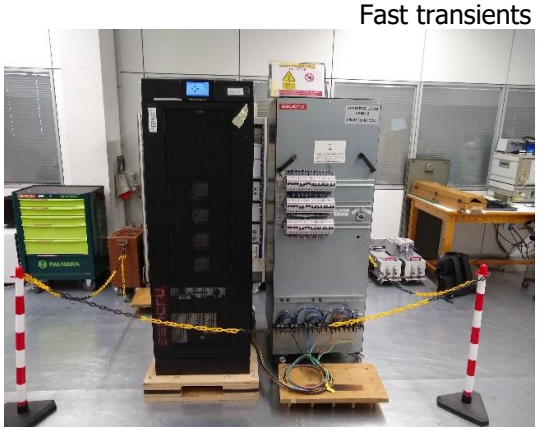
Electrostatic discharges immunity

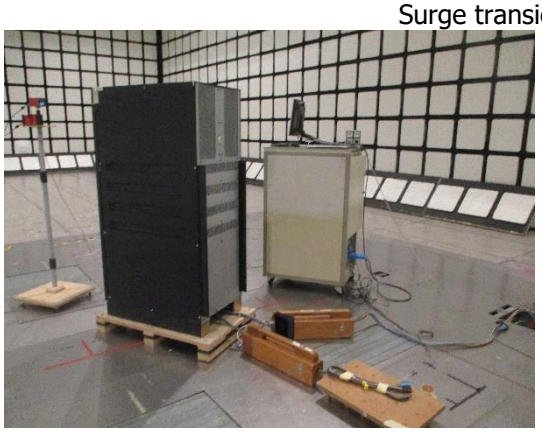
Electromagnetic field immunity 80 MHz to 1 GHz




Fast transients in burst immunity

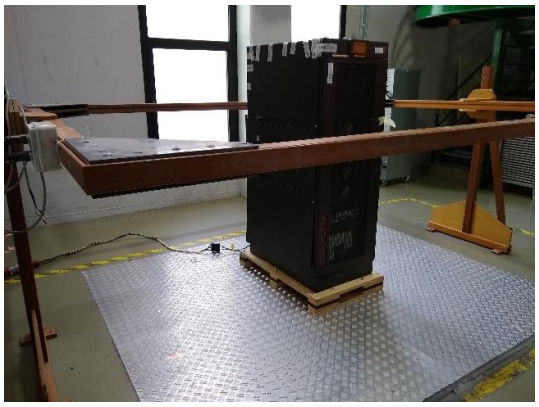



Surge transients immunity




Current injections immunity


Voltage variations immunity, flicker emissions and harmonic current emissions



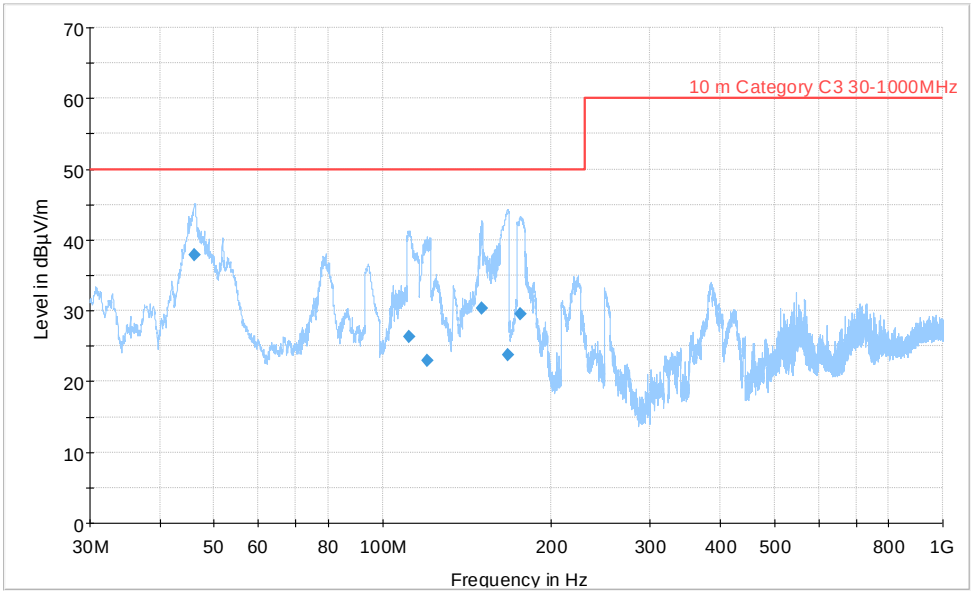

Magnetic field immunity

4.2. Results Details

RADIO-FREQUENCY RADIATED EMISSIONS					
Technician: J.J.Peramos			**Frequency range:** 30 MHz – 1 GHz		
Test date: 2021-05-10			**Test Area:** Semi-Anechoic chamber, SAC-0		
Basic standard: CISPR 11:2015					
Temperature: 22.1 ºC **Humidity:** 61.3 % **Atm. Pressure:** 1006.6 hPa					
EUT:	**Class**	**Test Area**	**Distance**	**PreScan**	**Evaluation**
Floor standing	C3	SAC-0	10 m	4 faces	Individual
RESULTS: Pass					
Identification		**Emissions**		**Main emission source and type**	
DUT: Device under test AUX: Auxiliary Devices SYS: DUT + AUX BB: Broad-band NB: Narrow-band QP: Quasi-peak		QP < Limit - I I=Uncertainty		DUT, BB	
Comments					
Emission Level = Measured Level + Correction Factor					

RADIO-FREQUENCY RADIATED EMISSIONS II

PRESCAN MODE 1 30 MHz – 1 GHz



FINAL MEASUREMENTS

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
46.110	38.96	50.00	11.04	200.0	V	324.0	-26.9	BB
111.330	27.35	50.00	22.65	155.0	V	178.0	-27.6	BB
120.270	23.88	50.00	26.12	263.0	H	0.0	-26.5	BB
150.510	31.39	50.00	18.61	400.0	H	275.0	-20.4	BB
166.920	24.79	50.00	25.21	100.0	V	196.0	-19.5	BB
176.160	30.51	50.00	19.49	400.0	V	193.0	-22.1	BB

Comments:

CONTINUOUS CONDUCTED EMISSIONS	
Technician: Alfredo Plans	**Test Area:** Semi-Anechoic chamber, SAC-0
Test date: 2021-05-10	
Basic standard: CISPR 11:2015	

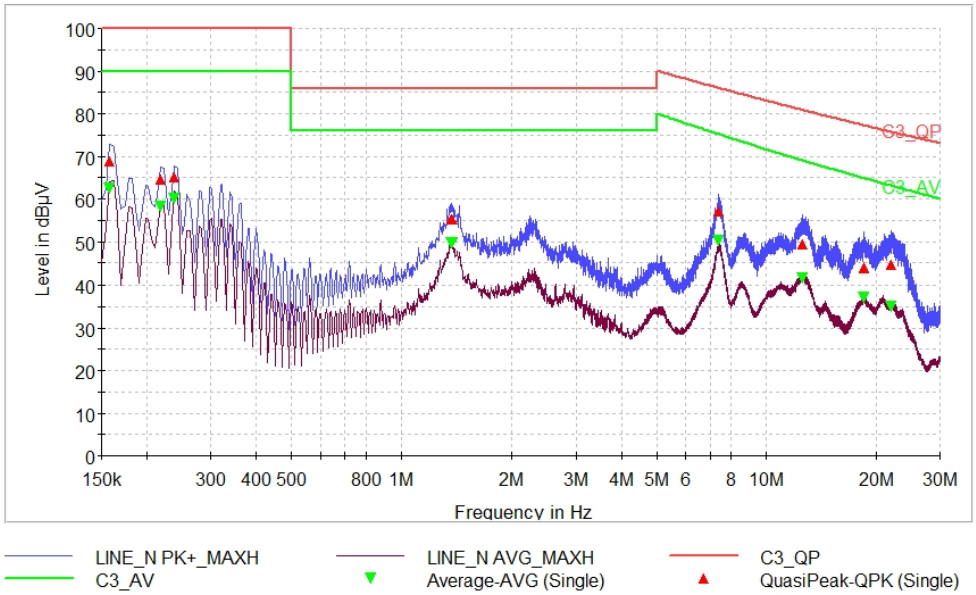
Temperature:	22.0	ºC
Humidity:	56.9	%
Atm. Pressure:	1005.3	hPa

CONTINUOUS CONDUCTED EMISSIONS	
Supply	
Mains Supply	
T. in power Supply: (dBµV)	Pass Vpeak < lim AVG
Source and type of the most important emissions	
Source: Device under test	**Type:** Broad Band
RESULTS: Pass	
Comments:	

CONTINUOUS CONDUCTED EMISSIONS II

LINE NEUTRAL

AC INPUT PORT PRESCAN



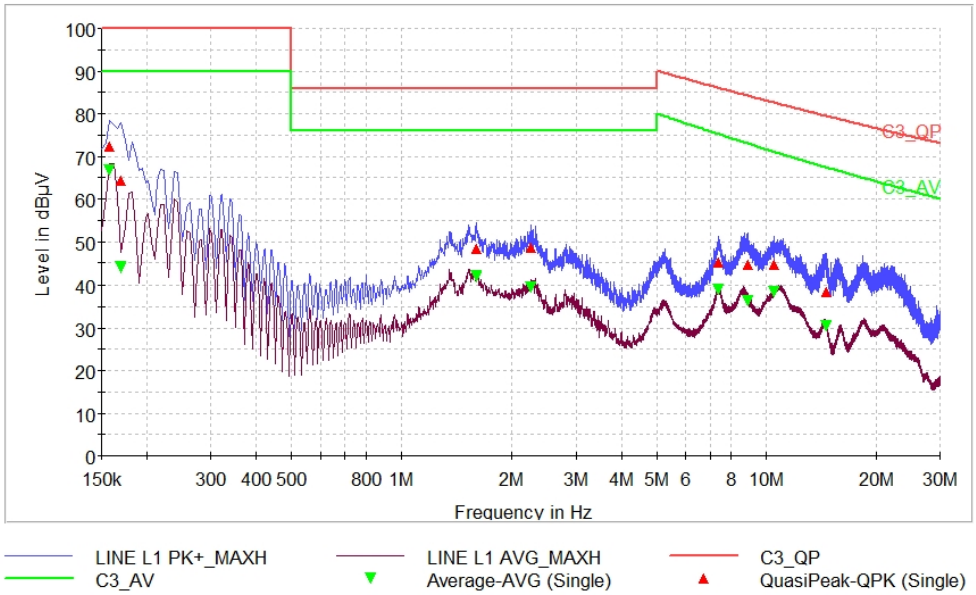
FINAL MEASUREMENTS

Frequency (MHz)	QuasiPeak (dBµV)	Limit - QPK (dBµV)	Margin - QPK (dB)	Average (dBµV)	Limit - AVG (dBµV)	Margin - AVG (dB)	Line	Corr. (dB)
0.158	68.8	100.0	31.2	62.4	90.0	27.6	N	10.2
0.218	64.5	100.0	35.5	58.2	90.0	31.8	N	10.2
0.238	65.0	100.0	35.0	59.9	90.0	30.1	N	10.2
1.378	55.2	86.0	30.8	49.6	76.0	26.4	N	10.3
7.410	57.0	86.0	29.0	50.3	75.1	24.8	N	10.6
12.610	49.2	80.8	31.6	41.5	69.0	27.5	N	10.7
18.594	44.1	77.2	33.1	37.0	64.8	27.8	N	10.9
21.978	44.5	75.7	31.2	34.9	63.1	28.2	N	11.0

CONTINUOUS CONDUCTED EMISSIONS II

LINE L1

AC INPUT PORT PRESCAN



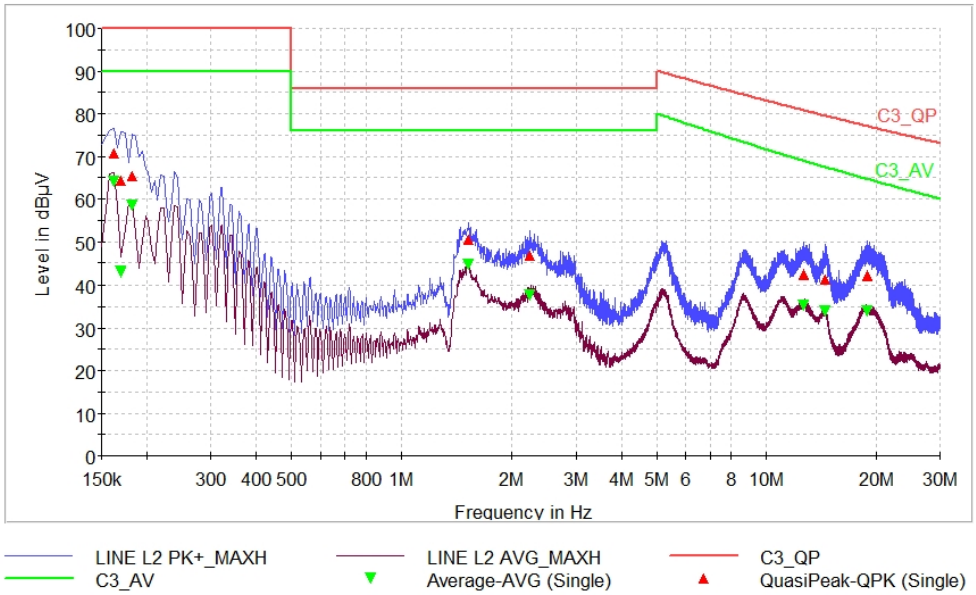
FINAL MEASUREMENTS

Frequency (MHz)	QuasiPeak (dBµV)	Limit - QPK (dBµV)	Margin - QPK (dB)	Average (dBµV)	Limit - AVG (dBµV)	Margin - AVG (dB)	Line	Corr. (dB)
0.158	72.2	100.0	27.8	66.6	90.0	23.4	L1	10.2
0.170	64.2	100.0	35.9	44.1	90.0	45.9	L1	10.2
1.602	48.3	86.0	37.7	41.8	76.0	34.2	L1	10.4
2.258	48.4	86.0	37.6	39.4	76.0	36.6	L1	10.4
7.378	45.1	86.0	40.9	38.8	75.2	36.3	L1	10.6
8.890	44.5	84.1	39.7	36.3	72.9	36.6	L1	10.6
10.470	44.5	82.6	38.0	38.5	71.0	32.6	L1	10.7
14.654	38.5	79.4	40.9	30.3	67.3	37.0	L1	11.0

CONTINUOUS CONDUCTED EMISSIONS III

LINE L2

AC INPUT PORT PRESCAN



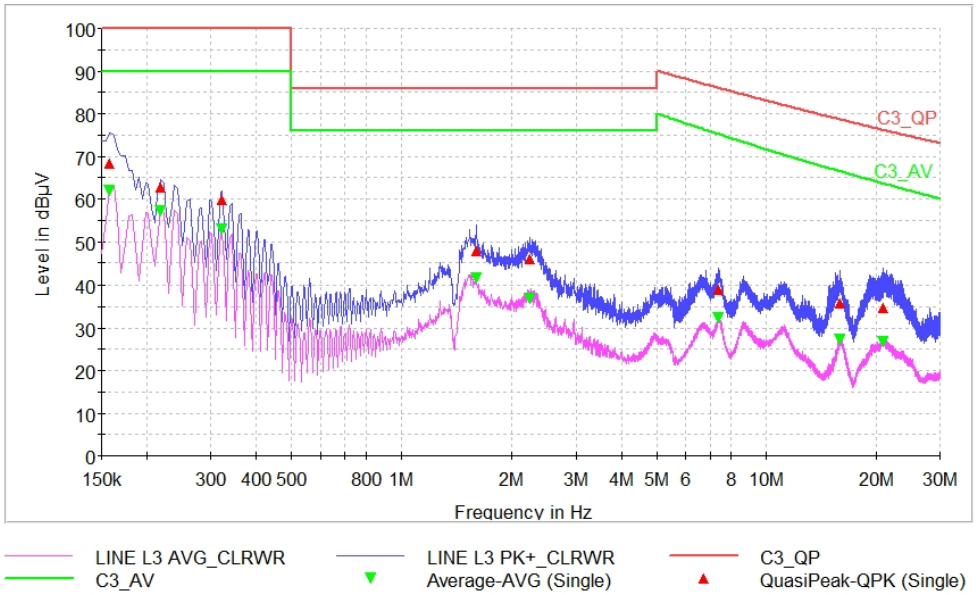
FINAL MEASUREMENTS

Frequency (MHz)	QuasiPeak (dBµV)	Limit - QPK (dBµV)	Margin - QPK (dB)	Average (dBµV)	Limit - AVG (dBµV)	Margin - AVG (dB)	Line	Corr. (dB)
0.162	70.8	100.0	29.2	64.0	90.0	26.0	L2	10.2
0.170	64.3	100.0	35.7	42.9	90.0	47.1	L2	10.2
0.182	65.3	100.0	34.7	58.3	90.0	31.7	L2	10.2
1.518	50.4	86.0	35.6	44.5	76.0	31.5	L2	10.3
2.238	46.7	86.0	39.3	37.5	76.0	38.5	L2	10.3
12.650	42.4	80.7	38.3	35.1	68.9	33.8	L2	10.8
14.498	41.3	79.5	38.1	33.9	67.4	33.5	L2	10.9
18.946	42.1	77.0	34.9	33.9	64.6	30.7	L2	10.9

CONTINUOUS CONDUCTED EMISSIONS IV

LINE L3

AC INPUT PORT PRESCAN



FINAL MEASUREMENTS

Frequency (MHz)	QuasiPeak (dBµV)	Limit - QPK (dBµV)	Margin - QPK (dB)	Average (dBµV)	Limit - AVG (dBµV)	Margin - AVG (dB)	Line	Corr. (dB)
0.158	68.4	100.0	31.6	61.8	90.0	28.2	L3	10.1
0.218	62.7	100.0	37.3	57.1	90.0	32.9	L3	10.1
0.322	59.9	100.0	40.1	52.7	90.0	37.3	L3	10.1
1.598	47.7	86.0	38.3	41.5	76.0	34.5	L3	10.2
2.242	45.9	86.0	40.1	36.8	76.0	39.2	L3	10.2
7.,370	38.9	86.0	47.1	32.3	75.2	42.9	L3	10.4
15.926	35.8	78.6	42.8	27.2	66.4	39.2	L3	10.7
20.986	34.8	76.1	41.3	26.6	63.5	36.9	L3	10.9

VOLTAGE FLUCTUATIONS EMISSION

Technician: Andreu Tey **Test Area:** Ground plane

Test date: 2021-06-04

Basic standard: IEC 61000-3-11:2017

Temperature:	23.5	ºC
Humidity:	58.9	%
Atm. Pressure:	1002.1	hPa

RESULTS: Pass

Line - R

Test conditions: EN 61000-3-11:2019 / 230 V / 50 Hz / Phase L1
EN 61000-4-15:2011 / d(t) = 1.8 % / Obs 1 x 10 min / Ztest (0.025+j0.250) Ohm
Ra+jXa (0.0150+j0.1500) Ohm / Rn+jXn (0.0100+j0.1000) Ohm

FLICKER (EN 61000-3-11 recalculated to Zref): Test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
08:41:05	1.378	0.3417	0.3417	0.000	-0.957	-0.638	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.341693								
Evaluated: PST, dc, dmax, Tmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
08:41:05	0.001	0.0270	- . - - - -	0.000	+0.000	- . - - -	X	
Plt: 0.027000								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with SPS EMC 4.4.3 / PAS15000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021

Comments:

VOLTAGE FLUCTUATIONS EMISSION II

Line – S

Test conditons: EN 61000-3-11:2019 / 230 V / 50 Hz / Phase L2
EN 61000-4-15:2011 / d(t) = 1.8 % / Obs 1 x 10 min / Ztest (0.025+j0.250) Ohm
Ra+jXa (0.0150+j0.1500) Ohm / Rn+jXn (0.0100+j0.1000) Ohm

FLICKER (EN 61000-3-11 recalculated to Zref): Test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
08:53:08	4.288	0.3849	0.3849	0.000	-1.690	-0.957	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.384874							X	
Evaluated: PST, PLT, Sliding PLT, dc, dmax, Tmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
08:53:08	0.015	0.0860	- . - - - -	0.000	+0.000	- . - - -	X	
Plt: 0.086000								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with SPS EMC 4.4.3 / PAS15000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021

VOLTAGE FLUCTUATIONS EMISSION III

Line – T

Test conditions: EN 61000-3-11:2019 / 230 V / 50 Hz / Phase L3
EN 61000-4-15:2011 / d(t) = 1.8 % / Obs 1 x 10 min / Ztest (0.025+j0.250) Ohm
Ra+jXa (0.0150+j0.1500) Ohm / Rn+jXn (0.0100+j0.1000) Ohm

FLICKER (EN 61000-3-11 recalculated to Zref): Test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
09:06:35	1.842	0.3586	0.3586	0.000	-1.577	+0.901	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.358590							X	
Evaluated: PST, PLT, Sliding PLT, dc, dmax, Tmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
09:06:35	0.015	0.0860	- . - - - -	0.000	+0.000	- . - - -	X	
Plt: 0.086000								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with SPS EMC 4.4.3 / PAS15000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021

HARMONIC CURRENT EMISSION

Technician: Andreu Tey **Test Area:** Ground plane

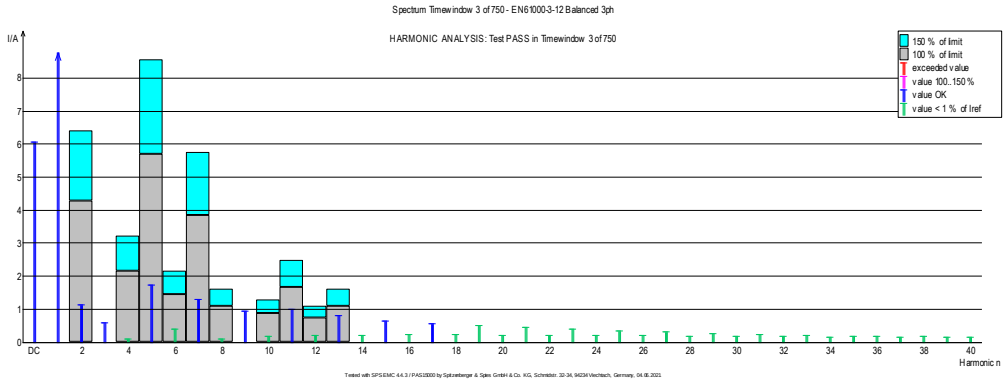
Test date: 2021-06-04

Basic standard: IEC 61000-3-12:2011

Temperature:	23.5	ºC
Humidity:	58.9	%
Atm. Pressure:	1002.1	hPa

RESULTS: Pass

Line - R



Comments:

HARMONIC CURRENT EMISSION II

Maximum RMS current and corresponding values in timewindow 14:

Voltage:	230.71 Vrms		THD=0.07 %	THV=0.154 V	POHV=0.074 V	PWHD=0.25 %
Current:	53.283 Arms		THD=5.99 %	THC=3.165 A	POHC=0.000 A	PWHD=6.77 %
Power:	12176.4 W	P1=12176.8 W	12292.9 VA		THC/Iref=5.95%	
Power factor:	0.991	CosPhi1: 0.999			PWHC/Iref=6.72%	

Test conditions: EN 61000-3-12:2011, f=50 Hz, Phase=L1, Range=80.00 A
Time window=10/12 (200ms), Grouping (>2nd harm.)=on, Iequ=53.161 A, Rated Rsce=33
No Ztest selected, Inserted reactor impedance: --
harmonic currents < 1 % of Iref are disregard for calc. of THD, THC, POHC, PWHD, PWHC

HARMONIC ANALYSIS: Test PASS
Tobs = worst 2.5 min: tw 1..750; Avg: THC/Iref=6.0 %, PWHC/Iref=8.1 % (Limits: THC/Iref=13.0 %, PWHC/Iref=22.0 %); Iavg=53.161 Arms; Iref is set to Iequ

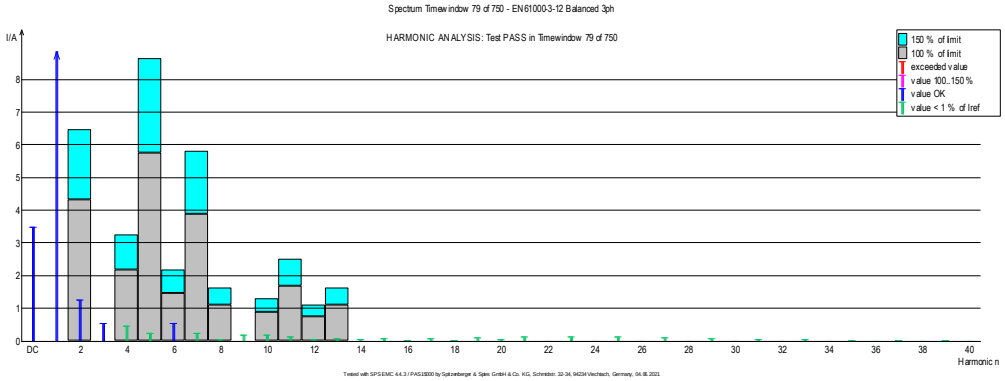
Ha	Entire measurement (2.5 min = 750 time windows)						Worst 2.5 min		Worst 2.5 min avg		PASS	FAIL
	Maximum	Window	EN61000-3-12 Balanced 3ph	Margin in MaxWin	100 to 150%	Exceeded	100 to 150%	Exceeded	Value	Exceeded		
DC	-6.2721 A	236	-.- - - -	- - - . -	0	0	0	0	-6.1332 A	0	--	
1	52.8161 A	14	-.- - - -	- - - . -	0	0	0	0	52.6882 A	0	X	
2	1.1651 A	3	4.2529 A	-72.6 %	0	0	0	0	1.1091 A	0	X	
3	0.7170 A	400	-.- - - -	- - - . -	0	0	0	0	0.6166 A	0	X	
4	0.1845 A	216	2.1264 A	-91.3 %	0	0	0	0	0.1253 A	0	X	
5	1.8770 A	140	5.6882 A	-67.0 %	0	0	0	0	1.8057 A	0	X	
6	0.4699 A	588	1.4176 A	-66.9 %	0	0	0	0	0.4241 A	0	X	
7	1.3630 A	620	3.8276 A	-64.4 %	0	0	0	0	1.3213 A	0	X	
8	0.1681 A	179	1.0632 A	-84.2 %	0	0	0	0	0.1082 A	0	X	
9	1.0085 A	500	-.- - - -	- - - . -	0	0	0	0	0.9628 A	0	X	
10	0.2366 A	175	0.8506 A	-72.2 %	0	0	0	0	0.2040 A	0	X	
11	1.0395 A	705	1.6480 A	-36.9 %	0	0	0	0	1.0122 A	0	X	
12	0.2536 A	132	0.7088 A	-64.2 %	0	0	0	0	0.2286 A	0	X	
13	0.8502 A	54	1.0632 A	-20.0 %	0	0	0	0	0.8136 A	0	X	
14	0.2349 A	199	-.- - - -	- - - . -	0	0	0	0	0.2110 A	0	X	
15	0.7184 A	661	-.- - - -	- - - . -	0	0	0	0	0.6830 A	0	X	
16	0.2826 A	195	-.- - - -	- - - . -	0	0	0	0	0.2575 A	0	X	
17	0.6133 A	175	-.- - - -	- - - . -	0	0	0	0	0.5950 A	0	X	
18	0.2694 A	68	-.- - - -	- - - . -	0	0	0	0	0.2552 A	0	X	
19	0.5477 A	161	-.- - - -	- - - . -	0	0	0	0	0.5350 A	0	X	
20	0.2539 A	737	-.- - - -	- - - . -	0	0	0	0	0.2420 A	0	X	
21	0.4842 A	69	-.- - - -	- - - . -	0	0	0	0	0.4677 A	0	X	
22	0.2474 A	615	-.- - - -	- - - . -	0	0	0	0	0.2399 A	0	X	
23	0.4225 A	127	-.- - - -	- - - . -	0	0	0	0	0.4129 A	0	X	
24	0.2467 A	750	-.- - - -	- - - . -	0	0	0	0	0.2332 A	0	X	
25	0.3756 A	495	-.- - - -	- - - . -	0	0	0	0	0.3655 A	0	X	
26	0.2281 A	630	-.- - - -	- - - . -	0	0	0	0	0.2206 A	0	X	
27	0.3324 A	255	-.- - - -	- - - . -	0	0	0	0	0.3217 A	0	X	
28	0.2165 A	324	-.- - - -	- - - . -	0	0	0	0	0.2070 A	0	X	
29	0.2937 A	670	-.- - - -	- - - . -	0	0	0	0	0.2862 A	0	X	
30	0.2090 A	177	-.- - - -	- - - . -	0	0	0	0	0.1999 A	0	X	
31	0.2686 A	243	-.- - - -	- - - . -	0	0	0	0	0.2627 A	0	X	
32	0.2012 A	258	-.- - - -	- - - . -	0	0	0	0	0.1962 A	0	X	
33	0.2285 A	249	-.- - - -	- - - . -	0	0	0	0	0.2207 A	0	X	
34	0.1999 A	445	-.- - - -	- - - . -	0	0	0	0	0.1920 A	0	X	
35	0.2164 A	515	-.- - - -	- - - . -	0	0	0	0	0.2110 A	0	X	
36	0.2018 A	524	-.- - - -	- - - . -	0	0	0	0	0.1955 A	0	X	
37	0.1910 A	70	-.- - - -	- - - . -	0	0	0	0	0.1871 A	0	X	
38	0.1958 A	516	-.- - - -	- - - . -	0	0	0	0	0.1897 A	0	X	
39	0.1719 A	419	-.- - - -	- - - . -	0	0	0	0	0.1693 A	0	X	
40	0.1938 A	248	-.- - - -	- - - . -	0	0	0	0	0.1877 A	0	X	

average value < 1.0 % of Iref

Tested with SPS EMC 4.4.3 / PAS15000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021

HARMONIC CURRENT EMISSION III

Line- S



HARMONIC CURRENT EMISSION IV

Maximum RMS current and corresponding values in timewindow 115:

Voltage:	230.44 Vrms		THD=0.03 %	THV=0.060 V	POHV=0.030 V	PWHD=0.07 %
Current:	53.793 Arms		THD=2.79 %	THC=1.496 A	POHC=0.000 A	PWHD=0.00 %
Power:	12351.1 W	P1=12351.2 W	12395.9 VA		THC/Iref=2.79%	
Power factor:	0.996	CosPhi1: 0.999			PWHC/Iref=0.00%	

Test conditions: EN 61000-3-12:2011, f=50 Hz, Phase=L2, Range=80.00 A
Time window=10/12 (200ms), Grouping (>2nd harm.)=on, Iequ=53.66 A, Rated Rsce=33
No Ztest selected, Inserted reactor impedance: --
harmonic currents < 1 % of Iref are disregard for calc. of THD, THC, POHC, PWHD, PWHC

HARMONIC ANALYSIS: Test PASS
Tobs = worst 2.5 min: tw 1..750; Avg: THC/Iref=2.7 % , PWHC/Iref=0.0 % (Limits: THC/Iref=13.0 % , PWHC/Iref=22.0 %); Iavg=53.660 Arms; Iref is set to Iequ

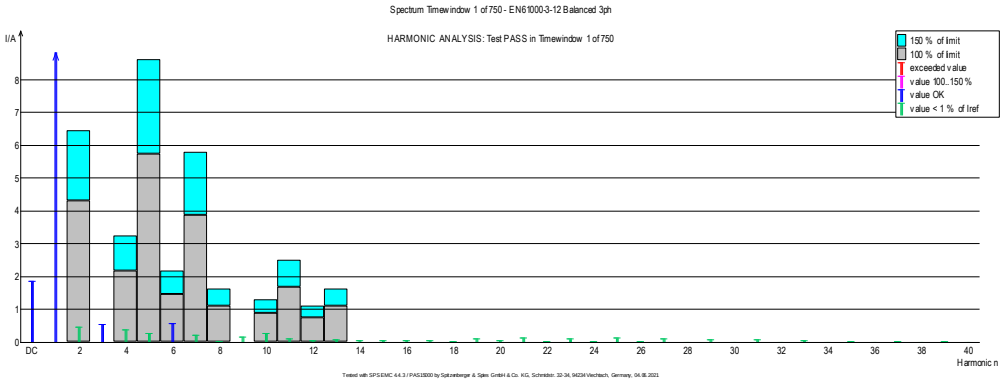
Ha	Entire measurement (2.5 min = 750 time windows)						Worst 2.5 min		Worst 2.5 min avg		PASS	FAIL
	Maximum	Window	EN61000-3-12 Balanced 3ph	Margin in MaxWin	100 to 150%	Exceeded	100 to 150%	Exceeded	Value	Exceeded		
DC	3.5985 A	202	-.- - - -	- - - . -	0	0	0	0	3.4671 A	0	--	
1	53.6543 A	115	-.- - - -	- - - . -	0	0	0	0	53.5220 A	0	X	
2	1.2772 A	79	4.2928 A	-70.2 %	0	0	0	0	1.2094 A	0	X	
3	0.5986 A	655	-.- - - -	- - - . -	0	0	0	0	0.5639 A	0	X	
4	0.6078 A	190	2.1464 A	-71.7 %	0	0	0	0	0.5174 A	0	X	
5	0.3000 A	641	5.7416 A	-94.8 %	0	0	0	0	0.2632 A	0	X	
6	0.6067 A	366	1.4309 A	-57.6 %	0	0	0	0	0.5673 A	0	X	
7	0.2590 A	535	3.8635 A	-93.3 %	0	0	0	0	0.2364 A	0	X	
8	0.0999 A	395	1.0732 A	-90.7 %	0	0	0	0	0.0692 A	0	X	
9	0.2054 A	70	-.- - - -	- - - . -	0	0	0	0	0.1718 A	0	X	
10	0.2067 A	313	0.8586 A	-75.9 %	0	0	0	0	0.1677 A	0	X	
11	0.1688 A	434	1.6635 A	-89.9 %	0	0	0	0	0.1481 A	0	X	
12	0.1530 A	174	0.7155 A	-78.6 %	0	0	0	0	0.1037 A	0	X	
13	0.1122 A	340	1.0732 A	-89.5 %	0	0	0	0	0.0924 A	0	X	
14	0.1169 A	29	-.- - - -	- - - . -	0	0	0	0	0.0670 A	0	X	
15	0.1101 A	186	-.- - - -	- - - . -	0	0	0	0	0.0991 A	0	X	
16	0.0612 A	367	-.- - - -	- - - . -	0	0	0	0	0.0324 A	0	X	
17	0.1354 A	238	-.- - - -	- - - . -	0	0	0	0	0.1113 A	0	X	
18	0.0471 A	268	-.- - - -	- - - . -	0	0	0	0	0.0341 A	0	X	
19	0.1397 A	727	-.- - - -	- - - . -	0	0	0	0	0.1274 A	0	X	
20	0.0737 A	109	-.- - - -	- - - . -	0	0	0	0	0.0466 A	0	X	
21	0.1607 A	115	-.- - - -	- - - . -	0	0	0	0	0.1475 A	0	X	
22	0.0396 A	141	-.- - - -	- - - . -	0	0	0	0	0.0255 A	0	X	
23	0.1638 A	562	-.- - - -	- - - . -	0	0	0	0	0.1561 A	0	X	
24	0.0251 A	5	-.- - - -	- - - . -	0	0	0	0	0.0172 A	0	X	
25	0.1525 A	85	-.- - - -	- - - . -	0	0	0	0	0.1376 A	0	X	
26	0.0214 A	360	-.- - - -	- - - . -	0	0	0	0	0.0165 A	0	X	
27	0.1217 A	81	-.- - - -	- - - . -	0	0	0	0	0.1087 A	0	X	
28	0.0203 A	217	-.- - - -	- - - . -	0	0	0	0	0.0160 A	0	X	
29	0.0996 A	297	-.- - - -	- - - . -	0	0	0	0	0.0915 A	0	X	
30	0.0330 A	340	-.- - - -	- - - . -	0	0	0	0	0.0242 A	0	X	
31	0.0850 A	66	-.- - - -	- - - . -	0	0	0	0	0.0755 A	0	X	
32	0.0227 A	524	-.- - - -	- - - . -	0	0	0	0	0.0123 A	0	X	
33	0.0775 A	1	-.- - - -	- - - . -	0	0	0	0	0.0664 A	0	X	
34	0.0184 A	62	-.- - - -	- - - . -	0	0	0	0	0.0136 A	0	X	
35	0.0588 A	156	-.- - - -	- - - . -	0	0	0	0	0.0516 A	0	X	
36	0.0136 A	88	-.- - - -	- - - . -	0	0	0	0	0.0097 A	0	X	
37	0.0544 A	478	-.- - - -	- - - . -	0	0	0	0	0.0449 A	0	X	
38	0.0266 A	131	-.- - - -	- - - . -	0	0	0	0	0.0222 A	0	X	
39	0.0553 A	6	-.- - - -	- - - . -	0	0	0	0	0.0480 A	0	X	
40	0.0206 A	167	-.- - - -	- - - . -	0	0	0	0	0.0161 A	0	X	

average value < 1.0 % of Iref

Tested with SPS EMC 4.4.3 / PAS15000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021

HARMONIC CURRENT EMISSION V

Line – T



HARMONIC CURRENT EMISSION VI

Maximum RMS current and corresponding values in timewindow 2:

Voltage:	230.58 Vrms		THD=0.02 %	THV=0.047 V	POHV=0.025 V	PWHD=0.06 %
Current:	53.614 Arms		THD=1.53 %	THC=0.820 A	POHC=0.000 A	PWHD=0.00 %
Power:	12339.2 W	P1=12339.3 W	12362.1 VA		THC/Iref=1.53%	
Power factor:	0.998	CosPhi1: 0.999			PWHC/Iref=0.00%	

Test conditions: EN 61000-3-12:2011, f=50 Hz, Phase=L3, Range=80.00 A
Time window=10/12 (200ms), Grouping (>2nd harm.)=on, Iequ=53.541 A, Rated Rsce=33
No Ztest selected, Inserted reactor impedance: --
harmonic currents < 1 % of Iref are disregard for calc. of THD, THC, POHC, PWHD, PWHC

HARMONIC ANALYSIS: Test PASS
Tobs = worst 2.5 min: tw 1..750; Avg: THC/Iref=1.4 %, PWHC/Iref=0.0 % (Limits: THC/Iref=13.0 %, PWHC/Iref=22.0 %); Iavg=53.541 Arms; Iref is set to Iequ

Ha	Entire measurement (2.5 min = 750 time windows)						Worst 2.5 min		Worst 2.5 min avg		PASS	FAIL
	Maximum	Window	EN61000-3-12 Balanced 3ph	Margin in MaxWin	100 to 150%	Exceeded	100 to 150%	Exceeded	Value	Exceeded		
DC	1.9123 A	16	-.----	---.-	0	0	0	0	1.7886 A	0	--	
1	53.5662 A	2	-.----	---.-	0	0	0	0	53.4976 A	0	X	
2	0.5246 A	77	4.2833 A	-87.8 %	0	0	0	0	0.4808 A	0	X	
3	0.5706 A	225	-.----	---.-	0	0	0	0	0.5494 A	0	X	
4	0.4409 A	61	2.1416 A	-79.4 %	0	0	0	0	0.3764 A	0	X	
5	0.3361 A	673	5.7289 A	-94.1 %	0	0	0	0	0.3091 A	0	X	
6	0.6026 A	1	1.4278 A	-57.8 %	0	0	0	0	0.5420 A	0	X	
7	0.2656 A	120	3.8550 A	-93.1 %	0	0	0	0	0.2397 A	0	X	
8	0.1070 A	172	1.0708 A	-90.0 %	0	0	0	0	0.0785 A	0	X	
9	0.1918 A	4	-.----	---.-	0	0	0	0	0.1515 A	0	X	
10	0.3091 A	727	0.8567 A	-63.9 %	0	0	0	0	0.2929 A	0	X	
11	0.1418 A	279	1.6598 A	-91.5 %	0	0	0	0	0.1186 A	0	X	
12	0.1026 A	109	0.7139 A	-85.6 %	0	0	0	0	0.0843 A	0	X	
13	0.1154 A	526	1.0708 A	-89.2 %	0	0	0	0	0.1009 A	0	X	
14	0.1396 A	189	-.----	---.-	0	0	0	0	0.0986 A	0	X	
15	0.1056 A	477	-.----	---.-	0	0	0	0	0.0897 A	0	X	
16	0.0860 A	236	-.----	---.-	0	0	0	0	0.0648 A	0	X	
17	0.0865 A	60	-.----	---.-	0	0	0	0	0.0744 A	0	X	
18	0.0701 A	454	-.----	---.-	0	0	0	0	0.0531 A	0	X	
19	0.1523 A	133	-.----	---.-	0	0	0	0	0.1407 A	0	X	
20	0.0714 A	277	-.----	---.-	0	0	0	0	0.0600 A	0	X	
21	0.1613 A	413	-.----	---.-	0	0	0	0	0.1485 A	0	X	
22	0.0627 A	103	-.----	---.-	0	0	0	0	0.0489 A	0	X	
23	0.1410 A	336	-.----	---.-	0	0	0	0	0.1321 A	0	X	
24	0.0641 A	459	-.----	---.-	0	0	0	0	0.0520 A	0	X	
25	0.1473 A	192	-.----	---.-	0	0	0	0	0.1415 A	0	X	
26	0.0361 A	11	-.----	---.-	0	0	0	0	0.0224 A	0	X	
27	0.1280 A	741	-.----	---.-	0	0	0	0	0.1165 A	0	X	
28	0.0170 A	398	-.----	---.-	0	0	0	0	0.0118 A	0	X	
29	0.0891 A	243	-.----	---.-	0	0	0	0	0.0795 A	0	X	
30	0.0194 A	216	-.----	---.-	0	0	0	0	0.0139 A	0	X	
31	0.0850 A	247	-.----	---.-	0	0	0	0	0.0778 A	0	X	
32	0.0200 A	660	-.----	---.-	0	0	0	0	0.0131 A	0	X	
33	0.0707 A	235	-.----	---.-	0	0	0	0	0.0646 A	0	X	
34	0.0127 A	210	-.----	---.-	0	0	0	0	0.0094 A	0	X	
35	0.0627 A	164	-.----	---.-	0	0	0	0	0.0548 A	0	X	
36	0.0206 A	1	-.----	---.-	0	0	0	0	0.0160 A	0	X	
37	0.0547 A	705	-.----	---.-	0	0	0	0	0.0478 A	0	X	
38	0.0220 A	381	-.----	---.-	0	0	0	0	0.0171 A	0	X	
39	0.0570 A	182	-.----	---.-	0	0	0	0	0.0527 A	0	X	
40	0.0164 A	576	-.----	---.-	0	0	0	0	0.0125 A	0	X	

average value < 1.0 % of Iref

Tested with SPS EMC 4.4.3 / PAS15000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021

ELECTROSTATIC DISCHARGE IMMUNITY I

Technician: Andreu Tey
Test date: 2021-06-16
Resistance value: 0.934MΩ

Test Area: Ground plane
Criteria: B

Basic standard: IEC-61000-4-2:2008:2008

Temperature:	23.0	ºC
Humidity:	59.6	%
Atm. Pressure:	997.8	hPa

Result: Pass

DC- Direct Contact, sharp tip	**IH**- Horizontal coupling, Sharp tip.
AC- Air Contact, round tip	**IV**- Vertical coupling, Sharp tip.

Point	Level	Discharges		Pol +/-	Application point	Results	Comments
		Nº	Type				
1	4 kV	25	IV	+ / -	0º Top	A	
2	4 kV	25	IV	+ / -	0º Bottom	A	
3	4 kV	25	IV	+ / -	90º Top	A	
4	4 kV	25	IV	+ / -	90º Bottom	A	
5	4 kV	25	IH	+ / -	180º Top	A	
6	4 kV	25	IH	+ / -	180º Bottom	A	
7	4 kV	25	IH	+ / -	270º Top	A	
8	4 kV	25	IH	+ / -	270º Bottom	A	
9	4 kV	25	DC	+ / -	Front	A	
10	4 kV	25	DC	+ / -	Right side	A	
11	4 kV	25	DC	+ / -	Left side	A	
12	4 kV	25	DC	+ / -	Rear	A	
13	4 kV	25	DC	+ / -	Top	A	
14	4 kV	25	DC	+ / -	Metallic support	A	
15	4 kV	25	DC	+ / -	Screws	A	
16	4 kV	25	DC	+ / -	RS-232 HOUSING	A	
14	4 kV	25	DC	+ / -	USB HOUSING	A	
15	4 kV	25	DC	+ / -	LAN HOUSING	A	

Comments:

ND: Not discharges.
No evidence of malfunctioning was detected in the EUT during the test.

ELECTROSTATIC DISCHARGE IMMUNITY II

Technician: Andreu Tey
Test date: 2021-06-16
Resistance value: 0.934MΩ

Test Area: Ground plane
Criteria: B

Basic standard: IEC-61000-4-2:2008:2008

Temperature:	23.0	ºC
Humidity:	59.6	%
Atm. Pressure:	997.8	hPa

Result: Pass

DC- Direct Contact, sharp tip	**IH**- Horizontal coupling, Sharp tip.
AC- Air Contact, round tip	**IV**- Vertical coupling, Sharp tip.

Point	Level	Discharges		Pol +/-	Application point	Results	Comments
		Nº	Type				
16	8 kV	25	AC	+ -	PLASTIC DOOR LOCKS	A	ND
14	8 kV	25	AC	+ -	DISPLAY CHASSIS	A	
15	8 kV	25	AC	+ -	DISPLAY	A	

Comments:

ND: Not discharges.
No evidence of malfunctioning was detected in the EUT during the test.

ELECTROMAGNETIC FIELD IMMUNITY

Technician: J.J.Peramos; A. Plans **Test Area:** Semi-Anechoic chamber, SAC-0

Test date: 2021-05-10 **Criteria:** A

Basic standard: IEC 61000-4-3:2006/ISH1:2008

Temperature:	22.5	ºC
Humidity:	60.1	%
Atm. Pressure:	1007.3	hPa

Frequency range		**80 MHz – 1000 MHz**		**1000 MHz- 6000 MHz**	
Severity		10 V/m		10 V/m	
Antenna type		Log Periodic		Log Periodic	
Frequency step		1%		1%	
Dwell time		3 s		3 s	
Modulation		80% AM 1 kHz		PM 200Hz	
Dist. DUT/antenna		3 m	3 m	3 m	3 m
Polarization		H	V	H	V
FACE	FRONTAL 0º	A	A	NA	NA
	LEFT 90º	A	A	NA	NA
	REAR180º	A	A	NA	NA
	RIGHT 270º	A	A	NA	NA

RESULTS: Pass

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

FAST TRANSIENTS IN BURST IMMUNITY

Technician: Antonio Mayayo
Test Area: Ground plane
Test date: 2021-05-11
Criteria: B

Basic standard: IEC 61000-4-4:2012

Temperature:	22.3	ºC
Humidity:	55.1	%
Atm. Pressure:	1007.2	hPa

Result: Pass

Test ports	Application	Severity (kV)	Duration	Results	Comments
AC supply	L1+L2+L3+GND	+2	2 min	A	5 kHz
		-2	2 min	A	
LOADS	Clamp	+2	2 min	A	5 kHz
		-2	2 min	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

SURGE TRANSIENTS IMMUNITY (1,2/50) I

Technician: Andreu Tey, Adrián Pérez **Test Area:** Ground plane

Test date: 2021-06-08 **Criteria:** B

Basic standard: IEC 61000-4-5:2014/Amd1:2017

Temperature:	24.3	ºC
Humidity:	50.9	%
Atm. Pressure:	1002.9	hPa

Result: Pass

Application	Zo	Line	Phase	Severity (kV)	Nº Pulses		Results		Comments
					+	-	Polarity +	Polarity -	
AC INPUT POWER SUPPLY									
Line to line	2	L1 / L2	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L2 / L3	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L1 / L3	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L1 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L2 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L3 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

SURGE TRANSIENTS IMMUNITY (1,2/50) II

Technician: Adrián Pérez **Test Area:** Ground plane

Test date: 20210-06-18 / 2021-07-17 **Criteria:** B

Basic standard: IEC 61000-4-5:2014/Amd1:2017

Temperature:	25.4	ºC
Humidity:	43.7	%
Atm. Pressure:	1000.4	hPa

Result: Pass

Application	Zo	Line	Phase	Severity (kV)	Nº Pulses		Results		Comments
					+	-	Polarity +	Polarity -	
AC INPUT POWER SUPPLY									
Line to ground	12	L1 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	L2 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	L3 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	N / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

SURGE TRANSIENTS IMMUNITY (1,2/50) III

Technician: Andreu Tey, Adrián Pérez **Test Area:** Ground plane

Test date: 2021-06-08 **Criteria:** B

Basic standard: IEC 61000-4-5:2014/Amd1:2017

Temperature:	23.7	ºC
Humidity:	51.6	%
Atm. Pressure:	1003.2	hPa

Result: Pass

Application	Zo	Line	Phase	Severity (kV)	Nº Pulses		Results		Comments
					+	-	Polarity +	Polarity -	
AC OUTPUT POWER SUPPLY									
Line to line	2	L1 / L2	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L2 / L3	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L1 / L3	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L1 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L2 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L3 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

SURGE TRANSIENTS IMMUNITY (1,2/50) IV

Technician: Adrián Pérez **Test Area:** Ground plane

Test date: 2021-06-18 / 2021-06-17 **Criteria:** B

Basic standard: IEC 61000-4-5:2014/Amd1:2017

Temperature:	25.4	ºC
Humidity:	43.7	%
Atm. Pressure:	1000.4	hPa

Result: Pass

Application	Zo	Line	Phase	Severity (kV)	Nº Pulses		Results		Comments
					+	-	Polarity +	Polarity -	
AC OUTPUT POWER SUPPLY									
Line to ground	12	L1 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	L2 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	L3 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	N / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

SURGE TRANSIENTS IMMUNITY (1,2/50) III

Technician: Adrián Pérez **Test Area:** Ground plane

Test date: 2021-06-08 **Criteria:** B

Basic standard: IEC 61000-4-5:2014/Amd1:2017

Temperature:	24.3	ºC
Humidity:	50.9	%
Atm. Pressure:	1002.9	hPa

Result: Pass

Application	Zo	Line	Phase	Severity (kV)	Nº Pulses		Results		Comments
					+	-	Polarity +	Polarity -	
AC OUTPUT POWER SUPPLY									
Line to line	2	L1 / L2	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L2 / L3	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L1 / L3	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L1 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L2 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	
Line to line	2	L3 / N	0º	1	5	5	A	A	
			90º	1	5	5	A	A	
			180º	1	5	5	A	A	
			270º	1	5	5	A	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

SURGE TRANSIENTS IMMUNITY (1,2/50) IV

Technician: Adrián Pérez **Test Area:** Ground plane

Test date: 2021-06-18 / 2021-07-17 **Criteria:** B

Basic standard: IEC 61000-4-5:2014/Amd1:2017

Temperature:	25.4	ºC
Humidity:	43.7	%
Atm. Pressure:	1000.4	hPa

Result: Pass

Application	Zo	Line	Phase	Severity (kV)	Nº Pulses +	Nº Pulses -	Results Polarity +	Results Polarity -	Comments
AC OUTPUT POWER SUPPLY									
Line to ground	12	L1 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	L2 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	L3 / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	
Line to ground	12	N / E	0º	2	5	5	A	A	
			90º	2	5	5	A	A	
			180º	2	5	5	A	A	
			270º	2	5	5	A	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

CURRENT INJECTIONS IMMUNITY

Technician: Antonio Mayayo
Test Area: Ground plane
Test date: 2021-05-11
Criteria: A
Level of Severity: 10 V RMS
Part of a system?: No
Frequency range: 150 kHz - 80 MHz
Dwell time: 3s
Modulation: 80% AM 1 kHz
Increase: 1%

Basic standard: IEC 61000-4-6:2013/Corr1:2015

Temperature:	21.9	ºC
Humidity:	56.0	%
Atm. Pressure:	1007.4	hPa

Result: Pass

CDN	Severity (V)	Application point	Results	Comments
CLAMP	10V	AC supply	A	
CLAMP	10V	LOADS	A	

Comments:

No evidence of malfunctioning was detected in the EUT during the test.

LOW FREQUENCY MAGNETIC FIELDS IMMUNITY

Technician: Andreu Tey
Test Area: Ground plane
Test date: 2021-06-16
Applied voltage to coil (Vrms): 27.3 V
Stabilizing EUT time: 15 minutes
Ambient measure (A/m): 0.209 A/m

Basic standard: IEC 61000-4-8:2009

Temperature:	22.3	ºC
Humidity:	64.3	%
Atm. Pressure:	1014.5	hPa

Result: Pass

50Hz

Axe	Intensity (A/m)	Field type	Results	Comments:
X	30	Continuous field (5min)	A	
Y	30	Continuous field (5min)	A	
Z	30	Continuous field (5min)	A	

Comments:

No evidence of problem was detected in the EUT during or after the test.

HARMONIC AND INTERHARMONIC IMMUNITY

Technician: Andreu Tey **Test Area:** Ground plane

Test date: 04/06/2021

Basic standard: *IEC 61000-4-13:2002/AMD:2015, *IEC 61000-2-2:2002

RESULTS: Pass

Test conditions:	EN 61000-4-13 Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests					
	230.0 Vrms / 50.0 Hz					
	EN 61000-4-13:2002 + A1:2009 + A2:2016 class X (course 3)					
Flat curve:	Cut off level:	0.90	Voltage ratio Ky:	1.0379	120.0 sec	
	Test time:	120.0 sec				
Over swing:	Level 3rd harmonic:	6.0 %	Level 5th harmonic:	4.0 %	120.0 sec	
	Test time:	120.0 sec				
	Any functional anomalies (decision by tester):			NO		
Sweep in frequencies:	Level 0.33*f to 2*f:	3.0 %	Level 2*f to 10*f:	9.0 %	5.0 min per decad	
	Level 10*f to 20*f:	4.5 %	Level 20*f to 30*f:	2.0 %		
	Level 30*f to 40*f:	2.0 %	Time per decade:	5.0 min		
	Any functional anomalies (decision by tester):			YES		
Individual harmonics:	Lv. 02: 03.0 %	Lv. 03: 08.0 %	Lv. 04: 01.5 %	Lv. 05: 09.0 %	5 sec per harm.	
	Lv. 06: 00.0 %	Lv. 07: 07.5 %	Lv. 08: 00.0 %	Lv. 09: 02.5 %		
	Lv. 10: 00.0 %	Lv. 11: 05.0 %	Lv. 12: 00.0 %	Lv. 13: 04.5 %		
	Lv. 14: 00.0 %	Lv. 15: 00.0 %	Lv. 16: 00.0 %	Lv. 17: 03.0 %		
	Lv. 18: 00.0 %	Lv. 19: 02.0 %	Lv. 20: 00.0 %	Lv. 21: 00.0 %		
	Lv. 22: 00.0 %	Lv. 23: 02.0 %	Lv. 24: 00.0 %	Lv. 25: 02.0 %		
	Lv. 26: 00.0 %	Lv. 27: 00.0 %	Lv. 28: 00.0 %	Lv. 29: 01.5 %		
	Lv. 30: 00.0 %	Lv. 31: 01.5 %	Lv. 32: 00.0 %	Lv. 33: 00.0 %		
	Lv. 34: 00.0 %	Lv. 35: 01.5 %	Lv. 36: 00.0 %	Lv. 37: 01.5 %		
	Lv. 38: 00.0 %	Lv. 39: 00.0 %	Lv. 40: 00.0 %			
Indiv. interharmonics:	Level 16.5 to 100 Hz:	2.5 %	Level 100 to 500 Hz:	5.0 %	5 sec per interharr	
	Level 500 to 750 Hz:	3.5 %	Level 750 to 1000 Hz:	2.0 %		
	Level 1000 to 2000 Hz:	1.5 %				
	Any functional anomalies (decision by tester):			NO		
Resonance points:	--					

Comments:

No evidence of problem was detected in the EUT during or after the test.