

File Number **21/36403424**



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-40-CUBE4
S/N:	0000448583	Internal Id:	10376/1 – 10949/1

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 IEC 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

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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.
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This is the first page of the document, which consists of 43 pages.

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1. EQUIPMENT RECEIVED AND TESTED

Equipment: CUBE4 series UPS			
Brand:	SALICRU	Model:	SLC-40-CUBE4
S/N:	0000448583	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-30-CUBE4 and SLC-40-CUBE4 models have same structure and format. No Communication modules available.



Test product reception:	January 11, 2021
Test initial date:	January 11, 2021
Test final date:	July 17, 2021

1.1. Test configuration

Power Supply:	400 V 3ph 50 Hz.
Set-up:	Floor standing. Equipment continuously working. Normal mode (aging mode disabled), DC Output voltage and current measured and operation mode checked on display.
Test exercise:	Flicker emissions, harmonics emissions tests and immunity tests, resistive full loaded equipment.
Equipment size:	380 mm x 1045 mm x 910 mm Note: 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	
<input checked="" type="checkbox"/> Radio-frequency radiated emissions (30 MHz-1000 MHz)	Class: C3
Basic standard: CISPR 11:2015/A1:2016	
<input checked="" type="checkbox"/> Continuous conducted emissions (0.15-30 MHz)	Class: C3
Note: AC input and Output port.	
Basic standard: IEC 61000-3-11:2017	
<input checked="" type="checkbox"/> 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	
<input checked="" type="checkbox"/> Harmonic current emissions	Class: A

2.1.1. Acceptance criteria for the emissions test

According to standard ***UNE-EN IEC 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 MHz	Limits dB (µV)			
		Mains terminal		Network port	
		Quasi-peak	Average	Quasi-peak	Average
A	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 (μ V/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	
<input checked="" type="checkbox"/> Electrostatic discharge immunity	Level AC: ±8 kV Level DC ±4 kV
Basic standard: IEC 61000-4-3:2006/ISH1:2008	
<input checked="" type="checkbox"/> 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	
<input checked="" type="checkbox"/> Fast transients in burst immunity.	
<input type="checkbox"/> Severity level in signal and control ports	Severity: ±2 kV 5 kHz
<input checked="" type="checkbox"/> Severity level in ground terminal	Severity: ±2 kV 5 kHz
<input checked="" type="checkbox"/> Severity level in I/O port of AC power Supply	Severity: ±2 kV 5 kHz
Basic standard: IEC 61000-4-5:2014/Amd1:2017	
<input checked="" type="checkbox"/> Surge transients immunity.	
<input type="checkbox"/> Communications port if cable length >30m.	Common mode severity: ± 1 kV Differential mode severity: --
<input checked="" type="checkbox"/> AC supply ports.	Common mode severity: ±2 kV Differential mode severity: ±1 kV
Basic standard: IEC 61000-4-6:2013/Corr1:2015	
<input checked="" type="checkbox"/> Current injections immunity.	
<input type="checkbox"/> Signal and control ports.	Severity: 10 V RMS
<input checked="" type="checkbox"/> AC Supply and access by ground terminal.	Severity: 10 V RMS
Basic standard: IEC 61000-4-8:2009	
<input checked="" type="checkbox"/> Magnetic field immunity	50 Hz 30 A/m
Basic standard: *IEC 61000-4-13:2002/Ams:2015, *IEC 61000-2-2:2002	
<input checked="" type="checkbox"/> 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).	

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2.2.1. Acceptance criteria for the immunity test

According to standard ***UNE-EN IEC 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

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

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	OSP220	--
DIRECTIONAL COUPLER	ROHDE & SCHWARZ	DDC25-BC60	1042393
LOG PERIODIC ANTENNA	EMC AUTOMATION	LPD80	104457
TEST SOTFTWARE	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

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

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 EMISSIONS			
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-40-CUBE4	
S/N: 0000448583	Power Supply: 400 V AC 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
<p>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:</p> <p>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.</p>		
IMMUNITY TESTING	RESULTS	REQUIREMENT 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
Low frequency magnetic field immunity.	Pass (A)	Criteria: A
Inter-harmonics immunity	Pass (A)	Criteria: A
<p>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%.</p>		

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

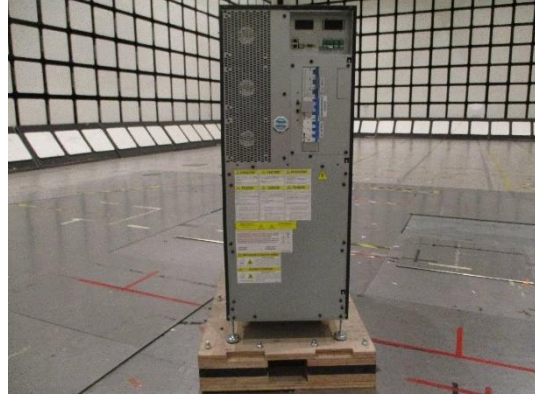
4. ANNEXES

4.1. Identification pictures

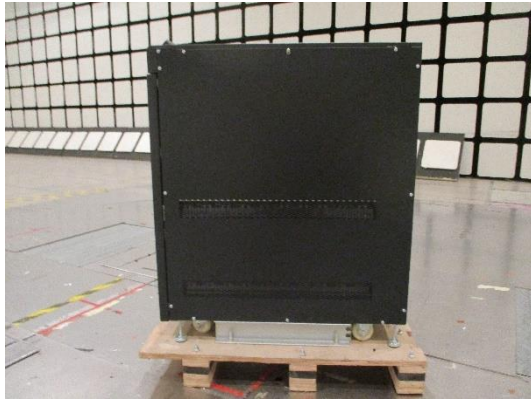
General view



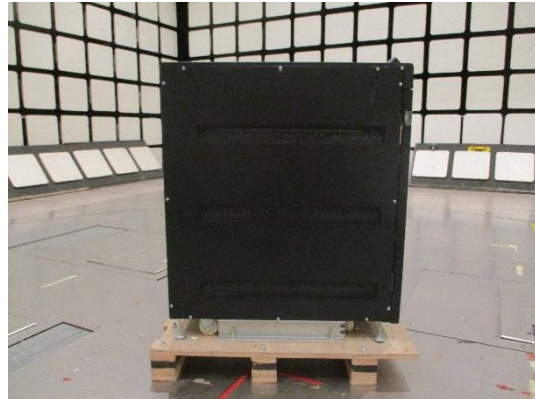
Front view



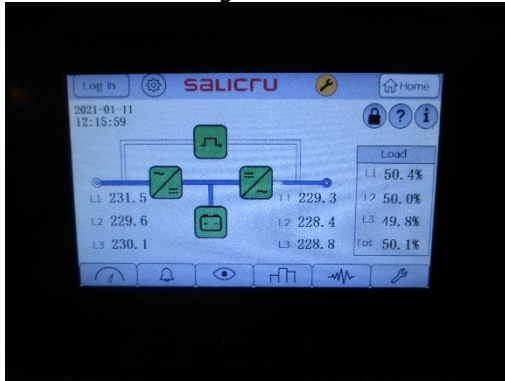
Rear view



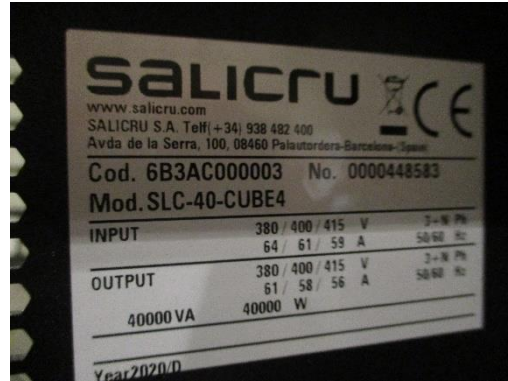
Right view



Left view



Front display view



Identifier label

ID: 10376/1



Cliente: SALICRU
 SLC-40-CUBE4+0000448583
 Fecha de entrada
 2021-01-11

Internal identifier label (first time, equipment damaged)

ID: 10949/1



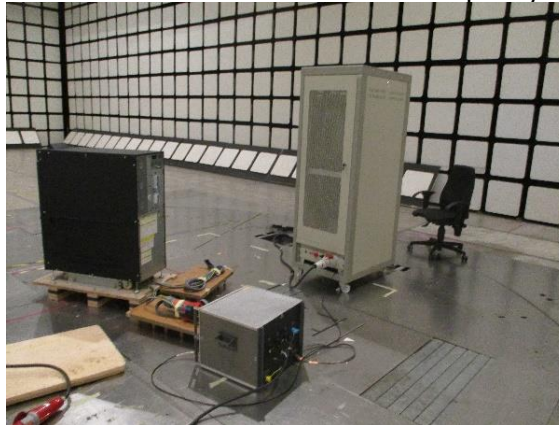
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 SLC-40-CUBE4+0000448583
 Fecha de entrada
 2021-05-10

Internal identifier label (second time, equipment repaired)

Test configuration



Radio-frequency radiated emissions



Continuous conducted emissions



Electrostatic discharges immunity

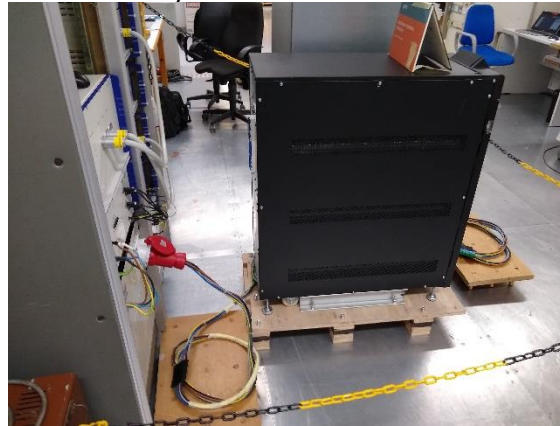


Electromagnetic field immunity 80 MHz to 1 GHz

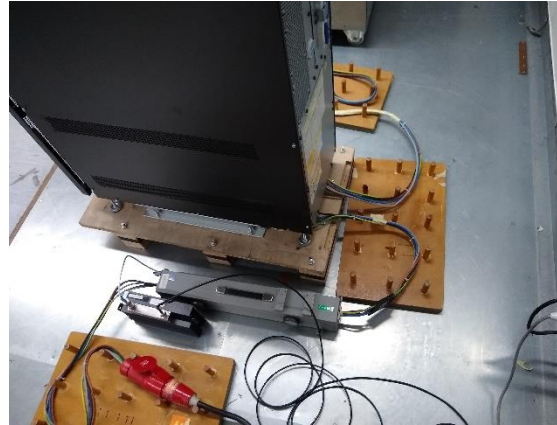
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Fast transients in burst immunity



Surge transients immunity



Current injections immunity



Voltage variations immunity, flicker emissions, harmonic current emissions and harmonics immunity



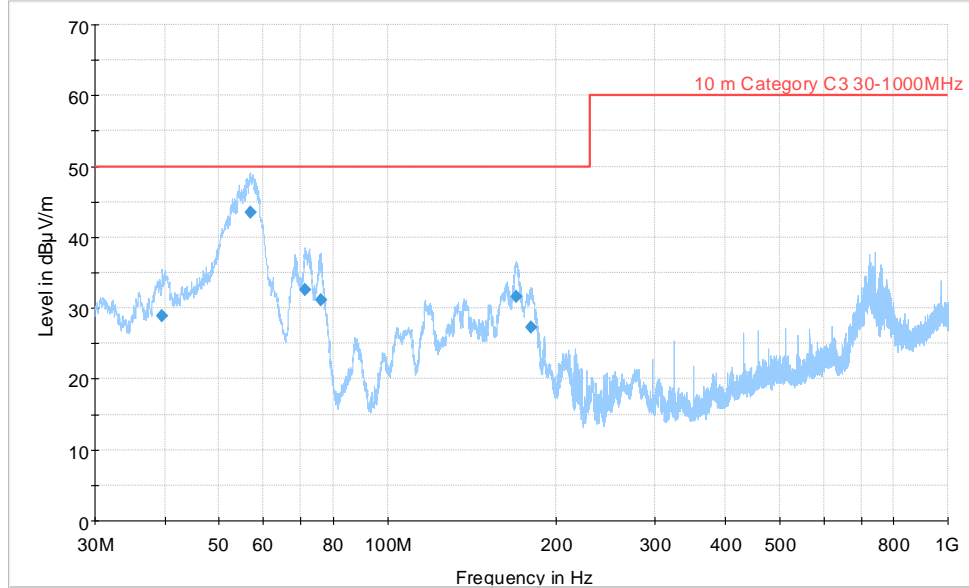
Magnetic field immunity

4.2. Results Details

RADIO-FREQUENCY RADIATED EMISSIONS					
Technician: J.J.Peros		Frequency range: 30 MHz – 1 GHz			
Test date: 2021-06-03		Test Area: Semi-Anechoic chamber, SAC-0			
Basic standard: CISPR 11:2015					
Temperature: 21.9 °C					
Humidity: 66.8 %					
Atm. Pressure: 1018.0 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					
<p><i>Emission Level = Measured Level + Correction Factor</i></p>					

RADIO-FREQUENCY RADIATED EMISSIONS II

PRESCAN MODE 1-30 MHz – 1 GHz



FINAL MEASUREMENTS

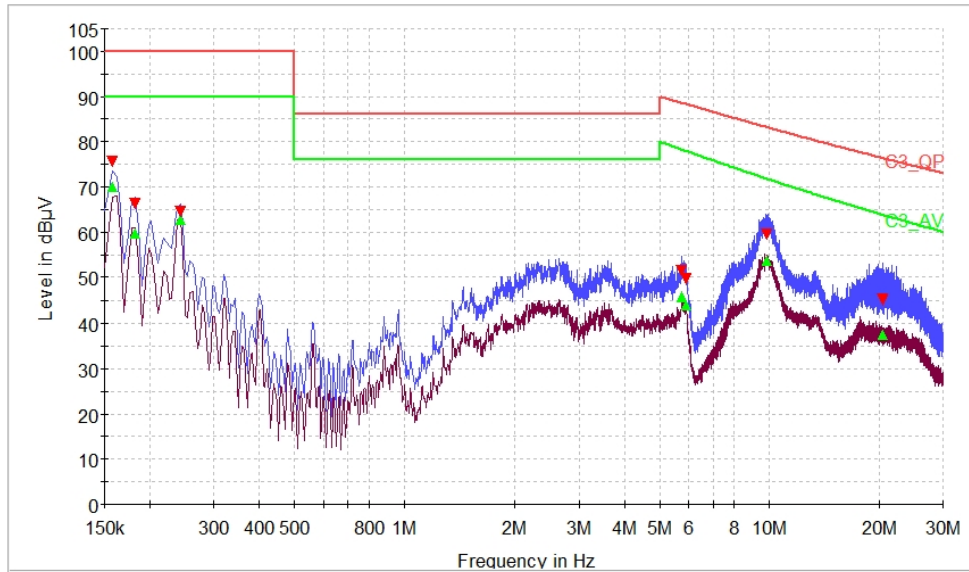
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)	Comment
39.570	28.85	50.00	21.15	106.0	V	151.0	-29.5	BB
56.790	43.46	50.00	6.54	400.0	V	45.0	-29.7	BB
71.250	32.62	50.00	17.38	181.0	V	20.0	-29.5	BB
75.990	31.08	50.00	18.92	294.0	V	15.0	-30.3	BB
169.680	31.70	50.00	18.30	110.0	V	0.0	-26.7	BB
180.480	27.24	50.00	22.76	160.0	V	3.0	-27.1	BB

Comments:

CONTINUOUS CONDUCTED EMISSIONS	
Technician: JJ.Permos	Test Area: Shielded Room, SR-2
Test date: 2021-06-03	
Basic standard: CISPR-11:2015	
Temperature:	21.6 °C
Humidity:	69.1 %
Atm. Pressure:	1018.7 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 LINE N

PRESCAN NEUTRAL



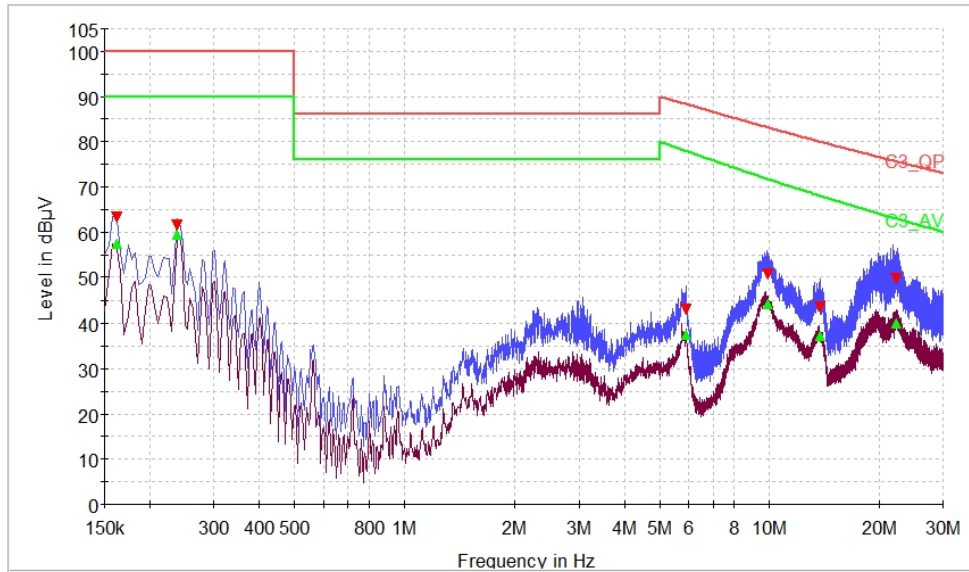
— NEUTRAL PK+_MAXH — NEUTRAL AVG_MAXH — C3_QP
— C3_AV ▲ Average-AVG (Single) ▼ QuasiPeak-QPK (Single)

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	75.5	100.0	24.5	70.0	90.0	20.0	N	10.2
0.182	66.1	100.0	33.9	59.7	90.0	30.3	N	10.2
0.242	64.4	100.0	35.6	62.6	90.0	27.4	N	10.2
5.750	51.3	88.5	37.3	45.8	78.2	32.4	N	10.5
5.914	49.5	88.3	38.8	44.1	77.9	33.7	N	10.5
9.842	59.4	83.2	23.8	53.7	71.8	18.1	N	10.7
20.502	45.2	76.3	31.1	37.4	63.8	26.3	N	10.9

CONTINUOUS CONDUCTED EMISSIONS LINE L1

PRESCAN LINE R



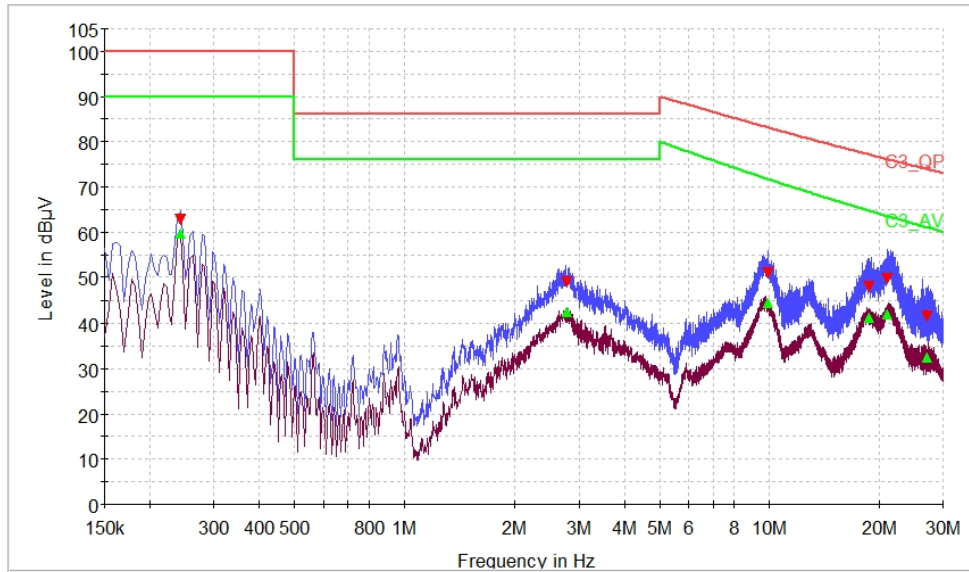
— L1 PK+_MAXH — L1 AVG_MAXH — C3_QP
— C3_AV ▲ Average-AVG (Single) ▼ QuasiPeak-QPK (Single)

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	63,2	90,0	32,6	57,4	90,0	32,6	L1	10,2
0.238	61,4	90,0	30,6	59,4	90,0	30,6	L1	10,2
5.918	43,0	77,9	40,4	37,5	77,9	40,4	L1	10,5
9.918	50,6	71,7	27,2	44,4	71,7	27,2	L1	10,7
13.830	43,5	67,9	30,7	37,3	67,9	30,7	L1	10,9
22.302	49,6	62,9	22,9	40,0	62,9	22,9	L1	11,0

CONTINUOUS CONDUCTED EMISSIONS LINE L2

PRESCAN LINE S



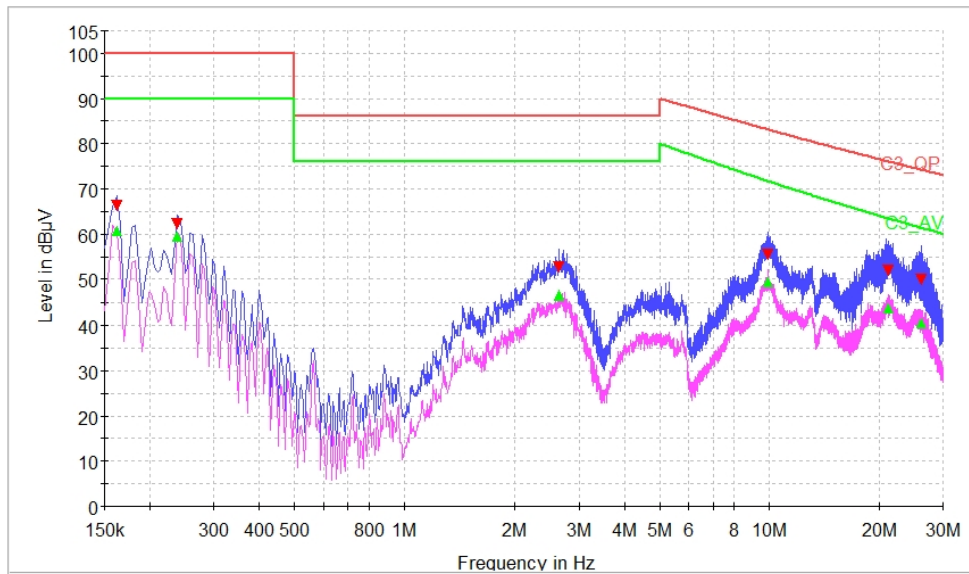
— L2 PK+_MAXH — L2 AVG_MAXH — C3_QP
— C3_AV ▲ Average-AVG (Single) ▼ QuasiPeak-QPK (Single)

FINAL MEASUREMENTS

Frequency (MHz)	QuasiPeak (dBµV)	Limit - QPK (dBµV)	Margin - QPK (dB)	Average (dBµV)	Limit - AVG (dBµV)	Margin - AVG (dB)	Line	Corr. (dB)
0.242	62.7	100.0	37.3	59.6	90.0	30.4	L2	10.2
2.782	48.8	86.0	37.2	42.6	76.0	33.4	L2	10.4
9.890	50.9	83.1	32.2	44.6	71.7	27.1	L2	10.7
18.842	48.0	77.1	29.1	41.2	64.7	23.5	L2	10.9
21.034	49.6	76.1	26.5	42.1	63.5	21.4	L2	10.9
27.070	41.6	73.9	32.3	32.4	61.0	28.6	L2	11.0

CONTINUOUS CONDUCTED EMISSIONS LINE L3

PRESCAN LINE T



— L3_AVG_CLRWR — L3_PK+_CLRWR — C3_QP
— C3_AV ▲ Average-AVG (Single) ▼ QuasiPeak-QPK (Single)

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	66.2	100.0	33.8	60.7	90.0	29.3	L3	10.1
0.238	62.3	100.0	37.7	59.4	90.0	30.6	L3	10.1
2.638	52.5	86.0	33.5	46.5	76.0	29.5	L3	10.2
9.910	55.4	83.1	27.7	49.3	71.7	22.3	L3	10.5
21.182	51.9	76.0	24.1	43.8	63.4	19.6	L3	10.9
26.198	49.9	74.2	24.3	40.6	61.3	20.7	L3	11.0

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	°C	
Humidity:	58.0	%	
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
11:24:54	0.775	0.3023	0.3023	0.000	+0.770	-0.319	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.302267							X	
Evaluated: PST, PLT, Sliding PLT, dc, dmax, Tmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
11:24:54	0.001	0.0260	- . - . - .	0.000	+0.000	- . - . - .	X	
Plt: 0.026000								
Evaluated: PST <= 0.4 dmax < 20 % dmax 1								

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 conditions: 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
11:12:49	1.065	0.3079	0.3079	0.000	-1.183	-0.263	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.307899							X	
Evaluated: PST, PLT, Sliding PLT, dc, dmax, Tmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
11:12:49	0.000	0.0110	- . - - -	0.000	+0.000	- . - - -	X	
Plt: 0.011000								
Evaluated: PST <= 0.4 dmax < 20 % dmax 1								

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
11:00:55	2.499	0.3774	0.3774	0.000	-1.408	-0.244	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.377364							X	
Evaluated: PST, PLT, Sliding PLT, dc, dmax, Tmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [s]	dmax [%]	dc [%]	PASS	FAIL
11:00:55	0.001	0.0190	- . - - -	0.000	+0.000	- . - - -	X	
Plt: 0.019000								
Evaluated: PST <= 0.4 dmax < 20 % dmax 1								

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

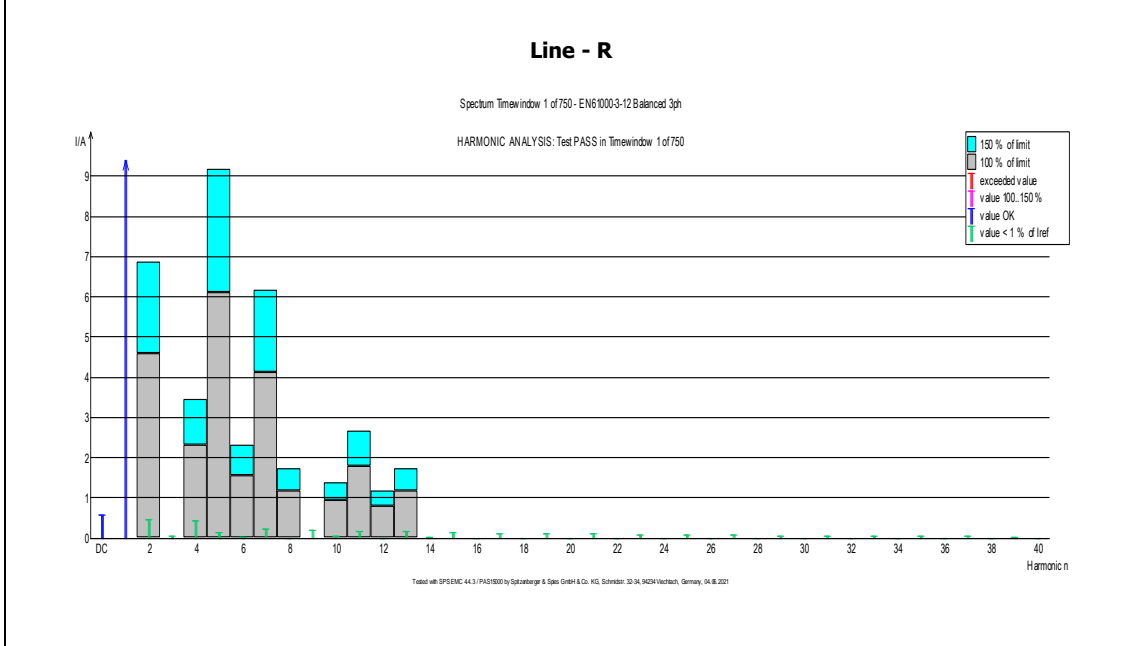
HARMONIC CURRENT EMISSION

Technician: Andreu Tey **Test Area:** Ground plane
Test date: 2021-06-04

Basic standard: IEC 61000-3-12:2011

Temperature:	23.5	°C
Humidity:	58.0	%
Atm. Pressure:	1002.1	hPa

RESULTS: Pass



Comments:

HARMONIC CURRENT EMISSION II

Maximum RMS current and corresponding values in timewindow 56:

Voltage: 230.40 Vrms THD=0.02 % THV=0.037 V POHV=0.020 V PWHd=0.05 %
 Current: 60.035 Arms THD=0.00 % THC=0.000 A POHC=0.000 A PWHd=0.00 %
 Power: 13828.5 W P1=13828.6 W 13832.2 VA THC/Iref=0.00%
 Power factor: 1.000 CosPhi1: 1.000 PWHC/Iref=0.00%

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, Ieq=56.995 A, Rated Rsc=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=0.0 % , PWHC/Iref=0.0 % (Limits: THC/Iref=13.0 % ,
 PWHC/Iref=22.0 %); Iavg=59.995 Arms; Iref is set to Ieq

Ha	Entire measurement (2.5 min = 750 time windows)						Worst 2.5 min		Worst 2.5 min avg		P A S S	F A I L
	Maximum	Window	EN61000-3-12 Balanced 3ph	Margin in MaxWin	100 to 150%	Ex- ceeded	100 to 150%	Ex- ceeded	Value	Ex- ceeded		
DC	0.6259 A	71	-----	-----	0	0	0	0	0.6003 A	0	--	
1	60.0250 A	56	-----	-----	0	0	0	0	59.9853 A	0	X	
2	0.5075 A	77	4.5596 A	-88.9 %	0	0	0	0	0.4900 A	0	X	
3	0.1231 A	620	-----	-----	0	0	0	0	0.0933 A	0	X	
4	0.4834 A	640	2.2798 A	-78.8 %	0	0	0	0	0.4696 A	0	X	
5	0.1680 A	1	6.0985 A	-97.2 %	0	0	0	0	0.1534 A	0	X	
6	0.0548 A	172	1.5199 A	-96.4 %	0	0	0	0	0.0463 A	0	X	
7	0.2562 A	216	4.1036 A	-93.8 %	0	0	0	0	0.2467 A	0	X	
8	0.0326 A	734	1.1399 A	-97.1 %	0	0	0	0	0.0242 A	0	X	
9	0.2319 A	163	-----	-----	0	0	0	0	0.2226 A	0	X	
10	0.0749 A	183	0.9119 A	-91.8 %	0	0	0	0	0.0672 A	0	X	
11	0.2100 A	104	1.7668 A	-88.1 %	0	0	0	0	0.2048 A	0	X	
12	0.0146 A	315	0.7599 A	-98.1 %	0	0	0	0	0.0126 A	0	X	
13	0.1781 A	1	1.1399 A	-84.4 %	0	0	0	0	0.1710 A	0	X	
14	0.0506 A	236	-----	-----	0	0	0	0	0.0456 A	0	X	
15	0.1629 A	130	-----	-----	0	0	0	0	0.1603 A	0	X	
16	0.0273 A	92	-----	-----	0	0	0	0	0.0220 A	0	X	
17	0.1424 A	1	-----	-----	0	0	0	0	0.1371 A	0	X	
18	0.0239 A	687	-----	-----	0	0	0	0	0.0207 A	0	X	
19	0.1292 A	165	-----	-----	0	0	0	0	0.1250 A	0	X	
20	0.0300 A	198	-----	-----	0	0	0	0	0.0262 A	0	X	
21	0.1214 A	53	-----	-----	0	0	0	0	0.1180 A	0	X	
22	0.0122 A	304	-----	-----	0	0	0	0	0.0103 A	0	X	
23	0.1036 A	50	-----	-----	0	0	0	0	0.0987 A	0	X	
24	0.0172 A	630	-----	-----	0	0	0	0	0.0150 A	0	X	
25	0.0989 A	377	-----	-----	0	0	0	0	0.0955 A	0	X	
26	0.0110 A	2	-----	-----	0	0	0	0	0.0087 A	0	X	
27	0.0900 A	1	-----	-----	0	0	0	0	0.0859 A	0	X	
28	0.0077 A	739	-----	-----	0	0	0	0	0.0068 A	0	X	
29	0.0793 A	53	-----	-----	0	0	0	0	0.0766 A	0	X	
30	0.0105 A	1	-----	-----	0	0	0	0	0.0088 A	0	X	
31	0.0804 A	1	-----	-----	0	0	0	0	0.0779 A	0	X	
32	0.0068 A	35	-----	-----	0	0	0	0	0.0057 A	0	X	
33	0.0690 A	34	-----	-----	0	0	0	0	0.0666 A	0	X	
34	0.0072 A	2	-----	-----	0	0	0	0	0.0056 A	0	X	
35	0.0676 A	1	-----	-----	0	0	0	0	0.0653 A	0	X	
36	0.0062 A	675	-----	-----	0	0	0	0	0.0052 A	0	X	
37	0.0644 A	102	-----	-----	0	0	0	0	0.0624 A	0	X	
38	0.0066 A	52	-----	-----	0	0	0	0	0.0059 A	0	X	
39	0.0562 A	105	-----	-----	0	0	0	0	0.0548 A	0	X	
40	0.0072 A	419	-----	-----	0	0	0	0	0.0063 A	0	X	

█ average value < 1.0 % of Iref

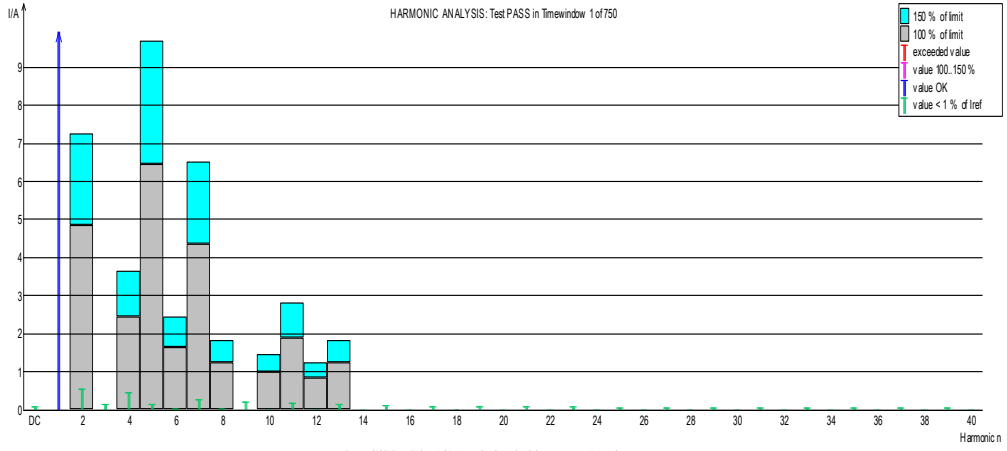
Tested with SPS EMC 44.3 / PAS1900 by Spitzberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021

HARMONIC CURRENT EMISSION III

Line- S

Spectrum Timewindow 1 of 750 - EN61000-3-12 Balanced 3ph

HARMONIC ANALYSIS: Test PASS in Timewindow 1 of 750



Tested with SPSEMIC 44.31 PAS5000 by Sotzenberger & Spies GmbH & Co. KG, Schmöder, 33104, 94234 Vellbach, Germany, 04.08.2021

HARMONIC CURRENT EMISSION IV

Maximum RMS current and corresponding values in timewindow 218:

Voltage: 230.30 Vrms THD=0.02 % THV=0.039 V POHV=0.023 V PWHD=0.06 %
 Current: 60.212 Arms THD=0.00 % THC=0.000 A POHC=0.000 A PWHD=0.00 %
 Power: 13863.7 W P1=13863.6 W 13866.9 VA THC/Iref=0.00%
 Power factor: 1.000 CosPhi1: 1.000 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, Ieq=60.188 A, Rated Rsc=33
 No Ztest selected, Inserted reactor impedance: --
 harmonic currents < 1 % of Iref are disregard for calc. of THD, THC, POHC, PWHD, PWHC

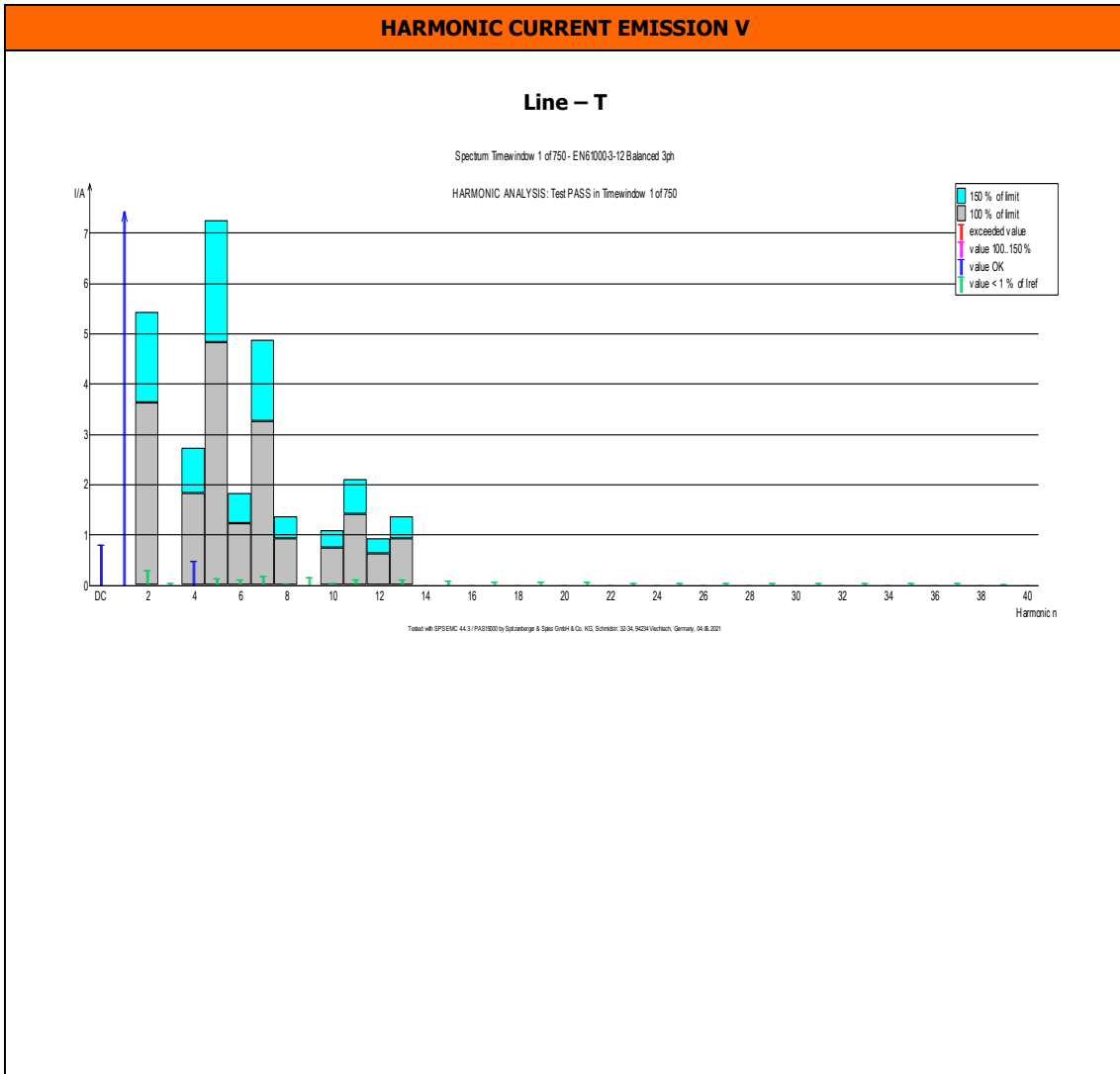
HARMONIC ANALYSIS: Test PASS

Tobs = worst 2.5 min: tw 1..750; Avg: THC/Iref=0.0 % , PWHC/Iref=0.0 % (Limits: THC/Iref=13.0 % , PWHC/Iref=22.0 %); Iavg=60.188 Arms; Iref is set to Ieq

Ha	Entire measurement (2.5 min = 750 time windows)						Worst2.5 min		Worst2.5 min avg		P A S S	F A I L
	Maximum	Window	EN61000-3-12 Balanced 3ph	Margin in MaxWin	100 to 150%	Ex- ceeded	100 to 150%	Ex- ceeded	Value	Ex- ceeded		
DC	0.1330 A	165	-----	-----	0	0	0	0	0.1025 A	0	X	
1	60.2045 A	218	-----	-----	0	0	0	0	60.1800 A	0	X	
2	0.5817 A	17	4.8150 A	-87.9 %	0	0	0	0	0.5606 A	0	X	
3	0.1559 A	747	-----	-----	0	0	0	0	0.1477 A	0	X	
4	0.4741 A	19	2.4075 A	-80.3 %	0	0	0	0	0.4503 A	0	X	
5	0.2012 A	157	6.4401 A	-96.9 %	0	0	0	0	0.1866 A	0	X	
6	0.0522 A	462	1.6050 A	-96.7 %	0	0	0	0	0.0452 A	0	X	
7	0.2917 A	310	4.3335 A	-93.3 %	0	0	0	0	0.2796 A	0	X	
8	0.0661 A	365	1.2038 A	-94.5 %	0	0	0	0	0.0572 A	0	X	
9	0.2238 A	681	-----	-----	0	0	0	0	0.2188 A	0	X	
10	0.0335 A	437	0.9630 A	-96.5 %	0	0	0	0	0.0288 A	0	X	
11	0.2048 A	738	1.8658 A	-89.0 %	0	0	0	0	0.1990 A	0	X	
12	0.0246 A	283	0.8025 A	-96.9 %	0	0	0	0	0.0211 A	0	X	
13	0.1622 A	115	1.2038 A	-86.5 %	0	0	0	0	0.1581 A	0	X	
14	0.0302 A	669	-----	-----	0	0	0	0	0.0267 A	0	X	
15	0.1445 A	1	-----	-----	0	0	0	0	0.1403 A	0	X	
16	0.0236 A	127	-----	-----	0	0	0	0	0.0204 A	0	X	
17	0.1234 A	5	-----	-----	0	0	0	0	0.1201 A	0	X	
18	0.0207 A	674	-----	-----	0	0	0	0	0.0179 A	0	X	
19	0.1142 A	249	-----	-----	0	0	0	0	0.1098 A	0	X	
20	0.0219 A	14	-----	-----	0	0	0	0	0.0187 A	0	X	
21	0.1005 A	239	-----	-----	0	0	0	0	0.0979 A	0	X	
22	0.0175 A	356	-----	-----	0	0	0	0	0.0153 A	0	X	
23	0.0955 A	1	-----	-----	0	0	0	0	0.0926 A	0	X	
24	0.0229 A	1	-----	-----	0	0	0	0	0.0197 A	0	X	
25	0.0877 A	112	-----	-----	0	0	0	0	0.0856 A	0	X	
26	0.0153 A	744	-----	-----	0	0	0	0	0.0138 A	0	X	
27	0.0864 A	52	-----	-----	0	0	0	0	0.0844 A	0	X	
28	0.0180 A	6	-----	-----	0	0	0	0	0.0157 A	0	X	
29	0.0821 A	53	-----	-----	0	0	0	0	0.0803 A	0	X	
30	0.0138 A	623	-----	-----	0	0	0	0	0.0116 A	0	X	
31	0.0788 A	299	-----	-----	0	0	0	0	0.0766 A	0	X	
32	0.0137 A	357	-----	-----	0	0	0	0	0.0115 A	0	X	
33	0.0742 A	1	-----	-----	0	0	0	0	0.0719 A	0	X	
34	0.0117 A	740	-----	-----	0	0	0	0	0.0095 A	0	X	
35	0.0684 A	72	-----	-----	0	0	0	0	0.0667 A	0	X	
36	0.0107 A	614	-----	-----	0	0	0	0	0.0089 A	0	X	
37	0.0669 A	195	-----	-----	0	0	0	0	0.0649 A	0	X	
38	0.0089 A	123	-----	-----	0	0	0	0	0.0072 A	0	X	
39	0.0620 A	1	-----	-----	0	0	0	0	0.0598 A	0	X	
40	0.0085 A	137	-----	-----	0	0	0	0	0.0074 A	0	X	

average value < 1.0 % of Iref

Tested with SPSEMC 44.3 / PAS1500 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 04.06.2021



HARMONIC CURRENT EMISSION VI

Maximum RMS current and corresponding values in timewindow 724:

Voltage: 230.69 Vrms THD=0.01 % THV=0.028 V POHV=0.016 V PWH D=0.04 %
 Current: 45.054 Arms THD=1.08 % THC=0.485 A POHC=0.000 A PWH D=0.00 %
 Power: 10387.4 W P1=10387.4 W 10393.7 VA THC/Iref=1.08%
 Power factor: 0.999 CosPhi1: 1.000 PWH C/Iref=0.00%

Test conditons: EN 61000-3-122011, f=50 Hz, Phase=L3, Range=80.00 A
 Time window=10/12 (200ms), Grouping (>2nd harm.)=on, Ieq=45.022 A, Rated Rsce=33
 No Ztest selected, Inserted reactor impedance: --
 harmonic currents < 1 % of Iref are disregard for calc. of THD, THC, POHC, PWH D, PWH C

HARMONIC ANALYSIS: Test PASS

Tobs = worst 2.5 min: Iw 1..750; Avg: THC/Iref=1.1 % , PWH C/Iref=0.0 % (Limits: THC/Iref=13.0 % ,
 PWH C/Iref=22.0 %); Iavg=45.022 Arms; Iref is set to Ieq

Ha	Entire measurement (2.5 min = 750 time windows)						Worst 2.5 min		Worst 2.5 min avg		P A S S	F A I L
	Maximum	Window	EN61000-3-12 Balanced 3ph	Margin in MaxWin	100 to 150%	Ex- ceeded	100 to 150%	Ex- ceeded	Value	Ex- ceeded		
DC	0.8508 A	167	----	----	0	0	0	0	0.8193 A	0	--	
1	45.0410 A	724	----	----	0	0	0	0	45.0086 A	0	X	
2	0.3101 A	656	3.6018 A	-91.4 %	0	0	0	0	0.2959 A	0	X	
3	0.0601 A	524	----	----	0	0	0	0	0.0394 A	0	X	
4	0.4894 A	1	1.8009 A	-72.8 %	0	0	0	0	0.4808 A	0	X	
5	0.1495 A	150	4.8174 A	-96.9 %	0	0	0	0	0.1390 A	0	X	
6	0.1221 A	260	1.2006 A	-89.8 %	0	0	0	0	0.1081 A	0	X	
7	0.2064 A	57	3.2416 A	-93.6 %	0	0	0	0	0.1963 A	0	X	
8	0.0357 A	229	0.9004 A	-96.0 %	0	0	0	0	0.0287 A	0	X	
9	0.1813 A	630	----	----	0	0	0	0	0.1725 A	0	X	
10	0.0746 A	16	0.7204 A	-89.6 %	0	0	0	0	0.0664 A	0	X	
11	0.1401 A	659	1.3957 A	-90.0 %	0	0	0	0	0.1352 A	0	X	
12	0.0244 A	188	0.6003 A	-95.9 %	0	0	0	0	0.0198 A	0	X	
13	0.1219 A	6	0.9004 A	-86.5 %	0	0	0	0	0.1144 A	0	X	
14	0.0280 A	714	----	----	0	0	0	0	0.0241 A	0	X	
15	0.0985 A	1	----	----	0	0	0	0	0.0946 A	0	X	
16	0.0157 A	750	----	----	0	0	0	0	0.0126 A	0	X	
17	0.0804 A	207	----	----	0	0	0	0	0.0783 A	0	X	
18	0.0139 A	1	----	----	0	0	0	0	0.0110 A	0	X	
19	0.0748 A	506	----	----	0	0	0	0	0.0720 A	0	X	
20	0.0123 A	1	----	----	0	0	0	0	0.0102 A	0	X	
21	0.0797 A	700	----	----	0	0	0	0	0.0768 A	0	X	
22	0.0159 A	62	----	----	0	0	0	0	0.0140 A	0	X	
23	0.0689 A	249	----	----	0	0	0	0	0.0664 A	0	X	
24	0.0113 A	401	----	----	0	0	0	0	0.0099 A	0	X	
25	0.0709 A	725	----	----	0	0	0	0	0.0691 A	0	X	
26	0.0092 A	546	----	----	0	0	0	0	0.0079 A	0	X	
27	0.0715 A	267	----	----	0	0	0	0	0.0698 A	0	X	
28	0.0096 A	502	----	----	0	0	0	0	0.0086 A	0	X	
29	0.0632 A	629	----	----	0	0	0	0	0.0610 A	0	X	
30	0.0108 A	173	----	----	0	0	0	0	0.0093 A	0	X	
31	0.0688 A	1	----	----	0	0	0	0	0.0660 A	0	X	
32	0.0092 A	299	----	----	0	0	0	0	0.0080 A	0	X	
33	0.0588 A	1	----	----	0	0	0	0	0.0568 A	0	X	
34	0.0084 A	195	----	----	0	0	0	0	0.0071 A	0	X	
35	0.0550 A	731	----	----	0	0	0	0	0.0538 A	0	X	
36	0.0076 A	443	----	----	0	0	0	0	0.0065 A	0	X	
37	0.0534 A	1	----	----	0	0	0	0	0.0515 A	0	X	
38	0.0049 A	434	----	----	0	0	0	0	0.0044 A	0	X	
39	0.0441 A	267	----	----	0	0	0	0	0.0432 A	0	X	
40	0.0066 A	39	----	----	0	0	0	0	0.0054 A	0	X	

average value < 1.0 % of Iref

Tested with SPS EMC 4.4.3 / PAS1000 by Spitzenberger & Spies GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtah, Germany, 04.06.2021

ELECTROSTATIC DISCHARGE IMMUNITY																
Technician: Andreu Tey				Test Area: Ground plane												
Test date: 2021-06-07				Criteria: B												
Resistance value: 0.934MΩ																
Basic standard: IEC-61000-4-2:2008																
<table border="1" style="width: 100%;"> <tr> <td>Temperature:</td> <td>23.5</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>52.2</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>1001.7</td> <td>hPa</td> </tr> </table>								Temperature:	23.5	°C	Humidity:	52.2	%	Atm. Pressure:	1001.7	hPa
Temperature:	23.5	°C														
Humidity:	52.2	%														
Atm. Pressure:	1001.7	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	+ -	0° FRONT FACE	A										
2	4 kV	25	IV	+ -	90° LEFT FACE	A										
3	4 kV	25	IV	+ -	180° REAR FACE	A										
4	4 kV	25	IV	+ -	270° RIGHT FACE	A										
5	4 kV	25	IH	+ -	FRONT DOOR	A										
6	4 kV	25	IH	+ -	RIGTH SIDE	A										
7	4 kV	25	IH	+ -	LEFT SIDE	A										
8	4 kV	25	IH	+ -	REAR SIDE	A										
9	4 kV	25	DC	+ -	TOP SIDE	A										
10	4 kV	25	DC	+ -	RS-232 HOUSING	A										
11	4 kV	25	DC	+ -	USB HOUSING	A										
12	4 kV	25	DC	+ -	LAN HOUSING	A										
13	8 kV	25	AC	+ -	PLASTIC DOOR LOCKS	A										
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.																

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

ELECTROMAGNETIC FIELD IMMUNITY				
Technician: Alfredo Plans		Test Area: Semi-Anechoic chamber, SAC-0		
Test date: 2021-01-11		Criteria: A		
Basic standard: IEC 61000-4-3:2006/ISH1:2008				
Temperature:		19.5	°C	
Humidity:		43.9	%	
Atm. Pressure:		1018.8	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 200 Hz	
Dist. DUT/antenna	3 m	3 m	3 m	3 m
Polarization	H	V	H	V
FACE	FRONTAL 0°	A	A	NA
	LEFT 90°	A	A	NA
	REAR180°	A	A	NA
	RIGHT 270°	A	A	NA
RESULTS: Pass				
Comments:				
No evidence of malfunctioning was detected in the EUT during the test.				

FAST TRANSIENTS IN BURST IMMUNITY																							
Technician: Andreu Tey			Test Area: Ground plane																				
Test date: 2021-06-17			Criteria: B																				
Basic standard: IEC 61000-4-4:2012																							
<table border="0"> <tr> <td>Temperature:</td> <td>23.5</td> <td>°C</td> <td colspan="3"></td> </tr> <tr> <td>Humidity:</td> <td>52.2</td> <td>%</td> <td colspan="3"></td> </tr> <tr> <td>Atm. Pressure:</td> <td>1001.7</td> <td>hPa</td> <td colspan="3"></td> </tr> </table>						Temperature:	23.5	°C				Humidity:	52.2	%				Atm. Pressure:	1001.7	hPa			
Temperature:	23.5	°C																					
Humidity:	52.2	%																					
Atm. Pressure:	1001.7	hPa																					
Result: Pass																							
Test ports	Application	Severity (kV)	Duration	Results	Comments																		
AC mains supply	L1+L2+L3+GND	+2	2 min	A	5 kHz																		
		-2	2 min	A																			
AC output supply	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)																		
Technician: Andreu Tey					Test Area: Ground plane													
Test date: 2021-06-17					Criteria: B													
Basic standard: IEC 61000-4-5:2014/Amd1:2017																		
<table border="1" style="width: 100%;"> <tr> <td>Temperature:</td> <td>23.5</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>52.2</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>1001.7</td> <td>hPa</td> </tr> </table>										Temperature:	23.5	°C	Humidity:	52.2	%	Atm. Pressure:	1001.7	hPa
Temperature:	23.5	°C																
Humidity:	52.2	%																
Atm. Pressure:	1001.7	hPa																
Result: Pass																		
Application	Zo	Line	Phase	Severity (kV)	N° Pulses		Results		Comments									
					+	-	Polarity +	Polarity -										
AC MAINS POWER SUPPLY																		
Line to line	2	L1 / L2	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L2 / L3	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L1 / L3	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L1 / N	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L2 / N	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L3 / N	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	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: Andreu Tey					Test Area: Ground plane													
Test date: 2021-06-18 / 2021-07-17					Criteria: B													
Basic standard: IEC 61000-4-5:2014/Amd1:2017																		
<table border="1" style="width: 100%;"> <tr> <td>Temperature:</td> <td>24.3</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>50.9</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>1002.9</td> <td>hPa</td> </tr> </table>										Temperature:	24.3	°C	Humidity:	50.9	%	Atm. Pressure:	1002.9	hPa
Temperature:	24.3	°C																
Humidity:	50.9	%																
Atm. Pressure:	1002.9	hPa																
Result: Pass																		
Application	Zo	Line	Phase	Severity (kV)	N° Pulses		Results		Comments									
					+	-	Polarity +	Polarity -										
AC MAINS POWER SUPPLY																		
Line to ground	12	L1 / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	2	5	5	A	A										
Line to ground	12	L2 / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	2	5	5	A	A										
Line to ground	12	L3 / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	2	5	5	A	A										
Line to ground	12	N / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	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 Perez					Test Area: Ground plane													
Test date: 2021-06-17					Criteria: B													
Basic standard: IEC 61000-4-5:2014/Amd1:2017																		
<table border="1" style="width: 100%;"> <tr> <td>Temperature:</td> <td>24.3</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>48.9</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>1001.8</td> <td>hPa</td> </tr> </table>										Temperature:	24.3	°C	Humidity:	48.9	%	Atm. Pressure:	1001.8	hPa
Temperature:	24.3	°C																
Humidity:	48.9	%																
Atm. Pressure:	1001.8	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	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L2 / L3	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L1 / L3	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L1 / N	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L2 / N	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	1	5	5	A	A										
Line to line	2	L3 / N	0°	1	5	5	A	A										
			90°	1	5	5	A	A										
			180°	1	5	5	A	A										
			270°	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: Andreu Tey					Test Area: Ground plane													
Test date: 2021-06-18 / 2021-07-17					Criteria: B													
Basic standard: IEC 61000-4-5:2014/Amd1:2017																		
<table border="1" style="width: 100%;"> <tr> <td>Temperature:</td> <td>24.3</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>50.9</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>1002.9</td> <td>hPa</td> </tr> </table>										Temperature:	24.3	°C	Humidity:	50.9	%	Atm. Pressure:	1002.9	hPa
Temperature:	24.3	°C																
Humidity:	50.9	%																
Atm. Pressure:	1002.9	hPa																
Result: Pass																		
Application	Zo	Line	Phase	Severity (kV)	N° Pulses		Results		Comments									
					+	-	Polarity +	Polarity -										
AC OUTPUT POWER SUPPLY																		
Line to ground	12	L1 / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	2	5	5	A	A										
Line to ground	12	L2 / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	2	5	5	A	A										
Line to ground	12	L3 / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	2	5	5	A	A										
Line to ground	12	N / E	0°	2	5	5	A	A										
			90°	2	5	5	A	A										
			180°	2	5	5	A	A										
			270°	2	5	5	A	A										
Comments:																		
No evidence of malfunctioning was detected in the EUT during 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 decade
	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 malfunctioning was detected in the EUT during or after the test.					