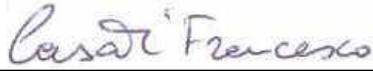




LAB N° 1363 L

EMC TEST REPORT

Test Report No:	19-4789233262-5-1-0-EMC-A Cancel and replace the test report No. 19-4788981241-6-1-0-EMC-A issued on 2019-06-14
UL Project No:	4789233262
Date of issue:	2019-11-28
Total number of pages:	50
Applicant:	Neri S.p.A. SS Emilia 1622 47020 Longiano (FC) – Italy
Contact's person:	Simone Zoffoli (zoffoli.s@neri.biz)
Testing Laboratory:	UL International Italia S.r.l. Via delle Industrie, 6 (Sede A) 20061 Carugate (MI) – Italy
Testing location:	UL International Italia S.r.l. Via delle Industrie, 6 (Sede A) 20061 Carugate (MI) – Italy
Test specification:	
Regulations:	2014/30/EU (EMC)
Standards:	EN 55015:2013 + A1:2015 EN 61000-3-2:2014 EN 61000-3-3:2013 EN 61547:2009
Non-standard test method:	N/A
Scope of testing:	EMC tests on a new product
TRF No.:	TRF_Accredia_RAFI_rev 17.4
Test Report Form(s) Originator:	UL International Italia S.r.l.
Master TRF	2017-07
Compiled by: (name, function, signature)	Andrea Giovanni Galbiati <i>Laboratory Engineer</i> 
Approved by: (name, function, signature)	Francesco Casati <i>Laboratory Engineer</i> 
General disclaimer:	<p>The test results presented in this test report relate only to the object tested, not selected by UL International Italia S.r.l.</p> <p>This report shall not be reproduced, except in full, without the written approval of the issuing Testing Laboratory.</p> <p>This document contains data (of information) using color and if printed, should be printed in color to retain legibility and the information represented by the color.</p>



LAB N° 1363 L

Description:	Street LED lighting equipment
Trade Mark:	Neri
Manufacturer:	Neri S.p.A. SS Emilia 1622 47020 Longiano (FC) – Italy
Model/Type reference:	Lyra 32
Ratings:	220-240 V~; 50/60 Hz; 83 W
Testing:	
Date of receipt of test item:	2019-05-16
UL Sample Tag No.:	2265296
Status of sample upon receipt:	<input checked="" type="checkbox"/> New and operational <input type="checkbox"/> Reconditioned <input type="checkbox"/> Damaged
Date(s) of performance of tests:	2019-06-07 to 2019-06-11
Name and address of factory(ies):	Neri S.p.A. Via delle Querce, 4 47020 Longiano (FC) – Italy
General remarks: A cross <input checked="" type="checkbox"/> in a rectangular shape means that this option is applied. <input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report. <input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report. Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as decimal separator.	

General product information: Post top mounted LED luminaire, with aluminum frame, tempered glass screen. <u>Reissuing of the test report:</u> This test report is a reissue of Ref. No.: 19-4788981241-6-1-0-EMC-A (dated 2019-06-14). This reissue includes the following updates: <ul style="list-style-type: none">• Change of model/type reference (from Light 112 to Lyra 32).• Update of ratings (from 80 W to 83 W. Additional “~” after voltage rating)• Marking plate added The product is the same. No additional testing is needed.



LAB N° 1363 L

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LAB N° 1363 L

1 Test Item Description

Description:	Street LED lighting equipment					
Trade Mark:	Neri					
Model number:	Lyra 32					
Serial number:	---					
Date of production:	---					
Ports:	Port name and description	Cable				
		Specified length(m)	Attached during test	Shielded		
	AC Mains	---	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
Supplementary information to the ports:	---					
Rated power supply:		Voltage and frequency	Reference poles			
			N	L1	L2	L3
	<input checked="" type="checkbox"/>	AC: 220-240 V; 50/60 Hz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	DC:				
Rated power:	83 W					
Protection class:	II					
Environment of intended use:	<input type="checkbox"/>	Household				
	<input checked="" type="checkbox"/>	Commercial and light-industrial				
	<input type="checkbox"/>	Industrial				
	<input type="checkbox"/>	Professional healthcare facility (only for ME)				
	<input type="checkbox"/>	Home healthcare (only for ME)				
	<input type="checkbox"/>	Special (only for ME)				
Working frequencies:	---					
Other parameters:	---					
Firmware/Software version:	---					
Hardware version:	---					
Dimensions in cm (W x H x D):	42 x 50 x 42					
Mounting position:	<input type="checkbox"/>	Table top equipment				
	<input type="checkbox"/>	Wall/Ceiling mounted equipment				
	<input type="checkbox"/>	Floor standing equipment				
	<input type="checkbox"/>	Hand-held equipment				
	<input checked="" type="checkbox"/>	Other: port top support, treated as table top equipment				



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Modules/parts:	Module/parts of test item		Type	Manufacturer
	---		---	---
Operating modes:	No.	Operating mode of test item	Applied for testing	
			Emission	Immunity
	1	On	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Supplemental information to the operating mode:	---			
Accessories (not part of the test item):	Accessory	Type	Manufacturer	
	---	---	---	
Documents as provided by the applicant:	Description	File name	Issue date	
	---	---	---	
Modifications to the test item during testing:	None			

Copy of marking plate:

NERI Lyra 32

Lotto
00/00
00001

220-240V ~ 50/60Hz Ta 50°C IP66 IK09

3000K 8000lm 83 W type IV

modello brevettato
made in Italy

* 0 0 0 0 1 1 9 0 0 0 0 1 *

Neri S.p.A.
Via Emilia, 1622
47020 (FC)
Longiano - Italy



LAB N° 1363 L

2 Verdict summary section

Requirement – Test case	Reference standard	Accredia Scope	Verdict
Insertion loss	CISPR 15:2013 + A1:2015	Yes	N/A ¹
Conducted emission	CISPR 15:2013 + A1:2015	Yes	P
Radiated emission, magnetic field	CISPR 15:2013 + A1:2015	Yes	P
Radiated emission, electric field	CISPR 15:2013 + A1:2015	Yes	P
Harmonic current emissions	IEC 61000-3-2:2014	Yes	P
Voltage changes, voltage fluctuations and flicker	IEC 61000-3-3:2013	Yes	N/A ²
Electrostatic discharges	IEC 61000-4-2:2008	Yes	P
Radiated, radio-frequency electromagnetic field	IEC 61000-4-3:2006 + A1:2007	Yes	P
Electrical fast transients/burst	IEC 61000-4-4:2004	Yes	P
Surges	IEC 61000-4-5:2005	Yes	P
Conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6:2008	Yes	P
Power frequency magnetic fields	IEC 61000-4-8:1993 + A1:2000	Yes	P
Voltage dips and short interruptions	IEC 61000-4-11:2004	Yes	P
Remarks:			
1. The EUT is not a starter switch operated type fluorescent lamp luminaire.			
2. The total power of LED lamps is less than 200 W.			

Possible test case verdicts:

Test case not performed: N/P

Test case does not apply to test object: N/A

Test object does meet requirement: Pass (P)

Test object does not meet requirement: Fail (F)



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3 Test Conditions

3.1 Environmental reference conditions

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.

The climatic conditions during the tests were within the following limits:

Ambient temperature	Relative humidity	Atmospheric pressure
15 °C – 30 °C	30 % – 60 %	860 mbar – 1060 mbar

3.2 Measurement uncertainties

For all measurements where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in CISPR 16-4-2, IEC 61000-4 series or a product standard, the measurement instrumentation uncertainty has been calculated and applied in accordance with these standards.

In all cases if the test laboratory uncertainty is larger than the value for U_{cispr} given in CISPR 16-4-2 the uncertainty are included in the test report annex.

In case the standards in the IEC 61000-4 series or the product standard requires the indication of the uncertainty in the report these uncertainty values are included in the annex.



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3.3 Formula used for RF emission quantities

Conducted emission

$$V \text{ (dB}\mu\text{V)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{I.L. transducer (dB)} + \text{I.L. cable (dB)}$$

Magnetic field

$$H \text{ (dB}\mu\text{A/m)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{Magnetic antenna factor (dB}/\Omega\text{m)} + \text{I.L. cables (dB)}$$

Magnetic field induced current

$$I \text{ (dB}\mu\text{A)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{Corrective antenna factor (dB}\Omega^{-1}\text{)}$$

Disturbance power

$$P \text{ (dBpW)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{Clamp factor (dBpW}/\mu\text{V)} + \text{I.L. external 6 dB attenuator (dB)} + \text{I.L. cable (dB)}$$

Radiated emission

$$E \text{ (dB}\mu\text{V/m)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{Electric antenna factor (dB/m)} - \text{Gain external preamplifier (dB)} + \text{I.L. external filter (dB)} + \text{I.L. cables (dB)}$$

Note: external preamplifier and external filter are optional and, if used, are indicated in the list of test equipment

Independent method of measurement of radiated emission (CDNE)

$$V \text{ (dB}\mu\text{V)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{I.L. CDN (dB)} + \text{I.L. external 6dB attenuator (dB)} + \text{I.L. cable (dB)}$$

Radiated power (substitution method)

$$\text{Radiated power (dBm)} = V \text{ receiver (dB}\mu\text{V)} + \text{Correction (dB)}$$

where:

$$\text{Correction (dB)} = \text{Chamber attenuation (dB)} + \text{Gain of calibration transmitting antenna (dBi)} - \text{Gain external preamplifier (dB)} + \text{I.L. external filter (dB)}$$

Note: external preamplifier and external filter are optional and, if used, are indicated in the list of test equipment

$$\square E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20 \log D + 104.8; \text{ where } D \text{ is the measurement distance in meters}$$

$$\square \text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20 \log D - 104.8; \text{ where } D \text{ is the measurement distance in meters}$$

$$\square \text{ERP} = \text{EIRP} - 2.15 \text{ (dB)}; \text{ where ERP and EIRP are expressed in consistent units}$$

$$\square \text{EIRP} = \text{ERP} + 2.15 \text{ (dB)}; \text{ ERP and EIRP are expressed in consistent units}$$

Margin

$$\text{Margin (dB)} = \text{Measure} - \text{Limit}$$

Radiated emission limit conversion for a different measuring distance

$$40 \text{ dB/decade (f} < 30 \text{ MHz)}; 20 \text{ dB/decade (f} \geq 30 \text{ MHz)}$$

Linear to logarithmic conversion

$$\text{Log} = 20 * \log(\text{Lin}) \text{ for voltage and current; } \text{Log} = 10 * \log(\text{Lin}) \text{ for power}$$



LAB N° 1363 L

4 Emission

4.1 Conducted emission

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-11	
Test location (stand):	Semi Anechoic Chamber	
Ambient temperature:	22 °C	
Relative humidity:	44 %	
Atmospheric pressure:	999 mbar	
Applied limits:	CISPR 15-1, Table 2a	
Test set-up description:	<input type="checkbox"/>	Set-up Type A (40 cm distance to vertical ground plane and 80 cm to horizontal ground plane)
	<input checked="" type="checkbox"/>	Set-up Type B (40 cm distance to horizontal ground plane)
	<input type="checkbox"/>	Floor standing equipment set-up (10 cm over ground plane)
	<input type="checkbox"/>	80 cm to horizontal ground plane (vertical ground plane not used according to ANSI C63.4-2014 clause 5.2.3)
	<input type="checkbox"/>	Other:
	<input type="checkbox"/>	Artificial hand applied
Supplementary test set-up description:	---	
Test method applied:	<input checked="" type="checkbox"/>	Artificial mains network
	<input type="checkbox"/>	Artificial mains network used as voltage probe
	<input type="checkbox"/>	Voltage probe
	<input type="checkbox"/>	CDN according to IEC 61000-4-6
	<input type="checkbox"/>	Current probe and capacitive voltage probe (CVP)
	<input type="checkbox"/>	ISN
	<input type="checkbox"/>	In situ CDN (150 Ohm and current probe)
	<input type="checkbox"/>	Other:
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	



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Photo of test setup:



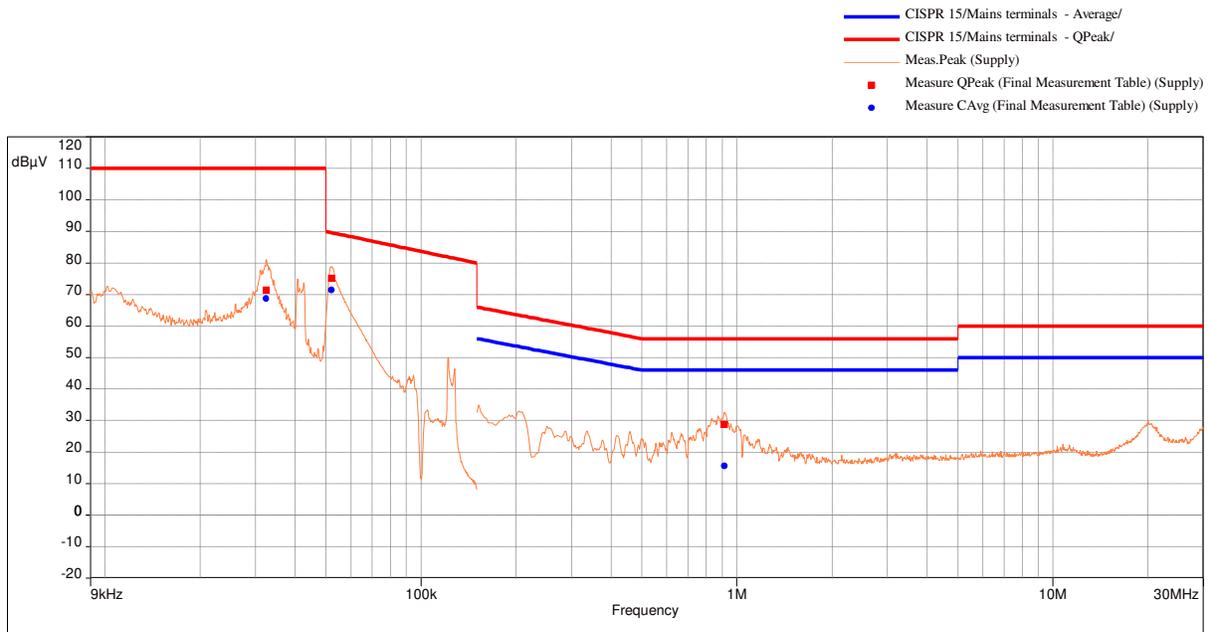


LAB N° 1363 L

Results

Operator:	Andrea Giovanni Galbiati		
Supply condition:	230 V; 50 Hz		
Test Condition:	1		
Port tested:	Phase		
Test result:	Pass	Tested on:	2019-06-11

Start Frequency:9kHz; Stop Frequency:150kHz; Step:50Hz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:200Hz; Preamplifier:OFF; Preselector: ON
Start Frequency:150kHz; Stop Frequency:30MHz; Step:2.25kHz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:9kHz; Preamplifier:OFF; Preselector: ON



Final Measurement Table

Frequency (MHz)	SR	Measure Peak (dBµV)	Measure QPeak (dBµV)	Limit QPeak (dBµV)	Margin QPeak (dB)	Measure CAvg (dBµV)	Limit Avg (dBµV)	Margin Avg (dB)	Comments	Correction (dB)
0.0324	1	81.05	71.41	110.00	-38.59	68.68			Pass	10.61
0.05225	1	78.87	75.12	89.60	-14.48	71.39			Pass	10.31
0.915	2	32.60	28.70	56.00	-27.30	15.53	46.00	-30.47	Pass	10.23

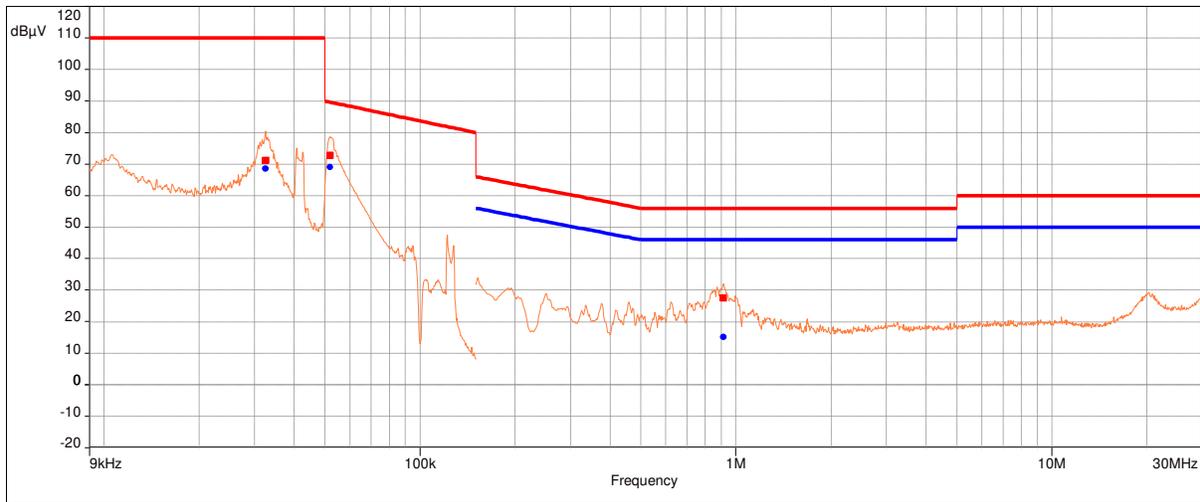


LAB N° 1363 L

Operator:	Andrea Giovanni Galbiati		
Supply condition:	230 V; 50 Hz		
Test Condition:	1		
Port tested:	Neutral		
Test result:	Pass	Tested on:	2019-06-11

Start Frequency:9kHz; Stop Frequency:150kHz; Step:50Hz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:200Hz; Preamplifier:OFF; Preselector: ON
Start Frequency:150kHz; Stop Frequency:30MHz; Step:2.25kHz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:9kHz; Preamplifier:OFF; Preselector: ON

- CISPR 15/Mains terminals - Average/
- CISPR 15/Mains terminals - QPeak/
- Meas.Peak (Supply)
- Measure QPeak (Final Measurement Table) (Supply)
- Measure CAvg (Final Measurement Table) (Supply)



Final Measurement Table

Frequency (MHz)	SR	Measure Peak (dBµV)	Measure QPeak (dBµV)	Limit QPeak (dBµV)	Margin QPeak (dB)	Measure CAvg (dBµV)	Limit Avg (dBµV)	Margin Avg (dB)	Comments	Correction (dB)
0.03245	1	80.47	71.28	110.00	-38.72	68.59			Pass	10.61
0.0519	1	78.67	72.88	89.66	-16.79	69.00			Pass	10.33
0.91275	2	31.95	27.44	56.00	-28.56	15.05	46.00	-30.95	Pass	10.23

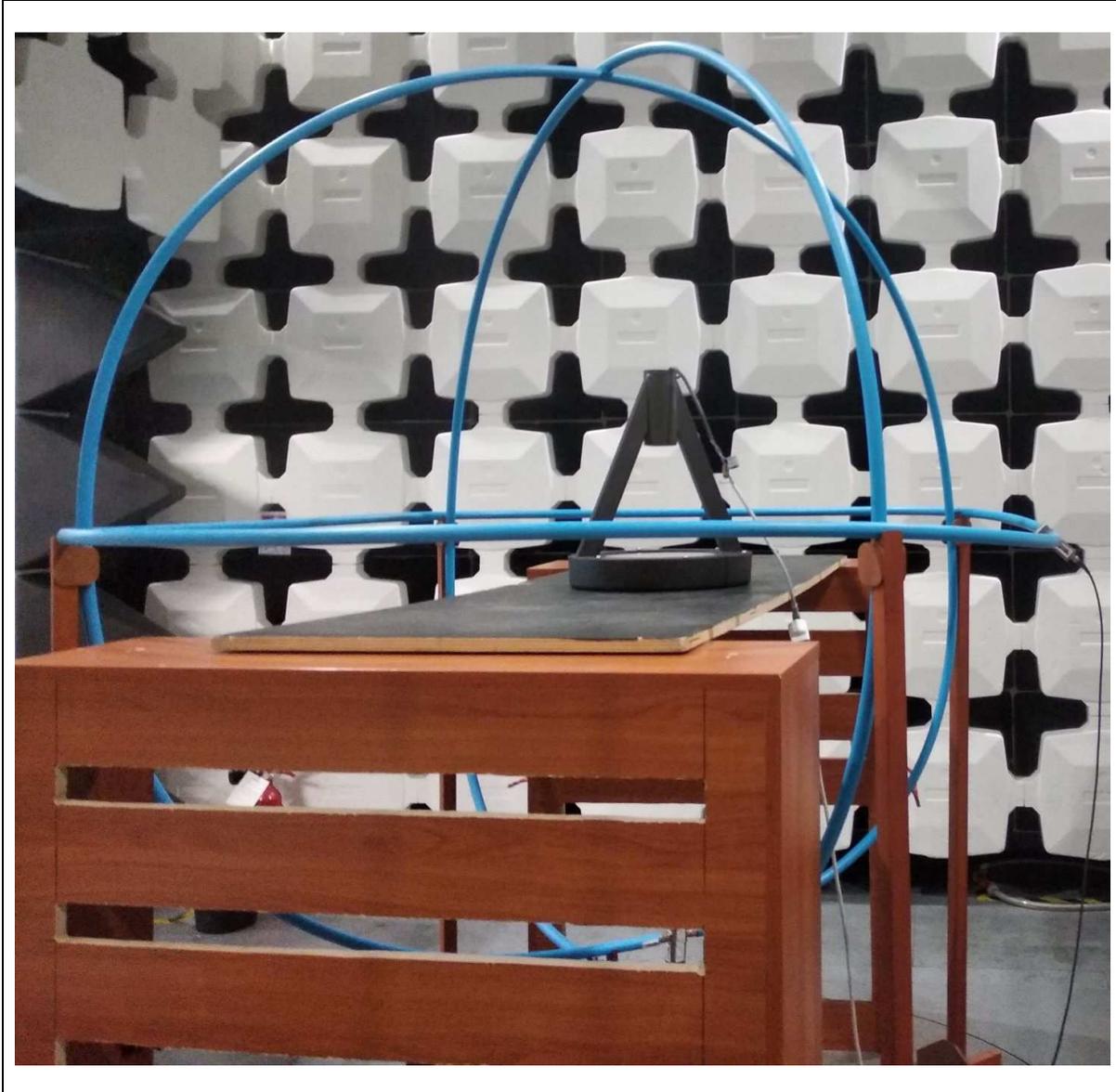


LAB N° 1363 L

4.2 Radiated emission (magnetic field)

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-11	
Test location (stand):	Semi Anechoic Chamber	
Ambient temperature:	22 °C	
Relative humidity:	44 %	
Atmospheric pressure:	999 mbar	
Applied limits:	CISPR 15-1, Table 3a	
Test set-up description:	<input type="checkbox"/>	Equipment on a table of 80 cm height
	<input type="checkbox"/>	Equipment on the floor (insulated from ground plane)
	<input checked="" type="checkbox"/>	Equipment placed in the centre of the loop antenna system (LAS) according CISPR 16-2-3
	<input type="checkbox"/>	Other:
Supplementary test set-up description:	---	
Test method:	<input type="checkbox"/>	3 m distance with 0.6 m loop antenna according CISPR 16-1-4
	<input checked="" type="checkbox"/>	2 m loop antenna system (LAS) according CISPR 16-2-3
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:



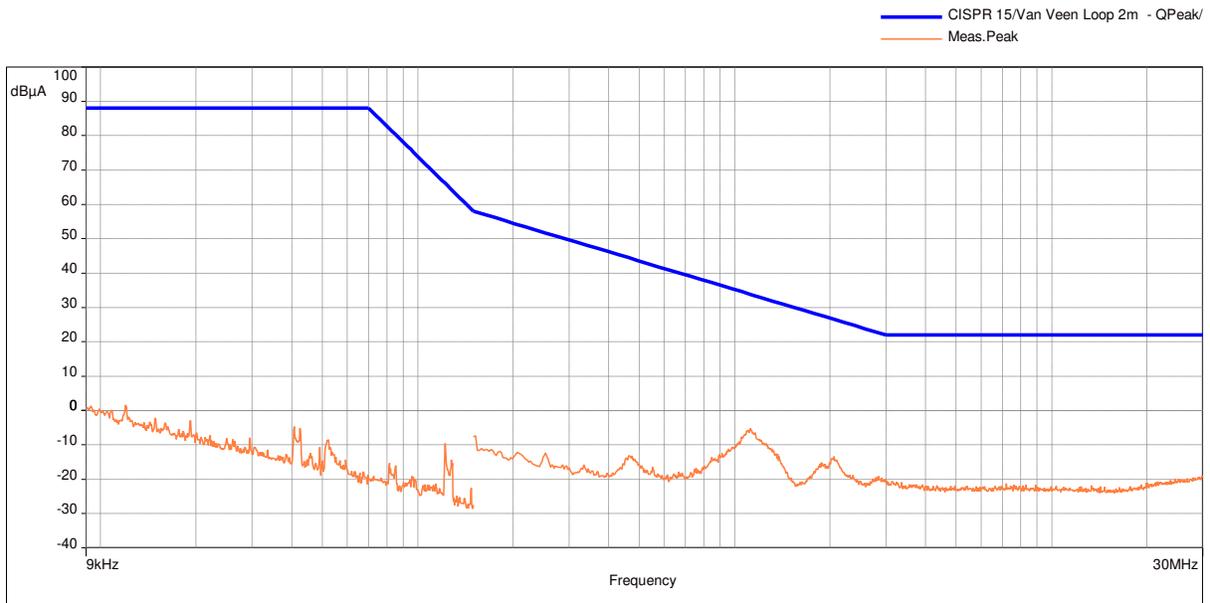


LAB N° 1363 L

Results

Operator:	Andrea Giovanni Galbiati		
Supply condition:	230 V; 50 Hz		
Test Condition:	1		
Axis:	A (vertical H component)		
Test result:	Pass	Tested on:	2019-06-11

Start Frequency:9kHz; Stop Frequency:150kHz; Step:50Hz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:200Hz; Preamplifier:OFF; Preselector: ON
Start Frequency:150kHz; Stop Frequency:30MHz; Step:2.25kHz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:9kHz; Preamplifier:OFF; Preselector: ON



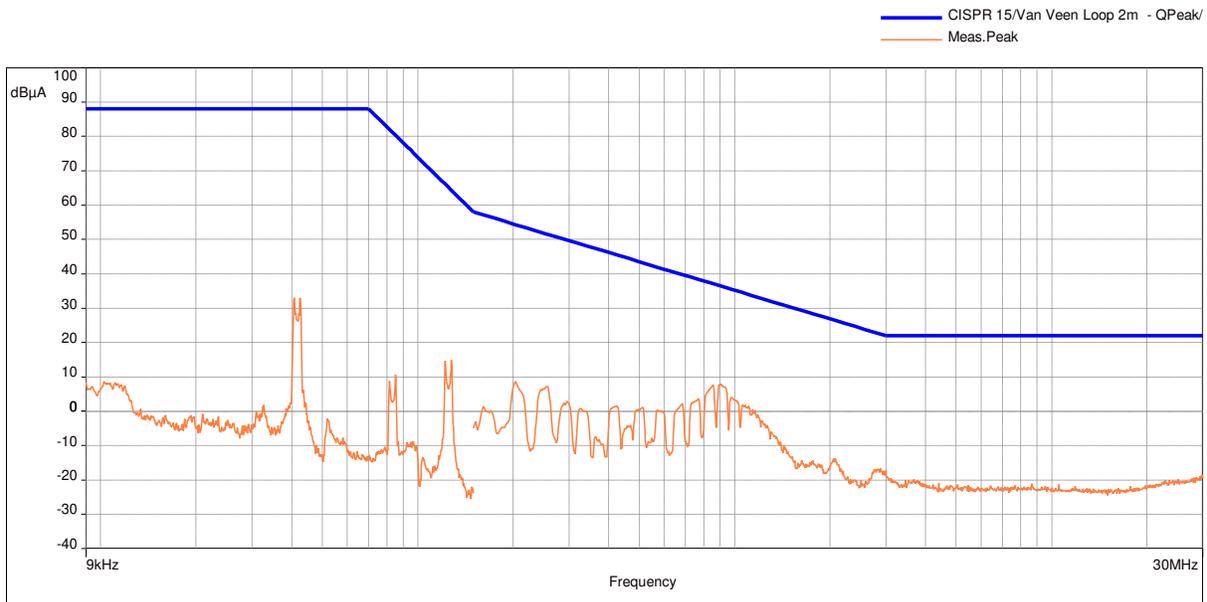
No relevant peak are detectable



LAB N° 1363 L

Operator:	Andrea Giovanni Galbiati		
Supply condition:	230 V; 50 Hz		
Test Condition:	1		
Axis:	B (horizontal H component)		
Test result:	Pass	Tested on:	2019-06-11

Start Frequency:9kHz; Stop Frequency:150kHz; Step:50Hz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:200Hz; Preamplifier:OFF; Preselector: ON
Start Frequency:150kHz; Stop Frequency:30MHz; Step:2.25kHz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:9kHz; Preamplifier:OFF; Preselector: ON



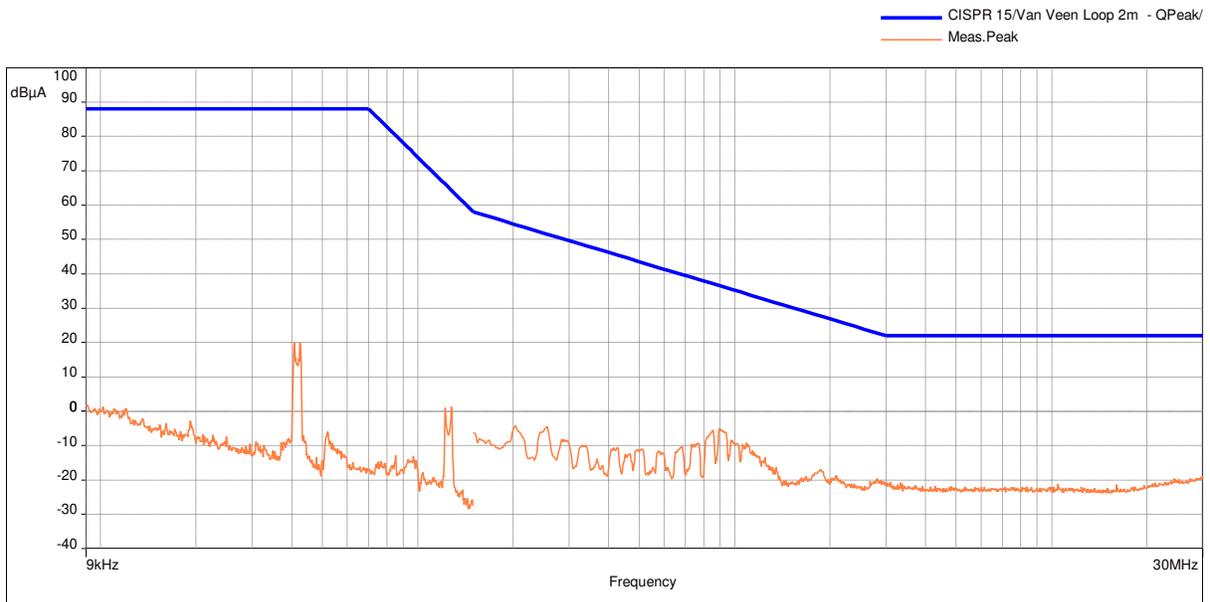
No relevant peak are detectable



LAB N° 1363 L

Operator:	Andrea Giovanni Galbiati		
Supply condition:	230 V; 50 Hz		
Test Condition:	1		
Axis:	C (horizontal H component)		
Test result:	Pass	Tested on:	2019-06-11

Start Frequency:9kHz; Stop Frequency:150kHz; Step:50Hz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:200Hz; Preamplifier:OFF; Preselector: ON
Start Frequency:150kHz; Stop Frequency:30MHz; Step:2.25kHz; Sweep Time:500 ms/Pts; RF Attenuation:Auto; 10 dB min attenuation:ON; RBW:9kHz; Preamplifier:OFF; Preselector: ON



No relevant peak are detectable

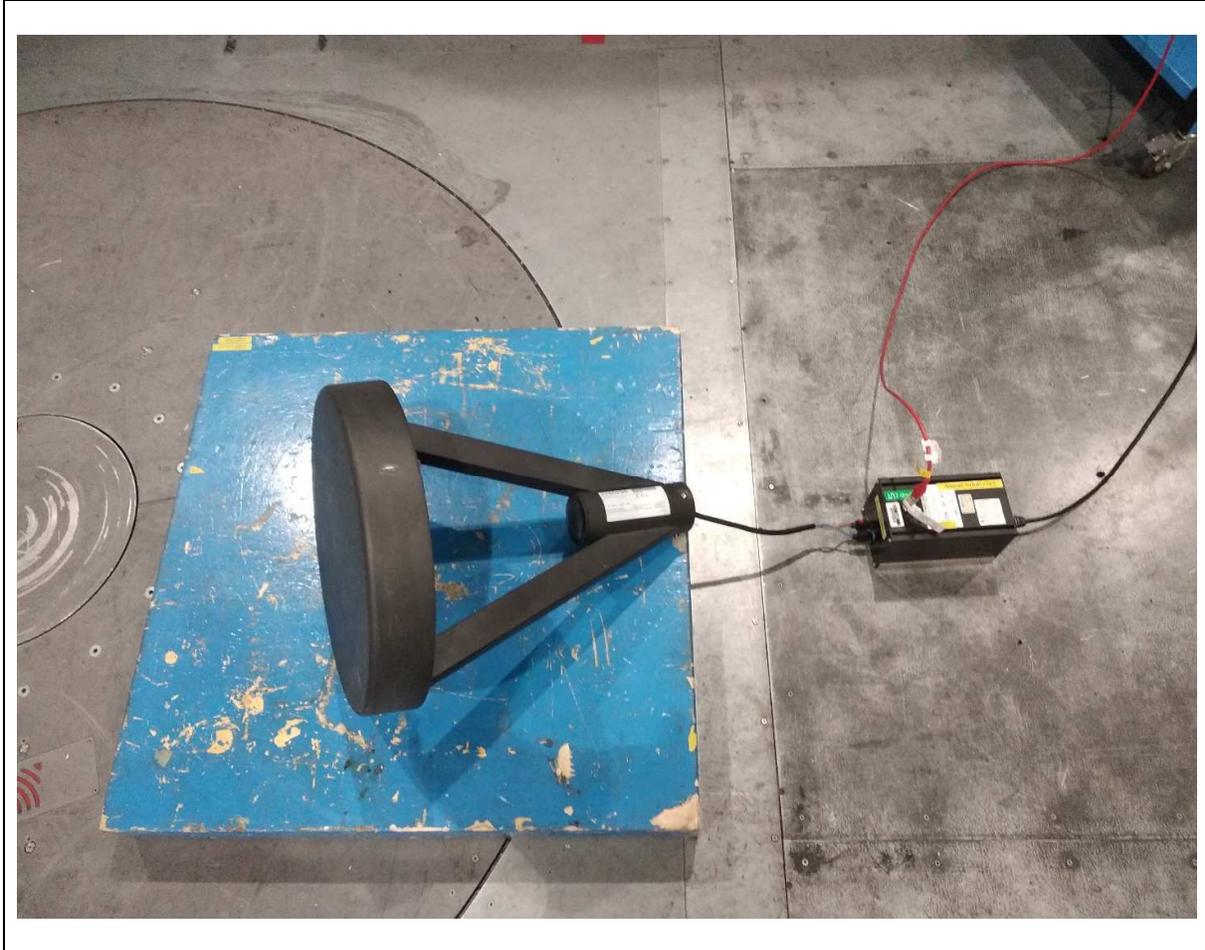


LAB N° 1363 L

4.3 Radiated emission (electric field)

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-11	
Test location (stand):	Semi Anechoic Chamber	
Ambient temperature:	22 °C	
Relative humidity:	44 %	
Atmospheric pressure:	999 mbar	
Applied limits:	CISPR 15-1, Table B.1	
Test set-up description:	<input type="checkbox"/>	Equipment on table of 80 cm height
	<input type="checkbox"/>	Equipment on support of 10 cm height
	<input checked="" type="checkbox"/>	Equipment on a 10 cm support over the ground plane according CISPR 15 Annex B
	<input type="checkbox"/>	Other:
Supplementary test set-up description:	---	
Test method:	<input type="checkbox"/>	OATS or SAC with measurement distance [m]: 3
	<input type="checkbox"/>	FAR with measurement distance [m]:
	<input type="checkbox"/>	TEM Waveguide
	<input checked="" type="checkbox"/>	CDN(E) according to CISPR 15 Annex B
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:





LAB N° 1363 L

Results

Operator:	Andrea Giovanni Galbiati		
Supply condition:	230 V; 50 Hz		
Test Condition:	1		
Port tested:	Supply		
Test result:	Pass	Tested on:	2019-06-11

Start Frequency:30MHz; Stop Frequency:300MHz; Step:30kHz; Sweep Time:100 ms/Pts; RF Attenuation:Auto;
 10 dB min attenuation:ON; RBW:120kHz; Preamplifier:OFF; Preselector: ON

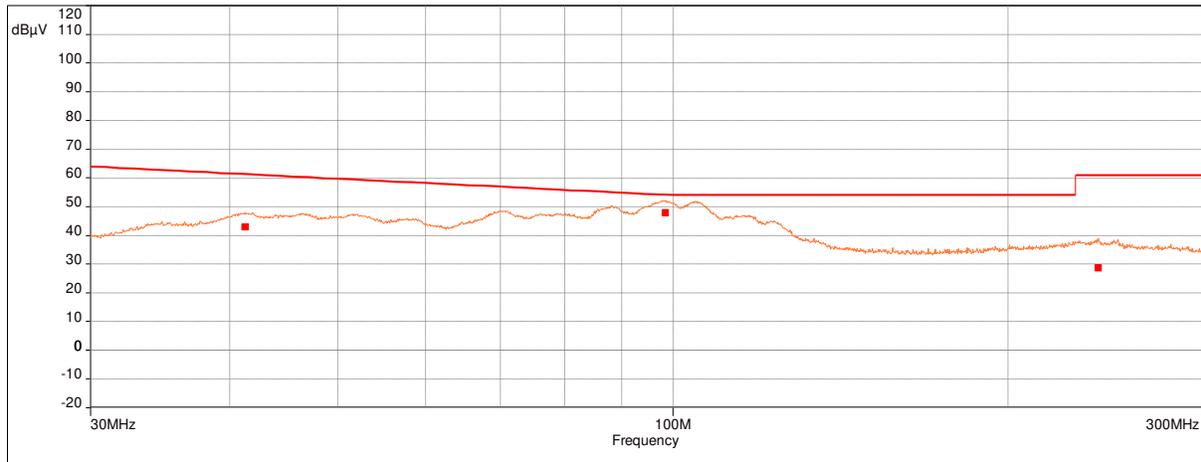
- CISPR 15/Radiated CDN method - QPeak/
- Meas.Peak (Supply)
- Measure QPeak (Final Measurement Table) (Supply)

Sub-range 1

Frequencies: 30 MHz - 300 MHz (Mode: - Step: 30 kHz)

Settings: RBW: 120kHz, VBW: Auto, Sweep time: 100 ms/Pts, Attenuation: Auto, Sweep count 2, Preamp: Off, LN Preamp: On, Preselector: On

Line:Supply



Final Measurement Table

Frequency (MHz)	SR	Measure Peak (dBµV)	Measure QPeak (dBµV)	Limit QPeak (dBµV)	Margin QPeak (dB)	Comments	Correction (dB)
41.28	1	47.91	42.99	61.35	-18.36	Pass	16.09
98.52	1	52.09	47.94	54.12	-6.18	Pass	16.28
241.08	1	38.99	28.68	61.00	-32.32	Pass	16.61

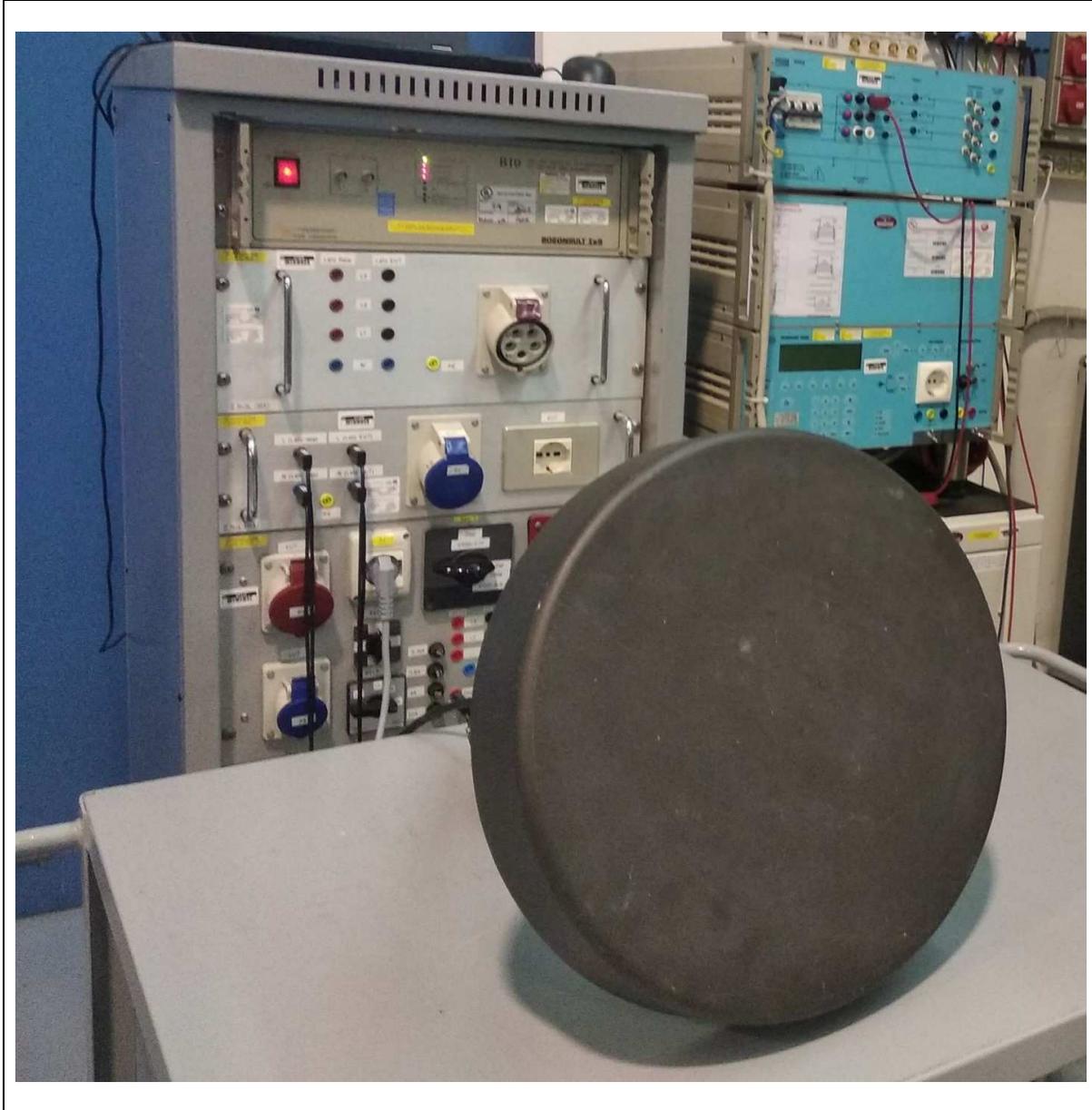


LAB N° 1363 L

5 Harmonic current emission

Tested by:	Andrea Giovanni Galbiati		
Test date:	2019-06-10		
Test location (stand):	EMC Lab		
Ambient temperature:	22 °C		
Relative humidity:	58 %		
Atmospheric pressure:	995 mbar		
Applied standard:	<input checked="" type="checkbox"/>	IEC 61000-3-2	
	<input type="checkbox"/>	IEC 61000-3-12	
Applied limits:	<input type="checkbox"/>	Class A	
	<input type="checkbox"/>	Class B	
	<input checked="" type="checkbox"/>	Class C with active input power > 25 W	
	<input type="checkbox"/>	Class C with active input power ≤ 25 W (First requirement, Table 3 column 2)	
	<input type="checkbox"/>	Class C with active input power ≤ 25 W (Second requirement)	
	<input type="checkbox"/>	Class D	
	<input type="checkbox"/>	Non symmetrical equipment (Table 2)	
	<input type="checkbox"/>	Symmetrical 3-phase equipment (Table 3)	
	<input type="checkbox"/>	Symmetrical 3-phase equipment under special conditions (Table 4)	
	<input type="checkbox"/>	Symmetrical 3-phase equipment under special conditions (Table 5)	
Observation period:	Description	Period selected T_{obs}	
	<input checked="" type="checkbox"/>	Quasi stationary	$T_{obs} = 2.5$ minutes
	<input type="checkbox"/>	Short cyclic	$T_{obs} \geq 10$ cycles =
	<input type="checkbox"/>	Random	$T_{obs} =$
	<input type="checkbox"/>	Long cyclic	Full program cycle or 2.5 min. with highest THC $T_{obs} =$
Version of measurement instrument standard used IEC 61000-4-7:	<input type="checkbox"/>	IEC 61000-4-7:1991	
	<input checked="" type="checkbox"/>	IEC 61000-4-7:2002 + A1:2008	
Control principle used in the sample:	None		
Used mains voltage/frequency:	230 V; 50 Hz		
Supplementary information:	The supply source complies with clause A.2 of IEC 61000-3-2		

Photo of test setup:





LAB N° 1363 L

Results:

Operation mode	1
Port	AC Mains, L terminal
Verdict.....	Pass

Maximum RMS current and corresponding values in time window 3:

Voltage: 230.12 Vrms THD=0.03 % THV=0.060 V POHV=0.011 V PWHD=0.05 %
 Current: 0.362 Arms THD=8.29 % THC=0.030 A POHC=0.003 A PWHD=8.05 %
 Power: 82.4 W P1=82.4 W 83.4 VA
 Power factor: 0.988 CosPhi1: 0.992

Test conditions: EN 61000-3-2:2014, f=50 Hz, Phase=L1, Range=0.80 A
 Time window =10/12 (200ms), Grouping (>2nd harm.)=on, Rated I1=0.36 A, Rated pf=0.988
 No Ztest selected
 harmonic currents < 0.6 % of I or < 5 mA are disregard for calc. of THD, THC, POHC, PWHD

HARMONIC ANALYSIS: Test PASS
 Tabs = entire measurement; POHC: avg=0.00 A, limits=0.03 A
 Iavg=0.361 Arms

Ha	Entire measurement (2.5 min = 750 time windows)				Worst 2.5 min		Average		P A S S	F A I L	
	Maximum	Window	EN61000-3-2 Class C a)	Margin in MaxWin	100 to 150%	Ex- ceeded	100 to 150%	Ex- ceeded			Value
DC	-0.0126 A	57	-----	-----	0	0	n.e.	n.e.	-0.0125 A	0	--
1	0.3609 A	3	-----	-----	0	0	n.e.	n.e.	0.3597 A	0	X
2	0.0003 A	593	0.0072 A	-96.2 %	0	0	n.e.	n.e.	0.0002 A	0	X
3	0.0248 A	53	0.1067 A	-76.8 %	0	0	n.e.	n.e.	0.0245 A	0	X
4	0.0002 A	492	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
5	0.0030 A	22	0.0360 A	-91.6 %	0	0	n.e.	n.e.	0.0029 A	0	X
6	0.0001 A	587	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
7	0.0077 A	730	0.0252 A	-69.3 %	0	0	n.e.	n.e.	0.0077 A	0	X
8	0.0001 A	505	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
9	0.0097 A	685	0.0180 A	-45.9 %	0	0	n.e.	n.e.	0.0097 A	0	X
10	0.0001 A	509	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
11	0.0076 A	19	0.0108 A	-29.8 %	0	0	n.e.	n.e.	0.0075 A	0	X
12	0.0001 A	469	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
13	0.0047 A	218	0.0108 A	-56.6 %	0	0	n.e.	n.e.	0.0046 A	0	X
14	0.0001 A	368	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
15	0.0035 A	250	0.0108 A	-67.7 %	0	0	n.e.	n.e.	0.0034 A	0	X
16	0.0001 A	521	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
17	0.0035 A	689	0.0108 A	-67.2 %	0	0	n.e.	n.e.	0.0035 A	0	X
18	0.0001 A	1	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
19	0.0035 A	140	0.0108 A	-67.4 %	0	0	n.e.	n.e.	0.0035 A	0	X
20	0.0001 A	101	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
21	0.0025 A	205	0.0108 A	-76.8 %	0	0	n.e.	n.e.	0.0025 A	0	X
22	0.0001 A	368	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
23	0.0013 A	236	0.0108 A	-88.2 %	0	0	n.e.	n.e.	0.0012 A	0	X
24	0.0001 A	535	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
25	0.0007 A	171	0.0108 A	-93.5 %	0	0	n.e.	n.e.	0.0006 A	0	X
26	0.0001 A	417	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
27	0.0007 A	38	0.0108 A	-93.9 %	0	0	n.e.	n.e.	0.0006 A	0	X
28	0.0001 A	596	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
29	0.0006 A	236	0.0108 A	-94.8 %	0	0	n.e.	n.e.	0.0005 A	0	X
30	0.0001 A	368	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
31	0.0001 A	714	0.0108 A	-98.8 %	0	0	n.e.	n.e.	0.0001 A	0	X
32	0.0001 A	81	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
33	0.0004 A	237	0.0108 A	-95.9 %	0	0	n.e.	n.e.	0.0004 A	0	X
34	0.0001 A	534	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
35	0.0004 A	747	0.0108 A	-96.3 %	0	0	n.e.	n.e.	0.0004 A	0	X
36	0.0001 A	604	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
37	0.0004 A	162	0.0108 A	-96.2 %	0	0	n.e.	n.e.	0.0004 A	0	X
38	0.0001 A	598	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X
39	0.0005 A	2	0.0108 A	-95.6 %	0	0	n.e.	n.e.	0.0004 A	0	X
40	0.0001 A	464	-----	-----	0	0	n.e.	n.e.	0.0001 A	0	X

average value < 0.6 % of Iavg or < 5 mA n.e. = not evaluated

Tested with SPSEMC 4.1.1 / None by Spitz enberger & Spitz GmbH & Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 10.06.2019



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6 Immunity

6.1 General Information

Criterion	Performance criteria as defined by the standard
A	During the test, no change of the luminous intensity shall be observed and the regulating control, if any shall operate during the test as intended.
B	During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.
C	During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control. Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.
NOTE 1:	Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.
NOTE 2:	A change of luminous intensity may be checked by visual observation but, in case of doubt, the following applies. The luminous intensity of a luminaire or of the lamp(s) shall be measured by means of a illuminance (lux) meter which is positioned in an axis perpendicular to the main plane of the luminaire or lamp(s), in its centre and at a distance for proper operation of the lux meter. The luminous intensity shall be deemed to be unchanged if the measured intensities do not deviate by more than 15 %.

Manufacturer defined performance criteria.....:	A	---
	B	---
	C	---
	D	---
Monitoring during the tests	<ul style="list-style-type: none"> Luminous intensity by lux meter Absorbing DC current of LED module 	

6.2 Specific information IEC 61547

Category acc. IEC 61547.....:	<input type="checkbox"/>	Non-electronic lighting equipment
	<input type="checkbox"/>	Self-ballasted lamps
	<input type="checkbox"/>	Independent electronic auxiliary
	<input checked="" type="checkbox"/>	Luminaire including active electronic components
	<input type="checkbox"/>	Luminaire for emergency lighting



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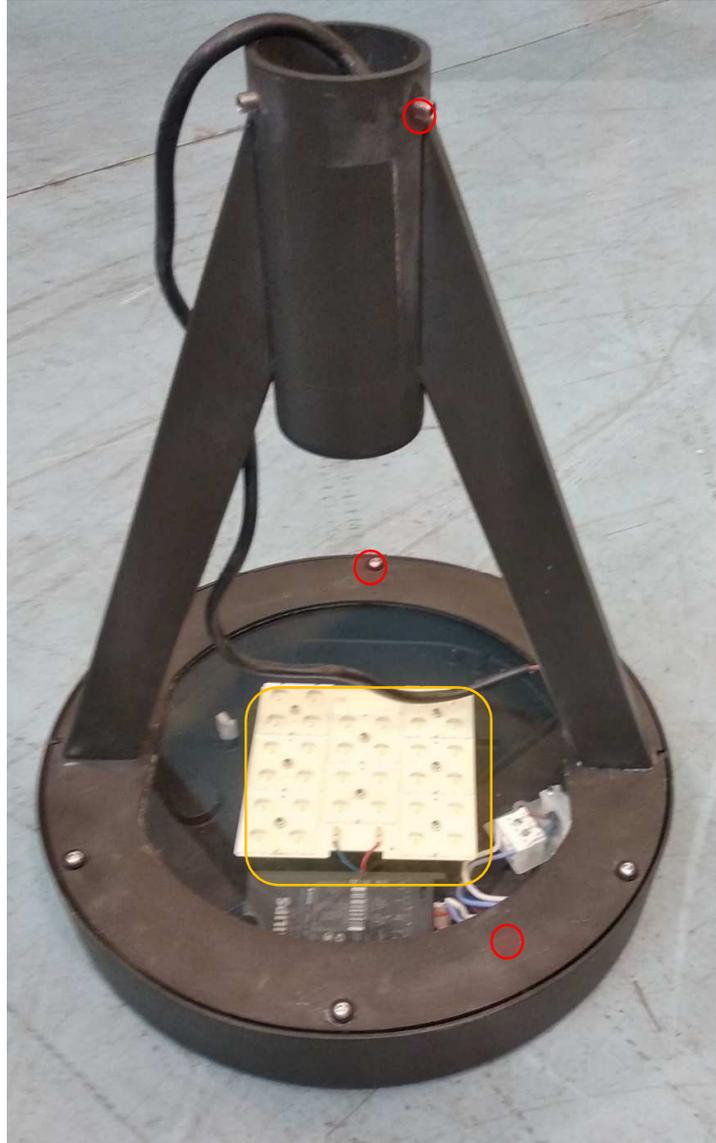
6.3 Electrostatic discharge

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-11	
Test location (stand):	EMC Lab	
Ambient temperature:	22 °C	
Relative humidity:	57 %	
Atmospheric pressure:	992 mbar	
Applied test level:	<input checked="" type="checkbox"/>	Contact: 4 kV
	<input checked="" type="checkbox"/>	Air: 8 kV
	<input type="checkbox"/>	Other:
Test set-up:	<input type="checkbox"/>	Table top equipment
	<input type="checkbox"/>	Floor standing equipment
	<input checked="" type="checkbox"/>	Wall or ceiling mounted equipment (Treated as table top)
Supplementary test set-up description:	---	
Size of horizontal coupling plate:	1.6 x 0.8 m	
Size of vertical coupling plate:	0.5 x 0.5 m	
Number of discharges for each test point:	20 (10 positive and 10 negative)	
Discharge interval:	1 s	
Performance criterion:	B	
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:



Photo of selected test points:



 : contact discharge

 : air discharge



LAB N° 1363 L

Table: Test results

No.	Location of discharge	Polarity	Discharge	Number of discharges	Test level [kV]	Operating mode	Observations
1	HCP top side	P	C	10	4	1	A1
2	HCP top side	N	C	10	4	1	A1
3	HCP bottom side	P	C	10	4	1	A1
4	HCP bottom side	N	C	10	4	1	A1
5	VCP right side	P	C	10	4	1	A1
6	VCP right side	N	C	10	4	1	A1
7	VCP left side	P	C	10	4	1	A1
8	VCP left side	N	C	10	4	1	A1
9	VCP front side	P	C	10	4	1	A1
10	VCP front side	N	C	10	4	1	A1
11	VCP rear side	P	C	10	4	1	A1
12	VCP rear side	N	C	10	4	1	A1
13	Points on conductive surface as indicated in the picture above	P	C	10	4	1	A1
14	Points on conductive surface as indicated in the picture above	N	C	10	4	1	A1
15	Points on non-conductive surface as indicated in the picture above	P	A	10	8	1	A1
16	Points on non-conductive surface as indicated in the picture above	N	A	10	8	1	A1
Lower test levels	<input checked="" type="checkbox"/>	Tested					
	<input type="checkbox"/>	Not tested					
HCP = Horizontal coupling plate		P = Positive		A = Air discharge			
VCP = Vertical coupling plate		N = Negative		C = Contact discharge			
Supplementary information:							
A1: Pass. No observed response / malfunction from EUT during and after the test							



LAB N° 1363 L

6.4 Radiated, radio-frequency electromagnetic field

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-11	
Test location (stand):	Semi Anechoic Chamber	
Ambient temperature:	23 °C	
Relative humidity:	56 %	
Atmospheric pressure:	991 mbar	
Applied test level:	<input type="checkbox"/>	1 V/m
	<input checked="" type="checkbox"/>	3 V/m
	<input type="checkbox"/>	10 V/m
	<input type="checkbox"/>	Other:
Test set-up:	<input checked="" type="checkbox"/>	Equipment on the table (0.8 m height)
	<input type="checkbox"/>	Equipment standing on floor (0.05 – 0.15 m height)
Supplementary test set up description:	---	
Exposed side of EUT:	<input checked="" type="checkbox"/>	0° (Front)
	<input checked="" type="checkbox"/>	90 °
	<input checked="" type="checkbox"/>	180 ° (Rear)
	<input checked="" type="checkbox"/>	270 °
	<input type="checkbox"/>	Top side
	<input type="checkbox"/>	Bottom side
Reason for not exposing a side:	The equipment cannot be used in different orientations (i.e. vertical or horizontal). So only four sides shall be exposed to the field.	
Distance Antenna to EUT:	2 m	
Test method:	<input checked="" type="checkbox"/>	IEC 61000-4-3
	<input type="checkbox"/>	IEC 61000-4-22
Step size:	1 %	
Performance criterion:	A	
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:

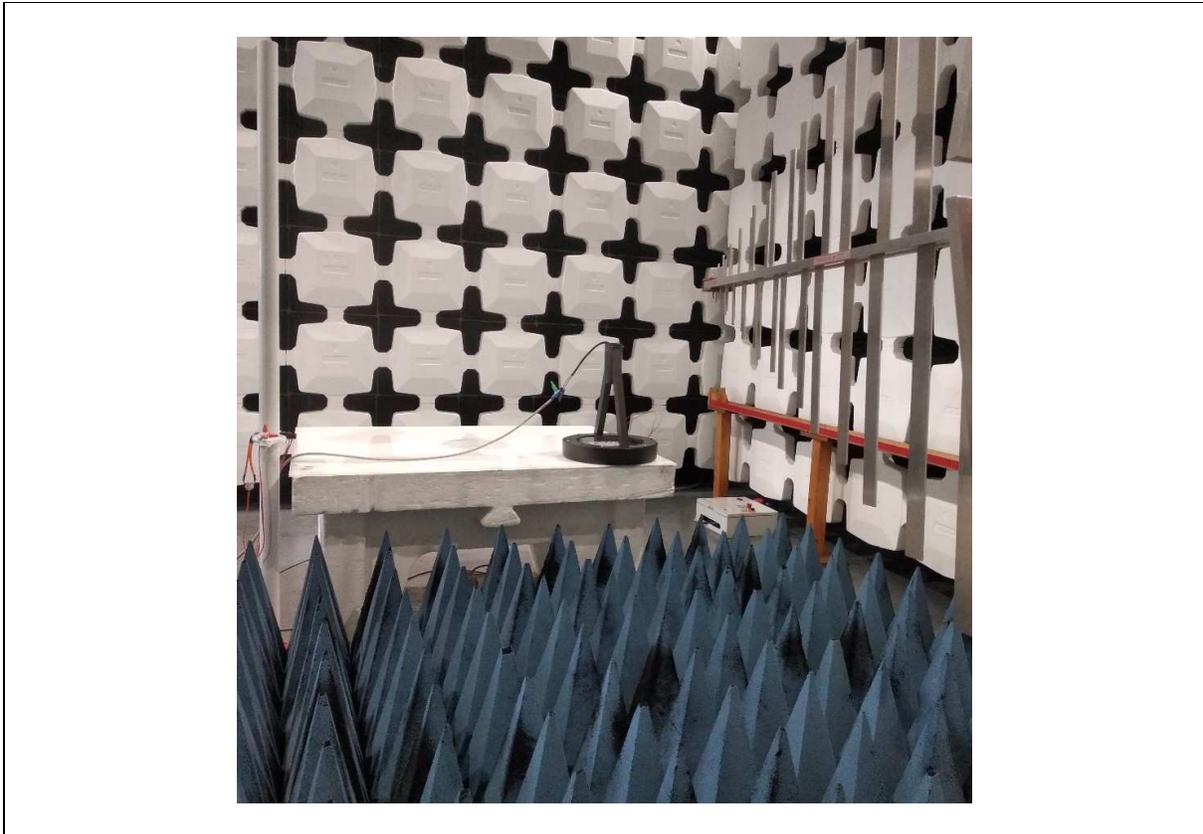


Table: Test results

Frequency range	Test Level [V/m]	Polarization	Modulation	Operation mode	Dwell time [s]	Observations
80 MHz – 1 GHz	3	H	80% AM 1kHz	1	3	A1
80 MHz – 1 GHz	3	V	80% AM 1kHz	1	3	A1

H = Horizontal
V = Vertical

Supplementary information:
A1: Pass. No observed response / malfunction from EUT during and after the test



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6.5 Electrical fast transients/burst

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-11	
Test location (stand):	EMC Lab	
Ambient temperature:	22 °C	
Relative humidity:	56 %	
Atmospheric pressure:	992 mbar	
Applied test level:	<input type="checkbox"/>	Signal/control ports: 0.5 kV
	<input type="checkbox"/>	Input and output DC power ports: 0.5 kV
	<input checked="" type="checkbox"/>	Input and output AC power ports: 1 kV
	<input type="checkbox"/>	Other:
Test set-up:	<input type="checkbox"/>	Equipment on the table (0.1 ± 0.01) m above ground plane
	<input checked="" type="checkbox"/>	Equipment standing on floor at (0.1 ± 0.01) m above ground plane
	<input type="checkbox"/>	Artificial hand applied. Location see photo.
Supplementary test set-up description:	---	
Repetition frequency:	<input type="checkbox"/>	2.5 kHz
	<input checked="" type="checkbox"/>	5 kHz
	<input type="checkbox"/>	100 kHz
	<input type="checkbox"/>	Other:
Test time:	<input type="checkbox"/>	1 minute for each polarity
	<input checked="" type="checkbox"/>	2 minute for each polarity
	<input type="checkbox"/>	Other:
Performance criterion:	B	
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:

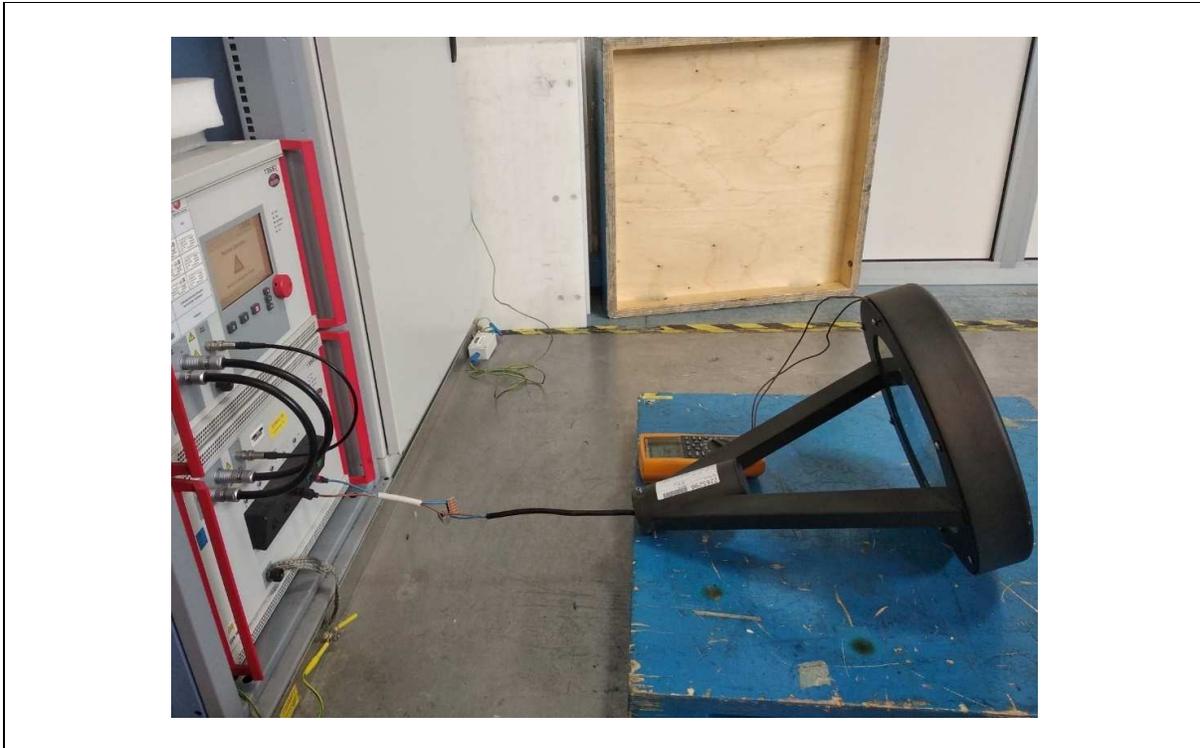


Table: Test results						
Port	Coupling	Level [kV]	Polarity	Test frequency [kHz]	Operating mode	Observation
AC Mains	CDN	1	P	5	1	A1
AC Mains	CDN	1	N	5	1	A1
CDN = Coupling/Decoupling Network			P = Positive			
D = Direct Coupling			N = Negative			
CCC = Capacitive Coupling Clamp						
Supplementary information:						
A1: Pass. No observed response / malfunction from EUT during and after the test						



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6.6 Surges

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-11	
Test location (stand):	EMC Lab	
Ambient temperature :	22 °C	
Relative humidity:	56 %	
Atmospheric pressure:	992 mbar	
Applied test level:	<input type="checkbox"/>	Signal/control ports: N/A
	<input type="checkbox"/>	Input and output DC power ports: N/A
	<input type="checkbox"/>	Input and output AC power ports: 0.5 kV (DM); 1 kV (CM)
	<input checked="" type="checkbox"/>	Input and output AC power ports: 1 kV (DM); 2 kV (CM)
	<input type="checkbox"/>	Other:
Test set-up description:	<input type="checkbox"/>	Equipment on a support (0.1 ± 0.01) m above ground plane
	<input checked="" type="checkbox"/>	Ground plane not applicable
Repetition rate:	60 s	
Number of pulses for each coupling:	10 (5 positive and 5 negative)	
Performance criterion:	C	
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:



Table: Test results							
Port	Coupling	Application points	Level [kV]	Polarity	Phase angles [°]	Operating mode	Observation
AC Mains	MCN	N → L	1	P	90	1	A1
AC Mains	MCN	N → L	1	N	270	1	A1
AC Mains	MCN	PE → N	2	P	90	---	N/A
AC Mains	MCN	PE → N	2	N	270	---	N/A
AC Mains	MCN	PE → L	2	P	90	---	N/A
AC Mains	MCN	PE → L	2	N	270	---	N/A
Lower test levels.....:		<input checked="" type="checkbox"/>	Tested				
		<input type="checkbox"/>	Not tested				
P = Positive N = Negative		MCN = Mains Coupling Network ICN = Coupling Network for interconnection lines D = Direct Coupling (shielded lines)					
Supplementary information: A1: Pass. No observed response / malfunction from EUT during and after the test							



LAB N° 1363 L

6.7 Conducted disturbances, induced by radio-frequency fields

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-07	
Test location (stand):	EMC Lab	
Ambient temperature:	23 °C	
Relative humidity:	51 %	
Atmospheric pressure:	999 mbar	
Applied test level:	<input type="checkbox"/>	Signal/control ports: 3 V
	<input type="checkbox"/>	Input and output DC power ports: 3 V
	<input checked="" type="checkbox"/>	Input and output AC power ports: 3 V
	<input type="checkbox"/>	Other:
Test set-up:	<input checked="" type="checkbox"/>	Equipment located (0.1 ± 0.05) m above ground plane
	<input type="checkbox"/>	Elevated ground plane according to Annex F
	<input type="checkbox"/>	Artificial hand applied. Location see photo.
	<input type="checkbox"/>	Other:
Supplementary test set-up description:	---	
Modulation:	<input checked="" type="checkbox"/>	80 % AM with 1 kHz
	<input type="checkbox"/>	80 % AM with 2 Hz
	<input type="checkbox"/>	Other:
Step size:	1 %	
Performance criterion:	A	
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:



Table: Test results

Frequency range	Test Level [V]	Port under test	Coupling device	Port with terminated CDN	Operating mode	Dwell time [s]	Observations
0.15-80 MHz	3	AC Mains	CDN M2	None	1	2	A1

Supplementary information:

A1: Pass. No observed response / malfunction from EUT during and after the test



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6.8 Power frequency magnetic fields

Tested by:	Andrea Giovanni Galbiati		
Test date:	2019-06-10		
Test location (stand):	EMC Lab		
Ambient temperature:	22 °C		
Relative humidity:	58 %		
Atmospheric pressure:	995 mbar		
Applied test level:	Continuous field		Short duration: 1 s to 3 s
	<input type="checkbox"/>	1 A/m	<input type="checkbox"/> 300 A/m
	<input checked="" type="checkbox"/>	3 A/m	<input type="checkbox"/> 1000 A/m
	<input type="checkbox"/>	10 A/m	<input type="checkbox"/> Other:
	<input type="checkbox"/>	30 A/m	
	<input type="checkbox"/>	100 A/m	
	<input type="checkbox"/>	Other:	
Test set-up:	<input type="checkbox"/>	0.1 m above metal surface	
	<input checked="" type="checkbox"/>	Homogeneous field (Helmholtz coil). Dimensions: 1.8 x 1.8 m	
	<input type="checkbox"/>	Single Coil. Dimensions: 1 x 1 m	
	<input type="checkbox"/>	Single Coil. Dimensions: 1 x 2.6 m	
Performance criterion:	A		
Reason for not performing the test:	<input type="checkbox"/>	The equipment contains no components which are susceptible to power frequency magnetic fields.	
	<input type="checkbox"/>	Other:	
Used mains voltage/frequency:	230 V; 50 Hz		
Supplementary information:	---		

Photo of test setup:

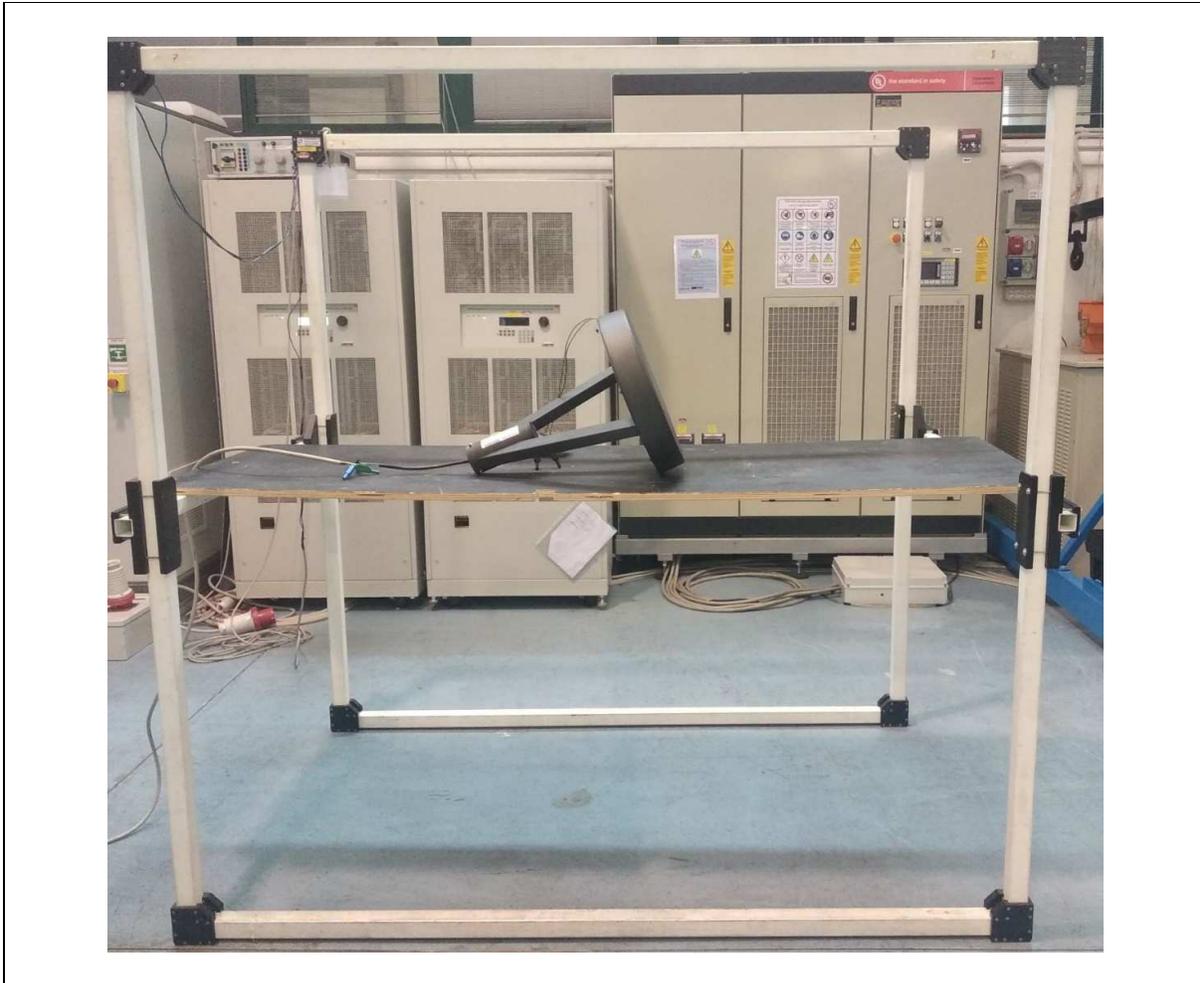


Table: Test results

Test frequency [Hz]	Test Level [A/m]	Test time [s]	Coil size/type [m]	Axis	Operating mode	Mains voltage/frequency	Observations
50	3	60	1.8 x 1.8	X	1	230 V; 50 Hz	A1
50	3	60	1.8 x 1.8	Y	1	230 V; 50 Hz	A1
50	3	60	1.8 x 1.8	Z	1	230 V; 50 Hz	A1
60	3	60	1.8 x 1.8	X	1	230 V; 50 Hz	A1
60	3	60	1.8 x 1.8	Y	1	230 V; 50 Hz	A1
60	3	60	1.8 x 1.8	Z	1	230 V; 50 Hz	A1

Supplementary information:

A1: Pass. No observed response / malfunction from EUT during and after the test



LAB N° 1363 L

6.9 Voltage dips and short interruptions

Tested by:	Andrea Giovanni Galbiati	
Test date:	2019-06-10	
Test location (stand):	EMC Lab	
Ambient temperature:	22 °C	
Relative humidity:	58 %	
Atmospheric pressure:	994 mbar	
Applied test level:	<input checked="" type="checkbox"/>	0 % during 1/2 cycle
	<input type="checkbox"/>	0 % during 1 cycle
	<input type="checkbox"/>	40 % during 10/12 cycles (50/60 Hz)
	<input type="checkbox"/>	70 % during 25/30 cycles (50/60 Hz)
	<input type="checkbox"/>	80 % during 250/300 cycles (50/60 Hz)
	<input type="checkbox"/>	0 % during 250/300 cycles (50/60 Hz)
	<input checked="" type="checkbox"/>	Other: 70 % during 10 cycle
Repetition rate:	10 s	
Number of dips or interruptions:	3	
Performance criterion:	C; B	
Used mains voltage/frequency:	230 V; 50 Hz	
Supplementary information:	---	

Photo of test setup:



Table: Test results							
U_N [V]	Frequency [Hz]	Test Level [% of U_N]	Phase angle [°]	Duration [Cycles]	Operating mode	Coupling	Observations
230	50	70	0°	10	1	N-L	A1
230	50	0	0°	0.5	1	N-L	B1
230	50	0	180°	0.5	1	N-L	B1

Supplementary information:
A1: Pass. No observed response / malfunction from EUT during and after the test
B1: Pass. Temporary switching off during the event. EUT returns in previously condition after test.



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7 List of test equipment

Equipment used					
Equipment	Type	Inventory number	Manufacturer	Last calibration date	Calibration due date
Test Stand: Conducted emission + Discontinuous disturbance (clicks)					
RF CABLES	LMR-240	175758	TIMES MICROWAVE SYSTEMS	2019-02-06	2020-02-28
Line Impedance Stabilization Network 3PH32A	ENV432	154695	Rohde & Schwarz	2019-02-28	2020-02-28
EMI TEST RECEIVER	ESR7	82570	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-02-27	2020-02-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
Test Stand: Radiated emission (magnetic field)					
LARGE LOOP ANTENNA (B)	RF300	51020	LAPLACE INSTRUMENTS	2019-04-28	2020-04-28
LARGE LOOP ANTENNA (A)	RF300	51021	LAPLACE INSTRUMENTS	2019-04-28	2020-04-28
EMI TEST RECEIVER	ESR7	82570	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-02-27	2020-02-28
LARGE LOOP ANTENNA (C)	RF300	51029	LAPLACE INSTRUMENTS	2019-04-28	2020-04-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
Test Stand: Radiated emission (electric field)					
6dB-1W ATTENUATOR	J01006A0835	71481	TELEGARTNER	2018-06-27	2019-06-28
50ohm COAXIAL CABLE	None	72556	VARIOUS	2019-03-28	2020-03-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
EMI TEST RECEIVER	ESR7	82570	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-02-27	2020-02-28
COUPLING AND DECOUPLING NETWORK	CDN L-801 M2	63553	LÜTHI	2018-07-02	2019-07-28
Test Stand: Harmonic current emission					
DIGITAL LOW FREQUENCY EMISSION ANALYZER	B10	68332	BOCONSULT	2019-03-28	2020-03-28
Software - EMC	SPS-EMC	156546	Spitzenberger & Spies	-	-



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Test Stand: Electrostatic discharge					
VERTICAL COUPLING PLANE 500x500x3 mm	None	135137	ER.CO.L.FER	-	-
Resistance Box 470 kOhm for ESD Test	R470k	124390	Lab Services (CAR)	2018-12-28	2019-12-28
Resistance Box 470 kOhm for ESD Test	R470k	124389	Lab Services (CAR)	2018-12-28	2019-12-28
Resistance Box 470 kOhm for ESD Test	R470k	124387	Lab Services (CAR)	2018-12-28	2019-12-28
Resistance Box 470 kOhm for ESD Test	R470k	124388	Lab Services (CAR)	2018-12-28	2019-12-28
GROUND REFERENCE PLANE	EN AW-1050A	80047	COM-MET	-	-
ESD GENERATOR	ESD 30N	89434	EM Test (Ametek)	2019-05-28	2020-05-28
ESD TABLE	None	77109	None	-	-
Test Stand: Radiated, radio-frequency electromagnetic field					
ULTRA-BROADBAND ANTENNA	BTA-M	51051	FRANKONIA EMV	-	-
RF-POWER AMPLIFIER	FLH-200B	51049	FRANKONIA EMV	-	-
Directional Coupler	C5982-5P	51045	WERLATONE	2019-02-27	2020-02-28
RF and Microwave Signal Generator	SMB100A	135881	Rohde & Schwarz (Koeln) GmbH & Co. KG	2018-11-08	2019-11-28
EMC CAMERA SYSTEM	IMAGE 200	71914	TESEQ	-	-
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
THERMAL POWER SENSOR (A)	NRV-Z51	51039	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-02-27	2020-02-28
Laser Probe Interface	FI7000	76776	AMPLIFIER RESEARCH	-	-
Switching Unit	GTS4440	51048	NOVOTRONIK	-	-
UFA Uniformity Field Area (IEC61000-4-3)	UFA	154713	Lab Services (CAR)	2019-05-28	2020-05-28
Power Meter	NRVD	51035	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-03-04	2020-03-28
THERMAL POWER SENSOR (B)	NRV-Z51	51038	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-02-27	2020-02-28
LASER POWERED FIELD PROBE	FL7006	76775	AMPLIFIER RESEARCH	2019-04-05	2020-04-28



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Test Stand: Electric fast transient/burst					
GROUND REFERENCE PLANE	EN AW-1050A	80047	COM-MET	-	-
EMC Test System	NSG 3060	78501	TESEQ INC.	-	-
Automated 3-phase Coupling/Decoupling Networks	CDN 3063-C32	78506	TESEQ INC.	-	-
Electrical fast transient/burst generator module	FTM 3425	78504	TESEQ INC.	2018-09-28	2019-09-28
Software - EMC	WIN 3000	156548	Teseq (Ametek)	-	-
Test Stand: Surges					
EMC Test System	NSG 3060	78501	TESEQ INC.	-	-
Combination wave surge generator module	CWM 3650	78502	TESEQ INC.	2018-09-28	2019-09-28
Automated 3-phase Coupling/Decoupling Networks	CDN 3063-C32	78506	TESEQ INC.	-	-
Software - EMC	WIN 3000	156548	Teseq (Ametek)	-	-
Test Stand: Conducted disturbances, induced by radio-frequency fields					
GROUND REFERENCE PLANE	EN AW-1050A	80047	COM-MET	-	-
RF AMPLIFIER	75A250AM1	71482	AMPLIFIER RESEARCH	2019-03-28	2020-03-28
Software - EMC	BAT-EMC	156535	Nexio Technologies	-	-
COUPLING AND DECOUPLING NETWORK	CDN-M2N/32A	63549	EM Test	2018-07-02	2019-07-28
Signal Generator	SMT 06	51036	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-02-28	2020-02-28
Power Sensor	NRP-Z92	135576	Rohde & Schwarz (Koeln) GmbH & Co. KG	2019-03-22	2020-03-28
Directional Coupler	C5091-10	53280	WERLATONE	2019-02-28	2020-02-28
Test Stand: Power frequency magnetic fields					
HELMHOLTZ COILS	HSS 5218	77940	Schwarzbeck Mess - Elektronik	2019-03-28	2020-03-28
DUMMY LOAD	DL 1000V50A	80484	SICUR CONTROL	-	-
AC/DC POWER SOURCE SYSTEM	RS180-3PI-MB-400-411-413-LAN-SNK	78970	AMETEK (CALIFORNIA INSTRUMENTS)	-	-
Test Stand: Voltage dips and short interruptions					
TRANSIENT GENERATOR	TRA2000IN6	57875	EMC PARTNER	2018-10-30	2019-10-28
INTERRUPTION GENERATOR	PFS32	57949	EMC PARTNER	2019-05-28	2020-05-31
Variable Autotransformer	V 40 NC/4	85337	BELOTTI VARIATORI	-	-
AC/DC POWER SOURCE SYSTEM	RS180-3PI-MB-400-411-413-LAN-SNK	78970	AMETEK (CALIFORNIA INSTRUMENTS)	-	-



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Test Stand: Auxiliary equipment					
TAPE-MEASURE	3 METERS	37617	ORECA	2018-05-18	2021-05-28
DIGITAL OSCILLOSCOPE	HMO1024	79097	Rohde & Schwarz (Koeln) GmbH & Co. KG	2018-06-13	2019-06-28
AC/DC POWER SOURCE SYSTEM	RS180-3PI- MB-400-411- 413-LAN-SNK	78970	AMETEK (CALIFORNIA INSTRUMENTS)	-	-
DIFFERENTIAL PROBE	SI-9010A	88343	TESTEC	2018-06-14	2019-06-28
Power Supply	None	83094	BELOTTI VARIATORI	-	-
Power Frequency Converter AC/AC	FVC 520- 150K BF Ver. 1.0	70835	ZENONE ELETTRONICA	-	-
CLIMATIC CENTRAL UNIT	iBTHX-W	70611	Omega Engineering Inc.	2019-04-18	2020-04-28
CLIMATIC CENTRAL UNIT	iBTHX-W	70614	Omega Engineering Inc.	2019-04-18	2020-04-28
TRUE-RMS DIGITAL MULTIMETER	289	169495	Fluke Corporation	2019-05-23	2020-05-28
MAIN SUPPLY VARIAC	T40NC-6	80699	BELOTTI VARIATORI	-	-
LIGHT METER & SENSOR	LUX-1335	85316	ISO-TECH	2017-06-29	2020-06-28



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8 Measurement instrumentation uncertainties

Uncertainties of radio disturbance measurements		
Measurement	U_{lab}	U_{cispr}
Conducted disturbance at mains port using AMN (9 kHz to 150 kHz)	3.99 dB	3.8 dB
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	3.63 dB	3.4 dB
Conducted disturbance at mains port using voltage probe (9 kHz to 30 MHz)	3.12 dB	2.9 dB
Conducted disturbance at telecommunication port using AAN (150 kHz to 30 MHz)	n.c.	5.0 dB
Conducted disturbance at telecommunication port using CVP (150 kHz to 30 MHz)	n.c.	3.9 dB
Conducted disturbance at telecommunication port using CP (150 kHz to 30 MHz)	n.c.	2.9 dB
Disturbance power (30 MHz to 300 MHz)	4.41 dB	4.5 dB
Magnetic field with 0.6 m loop antenna	3.56 dB	n.c.
Magnetic field induced current	5.22 dB	3.3 dB
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.43 dB	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.74 dB	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.83 dB	5.5 dB
Conducted disturbance at mains port using CDNE (30 MHz to 300 MHz)	3.95 dB	3.8 dB

n.c.: not calculated

The calculated numbers are valid for the expanded uncertainty ($k=2$) of measurements that have been carried out in accordance with the provisions of CISPR 16-4-2.

Compliance assessment:

Determining compliance with the limits in the standard shall be based on the results of the compliance measurement not taking into account measurement instrumentation uncertainty.

Determining compliance with the limits in the standard shall be based on the results of the compliance measurements taking into account measurement instrumentation uncertainty.

Where guidance for the calculation of the instrumentation uncertainty of a measurement is specified in CISPR 16-4-2 this shall be followed, and for these measurements the determination of compliance with the limits in this standard shall take into consideration the measurement instrumentation uncertainty in accordance with CISPR 16-4-2. Calculations to determine the measurement result and any adjustment of the test result required when the test laboratory uncertainty is larger than the value for U_{cispr} given in CISPR 16-4-2 shall also be included in the test report.

Uncertainties of harmonic currents measurements:	
Measurement	U_{lab}
Voltage	$\pm 2.5 \%_{rdg}$
Current	$\pm 3.5 \%_{rdg}$

Uncertainties of voltage changes, voltage fluctuations and flicker measurements:

Measurement	U_{lab}
d_c, d_{max}	$\pm 5.0 \%_{rdg}$
P_{st}, P_{lt}	± 0.2

Uncertainties of immunity measurements:

Measurement	U_{lab}
Radiated, radio-frequency, electromagnetic field immunity test (F.U. deviation not included)	± 2.87 dB
Immunity to conducted disturbances, induced by radio-frequency fields (CDN)	± 1.23 dB
Immunity to conducted disturbances, induced by radio-frequency fields (EM-clamp)	± 3.14 dB

All instruments used for other immunity tests are calibrated and are within the specifications required by the basic standards (IEC 61000-4-X).



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9 Critical components

Table: Critical components information			
Object	Manufacturer/ Trademark	Type/Model	Technical data
LED DRIVER	PHILIPS	Xi FP 75W 0.3-1.0A	---
LED MODULE	NERI	H0450	---

10 Photos of EUT

Photo 1



Photo 2



Photo 3

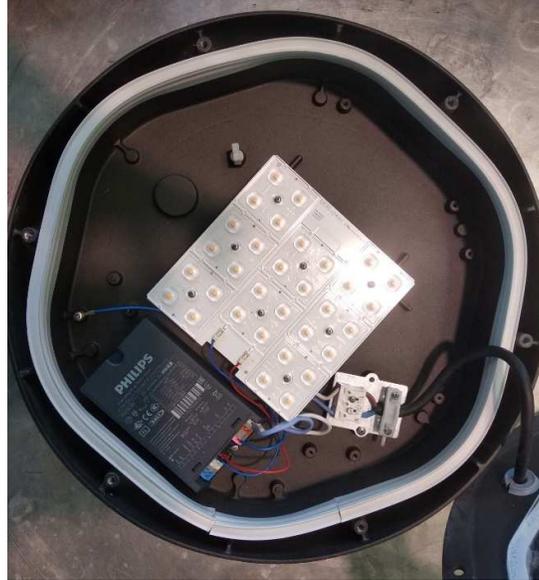


Photo 4





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Photo 5



Photo 6





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11 Type code designation

None

< END OF TEST REPORT >