



AB 003



**TEST REPORT  
IEC CISPR15**

**Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment**

Report Number..... : B10-4/117/EMC/22

Date of issue ..... : 2022-11-25

Total number of pages ..... : 68

Name of Testing Laboratory preparing the Report ..... : Łukasiewicz - IMiF PREDOM Division  
02-255 Warszawa, ul. Krakowiaków 53, Poland

Applicant's name ..... : LUG Light Factory Sp. z o.o.  
Address ..... : 65-127 Zielona Góra, ul. Gorzowska 11, Poland

**Test specification:**

Standard ..... : PN-EN IEC 55015:2019-11+A11:2020-07, PN-EN 61547:2009,  
PN-EN IEC 61000-3-2:2019-04+A1:2021-08,  
PN-EN 61000-3-3:2013-10+A1:2019-10,  
EN IEC 55015:2019+A11:2020, EN 61547:2009,  
EN IEC 61000-3-2:2019+A1:2021, EN 61000-3-3:2013+A1:2019,  
CISPR 15:2018, IEC 61547:2009,  
IEC 61000-3-2:2018+AMD1:2020, IEC 61000-3-3:2013+AMD1:2017

Test procedure..... : EMC

Non-standard test method..... : N/A

Test Report Form No. .... : PREDOM IEC CISPR15\_ IEC 61547/21

Test Report Form(s) Originator .... : Łukasiewicz - IMiF PREDOM Division  
02-255 Warszawa, ul. Krakowiaków 53, Poland





Master TRF ..... : Dated 2022-01

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Test item description .....	Luminaire for road and street lighting	
Trade Mark(s) .....		
Original Product/Equipment Manufacturer .....	LUG Light Factory Sp. z o.o. 65-127 Zielona Góra, ul. Gorzowska 11, Poland	
Branding Manufacturer(s) .....	LUG	
Model/Type reference .....	130782.3L232.020.001 URBINO S ED DALI 9650lm/730 IP66 O2 szary II kl.	
Ratings .....	220-240 V, 50/60 Hz, LED 1 x max 71 W, IP66, cl. II	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/> Testing Laboratory:	Łukasiewicz - IMiF PREDOM Division	
Testing location/ address .....	02-255 Warszawa, ul. Krakowiaków 53, Poland	
Tested by (name, function, signature) .....	Marek Gabryszewski	
Approved by (name, function, signature) ..	Tomasz Małyska	
Supervised by (name, function, signature):	Filip Walczak	
<input type="checkbox"/> Testing procedure: CTF Stage 1:		
Testing location/ address .....		
Tested by (name, function, signature) .....		
Approved by (name, function, signature) ..		
<input type="checkbox"/> Testing procedure: CTF Stage 2:		
Testing location/ address .....		
Tested by (name + signature) .....		
Witnessed by (name, function, signature) .:		
Approved by (name, function, signature) ..		



<input type="checkbox"/>	Testing procedure: CTF Stage 3:	
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	
Testing location/ address .....		:
Tested by (name, function, signature) .....		:
Witnessed by (name, function, signature) ..		:
Approved by (name, function, signature) ..		:
Supervised by (name, function, signature) :		

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

Summary of testing: Tests results - Positive

*According to ISO / IEC Guide 98-4 for the assessment of compliance of the measurement result with the requirements, criterion B was chosen. 50% risk of incorrect assessment decision belongs to the customer and 50% risk of incorrect assessment belongs to the laboratory.*

Tests performed (name of test and test clause):

Conducted EMISSIONS (4.3)  
 Radiated electromagnetic disturbances (4.5.2)  
 Radiated EMISSIONS (4.5.3)  
 Harmonic Currents (7)  
 Voltage Fluctuations and Flicker (5)  
 Electrostatic Discharges (5.2)  
 RF Electromagnetic Fields (5.3)  
 Power frequency magnetic fields (5.4)  
 Electrical Fast Transients (5.5)  
 Conducted Disturbances Induced by RF Fields (5.6)  
 Surge (5.7)  
 Voltage Dips and short Interruptions (5.8)

Testing location:

Łukasiewicz - IMiF PREDOM Division  
 02-255 Warszawa, ul. Krakowiaków 53, Poland

Summary of compliance with National Differences (List of countries addressed): N/A

Statement concerning the uncertainty of the measurement systems used for the tests  
 no required (N/A)

Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:

Procedure number, issue date and title: General concept of methodologies for determining uncertainty of measurement, dated: October 2013

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

Statement not required by the standard used for type testing

Copy of marking plate:



Test item particulars..... : For test item particulars refer to item 1	
Classification of installation and use..... : Luminaire for road and street lighting	
Supply Connection ..... : Power connector	
Possible test case verdicts: - test case does not apply to the test object..... : N/A - test object does meet the requirement..... : P (Pass) - test object does not meet the requirement..... : F (Fail)	
Testing: Date of receipt of test item ..... : 2022-11-03 Date (s) of performance of tests ..... : 2022-11-14 + 2022-11-24	
General remarks: "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 61010-2-010:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) ..... : LUG Light Factory Sp. z o.o. 65-127 Zielona Góra, ul. Gorzowska 11, Poland	
General product information (GPI) and other remarks: Zhaga standards for LED module has not been tested. The power supply (Osram OT 75/170-240/1A0 4DIM) is programmed for the 950 mA current. The results in this report reflect the results for that specific model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the requirements detailed in this report. According to the information from our Applicant, the tests were done on 220 V / 60 Hz supply.	



Table of Contents:	
1	General description of test item(s)..... 7
1.1	Description of test item(s) according to CISPR 15..... 9
1.2	Photos of the test item ..... 11
2	Verdict summary section ..... 13
3	Test conditions..... 14
3.1	General..... 14
3.2	Specific test conditions for CISPR 15..... 14
4	Emission ..... 15
4.1	Conducted disturbances..... 15
4.2	Radiated electromagnetic disturbances (9 kHz to 30 MHz)..... 22
4.3	Radiated electromagnetic disturbances(30 MHz to 1000 MHz)..... 27
5	Harmonic current emissions according to IEC 61000-3-2..... 34
6	Voltage changes, voltage fluctuations and flicker according to IEC 61000-3-3..... 40
7	Immunity ..... 42
7.1	General information ..... 42
7.2	Electrostatic discharges..... 43
7.3	Radio-frequency electromagnetic fields ..... 46
7.4	Power frequency magnetic fields ..... 50
7.5	Fast transients ..... 52
7.6	Injected currents (radio-frequency common mode) ..... 54
7.7	Surges ..... 56
7.8	Voltage dips and short interruptions..... 58
8	List of test equipment..... 61
9	Measurement instrumentation uncertainties..... 62
10	Annex..... 63
10.1	Annex A: ..... 63
10.2	Annex B: ..... 63

## 1 General description of test item(s)

Description .....	Luminaire for road and street lighting				
Model number .....	130782.3L232.020.001 URBINO S				
Serial number .....	N/A				
Brand name .....	LUG				
Ports .....	Port name and description	Cable			
		Specified length [m]	Attached during test	Shielded	
Local wired ports .....	Mains, Supply Connection: power cord	0.8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
Wired network ports .....	N/A		<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
			<input type="checkbox"/>	<input type="checkbox"/>	
Supplemental information to the ports .....	N/A				
Rated power supply .....		Voltage and frequency	1 ph/ PE	2 ph/N/PE	3 ph/N/PE
	<input checked="" type="checkbox"/>	AC: 220 V / 60 Hz	<input checked="" type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/> / <input type="checkbox"/> / <input type="checkbox"/>	<input type="checkbox"/> / <input type="checkbox"/> / <input type="checkbox"/>
	<input type="checkbox"/>	DC:			
Rated power .....	1 x max 71 W				
Protection class .....	cl. II				
Clock frequencies .....	No available data for these selection criteria				
Other parameters .....	See page 4				
Software version .....	of 11_2022				
Hardware version .....	of 11_2022				
Dimensions in mm (W x H x D):	475 x 160 x 195				
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: In accordance with the manufacturer's instructions			
Modules / parts .....	Module / parts of test item	Type	Manufacturer		
	See section Annex A Supplementary information: See section Annex B				

Operating modes.....:	<b>No.</b>	<b>Operating mode of test item</b>	<b>Applied for testing</b>	
			<b>Emission</b>	<b>Immunity</b>
	1	Powered by 220 VAC 60 Hz, in accordance with the manufacturer's instructions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	2	Powered by 120 VAC 60 Hz, in accordance with the manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
	3	EUT with battery power Powered by ...VDC (built-in battery), in accordance with the manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>
Supplemental information to the operating modes.....:	N/A			
Accessories (not part of the test item).....:	<b>Accessory</b>	<b>Type</b>	<b>Manufacturer</b>	
	N/A	N/A	N/A	
	AE			
Documents as provided by the applicant .....	<b>Description</b>	<b>File name</b>	<b>Issue date</b>	
	N/A	N/A	N/A	
Modifications to the test item during testing .....	N/A			



## 1.1 Description of test item(s) according to CISPR 15 and IEC 61000-3-2

Description of the test item .....	<input checked="" type="checkbox"/>	Luminaire
	<input type="checkbox"/>	Rope light (6.3)
	<input type="checkbox"/>	Internal Module (6.4.3)
	<input type="checkbox"/>	External module (6.4.4)
	<input type="checkbox"/>	Module having multiple applications (6.4.2)
	<input type="checkbox"/>	Single capped self-ballasted lamp (6.4.5)
	<input type="checkbox"/>	Double-capped self-ballasted lamps, double-capped lamp adapters, double-capped semi-luminaires and double-capped retrofit lamps used in fluorescent lamp luminaires (6.4.6)
	<input type="checkbox"/>	ELV lamps (6.4.7)
	<input type="checkbox"/>	Single-capped semi-luminaires (6.4.8)
	<input type="checkbox"/>	Independent igniter (6.4.9)
	<input type="checkbox"/>	Replaceable starters for fluorescent lamps (6.4.10)
	<input type="checkbox"/>	Others: LED converter
Lamp technology used .....	<input checked="" type="checkbox"/>	Light emitting diode (LED/OLED)
	<input type="checkbox"/>	High pressure discharge lamp (HID)
	<input type="checkbox"/>	Fluorescent lamp
	<input type="checkbox"/>	Tungsten halogen lamp
	<input type="checkbox"/>	Incandescent lamp
	<input type="checkbox"/>	Others: ---
Control Gear .....	<input checked="" type="checkbox"/>	Electronic control gear
	<input type="checkbox"/>	Magnetic control gear / transformer
	<input type="checkbox"/>	Others: ---

Dimming.....:	<input checked="" type="checkbox"/>	Test item has NO dimming functions
	<input type="checkbox"/>	Test item includes dimming functions other than phase control
	<input type="checkbox"/>	Test item has phase control dimming functions with the following characteristic(s):
	<input type="checkbox"/>	rated power less than or equal to 1 kW when operating incandescent lamps
	<input type="checkbox"/>	rated power less than or equal to 200 W for trailing edge dimmers, and universal phase control dimmers with the default mode set to trailing edge, when operating lighting equipment other than incandescent lamps
	<input type="checkbox"/>	rated power less than or equal to 100 W for leading edge dimmers, and universal phase control dimmers without default mode set to trailing edge, when operating lighting equipment other than incandescent lamps
	<input type="checkbox"/>	Other: ---

Type of equipment.....:	<input checked="" type="checkbox"/>	Not for professional use
	<input type="checkbox"/>	For professional use
	<input type="checkbox"/>	Others: Supply power

1.2 Photos of the test item

Photo of test item:





Photo of test item:



## 2 Verdict summary section

CISPR15			
Clause	Requirement – Test case	Basic standard	Verdict
4.3	Assessment of wired network ports Table 1, Table 2, Table 3	CISPR 16-1-1:2019 CISPR 16-1-2:2014+AMD1:2017	Pass
4.4	Assessment of local wired ports Table 4, Table 5, Table 6	CISPR 16-2-1:2014+AMD1:2017 CISPR 32:2015+AMD1:2019	N/A
4.5	Assessment of the enclosure port	---	---
4.5.2	Frequency range 9 kHz to 30 MHz Table 8, Table 9	CISPR 16-1-4:2019+AMD1:2020 CISPR 15:2018	Pass
4.5.3	Frequency range 30 MHz to 1 GHz Table 10	CISPR 16-2-3:2016+AMD1:2019	Pass
IEC 61000-3-2			
Clause	Requirement – Test case	Basic standard	Verdict
6.2 6.3	Harmonic current emissions	IEC 61000-3-2:2018+AMD1:2020 IEC 61000-4-7:2002+AMD1:2008	Pass
IEC 61000-3-3			
Clause	Requirement – Test case	Basic standard	Verdict
4	Voltage changes, voltage fluctuations and flicker	IEC 61000-3-3:2013+AMD1:2017 IEC 61000-4-15:2010	Pass
IEC 61547			
Clause	Requirement – Test case	Basic standard	Verdict
5.2	Electrostatic discharge	IEC 61000-4-2:2008	Pass
5.3	Radio-frequency electromagnetic fields	IEC 61000-4-3:2020	Pass
5.4	Power frequency magnetic fields	IEC 61000-4-8:2009	Pass
5.5	Fast transients	IEC 61000-4-4:2012	Pass
5.6	Injected currents (radio-frequency common mode)	IEC 61000-4-6:2013	Pass
5.7	Surges	IEC 61000-4-5:2014+AMD1:2017	Pass
5.8	Voltage dips and short interruptions	IEC 61000-4-11:2020	Pass
Supplementary information:			
According to ISO / IEC Guide 98-4 for the assessment of compliance of the measurement result with the requirements, criterion B was chosen. 50% risk of incorrect assessment decision belongs to the customer and 50% risk of incorrect assessment belongs to the laboratory.			

### 3 Test conditions

#### 3.1 General

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:		
	Temperature	Humidity	Atmospheric pressure
	15°C – 35°C	30% – 60%	860 hPa – 1060 hPa
	If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.		
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 an applied in accordance with these standards. In all cases if the test laboratory uncertainty is larger than the value for UCISPR 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.		

#### 3.2 Specific test conditions for CISPR 15

Test set up .....	<input checked="" type="checkbox"/>	CISPR 15
	<input type="checkbox"/>	CISPR 30 technical report applied for built-in appliances
Type of test item (Clause 6.2 of CISPR 15).....	<input checked="" type="checkbox"/>	Active EUT
	<input type="checkbox"/>	Passive EUT (Deemed to comply without further testing)
	<input type="checkbox"/>	Others: ---
Maximum clock frequency (Clause 3.2.2)..... *No available data for these selection criteria	<input type="checkbox"/>	≤ 30 MHz → Measurement of radiated emissions up to 300 MHz is sufficient.
	<input checked="" type="checkbox"/>	> 30 MHz → Measurement of radiated emissions up to 1000 MHz is required.



## 4 Emission

## 4.1 Conducted disturbances

Tested by .....	Marek Gabryszewski
Test date .....	2022-11-14
Test Location (stand) .....	Disturbance voltage stand Faraday Cage U-11
Test set-up description .....	<input type="checkbox"/> Set-up Type A (40 cm distance to vertical ground plane, 80 cm o 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"/> Other: ---
	<input type="checkbox"/> Artificial hand applied (See photo)
Supplementary Test set-up description .....	Operating mode: 1
Test method applied .....	<input checked="" type="checkbox"/> Voltage disturbance measurement (Table 1, Table 2, Table 4, Table 5)
	<input type="checkbox"/> Current disturbance measurement (Table 3, Table 6)
	<input type="checkbox"/> Other: ---
Supplementary information.....	220 V / 60 Hz



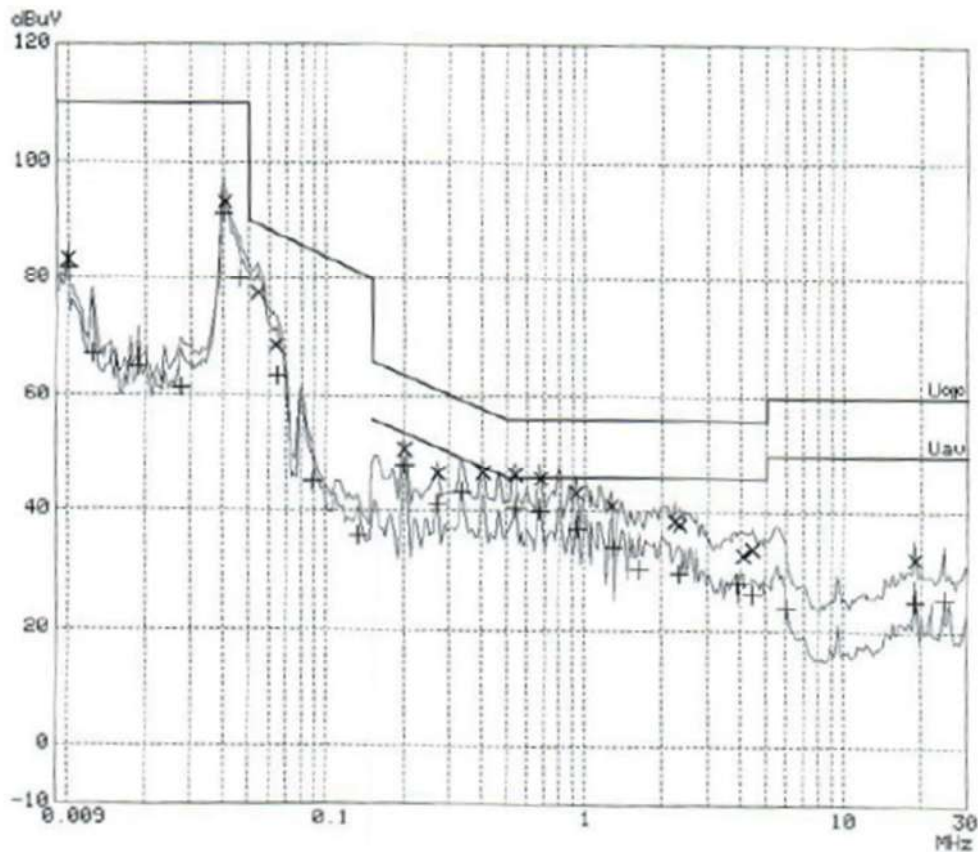
# IMiF PREDOM Division Disturbance Voltage Measurement

EUT: URBINO S  
 Manuf: LUG  
 Operator: 220 V / 60 Hz  
 Test Spec: EN 55015  
 Comment: Phase L1  
 File name: \_55015\_.RES  
 Date: 14. Nov 22 12:05

Overview Scan Settings (2 Ranges)

----- Frequencies -----			----- Receiver Settings -----				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	150k	61.0Hz	200Hz	PK+AV	10ms	60dB LN	OFF
150k	30M	3.9k	9k	PK+AV	10ms	15dB LN	OFF

Final Measurement: x QP / + AV  
 Meas Time: 1 s  
 Subranges: 25  
 Acc Margin: 25dB



# IMiF PREDOM Division Disturbance Voltage Measurement

EUT: URBINO S  
 Manuf: LUG  
 Operator: 220 V / 60 Hz  
 Test Spec: EN 55015  
 Comment: Phase L1  
 File name: \_55015\_.RES  
 Date: 14. Nov 22 12:05

## Final Measurement Results:

Indicated Phase/PE shows Configuration of max. Emission

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.0099766	83.2	-26.7	N	f1
0.0402500	93.3	-16.6	N	f1
0.05423	77.5	-11.8	L1	f1
0.06338	68.7	-19.1	L1	f1
0.20078	50.8	-12.7	L1	f1
0.27109	46.6	-14.6	L1	f1
0.40391	46.9	-10.9	L1	f1
0.54063	46.5	-9.4	L1	f1
0.67344	45.7	-10.2	L1	f1
0.92734	43.2	-12.7	L1	f1
1.27891	41.2	-14.7	L1	f1
2.22422	38.4	-17.6	L1	f1
2.33750	37.8	-18.1	L1	f1
4.09141	32.6	-23.3	L1	f1
4.46250	33.8	-22.2	L1	f1
18.91953	32.1	-27.8	N	f1

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.0100376	81.7		N	f1
0.0125400	67.2		L1	f1
0.0187656	65.1		L1	f1
0.0275547	61.4		L1	f1
0.0399448	91.1		N	f1
0.0457432	80.0		N	f1
0.06442	63.4		N	f1
0.08798	45.0		L1	f1
0.13254	36.0		L1	f1
0.20078	49.1	-5.4	L1	f1
0.27109	41.3	-9.9	L1	f1
0.33359	43.4	-5.9	L1	f1
0.54063	40.5	-5.4	L1	f1
0.66563	40.0	-5.9	L1	f1
0.93125	37.1	-8.8	L1	f1
1.28281	33.9	-12.1	L1	f1
1.62266	30.3	-15.6	L1	f1
2.32188	29.6	-16.3	L1	f1
3.85313	28.0	-17.9	N	f1
4.46250	26.2	-19.7	L1	f1
6.00938	23.9	-26.0	L1	f1
18.90391	24.9	-25.1	N	f1



Date: 14. Nov 22 12:05  
24.43125 25.4 -24.5 L1 f1  
\* limit exceeded

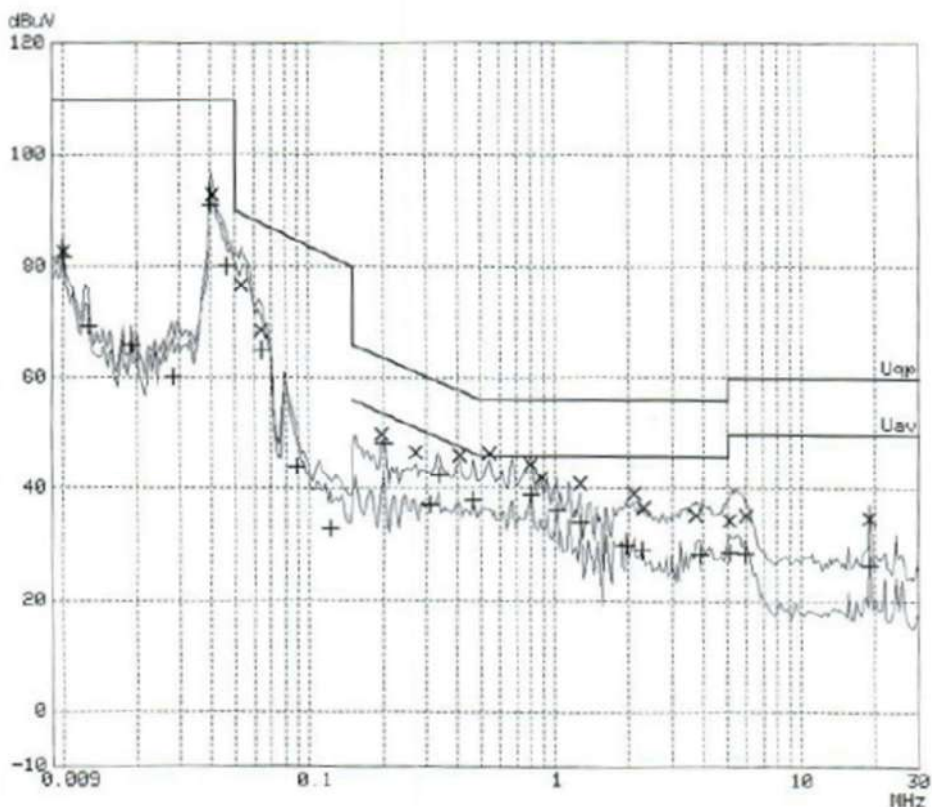
# IMiF PREDOM Division Disturbance Voltage Measurement

EUT: URBINO S  
 Manuf: LUG  
 Operator: 220 V / 60 Hz  
 Test Spec: EN 55015  
 Comment: Phase N  
 File name: \_55015\_.RES  
 Date: 14. NOV 22 12:21

Overview Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	150k	61.0Hz	200Hz	PK+AV	10ms	60dB LN	OFF
150k	30M	3.9k	9k	PK+AV	10ms	15dB LN	OFF

Final Measurement: x QP / + AV  
 Meas Time: 1 s  
 Subranges: 25  
 Acc Margin: 25dB



## IMiF PREDOM Division Disturbance Voltage Measurement

EUT: URBINO S  
 Manuf: LUG  
 Operator: 220 V / 60 Hz  
 Test Spec: EN 55015  
 Comment: Phase N  
 File name: \_55015\_.RES  
 Date: 14. Nov 22 12:21

### Final Measurement Results:

Indicated Phase/PE shows Configuration of max. Emission

Frequency MHz	QP Level dBuV	Delta Limit dB	Phase -	PE -
0.0100376	82.8	-27.1	N	f1
0.0403110	92.8	-17.1	N	f1
0.05288	76.7	-12.8	N	f1
0.06357	68.7	-19.1	N	f1
0.19688	49.9	-13.8	L1	f1
0.27109	46.7	-14.5	L1	f1
0.40781	46.2	-11.4	L1	f1
0.54063	46.5	-9.4	L1	f1
0.79453	44.6	-11.3	L1	f1
0.87656	42.0	-13.9	L1	f1
1.25938	40.9	-15.0	L1	f1
2.09531	39.2	-16.8	L1	f1
2.30234	36.5	-19.4	L1	f1
3.72031	35.2	-20.7	N	f1
5.13047	34.4	-21.6	N	f1
5.95469	35.1	-24.8	N	f1
18.92734	34.7	-25.2	N	f1

Frequency MHz	AV Level dBuV	Delta Limit dB	Phase -	PE -
0.0100376	81.7		N	f1
0.0126621	69.4		N	f1
0.0188877	65.8		N	f1
0.0279819	60.2		L1	f1
0.0399448	91.1		N	f1
0.0458652	80.1		N	f1
0.06357	64.9		L1	f1
0.08828	44.3		N	f1
0.12130	32.8		N	f1
0.20078	48.3	-5.2	L1	f1
0.31016	37.2	-12.7	L1	f1
0.33750	42.5	-6.8	L1	f1
0.46250	37.9	-8.7	L1	f1
0.79844	39.0	-6.9	L1	f1
1.01328	36.1	-9.8	L1	f1
1.26328	33.9	-12.0	L1	f1
1.96250	29.9	-16.1	L1	f1
2.25547	28.8	-17.1	L1	f1
3.85313	28.1	-17.8	N	f1
5.10703	28.4	-17.5	N	f1
5.95469	28.3	-21.7	N	f1

Date: 14. Nov 22 12:21  
18.90781 26.4 -23.5 N f1  
\* limit exceeded



## 4.2 Radiated electromagnetic disturbances (9 kHz to 30 MHz)

Tested by .....	Marek Gabryszewski	
Test date .....	2022-11-16	
Test Location (stand) .....	Radiated electromagnetic disturbances (9 kHz to 30 MHz) stand	
Applied Limit for antenna measurement (Table 9) .....	<input type="checkbox"/>	Loop antenna radiated disturbance limit 9 kHz – 30 MHz for equipment with a dimension > 1.6 m
Applied limit according to LLAS diameter (Table 8) .....	<input checked="" type="checkbox"/>	2 m for equipment length not exceeding 1.6 m
	<input type="checkbox"/>	3 m for equipment length between 1.6 m and 2.6 m
	<input type="checkbox"/>	4 m for equipment length between 2.6 m and 3.6 m
Test set-up description .....	<input checked="" type="checkbox"/>	Equipment placed in the centre of the LLAS
	<input type="checkbox"/>	Equipment on a table 80 cm height
	<input type="checkbox"/>	Equipment on the floor (isolated from ground plane)
	<input type="checkbox"/>	Other: ---
Supplementary test set-up description .....	Position: Vertical and Horizontal Operating mode: 1	
Supplementary information .....	---	

Test set-up photo:



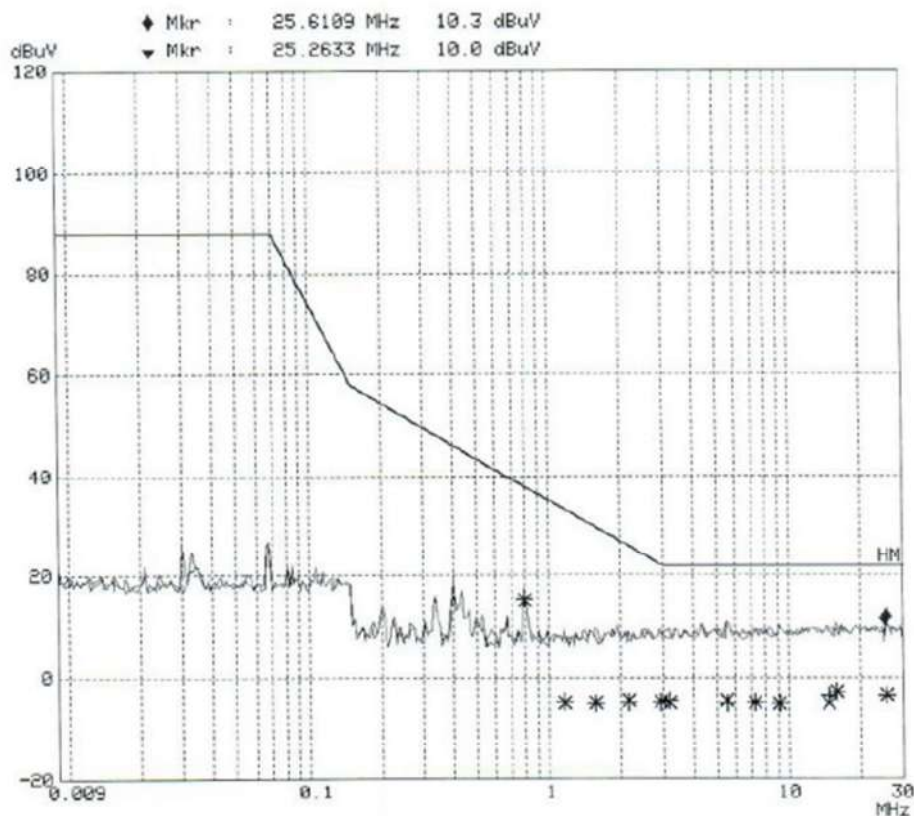
# IMiF PREDOM Division Measurement of Radiation Disturbances

EUT: URBINO S  
 Manuf: LUG  
 Test Spec: EN 55015  
 Comment: Vertical  
 File name: 55015\_V.RES  
 Date: 16. Nov 22 09:31

Overview Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	150k	61.0Hz	200Hz	PK	10ms	35dB	OFF
150k	30M	3.9k	9k	PK	10ms	5dB	OFF

Final Measurement: x Hor-Max / + Vert-Max  
 Meas Time: 1 s  
 Subranges: 25  
 Acc Margin: 25dB



IMiF PREDOM Division  
Measurement of Radiation Disturbances

EUT: URBINO S  
Manuf: LUG  
Test Spec: EN 55015  
Comment: Vertical  
File name: 55015\_V.RES  
Date: 16. Nov 22 09:31

## Final Measurement Results:

Frequency MHz	QP Level hor. dBuV	QP Level vert. dBuV	Delta Limit dB
0.79453	15.1	15.3	-22.8
1.16172	-4.8	-4.7	-38.2
1.56406	-4.8	-4.9	-34.7
2.15391	-4.4	-4.7	-30.5
2.92344	-4.5	-4.7	-26.9
3.18906	-4.8	-4.4	-26.4
5.51328	-4.4	-4.9	-26.4
7.19688	-4.7	-4.7	-26.7
9.16172	-5.0	-5.0	-27.0
14.62656	-4.9	-3.3	-25.3
15.64531	-2.6	-2.5	-24.5
25.61094	-3.3	-3.4	-25.3

\* limit exceeded

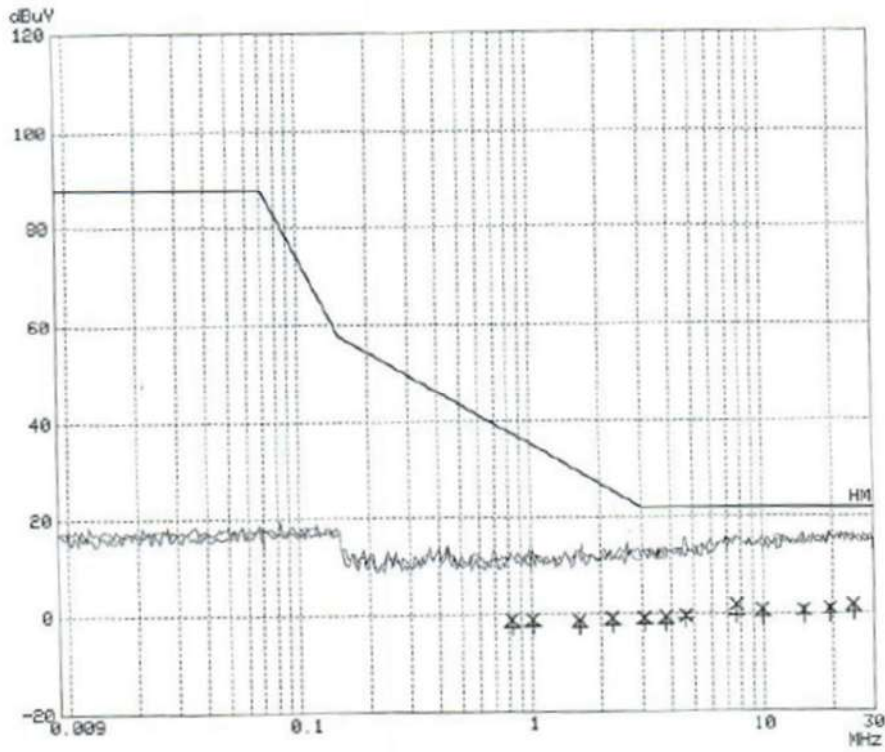
# IMiF PREDOM Division Measurement of Radiation Disturbances

EUT: URBINO S  
Manuf: LUG  
Test Spec: EN 55015  
Comment: Horizontal  
File name: 55015\_H.RES  
Date: 16. Nov 22 10:29

## Overview Scan Settings (2 Ranges)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	150k	61.0Hz	200Hz	PK	10ms	35dB LN	OFF
150k	30M	3.9k	9k	PK	10ms	10dB LN	OFF

Final Measurement: x QP / + AV  
Meas Time: 1 s  
Subranges: 23  
Acc Margin: 25dB





IMiF PREDOM Division  
 Measurement of Radiation Disturbances

EUT: URBINO S  
 Manuf: LUG  
 Test Spec: EN 55015  
 Comment: Horizontal  
 File name: 55015\_H.RES  
 Date: 16. Nov 22 10:29

## Final Measurement Results:

Frequency MHz	QP Level dBuV	Delta Limit dB
0.82188	-0.9	-38.6
1.00938	-1.0	-36.2
1.61484	-1.0	-30.7
2.22422	-0.7	-26.5
3.06797	-0.7	-22.7
3.81016	-0.5	-22.5
4.59531	-0.2	-22.2
7.64219	2.0	-19.9
9.91172	0.9	-21.0
14.92344	0.8	-21.1
19.37656	1.2	-20.7
24.62656	1.9	-20.0

Frequency MHz	AV Level dBuV	Delta Limit dB
0.82188	-2.4	
1.00938	-2.3	
1.61484	-2.4	
2.22422	-2.0	
3.06797	-1.9	
3.81016	-1.8	
4.59531	-1.0	
7.64219	-0.1	
9.91172	-0.4	
14.92344	-0.0	
19.37656	0.0	
24.62656	0.4	

\* limit exceeded



## 4.3 Radiated electromagnetic disturbances (30 MHz to 1000 MHz)

Tested by .....	Marek Gabryszewski
Test date.....	2022-11-14, 2022-11-15
Test Location (stand) .....	Radiated electromagnetic disturbances stand Semi- anechoic chamber U-86
Applied limit class .....	<input checked="" type="checkbox"/> Table 10 Radiated disturbance limits
	<input type="checkbox"/> Other: ---
Test set-up description .....	<input checked="" type="checkbox"/> Equipment on a table of 80 cm height
	<input type="checkbox"/> Equipment on the floor (insulated from ground plane)
	<input type="checkbox"/> Equipment located approximately in the middle of the validated test volume (FAR)
	<input type="checkbox"/> Equipment on a 10 cm support over the ground plane according CDNE-Method
	<input type="checkbox"/> Other: ---
Supplementary test set-up description .....	Operating mode: 1
Test method applied .....	<input type="checkbox"/> CDN(E)
	<input checked="" type="checkbox"/> OATS or SAC with measurement distance [m]: 10
	<input type="checkbox"/> FAR with measurement distance [m]: ---
	<input type="checkbox"/> TEM Waveguide (test item without cables and max. 300 mm dimension)
	<input type="checkbox"/> Other: ---
Supplementary information.....	---

Test set-up photo:





## EMC32 Report

### EMI Auto Test Template: 55015 EMI Test Auto 30MHz-1000MHz - 10m

Hardware Setup:	HL562 EMI
Measurement Type:	SAC
Frequency Range:	30 MHz - 1 GHz
Graphics Level Range:	0 dB $\mu$ V/m - 60 dB $\mu$ V/m

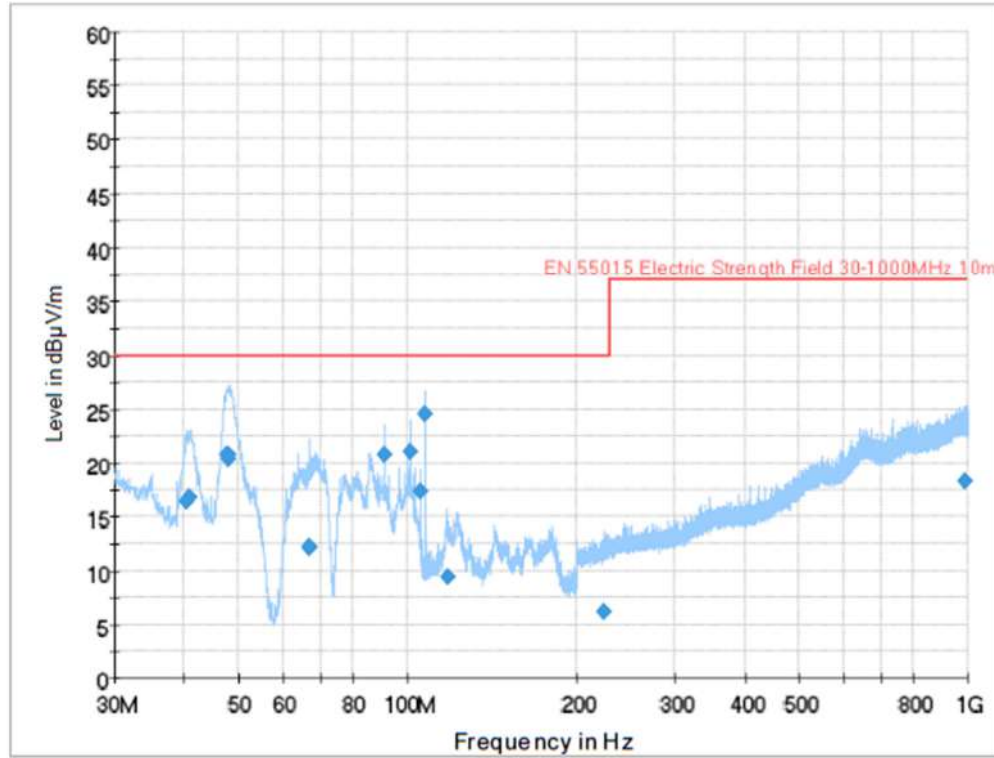
Preview Measurements:	
Scan Test Template:	EMI Prescan auto

Frequency Zoom:	
Zoom Scan Template:	EMI Zoom auto

Maximization Measurements:	
Template for Single Meas.:	EMI Prescan auto

Final Measurements:	
Template for Single Meas.:	EMI Final auto

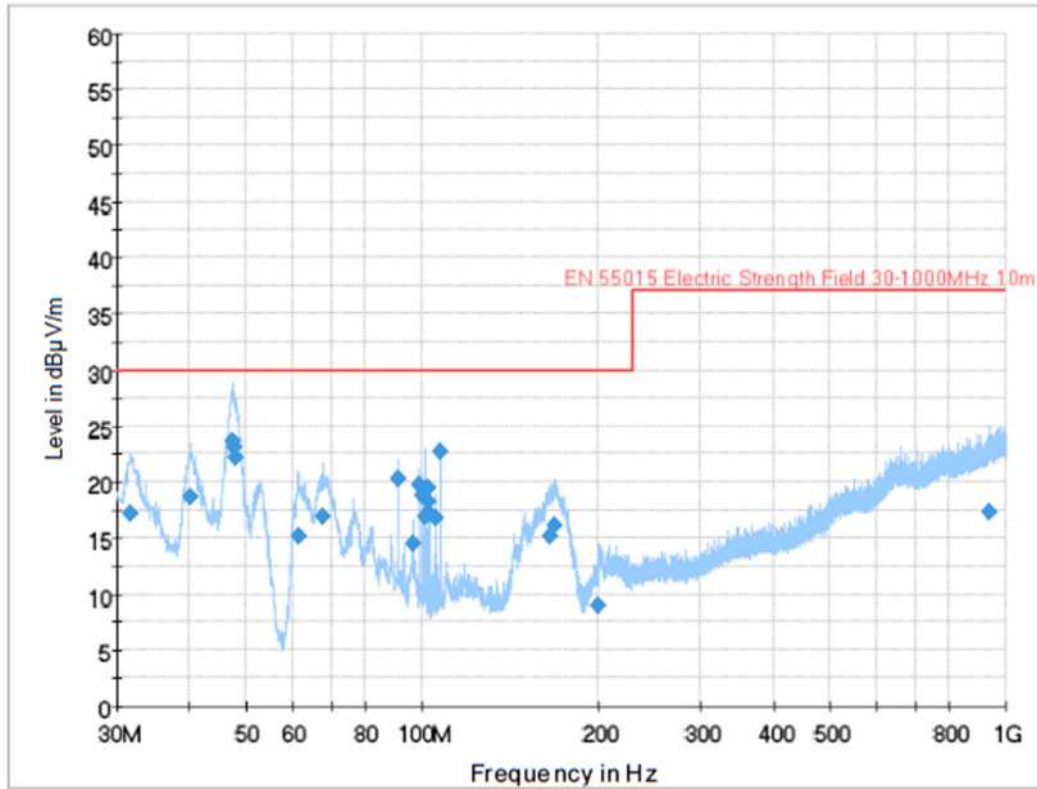
## EMC32 Report 0deg



### Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
40.260000	16.36	30.00	13.64	1000.0	120.000	100.0	V	0.0	17
40.795100	16.71	30.00	13.29	1000.0	120.000	100.0	V	0.0	16
47.520000	20.75	30.00	9.25	1000.0	120.000	100.0	V	0.0	13
47.940000	20.87	30.00	9.13	1000.0	120.000	100.0	V	0.0	12
48.039400	20.38	30.00	9.62	1000.0	120.000	100.0	V	0.0	12
66.780000	12.07	30.00	17.93	1000.0	120.000	100.0	V	0.0	10
67.025200	12.25	30.00	17.75	1000.0	120.000	200.0	V	0.0	10
91.034900	20.76	30.00	9.24	1000.0	120.000	400.0	V	0.0	11
101.035000	21.03	30.00	8.97	1000.0	120.000	300.0	V	0.0	11
105.622000	17.33	30.00	12.67	1000.0	120.000	200.0	V	0.0	11
107.562000	24.58	30.00	5.42	1000.0	120.000	100.0	V	0.0	11
117.992500	9.38	30.00	20.62	1000.0	120.000	100.0	V	0.0	12
223.916000	6.18	30.00	23.82	1000.0	120.000	300.0	H	0.0	12
986.230000	18.32	37.00	18.68	1000.0	120.000	400.0	H	0.0	26

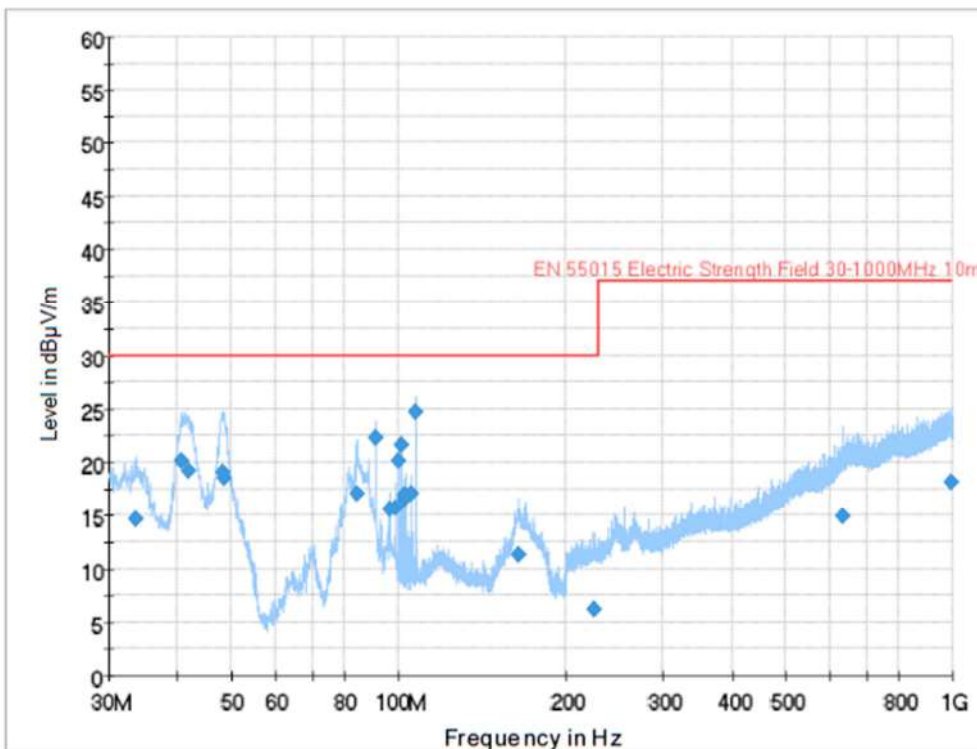
## EMC32 Report 90deg



### Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.621600	17.16	30.00	12.84	1000.0	120.000	300.0	H	90.0	22
40.039300	18.66	30.00	11.34	1000.0	120.000	100.0	V	90.0	17
47.353300	23.57	30.00	6.43	1000.0	120.000	100.0	V	90.0	13
47.580000	23.08	30.00	6.92	1000.0	120.000	100.0	V	90.0	12
48.060000	22.09	30.00	7.91	1000.0	120.000	100.0	V	90.0	12
61.500000	15.20	30.00	14.80	1000.0	120.000	100.0	V	90.0	8
67.651900	16.90	30.00	13.10	1000.0	120.000	200.0	V	90.0	10
90.994900	20.26	30.00	9.74	1000.0	120.000	300.0	V	90.0	11
96.517300	14.45	30.00	15.55	1000.0	120.000	200.0	V	90.0	11
98.815900	19.74	30.00	10.26	1000.0	120.000	400.0	V	90.0	11
100.099500	18.82	30.00	11.18	1000.0	120.000	100.0	V	90.0	11
101.065000	16.88	30.00	13.12	1000.0	120.000	100.0	V	90.0	11
102.378000	18.20	30.00	11.80	1000.0	120.000	100.0	V	90.0	11
102.410000	19.52	30.00	10.48	1000.0	120.000	100.0	V	90.0	11
103.035000	17.23	30.00	12.77	1000.0	120.000	100.0	V	90.0	11
105.592000	16.82	30.00	13.18	1000.0	120.000	100.0	V	90.0	11
107.472500	22.64	30.00	7.36	1000.0	120.000	100.0	V	90.0	11
166.020000	15.17	30.00	14.83	1000.0	120.000	300.0	H	90.0	10
168.954500	16.12	30.00	13.88	1000.0	120.000	300.0	H	90.0	10
200.485500	8.95	30.00	21.05	1000.0	120.000	300.0	H	90.0	11
935.032500	17.28	37.00	19.72	1000.0	120.000	300.0	V	90.0	25

## EMC32 Report 180deg

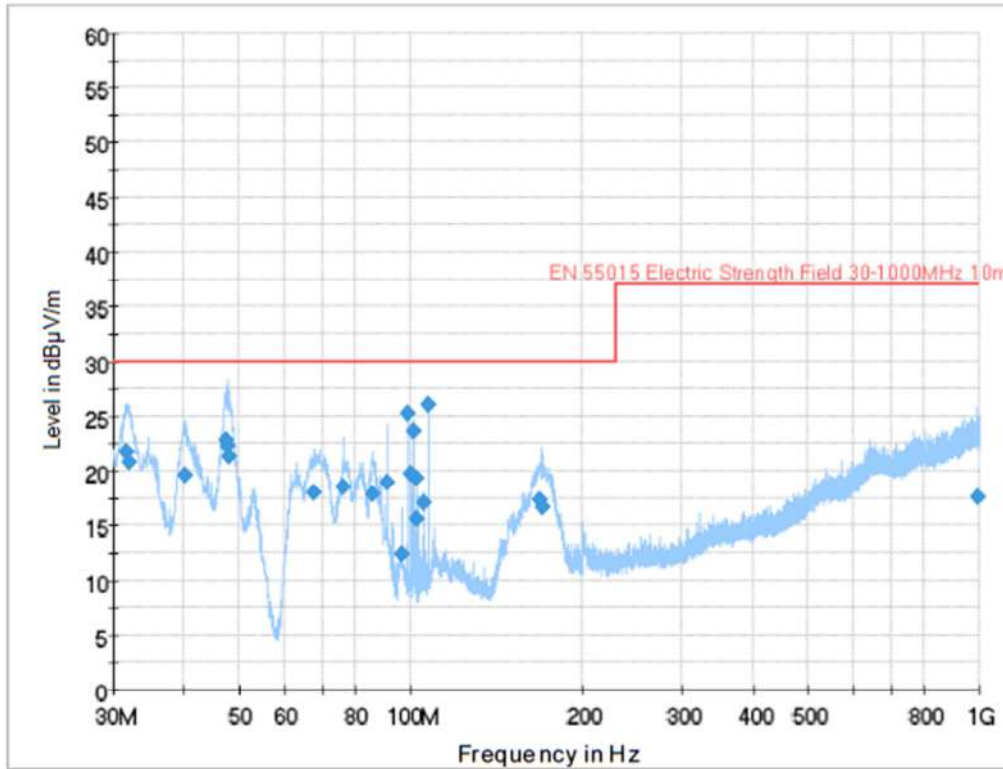


### Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.541700	14.69	30.00	15.31	1000.0	120.000	300.0	H	180.0	21
40.677500	20.07	30.00	9.93	1000.0	120.000	100.0	V	180.0	17
41.880000	19.17	30.00	10.83	1000.0	120.000	100.0	V	180.0	16
48.178500	19.12	30.00	10.88	1000.0	120.000	100.0	V	180.0	12
48.480000	18.52	30.00	11.48	1000.0	120.000	100.0	V	180.0	12
84.400000	17.00	30.00	13.00	1000.0	120.000	100.0	V	180.0	12
91.044900	22.29	30.00	7.71	1000.0	120.000	300.0	H	180.0	11
96.527300	15.57	30.00	14.43	1000.0	120.000	300.0	V	180.0	11
98.815900	15.68	30.00	14.32	1000.0	120.000	300.0	H	180.0	12
100.119500	20.17	30.00	9.83	1000.0	120.000	100.0	V	180.0	11
101.045000	21.64	30.00	8.36	1000.0	120.000	100.0	V	180.0	11
102.408000	16.94	30.00	13.06	1000.0	120.000	200.0	V	180.0	11
102.439500	16.54	30.00	13.46	1000.0	120.000	100.0	V	180.0	11
103.045000	16.94	30.00	13.06	1000.0	120.000	200.0	V	180.0	11
105.621500	16.99	30.00	13.01	1000.0	120.000	200.0	V	180.0	11
107.522500	24.66	30.00	5.34	1000.0	120.000	200.0	V	180.0	11
165.165000	11.23	30.00	18.77	1000.0	120.000	300.0	V	180.0	11
225.179000	6.13	30.00	23.87	1000.0	120.000	200.0	H	180.0	12
634.440000	14.92	37.00	22.08	1000.0	120.000	100.0	H	180.0	21
996.565500	18.07	37.00	18.93	1000.0	120.000	200.0	H	180.0	26



## EMC32 Report 270deg



### Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.692200	21.70	30.00	8.30	1000.0	120.000	300.0	H	270.0	22
31.980000	20.85	30.00	9.15	1000.0	120.000	300.0	H	270.0	21
40.079000	19.56	30.00	10.44	1000.0	120.000	100.0	V	270.0	17
47.482100	22.80	30.00	7.20	1000.0	120.000	100.0	V	270.0	13
47.580000	22.26	30.00	7.74	1000.0	120.000	100.0	V	270.0	12
47.880000	21.40	30.00	8.60	1000.0	120.000	100.0	V	270.0	12
67.651600	18.03	30.00	11.97	1000.0	120.000	200.0	V	270.0	10
76.099300	18.55	30.00	11.45	1000.0	120.000	200.0	V	270.0	11
85.861300	17.88	30.00	12.12	1000.0	120.000	300.0	V	270.0	11
90.964900	18.98	30.00	11.02	1000.0	120.000	300.0	V	270.0	11
96.497300	12.32	30.00	17.68	1000.0	120.000	300.0	V	270.0	11
98.835600	25.28	30.00	4.72	1000.0	120.000	400.0	V	270.0	11
100.139500	19.77	30.00	10.23	1000.0	120.000	100.0	V	270.0	11
101.025000	23.56	30.00	6.44	1000.0	120.000	400.0	V	270.0	11
102.418000	19.38	30.00	10.62	1000.0	120.000	100.0	V	270.0	11
102.505000	15.54	30.00	14.46	1000.0	120.000	100.0	V	270.0	11
105.592000	17.10	30.00	12.90	1000.0	120.000	100.0	V	270.0	11
107.532500	25.98	30.00	4.02	1000.0	120.000	100.0	V	270.0	11
168.943500	17.25	30.00	12.75	1000.0	120.000	300.0	H	270.0	10
170.280000	16.65	30.00	13.35	1000.0	120.000	300.0	H	270.0	10
992.284000	17.52	37.00	19.48	1000.0	120.000	100.0	V	270.0	26

## 5 Harmonic current emissions according to IEC 61000-3-2

Tested by .....	Marek Gabryszewski		
Test date .....	2022-11-15		
Test Location (stand) .....	U-84		
Version of measurement instrument standard used IEC 61000-4-7 (Clause 7) .....	<input type="checkbox"/>	IEC 61000-4-7:1991	
	<input checked="" type="checkbox"/>	IEC 61000-4-7:2002 + AMD1:2008	
Test set-up description .....	---		
Operating modes of EUT .....	1		
Limit classification in accordance with the standard .....	<input type="checkbox"/>	Class A	
	<input type="checkbox"/>	Class B	
	<input checked="" type="checkbox"/>	Class C with rated power > 25 W (Table 2)	
	<input type="checkbox"/>	Class C with rated power $\geq 5$ and $\leq 25$ W (First requirement, Table 3 column 2)	
		<input type="checkbox"/>	Table 3, column 2 (Power related limits)
		<input type="checkbox"/>	3 <sup>rd</sup> harmonic $\leq 86$ %, 5 <sup>th</sup> harmonic $\leq 61$ % and waveform conditions
		<input type="checkbox"/>	THD $\leq 70$ %, Harmonics: 3 <sup>rd</sup> $\leq 35$ %, 5 <sup>th</sup> $\leq 25$ %, 7 <sup>th</sup> $\leq 30$ %, 9 <sup>th</sup> and 11 <sup>th</sup> $\leq 20$ %, 2 <sup>nd</sup> $\leq 5$ %
		<input type="checkbox"/>	Other: Lighting equipment having a rated power-less to 5 W - test not required.
<input type="checkbox"/>	Class D		
Observation period .....	Description	Period selected $T_{obs}$	
	<input checked="" type="checkbox"/>	Quasi stationary	2.5 min
	<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 $T_{obs} =$
Control method used in the sample according clause 6.2 of the standard .....	<input checked="" type="checkbox"/>	The EUT does not utilize half-wave rectification or any other method to control the active input power. Such equipment is in conformity with the standard if the measured values comply with the applicable limit.	
	<input type="checkbox"/>	The EUT uses half-wave rectification directly on the mains supply, or it uses symmetrical or asymmetrical methods to control the active input power. Such equipment is permitted under conditions only. An evaluation on the control method is required. However, the equipment shall still comply with the harmonic requirements of the standard.	
Supplementary information .....	---		

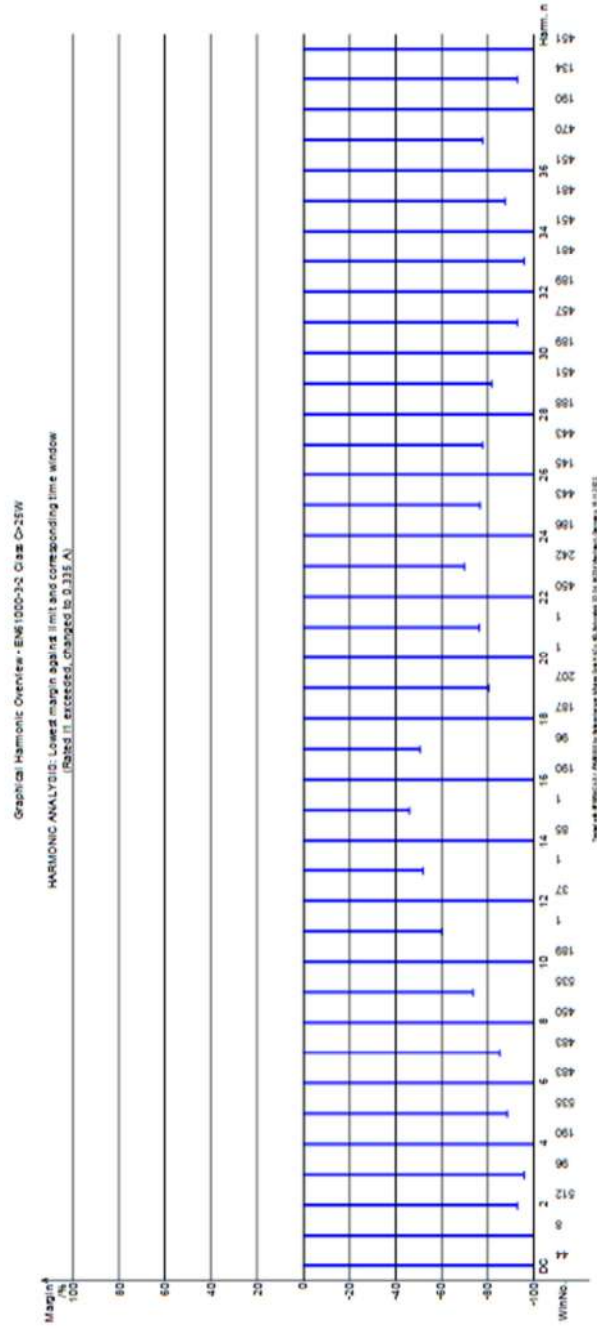
Test set-up photo:











Name:		Serial no:	
Department:		Operating modes:	220 V / 60 Hz
Company:	IMIF PREDOM Division	Comment1:	
Test report no:	B10-4/117/EMC22	Comment2:	
Device:	URBINO S	Comment3:	
Specimen:		Comment4:	
Manufacturer:	LUG	Date:	15.11.2022
Type:		Test date:	15.11.2022

Maximum RMS current and corresponding values in timewindow 1:

Voltage: 220.44 Vrms THD=0.00 % THV=0.007 V POHV=0.004 V PWH=0.01 %  
 Current: 0.337 Arms 0.467 Apk THD=4.12 % THC=0.014 A POHC=0.006 A PWH=12.97 %  
 Power: -73.5 W P1=-73.5 W 74.2 VA  
 Power factor: -0.990 CosPhi1: -0.991

Test conditions: EN IEC 61000-3-2:2019/FprA 1:2020, f=60 Hz, Phase=N, Range=0.80 A  
 Time window=16, Grouping (>2nd harm.)=off, Rated I1=3.0 A  
 No Ztest selected  
 Time window=16, Grouping (>2nd harm.)=off, Rated I1=3.0 A

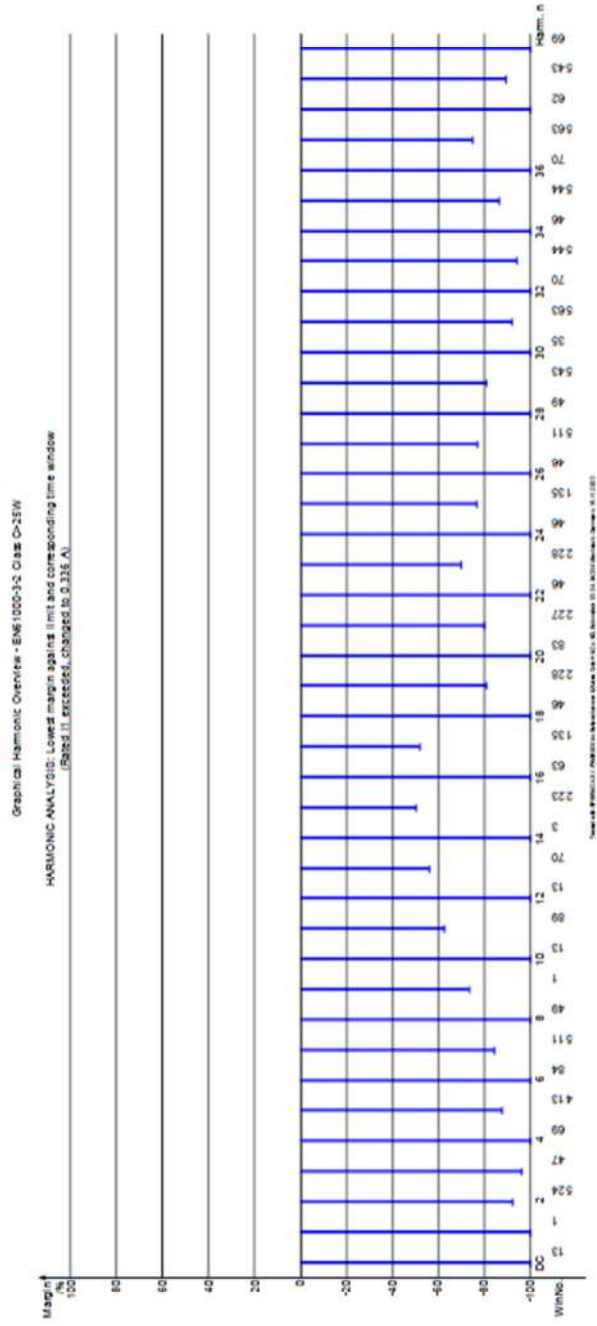
HARMONIC ANALYSIS: Test PASS

Tobs = worst 2.5 min: tw 1.563; POHC (C.2): avg=0.01 A, limit=0.03 A  
 Iavg=0.336 Arms; Rated I1 exceeded, changed to 0.336 A

Ha	Entire measurement (2.5 min = 563 time windows)		Worst 2.5 min		Worst 2.5 min avg		P	F			
	Maximum	Window	EN61000-3-2 Class C>25W vdl	Margin in MaxWn	100 to 150%	Ex-ceeded			100 to 150%	Ex-ceeded	Value
DC	0.0011 A	13	-----	-----	0	0	0	0	0.0001 A	0	X
1	0.3363 A	1	-----	-----	0	0	0	0	0.3359 A	0	X
2	0.0005 A	524	0.0070 A	-92.3 %	0	0	0	0	0.0003 A	0	X
3	0.0035 A	47	0.0949 A	-96.3 %	0	0	0	0	0.0034 A	0	X
4	0.0003 A	225	-----	-----	0	0	0	0	0.0002 A	0	X
5	0.0043 A	413	0.0352 A	-87.6 %	0	0	0	0	0.0042 A	0	X
6	0.0002 A	84	-----	-----	0	0	0	0	0.0001 A	0	X
7	0.0038 A	511	0.0246 A	-84.4 %	0	0	0	0	0.0037 A	0	X
8	0.0002 A	140	-----	-----	0	0	0	0	0.0001 A	0	X
9	0.0047 A	1	0.0176 A	-73.5 %	0	0	0	0	0.0046 A	0	X
10	0.0002 A	135	-----	-----	0	0	0	0	0.0001 A	0	X
11	0.0040 A	89	0.0105 A	-62.5 %	0	0	0	0	0.0039 A	0	X
12	0.0002 A	13	-----	-----	0	0	0	0	0.0001 A	0	X
13	0.0046 A	70	0.0105 A	-56.2 %	0	0	0	0	0.0045 A	0	X
14	0.0002 A	452	-----	-----	0	0	0	0	0.0001 A	0	X
15	0.0053 A	223	0.0105 A	-50.2 %	0	0	0	0	0.0051 A	0	X
16	0.0002 A	167	-----	-----	0	0	0	0	0.0001 A	0	X
17	0.0051 A	135	0.0105 A	-52.0 %	0	0	0	0	0.0050 A	0	X
18	0.0001 A	99	-----	-----	0	0	0	0	0.0001 A	0	X
19	0.0020 A	228	0.0105 A	-80.7 %	0	0	0	0	0.0020 A	0	X
20	0.0001 A	84	-----	-----	0	0	0	0	0.0001 A	0	X
21	0.0021 A	227	0.0105 A	-80.0 %	0	0	0	0	0.0020 A	0	X
22	0.0003 A	70	-----	-----	0	0	0	0	0.0001 A	0	X
23	0.0032 A	228	0.0105 A	-69.9 %	0	0	0	0	0.0031 A	0	X
24	0.0001 A	99	-----	-----	0	0	0	0	0.0001 A	0	X
25	0.0025 A	135	0.0105 A	-76.4 %	0	0	0	0	0.0024 A	0	X
26	0.0002 A	135	-----	-----	0	0	0	0	0.0001 A	0	X
27	0.0024 A	511	0.0105 A	-77.3 %	0	0	0	0	0.0023 A	0	X
28	0.0002 A	70	-----	-----	0	0	0	0	0.0001 A	0	X
29	0.0020 A	543	0.0105 A	-80.8 %	0	0	0	0	0.0020 A	0	X
30	0.0002 A	70	-----	-----	0	0	0	0	0.0001 A	0	X
31	0.0009 A	563	0.0105 A	-91.8 %	0	0	0	0	0.0008 A	0	X
32	0.0002 A	71	-----	-----	0	0	0	0	0.0001 A	0	X
33	0.0006 A	544	0.0105 A	-94.1 %	0	0	0	0	0.0005 A	0	X
34	0.0003 A	230	-----	-----	0	0	0	0	0.0001 A	0	X
35	0.0015 A	544	0.0105 A	-86.3 %	0	0	0	0	0.0013 A	0	X
36	0.0005 A	71	-----	-----	0	0	0	0	0.0002 A	0	X
37	0.0027 A	563	0.0105 A	-74.8 %	0	0	0	0	0.0025 A	0	X
38	0.0003 A	71	-----	-----	0	0	0	0	0.0002 A	0	X
39	0.0011 A	543	0.0105 A	-89.5 %	0	0	0	0	0.0009 A	0	X
40	0.0004 A	135	-----	-----	0	0	0	0	0.0002 A	0	X

average value < 0.6 % of Iavg or < 5 mA

Table 10: IPRNCE.1.PREDOM by IMIF/PreDom/Alma/Gen/AG/RE/Verst/30-14-14/1/Verst/Gen/05.11.2022



## 6 Voltage changes, voltage fluctuations and flicker according to IEC 61000-3-3

Tested by .....	Marek Gabryszewski
Test date .....	2022-11-15
Test Location (stand) .....	U-84
Test set-up description .....	---
Test method .....	<input checked="" type="checkbox"/> 4.2.2 Flicker meter according IEC 61000-4-15
	<input type="checkbox"/> 4.2.3 Simulation
	<input type="checkbox"/> 4.2.4 Analytical method
	<input type="checkbox"/> 4.2.5 Use of $P_{st} = 1$ curve
Observation time selected .....	<input checked="" type="checkbox"/> 10 Minutes
	<input type="checkbox"/> 120 Minutes
	<input type="checkbox"/> 24 times switching according to Annex B
Limit for dmax applied .....	<input type="checkbox"/> 4 %
	<input checked="" type="checkbox"/> 6 %
	<input type="checkbox"/> 7 %
Supplementary information.....	---

Test set-up photo:





## Tabulated Results for Voltage Fluctuations and Flicker:

Name:		Serial no:	
Department:		Operating modes:	220 V / 60 Hz
Company:	IMI F PREDOM Division	Comment1:	
Test report no:	B10-4/117/EMC/22	Comment2:	
Device:	URBINO S	Comment3:	
Specimen:		Comment4:	
Manufacturer:	LUG	Date:	15.11.2022
Type:		Test date:	15.11.2022

Test conditions: EN 61000-3-3:2013 + A1:2019 / 220 V / 60 Hz / Phase L1  
 EN 61000-4-15:2011 / d(t) = 3.3 % / Obs 1 x 10 min / Ztest (0.400+j0.300) Ohm  
 Ra+jXa (0.2400+j0.1800) Ohm / Rn+jXn (0.1600+j0.1200) Ohm

FLICKER (Automatically recalculated to Zref): Test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [μ]	dmax  [%]	dq  [%]	PASS	FAIL
09:53:48	0.001	0.0208	0.0208	- . - - -	0.000	- . - - -	X	
Limits:		1.000	0.650	0.500	6.000	3.300		
Plt 0.020755								
Evaluated: PST, dc, dmax, Tmax								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	Tmax [μ]	dmax  [%]	dq  [%]	PASS	FAIL
09:53:48	0.001	0.0230	- . - - - -	- . - - -	0.000	- . - - -	X	
Plt 0.023000								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with IFS EMC 4.5.1 / PAS 000 by IFS Ingenieurbüro GmbH & Co. KG, Schenkstr. 32-34, 92245 Vordach, Germany, 15.11.2022

## 7 Immunity

### 7.1 General information

Performance criteria as defined by the standard	
Criterion	Description from 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.
Other:	---

Manufacturer defined performance criteria .....	Criterion	Description
	A	Manufacturer defined performance criteria- not specified.
	B	Apply performance criteria as defined by the standard.
	C	See above: Performance criteria as defined by the standard
D		
Monitoring during the tests .....	Radio-frequency electromagnetic fields: visual EUT observation using a camera.	
Mains voltage applied during the testing if not otherwise specified....	AC: 220 V / 60 Hz	

7.2 Electrostatic discharges




Tested by .....	Marek Gabryszewski	
Test date .....	2022-11-21	
Test Location(Stand) .....	ESD stand	
Test set-up .....	<input checked="" type="checkbox"/>	Table top equipment
	<input type="checkbox"/>	Floor standing equipment
	<input type="checkbox"/>	Wall or ceiling mounted equipment (Treated as table top)
Supplementary test set-up description .....	Operating mode: 1	
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 .....	10 positive / 10 negative	
Discharge interval .....	1/s	
Performance criterion .....	B	
Supplementary information.....	---	
Symbols identifying discharge applied .....		Contact discharge
		Air discharge
		Air discharge, discharge did not occur



Photo of selected test points:



Photo of selected test points:

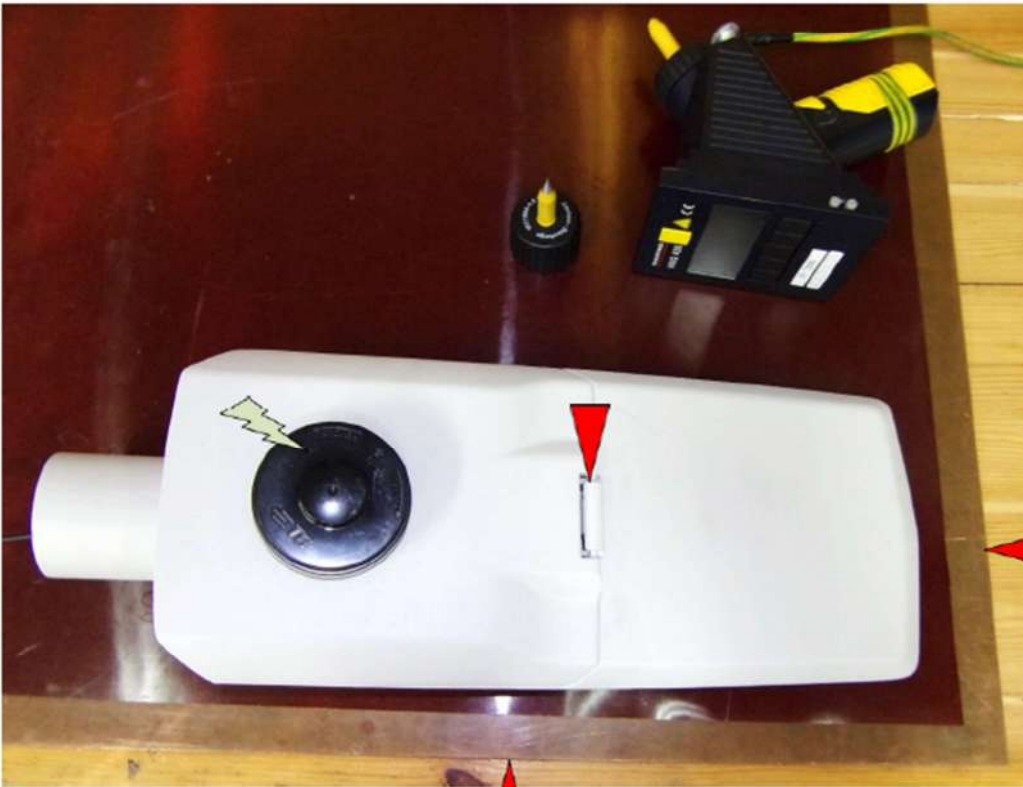




Table: Test results for electrostatic discharges							
No.	Location of discharge	Polarity	Discharge	Number of discharges	Test level [kV]	Operating mode	Observations
1	HCP	P	C	10	4	1	Pass
2	VCP	P	C	10	4	1	Pass
3	Points on conductive surface as indicated in the picture above	P	C	10	4	1	Pass
4	Points on conductive surface as indicated in the picture above	N	C	10	4	1	Pass
5	Points on non-conductive surface as indicated in the picture above	P	A	10	8	1	Pass
6	Points on non-conductive surface as indicated in the picture above	N	A	10	8	1	Pass
HCP = Horizontal coupling plate VCP = Vertical coupling plate		N = Negative P = Positive		A = Air discharge C = Contact discharge X = Not performed nor required			
Supplementary information: No observed response from EUT.							

## 7.3 Radio-frequency electromagnetic fields

Tested by .....	Marek Gabryszewski		
Test date .....	2022-11-18		
Test location (stand) .....	Radio-frequency electromagnetic fields stand Semi-anechoic chamber U-86		
Test set-up .....	<input checked="" type="checkbox"/>	Equipment on the table (see photos below)	
	<input type="checkbox"/>	Equipment standing on floor (0.05 – 0.15 m height)	
Supplementary test set up description .....	Operating mode: 1		
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 checked="" type="checkbox"/>	Top side	
	<input checked="" type="checkbox"/>	Bottom side	
Reason for not exposing a side ...:	As a result of the analysis, it was found that the EUT (front) side is the most susceptible to radiation, see below photos, next page.		
Distance Antenna to EUT .....	3 m		
Step size [%] .....	1		
Performance criterion .....	A		
Supplementary information .....	---		

Test set-up photo:



#### Test results for radiated electromagnetic field

Frequency range	Test Level [V/m]	Polarization	Modulation	Operating mode	Dwell time [s]	Observations
80 MHz + 1 GHz	3.0	V	AM: 80.0 %; 1.0 kHz	1	3.0	Pass
80 MHz + 1 GHz	3.0	H	AM: 80.0 %; 1.0 kHz	1	3.0	Pass

H = Horizontal  
 V = Vertical  
 X = Not performed nor required

Supplementary information: No observed response from EUT.

# EMC32 Report position antenna: V

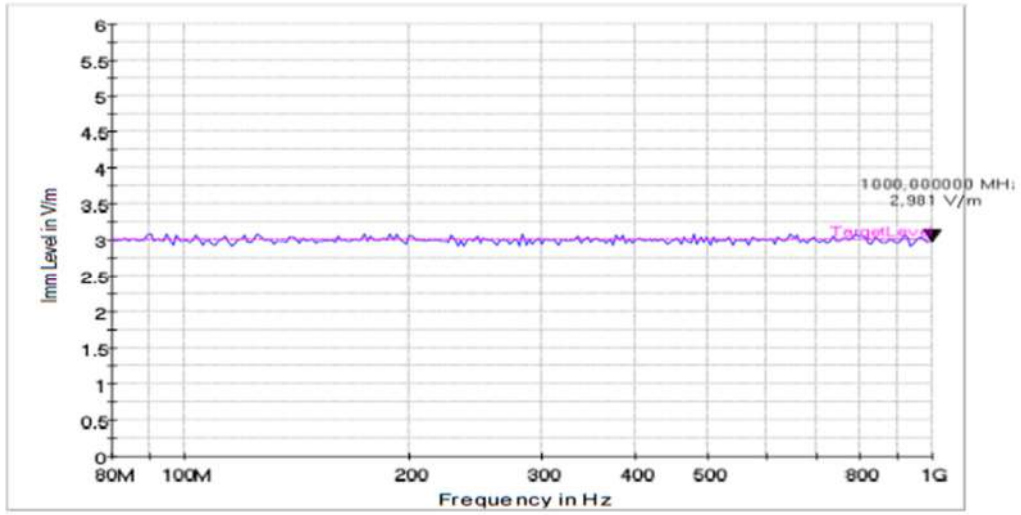
## EMS Scan Template: EMS Scan 3Vm 80-1000MHz [EMS Radiated]

Hardware Setup: EMS radiated\Copy of Hardware Setup 80-1000MHz\_SMBV100A

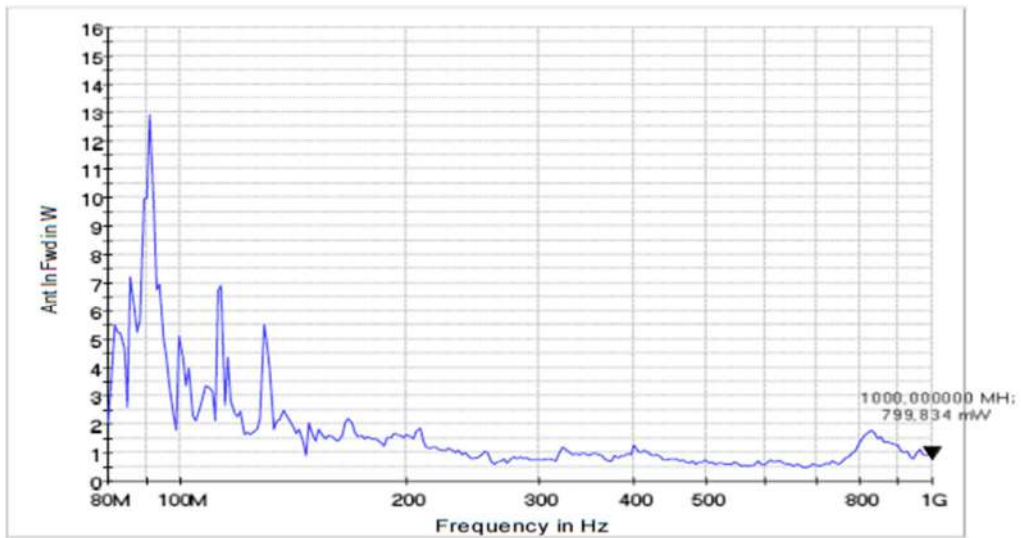
Level On: Substitution Method: EMS radiated\Kalibracja pola EMSIC28Vm\_80-1000

Subrange	Step Width	Level	Modulation	Dwell Time
80MHz - 1GHz	1% LOG	3V/m	AM: 80.0%; 1.0kHz	3s

Imm Level



Ant In Fwd





## EMC32 Report position antenna: H

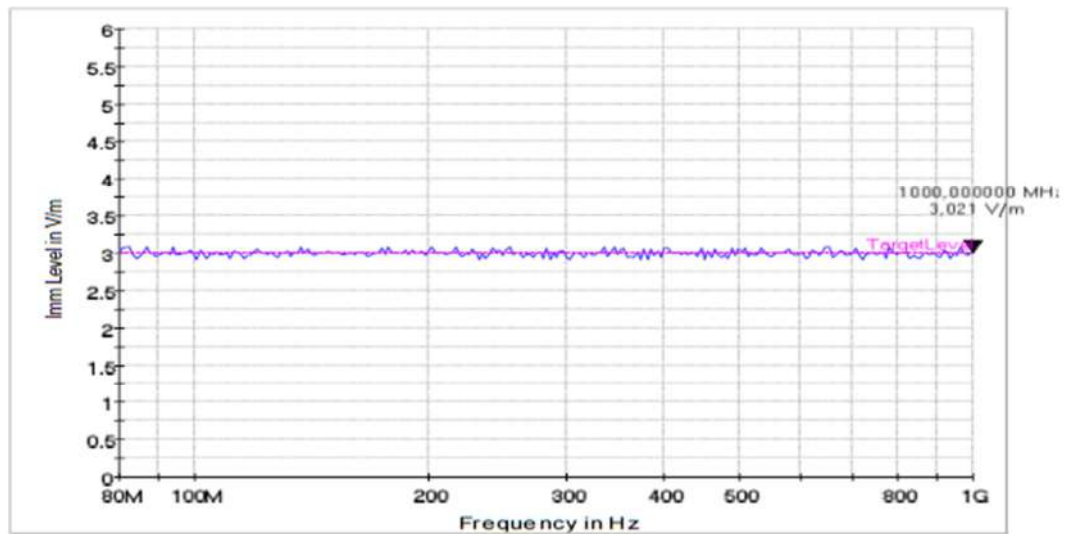
### EMS Scan Template: EMS Scan 3Vm 80-1000MHz [EMS Radiated]

Hardware Setup: EMS radiated\Copy of Hardware Setup 80-1000MHz\_SMBV100A

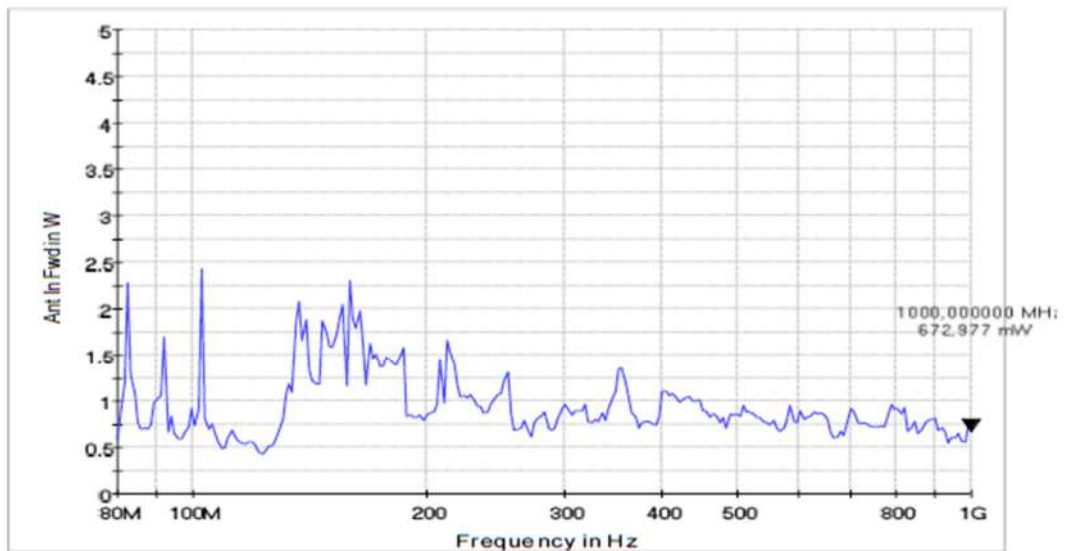
Level On: Substitution Method: EMS radiated\Kalibracija pola  
EMSiC28Vm\_80-1000

Subrange	Step Width	Level	Modulation	Dwell Time
80MHz - 1GHz	1% LOG	3V/m	AM: 80.0%; 1.0kHz	3s

Imm Level



Ant In Fwd



7.4 Power frequency magnetic fields

Tested by .....	Marek Gabryszewski
Test date .....	2022-11-18
Test location (Stand) .....	PMM 1008
Applicability .....	<input checked="" type="checkbox"/> The test was performed
	<input type="checkbox"/> The test was not performed Reason: According to the manufacturers information there are no magnetic sensitive components in the product.
Test set-up .....	<input type="checkbox"/> 0.1 m above metal surface
	<input type="checkbox"/> Homogeneous field (Helmholtz coil). Dimensions: ---
	<input checked="" type="checkbox"/> Single Coil. Dimensions: 1 x 1 m
	<input type="checkbox"/> Single Coil. Dimensions: 1 x 2.6 m
Performance criterion .....	A
Supplementary information .....	---



Test results for power frequency magnetic field immunity test							
Test frequency	Test Level [A/m]	Test time [s]	Coil size/type	Axis	Operating mode	Mains voltage/ frequency (PMM)	Observations
60 Hz	3.0	180	1 m x 1 m	X	1	220 V / 60 Hz	Pass
60 Hz	3.0	180	1 m x 1 m	Y	1	220 V / 60 Hz	Pass
60 Hz	3.0	180	1 m x 1 m	Z	1	220 V / 60 Hz	Pass
X = Not performed nor required							
Supplementary information: No observed response from EUT.							

## 7.5 Fast transients

Tested by .....	Marek Gabryszewski
Test date .....	2022-11-17
Test location (stand) .....	Fast transient stand
Test set-up .....	<input checked="" type="checkbox"/> Equipment on the table ( $0.1 \pm 0.01$ ) m above ground plane
	<input type="checkbox"/> Equipment standing on floor at ( $0.1 \pm 0.01$ ) m above ground plane
	<input type="checkbox"/> Artificial hand applied. Location see photo.
Supplementary test set-up description .....	Operating mode: 1
Repetition frequency .....	5 kHz
Test time .....	4 min
Performance criterion .....	B
Supplementary information .....	--

Test set-up photo:





Test results fast transients						
Port	Coupling	Level [kV]	Polarity	Operating mode	Mains voltage/frequency	Observation
AC power port	L1 N	1	Positive	1	220 V / 60 Hz	Pass
AC power port	L1 N	1	Negative	1	220 V / 60 Hz	Pass
AC power port	L1 N PE	1	Positive	---	---	X
AC power port	L1 N PE	1	Negative	---	---	X
SIP/SOP	Clamp	0.5	Positive	---	---	X
SIP/SOP	Clamp	0.5	Negative	---	---	X
X = Not performed nor required						
Supplementary information: No observed response from EUT.						

## 7.6 Injected currents (radio-frequency common mode)

Tested by .....	Marek Gabryszewski
Test date .....	2022-11-17
Test location (Stand) .....	Injected currents stand
Test set-up .....	<input checked="" type="checkbox"/> Equipment located ( $0.1 \pm 0.05$ ) m above ground plane
	<input type="checkbox"/> Elevated ground plane according to Annex F
	<input type="checkbox"/> Artificial hand applied. Location see photo
Supplementary test set-up description .....	Operating mode: 1
Modulation .....	<input checked="" type="checkbox"/> 80 % AM with 1 kHz
	<input type="checkbox"/> Other: ---
Step size .....	1 %
Performance criterion .....	A
Supplementary information.....	---

Test set-up photo:



Test results for conducted disturbances, induced by radio-frequency fields							
Frequency range	Test Level [V]	Port under test	CDN type	Port with terminated CDN	Operating mode	Dwell time [s]	Observations
0.15 + 80 MHz	3.0	AC power port	CDN-M2	ATT 6	1	1.0	Pass
0.15 + 80 MHz	3.0	AC power port	CDN-M3	---	---	---	X
0.15 + 80 MHz	3.0	AC power port	CDN-M5	---	---	---	X
X = Not performed nor required							
Supplementary information: No observed response from EUT.							

## 7.7 Surges

Tested by .....	Marek Gabryszewski
Test date .....	2022-11-17
Test location(Stand) .....	Surge stand
Test set-up description .....	Operating mode: 1
Repetition rate .....	1 / min
Number of pulses for each coupling .....	5
Performance criterion .....	B
Supplementary information.....	---

Test set-up photo:





Test results for surges								
Port	Coupling	CDN	Level [kV]	Polarity	Phase angles [°]	Operating mode	Mains voltage/frequency	Observation*
AC power port	L1-N	MCN	1	Positive	90	1	220 V / 60 Hz	Pass
AC power port	L1-N	MCN	1	Negative	270	1	220 V / 60 Hz	Pass
AC power port	N-PE	MCN	2	Positive	90	--	--	X
AC power port	N-PE	MCN	2	Negative	270	--	--	X
AC power port	L1-PE	MCN	2	Positive	90	--	--	X
AC power port	L1-PE	MCN	2	Negative	270	--	--	X
Lower test levels:			<input type="checkbox"/>	Tested				
			<input checked="" type="checkbox"/>	Not tested				
P = Positive N = Negative X = Not performed nor required				MCN = Mains Coupling Network ICN = Coupling Network for interconnection lines D = Direct Coupling (shielded lines)				
Supplementary information: *Observed response from EUT. During the test, the luminous intensity change, dimming, flashing light. Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention. Consistent with the evaluation criterion.								

## 7.8 Voltage dips and short interruptions

Tested by .....	Marek Gabryszewski
Test date .....	2022-11-15
Test Location (Stand) .....	U-84
Test set-up description .....	Operating mode: 1
Repetition rate .....	10 s
Number of dips or interruptions ...:	3
Performance criterion .....	B (Voltage dips) C (Short interruptions $U_N=0\%$ )
Supplementary information.....:	---

Test results voltage dips						
$U_N$ [V]	Frequency in Hz	Test Level [% of $U_N$ ]	Phase angle	Duration [Cycles]	Operating mode	Observations*
220	60	70	0°	12	1	Pass
Supplementary information: *Observed response from EUT. During the test, the luminous intensity change, dimming, flashing light. Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention. Consistent with the evaluation criterion.						

Test results voltage interruptions						
$U_N$ [V]	Frequency [Hz]	Test Level [% of $U_N$ ]	Phase angle	Duration [Cycles]	Operating mode	Observations*
220	60	0	0°	0.5	1	Pass
Supplementary information: *Observed response from EUT. During the test, the luminous intensity change, dimming, flashing light. Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention. Consistent with the evaluation criterion.						

Test set-up photo:



## Tabulated Results for Voltage Dips and Interruptions

Name:		Serial no:	
Department:		Operating modes:	
Company:	IMIF PREDOM Division	Comment1:	
Test report no:	B10-4/117/EMC/22	Comment2:	
Device:	URBINO LED S	Comment3:	
Specimen:		Comment4:	
Manufacturer:	LUG	Date:	15.11.2022
Type:		Test date:	15.11.2022

Test conditions EN 61000-4-11 voltage dips, short interruptions and variations test

Voltage / frequency: 220.0 V / 60.0 Hz  
 Test phase: Single phase / L1-N  
 Executed test: 61547 dips  
 Test description: --  
 Disturbances per step: 3 (per phase angle) / 10.5  $\mu$ c delay between

Step	Disturbance	Test level	Duration	Phase angle(s) (Ref. L1)
1	Voltage dip / short interruption	70 %	12 periods	0° L1

## Test results:

- Normal performance within limits specified by manufacturer, requestor or purchaser
- Temporary loss of function or degradation of performance which ceases after the disturbance ceases and from which the equipment under test recovers its normal performance, without operator intervention
- Temporary loss of function or degradation of performance, the correction of which requires operator intervention
- Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data

## Comments:

Pass

Tested with IEC 61000-4-11:2000 by Sphorberg & Sphorberg AG, Im Gröblich Co. HG, Ostendstr. 22/24, 54244 Kall, Germany, 15.11.2022

Name:		Serial no:	
Department:		Operating modes:	
Company:	IMIF PREDOM Division	Comment1:	
Test report no:	B10-4/117/EMC/22	Comment2:	
Device:	URBINO LED S	Comment3:	
Specimen:		Comment4:	
Manufacturer:	LUG	Date:	15.11.2022
Type:		Test date:	15.11.2022

Test conditions EN 61000-4-11 voltage dips, short interruptions and variations test

Voltage / frequency: 220.0 V / 60.0 Hz  
 Test phase: Single phase / L1-N  
 Executed test: 61547 short interruption  
 Test description: --  
 Disturbances per step: 3 (per phase angle) / 10.5  $\mu$ c delay between

Step	Disturbance	Test level	Duration	Phase angle(s) (Ref. L1)
1	Voltage dip / short interruption	0 %	0.5 periods	0° L1

## Test results:

- Normal performance within limits specified by manufacturer, requestor or purchaser
- Temporary loss of function or degradation of performance which ceases after the disturbance ceases and from which the equipment under test recovers its normal performance, without operator intervention
- Temporary loss of function or degradation of performance, the correction of which requires operator intervention
- Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data

## Comments:

Pass

Tested with IEC 61000-4-11:2000 by Sphorberg & Sphorberg AG, Im Gröblich Co. HG, Ostendstr. 22/24, 54244 Kall, Germany, 15.11.2022



## 8 List of test equipment

Equipment	Type	Inventory number	Manufacturer
Test Stand:	Disturbance voltages		
EMI Test Receiver	ESCS 30	U-57	Rohde & Schwarz
Artificial Mains Network	ESH 2-Z5	U-57/A	Rohde & Schwarz
Artificial hand	RC	Pp-416	PREDOM-OBR
Faraday Cage	EK-1	U-11	Unitra Unima Olsztyn
Test Stand:	Disturbance powerstand		
EMI Test Receiver	ESCS 30	U-57	Rohde & Schwarz
Absorbing clamp	MDS-21	P-395/A	Rohde & Schwarz
Faraday Cage	EK-1	U-11	UnitraUnima Olsztyn
Test Stand:	Harmonic current emissions, Voltage changes, voltage fluctuations and flicker		
Test System	EMV D 15000/PAS	U-84	Spitzenberger+Spies GmbH
Test Stand:	Electrostatic discharges		
Simulator ESD	NSG 435	P-396	Schaffner
Test Stand:	Fast Transients / Surges		
Multifunctional Test Generator	COMPACT NX5	U-117A	EM TEST
Combined 3-Phase Coupling/ Decoupling Networks	COUPLING NX5	U-117B	EM TEST
Test Stand:	Conducted Disturbances Immunity		
Compact Immunity Test System	NSG4070C-35		AMETEK CTS
Coupling-Decoupling Network	CDN-M5,M3,M2	U-56/D,C,B	EM TEST
Attenuator	ATT 6	U-56/F	EM TEST
Test Stand:	Radiated electromagnetic disturbances stand Semi-anechoic chamber U-86		
EMI Test Receiver	ESIB 26	P-377	Rohde & Schwarz
Antenna	HL 562	P-382	Rohde & Schwarz
Test Stand:	Radiated, radio-frequency, electromagnetic field stand Semi-anechoic chamber U-86		
Vector Signal Generator	SMBV100A	P-601	Rohde & Schwarz
Power Amplifier	BLWA 0810-250/75D	P-370	BONN Elektronik
Power Amplifier	BLMA 0830-40	P-369	BONN Elektronik
Power Amplifier	BLMA 4060-10	P-467	BONN Elektronik
Power Meter	NRVD	P-375	Rohde & Schwarz
Power Sensor	NRP-Z211	P-468/469	Rohde & Schwarz
Power Sensor	URV5-Z2	P-373/374	Rohde & Schwarz
Ultra log antenna	HL 046	P-434	Rohde & Schwarz
Horn antenna	HF 907	P-447	Rohde & Schwarz
Test Stand:	Power frequency magnetic fields		
Magnetic field generator	1008	P-326	PMM

## 9 Measurement instrumentation uncertainties

Type of disturbance test method	Used test equipment (only main instruments, no details)	Calculated uncertainty	$U_{\text{CISPR}}$
Disturbance voltage Mains terminals 9 kHz ... 150 kHz 150 kHz ... 30 MHz	EMI Test Receiver Artificial Mains Network	3.6 dB	4.0 dB 3.6 dB
Electric field strength Horiz. 30 MHz ... 200 MHz Horiz. 200 MHz ... 1000 MHz Vert. 30 MHz ... 130 MHz Vert. 130 MHz ... 200 MHz Vert. 200 MHz ... 1000 MHz	EMI Test Receiver Antenna	Horiz. 30 MHz ... 200 MHz 4.9 dB Horiz. 200 MHz ... 300 MHz 5.2 dB Vert. 30 MHz ... 200 MHz 5.1 dB Vert. 30 MHz ... 200 MHz 5.2 dB Vert. 200 MHz ... 300 MHz 5.2 dB	5.2 dB

10 Annex

10.1 Annex A:

Critical components information			
Object	Manufacturer/ Trademark	Type/Model	Remark
Power supply	OSRAM OPTOTRONIC	OT 75/170-240/1A0 4DIMLT2 G2 CE	See page 65

See Technical documentation and photos Annex B.

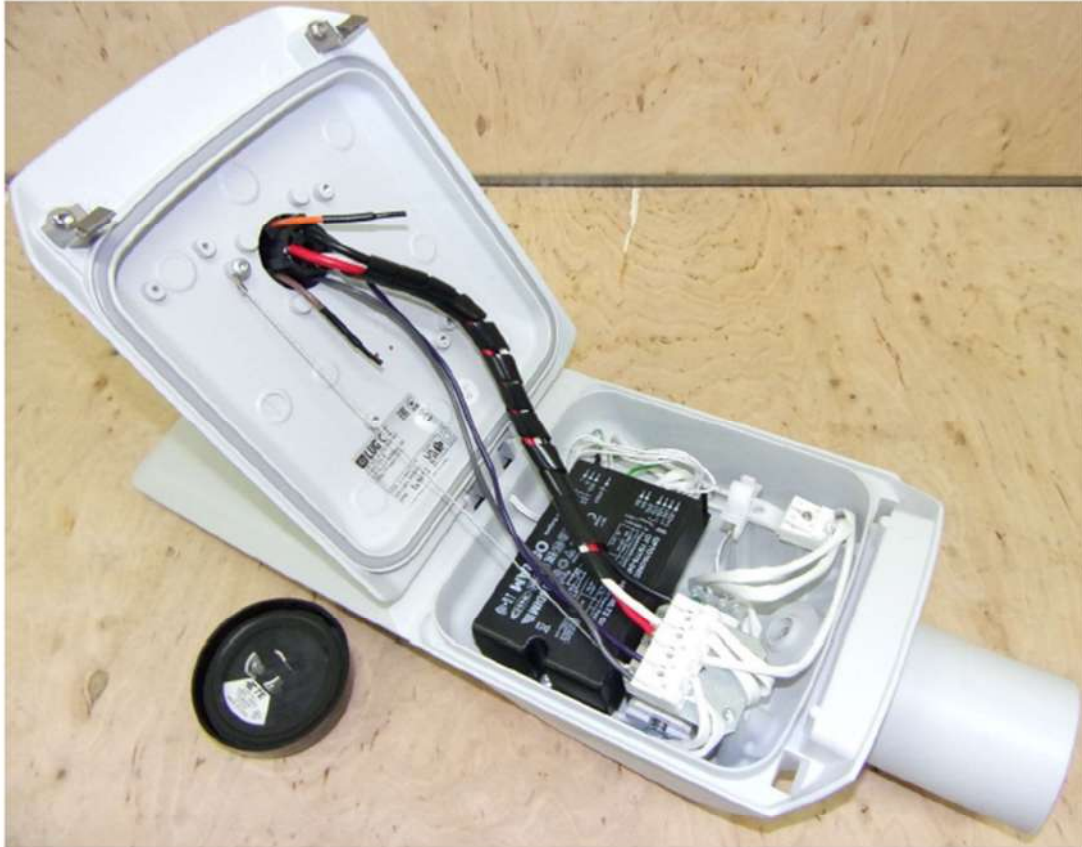
10.2 Annex B:

TABLE: Photography of the components	
Component/ Part No.	Photography





EUT



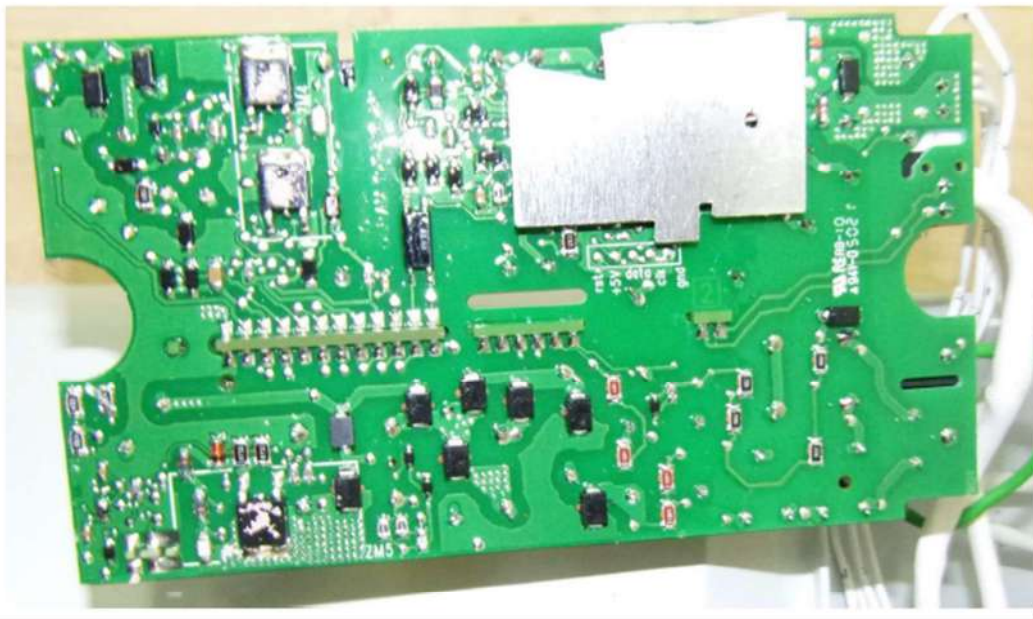
Surge protection



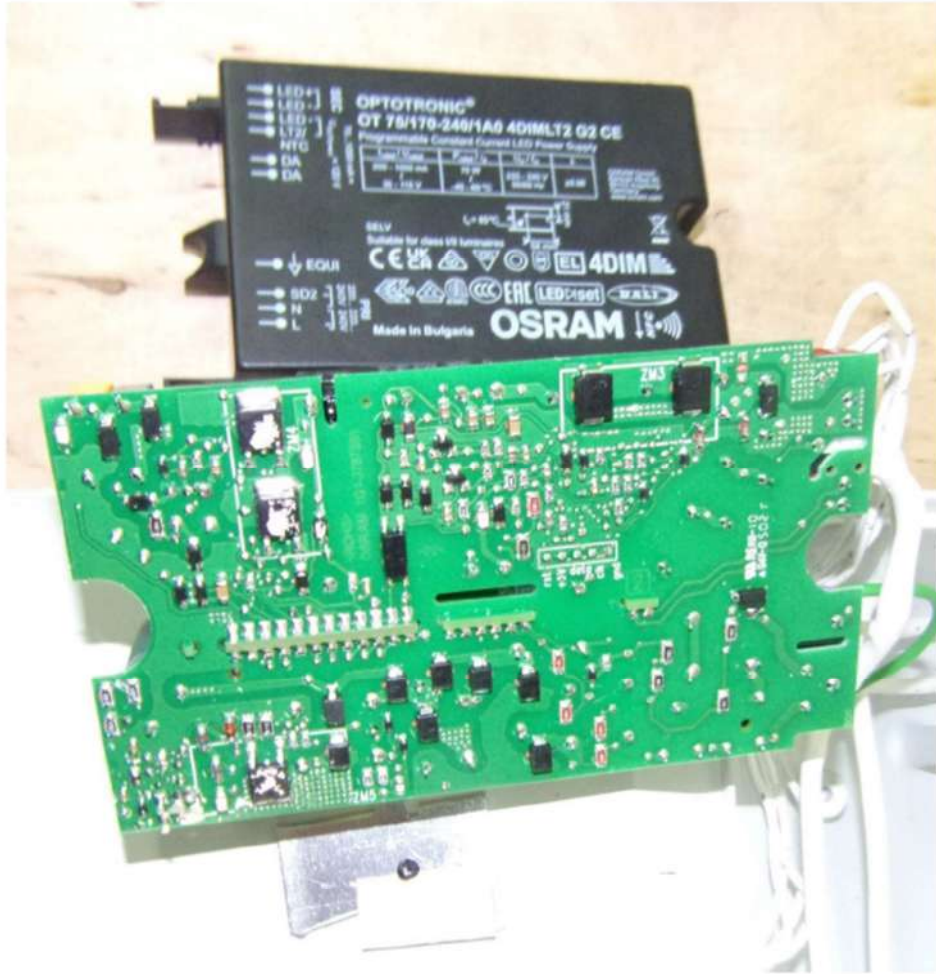




Power supply



Power supply





LED module



*End of the Report*