

SGS Germany GmbH

Test Report No.: H0FA0004

Order No.: H0FA

Pages: 58

Munich, Sep 08, 2014

Client: Deta-Elis Europa GmbH

Equipment Under Test: Wellness Devices DeVita:
 - DeVita AP Model Base;
 - DeVita RITM Model Base;
 - DeVita Cosmo

Manufacturer / Importer: Deta-Elis Europa GmbH

Task: Compliance with the requirements mentioned below:

Test Specification(s):
 [covered by accreditation]


- EN 55014-1:2006+ A1:2009 + A2:2011
- EN 55014-2:1997 + A1: 2001 + A2:2008
- EN 61000-3-2:2006 + A1:2009 + A2:2009
- EN 61000-3-3:2008

Result: The EUTs comply with the requirements of the test specifications. See details.

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The results relate only to the items tested as described in this test report.

edited by:	Date	Signature
Tchatchouang Qualification Engineer	Sep 08, 2014	

approved by:	Date	Signature
Bauer Lab Manager EMC	Sep 08, 2014	

This document was signed electronically.

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1 Result Summary

Classification of EUT acc. to EN 55014-2:

The EUT is classified as

Category I	<input type="checkbox"/>
Category II	<input type="checkbox"/>
Category III	<input type="checkbox"/>
Category IV	<input checked="" type="checkbox"/>

EUTs identification:

EUT1: DeVita AP Model Base
EUT2: DeVita RITM Model Base
EUT3: DeVita Cosmo

Standard: EN 55014-1

Clause	Item	Requirement – Test performed	Result	Verdict *
4.1.1	6.1	Continuous disturbance, Terminal voltages, Mains terminal Frequency range 148.5 kHz to 30 MHz	EUT 3: margin: 19.45 dB	P
4.1.1	6.1	Continuous disturbance, Terminal voltages, Load terminal Frequency range 148.5 kHz to 30 MHz	margin: xx dB	NA
4.1.2.1	6.2	Continuous disturbance, disturbance power, frequency range 30 MHz to 300 MHz	margin: xx dB	N/A
4.1.2.2	6.3	Continuous disturbance, Radiated disturbances, frequency range 30 MHz to 1 000 MHz	EUT 1: margin: 5.05 dB EUT 2: margin: 18.51 dB EUT 2: margin: 2.01 dB	P P P
4.2	6.4	Discontinuous disturbance (Clicks), Terminal Voltage Frequency range 148.5 kHz to 30 MHz	--	P

Standard: EN 61000-3-2

Clause	Item	Requirement – Test performed	Result	Verdict *
6.2	6.5	harmonic current emissions	EUT 3: margin: - 97.6 %	P

Standard: EN 61000-3-3

Clause	Item	Requirement – Test performed	Result	Verdict *
4	6.7	Voltage changes, voltage fluctuations and flicker	EUT 3: --	P

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Standard: EN 55014-2

Clause	Item	Requirement – Test performed	Result	Verdict*
5.1	0	Electrostatic discharge	Criterion B fulfilled	EUT 1: P EUT 2: P EUT 3: P ⁽¹⁾
5.2	6.9	Fast transients	Criterion B fulfilled	P
5.3	0	Injected currents, 0.15 to 230 MHz	Criterion A fulfilled	N/A
5.4	0	Injected currents, 0.15 to 80 MHz	Criterion A fulfilled	P
5.5	6.12	Radio frequency electromagnetic fields, 80 MHz to 1000 MHz	Criterion A fulfilled	EUT 1: P EUT 2: P EUT 3: P
5.6	6.13	Surges	Criterion B fulfilled	EUT 3: P
5.7	6.14	Voltage dips and interruptions	Criterion C fulfilled	EUT 3: P

(1) The ESD Test was performed on the EUT2; DeVita Cosmo, SN 0000000004.

- * P (Pass): test object does meet the requirement
- F (Fail): test object does not meet the requirement
- N/A: test case does not apply to the test object

2 References

2.1 Specification(s)

- [1] EN 55014-1:2006 + A1:2009 + A2:2011
Electromagnetic compatibility -
Requirements for household appliances,
electric tools and similar apparatus -
Part 1: Emission -Product family standard
- [2] EN 55014-2:1997 + A1: 2001 + A2:2008
Electromagnetic compatibility -
Requirements for household appliances,
electric tools and similar apparatus -
Part 2: Immunity -Product family standard
- [3] EN 61000-3-2:2006 + A1:2009 + A2:2009
Electromagnetic compatibility (EMC)
Limits for harmonic current emission
(equipment input current up to and including 16 A per phase)
(Harmonized Standard EMCD)
- [4] EN 61000-3-3:2008
Electromagnetic compatibility (EMC)
Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker
in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase
and not subject to conditional connection

2.2 Glossary

AM	Amplitude Modulation
AMN	Artificial Mains Network
CE	CE-Conformity requirement
EFT	Electrical Fast Transient
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EN	European Standard
ESD	Electro Static Discharge
EUT	Equipment Under Test
LISN	Line Impedance Stabilization Network
LtG	Line to Ground coupling
LtL	Line to Line coupling
N/A	not applicable

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3 General Information

3.1 Identification of Client

Deta-Elis Europa GmbH
Justus-Liebig-Str.2-4
36093 Künzell

3.2 Test Laboratory

SGS Germany GmbH
Hofmannstraße 50
81379 München

3.3 Time Schedule

Delivery of EUT: Jul 15, 2014
Start of test: Jul 24, 2014
End of test: Aug 11, 2014

3.4 Participants

Name	Function	Phone	E-Mail
Chibiy Tchatchouang	Accredited testing, Editor	+49 89 787475-465	Chibiy.tchatchouang@sgs.com
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3.5 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 20 - 30 °C
Humidity: 30 - 60 %

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4 Equipment Under Test

4.1 DeVita AP Model Base

Test item description: DeVita AP Model Base
Trade Mark: DETA-ELIS (combined Trade Mark)
Manufacturer / Importer: Deta-Elis Europa GmbH
Model/Type: DeVita AP Model Base
Number of tested samples.: 1
Serial Number(s): 0000000001
Ratings.....:

- 2 x AA batteries 1.5V
- 2 x Ni-Mn Aa batteries (min capacity 900 mAh) 1.2V

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Figure 4-1: DeVita AP Model Base

4.1.1 EUT operation mode:

Normal operation

4.1.2 Power supply system utilised

Voltage:

- 2 x AA batteries 1.5V
- 2 x Ni-Mn Aa batteries (min capacity 900 mAh) 1.2V

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4.2 DeVita RITM Model Base

Test item description: DeVita RITM Model Base
Trade Mark: DETA-ELIS (combined Trade Mark)
Manufacturer / Importer: Deta-Elis Europa GmbH
Model/Type: DeVita RITM Model Base
Number of tested samples.: 1
Serial Number(s): 0000000001
Ratings.....: - 2 x AA batteries 1.5V
 - 2 x Ni-Mn Aa batteries (min capacity 900 mAh) 1.2V

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Figure 4-2: DeVita Ritm Model Base

4.2.1 EUT operation mode:

Normal operation

4.2.2 Power supply system utilised

- 2 x AA batteries 1.5V
- 2 x Ni-Mn Aa batteries (min capacity 900 mAh) 1.2V

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Figure 4-4: DeVita Cosmo EUT2

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4.3.1 EUT operation mode:

- Normal operation

Operation mode 1: AC/DC Network Adapter

Operation mode 2: Battery

4.3.2 Power supply system utilised

- 2 x AA batteries 1.5V
- 2 x Ni-Mn Aa batteries (min capacity 900 mAh) 1.2V
- AC/DC Network adapter 1: Robiton IB12-500S
Input: 100 – 240 V AC , 50/60 Hz, 138mA
Output: 12 V DC, 500 mA, 6 W



Figure 4-5: Network adapter 1: Robiton IB12-500S

- AC/DC Network adapter 2: Mean Well GPSU15E-3I
Input: 100 – 240 V AC, 50/60 Hz, 500mA
Output: 12 V DC, 1.25 A, 15 W



Figure 4-6: Network adapter 2: Mean Well GPSU15E-3

4.3.3 EUT configuration

The following peripheral devices and interface cables were connected during the measurement :

<input checked="" type="checkbox"/>	Remote quantum attachment	Model:	
<input checked="" type="checkbox"/>	Customer specific cables		

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Figure 4-7: Remote quantum attachment

4.4 EUT Specific Performance Criteria

Criterion A:

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed.

Criterion B:

The apparatus shall continue to operate as intended after the test. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed.

Criterion C:

Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

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5 Test Equipment

5.1 Test Facility

The EMC-tests are carried out in the EMC-laboratory of SGS Germany, Consumer Testing Services, Hofmannstraße 50, 81379 München, Germany.

Chamber	1	2	3	4 / 5	6
Dimensions (net)	17.7 * 10.8 * 6.8m	9.6 * 8.5 * 5.3m	7.4 * 6.6 * 5.2m	4.1 * 3.5 * 3.5m	6.4 * 4.3 * 4.3m
Max. Door Exit (w x h)	2.9 * 3.86m	3.9 * 4.0m	2.0 * 2.7m	0.9 * 2.25m	1.8 * 3.0m
Shielding material	Sheet steel (Thickness:1.5mm on floor, 1.0mm on walls and ceiling)	Sheet steel	Sheet steel	Sheet steel	Sheet steel
Absorbers	Hybrid absorbers on walls and ceiling (TDK), length 1m	Hybrid absorbers on walls and ceiling (E+C), length 0.5m	Hybrid absorbers on walls and ceiling (E+C), length 0.3m	Without absorbers	Without absorbers
Floor	Metallic ground plane floor load: 12 t/m ²	Metallic ground plane floor load: 1.5 t/m ²	Metallic ground plane floor load: 1 t/m ²	Metallic ground plane	Metallic ground plane
Turntable	Ø 4m / 6t	Ø 3.2m / 1.5t	Ø 2.0m / 1t		
Listings	FCC-listed until Dec. 2014, Reg. No.: 90932 Industry Canada listed until June 2015 Reg. No. 9058A-1	FCC-listed until Dec. 2014, Reg. No.: 97242 Industry Canada listed until June 2015 Reg. No. 9058A-2 VCCI-listed until Oct. 2016, Reg. No. R-2623, G-266	FCC-listed until Dec. 2014, Reg. No.: 299569 Industry Canada listed until June 2015 Reg. No. 9058A-3		VCCI-listed until Oct. 2016, Reg. No. C-2866 & No. T-326
Specials	<p>Emission: 30 – 1000 MHz (d = 10 m)</p> <ul style="list-style-type: none"> - NSA acc. to: <ul style="list-style-type: none"> • EN 55022 / 2010 • CISPR 16-1-4 / 2008 • ANSI C63.4 / 2003 <p>1 – 18 GHz (d = 3 m)</p> <ul style="list-style-type: none"> - Site VSWR 1 – 18GHz acc. to CISPR 16-1-4 / 2008 <p>Immunity: Field uniformity 27 – 3000 MHz acc. EN 61000-4-3:2006</p>	<p>Emission: 30 – 1000 MHz (d = 3 m)</p> <ul style="list-style-type: none"> - NSA acc. to: <ul style="list-style-type: none"> • EN 55022 / 2010 • CISPR 16-1-4 / 2008 • ANSI C63.4 / 2003 <p>1 – 18 GHz (d = 3 m)</p> <ul style="list-style-type: none"> - Site VSWR 1 – 18GHz acc. to CISPR 16-1-4 / 2008 <p>Immunity: Field uniformity 80 – 3000 MHz acc. EN 61000-4-3:2006</p>	<p>Emission: 30 – 1000 MHz (d = 3 m)</p> <ul style="list-style-type: none"> - NSA acc. to: <ul style="list-style-type: none"> • EN 55022 / 2010 • CISPR 16-1-4 / 2008 • ANSI C63.4 / 2003 <p>1 – 18 GHz (d = 3 m)</p> <ul style="list-style-type: none"> - Site VSWR 1 – 18GHz acc. to CISPR 16-1-4 / 2008 <p>Immunity: Field uniformity 80 – 3000 MHz acc. EN 61000-4-3:2006</p>		

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5.2 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. As far as the underlying standards include requirements concerning the uncertainty of measuring instruments or measuring methods, they are met.

The expanded measurement uncertainty of the measuring chain was calculated for all tests according to the "ISO Guide to the expression of uncertainty in measurement (GUM)". The results are documented in an "internal controlled document" at QM archives.

The measuring accuracy for all measuring devices is given in their technical description. The measuring instruments, including any accessories, are calibrated respectively verified to ensure the necessary accuracy. Depending on the kind of measuring equipment it is checked within regular intervals or directly before the measurement. Adjustments are made and correction factors applied to measured data in accordance with the specifications of the specific instrument.

The expanded measurement instrumentation uncertainty of our Test Laboratory meets the requirements of IEC CISPR 16-4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" for all listed Tests and is documented in the quality system acc. to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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6 Test Conditions and Results

6.1 Continuous disturbance (terminal voltages) 148.5 kHz to 30 MHz

Table 1 – Terminal voltage limits for the frequency range 148,5 kHz to 30 MHz
 (see Figures 1 and 2)

HOUSEHOLD APPLIANCES AND EQUIPMENT CAUSING SIMILAR DISTURBANCES
 AND REGULATING CONTROLS INCORPORATING SEMICONDUCTOR DEVICES

Frequency range	At mains terminals		At load terminals and additional terminals	
	2	3	4	5
(MHz)	dB (μV) Quasi-peak	dB (μV) Average*	dB (μV) Quasi-peak	dB (μV) Average*
0,15 to 0,50	Decreasing linearly with the logarithm of the frequency from: 66 to 56		80	70
0,50 to 5	56	46	74	64
5 to 30	60	50	74	64

MAINS TERMINALS OF TOOLS

1	6	7	8	9	10	11
Frequency range	Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1 000 W		Rated motor power above 1 000 W	
(MHz)	dB (μV) Quasi-peak	dB (μV) Average*	dB (μV) Quasi-peak	dB (μV) Average*	dB (μV) Quasi-peak	dB (μV) Average*
0,15 to 0,35	Decreasing linearly with the logarithm of the frequency from:					
	66 to 59	59 to 49	70 to 63	63 to 53	76 to 69	69 to 59
0,35 to 5	59	49	63	53	69	59
5 to 30	64	54	68	58	74	64

* If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

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6.1.1 Mains Terminal Voltages

Test location: shielded room No. 4

Environmental Conditions

Temperature (°C): 23.7
Relative Humidity (%): 25.0

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1325	EMI receiver	ESPI-3	R&S	9 kHz - 3 GHz, with preselector	cal	Mar 13, 2013	Mar 31, 2015
P0320	EMI receiver, MZ4	ESCS30	R&S	9 kHz - 2.75 GHz	cal	Mar 12, 2014	Mar 31, 2016
P0439	LISN (integrated pulse limiter P0489)	ESH3-Z5	R&S	2 x 10 A; 50 Ohm	cal	Mar 10, 2014	Mar 31, 2016
P1318	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH	0 - 100%rF, -40 - 85°C	chk	May 07, 2014	May 31, 2015
P1812	multimeter, digital (MZ04)	METRAHIT2+	GMC-I Gossen-Metrawatt GmbH	60 mV...600V, 60mA...10A, 600Ohm...40MOhm, 0.1Hz...1kHz, -50,0 °C ...+400,0°C	cal	Jun 13, 2014	Jun 30, 2015
P0339	test chamber 4		Siemens	4.1 • 3.5 • 3.0 m; without absorbers	chk	Jan 16, 2014	Jan 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

Photo documentation of the test set-up:



Figure 6-1: test setup for Continuous disturbance (terminal voltages)

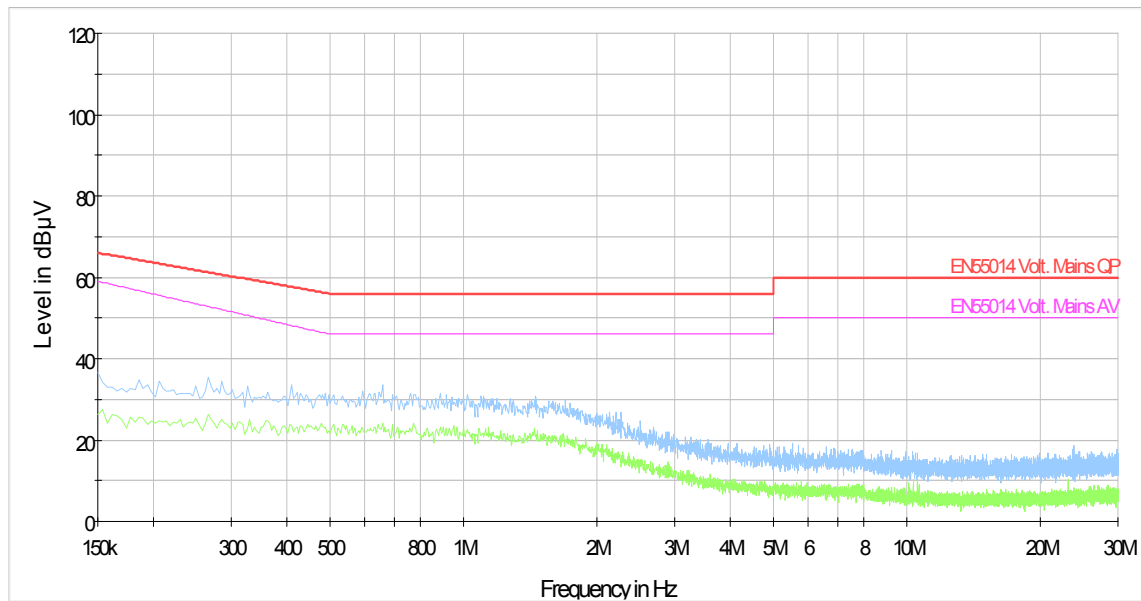
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Result:

Min. limit margin:	19.45 dB	verdict:	pass
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For detailed results, please see below.

Results in detail:	
Operation mode 1:	AC/DC Adapter (Program Nr. 2: Tones of face)
Remarks	None



— PreviewResult 2-AVG — PreviewResult 1-PK+ — EN65014 Volt. Mains QP
— EN65014 Volt. Mains AV ◆ Final_Result QPK ◆ Final_Result AVG

Figure 6-2: Graphical presentation Continuous disturbance (terminal voltages) Reference noise

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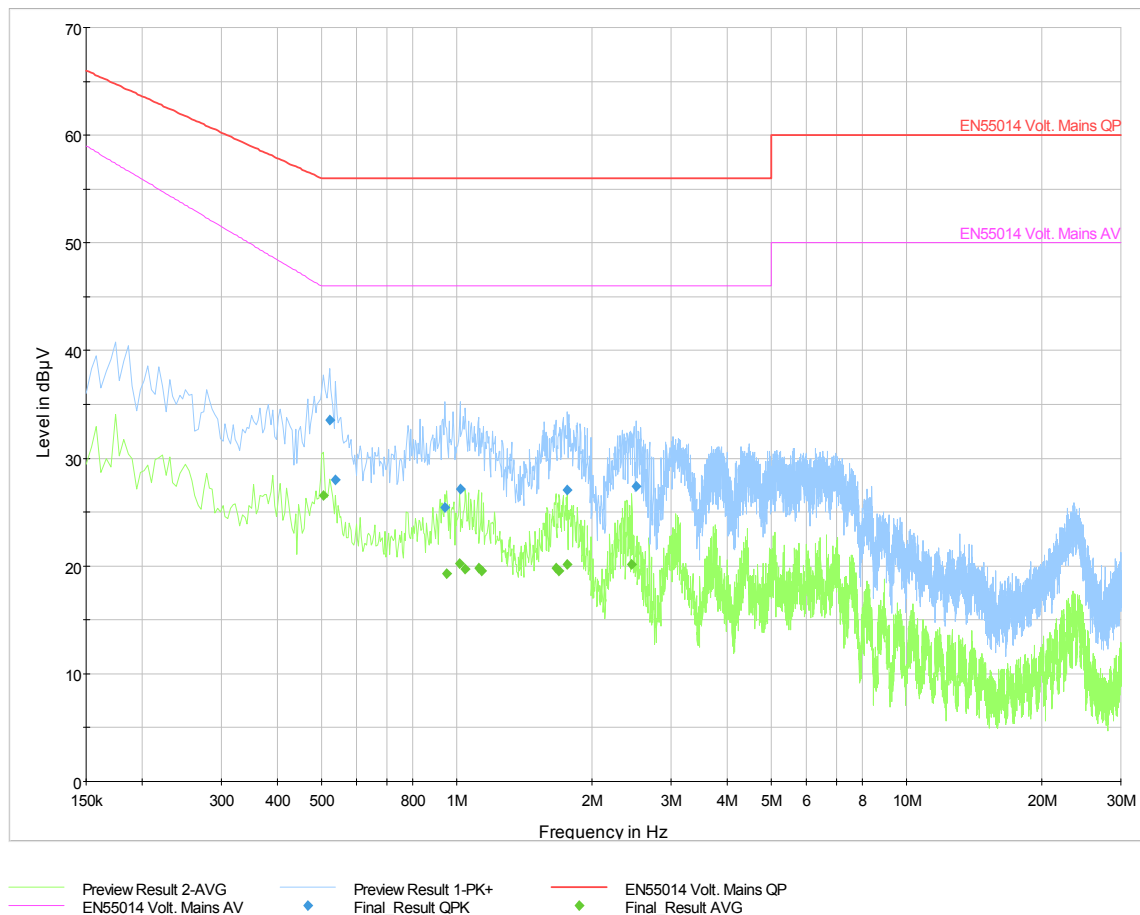


Figure 6-3: Graphical presentation Continuous disturbance (terminal voltages)

Result table:

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	PE	Corr. (dB)
0.506000	---	26.55	46.00	19.45	1000.0	9.000	N	GND	10.1
0.522000	33.59	---	56.00	22.41	1000.0	9.000	N	GND	10.1
0.538000	28.02	---	56.00	27.98	1000.0	9.000	N	GND	10.1
0.942000	25.40	---	56.00	30.60	1000.0	9.000	L1	GND	10.1
0.950000	---	19.31	46.00	26.69	1000.0	9.000	N	GND	10.1
1.014000	---	20.24	46.00	25.76	1000.0	9.000	N	GND	10.1
1.018000	27.11	---	56.00	28.89	1000.0	9.000	N	GND	10.1
1.046000	---	19.75	46.00	26.25	1000.0	9.000	L1	GND	10.1
1.118000	---	19.81	46.00	26.19	1000.0	9.000	N	GND	10.1
1.134000	---	19.59	46.00	26.41	1000.0	9.000	N	GND	10.1
1.662000	---	19.77	46.00	26.23	1000.0	9.000	N	GND	10.1
1.690000	---	19.59	46.00	26.41	1000.0	9.000	L1	GND	10.1
1.762000	---	20.16	46.00	25.84	1000.0	9.000	N	GND	10.1
1.762000	27.08	---	56.00	28.92	1000.0	9.000	N	GND	10.1
2.454000	---	20.15	46.00	25.85	1000.0	9.000	N	GND	10.2
2.506000	27.36	---	56.00	28.64	1000.0	9.000	L1	GND	10.2

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6.2 Disturbance power 30 MHz to 300 MHz

Table 2a – Disturbance power limits for the frequency range 30 MHz to 300 MHz

1	Household and similar appliances		Tools					
	2	3	4	5	6	7	8	9
Frequency range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1 000 W		Rated motor power above 1 000 W	
(MHz)	dB (pW) Quasi-peak	dB (pW) Average ^a	dB (pW) Quasi-peak	dB (pW) Average ^a	dB (pW) Quasi-peak	dB (pW) Average ^a	dB (pW) Quasi-peak	dB (pW) Average ^a
30 to 300	Increasing linearly with the frequency from:							
	45 to 55	35 to 45	45 to 55	35 to 45	49 to 59	39 to 49	55 to 65	45 to 55

The test is not applicable.

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6.3 Radiated disturbances 30 MHz to 1000 MHz

Selected Test	Antenna distance	Frequency range MHz	Limits dB(μ V/m) QP
<input type="checkbox"/>	10 m	30 to 230 230 to 1000	30 37
<input checked="" type="checkbox"/>	3 m	30 to 230 230 to 1000	40.5 47.5

Test location: semi anechoic chamber No. 2

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1327	EMI receiver	ESU40	R&S	20Hz - 40GHz, FFT-Scan, Preamplifier 100kHz - 40GHz, 30dB	cal	Mar 12, 2014	Mar 31, 2016
P1283	Mast	MA 4000	innco GmbH	1 - 4m, hor./vert.	cnn		
P1284	Controller	CO 2000	innco GmbH		cnn		
P0018	antenna	CBL6111	Chase	30 - 1000 MHz E	cal	Apr 01, 2014	Apr 30, 2017
P1316	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH	0 - 100%rF, -40 - 85°C	chk	May 07, 2014	May 31, 2015
P0337	test chamber 2		Siemens	11.0 • 10.0 • 6.0 m; 0.5 m pyramid absorbers + ferrite tiles	chk	Jan 16, 2014	Jan 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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6.3.1 Radiated disturbances 30 MHz to 1000 MHz – DeVita AP Model Base

Photo documentation of the test set-up:



Figure 6-4: test setup for Radiated disturbances 30 MHz to 1000 MHz

Result:

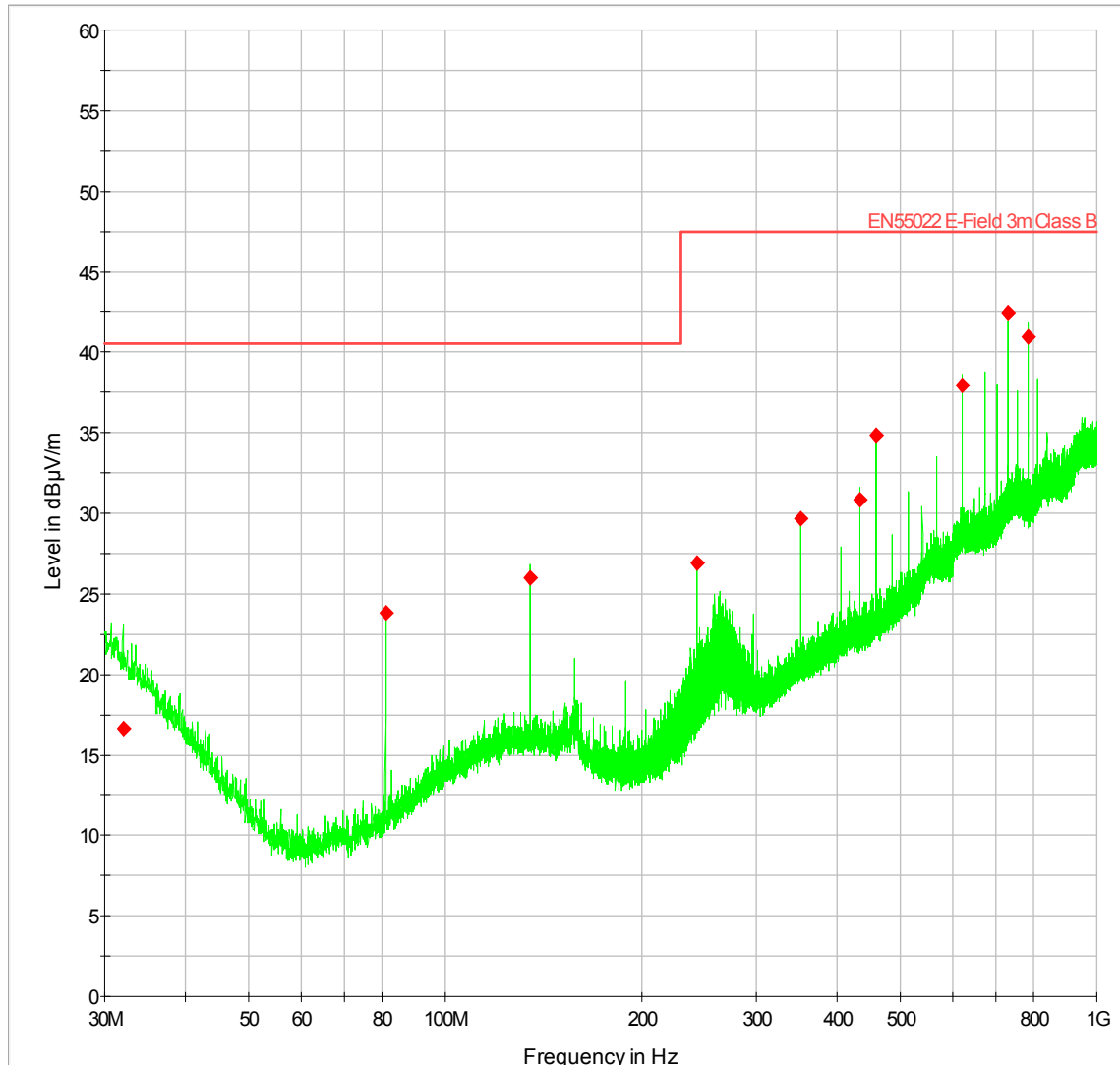
Min. limit margin:	5.05 dB	verdict:	pass
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For detailed results, please see the following page.

Results in detail:	
Operation mode:	normal operation
Remarks	Program No.1

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— Preview Result 1-PK+
 — EN55022 E-Field 3m Class B
 ◆ Final_Result QPK

Figure 6-5: Graphical presentation Radiated disturbances 30 MHz to 1000 MHz

Result table:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
32.000000	16.62	40.50	23.88	1000.0	277.0	H	276.0	18.6
81.000000	23.83	40.50	16.67	1000.0	235.0	H	21.0	9.0
135.000000	26.02	40.50	14.48	1000.0	177.0	H	8.0	13.4
243.000000	26.88	47.50	20.62	1000.0	107.0	H	198.0	13.4
351.000000	29.67	47.50	17.83	1000.0	170.0	V	247.0	16.7
432.000000	30.85	47.50	16.65	1000.0	205.0	H	311.0	18.7
459.000000	34.83	47.50	12.67	1000.0	192.0	H	155.0	19.3
621.000000	37.95	47.50	9.55	1000.0	281.0	H	201.0	22.7
729.000000	42.45	47.50	5.05	1000.0	114.0	H	337.0	24.9
782.960000	40.94	47.50	6.56	1000.0	106.0	H	183.0	24.6

6.3.2 Radiated disturbances 30 MHz to 1000 MHz – DeVita RITM Model Base

Photo documentation of the test set-up:

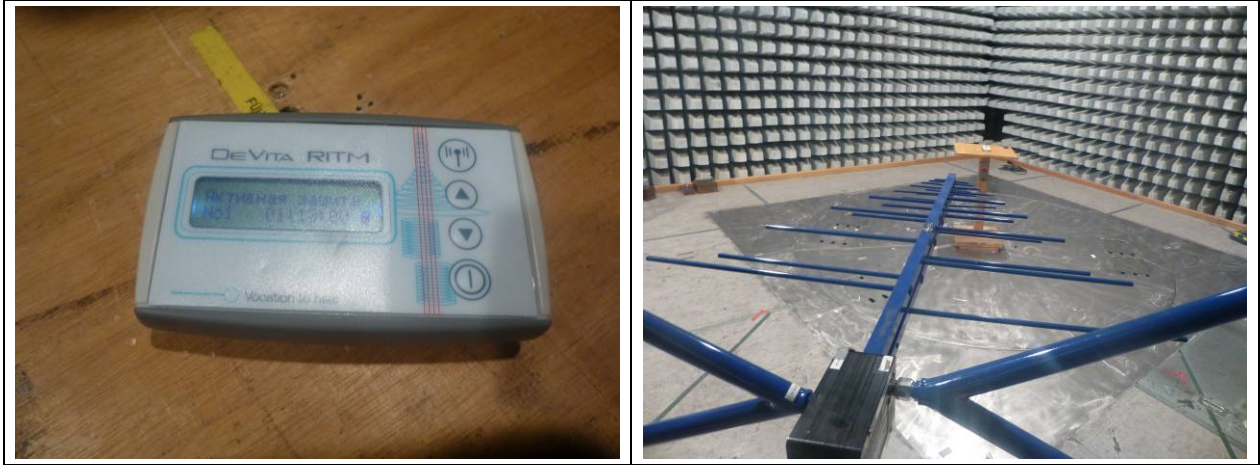


Figure 6-6: test setup for Radiated disturbances 30 MHz to 1000 MHz

Result:

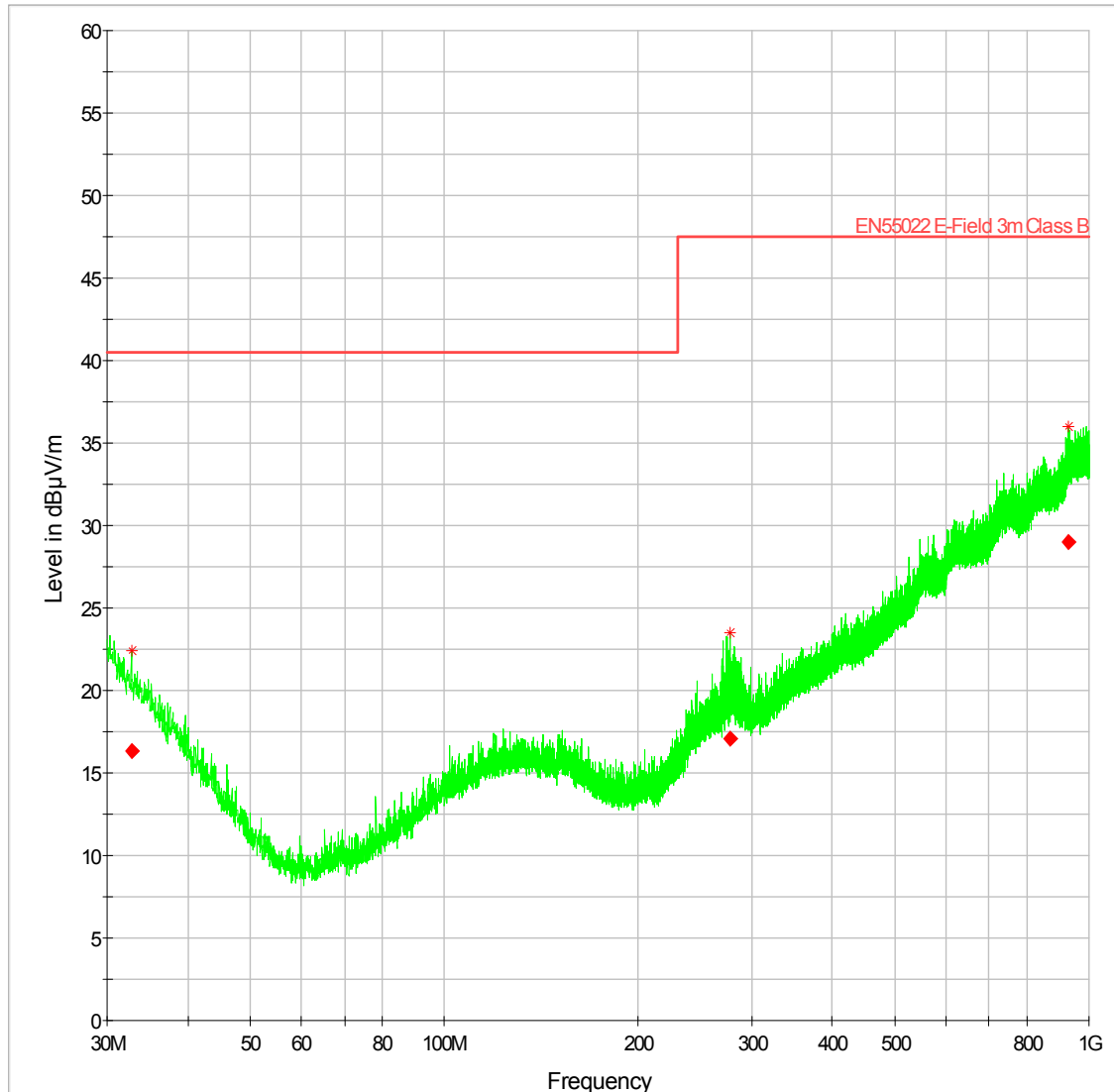
Min. limit margin:	18.51 dB	verdict:	pass
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For detailed results, please see the following page.

Results in detail:	
Operation mode:	normal operation
Remarks	Program No.1

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— PreviewResult 1-PK+
 * Critical_Freqs PK+
— EN55022 E-Field 3m Class B
◆ Final_Result QPK

Figure 6-7: Graphical presentation Radiated disturbances 30 MHz to 1000 MHz

Result table:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
32.720000	16.33	40.50	24.17	1000.0	113.0	H	300.0	18.2
277.920000	17.05	47.50	30.45	1000.0	122.0	H	204.0	14.4
929.280000	28.99	47.50	18.51	1000.0	178.0	V	178.0	27.4

6.3.3 Radiated disturbances 30 MHz to 1000 MHz – DeVita Cosmo

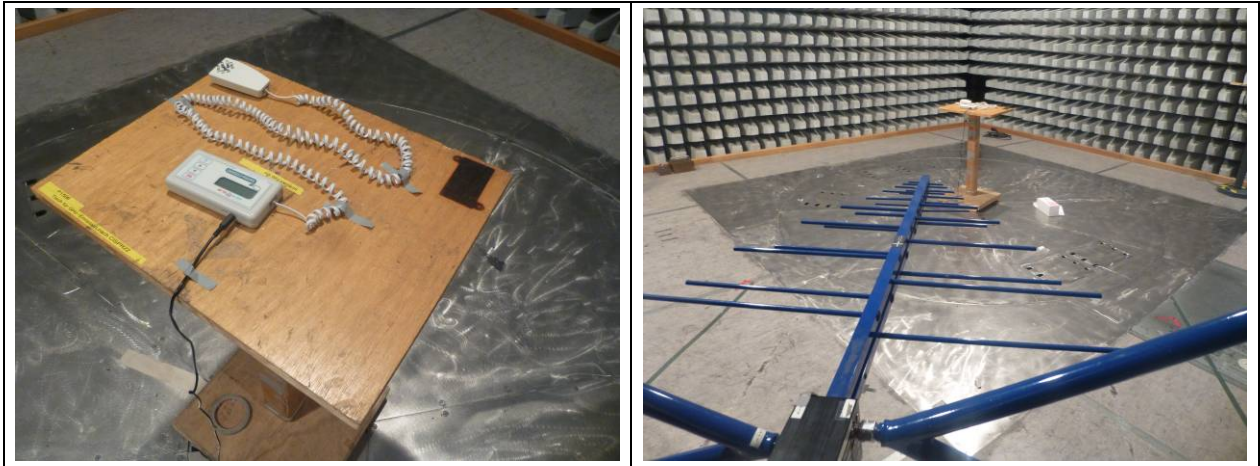


Figure 6-8: test setup for Radiated disturbances 30 MHz to 1000 MHz

Result:

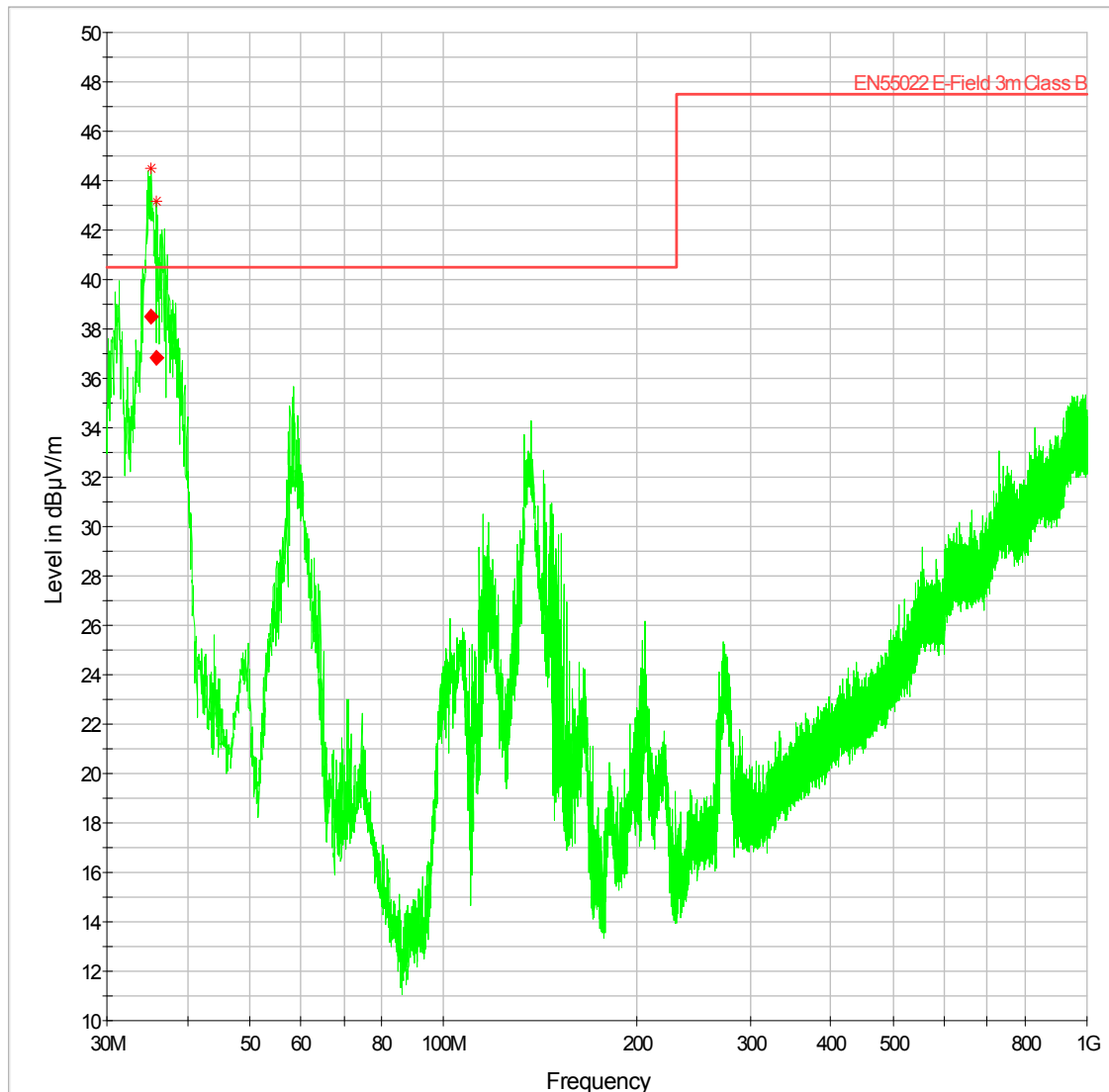
Min. limit margin:	2.01 dB	verdict:	pass
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For detailed results, please see the following page.

Results in detail:	
Operation mode:	normal operation
Remarks	Program No.1

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— PreviewResult 1-PK+
 * Critical_Freqs PK+
 — EN55022 E-Field 3m Class B
 ◆ Final_Result QPK

Figure 6-9: Graphical presentation Radiated disturbances 30 MHz to 1000 MHz

Result table:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
35.160000	38.49	40.50	2.01	1000.0	120.0	V	254.0	16.8
35.760000	36.83	40.50	3.67	1000.0	107.0	V	248.0	16.5

6.4 Discontinuous disturbance (Clicks) 148.5 kHz to 30 MHz (terminal voltages)

4.2.2.1 The limits of Table 1 apply also to discontinuous disturbances from all equipment which produce:

- a) disturbances other than clicks, or
- b) clicks with a click rate N equal to or greater than 30.

Appliances as described in 4.2.3 are exempted.

NOTE Examples of discontinuous disturbances for which the limits for continuous disturbance apply are shown in Figures 4a and 4b.

4.2.2.2 For discontinuous disturbance, the click limit L_q is attained by increasing the relevant limit L (as given in 4.1.1) with:

$$44 \text{ dB} \quad \text{for } N < 0,2, \text{ or}$$

$$20 \lg (30/N) \text{ dB} \quad \text{for } 0,2 \leq N < 30$$

Test location: shielded room No. 6

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1327	EMI receiver	ESU40	R&S	20Hz - 40GHz, FFT-Scan, Preamplifier 100kHz - 40GHz, 30dB	cal	Mar 12, 2014	Mar 31, 2016
P0439	LISN (integrated pulse limiter P0489)	ESH3-Z5	R&S	2 x 10 A; 50 Ohm	cal	Mar 10, 2014	Mar 31, 2016
P1812	multimeter, digital (MZ04)	METRAHIT2+	GMC-I Gossen-Metrawatt GmbH	60 mV...600V, 60mA...10A, 600Ohm...40MOhm, 0.1Hz...1kHz, -50,0 °C ...+400,0°C	cal	Jun 13, 2014	Jun 30, 2015
P1318	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH	0 - 100%rF, -40 - 85°C	chk	May 07, 2014	May 31, 2015
P0977	test chamber 6		Siemens	6.4 • 4.3 • 4.35 m; without absorbers	chk	Jan 16, 2014	Jan 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Photo documentation of the test set-up:



Figure 6-10: test setup for Discontinuous disturbance (Clicks)

Result:

verdict:	pass
----------	------

For detailed results, please see below.

Results in detail:	
Operation mode:	normal operation
Remarks	

Used frequencies [MHz]:		0.15	0.5
Limit [dB(μV)]:	66	66	56
Number of counted clicks, (short)	L1, N	0	0
Number of counted clicks, (long):		0	0
Total number of clicks (n1):		0	0
Duration over 200 ms:		0	0

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Click rate analysis at 150 kHz:

Print test report

Test report template

SGS	Mode Nr. 2		
Detavita Cosmo			
C. Tchatchouang	normal		
Clicks (< 10ms)	0	Frequency (kHz)	150
Clicks (10ms-20ms)	0	Duration (h:mm:ss)	0:05:00
Clicks (> 20ms)	0	Click Rate per Minute	0
Clicks > Lq (Number)	0	L (dBuV)	66
Clicks > Lq (Percent)	0	Lq (dBuV)	0
Continuous Disturbances	0	600 ms Rule used ? (See EN55014; 4.2.3.2 or CISPR16-1-1; E2 Page 125)	No
Overload Occured ?	No	Number of Refrigerator Rule Used (See EN55014; 4.2.3.4 or CISPR16-1-1; E4 Page 127)	0
Misrepresented due to Overload ?	No		

PASSED!

Print report Cancel

Click rate analysis at 500 kHz:

Print test report

Test report template

SGS	Mode Nr. 2		
Detavita Cosmo			
C. Tchatchouang	normal		
Clicks (< 10ms)	0	Frequency (kHz)	500
Clicks (10ms-20ms)	0	Duration (h:mm:ss)	0:05:00
Clicks (> 20ms)	0	Click Rate per Minute	0
Clicks > Lq (Number)	0	L (dBuV)	66
Clicks > Lq (Percent)	0	Lq (dBuV)	0
Continuous Disturbances	0	600 ms Rule used ? (See EN55014; 4.2.3.2 or CISPR16-1-1; E2 Page 125)	No
Overload Occured ?	No	Number of Refrigerator Rule Used (See EN55014; 4.2.3.4 or CISPR16-1-1; E4 Page 127)	0
Misrepresented due to Overload ?	No		

PASSED!

Print report Cancel

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6.5 Harmonic current emissions

Reference Standard: EN 61000-3-2

Parameters:

- Class A
- Observation Time 2.5 minutes

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1088	4-quadrant amplifier (L1)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1090	control unit	SyCore 1k4	SPIBE	4 phase, 1MByte RAM	cnn		
P1286	4-quadrant amplifier (L2)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1287	4-quadrant amplifier (L3)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1288	power supply		SPIBE	common power supply for all PAS 20000	cnn		
P1368	oscilloscope (SPIBE)	TDS 3034/C	Tektronix	300Mhz, 2.5GS/s, 4 channels, IEEE 488 Interface	cal	Mar 11, 2014	Mar 31, 2015
P1222	oscilloscope probe	P5100	Tektronix	100x, DC to 250 MHz, 2500V pk, 1000V	cal	Mar 12, 2014	Mar 31, 2015
P1809	multimeter, digital (MZ01)	METRAHIT2+	GMC-I Gossen-Metrawatt GmbH	60 mV...600V, 60mA...10A, 600Ohm...40MOhm, 0.1Hz...1kHz, -50,0 °C ...+400,0°C	cal	Jun 13, 2014	Jun 30, 2015
P1624	data logger temperature/humidity	Hydrolog-D-Set	rotronic messgeräte GmbH		chk	May 07, 2014	May 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Photo documentation of the test set-up:



Figure 6-11: test setup for harmonic current emissions

Result:

The test is passed. For detailed results, please see following page:

Name:	C. Tchatchouang	Serial no:	000000001
Department:	CTS Technik EMC	Operating modes:	mode Nr 2
Company:	SGS Germany GmbH	Comment1:	230 V / 50 Hz
Test report no:	H0FA0004	Comment2:	
Device:	DeVita Cosmo	Comment3:	--
Specimen:	230 V / 50 Hz	Comment4:	--
Manufacturer:	DETA-ELUS Europa GrmbH	Date:	08.08.2014
Type:		Test date:	08.08.2014

Maximum RMS current and corresponding values in timewindow 1:

Voltage:	231.15 Vrms	THD=0.03 %	THV=0.065 V	POHV=0.017 V	PWHD=0.06 %
Current:	0.011 Arms	0.067 Apk	THD=163.04 %	THC=0.010 A	POHC=0.006 A
Power:	0.7 W	P1=0.7 W	2.6 VA		PWHD=1186.82 %
Power factor:	0.274	CosPhi1:0.999			

Test conditions: EN 61000-3-2:2006 + A1:2009 + A2:2009, f=50 Hz, Phase=L1, Range=0.80 A

Time window=10/12 (200ms), Grouping (>2nd harm.)=on

No Ztest selected

harmonic cur. < 0.6 % of I or < 5 mA are NOT DISREGARD for calc. of THD, THC, POHC, PWHD

HARMONIC ANALYSIS: Test PASS

Tobs = entire measurement; POHC: avg=0.01 A, limits=0.25 A

lavg=0.010 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 A	Margin in Max/Min	100 to 150%	150 to 200%	Ex- ceeded	100 to 150%	Ex- ceeded	Value	Ex- ceeded		
DC	-0.0013 A	208	-	-	0	0	0	n.e.	n.e.	-0.0012 A	0	X	
1	0.0030 A	1	-	-	0	0	0	n.e.	n.e.	0.0027 A	0	X	
2	0.0002 A	513	1.0800 A	-100.0 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
3	0.0031 A	1	2.3000 A	-99.9 %	0	0	0	n.e.	n.e.	0.0027 A	0	X	
4	0.0002 A	523	0.4300 A	-100.0 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
5	0.0031 A	1	1.1400 A	-99.7 %	0	0	0	n.e.	n.e.	0.0027 A	0	X	
6	0.0002 A	528	0.3000 A	-99.9 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
7	0.0030 A	1	0.7700 A	-99.6 %	0	0	0	n.e.	n.e.	0.0027 A	0	X	
8	0.0002 A	550	0.2300 A	-99.9 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
9	0.0030 A	1	0.4000 A	-99.3 %	0	0	0	n.e.	n.e.	0.0026 A	0	X	
10	0.0002 A	550	0.1840 A	-99.9 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
11	0.0029 A	1	0.3300 A	-99.1 %	0	0	0	n.e.	n.e.	0.0026 A	0	X	
12	0.0002 A	528	0.1533 A	-99.9 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
13	0.0028 A	1	0.2100 A	-98.7 %	0	0	0	n.e.	n.e.	0.0025 A	0	X	
14	0.0002 A	530	0.1314 A	-99.9 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
15	0.0027 A	1	0.1500 A	-98.2 %	0	0	0	n.e.	n.e.	0.0024 A	0	X	
16	0.0002 A	530	0.1150 A	-99.8 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
17	0.0026 A	1	0.1324 A	-98.0 %	0	0	0	n.e.	n.e.	0.0023 A	0	X	
18	0.0002 A	528	0.1022 A	-99.8 %	0	0	0	n.e.	n.e.	0.0002 A	0	X	
19	0.0025 A	1	0.1184 A	-97.9 %	0	0	0	n.e.	n.e.	0.0023 A	0	X	
20	0.0002 A	545	0.0920 A	-99.8 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
21	0.0024 A	1	0.1071 A	-97.8 %	0	0	0	n.e.	n.e.	0.0022 A	0	X	
22	0.0002 A	538	0.0836 A	-99.8 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
23	0.0023 A	1	0.0978 A	-97.7 %	0	0	0	n.e.	n.e.	0.0021 A	0	X	
24	0.0002 A	535	0.0767 A	-99.8 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
25	0.0022 A	1	0.0900 A	-97.6 %	0	0	0	n.e.	n.e.	0.0019 A	0	X	
26	0.0002 A	533	0.0708 A	-99.8 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
27	0.0020 A	1	0.0833 A	-97.6 %	0	0	0	n.e.	n.e.	0.0018 A	0	X	
28	0.0002 A	528	0.0657 A	-99.8 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
29	0.0019 A	1	0.0776 A	-97.6 %	0	0	0	n.e.	n.e.	0.0017 A	0	X	
30	0.0001 A	530	0.0613 A	-99.8 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
31	0.0017 A	1	0.0726 A	-97.6 %	0	0	0	n.e.	n.e.	0.0016 A	0	X	
32	0.0001 A	530	0.0575 A	-99.8 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
33	0.0016 A	1	0.0682 A	-97.6 %	0	0	0	n.e.	n.e.	0.0015 A	0	X	
34	0.0001 A	538	0.0541 A	-99.7 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
35	0.0015 A	1	0.0643 A	-97.7 %	0	0	0	n.e.	n.e.	0.0014 A	0	X	
36	0.0001 A	548	0.0511 A	-99.7 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
37	0.0013 A	1	0.0608 A	-97.8 %	0	0	0	n.e.	n.e.	0.0012 A	0	X	
38	0.0001 A	535	0.0484 A	-99.7 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	
39	0.0012 A	1	0.0577 A	-97.9 %	0	0	0	n.e.	n.e.	0.0011 A	0	X	
40	0.0001 A	660	0.0460 A	-99.7 %	0	0	0	n.e.	n.e.	0.0001 A	0	X	

average value < 0.6 % of Iavg or < 5 mA

Tested with SPS EMC 3.0.2/PAS20000 by Spitzberger & Spies GmbH & Co. KG, Schmidstr. 32-36, 94234 Viechtach Germany, 08.08.2014

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6.6 Flicker

Reference Standard: EN 61000-3-3

Parameters:

- $P_{st} \leq 1.0$
- $P_{lt} \leq 0.65$
- $d(t) \leq 3.3\%$ for a time period longer than 500 ms.
- $d_c \leq 3.3\%$
- $d_{max} \leq 4\%$ (for relaxations see reference standard)

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1088	4-quadrant amplifier (L1)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1090	control unit	SyCore 1k4	SPIBE	4 phase, 1MByte RAM	cnn		
P1286	4-quadrant amplifier (L2)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1287	4-quadrant amplifier (L3)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1288	power supply		SPIBE	common power supply for all PAS 20000	cnn		
P1368	oscilloscope (SPIBE)	TDS 3034/C	Tektronix	300Mhz, 2.5GS/s, 4 channels, IEEE 488 Interface	cal	Mar 11, 2014	Mar 31, 2015
P1222	oscilloscope probe	P5100	Tektronix	100x, DC to 250 MHz, 2500V pk, 1000V	cal	Mar 12, 2014	Mar 31, 2015
P1809	multimeter, digital (MZ01)	METRAHIT2+	GMC-I Gossen-Metrawatt GmbH	60 mV...600V, 60mA...10A, 600Ohm...40MOhm, 0.1Hz...1kHz, -50,0 °C ...+400,0°C	cal	Jun 13, 2014	Jun 30, 2015
P1624	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH		chk	May 07, 2014	May 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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6.7 Voltage changes, voltage fluctuations and flicker

Reference Standard: EN 61000-3-3

Parameters:

- $P_{st} \leq 1.0$
- $P_{lt} \leq 0.65$
- $d(t) \leq 3.3\%$ for a time period longer than 500 ms.
- $d_c \leq 3.3\%$
- $d_{max} \leq 4\%$ (for relaxations see reference standard)

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1088	4-quadrant amplifier (L1)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1090	control unit	SyCore 1k4	SPIBE	4 phase, 1MByte RAM	cnn		
P1286	4-quadrant amplifier (L2)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1287	4-quadrant amplifier (L3)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1288	power supply		SPIBE	common power supply for all PAS 20000	cnn		
P1368	oscilloscope (SPIBE)	TDS 3034/C	Tektronix	300Mhz, 2.5GS/s, 4 channels, IEEE 488 Interface	cal	Mar 11, 2014	Mar 31, 2015
P1222	oscilloscope probe	P5100	Tektronix	100x, DC to 250 MHz, 2500V pk, 1000V	cal	Mar 12, 2014	Mar 31, 2015
P1809	multimeter, digital (MZ01)	METRAHIT2+	GMC-I Gossen-Metrawatt GmbH	60 mV...600V, 60mA...10A, 600Ohm...40MOhm, 0.1Hz...1kHz, -50,0 °C ...+400,0°C	cal	Jun 13, 2014	Jun 30, 2015
P1624	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH		chk	May 07, 2014	May 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Photo documentation of the test set-up:



Figure 6-12: test setup for harmonic current emissions

Result:

Name:	C. Tchatchouang	Serial no:	000000001
Department:	CTS Technik EMC	Operating modes:	Mode Nr 2
Company:	SGS Germany GmbH	Comment1:	230 V / 50 Hz
Test report no:	H0FA0004	Comment2:	
Device:	Devita Cosmo	Comment3:	--
Specimen:	230 V / 50 Hz	Comment4:	--
Manufacturer:	Deta-Elis Europa GmbH	Date:	08.08.2014
Type:		Test date:	08.08.2014

Test conditions: EN 61000-3-11:2000 / 230 V / 50 Hz / Phase L1 /
Obs 1 x 10 min / Ztest (0.400+j0.250) Ohm

FLICKER: Test PASS!

Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax[%]	dc [%]	PASS	FAIL
13:24:42	0.016	0.0910	- . - . - . - .	0.000	0.000	- . - . - . - .	X	
Limits:		1.000	0.650	0.500	4.000	3.300		
Plt: 0.039748 (calculated over 12 periods)							X	
Evaluated: PST, PLT, Sliding PLT, dc, dmax, d(t)								

FLICKER: Source test PASS!

Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax[%]	dc [%]	PASS	FAIL
13:24:42	0.016	0.0910	- . - . - . - .	0.000	0.000	- . - . - . - .	X	
Plt: 0.039748 (calculated over 12 periods)								
Evaluated: PST <= 0.4 dmax < 20 % dmax1								

Tested with SPS EMC 30.2 / PAS20000 by Spitzenberger & Spies GmbH & Co. KG, Schmiestr. 32-34, 94234 Viechtach, Germany, 08.08.2014

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6.8 Electrostatic discharge

Reference Standard: EN 61000-4-2

Test location: anechoic room No. 5

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P0983	ESD generator, basic unit	ESD3000	EMC Partner	up to 30 kV, contact & air, depending on discharge module	cal	Mar 12, 2013	Mar 31, 2015
P0984	ESD generator, discharge module	ESD3000DM1	EMC Partner	contact +/-10kV, air +/-16kV, 150pF/330Ohm, EN61000-4-2	cal	Mar 12, 2013	Mar 31, 2015
P0726	vertical coupling plane	VCP-1	Keytek	for Minizap	cnn		

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Test Specification:

Contact discharge voltage: $\pm 4\text{kV}$

Air discharge voltage: $\pm 8\text{kV}$

Number of discharges: 10 per voltage level and polarity

Type of discharge: Direct discharge Air discharge
 Contact discharge
 Indirect discharge Contact discharge

Discharge location:

- see photo documentation of the test set-up
- all external locations accessible by hand
- horizontal coupling planes (HCP)
- vertical coupling planes (VCP)

Result:

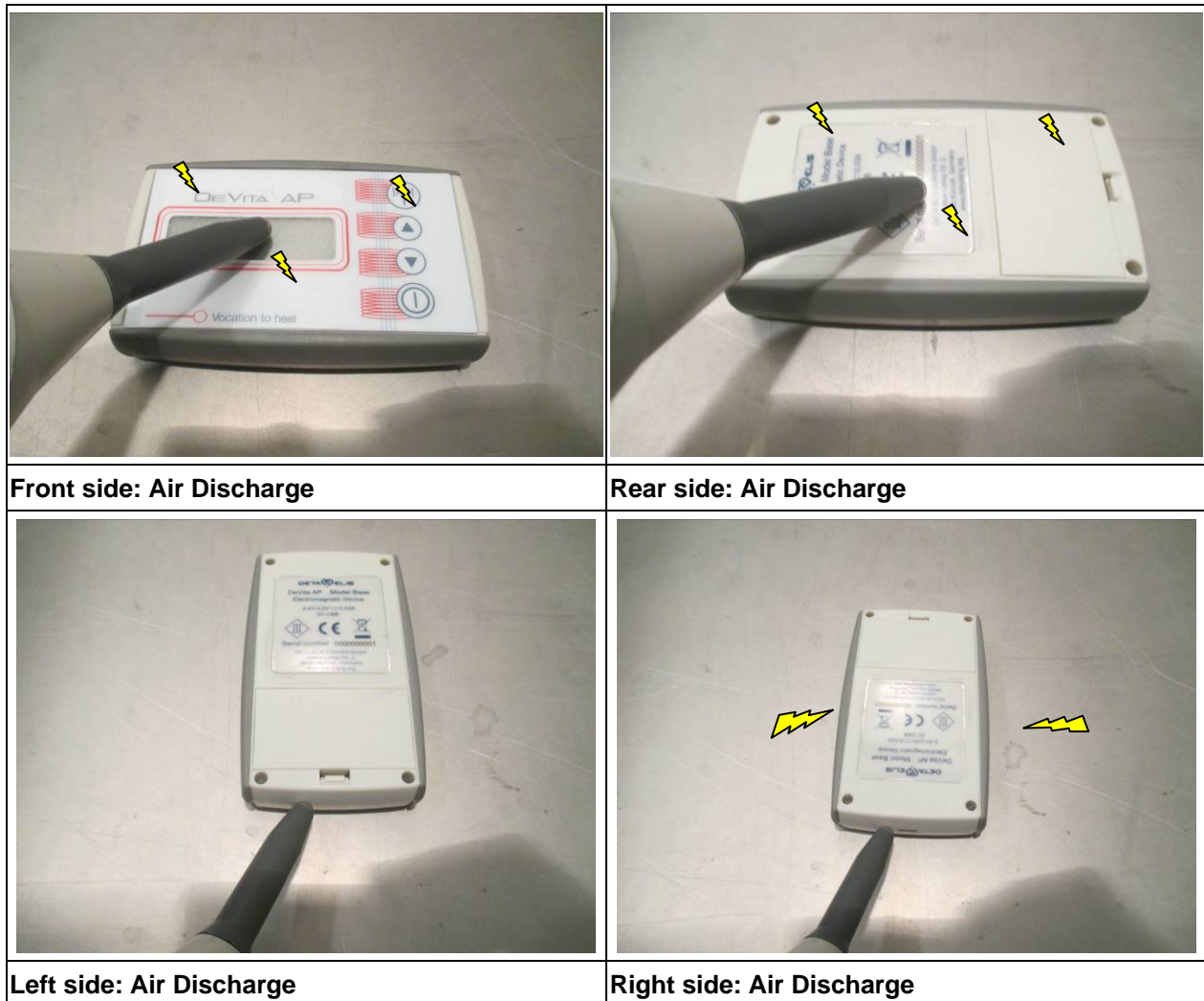
Criterion: B	verdict: pass
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For detailed results, please see the following page.

6.8.1 Electrostatic discharge – DeVita AP Model Base

6.8.1.1 ESD test points for direct coupling

Photo documentation of the test set-up:



Front side: Air Discharge

Rear side: Air Discharge

Left side: Air Discharge

Right side: Air Discharge

Figure 6-13: test setup for Electrostatic discharges and discharge points

Discharge point	Air	Test level (max ± 8 kV)	Observation	Verdict
See pictures	A	± 8 kV	None	pass

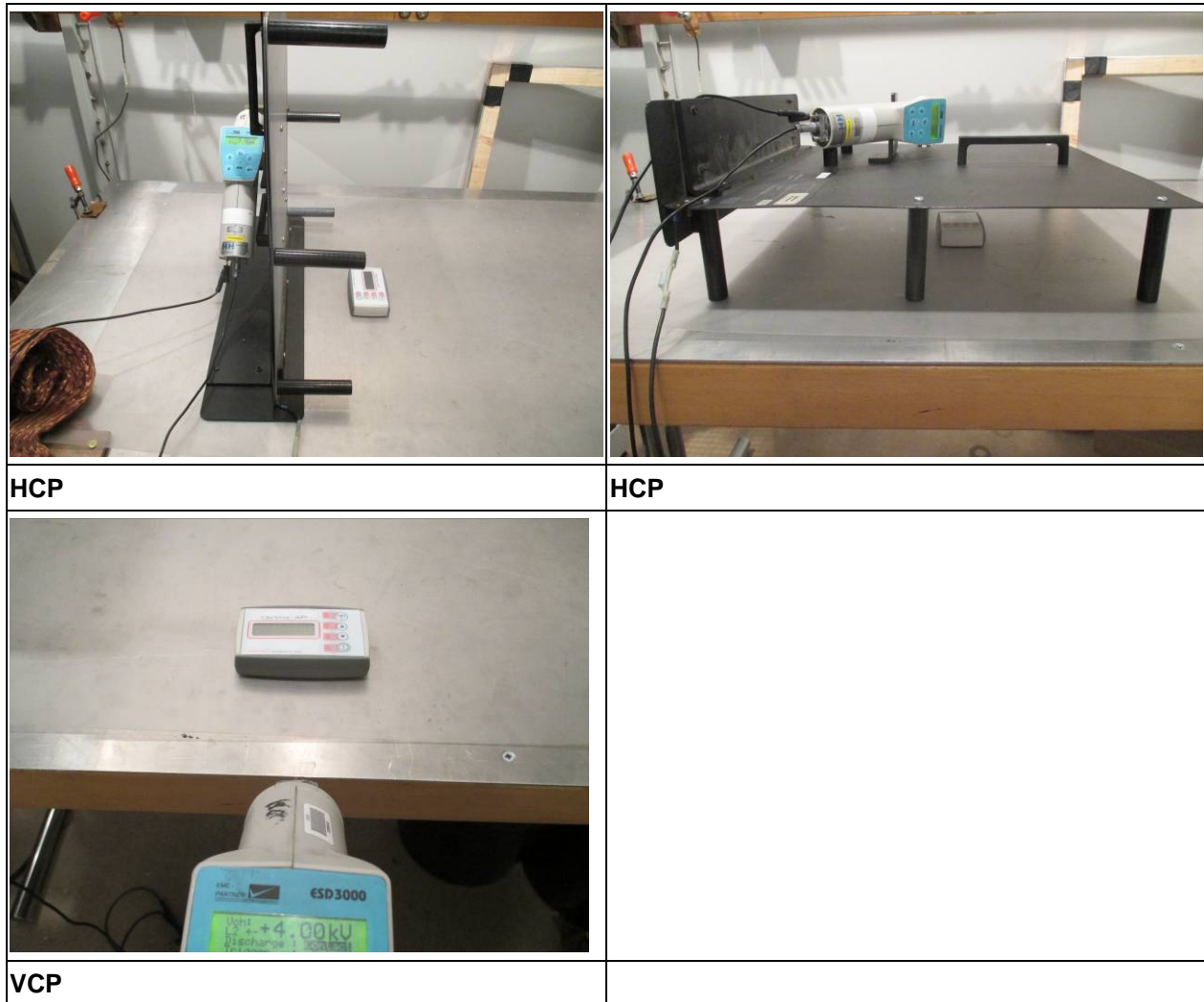
Results in detail:

Operation mode: normal operation

Remarks :

6.8.1.2 ESD test points for indirect coupling

Photo documentation of the test set-up:



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Figure 6-14: test setup for Electrostatic discharges

Result:

Position	Coupling plane	Test level	Observation	Verdict
Vertical	VCP	±4 kV	None	pass
Horizontal	HCP	±4 kV	None	pass

6.8.2 Electrostatic discharge – DeVita RITM Model Base

6.8.2.1 ESD test points for direct coupling

Photo documentation of the test set-up:

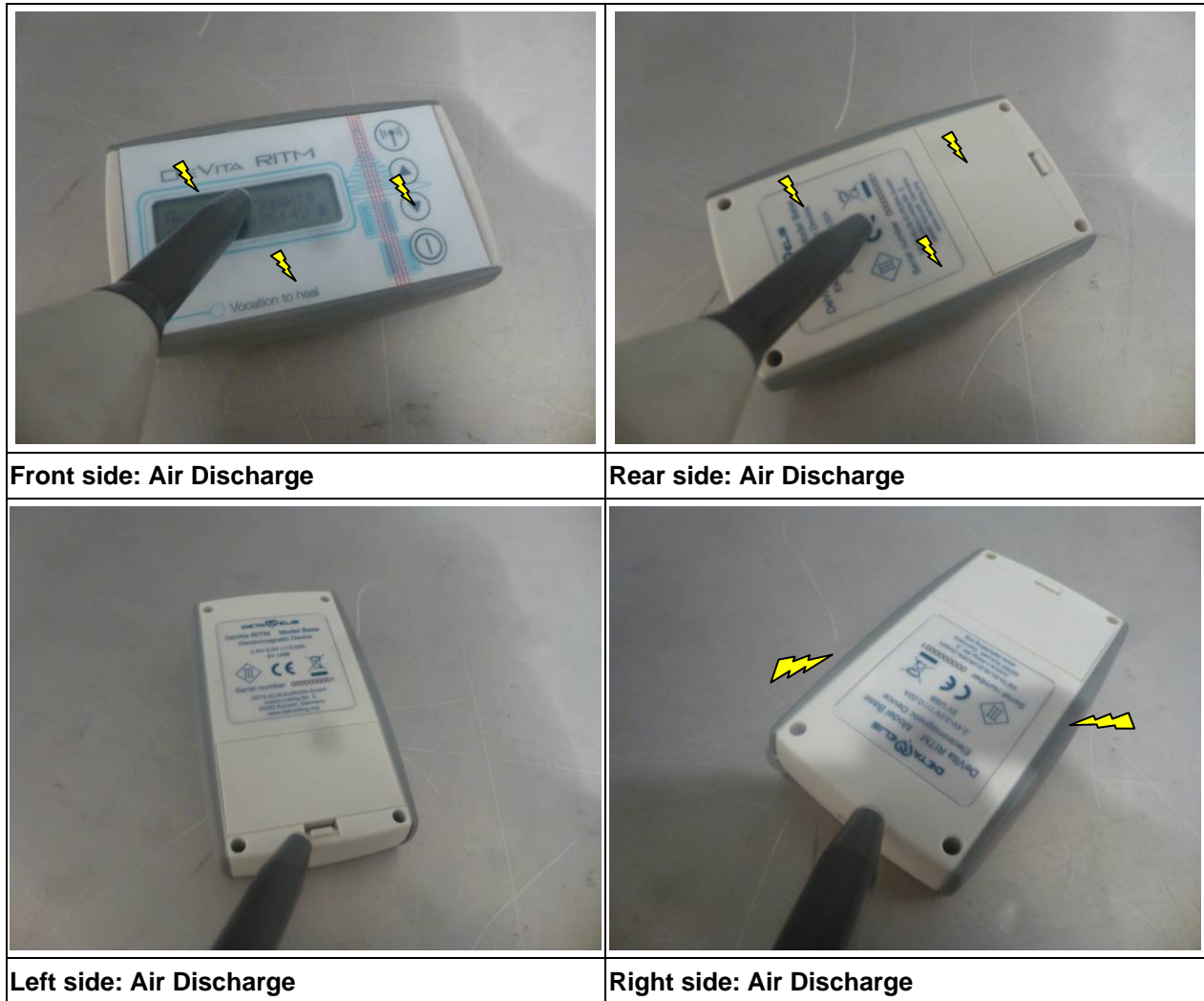


Figure 6-15: test setup for Electrostatic discharges and discharge points

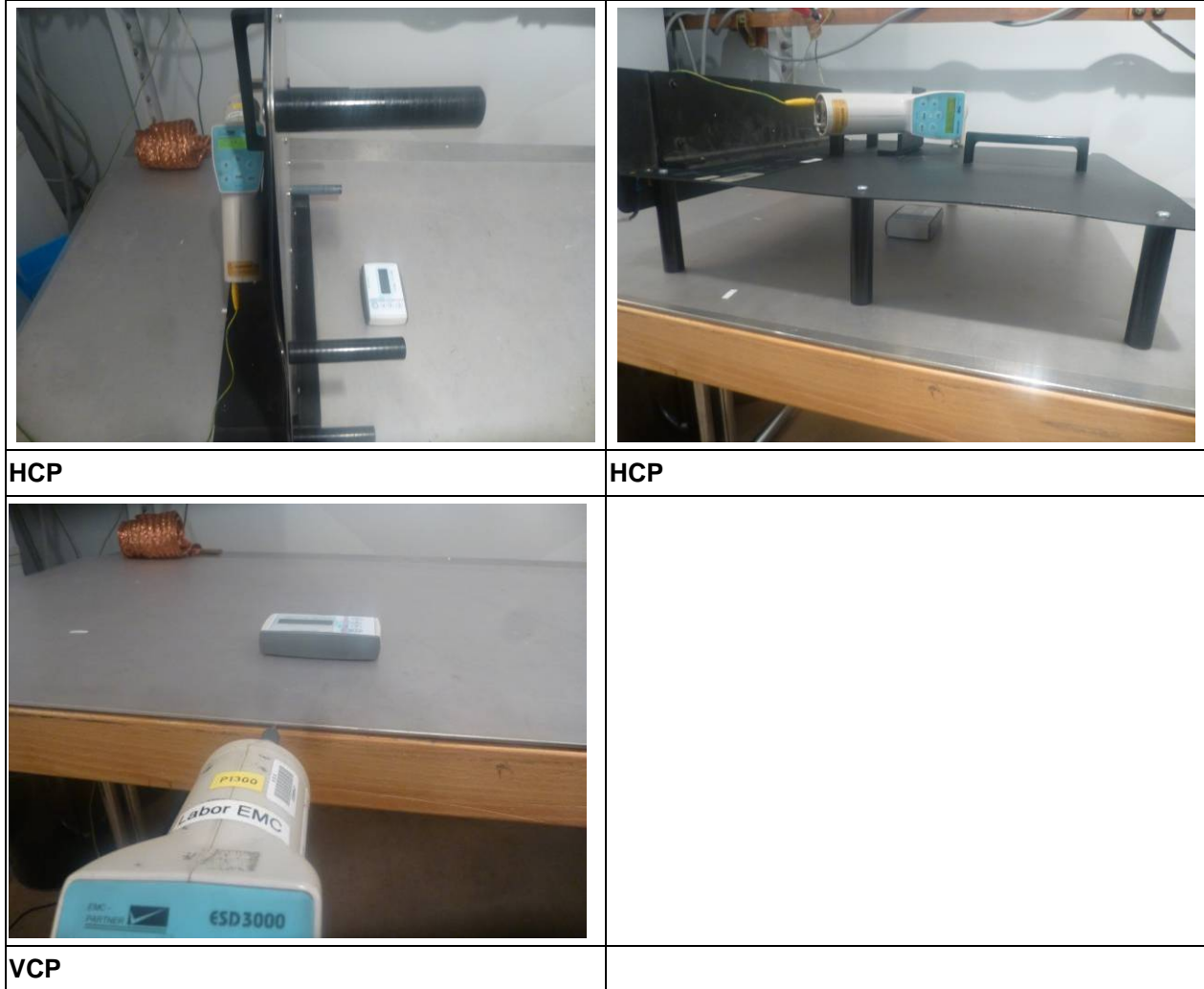
Discharge point	Air	Test level (max ±8 kV)	Observation	Verdict
See pictures	A	±8 kV	None	pass

Results in detail:	
Operation mode:	normal operation
Remarks	

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6.8.2.2 ESD test points for indirect coupling

Photo documentation of the test set-up:



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Figure 6-16: test setup for Electrostatic discharges

Result:

Position	Coupling plane	Test level	Observation	Verdict
Vertical	VCP	±4 kV	None	pass
Horizontal	HCP	±4 kV	None	pass

6.8.3 Electrostatic discharge – DeVita Cosmo

6.8.3.1 ESD test points for direct coupling

Photo documentation of the test set-up:

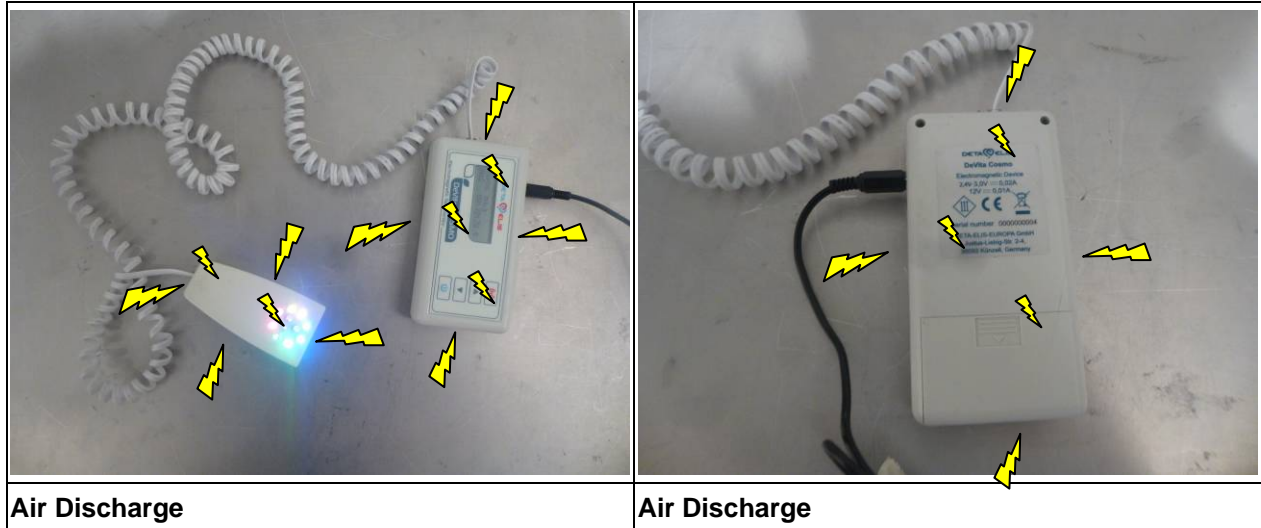


Figure 6-17: test setup for Electrostatic discharges and discharge points

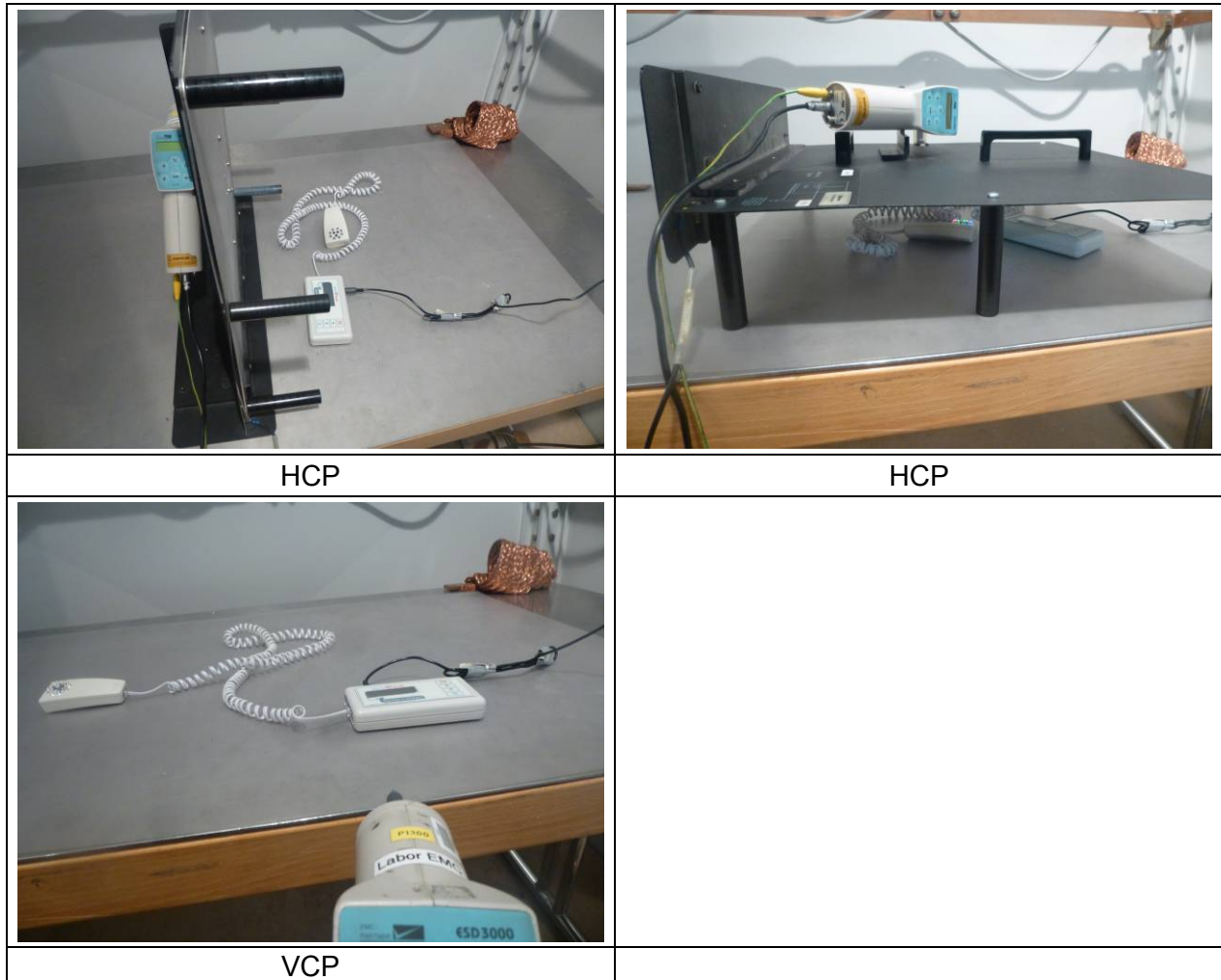
Discharge point	Air	Test level (max ±8 kV)	Observation	Verdict
See pictures	A	±8 kV	None	pass

Results in detail:	
Operation mode:	normal operation
Remarks	

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6.8.3.2 ESD test points for indirect coupling

Photo documentation of the test set-up:



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Figure 6-18: test setup for Electrostatic discharges

Result:

Position	Coupling plane	Test level	Observation	Verdict
Vertical	VCP	±4 kV	None	pass
Horizontal	HCP	±4 kV	None	pass

6.9 Fast Transients

Reference Standard: EN 61000-4-4

Tested line(s):

- AC 230 V

Parameters:

- Input and output a.c. power ports: ± 1 kV
- Input and output d.c. power ports: ± 0.5 kV
- Ports for signal lines and control lines: ± 0.5 kV
- 5/50ns
- 300ms
- 5kHz
- 120sec at each voltage & polarity
- Coupling with internal coupling network

Criterion: **B**

Test location: shielded room No. 4

Environmental Conditions

Temperature (°C): 26.3 – 26.9

Relative Humidity (%): 37.8 – 41.0

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P0592	burst generator	SFT 4000	Schloeder	230 V/16 A, 0.2 - 4.4kV, 0.1 - 500kHz Rep.	cal	Mar 12, 2013	Mar 31, 2016
P0593	burst coupling clamp	SFT410	Schloeder	cap. coupling clamp	chk	Feb 06, 2014	Feb 29, 2016
P1318	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH	0 - 100%rF, -40 - 85°C	chk	May 07, 2014	May 31, 2015
P1812	multimeter, digital (MZ04)	METRAHIT2+	GMC-I Gossen- Metrawatt GmbH	60 mV...600V, 60mA...10A, 600Ohm...40MOhm, 0.1Hz...1kHz, -50,0 °C ...+400,0°C	cal	Jun 13, 2014	Jun 30, 2015
P0977	test chamber 6		Siemens	6.4 • 4.3 • 4.35 m; without absorbers	chk	Jan 16, 2014	Jan 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Photo documentation of the test set-up:

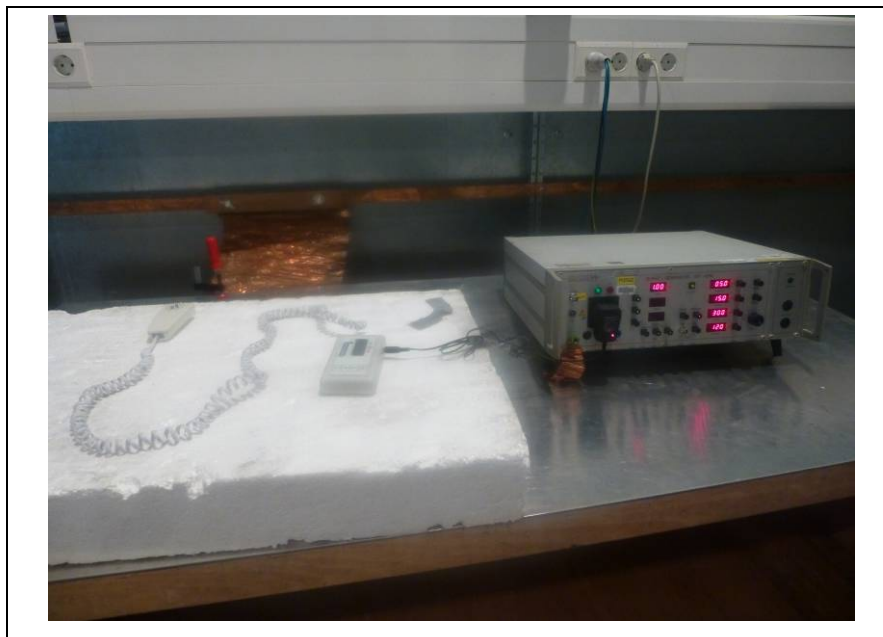


Figure 6-19: test setup for Fast Transients

Result:

Criterion:	B	verdict:	pass
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For detailed results, please see the following page:

Port / Cable	Test Voltage	Observation	Verdict
AC mains power port	±0.5 kV	None	pass
AC mains power port	±1.0 kV	None	pass

Results in detail:

Operation mode:	normal operation AC/DC Adapter (Program Nr. 2: Tones of face)
Remarks	

The EFT Test was performed on the EUT2; DeVita Cosmo, SN 0000000004.

The test report shall not be reproduced except in full without the written approval of the testing laboratory

6.10 Injected currents, 0.15 MHz to 230 MHz

Reference Standard: EN 61000-4-6

Parameters:

- Input and output a.c. power ports: 3 V_{r.m.s.}
- Input and output d.c. power ports: 1 V_{r.m.s.}
- Ports for signal lines and control lines: 1 V_{r.m.s.}
- 150 kHz – 230 MHz
- 80% AM @ 1kHz

Criterion: A

The test is not applicable

6.11 Injected currents, 0.15 MHz to 80 MHz

Reference Standard: EN 61000-4-6

Tested line(s):

- AC 230V

Parameters:

- Input and output a.c. power ports: 3 V_{r.m.s.}
- Input and output d.c. power ports: 1 V_{r.m.s.}
- Ports for signal lines and control lines: 1 V_{r.m.s.}
- 150 kHz – 80 MHz
- 80% AM @ 1kHz
- Coupling: CDN-M3

Criterion: A

Test location: shielded room No. 6

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1097	continuous wave simulator	CWS 500 A	EMTest	9kHz - 240MHz, 75W	cal	Jun 14, 2013	Jun 30, 2015
P0117	cdn	FCC-801-M3-16	FCC	Power Line 16 A	cal	Mar 12, 2013	Mar 31, 2015
P1413	attenuator 6dB	768-6	Narda	6dB; 20W; 0-11 GHz	chk	Apr 08, 2014	Apr 30, 2015
P0189	EM radiation meter	EMR20	W&G	100 kHz - 3 GHz, 800 V/m	cal	Jul 02, 2014	Jul 31, 2016
P1318	data logger temperature/humidity	Hydrolog-D-Set	rotronic messgeräte GmbH	0 - 100%rF, -40 - 85°C	chk	May 07, 2014	May 31, 2015
P0977	test chamber 6		Siemens	6.4 • 4.3 • 4.35 m; without absorbers	chk	Jan 16, 2014	Jan 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Photo documentation of the test set-up:



Figure 6-20: test setup for Injected currents, 0.15 MHz to 80 MHz

Result:

Criterion:	A	verdict:	pass
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For detailed results, please see below:

Results in detail:	
Operation mode:	normal operation AC/DC Adapter (Program Nr. 2: Tones of face)
Remarks	

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6.12 Radio frequency electromagnetic fields, 80 MHz to 1000 MHz

Reference Standard: EN 61000-4-3

Parameters:

- 80 – 1000 MHz
- $3^V/m$
- 80% AM @ 1kHz

Criterion: A

Test location: anechoic room No. 2

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P0261	power meter	NRVS	R&S	true RMS	chk	May 12, 2014	May 31, 2016
P0567	signal generator	SMR 20	R&S	10 MHz - 20 GHz	cal	Apr 04, 2012	Apr 30, 2015
P0289	power sensor	NRV-Z51	R&S	DC - 18 GHz, 1 μ W - 100mW	chk	Jun 10, 2014	Jun 30, 2015
P0495	RF coupler	3020A	Narda	50 - 1000 MHz; 20dB, 500W	chk	Nov 08, 2013	Nov 30, 2014
P1328	amplifier	500W1000A	AR	80 - 1000 MHz, 500W	cnn		
P0190	EM radiation meter	EMR-200	W&G	basic device	cal	Jun 17, 2014	Jun 30, 2016
P0206	EM radiation probe	Type 9.2	W&G	E - Field, 10 MHz - 18GHz	cal	Jun 17, 2014	Jun 30, 2016
P0033	antenna L (MZ2)	3140	Emco	26 - 2000 MHz, 750W max.	cnn		
P0337	test chamber 2		Siemens	11.0 • 10.0 • 6.0 m; 0.5 m pyramid absorbers + ferrite tiles	chk	Jan 16, 2014	Jan 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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6.12.1 Radio frequency electromagnetic fields – DeVita AP Model Base

Photo documentation of the test set-up:

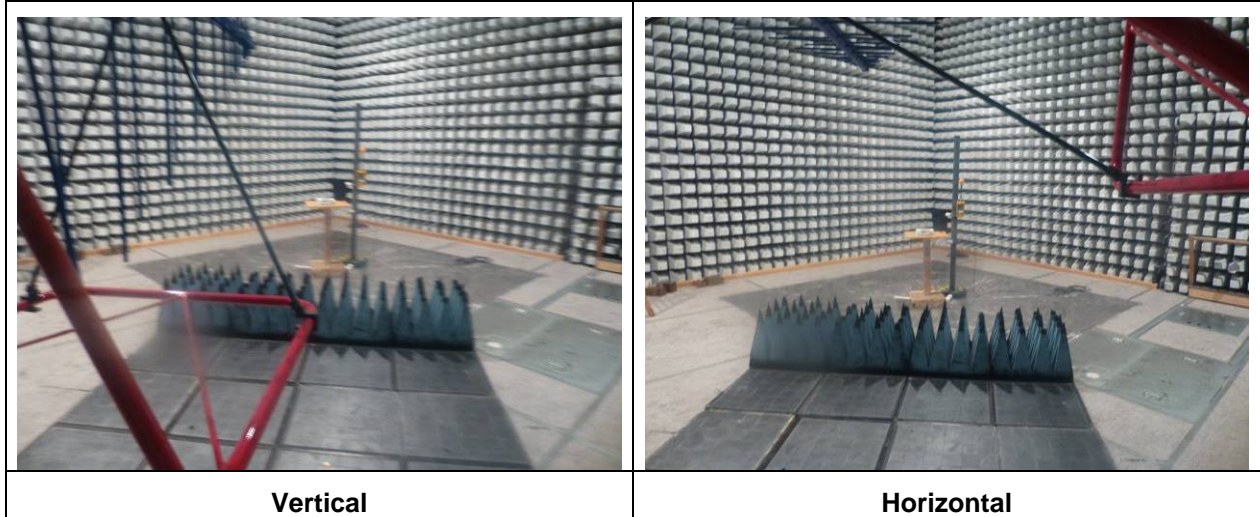


Figure 6-21: test setup for radio frequency electromagnetic fields 80 MHz to 1000 MHz

Result:

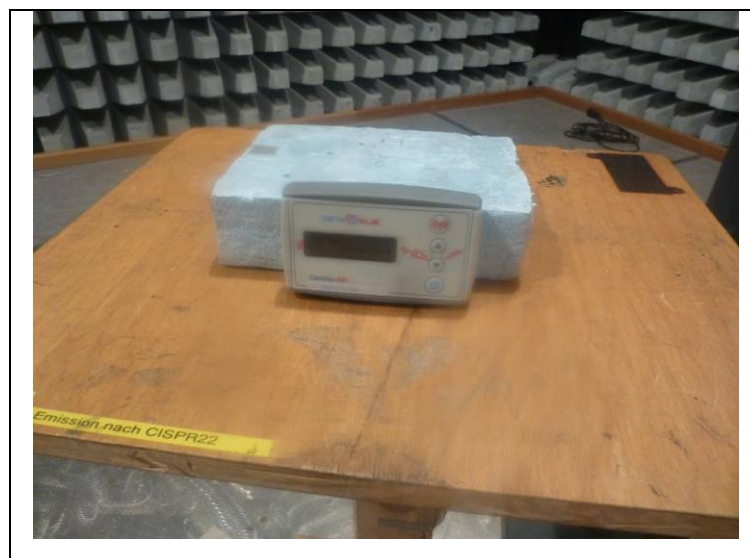
Criterion:	A	verdict:	pass
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Results in detail:

Operation mode: normal operation

Remarks

Monitoring:



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6.12.2 Radio frequency electromagnetic fields – DeVita RITM Model Base

Photo documentation of the test set-up:

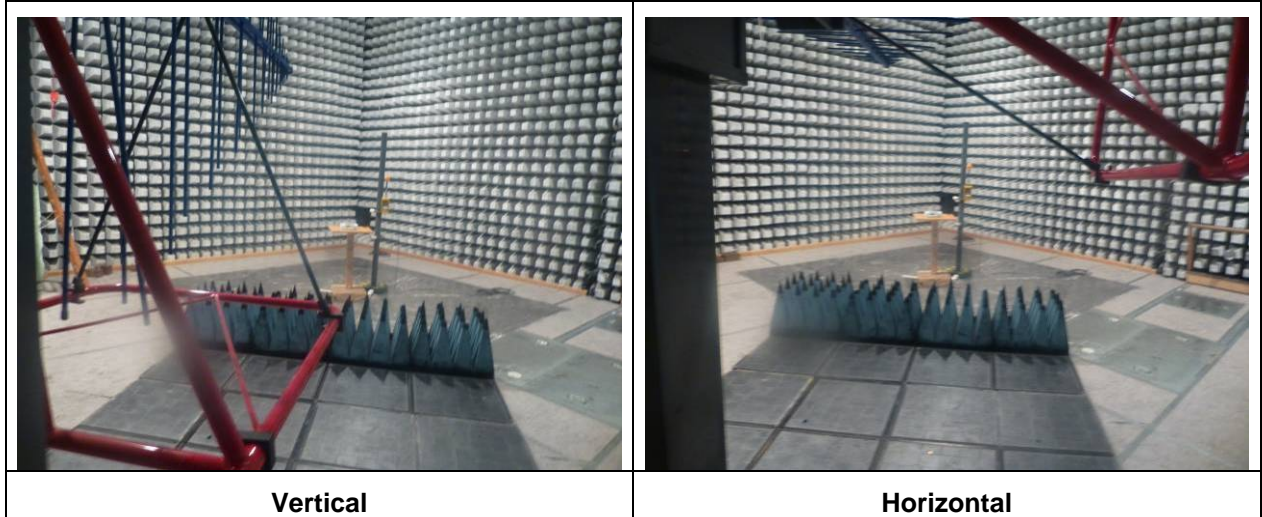


Figure 6-22: test setup for radio frequency electromagnetic fields 80 MHz to 1000 MHz

Result:

Criterion:	A	verdict:	pass
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Results in detail:

Operation mode: normal operation

Remarks

Monitoring:



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6.12.3 Radio frequency electromagnetic fields – DeVita Cosmo

Photo documentation of the test set-up:

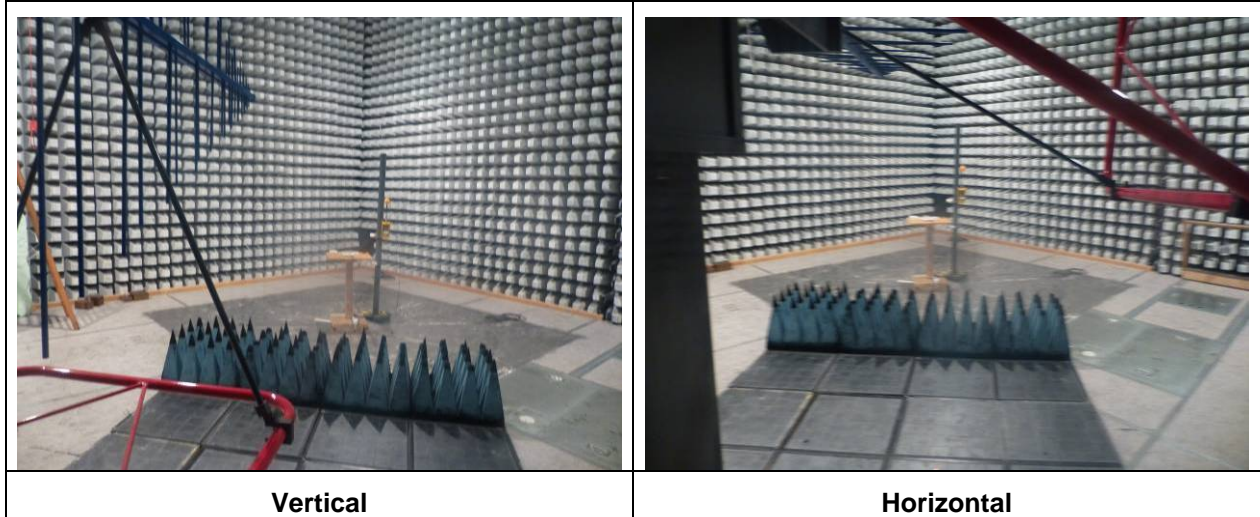


Figure 6-23: test setup for radio frequency electromagnetic fields 80 MHz to 1000 MHz

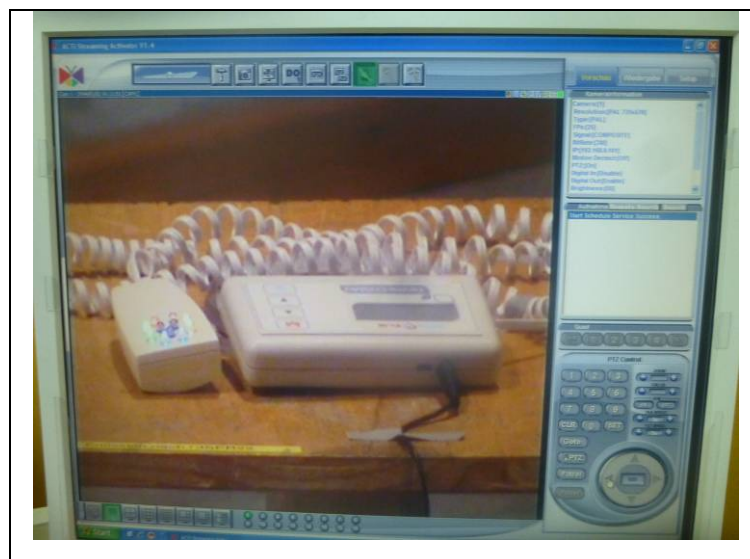
Result:

Criterion:	A	verdict:	pass
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Results in detail:

Operation mode:	normal operation
Remarks	

Monitoring:



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6.13 Surges

Reference Standard: EN 61000-4-5

Tested line(s):

- AC 230V

Parameter:

- ± 1 kV line to line
- ± 2 kV line to GND
- 1,2/50, 8/20 μ s
- 10 pulses alternating
- coupling: pulses coupled at 0°, 90°, 180°, 270°
- test with lower voltage levels is not required

Criterion: **B**

Test location: shielded room No. 6

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1614	Ultra Compact Simulator (3-Phase Testsystem)	UCS 500 N5	EMTest		cal	Sep 02, 2013	Sep 30, 2015
P1629	Oscilloscope, (used for Surge/Burst 63A)	WaveJet 354	LeCroy	500 MHz; 750 ps; 4 Channel	cal	Mar 12, 2014	Mar 31, 2015
P1557	Notebook Labor EMV 03 (used for Surge/EFT 63A)	Think Pad T400	Lenovo	sound card: 20Hz - 22kHz	cnn		
P0977	test chamber 6		Siemens	6.4 • 4.3 • 4.35 m; without absorbers	chk	Jan 16, 2014	Jan 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Photo documentation of the test set-up:

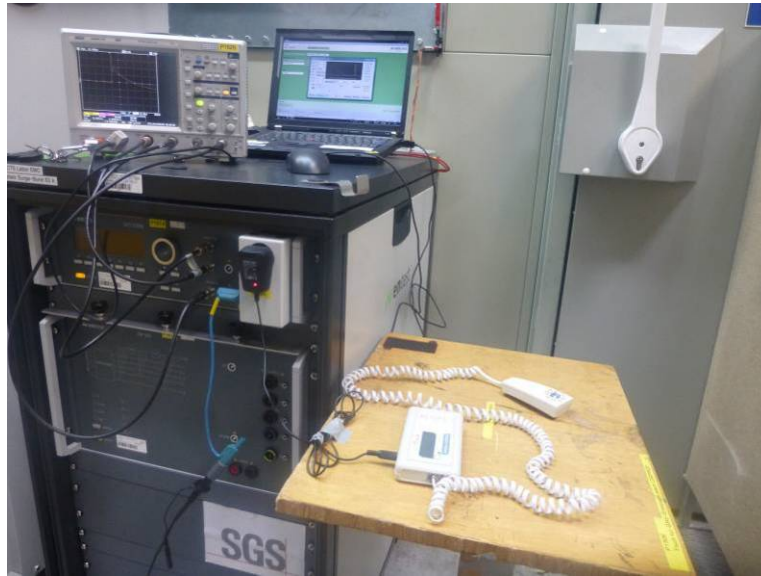


Figure 6-24: test setup for Surges

Result:

Criterion:	B	verdict:	pass
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For detailed results, please see below:

Results in detail:	
Operation mode:	normal operation
Remarks	

Port	Voltage	coupling	Observation	Result
AC input	±0.5 kV	Line-to-line (L-N)	none	pass
AC input	±1.0 kV	Line-to-line (L-N)	none	pass

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6.14 Voltage Dips and Interruptions

Reference Standard: EN 61000-4-11

Parameters: (EN 61547)

- 0% of U_N , 0.5 period
- 40% of U_N , 10/12 periods @ 50/60 Hz
- 70% of U_N , 25/30 periods @ 50/60 Hz

Criterion: **C**

Instruments and accessories

ID. No.	Equipment	(Type)	Manufacturer	(Specification)	Status	Last Cal.	Next Cal.
P1088	4-quadrant amplifier (L1)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1090	control unit	SyCore 1k4	SPIBE	4 phase, 1MByte RAM	cnn		
P1286	4-quadrant amplifier (L2)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1287	4-quadrant amplifier (L3)	PAS 20000	SPIBE	20000 VA; 0 - 270 Veff, DC - 5kHz	cnn		
P1288	power supply		SPIBE	common power supply for all PAS 20000	cnn		
P1368	oscilloscope (SPIBE)	TDS 3034/C	Tektronix	300Mhz, 2.5GS/s, 4 channels, IEEE 488 Interface	cal	Mar 11, 2014	Mar 31, 2015
P1222	oscilloscope probe	P5100	Tektronix	100x, DC to 250 MHz, 2500V pk, 1000V	cal	Mar 12, 2014	Mar 31, 2015
P1809	multimeter, digital (MZ01)	METRAHIT2+	GMC-I Gossen-Metrawatt GmbH	60 mV...600V, 60mA...10A, 600Ohm...40MOhm, 0.1Hz...1kHz, -50,0 °C ...+400,0°C	cal	Jun 13, 2014	Jun 30, 2015
P1624	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH		chk	May 07, 2014	May 31, 2015

cal = Calibration, car = Calibration restricted use, chk = Check, chr = Check restricted use, cpu = Check prior to use, calchk = Calibration and check, ind = for indication only, cnn = Calibration not necessary

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Photo documentation of the test set-up:



Figure 6-25: test setup for Voltage Dips and Interruptions

Result:

Criterion:	C	verdict:	pass
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For detailed results, please see below:

Results in detail:	
Operation mode:	normal operation
Remarks	

Name:	C. Tchatchouang	Serial no:	000000001
Department:	CTS TechnikEMC	Operating modes:	Mode Nr 2
Company:	SGS Germany GmbH	Comment1:	230 V / 50 Hz
Test report no:	H0FA0004	Comment2:	
Device:	DeVita Cosmo	Comment3:	--
Specimen:	230 V / 50 Hz	Comment4:	--
Manufacturer:	Deta-Elis Europa GmbH	Date:	11.08.2014
Type:		Test date:	11.08.2014

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

Voltage / frequency:	230.0 V / 50.0 Hz
Test phase:	Single phase / L1-N
Executed test:	55014-2
Test description:	--
Disturbances per step:	3 (per phase angle) / 10.5 sec delay between

Step	Disturbance	TestLevel	Duration	Phase angle(s) (Ref.Ph.1)
1	Voltage dip / short interruption	0 %	0.5 periods	0°
2	Voltage dip / short interruption	40 %	10 periods	0°
3	Voltage dip / short interruption	70 %	25 periods	0°

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:

Tested with SPS EMC 302 / PAS20000 by Spitzenberger & Spies GmbH & Co.K.G, Schmidstr. 3234, 94234 Vlechtlach, Germany, 11.08.2014

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