SGS Germany GmbH

Test Report No.: H0FA0005

Order No.: H0FA	**Pages:** 46	**Munich,** Sep 08, 2014

Client:	Deta-Elis Europa GmbH
Equipment Under Test:	Wellness Devices DeVita: - DeVita Ritm Model Mini; - DeVita AP Model Mini; - DeVita Energy
Manufacturer / Importer:	Deta-Elis Europa
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 EUT complies with the requirements of the test specifications.

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

edited by:	**Date**	**Signature**
Nakpane Qualification Engineer	Sep 08, 2014	
approved by:	**Date**	**Signature**
Bauer Lab Manager EMC	Sep 08, 2014	

This document was signed electronically.

CONTENTS

1 Result Summary

Classification of EUT acc. to EN 55014-2:

The EUT is classified as
Category I ☐
Category II ☐
Category III ☐
Category IV ☒

EUT's identification:

EUT1: DeVita Ritm Model Mini
EUT2: DeVita AP Model Mini
EUT3: DeVita Energy

The EUT's are battery operated

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	margin: xx dB	NA
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	NA
4.1.2.2	0	Continuous disturbance, Radiated disturbances, frequency range 30 MHz to 1 000 MHz	EUT 1 margin: 19.83 dB EUT 2 margin: 4.99 dB EUT 3 margin: 1.09 dB	EUT 1: P EUT 2: P EUT 3: P
4.2	6.4	Discontinuous disturbance (Clicks), Terminal Voltage Frequency range 148.5 kHz to 30 MHz	--	NA

Standard: EN 61000-3-2

Clause	Item	Requirement – Test performed	Result	Verdict *
6.2	6.5	harmonic current emissions	--	NA

Standard: EN 61000-3-3

Clause	Item	Requirement – Test performed	Result	Verdict *
4	0	Voltage changes, voltage fluctuations and flicker	--	NA

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
5.2	6.8	Fast transients	Criterion B fulfilled	NA
5.3	0	Injected currents, 0.15 to 230 MHz	Criterion A fulfilled	NA
5.4	6.10	Injected currents, 0.15 to 80 MHz	Criterion A fulfilled	NA
5.5	0	Radio frequency electromagnetic fields, 80 MHz to 1000 MHz	Criterion A fulfilled	EUT 1: P EUT 2: P EUT 3: P
5.6	6.12	Surges	Criterion B fulfilled	NA
5.7	0	Voltage dips and interruptions	Criterion C fulfilled	NA

*
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

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

	EUT1: DeVita Ritm Model Mini	EUT2: DeVita AP Model Mini	EUT3: DeVita Energy
Delivery of EUT:	Feb 26, 2014	May 19, 2014	May 19, 2014
Start of test:	Mar 12, 2014	May 27, 2014	May 27, 2014
End of test:	Mar 27, 2014	Jun 05, 2014	Jun 05, 2014

3.4 Participants

Name	**Function**	**Phone**	**E-Mail**
Stefan Wössner	Accredited testing	+49 89 787475-452	stephan.woessner@sgs.com
André Stéphane Nakpane	Editor/Testing	+49 89 787475-213	andre.nakpane@sgs.com

3.5 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:
Temperature: 20 - 26 °C
Humidity: 30 - 60 %

4 Equipment Under Test

4.1 DeVita Ritm Model Mini

Test item description .....:	DeVita Ritm Model Mini
Trade Mark .....:	DETA – ELIS (combined Trade Mark)
Manufacturer / Importer.....:	Deta-Elis Europa GmbH
Model/Type .....:	DeVita Ritm Model Mini
Number of tested samples.:	1
Serial Number(s) .....:	--
Ratings.....:	Built-in Li-Pol battery 3.7V, 0,05A

Figure 4-1: Pictures of DeVita Ritm Model Mini

4.1.1 EUT operation mode:

☒ Normal operation

4.1.2 Power supply system utilised

Voltage: Built-in Li-Pol battery 3.7V, 0.05A

4.2 DeVita AP Model Mini

Test item description .....:	DeVita AP Model Mini
Trade Mark .....:	DETA – ELIS (combined Trade Mark)
Manufacturer / Importer.....:	Deta-Elis Europa GmbH
Model/Type .....:	DeVita AP Model Mini
Number of tested samples.:	1
Serial Number(s) .....:	0000000001
Ratings.....:	Built-in Li-Pol battery 3.7V, 0.05A

Figure 4-2: Pictures of DeVita AP Model Mini

4.2.1 EUT operation mode:

☒ Normal operation

4.2.2 Power supply system utilised

Voltage: Built-in Li-Pol battery 3.7V, 0.05A

4.3 DeVita Energy

Test item description .....:	DeVita Energy
Trade Mark .....:	DETA – ELIS (combined Trade Mark)
Manufacturer / Importer.....:	Deta-Elis Europa GmbH
Model/Type .....:	DeVita Energy
Number of tested samples.:	1
Serial Number(s) .....:	0000000001
Ratings.....:	Built-in Li-Pol battery 3.7V, 0.05A

Figure 4-3: Pictures of DeVita Energy

4.3.1 EUT operation mode:

☒ Normal operation

4.3.2 Power supply system utilised

Voltage: Built-in Li-Pol battery 3.7V, 0.05A

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 selfrecoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

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/m²	Metallic ground plane floor load: 1.5 t/m²	Metallic ground plane floor load: 1 t/m²	Metallic ground plane	Metallic ground plane
Turntable	∅ 4m / 6t	∅ 3.2m / 1.5t	∅ 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	***Emission*:** ***30 – 1000 MHz (d = 10 m)*** - NSA acc. to: ・ EN 55022 / 2010 ・ CISPR 16-1-4 / 2008 ・ ANSI C63.4 / 2003 ***1 – 18 GHz (d = 3 m)*** - Site VSWR 1 – 18GHz acc. to CISPR 16-1-4 / 2008 ***Immunity:*** Field uniformity 27 – 3000 MHz acc. EN 61000-4-3:2006	***Emission*:** ***30 – 1000 MHz (d = 3 m)*** - NSA acc. to: ・ EN 55022 / 2010 ・ CISPR 16-1-4 / 2008 ・ ANSI C63.4 / 2003 ***1 – 18 GHz (d = 3 m)*** - Site VSWR 1 – 18GHz acc. to CISPR 16-1-4 / 2008 ***Immunity:*** Field uniformity 80 – 3000 MHz acc. EN 61000-4-3:2006	***Emission*:** ***30 – 1000 MHz (d = 3 m)*** - NSA acc. to: ・ EN 55022 / 2010 ・ CISPR 16-1-4 / 2008 ・ ANSI C63.4 / 2003 ***1 – 18 GHz (d = 3 m)*** - Site VSWR 1 – 18GHz acc. to CISPR 16-1-4 / 2008 ***Immunity:*** Field uniformity 80 – 3000 MHz acc. EN 61000-4-3:2006		

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.

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	
1	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:		80	70
	66 to 56	59 to 46		
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.

The test is not applicable since the EUT's are battery operated

6.2 Disturbance power 30 MHz to 300 MHz

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

	Household and similar appliances		Tools					
1	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 since the EUT's are battery operated

6.3 Radiated disturbances 30 MHz to 1000 MHz

Selected Test	Antenna distance	Frequency range MHz	Limits dB(µV/m) QP
☐	10 m	30 to 230 230 to 1000	30 37
☒	3 m	30 to 230 230 to 1000	40.5 47.5

6.3.1 Radiated disturbances 30 MHz to 1000 MHz – DeVita Ritm Model Mini

Test location: semi anechoic chamber No. 3

Environmental Conditions

Temperature (°C): 20.9 – 22.8
Relative Humidity (%): 28.5 – 31.3

Instruments and accessories

ID. No.	Equipment	Type	Manufacturer	Specification	Status	Last Cal.	Next Cal.
P1326	EMI receiver	ESU26	R&S	20Hz - 26.5GHz, FFT-Scan, Preamplifier 100kHz - 26.5GHz, 30dB	cal	Mar 20, 2012	Mar 31, 2014
P1303	Mast	MA 4000	innco GmbH	1 - 4m, hor./vert.	cnn		
P1304	Controller	CO 2000	innco GmbH		cnn		
P0311	antenna	CBL6111	Chase	30 - 1000 MHz E	cal	Apr 23, 2012	Apr 30, 2015
P1317	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH	0 - 100%rF, -40 - 85°C	chk	May 08, 2013	May 31, 2014
P0338	test chamber 3		Siemens	8.7 • 7.5 • 5.8 m; 0.4 m hybrid 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:

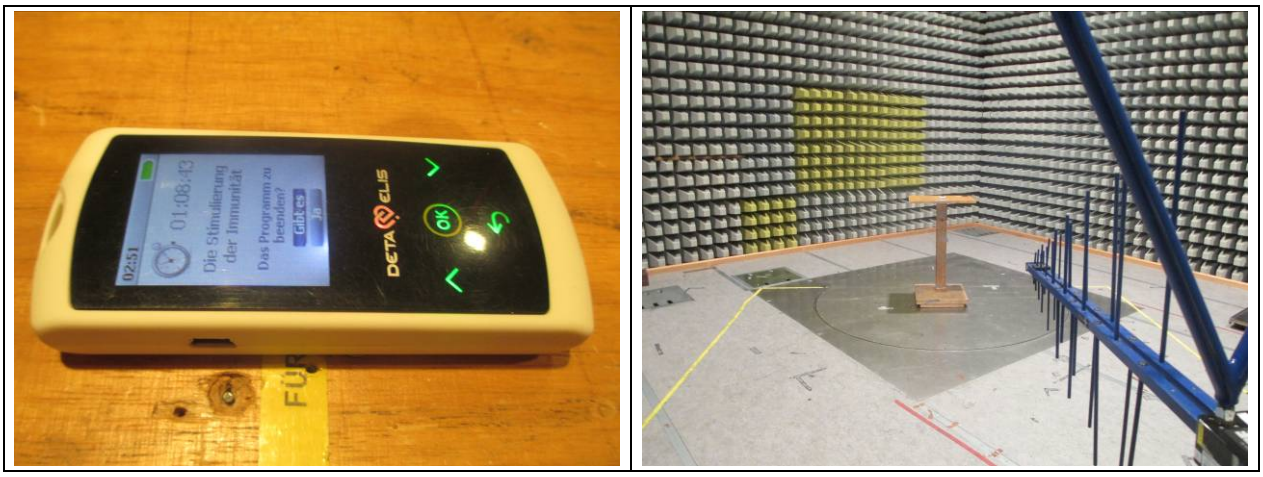


Figure 6-1: test setup for Radiated disturbances 30 MHz to 1000 MHz

Result:

Min. limit margin:	19.83 dB	verdict:	pass

For detailed results, please see the following page.

Results in detail:	
Operation mode:	normal operation (Program: Komplex->Die Hilfe im Studium->Stimulierung der Immunität
Remarks ..... :	Display in standby if no operation. Only blinking LED shows activity

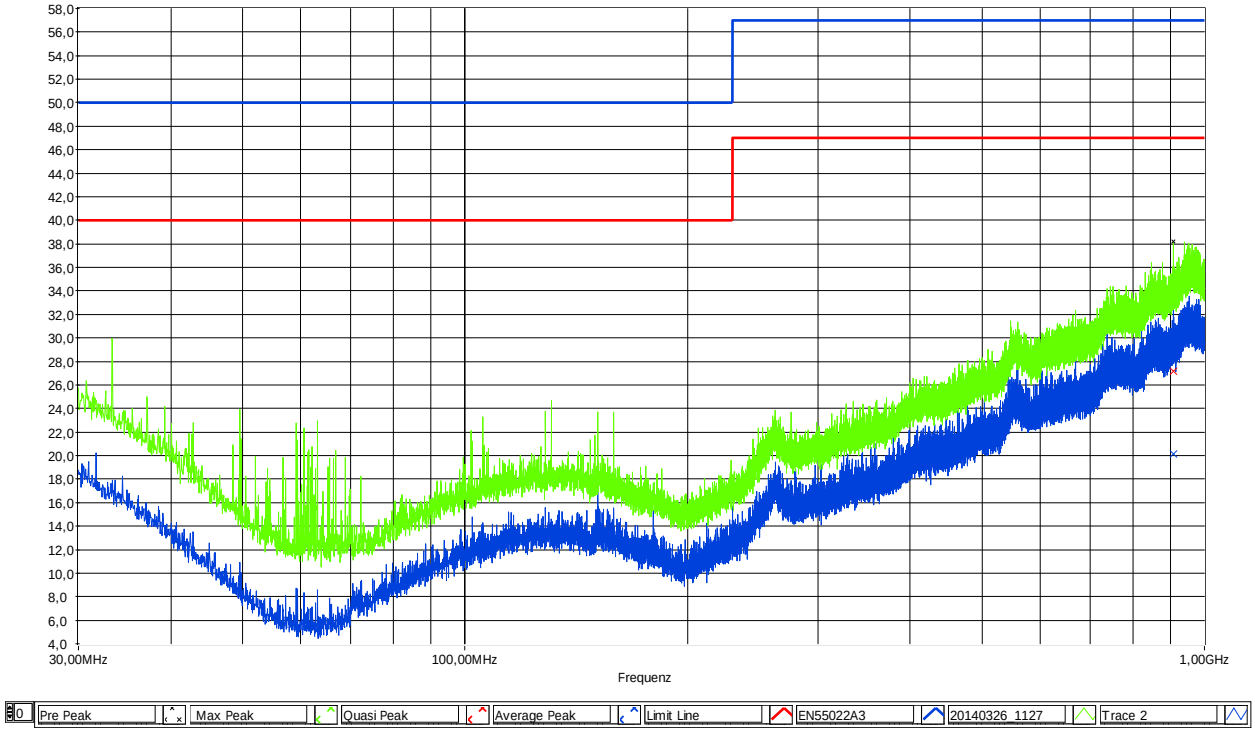


Figure 6-2: Graphical presentation Radiated disturbances 30 MHz to 1000 MHz

Result table:

Frequency	Pre Peak	Angle	Height	Polar.	Type	Rec Freq	Rec PK	Rec QPK	Rec AV	Position	Limit	Margin PK	Margin QPK	Margin AV
907,996M	38,20	0	300	V	SB	907,996M	32,91	27,17	20,13	0°/250c	47,00	14,09	19,83	26,87

6.3.2 Radiated disturbances 30 MHz to 1000 MHz – DeVita AP Model Mini

Test location: semi anechoic chamber No. 2

Environmental Conditions

Temperature (°C): 22.8 – 24.7
Relative Humidity (%): 34.5 – 36.4

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
P1367	video camera MZ2		Pontis		ind		
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

Photo documentation of the test set-up:

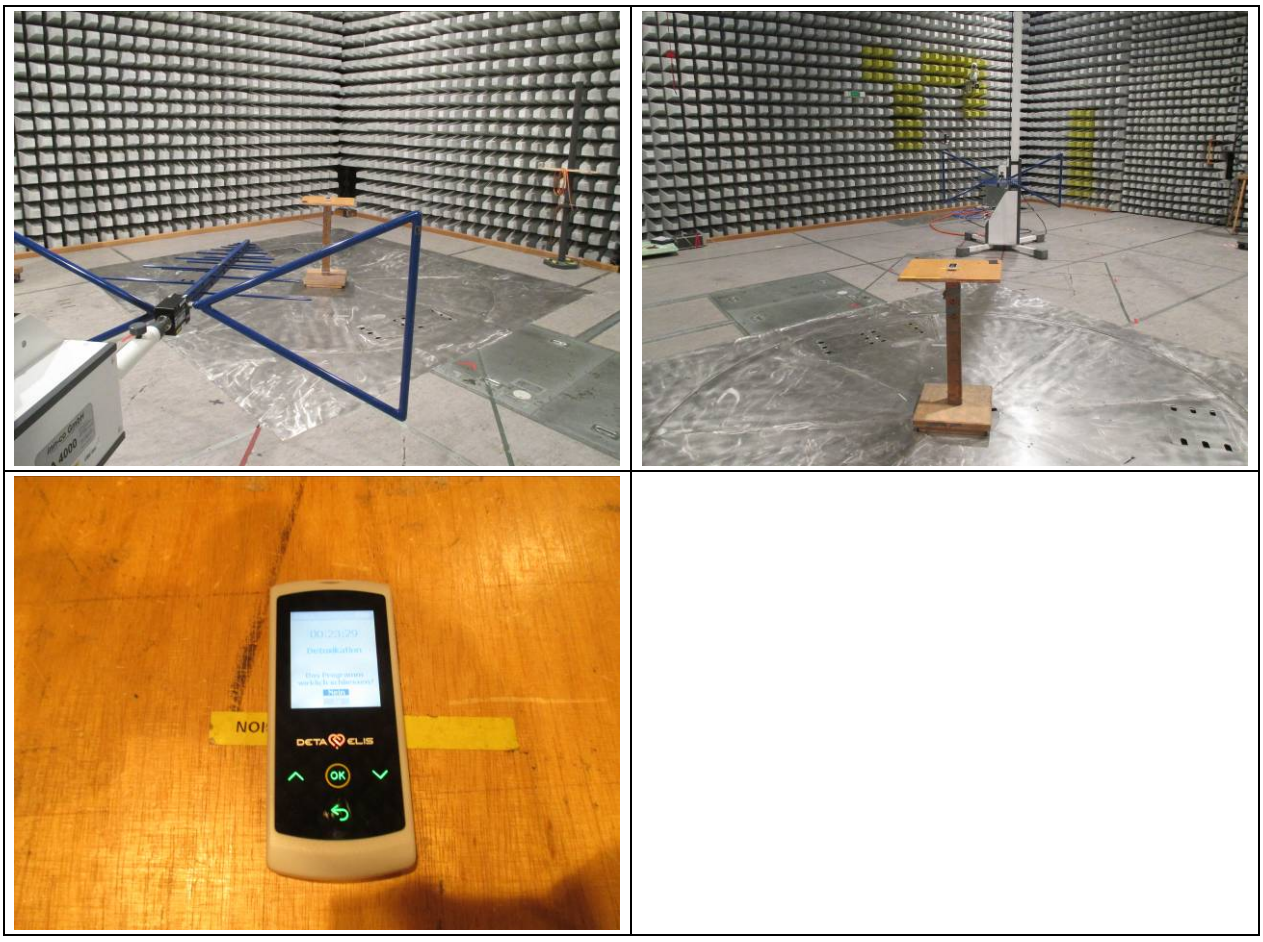


Figure 6-3: test setup for Radiated disturbances 30 MHz to 1000 MHz

Result:

Min. limit margin:	4.99 dB	verdict:	**pass**

For detailed results, please see the following page.

Results in detail:	
Operation mode:	normal operation (Program:Komplex->Säuberung-> Detoxikation)
Remarks ..... :	Display in standby if no operation. Only LED show activity

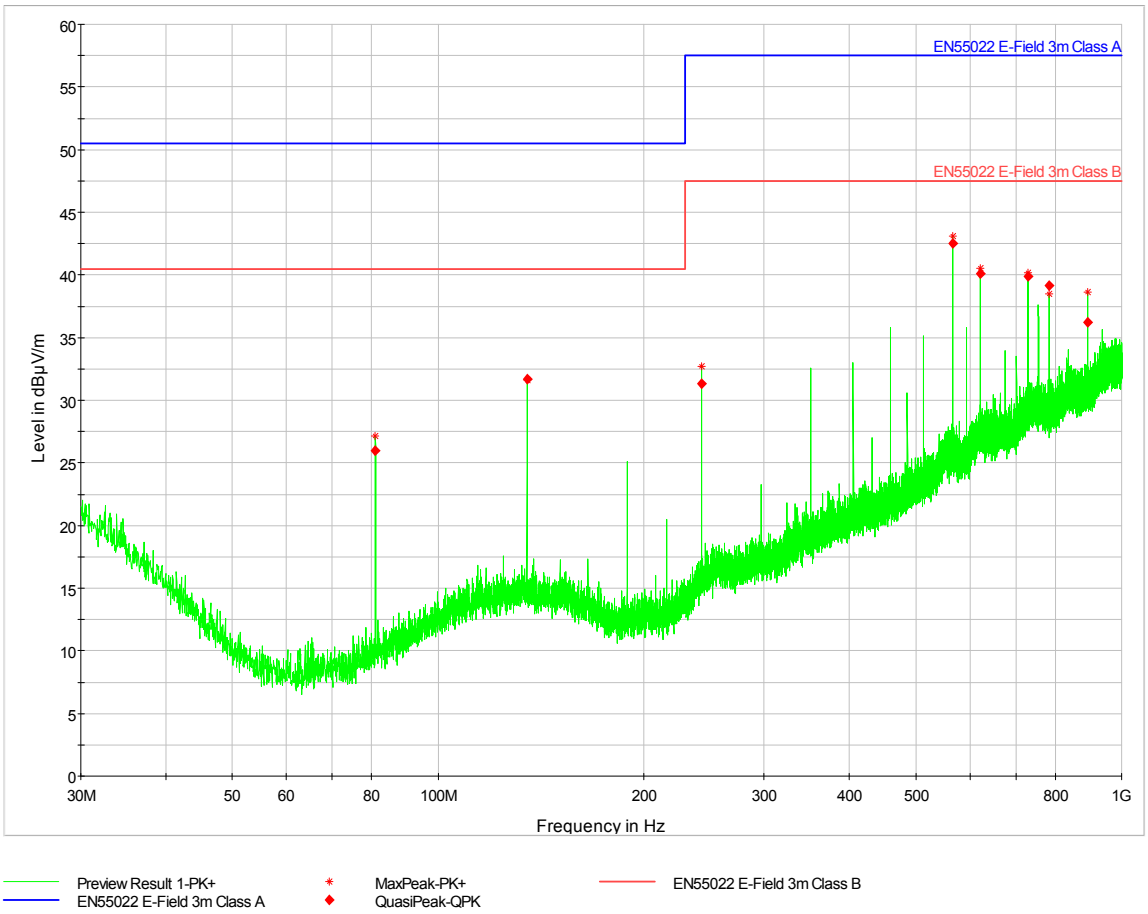


Figure 6-4: Graphical presentation Radiated disturbances 30 MHz to 1000 MHz

Result table:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
80.973500	26.01	40.50	14.49	1000.0	120.000	109.0	V	335.0	9.0
135.002500	31.66	40.50	8.84	1000.0	120.000	211.0	H	263.0	13.4
242.963500	31.29	47.50	16.21	1000.0	120.000	107.0	H	102.0	13.4
566.992000	42.51	47.50	4.99	1000.0	120.000	103.0	V	99.0	22.3
621.021000	40.07	47.50	7.43	1000.0	120.000	100.0	V	81.0	22.7
729.030500	39.86	47.50	7.64	1000.0	120.000	114.0	H	111.0	24.9
783.011000	39.16	47.50	8.34	1000.0	120.000	100.0	H	111.0	24.6
891.020500	36.19	47.50	11.31	1000.0	120.000	103.0	H	151.0	26.1

6.3.3 Radiated disturbances 30 MHz to 1000 MHz – DeVita Energy

Test location: semi anechoic chamber No. 2

Environmental Conditions

Temperature (°C): 22.8 – 24.7
Relative Humidity (%): 34.5 – 36.4

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
P1367	video camera MZ2		Pontis		ind		
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

Photo documentation of the test set-up:

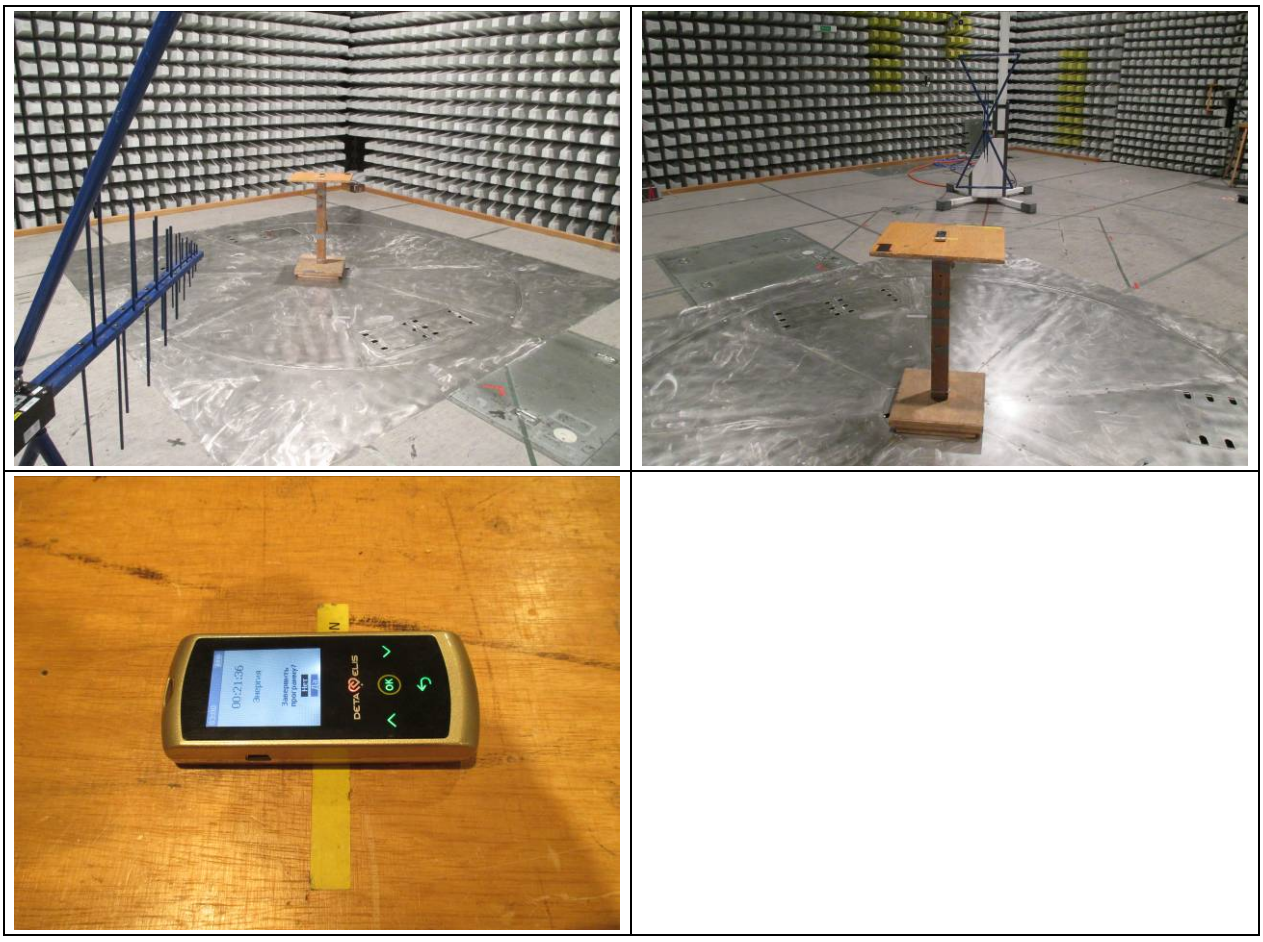


Figure 6-5: test setup for Radiated disturbances 30 MHz to 1000 MHz

Result:

Min. limit margin:	1.09 dB	verdict:	**pass**

For detailed results, please see the following page.

Results in detail:	
Operation mode:	normal operation (Only one program)
Remarks ..... :	Display in standby if no operation. Only blinking LED shows activity

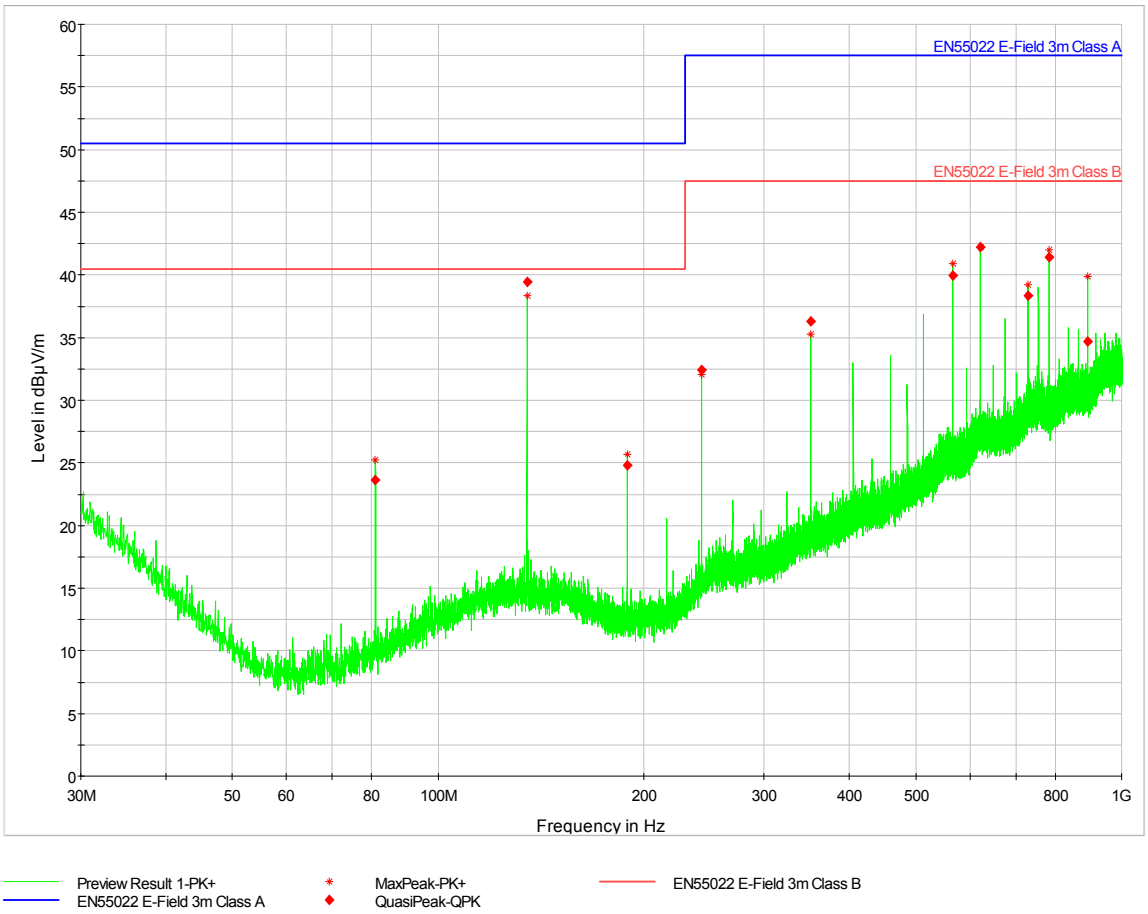


Figure 6-6: Graphical presentation Radiated disturbances 30 MHz to 1000 MHz

Result table:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
80.973500	23.60	40.50	16.90	1000.0	120.000	100.0	V	294.0	9.0
135.002500	39.41	40.50	1.09	1000.0	120.000	192.0	H	247.0	13.4
188.983000	24.77	40.50	15.73	1000.0	120.000	129.0	H	263.0	10.6
242.963500	32.38	47.50	15.12	1000.0	120.000	123.0	H	248.0	13.4
350.973000	36.27	47.50	11.23	1000.0	120.000	158.0	V	212.0	16.7
566.992000	39.98	47.50	7.52	1000.0	120.000	103.0	V	337.0	22.3
620.972500	42.20	47.50	5.30	1000.0	120.000	103.0	V	23.0	22.7
729.030500	38.32	47.50	9.18	1000.0	120.000	221.0	H	109.0	24.9
783.011000	41.43	47.50	6.07	1000.0	120.000	103.0	H	120.0	24.6
891.069000	34.65	47.50	12.85	1000.0	120.000	150.0	H	112.0	26.1

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 dB for $N < 0,2$, or

20 lg (30/*N*) dB for $0,2 \leq N < 30$

The test is not applicable since the EUT's are battery operated

6.5 Harmonic current emissions

Reference Standard: EN 61000-3-2

The test is not applicable since the EUT's are battery operated

6.6 Voltage changes, voltage fluctuations and flicker

Reference Standard: EN 61000-3-3

The test is not applicable since the EUT's are battery operated

6.7 Electrostatic discharge

Reference Standard: EN 61000-4-2

Test Specification:

Contact discharge voltage: ± 4kV
Air discharge voltage: ± 8kV
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)

Test location: anechoic room No. 5

6.7.1 Electrostatic discharge – DeVita Ritm Model Mini

Environmental Conditions

Temperature (°C): 22.8 – 24.4
Relative Humidity (%): 23.8 – 25.7

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
P1300	ESD generator, basic unit	ESD3000	EMC Partner	up to 30 kV, contact & air, depending on discharge module	cal	Mar 14, 2013	Mar 31, 2015
P1301	ESD generator, discharge module	ESD3000DM1	EMC Partner	contact +/-10kV, air +/-16kV, 150pF/330Ohm, EN61000-4-2	cal	Mar 14, 2013	Mar 31, 2015
P0726	vertical coupling plane	VCP-1	Keytek	for Minizap	cnn		
P0727	vertical coupling plane	VCP	QE13	for Minizap	cnn		
P1624	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH		chk	May 08, 2013	May 31, 2014
P0340	test chamber 5		Siemens and Albatross resp.	4.1 • 3.5 • 3.5 m; without absorbers	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

Result:

Criterion:	B	verdict:	pass

For detailed results, please see the following page.

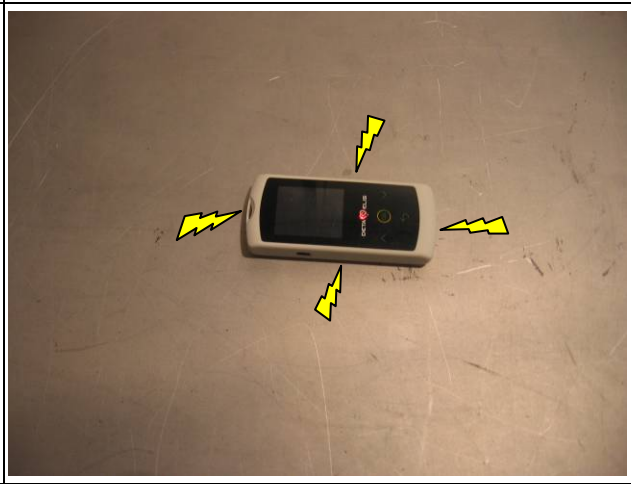
6.7.1.1 ESD test points for direct coupling

Photo documentation of the test set-up:

Front side: Air Discharge

Rear side: Air Discharge

Left: Contact Discharge



Top, down, Left and Right side: Air Discharge

Figure 6-7: 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

Discharge point	Contact	Test level (max ±4 kV)	Observation	Verdict
See pictures	C	±4 kV	None	pass

Results in detail:	
Operation mode:	normal operation (Program: Komplex->Die Hilfe im Studium->Stimulierung der Immunität
Remarks ..... :	Display in standby if no operation. Only blinking LED shows activity

6.7.1.2 ESD test points for indirect coupling

Photo documentation of the test set-up:

	
VCP	**HCP**

Figure 6-8: 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

6.7.2 Electrostatic discharge – DeVita AP Model Mini

Environmental Conditions

Temperature (°C): 22.5 – 23.9
Relative Humidity (%): 23.4 – 25.2

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
P1300	ESD generator, basic unit	ESD3000	EMC Partner	up to 30 kV, contact & air, depending on discharge module	cal	Mar 14, 2013	Mar 31, 2015
P1301	ESD generator, discharge module	ESD3000DM1	EMC Partner	contact +/-10kV, air +/-16kV, 150pF/330Ohm, EN61000-4-2	cal	Mar 14, 2013	Mar 31, 2015
P0726	vertical coupling plane	VCP-1	Keytek	for Minizap	cnn		
P0727	vertical coupling plane	VCP	QE13	for Minizap	cnn		
P1624	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH		chk	May 08, 2013	May 31, 2014
P0340	test chamber 5		Siemens and Albatross resp.	4.1 • 3.5 • 3.5 m; without absorbers	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

Result:

Criterion:	B	verdict:	pass

For detailed results, please see the following page.

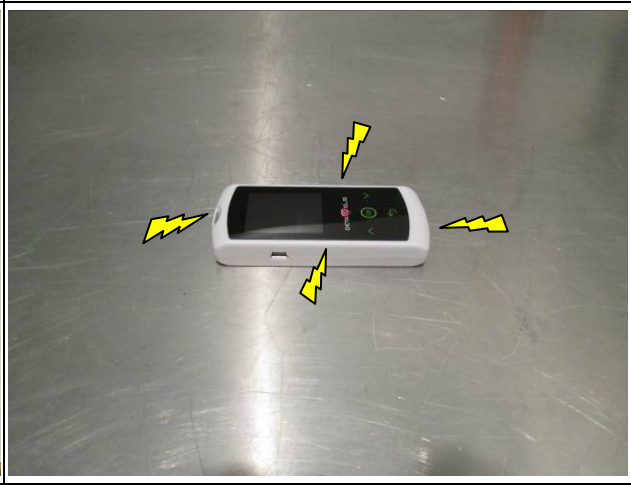
6.7.2.1 ESD test points for direct coupling

Photo documentation of the test set-up:

Front side: Air Discharge

Rear side: Air Discharge

Left: Contact Discharge



Top, down, Left and Right side: Air Discharge

Figure 6-9: test setup for Electrostatic discharges and discharge points

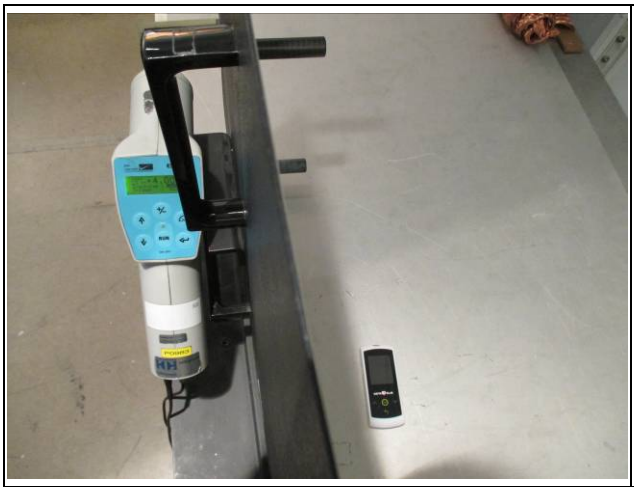
Discharge point	Air	Test level (max ±8 kV)	Observation	Verdict
See pictures	A	±8 kV	None	pass

Discharge point	Contact	Test level (max ±4 kV)	Observation	Verdict
See pictures	C	±4 kV	None	pass

Results in detail:	
Operation mode:	normal operation (Program:Komplex->Säuberung-> Detoxication)
Remarks ..... :	Display in standby if no operation. Only LED show activity

6.7.2.2 ESD test points for indirect coupling

Photo documentation of the test set-up:



VCP

HCP

Figure 6-10: 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

6.7.3 Electrostatic discharge – DeVita Energy

Environmental Conditions

Temperature (°C): 22.5 – 23.9
Relative Humidity (%): 23.4 – 25.2

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
P1300	ESD generator, basic unit	ESD3000	EMC Partner	up to 30 kV, contact & air, depending on discharge module	cal	Mar 14, 2013	Mar 31, 2015
P1301	ESD generator, discharge module	ESD3000DM1	EMC Partner	contact +/-10kV, air +/-16kV, 150pF/330Ohm, EN61000-4-2	cal	Mar 14, 2013	Mar 31, 2015
P0726	vertical coupling plane	VCP-1	Keytek	for Minizap	cnn		
P0727	vertical coupling plane	VCP	QE13	for Minizap	cnn		
P1624	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH		chk	May 08, 2013	May 31, 2014
P0340	test chamber 5		Siemens and Albatross resp.	4.1 • 3.5 • 3.5 m; without absorbers	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

Result:

Criterion:	B	verdict:	pass

For detailed results, please see the following page.

6.7.3.1 ESD test points for direct coupling

Photo documentation of the test set-up:

	
Front side: Air Discharge	**Rear side: Air Discharge**
	
Left: Contact Discharge	**Top, down, Left and Right side: Air Discharge**

Figure 6-11: test setup for Electrostatic discharges and discharge points

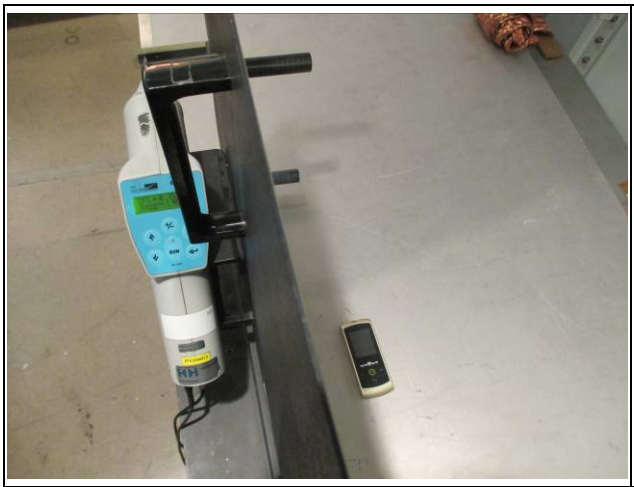
Discharge point	Air	Test level (max ±8 kV)	Observation	Verdict
See pictures	A	±8 kV	None	pass

Discharge point	Contact	Test level (max ±4 kV)	Observation	Verdict
See pictures	C	±4 kV	None	pass

Results in detail:	
Operation mode:	normal operation (Program: Komplex->Energy)
Remarks ..... :	Display in standby if no operation. Only blinking LED shows activity

6.7.3.2 ESD test points for indirect coupling

Photo documentation of the test set-up:



VCP

HCP

Figure 6-12: 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 Fast Transients

Reference Standard: EN 61000-4-4

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**

The test is not applicable since the EUT's are battery operated and/or there are no signal lines

6.9 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 since the EUT's are battery operated

6.10 Injected currents, 0.15 MHz to 80 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 – 80 MHz
- 80% AM @ 1kHz

Criterion: **A**

The test is not applicable since the EUT's are battery operated

6.11 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**

6.11.1 Radio frequency electromagnetic fields, 80 MHz to 1000 MHz – DeVita Ritm Model Mini

Test location: anechoic room No. 3

Environmental Conditions

Temperature (°C): 22.3 – 24.9
Relative Humidity (%): 25.5 – 28.4

Instruments and accessories

ID. No.	Equipment	Type	Manufacturer	Specification	Status	Last Cal.	Next Cal.
P1094	signal generator MZ3	SML 03	R&S	9kHz - 3.3GHz	cal	Nov 30, 2012	Nov 30, 2015
P0264	power meter	NRVS	R&S	true RMS	chk	May 04, 2012	May 31, 2014
P0283	power sensor	NRV-Z5	R&S	100 kHz - 6 GHz, 10nW - 500mW	chk	Jun 05, 2013	Jun 30, 2014
P0494	RF coupler	3020A	Narda	50 - 1000 MHz; 20dB, 500W	chk	Nov 08, 2013	Nov 30, 2014
P0032	antenna K (MZ3)	3140	Emco	26 - 2000 MHz, 750W max.	cnn		
P0906	EM radiation meter, readout unit (MZ2)	RadiSense IV	Dare	read out unit with display	cal	Apr 09, 2013	Apr 30, 2015
P0907	EM radiation meter, probe (MZ2)	RadiSense IV	Dare	probe 10 kHz - 4 GHz	cal	Apr 09, 2013	Apr 30, 2015
P0911	video camera	TVCCD-160SCOL	Monacor	CCD camera, colour	ind		
P1553	video camera	TVCCD-160SCOL	Monacor	CCD camera, colour	ind		
P1317	data logger temperature/humidity	Hygrolog-D-Set	rotronic messgeräte GmbH	0 - 100%rF, -40 - 85°C	chk	May 08, 2013	May 31, 2014
P0338	test chamber 3		Siemens	8.7 • 7.5 • 5.8 m; 0.4 m hybrid 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:

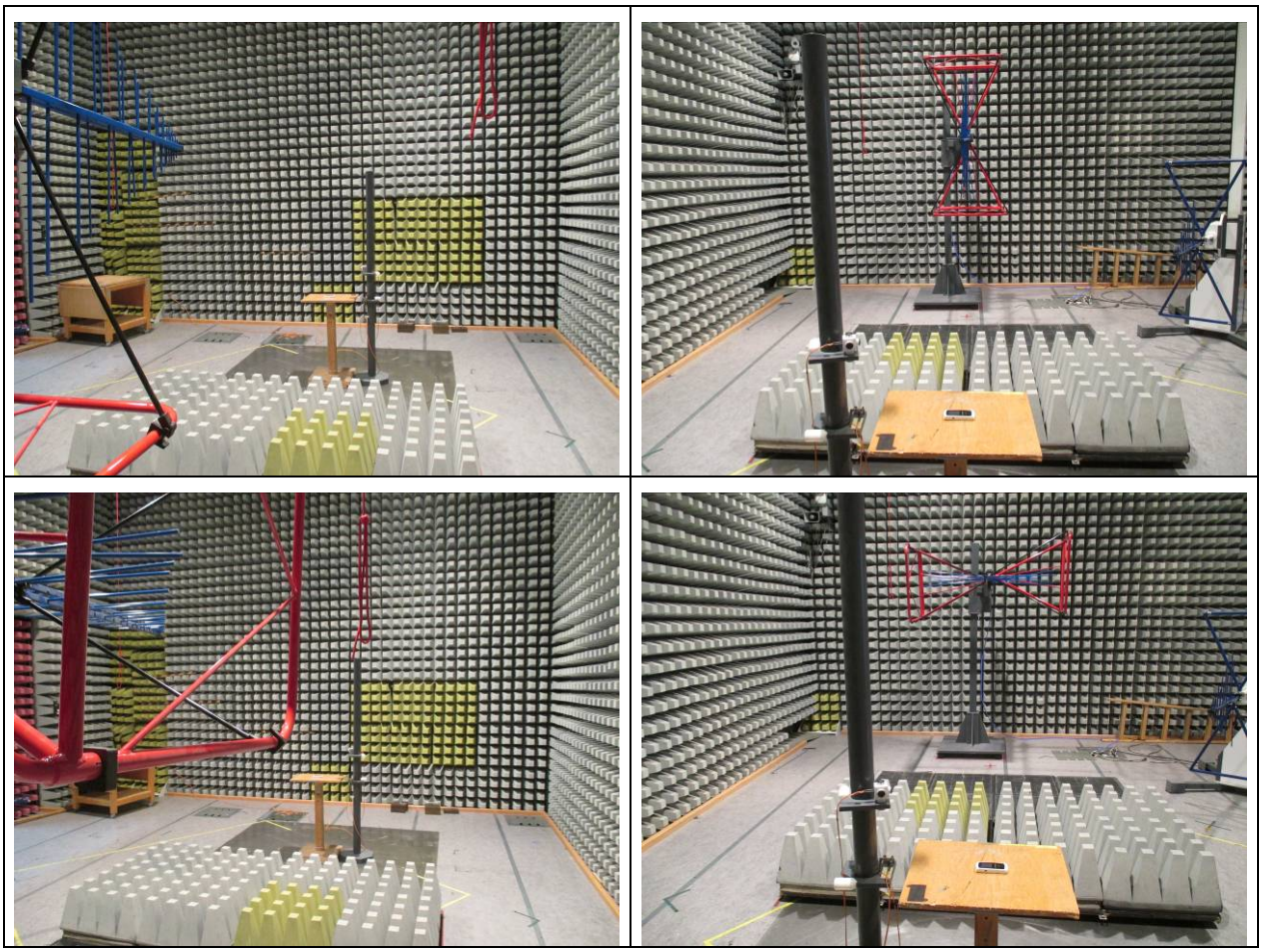


Figure 6-13: test setup for radio frequency electromagnetic fields 80 MHz to 1000 MHz

Result:

Criterion:	A	verdict:	pass

For detailed results, please see below:

Results in detail:	
Operation mode:	normal operation (Program: Komplex->Die Hilfe im Studium->Stimulierung der Immunität
Remarks ..... :	Display in standby if no operation. Only blinking LED shows activity

Monitoring:

6.11.2 Radio frequency electromagnetic fields, 80 MHz to 1000 MHz – DeVita AP Model Mini

Test location: anechoic room No. 2

Environmental Conditions

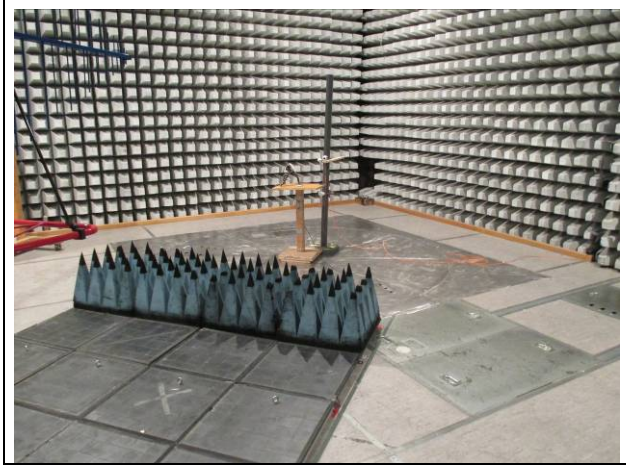
Temperature (°C): 22.7 – 24.9
Relative Humidity (%): 34.6 – 40.5

Instruments and accessories

ID. No.	Equipment	Type	Manufacturer	Specification	Status	Last Cal.	Next Cal.
P0567	signal generator	SMR 20	R&S	10 MHz - 20 GHz	cal	Apr 04, 2012	Apr 30, 2015
P0261	power meter	NRVS	R&S	true RMS	chk	May 04, 2012	May 31, 2014
P0289	power sensor	NRV-Z51	R&S	DC - 18 GHz, 1µW - 100mW	chk	Jun 05, 2013	Jun 30, 2014
P0495	RF coupler	3020A	Narda	50 - 1000 MHz; 20dB, 500W	chk	Nov 08, 2013	Nov 30, 2014
P0902	attenuator 20dB	46-20-34	Weinschel	20dB	chk	May 23, 2013	May 31, 2014
P1284	Controller	CO 2000	innco GmbH		cnn		
P1367	video camera MZ2		Pontis		ind		
P0186	EM radiation meter, probe (MZ2)	RadiSense IV	Dare	probe 10 kHz - 4 GHz	cal	Apr 10, 2014	Apr 30, 2016
P0192	EM radiation meter, readout unit (MZ2)	RadiSense IV	Dare	read out unit with display	cal	Apr 10, 2014	Apr 30, 2016
P0033	antenna L (MZ2)	3140	Emco	26 - 2000 MHz, 750W max.	cnn		
P1328	amplifier	500W1000A	AR	80 - 1000 MHz, 500W	cnn		
P1244	video camera	TVCCD-160SCOL	Monacor	CCD camera, colour	ind		
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

Photo documentation of the test set-up:



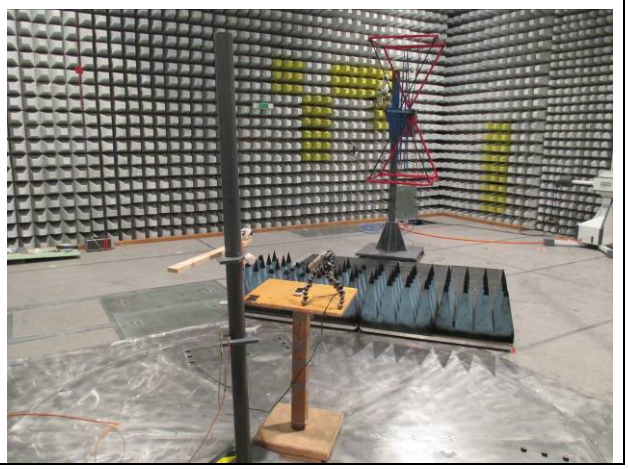


Figure 6-14: test setup for radio frequency electromagnetic fields 80 MHz to 1000 MHz

Result:

Criterion:	A	verdict:	pass

For detailed results, please see below:

Results in detail:	
Operation mode:	normal operation (Program:Komplex->Säuberung-> Detoxication)
Remarks ..... :	Display in standby if no operation. Only LED show activity

Monitoring:

6.11.3 Radio frequency electromagnetic fields, 80 MHz to 1000 MHz – DeVita Energy

Test location: anechoic room No. 2

Environmental Conditions

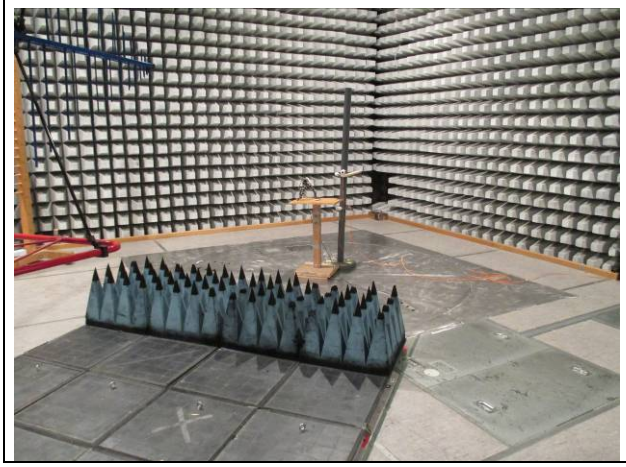
Temperature (°C): 22.7 – 24.9
Relative Humidity (%): 34.6 – 40.5

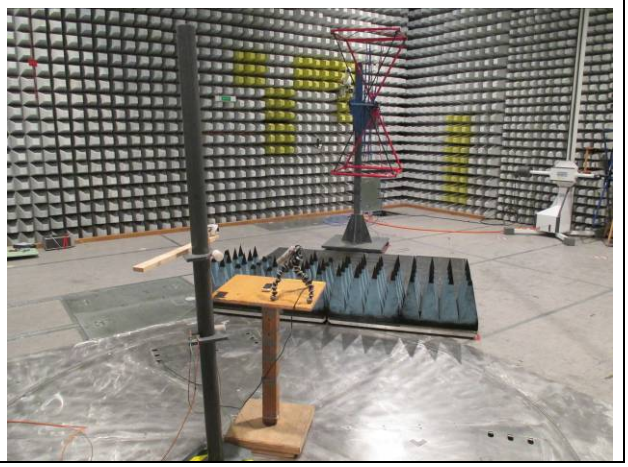
Instruments and accessories

ID. No.	Equipment	Type	Manufacturer	Specification	Status	Last Cal.	Next Cal.
P0567	signal generator	SMR 20	R&S	10 MHz - 20 GHz	cal	Apr 04, 2012	Apr 30, 2015
P0261	power meter	NRVS	R&S	true RMS	chk	May 04, 2012	May 31, 2014
P0289	power sensor	NRV-Z51	R&S	DC - 18 GHz, 1µW - 100mW	chk	Jun 05, 2013	Jun 30, 2014
P0495	RF coupler	3020A	Narda	50 - 1000 MHz; 20dB, 500W	chk	Nov 08, 2013	Nov 30, 2014
P0902	attenuator 20dB	46-20-34	Weinschel	20dB	chk	May 23, 2013	May 31, 2014
P1284	Controller	CO 2000	innco GmbH		cnn		
P1367	video camera MZ2		Pontis		ind		
P0186	EM radiation meter, probe (MZ2)	RadiSense IV	Dare	probe 10 kHz - 4 GHz	cal	Apr 10, 2014	Apr 30, 2016
P0192	EM radiation meter, readout unit (MZ2)	RadiSense IV	Dare	read out unit with display	cal	Apr 10, 2014	Apr 30, 2016
P0033	antenna L (MZ2)	3140	Emco	26 - 2000 MHz, 750W max.	cnn		
P1328	amplifier	500W1000A	AR	80 - 1000 MHz, 500W	cnn		
P1244	video camera	TVCCD-160SCOL	Monacor	CCD camera, colour	ind		
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

Photo documentation of the test set-up:





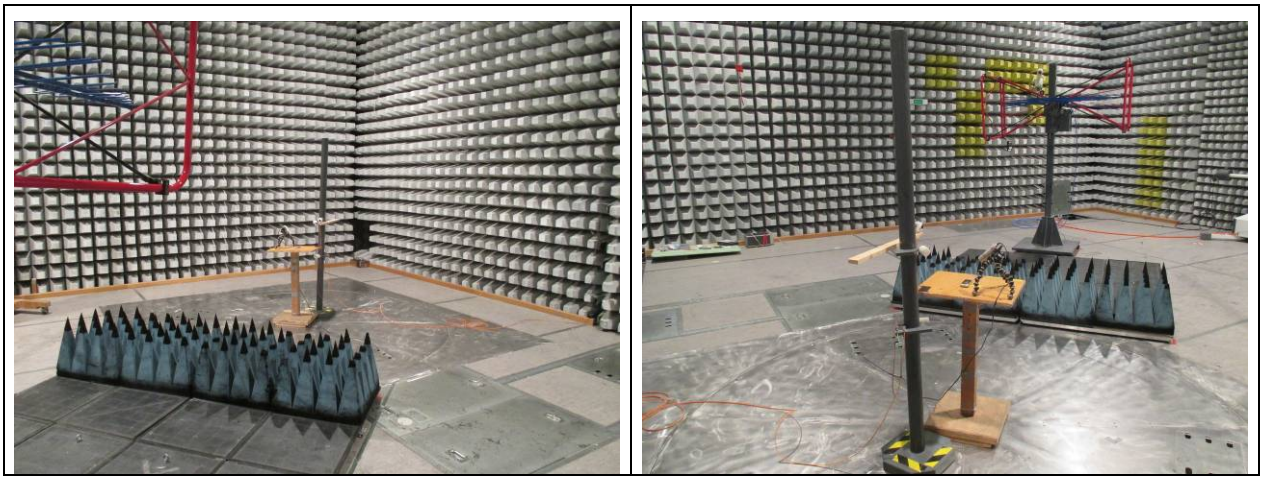


Figure 6-15: test setup for radio frequency electromagnetic fields 80 MHz to 1000 MHz

Result:

Criterion:	A	verdict:	pass

For detailed results, please see below:

Results in detail:	
Operation mode:	normal operation (Program: Komplex->Die Hilfe im Studium->Stimulierung der Immunität
Remarks ..... :	Display in standby if no operation. Only blinking LED shows activity

Monitoring:

6.12 Surges

Reference Standard: EN 61000-4-5

Parameter:

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

Criterion: **B**

The test is not applicable since the EUT's are battery operated

6.13 Voltage Dips and Interruptions

Reference Standard: EN 61000-4-11

Parameter:

- 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**

The test is not applicable since the EUT's are battery operated

7 Disclaimer

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