



Annex C

Appendix No.: 1-9362-25-03-02_TR2-A301-R01

Testing Laboratory

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Appendix with Calibration data



Accredited by the Swiss Accreditation Service (SAS)
**The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates**

Accreditation No.: **SCS 0108**

Client

Cetecom Advanced
Saarbrücken, Germany

Certificate No.

MAGPy-8H3D-3079_Nov24

CALIBRATION CERTIFICATE

Object

MAGPy-8H3D+E3DV2 SN:3079
MAGPy-DASV2 SN:1023

Calibration procedure(s)

QA CAL-46.v1
Calibration Procedure for MAGPy-8H3D+E3D
Near-field Electric and Magnetic Field Sensor System

Calibration date

November 06, 2024

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Oscilloscope	SN: 110918	03-Sep-24 (No. 4030A315008835)	Sep-25
Reference 20 dB Attenuator	SN: CC2552 (20x)	26-Mar-24 (No. 217-04046)	Mar-25
Type-N mismatch	SN: 310982 / 06327	26-Mar-24 (No. 217-04047)	Mar-25

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Network Analyzer E5061B	SN: MY49810822	In house check: Nov-23	In house check: Nov-24
TEM Cell	SN: S6029i	In house check: Nov-23	In house check: Nov-24
Plate Capacitor	SN: 6028i	In house check: Nov-23	In house check: Nov-24
Resonator (160kHz)	SN: 6030i	In house check: Nov-23	In house check: Nov-24

	Name	Function	Signature
Calibrated by	Aidonia Georgiadou	Laboratory Engineer	
Approved by	Sven Kühn	Technical Manager	

Issued: November 06, 2024

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Calibration Laboratory of

Schmid & Partner
Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

**The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates**

Accreditation No.: SCS 0108

Glossary

MAGPy-8H3D-E3D Magnetic Amplitude and Gradient Probe – Eight H-field Sensors, Single E-field sensor
MAGPy-DAS Magnetic Amplitude and Gradient Data Acquisition System

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1309-2013, "IEEE Standard for calibration of electromagnetic field sensors and probes, excluding antennas, from 9 kHz to 40 GHz", November 2013

Methods Applied and Interpretation of Parameters

- Calibration has been performed after the adjustment of the device.
- *Linearity*: Calibration of the linearity of the field reading over the specified dynamic range at 161.75 kHz. Influence of offset voltage is included in this measurement.
- *Frequency response*: Calibration of the field reading over the specified frequency range from 3.0 kHz to 10.0 MHz.
- Receiving Pattern: Assessed for H-field polarizations ϑ , and $\phi = 0^\circ \dots 360^\circ$; $\vartheta = 90^\circ$, and $\phi = 0^\circ \dots 360^\circ$; for the XYZ sensors (in TEM-Cell at 4 kHz, 40 kHz, 400 kHz and 4 MHz).
- Receiving Pattern: Assessed for E-field polarizations ϑ , and $\phi = 0^\circ \dots 360^\circ$; $\vartheta = 90^\circ$, and $\phi = 0^\circ \dots 360^\circ$; for the XYZ sensor (in parallel plate capacitor at 4 kHz, 40 kHz, 400 kHz and 4 MHz).

Calibration Uncertainty

The calibration uncertainty is 0.7 dB for the H-field readings and 1.06 dB for the E-field readings. The calibration uncertainty is specified over the frequency range from 3.0 kHz to 10.0 MHz and a dynamic range from 0.1 A/m to 3200 A/m and from 0.08 V/m to 2000 V/m respectively.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

Unit Type	MAGPy-8H3D+E3DV2 (SP MGY 303 AA)	3079
	MAGPy-DASV2 (SE UMS 303 AE)	1023
	MAGPy FPGA Board	WP000009
Adjustment Date	Last MAGPy Adjustment	November 06, 2024
Firmware SW Version	MAGPy Firmware	Ver. 1.00
Backend SW Version	MAGPy Backend	Ver. 1.0.2
Calibration SW Version	MAGACAP	Ver. 1.0

Dynamic Range

Dynamic Range, H-field, Channel 0

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.410	0.390	0.380	0.430	0.410	0.400	0.41	0.43	0.45	±1.00
0.550	0.530	0.520	0.560	0.550	0.540	0.16	0.32	0.33	±1.00
0.760	0.730	0.710	0.750	0.750	0.710	-0.12	0.23	0.00	±1.00
0.990	0.950	0.930	0.990	0.980	0.920	0.00	0.27	-0.09	±1.00
1.34	1.29	1.25	1.34	1.28	1.25	0.00	-0.07	0.00	±1.00
1.84	1.77	1.72	1.84	1.75	1.72	0.00	-0.10	0.00	±1.00
2.45	2.35	2.29	2.44	2.35	2.29	-0.04	0.00	0.00	±0.20
3.27	3.14	3.06	3.25	3.15	3.07	-0.05	0.03	0.03	±0.20
4.43	4.26	4.15	4.43	4.27	4.16	0.00	0.02	0.02	±0.20
5.99	5.76	5.62	6.01	5.77	5.63	0.03	0.02	0.02	±0.20
8.04	7.75	7.55	8.07	7.76	7.58	0.03	0.01	0.03	±0.20
10.7	10.3	10.1	10.8	10.3	10.1	0.08	0.00	0.00	±0.20
14.5	14.0	13.6	14.6	14.0	13.7	0.06	0.00	0.06	±0.20
19.6	18.8	18.3	19.6	18.8	18.4	0.00	0.00	0.05	±0.20
26.4	25.4	24.7	26.5	25.5	24.8	0.03	0.03	0.04	±0.20
35.3	34.0	33.1	35.5	34.1	33.3	0.05	0.03	0.05	±0.20
47.6	45.9	44.7	47.9	46.1	44.9	0.05	0.04	0.04	±0.20
64.6	62.2	60.6	64.9	62.5	60.9	0.04	0.04	0.04	±0.20
88.7	85.4	83.2	88.3	85.1	82.8	-0.04	-0.03	-0.04	±0.20
116	112	109	116	111	108	0.00	-0.08	-0.08	±0.20
159	153	149	159	153	149	0.00	0.00	0.00	±0.20
221	212	207	220	212	207	-0.04	0.00	0.00	±0.20
305	294	286	300	289	281	-0.14	-0.15	-0.15	±0.20
450	433	421	444	428	416	-0.12	-0.10	-0.10	±0.20
619	596	580	615	592	576	-0.06	-0.06	-0.06	±0.20
922	887	863	926	891	867	0.04	0.04	0.04	±0.20
1390	1340	1300	1420	1360	1330	0.19	0.13	0.20	±0.30
1890	1820	1770	1950	1870	1820	0.27	0.24	0.24	±0.30
3080	2960	2880	3200	3080	3000	0.33	0.35	0.35	±0.50
3670	3530	3450	3840	3690	3600	0.39	0.39	0.37	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0 A/m
- ±0.2dB for applied H-fields ≥ 2.0 A/m and < 1000 A/m
- ±0.3dB for applied H-fields ≥ 1000 A/m and < 2000 A/m
- ±0.4dB for applied H-fields ≥ 2000 A/m and < 3000 A/m
- ±0.5dB for applied H-fields ≥ 3000 A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 1

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.410	0.390	0.390	0.420	0.420	0.420	0.21	0.64	0.64	±1.00
0.560	0.540	0.530	0.550	0.560	0.570	-0.16	0.32	0.63	±1.00
0.770	0.740	0.730	0.760	0.740	0.740	-0.11	0.00	0.12	±1.00
1.00	0.960	0.950	1.01	0.960	0.960	0.09	0.00	0.09	±1.00
1.35	1.30	1.28	1.35	1.31	1.30	0.00	0.07	0.13	±1.00
1.85	1.79	1.76	1.85	1.78	1.77	0.00	-0.05	0.05	±1.00
2.47	2.39	2.34	2.47	2.40	2.35	0.00	0.04	0.04	±0.20
3.30	3.19	3.13	3.29	3.19	3.14	-0.03	0.00	0.03	±0.20
4.47	4.32	4.25	4.47	4.33	4.26	0.00	0.02	0.02	±0.20
6.05	5.84	5.74	6.05	5.85	5.74	0.00	0.01	0.00	±0.20
8.12	7.85	7.72	8.13	7.88	7.74	0.01	0.03	0.02	±0.20
10.8	10.5	10.3	10.9	10.5	10.3	0.08	0.00	0.00	±0.20
14.6	14.2	13.9	14.7	14.2	13.9	0.06	0.00	0.00	±0.20
19.7	19.1	18.7	19.8	19.1	18.8	0.04	0.00	0.05	±0.20
26.6	25.8	25.3	26.7	25.9	25.3	0.03	0.03	0.00	±0.20
35.6	34.4	33.8	35.8	34.6	34.0	0.05	0.05	0.05	±0.20
48.0	46.5	45.7	48.3	46.7	45.9	0.05	0.04	0.04	±0.20
65.2	63.0	62.0	65.5	63.3	62.2	0.04	0.04	0.03	±0.20
89.5	86.6	85.0	89.2	86.3	84.7	-0.03	-0.03	-0.03	±0.20
117	113	111	117	113	111	0.00	0.00	0.00	±0.20
161	156	153	160	155	152	-0.05	-0.06	-0.06	±0.20
223	215	212	222	215	211	-0.04	0.00	-0.04	±0.20
308	298	293	303	293	288	-0.14	-0.15	-0.15	±0.20
454	439	431	448	434	426	-0.12	-0.10	-0.10	±0.20
624	604	593	621	601	589	-0.04	-0.04	-0.06	±0.20
930	899	883	935	905	886	0.05	0.06	0.03	±0.20
1400	1360	1330	1430	1380	1360	0.18	0.13	0.19	±0.30
1910	1850	1810	1960	1900	1860	0.22	0.23	0.24	±0.30
3110	3000	2950	3230	3130	3060	0.33	0.37	0.32	±0.50
3700	3580	3520	3870	3750	3680	0.39	0.40	0.39	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 2

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.400	0.390	0.390	0.410	0.420	0.430	0.21	0.64	0.85	±1.00
0.550	0.530	0.530	0.550	0.560	0.570	0.00	0.48	0.63	±1.00
0.750	0.740	0.730	0.750	0.760	0.750	0.00	0.23	0.23	±1.00
0.980	0.960	0.960	1.00	0.970	0.960	0.18	0.09	0.00	±1.00
1.33	1.30	1.29	1.35	1.29	1.31	0.13	-0.07	0.13	±1.00
1.82	1.79	1.78	1.84	1.77	1.79	0.09	-0.10	0.05	±1.00
2.43	2.38	2.37	2.43	2.39	2.38	0.00	0.04	0.04	±0.20
3.24	3.17	3.16	3.25	3.16	3.16	0.03	-0.03	0.00	±0.20
4.40	4.31	4.29	4.40	4.30	4.29	0.00	-0.02	0.00	±0.20
5.95	5.83	5.79	5.94	5.81	5.79	-0.01	-0.03	0.00	±0.20
7.98	7.83	7.79	7.99	7.82	7.79	0.01	-0.01	0.00	±0.20
10.7	10.4	10.4	10.7	10.5	10.4	0.00	0.08	0.00	±0.20
14.4	14.1	14.0	14.4	14.2	14.0	0.00	0.06	0.00	±0.20
19.4	19.0	18.9	19.5	19.1	19.0	0.04	0.05	0.05	±0.20
26.2	25.7	25.5	26.3	25.8	25.6	0.03	0.03	0.03	±0.20
35.0	34.3	34.1	35.2	34.5	34.3	0.05	0.05	0.05	±0.20
47.3	46.4	46.1	47.5	46.5	46.4	0.04	0.02	0.06	±0.20
64.1	62.8	62.5	64.4	63.1	62.8	0.04	0.04	0.04	±0.20
88.0	86.3	85.8	87.7	86.0	85.4	-0.03	-0.03	-0.04	±0.20
115	113	112	115	112	112	0.00	-0.08	0.00	±0.20
158	155	154	158	155	154	0.00	0.00	0.00	±0.20
219	215	214	219	214	213	0.00	-0.04	-0.04	±0.20
303	297	295	298	292	290	-0.14	-0.15	-0.15	±0.20
446	438	435	441	432	429	-0.10	-0.12	-0.12	±0.20
614	602	598	611	599	594	-0.04	-0.04	-0.06	±0.20
915	896	891	920	901	894	0.05	0.05	0.03	±0.20
1380	1350	1340	1410	1380	1370	0.19	0.19	0.19	±0.30
1880	1840	1830	1930	1900	1880	0.23	0.28	0.23	±0.30
3050	2990	2980	3180	3110	3090	0.36	0.34	0.31	±0.50
3640	3570	3550	3810	3730	3710	0.40	0.38	0.38	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 3

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.400	0.390	0.390	0.420	0.420	0.370	0.42	0.64	-0.46	±1.00
0.550	0.530	0.530	0.560	0.560	0.510	0.16	0.48	-0.33	±1.00
0.750	0.740	0.730	0.750	0.730	0.720	0.00	-0.12	-0.12	±1.00
0.980	0.960	0.950	0.980	0.950	0.960	0.00	-0.09	0.09	±1.00
1.33	1.30	1.28	1.34	1.30	1.28	0.07	0.00	0.00	±1.00
1.82	1.78	1.76	1.83	1.77	1.74	0.05	-0.05	-0.10	±1.00
2.43	2.38	2.35	2.42	2.38	2.35	-0.04	0.00	0.00	±0.20
3.24	3.17	3.13	3.24	3.17	3.13	0.00	0.00	0.00	±0.20
4.40	4.30	4.25	4.40	4.31	4.26	0.00	0.02	0.02	±0.20
5.95	5.82	5.75	5.95	5.82	5.75	0.00	0.00	0.00	±0.20
7.98	7.82	7.72	8.01	7.84	7.75	0.03	0.02	0.03	±0.20
10.7	10.4	10.3	10.7	10.4	10.3	0.00	0.00	0.00	±0.20
14.4	14.1	13.9	14.4	14.2	13.9	0.00	0.06	0.00	±0.20
19.4	19.0	18.8	19.4	19.0	18.8	0.00	0.00	0.00	±0.20
26.2	25.6	25.3	26.2	25.7	25.4	0.00	0.03	0.03	±0.20
35.0	34.3	33.8	35.2	34.5	34.0	0.05	0.05	0.05	±0.20
47.2	46.3	45.7	47.5	46.5	46.0	0.06	0.04	0.06	±0.20
64.1	62.8	62.0	64.3	63.1	62.3	0.03	0.04	0.04	±0.20
88.0	86.2	85.1	87.7	85.9	84.7	-0.03	-0.03	-0.04	±0.20
115	113	111	115	112	111	0.00	-0.08	0.00	±0.20
158	155	153	158	154	152	0.00	-0.06	-0.06	±0.20
219	214	212	219	214	211	0.00	0.00	-0.04	±0.20
303	297	293	298	292	288	-0.14	-0.15	-0.15	±0.20
446	437	431	441	432	426	-0.10	-0.10	-0.10	±0.20
614	601	593	611	598	590	-0.04	-0.04	-0.04	±0.20
915	895	884	920	899	887	0.05	0.04	0.03	±0.20
1380	1350	1330	1410	1370	1360	0.19	0.13	0.19	±0.30
1880	1840	1810	1930	1890	1860	0.23	0.23	0.24	±0.30
3050	2990	2950	3180	3090	3060	0.36	0.29	0.32	±0.50
3640	3570	3530	3810	3690	3680	0.40	0.29	0.36	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 4

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.400	0.400	0.390	0.410	0.420	0.400	0.21	0.42	0.22	±1.00
0.540	0.540	0.530	0.550	0.550	0.550	0.16	0.16	0.32	±1.00
0.750	0.750	0.730	0.730	0.740	0.740	-0.23	-0.12	0.12	±1.00
0.980	0.970	0.960	0.970	0.980	0.960	-0.09	0.09	0.00	±1.00
1.32	1.32	1.30	1.33	1.33	1.29	0.07	0.07	-0.07	±1.00
1.81	1.81	1.78	1.80	1.81	1.77	-0.05	0.00	-0.05	±1.00
2.42	2.41	2.37	2.42	2.42	2.37	0.00	0.04	0.00	±0.20
3.23	3.21	3.16	3.22	3.23	3.15	-0.03	0.05	-0.03	±0.20
4.38	4.36	4.29	4.38	4.38	4.30	0.00	0.04	0.02	±0.20
5.92	5.90	5.80	5.93	5.90	5.80	0.01	0.00	0.00	±0.20
7.95	7.93	7.80	7.97	7.93	7.80	0.02	0.00	0.00	±0.20
10.6	10.6	10.4	10.6	10.6	10.4	0.00	0.00	0.00	±0.20
14.3	14.3	14.1	14.4	14.4	14.1	0.06	0.06	0.00	±0.20
19.3	19.3	18.9	19.4	19.3	19.0	0.04	0.00	0.05	±0.20
26.1	26.0	25.6	26.2	26.1	25.6	0.03	0.03	0.00	±0.20
34.9	34.7	34.2	35.1	34.9	34.4	0.05	0.05	0.05	±0.20
47.1	46.9	46.1	47.3	47.2	46.4	0.04	0.06	0.06	±0.20
63.8	63.6	62.6	64.1	63.9	62.9	0.04	0.04	0.04	±0.20
87.7	87.4	85.9	87.3	87.0	85.5	-0.04	-0.04	-0.04	±0.20
115	114	112	114	114	112	-0.08	0.00	0.00	±0.20
157	157	154	157	157	154	0.00	0.00	0.00	±0.20
218	217	214	218	217	213	0.00	0.00	-0.04	±0.20
302	301	296	297	296	291	-0.15	-0.15	-0.15	±0.20
445	443	435	439	437	430	-0.12	-0.12	-0.10	±0.20
612	609	599	608	606	596	-0.06	-0.04	-0.04	±0.20
911	908	892	915	912	896	0.04	0.04	0.04	±0.20
1370	1370	1350	1400	1390	1370	0.19	0.13	0.13	±0.30
1870	1860	1830	1920	1920	1880	0.23	0.28	0.23	±0.30
3040	3030	2980	3160	3150	3100	0.34	0.34	0.34	±0.50
3630	3620	3560	3790	3780	3720	0.37	0.38	0.38	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 5

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.400	0.400	0.400	0.410	0.420	0.420	0.21	0.42	0.42	±1.00
0.550	0.550	0.550	0.540	0.550	0.560	-0.16	0.00	0.16	±1.00
0.750	0.760	0.760	0.750	0.750	0.760	0.00	-0.12	0.00	±1.00
0.980	0.990	0.980	0.980	0.980	0.980	0.00	-0.09	0.00	±1.00
1.33	1.33	1.33	1.33	1.35	1.34	0.00	0.13	0.07	±1.00
1.82	1.83	1.83	1.82	1.82	1.84	0.00	-0.05	0.05	±1.00
2.43	2.44	2.44	2.42	2.44	2.45	-0.04	0.00	0.04	±0.20
3.25	3.26	3.25	3.24	3.26	3.26	-0.03	0.00	0.03	±0.20
4.40	4.42	4.41	4.40	4.41	4.42	0.00	-0.02	0.02	±0.20
5.96	5.98	5.97	5.96	5.98	5.98	0.00	0.00	0.01	±0.20
7.99	8.04	8.02	8.01	8.07	8.06	0.02	0.03	0.04	±0.20
10.7	10.7	10.7	10.7	10.8	10.8	0.00	0.08	0.08	±0.20
14.4	14.5	14.4	14.4	14.6	14.5	0.00	0.06	0.06	±0.20
19.4	19.5	19.5	19.5	19.6	19.5	0.04	0.04	0.00	±0.20
26.2	26.4	26.3	26.3	26.5	26.4	0.03	0.03	0.03	±0.20
35.0	35.2	35.1	35.3	35.4	35.4	0.07	0.05	0.07	±0.20
47.3	47.6	47.5	47.6	47.8	47.7	0.05	0.04	0.04	±0.20
64.2	64.5	64.4	64.5	64.8	64.7	0.04	0.04	0.04	±0.20
88.1	88.6	88.4	87.8	88.3	88.0	-0.03	-0.03	-0.04	±0.20
115	116	116	115	115	115	0.00	-0.08	-0.08	±0.20
158	159	159	158	159	158	0.00	0.00	-0.05	±0.20
219	220	220	219	220	220	0.00	0.00	0.00	±0.20
303	305	304	298	300	299	-0.14	-0.14	-0.14	±0.20
447	449	448	441	444	442	-0.12	-0.10	-0.12	±0.20
615	618	616	611	615	613	-0.06	-0.04	-0.04	±0.20
916	920	918	920	925	922	0.04	0.05	0.04	±0.20
1380	1390	1380	1410	1410	1410	0.19	0.12	0.19	±0.30
1880	1890	1880	1930	1940	1940	0.23	0.23	0.27	±0.30
3060	3070	3060	3180	3200	3180	0.33	0.36	0.33	±0.50
3650	3670	3660	3810	3830	3820	0.37	0.37	0.37	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 6

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.410	0.400	0.400	0.410	0.410	0.420	0.00	0.21	0.42	±1.00
0.560	0.540	0.550	0.560	0.560	0.540	0.00	0.32	-0.16	±1.00
0.770	0.750	0.750	0.780	0.770	0.750	0.11	0.23	0.00	±1.00
1.01	0.980	0.980	1.02	1.00	0.990	0.09	0.18	0.09	±1.00
1.36	1.32	1.33	1.36	1.34	1.32	0.00	0.13	-0.07	±1.00
1.87	1.82	1.82	1.87	1.81	1.84	0.00	-0.05	0.09	±1.00
2.49	2.42	2.43	2.49	2.42	2.46	0.00	0.00	0.11	±0.20
3.32	3.23	3.24	3.33	3.24	3.27	0.03	0.03	0.08	±0.20
4.51	4.38	4.40	4.50	4.37	4.42	-0.02	-0.02	0.04	±0.20
6.10	5.93	5.95	6.09	5.92	5.96	-0.01	-0.01	0.01	±0.20
8.18	7.96	7.99	8.18	7.96	8.04	0.00	0.00	0.05	±0.20
10.9	10.6	10.7	10.9	10.6	10.7	0.00	0.00	0.00	±0.20
14.8	14.3	14.4	14.8	14.4	14.5	0.00	0.06	0.06	±0.20
19.9	19.4	19.4	19.9	19.4	19.5	0.00	0.00	0.04	±0.20
26.8	26.1	26.2	26.9	26.2	26.3	0.03	0.03	0.03	±0.20
35.9	34.9	35.0	36.1	35.1	35.2	0.05	0.05	0.05	±0.20
48.4	47.1	47.3	48.7	47.4	47.6	0.05	0.06	0.05	±0.20
65.7	63.9	64.2	66.0	64.2	64.4	0.04	0.04	0.03	±0.20
90.2	87.8	88.1	89.9	87.5	87.7	-0.03	-0.03	-0.04	±0.20
118	115	115	118	114	115	0.00	-0.08	0.00	±0.20
162	158	158	162	157	158	0.00	-0.06	0.00	±0.20
224	218	219	224	218	219	0.00	0.00	0.00	±0.20
311	302	303	305	297	298	-0.17	-0.15	-0.14	±0.20
458	445	446	452	440	441	-0.11	-0.10	-0.10	±0.20
630	612	614	626	609	611	-0.06	-0.04	-0.04	±0.20
938	912	915	942	916	918	0.04	0.04	0.03	±0.20
1410	1380	1380	1440	1400	1400	0.18	0.12	0.12	±0.30
1920	1870	1870	1980	1930	1930	0.27	0.27	0.27	±0.30
3130	3050	3060	3260	3170	3170	0.35	0.34	0.31	±0.50
3730	3630	3650	3900	3790	3810	0.39	0.37	0.37	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0 A/m
- ±0.2dB for applied H-fields ≥ 2.0 A/m and < 1000 A/m
- ±0.3dB for applied H-fields ≥ 1000 A/m and < 2000 A/m
- ±0.4dB for applied H-fields ≥ 2000 A/m and < 3000 A/m
- ±0.5dB for applied H-fields ≥ 3000 A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, H-field, Channel 7

H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
x	y	z	x	y	z	x	y	z	
0.410	0.400	0.390	0.400	0.420	0.370	-0.21	0.42	-0.46	±1.00
0.560	0.540	0.520	0.540	0.560	0.510	-0.32	0.32	-0.17	±1.00
0.770	0.750	0.720	0.760	0.750	0.710	-0.11	0.00	-0.12	±1.00
1.00	0.980	0.940	1.00	0.960	0.950	0.00	-0.18	0.09	±1.00
1.35	1.32	1.27	1.35	1.31	1.28	0.00	-0.07	0.07	±1.00
1.85	1.81	1.75	1.84	1.82	1.76	-0.05	0.05	0.05	±1.00
2.47	2.42	2.33	2.47	2.42	2.35	0.00	0.00	0.07	±0.20
3.30	3.23	3.11	3.28	3.24	3.11	-0.05	0.03	0.00	±0.20
4.48	4.38	4.22	4.47	4.40	4.24	-0.02	0.04	0.04	±0.20
6.05	5.92	5.70	6.05	5.95	5.72	0.00	0.04	0.03	±0.20
8.12	7.96	7.66	8.14	7.98	7.68	0.02	0.02	0.02	±0.20
10.8	10.6	10.2	10.8	10.7	10.2	0.00	0.08	0.00	±0.20
14.7	14.3	13.8	14.7	14.4	13.8	0.00	0.06	0.00	±0.20
19.8	19.3	18.6	19.8	19.4	18.7	0.00	0.04	0.05	±0.20
26.6	26.1	25.1	26.7	26.1	25.2	0.03	0.00	0.03	±0.20
35.6	34.9	33.6	35.8	35.0	33.8	0.05	0.02	0.05	±0.20
48.1	47.1	45.4	48.4	47.3	45.6	0.05	0.04	0.04	±0.20
65.2	63.9	61.6	65.5	64.2	61.8	0.04	0.04	0.03	±0.20
89.6	87.7	84.5	89.2	87.4	84.1	-0.04	-0.03	-0.04	±0.20
117	115	110	117	114	110	0.00	-0.08	0.00	±0.20
161	158	152	161	157	151	0.00	-0.06	-0.06	±0.20
223	218	210	223	218	210	0.00	0.00	0.00	±0.20
308	302	291	303	297	286	-0.14	-0.15	-0.15	±0.20
454	445	428	449	440	423	-0.10	-0.10	-0.10	±0.20
625	612	589	621	609	585	-0.06	-0.04	-0.06	±0.20
931	911	877	936	916	880	0.05	0.05	0.03	±0.20
1400	1370	1320	1430	1400	1350	0.18	0.19	0.20	±0.30
1910	1870	1800	1970	1930	1850	0.27	0.27	0.24	±0.30
3110	3040	2930	3230	3160	3040	0.33	0.34	0.32	±0.50
3710	3630	3500	3880	3790	3650	0.39	0.37	0.36	±0.50

SPEAG H-field linearity tolerance criteria¹:

- ±1.0dB for applied H-fields < 2.0A/m
- ±0.2dB for applied H-fields ≥ 2.0A/m and < 1000A/m
- ±0.3dB for applied H-fields ≥ 1000A/m and < 2000A/m
- ±0.4dB for applied H-fields ≥ 2000A/m and < 3000A/m
- ±0.5dB for applied H-fields ≥ 3000A/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Dynamic Range, E-field, Channel 0

E-field/(V/m) Applied			E-field/(V/m) Reading			Difference/(dB)			Tolerance/(dB)		
x	y	z	x	y	z	x	y	z	x	y	z
0.350	0.210	0.080	0.340	0.220	0.110	-0.25	0.40	2.77	±5.00	±5.00	±5.00
0.470	0.290	0.110	0.490	0.300	0.120	0.36	0.29	0.76	±5.00	±5.00	±5.00
0.650	0.400	0.150	0.640	0.400	0.150	-0.13	0.00	0.00	±5.00	±5.00	±5.00
0.850	0.520	0.200	0.860	0.520	0.180	0.10	0.00	-0.92	±5.00	±5.00	±5.00
1.15	0.710	0.270	1.15	0.710	0.270	0.00	0.00	0.00	±5.00	±5.00	±5.00
1.58	0.970	0.370	1.57	0.960	0.380	-0.06	-0.09	0.23	±5.00	±5.00	±5.00
2.10	1.29	0.490	2.11	1.29	0.480	0.04	0.00	-0.18	±1.00	±5.00	±5.00
2.80	1.73	0.660	2.81	1.71	0.660	0.03	-0.10	0.00	±1.00	±5.00	±5.00
3.81	2.34	0.900	3.80	2.32	0.880	-0.02	-0.07	-0.20	±1.00	±1.00	±5.00
5.14	3.17	1.21	5.17	3.15	1.18	0.05	-0.05	-0.22	±1.00	±1.00	±5.00
6.91	4.26	1.63	6.94	4.24	1.58	0.04	-0.04	-0.27	±1.00	±1.00	±5.00
9.23	5.68	2.17	9.25	5.65	2.13	0.02	-0.05	-0.16	±1.00	±1.00	±1.00
12.5	7.67	2.93	12.5	7.65	2.86	0.00	-0.02	-0.21	±1.00	±1.00	±1.00
16.8	10.3	3.95	16.9	10.3	3.86	0.05	0.00	-0.20	±1.00	±1.00	±1.00
22.7	14.0	5.33	22.8	13.9	5.23	0.04	-0.06	-0.16	±1.00	±1.00	±1.00
30.3	18.6	7.13	30.5	18.7	6.98	0.06	0.05	-0.18	±1.00	±1.00	±1.00
40.9	25.2	9.63	41.2	25.2	9.49	0.06	0.00	-0.13	±1.00	±1.00	±1.00
55.5	34.2	13.1	55.9	34.1	12.8	0.06	-0.03	-0.20	±1.00	±1.00	±1.00
76.2	46.9	17.9	76.1	46.5	17.5	-0.01	-0.07	-0.20	±1.00	±1.00	±1.00
99.7	61.4	23.5	99.5	60.9	22.9	-0.02	-0.07	-0.22	±1.00	±1.00	±1.00
137	84.3	32.2	137	83.8	31.5	0.00	-0.05	-0.19	±1.00	±1.00	±1.00
189	117	44.6	190	116	43.7	0.05	-0.07	-0.18	±1.00	±1.00	±1.00
262	162	61.7	265	162	61.0	0.10	0.00	-0.10	±1.00	±1.00	±1.00
386	238	90.9	374	228	90.3	-0.27	-0.37	-0.06	±1.00	±1.00	±1.00
532	327	125	517	316	125	-0.25	-0.30	0.00	±1.00	±1.00	±1.00
792	487	186	779	476	188	-0.14	-0.20	0.09	±1.00	±1.00	±1.00
1190	735	281	1190	730	288	0.00	-0.06	0.21	±1.00	±1.00	±1.00
1620	1000	382	1640	1000	397	0.11	0.00	0.33	±1.00	±1.00	±1.00
2640	1630	622	2700	1650	623	0.20	0.11	0.01	±1.00	±1.00	±1.00
3150	1940	742	3230	1980	748	0.22	0.18	0.07	±1.00	±1.00	±1.00

SPEAG E-field linearity tolerance criteria¹:

- ±5.0dB for applied E-field < 2V/m
- ±1.0dB for applied E-field ≥ 2V/m

¹Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response

Frequency Response, H-field, Channel 0

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.54	1.54	1.55	0.00	0.00	0.06	±0.3
3200	1.54	1.54	1.54	1.54	1.52	1.54	0.00	-0.11	0.00	±0.3
4000	1.53	1.53	1.53	1.53	1.53	1.53	0.00	0.00	0.00	±0.3
5200	1.52	1.52	1.52	1.53	1.52	1.52	0.06	0.00	0.00	±0.3
6600	1.51	1.51	1.51	1.51	1.51	1.50	0.00	0.00	-0.06	±0.3
8200	1.50	1.50	1.50	1.51	1.50	1.50	0.06	0.00	0.00	±0.3
9000	1.49	1.49	1.49	1.49	1.49	1.49	0.00	0.00	0.00	±0.3
10600	4.29	4.18	4.28	4.29	4.30	4.25	0.00	0.25	-0.06	±0.3
13400	4.32	4.30	4.29	4.32	4.29	4.30	0.00	-0.02	0.02	±0.3
17000	4.32	4.29	4.29	4.32	4.29	4.30	0.00	0.00	0.02	±0.3
21400	4.34	4.31	4.31	4.34	4.31	4.31	0.00	0.00	0.00	±0.3
27200	4.34	4.31	4.31	4.35	4.31	4.31	0.02	0.00	0.00	±0.3
34400	4.34	4.32	4.32	4.35	4.32	4.32	0.02	0.00	0.00	±0.3
40000	4.33	4.32	4.32	4.34	4.31	4.32	0.02	-0.02	0.00	±0.3
43600	4.32	4.31	4.31	4.33	4.31	4.31	0.02	0.00	0.00	±0.3
55400	4.32	4.30	4.30	4.33	4.30	4.30	0.02	0.00	0.00	±0.3
70000	4.30	4.29	4.29	4.32	4.29	4.29	0.04	0.00	0.00	±0.3
88800	4.29	4.27	4.27	4.29	4.28	4.28	0.00	0.02	0.02	±0.3
112400	4.28	4.26	4.26	4.29	4.26	4.26	0.02	0.00	0.00	±0.3
142400	4.26	4.25	4.25	4.27	4.25	4.24	0.02	0.00	-0.02	±0.3
161750	4.24	4.23	4.23	4.24	4.23	4.23	0.00	0.00	0.00	±0.3
180400	4.23	4.22	4.22	4.24	4.22	4.22	0.02	0.00	0.00	±0.3
228400	4.21	4.19	4.19	4.22	4.19	4.18	0.02	0.00	-0.02	±0.3
289400	4.16	4.15	4.15	4.16	4.16	4.16	0.00	0.02	0.02	±0.3
366400	4.13	4.12	4.12	4.14	4.12	4.12	0.02	0.00	0.00	±0.3
400000	4.11	4.10	4.10	4.12	4.10	4.10	0.02	0.00	0.00	±0.3
464000	4.08	4.07	4.07	4.08	4.07	4.07	0.00	0.00	0.00	±0.3
587800	4.04	4.03	4.03	4.04	4.03	4.03	0.00	0.00	0.00	±0.3
744200	3.99	3.98	3.98	4.00	3.98	3.98	0.02	0.00	0.00	±0.3
942600	3.98	3.97	3.97	3.98	3.98	3.98	0.00	0.02	0.02	±0.3
1193600	3.96	3.95	3.95	3.96	3.95	3.95	0.00	0.00	0.00	±0.3
1511600	3.95	3.94	3.94	3.96	3.94	3.94	0.02	0.00	0.00	±0.3
1914400	3.93	3.93	3.93	3.94	3.93	3.93	0.02	0.00	0.00	±0.3
2424400	3.92	3.91	3.91	3.93	3.91	3.91	0.02	0.00	0.00	±0.3
3070200	3.89	3.89	3.89	3.90	3.88	3.89	0.02	-0.02	0.00	±0.3
3888000	3.84	3.83	3.83	3.85	3.82	3.83	0.02	-0.02	0.00	±0.3
4000000	3.83	3.82	3.82	3.83	3.82	3.83	0.00	0.00	0.02	±0.3
4923800	3.77	3.76	3.76	3.77	3.75	3.77	0.00	-0.02	0.02	±0.3
6235400	3.65	3.65	3.65	3.65	3.65	3.65	0.00	0.00	0.00	±0.3
7896400	3.52	3.51	3.51	3.52	3.51	3.51	0.00	0.00	0.00	±0.3
10000000	3.37	3.36	3.37	3.36	3.38	3.37	-0.03	0.05	0.00	±0.3

SPEAG H-field frequency response tolerance criteria¹:

±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 1

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.54	1.54	1.54	0.00	0.00	0.00	±0.3
3200	1.54	1.54	1.54	1.54	1.53	1.54	0.00	-0.06	0.00	±0.3
4000	1.53	1.53	1.53	1.53	1.53	1.53	0.00	0.00	0.00	±0.3
5200	1.52	1.52	1.52	1.52	1.52	1.52	0.00	0.00	0.00	±0.3
6600	1.51	1.51	1.51	1.50	1.51	1.50	-0.06	0.00	-0.06	±0.3
8200	1.50	1.50	1.50	1.50	1.50	1.50	0.00	0.00	0.00	±0.3
9000	1.49	1.49	1.49	1.49	1.49	1.49	0.00	0.00	0.00	±0.3
10600	4.29	4.18	4.28	4.30	4.27	4.25	0.02	0.19	-0.06	±0.3
13400	4.32	4.30	4.29	4.31	4.28	4.30	-0.02	-0.04	0.02	±0.3
17000	4.32	4.29	4.29	4.33	4.29	4.29	0.02	0.00	0.00	±0.3
21400	4.34	4.31	4.31	4.35	4.31	4.33	0.02	0.00	0.04	±0.3
27200	4.34	4.31	4.31	4.35	4.32	4.30	0.02	0.02	-0.02	±0.3
34400	4.34	4.32	4.32	4.35	4.32	4.32	0.02	0.00	0.00	±0.3
40000	4.33	4.32	4.32	4.35	4.31	4.31	0.04	-0.02	-0.02	±0.3
43600	4.32	4.31	4.31	4.33	4.32	4.31	0.02	0.02	0.00	±0.3
55400	4.32	4.30	4.30	4.33	4.30	4.30	0.02	0.00	0.00	±0.3
70000	4.30	4.29	4.29	4.31	4.29	4.29	0.02	0.00	0.00	±0.3
88800	4.29	4.27	4.27	4.30	4.27	4.28	0.02	0.00	0.02	±0.3
112400	4.28	4.26	4.26	4.29	4.26	4.26	0.02	0.00	0.00	±0.3
142400	4.26	4.25	4.25	4.27	4.25	4.25	0.02	0.00	0.00	±0.3
161750	4.24	4.23	4.23	4.25	4.23	4.23	0.02	0.00	0.00	±0.3
180400	4.23	4.22	4.22	4.24	4.22	4.23	0.02	0.00	0.02	±0.3
228400	4.21	4.19	4.19	4.22	4.19	4.19	0.02	0.00	0.00	±0.3
289400	4.16	4.15	4.15	4.18	4.16	4.15	0.04	0.02	0.00	±0.3
366400	4.13	4.12	4.12	4.14	4.12	4.12	0.02	0.00	0.00	±0.3
400000	4.11	4.10	4.10	4.12	4.10	4.10	0.02	0.00	0.00	±0.3
464000	4.08	4.07	4.07	4.09	4.07	4.08	0.02	0.00	0.02	±0.3
587800	4.04	4.03	4.03	4.04	4.03	4.03	0.00	0.00	0.00	±0.3
744200	3.99	3.98	3.98	4.00	3.99	3.98	0.02	0.02	0.00	±0.3
942600	3.98	3.97	3.97	3.99	3.98	3.98	0.02	0.02	0.02	±0.3
1193600	3.96	3.95	3.95	3.96	3.95	3.95	0.00	0.00	0.00	±0.3
1511600	3.95	3.94	3.94	3.96	3.94	3.94	0.02	0.00	0.00	±0.3
1914400	3.93	3.93	3.93	3.94	3.93	3.93	0.02	0.00	0.00	±0.3
2424400	3.92	3.91	3.91	3.93	3.91	3.91	0.02	0.00	0.00	±0.3
3070200	3.89	3.89	3.89	3.90	3.88	3.89	0.02	-0.02	0.00	±0.3
3888000	3.84	3.83	3.83	3.85	3.83	3.83	0.02	0.00	0.00	±0.3
4000000	3.83	3.82	3.82	3.83	3.82	3.82	0.00	0.00	0.00	±0.3
4923800	3.77	3.76	3.76	3.77	3.76	3.76	0.00	0.00	0.00	±0.3
6235400	3.65	3.65	3.65	3.66	3.65	3.65	0.02	0.00	0.00	±0.3
7896400	3.52	3.51	3.51	3.52	3.51	3.51	0.00	0.00	0.00	±0.3
10000000	3.37	3.36	3.37	3.37	3.36	3.37	0.00	0.00	0.00	±0.3

SPEAG H-field frequency response tolerance criteria¹:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 2

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.55	1.54	0.06	0.06	0.00	±0.3
3200	1.54	1.54	1.54	1.55	1.52	1.54	0.06	-0.11	0.00	±0.3
4000	1.53	1.53	1.53	1.53	1.53	1.53	0.00	0.00	0.00	±0.3
5200	1.52	1.52	1.52	1.53	1.52	1.52	0.06	0.00	0.00	±0.3
6600	1.51	1.51	1.51	1.50	1.50	1.50	-0.06	-0.06	-0.06	±0.3
8200	1.50	1.50	1.50	1.51	1.50	1.51	0.06	0.00	0.06	±0.3
9000	1.49	1.49	1.49	1.50	1.49	1.49	0.06	0.00	0.00	±0.3
10600	4.29	4.18	4.28	4.27	4.28	4.23	-0.04	0.21	-0.10	±0.3
13400	4.32	4.30	4.29	4.32	4.30	4.28	0.00	0.00	-0.02	±0.3
17000	4.32	4.29	4.29	4.33	4.30	4.30	0.02	0.02	0.02	±0.3
21400	4.34	4.31	4.31	4.37	4.32	4.31	0.06	0.02	0.00	±0.3
27200	4.34	4.31	4.31	4.34	4.31	4.31	0.00	0.00	0.00	±0.3
34400	4.34	4.32	4.32	4.35	4.32	4.33	0.02	0.00	0.02	±0.3
40000	4.33	4.32	4.32	4.34	4.31	4.32	0.02	-0.02	0.00	±0.3
43600	4.32	4.31	4.31	4.33	4.30	4.30	0.02	-0.02	-0.02	±0.3
55400	4.32	4.30	4.30	4.32	4.30	4.30	0.00	0.00	0.00	±0.3
70000	4.30	4.29	4.29	4.31	4.29	4.29	0.02	0.00	0.00	±0.3
88800	4.29	4.27	4.27	4.30	4.28	4.27	0.02	0.02	0.00	±0.3
112400	4.28	4.26	4.26	4.29	4.26	4.26	0.02	0.00	0.00	±0.3
142400	4.26	4.25	4.25	4.26	4.25	4.25	0.00	0.00	0.00	±0.3
161750	4.24	4.23	4.23	4.25	4.23	4.23	0.02	0.00	0.00	±0.3
180400	4.23	4.22	4.22	4.24	4.22	4.22	0.02	0.00	0.00	±0.3
228400	4.21	4.19	4.19	4.21	4.19	4.19	0.00	0.00	0.00	±0.3
289400	4.16	4.15	4.15	4.17	4.16	4.15	0.02	0.02	0.00	±0.3
366400	4.13	4.12	4.12	4.14	4.12	4.12	0.02	0.00	0.00	±0.3
400000	4.11	4.10	4.10	4.12	4.10	4.10	0.02	0.00	0.00	±0.3
464000	4.08	4.07	4.07	4.09	4.07	4.07	0.02	0.00	0.00	±0.3
587800	4.04	4.03	4.03	4.04	4.03	4.03	0.00	0.00	0.00	±0.3
744200	3.99	3.98	3.98	4.00	3.98	3.98	0.02	0.00	0.00	±0.3
942600	3.98	3.97	3.97	3.98	3.98	3.98	0.00	0.02	0.02	±0.3
1193600	3.96	3.95	3.95	3.96	3.95	3.95	0.00	0.00	0.00	±0.3
1511600	3.95	3.94	3.94	3.96	3.95	3.94	0.02	0.02	0.00	±0.3
1914400	3.93	3.93	3.93	3.94	3.93	3.93	0.02	0.00	0.00	±0.3
2424400	3.92	3.91	3.91	3.92	3.91	3.91	0.00	0.00	0.00	±0.3
3070200	3.89	3.89	3.89	3.90	3.88	3.89	0.02	-0.02	0.00	±0.3
3888000	3.84	3.83	3.83	3.85	3.83	3.83	0.02	0.00	0.00	±0.3
4000000	3.83	3.82	3.82	3.83	3.82	3.82	0.00	0.00	0.00	±0.3
4923800	3.77	3.76	3.76	3.77	3.76	3.76	0.00	0.00	0.00	±0.3
6235400	3.65	3.65	3.65	3.65	3.65	3.65	0.00	0.00	0.00	±0.3
7896400	3.52	3.51	3.51	3.52	3.51	3.51	0.00	0.00	0.00	±0.3
10000000	3.37	3.36	3.37	3.38	3.35	3.37	0.03	-0.03	0.00	±0.3

SPEAG H-field frequency response tolerance criteria¹:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹ Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 3

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.54	1.55	1.55	0.00	0.06	0.06	±0.3
3200	1.54	1.54	1.54	1.54	1.53	1.54	0.00	-0.06	0.00	±0.3
4000	1.53	1.53	1.53	1.53	1.53	1.53	0.00	0.00	0.00	±0.3
5200	1.52	1.52	1.52	1.52	1.52	1.52	0.00	0.00	0.00	±0.3
6600	1.51	1.51	1.51	1.51	1.51	1.50	0.00	0.00	-0.06	±0.3
8200	1.50	1.50	1.50	1.51	1.50	1.50	0.06	0.00	0.00	±0.3
9000	1.49	1.49	1.49	1.49	1.49	1.50	0.00	0.00	0.06	±0.3
10600	4.29	4.18	4.28	4.28	4.26	4.26	-0.02	0.16	-0.04	±0.3
13400	4.32	4.30	4.29	4.31	4.29	4.31	-0.02	-0.02	0.04	±0.3
17000	4.32	4.29	4.29	4.32	4.29	4.30	0.00	0.00	0.02	±0.3
21400	4.34	4.31	4.31	4.36	4.31	4.31	0.04	0.00	0.00	±0.3
27200	4.34	4.31	4.31	4.34	4.31	4.31	0.00	0.00	0.00	±0.3
34400	4.34	4.32	4.32	4.35	4.32	4.32	0.02	0.00	0.00	±0.3
40000	4.33	4.32	4.32	4.34	4.31	4.32	0.02	-0.02	0.00	±0.3
43600	4.32	4.31	4.31	4.33	4.31	4.32	0.02	0.00	0.02	±0.3
55400	4.32	4.30	4.30	4.33	4.30	4.31	0.02	0.00	0.02	±0.3
70000	4.30	4.29	4.29	4.31	4.29	4.29	0.02	0.00	0.00	±0.3
88800	4.29	4.27	4.27	4.30	4.28	4.29	0.02	0.02	0.04	±0.3
112400	4.28	4.26	4.26	4.30	4.27	4.27	0.04	0.02	0.02	±0.3
142400	4.26	4.25	4.25	4.28	4.25	4.25	0.04	0.00	0.00	±0.3
161750	4.24	4.23	4.23	4.25	4.23	4.24	0.02	0.00	0.02	±0.3
180400	4.23	4.22	4.22	4.24	4.22	4.23	0.02	0.00	0.02	±0.3
228400	4.21	4.19	4.19	4.22	4.18	4.20	0.02	-0.02	0.02	±0.3
289400	4.16	4.15	4.15	4.18	4.15	4.16	0.04	0.00	0.02	±0.3
366400	4.13	4.12	4.12	4.14	4.12	4.13	0.02	0.00	0.02	±0.3
400000	4.11	4.10	4.10	4.12	4.10	4.11	0.02	0.00	0.02	±0.3
464000	4.08	4.07	4.07	4.10	4.07	4.08	0.04	0.00	0.02	±0.3
587800	4.04	4.03	4.03	4.04	4.03	4.04	0.00	0.00	0.02	±0.3
744200	3.99	3.98	3.98	4.00	3.99	3.99	0.02	0.02	0.02	±0.3
942600	3.98	3.97	3.97	3.98	3.97	3.98	0.00	0.00	0.02	±0.3
1193600	3.96	3.95	3.95	3.96	3.95	3.96	0.00	0.00	0.02	±0.3
1511600	3.95	3.94	3.94	3.96	3.95	3.94	0.02	0.02	0.00	±0.3
1914400	3.93	3.93	3.93	3.94	3.93	3.94	0.02	0.00	0.02	±0.3
2424400	3.92	3.91	3.91	3.92	3.91	3.92	0.00	0.00	0.02	±0.3
3070200	3.89	3.89	3.89	3.90	3.88	3.89	0.02	-0.02	0.00	±0.3
3888000	3.84	3.83	3.83	3.84	3.83	3.83	0.00	0.00	0.00	±0.3
4000000	3.83	3.82	3.82	3.84	3.82	3.83	0.02	0.00	0.02	±0.3
4923800	3.77	3.76	3.76	3.77	3.76	3.77	0.00	0.00	0.02	±0.3
6235400	3.65	3.65	3.65	3.66	3.63	3.66	0.02	-0.05	0.02	±0.3
7896400	3.52	3.51	3.51	3.52	3.51	3.52	0.00	0.00	0.02	±0.3
10000000	3.37	3.36	3.37	3.37	3.36	3.37	0.00	0.00	0.00	±0.3

SPEAG H-field frequency response tolerance criteria¹:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹ Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 4

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.54	1.54	1.54	0.00	0.00	0.00	±0.3
3200	1.54	1.54	1.54	1.54	1.53	1.53	0.00	-0.06	-0.06	±0.3
4000	1.53	1.53	1.53	1.54	1.53	1.53	0.06	0.00	0.00	±0.3
5200	1.52	1.52	1.52	1.53	1.52	1.51	0.06	0.00	-0.06	±0.3
6600	1.51	1.51	1.51	1.51	1.51	1.50	0.00	0.00	-0.06	±0.3
8200	1.50	1.50	1.50	1.50	1.51	1.50	0.00	0.06	0.00	±0.3
9000	1.49	1.49	1.49	1.49	1.49	1.49	0.00	0.00	0.00	±0.3
10600	4.29	4.18	4.28	4.30	4.28	4.25	0.02	0.21	-0.06	±0.3
13400	4.32	4.30	4.29	4.32	4.30	4.29	0.00	0.00	0.00	±0.3
17000	4.32	4.29	4.29	4.33	4.29	4.29	0.02	0.00	0.00	±0.3
21400	4.34	4.31	4.31	4.34	4.32	4.33	0.00	0.02	0.04	±0.3
27200	4.34	4.31	4.31	4.35	4.30	4.30	0.02	-0.02	-0.02	±0.3
34400	4.34	4.32	4.32	4.35	4.32	4.32	0.02	0.00	0.00	±0.3
40000	4.33	4.32	4.32	4.34	4.31	4.32	0.02	-0.02	0.00	±0.3
43600	4.32	4.31	4.31	4.33	4.31	4.30	0.02	0.00	-0.02	±0.3
55400	4.32	4.30	4.30	4.33	4.30	4.30	0.02	0.00	0.00	±0.3
70000	4.30	4.29	4.29	4.32	4.29	4.29	0.04	0.00	0.00	±0.3
88800	4.29	4.27	4.27	4.30	4.27	4.28	0.02	0.00	0.02	±0.3
112400	4.28	4.26	4.26	4.29	4.26	4.27	0.02	0.00	0.02	±0.3
142400	4.26	4.25	4.25	4.27	4.25	4.25	0.02	0.00	0.00	±0.3
161750	4.24	4.23	4.23	4.25	4.23	4.23	0.02	0.00	0.00	±0.3
180400	4.23	4.22	4.22	4.24	4.22	4.22	0.02	0.00	0.00	±0.3
228400	4.21	4.19	4.19	4.22	4.19	4.19	0.02	0.00	0.00	±0.3
289400	4.16	4.15	4.15	4.18	4.16	4.15	0.04	0.02	0.00	±0.3
366400	4.13	4.12	4.12	4.13	4.12	4.12	0.00	0.00	0.00	±0.3
400000	4.11	4.10	4.10	4.12	4.10	4.10	0.02	0.00	0.00	±0.3
464000	4.08	4.07	4.07	4.09	4.07	4.07	0.02	0.00	0.00	±0.3
587800	4.04	4.03	4.03	4.04	4.03	4.03	0.00	0.00	0.00	±0.3
744200	3.99	3.98	3.98	4.00	3.99	3.98	0.02	0.02	0.00	±0.3
942600	3.98	3.97	3.97	3.99	3.98	3.98	0.02	0.02	0.02	±0.3
1193600	3.96	3.95	3.95	3.96	3.95	3.95	0.00	0.00	0.00	±0.3
1511600	3.95	3.94	3.94	3.96	3.95	3.94	0.02	0.02	0.00	±0.3
1914400	3.93	3.93	3.93	3.94	3.93	3.93	0.02	0.00	0.00	±0.3
2424400	3.92	3.91	3.91	3.92	3.91	3.91	0.00	0.00	0.00	±0.3
3070200	3.89	3.89	3.89	3.90	3.88	3.88	0.02	-0.02	-0.02	±0.3
3888000	3.84	3.83	3.83	3.84	3.83	3.83	0.00	0.00	0.00	±0.3
4000000	3.83	3.82	3.82	3.83	3.81	3.83	0.00	-0.02	0.02	±0.3
4923800	3.77	3.76	3.76	3.77	3.76	3.76	0.00	0.00	0.00	±0.3
6235400	3.65	3.65	3.65	3.66	3.65	3.65	0.02	0.00	0.00	±0.3
7896400	3.52	3.51	3.51	3.51	3.51	3.51	-0.02	0.00	0.00	±0.3
10000000	3.37	3.36	3.37	3.37	3.35	3.37	0.00	-0.03	0.00	±0.3

SPEAG H-field frequency response tolerance criteria¹:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 5

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.54	1.54	1.54	0.00	0.00	0.00	±0.3
3200	1.54	1.54	1.54	1.54	1.52	1.54	0.00	-0.11	0.00	±0.3
4000	1.53	1.53	1.53	1.54	1.52	1.53	0.06	-0.06	0.00	±0.3
5200	1.52	1.52	1.52	1.53	1.53	1.52	0.06	0.06	0.00	±0.3
6600	1.51	1.51	1.51	1.51	1.50	1.50	0.00	-0.06	-0.06	±0.3
8200	1.50	1.50	1.50	1.50	1.50	1.50	0.00	0.00	0.00	±0.3
9000	1.49	1.49	1.49	1.49	1.49	1.49	0.00	0.00	0.00	±0.3
10600	4.29	4.18	4.28	4.31	4.28	4.25	0.04	0.21	-0.06	±0.3
13400	4.32	4.30	4.29	4.33	4.30	4.32	0.02	0.00	0.06	±0.3
17000	4.32	4.29	4.29	4.32	4.29	4.30	0.00	0.00	0.02	±0.3
21400	4.34	4.31	4.31	4.36	4.33	4.31	0.04	0.04	0.00	±0.3
27200	4.34	4.31	4.31	4.36	4.31	4.30	0.04	0.00	-0.02	±0.3
34400	4.34	4.32	4.32	4.35	4.32	4.33	0.02	0.00	0.02	±0.3
40000	4.33	4.32	4.32	4.35	4.32	4.32	0.04	0.00	0.00	±0.3
43600	4.32	4.31	4.31	4.33	4.32	4.31	0.02	0.02	0.00	±0.3
55400	4.32	4.30	4.30	4.32	4.30	4.31	0.00	0.00	0.02	±0.3
70000	4.30	4.29	4.29	4.31	4.29	4.29	0.02	0.00	0.00	±0.3
88800	4.29	4.27	4.27	4.31	4.28	4.28	0.04	0.02	0.02	±0.3
112400	4.28	4.26	4.26	4.29	4.27	4.27	0.02	0.02	0.02	±0.3
142400	4.26	4.25	4.25	4.27	4.25	4.25	0.02	0.00	0.00	±0.3
161750	4.24	4.23	4.23	4.26	4.23	4.24	0.04	0.00	0.02	±0.3
180400	4.23	4.22	4.22	4.24	4.22	4.22	0.02	0.00	0.00	±0.3
228400	4.21	4.19	4.19	4.21	4.19	4.19	0.00	0.00	0.00	±0.3
289400	4.16	4.15	4.15	4.18	4.16	4.16	0.04	0.02	0.02	±0.3
366400	4.13	4.12	4.12	4.14	4.12	4.12	0.02	0.00	0.00	±0.3
400000	4.11	4.10	4.10	4.12	4.11	4.10	0.02	0.02	0.00	±0.3
464000	4.08	4.07	4.07	4.10	4.07	4.07	0.04	0.00	0.00	±0.3
587800	4.04	4.03	4.03	4.04	4.03	4.03	0.00	0.00	0.00	±0.3
744200	3.99	3.98	3.98	4.00	3.99	3.98	0.02	0.02	0.00	±0.3
942600	3.98	3.97	3.97	3.99	3.98	3.98	0.02	0.02	0.02	±0.3
1193600	3.96	3.95	3.95	3.96	3.95	3.95	0.00	0.00	0.00	±0.3
1511600	3.95	3.94	3.94	3.96	3.94	3.94	0.02	0.00	0.00	±0.3
1914400	3.93	3.93	3.93	3.94	3.93	3.93	0.02	0.00	0.00	±0.3
2424400	3.92	3.91	3.91	3.93	3.90	3.91	0.02	-0.02	0.00	±0.3
3070200	3.89	3.89	3.89	3.90	3.89	3.89	0.02	0.00	0.00	±0.3
3888000	3.84	3.83	3.83	3.84	3.83	3.83	0.00	0.00	0.00	±0.3
4000000	3.83	3.82	3.82	3.83	3.82	3.82	0.00	0.00	0.00	±0.3
4923800	3.77	3.76	3.76	3.77	3.76	3.76	0.00	0.00	0.00	±0.3
6235400	3.65	3.65	3.65	3.66	3.65	3.65	0.02	0.00	0.00	±0.3
7896400	3.52	3.51	3.51	3.51	3.51	3.52	-0.02	0.00	0.02	±0.3
10000000	3.37	3.36	3.37	3.37	3.36	3.37	0.00	0.00	0.00	±0.3

SPEAG H-field frequency response tolerance criteria¹:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 6

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.55	1.55	1.55	0.06	0.06	0.06	±0.3
3200	1.54	1.54	1.54	1.54	1.53	1.55	0.00	-0.06	0.06	±0.3
4000	1.53	1.53	1.53	1.53	1.53	1.54	0.00	0.00	0.06	±0.3
5200	1.52	1.52	1.52	1.53	1.52	1.51	0.06	0.00	-0.06	±0.3
6600	1.51	1.51	1.51	1.51	1.51	1.50	0.00	0.00	-0.06	±0.3
8200	1.50	1.50	1.50	1.51	1.50	1.50	0.06	0.00	0.00	±0.3
9000	1.49	1.49	1.49	1.49	1.49	1.50	0.00	0.00	0.06	±0.3
10600	4.29	4.18	4.28	4.30	4.27	4.25	0.02	0.19	-0.06	±0.3
13400	4.32	4.30	4.29	4.33	4.29	4.30	0.02	-0.02	0.02	±0.3
17000	4.32	4.29	4.29	4.34	4.30	4.29	0.04	0.02	0.00	±0.3
21400	4.34	4.31	4.31	4.34	4.33	4.32	0.00	0.04	0.02	±0.3
27200	4.34	4.31	4.31	4.36	4.30	4.31	0.04	-0.02	0.00	±0.3
34400	4.34	4.32	4.32	4.36	4.31	4.33	0.04	-0.02	0.02	±0.3
40000	4.33	4.32	4.32	4.35	4.31	4.33	0.04	-0.02	0.02	±0.3
43600	4.32	4.31	4.31	4.35	4.30	4.31	0.06	-0.02	0.00	±0.3
55400	4.32	4.30	4.30	4.33	4.30	4.31	0.02	0.00	0.02	±0.3
70000	4.30	4.29	4.29	4.32	4.29	4.30	0.04	0.00	0.02	±0.3
88800	4.29	4.27	4.27	4.30	4.27	4.28	0.02	0.00	0.02	±0.3
112400	4.28	4.26	4.26	4.30	4.26	4.27	0.04	0.00	0.02	±0.3
142400	4.26	4.25	4.25	4.27	4.25	4.26	0.02	0.00	0.02	±0.3
161750	4.24	4.23	4.23	4.26	4.23	4.24	0.04	0.00	0.02	±0.3
180400	4.23	4.22	4.22	4.25	4.22	4.23	0.04	0.00	0.02	±0.3
228400	4.21	4.19	4.19	4.22	4.18	4.20	0.02	-0.02	0.02	±0.3
289400	4.16	4.15	4.15	4.18	4.15	4.16	0.04	0.00	0.02	±0.3
366400	4.13	4.12	4.12	4.14	4.12	4.12	0.02	0.00	0.00	±0.3
400000	4.11	4.10	4.10	4.13	4.10	4.11	0.04	0.00	0.02	±0.3
464000	4.08	4.07	4.07	4.10	4.07	4.08	0.04	0.00	0.02	±0.3
587800	4.04	4.03	4.03	4.05	4.03	4.04	0.02	0.00	0.02	±0.3
744200	3.99	3.98	3.98	4.00	3.97	3.99	0.02	-0.02	0.02	±0.3
942600	3.98	3.97	3.97	4.00	3.97	3.98	0.04	0.00	0.02	±0.3
1193600	3.96	3.95	3.95	3.97	3.95	3.95	0.02	0.00	0.00	±0.3
1511600	3.95	3.94	3.94	3.96	3.94	3.95	0.02	0.00	0.02	±0.3
1914400	3.93	3.93	3.93	3.95	3.92	3.93	0.04	-0.02	0.00	±0.3
2424400	3.92	3.91	3.91	3.93	3.90	3.92	0.02	-0.02	0.02	±0.3
3070200	3.89	3.89	3.89	3.90	3.88	3.90	0.02	-0.02	0.02	±0.3
3888000	3.84	3.83	3.83	3.85	3.83	3.83	0.02	0.00	0.00	±0.3
4000000	3.83	3.82	3.82	3.84	3.82	3.83	0.02	0.00	0.02	±0.3
4923800	3.77	3.76	3.76	3.77	3.75	3.76	0.00	-0.02	0.00	±0.3
6235400	3.65	3.65	3.65	3.66	3.65	3.66	0.02	0.00	0.02	±0.3
7896400	3.52	3.51	3.51	3.52	3.51	3.52	0.00	0.00	0.02	±0.3
10000000	3.37	3.36	3.37	3.37	3.36	3.38	0.00	0.00	0.03	±0.3

SPEAG H-field frequency response tolerance criteria¹:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, H-field, Channel 7

f/(Hz)	H-field/(A/m) Applied			H-field/(A/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	1.54	1.54	1.54	1.54	1.54	1.55	0.00	0.00	0.06	±0.3
3200	1.54	1.54	1.54	1.53	1.52	1.54	-0.06	-0.11	0.00	±0.3
4000	1.53	1.53	1.53	1.53	1.53	1.53	0.00	0.00	0.00	±0.3
5200	1.52	1.52	1.52	1.53	1.52	1.51	0.06	0.00	-0.06	±0.3
6600	1.51	1.51	1.51	1.50	1.50	1.50	-0.06	-0.06	-0.06	±0.3
8200	1.50	1.50	1.50	1.50	1.51	1.51	0.00	0.06	0.06	±0.3
9000	1.49	1.49	1.49	1.49	1.49	1.49	0.00	0.00	0.00	±0.3
10600	4.29	4.18	4.28	4.31	4.27	4.25	0.04	0.19	-0.06	±0.3
13400	4.32	4.30	4.29	4.33	4.30	4.32	0.02	0.00	0.06	±0.3
17000	4.32	4.29	4.29	4.33	4.31	4.31	0.02	0.04	0.04	±0.3
21400	4.34	4.31	4.31	4.36	4.33	4.33	0.04	0.04	0.04	±0.3
27200	4.34	4.31	4.31	4.37	4.32	4.32	0.06	0.02	0.02	±0.3
34400	4.34	4.32	4.32	4.35	4.32	4.32	0.02	0.00	0.00	±0.3
40000	4.33	4.32	4.32	4.34	4.33	4.33	0.02	0.02	0.02	±0.3
43600	4.32	4.31	4.31	4.33	4.32	4.31	0.02	0.02	0.00	±0.3
55400	4.32	4.30	4.30	4.32	4.30	4.30	0.00	0.00	0.00	±0.3
70000	4.30	4.29	4.29	4.33	4.30	4.28	0.06	0.02	-0.02	±0.3
88800	4.29	4.27	4.27	4.30	4.28	4.28	0.02	0.02	0.02	±0.3
112400	4.28	4.26	4.26	4.29	4.27	4.26	0.02	0.02	0.00	±0.3
142400	4.26	4.25	4.25	4.27	4.25	4.25	0.02	0.00	0.00	±0.3
161750	4.24	4.23	4.23	4.25	4.23	4.24	0.02	0.00	0.02	±0.3
180400	4.23	4.22	4.22	4.25	4.22	4.23	0.04	0.00	0.02	±0.3
228400	4.21	4.19	4.19	4.22	4.19	4.20	0.02	0.00	0.02	±0.3
289400	4.16	4.15	4.15	4.17	4.16	4.16	0.02	0.02	0.02	±0.3
366400	4.13	4.12	4.12	4.15	4.12	4.12	0.04	0.00	0.00	±0.3
400000	4.11	4.10	4.10	4.12	4.11	4.11	0.02	0.02	0.02	±0.3
464000	4.08	4.07	4.07	4.08	4.08	4.08	0.00	0.02	0.02	±0.3
587800	4.04	4.03	4.03	4.05	4.04	4.03	0.02	0.02	0.00	±0.3
744200	3.99	3.98	3.98	3.99	3.99	3.98	0.00	0.02	0.00	±0.3
942600	3.98	3.97	3.97	3.99	3.98	3.98	0.02	0.02	0.02	±0.3
1193600	3.96	3.95	3.95	3.98	3.96	3.96	0.04	0.02	0.02	±0.3
1511600	3.95	3.94	3.94	3.96	3.95	3.95	0.02	0.02	0.02	±0.3
1914400	3.93	3.93	3.93	3.94	3.93	3.94	0.02	0.00	0.02	±0.3
2424400	3.92	3.91	3.91	3.93	3.91	3.91	0.02	0.00	0.00	±0.3
3070200	3.89	3.89	3.89	3.90	3.89	3.89	0.02	0.00	0.00	±0.3
3888000	3.84	3.83	3.83	3.85	3.84	3.83	0.02	0.02	0.00	±0.3
4000000	3.83	3.82	3.82	3.83	3.82	3.83	0.00	0.00	0.02	±0.3
4923800	3.77	3.76	3.76	3.77	3.76	3.77	0.00	0.00	0.02	±0.3
6235400	3.65	3.65	3.65	3.66	3.65	3.65	0.02	0.00	0.00	±0.3
7896400	3.52	3.51	3.51	3.52	3.51	3.52	0.00	0.00	0.02	±0.3
10000000	3.37	3.36	3.37	3.38	3.37	3.37	0.03	0.03	0.00	±0.3

SPEAG H-field frequency response tolerance criteria¹:
±0.3dB for applied H-fields at calibration points from 3kHz to 10MHz

¹Calibration uncertainty not taken into account (shared risk 50%).

Frequency Response, E-field, Channel 0

f/(Hz)	E-field/(V/m) Applied			E-field/(V/m) Reading			Difference/(dB)			Tolerance/(dB)
	x	y	z	x	y	z	x	y	z	
3000	82.8	82.8	83.7	82.8	82.8	83.8	0.00	0.00	0.01	±0.3
3200	82.2	82.2	79.2	83.3	82.6	78.9	0.12	0.04	-0.03	±0.3
4000	85.7	85.7	82.9	85.7	85.7	82.9	0.00	0.00	0.00	±0.3
5200	80.3	80.3	80.0	80.4	80.4	80.2	0.01	0.01	0.02	±0.3
6600	80.0	80.0	78.3	80.1	80.0	78.7	0.01	0.00	0.04	±0.3
8200	79.5	79.5	77.6	79.8	79.8	77.7	0.03	0.03	0.01	±0.3
9000	79.9	79.9	80.0	80.0	80.0	80.1	0.01	0.01	0.01	±0.3
10600	81.5	81.5	77.7	81.4	81.7	77.8	-0.01	0.02	0.01	±0.3
13400	80.1	80.1	79.2	80.2	80.0	79.4	0.01	-0.01	0.02	±0.3
17000	79.2	79.2	79.8	79.2	79.2	79.8	0.00	0.00	0.00	±0.3
21400	77.2	77.2	77.7	77.2	77.2	77.7	0.00	0.00	0.00	±0.3
27200	77.6	77.6	77.0	77.7	77.7	77.0	0.01	0.01	0.00	±0.3
34400	79.5	79.5	78.1	79.6	79.5	78.1	0.01	0.00	0.00	±0.3
40000	79.0	79.0	78.7	79.2	79.1	78.7	0.02	0.01	0.00	±0.3
43600	79.4	79.4	78.4	79.5	79.5	78.4	0.01	0.01	0.00	±0.3
55400	78.9	78.9	77.8	79.0	78.9	77.8	0.01	0.00	0.00	±0.3
70000	79.4	79.4	78.2	79.5	79.5	78.2	0.01	0.01	0.00	±0.3
88800	79.2	79.2	78.4	79.2	79.2	78.4	0.00	0.00	0.00	±0.3
112400	79.1	79.1	78.3	79.2	79.1	78.3	0.01	0.00	0.00	±0.3
142400	79.5	79.5	78.5	79.6	79.5	78.5	0.01	0.00	0.00	±0.3
161750	79.9	79.9	79.1	80.0	79.9	79.1	0.01	0.00	0.00	±0.3
180400	80.2	80.2	79.3	80.3	80.2	79.3	0.01	0.00	0.00	±0.3
228400	80.9	80.9	79.7	81.0	80.9	79.7	0.01	0.00	0.00	±0.3
289400	80.9	80.9	80.0	81.0	80.9	80.0	0.01	0.00	0.00	±0.3
366400	81.0	81.0	80.1	81.0	81.0	80.1	0.00	0.00	0.00	±0.3
400000	81.3	81.3	80.3	81.3	81.3	80.3	0.00	0.00	0.00	±0.3
464000	81.9	81.9	80.8	81.6	81.9	80.8	-0.03	0.00	0.00	±0.3
587800	82.1	82.1	81.0	82.1	82.2	81.0	0.00	0.01	0.00	±0.3
744200	82.1	82.1	81.0	82.0	82.1	81.0	-0.01	0.00	0.00	±0.3
942600	82.2	82.2	81.1	82.1	82.3	81.1	-0.01	0.01	0.00	±0.3
1193600	82.4	82.4	81.1	82.2	82.4	81.2	-0.02	0.00	0.01	±0.3
1511600	82.0	82.0	81.0	81.8	82.0	81.0	-0.02	0.00	0.00	±0.3
1914400	81.7	81.7	80.7	81.6	81.7	80.8	-0.01	0.00	0.01	±0.3
2424400	81.5	81.5	80.6	81.5	81.5	80.6	0.00	0.00	0.00	±0.3
3070200	81.6	81.6	80.8	81.6	81.6	80.8	0.00	0.00	0.00	±0.3
3888000	81.8	81.8	80.9	81.8	81.8	80.9	0.00	0.00	0.00	±0.3
4000000	81.9	81.9	81.1	81.9	81.9	81.1	0.00	0.00	0.00	±0.3
4923800	82.5	82.5	81.7	82.5	82.5	81.8	0.00	0.00	0.01	±0.3
6235400	83.6	83.6	82.5	83.7	83.7	82.5	0.01	0.01	0.00	±0.3
7896400	86.8	86.8	86.3	86.8	86.8	86.3	0.00	0.00	0.00	±0.3
10000000	94.4	94.4	93.8	94.4	94.4	93.8	0.00	0.00	0.00	±0.3

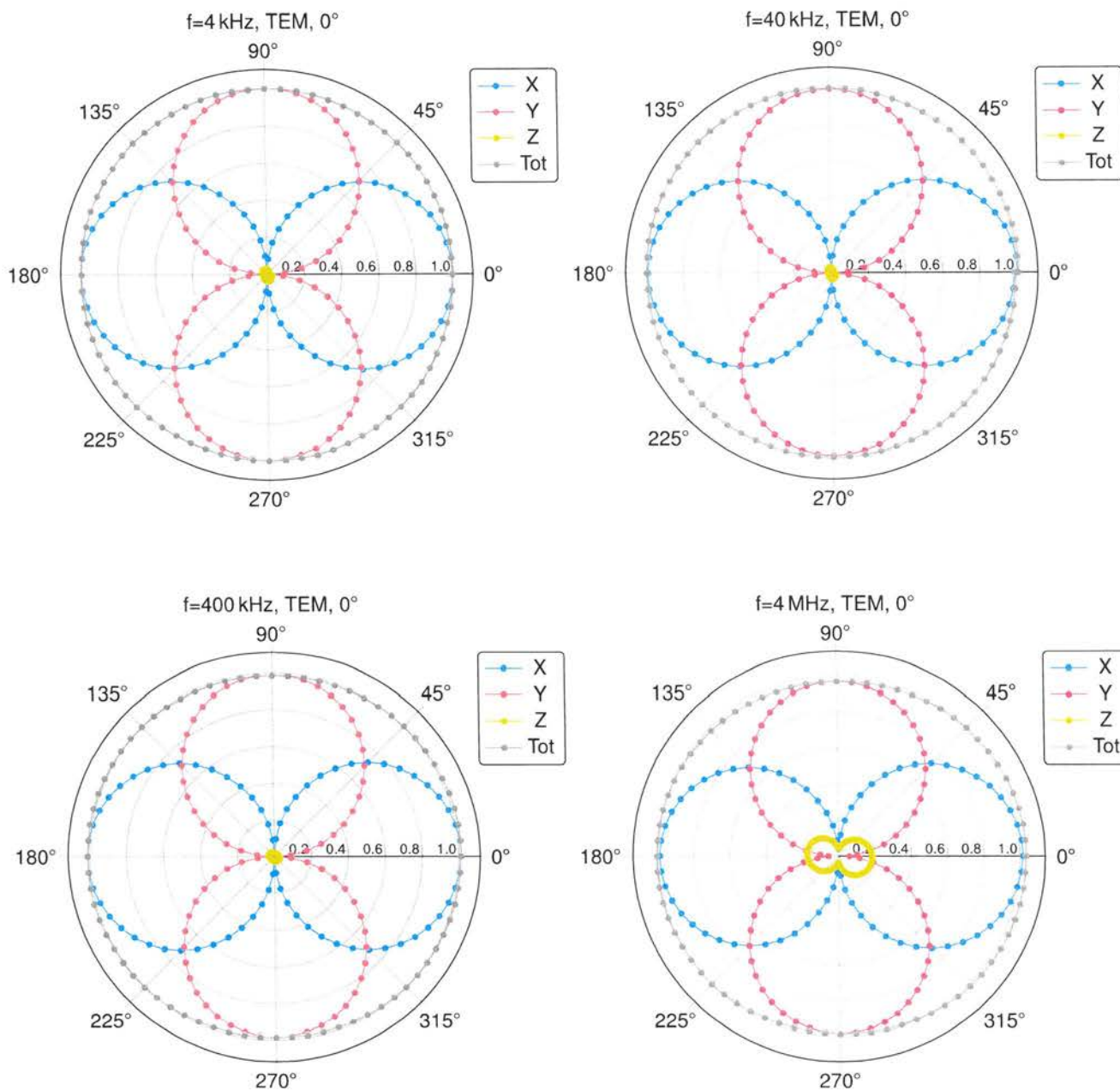
SPEAG E-field frequency response tolerance criteria¹:

±0.3dB for applied E-fields at calibration points from 3kHz to 10MHz

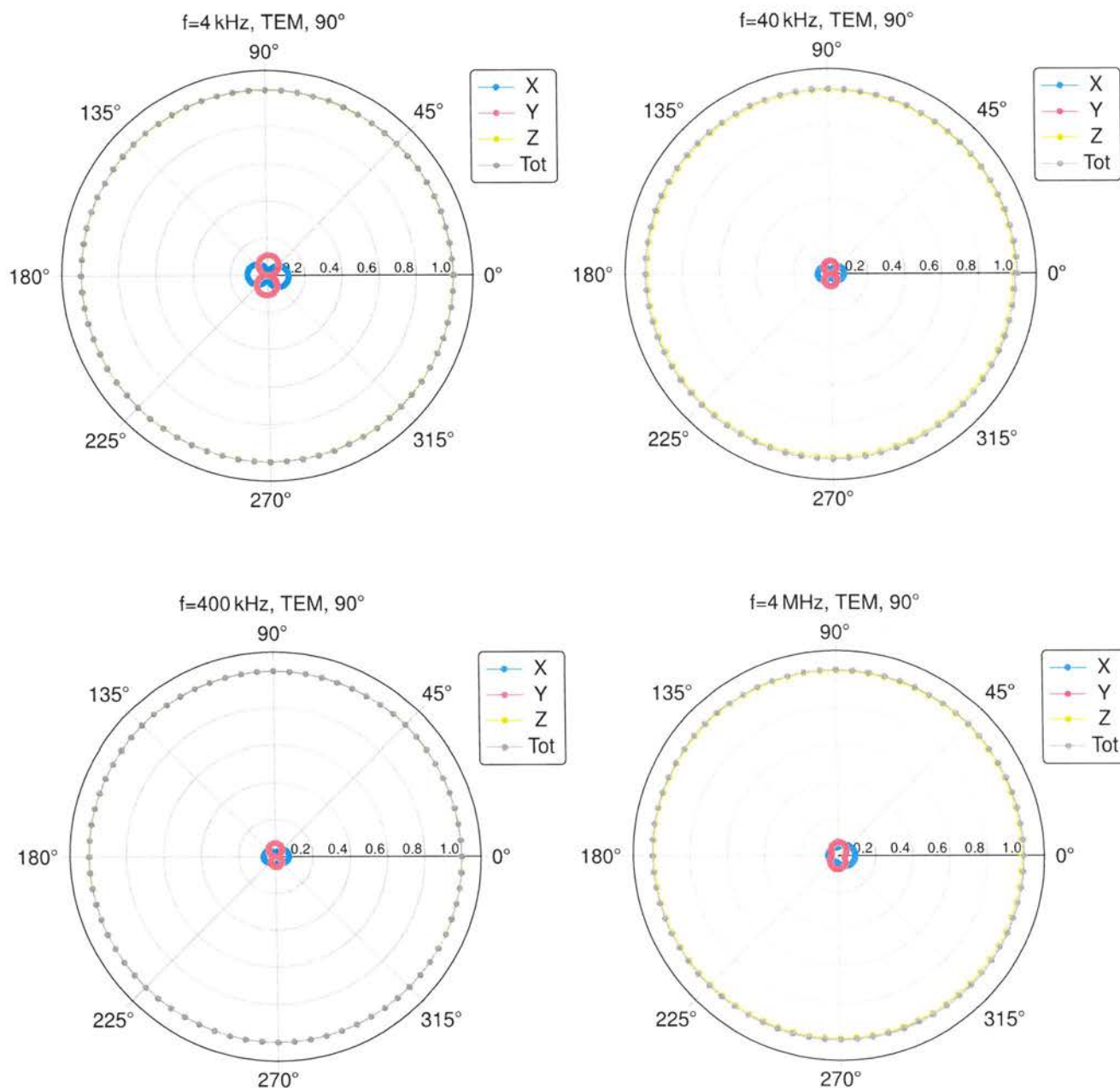
¹Calibration uncertainty not taken into account (shared risk 50%).

Isotropy H-Field

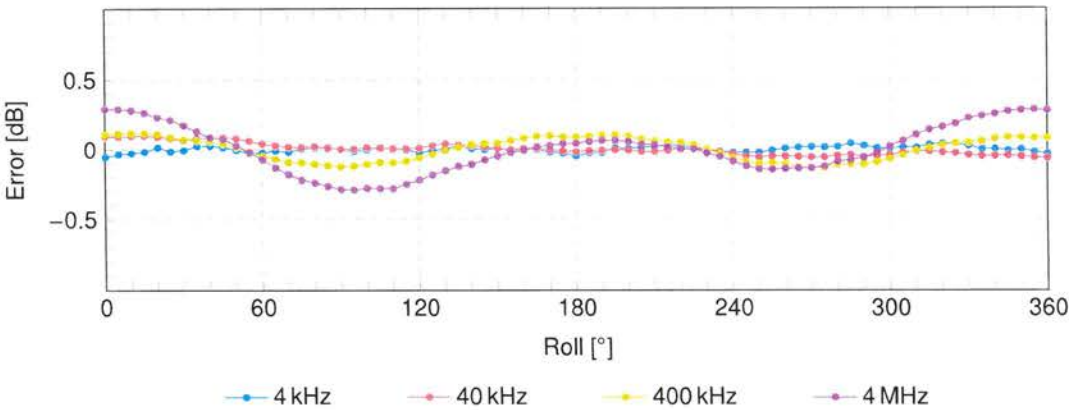
H-Field Receiving Pattern (ϕ), $\vartheta = 0^\circ$



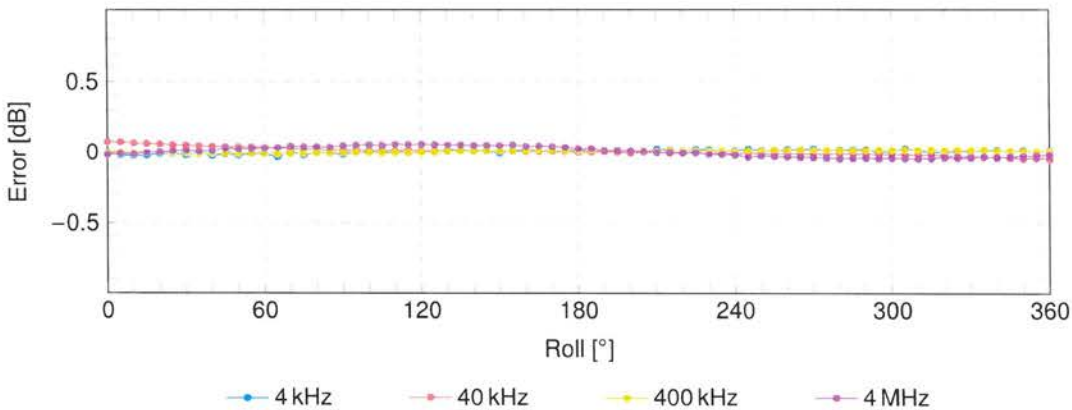
H-Field Receiving Pattern (ϕ), $\vartheta = 90^\circ$



H-Field Receiving Pattern (ϕ), $\vartheta = 0^\circ$



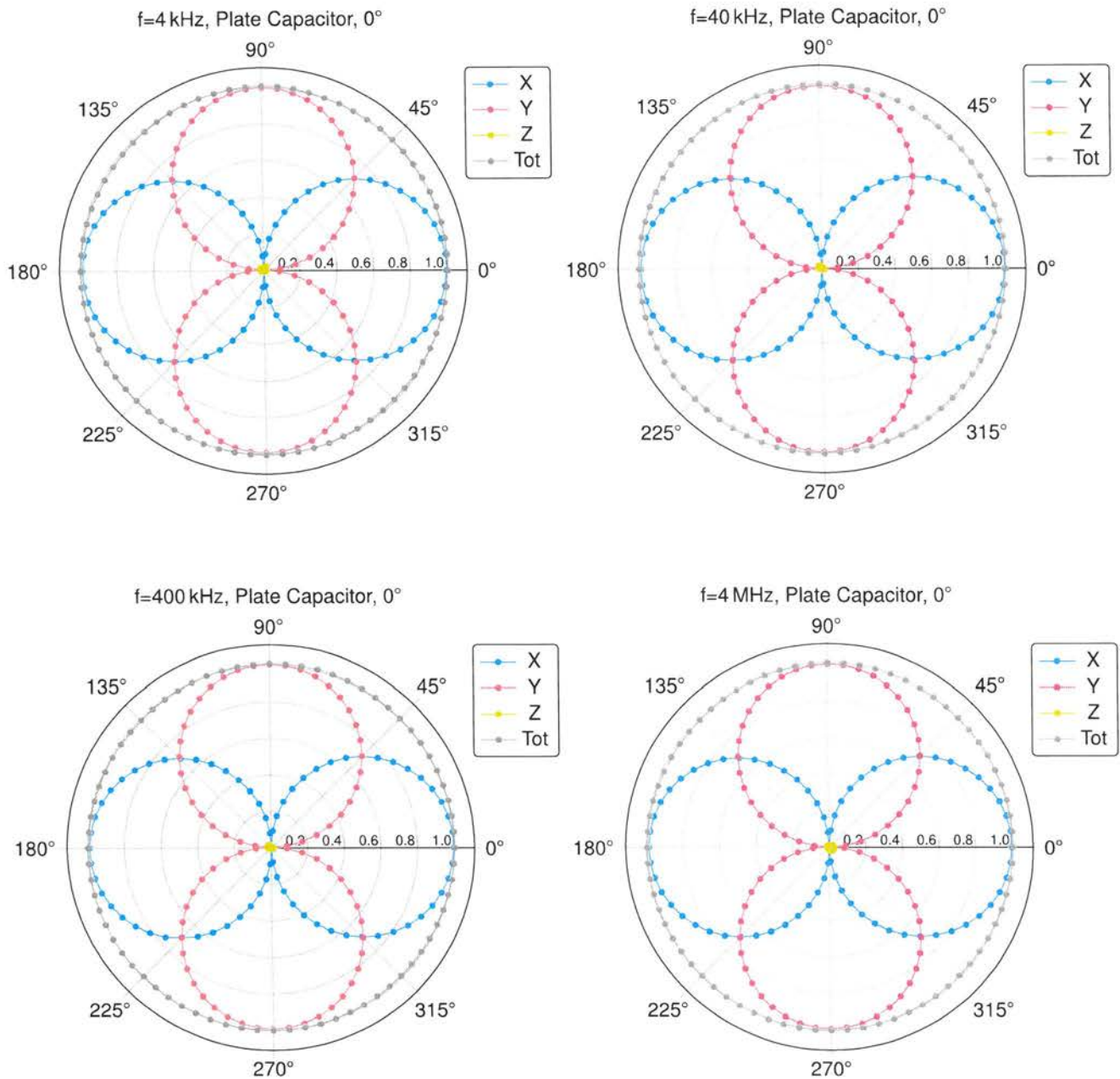
H-Field Receiving Pattern (ϕ), $\vartheta = 90^\circ$



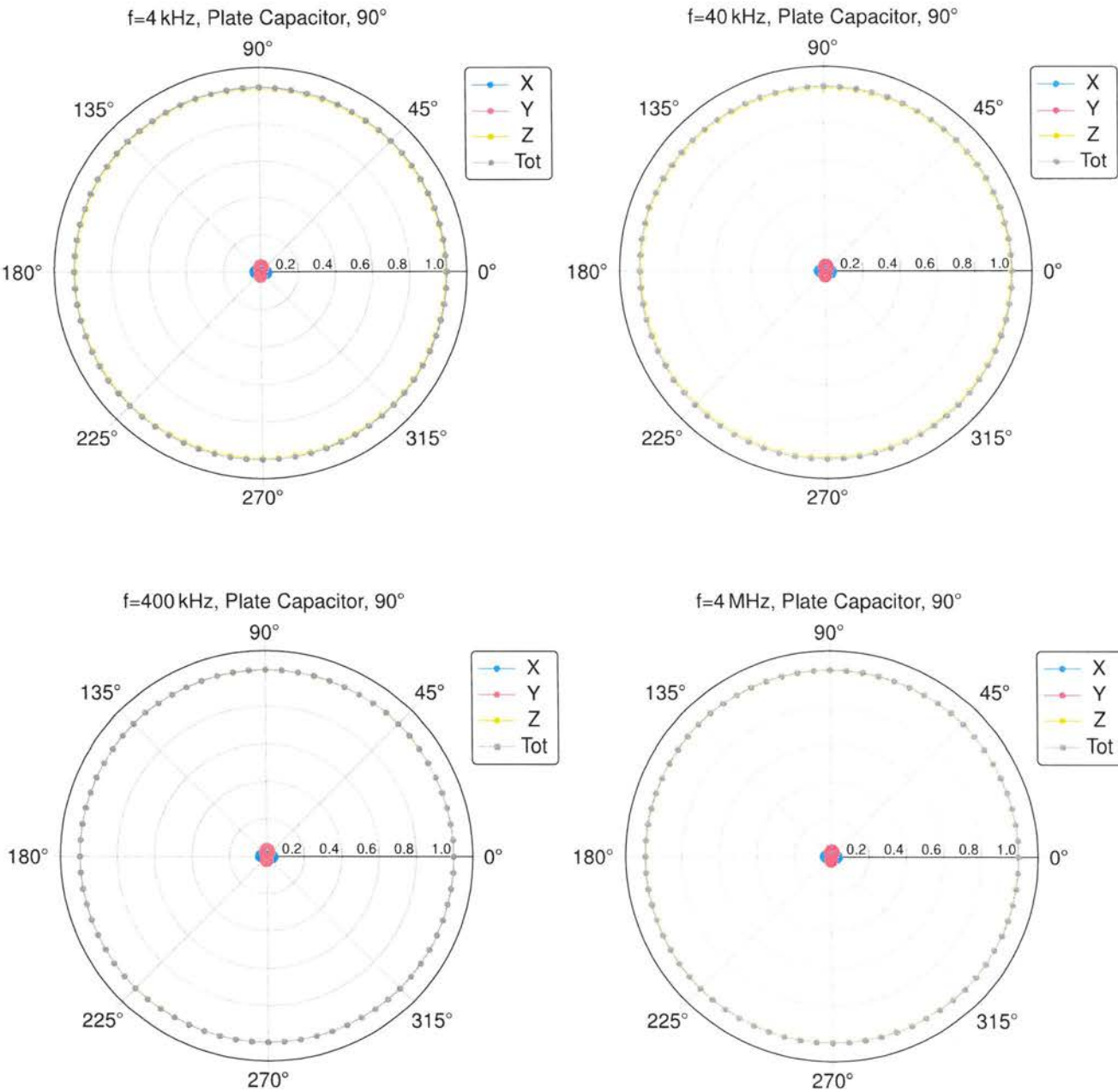
SPEAG axial deviation from the ideal response tolerance for H-field: ± 0.6 dB

Isotropy E-Field

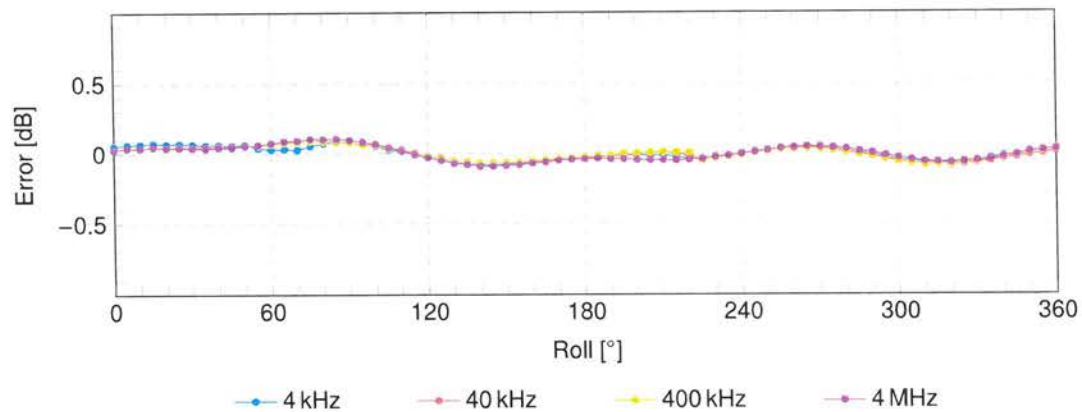
E-Field Receiving Pattern (ϕ), $\vartheta = 0^\circ$



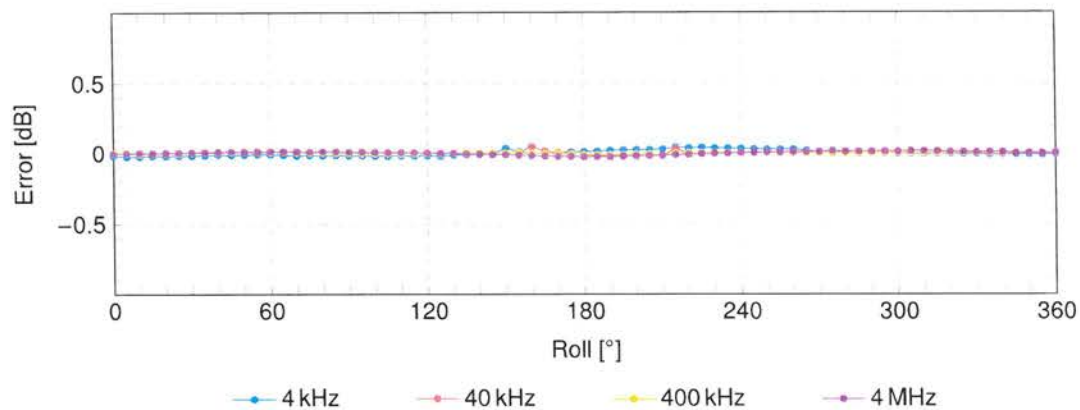
E-Field Receiving Pattern (ϕ), $\vartheta = 90^\circ$



E-Field Receiving Pattern (ϕ), $\vartheta = 0^\circ$



E-Field Receiving Pattern (ϕ), $\vartheta = 90^\circ$



SPEAG axial deviation from the ideal response tolerance for E-field: ± 0.8 dB



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **Cetecom Advanced**
Saarbrücken, Germany

Certificate No. **V-Coil50/400-1021_Oct24**

CALIBRATION CERTIFICATE

Object **V-Coil50/400V2 - SN: 1021**

Calibration procedure(s) **QA CAL-47.v13**
Calibration Procedure for WPT Verification & Validation Sources

Calibration date: **October 31, 2024**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
MAGPy-8H3D+E3D/DAS	SN: 3090/3078	22-Aug-24 (MAGPy-8H3D-3090_Aug24)	Aug-25

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
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Calibrated by:	Name	Function	Signature
	Jingtian Xi	Project Leader	
Approved by:	Sven Kühn	Technical Manager	

Issued: November 6, 2024

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Accreditation Service (SAS)

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Glossary:

WPT	wireless power transfer
V&V	verification & validation

Calibration is Performed According to the Following Standards:

- Internal procedure QA CAL-47 Calibration procedure for WPT verification & validation sources from 3 kHz to 10 MHz
- IEC/IEEE 63164, "Assessment methods of the human exposure to electric and magnetic fields from wireless power transfer systems – Models, instrumentation, measurement and computational methods and procedures (Frequency range 3 kHz to 30 MHz)", draft standard, 2023

Additional Documentation:

- a) cDASY6/DASY8 Module WPT Manual

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* The V&V source is switched on for at least 30 minutes.
- *Source Positioning:* The V&V source is placed in the center of the UniPV1 phantom such that the source surface is parallel to phantom surface. The probe location used for DUT teaching is the top center of the coil (marked on the source casing). The probe distance is verified using mechanical gauges placed on the source surface.
- *H-field distribution:* H-field is measured in the volume above the V&V source in a rectilinear grid with a uniform grid step of 7.33 mm.

Calibrated Quantity

- Spatial peak of H-field (RMS value) at d mm from the DUT surface (extrapolated from measurements)

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

Software version	cDASY6 Module WPT	2.6.0.5002
	Notebook GUI	2.6.0.9
	Sim4Life	8.0.1
Scan setup	Grid dimensions	x: 125 mm, y: 125 mm, z: 36.7 mm
	Grid resolutions	dx, dy, dz: 7.33 mm
Nominal frequency	400 kHz	

Calibrated Quantities

Distance (relative to source surface) (mm)	Peak H-field (A/m)	Uncertainty (k=2) (dB)
0	283	1.13
2	248	1.13

Appendix (Additional assessments outside the scope of SCS 0108)

Peak values of induced fields¹

Distance (relative to source surface) (mm)	Induced peak current density, 1cm ² area avg. (A/m ²)	Induced peak E-field (V/m)			peak spatial SAR (mW/kg)	
		2mm cube avg.	Local	5mm line avg.	1g avg.	10g avg.
0	2.84	4.48	4.60	4.59	7.95	3.96
2	2.42	3.88	4.00	3.99	5.82	2.94

Voltage measurement

Total voltage (V)	Voltages at harmonics (dBc)
0.413	Highest harmonic: -21.5 2 nd highest harmonic: -31.4

¹ determined for a virtual half-space phantom with tissue properties $\epsilon_r = 55$, $\sigma = 0.75$ S/m, $\rho = 1000$ kg/m³ and a 2 mm thick phantom shell

Measurement report

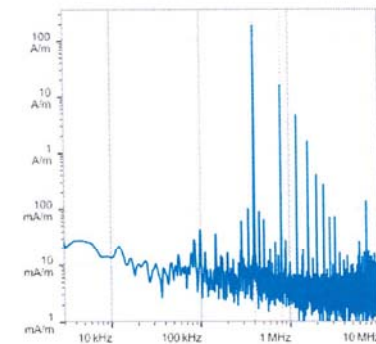
cDASY6 Module WPT Measurement Report

Device under test	Tool info	Scan info
Info: V-Coil50/400	DASY software version: cDASY6 Module WPT 2.6.0.5002	Center location: x: -186.16 mm, y: -319.40 mm, z: 36.77 mm
Serial number: 1021	Probe model, serial no. and configuration date: MAGPy-8H3D+E3Dv2, WP000230, 2024/08/23	Dimensions: x: 125.0 mm, y: 124.0 mm, z: 36.6 mm
Scenario: source calibration	Software version: 2.0.63, backend: 2.2.22	Resolution: x: 7.33 mm, y: 7.33 mm, z: 7.33 mm
		Completed on: 2024/10/31 14:36:18

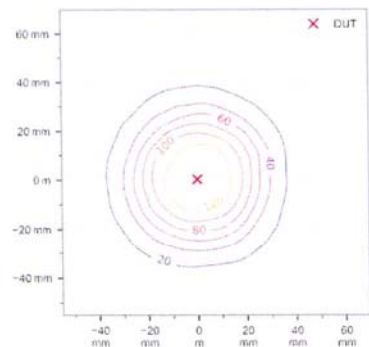
Measurement results

Maximum H-field [RMS]:
MAGNITUDE: 137.67 A/m
x: 29.15 A/m, y: 13.24 A/m, z: 133.90 A/m
Maximum H-field location relative to DUT:
x: -3.67 mm, y: 3.67 mm, z: 8.50 mm
Distance to -20.0 dB boundary:
37.39 mm
Offset relative to DUT:
x: 0.00 m, y: 0.00 m, z: 1.00 mm

H-field magnitude [RMS] at maximum location



H-field magnitude [RMS] at lowest plane



Incident fields and induced fields in the homogeneous phantom at the peak frequency (f = 400.00 kHz, $\sigma = 0.750\text{ S/m}$, tissue density = 1.000 kg/m^3)

Distance [mm]	Peak incident fields [rms]	Peak E_{ind} [V/m, rms]			Peak J_{ind} [A/m ² , rms]		psSAR [mW/kg]		H-field extent	Sign	Vector potential	Warnings
	H_{inc} [A/m]	Cube avg.	Local	Line avg.	Surface avg.		1g avg.	10g avg.	-20 dB radius [mm]			Boundary effect
0.00	283	4.48	4.60	4.59	2.84		7.95	3.96	39.0	1%	7%	23%
2.00	248	3.88	4.00	3.99	2.42		5.82	2.94	39.2	1%	7%	26%

Compliance evaluation (Field values at the peak frequency) (f=400.00 kHz,)

Distance [mm]	ICNIRP 2010/2020			ICNIRP 1998			IEEE 2019			FCC			HC Code 6		
	RL [rms]	BR [rms]		RL [rms]	BR [rms]		ERL [rms]	DRL [rms]		MPE [rms]	BR [rms]		RL [rms]	BR [rms]	
	ρH_{inc} [A/m]	ρE_{ind} [V/m]	psSAR [mW/kg]	ρH_{inc} [A/m]	ρJ_{ind} [A/m ²]	psSAR [mW/kg]	ρH_{inc} [A/m]	ρE_{ind} [V/m]	psSAR [mW/kg]	ρH_{inc} [A/m]	ρE_{ind} [V/m]	psSAR [mW/kg]	ρH_{inc} [A/m]	ρE_{ind} [V/m]	psSAR [mW/kg]
0.00	283	4.48	3.96	283	2.84	3.96	283	4.59	3.96	283	N/A	7.95	283	4.60	7.95
2.00	248	3.88	2.94	248	2.42	2.94	248	3.99	2.94	248	N/A	5.82	248	4.00	5.82

Compliance evaluation (Exposure ratios) (ratios in dB)

Distance [mm]	ICNIRP 2010/2020			ICNIRP 1998			IEEE 2019			FCC			HC Code 6		
	RL	BR		RL	BR		ERL	DRL		MPE	BR		RL	BR	
	ρH_{inc}	ρE_{ind}	psSAR	ρH_{inc}	ρJ_{ind}	psSAR	ρH_{inc}	ρE_{ind}	psSAR	ρH_{inc}	ρE_{ind}	psSAR	ρH_{inc}	ρE_{ind}	psSAR
0.00	NS	TH	NS	TH	NS	TH	NS	TH	NS	TH	NS	TH	NS	TH	NS
0.00	22.6	27.3	-21.6	-27.0	43.8	11.0	-27.0	4.79	9.85	-25.2	-27.0	44.8	N/A	-23.0	9.95
2.00	21.5	26.1	-22.9	-28.3	42.7	9.62	-28.3	3.65	8.71	-26.4	-28.3	43.7	N/A	-24.4	8.81

Document generated at 2024/10/31 15:05:37, simulation performed at 2024/10/31 14:39:20 using Sim4Life version 8.0.1.15446