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CERTIFICATE OF COMPLIANCE RF EXPOSURE & NERVE STIMULATION EVALUATION

XP Metal Detectors
8 Rue du Developpement ZI de VIC
Castanet-Tolosan 31320
France

Dates of Test: March 12-13, 2025
Test Report Number: SAR.20250320

Lab Designation Number: US1195

FCC ID:	XFJDELLFMFHP
Model(s):	DELLFMFHP
Serial Number:	4C0051
Equipment Type:	Metal Detector
Classification:	Low Frequency Transmitter
TX Frequency Range:	8.8 – 120 kHz
Frequency Tolerance:	± 2.5 ppm
Maximum RF Output:	33 kHz – 35.7 dBμV/m at 300 m EIRP
Signal Modulation:	CW
Antenna Type:	Internal
Application Type:	Certification
Standard(s):	KDB680106 D01 v04
Maximum E-Field (6 Min. Avg.):	14.73 V/m
Maximum H-Field (6 Min. Avg.):	1.52 A/m
Distance to Probe:	0 mm

This wireless mobile device has been shown to meet the requirements for RF exposure testing for uncontrolled environment/general exposure limits specified in above listed standards. The device has also been shown to meet the simultaneous requirements of each standard as well (See test report).

I attest to the accuracy of the data. I assume full responsibility for the completeness of these calculations and vouch for the qualifications of all persons making them.

Jay M. Moulton
Vice President



Testing Certificate # 2387.01

N/V – Not Provided

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Note: The latest version supersedes all previous versions listed in the above table. The latest version shall be used.

1. Introduction

This report shows the RF exposure evaluation of the XP Metal Detectors Model DELLFMFHP Metal Detector with KDB680106 D01 v04.

The test results recorded herein are based on a single type test of XP Metal Detectors Model DELLFMFHP and therefore apply only to the tested sample.

2. Radiation Sources

Radio	Description	
8.8 – 120.3 kHz	Frequency (MHz)	33 kHz
	Maximum Power (dBm)	35.7 dB μ V/m at 300 m (EIRP)
	Maximum Duty Cycle (%)	100%

3. DELLFMFHP

Photo Removed

Testing Position

4. RF Exposure Classifications

Device Types	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091)
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093)

Exposure Categories	
Occupational / Controlled	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General population / uncontrolled	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

5. RF Exposure Limits

FCC Requirements

The RF exposure limits, as set forth in § 1.1310, do not cover the frequency range below 100 kHz for Specific Absorption Rate (SAR) and below 300 kHz for Maximum Permitted Exposure (MPE). In addition, present limitations of RF exposure evaluation systems prevent an accurate evaluation of SAR below 4 MHz. For these reasons, a specific MPE-based RF Exposure compliance procedure for devices operating in the aforementioned low-frequency ranges has been set in place. This procedure is applicable to Equipment Authorization of all RF devices, thus including, but not limited to, Part 18 and WPT devices.

Accordingly, for § 2.1091-Mobile devices, the MPE limits between 100 kHz to 300 kHz are to be considered the same as those at 300 kHz in Table 1 of § 1.1310, that is, 614 V/m and 1.63 A/m, for the electric field and magnetic field, respectively. For § 2.1093-Portable devices below 4 MHz and down to 100 kHz, the MPE limits in § 1.1310 (with the 300 kHz limit applicable all the way down to 100 kHz) can be used for the purpose of equipment authorization in lieu of SAR evaluations. For frequencies below 100 kHz, the peak temporal field strength must not exceed 83 V/m and 90 A/m.

Table 1 to § 1.1310(e)(1)—Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3–3.0	614	1.63	*(100)	≤6
3.0–30	1842/f	4.89/f	*(900/f ²)	<6
30–300	61.4	0.163	1.0	<6
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	<30
1.34–30	824/f	2.19/f	*(180/f ²)	<30
30–300	27.5	0.073	0.2	<30
300–1,500			f/1500	<30
1,500–100,000			1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

6. General Conditions

- This report is only in reference to the item that has undergone the assessment.
- This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.

7. Environmental Conditions

The following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative Humidity	Min. = 30% Max. = 60%

8. Test Equipment

- | | Serial Number | Last Cal. Date | Cal. Due Date |
|--------------------|---------------|----------------|------------------|
| • Wavecontrol SMP2 | 19SN1179 | 04/15/2024 | 04/15/2026 |
| • WP400-3 | 19WP120054 | 04/15/2024 | 04/15/2026 32 mm |
- Positioning Apparatus used is a plastic tripod to hold the meter and probe at a specified position, a camera motion device is installed on the tripod to make precise positions at 10 mm steps away from the EUT
 - Testing was conducted in a shielded room with the EUT sitting on a wooden table.
 - Testing was conducted on all four sides of the antenna at the low, middle and high frequency of the transmitter. Only the highest value (Back) is recorded in this report.

9. EUT Description

The DELLFMFHP is a Metal Detector that is used to scan for metal in areas of interest to the user. There is one transmitter in the device (8.8 – 120.3 kHz). Therefore, simultaneous evaluation is not required.

The device does not have any standby mode. It is either on or off during use.

For the measurements, the device had remote device that was used to set each transmitter into the maximum Tx power on the frequency of test. The testing at each measurement point was conducted for 3 seconds to ensure the maximum power was detected.

The description of the antenna is listed in a confidential document number 'DELLFMFHP Coil Antenna Specifications' which has been filed with this application.

10. Nerve Stimulation Evaluation Results 8.8 – 120.3 kHz

The measurements for the DELLFMFHP was conducted at 20 mm distance from the device to the center of the probe diameter. A pre-scan of the around the antenna was conducted first by moving the probe around all areas of the device being tested. The movement was conducted at a very slow pace to find the peak value for the device. Once the peak position was determined for the device, the meter and probe were installed on the positioning apparatus for conducting the final measurements. The location of the highest value was at x=-111 mm, y=-27 mm, z=20 mm. The grid is based on the center of the antenna being 0,0,0 mm.

Below are all the measured values for the e- and h-field. All evaluations were conducted with a 95% confidence.

E-field		H-field	
Distance	Measured Value	Distance	Measured Value
20 mm	10.21	20 mm	0.938
30 mm	8.62	30 mm	0.721
40 mm	8.32	40 mm	0.572
50 mm	6.76	50 mm	0.455
60 mm	6.35	60 mm	0.365
70 mm	6.48	70 mm	0.301
80 mm	6.44	80 mm	0.247
90 mm	5.65	90 mm	0.206
100 mm	6.16	100 mm	0.174
110 mm	4.96	110 mm	0.148
120 mm	5.89	120 mm	0.125
130 mm	5.53	130 mm	0.110
140 mm	4.41	140 mm	0.095
150 mm	4.83	150 mm	0.064

The highest value of all the sides at 20 mm was then tested at 20 mm moving away from the device every 10 mm. All the values were used to extrapolate to the 0 mm distance. The equation used to extrapolate the value to zero is $y = a * b^x$, where x is the distance and y is the extrapolated value. This form of regression is exponential regression decay.

The extrapolated value at 10 mm is 9.25 V/m.

The extrapolated value at 0 mm is 9.74 V/m.

Regression Statistics

Multiple R	0.918948243
R Square	0.844465873
Adjusted R Square	0.831504696
Standard Error	0.095459484
Observations	14

The extrapolated value at 10 mm is 1.01 A/m.

The extrapolated value at 0 mm is 1.23 A/m.

Regression Statistics

Multiple R	0.996340323
R Square	0.992694038
Adjusted R Square	0.992085208
Standard Error	0.071746889
Observations	14

The highest value of all the sides at 20 mm was then tested at 20 mm moving away from the device every 10 mm. All the values were used to extrapolate to the 0 mm distance. The equation used to extrapolate the value to zero is $y = a_4x^4 + a_3x^3 + a_2x^2 + a_1x^1 + a_0$, where x is the distance and y is the extrapolated value. Below are all the measured values for the e- and h-field. This form of regression is quartic regression decay.

The extrapolated value at 10 mm is 12.15 V/m.

The extrapolated value at 0 mm is 14.73 V/m.

Regression Statistics

Multiple R	0.970547551
R Square	0.941962549
Adjusted R Square	0.916168127
Standard Error	0.463441684
Observations	14

The extrapolated value at 10 mm is 1.19 A/m.

The extrapolated value at 0 mm is 1.52 A/m.

Regression Statistics

Multiple R	0.999852442
R Square	0.999704905
Adjusted R Square	0.999573752
Standard Error	0.005412287
Observations	14

The highest value of all the sides at 20 mm was then tested at 20 mm moving away from the device every 10 mm. All the values were used to extrapolate to the 0 mm distance. The equation used to extrapolate the value to zero is the second degree polynomial $y = a_2x^2 + a_1x + a_0$, where x is the distance and y is the extrapolated value. This form of regression is quadratic regression decay.

The extrapolated value at 10 mm is 10.35 V/m.

The extrapolated value at 0 mm is 11.21 V/m.

Regression Statistics

Multiple R	0.946645897
R Square	0.896138455
Adjusted R Square	0.877254537
Standard Error	0.560780924
Observations	14

The extrapolated value at 10 mm is 1.01 A/m.

The extrapolated value at 0 mm is 1.17 A/m.

Regression Statistics

Multiple R	0.990657992
R Square	0.981403257
Adjusted R Square	0.978022031
Standard Error	0.038863623
Observations	14

Table of Regression Statistics				
	Multiple R	R ^ 2	Adjusted R ^ 2	Standard Error
Exponential E-Field	0.918948243	0.844465873	0.831504696	0.095459484
Exponential H-Field	0.996340323	0.992694038	0.992085208	0.071746889
Quartic E-Field	0.970547551	0.941962549	0.916168127	0.463441684
Quartic H-Field	0.999852442	0.999704905	0.999573752	0.005412287
Quadratic E-Field	0.946645897	0.896138455	0.877254537	0.560780924
Quadratic H-Field	0.990657992	0.981403257	0.978022031	0.038863623

Comparison of the Three Interpolations		
	E-Field	H-Field
Exponential	9.74	1.23
Quartic	14.73	1.52
Quadratic	11.21	1.17

Frequency	E-Field Measurement	Limit [V/m]	% Limit	Verdict
8.8-120.3 kHz	14.73	614	2.4	Pass

Frequency	H-Field Measurement	Limit [A/m]	% Limit	Verdict
8.8-120.3 kHz	1.52	1.63	93.3	Pass

Appendix A – Calibration Certificates



Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 240411-151731-99c41b



Model Number WP400-3; SMP2
Manufacturer Wavecontrol
Description Field Probe
Serial Number 19WP120054; 19SN1179
Customer Asset No. N/A

Customer
RF Exposure Lab, LLC
802 N. Twin Oaks Valley Rd
Suite 105
San Marcos, CA 92069
USA

Date of Calibration 04/15/2024
Temperature 24°C
Humidity 30% RH

Location of Calibration
Keysight Technologies Inc.
1346 Yellowwood Road
Kimballton, IA 51543
United States

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures and in compliance with ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994 (R2002). The quality management system is registered to ISO 9001:2015.

Calibration Standard(s)
IEEE Std 1309-2013

Calibration Method(s)
Substitution

Calibration Procedure(s)
909579

Calibration Software
Probe Comparison 1.5.2

As Received Conditions
The measured values of the equipment were observed in specification at the points tested.

Action Taken
No action was taken.

As Completed Conditions
The measured values of the equipment were observed in specification at the points tested.

Calibration Due
Based on the customer's request, the next calibration is due on 15 Apr 2026

Remarks or Special Requirements

This calibration report shall not be reproduced, except in full. The documented results relate to the equipment calibrated only.

The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.

Keysight Technologies, Inc.
1346 Yellowwood Road
Kimballton, IA 51543
United States

Brandt Langer Iowa Service Center Manager



Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 240411-151731-99c41b



Traceability Information

Technician Name Dave Grabill

Measurements are traceable to the International System of Units (SI) via national metrology institutes (www.keysight.com/find/NMI) that are signatories to the CIPM Mutual Recognition Arrangement.

Calibration Equipment Used

Manufacturer	Model Number	Model Description	Equipment ID	Cal Due Date	Certificate Number
Agilent Technologies, Inc.	33250A	Function/Arbitrary Waveform Generator	11101	06/30/2024	230601-152459-8b26d8
AR	350AH1	Amp	11453	NA	NA
Hewlett-Packard	8563E	Spectrum Analyzer	2084	11/30/2024	231026-133128-431894
Combinova	FD1	Field Detector	10348	01/31/2025	240117-073922-a02261
Combinova	FD2	Field Detector	10347	02/28/2025	240202-080515-3d46de
Schwarzbeck Mess-Elektronik	FESP 5133-7/41	Loop	11285	10/31/2024	231026-131402-6bd9de
Schwarzbeck Mess-Elektronik	HHS 5204-12	Helmholtz Coil	11091	NA	NA
Holaday	HI-3624	ELF Magnetic Field Meter	10569	09/30/2024	230915-073549-c990d5
Holaday	HI-3627	ELF Magnetic Field Meter	10570	03/31/2025	240312-074557-4a2507

Compliance with Specification

Unless otherwise noted, the calibration results are reported without factoring in the effect of uncertainty on the assessment of compliance/specification.

In Specification/Out of Specification Explanation

The standard criteria to determine the "In Specification/Out of Specification" status is based on one or more of the following conditions, as requested by the client:

1. If the manufacturer has a specified specification for the item being calibrated, then the calibration values are compared to this specification, and the values must fall within the manufacturer's specification. The specification may be obtained from the manufacturer's web site, data sheets, equipment manuals, etc.
2. Where specifications are called out in a published standard, the calibration results are compared to this specification, and the measured values must fall within the standard's specification.
3. In cases where the manufacturer, standard, or client does not identify any relevant specifications, applicable calibration results are compared to historical data with a +/- 3 dB specification.

Uncertainty of Measurement

The uncertainty evaluation has been performed in accordance with ISO/IEC Guide 98-3:2008(GUM). The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This probability corresponds to a coverage factor of k=2 for a normal distribution.

Parameter	Range	MU (+/-)
Magnetic Field Strength Meters - AC	0.20 mG to 20 G	0.33% + 1.2 mG

Customer Name: RF Exposure Lab, LLC

Probe Manufacturer: Wavecontrol

Probe Model: WP400-3; SMP2

Probe Serial No.: 19WP120054; 19SN1179

Notes:

CAL CERT #: 240411-151731-99c41b

Magnetic Field

B Field (uT)	Linearity - 50Hz						Mean CF
	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	
750	0.99	-0.12	0.99	-0.11	0.99	-0.12	0.99
500	0.97	-0.23	0.97	-0.24	0.97	-0.25	0.97
250	1.01	0.10	1.01	0.07	1.01	0.06	1.01
100	0.98	-0.16	0.98	-0.17	0.98	-0.19	0.98
50	1.00	0.02	1.00	-0.02	0.98	-0.19	0.99
10	1.05	0.43	1.04	0.33	1.03	0.22	1.04
5	0.96	-0.38	0.96	-0.31	0.94	-0.52	0.95

Freq Hz	Frequency Response						Mean CF
	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	
10	1.07	0.59	1.06	0.51	1.06	0.50	1.06
30	1.00	0.04	1.00	-0.01	1.00	0.01	1.00
60	0.98	-0.16	0.98	-0.17	0.98	-0.20	0.98
100	0.98	-0.22	0.98	-0.21	0.97	-0.22	0.98
500	1.01	0.08	1.01	0.07	1.00	-0.02	1.01
1000	0.99	-0.09	0.99	-0.08	0.98	-0.17	0.99
2000	0.99	-0.06	0.99	-0.08	0.99	-0.12	0.99
10000	0.85	-1.41	0.85	-1.38	0.85	-1.38	0.85
100000	0.84	-1.48	0.84	-1.52	0.85	-1.45	0.84
200000	0.81	-1.84	0.81	-1.87	0.80	-1.90	0.81

Customer Name: RF Exposure Lab, LLC

Probe Manufacturer: Wavecontrol

Probe Model: WP400-3; SMP2

Probe Serial No.: 19WP120054; 19SN1179

Notes:

CAL CERT #: 240411-151731-99c41b

Electric Field

E Field (V/m)	Linearity - 50Hz						Mean CF
	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	
350	1.00	-0.02	0.99	-0.05	1.00	-0.02	1.00
250	1.00	-0.01	1.00	0.03	1.00	0.04	1.00
100	1.01	0.05	1.01	0.08	1.01	0.05	1.01
50	1.03	0.24	1.02	0.16	1.02	0.15	1.02
20	1.02	0.14	1.01	0.12	1.02	0.18	1.02

Freq Hz	Frequency Response 25Hz-100kHz: 350V/m / 10Hz, 200-400kHz: 300V/m						Mean CF
	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	
10	1.23	1.83	1.23	1.80	1.24	1.84	1.23
25	1.12	0.96	1.12	0.98	1.12	0.98	1.12
50	1.00	-0.02	1.00	-0.02	1.00	-0.03	1.00
100	0.99	-0.08	0.99	-0.09	0.99	-0.09	0.99
500	0.99	-0.08	0.99	-0.09	0.99	-0.08	0.99
1000	0.98	-0.21	0.98	-0.20	0.97	-0.23	0.98
2000	1.02	0.18	1.02	0.16	1.02	0.14	1.02
10000	1.02	0.20	1.02	0.19	1.02	0.19	1.02
100000	1.04	0.32	1.04	0.32	1.04	0.32	1.04
200000	1.02	0.17	1.02	0.16	1.02	0.16	1.02
300000	1.02	0.19	1.02	0.19	1.02	0.18	1.02
400000	1.06	0.49	1.06	0.51	1.06	0.48	1.06