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Global Product Certification
EMC-EMF Safety Approvals

RF Exposure Compliance Report

Report No.: M2501025-5

TESTED FOR:	**ISSUED BY:**
Nanosonics Limited	EMC Technologies Pty. Ltd.
Building A, Level 1, 7-11 Talavera Rd., Macquarie Park, NSW 2113, Australia	176 Harrick Road, Keilor Park, VIC, 3042, Australia.
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Product Name:	CORIS Endoscope Channel Cleaner
Model:	N05515
FCC ID:	2AM5R-CORIS
Assessment Date(s):	4 March 2025
Issue Date:	11 June 2025
Specification(s):	**447498 D01 General RF Exposure Guidance v06** *RF exposure procedures and equipment authorization policies for mobile and portable devices.* **47 CFR § 2.1091** *Radiofrequency radiation exposure evaluation: mobile devices (Transmitter is more than 20 cm from human body).*

Based on an assessment of the documentation provided, performed measurements and the declared separation distance from the human body under normal use, the CORIS Endoscope Channel Cleaner, model: N05515, complies with the RF exposure requirements of the standard/s listed above.

Assessment Engineer(s):

Ruel Badajos

Authorized Signatory:

Shabbir Ahmed
Technical Director

NATA Accreditation No. 5292
Accredited for compliance with ISO/IEC 17025.
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection and proficiency testing scheme providers reports.

Revision History

Version	Issue Date	Reason / Comments
1	11 June 2025	Initial issue

General Remarks

EMC Technologies Pty Ltd reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. EMC Technologies Pty Ltd shall have no liability for any deductions, inferences or generalisations drawn by the client or others from EMC Technologies Pty Ltd issued reports. This report shall not be used to claim, constitute or imply product endorsement by EMC Technologies Pty Ltd.

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Content

1 Project Overview

1.1 Test Facility

Inspections were performed at the following location:

☒ Melbourne Laboratory 176 Harrick Road, Keilor Park, Vic 3042

☐ Sydney Laboratory Unit 3/87 Station Road, Seven Hills, NSW 2147

EMC Technologies Pty. Ltd. is an independently owned Australian company that is NATA accredited to ISO 17025 for both testing and calibration and ISO 17020 for Inspection. – **Accreditation Number 5292**.

Country	Assessment Body	Lab Code / Member No.
Australia	NATA	Accreditation Number: 5292
Europe	European Union	Notified Body Number: 0819
USA	FCC	Designation Number: AU0001/AU0002
Canada	ISED Canada	CAB Identifier Number: AU0001/AU0002
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R

1.2 Standards Applied

Unless otherwise noted, only the cited edition applies.

KDB 447498 D01 General RF Exposure Guidance v06
RF exposure procedures and equipment authorization policies for mobile and portable devices

47 CFR § 2.1091
Radiofrequency radiation exposure evaluation: mobile devices (Transmitter is more than 20 cm from human body)

*Latest version of the standard applied.

1.3 Measurement Uncertainty

EMC Technologies has evaluated the tools and methods used to perform Radiated Electromagnetic Field predictions. The estimated measurement uncertainties shown within this report are as follows:

EMC Testing	Range	Value
Broadband Radiated Electromagnetic Fields	9 kHz to 45.5 GHz	±3.0 dB
Electromagnetic Modelling	30 MHz to 100 GHz	±2.8 dB

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

2 Device Details

2.1 Device Host Details

(Information supplied by the customer)

Product Name:	CORIS Endoscope Channel Cleaner
Model:	N05515
FCC ID:	2AM5R-CORIS
Manufacturer:	Nanosonic Limited
Serial No:	N/A
Description:	The Nanosonics CORIS is a software controlled automated device designed to clean the internal channels of nominated endoscopes prior to high-level disinfection (HLD). The device is designed for use in hospital endoscope reprocessing areas. Its use is intended to replace the action of manual brushing and flushing of the endoscope in order to remove physical procedure-related debris.

2.2 Device Transmitters Details

(Information supplied by the customer)

Transmitter #1 - RFID	
Module:	Texas Instruments – TRF7960ARHBR
Operating Frequency:	13.56 MHz
Maximum RF Output Power:	23 dBm
Antenna Type*:	RFID Antenna 1: E03006 NFC Inductive Flex Loop Antenna RFID Antenna 2: E05339 NFC Inductive Rigid Loop Antenna
Maximum Antenna Gain:	RFID Antenna 1: Unknown RFID Antenna 2: Unknown
Distance from human body in normal use:	Greater than 20cm

Note: * Two RFID antennas will only transmit one at a time.

Transmitter #2 - WiFi	
Module:	2.4 GHz/5GHz WiFi module, Ezurio 453-00048
FCC ID:	SQG-LWB5PLUS
Operating Frequency:	2400 – 2480 MHz 4900 – 5900 MHz
Maximum RF Output Power:	20 dBm
Antenna Type:	Flexible Planar Inverted-F Antenna (PIFA)
Maximum Antenna Gain:	2.4GHz: 2.5 dBi 5G: 3.0 dBi
Distance from human body in normal use:	Greater than 20cm

2.3 Reference Document

No.	Document Title	Issue No.
1	RFID Module Datasheet	trf7960a
2	Coris -WiFi module -datasheet- CS-DS-LWB5-Plus-M.2_v2_1	---
3	FCC RF Exposure Report, Report No. FA061103-09 Rev. 01	SP-ABZ-K
4	Form 005 Customer and EUT Information-CORIS A3	---
5	CORIS A3.0 EMC Test Plan	Rev 1.0

3 Evaluation of Radio Exposure Assessment

This assessment does not include accumulated RF fields from nearby sites/antennas or possible radio signal reflections or attenuation due to buildings or the general environment.

Antenna Parameters and power settings were supplied by the customer.

The following assumptions applied:

- A 100% duty cycle is assumed.
- The aperture of the radiating element assumed to be a point source in free space and far field conditions.

3.1 FCC Requirement

3.1.1 Applicable Limit

Limits for maximum permissible exposure (MPE), §1.1310

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) 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
(B) 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

3.2 Measurement Method: Tansmitter #1

3.2.1 Test Equipment List

Equipment Type	Make, Model and Serial Number	Calibration due	Calibrated by
EM Field Meter*	Asset Number: P-179 Manufacturer: Narda Model Number: NBM550 S/N: E-0743	18/07/2025	EMC Technologies
E-Field Probe**	Asset Number: P-179-3 Manufacturer: Narda Model Number: EF0392 Freq: 100kHz to 3GHz Measurement Type: Broadband S/N: D-0157	18/07/2025	EMC Technologies
H-Field Probe***	Asset Number: P-199-5 Manufacturer: Narda Model Number: HF-3061 Freq: 10kHz to 30MHz Measurement Type: Broadband S/N: D-0229	18/07/2025	EMC Technologies

Notes:

* ***Probe Correction Factors (CF) from the probe calibration (tabled in the probe's Calibration Report) must be included to derive the actual field from the field measured. As the probe is a wideband device, suitable CF is selected if the dominant emitter is known, or if there are multiple emitters present in the ambient, then the worst-case CF is used.***

** ***EF0392 probe is a Realtime isotropic, 3-axis probe.***

*** ***HF-3061 3061 probe is a Realtime isotropic, 3-axis probe.***

Probe specification sheets attached in Appendix B.

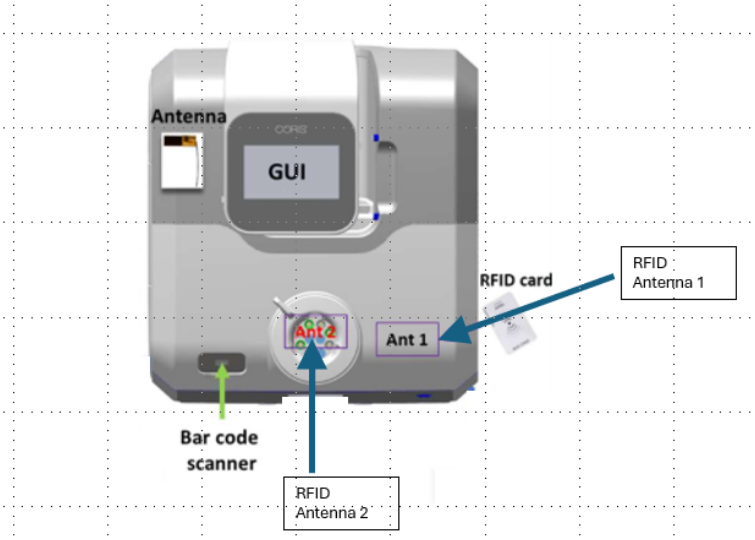
3.2.2 Measurement Procedures

The measurements were performed using the NBM550 Narda meter with different probes for magnetic and electric field (mounted on a non-magnetic aluminium tripod) in units of Ampere per meter (A/m) and Volts per metre (V/m) respectively. The field meter was set to current RMS. Measurements were performed at the distance of 0, 10, and 20 cm in front of the Reader, and 20cm for other test points (left, right, top and bottom). The levels recorded were then compared against the limits in Section 3. Please refer to section 6.5 for the results at 20cm distance from human body in normal use.

RFID Antenna 1 and RFID Antenna 2 were activated one at a time during the test, transmitting at 13.56 MHz.

3.2.3 Measurement Location

Electric and Magnetic Field measurements were taken at the distance of 20 cm (front, left, right, top, and bottom) from the RFID – 1 and RFID – 2 readers.



3.2.4 Measurement Results

RFID reader operates at 13.56 MHz, H-field and E-field measurements were performed at 0.2m.

For measured E-Field and H-Field values, a conservative probe calibration factors were applied to reduce the uncertainty due to systematic errors. E-Field Probe Cal Factor: 1.04 and H-Field Probe Cal Factor: 1.36.

3.2.4.1 RFID Antenna 1

Table 3-1: Magnetic Field HF-3061 Probe (10kHz- 30MHz)

Survey Point		Measured Magnetic Field (A/m)	CF	Calculated Field (A/m)	Limit (A/m)	% of General Public Limit
Front of the RFID	20 cm	0.016	1.36	0.021	0.162	9.630%
Right Side	20 cm	0.010	1.36	0.013	0.162	6.049%
Left Side	20 cm	0.012	1.36	0.016	0.162	7.222%
Top	20 cm	0.013	1.36	0.017	0.162	7.778%
Bottom	20 cm	0.015	1.36	0.020	0.162	9.198%

Table 3-2: Electric Field EF0392 (100kHz – 3GHz)

Survey Point		Measured Electric Field (V/m)	CF	Calculated Field (V/m)	Limit (V/m)	% of General Public Limit
Front of the RFID	20 cm	1.23	1.04	1.28	60.77	2.024%
Right Side	20 cm	1.28	1.04	1.33	60.77	2.106%
Left Side	20 cm	1.35	1.04	1.40	60.77	2.221%
Top	20 cm	1.01	1.04	1.05	60.77	1.662%
Bottom	20 cm	1.28	1.04	1.33	60.77	2.106%

3.2.5 RFID Antenna 2

Table 3-3: Magnetic Field HF-3061 Probe (10kHz- 30MHz)

Survey Point		Measured Magnetic Field (A/m)	CF	Calculated Field (A/m)	Limit (A/m)	% of General Public Limit
Front of the RFID	20 cm	0.020	1.36	0.027	0.162	**12.469%**
Right Side	20 cm	0.014	1.36	0.020	0.162	8.889%
Left Side	20 cm	0.015	1.36	0.021	0.162	9.383%
Top	20 cm	0.013	1.36	0.017	0.162	7.901%
Bottom	20 cm	0.019	1.36	0.025	0.162	11.543%

Table 3-4: Electric Field EF0392 (100kHz – 3GHz)

Survey Point		Measured Electric Field (V/m)	CF	Calculated Field (V/m)	Limit (V/m)	% of General Public Limit
Front of the RFID	20 cm	3.51	1.04	3.6504	60.77	5.776%
Right Side	20 cm	3.6	1.04	3.744	60.77	5.924%
Left Side	20 cm	2.9	1.04	3.016	60.77	4.772%
Top	20 cm	2.26	1.04	2.3504	60.77	3.719%
Bottom	20 cm	6.78	1.04	7.0512	60.77	**11.157%**

3.3 Calculation Method: Transmitter #2

The following formula was used to calculate the power density at 0.2 m:

$$S = \frac{P * G}{4\pi R^2}$$

$$S = \frac{EIRP}{4\pi R^2}$$

Where

(S): Power density (W/m^2)

(P): Output power at antenna terminal (W)

(G): Gain (ratio)

(R): Minimum separation distance (0.2 m)

Technology	Frequency Band (MHz)	Power	Gain	Duty Cycle	EIRP	EIRP	Flux Density at 20 cm	Flux Density limit	Percentage of the GP limit
		dBm	*dBi*	*%*	*dBm*	*mW*	*mW/cm^2*	*mW/cm^2*	*%*
Wi-Fi 2.4GHz	2400 - 2480	20	2.5	100%	22.5	177.8	0.035396	1.00	3.54%
Wi-Fi 5GHz	4900 - 5900	20	3.0	100%	23.0	199.5	0.039715	1.00	3.97%
Worst Case Percentage of the limit for transmission at 20 cm									**3.97%**

3.4 Co-location Consideration

Simultaneous transmission EMR test exclusion applies when the sum of the EMR ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0.

$$\sum_1^N \frac{S_{eqN}}{S_{limN}} = \frac{S_{eq1}}{S_{lim1}} + \frac{S_{eq2}}{S_{lim2}} + \cdots + \frac{S_{eqN}}{S_{limN}} \leq 1$$

Where: Seq = Power Spectral density (W/m^2) of a specific transmitter
Slim = EMR limit (W/m^2)

The following simultaneous transmissions are possible:

Table 3-5: Co-location with Wi-Fi & RFID

Transmitter 2 – Wi-Fi	Transmitter 1 - RFID E-Field	Transmitter 1 - RFID H-Field	EMR Ratio Sum	Result
0.04	0.11	0.12	0.28	Pass

4 Appendix A

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H-FIELD PROBE

HF3061

Measuring magnetic fields from 300 kHz to 30 MHz

using instruments in the NBM-500 family

- **Public and occupational field exposure from broadcasting, telecoms, and industrial equipment**
- **Isotropic (non-directional) measurement**
- **62 dB dynamic range without changing measurement range**

The probe contains three orthogonally arranged coils with detector diodes. The three voltages, corresponding to the spatial components, are available individually at the probe output. The NBM basic unit calculates the resulting isotropic field strength.

APPLICATIONS

The probe detects magnetic fields from 300 kHz to 30 MHz, such as those caused by short and medium wave transmitters, many RF communications services, and industrial equipment. The dynamic range from 0.012 A/m to 16 A/m (62 dB) makes it ideal for measuring field exposure in both the public and the occupational environment.

PROPERTIES

The probe has mechanical and electrical properties that are ideal for field use. The sensors are effectively protected by impact resistant plastic. The electric destruction limit is above 35 A/m for continuous wave signals, which is several times more than any of the human safety limit values.

CALIBRATION

The probe is calibrated at several frequencies. The correction values are stored in an EPROM in the probe and are automatically taken into account by the NBM instrument. Calibrated accuracy is thus obtained regardless of the combination of probe and instrument.

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SPECIFICATIONS [a]

Probe HF3061	Magnetic (H-)Field	
Frequency range [b]	300 kHz to 30 MHz	
Type of frequency response	Flat	
Measurement range	0.012 to 16 A/m (CW) 0.012 to 0.7 A/m (True RMS)	5.4 µW/cm² to 10 W/cm² (CW) 5.4 µW/cm² to 18 mW/cm² (True RMS)
Dynamic range	62 dB	
CW damage level	35 A/m	46 W/cm²
Peak damage level [c]	350 A/m	4.6 kW/cm²
Sensor type	Diode based system	
Directivity	Isotropic (Tri-axial)	
Readout mode / spatial assessment	3 separate axes	
UNCERTAINTY		
Flatness of frequency response [d] Calibration uncertainty not included	0/-1 dB (500 to 800 kHz) +0.1/ -0.5 dB (800 kHz to 30 MHz)	
Linearity Referred to 0.59 mW/cm² (0.125 A/m)	±3 dB (0.017 to 0.033 A/m) ±1 dB (0.033 to 0.068 A/m) ±0.5 dB (0.068 to 3 A/m) ±1 dB (3 to 16 A/m)	±3 dB (10 to 40 µW/cm²) ±1 dB (40 to 175 µW/cm²) ±0.5 dB (175 µW/cm² to 340 mW/cm²) ±1 dB (0.34 to 10 W/cm²)
Isotropic response [e]	±1 dB	
Temperature response	+0.2/ -0.8 dB (±0.025 dB/K @ 10 to 50 °C)	
GENERAL SPECIFICATIONS		
Factory calibration frequencies	0.1/ 0.15/ 0.2/ 0.3/ 0.4/ 0.5/ 0.6/ 0.7/ 0.8/ 0.9 MHz 1/ 1.2/ 1.5/ 2/ 3/ 4/ 5/ 10/ 15/ 20/ 25/ 27.12/ 30 MHz	
Recommended calibration interval	24 months	
Temperature range Operating Non-operating (transport)	 0 °C to +50 °C -40 °C to +70 °C	
Humidity	5 to 95 % RH @ ≤28 °C	≤26 g/m³ absolute humidity
Size	300 mm x 120 mm Ø	
Weight	190 g	
Compatibility	NBM-500 series meters	
Country of origin	Germany	

(a) Unless otherwise noted specifications apply at reference condition: device in far-field of source, ambient temperature 23±3 °C, relative air humidity 25% to 75%, sinusoidal signal
(b) Cutoff frequency at approx. -3 dB
(c) Pulse length 1µsec, duty cycle 1:100
(d) Frequency response can be compensated for by the use of correction factors stored in the probe memory
(e) Results are calculated from the maximum and minimum response obtained during the full revolution about the stem of the probe, oriented 54.7° to the electric field vector.

ORDERING INFORMATION

	Part number
Probe HF3061, H-field for NBM, 300 kHz - 30 MHz, isotropic	**2402/05B**
Probe HF3061, H-field, ACC - with accredited (DAkkS) calibration, basic unit required	**2402/05B/ACC**

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Measuring electric fields from 100 kHz to 3 GHz

using instruments in the NBM-500 family

- **General public and occupational field exposure from broadcasting, telecoms and industrial equipment**
- **Isotropic (non-directional) measurement**
- **64 dB dynamic range without changing measurement range**
- **For high field strengths up to 1300 V/m**

The probe contains three orthogonally arranged dipoles with detector diodes. The three voltages, corresponding to the spatial components, are available individually at the probe output. The NBM basic unit calculates the resulting isotropic field strength.

APPLICATIONS

The probe detects electric fields from 100 kHz to 3 GHz, covering the fields that occur in broadcasting, telecoms, and industry. The dynamic range from 0.8 V/m up to 1,300 V/m (64 dB) makes the probe ideal for measuring exposure in both the general public and the occupational environment.

PROPERTIES

The probe is designed with mechanical and electrical properties ideal for field use. The probe head is made of foam material to provide effective protection for the sensors, while having excellent RF characteristics. The electric destruction limit of 2,000 V/m for continuous wave signals is several times higher than any of the human safety limit values.

CALIBRATION

The probe is calibrated at several frequencies. The correction values are stored in an EPROM in the probe and are automatically taken into account by the NBM instrument. Calibrated accuracy is thus obtained regardless of the combination of probe and instrument.

SPECIFICATIONS [a]

Probe EF0392	Electric (E-)Field	
Frequency range [b]	100 kHz to 3 GHz	
Type of frequency response	Flat	
Measurement range	0.8 to 1300 V/m (CW) 0.8 to 36 V/m (True RMS)	170 nW/cm² to 450 mW/cm² (CW) 170 nW/cm² to 0.35 mW/cm² (True RMS)
Dynamic range	64 dB	
CW damage level	2000 V/m	1000 mW/cm²
Peak damage level [c]	20 kV/m	100 W/cm²
Sensor type	Diode based system	
Directivity	Isotropic (Tri-axial)	
Readout mode / spatial assessment	3 separate axes	
UNCERTAINTY		
Flatness of frequency response [d] Calibration uncertainty not included	±1 dB (1 MHz to 400 MHz) +1.4/ -1 dB (400 MHz to 2.45 GHz)	
Linearity Referred to 0.2 mW/cm² (27.5 V/m)	+2/-3 dB (1 to 2 V/m) ±1 dB (2 to 4 V/m) ±0.5 dB (4 to 400 V/m) ±1 dB (400 to 1300 V/m)	+2/-3 dB (0.265 to 1.06 µW/cm²) ±1 dB (1.06 to 4.25 µW/cm²) ±0.5 dB (4.25 µW/cm² to 42 mW/cm²) ±1 dB (42 to 450 mW/cm²)
Isotropic response [e]	±1 dB	
Temperature response	+0.2/ -1 dB (±0.025 dB/K)	
GENERAL SPECIFICATIONS		
Factory calibration frequencies	0.1/ 0.2/ 0.3/ 1/ 3/ 10/ 27.12 MHz 0.1/ 0.2/ 0.3/ 0.5/ 0.75/ 1/ 1.8/ 2.45/ 2.7/ 3 GHz	
Recommended calibration interval	24 months	
Temperature range Operating Non-operating (transport)	 0 °C to +50 °C -40 °C to +70 °C	
Humidity	5 to 95 % RH @ ≤25 °C	≤23 g/m³ absolute humidity
Size	318 mm x 66 mm Ø	
Weight	90 g	
Compatibility	NBM-500 series meters	
Country of origin	Germany	

(a) Unless otherwise noted specifications apply at reference condition: device in far-field of source, ambient temperature 23±3 °C, relative air humidity 25% to 75%, sinusoidal signal
(b) Cutoff frequency at approx. -3 dB
(c) Pulse length 1µsec, duty cycle 1:100
(d) Frequency response can be compensated for by the use of correction factors stored in the probe memory
(e) Results are calculated from the maximum and minimum response obtained during the full revolution about the stem of the probe, oriented 54.7° to the electric field vector.

ORDERING INFORMATION

	Part number
Probe EF0392, E-Field for NBM, 100 kHz – 3 GHz, High Power, Isotropic	**2402/12B**
Probe EF0392, E-Field, ACC - with accredited (DAkkS) calibration, basic unit required	**2402/12B/ACC**

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