EMC TEST REPORT

FCC 47 CFR Part 15B, ISED ICES-003 Issue 6

Report Reference No	G0M-1903-8084-EF0115B-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-03 (ISED) ISED Testing Laboratory site: 3470A-3 DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	W.O.M. WORLD OF MEDICINE GmbH
Address	Salzufer 8 10587 Berlin GERMANY
Test Specification	
Standard	FCC 47 CFR Part 15 Subpart B ISED ICES-003 Issue 6 ANSI C63.4:2014
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Irrigation Pump for HYS/LAP with Fluid Monitoring Module
Model(s)	PH304
Additional Model(s)	None
Brand Name(s)	GYN-Pump
Hardware Version(s)	03/2019
Software Version(s)	0.0.6.5
Contains FCC-ID	2AS5K-TSHW42
Contains IC	25004-TSHW42A
Test Result	**PASSED**

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
required by standard but not appl. to test object	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Date of receipt of test item	2019-04-01	
Report:		
Compiled by	Ruslan Colbasiuc	
Tested by (+ signature) (Responsible for Test)	Ruslan Colbasiuc	Colbasiuc
Approved by (+ signature) (Deputy Head of Lab)	Jens Marquardt	
Date of Issue	2019-08-16	
Total number of pages	39	
General Remarks:		
The test results presented in this report relate only to the object tested. **The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.** This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
EUT consists of an irrigation pump for HYS/LAP PH304 (2205937) and a fluid monitoring module PS304 (2206000).		

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T_{NOM}	Nominal operating temperature
V_{NOM}	Nominal supply voltage

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2019-07-24	Initial Release	
02	2019-08-16	Editorial corrections	R. Colbasiuc

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1 Equipment (Test Item) Under Test

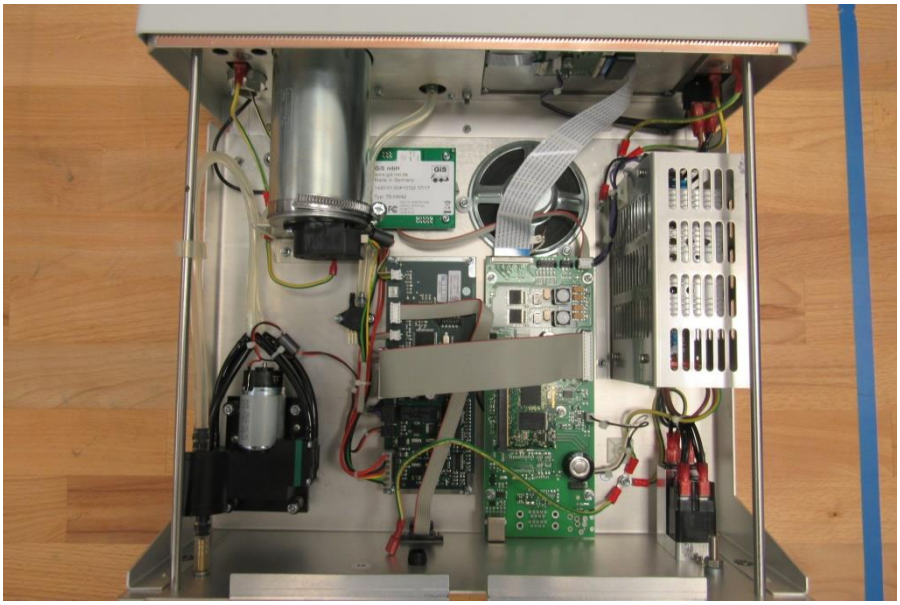
Description	Irrigation Pump for HYS/LAP with Fluid Monitoring Module	
Model	PH304	
Additional Model(s)	None	
Brand Name(s)	GYN-Pump	
Serial Number(s)	SN GYN-Pump: 1709VG0797 SN Fluid Monitoring Module: 1705PT0003	
Hardware Version(s)	03/2019	
Software Version(s)	0.0.6.5	
Contains FCC-ID	2AS5K-TSHW42	
Contains IC	25004-TSHW42A	
Class	Class B	
Equipment type	Floor standing	
Highest internal frequency [MHz]	792	
Radio Module	Type	RFID Module
	Model	TS-HW42
	Manufacturer	GiS GmbH
	FCC-ID	2AS5K-TSHW42
	IC	25004-TSHW42A
Supply Voltage	V_{NOM}	120 VAC / 60 Hz
Manufacturer	W.O.M. WORLD OF MEDICINE GmbH Salzufer 8 10587 Berlin GERMANY	

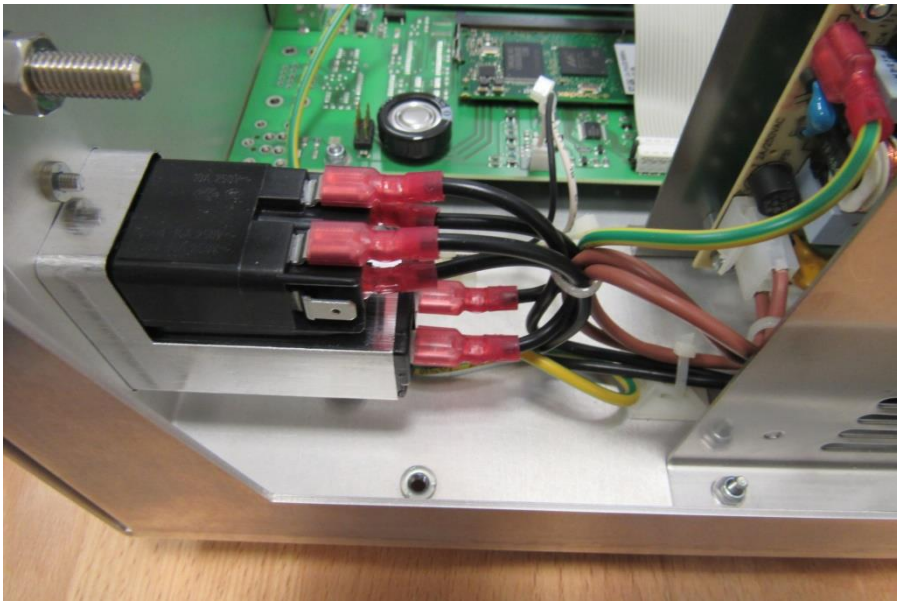
1.1 Equipment Ports

Name	Type	Attributes	Comment
Mains	AC	Count: 1 Direction: IO Service only: No	
Scale Interface	IO	Count: 1 Direction: IO Service only: Yes	
Vacuum Port	NE	Count: 1 Direction: In Service only: No	
Service Interface	IO	Count: 1 Direction: IO Service only: Yes	
Potential Equalization	AC	Count: 1 Direction: In Service only: No	

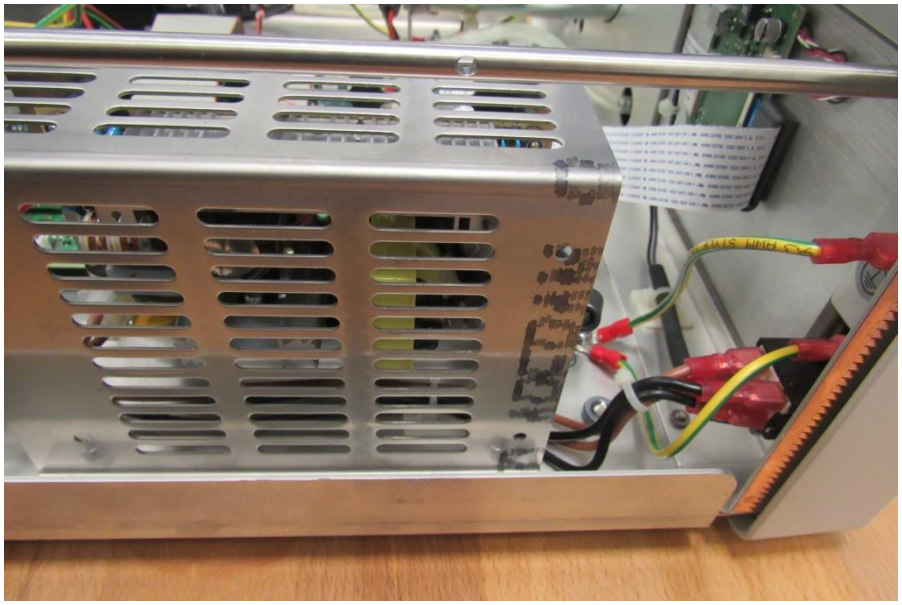
Description:	
AC	AC mains power input/output port
DC	DC power input/output port
IO	Input/Output port
TP	Telecommunication port
NE	Non-electrical port

1.2 Equipment Photos - Internal

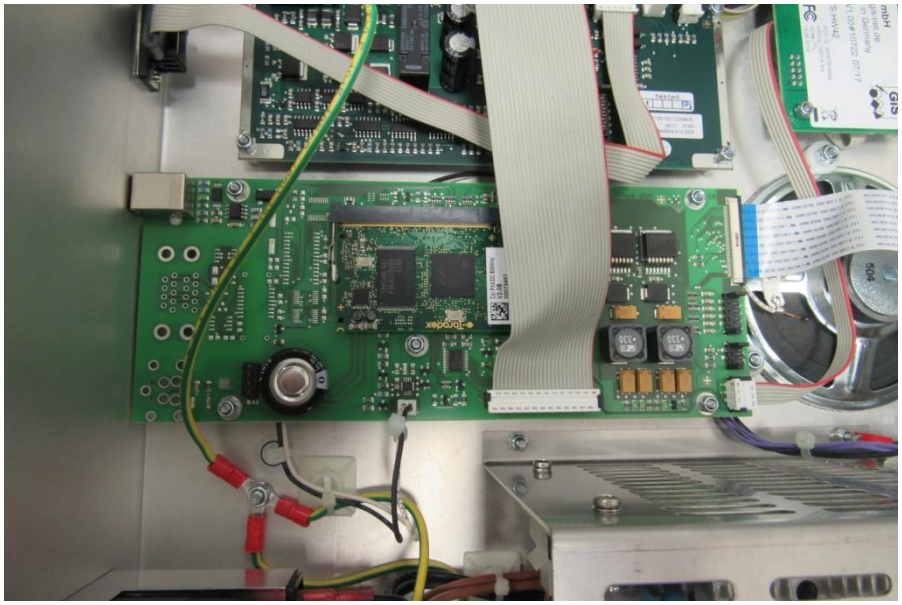
EUT Internal Architecture


EUT Intern Picture 1


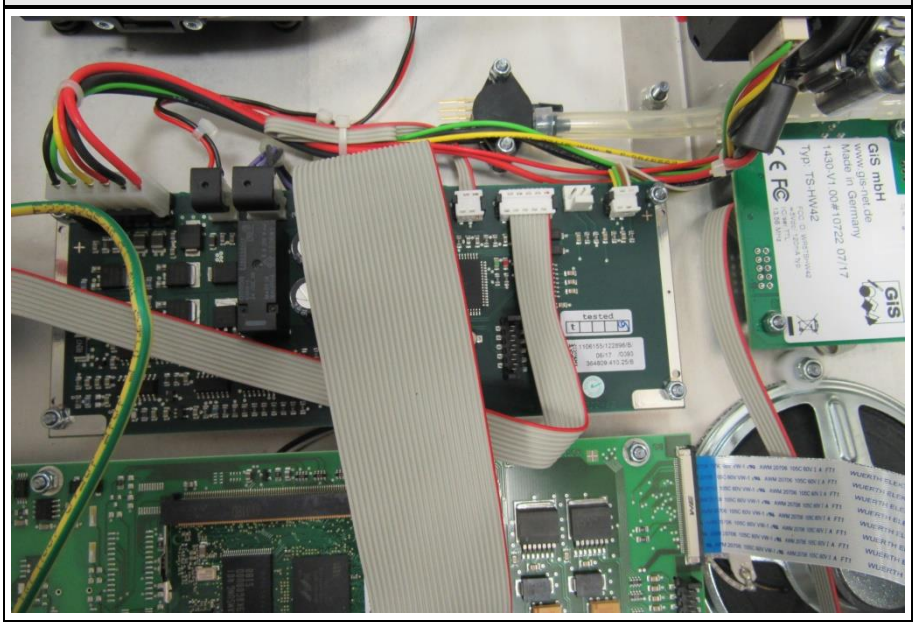
EUT Intern Picture 2



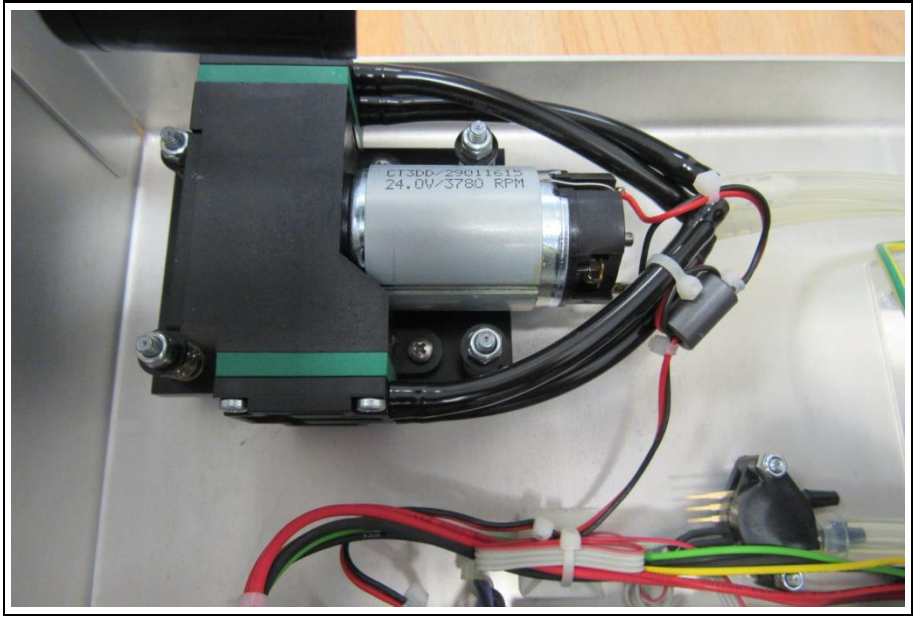
EUT Intern Picture 3



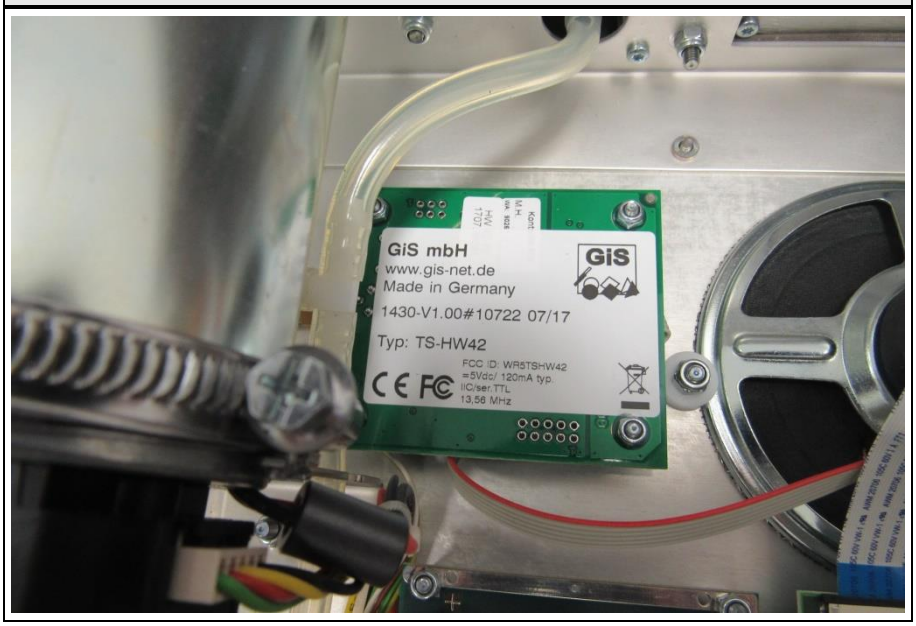
EUT Intern Picture 4



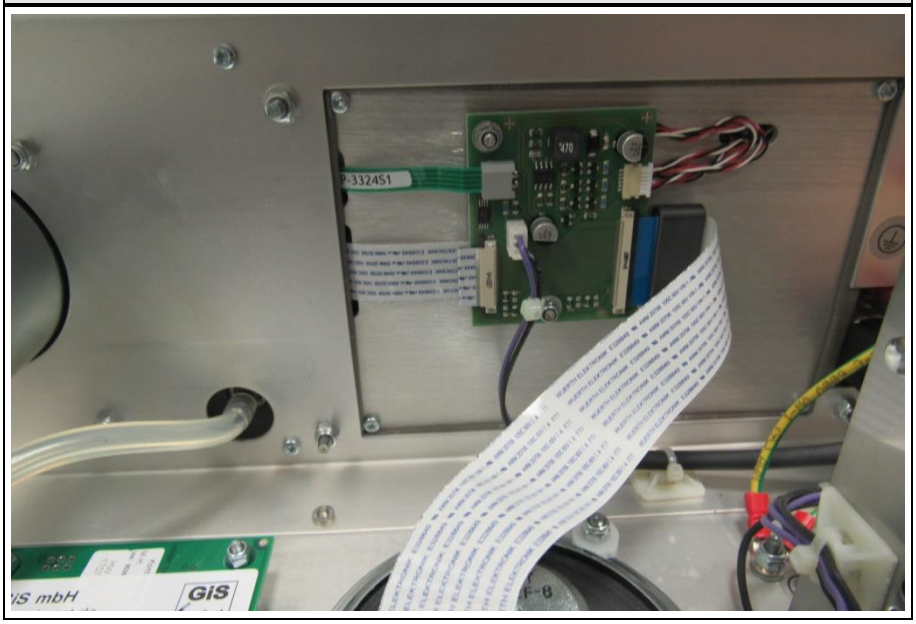
EUT Intern Picture 5



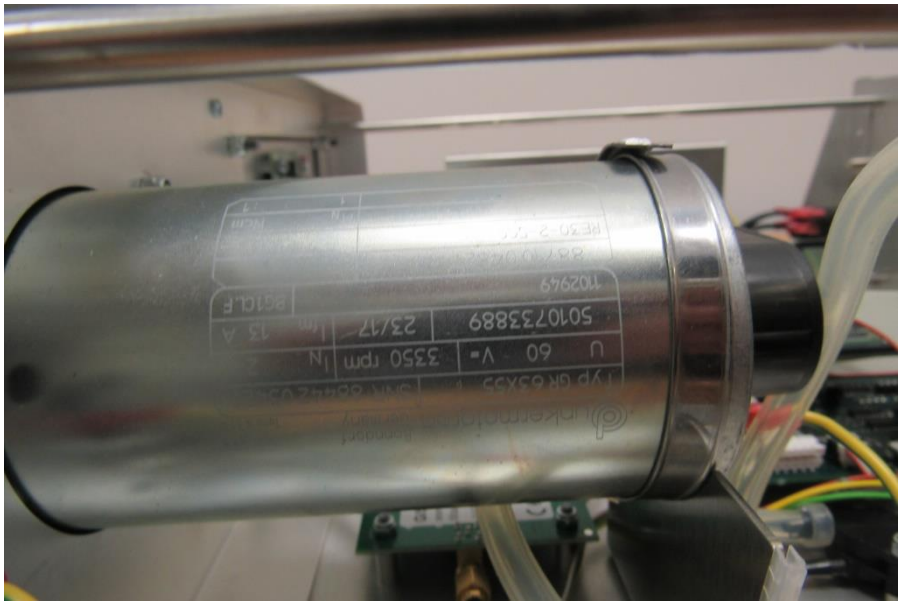
EUT Intern Picture 6



EUT Intern Picture 7



EUT Intern Picture 8



EUT Intern Label

1.3 Equipment Photos - External

EUT Setup Front Side

EUT Setup Right Side

EUT Setup Back Side

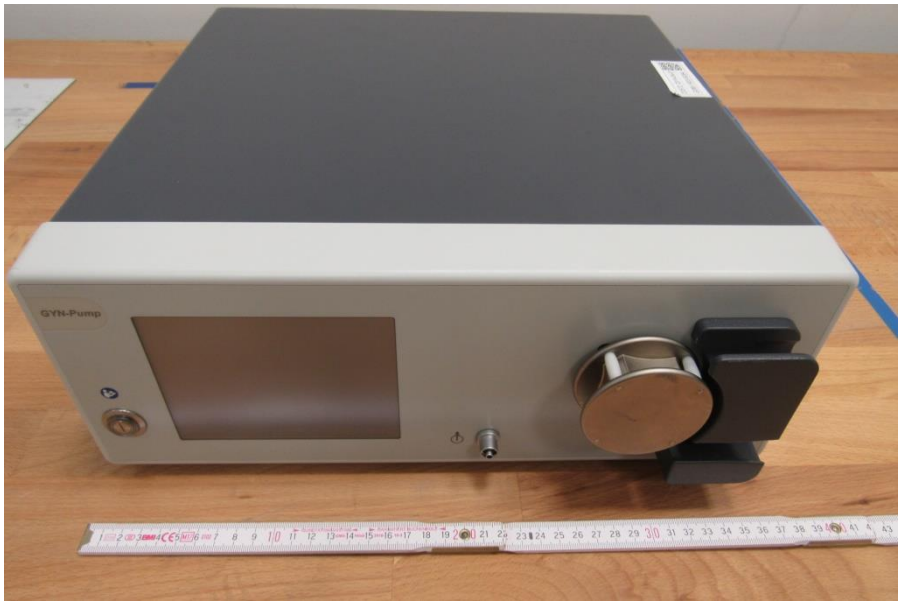
EUT Setup Left Side

Fluid Monitoring Module

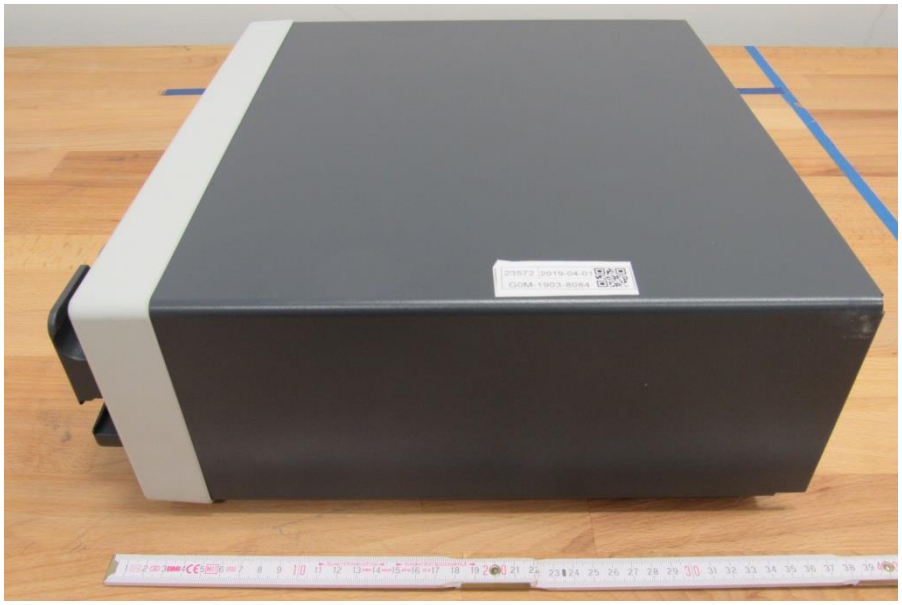
Fluid Monitoring Module Label 1

Fluid Monitoring Module Label 2

Irrigation Pump Display Side

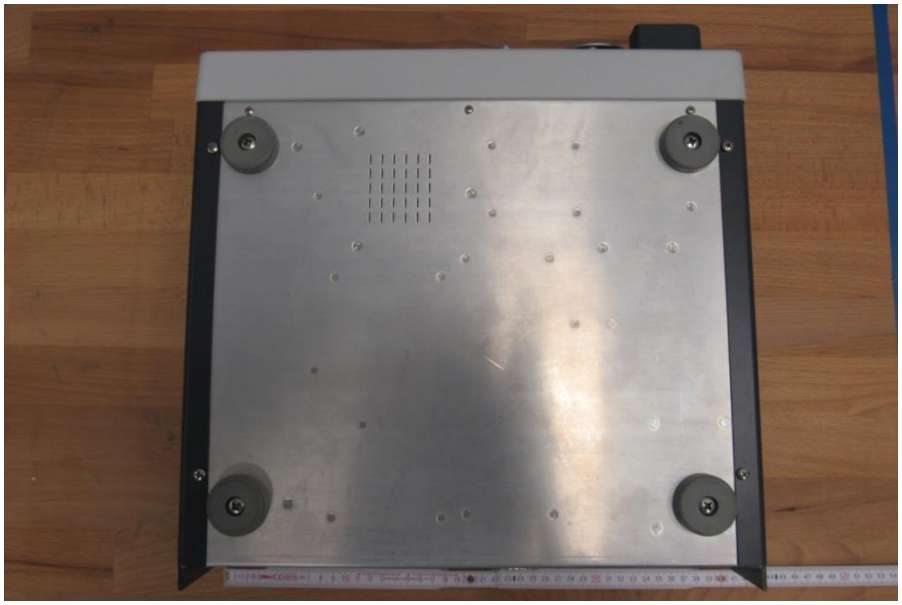


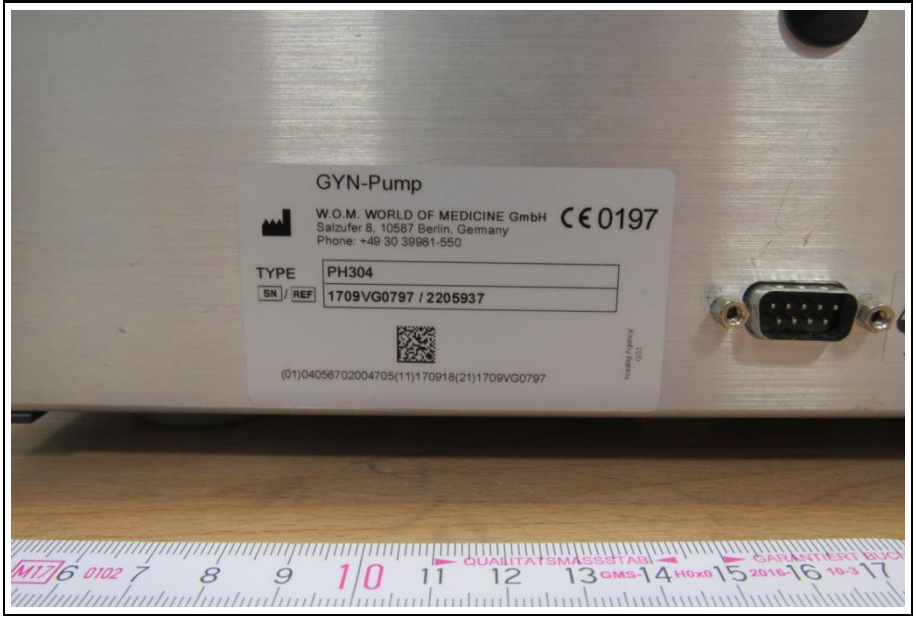
Irrigation Pump Top Side

Irrigation Pump Right Side


Irrigation Pump Back Side

Irrigation Pump Left Side

Irrigation Pump Bottom Side


Irrigation Pump Label 1


Irrigation Pump Label 2

1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
CBL	Power cable EU 5.0 m	-	Z4101-01	
CBL	Potential Equalization cable 5 m	-	-	
AE	Irrigation tube set with multiuse RFID transponder	W.O.M. WORLD OF MEDICINE GmbH	T0505-01	Standard tubeset modified with multiuse service transponder
AE	Vacuum Tube	W.O.M. WORLD OF MEDICINE GmbH	T0504-01	
SIM	EMC test bench with abdominal cavity and mechanical pressure sensors for irrigation and vacuum pressure	W.O.M. WORLD OF MEDICINE GmbH	TestDummy I	
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
Comment:				

1.5 Operational Modes

Mode #	Description
1	Active mode. Therapy
Comment:	

1.6 EUT Configuration

Configuration #	Description
1	The EUT is connected with irrigation tube with multiuse RFID transponder. Continues TAG reading. The tubes are connected with the Test Dummy. Device is in Hysteroscopic mode, pressure setting 80 mmHg. Vacuum on highest underflow level.
Comment:	

1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyser in dBµV. Any external preamplifiers used are taken into account through internal analyser settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyser. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

Reading on Analyser (dBµV) + A.F. (dB/m) = Net field strength (dBµV/m)

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/m)

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dBµV + 26 dB/m	= 47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15B, ISED ICES-003 Issue 6				
Reference	**Requirement**	**Reference Method**	**Result**	**Remarks**
Emission				
FCC 47 CFR 15.109 ISED ICES-003, 8, 6.1	Radiated emissions	ANSI C63.4:2014	PASS	
FCC 47 CFR 15.107 ISED ICES-003, 8, 6.2	AC power line conducted emissions	ANSI C63.4:2014	PASS	
Comment:				

Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

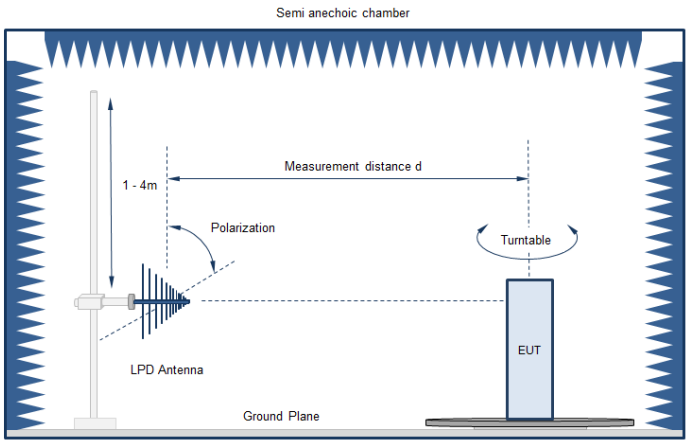
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

2.1.1 Information

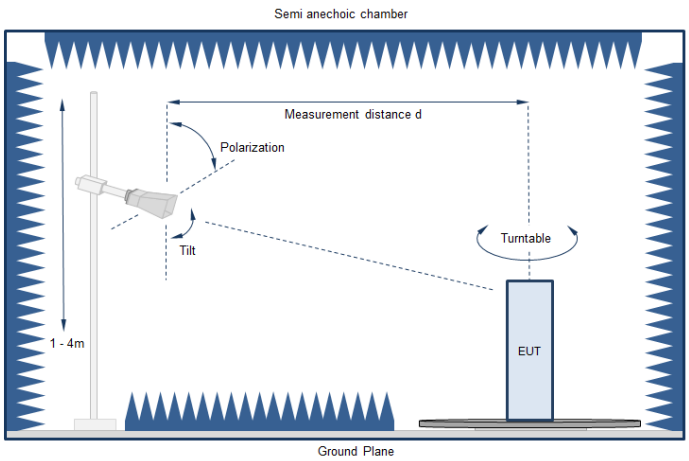
Test Information	
Reference	FCC 47 CFR 15.109, ISED ICES-003, 8, 6.1
Reference method	ANSI C63.4:2014 Section 8
Equipment class	Class B
Equipment type	Floor standing
Highest internal frequency [MHz]	792
Measurement range	30 MHz to 5 GHz
Temperature [°C]	24 °C
Humidity [%]	31 %
Operator	Ruslan Colbasiuc
Date	2019-04-03

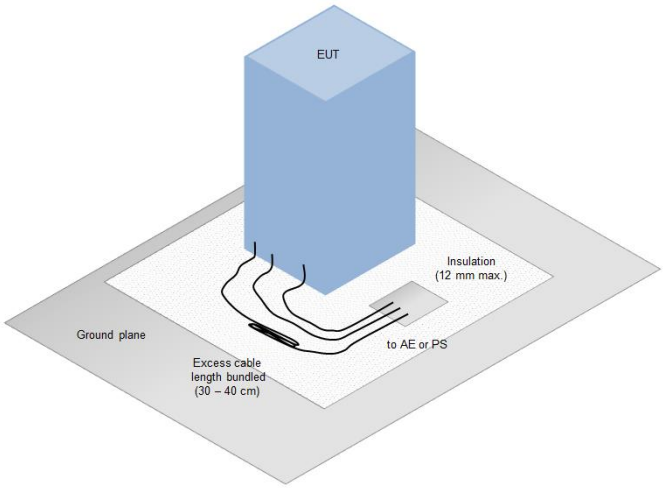
2.1.2 Setup

Measurement up to 1 GHz



Measurement above 1 GHz



Test Setup - Floor standing


2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC6	EF00910	2017-03	2020-03
EMI Test Receiver	Rohde & Schwarz Vertriebs GmbH	ESU26	EF00887	2018-08	2019-08
TRILOG Broadband Antenna	Schwarzbeck	VULB 9162 (30MHz - 7GHz, 100W)	EF00978	2016-11	2019-11
Horn Antenna	ETS-Lindgren	3117	EF00976	2019-03	2022-03

2.1.4 Procedure

Exploratory measurement
1. The EUT was placed on a non-conductive table at a height of 0.8m. 2. The EUT and support equipment, if needed, were set up to simulate typical usage. 3. Cables, of type and length specified by the manufacturer, were connected to at least one port of each type and were terminated by a device or simulating load of actual usage. 4. The antenna was placed at a distance of 3 or 10 m. 5. The received signal was monitored at the measurement receiver. 6. This procedure has to be performed in both antenna polarizations, horizontal and vertical. 7. The arrangement of the equipment with the maximum emission level is shown on the setup picture at item 1.3

Final measurement
1. The EUT was placed on a 0.8 m non-conductive table at a 3 m distance from the receive antenna. The antenna output was connected to the measurement receiver. 2. A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast. 3. The EUT and cable arrangement were based on the exploratory measurement results. 4. Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded. 5. The test data of the worst-case conditions were recorded and shown on the next pages.

2.1.5 Limits

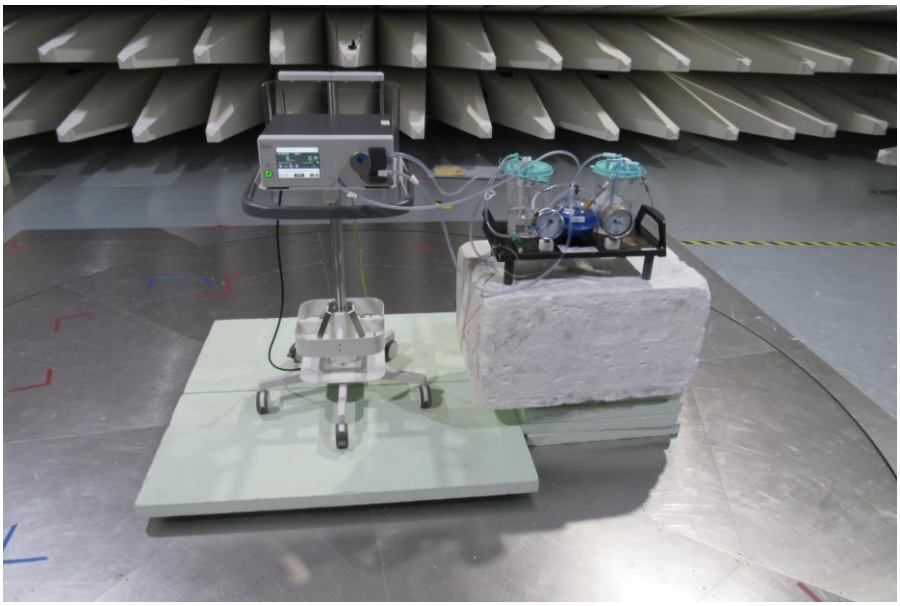
Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dBµV/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak Average	74 54

Class A @ 10 m		
Frequency [MHz]	Detector	Limit [dBµV/m]
30 - 88	Quasi-peak	39
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46.5
960 - 1000	Quasi-peak	49.5
> 1000	Peak Average	69.5 49.5

2.1.6 Results

Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	

2.1.7 Setup Photos

Test Setup


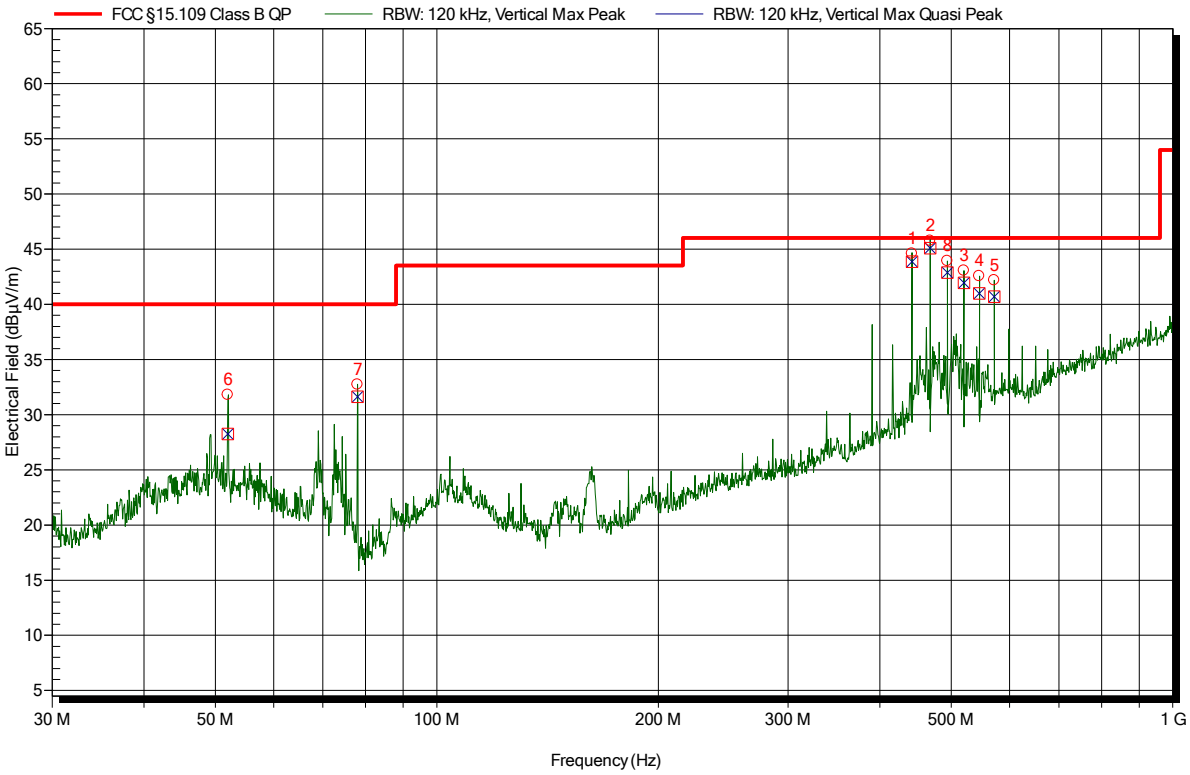
2.1.8 Records

Radiated emissions according to FCC 47 CFR 15.109

Project number: G0M-1903-8084

Applicant:	W.O.M. WORLD OF MEDICINE GmbH
EUT Name:	Irrigation Pump for HYS/LAP with Fluid Monitoring Module
Model:	PH304
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Colbasiuc
Test Conditions:	Tnom: 24°C, Unom: 120 VAC / 60 Hz
Antenna:	Schwarzbeck VULB 9162, Vertical
Measurement distance:	10 m (calculated to 3 m)
Mode:	1
Test Date:	2019-04-05
Note:	

Index 1



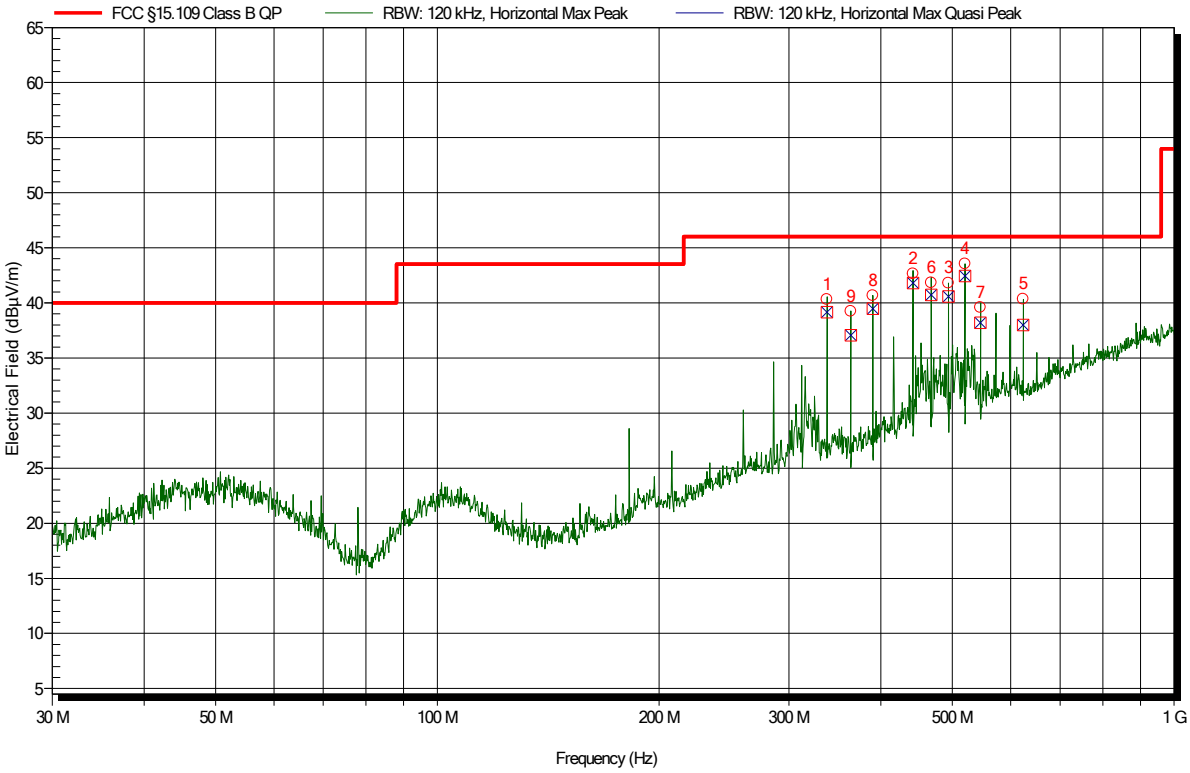
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	441.966 MHz	43.9 dBµV/m	46 dBµV/m	-2.2 dB	Pass	20 Degree	2.9 m
2	467.964 MHz	45.1 dBµV/m	46 dBµV/m	-0.9 dB	Pass	20 Degree	2.9 m
3	519.954 MHz	42 dBµV/m	46 dBµV/m	-4.1 dB	Pass	20 Degree	2.9 m
4	545.952 MHz	41 dBµV/m	46 dBµV/m	-5.0 dB	Pass	20 Degree	2.9 m
5	571.956 MHz	40.7 dBµV/m	46 dBµV/m	-5.3 dB	Pass	20 Degree	2.9 m
6	52.008 MHz	28.2 dBµV/m	40 dBµV/m	-11.8 dB	Pass	20 Degree	2.9 m
7	77.994 MHz	31.6 dBµV/m	40 dBµV/m	-8.4 dB	Pass	20 Degree	2.9 m
8	493.962 MHz	42.9 dBµV/m	46 dBµV/m	-3.1 dB	Pass	20 Degree	2.9 m

Radiated emissions according to FCC 47 CFR 15.109

Project number: G0M-1903-8084

Applicant:	W.O.M. WORLD OF MEDICINE GmbH
EUT Name:	Irrigation Pump for HYS/LAP with Fluid Monitoring Module
Model:	PH304
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Colbasiuc
Test Conditions:	Tnom: 24°C, Unom: 120 VAC / 60 Hz
Antenna:	Schwarzbeck VULB 9162, Horizontal
Measurement distance:	10m (calculated to 3 m)
Mode:	1
Test Date:	2019-04-05
Note:	

Index 2



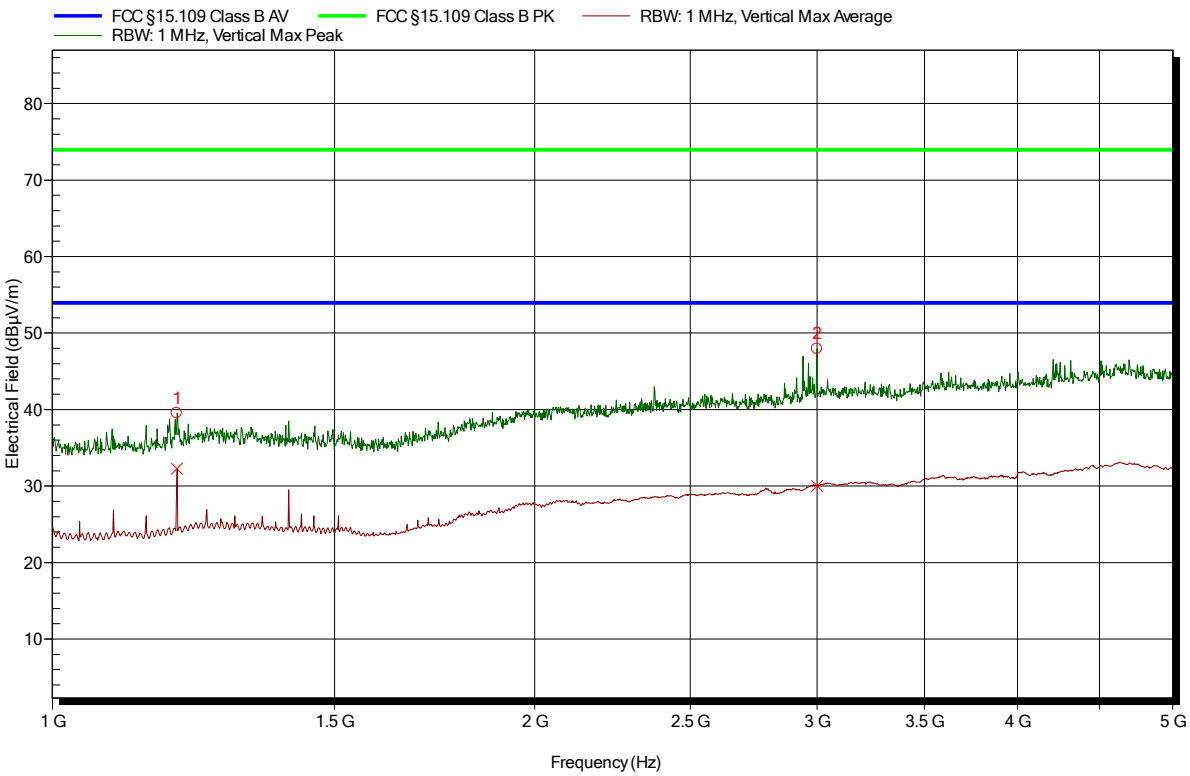
Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	337.974 MHz	39.2 dBµV/m	46 dBµV/m	-6.9 dB	Pass	20 Degree	1.55 m
2	441.966 MHz	41.8 dBµV/m	46 dBµV/m	-4.2 dB	Pass	20 Degree	1.55 m
3	493.962 MHz	40.6 dBµV/m	46 dBµV/m	-5.4 dB	Pass	20 Degree	1.55 m
4	519.96 MHz	42.4 dBµV/m	46 dBµV/m	-3.6 dB	Pass	20 Degree	1.55 m
5	623.952 MHz	38 dBµV/m	46 dBµV/m	-8.0 dB	Pass	20 Degree	1.55 m
6	467.964 MHz	40.7 dBµV/m	46 dBµV/m	-5.3 dB	Pass	20 Degree	1.55 m
7	545.958 MHz	38.2 dBµV/m	46 dBµV/m	-7.8 dB	Pass	20 Degree	1.55 m
8	389.97 MHz	39.5 dBµV/m	46 dBµV/m	-6.5 dB	Pass	20 Degree	1.55 m
9	363.972 MHz	37.1 dBµV/m	46 dBµV/m	-8.9 dB	Pass	20 Degree	1.55 m

Radiated emissions according to FCC 47 CFR 15.109

Project number: G0M-1903-8084

Applicant:	W.O.M. WORLD OF MEDICINE GmbH
EUT Name:	Irrigation Pump for HYS/LAP with Fluid Monitoring Module
Model:	PH304
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Colbasiuc
Test Conditions:	Tnom: 24°C, Unom: 120 VAC / 60 Hz
Antenna:	ETS-Lindgren 3117, Vertical
Measurement distance:	3 m
Mode:	1
Test Date:	2019-04-05
Note:	

Index 3



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.196 GHz	39.5 dBµV/m	74 dBµV/m	-34.5 dB	Pass	-30 Degree	1 m
2	3 GHz	47.9 dBµV/m	74 dBµV/m	-26.1 dB	Pass	-30 Degree	1 m

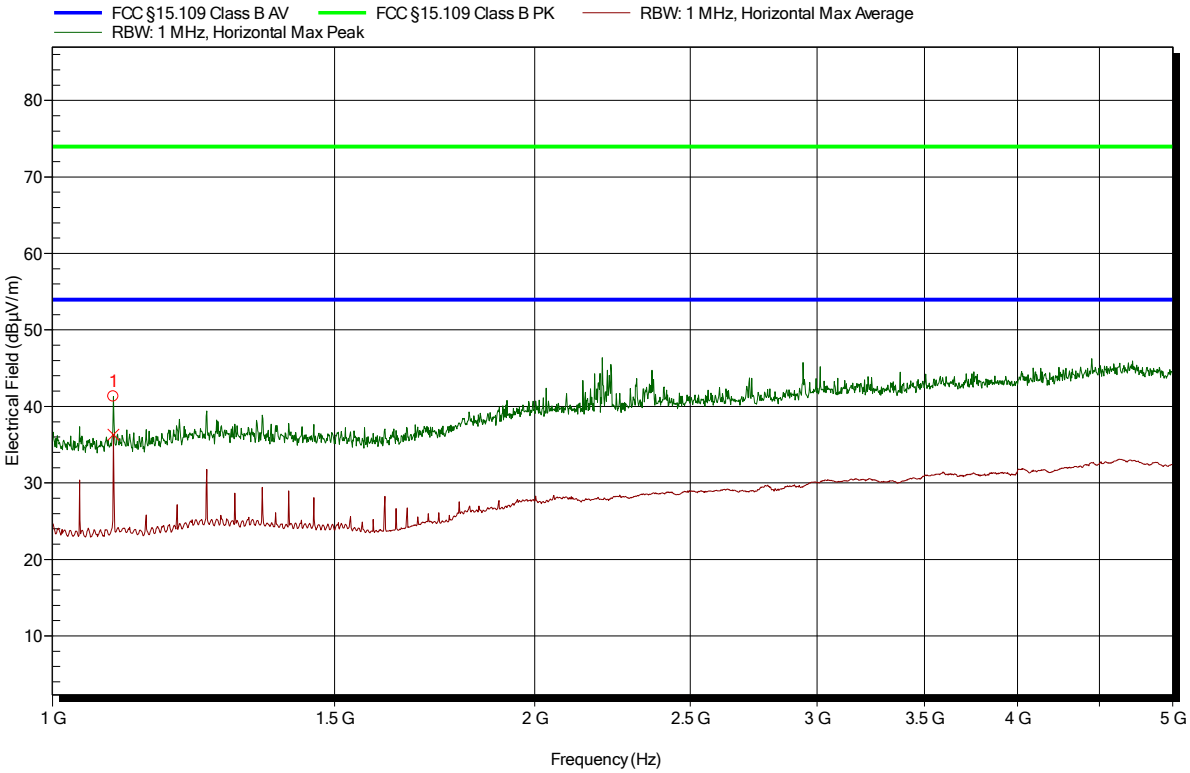
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.196 GHz	32.3 dBµV/m	54 dBµV/m	-21.7 dB	Pass	-30 Degree	1 m
2	3 GHz	30 dBµV/m	54 dBµV/m	-24.0 dB	Pass	-30 Degree	1 m

Radiated emissions according to FCC 47 CFR 15.109

Project number: G0M-1903-8084

Applicant:	W.O.M. WORLD OF MEDICINE GmbH
EUT Name:	Irrigation Pump for HYS/LAP with Fluid Monitoring Module
Model:	PH304
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Colbasiuc
Test Conditions:	Tnom: 24°C, Unom: 120 VAC / 60 Hz
Antenna:	ETS-Lindgren 3117, Horizontal
Measurement distance:	3 m
Mode:	1
Test Date:	2019-04-05
Note:	

Index 4



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	1.092 GHz	41.3 dBµV/m	74 dBµV/m	-32.7 dB	Pass	40 Degree	2.5 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	1.092 GHz	36.3 dBµV/m	54 dBµV/m	-17.7 dB	Pass	40 Degree	2.5 m

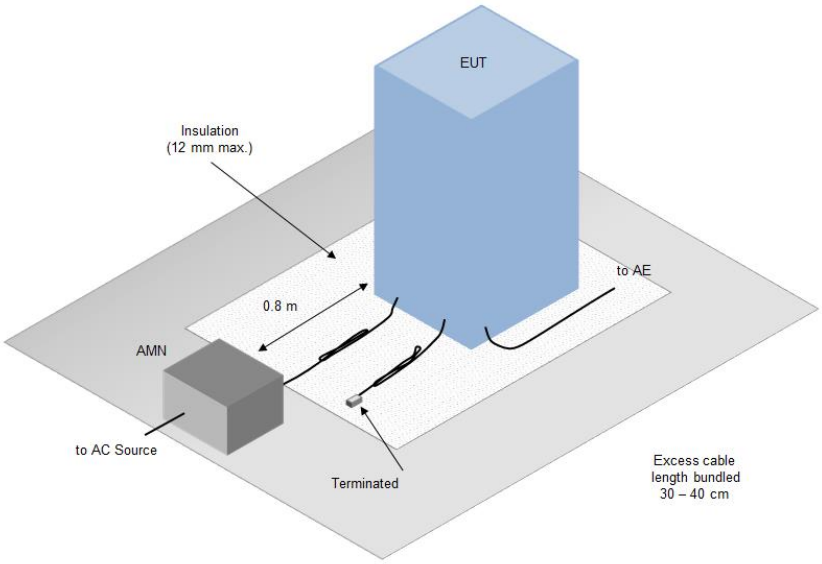
2.2 Test Conditions and Results - Conducted emissions acc. to ANSI C63.4

2.2.1 Information

Test Information	
Reference	FCC 47 CFR 15.107, ISED ICES-003, 8, 6.2
Reference method	ANSI C63.4:2014 Section 12
Measurement range	150 kHz to 30 MHz
Equipment class	Class B
Equipment type	Floor standing
Temperature [°C]	24 °C
Humidity [%]	31 %
Operator	Ruslan Colbasiuc
Date	2019-04-03

2.2.2 Setup

Test Setup - Floor standing



2.2.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2016.1.10

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	Schwarzbeck	NSLK 8128	EF00975	2017-07	2019-07
Pulse Limiter	R&S	ESH3-Z2	EF01063	2018-07	2019-07
EMI Test Receiver	R&S	ESU26	EF00887	2018-08	2019-08

2.2.4 Procedure

Exploratory measurement
1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1) 2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN. 3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length). 4. The LISN measurement port was connected to a measurement receiver 5. I/O cables were bundled not longer than 0.4 m 6. Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor 7. To maximize the emissions the cable positions were manipulated 8. The worst configuration of EUT and cables is shown on a test setup picture at item 1.3

Final measurement
1. The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1) 2. The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN. 3. The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length). 4. The LISN measurement port was connected to a measurement receiver 5. The EUT and cable arrangement were based on the exploratory measurement results 6. The test data of the worst-case conditions were recorded and shown on the next pages

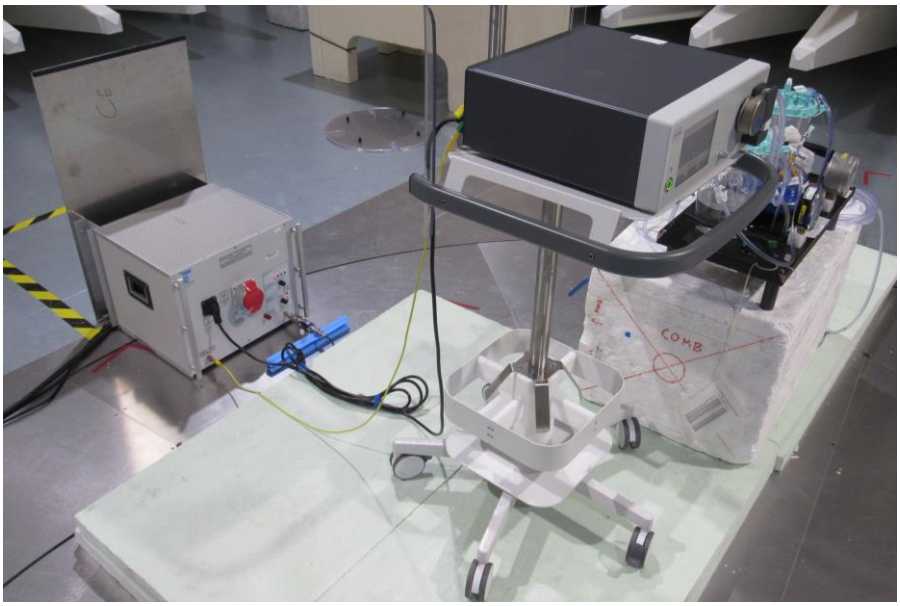
2.2.5 Limits

Class B		
Frequency [MHz]	Quasi-peak Limit [dBµV]	Average Limit [dBµV]
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50
* Decreases with the logarithm of the frequency		

2.2.6 Results

AC power line conducted emissions					
Port	Coupling	Operational mode	EUT Configuration	Verdict	Remark
Mains	AMN	1	1	PASS	

2.2.7 Setup Photos

Test Setup


2.2.8 Records

Conducted emissions according to FCC 47 CFR 15.107

Project number: G0M-1903-8084

Applicant:	W.O.M. WORLD OF MEDICINE GmbH
EUT Name:	Irrigation Pump for HYS/LAP with Fluid Monitoring Module
Model:	PH304
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Colbasiuc
Test Conditions:	Tnom: 24°C, Unom: 120 VAC / 60 Hz
LISN:	Schwarzbeck NSLK 8128 (L)
Mode:	1
Test Date:	2019-04-03
Note:	

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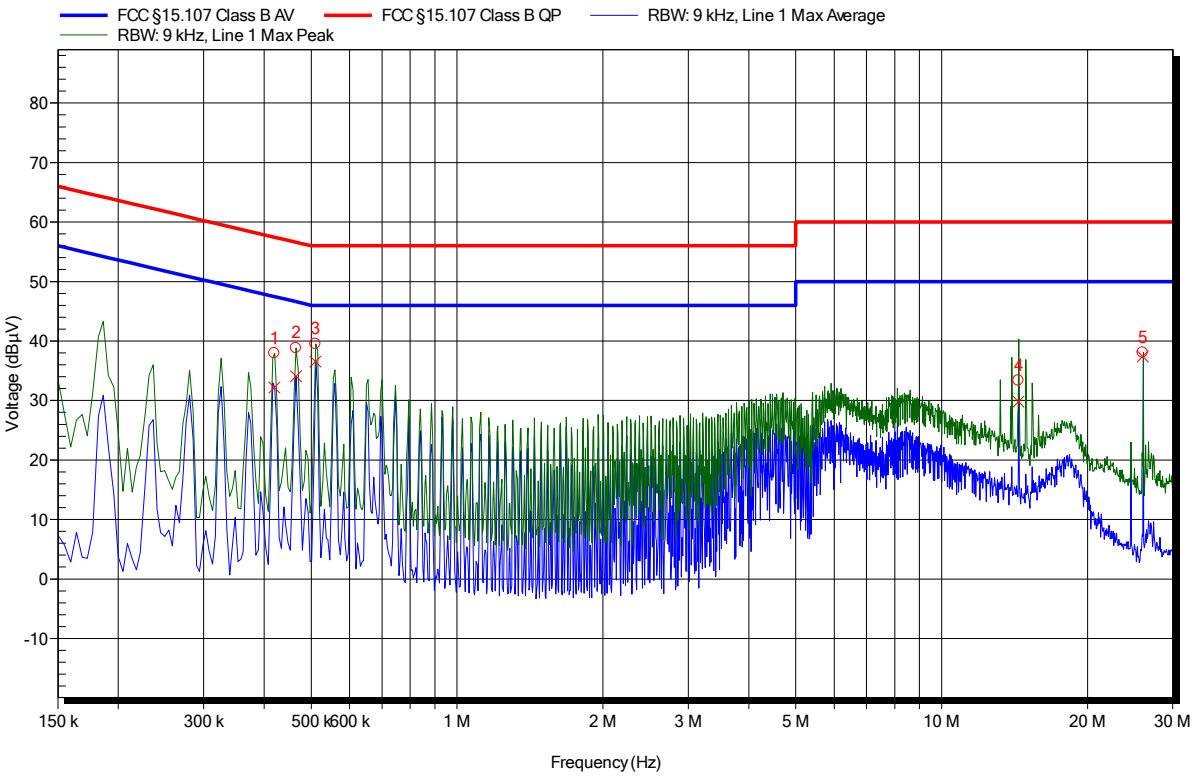

Peak Number	Frequency
1	420 kHz
2	465 kHz
3	510 kHz
4	14.397 MHz
5	25.998 MHz

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	420 kHz	32.2 dBµV	47.4 dBµV	-15.3 dB	Pass
2	465 kHz	34 dBµV	46.6 dBµV	-12.6 dB	Pass
3	510 kHz	36.5 dBµV	46 dBµV	-9.5 dB	Pass
4	14.397 MHz	29.8 dBµV	50 dBµV	-20.2 dB	Pass
5	25.998 MHz	37.4 dBµV	50 dBµV	-12.6 dB	Pass

Conducted emissions according to FCC 47 CFR 15.107

Project number: G0M-1903-8084

Applicant:	W.O.M. WORLD OF MEDICINE GmbH
EUT Name:	Irrigation Pump for HYS/LAP with Fluid Monitoring Module
Model:	PH304
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Colbasiuc
Test Conditions:	Tnom: 24°C, Unom: 120 VAC / 60 Hz
LISN:	Schwarzbeck NSLK 8128 (N)
Mode:	1
Test Date:	2019-04-03
Note:	

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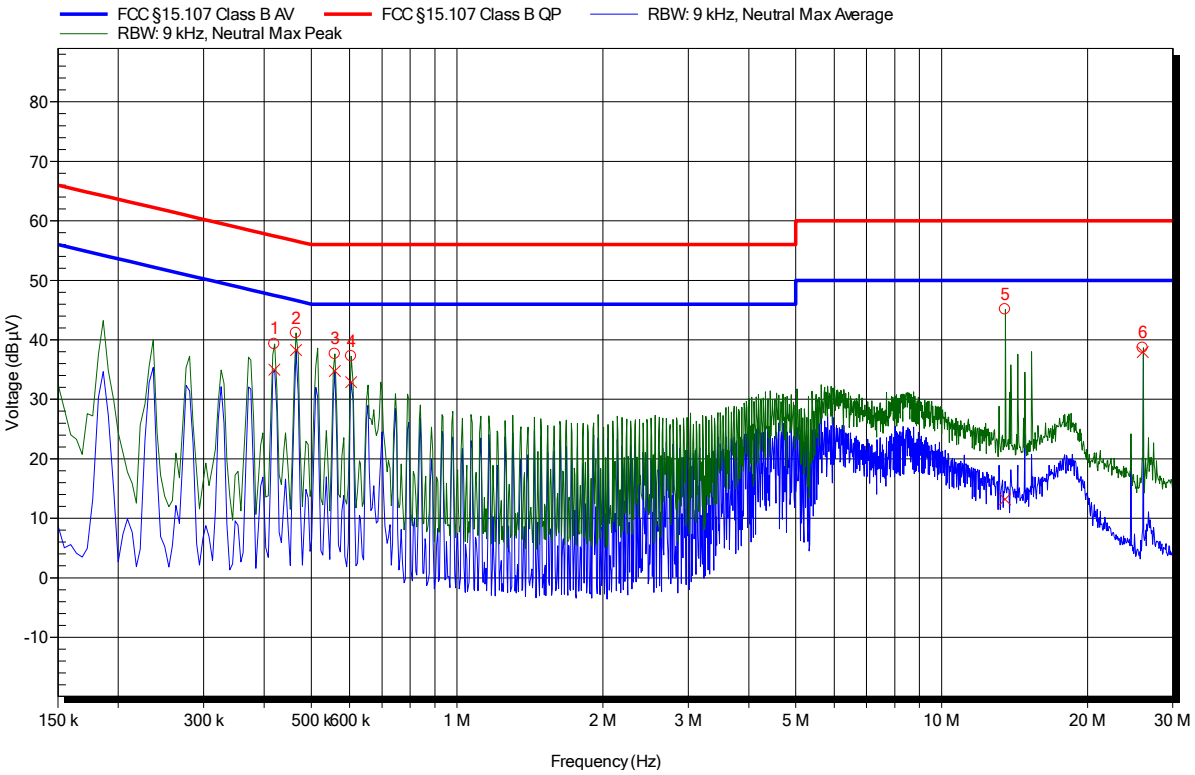

Peak Number	Frequency
1	420 kHz
2	465 kHz
3	559.5 kHz
4	604.5 kHz
5	13.524 MHz
6	25.998 MHz

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status
1	420 kHz	35 dBµV	47.4 dBµV	-12.5 dB	Pass
2	465 kHz	38.3 dBµV	46.6 dBµV	-8.3 dB	Pass
3	559.5 kHz	34.7 dBµV	46 dBµV	-11.3 dB	Pass
4	604.5 kHz	32.9 dBµV	46 dBµV	-13.1 dB	Pass
5	13.524 MHz	13.2 dBµV	50 dBµV	-36.8 dB	Pass
6	25.998 MHz	37.9 dBµV	50 dBµV	-12.1 dB	Pass