



## **Onsource International Limited**

Application  
For  
Certification  
**(FCC ID: VVWOS200702)**

Ball Ultrasonic Humidifier

0729665  
AL / Connie Lau  
December 31, 2007

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### **Intertek Testing Services Hong Kong Ltd.**

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# INTERTEK TESTING SERVICES

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## INTERTEK TESTING SERVICES

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### MEASUREMENT/TECHNICAL REPORT

Onsource International Limited

**MODEL: Onsource: WA-95, WA-93, WA-94**  
**Health Select: WA-95, WA-93, WA-94**

**FCC ID: VVWOS200702**

**December 31, 2007**

This report concerns (check one:) Original Grant   X   Class II Change       

Equipment Type: Ball Ultrasonic Humidifier

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes        No   X  

If yes, defer until:                       
date

Company Name agrees to notify the Commission by:                                       
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 18.123? Yes        No   X  

If no, assumed Part 18 for Ball Ultrasonic Humidifier - the new 47 CFR Part 18 [10-01-06 Edition] provision.

Report prepared by:

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# INTERTEK TESTING SERVICES

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## INTERTEK TESTING SERVICES

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### List of attached file

Exhibit type	File Description	filename
Test Report	Test Report	report.pdf
Operation Description	Technical Description	descri.pdf
Test Setup Photo	Radiated Emission	radiated photos.doc
Test Setup Photo	Conducted Emission	conducted photos.doc
External Photo	External Photo	external photos.doc
Internal Photo	Internal Photo	internal photos.doc
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf

# **INTERTEK TESTING SERVICES**

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## **EXHIBIT 1**

### **GENERAL DESCRIPTION**

## INTERTEK TESTING SERVICES

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### 1.0 **General Description**

#### 1.1 Product Description

The Equipment Under Test (EUT) is an Ball Ultrasonic Humidifier which is powered by AC 120V 60Hz and operating at around 2.4MHz frequency. When the EUT is powered ON, it will use high-frequency vibration to create water droplets and emit these mist of water into the room.

The models WA-93 and WA-94 are declared to be identical to the model WA-95 in hardware aspect. The difference in model number and trade name serves as marketing strategy. The representative model WA-95 was selected to test.

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

#### 1.2 Related Submittal(s) Grants

This is an application for certification of a Ball Ultrasonic Humidifier. No other related submittal grants.

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### 1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in FCC/OST MP-5 (1986). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “**Justification Section**” of this Application.

### 1.4 Test Facility

The open area test site and conducted measurement facility used to collect the emission data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.



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### **EXHIBIT 2**

### **SYSTEM TEST CONFIGURATION**

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### 2.0 **System Test Configuration**

#### 2.1 Justification

The EUT was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in FCC/OST MP-5 (1986).

The EUT was powered by 120V a.c. 60Hz.

For maximizing emissions, the EUT was rotated through 360°. For loop antenna, the antenna height was fixed at around 2 meters above the ground plane. For biconical and log-periodic antenna, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

#### 2.2 EUT Exercising Software

There was no special software to exercise the device. Once the EUT is turned on, it emits the RF energy.

#### 2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

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### 2.4 Equipment Modification

Any modifications installed previous to testing by Onsource International Limited will be incorporated in each production model sold/leased in the United States. No modifications were installed by Intertek Testing Services.

### 2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

### 2.6 Support Equipment List and Description

N/A

All the items listed under section 2.0 of this report are

*Confirmed by:*

*Chow Chi Ming, Billy  
Manager  
Intertek Testing Services Hong Kong Ltd.  
Agent for Onsource International Limited*

\_\_\_\_\_  
Signature

\_\_\_\_\_  
December 31, 2007      Date

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### **EXHIBIT 3**

### **EMISSION RESULTS**

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### 3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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### 3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization, average factor and distance factor (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + PD + AV - DF$$

where FS = Field Strength in dB $\mu$ V/m

RA = Receiver Amplitude (including preamplifier) in dB $\mu$ V

AF = Antenna Factor in dB (including the cable factor)

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

DF = Distance Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + PD + AV - DF$$

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### 3.1 Field Strength Calculation (cont'd)

#### Example

Assume a receiver reading of 39.0 dB $\mu$ V is obtained. The antenna factor of 10.6 dB is added. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was 0 dB, however, the distance factor is -20 dB. The net field strength for comparison to the appropriate emission limit is 29.6 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$RA = 39.0 \text{ dB}\mu\text{V}$$

$$AF = 10.6 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$DF = 20 \log(3/30) = -20\text{dB}$$

$$AV = 0 \text{ dB}$$

$$FS = 39 + 10.6 - 20 = 29.6 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm} [(29.6 \text{ dB}\mu\text{V/m})/20] = 30.2 \mu\text{V/m}$$

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### **3.2 Radiated Emission Configuration Photograph**

Worst Case Radiated Emission  
at  
2.503 MHz

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.doc.



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### 3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by -5.0 dB margin

The radiated emission test was observed up to 400MHz

#### **TEST PERSONNEL:**



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*Signature*

Tam Ka Po, Sylvia, Compliance Engineer  
*Typed/Printed Name*

December 31, 2007  
*Date*

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## INTERTEK TESTING SERVICES

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Applicant: Onsource International Limited  
Model: WA-95

Date of Test: 19 December, 2007

Table 1

**Radiated Emissions**  
**Pursuant to FCC 18.305(b) emissions requirement**

Frequency (MHz)	Net at 3m (dB $\mu$ V/m)	Calculated at 30m (dB $\mu$ V/m)	Limit at 30m (dB $\mu$ V/m)	Margin (dB)
2.503	38.5	18.5	23.5	-5.0
5.037	31.3	11.3	23.5	-12.2
7.570	32.7	12.7	23.5	-10.8
10.200	31.4	11.4	23.5	-12.1
12.510	30.9	10.9	23.5	-12.6
15.500	31.5	11.5	23.5	-12.0

- Notes:
1. Average Detector Data unless otherwise stated.
  2. Negative value in the margin column shows emission below limit.
  3. Frequency range scanned: 9kHz to 30MHz
  4. Only emissions significantly above equipment noise floor are reported.
  5. A closer fixed distance was used for testing and 1/d attenuation law factor was used.
  6. Loop antenna was used for the emission below 30MHz.

Test Engineer: Tam Ka Po, Sylvia

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## INTERTEK TESTING SERVICES

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Applicant: Onsource International Limited  
Model: WA-95

Date of Test: 19 December, 2007

Table 2

**Radiated Emissions**  
**Pursuant to FCC 18.305(b) emissions requirement**

Polarization	Frequency (MHz)	Net at 3m (dB $\mu$ V/m)	Calculated at 30m (dB $\mu$ V/m)	Limit at 30m (dB $\mu$ V/m)	Margin (dB)
V	32.500	28.3	8.3	23.5	-15.2
V	45.100	29.0	9.0	23.5	-14.5
V	82.510	30.1	10.1	23.5	-13.4
V	85.500	30.3	10.3	23.5	-13.2
V	87.501	30.1	10.1	23.5	-13.4
V	160.031	29.6	9.6	23.5	-13.9
V	165.003	31.1	11.1	23.5	-12.4
V	175.210	30.9	10.9	23.5	-12.6
V	180.110	28.8	8.8	23.5	-14.7

- Notes: 1. Average Detector Data unless otherwise stated.
2. Negative value in the margin column shows emission below limit.
3. Frequency range scanned: 30MHz to 400MHz
4. Only emissions significantly above equipment noise floor are reported.
5. A closer fixed distance was used for testing and 1/d attenuation law factor was used.

Test Engineer: Tam Ka Po, Sylvia

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### 3.4 Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration  
at  
2.575 MHz

For electronic filing, the worst case line-conducted configuration photograph are saved with filename: conducted photos.doc.

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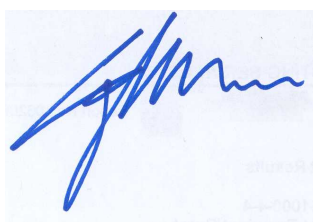
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### 3.5 Conducted Emission Data

The data on the following page lists the significant emission frequencies, the level and the limit of compliance.

Judgement: Passed by at least -7.1 dB margin

#### **TEST PERSONNEL:**



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*Signature*

Tam Ka Po, Sylvia, Compliance Engineer  
*Typed/Printed Name*

December 31, 2007  
*Date*

# INTERTEK TESTING SERVICES

Report No.: 0729665  
ON mode  
AC mains "L"

Report No.:0729665

Scan Settings (3 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
9k	50k	100Hz	200Hz	PK+AV	50ms	AUTO	LD OFF	60dB
50k	150k	100Hz	200Hz	PK+AV	20ms	AUTO	LN OFF	60dB
150k	30M	5k	10k	PK+AV	10ms	AUTO	LN OFF	60dB

Final Measurement: x QP / + AV

Meas Time: 1 s

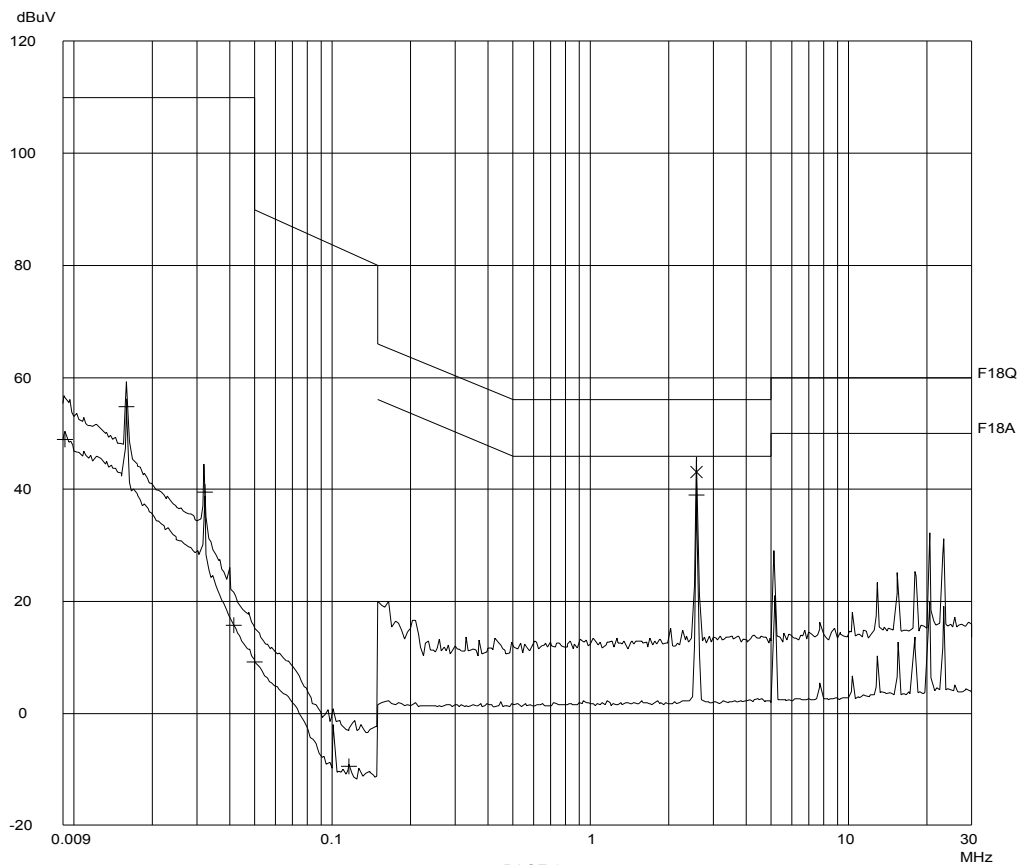
Subranges: 16

Acc Margin: 20dB

Transducer No.	Start	Stop	Name
----------------	-------	------	------

2	1	9k	30M	EW0699
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12	9k	30M	EW1449
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## INTERTEK TESTING SERVICES

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Report No.:0729665

### Scan Settings (3 Ranges)

|----- Frequencies -----||----- Receiver Settings -----|

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
9k	50k	100Hz	200Hz	PK+AV	50ms	AUTO	LD OFF	60dB
50k	150k	100Hz	200Hz	PK+AV	20ms	AUTO	LN OFF	60dB
150k	30M	5k	10k	PK+AV	10ms	AUTO	LN OFF	60dB

### Final Measurement

Frequency	QP Level	QP Limit
MHz	dBuV	dBuV

2.57500	43.0	56.0
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Frequency	AV Level	AV Limit
MHz	dBuV	dBuV

0.0092000	48.9	
0.0160000	54.8	
0.0320000	39.5	
0.0415000	15.8	
0.05010	9.1	
0.11610	-9.4	
2.57500	38.9	46.0

\* limit

# INTERTEK TESTING SERVICES

Report No.: 0729665  
ON mode  
AC mains "N"

Report No.:0729665

Scan Settings (3 Ranges)

Frequencies				Receiver Settings			
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp
9k	50k	100Hz	200Hz	PK+AV	50ms	AUTO	LD OFF
50k	150k	100Hz	200Hz	PK+AV	20ms	AUTO	LN OFF
150k	30M	5k	10k	PK+AV	10ms	AUTO	LN OFF

Final Measurement: x QP / + AV

Meas Time: 1 s

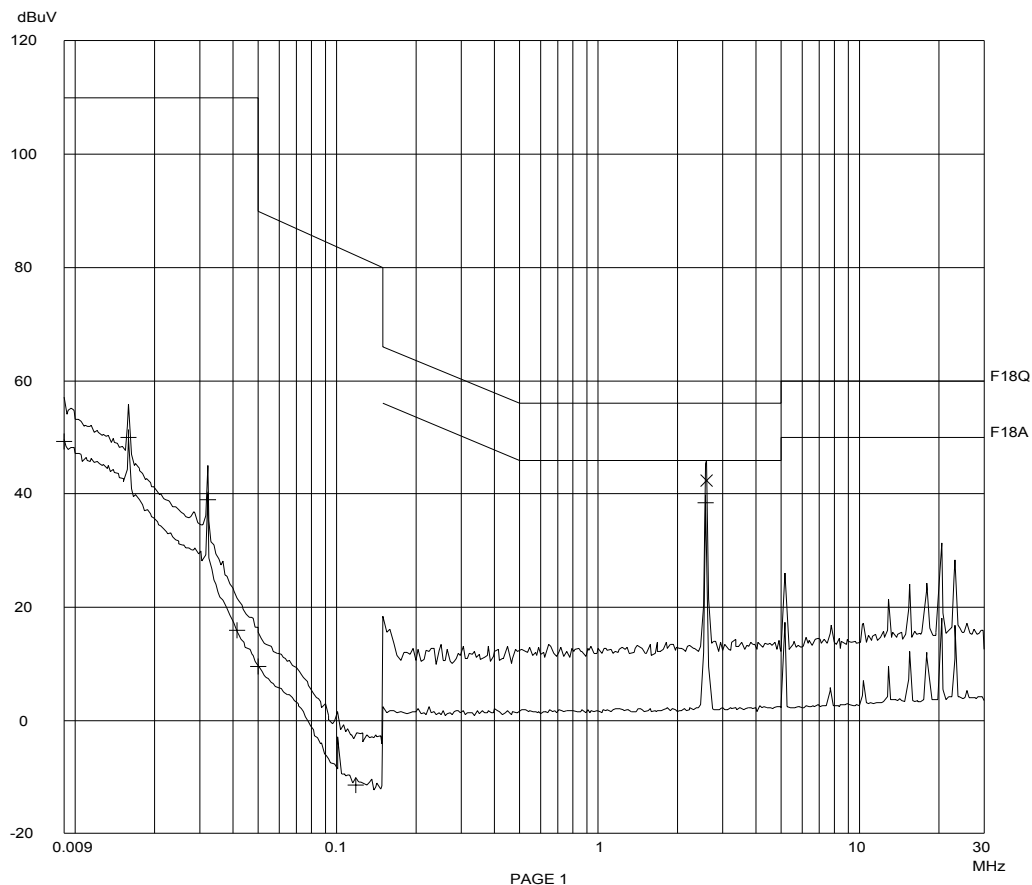
Subranges: 16

Acc Margin: 20dB

Transducer No.	Start	Stop	Name
----------------	-------	------	------

2	1	9k	30M
---	---	----	-----

12	9k	30M	EW1449
----	----	-----	--------





## INTERTEK TESTING SERVICES

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Report No.:0729665

### Scan Settings (3 Ranges)

----- Frequencies -----			----- Receiver Settings -----					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
9k	50k	100Hz	200Hz	PK+AV	50ms	AUTO	LD OFF	60dB
50k	150k	100Hz	200Hz	PK+AV	20ms	AUTO	LN OFF	60dB
150k	30M	5k	10k	PK+AV	10ms	AUTO	LN OFF	60dB

### Final Measurement

Frequency	QP Level	QP Limit
MHz	dBuV	dBuV

2.58500	42.3	56.0
---------	------	------

Frequency	AV Level	AV Limit
MHz	dBuV	dBuV

0.0090000	49.3	
0.0160000	50.0	
0.0320000	39.0	
0.0415000	15.9	
0.0500000	9.5	
0.11790	-11.4	
2.58000	38.4	46.0

\* limit

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### **EXHIBIT 4**

### **EQUIPMENT PHOTOGRAPHS**

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### 4.0 **Equipment Photographs**

For electronic filing, the photographs of the tested EUT are saved with filename: external photos.doc & internal photos.doc.

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### **EXHIBIT 5**

### **PRODUCT LABELLING**

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### 5.0 **Product Labelling**

For electronic filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

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### **EXHIBIT 6**

### **TECHNICAL SPECIFICATIONS**

## INTERTEK TESTING SERVICES

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### 6.0 **Technical Specifications**

For electronic filing, the block diagram and schematics of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

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### **EXHIBIT 7**

### **INSTRUCTION MANUAL**



## INTERTEK TESTING SERVICES

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### 7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

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**EXHIBIT 8**

**MISCELLANEOUS INFORMATION**

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### 8.0 **Miscellaneous Information**

This miscellaneous information includes details of the test procedure and calculation of factors such as pulse desensitization and averaging factor.

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### **8.1 Discussion of Pulse Desensitization**

No desensitization of the measurement equipment is required as this device is an Ball Ultrasonic Humidifier.

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### **8.2 Calculation of Average Factor**

This device is an Animal Ultrasonic Humidifier. It is not necessary to apply average factor to the measurement result.

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### 8.3 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of Ball Ultrasonic Humidifier operating under Part 18, Subpart C rules.

The test set-up and procedures described below are designed to meet the requirements of FCC/OST MP-5 (1986).

The equipment under test (EUT) is placed on a wooden turntable which is 1.5 x 1 meter dimension and approximately 1 meter in height above the ground plane. During the radiated emissions test, the turntable is rotated to resulting in maximum emissions. The antenna polarization is varied during the testing to search for maximum signal levels. For loop antenna, the height of the antenna is set at 2 meters. For biconical and log-periodic antenna, the antenna height is varied from one to four meters.

According to FCC/OST MP-5 (1986), the frequency range scanned is 9 kHz to 400MHz in field strength emission. The detector function of the measurement is set to average. For line conducted emission, the frequency range scanned is from 9 kHz to 30 MHz in quasi peak and average measurement.