Prüfbericht-Nr.: *Test Report No.*:	**60387373 001**	**Auftrags-Nr.:** *Order No.*:	**190126960**	Seite 1 von 18 *Page 1 of 18*
Kunden-Referenz-Nr.: *Client Reference No.*:	**N/A**	**Auftragsdatum:** *Order date*:	**16.06.2020**	
Auftraggeber: *Client*:	**TianjinYolinTechnologyCo.,Ltd** 52-1Factory Building,Yougu New Science Park east of Jingfu Road,Medical and Medical Device Industrial Park,Tianjin BeichenEconomic and Technological Development Zone,Beichen Distrct, Tianjin 300400, P.R. China			
Prüfgegenstand: *Test item*:	**Yolin Intelligent Pump**			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	**YLBP**			
Auftrags-Inhalt: *Order content*:	**CE EMC**			
Prüfgrundlage: *Test specification*:	**EN 55014-1:2017, EN 55014-2:2015**			

Wareneingangsdatum: *Date of receipt*:	**14.08.2020**
Prüfmuster-Nr.: *Test sample No.*:	**A002876417-001**
Prüfzeitraum: *Testing period*:	**14.08.2020**
Ort der Prüfung: *Place of testing*:	**Refer to section 1.1**
Prüflaboratorium: *Testing laboratory*:	**Refer to section 1.1**
Prüfergebnis*: *Test result**:	**Pass**

geprüft von / *tested by*:

15.10.2020 Wang Gang/ PE Wang Gang

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

kontrolliert von / *reviewed by*:

15.10.2020 Sun, Lixun/ TC

Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:
Manufacturer or/and his importer shall ensure product bears label requirements in article 7 and article 9 of the 2014/30/EU relate to name, batch number, post address prior place the product into EU market.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m test specification(s)		*F(ail) = failed a.m test specification(s)*	*N/A = not applicable*	*N/T = not tested*

V04

TEST SUMMARY

4.1.1 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE
Result:
N/A
4.1.2 DISCONTINUOUS INTERFERENCE ON AC MAINS
Result:
N/A
4.2.1 DISTURBANCE POWER
Result:
N/A
4.2.2 RADIATED EMISSION
Result:
Pass
5.1.1 ELECTROSTATIC DISCHARGE
Result:
Pass
5.1.2 RF ELECTROMAGNETIC FIELD IMMUNITY TEST
Result:
Pass
5.2.1 FAST TRANSIENTS ON AC POWER LINE, SIGNAL LINE AND CONTROL LINE
Result:
N/A
5.2.2 SURGES TO AC POWER LINE
Result:
N/A
5.2.3 INJECTED CURRENT INTO AC POWER LINE, SIGNAL LINE AND CONTROL LINE
Result:
N/A
5.2.4 VOLTAGE DIPS AND INTERRUPTIONS
Result:
N/A

Contents

1 Test Sites

1.1 Test Facilities

Laboratory 1: CHEARI (Beijing) Certification & Testing Co., Ltd
Address: No.3, Boxing Balu, Beijing Economic and Technological Development Area, Beijing, China

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Type	S/N	Manufacturer	Calibrated until
Horn Antenna	SWB-STLP9149	0304827-07	R&S	/
Bi-log Antenna	HL046E	0304807-06	R&S	/
Signal Generator	SMB100A	0304827-02	R&S	2020-10-22
Power Amplifier	BLWA 0810-160/100D	0304828	R&S	/
Power Amplifier	BLMA 1060-100/50D	0304828-01	R&S	/
Power Meter	NRP2	0304827-03	R&S	2020-10-18
EMI Receiver	ESCI7	0304826-03	R&S	2020-11-13
Bi-log Antenna	HL562	0304826-06	R&S	2020-11-18
ESD Simulator	NSG 437	0304788	TESEQ	2021-06-26

2 General Product Information

2.1 Product Function and Intended Use

The EUT (equipment under test) is an Intelligent Pump. For the further information, refer to the user's manual.

2.2 Ratings and System Details

Type	:	YLBP
Rated Voltage	:	7.4Vdc
Capacity	:	2.5Ah
Rated power	:	60W
Protection Class	:	III

2.3 Independent Operation Modes

The basic operation modes are:
"On": continuous working mode use car mode.
"Off".

2.4 Noise Generating and Noise Suppressing Parts

Refer to the circuit diagram for further information.

2.5 Submitted Documents

User's manual, Nameplate, PCB, BOM.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test conditions were adapted accordingly in reference to the instructions for use.
Refer to the related paragraph of this report.

Immunity: The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test conditions were adapted accordingly in reference to the instructions for use.
Refer to the related paragraph of this report.

3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

3.3 Test Operation and Test Software

Refer to the related paragraph of this report. No software was used.

3.4 Special Accessories and Auxiliary Equipment

None.

3.5 Countermeasures to achieve EMC Compliance

None.

4 Electromagnetic emission measurement results

4.1 Emission in the Frequency Range up to 30 MHz

4.1.1 Mains Terminal Continuous Disturbance Voltage

Result:	**N/A**

EUT is powered by internal battery and does not connect to the mains network, so this test is not applicable.

4.1.2 Discontinuous Interference on AC Mains

Result:	**N/A**

EUT is powered by internal battery and does not connect to the mains network, so this test is not applicable.

4.2 Emission in the Frequency Range above 30 MHz

4.2.1 Disturbance Power

Result:	**N/A**

EUT is powered by internal battery and does not connect to the mains network, so this test is not applicable.

4.2.2 Radiated emission

Result:	**Pass**

Date of testing : 14.08.2020
Test procedure : EN 55014-1:2017 and CISPR 16-1 series standards
Frequency range : 30 - 1000MHz
Limits : 30-230MHz, 40dBµV/m with 3m test distance;
230-1000MHz, 47dBµV/m with 3m test distance.
Kind of test site : Semi-anechoic chamber
Operation mode : On

The measurement setup was made according to EN 55014-1:2017.

The test equipment listed in 1.1, table 1 of this report are as specified in CISPR 16-1.

The EUT was placed on a turntable. The turntable can turn in 360º. A log periodic antenna or a loop antenna is fixed 3m from centre of the turntable.

During the test, the turntable was rotated fully with a measurement antenna oriented for both horizontal and vertical polarisation. The antenna was adjusted between 1m and 4m in height above the ground plane to find the max disturbance.

In this anechoic chamber the distance between EUT and centre is 3m. The limit of EN 55014-1:2017 is given for 10m. According to the 4.3.4.5 of EN 55014-1:2017, An inverse proportionality factor of 20 dB per decade should be used to normalize the measured data to the specified distance for determining compliance.

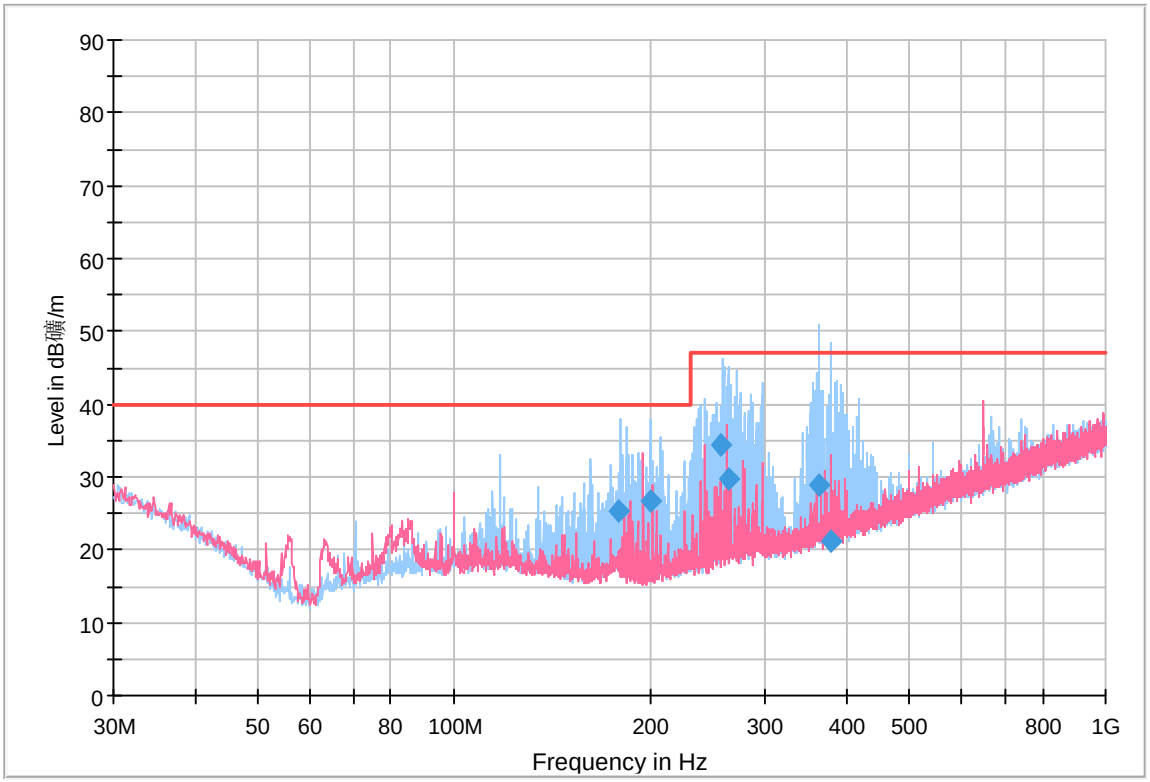
That means: L(a)-L(b) =10 dB

Frequency MHz	Limit in 10m	Limit in 3m
30-230	30 dB(µV/m)	40 dB(µV/m)
230-1000	37 dB(µV/m)	47 dB(µV/m)

The following figures and tables were those measured by an automatic measurement system. A preview test was firstly performed with peak detector. The final test was performed with quasi-peak detector at those critical frequencies found during the preview test. In the following figures, the vertical results are marked with red, and the horizontal ones are marked with blue.

Figure 1: Spectral diagrams and measurement results, Horizontal and Vertical polarization

Level in dBµV/m



Final test result:

Frequency (MHz)	QuasiPeak (dBµV/m)	Average (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol
179.142500	25.38	---	---	40.00	14.62	15000.0	120.000	99.9	H
199.999500	26.70	---	---	40.00	13.30	15000.0	120.000	99.9	H
257.432000	34.53	---	---	47.00	12.47	15000.0	120.000	99.9	H
264.018750	29.71	---	---	47.00	17.29	15000.0	120.000	99.9	H
362.268750	28.88	---	---	47.00	18.12	15000.0	120.000	99.9	H
377.906750	21.20	---	---	47.00	25.80	15000.0	120.000	99.9	H

5 Test Results Immunity

During the immunity tests, the EUT was operated under conditions specified by clause 2.3 of this report.

Performance criterion A: The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Due to category III equipment, Electrostatic Discharge, Radiated Radio-frequency Electromagnetic Field (RS) were performed on the EUTs.

5.1 Enclosure

5.1.1 Electrostatic Discharge

Result:	**Pass**

During the test, the EUT was placed on a 0.5mm high insulating support above the ground plane. The minimum distance between the EUT and all other conductive structures except the ground plane beneath the EUT is more than 0.5m. The size of the reference ground plane is more than 2m by 2m.

A horizontal coupling plane (HCP), sized 1.6m x 0.8m, and vertical coupling plane (VCP), size 0.5m x 0.5m were placed on the wooden table and an insulating plate was placed beneath the EUT to isolate the EUT from the horizontal ground plane.

Date of testing	:	14.08.2020
Basic standard	:	IEC 61000-4-2:2008
Test level	:	±4.0kV (contact discharge), ±2.0kV, ±4.0kV, ±8.0kV (air discharge)
Polarity	:	Positive / negative
Number of discharges	:	10
Performance criteria	:	B
Ambient conditions	:	Temperature: 23°C; Relative humidity: 47%

Table 2: Electrostatic discharge immunity test results

Position	Kind of Discharge	Result	Remarks
Nonmetallic part of enclosure, screen, button	Air discharge ±2.0kV, ±4.0kV, ±8.0kV	Pass	During the test, the EUT can operate as intended.
Pump air line	Air discharge ±2.0kV, ±4.0kV, ±8.0kV	Pass	During the test, the EUT can operate as intended.
Metallic enclosure	Contact discharge ±4.0kV	Pass	During the test, the EUT can operate as intended.
VCP and HCP	Indirect Contact ±4.0kV	Pass	During the test, the EUT can operate as intended.

5.1.2 RF electromagnetic field immunity test

Result:	**Pass**

The test for frequency range 80MHz-1GHz was performed inside a 3m modified semi-anechoic chamber with a test disturbance of 3m. The field uniformity of the test sites is regularly calibrated to ensure the 0-6dB field uniformity criterion as specified by IEC 61000-4-3 is met.

Date of testing	:	14.08.2020
Basic standard	:	IEC 61000-4-3:2006+A1+A2
Test level	:	Table 11 of EN 55014-2:2015
Frequency range	:	80MHz-1GHz
Modulation	:	80% 1kHz AM
Frequency scan speed	:	Frequency step: 1%; Dwell time: 3s
Ambient condition	:	Temperature: 23°C; Relative humidity: 47%

Table 3: RF electromagnetic field immunity test results

Polarization	Result	Remarks
Horizontal	Pass	During the test, the EUT can operate as intended.
Vertical	Pass	During the test, the EUT can operate as intended.

5.2 Input and Output AC Power Port, Signal Port and Control Port

5.2.1 Fast Transients on AC Power Line, Signal Line and Control Line

Result:	**N/A**

EUT is powered by internal battery and does not connect to the mains network, so this test is not applicable.

5.2.2 Surges to AC Power Line

Result:	**N/A**

EUT is powered by internal battery and does not connect to the mains network, so this test is not applicable.

5.2.3 Injected Current into AC Power Line, Signal Line and Control Line

Result:	**N/A**

EUT is powered by internal battery and does not connect to the mains network, so this test is not applicable.

5.2.4 Voltage Dips and Interruptions

Result:	**N/A**

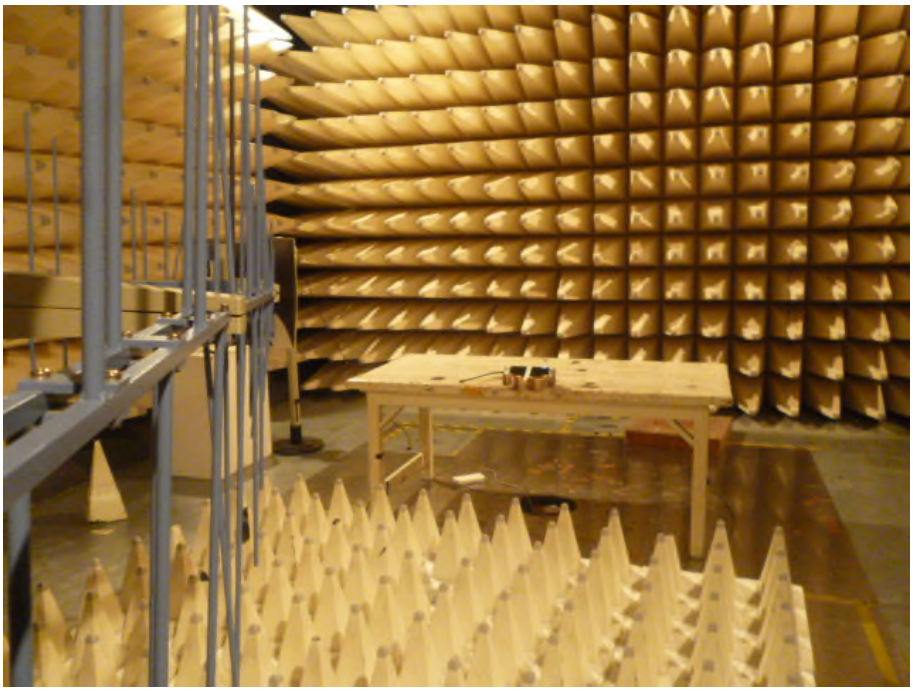
EUT is powered by internal battery and does not connect to the mains network, so this test is not applicable.

6 Photographs of the Test Set-Up

Photograph 1: Set-up for Radiated Emission

Photograph 2: Set-up for immunity test of electrostatic discharge

Photograph 3: Set-up for immunity test of RF electromagnetic field



7 List of Tables

8 List of Figures

9 List of Photographs

Appendix 1

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Measurement Uncertainties

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

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

Table 1: Measurement Uncertainty levels

Test	**Parameters**	**Expanded uncertainty (U_{lab})**	**Expanded uncertainty (U_{cispr})**
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 3.1 dB ± 3.1 dB	± 4.0 dB ± 3.6 dB
Power disturbance	Level accuracy (30MHz to 300MHz)	± 4.24 dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 2.5 dB	N/A
Radiated Emission	Level accuracy (9kHz to 30MHz)	N/A	N/A
Radiated Emission	Level accuracy (30MHz to 200MHz) (200MHz to 1000MHz)	± 4.66 dB ± 4.66 dB	± 5.2 dB ± 5.2 dB
Radiated Emission	Level accuracy (1 to 6GHz) (6 to 18GHz)	± 4.42 dB	N/A
Insertion Loss	Level accuracy (150kHz to 1605kHz)	N/A	N/A
Mains Harmonic	Voltage	N/A	N/A
Voltage Fluctuations & Flicker	Voltage	N/A	N/A

As U_{lab} in all applicable tests listed above are less than U_{cispr} according to CISPR 16-4-2:2003,

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.