TEST REPORT

EN14511-4:2004 EN ISO 4871:2009
Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for heating and cooling
Acoustics - Declaration and verification of noise emission values of machinery and equipment

procedure:	HEAT PUMP WATER HEATER
Model No.:	FA-03, FA-04, FA-05, FA-07, FA-10, FAC-05, FAC-12, FAW-03, FAW-05, FAW-10, FW-03, FW-04, FW-05, FW-10, FWC-05, FWC-10, FWW-03, FWW-12, FAD-03, FAT-12
Applicant :	Folansi Energy Saving Equipment Co., Ltd Jinshazhou Baisha Industrial Zone Baiyun District Guangzhou City Guangdong Province China
Manufacturer :	Folansi Energy Saving Equipment Co., Ltd Jinshazhou Baisha Industrial Zone Baiyun District Guangzhou City Guangdong Province China
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Date of Report :	2013/5/25

DEU TECHNOLOGY TESTING CO., LTD. TESTING SEAL

Test item

Type of test object ……..:		HEAT PUMP WATER HEATER
Trademark ……..:		Folansi
Model and/or type reference…… :		FA-03
Manufacturer……..:		Folansi Energy Saving Equipment Co., Ltd
Tested for IT power systems	:	No
IT testing, phase-phase voltage (V)	:	N.A.
Class of equipment	:	/
Mass of equipment (kg)	:	120
Protection against ingress of water…	:	/

Possible test case verdicts

Test case does not apply to the test object..... :	N(.A.)
Test object does meet the requirement..... :	P(ass)
Test object does not meet the requirement..... :	F(ail)

General remarks

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

General descriptions

Remarks:

Brief description of the tested sample(s):

Ambient temperature :22℃ humidity:65%

Complete test was conducted on **FA-03**.

FA-04, FA-05, FA-07, FA-10, FAC-05, FAC-12, FAW-03, FAW-05, FAW-10, FW-03, FW-04,

FW-05, FW-10, FWC-05, FWC-10, FWW-03, FWW-12, FAD-03, FAT-12 are serial products. They belong to the same circuit type except the difference in power, load capacity and the dimension.

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4	**Requirements**		
4.2	**Temperature operating range**		P
4.2.1	**Starting test**		
	The unit shall be capable of operating within the limit of use indicated by the manufacturer. For every condition stated in Table 1, and for both cooling and heating mode where applicable, the unit shall start up and operate for at least 20 min, without being stopped by the safety devices. The temperatures are set at the beginning of the test and maintained constant during the test. Test voltage shall be as specified in Table 1. It is set at the beginning of the test and maintained constant during the test. The environmental conditions during the test shall be as specified in Tables 1 and 2 of EN 14511-2:2004. The flow rates shall be the same as that used for rating capacity test, as specified in EN 14511-2. Deviation between individual values and set values shall be between: –zero and minus twice the permissible deviation according to Table 2 of EN 14511-3:2004, for the upper limit of use; – zero and plus twice the permissible deviation according to Table 2 of EN 14511-3:2004, for the lower limit of use. Uncertainty of measurement shall be as specified in Table 1 of EN 14511-3:2004.		P
4.2.2	**Test at maximum operating conditions (cooling mode)**		
	When operated at conditions stated in Table 2 during 1 h, then switch off for 3 min, and then switched on again for 1 h, the unit shall meet the following requirements: - the unit shall suffer no damage; – the unit motor shall operate continuously for the first hour without tripping of the motor overload protective devices; – after the shut-down period of 3 min, the unit shall restart automatically no more than 5 min after restarting of the compressor; – the unit motor shall operate again continuously for the rest of the second hour without tripping of the motor overload protective devices. NOTE When possible, switching off the unit should be done through the control panel of the unit. This test can be combined with the corresponding starting test, except for control cabinet air conditioners where the inlet temperature at the indoor heat exchanger is lowered to 35 °C after the starting time.		P
4.2.3	**Freeze-up test**		
4.2.3.1	**Air-cooled unit**		

	After the unit has operated for 6 h at the conditions stated in Table 3, and after the last freeze up cycle has completed, the following requirements shall be fulfilled: – no ice shall have accumulated on the evaporator; – no ice shall drip from the unit; – no water shall drip or be blown off the unit into the room. – the saturated temperature corresponding to the pressure measured at the suction of the compressor shall not have decreased by more than 2 K. For all units, electrical power voltage and frequency shall be given by the manufacturer.		P
4.4	**Shutting off the heat transfer medium flows**		
	To check the correct operating of the safety devices on the unit, the following faults shall be simulated consecutively. The unit shall have attained steady state in the standard rating conditions according to Tables 3 to 15 of EN14511-2:2004 before every fault is simulated. Each fault simulated shall be maintained for at least 1 h. NOTE In case the unit is provided without flow switch but it is required by the manufacturer instructions, the unit should be tested with an additional flow switch. a) Shutting off the heat transfer medium flow at the outdoor heat exchanger. b) Shutting off the heat transfer medium flow at the indoor heat exchanger. c) Shutting off the heat transfer medium flow at the heat recovery heat exchanger where applicable. The unit is checked for any damage sustained during the test and if any safety devices have operated during the test. The unit shall suffer no damage and shall remain capable of operating after restoration of the flow rates. A safety device that does not automatically reset may trip provided that a warning device is fitted. For units with defrosting system, an additional test will be conducted at the test conditions specified in Table 4 by shutting off the heat transfer medium flow at the indoor heat exchanger, at the beginning of the defrosting phase.		P
4.5	**Complete power supply failure**		
	Complete power supply failure lasting approximately 5 s shall be simulated. The unit shall have attained steady state conditions before the fault simulation, at the standard rating condition according to Table 3 to 15 of EN 14511-2:2004. After restoration of power the unit shall restart automatically no more than 20 min after the compressor has been allowed to restart by the control devices of the unit. The unit is checked for any damage sustained during the test and if any safety devices have operated during the test. The test does not apply when the manufacturer states that the machine does not automatically restart after power supply failure.		P

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4.6	**Condensate draining and enclosure sweat test**		
	In heating mode, draining of condensate, including that formed on the enclosure, shall be made correctly when operating at the standard rating conditions given in Tables 3 to 15 of EN 14511-2:2004. In cooling mode, draining of condensate, including that formed on the enclosure, shall be made correctly when operating at conditions given in Table 5. During the test of 4 h no condensed water shall drip, run or blow off the unit except through the drain. For indoor units, drain holes shall be provided with suitable pipe connection, the minimum diameter of which shall be 12 mm.		P
4.7	**Defrosting (where applicable)**		
	The functioning of any defrosting system shall be specified under any one of the application rating conditions (see Table 3 to 15 in EN 14511-2:2004), where frosting occurs. Successive frosting/defrosting cycles shall be repeated without running in progressively deteriorating average performances. There shall not be growth of ice in and around the drip tray.		P
4.8	**Other requirements**		
	Components in air handling systems, such as fans, filters, heat exchangers, etc., shall be easily accessible and resistant for cleaning purposes recommended by the manufacturer.		P
5	**Marking**.		P

	Each unit shall have a durable, permanently fixed rating plate that is easily readable or accessible when the unit is in position for use, bearing at least the following information in addition to information required by safety standards. In the case of units consisting of several parts which can be made by different matching, only items a) and b) are to be indicated, where item b) applies to each part. Items c) and d) depend on the considered matching and shall be indicated in the manufacturer's data sheet. a) manufacturer or supplier; b) manufacturer's model designation and serial number; c) the COP and/or EER to three significant figures and the standard rating condition at which it is measured according to Tables 3 to 15 of EN 14511-2:2004; d) heating/cooling capacity in kilowatts, with two digits after the decimal comma but not more than 3 significant figures at the test condition given in item c) of clause 5. e) for control cabinet air conditioners, the sensible cooling capacity in kilowatts, with one digit after the decimal comma but not more than 3 significant figures at the test condition given in item c) of clause 5. Further information may be provided; with regard to rating only the other rating conditions given in Tables 3 to 15 of EN 14511-2:2004 are to be used.		P
6	**Performance characteristics**		
6.2.1	**Rating characteristics**		
	The manufacturer shall provide in a table or as a graph the rating characteristics according to EN 14511-2 and EN 14511-3. Rating characteristics include: – the cooling capacity, the effective power input, the EER and the SHR (where applicable); – the heating capacity, the effective power input and the COP (where applicable); – the heat recovery capacity and the type of liquid (where applicable). The manufacturer shall state that the characteristics apply to a new unit with clean heat exchangers.		P
6.2.2	**Additional characteristics**		
	In addition, the manufacturer shall provide the following characteristics for the rated point(s): – non ducted air-to-air units: flow rates or rotational speeds of fans; – non ducted air-to-water units: air flow rate or rotational speed of fan; water flow rate and pressure difference; – unit intended to discharge into double floor: nominal flow rate and external static pressure difference; – other types of units: nominal flow rates and external static pressure differences for air and water.		P
6.2.3	**Sound characteristics**		

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	The manufacturer shall provide the sound power level and the corresponding test method according to ENV 12102.		P
6.3	**Electrical characteristics**		
	The manufacturer shall specify the electrical the characteristics in accordance with EN 60335-2-40 or EN 60204-1 as applicable and: – maximum starting current of the unit, as defined in EN 61000-3-11; – total power input and current at the rated point, excluding the starting period; – reactive power or power factor at the rated point, for units with a total power input greater than 10 kW; – power input of fan and pump if included in the units.		P
6.4	**Operating range**		
	The manufacturer shall specify: – limits of use (temperatures and flows); – whether there are devices fitted which do not allow the unit to operate when these limits are exceeded.		P
7	**Instructions**		
7.1	**General**		
	If not already required by other standards, the manufacturer shall provide the information as described.	See instructions	P
7.2	**Physical description**		
7.2.1	**Refrigerant, air and/or liquid circuits**		
	The manufacturer shall:. – specify the refrigerant, air and liquid circuits preferably providing circuit diagrams, showing every functional unit, control and safety device and specifying their type; – if the unit uses water in the heat exchangers specify the water capacity contained in the unit, and specify either the constructional materials of the heat exchangers or the water quality; – if used, specify the type of brine and the concentration into any other liquid; – specify the type of oil to be used in the compressor.		P
7.2.2	**Additional heating devices, when integral to the unit**		
	The manufacturer shall specify the type and location of additional heating devices and their control and safety devices.		P
7.2.3	**Control and safety**		

	The manufacturer shall: – state the functions achieved by the control and safety devices provided with the unit and specify when applicable their provision for adjustment and the method by which the safety devices are reset; – provide specifications for any control or safety devices necessary to ensure correct operation of the unit but which are not provided with the unit; – specify any limitation to the use of the rest of the installation.		P
7.3	**Instructions for installation**		
	The manufacturer shall specify in particular: – the required location conditions (whether units are to be installed outside or in a weather proof enclosure, or in a heated space); – requirements of physical layout, access and clearance; — requirements for the electrical, liquid, air and refrigerant connections, to be made on site; – the location of warning and tripping devices; – the installation precautions to be taken to ensure, in particular: – correct circulation of the heat transfer media; – water draining; – cleanliness of heat exchange surfaces; – to minimise noise, vibration or other adverse effects. Special indications for units using soil, sea water, ground water or surface water: specify any materials which are in contact with the water or with the brine.		P
7.4	**Instruction for maintenance**		
	The manufacturer shall state: – content and frequency of routine maintenance operations to be performed by the user; – content and frequency of maintenance and inspection operations which shall be performed by a specialist.		P

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Table 1 — Operational requirements conditions

Type	Temperature at outdoor heat exchanger °C	Temperature at indoor heat exchanger °C	Voltage V
All types	Upper limit of use	Upper limit of use	Rated voltage
All types	Lower limit of use	Lower limit of use	Rated voltage

Table 2 — Maximum operating conditions

Type	Temperature at outdoor heat exchanger °C	Temperature at indoor heat exchanger °C	Voltage V
Control cabinet air conditioner	Upper limit of use	35	Rated voltage
All other types	Upper limit of use	Upper limit of use	Rated voltage

Table 3 — Freeze up test conditions

Unit type	Temperature at outdoor heat exchanger	Temperature at indoor heat exchanger °C			Air flow rate
		Air		Water	
		Dry bulb	Wet bulb		
All types	Lowest limit of use	−15	-19	Lowest entering temperature	Minimum setting as allowed by the manufacturer

Table 4 — Shutting off the heat transfer medium flows

Type of unit	Outdoor heat exchanger		Indoor heat exchanger			
	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet water temperature °C	Outlet water temperature °C
Air-to-air units	2	1	20	15 max.		
Air-to-water units	2	1			[a]	45
Air-to-water units (for floor heating or similar application)	2	1			[a]	35
[a] The test is performed at the flow rate obtained during the test at the corresponding standard rating conditions.						

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6	**Verification of Noise emission values declarations**		
	The quantity to be verified is either the declared single-number noise emission value L_d, or the sum of the measured noise emission value L, and the uncertainty K, depending on the form of the noise emission declaration. Verification shall be effected by means of noise measurements made according to the same noise test code, or, if there is no noise test code, according to a basic measurement standard with the same or better grade of accuracy, and under the same machinery or equipment operating conditions as those to which the declared noise equation values refer.		P

Test Result

MODEL	Item	Result
FA-03 Rated Voltage: 380-415V Frequency: 50Hz	Coefficient Of Performance	4.7
	Heating capacity	11000(w)
	Power Input	2340(w)

Declared Single-number Noise Emission Values in accordance with ISO 4871	
(At rated load)	Values (dBA)
A-Weighted sound power level, L_{WAD}, in decibels;	53
A-Weighted emission sound pressure level, L_{pAd} at the operator's position, in decibels;	49
NOTE - Declared Single-number Noise Emission Values are the sum of measured values and the associated uncertainty, and they represent upper boundaries of the range of values which is likely to occur in measurements.	

Components List

ELECTRICITY COMPONENT WATCH FOR

PART CODE	DESCRIPTION	SUPPLY FACTORY	Model	SPECFICATION	QTY	ACCORD ARTICLE	CERTIFICATION MARK
M	Compressor	Dalian Sanyo Refrigeration Co., Ltd	C-SBN263H8D	AC380V	1	DIN EN 60335-1 DIN EN 60335-2-34	CE
M	Fan motor	Nanhai junfeng	YDK90-6	AC220V 90W	1	EN 60335-1	CE
XT	terminal row	Huangzhong Electrical Equipment Co.,Ltd	TC1-1,8P	2.5 mm2 250V	1	EN 60998-1 EN 60998-2-1	CE
KM	contactor	LSIS CO.,LTD	GMC-18	380V/440V 18A	1	EN 60947-1 EN 60947-4-1 EN 60947-5-1	CE
YV	four-way valve	Zhejiang DunAn Valves Co., Ltd	DSF-9	AC220V	1	GB14536.1-1998	CQC
SP	High Voltage Switch	Changzhou Match-Well	YK	AC125-250V 4.15/3.5MPa	1	GB14536.1-1998, GB14536.7-1996	CQC
SP	low-voltage switch	Changzhou Match-Well	YK	AC125-250V 0.05/0.15MPa	1	GB14536.1-1998, GB14536.7-1996	CQC
C	Fan capacitance	Shunde Beijiao Xinda Electrical Appliance Co., Ltd	CBB61	5μF AC450V	1	GB/T3667.1-2005	CQC
QF	air switch	CHINT Electrics Co., Ltd	DZ47-60 D32	32A AC400V	1	GB 10963.1-2005、 GB 10963.2-2003	CCC
TM	transformer	Shenzhen Sanma Electric Appliance Co., Ltd	DB48-120-0060	input：220VAC 50HZ output：12VAC 600mA	1	GB19212.1-2003 GB19212.7-2006	CQC
FU	fuses	Lanbaoe lectrical Co., Ltd	RFI-20	F10A1250V	1	GB9364.2-1997	CQC
KA	relay	Xiamen Hongfa electroacoustic Co.,Ltd	HF32F-G	10A 250VAC		GB/T21711.1-2008	CQC
C	X2 capacitance	DaHua Electric Co.LTD	HD	0.1μF 275VAC	1	GB/T14472-1998	CQC

PHOTO

Picture 1

Picture 2

PHOTO

Picture 3

Picture 4

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Air to water heat pump unit (EN 14511)

MODEL		UNIT	FA-015	FA-02	FA-03	FA-04	FA-06	FA-08	FA-03	FA-04
Rated heating capacity	W:30/35 A:7/6	kW	4.05	5.99	10.12	10.46	20.24	20.92	9.55	10.35
heating input power		kW	1.03	1.50	2.97	2.94	5.92	6.06	2.72	2.70
water flow		m3/h	0.70	1.03	1.74	1.80	3.48	3.60	1.64	1.78
cop			3.95	4.00	3.40	3.55	3.42	3.45	3.50	3.84
Rated heating capacity	W:30/35 A:2/1	kW	3.50	5.17	9.36	9.40	18.70	19.10	8.50	8.82
heating input power		kW	1.03	1.50	2.97	2.94	5.92	6.06	2.69	2.66
water flow		m3/h	0.60	0.89	1.50	1.56	3.01	3.11	1.40	1.52
cop			3.41	3.46	3.15	3.19	3.16	3.15	3.16	3.32
Rated heating capacity	W:40/45 A:2/1	kW	3.35	4.95	9.52	9.70	19.00	19.40	8.48	8.44
heating input power		kW	1.27	1.85	3.66	3.64	7.29	7.46	3.26	3.24
water flow		m3/h	0.58	0.85	1.44	1.49	2.88	2.98	1.34	1.45
cop			2.64	2.67	2.60	2.66	2.61	2.60	2.60	2.60
Rated heating capacity	W:40/45 A:7/6	kW	3.85	5.69	9.62	9.95	19.24	19.89	8.96	9.72
heating input power		kW	1.27	1.85	3.66	3.64	7.29	7.46	3.33	3.32
water flow		m3/h	0.66	0.98	1.65	1.71	3.31	3.42	1.54	1.67
cop			3.03	3.07	2.63	2.73	2.64	2.67	2.69	2.93
Rated heating capacity	W:47/55 A:7/6	kW	3.70	5.47	9.25	9.56	18.49	19.12	8.60	9.33
heating input power		kW	1.58	2.31	4.54	4.55	9.05	9.27	4.04	4.05
water flow		m3/h	0.64	0.94	1.59	1.64	3.18	3.29	1.48	1.61
cop			2.34	2.37	2.04	2.10	2.04	2.06	2.13	2.30
Rated heating capacity	W:47/55 A:-7/-8	kW	2.58	3.82	6.46	6.68	12.92	13.35	5.98	6.49
heating input power		kW	1.48	2.16	4.25	4.25	8.48	8.68	3.59	3.59
water flow		m3/h	0.44	0.66	1.11	1.15	2.22	2.30	1.03	1.12
cop			1.75	1.77	1.52	1.57	1.52	1.54	1.66	1.81
Power supply		V/Ph/Hz	220V/~/50HZ						380V/3N/50Hz	

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Air to water heat pump unit (EN 14511)

MODEL		UNIT	FA-05	FA-06	FA-07	FA-10	FA-15	FA-20	FA-25
Rated heating capacity	W:30/35 A:7/6	kW	14.50	17.05	19.98	29.01	43.51	58.01	68.19
heating input power		kW	3.67	4.46	5.17	7.34	11.31	14.98	17.84
water flow		m3/h	2.49	2.93	3.44	4.99	7.48	9.98	11.73
cop			3.95	3.83	3.86	3.95	3.85	3.87	3.82
Rated heating capacity	W:30/35 A:2/1	kW	12.35	14.52	17.02	24.71	37.06	49.42	58.09
heating input power		kW	3.62	4.40	5.10	7.25	11.17	14.79	17.61
water flow		m3/h	2.12	2.50	2.93	4.25	6.37	8.50	9.99
cop			3.41	3.30	3.34	3.41	3.32	3.34	3.30
Rated heating capacity	W:40/45 A:2/1	kW	11.82	13.89	16.28	23.63	35.45	47.27	55.56
heating input power		kW	4.38	5.32	6.18	8.77	13.45	17.83	21.30
water flow		m3/h	2.03	2.39	2.80	4.07	6.10	8.13	9.56
cop			2.70	2.61	2.63	2.70	2.64	2.65	2.61
Rated heating capacity	W:40/45 A:7/6	kW	13.61	16.00	18.74	27.22	40.82	54.43	63.98
heating input power		kW	4.48	5.43	6.32	8.96	13.73	18.21	21.76
water flow		m3/h	2.34	2.75	3.22	4.68	7.02	9.36	11.00
cop			3.04	2.94	2.97	3.04	2.97	2.99	2.94
Rated heating capacity	W:47/55 A:7/6	kW	13.07	15.36	18.00	26.14	39.21	52.28	61.46
heating input power		kW	5.43	6.59	7.68	10.87	16.60	22.03	26.39
water flow		m3/h	2.25	2.64	3.10	4.50	6.74	8.99	10.57
cop			2.41	2.33	2.34	2.41	2.36	2.37	2.33
Rated heating capacity	W:47/55 A:-7/-8	kW	9.09	10.68	12.52	18.18	27.27	36.35	42.73
heating input power		kW	4.83	5.86	6.82	9.67	14.80	19.63	23.48
water flow		m3/h	1.56	1.84	2.15	3.13	4.69	6.25	7.35
cop			1.88	1.82	1.83	1.88	1.84	1.85	1.82
Power supply		V/Ph/Hz	380V/3N/50Hz						