Technical Report No. 64.181.18.04708.01

Rev. 00

Dated 2018-08-08

Client:	Name: Zhongshan Amitime Electric Co.,LTD Address: 5th Yandong Rd, Dayan Industrial Zone, Huangpu Town, 528429 Zhongshan City,Guangdong,China Contact person: Nian Dongquan
Manufacturing place:	Manufacturer's name: same as about Address: same as about Factory's name: same as about Address: same as about
Test subject:	Product: DC Inverter Type Air To Water Unit (Heat pump) Type: AVH-06V1D*-II (* can be A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z; indicate different appearance) Trade mark: AMITIME®
Test specification:	EN 14825:2016
Purpose of examination:	Test according to the test specification (details see page 6, summary of testing)
Test result:	This report is only for test result, without verdict, see item 3 of this report for Details.

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1 Description of the test subject

1.1 Function

☒ Manufacturer's specification for intended use:

The appliance is air to water heat pump.

1.2 Technical Data

Model	:	Type: AVH-06V1D*-II (* can be A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y or Z; indicate different appearance)
Rated Voltage (V)	:	220-240V~
Rated Frequency (Hz)	:	50Hz
Rated Current (A)	:	--
Rated input (W)	:	1700 for Heating, 1680 for cooling
Protection Class	:	☒ Class I; ☐ Class II; ☐ Class III
Protection Against Moisture	:	IPX4
Construction	:	☒ Stationary ☐ Portable ☐ Hand-held ☐ Open-frame
Supply connection	:	☐ Non detachable cord ☒ Permanent connection to fixed wiring ☐ Appliance inlet
Operation mode	:	☒ continuous operation; ☐ Intermittent operation; ☐ Short time operation;
Rated capacity (ml), if any	:	N/A
Refrigerant	:	R410A, 1300g
Weight (kg)	:	62.5 for outdoor unit, 45 for indoor unit
Serial Nr	:	--

2 Order

2.1 Date of Purchase Order, Customer's Reference

2018-07-05

2.2 Receipt of Test Sample, Location

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2018-07-11,

Energy test:
Zhongshan Amitime Electric Co.,LTD
5th Yandong Rd, Dayan Industrial Zone, Huangpu Town, 528429 Zhongshan City,Guangdong,China
For Noise tests:

Vkan Certification & Testing Co., Ltd
Address: No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, P.R.China

2.3 Date of Testing

2018-07-12~2018-07-19

2.4 Location of Testing

Same as 2.2

3 Test Results

3.1 Heating test data

【Low temperature application】

Table1: average condition							
General test conditions/Part-Load	Unit	A-7/W34 (88%)	A2/W30 (54%)	A7/W27 (35%)	A12/W24 (15%)	A-10/ W35.3 (100%)	A-7/W34 (88%)
		A	B	C	D	E	F
Data collection period	hh : min : sec	03:00:00	01:10:00	01:10:00	01:10:00	01:10:00	03:00:00
Defrosts	-	Yes	No	No	No	No	Yes
Complete Cycles	-	1	-	-	-	-	1
Voltage	V	230.5	230.6	230.2	230.8	230.2	230.5
Current input of the unit	A	8.14	2.83	1.58	2.16	8.74	8.14
Power input of the unit	kW	1.743	0.626	0.353	0.477	1.937	1.743
Test conditions outdoor exchange:							
Air tempera-ture, DB/WB	°C	-7.00/ -8.08	2.01/1.01	7.00/6.00	11.99/ 11.00	-9.99/ -11.00	-7.00/ -8.08
Test conditions for indoor side heat exchange:							
Inlet water	°C	27.16	26.20	24.14	19.43	28.96	27.16

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temperature							
Outlet water temperature	°C	33.50*	29.95	27.03	24.08	35.14	33.50*
Summary of the results:							
Total heating capacity	kW	4.655	2.853	2.201	3.530	4.711	4.655
Effective power input	kW	1.763	0.636	0.373	0.497	1.986	1.763
Coefficient of performance	-	2.64	4.48	5.88	7.09	2.37	2.64
Water flow	m³/h	0.65	0.65	0.65	0.65	0.65	0.65
Compressor frequency	Hz	115	49	30	30	115	115
Remark: * in part load condition, outlet temperature data is recorded by a full average complete cycle's data.							

Table 2:	Sound power level measurement:		
	Heat source, Air temperature DB/WB (indoor unit) .... (°C):		20.0/16.9
	Heat source, Air temperature DB/WB (outdoor unit) .... (°C):		7.0/6.1
	Voltage ..... (V):		230V
	Frequency ..... (Hz):		50Hz
	Working condition class.....:		Class A
	Acoustical environment.....:		Hemi-anechoic
	Windshield type.....:		Sponge
	Measured position amount .....:.....		20
Measured quantity	LWA,indoors	LWA,outdoors	Remark
Sound pressure level Lpf****	33.0 dB	43.5 dB	-
Spheres radius r *	2.0 m	2.0 m	-
Sound power level LwA ****	47.2 dB(A)	57.3 dB(A)	-
Supplementary information: water inlet/outlet temperature: 30/35°C Setting of controls: According to user manual. Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer			

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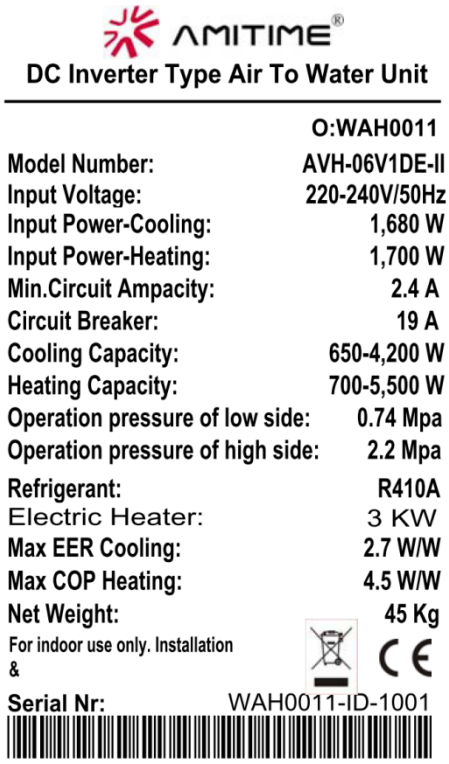
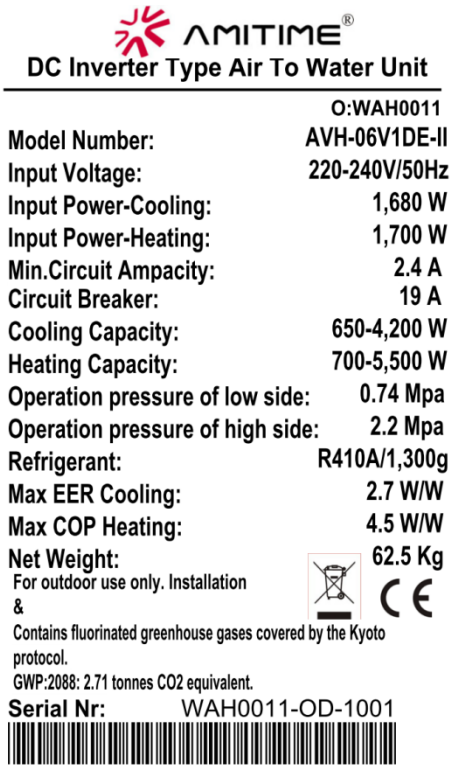
3.2 Copy of marking plate:





1. The height of CE marking shall be higher than 5mm and the height of WEEE marking shall be higher than 7mm.
2. The marking plate of other models are same as above except for model name.

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4 Remark

N/A

5 Documentation

- Annex A: calculation for SCOP
- Annex B: Photo documentation
- Annex C: Construction data form
- Annex D: Test equipment list

6 Summary

1. The appliance is low-temperature heat pump space heater, its including a whole compression type refrigerant circuit to heat water in another circuit. The appliance was for cooling and heating water function.
2. The main power is supplied by a 3-pole supply cable not with plug which not supply by manufactory.
3. All the models are same except for the apperance, the test are carried out at model AVH-06V1DE-II as representative.
4. Water enthalpy method was adopted in this report.
5. The test was performed according to test specifications, the tests were performed on the appliance as below:

   The heating mode part load tests were performed on the condition below:

   Average condition: Tdesignh: -10 °C; Tbiv :-7°C; TOL:-10 °C

	A		Outdoor air dry bulb (wet bulb) temperature °C	Indoor water inlet/outlet temperature °C
	Part load ratio	Part load ratio %		(variable outlet)
A	(-7-16)/ (Tdesignh-16)	88	-7(-8)	a)/34
B	(+2-16)/ (Tdesignh- 16)	54	2(1)	a)/30
C	(+7-16)/ (Tdesignh- 16)	35	7(6)	a)/27
D	(12-16)/ (Tdesignh- 16)	15	12(11)	a)/24
E	(TOL-16)/ (Tdesignh- 16)	100	-10(-11)	a)/35
F	(Tbivalent- 16)/ (Tdesignh-16)	88	-7(-8)	a)/34
Remark: 1. a) the water flow rate as determined at the standard rating conditions given in EN14511-2 at 30/35 conditions.				

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6. Standby mode power, off mode power and thermostat-off mode power were tested according to clause 9 of standard EN 14825:2016.

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Engineer: _____ **Technical Report checked:** _____

«Tony Xie» **«Gary Sun»**
Project Handler **Designated Reviewer**

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Telefax : +86 20 38320478

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Annex A calculation for SCOP

A.1 SCOP

Tdesignh: -10°C

Pdesignh: 5.262kW

Tbiv: -7°C

TOL: -10°C

Test result at A, B, C, D, E, F conditions as below table 1:

Table 1: data for SCOP

	Part load	Measured capacity	COP at measured capacity	Cc	CRu	COP at part load
E	5.262	4.711	2.39	--	1.00	2.39
F	4.655	4.655	2.64	--	1.00	2.64
A	4.655	4.655	2.64	--	1.00	2.64
B	2.833	2.853	4.48	0.99	0.99	4.48
C	1.822	2.201	5.88	0.99	0.83	5.87
D	0.810	3.530	7.09	0.99	0.23	6.86
CRu: part load divided by capacity.						

Test result of electric power consumption for below four modes, see table 2:
Table 2: electric power consumptions

Power consumption	**Unit**	**Value**
Thermostat-off mode [PTO]	kW	0.009
Standby mode [PSB]	kW	0.009
Crankcase heater [PCK]	kW	0.040
Off mode [POFF]	kW	0.009

Final result:

SCOPon:	4.48
SCOP:	4.47
Qh:	10871 kWh/year
Qhe:	2431 kWh/year
$\eta_{s:}$	175.6 %
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1**)**	A+++

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Annex C: Construction data form

Details of:	Overall view for outdoor unit
View: [ ] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

Details of:	Overall view for outdoor unit
View: [ ] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

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Annex C: Construction data form

Details of:	Compressor
View: [ ] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

Details of:	Fan motor
View: [ ] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

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Annex C: Construction data form

Part		Technical data
1. Compressor		
	Manufacture	Mitsubishi Electric (GuangZhou) Compressor Co., Ltd.
	Type	SNB130FGAMC
	Rated capacity	4100W
	Serial-number	/
	Rated input	35-190V,30-390Hz,,1200W
2.Condenser		
	Type	B26Hx20/1P-SC-M9.65+12.8+2x1 "
	Manufacture	SWEP
	Bauart Construction	Plate heat exchanger
	Number of plate	20
	Plate spacing	1.75mm
	Water pip specification	G1”
	Max. permissible pressure	0.7MPa
	Dimension	376(L)mmX37(H)mmX119(D)mm
3. Evaporator		
	Manufacture	Foshan HuiZe Heat Exchange Equipment Co., Ltd.
	Type	AVH-06V1DB
	Fan type	Axial
	Bauart Construction	Compact Brazed Heat Exchanger
	Fin type	Hydrophilic aluminum
	Fin spacing	2.0 mm
	Tube pitch x row pitch	25mm X21.65mm
	Pip specification	Φ 9mm
	Max. permissible pressure	4.5MPa
	Dimension	625(L)mmX213(H)mmX650(D)mm
4. Fan motor of evaporator		
	Manufacture	NIDEC SHIBAURA (ZHEJIANG) CORP.

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Annex C: Construction data form

	Type	SIC-65FV-F160-2
	Specification	DC310V, 8P; Class E; 750r/min; 60 W
	Serial-number	/
5. Controller		
	Manufacture	GuangZhou QianXi Technology Exploitation Co.,Ltd
	Type	WLT-TFT4827L

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Annex D: Test equipment list

Equipment	ID No.	Model	Brand/Manufacturer	Calibration due date
R&A performance measuring system	--	Laboratory	CEI	2019-05-25
Platinum resistance	PB01	Pt100	OMEGA	2019-05-25
Platinum resistance	PB02	Pt100	OMEGA	2019-05-25
Platinum resistance	TS126A258	Pt100	CHINO	2019-05-25
Platinum resistance	TS1274477	Pt100	CHINO	2019-05-25
Flowmeter	H16208933	DPTIFLUX4100C	YOKOGAWA	2019-05-25
AC source Supply	91M541052	WT230	YANGHONG	2019-05-25
Temperature and humidity meter	20120803	AFC-360	Guangzhou Coltherml	2019-05-25
Water pressure difference transmitter	H3320039	HMD120	VAISALA	-----
Hemi-anechoic Rooms(A)	NC-036-2	5.2mx4.7mx4.6m	Guangzhou Kinte	2018-10-08
Hemi-anechoic Rooms(B)	NC-036-3	5.2mx4.7mx4.6m	Guangzhou Kinte	2018-10-08
PULSE system	VGDY-0184	3660C	Bruel & Kjaer	2019-04-16
Microphone	HJ-000123	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000110	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000122	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000107	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000121	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000120	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000104	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000103	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000102	4189	Bruel & Kjaer	2019-04-16
Microphone	HJ-000119	4189	Bruel & Kjaer	2019-04-16
Calibrator	HJ-000095	4231	Bruel & Kjaer	2019-06-24
Power meter	KA-0008	8705B	Qingdao Qinzhi	2019-01-03
Long steel tape	HJ-000062	5m	STANLEY	2018-09-08
Temperature measurement system	NC-036-1	-	Guangzhou Kinte	2019-08-08

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Annex D: Test equipment list

Atmospheric pressure meter	HJ-000165	-	Sportstar	2018-10-17
Windscreen	-	WS002-5	BSWA TECH	-

-- End of Report --

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