



**TEST REPORT
PPP 18025A: 2014**

**TÜV SÜD Test program for ErP – for Heat Pump Space Heater using electricity
Ecodesign requirement for space heaters and combination heaters
Implementation measure EU No. 813/2013**

Report reference No. :	64.181.17.05113.01 Rev.00
Date of issue :	2017-12-22
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Testing location :	(For enrgy tests) 5th Yandong Rd, Dayan Industrial Zone, Huangpu Town, Zhongshan City, Guangdong, China (For noise tests): Penglai Industry Road, Beijiao, Shunde, Foshan, Guangdong, 528311 P.R. China.
Client..... :	Energy Save Nordic AB
Client number..... :	--
Address :	Nitgatan 2, 441 38 Alingsas, SWEDEN
Contact person..... :	Mr Fredrik Sävenstrand
Standard..... :	This TÜV SUD test report form is based on the following requirements (EU) 813/2013: 2013-08-02 OJ (2014/C 207/02): 2014-07-03
TRF originated by. :	TÜV SÜD Product Service GmbH, Mr. Gary Sun
Copyright blank test report..... :	This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TÜV SÜD Product Service GmbH. TUV SUD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
Test procedure :	<input type="checkbox"/> TÜV Mark, <input checked="" type="checkbox"/> EU-Directive, <input type="checkbox"/> without certification
Non-standard test method :	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes, see details under Summary
National deviations..... :	None
Number of pages (Report)..... :	24
Number of pages (Attachments)..... :	6
Compiled by :	Tony Xie
(+ signature)	
Approved by..... :	Gary Sun
(+ signature)	



Test sample.....	Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6	
Serial Nr.....	120209-170918-6001 for outdoor unit; 120208-170918-6001 for indoor unit.	
Type of test object.....	DC Inverter Type Air To Water Heat Pump Unit	
Trademark.....	ES	
Model and/or type reference.....	Indoor unit:AWT9/11-V5+, Outdoor unit:AWT9-V5+; Indoor unit:AWH9/11-V5+, Outdoor unit:AWH9-V5+; Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6; Indoor unit:AWH9/11-V6, Outdoor unit:AWH9-V6; Indoor unit:AWMH9/11/13-V5+, Outdoor unit:AWM9-V5+; Indoor unit:AWMH9/11/13-V6, Outdoor unit:AWM9-V6	
Rating(s).....	220-240V; 50Hz; Class I; R410A; IPX4 for outdoor unit; Rated power:2850W(cooling), 4300W(heating); Rated current:12,5A(cooling), 19A(heating).	
Manufacturer.....	Energy Save Nordic AB	
Client number.....	-	
Address.....	Nitgatan 2, 441 38 Alingsas, SWEDEN	
Order description.....	<input checked="" type="checkbox"/>	Complete test according to TRF
	<input type="checkbox"/>	Partial test according to manufacturer's specifications
	<input type="checkbox"/>	Preliminary test
	<input type="checkbox"/>	Spot check
	<input type="checkbox"/>	Others:
Date of order.....	2015-07-17, 2017-08-24	
Date of receipt of test item.....	2015-08-02; 2015-12-27	
Date(s) of performance of test.....	2015-08-02 to 2015-11-12; 2015-12-28 to 2015-12-29	
Test item particulars: (declared)		
Product type.....	<input checked="" type="checkbox"/>	Heat pump space heater
	<input type="checkbox"/>	Heat pump combination heater
	<input type="checkbox"/>	Split type
	<input type="checkbox"/>	All in one
	<input type="checkbox"/>	others:
Capacity control.....	<input checked="" type="checkbox"/>	Variable capacity
	<input type="checkbox"/>	Fixed capacity
	<input type="checkbox"/>	Staged capacity
Power source.....	<input checked="" type="checkbox"/>	Single phase
	<input type="checkbox"/>	Three phase

Summary :

1. The appliance was installed according to user manual and the connection pipe length is 5m.
2. Water enthalpy method was adopted in this report.
3. The appliance was for cooling and heating water function.
4. The models Indoor unit:AWT9/11-V5+, Outdoor unit:AWT9-V5+; Indoor unit:AWH9/11-V5+, Outdoor unit:AWH9-V5+; Indoor unit:AWH9/11-V6, Outdoor unit:AWH9-V6; Indoor unit:AWMH9/11/13-V5+, Outdoor unit:AWM9-V5+; Indoor unit:AWMH9/11/13-V6, Outdoor unit:AWM9-V6 are same as model Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6 except model name difference.
5. The tests were carried out on model Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6 as representative.
6. This test report 64.181.17.05113.01 Rev.00, dated 2017-12-22 is based on report 64.181.15.03618.02 Rev.00, dated 2016-02-24 to include the following changes and additions, which were considered technical modifications:
 - a)The original model name AVH-24V1DE is the same as the models name Indoor unit:AWT9/11-V5+, Outdoor unit:AWT9-V5+; Indoor unit:AWH9/11-V5+, Outdoor unit:AWH9-V5+; Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6; Indoor unit:AWH9/11-V6, Outdoor unit:AWH9-V6; Indoor unit:AWMH9/11/13-V5+, Outdoor unit:AWM9-V5+; Indoor unit:AWMH9/11/13-V6, Outdoor unit:AWM9-V6 except that changing trademark and applicant, and model name.
 - b)Standard EN 14825:2013 is replaced by standard EN 14825:2016.
 - c)After evaluating, no additional test was needed.
7. According to the manufacturer's application, the tests according client provides test software and according to the standard EN 14825 requirements, the unit was tested on below conditions:

Low temperature application:

	A		Outdoor air dry bulb (wet bulb) temperature °C	Indoor water inlet/outlet temperature °C	The compressor frequency of the appliance
	Part load ratio	Part load ratio %		Variable outlet	
A	(-7-16)/ (Tdesignh-16)	88	-7(-8)	a)/34	74Hz
B	(+2-16)/ (Tdesignh- 16)	54	2(1)	a)/30	42Hz
C	(+7-16)/ (Tdesignh- 16)	35	7(6)	a)/27	42Hz
D	(12-16)/ (Tdesignh- 16)	15	12(11)	a)/24	42Hz
E	(TOL-16)/ (Tdesignh- 16)	100	-10(-11)	a)/35	74Hz
F	(Tbivalent-16)/ (Tdesignh-16)	88	-7(-8)	a)/34	74Hz

Remark: a) the water flow rate as determined at the standard rating conditions given in EN14511-2 at inlet air temperature DB/WB:7/6°C; inlet water/outlet water temperature 30/35°C conditions.

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

Name and address of Factory (ies):

Zhongshan Amitime Electric Co., Ltd.

5th Yandong Rd, Dayan Industrial Zone, Huangpu Town, Zhongshan City, Guangdong, China.

Summary of testing:

- deviation(s) found
 no deviations found (see additional information)

The product meets the Stage 2 (26 September 2017) requirement of the implementation measure.

Remark:

Requirement (Annex II)	Stage 1	Stage 2
	26 September 2015	26 September 2017
Seasonal space heating energy efficiency	Clause 1(a)	Clause 1(b)
Energy efficiency of combination heaters	Clause 2(a)	Clause 2(b)
Sound power level	Clause 3	No change
Product information related to heat pump space heater	Clause 4	No change

Note: stage 3 is not applicable to electric using only products


If additional information is necessary, please provide:

1. According to **COMMISSION DELEGATED REGULATION (EU) No 811/2013** with regard to the energy labelling of space heater, the seasonal space heating energy efficiency class of the unit is **A++**.


Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Indoor unit:

•E S®		DC Inverter Air to Water Heat Pump Unit		CE
Model Number:	AWT9/11-V6	Power Supply:	220-240V/1Ph/50Hz	
Rated Power-Cooling:	2850 W	Electrical heater:	1850 W	
Rated Power-Heating:	4300 W	Refrigerant Charge	R410A / 1.90kg	
Rated Current-Cooling:	12.5 A	Net Weight:	28 kg	
Rated Current-Heating:	19 A			
Operation pressure of low side:	0.98MPa	For indoor use only. Installation & service by licensed mechanic only.		
Operation pressure of high side:	3.0 MPa			
Serial No:	120208-170918-6001			
Energy Save Nordic AB, 441 39 Alingsas, SWEDEN				

Outdoor unit:

•E S®		DC Inverter Air to Water Heat Pump Unit		CE
Model Number:	AWT9-V6			
Power Supply:	220-240V/1Ph/50Hz			
Rated Power-Cooling:	2850 W			
Rated Power-Heating:	4300 W			
Rated Current-Cooling:	12.5 A			
Rated Current-Heating:	19 A			
Operation pressure of low side:	0.98MPa			
Operation pressure of high side:	3.0 MPa			
Protection Against Water Class:	IPX4			
Electrical heater:	1850 W			
Refrigerant/Charge:	R410A / 1.90kg			
Net Weight:	62.5 kg			
For outdoor use only. Installation & service by licensed mechanic only.				
Serial No:	120209-170918-6001			
Energy Save Nordic AB, 441 39 Alingsas, SWEDEN				

Remark:

1. The name plate parameter for all models are the same as model Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6 except model name difference.
2. The height of CE marking shall be higher than 5mm and the height of WEEE marking shall be higher than 7mm.
3. According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.



<p>Picture of the product:</p> <p>See attachment No.2.</p>
<p>Attachments:</p> <ol style="list-style-type: none">1. Key components table2. Photo details3. Test equipment list
<p>General remarks:</p> <p>“(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.</p> <p>Measurement uncertainty budgets have been determined for applicable test methods and are available upon request.</p>
<p>Possible test case verdicts:</p> <p>- 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)</p> <p>Possible suffixes to the verdicts:</p> <p>- suffix for detailed information for the client..... : - C(omment) - suffix for important information for factory inspection...: - M(anufacturing)</p>

Clause	Requirement – Test	Measuring result – Remark	Verdict
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EC Regulation 813/2013			-
Article 1	Subject matter and scope		-
1.	This Regulation establishes ecodesign requirements for the placing on the market and/or putting into service of space heaters and combination heaters with a rated heat output \leq 400 Kw, including those integrated in packages of space heater, temperature control and solar device or packages of combination heater, temperature control and solar device as defined in Article 2 of Commission Delegated Regulation (EU) No 811/2013.	Space heater	P
2.	This Regulation shall not apply to:		-
(a)	Heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;		N/A
(b)	Heaters using solid fuels;		N/A
I	Heaters within the scope of Directive 2010/75/EU of the European Parliament and of the Council;		N/A
(d)	Heaters generating heat only for the purpose of providing hot drinking or sanitary water;		N/A
(e)	Heaters for heating and distributing gaseous heat transfer media such as vapour or air;		N/A
(f)	Cogeneration space heaters with a maximum electrical capacity of 50Kw or above;		N/A
(g)	Heat generators designed for heaters and heater housings to be equipped with such heat generators placed on the market before 1 January 2018 to replace identical heat generators and identical heater housings. The replacement product or its packaging shall clearly indicate the heater for which it is intended.		N/A

Annex II	Ecodesign requirements		-
1	Requirements for seasonal space heating energy efficiency (η_s)		-
(a)	From 26 September 2015 the seasonal space heating energy efficiency shall not fall below the following values:	Tested $\eta_s(\%)$:156,6% Limit $\eta_s(\%)$:115%	P
	- Heat pump space heaters , with the exception of low-temperature heat pumps: 100%;		N/A
	- Low-temperature heat pumps : 115%.		P

Clause	Requirement – Test	Measuring result – Remark	Verdict																						
(b)	From 26 September 2017 the seasonal space heating energy efficiency of heat pump space heaters and heat pump combination heaters shall not fall below the following values:	Tested $\eta_s(\%)$:156,6% Limit $\eta_s(\%)$:125%	P																						
	- Heat pump space heaters, with the exception of low-temperature heat pumps: 110%;			N/A																					
	- Low-temperature heat pumps: 125%.			P																					
2	Requirements for water heating energy efficiency (η_{wh})		-																						
(a)	(a) From 26 September 2015 the water heating energy efficiency of combination heaters shall not fall below the following values: $\eta_{wh}(\%)$:	Load profile: Tested $\eta_{wh}(\%)$: Limited $\eta_{wh}(\%)$:	N/A																						
	<table border="1"> <tr> <td>Declared load profile</td> <td>3XS</td> <td>XXS</td> <td>XS</td> <td>S</td> <td>M</td> <td>L</td> <td>XL</td> <td>XXL</td> <td>3XL</td> <td>4XL</td> </tr> <tr> <td>η_{wh}</td> <td>22%</td> <td>23%</td> <td>26%</td> <td>26%</td> <td>30%</td> <td>30%</td> <td>30%</td> <td>32%</td> <td>32%</td> <td>32%</td> </tr> </table>	Declared load profile	3XS	XXS	XS	S	M	L	XL	XXL	3XL	4XL	η_{wh}	22%	23%	26%	26%	30%	30%	30%	32%	32%	32%		N/A
Declared load profile	3XS	XXS	XS	S	M	L	XL	XXL	3XL	4XL															
η_{wh}	22%	23%	26%	26%	30%	30%	30%	32%	32%	32%															
(b)	(a) From 26 September 2017 the water heating energy efficiency of combination heaters shall not fall below the following values: $\eta_{wh}(\%)$:	Load profile: Tested $\eta_{wh}(\%)$: Limited $\eta_{wh}(\%)$:	N/A																						
	<table border="1"> <tr> <td>Declared load profile</td> <td>3XS</td> <td>XXS</td> <td>XS</td> <td>S</td> <td>M</td> <td>L</td> <td>XL</td> <td>XXL</td> <td>3XL</td> <td>4XL</td> </tr> <tr> <td>η_{wh}</td> <td>32</td> <td>32%</td> <td>32%</td> <td>32%</td> <td>36%</td> <td>37%</td> <td>38%</td> <td>60%</td> <td>64%</td> <td>64%</td> </tr> </table>	Declared load profile	3XS	XXS	XS	S	M	L	XL	XXL	3XL	4XL	η_{wh}	32	32%	32%	32%	36%	37%	38%	60%	64%	64%		N/A
Declared load profile	3XS	XXS	XS	S	M	L	XL	XXL	3XL	4XL															
η_{wh}	32	32%	32%	32%	36%	37%	38%	60%	64%	64%															
3	Requirements for sound power level (L_{WA})		-																						
	From 26 September 2015 the sound power level of heat pump space heater and heat pump combination heaters shall not exceed the following values:		P																						
	<table border="1"> <tr> <td>Rated heat output</td> <td>$L_{WA,indoors}$</td> <td>$L_{WA,outdoors}$</td> </tr> <tr> <td>≤ 6 kW</td> <td>≤ 60 dB</td> <td>≤ 65 dB</td> </tr> <tr> <td>>6 kW and ≤ 12 kW</td> <td>≤ 65 dB</td> <td>≤ 70 dB</td> </tr> <tr> <td>> 12 kW and ≤ 30 kW</td> <td>≤ 70 dB</td> <td>≤ 78 dB</td> </tr> <tr> <td>> 30 kW and ≤ 70 kW</td> <td>≤ 80 dB</td> <td>≤ 88 dB</td> </tr> </table>	Rated heat output	$L_{WA,indoors}$	$L_{WA,outdoors}$	≤ 6 kW	≤ 60 dB	≤ 65 dB	>6 kW and ≤ 12 kW	≤ 65 dB	≤ 70 dB	> 12 kW and ≤ 30 kW	≤ 70 dB	≤ 78 dB	> 30 kW and ≤ 70 kW	≤ 80 dB	≤ 88 dB	Rated output: 6,047kW Outdoor unit: 62 dB $L_{WA,outdoors} : \leq 70$ dB Indoor unit: 43 dB $L_{WA,indoors}: \leq 65$ dB	P							
Rated heat output	$L_{WA,indoors}$	$L_{WA,outdoors}$																							
≤ 6 kW	≤ 60 dB	≤ 65 dB																							
>6 kW and ≤ 12 kW	≤ 65 dB	≤ 70 dB																							
> 12 kW and ≤ 30 kW	≤ 70 dB	≤ 78 dB																							
> 30 kW and ≤ 70 kW	≤ 80 dB	≤ 88 dB																							
4	Requirements for product information		-																						
	From 26 September 2015 the following product information on heater shall be provided:		P																						
(a)	The instruction manuals for installers and end-users, free access websites of manufacturers, their authorised representatives and importers shall contain the following elements:		P																						

Clause	Requirement – Test	Measuring result – Remark	Verdict
	- For heat pump space heaters and heat pump combination heaters, the technical parameters set out in Table 2 of clause 5 in Annex II , measured and calculated in accordance with Annex III;	Heat pump space heater	P
(b)	The technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:		-
	-The elements specified in point(a);		P
	-For heat pump space heaters and heat pump combination heaters where the information relating to a specific model comprising a combination of indoor and outdoor units has been obtained by calculation on the basis of design and/or extrapolation from other combinations, the details of such calculations and/or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify this model.		N/A

ANNEX III	Measurements and calculations		
1.	For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the Official Journal of the European Union, or using other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions and technical parameters set out in points 2 to 5.	Standards considered: See OJ (2014/C 207/02): 2014-07-03	P
2.	General conditions for Measurements and calculations		-
(a)	For the purposes of the measurements set out in point 2 to 5, the indoor ambient temperature shall be set at 20°C±1°C.		P
(b)	For the purposes of the calculations set out in point 3 to 5, consumption of electricity shall be multiplied by a conversion coefficient CC of 2,5.		P
I	Emissions of nitrogen oxides shall be measured as the sum of nitrogen monoxide and nitrogen dioxide, and expressed in nitrogen dioxide.		NA
(d)	For heaters equipped with supplementary heaters, the measurement and calculation of rated heat output, seasonal space heating energy efficiency, water heating energy efficiency, sound power level and emissions of		P

Clause	Requirement – Test	Measuring result – Remark	Verdict																													
	nitrogen oxides shall take account of the supplementary heater.																															
(e)	Declared values for rated heat output, seasonal space heating energy efficiency, water heating energy efficiency, sound power level and emissions of nitrogen oxides shall be rounded to the nearest integer.		P																													
(f)	Any heat generator designed for a heater, and heater housing to be equipped with such a heat generator, shall be tested with an appropriate heater housing and heat generator respectively.		N/A																													
3.	Seasonal space heating energy efficiency of boiler space heaters, boiler combination heater and cogeneration space heaters		-																													
4	Seasonal space heating energy efficiency of heat pump space heaters and heat pump combination heaters		-																													
(a)	For establishing the rated coefficient of performance COP_{rated} or rated primary energy ratio PER_{rated} , the sound power level or emissions of nitrogen oxides, the operating conditions shall be the standard rating conditions set out in Table 3 of ANNEX III and the same declared capacity for heating shall be used;		P																													
	Table 3 <table border="1"> <thead> <tr> <th rowspan="2">Heat source</th> <th>Outdoor heat exchanger</th> <th colspan="4">Indoor heat exchanger</th> </tr> <tr> <th>Inlet dry bulb (Web bulb) temperature</th> <th colspan="2">Heat pump space heaters and heat pump combination heaters, except low-temperature heat pump</th> <th colspan="2">Low-temperature heat pump</th> </tr> <tr> <th>Outdoor air</th> <td>+7°C(+6°C)</td> <th>Inlet temperature</th> <th>Outlet temperature</th> <th>Inlet temperature</th> <th>Outlet temperature</th> </tr> <tr> <th>Exhaust air</th> <td>+20°C(+12°C)</td> <td rowspan="4">+47°C</td> <td rowspan="4">+55°C</td> <td rowspan="4">+30°C</td> <td rowspan="4">+35°C</td> </tr> <tr> <th>--</th> <td>Inlet/outlet temperature</td> </tr> <tr> <th>Water</th> <td>+10°C/+7°C</td> </tr> <tr> <th>Brine</th> <td>0°C/-3°C</td> </tr> </thead> </table>	Heat source	Outdoor heat exchanger	Indoor heat exchanger				Inlet dry bulb (Web bulb) temperature	Heat pump space heaters and heat pump combination heaters, except low-temperature heat pump		Low-temperature heat pump		Outdoor air	+7°C(+6°C)	Inlet temperature	Outlet temperature	Inlet temperature	Outlet temperature	Exhaust air	+20°C(+12°C)	+47°C	+55°C	+30°C	+35°C	--	Inlet/outlet temperature	Water	+10°C/+7°C	Brine	0°C/-3°C		P
Heat source	Outdoor heat exchanger		Indoor heat exchanger																													
	Inlet dry bulb (Web bulb) temperature	Heat pump space heaters and heat pump combination heaters, except low-temperature heat pump		Low-temperature heat pump																												
Outdoor air	+7°C(+6°C)	Inlet temperature	Outlet temperature	Inlet temperature	Outlet temperature																											
Exhaust air	+20°C(+12°C)	+47°C	+55°C	+30°C	+35°C																											
--	Inlet/outlet temperature																															
Water	+10°C/+7°C																															
Brine	0°C/-3°C																															
(b)	The active mode coefficient of performance SCOP_{on} or active mode primary energy ratio SPER_{on} shall be calculated on the basis of the part load for heating Ph(T_j) , the supplementary capacity for heating sup(T_j) (if applicable) and the bin-specific coefficient of performance COP_{bin}(T_j) or bin-specific primary energy ratio PER_{bin}(T_j) , weighted by the bin-hours for which the bin conditions apply, using the following conditions:		P																													

Clause	Requirement – Test	Measuring result – Remark	Verdict									
	<p>-The reference design conditions set out in Table 4;</p> <p>-The European reference heating season under average climate conditions set out in Table 5 of ANNEX III;</p> <p>-If applicable, the effects of any degradation of energy efficiency caused by cycling depending on the type of control of the heating capacity;</p>		P									
	<p>Table 4</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Reference design temperature</th> <th style="width: 33%;">Bivalent temperature</th> <th style="width: 33%;">Operation limit temperature</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">T_{design}</td> <td style="text-align: center;">T_{biv}</td> <td style="text-align: center;">TOL</td> </tr> <tr> <td style="text-align: center;">-10 (-11)°C</td> <td style="text-align: center;">Maximum +2°C</td> <td style="text-align: center;">Maximum -7°C</td> </tr> </tbody> </table>	Reference design temperature	Bivalent temperature	Operation limit temperature	T_{design}	T_{biv}	TOL	-10 (-11)°C	Maximum +2°C	Maximum -7°C		P
Reference design temperature	Bivalent temperature	Operation limit temperature										
T_{design}	T_{biv}	TOL										
-10 (-11)°C	Maximum +2°C	Maximum -7°C										
I	<p>The reference annual heat demand Q_H shall be the design load for heating $P_{designh}$ multiplied by the annual equivalent active mode hours H_{HE} of 2066;</p> <p>$Q_H = P_{designh} * H_{HE}$</p>		P									
(d)	<p>The annual energy consumption Q_{HE} shall be calculated as the sum of:</p>		P									
	<p>-The ratio of the reference annual heating demand Q_H and the active mode coefficient of performance $SCOP_{on}$ or active mode primary energy ratio $SPER_{on}$ and</p>		P									
	<p>-The energy consumption for off, thermostat-off, standby, and crankcase heater mode during the heating season;</p> <p>$Q_{HE} = Q_H / (SCOP_{on}(SPER_{on}) + P_{TO} + P_{SB} + P_{CK} + P_{OFF})$</p>		P									
(e)	<p>The seasonal coefficient of performance $SCOP$ or seasonal primary energy ratio $SPER$ shall be calculated as the ratio of the reference annual heat demand Q_H and the annual energy consumption Q_{HE};</p> <p>$SCOP(SPERS) = Q_H / Q_{HE}$</p>		P									
(f)	<p>The seasonal space heating energy efficiency η_s shall be calculated as the seasonal coefficient of performance $SCOP$ divided by the conversion coefficient CC or the seasonal primary energy ratio $SPER$, corrected by contributions accounting for temperature controls and, for water-/brine-to-water heat pump space heaters and heat pump combination heaters, the electricity consumption of one or more ground water pumps.</p> <p>$H_s = SCOP / CC - \sum F(i)$</p> <p>$\eta_s = SPER / CC - \sum F(i)$</p>		P									
5	Water heating energy efficiency of combination heaters		-									

Clause	Requirement – Test	Measuring result – Remark	Verdict
(a)	The water heating energy efficiency η_{wh} of a combination heater shall be calculated as the ratio between the reference energy Q_{ref} of the declared load profile and the energy required for its generation under the following conditions:		N/A
(b)	measurements shall be carried out using the load profiles set out in Table 7;		N/A
	measurements shall be carried out using a 24-hour measurement cycle as follows: — 00:00 to 06:59: no water draw-off; — from 07:00: water draw-offs according to the declared load profile; — from end of last water draw-off until 24:00: no water draw-off;		N/A
l	the declared load profile shall be the maximum load profile or the load profile one below the maximum load profile;		N/A
(d)	for heat pump combination heaters, the following additional conditions apply:		N/A
	— heat pump combination heaters shall be tested under the conditions set out in Table 3;		N/A
	— heat pump combination heaters which use ventilation exhaust air as the heat source shall be tested under the conditions set out in Table 6.		N/A
Additional requirements from Commission communication (2014/C 207/02): 2014-07-03			-
5	Additional elements for calculations related to the seasonal space heating energy efficiency of heat pump space heaters and heat pump combination heaters		-
5.1	Calculation of the seasonal space heating energy efficiency		-
	The seasonal space heating energy efficiency η_s is defined as		P
(a)	for heat pump space heaters and heat pump combination heaters using electricity : $\eta_s = (100/CC) \times COP - \sum F(i)$	Heat pump space heater	P
(b)	for heat pump space heaters and heat pump combination heaters using fuels:		N/A
	F(i) are corrections calculated according to point 5.2 and expressed in %. SCOP and SPER shall be calculated according to the tables in 5.3, and are expressed in %.		N/A
5.2	Calculation of F(i)		P
(a)	For heat pump space heaters and heat pump combination heaters, the correction is $F(1) = 3\%$.		P

Clause	Requirement – Test	Measuring result – Remark	Verdict																														
(b)	The correction F(2) accounts for a negative contribution to the seasonal space heating energy efficiency by electricity consumption of ground water pump(s) expressed in %. For water-/brine-to-water heat pump space heaters and heat pump combination heaters, the correction is $F(2) = 5\%$.		N/A																														
5.3	Hours for the calculation of SCOP or SPER		-																														
	For the calculation of SCOP or SPER the following reference number of hours that the units work in active mode, thermostat off mode, standby mode, off more and crankcase heater mode shall be used:		-																														
	Number of hours used for heating only <table border="1" data-bbox="311 728 1284 1120"> <thead> <tr> <th></th> <th>On mode</th> <th>Thermostat-off mode</th> <th>Standby mode</th> <th>Off mode</th> <th>Crankcase heater mode</th> </tr> <tr> <th></th> <th>H_{HE}</th> <th>H_{TO}</th> <th>H_{SB}</th> <th>H_{OFF}</th> <th>H_{CK}</th> </tr> </thead> <tbody> <tr> <td>Average climate (h/y)</td> <td>2066</td> <td>178</td> <td>0</td> <td>3672</td> <td>3850</td> </tr> <tr> <td>Warmer climate (h/y)</td> <td>1336</td> <td>754</td> <td>0</td> <td>4416</td> <td>5170</td> </tr> <tr> <td>Colder climate (h/Y)</td> <td>2465</td> <td>106</td> <td>0</td> <td>2208</td> <td>2314</td> </tr> </tbody> </table>		On mode	Thermostat-off mode	Standby mode	Off mode	Crankcase heater mode		H _{HE}	H _{TO}	H _{SB}	H _{OFF}	H _{CK}	Average climate (h/y)	2066	178	0	3672	3850	Warmer climate (h/y)	1336	754	0	4416	5170	Colder climate (h/Y)	2465	106	0	2208	2314		N/A
	On mode	Thermostat-off mode	Standby mode	Off mode	Crankcase heater mode																												
	H _{HE}	H _{TO}	H _{SB}	H _{OFF}	H _{CK}																												
Average climate (h/y)	2066	178	0	3672	3850																												
Warmer climate (h/y)	1336	754	0	4416	5170																												
Colder climate (h/Y)	2465	106	0	2208	2314																												
	Number of hours used for reversible heat pumps <table border="1" data-bbox="311 1164 1284 1556"> <thead> <tr> <th></th> <th>On mode</th> <th>Thermostat-off mode</th> <th>Standby mode</th> <th>Off mode</th> <th>Crankcase heater mode</th> </tr> <tr> <th></th> <th>H_{HE}</th> <th>H_{TO}</th> <th>H_{SB}</th> <th>H_{OFF}</th> <th>H_{CK}</th> </tr> </thead> <tbody> <tr> <td>Average climate (h/y)</td> <td>2066</td> <td>178</td> <td>0</td> <td>0</td> <td>178</td> </tr> <tr> <td>Warmer climate (h/y)</td> <td>1336</td> <td>754</td> <td>0</td> <td>0</td> <td>754</td> </tr> <tr> <td>Colder climate (h/Y)</td> <td>2465</td> <td>106</td> <td>0</td> <td>0</td> <td>106</td> </tr> </tbody> </table> <p>H_{HE}, H_{TO}, H_{SB}, H_{CK}, H_{OFF} = Number of hours the unit is considered to work in respectively, active mode, thermostat off mode, standby mode, crankcase heater mode and off mode.</p>		On mode	Thermostat-off mode	Standby mode	Off mode	Crankcase heater mode		H _{HE}	H _{TO}	H _{SB}	H _{OFF}	H _{CK}	Average climate (h/y)	2066	178	0	0	178	Warmer climate (h/y)	1336	754	0	0	754	Colder climate (h/Y)	2465	106	0	0	106		P
	On mode	Thermostat-off mode	Standby mode	Off mode	Crankcase heater mode																												
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Warmer climate (h/y)	1336	754	0	0	754																												
Colder climate (h/Y)	2465	106	0	0	106																												



Table 1	Part load test							P
Model:	Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6				Fixed outlet <input type="checkbox"/> , variable outlet <input checked="" type="checkbox"/>			
General test conditions	Unit	E	F	A	B	C	D	G
Part-Load	%	100	88	88	54	35	15	-
Voltage	V	230,4	230,4	230,4	230,3	230,3	230,2	-
Frequency	Hz	50	50	50	50	50	50	-
Total power input	kW	2,314	2,189	2,189	1,184	1,130	1,035	-
Test conditions for outdoor side heat exchange for air to water								
Inlet DB/WB temperature	°C	-10,0/ -10,4	-6,7/ -7,3	-6,7/ -7,3	2,0/1,0	7,0/6,0	12,0/11,0	-
Test conditions for outdoor side heat exchange for water/brine to water								
Inlet/outlet temperature	°C	-	-	-	-	-	-	-
Water/brine flow rate	m³/h	-	-	-	-	-	-	-
Test conditions for indoor side heat exchange								
Inlet/outlet temperature	°C	30,8/34,9	29,1/33,6	29,1/33,6	26,1/29,6	22,6/27,1	18,8/24,2	-
Total heating capacity	kW	5,150	5,668	5,668	4,393	5,660	6,774	-
Effective power input	kW	2,268	2,144	2,144	1,139	1,084	0,989	-
Coefficient of performance	-	2,27	2,64	2,64	3,86	5,22	6,85	-
Compressor frequency	Hz	74	74	74	42	42	42	-
Water flow rate	m³/h	1,08	1,08	1,08	1,08	1,08	1,08	
Supplementary information: --								



Table 2		Calculation for seasonal space heating energy efficiency					P
Model:		Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6			Heat pump only <input type="checkbox"/> , reversible heat pump <input checked="" type="checkbox"/>		
Tdesignh (°C):							-10
Pdesignh (kW):							6,047
Tbiv(°C):							-7
TOL(°C):							-10
	Part load (Kw)	Measured capacity (Kw)	COP at measured capacity	Cc	Cru	COP at part load	
G	-	-	-	-	-	-	
E	6,407	5,150	2,27	0	1,00	2,27	
F	5,668	5,668	2,64	0	1,00	2,64	
A	5,668	5,668	2,64	0	1,00	2,64	
B	3,450	4,393	3,86	0,99	0,79	3,85	
C	2,218	5,660	5,22	0,99	0,39	5,14	
D	0,986	6,774	6,85	0,99	0,15	6,47	
Low power mode power consumption							
Thermostat-off mode [P _{TO}] W		Standby mode [PSB] W		Crankcase heater [PCK] W		Off mode [POFF] W	
0		16,217		32,491		16,217	
SCOP _{on} : 4,00			SCOP: 3,99				
Q _H :13237kWh			Q _{HE} :3318 kWh				
Correction F(1) = 3%			Correction F(2) = 5% (for water/brine to water heat pump)				
η _s =156,6%							
Supplementary information: CRu: part load divided by capacity.							



Table 3:		Water heating energy efficiency (η_{wh})		N/A
Model :		Declared load profile:		
	Heat source, Air temperature DB/WB (°C):	/		
	Ambient temperature of storage tank (°C):			
	Voltage (V):			
	Frequency (Hz):			
Measured quantity		Result	Remark	
Standby heat loss P_{stby}^{***}				
Reference energy Q_{ref}^{***}				
Daily electricity consumption Q_{elec}^{***}				
Weekly electricity consumption with smart controls $Q_{elec,week,smart}^{***}$				
Weekly electricity consumption without smart controls $Q_{elec,week}^{***}$				
Smart control factor SCF *				
Smart control compliance smart				
Ambient correction term Q_{cor}^*				
Water heating energy efficiency (smart=0) η_{wh}^*				
Water heating energy efficiency (smart=1) η_{wh}^*				
Supplementary information: - Number of brine pump considered:- Setting of controls: - Duct connection:- Note: η_{wh} , Q_{ref} , Q_{elec} are calculated acc. to (EU) 814/2013 Annex IV § 3.a and OJ (2014/C 207/03) Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer				



Table 4:		Sound power level measurement		P
Model :	Indoor unit:AWT9/11-V6, Outdoor unit:AWT9-V6			
	Heat source, Air temperature DB/WB (°C):	7,0/6,0°C		
	Voltage (V):	230,1V		
	Frequency (Hz):	50Hz		
	Working condition class.....:	Class A		
	Acoustical environment.....:	Reverberation test room		
	Windshield type.....:	Sponge		
	Measured position amount	6		
Measured quantity	LWA,indoors	LWA,outdoors	Remark	
Sound pressure level $\overline{L}_{p(ST)}$ ****	41 dB	64 dB	--	
Spheres radius r *	--	--	--	
Sound power level L_{wA} ****	43 dB(A)	62 dB(A)	--	
Supplementary information: 30/35°C Setting of controls: -- Duct connection: --				
Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer				



Attachment No.1: Key Components Table

Part		Technical data
1. Compressor	Manufacture	Matsushita Electric Industrial Co., Ltd.
	Type	5KD240XCA21
	Rated capacity	7280W
	Serial-number	/
	Rated input	DC280V; 2405W
2. Condenser	Type	GBH400H-40
	Manufacture	GEA
	Bauart Construction	Plate heat exchanger
	Number of plate	40
	Plate spacing	2,24mm
	Water pip specification	G1"
	Max. permissible pressure	0,7MPa
	Dimension	335(L)mmX101(H)mmX124(D)mm
3. Evaporator	Manufacture	Foshan Gaoming lds heat exchanger pro mfg Co., Ltd
	Type	AVH-24V1DB
	Fan type	Axial
	Bauart Construction	Compact Brazed Heat Exchanger
	Fin type	Hydrophilic aluminum
	Fin spacing	1,8 mm
	Tube pitch x row pitch	22mm X25.4mm
	Pip specification	Φ 9,52mm
	Max. permissible pressure	4,2MPa
	Dimension	608(L)mmX320(H)mmX675(D)mm
4. Fan motor of evaporator		
	Manufacture	FOSHAN JUNFENG ELECTRICAL APPLIANCE CO., LTD.
	Type	YDK-60-6S
	Specification	220-240V, 50 Hz; Class B; 0,76 A; 60 W
	Serial-number	/
5. Controller	Manufacture	Shenzhen Luhai Electronics Co.,Ltd.
	Type	86X86

Attachment No.2: Photo detail

Details of: Front view for indoor unit for all models



Details of: Uncover view for indoor unit for all models



Details of: Front view for outdoor unit for all models



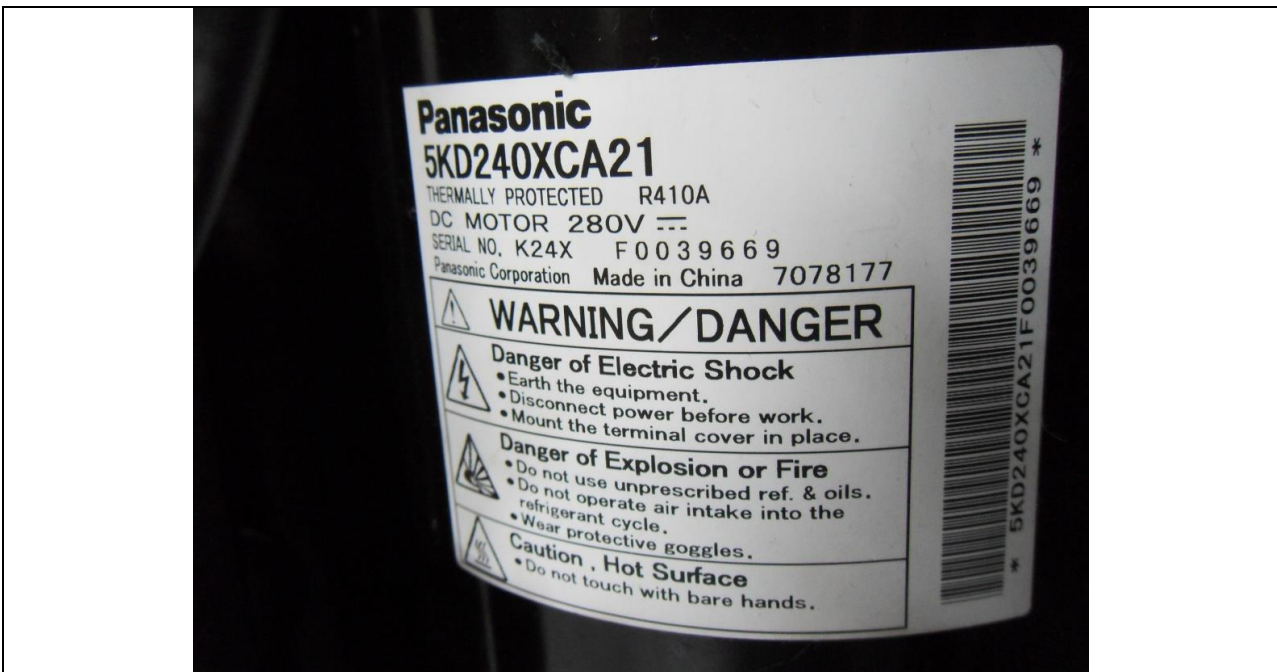
Details of: Back view for outdoor unit for all models



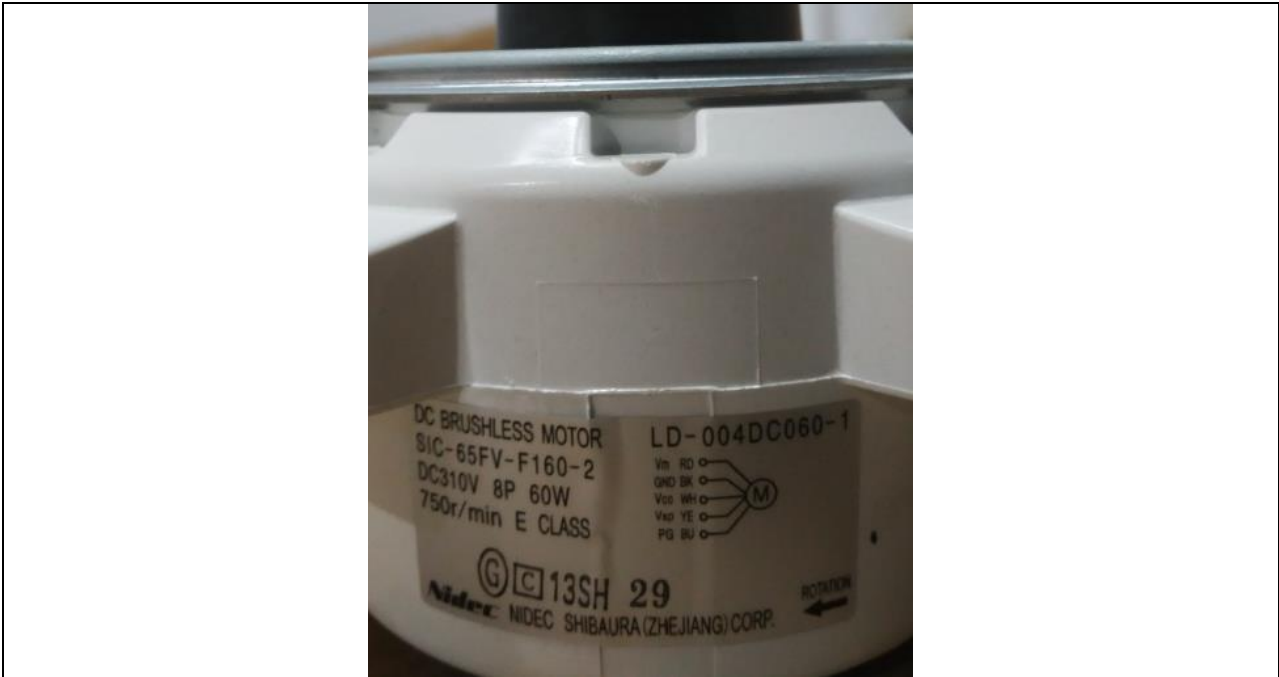
Details of: Uncover view for outdoor unit for all models



Details of: Compressor for all models



Details of: Fan motor for all models





Attachment No.3: Equipment List

Equipment	ID No.	Model	Brand/Manufacturer	Calibration due date
For ennrny tests (test date: 2015-08-02 to 2015-11-12)				
R&A performance measuring system	--	20kW	guangzhoupinxin	2016-08-04
Flowmeter	S5J607346925	AXF025G	YOKOGAWA	2016-06-24
Platinum resistance	--	PT-100	YINUO	2016-08-04
Multi-function digital power meter	91MB20642	WT230	YOKOGAWA	2016-08-04
Pressure transmitter	240502	MPM489	MICRO	2016-08-04
Pressure transmitter	240503	MPM489	MICRO	2016-08-04
Water pressure difference transmitter	291459	MDM3051	MICRO	2016-08-04
AC source Supply	--	YF-3600	YANGHONG	2016-01-02
Temperature and humidity meter	H5110021	HMD42	VAISALA	2016-08-04
For noise tests (test date: 2015-12-28~2015-12-29)				
Reverberation test rooms	ZYS13101154	7.86m*3.26m*4.94m	GD Midea	2016-11-11
-PULSE System	3050-107994	3050-A-040	B & K	2016-11-05
-Microphone	2915712	4942-A-021	B & K	2016-10-15
-Microphone	2915714	4942-A-021	B & K	2016-10-15
-Microphone	2915711	4942-A-021	B & K	2016-10-15
-Microphone	2915713	4942-A-021	B & K	2016-10-15
-Sound Calibrator	2637378	4231	B & K	2016-05-14
-Reference sound source	2931701	4204	B & K	2016-11-22
- Temperature measuring system	ZYS13101152	UT35A	YOKOGAWA	2016-09-22
- AC source Supply	119708382	AN97090TT	Ainuo	2016-08-23
- Multi-function digital power meter	891303091	8904F	Qingdao Qingzhi	2016-09-02
-Humidity sensor	H2250026	HMD60Y	VAISALA	2016-09-14
-Humidity sensor	H2250027	HMD60Y	VAISALA	2016-09-14
-Vibration Calibrator	2627037	4294	B&K	2016-04-24

-- End of report --