

Prüfbericht - Nr.: 16038608 005		Seite 1 von 29 Page 1 of 29	
<i>Test Report No.:</i>			
Auftraggeber: <i>Client:</i>	Guangdong Phnix Eco-Energy Solution Ltd. Lizhiwan, Lingdong, Dagang Town, Panyu, Guangzhou, Guangdong, China		
Gegenstand der Prüfung: <i>Test item:</i>	AIR COOLED WATER CHILLER/HEAT PUMP		
Bezeichnung: <i>Identification:</i>	PASRW060B-D-KA	Serien-Nr.: <i>Serial No.:</i>	Engineering Sample
Wareneingangs-Nr.: <i>Receipt No.:</i>	173064430	Eingangsdatum: <i>Date of receipt:</i>	2012-01-31
Zustand des Prüfgegenstandes bei Anlieferung: Good for checking and testing Condition of test item at delivery:			
Prüfart: <i>Testing location:</i>	Guangdong Phnix Eco-Energy Solution Ltd. Lizhiwan, Lingdong, Dagang Town, Panyu, Guangzhou, Guangdong, China		
Prüfgrundlage: <i>Test specification:</i>	EN 14511-1: 2007 EN 14511-2: 2007	EN 14511-3: 2007 EN 14511-4: 2007	
Prüfergebnis: <i>Test Result:</i>	Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). The test item passed the test specification(s).		
Prüflaboratorium: <i>Testing Laboratory:</i>	TÜV Rheinland (Guangdong) Ltd.		
geprüft/ tested by:		kontrolliert/ reviewed by:	
2012.02.21	David Chen	2012.02.22	Brenda Fan
Datum Date	Name/Stellung Name/Position	Datum Date	Name/Stellung Name/Position
	Unterschrift Signature		Unterschrift Signature
Sonstiges/ Other Aspects:			
Remark: According the client's requirement, this report is only for evaluate the heating/cooling capacity, and COP/EER data listed on manufacturer's data sheet.			
Abkürzungen:		Abbreviations:	
P(ass) =	entspricht Prüfgrundlage	P(ass) =	passed
F(ail) =	entspricht nicht Prüfgrundlage	F(ail) =	failed
N/A =	nicht anwendbar	N/A =	not applicable
N/T =	nicht getestet	N/T =	not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report relates to the a. m. test item. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.			

Test item particulars:						
Class of protection Class I						
Degree of protection IPX4						
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)						
Summary of testing						
<p>1. Tests were performed according to the standard EN 14511:2007.</p> <p>2. The standard rating conditions and application rating conditions (excluding Exhaust air and brine) in table 9&10 of standard EN 14511-2:2007 were tested (see table 4 for details).</p>						
General product information						
<ul style="list-style-type: none"> ● This appliance is air source heat pump providing hot water for consumer use (space heating). ● The unit is IPX4 water proof which can be installed in either indoor or outdoor. ● The main power is supplied to the unit via a 3- pole supply cable cord. ● The unit is equipped with remote control unit. ● The unit incorporated with two compressors and two fan motors. 						
Model list:						
Code	Model	Rated Capacity(kW)		Rated Power Input (kW)		Remark
		Heating	Cooling	Heating	Cooling	
A1	PASRW060B-D-KA	17,0	13,5	4,1	4,7	Heating/Cooling

Rating labels and marking:

PASRW060B-D-KA**AIR COOLED WATER CHILLER/HEAT PUMP**

RATED VOLTAGE/FREQUENCY:	230V~/50Hz
MOISTURE RESISTANCE:	IPX4
ELECTRICAL SHOCKPROOF:	I
RATED COOLINGCAPACITY:	13.5kW/46000Btu/h
RATED HEATING CAPACITY:	17.0kW/60000Btu/h
RATED COOLINGPOWER INPUT:	4.7kW
RATED HEATING POWER INPUT:	4.1kW
RATED COOLINGCURRENT INPUT:	20.4A
RATED HEATING CURRENT INPUT	17.8A
ELECTRIC-HEATER:	3.0kW
MAX POWER INPUT:	4.9+3.0kW
MAX CURRENT INPUT:	21.3+13.5A
WATERFLOW VOLUME:	2.8m³/h
WATERHEAD:	10m
WATERPRESSURE DROP:	34kPa
WATERPIPE OUTLET/INTET:	1 inch
REFRIGERATE/PROPER INPUT:	R410A/2X2.2kg
NOISE:	56dB(A)
NET WEIGHT:	185kg
OPERATION PRESSURE(LOW SIDE):	2.1MPa
OPERATION PRESSURE(HIGH SIDE):	4.4MPa
FACTORYNUMBER:	ON THEBAR CODE
MAKING DATE:	ON THE BAR CODE

**PHNIX**

EN 14511:2007			
Clause	Requirement - Test	Result - Remark	Verdict

EN 14511-1:2007			
1	Scope		P
	This standard does not apply to - heat pumps for sanitary hot water - installations used for heating and/or cooling of industrial processes - units using transcritical cycles	Air to water heat pump.	P

EN 14511-2:2007			
4	Test condition		P
4.1	Environmental condition and electrical power supply requirements		P
	Environmental condition		P
	Electrical power supply	230V~, 50Hz	P
4.2	Rating condition		P
	Standard Rating Condition for heating mode		P
	Indoor heat exchanger; Outdoor heat exchanger (°C)	See table 4.1 for test condition	P
	Standard Rating Condition for cooling mode		P
	Indoor heat exchanger; Outdoor heat exchanger (°C)	See table 4.2 for test condition	P
	Application rating conditions for heating mode		P
	Indoor heat exchanger; Outdoor heat exchanger (°C)	See table 4.1 for test condition	P
	Application rating conditions for cooling mode		P
	Indoor heat exchanger; Outdoor heat exchanger (°C)	See table 4.2 for test condition	P

EN 14511-3:2007			
4.1	Basic principles		P
4.1.1	Heating capacity	(See appended table)	P
	Heating capacity determined by measurements on a calorimeter room or by the air enthalpy method		N/A
	The heating capacity of air-to-water, water-to-water heat pumps and liquid chilling packages the direct method	Air to water heat pump	P
	The heating capacity shall be corrected for the heat from the fan or pump		N/A
	The fan or pump at the indoor heat exchanger is an integral part of the unit		N/A
	The fan or pump at the indoor heat exchanger is not an integral part of the unit		N/A
4.1.2	Cooling capacity		P

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Clause	Requirement - Test	Result - Remark	Verdict
	The cooling capacity of air conditioners and of air-to-air or water-to-air heat pumps determined by measurements in a calorimeter room or by the air enthalpy method		N/A
	The cooling capacity of air-to-water, water-to-water heat pumps and liquid chilling packages the direct method		P
	The cooling capacity shall be corrected for the heat from the fan or pump		N/A
	The fan or pump at the indoor heat exchanger is an integral part of the unit		N/A
	The fan or pump at the indoor heat exchanger is not an integral part of the unit		N/A
4.1.3	Heat recovery capacity	No heat recovery	N/A
	The heat recovery capacity of air-to-water and water-to-water heat pumps and liquid chilling packages shall be determined in accordance with the direct method		N/A
4.1.4	Power input of fans for units without duct connection	Power of fan included in the effective power	P
4.1.5	Power input of fans for units with duct connection	No duct connection	N/A
4.1.5.1	Fan is an integral part of the unit		N/A
4.1.5.2	No fan is provided with the unit		N/A
4.1.6	Power input of liquid pumps	Liquid pump not integral part of the unit.	N/A
4.1.6.1	If a liquid pump is an integral part of the unit		N/A
4.1.6.2	If no liquid pump is provided with the unit		N/A
4.1.6.3	In the case of appliances designed especially to operate on a distributing network of pressurized water without water-pump, no correction is to be applied to the power input.		N/A
4.1.7	Units for use with remote condenser	No remote condenser	N/A
4.2	Test apparatus		P
4.2.1	Arrangement of the test apparatus		P
4.2.1.1	General requirements		P
	The test apparatus shall be designed in such a way that all requirements on adjustment of set values, stability criteria and uncertainties of measurement according to this European Standard can be fulfilled.		P
4.2.1.2	Test room for the air side		P
	The size of the test room		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Any direct heat radiation by heating units in the test room onto the unit or onto the temperature measuring points shall be avoided.		P
4.2.1.3	Appliances with duct connection	Not duct connection	N/A
	Ducted air systems shall be sufficiently air tight to ensure that the measured results are not significantly influenced by exchange of air with the surroundings.		N/A
4.2.1.4	Appliances with integral pumps		P
	For appliances with integral and adjustable water or brine pumps, the external static pressure will be set at the same time as the temperature difference		P
4.2.1.5	Liquid chilling package for use with remote condenser		N/A
	Units for use with remote condenser are tested by using a water-cooled condenser, the characteristics of which shall enable the intended operating conditions to be achieved.		N/A
4.2.2	Installation and connection of the test object		P
4.2.2.1	General		P
	The test object shall be installed and connected for the test as recommended by the manufacturer in his installation and operation manual. The accessories provided by option are not included in the test.	Installed and connected according to installation manual.	P
	For single duct units The discharge duct shall be as short and straight as possible but not less than 50cm to the wall		N/A
	For double duct units: the requirements apply to both suction and discharge ducts, unless the appliance is designed to be installed directly on wall.		N/A
	For multisplit systems, the test shall be performed with the system operating at a capacity ratio of 1, or as close as possible.		N/A
	Set the highest room temperature on the unit/system control device in heating mode		P
	Set the lowest room temperature on the unit/system control device in cooling mode		N/A
	For unit with open-type compressor the electric motor shall be supplied or specified by the manufacturer. The compressor shall be operated at the rotational speed specified by the manufacturer.	No open-type compressor	N/A
	For inverter type control units, if the manufacturer gives instructions for the setting of the frequency for each rating condition, this setting shall be done.	Not inverter type control unit.	N/A
4.2.2.2	Installation of unit consisting of several parts		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	a) The refrigerant lines shall be installed in accordance with the manufacturer instructions with a minimum length of 5 m and a greater length to a maximum of 7,5 m if the constraints of the test installation make 5 m not possible.		N/A
	b) The lines shall be installed so that the difference in elevation does not exceed 2,5 m.		N/A
	c) The thermal insulation of the lines shall be applied in accordance with the manufacturer's instructions.		N/A
	d) At least half of the connecting lines shall be exposed to the outside conditions, with the rest of the lines exposed to the inside conditions.		N/A
4.2.2.3	Indoor units of multi-split systems	Not multi-split system	N/A
	When testing a multi-split system, indoor units shall be either all non ducted or all ducted.		N/A
	All indoor units shall be of the same model for ducted, i.e. having the same airflow rate and the same external static pressure.		N/A
	Indoor units tested using the air enthalpy method for non ducted, the above requirement on ducted indoor units shall apply.		N/A
4.2.2.4	Measurements		P
	Temperature and pressure measuring points shall be arranged in order to obtain mean significant values.		P
	Free air intake temperature measurements		P
	—either to have at least one sensor per square meter and not less than four measuring points equally distributed on the air surface;		P
	—or to use a sampling device. It shall be completed by four sensors for checking uniformity if the surface area is greater than 1 m ² .		N/A
	For control cabinet air conditioners, the inlet temperature at the evaporator is measured instead of the temperature inside the control cabinet.	Not control cabinet air conditioner	N/A
4.3	Uncertainties of measurement		P
	The uncertainties of measurement shall not exceed the values specified in table 1.		P
	The heating or cooling capacities measured on the liquid side shall be determined within a maximum uncertainty of 5% independent of the individual uncertainties of measurement including the uncertainties on the properties of fluids.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	The steady state heating or cooling capacities determined using the calorimeter method should be determined with a maximum uncertainty of 5%, independent of the individual uncertainties of measurement including the uncertainties on the properties of fluids.		P
	Heating capacity determined during transient operation (defrost cycles) using the calorimeter method shall be determined with a maximum uncertainty of 10%, independent of the individual uncertainties of measurement including the uncertainties on the properties of fluids.		P
	The heating and cooling capacities measured on the air side using the air enthalpy method shall be determined with a maximum uncertainty of 10%, independent of the individual uncertainties of measurement including the uncertainties on the properties of fluids.		N/A
4.4	Test procedure		P
4.4.1	General		P
4.4.1.1	All units The test conditions are given in EN 14511-2.		P
	If liquid heat transfer media other than water are used, the specific heat capacity and density of such heat transfer media shall be determined and taken into consideration in the evaluation.		N/A
	Table 4 states permissible deviations of the measured values from the test conditions.		P
4.4.1.2	Non ducted units		P
	For non ducted units, the adjustable settings such as louvers and fan speed shall be set for maximum air flow.		P
4.4.1.3	Ducted units		N/A
	The volume flow and the pressure difference shall be related to standard air and with dry evaporator.		N/A
	The air flow rate given by the manufacturer shall be converted into standard air conditions. The air flow rate setting shall be made when the fan only is operating, at standard air conditions.		N/A
	The rated airflow rate given by the manufacturer shall be set and the resulting external static pressure (ESP) measured. This ESP shall be greater than the minimum value given in Table 2 for comfort air conditioners and Table 3 for close control air conditioners but not greater than 80 % of the maximum external static pressure specified by the manufacturer.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	If the fan of the unit has an adjustable speed, it shall be adjusted to the lowest speed that provide the minimum ESP or greater.		N/A
	If the maximum ESP of the unit is lower than the minimum ESP given in Table 2 or Table 3, then the air flow rate is lowered to achieve an ESP equal to 80% of the maximum ESP of the manufacturer.		N/A
	In case this ESP is lower than 25 Pa, the unit can be considered as a free delivery unit and be tested as a non ducted unit with an ESP of 0 Pa.		N/A
4.4.2	Output measurement for water-to-water and water-to-air units		N/A
4.4.2.1	Steady state conditions		N/A
	This condition is considered obtained and maintained when all the measured quantities remain constant without having to alter the set values, for a minimum duration of 1 h, with respect to the tolerances given in Table 4.		N/A
4.4.2.2	Measurement of heating capacity, cooling capacity and heat recovery capacity		N/A
	For the output measurement it is necessary to record all the meaningful data continuously. In the case of recording instruments which operate on a cyclic basis, the sequence shall be adjusted such that a complete recording is effected at least once every 30 s.		N/A
	The output shall be measured in the steady state condition. The duration of measurement shall be not less than 35mm		N/A
4.4.3	Output measurement for cooling capacity of air-to-water and air-to-air units		P
4.4.3.1	Steady state conditions		P
	This condition is considered obtained and maintained:		P
	When all the measured quantities remain constant without having to alter the set values,		P
	For a minimum duration of 1 h, with respect to the tolerances given in Table 4.		P
	Periodic fluctuations of measured quantities caused by the operation of regulation and control devices are permissible, on condition the mean value of such fluctuations does not exceed the permissible deviations listed in table 4.		N/A
4.4.3.2	Measurement of cooling capacity		P
	Record all the meaningful data continuously.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	At least once every 30s in case of recording instruments operate on a cyclic basis.		P
	Measured in the steady state condition.		P
	Not less than 35min duration		P
4.4.4	Output measurement for heating capacity of air-to-water and air-to-air units		P
4.4.4.1	General		P
	The test procedure consists of three periods: a preconditioning period, an equilibrium period, and a data collection period. The duration of the data collection differs depending upon whether the heat pump's operation is steady state or transient.		P
	Annex C gives a flow chart of the procedure and pictorially represents most of the different test sequences that are possible when conducting a heating capacity test.		P
4.4.4.2	Preconditioning period		P
	The test room reconditioning apparatus and the heat pump under test shall be operated until the test tolerances specified in Table 4 are attained for at least 10 min.		P
	A defrost cycle may end a preconditioning period. If a defrost cycle does end a preconditioning period, the heat pump shall operate in the heating mode for at least 10 min after defrost termination prior to beginning the equilibrium period.		P
	It is recommended that the preconditioning period end with an automatic or manually-induced defrost cycle when testing at application rating conditions for outdoor air stated in Table 3 and Table 9 of EN 14511-2:2004.		P
4.4.4.3	Equilibrium period		P
	The equilibrium period immediately follows the preconditioning period or the defrost cycle and a recovery period of 10 min that ends a preconditioning period.		P
	A complete equilibrium period is one hour in duration.		P
	Except as specified in 4.4.4.7, the heat pump shall operate while meeting the test tolerances specified in Table 4.		P
4.4.4.4	Data collection period		P
	The data collection period immediately follows the equilibrium period.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Data shall be sampled at equal intervals that span every 30 s or less, excepted during defrost cycles as specified below.		P
	During defrost cycles, plus the first 10 min following defrost termination, data used in evaluating the integrated heating capacity and the integrated power input of the heat pump shall be sampled more frequently, at equal intervals that span every 10 s or less.		P
	For heat pumps that automatically cycle off the indoor fan during a defrost, the contribution of the net heating delivered and/or the change in indoor-side dry bulb temperature shall be assigned the value of zero when the indoor fan is off, if using the indoor air enthalpy method. If using the calorimeter test method, the integration of capacity shall continue while the indoor fan is off.		P
	The difference between the leaving and entering temperatures of the heat transfer medium at the indoor heat exchanger shall be measured.		P
4.4.4.5	Test procedure: When a defrost cycle ends the preconditioning period		P
	If the quantity % AT exceeds 2,5 % during the first 35 min of the data collection period, the heating capacity test shall be designated a transient test.		N/A
	If the heat pump initiates a defrost cycle during the equilibrium period or during the first 35 min of the data collection period, the heating capacity test shall be designated a transient test.		N/A
	If the above conditions do not occur and the test tolerances specified in Table 2 are satisfied during both the equilibrium period and the first 35 min of the data collection period, then the heat capacity test shall be designated a steady-state test. Steady-state tests shall be terminated after 35 min of data collection		P
4.4.4.6	Test procedure: When a defrost cycle does not end the preconditioning period		N/A
4.4.4.6.1	If the heat pump initiates a defrost cycle during the equilibrium period or during the first 35 min of the data collection period, the heating capacity test shall be restarted as specified		N/A
4.4.4.6.2	If the quantity %AT exceeds 2,5 % any time during the first 35 min of the data collection period, then the heating capacity test procedure shall be restarted as specified in 4.4.4.6.3		N/A
	Prior to the restart, defrost cycle shall occur. This defrost cycle may be manually initiated or delayed until the heat pump initiates an automatic defrost.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
4.4.4.6.3	If either 4.4.4.6.1 or 4.4.4.6.2 apply, then the restart shall begin 10 min after the defrost cycle terminates with a new equilibrium period of one hour.		N/A
	This second attempt shall follow the requirements of 4.4.4.3 and 4.4.4.4 and the test procedure of 4.4.4.5.		N/A
4.4.4.6.4	If the conditions specified in 4.4.4.6.1 or 4.4.4.6.2 do not occur and the test tolerances specified in Table 4 are satisfied during both the equilibrium period and the first 35 min of the data collection period, then the heat capacity test shall be designated a steady-state test. Steady-state tests shall be terminated after 35min of data collection.		N/A
4.4.4.7	Test procedure for transient tests		N/A
	When, in accordance with 4.4.4.5, a heating capacity test is designated a transient test, the following adjustments shall apply.		N/A
	To constitute a valid transient heating capacity tests, the test tolerances specified in Table 5 shall be achieved during both the equilibrium period and the data collection period.		N/A
	The test tolerance parameters in Table 5 shall be determined throughout the equilibrium and data collection periods. All data collected during each interval, H or D, shall be used to evaluate compliance with the Table 5 test tolerances.		N/A
	The data collection period shall be extended until 3 h have elapsed or until the heat pump completes three complete cycles during the period, whichever occurs first.		N/A
	Applies when the heat pump is in the heating mode, except for the first 10 min after termination of a defrost cycle.		N/A
	Applies during a defrost cycle and during the first 10 min after the termination of a defrost cycle when the heat pump is operating in the heating mode.		N/A
4.5	Test results		P
4.5.1	Data to be recorded		P
	Data to be recorded for the capacity tests are given in table 6, and these data shall be the mean values taken over the test period.		P
4.5.2	Cooling capacity and heat recovery capacity calculation	See appended table	P
	The cooling capacity and heat recovery capacities shall be determined from the set of cooling and heat recovery capacities recorded over the data collection period.		N/A
4.5.3	Heating capacity calculation		P

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Clause	Requirement - Test	Result - Remark	Verdict
4.5.3.1	Steady state capacity test		P
	An average capacity shall be determined from the set of heating capacities recorded over the 35min data collection period.		P
4.5.3.2	Transient capacity test		N/A
	For equipment where one or more complete cycle occurs during the data collection period, the following shall apply.		N/A
	The average heating capacity shall be determined using the integrated capacity and the elapsed time corresponding to the total number of complete cycles that occurred over the data collection period.		N/A
	For equipment where no complete cycle occurs during the data collection period, the following shall apply.		N/A
	The average heating capacity shall be determined by using the integrated capacity and the elapsed time corresponding to the total data collection period.		N/A
4.5.4	Effective power input calculation		N/A
4.5.4.1	Steady state test		N/A
	An average electric power input shall be determined from the integrated electrical power over the same data collection period than the one used for the heating / cooling capacity or heat recovery capacity calculation.		N/A
4.5.4.2	Transient with defrost cycle		N/A
	An average electric power input shall be determined on the basis of the integrated electrical power and the time corresponding to the total number of complete cycles during the same data collection period as the one used for the heat capacity calculation.		N/A
4.5.4.3	Transient without defrost cycle		N/A
	An average electric power input shall be determined on the basis of the integrated electrical power and the time corresponding to the same data collection period as the one used for the heat capacity calculation.		N/A
5	Heat recovery test for multisplit systems	No heat recovery	N/A
5.1	Test installation		N/A
5.1.1	General		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	The heat recovery capacity of the system is determined by measurements in a three room calorimeter or by the air enthalpy method using two or three rooms. The three rooms shall consist of one outdoor room and two indoor rooms, one at the heating condition and the other at the cooling condition. The two room air enthalpy method shall have one room at the outdoor condition and the other at the common indoor side condition given in Table 15 of EN 14511-2:2004.		N/A
	The calorimeter room and air enthalpy methods are described in annex A and annex B respectively. Each calorimeter room shall satisfy the requirements of annex A and the test facilities for the air enthalpy method shall satisfy the requirements of annex B.		N/A
5.1.2	Three-room calorimeter method		N/A
	If measurements are made by the calorimeter method, then the testing of a heat recovery system shall need a three-room calorimeter test facility. The indoor units in the cooling mode shall be assembled in one room and the indoor units in the heating mode in the other. The outdoor unit shall be installed in the third room.		N/A
5.1.3	Three-room air-enthalpy method		N/A
	The indoor units in the cooling mode shall be assembled in one room and the indoor units in the heating mode in another room; the outdoor unit shall be installed in the third room.		N/A
5.1.4	Two-room air-enthalpy method		N/A
	All indoor units, either operating in cooling or heating mode, are assembled in one indoor room. The outdoor unit shall be installed in the other room.		N/A
	All units operating in the heating mode shall be connected to a common plenum, all units operating in the cooling mode shall be connected to another common plenum, both in accordance with the requirements established in annex B.		N/A
5.2	Test procedure		N/A
	The heat recovery test shall be carried out with all operating indoor units.		N/A
	For ducted indoor units, the individual external static pressure of each indoor unit is set by adjusting a damper located in the duct length connecting the discharge area of the unit to the common plenum.		N/A
5.3	Test results		N/A
	Test results are recorded and expressed as specified in 4.5.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	The references of the indoor units operating in cooling mode and of the indoor units operating in heating mode shall be specified.		N/A
6	Test report		P
6.1	General information		P
	<p>The test report shall at least contain:</p> <ul style="list-style-type: none"> a) date; b) test institute; c) test location; d) test method; e) test supervisor; f) test object designation: <ul style="list-style-type: none"> — Type; — serial number; — name of the manufacturer; — year of initial installation; g) type of refrigerant; h) mass of refrigerant; i) properties of fluids; j) reference to this European Standard. 	See appended table 6.1.	P
6.2	Additional information		P
	Additional information given on the rating plate shall be noted and any other information relevant for the test. Particularly, it shall be stated whether the test is performed on a unit new or not. In the case of a test performed on a unit in use, information relative to the year of installation, and heat exchange tubes cleaning shall be given.		N/A
6.3	Rating test results		P
	The rating capacities, power inputs, COP, EER, internal or external static pressure shall be given together with the rating conditions.		P
EN 14511-4:2007			
4	Requirements		N/A
4.1	General		N/A
	Except where otherwise stated, tests shall be conducted as described in EN 14511-2 and EN 14511-3.		N/A
4.2	Temperature operating range		N/A
4.2.1	Starting test		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	The unit shall be capable of operating within the limit of use indicated by the manufacturer.		N/A
	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.		N/A
4.2.2	Test at maximum operating conditions (cooling mode)		N/A
	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:		N/A
	— the unit shall suffer no damage;		N/A
	— the unit motor shall operate continuously for the first hour without tripping of the motor overload protective devices;		N/A
	— after the shut-down period of 3 min, the unit shall restart automatically no more than 5 min after restarting of the compressor;		N/A
	— the unit motor shall operate again continuously for the rest of the second hour without tripping of the motor overload protective devices.		N/A
4.2.3	Freeze-up test		N/A
4.2.3.1	Air-cooled unit		N/A
	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:		N/A
	— no ice shall have accumulated on the evaporator;		N/A
	— no ice shall drip from the unit;		N/A
	— no water shall drip or be blown off the unit into the room.		N/A
4.2.3.2	Water-cooled units		N/A
	After the unit has operated for 6 h at the conditions stated in Table 3 the following requirements shall be fulfilled:		N/A
	— air flow through the unit shall not have dropped by more than 5 %;		N/A
	NOTE It shall be assured that the air flow through the unit is not adjusted during the test by some automatic control device.		N/A
	— the water temperature difference through the unit shall not have dropped by more than 30 %;		N/A
4.3	Outside the operating range		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	If operating outside the temperature range can cause damage to the unit, it shall be provided with safety devices which ensure that the unit suffers no damage when the operating limits of use indicated by the manufacturer are exceeded and remains capable of operating when coming back within these limits. A safety device that does not automatically reset may trip provided that a warning device is fitted.		N/A
	The manufacturer shall indicate any safety devices provided and their operating conditions according to 7.2.3.		N/A
4.4	Shutting off the heat transfer medium flows	Not evaluated in this report	N/A
	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.	Not evaluated in this report	N/A
	a) Shutting off the heat transfer medium flow at the outdoor heat exchanger.	Not evaluated in this report	N/A
	b) Shutting off the heat transfer medium flow at the indoor heat exchanger.	Not evaluated in this report	N/A
	c) Shutting off the heat transfer medium flow at the heat recovery heat exchanger where applicable.	Not evaluated in this report	N/A
	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.		N/A
	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.		N/A
	— the saturated temperature corresponding to the pressure measured at the suction of the compressor shall not have decreased by more than 2 K.		N/A
4.5	Complete power supply failure		N/A
	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.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	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.		N/A
	The unit is checked for any damage sustained during the test and if any safety devices have operated during the test.		N/A
	The test does not apply when the manufacturer states that the machine does not automatically restart after power supply failure.		N/A
4.6	Condensate draining and enclosure sweat test		N/A
	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.		N/A
	During the test of 4 h no condensed water shall drip, run or blow off the unit except through the drain.		N/A
	For indoor units, drain holes shall be provided with suitable pipe connection, the minimum diameter of which shall be 12 mm.		N/A
4.7	Defrosting (where applicable)		N/A
	The functioning of any defrosting system shall be specified under any one of the application rating conditions (see Table 3 to 15 in EN 1451 1-2:2004), where frosting occurs.		N/A
	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.		N/A
4.8	Other requirements		N/A
	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.		N/A
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.	Label attached on outdoor unit	P

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Clause	Requirement - Test	Result - Remark	Verdict
	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.		N/A
	Items c) and d) depend on the considered matching and shall be indicated in the manufacturer's data sheet.		P
	a) manufacturer or supplier;	See rating label	P
	b) manufacturer's model designation and serial number;	See rating label	P
	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;	See appended table 6.1	P
	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.	See appended table 6.1	P
	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.		N/A
	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	Technical data sheet		P
6.1	General description	See appended table 6.1	P
	The manufacturer shall provide the following information: <ul style="list-style-type: none"> — trade mark, model designation; — power supply (voltage, frequency); — denomination of the unit (e.g.: air-to-water); — intended use of the unit (e.g.: control cabinet air conditioner); — number of separate component units; — type and mass of refrigerant charge; — overall dimensions and weight of each separate component unit. 		P
6.2	Performance characteristics		P
6.2.1	Rating characteristics		P
	The manufacturer shall provide in a table or as a graph the rating characteristics according to EN 14511-2 and EN 14511-3.		P

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Clause	Requirement - Test	Result - Remark	Verdict
	Rating characteristics include: <ul style="list-style-type: none"> — 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). 	See appended table 6.1	P
	The manufacturer shall state that the characteristics apply to a new unit with clean heat exchangers.	A new unit	P
6.2.2	Additional characteristics		P
	In addition, the manufacturer shall provide the following characteristics for the rated point(s): <ul style="list-style-type: none"> — 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. 	See appended table 6.1	P
6.2.3	Sound characteristics		P
	The manufacturer shall provide the sound power level and the corresponding test method according to ENV 12102.	Declared by the manufacturer.	P
6.3	Electrical characteristics		P
	The manufacturer shall specify the electrical the characteristics in accordance with EN 60335-2-40 or EN 60204-1 as applicable and: <ul style="list-style-type: none"> — maximum starting current of the unit, as defined in EN 61000-3-11; 		P
	— total power input and current at the rated point, excluding the starting period;		P
	— reactive power or power factor at the rated point, for units with a total power input greater than 10 kW;		N/A
	— power input of fan and pump if included in the units.		P
6.4	Operating range		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	The manufacturer shall specify: <ul style="list-style-type: none"> — limits of use (temperatures and flows); — whether there are devices fitted which do not allow the unit to operate when these limits are exceeded. 		N/A
7	Instructions		N/A
7.1	General		N/A
	If not already required by other standards, the manufacturer shall provide the information as described.		N/A
7.2	Physical description		N/A
7.2.1	Refrigerant, air and/or liquid circuits		N/A
	The manufacturer shall: <ul style="list-style-type: none"> — specify the refrigerant, air and liquid circuits preferably providing circuit diagrams, showing every functional unit, control and safety device and specifying their type; 		N/A
	— 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;		N/A
	— if used, specify the type of brine and the concentration into any other liquid;		N/A
	— specify the type of oil to be used in the compressor.		N/A
7.2.2	Additional heating devices, when integral to the unit		N/A
	The manufacturer shall specify the type and location of additional heating devices and their control and safety devices.		N/A
7.2.3	Control and safety The manufacturer shall: <ul style="list-style-type: none"> — 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. 		N/A
7.3	Instructions for installation		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	<p>The manufacturer shall specify in particular:</p> <ul style="list-style-type: none"> — 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: <ul style="list-style-type: none"> — correct circulation of the heat transfer media; — water draining; — cleanliness of heat exchange surfaces; — to minimise noise, vibration or other adverse effects. 		N/A
	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.		N/A
7.4	Instruction for maintenance		N/A
	<p>The manufacturer shall state:</p> <ul style="list-style-type: none"> — 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. 		N/A

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Clause	Requirement - Test	Result - Remark	Verdict

Appended table

Table 4.1-1 for EN 14511-3: Heating capacity			P
Model:	PASRW060B-D-KA		
	-	Heating condition 1	Heating condition 2
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	40/45	30/35
	Outdoor heat exchanger: dry/wet (°C)	7/6	7/6
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	--	4,1
	Test Power Input (kW)	5,28	4,45
Cooling/Heating Capacity	Declared Rated Capacity (kW)	16,18	17,0
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	16,18	17,47
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	1,03
COP	Declared COP	--	4,15
	Tested COP	--	3,93
	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	--	0,95
Does the air-cooled condenser evaporate condensate?		No	

Table 4.1-2 for EN 14511-3: Heating capacity			P
Model:	PASRW060B-D-KA		
	-	Heating condition 3	Heating condition 4
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	-/35	-/35
	Outdoor heat exchanger: dry/wet (°C)	2/1	-7/-8
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	--	--
	Test Power Input (kW)	4,47	4,36
Cooling/Heating Capacity	Declared Rated Capacity (kW)	13,70	10,98
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	13,70	10,98
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	1,0
COP	Declared COP	--	--
	Tested COP	--	--

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Clause	Requirement - Test	Result - Remark	Verdict
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	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	--	--
Does the air-cooled condenser evaporate condensate?		No	

Table 4.1-3 for EN 14511-3: Heating capacity

P

Model:	PASRW060B-D-KA		
	-	Heating condition 5	Heating condition 6
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	-/35	-/45
	Outdoor heat exchanger: dry/wet (°C)	-15/-	2/1
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	--	--
	Test Power Input (kW)	4,21	5,13
Cooling/Heating Capacity	Declared Rated Capacity (kW)	8,05	13,58
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	8,05	13,58
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	1,0
COP	Declared COP	--	--
	Tested COP	--	--
	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	--	--
Does the air-cooled condenser evaporate condensate?		No	

Table 4.1-4 for EN 14511-3: Heating capacity

P

Model:	PASRW060B-D-KA		
	-	Heating condition 7	Heating condition 8
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	-/45	-/45
	Outdoor heat exchanger: dry/wet (°C)	-7/-8	-15/-
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	--	--
	Test Power Input (kW)	4,97	4,76
Cooling/Heating Capacity	Declared Rated Capacity (kW)	10,11	7,23
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	10,11	7,23
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	1,0

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Clause	Requirement - Test	Result - Remark	Verdict
COP	Declared COP	--	--
	Tested COP	--	--
	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	--	--
Does the air-cooled condenser evaporate condensate?		No	

Table 4.1-5 for EN 14511-3: Heating capacity			P
Model:	PASRW060B-D-KA		
	-	Heating condition 9	Heating condition 10
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	-/55	-/55
	Outdoor heat exchanger: dry/wet (°C)	7/6	-7/-8
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	--	--
	Test Power Input (kW)	6,12	5,68
Cooling/Heating Capacity	Declared Rated Capacity (kW)	15,06	8,81
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	15,06	8,81
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	1,0
COP	Declared COP	--	--
	Tested COP	--	--
	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	--	--
Does the air-cooled condenser evaporate condensate?		No	

Table 4.2-1 for EN 14511-3: Cooling capacity			P
Model:	PASRW060B-D-KA		
	-	Cooling condition 1	Cooling condition 2
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	12/7	23/18
	Outdoor heat exchanger: dry/wet (°C)	35/--	35/--
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	4,7	--
	Test Power Input (kW)	5,58	5,84
Cooling/Heating Capacity	Declared Rated Capacity (kW)	13,5	16,42
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	13,48	16,42

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Clause	Requirement - Test	Result - Remark	Verdict
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	1,0
EER	Declared EER	2,84	--
	Tested EER	2,42	--
	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	0,85	--
Does the air-cooled condenser evaporate condensate?		No	

Table 4.2-2 for EN 14511-3: Cooling capacity			P
Model:	PASRW060B-D-KA		
	-	Cooling condition 3	Cooling condition 4
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	--/7	--/18
	Outdoor heat exchanger: dry/wet (°C)	27/--	27/--
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	--	--
	Test Power Input (kW)	4,97	5,15
Cooling/Heating Capacity	Declared Rated Capacity (kW)	15,48	17,59
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	15,48	17,59
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	1,0
EER	Declared EER	--	--
	Tested EER	--	--
	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	--	--
Does the air-cooled condenser evaporate condensate?		No	

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Clause	Requirement - Test	Result - Remark	Verdict

Table 4.2-3 for EN 14511-3: Cooling capacity			P
Model:	PASRW060B-D-KA		
	-	Cooling condition 5	--
Test Condition	Indoor heat exchanger: inlet/outlet temp. (°C)	--/7	--
	Outdoor heat exchanger: dry/wet (°C)	46/--	--
Test Method	Calorimeter test method	Indoor air enthalpy test method.	
Cooling/Heating Power	Rated Power Input (kW)	--	--
	Test Power Input (kW)	6,43	--
Cooling/Heating Capacity	Declared Rated Capacity (kW)	10,79	--
	Tested Sensible Cooling Capacity (kW)	--	--
	Tested Capacity (kW)	10,79	--
	Tested capacity divided by declared capacity (limit: $\geq 0,88$)	1,0	--
EER	Declared EER	--	--
	Tested EER	--	--
	Tested EER/COP divided by declared EER/COP (limit: $\geq 0,85$)	--	--
Does the air-cooled condenser evaporate condensate?		No	

Table 6.1-1 for EN 14511-3: General information	
a) Test date: (month/year)	2012.01.31—2012.02.17
b) Test institute:	TÜV Rheinland (Guangdong) Co., Ltd.
c) Test location:	Guangdong Phnix Eco-Energy Solution Ltd Lizhiwan, Lingdong, Dagang Town, Panyu, Guangzhou, Guangdong, China
d) Test method:	-
e) Test supervisor:	David Chen
f) Test object designation	--
-Type	See rating label.
-Serial number	Pre-production without serial number.
-Name of manufacturer	Guangdong Phnix Eco-Energy Solution Ltd
-Year of initial installation	2012
g) Type of refrigerant	R410A
h) Mass of refrigerant	2x2,2kg

Table 6 for EN 14511-4: Technical data sheet

Clause	Requirement - Test	Result - Remark	Verdict
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General description	
-Trade mark, model designation	PHNIX, PASRW060B-D-KA
-Power supply (voltage, frequency)	230V~, 50Hz
-Denomination of the unit	Air-to-water
-Intended use of the unit	Air source heat pump.
-Number of separate component units	1
-Type and mass of refrigerant charge	Same as that stated in Table 6.1 for EN 14511-3
-Overall dimensions of Width(mm) / Depth(mm) / Height (mm):	1100 x 440 x 1350
-Weight of each separate component unit (kg):	185kg
Rating characteristics	--
-The cooling capacity(kW)	13,5kW
-The effective power input(kW)	4,7kW
-EER (where applicable)	2,84
-SHR(where applicable)	--
-The heating capacity(kW)	17,0kW
-The effective power input(kW)	4,1kW
-COP (where applicable)	4,15
-The heat recovery capacity and the type of liquid (where applicable)	N/A
Remark: The characteristics apply to a new unit with clean heat exchangers.	
Additional characteristics	
-Non ducted air-to-air units: flow rates or rotational speeds of fans;	Not intended.
-Non ducted air-to-water: flow rates or rotational speeds of fans; water flow rate and pressure difference;	Air-to-water units, hot water flow rate: 2,8m ³ /h
-Unit intended to discharge into double floor: nominal flow rate and external static pressure difference	Not intended.
-Other types of units: nominal flow rates and external static pressure differences for air and water.	Not intended.
Sound characteristics	56dB(A)
Electrical characteristics	
In accordance with EN 60335-2-40	All the electrical characteristics required of EN 60335-2-40 are specified by the manufacturer
-The maximum starting current of the unit	40A

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Clause	Requirement - Test	Result - Remark	Verdict

-The total power input and current at the rate point, excluding the starting period.	Total power input: (4,9+3,0)kW, total current: (21,3+13,5)A
-Reactive power or power factor at the rated point, for units with a total power input greater than 10kW;	N.A.
-The power input of the fan and pump if included in the units.	Included
Operating range	
-The limits of use (temperatures and flows)	-10-43 °C
-Whether there are devices fitted which do not allow the unit to operate when these limits are exceeded;	Yes, several protective devices provided in the product.
-The maximum inlet temperature permitted at the indoor heat exchanger when the unit is not operating (for heating mode requirements)	50°C

Appendix table:

Model	Rated voltage	Dimension (WxDxH) mm	Max. Starting current (A)
PASRW060B-D-KA	230V~ 50Hz	1100 x 440 x 1350	40

Compressor and fan motor information of model PASRW060B-D-KA:

Object/part No.	Manufacturer/ trademark	Type/model	Number of provided
Compressor	GUANGDONG MEIZHI COMPRESSOR LIMITED	PA330X3CS-4MU1	Two
Fan motor	Zhongshan Galanz Motor Manufacture Co.,Ltd	GAL045H61225-K01	Two

---End of report---