Dorota Szmajda-Kuberczyk
tłumacz przysięgły języka angielskiego
Rybie, ul. Kasztanowa 33, 05-090 Raszyn
tel. 501 123 253

POŚWIADCZONE TŁUMACZENIE Z JĘZYKA ANGIELSKIEGO

[Dokument źródłowy, przedstawiony w formie elektronicznej, składa się z 35 numerowanych arkuszy. Na życzenie Klienta przetłumaczono strony jak niżej. Tekst w nawiasach kwadratowych pochodzi od tłumacza.] ------------------------

[nagłówek (na każdym arkuszu oprócz 1)]: logo · **DUŃSKI INSTYTUT TECHNOLOGICZNY** [ang. Danish Technological Institute] · numer strony w formacie [nr strony] z 35 · 300-KLAB-24-026-3 ---------------------------------

[stopka (na każdym arkuszu)]: logo ilac-MRA · logo DANAK · Test Reg. nr. 300 --

[arkusz 1]: --

logo · **DUŃSKI INSTYTUT TECHNOLOGICZNY** [ang. Danish Technological Institute] · Teknologiparken · Kongsvang Allé 29, DK-8000 Aarhus C · +45 72 20 20 00 · Info@teknologisk.dk · www.teknologisk.dk ------

Strona 1 z 35 ---

Inicjały: PRES/RTHI ---

Nr akt: 249417 ---

Załączniki: 1 ---

RAPORT Z BADAŃ ---

Nr raportu: 300-KLAB-24-026-3 --

Klient: --

Firma: GUANGDONG PHNIX ECO-ENERGY SOLUTION LTD. -------------

Adres: No. 3 Tianyuan Road, Dagang Town, Nansha District, Guangzhou ------

Miasto: Guangdong, 511470, Chiny --

Tel. + 86 020-39067523 ---

Element: --

Marka: PHNIX ---

Typ: pompa ciepła powietrze-woda (monoblok) ------------------------------------

Model: PASRW040S-BP-PS-B ---

Nr serii: B082209290005 ---

Rok produkcji: nie dotyczy ---

Marka: --

Marka: Cooper & Hunter --

Typ: pompa ciepła powietrze-woda (monoblok) ----------------------------------

Model: CH-HP12-UIMPRM-P --

Daty: element badany: od kwietnia do czerwca 2024 r. ----------------------------

Procedura: zob. cel z wykazem norm (strona 2). ------------------------------------

Uwagi: jednostka została dostarczona przez klienta. Instalacji oraz ustawień testowych dokonano zgodnie z instrukcjami producenta. ---------------------------

Warunki: niniejsze badanie zostało przeprowadzone w ramach akredytacji zgodnie z wymogami międzynarodowymi (ISO/IEC 17025:2017) oraz zgodnie z Ogólnymi Warunkami Duńskiego Instytutu Technologicznego. Wyniki badania odnoszą się wyłącznie do badanego urządzenia. Niniejszy raport z badań może być przytaczany w formie wyciągu wyłącznie po uzyskaniu pisemnej zgody Duńskiego Instytutu Technologicznego. ---------------------------

Klient nie może wymieniać ani powoływać się na Duński Instytut Technologiczny ani na pracowników Duńskiego Instytutu Technologicznego w celach marketingowych lub reklamowych bez każdorazowej pisemnej zgody Duńskiego Instytutu Technologicznego. --

Dział/Ośrodek: Duński Instytut Technologiczny · Energia i Klimat · Laboratorium Pomp Ciepła, Aarhus --

Data: 06 sierpnia 2024 r. ---

Podpis: ---

Preben Eskerod --

B.TecMan & MarEng ---

Współpraca: ---

Rasmus Thisgaard ---

B.TecMan & MarEng ---

DOKUMENT PODPISANY CYFROWO --

06 sierpnia 2024 r. --

Duński Instytut Technologiczny ---

[arkusz 8]: --

Wyniki badań SCOP w niskiej temperaturze – dla średniej sezonu grzewczego (A) – EN 14825 --

Model (jednostka zewnętrzna)	PASRW040S-BP-PS-B

Pompa ciepła powietrze-woda monoblok	T
Niskotemperaturowa pompa ciepła	N
Wyposażona w dodatkowy ogrzewacz	N
Wielofunkcyjny ogrzewacz z pompą ciepła	N
Obliczenie SCOP wykonane jako odwracalne	T

Znamionowa moc cieplna[1)]	P_{RATED}	**8,73 [kW]**
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	ηs	**178,6 [%]**
	SCOP	**4,54 [-]**

Zmierzona wydajność grzewcza przy częściowym obciążeniu w temperaturze zewnętrznej T_j	**Klimat umiarkowany - Zastosowanie w niskiej temperaturze**	T_j = 15°C	Pdh	- [kW]
		T_j = -7°C		7,94 [kW]
		T_j = 2°C	Pdh	5,20 [kW]
		T_j = 7°C	Pdh	3,64 [kW]
		T_j = 12°C	Pdh	4,21 [kW]
		T_j = temperatura dwuwartościowa	Pdh	7,94 [kW]
		T_j = granica działania	Pdh	8,73 [kW]

Zmierzony współczynnik wydajności w temperaturze zewnętrznej T_j	**Klimat umiarkowany - Zastosowanie w niskiej temperaturze**	T_j = 15°C	COPd	- [-]
		T_j = -7°C	COPd	3,29 [-]
		T_j = 2°C	COPd	4,22 [-]
		T_j = 7°C	COPd	5,74 [-]
		T_j = 12°C	COPd	8,15 [-]
		T_j = temperatura dwuwartościowa	COPd	3,29 [-]
		T_j = granica działania	COPd	2,91 [-]

Temperatura dwuwartościowa	Tbivalent	-7 [°C]
Graniczna temperatura	TOL	-10 [°C]
robocza	WTOL	- [°C]
Współczynnik strat	Cdh	0,95 [-]

Pobór mocy w trybach innych niż aktywny	Tryb wyłączenia	P_{OFF}	0,020 [kW]
	Tryb wyłączonego termostatu	P_{TO}	0,024 [kW]
	Tryb gotowości	P_{SB}	0,020 [kW]
	Tryb włączonej grzałki karteru	P_{CK}	0,020 [kW]
Ogrzewacz dodatkowy[1)]	Znamionowa moc cieplna	P_{SUP}	0,00 [kW]
	Rodzaj energii zasilania		elektryczna

Inne pozycje	Regulacja wydajności		zmienna
	Regulacja przepływu wody		stała
	Natężenie przepływu wody		1700 [l/h]
	Roczne zużycie energii	Q_{HE}	3973 [kWh]

W przypadku ogrzewaczy pomieszczeń z pompą ciepła i wielofunkcyjnych ogrzewaczy z pompą ciepła znamionowa moc cieplna (Prated) jest równa obciążeniu obliczeniowemu dla trybu ogrzewania (Pdesignh), a znamionowa moc grzewcza ogrzewacza dodatkowego (Psup), jest równa dodatkowej wydajności grzewczej (sup(Tj)).

Do obliczenia SCOP użyto wartości P_{CK} - P_{SB}. Zob. „SCOP – dokładne obliczenie".

[arkusz 9]: --

Wyniki badań SCOP w średniej temperaturze – dla średniej sezonu

grzewczego (A) – EN 14825 --

Model (jednostka zewnętrzna)	PASRW040S-BP-PS-B
Pompa ciepła powietrze-woda monoblok	T
Niskotemperaturowa pompa ciepła	N
Wyposażona w dodatkową grzałkę	N
Kombinowana grzałka z pompą ciepła	N
Obliczenie SCOP wykonane jako odwrotne	T

Znamionowa moc cieplna[1]	P_{RATED}	**9,51** [kW]
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	ηs	**129,3** [%]
	SCOP	**3,31** [-]

Zmierzona wydajność grzewcza przy częściowym obciążeniu w temperaturze zewnętrznej T_j	**Klimat umiarkowany - Zastosowanie w średniej temperaturze**	T_j = 15°C	Pdh	- [kW]
		T_j = -7°C		8,61 [kW]
		T_j = 2°C	Pdh	5,55 [kW]
		T_j = 7°C	Pdh	3,63 [kW]
		T_j = 12°C	Pdh	4,11 [kW]
		T_j = temperatura dwuwartościowa	Pdh	8,61 [kW]
		T_j = granica działania	Pdh	8,45 [kW]

Zmierzony współczynnik wydajności w temperaturze zewnętrznej T_j	**Klimat umiarkowany - Zastosowanie w średniej temperaturze**	T_j = 15°C	COPd	- [-]
		T_j = -7°C	COPd	2,24 [-]
		T_j = 2°C	COPd	3,27 [-]
		T_j = 7°C	COPd	3,84 [-]
		T_j = 12°C	COPd	5,87 [-]
		T_j = temperatura dwuwartościowa	COPd	2,24 [-]
		T_j = granica działania	COPd	2,11 [-]

Temperatura dwuwartościowa	Tbivalent	-7 [°C]
Graniczna temperatura robocza	TOL	-10 [°C]
	WTOL	- [°C]
Współczynnik strat	Cdh	0,97 [-]

Pobór mocy w trybach innych niż aktywny	Tryb wyłączenia	P_{OFF}	0,020 [kW]
	Tryb wyłączonego termostatu	P_{TO}	0,024 [kW]
	Tryb gotowości	P_{SB}	0,020 [kW]
	Tryb włączonej grzałki karteru	P_{CK}	0,020 [kW]
Ogrzewacz dodatkowy[1]	Znamionowa moc cieplna	P_{SUP}	1,06 [kW]
	Rodzaj energii zasilania		elektryczna

Inne pozycje	Regulacja wydajności		zmienna
	Regulacja przepływu wody		stała
	Natężenie przepływu wody		1050 (l/h)
	Roczne zużycie energii	Q_{HE}	5942 [kWh]

W przypadku ogrzewaczy pomieszczeń z pompą ciepła i wielofunkcyjnych ogrzewaczy z pompą ciepła znamionowa moc cieplna (Prated) jest równa obciążeniu obliczeniowemu dla trybu ogrzewania (Pdesignh), a znamionowa moc grzewcza ogrzewacza dodatkowego (Psup), jest równa dodatkowej wydajności grzewczej (sup(Tj)).

Do obliczenia SCOP użyto wartości P_{CK} - P_{SB}. Zob. „SCOP – dokładne obliczenie".

[arkusz 10]: --

Wyniki badań dla warunków znamionowych znormalizowanych – EN 14511 --

Nr	Warunki badania	Wydajność grzewcza [kW]	COP
1	A7/W35	10,119	4,637
2	A7/W55	9,647	2,930

Wyniki badań dla rozruchu i działania – EN 14511-4 ---------------------------

Nr	Warunki badania Wlot powietrze/woda [C°]	Walidacja badania
rozruch	A-25/W9	pozytywna
działanie	A-25/W50	pozytywna

Wyniki badań przy zamknięciu przepływu czynnika przekazującego ciepło po stronie skraplacza – EN 14511-4---

Nr	Wymiennik ciepła	Walidacja badania
1	wewnętrzny	pozytywna
2	zewnętrzny	pozytywna

Wyniki badań przy całkowitej awarii zasilania energią elektryczną – EN 14511-4---

Nr	Walidacja badania
1	pozytywna

[arkusz 11]: --

Wyniki pomiaru mocy akustycznej – EN 12102-1 --------------------------------

Nr	Warunki badania	Poziom mocy akustycznej LW(A) [dB re 1pW]	Niepewność σ_{tot} [dB]
1^E	A7/W55	54,3	1,6

E) Oznaczenie ErP ---

Poziom mocy akustycznej odniesionej do A jest oznaczony dla mierzonego zakresu częstotliwości od 100 Hz do 10 kHz. W celu obliczenia niepewności zob. Załącznik 1. --

Pomiary mocy akustycznej wykonuje Kamalathasan Arumugam (KAMA) we współpracy z Patrickiem Gilbertem (PGL), Duński Instytut Technologiczny. ---

[arkusz 35]: --

Załącznik 2 – Upoważnienie---

Upoważnienie --

[ang. Authorization Letter] ---

Niniejsza deklaracja zgodności zostaje wydana na wyłączną odpowiedzialność:

Nazwa producenta: Guangdong PHNIX ECO-Energy Solution LTD -------------
Adres producenta: No. 3 Tianyuan Road, Dagang Town, Nansha District Guangzhou Guangdong, 511470 Chiny ---
Oświadczamy, iż poniższy produkty, pompy ciepła, który wyprodukowaliśmy dla firmy COOPER AND HUNTER OVERSEAS LP, są identyczne jak nasze poniższe modele: ---

Model Cooper&Hunter	CH-HP12-UIMPRM-P
Model PHNIX	PASRW040S-BP-PS-B

Nazwa [firma] Cooper&Hunter: COOPER AND HUNTER OVERSEAS LP ---
Nazwa marki Cooper&Hunter: Cooper&Hunter ---------------------------------------
Adres Cooper&Hunter: SUITE 201, 45B WEST WILMOT STREET, RICHMOND HILL, ON L4B2P3 KANADA ---
Uwaga: Niniejsza deklaracja traci ważność w przypadku wprowadzenia zmian technologicznych lub funkcjonalnych bez zgody producenta. ----------------------
Data: 24 maja 2024 r. ---
Podmiot upoważniony: Guangdong PHNIX ECO-Energy Solution LTD ---------
[-], nieczytelny podpis ---
[Odcisk pieczęci o treści]: W imieniu Guangdong PHNIX ECO-Energy Solution LTD · *[-], nieczytelny podpis* · Podpis osoby upoważnionej -------------

[koniec tłumaczenia]

Ja, Dorota Szmajda-Kuberczyk, tłumacz przysięgły języka angielskiego wpisana na listę tłumaczy przysięgłych Ministra Sprawiedliwości pod numerem TP/2161/05, stwierdzam zgodność powyższego tłumaczenia z dokumentem w języku angielskim (dokument elektroniczny pdf, którego wydruk, opatrzony pieczęcią i podpisem tłumacza, załączono do niniejszego).
Rybie, 08.08.2024 r.
Nr Repertorium: 544/24

TEST REPORT

Report no.:
300-KLAB-24-026-3

DANISH
TECHNOLOGICAL
INSTITUTE

Teknologiparken
Kongsvang Allé 29
DK-8000 Aarhus C
+45 72 20 20 00
Info@teknologisk.dk
www.teknologisk.dk

Init: PRES/RTHI
File no.: 249401
Enclosures: 1

Customer:	Company:	Guangdong PHNIX ECO-Energy Solution LTD
	Address:	No. 3 Tianyuan Road, Dagang Town, Nansha District
	City:	Guangzhou Guangdong, 511470 China
	Tel.:	+86 020-39067523
Component:	Brand:	PHNIX
	Type:	Air to water heat pump (monobloc)
	Model:	PASRW040S-BP-PS-B
	Series no.:	B082209290005
	Prod. year:	N/A
Brand name:	Brand:	Cooper&Hunter
	Type:	Air to water heat pump (mono block)
	Model:	CH-HP12-UIMPRM-P

Dates: Component tested: April-June 2024

Procedure: See objective (page 2) for list of standards.

Remarks: The unit was delivered by the customer. The installation and test settings were done according to the manufacturer's instructions. All tests are done with enabled defrost mode.

Terms: This test was conducted under accreditation in accordance with international requirements (ISO/IEC 17025:2017) and in accordance with the General Terms and Conditions of Danish Technological Institute. The test results solely apply to the tested item. This test report may be quoted in extract only if Danish Technological Institute has granted its written consent.

The customer may not mention or refer to Danish Technological Institute or Danish Technological Institute's employees for advertising or marketing purposes unless Danish Technological Institute has granted its written consent in each case.

Division/Centre: Danish Technological Institute
Energy and Climate
Heat Pump Laboratory, Aarhus

Date: 2024.08.06

Test Engineer:
Preben Eskerod
B.TecMan & MarEng

Co-reader:
Rasmus Thisgaard
B.TecMan & MarEng

DIGITALLY SIGNED DOCUMENT
6 August 2024
DANISH TECHNOLOGICAL INSTITUTE

ilac-MRA DANAK
Test Reg. nr. 300

Test results

Test results of SCOP test at low temperature - heating season average (A) – EN 14825

Model (Outdoor)	PASRW040S-BP-PS-B
Air-to-water heat pump mono bloc	Y
Low-temperature heat pump	N
Equipped with supplementary heater	N
Heat pump combination heater	N
SCOP calculation done as reversible	Y

Rated heat output[1)]	P_{rated}	**8.73** [kW]
Seasonal space heating energy efficiency	η_s	**178.6** [%]
	SCOP	**4.54** [-]

Measured capacity for heating for part load at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	Pdh	- [kW]
		Tj=-7 °C	Pdh	7.94 [kW]
		Tj=2 °C	Pdh	5.20 [kW]
		Tj=7 °C	Pdh	3.64 [kW]
		Tj=12 °C	Pdh	4.21 [kW]
		Tj=bivalent temperature	Pdh	7.94 [kW]
		Tj=operation limit	Pdh	8.73 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	3.29 [-]
		Tj=2 °C	COPd	4.22 [-]
		Tj=7 °C	COPd	5.74 [-]
		Tj=12 °C	COPd	8.15 [-]
		Tj=bivalent temperature	COPd	3.29 [-]
		Tj=operation limit	COPd	2.91 [-]

Bivalent temperature	Tbivalent	-7 [°C]
Operation limit	TOL	-10 [°C]
temperatures	WTOL	- [°C]
Degradation coefficient	Cdh	0.95 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.020 [kW]
	Thermostat-off mode	P_{TO}	0.024 [kW]
	Standby mode	P_{SB}	0.020 [kW]
	Crankcase heater mode[2]	P_{CK}	0.020 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	0.00 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Fixed
	Water flow rate		1700 [l/h]
	Annual energy consumption	Q_{HE}	3973 [kWh]

[1)] For heat pump space heaters and heat pump combination heaters, the rated heat output, Prated, is equal to the design load for heating, Pdesignh, and the rated heat output of a supplementary heater, Psup, is equal to the supplementary capacity for heating, sup(Tj).

[2)] For SCOP calculation the value PCK - PSB is used. See section "SCOP - detailed calculation"

Test results of SCOP test at medium temperature - heating season average (A) – EN 14825

Model (Outdoor)	PASRW040S-BP-PS-B
Air-to-water heat pump mono bloc	Y
Low-temperature heat pump	N
Equipped with supplementary heater	N
Heat pump combination heater	N
SCOP calculation done as reversible	Y

Rated heat output[1)]	P_{rated}	**9.51** [kW]
Seasonal space heating energy efficiency	η_s	**129.3** [%]
	SCOP	**3.31** [-]

Measured capacity for heating for part load at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	Pdh	- [kW]
		Tj=-7 °C	Pdh	8.61 [kW]
		Tj=2 °C	Pdh	5.55 [kW]
		Tj=7 °C	Pdh	3.63 [kW]
		Tj=12 °C	Pdh	4.11 [kW]
		Tj=bivalent temperature	Pdh	8.61 [kW]
		Tj=operation limit	Pdh	8.45 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	2.24 [-]
		Tj=2 °C	COPd	3.27 [-]
		Tj=7 °C	COPd	3.84 [-]
		Tj=12 °C	COPd	5.87 [-]
		Tj=bivalent temperature	COPd	2.24 [-]
		Tj=operation limit	COPd	2.11 [-]

Bivalent temperature	Tbivalent	-7 [°C]
Operation limit temperatures	TOL	-10 [°C]
	WTOL	- [°C]
Degradation coefficient	Cdh	0.97 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.020 [kW]
	Thermostat-off mode	P_{TO}	0.024 [kW]
	Standby mode	P_{SB}	0.020 [kW]
	Crankcase heater mode[2]	P_{CK}	0.020 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	1.06 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Fixed
	Water flow rate		1050 [l/h]
	Annual energy consumption	Q_{HE}	5942 [kWh]

[1)]For heat pump space heaters and heat pump combination heaters, the rated heat output, Prated, is equal to the design load for heating, Pdesignh, and the rated heat output of a supplementary heater, Psup, is equal to the supplementary capacity for heating, sup(Tj).

[2)] For SCOP calculation the value PCK - PSB is used. See section "SCOP - detailed calculation"

Test results of standard rating test – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W35	10.119	4.637
2	A7/W55	9.647	2.930

Test results for starting and operating test - EN 14511-4

N#	Test conditions air/water inlet [°C]	Test validation
Starting	A-25/W9	Passed
Operating	A-25/W50	Passed

Test results for shutting off the heat transfer medium – EN 14511-4

N#	Heat exchanger	Test validation
1	Indoor	Passed
2	Outdoor	Passed

Test results for complete power supply failure – EN 14511-4

N#	Test validation
1	Passed

Test results of sound power measurements – EN 12102-1

N#	Test conditions	Sound power level LW(A) [dB re 1pW]	Uncertainty σ_{tot} [dB]
1[E]	A7/W55	54.3	1.6

E) ErP labelling

The A-weighted total sound power level is determined for the measured frequency range from 100 Hz to 10 kHz. For the calculation of uncertainty, see appendix 1.

The sound power measurements are carried out by Kamalathasan Arumugam (KAMA) and co-read by Patrick Glibert (PGL), Danish Technological Institute.

Appendix 2 Authorization Letter

Authorization Letter

This declaration of conformity is issued under the sole responsibility of

Manufacturer's Name: Guangdong PHNIX ECO-Energy Solution LTD

Manufacturer's Address: No. 3 Tianyuan Road, Dagang Town, Nansha District Guangzhou Guangdong, 511470 China

We declare that the following Heat pump product we produced for COOPER AND HUNTER OVERSEAS LP are identical to our following models

Cooper&Hunter model	CH-HP12-UIMPRM-P
PHNIX model	PASRW040S-BP-PS-B

Cooper&Hunter company name: COOPER AND HUNTER OVERSEAS LP

Cooper&Hunter brand /-mark: Cooper&Hunter

Cooper&Hunter address: SUITE 201, 45B WEST WILMOT STREET, RICHMOND HILL, ON L4B2P3 CANADA

Note: This declaration becomes invalid if technical or operational modifications are introduced without the manufacturer's consent.

For and on behalf of
GUANGDONG PHNIX ECO-ENERGY SOLUTION LTD.
广东芬尼克兹节能设备有限公司

Date: 24 May 2024

刘莲 Lilian Phnix
Authorized Signature(s)

Authorised party: Guangdong PHNIX ECO-Energy Solution LTD

DOROTA SZMAJDA ... TŁUMACZ PRZYSIĘGŁY JĘZYKA ...

ilac-MRA DANAK
Test Reg. nr. 300

TEST REPORT

Report no.:
300-KLAB-24-026-3

DANISH TECHNOLOGICAL INSTITUTE

Teknologiparken
Kongsvang Allé 29
DK-8000 Aarhus C
+45 72 20 20 00
Info@teknologisk.dk
www.teknologisk.dk

Init: PRES/RTHI
File no.: 249401
Enclosures: 1

Customer:	Company:	Guangdong PHNIX ECO-Energy Solution LTD
	Address:	No. 3 Tianyuan Road, Dagang Town, Nansha District
	City:	Guangzhou Guangdong, 511470 China
	Tel.:	+86 020-39067523
Component:	Brand:	PHNIX
	Type:	Air to water heat pump (monobloc)
	Model:	PASRW040S-BP-PS-B
	Series no.:	B082209290005
	Prod. year:	N/A
Brand name:	Brand:	Cooper&Hunter
	Type:	Air to water heat pump (mono block)
	Model:	CH-HP12-UIMPRM-P

Dates: Component tested: April-June 2024

Procedure: See objective (page 2) for list of standards.

Remarks: The unit was delivered by the customer. The installation and test settings were done according to the manufacturer's instructions. All tests are done with enabled defrost mode.

Terms:

Division/Centre: Danish Technological Institute
Energy and Climate
Heat Pump Laboratory, Aarhus

Date: 2024.08.06

Test Engineer:
Preben Eskerod
B.TecMan & MarEng

Co-reader:
Rasmus Thisgaard
B.TecMan & MarEng

Objective

The objective of this report is to document the following:

The Seasonal Coefficient of Performance (SCOP) at low and medium temperature application for average climate according to EN 14825:2022.

In order to calculate the SCOP, tests were carried out at the part load conditions stated in the tables on page 4 and 5.

COP test standard rating conditions A7/W35 and A7/W55 according to EN 14511:2022.

Operating requirements according to EN 14511-4:2022
- 4.2.1 Starting and operating tests
- 4.5 Shutting of the heat transfer medium flows
- 4.6 Complete power supply failure

Sound power measurements according to EN 12102-1:2022.

Contents:

Test conditions

SCOP test conditions for low temperature – EN 14825

Part load conditions for reference SCOP and reference SCOPon calculation of air to water units for low temperature application for the reference heating season;
"A" = average, "W" = warmer, and "C" = colder.

Condition	Part Load Ratio in %				Outdoor heat exchanger		Indoor heat exchanger			
					Inlet dry (wet) bulb temperature °C		Fixed outlet °C	Variable outlet[d] °C		
	Formula	A	W	C	Outdoor air	Exhaust air	All climates	A	W	C
A	(−7 - 16) / ($T_{designh}$ −16)	88	n/a	61	−7(−8)	20(12)	[a] / 35	[a] / 34	n/a	[a] / 30
B	(+2 - 16) / ($T_{designh}$ −16)	54	100	37	2(1)	20(12)	[a] / 35	[a] / 30	[a] / 35	[a] / 27
C	(+7 - 16) / ($T_{designh}$ −16)	35	64	24	7(6)	20(12)	[a] / 35	[a] / 27	[a] / 31	[a] / 25
D	(+12 - 16) / ($T_{designh}$ −16)	15	29	11	12(11)	20(12)	[a] / 35	[a] / 24	[a] / 26	[a] / 24
E	(TOL - 16) / ($T_{designh}$ - 16)				TOL	20(12)	[a] / 35	[a] / [b]	[a] / [b]	[a] / [b]
F	($T_{bivalent}$ - 16) / ($T_{designh}$ - 16)				$T_{bivalent}$	20(12)	[a] / 35	[a] / [c]	[a] / [c]	[a] / [c]
G	(−15 - 16) / ($T_{designh}$ −16)	n/a	n/a	82	−15	20(12)	[a] / 35	n/a	n/a	[a] / 32

[a] With the water flow rate as determined at the standard rating conditions given in EN 14511–2 at 30/35 conditions for units with a fixed water flow rate, and with a fixed delta T of 5 K for units with a variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum flow rate is used with the outlet temperature.

[b] Variable outlet shall be calculated by interpolation from $T_{designh}$ and the temperature which is closest to the TOL.

[c] Variable outlet shall be calculated by interpolation between the upper and lower temperatures which are closest to the bivalent temperature.

[d] If the variable outlet temperature is below the minimum of the operation range of the unit, this minimum should be considered.

Additional information

Climate	$T_{designh}$ [°C]	$T_{bivalent}$ [°C]	TOL [°C]	Outlet temperature	Flow rate
Average	-10	-7	-10	Variable	Fixed

SCOP test conditions for medium temperature – EN 14825

Part load conditions for reference SCOP and reference SCOPon calculation of air to water units for medium temperature application for the reference heating season;
"A" = average, "W" = warmer, and "C" = colder.

Condition	Part Load Ratio in %				Outdoor heat exchanger: Inlet dry (wet) bulb temperature °C		Indoor heat exchanger: Fixed outlet °C	Indoor heat exchanger: Variable outlet[d] °C		
	Formula	A	W	C	Outdoor air	Exhaust air	All climates	A	W	C
A	(−7 - 16) / ($T_{designh}$ −16)	88	n/a	61	−7(−8)	20(12)	[a] / 55	[a] / 52	n/a	[a] / 44
B	(+2 - 16) / ($T_{designh}$ −16)	54	100	37	2(1)	20(12)	[a] / 55	[a] / 42	[a] / 55	[a] / 37
C	(+7 - 16) / ($T_{designh}$ −16)	35	64	24	7(6)	20(12)	[a] / 55	[a] / 36	[a] / 46	[a] / 32
D	(+12 - 16) / ($T_{designh}$ −16)	15	29	11	12(11)	20(12)	[a] / 55	[a] / 30	[a] / 34	[a] / 28
E	(TOL - 16) / ($T_{designh}$ −16)				TOL	20(12)	[a] / 55	[a] / [b]	[a] / [b]	[a] / [b]
F	($T_{bivalent}$ - 16) / ($T_{designh}$ - 16)				$T_{bivalent}$	20(12)	[a] / 55	[a] / [c]	[a] / [c]	[a] / [c]
G	(−15 - 16) / ($T_{designh}$ −16)	n/a	n/a	82	−15	20(12)	[a] / 55	n/a	n/a	[a] / 49

[a] With the water flow rate as determined at the standard rating conditions given in EN 14511-2 at 47/55 conditions for units with a fixed water flow rate, and with a fixed delta T of 8 K for units with a variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum flow rate is used with the outlet temperature.

[b] Variable outlet shall be calculated by interpolation $T_{designh}$ and the temperature which is closest to the TOL.

[c] Variable outlet shall be calculated by interpolation between the upper and lower temperatures which are closest to the bivalent temperature.

[d] If the variable outlet temperature is below the minimum of the operation range of the unit, this minimum should be considered.

Additional information

Climate	$T_{designh}$ [°C]	$T_{bivalent}$ [°C]	TOL [°C]	Outlet temperature	Flow rate
Average	-10	-7	-10	Variable	Fixed

Test conditions for standard rating condition - EN14511

N#	Heat source		Heat sink	
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)
1	7	6	30	35
2	7	6	47	55

Test conditions for operating requirements – EN 14511-4

N#	Heat source		Heat sink	Water flow rate at indoor heat exchanger	Test
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)		
1	-25	-	9	850 L/h	Starting
2	-25	-	50	850 L/h	Operating

Test conditions for shutting off the heat transfer medium – EN 14511-4

N#	Heat source		Heat sink		Heat exchanger
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)	
1	7	6	30	35	Indoor
2	7	6	30	35	Outdoor

Test conditions for complete power supply failure – EN 14511-4

N#	Heat source		Heat sink	
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)
1	7	6	30	35

Test conditions for sound power measurements – EN 12102-1

N#	Test condition		Heat pump setting			
	Outdoor heat exchanger (dry bulb/ wet bulb) (°C)	Indoor heat exchanger (inlet/ outlet) (°C)	Compressor speed (Hz)	Fan speed Motor speed 1 (rpm)	Heating capacity (kW)	Power input (kW)
1[E]	7/6	47/55	33	325	3.73	1.62

E) ErP labelling

Test results

Test results of SCOP test at low temperature - heating season average (A) – EN 14825

Model (Outdoor)	PASRW040S-BP-PS-B
Air-to-water heat pump mono bloc	Y
Low-temperature heat pump	N
Equipped with supplementary heater	N
Heat pump combination heater	N
SCOP calculation done as reversible	Y

Rated heat output[1)]	P_{rated}	**8.73** [kW]
Seasonal space heating energy efficiency	η_s	**178.6** [%]
	SCOP	**4.54** [-]

Measured capacity for heating for part load at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	Pdh	- [kW]
		Tj=-7 °C	Pdh	7.94 [kW]
		Tj=2 °C	Pdh	5.20 [kW]
		Tj=7 °C	Pdh	3.64 [kW]
		Tj=12 °C	Pdh	4.21 [kW]
		Tj=bivalent temperature	Pdh	7.94 [kW]
		Tj=operation limit	Pdh	8.73 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	3.29 [-]
		Tj=2 °C	COPd	4.22 [-]
		Tj=7 °C	COPd	5.74 [-]
		Tj=12 °C	COPd	8.15 [-]
		Tj=bivalent temperature	COPd	3.29 [-]
		Tj=operation limit	COPd	2.91 [-]

Bivalent temperature	Tbivalent	-7 [°C]
Operation limit	TOL	-10 [°C]
temperatures	WTOL	- [°C]
Degradation coefficient	Cdh	0.95 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.020 [kW]
	Thermostat-off mode	P_{TO}	0.024 [kW]
	Standby mode	P_{SB}	0.020 [kW]
	Crankcase heater mode²	P_{CK}	0.020 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	0.00 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Fixed
	Water flow rate		1700 [l/h]
	Annual energy consumption	Q_{HE}	3973 [kWh]

[1)]For heat pump space heaters and heat pump combination heaters, the rated heat output, Prated, is equal to the design load for heating, Pdesignh, and the rated heat output of a supplementary heater, Psup, is equal to the supplementary capacity for heating, sup(Tj).

[2)] For SCOP calculation the value PCK - PSB is used. See section "SCOP - detailed calculation"

Test results of SCOP test at medium temperature - heating season average (A) – EN 14825

Model (Outdoor)	PASRW040S-BP-PS-B
Air-to-water heat pump mono bloc	Y
Low-temperature heat pump	N
Equipped with supplementary heater	N
Heat pump combination heater	N
SCOP calculation done as reversible	Y

Rated heat output[1)]	P_{rated}	**9.51**	[kW]
Seasonal space heating energy efficiency	η_s	**129.3**	[%]
	SCOP	**3.31**	[-]

Measured capacity for heating for part load at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	Pdh	-	[kW]
		Tj=-7 °C	Pdh	8.61	[kW]
		Tj=2 °C	Pdh	5.55	[kW]
		Tj=7 °C	Pdh	3.63	[kW]
		Tj=12 °C	Pdh	4.11	[kW]
		Tj=bivalent temperature	Pdh	8.61	[kW]
		Tj=operation limit	Pdh	8.45	[kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	COPd	-	[-]
		Tj=-7 °C	COPd	2.24	[-]
		Tj=2 °C	COPd	3.27	[-]
		Tj=7 °C	COPd	3.84	[-]
		Tj=12 °C	COPd	5.87	[-]
		Tj=bivalent temperature	COPd	2.24	[-]
		Tj=operation limit	COPd	2.11	[-]

Bivalent temperature	Tbivalent	-7	[°C]
Operation limit	TOL	-10	[°C]
temperatures	WTOL	-	[°C]
Degradation coefficient	Cdh	0.97	[-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.020	[kW]
	Thermostat-off mode	P_{TO}	0.024	[kW]
	Standby mode	P_{SB}	0.020	[kW]
	Crankcase heater mode[2]	P_{CK}	0.020	[kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	1.06	[kW]
	Type of energy input		Electrical	

Other items	Capacity control		Variable
	Water flow control		Fixed
	Water flow rate		1050 [l/h]
	Annual energy consumption	Q_{HE}	5942 [kWh]

[1)]For heat pump space heaters and heat pump combination heaters, the rated heat output, Prated, is equal to the design load for heating, Pdesignh, and the rated heat output of a supplementary heater, Psup, is equal to the supplementary capacity for heating, sup(Tj).

[2)] For SCOP calculation the value PCK - PSB is used. See section "SCOP - detailed calculation"

Test results of standard rating test – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W35	10.119	4.637
2	A7/W55	9.647	2.930

Test results for starting and operating test - EN 14511-4

N#	Test conditions air/water inlet [°C]	Test validation
Starting	A-25/W9	Passed
Operating	A-25/W50	Passed

Test results for shutting off the heat transfer medium – EN 14511-4

N#	Heat exchanger	Test validation
1	Indoor	Passed
2	Outdoor	Passed

Test results for complete power supply failure – EN 14511-4

N#	Test validation
1	Passed

Test results of sound power measurements – EN 12102-1

N#	Test conditions	Sound power level LW(A) [dB re 1pW]	Uncertainty σ_{tot} [dB]
1[E]	A7/W55	54.3	1.6

E) ErP labelling

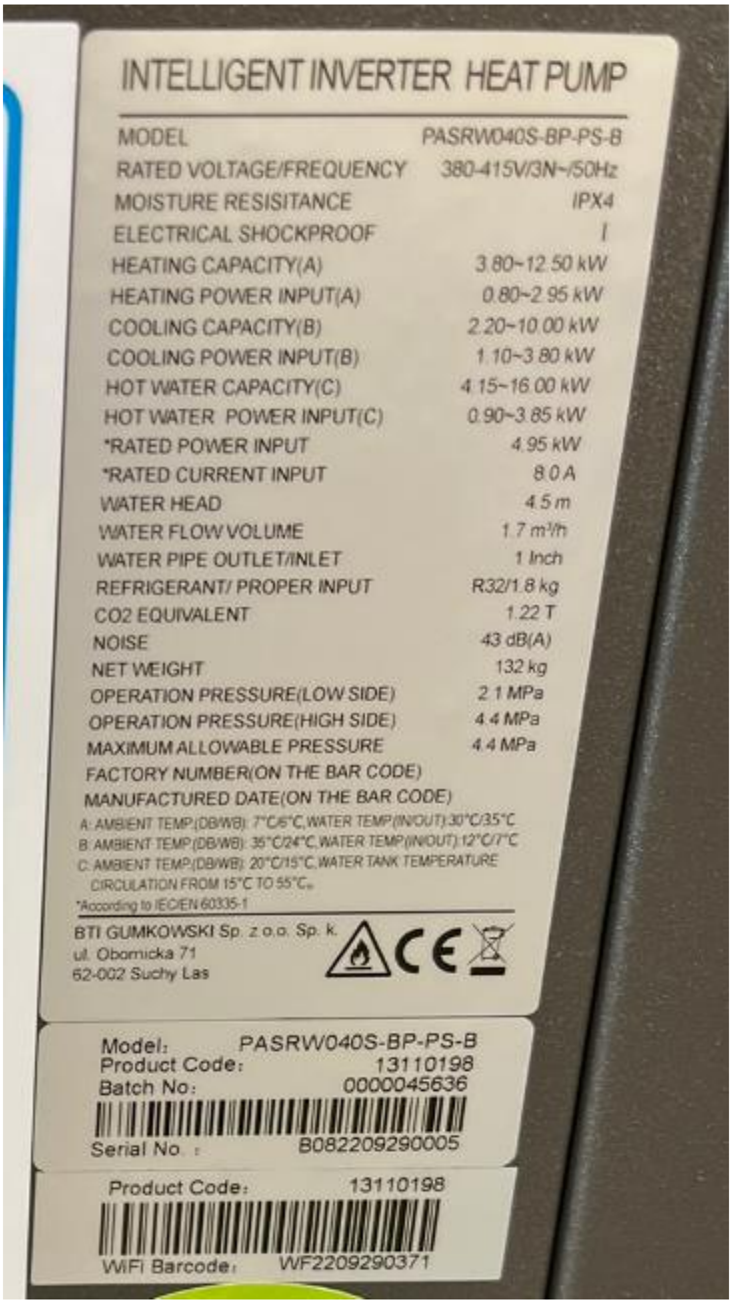
The A-weighted total sound power level is determined for the measured frequency range from 100 Hz to 10 kHz. For the calculation of uncertainty, see appendix 1.

The sound power measurements are carried out by Kamalathasan Arumugam (KAMA) and co-read by Patrick Glibert (PGL), Danish Technological Institute.

Photo

Unit

Rating plate



SCOP - detailed calculation

Detailed SCOP calculation of low temperature and average climate conditions – EN 14825

Calculation of reference SCOP

$$SCOP = \frac{P_{designh} \times H_{he}}{\frac{P_{designh} \times H_{he}}{SCOP_{on}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

P_{design} =	Heating load of the building at design temperature, kW
H_{he} =	Number of equivalent heating hours, 2066 h
H_{TO}, H_{SB}, H_{CK}, H_{OFF} =	Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively
P_{TO}, P_{SB}, P_{CK}, P_{OFF} =	Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SCOP

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared COP [-]	cdh [-]	CR [-]	COPbin [-]
A	-7	88	7.72	7.94	3.29	0.99	1.00	3.29
B	2	54	4.70	5.20	4.22	0.98	1.00	4.22
C	7	35	3.02	3.64	5.74	0.96	0.83	5.70
D	12	15	1.34	4.21	8.15	0.95	0.32	7.42
E	-10	100	8.73	8.73	2.91	0.99	1.00	2.91
F - BIV	-7	88	7.72	7.94	3.29	0.99	1.00	3.29

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.01952	0.01952	0
Thermostat off	178	0.02394	0.02394	4.26132
Standby	0	0.01952	0.01952	0
Crankcase heater	178	0.01963	0.00011	0.01958

Calculation Bin for $SCOP_{on}$

	Bin [-]	Outdoor temperature [°C]	Hours [h]	Heat load [kW]	Heat load covered by heat pump [kW]	Electrical back up heater [kW]	backup heater energy input [kWh]	COP_{bin} [-]	Annual heating demand [kWh]	Annual energy input [kWh]	Net annual heating capacity [kWh]	Net annual power input [kWh]
E	21	-10	1	8.73	8.73	0.00	0.00	2.91	8.73	3.00	8.73	3.00
	22	-9	25	8.39	8.39	0.00	0.00	3.03	209.86	69.17	209.86	69.17
	23	-8	23	8.06	8.06	0.00	0.00	3.16	185.34	58.63	185.34	58.63
A / F - BIV	24	-7	24	7.72	7.72	0.00	0.00	3.29	185.34	56.35	185.34	56.35
	25	-6	27	7.39	7.39	0.00	0.00	3.39	199.45	58.80	199.45	58.80
	26	-5	68	7.05	7.05	0.00	0.00	3.49	479.48	137.19	479.48	137.19
	27	-4	91	6.72	6.72	0.00	0.00	3.60	611.10	169.85	611.10	169.85
	28	-3	89	6.38	6.38	0.00	0.00	3.70	567.79	153.42	567.79	153.42
	29	-2	165	6.04	6.04	0.00	0.00	3.80	997.23	262.16	997.23	262.16
	30	-1	173	5.71	5.71	0.00	0.00	3.91	987.50	252.76	987.50	252.76
	31	0	240	5.37	5.37	0.00	0.00	4.01	1289.35	321.55	1289.35	321.55
	32	1	280	5.04	5.04	0.00	0.00	4.11	1410.23	342.89	1410.23	342.89
B	33	2	320	4.70	4.70	0.00	0.00	4.22	1504.25	356.82	1504.25	356.82
	34	3	357	4.37	4.37	0.00	0.00	4.51	1558.31	345.32	1558.31	345.32
	35	4	356	4.03	4.03	0.00	0.00	4.81	1434.41	298.25	1434.41	298.25
	36	5	303	3.69	3.69	0.00	0.00	5.11	1119.12	219.17	1119.12	219.17
	37	6	330	3.36	3.36	0.00	0.00	5.40	1108.04	205.08	1108.04	205.08
C	38	7	326	3.02	3.02	0.00	0.00	5.70	985.15	172.84	985.15	172.84
	39	8	348	2.69	2.69	0.00	0.00	6.04	934.78	154.67	934.78	154.67
	40	9	335	2.35	2.35	0.00	0.00	6.39	787.38	123.26	787.38	123.26
	41	10	315	2.01	2.01	0.00	0.00	6.73	634.60	94.27	634.60	94.27
	42	11	215	1.68	1.68	0.00	0.00	7.08	360.95	51.01	360.95	51.01
D	43	12	169	1.34	1.34	0.00	0.00	7.42	226.98	30.59	226.98	30.59
	44	13	151	1.01	1.01	0.00	0.00	7.76	152.10	19.59	152.10	19.59
	45	14	105	0.67	0.67	0.00	0.00	8.11	70.51	8.70	70.51	8.70
	46	15	74	0.34	0.34	0.00	0.00	8.45	24.85	2.94	24.85	2.94

SUM	18032.82	3968.29	18032.82	3968.29
$SCOP_{on}$		4.54	**$SCOP_{net}$**	4.54

Detailed SCOP calculation of medium temperature and average climate conditions – EN 14825

Calculation of reference SCOP

$$SCOP = \frac{P_{designh} \times H_{he}}{\frac{P_{designh} \times H_{he}}{SCOP_{on}} + H_{TO} \times P_{TO} + H_{SB} \times P_{SB} + H_{CK} \times P_{CK} + H_{OFF} \times P_{OFF}}$$

Where

P_{design} =	Heating load of the building at design temperature, kW
H_{he} =	Number of equivalent heating hours, 2066 h
H_{TO}, H_{SB}, H_{CK}, H_{OFF} =	Number of hours for which the unit is considered to work in thermostat off mode, standby mode, crankcase heater mode and off mode, h, respectively
P_{TO}, P_{SB}, P_{CK}, P_{OFF} =	Electricity consumption during thermostat off mode, standby mode, crankcase heater mode and off mode, kW, respectively

Data for SCOP

	Outdoor temperature [°C]	Part load ratio [%]	Part load [kW]	Declared capacity [kW]	Declared COP [-]	cdh [-]	CR [-]	COPbin [-]
A	-7	88	8.41	8.61	2.24	0.99	1.00	2.24
B	2	54	5.12	5.55	3.27	0.99	1.00	3.27
C	7	35	3.29	3.63	3.84	0.97	1.00	3.84
D	12	15	1.46	4.11	5.87	0.97	0.36	5.53
E	-10	100	9.51	8.45	2.11	0.99	1.00	2.11
F - BIV	-7	88	8.41	8.61	2.24	0.99	1.00	2.24

Energy consumption for thermostat off, standby, off mode, crankcase heater mode

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.01952	0.01952	0
Thermostat off	178	0.02394	0.02394	4.26132
Standby	0	0.01952	0.01952	0
Crankcase heater	178	0.01963	0.00011	0.01958

Calculation Bin for $SCOP_{on}$

	Bin [-]	Outdoor temperature [°C]	Hours [h]	Heat load [kW]	Heat load covered by heat pump [kW]	Electrical back up heater [kW]	backup heater energy input [kWh]	COP_{bin} [-]	Annual heating demand [kWh]	Annual energy input [kWh]	Net annual heating capacity [kWh]	Net annual power input [kWh]
E	21	-10	1	9.51	8.45	1.06	1.06	2.11	9.51	5.06	8.45	4.00
	22	-9	25	9.14	8.44	0.71	17.64	2.16	228.61	115.52	210.97	97.88
	23	-8	23	8.78	8.43	0.35	8.11	2.20	201.90	96.35	193.79	88.23
A / F - BIV	24	-7	24	8.41	8.41	0.00	0.00	2.24	201.90	90.25	201.90	90.25
	25	-6	27	8.05	8.05	0.00	0.00	2.35	217.27	92.39	217.27	92.39
	26	-5	68	7.68	7.68	0.00	0.00	2.47	522.32	211.81	522.32	211.81
	27	-4	91	7.32	7.32	0.00	0.00	2.58	665.70	257.98	665.70	257.98
	28	-3	89	6.95	6.95	0.00	0.00	2.69	618.52	229.52	618.52	229.52
	29	-2	165	6.58	6.58	0.00	0.00	2.81	1086.33	386.71	1086.33	386.71
	30	-1	173	6.22	6.22	0.00	0.00	2.92	1075.73	367.95	1075.73	367.95
	31	0	240	5.85	5.85	0.00	0.00	3.04	1404.55	462.33	1404.55	462.33
	32	1	280	5.49	5.49	0.00	0.00	3.15	1536.23	487.33	1536.23	487.33
B	33	2	320	5.12	5.12	0.00	0.00	3.27	1638.65	501.61	1638.65	501.61
	34	3	357	4.76	4.76	0.00	0.00	3.38	1697.54	502.03	1697.54	502.03
	35	4	356	4.39	4.39	0.00	0.00	3.50	1562.57	446.97	1562.57	446.97
	36	5	303	4.02	4.02	0.00	0.00	3.61	1219.11	337.66	1219.11	337.66
	37	6	330	3.66	3.66	0.00	0.00	3.73	1207.04	324.03	1207.04	324.03
C	38	7	326	3.29	3.29	0.00	0.00	3.84	1073.17	279.50	1073.17	279.50
	39	8	348	2.93	2.93	0.00	0.00	4.18	1018.30	243.80	1018.30	243.80
	40	9	335	2.56	2.56	0.00	0.00	4.51	857.73	190.01	857.73	190.01
	41	10	315	2.19	2.19	0.00	0.00	4.85	691.30	142.50	691.30	142.50
	42	11	215	1.83	1.83	0.00	0.00	5.19	393.20	75.78	393.20	75.78
D	43	12	169	1.46	1.46	0.00	0.00	5.53	247.26	44.75	247.26	44.75
	44	13	151	1.10	1.10	0.00	0.00	5.86	165.69	28.26	165.69	28.26
	45	14	105	0.73	0.73	0.00	0.00	6.20	76.81	12.39	76.81	12.39
	46	15	74	0.37	0.37	0.00	0.00	6.54	27.07	4.14	27.07	4.14

SUM	19644.00	5936.63	19617.19	5909.82
$SCOP_{on}$		3.31	**$SCOP_{net}$**	3.32

Detailed test results

Detailed SCOP test results - low temperature application and average climate – EN 14825

Detailed result for 'EN14825:2022' Average Low (A and F) A -7 /W34		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		A and F
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	9.94
Heating demand:	kW	8.80
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**7.937**
COP	-	**3.289**
Power consumption	kW	**2.413**
Measured		
Heating capacity	kW	7.998
COP	-	3.192
Power consumption	kW	2.505
During heating		
Air_inlet temperature dry bulb	°C	-7.01
Air temperature wet bulb	°C	-8.07
Water_inlet temperature	°C	29.99
water_outlet temperature	°C	34.08
Water_outlet temperature (Time averaged)	°C	**34.08**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	65829
Calculated Hydraulic power	W	31
Calculated global efficiency	η	0.34
Calculated Capacity correction	W	60
Calculated Power correction	W	91
Water Flow	m^3/s	0.000471

Detailed result for 'EN14825:2022' Average Low (B) A 2 /W30		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		B
Condition temperature:	°C	2
Part load:	%	54%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.73
Heating demand:	kW	4.70
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**5.205**
COP	-	**4.216**
Power consumption	kW	**1.235**
Measured		
Heating capacity	kW	5.267
COP	-	3.961
Power consumption	kW	1.330
During heating		
Air_inlet temperature dry bulb	°C	2.02
Air temperature wet bulb	°C	1.00
Water_inlet temperature	°C	27.58
water_outlet temperature	°C	30.27
Water_outlet temperature (Time averaged)	°C	**30.27**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	69180
Calculated Hydraulic power	W	33
Calculated global efficiency	η	0.34
Calculated Capacity correction	W	62
Calculated Power correction	W	95
Water Flow	m^3/s	0.000471

Detailed result for 'EN14825:2022' Average Low (C) A 7 /W27		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		C
Condition temperature:	°C	7
Part load:	%	35%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.73
Heating demand:	kW	3.02
CR:	-	0.8
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**3.636**
COP	-	**5.744**
Power consumption	kW	**0.633**
Measured		
Heating capacity	kW	3.700
COP	-	5.066
Power consumption	kW	0.730
During heating		
Air_inlet temperature dry bulb	°C	6.98
Air temperature wet bulb	°C	6.01
Water_inlet temperature	°C	25.49
water_outlet temperature	°C	27.37
Water_outlet temperature (Time averaged)	°C	**27.06**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	71399
Calculated Hydraulic power	W	34
Calculated global efficiency	η	0.35
Calculated Capacity correction	W	64
Calculated Power correction	W	97
Water Flow	m^3/s	0.000471

Detailed result for 'EN14825:2022' Average Low (D) A 12 /W24		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		D
Condition temperature:	°C	12
Part load:	%	15%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.73
Heating demand:	kW	1.34
CR:	-	0.3
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**4.212**
COP	-	**8.154**
Power consumption	kW	**0.517**
Measured		
Heating capacity	kW	4.273
COP	-	7.021
Power consumption	kW	0.609
During heating		
Air_inlet temperature dry bulb	°C	12.01
Air temperature wet bulb	°C	11.01
Water_inlet temperature	°C	23.25
water_outlet temperature	°C	25.42
Water_outlet temperature (Time averaged)	°C	**23.94**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	66504
Calculated Hydraulic power	W	31
Calculated global efficiency	η	0.34
Calculated Capacity correction	W	61
Calculated Power correction	W	92
Water Flow	m^3/s	0.000471

Detailed result for 'EN14825:2022' Average Low (E) A -10 /W35		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		E
Condition temperature:	°C	-10
Part load:	%	100%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.73
Heating demand:	kW	8.73
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**8.732**
COP	-	**2.906**
Power consumption	kW	**3.005**
Measured		
Heating capacity	kW	8.793
COP	-	2.839
Power consumption	kW	3.097
During heating		
Air_inlet temperature dry bulb	°C	-10.00
Air temperature wet bulb	°C	-11.01
Water_inlet temperature	°C	30.73
water_outlet temperature	°C	35.22
Water_outlet temperature (Time averaged)	°C	**35.22**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	66101
Calculated Hydraulic power	W	31
Calculated global efficiency	η	0.34
Calculated Capacity correction	W	61
Calculated Power correction	W	92
Water Flow	m^3/s	0.000471

Detailed SCOP test results - medium temperature application and average climate – EN 14825

Detailed result for 'EN14825:2022' Average Medium (A and F) A -7 /W52		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Medium
Condition name:		A and F
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	9.51
Heating demand:	kW	8.41
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**8.609**
COP	-	**2.237**
Power consumption	kW	**3.848**
Measured		
Heating capacity	kW	8.660
COP	-	2.207
Power consumption	kW	3.923
During heating		
Air_inlet temperature dry bulb	°C	-7.01
Air temperature wet bulb	°C	-8.01
Water_inlet temperature	°C	45.00
water_outlet temperature	°C	52.21
Water_outlet temperature (Time averaged)	°C	**52.21**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	80829
Calculated Hydraulic power	W	24
Calculated global efficiency	η	0.31
Calculated Capacity correction	W	51
Calculated Power correction	W	75
Water Flow	m^3/s	0.000291

Detailed result for 'EN14825:2022' Average Medium (B) A 2 /W42		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Medium
Condition name:		B
Condition temperature:	°C	2
Part load:	%	54%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	9.51
Heating demand:	kW	5.12
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**5.547**
COP	-	**3.267**
Power consumption	kW	**1.698**
Measured		
Heating capacity	kW	5.596
COP	-	3.162
Power consumption	kW	1.770
During heating		
Air_inlet temperature dry bulb	°C	2.01
Air temperature wet bulb	°C	1.00
Water_inlet temperature	°C	37.47
water_outlet temperature	°C	42.12
Water_outlet temperature (Time averaged)	°C	**42.12**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	76142
Calculated Hydraulic power	W	22
Calculated global efficiency	η	0.31
Calculated Capacity correction	W	49
Calculated Power correction	W	72
Water Flow	m^3/s	0.000291

Detailed result for 'EN14825:2022' Average Medium (C) A 7 /W36		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Medium
Condition name:		C
Condition temperature:	°C	7
Part load:	%	35%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	9.51
Heating demand:	kW	3.29
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**3.631**
COP	-	**3.840**
Power consumption	kW	**0.946**
Measured		
Heating capacity	kW	3.682
COP	-	3.611
Power consumption	kW	1.020
During heating		
Air_inlet temperature dry bulb	°C	7.01
Air temperature wet bulb	°C	6.02
Water_inlet temperature	°C	33.22
water_outlet temperature	°C	36.26
Water_outlet temperature (Time averaged)	°C	**36.26**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	79737
Calculated Hydraulic power	W	23
Calculated global efficiency	η	0.31
Calculated Capacity correction	W	51
Calculated Power correction	W	74
Water Flow	m^3/s	0.000291

Detailed result for 'EN14825:2022' Average Medium (D) A 12 /W30		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Medium
Condition name:		D
Condition temperature:	°C	12
Part load:	%	15%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	9.51
Heating demand:	kW	1.46
CR:	-	0.4
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**4.107**
COP	-	**5.867**
Power consumption	kW	**0.700**
Measured		
Heating capacity	kW	4.159
COP	-	5.357
Power consumption	kW	0.776
During heating		
Air_inlet temperature dry bulb	°C	11.99
Air temperature wet bulb	°C	11.00
Water_inlet temperature	°C	28.78
water_outlet temperature	°C	32.22
Water_outlet temperature (Time averaged)	°C	**30.01**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	82846
Calculated Hydraulic power	W	24
Calculated global efficiency	η	0.32
Calculated Capacity correction	W	52
Calculated Power correction	W	76
Water Flow	m^3/s	0.000291

Detailed result for 'EN14825:2022' Average Medium (E) A -10 /W55		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Medium
Condition name:		E
Condition temperature:	°C	-10
Part load:	%	100%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	9.51
Heating demand:	kW	9.51
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**8.452**
COP	-	**2.115**
Power consumption	kW	**3.997**
Measured		
Heating capacity	kW	8.503
COP	-	2.088
Power consumption	kW	4.072
During heating		
Air_inlet temperature dry bulb	°C	-10.01
Air temperature wet bulb	°C	-11.01
Water_inlet temperature	°C	47.99
water_outlet temperature	°C	55.08
Water_outlet temperature (Time averaged)	°C	**55.08**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	80491
Calculated Hydraulic power	W	23
Calculated global efficiency	η	0.31
Calculated Capacity correction	W	51
Calculated Power correction	W	74
Water Flow	m^3/s	0.000291

Test results of standard rating condition - EN14511

Detailed result for 'EN14511:2022' A7/W35		
Tested according to:		EN14511:2022
Minimum flow reached:		No
Measurement type:		Steady State
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	**10.119**
COP	-	**4.637**
Power consumption	kW	**2.182**
Measured		
Heating capacity	kW	10.179
COP	-	4.477
Power consumption	kW	2.273
During heating		
Air temperature dry bulb	°C	7.01
Air temperature wet bulb	°C	5.99
Inlet temperature	°C	30.02
Outlet temperature	°C	35.08
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	63674
Calculated Hydraulic power	W	31
Calculated global efficiency	η	0.34
Calculated Capacity correction	W	60
Calculated Power correction	W	91
Water Flow	m^3/s	0.000485

Detailed result for 'EN14511:2022' A7/W55		
Tested according to:		EN14511:2022
Minimum flow reached:		No
Measurement type:		Steady State
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	**9.647**
COP	-	**2.930**
Power consumption	kW	**3.292**
Measured		
Heating capacity	kW	9.699
COP	-	2.880
Power consumption	kW	3.367
During heating		
Air temperature dry bulb	°C	7.00
Air temperature wet bulb	°C	6.02
Inlet temperature	°C	47.00
Outlet temperature	°C	55.09
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	81062
Calculated Hydraulic power	W	24
Calculated global efficiency	η	0.32
Calculated Capacity correction	W	51
Calculated Power correction	W	75
Water Flow	m^3/s	0.000291

Detailed test results of sound power measurement – Test N#1

Sound power levels according to ISO 3743-1:2010

TEKNOLOGISK INSTITUT

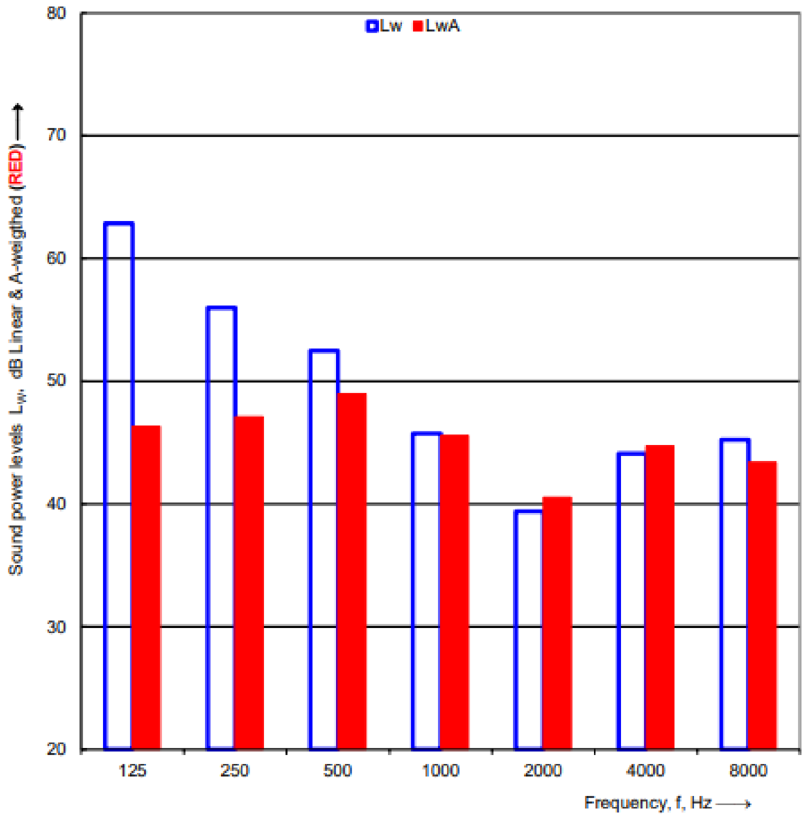
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms

Client:	GUANGDONG PHNIX ECO-ENERGY SOLUTION LTD.	Date of test:	14-06-2024
Object:	Type: Mono air to water heat pump, Model: PASRW040S-BP-PS-B		
Mounting conditions:	The outdoor unit is mounted on the supporting metal support frame using four pieces of spring mounts vibration isolators and placed on four pieces of concrete tiles (50x50x5 cm). All of these are placed in a water drop dray on two pieces of heavy concrete tiles (90x90x10cm) laying on a vibration damping mat on the floor. The noise radiated by the outdoor unit has been measured in Test room 2.		
Operating conditions:	A7/W55, Compressor speed: 33[Hz], Speed-fan motor 1: 325[rpm], Heating capacity: 3.73 [kW], Power_input: 1.62 [kW], Water flow rate: 1050 [l/h] and dP_water: 800 [mbar]		

Static pressure:	1010 hPa			Reference box:	
Air temperature:	7,0 °C			L1:	1,3 m
Relative air humidity:	84,0 %			L2:	0,5 m
Test room volume:	102,8 m³	Room:	Room 2	L3:	0,9 m
Area, S, of test room:	138,9 m²			Volume:	0,6 m³

Frequency f [Hz]	L_W 1/3 octave [dB]	1/1 oct [dB]
100	57,4	
125	61,1	62,9 [2]
160	49,9	
200	52,0	
250	52,4	56,0
315	48,2	
400	49,5	
500	46,7	52,5
630	46,2	
800	41,9	
1000	41,0	45,7
1250	39,7	
1600	35,6	
2000	35,1	39,4
2500	32,6	
3150	32,3	
4000	33,4	44,1
5000	43,4	
6300	34,6	
8000	39,3	45,2
10000	43,4	

[2] Correction



Sound power level L_W(A): **54,3 dB [re 1pW]** **Uncertainty σtot: 1,6 dB**

Name of test institute:	DTI	Date:	14-06-2024
No. of test report:	300-KLAB-24-026		

Measurements are in full conformity with ISO 3743-1

Appendix 1 Sound power measurement

Unit specification

Type of unit: Mono air to water heat pump

Manufacturer: PHNIX

Size of the heat pump: 0.5x1.3x0.9 m (W x L x H)

Year of production: N/A.

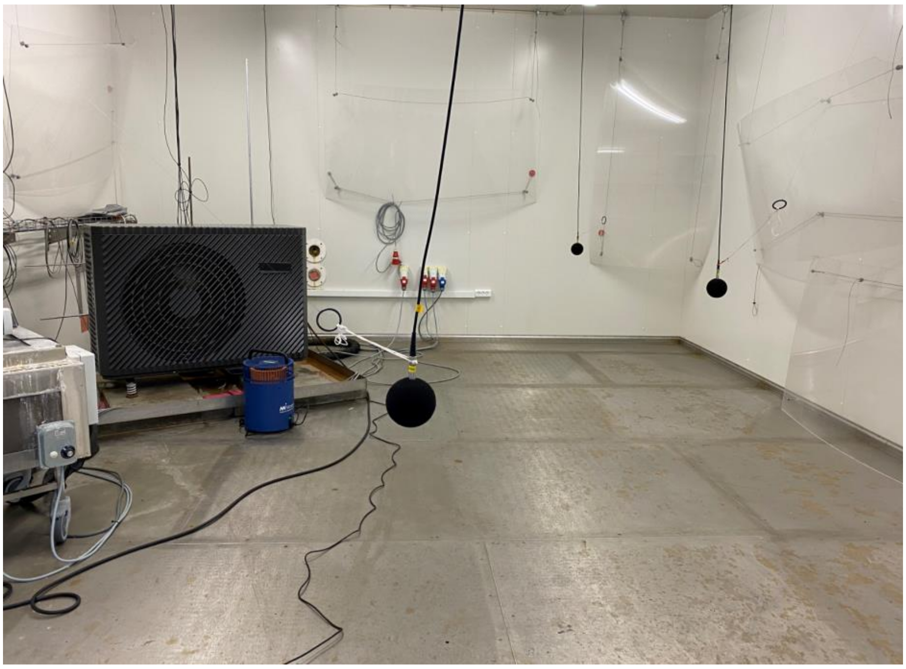
Operating conditions and environment

The operating conditions of the unit under test fulfill the requirements for Class A.

The acoustic test chamber is a hard walled reverberant room (103 m^3) and equipped with relevant sound diffusing reflector panels. The acoustical test chamber fulfils the requirements of ISO3743-1 accuracy grade 2 (Engineering grade).

The measurements of the average sound pressure levels in 1/3 octave frequency bands are carried out using three microphones in the test chamber. During the measurements, the microphones are traversed up and down for one meter in the arc of a quarter circle.

The picture below shows the installation of the unit under test, position of microphones, sound diffusing reflector panels and the reference sound source.



Measurement instruments

Id nr.	Manufacturer	Description	Calibration company
100864	GRAS	Gras 40AE_26CA, ½" free field microphone, Room 1	Norsonic A/S, Norway
100865	GRAS	Gras 40AE_26CA, ½" free field microphone, Room 1	Norsonic A/S, Norway
100866	GRAS	Gras 40AE_26CA, ½" free field microphone, Room 1	Norsonic A/S, Norway
100867*	GRAS	Gras 40AE_26CA, ½" free field microphone, Room 2	Norsonic A/S, Norway
100868*	GRAS	Gras 40AE_26CA, ½" free field microphone, Room 2	Norsonic A/S, Norway
100869*	GRAS	Gras 40AE_26CA, ½" free field microphone, Room 2	Norsonic A/S, Norway
100870	GRAS	Gras 40AE_26CA, ½" free field microphone, Roof monitor	Norsonic A/S, Norway
100873*	Brüel & Kjær	Acoustical calibrator, Brüel & Kjær 4231	Element Metech, Denmark
100859	Norsonic	Reference sound source, Norsonic Nor278 Room 1	RISE, Sweden
100872*	Norsonic	Reference sound source, Norsonic Nor278 Room 2	RISE, Sweden
100620*	Norsonic	Multi-channel measurement system Nor850	Norsonic A/S, Norway

*Instruments are used for the actual measurements for the calculation of the test results.

The other instruments are used for control measurements.
All microphones are equipped with windshields.

Test Procedure

The measurements of the emitted sound power level from the heat pump are carried out according to the following standard:

- DS/EN 14511:2022
- EN 12102-1:2022
- ISO/EN 3743-1:2010

The basic acoustic measurement standard DS/EN 3743-1 is a comparison method using a calibrated reference sound source. Two series of sound pressure measurements are made under exactly the same acoustic conditions, e.g., the same microphone positions, temperature and air humidity. The calibrated sound power levels are known for the reference sound source at each frequency band, and they are used in the estimation of the acoustical correction factor for the calculation of the sound power emitted from the unit under test. The background noise levels are measured and used for relevant corrections.

The final total A-weighted sound power level is based on measurements and calculations in 1/3-octave levels, which then are summed into 1/1-octave levels. The A-weighted total sound power level is determined for the measured frequency range from 100 Hz to 10 kHz.

The actual microphone positions and correction values are saved in data files linked to the complete project documentation according to the DANAK-accreditation.

The complete measurement system is documented and regularly calibrated according to DANAK.

The detailed description of the measurement method is given in Danish in the quality database system "QA Web" at Danish Technological Institute, which is accessible by DANAK.

Measurement uncertainty

The uncertainty of sound power level in decibel is determined in accordance with ISO 3743-1, equation 22 $\sigma_{tot} = \sqrt{\sigma_{RO}{}^2 + \sigma_{omc}{}^2}$ where:

- σ_{RO} is the standard deviation of the reproducibility of the method and
- σ_{omc} is the standard deviation describing the uncertainty associated with the instability of the operating and mounting conditions for the particular noise source under test.

σ_{RO} expresses the uncertainty in test results delivered by the different accredited test laboratories due to different instrumentation and implementation of measurement procedure as well different radiation characteristic of the noise source under test.

σ_{omc} expresses the uncertainty associated with the instability of the operating and mounting conditions for the particular noise source under test. The mounting and installation conditions in two DTI acoustical test chambers are well defined in the test procedure. Possible instability of the operating conditions is monitored and assessed prior to each noise test.

The test uncertainty σ_{omc} is calculated according to ISO3743-1 Annex C formula C.1 and is typically below 1.0dB, however in the report rounded up to the nearest 0.5dB og 1.0dB increment. As pr. Table C.1 (Accuracy grade 2) the uncertainty σ_{RO} is set to 1.5.

The expanded uncertainty U is calculated according to ISO 3743-1 equation 23:
$U = k\ \sigma_{tot}$ where k = 2 for 95% confidence.

EXAMPLE: σ_{tot}: $\sqrt{1.5^2 + 0.5^2} = 1.6\ dB$ and $U(95\%) = 3.2\ dB$

Note: The expanded uncertainty does not include the standard deviation of production which is used in ISO4871 for the purpose of making noise declaration for batches of machines.

Appendix 2 Authorization Letter

Authorization Letter

This declaration of conformity is issued under the sole responsibility of

Manufacturer's Name: Guangdong PHNIX ECO-Energy Solution LTD

Manufacturer's Address: No. 3 Tianyuan Road, Dagang Town, Nansha District Guangzhou Guangdong, 511470 China

We declare that the following Heat pump product we produced for COOPER AND HUNTER OVERSEAS LP are identical to our following models

Cooper&Hunter model	CH-HP12-UIMPRM-P
PHNIX model	PASRW040S-BP-PS-B

Cooper&Hunter company name: COOPER AND HUNTER OVERSEAS LP

Cooper&Hunter brand /-mark: Cooper&Hunter

Cooper&Hunter address: SUITE 201, 45B WEST WILMOT STREET, RICHMOND HILL, ON L4B2P3 CANADA

Note: This declaration becomes invalid if technical or operational modifications are introduced without the manufacturer's consent.

For and on behalf of
GUANGDONG PHNIX ECO-ENERGY SOLUTION LTD.
广东芬尼克兹节能设备有限公司

Date: 24 May 2024

Authorized Signature(s)

Authorised party: Guangdong PHNIX ECO-Energy Solution LTD

OŚWIADCZENIE

Producent Cooper&Hunter oświadcza, iż pompy ciepła

1) CH-HP12UIMPRM-P
Oznaczenie/typ/identyfikator modelu

2) CH-HP08UIMPRK-P
Oznaczenie/typ/identyfikator modelu

3)
Oznaczenie/typ/identyfikator modelu

4)
Oznaczenie/typ/identyfikator modelu

5)
Oznaczenie/typ/identyfikator modelu

Należą do jednego podtypu w danym typoszeregu i spełniają łącznie następujące warunki:

- identyczna konstrukcja obiegu chłodniczego, ten sam czynnik chłodniczy/roboczy;
- ten sam producent, typ i liczba sprężarek;
- ten sam typ elementu rozprężnego;
- ten sam typ skraplacza;
- ten sam typ parownika;
- ten sam typ procesu odszraniania;
- ten sam sterownik i zasada sterowania wydajnością;
- ten sam producent, typ i liczba wentylatorów parownika (w przypadku powietrznych pomp ciepła) i zasada sterowania wydajnością (stała, zmienna lub stopniowana regulacja prędkości obrotowej);
- urządzenia z i bez zaworu czterodrogowego nie mogą być zaliczone do tego samego typoszeregu.

12.08.2024

Miejscowość, data

Jarosław [illegible]szewski

ERKUD Sp. z o.o.
ul. Bazylowa 7
82-310 Gronowo Górne
NIP 578-316-53-29
KRS 0000980726

Podpis osoby upoważnionej