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 34 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 34 · 300-KLAB-24-020-2 ----------

[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 34 ----------

Inicjały: PRES/RTHI ----------

Nr akt: 249417 ----------

Załączniki: 1 ----------

RAPORT Z BADAŃ ----------

Nr raportu: 300-KLAB-24-020-2 ----------

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 ----------

Model: PASRW060S-BP-PS-B ----------

Nr serii: B082208260010 ----------

Rok produkcji: nie dotyczy ----------

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

Marka: ----------

Marka: Cooper & Hunter ----------

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

Model: CH-HP23-UIMPRM-P ----------

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: 05 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 7]: ----------

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

Model (jednostka zewnętrzna)	PASRW060S-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}	**12,75** [kW]
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	η_S	**192,2** [%]
	SCOP	**4,88** [-]

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		12,11 [kW]
		T_j = 2°C	Pdh	7,17 [kW]
		T_j = 7°C	Pdh	7,18 [kW]
		T_j = 12°C	Pdh	7,90 [kW]
		T_j = temperatura dwuwartościowa	Pdh	12,11 [kW]
		T_j = granica działania	Pdh	12,26 [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	3,36 [-]
		T_j = 2°C	COPd	4,81 [-]
		T_j = 7°C	COPd	5,96 [-]
		T_j = 12°C	COPd	7,88 [-]
		T_j = temperatura dwuwartościowa	COPd	3,36 [-]
		T_j = granica działania	COPd	2,92 [-]

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

Pobór mocy w trybach innych niż aktywny	Tryb wyłączenia	P_{OFF}	0,022 [kW]
	Tryb wyłączonego termostatu	P_{TO}	0,034 [kW]
	Tryb gotowości	P_{SB}	0,022 [kW]
	Tryb włączonej grzałki karteru	P_{CK}	0,022 [kW]
Ogrzewacz dodatkowy[1)]	Znamionowa moc cieplna	P_{SUP}	0,49 [kW]
	Rodzaj energii zasilania		elektryczna

Inne pozycje	Regulacja wydajności		zmienna
	Regulacja przepływu wody		zmienna
	Natężenie przepływu wody		-
	Roczne zużycie energii	Q_{HE}	5398 [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)).			

[arkusz 8]: ----------

Wyniki badań SCOP w średniej temperaturze – dla średniej sezonu

grzewczego – EN 14825 ----------

Model (jednostka zewnętrzna)	PASRW060S-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}	**14,44** [kW]
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	η_S	**138,2** [%]
	SCOP	**3,53** [-]

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		13,25 [kW]
		T_j = 2°C	Pdh	8,16 [kW]
		T_j = 7°C	Pdh	7,02 [kW]
		T_j = 12°C	Pdh	8,07 [kW]
		T_j = temperatura dwuwartościowa	Pdh	13,25 [kW]
		T_j = granica działania	Pdh	11,27 [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	2,26 [-]
		T_j = 2°C	COPd	3,46 [-]
		T_j = 7°C	COPd	4,49 [-]
		T_j = 12°C	COPd	6,43 [-]
		T_j = temperatura dwuwartościowa	COPd	2,26 [-]
		T_j = granica działania	COPd	1,80 [-]

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}	0,022 [kW]
	Tryb wyłączonego termostatu	P_{TO}	0,034 [kW]
	Tryb gotowości	P_{SB}	0,022 [kW]
	Tryb włączonej grzałki karteru	P_{CK}	0,022 [kW]
Ogrzewacz dodatkowy[1)]	Znamionowa moc cieplna	P_{SUP}	3,17 [kW]
	Rodzaj energii zasilania		elektryczna

Inne pozycje	Regulacja wydajności		zmienna
	Regulacja przepływu wody		zmienna
	Natężenie przepływu wody		-
	Roczne zużycie energii	Q_{HE}	8452 [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)).

[arkusz 9]: ----------

Wyniki badań COP w niskiej temperaturze – EN 14511 ----------

Nr	Warunki badania	Wydajność grzewcza [kW]	COP
1	A7/W35	16,097	4,325

Wyniki badań COP w średniej temperaturze – EN 14511 ----------

Nr	Warunki badania	Wydajność grzewcza [kW]	COP
1	A7/W55	16,208	3,026

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

[arkusz 10]: ----------

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

Nr	Walidacja badania
1	pozytywna

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	57,2	1,7

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 34]: ----------

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-HP23-UIMPRM-P
Model PHNIX	PASRW060S-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. ----------

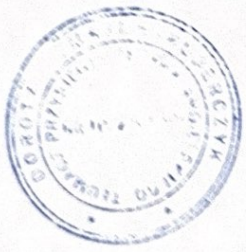
Podmiot upoważniony: Guangdong PHNIX ECO-Energy Solution LTD --------

[-], 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: 543/24



TEST REPORT

Report no.:
300-KLAB-24-020-2

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.: 249417
Enclosures: 1

Customer: Company: GUANGDONG PHNIX ECO-ENERGY SOLUTION LTD.
Address: No. 3 Tianyuan Road, Dagang Town, Nansha District, Guangzhou,
City: Guangdong, 511470, China
Tel.: +86 020-39067523

Component: Brand: PHNIX
Type: Air to water heat pump
Model: PASRW060S-BP-PS-B
Series no.: B082208260010
Prod. Year: N/A

Dates: Component tested: May - June 2024

Brand name: Brand: Cooper & Hunter
Type: Air to water heat pump (mono block)
Model: CH-HP23-UIMPRM-P

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.

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: 2024.08.05

Signature:
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 – EN 14825

Model (Outdoor)	PASRW060S-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
Reversible	Y

Rated heat output[1)]	P_{rated}		**12.75** [kW]
Seasonal space heating energy efficiency	η_s		**192.2** [%]
	SCOP		**4.88** [-]

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	12.11 [kW]
		Tj=2 °C	Pdh	7.17 [kW]
		Tj=7 °C	Pdh	7.18 [kW]
		Tj=12 °C	Pdh	7.90 [kW]
		Tj=bivalent temperature	Pdh	12.11 [kW]
		Tj=operation limit	Pdh	12.26 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	3.36 [-]
		Tj=2 °C	COPd	4.81 [-]
		Tj=7 °C	COPd	5.96 [-]
		Tj=12 °C	COPd	7.88 [-]
		Tj=bivalent temperature	COPd	3.36 [-]
		Tj=operation limit	COPd	2.92 [-]

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}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.034 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	0.49 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	5398 [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).

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

Model (Outdoor)	PASRW060S-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
Reversible	Y

Rated heat output[1)]	P_{rated}		**14.44** [kW]
Seasonal space heating energy efficiency	η_s		**138.2** [%]
	SCOP		**3.53** [-]

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	13.25 [kW]
		Tj=2 °C	Pdh	8.16 [kW]
		Tj=7 °C	Pdh	7.02 [kW]
		Tj=12 °C	Pdh	8.07 [kW]
		Tj=bivalent temperature	Pdh	13.25 [kW]
		Tj=operation limit	Pdh	11.27 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	2.26 [-]
		Tj=2 °C	COPd	3.46 [-]
		Tj=7 °C	COPd	4.49 [-]
		Tj=12 °C	COPd	6.43 [-]
		Tj=bivalent temperature	COPd	2.26 [-]
		Tj=operation limit	COPd	1.80 [-]

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}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.034 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	3.17 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	8452 [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).

COP test results - low temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W35	16.097	4.325

COP test results - medium temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W55	16.208	3.036

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	57.2	1.7

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 Institut

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-HP23-UIMPRM-P
PHNIX model	PASRW060S-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.
广东菲尼克珠节能设备有限公司

Date: 24 May 2024 刘建 Lilian Phnix

Authorised party: Guangdong PHNIX ECO-Energy Solution LTD

TEST REPORT

Report no.:
300-KLAB-24-020-2

DANISH TECHNOLOGICAL INSTITUTE

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

Customer: Company: GUANGDONG PHNIX ECO-ENERGY SOLUTION LTD.
Address: No. 3 Tianyuan Road, Dagang Town, Nansha District, Guangzhou,
City: Guangdong, 511470, China
Tel.: +86 020-39067523

Component: Brand: PHNIX
Type: Air to water heat pump
Model: PASRW060S-BP-PS-B
Series no.: B082208260010
Prod. Year: N/A

Dates: Component tested: May - June 2024

Brand name: Brand: Cooper & Hunter
Type: Air to water heat pump (mono block)
Model: CH-HP23-UIMPRM-P

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.

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.

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Division/Centre: Danish Technological Institute
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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.

	Part load ratio in %				Outdoor heat exchanger		Indoor heat exchanger			
					Dry (wet) bulb temperature °C		Fixed outlet °C	Variable outlet[d] °C		
	Formula	Average	Warmer	Colder	Outdoor air	Exhaust air	All climates	Average	Warmer	Colder
A	$(-7 - 16) / (T_{designh} - 16)$	88,46	n.a.	60,53	−7(−8)	20(12)	[a] / 35	[a] / 34	n.a.	[a] / 30
B	$(+2 - 16) / (T_{designh} - 16)$	53,85	100,00	36,84	2(1)	20(12)	[a] / 35	[a] / 30	[a] / 35	[a] / 27
C	$(+7 - 16) / (T_{designh} - 16)$	34,62	64,29	23,68	7(6)	20(12)	[a] / 35	[a] / 27	[a] / 31	[a] / 25
D	$(+12 - 16) / (T_{designh} - 16)$	15,38	28,57	10,53	12(11)	20(12)	[a] / 35	[a] / 24	[a] / 26	[a] / 24
E	$(TOL^{e} - 16) / (T_{designh} - 16)$				TOL^{e}	20(12)	[a] / 35	[a] / [b]	[a] / [b]	[a] / [b]
F	$(T_{biv} - 16) / (T_{designh} - 16)$				T_{biv}	20(12)	[a] / 35	[a] / [c]	[a] / [c]	[a] / [c]
G	$(-15 - 16) / (T_{designh} - 16)$	n.a.	n.a.	81,58	−15	20(12)	[a] / 35	n.a.	n.a.	[a] / 32

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.

	Part load ratio in %				Outdoor heat exchanger		Indoor heat exchanger			
					Dry (wet) bulb temperature °C		Fixed outlet °C	Variable outlet[d] °C		
	Formula	Average	Warmer	Colder	Outdoor air	Exhaust air	All climates	Average	Warmer	Colder
A	$(-7 - 16) / (T_{designh} - 16)$	88,46	n.a.	60,53	−7(−8)	20(12)	[a] / 55	[a] / 52	n.a.	[a] / 44
B	$(+2 - 16) / (T_{designh} - 16)$	53,85	100	36,84	2(1)	20(12)	[a] / 55	[a] / 42	[a] / 55	[a] / 37
C	$(+7 - 16) / (T_{designh} - 16)$	34,62	64,29	23,68	7(6)	20(12)	[a] / 55	[a] / 36	[a] / 46	[a] / 32
D	$(+12 - 16) / (T_{designh} - 16)$	15,38	28,57	10,53	12(11)	20(12)	[a] / 55	[a] / 30	[a] / 34	[a] / 28
E	$(TOL^{e} - 16) / (T_{designh} - 16)$				TOL^{e}	20(12)	[a] / 55	[a] / [b]	[a] / [b]	[a] / [b]
F	$(T_{biv} - 16) / (T_{designh} - 16)$				T_{biv}	20(12)	[a] / 55	[a] / [c]	[a] / [c]	[a] / [c]
G	$(-15 - 16) / (T_{designh} - 16)$	n.a.	n.a.	81,58	−15	20(12)	[a] / 55	n.a.	n.a.	[a] / 49

Additional information

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

COP test conditions - low temperature – EN 14511

N#	Heat source		Heat sink		Heat pump settings
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)	Compressor speed/ Fan speed
1S	7	6	30	35	65 Hz / 500 rpm

S: Standard rating condition

COP test conditions - medium temperature – EN 14511

N#	Heat source		Heat sink		Heat pump settings
	Inlet dry bulb temperature (°C)	Inlet wet bulb temperature (°C)	Inlet temperature (°C)	Outlet temperature (°C)	Compressor speed/ Fan speed
1S	7	6	47	55	60 Hz / 500 rpm

S: Standard rating condition

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 1/2 (rpm)	Heating capacity (kW)	Power input (kW)
1E	7/6	47/55	30	415/420	6.95	3.11

E) ErP labelling

Test results

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

Model (Outdoor)	PASRW060S-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
Reversible	Y

Rated heat output[1)]	P_{rated}		**12.75** [kW]
Seasonal space heating energy efficiency	η_s		**192.2** [%]
	SCOP		**4.88** [-]

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	12.11 [kW]
		Tj=2 °C	Pdh	7.17 [kW]
		Tj=7 °C	Pdh	7.18 [kW]
		Tj=12 °C	Pdh	7.90 [kW]
		Tj=bivalent temperature	Pdh	12.11 [kW]
		Tj=operation limit	Pdh	12.26 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	3.36 [-]
		Tj=2 °C	COPd	4.81 [-]
		Tj=7 °C	COPd	5.96 [-]
		Tj=12 °C	COPd	7.88 [-]
		Tj=bivalent temperature	COPd	3.36 [-]
		Tj=operation limit	COPd	2.92 [-]

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}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.034 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	0.49 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	5398 [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).

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

Model (Outdoor)	PASRW060S-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
Reversible	Y

Rated heat output[1)]	P_{rated}	**14.44** [kW]
Seasonal space heating energy efficiency	η_s	**138.2** [%]
	SCOP	**3.53** [-]

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	13.25 [kW]
		Tj=2 °C	Pdh	8.16 [kW]
		Tj=7 °C	Pdh	7.02 [kW]
		Tj=12 °C	Pdh	8.07 [kW]
		Tj=bivalent temperature	Pdh	13.25 [kW]
		Tj=operation limit	Pdh	11.27 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	2.26 [-]
		Tj=2 °C	COPd	3.46 [-]
		Tj=7 °C	COPd	4.49 [-]
		Tj=12 °C	COPd	6.43 [-]
		Tj=bivalent temperature	COPd	2.26 [-]
		Tj=operation limit	COPd	1.80 [-]

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}	0.022 [kW]
	Thermostat-off mode	P_{TO}	0.034 [kW]
	Standby mode	P_{SB}	0.022 [kW]
	Crankcase heater mode	P_{CK}	0.022 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	3.17 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	8452 [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).

COP test results - low temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W35	16.097	4.325

COP test results - medium temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W55	16.208	3.036

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	57.2	1.7

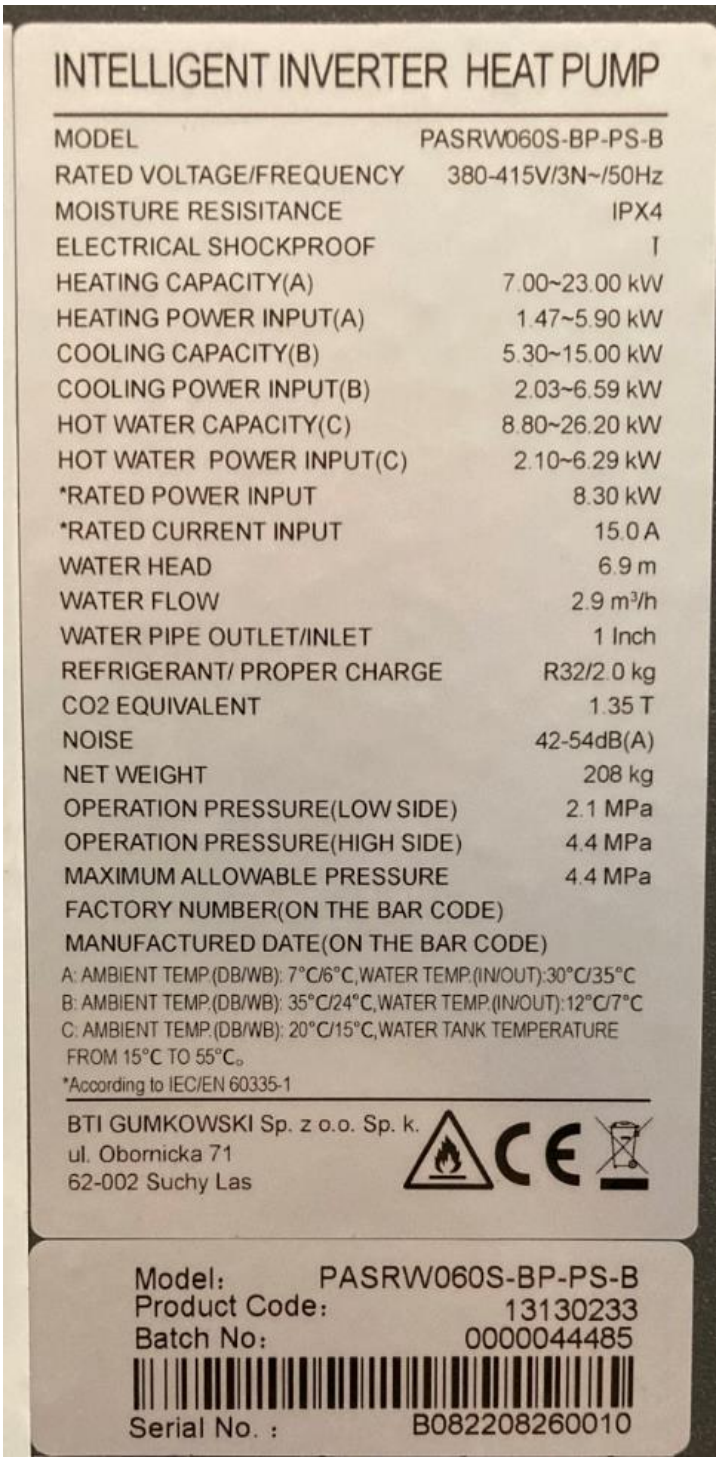
E) ErP labelling

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 Institut

Photos

Rating plate



Outdoor unit

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	11.28	12.11	3.36	0.99	1.00	3.36
B	2	54	6.87	7.17	4.81	0.98	1.00	4.81
C	7	35	4.41	7.18	5.96	0.97	0.61	5.85
D	12	15	1.96	7.90	7.88	0.97	0.25	7.15
E	-10	100	12.75	12.26	2.92	0.99	1.00	2.92
F - BIV	-7	88	11.28	12.11	3.36	0.99	1.00	3.36

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	0.022	0.022	0
Thermostat off	178	0.034	0.034	6.052
Standby	0	0.022	0.022	0
Crankcase heater	178	0.022	0	0

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	12.75	12.26	0.49	0.49	2.92	12.75	4.69	12.26	4.20
	22	-9	25	12.26	11.94	0.32	8.09	3.07	306.49	105.42	298.40	97.34
	23	-8	23	11.77	11.61	0.16	3.72	3.21	270.69	86.77	266.97	83.05
A / F - BIV	24	-7	24	11.28	11.28	0.00	0.00	3.36	270.69	80.48	270.69	80.48
	25	-6	27	10.79	10.79	0.00	0.00	3.52	291.29	82.64	291.29	82.64
	26	-5	68	10.30	10.30	0.00	0.00	3.69	700.27	190.00	700.27	190.00
	27	-4	91	9.81	9.81	0.00	0.00	3.85	892.50	232.03	892.50	232.03
	28	-3	89	9.32	9.32	0.00	0.00	4.01	829.24	206.92	829.24	206.92
	29	-2	165	8.83	8.83	0.00	0.00	4.17	1456.44	349.40	1456.44	349.40
	30	-1	173	8.34	8.34	0.00	0.00	4.33	1442.22	333.12	1442.22	333.12
	31	0	240	7.85	7.85	0.00	0.00	4.49	1883.08	419.36	1883.08	419.36
	32	1	280	7.36	7.36	0.00	0.00	4.65	2059.62	442.81	2059.62	442.81
B	33	2	320	6.87	6.87	0.00	0.00	4.81	2196.92	456.53	2196.92	456.53
	34	3	357	6.38	6.38	0.00	0.00	5.02	2275.88	453.29	2275.88	453.29
	35	4	356	5.88	5.88	0.00	0.00	5.23	2094.92	400.61	2094.92	400.61
	36	5	303	5.39	5.39	0.00	0.00	5.44	1634.45	300.57	1634.45	300.57
	37	6	330	4.90	4.90	0.00	0.00	5.65	1618.27	286.61	1618.27	286.61
C	38	7	326	4.41	4.41	0.00	0.00	5.85	1438.79	245.74	1438.79	245.74
	39	8	348	3.92	3.92	0.00	0.00	6.11	1365.23	223.30	1365.23	223.30
	40	9	335	3.43	3.43	0.00	0.00	6.37	1149.95	180.44	1149.95	180.44
	41	10	315	2.94	2.94	0.00	0.00	6.63	926.83	139.75	926.83	139.75
	42	11	215	2.45	2.45	0.00	0.00	6.89	527.16	76.50	527.16	76.50
D	43	12	169	1.96	1.96	0.00	0.00	7.15	331.50	46.36	331.50	46.36
	44	13	151	1.47	1.47	0.00	0.00	7.41	222.14	29.98	222.14	29.98
	45	14	105	0.98	0.98	0.00	0.00	7.67	102.98	13.43	102.98	13.43
	46	15	74	0.49	0.49	0.00	0.00	7.93	36.29	4.58	36.29	4.58

SUM	26336.60	5391.35	26324.31	5379.05
$SCOP_{on}$		4.88	**$SCOP_{net}$**	4.89

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	12.77	13.25	2.26	0.99	1.00	2.26
B	2	54	7.78	8.16	3.46	0.99	1.00	3.46
C	7	35	5.00	7.02	4.49	0.98	0.71	4.45
D	12	15	2.22	8.07	6.43	0.97	0.28	6.01
E	-10	100	14.44	11.27	1.80	0.99	1.00	1.80
F - BIV	-7	88	12.77	13.25	2.26	0.99	1.00	2.26

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	0.022	0.022	0
Thermostat off	178	0.034	0.034	6.052
Standby	0	0.022	0.022	0
Crankcase heater	178	0.022	0	0

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	14.44	11.27	3.17	3.17	1.80	14.44	9.44	11.27	6.27
	22	-9	25	13.88	11.77	2.11	52.86	1.95	347.12	203.55	294.26	150.69
	23	-8	23	13.33	12.27	1.06	24.32	2.11	306.57	158.17	282.26	133.85
A / F - BIV	24	-7	24	12.77	12.77	0.00	0.00	2.26	306.57	135.37	306.57	135.37
	25	-6	27	12.22	12.22	0.00	0.00	2.40	329.90	137.62	329.90	137.62
	26	-5	68	11.66	11.66	0.00	0.00	2.53	793.09	313.54	793.09	313.54
	27	-4	91	11.11	11.11	0.00	0.00	2.66	1010.80	379.74	1010.80	379.74
	28	-3	89	10.55	10.55	0.00	0.00	2.79	939.16	336.11	939.16	336.11
	29	-2	165	10.00	10.00	0.00	0.00	2.93	1649.49	563.63	1649.49	563.63
	30	-1	173	9.44	9.44	0.00	0.00	3.06	1633.39	533.98	1633.39	533.98
	31	0	240	8.89	8.89	0.00	0.00	3.19	2132.68	668.28	2132.68	668.28
	32	1	280	8.33	8.33	0.00	0.00	3.32	2332.62	701.83	2332.62	701.83
B	33	2	320	7.78	7.78	0.00	0.00	3.46	2488.12	719.94	2488.12	719.94
	34	3	357	7.22	7.22	0.00	0.00	3.65	2577.54	705.32	2577.54	705.32
	35	4	356	6.66	6.66	0.00	0.00	3.85	2372.60	615.81	2372.60	615.81
	36	5	303	6.11	6.11	0.00	0.00	4.05	1851.10	456.92	1851.10	456.92
	37	6	330	5.55	5.55	0.00	0.00	4.25	1832.77	431.27	1832.77	431.27
C	38	7	326	5.00	5.00	0.00	0.00	4.45	1629.50	366.34	1629.50	366.34
	39	8	348	4.44	4.44	0.00	0.00	4.76	1546.19	324.86	1546.19	324.86
	40	9	335	3.89	3.89	0.00	0.00	5.07	1302.38	256.82	1302.38	256.82
	41	10	315	3.33	3.33	0.00	0.00	5.38	1049.68	195.01	1049.68	195.01
	42	11	215	2.78	2.78	0.00	0.00	5.69	597.04	104.85	597.04	104.85
D	43	12	169	2.22	2.22	0.00	0.00	6.01	375.44	62.51	375.44	62.51
	44	13	151	1.67	1.67	0.00	0.00	6.32	251.59	39.83	251.59	39.83
	45	14	105	1.11	1.11	0.00	0.00	6.63	116.63	17.59	116.63	17.59
	46	15	74	0.56	0.56	0.00	0.00	6.94	41.10	5.92	41.10	5.92

SUM	29827.49	8444.25	29747.14	8363.91
$SCOP_{on}$		3.53	**$SCOP_{net}$**	3.56

Detailed test results

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

Detailed result for 'EN14825:2022' Average Low (A) A -7 /W34		
Tested according to:	EN14511:2022 and	EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		A
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-10
Tdesign	°C	-10
Pdesign	kW	12.75
Heating demand:	kW	11.28
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	**12.114**
COP	-	**3.364**
Power consumption	kW	**3.601**
Measured		
Heating capacity	kW	12.189
COP	-	3.276
Power consumption	kW	3.721
During heating		
Air_inlet temperature dry bulb	°C	-7.02
Air temperature wet bulb	°C	-8.16
Water_inlet temperature	°C	30.71
water_outlet temperature	°C	34.11
Water_outlet temperature (Time averaged)	°C	**34.11**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	50585
Calculated Hydraulic power	W	43
Calculated global efficiency	η	0.36
Calculated Capacity correction	W	76
Calculated Power correction	W	119
Water Flow	m^3/s	0.000858

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	-10
Tdesign	°C	-10
Pdesign	kW	12.75
Heating demand:	kW	6.87
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	**7.171**
COP	-	**4.812**
Power consumption	kW	**1.490**
Measured		
Heating capacity	kW	7.246
COP	-	4.503
Power consumption	kW	1.609
During heating		
Air_inlet temperature dry bulb	°C	1.98
Air temperature wet bulb	°C	1.00
Water_inlet temperature	°C	28.07
water_outlet temperature	°C	30.10
Water_outlet temperature (Time averaged)	°C	**30.10**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	50585
Calculated Hydraulic power	W	43
Calculated global efficiency	η	0.36
Calculated Capacity correction	W	76
Calculated Power correction	W	119
Water Flow	m^3/s	0.000858

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	-10
Tdesign	°C	-10
Pdesign	kW	12.75
Heating demand:	kW	4.41
CR:	-	0.6
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	**7.179**
COP	-	**5.958**
Power consumption	kW	**1.205**
Measured		
Heating capacity	kW	7.255
COP	-	5.480
Power consumption	kW	1.324
During heating		
Air_inlet temperature dry bulb	°C	6.97
Air temperature wet bulb	°C	5.82
Water_inlet temperature	°C	25.80
water_outlet temperature	°C	27.82
Water_outlet temperature (Time averaged)	°C	**27.04**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	50585
Calculated Hydraulic power	W	43
Calculated global efficiency	η	0.36
Calculated Capacity correction	W	76
Calculated Power correction	W	119
Water Flow	m^3/s	0.000858

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	-10
Tdesign	°C	-10
Pdesign	kW	12.75
Heating demand:	kW	1.96
CR:	-	0.2
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	**7.898**
COP	-	**7.885**
Power consumption	kW	**1.002**
Measured		
Heating capacity	kW	7.973
COP	-	7.114
Power consumption	kW	1.121
During heating		
Air_inlet temperature dry bulb	°C	11.87
Air temperature wet bulb	°C	11.00
Water_inlet temperature	°C	23.60
water_outlet temperature	°C	25.83
Water_outlet temperature (Time averaged)	°C	**24.15**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	50585
Calculated Hydraulic power	W	43
Calculated global efficiency	η	0.36
Calculated Capacity correction	W	76
Calculated Power correction	W	119
Water Flow	m^3/s	0.000858

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	-10
Tdesign	°C	-10
Pdesign	kW	12.75
Heating demand:	kW	12.75
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Transient
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**12.265**
COP	-	**2.917**
Power consumption	kW	**4.205**
Measured		
Heating capacity	kW	12.340
COP	-	2.854
Power consumption	kW	4.324
During heating		
Air_inlet temperature dry bulb	°C	-10.10
Air temperature wet bulb	°C	-11.19
Water_inlet temperature	°C	31.38
water_outlet temperature	°C	35.06
Water_outlet temperature (Time averaged)	°C	**35.06**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	50109
Calculated Hydraulic power	W	43
Calculated global efficiency	η	0.36
Calculated Capacity correction	W	75
Calculated Power correction	W	118
Water Flow	m^3/s	0.000858

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

Detailed result for 'EN14825:2022' Average Medium (A) A -7 /W52		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Medium
Condition name:		A
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-10
Tdesign	°C	-10
Pdesign	kW	14.44
Heating demand:	kW	12.77
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	**13.247**
COP	-	**2.265**
Power consumption	kW	**5.849**
Measured		
Heating capacity	kW	13.335
COP	-	2.226
Power consumption	kW	5.991
During heating		
Air_inlet temperature dry bulb	°C	-7.04
Air temperature wet bulb	°C	-8.22
Water_inlet temperature	°C	45.71
water_outlet temperature	°C	52.21
Water_outlet temperature (Time averaged)	°C	**52.21**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	108303
Calculated Hydraulic power	W	53
Calculated global efficiency	η	0.38
Calculated Capacity correction	W	88
Calculated Power correction	W	141
Water Flow	m^3/s	0.000491

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	-10
Tdesign	°C	-10
Pdesign	kW	14.44
Heating demand:	kW	7.78
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	**8.162**
COP	-	**3.456**
Power consumption	kW	**2.362**
Measured		
Heating capacity	kW	8.250
COP	-	3.296
Power consumption	kW	2.503
During heating		
Air_inlet temperature dry bulb	°C	1.95
Air temperature wet bulb	°C	1.01
Water_inlet temperature	°C	38.10
water_outlet temperature	°C	42.12
Water_outlet temperature (Time averaged)	°C	**42.12**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	108303
Calculated Hydraulic power	W	53
Calculated global efficiency	η	0.38
Calculated Capacity correction	W	88
Calculated Power correction	W	141
Water Flow	m^3/s	0.000491

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	-10
Tdesign	°C	-10
Pdesign	kW	14.44
Heating demand:	kW	5.00
CR:	-	0.7
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	**7.024**
COP	-	**4.487**
Power consumption	kW	**1.565**
Measured		
Heating capacity	kW	7.112
COP	-	4.169
Power consumption	kW	1.706
During heating		
Air_inlet temperature dry bulb	°C	6.92
Air temperature wet bulb	°C	5.99
Water_inlet temperature	°C	33.57
water_outlet temperature	°C	37.04
Water_outlet temperature (Time averaged)	°C	**36.04**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	108303
Calculated Hydraulic power	W	53
Calculated global efficiency	η	0.38
Calculated Capacity correction	W	88
Calculated Power correction	W	141
Water Flow	m^3/s	0.000491

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	-10
Tdesign	°C	-10
Pdesign	kW	14.44
Heating demand:	kW	2.22
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	**8.068**
COP	-	**6.434**
Power consumption	kW	**1.254**
Measured		
Heating capacity	kW	8.156
COP	-	5.848
Power consumption	kW	1.395
During heating		
Air_inlet temperature dry bulb	°C	11.90
Air temperature wet bulb	°C	11.07
Water_inlet temperature	°C	28.99
water_outlet temperature	°C	32.97
Water_outlet temperature (Time averaged)	°C	**30.09**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	108303
Calculated Hydraulic power	W	53
Calculated global efficiency	η	0.38
Calculated Capacity correction	W	88
Calculated Power correction	W	141
Water Flow	m^3/s	0.000491

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	-10
Tdesign	°C	-10
Pdesign	kW	14.44
Heating demand:	kW	14.44
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	**11.268**
COP	-	**1.797**
Power consumption	kW	**6.272**
Measured		
Heating capacity	kW	11.356
COP	-	1.771
Power consumption	kW	6.414
During heating		
Air_inlet temperature dry bulb	°C	-9.98
Air temperature wet bulb	°C	-11.14
Water_inlet temperature	°C	49.42
water_outlet temperature	°C	54.96
Water_outlet temperature (Time averaged)	°C	**54.96**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	108303
Calculated Hydraulic power	W	53
Calculated global efficiency	η	0.38
Calculated Capacity correction	W	88
Calculated Power correction	W	141
Water Flow	m^3/s	0.000491

Detailed COP test results - low temperature – EN 14511

Detailed result for 'EN14511:2022' A7/W35		
Tested according to:		EN14511:2022
Minimum flow reached:		No
Measurement type:		Transient
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	**16.097**
COP	-	**4.325**
Power consumption	kW	**3.722**
Measured		
Heating capacity	kW	16.172
COP	-	4.210
Power consumption	kW	3.841
During heating		
Air temperature dry bulb	°C	6.88
Air temperature wet bulb	°C	5.86
Inlet temperature	°C	29.98
Outlet temperature	°C	34.89
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	50585
Calculated Hydraulic power	W	43
Calculated global efficiency	η	0.36
Calculated Capacity correction	W	76
Calculated Power correction	W	119
Water Flow	m^3/s	0.000858

Detailed COP test results - medium temperature – EN 14511

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	**16.208**
COP	-	**3.036**
Power consumption	kW	**5.339**
Measured		
Heating capacity	kW	16.295
COP	-	2.974
Power consumption	kW	5.480
During heating		
Air temperature dry bulb	°C	6.95
Air temperature wet bulb	°C	5.95
Inlet temperature	°C	46.97
Outlet temperature	°C	54.91
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	108303
Calculated Hydraulic power	W	53
Calculated global efficiency	η	0.38
Calculated Capacity correction	W	88
Calculated Power correction	W	141
Water Flow	m^3/s	0.000491

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

Sound power levels according to ISO 3743-1:2010

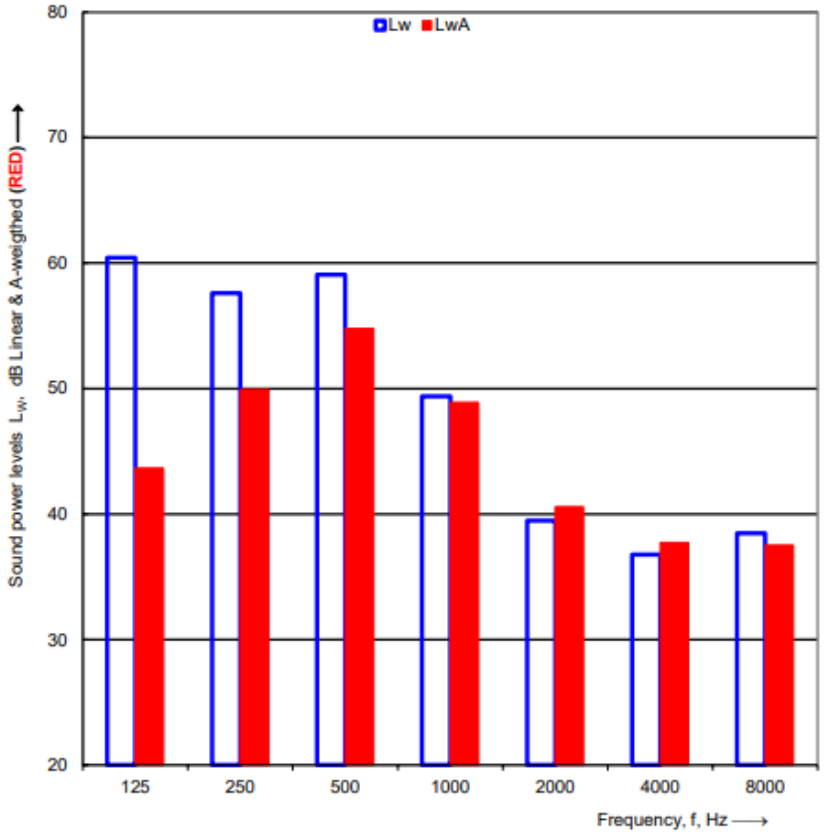
TEKNOLOGISK INSTITUT

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:	18-06-2024
Object:	Type: Mono air to water heat pump, Model: PASRW060S-BP-PS-B		
Mounting conditions:	The outdoor unit is mounted on the supporting metal support frame using six 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: 30[Hz], Speed-fan motor 1: 415[rpm], Speed-fan motor 2: 420 [rpm], Heating capacity: 6.95 [kW], Power_input: 3.11 [kW], Water flow rate: 1768 [l/h] and dP_water: 1108 [mbar]		

				Reference box:	
Static pressure:	1013 hPa				
Air temperature:	7,0 °C			L1:	1,2 m
Relative air humidity:	84,0 %			L2:	0,5 m
Test room volume:	102,8 m³	Room:	Room 2	L3:	1,3 m
Area, S, of test room:	138,9 m²			Volume:	0,8 m³

Frequency f [Hz]	L_W 1/3 octave [dB]	1/1 oct [dB]
100	57,3	
125	56,4	60,4
160	51,1	
200	51,7	
250	49,9	57,6
315	55,2	
400	58,2	
500	49,1	59,1
630	48,3	
800	48,0	
1000	42,0	49,4
1250	39,0	
1600	36,9	
2000	34,7	39,5
2500	30,1	
3150	32,1	
4000	33,0	36,8
5000	30,6	
6300	33,8	
8000	35,1	38,5
10000	31,5	



Sound power level $L_W(A)$: **57,2 dB [re 1pW]** **Uncertainty** **σ_{tot}: 1,7 dB**

Name of test institute:	DTI	Date:	18-06-2024
No. of test report:	300-KLAB-24-020		

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: 0.5x1.2x1.3 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-HP23-UIMPRM-P
PHNIX model	PASRW060S-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 刘建 Lilian Phnix

Authorised party: Guangdong PHNIX ECO-Energy Solution LTD