

OŚWIADCZENIE

Producent BERETTA/RUG Riello Urządzenia Grzewcze S.A. oświadcza, iż pompy ciepła

1) HYDRO UNIT M 004
Oznaczenie typ identyfikator modelu

2) HYDRO UNIT M 006
Oznaczenie typ identyfikator modelu

3) HYDRO UNIT M 008
Oznaczenie typ identyfikator modelu

4) HYDRO UNIT M 010
Oznaczenie typ identyfikator modelu

5) HYDRO UNIT M 012
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.

Tonin, 20.03.2024
Miejscowość, data

RIELLO URZĄDZENIA GRZEWcze S.A.
[Signature]
Dyrektor Handlowy
Podpis osoby upoważnionej

RUG
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RAPORT Z BADANIA

Raport nr: 300-KLAB-23-042-5

Strona 1 z 40
Ref.: KAMA/PRES
Nr pliku: 226011
Załącznik: 2

Klient: Spółka: GD MIDEA HEATING & VENTILATING EQUIPMENT CO., LTD.
Adres: Penglai Industry Road, Beijiao
Miasto: Shunde, Foshan, Guangdong, 528311, Chiny
Tel.: +86 13902810522

Urządzenie: Marka: Midea
Typ: Pompa ciepła powietrze-woda (Monoblok)
Model: MHC-V10W/D2N8-BER90
Nr serii: 341H27881012C060100005
Rok prod: Jednostka zewnętrzna: NIE DOTYCZY

Daty: Czasowy zakres badania: marzec-kwiecień 2024 r.

Nazwa handlowa: Marka: BERETTA
Typ: Pompa ciepła powietrze-woda (Monoblok)
Model: HYDRO UNIT M 010

Procedury: Aby zapoznać się z listą norm, patrz Cel (strona 2)

Uwagi: Urządzenie zostało dostarczone przez klienta. Montaż i ustawienia badawcze zostały wykonane zgodnie z instrukcjami producenta. Pomiędzy poszczególnymi warunkami badań, Midea zmieniała różne parametry, takie jak prędkość sprężarki, zawór rozprężny, prędkość wentylatora, prędkość pompy, czas odszraniania, czas nagrzewania. Raport dla badanego urządzenia nosi nazwę 300-KLAB-23-042, wydany 2024.04.17. Patrz również załącznik 2.

Warunki: Niniejsze badanie zostało przeprowadzone w ramach akredytacji zgodnie z międzynarodowymi wymogami (ISO/IEC 17025:2017) oraz zgodnie z Ogólnymi Warunkami Duńskiego Instytutu Technologicznego. Wyniki badania odnoszą się wyłącznie do badanego przedmiotu. Niniejszy raport z badania może być publikowany we fragmentach wyłącznie za pisemną zgodą Duńskiego Instytutu Technologicznego.

Klient nie może wymieniać ani powoływać się na Danish Technological Institute lub pracowników Danish Technological Institute w celach reklamowych lub marketingowych, chyba że Danish Technological Institute wyraził w każdym przypadku pisemną zgodę.

Dział/Centrum: Duński Instytut Technologiczny
Energia i klimat
Laboratorium pomp ciepła, Aarhus

Data: 2024.04.19

Podpisał:
Kamalathasan Arumugam
B. Sc. Engineer

Sprawdził:
Preben Eskerod
B.TecMan & MarEng

[Dokument podpisany elektronicznie
22 kwietnia 2024
Duński Instytut Technologiczny]



Cel

Celem niniejszego raportu jest udokumentowanie następujących kwestii:

Sezonowy współczynnik wydajności (SCOP) przy zastosowaniu w niskiej i średniej temperaturze dla klimatu umiarkowanego zgodnie z normą EN 14825:2022.

W celu obliczenia SCOP przeprowadzono badania w warunkach obciążenia częściowego podanych w tabelach na stronie 5 i 6.

Badanie obciążenia częściowego SCOP warunkach SCOP_B przy zastosowaniu w niskiej temperaturze dla cieplejszego klimatu zgodnie z EN 14825:2022.

Warunki badania obciążenia częściowego: SCOP_A i SCOP_{F/G} przy zastosowaniu w niskiej temperaturze dla chłodniejszego klimatu zgodnie z EN 14825:2022.

Standardowe warunki znamionowe badania COP A7/W35 i A7/W55 zgodnie z EN 14511:2022.

Wymagania eksploatacyjne zgodnie z normą EN 14511-4:2022

4.2.1 Badania rozruchowe i eksploatacyjne

4.5 Odcięcie przepływu nośnika ciepła

4.6 Całkowita awaria zasilania

Pomiary mocy akustycznej zgodnie z normą EN 12102-1:2022.

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Nr badania 300



Warunki badania

Warunki badania SCOP dla niskich temperatur - EN 14825

Warunki częściowego obciążenia dla referencyjnego SCOP i referencyjnego SCOPon przy obliczaniu jednostek powietrze-woda dla zastosowań niskotemperaturowych dla referencyjnego sezonu grzewczego;

"A" = klimat umiarkowany, "W" = klimat cieplejszy i "C" = klimat chłodniejszy.

	Współczynnik obciążenia częściowego w %				Zewnętrzny wymiennik ciepła		Wewnętrzny wymiennik ciepła			
					Temperatura termometru suchego (mokrego) °C		Stały wylot °C	Zmienny wylot °C		
	Wzór	umiarkowany	cieplejszy	chłodniejszy	Powietrze zewnętrzne	Wylot powietrza	Wszystkie klimaty	umiarkowany	cieplejszy	chłodniejszy
A	$(-7-16) / (T_{designh} - 16)$	88,46	Nie dotyczy	60,53	-7(-8)	20(12)	a / 35	a / 34	Nie dotyczy	a / 30
B	$(+2-16) / (T_{designh} - 16)$	53,85	100	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	$(-15-16) / (T_{designh} - 16)$	Nie dotyczy	Nie dotyczy	81,58	-15	20(12)	a / 35	Nie dotyczy	Nie dotyczy	a / 32

Dodatkowe informacje

Klimat	T _{designh} [°C]	T _{bivalent} [°C]	TOL [°C]	Temperatura na wylocie	Natężenie przepływu
umiarkowany	-10	-7	-10	Zmienna	Zmienne
cieplejszy	2	7	2	Zmienna	Zmienne
chłodniejszy	-22	-15	-22	Zmienna	Zmienne

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Nr badania 300



Warunki badania SCOP dla średnich temperatur - EN 14825

Warunki częściowego obciążenia dla referencyjnego SCOP i referencyjnego SCOPon przy obliczaniu jednostek powietrze-woda dla zastosowań średniotemperaturowych dla referencyjnego sezonu grzewczego;

"A" = klimat umiarkowany, "W" = klimat cieplejszy i "C" = klimat chłodniejszy.

	Współczynnik obciążenia częściowego w %				Zewnętrzny wymiennik ciepła		Wewnętrzny wymiennik ciepła			
					Temperatura termometru suchego (mokrego) °C		Stały wylot °C	Zmienny wylot d °C		
	Wzór	umiarkowany	cieplejszy	chłodniejszy	Powietrze zewnętrzne	Wylot powietrza	Wszystkie klimaty	umiarkowany	cieplejszy	chłodniejszy
A	$\frac{(-7-16)}{(T_{designh} - 16)}$	88,46	Nie dotyczy	60,53	-7(-8)	20(12)	a / 55	a / 52	Nie dotyczy	a / 44
B	$\frac{(+2-16)}{(T_{designh} - 16)}$	53,85	100,00	36,84	2(1)	20(12)	a / 55	a / 42	a / 55	a / 37
C	$\frac{(+7-16)}{(T_{designh} - 16)}$	34,62	64,29	23,68	7(6)	20(12)	a / 55	a / 36	a / 46	a / 32
D	$\frac{(+12-16)}{(T_{designh} - 16)}$	15,38	28,57	10,53	12(11)	20(12)	a / 55	a / 30	a / 34	a / 28
E	$\frac{(TOL^e - 16)}{(T_{designh} - 16)}$				TOL ^e	20(12)	a / 55	a / b	a / b	a / b
F	$\frac{(T_{biv} - 16)}{(T_{designh} - 16)}$				T _{biv}	20(12)	a / 55	a / c	a / c	a / c
G	$\frac{(-15-16)}{(T_{designh} - 16)}$	Nie dotyczy	Nie dotyczy	81,58	-15	20(12)	a / 55	Nie dotyczy	Nie dotyczy	a / 49

Dodatkowe informacje

Klimat	T _{designh} [°C]	T _{bivalent} [°C]	TOL [°C]	Temperatura na wylocie	Natężenie przepływu
umiarkowany	-10	-7	-10	Zmienna	Zmienne

[logo]
Nr badania 300



Warunki badania COP - niska temperatura - EN 14511

Nr	Źródło ciepła		Radiator		Ustawienia pompy ciepła
	Temperatura termometru suchego na wlocie temperatury (°C)	Temperatura termometru mokrego na wlocie temperatury (°C)	Temperatura na wlocie (°C)	Temperatura na wylocie (°C)	
1 ^s	7	6	30	35	

S: Standardowy warunek oceny

Warunki badania COP - średnia temperatura - EN

Nr	Źródło ciepła		Radiator		Ustawienia pompy ciepła
	Temperatura termometru suchego na wlocie temperatury (°C)	Temperatura termometru mokrego na wlocie temperatury (°C)	Temperatura na wlocie (°C)	Temperatura na wylocie (°C)	
1 ^s	7	6	47	55	

S: Standardowy warunek oceny

Warunki badania dla wymagań eksploatacyjnych - EN 14511-4

Nr	Źródło ciepła		Radiator	Natężenie przepływu wody w wewnętrznym wymienniku ciepła	Badanie
	Temperatura termometru suchego na wlocie temperatury (°C)	Temperatura termometru mokrego na wlocie temperatury (°C)	Temperatura na wlocie (°C)		
1	-25	-	12	500 L/h	Rozruchowe
2	-25	-	38	500 L/h	Eksploatacyjne

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Nr badania 300



Warunki badania odcięcia nośnika ciepła - EN 14511-4

Nr	Źródło ciepła		Radiator		Wymiennik ciepła
	Temperatura termometru suchego na wlocie temperatury (°C)	Temperatura termometru mokrego na wlocie temperatury (°C)	Temperatura na wlocie (°C)	Temperatura na wylocie (°C)	
1	7	6	30	35	Wewnętrzny
2	7	6	30	35	Zewnętrzny

Warunki badania dla całkowitej awarii zasilania - EN 14511-4

Nr	Źródło ciepła		Radiator	
	Temperatura termometru suchego na wlocie temperatury (°C)	Temperatura termometru mokrego na wlocie temperatury (°C)	Temperatura na wlocie (°C)	Temperatura na wylocie (°C)
1	7	6	30	35

Warunki badania dla pomiarów mocy akustycznej - EN 12102-1

Nr	Warunki badania		Ustawienie pompy ciepła			
	Zewnętrzny wymiennik ciepła (Termometr suchy/termometr mokry) (°C)	Wewnętrzny wymiennik ciepła (wlot/wylot) (°C)	Prędkość sprężarki (Hz)	Prędkość wentylatora na zewnątrz (obr./min)	Moc grzewcza (kW)	Moc wejściowa (kW)
1 ^E	7/6	47/55	37	400	3,95	1,43

E) Oznaczenie ErP

[logo]
Nr badania 300



Wyniki badania

Wyniki badania SCOP w niskiej temperaturze - średnia sezonu grzewczego - EN 14825

Model (zewnątrzny)	MHC-V10W/D2N8-BER90
Monoblokowa pompa ciepła powietrze-woda	Tak
Niskotemperaturowa pompa ciepła	Nie
Wyposażony w dodatkową grzałkę	Nie
Pompa ciepła z wielofunkcyjnym podgrzewaczem	Nie
Odwracalny	Tak

Znamionowa moc cieplna ¹⁾	P_{rated}	9,2 [kW]
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	ns	202,0 [%]
	SCOP	5,12 [-]

Zmierzona wydajność ogrzewania dla częściowego obciążenia przy temperaturze zewnętrznej T_j	Klimat umiarkowany - Zastosowanie w niskich temperaturach	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
		$T_j = -7\text{ °C}$	P_{dh}	7,89 [kW]
		$T_j = 2\text{ °C}$	P_{dh}	4,98 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	4,16 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	4,77 [kW]
		$T_j = \text{temperatura dwuwartościowa}$	P_{dh}	7,89 [kW]
		$T_j = \text{limit operacyjny}$	P_{dh}	7,42 [kW]

Zmierzony współczynnik wydajności w temperaturze zewnętrznej T_j	Klimat umiarkowany - Zastosowanie w niskich temperaturach	$T_j = -15\text{ °C}$	COPd	- [-]
		$T_j = -7\text{ °C}$	COPd	3,09 [-]
		$T_j = 2\text{ °C}$	COPd	5,02 [-]
		$T_j = 7\text{ °C}$	COPd	7,02 [-]
		$T_j = 12\text{ °C}$	COPd	8,90 [-]
		$T_j = \text{temperatura dwuwartościowa}$	COPd	3,09 [-]
		$T_j = \text{limit operacyjny}$	COPd	2,87 [-]

Temperatura dwuwartościowa	Tbivalent	-7 [°C]
Limit eksploatacji	TOL	-10 [°C]
Temperatury	WTOL	- [°C]
Współczynnik degradacji	Cdh	0,97 [-]

Zużycie energii w trybach innych niż tryb aktywny	Tryb off	P_{OFF}	0,012 [kW]
	Termostat - Tryb off	P_{TO}	0,017 [kW]
	Tryb gotowości	P_{SB}	0,012 [kW]
	Tryb grzałki skrzyni korbowej	P_{CK}	0,012 [kW]
Grzałka dodatkowa ¹⁾	Znamionowa moc cieplna	P_{SUP}	1,78 [kW]
	Rodzaj pobieranej energii		Elektryczna

Inne przedmioty	Kontrola wydajności		Zmienna
	Kontrola przepływu wody		Zmienna
	Natężenie przepływu wody		-
	Roczne zużycie energii	Q_{HE}	3709 [kWh]

¹⁾ W przypadku ogrzewania pomieszczeń pompą ciepła oraz pomp ciepła z wielofunkcyjnymi podgrzewaczami, znamionowa moc cieplna P_{rated} , jest równa projektowemu obciążeniu grzewczemu $P_{designh}$, a wskaźnik mocy cieplnej dodatkowego podgrzewacza P_{sup} , jest równy dodatkowej wydajności grzewczej, $sup(T_j)$.

²⁾ Do obliczenia SCOP używana jest wartość PCK - PSB. Patrz rozdział „SCOP - szczegółowe obliczenia”

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Wyniki badania SCOP w średniej temperaturze - średnia sezonu grzewczego - EN 14825

Model (zewnątrzny)	MHC-V10W/D2N8-BER90
Monoblokowa pompa ciepła powietrze-woda	Tak
Niskotemperaturowa pompa ciepła	Nie
Wypożarty w dodatkową grzałkę	Nie
Pompa ciepła z wielofunkcyjnym podgrzewaczem	Nie
Odwracalny	Tak

Znamionowa moc cieplna ¹⁾	P _{rated}	7,7 [kW]
Sezonowa efektywność energetyczna	ns	144,6 [%]
ogrzewania pomieszczeń	SCOP	3,69 [-]

Zmierzona wydajność ogrzewania dla częściowego obciążenia przy temperaturze zewnętrznej T _j	Klimat umiarkowany - Zastosowanie w średniej temperaturze	T _j = -15 °C	P _{dh}	- [kW]
		T _j = -7 °C	P _{dh}	7,04 [kW]
		T _j = 2 °C	P _{dh}	4,58 [kW]
		T _j = 7 °C	P _{dh}	3,92 [kW]
		T _j = 12 °C	P _{dh}	4,62 [kW]
		T _j = temperatura dwuwartościowa	P _{dh}	7,04 [kW]
		T _j = limit operacyjny	P _{dh}	6,11 [kW]

Zmierzony współczynnik wydajności w temperaturze zewnętrznej T _j	Klimat umiarkowany - Zastosowanie w średniej temperaturze	T _j = -15 °C	COP _d	- [-]
		T _j = -7 °C	COP _d	2,23 [-]
		T _j = 2 °C	COP _d	3,65 [-]
		T _j = 7 °C	COP _d	4,88 [-]
		T _j = 12 °C	COP _d	6,51 [-]
		T _j = temperatura dwuwartościowa	COP _d	2,23 [-]
		T _j = limit operacyjny	COP _d	1,85 [-]

Temperatura dwuwartościowa	T _{bivalent}	-7 [°C]
Limit eksploatacji temperatury	TOL	-10 [°C]
Współczynnik degradacji	C _{dh}	0,98 [-]

Zużycie energii w trybach innych niż tryb aktywny	Tryb off	P _{OFF}	0,012 [kW]
	Termostat - Tryb off	P _{TO}	0,017 [kW]
	Tryb gotowości	P _{SB}	0,012 [kW]
	Tryb grzałki skrzyni korbowej	P _{CK}	0,012 [kW]
Grzałka dodatkowa ¹⁾	Znamionowa moc cieplna	P _{SUP}	1,59 [kW]
	Rodzaj pobieranej energii		Elektryczna

Inne przedmioty	Kontrola wydajności		Zmienna
	Kontrola przepływu wody		Zmienna
	Natężenie przepływu wody		-
	Roczne zużycie energii	Q _{HE}	4310 [kWh]

¹⁾ W przypadku ogrzewania pomieszczeń pompą ciepła oraz pomp ciepła z wielofunkcyjnymi podgrzewaczami, znamionowa moc cieplna P_{rated}, jest równa projektowemu obciążeniu grzewczemu P_{design,h}, a wskaźnik mocy cieplnej dodatkowego podgrzewacza P_{sup}, jest równy dodatkowej wydajności grzewczej, sup(T_j).

²⁾ Do obliczenia SCOP używana jest wartość P_{CK} - P_{SB}. Patrz rozdział „SCOP - szczegółowe obliczenia”



Wyniki badań dla cieplejszego klimatu, niska temperatura zgodnie z EN14825

Nr	Warunki badania	Moc grzewcza [kW]	COP
1	B	8,315	3,753

Wyniki badań dla chłodniejszego klimatu, niska temperatura zgodnie z EN14825

Nr	Warunki badania	Moc grzewcza [kW]	COP
1	A	4,876	3,842
2	F & G	6,516	2,673

Wyniki badania COP - niska temperatura - EN 14511

Nr	Warunki badania	Moc grzewcza [kW]	COP
1	A7/W35	9,900	4,815

Wyniki badania COP - średnia temperatura - EN 14511

Nr	Warunki badania	Moc grzewcza [kW]	COP
1	A7/W55	9,080	2,958

[logo]
Nr badania 300



Wyniki badań rozruchu i działania - EN 14511-4

Nr	Warunki badania powietrze/woda na wlocie [°C]	Walidacja badania
Rozruchowe	A-25/W12	Zaliczone
Eksploatacyjne	A-25/W38	zaliczone

Wyniki badań odcięcia nośnika ciepła - EN 14511-4

Nr	Wymiennik ciepła	Walidacja badania
1	Wewnętrzny	zaliczone
2	Zewnętrzne	zaliczone

Wyniki badań dla całkowitej awarii zasilania - EN 14511-4

Nr	Walidacja badania
1	zaliczone

[logo]
Nr badania 300



Wyniki pomiarów mocy akustycznej - EN 12102- 1

Nr	Warunki badania	Poziom mocy akustycznej LW(A) [dB re 1pW]	Niepewność σ_{tot} [dB]
1 ^E	A7/W55	56,4	1,7

E) Oznaczenie ErP

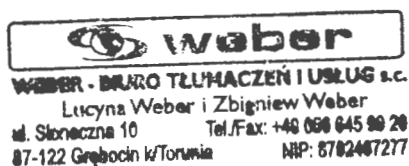
Całkowity poziom mocy akustycznej skorygowany charakterystyką A jest określany dla mierzonego zakresu częstotliwości od 100 Hz do 10 kHz. W celu obliczenia niepewności proszę zapoznać się z Załącznikiem 1.

Pomiary mocy akustycznej są przeprowadzane przez Kamalathasana Arumugama (KAMA) i sprawdzane przez Patricka Gliberta (PGL) z Duńskiego Instytutu Technologicznego.

[logo]
Nr badania 300

Poświadczam, że tłumaczenie jest zgodne
z dokumentem mi przedstawionym

rep. **340/24** data **27.05.2024**



TEST REPORT

Report no.:
300-KLAB-23-042-5



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File no.: 226011
Enclosures: 2

Customer: Company: GD MIDEA HEATING & VENTILATING EQUIPMENT CO., LTD.
Address: Penglai Industry Road, Beijiao
City: Shunde, Foshan, Guangdong, 528311, China
Tel.: +86 13902810522

Component: Brand: Midea
Type: Air to water heat pump (mono block)
Model: MHC-V10W/D2N8-BER90
Series no.: 341H27881012C060100005
Prod. Year: Outdoor unit: N/A
Dates: Component tested: Marts - April 2024

Brand name: Brand: BERETTA
Type: Air to water heat pump (mono block)
Model: HYDRO UNIT M 010

Procedures 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. Between each test condition, Midea has been changing various parameters like compressor speed, expansion valve, fan speed, pump speed, defrost time, heating time. The report for the tested unit is named 300-KLAB-23-042 issued 2024.04.17 Also see appendix 2.

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: 2024.04.19

Signature:
Kamalathanan Arumugam
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Preben Eskerod
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DANAK
Test Reg. nr. 300



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 5 and 6.

SCOP part load test in condition SCOP_B at low temperature application for warmer climate according to EN 14825:2022.

SCOP part load test conditions SCOP_A and SCOP_{F/G} at low temperature application for colder climate according to EN 14825:2022.

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.



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Test conditions

SCOP test conditions for low temperature – EN 14825

Part load conditions for reference SCOP and reference SCOP_{on} 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	$(-7 - 16) / (T_{\text{designh}} - 16)$	88,46	n.a.	60,53	-7(-8)	20(12)	^a / 35	^a / 34	n.a.	^a / 30
B	$(+2 - 16) / (T_{\text{designh}} - 16)$	53,85	100,00	36,84	2(1)	20(12)	^a / 35	^a / 30	^a / 35	^a / 27
C	$(+7 - 16) / (T_{\text{designh}} - 16)$	34,62	64,29	23,68	7(6)	20(12)	^a / 35	^a / 27	^a / 31	^a / 25
D	$(+12 - 16) / (T_{\text{designh}} - 16)$	15,38	28,57	10,53	12(11)	20(12)	^a / 35	^a / 24	^a / 26	^a / 24
E	$(TOL^e - 16) / (T_{\text{designh}} - 16)$				TOL^e	20(12)	^a / 35	^a / b	^a / b	^a / b
F	$(T_{\text{biv}} - 16) / (T_{\text{designh}} - 16)$				T_{biv}	20(12)	^a / 35	^a / c	^a / c	^a / c
G	$(-15 - 16) / (T_{\text{designh}} - 16)$	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	Variable
Warmer	2	7	2	Variable	Variable
Colder	-22	-15	-22	Variable	Variable



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	$(-7 - 16) / (T_{\text{designh}} - 16)$	88,46	n.a.	60,53	-7(-8)	20(12)	^a / 55	^a / 52	n.a.	^a / 44
B	$(+2 - 16) / (T_{\text{designh}} - 16)$	53,85	100	36,84	2(1)	20(12)	^a / 55	^a / 42	^a / 55	^a / 37
C	$(+7 - 16) / (T_{\text{designh}} - 16)$	34,62	64,29	23,68	7(6)	20(12)	^a / 55	^a / 36	^a / 46	^a / 32
D	$(+12 - 16) / (T_{\text{designh}} - 16)$	15,38	28,57	10,53	12(11)	20(12)	^a / 55	^a / 30	^a / 34	^a / 28
E	$(TOL^e - 16) / (T_{\text{designh}} - 16)$				TOL^e	20(12)	^a / 55	^a / ^b	^a / ^b	^a / ^b
F	$(T_{\text{biv}} - 16) / (T_{\text{designh}} - 16)$				T_{biv}	20(12)	^a / 55	^a / ^c	^a / ^c	^a / ^c
G	$(-15 - 16) / (T_{\text{designh}} - 16)$	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	Variable



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)	
1 ^S	7	6	30	35	

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)	
1 ^S	7	6	47	55	

S: Standard rating condition

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	-	12	500 L/h	Starting
2	-25	-	38	500 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 outdoor (rpm)	Heating capacity (kW)	Power input (kW)
1 ^E	7/6	47/55	37	400	3.95	1.43

E) ErP labelling



Test results

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

Model (Outdoor)	MHC-V10W/D2N8-BER90
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 output¹⁾	P_{rated}	9.2 [kW]
Seasonal space heating energy efficiency	η_s	202.0 [%]
	SCOP	5.12 [-]

Measured capacity for heating for part load at outdoor temperature T_j	Average Climate - Low temperature application	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
		$T_j = -7\text{ °C}$	P_{dh}	7.89 [kW]
		$T_j = 2\text{ °C}$	P_{dh}	4.98 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	4.16 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	4.77 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	7.89 [kW]
		$T_j = \text{operation limit}$	P_{dh}	7.42 [kW]

Measured coefficient of performance at outdoor temperature T_j	Average Climate - Low temperature application	$T_j = -15\text{ °C}$	COPd	- [-]
		$T_j = -7\text{ °C}$	COPd	3.09 [-]
		$T_j = 2\text{ °C}$	COPd	5.02 [-]
		$T_j = 7\text{ °C}$	COPd	7.02 [-]
		$T_j = 12\text{ °C}$	COPd	8.90 [-]
		$T_j = \text{bivalent temperature}$	COPd	3.09 [-]
		$T_j = \text{operation limit}$	COPd	2.87 [-]

Bivalent temperature	$T_{bivalent}$	-7 [°C]
Operation limit temperatures	TOL	-10 [°C]
	WTOL	- [°C]
Degradation coefficient	C_{dh}	0.97 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.012 [kW]
	Thermostat-off mode	P_{TO}	0.017 [kW]
	Standby mode	P_{SB}	0.012 [kW]
	Crankcase heater mode	P_{CK}	0.012 [kW]
Supplementary heater¹⁾	Rated heat output	P_{SUP}	1.78 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	3709 [kWh]

¹⁾For heat pump space heaters and heat pump combination heaters, the rated heat output, P_{rated} , is equal to the design load for heating, $P_{design,h}$, and the rated heat output of a supplementary heater, P_{sup} , is equal to the supplementary capacity for heating, $sup(T_j)$.

²⁾For SCOP calculation the value $P_{CK} - P_{SB}$ is used. See section "SCOP - detailed calculation"



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

Model (Outdoor)	MHC-V10W/D2N8-BER90
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 output¹⁾	P_{rated}	7.7 [kW]
Seasonal space heating energy efficiency	η_s	144.6 [%]
	SCOP	3.69 [-]

Measured capacity for heating for part load at outdoor temperature T_j	Average Climate	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
	-	$T_j = -7\text{ °C}$	P_{dh}	7.04 [kW]
	Medium temperature application	$T_j = 2\text{ °C}$	P_{dh}	4.58 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	3.92 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	4.62 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	7.04 [kW]
		$T_j = \text{operation limit}$	P_{dh}	6.11 [kW]

Measured coefficient of performance at outdoor temperature T_j	Average Climate	$T_j = -15\text{ °C}$	COPd	- [-]
	-	$T_j = -7\text{ °C}$	COPd	2.23 [-]
	Medium temperature application	$T_j = 2\text{ °C}$	COPd	3.65 [-]
		$T_j = 7\text{ °C}$	COPd	4.88 [-]
		$T_j = 12\text{ °C}$	COPd	6.51 [-]
		$T_j = \text{bivalent temperature}$	COPd	2.23 [-]
		$T_j = \text{operation limit}$	COPd	1.85 [-]

Bivalent temperature	$T_{bivalent}$	-7 [°C]
Operation limit temperatures	TOL	-10 [°C]
Degradation coefficient	WTOL	- [°C]
	C_{dh}	0.98 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.012 [kW]
	Thermostat-off mode	P_{TO}	0.017 [kW]
	Standby mode	P_{SB}	0.012 [kW]
	Crankcase heater mode	P_{CK}	0.012 [kW]
Supplementary heater¹⁾	Rated heat output	P_{SUP}	1.59 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	4310 [kWh]

¹⁾For heat pump space heaters and heat pump combination heaters, the rated heat output, P_{rated} , is equal to the design load for heating, $P_{designh}$, and the rated heat output of a supplementary heater, P_{sup} , is equal to the supplementary capacity for heating, $sup(T_j)$.

²⁾For SCOP calculation the value $P_{CK} - P_{SB}$ is used. See section "SCOP - detailed calculation"



Test results for warmer climate, low temperature according to EN14825

N°	Test condition	Heating capacity [kW]	COP
1	B	8.315	3.753

Test results for colder climate, low temperature according to EN14825

N°	Test condition	Heating capacity [kW]	COP
1	A	4.876	3.842
2	F&G	6.516	2.673

COP test results - low temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W35	9.900	4.815

COP test results - medium temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W55	9.080	2.958



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

N#	Test conditions air/water inlet [°C]	Test validation
Starting	A-25/W12	Passed
Operating	A-25/W38	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	56.4	1.7

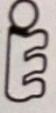
E) ErP labelling

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 Kamalathanan Arumugam (KAMA) and co-read by Patrick Glibert (PGL), Danish Technological Institute.

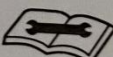


Photos Rating plate

CE UK CA   041-K007-06

MONOBLOC HEAT PUMP

MODEL	MHC-V10W/D2N8-BER90	
COOLING CAPACITY/EER @ A35W18	9.90kW / 4.55	
HEATING CAPACITY/COP @ A7W35	10.00kW / 4.95	
POWER SOURCE	380-415V 3N~ 50Hz	
RATED INPUT	3700W+9000W(IBH)	
BACKUP HEATER RATED POWER INPUT	9000W	
RATED WATER PRESSURE	0.1-0.3MPa	
NET WEIGHT	110kg	
REFRIGERANT	R32/1400g	
GWP	675	
EQUIVALENT CO ₂	0.95t	
EXCESSIVE OPERATING PRESSURE	HIGH	4.3MPa
	LOW	2.6MPa
MAXIMUM ALLOWABLE PRESSURE	4.3MPa	
OUTDOOR RESISTANCE CLASS	IP24	

Hermetically sealed equipment contains
fluorinated greenhouse gases

Midea

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SN: 341H27881012C060100005
MADE IN P.R.C.



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	8.14	7.89	3.09	0.99	1.00	3.09
B	2	54	4.95	4.98	5.02	0.98	1.00	5.02
C	7	35	3.18	4.16	7.02	0.97	0.76	6.96
D	12	15	1.42	4.77	8.90	0.97	0.30	8.27
E	-10	100	9.20	7.42	2.87	0.99	1.00	2.87
F - BIV	-7	88	8.14	7.89	3.09	0.99	1.00	3.09

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	0.012	0.012	0
Thermostat off	178	0.017	0.017	3.026
Standby	0	0.012	0.012	0
Crankcase heater	178	0.012	0	0



Calculation Bin for SCOPon

	Bin	Outdoor temperature [°C]	Hours [h]	Heat load [kW]	Heat load covered by heat pump [kW]	Electrical back up heater [kW]	Annual backup heater energy input [kWh]	COPbin	Annual heating demand [kWh]	Annual energy input [kWh]	Net annual heating capacity [kWh]	Net annual power input [kWh]
E	21	-10	1	9.20	7.42	1.78	1.78	2.87	9.20	4.37	7.42	2.59
	22	-9	25	8.85	7.58	1.27	31.67	2.94	221.15	96.07	189.48	64.40
	23	-8	23	8.49	7.73	0.76	17.42	3.02	195.32	76.37	177.90	58.95
A / F - BIV	24	-7	24	8.14	7.89	0.00	0.00	3.09	195.32	63.14	195.32	63.14
	25	-6	27	7.78	7.56	0.00	0.00	3.31	210.18	63.56	210.18	63.56
	26	-5	68	7.43	7.24	0.00	0.00	3.52	505.29	143.52	505.29	143.52
	27	-4	91	7.08	6.91	0.00	0.00	3.73	644.00	172.46	644.00	172.46
	28	-3	89	6.72	6.59	0.00	0.00	3.95	598.35	151.57	598.35	151.57
	29	-2	165	6.37	6.26	0.00	0.00	4.16	1050.92	252.56	1050.92	252.56
	30	-1	173	6.02	5.93	0.00	0.00	4.37	1040.66	237.89	1040.66	237.89
	31	0	240	5.66	5.61	0.00	0.00	4.59	1358.77	296.15	1358.77	296.15
	32	1	280	5.31	5.28	0.00	0.00	4.80	1486.15	309.51	1486.15	309.51
B	33	2	320	4.95	4.95	0.00	0.00	5.02	1585.23	316.09	1585.23	316.09
	34	3	357	4.60	4.60	0.00	0.00	5.40	1642.20	303.88	1642.20	303.88
	35	4	356	4.25	4.25	0.00	0.00	5.79	1511.63	260.94	1511.63	260.94
	36	5	303	3.89	3.89	0.00	0.00	6.18	1179.37	190.77	1179.37	190.77
	37	6	330	3.54	3.54	0.00	0.00	6.57	1167.69	177.70	1167.69	177.70
C	38	7	326	3.18	3.18	0.00	0.00	6.96	1038.18	149.16	1038.18	149.16
	39	8	348	2.83	2.83	0.00	0.00	7.22	985.11	136.39	985.11	136.39
	40	9	335	2.48	2.48	0.00	0.00	7.49	829.77	110.85	829.77	110.85
	41	10	315	2.12	2.12	0.00	0.00	7.75	668.77	86.31	668.77	86.31
	42	11	215	1.77	1.77	0.00	0.00	8.01	380.38	47.48	380.38	47.48
D	43	12	169	1.42	1.42	0.00	0.00	8.27	239.20	28.91	239.20	28.91
	44	13	151	1.06	1.06	0.00	0.00	8.54	160.29	18.78	160.29	18.78
	45	14	105	0.71	0.71	0.00	0.00	8.80	74.31	8.44	74.31	8.44
	46	15	74	0.35	0.35	0.00	0.00	9.06	26.18	2.89	26.18	2.89

SUM	19003.66	3705.77	18952.79	3654.90
SCOPon		5.13	SCOPnet	5.19



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

Calculation of reference SCOP

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

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	6.81	7.04	2.23	0.99	1.00	2.23
B	2	54	4.15	4.58	3.65	0.99	1.00	3.65
C	7	35	2.67	3.92	4.88	0.98	0.68	4.83
D	12	15	1.18	4.62	6.51	0.98	0.26	6.08
E	-10	100	7.70	6.11	1.85	0.99	1.00	1.85
F - BIV	-7	88	6.81	7.04	2.23	0.99	1.00	2.23

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	0.012	0.012	0
Thermostat off	178	0.017	0.017	3.026
Standby	0	0.012	0.012	0
Crankcase heater	178	0.012	0	0



Calculation Bin for SCOPon

	Bin	Outdoor temperature [°C]	Hours [h]	Heat load [kW]	Heat load covered by heat pump [kW]	Electrical back up heater [kW]	Annual backup heater energy input [kWh]	COPbin	Annual heating demand [kWh]	Annual energy input [kWh]	Net annual heating capacity [kWh]	Net annual power input [kWh]
E	21	-10	1	7.70	6.11	1.59	1.59	1.85	7.70	4.89	6.11	3.29
	22	-9	25	7.40	6.34	1.06	26.58	1.98	185.10	106.69	158.51	80.11
	23	-8	23	7.11	6.58	0.53	12.23	2.10	163.48	84.17	151.25	71.94
A / F - BIV	24	-7	24	6.81	6.81	0.00	0.00	2.23	163.48	73.43	163.48	73.43
	25	-6	27	6.52	6.52	0.00	0.00	2.38	175.92	73.79	175.92	73.79
	26	-5	68	6.22	6.22	0.00	0.00	2.54	422.91	166.38	422.91	166.38
	27	-4	91	5.92	5.92	0.00	0.00	2.70	539.00	199.66	539.00	199.66
	28	-3	89	5.63	5.63	0.00	0.00	2.86	500.80	175.26	500.80	175.26
	29	-2	165	5.33	5.33	0.00	0.00	3.02	879.58	291.70	879.58	291.70
	30	-1	173	5.03	5.03	0.00	0.00	3.17	870.99	274.49	870.99	274.49
	31	0	240	4.74	4.74	0.00	0.00	3.33	1137.23	341.41	1137.23	341.41
	32	1	280	4.44	4.44	0.00	0.00	3.49	1243.85	356.52	1243.85	356.52
B	33	2	320	4.15	4.15	0.00	0.00	3.65	1326.77	363.83	1326.77	363.83
	34	3	357	3.85	3.85	0.00	0.00	3.88	1374.45	353.87	1374.45	353.87
	35	4	356	3.55	3.55	0.00	0.00	4.12	1265.17	306.97	1265.17	306.97
	36	5	303	3.26	3.26	0.00	0.00	4.36	987.08	226.46	987.08	226.46
	37	6	330	2.96	2.96	0.00	0.00	4.60	977.31	212.64	977.31	212.64
C	38	7	326	2.67	2.67	0.00	0.00	4.83	868.92	179.77	868.92	179.77
	39	8	348	2.37	2.37	0.00	0.00	5.08	824.49	162.19	824.49	162.19
	40	9	335	2.07	2.07	0.00	0.00	5.33	694.48	130.21	694.48	130.21
	41	10	315	1.78	1.78	0.00	0.00	5.58	559.73	100.25	559.73	100.25
	42	11	215	1.48	1.48	0.00	0.00	5.83	318.37	54.58	318.37	54.58
D	43	12	169	1.18	1.18	0.00	0.00	6.08	200.20	32.91	200.20	32.91
	44	13	151	0.89	0.89	0.00	0.00	6.33	134.16	21.18	134.16	21.18
	45	14	105	0.59	0.59	0.00	0.00	6.58	62.19	9.45	62.19	9.45
	46	15	74	0.30	0.30	0.00	0.00	6.83	21.92	3.21	21.92	3.21

SUM	15905.24	4305.89	15864.83	4265.49
SCOPon	3.69		SCOPnet	3.72



Detailed test results

Detailed SCOP part load test results - low temperature application - 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	9.2
Heating demand:	kW	8.14
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:	Steady State	
Integrated liquid pump:	Yes	
Integrated liquid pump able to generate a positive ext. static pressure difference:	Yes	
Included corrections (Final result)		
Heating capacity	kW	7.890
COP	-	3.094
Power consumption	kW	2.551
Measured		
Heating capacity	kW	7.902
COP	-	3.084
Power consumption	kW	2.562
During heating		
Air_inlet temperature dry bulb	°C	-6.85
Air temperature wet bulb	°C	-7.86
Air_outlet temperature dry bulb	°C	1.01
Water_inlet temperature	°C	28.99
water_outlet temperature	°C	33.74
Water_outlet temperature (Time averaged)	°C	33.74
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	4533
Calculated Hydraulic power	W	2
Calculated global efficiency	η	0.14
Calculated Capacity correction	W	12
Calculated Power correction	W	13
Water Flow	m³/s	0.000400



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	9.2
Heating demand:	kW	4.95
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Transient
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	4.981
COP	-	5.015
Power consumption	kW	0.993
Measured		
Heating capacity	kW	4.991
COP	-	4.945
Power consumption	kW	1.009
During heating		
Air_inlet temperature dry bulb	°C	2.08
Air temperature wet bulb	°C	1.00
Water_inlet temperature	°C	25.04
water_outlet temperature	°C	30.04
Water_outlet temperature (Time averaged)	°C	30.04
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	5979
Calculated Hydraulic power	W	2
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	10
Calculated Power correction	W	12
Water Flow	m ³ /s	0.000258



Detailed result for 'EN14825:2022' Average Low (C) A 7 IW27		
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	9.2
Heating demand:	kW	3.18
CR:	-	0.8
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	4.164
COP	-	7.021
Power consumption	kW	0.593
Measured		
Heating capacity	kW	4.169
COP	-	6.965
Power consumption	kW	0.599
During heating		
Air_inlet temperature dry bulb	°C	6.97
Air temperature wet bulb	°C	5.94
Water_inlet temperature	°C	23.22
water_outlet temperature	°C	28.22
Water_outlet temperature (Time averaged)	°C	27.04
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	3870
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	6
Calculated Power correction	W	6
Water Flow	m ³ /s	0.000200



Detailed result for 'EN14825:2022' Average Low (D) A 12 IW24		
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	9.2
Heating demand:	kW	1.42
CR:	-	0.3
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	4.767
COP	-	8.895
Power consumption	kW	0.536
Measured		
Heating capacity	kW	4.778
COP	-	8.676
Power consumption	kW	0.551
During heating		
Air_inlet temperature dry bulb	°C	12.01
Air temperature wet bulb	°C	10.90
Water_inlet temperature	°C	22.46
water_outlet temperature	°C	27.49
Water_outlet temperature (Time averaged)	°C	23.95
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	7035
Calculated Hydraulic power	W	2
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	10
Calculated Power correction	W	12
Water Flow	m ³ /s	0.000228



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	9.2
Heating demand:	kW	9.20
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	7.424
COP	-	2.867
Power consumption	kW	2.590
Measured		
Heating capacity	kW	7.435
COP	-	2.849
Power consumption	kW	2.610
During heating		
Air_inlet temperature dry bulb	°C	-10.01
Air temperature wet bulb	°C	-11.00
Water_inlet temperature	°C	30.01
water_outlet temperature	°C	35.05
Water_outlet temperature (Time averaged)	°C	35.05
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	4916
Calculated Hydraulic power	W	2
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	11
Calculated Power correction	W	13
Water Flow	m ³ /s	0.000355



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

Detailed result for 'EN14825:2022' Average Medium (A and F) A -7 IW52		
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	7.70
Heating demand:	kW	6.81
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	7.043
COP	-	2.226
Power consumption	kW	3.164
Measured		
Heating capacity	kW	7.046
COP	-	2.222
Power consumption	kW	3.171
During heating		
Air_inlet temperature dry bulb	°C	-6.90
Air temperature wet bulb	°C	-7.95
Water_inlet temperature	°C	44.01
water_outlet temperature	°C	52.14
Water_outlet temperature (Time averaged)	°C	52.14
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	2415
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	4
Calculated Power correction	W	4
Water Flow	m ³ /s	0.000210



Detailed result for 'EN14825:2022' Average Medium (B) A 2 IW42		
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	7.70
Heating demand:	kW	4.15
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	4.578
COP	-	3.647
Power consumption	kW	1.255
Measured		
Heating capacity	kW	4.581
COP	-	3.647
Power consumption	kW	1.256
During heating		
Air_inlet temperature dry bulb	°C	2.04
Air temperature wet bulb	°C	1.04
Water_inlet temperature	°C	34.05
water_outlet temperature	°C	42.22
Water_outlet temperature (Time averaged)	°C	42.22
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	2800
Calculated Hydraulic power	W	0
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	3
Calculated Power correction	W	3
Water Flow	m ³ /s	0.000135



Detailed result for 'EN14825:2022' Average Medium (C) A 7 IW36		
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	7.70
Heating demand:	kW	2.67
CR:	-	0.7
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	3.919
COP	-	4.882
Power consumption	kW	0.803
Measured		
Heating capacity	kW	3.924
COP	-	4.859
Power consumption	kW	0.808
During heating		
Air_inlet temperature dry bulb	°C	7.00
Air temperature wet bulb	°C	6.00
Water_inlet temperature	°C	30.36
water_outlet temperature	°C	38.49
Water_outlet temperature (Time averaged)	°C	35.89
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	6635
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	6
Calculated Power correction	W	6
Water Flow	m ³ /s	0.000116



Detailed result for 'EN14825:2022' Average Medium (D) A 12 IW30		
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	7.70
Heating demand:	kW	1.18
CR:	-	0.3
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	4.618
COP	-	6.506
Power consumption	kW	0.710
Measured		
Heating capacity	kW	4.626
COP	-	6.481
Power consumption	kW	0.714
During heating		
Air_inlet temperature dry bulb	°C	11.98
Air temperature wet bulb	°C	11.00
Water_inlet temperature	°C	27.94
water_outlet temperature	°C	35.98
Water_outlet temperature (Time averaged)	°C	30.00
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	8612
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	8
Calculated Power correction	W	9
Water Flow	m ³ /s	0.000139



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	7.70
Heating demand:	kW	7.70
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	6.105
COP	-	1.855
Power consumption	kW	3.291
Measured		
Heating capacity	kW	6.109
COP	-	1.853
Power consumption	kW	3.296
During heating		
Air_inlet temperature dry bulb	°C	-9.91
Air temperature wet bulb	°C	-10.83
Water_inlet temperature	°C	47.00
water_outlet temperature	°C	54.95
Water_outlet temperature (Time averaged)	°C	54.95
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	3182
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	4
Calculated Power correction	W	5
Water Flow	m ³ /s	0.000186



Detailed SCOP part load test results - low temperature application - warmer climate – EN 1482

Detailed result for 'EN14825:2022' Warmer Low (B) A 2 W35		
Tested according to:	EN14511:2022 and EN14825:2022	
Climate zone:		Warmer
Temperature application:		Low
Condition name:		B
Condition temperature:	°C	2
Part load:	%	100%
Chosen Tbivalent	°C	-7
Tdesign	°C	2
Pdesign	kW	8.60
Heating demand:	kW	8.60
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Transient
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	8.315
COP	-	3.753
Power consumption	kW	2.215
Measured		
Heating capacity	kW	8.329
COP	-	3.728
Power consumption	kW	2.234
During heating		
Air_inlet temperature dry bulb	°C	2.00
Air temperature wet bulb	°C	1.00
Air_outlet temperature dry bulb	°C	1.02
Water_inlet temperature	°C	30.07
water_outlet temperature	°C	35.04
Water_outlet temperature (Time averaged)	°C	35.04
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	5521
Calculated Hydraulic power	W	2
Calculated global efficiency	η	0.14
Calculated Capacity correction	W	15
Calculated Power correction	W	17
Water Flow	m ³ /s	0.000441



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

Detailed result for 'EN14825:2022' Colder Low (A) A -7 IW30		
Tested according to:	EN14511:2022 and EN14825:2022	
Climate zone:		Colder
Temperature application:		Low
Condition name:		A
Condition temperature:	°C	-7
Part load:	%	61%
Chosen Tbivalent	°C	-15
Tdesign	°C	-22
Pdesign	kW	7.70
Heating demand:	kW	4.66
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	4.876
COP	-	3.842
Power consumption	kW	1.269
Measured		
Heating capacity	kW	4.882
COP	-	3.822
Power consumption	kW	1.278
During heating		
Air_inlet temperature dry bulb	°C	-7.00
Air temperature wet bulb	°C	-7.99
Water_inlet temperature	°C	25.00
water_outlet temperature	°C	29.97
Water_outlet temperature (Time averaged)	°C	29.97
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	3411
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	6
Calculated Power correction	W	7
Water Flow	m ³ /s	0.000236



Detailed result for 'EN14825:2022' Colder Low (F and G) A -15 W32		
Tested according to:	EN14511:2022 and EN14825:2022	
Climate zone:		Colder
Temperature application:		Low
Condition name:		F and G
Condition temperature:	°C	-15
Part load:	%	82%
Chosen Tbivalent	°C	-15
Tdesign	°C	-22
Pdesign	kW	7.70
Heating demand:	kW	6.28
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	6.516
COP	-	2.673
Power consumption	kW	2.437
Measured		
Heating capacity	kW	6.518
COP	-	2.673
Power consumption	kW	2.439
During heating		
Air_inlet temperature dry bulb	°C	-15.01
Air temperature wet bulb	°C	-
Water_inlet temperature	°C	27.01
water_outlet temperature	°C	32.16
Water_outlet temperature (Time averaged)	°C	32.16
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	1087
Calculated Hydraulic power	W	0
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	3
Calculated Power correction	W	3
Water Flow	m ³ /s	0.000304



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:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	9.900
COP	-	4.815
Power consumption	kW	2.056
Measured		
Heating capacity	kW	9.907
COP	-	4.800
Power consumption	kW	2.064
During heating		
Air_inlet temperature dry bulb	°C	7.00
Air temperature wet bulb	°C	6.00
Water_inlet temperature	°C	29.94
water_outlet temperature	°C	34.93
Water_outlet temperature (Time averaged)		
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	1996
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	7
Calculated Power correction	W	8
Water Flow	m ³ /s	0.000478

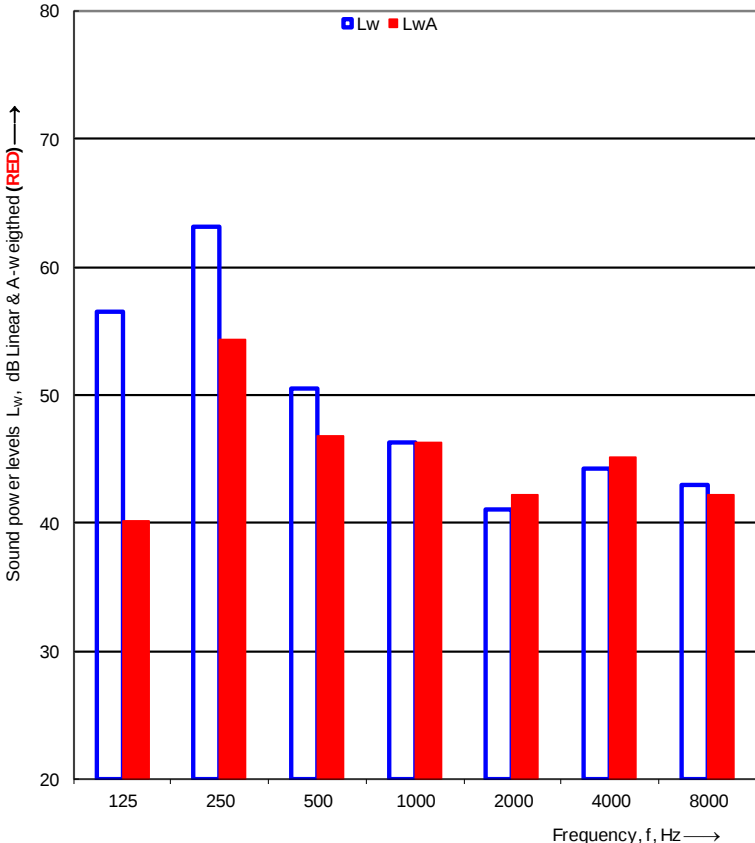


Detailed COP test results - medium temperature – EN 14511

Detailed result for 'EN14511:2022' A7/W55		
Tested according to:		EN14511:2022
Minimum flow reached:		No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positive ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	9.080
COP	-	2.958
Power consumption	kW	3.070
Measured		
Heating capacity	kW	9.089
COP	-	2.951
Power consumption	kW	3.080
During heating		
Air_inlet temperature dry bulb	°C	6.99
Air temperature wet bulb	°C	5.99
Water_inlet temperature	°C	47.01
water_outlet temperature	°C	54.99
Water_outlet temperature (Time averaged)		
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	4824
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	9
Calculated Power correction	W	10
Water Flow	m ³ /s	0.000276



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: Midea		Date of test: 19-03-2024																																																																					
Object: Type: Mono air to water heat pump, Model: MHC-V10W/D2N8-BER90																																																																							
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 (20x20x2.5 cm). All of these are placed in a water drop tray 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: A7W55, Compressor speed: 37[Hz], Fan speed: 400[rpm], Pump speed: 35[%], EXV1: 80[%], Heating capacity: 3.95 [kW], Power_input: 1.43 [kW], Water flow rate: 430 [l/h] and dP_water: 70 [mbar]																																																																							
Static pressure: 1018 hPa		Reference box:																																																																					
Air temperature: 7.0 °C		L1: 1.4 m																																																																					
Relative air humidity: 84.0 %		L2: 0.4 m																																																																					
Test room volume: 102.8 m³		Room: Room 2		L3: 0.9 m																																																																			
Area, S, of test room: 138.9 m²		Volume: 0.5 m³																																																																					
<table border="1"><thead><tr><th>Frequency f [Hz]</th><th>L_w 1/3 octave [dB]</th><th>1/1 oct [dB]</th></tr></thead><tbody><tr><td>100</td><td>54.1¹</td><td></td></tr><tr><td>125</td><td>47.8²</td><td>56.5²</td></tr><tr><td>160</td><td>51.0²</td><td></td></tr><tr><td>200</td><td>60.2</td><td></td></tr><tr><td>250</td><td>56.7</td><td>63.1</td></tr><tr><td>315</td><td>57.4</td><td></td></tr><tr><td>400</td><td>47.8</td><td></td></tr><tr><td>500</td><td>44.8</td><td>50.5</td></tr><tr><td>630</td><td>43.2</td><td></td></tr><tr><td>800</td><td>41.5</td><td></td></tr><tr><td>1000</td><td>40.7</td><td>46.2</td></tr><tr><td>1250</td><td>42.1</td><td></td></tr><tr><td>1600</td><td>37.0</td><td></td></tr><tr><td>2000</td><td>35.8</td><td>41.1</td></tr><tr><td>2500</td><td>36.0</td><td></td></tr><tr><td>3150</td><td>40.8</td><td></td></tr><tr><td>4000</td><td>37.3</td><td>44.2</td></tr><tr><td>5000</td><td>39.6</td><td></td></tr><tr><td>6300</td><td>40.1</td><td></td></tr><tr><td>8000</td><td>37.2</td><td>42.9</td></tr><tr><td>10000</td><td>36.1</td><td></td></tr></tbody></table>		Frequency f [Hz]	L _w 1/3 octave [dB]	1/1 oct [dB]	100	54.1 ¹		125	47.8 ²	56.5 ²	160	51.0 ²		200	60.2		250	56.7	63.1	315	57.4		400	47.8		500	44.8	50.5	630	43.2		800	41.5		1000	40.7	46.2	1250	42.1		1600	37.0		2000	35.8	41.1	2500	36.0		3150	40.8		4000	37.3	44.2	5000	39.6		6300	40.1		8000	37.2	42.9	10000	36.1					
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¹ Diff. to backgr. noise < 6dB ² Correction																																																																							
Sound power level L _w (A):		56.4 dB [re 1pW]		Uncertainty σ_{tot} : 1.7 dB																																																																			
Name of test institute: DTI		Date: 19-03-2024																																																																					
No. of test report: 300-KLAB-23-042																																																																							
Measurements are in full conformity with ISO 3743-1																																																																							



Appendix 1

Unit specification

Type of unit: Mono air to water heat pump
Manufacturer: Midea
Size of the heat pump: 0.4 x 1.4 x 0.9 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 wall reverberant room (103 m³) 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 during 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	Nor0sonic 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
- σ_{omc} is the standard deviation describing the uncertainty associated with the instability of the operating and mounting conditions for the particular noise source during 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 characteristics of the noise source during test.

σ_{omc} expresses the uncertainty associated with the instability of the operating and mounting conditions for the particular noise source during 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. 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:
 $U = k \sigma_{\text{tot}}$ where $k = 2$ for 95% confidence.

EXAMPLE: $\sigma_{\text{tot}}: \sqrt{1.5^2 + 0.7^2} = 1.7 \text{ dB}$ and $U(95\%) = 3.4 \text{ dB}$

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



EU Declaration of Consistency

Product: Air source heat pump

Brand: Beretta

Manufacturer' s Name: GD Midea HEATING&VENTILATING Equipment Co.,Ltd.

Manufacturer' s Address: Midea Industrial City, Shunde, Foshan, Guangdong, P.R. China

Importer' s Name: Riello S.p.A

Importer' s Address: VIA ING. PILADE RIELLO 7, 37045 LEGNAGO VR (ITALY), Italy

We, GD Midea Heating & Ventilating Equipment Co., Ltd, hereby declare that the following Heat Pump we produced for Riello S.p.A are identical to our following models, except for the model name, for the labels and for the manuals.

Midea model name	Model names (per brand) for Riello SpA
	BERETTA
MHC-V4W/D2N8-B	HYDRO UNIT M 004
MHC-V6W/D2N8-B	HYDRO UNIT M 006
MHC-V8W/D2N8-B	HYDRO UNIT M 008
MHC-V10W/D2N8-B	HYDRO UNIT M 010
MHC-V12W/D2N8-B	HYDRO UNIT M 012
MHC-V14W/D2N8-B	HYDRO UNIT M 014
MHC-V16W/D2N8-B	HYDRO UNIT M 016
MHC-V12W/D2RN8-B	HYDRO UNIT M 012T
MHC-V14W/D2RN8-B	HYDRO UNIT M 014T
MHC-V16W/D2RN8-B	HYDRO UNIT M 016T
MHC-V18W/D2RN8-B	HYDRO UNIT M 018T
MHC-V22W/D2RN8-B	HYDRO UNIT M 022T
MHC-V26W/D2RN8-B	HYDRO UNIT M 026T
MHC-V30W/D2RN8-B	HYDRO UNIT M 030T

广东美的暖通设备有限公司 GD Midea Heating & Ventilating Equipment Co., Ltd.

地址：中国广东省佛山市顺德区北滘镇美的工业城 邮编：528311

Address: Midea Industrial City, Beijiao, Shunde, Foshan, Guangdong, P.R. China Postcode: 528311

电话 Tel: +86-757-26338495 传真 Fax: +86-757-22390205 网址 Website: <http://www.midea.com> <http://cac.midea.com>





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

Production year: From 2022

Year of affixing CE Marking: From 2022

Address: Midea Industrial City, Beijiao, Shunde, Foshan, Guangdong, P.R.C.

Date : 28/03/2024

Authorization:



广东美的暖通设备有限公司 GD Midea Heating & Ventilating Equipment Co. , Ltd.

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