

TEST REPORT

Report no.:
300-KLAB-23-040-2



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Enclosures: 1

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-V6W/D2N8-B
Series no.: 341H09752012A250100012
Prod. year: Outdoor unit: N/A
Dates: Teste period: January 2024

Brand name: Brand: NETSU
Type: Air to water heat pump (mono block)
Model: M-NET-II-06-1PH

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-23-040 issued 2024.03.12 Also see appendix 2.

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Division/Centre: Danish Technological Institute
Energy and Climate
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Date: 2024.04.16

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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 conditions $SCOP_C$ and $SCOP_{B\&F}$ at low temperature application for warmer climate according to EN 14825:2022.

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

COP test standard rating conditions (heating mode) at low and medium temperature 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 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	$(-7 - 16) / (T_{\text{designh}} - 16)$	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	
	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	
	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	-	14	415 L/h	Starting
2	-25	-	35	415 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	47	55	Indoor
2	7	6	47	55	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	47	55

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 ^F	7/6	30/35	66	550	6.46	1.23
2 ^P	7/6	30/35	30	400	3.06	0.57
3 ^F	7/6	47/55	66	550	6.13	2.06
4 ^E	7/6	47/55	38	400	3.19	1.14

F) Full load, P) part load, E) ErP labelling



Test results

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

Model (Outdoor)	MHC-V6W/D2N8-B
Air-to-water heat pump mono bloc	Y
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	N
Reversible	Y

Rated heat output ¹⁾	P_{rated}	6.8 [kW]
Seasonal space heating energy efficiency	η_s	192.8 [%]
	SCOP	4.89 [-]

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}	5.74 [kW]
		$T_j = 2\text{ °C}$	P_{dh}	3.72 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	3.21 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	3.76 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	5.74 [kW]
		$T_j = \text{operation limit}$	P_{dh}	5.39 [kW]

Measured coefficient of performance at outdoor temperature T_j	Average Climate - Low temperature application	$T_j = -15\text{ °C}$	COP_d	- [-]
		$T_j = -7\text{ °C}$	COP_d	3.02 [-]
		$T_j = 2\text{ °C}$	COP_d	4.76 [-]
		$T_j = 7\text{ °C}$	COP_d	6.79 [-]
		$T_j = 12\text{ °C}$	COP_d	8.85 [-]
		$T_j = \text{bivalent temperature}$	COP_d	3.02 [-]
		$T_j = \text{operation limit}$	COP_d	2.68 [-]

Bivalent temperature	$T_{bivalent}$	-7 [°C]
Operation limit temperatures	TOL	-10 [°C]
	WTOL	- [°C]
Degradation coefficient	C_{dh}	0.95 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.015 [kW]
	Thermostat-off mode	P_{TO}	0.020 [kW]
	Standby mode	P_{SB}	0.015 [kW]
	Crankcase heater mode ²⁾	P_{CK}	0.015 [kW]
Supplementary heater ¹⁾	Rated heat output	P_{SUP}	1.41 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	2870 [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 page 15



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

Model (Outdoor)	MHC-V6W/D2N8-B
Air-to-water heat pump mono bloc	Y
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	N
Reversible	Y

Rated heat output¹⁾	P_{rated}	5.7 [kW]
Seasonal space heating energy efficiency	η_s	140.4 [%]
	SCOP	3.58 [-]

Measured capacity for heating for part load at outdoor temperature T_j	Average Climate - Medium temperature application	$T_j = -15\text{ °C}$	P_{dh}	- [kW]
		$T_j = -7\text{ °C}$	P_{dh}	5.18 [kW]
		$T_j = 2\text{ °C}$	P_{dh}	3.13 [kW]
		$T_j = 7\text{ °C}$	P_{dh}	2.94 [kW]
		$T_j = 12\text{ °C}$	P_{dh}	3.59 [kW]
		$T_j = \text{bivalent temperature}$	P_{dh}	5.18 [kW]
		$T_j = \text{operation limit}$	P_{dh}	4.49 [kW]

Measured coefficient of performance at outdoor temperature T_j	Average Climate - Medium temperature application	$T_j = -15\text{ °C}$	COPd	- [-]
		$T_j = -7\text{ °C}$	COPd	2.13 [-]
		$T_j = 2\text{ °C}$	COPd	3.58 [-]
		$T_j = 7\text{ °C}$	COPd	4.74 [-]
		$T_j = 12\text{ °C}$	COPd	6.39 [-]
		$T_j = \text{bivalent temperature}$	COPd	2.13 [-]
		$T_j = \text{operation limit}$	COPd	1.83 [-]

Bivalent temperature	$T_{bivalent}$	-7 [°C]
Operation limit temperatures	TOL	-10 [°C]
Degradation coefficient	WTOL	- [°C]
	C_{dh}	0.96 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.015 [kW]
	Thermostat-off mode	P_{TO}	0.020 [kW]
	Standby mode	P_{SB}	0.015 [kW]
	Crankcase heater mode ²⁾	P_{CK}	0.015 [kW]
Supplementary heater¹⁾	Rated heat output	P_{SUP}	1.21 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	3286 [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 page 17



Test results for warmer climate, low temperature according to EN14825

N°	Test condition	Heating capacity [kW]	COP
1	B	5.895	3.817
2	Tbivalent C and F	3.994	6.027

Test results for colder climate, low temperature according to EN14825

N°	Test condition	Heating capacity [kW]	COP
1	A	3.392	3.736
2	Tbivalent F & G	4.526	2.365

COP test results - low temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W35	6.462	4.996

COP test results - medium temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W55	6.127	2.979



Test results of sound power measurements – EN 12102

N [#]	Test conditions	Sound power level LW(A) [dB re 1pW]	Uncertainty σ_{tot} [dB]
1 ^F	A7/W35	57.1	1.6
2 ^P	A7/W35	48.9	1.6
3 ^F	A7/W55	60.1	1.6
4 ^E	A7/55	50.7	1.6

F) Full load, P) part load, E) ErP labelling

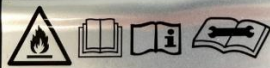
The A-weighted total sound power level is determined for the measured frequency range from 100 Hz to 10 kHz. For the calculation of uncertainty, see appendix 1.

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



Photos

Rating plate (outdoor unit)

	
MONOBLOC HEAT PUMP	
MODEL	MHC-V6W/D2N8-B
COOLING CAPACITY/EER @ A35W18	6.50kW / 4.80
HEATING CAPACITY/COP @ A7W35	6.35kW / 4.95
POWER SOURCE	220-240V~ 50Hz
RATED INPUT	2700W
RATED WATER PRESSURE	0.1-0.3MPa
NET WEIGHT	86kg
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	
	
GD Midea Heating & Ventilating Equipment Co., Ltd.	
(Pengjia Industry Road, Beijing, Shunde, Foshan, Guangdong, P.R. China)	



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	6.02	5.74	3.02	0.99	1.00	3.02
B	2	54	3.66	3.72	4.76	0.97	1.00	4.76
C	7	35	2.35	3.21	6.79	0.96	0.73	6.68
D	12	15	1.05	3.76	8.85	0.95	0.28	7.90
E	-10	100	6.80	5.39	2.68	0.99	1.00	2.68
F - BIV	-7	88	6.02	5.74	3.02	0.99	1.00	3.02

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	0.0149	0.0149	0
Thermostat off	178	0.0197	0.0197	3.5066
Standby	0	0.0149	0.0149	0
Crankcase heater	178	0.0149	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	6.80	5.39	1.41	1.41	2.68	6.80	3.42	5.39	2.01
	22	-9	25	6.54	5.51	1.03	25.77	2.80	163.46	75.03	137.69	49.26
	23	-8	23	6.28	5.62	0.65	15.03	2.91	144.37	59.54	129.34	44.51
A / F - BIV	24	-7	24	6.02	5.74	0.00	0.00	3.02	144.37	47.85	144.37	47.85
	25	-6	27	5.75	5.51	0.00	0.00	3.21	155.35	48.39	155.35	48.39
	26	-5	68	5.49	5.28	0.00	0.00	3.40	373.48	109.73	373.48	109.73
	27	-4	91	5.23	5.05	0.00	0.00	3.60	476.00	132.33	476.00	132.33
	28	-3	89	4.97	4.82	0.00	0.00	3.79	442.26	116.68	442.26	116.68
	29	-2	165	4.71	4.58	0.00	0.00	3.98	776.77	194.99	776.77	194.99
	30	-1	173	4.45	4.35	0.00	0.00	4.18	769.18	184.15	769.18	184.15
	31	0	240	4.18	4.12	0.00	0.00	4.37	1004.31	229.80	1004.31	229.80
	32	1	280	3.92	3.89	0.00	0.00	4.56	1098.46	240.70	1098.46	240.70
B	33	2	320	3.66	3.66	0.00	0.00	4.76	1171.69	246.31	1171.69	246.31
	34	3	357	3.40	3.40	0.00	0.00	5.14	1213.80	236.03	1213.80	236.03
	35	4	356	3.14	3.14	0.00	0.00	5.53	1117.29	202.12	1117.29	202.12
	36	5	303	2.88	2.88	0.00	0.00	5.91	871.71	147.41	871.71	147.41
	37	6	330	2.62	2.62	0.00	0.00	6.30	863.08	137.02	863.08	137.02
C	38	7	326	2.35	2.35	0.00	0.00	6.68	767.35	114.80	767.35	114.80
	39	8	348	2.09	2.09	0.00	0.00	6.93	728.12	105.11	728.12	105.11
	40	9	335	1.83	1.83	0.00	0.00	7.17	613.31	85.54	613.31	85.54
	41	10	315	1.57	1.57	0.00	0.00	7.41	494.31	66.68	494.31	66.68
	42	11	215	1.31	1.31	0.00	0.00	7.66	281.15	36.73	281.15	36.73
D	43	12	169	1.05	1.05	0.00	0.00	7.90	176.80	22.38	176.80	22.38
	44	13	151	0.78	0.78	0.00	0.00	8.14	118.48	14.55	118.48	14.55
	45	14	105	0.52	0.52	0.00	0.00	8.38	54.92	6.55	54.92	6.55
	46	15	74	0.26	0.26	0.00	0.00	8.63	19.35	2.24	19.35	2.24
SUM									14046.18	2866.09	14003.97	2823.88
SCOPon										4.90	SCOPnet	4.96



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	5.04	5.18	2.13	0.99	1.00	2.13
B	2	54	3.07	3.13	3.58	0.98	1.00	3.58
C	7	35	1.97	2.94	4.74	0.97	0.67	4.67
D	12	15	0.88	3.59	6.39	0.96	0.24	5.77
E	-10	100	5.70	4.49	1.83	0.99	1.00	1.83
F - BIV	-7	88	5.04	5.18	2.13	0.99	1.00	2.13

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	0.0149	0.0149	0
Thermostat off	178	0.0197	0.0197	3.5066
Standby	0	0.0149	0.0149	0
Crankcase heater	178	0.0149	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	5.70	4.49	1.21	1.21	1.83	5.70	3.66	4.49	2.46
	22	-9	25	5.48	4.67	0.81	20.15	1.93	137.02	80.72	116.87	60.57
	23	-8	23	5.26	4.86	0.40	9.27	2.03	121.02	64.33	111.75	55.06
A / F - BIV	24	-7	24	5.04	5.04	0.00	0.00	2.13	121.02	56.81	121.02	56.81
	25	-6	27	4.82	4.82	0.00	0.00	2.29	130.22	56.84	130.22	56.84
	26	-5	68	4.60	4.60	0.00	0.00	2.45	313.06	127.69	313.06	127.69
	27	-4	91	4.38	4.38	0.00	0.00	2.61	399.00	152.72	399.00	152.72
	28	-3	89	4.17	4.17	0.00	0.00	2.77	370.72	133.66	370.72	133.66
	29	-2	165	3.95	3.95	0.00	0.00	2.93	651.12	221.89	651.12	221.89
	30	-1	173	3.73	3.73	0.00	0.00	3.10	644.76	208.30	644.76	208.30
	31	0	240	3.51	3.51	0.00	0.00	3.26	841.85	258.53	841.85	258.53
	32	1	280	3.29	3.29	0.00	0.00	3.42	920.77	269.46	920.77	269.46
	33	2	320	3.07	3.07	0.00	0.00	3.58	982.15	274.50	982.15	274.50
B	34	3	357	2.85	2.85	0.00	0.00	3.80	1017.45	268.03	1017.45	268.03
	35	4	356	2.63	2.63	0.00	0.00	4.01	936.55	233.31	936.55	233.31
	36	5	303	2.41	2.41	0.00	0.00	4.23	730.70	172.65	730.70	172.65
	37	6	330	2.19	2.19	0.00	0.00	4.45	723.46	162.56	723.46	162.56
C	38	7	326	1.97	1.97	0.00	0.00	4.67	643.22	137.78	643.22	137.78
	39	8	348	1.75	1.75	0.00	0.00	4.89	610.34	124.87	610.34	124.87
	40	9	335	1.53	1.53	0.00	0.00	5.11	514.10	100.66	514.10	100.66
	41	10	315	1.32	1.32	0.00	0.00	5.33	414.35	77.79	414.35	77.79
	42	11	215	1.10	1.10	0.00	0.00	5.55	235.67	42.49	235.67	42.49
D	43	12	169	0.88	0.88	0.00	0.00	5.77	148.20	25.70	148.20	25.70
	44	13	151	0.66	0.66	0.00	0.00	5.98	99.31	16.59	99.31	16.59
	45	14	105	0.44	0.44	0.00	0.00	6.20	46.04	7.42	46.04	7.42
	46	15	74	0.22	0.22	0.00	0.00	6.42	16.22	2.53	16.22	2.53

SUM	11774.01	3281.51	11743.38	3250.88
SCOPon		3.59	SCOPnet	3.61



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	6.80
Heating demand:	kW	6.02
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Transient
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	5.739
COP	-	3.017
Power consumption	kW	1.902
Measured		
Heating capacity	kW	5.746
COP	-	3.007
Power consumption	kW	1.911
During heating		
Air temperature dry bulb	°C	-7.00
Air temperature wet bulb	°C	-8.12
Inlet temperature	°C	29.02
Outlet temperature	°C	33.99
Outlet temperature (Time averaged)	°C	33.99
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	3774
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	8
Calculated Power correction	W	9
Water Flow	m³/s	0.000295



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	6.80
Heating demand:	kW	3.66
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:	Transient	
Integrated circulation pump:	Yes	
Included corrections (Final result)		
Heating capacity	kW	3.716
COP	-	4.757
Power consumption	kW	0.781
Measured		
Heating capacity	kW	3.724
COP	-	4.709
Power consumption	kW	0.791
During heating		
Air temperature dry bulb	°C	2.09
Air temperature wet bulb	°C	0.95
Inlet temperature	°C	25.00
Outlet temperature	°C	29.86
Outlet temperature (Time averaged)	°C	29.86
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	6441
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	8
Calculated Power correction	W	10
Water Flow	m ³ /s	0.000193



Detailed result for 'EN14825:2022' Average Low (C) A 7 /W27		
Tested according to:	EN14511:2022 and EN14825:2022	
Climate zone:	Average	
Temperature application:	Low	
Condition name:	C	
Condition temperature:	°C	7
Part load:	%	35%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	6.80
Heating demand:	kW	2.35
CR:	-	0.7
Minimum flow reached:	-	No
Measurement type:	Steady State	
Integrated circulation pump:	Yes	
Included corrections (Final result)		
Heating capacity	kW	3.214
COP	-	6.786
Power consumption	kW	0.474
Measured		
Heating capacity	kW	3.222
COP	-	6.671
Power consumption	kW	0.483
During heating		
Air temperature dry bulb	°C	7.00
Air temperature wet bulb	°C	6.01
Inlet temperature	°C	23.23
Outlet temperature	°C	28.22
Outlet temperature (Time averaged)	°C	26.88
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	7725
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	8
Calculated Power correction	W	9
Water Flow	m³/s	0.000155



Detailed result for 'EN14825:2022' Average Low (D) A 12 /W24

Tested according to:		EN14511:2022 and EN14825:2022	
Climate zone:		Average	
Temperature application:		Low	
Condition name:		D	
Condition temperature:	°C	12	
Part load:	%	15%	
Chosen Tbivalent	°C	-7	
Tdesign	°C	-10	
Pdesign	kW	6.80	
Heating demand:	kW	1.05	
CR:	-	0.3	
Minimum flow reached:	-	No	
Measurement type:		Steady State	
Integrated circulation pump:		Yes	
Included corrections (Final result)			
Heating capacity	kW	3.760	
COP	-	8.848	
Power consumption	kW	0.425	
Measured			
Heating capacity	kW	3.766	
COP	-	8.724	
Power consumption	kW	0.432	
During heating			
Air temperature dry bulb	°C	12.00	
Air temperature wet bulb	°C	10.92	
Inlet temperature	°C	22.61	
Outlet temperature	°C	27.47	
Outlet temperature (Time averaged)	°C	23.96	
Circulation pump			
Measured: Static differential pressure, liquid pump	Pa		4440
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		0.000185



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	6.80
Heating demand:	kW	6.80
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:	Steady State	
Integrated circulation pump:	Yes	
Included corrections (Final result)		
Heating capacity	kW	5.392
COP	-	2.684
Power consumption	kW	2.009
Measured		
Heating capacity	kW	5.404
COP	-	2.672
Power consumption	kW	2.023
During heating		
Air temperature dry bulb	°C	-10.00
Air temperature wet bulb	°C	-11.02
Inlet temperature	°C	29.99
Outlet temperature	°C	34.96
Outlet temperature (Time averaged)	°C	34.96
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	7052
Calculated Hydraulic power	W	2
Calculated global efficiency	η	0.14
Calculated Capacity correction	W	12
Calculated Power correction	W	14
Water Flow	m³/s	0.000261



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 /W52		
Tested according to:	EN14511:2022 and EN14825:2022	
Climate zone:	Average	
Temperature application:	Medium	
Condition name:	A and F	
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	5.70
Heating demand:	kW	5.04
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:	Steady State	
Integrated circulation pump:	Yes	
Included corrections (Final result)		
Heating capacity	kW	5.180
COP	-	2.130
Power consumption	kW	2.433
Measured		
Heating capacity	kW	5.188
COP	-	2.125
Power consumption	kW	2.441
During heating		
Air temperature dry bulb	°C	-6.98
Air temperature wet bulb	°C	-8.01
Inlet temperature	°C	44.00
Outlet temperature	°C	52.01
Outlet temperature (Time averaged)	°C	52.01
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	7038
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	8
Calculated Power correction	W	9
Water Flow	m³/s	0.000156



Detailed result for 'EN14825:2022' Average Medium (B) A 2 /W42

Tested according to:		EN14511:2022 and EN14825:2022	
Climate zone:		Average	
Temperature application:		Medium	
Condition name:		B	
Condition temperature:	°C	2	
Part load:	%	54%	
Chosen Tbivalent	°C	-7	
Tdesign	°C	-10	
Pdesign	kW	5.70	
Heating demand:	kW	3.07	
CR:	-	1.0	
Minimum flow reached:	-	No	
Measurement type:		Steady State	
Integrated circulation pump:		Yes	
Included corrections (Final result)			
Heating capacity	kW	3.134	
COP	-	3.578	
Power consumption	kW	0.876	
Measured			
Heating capacity	kW	3.138	
COP	-	3.564	
Power consumption	kW	0.880	
During heating			
Air temperature dry bulb	°C	2.10	
Air temperature wet bulb	°C	1.01	
Inlet temperature	°C	35.01	
Outlet temperature	°C	41.85	
Outlet temperature (Time averaged)	°C	41.85	
Circulation pump			
Measured: Static differential pressure, liquid pump	Pa	4813	
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	0.000110	



Detailed result for 'EN14825:2022' Average Medium (C) A 7 /W36

Tested according to:		EN14511:2022 and EN14825:2022	
Climate zone:		Average	
Temperature application:		Medium	
Condition name:		C	
Condition temperature:	°C	7	
Part load:	%	35%	
Chosen Tbivalent	°C	-7	
Tdesign	°C	-10	
Pdesign	kW	5.70	
Heating demand:	kW	1.97	
CR:	-	0.7	
Minimum flow reached:	-	Yes	
Measurement type:		Steady State	
Integrated circulation pump:		Yes	
Included corrections (Final result)			
Heating capacity	kW	2.938	
COP	-	4.741	
Power consumption	kW	0.620	
Measured			
Heating capacity	kW	2.945	
COP	-	4.695	
Power consumption	kW	0.627	
During heating			
Air temperature dry bulb	°C	7.00	
Air temperature wet bulb	°C	6.00	
Inlet temperature	°C	31.81	
Outlet temperature	°C	38.11	
Outlet temperature (Time averaged)	°C	36.04	
Circulation pump			
Measured: Static differential pressure, liquid pump	Pa		8300
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		0.000112



Detailed result for 'EN14825:2022' Average Medium (D) A 12 /W30

Tested according to:		EN14511:2022 and EN14825:2022	
Climate zone:		Average	
Temperature application:		Medium	
Condition name:		D	
Condition temperature:	°C		12
Part load:	%		15%
Chosen Tbivalent	°C		-7
Tdesign	°C		-10
Pdesign	kW		5.70
Heating demand:	kW		0.88
CR:	-		0.2
Minimum flow reached:	-		Yes
Measurement type:		Steady State	
Integrated circulation pump:		Yes	
Included corrections (Final result)			
Heating capacity	kW		3.589
COP	-		6.391
Power consumption	kW		0.562
Measured			
Heating capacity	kW		3.593
COP	-		6.343
Power consumption	kW		0.566
During heating			
Air temperature dry bulb	°C		12.00
Air temperature wet bulb	°C		10.90
Inlet temperature	°C		28.11
Outlet temperature	°C		35.79
Outlet temperature (Time averaged)	°C		29.98
Circulation pump			
Measured: Static differential pressure, liquid pump	Pa		5273
Calculated Hydraulic power	W		1
Calculated global efficiency	η		0.12
Calculated Capacity correction	W		4
Calculated Power correction	W		5
Water Flow	m³/s		0.000112



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	5.70
Heating demand:	kW	5.70
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:	Steady State	
Integrated circulation pump:	Yes	
Included corrections (Final result)		
Heating capacity	kW	4.491
COP	-	1.829
Power consumption	kW	2.455
Measured		
Heating capacity	kW	4.496
COP	-	1.827
Power consumption	kW	2.461
During heating		
Air temperature dry bulb	°C	-10.03
Air temperature wet bulb	°C	-11.14
Inlet temperature	°C	46.99
Outlet temperature	°C	55.08
Outlet temperature (Time averaged)	°C	55.08
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	5299
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	5
Calculated Power correction	W	6
Water Flow	m³/s	0.000135



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

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	6.10
Heating demand:	kW	6.10
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:	Transient	
Integrated circulation pump:	Yes	
Included corrections (Final result)		
Heating capacity	kW	5.895
COP	-	3.817
Power consumption	kW	1.544
Measured		
Heating capacity	kW	5.906
COP	-	3.794
Power consumption	kW	1.556
During heating		
Air temperature dry bulb	°C	2.12
Air temperature wet bulb	°C	0.97
Inlet temperature	°C	30.05
Outlet temperature	°C	35.21
Outlet temperature (Time averaged)	°C	35.21
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	5353
Calculated Hydraulic power	W	2
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	10
Calculated Power correction	W	12
Water Flow	m³/s	0.000295



Detailed result for 'EN14825:2022' Warmer Low (C) A 7 /W31

Tested according to:	EN14511:2022 and EN14825:2022	
Climate zone:		Warmer
Temperature application:		Low
Condition name:		C
Condition temperature:	°C	7
Part load:	%	64%
Chosen Tbivalent	°C	7
Tdesign	°C	2
Pdesign	kW	6.10
Heating demand:	kW	3.92
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	3.994
COP	-	6.027
Power consumption	kW	0.663
Measured		
Heating capacity	kW	3.997
COP	-	5.998
Power consumption	kW	0.666
During heating		
Air temperature dry bulb	°C	7.00
Air temperature wet bulb	°C	6.00
Inlet temperature	°C	26.01
Outlet temperature	°C	31.07
Outlet temperature (Time averaged)	°C	31.07
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	2369
Calculated Hydraulic power	W	0
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	3
Calculated Power correction	W	4
Water Flow	m ³ /s	0.000190



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

Detailed result for 'EN14825:2022' Colder Low (A) A -7 /W30		
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	5.60
Heating demand:	kW	3.39
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated circulation pump:		Yes
Included corrections (Final result)		
Heating capacity	kW	3.392
COP	-	3.736
Power consumption	kW	0.908
Measured		
Heating capacity	kW	3.400
COP	-	3.708
Power consumption	kW	0.917
During heating		
Air temperature dry bulb	°C	-6.98
Air temperature wet bulb	°C	-8.00
Inlet temperature	°C	25.00
Outlet temperature	°C	29.92
Outlet temperature (Time averaged)	°C	29.92
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	6897
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	0.000166



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	5.60
Heating demand:	kW	4.57
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:	Steady State	
Integrated circulation pump:	Yes	
Included corrections (Final result)		
Heating capacity	kW	4.526
COP	-	2.365
Power consumption	kW	1.913
Measured		
Heating capacity	kW	4.536
COP	-	2.356
Power consumption	kW	1.925
During heating		
Air temperature dry bulb	°C	-15.01
Air temperature wet bulb	°C	-15.07
Inlet temperature	°C	26.99
Outlet temperature	°C	31.89
Outlet temperature (Time averaged)	°C	31.89
Circulation pump		
Measured: Static differential pressure, liquid pump	Pa	6897
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	0.000222



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 circulation pump:			Yes
Included corrections (Final result)			
Heating capacity	kW		6.462
COP	-		4.996
Power consumption	kW		1.294
Measured			
Heating capacity	kW		6.471
COP	-		4.961
Power consumption	kW		1.304
During heating			
Air temperature dry bulb	°C		6.99
Air temperature wet bulb	°C		6.00
Inlet temperature	°C		30.04
Outlet temperature	°C		35.09
Circulation pump			
Measured: Static differential pressure, liquid pump	Pa		4628
Calculated Hydraulic power	W		1
Calculated global efficiency	η		0.13
Calculated Capacity correction	W		10
Calculated Power correction	W		11
Water Flow	m ³ /s		0.000308



Detailed COP test results - medium temperature – EN 14511

Detailed result for 'EN14511:2018' A7/W55			
Tested according to:			EN14511:2018
Minimum flow reached:			No
Measurement type:			Steady State
Integrated circulation pump:			Yes
Included corrections (Final result)			
Heating capacity	kW		6.127
COP	-		2.979
Power consumption	kW		2.057
Measured			
Heating capacity	kW		6.133
COP	-		2.972
Power consumption	kW		2.063
During heating			
Air temperature dry bulb	°C		7.00
Air temperature wet bulb	°C		6.00
Inlet temperature	°C		47.00
Outlet temperature	°C		54.99
Circulation pump			
Measured: Static differential pressure, liquid pump	Pa		4303
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		0.000186

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





TEST Reg. nr. 305

Sound power levels according to
ISO 3743-1:2010



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

Client:

Object:

Mounting conditions:

Midea

Type: Air to water heat pump Model: MHC-V6WD2N8-BE30

The outdoor unit is mounted on the supporting metal support frame using six vibration insulatores and placed on four pices of concrete tiles (20x20x2.5 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.

Date of test:

20-01-2024

Operating conditions:

Static pressure:

Air temperature:

Relative air humidity:

Test room volume:

Area, S, of test room:

A7/W35, Compressor speed: 66[Hz], Fan speed: 550[rpm], Pump speed: 40 [%], EXV1(P): 264, Heating capacity: 6.46 [kW], Power_input: 1.23 [kW], Water flow rate: 1109 [l/h]

101.7 kPa

7.0 °C

84.0 %

102.8 m³

138.9 m²

Room:

Room 2

Reference box:

L1:

L2:

L3:

Volume:

1.3 m

0.4 m

0.7 m

0.4 m³

Frequency f [Hz]	L _w 1/3 octave [dB]	1/1 oct [dB]
100	57.6	
125	57.3	60.7
160	48.6	
200	54.0	
250	55.6	58.9
315	52.2	
400	56.1	
500	49.9	57.6
630	48.6	
800	46.7	
1000	45.0	50.0
1250	43.3	
1600	43.0	
2000	40.2	45.5
2500	36.9	
3150	34.7	
4000	32.6	38.1
5000	32.2	
6300	33.2	
8000	33.7	38.6
10000	34.5	

Sound power levels L_w, dB Linear & A-weighted (RED)

125

250

500

1000

2000

4000

8000

Frequency, f, Hz →

Sound power level L_w(A): 57.1 dB [re 1pW], Uncertainty σ_{tot}: 1.6 dB

Name of test institute:

No. of test report:

Measurements are in full conformity with ISO 3743-1

DTI

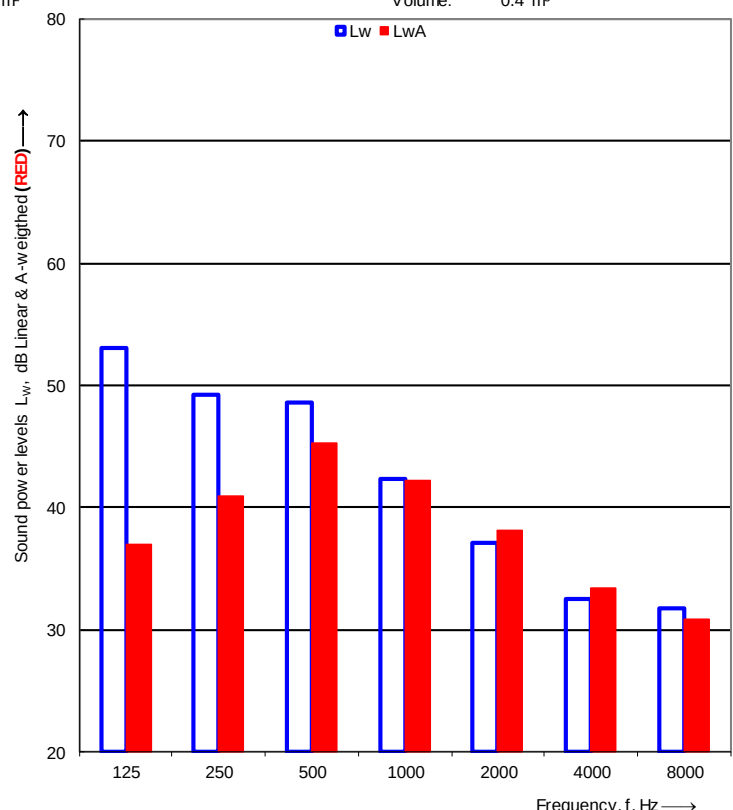
300-KLAB-23-040

Date:

20-01-2024

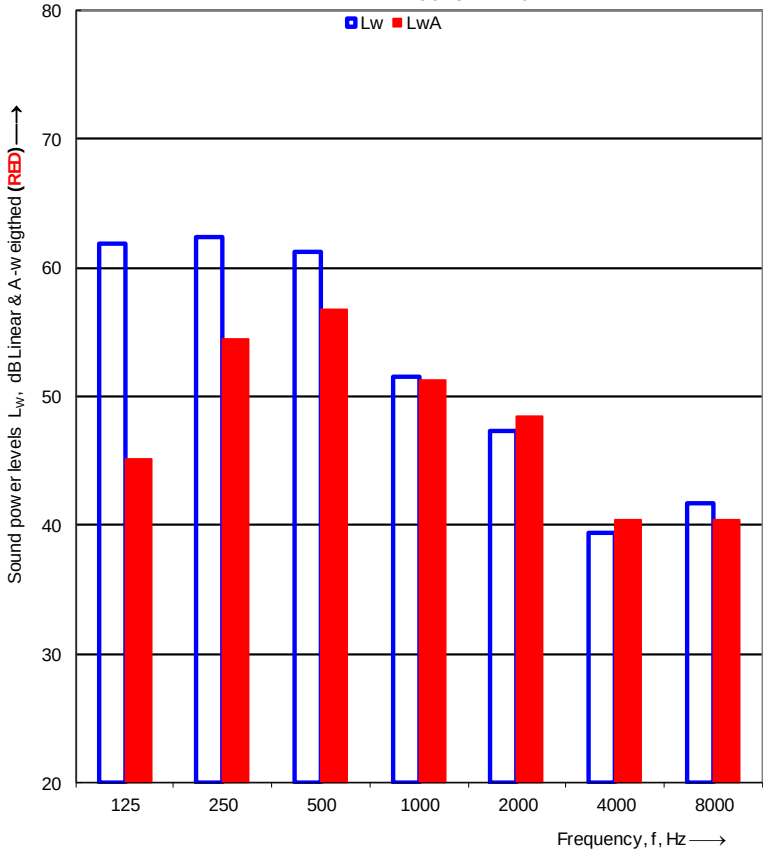


Detailed test results of sound power measurement – Test N#2

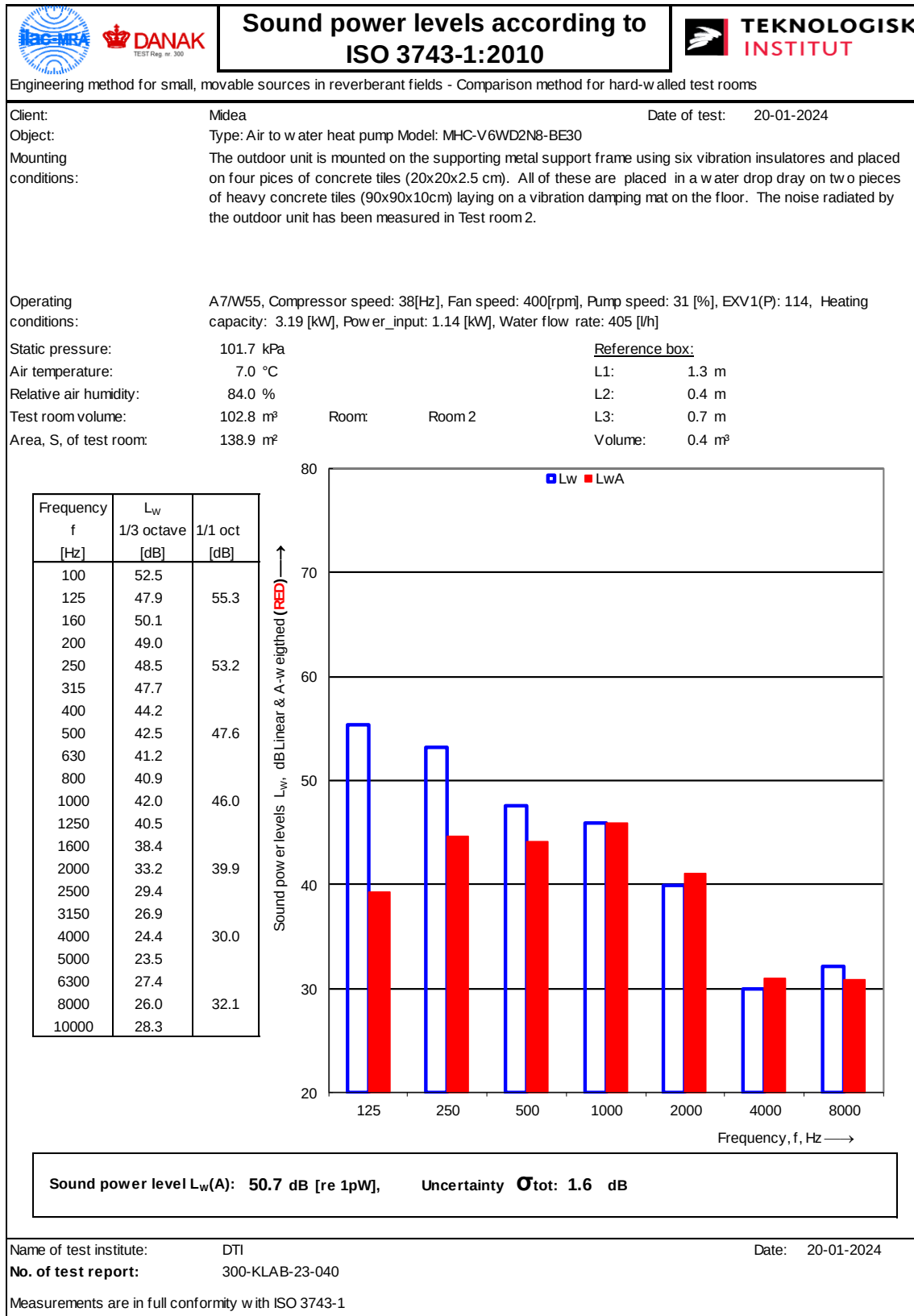
 		Sound power levels according to ISO 3743-1:2010		 TEKNOLOGISK INSTITUT																																																																			
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms																																																																							
Client: Midea		Date of test: 20-01-2024																																																																					
Object: Type: Air to water heat pump Model: MHC-V6WD2N8-BE30																																																																							
Mounting conditions: The outdoor unit is mounted on the supporting metal support frame using six vibration insulators 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: A7/W35, Compressor speed: 30[Hz], Fan speed: 400[rpm], Pump speed: 34 [%], EXV1(P): 124, Heating capacity: 3.06 [kW], Power_input: 0.566 [kW], Water flow rate: 525 [l/h]																																																																							
Static pressure: 101.7 kPa		Reference box:																																																																					
Air temperature: 7.0 °C		L1: 1.3 m																																																																					
Relative air humidity: 84.0 %		L2: 0.4 m																																																																					
Test room volume: 102.8 m³		Room: Room 2		L3: 0.7 m																																																																			
Area, S, of test room: 138.9 m²		Volume: 0.4 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>49.7</td><td></td></tr><tr><td>125</td><td>47.8</td><td>53.1</td></tr><tr><td>160</td><td>47.0</td><td></td></tr><tr><td>200</td><td>44.3</td><td></td></tr><tr><td>250</td><td>44.9</td><td>49.2</td></tr><tr><td>315</td><td>44.2</td><td></td></tr><tr><td>400</td><td>43.1</td><td></td></tr><tr><td>500</td><td>46.1</td><td>48.6</td></tr><tr><td>630</td><td>40.5</td><td></td></tr><tr><td>800</td><td>38.1</td><td></td></tr><tr><td>1000</td><td>36.8</td><td>42.3</td></tr><tr><td>1250</td><td>37.6</td><td></td></tr><tr><td>1600</td><td>34.5</td><td></td></tr><tr><td>2000</td><td>31.8</td><td>37.1</td></tr><tr><td>2500</td><td>28.7</td><td></td></tr><tr><td>3150</td><td>26.7</td><td></td></tr><tr><td>4000</td><td>26.5</td><td>32.5</td></tr><tr><td>5000</td><td>29.4</td><td></td></tr><tr><td>6300</td><td>28.6</td><td></td></tr><tr><td>8000</td><td>26.3</td><td>31.7</td></tr><tr><td>10000</td><td>25.2</td><td></td></tr></tbody></table>		Frequency f [Hz]	L _w 1/3 octave [dB]	1/1 oct [dB]	100	49.7		125	47.8	53.1	160	47.0		200	44.3		250	44.9	49.2	315	44.2		400	43.1		500	46.1	48.6	630	40.5		800	38.1		1000	36.8	42.3	1250	37.6		1600	34.5		2000	31.8	37.1	2500	28.7		3150	26.7		4000	26.5	32.5	5000	29.4		6300	28.6		8000	26.3	31.7	10000	25.2					
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10000	25.2																																																																						
Sound power level L_w(A): 48.9 dB [re 1pW], Uncertainty σ_{tot}: 1.6 dB																																																																							
Name of test institute: DTI		Date: 20-01-2024																																																																					
No. of test report: 300-KLAB-23-040																																																																							
Measurements are in full conformity with ISO 3743-1																																																																							



Detailed test results of sound power measurement – Test N#3

 		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: 20-01-2024																																																																					
Object: Type: Air to water heat pump Model: MHC-V6WD2N8-BE30																																																																							
Mounting conditions: The outdoor unit is mounted on the supporting metal support frame using six vibration insulators 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: A7/W55, Compressor speed: 66[Hz], Fan speed: 550[rpm], Pump speed: 31 [%], EXV1(P): 196, Heating capacity: 6.13 [kW], Power_input: 2.06 [kW], Water flow rate: 668 [l/h]																																																																							
Static pressure: 101.7 kPa		Reference box:																																																																					
Air temperature: 7.0 °C		L1: 1.3 m																																																																					
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Sound power level L_w(A): 60.1 dB [re 1pW], Uncertainty σ_{tot}: 1.6 dB																																																																							
Name of test institute: DTI		Date: 20-01-2024																																																																					
No. of test report: 300-KLAB-23-040																																																																							
Measurements are in full conformity with ISO 3743-1																																																																							

Detailed test results of sound power measurement – Test N# 4





Appendix 1

Unit specification

Type of unit: Mono air to water heat pump
Manufacturer: Midea
Size of the heat pump: 0.4 x 0.7 x 1.3m (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	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
- 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 0.5dB. However, the uncertainty is rounded up to the nearest 0.5dB increment in the report. 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: $\sigma_{\text{tot}}: \sqrt{1.5^2 + 0.5^2} = 1.6 \text{ dB}$ and $U(95\%) = 3.2 \text{ dB}$

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



Authorization Letter

This declaration of conformity is issued under the sole responsibility of

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

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

We declare that the following HP product we produced for KLIMA-THERM SP. Z O. O are identical to our following models

Master company(Midea) model	NETSU model
MHC-V6W/D2N8-B	M-NET-II-06-1PH
MHC-V10W/D2N8-B	M-NET-II-10-3PH
MHC-V16W/D2RN8-B	M-NET-II-16-3PH

Company name: **KLIMA-THERM SP. Z O. O**

Tradename /-mark: NETSU

Address: UL. OSTROBRAMSKA 101A, WARSZAWA, 04-041, POLAND

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

Production year: 2021~2023

Date : 20/03/2023

Authorization:



*Tłumacz Przysięgły Języka Angielskiego – Danuta Zalewska, ul. Kossaka 6/1, 80-249 Gdańsk,
tel./fax (058) 341 76 04*

**[Tłumaczenie przysięgłe z języka angielskiego. Tłumaczenie przedstawia wybrane strony raportu.
Pozostała część raportu pominięta w tłumaczeniu.]**

[na każdej stronie raportu umieszczono logo Duńskiego Instytutu Technologicznego oraz numer rej badań 300]]

Raport z badań

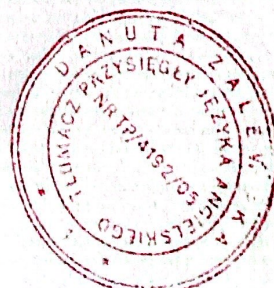
Nr raportu:
300-KLAB-23-040-2

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

Strona 1 z 41
Init: KAMA/RTHI
Nr pliku: 225959
Załączniki: 1

Klient:	Firma:	GD MIDEA HEATING & VENTILATING EQUIPMENT CO., LTD.
	Adres:	Penglai Industry Road, Beijiao
	Miasto:	Shunde, Foshan, Guangdong, 528311, Chiny
	Tel:	+86 13902810522
Komponent:	Marka:	Midea
	Typ:	Pompa ciepła powietrze-woda (mono blok)
	Model:	MHC-V6W/D2N8-B
	Nr serii:	341H09752012A250100012
	Rok prod:	Jednostka zewnętrzna: NIE DOTYCZY
Daty:	Okres badań:	styczeń 2024
Nazwa marki:	Marka:	NETSU
	Typ:	Pompa ciepła powietrze-woda (mono blok)
	Model:	M-NET-II-06-1PH
Procedury	Patrz cel (strona 2), aby zapoznać się z listą standardów.	
Uwagi:	Urządzenie zostało dostarczone przez klienta. Instalacja i ustawienia testowe zostały wykonane zgodnie z instrukcjami producenta. Pomiędzy każdym testem Midea zmieniała różne parametry, takie jak prędkość sprężarki, zawór rozprężny, prędkość wentylatora, prędkość pompy, czas odszraniania, czas ogrzewania. Raport dla badanej jednostki nosi nazwę 300-KLAB-23-040. Wydano 2024.03.12. Patrz również załącznik 2.	
Warunki:	Niniejszy test został przeprowadzony w ramach akredytacji zgodnie z międzynarodowymi wymogami (ISO/IEC 17025:2017) oraz zgodnie z Ogólnymi Warunkami Duńskiego Instytutu Technologicznego. Wyniki testu odnoszą się wyłącznie do testowanego produktu. Niniejszy raport z testu może być cytowany we fragmentach wyłącznie za pisemną zgodą Duńskiego Instytutu Technologicznego. Klient nie może wspominać ani odnosić się do Duńskiego Instytutu Technologicznego lub pracowników Duńskiego Instytutu Technologicznego w celach reklamowych lub marketingowych, chyba że Duński Instytut Technologiczny wyrazi na to pisemną zgodę w każdym przypadku.	
Oddział/Centrum:	Duński Instytut Technologiczny Energia i klimat Laboratorium pomp ciepła, Aarhus Podpis: Kamalathasan Arumugam B.Sc. Engineer	Data: 2024.04.16 Współczytający: Rasmus Thisgaard B.TecMan & MarEng

[logo] ilac -MRA I DANAK
nr rejestru testu 300



Cel

Celem niniejszego raportu jest udokumentowanie następujących kwestii:

Sezonowy współczynnik wydajności (SCOP) 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.

Warunki testu obciążenia częściowego SCOP_P i SCOP_{B&F} w niskiej temperaturze dla cieplejszego klimatu zgodnie z normą EN 14825:2022.

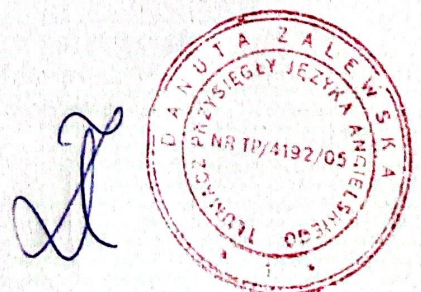
Warunki testu obciążenia częściowego SCOP_A i SCOP_{G&F} w niskiej temperaturze dla chłodniejszego klimatu zgodnie z EN 14825:2022.

Standardowe warunki znamionowe testu COP (tryb ogrzewania) w niskiej i średniej temperaturze zgodnie z normą EN 14511:2022.

Wymagania eksploatacyjne zgodnie z normą EN 14511-4:2022

- 4.2.1 Testy rozruchu i działania
- 4.5 Odcięcie przepływu nośnika ciepła
- 4.6 Całkowita awaria zasilania

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



Wyniki badań

Wyniki badań SCOP w niskiej temperaturze – umiarkowany sezon grzewczy – EN 14825

Model (zewnątrzny)	MHC-V6W/D2N8-B
Pompa ciepła powietrze-woda, monoblok	T
Niskotemperaturowa pompa ciepła	N
Wyposażona w dodatkową grzałkę	T
Kombinowana pompa ciepła i grzałka	N
Odwracalna	T

Znamionowa moc cieplna ¹⁾	P_{rated}	6,8 [kW]
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	η_s	192,8 [%]
	SCOP	4,89 [-]

Zmierzona wydajność ogrzewania dla częściowego obciążenia przy temperaturze zewnętrznej T_j	Klimat umiarkowany - Zastosowanie w niskiej temperaturze	$T_j = -15^\circ\text{C}$	P_{dh}	- [kW]
		$T_j = -7^\circ\text{C}$	P_{dh}	5,74 [kW]
		$T_j = 2^\circ\text{C}$	P_{dh}	3,72 [kW]
		$T_j = 7^\circ\text{C}$	P_{dh}	3,21 [kW]
		$T_j = 12^\circ\text{C}$	P_{dh}	3,76 [kW]
		$T_j = \text{temperatura dwuwartościowa}$	P_{dh}	5,74 [kW]
		$T_j = \text{graniczna temperatura robocza}$	P_{dh}	5,39 [kW]

Zmierzony współczynnik efektywności przy temperaturze zewnętrznej T_j	Klimat umiarkowany - Zastosowanie w niskiej temperaturze	$T_j = -15^\circ\text{C}$	COPd	- [kW]
		$T_j = -7^\circ\text{C}$	COPd	3,02 [kW]
		$T_j = 2^\circ\text{C}$	COPd	4,76 [kW]
		$T_j = 7^\circ\text{C}$	COPd	6,79 [kW]
		$T_j = 12^\circ\text{C}$	COPd	8,85 [kW]
		$T_j = \text{temperatura dwuwartościowa}$	COPd	3,02 [kW]
		$T_j = \text{graniczna temperatura robocza}$	COPd	2,68 [kW]

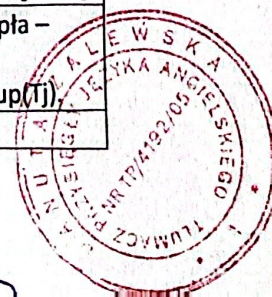
Temperatura dwuwartościowa	$T_{dwuwartościowa}$	-7 [°C]
Graniczna temperatura robocza	TOL	-10 [°C]
Temperatury	WTOL	- [°C]
Współczynnik strat	Cdh	0,95 [-]

Zużycie energii w trybach innych niż tryb aktywny	Tryb wyłączenia	P_{OFF}	0,015 [kW]
	Tryb wyłączenia termostatu	P_{TO}	0,020 [kW]
	Tryb czuwania	P_{SB}	0,015 [kW]
	Tryb włączonej grzałki karteru ²⁾	P_{CK}	0,015 [kW]
Grzałka dodatkowa ¹⁾	Znamionowa moc ogrzewania	P_{SUP}	1,41 [kW]
	Rodzaj zasilania		Elektryczne

Inne pozycje	Regulacja wydajności	Zmienna	
	Regulacja przepływu wody	Zmienna	
	Prędkość przepływu wody	-	
	Roczne zużycie energii	Q _{HE}	2870 [kWh]

1) W przypadku ogrzewaczy pomieszczeń z pompą ciepła i wielofunkcyjnych ogrzewaczy z pompą ciepła – znamionowa moc cieplna, P_{rated} , jest równa projektowemu obciążeniu ogrzewania, $P_{designh}$, a znamionowa moc cieplna grzałki dodatkowej, P_{sup} , jest równa dodatkowej wydajności ogrzewania $\text{sup}(T_j)$

2) Dla kalkulacji SCOP stosuje się wartość P_{CK} - P_{SB} . Patrz strona 15.



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Wyniki badań SCOP w średniej temperaturze – umiarkowany sezon grzewczy – EN 14825

Model (zewnątrzny)	MHC-V6W/D2N8-B
Pompa ciepła powietrze-woda, monoblok	T
Niskotemperaturowa pompa ciepła	N
Wyposażona w dodatkową grzałkę	T
Kombinowana pompa ciepła i grzałka	N
Odwracalna	T

Znamionowa moc cieplna ¹⁾	P_{rated}	5,7 [kW]
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	η_s	140,4 [%]
	SCOP	3,58 [-]

Zmierzona wydajność ogrzewania dla częściowego obciążenia przy temperaturze zewnętrznej T_j	Klimat umiarkowany - Zastosowanie w średniej temperaturze	$T_j = -15^{\circ}\text{C}$	P_{dh}	- [kW]
		$T_j = -7^{\circ}\text{C}$	P_{dh}	5,18 [kW]
		$T_j = 2^{\circ}\text{C}$	P_{dh}	3,13 [kW]
		$T_j = 7^{\circ}\text{C}$	P_{dh}	2,94 [kW]
		$T_j = 12^{\circ}\text{C}$	P_{dh}	3,59 [kW]
		$T_j = \text{temperatura dwuwartościowa}$	P_{dh}	5,18 [kW]
		$T_j = \text{graniczna temperatura robocza}$	P_{dh}	4,49 [kW]

Zmierzony współczynnik efektywności przy temperaturze zewnętrznej T_j	Klimat umiarkowany - Zastosowanie w średniej temperaturze	$T_j = -15^{\circ}\text{C}$	COP_d	- [kW]
		$T_j = -7^{\circ}\text{C}$	COP_d	2,13 [kW]
		$T_j = 2^{\circ}\text{C}$	COP_d	3,58 [kW]
		$T_j = 7^{\circ}\text{C}$	COP_d	4,74 [kW]
		$T_j = 12^{\circ}\text{C}$	COP_d	6,39 [kW]
		$T_j = \text{temperatura dwuwartościowa}$	COP_d	2,13 [kW]
		$T_j = \text{graniczna temperatura robocza}$	COP_d	1,83 [kW]

Temperatura dwuwartościowa	$T_{dwuwartościowa}$	-7 [°C]
Graniczna temperatura robocza	TOL	-10 [°C]
Temperatury	WTOL	- [°C]
Współczynnik strat	C_{dh}	0,96 [-]

Zużycie energii w trybach innych niż tryb aktywny	Tryb wyłączenia	P_{OFF}	0,015 [kW]
	Tryb wyłączenia termostatu	P_{TO}	0,020 [kW]
	Tryb czuwania	P_{SB}	0,015 [kW]
	Tryb włączonej grzałki karteru	P_{CK}	0,015 [kW]
Grzałka dodatkowa ¹⁾	Znamionowa moc ogrzewania	P_{SUP}	1,21 [kW]
	Rodzaj zasilania		Elektryczne

Inne pozycje	Regulacja wydajności	Zmienna	
	Regulacja przepływu wody	Zmienna	
	Prędkość przepływu wody	-	
	Roczne zużycie energii	Q _{HE}	3286 [kWh]

1) W przypadku ogrzewaczy pomieszczeń z pompą ciepła i wielofunkcyjnych ogrzewaczy z pompą ciepła – znamionowa moc cieplna, P_{rated} , jest równa projektowemu obciążeniu ogrzewania, $P_{designh}$, a znamionowa moc cieplna grzałki dodatkowej, P_{sup} , jest równa dodatkowej wydajności ogrzewania $\sup(T_j)$.

*) Dla kalkulacji SCOP stosuje się wartość P_{CK} - P_{SB} . Patrz strona 17.



Wyniki badań dla cieplejszego klimatu, niska temperatura, zgodnie z EN 14825

Nr	Warunki testowe	Moc grzewcza [kW]	COP
1	B	5.895	3.817
2	$T_{\text{dwuwartościowa}}$ C i F	3.994	6.027

Wyniki badań dla chłodniejszego klimatu, niska temperatura, zgodnie z EN 14825

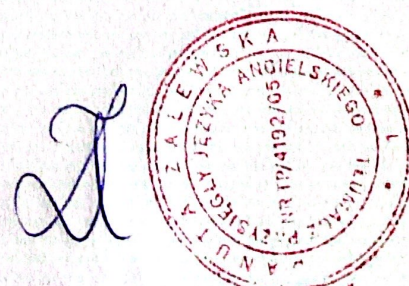
Nr	Warunki testowe	Moc grzewcza [kW]	COP
1	A	3.392	3.736
2	$T_{\text{dwuwartościowa}}$ F i G	4.526	2.365

Wyniki testu COP – niska temperatura – zgodnie z EN 14511

Nr	Warunki testowe	Moc grzewcza [kW]	COP
1	A7/W35	6.462	4.996

Wyniki testu COP – średnia temperatura – zgodnie z EN 14511

Nr	Warunki testowe	Moc grzewcza [kW]	COP
1	A7/W55	6.127	2.979



Wyniki pomiarów mocy akustycznej – EN 12102

Nr	Warunki testowe	Poziom mocy akustycznej LW(A) [dB re 1pW]	Niepewność σ_{tot} [dB]
1 ^F	A7/W35	57.1	1,6
2 ^P	A7/W35	48.9	1,6
3 ^F	A7/W55	60.1	1,6
4 ^E	A7/55	50.7	1,6

F) pełne obciążenie, P) częściowe obciążenie oraz E) etykietowane ErP

Całkowity poziom mocy akustycznej skorygowany charakterystyką A jest określany dla mierzonego zakresu częstotliwości od 100 Hz do 10 kHz. Obliczenia niepewności znajdują się w załączniku 1.

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

Ja, Danuta Zalewska, tłumacz przysięgły języka angielskiego w Gdańsku, zarejestrowana na liście tłumaczy przysięgłych w Ministerstwie Sprawiedliwości pod numerem TP/4109/05, zaświadczam zgodność niniejszego tłumaczenia z treścią oryginału dokumentu okazanego mi w języku angielskim.

Koniec tłumaczenia 8 stron

Gdańsk, 18/04/2024

Rep.: 59/2024

