TEST REPORT

Report no.:
300-KLAB-24-044 rev. 2 - 1

DANISH TECHNOLOGICAL INSTITUTE

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Customer:	Company:	NINGBO AUX ELECTRIC CO., LTD
	Address:	NO.1166 MingGuang North Road
	City:	JiangShan Town, Yinzhou Disrtict, Ningbo, Zhejiang,China PR CHINA
Component:	Brand:	AUX
	Type:	Air to water heat pump (Split)
	Model:	Outdoor unit: ACHP-H08/4R3HA-O Indoor unit: ACHP-H08/4R3HA-I
	Series no.:	Outdoor unit: 8E0384002404110001 Indoor unit: 8C1493002404210001
	Prod. year:	Outdoor unit:2024.04 Indoor unit:2024.04
Dates:	Component tested:	July 2024 – August 2024
Brand name:	Brand:	SEVRA
	Type:	Air to water heat pump (mono block)
	Model:	SEV-ACHP3-08-I / SEV-ACHP1-08-O

Remarks: This report replaces report 300-KLAB-24-044-1 issued 2024.09.11, as the customer name was changed. The unit was delivered by the customer. The installation and test settings were done according to the manufacturer's instructions. The report for the tested unit is named 300-KLAB-24-044 rev 1. issued 2024.08.23. Also see appendix 2.

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

Date: 2024.09.19

Signature:
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B.Sc. Engineer

Co-reader:
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DIGITALLY SIGNED DOCUMENT
20 September 2024
DANISH TECHNOLOGICAL INSTITUTE

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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 4 and 5.

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

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

Contents:

Test conditions

SCOP test conditions for low temperature – EN 14825

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

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

Additional information

Climate	$T_{designh}$ [°C]	$T_{bivalent}$ [°C]	TOL [°C]	Outlet temperature	Flow rate
Average	-10	-7	-10	Variable	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	$(-7 - 16) / (T_{designh} - 16)$	88,46	n.a.	60,53	−7(−8)	20(12)	[a] / 55	[a] / 52	n.a.	[a] / 44
B	$(+2 - 16) / (T_{designh} - 16)$	53,85	100	36,84	2(1)	20(12)	[a] / 55	[a] / 42	[a] / 55	[a] / 37
C	$(+7 - 16) / (T_{designh} - 16)$	34,62	64,29	23,68	7(6)	20(12)	[a] / 55	[a] / 36	[a] / 46	[a] / 32
D	$(+12 - 16) / (T_{designh} - 16)$	15,38	28,57	10,53	12(11)	20(12)	[a] / 55	[a] / 30	[a] / 34	[a] / 28
E	$(TOL^{e} - 16) / (T_{designh} - 16)$				TOL^{e}	20(12)	[a] / 55	[a] / [b]	[a] / [b]	[a] / [b]
F	$(T_{biv} - 16) / (T_{designh} - 16)$				T_{biv}	20(12)	[a] / 55	[a] / [c]	[a] / [c]	[a] / [c]
G	$(-15 - 16) / (T_{designh} - 16)$	n.a.	n.a.	81,58	−15	20(12)	[a] / 55	n.a.	n.a.	[a] / 49

Additional information

Climate	**$T_{designh}$ [°C]**	**$T_{bivalent}$ [°C]**	**TOL [°C]**	**Outlet temperature**	**Flow rate**
Average	-10	-7	-10	Variable	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)
1S	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)
1S	7	6	47	55

S: Standard rating condition

Test conditions for sound power measurement - EN12102-1

N#	Test condition		Heat pump setting			
	Ambient air temperature (°C)	Out/Indoor - heat exchanger (°C)	Compressor speed (Hz)	Fan speed (rpm)	Heating capacity (kW)	Power input (kW)
1[1]	20	7/55	-	-	2.55	1.14
2[2]	7	7/55	25	400	2.55	1.14

1) Indoor unit
2) Outdoor unit

Test results

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

Model (Outdoor)	ACHP-H08/4R3HA-O
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	N

Rated heat output[1)]	P_{rated}	**8.1** [kW]
Seasonal space heating energy efficiency	η_s	**199.2** [%]
	SCOP	**5.06** [-]

Measured capacity for heating for part load at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	Pdh	- [kW]
		Tj=-7 °C	Pdh	6.64 [kW]
		Tj=2 °C	Pdh	4.18 [kW]
		Tj=7 °C	Pdh	3.00 [kW]
		Tj=12 °C	Pdh	2.47 [kW]
		Tj=bivalent temperature	Pdh	6.64 [kW]
		Tj=operation limit	Pdh	6.78 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Low temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	3.26 [-]
		Tj=2 °C	COPd	4.99 [-]
		Tj=7 °C	COPd	6.79 [-]
		Tj=12 °C	COPd	7.60 [-]
		Tj=bivalent temperature	COPd	3.26 [-]
		Tj=operation limit	COPd	2.90 [-]

Bivalent temperature	Tbivalent	-7 [°C]
Operation limit	TOL	-10 [°C]
temperatures	WTOL	- [°C]
Degradation coefficient	Cdh	0.90 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.015 [kW]
	Thermostat-off mode	P_{TO}	0.060 [kW]
	Standby mode	P_{SB}	0.015 [kW]
	Crankcase heater mode	P_{CK}	0.011 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	1.32 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	3310 [kWh]

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

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

Model (Outdoor)	ACHP-H08/4R3HA-O
Air-to-water heat pump mono bloc	N
Low-temperature heat pump	N
Equipped with supplementary heater	Y
Heat pump combination heater	N

Rated heat output[1)]	P_{rated}	**6.6** [kW]
Seasonal space heating energy efficiency	η_s	**142.3** [%]
	SCOP	**3.63** [-]

Measured capacity for heating for part load at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	Pdh	- [kW]
		Tj=-7 °C	Pdh	6.20 [kW]
		Tj=2 °C	Pdh	3.83 [kW]
		Tj=7 °C	Pdh	2.52 [kW]
		Tj=12 °C	Pdh	2.23 [kW]
		Tj=bivalent temperature	Pdh	6.20 [kW]
		Tj=operation limit	Pdh	5.60 [kW]

Measured coefficient of performance at outdoor temperature Tj	Average Climate - Medium temperature application	Tj=-15 °C	COPd	- [-]
		Tj=-7 °C	COPd	2.29 [-]
		Tj=2 °C	COPd	3.61 [-]
		Tj=7 °C	COPd	4.61 [-]
		Tj=12 °C	COPd	6.30 [-]
		Tj=bivalent temperature	COPd	2.29 [-]
		Tj=operation limit	COPd	1.97 [-]

Bivalent temperature	Tbivalent	-7 [°C]
Operation limit	TOL	-10 [°C]
temperatures	WTOL	- [°C]
Degradation coefficient	Cdh	0.90 [-]

Power consumption in modes other than active mode	Off mode	P_{OFF}	0.015 [kW]
	Thermostat-off mode	P_{TO}	0.060 [kW]
	Standby mode	P_{SB}	0.015 [kW]
	Crankcase heater mode	P_{CK}	0.011 [kW]
Supplementary heater[1)]	Rated heat output	P_{SUP}	1.00 [kW]
	Type of energy input		Electrical

Other items	Capacity control		Variable
	Water flow control		Variable
	Water flow rate		-
	Annual energy consumption	Q_{HE}	3753 [kWh]

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

COP test results - low temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W35	8.367	4.994

COP test results - medium temperature – EN 14511

N#	Test conditions	Heating capacity [kW]	COP
1	A7/W55	8.354	3.075

Test results of sound power measurements - EN 12102-1

N#	Sound power level LW(A) [dB re 1pW]	Uncertainty (dB) (weighted value)
1[1]	**44.9**	1.6
2[2]	**53.8**	1.6

1) Indoor unit
2) Outdoor unit

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

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

Photos

Rating plate outdoor unit

Outdoor unit

Rating plate indoor unit

Indoor 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	7.17	6.64	3.26	0.97	1.00	3.26
B	2	54	4.36	4.18	4.99	0.93	1.00	4.99
C	7	35	2.80	3.00	6.79	0.90	1.00	6.79
D	12	15	1.25	2.47	7.60	0.90	0.50	6.92
E	-10	100	8.10	6.78	2.90	0.97	1.00	2.90
F - BIV	-7	88	7.17	6.64	3.26	0.97	1.00	3.26

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

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.015385	0.01539	0
Thermostat off	178	0.060397	0.0604	10.750666
Standby	0	0.015385	0.01539	0
Crankcase heater	178	0.010899	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	8.10	6.78	1.32	1.32	2.90	8.10	3.66	6.78	2.34
	22	-9	25	7.79	6.73	1.06	26.39	3.02	194.71	82.16	168.32	55.76
	23	-8	23	7.48	6.69	0.79	18.15	3.14	171.97	67.11	153.82	48.96
A / F - BIV	24	-7	24	7.17	6.64	0.00	0.00	3.26	171.97	52.67	171.97	52.67
	25	-6	27	6.85	6.37	0.00	0.00	3.46	185.05	53.54	185.05	53.54
	26	-5	68	6.54	6.09	0.00	0.00	3.65	444.88	121.94	444.88	121.94
	27	-4	91	6.23	5.82	0.00	0.00	3.84	567.00	147.66	567.00	147.66
	28	-3	89	5.92	5.55	0.00	0.00	4.03	526.81	130.67	526.81	130.67
	29	-2	165	5.61	5.27	0.00	0.00	4.22	925.27	219.08	925.27	219.08
	30	-1	173	5.30	5.00	0.00	0.00	4.42	916.23	207.52	916.23	207.52
	31	0	240	4.98	4.72	0.00	0.00	4.61	1196.31	259.68	1196.31	259.68
	32	1	280	4.67	4.45	0.00	0.00	4.80	1308.46	272.67	1308.46	272.67
B	33	2	320	4.36	4.18	0.00	0.00	4.99	1395.69	279.68	1395.69	279.68
	34	3	357	4.05	3.90	0.00	0.00	5.35	1445.85	270.21	1445.85	270.21
	35	4	356	3.74	3.63	0.00	0.00	5.71	1330.89	233.04	1330.89	233.04
	36	5	303	3.43	3.35	0.00	0.00	6.07	1038.36	171.02	1038.36	171.02
	37	6	330	3.12	3.08	0.00	0.00	6.43	1028.08	159.84	1028.08	159.84
C	38	7	326	2.80	2.80	0.00	0.00	6.79	914.05	134.57	914.05	134.57
	39	8	348	2.49	2.49	0.00	0.00	6.82	867.32	127.21	867.32	127.21
	40	9	335	2.18	2.18	0.00	0.00	6.84	730.56	106.74	730.56	106.74
	41	10	315	1.87	1.87	0.00	0.00	6.87	588.81	85.71	588.81	85.71
	42	11	215	1.56	1.56	0.00	0.00	6.90	334.90	48.57	334.90	48.57
D	43	12	169	1.25	1.25	0.00	0.00	6.92	210.60	30.43	210.60	30.43
	44	13	151	0.93	0.93	0.00	0.00	6.95	141.13	20.31	141.13	20.31
	45	14	105	0.62	0.62	0.00	0.00	6.97	65.42	9.38	65.42	9.38
	46	15	74	0.31	0.31	0.00	0.00	7.00	23.05	3.29	23.05	3.29

SUM	16731.48	3298.38	16685.62	3252.51
SCOPon		5.07	**SCOPnet**	5.13

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	5.84	6.20	2.29	0.98	1.00	2.29
B	2	54	3.55	3.83	3.61	0.94	1.00	3.61
C	7	35	2.28	2.52	4.61	0.90	1.00	4.61
D	12	15	1.02	2.23	6.30	0.90	0.46	5.63
E	-10	100	6.60	5.60	1.97	0.98	1.00	1.97
F - BIV	-7	88	5.84	6.20	2.29	0.98	1.00	2.29

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

	Hours [h]	Power input [kW]	Applied to SCOP calculation [kW]	Energy consumption [kWh]
Off mode	0	0.015385	0.01539	0
Thermostat off	178	0.060397	0.0604	10.750666
Standby	0	0.015385	0.01539	0
Crankcase heater	178	0.010899	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	6.60	5.60	1.00	1.00	1.97	6.60	3.84	5.60	2.85
	22	-9	25	6.35	5.68	0.67	16.63	2.08	158.65	85.02	142.02	68.39
	23	-8	23	6.09	5.76	0.33	7.65	2.18	140.12	68.28	132.47	60.63
A / F - BIV	24	-7	24	5.84	5.84	0.00	0.00	2.29	140.12	61.11	140.12	61.11
	25	-6	27	5.58	5.58	0.00	0.00	2.44	150.78	61.81	150.78	61.81
	26	-5	68	5.33	5.33	0.00	0.00	2.59	362.49	140.18	362.49	140.18
	27	-4	91	5.08	5.08	0.00	0.00	2.73	462.00	169.08	462.00	169.08
	28	-3	89	4.82	4.82	0.00	0.00	2.88	429.25	149.10	429.25	149.10
	29	-2	165	4.57	4.57	0.00	0.00	3.03	753.92	249.20	753.92	249.20
	30	-1	173	4.32	4.32	0.00	0.00	3.17	746.56	235.37	746.56	235.37
	31	0	240	4.06	4.06	0.00	0.00	3.32	974.77	293.75	974.77	293.75
	32	1	280	3.81	3.81	0.00	0.00	3.46	1066.15	307.71	1066.15	307.71
B	33	2	320	3.55	3.55	0.00	0.00	3.61	1137.23	314.91	1137.23	314.91
	34	3	357	3.30	3.30	0.00	0.00	3.81	1178.10	309.16	1178.10	309.16
	35	4	356	3.05	3.05	0.00	0.00	4.01	1084.43	270.44	1084.43	270.44
	36	5	303	2.79	2.79	0.00	0.00	4.21	846.07	201.01	846.07	201.01
	37	6	330	2.54	2.54	0.00	0.00	4.41	837.69	190.02	837.69	190.02
C	38	7	326	2.28	2.28	0.00	0.00	4.61	744.78	161.64	744.78	161.64
	39	8	348	2.03	2.03	0.00	0.00	4.81	706.71	146.85	706.71	146.85
	40	9	335	1.78	1.78	0.00	0.00	5.02	595.27	118.65	595.27	118.65
	41	10	315	1.52	1.52	0.00	0.00	5.22	479.77	91.88	479.77	91.88
	42	11	215	1.27	1.27	0.00	0.00	5.43	272.88	50.29	272.88	50.29
D	43	12	169	1.02	1.02	0.00	0.00	5.63	171.60	30.47	171.60	30.47
	44	13	151	0.76	0.76	0.00	0.00	5.84	114.99	19.70	114.99	19.70
	45	14	105	0.51	0.51	0.00	0.00	6.04	53.31	8.82	53.31	8.82
	46	15	74	0.25	0.25	0.00	0.00	6.25	18.78	3.01	18.78	3.01

SUM	13633.06	3741.31	13607.78	3716.03
SCOPon		3.64	**SCOPnet**	3.66

Detailed test results

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

Detailed result for 'EN14825:2022' Average Low (A) A -7 /W34		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		A
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.10
Heating demand:	kW	7.17
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		No
Included corrections (Final result)		
Heating capacity	kW	**6.643**
COP	-	**3.265**
Power consumption	kW	**2.035**
Measured		
Heating capacity	kW	6.634
COP	-	3.277
Power consumption	kW	2.024
During heating		
Air_inlet temperature dry bulb	°C	-6.98
Air temperature wet bulb	°C	-8.00
Water_inlet temperature	°C	29.01
water_outlet temperature	°C	34.02
Water_outlet temperature (Time averaged)	°C	**34.02**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	4211
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	0.000319

Detailed result for 'EN14825:2022' Average Low (B) A 2 /W30		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		B
Condition temperature:	°C	2
Part load:	%	54%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.10
Heating demand:	kW	4.36
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**4.177**
COP	-	**4.990**
Power consumption	kW	**0.837**
Measured		
Heating capacity	kW	4.179
COP	-	4.977
Power consumption	kW	0.840
During heating		
Air_inlet temperature dry bulb	°C	2.04
Air temperature wet bulb	°C	1.00
Water_inlet temperature	°C	24.99
water_outlet temperature	°C	29.82
Water_outlet temperature (Time averaged)	°C	**29.82**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	1462
Calculated Hydraulic power	W	0
Calculated global efficiency	η	0.12
Calculated Capacity correction	W	2
Calculated Power correction	W	3
Water Flow	m^3/s	0.000208

Detailed result for 'EN14825:2022' Average Low (C) A 7 /W27		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		C
Condition temperature:	°C	7
Part load:	%	35%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.10
Heating demand:	kW	2.80
CR:	-	1.0
Minimum flow reached:	-	Yes
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**2.999**
COP	-	**6.792**
Power consumption	kW	**0.442**
Measured		
Heating capacity	kW	3.002
COP	-	6.747
Power consumption	kW	0.445
During heating		
Air_inlet temperature dry bulb	°C	7.00
Air temperature wet bulb	°C	6.01
Water_inlet temperature	°C	22.98
water_outlet temperature	°C	26.98
Water_outlet temperature (Time averaged)	°C	**26.98**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	2240
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	0.000180

Detailed result for 'EN14825:2022' Average Low (D) A 12 /W24		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		D
Condition temperature:	°C	12
Part load:	%	15%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.10
Heating demand:	kW	1.25
CR:	-	0.5
Minimum flow reached:	-	Yes
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**2.473**
COP	-	**7.603**
Power consumption	kW	**0.325**
Measured		
Heating capacity	kW	2.516
COP	-	6.548
Power consumption	kW	0.384
During heating		
Air_inlet temperature dry bulb	°C	12.02
Air temperature wet bulb	°C	10.98
Water_inlet temperature	°C	22.50
water_outlet temperature	°C	25.61
Water_outlet temperature (Time averaged)	°C	**24.07**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	85001
Calculated Hydraulic power	W	16
Calculated global efficiency	η	0.28
Calculated Capacity correction	W	42
Calculated Power correction	W	59
Water Flow	m^3/s	0.000194

Detailed result for 'EN14825:2022' Average Low (E) A -10 /W35		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Low
Condition name:		E
Condition temperature:	°C	-10
Part load:	%	100%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	8.10
Heating demand:	kW	8.10
CR:	-	1.0
Minimum flow reached:	-	No
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		No
Included corrections (Final result)		
Heating capacity	kW	**6.778**
COP	-	**2.895**
Power consumption	kW	**2.341**
Measured		
Heating capacity	kW	6.768
COP	-	2.905
Power consumption	kW	2.330
During heating		
Air_inlet temperature dry bulb	°C	-9.98
Air temperature wet bulb	°C	-10.99
Water_inlet temperature	°C	30.00
water_outlet temperature	°C	35.07
Water_outlet temperature (Time averaged)	°C	**35.07**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	4351
Calculated Hydraulic power	W	1
Calculated global efficiency	η	0.13
Calculated Capacity correction	W	-9
Calculated Power correction	W	- 11
Water Flow	m^3/s	0.000321

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

Detailed result for 'EN14825:2022' Average Medium (A) A -7 /W52		
Tested according to:		EN14511:2022 and EN14825:2022
Climate zone:		Average
Temperature application:		Medium
Condition name:		A
Condition temperature:	°C	-7
Part load:	%	88%
Chosen Tbivalent	°C	-7
Tdesign	°C	-10
Pdesign	kW	6.60
Heating demand:	kW	5.84
CR:	-	1.0
Minimum flow reached:	-	Yes
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**6.199**
COP	-	**2.293**
Power consumption	kW	**2.704**
Measured		
Heating capacity	kW	6.242
COP	-	2.259
Power consumption	kW	2.762
During heating		
Air_inlet temperature dry bulb	°C	-6.98
Air temperature wet bulb	°C	-7.99
Water_inlet temperature	°C	44.32
water_outlet temperature	°C	52.11
Water_outlet temperature (Time averaged)	°C	**52.11**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	84837
Calculated Hydraulic power	W	16
Calculated global efficiency	η	0.28
Calculated Capacity correction	W	42
Calculated Power correction	W	59
Water Flow	m^3/s	0.000194

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	6.60
Heating demand:	kW	3.55
CR:	-	1.0
Minimum flow reached:	-	Yes
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**3.829**
COP	-	**3.611**
Power consumption	kW	**1.060**
Measured		
Heating capacity	kW	3.832
COP	-	3.602
Power consumption	kW	1.064
During heating		
Air_inlet temperature dry bulb	°C	2.01
Air temperature wet bulb	°C	1.01
Water_inlet temperature	°C	36.61
water_outlet temperature	°C	41.74
Water_outlet temperature (Time averaged)	°C	**41.74**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	2379
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	0.000180

Detailed result for 'EN14825:2022' Average Medium (C) A 7 /W36		
Tested according to:		N14825:2022
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	6.60
Heating demand:	kW	2.28
CR:	-	1.0
Minimum flow reached:	-	Yes
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**2.521**
COP	-	**4.608**
Power consumption	kW	**0.547**
Measured		
Heating capacity	kW	2.561
COP	-	4.251
Power consumption	kW	0.603
During heating		
Air_inlet temperature dry bulb	°C	7.00
Air temperature wet bulb	°C	6.01
Water_inlet temperature	°C	32.71
water_outlet temperature	°C	35.89
Water_outlet temperature (Time averaged)	°C	**35.89**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	76840
Calculated Hydraulic power	W	15
Calculated global efficiency	η	0.27
Calculated Capacity correction	W	40
Calculated Power correction	W	55
Water Flow	m^3/s	0.000194

Detailed result for 'EN14825:2022' Average Medium (D) A 12 /W30		
Tested according to:		N14825:2022
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	6.60
Heating demand:	kW	1.02
CR:	-	0.5
Minimum flow reached:	-	Yes
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**2.229**
COP	-	**6.304**
Power consumption	kW	**0.354**
Measured		
Heating capacity	kW	2.271
COP	-	5.506
Power consumption	kW	0.412
During heating		
Air_inlet temperature dry bulb	°C	11.99
Air temperature wet bulb	°C	10.99
Water_inlet temperature	°C	28.70
water_outlet temperature	°C	31.52
Water_outlet temperature (Time averaged)	°C	**29.98**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	85126
Calculated Hydraulic power	W	17
Calculated global efficiency	η	0.28
Calculated Capacity correction	W	42
Calculated Power correction	W	59
Water Flow	m^3/s	0.000194

Detailed result for 'EN14825:2022' Average Medium (E) A -10 /W55		
Tested according to:		N14825:2022
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	6.60
Heating demand:	kW	6.60
CR:	-	1.0
Minimum flow reached:	-	Yes
Measurement type:		Steady State
Integrated liquid pump:		Yes
Integrated liquid pump able to generate a positve ext. static pressure difference:		Yes
Included corrections (Final result)		
Heating capacity	kW	**5.602**
COP	-	**1.969**
Power consumption	kW	**2.846**
Measured		
Heating capacity	kW	5.644
COP	-	1.943
Power consumption	kW	2.905
During heating		
Air_inlet temperature dry bulb	°C	-10.03
Air temperature wet bulb	°C	-11.00
Water_inlet temperature	°C	48.01
water_outlet temperature	°C	55.07
Water_outlet temperature (Time averaged)	°C	**55.07**
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	84644
Calculated Hydraulic power	W	16
Calculated global efficiency	η	0.28
Calculated Capacity correction	W	42
Calculated Power correction	W	59
Water Flow	m^3/s	0.000194

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 positve ext. static pressure difference:		No
Included corrections (Final result)		
Heating capacity	kW	**8.367**
COP	-	**4.994**
Power consumption	kW	**1.676**
Measured		
Heating capacity	kW	8.347
COP	-	5.053
Power consumption	kW	1.652
During heating		
Air_inlet temperature dry bulb	°C	6.99
Air temperature wet bulb	°C	6.03
Water_inlet temperature	°C	30.00
water_outlet temperature	°C	35.04
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	9397
Calculated Hydraulic power	W	4
Calculated global efficiency	η	0.16
Calculated Capacity correction	W	-20
Calculated Power correction	W	-23
Water Flow	m^3/s	0.000399

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 positve ext. static pressure difference:		No
Included corrections (Final result)		
Heating capacity	kW	**8.354**
COP	-	**3.075**
Power consumption	kW	**2.717**
Measured		
Heating capacity	kW	8.353
COP	-	3.076
Power consumption	kW	2.715
During heating		
Air_inlet temperature dry bulb	°C	6.99
Air temperature wet bulb	°C	6.03
Water_inlet temperature	°C	46.99
water_outlet temperature	°C	55.12
Circulation pump		
Measured external static pressure difference, liquid pump	Pa	810
Calculated Hydraulic power	W	0
Calculated global efficiency	η	0.11
Calculated Capacity correction	W	-2
Calculated Power correction	W	-2
Water Flow	m^3/s	0.000249

Detailed test results of sound power measurement – EN 12102-1

Test#1_Indoor unit

Sound power levels according to ISO 3743-1:2010

TEKNOLOGISK INSTITUT

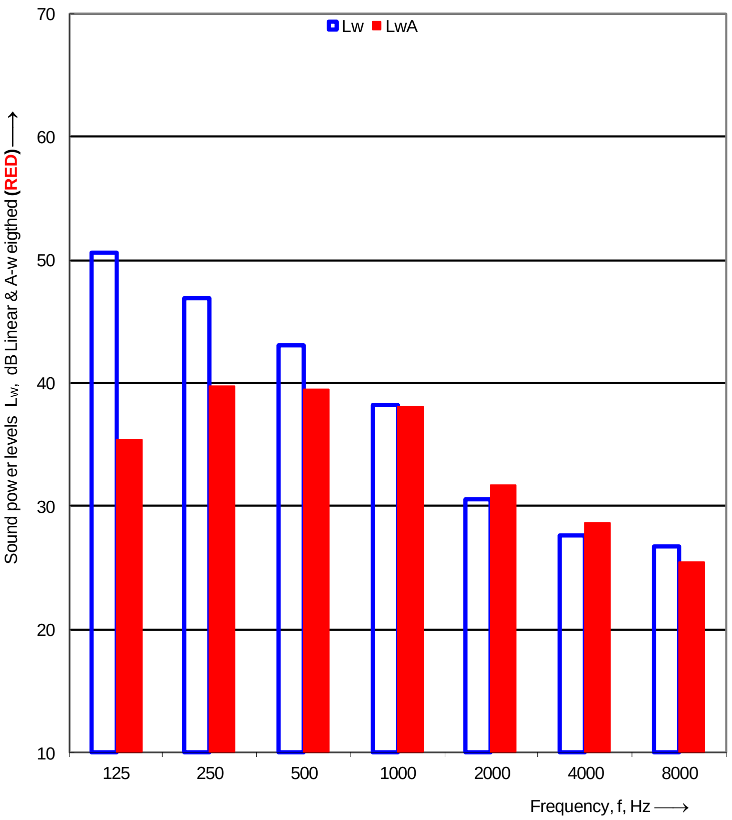
Engineering method for small, movable sources in reverberant fields - Comparison method for hard-walled test rooms

Client:	KLIMA-THERM	Date of test:	20-08-2024
Object:	Type: Split air to water heat pump, Model: IDU: ACHP-H08 5R3HA-I & ODU: ACHP-H08/4R3HA-O		
Mounting conditions:	The indoor unit is mounted at a hight of 1.7 meter above floor level using a metal support frame and a wooden board (90 x 110 cm). The IDU is mounted on the wooden board using vibration isolatores. The metal frame is damped by filling the pipes with dry sand placed it all on placed on four pices of concrete tiles (50x50x2.5 cm), which 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 indoor unit has been measured in Test room 1 and the outdoor unit is installed in the neighboring Test room 2.		
Operating conditions:	IDU: Ambient temperature = 20*C, ODU: A7W55, Compressor speed: 25[Hz], Fan speed: 400 [rpm], Heating capacity: 2.55 [kW], Power_input: 1.140[kW], Water flow rate: 700 [l/h] and dP_water: 839 [mbar]		

				Reference box:	
Static pressure:	1013 hPa				
Air temperature:	20.0 °C			L1:	0.4 m
Relative air humidity:	73.0 %			L2:	0.3 m
Test room volume:	102.8 m³	Room:	Room 1	L3:	0.8 m
Area, S, of test room:	138.9 m²			Volume:	0.1 m³

Frequency f [Hz]	L_W 1/3 octave [dB]	1/1 oct [dB]
100	45.6	
125	43.7	50.5 [1]
160	47.3	
200	37.4	
250	37.0	46.9
315	45.8	
400	39.1	
500	40.1	43.1
630	32.7	
800	32.0	
1000	36.2	38.2
1250	29.1	
1600	25.1	
2000	27.4	30.6
2500	24.2	
3150	23.1	
4000	22.6	27.6 [2]
5000	22.9	
6300	21.1	
8000	21.9	26.6 [2]
10000	22.5	

[1] Diff. to backgr. noise < 6dB
[2] Correction



Sound power level L_W(A): **44.9** dB [re 1pW] **Uncertainty σtot: 1.6** dB

Name of test institute:	DTI	Date:	20-08-2024
No. of test report:	300-KLAB-24-044		

In conformity with ISO 3743-1, except for some frequencies where the sound level is close to the background noise, see table. Difference less than 0,52 dB. The result thus represent the upper bound.

Test#2_Outdoor unit

ilac-MRA DANAK TEST Reg. nr. 300

Sound power levels according to ISO 3743-1:2010

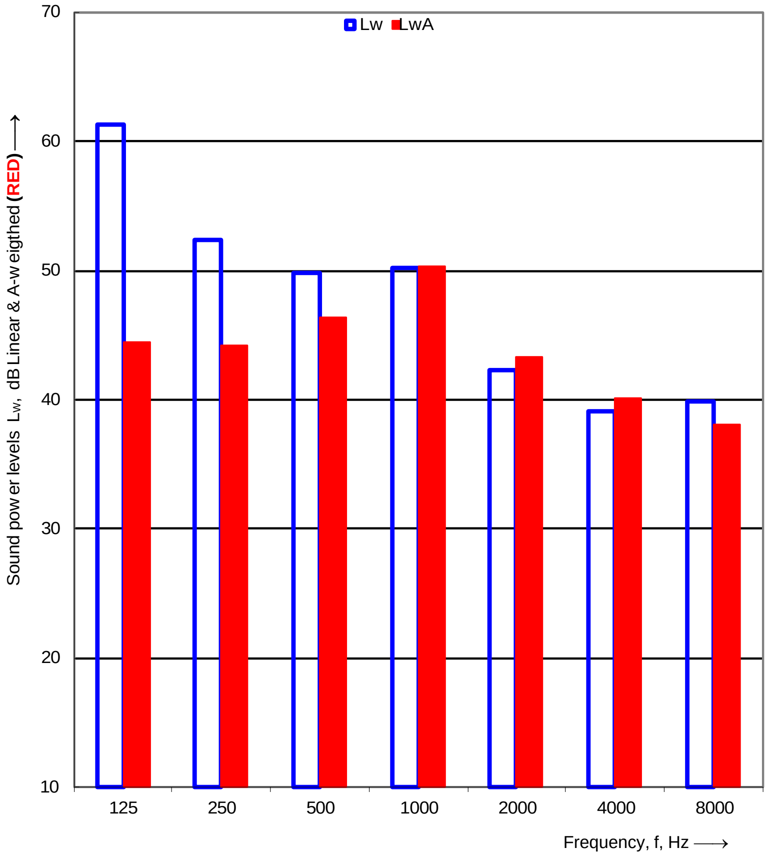
TEKNOLOGISK INSTITUT

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

Client:	KLIMA-THERM	Date of test:	20-08-2024
Object:	Type: Split air to water heat pump, Model: IDU: ACHP-H08 5R3HA-I & ODU: ACHP-H08/4R3HA-O		
Mounting conditions:	The outdoor unit is mounted on the supporting metal support frame using two pieces of vibration isolators and placed on four pieces of concrete tiles (45x45x5 cm). All of these are placed in a water drop dray on two pieces of heavy concrete tiles (90x90x10cm) laying on a vibration damping mat on the floor. The noise radiated by the outdoor unit has been measured in Test room 2.		
Operating conditions:	A7W55, Compressor speed: 25[Hz], Fan speed: 400 [rpm], Heating capacity: 2.55 [kW], Power_input: 1.140[kW], Water flow rate: 700 [l/h] and dP_water: 839 [mbar]		

Static pressure:	1013 hPa			Reference box:	
Air temperature:	7.0 °C			L1:	1.0 m
Relative air humidity:	84.0 %			L2:	0.4 m
Test room volume:	102.8 m³	Room:	Room 2	L3:	0.8 m
Area, S, of test room:	138.9 m²			Volume:	0.3 m³

Frequency f [Hz]	L_W 1/3 octave [dB]	1/1 oct [dB]
100	59.8	
125	49.1	61.3
160	54.9	
200	45.1	
250	49.8	52.4
315	46.7	
400	46.4	
500	45.3	49.8
630	42.7	
800	44.0	
1000	46.6	50.2
1250	45.4	
1600	39.6	
2000	36.6	42.2
2500	34.9	
3150	35.3	
4000	33.3	39.1
5000	34.3	
6300	31.4	
8000	32.9	39.9
10000	38.1	



Sound power level L_W(A): **53.8 dB [re 1pW]** **Uncertainty σtot: 1.6 dB**

Name of test institute:	DTI	Date:	20-08-2024
No. of test report:	300-KLAB-24-044		

Measurements are in full conformity with ISO 3743-1

Appendix 1

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 m^3) and equipped with relevant sound diffusing reflector panels. The acoustical test chamber fulfils the requirements of ISO3743-1 accuracy grade 2 (engineering grade).

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

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

Test#1_indoor unit

Test#2_outdoor unit

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

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 $\sigma_{tot} = \sqrt{\sigma_{R0}{}^2 + \sigma_{omc}{}^2}$ 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. However, the uncertainty is rounded up to the nearest 0.5 or 1.0dB 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:
$U = k\,\sigma_{tot}$ where k = 2 for 95% confidence.

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

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

Appendix 2 Authrization letter

CE DECLARATION OF CONFORMITY

We, NINGBO AUX ELECTRIC.,CO, LTD BUILDING B4 4 NO:1166 NORTH MINGGUANG ROAD,JIANGSHAN,YINZHOU NINGBO,CHINA

Declare under our sole responsibility that the devices:
Brand name: **SEVRA**
Type of units: Heat Pumps
Model: please see the list below

We, NINGBO AUX ELECTRIC CO., LTD (BUILDING B4 4 NO:1166 NORTH MINGGUANG ROAD , JIANGSHAN, YINZHOU NINGBO, CHINA) hereby confirm that all below Heat Pumps are the same except model no., nameplate specification and address. We declare that these units are produced by us under SEVRA BRAND NAME and shipped to Wienkra sp. z o.o. (located in Ul. Kotlarska 34, 31-539 Kraków, Poland) and we declare that this declaration is in conformity with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electro Magnetic Compatibility (2014/30/EU), Low Voltage (2014/35/EU) for evaluation of compliance with this directives, following standards were applied

EMC (2014/30/EU)
EN55014-1:2017+A11:2020
EN55014-2:2015
EN IEC 61000-3-2:2019
EN 61000-3-3:2013+A1:2019

LVD (2014/35/EU)
EN60335-2-40:2003+A11:2004+A12:2005+A1:2006+A2:2009+A13:2012
EN60035-1:2012+A11:2014+A13:2017+A1:2019+A14:2009+A2:2009
EN62233:2008

FOR SALES ONLY*

Model List:

SEVRA Model	AUX Model
SEV-ACHP3-08-I / SEV-ACHP1-08-O	**ACHP-H08/4R3HA-I / ACHP-H08/4R3HA-O**

This Declaration of Conformity is issued under the sole responsibility of the Manufacturer.

Authorized representative:

NINGBO AUX ELECTRIC.,CO,LTD

NAME : Ada Qiu

Title: CAC Regional Sales Manager of Central & Southeast Europe

宁波奥克斯电气股份有限公司

Date : Aug 30th., 2024

NINGBO AUX ELECTRIC CO.,LTD

FOR SALES ONLY

SIGNATURE:

Ada. Qiu.

Mgr Edyta Winiarska-Stachowicz
Tłumacz przysięgły języka angielskiego
Ul. Kazimierza Wielkiego 4/4, Kraków
tel. 609-570-720
Uwierzytelnione tłumaczenie z języka angielskiego

Raport z przeprowadzonej próby

Nr raportu:
300-KLAB-24-044 rew. 2 - 1

DANISH TECHNOLOGICAL INSTITUTE

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

Znak: KAMA/HSG
Nr pliku: 251355
Załączniki: 1

Klient:	Firma:	NINGBO AUX ELECTRIC CO., LTD
	Adres:	NO.1166 MingGuang North Road
	Miejscowość:	JiangShan Town, Yinzhou Disrtict, Ningbo, Zhejiang, ChRL
Charakt. prod.:	Nazwa:	AUX
	Typ:	Pompa ciepła typu powietrze-woda (dzielona)
	Model:	Jedn. zewn.: ACHP-H08/4R3HA-O
		Jedn. wewn.: ACHP-H08/4R3HA-I
	Nr fabr.:	Jedn. zewn.: 8E0384002404110001
		Jedn. wewn.: 8C1493002404210001
	Rok prod.:	Jedn. zewnętrzna:2024.04 Jedn. wewnętrzna:2024.04
Data:	Prod. badany:	lipiec 2024 r. - sierpień 2024 r.
Nazwa marki:	Nazwa:	SEVRA
	Typ:	Pompa ciepła typu powietrze-woda (monoblok)
	Model:	SEV-ACHP3-08-I / SEV-ACHP1-08-O

Uwagi:

Niniejszy raport zastępuje raport 300-KLAB-24-044-1 wydany 2024.09.11, ponieważ zmieniono nazwę klienta. Urządzenie dostarczył klient. Instalacja i ustawienia testowe zostały wykonane zgodnie z zaleceniami producenta. Raport dotyczący testowanej jednostki nosi nazwę 300-KLAB-24-044 rev 1.; data wydania 2024.08.23. Zob. również załącznik 2.

Warunki przeprowadzenia próby:

Niniejsza próba została przeprowadzona w ramach akredytacji zgodnie z międzynarodowymi wymogami (ISO/IEC 17025:2017) oraz zgodnie z Ogólnymi Warunkami Duńskiego Instytutu Technologicznego. Wyniki próby odnoszą się wyłącznie do testowanego produktu. Niniejszy raport z przeprowadzonej próby można przytaczać we fragmentach wyłącznie za pisemną zgodą Duńskiego Instytutu Technologicznego.

Klient nie może powoływać się na Duński Instytut Technologiczny lub jego pracowników w celach reklamowych lub marketingowych, chyba że Duński Instytut Technologiczny wyrazi na to każdorazowo pisemną zgodę.

Oddział/Centrum: Danish Technological Institute
Energy and Climate
Heat Pump Laboratory, Aarhus

Data: 2024.09.19

Podpis:
Kamalathasan Arumugam
B.Sc. Engineer

Współpraca:
Henning S. Grindorf
B.TecMan & MarEng

DOKUMENT PODPISANY CYFROWO
20 września 2024
DANISH TECHNOLOGICAL INSTITUTE

ilac-MRA DANAK
Test Reg. nr. 300

Cel przeprowadzenia próby

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 próby w warunkach obciążenia częściowego podanych w tabelach na stronie 4 i 5.

Standardowe warunki znamionowe próby COP A7/W35 według normy EN 14511:2022.
Standardowe warunki znamionowe próby COP A7/W55 według normy EN 14511:2022.

Pomiary mocy akustycznej według normy EN 12102-1:2022.

Warunki prowadzenia próby

Warunki próby SCOP dla niskich temperatur - EN 14825

Warunki częściowego obciążenia dla referencyjnego SCOP i referencyjnego SCOPon do obliczania jednostek powietrze-woda dla zastosowań niskotemperaturowych dla referencyjnego sezonu grzewczego;
„A” = umiarkowanie, „W” = cieplej, „C” = chłodniej.

	Współczynnik obciążenia częściowego w %				Zewnętrzny wymiennik ciepła		Wewnętrzny wymiennik ciepła			
					Temperatura termometru suchego (mokrego) °C		Wylot stały °C	Wylot zmienny[d] °C		
	Wzór	War. umiarkow.	Cieplej	Chłodniej	Powietrze zewnętrzne	Powietrze wylotowe	Wsz. war. klimatyczne	War. umiarkow.	Cieplej	Chłodniej
A	(-7-16)/($T_{designh}$ -16)	88,46	n.d.	60,53	-7(-8)	20(12)	[a] / 35	[a] / 34	n.d.	[a] / 30
B	(+2-16)/($T_{designh}$ - 16)	53,85	100,00	36,84	2(1)	20(12)	[a] / 35	[a] / 30	[a] / 35	[a] / 27
C	(+7-16)/($T_{designh}$ - 16)	34,62	64,29	23,68	7(6)	20(12)	[a] / 35	[a] / 27	[a] / 31	[a] / 25
D	(+12-16) / ($T_{designh}$ - 16)	15,38	28,57	10,53	12(11)	20(12)	[a] / 35	[a] / 24	[a] / 26	[a] / 24
E	(TOL^e - 16) / ($T_{designh}$ - 16)				TOL^e	20(12)	[a] / 35	[a] / [b]	[a] / [b]	[a] / [b]
F	(T_{biv} - 16) / ($T_{designh}$ - 16)				T_{biv}	20(12)	[a] / 35	[a] / [c]	[a] / [c]	[a] / [c]
G	(-15-16) / ($T_{designh}$ - 16)	n.d.	n.d.	81,58	-15	20(12)	[a] / 35	n.d.	n.d.	[a] / 32

Informacje dodatkowe

Uwarunk. klimatyczne	$T_{designh}$ [°C]	$T_{bivalent}$ [°C]	TOL [°C]	Temperatura zewnętrzna	Natężenie przepływu
War. umiarkow.	-10	-7	-10	Zmienna	Zmienna

Warunki próby SCOP dla średnich temperatur - EN 14825

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

	Współczynnik obciążenia częściowego w %				Zewnętrzny wymiennik ciepła		Wewnętrzny wymiennik ciepła			
					Temperatura termometru suchego (mokrego) °C		Wylot stały °C	Wylot zmienny °C		
	Wzór	War. umiarkow	Cieplej	Chłodniej	Powietrze zewnętrzne	Powietrze wylotowe	Wsz. war. klimatyczne	War. umiarkow	Cieplej	Chłodniej
A	(-7 - 16) / ($T_{designh}$ - 16)	88,46	n.d.	60,53	-7(-8)	20(12)	[a] / 55	[a] / 52	n.d.	[a] / 44
B	(+2 - 16) / ($T_{designh}$ - 16)	53,85	100	36,84	2(1)	20(12)	[a] / 55	[a] / 42	[a] / 55	[a] / 37
C	(+7 -16) / ($T_{designh}$ - 16)	34,62	64,29	23,68	7(6)	20(12)	[a] / 55	[a]/ 36	[a]/ 46	[a]/ 32
D	(+12-16) / ($T_{designh}$ - 16)	15,38	28,57	10,53	12(11)	20(12)	[a] / 55	[a] / 30	[a] / 34	[a] / 28
E	(TOL^e-16) / ($T_{designh}$ - 16)				TOL^e	20(12)	[a] / 55	[a] / [b]	[a] / [b]	[a] / [b]
F	(T_{biv} - 16) / ($T_{designh}$ - 16)				T_{biv}	20(12)	[a] / 55	[a] / [c]	[a] / [c]	[a] / [c]
G	(-15-16) / ($T_{designh}$ - 16)	n.d.	n.d.	81,58	-15	20(12)	[a] / 55	n.d.	n.d.	[a] / 49

Informacje dodatkowe

Uwarunk. klimatyczne	$T_{designh}$ [°C]	$T_{bivalent}$ [°C]	TOL [°C]	Temperatura zewnętrzna	Natężenie przepływu
War. umiarkow.	-10	-7	-10	Zmienna	Zmienna

Warunki próby COP dla niskich temperatur - EN 14511

N#	Źródło ciepła		Ujście ciepła	
	Temperatura termometru suchego na wlocie (°C)	Temperatura termometru mokrego na wlocie (°C)	Temperatura wlotowa (°C)	Temperatura wylotowa (°C)
1^S	7	6	30	35

S: Standardowy warunek znamionowy

Warunki próby COP dla umiarkowanych temperatur - EN 14511

N#	Źródło ciepła		Ujście ciepła	
	Temperatura termometru suchego na wlocie (°C)	Temperatura termometru mokrego na wlocie (°C)	Temperatura wlotowa (°C)	Temperatura wylotowa (°C)
1^S	7	6	47	55

S: Standardowy warunek znamionowy

Warunki prowadzenia prób dla pomiaru mocy akustycznej - EN12102-1

N#	Warunki prowadzenia próby		Ustawienia pompy ciepła			
	Temperatura otaczającego powietrza (°C)	Zewnętrzny/ wewnętrzny wymiennik ciepła (°C)	Prędkość obrotowa sprężarki (Hz)	Prędkość obrotowa wentylatora (obr./min.)	Wydajność grzewcza (kW)	Moc wejściowa (kW)
1[1]	20	7/55	-	-	2,55	1,14
2[2]	7	7/55	25	400	2,55	1,14

1) Jedn. wewnętrzna
2) Jedn. zewnętrzna

Wyniki przeprowadzonej próby

Wyniki przeprowadzonej próby SCOP w niskiej temperaturze - średnia sezonu grzewczego - EN 14825

Model (zewnętrzny)	ACHP-H08/4R3HA-O
Monoblokowa pompa ciepła powietrze-woda	N
Niskotemperaturowa pompa ciepła	N
Wyposażona w dodatkowy podgrzewacz	Y
Podgrzewacz kombinowany z pompą ciepła	N

Znamionowa moc cieplna[15]	P_{rated}	**8,1** [kW]
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	η_s	**199,2** [%]
	SCOP	**5,06** [-]

Zmierzona wydajność ogrzewania dla częściowego obciążenia przy temperaturze zewnętrznej Tj	Umiark. war. klimatyczne	Tj=-15°C	Pdh	- [kW]
		Tj=-7°C	Pdh	6,64 [kW]
		Tj=2°C	Pdh	4,18 [kW]
	Aplikacja niskotemperaturowa	Tj=7°C	Pdh	3,00 [kW]
		Tj = 12°C	Pdh	2,47 [kW]
		Tj=temperatura dwuwartościowa	Pdh	6,64 [kW]
		Tj=limit operacyjny	Pdh	6,78 [kW]

Zmierzony współczynnik wydajności przy temperaturze zewnętrznej Tj	Umiark. war. klimatyczne	Tj=-15°C	COPd	- [-]
		Tj=-7°C	COPd	3,26 H
		Tj=2°C	COPd	4,99 [-]
	Aplikacja niskotemperaturowa	Tj=7°C	COPd	6,79 [-]
		Tj=12°C	COPd	7,60 [-]
		Tj=temperatura dwuwartościowa	COPd	3,26 H
		Tj=limit operacyjny	COPd	2,90 [-]

Temperatura dwuwartościowa	Tbivalent	-7 [°C]
Limit operacyjny	TOL	-10 [°C]
temperatury	WTOL	- [°C]
Współczynnik utraty energii	Cdh	0,90 [*]

Pobór mocy w trybach innych niż tryb aktywny	Tryb wył.	P_{OFF}	0,015 [kW]
	Tryb wył. termostatu	P_{TO}	0,060 [kW]
	Tryb oczekiwania	P_{SB}	0,015 [kW]
	Tryb grzania skrzyni korbowej	P_{CK}	0,011 [kW]
Podgrzewacz dodatkowy[1)]	Znamionowa moc cieplna	P_{SUP}	1,32 [kW]
	Rodzaj dostarczanej energii		Elektryczna

Pozostałe elementy	Sterowanie przepustowością		Zmienna
	Sterowanie przepływem wody		Zmienna
	Natężenie przepływu wody		-
	Roczne zapotrzebowanie na energię	Q_{HE}	3310 [kWh]

[1)] W przypadku ogrzewaczy pomieszczeń z pompą ciepła i wielofunkcyjnych podgrzewaczy z pompą ciepła znamionowa moc cieplna Prated, jest równa projektowemu obciążeniu grzewczemu, Pdesignh, a znamionowa moc cieplna dodatkowego ogrzewacza, Psup, jest równa dodatkowej wydajności grzewczej, sup(Tj).

Wyniki próby SCOP w średnich temperaturach - średnia sezonu grzewczego – EN 14825

Model (zewnętrzny)	ACHP-H08/4R3HA-O
Monoblokowa pompa ciepła powietrze-woda	N
Niskotemperaturowa pompa ciepła	N
Wyposażona w dodatkowy podgrzewacz	Y
Podgrzewacz kombinowany z pompą ciepła	N

Znamionowa moc cieplna[11]	P_{rated}	**6,6** [kW]
Sezonowa efektywność energetyczna pomieszczeń	η_s	**142,3** [%]
	SCOP	**3,63** [-]

Zmierzona wydajność ogrzewania dla częściowego obciążenia przy temperaturze zewnętrznej Tj	Umiark. war. klimatyczne	Tj=-15°C	Pdh	- [kW]
		Tj= 7°C	Pdh	6,20 [kW]
	Aplikacja średniotemperaturowa	Tj=2°C	Pdh	3,83 [kW]
		Tj=7°C	Pdh	2,52 [kW]
		Tj=12°C	Pdh	2,23 [kW]
		Tj=temperatura dwuwartościowa	Pdh	6,20 [kW]
		Tj=limit operacyjny	Pdh	5,60 [kW]

Zmierzony współczynnik wydajności przy temperaturze zewnętrznej Tj	Umiark. war. klimatyczne	Tj=-15°C	COPd	- [-]
		Tj=-7°C	COPd	2,29 [-]
	Aplikacja średniotemperaturowa	Tj=2°C	COPd	3,61 [-]
		Tj=7°C	COPd	4,61 [-]
		Tj = 12°C	COPd	6,30 [-]
		Tj = temperatura dwuwartościowa	COPd	2,29 [-]
		Tj=limit operacyjny	COPd	1,97 [-]

Temperatura dwuwartościowa	Tbivalent	-7 [°C]
Limit operacyjny	TOL	-10 [°C]
temperatury	WTOL	- [°C]
Współczynnik utraty energii	Cdh	0,90 [-]

Pobór mocy w trybach innych niż tryb aktywny	Tryb wył.	P_{OFF}	0,015 [kW]
	Tryb wył. termostatu	P_{TO}	0,060 [kW]
	Tryb oczekiwania	P_{SB}	0,015 [kW]
	Tryb grzania skrzyni korbowej	P_{CK}	0,011 [kW]
Podgrzewacz dodatkowy[1)]	Znamionowa moc cieplna	P_{SUP}	1,00 [kW]
	Rodzaj dostarczanej energii		Elektryczna

Pozostałe elementy	Sterowanie przepustowością		Zmienna
	Sterowanie przepływem wody		Zmienna
	Natężenie przepływu wody		-
	Roczne zapotrzebowanie na energię	Q_{ME}	3753 [kWh]

[1)] W przypadku ogrzewaczy pomieszczeń z pompą ciepła i wielofunkcyjnych podgrzewaczy z pompą ciepła znamionowa moc cieplna Prated, jest równa projektowemu obciążeniu grzewczemu, Pdesignh, a znamionowa moc cieplna dodatkowego ogrzewacza, Psup, jest równa dodatkowej wydajności grzewczej, sup(Tj).

Wyniki próby COP - niska temperatura - EN 14511

N#	Warunki prowadzenia próby	Wydajność grzewcza [kW]	COP
1	A7/W35	8,367	4,994

Wyniki próby COP - średnia temperatura - EN 14511

N#	Warunki prowadzenia próby	Wydajność grzewcza [kW]	COP
1	A7/W55	8,354	3,075

Wyniki próby pomiaru mocy akustycznej – EN 12102-1

N#	Poziom mocy akustycznej LW(A) [dB re 1pW]	Niepewność (dB) (wartość ważona)
1[1]	**44,9**	1,6
2[2]	**53,8**	1,6

1) Jedn. wewnętrzna
2) Jedn. zewnętrzna

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

Pomiary mocy akustycznej zostały przeprowadzone przez Kamalathasana Arumugama (KAMA) i nadzorowane przez Patricka Gliberta (PGL) z Duńskiego Instytutu Technologicznego.

Załącznik 2 List uwierzytelniający

DEKLARACJA ZGODNOŚCI CE

Firma NINGBO AUX ELECTRIC, CO, LTD BUILDING B4 4 NO:1166 NORTH MINGGUANG ROAD, JIANGSHAN, YINZHOU NINGBO, CHINY

oświadcza na swoją wyłączną odpowiedzialność, że urządzenia:

Nazwa marki: **SEVRA**

Typ: Pompy ciepła

Model: zapoznać się z poniższym wykazem

Firma NINGBO AUX ELECTRIC CO., LTD (BUILDING B4 4 NO:1166 NORTH MINGGUANG ROAD , JIANGSHAN, YINZHOU NINGBO, CHINY) niniejszym potwierdza, że wszystkie poniższe pompy ciepła są takie same, z wyjątkiem modelu o numerze, wyszczególnionym w treści tabliczki znamionowej i adresie. Oświadczamy, że niniejsze urządzenia zostały wyprodukowane przez naszą firmę pod marką SEVRA i wysłane do przedsiębiorstwa Wienkra sp. z o.o. (z siedzibą przy ul. Kotlarskiej 34; 31-539 Kraków, Polska) i oświadczamy, że niniejsza deklaracja jest zgodna z wymaganiami określonymi w Dyrektywie Rady w sprawie zbliżenia ustawodawstw państw członkowskich odnoszących się do kompatybilności elektromagnetycznej (2014/30/UE), niskonapięciowej (2014/35/UE) w celu oceny zgodności z tymi dyrektywami zastosowano następujące normy:

EMC (2014/30/EU)
EN55014-1:2017+A11:2020
EN55014-2:2015
EN IEC 61000-3-2:2019
EN 61000-3-3:2013+A1:2019

LVD(2014/35/EU)
EN60335-2-40:2003+A11:2004+A12:2005+A1:2006+A2:2009+A13:2012
EN60035-1:2012+A11:2014+A13:2017+A1:2019+A14:2009+A2:2009
EN62233:2008

Wykaz modeli:

Model SEVRA	Model AUX
SEV-ACHP3-08-I / SEV-ACHP1-08-O	**ACHP-H08/4R3HA-I / ACHP-H08/4R3HA-O**

Niniejsza Deklaracja zgodności została wydana na wyłączną odpowiedzialność Producenta.

Upoważniony przedstawiciel:

NINGBO AUX ELECTRIC.,CO, LTD

NAZWISKO: Ada Qiu

Stanowisko: CAC Regional Sales Manager of Central & Southeast Europe

Data: 30 sierpnia 2024

PODPIS:

Ada. Qiu.

Poświadczam zgodność powyższego tłumaczenia z okazanym mi dokumentem w języku angielskim.

Kraków, dnia 4 października 2024 r. Rep. nr 10/634/24

Edyta Winiarska-Stachowicz
Tłumacz przysięgły języka angielskiego

OŚWIADCZENIE

Producent SEVRA oświadcza, iż pompy ciepła

1) SEV-ACHP3-08-I + SEV-ACHP1-08-O

2) SEV-ACHP3-10-I + SEV-ACHP1-10-O

3)

Oznaczenie/typ/identyfikator modelu

4)

Oznaczenie/typ/identyfikator modelu

5)

Oznaczenie/typ/identyfikator modelu

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

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

Kraków, 15.10.2024
Miejscowość, data

Maciej Kosman
Podpis osoby upoważnionej