L 1045.1

TEST REPORT
39-17666/T

Product:	Outdoor Air/Water Heat pump - monobloc
Type designation:	**EUROS ATMO15**
Customer:	Euros Energy Sp. z o.o ul. Macieja Rataja 4F 05-850 Koprki POLAND
Manufacturer:	Euros Energy Sp. z o.o ul. Macieja Rataja 4F 05-850 Koprki POLAND
Report issue date:	2024-05-23
Distribution list:	1 copy to the Customer 1 copy to the Engineering Test Institute

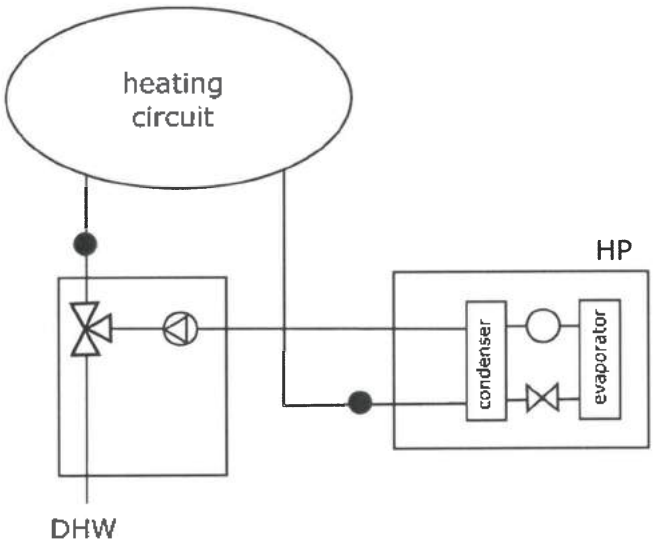
I. Description of product tested

The Heat pump **EUROS ATMO15** supplied by the company **Euros Energy Sp. z o.o** is structurally adapted to operate in air/water system. Device is designed as monobloc **EUROS ATMO 15 OUT** placed outside and indoor hydrobox **EUROS ATMO 15 IN** hanging on inner wall. Outdoor and indoor units are connected by water hoses and electrical wires. Refrigerant R32 is used with charge 1.8 kg. Power supply is a three-phase. Heat pump is able to work in heating and cooling mode. Heat pump is working with fixed flow rate.

Main components of the outdoor unit **EUROS ATMO 15 OUT**:

Main components of the indoor hydrobox **EUROS ATMO 15 IN:**

Scheme:



Photodocumentation:

Heat pump **EUROS ATMO15** – outdoor unit
– Front view –

Heat pump **EUROS ATMO15** – outdoor unit
– Back view –

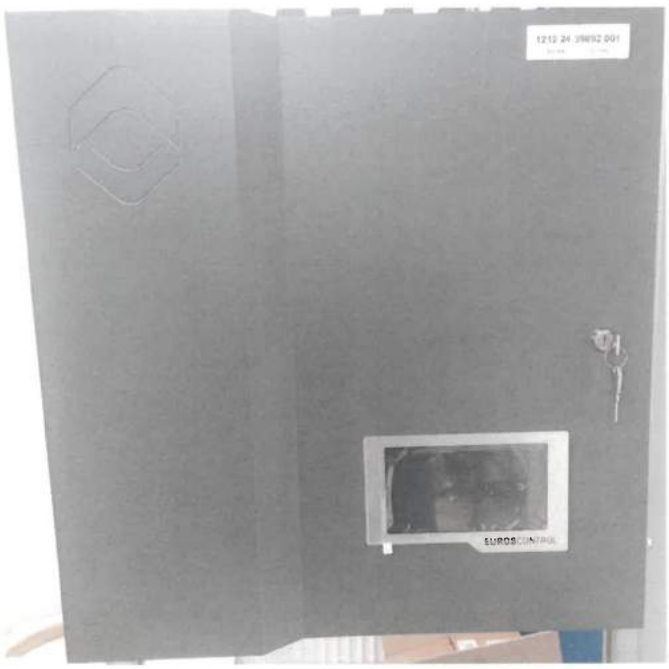
Not recognized

Heat pump **EUROS ATMO15** – outdoor unit
– Compressor label –

Heat pump **EUROS ATMO15** – outdoor unit
– Label –

Heat pump **EUROS ATMO15** – outdoor unit
– Without cover –

Heat pump **EUROS ATMO15** – indoor hydrobox
– Label –



Heat pump **EUROS ATMO15** – indoor hydrobox
– With cover –

Heat pump **EUROS ATMO15** – indoor hydrobox
– Without cover –

II. Sample tested

SZU reg. no.	Product name	Date of submission
1212.24.39892.001	EUROS ATMO15	2024-04-19

The visual inspection, tests and verification were carried out by Ing. Tomáš Sedláček at the test station of SZU
The tests were performed using measuring and testing equipment with valid calibration.

III. Measuring and test equipment:

No.	Description:	Inventory number:
1.	Electrical energy meter	E2.1
2.	Digital watt meter	1.2.2 ENERGIE ANALYZATOR_2
3.	Flow meter Krohne Optiflux	8.1.1 TECH_K1_V_DN15
4.	Barometer	2.4 MAR18_1_PB
5.	Differential pressure gauge	2.2 MAR18_1_dP
6.	Temperature-humidity meter HF532	3.1.1 K2_VLHKOST_1
7.	Temperature-humidity meter HF532	3.1.3 K2_VLHKOST_2
8.	Thermometers	3.4 MAR18_T

IV. Methods, results of tests and verifications

No.	Test objective	Requirement	Method of test	Documentation	Test evaluation/ verification *
1.	Rating conditions	–	ČSN EN 14511-2:2023 ČSN EN 14511-3:2023	Page No. 7	x
2.	Seasonal performance tests and SCOP calculation – Low temperature application	–	ČSN EN 14511-3:2023 ČSN EN 14825:2023	Page No. 8 – 14	x
3.	Seasonal performance tests and SCOP calculation – Medium temperature application	–	ČSN EN 14511-3:2023 ČSN EN 14825:2023	Page No. 15 – 21	x

*) **Evaluation / statement of conformity:**
+..... Requirement fulfilled
-..... Requirement not fulfilled
0 .....Not applicable
x .....Not evaluated

Measured quantity	Unit	Uncertainty of measurement	Evaluation
Liquid			
- temperature difference (dT)	[K]	± 0.15 K	**fulfilled**
- temperature inlet/outlet	[°C]	± 0.15 K	**fulfilled**
- volume flow	[m3/s]	± 1 %	**fulfilled**
- static pressure difference	[kPa]	± 1 kPa (Δp ≤ 20 kPa) or ± 5 % (Δp > 20 kPa)	fulfilled
Air			
- dry bulb temperature	[°C]	± 0.2 K	fulfilled
- wet bulb temperature	[°C]	± 0.4 K	fulfilled
- volume flow	[m3/s]	± 5 %	not applied
- static pressure difference	[Pa]	± 5 Pa (Δp ≤ 100 Pa) or ± 5 % (Δp > 100 Pa)	not applied
Refrigerant			
- pressure at compressor outlet	[kPa]	± 1 %	not applied
- temperature	[°C]	± 0.5 K	not applied
Concentration (in volume)			
- heat transfer medium	[%]	± 2	not related
Electrical quantities			
- electric power	[W]	± 1 %	fulfilled
- voltage	[V]	± 0.5 %	fulfilled
- current	[A]	± 0.5 %	fulfilled
- electric energy	[kWh]	± 1 %	not applied
Compressor rotational speed	[min-1]	± 0.5 %	not applied
The heating or cooling capacities measured on the liquid side shall be determined within a maximum uncertainty of 5 % independent of the individual uncertainties of measurement including the uncertainties on the properties of fluids.			fulfilled

Note:
The stated extended measurement uncertainties are calculated as a factor of the measurement uncertainty and the extension coefficient k=2, corresponding to the coverage certainty of 95% as regards standard classification.

If a statement of conformity is provided, the decision rule pursuant to ILAC-G8:09/2019, Art. 4.2.1 - binary statement for the simple acceptance rule shall apply.

Comment to abbreviated marking: e.g. A7/W35
A (air) 7 (input air, dry-bulb temperature in °C) / W (water), 35 (output heating water temperature in °C)

Test objective:	Rating conditions
Exact name of the test procedure:	**1.37* - Tests of leakage, pressure resistance, thermal and technical parameters, combustion efficiency, safety functions**
Test method:	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023
Sample tested:	Heat pump **EUROS ATMO15**
Measuring equipment used:	see Chapter III

Specification of the assessment condition		**A7/W35**	**A7/W55**
Date of testing		**2024-04-26**	**2024-04-25**
Transient test procedure	YES / NO	YES	YES
Average defrost time of 1 cycle	[min]	–	–
Average time of 1 cycle	[min]	–	–
Calculation time	[min]	180.0	180.0
Output heating water – temperature calculation	[°C]	35.07	55.05
Input heating water – temperature calculation	[°C]	30.01	47.06
Output heating water temperature	[°C]	35.07	55.05
Input heating water temperature	[°C]	30.01	47.06
Air temperature – dry bulb temperature	[°C]	6.99	6.99
Air temperature – wet bulb temperature	[°C]	6.00	6.00
Relative humidity	[%]	86.98	87.08
Barometric pressure	[kPa]	98.007	97.656
Ambient temperature	[°C]	6.91	6.91
Secondary circuit pressure difference	[kPa]	39.613	55.670
Efficiency of the secondary liquid pump	[–]	0.272	0.230
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	1.3767	0.8924
Density of heating water	[$kg \cdot m^{-3}$]	994.0	986.0
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.175	4.178
Voltage	[V]	401.53	401.04
Total current	[A]	8.76	15.08
Overall power input	[kW]	1.564	2.796
Capacity correction of sec. liquid pump	[W]	40.558	38.829
Power input correction of sec. liquid pump	[W]	55.67	52.63
Heating capacity – heating water	[kW]	8.041	8.179
Corrected heating capacity – heating water	**[kW]**	**8.001**	**8.140**
Uncertainty of corrected heating capacity	[kW]	± 0.137	± 0.091
Effective electric power input	**[kW]**	**1.508**	**2.743**
COP	**[–]**	**5.305**	**2.967**
Uncertainty of COP	[–]	± 0.094	± 0.034
Control settings	**[–]**	**1**	**2**
Circulation pump settings – heating water	[%]	-	-

Test objective:	Seasonal performance tests and SCOP calculation – Low temperature application
Exact name of the test procedure:	**1.37* - Tests of leakage, pressure resistance, thermal and technical parameters, combustion efficiency, safety functions**
Test method:	ČSN EN 14511-3:2023, ČSN EN 14825:2023
Sample tested:	Heat pump **EUROS ATMO15**
Measuring equipment used:	see Chapter III

Design					Air / water – monobloc		
Conditions specification according to ČSN EN 14825:2023	Temperature application				**Low** (reference water temperature 35 °C)		
	Reference heating season				**Average**		
	Outlet water temperature - indoor heat exchanger				Variable		
	Compressor speed control				Variable		
	Water flow rate – primary circuit				–		
	Water flow rate – secondary circuit				Fixed		
Seasonal space heating energy efficiency	Heating	Average	η_s		<u>203.4</u>	%	
		Warmer	η_s		–	%	
		Colder	η_s		–	%	
Seasonal efficiency according to ČSN EN 14825:2023	Heating	Average	**SCOP**		<u>5.16</u>	–	
		Warmer	SCOP		–	–	
		Colder	SCOP		–	–	
Function	Cooling				Yes		
	Heating	Yes	Reference heating season	Average	Yes		
				Warmer	–		
				Colder	–		
Full heating load	Cooling		$P_{designc}$		–	kW	
	Heating	Average	$P_{designh}$		<u>11.68</u>	kW	
		Warmer	$P_{designh}$		–	kW	
		Colder	$P_{designh}$		–	kW	
Bivalent temperatures	Heating	Average	$T_{bivalent}$		-7	°C	
		Warmer	$T_{bivalent}$		–	°C	
		Colder	$T_{bivalent}$		–	°C	
Operation limit temperatures	Heating	Average	TOL		-10	°C	
		Warmer	TOL		–	°C	
		Colder	TOL		–	°C	
Seasonal power consumption according to ČSN EN 14825:2023	Cooling		Q_{CE}		–	kWh	
	Heating	Average	Q_{HE}		4677	kWh	
		Warmer	Q_{HE}		–	kWh	
		Colder	Q_{HE}		–	kWh	
Modes other than „active mode“	Off mode			P_{OFF}	18.3	W	
	Thermostat off mode			P_{TO}	18.2	W	
	Standby mode			P_{SB}	18.3	W	
	Crankcase heater mode			P_{CK}	0.0	W	

Calculation of SCOP according to ČSN EN 14825:2023:

Number of hours used for calculation of reference SCOP (Annex B – Table B. 2, B. 3)
- For reversible heat pumps and reference heating season „A" = average

H_{HE}	2066	[h]
H_{TO}	178	[h]
H_{SB}	0	[h]
H_{CK}	178	[h]
H_{OFF}	0	[h]

Measured data:

P_{TO}	0.0182	[kW]
P_{SB}	0.0183	[kW]
P_{CK}	0.0000	[kW]
P_{OFF}	0.0183	[kW]
$P_{designh}$	11.68	[kW]
$SCOP_{ON}$	5.16	[–]

Coefficient and correction:

F(1)	3	[%]
F(2)	0	[%]
CC	2.5	[–]

Calculation of SCOP:

7.3 Calculation of the reference annual heating demand (Q_H)

$Q_H = P_{designh} \cdot H_{HE}$ [kWh]

$Q_H = 11.68 \cdot 2066 = 24132$ [kWh]

7.4 Calculation of the annual electricity consumption (Q_{HE})

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} \cdot P_{TO} + H_{SB} \cdot P_{SB} + H_{CK} \cdot P_{CK} + H_{OFF} \cdot P_{OFF}$ [kWh]

$Q_{HE} = 24132 / 5.16 + 178 \cdot 0.0182 + 0 \cdot 0.0183 + 178 \cdot 0 + 0 \cdot 0.0183 = 4677$ [kWh]

7.2 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [–]

$SCOP = 24132 / 4677 = 5.16$ [–]

7.1 Calculation of the seasonal space heating efficiency η_s

$\Sigma F(i) = F(1) + F(2)$ [–]

$\Sigma F = 0.03 + 0 = 0.03$ [–]

$\eta_s = 1 / CC \cdot SCOP - \Sigma F(i)$ [–]

$\eta_s (A) = (1 / 2.5) \cdot 5.16 - 0.03 =$ **2.034** [–]

Temperature level		Low (reference water temperature 35 °C)		
Reference heating season		„A" = average ($T_{designh}$ = -10 °C)		
Assessment condition		**A, Tbiv(F)**	**B**	**C**
Specification of the assessment condition		**A-7/W34**	**A2/W30**	**A7/W29.63**
Date of testing		**2024-04-26**	**2024-04-29**	**2024-04-30**
Transient test procedure	YES / NO	NO	NO	YES
Average defrost time of 1 cycle	[min]	–	–	–
Average time of 1 cycle	[min]	–	–	–
Calculation time	[min]	70.0	70.0	180.0
Output heating water – temperature calculation	[°C]	34.00	29.99	29.64
Input heating water – temperature calculation	[°C]	27.47	25.62	24.43
Output heating water temperature	[°C]	34.00	29.99	29.64
Input heating water temperature	[°C]	27.47	25.62	24.43
Air temperature – dry bulb temperature	[°C]	-6.99	1.99	7.00
Air temperature – wet bulb temperature	[°C]	-8.04	1.00	6.02
Relative humidity	[%]	73.96	83.92	87.00
Barometric pressure	[kPa]	97.901	99.064	99.211
Ambient temperature	[°C]	-7.17	1.87	6.92
Secondary circuit pressure difference	[kPa]	40.160	44.540	42.147
Efficiency of the secondary liquid pump	[–]	0.273	0.273	0.273
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	1.3770	1.3768	1.3770
Density of heating water	[$kg \cdot m^{-3}$]	994.4	995.6	995.7
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.176	4.177	4.177
Voltage	[V]	400.51	401.77	400.58
Total current	[A]	16.78	7.71	7.67
Overall power input	[kW]	3.090	1.385	1.359
Capacity correction of sec. liquid pump	[W]	40.875	43.015	41.853
Power input correction of sec. liquid pump	[W]	56.24	60.05	57.97
Heating capacity – heating water	[kW]	10.374	6.949	8.286
Corrected heating capacity – heating water	**[kW]**	**10.333**	**6.906**	**8.244**
Uncertainty of corrected heating capacity	[kW]	± 0.139	± 0.137	± 0.138
Effective electric power input	**[kW]**	**3.033**	**1.325**	**1.301**
COP	**[–]**	**3.406**	**5.211**	**6.337**
Uncertainty of COP	[–]	± 0.047	± 0.107	± 0.111
Control settings	**[–]**	**7**	**1**	**1**
Circulation pump settings – heating water	[%]	-	-	-

Temperature level		Low (reference water temperature 35 °C)	
Reference heating season		„A" = average ($T_{designh}$ = -10 °C)	
Assessment condition		**D**	**TOL(E)**
Specification of the assessment condition		**A12/W28.79**	**A-10/W35**
Date of testing		**2024-04-30**	**2024-05-06**
Transient test procedure	YES / NO	YES	NO
Average defrost time of 1 cycle	[min]	–	–
Average time of 1 cycle	[min]	–	–
Calculation time	[min]	180.0	70.0
Output heating water – temperature calculation	[°C]	28.75	35.00
Input heating water – temperature calculation	[°C]	22.78	29.08
Output heating water temperature	[°C]	28.75	35.00
Input heating water temperature	[°C]	22.78	29.08
Air temperature – dry bulb temperature	[°C]	12.00	-9.99
Air temperature – wet bulb temperature	[°C]	11.01	-10.92
Relative humidity	[%]	89.00	72.08
Barometric pressure	[kPa]	98.821	97.573
Ambient temperature	[°C]	11.93	-10.09
Secondary circuit pressure difference	[kPa]	46.789	43.754
Efficiency of the secondary liquid pump	[–]	0.273	0.273
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	1.3770	1.3771
Density of heating water	[$kg \cdot m^{-3}$]	995.9	994.1
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.178	4.175
Voltage	[V]	402.10	402.44
Total current	[A]	7.50	16.50
Overall power input	[kW]	1.231	3.108
Capacity correction of sec. liquid pump	[W]	44.103	42.638
Power input correction of sec. liquid pump	[W]	62.00	59.37
Heating capacity – heating water	[kW]	9.502	9.394
Corrected heating capacity – heating water	**[kW]**	**9.458**	**9.351**
Uncertainty of corrected heating capacity	[kW]	± 0.139	± 0.138
Effective electric power input	**[kW]**	**1.169**	**3.048**
COP	**[–]**	**8.093**	**3.068**
Uncertainty of COP	[–]	± 0.127	± 0.046
Control settings	**[–]**	**1**	**7**
Circulation pump settings – heating water	[%]	-	-

Data for SCOP calculation

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „A" – average

	Outdoor heat exchanger Outdoor air inlet	Indoor heat exchanger Outlet water temperature	Part load ratio	Part load	DC Declared capacity	COPd at declared capacity	Cdh degradation coefficient	CR	COPbin (Tj)	Eff. power input of compressor off state
	[°C]	[°C]	[%]	[kW]	[kW]	[–]	[–]	[–]	[–]	[kW]
A	-7	34.00	88.46	10.33	10.333	3.406	0.900	1.00	3.406	–
B	2	30.00	53.85	6.29	6.906	5.211	0.900	1.00	5.211	–
C	7	29.63	34.62	4.04	8.244	6.337	0.986	0.49	6.246	0.0182
D	12	28.79	15.38	1.80	9.458	8.093	0.984	0.19	7.589	0.0182
TOL (E)	-10	35.00	100.00	11.68	9.351	3.068	0.900	1.00	3.068	–
Tbiv (F)	-7	34.00	88.46	10.33	10.333	3.406	0.900	1.00	3.406	–

Adaption of water temperature – according to ČSN EN 14825:2023, Annex E

- Low temperature application (reference water temperature 35 °C)
- Reference season „A"– average
- Condition D
- Fixed water flow rate – secondary circuit

General formulas and derivation:

$t_{outlet,\,average} = t_{inlet,\,capacity\,test} + (t_{outlet,\,capacity\,test} - t_{inlet,\,capacity\,test}) \cdot CR$ [°C]

$t_{outlet,\,average} = t_{inlet,\,capacity\,test} + (\Delta t) \cdot CR$ [°C]

$t_{outlet,\,average} = t_{outlet,\,capacity\,test} - \Delta t + \Delta t \cdot CR$ [°C]

$t_{outlet,\,capacity\,test} = t_{outlet,\,average} + \Delta t - \Delta t \cdot CR$ [°C]

For fixed flow:

Δt = Declared capacity / Declared capacity $_{standard\ rating\ conditions\ A7W35} \cdot 5$

$CR \cdot \Delta t$ = Part load / Declared capacity · Declared capacity / Declared capacity$_{standard\ rating\ conditions\ A7W35} \cdot 5$

$CR \cdot \Delta t$ = Part load / Declared capacity $_{standard\ rating\ conditions\ A7W35} \cdot 5$

$t_{outlet,\,capacity\,test,\,fixed\,flow} = t_{outlet,\,average}$ + Declared capacity / Declared capacity$_{standard\ rating\ conditions\ A7W35} \cdot 5$ - Part load / Declared capacity $_{standard\ rating\ conditions\ A7W35} \cdot 5$

$t_{outlet,\,capacity\,test,\,fixed\,flow} = t_{outlet,\,average} + 5$ / Declared capacity$_{standard\ rating\ conditions\ A7W35}$ · (Declared capacity - Part load)

Measured data:

$t_{outlet,\,average}$	24.00	[°C]
Declared capacity	9.458	[kW]
Declared capacity $_{standard\ rating\ condition\ A7/W35}$	8.001	[kW]
Part load	1.80	[kW]

Calculation of water temperature

$t_{outlet,\ capacity\ test,\ fixed\ flow} = 24 + 5 / 8.001 \cdot (9.458 - 1.8) = \underline{\mathbf{28.79}}$ [°C]

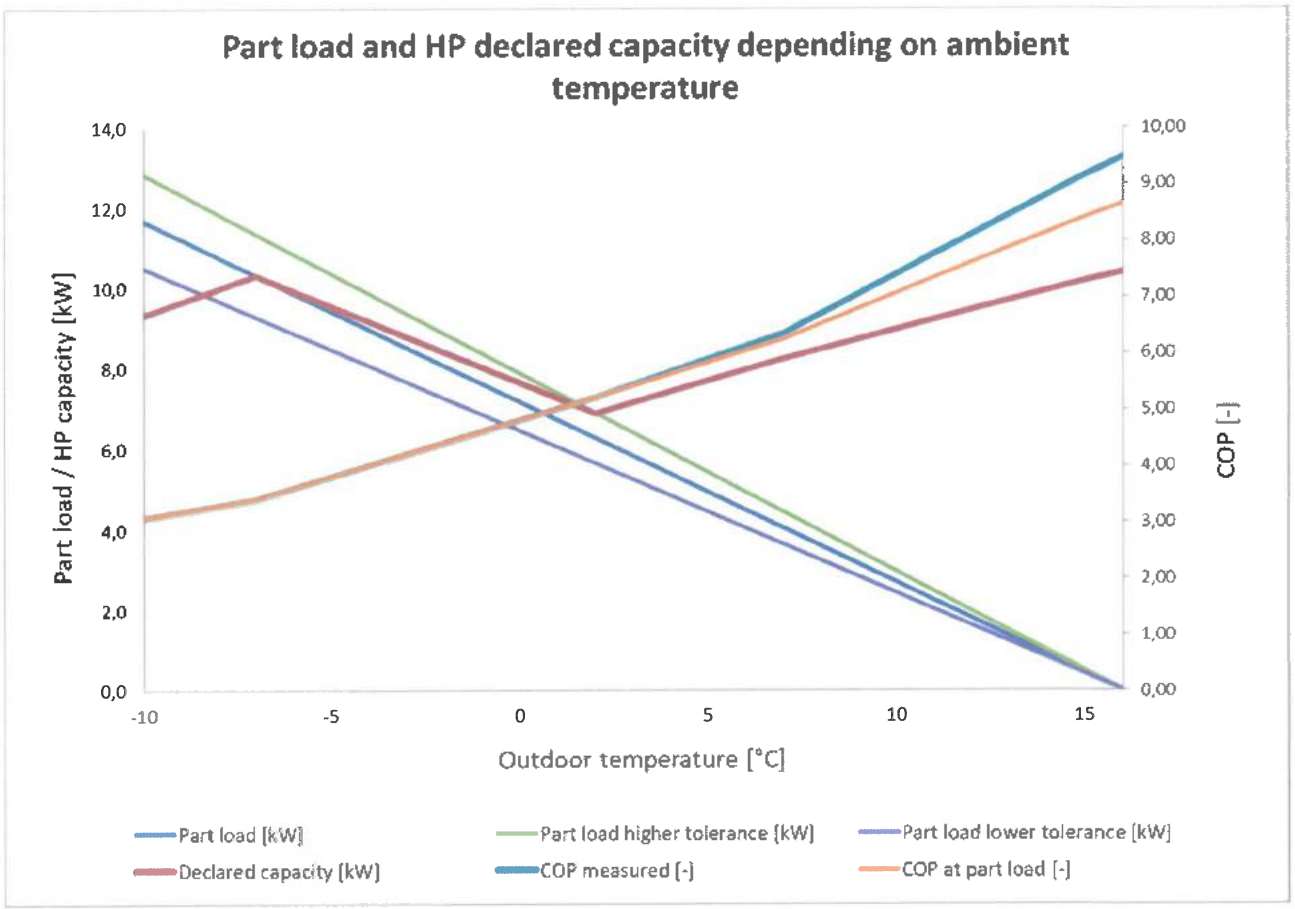
Calculation SCOP, $SCOP_{on}$, $SCOP_{net}$

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „A" – average

	Bin	Outdoor temp. (dry bulb)	Hours	Part load ratio	Heat load	Capacity of HP	Heat load covered by heat pump	Resistive heat elbu (Tj)	Annual resistive heat	COPbin (Tj)	Annual heating demand	Annual power input including electric back up heating	Net annual heating capacity	Net annual power input without electric back up heating
	j	Tj	hj		Ph(Tj)			elbu(Tj)	hj x elbu(Tj)	COPbin (Tj)	hj x Ph(Tj)		hj x (Ph(Tj) - elbu(Tj))	
	[–]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[–]	[kWh]	[kWh]	[kWh]	[kWh]
TOL(E)	21	-10	1	100.00	11.68	9.35	9.35	2.33	2.33	3.07	12	5	9	3
	22	-9	25	96.15	11.23	9.68	9.68	1.55	38.83	3.18	281	115	242	76
	23	-8	23	92.31	10.78	10.01	10.01	0.78	17.86	3.29	248	88	230	70
A, Tbiv(F)	24	-7	24	88.46	10.33	10.33	10.33	0.00	0.00	3.41	248	73	248	73
	25	-6	27	84.62	9.88	9.95	9.88	0.00	0.00	3.61	267	74	267	74
	26	-5	68	80.77	9.43	9.57	9.43	0.00	0.00	3.81	642	169	642	169
	27	-4	91	76.92	8.99	9.19	8.99	0.00	0.00	4.01	818	204	818	204
	28	-3	89	73.08	8.54	8.81	8.54	0.00	0.00	4.21	760	181	760	181
	29	-2	165	69.23	8.09	8.43	8.09	0.00	0.00	4.41	1334	303	1334	303
	30	-1	173	65.38	7.64	8.05	7.64	0.00	0.00	4.61	1321	287	1321	287
	31	0	240	61.54	7.19	7.67	7.19	0.00	0.00	4.81	1725	359	1725	359
	32	1	280	57.69	6.74	7.29	6.74	0.00	0.00	5.01	1887	377	1887	377
B	33	2	320	53.85	6.29	6.91	6.29	0.00	0.00	5.21	2013	386	2013	386
	34	3	357	50.00	5.84	7.17	5.84	0.00	0.00	5.42	2085	385	2085	385
	35	4	356	46.15	5.39	7.44	5.39	0.00	0.00	5.63	1919	341	1919	341
	36	5	303	42.31	4.94	7.71	4.94	0.00	0.00	5.83	1497	257	1497	257
	37	6	330	38.46	4.49	7.98	4.49	0.00	0.00	6.04	1483	245	1483	245
C	38	7	326	34.62	4.04	8.24	4.04	0.00	0.00	6.25	1318	211	1318	211
	39	8	348	30.77	3.59	8.49	3.59	0.00	0.00	6.51	1251	192	1251	192
	40	9	335	26.92	3.14	8.73	3.14	0.00	0.00	6.78	1054	155	1054	155
	41	10	315	23.08	2.70	8.97	2.70	0.00	0.00	7.05	849	120	849	120
	42	11	215	19.23	2.25	9.22	2.25	0.00	0.00	7.32	483	66	483	66
D	43	12	169	15.38	1.80	9.46	1.80	0.00	0.00	7.59	304	40	304	40
	44	13	151	11.54	1.35	9.70	1.35	0.00	0.00	7.86	204	26	204	26
	45	14	105	7.69	0.90	9.94	0.90	0.00	0.00	8.13	94	12	94	12
	46	15	74	3.85	0.45	10.19	0.45	0.00	0.00	8.39	33	4	33	4
		Σ	4910							Σ	24128	4673	24069	4614

SCOPon	5.16	SCOPnet	5.22
		SCOP	5.16

Part load performance diagram
- Low temperature application (reference water temperature 35 °C)
- Reference heating season „A" – average



Test objective:	Seasonal performance tests and SCOP calculation – Medium temperature application
Exact name of the test procedure:	**1.37* - Tests of leakage, pressure resistance, thermal and technical parameters, combustion efficiency, safety functions**
Test method:	ČSN EN 14511-3:2023, ČSN EN 14825:2023
Sample tested:	Heat pump **EUROS ATMO15**
Measuring equipment used:	see Chapter III

Design				Air / water – monobloc		
Conditions specification according to ČSN EN 14825:2023	Temperature application			**Medium** (reference water temperature 55 °C)		
	Reference heating season			**Average**		
	Outlet water temperature - indoor heat exchanger			Variable		
	Compressor speed control			Variable		
	Water flow rate – primary circuit			–		
	Water flow rate – secondary circuit			Fixed		
Seasonal space heating energy efficiency	Heating	Average	η_s		**140.8**	%
		Warmer	η_s		–	%
		Colder	η_s		–	%
Seasonal efficiency according to ČSN EN 14825:2023	Heating	Average	**SCOP**		**3.59**	–
		Warmer	SCOP		–	–
		Colder	SCOP		–	–
Function	Cooling				Yes	
	Heating	Yes	Reference heating season	Average	Yes	
				Warmer	–	
				Colder	–	
Full heating load	Cooling		$P_{designc}$		–	kW
	Heating	Average	$P_{designh}$		**10.57**	kW
		Warmer	$P_{designh}$		–	kW
		Colder	$P_{designh}$		–	kW
Bivalent temperatures	Heating	Average	$T_{bivalent}$		-7	°C
		Warmer	$T_{bivalent}$		–	°C
		Colder	$T_{bivalent}$		–	°C
Operation limit temperatures	Heating	Average	TOL		-10	°C
		Warmer	TOL		–	°C
		Colder	TOL		–	°C
Seasonal power consumption according to ČSN EN 14825:2023	Cooling		Q_{CE}		–	kWh
	Heating	Average	Q_{HE}		6074	kWh
		Warmer	Q_{HE}		–	kWh
		Colder	Q_{HE}		–	kWh
Modes other than „active mode“	Off mode			P_{OFF}	18.3	W
	Thermostat off mode			P_{TO}	18.2	W
	Standby mode			P_{SB}	18.3	W
	Crankcase heater mode			P_{CK}	0.0	W

Calculation of SCOP according to ČSN EN 14825:2023:

Number of hours used for calculation of reference SCOP (Annex B – Table B. 2, B. 3)
- For reversible heat pumps and reference heating season „A" = average

H_{HE}	2066	[h]
H_{TO}	178	[h]
H_{SB}	0	[h]
H_{CK}	178	[h]
H_{OFF}	0	[h]

Measured data:

P_{TO}	0.0182	[kW]
P_{SB}	0.0183	[kW]
P_{CK}	0.0000	[kW]
P_{OFF}	0.0183	[kW]
$P_{designh}$	10.57	[kW]
$SCOP_{ON}$	3.60	[–]

Coefficient and correction:

F(1)	3	[%]
F(2)	0	[%]
CC	2.5	[–]

Calculation of SCOP:

7.3 Calculation of the reference annual heating demand (Q_H)

$Q_H = P_{designh} \cdot H_{HE}$ [kWh]

$Q_H = 10.57 \cdot 2066 = 21830$ [kWh]

7.4 Calculation of the annual electricity consumption (Q_{HE})

$Q_{HE} = Q_H / SCOP_{on} + H_{TO} \cdot P_{TO} + H_{SB} \cdot P_{SB} + H_{CK} \cdot P_{CK} + H_{OFF} \cdot P_{OFF}$ [kWh]

$Q_{HE} = 21830 / 3.60 + 178 \cdot 0.0182 + 0 \cdot 0.0183 + 178 \cdot 0 + 0 \cdot 0.0183 = 6074$ [kWh]

7.2 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [–]

$SCOP = 21830 / 6074 = 3.59$ [–]

7.1 Calculation of the seasonal space heating efficiency η_s

$\Sigma F(i) = F(1) + F(2)$ [–]

$\Sigma F = 0.03 + 0 = 0.03$ [–]

$\eta_s = 1 / CC \cdot SCOP - \Sigma F(i)$ [–]

$\eta_s\ (A) = (1 / 2.5) \cdot 3.59 - 0.03 =$ **1.408** [–]

Temperature level		Medium (reference water temperature 55 °C)		
Reference heating season		„A" = average ($T_{designh}$ = -10 °C)		
Assessment condition		**A, Tbiv(F)**	**B**	**C**
Specification of the assessment condition		**A-7/W52**	**A2/W42.8**	**A7/W39.97**
Date of testing		**2024-04-26**	**2024-04-29**	**2024-04-30**
Transient test procedure	YES / NO	NO	YES	YES
Average defrost time of 1 cycle	[min]	–	–	–
Average time of 1 cycle	[min]	–	–	–
Calculation time	[min]	70.0	180.0	180.0
Output heating water – temperature calculation	[°C]	51.99	42.82	39.96
Input heating water – temperature calculation	[°C]	42.80	36.44	32.42
Output heating water temperature	[°C]	51.99	42.82	39.96
Input heating water temperature	[°C]	42.80	36.44	32.42
Air temperature – dry bulb temperature	[°C]	-7.01	2.01	7.00
Air temperature – wet bulb temperature	[°C]	-8.02	1.01	6.02
Relative humidity	[%]	74.80	83.92	87.03
Barometric pressure	[kPa]	97.899	99.069	99.013
Ambient temperature	[°C]	-7.15	1.88	6.92
Secondary circuit pressure difference	[kPa]	55.879	56.398	54.692
Efficiency of the secondary liquid pump	[–]	0.230	0.230	0.230
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	0.8920	0.8919	0.8919
Density of heating water	[$kg \cdot m^{-3}$]	987.4	991.3	992.3
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.177	4.175	4.175
Voltage	[V]	401.75	401.80	401.61
Total current	[A]	21.30	10.41	9.46
Overall power input	[kW]	4.141	1.874	1.709
Capacity correction of sec. liquid pump	[W]	38.890	39.059	38.496
Power input correction of sec. liquid pump	[W]	52.74	53.03	52.05
Heating capacity – heating water	[kW]	9.386	6.545	7.737
Corrected heating capacity – heating water	**[kW]**	**9.347**	**6.506**	**7.698**
Uncertainty of corrected heating capacity	[kW]	± 0.092	± 0.090	± 0.091
Effective electric power input	**[kW]**	**4.089**	**1.821**	**1.657**
COP	**[–]**	**2.286**	**3.573**	**4.645**
Uncertainty of COP	[–]	± 0.023	± 0.050	± 0.057
Control settings	**[–]**	**7**	**1**	**1**
Circulation pump settings – heating water	[%]	-	-	-

Temperature level		Medium (reference water temperature 55 °C)	
Reference heating season		„A" = average ($T_{designh}$ = -10 °C)	
Assessment condition		**D**	**TOL(E)**
Specification of the assessment condition		**A12/W37.09**	**A-10/W55**
Date of testing		**2024-04-30**	**2024-05-06**
Transient test procedure	YES / NO	YES	YES
Average defrost time of 1 cycle	[min]	–	5.5
Average time of 1 cycle	[min]	–	121.6
Calculation time	[min]	180.0	121.6
Output heating water – temperature calculation	[°C]	37.17	54.22
Input heating water – temperature calculation	[°C]	28.53	46.99
Output heating water temperature	[°C]	37.17	55.02
Input heating water temperature	[°C]	28.53	47.02
Air temperature – dry bulb temperature	[°C]	12.00	-10.01
Air temperature – wet bulb temperature	[°C]	11.01	-10.78
Relative humidity	[%]	89.04	76.85
Barometric pressure	[kPa]	98.820	97.721
Ambient temperature	[°C]	11.93	-10.06
Secondary circuit pressure difference	[kPa]	55.347	56.784
Efficiency of the secondary liquid pump	[–]	0.230	0.230
Volume flow rate of heating water	$[m^3 \cdot h^{-1}]$	0.8920	0.8919
Density of heating water	$[kg \cdot m^{-3}]$	993.3	986.3
Specific heat capacity of heating water	$[kJ \cdot kg^{-1} \cdot K^{-1}]$	4.175	4.178
Voltage	[V]	402.30	401.92
Total current	[A]	9.00	21.03
Overall power input	[kW]	1.551	4.223
Capacity correction of sec. liquid pump	[W]	38.714	39.186
Power input correction of sec. liquid pump	[W]	52.43	53.26
Heating capacity – heating water	[kW]	8.874	7.379
Corrected heating capacity – heating water	**[kW]**	**8.836**	**7.340**
Uncertainty of corrected heating capacity	[kW]	± 0.092	± 0.090
Effective electric power input	**[kW]**	**1.499**	**4.170**
COP	**[–]**	**5.894**	**1.760**
Uncertainty of COP	[–]	± 0.065	± 0.022
Control settings	**[–]**	**1**	**7**
Circulation pump settings – heating water	[%]	-	-

Data for SCOP calculation

- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „A" – average

	Outdoor heat exchanger Outdoor air inlet	Indoor heat exchanger Outlet water temperature	Part load ratio	Part load	DC Declared capacity	COPd at declared capacity	Cdh degradation coefficient	CR	COPbin (Tj)	Eff. power input of compressor off state
	[°C]	[°C]	[%]	[kW]	[kW]	[–]	[–]	[–]	[–]	[kW]
A	-7	52.00	88.46	9.35	9.347	2.286	0.900	1.00	2.286	–
B	2	42.80	53.85	5.69	6.506	3.573	0.990	0.87	3.568	0.0182
C	7	39.97	34.62	3.66	7.698	4.645	0.989	0.48	4.589	0.0182
D	12	37.09	15.38	1.63	8.836	5.894	0.988	0.18	5.593	0.0182
TOL (E)	-10	55.00	100.00	10.57	7.340	1.760	0.900	1.00	1.760	–
Tbiv (F)	-7	52.00	88.46	9.35	9.347	2.286	0.900	1.00	2.286	–

Adaption of water temperature – according to ČSN EN 14825:2023, Annex E

- Medium temperature application (reference water temperature 55 °C)
- Reference season „A"– average
- Condition D
- Fixed water flow rate – secondary circuit

General formulas and derivation:

$t_{outlet,\,average} = t_{inlet,\,capacity\,test} + (t_{outlet,\,capacity\,test} - t_{inlet,\,capacity\,test}) \cdot CR$ [°C]

$t_{outlet,\,average} = t_{inlet,\,capacity\,test} + (\Delta t) \cdot CR$ [°C]

$t_{outlet,\,average} = t_{outlet,\,capacity\,test} - \Delta t + \Delta t \cdot CR$ [°C]

$t_{outlet,\,capacity\,test} = t_{outlet,\,average} + \Delta t - \Delta t \cdot CR$ [°C]

For fixed flow:

Δt = Declared capacity / Declared capacity $_{standard\ rating\ conditions\ A7W55} \cdot 8$

$CR \cdot \Delta t$ = Part load / Declared capacity · Declared capacity / Declared capacity$_{standard\ rating\ conditions\ A7W55} \cdot 8$

$CR \cdot \Delta t$ = Part load / Declared capacity $_{standard\ rating\ conditions\ A7W55} \cdot 8$

$t_{outlet,\,capacity\,test,\,fixed\,flow} = t_{outlet,\,average}$ + Declared capacity / Declared capacity$_{standard\ rating\ conditions\ A7W55} \cdot 8$ - Part load / Declared capacity $_{standard\ rating\ conditions\ A7W55} \cdot 8$

$t_{outlet,\,capacity\,test,\,fixed\,flow} = t_{outlet,\,average} + 8$ / Declared capacity$_{standard\ rating\ conditions\ A7W55} \cdot$ (Declared capacity - Part load)

Measured data:

$t_{outlet,\,average}$	30.00	[°C]
Declared capacity	8.836	[kW]
Declared capacity $_{standard\ rating\ condition\ A7/W55}$	8.140	[kW]
Part load	1.63	[kW]

Calculation of water temperature

$t_{outlet,\ capacity\ test,\ fixed\ flow} = 30 + 8 / 8.14 \cdot (8.836 - 1.63) = \underline{\mathbf{37.09}}$ [°C]

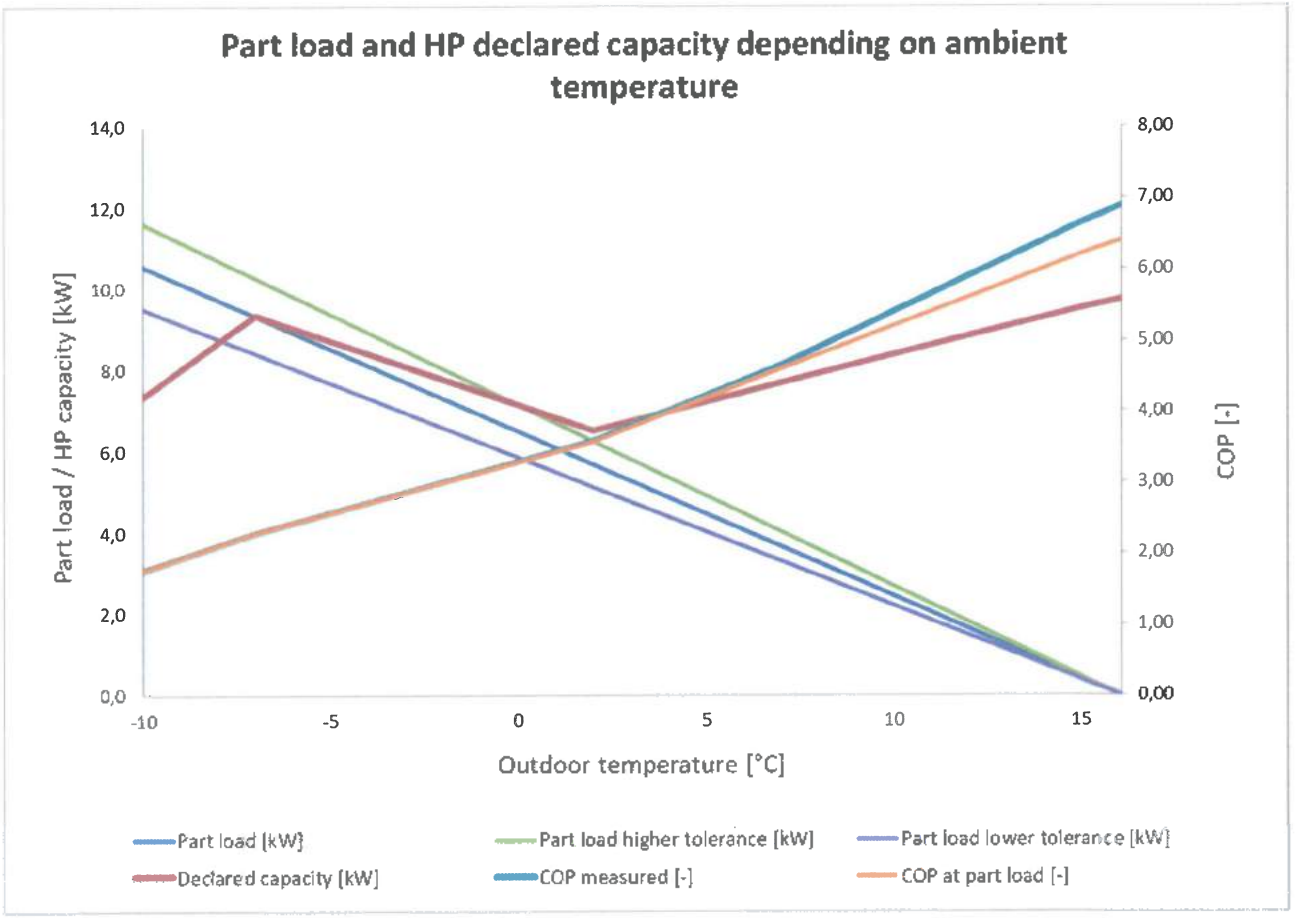
Calculation SCOP, $SCOP_{on}$, $SCOP_{net}$

- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „A" – average

	Bin	Outdoor temp. (dry bulb)	Hours	Part load ratio	Heat load	Capacity of HP	Heat load covered by heat pump	Resistive heat elbu (Tj)	Annual resistive heat	COPbin (Tj)	Annual heating demand	Annual power input including electric back up heating	Net annual heating capacity	Net annual power input without electric back up heating
	j	Tj	hj		Ph(Tj)			elbu(Tj)	hj x elbu(Tj)	COPbin (Tj)	hj x P h(Tj)		hj x (P h(Tj) - elbu(Tj))	
	[–]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[–]	[kWh]	[kWh]	[kWh]	[kWh]
TOL(E)	21	-10	1	100.00	10.57	7.34	7.34	3.23	3.23	1.76	11	7	7	4
	22	-9	25	96.15	10.16	8.01	8.01	2.15	53.77	1.94	254	157	200	103
	23	-8	23	92.31	9.75	8.68	8.68	1.08	24.73	2.11	224	119	200	95
A, Tbiv(F)	24	-7	24	88.46	9.35	9.35	9.35	0.00	0.00	2.29	224	98	224	98
	25	-6	27	84.62	8.94	9.03	8.94	0.00	0.00	2.43	241	99	241	99
	26	-5	68	80.77	8.53	8.72	8.53	0.00	0.00	2.57	580	226	580	226
	27	-4	91	76.92	8.13	8.40	8.13	0.00	0.00	2.71	740	273	740	273
	28	-3	89	73.08	7.72	8.08	7.72	0.00	0.00	2.86	687	241	687	241
	29	-2	165	69.23	7.32	7.77	7.32	0.00	0.00	3.00	1207	403	1207	403
	30	-1	173	65.38	6.91	7.45	6.91	0.00	0.00	3.14	1195	381	1195	381
	31	0	240	61.54	6.50	7.14	6.50	0.00	0.00	3.28	1561	475	1561	475
	32	1	280	57.69	6.10	6.82	6.10	0.00	0.00	3.43	1707	498	1707	498
B	33	2	320	53.85	5.69	6.51	5.69	0.00	0.00	3.57	1821	510	1821	510
	34	3	357	50.00	5.28	6.74	5.28	0.00	0.00	3.77	1886	500	1886	500
	35	4	356	46.15	4.88	6.98	4.88	0.00	0.00	3.98	1736	437	1736	437
	36	5	303	42.31	4.47	7.22	4.47	0.00	0.00	4.18	1355	324	1355	324
	37	6	330	38.46	4.06	7.46	4.06	0.00	0.00	4.39	1341	306	1341	306
C	38	7	326	34.62	3.66	7.70	3.66	0.00	0.00	4.59	1192	260	1192	260
	39	8	348	30.77	3.25	7.93	3.25	0.00	0.00	4.79	1131	236	1131	236
	40	9	335	26.92	2.84	8.15	2.84	0.00	0.00	4.99	953	191	953	191
	41	10	315	23.08	2.44	8.38	2.44	0.00	0.00	5.19	768	148	768	148
	42	11	215	19.23	2.03	8.61	2.03	0.00	0.00	5.39	437	81	437	81
D	43	12	169	15.38	1.63	8.84	1.63	0.00	0.00	5.59	275	49	275	49
	44	13	151	11.54	1.22	9.06	1.22	0.00	0.00	5.79	184	32	184	32
	45	14	105	7.69	0.81	9.29	0.81	0.00	0.00	5.99	85	14	85	14
	46	15	74	3.85	0.41	9.52	0.41	0.00	0.00	6.19	30	5	30	5
		Σ	4910							Σ	21826	6070	21744	5988

SCOPon	3.60	SCOPnet	3.63
		SCOP	3.59

Part load performance diagram
- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „A" – average

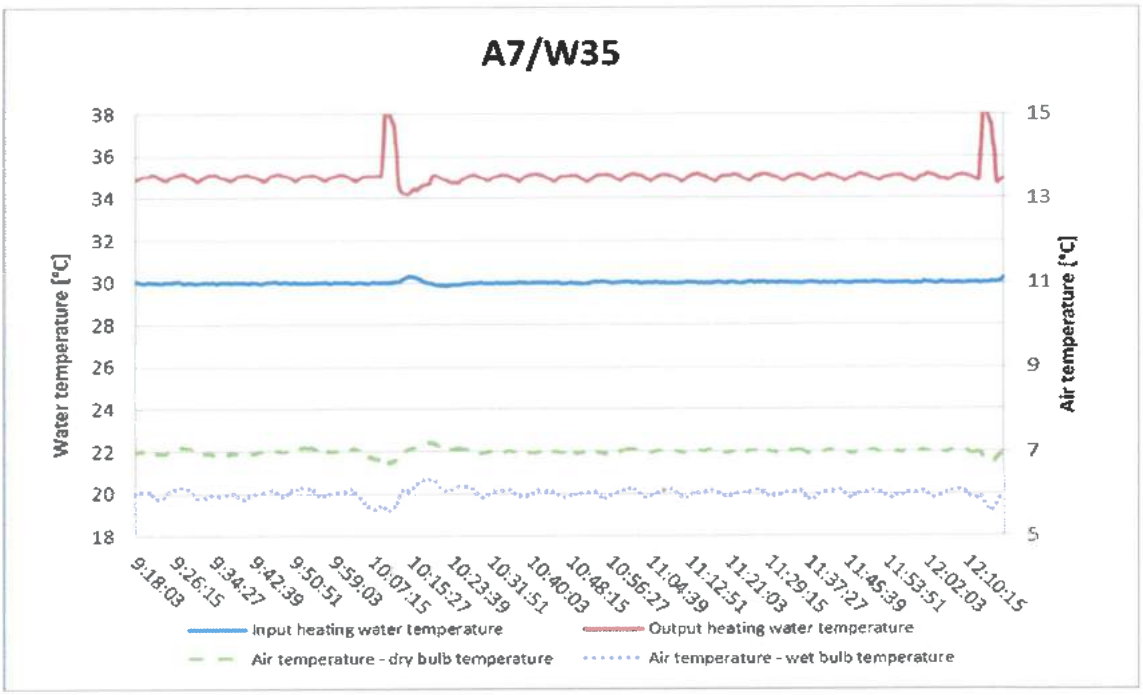


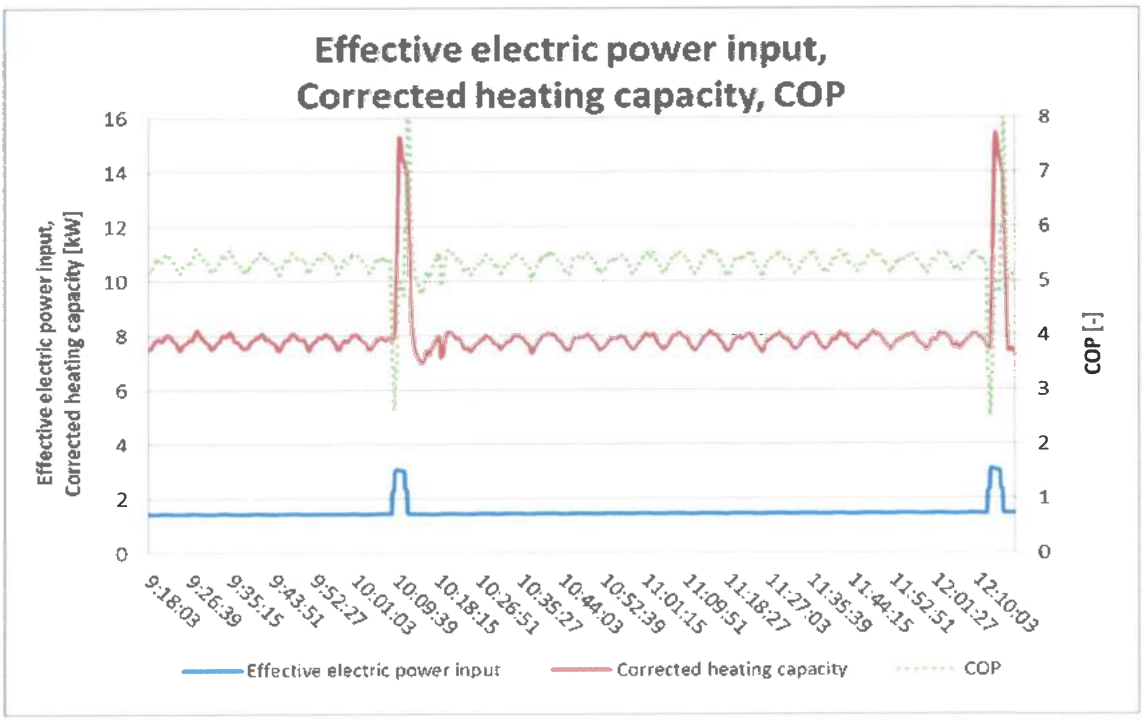
Tested by:	Ing Tomáš Sedláček	Date:	2024-05-23	Signed:	Sedlácek
Reviewed and approved by:	Ing. Michal Faltýnek	Date:	2024-05-23	Signed:	Faltýnek

V. Graphs

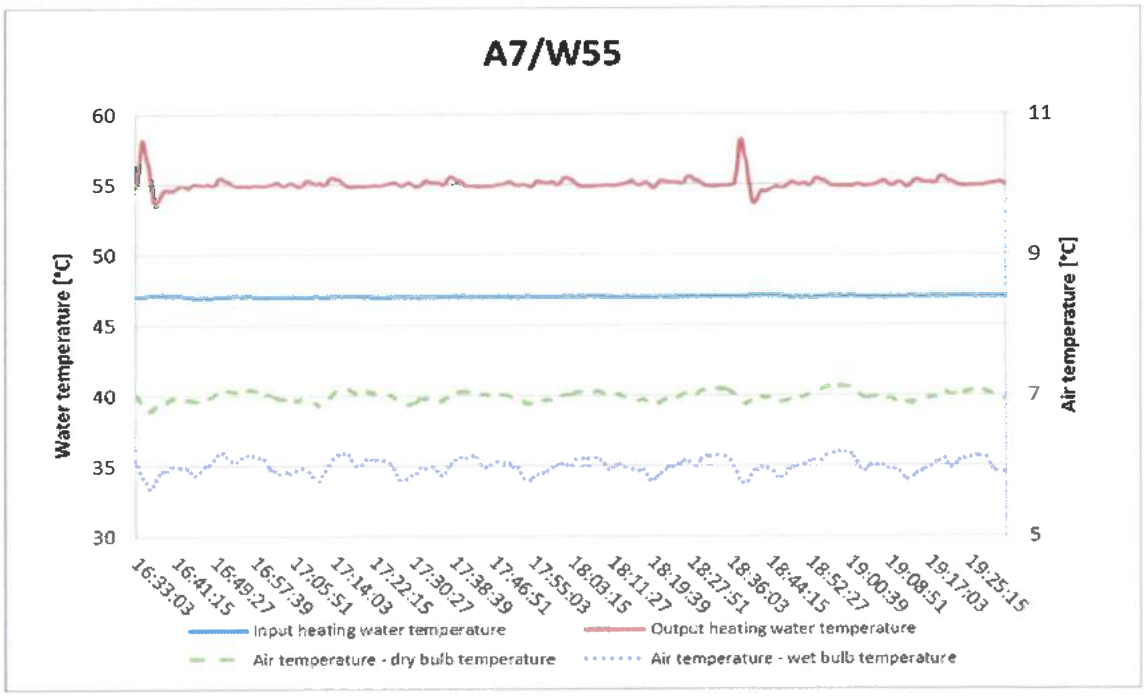
1. Rating conditions

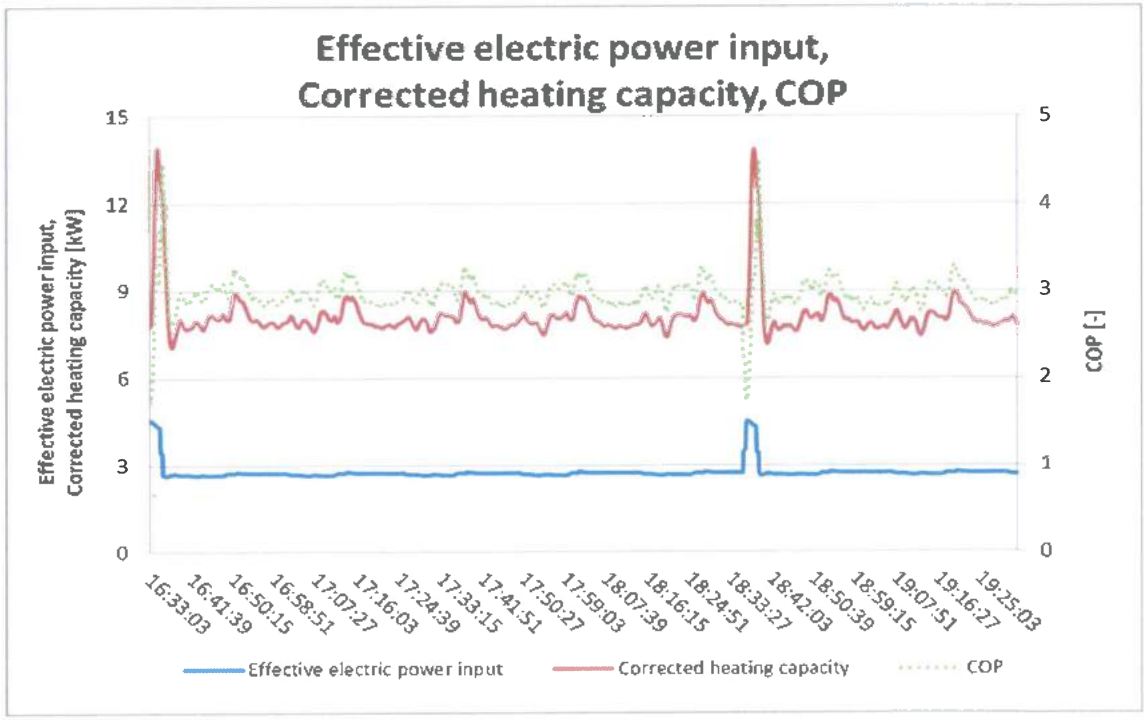
A7/W35 (Control settings: 1)





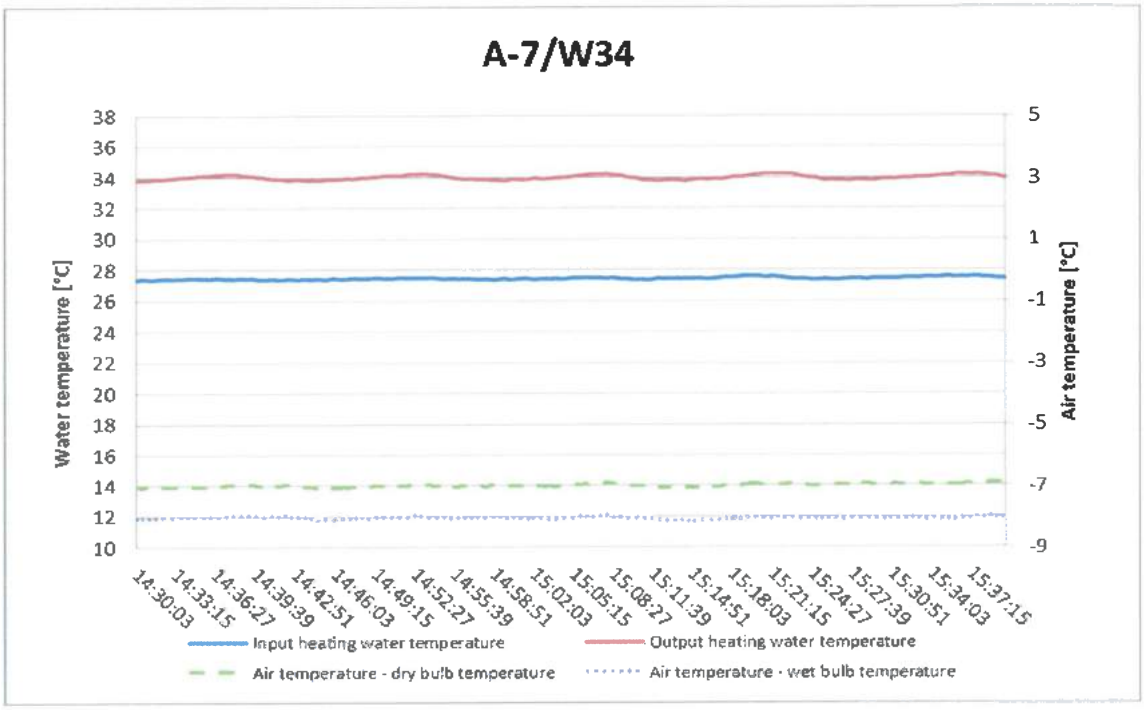
A7/W55 (Control settings: 2)

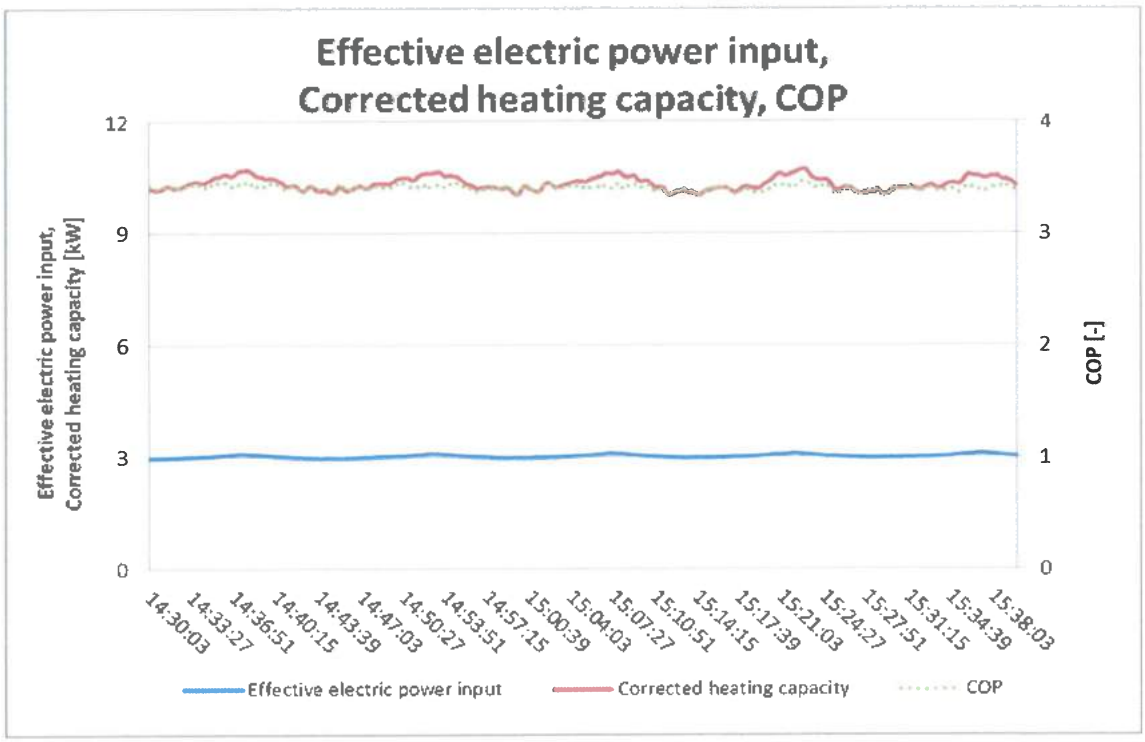




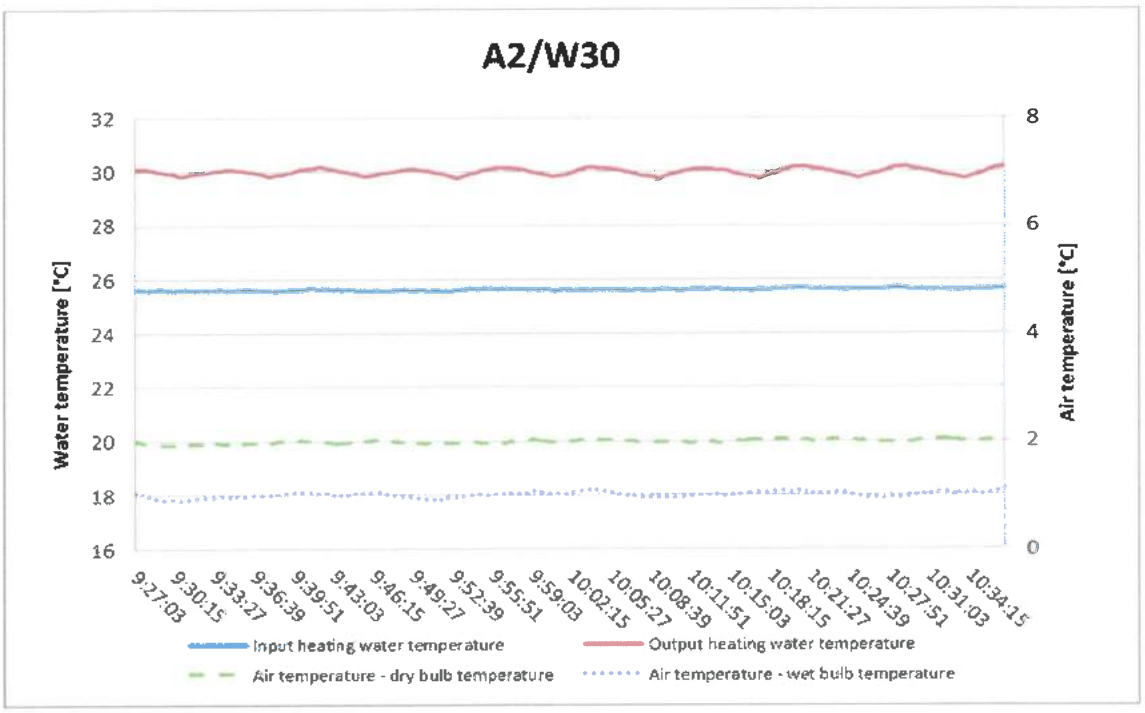
2. Seasonal performance tests and SCOP calculation – Low temperature application

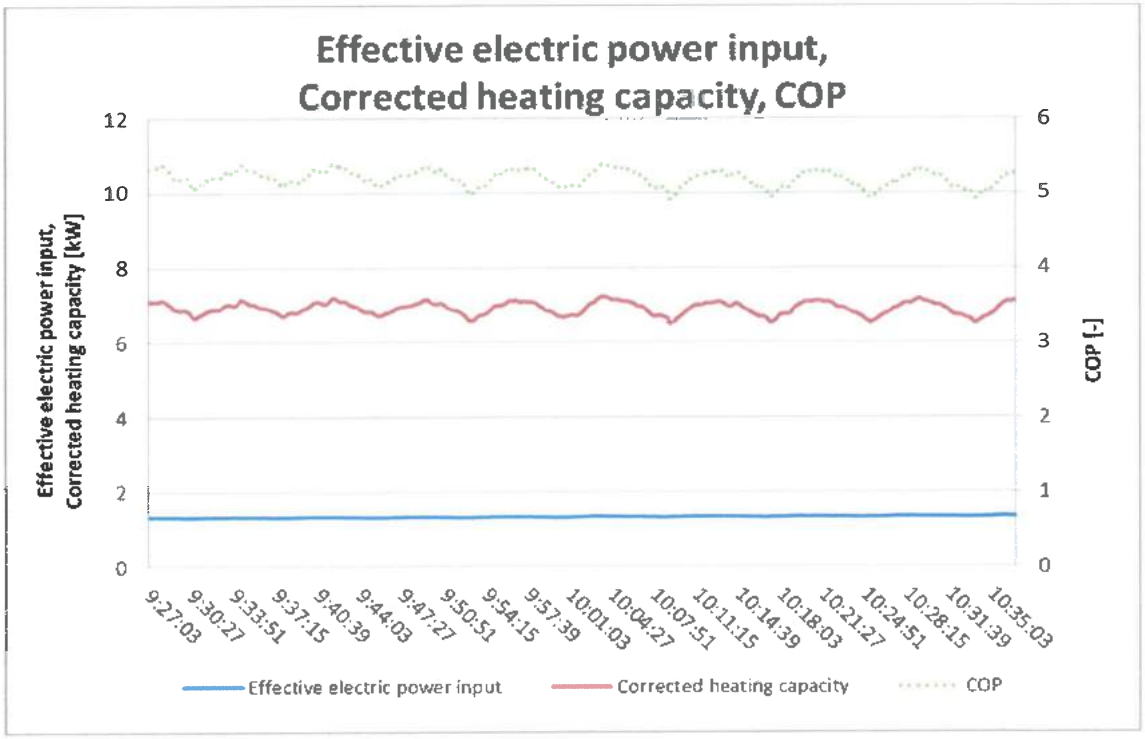
A-7/W34 (Control settings: 7)



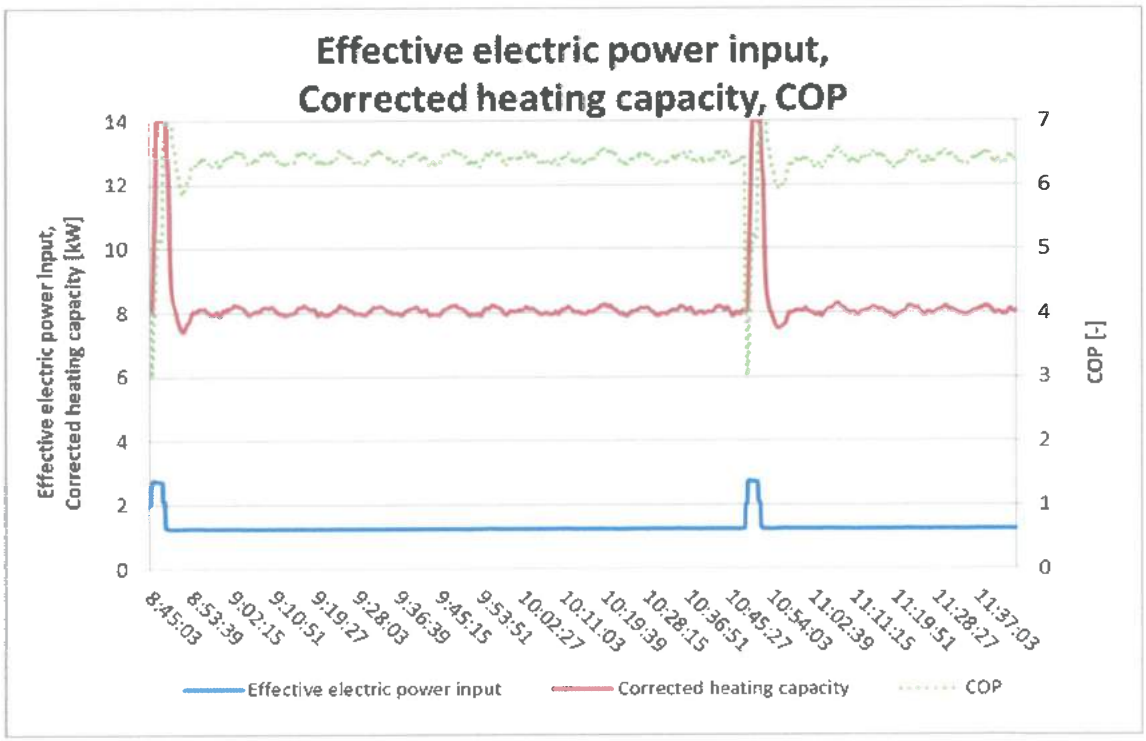


A2/W30 (Control settings: 1)

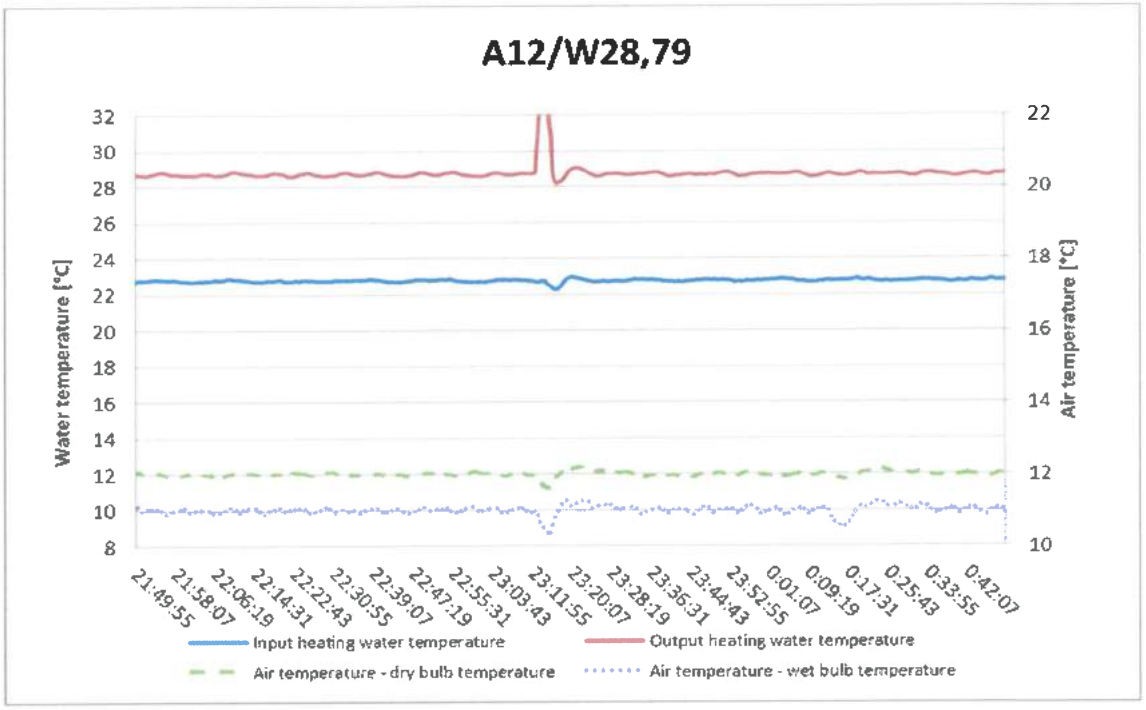


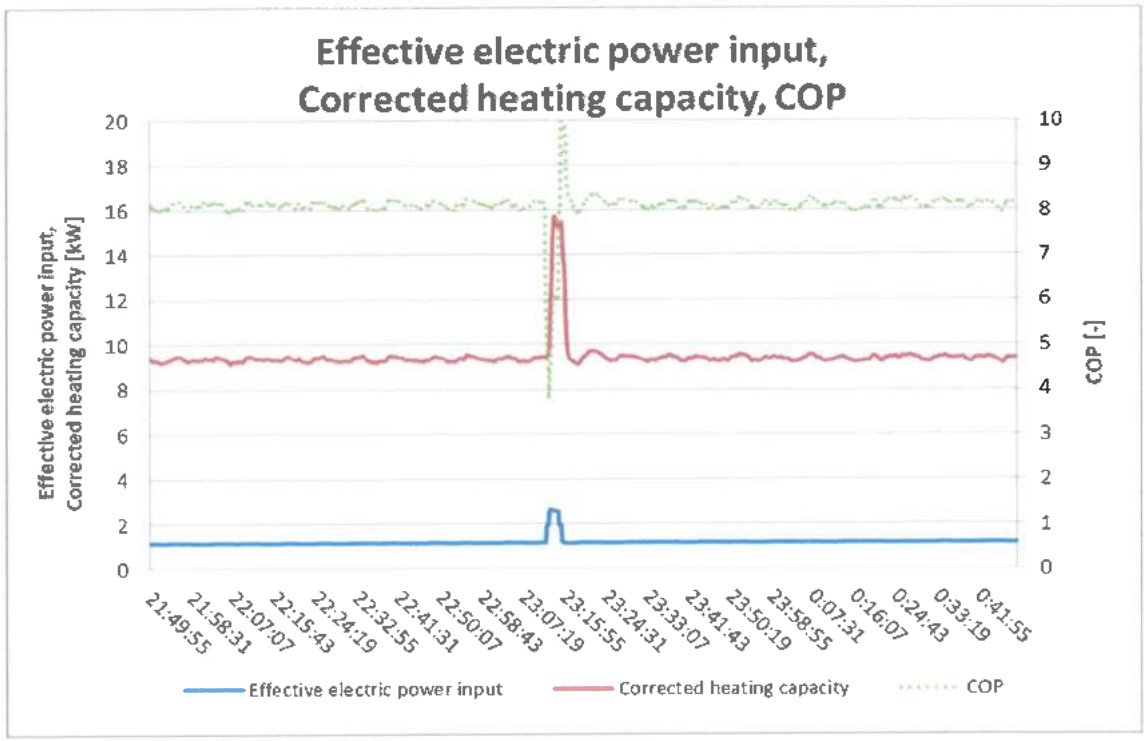


A7/W29.63 (Control settings: 1)

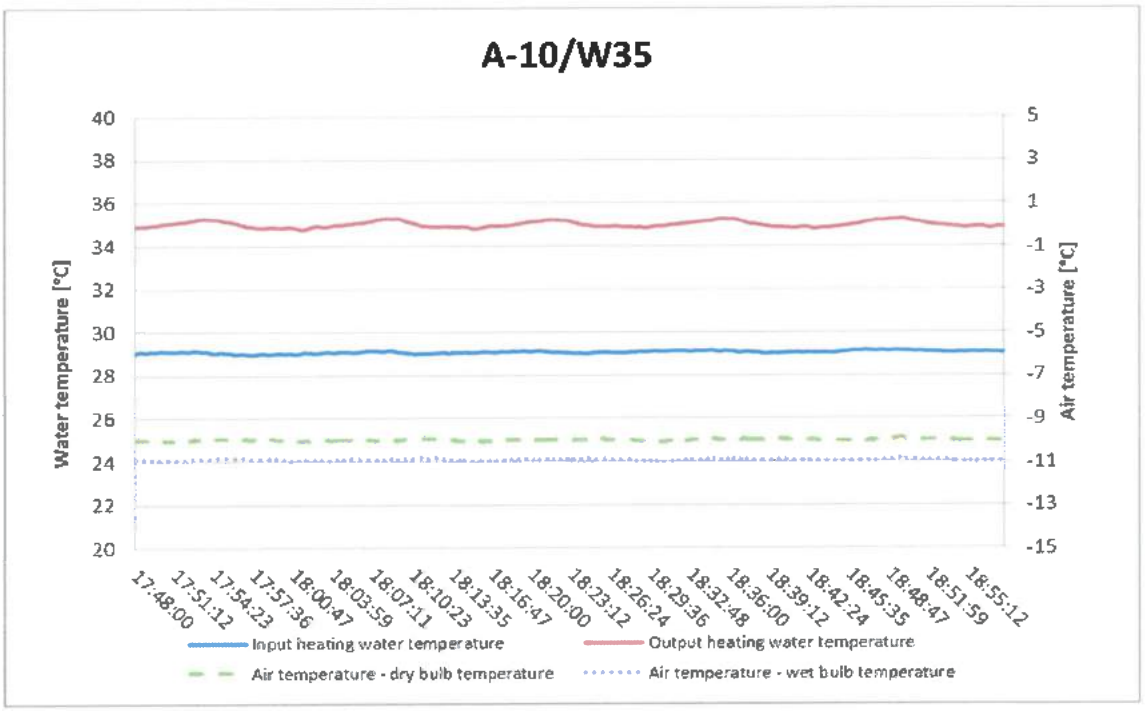


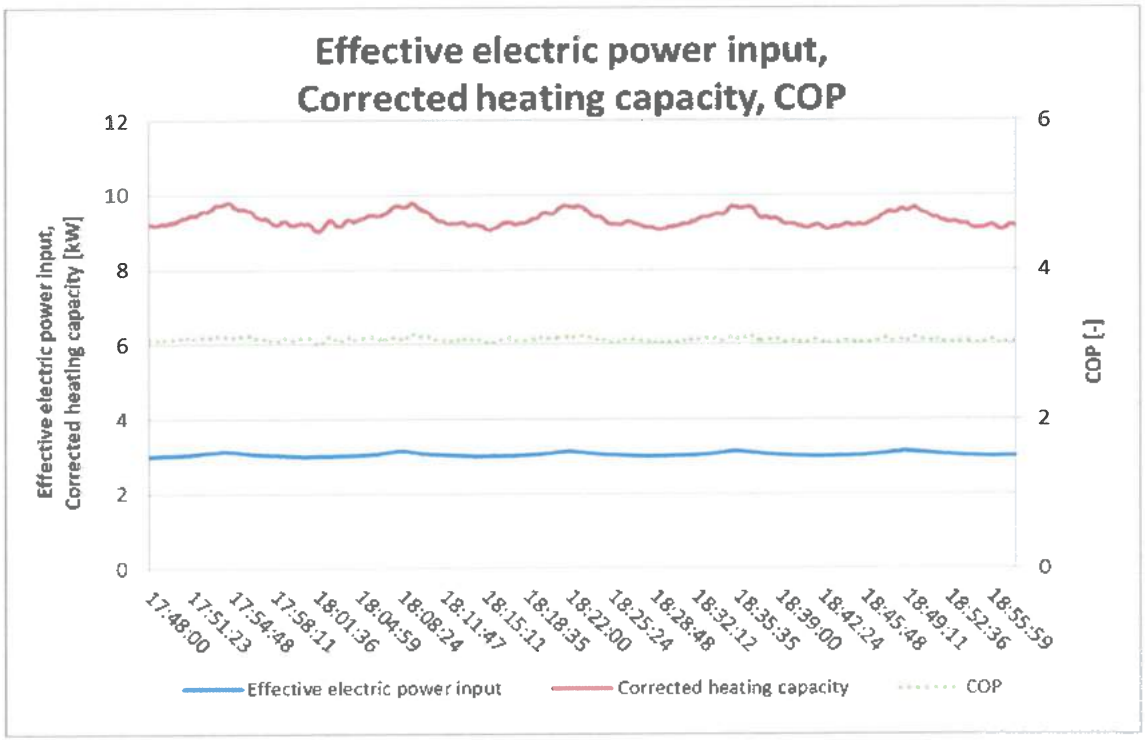
A12/W28.79 (Control settings: 1)





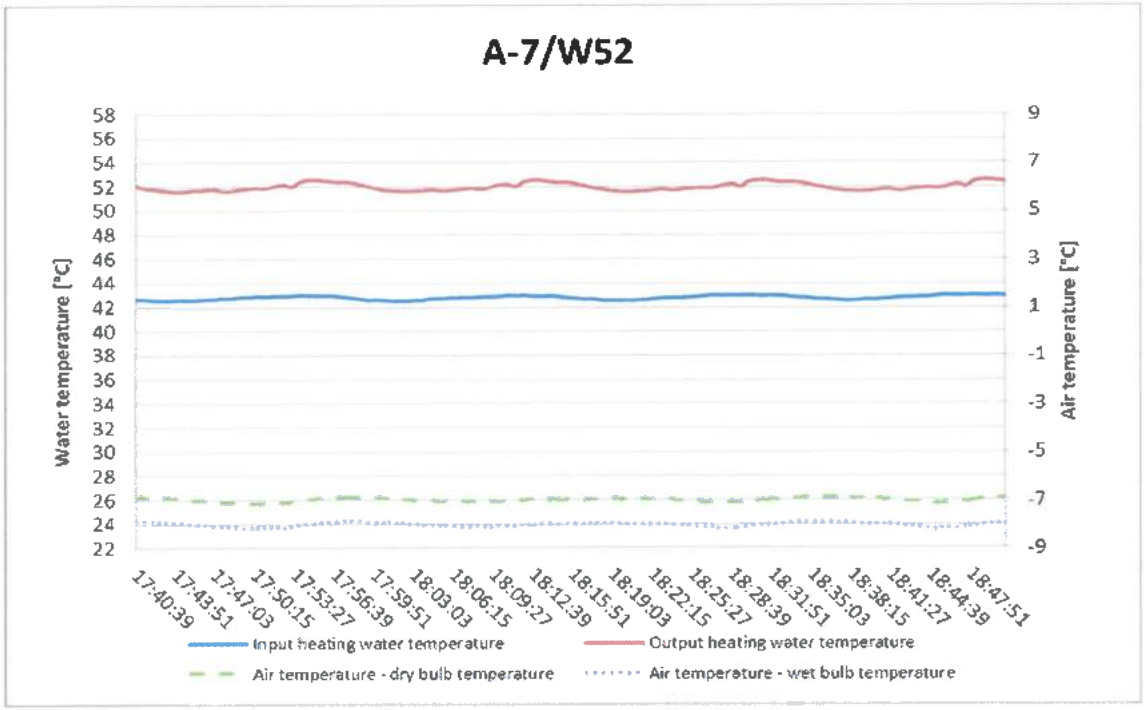
A-10/W35 (Control settings: 7)

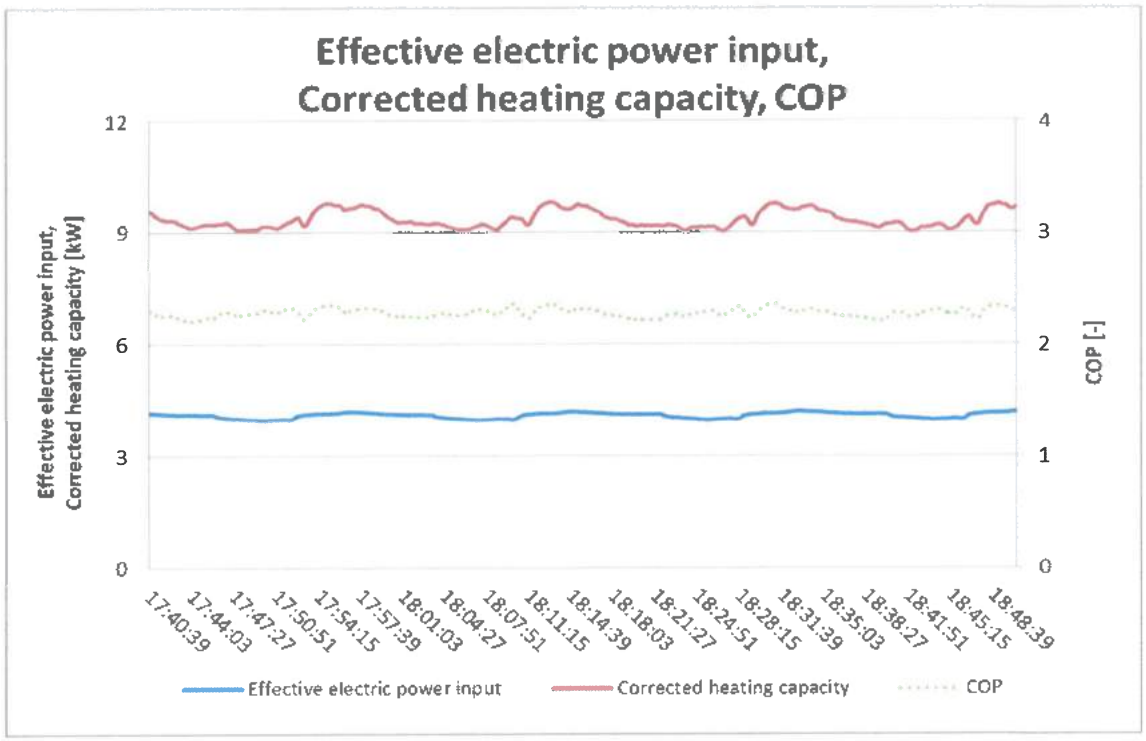




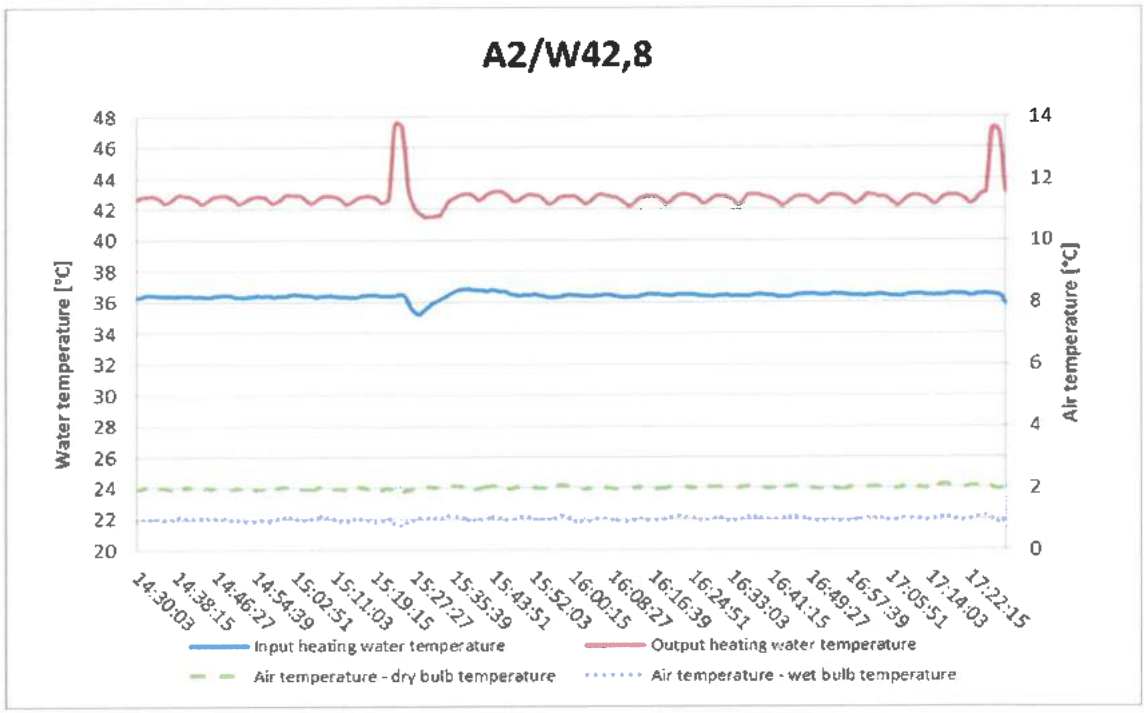
3. Seasonal performance tests and SCOP calculation – Medium temperature application

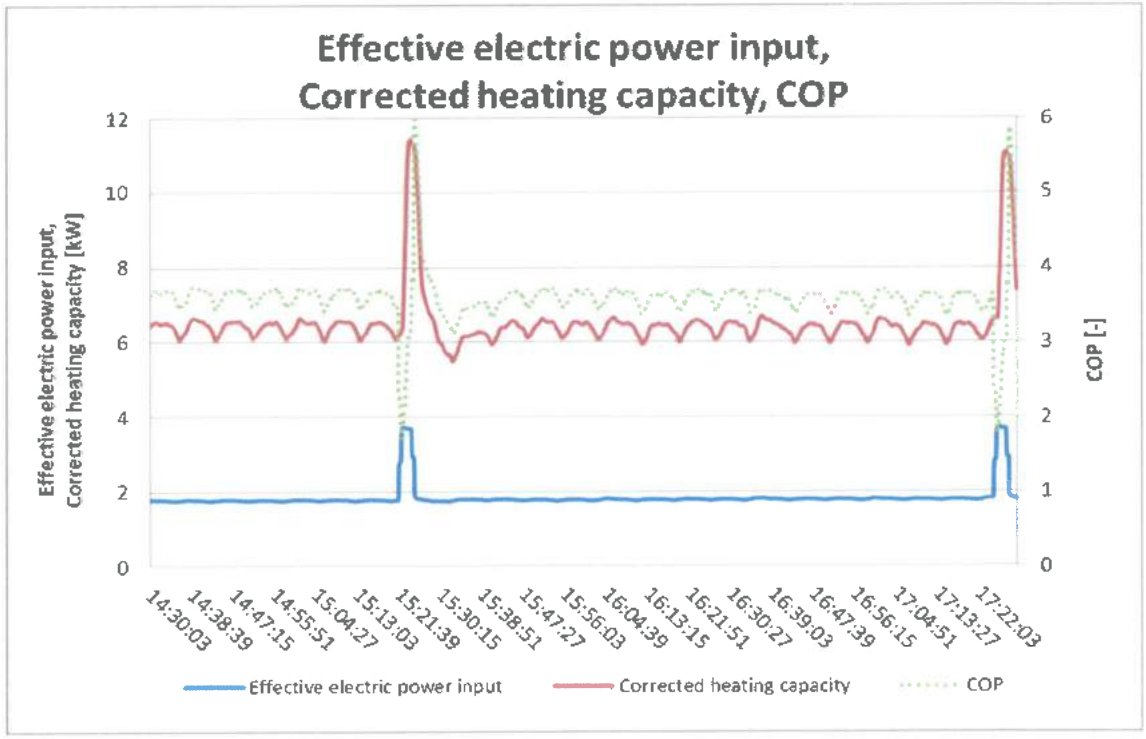
A-7/W52 (Control settings: 7)



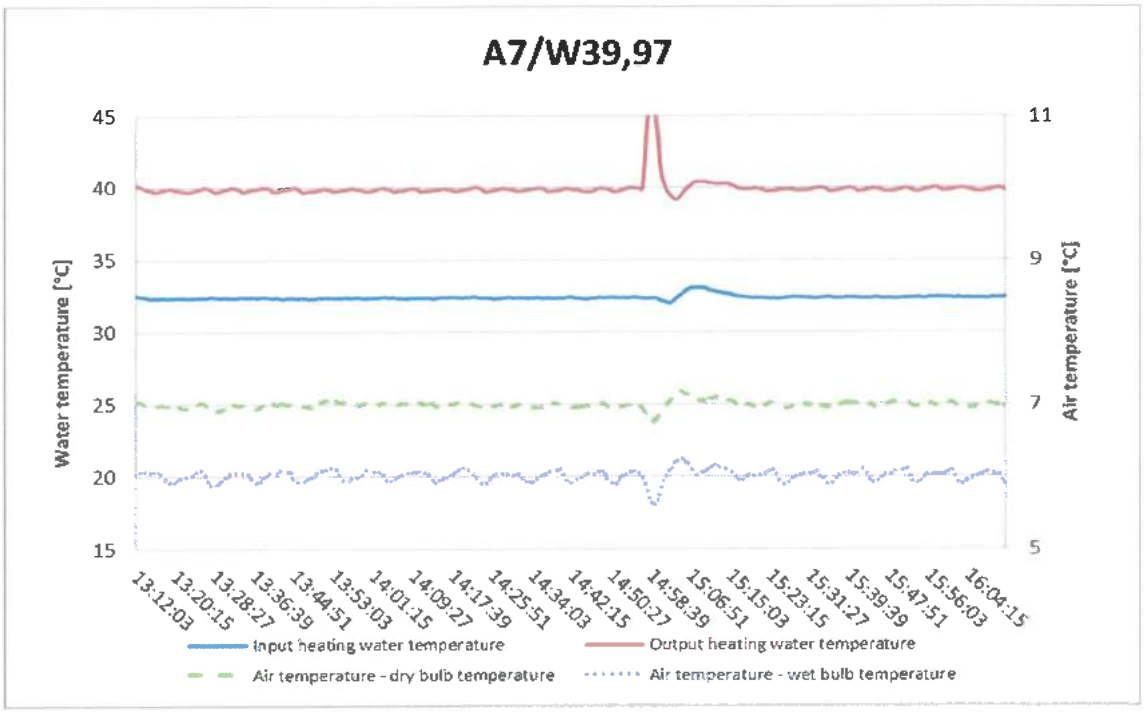


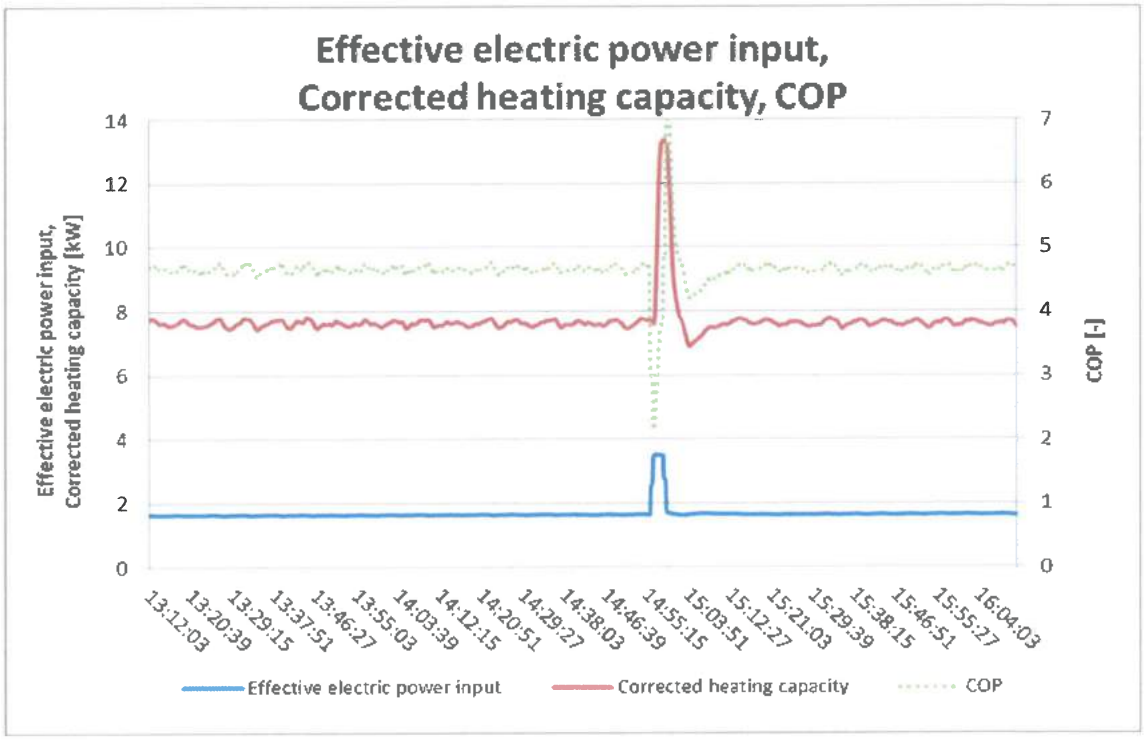
A2/W42.8 (Control settings: 1)



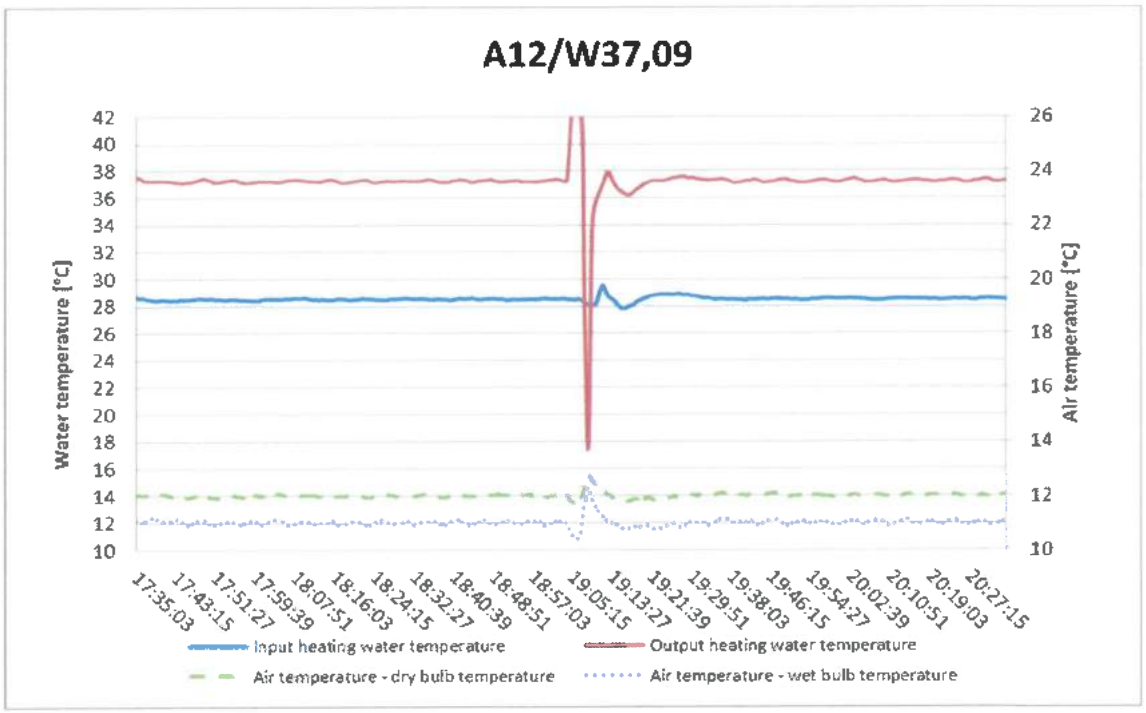


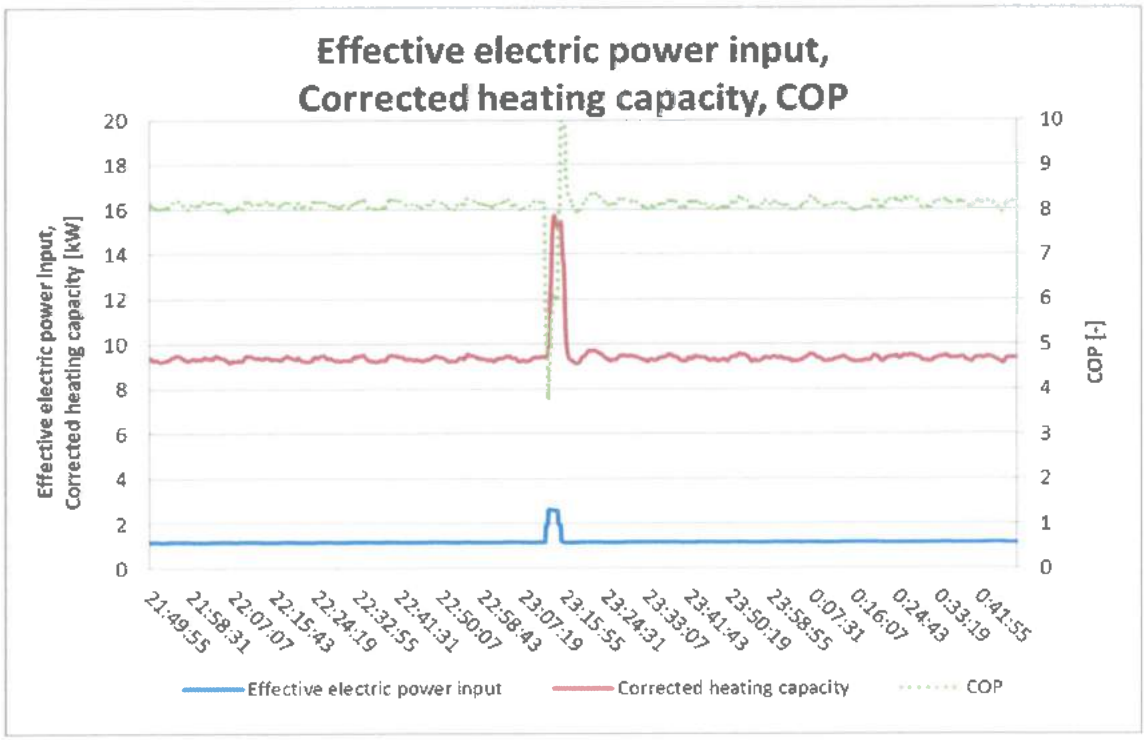
A7/W39.97 (Control settings: 1)



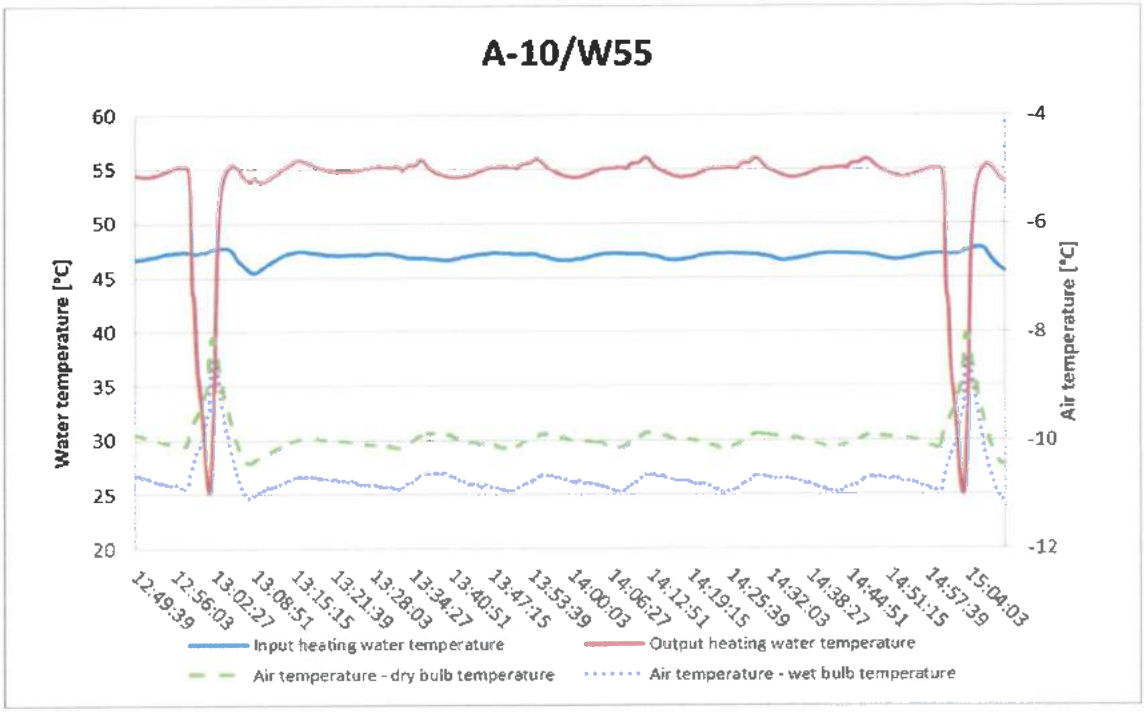


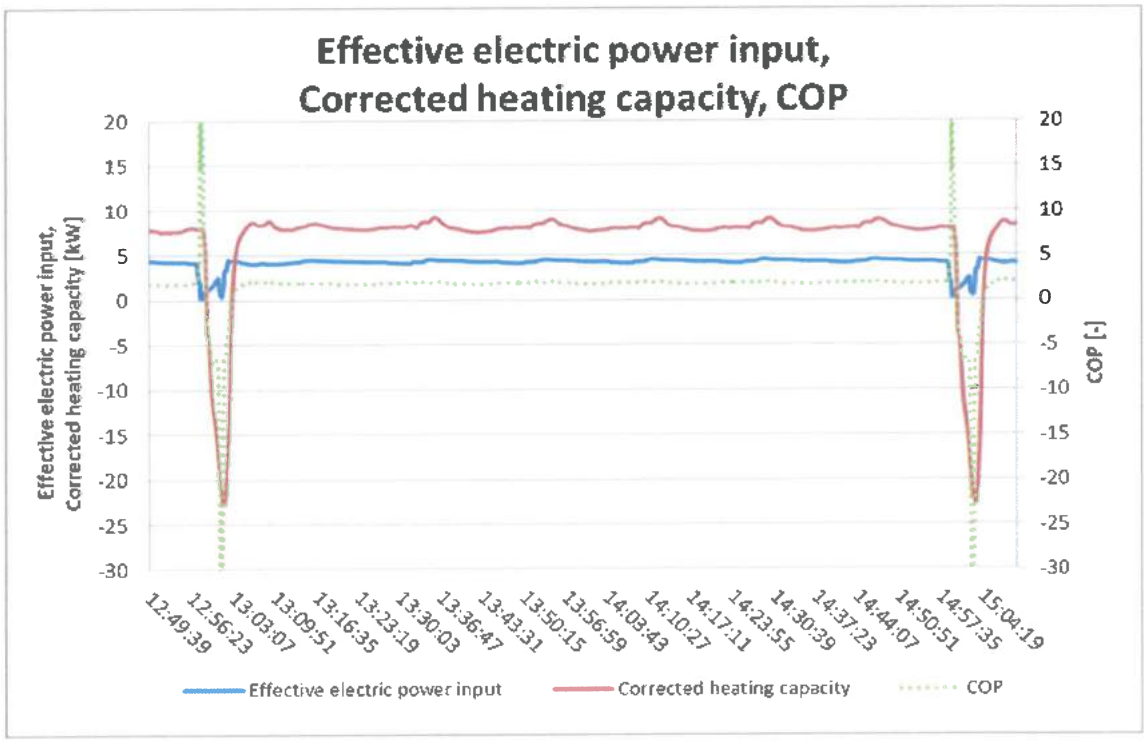
A12/W37.09 (Control settings: 1)





A-10/W55 (Control settings: 7)





VI. A list of referenced documents

- Order of 2024-04-03 (Order reg. no. B-81934, received on 2024-04-03)
- Contract B-81934/39

- ČSN EN 14511-2:2023 - Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 2: Test conditions
- ČSN EN 14511-3:2023 - Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 3: Test methods
- ČSN EN 14825:2023 - Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance

Accredited Testing Laboratory No. 1045.1 STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. 1

Test Report compiled by: Ing Tomáš Sedláček

Test Report approved by: Ing. Mario Jankola
Heating Equipment and Construction Products Manager

– End of Test Report –

Testing Laboratory 1045.1 accredited by the Czech Accreditation Institute pursuant to
ČSN EN ISO/IEC 17025:2018
Strojírenský zkušební ústav, s.p. Zkušební laboratoř
(Engineering Test Institute, Public Enterprise, Testing Laboratory)
Hudcova 424/56b, Medlánky, 621 00 Brno

L 1045.1

TEST REPORT
39-17666/H

Product:	Outdoor Air/Water Heat pump - monobloc
Type designation:	**EUROS ATMO 15**
Customer:	Euros Energy Sp. z o.o ul. Macieja Rataja 4F 05-850 Koprki POLAND
Manufacturer:	Euros Energy Sp. z o.o ul. Macieja Rataja 4F 05-850 Koprki POLAND
Report issue date:	2024-05-09
Distribution list:	1 copy to the Customer 1 copy to the Engineering Test Institute

I. Description of product tested

The Heat pump **EUROS ATMO 15** supplied by the company **Euros Energy Sp. z o.o** is structurally adapted to operate in air/water system. Device is designed as monobloc **EUROS ATMO 15 OUT** placed outside and indoor hydrobox **EUROS ATMO 15 IND** hanging on inner wall. Outdoor and indoor units are connected by copper piping and electrical wires. Refrigerant R32 is used with charge 1.8 kg. Power supply is a three-phase. Heat pump is able to work in heating and cooling mode. Heat pump is working with variable flow rate.

Main components of the outdoor unit **EUROS ATMO 15 OUT**:

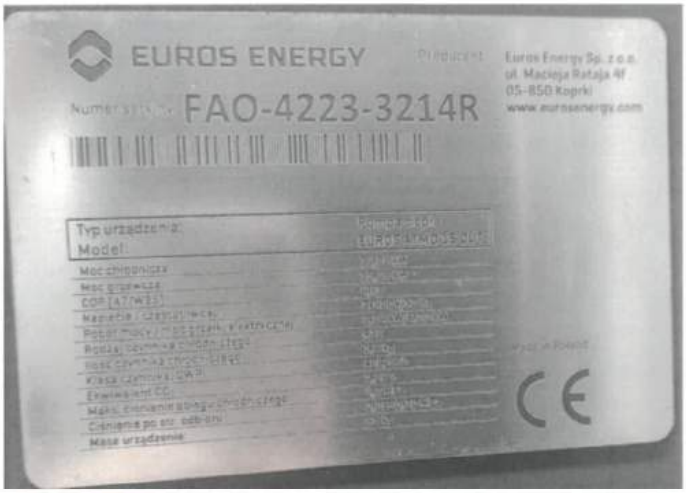
Main components of the indoor hydrobox **EUROS ATMO 15 IND:**

Photodocumentation:

Heat pump **EUROS ATMO 15 OUT** – outdoor unit
– Front view –

Heat pump **EUROS ATMO 15 OUT** – outdoor unit
– Back view –

Not recognized



Heat pump **EUROS ATMO 15 OUT** – outdoor unit
– Compressor label –

Heat pump **EUROS ATMO 15 OUT** – outdoor unit
– Label –

Heat pump **EUROS ATMO 15 OUT** – outdoor unit
– Without cover –

Heat pump **EUROS ATMO 15 IND** – indoor hydrobox
– Label –

Heat pump **EUROS ATMO 15 IND** – indoor hydrobox
– With cover –

Heat pump **EUROS ATMO 15 IND** – indoor hydrobox
– Without cover –

II. Sample tested

SZU reg. no.	Product name	Date of submission
1212.24.39891.001 1212.24.39892.001	**EUROS ATMO 15**	2024-04-19 2024-04-19

The visual inspection, tests and verification were carried out by Ing. Ondrej Bilkovič, at the test station of SZU. The tests were performed using measuring and testing equipment with valid calibration.

III. Measuring and test equipment:

No.	Description	Inventory number
1.	Electrical energy meter	E2.1
2.	Digital watt meter	1.2.2 ENERGIE ANALYZATOR_2
3.	Flow meter Krohne Optiflux	8.1.2 TECH_K2_V_DN15
4.	Barometer	2.3 MAR18_1_PB
5.	Differential pressure gauge	3.2 MAR18_2_dP
6.	Thermometers	3.4 MAR18_T
7.	Tape measure	ME 475
8.	Multi-analyser SINUS SoundBook MK2	000-000-000-875/1
9.	Calibrator G.R.A.S. 42AG	000-000-000-875/3
10.	Microphone pair G.R.A.S. 40 AK, wind deflector	000-000-000-875/2

IV. Methods, results of tests and verifications

No.	Test objective	Requirement	Method of test	Documentation	Test evaluation/ verification *
1.	Determination of the sound power level – Heat pump water heaters	Articles 4 and 9	**ČSN EN ISO 12102-1:2023**	Page No. 7-18	+
2.	Determination of sound power levels using sound intensity	Article 8.2	**ČSN EN ISO 9614-2:1997**	Page No. 8-18	+

***) Evaluation / statement of conformity:**

+..... Requirement fulfilled
-..... Requirement not fulfilled
0 .....Not applicable
x .....Not evaluated

Note:
If a statement of conformity is provided, the decision rule pursuant to ILAC-G8:09/2019, Art. 4.2.1 - binary statement for the simple acceptance rule shall apply.

Test objective:	Heating and cooling equipment
Exact name of the test procedure:	**2.136*** - Noise characteristics measurement
Test method:	**ČSN EN ISO 12102-1:2023;** **ČSN EN ISO 9614-2:1997**
Sample tested:	**EUROS ATMO 15**
Measuring equipment used:	see Chapter III
Place of test:	Engineering Test Institute, Hudcova 424/56b, 621 00 Brno, ČR

Measurement uncertainty:

Measured quantity	Unit	Uncertainty of measurement	Evaluation
Liquid			
- temperature difference (dT)	[K]	± 0.15 K	fulfilled
- temperature inlet/outlet	[°C]	± 0.15 K	fulfilled
- volume flow	[m^3/s]	± 1 %	fulfilled
- static pressure difference	[kPa]	± 1 kPa ($\Delta p \leq 20$ kPa) or ± 5 % ($\Delta p > 20$ kPa)	fulfilled
Air			
- dry bulb temperature	[°C]	± 0.2 K	fulfilled
- wet bulb temperature	[°C]	± 0.4 K	fulfilled
- volume flow	[m^3/s]	± 5 %	not applied
- static pressure difference	[Pa]	± 5 Pa ($\Delta p \leq 100$ Pa) or ± 5 % ($\Delta p > 100$ Pa)	not applied
Refrigerant			
- pressure at compressor outlet	[kPa]	± 1 %	not applied
- temperature	[°C]	± 0.5 K	not applied
Concentration (in volume)			
- heat transfer medium	[%]	± 2	not applied
Electrical quantities			
- electric power	[W]	± 1 %	fulfilled
- voltage	[V]	± 0.5 %	fulfilled
- current	[A]	± 0.5 %	fulfilled
- electric energy	[kWh]	± 1 %	not applied
Compressor rotational speed	[min^{-1}]	± 0.5 %	not applied
The heating or cooling capacities measured on the liquid side shall be determined within a maximum uncertainty of 5 % independent of the individual uncertainties of measurement including the uncertainties on the properties of fluids.			fulfilled

Note:
Comment to abbreviated marking: e.g. A7/W55
A (air) 7 (input source air temperature in °C) / W (water), 55 (output heating water temperature in °C)

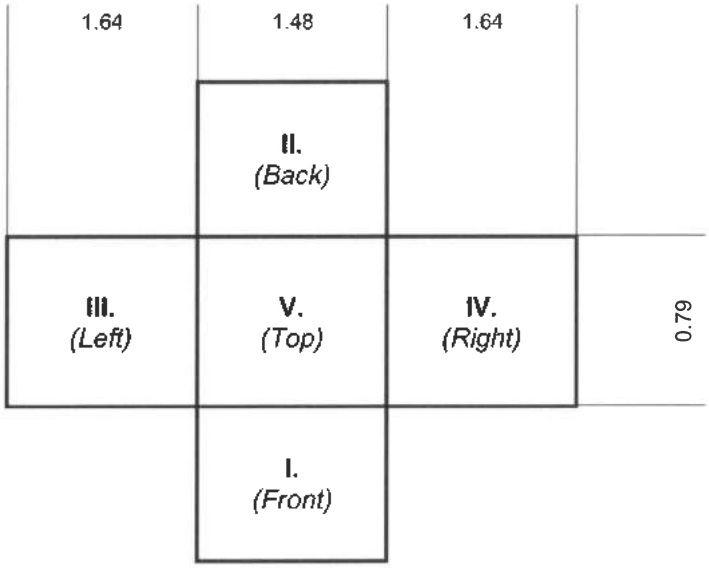
a) Measurement surface

Tested samples were surrounded by a cuboid-shape measuring surface set in distance d [m]. The partial areas of the indoor unit and outdoor unit were scanned with a sound intensity probe according to ČSN EN ISO 9614-2:1997 standard. For visualisation of the measuring surfaces see the sketches below.

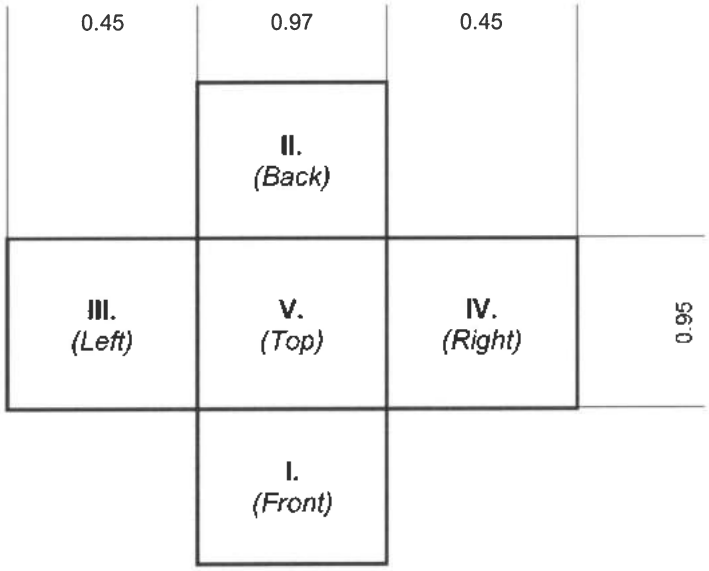
Test sample			**For outdoor unit**	**For indoor unit**
Distance from the test sample	*d*	[m]	0.20	0.20
Height of measurement surface	*h*	[m]	1.64	0.45
Width of measurement surface	*w*	[m]	1.48	0.97
Depth of measurement surface	*l*	[m]	0.79	0.95
Total measurement surface area	*S*	[m²]	8.61	2.65
Minimal measuring time	t_M	[s]	2x50.00	2x30.00

Sketch of measurement surface (not to scale):

Heat Pump
EUROS ATMO 15
- Outdoor Unit -



Heat Pump
EUROS ATMO 15
- Indoor Unit -



b) Acoustic environment

The tested samples were placed inside climate chambers (with dimensions shown below); sound absorption panels were mounted on the walls and the ceiling of the chamber. The units were placed near the middle of the chamber, at a sufficient distance from the surrounding walls, and were rotated by about 5÷10 °.

Climate-acoustic chamber *(Corresponds to free-field over a reflecting plane*)*			**For outdoor unit**	**For indoor unit**
Chamber width	l_1	[m]	6.95	3.75
Chamber length	l_2	[m]	4.50	4.50
Chamber height	l_3	[m]	3.60	4.25

c) Measured and calculated data – General overview:

The measured values are in accordance with **ČSN EN 12102-1:2023**			YES	YES
The measured values are in accordance with **ČSN EN ISO 9614-2:1997**			YES	YES
Operation mode			Heating	
Specification of the assessment condition			A7/W55*)	
Type of HP capacity regulation			Inverter	
Control settings of heat pump / compressor			Mode 1	
Fan speed settings [rpm]			Mode 1	
Test sample			Air/Water Heat pump **EUROS ATMO 15** – Outdoor unit –	Air/Water Heat pump **EUROS ATMO 15** – Indoor unit –
Date of testing (YYYY-MM-DD)			2024-05-02	
Reference air temperature	t	[°C]	7.0	20.0
Relative humidity of air	RH	[%]	84.7	37.9
Ambient pressure	p_{amb}	[hPa]	979.5	978.5
Overall sound power level (linear)	L_W	[dB]	69.1 ± 1.5	44.2 ± 1.5
Overall A-weighted sound power level	L_{WA}	**[dB(A)]**	**59.8 ± 1.5**	**36.2 ± 1.5**
Accuracy class			**Engineering (Grade 2)**	

*) *Comment to abbreviated marking: i.e. A7/W55*
A (air), 7 (input air, dry-bulb temperature in °C) / W (water), 55 (outlet heating water temperature in °C)

d) **Outdoor unit, Measurement results** – octave bands

Air/Water Heat pump **EUROS ATMO 15** Outdoor unit at A7/W55; Compressor Mode 1; Fan at Mode 1	**Engineering (Grade 2)**

f_m	Criterion 1			Criterion 2		Criterion 3	All criteria passed?	L_W	L_{WA}	U	Evaluation
[Hz]	L_d	F_{pl}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{w(1)}$-$L_{w(2)} \leq 5$		[dB]	[dB(A)]	[dB]	
125	20.7	1.3	YES	0.0	YES	YES	YES	66.6	51.5	± 3.0	passed
250	**21.5**	**3.0**	**YES**	**0.0**	**YES**	**YES**	**YES**	**64.4**	**54.2**	**± 2.0**	passed
500	22.1	3.1	YES	0.0	YES	YES	YES	57.5	54.1	± 1.5	passed
1000	**22.4**	**3.2**	**YES**	**0.0**	**YES**	**YES**	**YES**	**52.7**	**52.4**	**± 1.5**	**passed**
2000	22.1	3.1	YES	0.0	YES	YES	YES	46.8	48.0	± 1.5	c
4000	20.6	3.0	YES	0.0	YES	YES	YES	45.4	46.3	± 1.5	c
8000**)	20.1	3.2	YES	0.0	YES	YES	YES	41.3	41.2	± 2.5	c
Total								**69.1**	**59.8**	**± 1.5**	

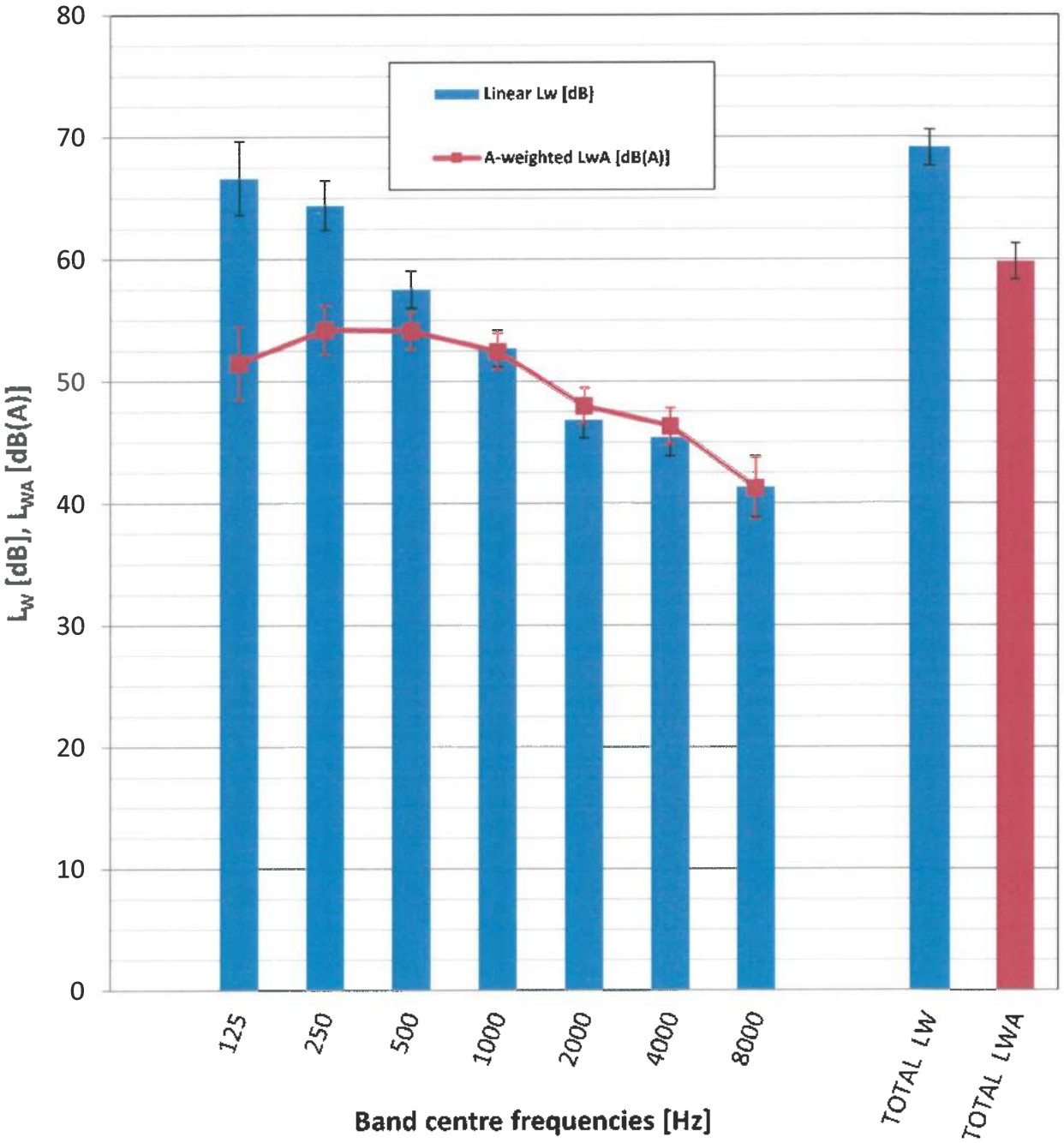
**) *Due to the sound intensity method limitations, the frequency of 6300 Hz was measured only.*

Legend:

passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is fulfilled in this band.*
not passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is not fulfilled in this band.*
c	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are evaluated in the calculation of L_{WA}.*
nc	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are not evaluated in the calculation of L_{WA}.*

e) Outdoor unit, Spectrum of Sound power level L_W – octave bands

Air/Water Heat pump **EUROS ATMO 15** Outdoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering** **(Grade 2)**



f) **Outdoor unit, Measurement results** – third octave bands

Air/Water Heat pump **EUROS ATMO 15** Outdoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering (Grade 2)**

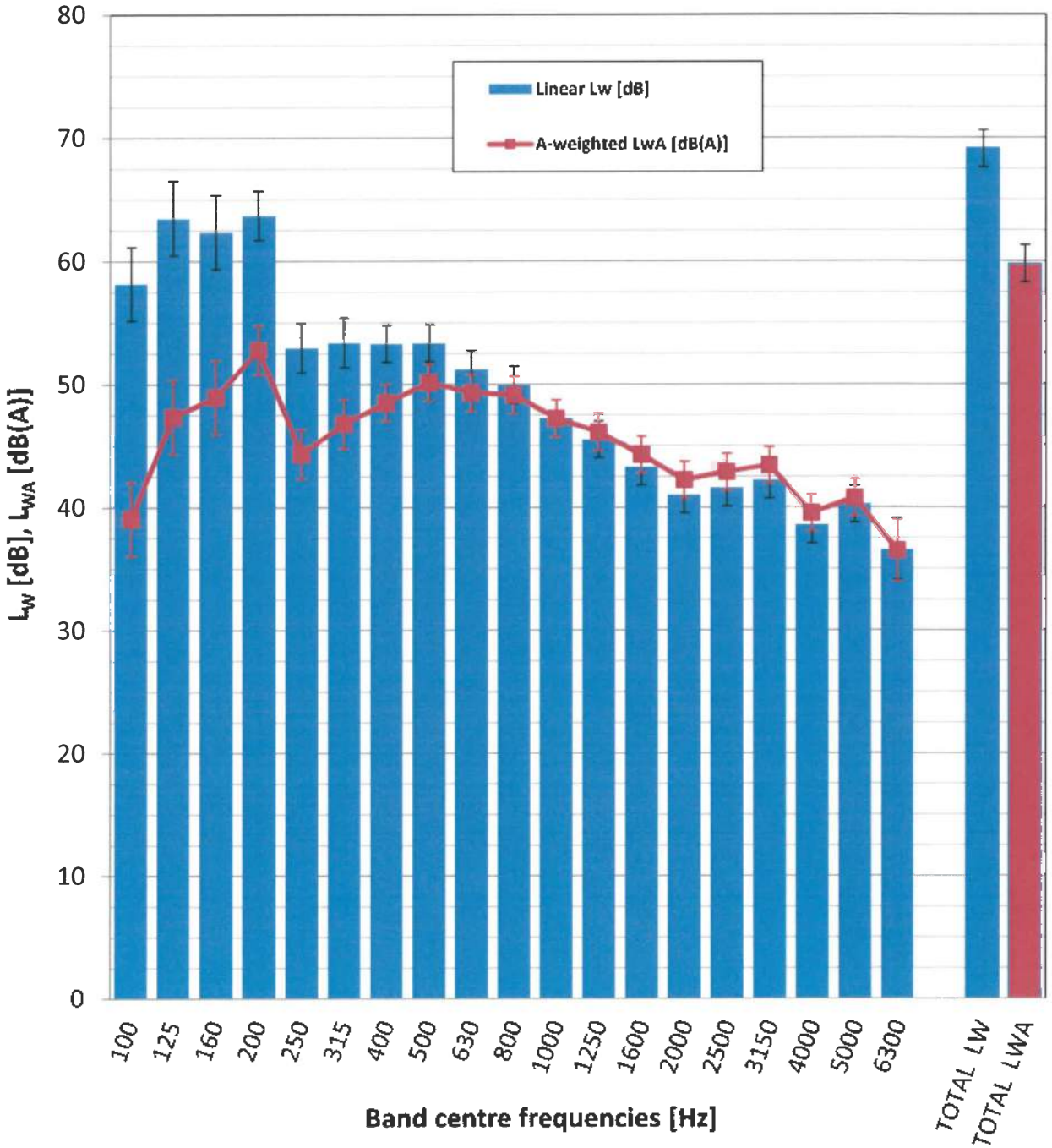
f_m	Criterion 1			Criterion 2		Criterion 3	All criteria passed?	L_W	L_{WA}	U	Evaluation
[Hz]	L_d	F_{pl}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{W(1)}-L_{W(2)} \leq 5$		[dB]	[dB(A)]	[dB]	
100	21.2	4.4	YES	0.0	YES	YES	YES	58.2	39.1	± 3.0	c
125	20.7	1.3	YES	0.0	YES	YES	YES	63.5	47.4	± 3.0	passed
160	20.8	3.3	YES	0.0	YES	YES	YES	62.3	48.9	± 3.0	passed
200	**21.6**	**3.6**	**YES**	**0.0**	**YES**	**YES**	**YES**	**63.7**	**52.8**	**± 2.0**	passed
250	21.5	3.0	YES	0.0	YES	YES	YES	52.9	44.3	± 2.0	passed
315	21.8	3.0	YES	0.0	YES	YES	YES	53.4	46.8	± 2.0	passed
400	22.3	3.3	YES	0.0	YES	YES	YES	53.3	48.5	± 1.5	passed
500	22.1	3.1	YES	0.0	YES	YES	YES	53.3	50.1	± 1.5	passed
630	21.9	3.2	YES	0.0	YES	YES	YES	51.2	49.3	± 1.5	passed
800	21.6	3.0	YES	0.0	YES	YES	YES	49.9	49.1	± 1.5	passed
1000	22.4	3.2	YES	0.0	YES	YES	YES	47.2	47.2	± 1.5	passed
1250	21.9	3.4	YES	0.0	YES	YES	YES	45.5	46.1	± 1.5	passed
1600	21.7	3.2	YES	0.0	YES	YES	YES	43.3	44.3	± 1.5	passed
2000	22.1	3.1	YES	0.0	YES	YES	YES	41.0	42.2	± 1.5	c
2500	21.2	2.8	YES	0.0	YES	YES	YES	41.6	42.9	± 1.5	passed
3150	20.5	2.5	YES	0.0	YES	YES	YES	42.2	43.4	± 1.5	passed
4000	20.6	3.0	YES	0.0	YES	YES	YES	38.6	39.6	± 1.5	c
5000	20.0	2.6	YES	0.0	YES	YES	YES	40.3	40.8	± 1.5	c
6300	20.1	3.2	YES	0.0	YES	YES	YES	36.6	36.5	± 2.5	c
Total								**69.1**	**59.8**	**± 1.5**	

Legend:

passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is fulfilled in this band.*
not passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is not fulfilled in this band.*
c	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are evaluated in the calculation of L_{WA}.*
nc	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are not evaluated in the calculation of L_{WA}.*

g) Outdoor unit, Spectrum of Sound power level L_W – third octave bands

Air/Water Heat pump **EUROS ATMO 15** Outdoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering (Grade 2)**



h) **Indoor unit, Measurement results** – octave bands

Air/Water Heat pump **EUROS ATMO 15** Indoor unit at A7/W55; Compressor Mode 1; Fan at Mode 1	**Engineering (Grade 2)**

f_m	Criterion 1			Criterion 2		Criterion 3	All criteria passed?	L_W	L_{WA}	U	Evaluation
[Hz]	L_d	F_{pl}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{W(1)}$-$L_{W(2)} \leq 5$		[dB]	[dB(A)]	[dB]	
125	21.6	11.5	YES	3.0	YES	YES	YES	42.4	25.2	± 3.0	passed
250	20.8	1.6	YES	0.0	YES	YES	YES	34.4	26.0	± 2.0	c
500	**20.8**	**2.1**	**YES**	**0.0**	**YES**	**YES**	**YES**	**36.9**	**33.3**	**± 1.5**	**passed**
1000	21.1	7.8	YES	3.0	YES	YES	YES	26.2	25.8	± 1.5	c
2000	20.5	2.6	YES	0.0	YES	YES	YES	27.7	28.9	± 1.5	passed
4000	20.1	4.6	YES	0.0	YES	YES	YES	21.1	22.2	± 1.5	c
8000**)	19.8	13.4	YES	6.2	NO	NO	NO	11.7	11.6	± 2.5	nc
Total								**44.2**	**36.2**	**± 1.5**	

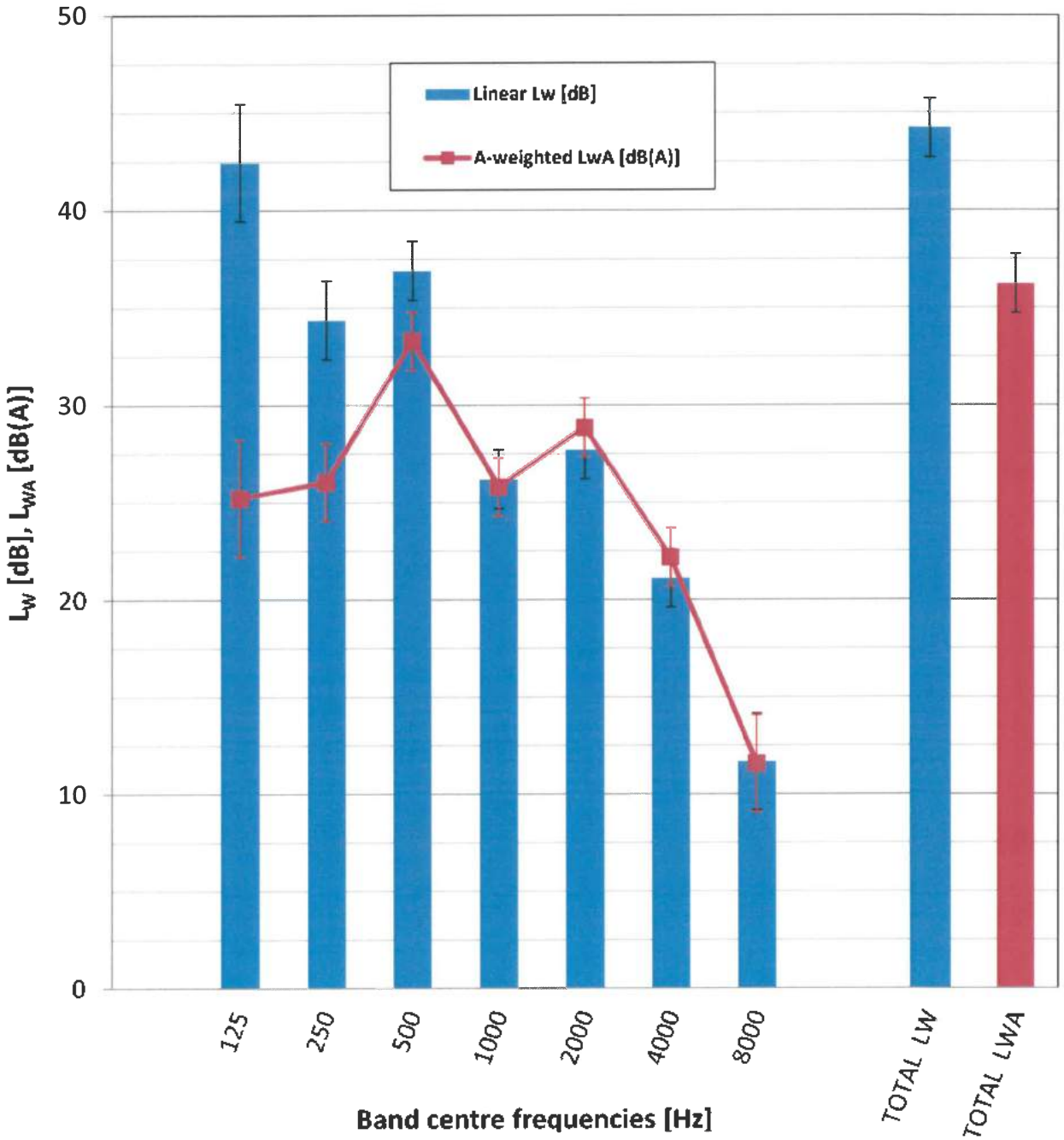
**) *Due to the sound intensity method limitations, the frequency of 6300 Hz was measured only.*

Legend:

passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is fulfilled in this band.*
not passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is not fulfilled in this band.*
c	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are evaluated in the calculation of L_{WA}.*
nc	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are not evaluated in the calculation of L_{WA}.*

i) Indoor unit, Spectrum of Sound power level L_W – octave bands

Air/Water Heat pump **EUROS ATMO 15** Indoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering (Grade 2)**



j) **Indoor unit, Measurement results** – third octave bands

Air/Water Heat pump **EUROS ATMO 15** Indoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering (Grade 2)**

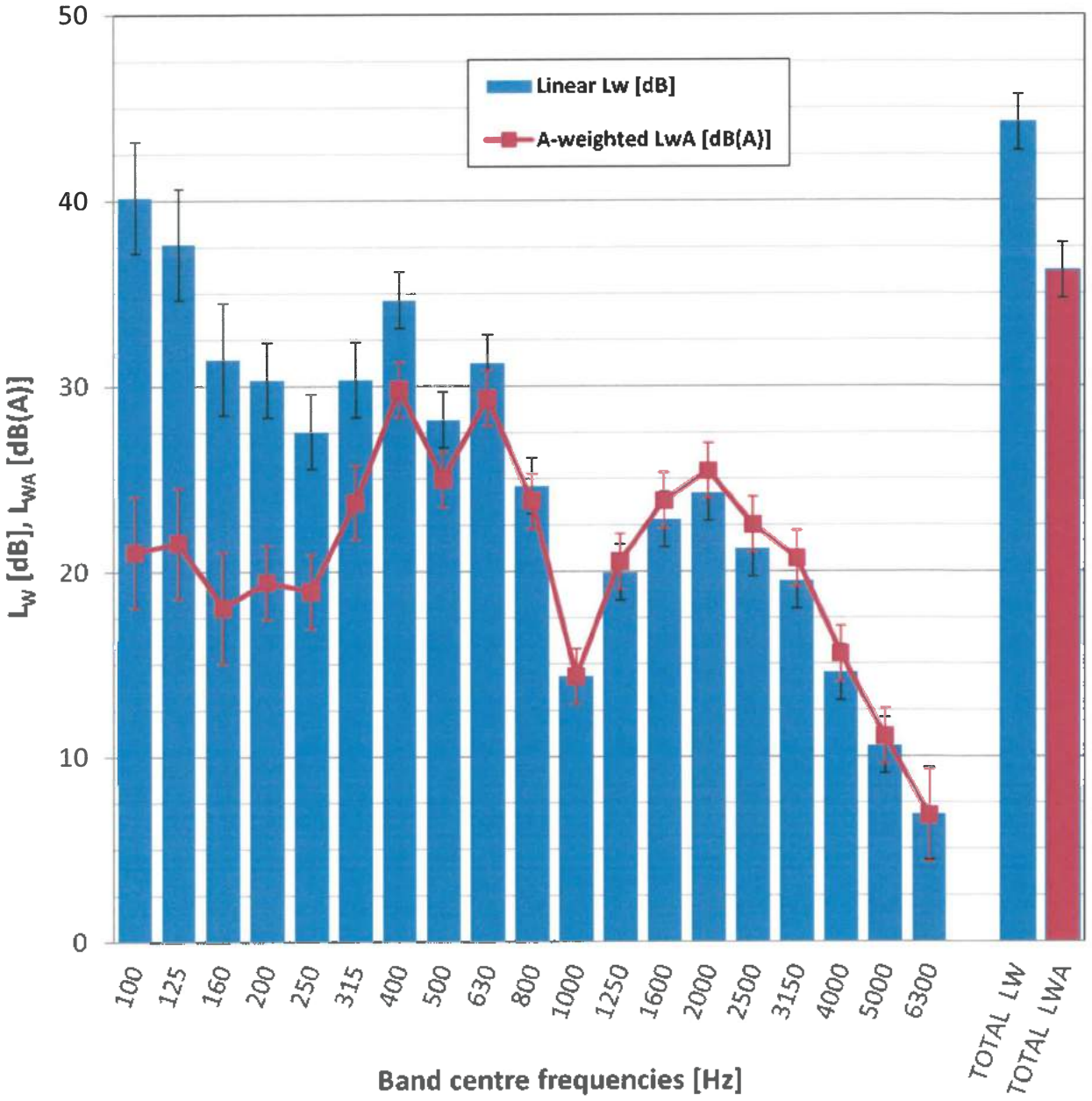
f_m	Criterion 1			Criterion 2		Criterion 3	All criteria passed?	L_W	L_{WA}	U	Evaluation
[Hz]	L_d	F_{pl}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{W(1)}$-$L_{W(2)} \leq s$		[dB]	[dB(A)]	[dB]	
100	23.0	12.0	YES	3.0	YES	YES	YES	40.2	21.1	± 3.0	passed
125	21.6	11.5	YES	3.0	YES	YES	YES	37.6	21.5	± 3.0	passed
160	21.2	1.6	YES	2.8	YES	YES	YES	31.4	18.0	± 3.0	c
200	21.3	2.9	YES	0.0	YES	YES	YES	30.3	19.4	± 2.0	c
250	20.8	1.6	YES	0.0	YES	YES	YES	27.5	18.9	± 2.0	c
315	21.3	2.0	YES	0.0	YES	YES	YES	30.3	23.7	± 2.0	passed
400	**21.2**	**1.2**	**YES**	**0.0**	**YES**	**YES**	**YES**	**34.6**	**29.8**	**± 1.5**	**passed**
500	20.8	2.1	YES	0.0	YES	YES	YES	28.2	25.0	± 1.5	passed
630	20.9	1.4	YES	0.0	YES	YES	YES	31.3	29.4	± 1.5	passed
800	21.6	3.2	YES	0.9	YES	YES	YES	24.6	23.8	± 1.5	passed
1000	21.1	7.8	YES	3.0	YES	YES	YES	14.3	14.3	± 1.5	c
1250	20.8	4.6	YES	0.4	YES	YES	YES	19.9	20.5	± 1.5	passed
1600	21.1	2.3	YES	0.0	YES	YES	YES	22.8	23.8	± 1.5	passed
2000	20.5	2.6	YES	0.0	YES	YES	YES	24.2	25.4	± 1.5	passed
2500	20.5	2.3	YES	0.0	YES	YES	YES	21.2	22.5	± 1.5	passed
3150	20.2	3.2	YES	0.0	YES	YES	YES	19.5	20.7	± 1.5	passed
4000	20.1	4.6	YES	0.0	YES	YES	YES	14.6	15.6	± 1.5	c
5000	19.7	8.8	YES	0.4	YES	NO	NO	10.6	11.1	± 1.5	nc
6300	19.8	13.4	YES	6.2	NO	NO	NO	6.9	6.8	± 2.5	nc
Total								**44.2**	**36.2**	**± 1.5**	

Legend:

passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is fulfilled in this band.*
not passed	*Frequency bands with this description are significant for the calculation of A-weighted total sound power level L_{WA}. Required accuracy class is not fulfilled in this band.*
c	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are evaluated in the calculation of L_{WA}.*
nc	*Frequency bands with this description are not significant for the calculation of A-weighted total sound power level L_{WA}. These bands are not evaluated in the calculation of L_{WA}.*

k) Indoor unit, Spectrum of Sound power level L_W – third octave bands

Air/Water Heat pump **EUROS ATMO 15** Indoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering** **(Grade 2)**



Tested by: Ing. Ondrej Bilkovič Date: 2024-05-09 Signed:

Reviewed and approved by: Ing. Petr Lindovský Date: 2024-05-09 Signed:

V. A list of referenced documents

- Order of 2024-04-03 (Order reg. no. B-81934, received on 2024-04-03)
- Contract B-81934/39

- ČSN ISO 9614-2:1997 - Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scannig
- ČSN EN 12102-1:2023 - Air conditioners, liquid chilling packages, heat pumps, process chillers and dehumidifiers with electrically driven compressors - Determination of the sound power level - Part 1: Air conditioners, liquid chilling packages, heat pumps for space heating and cooling, dehumidifiers and process chillers

- ČSN EN 14511-2:2023 - Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 2: Test conditions
- ČSN EN 14511-3:2023 - Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 3: Test methods
- ČSN EN 14511-4:2023 - Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors - Part 4: Requirements
- ČSN EN 14825:2023 - Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance

- Background of the SZU task no. 39-17666
- Measurement data file 39-17666-H(Euros_split).zip

Test Report compiled by: **Ing. Ondrej Bilkovič**
Test engineer

Accredited Testing Laboratory No. 1045.1 * STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. * 1

Test Report approved by: **Ing. Antonín Kolbábek, Ph.D.**
Hydraulic and Pressure Equipment Manager

– End of Test Report –

Tłumaczenie poświadczone z języka angielskiego

[Wybrane strony z raportu z testu. Strona 7:]----------

[znak graficzny]

Cel testu:	Warunki oceny
Dokładna nazwa procedury testowej:	**1.37* - Badania szczelności, wytrzymałości ciśnieniowej, parametrów termicznych i technicznych, sprawności spalania, funkcji bezpieczeństwa**
Metoda testowa:	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023
Testowana próbka:	Pompa ciepła **EUROS ATMO15**
Używany sprzęt pomiarowy:	zob. rozdział III

Specyfikacja warunku oceny		**A7/W35**	**A7/W55**
Data testu		**2024-04-26**	**2024-04-25**
Procedura testu przejściowego	TAK / NIE	TAK	TAK
Średni czas odszraniania w 1 cyklu	[min]	–	–
Średni czas 1 cyklu	[min]	–	–
Czas obliczeń	[min]	180,0	180,0
Wylot wody grzewczej – obliczanie temperatury	[°C]	35,07	55,05
Wlot wody grzewczej – obliczanie temperatury	[°C]	30,01	47,06
Temperatura wody grzewczej na wylocie	[°C]	35,07	55,05
Temperatura wody grzewczej na wlocie	[°C]	30,01	47,06
Temperatura powietrza – temperatura termometru suchego	[°C]	6,99	6,99
Temperatura powietrza – temperatura termometru mokrego	[°C]	6,00	6,00
Wilgotność względna	[%]	86,98	87,08
Ciśnienie barometryczne	[kPa]	98,007	97,656
Temperatura otoczenia	[°C]	6,91	6,91
Różnica ciśnień w obwodzie wtórnym	[kPa]	39,613	55,670
Wydajność wtórnej pompy cieczy	[–]	0,272	0,230
Objętościowe natężenie przepływu wody grzewczej	[$m^3 h^{-1}$]	1,3767	0,8924
Gęstość wody grzewczej	[kgm^3]	994,0	986,0
Pojemność cieplna właściwa wody grzewczej	[$kJkg^{-1}K^{-1}$]	4,175	4,178
Napięcie	[V]	401,53	401,04
Całkowity prąd	[A]	8,76	15,08
Całkowita moc wejściowa	[kW]	1,564	2,796
Korekta wydajności drugiej pompy cieczy	[W]	40,558	38,829
Korekta poboru mocy drugiej pompy cieczy	[W]	55,67	52,63
Wydajność grzewcza – podgrzewanie wody	[kW]	8,041	8,179
Skorygowana wydajność grzewcza – woda grzewcza	**[kW]**	**8,001**	**8,140**
Niepewność skorygowanej wydajności grzewczej	[kW]	±0,137	± 0,091
Efektywny pobór mocy elektrycznej	**[kW]**	**1,508**	**2,743**
COP	**[–]**	**5,305**	**2,967**
Niepewność COP	[–]	± 0,094	± 0,034
Ustawienia sterowania	**[–]**	**1**	**2**
Ustawienia pompy cyrkulacyjnej - podgrzewanie wody	[%]	–	–

SP-2021-000012_1_12

[znak graficzny]

Cel testu:	Sezonowe testy wydajności i obliczenia SCOP - Zastosowanie w niskich temperaturach
Dokładna nazwa procedury testowej:	**1.37* – Badania szczelności, wytrzymałości ciśnieniowej, parametrów termicznych i technicznych, sprawności spalania, funkcji bezpieczeństwa**
Metoda testowa:	ČSN EN 14511-3:2023, ČSN EN 14825:2023
Testowana próbka:	Pompa ciepła **EUROS ATMO15**
Używany sprzęt pomiarowy:	zob. rozdział III

Projekt				Powietrze/woda - monoblok			
Specyfikacja warunków zgodnie z ČSN EN 14825:2023	Zastosowanie w temperaturach				**Niskie** (referencyjna temperatura wody 35 °C)		
	Referencyjny sezon grzewczy				**Średni**		
	Temperatura wody na wylocie - wewnętrzny wymiennik ciepła				Zmienna		
	Kontrola prędkości kompresora				Zmienna		
	Natężenie przepływu wody - obwód pierwotny				–		
	Natężenie przepływu wody - obwód wtórny				Stałe		
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	Ogrzewanie	Średnia	η_s			<u>203,4</u>	%
		Cieplej	η_s			–	%
		Zimniej	η_s			–	%
Efektywność sezonowa zgodnie z ČSN EN 14825:2023	Ogrzewanie	Średnia	**SCOP**			<u>5,16</u>	–
		Cieplej	SCOP			–	–
		Zimniej	SCOP			–	–
Funkcja	Chłodzenie					tak	
	Ogrzewanie	Tak	Referencyjny sezon grzewczy	Średnia		tak	
				Cieplej		–	
				Zimniej		–	
Pełne obciążenie grzewcze	Chłodzenie		$P_{designc}$			–	kW
	Ogrzewanie	Średnia	$P_{designh}$			<u>11,68</u>	kW
		Cieplej	$P_{designh}$			–	kW
		Zimniej	$P_{designh}$			–	kW
Temperatury dwuwartościowe	Ogrzewanie	Średnia	$T_{bivalent}$			-7	°C
		Cieplej	$T_{bivalent}$			–	°C
		Zimniej	$T_{bivalent}$			–	°C
Graniczne temperatury pracy	Ogrzewanie	Średnia	TOL			-10	°C
		Cieplej	TOL			–	°C
		Zimniej	TOL			–	°C
Sezonowe zużycie energii zgodnie z ČSN EN 14825:2023	Chłodzenie		Q_{CE}			–	kWh
	Ogrzewanie	Średnia	Q_{HE}			4677	kWh
		Cieplej	Q_{HE}			–	kWh
		Zimniej	Q_{HE}			–	kWh
Tryby inne niż „tryb aktywny"	Tryb wyłączenia				P_{OFF}	18,3	W
	Tryb wyłączonego termostatu				P_{TO}	18,2	W
	Tryb czuwania				P_{SB}	18,3	W
	Tryb włączonej grzałki karteru				P_{CK}	0,0	W

Dane do obliczeń SCOP

– Zastosowanie w niskich temperaturach (referencyjna temperatura wody 35 °C)
– Referencyjny sezon grzewczy „A" – średni

	Zewnętrzny wymiennik ciepła	Wewnętrzny wymiennik ciepła	Współczynnik obciążenia częściowego	Obciążenie częściowe	Deklarowana wydajność DC	COPd przy deklarowanej wydajności	Współczynnik degradacji Cdh	CR	COPbin (Tj)	Efektywny pobór mocy kompresora wyłączonego
	Wlot powietrza zewnętrznego	Temperatura wody na wylocie								
	[°C]	[°C]	[%]	[kW]	[kW]	[–]	[–]	[–]	[–]	[kW]
A	-7	34,00	88,46	10,33	10,333	3,406	0,900	1,00	3,406	–
B	2	30,00	53,85	6,29	6,906	5,211	0,900	1,00	5,211	–
C	7	29,63	34,62	4,04	8,244	6,337	0,986	0,49	6,246	0,0182
D	12	28,79	15,38	1,80	9,458	8,093	0,984	0,19	7,589	0,0182
TOL (E)	-10	35,00	100,00	11,68	9,351	3,068	0,900	1,00	3,068	–
Tbiv (F)	-7	34,00	88,46	10,33	10,333	3,406	0,900	1,00	3,406	–

Dostosowanie temperatury wody – zgodnie z 6SN EN 14825:2023, załącznik E

– Zastosowanie w niskich temperaturach (referencyjna temperatura wody 35 °C)
– Sezon referencyjny „A" – średni
– Warunek D
– Stałe natężenie przepływu wody – obwód wtórny

Wzory ogólne:

$t_{wylot,\ średnia} = t_{wlot,\ test\ wydajności} + (t_{wylot,\ test\ wydajności} - t_{wlot,\ test\ wydajności}) \cdot CR$ [°C]

$t_{wylot,\ średnia} = t_{wlot,\ test\ wydajności} + (\Delta t) \cdot CR$ [°C]

$t_{wylot,\ średnia} = t_{wylot,\ test\ wydajności} - \Delta t + \Delta t \cdot CR$ [°C]

$t_{wylot,\ test\ wydajności} - t_{wylot,\ średnia} + \Delta t - \Delta t \cdot CR$ [°C]

Dla stałego przepływu:

Δt = deklarowana wydajność / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

CR Δt = obciążenie częściowe / deklarowana wydajność • deklarowana wydajność / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

CR • Δt = obciążenie częściowe / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

$t_{wylot,\ test\ wydajności,\ stały\ przepływ} = t_{wylot,\ średnia}$ + deklarowana wydajność / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$ – obciążenie częściowe / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

$t_{wylot,\ test\ wydajności,\ stały\ przepływ} = t_{wylot,\ średnia} + 5$ / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35}$ • (deklarowana wydajność – obciążenie częściowe)

Zmierzone dane:

$t_{wylot,\ średnia}$	24,00	[°C]
deklarowana wydajność	9,458	[kW]
deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7/W35}$	8,001	[kW]
obciążenie częściowe	1,80	[kW]

[znak graficzny]

Cel testu:	Sezonowe testy wydajności i obliczenia SCOP - Zastosowanie w średnich temperaturach
Dokładna nazwa procedury testowej:	**1.37* – Badania szczelności, wytrzymałości ciśnieniowej, parametrów termicznych i technicznych, sprawności spalania, funkcji bezpieczeństwa**
Metoda testowa:	ČSN EN 14511-3:2023, ČSN EN 14825:2023
Testowana próbka:	Pompa ciepła **EUROS ATMO15**
Używany sprzęt pomiarowy:	zob. rozdział III

Projekt			Powietrze/woda - monoblok				
Specyfikacja warunków zgodnie z ČSN EN 14825:2023	Zastosowanie w temperaturach					**Średnie** (referencyjna temperatura wody 55 °C)	
	Referencyjny sezon grzewczy					**Średni**	
	Temperatura wody na wylocie - wewnętrzny wymiennik ciepła					Zmienna	
	Kontrola prędkości kompresora					Zmienna	
	Natężenie przepływu wody - obwód pierwotny					–	
	Natężenie przepływu wody - obwód wtórny					Stałe	
Sezonowa efektywność energetyczna ogrzewania pomieszczeń	Ogrzewanie	Średnia	η_s			**<u>140,8</u>**	%
		Cieplej	η_s			–	%
		Zimniej	η_s			–	%
Efektywność sezonowa zgodnie z ČSN EN 14825:2023	Ogrzewanie	Średnia	**SCOP**			**<u>3,59</u>**	–
		Cieplej	SCOP			–	–
		Zimniej	SCOP			–	–
Funkcja	Chłodzenie					tak	
	Ogrzewanie	Tak	Referencyjny sezon grzewczy	Średnia		tak	
				Cieplej		–	
				Zimniej		–	
Pełne obciążenie grzewcze	Chłodzenie		$P_{designc}$			–	kW
	Ogrzewanie	Średnia	$P_{designh}$			**<u>10,57</u>**	kW
		Cieplej	$P_{designh}$			–	kW
		Zimniej	$P_{designh}$			–	kW
Temperatury dwuwartościowe	Ogrzewanie	Średnia	$T_{bivalent}$			-7	°C
		Cieplej	$T_{bivalent}$			–	°C
		Zimniej	$T_{bivalent}$			–	°C
Graniczne temperatury pracy	Ogrzewanie	Średnia	TOL			-10	°C
		Cieplej	TOL			–	°C
		Zimniej	TOL			–	°C
Sezonowe zużycie energii zgodnie z ČSN EN 14825:2023	Chłodzenie		Q_{CE}			–	kWh
	Ogrzewanie	Średnia	Q_{HE}			6074	kWh
		Cieplej	Q_{HE}			–	kWh
		Zimniej	Q_{HE}			–	kWh
Tryby inne niż „tryb aktywny"		Tryb wyłączenia			P_{OFF}	18,3	W
		Tryb wyłączonego termostatu			P_{TO}	18,2	W
		Tryb czuwania			P_{SB}	18,3	W
		Tryb włączonej grzałki karteru			P_{CK}	0,0	W

Dane do obliczeń SCOP
– Zastosowanie w średnich temperaturach (referencyjna temperatura wody 55 °C)
– Referencyjny sezon grzewczy „A" – średni

	Zewnętrzny wymiennik ciepła Wlot powietrza zewnętrznego	Wewnętrzny wymiennik ciepła Temperatura wody na wylocie	Współczynnik obciążenia częściowego	Obciążenie częściowe	Deklarowana wydajność DC	COPd przy deklarowanej wydajności	Współczynnik degradacji Cdh	CR	COPbin (Tj)	Efektywny pobór mocy kompresora wyłączonego
	[°C]	[°C]	[%]	[kW]	[kW]	[–]	[–]	[–]	[–]	[kW]
A	-7	52,00	88,46	9,35	9,347	2,286	0,900	1,00	2,286	–
B	2	42,80	53,85	5,69	6,506	3,573	0,990	0,87	3,568	0,0182
C	7	39,97	34,62	3,66	7,698	4,645	0,989	0,48	4,589	0,0182
D	12	37,09	15,38	1,63	8,836	5,894	0,988	0,18	5,593	0,0182
TOL (E)	-10	55,00	100,00	10,57	7,340	1,760	0,900	1,00	1,760	–
Tbiv (F)	-7	52,00	88,46	9,35	9,347	2,286	0,900	1,00	2,286	–

Dostosowanie temperatury wody – zgodnie z 65N EN 14825:2023, załącznik E

– Zastosowanie w średnich temperaturach (referencyjna temperatura wody 55 °C)
– Sezon referencyjny „A" – średni
– Warunek D
– Stałe natężenie przepływu wody – obwód wtórny

Wzory ogólne:

$t_{wylot,\ średnia} = t_{wlot,\ test\ wydajności} + (t_{wylot,\ test\ wydajności} - t_{wlot,\ test\ wydajności}) \cdot CR$ [°C]

$t_{wylot,\ średnia} = t_{wlot,\ test\ wydajności} + (\Delta t) \cdot CR$ [°C]

$t_{wylot,\ średnia} = t_{wylot,\ test\ wydajności} - \Delta t + \Delta t \cdot CR$ [°C]

$t_{wylot,\ test\ wydajności} - t_{wylot,\ średnia} + \Delta t - \Delta t \cdot CR$ [°C]

Dla stałego przepływu:

Δt = deklarowana wydajność / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

CR Δt = obciążenie częściowe / deklarowana wydajność • deklarowana wydajność / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

CR • Δt = obciążenie częściowe / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

$t_{wylot,\ test\ wydajności,\ stały\ przepływ} = t_{wylot,\ średnia}$ + deklarowana wydajność / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$ – obciążenie częściowe / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35} \cdot 5$

$t_{wylot,\ test\ wydajności,\ stały\ przepływ} = t_{wylot,\ średnia} + 5$ / deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7W35}$ • (deklarowana wydajność – obciążenie częściowe)

Zmierzone dane:

$t_{wylot,\ średnia}$	30,00	[°C]
deklarowana wydajność	8,836	[kW]
deklarowana wydajność $_{standardowe\ warunki\ znamionowe\ A7/W35}$	8,140	[kW]
obciążenie częściowe	1,63	[kW]

[Koniec tłumaczenia] ----------

REPERTORIUM NR 664/24

Ja, niżej podpisana Maria Filimon, tłumacz przysięgły języka angielskiego wpisany na listę tłumaczy przysięgłych Ministra Sprawiedliwości pod nr TP/1991/05, zaświadczam zgodność niniejszego tłumaczenia z okazanym dokumentem.

Warszawa, 13 czerwca 2024 r.

REPERTORY NO 664/24

I, the undersigned Maria Filimon, sworn translator of English, registered by the Polish Minister of Justice under No TP/1991/05, certify that this is a true and complete translation of the document presented to me.

Warsaw, June 13, 2024

Tłumaczenie poświadczone z języka angielskiego

[Strona 10 z raportu z testu.] ----------

[znak graficzny]

c) <u>Dane zmierzone i obliczone – przegląd ogólny</u>:

Zmierzone wartości są zgodne z **ČSN EN 12102-1:2023**			TAK	TAK
Zmierzone wartości są zgodne z **ČSN EN ISO 9614-2:1997**			TAK	TAK
Tryb pracy			Ogrzewanie	
Specyfikacja warunku oceny			A7/W55*)	
Typ regulacji wydajności HP			Falownik	
Ustawienia sterowania pompy ciepła / kompresora			Tryb 1	
Ustawienia prędkości wentylatora [obr/min]			Tryb 1	
Próbka testowa			Pompa ciepła powietrze/woda **EUROS ATMO 15** - jednostka zewnętrzna -	Pompa ciepła powietrze/woda **EUROS ATMO 15** - jednostka wewnętrzna -
Data testu (RRRR-MM-DD)			2024-05-02	
Referencyjna temperatura powietrza	t	[°C]	7,0	20,0
Wilgotność względna powietrza	RH	[%]	84,7	37,9
Ciśnienie otoczenia	p_{amb}	[hPa]	979,5	978,5
Ogólny poziom mocy akustycznej (liniowy)	L_W	(dB)	69,1 ± 1,5	44,2 ± 1,5
Ogólny poziom mocy akustycznej skorygowany charakterystyką A	L_{WA}	**[dB(A)]**	**59,8 ±1,5**	**36,2 ±1,5**
Klasa dokładności			**Inżynieria (Stopień 2)**	

**) Uwaga do skróconego oznaczenia: tzn. A7/W55*
A (powietrze), 7 (powietrze wejściowe, temperatura termometru suchego w °C) / W (woda), 55 (temperatura wody na wylocie w °C)

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[Koniec tłumaczenia] ----------

REPERTORIUM NR 663/24

Ja, niżej podpisana Maria Filimon, tłumacz przysięgły języka angielskiego wpisany na listę tłumaczy przysięgłych Ministra Sprawiedliwości pod nr TP/1991/05, zaświadczam zgodność niniejszego tłumaczenia z okazanym dokumentem.

Warszawa, 13 czerwca 2024 r.

REPERTORY NO 663/24

I, the undersigned Maria Filimon, sworn translator of English, registered by the Polish Minister of Justice under No TP/1991/05, certify that this is a true and complete translation of the document presented to me.

Warsaw, June 13, 2024

OŚWIADCZENIE

Producent Euros Energy sp. z o.o. oświadcza, iż pompy ciepła

1) EUROS ATMO 12 OUT + EUROS ATMO 12 IND
Oznaczenie/typ/identyfikator modelu

2) EUROS ATMO 15 OUT + EUROS ATMO 15 IND
Oznaczenie/typ/identyfikator modelu

3) EUROS ATMO 19 OUT + EUROS ATMO 19 IND
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.

Paweł Kwiatkowski
Dyrektor
Działu Rozwoju Produktu

Koperki, 02.07.2024r.
Miejscowość, data

.....
Podpis osoby upoważnionej