Strojírenský zkušební ústav, s.p.
(Engineering Test Institute, Public Enterprise)
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Testing Laboratory 1045.1 accredited by the CAI pursuant to ČSN EN ISO/IEC 17025:2018

L 1045.1

TEST REPORT
39-17853/T

Product:	Outdoor Air/Water Heat pump - monobloc
Type designation:	**EUROS ATMO 7**
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:	2024-10-02
Distribution list:	1 copy to the Customer 1 copy to the Engineering Test Institute

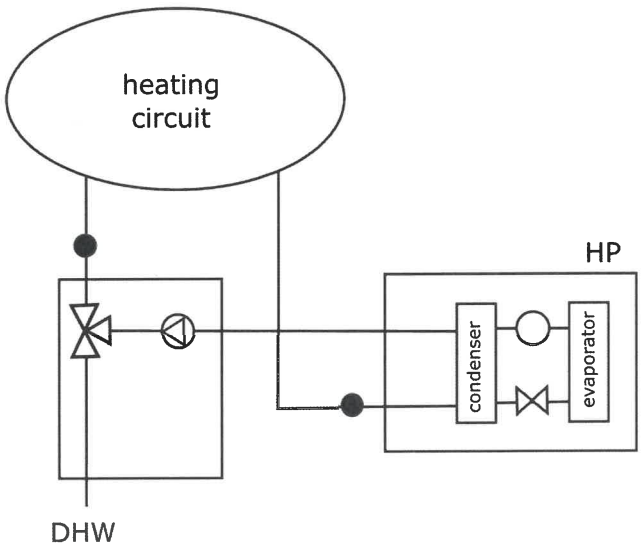
I. Description of product tested

The Heat pump **EUROS ATMO 7** 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 7 OUT** placed outside and indoor hydrobox **EUROS ATMO 7 IN** hanging on inner wall. Outdoor and indoor units are connected by water hoses and electrical wires. Refrigerant R32 is used with charge 0.9 kg. Power supply is a one-phase. Heat pump is able to work in heating and cooling mode. Heat pump is working with fixed flow rate.

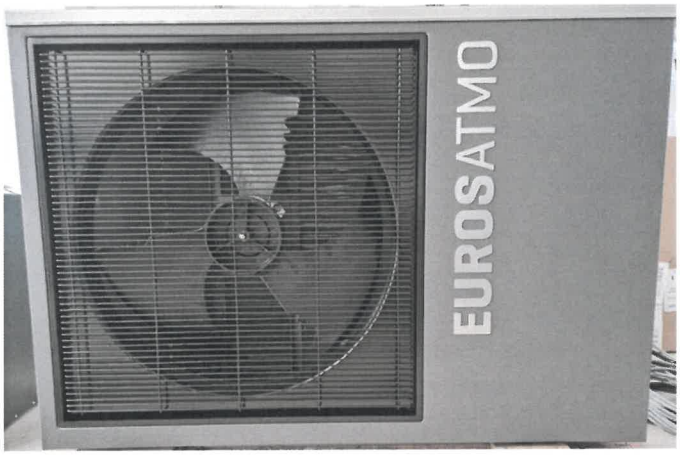
Main components of the outdoor unit **EUROS ATMO 7 OUT**:

Main components of the indoor hydrobox **EUROS ATMO 7 IN:**

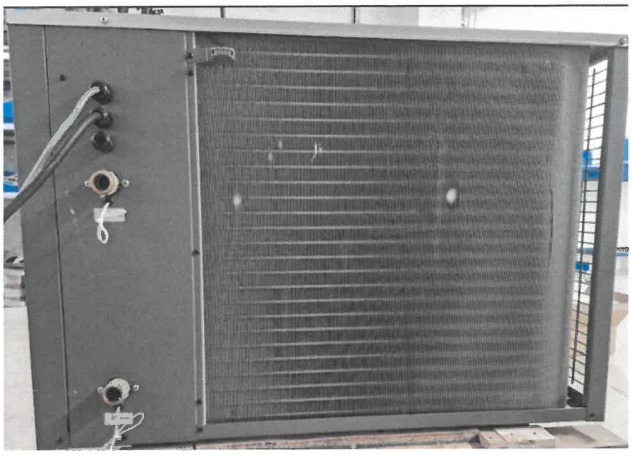
Scheme:



Photodocumentation:



Heat pump **EUROS ATMO 7** – outdoor unit
– Front view –



Heat pump **EUROS ATMO 7** – outdoor unit
– Back view –

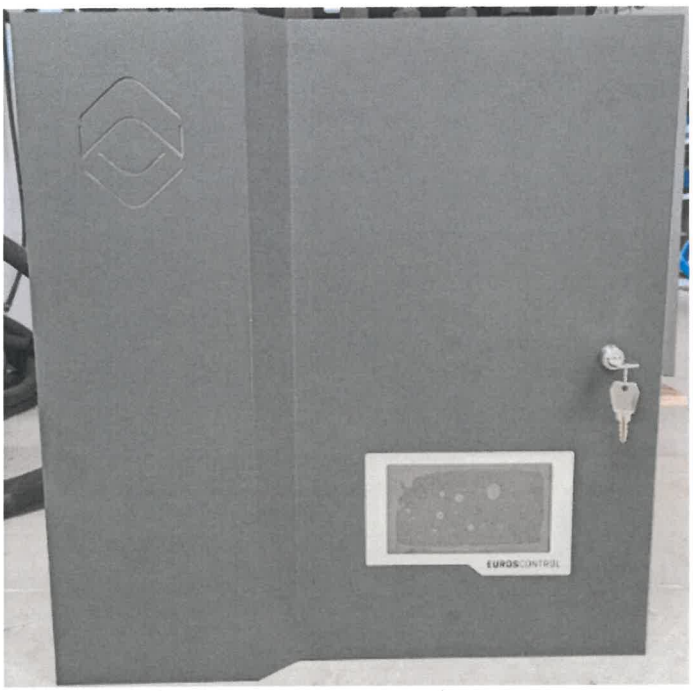
Not recognized

Heat pump **EUROS ATMO 7** – outdoor unit
– Compressor label –

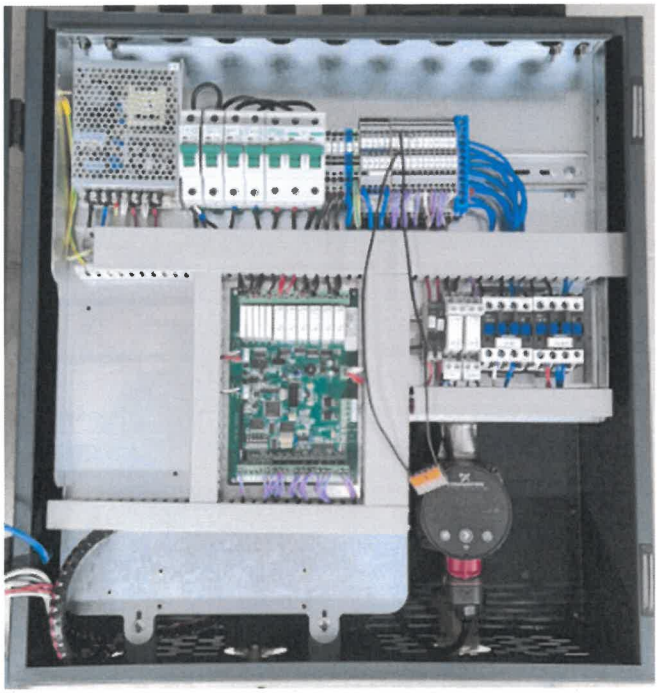
Heat pump **EUROS ATMO 7** – outdoor unit
– Label –

Heat pump **EUROS ATMO 7** – outdoor unit
– Without cover –

Heat pump **EUROS ATMO 7** – indoor hydrobox
– Label –



Heat pump **EUROS ATMO 7** – indoor hydrobox
– With cover –



Heat pump **EUROS ATMO 7** – indoor hydrobox
– Without cover –

II. Sample tested

SZU reg. no.	Product name	Date of submission
1212.24.40352.001	**EUROS ATMO 7**	2024-08-07

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	8.1.2 TECH_K2_V_DN15
4.	Barometer	2.4 MAR18_1_PB
5.	Differential pressure gauge	3.2 MAR18_2_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 ATMO 7**
Measuring equipment used:	see Chapter III

Specification of the assessment condition		**A7/W35***	**A7/W55**
Date of testing		**2024-08-19**	**2024-08-20**
Transient test procedure	YES / NO	NO	NO
Average defrost time of 1 cycle	[min]	–	–
Average time of 1 cycle	[min]	–	–
Calculation time	[min]	70.0	70.0
Output heating water – temperature calculation	[°C]	34.91	55.04
Input heating water – temperature calculation	[°C]	29.92	46.98
Output heating water temperature	[°C]	34.91	55.04
Input heating water temperature	[°C]	29.92	46.98
Air temperature – dry bulb temperature	[°C]	7.00	7.00
Air temperature – wet bulb temperature	[°C]	6.00	6.01
Relative humidity	[%]	86.98	86.99
Barometric pressure	[kPa]	98.309	98.466
Ambient temperature	[°C]	6.92	6.93
Secondary circuit pressure difference	[kPa]	33.259	36.327
Efficiency of the secondary liquid pump	[–]	0.185	0.155
Volume flow rate of heating water	$[m^3 \cdot h^{-1}]$	0.6232	0.3326
Density of heating water	$[kg \cdot m^{-3}]$	994.1	986.5
Specific heat capacity of heating water	$[kJ \cdot kg^{-1} \cdot K^{-1}]$	4.175	4.179
Voltage	[V]	232.31	231.74
Total current	[A]	3.53	4.97
Overall power input	[kW]	0.754	1.119
Capacity correction of sec. liquid pump	[W]	25.350	18.243
Power input correction of sec. liquid pump	[W]	31.10	21.60
Heating capacity – heating water	[kW]	3.585	3.079
Corrected heating capacity – heating water	**[kW]**	**3.560**	**3.061**
Uncertainty of corrected heating capacity	[kW]	± 0.062	± 0.034
Effective electric power input	**[kW]**	**0.723**	**1.098**
COP	**[–]**	**4.925**	**2.788**
Uncertainty of COP	[–]	± 0.090	± 0.032
Control settings	**[–]**	**4**	**4**
Circulation pump settings – heating water	[–]	3	3

*This condition was measured as a steady state condition even though an oil recovery occured.

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 ATMO 7**
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		**189.8**	%
		Warmer	η_s		–	%
		Colder	η_s		–	%
Seasonal efficiency according to ČSN EN 14825:2023	Heating	Average	**SCOP**		**4.82**	–
		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	$P_{designh}$		**5.22**	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}		2238	kWh
		Warmer	Q_{HE}		–	kWh
		Colder	Q_{HE}		–	kWh
Modes other than „active mode“	Off mode			P_{OFF}	13.8	W
	Thermostat off mode			P_{TO}	13.9	W
	Standby mode			P_{SB}	13.8	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}	0.0139	[kW]
P_{SB}	0.0138	[kW]
P_{CK}	0.0000	[kW]
P_{OFF}	0.0138	[kW]
$P_{designh}$	5.22	[kW]
$SCOP_{ON}$	4.83	[–]

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]

$Q_H = 5.22 \cdot 2066 = 10790$ [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]

$Q_{HE} = 10790 / 4.83 + 178 \cdot 0.0139 + 0 \cdot 0.0138 + 178 \cdot 0 + 0 \cdot 0.0138 = 2238$ [kWh]

7.2 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [–]

$SCOP = 10790 / 2238 = 4.82$ [–]

7.1 Calculation of the seasonal space heating efficiency η_s

$\Sigma F(i) = F(1) + F(2)$ [–]

$\Sigma F = 0.03 + 0 = 0.03$ [–]

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

$\eta_s / A = (1 / 2.5) * 4.82 - 0.03 =$ **1.898** [–]

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/W28.05**
Date of testing		**2024-08-20**	**2024-08-22**	**2024-08-23**
Transient test procedure	YES / NO	NO	NO	NO
Average defrost time of 1 cycle	[min]	–	–	–
Average time of 1 cycle	[min]	–	–	–
Calculation time	[min]	70.0	70.0	70.0
Output heating water – temperature calculation	[°C]	33.96	30.00	27.97
Input heating water – temperature calculation	[°C]	27.49	25.94	24.38
Output heating water temperature	[°C]	33.96	30.00	27.97
Input heating water temperature	[°C]	27.49	25.94	24.38
Air temperature – dry bulb temperature	[°C]	-7.00	2.00	7.00
Air temperature – wet bulb temperature	[°C]	-8.00	1.01	6.01
Relative humidity	[%]	74.99	84.04	86.99
Barometric pressure	[kPa]	98.139	98.364	98.304
Ambient temperature	[°C]	-7.07	1.92	6.96
Secondary circuit pressure difference	[kPa]	30.487	32.102	32.638
Efficiency of the secondary liquid pump	[–]	0.199	0.183	0.184
Volume flow rate of heating water	$[m^3 \cdot h^{-1}]$	0.6230	0.6230	0.6230
Density of heating water	$[kg \cdot m^{-3}]$	994.4	995.6	996.2
Specific heat capacity of heating water	$[kJ \cdot kg^{-1} \cdot K^{-1}]$	4.175	4.176	4.177
Voltage	[V]	232.65	232.17	232.37
Total current	[A]	6.88	2.98	2.24
Overall power input	[kW]	1.591	0.624	0.439
Capacity correction of sec. liquid pump	[W]	24.158	24.869	25.098
Power input correction of sec. liquid pump	[W]	29.43	30.42	30.75
Heating capacity – heating water	[kW]	4.644	2.917	2.577
Corrected heating capacity – heating water	**[kW]**	**4.620**	**2.892**	**2.552**
Uncertainty of corrected heating capacity	[kW]	± 0.071	± 0.066	± 0.065
Effective electric power input	**[kW]**	**1.562**	**0.594**	**0.408**
COP	**[–]**	**2.958**	**4.869**	**6.251**
Uncertainty of COP	[–]	± 0.048	± 0.131	± 0.208
Control settings	**[–]**	**10**	**3**	**1**
Circulation pump settings – heating water	[–]	**3**	**3**	**3**

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/W26.93**	**A-10/W35**
Date of testing		**2024-08-22**	**2024-08-21**
Transient test procedure	YES / NO	NO	NO
Average defrost time of 1 cycle	[min]	–	–
Average time of 1 cycle	[min]	–	–
Calculation time	[min]	70.0	70.0
Output heating water – temperature calculation	[°C]	26.94	34.96
Input heating water – temperature calculation	[°C]	22.88	29.02
Output heating water temperature	[°C]	26.94	34.96
Input heating water temperature	[°C]	22.88	29.02
Air temperature – dry bulb temperature	[°C]	12.00	-10.00
Air temperature – wet bulb temperature	[°C]	11.00	-10.98
Relative humidity	[%]	88.99	70.49
Barometric pressure	[kPa]	98.635	98.353
Ambient temperature	[°C]	11.92	-10.07
Secondary circuit pressure difference	[kPa]	32.496	31.548
Efficiency of the secondary liquid pump	[–]	0.183	0.199
Volume flow rate of heating water	$[m^3 \cdot h^{-1}]$	0.6230	0.6230
Density of heating water	$[kg \cdot m^{-3}]$	996.4	994.1
Specific heat capacity of heating water	$[kJ \cdot kg^{-1} \cdot K^{-1}]$	4.177	4.175
Voltage	[V]	230.09	232.45
Total current	[A]	2.09	6.78
Overall power input	[kW]	0.405	1.572
Capacity correction of sec. liquid pump	[W]	25.038	24.629
Power input correction of sec. liquid pump	[W]	30.66	30.09
Heating capacity – heating water	[kW]	2.917	4.257
Corrected heating capacity – heating water	**[kW]**	**2.892**	**4.232**
Uncertainty of corrected heating capacity	[kW]	± 0.066	± 0.070
Effective electric power input	**[kW]**	**0.375**	**1.542**
COP	**[–]**	**7.719**	**2.745**
Uncertainty of COP	[–]	± 0.251	± 0.047
Control settings	**[–]**	**1**	**10**
Circulation pump settings – heating water	[–]	**3**	**3**

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	4.62	4.620	2.958	0.900	1.00	2.958	–
B	2	30.00	53.85	2.81	2.892	4.869	0.900	1.00	4.869	–
C	7	28.05	34.62	1.81	2.552	6.251	0.966	0.71	6.165	0.0139
D	12	26.93	15.38	0.80	2.892	7.719	0.963	0.28	7.040	0.0139
TOL (E)	-10	35.00	100.00	5.22	4.232	2.745	0.900	1.00	2.745	–
Tbiv (F)	-7	34.00	88.46	4.62	4.620	2.958	0.900	1.00	2.958	–

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	2.892	[kW]
Declared capacity $_{standard\ rating\ condition\ A7/W35}$	3.560	[kW]
Part load	0.80	[kW]

Calculation of water temperature

$t_{outlet,\ capacity\ test,\ fixed\ flow} = 24 + 5 / 3.56 \cdot (2.892 - 0.8) = \mathbf{26.93}$ [°C]

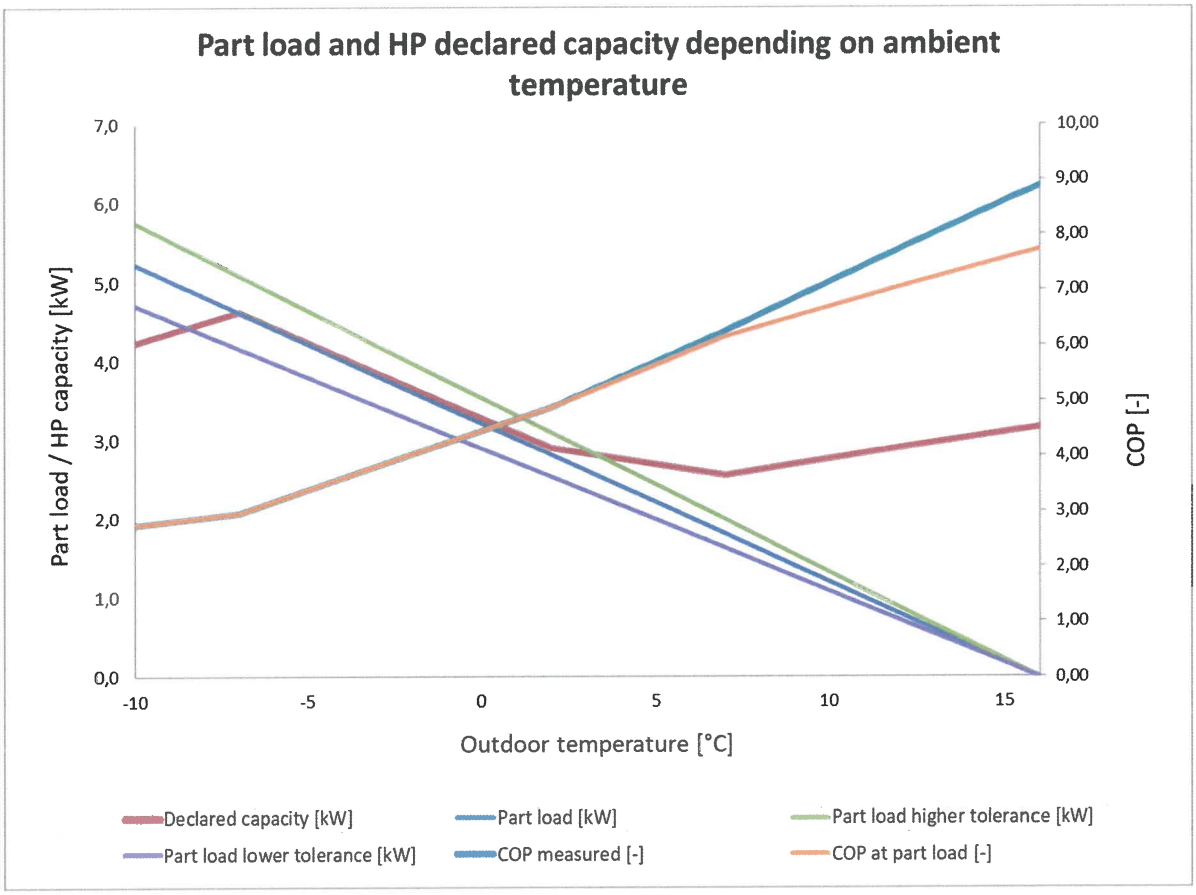
Calculation SCOP, $SCOP_{on}$, $SCOP_{net}$

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

	Bin j [–]	Outdoor temp. (dry bulb) Tj [°C]	Hours hj [h]	Part load ratio [%]	Heat load Ph(Tj) [kW]	Capacity of HP [kW]	Heat load covered by heat pump [kW]	Resistive heat elbu (Tj) elbu(Tj) [kW]	Annual resistive heat hj x elbu(Tj) [kWh]	COPbin (Tj) COPbin (Tj) [–]	Annual heating demand hj x P h(Tj) [kWh]	Annual power input including electric back up heating [kWh]	Net annual heating capacity hj × (P h(Tj) - elbu(Tj)) [kWh]	Net annual power input without electric back up heating [kWh]
TOL(E)	**21**	**-10**	**1**	**100.00**	**5.22**	**4.23**	**4.23**	**0.99**	**0.99**	**2.75**	**5**	**3**	**4**	**2**
	22	-9	25	96.15	5.02	4.36	4.36	0.66	16.51	2.82	126	55	109	39
	23	-8	23	92.31	4.82	4.49	4.49	0.33	7.59	2.89	111	43	103	36
A, Tbiv(F)	**24**	**-7**	**24**	**88.46**	**4.62**	**4.62**	**4.62**	**0.00**	**0.00**	**2.96**	**111**	**37**	**111**	**37**
	25	-6	27	84.62	4.42	4.43	4.42	0.00	0.00	3.17	119	38	119	38
	26	-5	68	80.77	4.22	4.24	4.22	0.00	0.00	3.38	287	85	287	85
	27	-4	91	76.92	4.02	4.04	4.02	0.00	0.00	3.60	366	102	366	102
	28	-3	89	73.08	3.82	3.85	3.82	0.00	0.00	3.81	340	89	340	89
	29	-2	165	69.23	3.62	3.66	3.62	0.00	0.00	4.02	597	148	597	148
	30	-1	173	65.38	3.41	3.47	3.41	0.00	0.00	4.23	591	140	591	140
	31	0	240	61.54	3.21	3.28	3.21	0.00	0.00	4.44	771	174	771	174
	32	1	280	57.69	3.01	3.08	3.01	0.00	0.00	4.66	844	181	844	181
B	**33**	**2**	**320**	**53.85**	**2.81**	**2.89**	**2.81**	**0.00**	**0.00**	**4.87**	**900**	**185**	**900**	**185**
	34	3	357	50.00	2.61	2.82	2.61	0.00	0.00	5.13	932	182	932	182
	35	4	356	46.15	2.41	2.76	2.41	0.00	0.00	5.39	858	159	858	159
	36	5	303	42.31	2.21	2.69	2.21	0.00	0.00	5.65	669	119	669	119
	37	6	330	38.46	2.01	2.62	2.01	0.00	0.00	5.91	663	112	663	112
C	**38**	**7**	**326**	**34.62**	**1.81**	**2.55**	**1.81**	**0.00**	**0.00**	**6.16**	**589**	**96**	**589**	**96**
	39	8	348	30.77	1.61	2.62	1.61	0.00	0.00	6.34	559	88	559	88
	40	9	335	26.92	1.41	2.69	1.41	0.00	0.00	6.51	471	72	471	72
	41	10	315	23.08	1.21	2.76	1.21	0.00	0.00	6.69	380	57	380	57
	42	11	215	19.23	1.00	2.82	1.00	0.00	0.00	6.86	216	31	216	31
D	**43**	**12**	**169**	**15.38**	**0.80**	**2.89**	**0.80**	**0.00**	**0.00**	**7.04**	**136**	**19**	**136**	**19**
	44	13	151	11.54	0.60	2.96	0.60	0.00	0.00	7.22	91	13	91	13
	45	14	105	7.69	0.40	3.03	0.40	0.00	0.00	7.39	42	6	42	6
	46	15	74	3.85	0.20	3.10	0.20	0.00	0.00	7.57	15	2	15	2
		Σ	4910							Σ	10788	2235	10763	2210

SCOPon	4.83	SCOPnet	4.87
		SCOP	**4.82**

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 ATMO 7**
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		**<u>131.4</u>**	%	
		Warmer	η_s		–	%	
		Colder	η_s		–	%	
Seasonal efficiency according to ČSN EN 14825:2023	Heating	Average	**SCOP**		**<u>3.36</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>4.81</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}		2957	kWh	
		Warmer	Q_{HE}		–	kWh	
		Colder	Q_{HE}		–	kWh	
Modes other than „active mode“	Off mode			P_{OFF}	13.8	W	
	Thermostat off mode			P_{TO}	13.9	W	
	Standby mode			P_{SB}	13.8	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}	0.0139	[kW]
P_{SB}	0.0138	[kW]
P_{CK}	0.0000	[kW]
P_{OFF}	0.0138	[kW]
$P_{designh}$	4.81	[kW]
$SCOP_{ON}$	3.36	[–]

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]

$Q_H = 4.81 \cdot 2066 = 9937$ [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]

$Q_{HE} = 9937 / 3.36 + 178 \cdot 0.0139 + 0 \cdot 0.0138 + 178 \cdot 0 + 0 \cdot 0.0138 = 2957$ [kWh]

7.2 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [–]

$SCOP = 9937 / 2957 = 3.36$ [–]

7.1 Calculation of the seasonal space heating efficiency η_s

$\Sigma F(i) = F(1) + F(2)$ [–]

$\Sigma F = 0.03 + 0 = 0.03$ [–]

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

$\eta_s / A = (1 / 2.5) * 3.36 – 0.03 =$ **1.314** [–]

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**	**A7/W37.84**
Date of testing		**2024-08-20**	**2024-08-22**	**2024-08-23**
Transient test procedure	YES / NO	NO	NO	NO
Average defrost time of 1 cycle	[min]	–	–	–
Average time of 1 cycle	[min]	–	–	–
Calculation time	[min]	70.0	70.0	70.0
Output heating water – temperature calculation	[°C]	51.81	42.04	37.88
Input heating water – temperature calculation	[°C]	40.36	35.07	31.64
Output heating water temperature	[°C]	51.81	42.04	37.88
Input heating water temperature	[°C]	40.36	35.07	31.64
Air temperature – dry bulb temperature	[°C]	-7.00	2.00	7.00
Air temperature – wet bulb temperature	[°C]	-7.97	1.01	6.02
Relative humidity	[%]	75.70	83.97	87.14
Barometric pressure	[kPa]	98.395	98.316	98.390
Ambient temperature	[°C]	-7.08	1.93	6.94
Secondary circuit pressure difference	[kPa]	30.977	36.837	35.953
Efficiency of the secondary liquid pump	[–]	0.148	0.156	0.155
Volume flow rate of heating water	$[m^3 \cdot h^{-1}]$	0.3312	0.3320	0.3320
Density of heating water	$[kg \cdot m^{-3}]$	988.1	991.8	993.3
Specific heat capacity of heating water	$[kJ \cdot kg^{-1} \cdot K^{-1}]$	4.178	4.175	4.175
Voltage	[V]	232.40	231.77	232.69
Total current	[A]	9.28	3.68	2.74
Overall power input	[kW]	2.152	0.798	0.563
Capacity correction of sec. liquid pump	[W]	15.981	18.393	18.094
Power input correction of sec. liquid pump	[W]	18.77	21.79	21.41
Heating capacity – heating water	[kW]	4.271	2.664	2.388
Corrected heating capacity – heating water	**[kW]**	**4.255**	**2.646**	**2.370**
Uncertainty of corrected heating capacity	[kW]	± 0.035	± 0.039	± 0.038
Effective electric power input	**[kW]**	**2.133**	**0.777**	**0.541**
COP	**[–]**	**1.995**	**3.407**	**4.377**
Uncertainty of COP	[–]	± 0.017	± 0.054	± 0.079
Control settings	**[–]**	**10**	**3**	**1**
Circulation pump settings – heating water	[–]	3	3	3

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/W35.36**	**A-10/W55**
Date of testing		**2024-08-22**	**2024-08-21**
Transient test procedure	YES / NO	NO	NO
Average defrost time of 1 cycle	[min]	–	–
Average time of 1 cycle	[min]	–	–
Calculation time	[min]	70.0	70.0
Output heating water – temperature calculation	[°C]	35.33	55.09
Input heating water – temperature calculation	[°C]	27.98	45.28
Output heating water temperature	[°C]	35.33	55.09
Input heating water temperature	[°C]	27.98	45.28
Air temperature – dry bulb temperature	[°C]	12.00	-10.00
Air temperature – wet bulb temperature	[°C]	11.00	-10.84
Relative humidity	[%]	88.98	74.53
Barometric pressure	[kPa]	98.509	98.194
Ambient temperature	[°C]	11.92	-10.07
Secondary circuit pressure difference	[kPa]	36.874	34.491
Efficiency of the secondary liquid pump	[–]	0.156	0.153
Volume flow rate of heating water	$[m^3 \cdot h^{-1}]$	0.3320	0.3320
Density of heating water	$[kg \cdot m^{-3}]$	994.1	986.6
Specific heat capacity of heating water	$[kJ \cdot kg^{-1} \cdot K^{-1}]$	4.175	4.179
Voltage	[V]	231.85	232.45
Total current	[A]	2.54	9.69
Overall power input	[kW]	0.513	2.241
Capacity correction of sec. liquid pump	[W]	18.405	17.505
Power input correction of sec. liquid pump	[W]	21.81	20.69
Heating capacity – heating water	[kW]	2.807	3.745
Corrected heating capacity – heating water	**[kW]**	**2.789**	**3.727**
Uncertainty of corrected heating capacity	[kW]	± 0.039	± 0.043
Effective electric power input	**[kW]**	**0.491**	**2.220**
COP	**[–]**	**5.680**	**1.679**
Uncertainty of COP	[–]	± 0.097	± 0.020
Control settings	**[–]**	**1**	**10**
Circulation pump settings – heating water	[–]	3	3

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	4.26	4.255	1.955	0.900	1.00	1.955	–
B	2	42.00	53.85	2.59	2.646	3.407	0.900	1.00	3.407	–
C	7	37.84	34.62	1.67	2.370	4.377	0.974	0.70	4.330	0.0139
D	12	35.36	15.38	0.74	2.789	5.680	0.972	0.27	5.267	0.0139
TOL (E)	-10	55.00	100.00	4.81	3.727	1.679	0.900	1.00	1.679	–
Tbiv (F)	-7	52.00	88.46	4.26	4.255	1.955	0.900	1.00	1.955	–

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$_{standard\ rating\ conditions\ A7W55}$ · (Declared capacity - Part load)

Measured data:

$t_{outlet,\,average}$	30.00	[°C]
Declared capacity	2.789	[kW]
Declared capacity $_{standard\ rating\ condition\ A7/W55}$	3.061	[kW]
Part load	0.74	[kW]

Calculation of water temperature

$t_{outlet,\ capacity\ test,\ fixed\ flow} = 30 + 8 / 3.061 \cdot (2.789 - 0.74) = \mathbf{35.36}$ [°C]

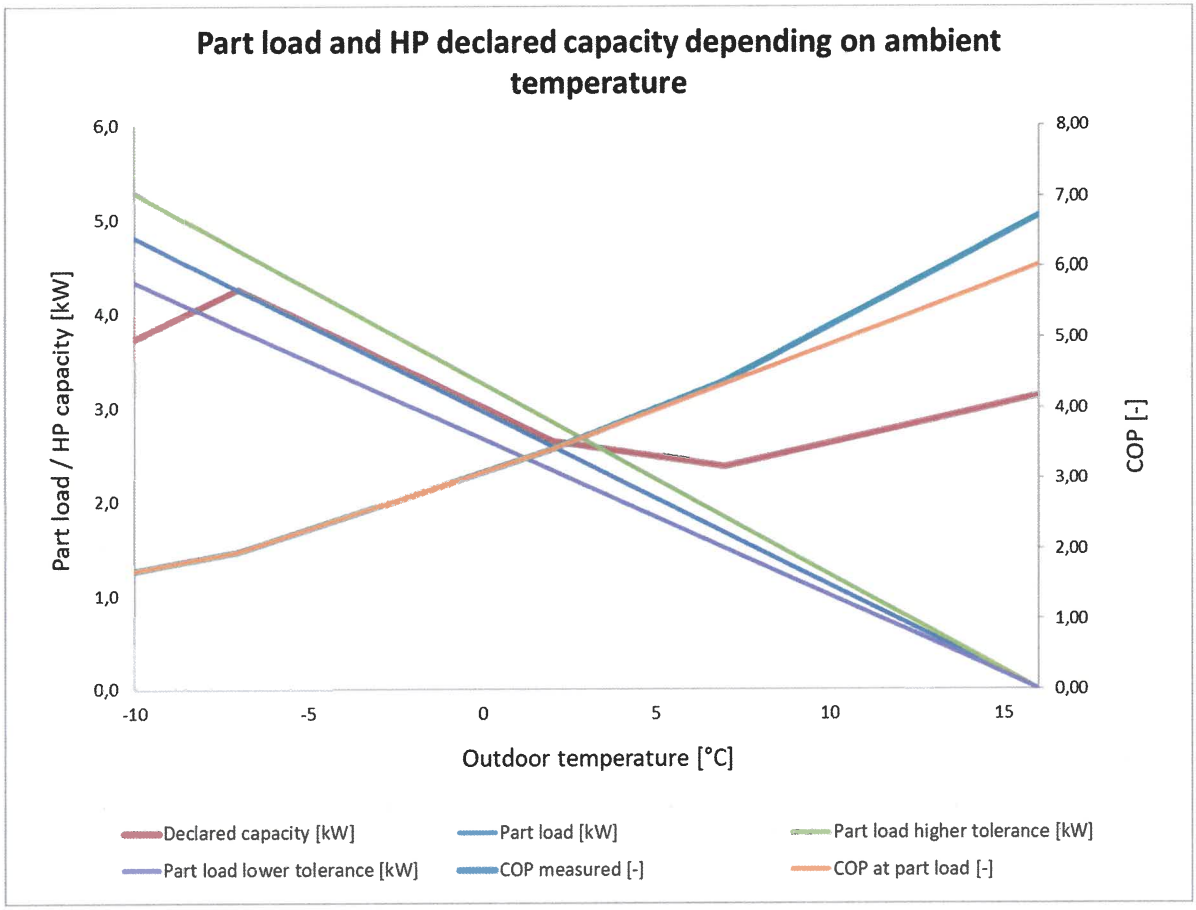
Calculation SCOP, $SCOP_{on}$, $SCOP_{net}$

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

	Bin j [–]	Outdoor temp. (dry bulb) Tj [°C]	Hours hj [h]	Part load ratio [%]	Heat load Ph(Tj) [kW]	Capacity of HP [kW]	Heat load covered by heat pump [kW]	Resistive heat elbu (Tj) elbu(Tj) [kW]	Annual resistive heat hj x elbu(Tj) [kWh]	COPbin (Tj) COPbin (Tj) [–]	Annual heating demand hj x P h(Tj) [kWh]	Annual power input including electric back up heating [kWh]	Net annual heating capacity hj x (P h(Tj) - elbu(Tj)) [kWh]	Net annual power input without electric back up heating [kWh]
TOL(E)	**21**	**-10**	**1**	**100.00**	**4.81**	**3.73**	**3.73**	**1.08**	**1.08**	**1.68**	**5**	**3**	**4**	**2**
	22	-9	25	96.15	4.63	3.90	3.90	0.72	18.05	1.77	116	73	98	55
	23	-8	23	92.31	4.44	4.08	4.08	0.36	8.30	1.86	102	59	94	50
A, Tbiv(F)	**24**	**-7**	**24**	**88.46**	**4.26**	**4.26**	**4.26**	**0.00**	**0.00**	**1.96**	**102**	**52**	**102**	**52**
	25	-6	27	84.62	4.07	4.08	4.07	0.00	0.00	2.12	110	52	110	52
	26	-5	68	80.77	3.89	3.90	3.89	0.00	0.00	2.28	264	116	264	116
	27	-4	91	76.92	3.70	3.72	3.70	0.00	0.00	2.44	337	138	337	138
	28	-3	89	73.08	3.52	3.54	3.52	0.00	0.00	2.60	313	120	313	120
	29	-2	165	69.23	3.33	3.36	3.33	0.00	0.00	2.76	549	199	549	199
	30	-1	173	65.38	3.15	3.18	3.15	0.00	0.00	2.92	544	186	544	186
	31	0	240	61.54	2.96	3.00	2.96	0.00	0.00	3.08	710	230	710	230
	32	1	280	57.69	2.78	2.82	2.78	0.00	0.00	3.25	777	239	777	239
B	**33**	**2**	**320**	**53.85**	**2.59**	**2.65**	**2.59**	**0.00**	**0.00**	**3.41**	**829**	**243**	**829**	**243**
	34	3	357	50.00	2.41	2.59	2.41	0.00	0.00	3.59	859	239	859	239
	35	4	356	46.15	2.22	2.54	2.22	0.00	0.00	3.78	790	209	790	209
	36	5	303	42.31	2.04	2.48	2.04	0.00	0.00	3.96	617	156	617	156
	37	6	330	38.46	1.85	2.43	1.85	0.00	0.00	4.15	611	147	611	147
C	**38**	**7**	**326**	**34.62**	**1.67**	**2.37**	**1.67**	**0.00**	**0.00**	**4.33**	**543**	**125**	**543**	**125**
	39	8	348	30.77	1.48	2.45	1.48	0.00	0.00	4.52	515	114	515	114
	40	9	335	26.92	1.30	2.54	1.30	0.00	0.00	4.70	434	92	434	92
	41	10	315	23.08	1.11	2.62	1.11	0.00	0.00	4.89	350	71	350	71
	42	11	215	19.23	0.93	2.71	0.93	0.00	0.00	5.08	199	39	199	39
D	**43**	**12**	**169**	**15.38**	**0.74**	**2.79**	**0.74**	**0.00**	**0.00**	**5.27**	**125**	**24**	**125**	**24**
	44	13	151	11.54	0.56	2.87	0.56	0.00	0.00	5.45	84	15	84	15
	45	14	105	7.69	0.37	2.96	0.37	0.00	0.00	5.64	39	7	39	7
	46	15	74	3.85	0.19	3.04	0.19	0.00	0.00	5.83	14	2	14	2
		Σ	4910							Σ	9936	2954	9908	2926

SCOPon	3.36	SCOPnet	3.39
		SCOP	**3.36**

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

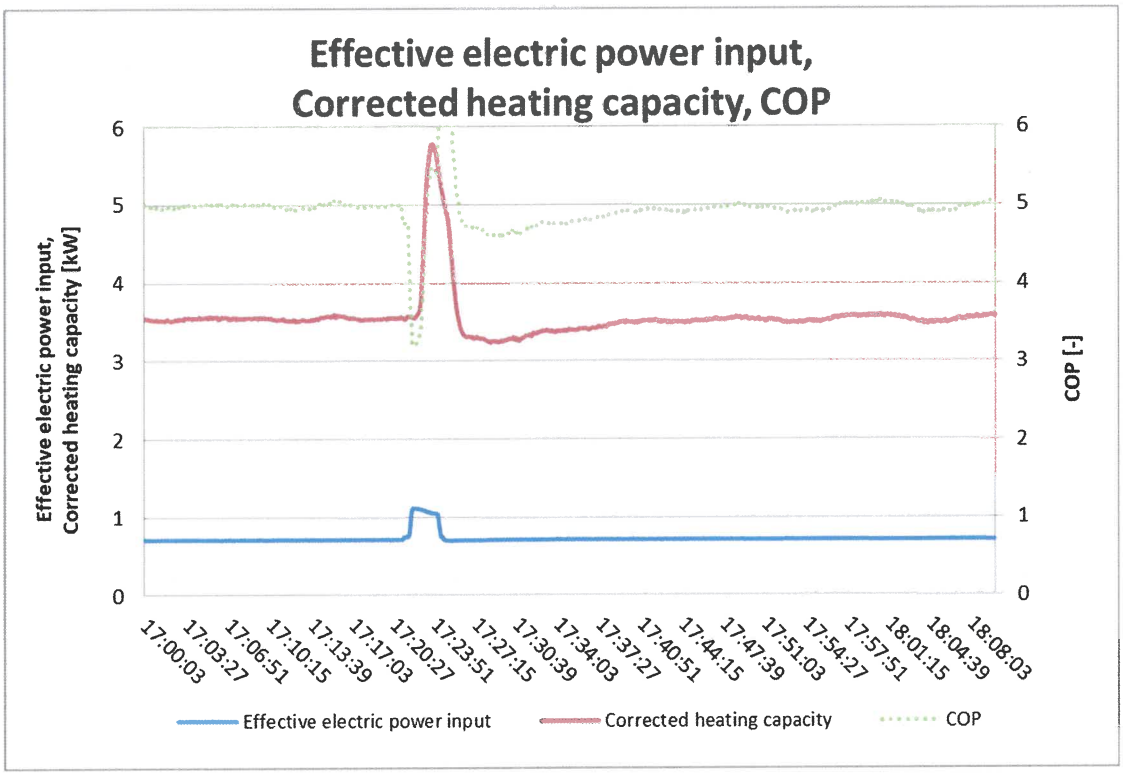


Tested by:	Ing Tomáš Sedláček	Date:	2024-10-02	Signed:	
Reviewed and approved by:	Ing. Michal Faltýnek	Date:	2024-10-02	Signed:	

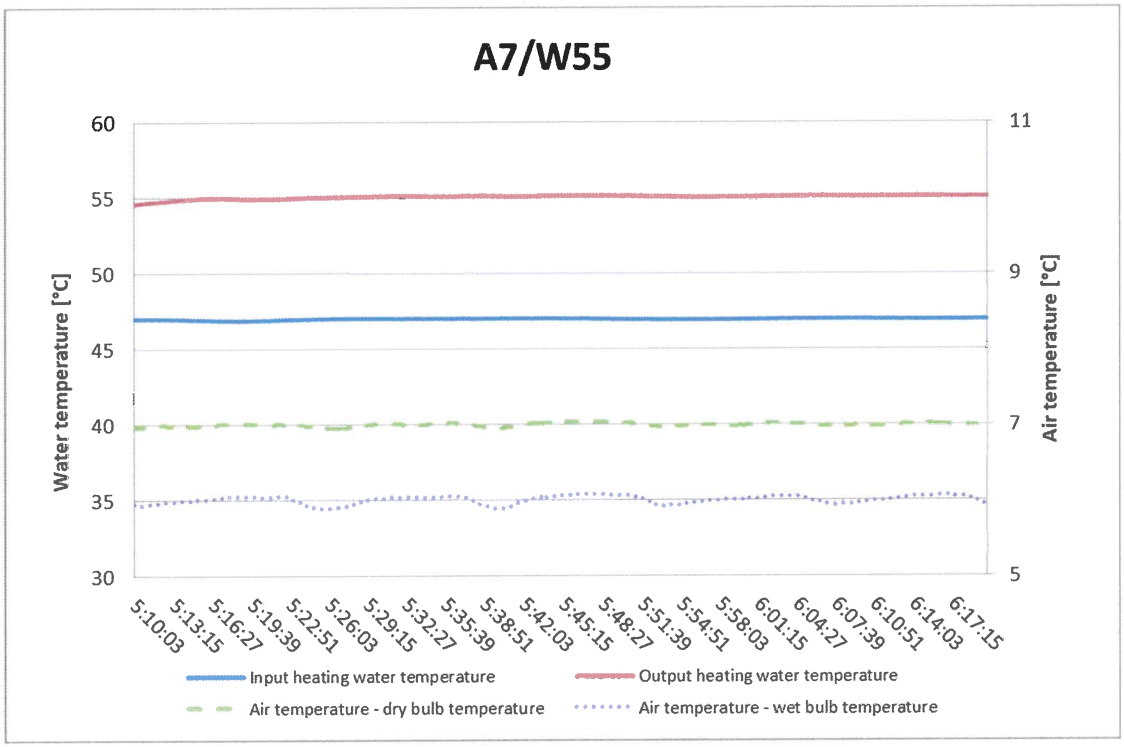
V. Graphs

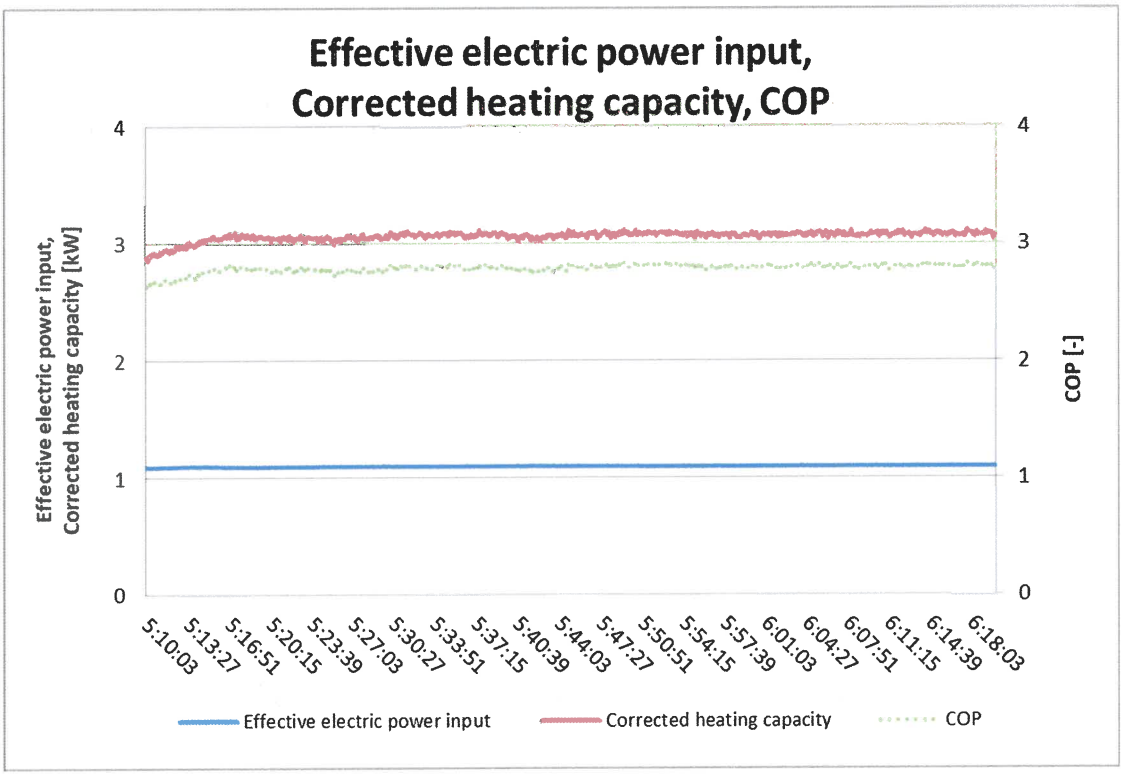
1. Rating conditions

A7/W35 (Control settings: 4)



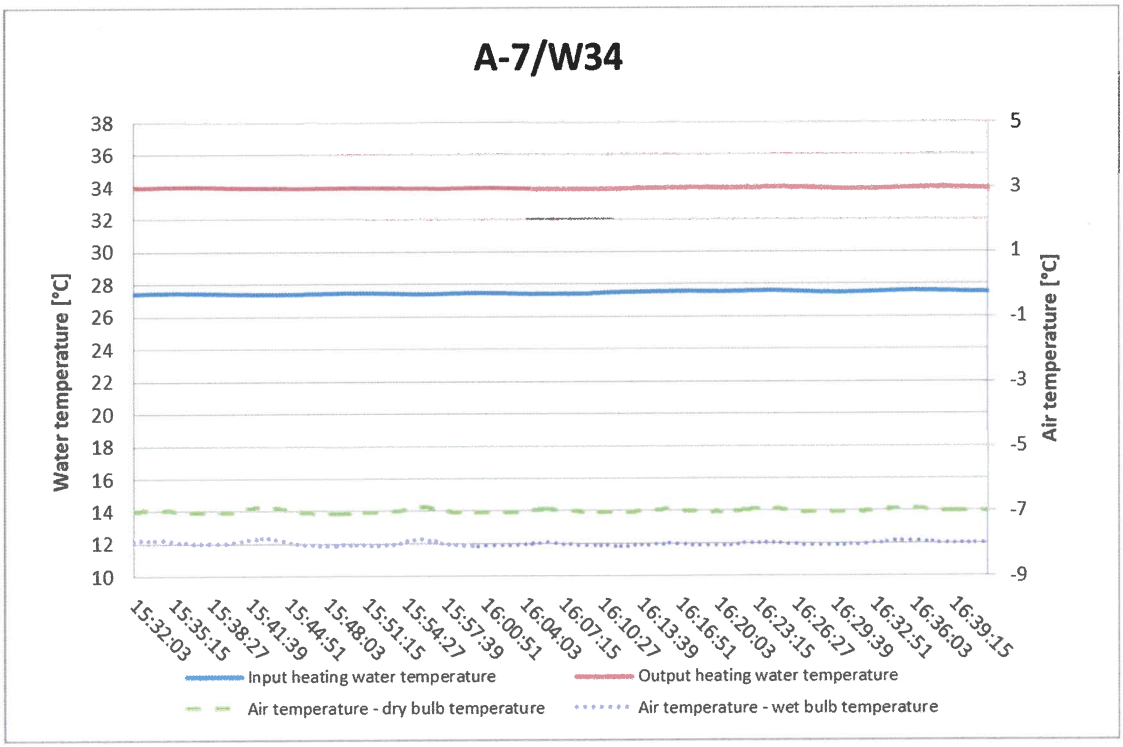
A7/W55 (Control settings: 4)

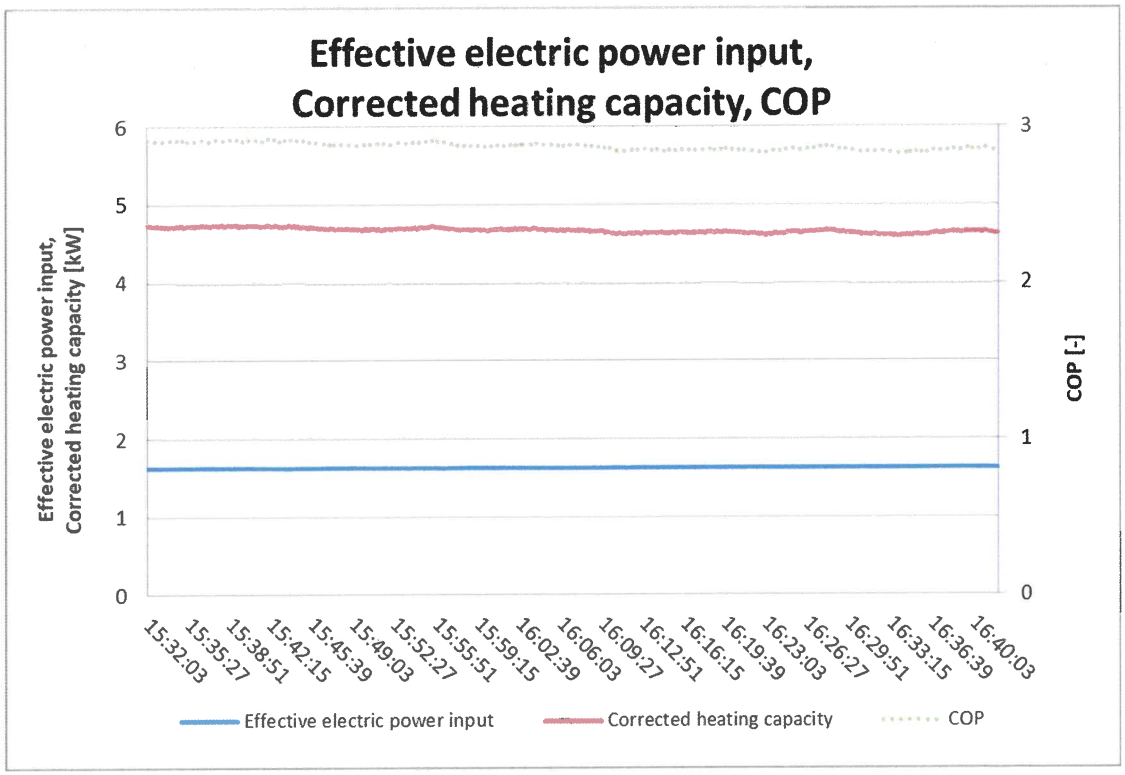




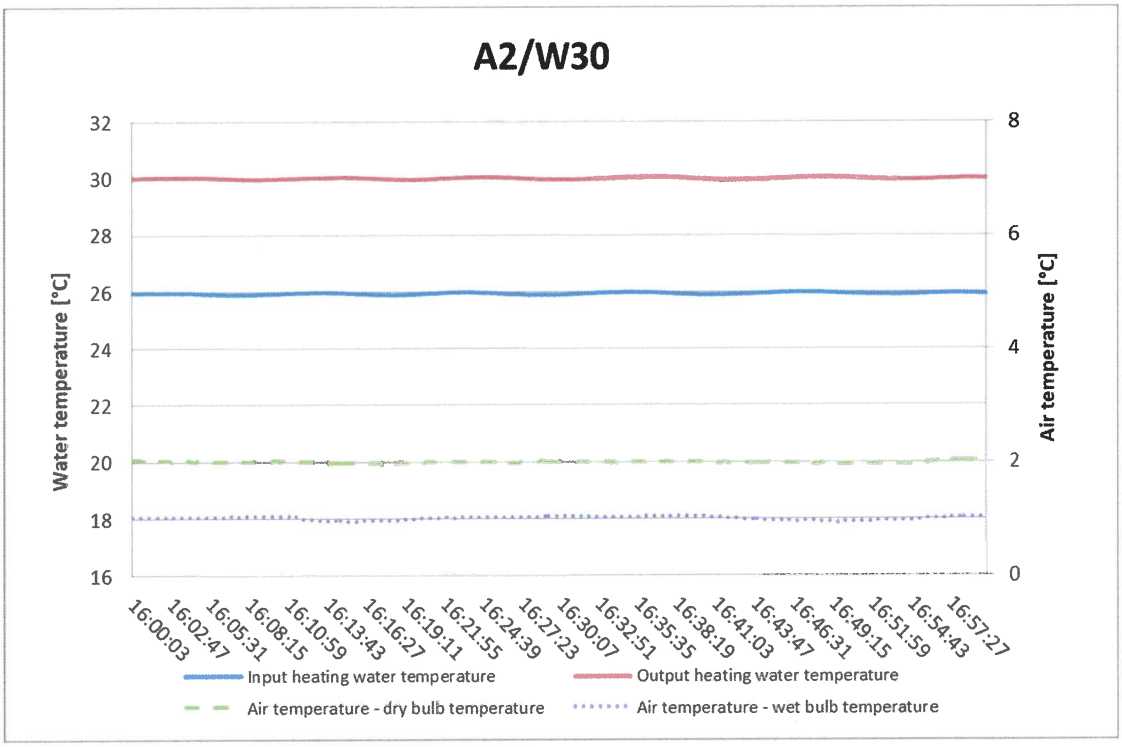
2. Seasonal performance tests and SCOP calculation – Low temperature application

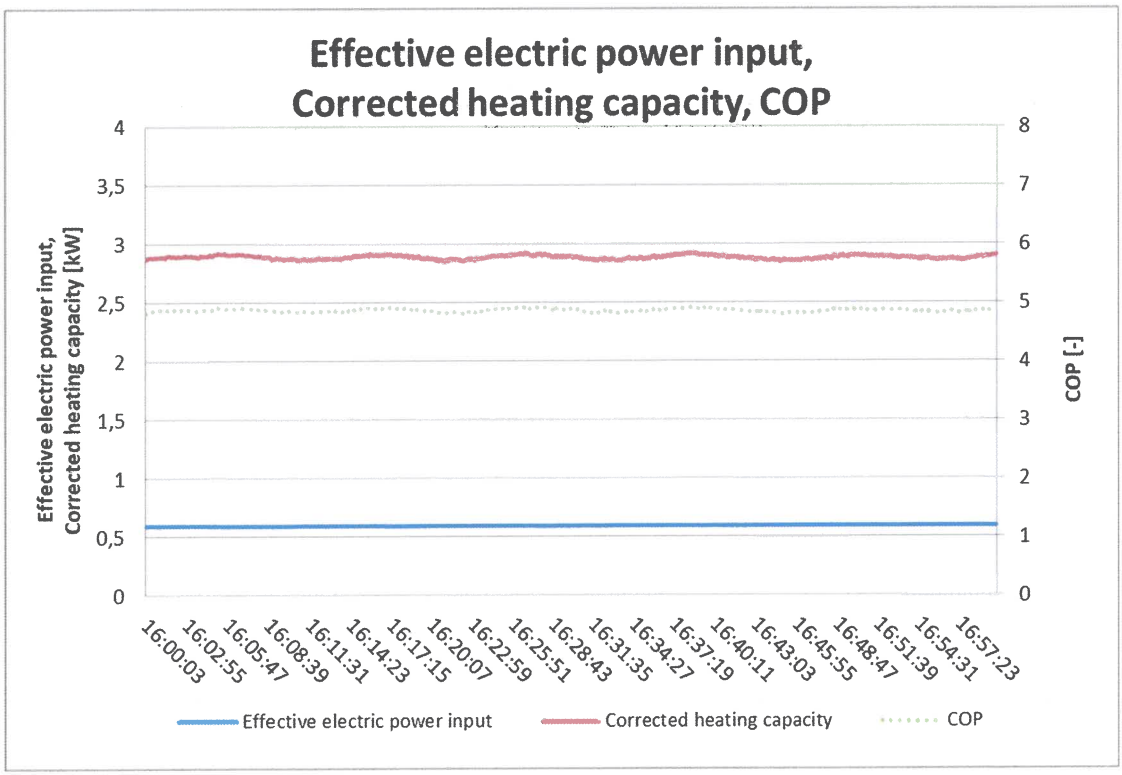
A-7W34 (Control settings: 10)



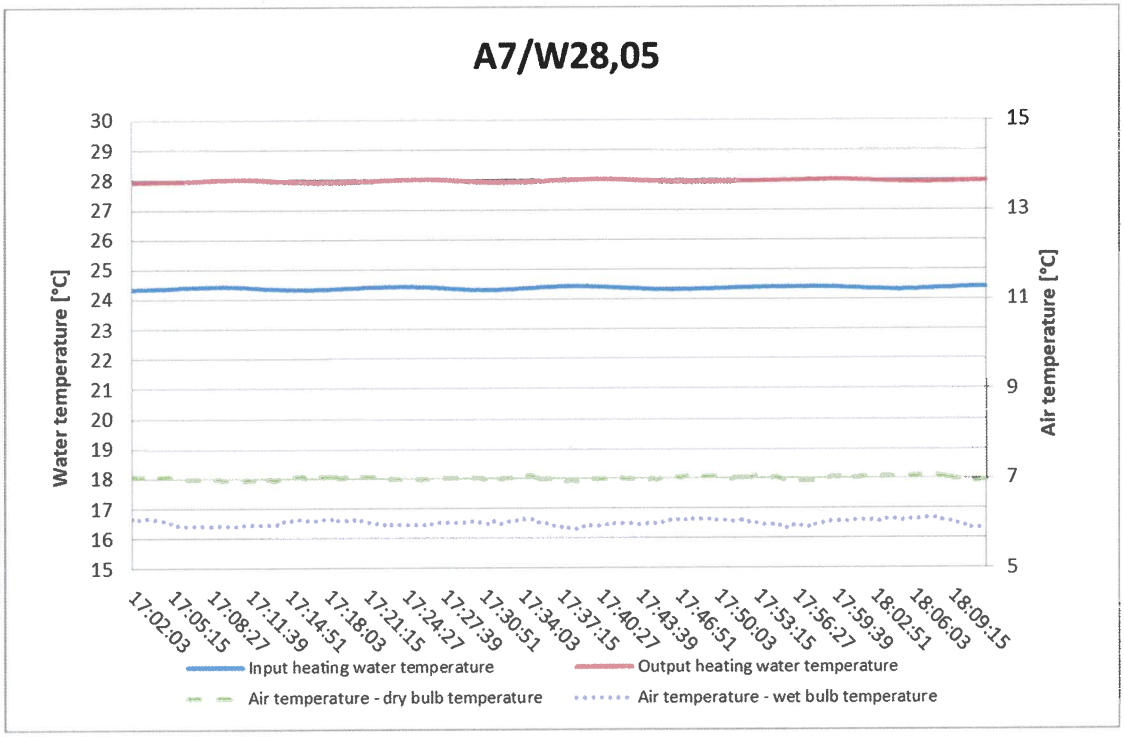


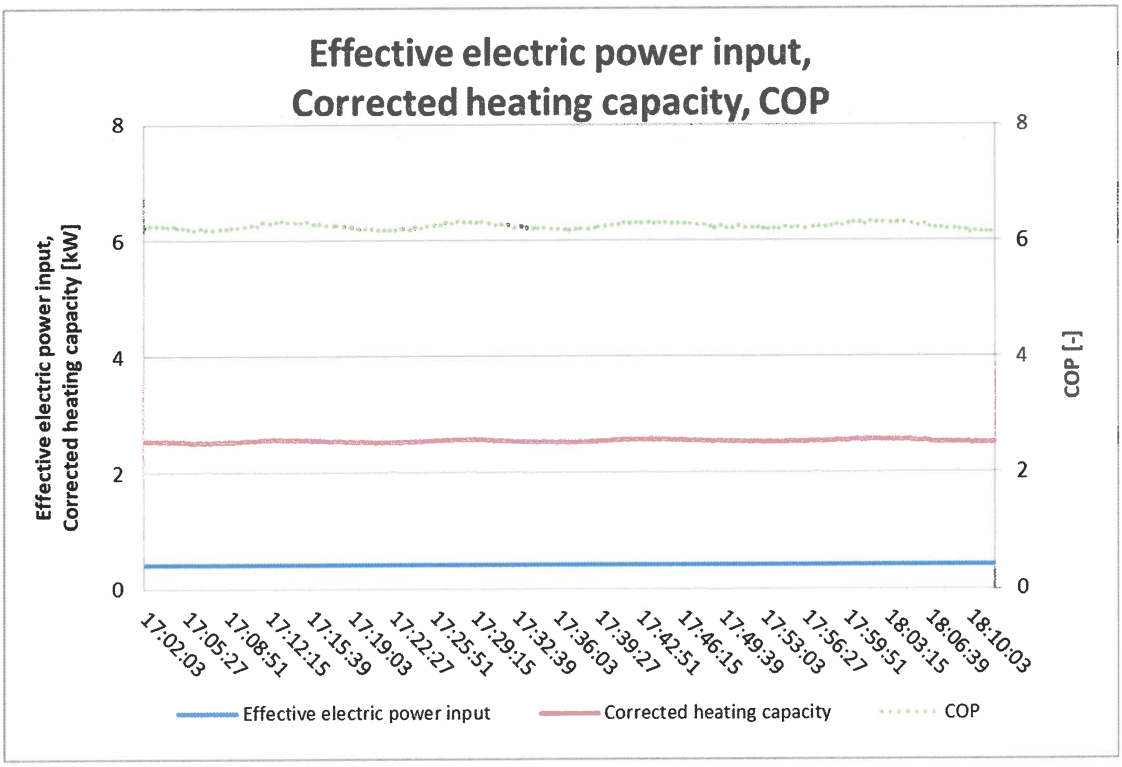
A2W30 (Control settings: 3)



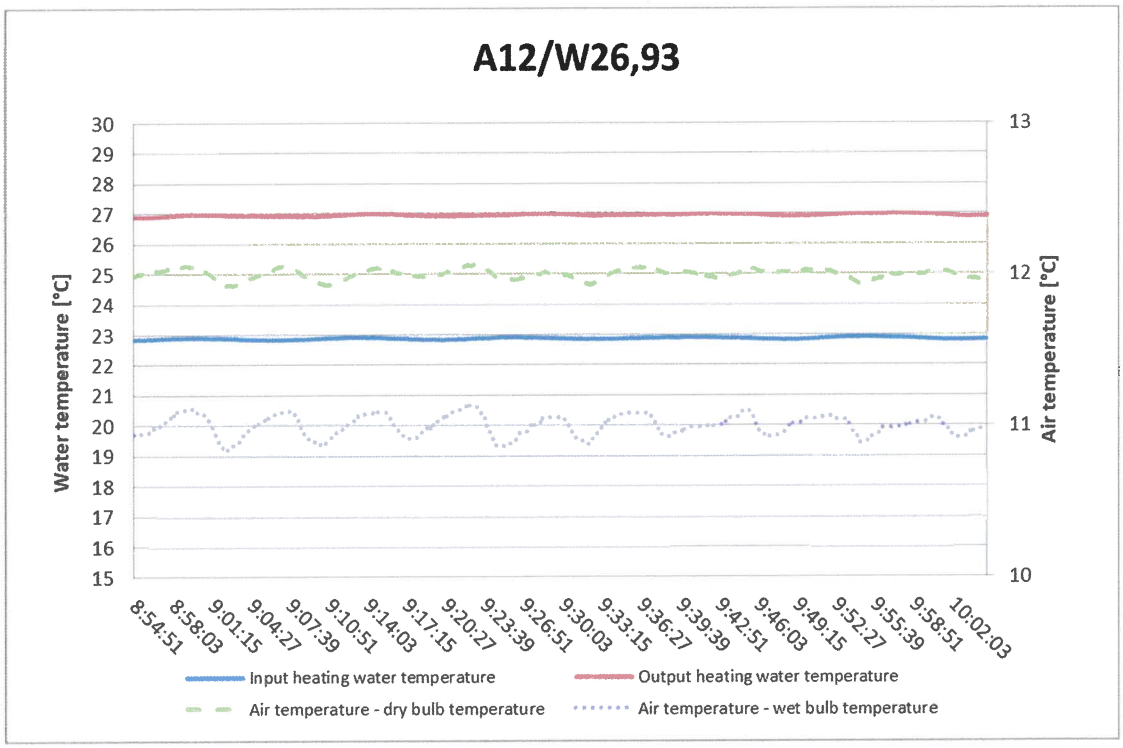


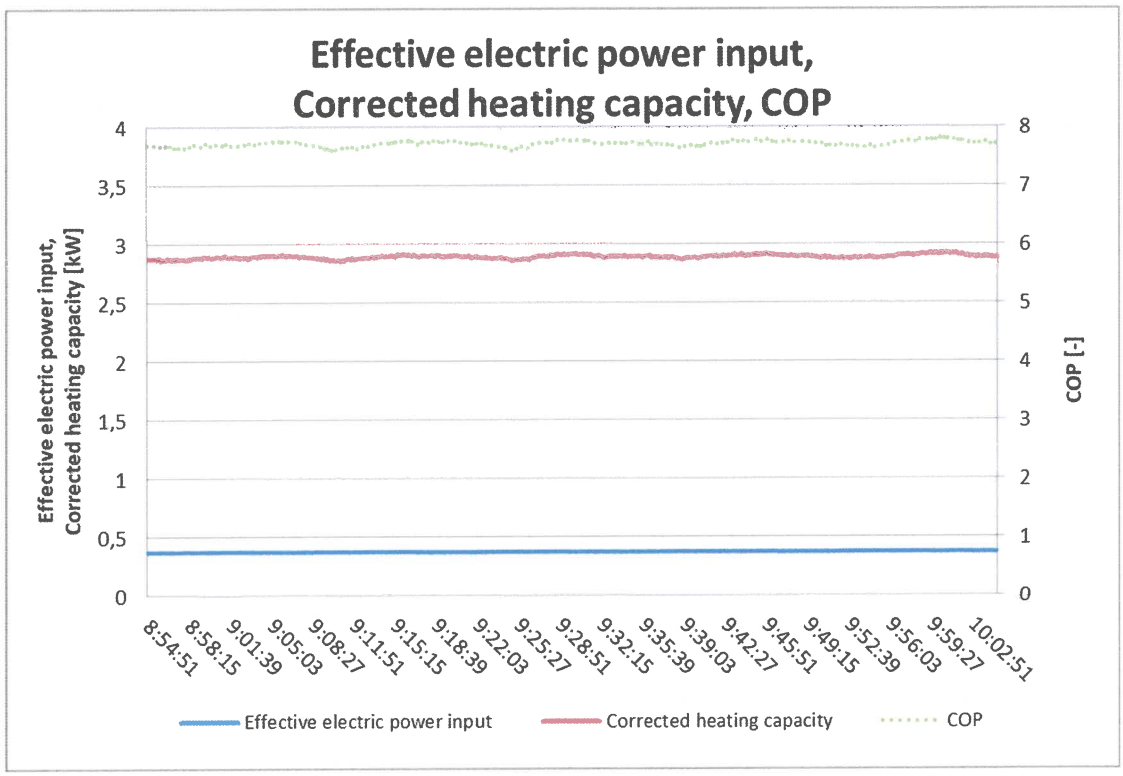
A7W28.05 (Control settings: 1)





A12W26.93 (Control settings: 1)





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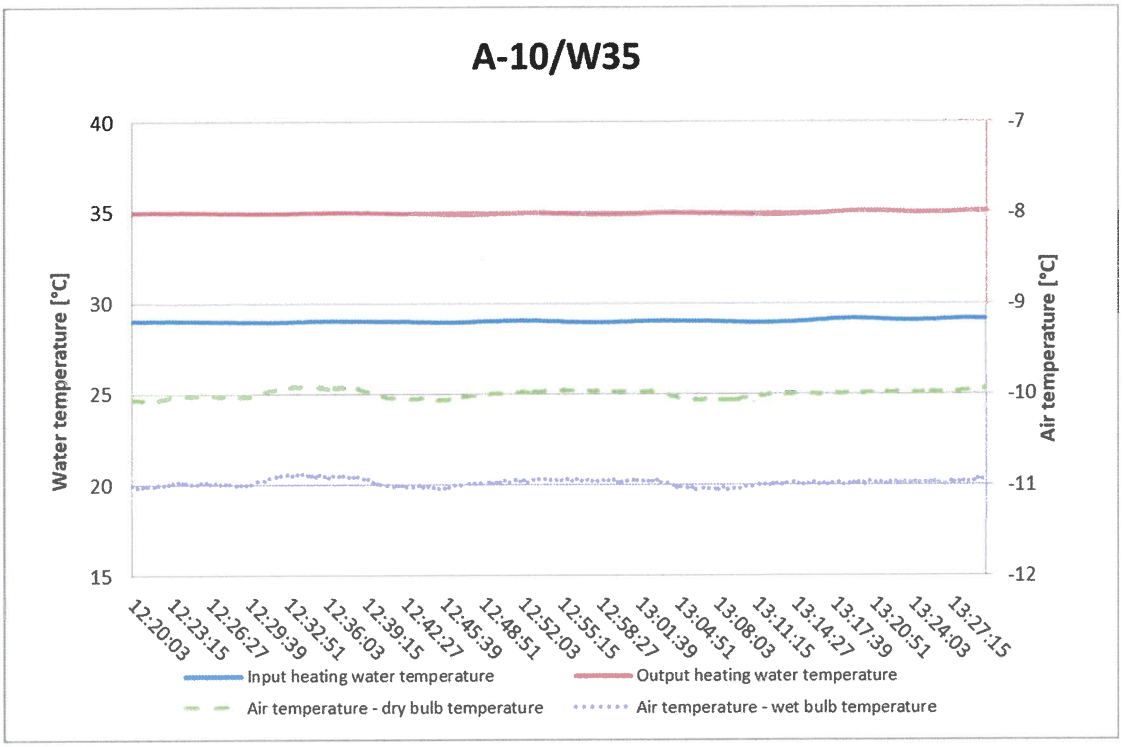
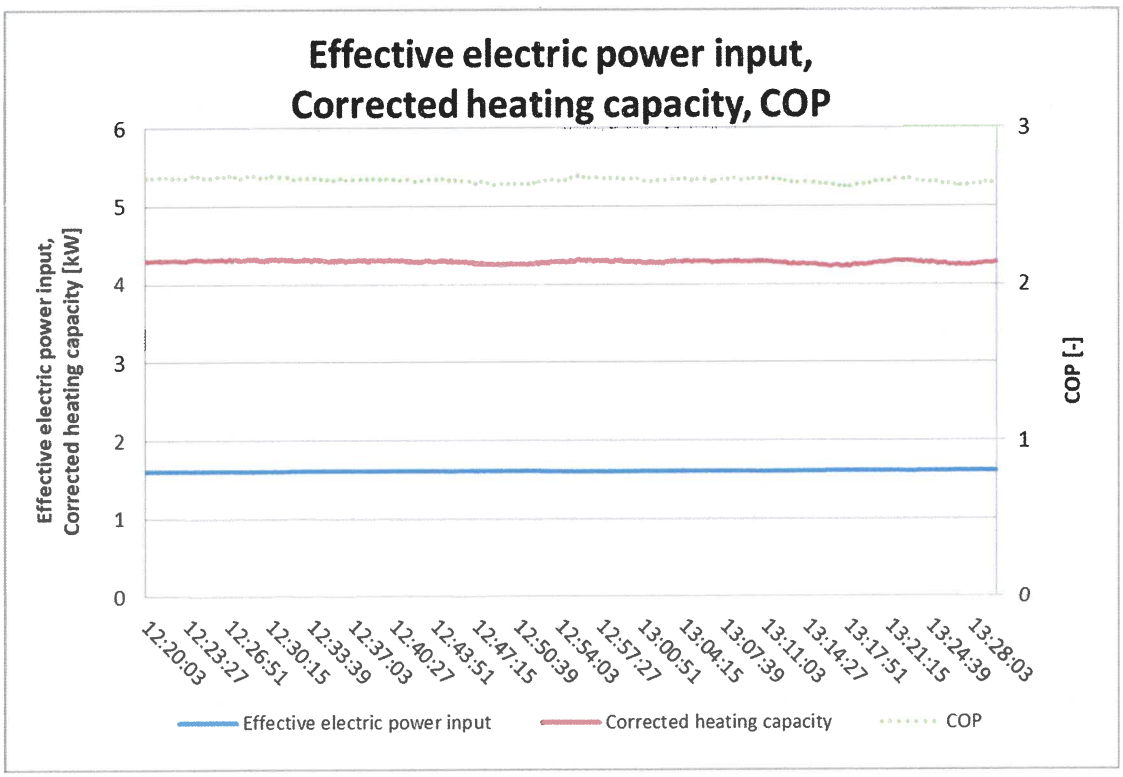
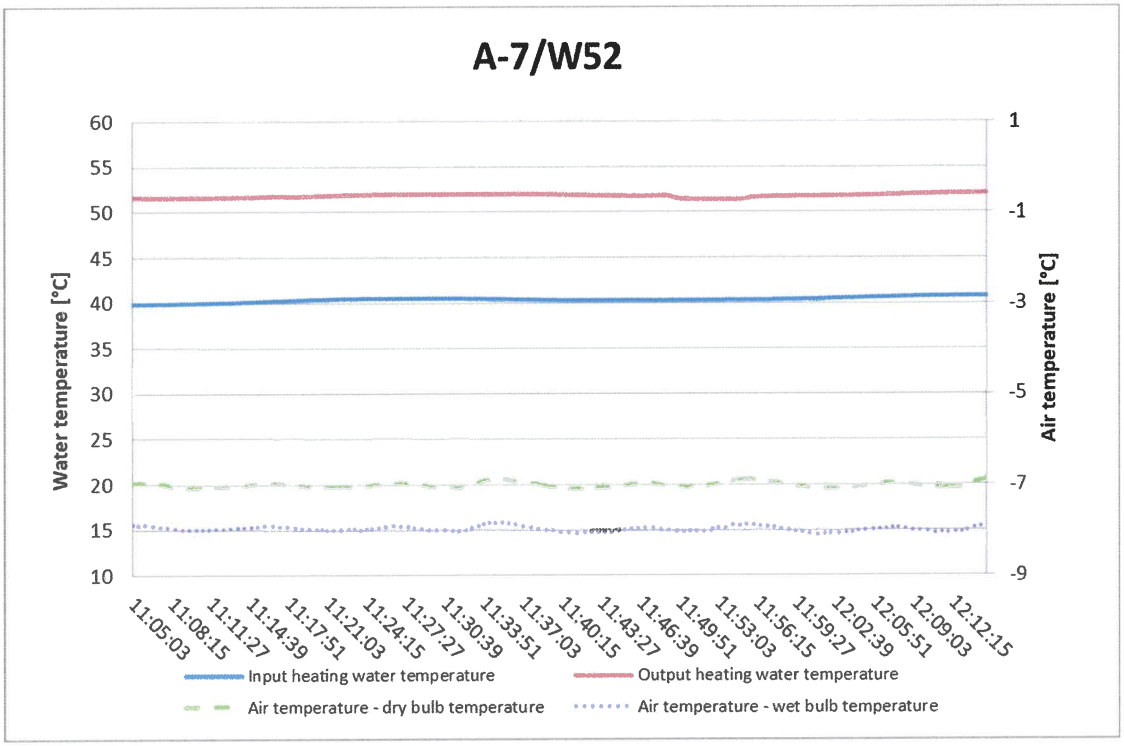
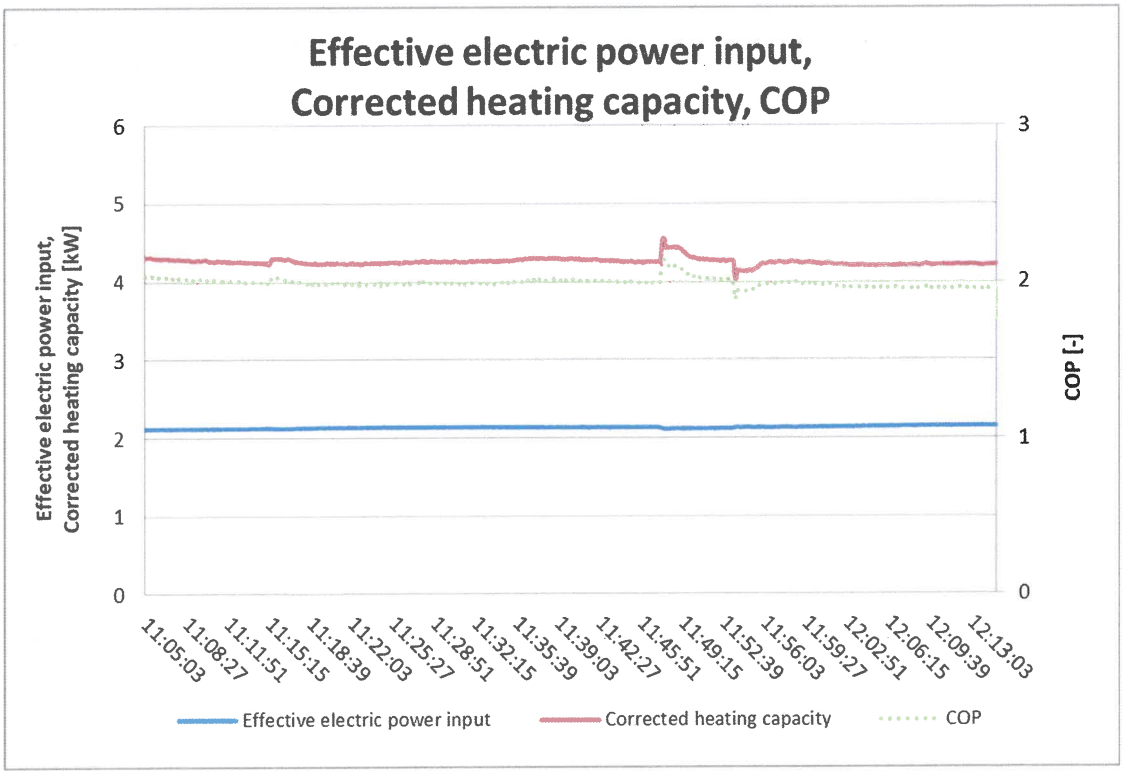




3. Seasonal performance tests and SCOP calculation – Medium temperature application

A-7W52 (Control settings: 10)





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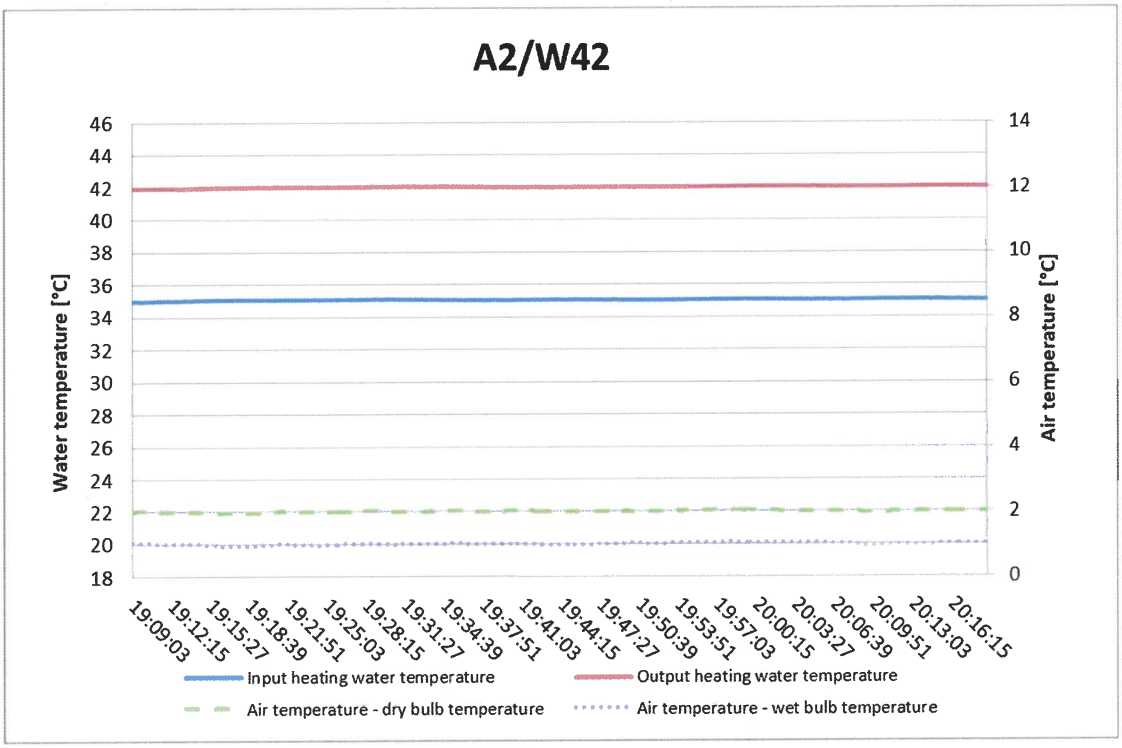
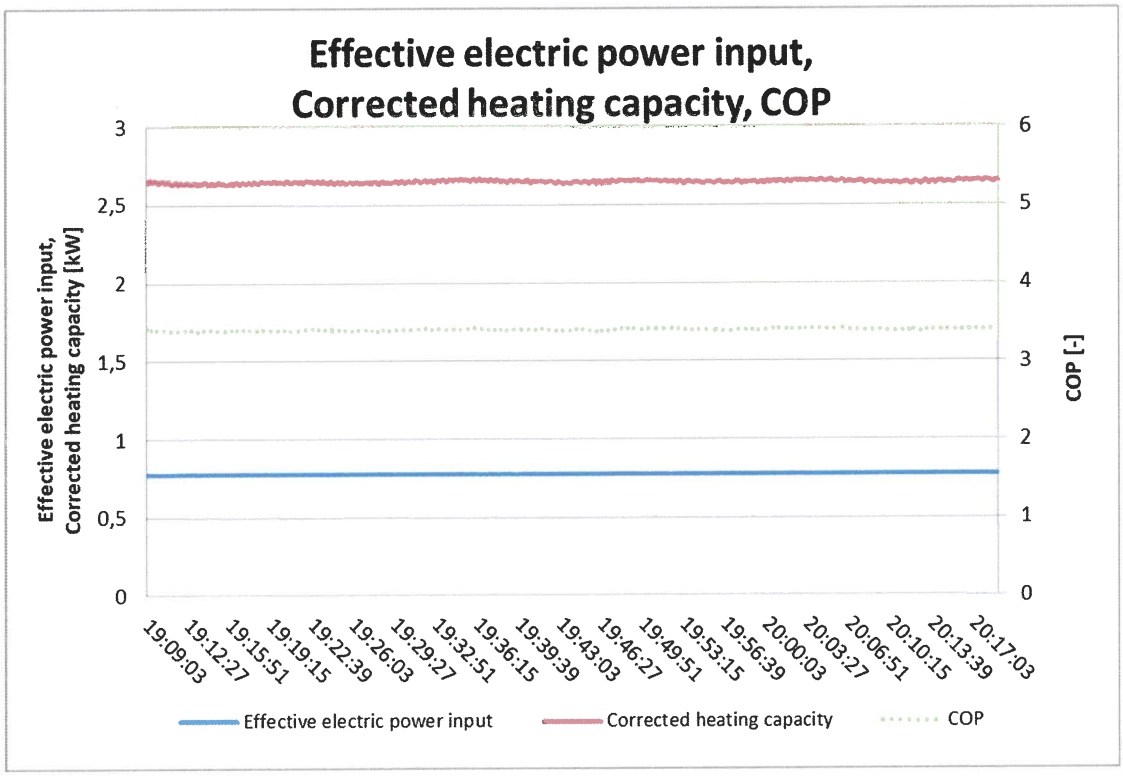
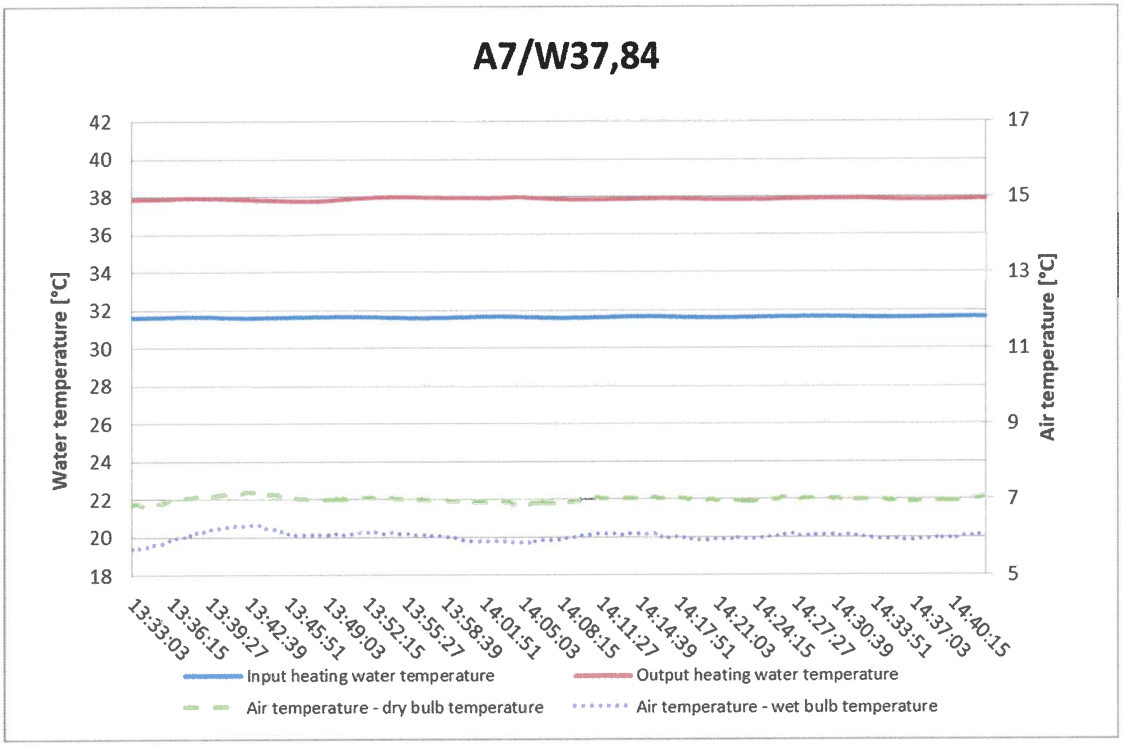
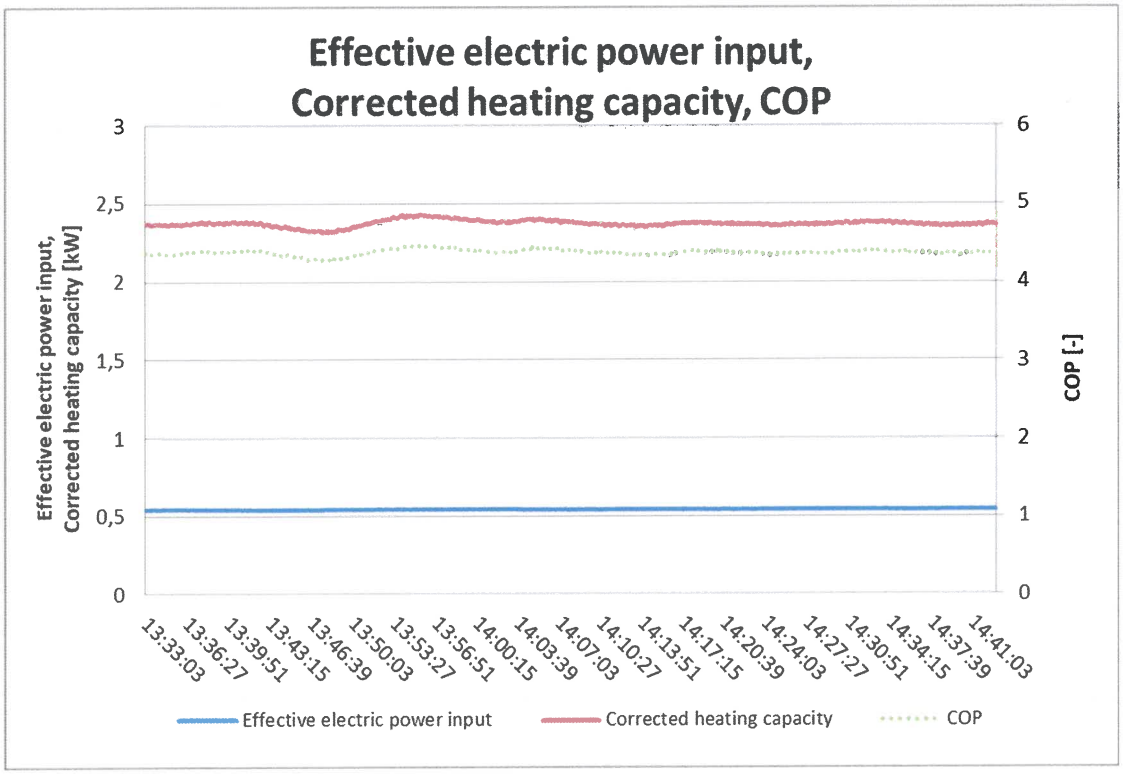




A7W37.84 (Control settings: 1)





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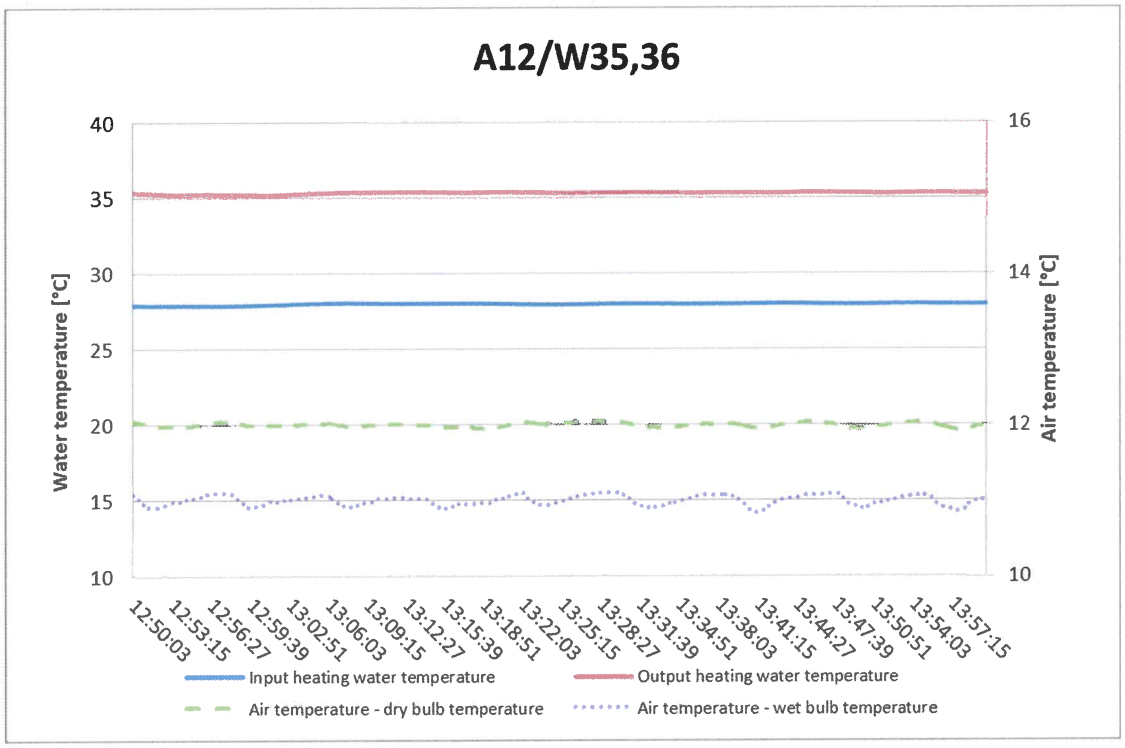
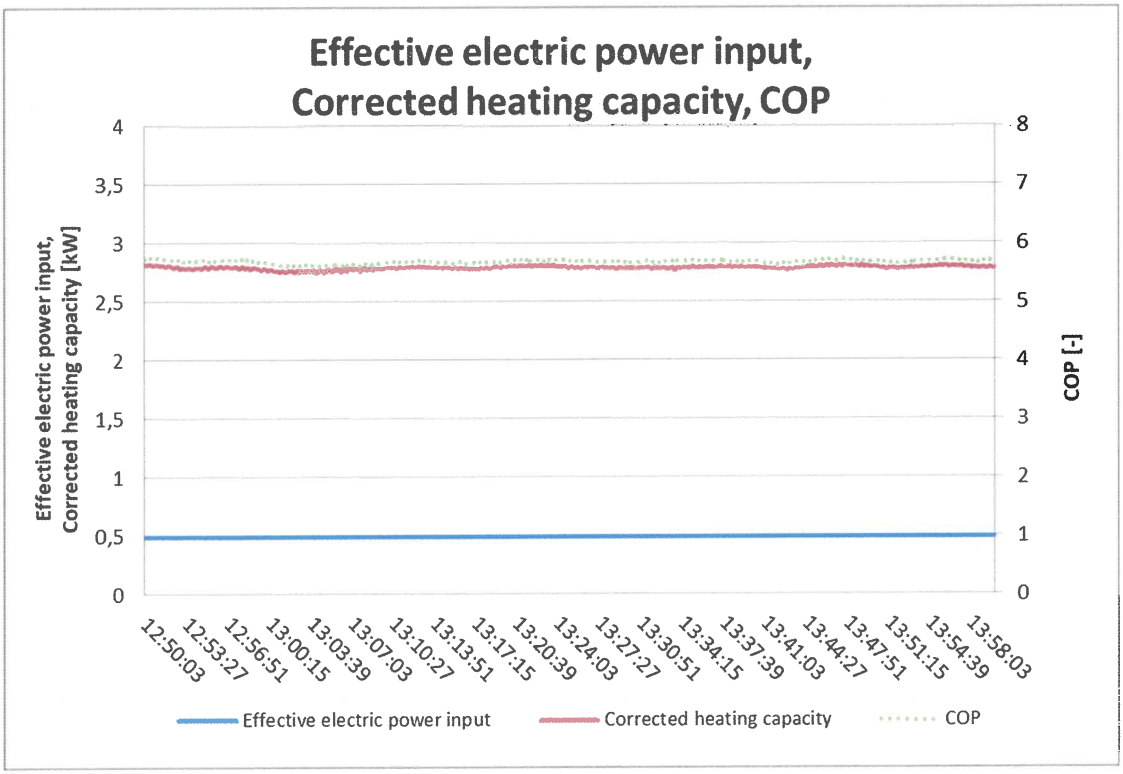
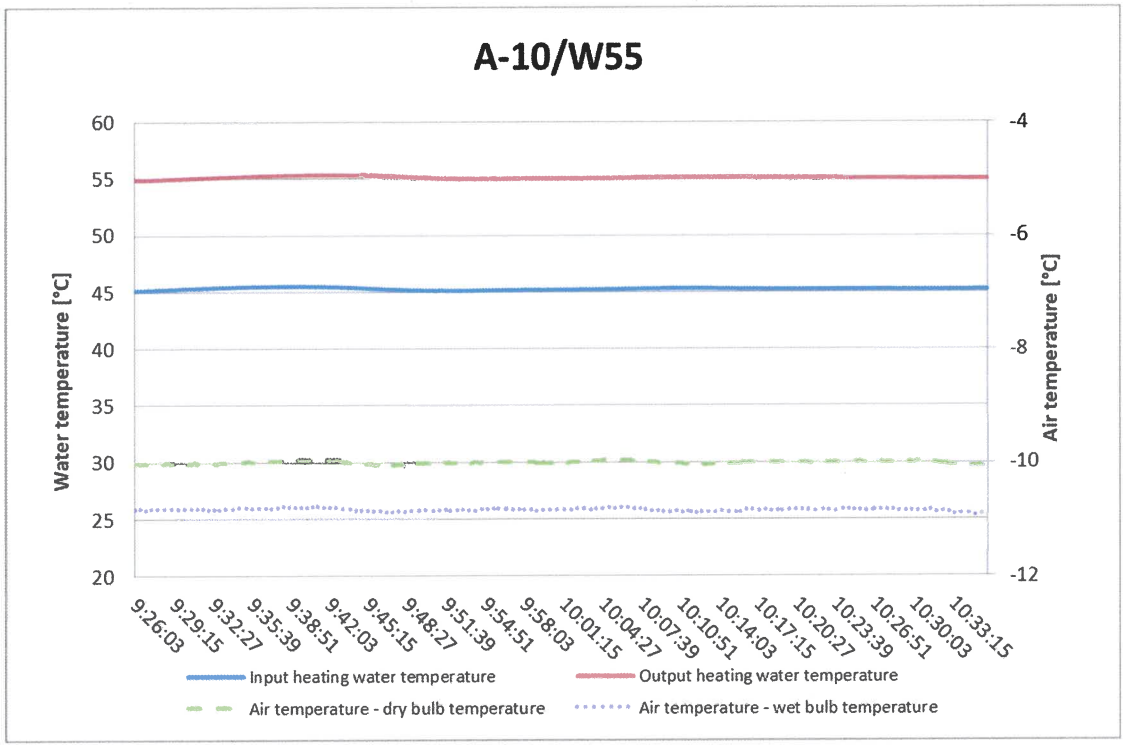
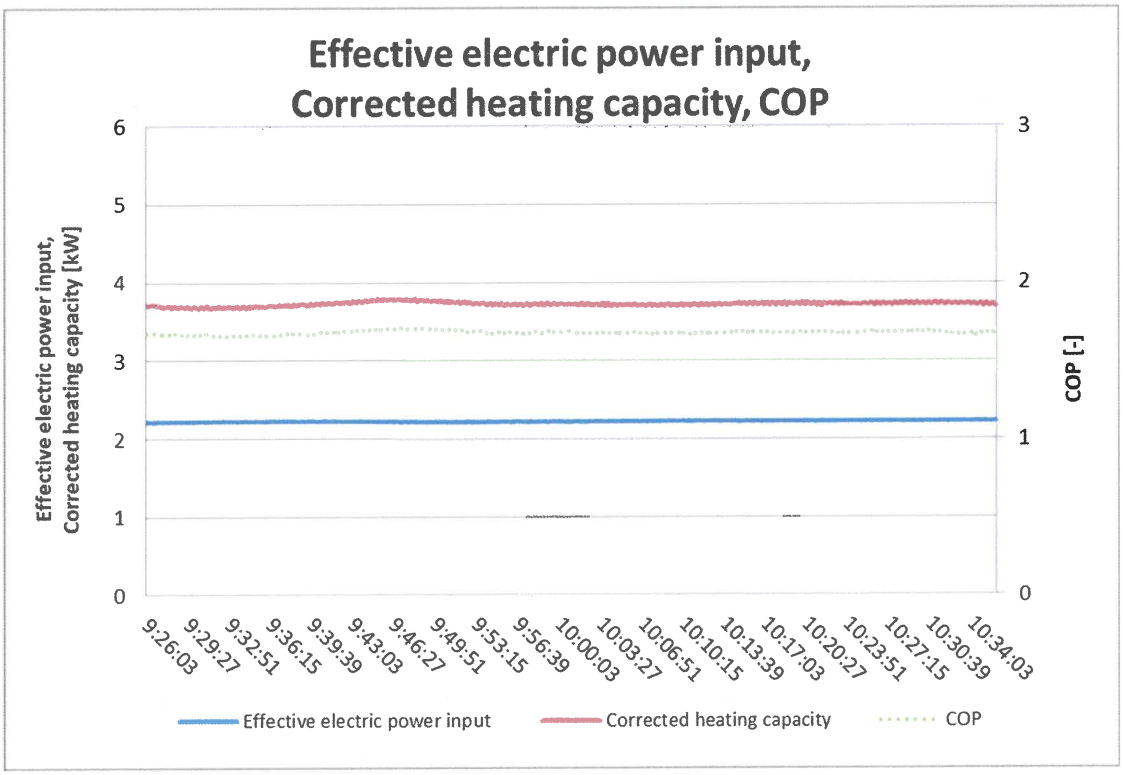




A-10W55 (Control settings: 10)





VI. A list of referenced documents

- Order of 2024-06-27 (Order reg. no. B-82537, received on 2024-06-27)
- Contract B-82537/39
- 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

Test Report compiled by: Ing. Tomáš Sedláček

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

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

– End of Test Report –

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

L 1045.1

TEST REPORT
39-17853/H

Product:	Outdoor Air/Water Heat pump - monobloc
Type designation:	**EUROS ATMO 7**
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:	2024-09-11
Distribution list:	1 copy to the Customer 1 copy to the Engineering Test Institute

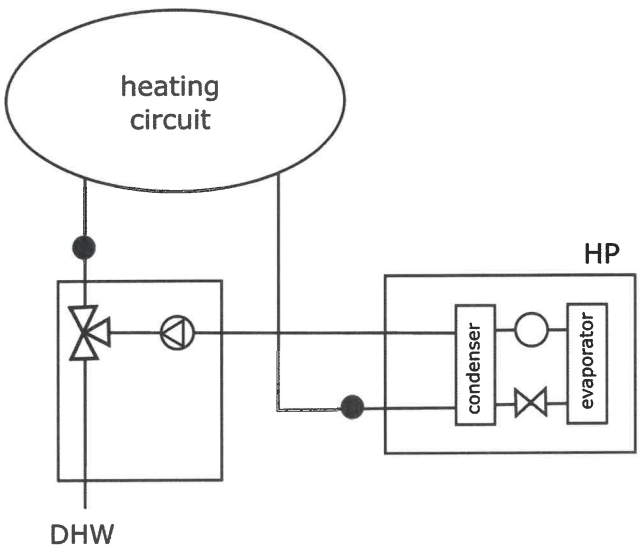
I. Description of product tested

The Heat pump **EUROS ATMO 7** 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 7 OUT** placed outside and indoor hydrobox **EUROS ATMO 7 IN** hanging on inner wall. Outdoor and indoor units are connected by water hoses and electrical wires. Refrigerant R32 is used with charge 0.9 kg. Power supply is a one-phase. Heat pump is able to work in heating and cooling mode. Heat pump is working with fixed flow rate.

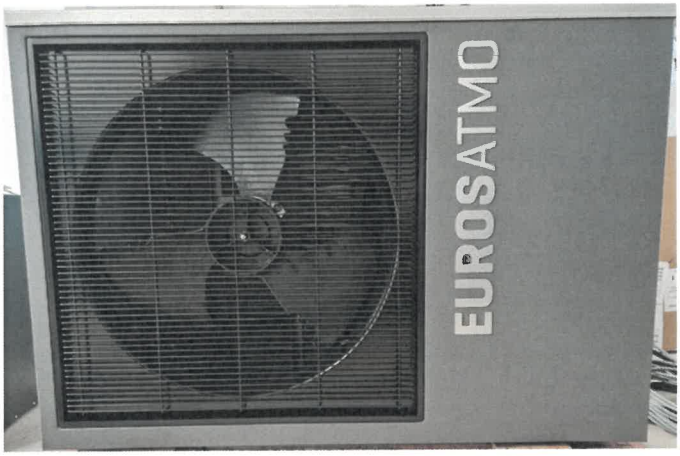
Main components of the outdoor unit **EUROS ATMO 7 OUT**:

Main components of the indoor hydrobox **EUROS ATMO 7 IN:**

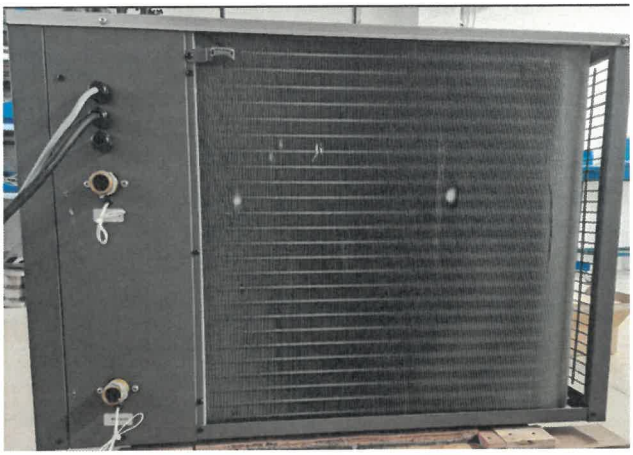
Scheme:



Photodocumentation:



Heat pump **EUROS ATMO 7** – outdoor unit
– Front view –



Heat pump **EUROS ATMO 7** – outdoor unit
– Back view –

Not recognized

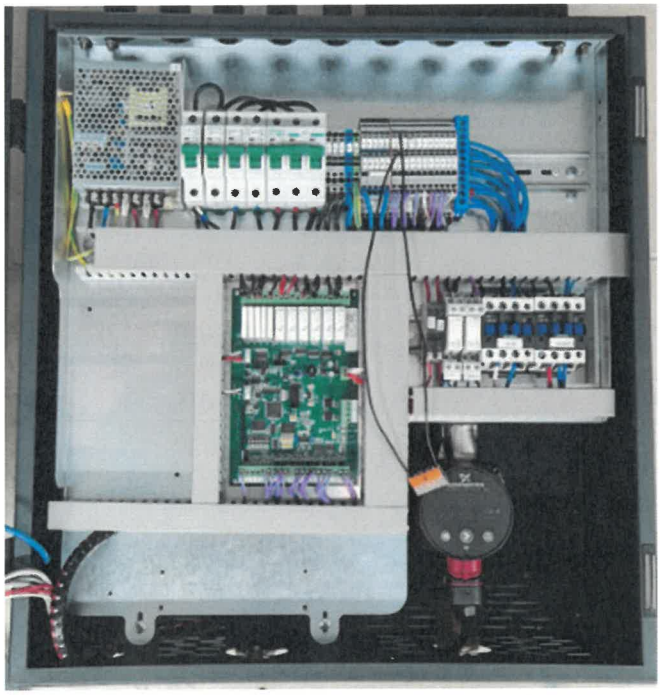
Heat pump **EUROS ATMO 7** – outdoor unit
– Compressor label –

Heat pump **EUROS ATMO 7** – outdoor unit
– Label –

Heat pump **EUROS ATMO 7** – outdoor unit
– Without cover –

Heat pump **EUROS ATMO 7** – indoor hydrobox
– Label –

Heat pump **EUROS ATMO 7** – indoor hydrobox
– With cover –



Heat pump **EUROS ATMO 7** – indoor hydrobox
– Without cover –

II. Sample tested

SZU reg. no.	Product name	Date of submission
1212.24.40352.001	**EUROS ATMO 7**	2024-08-07

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	E1.1 E2.1
2.	Digital watt meter	1.2.1 ENERGIE ANALYZATOR_1 1.2.2 ENERGIE ANALYZATOR_2
3.	Flow meter Krohne Optiflux	8.1.1 TECH_K1_V_DN15 8.1.2 TECH_K2_V_DN15 8.1.3 TECH_K2_V_DN25
4.	Barometer	2.4 MAR18_1_PB
5.	Differential pressure gauge	2.2 MAR18_1_dP 3.2 MAR18_2_dP
6.	Thermometers	2.4 MAR18_T 3.4 MAR18_T
7.	Thermo-hydro meter 608-H1	117043
8.	Tape measure	ME 475
9.	Multi-analyser SINUS SoundBook MK2	000-000-000-875/1
10.	Microphone pair G.R.A.S. 40 AK, wind deflector	000-000-000-875/2
11.	Calibrator G.R.A.S. 42AG	000-000-000-875/3

IV. Methods, results of tests and verifications

No.	Test objective	Requirement	Method of test	Documentation	Test evaluation/ verification *
1.	Calculation of sound power level	Art. 9	**ČSN ISO 9614-2:1997**	Page No. 8-18	+
2.	Acoustic measurements – Sound power level	Art. 8	**ČSN EN 12102-1:2023**	Page No. 7-18	+
*) **Evaluation / statement of conformity:** +..... Requirement fulfilled -..... Requirement not fulfilled 0 .....Not applicable x .....Not evaluated					

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.

Test objective:	Heating and cooling equipment
Exact name of the test procedure:	**2.136*** - Measurement of noise characteristics
Test method:	**ČSN EN 12102-1:2023**; **ČSN ISO 9614-2:1997**
Sample tested:	Air/Water Heat pump **EUROS ATMO 7**
Measuring equipment used:	see Chapter III
Place of test:	Engineering Test Institute, Hudcova 424/56b, 621 00 Brno, CZ

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)

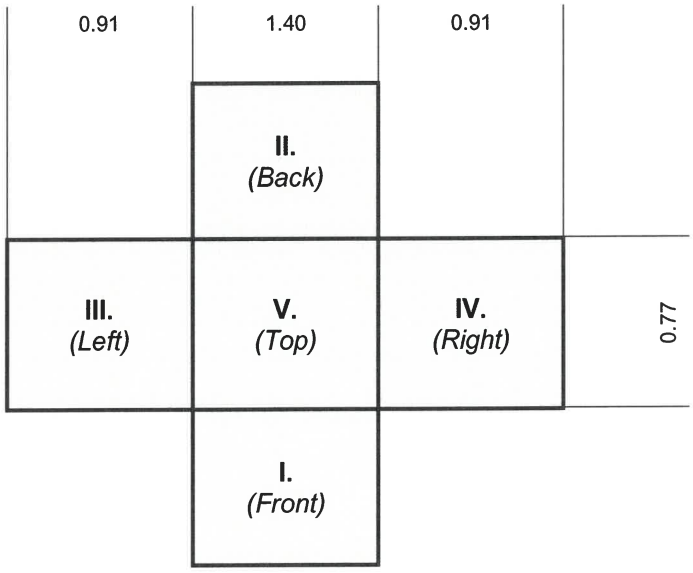
a) Measurement surface

Tested samples were surrounded by a cuboid-shaped measurement surface set at the distance *d* [m].

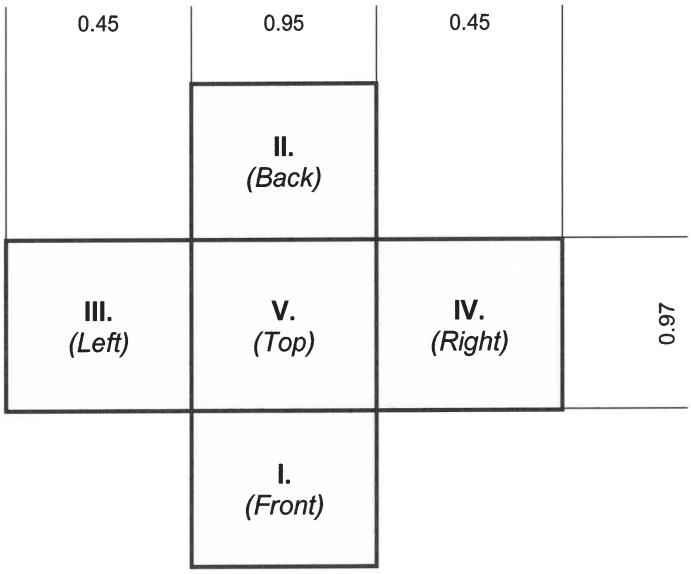
Test Sample: Air/Water Heat pump **EUROS ATMO 7**			**Outdoor unit**	**Indoor unit**
Distance from the test sample	*d*	[m]	0.20	0.20
Height of measurement surface	*h*	[m]	0.91	0.45
Width of measurement surface	*w*	[m]	1.40	0.95
Depth of measurement surface	*l*	[m]	0.77	0.97
Total measurement surface area	*S*	[m^2]	5.03	2.65
Minimal measuring time per surface	t_M	[s]	90.00	90.00

Sketch of measurement surface (not to scale):

Air/Water Heat pump **EUROS ATMO 7**
– Outdoor unit –



Air/Water Heat pump **EUROS ATMO 7**
– Indoor unit –



b) Acoustic environment

The device under test was placed inside a climate chamber (dimensions shown below). The chamber was acoustically treated to be compliant with ČSN EN ISO 3745:2012 requirements for hemi-anechoic chambers. The background noise was stable with the main noise source being the air conditioning of the climate chamber which was set to lower power or momentarily turned off for sufficient signal to noise ratio. The device under test was placed in a position offset from the middle of the chamber, at a sufficient distance from the surrounding walls, and was rotated by about 5÷10 °. Care was taken to ensure low air flow at the measurement surface by adjusting the measurement distance and positions.

Climate-acoustic chamber *(corresponds to free field over a reflecting plane)*			**Outdoor Unit**	**Indoor Unit**
Width of testing room	l_1	[m]	5.60	3.75
Length of testing room	l_2	[m]	4.50	4.50
Height of testing room	l_3	[m]	4.25	4.25

c) Measured and calculated data – General overview:

Test sample			Air/Water Heat pump **EUROS ATMO 7** Indoor unit	Air/Water Heat pump **EUROS ATMO 7** Outdoor unit
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	Heating
Specification of the assessment condition			A7/W55*	A7/W55*
Type of HP capacity regulation			Inverter	Inverter
Compressor speed settings			Mode 1	Mode 1
Fan speed settings			Mode 1	Mode 1
Date of testing (YYYY-MM-DD)			2024-08-23	2024-08-23
Reference air temperature	t_{amb}	[°C]	21.0	7.0
Relative humidity of air	RH	[%]	62.7	86.7
Ambient pressure	p_{amb}	[hPa]	986.3	986.3
Overall sound power level (linear)	L_W	[dB]	42.1 ± 1.5	62.9 ± 1.5
Overall A-weighted sound power level	L_{WA}	**[dB(A)]**	**32.3 ± 1.5**	**51.2 ± 1.5**
Accuracy class			**Engineering (grade 2)**	

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

1A) **Measurement results** – octave bands

Air/Water Heat pump **EUROS ATMO 7** 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}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{W(1)}-L_{W(2)} \leq 5$		[dB]	[dB(A)]	[dB]	
125	20.9	12.4	YES	1.3	YES	YES	YES	38.8	22.1	± 3.0	passed
250	22.2	5.1	YES	0.0	YES	YES	YES	30.3	22.7	± 2.0	c
500	**21.4**	**0.0**	**YES**	**0.0**	**YES**	**YES**	**YES**	**31.7**	**28.9**	**± 1.5**	**passed**
1000	22.3	8.4	YES	3.0	YES	YES	YES	26.7	26.1	± 1.5	c
2000	22.1	3.1	YES	0.0	YES	YES	YES	20.0	21.1	± 1.5	c
4000	20.6	25.8	YES	3.0	YES	NO	NO	15.4	16.5	± 1.5	nc
8000**)	19.7	2.2	YES	0.0	YES	NO	NO	18.5	18.4	± 2.5	nc
Total								**42.1**	**32.3**	**± 1.5**	

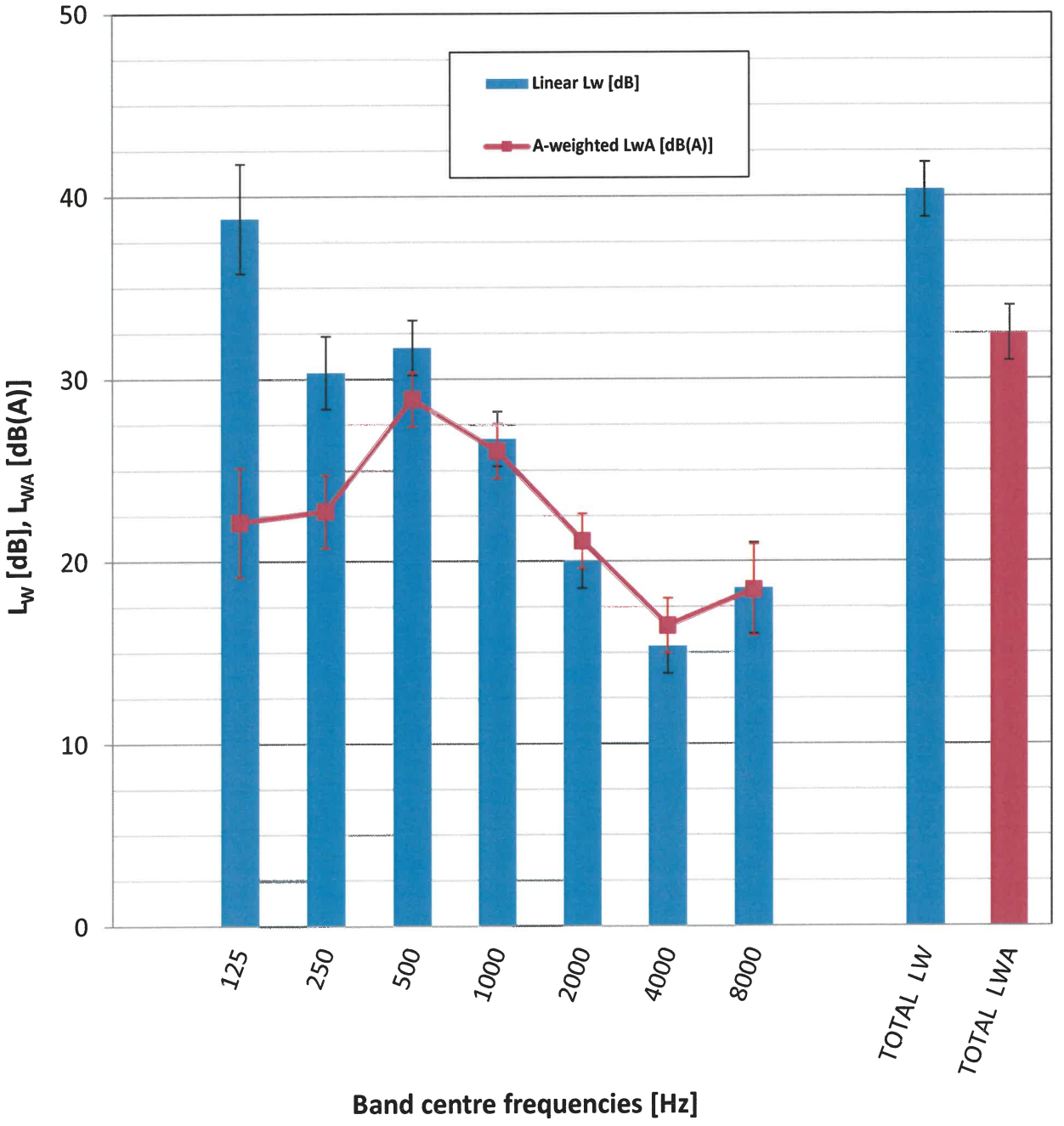
**) *Due to the sound intensity method limitations, the frequency of 6300 Hz was measured only.*

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}.*

Spectrum of Sound power level L_W – octave bands

Air/Water Heat pump **EUROS ATMO 7** Indoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering** **(Grade 2)**



1B) **Measurement results** – one-third octave bands

Air/Water Heat pump **EUROS ATMO 7** Indoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering (Grade 2)**

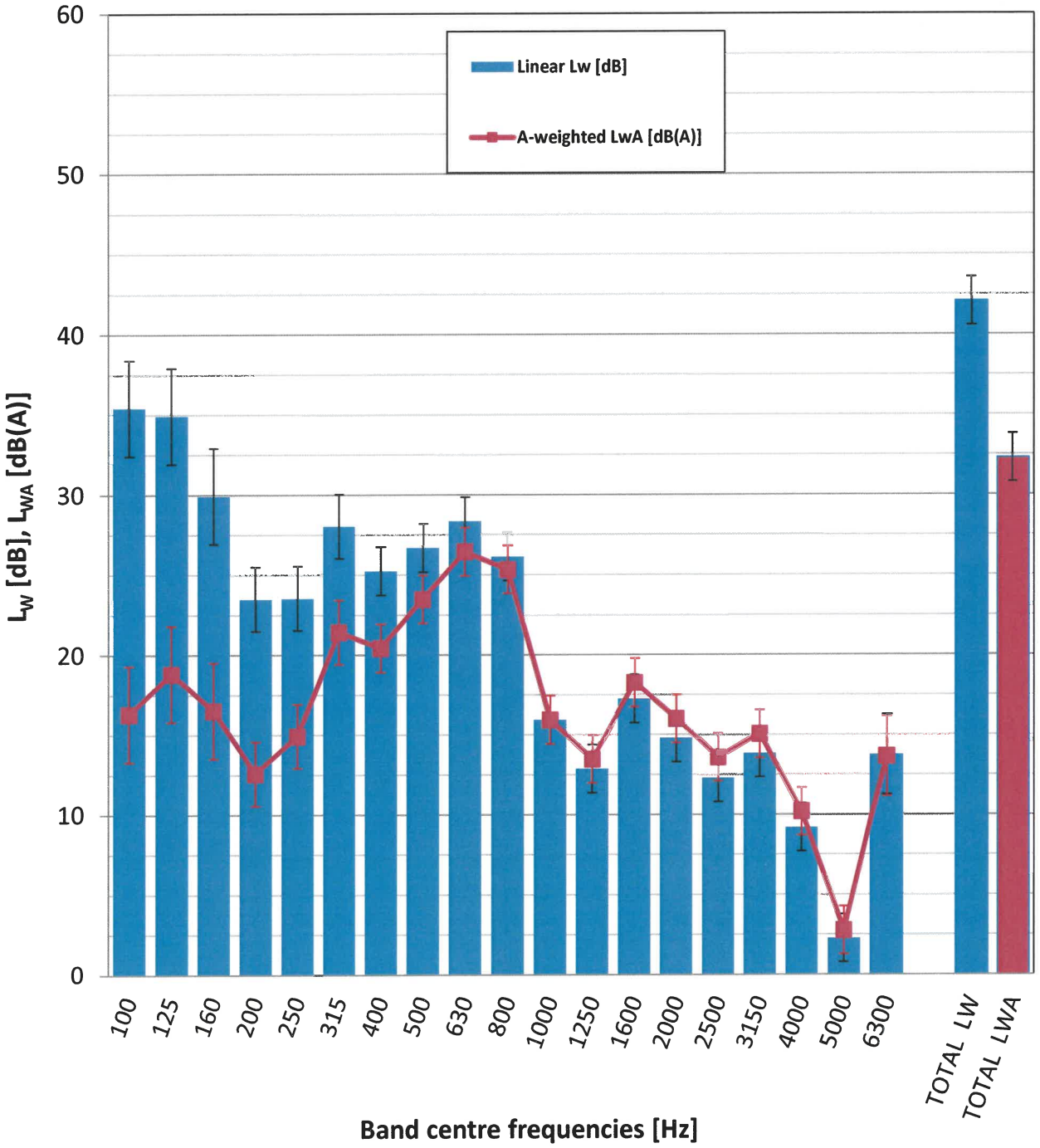
f_m	Criterion 1			Criterion 2		Criterion 3	All criteria passed?	L_W	L_{WA}	U	Evaluation
[Hz]	L_d	F_{pl}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{W(1)}-L_{W(2)} \leq 5$		[dB]	[dB(A)]	[dB]	
100	20.4	17.2	YES	2.9	YES	YES	YES	35.4	16.3	± 3.0	c
125	20.9	12.4	YES	1.3	YES	YES	YES	34.9	18.8	± 3.0	passed
160	21.3	15.2	YES	2.4	YES	YES	YES	29.9	16.5	± 3.0	passed
200	21.8	7.2	YES	0.0	YES	YES	YES	23.5	12.6	± 2.0	c
250	22.2	5.1	YES	0.0	YES	YES	YES	23.5	14.9	± 2.0	c
315	22.5	1.0	YES	0.0	YES	YES	YES	28.0	21.4	± 2.0	passed
400	22.3	0.0	YES	0.0	YES	YES	YES	25.2	20.4	± 1.5	passed
500	21.4	0.0	YES	0.0	YES	YES	YES	26.7	23.5	± 1.5	passed
630	**22.8**	**0.0**	**YES**	**0.0**	**YES**	**YES**	**YES**	**28.4**	**26.5**	**± 1.5**	**passed**
800	22.2	0.0	YES	0.0	YES	YES	YES	26.1	25.3	± 1.5	passed
1000	22.3	8.4	YES	3.0	YES	YES	YES	15.9	15.9	± 1.5	c
1250	21.8	8.9	YES	2.9	YES	YES	YES	12.9	13.5	± 1.5	c
1600	21.9	3.2	YES	0.0	YES	YES	YES	17.3	18.3	± 1.5	passed
2000	22.1	3.1	YES	0.0	YES	YES	YES	14.8	16.0	± 1.5	c
2500	21.7	5.4	YES	0.0	YES	NO	NO	12.3	13.6	± 1.5	nc
3150	21.2	4.3	YES	0.0	YES	YES	YES	13.9	15.1	± 1.5	c
4000	20.6	25.8	YES	3.0	YES	NO	NO	9.2	10.2	± 1.5	nc
5000	19.9	19.7	YES	2.4	YES	NO	NO	2.3	2.8	± 1.5	nc
6300	19.7	2.2	YES	0.0	YES	NO	NO	13.8	13.7	± 2.5	nc
Total								**42.1**	**32.3**	**± 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}.*

Spectrum of Sound power level L_W – one-third octave bands

Air/Water Heat pump **EUROS ATMO 7** Indoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering** **(Grade 2)**



2A) **Measurement results** – octave bands

Air/Water Heat pump **EUROS ATMO 7** 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}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{W(1)}-L_{W(2)} \leq s$		[dB]	[dB(A)]	[dB]	
125	26.8	3.2	YES	0.0	YES	YES	YES	52.1	35.9	± 3.0	c
250	27.5	1.8	YES	0.0	YES	YES	YES	52.5	43.5	± 2.0	passed
500	**28.0**	**2.1**	**YES**	**0.0**	**YES**	**YES**	**YES**	**50.8**	**47.7**	**± 1.5**	**passed**
1000	27.9	2.5	YES	0.0	YES	YES	YES	45.2	45.2	± 1.5	passed
2000	27.2	2.8	YES	0.0	YES	YES	YES	39.0	40.1	± 1.5	c
4000	26.3	5.5	YES	0.0	YES	YES	YES	30.1	31.2	± 1.5	c
8000**)	25.6	18.7	YES	0.0	YES	YES	YES	24.6	24.5	± 2.5	c
Total								**57.0**	**51.2**	**± 1.5**	

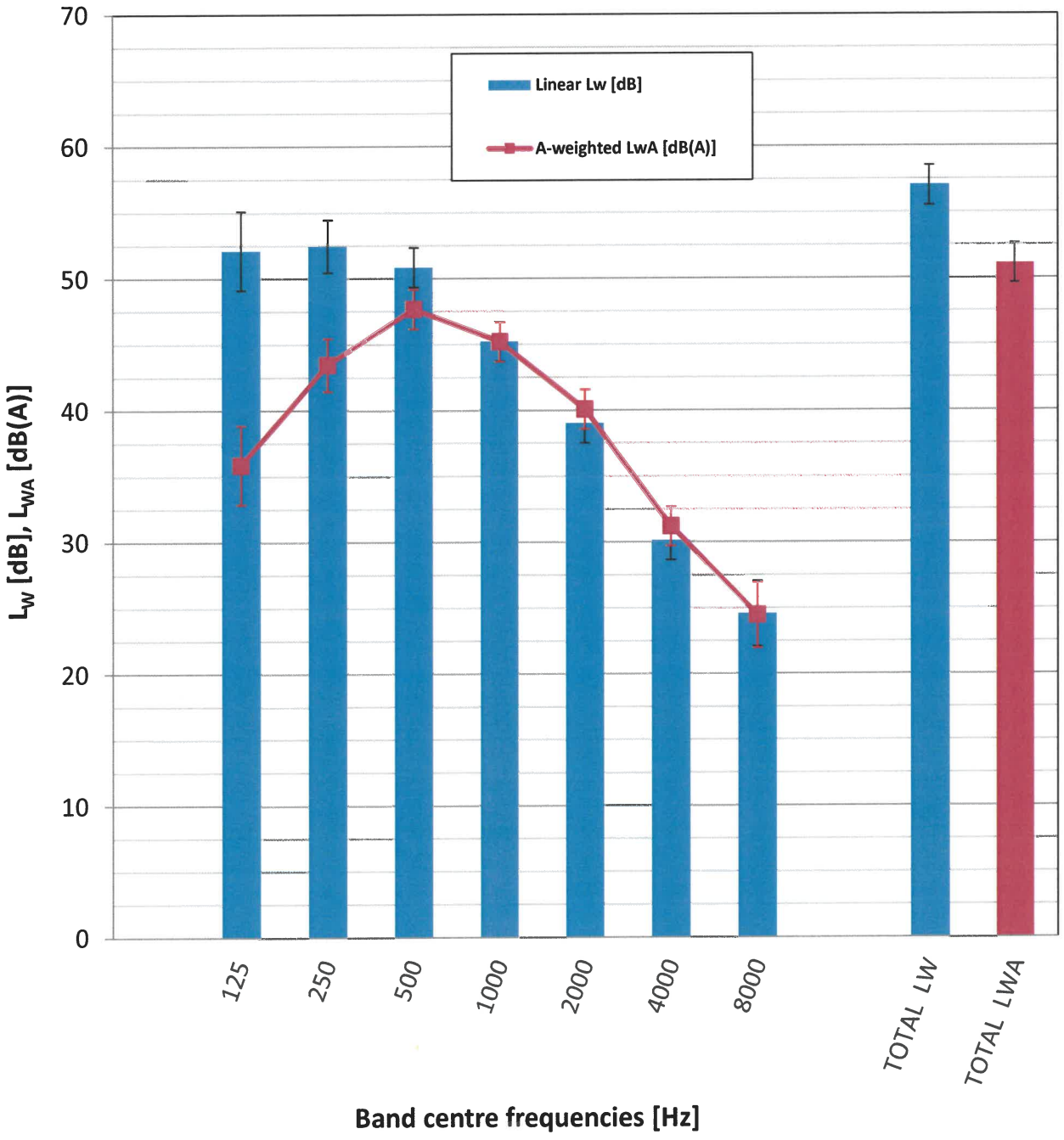
**) *Due to the sound intensity method limitations, the frequency of 6300 Hz was measured only.*

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}.*

Spectrum of Sound power level L_W – octave bands

Air/Water Heat pump **EUROS ATMO 7** Outdoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering** **(Grade 2)**



2B) **Measurement results** – one-third octave bands

Air/Water Heat pump **EUROS ATMO 7** Outdoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering (Grade 2)**

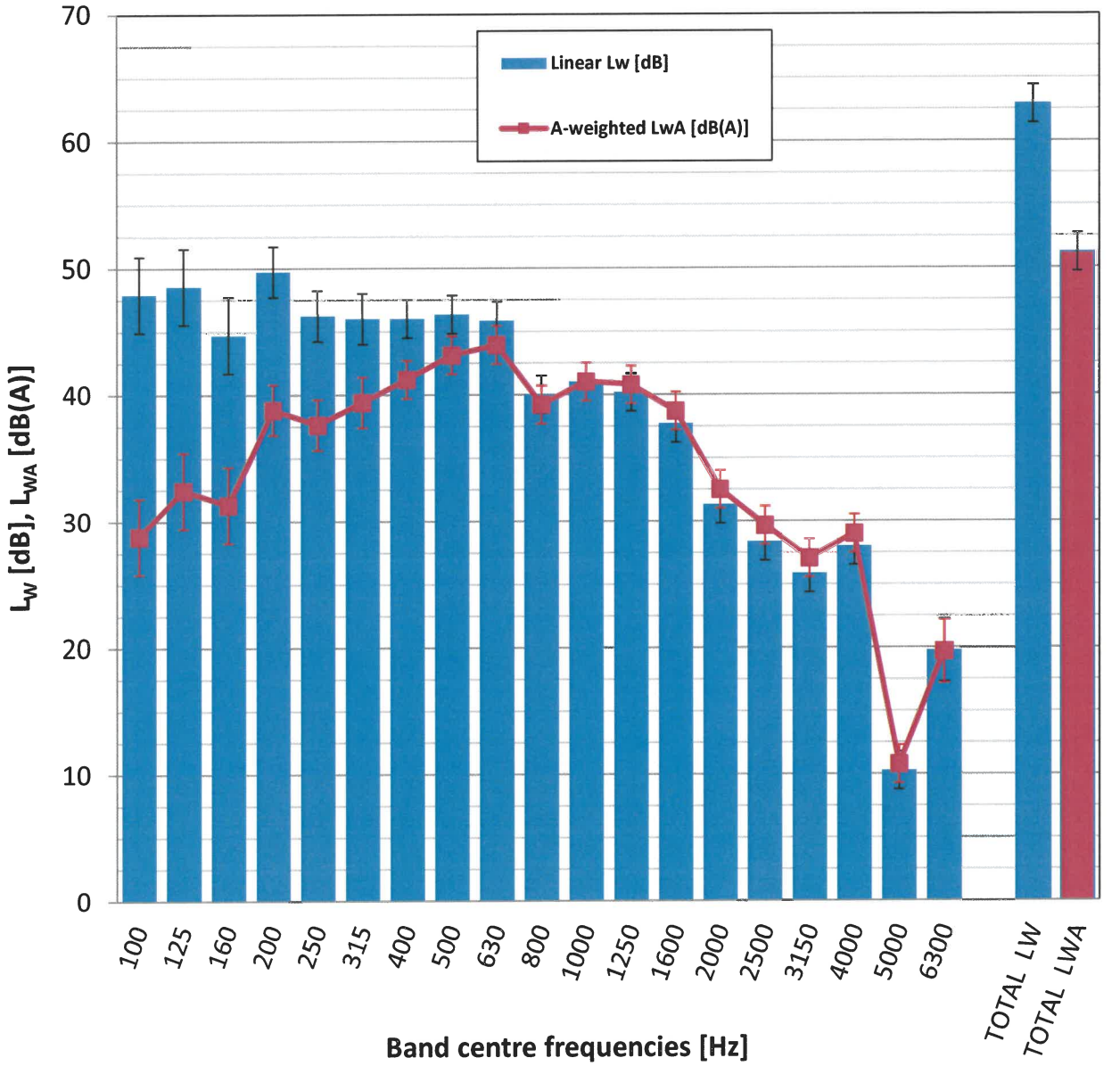
f_m	Criterion 1			Criterion 2		Criterion 3	All criteria passed?	L_W	L_{WA}	U	Evaluation
[Hz]	L_d	F_{pl}	$L_d > F_{pl}$	$F_{+/-}$	$F_{+/-} \leq 3$	$L_{W(1)}-L_{W(2)} \leq s$		[dB]	[dB(A)]	[dB]	
100	27.4	3.9	YES	0.0	YES	YES	YES	47.9	28.8	± 3.0	c
125	26.8	3.2	YES	0.0	YES	YES	YES	48.5	32.4	± 3.0	c
160	27.0	3.8	YES	0.0	YES	YES	YES	44.7	31.3	± 3.0	c
200	27.2	2.2	YES	0.0	YES	YES	YES	49.7	38.8	± 2.0	passed
250	27.5	1.8	YES	0.0	YES	YES	YES	46.2	37.6	± 2.0	passed
315	27.7	2.3	YES	0.0	YES	YES	YES	46.0	39.4	± 2.0	passed
400	27.9	2.2	YES	0.0	YES	YES	YES	46.0	41.2	± 1.5	passed
500	28.0	2.1	YES	0.0	YES	YES	YES	46.4	43.2	± 1.5	passed
630	**27.7**	**2.0**	**YES**	**0.0**	**YES**	**YES**	**YES**	**45.9**	**44.0**	**± 1.5**	**passed**
800	27.9	2.5	YES	0.0	YES	YES	YES	40.0	39.2	± 1.5	passed
1000	27.9	2.5	YES	0.0	YES	YES	YES	41.0	41.0	± 1.5	passed
1250	27.3	2.6	YES	0.0	YES	YES	YES	40.2	40.8	± 1.5	passed
1600	26.8	2.7	YES	0.0	YES	YES	YES	37.7	38.7	± 1.5	passed
2000	27.2	2.8	YES	0.0	YES	YES	YES	31.3	32.5	± 1.5	c
2500	26.8	2.9	YES	0.0	YES	YES	YES	28.4	29.7	± 1.5	c
3150	26.5	3.8	YES	0.0	YES	YES	YES	25.9	27.1	± 1.5	c
4000	26.3	5.5	YES	0.0	YES	YES	YES	28.0	29.0	± 1.5	c
5000	25.8	14.3	YES	2.5	YES	YES	YES	10.3	10.8	± 1.5	c
6300	25.6	18.7	YES	0.0	YES	YES	YES	19.8	19.7	± 2.5	c
Total								**62.9**	**51.2**	**± 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}.*

Spectrum of Sound power level L_W – one-third octave bands

Air/Water Heat pump **EUROS ATMO 7** Outdoor unit at A7/W55; Compressor at Mode 1; Fan at Mode 1	**Engineering** **(Grade 2)**



Tested by: Ing. Ondrej Bilkovič Date: 2024-09-11 Signed:

Reviewed and approved by: Ing. Antonín Kolbábek, Ph.D. Date: 2024-09-11 Signed:

V. A list of referenced documents

- Order of 2024-06-27 (Order reg. no. B-82537, received on 2024-06-27)
- Contract B-82537/39

- 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 ISO 9614-2:1997 - Acoustics - Determination of sound power levels of noise sources using sound intensity - Part 2: Measurement by scannig

- 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. 39-17853
- Record measurement file 39-17853-H.zip

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

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

– End of Test Report –

Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe, Brno, Republika Czeska
Engineering Test Institute. Public Enterprise. Brno. Czech Republic

CERTYFIKAT Z BADAŃ
TEST CERTIFICATE

Number **O-B-01662-24**

Producent *Customer*	Euros Energy Sp. z o.o ul. Macieja Rataja 4F 05-850 Koprki POLAND
Produkt *Product*	Pompa Ciepła powietrze/woda – monoblok *Outdoor Air/Water Heat Pump – monobloc*
Rodzaj oznaczenia / znak towarowy *Type designation / Trade mark*	**EUROS ATMO 7**
Metoda testowa *Test methods*	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023, ČSN EN 12102-1:2023
Podstawy zaświadczenia *Basis of certificate*	Raport z badań - *Test reports*: 39-17853/T z dnia - *of* 2024-10-02 39-17853/H z dnia - *of* 2024-09-11 Dokumentacja techniczna przedstawiona przez - *Technical documents of Euros Energy Sp. z o.o*
Zastosowanie *Temperature application*	**NISKOTEMPERATUROWA - *LOW*,** **WYSOKOTEMPERATUROWA - *MEDIUM*** referencyjna temperatura wody 35 °C i 55 °C - *Reference water temperature 35 °C and 55 °C*

Wyniki - *Results*:

Warunki cieplne* *Temperature conditions**		**A7/W35**	**A7/W55**
Skorygowana moc grzewcza *Corrected heat capacity*	[kW]	3.560	3.061
Efektywny pobór mocy elektrycznej *Effective electric power input*	[kW]	0.723	1.098
Współczynnik efektywności *Coefficient of performance*	[–]	4.925	2.788
Ustawienia sterowania *Control settings*	[–]	4	4

(*) Uwagi do skróconych oznaczeń: np. A7/W35: A (powietrze), 7 (temperatura wejściowa - temperatura termometru suchego) w °C, W (woda), 35 (temperatura wyjściowa) w °C.

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).

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Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
www.szutest.cz

Poziom mocy akustycznej dla danych warunków temperaturowych A7/W55* (Mode 1):
Sound power level at temperature condition A7/W55* (Mode 1):

Pompa Ciepla Powietrze/Woda – monobloc *Air/Water Heat Pump – monobloc*	**EUROS ATMO 7 OUT** – Jednostka zewnętrzna – *– outdoor unit –*	**EUROS ATMO 7 IN** – Jednostka wewnętrzna – *– indoor unit –*
Poziom mocy akustycznej *Sound power level*	L_{WA} 51.2 ± 1.5 dB(A)	L_{WA} 32.3 ± 3.0 dB(A)
Klasa dokładności *Accuracy class*	Techniczna (2) *Engineering (2)*	Techniczna (2) *Engineering (2)*

(*) Uwagi do skróconych oznaczeń: np. A7/W35: A (powietrze), 7 (temperatura wejściowa - temperatura termometru suchego) w °C, W (woda), 35 (temperatura wyjściowa) w °C.

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).

Specyfikacja warunków - *Specification of conditions*:

Kontrola prędkości kompresora *Compressor speed control*	**Zmienna** ***Variable***	Nominalne natężenie przepływu cieczy (wewnętrzny wymiennik ciepła) - *Rated liquid flow rate (indoor heat exchanger)*	**Stała** **Fixed**
Wylotowa temperatura wody (wewnętrzny wymiennik ciepła) - *Outlet water temperature (indoor heat exchanger)*	**Zmienna** ***Variable***	Nominalne natężenie przepływu cieczy (zewnętrzny wymiennik ciepła) - *Rated liquid flow rate (outdoor heat exchanger)*	–
Funkcja *Function*	**Odwracalna** ***Reversible***		

Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe potwierdza niniejszym certyficatem z badań, że badanie produktu, którego dotyczy dało wyniki wskazane powyżej. Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe jest akredytowanym Laboratorium 1045.1.
Engineering Test Institute, Public Enterprise, confirms by this Test Certificate that the testing of the product in question was performed with the results as stated above. Engineering Test Institute, Public Enterprise, is an accredited Testing Laboratory 1045.1.

Brno, 2024-10-03

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1

Ing. Mario Jankola
Kierownik ds. Urządzeń Grzewczych i Wyrobów Budowlanych
Heating Equipment and Construction Products Manager
- KONIEC CERTYFIKATU Z BADAŃ -
- END OF TEST CERTIFICATE -

Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe, Brno, Republika Czeska
Engineering Test Institute. Public Enterprise. Brno. Czech Republic

CERTYFIKAT Z BADAŃ
TEST CERTIFICATE

Number **O-B-01663-24**

Producent *Customer*	Euros Energy Sp. z o.o ul. Macieja Rataja 4F 05-850 Koprki POLAND
Produkt *Product*	Pompa Ciepła powietrze/woda – monoblok *Outdoor Air/Water Heat Pump – monobloc*
Rodzaj oznaczenie / znak towarowy *Type designation / Trade mark*	**EUROS ATMO 7**
Metoda testowa *Test methods*	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023, ČSN EN 14825:2023, ČSN EN 12102-1:2023
Podstawy zaświadczenia *Basis of certificate*	Raport z badań - *Test reports*: 39-17853/T z dnia - *of* 2024-10-02 39-17853/H z dnia - *of* 2024-09-11 Dokumentacja techniczna przedstawiona przez - *Technical documents of Euros Energy Sp. z o.o*
Referencyjny okres grzewczy *Reference heating season*	**„A" = Średni - *„A" = average*** (Warunki obliczeniowe odniesienia dla ogrzewania $T_{designh}$ = -10 °C - *Reference design temperature $T_{designh}$ = -10 °C*)

Wyniki - Results:

NISKA TEMPERATURA *LOW TEMPERATURE*		ŚREDNIA TEMPERATURA *MEDIUM TEMPERATURE*
Referencyjna temperatura wody 35 °C - *Reference water temperature 35 °C*		Referencyjna temperatura wody 55 °C - *Reference water temperature 55 °C*
5.22	**$P_{designh}$ [kW]** … Obciążenie obliczeniowe dla trybu ogrzewania - *Full load heating*	**4.81**
4.82	**SCOP [-]** … Wskaźnik sezonowej efektywności - *Seasonal coefficient of performance*	**3.36**

Temperatura zewnętrzna *Outdoor temperature* **T_j [°C]**	Deklarowana wydajność grzewcza *Heating declared capacity* **P_{dh} [kW]**	Wskaźnik efektywności dla deklarowanej wydajności *Coefficient of performance at the declared capacity* **COP_d [–]**	Temperatura zewnętrzna *Outdoor temperature* **T_j [°C]**	Deklarowana wydajność grzewcza *Heating declared capacity* **P_{dh} [kW]**	Wskaźnik efektywności dla deklarowanej wydajności *Coefficient of performance at the declared capacity* **COP_d [–]**
T_j = -7	4.620	2.958	T_j = -7	4.255	1.955
T_j = +2	2.892	4.869	T_j = +2	2.646	3.407
T_j = +7	2.552	6.251	T_j = +7	2.370	4.377
T_j = +12	2.892	7.719	T_j = +12	2.789	5.680
T_j = TOL = -10	4.232	2.745	T_j = TOL = -10	3.727	1.679
T_j = $T_{bivalent}$ = -7	4.620	2.958	T_j = $T_{bivalent}$ = -7	4.255	1.955

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NISKA TEMPERATURA ***LOW TEMPERATURE*** Referencyjna temperatura wody 35 °C - *Reference water temperature 35 °C*	**ŚREDNIA TEMPERATURA** ***MEDIUM TEMPERATURE*** Referencyjna temperatura wody 55 °C - *Reference water temperature 55 °C*

Pobór mocy w trybach innych niż „tryb aktywny" - *Power consumption in modes other than „active mode"*

13.8	Tryb wyłączenia *Off mode*	P_{OFF}	[W]	13.8
13.9	Tryb wyłączonego termostatu *Thermostat off mode*	P_{TO}	[W]	13.9
13.8	Tryb czuwania *Standby mode*	P_{SB}	[W]	13.8
0.0	Tryb włączonej grzałki karteru *Crankcase heater mode*	P_{CK}	[W]	0.0

Roczne zużycie energii elektrycznej na potrzeby ogrzewania wg: - *Annual electricity consumption for heating according to*:

2238	ČSN EN 14825:2023	Q_{HE}	[kWh]	**2957**

Sezonowa efektywność energetyczna ogrzewania pomieszczeń - *Seasonal Space heating energy efficiency*

189.8	ČSN EN 14825:2023	η_s	[%]	**131.4**

Przepływ cieczy w zewnętrznym wymienniku ciepła - *Liquid flow rate in outdoor heating exchanger*

–	Ciecz obiegu źródła *Source liquid*	Min/Max	[m^3/h]	–

Przepływ cieczy w wewnętrznym wymienniku ciepła - *Liquid flow rate in indoor heating exchanger*

0.623	Woda grzewcza *Heating water*	Min/Max	[m^3/h]	**0.332**

Poziom mocy akustycznej dla warunków - Sound power level at condition A7/W55* (Mode 1):

EUROS ATMO 7 OUT – Jednostka zewnętrzna – *– outdoor unit –*	L_{WA}	51.2 ± 1.5	dB(A)	Klasa dokładności 2 (Techniczna) *Accuracy class 2 (Engineering)*
EUROS ATMO 7 IN – Jednostka wewnętrzna – *– indoor unit –*	L_{WA}	32.3 ± 1.5	dB(A)	Klasa dokładności 2 (Techniczna) *Accuracy class 2 (Engineering)*

(*) Uwagi do skróconych oznaczeń: np. A7/W55: A (powietrze), 7 (temperatura wejściowa - temperatura termometru suchego w °C), W (woda), 55 (temperatura wyjściowa w °C).
Comment to abbreviated marking: e.g. A7/W55: A (air), 7 (input air – dry bulb temperature in °C) / W (water), 55 (output heating water temperature in °C).

Specyfikacja warunków - *Specification of conditions*:

Kontrola prędkości kompresora *Compressor speed control*	**Zmienna** ***Variable***	Nominalne natężenie przepływu cieczy (wewnętrzny wymiennik ciepła) - *Rated liquid flow rate (indoor heat exchanger)*	**Stała** **Fixed**
Wylotowa temperatura wody (wewnętrzny wymiennik ciepła) - *Outlet water temperature (indoor heat exchanger)*	**Zmienna** ***Variable***	Nominalne natężenie przepływu cieczy (zewnętrzny wymiennik ciepła) - *Rated liquid flow rate (outdoor heat exchanger)*	–
Funkcja *Function*	**Odwracalna** ***Reversible***		

Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe potwierdza niniejszym certyficatem z badań, że badanie produktu, którego dotyczy dało wyniki wskazane powyżej. Instytut Badawczy Przemysłu Maszynowego, przedsiębiorstwo państwowe jest akredytowanym Laboratorium 1045.1.
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- END OF TEST CERTIFICATE -

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1

OŚWIADCZENIE

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

1) EUROS ATMO 7 OUT + EUROS ATMO 7 IND
Oznaczenie/typ/identyfikator modelu

EUROS ATMO 7 OUT + EUROS HYDRO 200 AIO
Oznaczenie/typ/identyfikator modelu

2) EUROS ATMO 11 OUT + EUROS ATMO 11 IND
Oznaczenie/typ/identyfikator modelu

EUROS ATMO 11 OUT + EUROS HYDRO 200 AIO
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, 10.10.2024r.
Miejscowość, data

Podpis osoby upoważnionej