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ČSN EN ISO/IEC 17025:2018

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TEST REPORT 39-17769/T

Product: Outdoor Air/Water Heat pump - split

Type designation: NEXUS S17 EVI

Customer: SUNEX S.A.
ul. Piaskowa 7
47-400 Racibórz
POLAND

Manufacturer: SUNEX S.A.
ul. Piaskowa 7
47-400 Racibórz
POLAND

Report issue date: 2024-06-14

Distribution list: 1 copy to the Customer
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SP-2021-000012_1_12

I. Description of product tested

The Heat pump **NEXUS S17 EVI** supplied by the company **SUNEX S.A.** is structurally adapted to operate in air/water system. Device is divided to the outdoor unit **NEXUS S17 EVI/O**, placed outside on a pedestal and an indoor unit **NEXUS S17 EVI/I**. Outdoor and indoor units are connected by copper piping and electrical wires. Refrigerant R410A is used with charge 3.8 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.

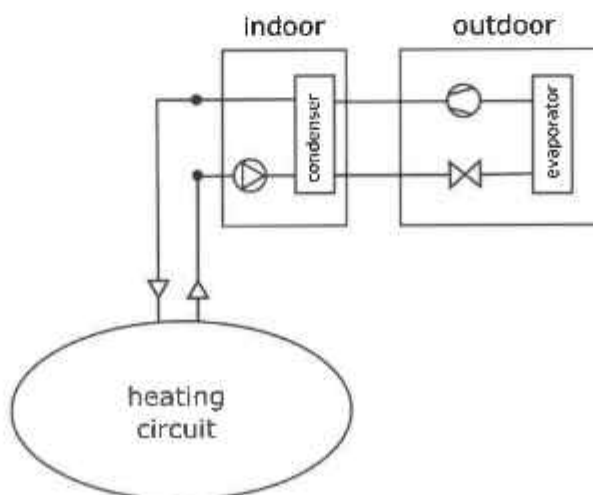
Main components of the outdoor unit **NEXUS S17 EVI/O**:

- Serial number 224130841
- tvar shape with dimensions 1100 × 420 × 1330 mm (W × D × H)
- Frame and casing made of varnished steel sheets
- L-shaped evaporator, 2 rows, dimensions 970 × 50 × 1320 mm (W × D × H), spacing 2.2 mm
- Compressor Panasonic H420D5VZAAJ2
- Refrigerant R410A (3.8 kg)
- 2x electric expansion valve Carel E2V
- 4-way reversing valve Sanhua SHF-20D-46-04
- Refrigerant separator
- 2x axial fan Ø55 cm with motor Wolong
- Refrigerant collector
- Economizer
- Power speed drive Carel PSD1024400

Main components of the indoor unit **NEXUS S17 EVI/I**:

- Serial number 224125536
- Cubic shape with dimensions 550 × 300 × 650 mm (W × D × H)
- Frame and casing made of varnished steel
- Plate condenser, dimensions 150 × 130 × 560 mm (W × D × H) including insulation
- Electric backup heater
- Expansion valve
- Circulation pump Grundfos UPMGEO 25-85 130
- Air vent
- Temperature sensors
- Pressure sensors

Scheme:



A large, light-colored rectangular unit, possibly a server or industrial equipment. It features two large circular fans on the left side, each with a white frame and a black mesh. To the right of the fans, the word "EXCEL" is printed vertically in a large, stylized font.

[illegible][illegible]

Heat pump NEXUS S17 EVI – outdoor unit
– Label –



Heat pump NEXUS S17 EVI – outdoor unit
– Without cover –



Heat pump NEXUS S17 EVI – indoor unit
– Label –



Heat pump NEXUS S17 EVI – indoor unit
– With cover –



Heat pump NEXUS S17 EVI – indoor unit
– Without cover –

II. Sample tested

SZU reg. no.	Product name	Date of submission
1212.24.40076.001	NEXUS S17 EVI	2024-05-27
1212.24.40077.001		2024-05-27

The visual inspection, tests and verification were carried out by Ing. Jakub Čederle 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	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 – 15	x
3.	Seasonal performance tests and SCOP calculation – Medium temperature application	-	ČSN EN 14511-3:2023 ČSN EN 14825:2023	Page No. 16 – 23	x
4.	Safety tests	Art. 4.2.1.2 Art. 4.5 sect. a) Art. 4.5 sect. b) Art. 4.6	ČSN EN 14511-4:2023	Page No. 24 – 26	+
5.	Out of accredited tests – SCOP calculations	-	ČSN EN 14511-3:2023 ČSN EN 14825:2023	Page No. 27 – 35	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]	$\pm 0.15 \text{ K}$	fulfilled
- temperature inlet/outlet	[°C]	$\pm 0.15 \text{ K}$	fulfilled
- volume flow	[m ³ /s]	$\pm 1 \%$	fulfilled
- static pressure difference	[kPa]	$\pm 1 \text{ kPa}$ ($\Delta p \leq 20 \text{ kPa}$) or $\pm 5 \%$ ($\Delta p > 20 \text{ kPa}$)	fulfilled
Air			
- dry bulb temperature	[°C]	$\pm 0.2 \text{ K}$	fulfilled
- wet bulb temperature	[°C]	$\pm 0.4 \text{ K}$	fulfilled
- volume flow	[m ³ /s]	$\pm 5 \%$	not applied
- static pressure difference	[Pa]	$\pm 5 \text{ Pa}$ ($\Delta p \leq 100 \text{ Pa}$) or $\pm 5 \%$ ($\Delta p > 100 \text{ Pa}$)	not applied
Refrigerant			
- pressure at compressor outlet	[kPa]	$\pm 1 \%$	not applied
- temperature	[°C]	$\pm 0.5 \text{ K}$	not applied
Concentration (in volume)			
- heat transfer medium	[%]	± 2	not related
Electrical quantities			
- electric power	[W]	$\pm 1 \%$	fulfilled
- voltage	[V]	$\pm 0.5 \%$	fulfilled
- current	[A]	$\pm 0.5 \%$	fulfilled
- electric energy	[kWh]	$\pm 1 \%$	not applied
Compressor rotational speed	[min ⁻¹]	$\pm 0.5 \%$	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 NEXUS S17 EVI
Measuring equipment used:	see Chapter III

Specification of the assessment condition		A7/W35	A7/W55
Date of testing		2024-05-27	2024-05-27
Transient test procedure	YES / NO	YES	NO
Average defrost time of 1 cycle	[min]	7.6	–
Average time of 1 cycle	[min]	158.4	–
Calculation time	[min]	158.4	70.0
Output heating water – temperature calculation	[°C]	34.60	55.03
Input heating water – temperature calculation	[°C]	30.02	47.03
Output heating water temperature	[°C]	35.02	55.03
Input heating water temperature	[°C]	30.04	47.03
Air temperature – dry bulb temperature	[°C]	6.98	7.00
Air temperature – wet bulb temperature	[°C]	5.97	6.01
Relative humidity	[%]	86.79	86.95
Barometric pressure	[kPa]	98.588	98.568
Ambient temperature	[°C]	6.92	6.89
Secondary circuit pressure difference	[kPa]	-23.051	25.137
Efficiency of the secondary liquid pump	[-]	0.292	0.257
Volume flow rate of heating water	[m ³ ·h ⁻¹]	2.8865	1.8856
Density of heating water	[kg·m ⁻³]	994.1	985.9
Specific heat capacity of heating water	[kJ·kg ⁻¹ ·K ⁻¹]	4.175	4.179
Voltage	[V]	401.95	400.15
Total current	[A]	25.67	39.83
Overall power input	[kW]	3.937	6.060
Capacity correction of sec. liquid pump	[W]	-43.818	37.978
Power input correction of sec. liquid pump	[W]	-62.32	51.14
Heating capacity – heating water	[kW]	15.181	17.334
Corrected heating capacity – heating water	[kW]	15.225	17.296
Uncertainty of corrected heating capacity	[kW]	± 0.287	± 0.191
Effective electric power input	[kW]	4.000	6.009
COP	[-]	3.807	2.879
Uncertainty of COP	[-]	± 0.072	± 0.032
Control settings	[rps]	70	70
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 NEXUS S17 EVI
Measuring equipment used:	see Chapter III

Design			Air / water – split				
Conditions specification according to ČSN 14825:2023	to EN	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			Variable		
Seasonal space heating efficiency	Heating	Average	η_s		187.7	%	
		Warmer	η_s		211.3	(Not tested)	%
		Colder	η_s		145.2	(Not tested)	%
Seasonal efficiency according to ČSN 14825:2023	Heating	Average	SCOP		4.77	–	
		Warmer	SCOP		5.36	(Not tested)	–
		Colder	SCOP		3.70	(Not tested)	–
Function	Cooling			Yes			
	Heating	Yes	Reference heating season	Average	Yes		
				Warmer	Yes		
				Colder	Yes		
Full heating load	Cooling		$P_{designc}$		–	kW	
	Heating	Average	$P_{designh}$		12.82	kW	
		Warmer	$P_{designh}$		12.10	kW	
		Colder	$P_{designh}$		14.97	kW	
Bivalent temperatures	Heating	Average	$T_{bivalent}$		-7	°C	
		Warmer	$T_{bivalent}$		2	°C	
		Colder	$T_{bivalent}$		-10	°C	
Operation temperatures limit	Heating	Average	TOL		-10	°C	
		Warmer	TOL		2	°C	
		Colder	TOL		-22	°C	
Seasonal power consumption according to ČSN EN 14825:2023	Cooling		Q_{CE}		–	kWh	
	Heating	Average	Q_{HE}		5553	kWh	
		Warmer	Q_{HE}		3015	(Not tested)	kWh
		Colder	Q_{HE}		9966	(Not tested)	kWh
Modes other than „active mode“		Off mode			P_{OFF}	17.0	W
		Thermostat off mode			P_{TO}	17.1	W
		Standby mode			P_{SB}	17.0	W
		Crankcase heater mode			P_{CK}	0.0	W

(Not tested): The technical data were declared by the Manufacturer and were not tested by the Testing Laboratory.

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}	0.0171	[kW]
P_{SB}	0.0170	[kW]
P_{CK}	0.0000	[kW]
P_{OFF}	0.0170	[kW]
$P_{designh}$	12.82	[kW]
$SCOP_{ON}$	4.77	[-]

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)

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

$$Q_H = 12.82 \cdot 2066 = 26482 \quad [kWh]$$

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

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

$$Q_{HE} = 26482 / 4.77 + 178 \cdot 0.0171 + 0 \cdot 0.017 + 178 \cdot 0 + 0 \cdot 0.017 = 5553 \quad [kWh]$$

7.2 General formula for calculation of reference SCOP

$$SCOP = Q_H / Q_{HE} \quad [-]$$

$$SCOP = 26482 / 5553 = 4.77 \quad [-]$$

7.1 Calculation of the seasonal space heating efficiency η_s

$$\Sigma F(i) = F(1) + F(2) \quad [-]$$

$$\Sigma F = 0.03 + 0 = 0.03 \quad [-]$$

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

$$\eta_s (A) = (1 / 2.5) \cdot 4.77 - 0.03 = \underline{1.877} \quad [-]$$

Temperature level		Low (reference water temperature 35 °C)		
Reference heating season		„A“ = average ($T_{designh} = -10\text{ °C}$)		
Assessment condition		A, T _{biv} (F)	B	C
Specification of the assessment condition		A-7/W34	A2/W30	A7/W29.1
Date of testing		2024-05-28	2024-05-29	2024-05-29
Transient test procedure	YES / NO	YES	NO	NO
Average defrost time of 1 cycle	[min]	7.5	–	–
Average time of 1 cycle	[min]	123.7	–	–
Calculation time	[min]	123.7	70.0	70.0
Output heating water – temperature calculation	[°C]	33.44	30.04	29.09
Input heating water – temperature calculation	[°C]	29.00	25.04	24.09
Output heating water temperature	[°C]	34.04	30.04	29.09
Input heating water temperature	[°C]	29.03	25.04	24.09
Air temperature – dry bulb temperature	[°C]	-7.03	2.00	7.00
Air temperature – wet bulb temperature	[°C]	-8.07	1.01	6.02
Relative humidity	[%]	73.88	84.01	87.05
Barometric pressure	[kPa]	98.495	98.337	98.164
Ambient temperature	[°C]	-7.06	1.87	6.90
Secondary circuit pressure difference	[kPa]	-5.636	9.133	8.551
Efficiency of the secondary liquid pump	[-]	0.157	0.154	0.153
Volume flow rate of heating water	[m ³ ·h ⁻¹]	2.2310	1.2942	1.3298
Density of heating water	[kg·m ⁻³]	994.5	995.6	995.8
Specific heat capacity of heating water	[kJ·kg ⁻¹ ·K ⁻¹]	4.175	4.176	4.176
Voltage	[V]	400.71	402.06	401.83
Total current	[A]	26.75	12.11	10.28
Overall power input	[kW]	3.867	1.581	1.287
Capacity correction of sec. liquid pump	[W]	-17.213	17.973	17.505
Power input correction of sec. liquid pump	[W]	-20.67	21.26	20.66
Heating capacity – heating water	[kW]	11.322	7.445	7.659
Corrected heating capacity – heating water	[kW]	11.339	7.427	7.642
Uncertainty of corrected heating capacity	[kW]	± 0.221	± 0.129	± 0.133
Effective electric power input	[kW]	3.888	1.559	1.266
COP	[-]	2.917	4.763	6.035
Uncertainty of COP	[-]	± 0.057	± 0.083	± 0.105
Control settings	[rps]	70	33	30
Circulation pump settings – heating water	[-]	–	–	–

Temperature level		Low (reference water temperature 35 °C)	
Reference heating season		„A“ = average ($T_{designh} = -10\text{ °C}$)	
Assessment condition		D	TOL(E)
Specification of the assessment condition		A12/W27.87	A-10/W35
Date of testing		2024-05-30	2024-05-28
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]	27.91	35.02
Input heating water – temperature calculation	[°C]	22.91	30.02
Output heating water temperature	[°C]	27.91	35.02
Input heating water temperature	[°C]	22.91	30.02
Air temperature – dry bulb temperature	[°C]	12.00	-9.99
Air temperature – wet bulb temperature	[°C]	11.00	-11.07
Relative humidity	[%]	89.03	67.61
Barometric pressure	[kPa]	97.593	98.598
Ambient temperature	[°C]	11.91	-10.15
Secondary circuit pressure difference	[kPa]	5.507	-4.820
Efficiency of the secondary liquid pump	[-]	0.142	0.148
Volume flow rate of heating water	[m ³ ·h ⁻¹]	1.5207	2.0945
Density of heating water	[kg·m ⁻³]	996.2	994.0
Specific heat capacity of heating water	[kJ·kg ⁻¹ ·K ⁻¹]	4.177	4.175
Voltage	[V]	400.64	402.15
Total current	[A]	9.20	26.02
Overall power input	[kW]	1.159	3.965
Capacity correction of sec. liquid pump	[W]	14.037	-16.100
Power input correction of sec. liquid pump	[W]	16.36	-18.90
Heating capacity – heating water	[kW]	8.760	12.048
Corrected heating capacity – heating water	[kW]	8.746	12.065
Uncertainty of corrected heating capacity	[kW]	± 0.152	± 0.208
Effective electric power input	[kW]	1.142	3.984
COP	[-]	7.657	3.028
Uncertainty of COP	[-]	± 0.134	± 0.052
Control settings	[rps]	30	70
Circulation pump settings – heating water	[-]	–	–

Temperature level		Low (reference water temperature 35 °C)		
Reference heating season		„W“ = warmer ($T_{designh} = 2$ °C)	„C“ = colder ($T_{designh} = -22$ °C)	
Assessment condition		B, TOL(E), Tbiv(F)	D	Tbiv(F)
Specification of the assessment condition		A2/W35	A12/W28.1	A-10/W30.75
Date of testing		2024-05-31	2024-06-04	2024-06-03
Transient test procedure	YES / NO	YES	NO	YES
Average defrost time of 1 cycle	[min]	5.8	–	7.3
Average time of 1 cycle	[min]	60.8	–	101.2
Calculation time	[min]	121.5	70.1	202.5
Output heating water – temperature calculation	[°C]	34.22	28.14	30.07
Input heating water – temperature calculation	[°C]	30.05	23.11	25.76
Output heating water temperature	[°C]	35.09	28.14	30.81
Input heating water temperature	[°C]	30.07	23.11	25.79
Air temperature – dry bulb temperature	[°C]	2.04	12.00	-10.03
Air temperature – wet bulb temperature	[°C]	0.90	11.00	-11.07
Relative humidity	[%]	81.87	89.03	68.49
Barometric pressure	[kPa]	97.553	98.323	98.182
Ambient temperature	[°C]	2.01	11.89	-10.09
Secondary circuit pressure difference	[kPa]	-11.007	6.271	-1.911
Efficiency of the secondary liquid pump	[-]	0.207	0.146	0.126
Volume flow rate of heating water	[m ³ ·h ⁻¹]	2.5203	1.5087	2.0857
Density of heating water	[kg·m ⁻³]	994.3	996.1	995.5
Specific heat capacity of heating water	[kJ·kg ⁻¹ ·K ⁻¹]	4.175	4.177	4.176
Voltage	[V]	400.34	402.25	401.73
Total current	[A]	24.01	8.69	23.32
Overall power input	[kW]	3.779	1.170	3.601
Capacity correction of sec. liquid pump	[W]	-23.621	15.365	-8.940
Power input correction of sec. liquid pump	[W]	-31.51	17.99	-10.08
Heating capacity – heating water	[kW]	12.071	8.746	10.237
Corrected heating capacity – heating water	[kW]	12.095	8.730	10.246
Uncertainty of corrected heating capacity	[kW]	± 0.250	± 0.151	± 0.207
Effective electric power input	[kW]	3.810	1.152	3.611
COP	[-]	3.174	7.581	2.837
Uncertainty of COP	[-]	± 0.066	± 0.132	± 0.057
Control settings	[rps]	70	30	70
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	Indoor heat exchanger	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
	Outdoor air inlet	Outlet water temperature								
	[°C]	[°C]	[%]	[kW]	[kW]	[-]	[-]	[-]	[-]	[kW]
A	-7	34.00	88.46	11.34	11.339	2.917	0.900	1.00	2.917	–
B	2	30.00	53.85	6.90	7.427	4.763	0.900	1.00	4.763	–
C	7	29.10	34.62	4.44	7.642	6.035	0.986	0.58	5.977	0.0171
D	12	27.87	15.38	1.97	8.746	7.657	0.985	0.23	7.282	0.0171
TOL (E)	-10	35.00	100.00	12.82	12.065	3.028	0.900	1.00	3.028	–
Tbiv (F)	-7	34.00	88.46	11.34	11.339	2.917	0.900	1.00	2.917	–

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
- Variable water flow rate – secondary circuit

General formulas and derivation:

$$\begin{aligned}
 t_{\text{outlet, average}} &= t_{\text{inlet, capacity test}} + (t_{\text{outlet, capacity test}} - t_{\text{inlet, capacity test}}) \cdot CR & [^{\circ}\text{C}] \\
 t_{\text{outlet, average}} &= t_{\text{inlet, capacity test}} + (\Delta t) \cdot CR & [^{\circ}\text{C}] \\
 t_{\text{outlet, average}} &= t_{\text{outlet, capacity test}} - \Delta t + \Delta t \cdot CR & [^{\circ}\text{C}] \\
 t_{\text{outlet, capacity test}} &= t_{\text{outlet, average}} + \Delta t - \Delta t \cdot CR & [^{\circ}\text{C}]
 \end{aligned}$$

For variable flow:

$$\Delta t = 5$$

$$CR \cdot \Delta t = \text{Part load} / \text{Declared capacity} \cdot 5$$

$$t_{\text{outlet, capacity test, variable flow}} = t_{\text{outlet, average}} + 5 - \text{Part load} / \text{Declared capacity} \cdot 5$$

Measured data:

t _{outlet, average}	24.00	[°C]
Declared capacity	8.746	[kW]
Declared capacity standard rating condition A7/W35	–	[kW]
Part load	1.97	[kW]

Calculation of water temperature

$$t_{\text{outlet, capacity test, variable flow}} = 24 + 5 - 1.97 / 8.746 \cdot 5 = \underline{27.87} \quad [^{\circ}\text{C}]$$

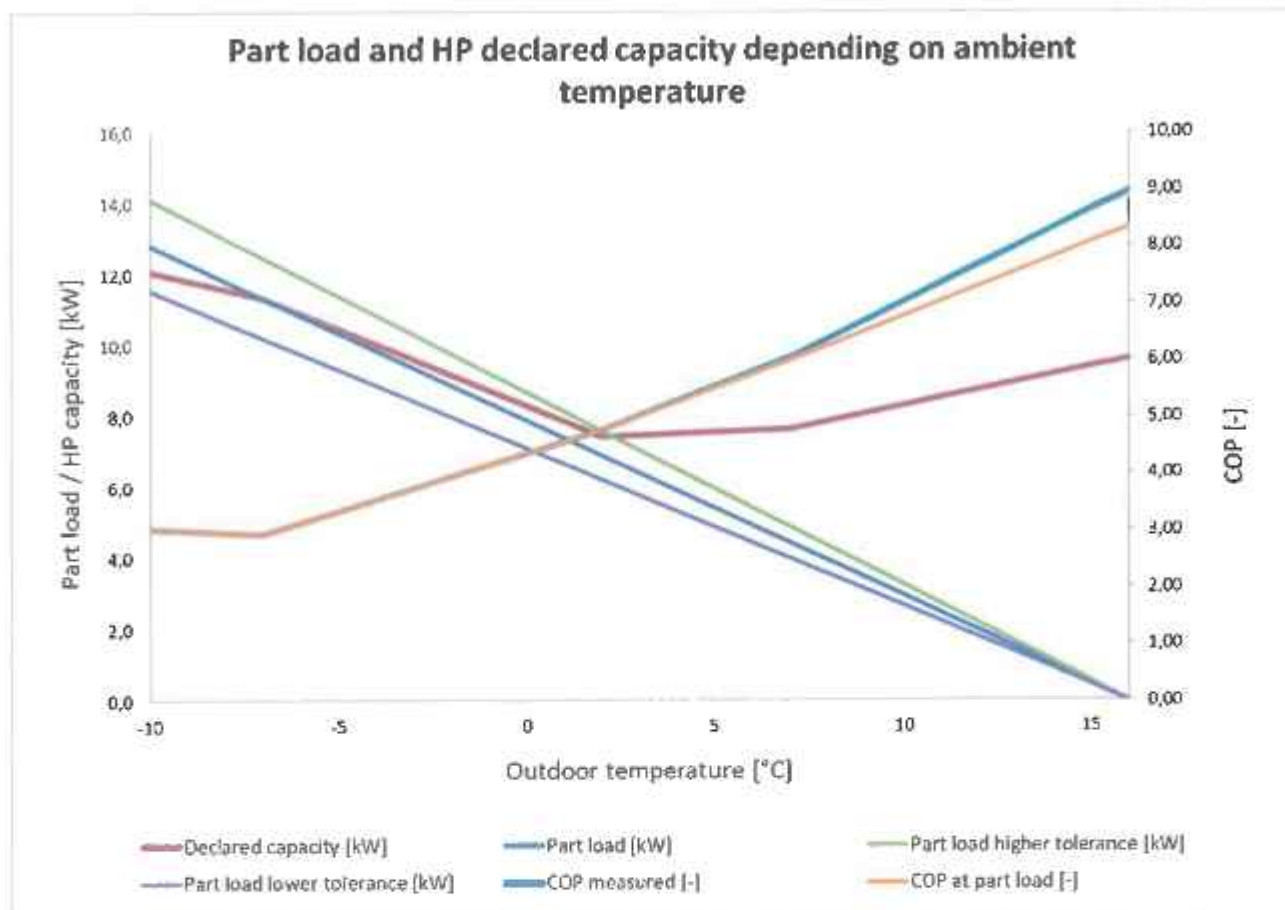
Calculation SCOP, SCOP_{on}, SCOP_{net}

- 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	COP _{bin} (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
	i	Tj	h _j		Ph(Tj)			elbu(Tj)	h _j x elbu(Tj)	COP _b in (Tj)	h _j x P h(Tj)		h _j x (P h(Tj) - elbu(Tj))	
	[-]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[-]	[kWh]	[kWh]	[kWh]	[kWh]
TOL(E)	21	-10	1	100.00	12.82	12.07	12.07	0.75	0.75	3.03	13	5	12	4
	22	-9	25	96.15	12.33	11.82	11.82	0.50	12.55	2.99	308	111	256	99
	23	-8	23	92.31	11.83	11.58	11.58	0.25	5.77	2.95	272	96	266	90
A, T _{bin} (F)	24	-7	24	88.46	11.34	11.34	11.34	0.00	0.00	2.92	272	93	272	93
	25	-6	27	84.62	10.85	10.90	10.85	0.00	0.00	3.12	293	94	293	94
	26	-5	66	80.77	10.35	10.47	10.35	0.00	0.00	3.33	704	212	704	212
	27	-4	91	76.92	9.86	10.04	9.86	0.00	0.00	3.53	897	254	697	254
	28	-3	89	73.08	9.37	9.60	9.37	0.00	0.00	3.74	834	223	834	223
	29	-2	165	69.23	8.87	9.17	8.87	0.00	0.00	3.94	1464	371	1464	371
	30	-1	173	65.38	8.38	8.73	8.38	0.00	0.00	4.15	1450	350	1450	350
	31	0	240	61.54	7.89	8.30	7.89	0.00	0.00	4.35	1893	435	1803	435
	32	1	280	57.69	7.40	7.86	7.40	0.00	0.00	4.56	2071	454	2071	454
B	33	2	320	53.85	6.90	7.43	6.90	0.00	0.00	4.76	2209	464	2209	464
	34	3	357	50.00	6.41	7.47	6.41	0.00	0.00	5.01	2288	457	2288	457
	35	4	355	46.15	5.92	7.51	5.92	0.00	0.00	5.25	2106	401	2106	401
	36	5	303	42.31	5.42	7.56	5.42	0.00	0.00	5.49	1643	299	1643	299
	37	6	330	38.46	4.93	7.60	4.93	0.00	0.00	5.73	1627	284	1627	284
C	38	7	326	34.62	4.44	7.64	4.44	0.00	0.00	5.98	1446	242	1446	242
	39	8	348	30.77	3.94	7.86	3.94	0.00	0.00	6.24	1373	220	1373	220
	40	9	335	26.92	3.45	8.08	3.45	0.00	0.00	6.50	1156	178	1156	178
	41	10	315	23.08	2.96	8.30	2.96	0.00	0.00	6.76	932	138	932	138
	42	11	215	19.23	2.47	8.53	2.47	0.00	0.00	7.02	530	75	530	75
D	43	12	169	15.38	1.97	8.75	1.97	0.00	0.00	7.28	333	46	333	46
	44	13	151	11.54	1.48	8.97	1.48	0.00	0.00	7.54	223	30	223	30
	45	14	105	7.69	0.99	9.19	0.99	0.00	0.00	7.80	104	13	104	13
	46	15	74	3.85	0.49	9.41	0.49	0.00	0.00	8.07	36	5	36	5
	Σ		4910							Σ	26477	5549	26458	5530
										SCOP _{on}	4.77		SCOP _{net}	4.76
													SCOP	4.77

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 NEXUS S17 EVI
Measuring equipment used:	see Chapter III

Design			Air / water – split				
Conditions specification according to ČSN 14825:2023	to EN	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			Variable		
Seasonal space heating efficiency	Heating	Average	η_s		143.2	%	
		Warmer	η_s		154.9	(Not tested) %	
		Colder	η_s		127.9	(Not tested) %	
Seasonal efficiency according to ČSN 14825:2023	Heating	Average	SCOP		3.66	–	
		Warmer	SCOP		3.95	(Not tested) –	
		Colder	SCOP		3.27	(Not tested) –	
Function	Cooling				Yes		
	Heating	Yes	Reference heating season	Average	Yes		
				Warmer	Yes		
				Colder	Yes		
Full heating load	Cooling		$P_{designc}$		–	kW	
	Heating	Average	$P_{designh}$		14.43	kW	
		Warmer	$P_{designh}$		13.23	kW	
		Colder	$P_{designh}$		17.55	kW	
Bivalent temperatures	Heating	Average	$T_{bivalent}$		-7	°C	
		Warmer	$T_{bivalent}$		2	°C	
		Colder	$T_{bivalent}$		-10	°C	
Operation temperatures limit	Heating	Average	TOL		-10	°C	
		Warmer	TOL		2	°C	
		Colder	TOL		-22	°C	
Seasonal power consumption according to ČSN EN 14825:2023	to	Cooling		Q_{CE}		–	kWh
		Heating	Average	Q_{HE}		8154	kWh
			Warmer	Q_{HE}		4476	(Not tested) kWh
			Colder	Q_{HE}		13220	(Not tested) kWh
Modes other than „active mode“		Off mode			P_{OFF}	17.0	W
		Thermostat off mode			P_{TO}	15.1	W
		Standby mode			P_{SB}	17.0	W
		Crankcase heater mode			P_{CK}	0.0	W

(Not tested): The technical data were declared by the Manufacturer and were not tested by the Testing Laboratory.

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}	0.0151	[kW]
P _{SB}	0.0170	[kW]
P _{CK}	0.0000	[kW]
P _{OFF}	0.0170	[kW]
P _{designh}	14.43	[kW]
SCOP _{ON}	3.66	[-]

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)

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

$$Q_H = 14.43 \cdot 2066 = 29812 \quad [kWh]$$

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

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

$$Q_{HE} = 29812 / 3.66 + 178 \cdot 0.0151 + 0 \cdot 0.017 + 178 \cdot 0 + 0 \cdot 0.017 = 8154 \quad [kWh]$$

7.2 General formula for calculation of reference SCOP

$$SCOP = Q_H / Q_{HE} \quad [-]$$

$$SCOP = 29812 / 8154 = 3.66 \quad [-]$$

7.1 Calculation of the seasonal space heating efficiency η_s

$$\Sigma F(i) = F(1) + F(2) \quad [-]$$

$$\Sigma F = 0.03 + 0 = 0.03 \quad [-]$$

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

$$\eta_s (A) = (1 / 2.5) \cdot 3.66 - 0.03 = \underline{1.432} \quad [-]$$

Temperature level		Medium (reference water temperature 55 °C)		
Reference heating season		„A“ = average ($T_{design,h} = -10\text{ °C}$)		
Assessment condition		A, $T_{biv}(F)$	B	C
Specification of the assessment condition		A-7/W52	A2/W42	A7/W38.46
Date of testing		2024-05-28	2024-05-29	2024-05-29
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]	52.01	41.99	38.39
Input heating water – temperature calculation	[°C]	44.02	33.99	30.39
Output heating water temperature	[°C]	52.01	41.99	38.39
Input heating water temperature	[°C]	44.02	33.99	30.39
Air temperature – dry bulb temperature	[°C]	-6.99	2.00	7.00
Air temperature – wet bulb temperature	[°C]	-8.00	1.01	6.01
Relative humidity	[%]	74.74	84.00	87.04
Barometric pressure	[kPa]	98.490	98.508	98.047
Ambient temperature	[°C]	-7.13	1.88	6.91
Secondary circuit pressure difference	[kPa]	33.276	40.179	40.179
Efficiency of the secondary liquid pump	[-]	0.255	0.223	0.218
Volume flow rate of heating water	[m ³ ·h ⁻¹]	1.3926	0.8285	0.7865
Density of heating water	[kg·m ⁻³]	987.4	991.6	992.9
Specific heat capacity of heating water	[kJ·kg ⁻¹ ·K ⁻¹]	4.178	4.175	4.175
Voltage	[V]	401.06	402.08	401.72
Total current	[A]	36.66	15.43	12.92
Overall power input	[kW]	5.305	2.167	1.617
Capacity correction of sec. liquid pump	[W]	37.577	32.211	31.427
Power input correction of sec. liquid pump	[W]	50.45	41.46	40.20
Heating capacity – heating water	[kW]	12.803	7.627	7.241
Corrected heating capacity – heating water	[kW]	12.765	7.595	7.210
Uncertainty of corrected heating capacity	[kW]	± 0.141	± 0.085	± 0.080
Effective electric power input	[kW]	5.254	2.126	1.577
COP	[-]	2.429	3.573	4.573
Uncertainty of COP	[-]	± 0.027	± 0.041	± 0.054
Control settings	[rps]	70	37	30
Circulation pump settings – heating water	[-]	–	–	–

Temperature level		Medium (reference water temperature 55 °C)	
Reference heating season		„A“ = average ($T_{designh} = -10\text{ °C}$)	
Assessment condition		D	TOL(E)
Specification of the assessment condition		A12/W35.87	A-10/W55
Date of testing		2024-05-30	2024-06-03
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]	35.84	54.97
Input heating water – temperature calculation	[°C]	27.84	46.97
Output heating water temperature	[°C]	35.84	54.97
Input heating water temperature	[°C]	27.84	46.97
Air temperature – dry bulb temperature	[°C]	12.00	-10.00
Air temperature – wet bulb temperature	[°C]	11.00	-10.95
Relative humidity	[%]	89.01	71.45
Barometric pressure	[kPa]	97.675	98.366
Ambient temperature	[°C]	11.92	-10.14
Secondary circuit pressure difference	[kPa]	39.824	34.606
Efficiency of the secondary liquid pump	[-]	0.231	0.252
Volume flow rate of heating water	[m ³ ·h ⁻¹]	0.9090	1.2953
Density of heating water	[kg·m ⁻³]	993.8	986.0
Specific heat capacity of heating water	[kJ·kg ⁻¹ ·K ⁻¹]	4.175	4.179
Voltage	[V]	401.32	401.56
Total current	[A]	11.49	38.24
Overall power input	[kW]	1.468	5.461
Capacity correction of sec. liquid pump	[W]	33.501	36.998
Power input correction of sec. liquid pump	[W]	43.56	49.45
Heating capacity – heating water	[kW]	8.369	11.903
Corrected heating capacity – heating water	[kW]	8.336	11.866
Uncertainty of corrected heating capacity	[kW]	± 0.093	± 0.131
Effective electric power input	[kW]	1.424	5.411
COP	[-]	5.853	2.193
Uncertainty of COP	[-]	± 0.070	± 0.025
Control settings	[rps]	30	70
Circulation pump settings – heating water	[-]	–	–

Temperature level		Medium (reference water temperature 55 °C)		
Reference heating season		„W“ = warmer ($T_{designh} = 2$ °C)	„C“ = colder ($T_{designh} = -22$ °C)	
Assessment condition		B, TOL(E), Tbiv(F)	C	Tbiv(F)
Specification of the assessment condition		A2/W55	A7/W35.47	A-10/W45.88
Date of testing		2024-05-31	2024-06-04	2024-06-03
Transient test procedure	YES / NO	YES	NO	NO
Average defrost time of 1 cycle	[min]	5.4	–	–
Average time of 1 cycle	[min]	84.6	–	–
Calculation time	[min]	169.3	70.0	70.0
Output heating water – temperature calculation	[°C]	53.98	35.45	45.88
Input heating water – temperature calculation	[°C]	46.96	27.45	37.88
Output heating water temperature	[°C]	55.02	35.45	45.88
Input heating water temperature	[°C]	47.02	27.45	37.88
Air temperature – dry bulb temperature	[°C]	2.15	7.00	-10.00
Air temperature – wet bulb temperature	[°C]	0.98	6.02	-11.07
Relative humidity	[%]	81.46	87.13	67.88
Barometric pressure	[kPa]	97.589	98.406	98.263
Ambient temperature	[°C]	2.26	6.90	-10.14
Secondary circuit pressure difference	[kPa]	28.912	40.179	34.424
Efficiency of the secondary liquid pump	[-]	0.257	0.220	0.252
Volume flow rate of heating water	[m ³ ·h ⁻¹]	1.6357	0.8014	1.3092
Density of heating water	[kg·m ⁻³]	986.4	993.9	990.0
Specific heat capacity of heating water	[kJ·kg ⁻¹ ·K ⁻¹]	4.179	4.175	4.176
Voltage	[V]	401.32	401.21	401.95
Total current	[A]	35.89	10.92	34.34
Overall power input	[kW]	5.535	1.510	4.687
Capacity correction of sec. liquid pump	[W]	37.811	31.707	37.091
Power input correction of sec. liquid pump	[W]	50.89	40.65	49.61
Heating capacity – heating water	[kW]	13.263	7.378	12.045
Corrected heating capacity – heating water	[kW]	13.225	7.347	12.008
Uncertainty of corrected heating capacity	[kW]	± 0.164	± 0.082	± 0.133
Effective electric power input	[kW]	5.484	1.469	4.638
COP	[-]	2.411	5.000	2.589
Uncertainty of COP	[-]	± 0.030	± 0.059	± 0.029
Control settings	[rps]	70	30	70
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	Indoor heat exchanger	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
	Outdoor air inlet	Outlet water temperature								
	[°C]	[°C]	[%]	[kW]	[kW]	[-]	[-]	[-]	[-]	[kW]
A	-7	52.00	88.46	12.77	12.765	2.429	0.900	1.00	2.429	–
B	2	42.00	53.85	7.77	7.595	3.573	0.900	1.00	3.573	–
C	7	38.46	34.62	5.00	7.210	4.573	0.990	0.69	4.554	0.0151
D	12	35.96	15.38	2.22	8.700	5.853	0.990	0.26	5.684	0.0151
TOL (E)	-10	55.00	100.00	14.43	11.866	2.193	0.900	1.00	2.193	–
Tbiv (F)	-7	52.00	88.46	12.77	12.765	2.490	0.900	1.00	2.490	–

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
- Variable water flow rate – secondary circuit

General formulas and derivation:

$$\begin{aligned}
 t_{\text{outlet, average}} &= t_{\text{inlet, capacity test}} + (t_{\text{outlet, capacity test}} - t_{\text{inlet, capacity test}}) \cdot CR & [^{\circ}\text{C}] \\
 t_{\text{outlet, average}} &= t_{\text{inlet, capacity test}} + (\Delta t) \cdot CR & [^{\circ}\text{C}] \\
 t_{\text{outlet, average}} &= t_{\text{outlet, capacity test}} - \Delta t + \Delta t \cdot CR & [^{\circ}\text{C}] \\
 t_{\text{outlet, capacity test}} &= t_{\text{outlet, average}} + \Delta t - \Delta t \cdot CR & [^{\circ}\text{C}]
 \end{aligned}$$

For variable flow:

$$\Delta t = 8$$

$$CR \cdot \Delta t = \text{Part load} / \text{Declared capacity} \cdot 8$$

$$t_{\text{outlet, capacity test, variable flow}} = t_{\text{outlet, average}} + 8 - \text{Part load} / \text{Declared capacity} \cdot 8$$

Measured data:

$t_{\text{outlet, average}}$	30.00	[°C]
Declared capacity	8.700	[kW]
Declared capacity standard rating condition A7/W55	–	[kW]
Part load	2.22	[kW]

Calculation of water temperature

$$t_{\text{outlet, capacity test, variable flow}} = 30 + 8 - 2.22 / 8.7 \cdot 8 = \underline{\underline{35.96}} \quad [^{\circ}\text{C}]$$

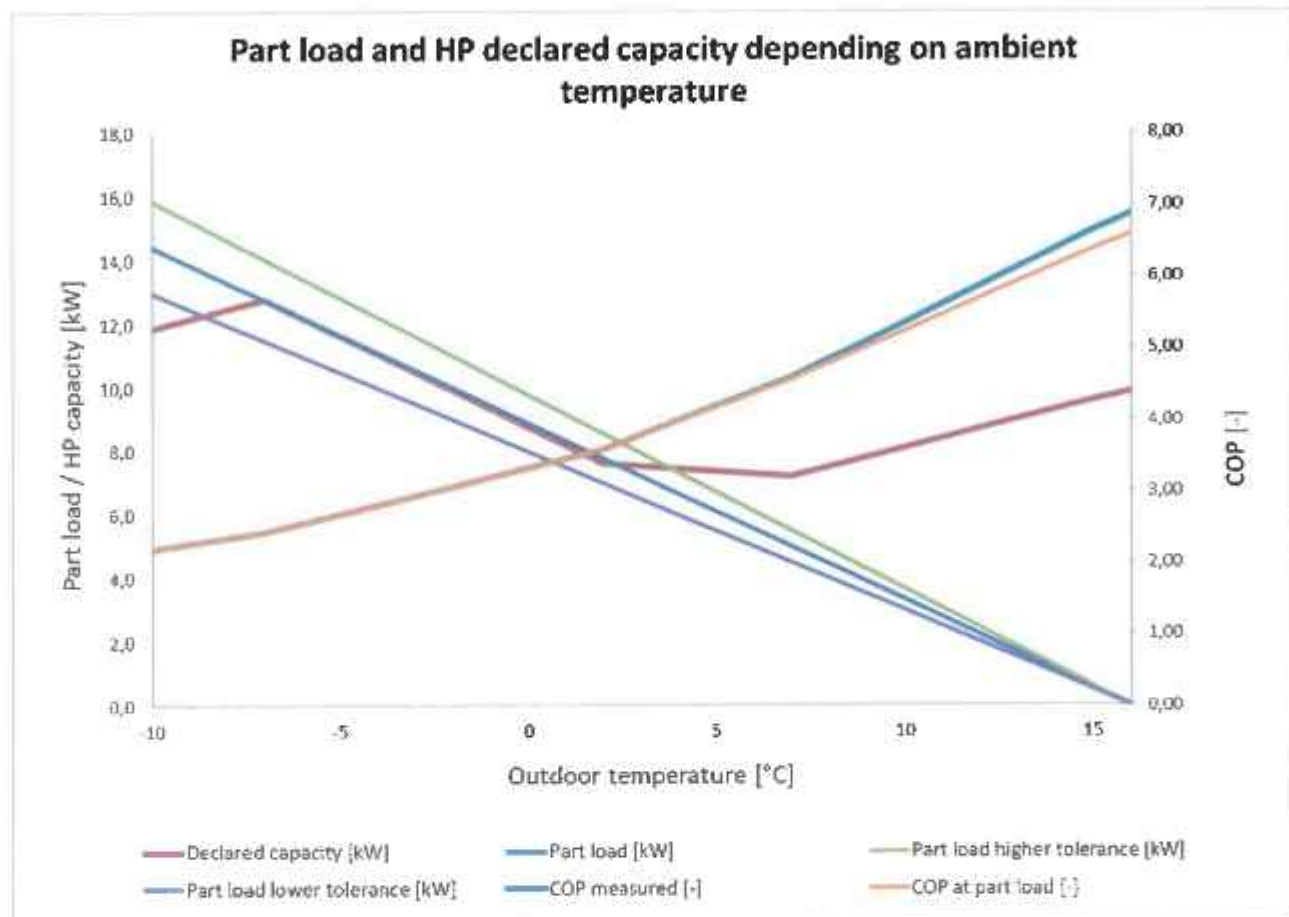
Calculation SCOP, SCOP_{cr}, SCOP_{net}

- 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	h		Ph(Tj)			elbu(Tj)	h _j x elbu(Tj)	COP _b in (Tj)	h _j x P _{h(Tj)}		h _j x (P _{h(Tj)} - elbu(Tj))		
	[–]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[–]	[kWh]	[kWh]	[kWh]	[kWh]	
TOL(E)	21	-10	1	100.00	14.43	11.87	11.87	2.56	2.56	2.19	14	8	12	5	
	22	-9	25	96.15	13.88	12.17	12.17	1.71	42.73	2.27	347	177	304	134	
	23	-8	23	92.31	13.32	12.47	12.47	0.85	19.66	2.35	306	142	287	122	
A _{cr} Tbhw(F)	24	-7	24	88.46	12.77	12.77	12.77	0.00	0.00	2.43	306	126	306	126	
	25	-6	27	84.62	12.21	12.19	12.19	0.00	0.00	2.56	330	129	330	129	
	26	-5	59	80.77	11.66	11.62	11.62	0.00	0.00	2.68	793	295	793	295	
	27	-4	91	76.92	11.10	11.04	11.04	0.00	0.00	2.81	1010	359	1010	359	
	28	-3	89	73.08	10.56	10.47	10.47	0.00	0.00	2.94	939	319	939	319	
	29	-2	165	69.23	9.99	9.89	9.89	0.00	0.00	3.06	1648	538	1648	538	
	30	-1	173	65.38	9.44	9.32	9.32	0.00	0.00	3.19	1632	511	1632	511	
	31	0	240	61.54	8.88	8.74	8.74	0.00	0.00	3.32	2131	642	2131	642	
	32	1	280	57.69	8.33	8.17	8.17	0.00	0.00	3.45	2331	676	2331	676	
B	33	2	320	53.85	7.77	7.60	7.60	0.00	0.00	3.57	2486	696	2486	696	
	34	3	357	50.00	7.22	7.52	7.22	0.00	0.00	3.77	2578	683	2576	683	
	35	4	396	46.15	6.66	7.44	6.66	0.00	0.00	3.87	2371	596	2371	596	
	36	5	303	42.31	6.11	7.36	6.11	0.00	0.00	4.16	1850	445	1850	445	
	37	6	330	38.46	5.55	7.28	5.55	0.00	0.00	4.36	1832	420	1632	420	
C	38	7	326	34.82	5.00	7.21	5.00	0.00	0.00	4.55	1628	358	1628	358	
	39	8	346	30.77	4.44	7.51	4.44	0.00	0.00	4.78	1545	323	1545	323	
	40	9	335	26.92	3.89	7.61	3.89	0.00	0.00	5.01	1301	260	1301	260	
	41	10	315	23.08	3.33	8.10	3.33	0.00	0.00	5.23	1049	200	1049	200	
	42	11	215	19.23	2.78	8.40	2.78	0.00	0.00	5.46	597	109	597	109	
D	43	12	169	15.38	2.22	8.70	2.22	0.00	0.00	5.68	375	66	375	66	
	44	13	151	11.54	1.67	9.00	1.67	0.00	0.00	5.91	251	43	251	43	
	45	14	105	7.69	1.11	9.30	1.11	0.00	0.00	6.14	117	19	117	19	
	46	15	74	3.85	0.56	9.59	0.56	0.00	0.00	6.36	41	6	41	6	
		Σ	4910								Σ	29807	8150	29742	8085
											SCOP _{cr}	3.66	SCOP _{net}	3.68	
													SCOP	3.66	

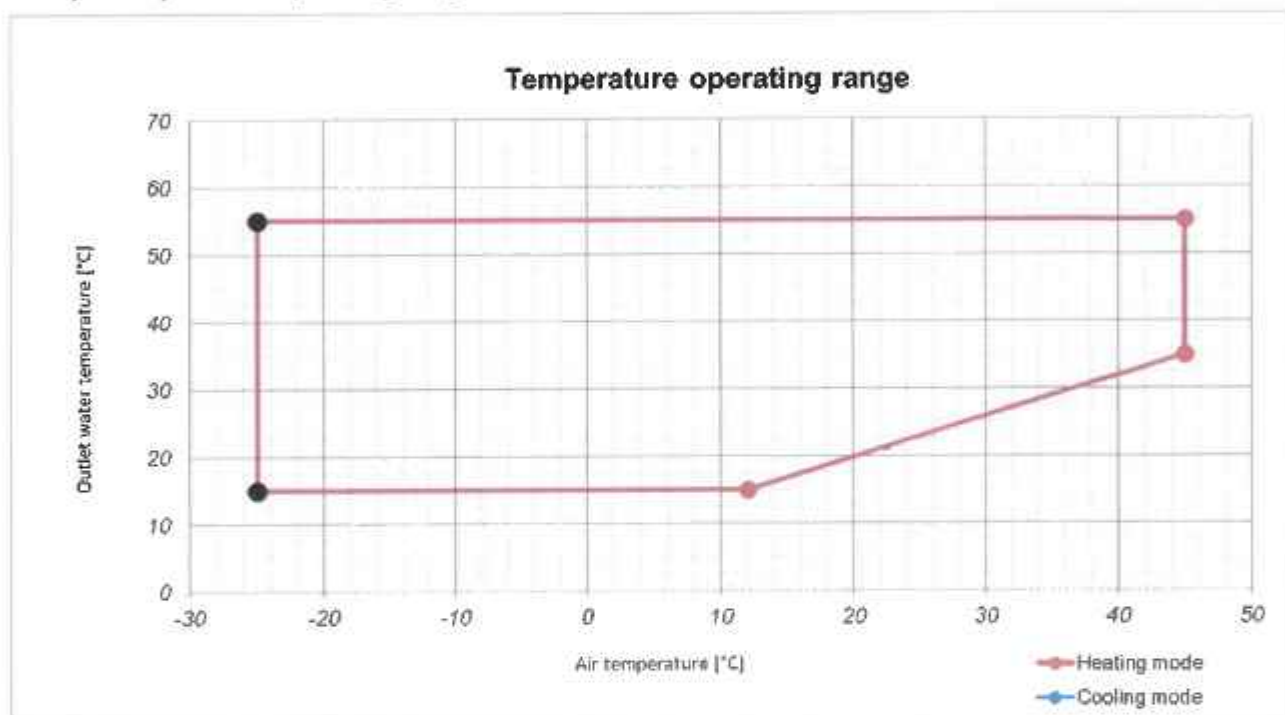
Part load performance diagram

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



Test objective:	Safety tests
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 14511-4:2023
Sample tested:	Heat pump NEXUS S17 EVI
Measuring equipment used:	see Chapter III

1) Temperature operating range



Test point	Inlet air dry bulb temperature [°C]		Outlet heating water temperature [°C]		Water flow rate in condenser [m³/h]	Note
Heating mode						
1.	A	-25	W	15	Minimum	Minimum water flow rate: 0.7865 m³·h⁻¹ Maximum water flow rate: 2.8865 m³·h⁻¹
2.	A	-25	W	55	Minimum	

Heat pump NEXUS S17 EVI is fully operational in the temperature operating range.

Starting and operating tests (heating mode)

Test according to Article 4.2.1.2 of ČSN EN 14511-4:2023

Operational requirements conditions for air-to-water units					
Test point	Inlet temperature at outdoor heat exchanger (°C)	Inlet temperature at indoor heat exchanger (°C)	Water flow rate at indoor heat exchanger	Voltage (V)	Test result
1 (starting)	Lower limit of use	Lower limit of use	minimum	Rated voltage	+
2 (operating)	Lower limit of use	Upper limit of use	minimum	Rated voltage	+

Evaluation: +... For a starting test, the unit shall start and operate during 15 min, for an operating test, the unit shall be able to operate during 1 h, without tripping of the motor overload protective devices.

-... The unit did not fulfill test requirements.

0... The requirement does not apply to the product concerned.

x... Test was not required.

Starting and operating tests (cooling mode)

Test according to Article 4.2.1.3 of ČSN EN 14511-4:2023

Operational requirements conditions for air-to-water units					
Test point	Inlet temperature at outdoor heat exchanger (°C)	Inlet temperature at indoor heat exchanger (°C)	Water flow rate at indoor heat exchanger	Voltage (V)	Test result
1 (starting)	Lower limit of use	Lower limit of use	minimum	Rated voltage	x
2 (starting)	Upper limit of use	Upper limit of use	maximum	Rated voltage	x

Evaluation: +... For a starting test, the unit shall start and operate during 15 min, without tripping of the motor overload protective devices.

-... The unit did not fulfill test requirements.

0... The requirement does not apply to the product concerned.

x... Test was not required.

2) Outside the operating range

Requirements for outside the operating range	Requirement specification	Test result	Note
If operating outside the temperature range can cause damage to the unit, it shall be provided with safety devices which ensure that the unit suffers no damage when the operating limits of use indicated by the manufacturer are exceeded and remains capable of operating when coming back within these limits. A safety device that does not automatically reset may trip provided that a warning device is fitted. The manufacturer shall indicate any safety devices provided and their operating conditions according to 7.2.3.	ČSN EN 14511-4:2023 Art. 4.3	x	-

Evaluation: +... The unit fulfills test requirements.

-... The unit did not fulfill test requirements.

0... The requirement does not apply to the product concerned.

x... Test was not required.

3) Freeze-up test in cooling mode

Air-to-air and water(brine)-to-air units

Required operating conditions	Test result	Note
Test according to Article 4.4 of ČSN EN 14511-4:2023	0	-

Evaluation:	+...	After the unit has operated for 6 hours or after the last freeze up cycle has been completed after these 6 h, the following requirements shall be fulfilled:
		- no ice shall have accumulated on the evaporator;
		- no ice shall drip from the unit;
		- no water shall drip or be blown off the unit into the room.
	-...	The unit did not fulfill test requirements.
	0...	The requirement does not apply to the product concerned.
	x...	Test was not required.

4) Shutting off the heat transfer medium flows

Required operating conditions	Test result	Note
Test for section a) Art. 4.5 ČSN EN 14511-4:2023 – heating	+	Unit ran with lower capacity, defrosted, after restart original parameters
Test for section a) Art. 4.5 ČSN EN 14511-4:2023 – cooling	x	–
Test for section b) Art. 4.5 ČSN EN 14511-4:2023 – heating	+	Unit shut off immediately, after restart original parameters
Test for section b) Art. 4.5 ČSN EN 14511-4:2023 – cooling	x	–
Test for section c) Art. 4.5 ČSN EN 14511-4:2023	0	–

Evaluation:	+...	The unit shall remain capable of operating after restoration of the flow rates for 30 min once the compressor has restarted.
	-...	The unit did not fulfill test requirements.
	0...	The requirement does not apply to the product concerned.
	x...	Test was not required.

5) Complete power supply failure

Required operating conditions	Test result	Note
Test according to Article 4.6 of ČSN EN 14511-4:2023	+	–

Evaluation:	+...	The unit has to restart automatically within 30 min. When manufacturer states that the unit does not automatically restart, fault detection is necessary. The unit is checked for any damage sustained during the test and if any safety devices have operated during the test.
	-...	The unit did not fulfill test requirements.
	0...	The requirement does not apply to the product concerned.
	x...	Test was not required.

6) Condensate draining and enclosure sweat test

Air-to-air and water(brine)-to-air units

Required operating conditions	Test result	Note
Test according to Article 4.7 of ČSN EN 14511-4:2023	0	–

Evaluation:	+...	During the test of 4 hours no condensed water shall drip, run or blow off the unit except through the drain. For indoor units, drain holes shall be provided with suitable pipe connection, the minimum diameter of which shall be 12 mm.
	-...	The unit did not fulfill test requirements.
	0...	The requirement does not apply to the product concerned.
	x...	Test was not required.

Test objective:	Out of accredited tests – SCOP calculations
Exact name of the test procedure:	SCOP calculations – based on values provided by the customer
Test method:	ČSN EN 14825:2023
Sample tested:	Heat pump NEXUS S17 EVI

Data for SCOP calculation

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „W“ – warmer

	Outdoor heat exchanger	Indoor heat exchanger	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
	Outdoor air inlet	Outlet water temperature								
	[°C]	[°C]	[%]	[kW]	[kW]	[-]	[-]	[-]	[-]	[kW]
A	–	–	–	–	–	–	–	–	–	–
B	2	35.00	100.00	12.10	12.095	3.810	0.900	1.00	3.810	–
C	7	31.00	64.29	7.78	7.650	5.300	0.900	1.00	5.300	–
D	12	29.02	28.57	3.46	8.720	5.820	0.989	0.40	5.721	0.0171
TOL (E)	2	35.00	100.00	12.10	12.095	3.810	0.900	1.00	3.810	–
Tbiv (F)	2	35.00	100.00	12.10	12.095	3.810	0.900	1.00	3.810	–

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

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „W“ – warmer

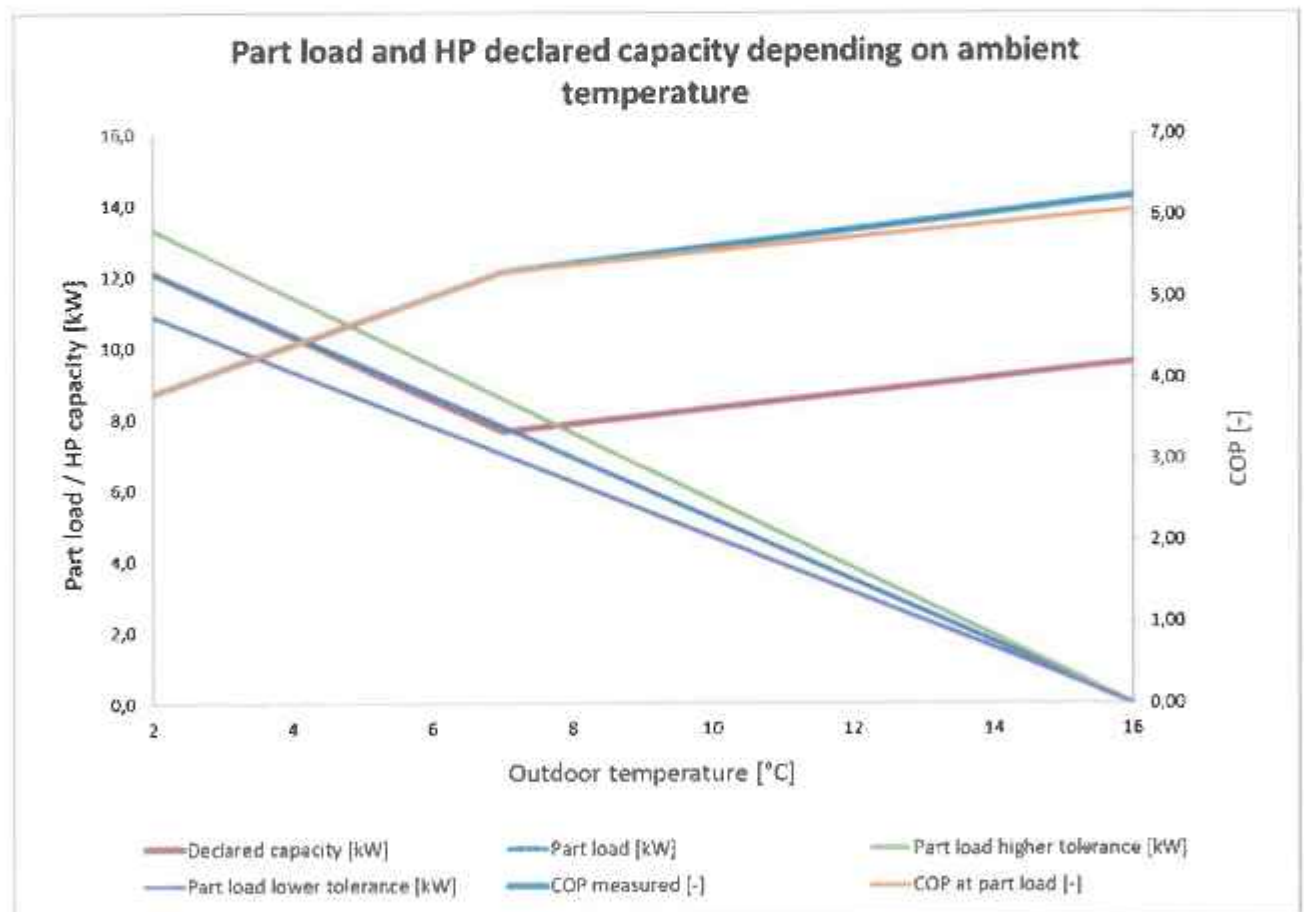
	B _{in}	Outdoor temp. (dry bulb)	Hours	Part load ratio	Heat load	Capacity of HP	Heat load covered by heat pump	Resistive heat elbu (Tj)	Annual resistive heat	COPbin (Tj)	Annual heating demand	Annual power input including electric back up heating	Net annual heating capacity	Net annual power input without electric back up heating
	J	T _j	t _j		P _{H(Tj)}			elbu _(Tj)	t _j x elbu _(Tj)	COP bin (Tj)	t _j x P _{H(Tj)}		t _j x (P _{H(Tj)} - elbu _(Tj))	
	[-]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[-]	[kWh]	[kWh]	[kWh]	[kWh]
B, TOL(E), Tbiv(F)	33	2	3	100.00	12.10	12.10	12.10	0.00	0.00	3.81	36	10	36	10
	34	3	22	92.86	11.23	11.21	11.21	0.00	0.00	4.11	247	60	247	60
	35	4	63	85.71	10.37	10.32	10.32	0.00	0.00	4.41	653	148	653	148
	36	5	63	78.57	9.50	9.43	9.43	0.00	0.00	4.70	599	127	599	127
	37	6	175	71.43	8.64	8.54	8.54	0.00	0.00	5.00	1512	302	1512	302
C	38	7	162	64.29	7.78	7.65	7.65	0.00	0.00	5.30	1260	238	1260	238
	39	8	259	57.14	6.91	7.86	6.91	0.00	0.00	6.38	1790	332	1790	332
	40	9	360	50.00	6.05	8.06	6.05	0.00	0.00	5.47	2177	398	2177	398

	41	10	428	42.86	5.18	8.29	5.18	0.00	0.00	5.55	2219	400	2219	400
	42	11	430	35.71	4.32	8.51	4.32	0.00	0.00	5.64	1857	330	1857	330
D	43	12	503	28.57	3.46	8.72	3.46	0.00	0.00	5.72	1738	304	1738	304
	44	13	444	21.43	2.59	8.93	2.59	0.00	0.00	5.80	1151	198	1151	198
	45	14	384	14.29	1.73	9.15	1.73	0.00	0.00	5.89	663	113	663	113
	46	15	294	7.14	0.86	9.36	0.86	0.00	0.00	5.97	254	43	254	43
	Σ		3590							Σ	16158	3002	16158	3002

SCOP _{on}	5.38	SCOP _{net}	5.38
SCOP		5.36	

Part load performance diagram

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „W“ – warmer



Data for SCOP calculation

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „C“ – colder

	Outdoor heat exchanger	Indoor heat exchanger	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
	Outdoor air inlet	Outlet water temperature								
	[°C]	[°C]	[%]	[kW]	[kW]	[-]	[-]	[-]	[-]	[kW]
A	-7	30.00	60.53	9.06	8.900	3.050	0.900	1.00	3.050	–
B	2	27.94	36.84	5.52	6.800	4.900	0.988	0.81	4.886	0.0171
C	7	27.70	23.68	3.55	7.700	6.100	0.986	0.46	6.005	0.0171
D	12	28.10	10.53	1.58	8.730	7.581	0.985	0.18	7.102	0.0171
TOL (E)	-22	35.00	100.00	14.97	7.100	2.000	0.900	1.00	2.000	–
Tbiv (F)	-10	30.75	68.42	10.25	10.246	2.837	0.900	1.00	2.837	–
G	-15	32.00	81.58	12.22	8.600	2.400	0.900	1.00	2.400	–

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

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „C“ – colder

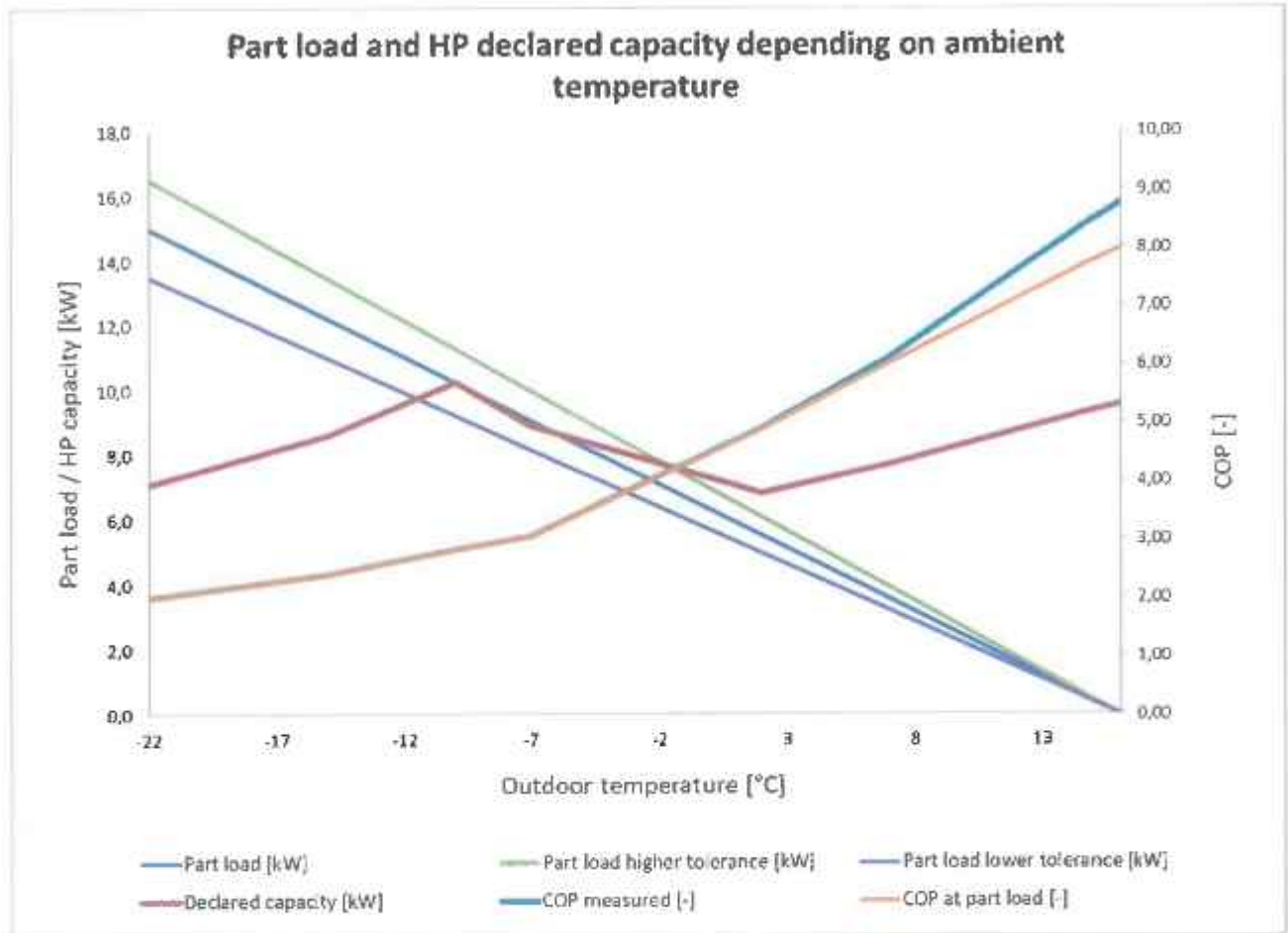
Bin	Outdoor temp. (dry bulb)	Hours	Part load ratio	Heat load	Capacity of HP	Heat load covered by heat pump	Resistive heat elbu (Tj)	Annual resistive heat	COPbin (Tj)	Annual heating demand	Annual power input including electric back up heating	Net annual heating capacity	Net annual power input without electric back up heating
j	Tj	hj		P _{HTj}			elbu _{HTj}	h _j x elbu _{HTj}	COP bin (Tj)	h _j x P _{NTj}		h _j x (P _{HTj} - elbu _{HTj})	
[-]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[-]	[kWh]	[kWh]	[kWh]	[kWh]
TOL(E)	9	-22	1	100.00	14.97	7.10	7.10	7.87	7.87	2.00	15	11	7
	10	-21	6	97.37	14.58	7.31	7.31	7.27	43.60	2.06	67	65	44
	11	-20	13	94.74	14.19	7.53	7.53	6.66	86.56	2.11	184	133	98
	12	-19	17	92.11	13.79	7.74	7.74	6.05	102.85	2.17	234	163	132
	13	-18	19	89.47	13.40	7.96	7.96	5.44	103.39	2.23	265	171	151
	14	-17	26	85.84	13.00	8.17	8.17	4.83	125.66	2.29	338	219	212
	15	-16	39	84.21	12.61	8.39	8.39	4.22	164.77	2.34	492	304	327
G	16	-15	41	81.58	12.22	8.60	8.60	3.62	148.27	2.40	501	295	353
	17	-14	35	78.95	11.82	8.93	8.93	2.99	101.26	2.49	414	227	313
	18	-13	52	76.32	11.43	9.26	9.26	2.17	112.83	2.57	594	300	461
	19	-12	37	73.68	11.03	9.59	9.59	1.45	53.52	2.66	408	167	355
	20	-11	41	71.05	10.64	9.92	9.92	0.72	29.65	2.75	436	178	407

Tbiv(F)	21	-10	43	68.42	10.25	10.25	10.25	0.00	0.00	2.84	441	155	441	155
	22	-9	54	65.79	9.85	9.80	9.80	0.00	0.00	2.91	532	183	532	183
	23	-8	90	63.16	9.46	9.35	9.35	0.00	0.00	2.98	851	286	851	286
A	24	-7	125	60.53	9.06	8.90	8.90	0.00	0.00	3.05	1133	371	1133	371
	25	-6	169	57.89	8.67	8.67	8.67	0.00	0.00	3.25	1465	450	1465	450
	26	-5	195	55.26	8.28	8.43	8.28	0.00	0.00	3.46	1614	467	1614	467
	27	-4	278	52.63	7.88	8.20	7.88	0.00	0.00	3.66	2191	598	2191	598
	28	-3	306	50.00	7.49	7.97	7.49	0.00	0.00	3.87	2291	593	2291	593
	29	-2	454	47.37	7.09	7.73	7.09	0.00	0.00	4.07	3220	791	3220	791
	30	-1	385	44.74	6.70	7.50	6.70	0.00	0.00	4.27	2579	603	2579	603
	31	0	490	42.11	6.31	7.27	6.31	0.00	0.00	4.46	3090	690	3090	690
	32	1	533	39.47	5.91	7.03	5.91	0.00	0.00	4.68	3151	673	3151	673
B	33	2	380	36.84	5.52	6.80	5.52	0.00	0.00	4.89	2096	429	2096	429
	34	3	228	34.21	5.12	6.98	5.12	0.00	0.00	5.11	1168	229	1168	229
	35	4	261	31.58	4.73	7.16	4.73	0.00	0.00	5.33	1234	231	1234	231
	36	5	279	28.95	4.33	7.34	4.33	0.00	0.00	5.56	1209	218	1209	218
	37	6	229	26.32	3.94	7.52	3.94	0.00	0.00	5.78	902	156	902	156
C	38	7	269	23.68	3.55	7.70	3.55	0.00	0.00	6.00	954	159	954	159
	39	8	223	21.05	3.15	7.91	3.15	0.00	0.00	6.22	735	118	735	118
	40	9	230	18.42	2.76	8.11	2.76	0.00	0.00	6.44	634	98	634	98
	41	10	243	15.79	2.36	8.32	2.36	0.00	0.00	6.66	575	86	575	86
	42	11	191	13.16	1.97	8.52	1.97	0.00	0.00	6.88	376	55	376	55
D	43	12	146	10.53	1.58	8.73	1.58	0.00	0.00	7.10	230	32	230	32
	44	13	150	7.89	1.18	8.94	1.18	0.00	0.00	7.32	177	24	177	24
	45	14	97	5.26	0.79	9.14	0.79	0.00	0.00	7.54	76	10	76	10
	46	15	61	2.63	0.39	9.35	0.39	0.00	0.00	7.76	24	3	24	3
Σ			6446							Σ	36910	9963	35829	6083

SCOPon	3.70	SCOPnet	4.03
		SCOP	3.70

Part load performance diagram

- Low temperature application (reference water temperature 35 °C)
- Reference heating season „C“ – colder



Data for SCOP calculation

- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „W“ – warmer

	Outdoor heat exchanger	Indoor heat exchanger	Part load ratio	Part load	DC Declared capacity	COPd at declared capacity	Cdh degradation coefficient	CR	COPbin (Ti)	Eff. power input of compressor off state
	Outdoor air inlet	Outlet water temperature								
	[°C]	[°C]								
A	–	–	–	–	–	–	–	–	–	–
B	2	55.00	100.00	13.23	13.225	2.411	0.900	1.00	2.411	–
C	7	46.00	64.29	8.50	8.200	3.100	0.900	1.00	3.100	–
D	12	38.44	28.57	3.78	8.500	5.400	0.990	0.44	5.336	0.0151

TOL (E)	2	55.00	100.00	13.23	13.225	2.411	0.900	1.00	2.411	–
Tbiv (F)	2	55.00	100.00	13.23	13.225	2.411	0.900	1.00	2.411	–

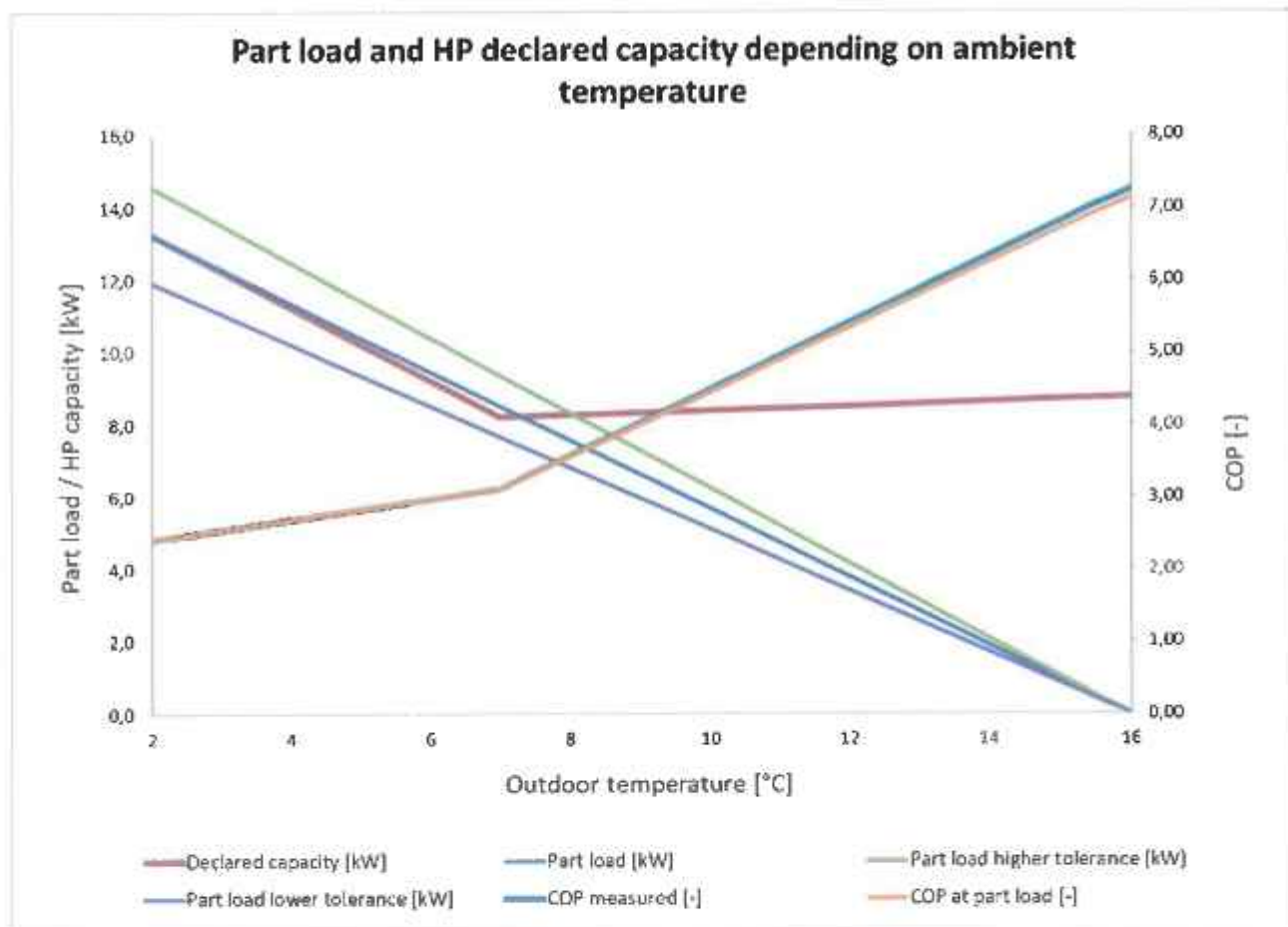
Calculation SCOP, SCOP_{on}, SCOP_{net}

- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „W” – warmer

	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	T _e	h _j		P _{h(j)}			elbu _(Tj)	h _j x elbu _(Tj)	COP bin (Tj)	h _j x P _{h(Tj)}		h _j x (P _{h(Tj)} - elbu _(Tj))	
	[–]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[–]	[kWh]	[kWh]	[kWh]	[kWh]
B, TOL(E), Tbiv(F)	33	2	3	100.00	13.23	13.23	13.23	0.00	0.00	2.41	40	16	40	16
	34	3	22	92.86	12.28	12.22	12.22	0.00	0.00	2.55	270	106	270	106
	35	4	63	85.71	11.34	11.22	11.22	0.00	0.00	2.69	714	286	714	286
	36	5	63	78.57	10.38	10.21	10.21	0.00	0.00	2.82	656	232	656	232
	37	6	175	71.43	9.45	9.21	9.21	0.00	0.00	2.96	1653	558	1653	558
C	38	7	162	64.29	8.50	8.20	8.20	0.00	0.00	3.10	1377	444	1377	444
	39	8	259	57.14	7.56	7.26	7.56	0.00	0.00	3.55	1957	552	1957	552
	40	9	360	50.00	6.61	6.32	6.61	0.00	0.00	3.99	2381	590	2381	590
	41	10	428	42.86	5.67	5.38	5.67	0.00	0.00	4.44	2426	546	2426	546
	42	11	430	35.71	4.72	4.44	4.72	0.00	0.00	4.89	2031	415	2031	415
D	43	12	503	28.57	3.78	3.50	3.78	0.00	0.00	5.34	1901	356	1901	356
	44	13	444	21.43	2.83	2.56	2.83	0.00	0.00	5.76	1258	218	1258	218
	45	14	384	14.29	1.89	1.62	1.89	0.00	0.00	6.23	725	116	725	116
	46	15	294	7.14	0.94	0.68	0.94	0.00	0.00	6.68	278	42	278	42
Σ		3590								Σ	17666	4464	17666	4464
											SCOPon	3.96	SCOPnet	3.96
													SCOP	3.95

Part load performance diagram

- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „W“ – warmer



Data for SCOP calculation

- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „C“ – colder

	Outdoor heat exchanger	Indoor heat exchanger	Part load ratio	Part load	DC Declared capacity	COPd at declared capacity	Cdh degradation coefficient	CR	COPbin (Ti)	Eff. power input of compressor off state
	Outdoor air inlet	Outlet water temperature								
	[°C]	[°C]								
A	-7	44.00	60.53	10.62	10.900	2.720	0.900	1.00	2.720	—
B	2	37.00	36.84	6.47	6.700	4.330	0.900	1.00	4.330	—
C	7	35.47	23.68	4.16	7.347	5.000	0.990	0.57	4.961	0.0151
D	12	34.32	10.53	1.85	8.780	5.910	0.990	0.21	5.693	0.0151
TOL (E)	-22	55.00	100.00	17.55	6.200	1.800	0.900	1.00	1.800	—

Tbiv (F)	-10	45.88	68.42	12.01	12.008	2.589	0.900	1.00	2.589	–
G	-15	49.00	81.58	14.32	9.100	2.140	0.900	1.00	2.140	–

Calculation SCOP, SCOP_{oil}, SCOP_{net}

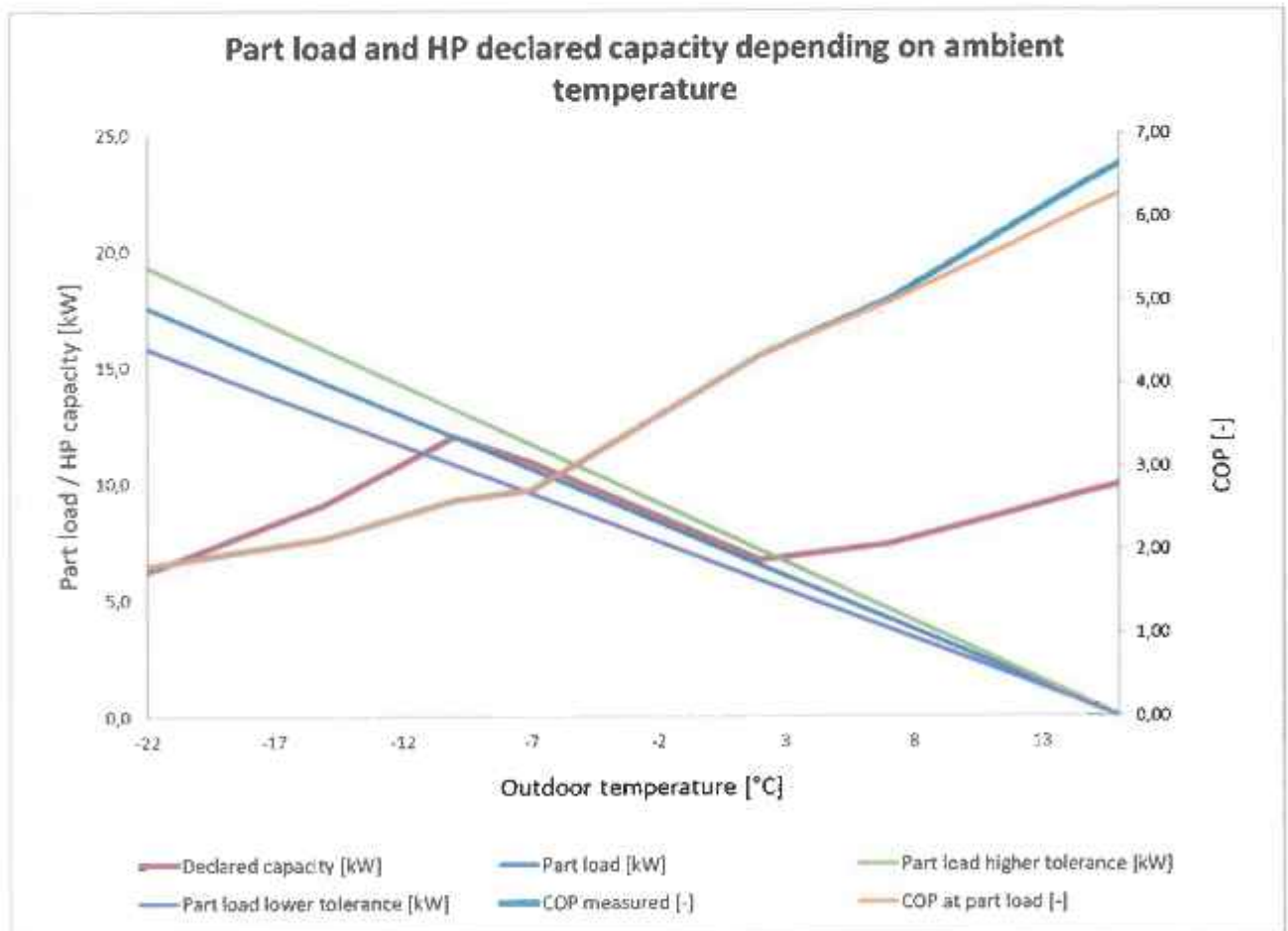
- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „C” – colder

	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		P _{h(Tj)}			e _{lbu(Tj)}	h _j x e _{lbu(Tj)}	COP bin (Tj)	h _j x P _{h(Tj)}		h _j x (P _{h(Tj)} - e _{lbu(Tj)})	
	[-]	[°C]	[h]	[%]	[kW]	[kW]	[kW]	[kW]	[kWh]	[-]	[kWh]	[kWh]	[kWh]	[kWh]
TOL (E)	9	-22	1	100.00	17.55	6.20	6.20	11.35	11.35	1.80	18	15	6	3
	10	-21	6	97.37	17.09	6.61	6.61	10.47	62.84	1.85	103	84	40	21
	11	-20	13	94.74	16.63	7.03	7.03	9.60	124.77	1.90	216	173	91	48
	12	-19	17	92.11	16.16	7.44	7.44	8.72	148.27	1.95	275	213	127	65
	13	-18	19	89.47	15.70	7.86	7.86	7.85	149.07	1.99	298	224	149	75
	14	-17	26	86.84	15.24	8.27	8.27	6.97	181.21	2.04	396	286	215	105
	15	-16	39	84.21	14.78	8.69	8.69	6.09	237.64	2.09	576	400	339	162
G	16	-15	41	81.58	14.32	9.10	9.10	5.22	213.91	2.14	587	388	373	174
	17	-14	35	78.95	13.86	9.68	9.68	4.17	146.08	2.23	485	298	339	152
	18	-13	52	76.32	13.39	10.26	10.26	3.13	162.78	2.32	696	393	534	230
	19	-12	37	73.68	12.93	10.84	10.84	2.09	77.22	2.41	478	244	401	167
	20	-11	41	71.05	12.47	11.43	11.43	1.04	42.78	2.50	511	230	468	187
Tbiv (F)	21	-10	43	68.42	12.01	12.01	12.01	0.00	0.00	2.59	516	199	516	199
	22	-9	54	65.79	11.55	11.64	11.55	0.00	0.00	2.63	623	237	623	237
	23	-8	90	63.16	11.08	11.27	11.08	0.00	0.00	2.68	998	373	998	373
A	24	-7	125	60.53	10.62	10.90	10.62	0.00	0.00	2.72	1328	488	1328	488
	25	-6	169	57.89	10.16	10.43	10.16	0.00	0.00	2.90	1717	592	1717	592
	26	-5	195	55.26	9.70	9.97	9.70	0.00	0.00	3.08	1891	614	1891	614
	27	-4	278	52.63	9.24	9.50	9.24	0.00	0.00	3.26	2568	788	2568	788
	28	-3	306	50.00	8.78	9.03	8.78	0.00	0.00	3.44	2685	782	2685	782
	29	-2	454	47.37	8.31	8.57	8.31	0.00	0.00	3.61	3774	1044	3774	1044
	30	-1	385	44.74	7.85	8.10	7.85	0.00	0.00	3.79	3023	797	3023	797
	31	0	490	42.11	7.39	7.63	7.39	0.00	0.00	3.97	3621	912	3621	912
	32	1	533	39.47	6.93	7.17	6.93	0.00	0.00	4.15	3692	890	3692	890
B	33	2	380	36.84	6.47	6.70	6.47	0.00	0.00	4.33	2457	567	2457	567
	34	3	228	34.21	6.00	6.83	6.00	0.00	0.00	4.46	1369	307	1369	307
	35	4	261	31.58	5.54	6.96	5.54	0.00	0.00	4.58	1447	316	1447	316
	36	5	279	28.95	5.08	7.09	5.08	0.00	0.00	4.71	1417	301	1417	301
	37	6	229	26.32	4.62	7.22	4.62	0.00	0.00	4.83	1058	219	1058	219

C	38	7	269	23.68	4.16	7.35	4.16	0.00	0.00	4.96	1118	225	1118	225	
	39	8	233	21.05	3.69	7.63	3.69	0.00	0.00	5.11	861	169	861	169	
	40	9	230	18.42	3.23	7.92	3.23	0.00	0.00	5.25	744	142	744	142	
	41	10	243	15.79	2.77	8.21	2.77	0.00	0.00	5.40	673	125	673	125	
	42	11	191	13.16	2.31	8.49	2.31	0.00	0.00	5.55	441	80	441	80	
D	43	12	146	10.53	1.85	8.78	1.85	0.00	0.00	5.69	270	47	270	47	
	44	13	150	7.89	1.39	9.07	1.39	0.00	0.00	5.84	208	36	208	36	
	45	14	97	5.26	0.92	9.35	0.92	0.00	0.00	5.99	90	15	90	15	
	46	15	61	2.63	0.46	9.64	0.46	0.00	0.00	6.13	28	5	28	5	
		Σ	6446							Σ	43257	13217	41699	11659	
												SCOP _{on}	3.27	SCOP _{net}	3.58
														SCOP	3.27

Part load performance diagram

- Medium temperature application (reference water temperature 55 °C)
- Reference heating season „C” – colder



Tested by: Ing. Jakub Čederle

Date: 2024-06-14

Signed: Čederle

Reviewed and approved by: Ing. Michal Faltýnek

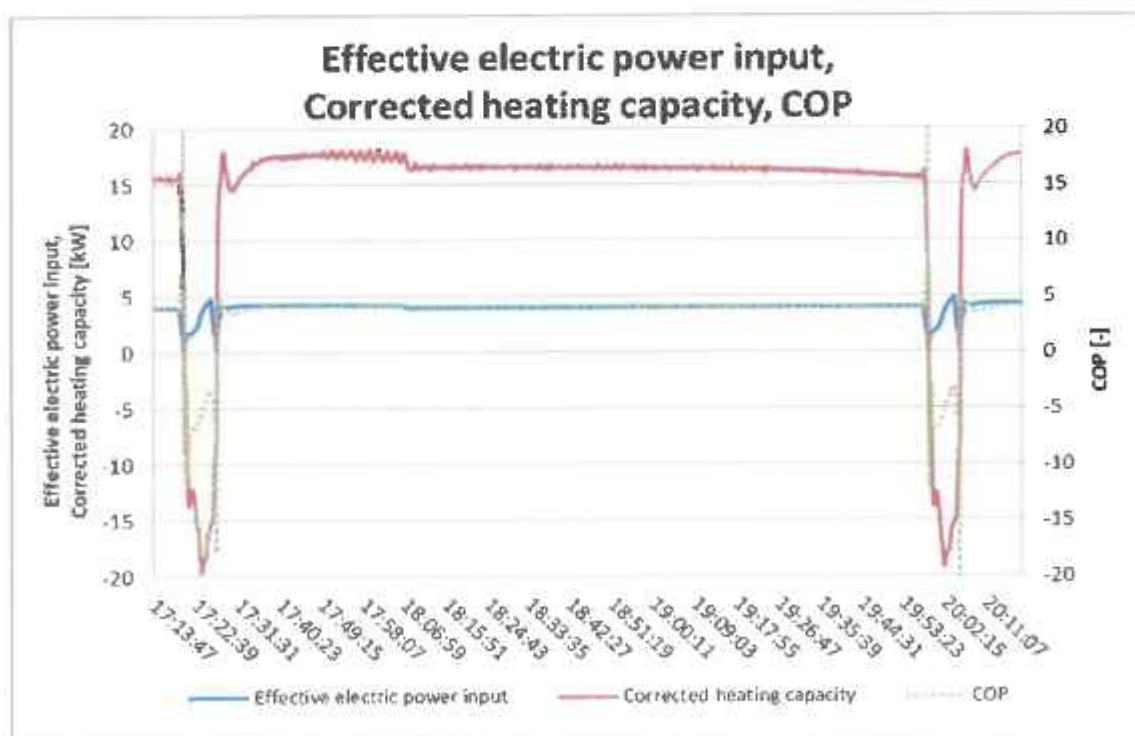
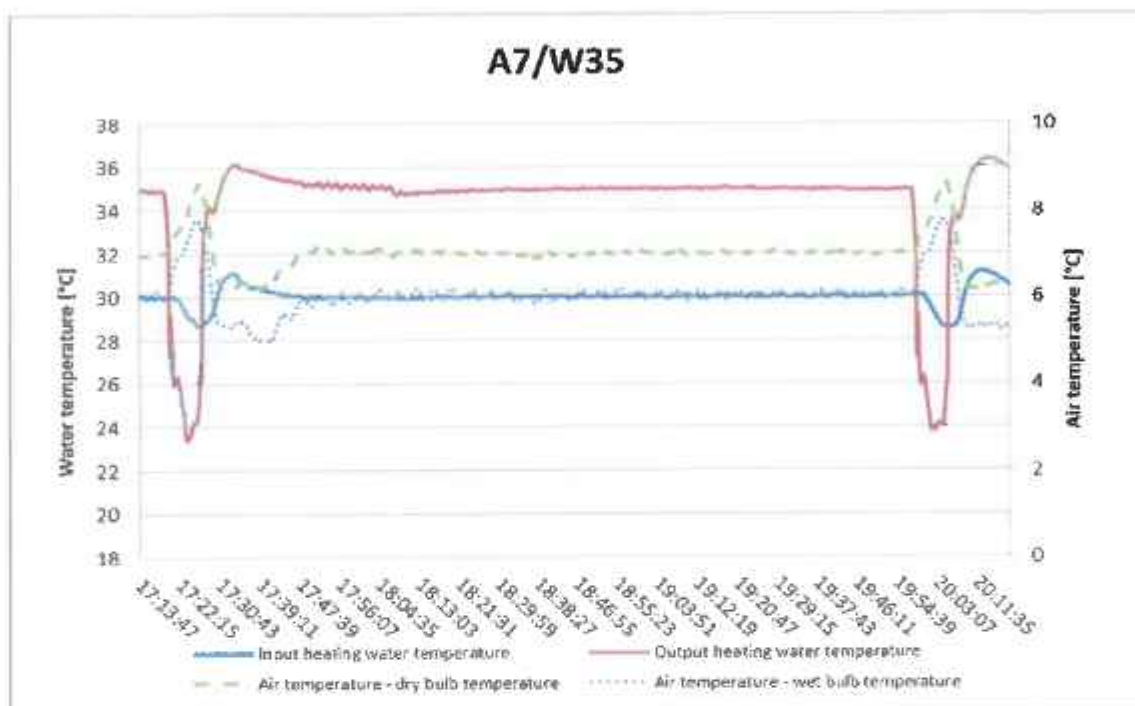
Date: 2024-06-14

Signed: Faltýnek

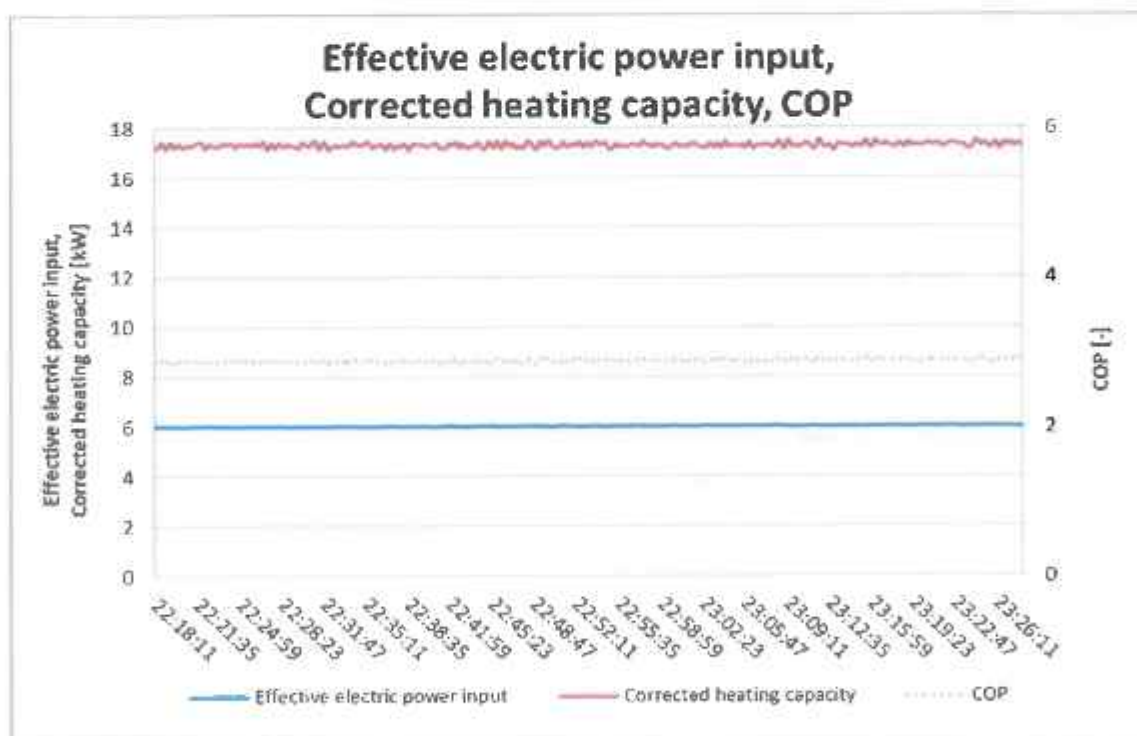
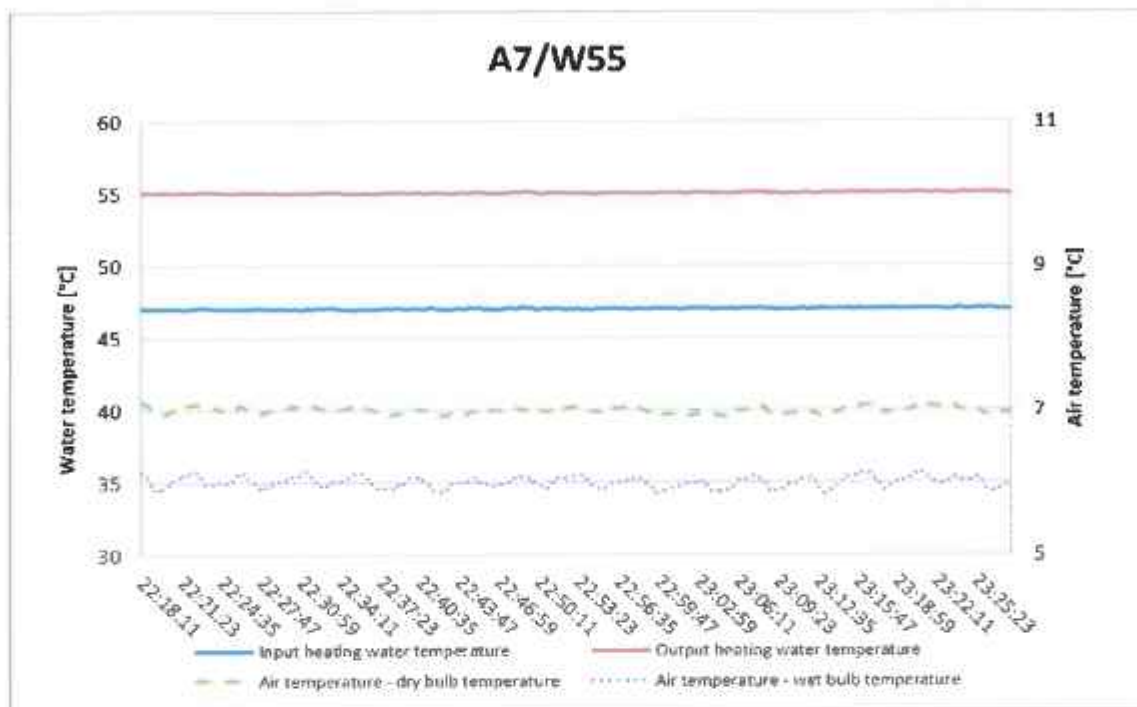
V. Graphs

1. Rating conditions

A7/W35 (70 rps)

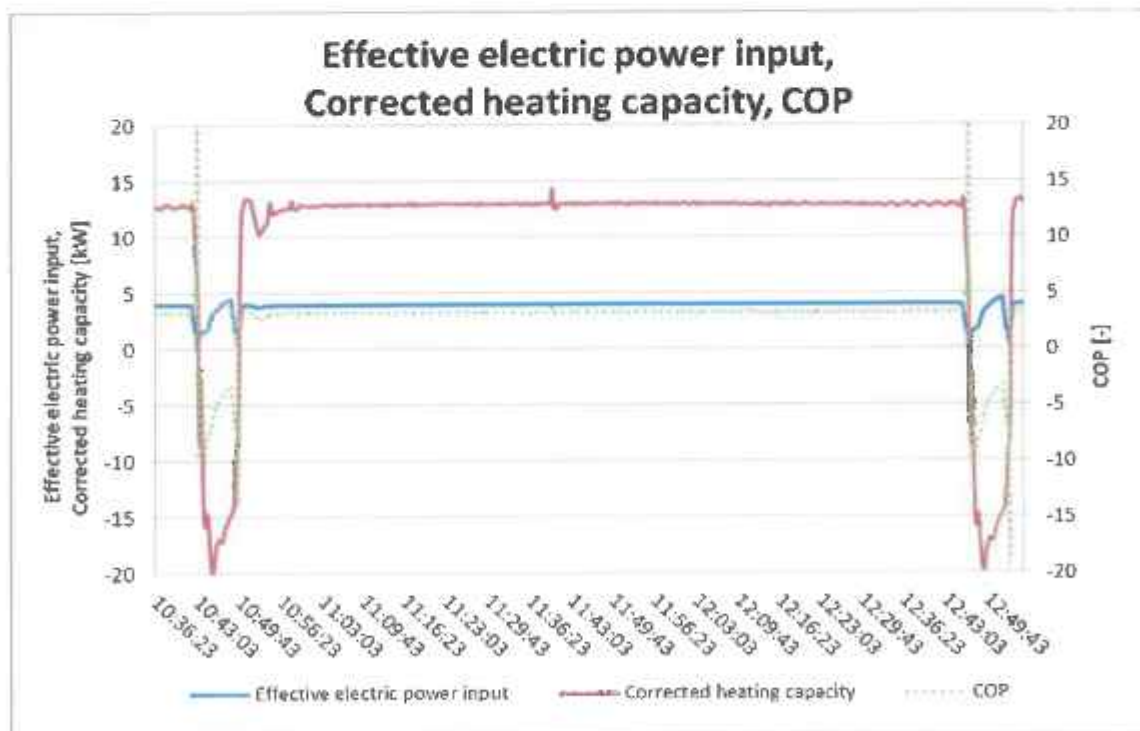
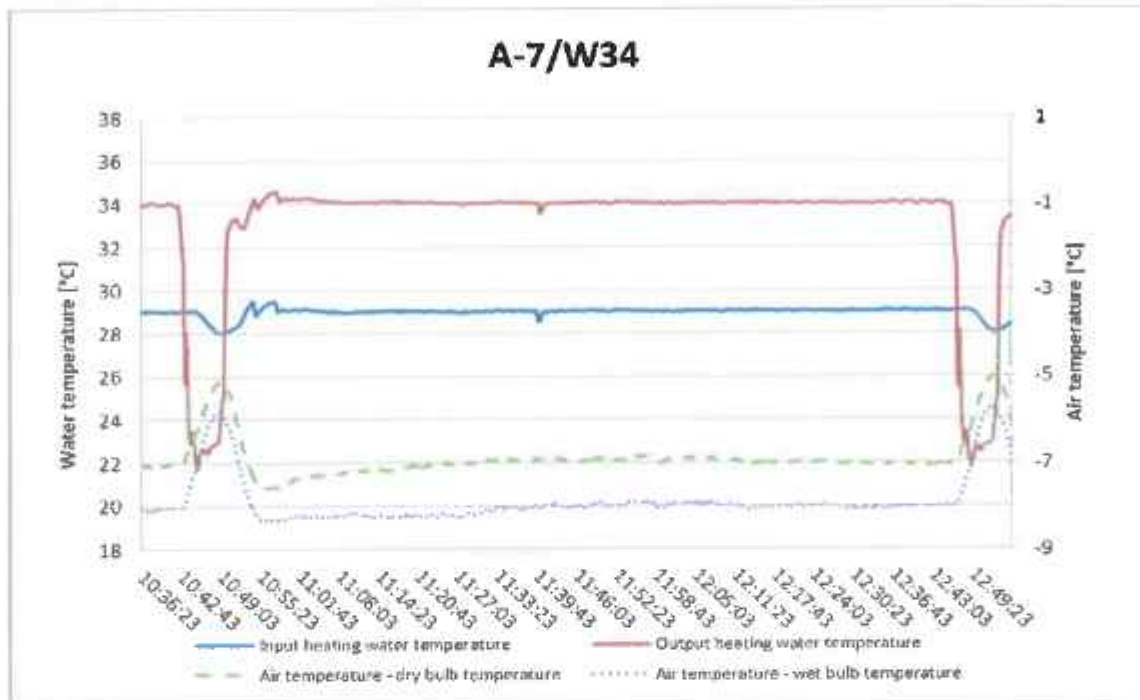


A7/W55 (70 rps)

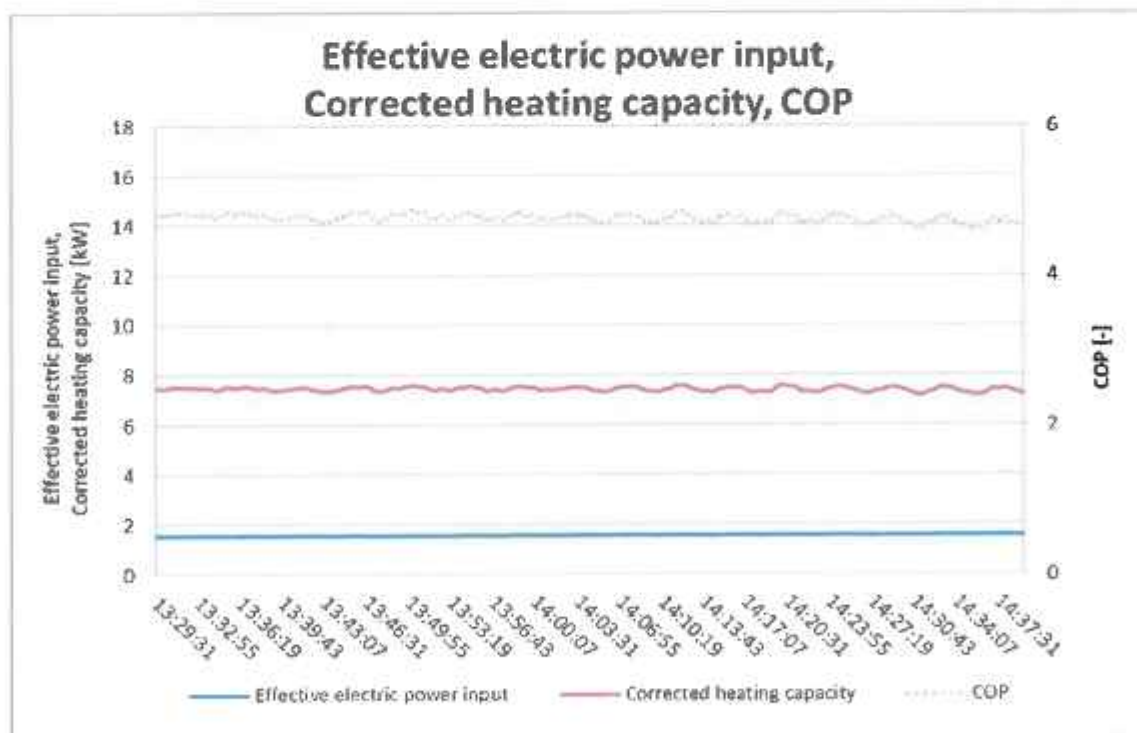
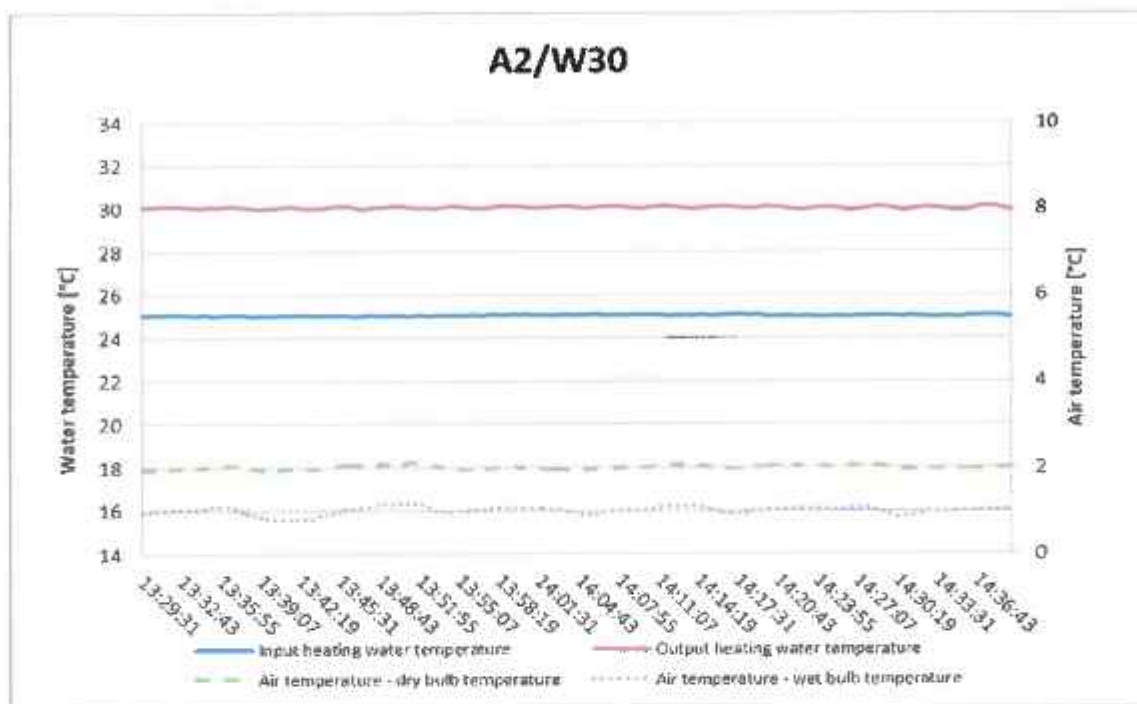


2. Seasonal performance tests and SCOP calculation – Low temperature application

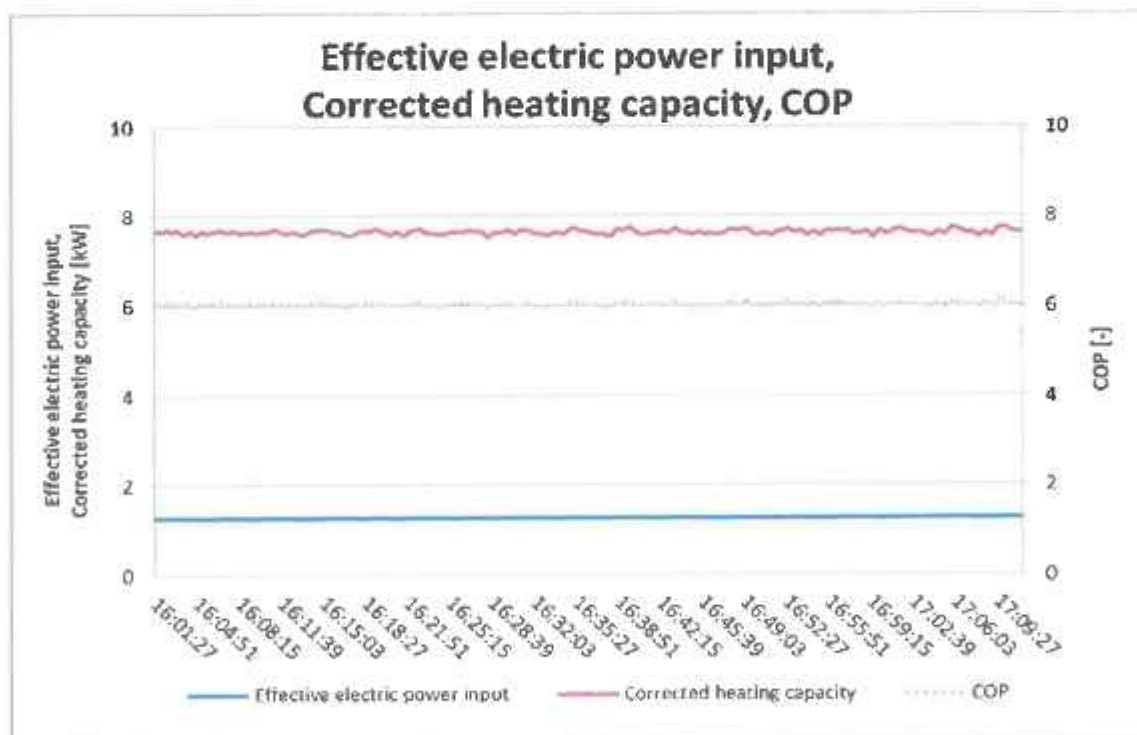
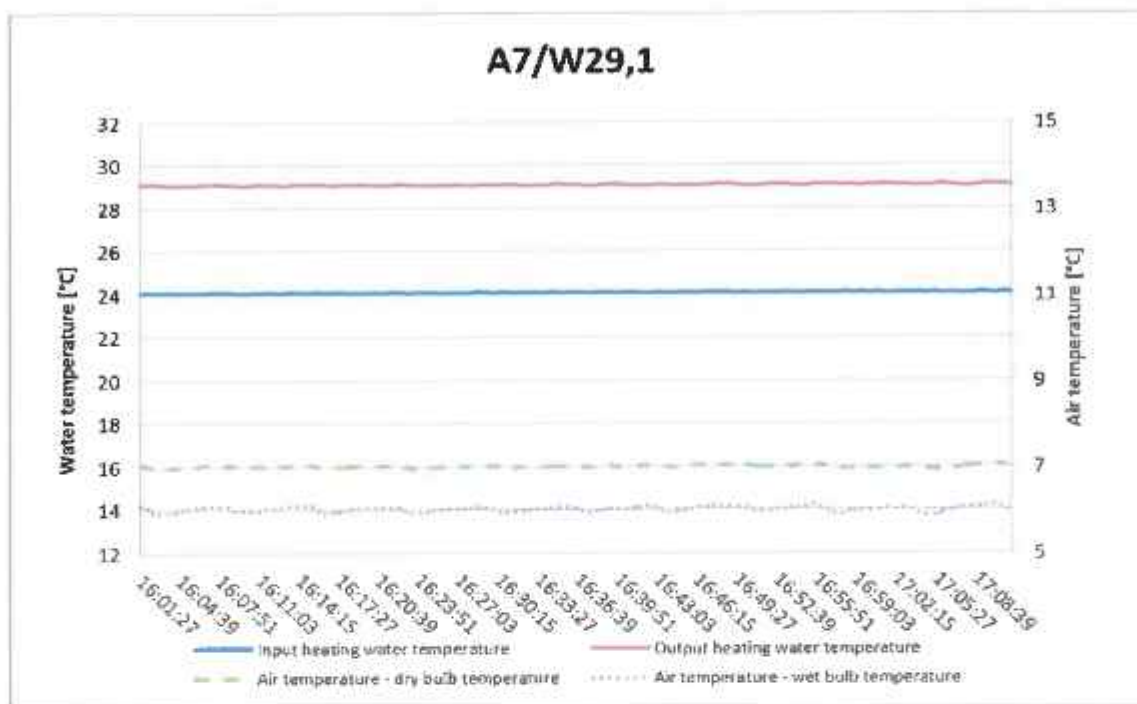
A-7/W34 (70 rps)



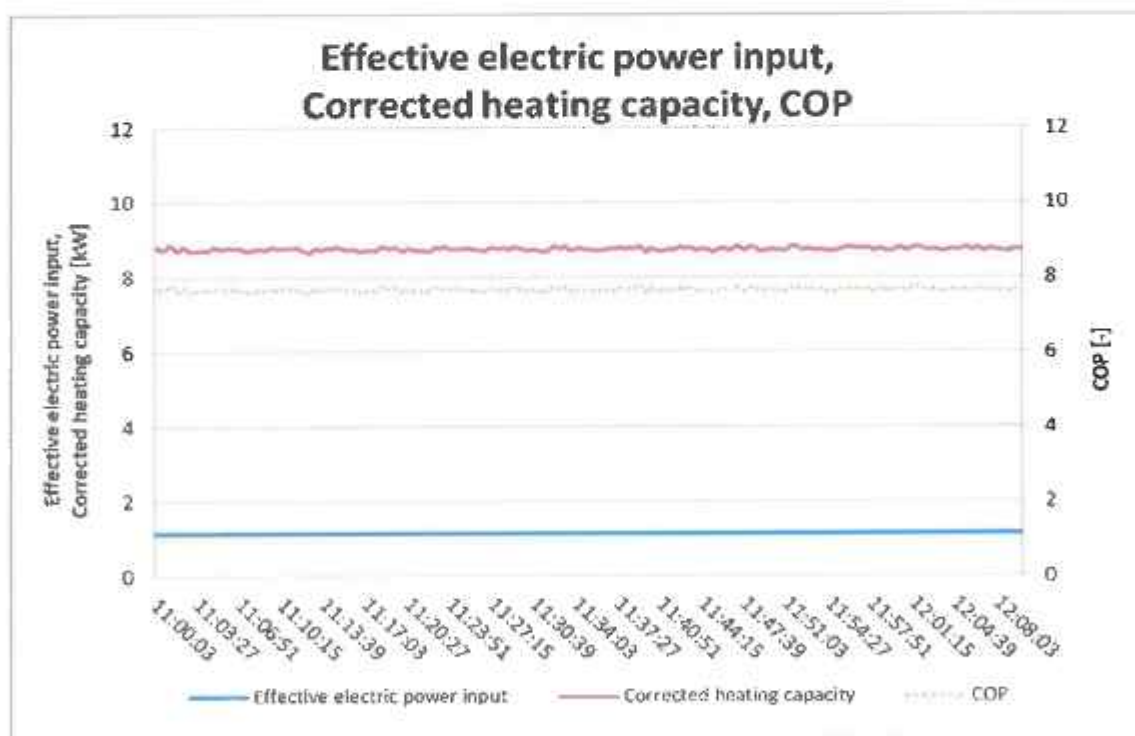
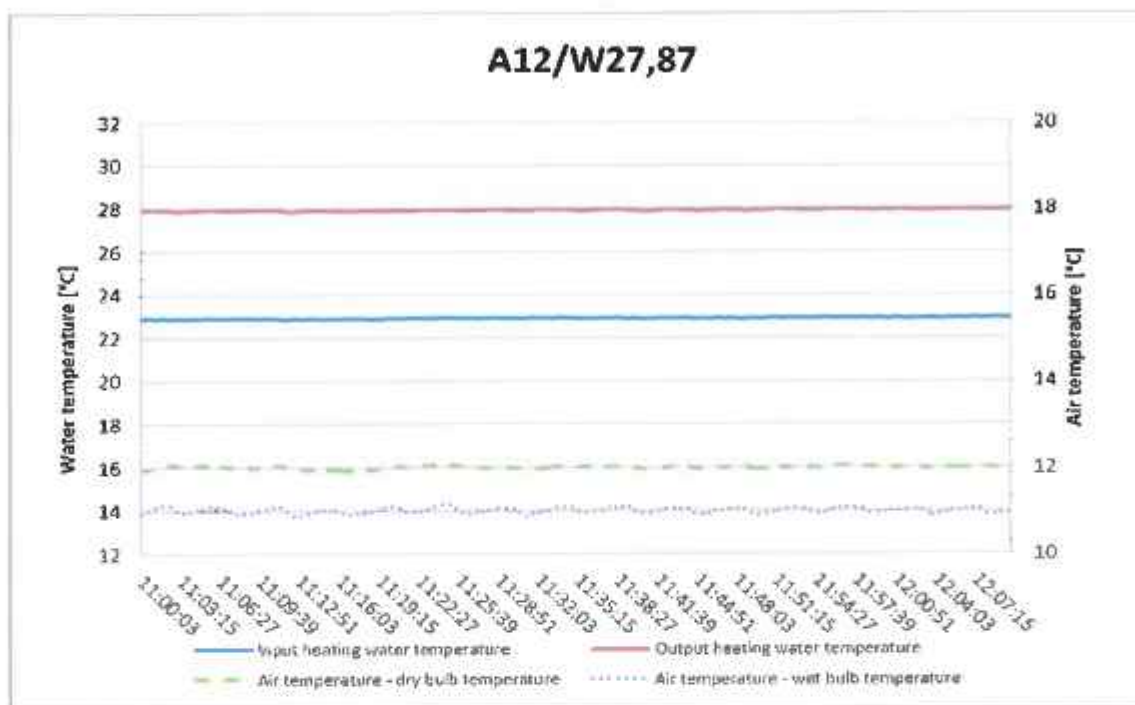
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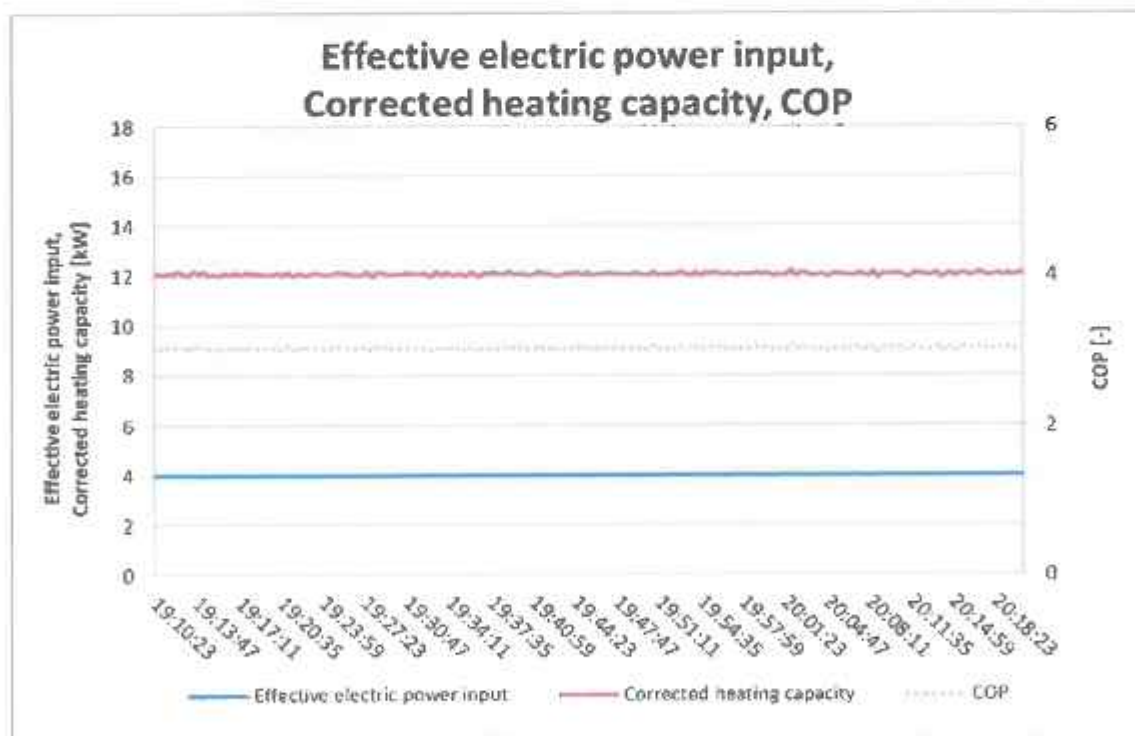
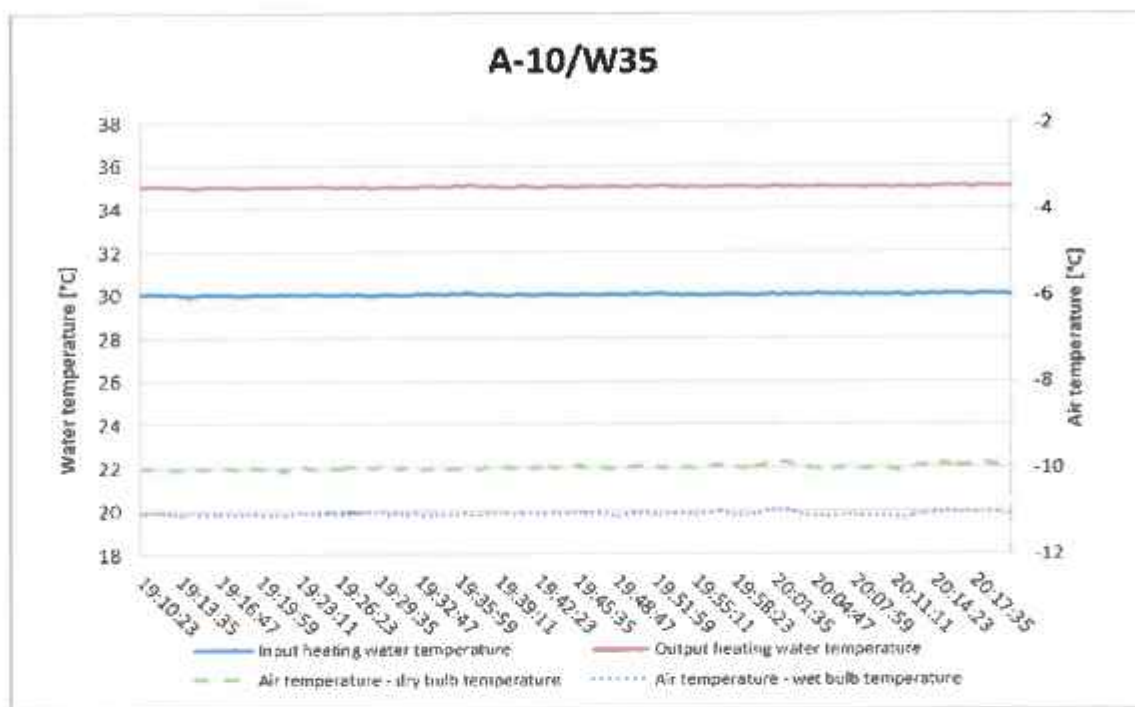
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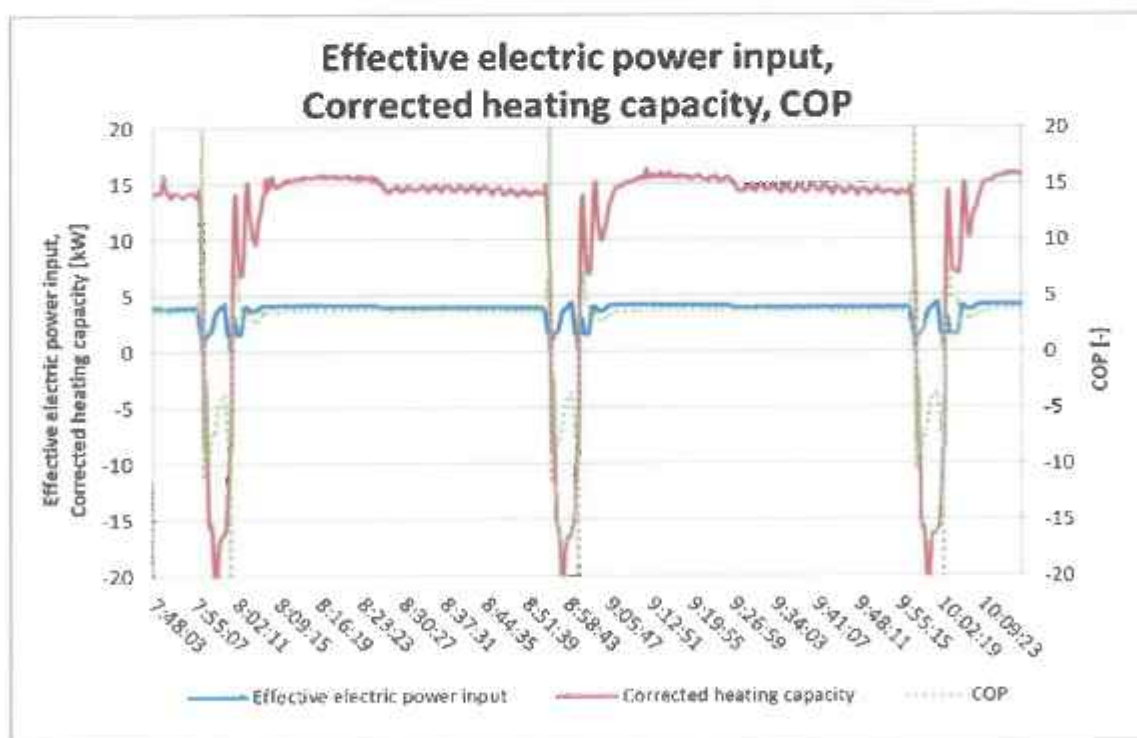
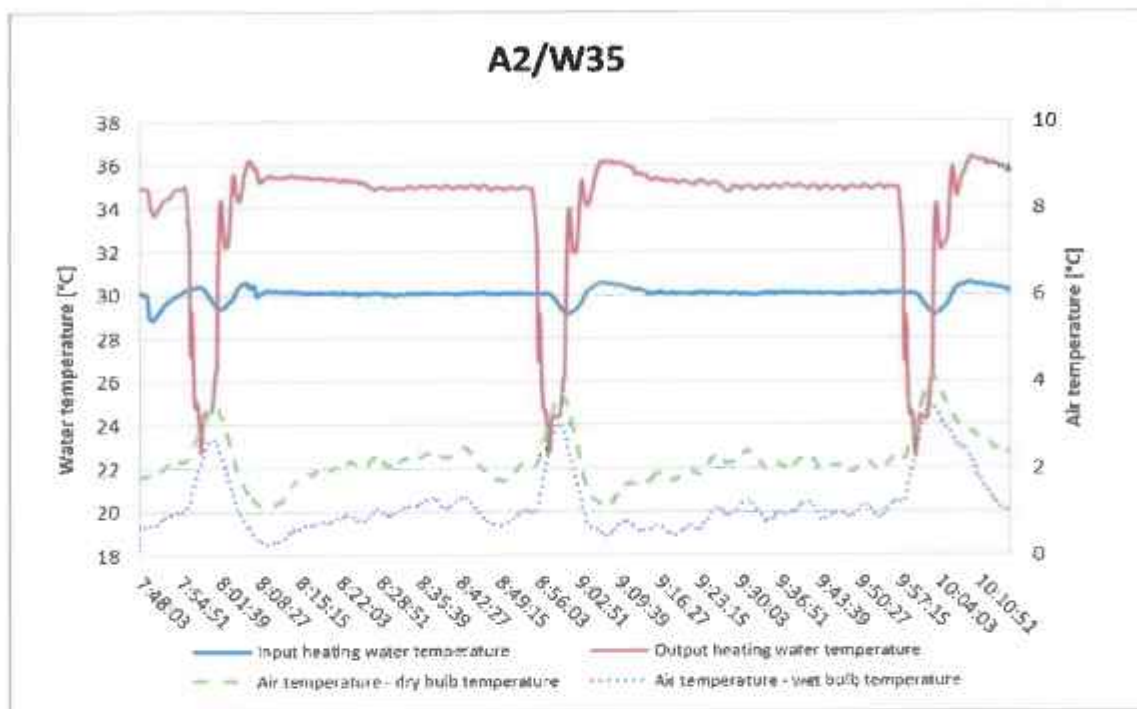
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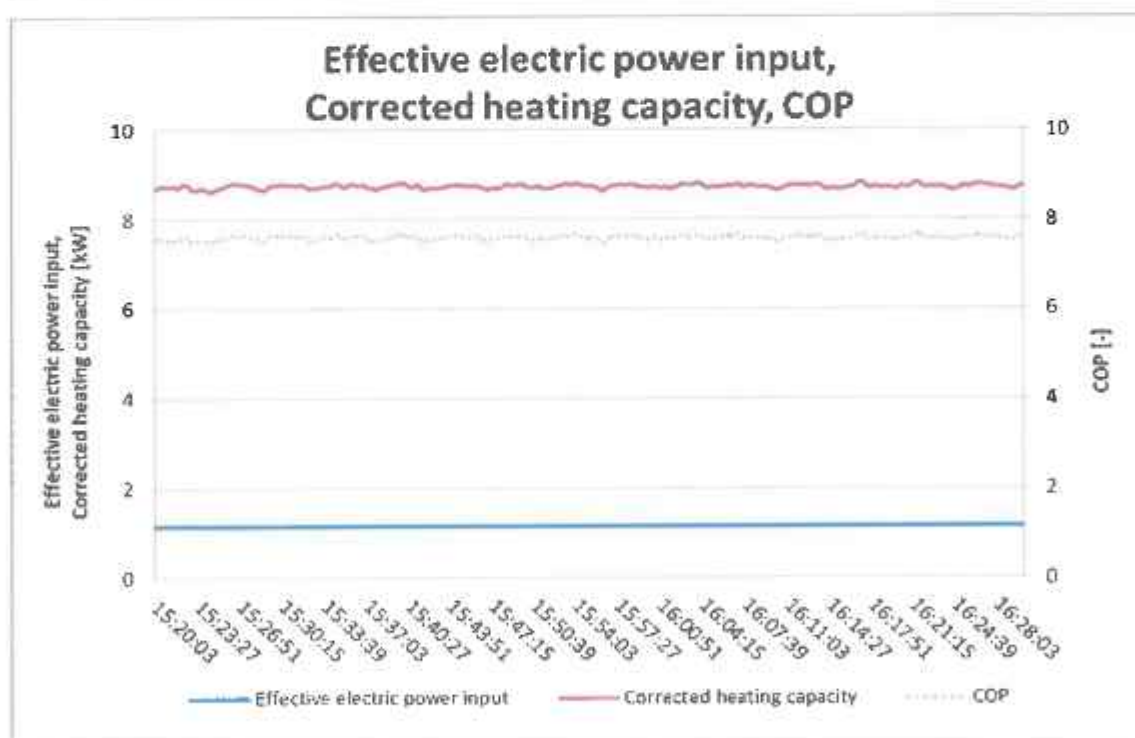
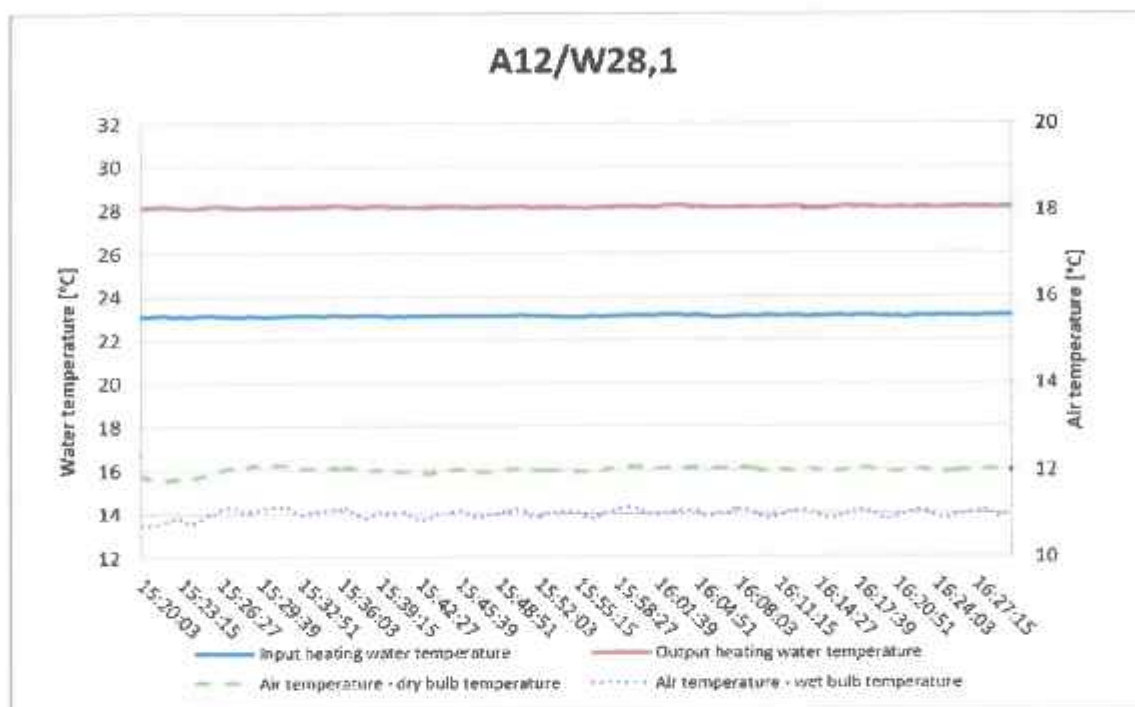
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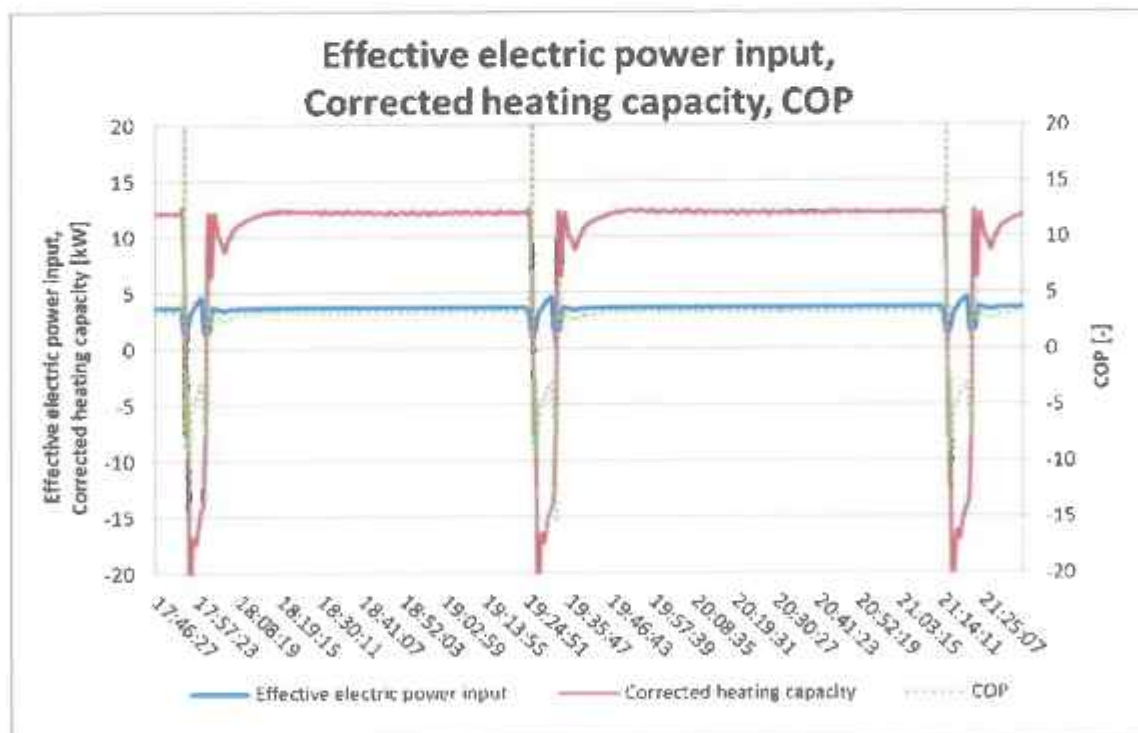
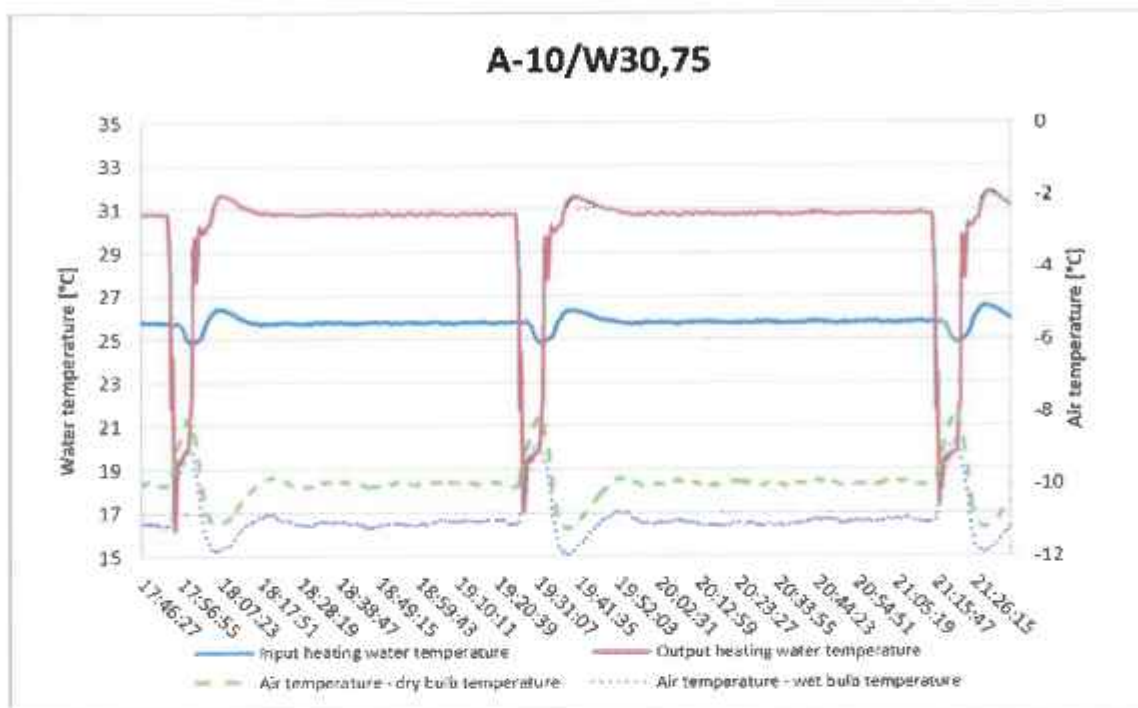
A2/W35 (70 rps)



A12/W28.1 (30 rps)

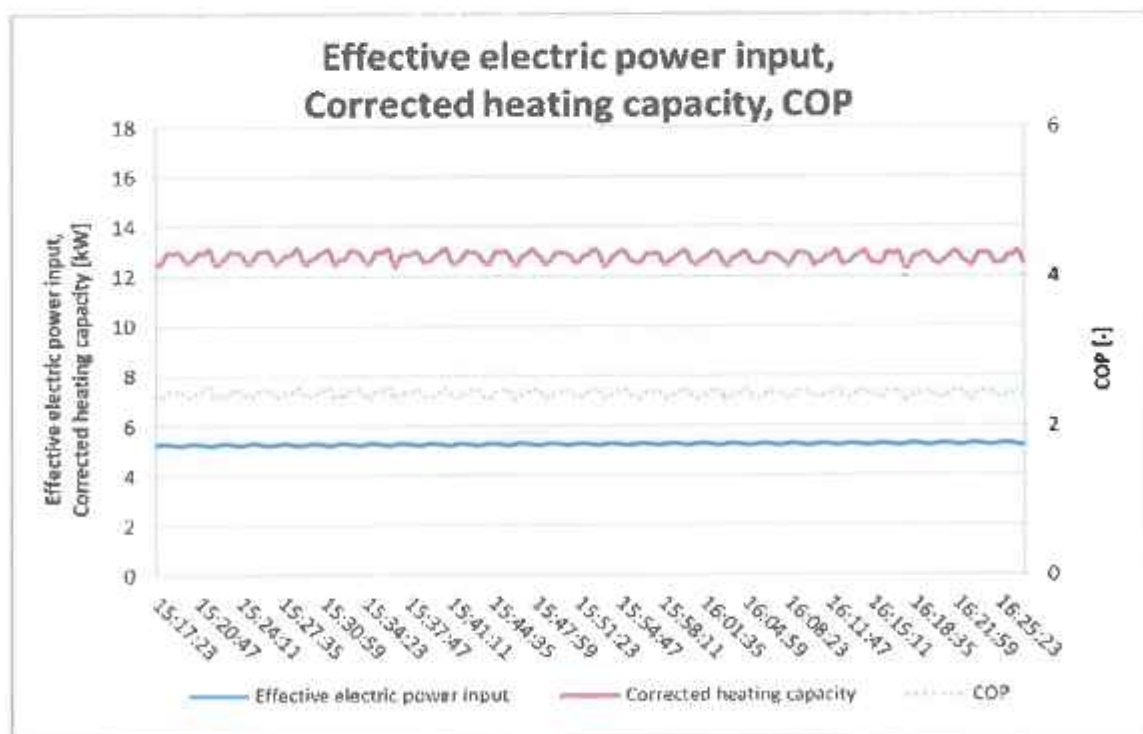
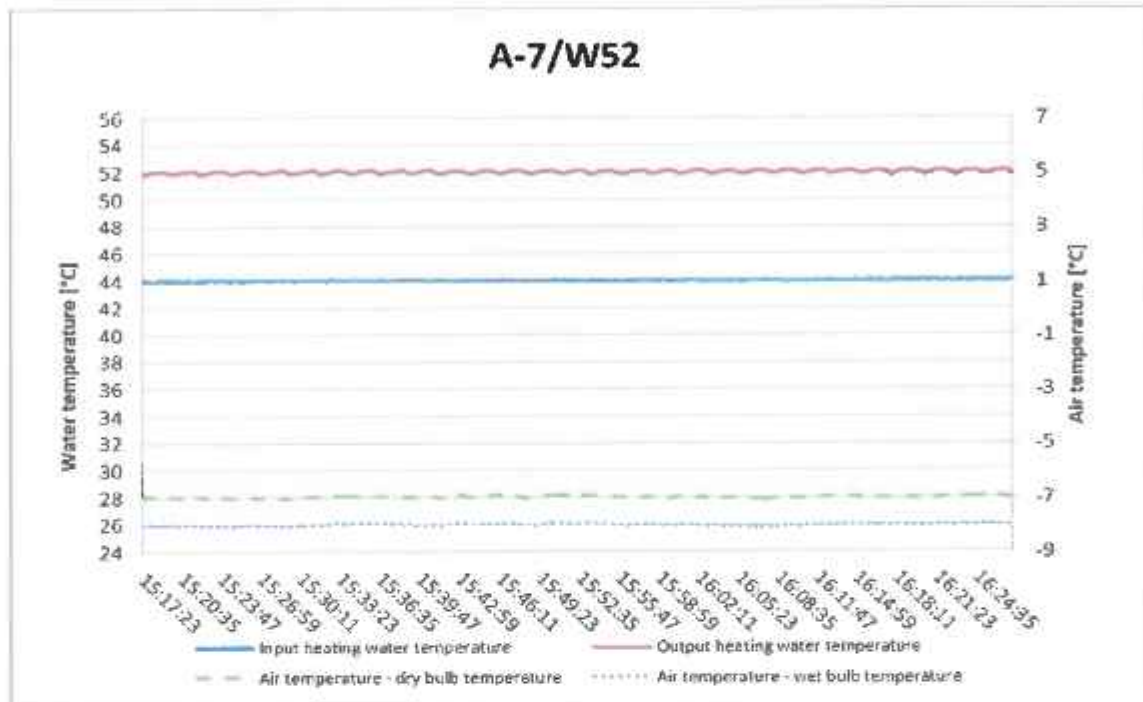


A7-10/W30.75 (70 rps)

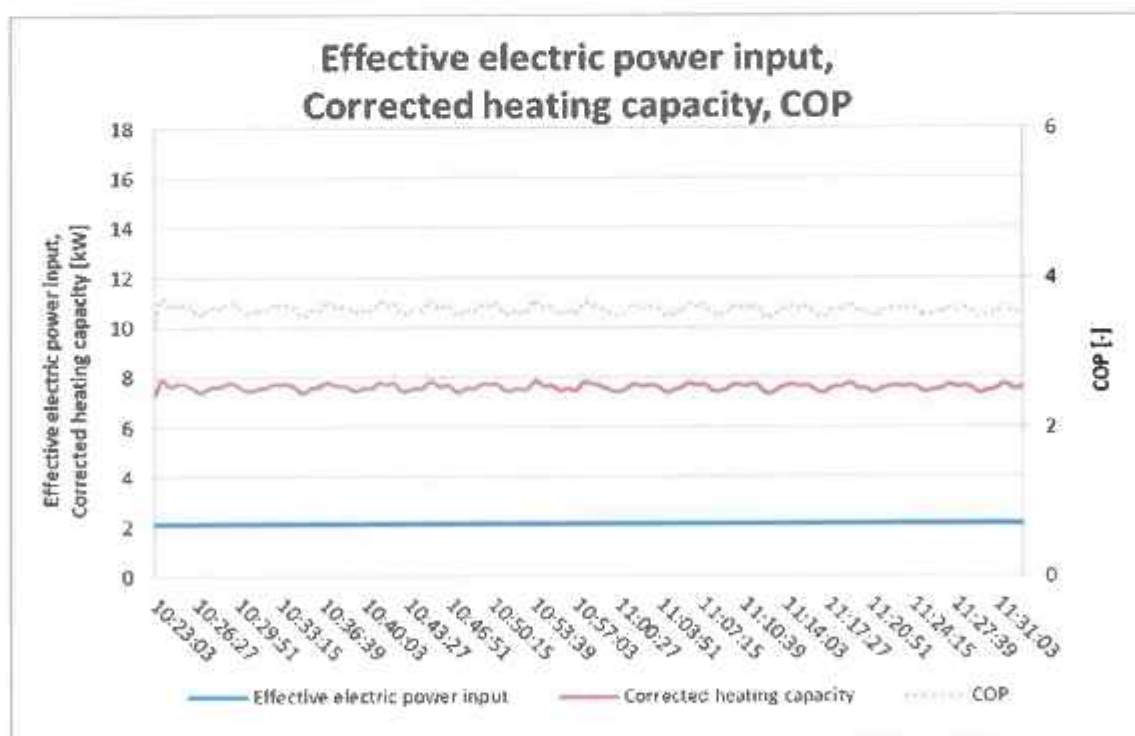
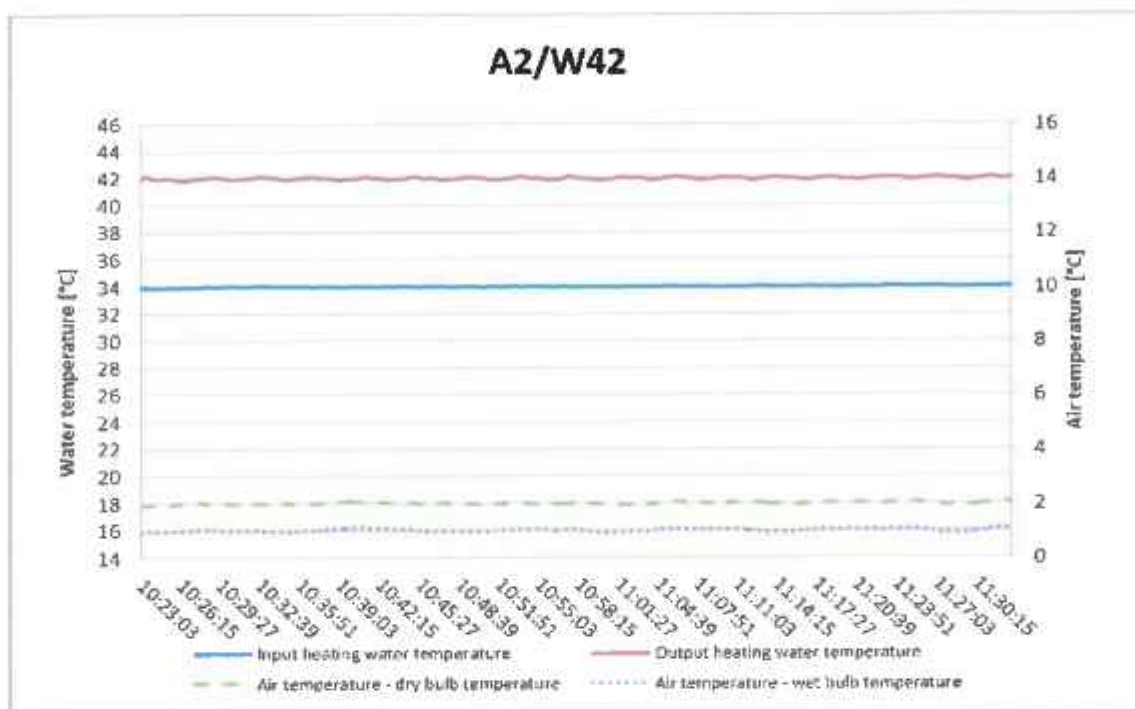


3. Seasonal performance tests and SCOP calculation – Medium temperature application

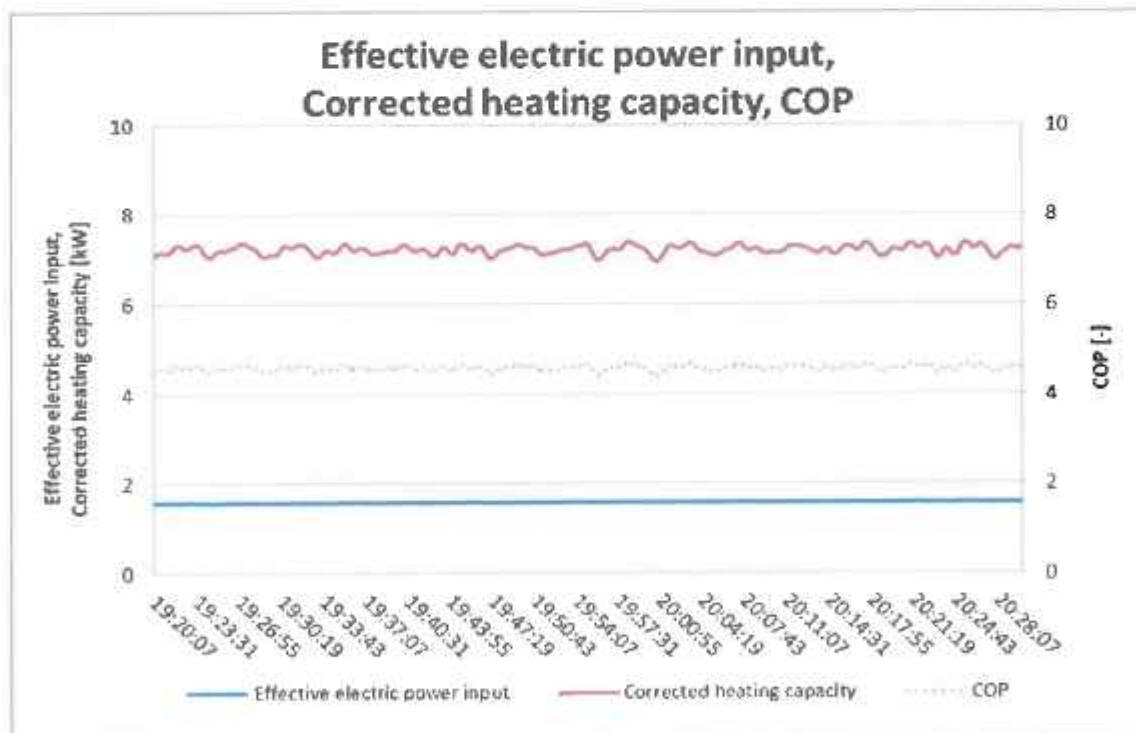
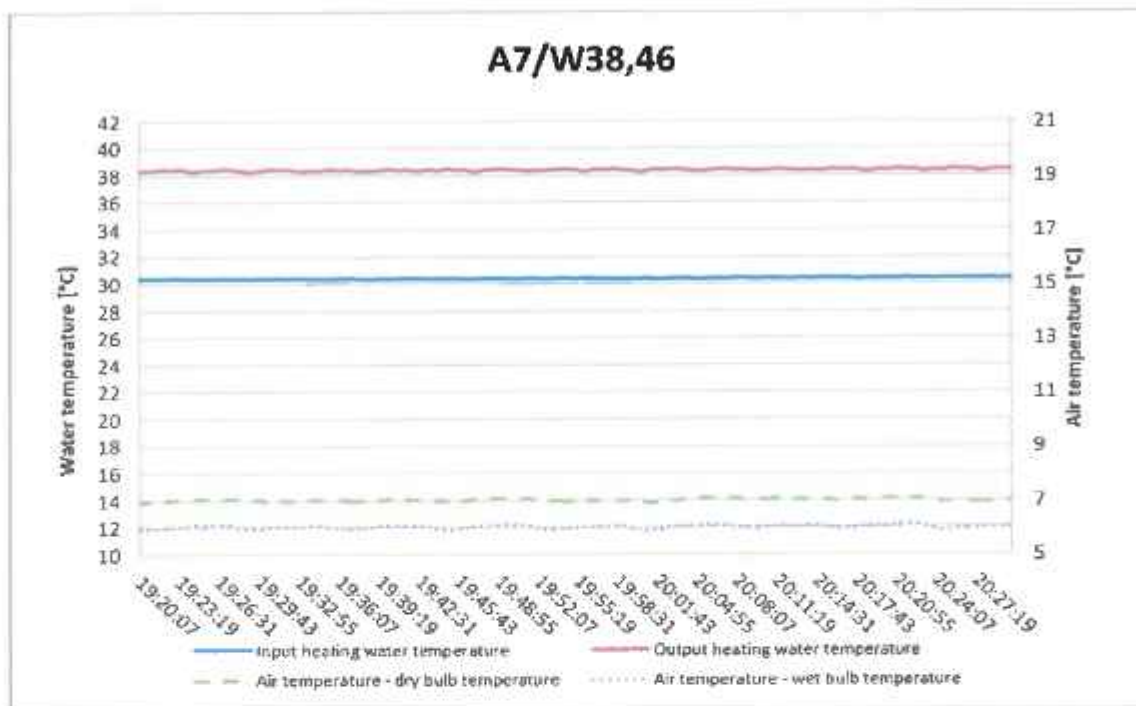
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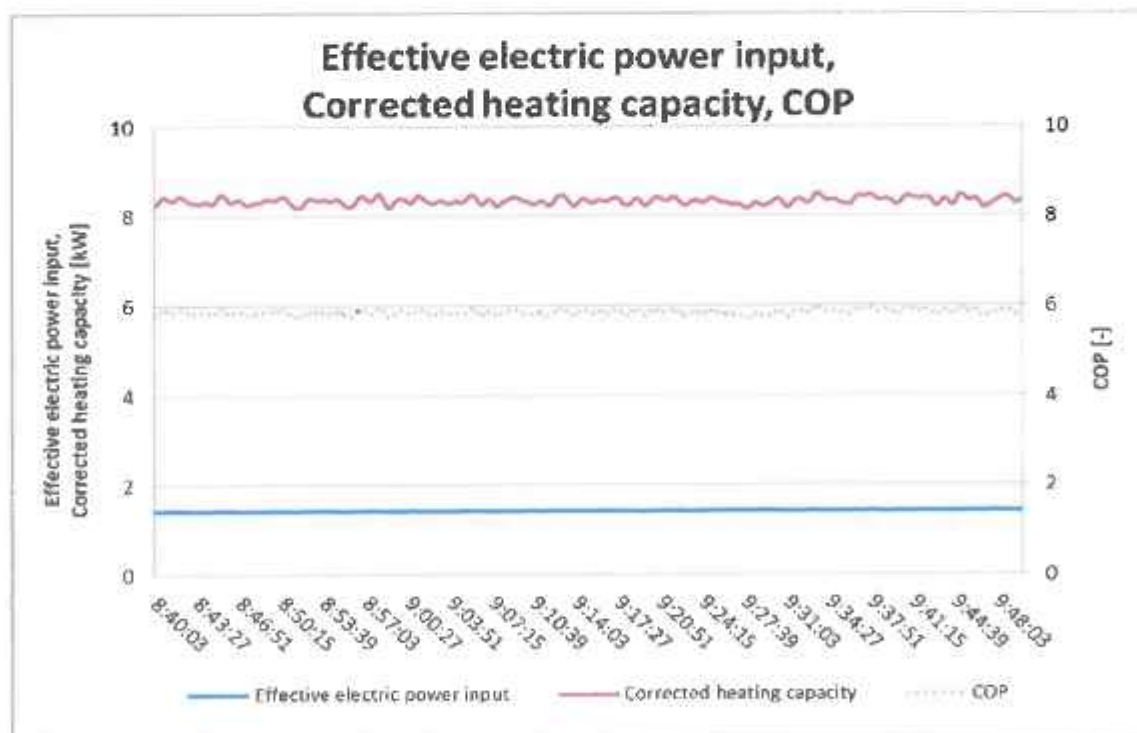
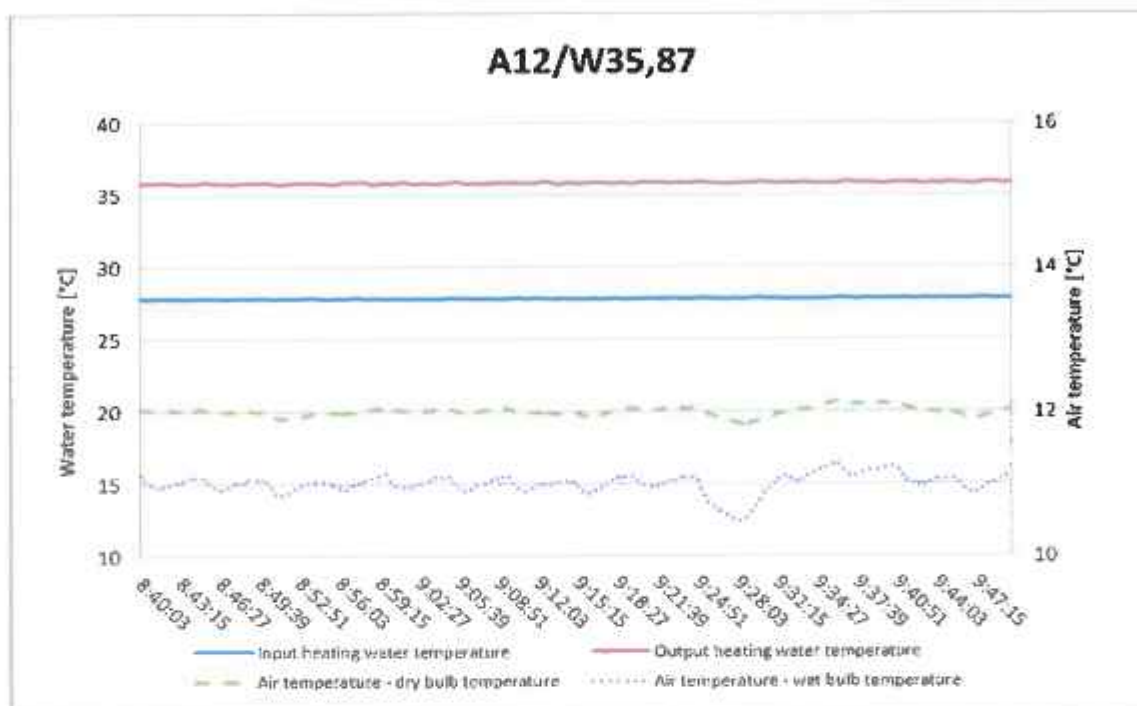
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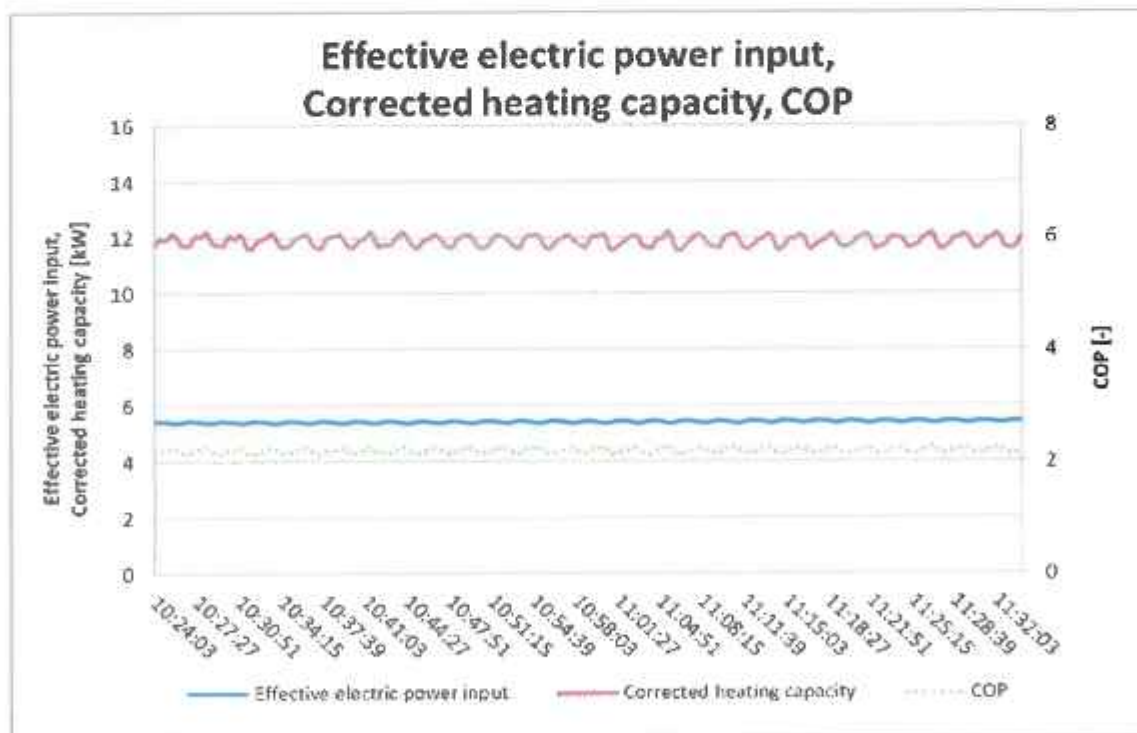
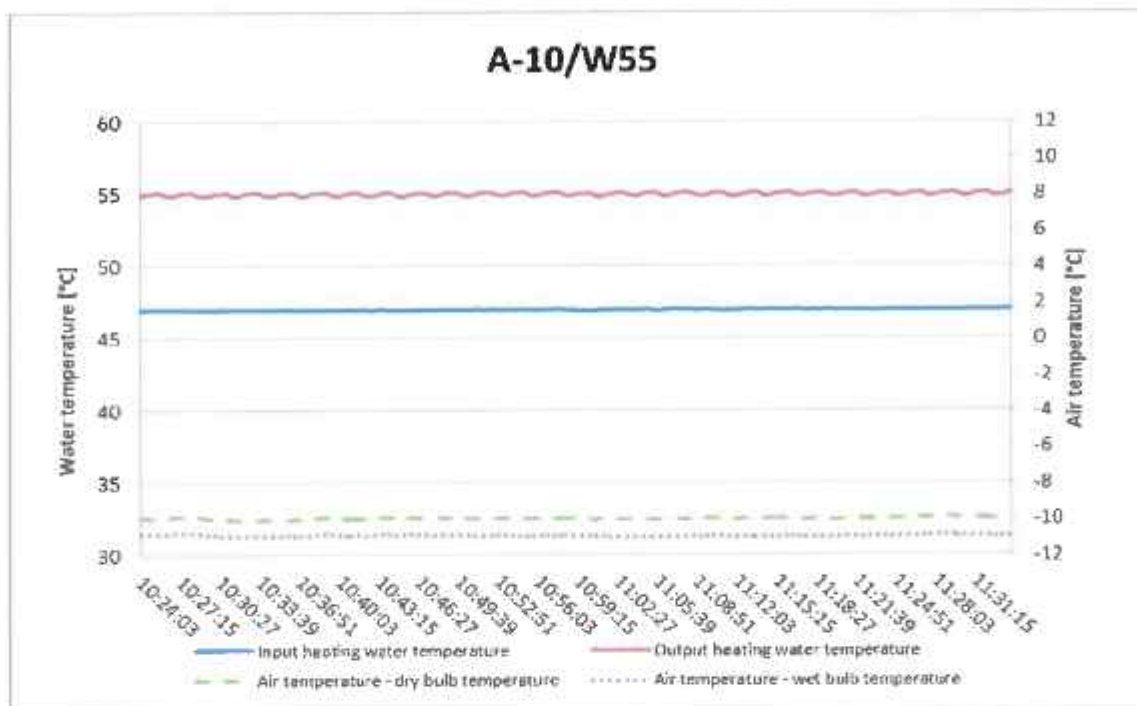
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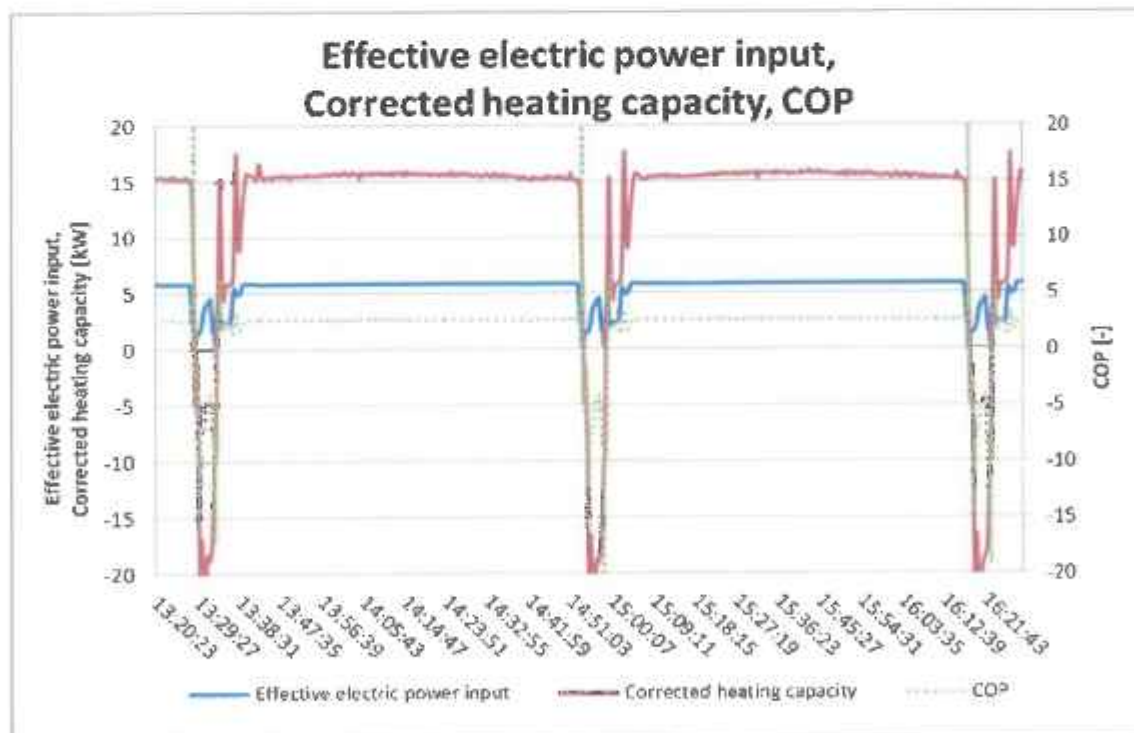
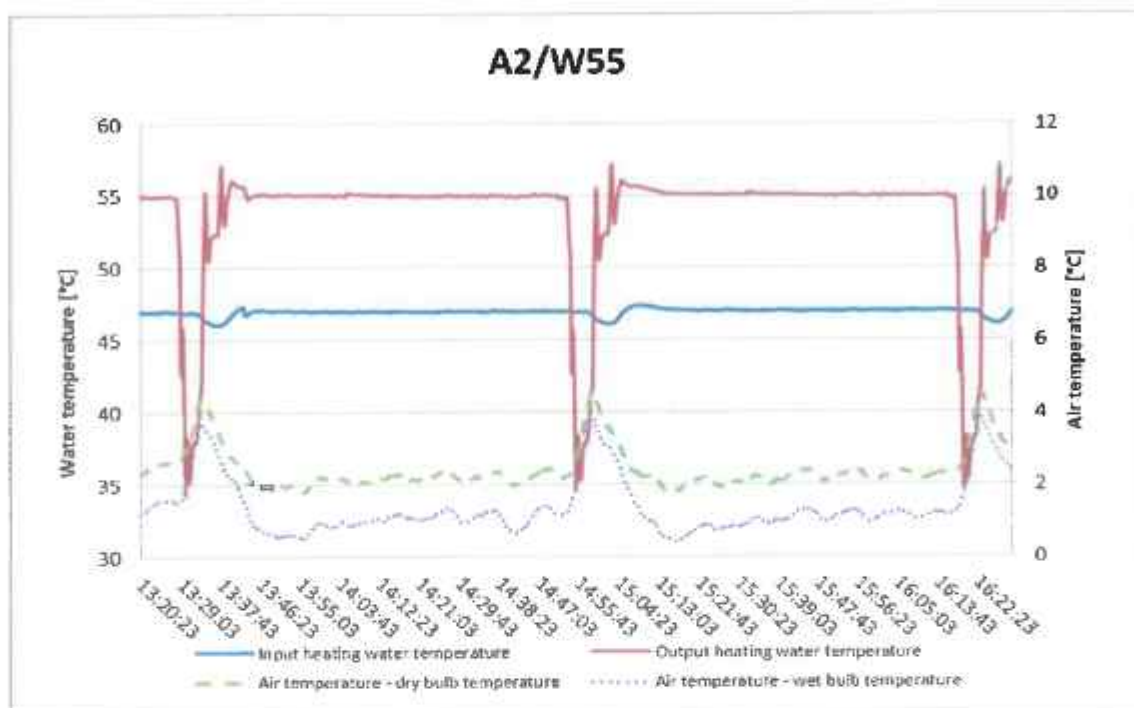
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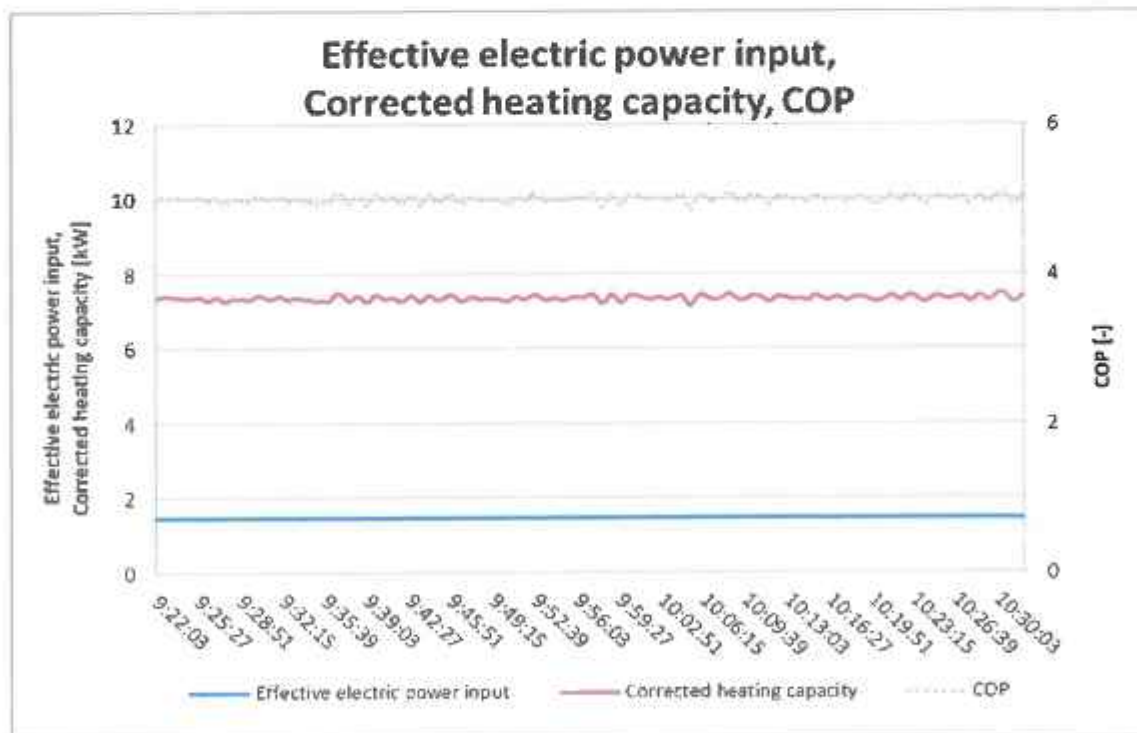
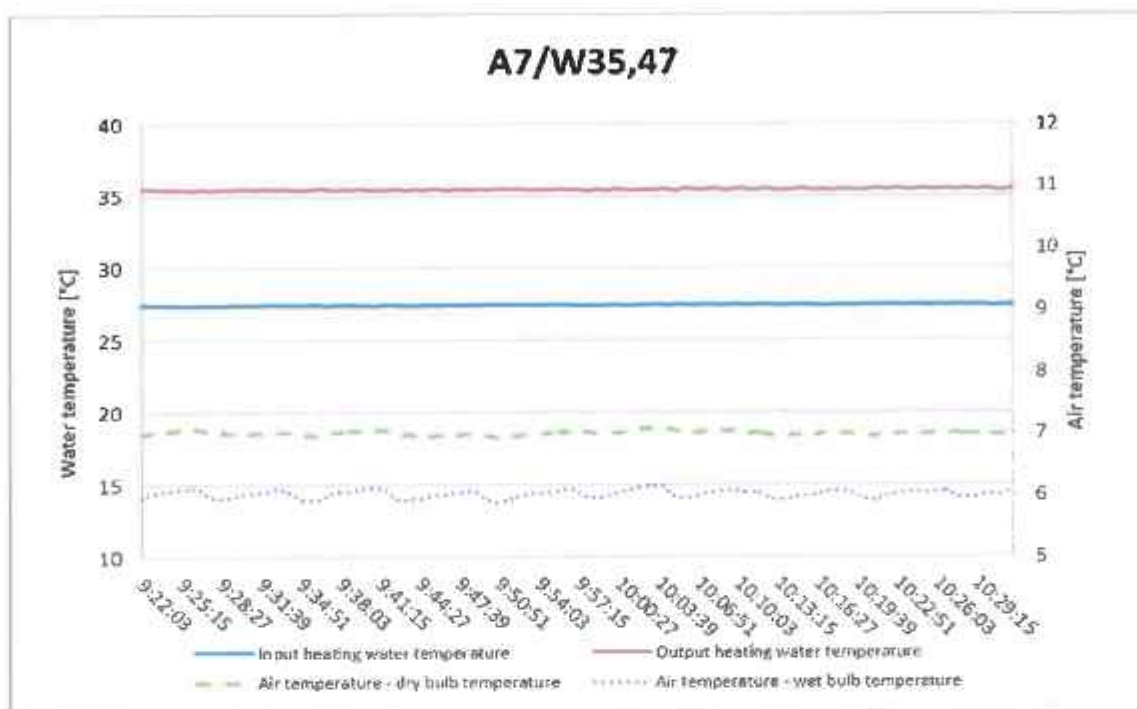
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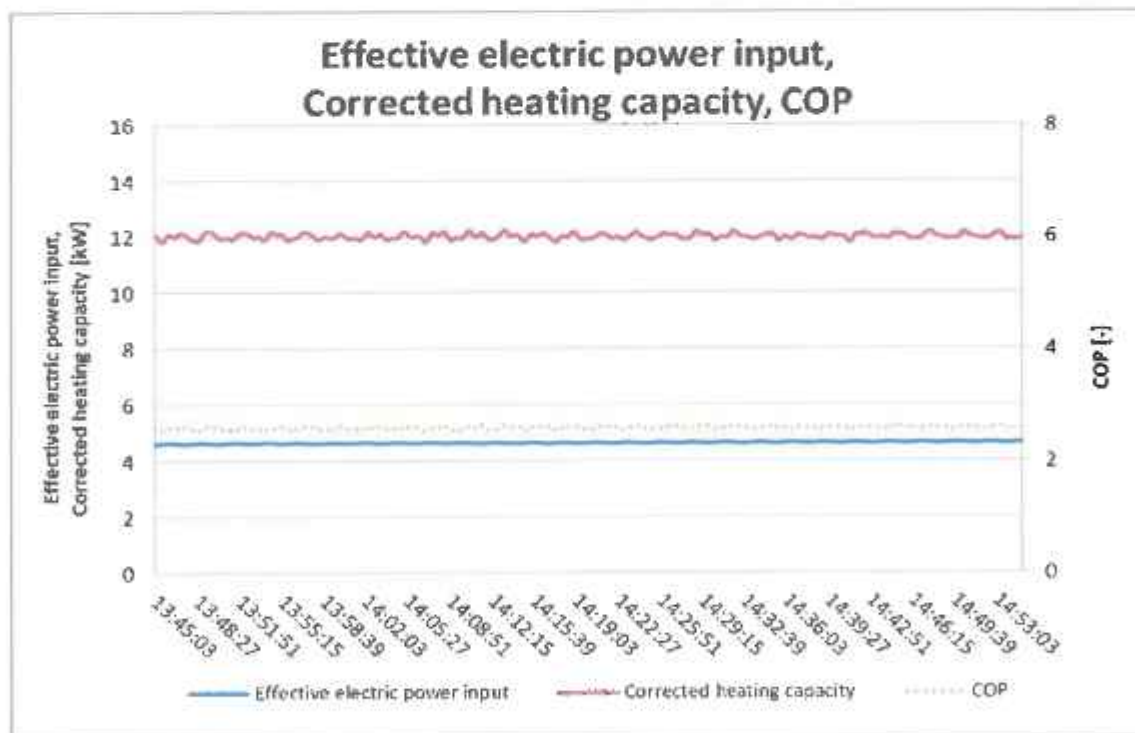
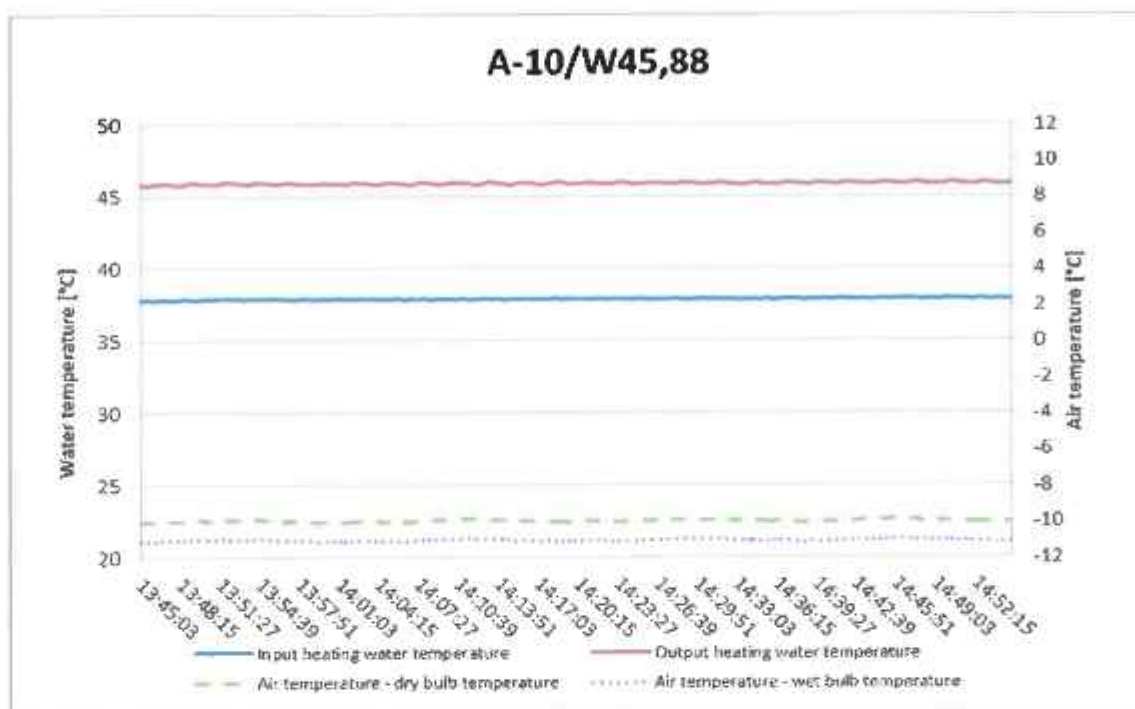
A2/W55 (70 rps)



A7/W35.47 (30 rps)



A-10/W45.88 (70 rps)



VI. A list of referenced documents

- Order of 2024-05-02 (Order reg. no. B-82166, received on 2024-05-02)
- Contract B-82166/39
- 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 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

Test Report compiled by: **Ing. Jakub Čederle**



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



– End of Test Report –