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L 1045.1

TEST REPORT
32-11087/T

Product: Outdoor Air/Water Heat pump - split

Type designation: **AWM1752.075.XG10.A00.C13**

Customer: GOLDEN GLOBE ENERGY SP. Z O.O.
INŻYNIERSKA str. 5B
20-484 LUBLIN
POLAND

Manufacturer: GOLDEN GLOBE ENERGY SP. Z O.O.
INŻYNIERSKA str. 5B
20-484 LUBLIN
POLAND

Report issue date: 2024-06-14

Distribution list: 1 copy to the Customer
1 copy to the Engineering Test Institute

This test report reproduces the test results of test report no. 39-17730/T of 2024-05-24.

I. Description of product tested

The Heat pump **AWM1752.075.XG10.A00.C13** supplied by the company **GOLDEN GLOBE ENERGY SP. Z O.O.** is structurally adapted to operate in air/water system. Device is divided to the outdoor unit **OU.A.120.C13**, placed outside on a pedestal and an indoor unit **IU.AWM1752.075.XG10.A00.C13**. Outdoor and indoor units are connected by copper piping and electrical wires. Refrigerant R32 is used with charge 1.75 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 **OU.A.120.C13:**

- Serial number **860010100131AX23051203090623001**
- Cuboid shape with dimensions 950 x 365 x 790 mm (W × D × H)
- Frame and casing made of varnished steel sheets
- L-shaped evaporator, 2 rows, dimensions 940 x 50 x 790 mm (W × D × H), spacing 1,6 mm
- Plate evaporator, 1 row, dimensions 475 x 25 x 790 mm (W × D × H), spacing 1,6 mm
- Compressor Mitsubishi Electric
- Refrigerant R32 (1.75 kg)
- Electric expansion valve DC12V PQM10058
- 4-way reversing valve SANHUA CHINA A21943
- Refrigerant accumulator KFR50WLB-16S
- Axial fan Panasonic D53009C
- Pressure sensors
- Temperature sensors
- Refrigerant pipes
- Air vent

Main components of the indoor unit **IU.AWM1752.075.XG10.A00.C13:**

- Serial number **Prototype**
- Cuboid shape with dimensions 605 x 610 x 1860 mm (W × D × H)
- Frame and casing made of varnished steel
- Electric backup heater
- Plate condenser, dimensions 90 x 145 x 550 mm (W × D × H) including insulation
- Expansion vessel WINKELMANN CRF 10
- Circulation pump PARA 25/8-87/IPWM1 Prototype 23-9648
- 3-way valve
- Air vent
- Temperature sensors
- Water tank

Scheme:

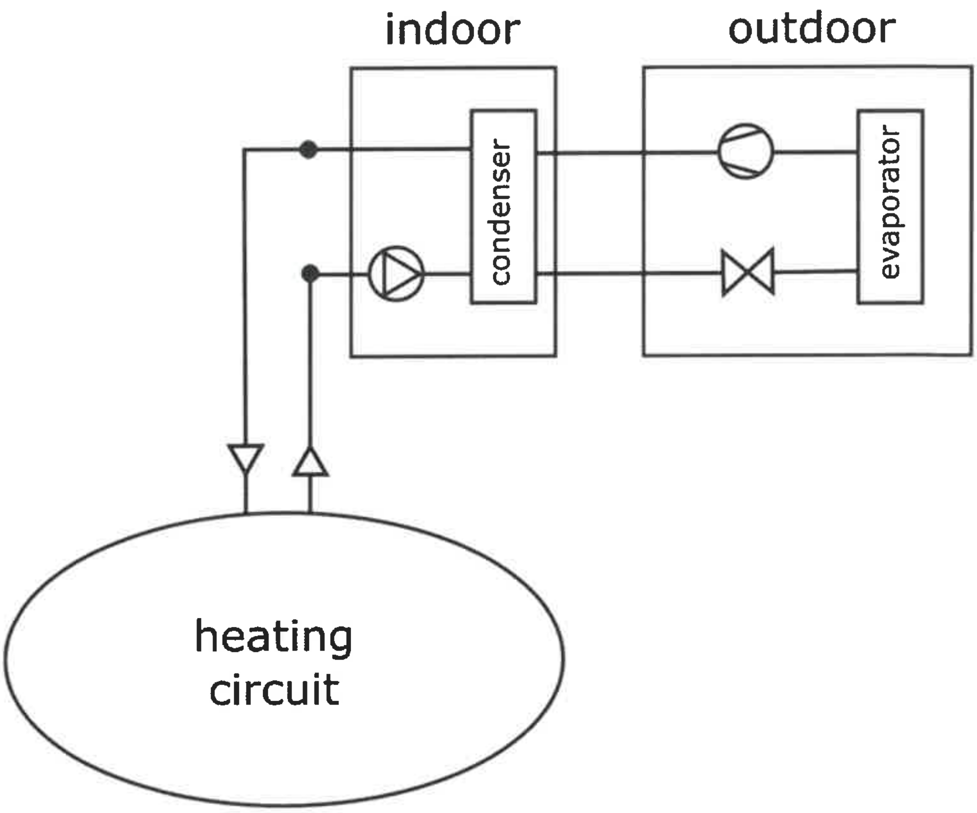


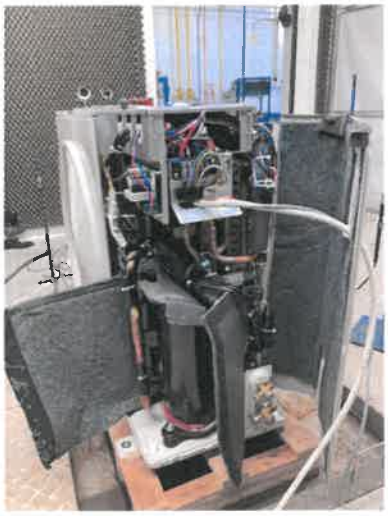
Photo documentation:

Heat pump **AWM1752.075.XG10.A00.C13**
outdoor unit
– Front view –

Heat pump **AWM1752.075.XG10.A00.C13**
outdoor unit
– Back view –

Heat pump **AWM1752.075.XG10.A00.C13**
outdoor unit
– Compressor label –

Heat pump **AWM1752.075.XG10.A00.C13**
outdoor unit
– Label –



Heat pump **AWM1752.075.XG10.A00.C13**
outdoor unit
– Without cover –

Heat pump **AWM1752.075.XG10.A00.C13**
indoor unit
– Label –

Heat pump **AWM1752.075.XG10.A00.C13**
indoor unit
– With cover –

Heat pump **AWM1752.075.XG10.A00.C13**
indoor unit
– Without cover –

II. Sample tested

SZU reg. no.	Product name	Date of submission
	AWM1752.075.XG10.A00.C13	

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. 8	x
2.	Seasonal performance tests and SCOP calculation – Low temperature application	-	ČSN EN 14511-3:2023 ČSN EN 14825:2023	Page No. 9 – 15	x
3.	Seasonal performance tests and SCOP calculation – Medium temperature application	-	ČSN EN 14511-3:2023 ČSN EN 14825:2023	Page No. 16 – 22	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.

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 **AWM1752.075.XG10.A00.C13**
Measuring equipment used:	see Chapter III

Specification of the assessment condition		**A7/W35***	**A7/W55***
Date of testing		**2023-10-02**	**2023-10-02**
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]	35.02	55.00
Input heating water – temperature calculation	[°C]	29.99	46.98
Output heating water temperature	[°C]	35.02	55.00
Input heating water temperature	[°C]	29.99	46.98
Air temperature – dry bulb temperature	[°C]	7.06	7.04
Air temperature – wet bulb temperature	[°C]	6.18	6.12
Relative humidity	[%]	88.34	87.85
Barometric pressure	[kPa]	99.117	99.155
Ambient temperature	[°C]	22.49	22.93
Secondary circuit pressure difference	[kPa]	7.462	10.019
Efficiency of the secondary liquid pump	[–]	0.160	0.153
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	1.7999	1.1529
Density of heating water	[$kg \cdot m^{-3}$]	994.0	985.8
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.175	4.178
Voltage	[V]	400.02	399.81
Total current	[A]	10.57	16.60
Overall power input	[kW]	2.245	3.629
Capacity correction of sec. liquid pump	[W]	19.566	17.695
Power input correction of sec. liquid pump	[W]	23.30	20.90
Heating capacity – heating water	[kW]	10.438	10.585
Corrected heating capacity – heating water	**[kW]**	**10.419**	**10.568**
Uncertainty of corrected heating capacity	[kW]	± 0.177	± 0.114
Effective electric power input	**[kW]**	**2.222**	**3.608**
COP	**[–]**	**4.690**	**2.929**
Uncertainty of COP	[–]	± 0.080	± 0.032
Control settings	**[rps]**	**52**	**58**
Circulation pump settings – heating water	[%]	76	60

* Obtained from test report 32-10989/1/T

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 **AWM1752.075.XG10.A00.C13**
Measuring equipment used:	see Chapter III

Design	Air / water – split					
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				Variable	
Seasonal space heating energy efficiency	Heating	Average		η_s	<u>179.0</u>	%
		Warmer		η_s	–	%
		Colder		η_s	–	%
Seasonal efficiency according to ČSN EN 14825:2023	Heating	Average		**SCOP**	<u>4.55</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>10.59</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}	4811	kWh
		Warmer		Q_{HE}	–	kWh
		Colder		Q_{HE}	–	kWh
Modes other than „active mode“		Off mode		P_{OFF}	18.4	W
		Thermostat off mode		P_{TO}	18.7	W
		Standby mode		P_{SB}	18.4	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}	0.0187	[kW]
P_{SB}	0.0184	[kW]
P_{CK}	0.0000	[kW]
P_{OFF}	0.0184	[kW]
$P_{designh}$	10.59	[kW]
$SCOP_{ON}$	4.55	[–]

Coefficient and correction:

F(1)	3	[%]
F(2)	0	[%]
CC	2.5	[–]

Calculation of SCOP:

7.3 Calculation of the reference annual heating demand (Q_H)

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

$Q_H = 10.59 \cdot 2066 = 21883$ [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]

$Q_{HE} = 21883 / 4.55 + 178 \cdot 0.0187 + 0 \cdot 0.0184 + 178 \cdot 0 + 0 \cdot 0.0184 = 4811$ [kWh]

7.2 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [–]

$SCOP = 21883 / 4811 = 4.55$ [–]

7.1 Calculation of the seasonal space heating efficiency η_s

$\Sigma F(i) = F(1) + F(2)$ [–]

$\Sigma F = 0.03 + 0 = 0.03$ [–]

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

$\eta_s (A) = (1 / 2.5) \cdot 4.55 – 0.03 = 1.79$ [–]

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/W27.62**
Date of testing		**2023-10-03**	**2024-05-12**	**2023-10-03**
Transient test procedure	YES / NO	YES	YES	NO
Average defrost time of 1 cycle	[min]	3.5	6.6	–
Average time of 1 cycle	[min]	82.9	167.3	–
Calculation time	[min]	165.9	167.3	70.0
Output heating water – temperature calculation	[°C]	33.59	29.69	27.58
Input heating water – temperature calculation	[°C]	28.93	25.01	22.58
Output heating water temperature	[°C]	34.04	30.08	27.58
Input heating water temperature	[°C]	28.99	25.03	22.58
Air temperature – dry bulb temperature	[°C]	-6.99	2.00	7.01
Air temperature – wet bulb temperature	[°C]	-7.96	1.00	6.07
Relative humidity	[%]	75.51	83.83	87.56
Barometric pressure	[kPa]	98.788	98.792	98.510
Ambient temperature	[°C]	21.20	1.93	21.41
Secondary circuit pressure difference	[kPa]	9.745	-1.921	4.421
Efficiency of the secondary liquid pump	[–]	0.172	0.119	0.124
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	1.7360	1.0086	0.7244
Density of heating water	[$kg \cdot m^{-3}$]	994.4	995.7	996.2
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.176	4.177	4.178
Voltage	[V]	399.59	401.61	400.40
Total current	[A]	15.62	6.06	3.32
Overall power input	[kW]	3.424	1.261	0.650
Capacity correction of sec. liquid pump	[W]	22.240	-4.893	6.306
Power input correction of sec. liquid pump	[W]	26.89	-5.42	7.20
Heating capacity – heating water	[kW]	9.392	5.450	4.188
Corrected heating capacity – heating water	**[kW]**	**9.370**	**5.455**	**4.182**
Uncertainty of corrected heating capacity	[kW]	± 0.171	± 0.100	± 0.072
Effective electric power input	**[kW]**	**3.398**	**1.266**	**0.643**
COP	**[–]**	**2.758**	**4.309**	**6.506**
Uncertainty of COP	[–]	± 0.050	± 0.080	± 0.112
Control settings	**[rps]**	**80**	**34**	**20**
Circulation pump settings – heating water	[%]	76	40	43

* Obtained from test report 32-10989/1/T

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/W27.57**	**A-10/W35**
Date of testing		**2024-05-07**	**2024-05-10**
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]	27.60	35.02
Input heating water – temperature calculation	[°C]	22.57	30.01
Output heating water temperature	[°C]	27.60	35.02
Input heating water temperature	[°C]	22.57	30.01
Air temperature – dry bulb temperature	[°C]	12.00	-10.00
Air temperature – wet bulb temperature	[°C]	11.00	-11.02
Relative humidity	[%]	88.99	69.06
Barometric pressure	[kPa]	98.369	99.016
Ambient temperature	[°C]	11.96	-10.13
Secondary circuit pressure difference	[kPa]	-3.640	-12.517
Efficiency of the secondary liquid pump	[–]	0.125	0.182
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	0.9749	1.5909
Density of heating water	[$kg \cdot m^{-3}$]	996.3	994.0
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.178	4.175
Voltage	[V]	401.98	401.16
Total current	[A]	3.92	15.65
Overall power input	[kW]	0.724	3.414
Capacity correction of sec. liquid pump	[W]	-6.907	-24.796
Power input correction of sec. liquid pump	[W]	-7.89	-30.33
Heating capacity – heating water	[kW]	5.672	9.191
Corrected heating capacity – heating water	**[kW]**	**5.679**	**9.215**
Uncertainty of corrected heating capacity	[kW]	± 0.097	± 0.158
Effective electric power input	**[kW]**	**0.731**	**3.444**
COP	**[–]**	**7.764**	**2.676**
Uncertainty of COP	[–]	± 0.134	± 0.046
Control settings	**[rps]**	**23**	**80**
Circulation pump settings – heating water	[%]	40	50

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	9.37	9.370	2.758	0.900	1.00	2.758	–
B	2	30.00	53.85	5.70	5.455	4.309	0.900	1.00	4.309	–
C	7	27.62	34.62	3.67	4.182	6.506	0.971	0.88	6.480	0.0187
D	12	27.57	15.38	1.63	5.679	7.764	0.974	0.29	7.300	0.0187
TOL (E)	-10	35.00	100.00	10.59	9.215	2.676	0.900	1.00	2.676	–
Tbiv (F)	-7	34.00	88.46	9.37	9.370	2.758	0.900	1.00	2.758	–

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:

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

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

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

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

For variable flow:

$\Delta t = 5$

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

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

Measured data:

$t_{\text{outlet, average}}$	24.00	[°C]
Declared capacity	5.679	[kW]
Declared capacity $_{\text{standard rating condition A7/W35}}$	–	[kW]
Part load	1.63	[kW]

Calculation of water temperature

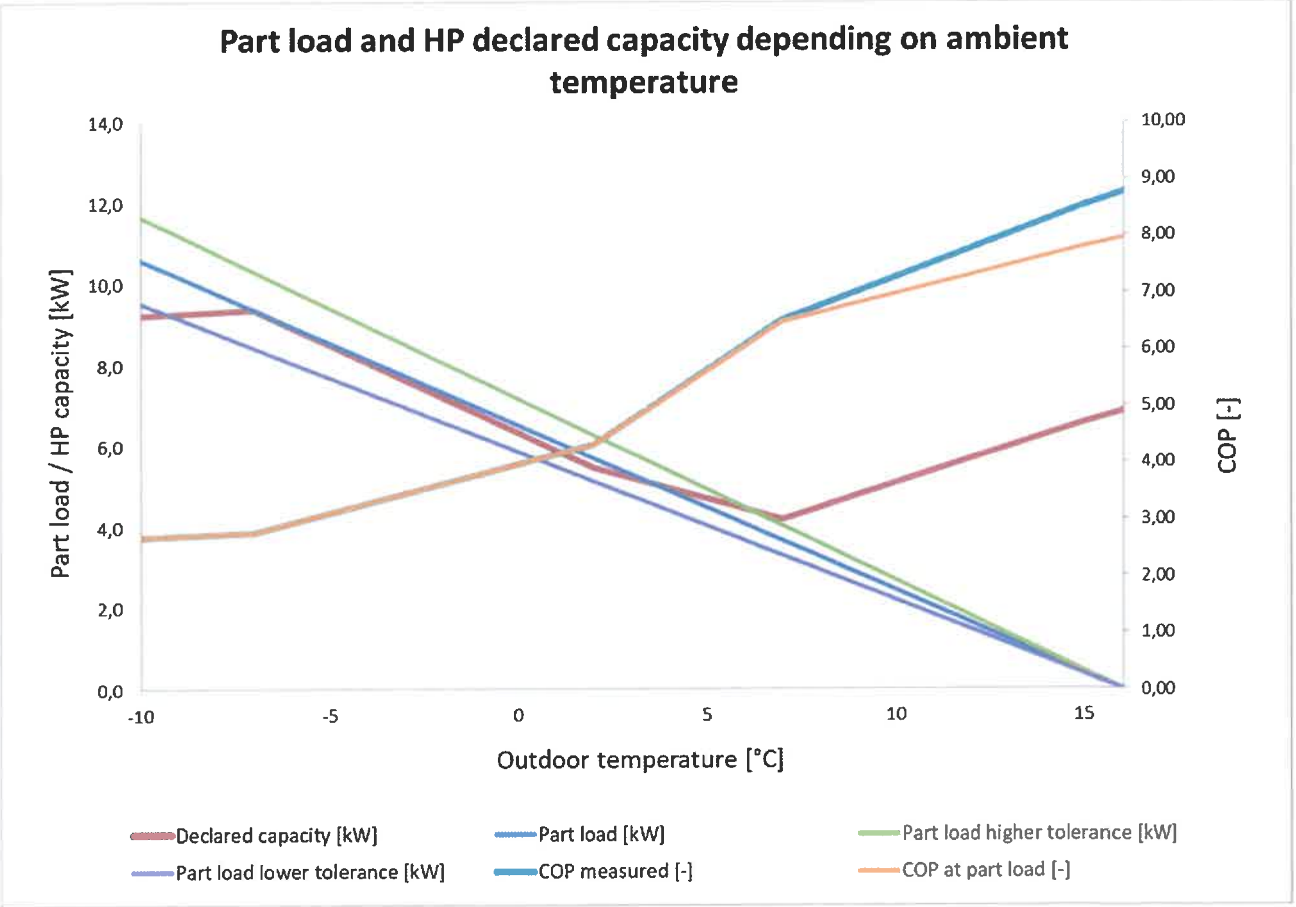
$t_{\text{outlet, capacity test, variable flow}} = 24 + 5 – 1.63 / 5.679 \cdot 5 =$ **27.57** [°C]

	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) COPb in (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**	**10.59**	**9.22**	**9.22**	**1.38**	**1.38**	**2.68**	**11**	**5**	**9**	**3**
	22	-9	25	96.15	10.18	9.27	9.27	0.92	22.95	2.70	255	109	232	86
	23	-8	23	92.31	9.78	9.32	9.32	0.46	10.56	2.73	225	89	214	78
A, Tbiv (F)	**24**	**-7**	**24**	**88.46**	**9.37**	**9.37**	**9.37**	**0.00**	**0.00**	**2.76**	**225**	**82**	**225**	**82**
	25	-6	27	84.62	8.96	8.94	8.94	0.00	0.00	2.93	242	83	242	83
	26	-5	68	80.77	8.56	8.50	8.50	0.00	0.00	3.10	582	188	582	188
	27	-4	91	76.92	8.15	8.07	8.07	0.00	0.00	3.28	741	226	741	226
	28	-3	89	73.08	7.74	7.63	7.63	0.00	0.00	3.45	689	200	689	200
	29	-2	165	69.23	7.33	7.20	7.20	0.00	0.00	3.62	1210	334	1210	334
	30	-1	173	65.38	6.93	6.76	6.76	0.00	0.00	3.79	1198	316	1198	316
	31	0	240	61.54	6.52	6.33	6.33	0.00	0.00	3.96	1564	395	1564	395
	32	1	280	57.69	6.11	5.89	5.89	0.00	0.00	4.14	1711	414	1711	414
B	**33**	**2**	**320**	**53.85**	**5.70**	**5.46**	**5.46**	**0.00**	**0.00**	**4.31**	**1825**	**424**	**1825**	**424**
	34	3	357	50.00	5.30	5.20	5.20	0.00	0.00	4.74	1891	399	1891	399
	35	4	356	46.15	4.89	4.95	4.89	0.00	0.00	5.18	1740	336	1740	336
	36	5	303	42.31	4.48	4.69	4.48	0.00	0.00	5.61	1358	242	1358	242
	37	6	330	38.46	4.07	4.44	4.07	0.00	0.00	6.05	1344	222	1344	222
C	**38**	**7**	**326**	**34.62**	**3.67**	**4.18**	**3.67**	**0.00**	**0.00**	**6.48**	**1195**	**184**	**1195**	**184**
	39	8	348	30.77	3.26	4.48	3.26	0.00	0.00	6.64	1134	171	1134	171
	40	9	335	26.92	2.85	4.78	2.85	0.00	0.00	6.81	955	140	955	140
	41	10	315	23.08	2.44	5.08	2.44	0.00	0.00	6.97	770	110	770	110
	42	11	215	19.23	2.04	5.38	2.04	0.00	0.00	7.14	438	61	438	61
D	**43**	**12**	**169**	**15.38**	**1.63**	**5.68**	**1.63**	**0.00**	**0.00**	**7.30**	**275**	**38**	**275**	**38**
	44	13	151	11.54	1.22	5.98	1.22	0.00	0.00	7.46	185	25	185	25
	45	14	105	7.69	0.81	6.28	0.81	0.00	0.00	7.63	86	11	86	11
	46	15	74	3.85	0.41	6.58	0.41	0.00	0.00	7.79	30	4	30	4
		Σ	4910							Σ	21879	4806	21844	4771

SCOPon	4.55	SCOPnet	4.58
		SCOP	**4.55**

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 **AWM1752.075.XG10.A00.C13**
Measuring equipment used:	see Chapter III

Design	Air / water – split				
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			Variable	
Seasonal space heating energy efficiency	Heating	Average	η_s	<u>127.7</u>	%
		Warmer	η_s	–	%
		Colder	η_s	–	%
Seasonal efficiency according to ČSN EN 14825:2023	Heating	Average	**SCOP**	<u>3.27</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>9.64</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}	6099	kWh
		Warmer	Q_{HE}	–	kWh
		Colder	Q_{HE}	–	kWh
Modes other than „active mode“	Off mode		P_{OFF}	18.4	W
	Thermostat off mode		P_{TO}	18.7	W
	Standby mode		P_{SB}	18.4	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}	0.0187	[kW]
P_{SB}	0.0184	[kW]
P_{CK}	0.0000	[kW]
P_{OFF}	0.0184	[kW]
$P_{designh}$	9.64	[kW]
$SCOP_{ON}$	3.27	[–]

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]

$Q_H = 9.64 \cdot 2066 = 19924$ [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]

$Q_{HE} = 19924 / 3.27 + 178 \cdot 0.0187 + 0 \cdot 0.0184 + 178 \cdot 0 + 0 \cdot 0.0184 = 6099$ [kWh]

7.2 General formula for calculation of reference SCOP

$SCOP = Q_H / Q_{HE}$ [–]

$SCOP = 19924 / 6099 = 3.27$ [–]

7.1 Calculation of the seasonal space heating efficiency η_s

$\Sigma F(i) = F(1) + F(2)$ [–]

$\Sigma F = 0.03 + 0 = 0.03$ [–]

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

$\eta_s (A) = (1 / 2.5) \cdot 3.27 - 0.03 =$ **<u>1.277</u>** [–]

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/W37.55**
Date of testing		**2023-10-04**	**2024-05-09**	**2023-10-04**
Transient test procedure	YES / NO	YES	NO	NO
Average defrost time of 1 cycle	[min]	4.5	–	–
Average time of 1 cycle	[min]	197.8	–	–
Calculation time	[min]	197.8	70.0	70.0
Output heating water – temperature calculation	[°C]	51.70	42.04	37.48
Input heating water – temperature calculation	[°C]	43.96	34.04	32.51
Output heating water temperature	[°C]	52.01	42.04	37.48
Input heating water temperature	[°C]	43.98	34.04	32.51
Air temperature – dry bulb temperature	[°C]	-6.99	2.00	6.97
Air temperature – wet bulb temperature	[°C]	-7.98	1.01	6.05
Relative humidity	[%]	75.04	83.91	87.81
Barometric pressure	[kPa]	99.608	99.099	99.522
Ambient temperature	[°C]	22.31	1.93	21.63
Secondary circuit pressure difference	[kPa]	14.320	7.623	2.490
Efficiency of the secondary liquid pump	[–]	0.162	0.128	0.119
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	0.9661	0.5756	0.7237
Density of heating water	[$kg \cdot m^{-3}$]	987.4	991.6	993.1
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.177	4.175	4.175
Voltage	[V]	398.83	402.61	400.24
Total current	[A]	22.95	7.58	4.54
Overall power input	[kW]	4.996	1.601	0.940
Capacity correction of sec. liquid pump	[W]	19.894	8.313	3.719
Power input correction of sec. liquid pump	[W]	23.72	9.53	4.22
Heating capacity – heating water	[kW]	8.551	5.296	4.147
Corrected heating capacity – heating water	**[kW]**	**8.531**	**5.288**	**4.143**
Uncertainty of corrected heating capacity	[kW]	± 0.095	± 0.059	± 0.071
Effective electric power input	**[kW]**	**4.972**	**1.592**	**0.936**
COP	**[–]**	**1.716**	**3.322**	**4.428**
Uncertainty of COP	[–]	± 0.019	± 0.037	± 0.076
Control settings	**[rps]**	**87**	**34**	**22**
Circulation pump settings – heating water	[%]	60	40	40

* Obtained from test report 32-10989/1/T

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/W35.44**	**A-10/W55**
Date of testing		**2024-05-09**	**2024-05-10**
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]	35.47	54.94
Input heating water – temperature calculation	[°C]	27.45	46.99
Output heating water temperature	[°C]	35.47	54.94
Input heating water temperature	[°C]	27.45	46.99
Air temperature – dry bulb temperature	[°C]	12.00	-10.00
Air temperature – wet bulb temperature	[°C]	11.01	-10.96
Relative humidity	[%]	89.02	70.81
Barometric pressure	[kPa]	99.309	99.034
Ambient temperature	[°C]	11.97	-10.10
Secondary circuit pressure difference	[kPa]	8.120	8.360
Efficiency of the secondary liquid pump	[–]	0.127	0.137
Volume flow rate of heating water	[$m^3 \cdot h^{-1}$]	0.5025	0.8134
Density of heating water	[$kg \cdot m^{-3}$]	994.0	986.1
Specific heat capacity of heating water	[$kJ \cdot kg^{-1} \cdot K^{-1}$]	4.175	4.178
Voltage	[V]	402.67	399.19
Total current	[A]	4.24	20.53
Overall power input	[kW]	0.809	4.485
Capacity correction of sec. liquid pump	[W]	7.806	11.945
Power input correction of sec. liquid pump	[W]	8.94	13.83
Heating capacity – heating water	[kW]	4.641	7.397
Corrected heating capacity – heating water	**[kW]**	**4.633**	**7.385**
Uncertainty of corrected heating capacity	[kW]	± 0.051	± 0.082
Effective electric power input	**[kW]**	**0.800**	**4.471**
COP	**[–]**	**5.791**	**1.652**
Uncertainty of COP	[–]	± 0.065	± 0.019
Control settings	**[rps]**	**20**	**80**
Circulation pump settings – heating water	[%]	40	50

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	8.53	8.531	1.716	0.900	1.00	1.716	–
B	2	42.00	53.85	5.19	5.288	3.322	0.900	1.00	3.322	–
C	7	37.55	34.62	3.34	4.143	4.428	0.980	0.81	4.407	0.0187
D	12	35.44	15.38	1.48	4.633	5.791	0.977	0.32	5.517	0.0187
TOL (E)	-10	55.00	100.00	9.64	7.385	1.652	0.900	1.00	1.652	–
Tbiv (F)	-7	52.00	88.46	8.53	8.531	1.716	0.900	1.00	1.716	–

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:

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

$\Delta t = 8$

$CR \cdot \Delta t$ = Part load / Declared capacity · 8

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

Measured data:

$t_{outlet, average}$	30.00	[°C]
Declared capacity	4.633	[kW]
Declared capacity standard rating condition A7/W55	–	[kW]
Part load	1.48	[kW]

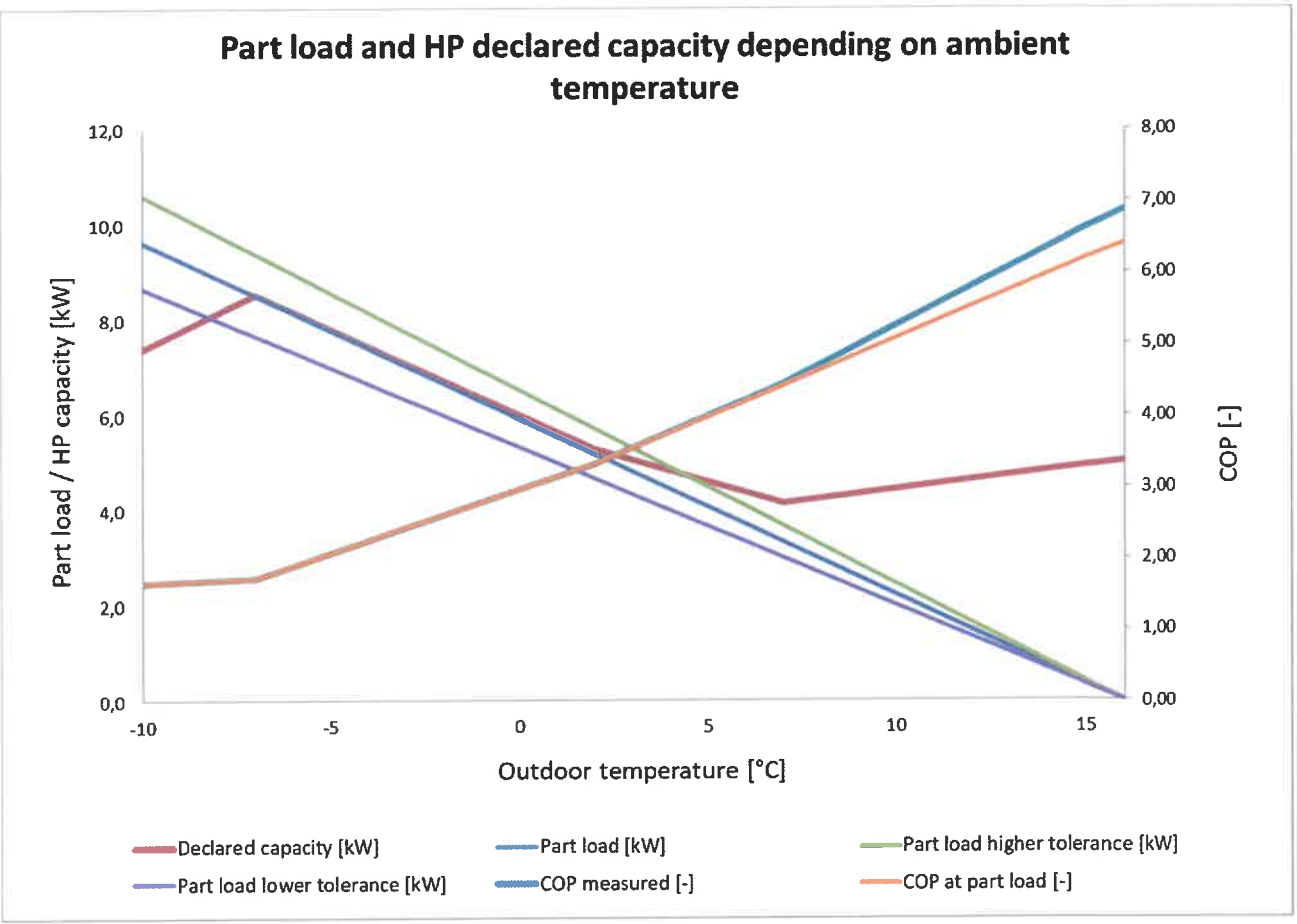
Calculation of water temperature

$t_{outlet, capacity test, variable flow} = 30 + 8 - 1.48 / 4.633 \cdot 8 = \underline{35.44}$ [°C]

	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**	**9.64**	**7.39**	**7.39**	**2.26**	**2.26**	**1.65**	**10**	**7**	**7**	**4**
	22	-9	25	96.15	9.27	7.77	7.77	1.51	37.65	1.67	232	154	194	116
	23	-8	23	92.31	8.90	8.15	8.15	0.75	17.32	1.69	205	128	187	111
A, Tbiv (F)	**24**	**-7**	**24**	**88.46**	**8.53**	**8.53**	**8.53**	**0.00**	**0.00**	**1.72**	**205**	**119**	**205**	**119**
	25	-6	27	84.62	8.16	8.17	8.16	0.00	0.00	1.89	220	116	220	116
	26	-5	68	80.77	7.79	7.81	7.79	0.00	0.00	2.07	530	256	530	256
	27	-4	91	76.92	7.42	7.45	7.42	0.00	0.00	2.25	675	300	675	300
	28	-3	89	73.08	7.05	7.09	7.05	0.00	0.00	2.43	627	258	627	258
	29	-2	165	69.23	6.68	6.73	6.68	0.00	0.00	2.61	1102	422	1102	422
	30	-1	173	65.38	6.31	6.37	6.31	0.00	0.00	2.79	1091	391	1091	391
	31	0	240	61.54	5.93	6.01	5.93	0.00	0.00	2.97	1424	480	1424	480
	32	1	280	57.69	5.56	5.65	5.56	0.00	0.00	3.14	1558	496	1558	496
B	**33**	**2**	**320**	**53.85**	**5.19**	**5.29**	**5.19**	**0.00**	**0.00**	**3.32**	**1662**	**500**	**1662**	**500**
	34	3	357	50.00	4.82	5.06	4.82	0.00	0.00	3.54	1721	486	1721	486
	35	4	356	46.15	4.45	4.83	4.45	0.00	0.00	3.76	1585	422	1585	422
	36	5	303	42.31	4.08	4.60	4.08	0.00	0.00	3.97	1236	311	1236	311
	37	6	330	38.46	3.71	4.37	3.71	0.00	0.00	4.19	1224	292	1224	292
C	**38**	**7**	**326**	**34.62**	**3.34**	**4.14**	**3.34**	**0.00**	**0.00**	**4.41**	**1088**	**247**	**1088**	**247**
	39	8	348	30.77	2.97	4.24	2.97	0.00	0.00	4.63	1033	223	1033	223
	40	9	335	26.92	2.60	4.34	2.60	0.00	0.00	4.85	870	179	870	179
	41	10	315	23.08	2.23	4.44	2.23	0.00	0.00	5.07	701	138	701	138
	42	11	215	19.23	1.85	4.54	1.85	0.00	0.00	5.30	399	75	399	75
D	**43**	**12**	**169**	**15.38**	**1.48**	**4.63**	**1.48**	**0.00**	**0.00**	**5.52**	**251**	**45**	**251**	**45**
	44	13	151	11.54	1.11	4.73	1.11	0.00	0.00	5.74	168	29	168	29
	45	14	105	7.69	0.74	4.83	0.74	0.00	0.00	5.96	78	13	78	13
	46	15	74	3.85	0.37	4.93	0.37	0.00	0.00	6.18	27	4	27	4
		Σ	4910							Σ	19920	6094	19863	6037

SCOPon	3.27	SCOPnet	3.29
		SCOP	**3.27**

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

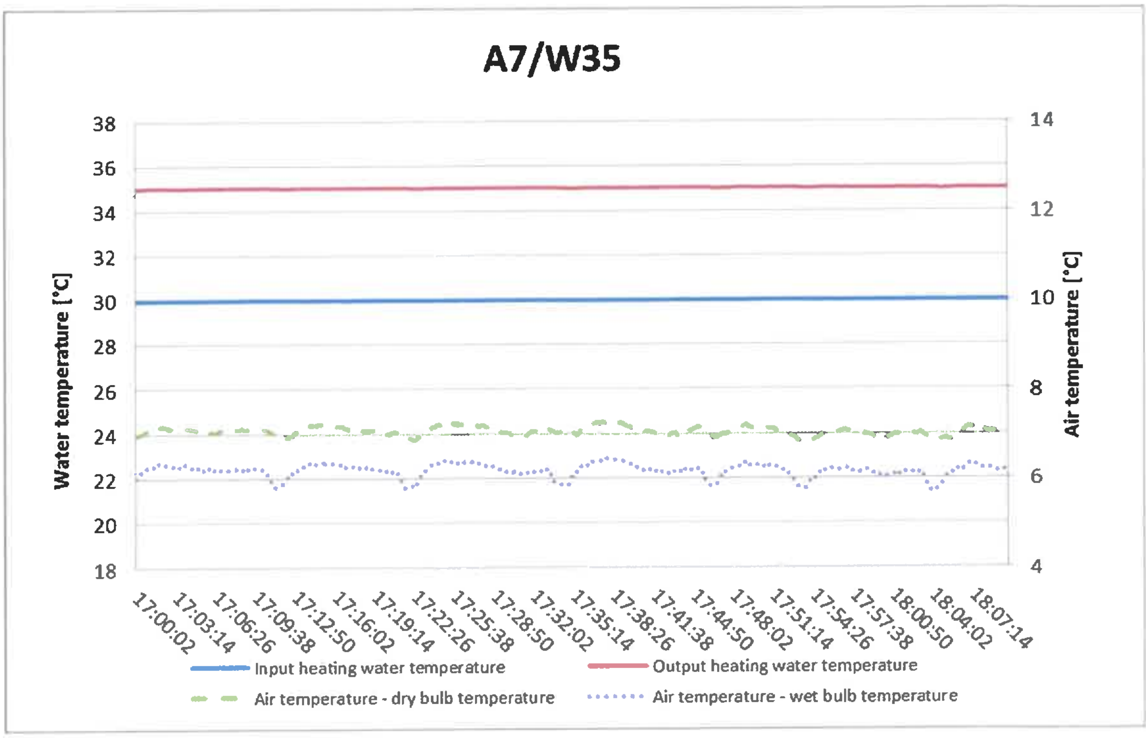


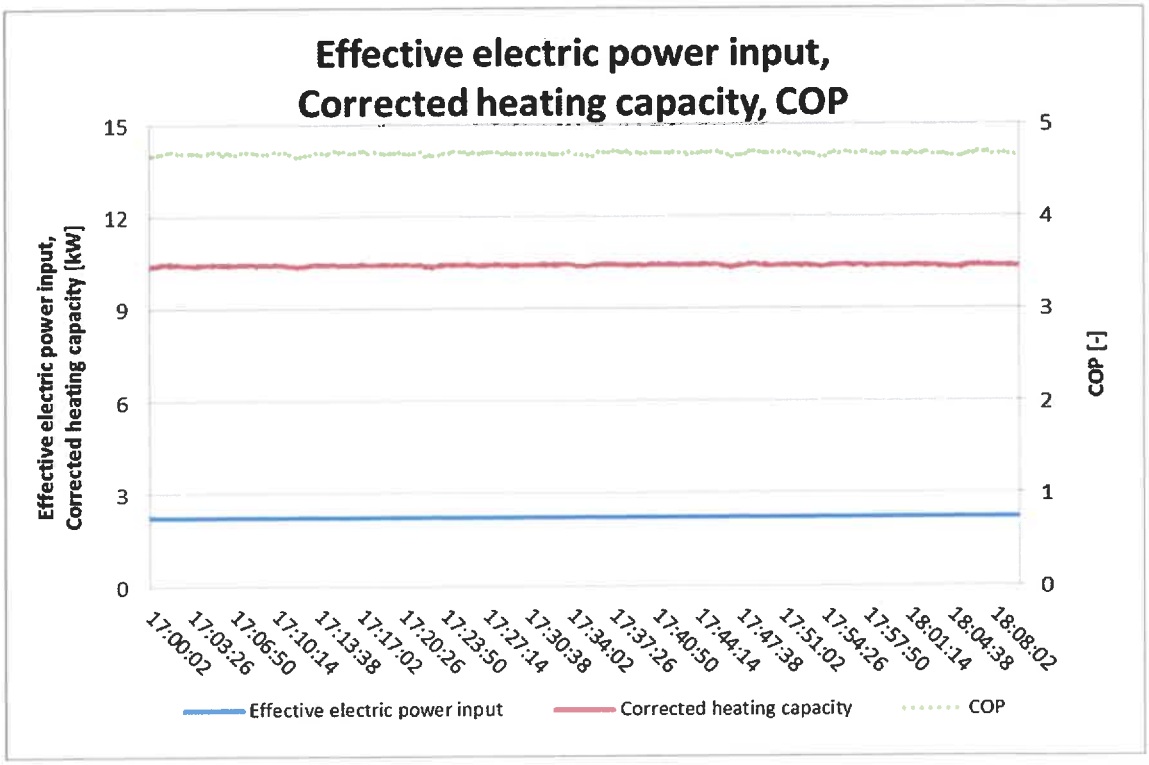
Tested by:	Ing. Jakub Čederle	Date:	2024-06-14	Signed:	
Reviewed and approved by:	Ing. Michal Faltýnek	Date:	2024-06-14	Signed:	

V. Graphs

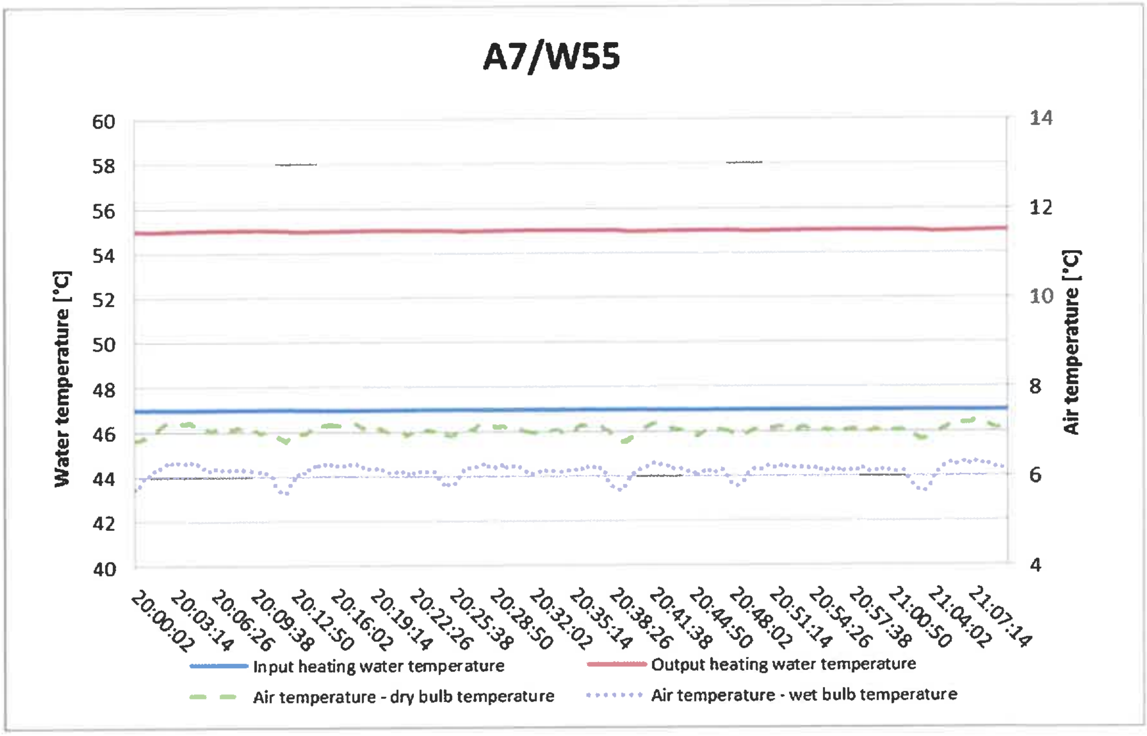
1. Rating conditions

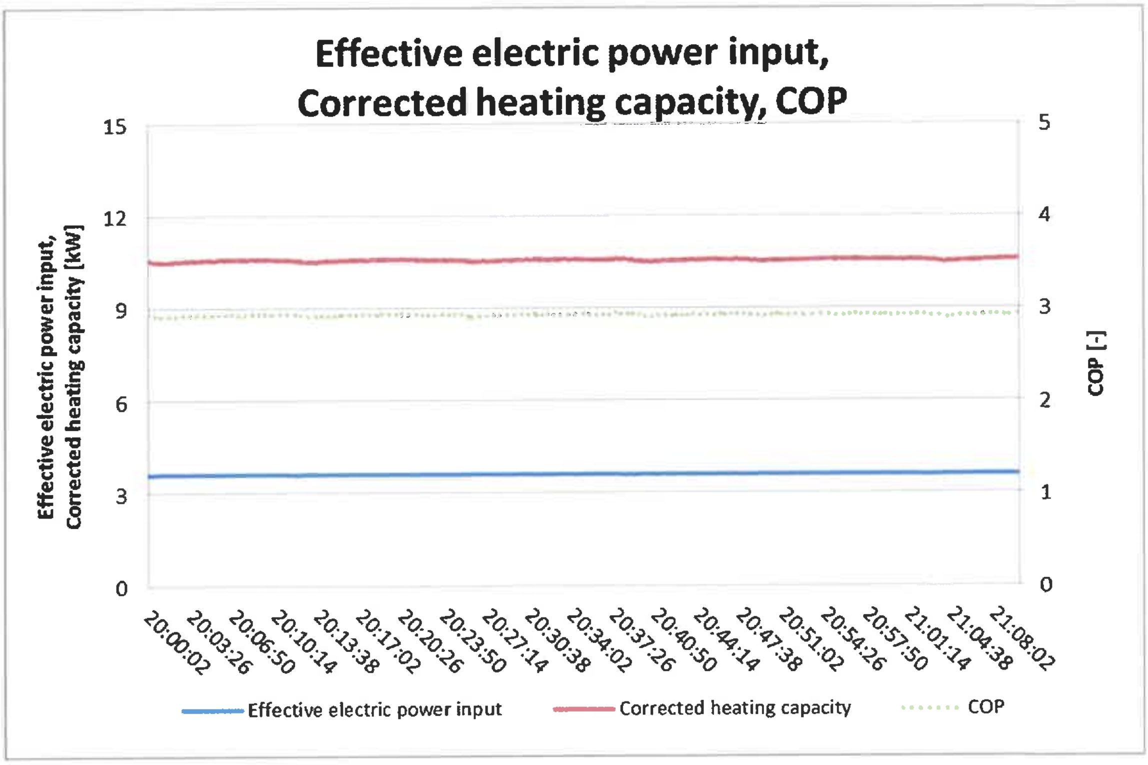
A7W35 (52 Hz)





A7W55 (58 Hz)

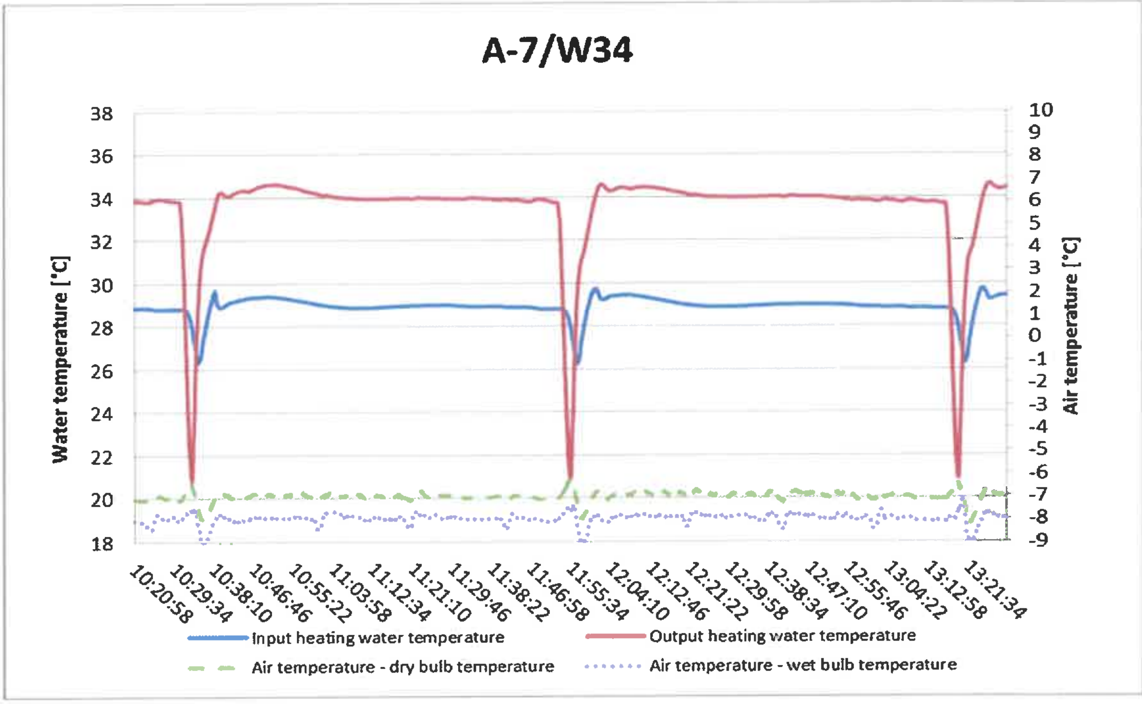

A7/W55
Water temperature [°C]
Air temperature [°C]
60
58
56
54
52
50
48
46
44
42
40
14
12
10
8
6
4
20:00:02
20:03:14
20:06:26
20:09:38
20:12:50
20:16:02
20:19:14
20:22:26
20:25:38
20:28:50
20:32:02
20:35:14
20:38:26
20:41:38
20:44:50
20:48:02
20:51:14
20:54:26
20:57:38
21:00:50
21:04:02
21:07:14
Input heating water temperature
Output heating water temperature
Air temperature - dry bulb temperature
Air temperature - wet bulb temperature

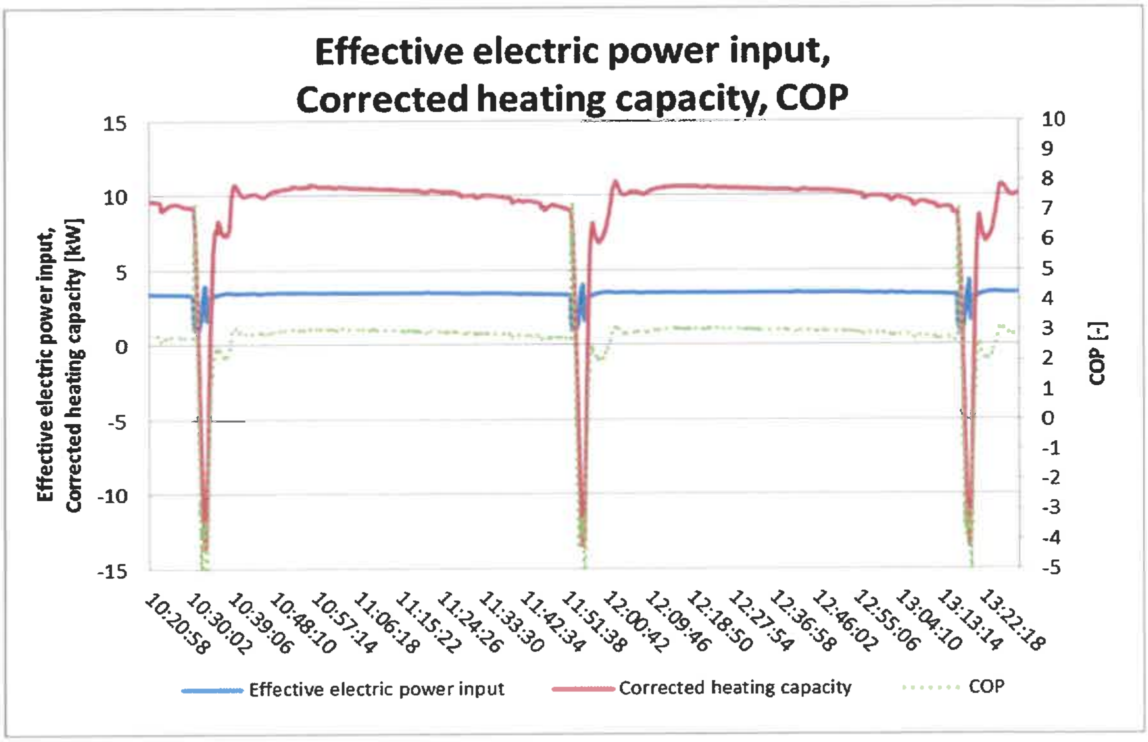

Effective electric power input, Corrected heating capacity, COP
Effective electric power input, Corrected heating capacity [kW]
COP [-]
15
12
9
6
3
0
5
4
3
2
1
0
20:00:02
20:03:26
20:06:50
20:10:14
20:13:38
20:17:02
20:20:26
20:23:50
20:27:14
20:30:38
20:34:02
20:37:26
20:40:50
20:44:14
20:47:38
20:51:02
20:54:26
20:57:50
21:01:14
21:04:38
21:08:02
Effective electric power input
Corrected heating capacity
COP

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV

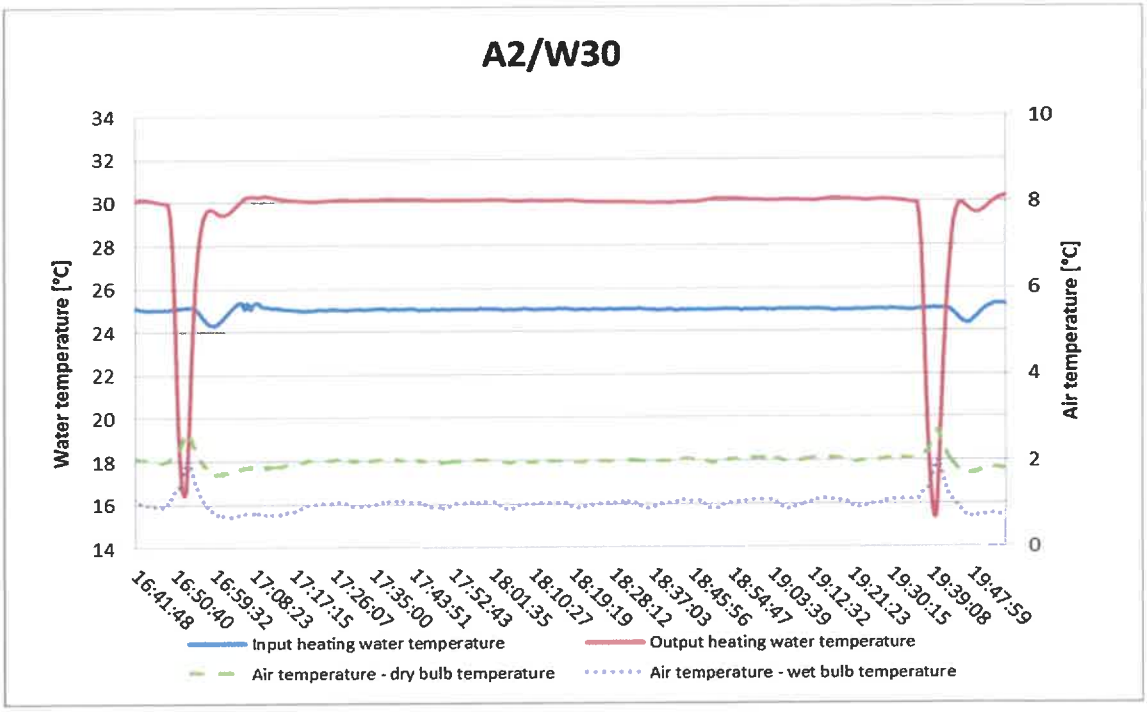
2. Seasonal performance tests and SCOP calculation – Low temperature application

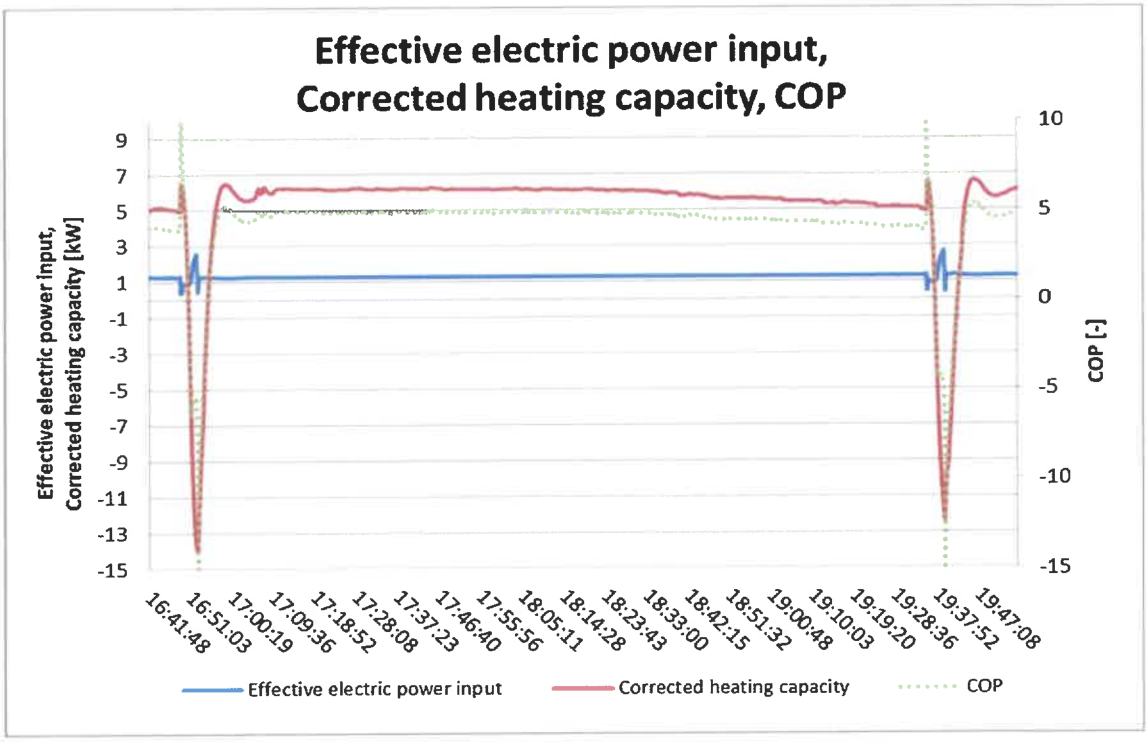
A-7/W34 (80 Hz)



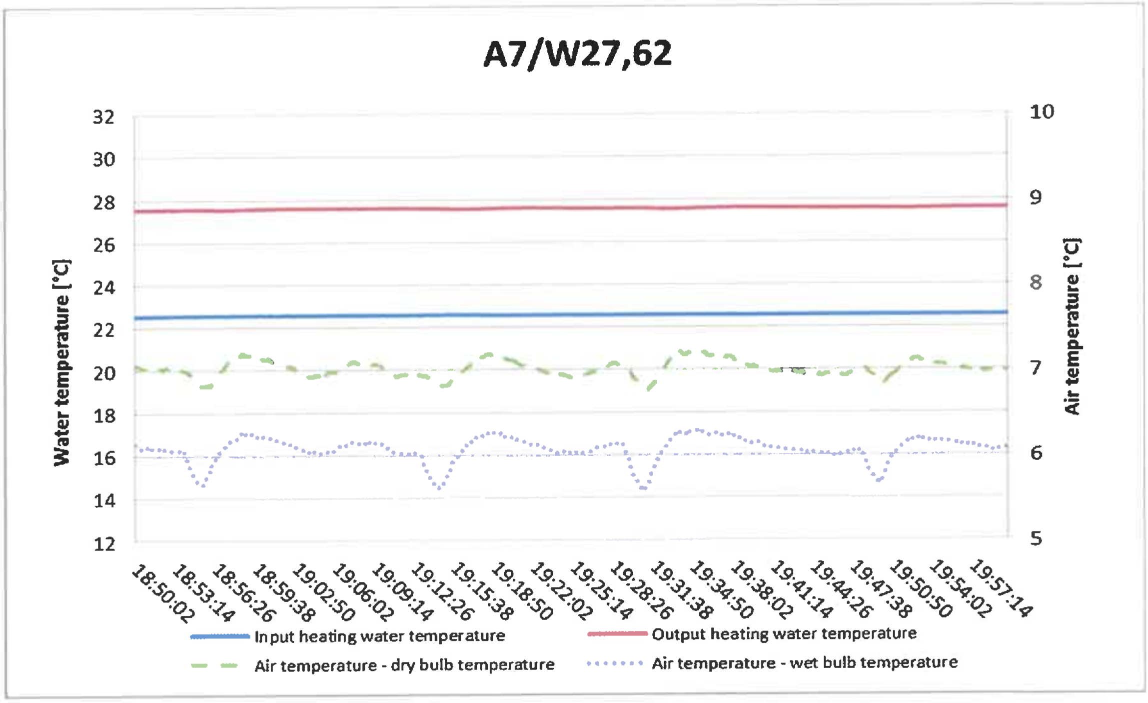


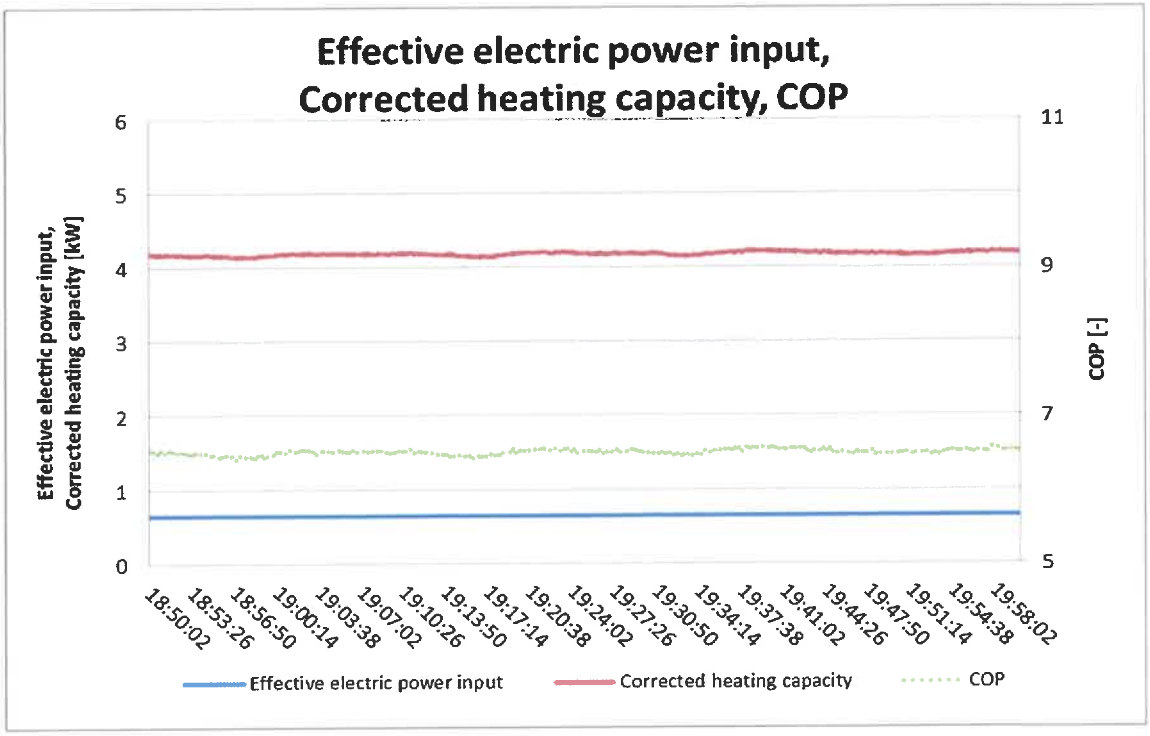
A2/W30 (34Hz)


A2/W30
Water temperature [°C]
Air temperature [°C]
34
32
30
28
26
24
22
20
18
16
14
10
8
6
4
2
0
16:41:48
16:50:40
16:59:32
17:08:23
17:17:15
17:26:07
17:35:00
17:43:51
17:52:43
18:01:35
18:10:27
18:19:19
18:28:12
18:37:03
18:45:56
18:54:47
19:03:39
19:12:32
19:21:23
19:30:15
19:39:08
19:47:59
Input heating water temperature
Output heating water temperature
Air temperature - dry bulb temperature
Air temperature - wet bulb temperature

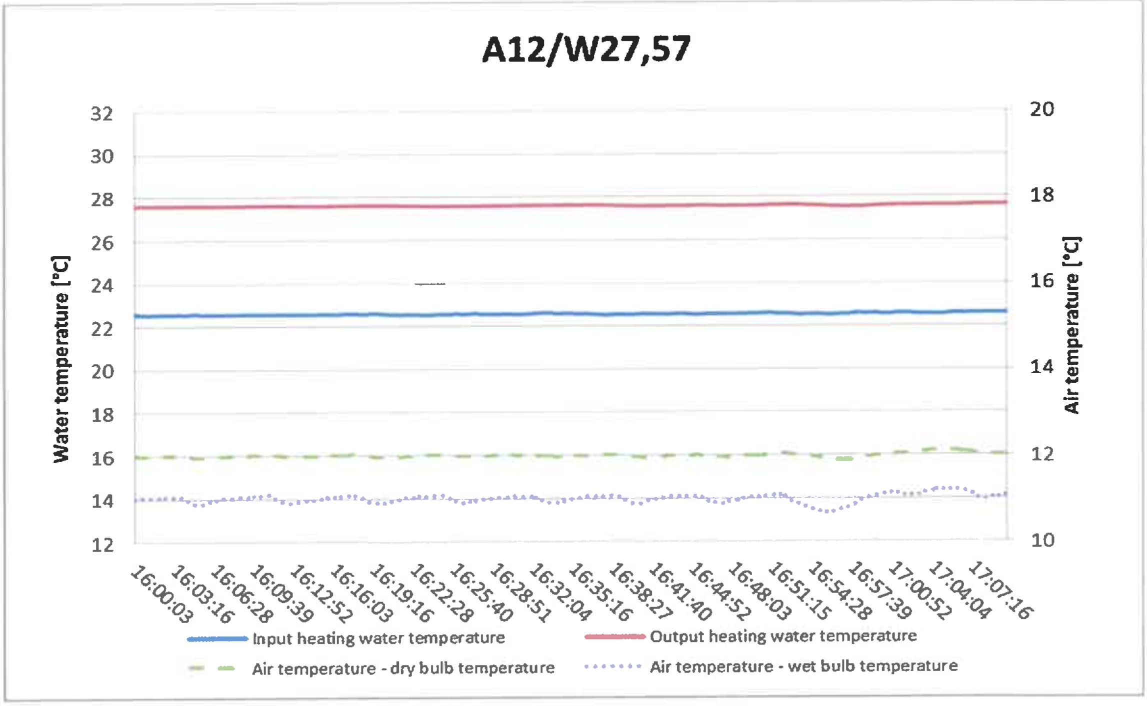

Effective electric power input, Corrected heating capacity, COP
Effective electric power input, Corrected heating capacity [kW]
COP [-]
9
7
5
3
1
-1
-3
-5
-7
-9
-11
-13
-15
10
5
0
-5
-10
-15
16:41:48
16:51:03
17:00:19
17:09:36
17:18:52
17:28:08
17:37:23
17:46:40
17:55:56
18:05:11
18:14:28
18:23:43
18:33:00
18:42:15
18:51:32
19:00:48
19:10:03
19:19:20
19:28:36
19:37:52
19:47:08
Effective electric power input
Corrected heating capacity
COP

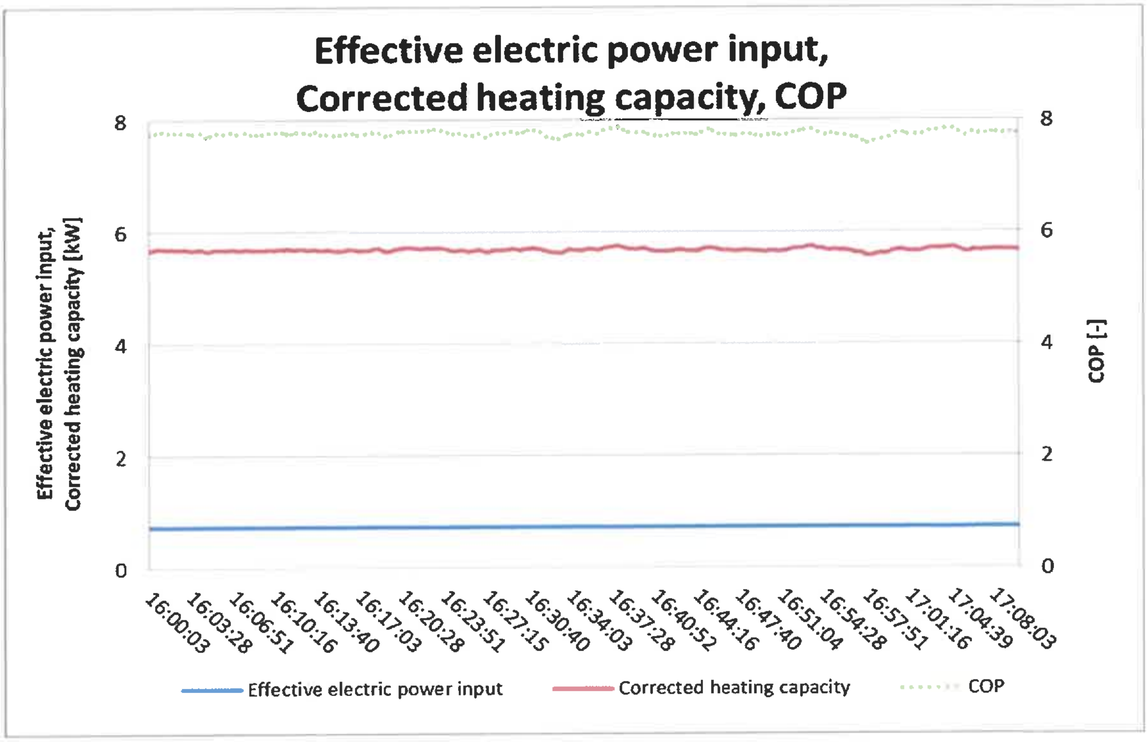
A7/W27.62 (20 Hz)



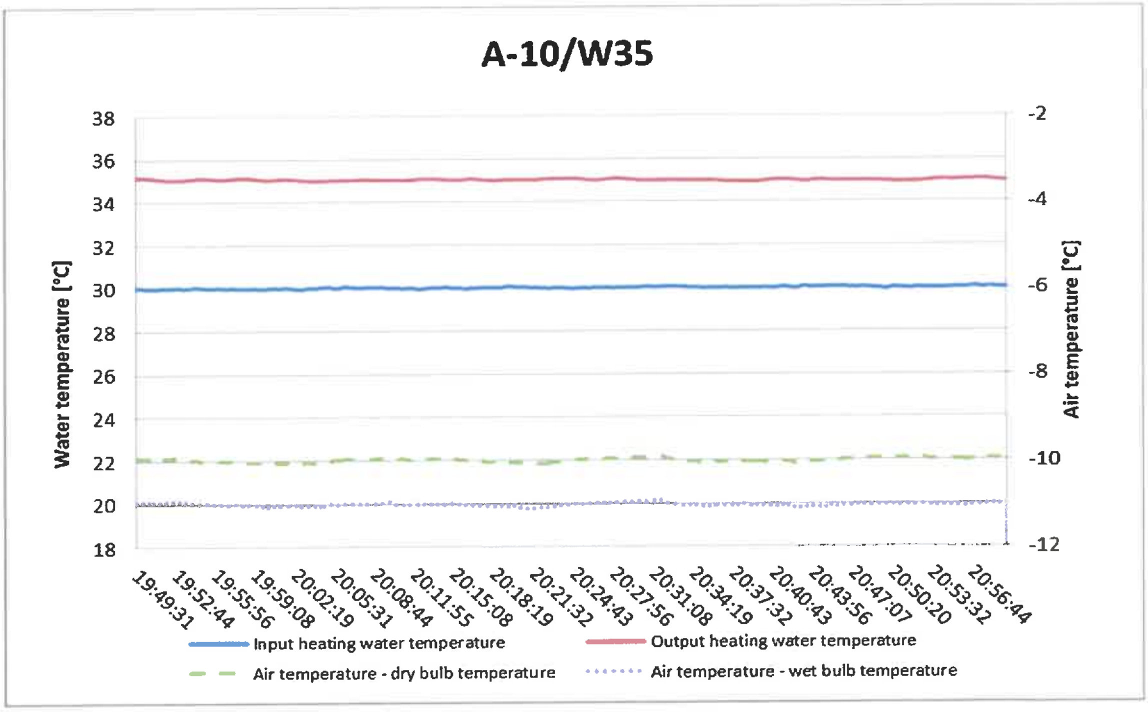


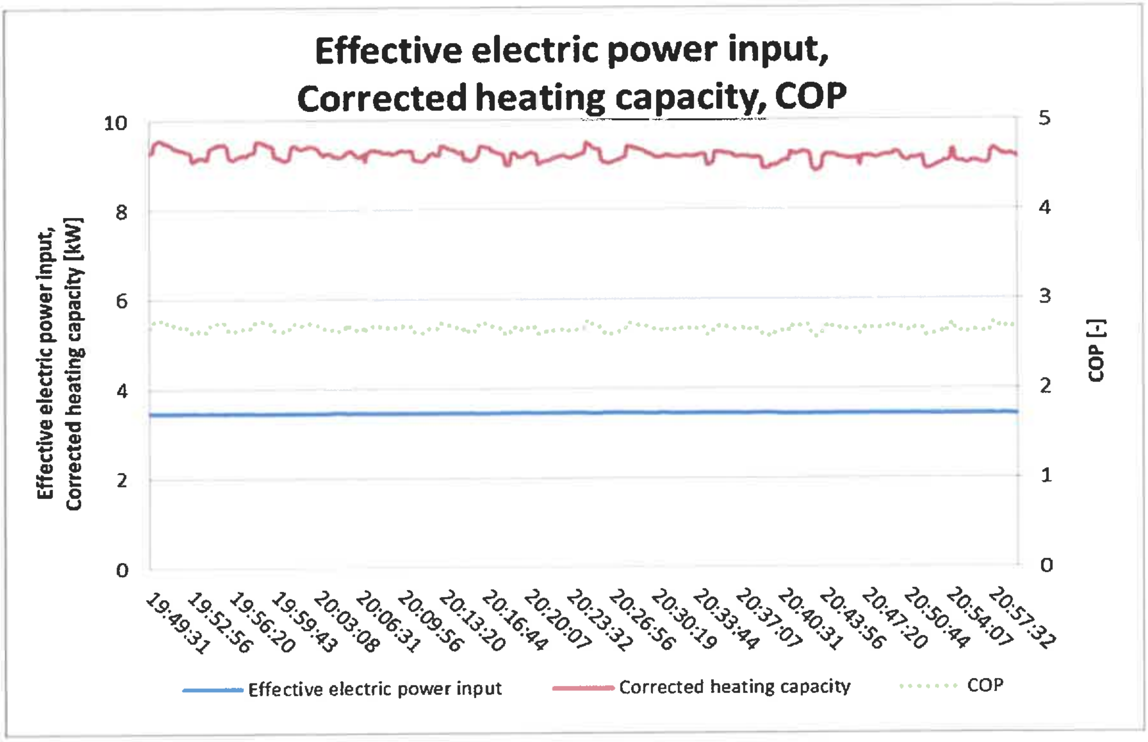
A12/W27.57 (23 Hz)





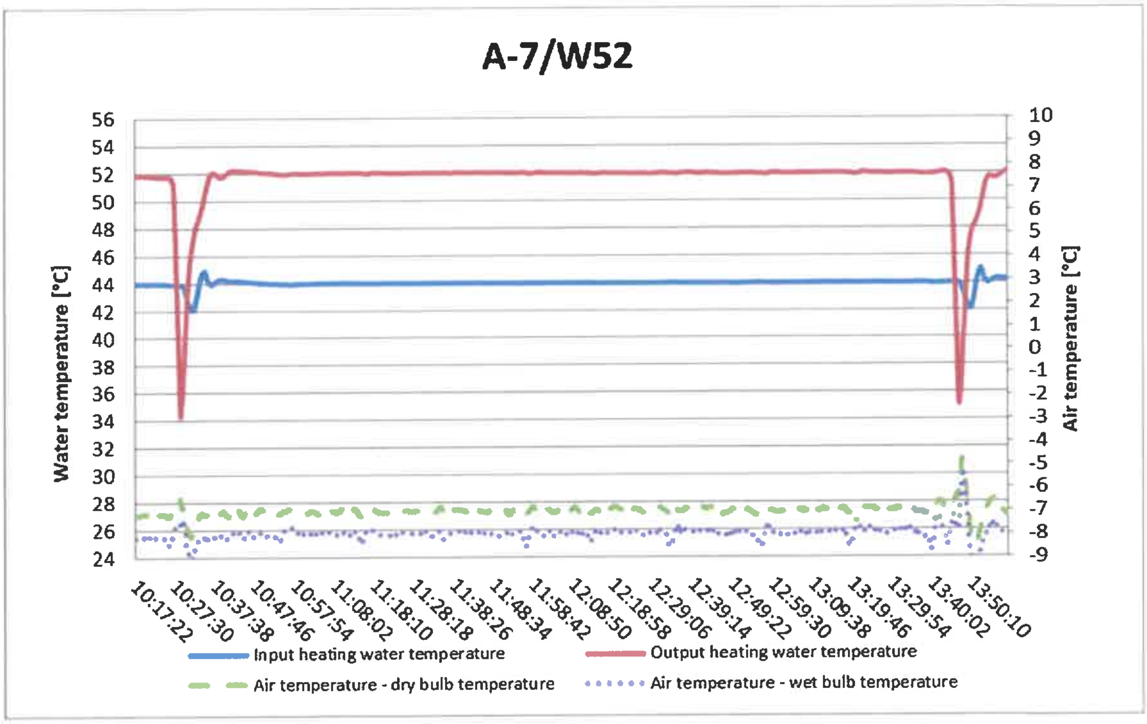
A-10/W35 (80 Hz)

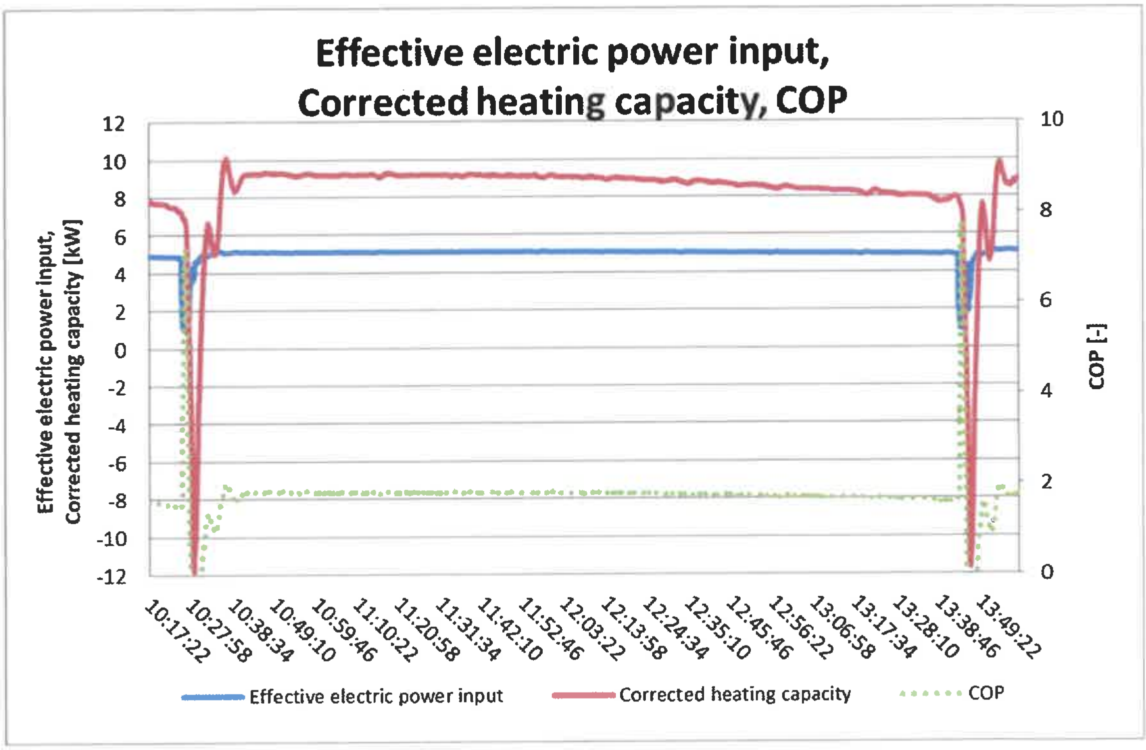

A-10/W35
Water temperature [°C]
Air temperature [°C]
Input heating water temperature
Output heating water temperature
Air temperature - dry bulb temperature
Air temperature - wet bulb temperature


Effective electric power input, Corrected heating capacity, COP
Effective electric power input, Corrected heating capacity [kW]
COP [-]
Effective electric power input
Corrected heating capacity
COP

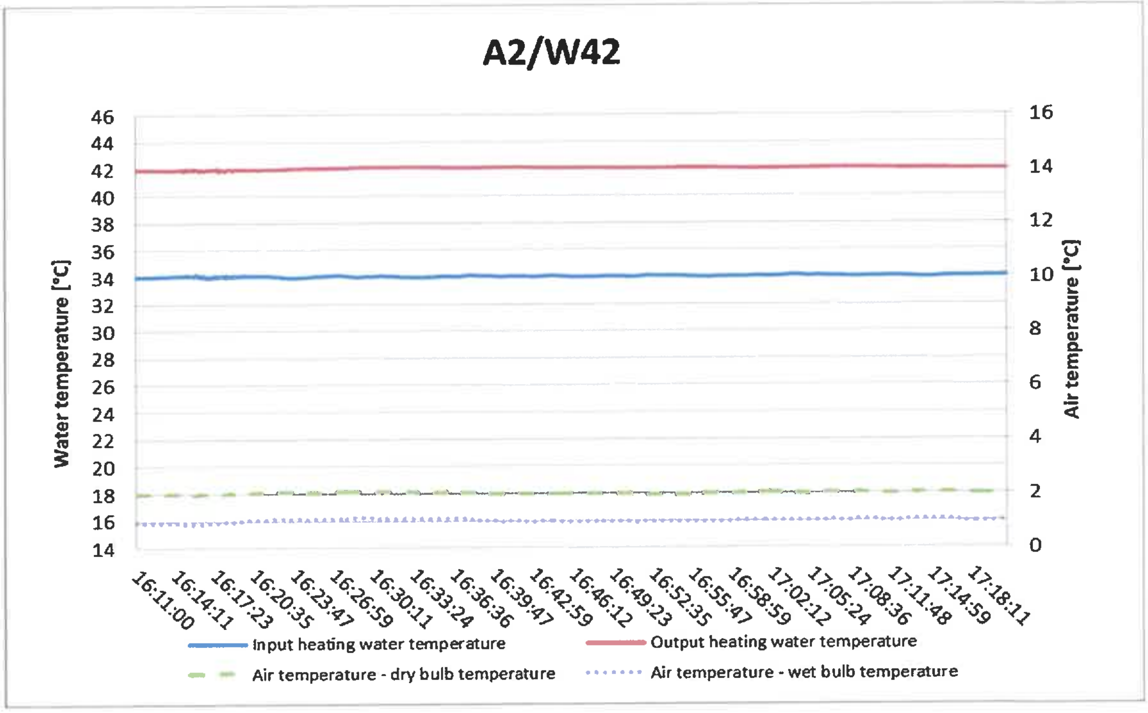
3. Seasonal performance tests and SCOP calculation – Medium temperature application

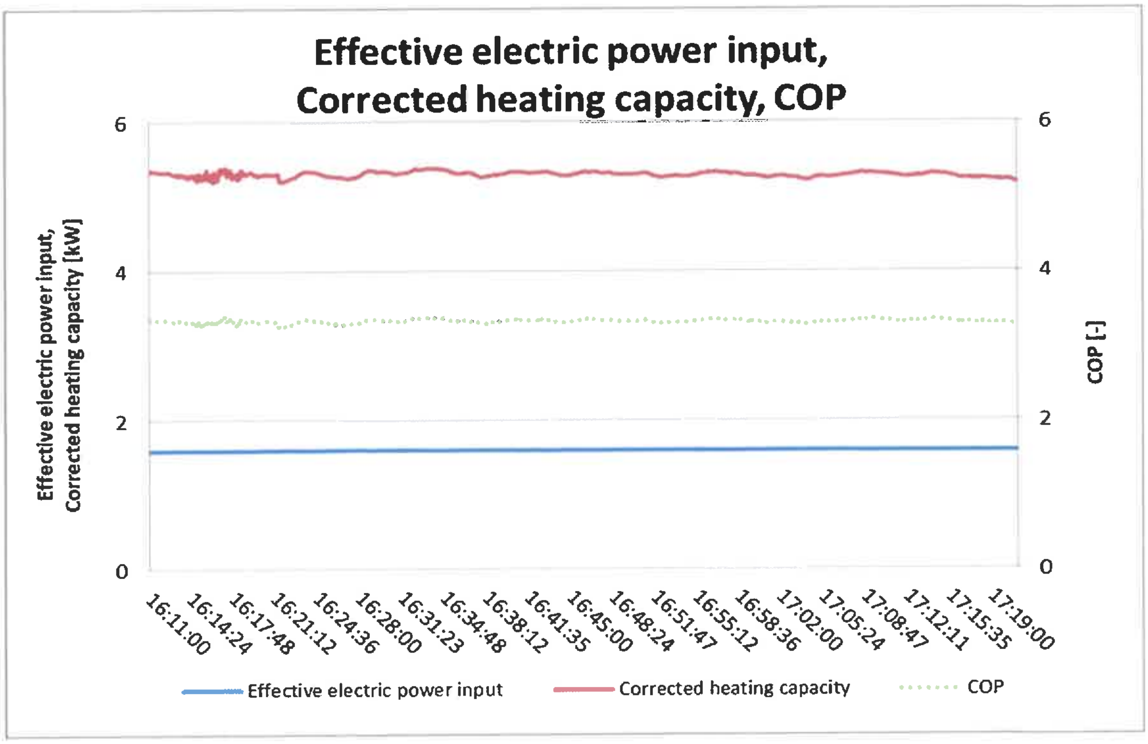
A-7/W52 (87 Hz)



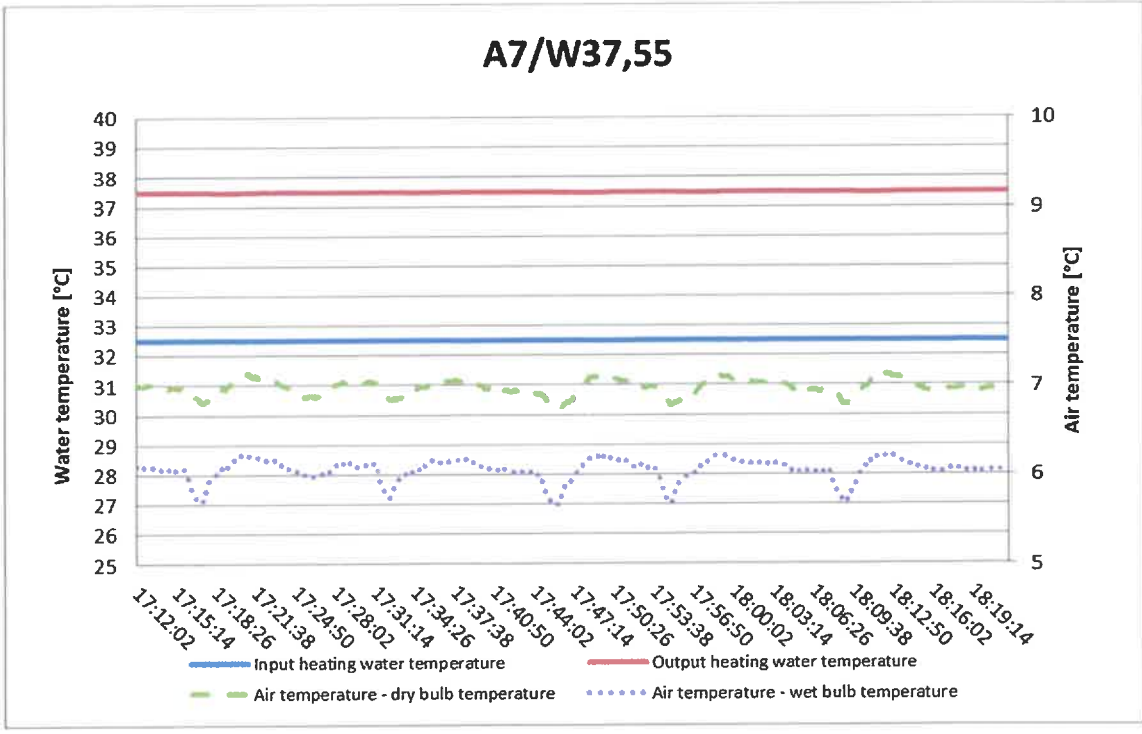


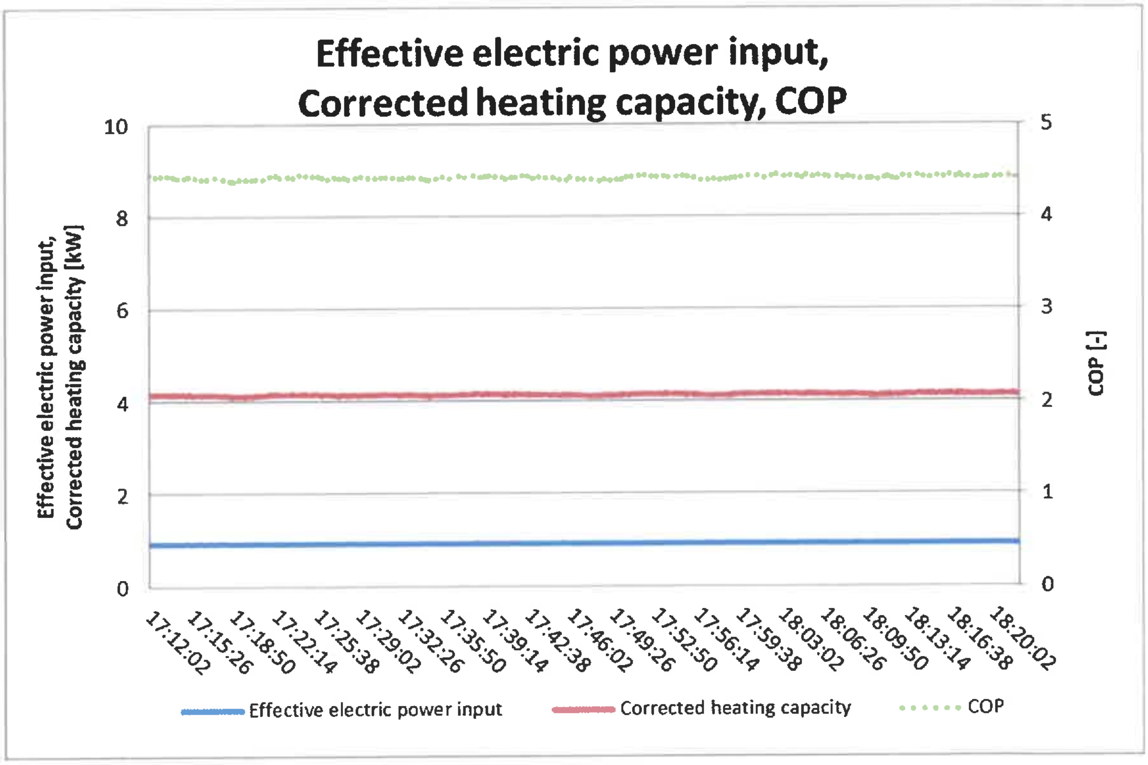
A2/W42 (34 Hz)


A2/W42
Water temperature [°C]
Air temperature [°C]
Input heating water temperature
Output heating water temperature
Air temperature - dry bulb temperature
Air temperature - wet bulb temperature

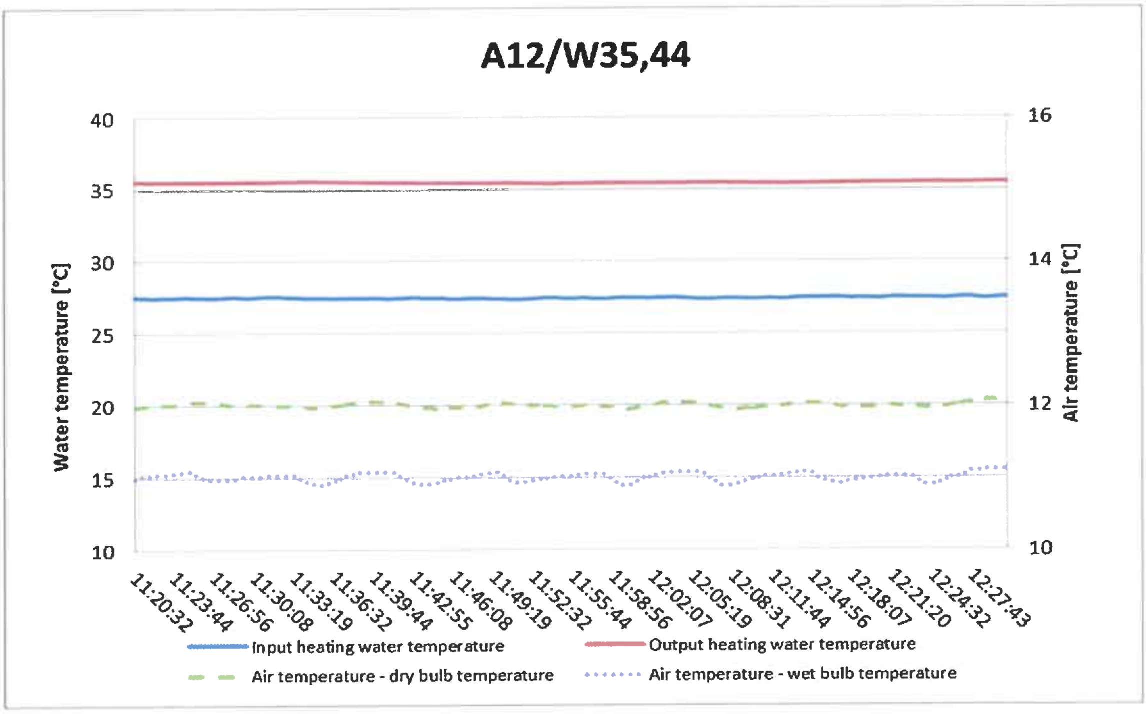

Effective electric power input, Corrected heating capacity, COP
Effective electric power input, Corrected heating capacity [kW]
COP [-]
Effective electric power input
Corrected heating capacity
COP

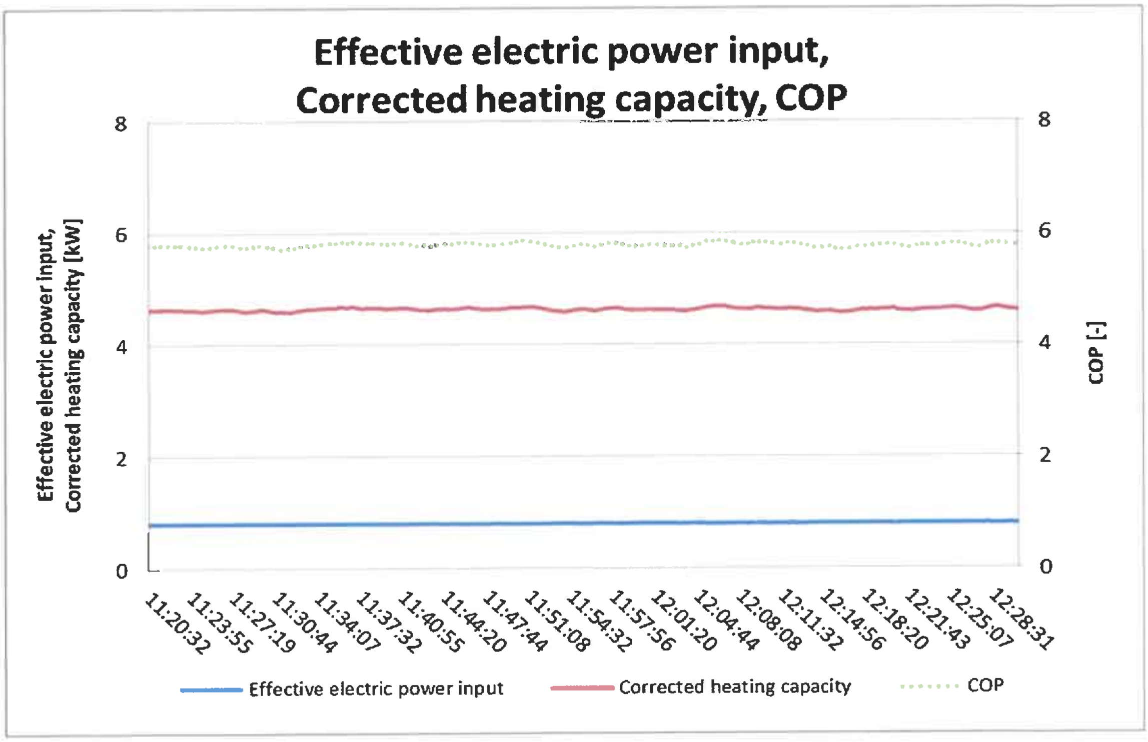
A7/W37.55 (22 Hz)



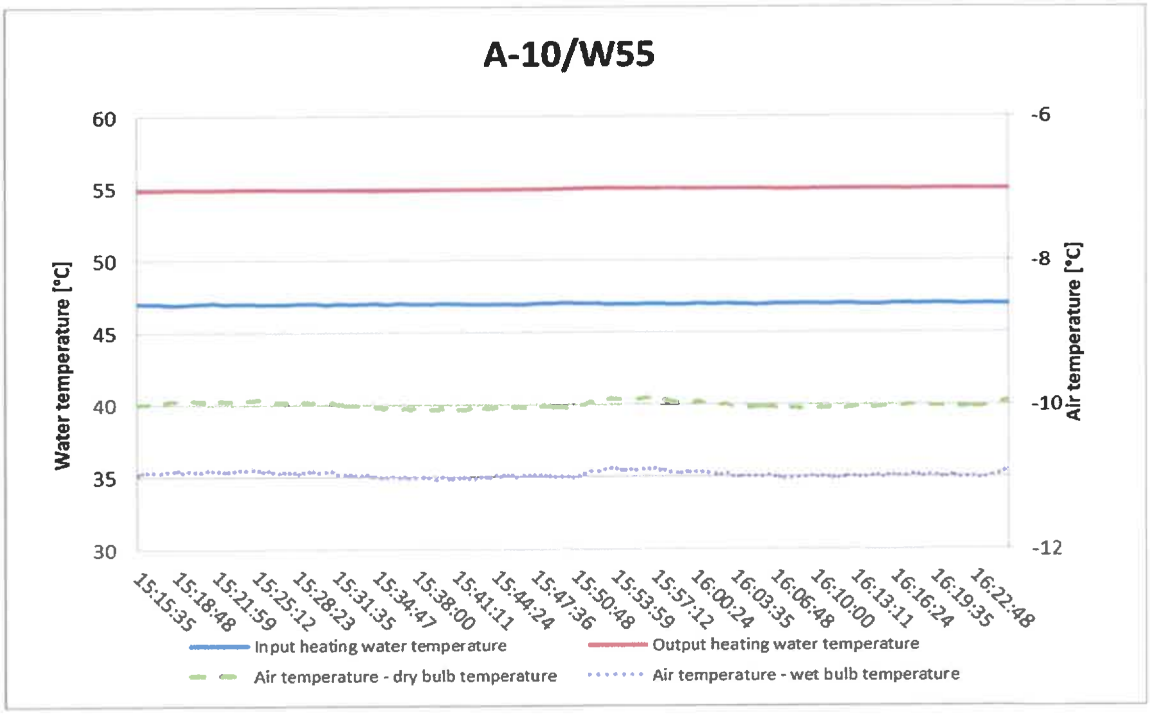


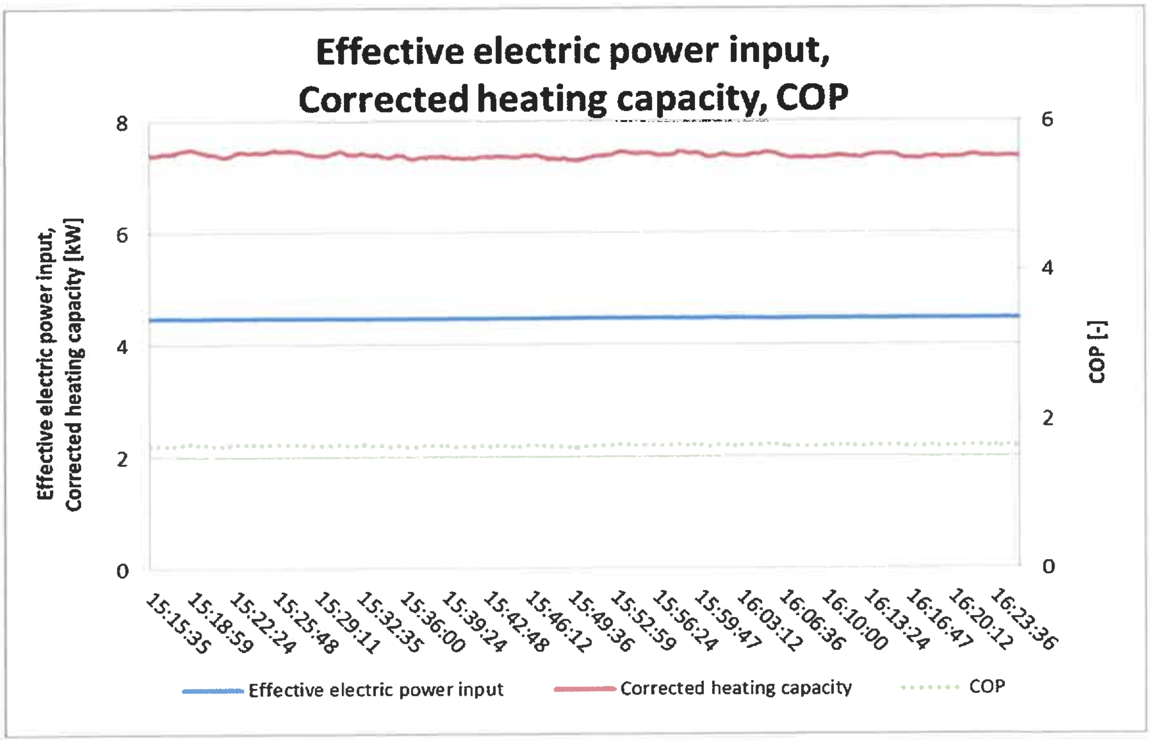
A12/W35.44 (20 Hz)





A-10/W55 (80 Hz)


A-10/W55
Water temperature [°C]
Air temperature [°C]
60
55
50
45
40
35
30
-6
-8
-10
-12
15:15:35
15:18:48
15:21:59
15:25:12
15:28:23
15:31:35
15:34:47
15:38:00
15:41:11
15:44:24
15:47:36
15:50:48
15:53:59
15:57:12
16:00:24
16:03:35
16:06:48
16:10:00
16:13:11
16:16:24
16:19:35
16:22:48
Input heating water temperature
Output heating water temperature
Air temperature - dry bulb temperature
Air temperature - wet bulb temperature


Effective electric power input, Corrected heating capacity, COP
Effective electric power input, Corrected heating capacity [kW]
COP [-]
8
6
4
2
0
6
4
2
0
15:15:35
15:18:59
15:22:24
15:25:48
15:29:11
15:32:35
15:36:00
15:39:24
15:42:48
15:46:12
15:49:36
15:52:59
15:56:24
15:59:47
16:03:12
16:06:36
16:10:00
16:13:24
16:16:47
16:20:12
16:23:36
Effective electric power input
Corrected heating capacity
COP

VI. A list of referenced documents

- Order of 2024-04-08 (Order reg. no. B-81972, received on 2024-04-08)
- Contract B-81972/32
- 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 39-17730/T of 2024-05-24

Test Report compiled by: Ing. Jakub Čederle

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., Brno, Česká republika
Engineering Test Institute, Public Enterprise, Brno, Czech Republic

TEST CERTIFICATE

Number **O-B-01012-24**

Customer	GOLDEN GLOBE ENERGY SP. Z O.O. INŻYNIERSKA str. 5B 20-484 LUBLIN POLAND
Product	Outdoor air/water heat pump – split
Type designation / Trade mark	**AWM1752.075.XG10.A00.C13**
Test methods	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023, ČSN EN 12102-1:2023
Basis of certificate	Test reports: 32-11087/T *of* 2024-06-14 32-11087/H *of* 2024-06-14 Technical documents of GOLDEN GLOBE ENERGY SP. Z O.O.
Temperature application	**LOW TEMPERATURE,** (Reference water temperature 35 °C) **MEDIUM TEMPERATURE** (Reference water temperature 55 °C)

Results:

Temperature conditions*	**A7/W35**	**A7/W55**
Corrected heating capacity [kW]	10.419	10.568
Effective electric power input [kW]	2.222	3.608
Coefficient of performance [–]	4.690	2.929
Compressor settings [rps]	52	58

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

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

Sound power level at temperature condition A7/W55* (at 22 Hz):

Outdoor air/water heat pump – split	**OU.A.120.C13** – outdoor unit –	**IU.AWM1752.075.XG10.A00.C13** – indoor unit –
Sound power level	L_{WA} 61.3 ± 3.0 dB(A)	L_{WA} 43.2 ± 3.0 dB(A)
Accuracy class	Engineering (grade 2)	Engineering (grade 2)

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

Specification of conditions:

Compressor speed control	**Variable**	Heating water volume flow rate (indoor heat exchanger)	**Variable**
Outlet water temperature (indoor heat exchanger)	**Variable**	Source liquid volume flow rate (outdoor heat exchanger)	**–**
Function	**Reversible**		

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, 2024-06-14

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1

Ing. Mario Jankola
Heating Equipment and Construction Products Manager

– END OF TEST CERTIFICATE –

Strojírenský zkušební ústav, s.p., Brno, Česká republika
Engineering Test Institute, Public Enterprise, Brno, Czech Republic

TEST CERTIFICATE

Number **O-B-01011-24**

Customer	GOLDEN GLOBE ENERGY SP. Z O.O. INŻYNIERSKA str. 5B 20-484 LUBLIN POLAND
Product	Outdoor Air/Water Heat pump - split
Type designation / Trademark	**AWM1752.075.XG10.A00.C13**
Test methods	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023, ČSN EN 14825:2023; ČSN EN 12102-1:2023
Basis of certificate	Test reports: 32-11087/T *of* 2024-06-14 32-11087/H *of* 2024-06-14 Technical documents of GOLDEN GLOBE ENERGY SP. Z O.O.
Reference heating season	**„A“ = average** (Reference design temperature $T_{designh}$ = -10 °C)

Results:

LOW TEMPERATURE (Reference water temperature 35 °C) — **MEDIUM TEMPERATURE** (Reference water temperature 55 °C)

LOW TEMPERATURE		MEDIUM TEMPERATURE
10.59	$P_{designh}$ [kW] … Full load heating	9.64
4.55	SCOP [–] … Seasonal coefficient of performance	3.27

Outdoor temperature T_j [°C]	Heating declared capacity P_{dh} [kW]	Coefficient of performance at the declared capacity COP_d [–]	Outdoor temperature T_j [°C]	Heating declared capacity P_{dh} [kW]	Coefficient of performance at the declared capacity COP_d [–]
T_j = -7	9.370	2.758	T_j = -7	8.531	1.716
T_j = +2	5.455	4.309	T_j = +2	5.288	3.322
T_j = +7	4.182	6.506	T_j = +7	4.143	4.428
T_j = +12	5.679	7.764	T_j = +12	4.633	5.791
T_j = TOL = -10	9.215	2.676	T_j = TOL = -10	7.385	1.652
$T_j = T_{bivalent}$ = -7	9.370	2.758	$T_j = T_{bivalent}$ = -7	8.531	1.716

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, S.P. CZ 1

Strojírenský zkušební ústav, s.p., Hudcova 424/56b, 621 00 Brno, Česká republika
Engineering Test Institute, public enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republic
www.szutest.cz

LOW TEMPERATURE (Reference water temperature 35 °C)				**MEDIUM TEMPERATURE** (Reference water temperature 55 °C)
	Power consumption in modes other than „active mode":			
18.4	Off mode	P_{OFF}	[W]	18.4
18.7	Thermostat off mode	P_{TO}	[W]	18.7
18.4	Standby mode	P_{SB}	[W]	18.4
0.0	Crankcase heater mode	P_{CK}	[W]	0.0
	Annual electricity consumption for heating according to:			
4811	ČSN EN 14825:2023	Q_{HE}	[kWh]	**6099**
	Seasonal Space heating energy efficiency			
179.0	ČSN EN 14825:2023	η_s	[%]	**127.7**
	Liquid flow rate in outdoor heating exchanger:			
–	Source liquid	Min/Max	[m³/h]	–
	Liquid flow rate in indoor heating exchanger:			
0.7244 / 1.7360	Heating water	Fixed	[m³/h]	0.5025 / 0.9661

Sound power level at condition A7W55* (at 22 Hz):

OU.A.120.C13 – outdoor unit –	L_{WA}	61.3 ± 3.0	dB(A)	Accuracy class 2 (Engineering)
IU.AWM1752.075.XG10.A00.C13 – indoor unit –	L_{WA}	43.2 ± 3.0	dB(A)	Accuracy class 2 (Engineering)

(*) Comment to abbreviated marking:
„A" air, „7" inlet temperature (dry-bulb temperature) in °C, „W" water, „35" outlet temperature in °C.

Specification of conditions:

Compressor speed control	**Variable**	Heating water volume flow rate (indoor heat exchanger)	**Variable**
Outlet water temperature (indoor heat exchanger)	**Variable**	Source liquid volume flow rate (outdoor heat exchanger)	**–**
Function	**Reversible**		

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, 2024-06-14

STROJÍRENSKÝ ZKUŠEBNÍ ÚSTAV, s.p. CZ 1

Ing. Mario Jankola
Heating Equipment and Construction Products Manager

– END OF TEST CERTIFICATE –

JOANNA PIKUŁA – TŁUMACZ PRZYSIĘGŁY JĘZYKA ANGIELSKIEGO
PŁOUSZOWICE KOLONIA 76B 21-008 TOMASZOWICE TEL. 501-240-396 e-mail: joannapikula@op.pl

Tłumaczenie przysięgłe z języka angielskiego na język polski
Opis dokumentu: 2 strony, druk.

[logo]
Strojírenský zkušební ústav, sp., Brno, Republika Czeska
Instytut Testów Inżynieryjnych, Przedsiębiorstwo Publiczne, Brno, Republika Czeska

CERTYFIKAT TESTU
Numer **O-B-01012-24**

Klient	GOLDEN GLOBE ENERGY SP. Z O.O. ul. INŻYNIERSKA 5B 20-484 LUBLIN POLSKA
Produkt	Zewnętrzna pompa ciepła powietrze/woda - typu split
Oznaczenie typu / znak towarowy	**AWM1752.075.XG10.A00.C13**
Metody badań	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023, ČSN EN 12102-1:2023
Podstawa certyfikatu	Raporty z testów: 32-11087/T z dnia 2024-06-14 32-11087/H z 2024-06-14 Dokumenty techniczne GOLDEN GLOBE ENERGY SP. Z O.O.
Zastosowanie temperatury	**NISKA TEMPERATURA** (Referencyjna temperatura wody 35°C) **ŚREDNIA TEMPERATURA** (Referencyjna temperatura wody 55°C)

Wyniki:

Warunki temperaturowe*	A7/W35	A7/W55
Skorygowana moc grzewcza [kW]	10,419	10.568
Efektywny pobór mocy elektrycznej [kW]	2,222	3.608
Współczynnik wydajności [-]	4,690	2.929
Ustawienia sprężarki [rps]	52	58

(*) Komentarz do skróconego oznaczenia: np. A7/W35
A (powietrze), 7 (powietrze wejściowe - temperatura termometru suchego w °C) / W (woda), 35 (wyjściowa temperatura wody grzewczej (chłodzącej) w °C).

Strojirensk9 zkuäebni ûstav, s.p., Hudcova 424156b, 621 00 Brno, Ceskå republika
Engineering Test Institute, publt enterprise, Hudcova 424/56b, 621 00 Brno, Czech Republt

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JOANNA PIKUŁA TŁUMACZ PRZYSIĘGŁY JĘZYKA ANGIELSKIEGO NR TP/2523/06

Poziom mocy akustycznej w warunkach temperaturowych A7/W55* (przy 22 Hz):

Zewnętrzna pompa ciepła powietrze/woda -typu split	**OU.A.120.C13** - urządzenie zewnętrzne -	**IU.AWM1752.075.XG10.A00.C13** - urządzenie wewnętrzne -
Poziom mocy akustycznej	L_{WA} 61,3 ± 3,0 dB(A)	L_{WA} 43.2 ± 3,0 dB(A) Inżynieria (stopień 2)
Klasa dokładności	Inżynieria (stopień 2)	

(*) Komentarz do skróconego oznaczenia: np. A7/W55
A (powietrze), 7 (powietrze wejściowe - temperatura termometru suchego w °C) / W (woda), 55 (wyjściowa temperatura wody grzewczej (chłodzącej) w °C).

Specyfikacja warunków:

Sterowanie prędkością sprężarki	**Zmienna**	Przepływ objętościowy wody grzewczej (wewnętrzny wymiennik ciepła)	Zmienna
Temperatura wody na wylocie (wewnętrzny wymiennik ciepła)	**Zmienna**	Objętość przepływu cieczy źródłowej (zewnętrzny wymiennik ciepła)	-
Funkcja	**Odwracalna**		

Inżynieryjny Instytut Testów, Przedsiębiorstwo Publiczne, potwierdza niniejszym Certyfikatem Testu, że badanie danego produktu zostało przeprowadzone z wynikami podanymi powyżej. Inżynieryjny Instytut Testów, Przedsiębiorstwo Publiczne, jest akredytowanym Laboratorium Badawczym 1045.1.

Brno, 2024-06-14

/podpis nieczytelny/
Ing. Mario Jankola
Kierownik ds. Urządzeń Grzewczych i
Wyrobów Budowlanych

-KONIEC CERTYFIKATU TESTU-

O-B-01012-24, strona 2 (2)

Koniec tłumaczenia przysięgłego
Ja, niżej podpisany tłumacz przysięgły języka angielskiego wpisany na listę tłumaczy przysięgłych prowadzonej przez Ministra Sprawiedliwości pod nr: TP/2523/06 zaświadczam, że powyższy tekst w języku polskim jest zgodny z dokumentem w języku angielskim przedstawionym mi dnia 19 czerwca 2024 r.
Repertorium Nr 883/06/2024
Płouszowice, dnia 19.06.2024

JOANNA PIKUŁA TŁUMACZ PRZYSIĘGŁY JĘZYKA ANGIELSKIEGO NR TP/2523/06

Joanna Pikuła

JOANNA PIKUŁA – TŁUMACZ PRZYSIĘGŁY JĘZYKA ANGIELSKIEGO
PŁOUSZOWICE KOLONIA 76B 21-008 TOMASZOWICE TEL. 501-240-396 e-mail: joannapikula@op.pl

Tłumaczenie przysięgłe z języka angielskiego na język polski
Opis dokumentu: 2 strony, druk.

[logo]

Strojírenský zkušební ústav, sp., Brno, Republika Czeska
Instytut Testów Inżynieryjnych, Przedsiębiorstwo Publiczne, Brno, Republika Czeska

CERTYFIKAT TESTU
Numer **O-B-01011-24**

Klient	GOLDEN GLOBE ENERGY SP. Z O.O. ul. INŻYNIERSKA 5B 20-484 LUBLIN POLSKA
Produkt	Zewnętrzna pompa ciepła powietrze/woda - typu split
Oznaczenie typu / znak towarowy	**AWM1752.075.XG10.A00.C13**
Metody badań	ČSN EN 14511-2:2023, ČSN EN 14511-3:2023, ČSN EN 14825:2023; ČSN EN 12102-1:2023
Podstawa certyfikatu	Raporty z testów: 32-11087/T z dnia 2024-06-14 32-11087/H z 2024-06-14 Dokumenty techniczne GOLDEN GLOBE ENERGY SP. Z O.O.
Referencyjny sezon grzewczy	**„A" = średnia wartość** (Referencyjna temperatura projektowa $T_{projekth}$ = -10°C)

Wyniki:

NISKA TEMPERATURA (Referencyjna temperatura wody 35°C) — **ŚREDNIA TEMPERATURA** (Referencyjna temperatura wody 55°C)

10,59	$P_{projekth}$ [kW] … Ogrzewanie przy pełnym obciążeniu				**9,64**
4,55	**SCOP[-]** … Sezonowy współczynnik efektywności				**3,27**
Temperatura zewnętrzna **T_j [°C]**	Deklarowana wydajność grzewcza **P_{dh} [kW]**	Współczynnik wydajności przy deklarowanej wydajności **COP_d[-]**	Temperatura zewnętrzna **T_j [°C]**	Deklarowana wydajność grzewcza **P_{dh} [kW]**	Współczynnik wydajności przy deklarowanej wydajności **COP_d[-]**
T_j = -7	9,370	2,758	T_j = -7	8,531	1,716
T_j = +2	5,455	4,309	T_j = +2	5,288	3,322
T_j = +7	4,182	6,506	T_j = +7	4,143	4,428
T_j = +12	5,679	7,764	T_j = +12	4,633	5,791
T_j = TOL = -10	9,215	2,676	T_j = TOL = -10	7,385	1,652
T_j = $T_{bivalent}$ = -7	9,370	2,758	T_j = $T_{bivalent}$ = -7	8,531	1,716

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JOANNA PIKUŁA TŁUMACZ PRZYSIĘGŁY JĘZYKA ANGIELSKIEGO NR TP/2523/06

NISKA TEMPERATURA (Referencyjna temperatura wody 35° C)				ŚREDNIA TEMPERATURA (Referencyjna temperatura wody 55° C)
	Pobór mocy w trybach innych niż „tryb aktywny":			
18,4	Tryb wyłączony	P_{OFF}	[W]	18,4
18,7	Termostat wyłączony	P_{TO}	[W]	18,7
18,4	Tryb podtrzymania	P_{CB}	[W]	18,4
0,00	Tryb grzałki skrzyni korbowej	P_{CK}	[W]	0,0
	Roczne zużycie energii elektrycznej na ogrzewanie według:			
4811	ČSN EN 14825:2023	Q_{HE}	[kWh]	**6099**
	Sezonowa efektywność energetyczna ogrzewania pomieszczeń			
179,0	ČSN EN 14825:2023	η_s	[%]	127,7
	Natężenie przepływu cieczy w zewnętrznym wymienniku ciepła:			
-	Płyn źródłowy	Min/Maks	$[m^3/h]$	-
	Natężenie przepływu cieczy w wewnętrznym wymienniku ciepła:			
0,7244/1,7360	Ogrzewanie wody	Mieszane	$[m^3/h]$	0,5025/0,9661

Poziom mocy akustycznej w stanie A7W55* (przy 22 Hz):

OU.A.120.C13 - jednostka zewnętrzna -	L_{WA} 61,3 ± 3,0 dB(A)	Klasa dokładności 2 (inżynieria)
IU.AWM1752.075.XG10.A00.C13 - urządzenie wewnętrzne -	L_{WA} 42,2 ± 3,0 dB(A)	Klasa dokładności 2 (inżynieria)

(*) Komentarz do skróconego oznaczenia:
„A" powietrze, „7" temperatura na wlocie (temperatura termometru suchego) w °C, „W" woda, „35" temperatura na wylocie w °C.

Specyfikacja warunków:

Sterowanie prędkością sprężarki	**Zmienna**	Przepływ objętościowy wody grzewczej (wewnętrzny wymiennik ciepła)	**Zmienna**
Temperatura wody na wylocie (wewnętrzny wymiennik ciepła)	**Zmienna**	Objętość przepływu cieczy źródłowej (zewnętrzny wymiennik ciepła)	-
Funkcja	**Odwracalna**		

Inżynieryjny Instytut Testów, Przedsiębiorstwo Publiczne, potwierdza niniejszym Certyfikatem Testu, że badanie danego produktu zostało przeprowadzone z wynikami podanymi powyżej. Inżynieryjny Instytut Testów, Przedsiębiorstwo Publiczne, jest akredytowanym Laboratorium Badawczym 1045.1.

Brno, 2024-06-14

/podpis nieczytelny/
Ing. Mario Jankola
Kierownik ds. Urządzeń Grzewczych i Wyrobów Budowlanych

-KONIEC CERTYFIKATU TESTU-

Koniec tłumaczenia przysięgłego
Ja, niżej podpisany tłumacz przysięgły języka angielskiego wpisany na listę tłumaczy przysięgłych prowadzonej przez Ministra Sprawiedliwości pod nr: TP/2523/06 zaświadczam, że powyższy tekst w języku polskim jest zgodny z dokumentem w języku angielskim przedstawionym mi dnia 16 września 2024 r.
Repertorium Nr 1432/09/2024
Płouszowice, dnia 16.09.2024

JOANNA PIKULA TŁUMACZ PRZYSIĘGŁY JĘZYKA ANGIELSKIEGO NR TP/2523/06

Joanna Pikula

Oświadczenie

Producent: GOLDEN GLOBE ENERGY SP. Z O.O.
ul. Inżynierska 5B
20-484 Lublin
Polska

oświadcza, iż pompy ciepła:

Nazwa produktu: GOLDEN GLOBE ENERGY AirMaster 100, 150, 150H, 175

Model:

AWM1002.075.XG06.A00.C11,
AWM1002.075.XG08.A00.C11,
AWM1502.075.XG06.A00.C11,
AWM1502.075.XG08.A00.C11,
AWM1502.H00.XG06.A00.C11,
AWM1502.H00.XG08.A00.C11,
AWM1752.075.XG06.A00.C11,
AWM1752.075.XG08.A00.C11,

Oznaczenie/typ/identyfikator modelu

AWM1002.075.XG10.A00.C11,
AWM1502.075.XG10.A00.C11,
AWM1502.H00.XG10.A00.C11,
AWM1752.075.XG10.A00.C11,
AWM1002.075.XG10.A00.C13,
AWM1502.075.XG10.A00.C13,
AWM1502.H00.XG10.A00.C13,
AWM1752.075.XG10.A00.C13,
AWM1002.075.XG12.A00.C13,
AWM1502.075.XG12.A00.C13,
AWM1502.H00.XG12.A00.C13,
AWM1752.075.XG12.A00.C13,

Oznaczenie/typ/identyfikator modelu

AWM1002.075.XG14.A00.C13,
AWM1502.075.XG14.A00.C13,
AWM1502.H00.XG14.A00.C13,
AWM1752.075.XG14.A00.C13,
AWM1002.075.XG16.A00.C13,
AWM1502.075.XG16.A00.C13,
AWM1502.H00.XG16.A00.C13,
AWM1752.075.XG16.A00.C13

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.**

GOLDEN GLOBE ENERGY
SPÓŁKA Z OGRANICZONĄ ODPOWIEDZIALNOŚCIĄ
UL. INŻYNIERSKA 5B, 20-484 LUBLIN, POLSKA
KRS 0000862020
NIP 9462700558 REGON 387113750

Lublin, 14.06.2024

(Miejscowość, data)

CEO Daniel Piszcz

Wyjaśnienie do oświadczenia o identyfikacji modeli

Golden Globe Energy

Producent: GOLDEN GLOBE ENERGY SP. Z O.O.
ul. Inżynierska 5B
20-484 Lublin
Polska

wyjaśnia, że:

Lista modeli obejmuje jeden typoszereg i trzy podtypy: AirMaster 8, AirMaster 12, AirMaster 16 z których zgodnie z standardem KEY MARK był testowany podtyp Airmaster 12 model AWM1752.075.XG10.A00.C13.

Do podtypu AirMaster 8 należą

Model:

AWM1002.075.XG06.A00.C11,
AWM1002.075.XG08.A00.C11,
AWM1502.075.XG06.A00.C11,
AWM1502.075.XG08.A00.C11,
AWM1502.H00.XG06.A00.C11,
AWM1502.H00.XG08.A00.C11,
AWM1752.075.XG06.A00.C11,
AWM1752.075.XG08.A00.C11,

Do podtypu AirMaster 12 należą

Model:

AWM1002.075.XG10.A00.C11,
AWM1502.075.XG10.A00.C11,
AWM1502.H00.XG10.A00.C11,
AWM1752.075.XG10.A00.C11,
AWM1002.075.XG10.A00.C13,
AWM1502.075.XG10.A00.C13,
AWM1502.H00.XG10.A00.C13,
AWM1752.075.XG10.A00.C13,
AWM1002.075.XG12.A00.C13,
AWM1502.075.XG12.A00.C13,
AWM1502.H00.XG12.A00.C13,
AWM1752.075.XG12.A00.C13,

Do podtypu AirMaster 16 należą

Model:

AWM1002.075.XG14.A00.C13,
AWM1502.075.XG14.A00.C13,
AWM1502.H00.XG14.A00.C13,
AWM1752.075.XG14.A00.C13,
AWM1002.075.XG16.A00.C13,
AWM1502.075.XG16.A00.C13,
AWM1502.H00.XG16.A00.C13,
AWM1752.075.XG16.A00.C13

Różnica między modelami polega na konstrukcji jednostek wewnętrznych:

- AWM1002.075.XGxx.A00.Cxx – model z manualnym panelem obsługi
- AWM1502.075.XGxx.A00.Cxx – model z dotykowym wyświetlaczem i szklanym frontem
- AWM1502.H00.XGxx.A00.Cxx – model z dotykowym wyświetlaczem, szklanym frontem i możliwością podłączenia pieca gazowego w trybie hybrydowym
- AWM1752.075.XGxx.A00.Cxx – model z dotykowym wyświetlaczem, szklanym frontem i wbudowanym zasobnikiem CWU oraz buforem

Oprócz deklarowanej różnicy podtypów wymienionej powyżej, nie ma żadnej różnicy w budowie układów chłodniczych.

GOLDEN GLOBE ENERGY
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Lublin, 14.06.2024

(Miejscowość, data)

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