Energy Save AW-EVI 30 – ErP Data

Appendix I Test results

Table 1.	Heating mode(Low temperature application):						P
Model	Indoor unit: PAEVH-30V4DEA/IA; Outdoor unit: PAEVH-30V4DEA						
Product type	Air to Water	Heating season	☑	Average	☐	Warmer ☐	Colder

1. Test conditions:

Condition	Part Load Ratio in %				Outdoor heat exchanger	Indoor heat exchanger
	Formula	A	W	C	Inlet dry (wet) bulb temperature °C	Inlet/outlet water temperatures (°C)
A	(-7-16)/(Tdesignh-16)	88	N/A	N/A	-7(-8)	a / 34
B	(+2-16)/ (Tdesignh-16)	54	N/A	N/A	2(1)	a / 30
C	(+7-16)/(Tdesignh-16)	35	N/A	N/A	7(6)	a / 27
D	(+12-16)/(Tdesignh-16)	15	N/A	N/A	12(11)	a / 24
E	(TOL-16)/ (Tdesignh-16)				TOL	a / 35.3
F	(Tbivalent-16)/(Tdesignh-16)				Tbiv	a / 34
G	(-15-16)/(Tdesignh-16)	N/A	N/A	N/A	-15	N/A

Remark: a) With the water flow rate as determined at the standard rating conditions given in EN14511-2 at 30/35 conditions, the capacity is 17715.33 W, the power is 4011.08W, the COP is 4.42W/W.

2.Tested data/correction data(Average):

General test conditions/ Part-Load	Unit	A(-7)/W34 (88%)	A2/W30 (54%)	A7/W27 (35%)	A12/W24 (15%)	A(-10)/W35.3 (100%)	A(-7)/W34 (88%)
	--	A	B	C	D	E	F
Data collection period	hh: min:sec	2:10:00	4:00:00	2:10:00	2:10:00	2:10:00	2:10:00
The heat pump defrosts	--	No	Yes	No	No	No	No
Complete Cycles	--	0	1	0	0	0	0
Barometric pressure	kPa	101.02	101.01	101.01	101.02	101.01	101.02
Voltage	V	397.7	398.5	398.4	398.9	397.8	397.7
Current input of the unit	A	15.86	6.98	5.08	4.15	15.79	15.86
Power input of the unit	kW	8.435	3.395	2.368	1.881	8.395	8.435
Test conditions **indoor** unit							
Inlet Water temperature, DB	°C	27.18	25.71	23.17	19.93	29.08	27.18
Outlet Water temperature, DB	°C	33.97	29.82	26.97	23.97	35.32	33.97

Appendix I Test results

Test conditions **outdoor** unit							
Air **inlet** temperature, DB	°C	-7.00	2.04	7.00	12.00	-10.00	-7.00
Air **inlet** temperature, WB	°C	-8.11	1.05	6.00	11.00	-10.91	-8.11
Summary of the results							
Total heating capacity	kW	23.609	14.356	13.259	14.157	21.684	23.609
Effective power input	kW	8.546	3.505	2.479	1.992	8.506	8.546
Coefficient of performance (COP)	--	2.76	4.10	5.35	7.11	2.55	2.76
Compressor frequency	Hz	90	40	30	30	90	90
Water flow	m³/h	3.00	3.00	3.00	3.00	3.00	3.00
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data.							

3.Calculation/conclusion for SCOP(Average):			
Tdesignh(°C)	-10	Tbiv(°C)	-7
Pdesignh(kW)	26.689	TOL(°C)	-10

Test result A, B, C, D, E, F conditions:

Condition	Part load	Measured capacity	COP at measured capacity	Cdh	CR	COP at part load
E	26.689	21.684	2.55	0.00	1.00	2.55
F	23.609	23.609	2.76	0.00	1.00	2.76
A	23.609	23.609	2.76	0.00	1.00	2.76
B	14.371	14.356	4.10	0.00	1.00	4.10
C	9.238	13.259	5.35	0.99	0.70	5.32
D	4.106	14.157	7.11	0.99	0.29	6.94

CR: part load divided by capacity;

Appendix I Test results

Electric power consumptions	Unit	Value
Thermostat-off mode [P_{TO}]	kW	0.010
Standby mode [P_{SB}]	kW	0.010
Crankcase heater [P_{CK}]	kW	0.033
Off mode [P_{OFF}]	kW	0.010

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	4.21
SCOP:	kWh/kWh	4.21
Q_H:	kWh/year	55139
Q_{HE}:	kWh/year	13089
$\eta_{s,h}$	%	165.5
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 2)	--	A++

Appendix I Test results

Table 2.	Heating mode(Medium temperature application):						P
Model	Indoor unit: PAEVH-30V4DEA/IA; Outdoor unit: PAEVH-30V4DEA						
Product type	Air to Water	Heating season	☑	Average	☐	Warmer ☐	Colder

1. Test conditions:

Condition	Part Load Ratio in %				Outdoor heat exchanger	Indoor heat exchanger
	Formula	A	W	C	Inlet dry (wet) bulb temperature °C	Inlet/outlet water temperatures (°C)
A	(-7-16)/(Tdesignh-16)	88	N/A	N/A	-7(-8)	a / 52
B	(+2-16)/ (Tdesignh-16)	54	N/A	N/A	2(1)	a / 42
C	(+7-16)/(Tdesignh-16)	35	N/A	N/A	7(6)	a / 36
D	(+12-16)/(Tdesignh-16)	15	N/A	N/A	12(11)	a / 30
E	(TOL-16)/ (Tdesignh-16)				TOL	a / 55.3
F	(Tbivalent-16)/(Tdesignh-16)				Tbiv	a / 52
G	(-15-16)/(Tdesignh-16)	N/A	N/A	N/A	-15	N/A

Remark: a) With the water flow rate as determined at the standard rating conditions given in EN14511-2 at 47/55 conditions, the capacity is 27251.16 W, the power is 10664.51W, the COP is 2.56W/W.

2.Tested data/correction data(Average):

General test conditions/ Part-Load	Unit	A(-7)/W52 (88%)	A2/W42 (54%)	A7/W36 (35%)	A12/W30 (15%)	A(-10)/W55.3 (100%)	A(-7)/W52 (88%)
	--	A	B	C	D	E	F
Data collection period	hh: min:sec	2:10:00	2:10:00	2:10:00	2:10:00	2:10:00	2:10:00
The heat pump defrosts	--	No	No	No	No	No	No
Complete Cycles	--	0	0	0	0	0	0
Barometric pressure	kPa	99.85	99.85	99.85	99.80	99.75	99.85
Voltage	V	397.9	398.4	398.6	398.7	397.8	397.9
Current input of the unit	A	17.78	9.47	5.15	4.40	18.60	17.78
Power input of the unit	kW	9.772	4.870	2.502	2.073	10.339	9.772
Test conditions **indoor** unit							
Inlet Water temperature, DB	°C	45.65	37.62	32.57	26.17	49.29	45.65
Outlet Water temperature, DB	°C	51.97	41.98	35.98	30.04	55.27	51.97

Appendix I Test results

Test conditions **outdoor** unit							
Air **inlet** temperature, DB	°C	-7.01	2.02	7.00	11.97	-10.00	-7.01
Air **inlet** temperature, WB	°C	-7.97	1.00	6.00	10.99	-10.93	-7.97
Summary of the results							
Total heating capacity	kW	21.818	15.165	11.894	13.494	20.644	21.818
Effective power input	kW	9.895	4.993	2.625	2.196	10.462	9.895
Coefficient of performance (COP)	--	2.20	3.04	4.53	6.15	1.97	2.20
Compressor frequency	Hz	76	43	27	27	76	76
Water flow	m³/h	3.00	3.00	3.00	3.00	3.00	3.00
Remark: * In part condition, outlet temperature data is recorded by a full average complete cycle's data.							

3.Calculation/conclusion for SCOP(Average):

Tdesignh(°C)	-10	Tbiv(°C)	-7
Pdesignh(kW)	24.664	TOL(°C)	-10

Test result A, B, C, D, E, F conditions:

Condition	Part load	Measured capacity	COP at measured capacity	Cdh	CR	COP at part load
E	24.664	20.644	1.97	0.00	1.00	1.97
F	21.818	21.818	2.20	0.00	1.00	2.20
A	21.818	21.818	2.20	0.00	1.00	2.20
B	13.281	15.165	3.04	0.99	0.88	3.03
C	8.538	11.894	4.53	0.99	0.72	4.51
D	3.794	13.494	6.15	0.99	0.28	5.99

CR: part load divided by capacity;

Appendix I Test results

Electric power consumptions	Unit	Value
Thermostat-off mode [P_{TO}]	kW	0.010
Standby mode [P_{SB}]	kW	0.010
Crankcase heater [P_{CK}]	kW	0.033
Off mode [P_{OFF}]	kW	0.010

Conclusions:	Unit	Value
SCOPon:	kWh/kWh	3.31
SCOP:	kWh/kWh	3.31
Q_H:	kWh/year	50956
Q_{HE}:	kWh/year	15401
$\eta_{s,h}$	%	129.3
Seasonal space heating energy efficiency classes: (According (EU) No 811/2013 Table 1)	--	A++