

Report No.: HP 271 2024 T2

Test report
for Heat pump heating appliances
acc. DIN EN 14511 and DIN EN 14825

Product:
Heat pump

Type:
WH-ADC0912K9E8

Company:
Panasonic Marketing Europe GmbH

Trademark:
Panasonic



Deutsche
Akkreditierungsstelle
D-PL-11120-04-00

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Examination: Testing and rating at part load conditions and calculation of seasonal performance acc. DIN EN 14825:2022

Applicant/contractor: **Panasonic Heating & Ventilation Air-Conditioning Europe (PHVACEU)**
Panasonic Marketing Europe GmbH
Hagenauer Straße 43
65203 Wiesbaden

Trademark **Panasonic**

Type designation: **WH-ADC0912K9E8**

Type: Air/water heat pump with electrically driven compressor. Split unit for outdoor air.

Technical Specifications:

Climate	average	
Temperature level	Low (35°C)	Medium (55°C)
Pdesignh [kW]	12	12
Heat Output at A7W(35/55) [kW]	12,1	12,1
COP at A7W(35/55)	4,84	3,04
Refrigerant	R32 (1,6kg)	
Size indoor unit (H x W x D):	1642 x 599 x 602 mm	
Size outdoor unit (H x W x D):	1340 x 900 x 320 mm	

Heat source

Air inlet temperature -28°C – 43 °C

Heat sink:

Outlet temperature 5 °C – 60 °C

Max. working pressure 3 bar

Remarks:

This examination has been carried out in a test laboratory equipped in accordance with EN 14511-3:2022

Test basis:

DIN EN 14511:2022 and DIN EN 14825:2022

Test results:

For detailed test results see Chapter 3 "Testing".

Cologne, 24.05.2024
667 / mz

Assessor:



B.Sc. M. Zerlett

Test Centre for Energy Appliances
DIN Certco Testcenter PI096
EHPA / DACH – Testcenter Nr.2008004-EHPA

Report released after review:

Mario

Reimbold

Dipl. Ing. M. Reimbold

Digital signed von: Mario
Reimbold
Name: CN = Mario Reimbold
email = Mario.Reimbold@de.
tuv.com
Datum: 2024.07.19 10:44:12 +
02'00'

1. Task

Testing the heat pump with electrically driven compressor **WH-ADC0912K9E8** (indoor unit) + **WH-UXZ12KE8** (outdoor unit) for determination of compliance according EN 14825:2022, evaluation of the performance numbers (COP – Values) at the specified test points.

To achieve the international EHPA seal of approval, the test report in conjunction with furthermore documents can be presented at the national commission for the seal of approval.

This report can also be used to obtain a heat pump KEYMARK certification.

2. Description of the appliance

The combination heat pump system WH-UXZ12KE8/WH-ADC0912K9E8 is designed for the production of hot water and heating. The system is designed for the production of hot water and heating. The system is designed for the production of hot water and heating.

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Figure 10. Type 10000



Figure 11. Type 10000

Figure 12. Type 10000

3.1. Test results



Project Information		Project Details		Project Status	
Project Name	Project ID	Project Manager	Project Start Date	Project End Date	Project Status
Project Description	Project Location	Project Budget	Project Progress	Project Risk	Project Impact
Project Scope	Project Team	Project Resources	Project Schedule	Project Communication	Project Reporting
Project Objectives	Project Deliverables	Project Milestones	Project Tasks	Project Issues	Project Risks
Project Constraints	Project Dependencies	Project Assumptions	Project Risks	Project Opportunities	Project Challenges
Project Stakeholders	Project Partners	Project Suppliers	Project Customers	Project Competitors	Project Regulators
Project History	Project Performance	Project Quality	Project Cost	Project Time	Project Satisfaction
Project Review	Project Feedback	Project Evaluation	Project Improvement	Project Innovation	Project Sustainability
Project Conclusion	Project Summary	Project Recommendations	Project Lessons Learned	Project Best Practices	Project Future Outlook



3.2. SCOP and ηs calculation

Low temperature application

Calculation of energy efficiency - Average climate

Product reference		Reference conditions		
Manufacturer	Panasonic	Climate	average	
Product reference	WH-ADC0912K9E8	Tdesignh	-10	°C
Type of heat pump	outdoor air-to-water	Prated	12	kW
Operating mode	reversible	Tbiv	-10	°C
Temperature application	35 °C	TOL	-10	°C
Water flow	variable	H _{HE}	2066	hours
Water outlet temperature	variable	Q _H	24792	kWh
Capacity control	variable	Fossil fuel backup efficiency	-	%
Backup heater	electricity			

Calculate

Reset

Energy Efficiency			
SCOPon	SCOP	η _s	Q _{HE} (kWh)
4,88	4,88	192,1	5084

Performance data									
Condition	Outdoor air T °C	Part load ratio (%)	Part Load (kW)	Inlet / outlet water temperatures for testing	Declared Capacity (kW)	Declared COP _d	C _{dh}	CR	COP _{bin}
A	-7	88	10,62	33,8 / 29	11,48	2,97	1,000	1,00	2,97
B	2	54	6,46	30 / 25	6,97	4,63	1,000	1,00	4,63
C	7	35	4,15	28,1 / 23,3	5,38	6,69	1,000	0,77	6,69
D	12	15	1,85	27,4 / 22,5	6,15	8,14	1,000	0,30	8,14
E(TOL) or E(Tdesignh)	-10	100	12,00	34,9 / 30	11,62	2,73	1,000	1,00	2,73
F(Tbiv)	-10	100	12,00	34,9 / 30	11,62	2,73	1,000	1,00	2,73

Auxiliary power consumptions			
Operating modes for heating only			
	Hours	Power input (W)	P * h (kWh)
Thermostat off	178	8,68	0
Stand by	0	7,95	0
Off mode	3672	0,09	4
Crankcase heater	3850	0	4
Operating modes for reversible units			
	Hours	Power input (W)	P * h (kWh)
Thermostat off	178	8,68	2
Stand by	0	7,95	0
Off mode	0	0,09	0
Crankcase heater	178	0	0

Bin calculation										
Condition	Bin	Outdoor air temp.	Hours	Part load ratio	Heat demand (kW)	Hea load covered by the heat pump		Back up heater	Annual heating demand	Annual energy consumption
	j	Tj	hj		Ph(tj)		COP _{bin} (Tj)	elbu(Tj)	hj * Ph(Tj)	
	-	°C	-							
Tbiv	21	-10	1	100,00	12,00	12,00	2,73	0,00	12	4
	22	-9	25	96,15	11,54	11,54	2,81	0,00	288	103
	23	-8	23	92,31	11,08	11,08	2,89	0,00	255	88
-7	24	-7	24	88,46	10,62	10,62	2,97	0,00	255	86
	25	-6	27	84,62	10,15	10,15	3,15	0,00	274	86,91
	26	-5	68	80,77	9,69	9,69	3,34	0,00	659	197,39
	27	-4	91	76,92	9,23	9,23	3,52	0,00	840	238,41
	28	-3	89	73,08	8,77	8,77	3,71	0,00	780	210,49
	29	-2	165	69,23	8,31	8,31	3,89	0,00	1371	352,18
	30	-1	173	65,38	7,85	7,85	4,08	0,00	1357	332,96
	31	0	240	61,54	7,38	7,38	4,26	0,00	1772	415,93
	32	1	280	57,69	6,92	6,92	4,45	0,00	1938	436,04
2	33	2	320	53,85	6,46	6,46	4,63	0,00	2068	447
	34	3	357	50,00	6,00	6,25	5,04	0,00	2142,00	424,83
	35	4	356	46,15	5,54	6,03	5,45	0,00	1971,69	361,52
	36	5	303	42,31	5,08	5,81	5,87	0,00	1538,31	262,25
	37	6	330	38,46	4,62	5,60	6,28	0,00	1523,08	242,61
7	38	7	326	34,62	4,15	5,38	6,69	0,00	1354	202
	39	8	348	30,77	3,69	5,54	6,98	0,00	1285	184
	40	9	335	26,92	3,23	5,69	7,27	0,00	1082	149
	41	10	315	23,08	2,77	5,85	7,56	0,00	872	115
	42	11	215	19,23	2,31	6,00	7,85	0,00	496	63
12	43	12	169	15,38	1,85	6,15	8,14	0,00	312	38
	44	13	151	11,54	1,38	6,31	8,43	0,00	209	25
	45	14	105	7,69	0,92	6,46	8,72	0,00	97	11
	46	15	74	3,85	0,46	6,62	9,01	0,00	34	4
			4910						24787	5081

Medium temperature application

Calculation of energy efficiency - Average climate

Product reference	
Manufacturer	Panasonic
Product reference	WH-ADC0912K9E8
Type of heat pump	outdoor air-to-water
Operating mode	reversible
Temperature application	55 °C
Water flow	variable
Water outlet temperature	variable
Capacity control	variable
Backup heater	electricity

Reference conditions		
Climate	average	
Tdesignh	-10	°C
Prated	12	kW
Tbiv	-10	°C
TOL	-10	°C
H _{HE}	2066	hours
Q _{EH}	24792	kWh
Fossil fuel backup efficiency	-	%

Calculate

Reset

Energy Efficiency			
SCOP _{on}	SCOP	η _s	Q _{HE} (kWh)
3,75	3,75	146,9	6617

Performance data									
Condition	Outdoor air T °C	Part load ratio (%)	Part Load (kW)	Inlet / outlet water temperatures for testine	Declared Capacity (kW)	Declared COP _d	C _{dh}	CR	COP _{bin}
A	-7	88	10,62	51,6 / 44	10,10	2,23	1,000	1,00	2,23
B	2	54	6,46	42 / 33,9	7,37	3,62	1,000	0,88	3,62
C	7	35	4,15	37,5 / 29,7	5,18	5,02	1,000	0,80	5,02
D	12	15	1,85	35,3 / 27,5	6,05	6,36	1,000	0,31	6,36
E(TOL) or E(Tdesignh)	-10	100	12,00	55 / 47	11,94	2,02	1,000	1,00	2,02
F(Tbiv)	-10	100	12,00	55 / 47	11,94	2,02	1,000	1,00	2,02

Auxiliary power consumptions

Operating modes for heating only

	Hours	Power input (W)	P * h (kWh)
Thermostat off	178	8,68	0
Stand by	0	7,95	0
Off mode	3672	0,09	4
Crankcase heater	3850	0	4

Operating modes for reversible units

	Hours	Power input (W)	P * h (kWh)
Thermostat off	178	8,68	2
Stand by	0	7,95	0
Off mode	0	0,09	0
Crankcase heater	178	0	0

Bin calculation										
Condition	Bin	Outdoor air temp.	Hours	Part load ratio	Heat demand (kW)	Hea load covered by the heat pump		Back up heater	Annual heating demand	Annual energy consumption
	j	Tj	hj		Ph(tj)		COP _{bin} (Tj)	elbu(Tj)	hj * Ph(Tj)	
	-	°C	-							
Tbiv	21	-10	1	100,00	12,00	12,00	2,02	0,00	12	6
	22	-9	25	96,15	11,54	11,54	2,09	0,00	288	138
	23	-8	23	92,31	11,08	11,08	2,16	0,00	255	118
-7	24	-7	24	88,46	10,62	10,62	2,23	0,00	255	114
	25	-6	27	84,62	10,15	10,25	2,38	0,00	274	114,98
	26	-5	68	80,77	9,69	9,89	2,54	0,00	659	259,59
	27	-4	91	76,92	9,23	9,53	2,69	0,00	840	311,88
	28	-3	89	73,08	8,77	9,17	2,85	0,00	780	274,06
	29	-2	165	69,23	8,31	8,81	3,00	0,00	1371	456,58
	30	-1	173	65,38	7,85	8,45	3,16	0,00	1357	430,01
	31	0	240	61,54	7,38	8,09	3,31	0,00	1772	535,26
	32	1	280	57,69	6,92	7,73	3,47	0,00	1938	559,35
2	33	2	320	53,85	6,46	7,37	3,62	0,00	2068	571
	34	3	357	50,00	6,00	6,93	3,90	0,00	2142,00	549,23
	35	4	356	46,15	5,54	6,49	4,18	0,00	1971,69	471,70
	36	5	303	42,31	5,08	6,05	4,46	0,00	1538,31	344,92
	37	6	330	38,46	4,62	5,61	4,74	0,00	1523,08	321,33
7	38	7	326	34,62	4,15	5,18	5,02	0,00	1354	270
	39	8	348	30,77	3,69	5,35	5,29	0,00	1285	243
	40	9	335	26,92	3,23	5,52	5,56	0,00	1082	195
	41	10	315	23,08	2,77	5,70	5,82	0,00	872	150
	42	11	215	19,23	2,31	5,87	6,09	0,00	496	81
12	43	12	169	15,38	1,85	6,05	6,36	0,00	312	49
	44	13	151	11,54	1,38	6,22	6,63	0,00	209	32
	45	14	105	7,69	0,92	6,39	6,89	0,00	97	14
	46	15	74	3,85	0,46	6,57	7,16	0,00	34	5
			4910						24787	6615

3.3. Testing of operating range acc. DIN EN 14511-4 chapter 4.2.1.2 Table 3

Test point	Water flow rate at indoor heat exchanger	Test	Result
1 (A-28W20)	Minimum (720l/h)	Starting	pass
2 (A-28W55)	Minimum (720l/h)	Operating	pass

3.4. Sound power level tests according DIN EN ISO 12102-1

Device	Testing Conditions	Compressor Speed [rps]	Sound power level L _{WA} [dB(A)]
Outdoor Unit WH-UXZ12KE8	A7W55	24	63,2
Indoor Unit WH-ADC0912K9E8			41,5

For detailed test results see Sound measurement Report : 650/21259740/02

4. Statement of test results

The heat pump space heater

WH-ADC0912K9E8 + WH-UXZ12KE8

of the company

Panasonic Heating & Ventilation Air-conditioning Europe (PHVACEU)

was tested at the reference period “average” for low and medium temperature applications according DIN EN 14511 and DIN EN 14825.

The seasonal coefficient of performance (SCOP) was determined acc. DIN EN 14825:2022 and achieved the following values:

	LT(35°C) average	MT(55°C) average
SCOP	4,88	3,75
η_s	192,1	146,9

5. Measurement apparatus

Device	Manufacturer	Model	Year	Range	Resolution	Accuracy
Force transducer	TEDEA HUNTLEIGH	1130	2005	0-10 N	0.001 N	±0.5%
Displacement transducer	TEDEA HUNTLEIGH	1130	2005	0-10 mm	0.001 mm	±0.5%
Temperature transducer	TEDEA HUNTLEIGH	1130	2005	0-100 °C	0.001 °C	±0.5%
Pressure transducer	TEDEA HUNTLEIGH	1130	2005	0-10 MPa	0.001 MPa	±0.5%
Strain transducer	TEDEA HUNTLEIGH	1130	2005	0-10 mε	0.001 mε	±0.5%
Angle transducer	TEDEA HUNTLEIGH	1130	2005	0-10 °	0.001 °	±0.5%
Frequency transducer	TEDEA HUNTLEIGH	1130	2005	0-10 kHz	0.001 kHz	±0.5%
Time transducer	TEDEA HUNTLEIGH	1130	2005	0-10 s	0.001 s	±0.5%
Position transducer	TEDEA HUNTLEIGH	1130	2005	0-10 m	0.001 m	±0.5%
Velocity transducer	TEDEA HUNTLEIGH	1130	2005	0-10 m/s	0.001 m/s	±0.5%
Acceleration transducer	TEDEA HUNTLEIGH	1130	2005	0-10 m/s ²	0.001 m/s ²	±0.5%
Angular velocity transducer	TEDEA HUNTLEIGH	1130	2005	0-10 rad/s	0.001 rad/s	±0.5%
Angular acceleration transducer	TEDEA HUNTLEIGH	1130	2005	0-10 rad/s ²	0.001 rad/s ²	±0.5%

