Technical Report No.: 64.181.24.00479.01 Rev.00

Date: 2024-10-24

Client:	Name:	Hisense Air Conditioning Co., Ltd.
	Address:	No.1, Hisense Road, Nancun Town, Pingdu, 266000 Qingdao, Shandong Province, PEOPLE'S REPUBLIC OF CHINA
	Contact person:	Ms. Zhou cui
Manufacturer:	Name:	Hisense Air Conditioning Co., Ltd.
	Address:	No.1, Hisense Road, Nancun Town, Pingdu, 266000 Qingdao, Shandong Province, PEOPLE'S REPUBLIC OF CHINA
Factory:	Name:	SolarEast Heat Pump Ltd.
	Address:	No.73 Defu Road, Xingtan Town Shunde District 528325 Foshan City, Guangdong Province, People's Republic of China
Test object:	Product:	Air to water Heat Pump
	Model:	AHZ-040U4GSA00
	Trade mark:	Hisense
Test specification:	EN 16147:2017+A1:2022 EN 12102-2:2019	
Purpose of examination:	Test according to the test specification	
Test result:	The test results show that the presented product is in compliance with the above listed test specifications.	

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1. Description of the test object

1.1 Function

Manufacturer's specification for intended use:

The appliance is an air/ water heat pumps with electrically driven compressor including a domestic hot water storage tank.

Manufacturer's specification for predictive use:

According to the user manual.

1.2 Consideration of the foreseeable use

☐ Not applicable
☒ Covered through the applied standard
☐ Covered by the following comment
☐ Covered by attached risk analysis

1.3 Technical Data

Model(s)	:	AHZ-040U4GSA00
Rated Voltage (V)	:	220-240V~
Rated Frequency (Hz)	:	50
Rated Power (W)	:	1800
Rated Current (A)	:	8.20
Auxiliary heater power (kW)	:	see the nameplate
Protection Class	:	☒ Class I; ☐ Class II; ☐ Class III
Degree of Protection	:	IP X4
Construction	:	☒ Stationary ☐ Portable ☐ Hand-held ☐ Open-frame
Supply connection	:	☐ Non detachable cord ☒ Permanent connection to fixed wiring ☐ Appliance inlet
Operation mode	:	☒ Continuous operation; ☐ Intermittent operation; ☐ Short time operation;
Rated capacity (L)	:	197.5
Refrigerant	:	R290 / 0.60kg
Noise (dB(A))	:	N/A
Series No.	:	8F00240801280292

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2. Order

2.1 Date of Purchase Order, Customer's Reference

- Date of Purchase Order: 2024-06-05
- Customer's Reference: Hisense Air Conditioning Co., Ltd.

2.2 Test Sample(s)

- Reception date(s): 2024-08-01
- Location(s) of reception:
  For Energy test:
  TUV SUD Certification and Testing (China) Co., Ltd.
  (CNAS accredited laboratory with Registration No.CNAS L3584)
  Address: B1/F. of Building A2, B1&2/F. of Building A4, Building B2/B3/D1, No.63, Chuangqi Road, Shilou, Panyu District, Guangzhou, Guangdong, China
  For Nosie test:
  CVC Testing Technology Co., Ltd.
  (CNAS accredited laboratory with Registration No.CNAS L0095)
  Address: Address: No.3, Tiantai Yilu, Kaitai Avenue, Science City, Guangzhou, Guangdong, China
- Condition of test sample(s): completed and can be normal operation

2.3 Date(s) of Testing

2024-08-12 to 2024-08-29

2.4 Location(s) of Testing

Same as 2.2

3. Test Results

☒ Decision rule according to ILAC-G8:09/2019 clause 4.2.1 Binary statement for simple acceptance rule or IEC Guide 115:2023, clause 4.3 Simple acceptance was applied.

☐ Decision rule according to customer's requirements was applied. It is:

☐ Decision rule according to ILAC-G8:09/2019 clause 4.2.2 Binary statement with guard band - guard band length = 95 % extended measurement uncertainty, was applied.

☐ Decision rule (based on ILAC-G8:09/2019 clause 4.2.3 Non-binary statement with guard band, guard band length = 95 % extended measurement uncertainty) for an upper specification limit (A lower limit or specification with an up-per and a lower limit is treated similarly.):

- Compliance with the requirement: If a specification limit is not breached by a measurement result plus the expanded uncertainty with a 95% coverage probability, then compliance with the specification will be stated (e. g. Pass).
- Non-compliance with the requirement: If a specification limit is exceeded by the measurement result minus the expanded uncertainty with a 95% coverage probability, then non-compliance with the specification will be stated (e. g. Fail).
- Inconclusive result: If a measurement result plus/minus the expanded uncertainty with a 95 % coverage probability overlaps the limit it will be stated that it is not possible to state compliance or non-compliance.

☐ There are no statements to conformity or no results with measurand stated in this report, no decision rule has been applied.

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Test results refer to Appendix No.1: Format of test results.

4. Remark

4.1 General

The user manual has been examined according to the minimum requirements described in the product standard. The manufacturer is responsible for the accuracy of further particulars as well as of the composition and layout.

4.2 When the product is placed on the market, it must be accompanied with safety Instructions written in official language of the country. The instructions shall give information regarding safe operation, installation and maintenance.

5. Documentation

- Appendix No.1: Format of test results
- Appendix No.2: Marking plate
- Appendix No.3: Photo documentations
- Appendix No.4: Construction data form
- Appendix No.5: Test equipment list

6. Test History

1. The appliance is a heat pump combination heater, this report only for water heating energy efficiency test.
2. The appliance is supplied by a 3-pole supply cord connecting to fixed wiring.
3. The test was performed according to test specifications and the standard EN 16147 requirements, the unit were performed on the condition below:

Item	Installation or setting
Air duct	N/A
Load profile	L
Thermostat set point temperature	46 °C
Temperature of the incoming cold water	10 °C
Test voltage	230V, 50Hz
Type of heat source	Outdoor air (placed outdoor side)
Heat source Air Dry(wet) bulb temperature	7°C(6°C) (Average climate)
Ambient temperature of heat pump	Heat source temperature
Ambient temperature of storage tank	20°C
Operating setting	Heat pump only

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TÜV SÜD Group

Tested by: William Liang, Project Handler

printed name, function & signature

Approved by: Plum Li, Designated Reviewer

printed name, function & signature

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Appendix No.1: Format of test results

Outdoor air (placed outdoor side) (Average climate) (Table 1 to Table 6):

Table 1: Filling and heating up period [stage C] (Average climate)		
Measured quantity	**Unit**	**Recorded data**
Heat source, Ambient DB/WB	°C	7.03/6.01
Ambient temperature of storage tank	°C	20.01
Test Voltage	V	229.92
Test Frequency	Hz	50
Heating up electrical energy consumption: $W_{eh\text{-}HP}$	kWh	1.593
Heating up time: t_h	s	10653

Table 2: Standby power input [stage D] (Average climate)		
Measured quantity	**Unit**	**Recorded data**
Heat source, Ambient DB/WB	°C	7.03/6.01
Ambient temperature of storage tank	°C	20.01
Test Voltage	V	229.92
Test Frequency	Hz	50
Total electrical energy consumption during the last on-off-cycle: $W_{es\text{-}HP}$	kWh	0.909
Duration of the last on-off-cycle of the heat pump: t_{es}	s	135337
Standby power input: P_{es}	kW	0.024

Table 3: Water draw-offs and COP calculation [stage E] (Average climate)		
Measured quantity	**Unit**	**Recorded data**
Heat source, Ambient DB/WB	°C	7.03/6.01
Ambient temperature of storage tank	°C	20.01
Test Voltage	V	229.92
Test Frequency	Hz	50
Load profile time in hours: t_{TTC}	H	53.23
Total useful energy content during the load profile: Q_{LP}	kWh	11.612
Useful energy during one single draw-off: $Q_{HP\text{-}tap}$	kWh	11.306
Calculated heat energy produced by electrical resistance heater during the whole load profile: $Q_{EL\text{-}LP}$	kWh	0.307
Total electrical energy consumption during the whole load profile: $W_{EL\text{-}LP}$	kWh	3.287
Total measured electrical energy consumption: $W_{EL\text{-}M\text{-}LP}$	kWh	3.688
Standby power input: P_{es}	kW	0.024
Coefficient of performance: COP_{DHW}	--	3.532

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Appendix No.1: Format of test results

Table 4: Reference hot water temperature and volume of mixed water at 40 °C [stage F] (Average climate)		
Measured quantity	**Unit**	**Recorded data**
Heat source, Ambient DB/WB	°C	7.03/6.01
Ambient temperature of storage tank	°C	20.01
Test Voltage	V	229.92
Test Frequency	Hz	50
Time from starting the draw-off until θ'_{WH} is less than 40°C: t40	s	915
Reference hot water temperature: θ'_{WH}	°C	44.30
Maximum volume of mixed water at 40°C: V_{40}	l	177

Table 5: Water heating energy efficiency (η_{wh}) (Average climate)		
Measured quantity	**Result**	**Remark**
Declared load profile:	L	--
Total electrical energy consumption during the smart period of the smart cycle Q_{elec}^{smart} ***	N/A	No smart control function
Total useful energy content during the smart period of the smart cycle Q_{LP}^{smart} ***	N/A	No smart control function
Smart control factor SCF *	N/A	No smart control function
Smart control compliance smart	0	No smart control function
Standby heat loss: P_{stby} (kW)***	0.060	--
Ambient correction term: Q_{cor} (kWh)***	-0.331	--
Reference energy of the load profile: Q_{ref} (kWh)***	11.655	--
Daily electrical energy consumption: Q_{elec} (kWh)***	3.299	--
Water heating energy efficiency (smart=0): η_{wh} *	141.3 %	--
Water heating energy efficiency (smart=1): η_{wh} *	N/A	No smart control function
Water heating energy efficiency classes:	A+	(According (EU) No 811/2013 ANNEX II Table 3)
Annual electrical energy consumption (AEC) (kWh/a)****	726	--
Supplementary information: Number of brine pump considered: no Setting of controls: Heating mode, thermostat set point temperature: 46°C Remark: Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer		

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Appendix No.1: Format of test results

Table 6: Other performance (Average climate)		
Measured quantity	**Unit**	**Recorded data**
Rated heat output: P_{rated}	kW	2.087
Seasonal coefficient of performance: $SCOP_{DHW}$	–	3.532

Table 7: Noise tests data:			
	Heat source, Ambient DB/WB..... (°C):	7.00 °C / 6.00 °C	
	Ambient temperature of storage tank .... (°C):	20 °C	
	Voltage ..... (V):	230V~	
	Frequency ..... (Hz):	50Hz	
	Working condition class.....:	Class A	
	Acoustical environment.....:	Hemi-anechoic	
	Windshield type.....:	Sponge	
	Measured position amount .....:.....	Outdoor unit: 14 Indoor unit: 9	
	Water flow .... (m^3/h):	--	

Measured quantity	$L_{WA,Indoor\ unit}$	$L_{WA,Outdoor\ unit}$	Remark
Averaged sound pressure level L_p****	19 dB(A)	44 dB(A)	-
Measurement distance d *	1.0m	1.0m	-
Sound power level L_{WA}****	34 dB(A)	57 dB(A)	-

Supplementary information: --

Setting of controls: Heating mode

Remark:

1. Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer

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Appendix No.2: Marking plate

Nameplate

Hisense Air to water Heat Pump			
Model			AHZ-040U4GSA00
Power Supply			220-240V~ / 50Hz
Heating[1]	Capacity	kW	4.05
	Input Power	kW	0.82
	Input Current	A	3.68
	COP	W/W	4.94
Heating[2]	Capacity	kW	4.01
	Input Power	kW	1.27
	Input Current	A	5.69
	COP	W/W	3.17
Hot Water	Capacity	kW	4.02
	Input Power	kW	1.02
	Input Current	A	4.57
	COP	W/W	3.96
Cooling	Capacity	kW	3.37
	Input Power	kW	1.05
	Input Current	A	6.23
	EER	W/W	3.21
Rated Input Power		kW	1.80
Rated Input Current		A	8.20
Refrigerant Type/Charge/GWP  A3		.../kg	R290/0.6/3
CO_2 Equivalent		/	0.0018t
Operation Pressure(Low Side)		MPa	0.8
Operation Pressure(High Side)		MPa	3.0
Maximum Allowable Pressure		MPa	3.2
Electrical Shockproof		/	I
IP Class		/	IPX4
Max. Outlet Water Temp.		℃	75
Operating Ambient Temperature		℃	-25 ~ 45
Water Piping Connections		inch	G1
Rated Water Flow		m^3/h	0.7
Water Pressure Drop		kPa	15
Min/Max Water Pressure		MPa	0.1 / 0.3
Sound Pressure Level		dB(A)	38
Net Dimensions (L×W×H)		mm	1064×438×655
Net Weight		kg	73

Rated Test Conditions:
Heating[1]: Ambient Temp 7℃/6℃(DB/WB), Water-In/Out Temp 30℃/35℃
Heating[2]: Ambient Temp 7℃/6℃(DB/WB), Water-In/Out Temp 47℃/55℃
Hot Water: Ambient Temp 7℃/6℃(DB/WB), Water-In/Out Temp 15℃/55℃
Cooling: Ambient Temp 35℃/24℃(DB/WB), Water-In/Out Temp 12℃/7℃
Hisense Air conditioning Co., Ltd.
No.1, Hisense Road, Nancun Town, Pingdu City, Qingdao City, Shandong Province, P. R.China



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Appendix No.3: Photo documentations

Details of:	General view
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

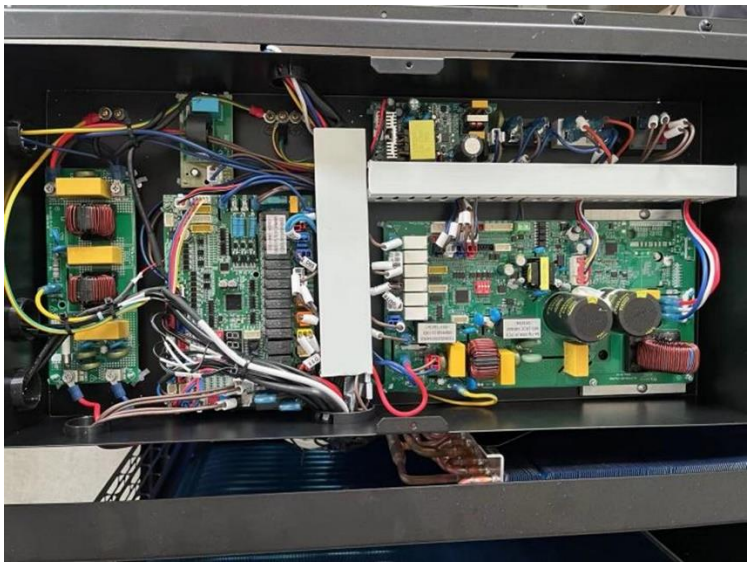
Details of:	Compressor
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

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Appendix No.3: Photo documentations

Details of:	Fan motor
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

Details of:	Main controller
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

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Appendix No.3: Photo documentations

Details of:	Water pump
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	 

Details of:	Storage tank
View: ☐ General ☐ Front ☐ Rear ☐ Right ☐ Left ☐ Top ☐ Bottom	

Appendix No.4: Construction data form

Part		Technical data
1. Compressor		
	Manufacture	GMCC
	Type	EDTN210D32EFZ
	Serial-number	4020090901
	Rated input	DC190V; R290
2. Condenser		
	Manufacture	Danfoss (Hangzhou) Plate Heat Exchanger Co.,Ltd.
	Type	C39L-EZ-28
	Heat exchanger	Plate heat exchanger
	Dimension(mm):	118×45×332 mm
3. Evaporator		
	Manufacture	Guangzhou Aotai Refrigeration Equipment Co.,Ltd.
	Type	KFDC-150XR2PN9A1-LQ-1
	Heat exchanger	Finned heat exchanger
	Dimension(mm):	640×263×588 mm
4. Fan motor		
	Manufacture	Jiangmen LT Motor Co.,Ltd.
	Type	RD50HP
	Fan type	3 blade
	Specification	DC310V; 50W
5. Main control board		
	Manufacture	GUANGDONG S-FINEV TECHNOLOGY CO., LTD
	Type	R-JY003-BP
	Specification	220-240V~; 50Hz
6. Water pump		
	Manufacture	GRUNDFOS
	Type	UPM3 K 25-75 130 AZA
	Specification	230V~; 50/60Hz
7. Storage tank		
	Manufacture	SolarEast Heat Pump Ltd.
	Type	HPHWT-200SE
	Liner specification	560(Φ)*1407(H)mm; duplex stainless steel δ=1.2mm;
	Heat exchanger	Internal coil; SUS316L; Φ28*10m bellows
	Volume	197.5L

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Appendix No.5: Test equipment list

Equipment	Brand/Manufacturer	Model	ID No.	Calibration due date
R&A performance measuring system	GEI	5HP	64-1-90-11-004	2024-12-24
Hemi-anechoic room(B)	Guangzhou Kinte	5.2m×4.4m×4.6m	NC-036-3	2028-10-06
Dynamic signal analysis system	—	HAHI2022	VGDY-2137	2025-01-08
Calibrator	B & K	4231	HJ-000095	2025-06-24
AC source Supply	YANGHONG	AFC-33030TS	VGDS-0637	2024-11-02
Long steel tape	—	5m	HJ-000062	2024-09-11
Temperature measurement system	—	Special	NC-036-1	2025-06-03
Atmospheric pressure meter	—	—	HJ-000165	2024-11-21
Constant temperature water system	B & K	Special	VGDS-0448	2025-04-12
Windscreen	B & K	WS002-5	—	—

--- End of Report ---

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