

Technical Report No.: 64.181.24.06832.01 Rev.00

Date: 2024-12-17

Client: Name: ARYA GROUP S.p.A

 Address: Via Tropea, 40 - 00178 Rome

 Contact person: Fabrizio Agostini

Manufacturer: Name: ARYA GROUP S.p.A

 Address: Via Tropea, 40 - 00178 Rome

Factory: Name: GD Honwo Intelligent Environment Technology Co.,Ltd.

 Address: 7th floor, Zhimi Industrial Park, Nantou, Zhongshan, Guangdong

Test object: Product: Heat Pump Heater

 Model: FUSION AR300L-PCS; FUSION AR300L-PC

Trade mark:

ARYA

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, for indoor used.

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)	: FUSION AR300L-PCS; FUSION AR300L-PC
Rated Voltage (V)	: 220-240V~
Rated Frequency (Hz)	: 50
Rated Power (W)	: 3100
Rated Current (A)	: 14
Auxiliary heater power (kW)	: 2000
Protection Class	: ☒ Class I; ☐ Class II; ☐ Class III
Degree of Protection	: IP X1
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)	: N/A
Net Weight (kg)	: 95
Refrigerant	: R290 / 0.150kg
Noise (dB(A))	: 42 (sound pressure level)
Series No.	: N/A

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2. Order

2.1 Date of Purchase Order, Customer's Reference

- Date of Purchase Order: 2024-11-14
- Customer's Reference: ARYA GROUP S.p.A

2.2 Test Sample(s)

- Reception date(s): 2024-11-14
- Location(s) of reception:
For Energy test:
TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
(CNAS accredited laboratory with Registration No.CNAS L3584)
Address: B1F&2F, No. 3 Chuangqi Building, No. 63 Chuangqi Road, Shilou Town, Panyu District, Guangzhou 511447, China
For Nosie test:
China Quality Certification Centre South China Laboratory
(CNAS accredited laboratory with Registration No.CNAS L0095)
Address: No. 11, South of Shenghui Road, Nantou, Zhongshan, Guangdong, China
- Condition of test sample(s): completed and can be normal operation

2.3 Date(s) of Testing 2024-12-26 to 2025-01-16

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.

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 an air/ water heat pumps with electrically driven compressor including a domestic hot water storage tank, for indoor used.
2. The main power 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	No duct for air outlet and air inlet
Load profile	XL
Thermostat set point temperature	55 °C
Temperature of the incoming cold water	10 °C
Test voltage	230V~, 50Hz;
Air heat source temperature	Dry bulb/wet bulb: 20 °C/15 °C (Indoor air)
Ambient temperature of storage tank	20°C
Operating setting	Heat pump only

4. The type of heat source is according to the client's requirement.
5. The model FUSION AR300L-PC is the same as the model FUSION AR300L-PCS except for model's name difference. And the tests are carried out at model FUSION AR300L-PCS as representative.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
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

Air heat source temperature Dry bulb/wet bulb: 20°C/15°C (Indoor air) (Table 1 to Table 6):

Table 1: Filling and heating up period [stage C]		
Measured quantity	Unit	Recorded data
Heat source, Ambient DB/WB	°C	19.99/15.00
Ambient temperature of storage tank	°C	19.99
Test Voltage	V	230
Test Frequency	Hz	50
Heating up electrical energy consumption: W_{eh-HP}	kWh	3.590
Heating up time: t_h	s	35223

Table 2: Standby power input [stage D]		
Measured quantity	Unit	Recorded data
Heat source, Ambient DB/WB	°C	19.97/15.00
Ambient temperature of storage tank	°C	19.97
Test Voltage	V	230
Test Frequency	Hz	50
Total electrical energy consumption during the last on-off-cycle: W_{es-HP}	kWh	0.865
Duration of the last on-off-cycle of the heat pump: t_{es}	s	103731
Standby power input: P_{es}	kW	0.030

Table 3: Water draw-offs and COP calculation [stage E]		
Measured quantity	Unit	Recorded data
Heat source, Ambient DB/WB	°C	19.96/15.00
Ambient temperature of storage tank	°C	19.96
Test Voltage	V	230
Test Frequency	Hz	50
Load profile time in hours: t_{TTC}	H	49.65
Total useful energy content during the load profile: Q_{LP}	kWh	19.093
Useful energy during one single draw-off: Q_{HP-tap}	kWh	19.085
Calculated heat energy produced by electrical resistance heater during the whole load profile: Q_{EL-LP}	kWh	0.008
Total electrical energy consumption during the whole load profile: W_{EL-LP}	kWh	5.371
Total measured electrical energy consumption: $W_{EL-M-LP}$	kWh	6.133
Standby power input: P_{es}	kW	0.030
Coefficient of performance: COP_{DHW}	--	3.555

Appendix No.1: Format of test results

Table 4: Reference hot water temperature and volume of mixed water at 40 °C [stage F]		
Measured quantity	Unit	Recorded data
Heat source, Ambient DB/WB	°C	19.99/15.00
Ambient temperature of storage tank	°C	19.99
Test Voltage	V	230
Test Frequency	Hz	50
Time from starting the draw-off until θ'_{WH} is less than 40°C: t_{40}	s	1557
Reference hot water temperature: θ'_{WH}	°C	54.81
Maximum volume of mixed water at 40°C: V_{40}	l	389

Table 5: Water heating energy efficiency (η_{wh})		
Measured quantity	Result	Remark
Declared load profile:	XL	--
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)***	0.075	--
Ambient correction term: Q_{cor} (kWh)***	-0.414	--
Reference energy of the load profile: Q_{ref} (kWh)***	19.07	--
Daily electrical energy consumption: Q_{elec} (kWh)***	5.365	--
Water heating energy efficiency (smart=0): η_{wh} *	146.7 %	--
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)****	1142	--
Supplementary information: Number of brine pump considered: no Setting of controls: Heating mode, thermostat set point temperature: 55°C Remark: Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) nearest integer		

Appendix No.1: Format of test results

Table 6: Other performance		
Measured quantity	Unit	Recorded data
Rated heat output: P_{rated}	kW	1.39
Seasonal coefficient of performance: $SCOP_{DHW}$	–	3.555

Table 7: Noise tests data:			
	Heat source (°C):	20.00 °C / 15.00 °C	
	Ambient temperature of storage tank (°C):	20 °C	
	Voltage (V):	see page 4	
	Frequency (Hz):	50Hz	
	Working condition class.....:	Class A	
	Acoustical environment.....:	Hemi-anechoic	
	Windshield type.....:	Sponge	
	Measured position amount:	14	
	Water flow (m³/h):	--	
Measured quantity	LWA, Indoor unit	LWA, Outdoor unit	Remark
Averaged sound pressure level L_p^{****}	38 dB(A)		-
Measurement distance d *	1.0m		-
Sound power level L_{WA}^{****}	54 dB(A)		Limit: ≤60dB
Supplementary information: --			
Setting of controls: Heating mode, outlet water temperature: 55°C.			
Remark:			
1. According to the OJ 2014/C 207/03, the tests shall be carried out at 3 points: 1st point at $25 \pm 3^\circ\text{C}$; 2nd point at $(T_{set}+25)/2 \pm 3^\circ\text{C}$; 3rd point at $T_{set} +0/- 6^\circ\text{C}$.			
2. Rounding to: *) 1 decimal places; **) 2 decimal places; ***) 3 decimal places; ****) 4 nearest integer			

Appendix No.2: Marking plate

Nameplate

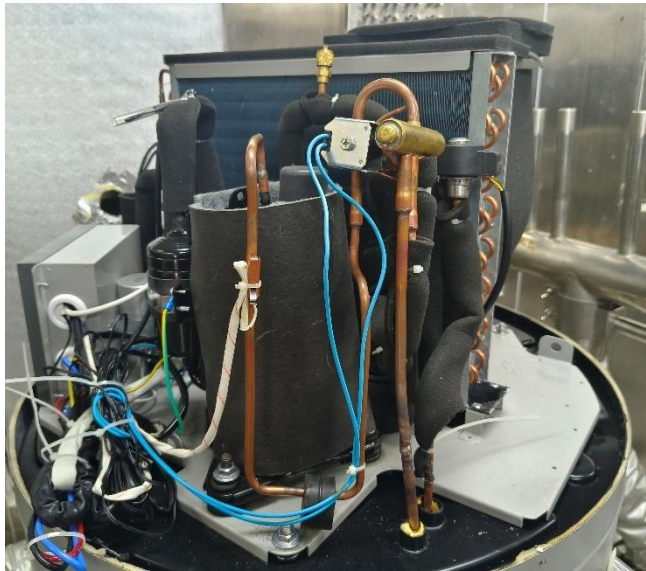


Remark:

1. The height of CE marking shall be higher than 5mm and the height of WEEE marking shall be higher than 7mm.
2. The nameplate for FUSION AR300L-PC as same as FUSION AR300L-PCS, except for model name.

Appendix No.3: Photo documentations

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

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

Appendix No.3: Photo documentations

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

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

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Appendix No.3: Photo documentations

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

Appendix No.4: Construction data form

Part		Technical data
1. Compressor		
	Manufacture	HIGHLY
	Type	WHP01750PSY-H6JUA
	Serial-number	N/A
	Rated input	220-240VAC; R290; 50Hz
2. Condenser		
	Manufacture	Changzhou Changfa Refrigeration Co., Ltd
	Type	N/A
	Heat exchanger	microchannel heat exchanger
	Pipe specification	1190mmx20mm
3. Evaporator		
	Manufacture	Changzhou Changfa Refrigeration Co., Ltd
	Type	N/A
	Heat exchanger	Finned heat exchanger
	Dimension	φ5 3mm*8U*365
4. Fan motor		
	Manufacture	GUANGDONG WELLING MOTOR MANUFACTURING CO., LTD
	Type	ZKFP-34-8-5
	Fan type	centrifugation style
	Specification	DC310V; 34W; 900r/min; 8P
6. Controller		
	Manufacture	Guangdong Chico Electronic inc.
	Type	GM11680007
7. Heater		
	Manufacture	Backerhts (ShenZhen) Co., Ltd
	Type	TC220VAC2500W
	Specification	220VAC; 2500W
8.4-way valve		
	Manufacture	Zhejiang Dunan Artificial Environment Co.,Ltd
	Type	DSF-4-R410A
	Specification	220-240VAC; 50/60Hz; 7/5W

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	2025-12-24
20 Channel noise and vibration testing system	RION	SA-02M	CQCSC-BE-0026	2026-01-11
Nosie Testing Lab	Beijing Zhongjia Zhirui Technology Co., LTD	ZR-02	CQCSC-BE-0026	2025-09-25
Nosie Testing Lab (Environmental control system)	Beijing Zhongjia Zhirui Technology Co., LTD	ZR-02	CQCSC-BE-0026	2025-09-25

--- End of Report ---