Guangdong Shunde NOON Electrical Appliance Manufacturing Co., Ltd.

TEST REPORT

SCOPE OF WORK

CADR Testing - Smart Starry Air Purifier - [DH-JH09W; MK09W; MGK23J09W; MJH009W; MG09WJH; MGJHQ09W; MJ009WH]

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Applicant Name	Guangdong Shunde NOON Electrical Appliance Manufacturing Co., Ltd.
Address	Floor 1-4, Building A, No. 8, Zhiye Road, Shunjiang Residents Committees Industrial Park, Beijiao Town,Shunde District, FOSHAN CITY, Guangdong Province, China
Manufacturing Name	KENNEDE ELECTRONICS MFG CO., LTD
Address	No.21 Jintong Road, Tangxia Town, Pengjiang District, JIANGMEN CITY, Guangdong Province 529000
Product	Smart Starry Air Purifier
Brand Name	AROEVE, POMORON
Description	The product covered by this report is a cord connected indoor used only Air Purifier.
Model(s) (if applicable)	DH-JH09W; MK09W; MGK23J09W; MJH009W; MG09WJH; MGJHQ09W; MJ009WH
Model Similarity	All models are identical except for the specific model number and the colour of the appearance.
Rated Voltage (V)	120
Rated Frequency (Hz)	60
Rated Power (W)	41
Other Ratings	NA
Sample(s) Receive Date	2-Nov-2023
Date Tested	18-Dec-2023
Sample Condition	Prototype
Test Standard(s) or Criteria(s)	ANSI/AHAM AC-1-2020 AHAM AC-7-2022 ENERGY STAR® Program Requirements for Room Air Cleaners Version 2.0 10 CFR 430, Appendix FF to subpart B - Uniform Test Method for Measuring the Energy Consumption of Air Cleaners
Conclusion	The results reported are within the minimum and maximum limits of measurability of the ANSI/AHAM AC-1-2020 "Association of Home Appliance Manufacturers Method for Measuring Performance of Portable Household Electric Room Air Cleaners" Test Method and meet the requirements of EPA Energy Star version 2.0 and the Minimum Efficiency on and after January 1, 2024 requirements of DOE

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Test Method:

Tests were performed in accordance with ANSI/AHAM AC-1-2020 entitled "Association of Home Appliance Manufacturers Method for Measuring Performance of Portable Household Electric Room Air Cleaners". This standard method has defined limits of measurability. The practical limits of measurability are: Dust 10 to 600 CADR, Tobacco smoke 10 to 600 CADR and Pollen 25 to 450 CADR. The statistical validity of test results outside of the stated practical limits is questionable and unevaluated. Clean Air Delivery Rates (CADR's) were determined using Tobacco Smoke, AC Fine Test Dust, and Paper Mulberry Pollen.

Additional requirements for energy taken from IEC 62301 Ed. 2 entitled, "Household Electrical Appliances – Measurement of Standby Power".

Monitored particle size ranges for the three particulates were as follows:
Smoke - 0.10-1.0 microns; Dust - 0.5-3 microns; Pollen - 5-11 microns.

$PM_{2.5}$ CADR is obtained by combining the CADR of Cigarette smoke particle sizes ranging from 0.1 and 0.5 microns with the CADR of dust particles that fall in the range of 0.5 to 2.5 microns and performing a geometric average calculation.

$$\mathrm{PM}_{2.5}\ \mathrm{CADR} = \sqrt[2]{Smoke\ CADR(0.1 - 0.5\mu m) * Dust\ CADR\ (0.5\ - 2.5\mu m)}$$

Additional calculations were performed in accordance with AHAM AC-7-2022 entitled "Energy Test Method for Consumer Room Air Cleaners". This standard primarily utilizes the test methods outlined in the standards above and outlines a calculation to determine annual energy use based on varying modes of usage an air cleaner will encounter including: active mode, inactive mode, and off mode, which make up the combined Annual Energy Consumption (AEC).

The air cleaner's AEC along with the $PM_{2.5}$ CADR, are used in the following equation to determine the Integrated Energy Factor (IEF).

$$IEF = \left[\frac{CADR\left(\frac{ft^3}{min}\right)}{\left(AEC\left(\frac{kWh}{year}\right) * \frac{1\ year}{5840\ hours} * \frac{1000\ Wh}{1\ kWh}\right)}\right]$$

$$IEF\ (PM_{2.5}CADR/watt) = \left[\frac{CADR}{\left(\frac{AEC}{5.840}\right)}\right]$$

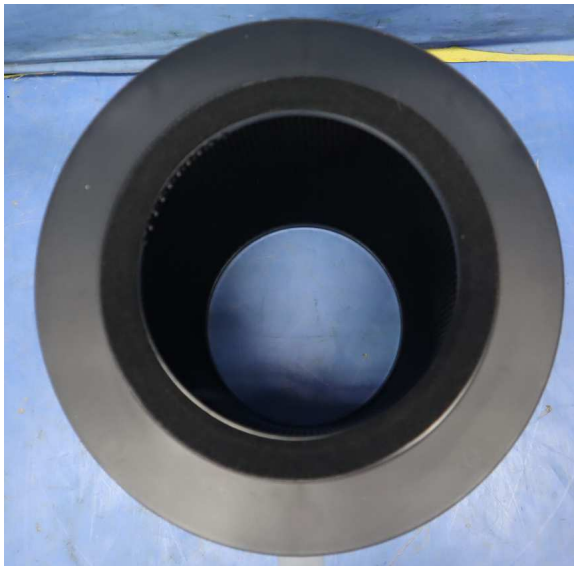
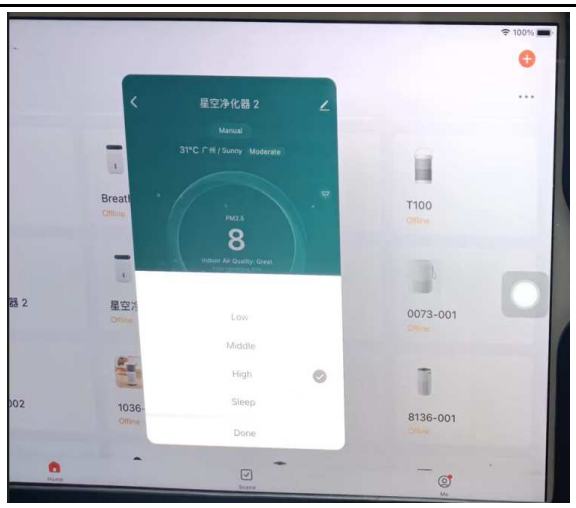
Test Equipment List:

Equipment Name	Type	Number	Calibration Date	Due Date
Laser Aerosol Spectrometer	3340	SA016-23-04	2023/1/6	2024/1/5
Aerodynamic Particle Sizer	3321	SA016-23-05	2022/12/9	2024/6/8
Fluidized Bed Aerosol Generator	3400A	SA016-23-05	2023/6/2	2024/6/1
Air Cleaner testing Chamber		SA016-23	2023/6/2	2024/6/1

Device Under Test Description:

The device(s) tested for this report were/was Model DH-JH09W

The following device settings were used during testing: 120V/60Hz, Turbo Speed, UV ON, Tested on the Table

 **Unit in test**	 **Control Panel view**
 **Filter view**	 **Filter view**
 **APP view**	**NA**

Critical Components

Name	Manufacturer / trademark	Type / model	Technical data
Filter	Various	Various	Combined by pre filter, HEPA filterand carbon filter. Measured Φ237.5mmX208.5mm. 160± 5layers.
Fan Motor	Shenzhenshi Yongyihao Eletronic Co.,Ltd.	JLT-6122M24-F	DC24V 1.4A, 30W, Class A.
UV LED light	Shenzhen Zhaoen Core Light Technology CO., LTD	UVC3535-265-275NM	270nm ~ 280nm, DC 5.0V-7.0V,If: max. 120mA, 3.5 mm x 3.5 mmx1.47 mm.

NOTE
“Various“ means any type, from any manufacturer that complies with the "Technical data and securement means" can be used.

Results of Performance Tests:

Model/Configuration	Test Particulate	Natural Decay Rate	CADR (FT^3/Min)	CADR STDEV	Power (W)
DH-JH09W	Smoke	0.00335	187.2	1.6	35.8
S231109159-001	Dust	0.00582	200.3	0.5	35.8
120V/60Hz, Turbo Speed, UV ON	Pollen	0.12566	230.8	11.6	35.6
Tested on the Table	$PM_{2.5}$	-	193.6	-	-
DH-JH09W	Smoke	0.00335	164.9	2.0	34.0
S231109159-002	Dust	0.00582	182.8	0.6	34.1
120V/60Hz, Turbo Speed, UV ON	Pollen	0.12566	202.5	8.7	34.0
Tested on the Table	$PM_{2.5}$	-	173.6	-	-

Conclusion:

The results reported are within the minimum and maximum limits of measurability of the ANSI/AHAM AC-1-2020 "Association of Home Appliance Manufacturers Method for Measuring Performance of Portable Household Electric Room Air Cleaners" Test Method.

Energy Star v2.0 Smoke Operating Power Test

Test Sample Information

Manufacturer/ Organization Name	Model Number	Serial Number	Rated Voltage (V)	Rated Freq. (Hz)	Rated Power (W)
KENNEDE ELECTRONICS MFG CO., LTD	DH-JH09W	2 Samples	120	60	41

Test Criteria

Test Voltage (V)	Test Freq. (Hz)	Ambient Temp. (°F)	Ambient Humidity (%RH)
120 ± 1	60 ± 1	70 ± 5	40 ± 5

Energy Star v2.0 Smoke CADR/Watt Requirement

Smoke CADR Bins	Minimum Smoke CADR/W
30 ≤ CADR < 100	1.9
100 ≤ CADR < 150	2.4
CADR ≥ 150	2.9

Test Results

Test Sample	Test Voltage (V)	Test Freq. (Hz)	Ambient Temp. (°F)	Ambient Humidity (%RH)	Smoke CADR (FT^3/Min)	Power (W)	Smoke CADR/W
S231109159-001	120.1	60.0	69.0	37.0	187.2	35.8	5.2
S231109159-002	120.1	60.0	68.0	39.0	164.9	34.0	4.9

Conclusion:

These results illustrate that this sample does meet the Energy Star Program performance requirements.

Energy Star v2.0 Partial On Mode Power Test

Test Criteria - IEC 62301

Test Voltage (V)	Test Frequency (Hz)	THD of the Electricity Supply System	Ambient Test Temperature (°F)
115 ± 1	60 ± 1	≤ 2%	73.4 ± 9

Energy Star v2.0 Partial On Mode Power Test

Item	Partial On Mode Power Allowance for models without Wi-Fi capability (W)	Partial On Mode Power Allowance for models with Wi-Fi capability (W)
$P_{Base_Allowance}$	1.00	1.00
$P_{Network_Connected}$	0.00	1.00
$P_{Max_Partial_On}$	1.00	2.00

Note: $P_{Max_Partial_On} = P_{Base_Allowance} + P_{Network_Connected}$

Partial On Mode Power Test Results

Test Sample	Test Voltage (V)	Test Freq. (Hz)	THD (%)	Ambient Temp. (°F)	Measured Partial On Mode Power (W)	$P_{Max_Partial_On}$ (W)
S231109159-001	115.6	60.0	0.92	69.0	1.11	2.00
S231109159-002	115.6	60.0	0.92	68.0	1.12	2.00

Conclusion:
The results illustrated in the Partial On Mode Power Data shows that this model with Wi-Fi capability complies with the criteria.

Energy Consumption Test for DOE

Test Sample Information

Manufacturer/ Organization Name	Model Number	Serial Number	Rated Voltage (V)	Rated Freq. (Hz)	Rated Power (W)
KENNEDE ELECTRONICS MFG CO., LTD	DH-JH09W	2 Samples	120	60	41

Test Criteria

Test Voltage (V)	Test Freq. (Hz)	Ambient Temp. (°F)	Ambient Humidity (%RH)
120 ± 1	60 ± 1	70 ± 5	40 ± 5

DOE IEF($PM_{2.5}$ CADR/W) Requirement

Product Class	IEF ($PM_{2.5}$ CADR/W)	
	Tier 1 December 31, 2023	Tier 2 December 31, 2025
10 ≤ PM2.5 CADR < 100	1.7	1.9
100 ≤ $PM_{2.5}$ CADR < 150	1.9	2.4
$PM_{2.5}$ CADR ⩾ 150	2.0	2.9

Test Results

Test Sample	Test Voltage (V)	Test Freq. (Hz)	Ambient Temp. (°F)	Ambient Humidity (%RH)	$PM_{2.5}$ CADR (FT^3/Min)	Power (W)	IEF($PM_{2.5}$) (CFM/W)
S231109159-001	120.1	60.0	69.0	37.0	193.6	35.8	5.3
S231109159-002	120.1	60.0	68.0	39.0	173.6	34.1	5.0

Partial On Mode Power Test

Test Criteria - IEC 62301

Test Voltage (V)	Test Frequency (Hz)	THD of the Electricity Supply System	Ambient Test Temperature (°F)
115 ± 1	60 ± 1	≤ 2%	73.4 ± 9

Partial On Mode Power Test Results

Test Sample	Test Voltage (V)	Test Freq. (Hz)	THD (%)	Ambient Temp. (°F)	Measured Partial On Mode Power (W)
S231109159-001	115.6	60.0	0.92	69.0	1.11
S231109159-002	115.6	60.0	0.92	68.0	1.12

Conclusion

Item	Smoke CADR (CFM)	Dust CADR (CFM)	Pollen CADR (CFM)	$PM_{2.5}$ CADR (CFM)	Standby (W)	Power (W)	AEC (kWh/year)	IEF($PM_{2.5}$) (CFM/W)
Sample 1	187.2	200.3	230.8	193.6	1.11	35.8	212.3	5.33
Sample 2	164.9	182.8	202.5	173.6	1.12	34.1	202.4	5.01
Number of Samples	2	2	2	2	2	2	2	2
Mean	176.1	191.6	216.7	183.6	1.12	35.0	207.4	5.17
Standard deviation	N/A	N/A	N/A	N/A	0.01	1.20	7.00	0.23
$LCL_{0.95}$/0.9 for CADR and IEF	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.62
$UCL_{0.95}$/1.1 for Power and AEC	N/A	N/A	N/A	N/A	1.05	36.7	217.0	N/A
Declarable value	176	192	217	184	1.12	36.7	217	4.6
Minimum Efficiency on and after January 1, 2024								2.0
Minimum Efficiency on and after January 1, 2026								2.9
Verdict								**Pass**

Revision Summary

Date/ Proj # Site ID	Project Handler/ Reviewer	Item	Description of change
			None

********** End of Report **********