# 1 NF-A15 HS-PWM

Lab ID NC15000121

Certification ID FN25121

Test Result Report ID: 25FN121A

Certificate Issue Date: Jul 9, 2024

Scheme: PHI

Airflow Rating

Static Pressure Rating

Aristeidis Bitziopoulos, Certification Body General Manager

## SECTION A: Noise Testing Equipment

| | |
|---|---|
| □□ Environment | Hemi-Anechoic Chamber with 6 dB(A) noise floor |
| Conditions | 25(±2) degrees Celsius, 40-50% humidity |
| Sound Analyzer | Bruel & Kjaer 2270-S G4 & 2250-L G4 |
| Microphone | Bruel & Kjaer Type 4955-A |
| Mic Calibrator | Bruel & Kjaer Type 4231 |
| Data Logger | Picoscope TC-08 |
| □□ ing Methodology | Cybenetics Phi Fan Performance Standard |

## SECTION B: Fan Testing Instrument Technical Specifications

| | |
|---|---|
| Manufacturer | Long Win Science & Technology Corporation |
| □□ l Number | LW-9266 |
| Air Flow Rate | 2.4 – 250 CFM |
| Accuracy of Air Flow Rate | < 3.5% INFS |
| Repeatability error | < 2% |
| Static pressure | 0-20mmAq (100mmAq with the high static pressure throttle device) |
| Overall Dimensions | 0.7 (W) x 2.2 (L) x 1.6 (H) m |
| Power Source | 220VAC, 5A, Single Phase, 50/60Hz |
| Based on Standards | ISO 5801-2007, AMCA 210-0, ASHRAE 51-2007, IEC 61591-2005, GB/T 1236-200 |

## SECTION C: PHI Performance Levels

| | | |
|---|---|---|
| Pressure at 25 dB(A) | P (mmAq) | 1.13 |
| Airflow at 25 dB(A) | Q (CFM) | 58.98 |

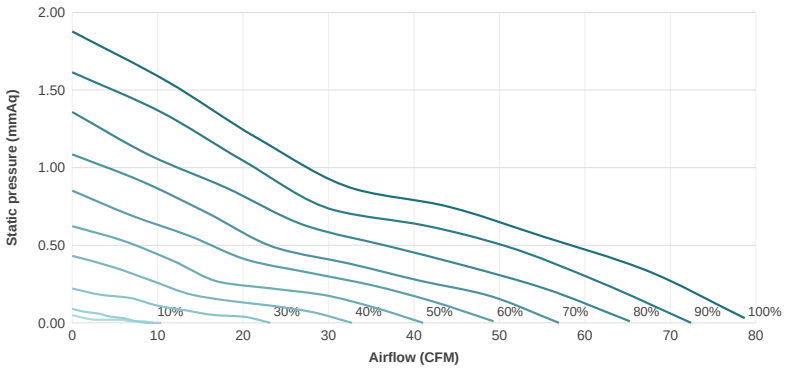
## SECTION D: Information about DUT

| | |
|---|---|
| Product Identification Details | |
| Brand | 1 |
| □□ l | NF-A15 HS-PWM |
| Serial Number | - |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Bearing | SSO2 |
| Connector | PWM |
| Cable length (mm) | 200 |
| Daisy-chain | □ ne |
| RGB Connector | □ ne |
| RGB Daisy-chain | □ ne |
| Cybenetics Measurements | |
| Max Speed (RPM) | 1515 |
| Max Airflow (CFM) | 78.70 |
| Max Static Pressure (mmAq) | 1.88 |
| Max □□□□ Level (dBA) | 31.80 |
| Fan Max Current (A) | 0.13 |
| Fan Weight (gr) | 170 |
| Dimensions (W x H x D) | 150mm x 150mm x 25mm |
| Cybenetics □□ ing Information | |
| Lab ID | NC15000121 |
| Date of receipt | Jun 5, 2024 |
| □□ ing Date | Jul 8, 2024 |
| Report Issued Date | Jul 9, 2024 |
| Engineer Name | Georgios Theodoros Sarimpalas |

## SECTION E: Long Win LW-9266 - Pressure and Airflow

### PQ Chart - All Speeds

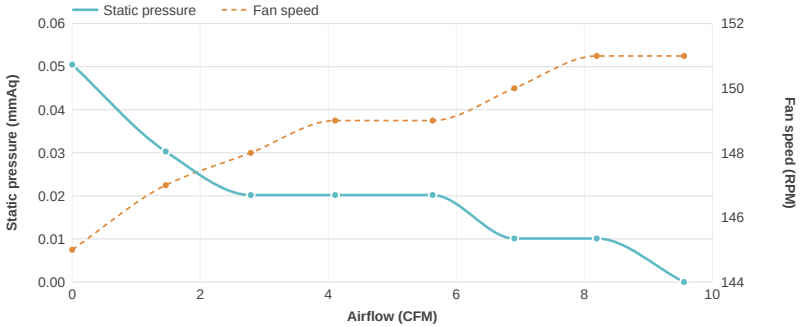
Static pressure against airflow, one curve per speed step




| Speed Setting | Max Airflow (CFM) | Max Static Pressure (mmAq) | Fan Speed (RPM) | Max Power (W) |
|---|---|---|---|---|
| 10% | 9.56 | 0.05 | 145 - 151 | 0.23 |
| 20% | 10.41 | 0.09 | 302 - 319 | 0.19 |
| 30% | 23.19 | 0.22 | 432 - 505 | 0.28 |
| 40% | 32.75 | 0.43 | 592 - 665 | 0.35 |
| 50% | 41.06 | 0.62 | 708 - 816 | 0.47 |
| 60% | 49.32 | 0.85 | 817 - 968 | 0.62 |
| 70% | 56.97 | 1.09 | 923 - 1117 | 0.82 |
| 80% | 65.26 | 1.36 | 1020 - 1241 | 1.04 |
| 90% | 72.43 | 1.61 | 1110 - 1384 | 1.30 |
| 100% | 78.71 | 1.88 | 1192 - 1500 | 1.56 |

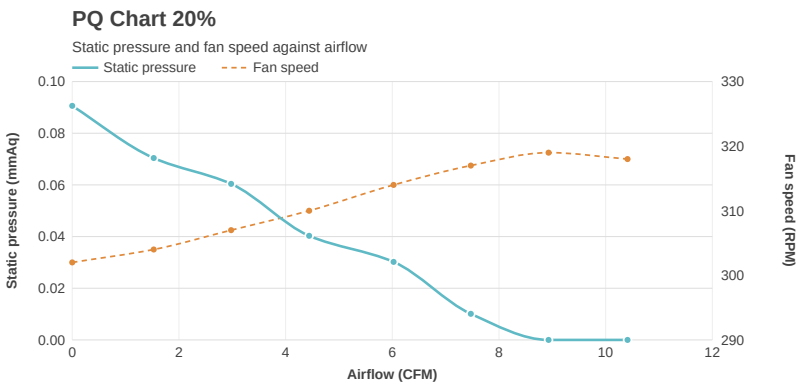
### PQ Chart 10%

Static pressure and fan speed against airflow



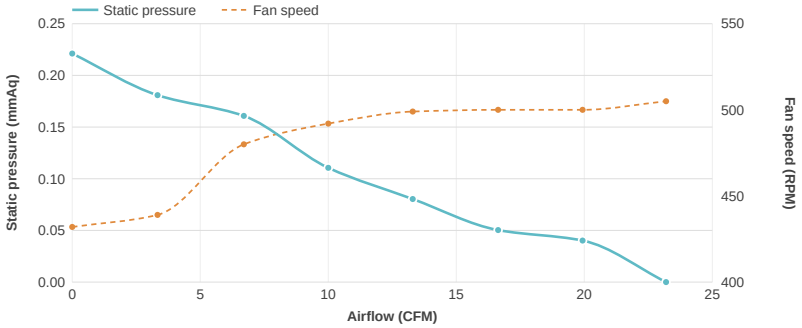

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.05 | 145 | 0.019 | 0.23 |
| 1.46 | 0.03 | 147 | 0.019 | 0.23 |
| 2.79 | 0.02 | 148 | 0.019 | 0.23 |
| 4.11 | 0.02 | 149 | 0.019 | 0.23 |
| 5.63 | 0.02 | 149 | 0.018 | 0.22 |
| 6.91 | 0.01 | 150 | 0.018 | 0.22 |
| 8.19 | 0.01 | 151 | 0.019 | 0.23 |
| 9.56 | -0.01 | 151 | 0.019 | 0.23 |

## PQ Chart 20%



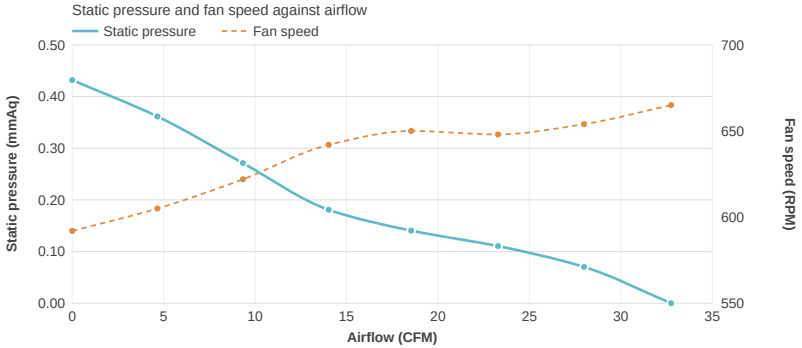

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.09 | 302 | 0.016 | 0.19 |
| 1.53 | 0.07 | 304 | 0.016 | 0.19 |
| 2.98 | 0.06 | 307 | 0.016 | 0.19 |
| 4.44 | 0.04 | 310 | 0.016 | 0.19 |
| 6.03 | 0.03 | 314 | 0.015 | 0.18 |
| 7.47 | 0.01 | 317 | 0.015 | 0.18 |
| 8.93 | 0.00 | 319 | 0.015 | 0.18 |
| 10.41 | -0.01 | 318 | 0.015 | 0.18 |

## PQ Chart 30%



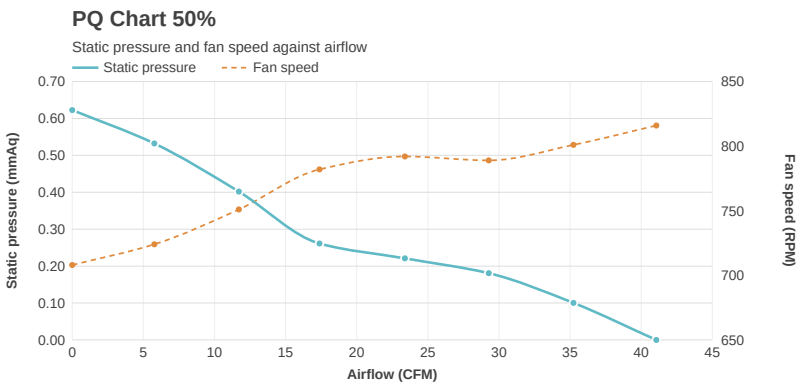

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.22 | 432 | 0.023 | 0.28 |
| 3.33 | 0.18 | 439 | 0.022 | 0.26 |
| 6.70 | 0.16 | 480 | 0.020 | 0.24 |
| 10.00 | 0.11 | 492 | 0.020 | 0.24 |
| 13.30 | 0.08 | 499 | 0.020 | 0.24 |
| 16.63 | 0.05 | 500 | 0.019 | 0.23 |
| 19.93 | 0.04 | 500 | 0.019 | 0.23 |
| 23.19 | 0.00 | 505 | 0.019 | 0.23 |

## PQ Chart 40%



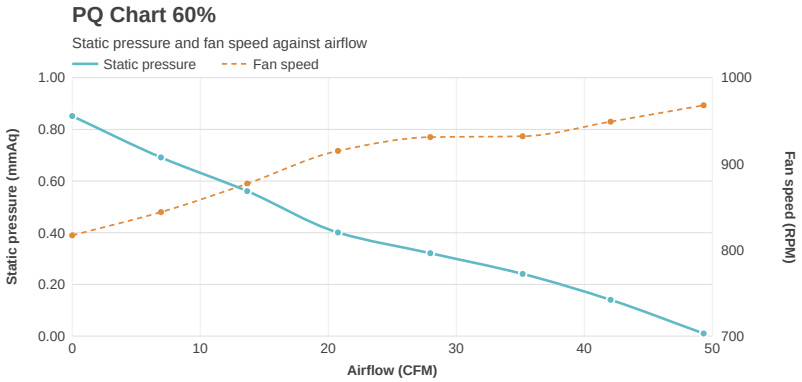

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.43 | 592 | 0.029 | 0.35 |
| 4.66 | 0.36 | 605 | 0.028 | 0.34 |
| 9.33 | 0.27 | 622 | 0.027 | 0.32 |
| 14.02 | 0.18 | 642 | 0.026 | 0.31 |
| 18.53 | 0.14 | 650 | 0.025 | 0.30 |
| 23.28 | 0.11 | 648 | 0.026 | 0.31 |
| 27.99 | 0.07 | 654 | 0.026 | 0.31 |
| 32.75 | 0.00 | 665 | 0.025 | 0.30 |

## PQ Chart 50%



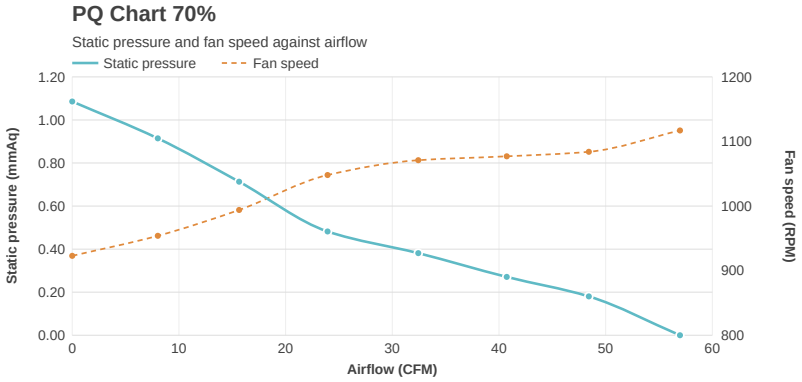

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.62 | 708 | 0.039 | 0.47 |
| 5.77 | 0.53 | 724 | 0.038 | 0.46 |
| 11.72 | 0.40 | 751 | 0.036 | 0.43 |
| 17.38 | 0.26 | 782 | 0.034 | 0.41 |
| 23.38 | 0.22 | 792 | 0.034 | 0.41 |
| 29.28 | 0.18 | 789 | 0.034 | 0.41 |
| 35.23 | 0.10 | 801 | 0.033 | 0.40 |
| 41.06 | -0.01 | 816 | 0.032 | 0.38 |

## PQ Chart 60%



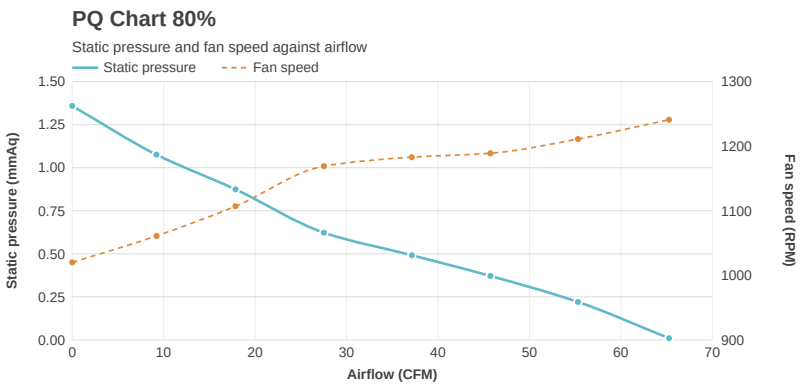

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.85 | 817 | 0.052 | 0.62 |
| 6.93 | 0.69 | 844 | 0.050 | 0.60 |
| 13.67 | 0.56 | 877 | 0.047 | 0.56 |
| 20.75 | 0.40 | 915 | 0.044 | 0.53 |
| 27.97 | 0.32 | 931 | 0.044 | 0.53 |
| 35.18 | 0.24 | 932 | 0.044 | 0.53 |
| 42.05 | 0.14 | 949 | 0.043 | 0.52 |
| 49.32 | 0.01 | 968 | 0.041 | 0.49 |

## PQ Chart 70%



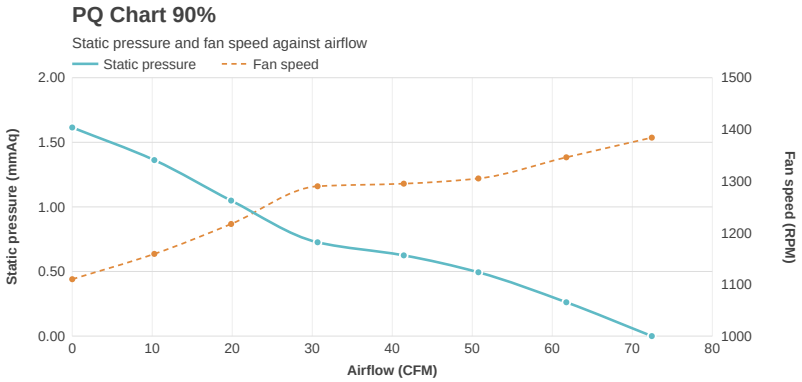

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.09 | 923 | 0.068 | 0.82 |
| 8.02 | 0.91 | 954 | 0.065 | 0.78 |
| 15.64 | 0.71 | 994 | 0.062 | 0.74 |
| 23.94 | 0.48 | 1048 | 0.057 | 0.68 |
| 32.44 | 0.38 | 1071 | 0.055 | 0.66 |
| 40.73 | 0.27 | 1077 | 0.055 | 0.66 |
| 48.42 | 0.18 | 1084 | 0.054 | 0.65 |
| 56.97 | 0.00 | 1117 | 0.051 | 0.61 |

## PQ Chart 80%



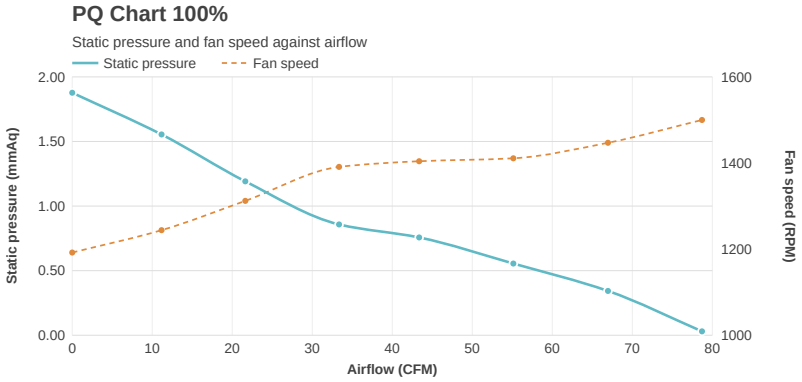

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.36 | 1020 | 0.087 | 1.04 |
| 9.21 | 1.08 | 1061 | 0.083 | 1.00 |
| 17.85 | 0.87 | 1107 | 0.079 | 0.95 |
| 27.51 | 0.62 | 1169 | 0.073 | 0.88 |
| 37.13 | 0.49 | 1183 | 0.071 | 0.85 |
| 45.73 | 0.37 | 1189 | 0.071 | 0.85 |
| 55.31 | 0.22 | 1211 | 0.069 | 0.83 |
| 65.26 | 0.01 | 1241 | 0.065 | 0.78 |

## PQ Chart 90%




| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.61 | 1110 | 0.108 | 1.30 |
| 10.26 | 1.36 | 1159 | 0.103 | 1.24 |
| 19.86 | 1.05 | 1217 | 0.097 | 1.16 |
| 30.66 | 0.73 | 1290 | 0.089 | 1.07 |
| 41.43 | 0.63 | 1295 | 0.089 | 1.07 |
| 50.76 | 0.49 | 1305 | 0.088 | 1.06 |
| 61.75 | 0.26 | 1346 | 0.083 | 1.00 |
| 72.43 | -0.01 | 1384 | 0.079 | 0.95 |

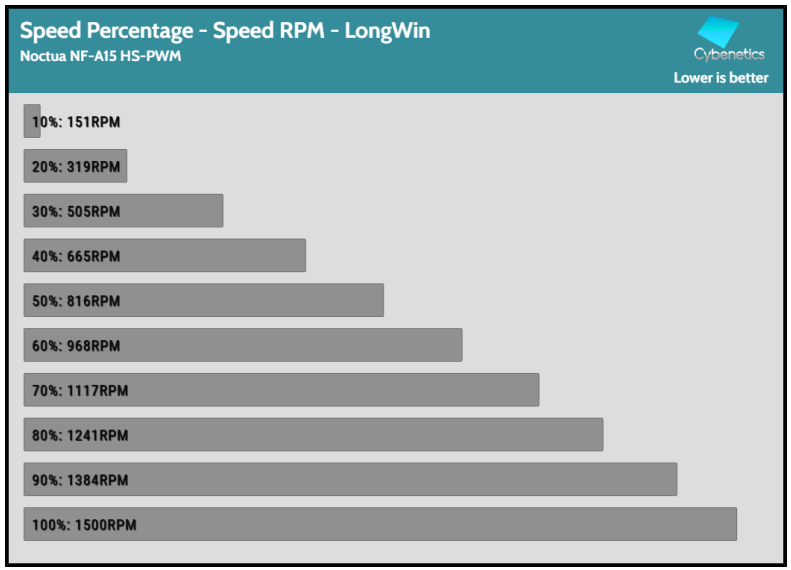
## PQ Chart 100%



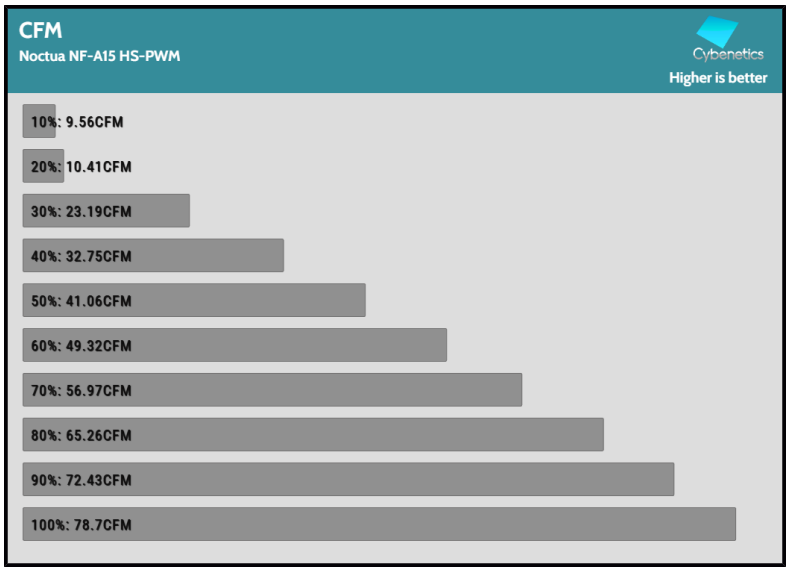

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.88 | 1192 | 0.130 | 1.56 |
| 11.16 | 1.55 | 1244 | 0.124 | 1.49 |
| 21.63 | 1.19 | 1312 | 0.116 | 1.39 |
| 33.34 | 0.86 | 1391 | 0.106 | 1.27 |
| 43.36 | 0.76 | 1404 | 0.105 | 1.26 |
| 55.13 | 0.56 | 1411 | 0.104 | 1.25 |
| 66.96 | 0.34 | 1447 | 0.100 | 1.20 |
| 78.71 | 0.03 | 1500 | 0.095 | 1.14 |

## SECTION F: General Performance

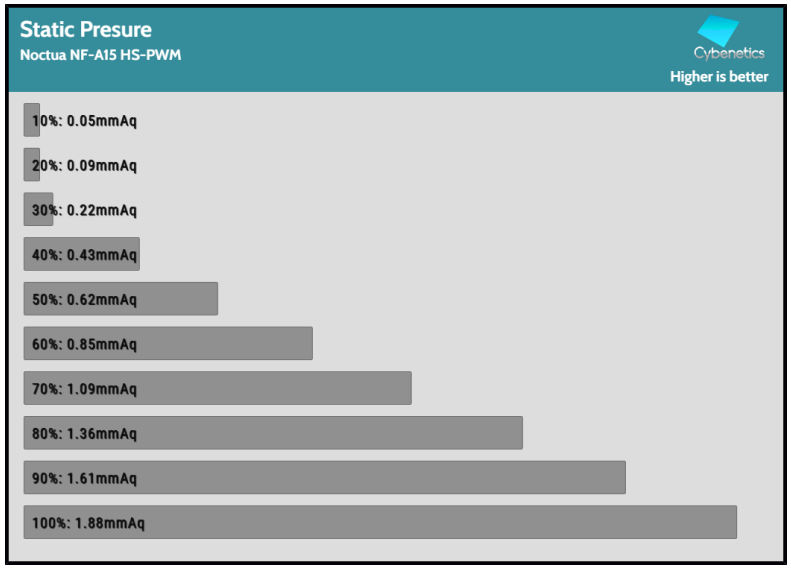
### Fan Percentage RPM LongWin



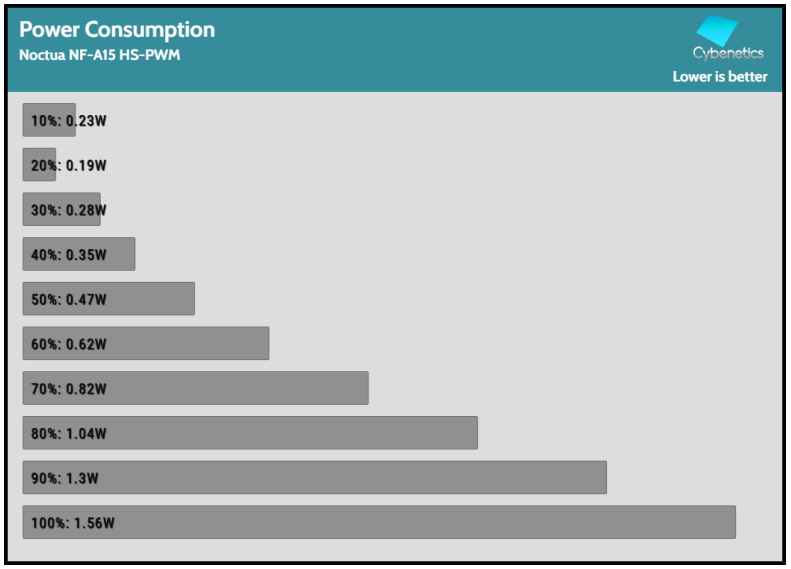

### Fan Percentage CFM



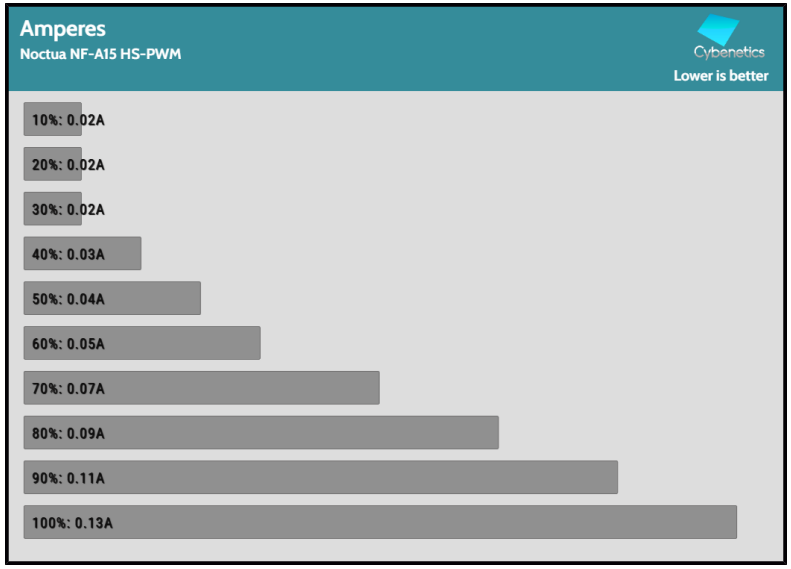

### Fan Percentage Pressure



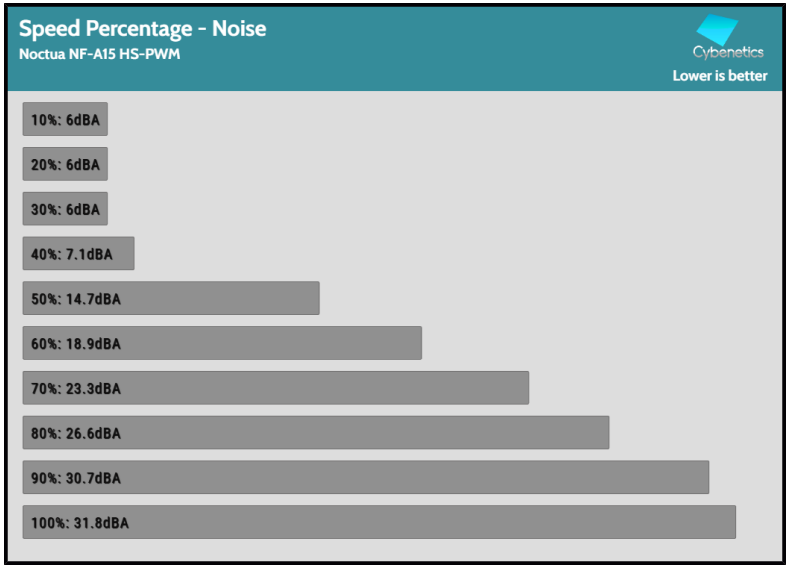

### Fan Percentage Power



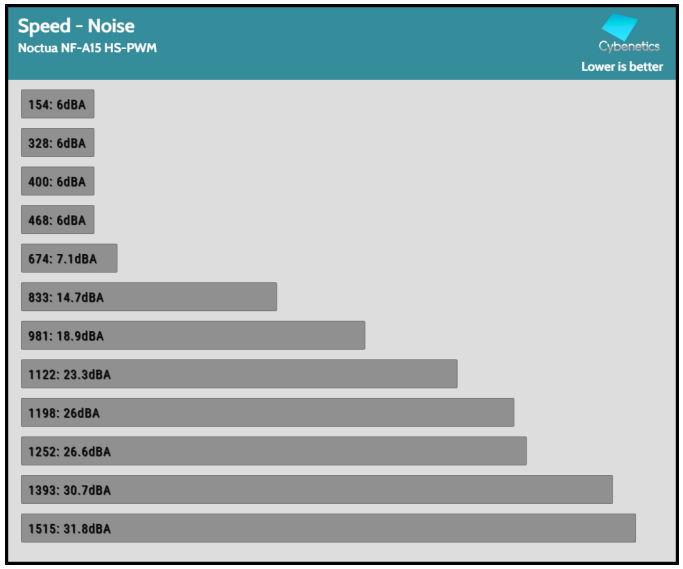
## Fan Percentage Amps




## Fan Percentage Noise




## Fan Speed Noise




## Fan Noise Speed



## SECTION G: Uncertainty

**Fan Performance Uncertainty Estimation**

### General Statement

Measurement uncertainty associated with the reported results was evaluated and estimated in accordance with JCGM 100:2008 (Guide to the Expression of Uncertainty in Measurement — GUM) and ISO/IEC 17025:2017, Clauses 7.6 and 7.2.

The uncertainty budget accounts for all significant identified contributors arising from the measurement process, instrumentation, test conditions, and operator interaction.

The reported expanded uncertainty U is obtained by multiplying the combined standard uncertainty uc by a coverage factor k = 2, corresponding to a confidence level of approximately 95 %, assuming a normal probability distribution.

Unless otherwise stated, the reported uncertainty applies only to the specific measurements performed and does not include long-term drift, aging effects, or future environmental changes.

### Expanded Measurement Uncertainty by Measurement Type

| Measurement | Expanded Uncertainty U (k=2, norm) |
|---|---|
| Fan Air Flow | ±1.23176 % of reading (k=2) — e.g. ±3.69 CFM at 25 CFM, ±4.29 at 92 CFM, ±7.15 at 250 CFM |
| Fan Static Pressure | ±0.6727 Pa |

Air flow uncertainty is relative to the reading: $U(Q) = 2 \cdot \sqrt{[(1.8200)^2 + (0.0123176 \cdot Q)^2]}$ CFM, valid over the declared measuring range 2.4 – 250 CFM.

The reported static pressure uncertainty applies over the 0 – 20 mmAq (0 – 196.1 Pa) measuring range of the Long Win LW-9266 apparatus. The apparatus can be extended to 100 mmAq (981 Pa) with the high static pressure throttle device; the uncertainty of that extended range has not been separately verified and the value stated above does not apply to it.





## 1 NF-A15 HS-PWM

Front

Rear

本测试报告中包含的所有数据和图表均可在以下条件下由任何人使用：使用过程需提及测试结果由 Cybenetics提供。
在任何情况下都应提供原始测试结果文档的网站链接

Cybenetics 提供自愿性认证计划：电源方面有 ETA（效率）、 LAMBDA（噪声）与 SAFE（安全与正确运行）；散热产品方面有 DELTA（机箱隔音）与 PHI（风扇风量与静压）

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