# 1 NF-A15 HS-PWM

Serial Number

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

| | |
|---|---|
| Test 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 |
| Testing Methodology | Cybenetics Phi Fan Performance Standard |

## SECTION B: Fan Testing Instrument Technical Specifications

| | |
|---|---|
| Manufacturer | Long Win Science & Technology Corporation |
| Model 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 |

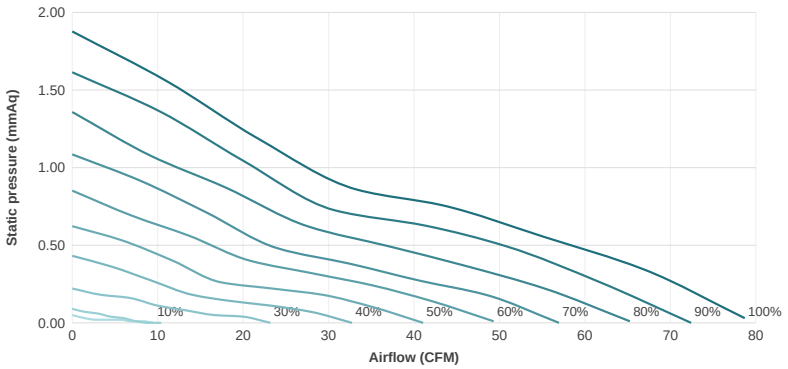
## SECTION D: Information about DUT

| | |
|---|---|
| Product Identification Details | |
| Brand | 1 |
| Model | NF-A15 HS-PWM |
| Serial Number | - |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Bearing | SSO2 |
| Connector | PWM |
| Cable length (mm) | 200 |
| Daisy-chain | None |
| RGB Connector | None |
| RGB Daisy-chain | None |
| Cybenetics Measurements | |
| Max Speed (RPM) | 1515 |
| Max Airflow (CFM) | 78.70 |
| Max Static Pressure (mmAq) | 1.88 |
| Max Fan Noise 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 Testing Information | |
| Lab ID | NC15000121 |
| Date of receipt | Jun 5, 2024 |
| Testing 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

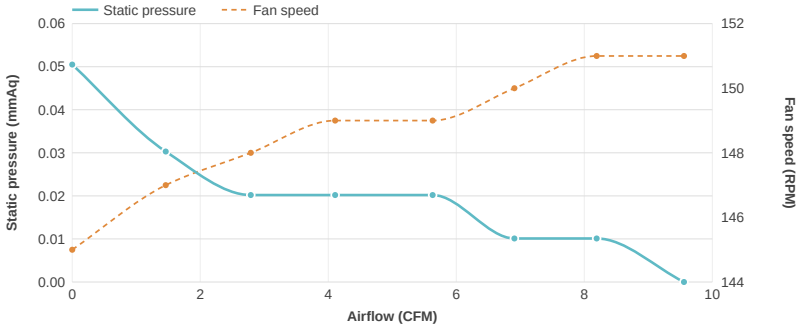
Static pressure against airflow, one curve per speed step




| 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 |

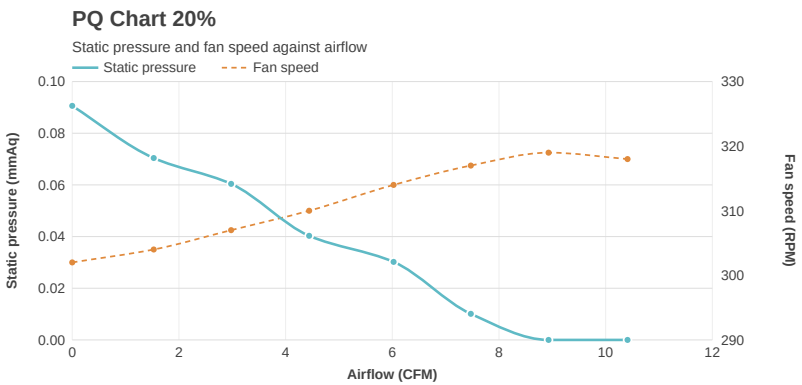
### PQ Chart 10%

Static pressure and fan speed against airflow



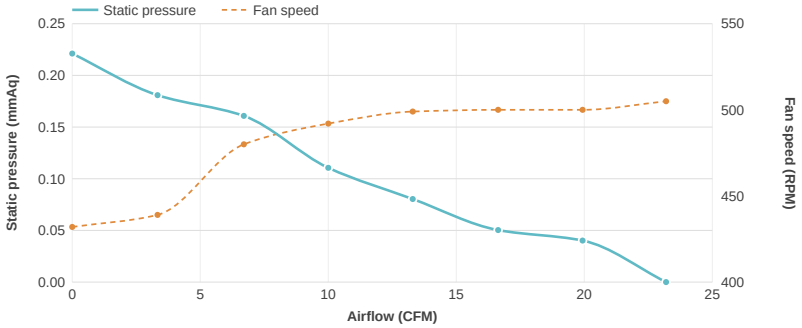

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.05 | 145 | 0.019 | 0.23 |
| 1.46 | 0.03 | 147 | 0.019 | 0.23 |
| 2.79 | 0.02 | 148 | 0.019 | 0.23 |
| 4.11 | 0.02 | 149 | 0.019 | 0.23 |
| 5.63 | 0.02 | 149 | 0.018 | 0.22 |
| 6.91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



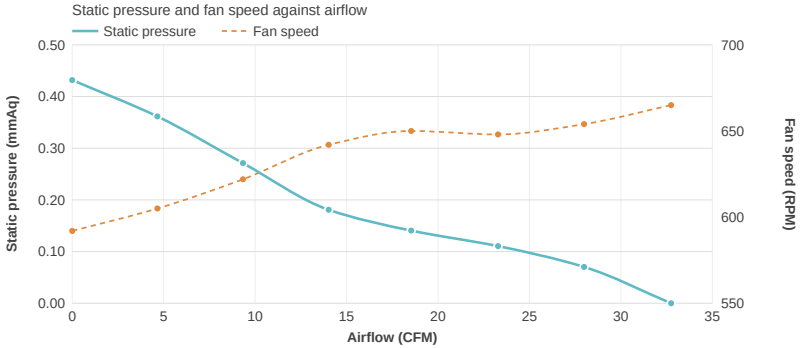

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.09 | 302 | 0.016 | 0.19 |
| 1.53 | 0.07 | 304 | 0.016 | 0.19 |
| 2.98 | 0.06 | 307 | 0.016 | 0.19 |
| 4.44 | 0.04 | 310 | 0.016 | 0.19 |
| 6.03 | 0.03 | 314 | 0.015 | 0.18 |
| 7.47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



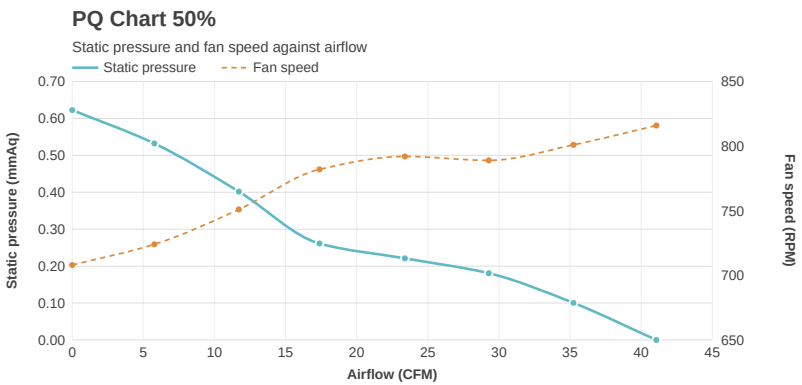

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.22 | 432 | 0.023 | 0.28 |
| 3.33 | 0.18 | 439 | 0.022 | 0.26 |
| 6.70 | 0.16 | 480 | 0.020 | 0.24 |
| 10.00 | 0.11 | 492 | 0.020 | 0.24 |
| 13.30 | 0.08 | 499 | 0.020 | 0.24 |
| 16.63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



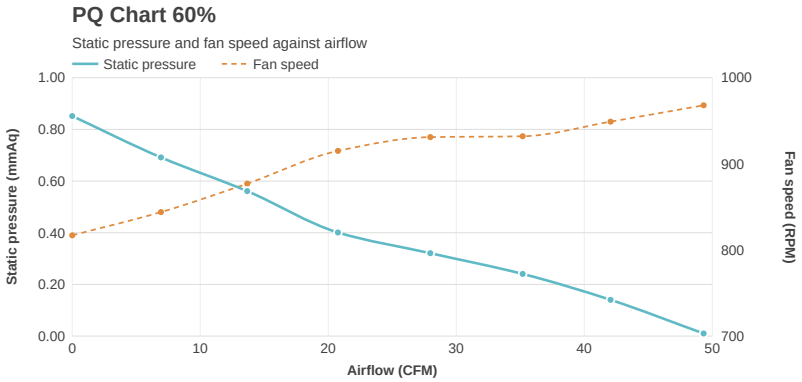

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.43 | 592 | 0.029 | 0.35 |
| 4.66 | 0.36 | 605 | 0.028 | 0.34 |
| 9.33 | 0.27 | 622 | 0.027 | 0.32 |
| 14.02 | 0.18 | 642 | 0.026 | 0.31 |
| 18.53 | 0.14 | 650 | 0.025 | 0.30 |
| 23.28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



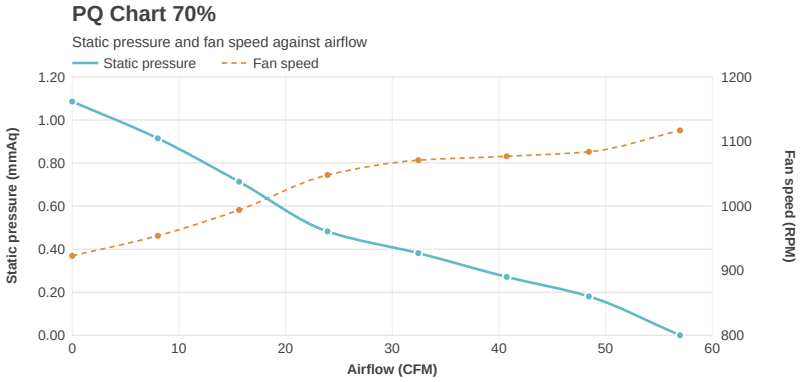

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.62 | 708 | 0.039 | 0.47 |
| 5.77 | 0.53 | 724 | 0.038 | 0.46 |
| 11.72 | 0.40 | 751 | 0.036 | 0.43 |
| 17.38 | 0.26 | 782 | 0.034 | 0.41 |
| 23.38 | 0.22 | 792 | 0.034 | 0.41 |
| 29.28 | 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%



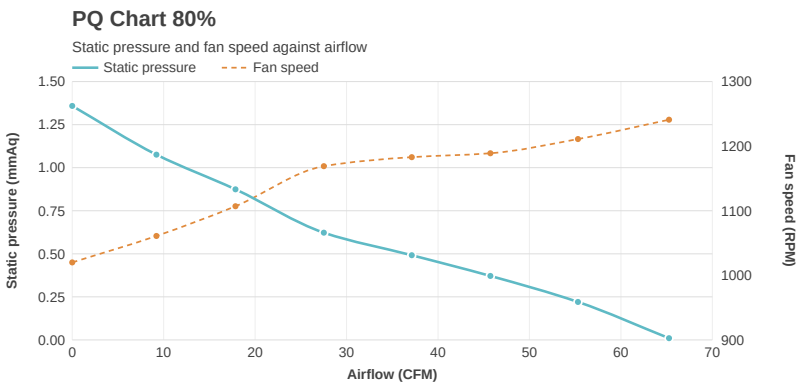

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.85 | 817 | 0.052 | 0.62 |
| 6.93 | 0.69 | 844 | 0.050 | 0.60 |
| 13.67 | 0.56 | 877 | 0.047 | 0.56 |
| 20.75 | 0.40 | 915 | 0.044 | 0.53 |
| 27.97 | 0.32 | 931 | 0.044 | 0.53 |
| 35.18 | 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%



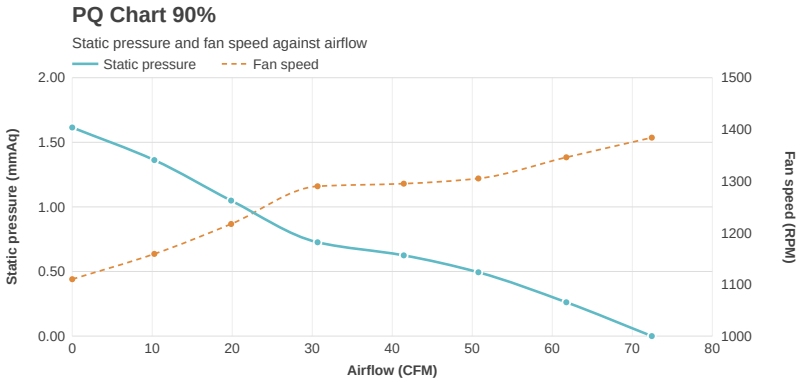

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.09 | 923 | 0.068 | 0.82 |
| 8.02 | 0.91 | 954 | 0.065 | 0.78 |
| 15.64 | 0.71 | 994 | 0.062 | 0.74 |
| 23.94 | 0.48 | 1048 | 0.057 | 0.68 |
| 32.44 | 0.38 | 1071 | 0.055 | 0.66 |
| 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%



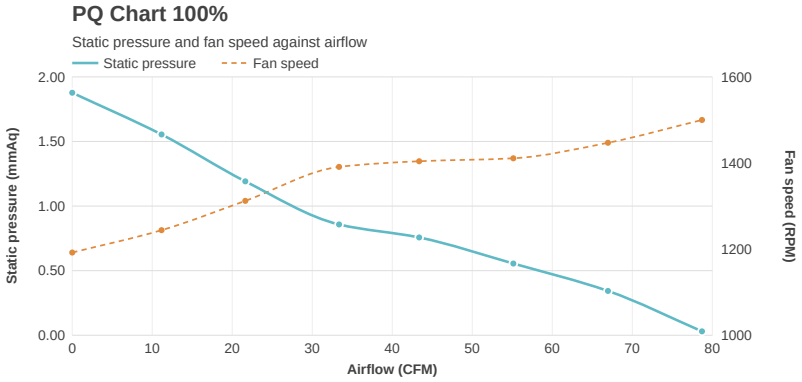

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.36 | 1020 | 0.087 | 1.04 |
| 9.21 | 1.08 | 1061 | 0.083 | 1.00 |
| 17.85 | 0.87 | 1107 | 0.079 | 0.95 |
| 27.51 | 0.62 | 1169 | 0.073 | 0.88 |
| 37.13 | 0.49 | 1183 | 0.071 | 0.85 |
| 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 |

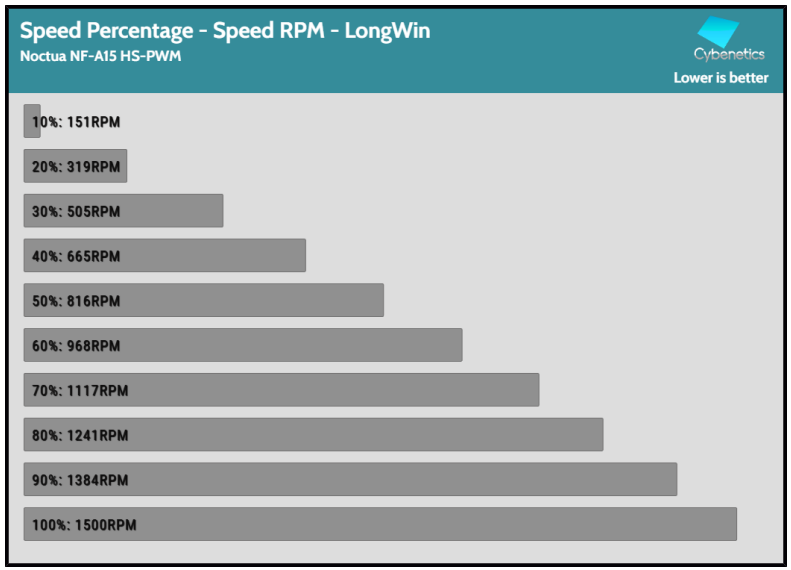
## PQ Chart 100%



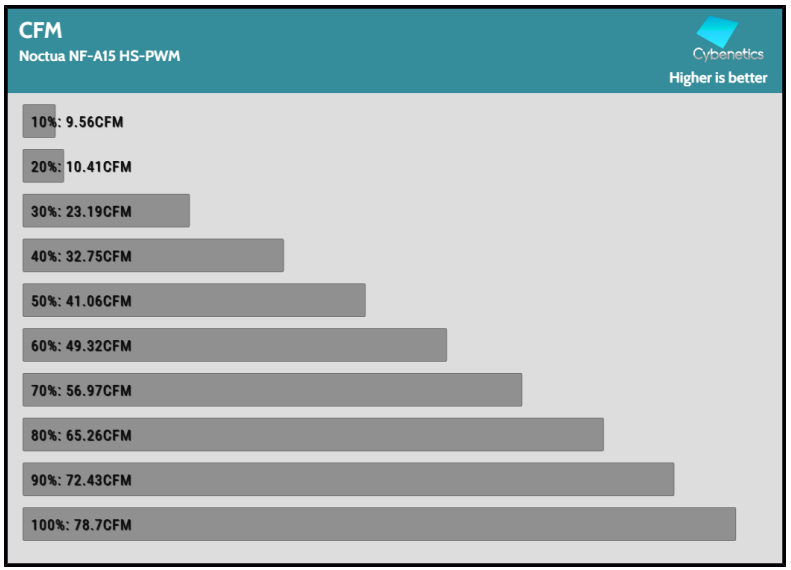

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.88 | 1192 | 0.130 | 1.56 |
| 11.16 | 1.55 | 1244 | 0.124 | 1.49 |
| 21.63 | 1.19 | 1312 | 0.116 | 1.39 |
| 33.34 | 0.86 | 1391 | 0.106 | 1.27 |
| 43.36 | 0.76 | 1404 | 0.105 | 1.26 |
| 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

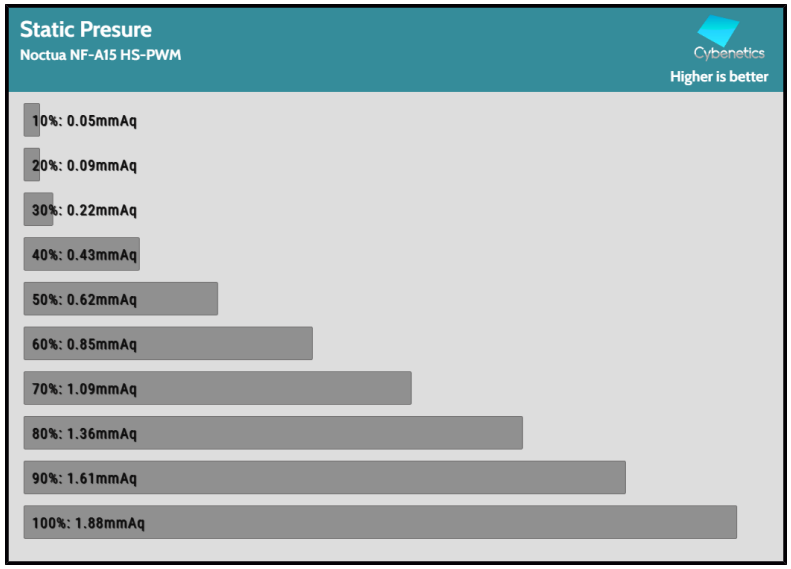
### Fan Percentage RPM LongWin



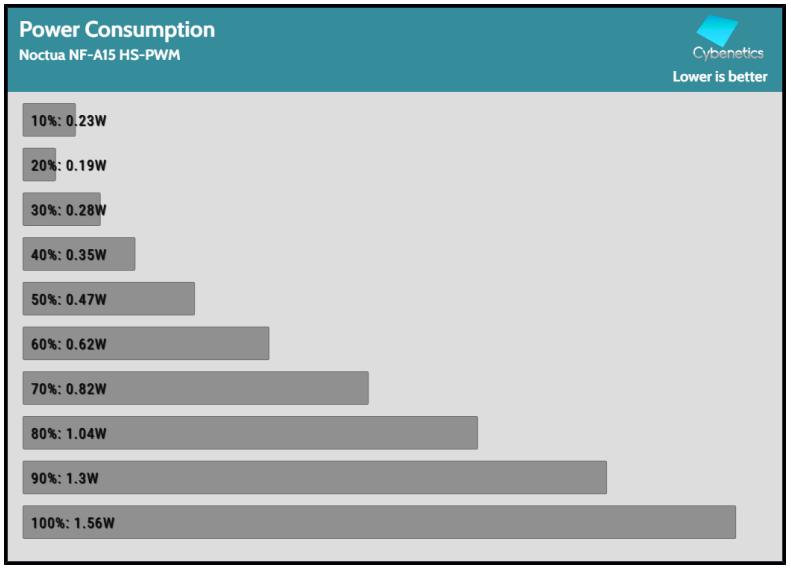

### Fan Percentage CFM



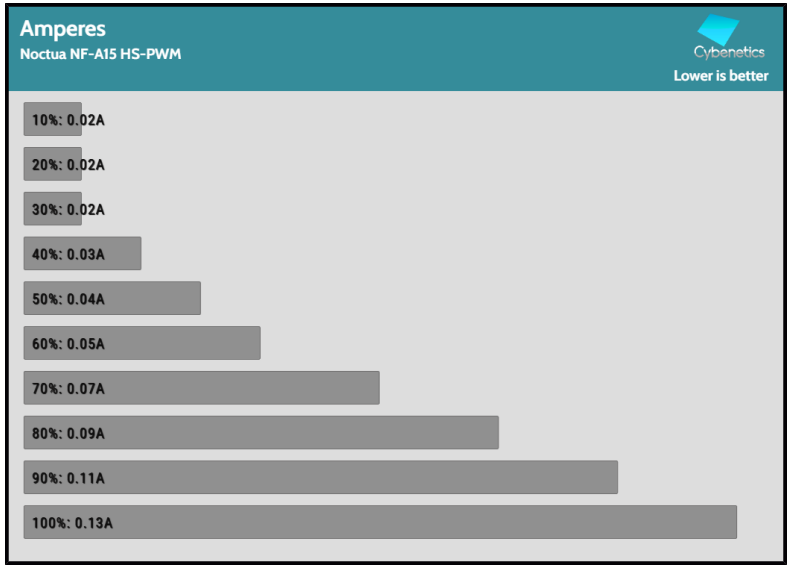

### Fan Percentage Pressure



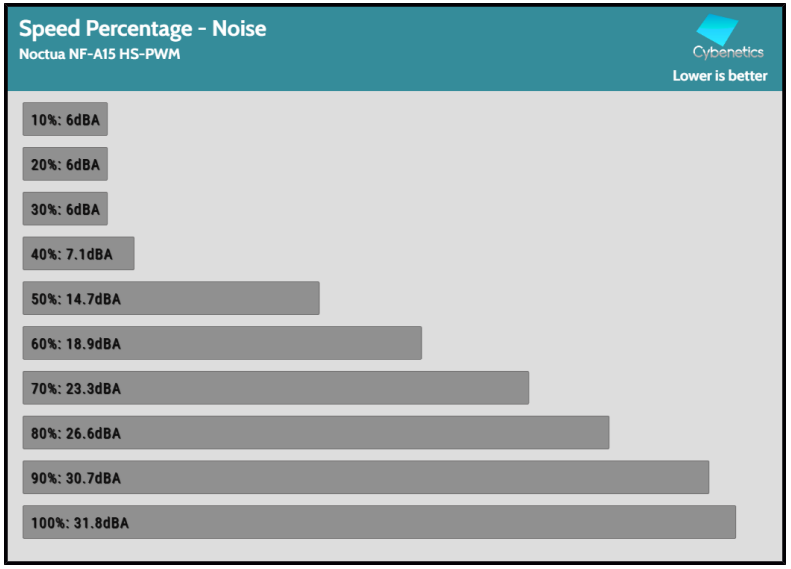

### Fan Percentage Power



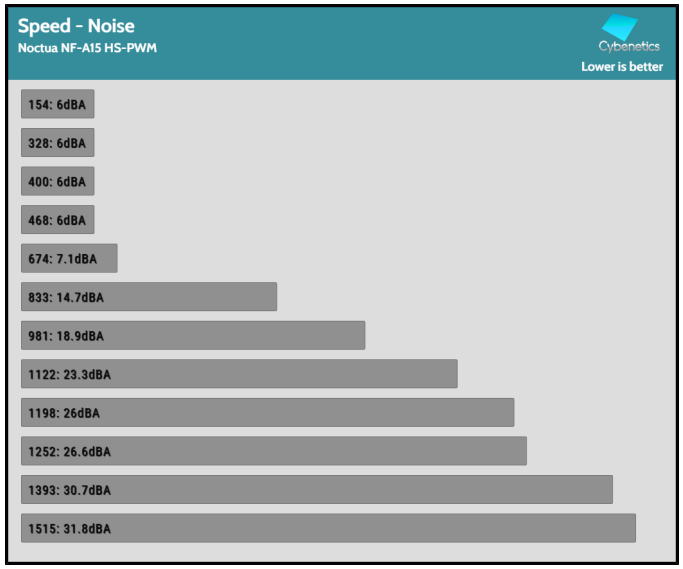
## Fan Percentage Amps




## 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

Cybenetics bietet freiwillige Zertifizierungsprogramme für Netzteile – ETA für Effizienz, LAMBDA für Lautstärke und SAFE für Sicherheit und korrekten Betrieb – sowie für Kühlprodukte mit DELTA für die Schalldämmung von Gehäusen und PHI für Luftstrom und statischen Druck von Lüftern

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