# 1 Neptune AN140

Serial Number

Lab ID  IW14000050

Certification ID  FN25050

Test Result Report ID: 25FN50A

Certificate Issue Date: Oct 5, 2023

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

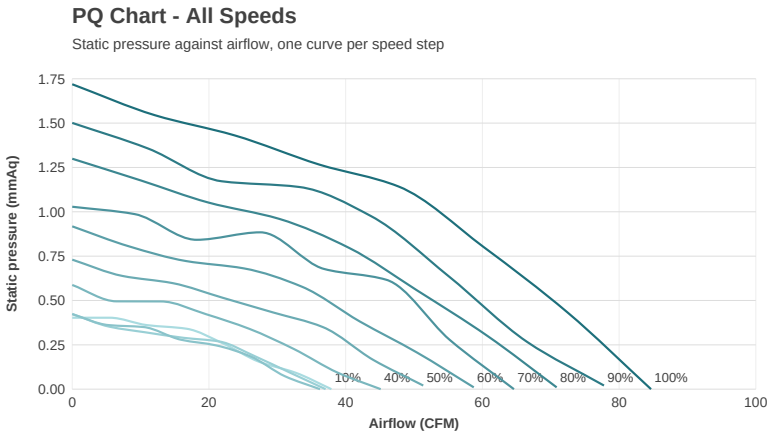
| | | |
|---|---|---|
| Pressure at 25 dB(A) | P (mmAq) | 1.52 |
| Airflow at 25 dB(A) | Q (CFM) | 66.60 |

## SECTION D: Information about DUT

| | |
|---|---|
| Product Identification Details | |
| Brand | 1 |
| Model | Neptune AN140 |
| Serial Number | - |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Bearing | Sleeve |
| Connector | PWM |

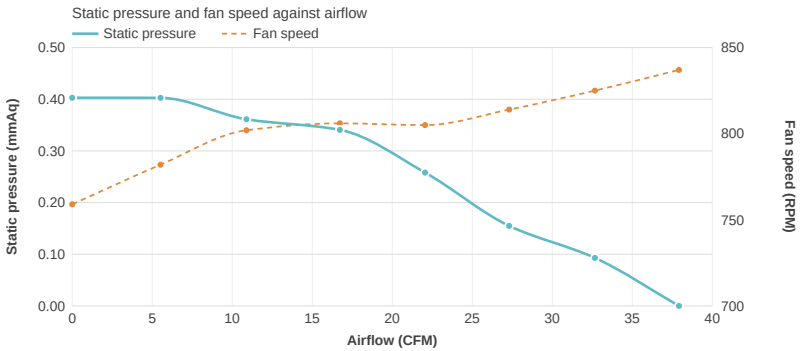
| | |
|---|---|
| Cable length (mm) | 150 |
| Daisy-chain | Cable |
| RGB Connector | None |
| RGB Daisy-chain | None |
| Cybenetics Measurements | |
| Max Speed (RPM) | 1790 |
| Max Airflow (CFM) | 84.67 |
| Max Static Pressure (mmAq) | 1.67 |
| Max Fan Noise Level (dBA) | 32.40 |
| Fan Max Current (A) | 0.20 |
| Fan Weight (gr) | 207 |
| Dimensions (W x H x D) | 140mm x 140mm x 25mm |
| Cybenetics Testing Information | |
| Lab ID | IW14000050 |
| Date of receipt | - |
| Testing Date | - |
| Report Issued Date | Oct 5, 2023 |
| Engineer Name | Georgios Theodoros Sarimpalas |

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



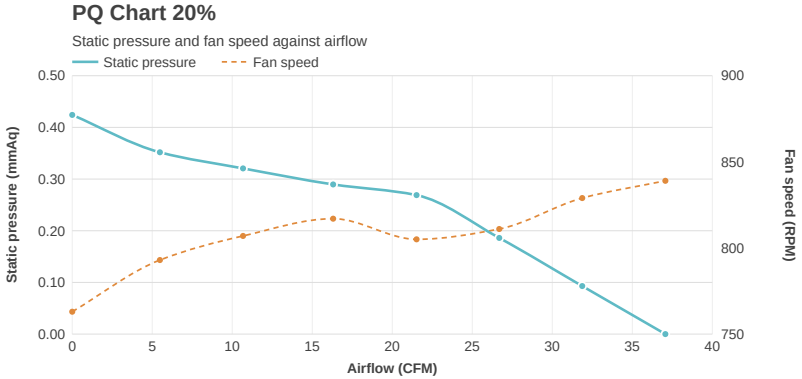

| Speed Setting | Max Airflow (CFM) | Max Static Pressure (mmAq) | Fan Speed (RPM) | Max Power (W) |
|---|---|---|---|---|
| 10% | 37.92 | 0.40 | 759 - 837 | 0.50 |
| 20% | 37.07 | 0.42 | 763 - 839 | 0.50 |
| 30% | 36.25 | 0.42 | 764 - 842 | 0.50 |
| 40% | 45.13 | 0.59 | 900 - 1004 | 0.68 |
| 50% | 51.35 | 0.73 | 1026 - 1149 | 0.86 |
| 60% | 58.74 | 0.92 | 1138 - 1284 | 1.08 |
| 70% | 64.62 | 1.03 | 1234 - 1406 | 1.34 |
| 80% | 70.86 | 1.30 | 1356 - 1528 | 1.63 |
| 90% | 77.79 | 1.50 | 1461 - 1651 | 1.94 |
| 100% | 84.67 | 1.72 | 1564 - 1813 | 2.36 |

## PQ Chart 10%



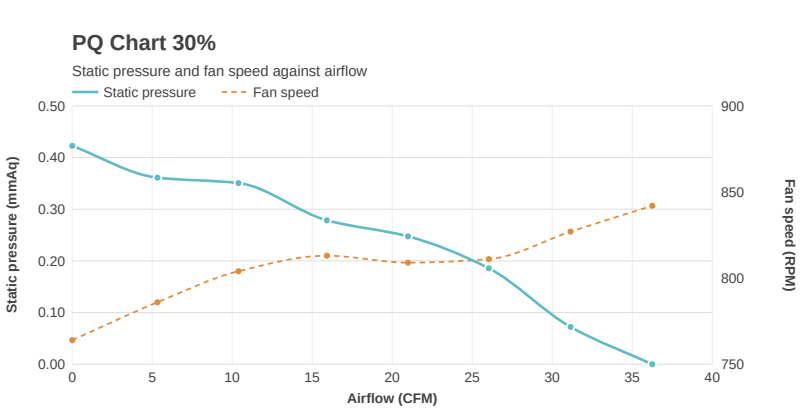

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.40 | 759 | 0.042 | 0.50 |
| 5.51 | 0.40 | 782 | 0.041 | 0.49 |
| 10.89 | 0.36 | 802 | 0.040 | 0.48 |
| 16.72 | 0.34 | 806 | 0.040 | 0.48 |
| 22.05 | 0.26 | 805 | 0.040 | 0.48 |
| 27.31 | 0.15 | 814 | 0.040 | 0.48 |
| 32.66 | 0.09 | 825 | 0.039 | 0.47 |
| 37.92 | 0.00 | 837 | 0.039 | 0.47 |

## PQ Chart 20%



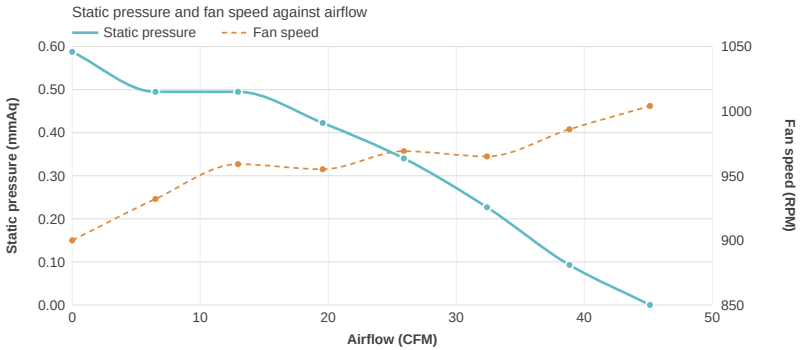

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.42 | 763 | 0.042 | 0.50 |
| 5.48 | 0.35 | 793 | 0.041 | 0.49 |
| 10.67 | 0.32 | 807 | 0.040 | 0.48 |
| 16.31 | 0.29 | 817 | 0.040 | 0.48 |
| 21.51 | 0.27 | 805 | 0.040 | 0.48 |
| 26.69 | 0.19 | 811 | 0.040 | 0.48 |
| 31.87 | 0.09 | 829 | 0.039 | 0.47 |
| 37.07 | -0.01 | 839 | 0.039 | 0.47 |

## PQ Chart 30%



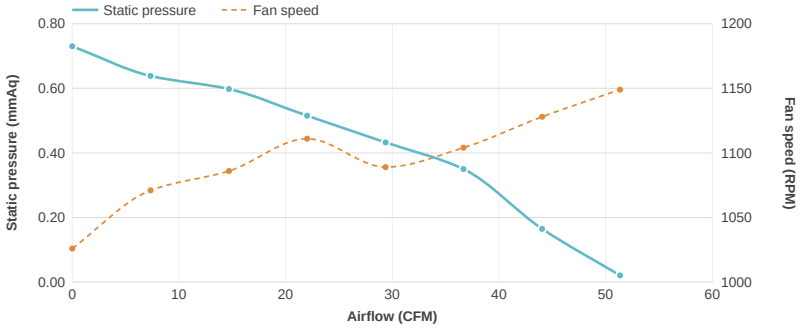

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.42 | 764 | 0.042 | 0.50 |
| 5.33 | 0.36 | 786 | 0.042 | 0.50 |
| 10.39 | 0.35 | 804 | 0.041 | 0.49 |
| 15.91 | 0.28 | 813 | 0.040 | 0.48 |
| 20.98 | 0.25 | 809 | 0.041 | 0.49 |
| 26.03 | 0.19 | 811 | 0.041 | 0.49 |
| 31.14 | 0.07 | 827 | 0.040 | 0.48 |
| 36.25 | 0.00 | 842 | 0.039 | 0.47 |

## PQ Chart 40%



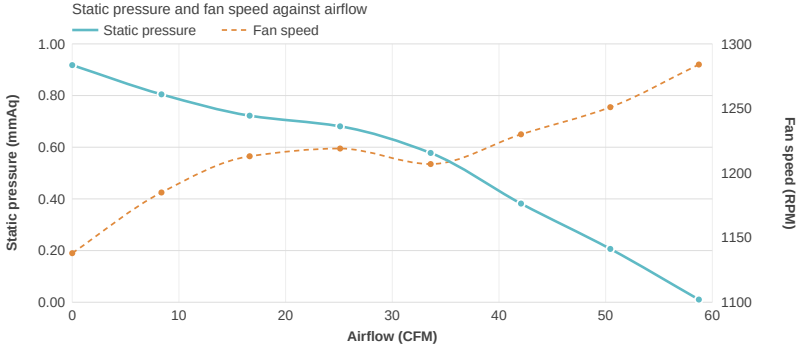

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.59 | 900 | 0.057 | 0.68 |
| 6.50 | 0.50 | 932 | 0.055 | 0.66 |
| 12.95 | 0.49 | 959 | 0.054 | 0.65 |
| 19.56 | 0.42 | 955 | 0.054 | 0.65 |
| 25.90 | 0.34 | 969 | 0.053 | 0.64 |
| 32.40 | 0.23 | 965 | 0.053 | 0.64 |
| 38.84 | 0.09 | 986 | 0.052 | 0.62 |
| 45.13 | -0.02 | 1004 | 0.051 | 0.61 |

## PQ Chart 50%



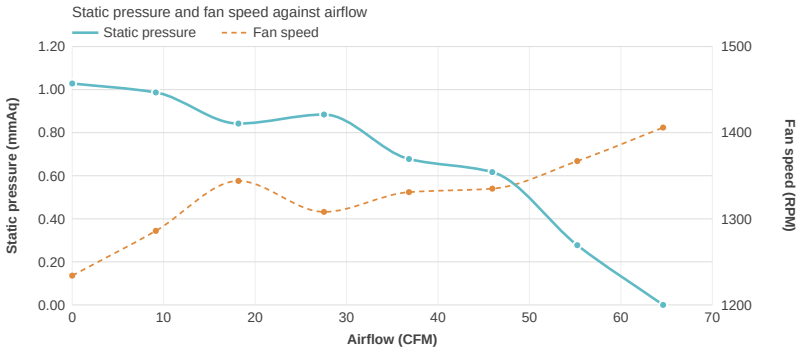

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.73 | 1026 | 0.072 | 0.86 |
| 7.34 | 0.64 | 1071 | 0.069 | 0.83 |
| 14.69 | 0.60 | 1086 | 0.069 | 0.83 |
| 22.02 | 0.52 | 1111 | 0.067 | 0.80 |
| 29.37 | 0.43 | 1089 | 0.069 | 0.83 |
| 36.67 | 0.35 | 1104 | 0.068 | 0.82 |
| 44.05 | 0.16 | 1128 | 0.066 | 0.79 |
| 51.35 | 0.02 | 1149 | 0.066 | 0.79 |

## PQ Chart 60%



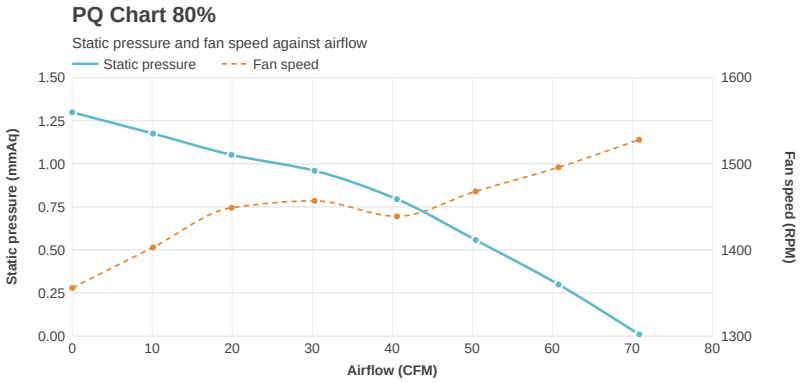

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.92 | 1138 | 0.090 | 1.08 |
| 8.36 | 0.80 | 1185 | 0.086 | 1.03 |
| 16.63 | 0.72 | 1213 | 0.085 | 1.02 |
| 25.11 | 0.68 | 1219 | 0.085 | 1.02 |
| 33.60 | 0.58 | 1207 | 0.085 | 1.02 |
| 42.07 | 0.38 | 1230 | 0.085 | 1.02 |
| 50.44 | 0.21 | 1251 | 0.084 | 1.01 |
| 58.74 | 0.01 | 1284 | 0.083 | 1.00 |

## PQ Chart 70%



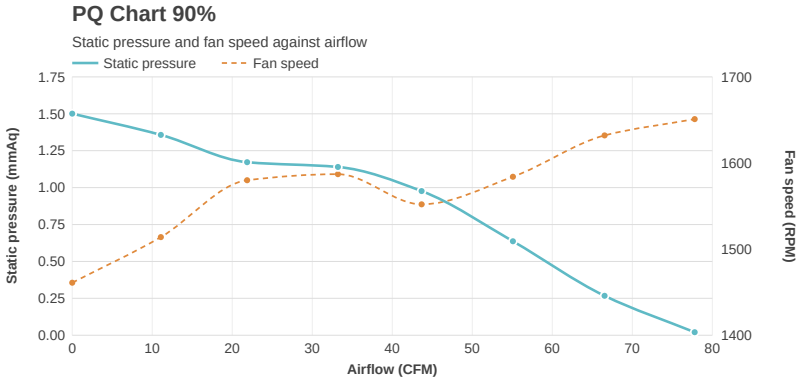

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.03 | 1234 | 0.112 | 1.34 |
| 9.14 | 0.99 | 1286 | 0.110 | 1.32 |
| 18.18 | 0.84 | 1344 | 0.106 | 1.27 |
| 27.53 | 0.88 | 1308 | 0.109 | 1.31 |
| 36.82 | 0.68 | 1331 | 0.107 | 1.28 |
| 45.94 | 0.62 | 1335 | 0.107 | 1.28 |
| 55.23 | 0.28 | 1367 | 0.104 | 1.25 |
| 64.62 | -0.01 | 1406 | 0.101 | 1.21 |

## PQ Chart 80%

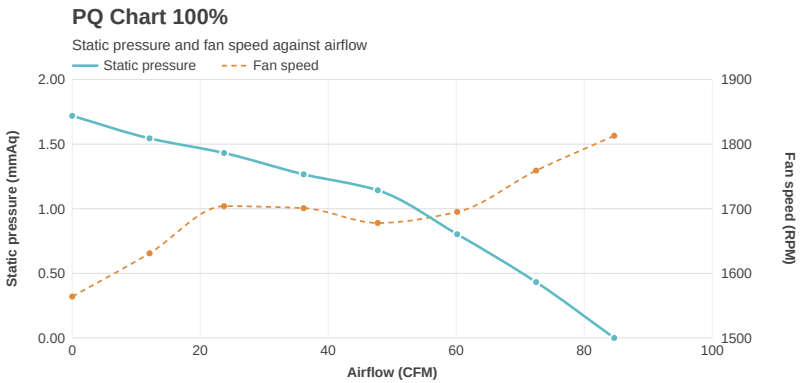



| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.30 | 1356 | 0.136 | 1.63 |
| 10.10 | 1.18 | 1403 | 0.131 | 1.57 |
| 19.90 | 1.05 | 1449 | 0.128 | 1.54 |
| 30.29 | 0.96 | 1457 | 0.128 | 1.54 |
| 40.58 | 0.80 | 1439 | 0.129 | 1.55 |
| 50.41 | 0.56 | 1468 | 0.126 | 1.51 |
| 60.78 | 0.30 | 1496 | 0.124 | 1.49 |
| 70.86 | 0.01 | 1528 | 0.123 | 1.48 |

## PQ Chart 90%



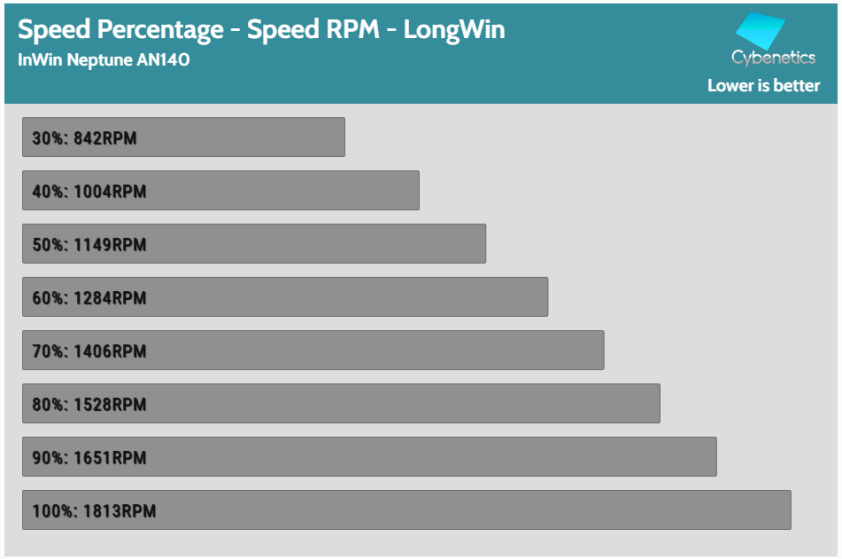

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.50 | 1461 | 0.162 | 1.94 |
| 11.08 | 1.36 | 1514 | 0.158 | 1.90 |
| 21.86 | 1.17 | 1580 | 0.155 | 1.86 |
| 33.21 | 1.14 | 1587 | 0.155 | 1.86 |
| 43.67 | 0.98 | 1552 | 0.155 | 1.86 |
| 55.07 | 0.64 | 1584 | 0.156 | 1.87 |
| 66.53 | 0.27 | 1632 | 0.153 | 1.84 |
| 77.79 | 0.02 | 1651 | 0.151 | 1.81 |



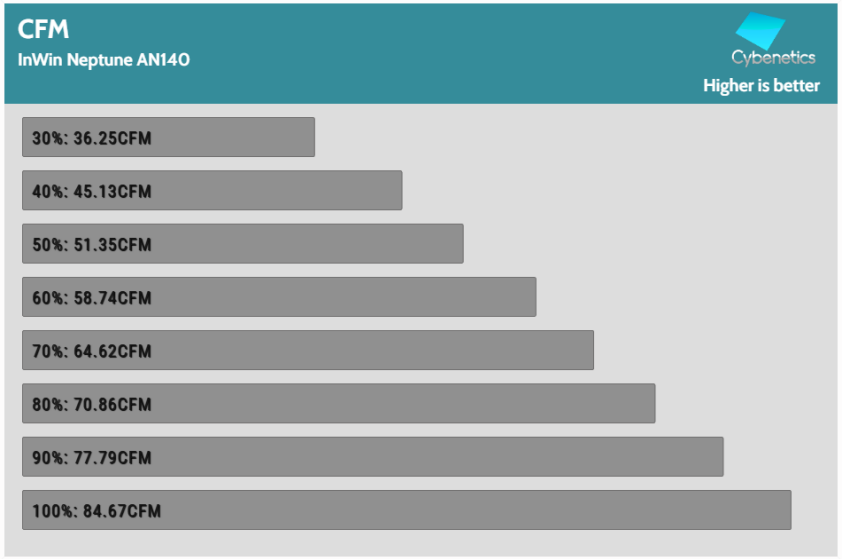

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.72 | 1564 | 0.197 | 2.36 |
| 12.08 | 1.54 | 1631 | 0.195 | 2.34 |
| 23.72 | 1.43 | 1704 | 0.188 | 2.26 |
| 36.16 | 1.27 | 1701 | 0.188 | 2.26 |
| 47.73 | 1.14 | 1678 | 0.191 | 2.29 |
| 60.14 | 0.80 | 1695 | 0.190 | 2.28 |
| 72.47 | 0.43 | 1759 | 0.183 | 2.20 |
| 84.67 | -0.02 | 1813 | 0.180 | 2.16 |

## SECTION F: General Performance

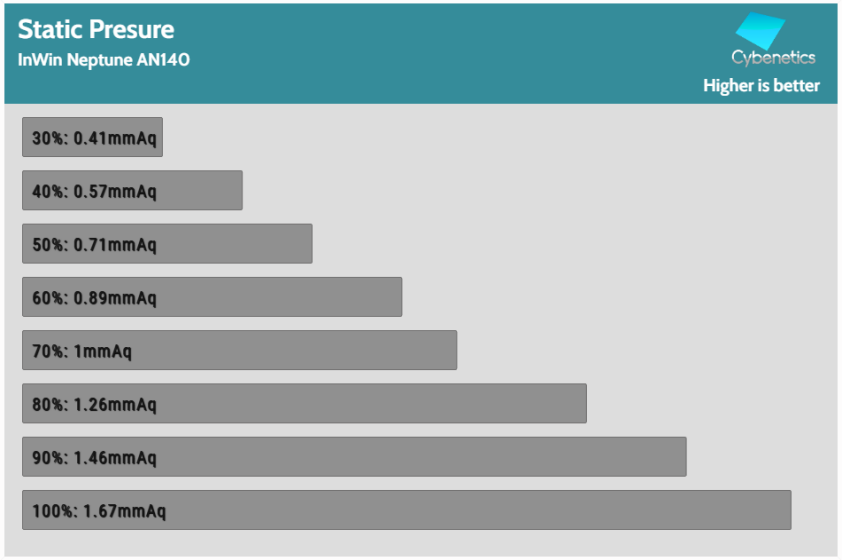
### Fan Percentage RPM LongWin



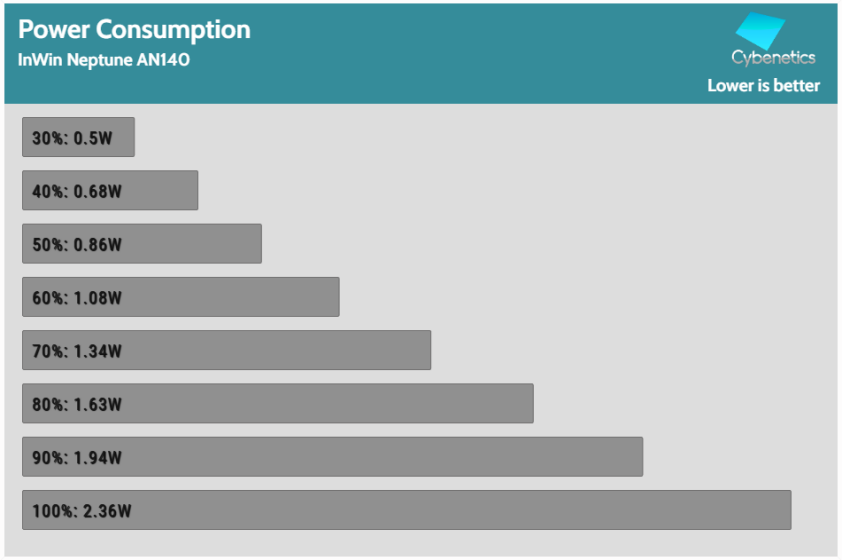

### Fan Percentage CFM



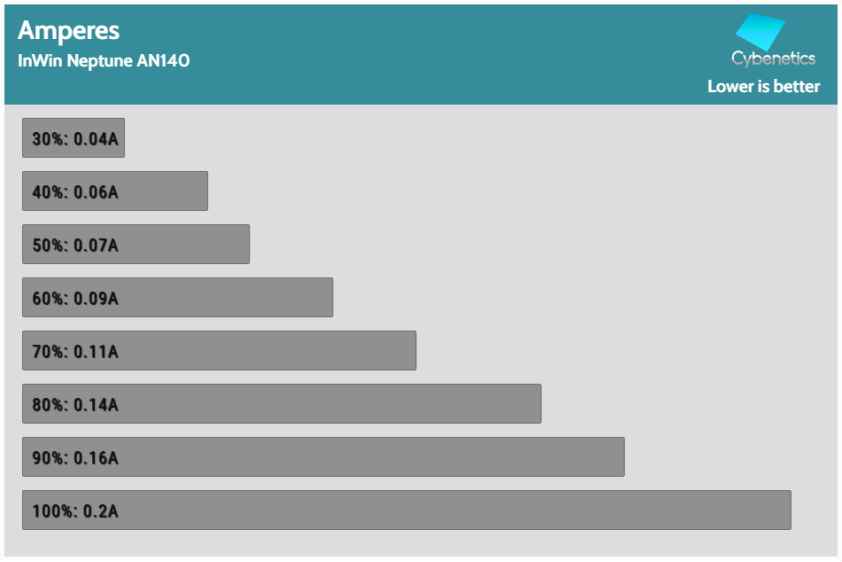
## Fan Percentage Pressure



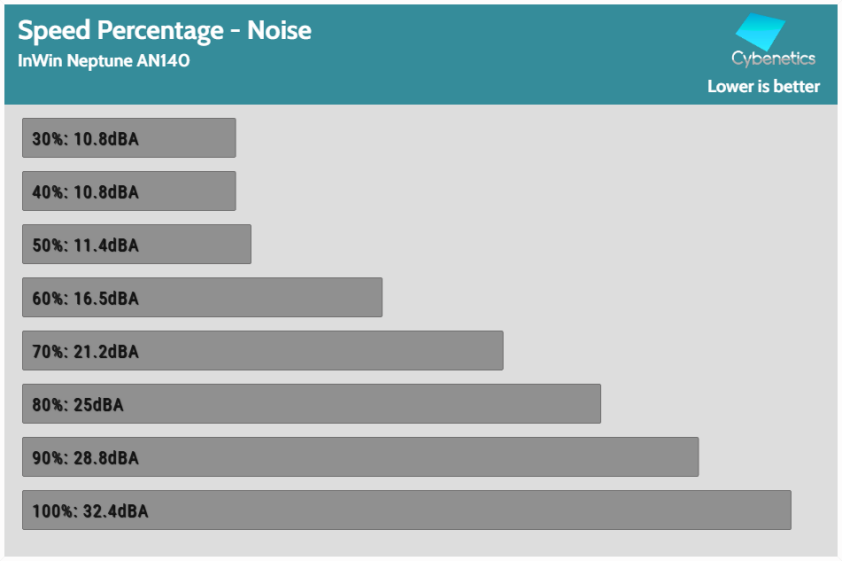

## Fan Percentage Power



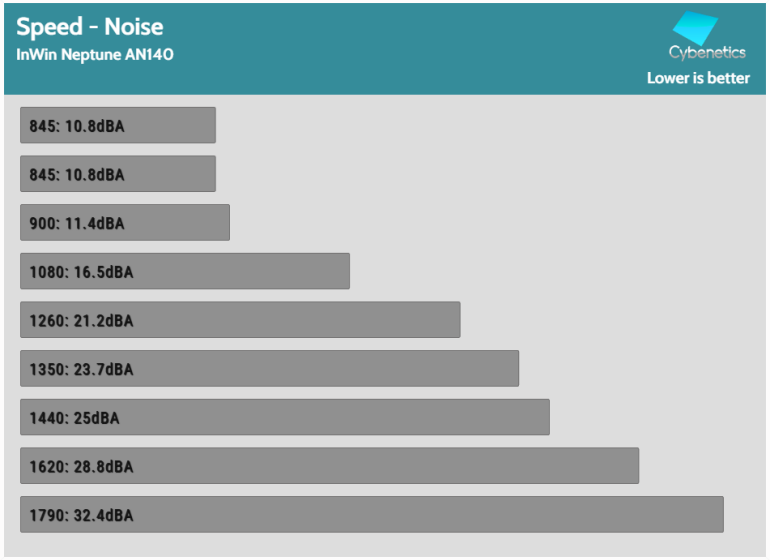

## Fan Percentage Amps




## 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 Neptune AN140



Front




Rear

All data and graphs included in this test report can be used by any individual on the following conditions:
› It should be mentioned that the test results are provided by Cybenetics
› The link to the original test results document should be provided in any case

Cybenetics runs voluntary certification programs for power supplies - ETA for efficiency, LAMBDA for noise and SAFE for safety and correct operation - and for cooling products, with DELTA for chassis soundproofing and PHI for fan airflow and static pressure. THETA rates cooler performance on AMD AM5 and Intel LGA1851 outside ISO 17065 and accreditation scope

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