# 1 APEX Stealth Metal Power 120mm

Serial Number

Lab ID AC12000068

Certification ID FN25068

Test Result Report ID: 25FN68A

Certificate Issue Date: Dec 8, 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) | 1.44 |
| Airflow at 25 dB(A) | Q (CFM) | 37.82 |

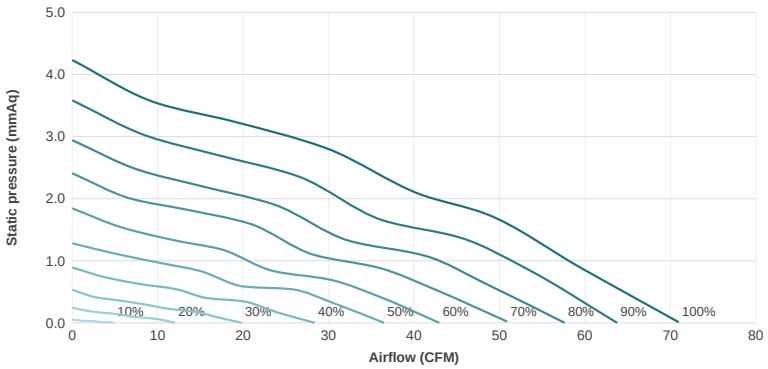
## SECTION D: Information about DUT

| | |
|---|---|
| Product Identification Details | |
| Brand | 1 |
| Model | APEX Stealth Metal Power 120mm |
| Serial Number | - |
| Product Specifications | |
| Manufacturer-Provided Information | |
| Bearing | Hydro Dynamic |
| Connector | PWM |
| Cable length (mm) | 30 |
| Daisy-chain | Cable |
| RGB Connector | None |
| RGB Daisy-chain | None |
| Cybenetics Measurements | |
| Max Speed (RPM) | 3030 |
| Max Airflow (CFM) | 70.98 |
| Max Static Pressure (mmAq) | 4.23 |
| Max Fan Noise Level (dBA) | 40.10 |
| Fan Max Current (A) | 0.28 |
| Fan Weight (gr) | 335 |
| Dimensions (W x H x D) | 120mm x 120mm x 26mm |
| Cybenetics Testing Information | |
| Lab ID | AC12000068 |
| Date of receipt | - |
| Testing Date | - |
| Report Issued Date | Dec 8, 2023 |
| Engineer Name | Georgios Theodoros Sarimpalas |

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

### PQ Chart - All Speeds

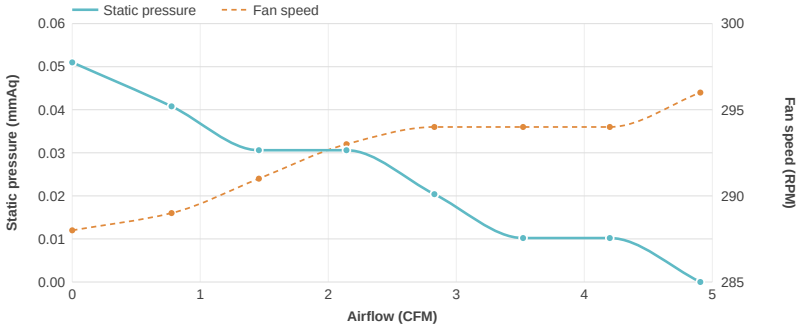
Static pressure against airflow, one curve per speed step




| Speed Setting | Max Airflow (CFM) | Max Static Pressure (mmAq) | Fan Speed (RPM) | Max Power (W) |
|---|---|---|---|---|
| 10% | 4.91 | 0.05 | 288 - 296 | 0.01 |
| 20% | 12.04 | 0.25 | 625 - 654 | 0.12 |
| 30% | 19.84 | 0.53 | 914 - 979 | 0.26 |
| 40% | 28.38 | 0.89 | 1213 - 1319 | 0.48 |
| 50% | 36.49 | 1.28 | 1497 - 1638 | 0.76 |
| 60% | 42.95 | 1.85 | 1732 - 1947 | 1.12 |
| 70% | 50.90 | 2.41 | 1979 - 2252 | 1.57 |
| 80% | 57.63 | 2.94 | 2194 - 2519 | 2.04 |
| 90% | 63.76 | 3.58 | 2415 - 2811 | 2.65 |
| 100% | 70.98 | 4.23 | 2623 - 3091 | 3.36 |

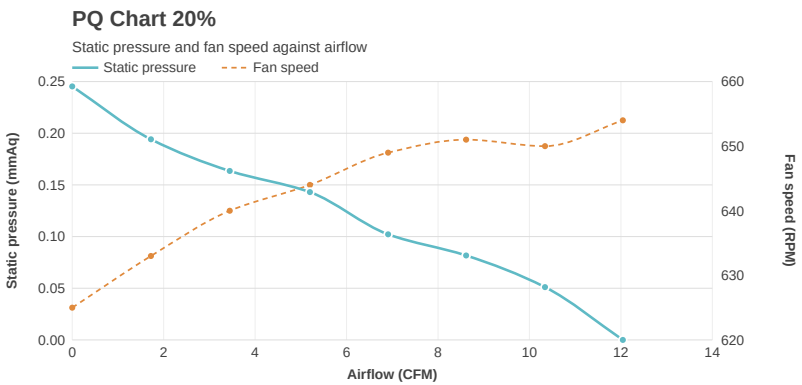
### PQ Chart 10%

Static pressure and fan speed against airflow



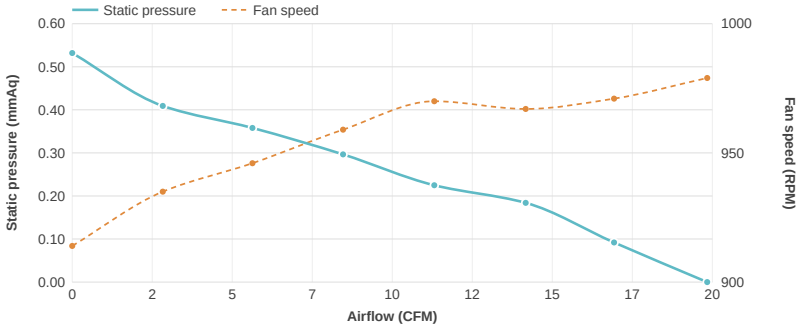

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.05 | 288 | 0.001 | 0.01 |
| 0.78 | 0.04 | 289 | 0.001 | 0.01 |
| 1.46 | 0.03 | 291 | 0.000 | 0.00 |
| 2.14 | 0.03 | 293 | 0.000 | 0.00 |
| 2.83 | 0.02 | 294 | 0.000 | 0.00 |
| 3.52 | 0.01 | 294 | 0.000 | 0.00 |
| 4.20 | 0.01 | 294 | 0.000 | 0.00 |
| 4.91 | 0.00 | 296 | 0.000 | 0.00 |

## PQ Chart 20%



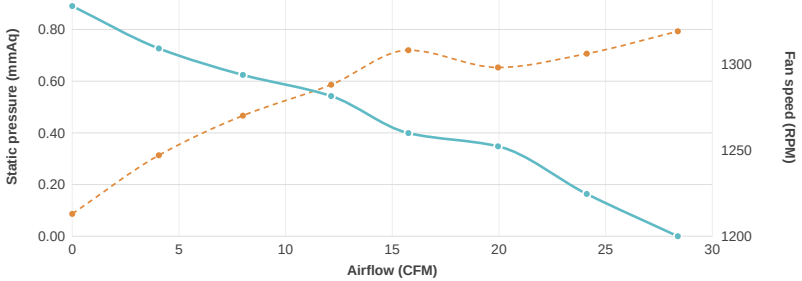

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.25 | 625 | 0.010 | 0.12 |
| 1.72 | 0.19 | 633 | 0.010 | 0.12 |
| 3.45 | 0.16 | 640 | 0.010 | 0.12 |
| 5.20 | 0.14 | 644 | 0.009 | 0.11 |
| 6.91 | 0.10 | 649 | 0.009 | 0.11 |
| 8.62 | 0.08 | 651 | 0.008 | 0.10 |
| 10.34 | 0.05 | 650 | 0.008 | 0.10 |
| 12.04 | 0.00 | 654 | 0.008 | 0.10 |

## PQ Chart 30%



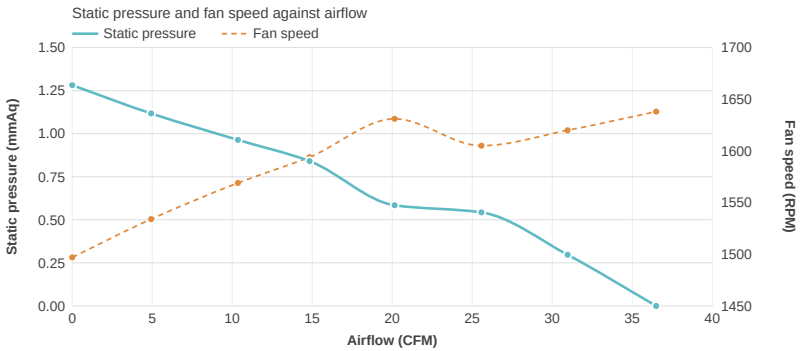

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.53 | 914 | 0.022 | 0.26 |
| 2.83 | 0.41 | 935 | 0.021 | 0.25 |
| 5.63 | 0.36 | 946 | 0.020 | 0.24 |
| 8.46 | 0.30 | 959 | 0.019 | 0.23 |
| 11.31 | 0.22 | 970 | 0.019 | 0.23 |
| 14.17 | 0.18 | 967 | 0.019 | 0.23 |
| 16.93 | 0.09 | 971 | 0.019 | 0.23 |
| 19.84 | 0.00 | 979 | 0.018 | 0.22 |

## PQ Chart 40%



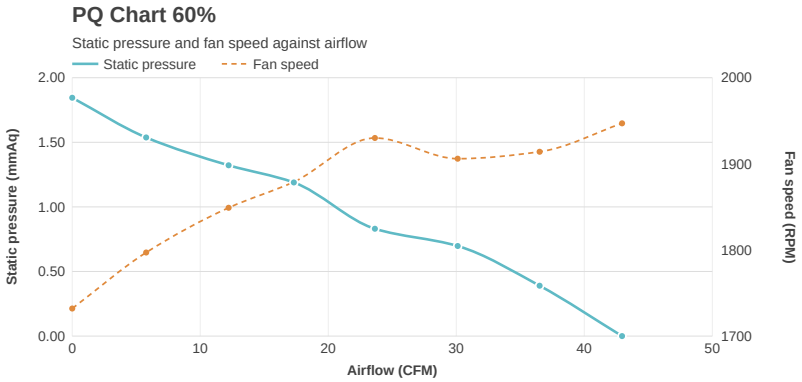

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 0.89 | 1213 | 0.040 | 0.48 |
| 4.06 | 0.73 | 1247 | 0.038 | 0.46 |
| 8.00 | 0.62 | 1270 | 0.037 | 0.44 |
| 12.14 | 0.54 | 1288 | 0.035 | 0.42 |
| 15.76 | 0.40 | 1308 | 0.033 | 0.40 |
| 19.96 | 0.35 | 1298 | 0.034 | 0.41 |
| 24.12 | 0.16 | 1306 | 0.034 | 0.41 |
| 28.38 | 0.00 | 1319 | 0.033 | 0.40 |

## PQ Chart 50%



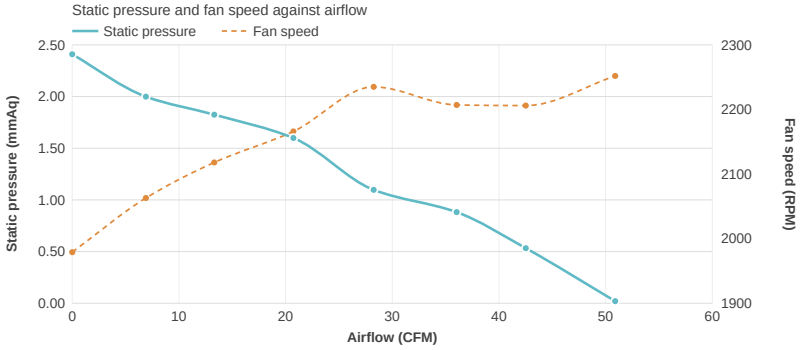

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.28 | 1497 | 0.063 | 0.76 |
| 4.93 | 1.12 | 1534 | 0.060 | 0.72 |
| 10.35 | 0.96 | 1569 | 0.057 | 0.68 |
| 14.83 | 0.84 | 1594 | 0.055 | 0.66 |
| 20.15 | 0.58 | 1631 | 0.052 | 0.62 |
| 25.57 | 0.54 | 1605 | 0.054 | 0.65 |
| 30.96 | 0.30 | 1620 | 0.053 | 0.64 |
| 36.49 | -0.02 | 1638 | 0.051 | 0.61 |

## PQ Chart 60%



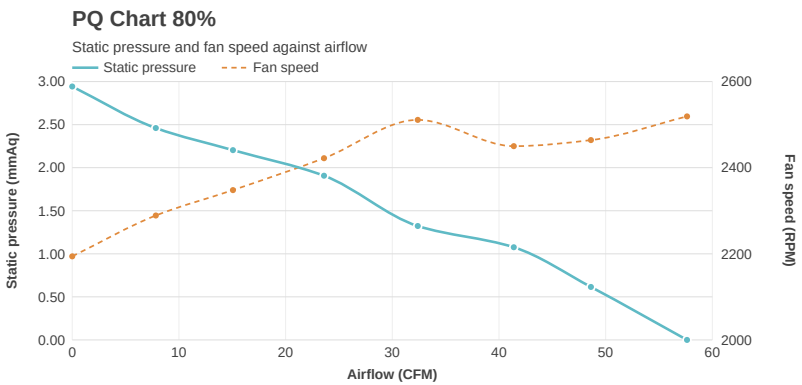

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 1.85 | 1732 | 0.093 | 1.12 |
| 5.77 | 1.54 | 1797 | 0.087 | 1.04 |
| 12.22 | 1.32 | 1849 | 0.082 | 0.98 |
| 17.31 | 1.19 | 1879 | 0.079 | 0.95 |
| 23.64 | 0.83 | 1930 | 0.074 | 0.89 |
| 30.11 | 0.70 | 1906 | 0.076 | 0.91 |
| 36.51 | 0.39 | 1914 | 0.076 | 0.91 |
| 42.95 | 0.00 | 1947 | 0.073 | 0.88 |

## PQ Chart 70%



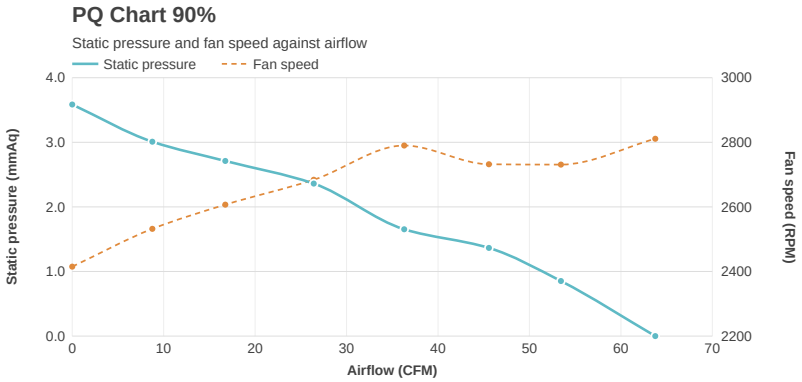

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 2.41 | 1979 | 0.131 | 1.57 |
| 6.91 | 2.00 | 2063 | 0.122 | 1.46 |
| 13.31 | 1.82 | 2118 | 0.116 | 1.39 |
| 20.73 | 1.60 | 2166 | 0.111 | 1.33 |
| 28.25 | 1.10 | 2235 | 0.103 | 1.24 |
| 36.03 | 0.88 | 2207 | 0.107 | 1.28 |
| 42.51 | 0.53 | 2206 | 0.107 | 1.28 |
| 50.90 | 0.02 | 2252 | 0.102 | 1.22 |

## PQ Chart 80%



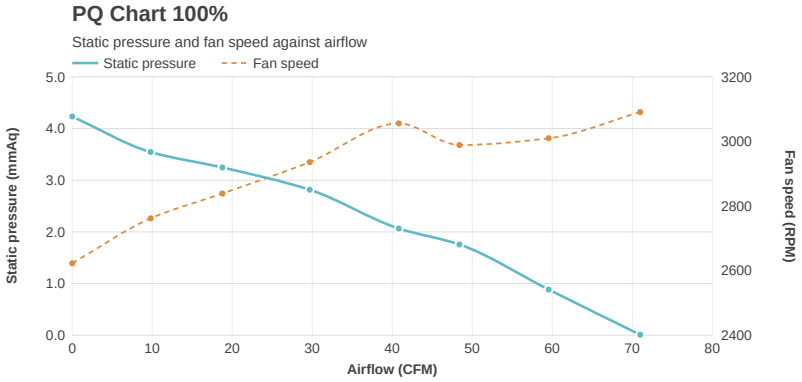

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 2.94 | 2194 | 0.170 | 2.04 |
| 7.83 | 2.46 | 2289 | 0.158 | 1.90 |
| 15.06 | 2.20 | 2348 | 0.150 | 1.80 |
| 23.60 | 1.91 | 2422 | 0.142 | 1.70 |
| 32.39 | 1.32 | 2511 | 0.132 | 1.58 |
| 41.39 | 1.08 | 2450 | 0.138 | 1.66 |
| 48.62 | 0.62 | 2464 | 0.137 | 1.64 |
| 57.63 | -0.03 | 2519 | 0.130 | 1.56 |

## PQ Chart 90%




| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 3.58 | 2415 | 0.221 | 2.65 |
| 8.76 | 3.01 | 2532 | 0.206 | 2.47 |
| 16.74 | 2.71 | 2607 | 0.195 | 2.34 |
| 26.41 | 2.36 | 2684 | 0.185 | 2.22 |
| 36.30 | 1.65 | 2790 | 0.171 | 2.05 |
| 45.57 | 1.37 | 2732 | 0.179 | 2.15 |
| 53.44 | 0.85 | 2731 | 0.179 | 2.15 |
| 63.76 | 0.00 | 2811 | 0.167 | 2.00 |

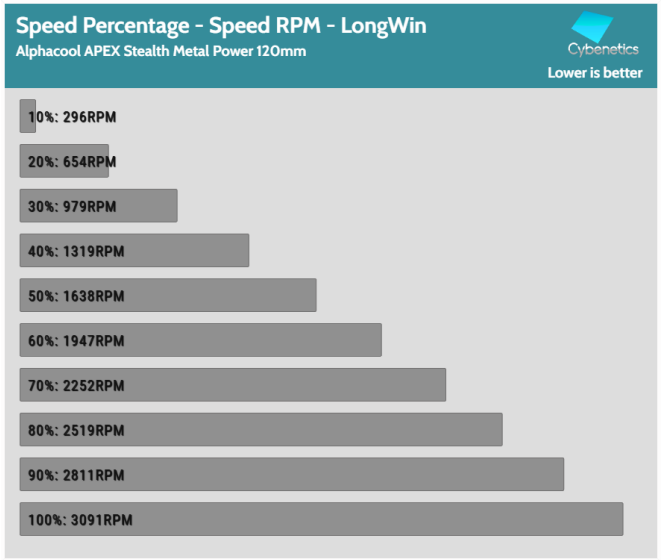
## PQ Chart 100%



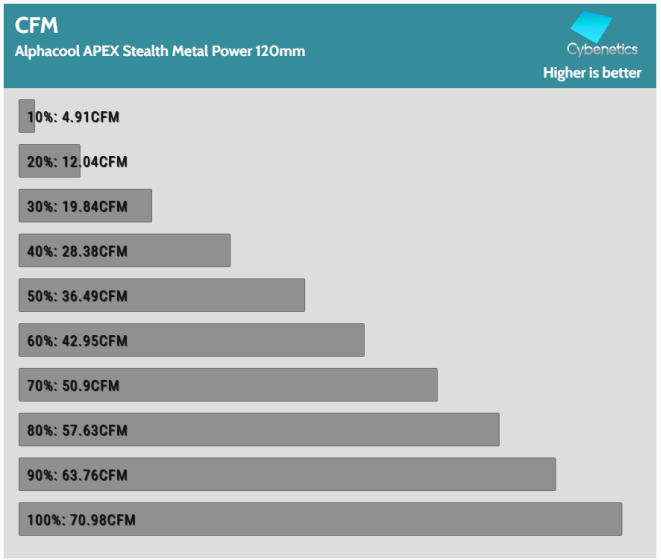

| Airflow (CFM) | Static Pressure (mmAq) | Fan Speed (RPM) | Current (A) | Power (W) |
|---|---|---|---|---|
| 0.00 | 4.23 | 2623 | 0.280 | 3.36 |
| 9.80 | 3.54 | 2762 | 0.258 | 3.10 |
| 18.76 | 3.25 | 2839 | 0.247 | 2.96 |
| 29.68 | 2.82 | 2936 | 0.232 | 2.78 |
| 40.82 | 2.07 | 3056 | 0.217 | 2.60 |
| 48.39 | 1.76 | 2989 | 0.225 | 2.70 |
| 59.54 | 0.88 | 3010 | 0.222 | 2.66 |
| 70.98 | 0.01 | 3091 | 0.213 | 2.56 |

## SECTION F: General Performance

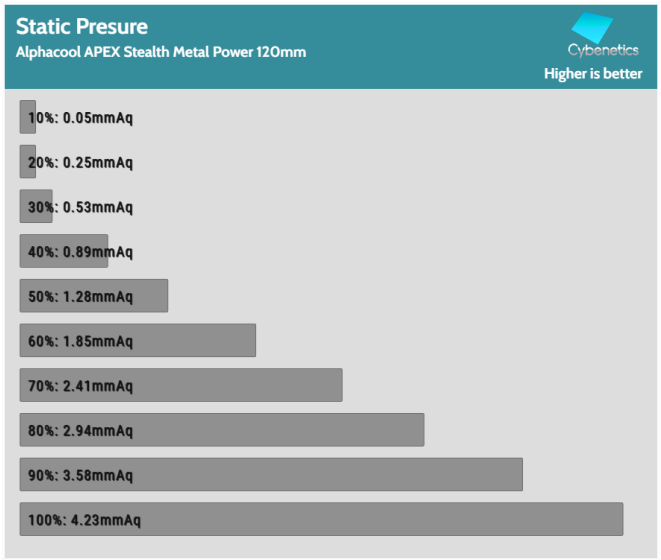
### Fan Percentage RPM LongWin



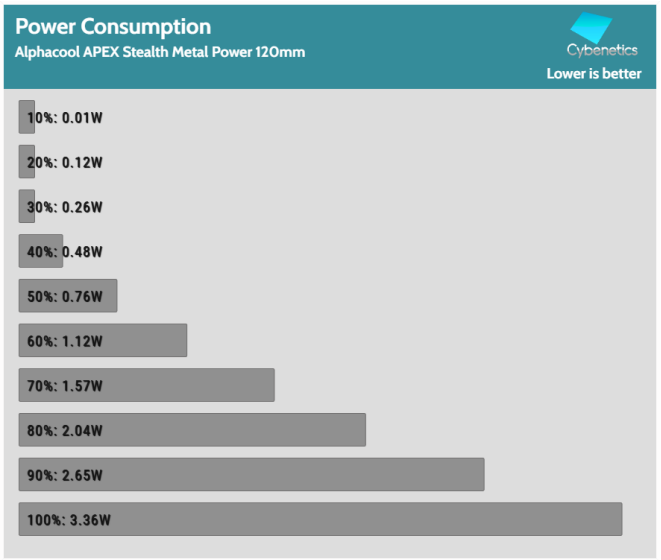

### Fan Percentage CFM



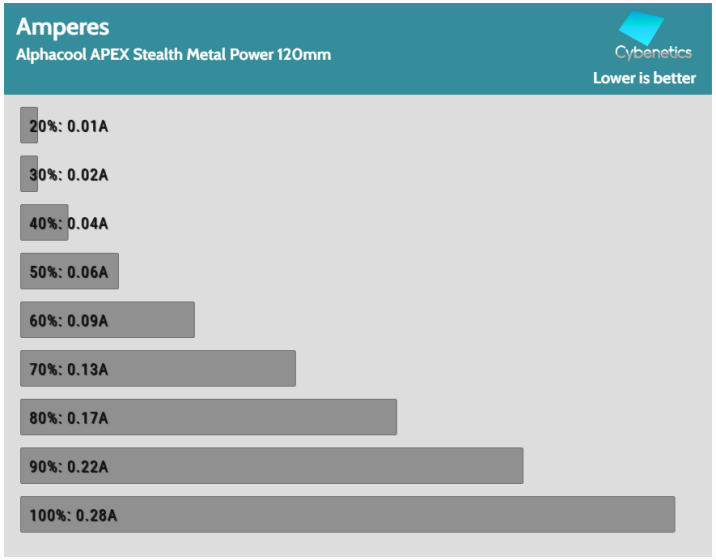

### Fan Percentage Pressure



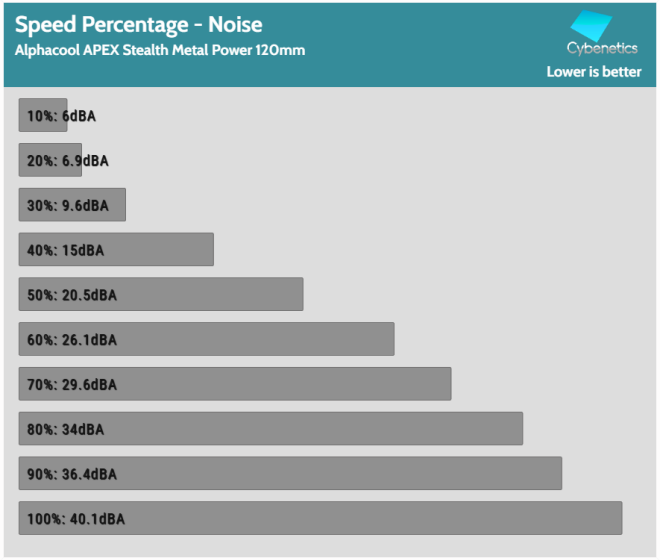

### Fan Percentage Power



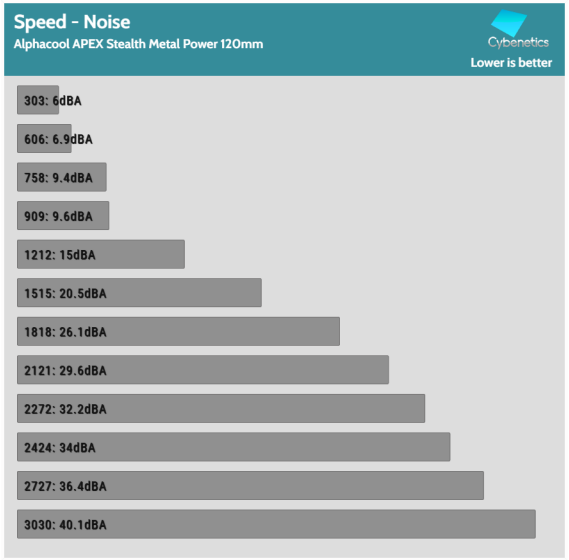
## Fan Percentage Amps



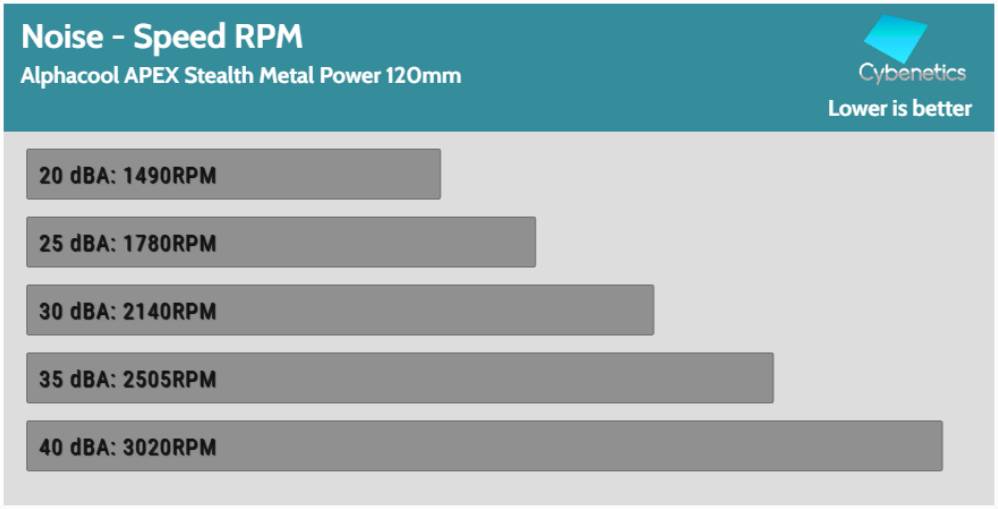

## Fan Percentage Noise




## 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 APEX Stealth Metal Power 120mm



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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