



# VORTEX PWM CF-V12HP

**120mm fan**

**Best cooling efficiency &  
super silent performance**



## Features

### PWM-FUNCTION

PWM stands for Pulse Width Modulation. The 4-Pin connector allows the mainboard to control the fan speed from 800-1500RPM.

### HIGH-VORTEX-AIRFLOW WITH TURBINE BLADE & FRAME PATENTED DESIGN

Optimum airflow, air pressure & extremely silent performance

### DIVERSION GROOVE BLADE DESIGN

Innovative blade design focus air flow & optimum cooling efficiency (Patent)

### ANTI-VIBRATION PAD DESIGN

Reduce the vibrations efficiently & silent operation

### AERO-DYNAMICAL DESIGN

Air-inlet with optimal aero-dynamical design reducing noisy air turbulences

### HYDRO-DYNAMIC-BEARING TECHNOLOGY

HDB runs more smoothly with no friction, make it quietly & durability(MTBF300,000hrs)

### TOOL-LESS FIXED PINS

Rubber fixed pins also reduces vibrations (fan run more quietly) and Tool-less makes it easy to mount, with no tools required

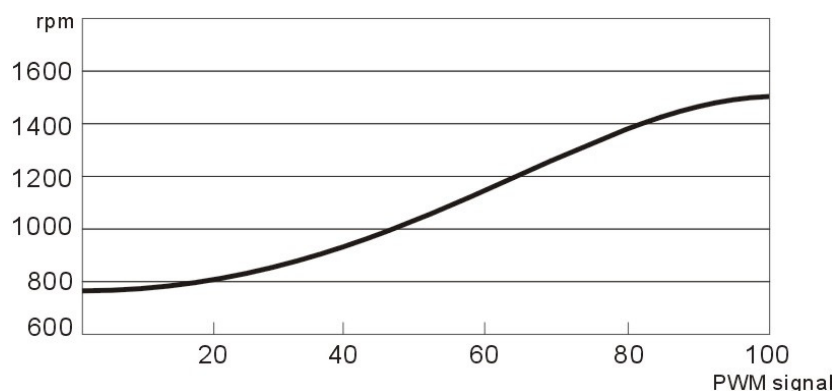
## Spec.

Model	CF-V12HP
Marketing name	VORTEX PWM 120
Dimensions	120 x 120 x 25
Speed	800-1500
Air flow @ 12V (CFM, m3/h)	70.5 / 119.8(max.)
Air pressure @ 12V (mm H2O)	2.2
Noise	17.9dB
Bearing type	HDB (Hydro-Dynamic Bearing)
Connector	PWM 4 pin
Cable length	450mm
Cable sleeve	Yes
Accessories	Small 4 to big 4pin adapter
	Tool-less fixed pins
	Screws
Carton	Color box with PVC window
Lifetime L10 (hours / 25°C)	300000



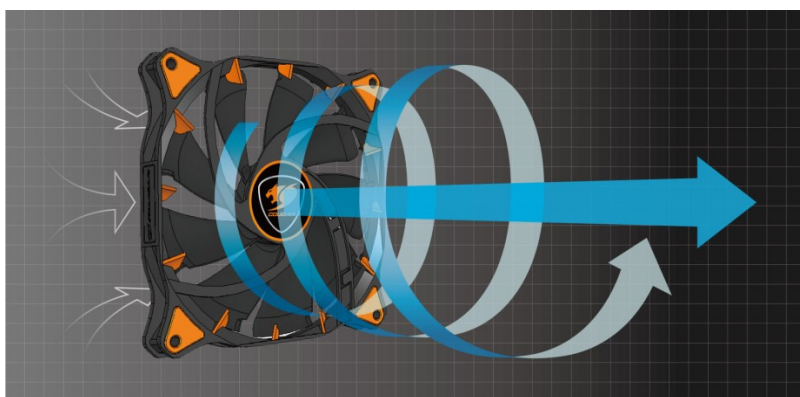
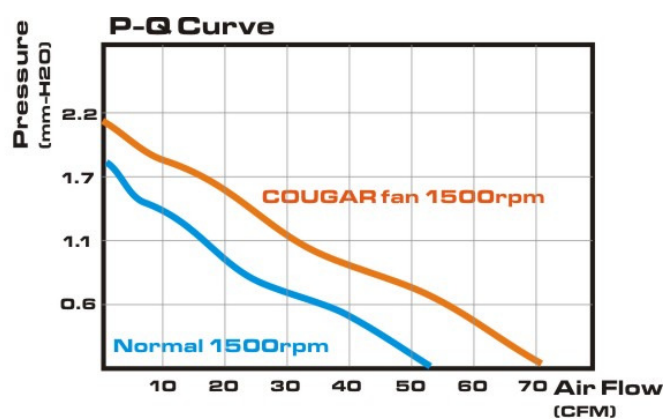
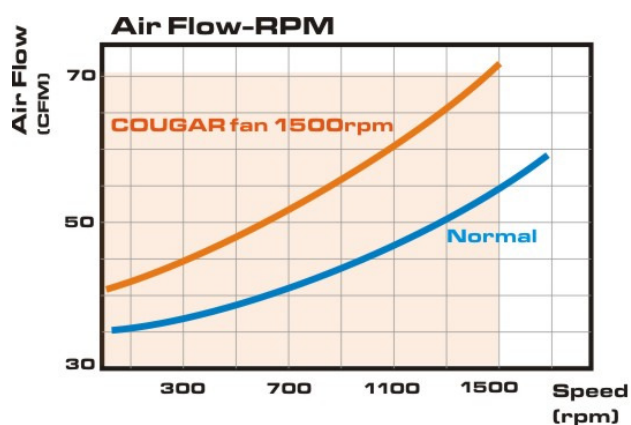
## PWM-FUNCTION

PWM stands for Pulse Width Modulation. The 4-Pin connector allows the mainboard to control the fan speed from 800-1500RPM. Fan speed is controlled by the PWM-signal, which delivers a value between 0-100%, the operating voltage remains a constant 12V



## HIGH-VORTEX-AIRFLOW WITH TURBINE BLADE & FRAME PATENTED DESIGN

Optimum airflow, air pressure & extremely silent performance



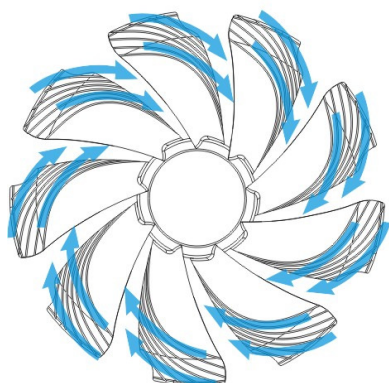


## DIVERSION GROOVE BLADE DESIGN

Innovative blade design focus air flow & optimum cooling efficiency (Patent)

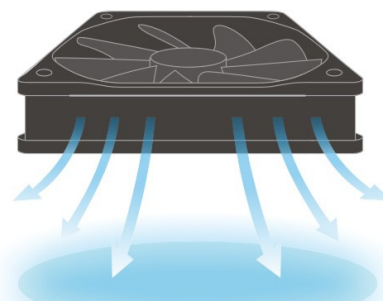
Diversion groove lead  
air flow centralizing (Patent)

Focus air flow to optimize  
cooling efficiency



Strong & Focus

Normal fan



Dispersion

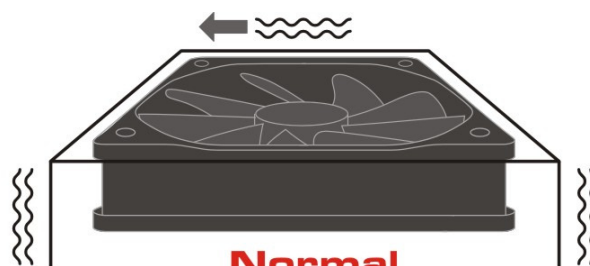
## ANTI-VIBRATION PAD DESIGN

Reduce the vibrations efficiently & silent operation

Anti-vibration pad



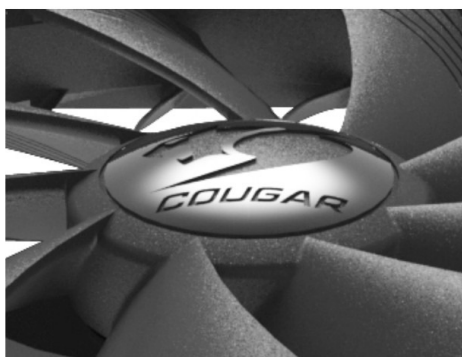
**VORTEX**  
Absorb vibration to keep quiet



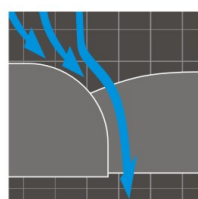
**Normal**  
resonance

## AERO-DYNAMICAL DESIGN

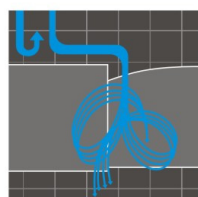
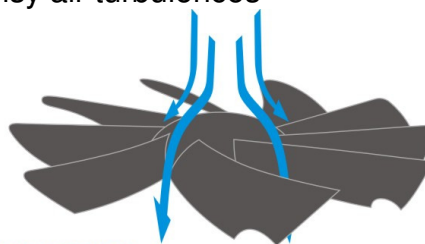
air-inlet with optimal aero-dynamical design reducing noisy air turbulences



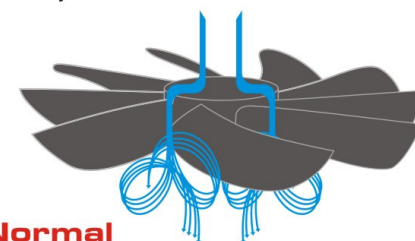
Central Hub



**VORTEX**  
Streamline shape  
more smooth, more airflow



**Normal**  
noisy air turbulences



## HYDRO-DYNAMIC-BEARING TECHNOLOGY

We defined HDB to Hydro Dynamic Bearing. An oil seal design that has a higher reliability and advantage than conventional fan motor design.

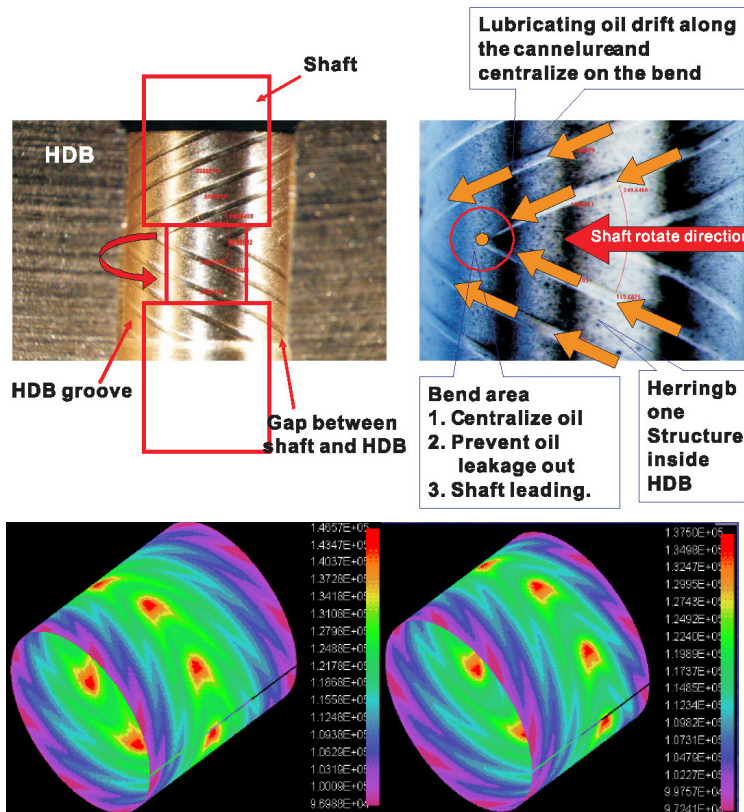
1. High revolution precision, low vibration noise
2. Fluid seal design provide extremely long life span
3. Surface tension effect, runs more smoothly with no friction, extremely quiet

Fluid seal design is achieved through the use of oil surface tension and hydrodynamic pumping forces provided by grooves. Bend area is centralized oil and prevented oil leakage out of motor (oil leakage is main problem of sleeve bearing, short life time) . Friction between shaft and HDB will be down due to herringbone structure reaction(friction between the metal is disadvantage of ball bearing, noise & waste heat problem). So HDB conquer sleeve & ball bearing disadvantage to become more reliable & quiet technology for Top-notch fan. Such design concept is successful and applicative on HDD, and we can see a reliability application in it.

HDB, Ball, & Sleeve comparison

	Sleeve	Ball	Hydro-Dynamic
revolution precision	mediocre	good	best
vibration noise	mediocre	loud	quiet
life span (hrs)	30,000	50,000	>150,000
waste heat	high	high	low
Cost	low	high	high

HDB Design Principles



Oil surface tension and hydrodynamic pumping forces provided by grooves, no friction, extremely quiet



**SAFETY & EMI CERTIFIED**

