



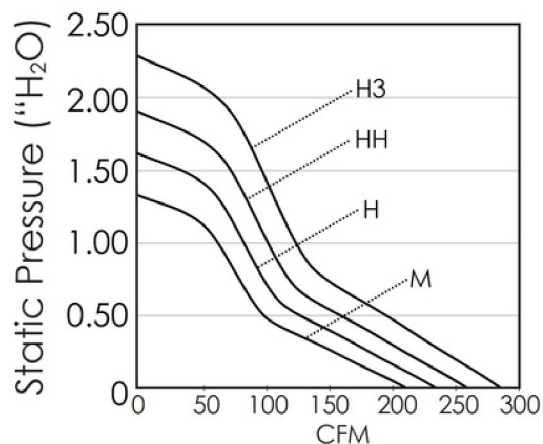
ORION FANS

**HIGH SPEED/  
HIGH PERFORMANCE  
FANS**

# STATIC PRESSURE

High static pressure environments exist where air is restricted and doesn't easily move. Static pressure is a system's resistance to airflow and is usually measured in inches of water column ("H<sub>2</sub>O) or in millimeters of water (mmH<sub>2</sub>O). In the case of thermal management, static pressure refers to a fan's ability to move air through restrictive areas. The less resistance to airflow that a system encounters, the lower the system's static pressure. Fans and blowers can deliver more airflow and cool equipment more effectively when working against a lower static pressure.

## Static pressure curve



It is essentially a measure of the differential air pressure between the air pressure inside an application vs ambient air pressure outside of an application. There is an inverse relationship between airflow and static pressure. As the pressure differential rises, airflow drops.

The vertical axis labeled "Inches of Water" describes relative air pressure. The horizontal axis labeled "Airflow (CFM)" describes Airflow volume in relation to air pressure.

The curve tells the user approximately how much air a fan will move for a given pressure reading. For instance - the curve meets the horizontal line at the bottom of the graph at about 290 (Cubic Feet/Minute). Look left along the bottom horizontal axis and notice that the air pressure (Inches of Water) is zero (No pressure difference at all between the inlet and outlet side of the fan).

Notice that the curve meets the vertical axis at about 0.90 (Inches of Water) and that airflow is 0 (zero).

High static pressure environments are commonly found in networking & telecom enclosures, industrial electronic cabinets, and medical imaging equipment.

## **HIGH SPEED/HIGH PERFORMANCE FANS**

To combat this problem, high speed/high performance fans were introduced to move air at high flow rates and pressure to create a high pressure system. Compared to a standard 80mm DC fan, an 80mm high speed vane axial fan can turn 80-90% faster which in turn creates nearly 2 times as much airflow with nearly 4 times the max static pressure.

High speed/high performance fans are designed to achieve higher airflow in a smaller frame size. This makes them the perfect solution when your cooling requirements increase but your project's design footprint cannot.

### **XE, XC, XJ**

Orion Fans denotes their high speed offering with either an XE, XC, or an XJ on the end of the part number. These fans offer a higher performance in their selected frame size. Their higher speeds and improved blade geometry provide higher airflow performance (CFM) compared with standard model fans. These fans do have greater power requirements and higher noise (dBA) when compared to standard models.

### **VXE & VXC**

Vane axial fans were introduced to provide the highest airflow and highest static pressure in a single fan when compared to standard fan models. It features a unique design where the motor strut vanes are curved to prevent backflow and turbulence while providing greater stability to the motor for high RPM operation. These fans offer the best performance but do also carry higher noise values.

## **NOISE**

In systems with higher static pressure and higher airflow there is always more noise. There is a way to partially mitigate the additional noise by operating the fans lower on the operating curve near the open-air pressure levels. It is also possible to mitigate noise by using pulse-width modulation (PWM) or thermal speed control to scale fan speed by the amount of cooling that is required.

## **APPLICATIONS**

These fans are perfect for applications that require higher airflow but the design doesn't allow for a larger fan. Many common applications include networking and telecom enclosures, fan trays, food and beverage industry, appliances, and electric car charging base stations.

## **ORION FANS OFFERING**

Orion Fans offers the ability to add special functions including PWM, tachometer, alarm, and thermal control. IP ratings are also available up to IP69K.

To learn more about the Orion Fans high speed/high performance offering, visit <https://orionfans.com/high-speed-performance/>