AIR MOVING SOLUTIONS

A COMPLETE LINE OF AIR MOVING SOLUTIONS
FOR THE MOST DEMANDING APPLICATIONS

www.moog.com

MOOG

ABOUT MOOG

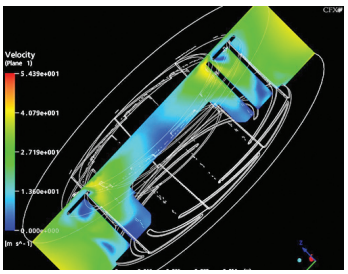
Moog offers off-the-shelf products through our Moog AirMaxTM series of fans and blowers and utilizes our proven high efficiency Silencer® series brushless DC motors to create tailored solutions for more unique applications. Combining our expertise in thermal management with our innovative motor technology, we have expanded the customer's options for solving difficult thermal, airflow, acoustic and efficiency problems. As an optimum choice for each application, we are offering tailored airflow products that are designed using off-the-shelf components to provide a cost effective solution without compromising performance.

Medical Equipment

- Ventilators
- Particle counters
- Pressure management mattresses

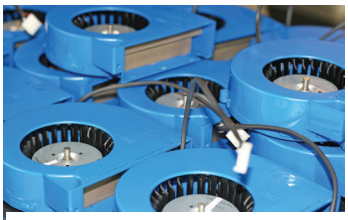
Telecommunications

- Data storage / servers
- Electronic rack cooling
- Power backup systems



PRODUCTS

With our combination of in-house design, development and production, we are able to offer custom products that are cost effective without the compromises associated with the use of off-the-shelf devices. We are dedicated to providing our customers with efficient, high quality and on target solutions.



Blowers

With our sheet metal capabilities, blowers can be tailored to the application. From 1U slot blowers, high pressure multistage blowers, dual centrifugal blowers to radial wheel blowers, we have the experience to help with your application. Our blowers are configurable with virtually any voltage, flow sensors and finger guards. Custom mounting flanges can be fabricated to fit your exact application.

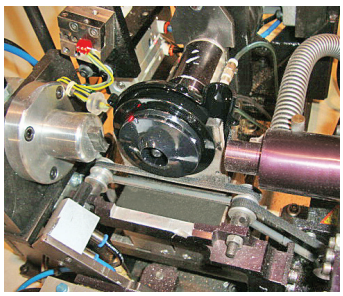
Impellers

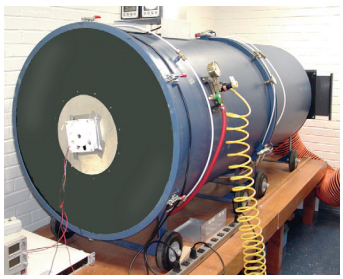
Our motorized impellers offer quiet, high pressure airflow in a compact versatile design. Designed for virtually any form factor, any bus voltage, our in-house electronic and sheet metal capabilities allow custom products to be used in cost sensitive, extreme environments and confined space applications.

Controllers

The ability to build electronic controls customized to the application means that the designer can select the exact combination of functions necessary to optimize the system.

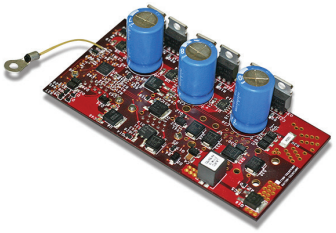
- AC or DC powered units
- Redundant systems sensing speed to maintain overall airflow in case of fan failure
- Speed synchronization for reduced noise
- Watchdog circuitry
- Digital communication, I²C, RS-232 / 485, CAN Bus
- Soft start and / or sequential start
- Filter blockage sensing
- Wide input voltage compensation
- Local and remote alarms
- Thermal speed control
- Conducted noise filtering





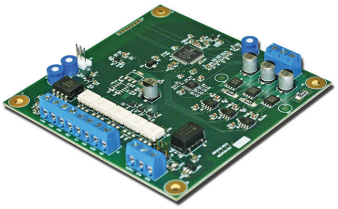
Fan Trays

Our fan assemblies creatively package axial fans for maximum airflow in a compact footprint. Available with cooling on demand, fan trays can be programmed to sense and evaluate temperature and vary fan speed to maintain an ideal operating environment. Not locked into using any particular off-the-shelf fan allows us to select the best fan for the application or use multiple fan manufacturers when dual sourcing is advantageous. If a standard fan is not available for your application, we can design one for you.



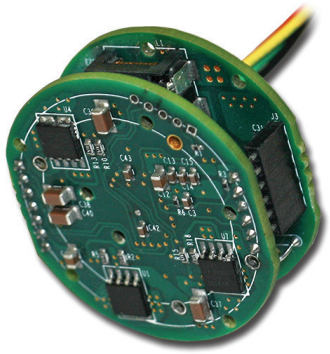
DEVELOPMENT OF MANUFACTURING

With a development process including mechanical and electrical design, airflow analysis, environmental testing, as well as safety and compliance requirements, you can count on our trained CAD design and engineering staff to get you the product that is best suited for your application. Moog provides on-site electronics testing and troubleshooting.



Environmental Testing

Moog has state-of-the-art environmental chambers that can verify whether the designed unit will work reliably at all temperature extremes from -73°C to 175°C. In addition, we can do extended temperature testing on most systems with the air movers installed to ensure overall system reliability. Humidity, salt fog, shock and vibration testing is also available.



Safety and Compliance

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Manufacturing

- Automation
- Molded parts
- SMT / through-hole prototype to production
- Simple functional to fully automated testing

CAPABILITIES

- Manufacturing and assembly
- Concept design and modeling
- Rapid prototyping and product development
- System airflow and thermal verification
- Airflow CFD modeling and testing
- Electronic controls experience
- Motor drive experience
- Distribution testing
- Environmental testing
- Electrical testing
- Acoustic and vibration testing
- Accelerated life testing
- Fabrication and assembly
- Precision balancing
- Rugged environment design and testing
- Automated production testing
- Aerodynamics design
- Simulation and analysis
- Thermal and airflow modeling
- Design modeling and verification

DESIGN GUIDE

Determining Airflow Requirements

$Q = m \bullet cp \bullet \Delta T$
Q = heat to be dissipated (watts)
cp = specific heat of fluid
m = mass flow rate
ΔT = fluid temperature rise through system
kW = kilowatts

For standard air (sea level 25°C ambient)

$$CFM = \frac{(3170) \bullet kw}{\Delta T(°F)} = \frac{(1760) \bullet kw}{\Delta T(°C)}$$

To ensure adequate cooling at altitude and temperature, additional margin must be added to account for reduced density.

Fan Laws

Along a system curve, airflow, speed, pressure and power requirements can be determined using fan laws:

$$CFM_2 = CFM_1 \left(\frac{rpm_2}{rpm_1}\right)$$

$$sp_2 = sp_1 \left(\frac{rpm_2}{rpm_1}\right)^2$$

$$pwr_2 = pwr_1 \left(\frac{rpm_2}{rpm_1}\right)^3$$

Moog has offices around the world.
For more information or the office nearest you, contact us online.
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Specifications and information are subject to change without prior notice.

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MS3277, rev. 2 05/20

For product information, visit
www.moog.com

This technical data is based on current available information and is subject to change at any time. Specifications for specific systems or applications may vary.