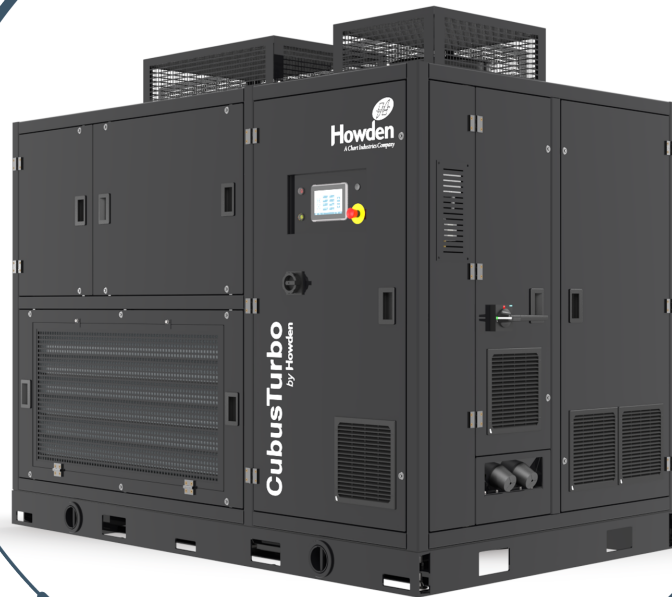


CubusTurbo

by Howden

Plug and play air solutions
for industrial and wastewater applications

TURBLEX™



Fully integrated compact plug and play turbo blower designed to deliver **high efficiency with low maintenance**

Howden, a Chart Industries Company, is a world leading turbomachinery manufacturer with over 300 years of combined experience across our legacy brands of TURBLEX™, HV-TURBO®, Spencer®, and Donkin.

Why Howden?

Howden products are designed to achieve maximum efficiency and long reliable operational life through our focus on engineering excellence. This has been established and enhanced across the largest base of single stage turbo compressors in the world.

Our manufacturing facilities maintain the highest levels of excellence with modern equipment and strict quality controls accredited to international

standards. A full test capability across our entire range ensures confidence in the performance quality of each unit.

With over 50 operational sites globally we have the largest coverage for sales and service. This means we can respond swiftly to our customers' needs in the project stages as well as through the operational lifetime of equipment.



Power Mizer®



CubusTurbo by
Howden



KA Series



SG Series

Turbo blowers serving a wide range of plant and process capacities

Key benefits

- High efficiency operation with unique dual point control
- Multi blower control removing the need for a master control panel
- Proven motor technology using active magnetic bearings
- Proven and reliable aerodynamic performance
- Simple handling and installation with a compact package
- Simplified maintenance for low lifetime costs
- Protection against power failure



CubusTurbo by Howden is a fully plug and play product, equipped with the following components **as standard:**

- Turbo blower with unique dual point control system
- Plug and play enclosure
- Suction air filter
- Blow off valve
- Discharge expansion joint
- Check valve (shipped loose)
- Integrated motor cooling
- Integrated silencing
- Multi blower operation
- HMI and PLC
- Integrated control and monitoring instrumentation
- Power failure mode
- Permanent magnet motor with active magnetic bearing system
- Integrated chokes
- Variable Frequency Drive (VFD)
- ASME PTC-13

Field of application:



Wastewater treatment



Gas desulphurisation



Process air



Combustion air



Yeast production



Pharmaceutical



Pulp and paper

The CubusTurbo by Howden is part of the broader Howden turbo technology product range and uses well established aerodynamics that have been proven in an installed base of more than 20,000 turbo compressors.

CubusTurbo by Howden

Filters/silencer

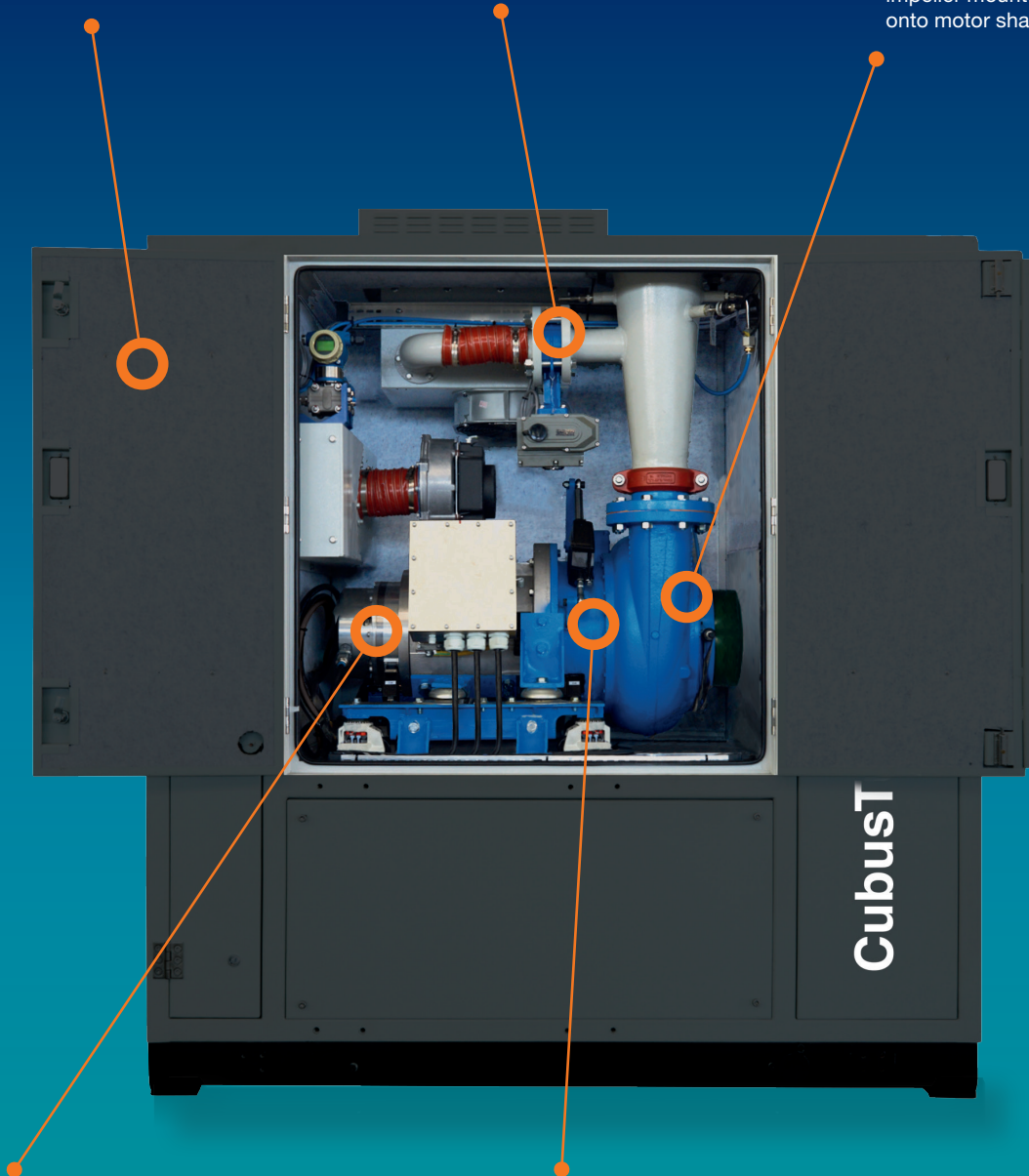
- Suction filter (grade EU4 or equivalent) installed on enclosure wall.

Fully integrated blow off valve

- Integrated in each package for both start-up and blower surge protection.
- Valve – cast iron butterfly type.
- Actuator – electrically operated.

Impeller

- Single high efficiency impeller mounted directly onto motor shaft.



Motor

- Active magnetic bearing technology.
- Oil free and zero friction.
- Integrated catcher bearing.

Diffuser vanes

- Volume and pressure control.
- Controlled by a linear actuator.
- Provides Dual Point Control in conjunction with integrated variable speed.

Cooling (for larger units)

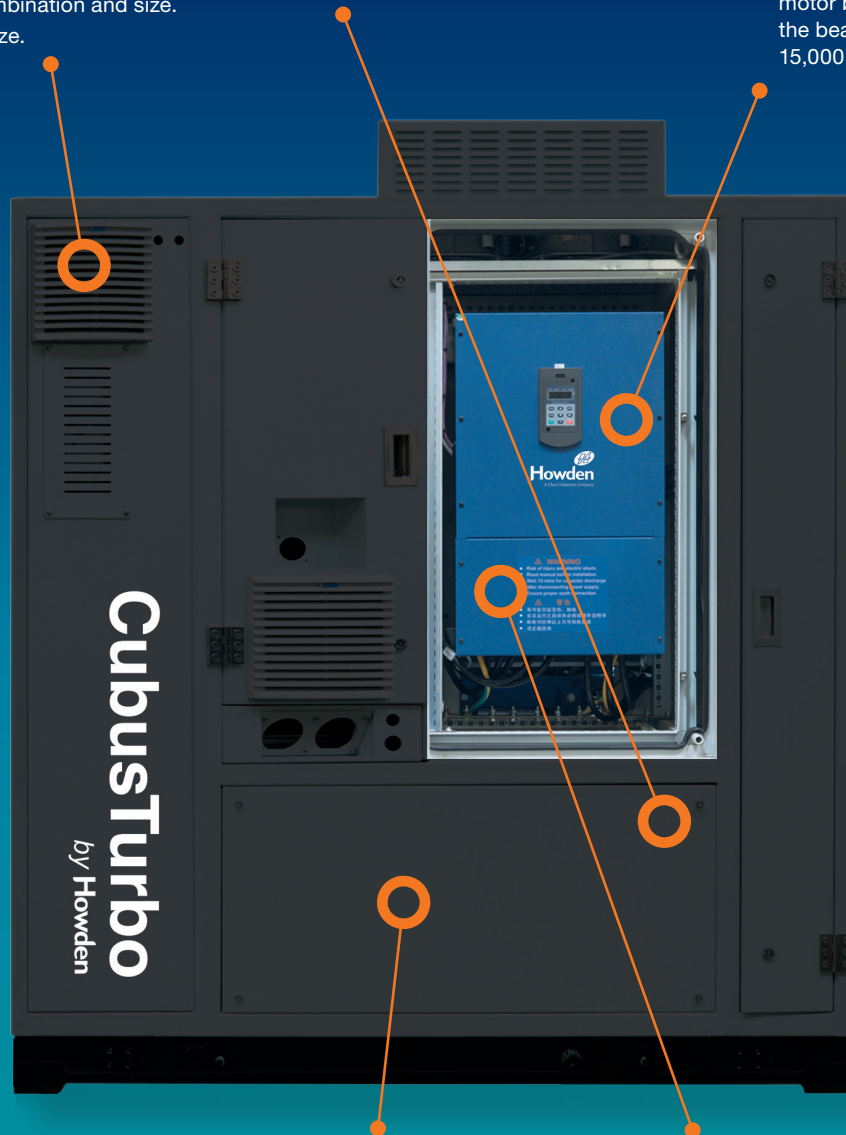
- Three low noise draft cooling fans installed on the top of the electrical cabinet providing large cooling capacity.
- Motor and VFD Cooling is either by air or cooling water dependant on the motor and VFD combination and size.
- Motor cooling by size.

Input chokes and filters

- Cleans up the harmonic distortions between the VFD and Motor which if not cleaned will be burnt as heat in motor windings causing motor stress and efficiency loss.

Active magnetic bearing controller

- Controls the position of the motor bearings and monitors the bearing position up to 15,000 times per second.



Integrated PLC and HMI

- Blower control and monitoring.

Choke

- Necessary to reduce harmonic distortion.

Variable frequency drive

- High frequency drive to control the speed of the blower.

Integrated run down system

- Ensures that the motor safely comes to rest without damage in the event of a supply power failure.

Howden Dual Point Control™ to deliver high efficiency operation

Maximum efficiency – widest operating range

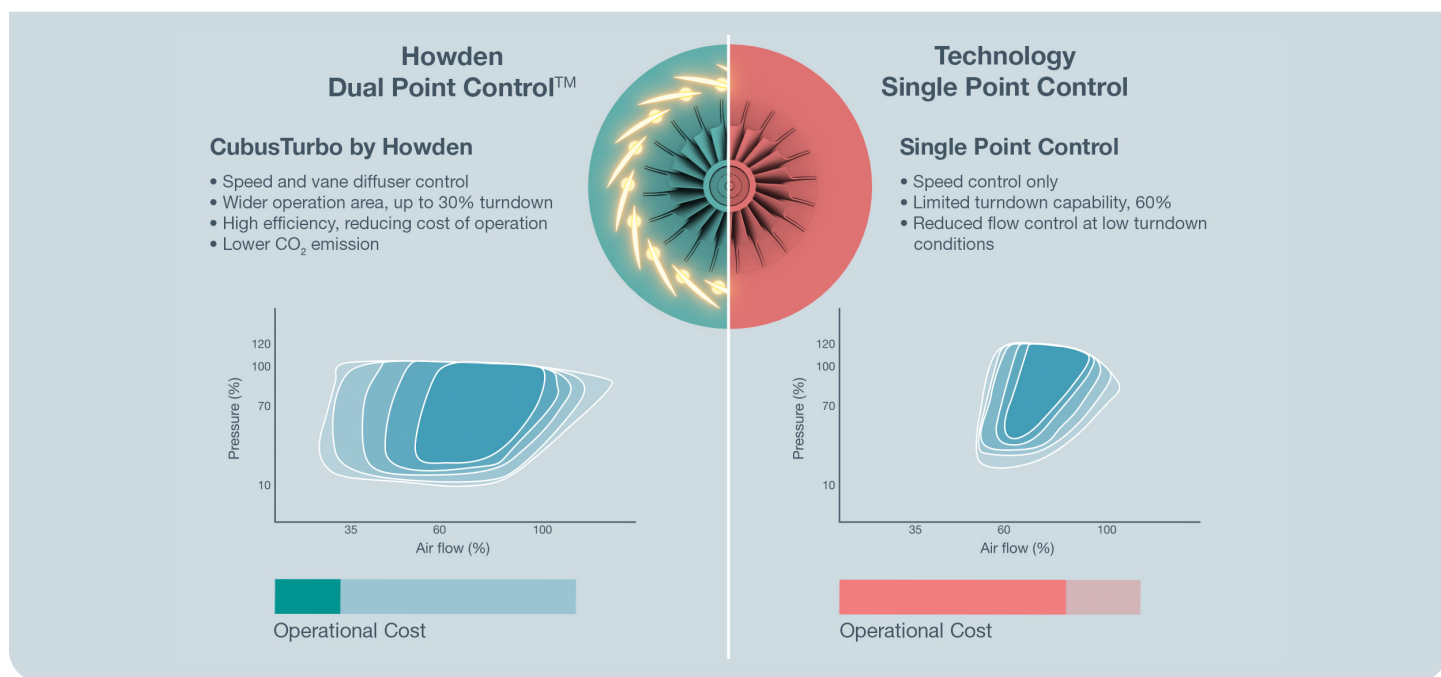
Applying advanced technology from much larger machines, Howden CubusTurbo by Howden packages incorporate Dual Point Capacity Control to provide optimised performance and minimal running costs throughout annual climatic and daily duty variations typically encountered.

Basic principles of centrifugal compressor aerodynamics determine

that speed variation primarily impacts pressure rise, whilst diffuser vanes primarily impacts volumetric flow. The High Speed Drive provides inherent speed variation, Variable Diffuser Vanes introduce a secondary element, and Howden Dual Point Capacity Control Algorithm logic combines to deliver a new advanced dimension for both efficiency and operating range.



Howden's unique dual point control – an industry first for maximum efficiency across all operating conditions.



Multi blower operation

CubusTurbo by Howden has a fully integrated 'multi blower control system' removing the need for an additional control system and master control panel. The system enables up to eight blowers on a network to be controlled.

This enables the plant to be operated at the maximum efficiency at all times through the use of our unique control algorithm by determining the optimal number of blowers required to match plant demand.

- **Enhanced plant reliability and availability**
- **Reduced energy costs due to optimisation of the blower system in line with plant capacity demand**
- **Cost saving from no additional control systems**

Proven motor technology

The blower uses active magnetic bearing technology to provide zero friction oil free bearings which are well proven for highly reliable performance within multiple industrial applications.

The active bearing system operates with a control system that tracks and controls rotor position up to 15,000 times per second to eliminate vibration ensuring extended life. The shaft is levitated prior to start-up which provides extended life to system components.

System protection

In the event of power failure, machine protection is provided through an integrated run down system that ensures the machine comes to a safe standstill.

Motor 'catcher' bearings provide a secondary level of protection for the magnetic bearings.



**Maintenance free
giving low life costs**



**Oil free operation with
proven reliability and
maximum efficiency**



**Safe run down in the
case of power failure
avoiding bearing damage**

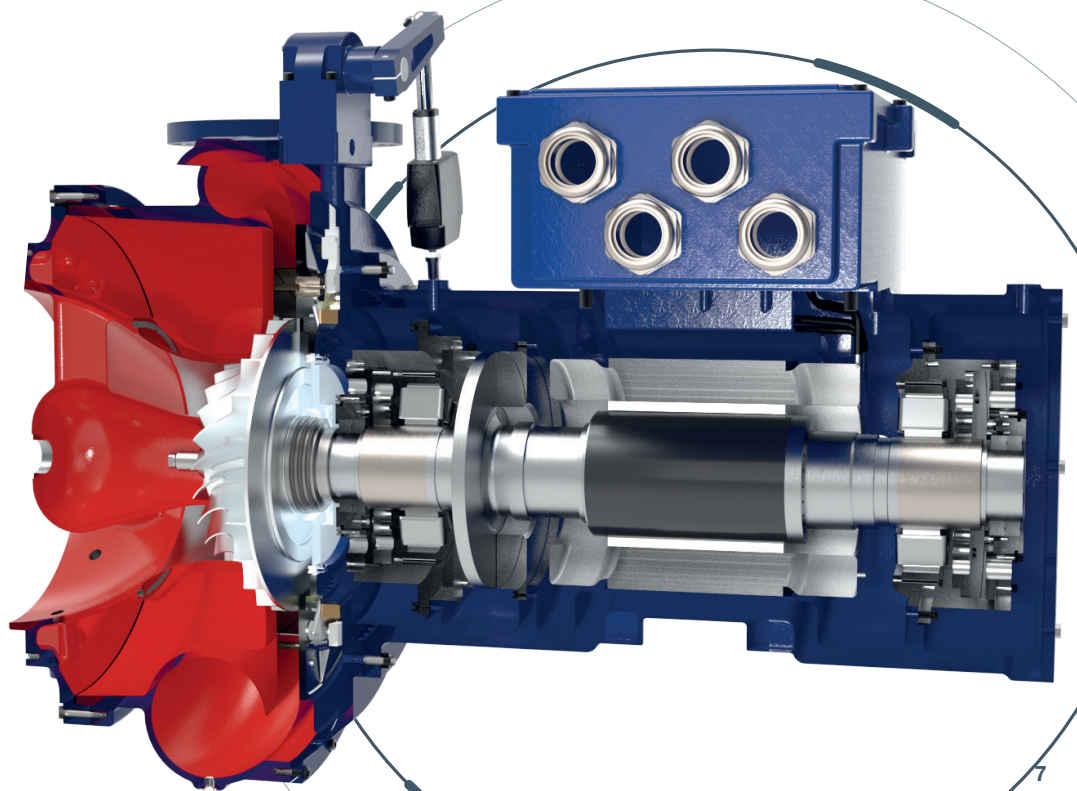


Highest efficiency

High efficiency permanent magnet motor with active magnetic bearings providing friction and lubrication free operation

Pre-loaded auxiliary (catcher) bearings provide secondary protection to the magnetic bearings during power failure at low speed as the rotor comes to rest

State-of-the-art Magnetic Bearing Technology eliminating the need for lubrication oils – resulting in ease of maintenance



Supplied fully integrated ready to install and operate

Simple handling and installation

CubusTurbo by Howden is a complete blower package in a single enclosure with plug and play concept.

It has a significantly smaller footprint than a traditional blower unit resulting in reduced plant space and foundation support requirements. As a result transportation and handling is simplified. Supplied complete with all ancillaries, there are no additional or hidden costs and all electrical filters are included reducing electrical disturbances.

Flexible to location environment

A fully flexible enclosure gives multiple placement options to fit site specific conditions.

The unit can be placed as a standalone unit in a new site or also be ducted into an existing filtration system. The flexible arrangement can also ensure warm air is removed through an external duct, when blower house temperatures need to be maintained. The low noise operation also ensures a better working environment for operators.

- **Reduced capital costs, civil and pipework**
- **Reduced system losses providing increased energy saving**



No additional motor starter or electronic components required



Reduced civil construction costs



Simplified installation resulting in time and cost savings at site



An aftercare service to maximise performance and longevity

We provide a multi-platform aftercare service built on key requirements for maximising performance and longevity.

Our maintenance philosophy is that a combination of quality spare parts, ongoing maintenance by skilled engineers, and periodic improvements and upgrades will keep your equipment in the best condition. Trust Howden to deliver on all three.

Our aftercare service

The commissioning of one of our systems is the culmination of months of design, testing, manufacturing and installation.

Partnering with Howden is the key to continuous, efficient plant performance with minimum downtime once it's up and running. Long Term Service Agreements are also available to ensure long term operation.

Simplified maintenance

As a direct drive machine with zero friction magnetic bearings there is no gearbox or lubrication system. Service requirement is minimized to filters.

- **Reduced maintenance costs**
- **Less disruptive to operations**

Quality assured parts

All Howden spare parts are manufactured to the highest quality and specifications.

Where we supply parts for Howden equipment, we refer to the original manufacturing drawings and specifications to ensure that new components are precision engineered to the original criteria.



Delivering performance optimisation with Howden Uptime

In Howden, we have combined our engineering expertise and product knowledge with our unique digital twin models and Augmented Reality (AR) driven services, to deliver Howden Uptime; the latest digital innovation offering a data driven advantage to our customers.

The CubusTurbo by Howden is fully equipped with Howden Uptime, and provides an invaluable insight into the performance of the equipment, offering blower and plant optimisation opportunities.

The digital twin

Howden's unique digital twin model is a combination of a theoretical performance map created using our OEM expertise, and an operational data set which is fed through the model directly from the sensors that are deployed around the equipment.

When the theoretical performance map is superimposed on the real-life operational data, this enables the mapping of the current operation in respect to the equipment's best efficiency point, delivering performance optimisation and increasing the overall efficiency of your plant.

Augmented Reality (AR) enablement

Howden's state-of-the-art AR service provides real-time sensor values which can be displayed on mobile and Microsoft HoloLens devices.

This allows the customer to witness a live performance of data while the machine is in operation. The AR service will display pressures, temperatures and vibration changes as they happen, and it will even pick up and alert the user of any anomalies.



Enabling predictive maintenance strategies



Improving blower efficiency levels



Providing a direct link to Howden experts

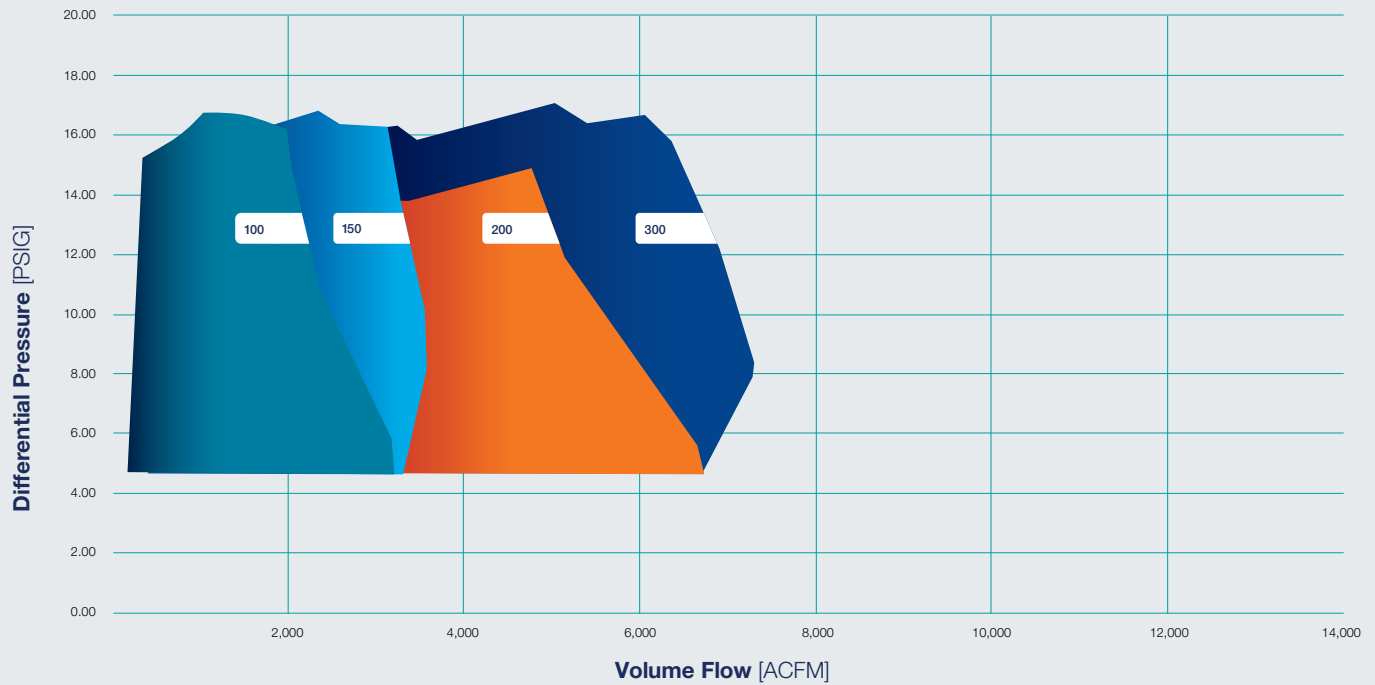


Reducing total cost of ownership



Performance Range

CubusTurbo by Howden is available in 4 models.



All units have 30% maximum available turndown.





Enclosure showing the mechanical and LCP sides



Enclosure showing the process air inlet and electrical sides



Cut away showing the blower/motor & blow-off valve



Cut away showing the LCP



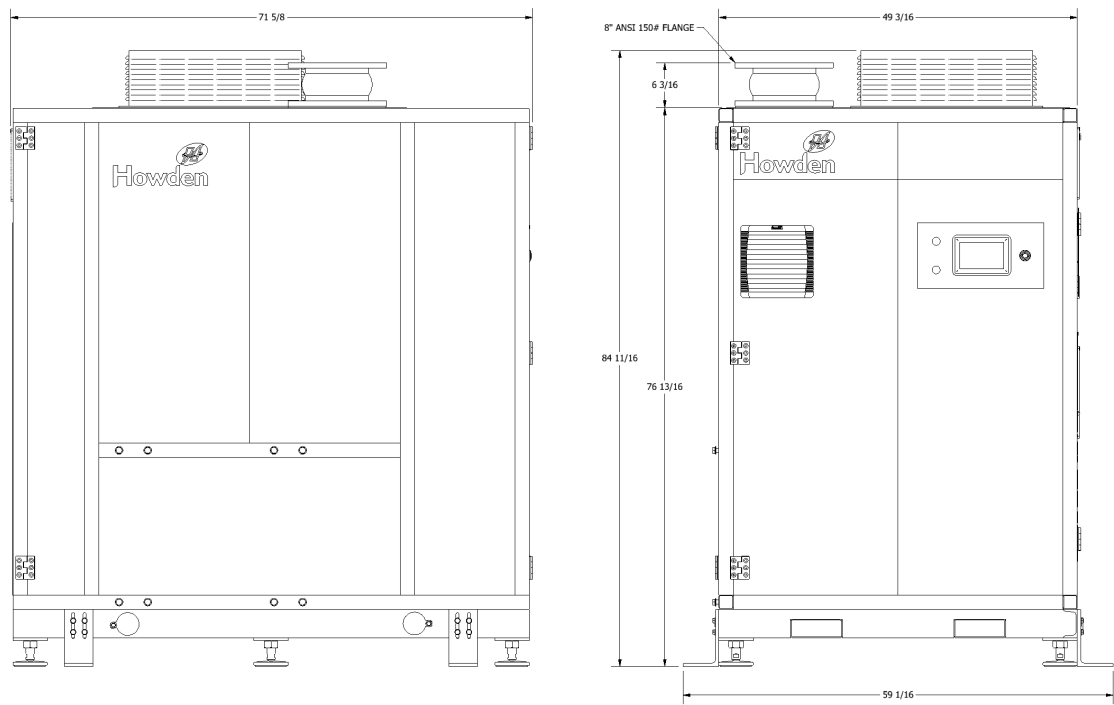
Shows option for ducting away the hot cooling air



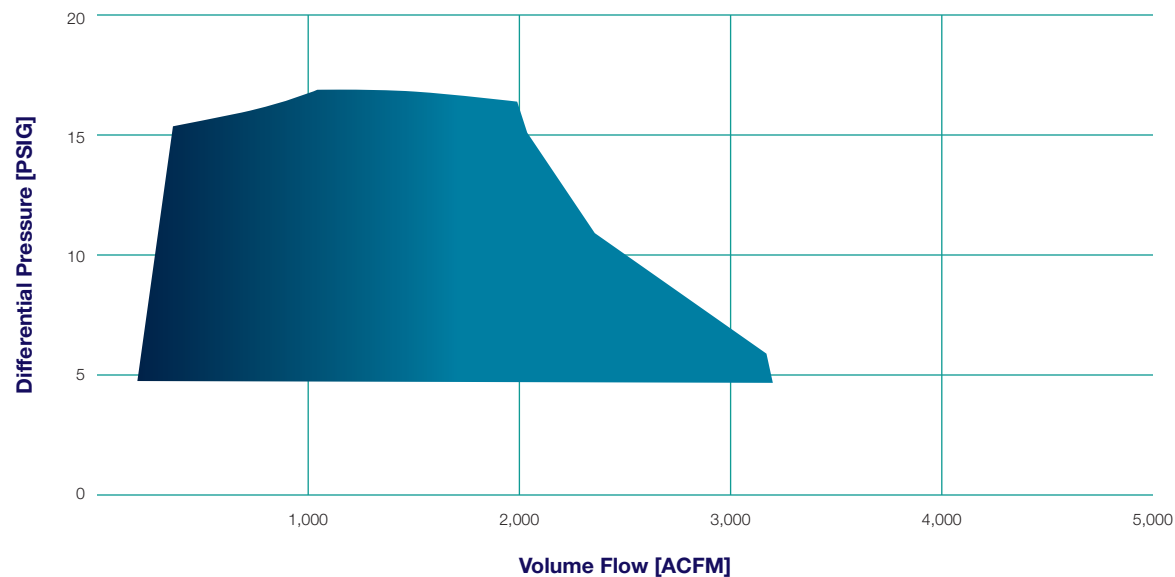
Shows platform for blower/motor service

Dimensional Drawing

- Weight: 5,500 lbs



Performance Range Map



Standard Conditions: Temperature 68 DEGF, Relative Humidity 36%, Barometric Pressure 14.7 PSIA



Enclosure showing the mechanical and LCP sides



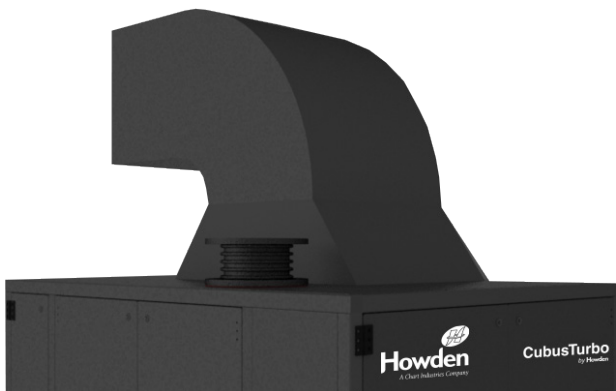
Enclosure showing the process air inlet and electrical sides



Cut away showing the blower/motor & blow-off valve



Cut away showing the LCP



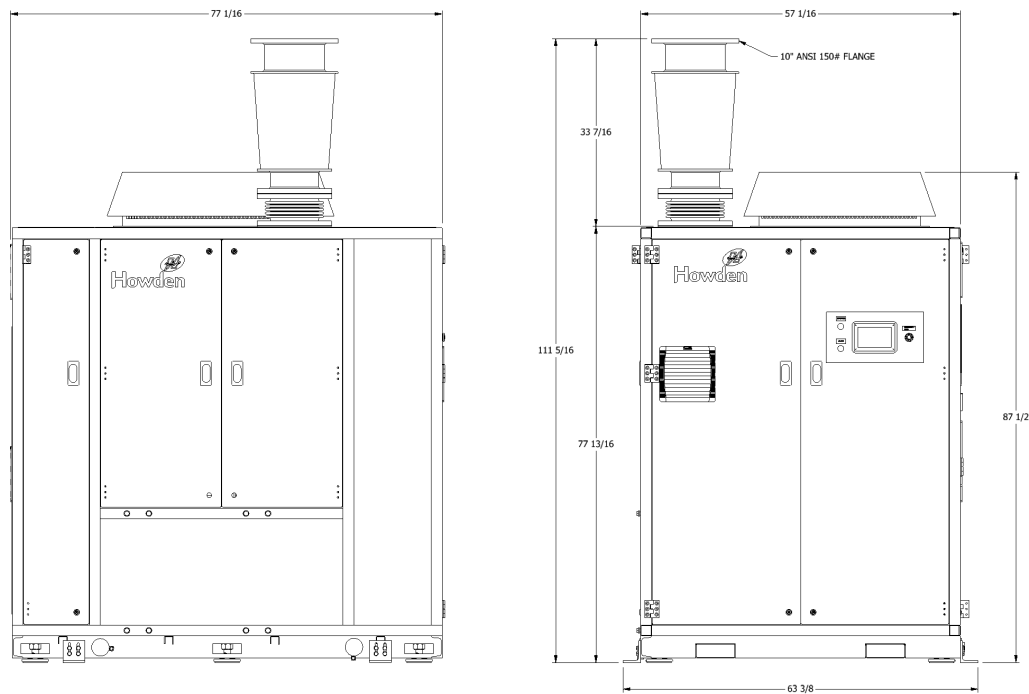
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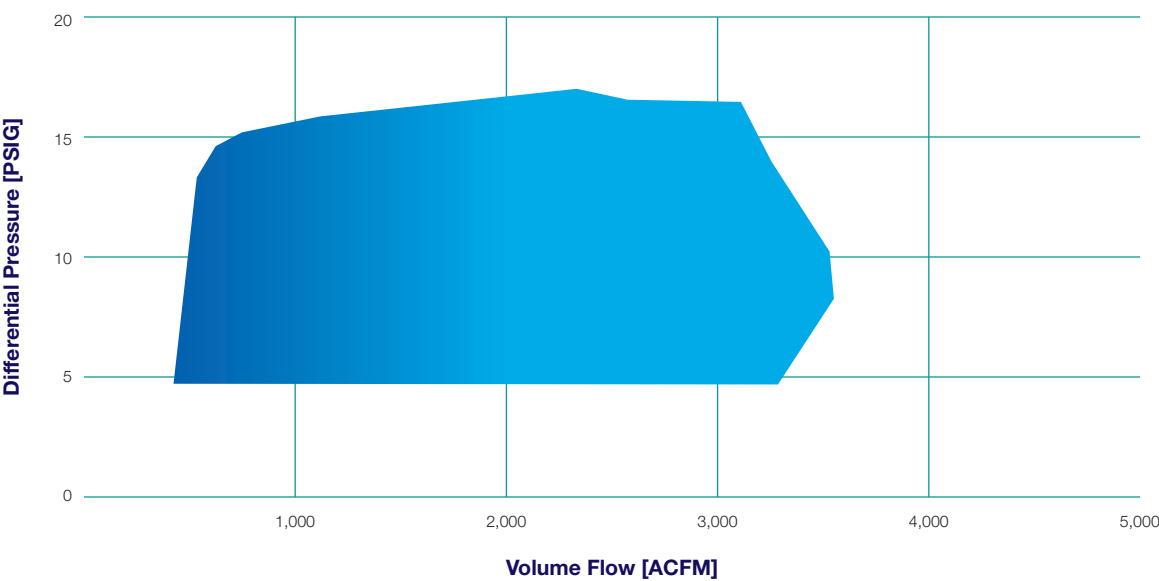
Shows platform for blower/motor service

Dimensional Drawing

- Weight: 7,700 lbs



Performance Range Map



Standard Conditions: Temperature 68 DEGF, Relative Humidity 36%, Barometric Pressure 14.7 PSIA



Enclosure showing the mechanical and LCP sides



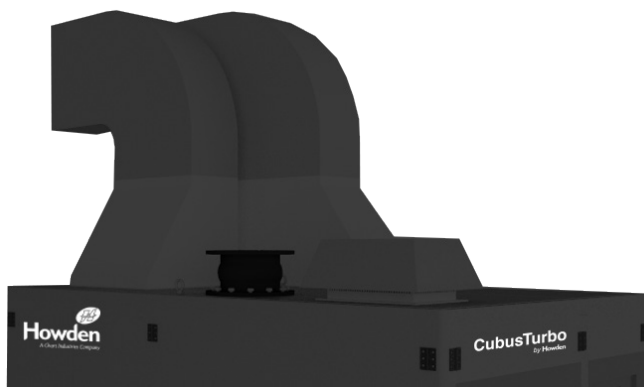
Enclosure showing the process air inlet and electrical sides



Cut away showing the blower/motor & blow-off valve



Cut away showing the LCP



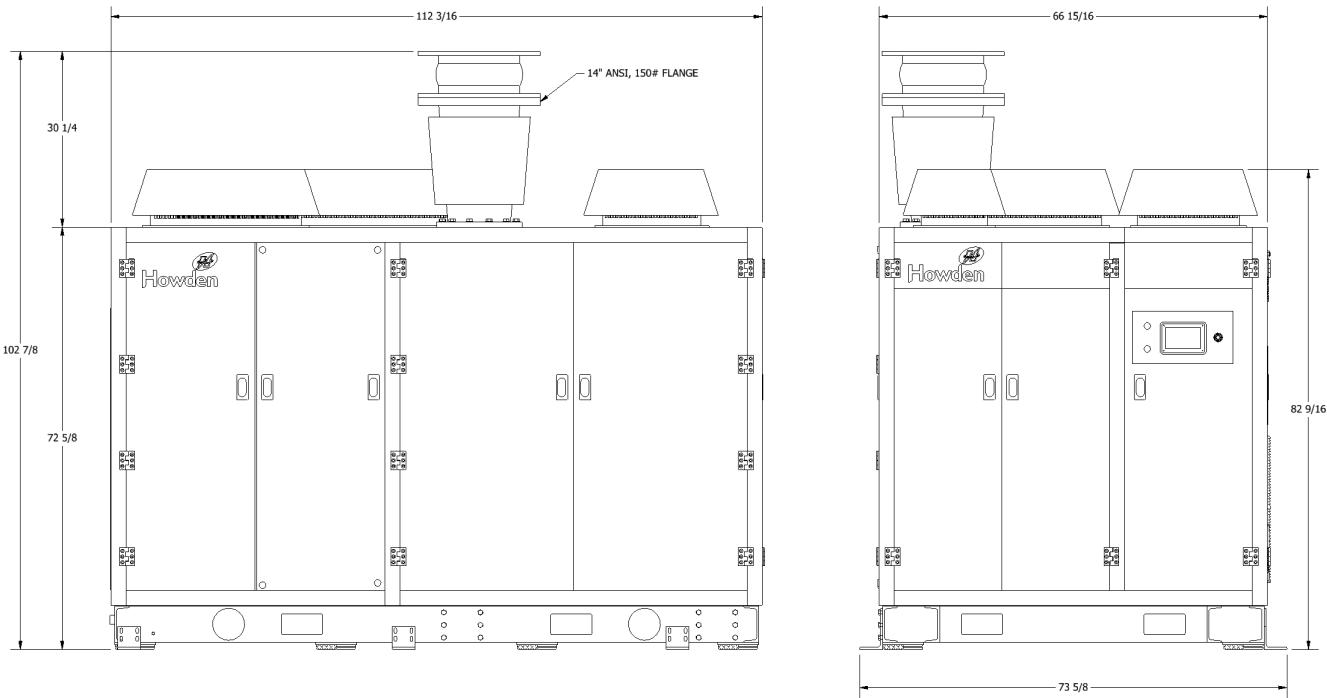
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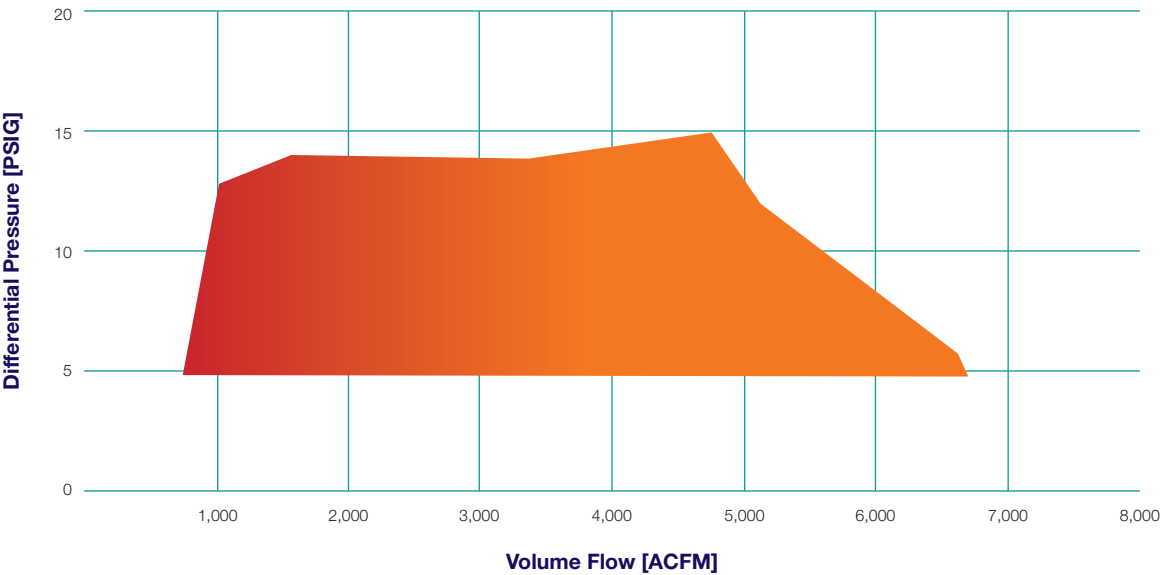
Shows platform for blower/motor service

Dimensional Drawing

- Weight: 8,400 lbs



Performance Range Map



Standard Conditions: Temperature 68 DEGF, Relative Humidity 36%, Barometric Pressure 14.7 PSIA



Enclosure showing the mechanical and LCP sides



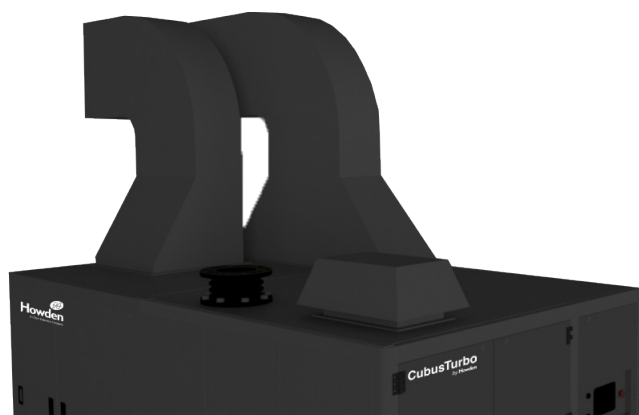
Enclosure showing the process air inlet and electrical sides



Cut away showing the blower/motor & blow-off valve



Cut away showing the LCP



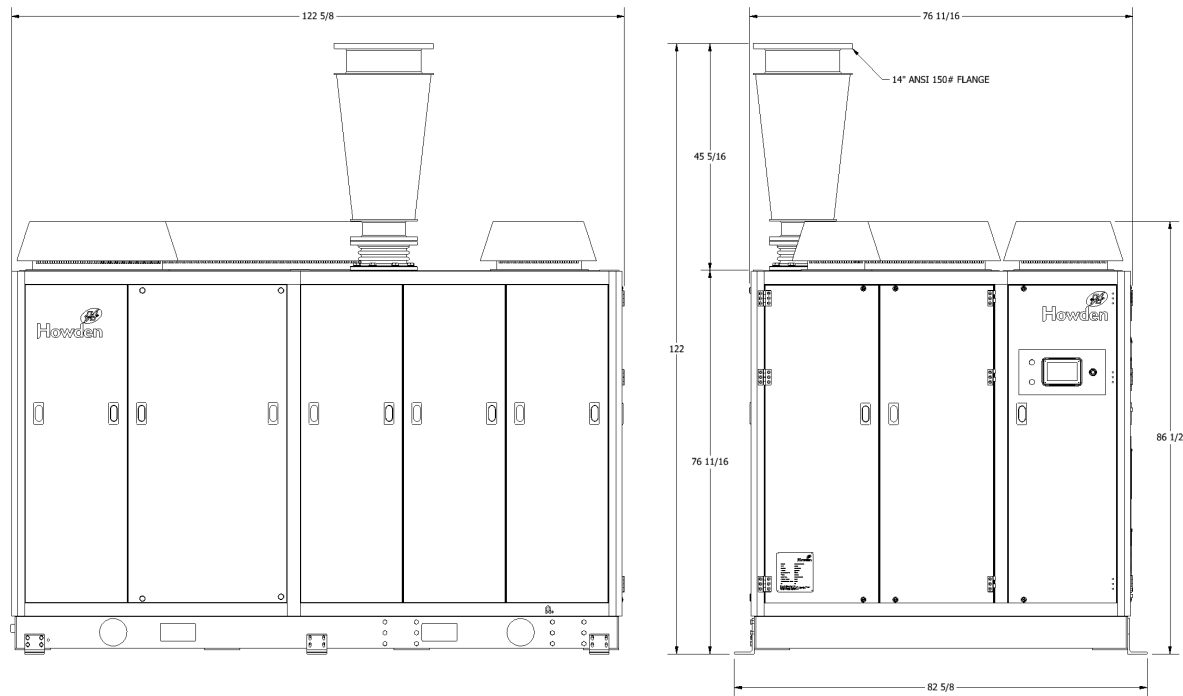
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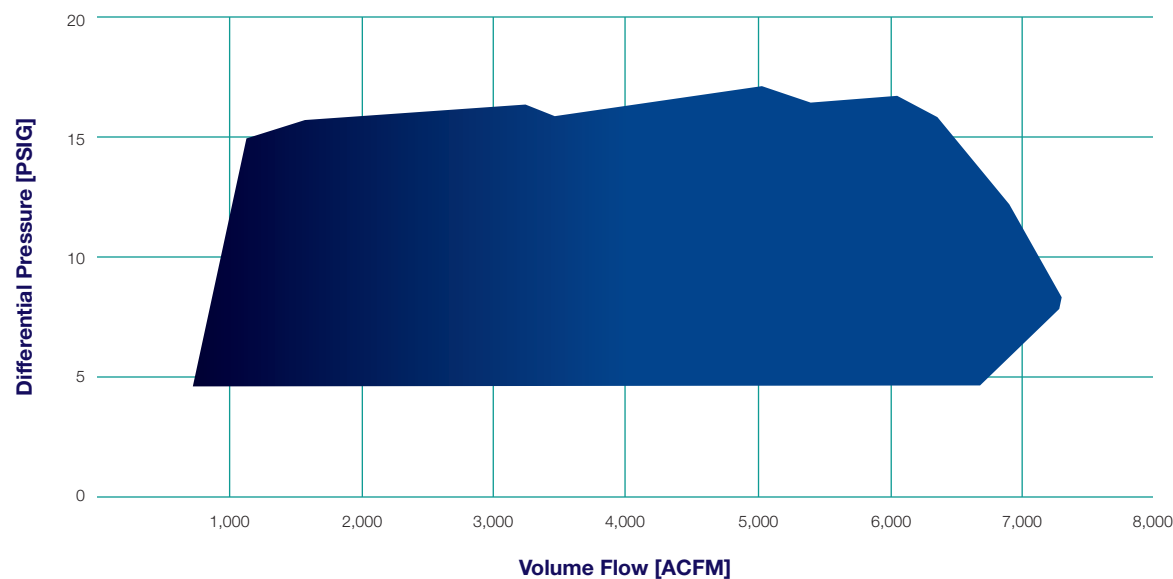
Shows platform for blower/motor service

Dimensional Drawing

- Weight: 9,500 lbs



Performance Range Map



Standard Conditions: Temperature 68 DEGF, Relative Humidity 36%, Barometric Pressure 14.7 PSIA

ChartWater™

ChartWater is a global manufacturer and service provider for municipal water treatment and industrial process applications, offering a comprehensive portfolio of proven and innovative water treatment solutions from Chart Industries, BlueInGreen, AdEdge Water Technologies, and Howden.



Chart Industries

Chart Industries is a leading, independent global manufacturer of highly engineered equipment servicing multiple applications in the Energy, Water, and Industrial Gas markets. For water applications, Chart provides cryogenic storage tanks and vaporizers for liquid oxygen, liquid carbon dioxide, liquid nitrogen, and liquid hydrogen, resulting in the lowest lifecycle cost solution in the market.



BlueInGreen

BlueInGreen is a gas dissolution expert that provides the most efficient method of dissolving gases in water. This efficiency provides the most effective solution for a variety of oxygen, carbon dioxide, and ozone applications using carbon dioxide for pH control, remineralization, and strong acid replacement in industrial wastewater pretreatment and discharge pH permit compliance – and dissolving the highest concentration of ozone for advanced oxidation applications.



AdEdge Water Technologies

AdEdge Water Technologies is a water treatment technology and solution provider specializing in the design, development, fabrication, and supply of water treatment solutions. Using specialty medias, legacy, and innovative technologies, AdEdge can help remove a wide range of contaminants such as PFAS, Arsenic, Iron and Manganese from water.



Howden, a Chart Industries Company

Howden is a global manufacturer of high efficiency blowers and compressors and innovative digital solutions for advanced, efficient smart ambient aeration systems.

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Revolving Around You™