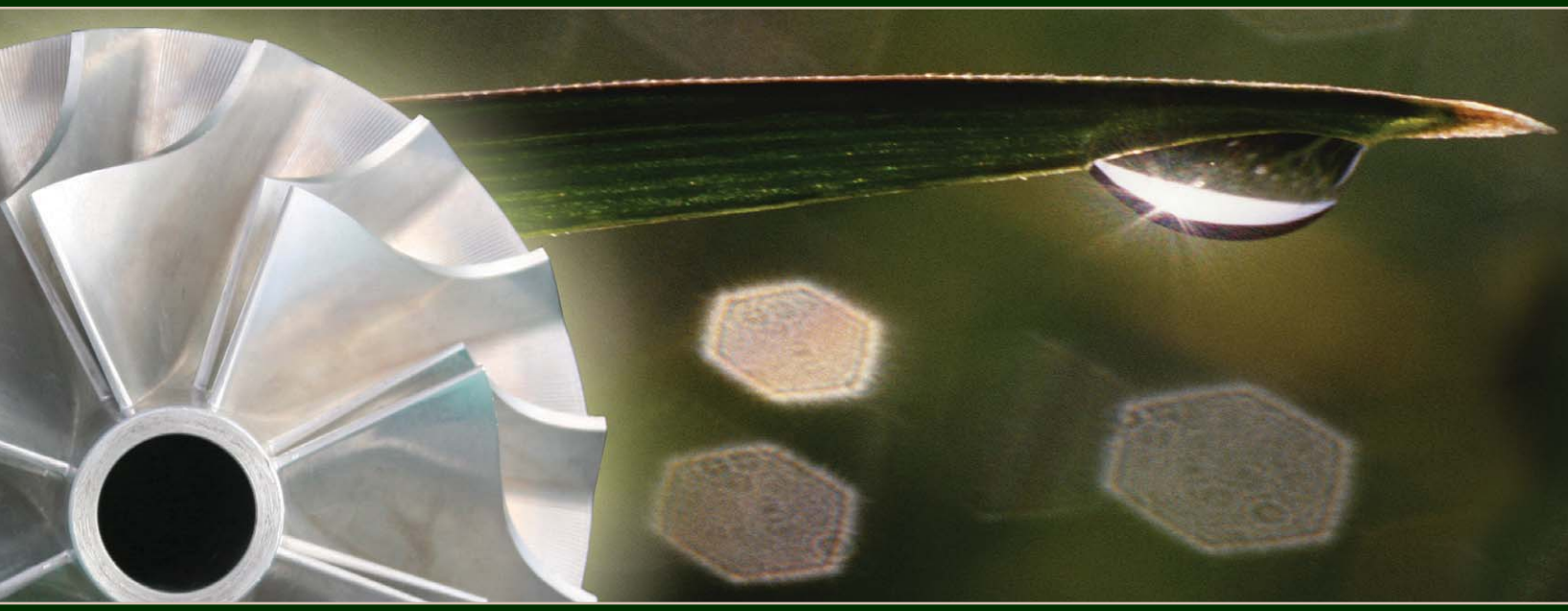
HIGH SPEED TURBO BLOWERS



Innovation | Service | Experience

HIGH SPEED TURBO

HSI HIGH SPEED TURBO

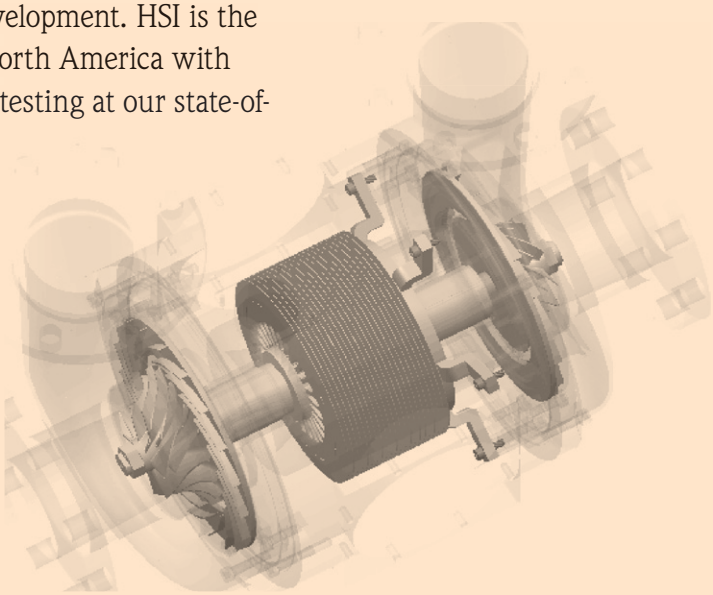
Introducing HSI High Speed Turbo Blowers and Exhausters

What if a blower could…

- Operate 20-40% more energy efficiently than conventional machines?
- Require NO lubrication?
- Require NO maintenance besides inlet filter changes?
- Achieve sound levels below 85 dBA and operate with virtually no vibration?
- Have a simple, yet rugged design?
- Be environmentally friendly?

What if you found this blower with the local service and support that you know and trust?

With 25 years of experience in the market, HSI is the industry leader in technology by providing tomorrow's innovations today with our high speed turbo product. The HT product line currently has over 45 performance configurations ranging from 5 hp to 300 hp (1 to 250kW) and more under development. HSI is the only air bearing turbo manufacturer in North America with design, engineering, manufacturing, and testing at our state-of-the-art facility in Houston, Texas USA.



These revolutionary blower designs incorporate air bearings supported on a single shaft with integrated variable frequency drive, control system and motor. These are all pre-packaged and pre-wired in a single enclosure for simple installation and application. Flow ranges from 10 to 10,000 SCFM (15 to 15,000 nm^3/hr) and pressures to 25 psi (1.7 bar) through the range of operation.

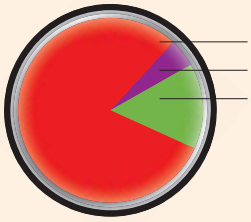
HSI HIGH SPEED TURBO

Shown above: State-of-the-Art blower test stand and customer viewing area

What is Your TRUE Cost of Ownership?

What does efficiency and payback really mean? "Wire to Air Efficiency" is the total cost of power to produce the performance you require. At HSI, we believe efficiency is only what a manufacturer can guarantee; and further what a manufacturer can verify with actual test results. Whether it be on our own ASME PTC-10 Compliant Performance Testing Facility or at your location, HSI is ready to show you real results.

A true total cost of ownership includes power consumption, maintenance, and initial capital costs.



Let us offer a 20 year life cycle analysis on your next project.

POWER SAVING

The HSI Turbo Blower is 20–40% more efficient than conventional blower technologies offering payback on investments in 2 to 3 years from energy savings alone.

LOW MAINTENANCE

NO lubrication, NO alignment and NO scheduled maintenance outside of routine inlet filter changes. This can save you time and money as compared to blower technologies requiring lubrication.

NOISE

Each standard package is fully enclosed and does not exceed 85 dBA per OSHA standards.

INSTALLATION

A compact blower design allows considerable space savings. No special foundation support required and the lightweight design offers easy access without the requirement of large overhead cranes.

CONTROL

Completely integrated controls are pre-engineered as a working system and can be upgraded to communicate with any known protocol for remote operation and monitoring.

INTEGRATION

With three different control modes as standard, this blower can seamlessly operate in parallel with other types of blowers.

COMPLETE PACKAGE

Compressor, motor, variable speed motor starter, pressure relief valve, expansion joint, and control cabinet built in one complete pre-engineered system. Just add electricity and piping.

SERVICE

Simple modular design offers complete replacement parts to be accessed without special tools or training. All in stock and readily available from our factory in Houston, Texas USA.

HIGH SPEED TURBO

Impeller

Highly advanced computation fluid dynamic programming allows for performance design to truly offer an advancement in efficiency.

Each impeller vane configuration is matched with it's own specific volute to optimize aerodynamic efficiency. Matching the specific speed with the diameter of the wheel assures the best aerodynamic efficiency possible.

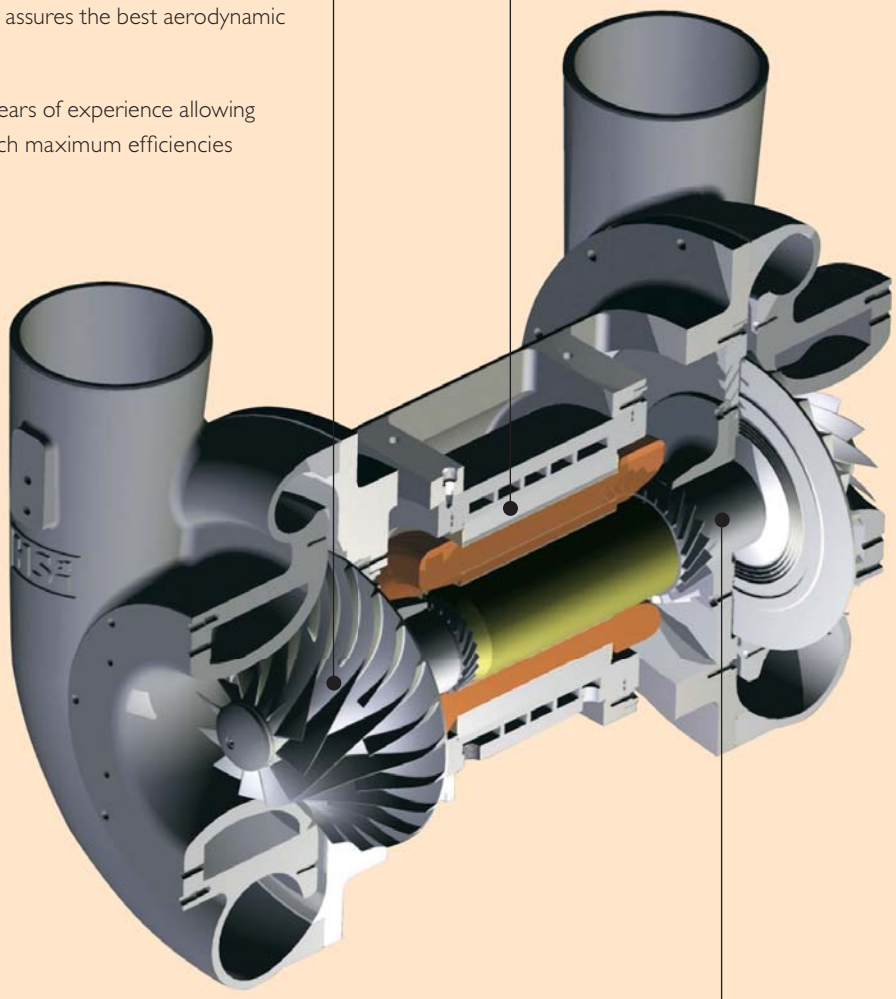
HSI's design team has more than 20 years of experience allowing for custom designed impellers to reach maximum efficiencies possible for any application.

Double suction symmetrical structure

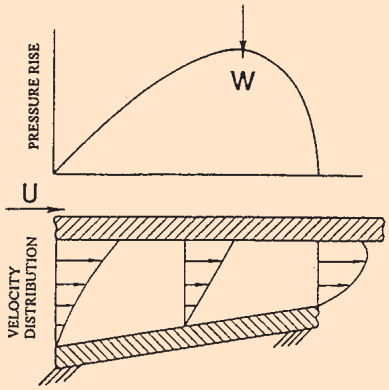
- Impellers at both ends of a common shaft counterbalance thrust load in the axial direction (axial load≈0)
- Superior stability and durability
- Improved efficiency over single impeller designs
- Reduction of local stress or twisting

Motor/Frame

- Highly efficient and reliable motor design
- Specifically designed for high speed service
- Designed for high heat environments
- Air or Liquid cooled



Principle of Air Bearing Technology



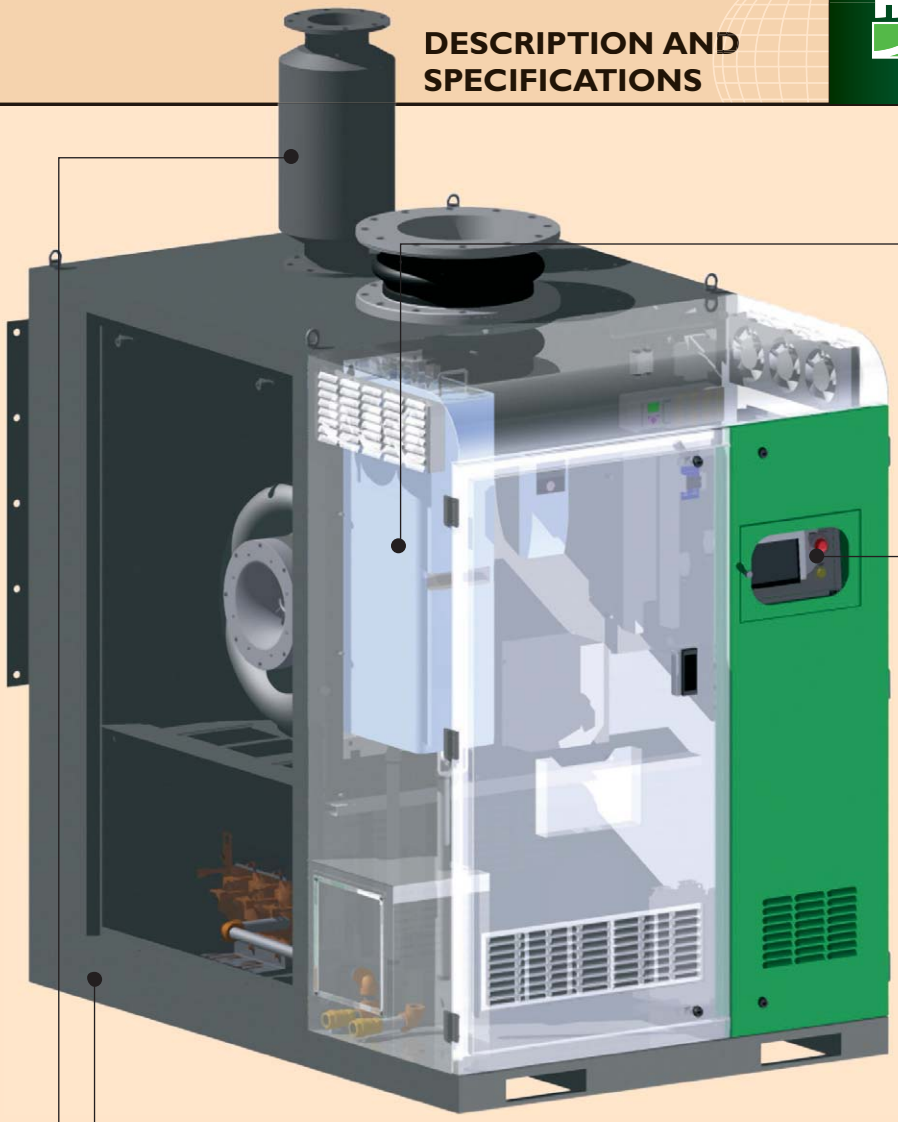
Bearings

Air Bearings

- Individually layered bearings are assembled in the housing to support the shaft
- As the shaft rotates at high speed, an air film is formed between the shaft and the bearings which achieves friction free floating without the use of lubricants
- No additional cooling required
- Suitable for high speed; bearing load capability increases with higher RPM.

Superior durability

- Little or no wear after 35,000 continuous on/off cycles
- Possible to operate under extreme environment (max. 250°C)
- Little to no vibration or noise



Enclosure and Control

Variable Frequency Drive

- Highly efficient design with minimal heat loss
- Specifically tuned to match high speed motor and provide the best efficiency over the entire speed range.
- Stable performance throughout the range of operation
- Lowest inrush current of any motor starter
- Unlimited starts and stops
- Liquid Cooled option for superior performance

Programmable Logic Controller (PLC)

- Integrated with VFD starter
- Complete system monitoring
- Simple touch screen HMI interface
- Protective cover
- Control modes include constant pressure mode, quantitative mode, and proportional mode

Enclosure

- UL/ULC/CSA certified electrical enclosure
- Self ventilating design
- Easy change inlet air filter
- Instant access to every component
- Compact low footprint

Blow Off Valve (BOV)

- Built in automated pressure relief valve for surge protection with enclosure mounted silencer.

Constant Pressure Mode

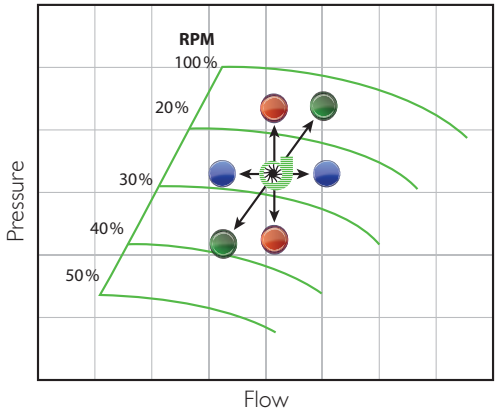
- Pressure: fixed
- Flow: variable

Quantitative Mode

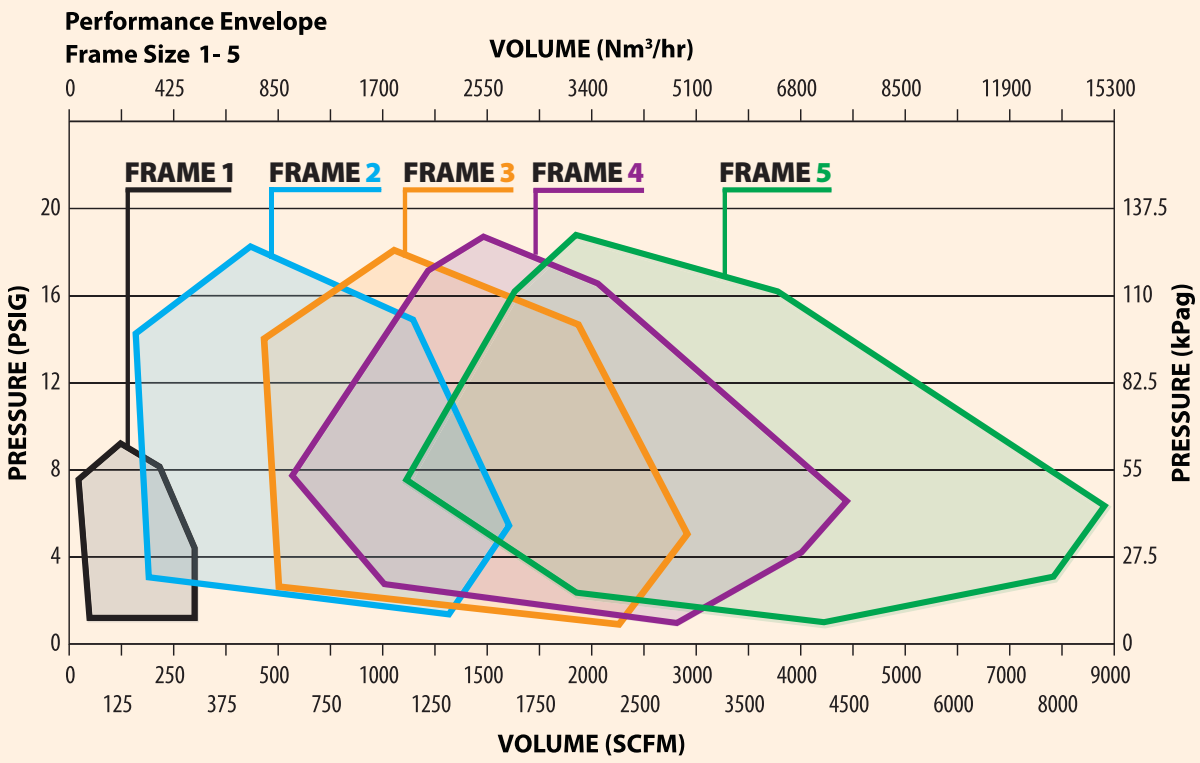
- Pressure: variable
- Flow: fixed

Proportional Mode

- Pressure: variable
- Flow: variable



HT Parallel Configuration



Consult HSI for Series Configurations to 25 PSIG/1.7 Bar

Blower Model	Impeller Configuration	HP Range	KW Range	Type of Motor
Frame 1	Single	5/10 HP	3/8 KW	Induction
Frame 2	Single/Dual	20/30/40/50 HP	15/22/30/37 KW	Induction / Permanent Magnet
Frame 3	Single/Dual	75/100/125 HP	56/75/93 KW	Induction / Permanent Magnet
Frame 4	Dual	125/150/200 HP	93/112/150 KW	Permanent Magnet
Frame 5	Dual	150/200/250/300 HP	112/150/186/225 KW	Permanent Magnet

Custom enclosures available including: Separate blower and control cabinets. Outdoor enclosure modifications.

Common Applications

Water and Wastewater

Basin aeration
Air scouring
Filter backwash systems
Grit chamber aeration
Lagoon aeration
Wastewater treatment
SBR
MBR

General Industrial

Pneumatic conveying
Blow off systems
Fermentation
Galvanization process
Printing systems
Pulp and paper industry
Carbon black
Steel plating
Black liquor recovery
Air knife drying

Power Industry

Flue gas
Desulphurization
Oxidation air
Coal gasification
Fluidized bed

Petroleum & Chemical

Sulphur recovery
Thermal oxidation

Specifications

TECHNICAL DATA

Configuration

Number of impellers	1 or 2 impellers (single, in series or in parallel)
Pressure range	2 To 25 PSIG (.13 to 1.7 bar)
Flow range	10 to 10,000 SCFM (15 to 15,000 nm^3/hr)
Outlet connection	Flanged ASA 125# / ANSI 150# drilling
Inlet filtration	Flanged inlet connection for external filter or Integral filter which is a 10 micron felted synthetic material that is washable
Pressure relief valve	Electric actuated pressure relief valve and integral silencer included in standard package. No external power supply required
Operating speed	8,000 RPM to 75,000 RPM (sub critical operation)
Casing pressure	50 PSIG maximum
Seals (air)	Self contained
Bearings	Air foil – Non contact, Non wearing, Dynamic fluid film – Utilizing air (leaf or journal type)
Lubrication	None required
Drive type	Self contained motor with impeller(s) coupled directly to the shaft
Rotor balance	ISO 1940 G 2.5. Individual impellers and rotating assembly dynamically balanced
Enclosure/electrical	NEMA 12 (standard), NEMA 4/3R and outdoor upgrades available
Electrical code	Electrical cabinet and all electrical components UL/ULC/CSA listed. HSI is a UL 508A certified panel shop
Motor voltage	380/440/480/575 volt, 50 or 60 Hz-3 phase input power. Internal control voltage transformer
Motor HP/KW rating	5 to 300 hp (1 to 250kW)
Motor	High efficiency permanent magnet or induction type motor
Motor starter	Inverter type – variable frequency drive
VFD type	High efficiency 6 pulse drive standard with operating range to 1250 hz operation (optional harmonic filters available)
Noise level	Under 85 dBA per OSHA standards
Control	Programmable logic controller with touch screen human machine interface (standard)
UV protective cover	Included to protect touch screen interface
Network connections	Ethernet, RS232, or DH485 as standard. Optional connections to communicate with any protocol available
Cooling system	Internally self cooled by inlet air or external cooling options available to capture heat to supplement HVAC or water heating.

MATERIALS OF CONSTRUCTION

Blower housing	Aluminum
Impellers	Aluminum
Air bearings	Teflon® coated Inconel®
Blower enclosure	16 gauge sheet metal with synthetic wool sound dampening material
Blower enclosure skid	Heavy duty steel I-beam construction with forklift access ports and top bounded lifting eyes
Enclosure finish	Powder coated with 2 coat epoxy paint standard

HIGH SPEED TURBO BLOWERS

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