Howden
A Chart Industries Company

SG Turbo Blowers

For applications in sulphur recovery
in downstream oil and gas

Revolving Around You™

howden.com

Keeping your process running with **reliable, safe and efficient turbo blowers**

Many gas reserves are rich in hydrogen sulphide (H_2S) and therefore, sulphur. While tighter standards mean gas plants need to achieve higher levels of sulpher removal in order to meet environmental mandates.

Customers are looking for solutions that will meet the required emission standards and minimise capital and operating costs. Howden help through increased reliability and performance as well as reducing complexity to keep costs down. The SG turbo blowers are used to remove and recycle sulphur gases, preventing it reaching the air we breathe. This is achieved by removing sulphur from the acid gases via the Claus process.

Our turbo compressors support the sulphur recovery processes throughout the world. We have experience working with major end-users, licensors and contractors. Our packages provide safe and reliable solutions that are economically attractive and environmentally responsible.

- Original equipment manufacturer
- Largest range blower and compressor products
- Proven experience across extensive references in SRU
- Flexible, adaptable and customisable
- Team of expert engineers with unrivalled applications knowledge
- Lifetime support from conceptual design, FEED, maintenance and site support

Why Howden

The transition to a low carbon economy is one of the great challenges of our time. Howden understands the urgency and is dedicated to being part of the solution. The Howden SG turbo blowers prevent toxins entering the air, causing pollution and acid rain.

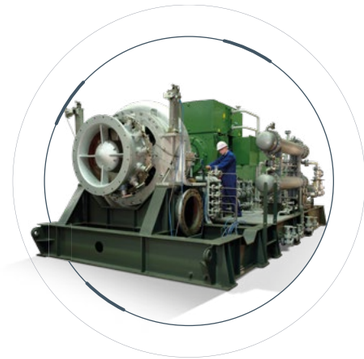
Our SG turbo blower range is cost-effective, flexible, and built for the future.

Howden are one of the world's leading engineering companies in the field of air and has handling. Howden provides full lifecycle support for the highly efficient SG turbo blowers.

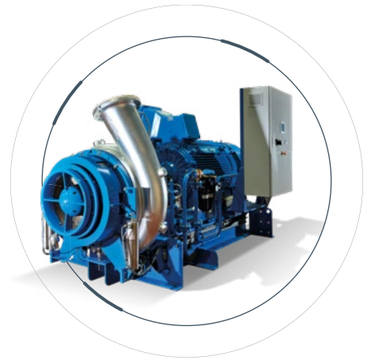
This includes design, manufacture, supply and aftermarket support. Our technology is supporting sulphur recovery applications in the downstream oil and gas industry and is suited for systems requiring end-user and API packaging specifications.

Our SG Turbo blowers offers high flexibility and maximises reliability. Let us implement solutions which meet environmental standards, sustainability concerns, and support the refineries to meet these global challenges.

Howden SG blowers have removed more than 13 million tonnes of sulphur from the atmosphere in the last 10 years.



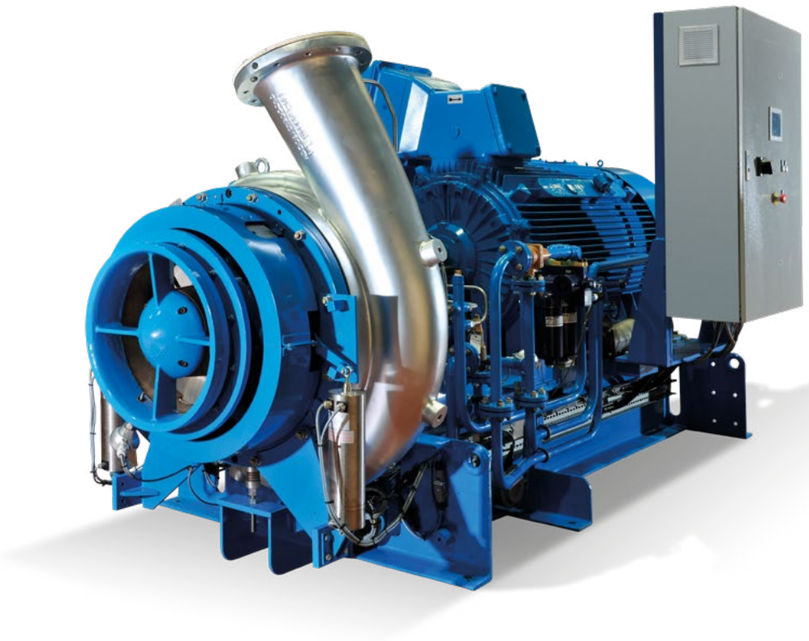
API Turbo blowers



Industrial Turbo blowers

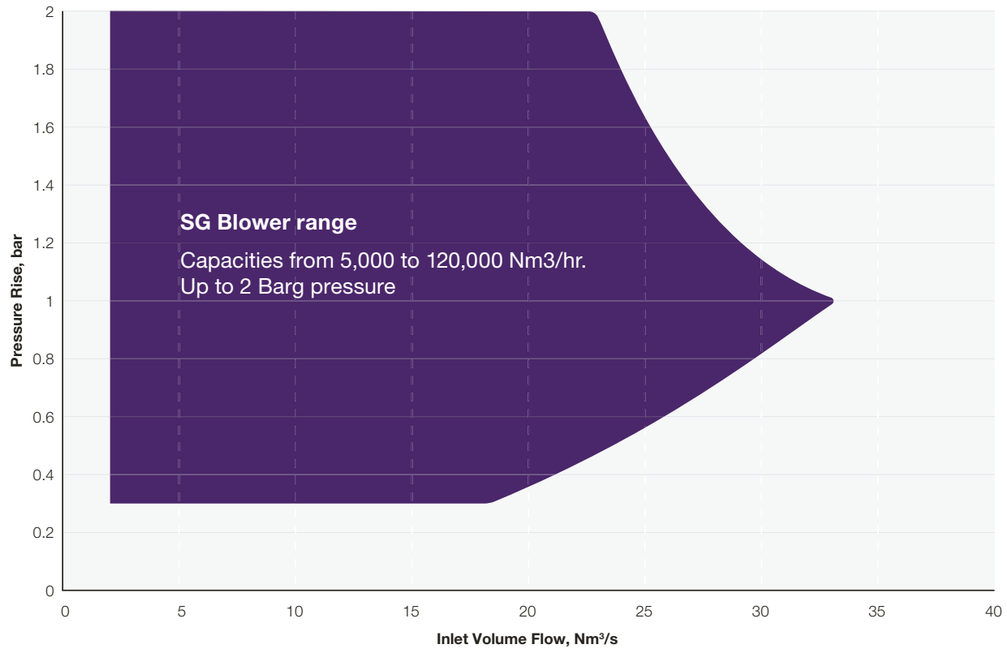
Key product features

Howden turbo blowers provide proven efficient and reliability developed over the last 100 years. The integration of overhung high efficiency impeller, precision gears and high stability bearings result in smooth, maximum power transmission. Pressurised oil lubrication with high integrity protection systems ensures maximum reliability.



- Volute with ultra-high efficiency impeller
- Speed increasing gearbox
- Fixed speed driver, motor or steam turbine does not require and Variable Speed Drive (VSD) panels
- Lube oil system
- Inlet and outlet guide vanes
- Base plate with integral oil tank

Combined vane control advantages and performance envelope



Adaptability

- Howden pioneered Combined Vane Control (CVC) in the 1990's. This is a combination of Inlet Guide Vanes (IGV) and Variable Vane Diffusers (VVD) and results in best efficiency in class
- CVC is the best method for highest performance and safe control demanded by the SRU Class process
- CVC extends and improves machine performance envelope lube oil console
- Maintains high efficiency over wide range of operating conditions
- Increases turn down capacity compared to IGV only machines
- Stable (no surge) turn down with no loss of pressure to 35%
- IGV only machines typically 'blow-off' excess air. This is wasteful and detrimental to the environment

Adaptability

Standard or bespoke

API Standards 617, 672 and 614

Compact skid design or separate lube oil console

Turn down to 35% volume flow

Efficiency

High efficiency designed impeller

Maintains optimum efficiency in all duty points

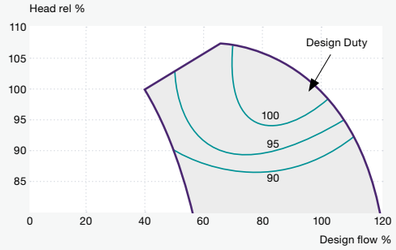
Reliability

Designed for maintainability

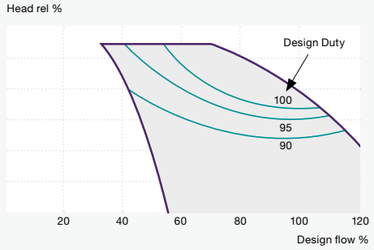
Minimum downtime

Designed to suit all environments

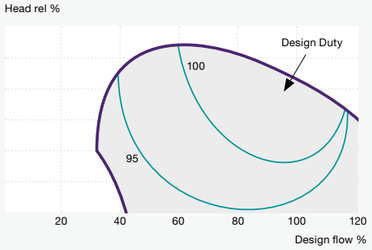
IGV: Inlet Guide Vane Control



IGV: Inlet Guide Vane Control

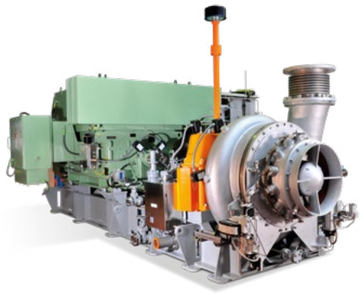


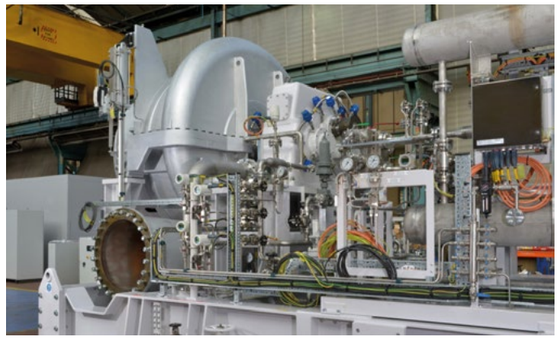
IGV: Inlet Guide Vane Control



Selected references

India





SRU application
6 x API 617 turbo blowers
2 x 1060kW turbine and 1 x 1060kW motor
2 x 725kW turbine and 1 x 725kW motor
AP617 and National standards applicable

Notes
Large impeller diameter
Large flow requirement
Turbine and motor installation
Combined vane control

Turkmenistan

SRU application
8 x SG70 (700mm impeller)
8 x 2200kW zone 2 motor
AP617 and project specs applied

Notes
High pressure rise
Low temperature installation
High flow demand
High power
Combined vane control
CUTR and technical passport

Digital transformation of Howden test studio

The state of the art test suite in our compressor manufacturing facility in Renfrew Scotland, has transformed the equipment testing experience for our customers.

Equipment testing is an essential part of purchasing a Howden blower. Many of our customers observe the blower testing by travelling to our facility, from all over the world, to validate the performance and reliability of their product.

Remote testing

The introduction of the new test studio allows the customers to witness the test of their equipment remotely, from anywhere in the world. The new test studio is equipped with live camera feeds and live trending screens showing the data in real-time, directly from the test bed. All of this data can be accessed on any smart device given there is an internet connection. Providing our customers with the option of remote testing eliminates the requirement to travel, reducing time and cost commitments, making the testing experience more convenient.

Optimising equipment performance

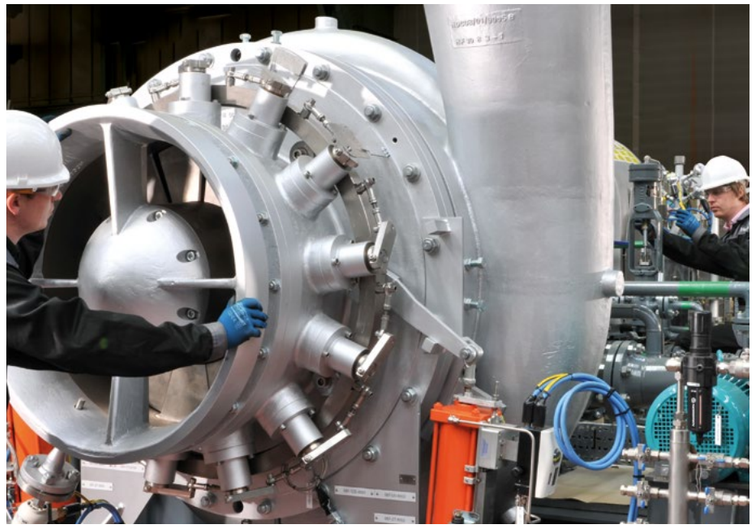
The data coming directly from the test bed is sent to our Uptime portal, where the live data is compared against the expected performance data, using our unique digital twin model. The data gathered using Uptime is now available for analysis in the future. This supports the improvement of engineering design data and product selection software, to bring the product performance closer to the optimum operational efficiency point.

Transforming the test experience with Augmented Reality

Utilising state-of-the-art Augmented Reality (AR) technology allows for a truly transformative test experience. The Test Engineer will complete the live test whilst wearing a Microsoft HoloLens device. On the live video feed, the customer will watch the live test and with the addition of AR, the real-time data values will be augmented on top on the equipment. This provides the customer with the live test and the test values, all available on one screen.

Expert engineering design

With over 1,200 individual turbo blowers supplied and installed worldwide, Howden has extensive knowledge in the process and engineering of these air systems to deliver the optimum performance for your project.



All Howden turbo blowers and compressors bear the European Standard's C.E. mark and comply with International standards and codes including API.

Our quality systems are continually assessed by Lloyds Register and certified to ISO9001:2008, ensuring consistent quality throughout all aspects of the design and manufacture process.

Howden process blowers holds triple certification to the following international standards:

- Quality Management: ISO 9001:2008
- Health and Safety Management: ISO 45001
- Environmental Management: ISO 14001:2004

Product testing

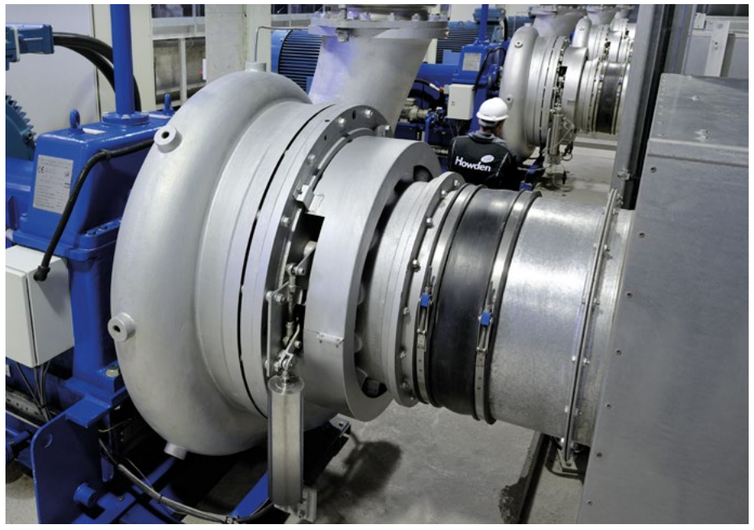
- Comprehensive in-house testing, to API standard, gives confidence that each turbo blower and compressor unit will perform reliably throughout its life.

Testing procedures available include

- Mechanical no-load test
- Standard as part of the Howden Process Blowers programme
- String test
- Optional:
  Performance test
  Complete unit test
  Turndown and surge tests
- Optional:
  To ISO 5389 or
  ASME PTC 10 code

Worldwide lifetime support

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 one of the largest installed bases of blowers in the world. Howden provides a lifelong aftercare service, from supplying original spare parts to maintenance services and engineering troubleshooting.



OEM spare parts

Our highly experienced engineers are available to install, assist in installation, commission the electrical, mechanical and control aspects and also to provide on-site training in maintenance techniques to our customers' own engineers. Our company policy in the area of after sales activities, is one of continuous support through the supply of spare parts for all machinery and its associated ancillary equipment. Full and comprehensive plant records are kept on an almost indefinite basis and, as an example, spare parts are regularly supplied for machinery in excess of 50 years old.

Overview of lifetime support

- Supply of original replacement parts
- Blower/Compressor up-grades and retrofits
- Component and valve repairs
- Field site service
- Engineering troubleshooting
- Maintenance contracts
- Re-commissioning
- Customer operator training
- Remote monitoring
- Global sourcing

Typical spare parts include

- Bearings
- Labyrinth seals
- Bearing oil seals
- Oil filter elements
- Air filter elements

The Howden advantage

Peace of mind

You can depend on Howden to guarantee your blower operates safety and reliably in the field, will performing flawlessly in the most demanding situations.

We understand that minimising down-time and maximising the reliability of your equipment is critical. Howden's focus is to ensure our build quality and attention to detail exceeds your expectations.

Health and safety

Effective management of Environment, Health and Safety is a way of life in Howden.

Howden's Global Environment Health and Safety (EHS) department work through a business-wide management system to ensure Howden adheres to common Environmental Health and Safety performance indicators.

Our remit includes running training sessions, driving the use of our EHS Hub as a management tool and embedding a Cross Audit Programme throughout Howden. The majority of our manufacturing and servicing operations worldwide are certified to both ISO 14001 and ISO 45001.

In addition to our externally certified EHS management systems, Howden has, since 2010, operated an extensive EHS Cross Audit Programme worldwide.

Turbo blower technology with a digital advantage

Howden offers unparalleled expertise in every application where reliable, round the clock operation is paramount.

With Howden's digital solution Uptime, and our in-depth knowledge of blower technology, we can increase blower reliability, predict maintenance requirements and optimise performance on demand.

Click here to visit our website

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