

Howden's range of Kühnle, Kopp & Kausch[®] customised process gas turbo compressors

for chemical and
petrochemical applications



The chemical and petrochemical industries require highest availability and most reliable performance of rotating equipment without compromises regarding safety.

Howden is your trusted partner to ensure safe and efficient gas handling.

The majority of our Howden compressors are running under very demanding operating conditions. Our compressor design is characterised by a very robust rotor and bearing design that has proven as extraordinarily reliable, even when handling sticky, corrosive and erosive gases. Our semi-open impellers with backward curved three-dimensional blades provide highest aerodynamic efficiency.

As one of the leading turbo machinery manufacturers with over 100 years of experience, continuous development and a fleet of more than 4,000 installed turbo compressors and blowers used for a wide range of applications in the metallurgical, oil and gas, and chemical industries, we are your prime partner to make gas handling processes more efficient and help you to reduce your total cost of ownership.

Range of applications includes but is not limited to:

- Polyethylene (PE – HDPE / LDPE)
- Polypropylene (PP)
- Oxo Alcohol
- Ethylene oxide (EO)/Ethylene glycol (EG)
- Ammonia
- Acrylic Acid
- Coal to Liquid (CTL), Coal to Gas (CTG), Coal to Chemical (CTC)
- Caprolactam
- Synthetic Natural Gas (SNG)
- Sulphuric Acid Plants (SAP)
- Spent Acid Recovery (SAR)
- Sulphur Recovery Units (SRU)
- Methyl Methacrylate (MMA)
- Maleic Anhydride (MA)
- Phthalic Anhydride (PA)
- Evaporation



In order to serve a wide range of process gas applications, the Howden Kühnle, Kopp & Kausch SF and SFG turbo compressor series are available for handling process gases up to 50 bar (g).

Kühnle, Kopp & Kausch

Turbo compressors for process gas applications

Each compressor train is fully designed, engineered and manufactured in our factory in Frankenthal, Germany. Our high level in-house manufacturing and testing capabilities ensure highest quality of our turbo compressors.

The collaboration with our Customers begins at the early feasibility design stage, continues through equipment delivery and plant commissioning, and extends through our full equipment lifetime aftermarket assistance.

Kühnle, Kopp & Kausch turbo compressors for process gas applications are available in two arrangements as shown below.



Centrifugal turbo compressor

Integrally geared design

- Single- or two-stage compressor with semi-open impeller
- Impeller in overhung design, mounted directly onto the pinion shaft of the gearbox
- Design as per API 617 Part 1 & 3 (API 672 for air service available)
- Preferred solution for demanding duties in process gas or air service applications, even in harsh environments

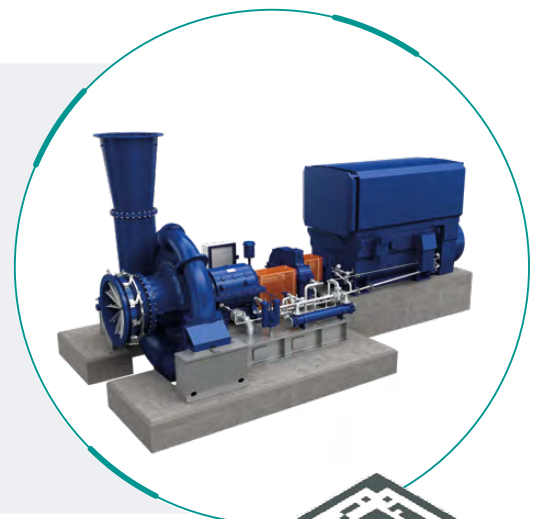


Open or download **Vuforia App** and scan QR code to open Augmented Reality (AR) model of machine

Centrifugal turbo compressor

Non-integrally geared design

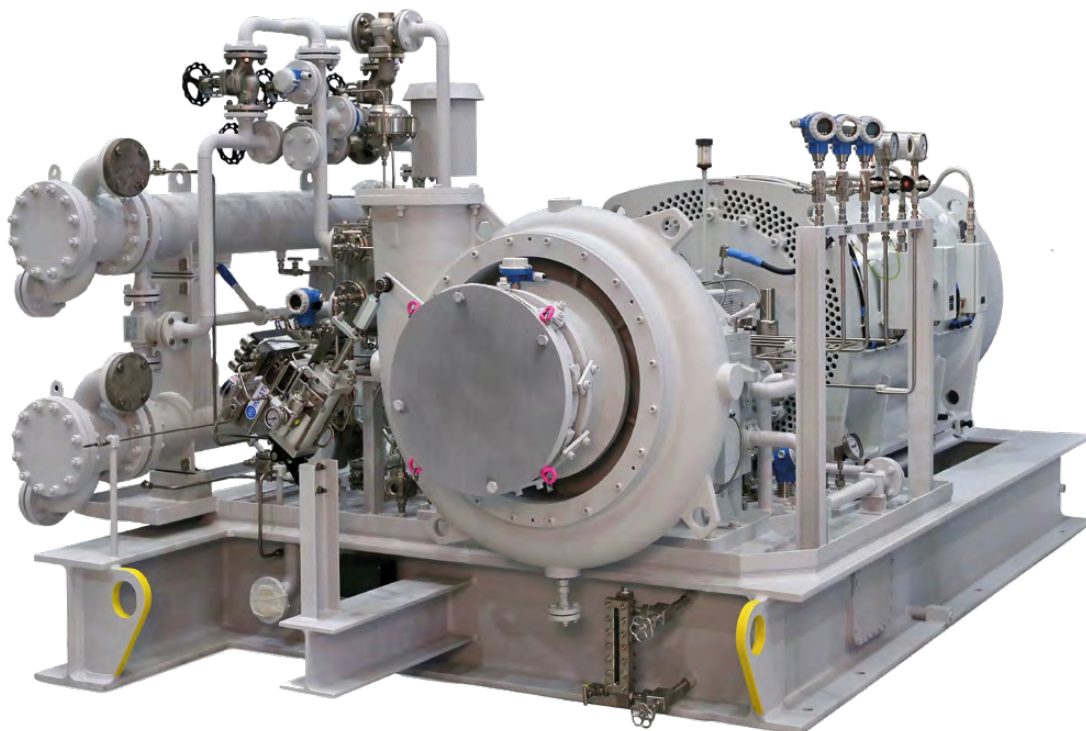
- Single-stage turbo compressor with semi-open impeller
- Impeller in overhung design, supported by a separate bearing pedestal to provide highest rigidity and optimised rotor-dynamic behaviour
- Design as per API 617 Part 1 & 2 serves the most demanding duties in process gas applications – especially when handling very sticky or extremely erosive gases



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Key features

- Semi-open impeller in 3D-design and casted compressor casing
- Material selection according to process requirements
- Gearbox design complying with AGMA, API or DIN EN requirements
- Various shaft seals available (Dry gas seals or restrictive carbon rings/turbo labyrinth seal)
- Seal gas panels designed according to API 614 or API 692
- Spacer type coupling comply with API 671
- Oil lubrication system is either integrated in the base frame (API 614, Part 3) or provided as a separate lube oil unit (API 614, Part 2)
- Driver: Electric motor or steam turbine



Technical data

Actual volume flow	m ³ /h	1,500 up to 200,000
Design pressure	bar g	Up to 50
Temperatures	°C	-150 up to 500
Speeds	rpm	Up to 40,000
Head	kJ/kg	Up to 130 per stage
Pressure ratio	—	Up to 3.0 per stage

Our in-house capabilities

- 5-axis milling machine for impeller production
- Hirth-type serration grinding centre
- Gearbox manufacturing centre
- Compressor test centre for mechanical and performance testing complying with ASME PTC-10 Type 2
- Certified high quality management system (ISO 9001, BS OHSAS 18001, etc.)



Highest aerodynamic efficiency



Low life cycle costs



Easy installation and easy access for maintenance



Highest availability based on API design

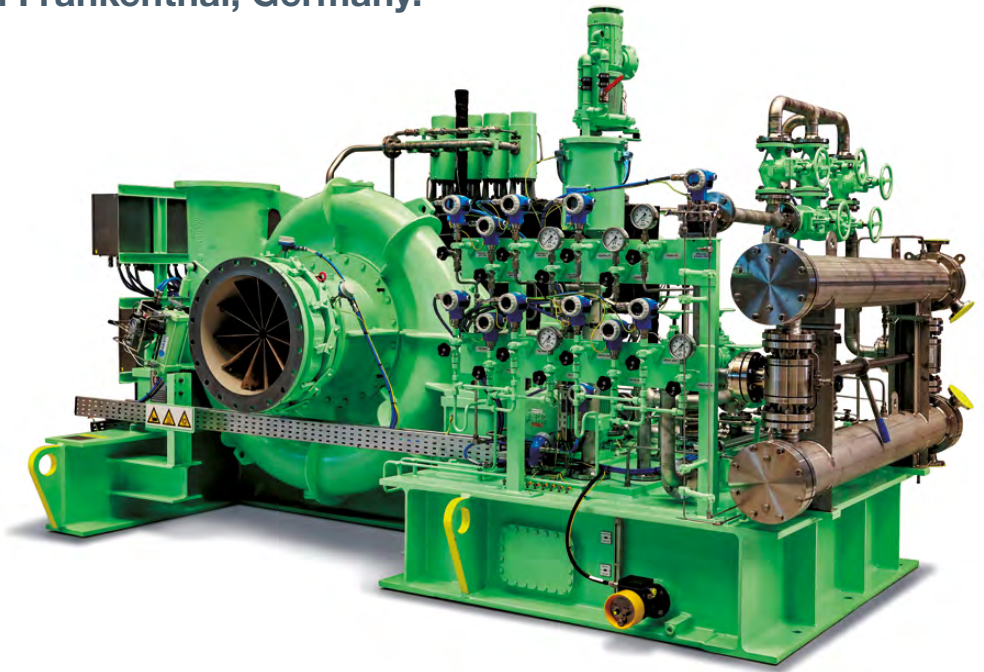


Widest performance envelope on the market

The Howden advantage

We produce high quality turbo compressors with market leading efficiencies at our in-house manufacturing facility in Frankenthal, Germany.

Our team of specialists in aerodynamics, design, manufacturing, mechanical engineering and testing collaborate throughout the process to ensure that we deliver long-term value for your most demanding and process critical requirements.



Your driver of choice

Our turbo compressors can be equipped with electric motors, or – if steam is available – with our very own in-house Kühnle, Kopp & Kausch or Peter Brotherhood (PB) steam turbines.

If the operating parameters are suitable, compressor and steam turbine can even run at the same speed – which allows the machine to operate without gearbox and with maximum efficiency. This does not only result in lower investment costs, but also brings additional OPEX savings.

Global presence, local service

Our regional offices develop close relationships with customers and end users, ensuring projects are clearly defined and contracts are successfully achieved.

Our regional teams have a clear view of challenges specific to the metallurgical, oil and gas and chemical industries and the local environment. Our aftermarket support is dedicated to maintaining, and where possible enhancing, product performance and extending the life of your operation.

Exceeding safety and environmental standards

As a number one priority, every parameter is carefully considered to ensure site and operators safety.

Our experts have extensive knowledge of designing products and services to ensure that we not only match, but exceed your environmental and safety standards, increase energy efficiency and reduce gas emission.

Howden Uptime

Our unique digital solution

Howden has been supplying robust, highly reliable products for the metallurgical, oil and gas and chemical industries for over a century and is combining our exceptional product knowledge and OEM expertise with a

unique data driven advantage. This offers our customers an invaluable insight into the performance of their rotating equipment that will increase the availability and reliability of critical assets and extend operational life.





We are committed
to delivering
confidence, security
and complete peace
of mind to every
Howden customer.

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