

Diaphragm Compressors

Turnkey installations for clean and hermetically isolated gas compression



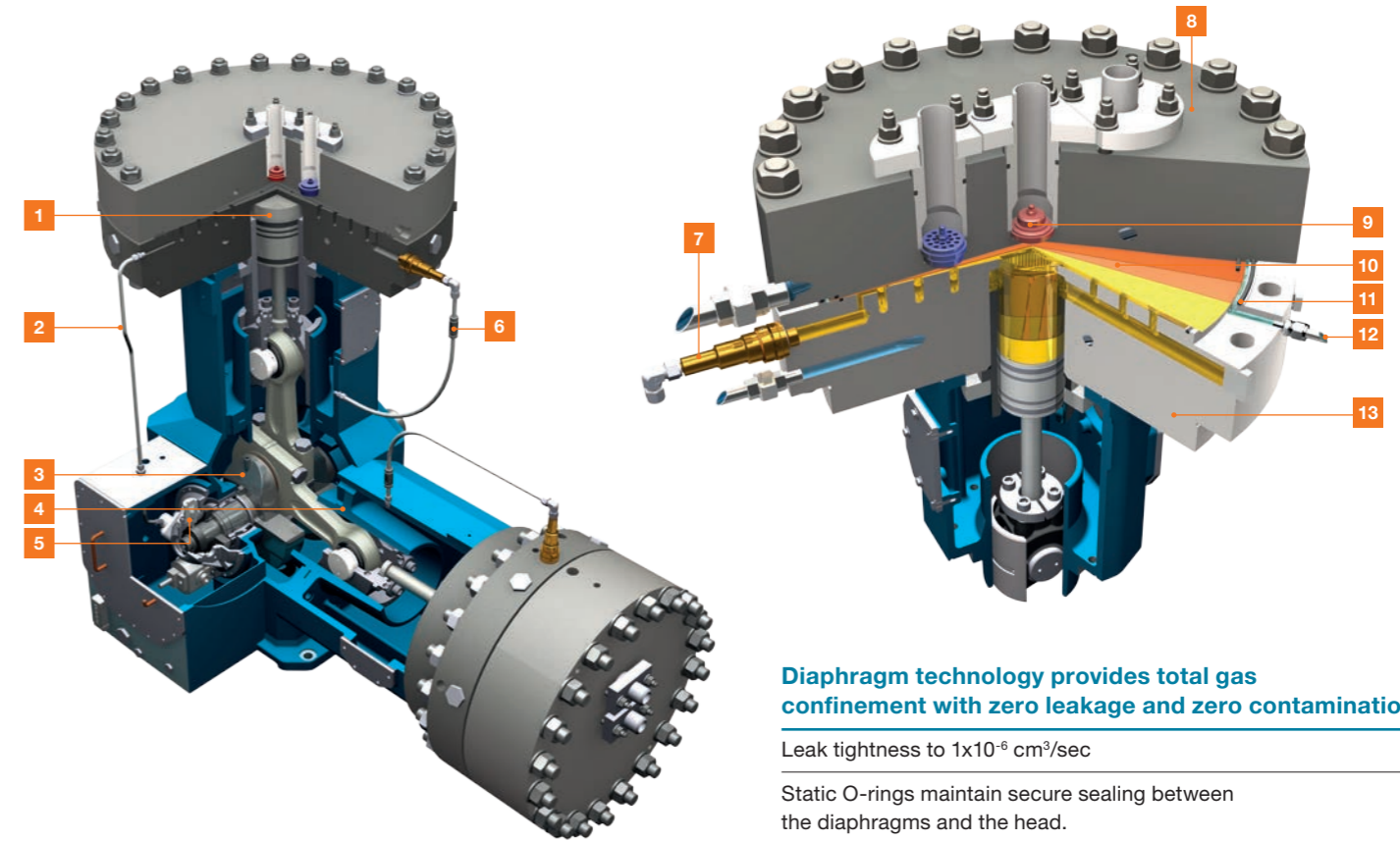
Advanced technology and robust engineering that delivers high pressure, contamination-free gas compression.



Pressure	up to 3,000 bar	43, 500 psi
Flow	up to 1,200 m ³ /hr	706 cfm
Power	up to 1,300 Kw	1,740 hp
Speed	from 200 – 750 rpm	

For more than 160 years, Howden has built a worldwide reputation for innovative air and gas handling technology, and for engineering of the highest quality. From breakthrough inventions like the diaphragm compressor, the screw compressor or the rotary heat exchanger to our philosophy of continual product development, everything we do is based on considerable applications knowledge and a real understanding of the needs of our customers. Today, our state-of-the-art diaphragm compressor range is an important part of Howden's compressor product portfolio.

Revolving Around You™



Diaphragm technology provides total gas confinement with zero leakage and zero contamination.

Leak tightness to 1×10^{-6} cm³/sec

Static O-rings maintain secure sealing between the diaphragms and the head.

1. Crosshead-piston assembly	6. Oil limiter return circuit	11. Static contacts and o-ring seals
2. Oil injection circuit	7. Oil pressure limiter	12. Leak detection collection
3. Crankshaft	8. High grade material gas plate	13. Oil plate
4. Connecting rod	9. Gas valves	
5. Oil compensating pump	10. Long life anti-friction diaphragm set	

The Howden reciprocating diaphragm compressor

Hermetically sealed, continuous leak-free operation.

The diaphragm compressor was invented by Henri Corblin in 1916 to meet the need for a powerful compressor that completely separated the gas under compression from the rest of the mechanism. Today, Howden produces Burton Corblin® compressors for the worldwide market.

The compression chamber is formed by two concave circular plates, fixed face to face. A flexible diaphragm of three metal discs is placed between the two concave surfaces, and the assembly is tightly bolted together to seal the outer edge, forming two entirely separate chambers.

As a piston forces oil in and out of one chamber, the diaphragm oscillates to move process gas into and out of the other chamber. The gas plate contains a valve system that controls flow and pressure, as well as channels for circulating coolant water.

Diaphragm compressor technology brings several unique advantages

Peripheral seals securely confine gas in the head, eliminating any environmental or human risk from toxic, explosive or radioactive gas leakage.

The process gas is completely separate from the piston cylinder, so **rod packing or purge systems are not required.**

Leak tight construction to 1×10^{-6} cm³/sec prevents gas losses and makes contamination impossible.

Maintenance demands are minimal.

Head cooling water consumption is extremely low.

Technical challenges are dealt with at the design stage using simulation software that models gas mixture behaviour.

High compression ratios of up to 1:20 can be achieved.

Compact, high-ratio vertical configuration reduces floorspace costs.

Heavy duty frames are manufactured to API618 standards for high reliability and availability.

Our fail-safe **Head Integrity Detection System** continually monitors diaphragm status, stopping the compressor and totally containing the process gas if integrity is breached.

We use high-quality materials appropriate to the process gas, and can supply compressors suitable for any gas. NACE certification can be supplied if required.

Low noise operation, typically below 85dBA, removes any need for acoustic enclosures, reducing cost and saving space.

More information available on request.

Custom designed for ultra-safe continuous operation

Manufactured to precisely match your operations and environmental conditions for constant peak performance.

Throughout the world, many hundreds of Burton Corblin® diaphragm compressor packages operate where complete gas isolation is essential. They are the first choice in production plants and laboratories handling high purity, rare, toxic, flammable, corrosive, explosive or radioactive gases. The compact high pressure units are perfect where space is limited. And, because each one is custom designed to meet all area protection requirements, they offer the best security levels available.

As air and gas handling specialists with vast knowledge of the applications we serve, we have a considerable reputation for solving complex operational challenges. And, as a global organisation, we understand the needs of local and national regulations.

Dealing with Howden has many benefits

We can provide expert advice on the best technology for each situation, and tender for any or all of the units in projects requiring different types of compressor.

We can supply fully assembled and tested skid mounted units for turnkey installation.

Every proposal meets all applicable regulatory frameworks.

Our extensive experience, covering various sectors and applications, enables us to match specific site and customer requirements.

Our capabilities are demonstrated by the number and variety of Howden diaphragm compressors in constant everyday use.

We can provide fast, expert advice and support anywhere in the world.

We are highly experienced in meeting the demanding standards and regulations of the oil & gas, power and industrial sectors.

Our network of local service centres ensures that reliability and availability are never compromised.



Petrochemical

The important differences in petrochemical applications, from gas composition to licensing constraints, make our ability to custom-design for specific needs and site conditions enormously valuable. Whatever the specification, our compressors will deliver long-term, heavy duty use. Designed to API618 standards, our reciprocating compressor packages for dry gases are the optimum choice for safe, hermetic operation in hazardous areas.



Refining

Our diaphragm compressors are widely used in alkylation, catalytic reforming, isomerisation and many other refinery processes. They offer absolute reliability in roles such as ensuring the permanent feed of H₂, HC gas recycling, and N₂ injection for reactors' critical start and stop phases. Our packages are fully certified to the exacting criteria of API618 and approved for use in hazardous areas.



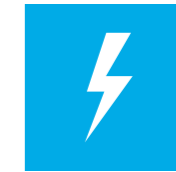
Industrial

Diaphragm compressors are the optimum choice for a variety of important industrial applications requiring clean gas at high pressures. They are ideal for either continuous running or tasks requiring intermittent operation, and can be supplied with flow, temperature and pressure regulation equipment connected to local control rooms. Each package is individually tailored to its specific duties and site conditions, and offers long-term problem free service.



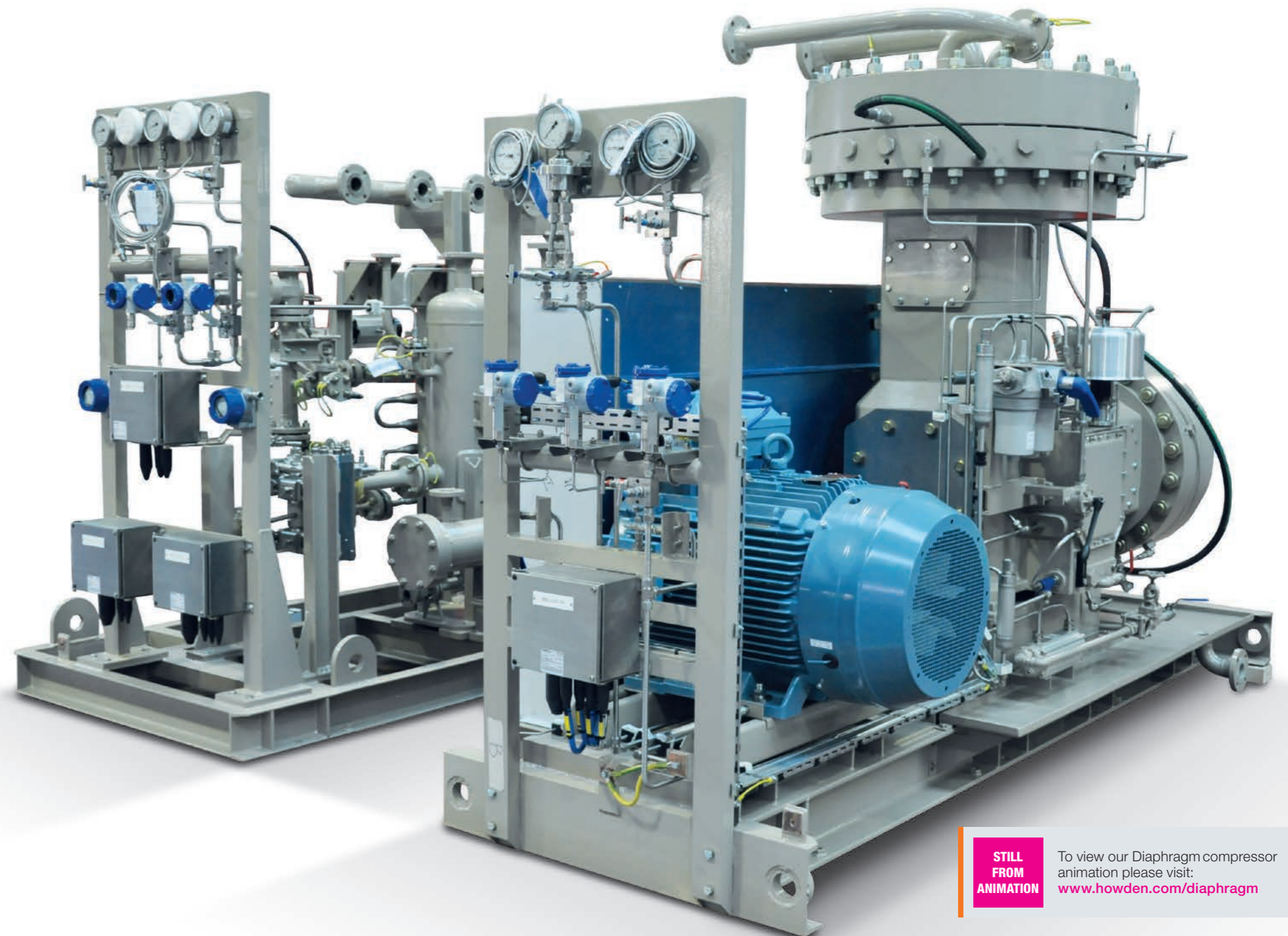
Chemicals

Process gas handling in the chemical industry demands the highest levels of purity. Our experience across a wide variety of gas mixtures, including extremely corrosive compositions, enables us to select the construction materials that will provide the most durable and safe long-term service for each individual application.



Power

Since the earliest days of nuclear power, our diaphragm compressors have been the preferred choice of designers and constructors of nuclear power stations. With applications in H₂ storage, fuel enrichment and other processes, they offer absolutely safe containment of radioactive gases and have been proven over several decades of effective, efficient and problem-free operation.



STILL FROM ANIMATION

To view our Diaphragm compressor animation please visit: www.howden.com/diaphragm

Complete turnkey service from design to commissioning

Howden skid-mounted compressor packages offer a fast, economic procurement process from specification to safe operation.

Our turnkey service removes the obstacles and delays between identifying the need for a diaphragm compressor and having the completed package fully operational and integrated into your processes and control mechanisms.

We use computer modelling techniques to simulate the behaviour of the specific gas under compression, taking account of the exact composition and temperatures used in your processes. From the data this produces, we define the compressor specification and the package design. Our software can replicate all types of gases, including the most complex mixtures, and its accuracy has been proven over years of successful manufacturing.

The finished compressor is skid mounted with all of the ancillary equipment required, and fully tested in the factory before being shipped to your site, installed, re-tested and commissioned.

Turnkey packages provide the best route to diaphragm compressor procurement

Every project begins with a meticulous feasibility analysis, endorsed by reference lists citing similar applications and technologies, to optimise the design at the earliest stage.

The package is designed as an integrated system that matches customer specifications in every detail, and meets all local and international regulations and guidelines including those of NACE, ATEX, EC Marking, ASME, API, GOST, KHK, SQI and KGGs.

Every part of the package is selected or adapted to deliver the specified performance.

The skid-mounted unit includes all necessary pipework, motor and instrumentation, ready for rapid connection on-site.

Our experienced engineers ensure that every unit is safely and properly installed and commissioned, and confirm that it delivers the expected performance and fully meets its specification.

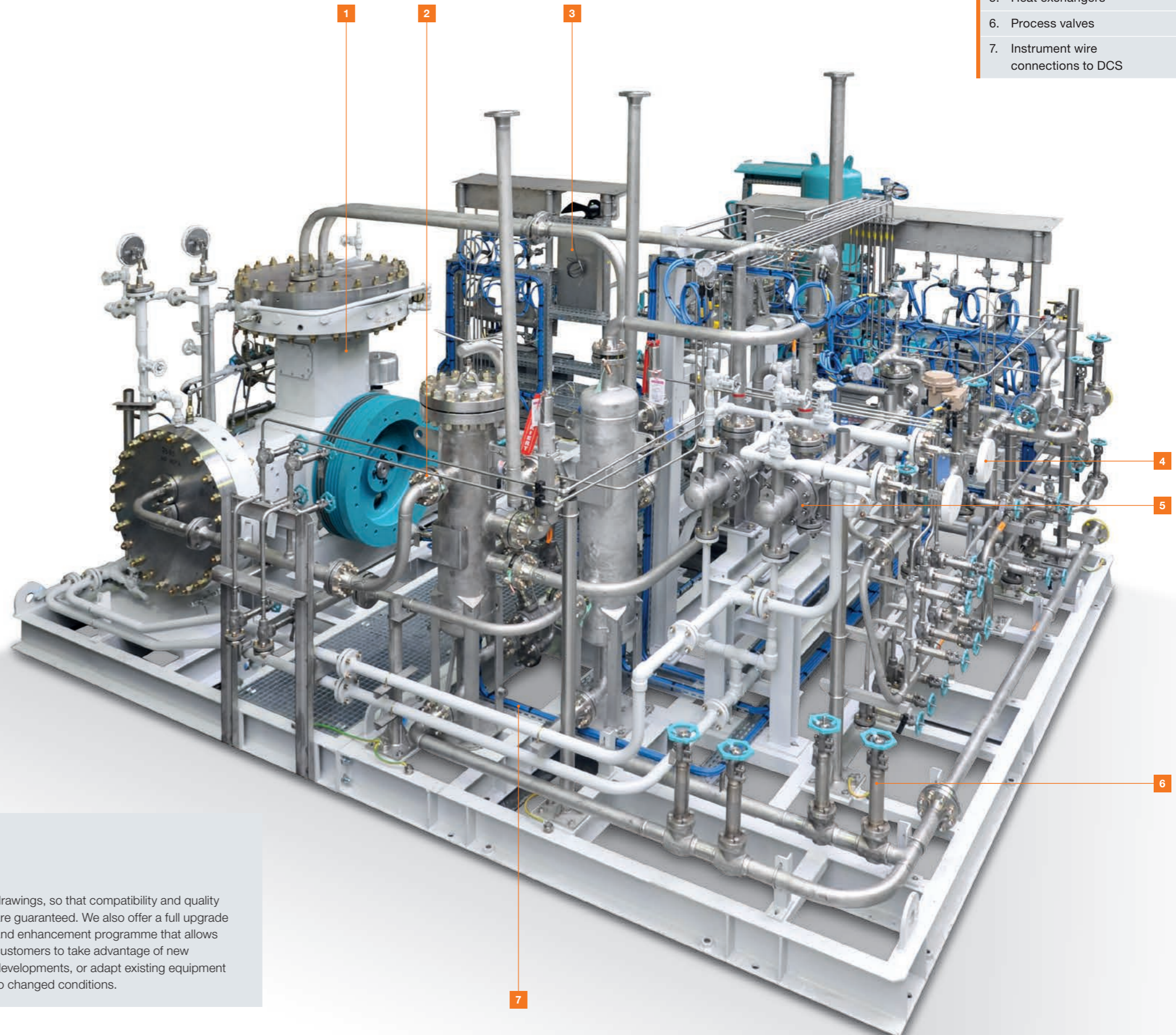
We select either vertical, horizontal, L-type or hybrid compressor configuration to offer the best match to site space and conditions with the greatest reliability and performance, and the whole package is designed for simple integration into the production process.



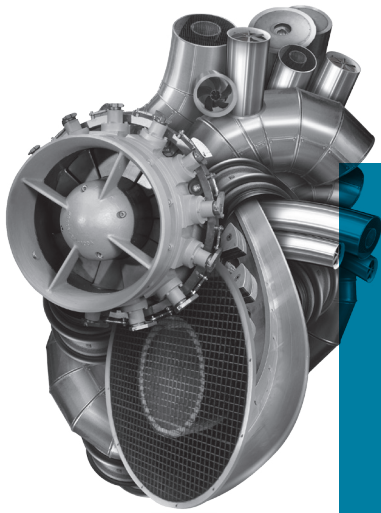
Howden is a truly global company, with an established presence in 27 countries across every continent. Our network of local support services enables us to respond urgently to customer queries and maintenance requirements, and we understand the

importance of local circumstances, from environmental legislation to energy costs. Every product we deliver is backed by an unequivocal lifetime commitment to spare parts and product support. Replacement parts are made using the original production

drawings, so that compatibility and quality are guaranteed. We also offer a full upgrade and enhancement programme that allows customers to take advantage of new developments, or adapt existing equipment to changed conditions.



1. Compressor
2. Drain capacities
3. Control panel
4. Visual controls
5. Heat exchangers
6. Process valves
7. Instrument wire connections to DCS



At the heart of your operations

Howden people live to improve our products and services and for over 160 years our world has revolved around our customers. This dedication means our air and gas handling equipment adds maximum value to your operations. We have innovation in our hearts and every day we focus on providing you with the best solutions for your vital operations.



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