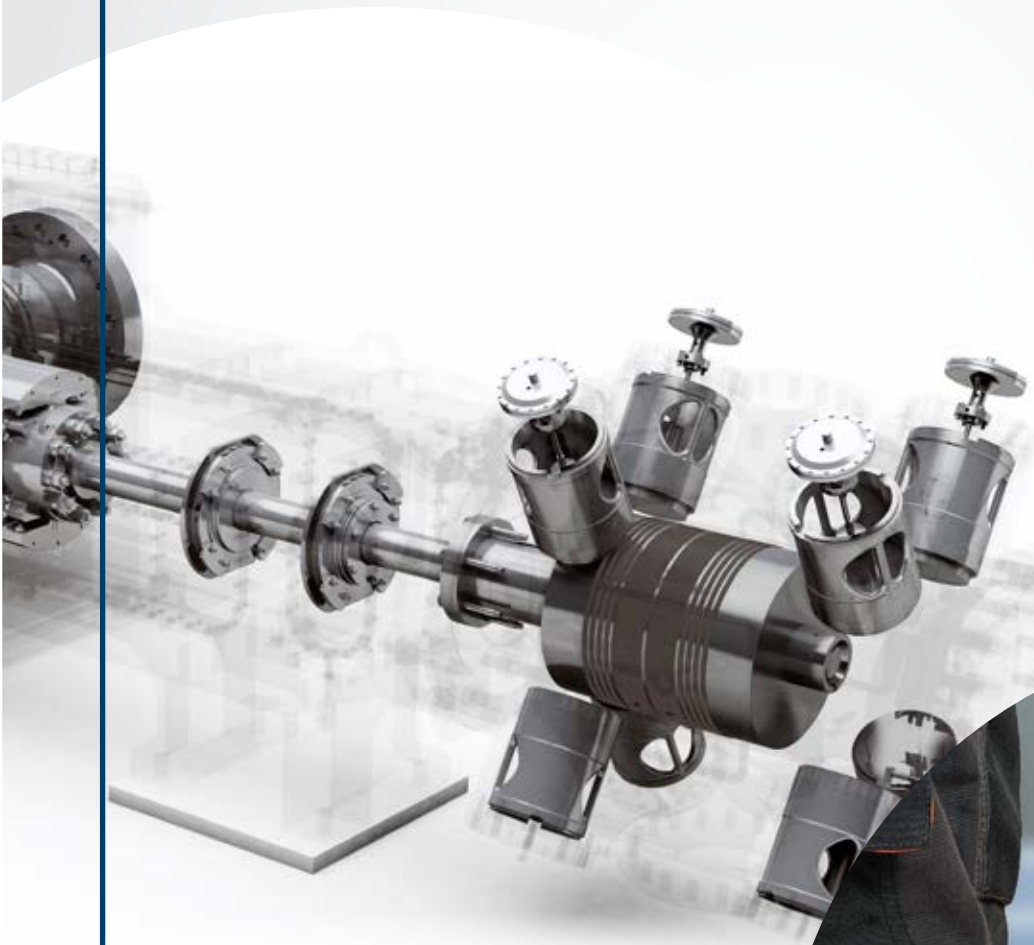
CPI by Howden

CPI Corporate Catalogue



Quality Manufacturing

CPI facilities adhere to strict manufacturing procedures to maintain the utmost quality assurance, including compliance with ISO 9001 standards. Wherever possible, we strive for total control of materials, from in-house blending and molding to manufacturing and distribution, to ensure quality product for our customers. Our global network of strategically placed manufacturing facilities and repair service centers provide customers with highly responsive and effective distribution of components worldwide.

Materials Research and Development

One of the cornerstones of CPI's commitment to customer satisfaction and success is a robust and innovative materials research and development team. Through in-depth partnerships with our customers, we have created new materials and manufacturing processes that improve compressor safety, reliability and performance.

Our special polymer alloys revolutionized piston and packing ring performance, providing greater temperature and chemical resistance than conventional seals in lubricated and oil-free applications.

Compressor Valves

Valves are one of the most important components in a reciprocating compressor and also the primary cause of efficiency problems and unscheduled shutdowns. CPI's global network and technological expertise ensure fewer incidents of unplanned downtime and that replacement parts and reconditioning services are available at a moment's notice, wherever you need them.

Our line of high-performance valves includes:

Hi-Flo™ Valves

- Hi-Flo™ VP – Custom built and highly durable, featuring an aerodynamic "V" profile design paired with a profiled seat.
- Hi-Flo™ RD – Self-aligning radiused disc design improves sealing in fluctuating temperatures and streamlines flow for entrained solids and liquids.
- Hi-Flo™ RS – Easily field reconditioned radiused disc valve that includes a replaceable PEEK seat.

Ring Valves

- For lubricated and non-lubricated applications, ring valves can suit a wide variety of applications and operating conditions.

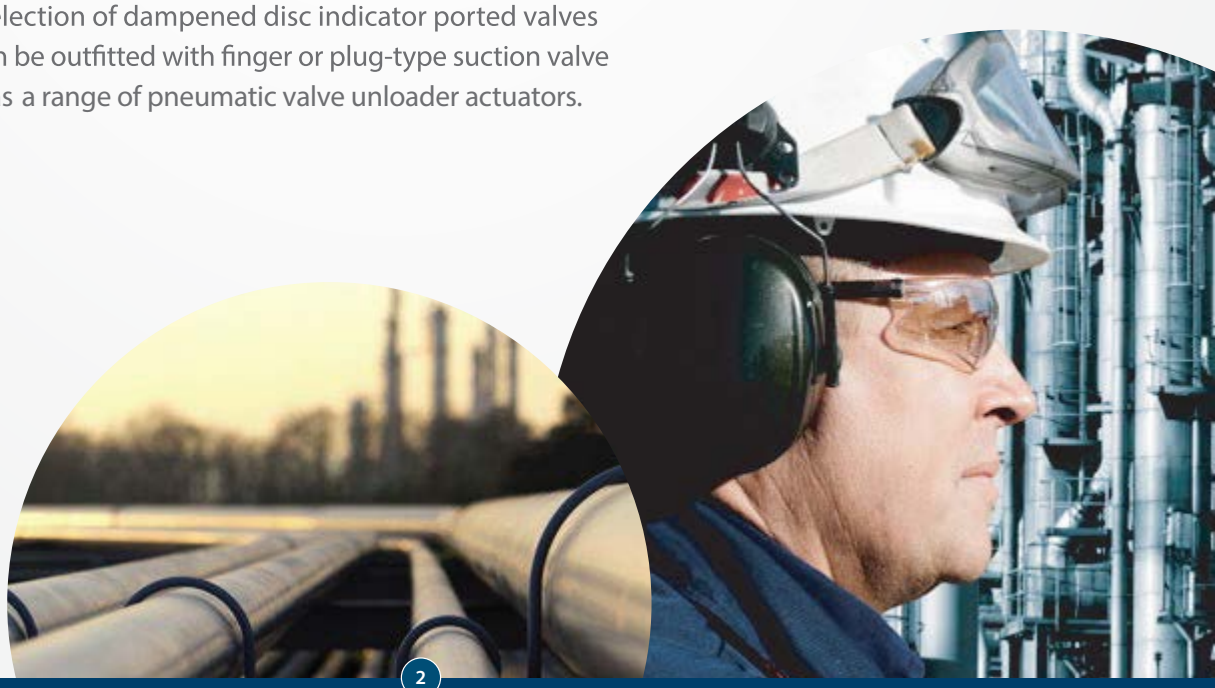
Plate Valves

- Ideal for air and process gas compressors, ported plate valves are available in both metallic and non-metallic assemblies and internal components.

Poppet Valves

- Precision machined in three available configurations, poppet valves feature large seat and guard porting for use in applications where debris or liquid is present.

CPI also offers a selection of dampened disc indicator ported valves and valves that can be outfitted with finger or plug-type suction valve unloaders as well as a range of pneumatic valve unloader actuators.



Sealing and Wear Products

CPI engineers and manufactures a full suite of sealing and wear products that increase compressor safety, reliability and productivity. Using only the highest quality materials and proven designs, our sealing and wear components last longer, perform better and waste less than competitive offerings. Plus, our expert technical support team can help ensure you select the best product for your specific application.

Some of the sealing and wear products we engineer, manufacture and service include:

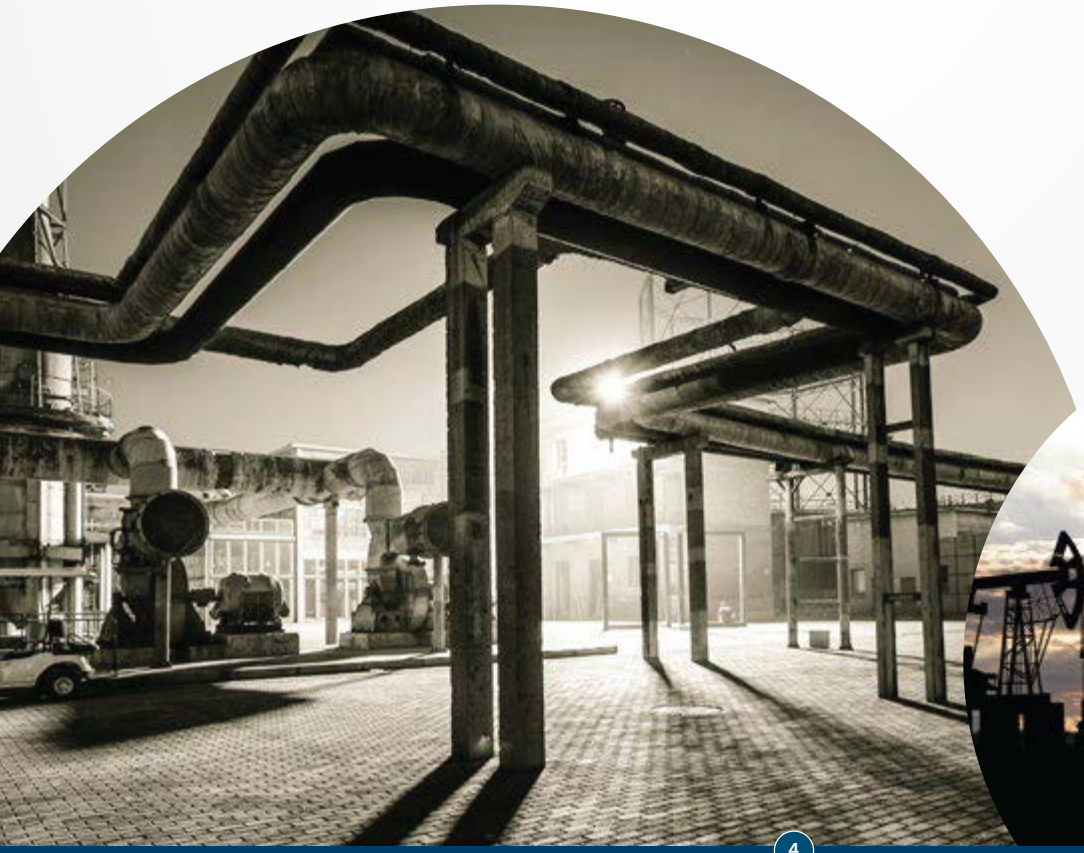
- Packing and wiper rings
- Packing cases
- Piston and rider rings
- Pistons and rods
- Purge and emission systems
- Hyper components

Lubrication

From individual components to complete systems, CPI engineers and manufactures a wide variety of products for lubricated compressor operations. Recognizing the critical importance and precision required of proper compressor lubrication, CPI designs products to provide industry-leading regulation and monitoring capabilities that prevent catastrophic breakdowns from loss of lubrication. All of our lubrication products are developed with safety, reliability and performance in mind. Our global technical support network is available at a moment's notice to respond to lubrication system concerns and questions.

Our lubrication components include:

- Lubricator pumps
- Lubrication boxes
- Lubrication consoles
- Divider blocks
- Check valves
- Monitoring devices
- Complete systems
- SAFEGUARD™ lubrication system consoles



Service

Designing and manufacturing industry-leading components and systems is just the beginning of a relationship with CPI. To make sure your reciprocating compressors are operating at peak functionality and minimize any unplanned downtime, we maintain worldwide sales and technical support facilities that can respond to your needs anywhere. From simple valve ring replacements to complete cylinder and engine block overhauls, we have the resources and expertise to diagnose and service virtually any reciprocating compressor need.

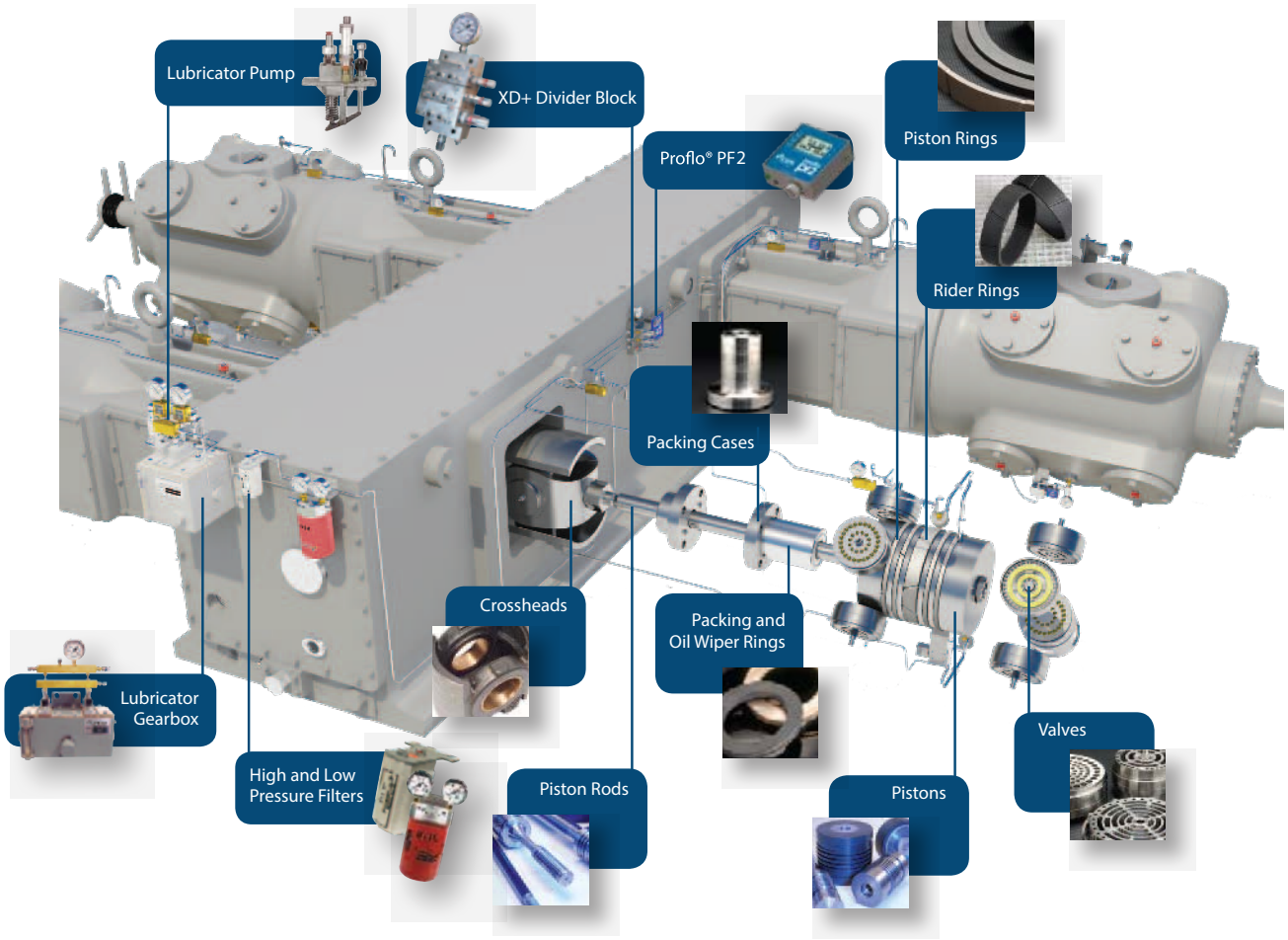
Our comprehensive service offerings include:

- Technical support
- Reconditioning services
- Field repair
- Spare parts resource
- Diagnostic analysis
- Technical training

Table of Contents

CPI by Howden

Products and Services



Sealing Components

- Oil Wiper Rings
- Packing Rings
- Packing Cases
- Rider Rings
- Piston Rings
- Valves
- Valve Unloaders and Actuators

Lubrication Systems

- Check Valves
- Divider Blocks
- Field Service
- Lubricator Boxes
- Lubricator Pumps
- Lubrication Accessories
- Monitoring Devices
- System Design

Related Products

- Emission Control
- Hi Speed Products
- Hyper Components
- Materials Technology
- Monitoring Systems
- Pistons and Piston Rods
- Spare/Replacement Parts

Services and Support

- Field Service
  - Compressor
  - Lubrication
  - Offshore/FPSO
- Spare and Replacement Parts
- Engineering Support
  - Technical Support
  - Product Design
- Reconditioning Services

Markets Served

- Refining
- Chemical
- Gas Transmission
- Gas Gathering
- Gas Storage
- Air Separation
- PET
- Offshore/FPSO
- Plant Air
- OEM
- Pulp and Paper
- Mining

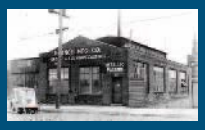
Build a Legacy

With roots dating back to 1897, CPI has grown tremendously, aquiring new technologies and services to better meet the global needs of today's reciprocating compressor operators.

1897

France Compressor Products

Founded in 1897, France Compressor Products (FCP) emerged as an industry leader in the late 1920's, when E.A. France, son of the founder, saw a trending need for compressor packing that would withstand higher speeds, pressures, temperatures and chemcial reactions. Realizing that inferior materials would inhibit engine and compressor development, E.A. France spurred the exploration of non-traditional, non-metallic packing materials. From the introduction of Bakelite for non-lubricated corrosive gas uses, FCP was always on the cutting edge of compressor technology, including the introduction of filled PTFE materials to the industry.



2006

Allwest

Allwest Compressor Services was purchased for products, capabilities and their strong leadershi in the natural gas and oil production markets of Western Canada

Southwest Compressor Services

The acquisition of Southwest added to France Compressor Products' manufacturing and reconditioning services for the natural gas markets.

H.A.R. Compressor Products

H.A.R. Compressor Products added the production of injection molded valve components to France Compressor Products' offerings.

2007

CPI

France Compressor Products purchased Compressor Products International (CPI) and adopted the name Compressor Products International to better align the brand with the business. The purchase of CPI helped gain market share and expand global reach, along with added materals expertise and valve capabilities.

Texflo

France Compressor Products purchased Texflo for the company's patented five-alloy plasma rod spray coating, sleeving expertise and state-of-the-art facilities.

2008

Horizon

CPI's acquisition of Horizon Compressor Services added a wide range of Production capabilities, manufacturing facilities and existing customers in the high speed natural gas and refinery markets. Horizon specialized in reconditioning services and the manufacture of valve components, packing case flanges, packing cups and many other compressor parts.

RAM Air

CPI's acquisition of RAM Air allowed expansion into the PET bottle blowing market and the expanded field service capabilities.

2009

USA Parts & Service

The acquisition of USA Parts added compressor and engine electronics, filters and spark plugs, gauges, field supplies and stainless steel tubing and fittings to CPI's product catalog, along with service center locations.

Player & Cornish

Player & Cornish specialized in components for the PET bottling industry, including larger items such as cylinders, crankcases and crossheads that were not common to CPI's existing offerings.

2010

Premier Lubrication and Progressive Equipment

The purchase of Premier Lubrication and Progressive Equipment provided CPI with expertise and technology on the lubrication side of compressors, which greatly impact the service life of components previously supplied by CPI. The acquisition also helped CPI expand from the petrochemical market into natural gas.

CC Technology

CPI aquired CC Technology for its Neomag, POPRTM, Proflo PF1, Proflo Jr, XDC and CVP products and technologies.

2011

Mid-Western

The acquisition of Mid-Western enhanced CPI's market position in Western Canada and added new products and capabilities.

Compressor Sales and Service

CPI's acquisition of Compressor Sales & Service provided CPI with local service support, engineering capabilities, compressor overhaul and component reconditioning and supply, as well as a variety of other shop and field services. It also strengthened its position in Southeast Asia to better serve the expanding customer base in this geographic market.

2012

Arrow S Mfg.

The acquisition of Arrow S Mfg. bolstered CPI's service offerings, including the re-lining of compressorcylinders. The aquisition also allowed CPI to bring piston and rod work in-house.

2021

Howden Acquires Compressor Products International (CPI)

This marks Howden's sixth acquisition of 2021 and is well aligned with Howden's strategy of expanding its global aftermarket presence in the compressor market. This acquisition also reinforces Howden's role in supporting the ongoing energy transition towards renewable sources of energy.

2023

Chart Industries Acquires Howden

Through the acquisition of Howden, Chart gained immediate access to new customers and commercial opportunities, increasing our geographic footprint to over 35 countries. This geographic footprint allows for increased commercial and manufacturing capabilities as well as the ability to bid on projects regionally that were not previously accessible.

CPI by Howden

CPI by Howden

Metallic and Non-Metallic Wear Products

Exceptional reliability and performance

High Performance Wear Products

CPI® designs and manufactures a complete line of high-performance packing and wiper rings, along with piston and rider rings, to meet a wide range of reciprocating compressor applications and demands. With designs dating back to 1899, CPI packing rings provide excellent sealing integrity and compensation for wear, rod movement and temperature change. CPI oil wiper rings provide reliable, positive containment of oil within the crankcase. Our piston and rider rings are engineered to provide excellent sealing capabilities and piston support.

To meet the needs of today's compressor operations, we offer our packing and wiper rings and piston and rider rings in both metallic and non-metallic materials and in an array of designs to handle both common and more problematic applications.

Non-Metallic

To meet the varied sealing and piston support requirements of reciprocating compressors, CPI manufactures an extensive line of non-metallic materials for compressor piston and rider rings and packing and wiper rings in a variety of styles to suit specific requirements.

CPI's long history of supplying PTFE based compounds and special polymer alloys has steadily advanced the service life and reliability of both fully lubricated and non-lubricated compressor applications.

Metallic

CPI offers a variety of packing, piston, rider and oil wiper rings in a range of metallic materials to meet the operational requirements of different compressor types and applications.

These highly engineered materials, including cast iron, bronze, and high-lead bronze, equal or surpass the performance and durability of both aftermarket and OEM metallic materials in lubricated compressor applications.

Rider Rings

Type 310: Uncut

- Designed with an interference to fit in the rider ring groove.
- Must be used wherever the rider ring passes over valve ports or into a counter bore on the end of the cylinder.
- Must be stretched to fit onto the groove or over the end of the piston.

Type 312: Angle Cut

- Used when the rider ring does not pass over a valve port or cylinder counter bore.
- Can be opened by hand to be slid over the piston.
- Optional face and/or side relief grooves prevent pressurizing and are recommended on all split (cut) rings.

Type 318: Angle Cut, Pressure Relieved

- This design incorporates both face and side relief grooves.
- In lubricated service, the grooves and the angled cut distribute the lubricant in a uniform film around the cylinder.
- Preferred design for most applications.

Piston Rings

Type 301: Straight Cut

- For applications that permit slight controlled leakage and minimal ring rotation.
- Preferred design for aluminum pistons.

Type 302: Angle Cut

- Provides minimal leakage path.
- Preferred design for most applications.

Type 332: Two Segment

- Required for installation of some of the rigid CPI polymer alloy materials.
- Angle cut ring with both cuts lying in the same plane to eliminate tendency of angle cut rings to rotate.
- Wear on piston rings having small wall-to-diameter ratio can generally be more uniformly distributed when the ring is of segmental design.

Type 334: Pressure Balanced

- Series of radial holes drilled into an OD groove for pressure balancing.
- Preferred ring style for some applications with high pressure differentials.

Type 322: TWIN RING™

- L-shaped ring and a rectangular filler ring for maximum and constant sealing performance.
- Provides optimum sealing efficiency in one direction and eliminates gap leakage without the need for an expander.
- Can sometimes be used to replace two to three conventional piston rings.
- For effective sealing in double acting service, at least one TWIN RING™ should face in each direction.

Packing Rings

Type 211: Radial Tangent Pair

- Consists of radial and tangent ring.
- Standard where positive sealing in one direction is required.
- Three tangentially-cut segments are the primary sealing element.
- The radial ring is pinned to the tangent ring to seal the gaps of the latter which are provided for wear compensation.
- The joints of the radial ring permit pressure build up on the OD of the rings during the compression stroke and its relief during the suction stroke.
- This is the preferred design wherever space is available.
- The radial ring must always face the maximum pressure.

Type 212: Double Tangent Pair

- Designed for bidirectional sealing.
- The tangent rings are pinned together so that the gaps of one are sealed by the segments of the other.

Type 252: Back-Up Ring

- Ring with clearance on the ID and gas tight joints installed behind seal rings to prevent extrusion of the tangent rings.

Type 205/252: Tangent-to-the-Rod with Back-Up Ring

- Used in applications where the ring groove width is less than 9/16" (14mm) and not sufficient to accommodate a three-ring assembly.
- Assembly consists of a polymer tangent-to-the-rod ring and a back-up ring.
- Not recommended for use where rod is plunged through the packing case due to potential damage to the inner tips of the rings.

Packing Rings (continued)

Type 206/252: Tangent-to-the-Rod with Back-up Ring

- Similar to 205/252 except there is no tangent ring pressure relief groove.
- Needs no gap for wear compensation.
- Used in bidirectional sealing.

Type 225: Sandwich Rings

- One polymer based tangent ring between radial and back-up metallic based rings.
- Recommended when pressure and temperature conditions increase to the point that a polymer radial ring would tend to extrude into the gaps in the tangent ring or into the clearance between the packing cups and the rod on the cylinder end of the packing case.

Type 253/212: Spring-Loaded Pressure Plate with Double-Tangent Pair

- Used whenever there is insufficient pressure differential to maintain the packing rings in sealing contact with the packing case.
- Commonly used as purge and vent seals.

Type 250: Pressure Breaker

- Three segment ring that fits tight to the rod with a small gap between the segment ends.
- Installed in the ring groove closest to the cylinder to avoid sudden pressure changes that could damage the seal rings. Throttles the flow of gas into the packing case and back into the cylinder.

Type 256: Pressure Breaker

- Three segment ring with zero gaps and clearance between the ring ID and the rod.
- Serves same functions as Type 250 ring.
- Includes additional pressure relief grooves on the ring face.

Oil Wiper Rings

Type 243: Tangent Cut

- Tangentially cut, allowing no direct path of leakage along the rod.
- Dual scraping edges are separated for maximum stability on the rod. Drainage slots are provided on one face for draining oil.
- Annular area between the edges is vented for drainage and to prevent a build-up of oil from lifting the ring off the rod.

Type 244: Radial Cut

- Radial cut style with gaps between the segments.
- Similar to Type 243 in that it has double wiping edges and drainage slots on one face.
- Normally used in multiple ring assemblies with adjacent rings pinned together to prevent a direct leakage path along the rod through the radial gaps.

Type 248: Radial Cut

- Radial cut design similar to the Type 244 except with added holes for the ID groove drainage.
- Manufactured from CPI 315 polymer material to conform to the rod and prevent rod wear.

Type 288: Radial Cut – Liard Style

- Provides extremely effective oil wiping and excellent service life in applications where oil control is a problem.
- Uses sharper scraper edges on the ID for more effective oil wiping.
- Has larger ID and OD slots for more effective oil drainage.

CPI by Howden

CPI, part of the Howden group, is an industry-leading manufacturer of precision-engineered components for reciprocating compressors used in petrochemical, refining, natural gas, and offshore industries. The CPI product range includes packing, piston and rider rings and a complete line of compressor valves designed to provide each customer with maximum performance and reliability for their application. In addition, CPI offers the highest quality lubrication system technology for further compressor efficiency and protection.

EMISSIONGUARD™ TR²

Packing Ring

CPI's EMISSIONGUARD™ TR² packing ring is the only ring design that multiplies the benefits of a tangent to rod ring and a step tangent ring by combining the two rings into one, providing a more efficient seal, reduced friction and extended lifetime.

DESIGN FEATURES

- Unique milled stop design eliminating pin breakage issues
- Increased end gaps of the step tangent ring compared to a conventional ring without the risk of breakage of the thin tangent sections, due to the ring being held captive inside the outer tangent to rod ring
- Outer tangent to rod ring covers the end gaps of the inner step tangent ring, effectively removing the leak path of the inner step tangent ring gaps

CPI by Howden

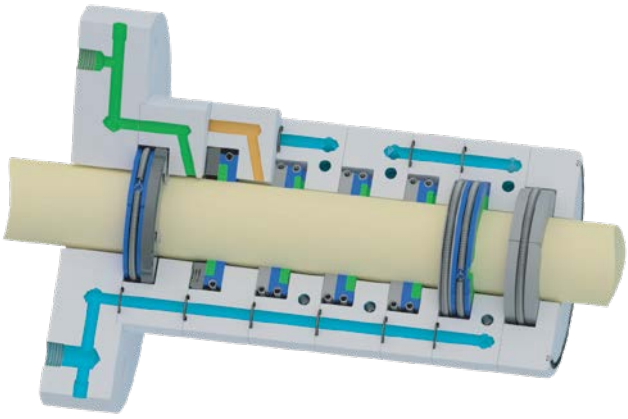
EMISSIONGUARD™ TR²
Packing Ring

FEATURES

- Double or single acting by use of face slots
- Suitable for all rod diameters and all gasses
- Inner step tangent ring keeps the assembly open, preventing the outer tangent to rod ring from closing in on itself
- Provides easy installation on the rod
- Radial load is shared between the inner and outer rings as the compressive gas force squeezes the outer tangent to rod ring resulting in:
  - Improved sealing performance
  - Lower friction
  - Reduced heat generation
  - Longer running life
- Controlled tests have shown the sealing performance to improve by at least 25% compared to conventional rings
- Available in mixed materials where the outer tangent to rod ring acts as an anti-extrusion ring
  - Depending on operating conditions it may be possible to avoid an additional anti-extrusion ring
  - Suitable for packing case designs with narrower seal grooves where axial length is limited

*The CPI EMISSIONGUARD TR² is patent pending

Exploded view of a double acting EMISSIONGUARD TR² packing ring



EMISSIONGUARD TR² packing rings in a purged packing case

CPI by Howden

CPI, part of the Howden group, is an industry-leading manufacturer of precision-engineered components for reciprocating compressors used in petrochemical, refining, natural gas, and offshore industries. The CPI product range includes packing, piston and rider rings and a complete line of compressor valves designed to provide each customer with maximum performance and reliability for their application. In addition, CPI offers the highest quality lubrication system technology for further compressor efficiency and protection.

EMISSIONGUARD™ ES³

Expandable Static Seal

The CPI EMISSIONGUARD™ ES³ expandable static seal is the first seal designed for optimum sealing when your compressor is not running and remains pressurized.

CPI, part of the Howden group, can supply a full control system which can interlock with the compressor controls to activate and deactivate the ES³ static seal only when the compressor is stopped.

DESIGN FEATURES

- EMISSIONGUARD ES³ seals are pneumatically actuated to create a zero leakage seal when the compressor is shut down. Prior to start-up the seal retracts to allow working clearance around the piston rod.
- Durable stainless steel ring housing
- Compact design allows it to fit with minimal modifications to the packing case

CPI by Howden

EMISSIONGUARD™ ES³
Expandable Static Seal

Pneumatic seals are the easiest, safest and most effective technique to statically seal parts that are separated by clearance. Existing static sealing system designs are known to be problematic and unreliable due to the tight clearances and the larger space requirement can be challenging for installation.

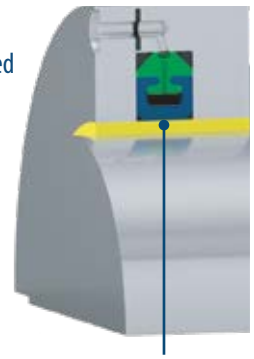
CPI's EMISSIONGUARD™ ES³ expandable static seal solves both of these issues by using proven advanced elastomer technology seals which are expanded and retracted by a pneumatic process. This allows the correct working clearance around the piston rod when the compressor is running and an expanded reliable seal on the piston rod while the compressor stopped.

Use with CPI's EMISSIONGUARD TR² packing rings for the optimal combination of sealing performance when the compressor is running and when it is stopped.

Exploded view of the EMISSIONGUARD™ ES³ seal

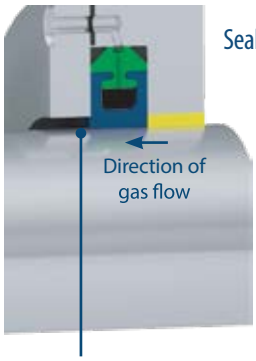
Example of control panel for the EMISSIONGUARD™ ES³ seal

Compressor Operating



The EMISSIONGUARD™ ES³ seal is clear of the piston rod allowing the rod to reciprocate and gas to flow.

Compressor Stopped



The EMISSIONGUARD™ ES³ seal is now in the expanded state creating a tight seal around the piston rod preventing any suction gas in the cylinder from leaking past the seal and out of the vent.

TECHNICAL SPECIFICATIONS

Pressure Rating: 1 Bar to 70 Bar*

*Depending on pressure vs diametral clearance

CPI, part of the Howden group, is an industry-leading manufacturer of precision-engineered components for reciprocating compressors used in petrochemical, refining, natural gas, and offshore industries. The CPI product range includes packing, piston and rider rings and a complete line of compressor valves designed to provide each customer with maximum performance and reliability for their application. In addition, CPI offers the highest quality lubrication system technology for further compressor efficiency and protection.

EMISSIONGUARD™ Purge Panels

CPI EMISSIONGUARD™ purge panels control and monitor the supply of an inert gas, such as nitrogen, into the packing assembly(s) of a reciprocating compressor, as well as monitor the vent pressure and vent flow rate.

With CPI's purge panel, buffer gas consumption is minimized compared to conventional purging. EMISSIONGUARD™ also enables condition-based maintenance, reduces unplanned down time and satisfies environmental regulations.

A single panel can service between one and four packing cases (modular construction). EMISSIONGUARD™ purge panels are available for all gases, including corrosive and flammable gases.

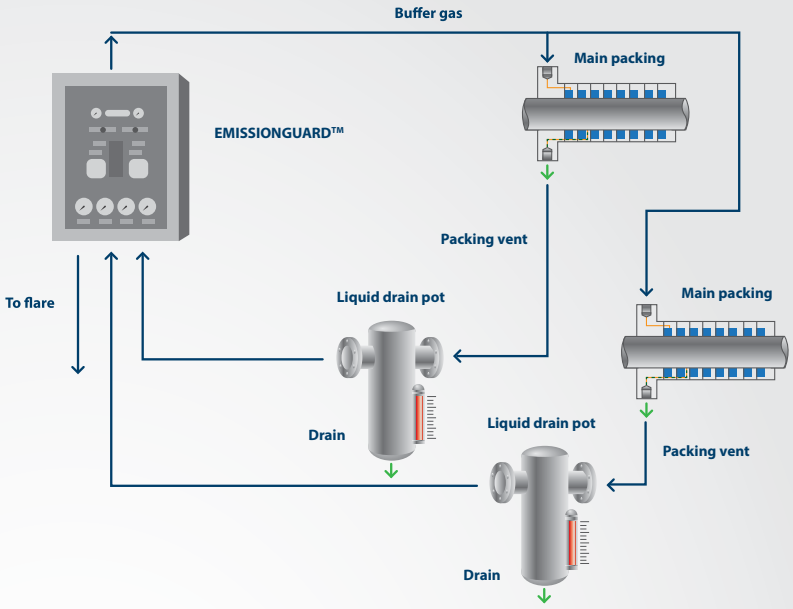
RISK MITIGATION AND COMPLIANCE

CPI, part of the Howden group, has selected the optimum materials and components for a reliable purge panel system, that complies with industry legislation. The system is ATEX registered, the panel does not contain any electrical components and also provides autonomous functionality. As part of its design an automatic control valve maintains buffer gas pressure at least 1 bar higher than the vent pressure, in compliance with API 618.

CE Ex IIC 2 G T4

CPI by Howden

EMISSIONGUARD™ Purge Panels



DESIGN FEATURES

- Stainless steel fittings, block valves and non-return valves
- Fully enclosed powder coated cabinet to IP66 IK10 – RAL7035
- Dimensions from 210 x 300 x 400 mm to 300 x 600 x 800 mm dependant on configuration
- Operates with buffer gas supply pressures up to 7 bar
  - For higher pressures an additional pressure reducer is required
- Glycerin-filled pressure gauges, constructed from stainless steel, are available in ranges of 0-6 bar
- Automatic control valve is compact and easy to use and comes equipped with an integrated over-pressure system
- Buffer gas line flowmeters consist of a full-view sight glass, aluminium body and stainless steel fittings
- Use of magnetic indicator gas flowmeter provides good visibility, even with dirty gas in the vent line
- Options include:
  - Supply connections in 6, 8 or 10 mm
  - Additional pressure reducer
  - Buffer gas inlet filter
  - By-pass line

Emissions, the Environment & Operator Safety

Increasing legislation and proactive environmental initiatives are requiring sites to take serious measures to monitor, evaluate and reduce emissions from key areas within their plants. In Natural Gas compression for example, studies have shown the reciprocating compressor contributes over 45% to the overall plant emissions, with the packing case leakage responsible for ~50% of this.

To reduce or even eliminate emissions caused by the packing case, CPI can provide the following proven solutions and packing case upgrades.

CPI EMISSIONGUARD™ ES^3 Expandable Static Seal

- Actuated seal creates reliable zero vent leakage when the compressor is stationary; seal retracts away from the piston rod when the compressor is running
- Full turnkey solution including actuation controls
- Simple addition to main pressure packing cases with a compact cartridge design

CPI EMISSIONGUARD™ TR^2 Packing Ring

- Consistent leakage reductions of up to 50%
- Outer tangent to rod ring covers the end gaps of the inner step tangent ring, effectively removing all leak paths
- Simple retrofit into existing or new packing cases
- Reduces rod loading, resulting in reduced contact temperature and lifetime improvements

Additional Packing Case Upgrades

- Side loaded packing with a buffer gas downstream of the vent to prevent process gas from leaking into the distance piece
- Upgraded case gaskets, including spiral wound designs, to eliminate leakage around the case
- Proper inspection and reconditioning to optimize ring sealing and to insure there is no external leakage between the cups

Valve Cover Conversions

- Redesign of the valve covers to add O-rings to eliminate leakage
- Removal or redesign of the jackbolts to eliminate leak paths, improve tightening procedures, and provide better loading of the valve in the port
- Upgraded unloader designs to eliminate actuator shaft leakage

EMISSIONGUARD™ Purge Panels

- Control and monitor the pressure of the buffer gas into the packing case assemblies
- Monitors vent line pressure and flow
- Automatically regulates inert buffer gas pressure
- Ensures positive buffer gas pressure in line with API618 to prevent process gas leakage into the distance piece

Compressor Optimization Management

CPI's Compressor Optimization Management Program (COMP) enables the study of reciprocating compressors to assess performance upgrade opportunities. Tailored reports are produced, illustrating the potential financial, environmental and operator safety benefits of implementing CPI's product upgrades.

These upgrades include CPI's EMISSIONGUARD™ family of products.

Please enquire with your local CPI representative for dedicated payback illustrations for your specific compressor applications.

Howden - Advancing a Sustainable Future

Howden, a Chart Industries Company, is a global leader in mission-critical air and gas handling products, services and solutions. We specialize in engineering for the future.

Our purpose, we enable our customers' vital processes which advance a more sustainable world, drives our business.

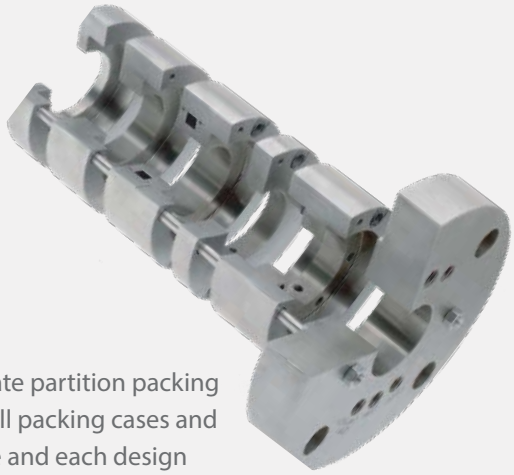
ESG is integrally linked to our vision of 'enabling our customers' vital processes which advance a more sustainable world and is clearly aligned with one of our core values, 'we do the right thing'.
In short, our ESG efforts are a fundamental characteristic of our brand as well as our purpose as an organization.

Visit https://www.howden.com/en-gb/company/esg - To learn more about Howden's commitment to ESG.

CPI, part of the Howden Group, is an industry-leading manufacturer of precision-engineered components for reciprocating compressors used in petrochemical, refining, natural gas, and offshore industries. The CPI product range includes packing, piston and rider rings and a complete line of compressor valves designed to provide each customer with maximum performance and reliability for their application. In addition, CPI offers the highest quality lubrication system technology for further compressor efficiency and protection.

Packing Cases

The packing case is critical to the efficient operation of the piston rod packing and the sealing of the cylinder.



PRODUCT DESCRIPTION

CPI designs and manufactures a full line of compressor packing cases, intermediate partition packing cases and wiper cases for reciprocating compressor piston rod sealing systems. All packing cases and wiper cases are precision machined from cast iron, steel, stainless steel, or bronze and each design can to be easily reconditioned when needed to maximize service life.

CPI Packing cases are available in cooled or non-cooled designs for use in both oil-free and lubricated applications to satisfy the full range of temperatures, pressures, and corrosive conditions.
CPI vent and purge designed packing cases meet environmental requirements and regulations for fugitive emissions of toxic or hazardous gases.

CPI™ by Howden

PACKING CASES

FEATURES

The CPI packing case has several important features that help to maximize your compressor's performance:

- Cylinder-end gasket to prevent process gas from bypassing the packing rings
- Precision-machined mating and sealing surfaces to prevent leakage
- Passages for lubrication, vent, coolant and buffer gas as required
- Flange with adequate bolting to maintain gasket seating and seal between cups at operating pressure
- Recess in each cup to contain the free floating packing rings

NON-COOLED CASES

CPI's non-cooled case design covers a broad range of operating conditions and is available for lubricated and non lubricated applications.

COOLED CASES

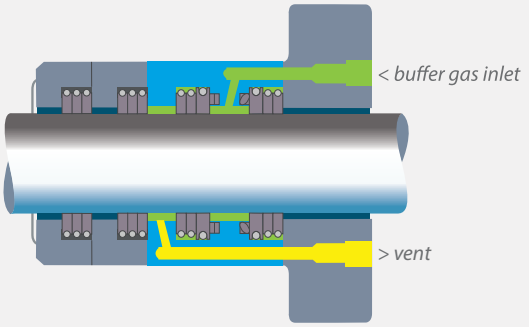
CPI's annular coolant passage design maximizes the amount of heat transferred from the packing rings. The cooling capability is optimized with either parallel or series flow pattern arrangements, depending on the specific application.

PACKING CASE PURGE CONVERSION

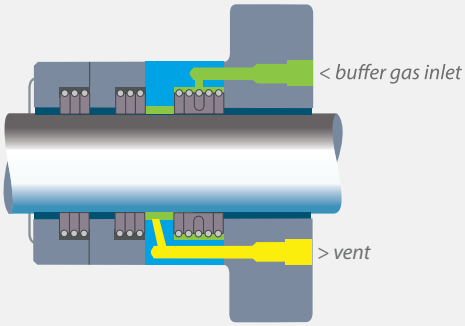
A purge gas system prevents the process gas from escaping through the packing case by introducing an inert buffer gas into the case. This provides compliance with emissions regulations and allows monitoring of the packing ring condition and life.

CPI can covert an existing packing case to a purge design. The standard purge design employs a two groove T-cup, but if the length of the assembly is limited a single groove cup arrangement is used.

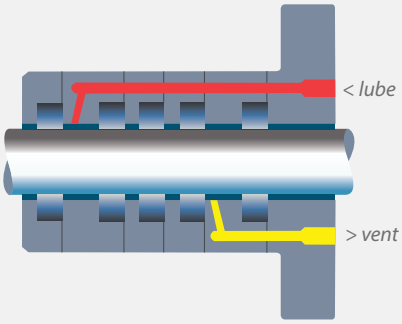
T-cup with side loaded packing



Single groove cup with wedge type packing

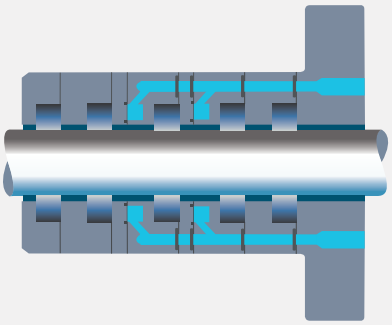


CPI standard non-cooled design: .

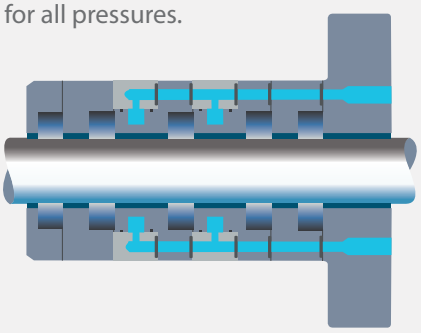


CPI offers two standard cooled designs: .

Plate and O-ring design allows passages to be cleaned out during case reconditioning.



Pressed cup design meets API standards for all pressures.



Compressor Valves

It is widely acknowledged that the compressor valve is the heart of any compressor; the efficient and reliable operation of this most critical part of a reciprocating compressor is key to its overall performance.

Valve problems are reportedly the primary reason for reciprocating compressor shutdowns, which in many cases can be attributed to design, improper reconditioning or external operating factors.

CPI compressor valves are custom designed to meet the full range of application requirements. These designs include concentric ring, ported plate, poppet and channel type.

Suction and discharge valves can be supplied to include CPI's Indicator Ported Valve design. CPI valves can also be fitted with a range of plug and finger unloaders and actuators. CPI valves are designed, manufactured and reconditioned at multiple CPI facilities strategically located around the world. Stocks of spare components are also held at these locations, providing complete customer support.

CPI Valve Design

Every application has unique challenges and demands, so CPI performs complex valve performance analysis to identify the optimum valve design solution for each specific application. We use sophisticated valve dynamics modeling programs that focus on achieving maximum reliability, efficiency, ease of installation and maintenance.

Quality Manufacturing

CPI's valve manufacturing process has total control of components and materials with in-house molding facilities to produce its unique range of plastic valve plate and ring sealing components.

CPI Hi-Flo™ Ring Valves

CPI Hi-Flo™ valves feature aerodynamic profiled rings that control and seal process gas as it flows from the compressor cylinder, providing increased efficiency and reliable operation in oil, gas, petrochemical and air separation applications where temperatures and pressures are extreme.

Hi-Flo™ DP (D-profile) & Hi-Flo™ VP (V-profile) ring valves
Hi-Flo™ RS (Replaceable Seat) ring valves*

**Developed specifically for customers who are operating compressors installed in offshore production platforms, FPSOs and remote facilities where no maintenance workshops are available.*

CPI Poppet Valves

CPI poppet valves are available in single deck and double deck configurations.

CPI Ported Plate Valves

CPI provides operators with a comprehensive range of both metallic and non-metallic plate valve assemblies and internal components for air and process gas compressors operating in a range of different applications. CPI Ported Plate valves can be designed and supplied with conventional coil springs and damping spring plates.

CPI Indicator Ported Valves (IPV)

The Indicator Ported Valves are designed to allow performance analysis and routine diagnostic testing of compressor cylinders that do not have drilled and tapped indicator ports.

CPI Unloaders and Actuators

CPI valves can be supplied with finger and plug-type suction unloaders, which are complemented by a range of pneumatic actuators custom designed specifically for each application.

CPI Pump Valves

CPI offers Hi-Flo™ Valves for reciprocating pumps that are used in a wide range of operating conditions.

Valve Reconditioning & Replacement Parts Services

We recondition and supply replacement parts for all types of valves within our global network of service centers and partners.

CPI by Howden

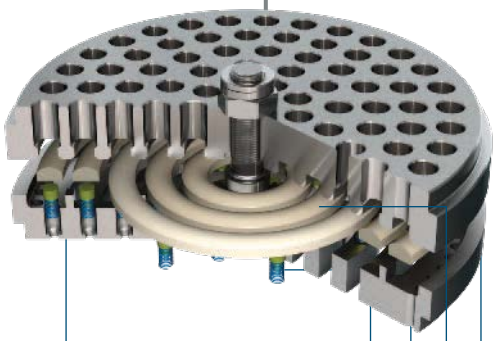
CPI prides itself on its unique approach to developing new compressor valve concepts and non-metallic materials used in the production of valves, piston rings, rider rings, packing and oil wipers. Our application expertise has transformed the performance and reliability of reciprocating compressors in a wide range of applications around the world.

CPI by Howden

CPI, part of the Howden group, is an industry-leading manufacturer of precision-engineered components for reciprocating compressors used in petrochemical, refining, natural gas, and offshore industries. The CPI product range includes packing, piston and rider rings and a complete line of compressor valves designed to provide each customer with maximum performance and reliability for their application. In addition, CPI offers the highest quality lubrication system technology for further compressor efficiency and protection.

Hi-Flo™ RD Valve

(Radiused Disc Ring Valve)



CPI Hi-Flo™ RD valves feature aerodynamic radiused profiled rings that control and seal process gas as it flows in and out of the compressor cylinder, providing increased efficiency and reliable operation in applications where temperatures and pressures are extreme. The durable thermoplastic radiused profile ring surface discourages the adherence of small particles of metal, sand or salt, providing improved performance over metal and non-profiled rings, which often become nicked, worn, cracked or warped. Each Hi-Flo™ RD valve is custom designed for its individual application to match specific compressor operating conditions.

DESIGN FEATURES

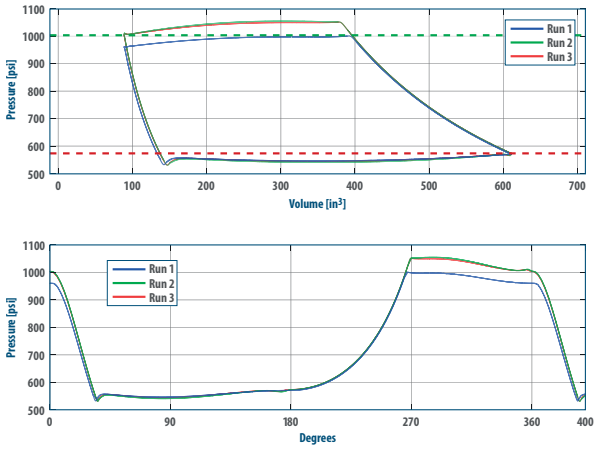
- Internal center bolt features a simple, reliable design that is easy to assemble
- Aerodynamic rings allow the free passage of foreign material and liquid slugs
- Secondary guidance prevents excessive lateral ring movement
- Springs are offered in chrome silicon and Hastelloy C materials
- Seats and guards are offered in Ductile Iron and 4140 alloy steel for standard valves and in 17-4 stainless steel for corrosive applications

CPI by Howden

Hi-Flo™ RD Valve
(Radiused Disc Ring Valve)

FEATURES

- Reliable performance in the most demanding operating conditions
- Provides increased operational efficiency and reduced power consumption
- Offers improved flow and reduced pressure drop and back flow
- Easily maintained and reconditioned
- Nose diameter – 2.375 in/60 mm and up
- Capable of operating across a wide range of parameters, including:
  - temperatures up to 390°F/200°C
  - pressures up to 6000 psi/400 bar
- Delivers self-aligning performance with good conformability and effective sealing throughout changing temperatures during operating cycles
- Custom spring design for each application to optimize opening and closing time
- Available with finger and plug-type unloaders
- Suitable for:
  - both lubricated and non-lubricated compressors
  - sour gas applications
  - compressor speed up to 1800 RPM

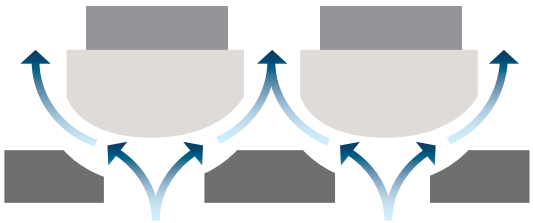


CPI provides comprehensive compressor valve performance analysis.

CPI Non-Return Valves (NRV)

CPI manufactures Non-Return Valves for air and gas compressor applications and pipelines, using the Hi-Flo™ RD alve design. NRV are used to direct flow and to manage gas conditions. NRV can be manufactured to fit customers' existing housings. Alternatively, a CPI-designed housing can be supplied.

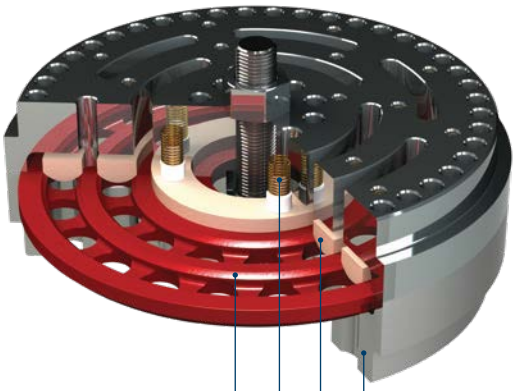
Radiused Profile Ring Design



Gas flow diagram

Hi-Flo™ RS Valve

(Replaceable Seat Valve)



Developed specifically for customers who are operating compressors installed in offshore production platforms, FPSOs and facilities where no maintenance workshops are available the Hi-Flo™ Replaceable Seat valves by CPI, part of the Howden group, eliminate the need for off-site reconditioning. The design incorporates a replaceable seat that can be quickly and easily removed and installed without the use of special tools.

DESIGN FEATURES

- Valve housing — Stainless steel for corrosion resistance
- Valve rings — Radiused disc ring design provides better gas flow
- Springs and buttons — Durable and corrosion resistant
- Replaceable seat — Eliminates wear to the valve housing

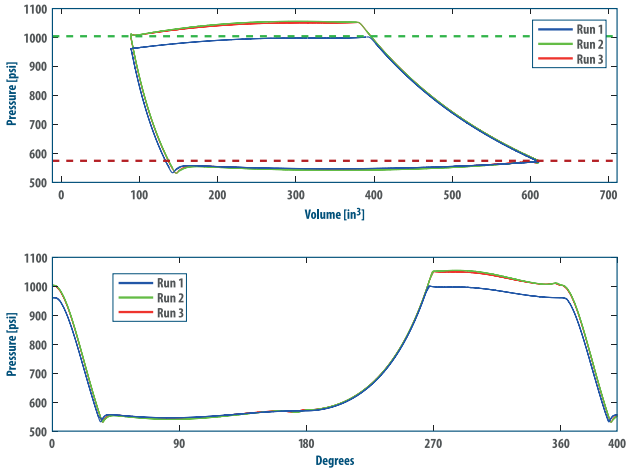
NOTE: Rebuild kit includes replaceable plate, new valve discs, springs and buttons.

CPI by Howden

Hi-Flo™ RS Valve
(Replaceable Seat Valve)

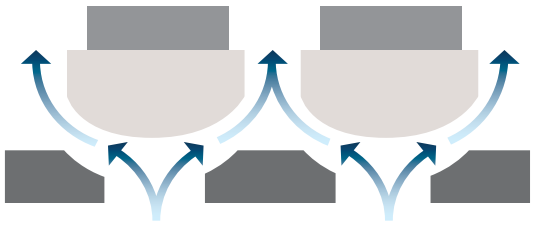
FEATURES

- Simplifies maintenance at remote or hazardous compressor operations
- Performs well under severe operating conditions as well as in processing of gases that contain liquid slugs and debris
- Eliminates need for spare valve inventory, reducing operating costs
- Easily reconditioned
  - No reduction in valve seat thickness
  - No adjustment is needed if unloader fingers are fitted
  - No special tooling or presses needed to remove the seat plate
- Reliable in oil, gas, petrochemical and air separation industries
- Non-replaceable components are produced in stainless steel to prevent corrosion
- Nose diameter — 2.95 in/75 mm and up
- Capable of operating across a wide range of parameters, including:
  - temperatures up to 390°F/200°C
  - pressures up to 3600 psi/250 bar
- Made with highly durable PEEK-based material
- Suitable for:
  - both lubricated and non-lubricated compressors
  - sour gas applications
  - compressor speed over 1200 RPM



CPI provides comprehensive compressor valve performance analysis.

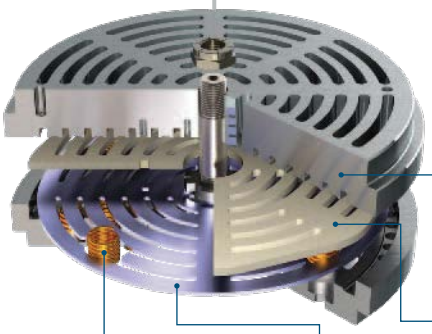
Radiused Disc Ring Design



Gas flow diagram

Ported Plate Valves

CPI provides customers with a comprehensive range of metallic and non-metallic Ported Plate Valve assemblies and components for air and process gas compressors operating in a wide range of different applications. Each Ported Plate Valve is custom designed for its individual application to match specific compressor operating conditions.



DESIGN FEATURES

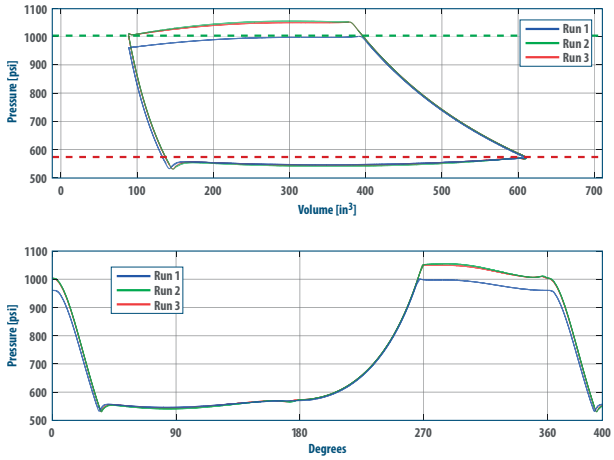
- Seats and guards are offered in Ductile Iron and 4140 alloy steel for standard valves and in 17-4 stainless steel for corrosive applications
- Non-metallic sealing component materials provide excellent chemical resistance, high temperature tolerances and strong impact capabilities in a wide variety of applications
- Metallic sealing and dampening plates are manufactured from high quality, heat-treated stainless steel
- Springs are offered in chrome silicon and Hastelloy C materials

CPI by Howden

Ported Plate Valves

FEATURES

- Non-metallic sealing component materials provide excellent chemical resistance, high temperature tolerances and strong impact capabilities in a wide variety of applications
- Easily maintained and reconditioned
- Ideal for medium and high-pressure compressors operating at high speed and varying degrees of capacity
- Available with finger and plug-type unloaders
- Custom spring design for each application to optimize opening and closing times
- Capable of operating across a wide range:
  - temperature over 500°F/260°C
  - pressure over 5000 psi/345 bar
- Nose diameter —1.57 in/40 mm and up
- Suitable for:
  - both lubricated and non-lubricated compressors
  - sour gas applications
  - compressor speed up to 1500 RPM

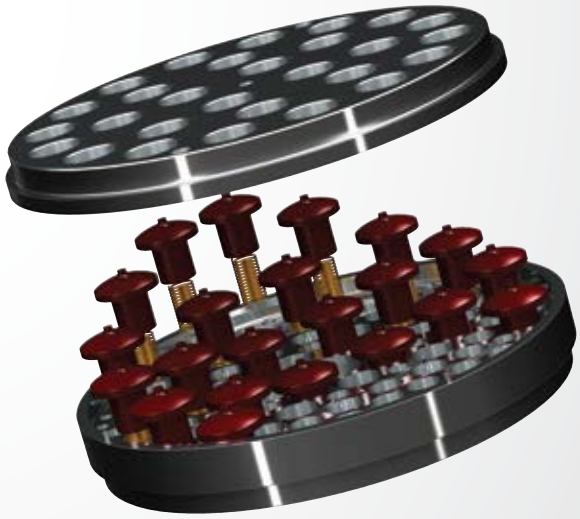


CPI provides comprehensive compressor valve performance analysis.

CPI Compressor Valves

RING VALVES, PLATE VALVES & POPPET VALVES

- Custom designed for each application.
- Designed for both lubricated and non-lubricated applications.
- Manufactured to high quality standards with metallic and non-metallic sealing components.



Achieving optimum performance and reliability are key to most operators. CPI ring and plate valves can deliver across a broad spectrum of applications and operating conditions.

CPI Unloaders & Actuators

CPI Unloader Diaphragm Actuators are used for replacing old style leaking or worn out unloader actuators, to remove membrane actuators in situations of membrane failure or insufficient stroke, or to replace manual hand-wheel style unloaders for automation. All CPI Unloader Actuators are custom designed for each application. CPI, part of the Howden group offers Finger and Plug style Unloader Diaphragm Actuators.

DESIGN FEATURES

- Available in air-to-load or air-to-unload
- Rolled diaphragm design:
  - effective membrane area - 175 cm^2
- 15 mm stroke available, and spindle length adjustable by 5 mm
- Highly visible adjustable position indicators
- Sealing with O-Rings and chevron gasket up to pressures of 250 bar
- Vent connection for collecting fugitive emissions
- All parts with direct contact to gas are AISI 316 stainless steel

CPI by Howden

CPI Unloaders & Actuators

FEATURES

- Proven technology
- CPI Unloader Actuators incorporate multiple design features to prevent gas emissions
- Reliable rolled diaphragm design eliminates problems caused by reconditioning and membrane failure
- Most old style unloading systems can be upgraded with CPI Unloader Actuators
- Depending on the application, a single plug unloader actuator per cylinder end can replace existing multiple finger unloader actuators
- Used for valve port unloading with a CPI plug valve or for volume pocket unloading
- Solid plug and balanced plug styles are available
- Air injecion pressure from **4 bar.g** to 6 bar.g (dependent upon required force and actuation mode)
- Meets API618 Standards

CPI Valve Reconditioning and Replacement Parts

ONE SOURCE WITH GLOBAL REACH

In the compressor industry, even the smallest components can interrupt uptime and productivity. In order to achieve continuous operation, you need an experienced and reliable partner — one that offers comprehensive, single source service for compressor parts, repair, installation and troubleshooting. A partner that is ready to respond with a solution at a moment's notice, anywhere in the world. CPI is that partner.

CPI offers field services to compressor operations on-shore and offshore, including:

- On-site scheduled and breakdown maintenance
- Off-site overhauls for major components and complete compressors
- Conversion from lubricated to non-lubricated
- Maintenance or upgrade of existing lubrication systems
- Valve monitoring
- Custom design
- Turnkey projects with full feasibility studies

RECONDITIONING SERVICES

CPI provides exceptional reconditioning services for restoring parts to their original specifications and performance, making them "good as new."

In problematic applications, CPI experts will carefully evaluate the condition of components on various types and makes of compressors, and provide an optimal solution. CPI technicians are prepared to offer in-depth guidance on product redesign and upgrades for:

- Valves, unloaders and actuators
- Packing cases
- Pistons and piston rods
- Major components: engine blocks, cylinders, crossheads and crankshafts

CPI by Howden

CPI Valve Reconditioning and Replacement Parts

VALVES, UNLOADERS AND ACTUATORS RECONDITIONING

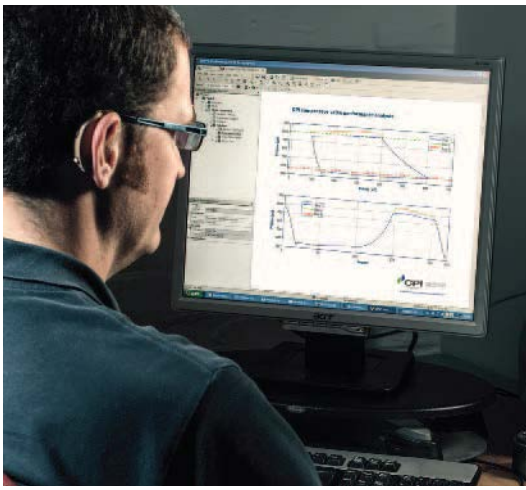
The reconditioning of and repairs of valves can be done at a number of CPI's manufacturing facilities and service centers that are strategically located worldwide for accessibility and quick turnaround.

CPI reconditions and repairs:

- Concentric ring valves
- Ported plate valves
- Poppet valves
- Channel valves
- Other, non-traditional valves with unique design features

REPLACEMENT PARTS

CPI stocks and supplies premium quality replacement parts in order to improve and restore the efficiency and performance of virtually all compressor valves. All CPI replacement parts are engineered and manufactured to assure interchangeability and optimum effectiveness.



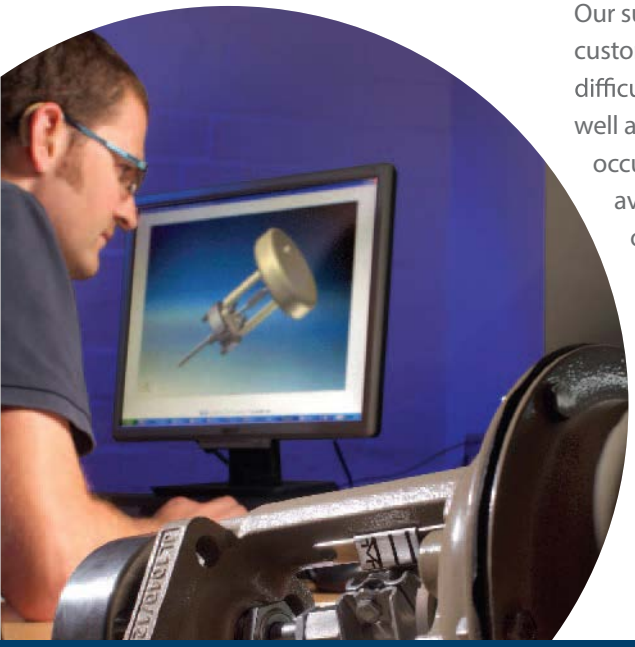
OVERHAULS & REBUILDS

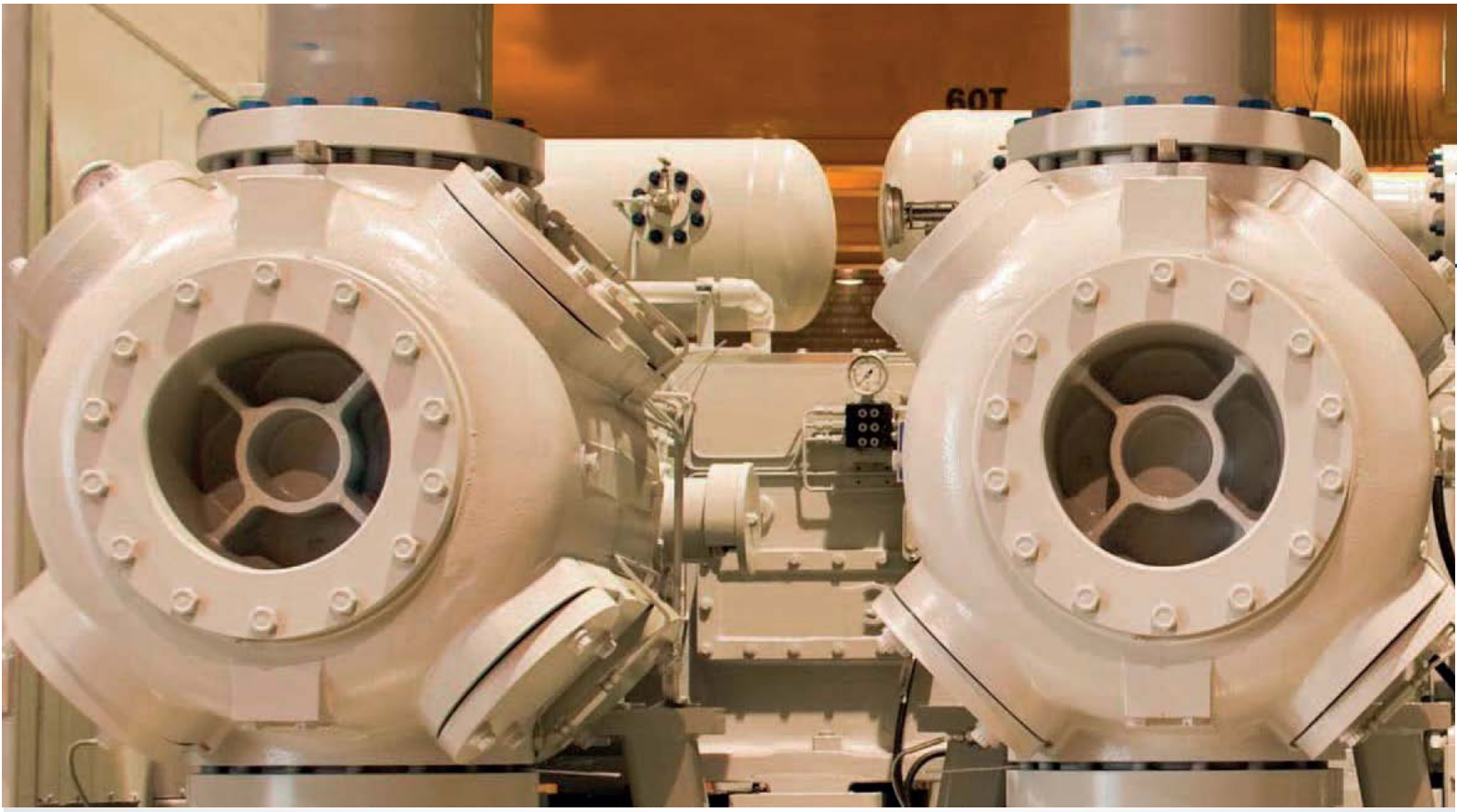
CPI provides quality cylinder design, manufacturing, retrofits and repairs. Cylinders are relined with slip or interference fit liners or spray coated to meet the needs of the application, and thoroughly inspected and tested before returning to customers. Aftermarket variable volume pockets are manufactured and available with improved design features to improve longevity and durability.

TECHNICAL SUPPORT AND TRAINING

With industry-leading expertise, CPI's technical support team will diagnose and provide solutions to challenging problems, particularly in situations where a previous material has failed.

Our support group provides training for customers' technicians to handle the difficult problems that occur in the field as well as how to prevent the problems from occurring. Custom, on-site training is available for technicians able to attend our technical training schools.

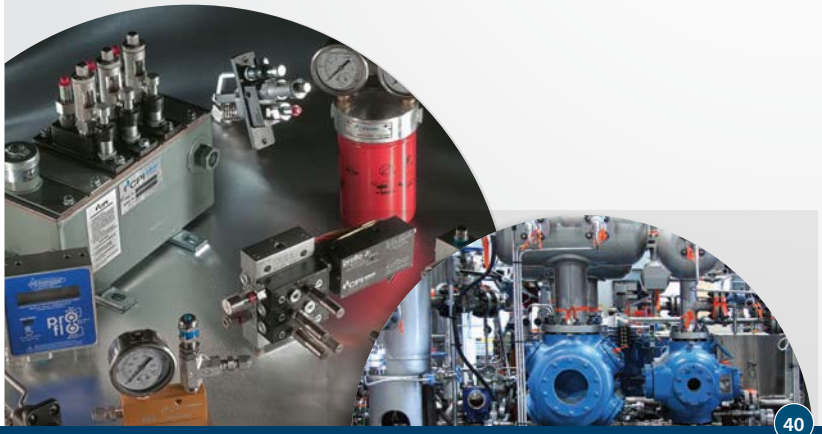




Lubrication Product Guide

The oil and lubrication system plays a very significant role in the performance of a reciprocating compressor. Too much, too little or inconsistent delivery can reduce performance, lead to premature wear and potentially result in catastrophic failure.

CPI, part of the Howden group, provides industry leading lubrication system products and services, partnering with our customers to develop individual solutions to their unique lubrication needs. From individual components to complete, turnkey systems, we can provide the resources and expertise to ensure your compressor operates at peak performance and longevity.



CPI by Howden

Divider Blocks & Accessories

HP+ DIVIDER BLOCKS

- Standard base plate assembly mounts to multiple traditional industry bolt patterns (CCT, Lincoln, Trabon)
- Simplified ordering process to save time and reduce errors
- Improved performance for applications up to 6500 PSI (448 BAR)
- Improved piston to bore geometry for consistent oil output and longer product life
- Improved overall sealing with precision CPI Custom 1/8 ORB (O-Ring Boss) port geometry
- Complete assembly standard with O-ring seals eliminating leakage and need for sealant
- Each assembly comes standard with Custom ORB inlet tube fitting
- Improved corrosion resistance with all components nickel plated
- All base plate assemblies feature internal check valves for added performance protection
- Standard O-ring seals are VITON® O-Rings (FKM) for improved chemical and heat resistance
- Each divider block assembly is easily configured to the customer's specific lubrication needs

Complete HP+ Divider Block

II 2 G c IIC T6

View our full HP+ product brochure for product dimensions.
*Base Plate Assemblies, Metering Elements and Crossport Bars can all be purchased separately.

HP+ Cross Port Bars

BASE PLATE ASSEMBLIES (HP+)

The HP+ base plate assemblies are pre-assembled and available to accommodate three to seven elements. The HP+ design mounts to multiple traditional industry bolt patterns. Base plate assemblies are fully assembled to simplify ordering and customer inventory. Each assembly comes with the CPI Custom 1/8 ORB to ¼" OD tube inlet fitting.

HP+ Base Plate Assembly

METERING ELEMENTS (HP+)

CPI's HP+ divider block metering elements range in size 06 to 30 with oil output from 0.006 in^3 (0.10 cc) to 0.060 in^3 (1.00 cc). Twin elements are ported to deliver oil to both left and right base outlet ports. Single elements are ported to deliver oil to one base outlet port, either left or right side as desired. Crossport bars are available to configure the oil output of the assembly. A crossport bar transfers the oil of the element it is mounted underneath to the next element in series.

HP+ Metering Element

XD+ DIVIDER BLOCKS

CPI's XD+ Divider Blocks are an Extreme Duty Performance product line featuring:

- Symmetric element design adds mass around the piston for improved performance at higher pressures by reducing piston bore warping and expansion
- Improved piston to bore geometry for consistent oil output and longer product life
- Extreme performance for applications up to 8000 PSI (551 BAR)
- Simplified ordering process to save time and reduce errors
- Improved overall sealing with precision CPI Custom 1/8 ORB (O-Ring Boss) port geometry
- Dual inlet ports on top and bottom of divider block assembly for added flexibility
- Complete assembly standard with O-ring seals eliminating leakage and need for sealant
- Each assembly comes standard with Custom ORB inlet tube fitting and ¼" NPT adapter fitting
- Improved corrosion resistance with all components nickel plated
- All base plate assemblies feature internal check valves for added performance protection
- Standard O-ring seals are VITON® O-Rings (FKM) for improved chemical and heat resistance
- Each divider block assembly is easily configured to the customer's specific lubrication needs

View our full XD+ product brochure for product dimensions.
*Base Plate Assemblies, Metering Elements and Crossport Bars can all be purchased separately.

Complete XD+ Divider Block


XD+ Cross Port Bars

BASE PLATE ASSEMBLIES (XD+)

The XD+ base plate assemblies are pre-assembled and available to accommodate three to six elements. The XD+ design mounting pattern is unique. CPI offers all mounting brackets and information to provide easy customer installation. The base plate assemblies are fully assembled to simplify ordering and customer inventory. Each assembly comes with the CPI Custom 1/8 ORB to ¼" OD tube inlet fitting and CPI Custom 1/8 ORB to ¼" NPT female adapter fitting.

XD+ Base Plate Assembly

METERING ELEMENTS (XD+)

CPI's XD+ divider block metering elements range in size 06 to 30 with oil output from 0.006 in^3 (0.10 cc) to 0.060 in^3 (1.00 cc). Twin elements are ported to deliver oil to both left and right base outlet ports. Single elements are ported to deliver oil to one base outlet port, either left or right side as desired. Crossport bars are available to configure the oil output of the assembly. A Crossport bar transfers the oil of the element it is mounted underneath to the next element in series.

XD+ Metering Element

SMX DIVIDER BLOCKS

CPI offers the DropsA SMX product line as an affordable performance product featuring:

- Multiple base plate assembly mounting patterns for traditional industry bolt patterns.
- Simplified ordering process to save time and reduce errors.
- Proven performance for applications up to 4000 PSI (276 BAR).
- Base assemblies are bolted together with a threaded insert and attachment screw. This provides no maximum limitation on the number of elements which can be used on the assembly.
- bypass element is available to accommodate an increase or decrease in lubrication points without disturbing the base assembly or pipe work. This element acts as a blank placeholder and is only used on four section or larger divider block assemblies.
- Each divider block assembly is easily configured to the customer's specific lubrication needs.

II 2 G c IIC T6

Complete SMX Divider Block

View our full SMX product brochure for product dimensions.
*Base Plate Assemblies, Metering Elements and Crossport Bars can all be purchased separately.

SMX Cross Port Bars

BASE PLATE ASSEMBLIES (SMX)

- Pre-assembled base plates to simplify ordering and customer inventory
- Accommodate three to eight elements
- Design allows for more elements to be added if required. Contact CPI if more than eight elements are required for the application.
- Available in three traditional industry bolt patterns (DropsA, Lincoln, Trabon).
- ¼" NPT to ¼" OD tube inlet fitting

SMX Base Plate Assembly

METERING ELEMENTS (SMX)

SMX divider block metering elements range in size 04 to 65 with oil output from 0.0025 in^3 (0.04 cc) to 0.080 in^3 (1.30 cc). Twin elements are ported to deliver oil to both left and right base outlet ports. Single elements are ported to deliver oil to one base outlet port, either left or right side as desired. Crossport bars are available to configure oil output of the assembly. A crossport bar transfers the oil of the element it is mounted underneath to the next element in series.

SMX Metering Element

BASE PLATE CHECK VALVES (SMX)

CPI recommends the use of the integral check valve and tube fitting with a 1/8" NPT geometry for SMX applications (Part 6500200421PRNPT) (only available through CPI and CPI distributors). This check valve is stainless steel and features an VITON® O-Rings (FKM) poppet sealing element. Other check valves are available if the recommended check valve does not meet the customer's application.

Base Plate Check Valves - SMX

BASE PLATE FITTINGS (SMX)

CPI offers other Custom 1/8 ORB fittings to support customer's specific needs. Industry standard 1/8" NPT fittings can be used with sealant if a Custom 1/8 ORB fitting solution is not available.

Base Plate Fittings - SMX

DIVIDER BLOCK ACCESSORIES (FOR SPECIFIC BLOCKS)

BASE PLATE CHECK VALVES (HP+ & XD+)

CPI recommends the use of the integral check valve and tube fitting featuring the CPI custom 1/8 ORB geometry for HP+ and XD+ applications. This check valve is stainless steel and features an VITON® O-Rings (FKM) poppet sealing element. This check valve is only available from CPI and CPI distributors. Other check valves are available if the recommended check valve does not meet the customer's application.

Base Plate Check Valves -HP+, XD+

BASE PLATE FITTINGS (HP+ & XD+)

CPI offers other custom 1/8 ORB fittings to support customer's specific needs. Industry standard 1/8" NPT fittings can be used with sealant if a Custom 1/8 ORB fitting solution is not available.

Base Plate Fittings - HP+, XD+

DIVIDER BLOCK ACCESSORIES (ALL BLOCKS)

MOUNTING BRACKETS (HP+, XD+, SMX)

CPI offers numerous mounting bracket options to suit the customer's mounting requirements.

Mounting Brackets

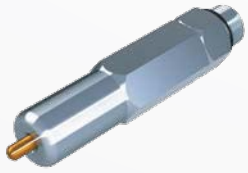
NEOMAG® CYCLE INDICATORS

The Neomag® cycle indicator follows the divider block piston movement so the operator can monitor and control oil consumption, set lube rates, and easily spot problems in the divider block system.

Neomag® Cycle Indicator

RESET PIN INDICATOR

Reset pin indicators identify tubing or lubrication point blockage to enable the operator to quickly verify exactly which point is causing high pressure in the system. Available in pressure ratings from 1500 PSI to 5000 PSI.



Reset Pin Indicator

DIVIDER BLOCK ACCESSORIES (ALL BLOCKS CONT.)

POPR® POP OPEN PRESSURE RELIEF

The CPI POPR® valve (Pop Open Pressure Relief) is a more reliable, cleaner, and safer device than the Atmospheric Rupture Assembly.

Automatically activated when the divider block system over pressures, the POPR® snaps open and diverts the oil to the lubricator reservoir, a closed container, the lubricator pump oil supply line or back to the compressor frame. The unit remains in open position until reset with a simple snap to close action by a technician - no need to replace a ruptured disc again.

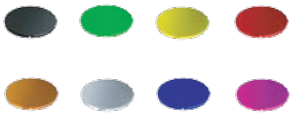
POPR® Pop Open Pressure Relief

ATMOSPHERIC RUPTURE ASSEMBLY

Atmospheric Rupture Assemblies are used to signal excessive pressure in a system. The assemblies contain an aluminum disc which ruptures at a predetermined pressure, venting the lubricant to atmosphere. The thickness of the metal disc determines the pressure at which the assembly ruptures. Discs are color coded to indicate relieving pressures.CPI offers full rupture indicator assemblies, components, as well as replacement rupture discs to help keep your system operating safely.

Note: Atmospheric rupture assemblies that lack return, when ruptured, leak oil out of the sytem.

Atmospheric Rupture Assembly



Atmospheric Rupture Discs

Check Valves

CVP® CHECK VALVE PROTECTOR AND XDC® EXTREME DUTY CHECK VALVE

The CPI CVP® check valve protector installed with the CPI XDC® extreme duty check valve (a double poppet stainless steel valve with Viton O-Rings) is designed to eliminate check valve failure caused by heat & gas stream contamination.

Unlike traditional check valve protectors, this assembly allows minimum oil capacity, reducing the amount of time at startup before oil actually gets to the injection point. The minimal design also eliminates fatigue failures from vibration typical of the older and larger check valve protector designs.

CVP® Assembly shown with gauge and XDC®

DOUBLE AND SINGLE BALL CHECK VALVES

CPI check valves are designed for high pressure applications where reverse flow and leakage must be kept to a minimum. Typical applications include engine, pump and compressor cylinder / packing lubrication and hydraulic systems. A relatively stiff spring in these check valves serves to increase the reliability of the circuit.

Check valves available from CPI include:

- Inline Single Ball, inline Double Ball
- 90° Single Ball, 90° Double Ball
- Inline Single Poppet

Sample Inline Double Ball Check Valves

Sample Inline Single Ball Check Valves

Monitoring and Shut Down Devices

PROFLO® PF2 MONITORING DEVICE

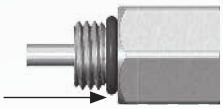
The Proflo® PF2 is a programmable shutdown device used to monitor the lubricant flow of divider valve metering systems. Cycle times are continuously monitored and communicated through both the LCD display and LED indicator lights. The Proflo® PF2 is a learning device that monitors and calibrates to the installed magnet assembly. This eliminates the historic issue of devices not working wih all magnet assemblies requiring field adjustments for optimal function.

The Proflo® PF2 allows users to configure the relay outputs which feature a shutdown alarm and a pulsed output signal or warning alarm. New diagnostic tools allow users to easily test the device functionality and validate settings, simplifying installation and troubleshooting. The Proflo® PF2 operates on a field replaceable lithium battery or DC power input and installs on either side of a divider block or in a remote location control panel. The Proflo® PF2 is certified for global markets and hazrdous locations.

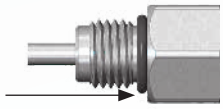
Proflo® PF2 Monitoring Device

MAGNET ASSEMBLIES

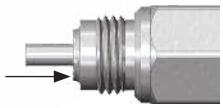
SBCO & Trabon*
O-Ring Seal
7/16" - 20



Lincoln
O-Ring Seal
Extended Nose
7/16" - 20



DropsA
No Gasket
Raised Shoulder



*For use on CPI HP+ and XD+ Divider Blocks

PROFLO CYCLE SWITCH

Compressor Products International's Proflo cycle switch is an electronic cycle indicator designed for use with all compressor and grease divider blocks. The Proflo cycle switch, a single pole single throw magnetically operated reed switch, sends a dry contact signal to any PLC style control panel or directly to the lubrication monitor, such as Proflo® PF2, if it detects a reduction in the cycle time.

Proflo Cycle Switch

Lubrication Accessories

PURGE GUN

A purge gun is a cost effective method to remove air from the divider block system to ensure all lubrication points will receive lubrication immediately on start-up of the compressor.

- Troubleshoot the divider block system to locate blockage in divider blocks, tubing lines and cylinder/packing injection points
- Delivers full pressure at a minimum stroke for ease of use in tight quarters
- 36" (914 mm) stainless steel braided hose for long reach applications
- 5,000 psi stainless steel liquid filled pressure gauge
- Chrome-plated steel tube with bullseye sight glass

Purge Gun

LUBE GUARD PUMP ASSEMBLY

The Lube Guard pump assembly provides protection for the lubrication system by verifying that the camshaft is rotating while also indicating a low oil level condition in the lubrication box.

- Can be installed in any pump location in a CPI lubricator box
- Maintains pressure in the manifold to indicate sufficient oil level in a lubricator box
- The function of the orifice is to provide a controlled leak rate. An orifice kit is included to configure the Lube Guard to the application oil viscosity and volumetric flow rate

Lube Guard Pump Assembly

BALANCING VALVE ASSEMBLIES

Balancing Valves (BV) are recommended for divider block systems experiencing pressure differential ≥ 1000 PSI (70 BAR). They are designed to increase the efficiency and reliability of divider block systems by balancing the effect of injection point differentials on the divider block.
Balancing Valve Assemblies (BVA) include the balancing valve attached to a positional pressure gauge allowing operators to easily adjust and balance outlet pressures in the field.

Balancing Valve

Balancing Valve Assembly

FILTERS

Filtering the lubricant prior to the pumps will keep debris from damaging the high pressure system components.
The Delta-P Filter adapter filters lubricant through a 25 micron filter on the low pressure feed prior to the suction manifold on the high pressure pump assemblies.
For harsh environments such as offshore salt environment or high concentrations of H2S gas, high pressure stainless steel filters are preferred.

Contact your CPI representative for more filter options.

Delta-P Filter

Stainless Steel Filter

Lubricator Pumps

CPI designs and manufactures a wide range high quality lubricator pumps that come in various models with several options. The model that's right for you will be the model designed to fit in your lubricator box.

One piece steel pump body
Precision roller rocker assembly
Pyrex sight glass with protective housing
Precision internal and outlet check valves
Weatherproof construction
Furnished as original equipment by engine, pump and compressor manufacturers
Three pump types: vacuum, gravity, pressure
Three pump sizes: 3/16", 1/4", 3/8"
Modular cylinder design

Consult CPI for the right pump for your application.

CPI Model P55

Discontinued CPI Model P92

MODEL P55 LUBRICATOR PUMPS

The CPI Model P55 pump is an updated version of the Premier Model P55 designed to retrofit Premier, Mega, McCord and Lincoln* lubricator boxes.

Discontinued iCPI Model 2001

DISCONTINUED PUMPS

Model P92 Pumps - designed to replace Madison Kipp style pumps: models DSL, SVH and SVK
Model 2000 - designed to replace Manzel Model 76 and 88 lubricators
Model 2001 - designed to replace Manzel Model 94V and 100V lubricators
Model 2012E - designed primarily but not exclusively for the European pump market

Discontinued CPI Model 2012E

Lubrication Boxes

CPI lubrication boxes, commonly referred to as lubricators, will accurately deliver a predetermined quantity of oil normally under pressure, at regular intervals to moving parts on all types of industrial machinery. The lubricator consists of a reservoir, drive mechanism, and oil pumps. They are furnished in electric motor drive or shaft driven from the machinery to be lubricated. Shaft driven units can be direct drive, pulley/ sheave, or oscillating drive motion.

- Force feed lubricators
- Heavy duty steel reservoirs
- All gear rotary drives
- Electric motor drives
- Rachet drives
- Bottom rotary drives
- Suitable for use with petroleum and synthetic based lubricants
- Automatic oil level controllers
- Level switches
- Electric heater and thermostat assemblies
- Shaft rotation alarms
- Partitions in reservoir for two or more lubricants
- Check valves available in carbon steel and stainless steel

Inside view of P55 Lubricator Box

Example Lubricator Boxes

SAFEGUARD® Lubrication System Consoles

CPI provides custom lubrication system consoles for all reciprocating compressor applications.

CPI SAFEGUARD® lubrication system consoles are self-contained lubrication systems that have been designed for hazardous locations and all types of industrial machinery, including reciprocating compressors and reciprocating pumps.

The SAFEGUARD® 5000 lubrication system console is CPI's most versatile SAFEGUARD® lubrication solution meeting ATEX requirements. Adding the optional dual motor package allows for complete redundancy so that you never need to shut down your compressor for scheduled lubrication system maintenance. Each SAFEGUARD® 5000 is designed to work with CPI's extensive line of divider blocks and lubrication system accessories. Using one CPI's patented shutdown devices or proximity switches, precisely timed and monitored lubrication is provided to your equipment, eliminating the significatn costs of over-or under-lubrication.

CPI's SAFEGUARD® 1000 lubrication system console is a more condensed version of the SAFEGUARD® 5000 console. A standard system includes lubrication box with pumps, motor package, and oil reserve tank with a visual sight glass. As with all CPI-designed lubrication systems, the SAFEGUARD® 1000 can be tailored to fit your compression needs.

CPI Single Motor SAFEGUARD® 5000 System

CPI SAFEGUARD® 1000

SAFEGUARD® 5000 motor package

SAFEGUARD® 1000 sample motor package

SAFEGUARD™ 1000

Lubrication System Console

CPI, a division of the Howden group, presents the SAFEGUARD™ lubrication system console, an exceptional standalone console designed specifically for hazardous environments and a wide range of industrial machinery, including reciprocating compressors and reciprocating pumps. This console is engineered to seamlessly integrate with CPI's extensive selection of divider blocks and lubrication system accessories, ensuring precise lubrication for your machinery.

With the implementation of CPI's innovative shutdown devices or proximity switches, the lubrication process becomes finely timed and closely monitored, eliminating the costly issues associated with over or under lubrication. This advanced control mechanism guarantees optimal performance and extends the lifespan of your equipment.

While the CPI SAFEGUARD™ 1000 serves as a cost-effective solution tailored for smaller and less critical compressors, it remains a highly appealing choice. Additionally, the system offers upgrade options, such as the inclusion of an attached panel for the divider block and the ability to connect level switches, thereby enhancing its functionality and versatility.

SAFEGUARD™ 1000

Lubrication System Console

Features:

- Single Motor Driven P-55 Pump Package
- 105 litres Stainless Steel Oil Supply Reservoir
- Single Oil Supply Filter Circuit
- Single Discharge Filter Circuit, 10-Micron
- Patented POPR
- CPI Divider Valve Assemblies (Optional)
- Heater/Thermostat (Optional)
- High and Low Level Switches (Optional)
- Rugged Steel Frame Powder Coated Finish

Dimensions:

Configuration	Height mm (in)	Width mm (in)	Depth mm (in)	Weight kg (lbs)
Standard	1446 (57)	1035 (41)	658 (26)	167.7 (390)
With pannel	1814 (72)	1035 (41)	658 (26)	205.4 (453)

System Working Pressure:

Supply MAWP: 150 psi (10 bar)
Discharge MAWP: 8000 psi (544 bar)

Reservoir:

Material: Stainless Steel
Capacity:
Usable: 105 Litres between Level Switch Controls
Total: 146 Litres

Lubrication Oil:

ISO 22 – ISO 680
SAE 5W Engine Oil – SAE 140W Gear Oil
IMPORTANT - Please consult CPI for higher viscosity oil usage.

P-55 Pump:

Plunger Size	MAWP: bar (psi)
3/16"	517 (7,500)
1/4"	488 (6,500)
3/8"	241 (3,500)

Gauges:

Material:
Case: Stainless Steel
Internals: Stainless Steel
Scale: Dual psi/bar
Fill: Glycerin

Pin Indicators:

Material: Stainless Steel (body & spring), Viton (seals)
Pin: Anodized Aluminium (Color Coded)

Pop Open Pressure Relief (POPR):

Material: Stainless Steel
MAWP: 241 bar (3, 500psi) or 379 bar (5,500 psi)
Resettable

ATEX Certification:

Mark: II 2 G / Ex cb db hb T4 Gb
Notified Body No: 2776

CPI by Howden

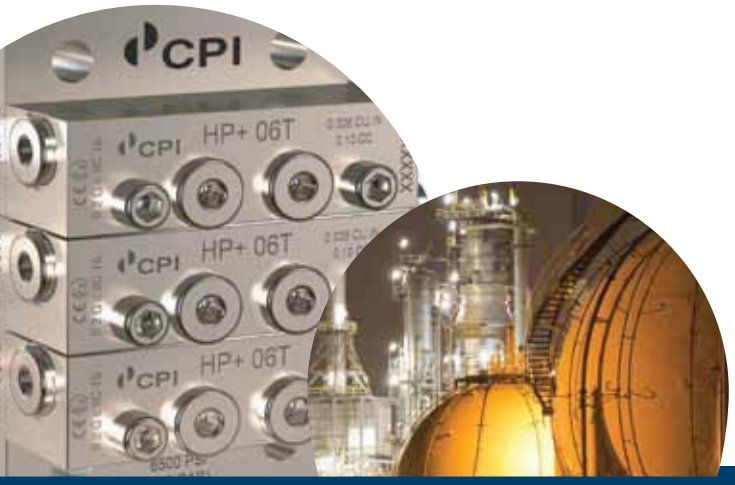
SAFEGUARD™ 5000

Lubrication System Console

The CPI, part of the Howden group, SAFEGUARD™ lubrication system console has been engineered as standalone lubrication console for hazardous locations and all types of industrial machinery including reciprocating compressors and reciprocating pumps.
It has been designed to work with CPI's extensive line of divider blocks and lubrication system accessories to provide precise lubrication to your machinery.

Using one of CPI's patented shutdown devices or proximity switches, precise timed and monitored lubrication is provided to your equipment eliminating the significant costs of over or under lubrication.

The CPI SAFEGUARD 5000 is configurable allowing for multiple options including dual motor packages allowing for complete redundancy so that you never need to shut down your compressor for scheduled lubrication system maintenance.



CPI by Howden

SAFEGUARD™ 5000

Lubrication System Console

Features:

- Single or Dual Motor Driven HVLP Pump Package
- 30-Gallon (useable) (114 litres) Stainless Steel Oil Supply Reservoir
- Dual Suction Side Filtration Circuit
- Single or Dual HVLP Pump Heads
- Dual 10-Micron Discharge Filter Circuit
- Patented POPR
- XD Master Divider Valve Assemblies
- Heater/Thermostat (Optional)
- High and Low Level Switches (Optional)
- Rugged Steel Frame Powder Coated Finish

Dimensions:

Configuration	Height mm (in)	Width mm (in)	Depth mm (in)	Weight kg (lbs)
Single	2032 (80)	1219 (48)	514 (20)	479.9 (1058)
Dual	2032 (80)	1219 (48)	819 (32)	714.4 (1575)

System Working Pressure:

Supply MAWP: 150 psi (10 bar)
Discharge MAWP: 8000 psi (544 bar)

Reservoir:

Material: Stainless Steel
Capacity:
Usable: 30 U.S. Gallon (114 litres) between Level Switch Controls
Total: 50 U.S. Gallons (189 litres)

Lubrication Oil:

ISO 22 – ISO 680
SAE 5W Engine Oil – SAE 140W Gear Oil
IMPORTANT - Please consult CPI for higher viscosity oil usage.

HVLP Pump:

Plunger Size: 7mm or 10mm
Maximum Operating Pressure: 3,500 psi (238 bar) - 10mm HVLP pump
Maximum Operating Pressure: 8,000 psi (544 bar) - 7mm HVLP pump

Gauges:

Material:
Case: Stainless Steel
Internals: Stainless Steel
Scale: Dual psi/bar
Fill: Glycerin

Pin Indicators:

Material: Stainless Steel (body & spring), Viton (seals)
Pin: Anodized Aluminium (Color Coded)

Pop Open Pressure Relief (POPR):

Material: Stainless Steel
MAWP: 241 bar (3,500 psi) or 379 bar (5,500 psi)
Resettable

ATEX Certification:

Mark: II 2 G / Ex cb bd hb T4 Gb
Notified Body No. 2776

CPI by Howden

Compressor Services

One Source with Global Reach

Even the smallest components can interrupt uptime and alter productivity. As an experienced and reliable partner, CPI, part of the Howden group, is ready to respond with a solution at a moment's notice, anywhere in the world.

Reconditioning Services

CPI provides exceptional reconditioning services for restoring parts to their original specifications and performance. Whenever a part has the potential to be made "good as new," CPI has the expertise to make it happen. CPI experts will carefully evaluate the condition of components on various types and makes of compressors, identifying the root causes of problems to arrive at an optimal solution. CPI technicians are prepared to offer in-depth guidance on product redesign and upgrades.

Valves, Unloaders and Actuators - Reconditioning can include machining of valve seats and guard, replacement of internal components, concluding with testing, quality inspection, and protective packaging.

Packing Cases - Reconditioning processes include cleaning, bead blasting, machining and lapping of cups, reassembly, quality inspection and protective packaging.

Piston and Piston Rods - Services include re-machining of grooves and re-anodizing. Rod reconditioning may consist of machining, grinding, polishing and the application of specialized spray coatings. Finally, all parts are re-assembled with CPI piston and rider rings.

Major Components - We also provide complete reconditioning services for all major compressor components, including engine blocks, cylinders, crossheads and crankshafts.

Screw Compressor - Body rebuilding, screw tip welding and re-machining. Shaft dimensional restoration of bearing, seal and coupling fits are also offered.

Overhauls and Rebuilds

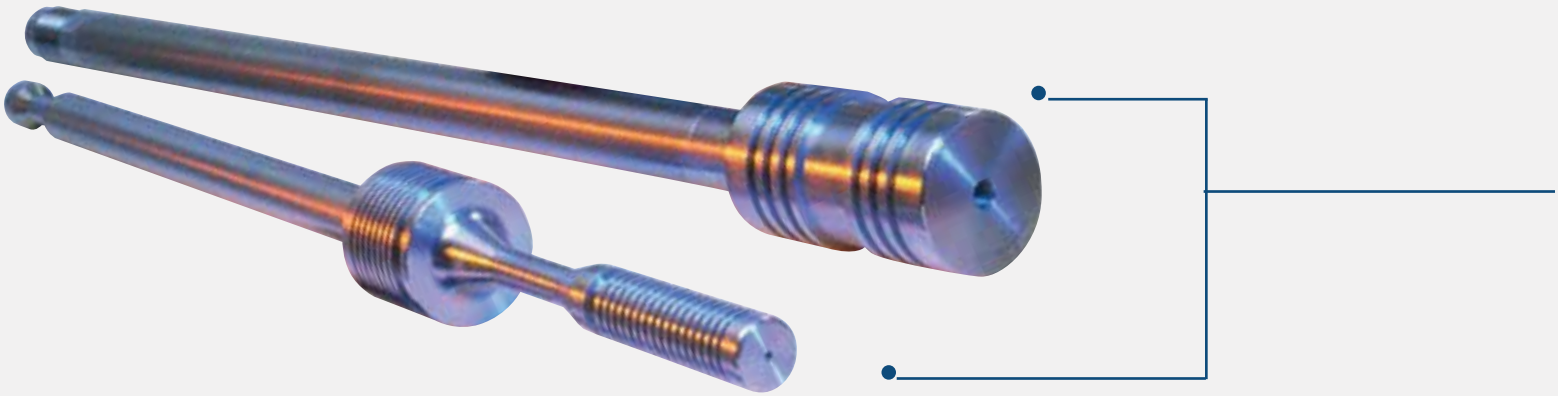
CPI provides quality service in all aspects of cylinder design, manufacture, retrofits and repairs. Cylinders are relined with slip or interference fit liners, spray coated to meet the needs of the application and thoroughly inspected and tested before being returned to customers. Aftermarket variable volume pockets are manufactured and available with improved design features to improve longevity and durability.

Field Services

CPI provides field services to compressor operations both on and off shore, including:

- On-site scheduled and breakdown maintenance
- Off-site workshop overhauls for major components and complete compressors
- Lubrication systems maintenance
- Turnkey projects with full feasibility studies
- Custom design
- Compressor overhauls and rebuilds

CPI field service engineers are highly experienced technical experts capable of fully servicing many compressor makes and models, either individually or as a maintenance team working on-site with an operator's own personnel.



Due to the nature of our business, which almost invariably includes technical upgrades, CPI's involvement goes far beyond just supplying components. Our expertise encompasses not only our products but also an understanding of the compressors an processes on which they are operating.

The evolution of our business has enabled CPI to develop its own capabilities and to offer field services, which may vary, from a simple piston redesign and installation or a lubrication box installation, to fully project managing a major modernization of compressor.

CPI field service include full feasibility studies, redesigns, manufacture or modernization of components, on-site service and overhauls. Our field service teams can solve any hard to isolate or recurring problems with your compressor. Down time is loss money and to minimize it, engineers will do a complete on site system analysis, troubleshoot the room cause and provide so CPI field services are able to maximize compressor efficiency either as an independent maintenance team or in conjunction with an operator's own personnel. Based in strategic locations around the world, CPI's field service teams are able to respond quickly to operators' needs... when it matters, where it matters. The technical team provides support by phone or e-mail 24 hours a day.

CPI by Howden

CPI, part of the Howden group, prides itself on its unique approach to developing new compresso valve concepts and non-metallic materials used in the production of valves, piston rings, rider rin packing and oil wipers. Our application expertise has transformed the performance and reliability of reciprocating compressors in a wide range of applications around the world.

Design

CPI is a world leader in designing innovative, reliable solutions for reciprocating compressors, with continually evolving technologies to meet the needs of today's rapidly changing industries.

Technical Support

With industry-leading expertise, our technical support team is highly adept at diagnosing and remediating challenging problems, particularly in situations where a previous material has failed. CPI technicians are prepared to provide expert technical advice, support and solutions for even the most extreme applications issues.

Quality Manufacturing

CPI is dedicated to manufacturing and distributing components in compliance with the most rigorous international standards for quality and management. Quality assurance is a core value that underscores the meticulous attention to detail applied to products and processes in each of our facilities worldwide.

CPI leverages its expansive global network to efficiently solve problems and meet customer needs all around the world with minimal downtime. In all facilities, from supply and distribution to repair, CPI prides itself on being a dynamic and responsive customer partner.

CPI by Howden

CPI, part of the Howden group, is an industry-leading manufacturer of precision-engineered components for reciprocating compressors used in petrochemical, refining, natural gas, and offshore industries. The CPI product range includes packing, piston and rider rings and a complete line of compressor valves designed to provide each customer with maximum performance and reliability for their application. In addition, CPI offers the highest quality lubrication system technology for further compressor efficiency and protection.