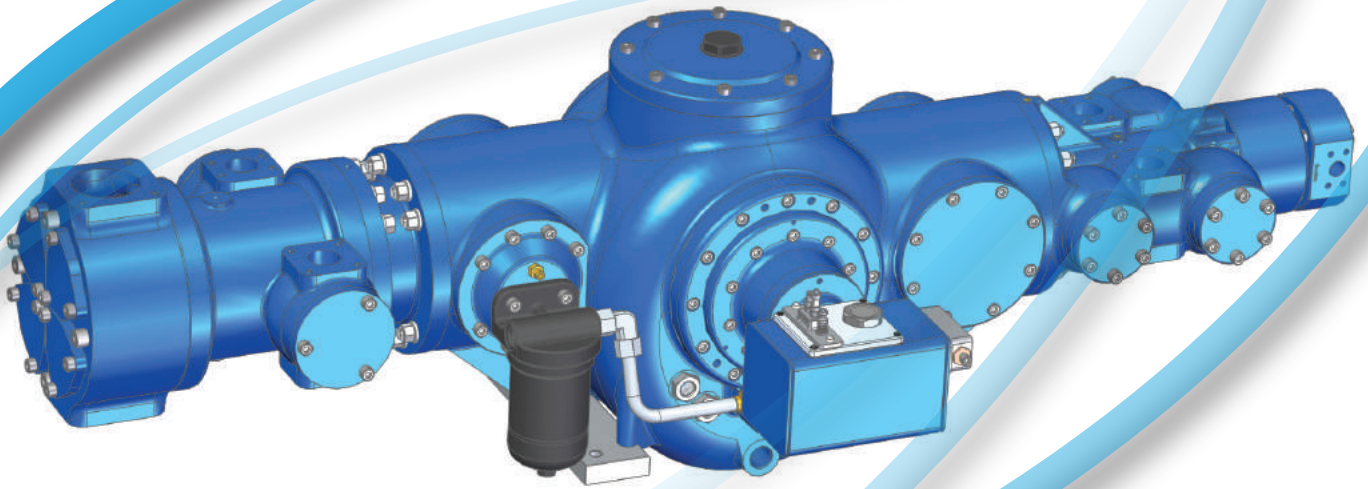


# **BISON**

**COMPRESSION LTD**





## COMPRESSION'S NEW GENERATION

25 years ago we designed a compressor that set the standard for CNG all around the world.

Today our new range of Bison CNG Compressors will lift the levels of performance and reliability expected from our machines.

Based in Auckland, New Zealand, our company has a reputation for designing innovative and reliable products for the CNG Industry. Our people have been involved in CNG since the 1970s which makes our reputation for quality and strength the cornerstone of the Bison Compression brand.

In every area of our product range, we have included new innovative solutions to lift the reliability and output of most installations. If it be in the Trailer Virtual Pipeline Systems, or improving the quality of delivered gas for vehicles, Bison Compression Ltd has the solution for your needs.

Bison Compression Ltd provides solutions for:

- New Generation CNG Compression Technology
- Filtration solutions
- Pressure Reducing Station Systems
- Innovative Virtual Pipeline Solutions

Bison Compression has a large range of products that are simple, reliable solutions for you and your company in the CNG industry. We are one of the top manufacturers in the world for CNG Compressors, Products and Technology and are the leading company in the New Zealand market. Having previously designed successful compressors, Hugh Fulton and his team have decades of experience designing and manufacturing CNG Compressors, making Bison Compression's products the best on the market.

We are a trustworthy, reliable company with quality products and solutions for your needs.

Contact the team at Bison Compression Ltd for a new look at old problems.





## ABOUT US

We have a long history in the CNG compression business, having pioneered the industry with compressors designed over 35 years ago still running today. Longevity and versatility have allowed Bison Compressors to thrive in harsh environments where other brands have failed.

Having operated reliably and consistently over the years, our compressor designs have pumped well over 20 billion cubic metres of gas around the globe – our knowledge and expertise have helped establish compressor manufacturers from such countries as Argentina, Canada, China, Korea and Thailand.

Having previously founded successful compressor companies, Hugh Fulton and his team's re-entry into the market has been driven by clients who seek the reliability and consistency of product since our exit from the market almost 10 years ago.

Located in the rural suburb of Clevedon, New Zealand; Bison Compression is surrounded by a beautiful environment. We want to take New Zealand's clean, green vision to the rest of the world, pushing for CNG solutions for a cleaner future.

Over thirty years ago, the founder of previously successful compressor companies and Bison Compression Ltd, Hugh Fulton, began packaging CNG compressors.

In 1980, the "W" type range was eventually developed to have increased capacity utilising double acting cylinders and non cooled technology. 300 of these compressors were produced.

In 1992, a successful compressor was developed which incorporated higher speed, a direct coupled pressurised crank case and non cooled cylinders. This crank case forms the heart of today's product range. The blocks are capable of a 10,000 lb rod load and 250 hp at 1800 rpm. More than 600 of these were produced.

In 2002, the 600hp compressor range was developed.

In 2009, Q-Subs Ltd was established and by 2013, the new 300hp range of Bison Compressors were developed.

After successful field testing, Bison Compression Ltd was established in 2015.

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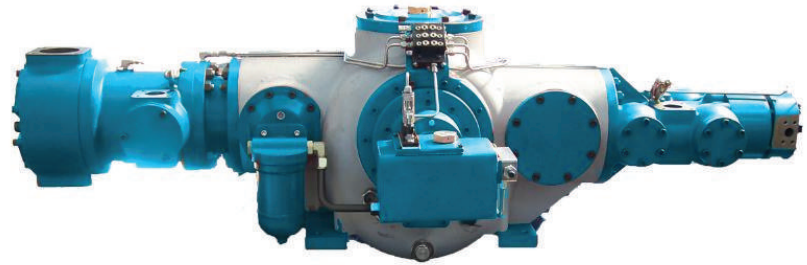
113 North Road, Clevedon, Auckland 2582, New Zealand





## BARE SHAFT COMPRESSOR

- Pressurised Crankcase
- Pressure Balanced Crankshaft
- Longer bearing life
- Cross-head integral with Crankcase
- Larger capacity oil filter
- Improved oil mist filtration
- 3-piece low pressure pistons
- Improved piston rod technology
- Rugged oil pump bearings
- Externally serviceable oil pump



Spec Table	Power				Stages	Inlet Pressure		Capacity 1480 rpm		Capacity 1800 rpm	
	hp		kW			BarG		SM <sup>3</sup> /hr		SM <sup>3</sup> /hr	
	Model	Min.	Max.	Min.	Max.	#	Min.	Max.	Min.	Max.	Min.
250 Series	111	225	83	168	4	0	2	350	1000	420	1200
225 Series	131	217	98	162	4	1.5	4	500	1100	600	1320
200 Series	139	232	104	173	4	2	8	550	1250	660	1500
150 Series	118	218	88	163	4	4	10	550	1350	660	1620
125 Series	146	253	109	189	3	6	14	750	1800	900	2160
100 Series	125	200	93	149	3	8	20	700	1650	840	1980
75 Series	91	205	68	153	3	10	25	750	1850	900	2220

### Pressurised Crankcase

Gas leaking from the rod seals and crankcase is one of the major sources of gas leakages in most CNG compressors. By pressurising the crankcase with gas and having internal seals capable of holding the gas internally ensures Zero Gas leakage. This improves the environmental impact due to no gas emissions and can decrease gas loss by up to 3% versus non pressurised systems.

### Pressure Balanced Crankshaft

With twin opposed seals balancing the crankcase / crankshaft pressures there is no end loading of the crankshaft. This extends bearing life up to 150,000 hrs L10.

### Horizontal Design

Horizontally opposed cylinders greatly reduces vibration. This creates longer service intervals, reduced foundation requirements and higher efficiency due to smoother running. It also allows for higher rotational speeds for increased system capacity and shorter stroke length

### High Strength Components

New designs, materials and technology result in superior component strength. Pistons, Piston rods have the potential to operate for the lifetime of the machine with the exclusion of wear.

### Lubricated Cylinder Technology

The Bison Compressor auxiliary oil pump is integrated onto the crankcase delivering oil to the divider block distributing measured amounts of oil directly to the piston rings and rod seals. The benefit of this system is increased ring and seal life through reduced friction. Our design and system components offer the ability to deliver gas at equal or less oil carryover than standard non lubricated machines and can operate at ¼ of the maintenance cost of a non-lubricated system.



## CNG COMPRESSOR PACKAGES

We have integrated our new Bare Shaft Compressor with a number of new features to enhance our new package systems' reliability and performance. Either electric driven or gas engine driven, our goal is to improve efficiency and to reduce operating costs of all our machines.

### **Pulsation and Separator Vessels**

Standard on Bison Machines, they remove unwanted condensates and pulsation effects. Reduces component wear and increases compressor efficiency.

### **Cooling**

Cylinders are all modern non-cooled design. Air cooled exchangers eliminate high maintenance costs associated with water cooling. Specific attention to deliver low temperature gas which enhances ability to remove oil from the gas stream. Lower temperatures means longer life.

### **Filtration**

Inlet and Discharge filters protect and ensure clean gas enters and exits the compressor. Coalescing filter minimises the oil carryover from the compressor

### **Modernisation**

Designed within the last three years utilising our 40 years of experience in the manufacture of CNG compressors.

Our design uses modern new techniques and materials

Designed to meet new concerns over the environmental impact especially in regards to efficiency and consumption.

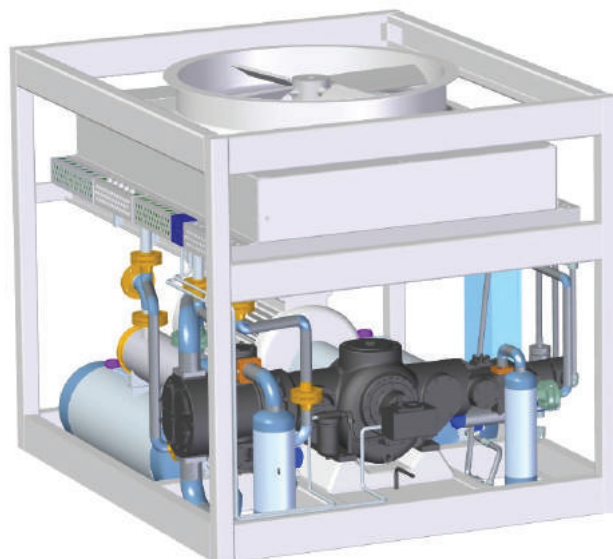
Integration of new communication technology to ensure key people have access to important information on the operation of their machines.

### **Electric Driven:**

- Low profile skid
- Efficient heat exchanger
- WEG electric motor
- Electric motor driver
- PLC controller
- ASME tested vessels

### **Gas Driven:**

- Caterpillar gas engine
- Efficient heat exchanger
- Scada controls
- CNG powered
- PLC controller
- ASME tested vessels





## COMPRESSOR SPARE PARTS

Compressor Spare Parts from Bison Compression Ltd. are built using our years of experience in the Compressor Manufacturing Industry. The combination of experience and the suppliers we use mean we supply high quality products.

We also supply design services to eliminate issues for existing machines or we can design changes to increase machine capacity or reliability.

Bison Compression Ltd are a complete one stop shop for your compression and CNG needs.

### Compressor Parts available:

O-rings	Oil Pump Systems
Gaskets	Seal housings and connections
Piston rings	Lubrication systems
Piston rods	Castings
Connecting rods	Crosshead Cylinders
Crank shafts	Crosshead Pistons
Compressor Valves	Cylinders
Valve Lanterns	Cylinder Heads
Bearings	Pistons and Piston assemblies
Rod seals	Service Kits

### Dispenser components:

Valves  
Non return Valves  
Manifolds  
Electrical  
Electronics  
Flow Meters

### Manifold and fill systems:

Priority systems  
Couplers  
Valves  
Bison Compressors:

A full range of compressors and packages are available on request.





## DESIGN

With over 100 combined years' experience in manufacturing CNG compressors we can accurately duplicate components to within 0.001mm tolerances. Our engineers do comprehensive material, dimension and weight analysis as well as detailed calculations for each part.

Detailed drawings for each component are drafted and full product review is initiated. In almost all cases our products are identical or of a higher specification than the original parts.

## MANUFACTURING

### Casting

Patterns are manufactured to our drawings. Materials are the same as the original cast components. Our castings are inspected by our QA team to ensure quality before the final machining is completed.

### Machining

We have our own CNC equipment onsite for small component manufacturing. Depending on the process we outsource some of our components to companies which have been manufacturing compressor parts for us for over 40 years. These companies have some of the best internal processes and have Jigs to make a variety of compressor parts to ensure consistency and the quality we require for our parts.

## QUALITY ASSURANCE

Our QA Manager held the same position at a well known compressor manufacturing company. All our QA systems are based off the this company's systems. Bison Compression has its own inspection facilities on site and check all items which we manufacture.

Ultrasonic and X-ray inspection for cast components on request.

### Systems

Our companies operate under our ISO 9001:2008 certificate.

### Warranty

Our company offer a similar product warranty as the OE company components.





## FILL / DECANT PANEL SYSTEMS

Bison Compression has many years experience in the delivery of industrial gas/ virtual pipeline systems. Historically, Decant Panels can be the weak point the system reducing gas delivery capabilities and creating downstream issues with regulators and other system components.

Bison has designed a complete range of decant and fill panels specifically to eliminate constraints in almost all other systems around the world.

### Features

- Low Surge operating valve system
- High flow coupling system
- High flow breakaway system
- Manual and Automated changeover system
- Dual Hose or single hose connections
- Internal gas regulators for control valves
- Simple coupling holder solutions
- Flow Meter capable
- Benefits
- Increased gas delivery capability

Bison decant systems in conjunction with the Bison PRS systems offer the capability to deliver significant amounts of extra gas per delivery than standard PRS systems.

### Low surge control valves.

PRS systems have issues with pressure surges when new trailers are coupled into the line. Bison Decant Systems eliminate these issues through a unique control system within the decant panel controlling the gas.

### Fully Automated or Manual control systems

Depending on the site, Bison Compression Decant and Fill Panel Systems can be built to work within the client's requirements. Fully automated systems can have hose coupling sensors, pressure changeover control and backup storage installed. Manual systems can have manual valves and bleed systems.







## FILL PANEL SYSTEMS

Bison Compression Fill Panels are designed to maximise the delivery of gas into CNG Trailers. The panel can be fitted with a host of additional components to customise the system to the type of trailer, the fill rate and the delivery temperature.

### Standard Features:

- Steel framing system
- ¾ or 1" main pipe lines
- Inbuilt bleed system vented to 3M above the ground
- High post coupling system
- Stainless steel valve housing enclosure
- Inlet and outlet control Valves

Optional features:

- High Flow rate coupling system
- Temperature control valve systems for type 4 trailers
- Fully automated trailer change over
- Single or dual trailer post
- Flow Meter
- Hose coupling solution

Bison Compression Ltd offer the most comprehensive solutions for your CNG trailer fill requirements.





## DECANT PANEL SYSTEMS

Bison Compression Ltd. Decant Panels for industrial gas/ virtual pipelines are the key to optimising the amount of gas being delivered and protecting the equipment downstream of the panel. Poor component selection and control can reduce the amount of gas and cause issues with regulators and valves.

Bison Decanting Panel Systems offer a number of unique features specifically designed to optimise delivery and protect equipment downstream of the decant panel. This can increase delivery of gas in some cases up to 30% and decrease the required maintenance on the pressure reducing system significantly.

### Standard Features:

- Steel framing system
- $\frac{3}{4}$  to 1 1/2" main pipe lines
- Inbuilt bleed system vented to 3M above the ground
- High post coupling system
- Stainless steel valve housing enclosure
- Inlet and outlet control Valves
- Single or dual hose
- Optional features:

- Decant Panel Close Up
- Decant Panel Close Up
- High Flow rate coupling system
- Fully automated trailer change over
- Single or dual trailer post
- Flow Meter
- Low Surge operating valve system
- Manual and Automated changeover system
- Internal gas regulators for control valves
- Simple coupling holder solutions



Bison Compression Ltd offer the most comprehensive solutions for your CNG trailer decanting requirements.

Please contact the team at Bison Compression for specifications and other information.





## FILTRATION SYSTEMS

The team at Bison Compression have been working in CNG since the 1970s. In that time we have experienced almost all issues relating to filtration and over the years have had to work out solutions to ensure the clients have clean gas to use. Our engineers have developed filtration solutions for the removal of oil and particulates. We have configurable solutions for your CNG needs.

### BISON ZERO

Bison Zero is an oil separation system which reduces the oil from the compressor line of the CNG system. Our unique system makes the oil accumulate in our oil separation vessel which is cooled for efficiency. The client can have multiple separators in series to reduce the amount of oil residue left in the line and depending on the flow rate, have multiple separators in parallel to meet the flow expectations.

#### Options:

Separator Cooling: The Bison Zero can cool the outside of the oil separation vessel to increase the removal potential of the gas.

Optional Inline Charcoal Filters.

### Q-FILTERS

The Bison range of Q-Filters are designed to be used in most Compressed Natural Gas (CNG) applications. Q-Filters are designed to filter contaminants like rust and pipe scale, compressor lube oil and water from compressed gases.

#### Applications:

- Inter-stage filters in the multiple stage compression of the gas
- Storage and delivery of the gas to CNG powered vehicles.
- Pressure Reducing Stations

#### Types:

Q-Filters varied media choices remove up to 99.995% of both solid and liquid aerosols and contaminants as small as 0.2 microns in size.

- Silica gel to remove desiccants and adsorb water vapour.
- Molecular sieve to remove particulates.
- Activated carbon filter to remove oil vapour.

#### Construction:

- Alloy or stainless steel
- Inline or T-style
- ¼", ½", ¾", 1", 1½"

#### Technical Specifications:

Max. pressure: 5000psig

Operating temperature:

Thread types: NPT standard, SAE and Code 62 available.

Flow rates: Model and configuration dependent.

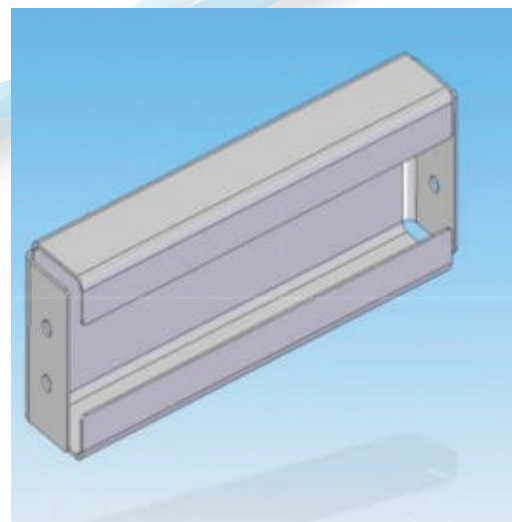
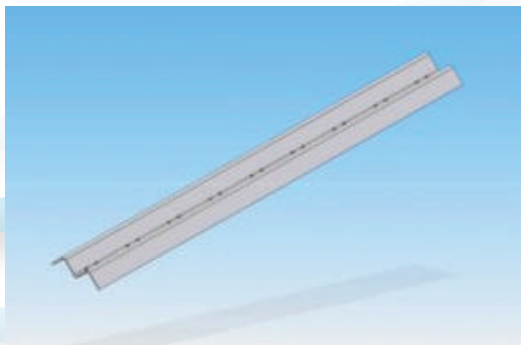
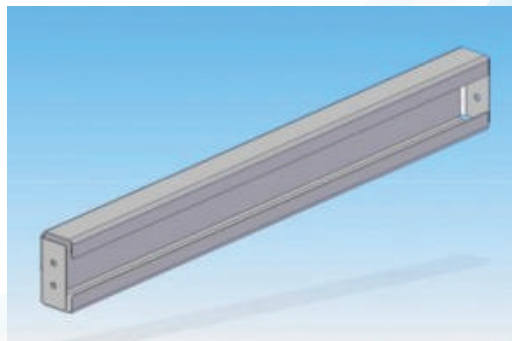
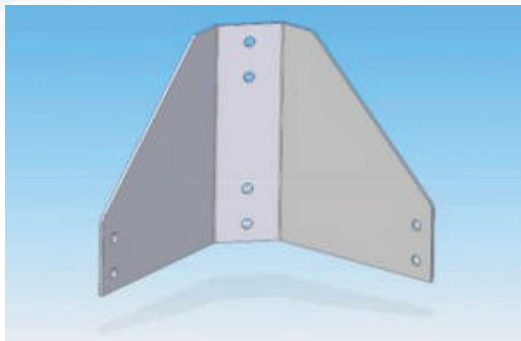
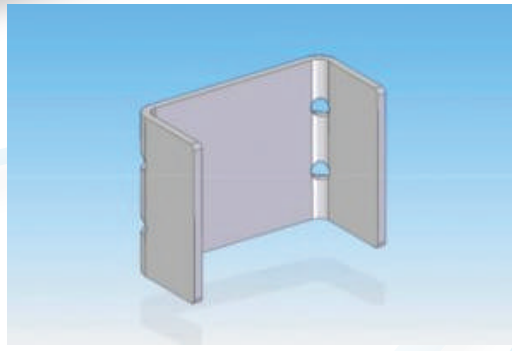
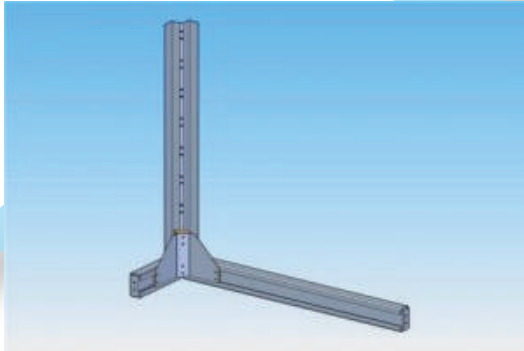




## FRAME SYSTEMS

Bison Modular Framing Systems for Plant & Machinery Housing.

- Complete plant & machinery packaging for simple installation at final location.
- Bolts together; requires no onsite welding, surface finishing or fabrication.
- 2.5, 3, 4, 5, 6 & 8mm thickness options for frame. C-sections in 200x100mm or 150x75mm.
- Acoustic panel and canopy options to fit frame.
- Made to order and supplied with all fasteners.
- Easy compact storage prior to assembly.
- Galvanised for long life.





## PRESSURE REDUCING SYSTEMS

Bison Compression Pressure Reducing Stations, "PRS", for Industrial Gas Virtual Pipeline Solutions are designed to maximise gas delivery per load, increase operating efficiency, improve reliability and reduce maintenance costs.

Made in New Zealand, our team have been involved in manufacturing Pressure Reducing Systems since 1984 and we understand the complexities and requirements to manufacture a reliable unit.

### Features:

#### Maximised Gas delivery:

Bison Pressure Reducing Stations are designed to optimise flow when the pressure is at its lowest. To do this we have designed a system, that in conjunction with our decanting systems, ensure the least possible amount of pressure drop across the system. The result is a dramatic increase in the amount of gas every trailer is capable of delivering per load.

#### Reduced Maintenance Costs:

Our electric boiler models do not require any pumps to reticulate the water within the system. This eliminates pump issues, piping issues, vessels and remote storage tanks. Our decant systems and regulator setups are designed to reduce pulsations which reduce regulator life. It is expected that the cost of maintaining a Bison PRS would be at least a ¼ of other similar technology

#### Operating Costs:

Our heating is directly coupled to the heat exchanger and therefore the losses incurred in pumping and moving water from out of zone is eliminated.

#### Eliminates Downtime:

Bison PRS dual line PRS systems offer dual regulator lines. If for any reason there is an issue with one line it will operate another parallel line. This gives the client the peace of mind that the gas can operate 24-7.

#### Total Cost of Ownership:

With increased delivery per trailer, plus reduced maintenance and operating costs, the total cost of ownership of our units are significantly less than other systems available on the market.





## PRS SPECIFICATIONS

**Maximum Inlet Pressure:**

250bar (3500psig)

**Minimum Delivery Pressure (Flow Dependent):**

7Bar (98psig)

**Outlet Pressure:**

Minimum 1Bar (14psig)

**Operating Temperature:**

20degC +- 10deg C

**Sizes:**

500nm3hr

1000nm3hr

2000nm3hr

3000nm3hr

**Standard Features:**

- All in one boiler/heat exchanger system
  - Two stage regulating system
  - State of the Art pressure control Valve systems
  - Expansion tubes
  - Dual regulators
  - Interstage relief Valves
  - Pipework and related Valving
  - Header Tank
  - Single piece skid
  - EX rated electrical Control Box
  - EX rated transmitters EX rated Heating element or Separate Gas Boiler Skid
- Option features:
- Dual Regulator Line
  - Scada control system
  - Bypass Line Valve system
  - Three stage regulating system
  - Flow Meter
  - Inline Filter Assemblies





## PRS SKIDS

Bison Compression's range of PRS systems are housed in self-contained skids, either within a stainless steel lockable canopy or on a standard plinth.

### Features:

Inlet and outlet flange connection.

Gas controls housed on the skid.

Electric heat models have no pumps or separate heating tanks.

All power and controls housed on the skid.

Electric heating models can be installed very quickly. This gives the ability to transport between sites.

High flow components for larger volume delivery at lower pressures.

Stainless steel lockable canopy.

Small combined footprint.

Gas heating skid available.

### Benefits:

Easy installation.

Higher delivery volumes per trailer.

Less gas returned.

Smaller space requirements.

Easily moved to additional sites.

All Bison PRS Systems are fully tested with our decanting systems before leaving the factory. Once full with gas, the PRS will operate independently.

