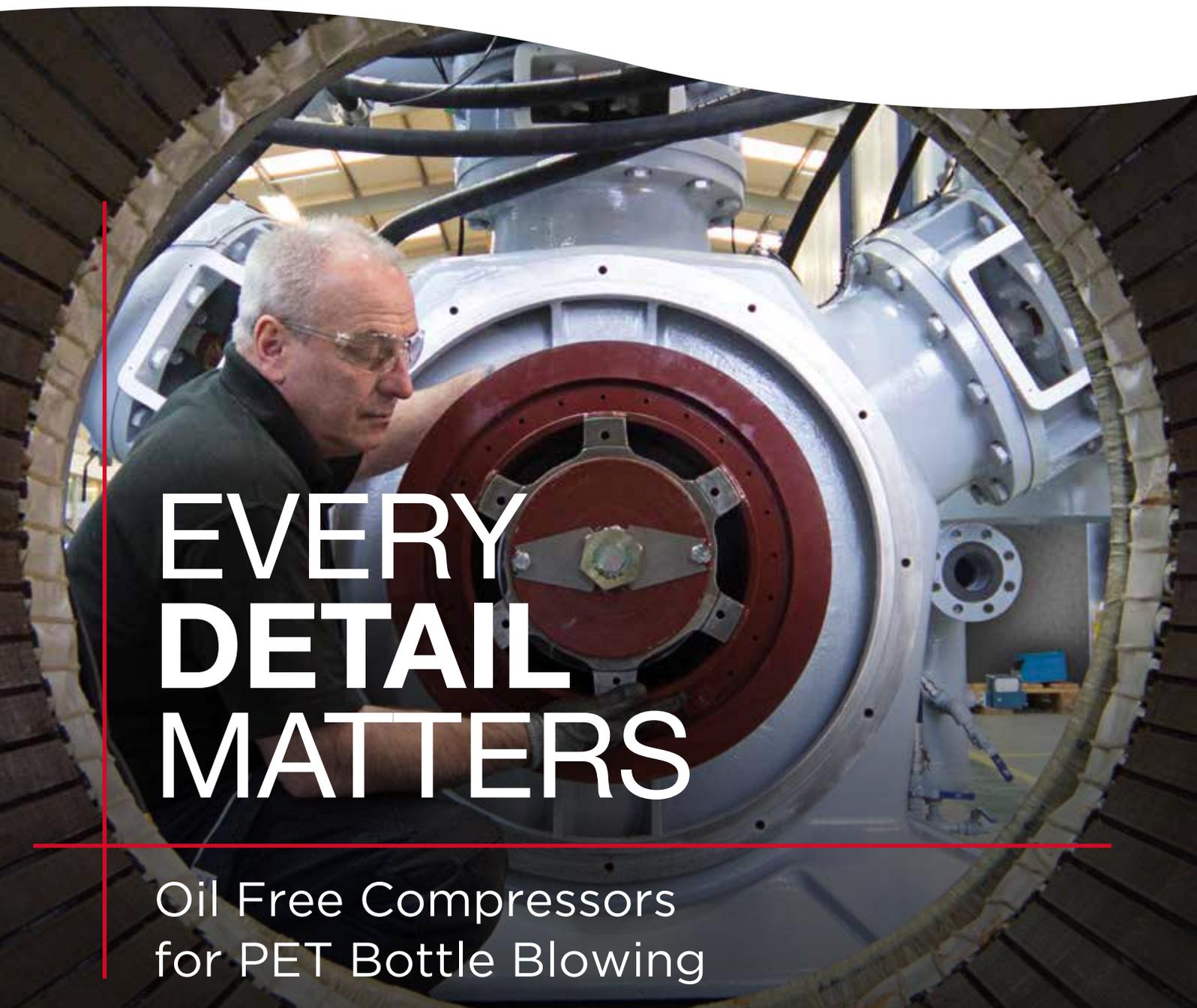


BellissMorcom

Gardner
Denver

HIGH PRESSURE SOLUTIONS

A man with short grey hair and safety glasses is looking intently at a large, complex industrial machine. The machine is primarily white with a prominent red circular component in the center. The background shows a factory setting with various pipes and machinery. The overall scene is well-lit, highlighting the intricate details of the equipment.

EVERY DETAIL MATTERS

Oil Free Compressors
for PET Bottle Blowing



EVERY DETAIL MATTERS

In the competitive world of PET bottle blowing, every efficiency-gain and cost-saving matters. Every bottle matters, every second of every production run matters. And every cubic metre of compressed air matters.

As world leaders in compressor technology for the PET industry, every detail of equipment design, specification and manufacturing matters to us.

Why Our Expertise Matters

Building on decades of innovation, every Belliss & Morcom compressor is engineered from the ground up, to deliver outstanding levels of efficiency, quality and performance, specifically for PET.

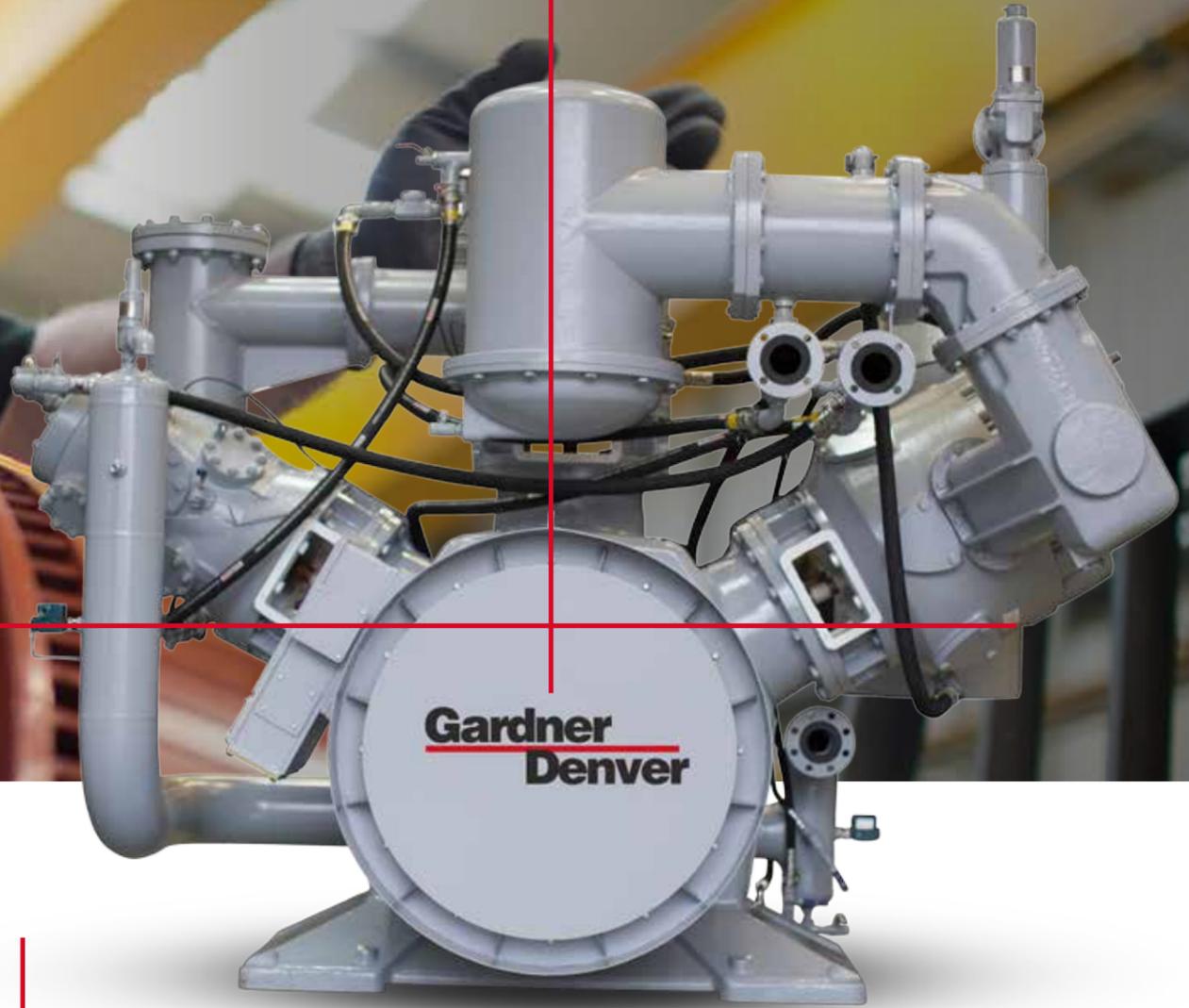
A combination of unique design features and engineering refinement adds up to real advantages for customers - including reduced energy consumption, greater uptime, lower total cost, and the sheer reliability of air delivery, when the pressure is on.



EVERY ONE PERCENT MATTERS

In PET bottle blowing, success depends on fine margins, and machine efficiency matters. The unique Belliss & Morcom shaftless motor offers 100% drive efficiency to deliver the lowest system running costs in the industry.

MARKET LEADING
**SYSTEM
EFFICIENCY**



Even a single percentage point can make a huge difference.

The smallest issues with the transfer of power from the compressor motor can result in significant energy loss, and serious financial impact. In fact, belt drive system inefficiencies can add up to 12% to energy bills. Which is why every Belliss & Morcom PET compressor is specified with a shaftless motor as standard*.

This means that 100% of the motor's output power is transferred directly into the compressor's running gear, with zero degradation over the lifetime of the equipment. So you start by saving, and you continue saving, year after year.

For example a single 500 kW PET machine might be costing over £400,000 a year to run**. Inefficiencies of even just 1% on the drive system can add in excess of £4,000 to your energy bill - every year.

Brand new belt drive systems typically operate with inefficiencies of around 5% to 7%, rising to around 12% after wear, depending on your maintenance schedule. This means your drive system alone could be costing upwards of £50,000 per compressor, per year in wasted energy. In contrast, with the Belliss & Morcom shaftless motor you enjoy zero energy loss, and zero extra cost.

**assuming 0.1 £/kWh energy prices and 8,000 running hours per year. (500/0.99)*8000*0.1 = £404,040

*VH7/9 excluded.

Unique W design

The unique Belliss & Morcom W design means each compression stage runs on its own cylinder line. This gives you an extra layer of reliability and efficiency. So whatever your system size and output, capacity control can be achieved in the most cost effective way possible.

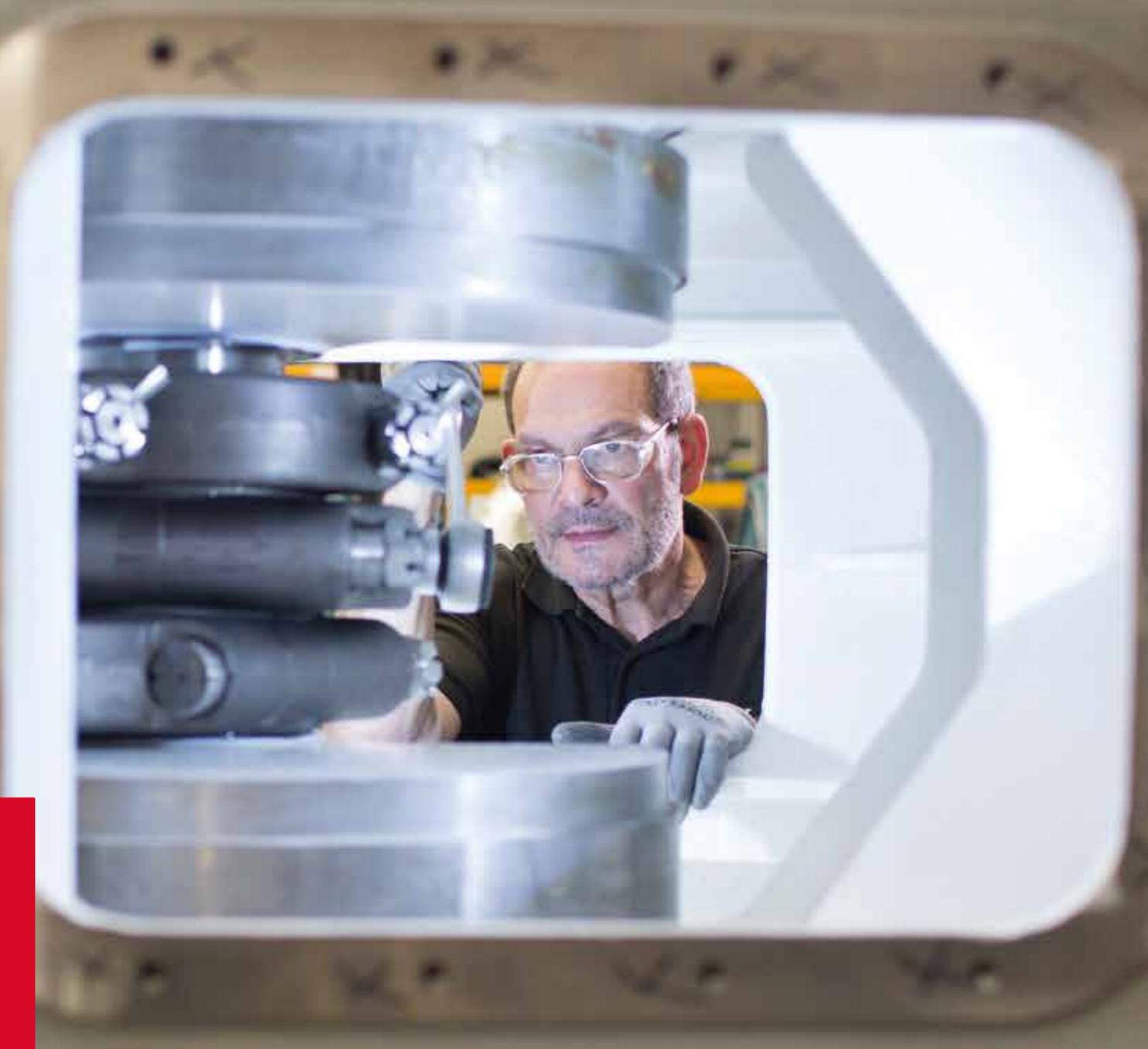
Our efficient 50% load system manages smaller flow variations and allows tighter pressure bandwidth without the need for a variable speed drive (VSD).

However, where required, Belliss & Morcom also offer a market leading VSD system. Combined with our 50% load and available running speed range, it offers unmatched output control - down to 30% of the maximum output.

EVERY BOTTLE MATTERS

In a busy factory, where the quality and reliability of every bottle matters, you need equipment you can rely on. Which is why every Belliss & Morcom PET compressor comes with quality and reliability built in.

**ENGINEERED
TO PERFORM**



Built to Last

Belliss & Morcom has been a trusted partner in the PET industry since 1978. In fact, the very first machine we supplied continues to run today. Our continuing commitment to outstanding build quality and dependability is backed up by our 5 year+ Belliss Xtra warranty programme.

In order to ensure reliability, every component must be carefully matched to the compressor duty. Compromise is a false economy, and simply aiming for the lowest possible cost is often counter-productive for the customer in the long run.

For example, many competitor machines rely on heavy welded base frame assemblies to provide support or dampen very high vibration levels. And while this can be cheaper to manufacture, it adds extra components which are vulnerable to unexpected and expensive failure. In contrast, the Belliss & Morcom diagonal frame design requires no external supports for structural integrity or vibration damping, and minimizes wear and tear. As a result, you benefit from longer intervals between planned service, and a reduced risk of machine failure and unplanned downtime.

Motor Service Factors

Compressor motors offer maximum reliability and deliver maximum efficiency when running at 75%-95% of their rated value. Running above the rated value means higher power costs and increased risk of breakdown. Unlike other equipment on the market, every Belliss & Morcom motor is specified with its full-service factor, so you can be confident that it will run continuously and at maximum efficiency throughout its full design life.

Water-Cooled Motor Protection

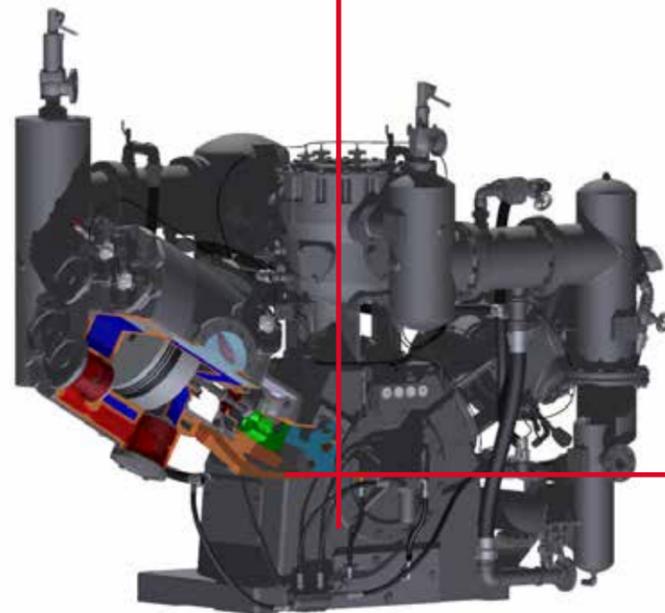
In harsh environments, at high altitudes or temperatures, where it is dusty or ventilation is limited, air-cooled motors can de-rate or even fail. Belliss & Morcom's bespoke water cooled motors eliminate this risk.

With IP56 protection and a cooling system that doesn't rely on the surrounding environment, our water cooled motors can run reliably where an air cooled motor can't.

EVERY MINUTE MATTERS

In key operational environments, every minute of available production matters. Routine service downtime eats into profitability. Through our unique diagonal design, Belliss & Morcom compressors remove the need for costly interim servicing and maintenance.

The design eradicates items that require regular maintenance, such as horizontal cylinder lines and belt drive systems. It means you can operate for 8,000 hours between service, and when routine maintenance time comes around, you'll find key components are easy to access and work on, so you'll be up and running quickly.



MAXIMUM UPTIME

Why Diagonal Design Matters

Reduced Wear

Belliss & Morcom compressors feature a 45 and 60 degree incline. This reduces static piston ring loading by up to 29.3% compared with horizontal cylinder lines. It means less wear and completely eliminates the need for interim turning of either compression or bearing rings.

Increased Access

As a result, our engineers have been able to move the largest 1st stage cylinder off the vertical cylinder line, significantly improving access and reducing service complexity and downtime.

No Shaft, No Problem

The Belliss & Morcom shaftless motor requires no drive system maintenance. No belt tensioning, no belt replacement, no motor alignment, no coupling checks or maintenance - this is a zero-maintenance drive system providing a constant and 100% efficient power transmission.

You're in Complete Control

Altogether it means that your compressor is up, running and available for production when you need it - your schedule doesn't need to be organized around maintenance downtime and frequent servicing. You're in control, every minute of the day and always with the peace of mind that comes with our extensive network of expert service technicians.

EVERY OPTION MATTERS

We offer a range of additional features designed to offer your plant enhanced levels of monitoring, control and cost savings.

Air PET Intelligent Multi Compressor Systems

On a multi-compressor network, the AirPET control system provides accurate control of network pressure, offering several benefits vs other methods.

Features

- Powerful trending and logging facilities for effective plant management
- Main plant networked if required, with the option of multi-equipment monitoring
- Broadband connection for remote monitoring
- Proven Technology with international hardware and software support
- Can monitor up to 30 Compressors of any make, model or combination

Benefits

- Reduces energy costs by reducing compressor off-load time
- Provides live energy usage, energy costs and live CO₂ emissions data
- AirPRESSURE control of the main line to within +/- 0.5 barg
- AirPREDICT allows a compressor to be online smoothly before the demand is required
- AirSAVE allows the compressor to be switched off, or at low pressure, at weekends or on non-productive shifts

Variable Speed Drives

- Reduced energy costs
- Variable capacity control - 30% to 100%
- Reduced motor starting current (within the FLC of the motor)
- Improved efficiency and power factor
- Extended component life
- Accurate and repeatable pressure control

High Efficiency Water Cooled Motor

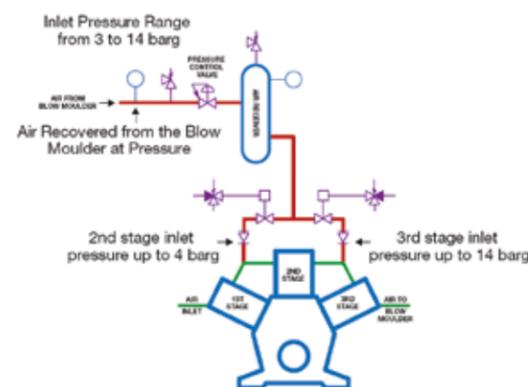
Specifically designed for the PET industry, the unique Belliss & Morcom water cooled shaftless motor drives the most reliable and energy efficient compressor system on the market - ensuring reliability in the most difficult operating conditions, and helping reduce your energy bills and carbon footprint.

- IP56 construction, reliable in all operating environments
- Maintenance free
- Lower electricity consumption and CO₂ emissions
- Suitable for variable speed drive
- 100% reduction in radiated heat
- Low noise specification
- Connects direct to the existing compressor cooling circuit

Air Recovery

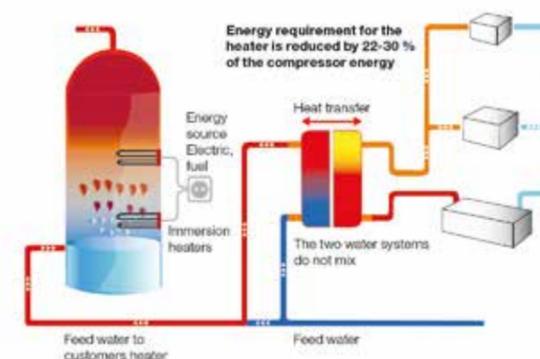
The Air Recovery System is designed to accommodate returned pressure from the blow moulding machines, that can be 'recycled' back through the compressor.

- Reduction in compressor energy consumption
- Easily installed to existing installation
- Can be used to supplement LP air requirements



Heat Recovery

Belliss & Morcom have developed a Heat Recovery System to work with the PET compressor. The cooling system can be modified to provide water at around 80°C, to pre-heat feed water to the heating systems - reducing the energy load and delivering savings of 22-30% of the compressor motor rating kW.



Customisation

The VH & WH Ranges are also available as complete packages including all essential ancillary items such as starter control panels with PLC logic systems, energy efficient motors, air dryer, air receiver, filters and optional cooling systems to suit all site conditions.

Ancillary skid options

All our ranges can be installed as floor mounted compressors with all ancillary equipment fixed on a baseplate, complete with all interconnecting pipework and electrical wiring, with options for acoustic enclosures.

Loose equipment

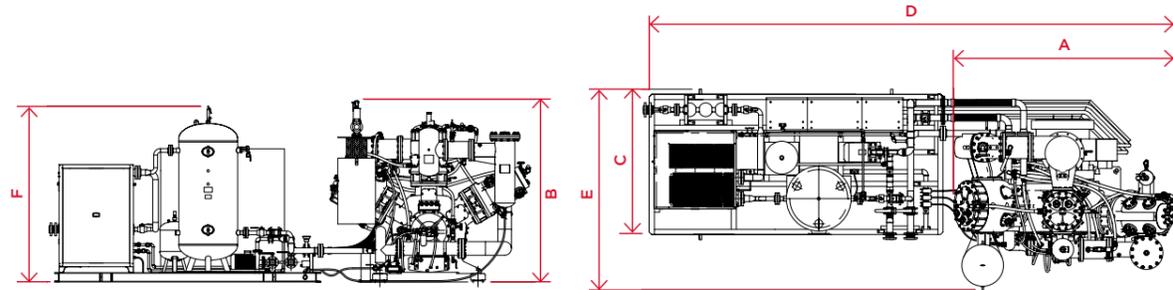
All equipment can be supplied as individual orders.

Energy Audits

In order to reduce energy costs and CO₂ emissions, Belliss & Morcom offer audits tailored to suit your specific needs by our team of dedicated experts. **Please contact us for more details.**



EVERY SPECIFICATION MATTERS



Nominal PET Range Dimensions

Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Weight Comp. (kg)	Weight Skid. (kg)
VH7	2350	2260	1980	5770	2100	2695	3875	2350
VH9	2350	2260	1980	5770	2100	2695	3875	2350
VH12	2950	2300	2645	6670	2100	2695	5160	2400
VH15	2950	2300	2645	6670	2100	2695	5160	2400
VH18	3025	2370	2600	6750	2100	2695	6345	2500
VH21	3025	2370	2600	6750	2100	2695	6345	2500
VH25	3025	2370	2600	6900	2100	2740	6800	2600
WH28	3275	2980	2950	7350	2100	2740	9900	2900
WH29	3275	2980	2950	7350	2100	2740	9900	2900
WH35	3500	3110	3190	7950	2100	2740	10410	3000
WH40	3500	3110	3190	7950	2100	2740	10410	3000
WH45	3400	3150	3190	7950	2100	3210	11500	3600
WH50	4000	3150	3315	9000	2100	3210	12000	3600

Belliss & Morcom PET Range Performance Data

Model		VH7	VH9	VH12	VH15	VH18	VH21	VH25	WH28	WH29	WH35	WH40	WH45	WH50	
Specifications	50 Hz Data	Capacity FAD (m ³ /hr/cfm)	423 / 249	584 / 344	734 / 432	922 / 543	1123 / 661	1411 / 830	1510 / 889	1691 / 995	1811 / 1066	2133 / 1255	2315 / 1363	2717 / 1599	3220 / 1895
		Shaft Power (kW/HP)	70 / 94	94 / 126	108 / 145	135 / 181	172 / 231	211 / 283	224 / 300	239 / 321	250 / 335	306 / 410	325 / 436	405 / 543	468 / 628
		Speed (rpm)	735	985	585	735	585	735	735	735	735	735	735	735	735
	60 Hz Data	Capacity FAD (m ³ /hr/cfm)	409 / 241	522 / 307	734 / 432	891 / 524	1123 / 661	1363 / 802	1459 / 859	1633 / 961	1749 / 1029	2060 / 1212	2236 / 1316	2625 / 1545	3110 / 1830
		Shaft Power (kW/HP)	68 / 91	84 / 113	108 / 145	130 / 174	172 / 231	204 / 274	216 / 290	231 / 310	241 / 323	296 / 397	314 / 421	391 / 524	452 / 606
		Speed (rpm)	710	880	585	710	585	710	710	710	710	710	710	710	710

Catalogue data for 30 barg. Designed for up to 45 barg running pressure

EVERY METRE MATTERS

In busy PET production sites, space is always at a premium, so a smaller machine footprint can be a big advantage.

Because of their unique diagonal design, Belliss & Morcom compressors are significantly more compact than competitors' equipment. It means more air delivered for a given amount of factory floor – and valuable extra space for productive activity.

Custom Design

Where your available space is limited, and yet you still require high performance, Belliss & Morcom can create a bespoke solution specifically for you. Our expert team have extensive experience of fitting complete PET systems in even the tightest of spaces. Our diagonal set up, water cooled motor and modular package mean our systems can operate effectively and efficiently where competitors' simply can't fit.

WHY OUR **EXPERTISE** MATTERS

Whatever details matter to you, Belliss & Morcom compressors are designed to meet your needs exactly. Engineered specifically for the PET industry, our machines are built to offer you maximum efficiency, reliability and uptime.

Efficiency

- Shaftless motors ensure 100% drive efficiency
- Unique 'W' design gives an extra layer of efficient flow control

Reliability

- Market leading 5 year+ warranty scheme, with re-warrant option
- Maximum motor service factor for maximum peace of mind
- Water cooled motor protection ensures reliable running in the harshest of environments

Uptime

- Diagonal design reduces wear and tear on all components
- Shaftless motor means absolutely no drive system maintenance

Specification

- Wide range of machines tailored to the PET industry

Options

- Range of additional features designed to offer operators enhanced levels of monitoring, control and cost savings

Footprint

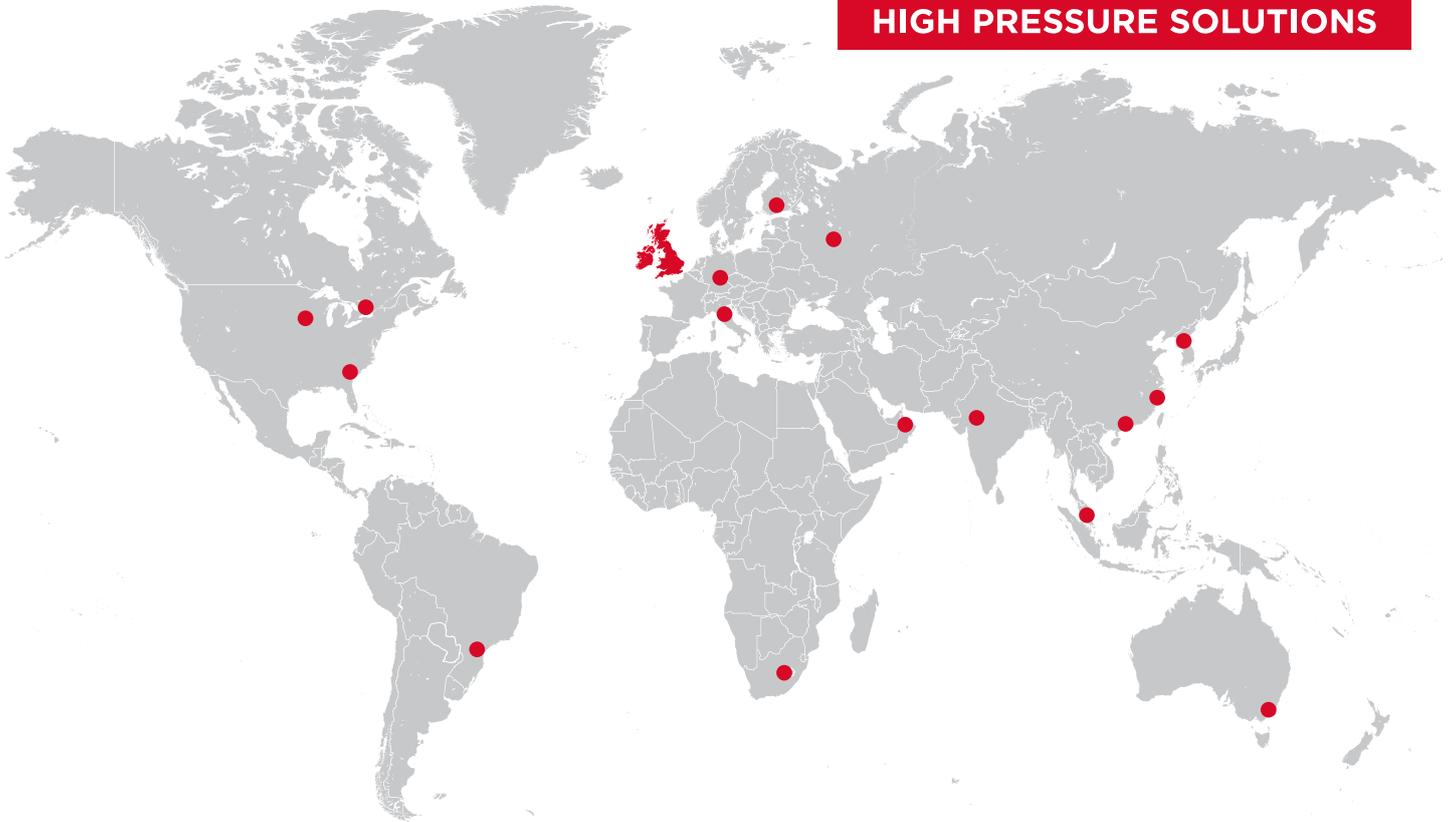
- Considerably more compact footprint than competitor machines, saving you valuable floor space

Find out how Belliss & Morcom compressors can improve operational efficiency and help you enjoy significant savings in your PET plant.

Contact us today.

Gardner Denver

HIGH PRESSURE SOLUTIONS



Global Expertise

For more information about the Gardner Denver High Pressure compressor ranges please contact your local Gardner Denver Sales & Service Centre, or see below for details of our High Pressure Centre of Excellence.

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For additional information please contact Gardner Denver or your local representative.

Specifications subject to change without notice.