Oil-free air rotary screw compressors

ZR 90–160 VSD^{+} (FF)

Setting the standard in energy efficiency, safety and reliability

The shortest route to superior productivity is to minimize operational cost while maintaining an uninterrupted supply of the right quality of air. The Atlas Copco Z compressor series is focused on effectively saving energy, ensuring product safety – only oil-free machines exclude contamination risks for 100% – and guaranteeing the utmost reliability around the clock. And not just today, but day after day, year after year, with minimal maintenance cost, few service interventions and long overhaul intervals.

Highest reliability

For 60 years, Atlas Copco Z compressors have set the benchmark for durability. They are built using long-standing internal engineering practices, and are designed and manufactured according to ISO 9001, ISO 14001, ISO 22000 & OHSAS 18001. The high-end ZR uses time-proven state-of-the-art screw technology, cooling and pulsation dampers and provides you with the highest reliability.

100% oil-free compressed air

The ZR offers you 100% pure, clean air that complies with ISO 8573-1 CLASS 0 (2010) certification. This means zero risk of contamination; zero risk of damaged products; zero risk of losses from operational downtime; and zero risk of damaging your company's hard-won professional reputation.

Maximum energy efficiency

The ZR's superior oil-free screw elements provide the optimum combination of high Free Air Delivery (FAD) with the lowest energy consumption. Ample sized cooling, low pressure drops and an extremely efficient drive train result in the highest compressor package efficiency.

The most complete package

With the ZR compressor, Atlas Copco provides a superior solution without hidden costs. The totally integrated, ready-to-use package includes internal piping, coolers, motor, lubrication and control system. The Full Feature version even integrates an IMD adsorption dryer for an impeccable end product. Installation is fault-free, commissioning time is low and no external instrument air is required. You simply plug and run.

Global presence - local service

Our aftermarket product portfolio is designed to add maximum value for our customers by ensuring the optimum availability and reliability of their compressed air equipment with the lowest possible operating costs. We deliver this complete service guarantee through our extensive service organization, maintaining our position as leader in compressed air.

Class 0: the industry standard

Class 0: oil-free air

Oil-free air is used in all kinds of industries where air quality is paramount for the end product and production process. These applications include food and beverage processing, pharmaceutical manufacturing and packaging, chemical and petrochemical processing, semiconductor and electronics manufacturing, the medical sector, automotive paint spraying, textile manufacturing and many more. In these critical environments, contamination by even the smallest quantities of oil can result in costly production downtime and product spoilage.

First in oil-free air technology

Over the past sixty years Atlas Copco has pioneered the development of oil free air technology, resulting in a range of air compressors and blowers that provide 100% pure, clean air. Through continuous research and development, Atlas Copco achieved a new milestone, setting the standard for air purity as the first manufacturer to be awarded ISO 8573-1 CLASS 0 certification.

CLASS	Concentration total oil (aerosol, liquid, vapor) mg/m³
0	As specified by the equipment user or supplier and more stringent than class 1
1	< 0.01
2	< 0.1
3	< 1
4	< 5

Current ISO 8573-1 (2010) classes (the five main classes and the associated maximum concentration in total oil content).

Eliminating any risk

As the industry leader committed to meeting the needs of the most demanding customers, Atlas Copco requested the renowned TÜV institute to type-test its range of oil-free compressors and blowers. Using the most rigorous testing methodologies available, all possible oil forms were measured across a range of temperatures and pressures. The TÜV found no traces of oil at all in the output air stream. Thus Atlas Copco is not only the first compressor and blower manufacturer to receive CLASS 0 certification, but also exceeds ISO 8573-1 CLASS 0 specifications.

100% certified oil-free air

Atlas Copco is renowned for designing and manufacturing some of the most durable oil-free screw compressors. The ZR high-end rotary screw compressor comes out of this strong tradition. Ideal for industries where high-quality oil-free air is key, the ZR offers the highest reliability and safety in combination with low energy costs.

Food & beverage

ZR water cooled oil-free air compressors provide 100% pure, clean, oil free air for all kinds of applications in the food and beverage industry such as fermentation, packaging, aeration, transportation,filling & capping, cleaning, instrument air. Class 0 certified ZR rotary screw compressors avoid compromising the purity of your end product and ensure zero risk of contamination.

Textiles

The oil-free air ZR compressors guarantee a CLASS 0 certified air quality for the highly sensitive production processes in the textile industry. This high-quality air is used in a variety of textile applications such as spinning, weaving, dyeing, texturizing, winding and coning.

Oil & gas

Through the years, we have built up extensive experience in providing compressed air and a strong global service support for the oil & gas industry. 100% oil-free compressed air is used for control and instrument air or buffer air.

Power plants

Power plants run round-the-clock to supply vital energy with a continuous supply of compressed air, critical for trouble-free continuous operation. ZR water cooled oil-free air compressors provide a reliable source of compressed air for applications such as flue gas desulphurization, oxidation air and fluidized beds.

Pharmaceuticals

Strict moisture control is a key factor in the manufacture of most pharmaceuticals. Many materials used to produce pharmaceuticals have a physical affinity for moisture, which can cause powdered material to aggregate. Other powders that are formed into a tablet under high pressures will adhere only when in a dry state. Humidity can cause a tablet to crumble or the drug to decompose and diminish in its therapeutic value. To assure consistently high-quality drugs, the presence of dry air in the processing area and machinery is therefore vital.

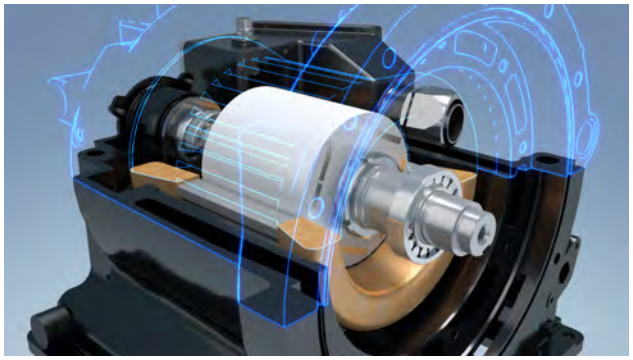
ZR PREMIUM

100% Oil-free Air (Class 0)

- Next generation world class compression element.
- Unique Z seal design guarantees 100% certified oil-free air.
- Atlas Copco superior rotor coating for high efficiency and durability.
- More compact, improved rotor profiles and cooling jackets for maximum efficiency and durability.

Advanced touch screen monitoring system

- User-friendly Elektronikon® Touch, with enhanced connectivity potential.
- Integrated smart algorithms to optimize system pressure and maximize energy efficiency.
- Included warning indications, maintenance scheduling and online visualization of the machine's condition.

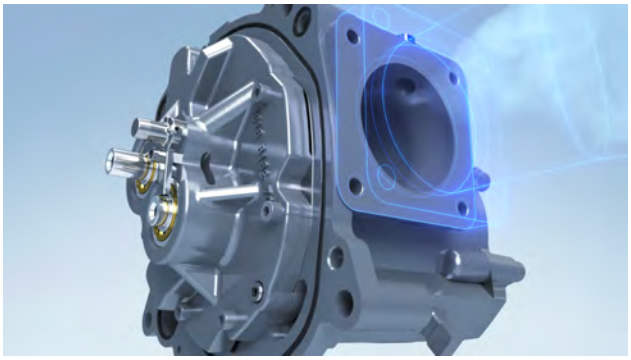


High efficiency motor

- IP66 Permanent Magnet water cooled motor with oil lubricated bearings.
- Class-leading efficiency and rock-solid reliability.
- Full regulation between 15 to 100% of the maximum capacity.
- Adjustable speed of motor to save energy at reduced air demand.

Optimal control

- Dual motor drive design incorporating Atlas Copco's most sophisticated Variable Speed technology.
- Reduced energy consumption, operating costs and environmental impact.
- Constantly optimizing the motor speed by ensuring optimum performance for every single pressure and flow.



Reliable cooling

- Cooler with highly efficient water separator for higher reliablity.
- Stainless steel enlarged surface coolers to ensure top performance over a long lifetime.
- Pipes with star profile form bi-anodised aluminium for preventing corrosion.
- Easily removable for quick, cost-efficient maintenance.

Complete plug-and-play package

- All-in-one solution: fault-free installation, easy commissioning and quick start-up.
- Includes internal piping, coolers, motor, drive, lubrication and control system.
- Optional integrated adsorption dryers available.

Compact design

- Amongst the lowest footprint on the market.
- Saves valuable and often expensive floor space in a facility.
- Highest ratio flow/footprint on the market.
- Easy upgrade of existing installations.

Soundproof design

- Silenced canopy ensures optimal working conditions for everyone in the immediate environment.
- Optimized internal ducting and integrated pulsation damper to reduce the noise level

Ease of maintenance

- Minimal service time because service parts are grouped together for ease of access.
- All components are designed for serviceability and long lasting lifetime.
- Optional service plans available to extend the warranty.

VSD

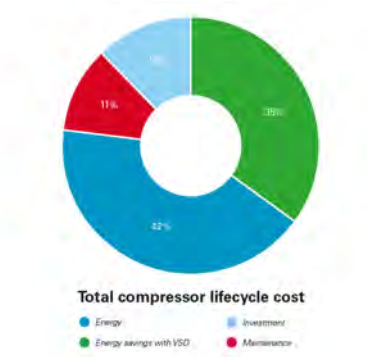
Variable Speed Drive

Driving down energy costs

Over 80% of a compressor's lifecycle cost is taken up by the energy it consumes. Moreover, the generation of compressed air can account for more than 40% of a plant's total electricity bill. To cut your energy costs, Atlas Copco pioneered Variable Speed Drive (VSD) technology in the compressed air industry. VSD leads to major energy savings, while protecting the environment for future generations. Thanks to continual investments in this technology, Atlas Copco offers the widest range of integrated VSD compressors on the market.

Energy savings up to 35%

Atlas Copco's VSD technology closely follows the air demand by automatically adjusting the motor speed. This results in large energy savings of up to 35%. The Life Cycle Cost of a compressor can be cut by an average of 22%. In addition, lowered system pressure with VSD minimizes energy use across your production dramatically.



What is unique about the integrated Atlas Copco VSD?

1. The Elektronikon® controls both the compressor and the integrated converter, ensuring maximum machine safety within parameters.
2. Flexible pressure selection with VSD reduces electricity costs.
3. Specific converter and motor design (with protected bearings) for the highest efficiency across the speed range.
4. Electric motor specifically designed for low operating speeds with clear attention to motor cooling and compressor cooling requirements.
5. All Atlas Copco VSD compressors are EMC tested and certified. Compressor operation does not influence external sources and vice versa.
6. Mechanical enhancements ensure that all components operate below critical vibration levels throughout the entire compressor speed range.
7. A highly efficient frequency converter in a cubicle ensures stable operation in high ambient temperatures up to 50°C/122°F
8. No 'speed windows' that can jeopardize the energy savings and the stable net pressure. Turndown capability of the compressor is maximized to 70-75%.
9. Net pressure band is maintained within 0.10 bar, 1.5 psi.

Monitoring and control

How to get the most from the least

Elektronikon® MK5 Touch

The Elektronikon® unit controller is specially designed to maximize the performance of your compressors and air treatment equipment under a variety of conditions. Our solutions provide you with key benefits such as increased energy efficiency, lower energy consumption, reduced maintenance times and less stress… less stress for both you and your entire air system.

Intelligence is part of the package

The full color touch display gives you an easy to understand readout of the equipment's running conditions.

- Clear icons and intuitive navigation provides you fast access to all of the important settings and data.
- Monitoring of the equipment running conditions and maintenance status; bringing this information to your attention when needed.
- Operation of the equipment to deliver specifically and reliably to your compressed air needs.
- Built in remote control and notifications functions provided as standard, including simple to use integrated webpage.
- Integrated **SMART**LINK
- Support for 31 different languages, including character based languages.

Online & mobile monitoring

Monitor your machines over the ethernet with the Elektronikon® unit controller and the **SMART**LINK service. Monitoring features include warning indications, compressor shut-down, sensor trending and maintenance scheduling.

Dual set-point and automatic stop

Most production processes create fluctuating levels of demand which, in turn, can create energy waste in low use periods. Using the Elektronikon® unit controller, you can manually or automatically switch between two different setpoints to optimize energy use and reduce costs at low use times. In addition, the sophisticated algorithm runs the drive motor only when needed. As the desired setpoint is maintained while the drive motor's run time is minimized, energy consumption is kept to a minimum.

SMARTLINK

Monitor your compressed air installation with SMARTLINK

Knowing the status of your compressed air equipment at all times is the surest way to achieve optimal efficiency and maximum availability.

Go for energy efficiency

Customized reports on the energy efficiency of your compressor room.

Increase uptime

All components are replaced on time, ensuring maximum uptime.

Save money

Early warnings avoid breakdowns and production loss.

Optimize your compressed air system

Minimizing Excess Pressure

Optimizer 4.0 minimizes the generation of excess compressed air by starting and stopping compressors. Its user friendly interface enables you to set multiple pressure bands, allowing you to optimize your compressor installation for varying circumstances, such as non-productive hours.

Full VSD Benefits

With Optimizer 4.0 you can realize the full energy saving potential of VSD (Variable Speed Drive). It regulates the VSD to ensure that the compressed air output is proportional to the demand, preventing higher pressures than required, excess unloaded running, and spiraling energy costs.

Improving Uptime

Optimizer 4.0 effectively eliminates production downtime caused by unexpected system pressure drops, because it regulates the system pressure instead of the compressor output pressure.

This means Optimizer 4.0 will automatically adjust the system pressure to compensate for pressure drops due to filters, piping and dryers for example.

Optimizing Wear and Tear

Optimizer 4.0 comes in different variants, for up to 4, up to 8 or over 8 machines and centrifugals.

We also provide additional functionality and services on Optimizer 4.0 to ensure that your energy savings will stand the test of time. Even when your installation needs adaptations or your demand changes.

A complete Full Feature package

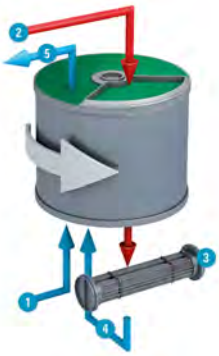
Atlas Copco's Full Feature concept stands for a compact, all-in-one quality air solution. Integrating the IMD dryer and its Variable Speed Drive on VSD models, this integrated package offers the highest quality air at the lowest possible cost.

Protect your compressed air system

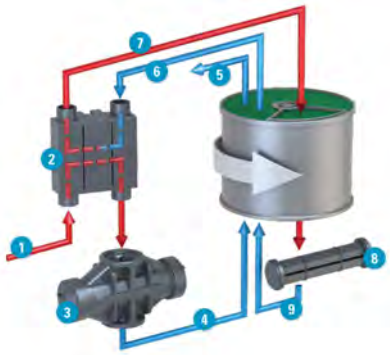
A dry compressed air system is essential to maintain the reliability of production processes and the quality of the end products. Untreated air can cause corrosion in the pipe work, premature failure of pneumatic equipment and product spoilage.

The IMD drying principle

The IMD adsorption dryer eliminates the moisture before it enters the air net, ensuring a reliable process and a impeccable end product. As no external energy is needed to dry the air, large savings are obtained. The pressure drop through the dryer is minimal, which again cuts down the operating cost.



1. Hot unsaturated air
2. Hot saturated air
3. Cold saturated air
4. Dry air
5. Drying section



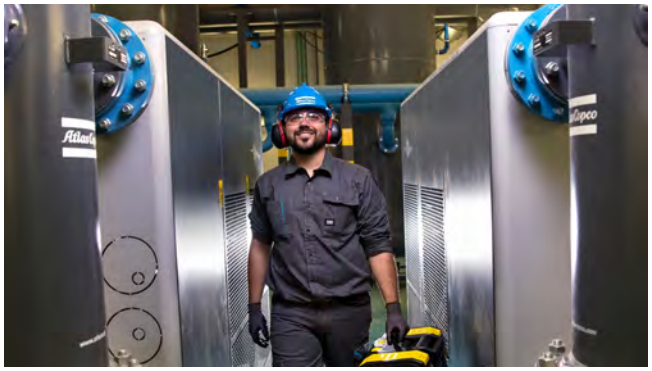
IMD adsorption dryer

The IMD adsorption dryer eliminates the moisture before it enters the air net, ensuring a reliable process and an impeccable end product. As no external energy is needed to dry the air, large savings are obtained. The pressure drop through the dryer is minimal, which again cuts down the operating cost.

1. Hot wet compressed air
2. Heat exchanger
3. Water-cooled cooler
4. Cooled wet compressed air
5. Dried compressed air
6. Regeneration compressed air
7. Heated regeneration compressed air
8. Water-cooled cooler
9. Cooled regeneration compressed air

Services

Properly caring for your air compressor helps you lower your operating costs and minimises the risk for unplanned breakdowns or production stops. Atlas Copco offers energy efficiency checks, service, repairs, spare parts and maintenance plans for all air compressors. Entrust your servicing to our expert professionals and ensure your business continues to run efficiently. Our plans cover repairs, preventative maintenance, spare parts, and more.



Total Responsibility Plan

Complete compressor care with our Total Responsibility Plan

We take care of all your compressor maintenance, upgrades, repairs and even breakdowns for an all-inclusive price.

Complete compressor care

On-time maintenance by expert service engineers, genuine parts, proactive upgrades and compressor overhauls.

Total risk coverage

This means we take care of all your compressor repairs and even breakdowns, without extra charges.

Ultimate efficiency

Fitting the latest drive line components gives you as-new levels of compressor efficiency and reliability.

Crossing the first 7 years with the Extended Warranty+ Plan

The Extended Warranty+ Plan carries you safely and comfortably across the first seven years of equipment ownership. Because a good start is what you need to go the distance.

Enjoy seven years of risk-free operation, sustained efficiency and maximum uptime.

Extended Warranty+

Energy Efficiency

Energy consumption is the biggest part of the total cost of ownership for compressed air equipment. Without proper maintenance, pressure drops may occur, decreasing the system's efficiency. With Extended Warranty+, all consumables are replaced on time using genuine parts.

Greater uptime

Compressed air is a vital part of your production process. A small disturbance could lead to a production stop, lost business, wasted materials, product contamination… As an Extended Warranty+ customer, you are given top priority for urgent repairs.

Fixed Budget

In 7 years, maintenance costs may fluctuate considerably. If an expensive repair comes up, this could seriously disrupt your budget. Extended Warranty+ covers all repairs and comes with a fixed annual cost.

AIRScan

Audit your compressed air installation with AIRScan

AIRScan offers a reliable analysis and well-founded recommendations to improve your energy efficiency.

Go for energy efficiency

AIRScan offers a reliable analysis and actionable insights for energy efficiency improvements.

Save energy: up to 30 % of your costs

Our unique compressor audit software simulates various configurations of your compressed air installation. This allows us to provide realistic projections on potential energy savings.

Clear report

An AIRScan report provides a summary for decision makers, as well as an in-depth evaluation of problems and solutions for your technicians.

Use your energy twice

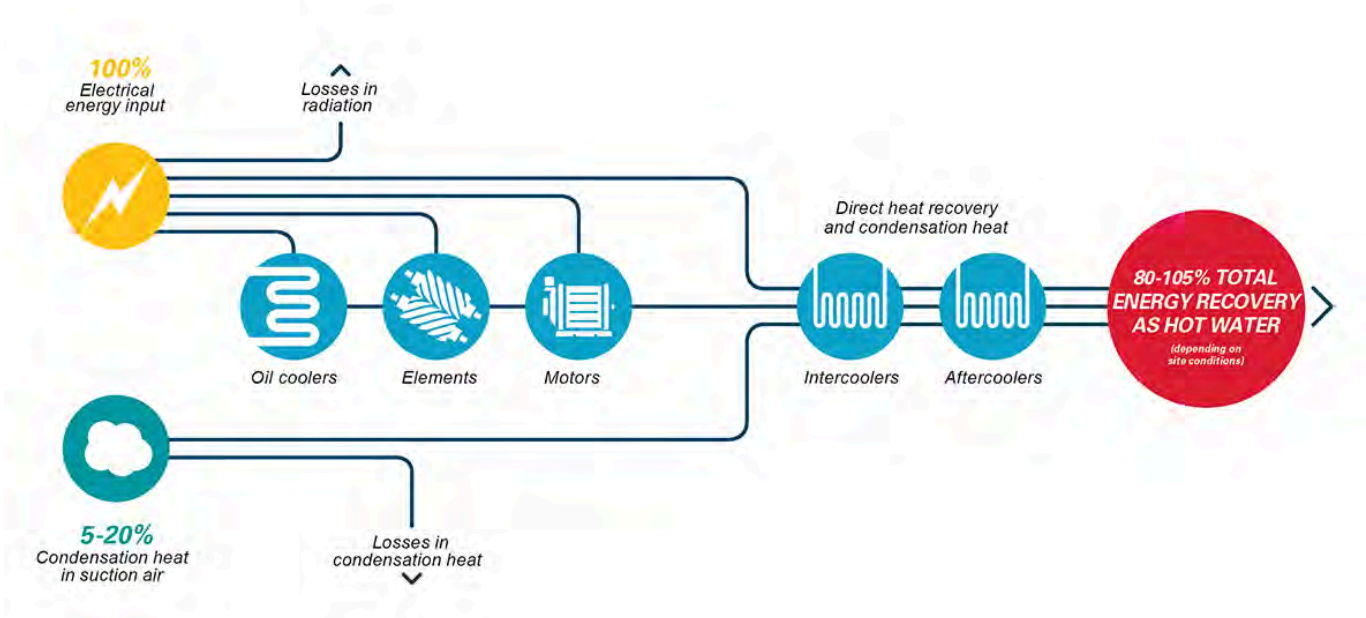
The energy used to compress air is transformed into heat. The major portion of this heat - more than 90% - remains in the compressed air and lubrication oil. A small part is lost to the environment through radiation.

Energy recovery

Electrical input is not the only source of energy entering the system. The suction air for the compressor contains water vapour. The heat stored in the vapour is released through condensation in the inter- and aftercooler of the compressor. Typically the condensation heat, contained in the suction air, is equivalent to 5-20% of the electrical input energy.

ZR water-cooled oil-free screw compressor

The water-cooled design of the ZR oil-free screw compressor with energy recovery allows to fully capture all this heat from the compressed air and oil system. As a result, the total energy recovered as hot water amounts up to 80-105% of the electrical input energy, depending on the actual site conditions and pressure of the compressed air system. In most industrial conditions it will be up to 95%.



Optimize your system

Options

	ZR 90-160 VSD+ (FF)
Anchor pads	•
Energy recovery	•
Silicone-free rotor	•
High ambient temperature version	•
Kit for purge of dry air during standstill	•
IT Network	•
Wooden case protection packaging	•
Test certificate	•
Witnessed Performance Test	•

(*) Maximum intake/cooling air temperature is 55°C/131 °F for HAT versions.
Please note the availability of the option depends on the chosen configuration.

• : Optional

Optimize your system

With the ZR, Atlas Copco provides an all-in-one standard package incorporating the latest technology in a built-to-last design. To further optimize your ZR's performance or to simply tailor it to your specific production environment, optional features are available.

Engineered solutions

Atlas Copco recognizes the need to combine our serially produced compressors and dryers with the specifications and standards applied by major companies for equipment purchases. Strategically located departments within the Atlas Copco Group take care of the design and manufacturing of customized equipment to operate at extreme temperatures, often in remote locations.

Innovative technology

All equipment is covered by our manufacturer warranty. The reliability, longevity and performance of our equipment will not be compromised. A global aftermarket operation employing 360 field service engineers in 160 countries ensures reliable maintenance by Atlas Copco as part of a local service operation.

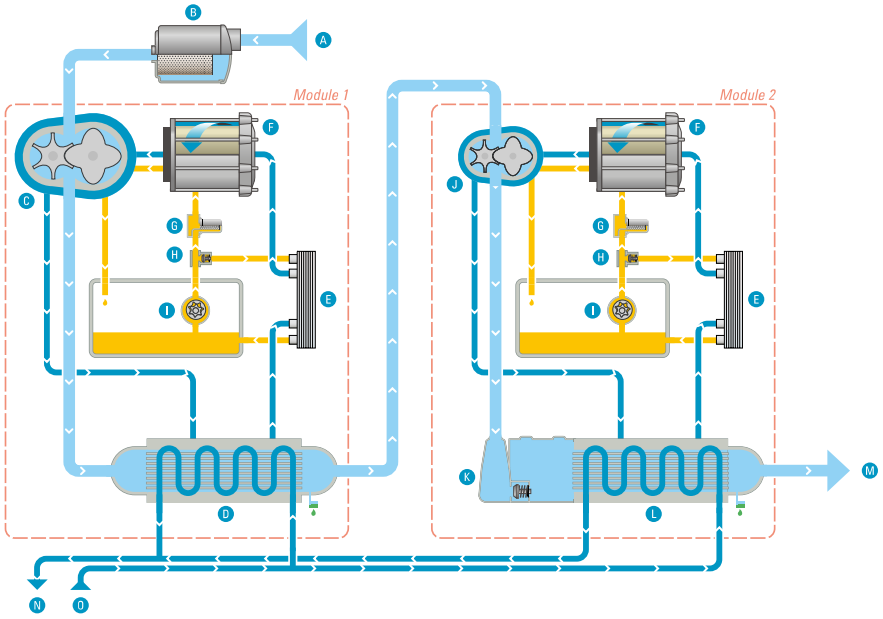
Innovative engineering

Each project is unique and by entering into partnership with our customers, we can appreciate the challenge at hand, ask the relevant questions and design the best engineered solution for all your needs.

Flowcharts

Process flow, oil flow and cooling flow - step by step

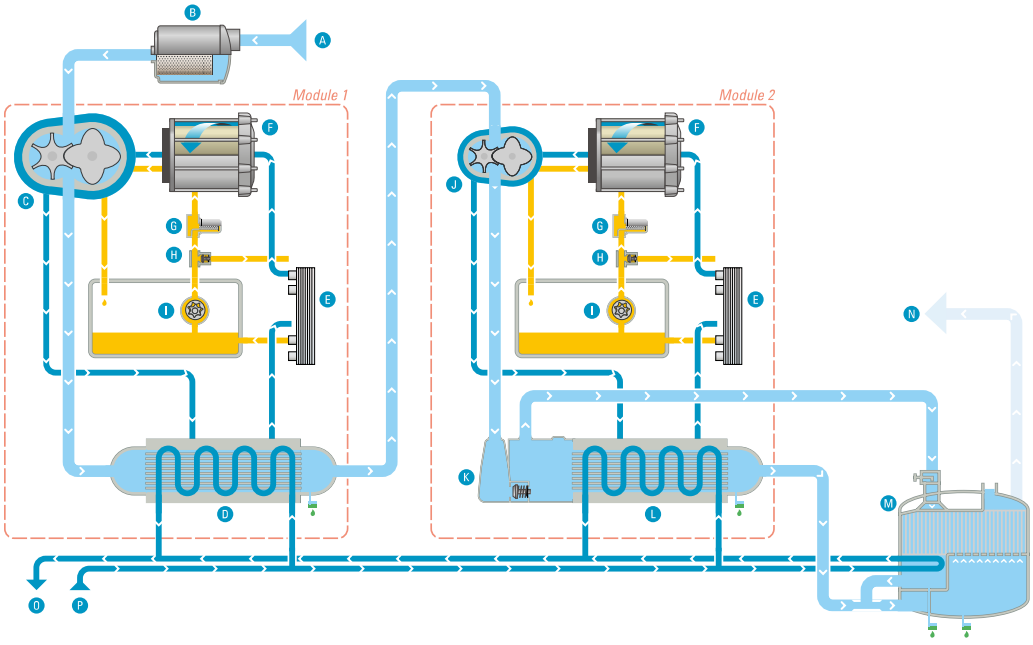
ZR 90 - 160 VSD+



- A Air in
- B Air filter
- C Low pressure element
- D Intercooler
- E Oil cooler
- F Motor
- G Oil filter
- H Bypass valve
- I Oil pump
- J High pressure element
- K Pulsation damper (with check valve)
- L Aftercooler
- M Air out
- N Water out
- O Water in

- Air
- Water
- Oil
- Condensate

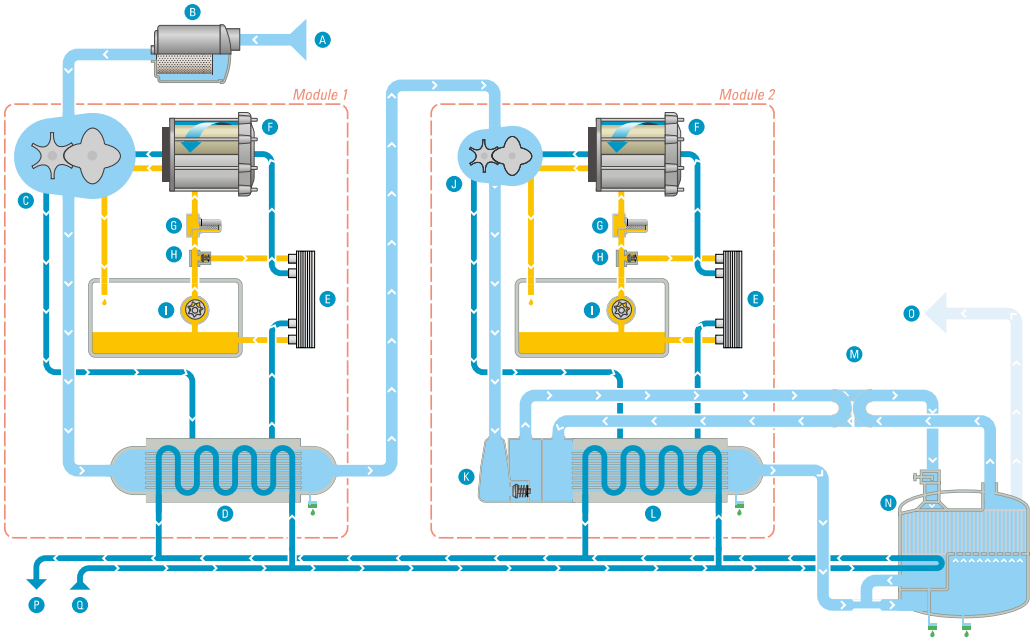
ZR 90 - 160 VSD+ FF (iMD)



- A Air in
- B Air filter
- C Low pressure element
- D Intercooler
- E Oil cooler
- F Motor
- G Oil filter
- H Bypass valve
- I Oil pump
- J High pressure element
- K Pulsation damper (with check valve)
- L Aftercooler
- M Rotary drum dryer (integrated MD)
- N Air out
- O Water out
- P Water in

- Air
- Dry compressed air
- Water
- Oil
- Condensate

ZR 90 - 160 VSD+ FF (iMDG)



- A Air in
- B Air filter
- C Low pressure element
- D Intercooler
- E Oil cooler
- F Motor
- G Oil filter
- H Bypass valve
- I Oil pump
- J High pressure element
- K Pulsation damper (with check valve)
- L Aftercooler
- M Heat exchanger
- N Rotary drum dryer (integrated MDG)
- O Air out
- P Water out
- Q Water in

- Air
- Dry compressed air
- Water
- Oil
- Condensate

Technical specifications
ZR 90 - 160 VSD+

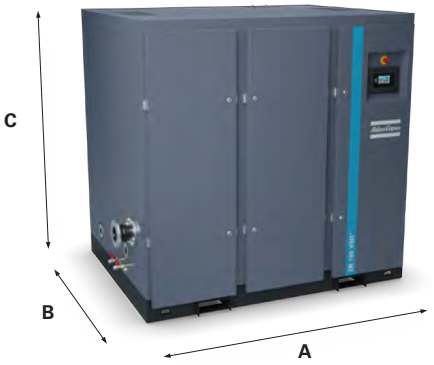
TYPE	Working pressure (1)			Free Air Delivery (2)			Installed motor power	Noise level (3)	Weight					
									Pack		Full Feature (iMD)		Full Feature (iMDG)	
		bar(e)	psig	l/s	m³/min	cfm	kW / hp	dB(A)	kg	lb	kg	lb	kg	lb
ZR 90 VSD+ - 10.4	Minimum	4	60	90 - 298	5.4 - 17.9	192 - 631	90 / 120	70	2500	5500	3400	7400	3700	8200
	Effective	7.5	100	90 - 276	5.4 - 16.5	192 - 584								
	Maximum	10.4	150	90 - 231	5.4 - 13.9	188 - 490								
ZR 110 VSD+ - 10.4	Minimum	4	60	90 - 346	5.4 - 20.7	192 - 732	110 / 150	70	2500	5500	3400	7400	3700	8200
	Effective	7.5	100	90 - 322	5.4 - 19.3	192 - 683								
	Maximum	10.4	150	90 - 275	5.4 - 16.5	188 - 584								
ZR 132 VSD+ - 10.4	Minimum	4	60	90 - 400	5.4 - 24.0	192 - 847	132 / 175	70	2500	5500	3400	7400	3700	8200
	Effective	7.5	100	90 - 376	5.4 - 22.6	192 - 797								
	Maximum	10.4	150	90 - 329	5.4 - 19.7	188 - 696								
ZR 145 VSD+ - 10.4	Minimum	4	60	90 - 431	5.4 - 25.9	192 - 913	145 / 200	70	2500	5500	3400	7400	3700	8200
	Effective	7.5	100	90 - 407	5.4 - 24.4	192 - 863								
	Maximum	10.4	150	90 - 360	5.4 - 21.6	188 - 763								
ZR 160 VSD+ - 10.4	Minimum	4	60	90 - 452	5.4 - 27.1	192 - 959	160 / 215	70	2500	5500	3400	7400	3700	8200
	Effective	7.5	100	90 - 444	5.4 - 26.6	192 - 941								
	Maximum	10.4	150	90 - 397	5.4 - 23.8	188 - 842								

(1) For the FF variant, please consult Atlas Copco.

(2) Unit performance measured according to ISO 1217, Annex C & E, Edition 4 (2009)
Reference conditions:
- Relative humidity 0%
- Absolute inlet pressure 1 bar (14.5 psi)
- Intake air temperature 20°C (68°F)
Free Air Delivery (FAD) is measured at maximum working pressure.

(3) A-weighted emission sound pressure level at the work station (LpWSAd).
Measured according to ISO 2151: 2008 using ISO 9614-2 (sound intensity scanning method).
The added correction factor (+/- 3 dB(A)) is the total uncertainty value (KpAd) conform with the test code.

TYPE	A (Length)		B (Width)		C (Height)	
	mm	inch	mm	inch	mm	inch
ZR 90 - 160 VSD+	2030	80	1660	65	2000	80
ZR 90 - 160 VSD+ FF (iMD & iMDG)	3430	135	1660	65	2000	80



COMMITTED TO SUSTAINABLE PRODUCTIVITY

We stand by our responsibilities towards our customers, towards the environment and the people around us. We make performance stand the test of time. This is what we call – Sustainable Productivity.

LLOYD'S REGISTER · LRQA

ISO 9001 · ISO 14001
OHSAS 18001
ISO 22000

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