

# *Oil-free rotary screw compressors*



ZR 300-750 & ZR 400-900 VSD

*Atlas Copco*



A close-up photograph of a dark grey Atlas Copco Z compressor. The machine features a prominent yellow and grey geometric graphic on its side. The 'Atlas Copco' logo is partially visible on the left, and the 'Oil-free ISO 8573-1' certification logo is at the bottom right. The machine is secured with several silver screws.

Atlas Copco

## ***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.

**Oil-free**  
ISO 8573-1



ZR700VSD

### **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.

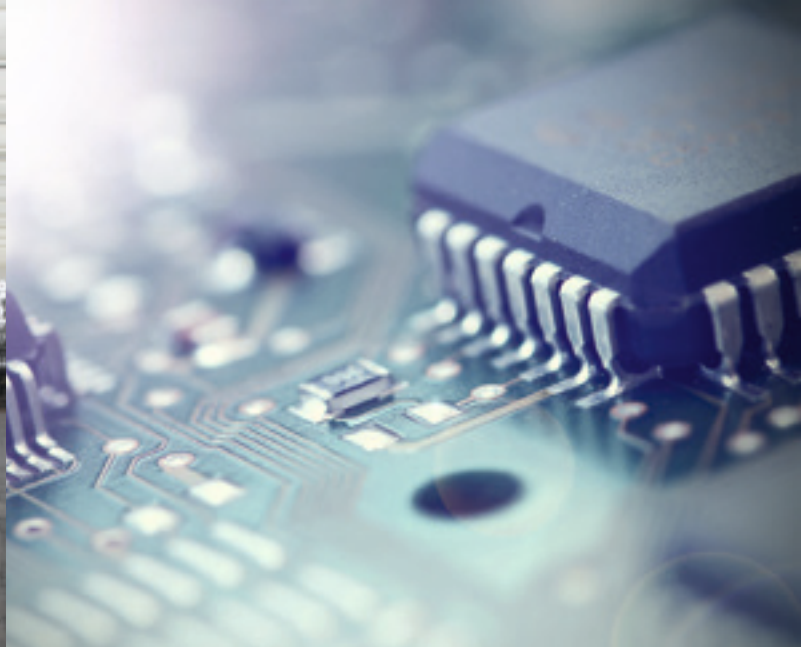
### **The most complete package**

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. Installation is fault-free, commissioning time is low and no external instrument air is required. You simply plug and run.

### **Global presence - local service**

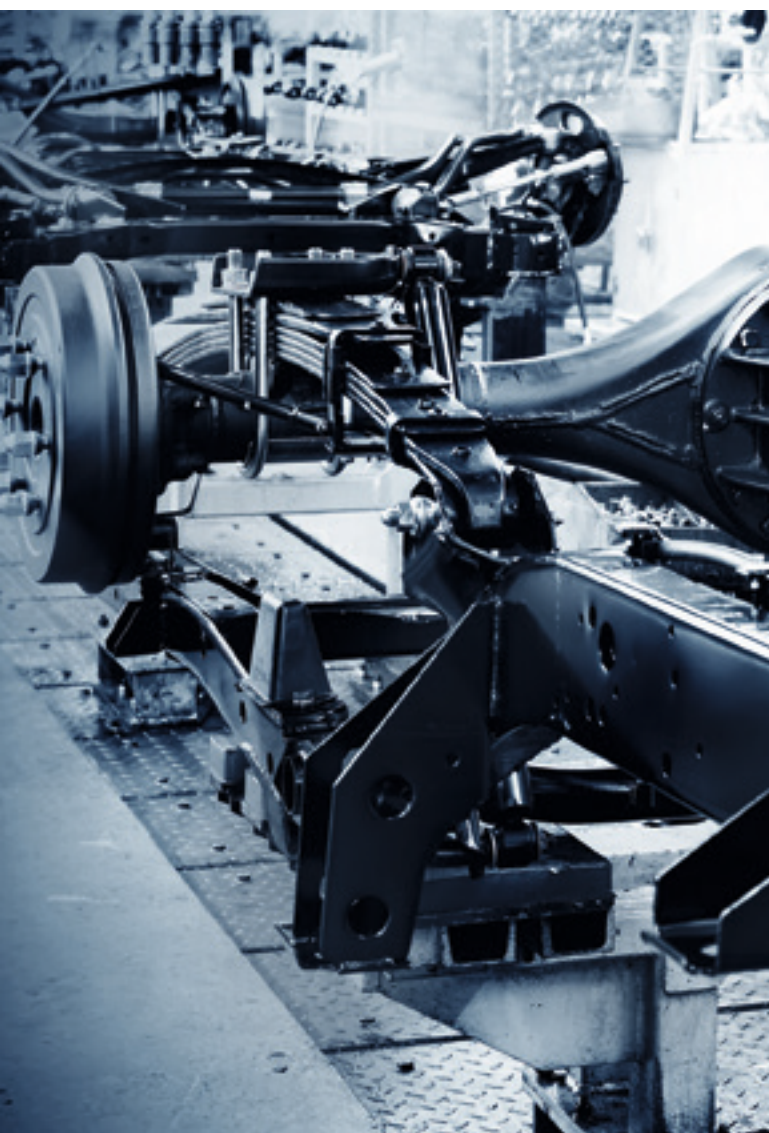
Our aftermarket product portfolio is designed to add maximum value for our customers by ensuring the optimum availability and reliability of their compressed air equipment with the lowest possible operating costs. We deliver this complete service guarantee through our extensive service organization,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

Free air  
3-1 CLASS 0



## **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.



### **Electronics**

- Clean, dry, high-quality air (Class 0) is essential, produced with optimal energy efficiency.
- Applications include the removal of microscopic debris from the surfaces of computer chips and computer boards.

### **Textiles**

- Easy and quick installation.
- A completely, fully integrated, ready-to-use solution.

### **Oil & gas**

- Years of experience in providing compressed air for the oil & gas industry.
- 100% oil-free compressed air for control/instrument air or buffer air.
- Strong global support network to provide 24/7 assistance.

### **Automotive**

- To maximize productivity in the automotive industry, downtime has to be eliminated.
- An integrated package designed for long-lasting performance is crucial.

# Class 0: the industry standard

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, pharmaceutical, chemical and petrochemical, semiconductor and electronics, the medical sector, automotive paint spraying, textile 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 CLASS 0 certification.

## 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.

CLASS	Concentration total oil (aerosol, liquid, vapor) mg/m <sup>3</sup>
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).



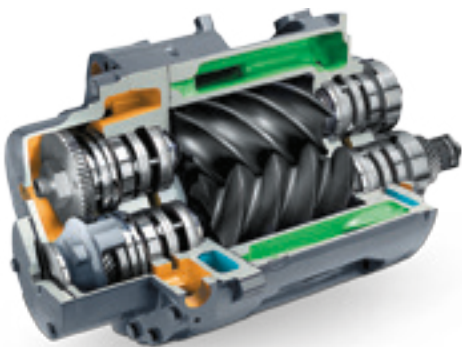
# Proven Z technology



1

## Throttle valve with load/unload regulation

- No external air supply required.
- Mechanical interlock of inlet and blow-off valve.
- Low unload power.



2

## World-class oil-free compression element

- Unique Z seal design guarantees 100% certified oil-free air.
- Atlas Copco superior rotor coating for high efficiency and durability.
- Cooling jackets.

3

## High-efficiency coolers and water separator

- Corrosion resistant stainless steel tubing.
- Highly reliable robot welding; no leakages.
- Aluminium star insert increases heat transfer.
- Water separator with labyrinth design to efficiently separate the condensate from the compressed air.
- Low moisture carry-over protects downstream equipment.

\* Only for ZR water-cooled versions.



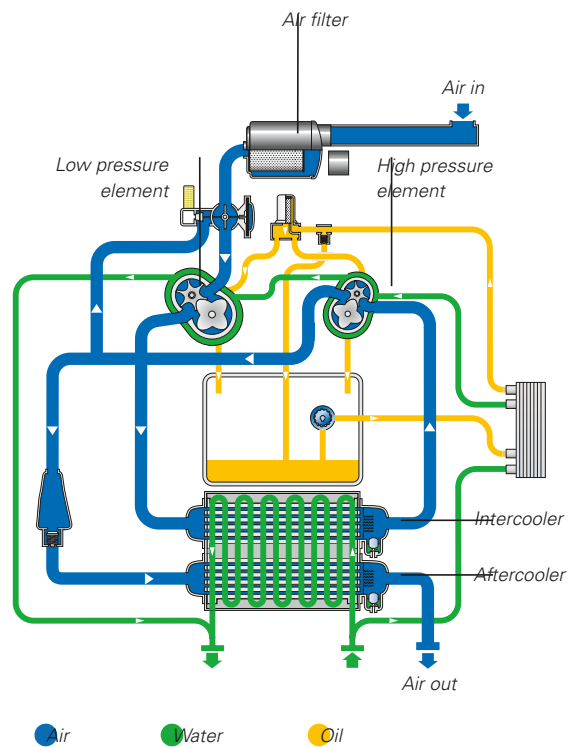


4

## Powerful motor + VSD

- TEFC IP55 motor protects against dust and chemicals.
- Continuous operation under severe ambient temperature conditions.
- Direct energy savings up to 35% with Variable Speed Drive (VSD) motor.
- Full regulation between 30 to 100% of the maximum capacity.

## Water-cooled ZR Pack



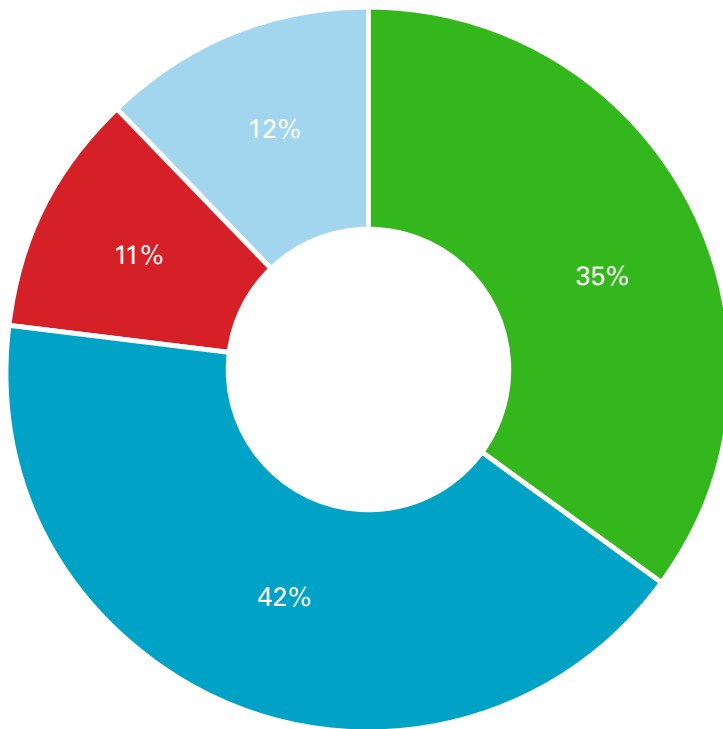
5

## Advanced Elektronikon®

- Large 5.7" sized color display available in 31 languages for optimal ease of use.
- Controls the main drive motor and regulates system pressure to maximize energy efficiency.

# VSD: 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 of 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.

## Total compressor lifecycle cost



## 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 from 4 to 10.4 bar 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 (standard up to 40°C/104°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

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

- High resolution color 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 Ethernet based communication.
- Support for 31 different languages, including character based languages.



## Online & mobile monitoring

Monitor your compressors over the Ethernet with the new Elektronikon® controller. Monitoring features include warning indications, compressor shut-down and maintenance scheduling. An Atlas Copco App is available for iPhone/Android phones as well as iPad and Android tablets. It allows fingertip monitoring of your compressed air system through your own secured network.



## SMARTLINK\*: Data monitoring program

- A remote monitoring system that helps you optimize your compressed air system and save you energy and cost.
- It offers you a complete insight in your compressed air network and anticipates on potential problems by warning you up-front.

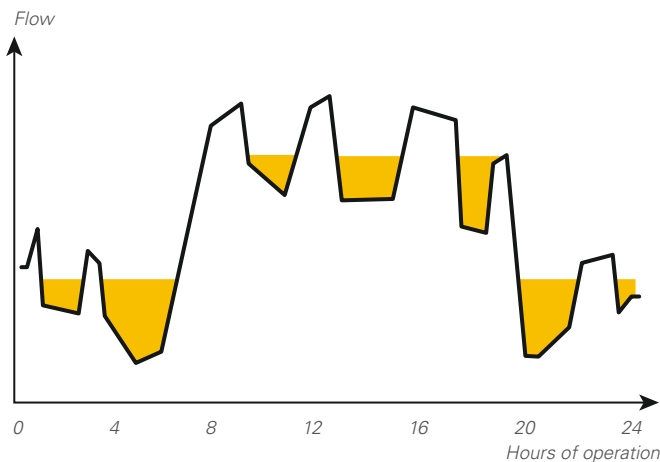
*\*Please contact your local sales representative for more information.*

## The magic formula: turbo + screw

Obtain the most efficient compressor solution for your high capacity application in the market by combining the advanced turbo technology of the ZH<sup>+</sup> with the regulating capabilities of the ZR screw compressor with Variable Speed Drive (VSD). Eliminating costly blow-off in all operating conditions, this combination is ideal to achieve the highest return on investment while enjoying the benefits of the ZH<sup>+</sup> turbo and ZR screw technology.

### Reduced blow-off

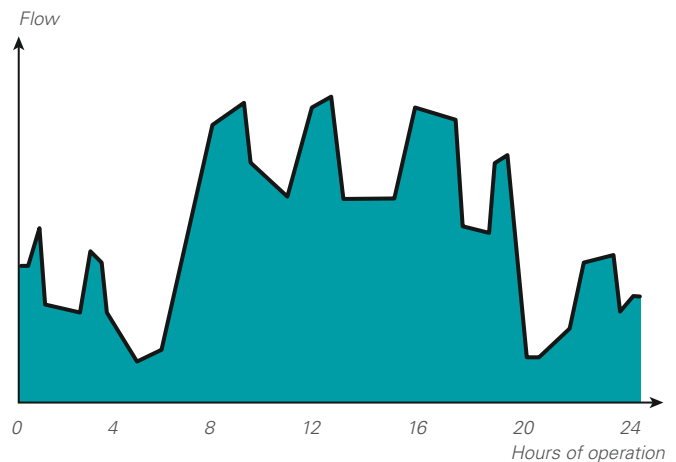
While turbo compressors are very efficient in turndown, a lot of energy is wasted during blow-off by expanding part of the compressed air into the blow-off valve and silencer. By combining two turbo compressors in an erratically varying air demand, the expensive blow-off is reduced but not completely eliminated.



● Operation with blow-off

### Eliminated blow-off

Atlas Copco's unique Variable Speed Drive (VSD) technology closely follows the air demand by automatically adjusting the motor speed. When combining the ZH<sup>+</sup> turbo compressor and the ZR screw compressor with VSD, the highest efficiency is achieved by completely eliminating blow-off.



● Operation without blow-off

### Find out how much you can save

Atlas Copco can help you map the load/air demand profile of your current compressor and blower installation and indicate potential energy savings with VSD compressors and blowers.

For more information, please contact your local Atlas Copco representative.

# *Protecting your production*

Untreated compressed air contains moisture and possibly dirt particles that can damage your air system and contaminate your end product. The resulting maintenance costs far exceed air treatment costs. Atlas Copco believes in effective prevention and provides a complete range of air treatment solutions to protect investments, equipment, production processes and end products.

## **Increase production reliability**

Low quality air heightens the risk of corrosion, which can lower the life span of production equipment. The air treatment solutions produce clean air that enhances your system's reliability, avoiding costly downtime and production delays.

## **Safeguard production quality**

Compressed air coming into contact with your final products should not affect their quality. Atlas Copco provides clean, dry air to protect your production and reputation in the market.

## **Supreme energy and cost savings**

Atlas Copco's quality air solutions stand for substantial energy savings all day, every day. Taking technology to a new level, these products achieve maximum cost savings.

## **Proven peace of mind**

Building on know-how and years of experience, the entire Atlas Copco quality air range is produced in-house and tested using the most stringent methods in the industry.



# A dryer solution for every need

Untreated compressed air contains moisture and possibly dirt particles that can damage your air system and contaminate your end product. The resulting maintenance costs far exceed air treatment costs. Atlas Copco believes in effective prevention and provides a complete range of air treatment solutions to protect investments, equipment, production processes and end products.

## Heat of compression reactivated adsorption dryers

### XD-G/XD<sup>+</sup>-G

-70°C/-40°C/-20°C  
-94°F/-40°F/-4°F

### XD-S

-20°C/+3°C  
-4°F/+37°F

- Use of freely available heat of compression.
- Limited pressure drop.
- Variants for dew point suppression and guaranteed dew point.
- Variants without loss of compressed air.

## Rotary drum heat of compression dryers

### ND

-40°C/-20°C  
-40°F/-4°F

### MD

-20°C/+3°C  
-4°F/+37°F

- Use of freely available heat of compression.
- Negligible power consumption.
- Variants with extra heat augmentation for lower dew points.

## Heat reactivated adsorption dryer

### BD/BD<sup>+</sup>

-70°C/-40°C/-20°C  
-94°F/-40°F/-4°F

- Use of electrical heaters for regenerating the desiccant.
- Limited pressure drop.
- Variants without loss of compressed air.

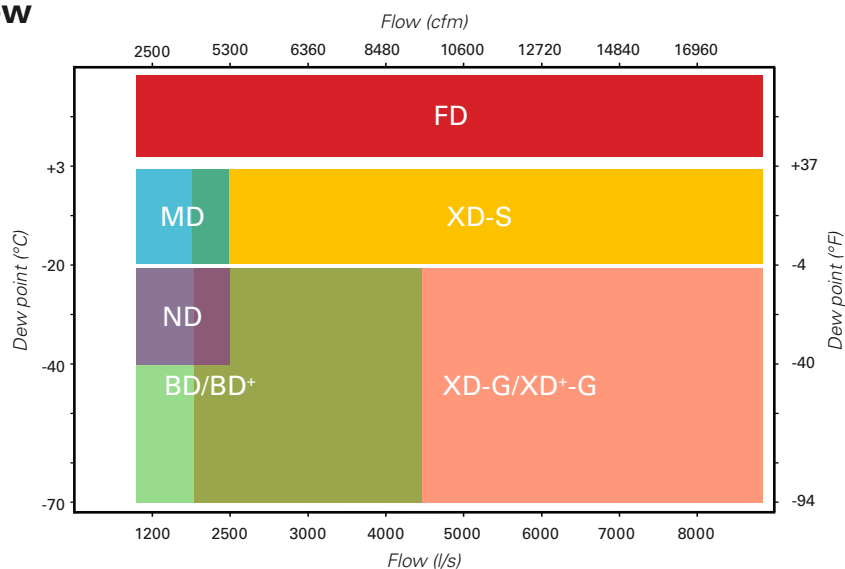
## Refrigerant dryer

### FD

+3°C/+20°C  
+37°F/+68°F

- Use of cooling circuit for cooling down compressed air.
- Guaranteed pressure dew points.
- Lowest energy consumption in all operating conditions.
- Air and water cooled variants.

## Dryers overview



# 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.

## Options

	ZR 300-750	ZR 400-900 VSD
Anchor pads	•	•
Duplex oil filters	•	•
ANSI flange(s) for air (and water) connections	•	•
Automatic water shut-off valve	•	•
Energy recovery	•	•
Separate air intake	•	•
Kit for purge of dry air during standstill	•	•
Prepared for free standing MD dryer	•	•
Hot air variant (= without aftercooler)	•	•
HAT (High Ambient Temperature) version	•	•
IP 55 (TEFC) enclosure for motor	•	-
With PT 100s in the windings	•	-
With PT 1000s in the windings	•	•
With PT 1000s in the bearings	•	•
With PT 1000s in the windings and bearings	•	•
Anti-condensation heaters	•	•
<b>SMARTLINK</b>	•	•
SPM monitoring equipment	•	•
Teflon-free elements	•	•
Wooden packing case	•	•
Material certificates	•	•
Test certificate	•	•
Witnessed performance test	•	•
Thermostatic water valve	-	•
12 pulse converter	-	•
Heavy duty dust filter for converter cooling air	-	•
IT network	-	•

Please note the availability of the option depends on the chosen configuration.

• : Optional    - : Not 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.

# Technical specifications

## ZR 300-750

Type	Free air delivery <sup>(1)</sup>			Installed motor		Noise level <sup>(2)</sup>	Weight	
	l/s	m <sup>3</sup> /min	cfm	kW	hp	dB(A)	kg	lb
<b>50 Hz</b>								
ZR 300 - 7.5	774.7	46.5	1642	315	400	77	6550	14440
ZR 300 - 8.6	725.6	43.5	1537	315	400	76	6550	14440
ZR 300 - 10	694.9	41.7	1472	315	400	77	6550	14440
ZR 315 - 7.5	848.3	50.9	1797	315	400	77	6550	14440
ZR 315 - 8.6	793.5	47.6	1681	315	400	76	6550	14440
ZR 315 - 10	766.7	46.0	1625	315	400	77	6550	14440
ZR 355 - 7.5	939.2	56.4	1990	355	450	77	6950	15322
ZR 355 - 8.6	877.3	52.6	1859	355	450	76	6950	15322
ZR 355 - 10	839.8	50.4	1779	355	450	77	6950	15322
ZR 400 - 7.5	1034.3	62.1	2192	400	500	77	7050	15542
ZR 400 - 8.6	964.0	57.8	2043	400	500	79	7050	15542
ZR 400 - 10	930.6	55.8	1972	400	500	77	7050	15542
ZR 425 - 7.5	1143.9	68.6	2424	425	600	77	7250	15983
ZR 425 - 8.6	1063.1	63.8	2253	425	600	77	7250	15983
ZR 450 - 7.5	1275.7	76.5	2703	450	600	79	8400	18519
ZR 450 - 8.6	1191.8	71.5	2525	450	600	75	8400	18519
ZR 450 - 10	1063.0	63.8	2252	450	600	77	8400	18519
ZR 500 - 7.5	1399.1	83.9	2965	500	700	79	8400	18519
ZR 500 - 8.6	1305.2	78.3	2766	500	700	79	8400	18519
ZR 500 - 10	1217.8	73.1	2580	500	700	77	8400	18519
ZR 630 - 7.5	1715.0	102.9	3634	630	800	78	9125	20117
ZR 630 - 8.6	1595.0	95.7	3380	630	800	79	9125	20117
ZR 630 - 10	1484.1	89.0	3145	630	800	79	9125	20117
ZR 750 - 7.5	2046.2	122.8	4336	750	900	78	9225	20337
ZR 750 - 8.6	1827.4	109.6	3872	750	900	79	9225	20337
ZR 750 - 10	1696.7	101.8	3595	750	900	79	9225	20337
<b>60 Hz</b>								
ZR 300 - 8.6	756.0	45.4	1602	315	400	76	6550	14440
ZR 300 - 10.4	685.2	41.1	1452	315	400	77	6550	14440
ZR 315 - 8.6	843.4	50.6	1787	315	400	76	6550	14440
ZR 315 - 10.4	763.4	45.8	1618	315	400	77	6550	14440
ZR 355 - 8.6	943.8	56.6	2000	355	450	76	6950	15322
ZR 355 - 10.4	853.1	51.2	1808	355	450	77	6950	15322
ZR 400 - 8.6	1027.2	61.6	2177	400	500	79	7050	15542
ZR 400 - 10.4	935.2	56.1	1982	400	500	77	7050	15542
ZR 450 - 8.6	1320.5	79.2	2798	450	600	75	8400	18519
ZR 450 - 10.4	1162.9	69.8	2464	450	600	77	8400	18519
ZR 500 - 8.6	1533.5	92.0	3249	500	700	79	8400	18519
ZR 500 - 10.4	1347.0	80.8	2854	500	700	77	8400	18519
ZR 630 - 8.6	1691.8	101.5	3585	630	800	79	9125	20117
ZR 630 - 10.4	1483.9	89.0	3144	630	800	79	9125	20117
ZR 750 - 8.6	1913.5	114.8	4055	750	900	79	9225	20337
ZR 750 - 10.4	1730.0	103.8	3666	750	900	79	9225	20337

(1) Unit performance measured according to ISO 1217, Annex C, Edition 4 (2009).

Reference conditions:

- Relative humidity 0%.
- Absolute inlet pressure: 1 bar (14.5 psi).
- Intake air temperature: 20°C/68°F

FAD is measured at the following working pressures:

Fixed speed:

- 7.5/8.6 bar versions at 7 bar.
- 10/10.4 bar versions at 9 bar.

For VSD: at their maximum working pressure.

(2) A-weighted emission sound pressure level at the work station (LpWSAd).

Measured according to ISO 2151: 2004 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.



# Technical specifications

## ZR 400-900 VSD (50/60 Hz)

Type	Working pressure		Free air delivery <sup>(1)</sup>			Noise level <sup>(2)</sup>	Weight	
		bar(e)	l/s	m <sup>3</sup> /min	cfm	dB(A)	kg	lb
ZR 400 VSD - 8.6 bar(e)	Minimum	3.5	373 - 1235	22.4 - 74.1	790-2617	77	8540	18827
	Effective	7	371 - 1121	22.3 - 67.3	786-2375			
	Maximum	8.6	371 - 1068	22.3 - 54.1	786-2263			
ZR 400 VSD - 10.4 bar(e)	Minimum	7	375 - 999	22.5 - 59.9	795-2117	79	8540	18827
	Effective	9	375 - 999	22.5 - 59.9	795-2117			
	Maximum	10.4	374 - 998	22.4 - 59.9	792-2115			
ZR 500 VSD - 8.6 bar(e)	Minimum	3.5	373 - 1327	22.4 - 79.6	790-2812	77	8540	18827
	Effective	7	371 - 1326	22.3 - 79.6	786-2810			
	Maximum	8.6	371 - 1248	22.3 - 74.9	786-2644			
ZR 500 VSD - 10.4 bar(e)	Minimum	7	375 - 1179	22.5 - 70.7	795-2498	76	8540	18827
	Effective	9	375 - 1178	22.5 - 70.7	795-2496			
	Maximum	10.4	374 - 1178	22.4 - 70.7	792-2496			
ZR 700 VSD - 8.6 bar(e)	Minimum	3.5	943 - 2418	56.6 - 145.1	1998-5124	78	12420	27381
	Effective	7	942 - 2125	56.5 - 127.5	1996-4503			
	Maximum	8.6	941 - 1985	56.5 - 119.1	1994-4206			
ZR 700 VSD - 10.4 bar(e)	Minimum	7	876 - 2046	52.6 - 122.8	1856-4335	79	12420	27381
	Effective	9	875 - 1897	52.5 - 113.8	1854-4020			
	Maximum	10.4	875 - 1789	52.5 - 107.3	1854-3791			
ZR 900 VSD - 8.6 bar(e)	Minimum	3.5	943 - 2506	56.6 - 150.4	1998-5310	79	12420	27381
	Effective	7	942 - 2505	56.5 - 150.3	1996-5308			
	Maximum	8.6	941 - 2378	56.5 - 142.7	1994-5039			
ZR 900 VSD - 10.4 bar(e)	Minimum	7	876 - 2101	52.6 - 126.1	1856-4452	79	12420	27381
	Effective	9	875 - 2101	52.5 - 126.1	1854-4452			
	Maximum	10.4	875 - 2100	52.5 - 126.0	1854-4450			

(1) Unit performance measured according to ISO 1217, Annex C, Edition 4 (2009).

Reference conditions:

- Relative humidity 0%.

- Absolute inlet pressure: 1 bar (14.5 psi).

- Intake air temperature: 20°C/68°F.

FAD is measured at the following working pressures:

Fixed speed:

- 7.5/8.6 bar versions at 7 bar.

- 10/10.4 bar versions at 9 bar.

For VSD: at their maximum working pressure.

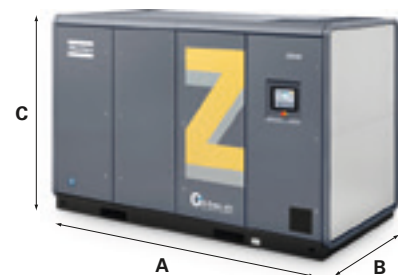
(2) A-weighted emission sound pressure level at the work station (LpWSAd).

Measured according to ISO 2151: 2004 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.

## Dimensions

Type	Standard					
	A (Length)		B (Width)		C (Height)	
	mm	inch	mm	inch	mm	inch
ZR 300-425	3700	145.7	2120	83.5	2400	94.5
ZR 450-750	4060	159.8	2120	83.5	2400	94.5
ZR 400-500 VSD	4060	159.8	2120	83.5	2400	94.5
ZR 700-900 VSD	4060	159.8	2120	83.5	2470	97.2



## ***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.



[www.atlascopco.com](http://www.atlascopco.com)

