

# Atlas Copco Air Compressors

## ZR300-750 & ZR500-900 VSD

Oil-free rotary screw compressor series  
with Variable Speed Drive variants



THE  
RIGHT  
CHOICE





# The Total Energy Saving concept...

The shortest route to maximizing your profitability, is to minimize operational cost. Because energy consumption is the major factor in a compressor's life cycle cost, the focus in the design of the Atlas Copco Z compressors

is on saving energy in every conceivable way. This focus is the basis for a total product development concept that encompasses every stage of R&D, manufacturing, installation and after sales service.



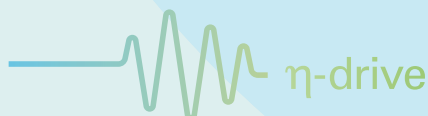
## The thorough needs assessment

Real savings rely on facts. Atlas Copco consultants assess the air demand profile of your application and suggest the best compressor selection for the job.



## The right core technology

Atlas Copco masters every compression principle and provides the most energy efficient technology for the required pressure and flow.



$\eta$ -drive

## The best drive arrangement

Fixed speed machines are fine when they can run at full load most of the time. But when air demand fluctuates, the Variable Speed Drive can achieve substantial savings of up to 35 %.

## Energy Circle





Pushing the limits in  
energy efficiency



Pushing the limits in reliability

## The lowest operating cost

### Energy recovery

Heat from the compression process can be recovered and put to good use in endothermic processes, heating of buildings etc.



### The fully optimized system

A multi-compressor installation can be centrally controlled to achieve a tight pressure band and the lowest overall energy cost.

### The innovative accessories

The matching MD adsorption dryer offers high quality dry air with the lowest pressure drop and uses the heat of the compressor for regeneration. These are two features that lead to significant energy savings.



## The highest reliability



### The professional follow-up

An Atlas Copco Service Contract will ensure you of comprehensive preventive maintenance. Immediate response and genuine spare parts... all over the globe.

### The trouble-free installation & commissioning

An Atlas Copco oil-free compressor is truly plug-and-play. No special field assembly is needed. Put the machine on a flat floor, connect the power line and the compressed air outlet.





# ... combined with the Total Reliability concept

An energy efficient machine saves money only if it runs reliably around the clock. And not just today, but day after day, year after year; with minimal service interventions, long overhaul intervals, an extended lifetime of all moving parts, individually and

thoroughly tested. For over a century, Atlas Copco has been building machines that stand the test of time. With the proven Z compressors, reliability has never been so timeless.

## Reliability Circle



### **The experienced partner**

Atlas Copco is the world leader in compressed air technology, with over 100 years of experience in air compression systems.



### **The integrated design**

Internal piping, integrated Variable Speed Drive, 100 % matched components... the only way to ensure total reliability.

### **The complete solution**

Compressor, dryer, drive, filters, control system... they all carry the same mark of quality: the Atlas Copco logo.



# Proven Z-technology in one package

The Total Energy Saving Concept takes solid form in the ZR500-900 VSD range. These compressors offer impressive energy savings thanks to Atlas Copco's integrated Variable Speed Drive. It's so much more than a combination of separate components.

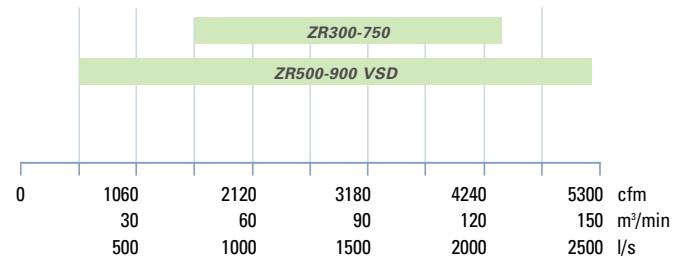
The ZR300-750 compressors are available in either water or air cooled versions (dependent on model). These machines are of a robust and reliable design, easy to service and environmentally friendly. Installation is straightforward and no special foundations are required.

## Excellence by design

- Completely oil-free – no risk of oil-contaminated air
- No oil in the condensate
- Completely ready-to-use package
- Easy, low cost installation – no foundations
- Low cooling water consumption with water cooled variant
- Proven reliability : 45,000+ installations
- True performance as per ISO 1217, Annex C, Ed. 3
- Flexible as a base load or a top load machine
- Consistent performance over the lifetime of the compressor
- Operator and service friendly
- Silenced package
- Very low vibration level

ZR/ZT160-750, ZR315-500-900 VSD

Capacity range (50 & 60 Hz)



ZT: Air cooled / ZR: Water cooled / VSD: Variable Speed Drive  
See data pages for range details



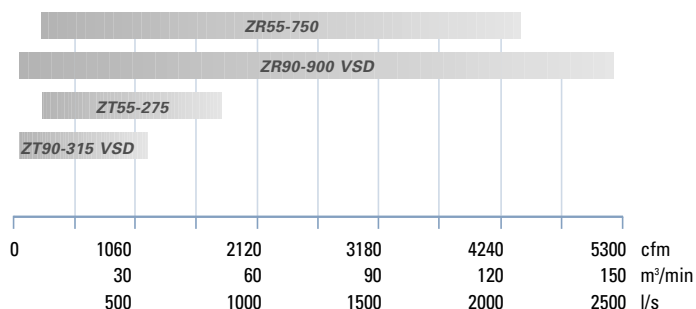
## Watercooled ZR

Unique integration of components

- Reduced number of parts
- Leakage-free



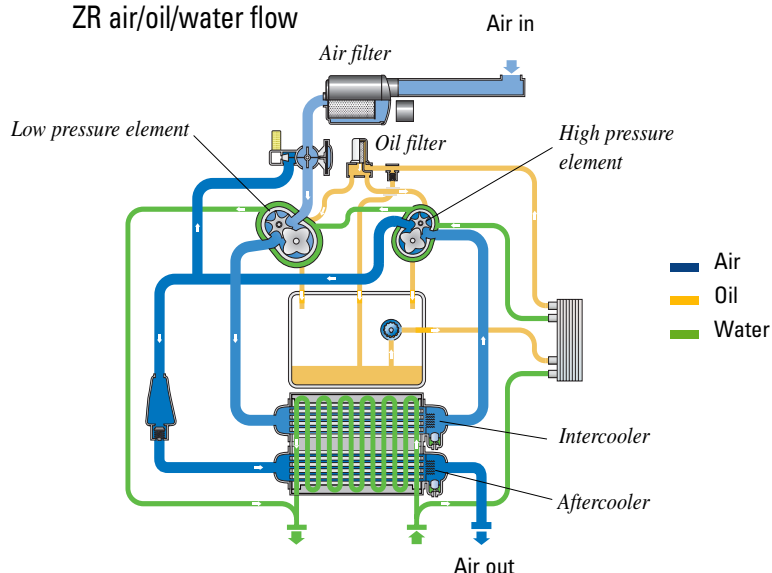
## Complete ZR/ZT range



## ZR500 VSD - Variable Speed Drive



### ZR air/oil/water flow



## Global presence Local service



Atlas Copco's Aftersales Service operation is unrivaled in the compressed air industry.

- ▶ An Atlas Copco's Service network in 150 countries worldwide. A sophisticated logistics concept delivers genuine Atlas Copco spare parts to your doorstep in record time, across the globe.
- ▶ Our service plans perfectly meet the requirements of your business and ensure a constant productivity at peak level.
- ▶ Consultancy services and on-site measurements help optimize the complete air net, minimizing leak losses and maximizing energy savings.



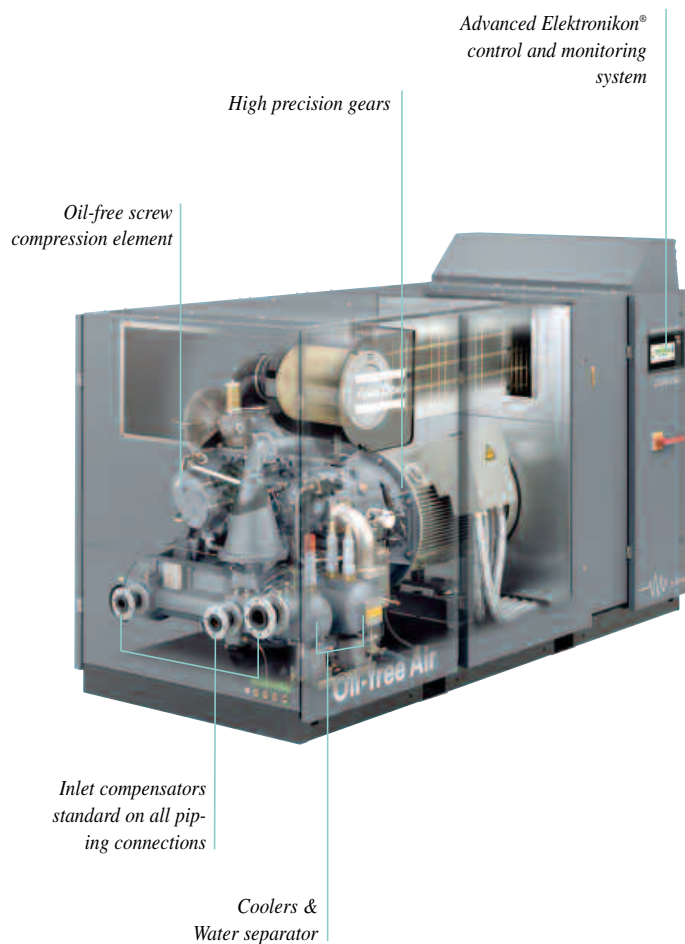
## Caring for the environment

- ▶ VSD technology and two-stage compression realize impressive energy savings.
- ▶ Reduced internal pressure drops save power.
- ▶ Provisions are made for energy recovery.
- ▶ The compressed air is 100 % oil-free, there is no oil in the condensate nor in the process.



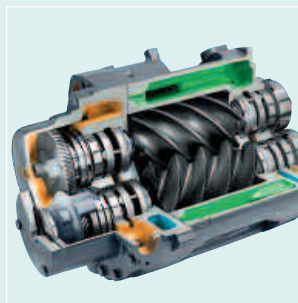
# Superior design in every detail

In every detail Atlas Copco Z-compressors are designed and manufactured to the highest standards of quality and reliability. There are no hidden extras or complicated installation requirements: every unit is delivered as a complete and integrated package, ready to run.



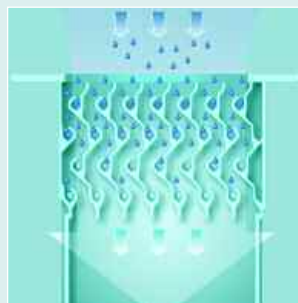
## Proven Z-technology

- ▶ 100% oil-free rotary screw compression
- ▶ operation far below critical speed
- ▶ high overall efficiency
- ▶ no oil 'clean-up' problems



## Superior element bearings

- ▶ high stability under varying load conditions
- ▶ easily adapts to changing loads
- ▶ no need for pre-lubrication/stabilization time



## Water separator

- ▶ the labyrinth design efficiently separates the condensate from the compressed air
- ▶ low moisture carry-over protects downstream equipment
- ▶ better dryer performance
- ▶ field proven design



### High precision gears according to AGMA Q13/DIN Class 5

- ▶ long lifetime
- ▶ low transmission losses
- ▶ low noise and vibration



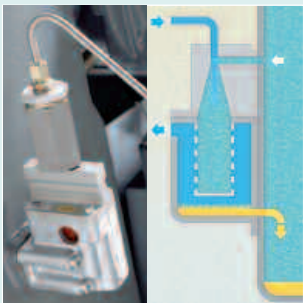
### Efficient filtration of the intake air

- ▶ machine mounted,  
easy to maintain
- ▶ minimum intake losses



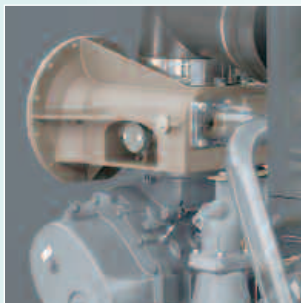
### Advanced Elektronikon® control and monitoring system

- ▶ overall system performance status with pro-active service indications, alarms for malfunctions and safety shutdowns
- ▶ multi-language selectable display
- ▶ all monitoring and control functions via one interface
- ▶ wide communication possibilities
- ▶ integration possible in many process control systems (field bus system)



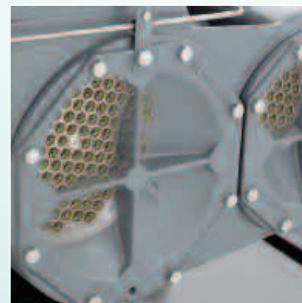
### Gearbox breathing system

- ▶ simple filter combined with venturi system
- ▶ keeps the oil inside the gearbox
- ▶ no oil fumes in the atmosphere



### Inlet valve

- ▶ air-operated diaphragm
- ▶ lowest unloaded power
- ▶ positive interlock with unload valve



### High efficiency cooling (water cooled ZR compressor)

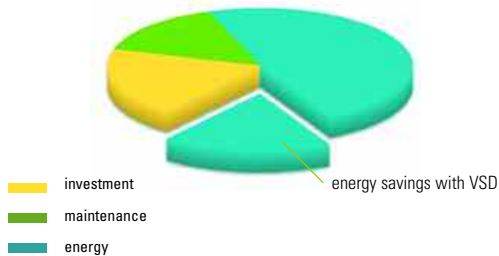
- ▶ coolers with tubes of special corrosion resistant stainless steel (R249)
- ▶ star profile increases heat transfer
- ▶ very low approach temperatures
  - nearly perfect intercooling – saves energy
  - nearly perfect aftercooling – enhances dryer performance



# Why Variable Speed Drive (VSD) compressors ?

Because a VSD compressor precisely follows the varying air demand that is typical in most production facilities, it dramatically reduces the energy bill and provides many additional benefits. The result is a fast payback of the investment and yearly savings long after that.

Because energy constitutes the biggest portion of the life cycle cost of a compressor, these savings have a significant impact on the operational costs of your plant air system.



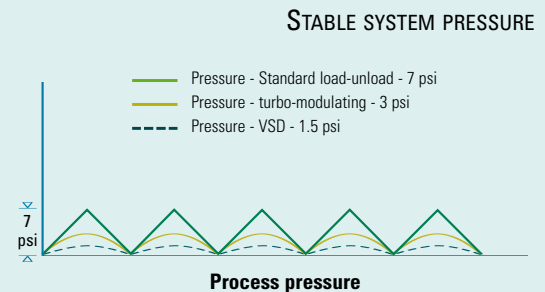
## Predicting your savings

Call upon the expertise of Atlas Copco specialists and have an assessment carried out in your factory. A detailed report will show your current operation and the achievable savings when adding a VSD solution to your plant air system.



## Direct energy savings of 15 to 35 %

- ▶ Unload losses are reduced to a minimum
- ▶ No blow-off of compressed air to the atmosphere
- ▶ Load/no load transition losses are eliminated
- ▶ The precise pressure control of the VSD compressor allows for a tighter pressure band and a lower average working pressure, resulting in reduced energy consumption

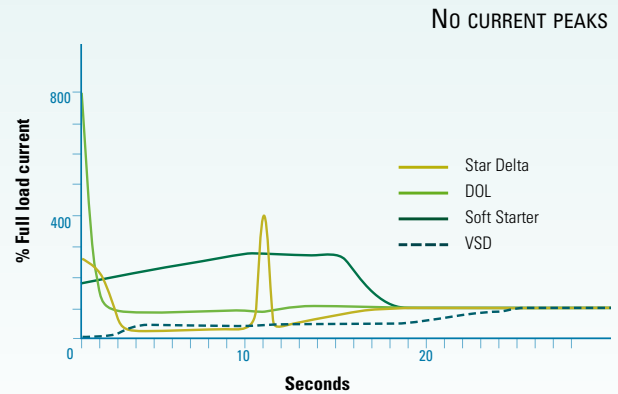


## Indirect savings

- ▶ The **lowered system pressure** obtained by the VSD compressor provides additional yearly savings:
  - other base-load compressors will consume less energy
  - leak losses – always present in compressed air systems – are significantly reduced: e.g. leakage at 90 psig is 13 % less than at 100 psig
  - most compressed air applications consume less air at a reduced pressure

## Additional VSD benefits

- ▶ The **stable system pressure** provides stability for all processes using compressed air.
- ▶ **Current peaks during start-up are eliminated**
  - VSD compressors can be started and stopped without limitation
  - starting the compressor no longer leads to current peak penalties
- ▶ Often, smaller transformers, breakers, fuses and cables can be used, saving on the electrical installation costs.



## Integrated VSD - The only way

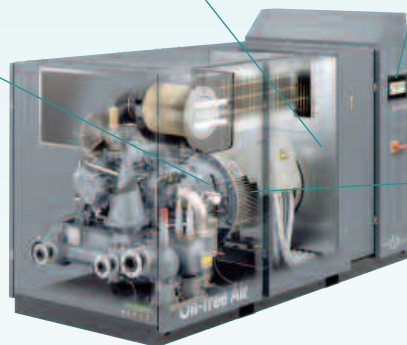
All Atlas Copco VSD compressors are EMC tested and certified. External sources do not influence the compressor operation, nor does the compressor disturb other equipment via emission or via the power supply line.

Mechanical enhancements are made to ensure that gears and bearings receive proper lubrication at all speeds and that all components operate well below critical vibrations.

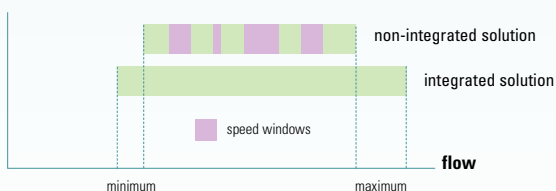
The machine is tested for the complete speed range to eliminate all "speed windows" that can jeopardize the energy savings and the stable system pressure.

The Elektronikon® system controls the compressor and the integrated converter; this ensures maximum machine safety and allows for easy networking of the compressor.

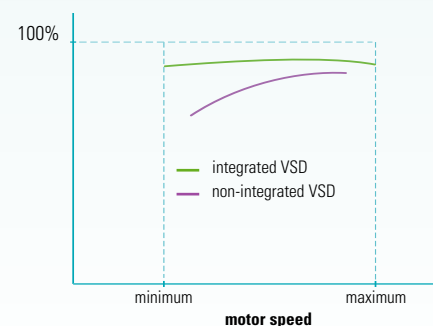
The electric motor is specifically designed for VSD operation. Bearings are protected against induced bearing currents and both motor and converter are perfectly tuned to obtain the best efficiency over the entire speed range. Cooling air flow to the motor is optimized over the complete range.



### OPERATING RANGE



### COMBINED MOTOR/CONVERTER EFFICIENCY





# Complete scope and additional options suiting all needs

## As standard included

✓ Air intake filter and silencer	✓ Complete oil circuit pre-piped
✓ Air intake flexible	✓ Built-in oil breather system
✓ Stainless steel inter and aftercooler cores*	✓ AGMA Q13 ; DIN class 5 gears
✓ Intercooler and aftercooler water traps and auto drains	✓ Electric motor pre-mounted
✓ Outlet air silencer	✓ IP 55 (TEFC) motors in low voltage
✓ Outlet air flange	✓ Wired and mounted YD starters for low voltage motors
✓ Complete water circuit*	✓ Premounted electrical cubicles
✓ Single point inlet and outlet cooling water connections*	✓ Six sided silencing canopy
✓ Piping and expansion joints	✓ Skid mounting, eliminating special foundations
✓ Back-flush arrangement for cooler cleaning*	

\* only for water cooled versions.

## Major Standard Options

Some applications may need or benefit from additional options and more refined control and air treatment systems.

	ZR 300-750	ZR 500 VSD	ZR 900 VSD
Energy recovery	•	•	•
Hot air version	•	•	•
Automatic water shut off valve	•	•	•
Thermostatic water valve	na	•	•
Electronic drain	•	std	std
ANSI flanges for air and water connections	•	•	•
Duplex oil filters	•	•	•
IP 55 (TEFC) enclosure for MV motors (1)	•	na	na
Anti condensation heater for motor	•	na	na
Thermistor motor winding protection (2)	•	std	std
PT100 motor winding protection (3)	•	•	•
MODBUS interface	•	•	•
PROFIBUS interface	•	•	•
Remote speed or setpoint control	na	•	•
Witness performance test (4)	•	•	•
Performance test certificates (4)	•	•	•
Material certificates (4)	•	•	•
Wooden packing case	•	•	•
MD dryer control in cubicle	std	•	•
IT net option (floating ground)	na	•	na

(1) MV: Medium Voltage above 2300 volts AC

(2) Only for LV motors – LV: Low Voltage below 600 volts AC

(3) For fixed speed compressors: only for Medium Voltage motors (>2300 VAC)

(4) Fixed content

na: not applicable / std: as standard included

# Optimize your installation

Tailored to the application, Atlas Copco has developed complementary equipment for the optimal quality air solution and the lowest cost compressed air.

## Energy-less MD and MD VSD adsorption dryers

If your process needs dry air, add the unique and environmentally friendly MD adsorption dryer. To match your installation, air and watercooled versions are available.

- ▶ Low dewpoints
- ▶ Very low energy use
- ▶ Very low pressure drops
- ▶ No need for filters

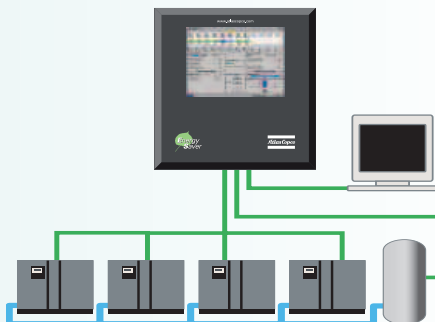
For each ZR VSD there is a matching MD VSD for the most stable dewpoint.



## ES – Energy Saving control and monitoring systems

The Elektronikon® controllers have an **Integrated Multiple Compressor Control System** as standard.

To further optimize your compressor room, install an ES energy saving system or contact Atlas Copco for an energy audit.



# True Performance

When specifying the true performance of an air compressor, at least three parameters must be considered:

## Capacity

The standard to which the capacity is measured

## Working pressure

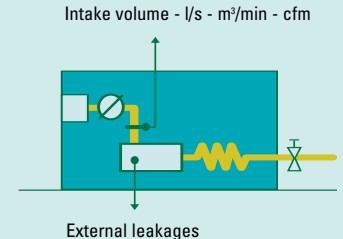
The point where the delivery pressure is measured

## Power consumption

The compressor package power required at an effective working pressure (including all internal losses from inlet to outlet). Main drive motor efficiency.

### Intake volume

*Inlet flow referred to compressor element inlet conditions. Seal leakages and inlet losses should not deprive you the air you paid for.*

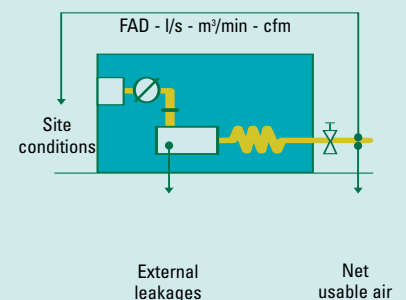


Atlas Copco Z-compressors are measured according to ISO 1217, Annex C, Edition 3, stipulating the FAD measurement at the end of the package, net of all losses.

Atlas Copco specifications correspond to the capacity and pressure which the customer receives, not to what the compressor draws in. Differences are substantial.

### Delivered volume

*FAD according to ISO 1217, Annex C, Edition 3. A Z-compressor truly gives what is promised.*





# Technical data

## ZR300-750 and ZR VSD compressors - 50 Hz

ZR watercooled	Free air delivery <sup>(1)</sup>			Installed motor	Cooling water consumption <sup>(2)</sup>	After-cooler approach temp.	Sound pressure level <sup>(3)</sup>
	cfm	m³/min	l/s				
<b>Type</b> <b>50 Hz - 7.5 bar(e)</b>				<b>kW</b>	<b>gpm</b>	<b>°F</b>	<b>dB(A)</b>
ZR300	1643	46.5	775	315	63	4	70
ZR315	1812	51.3	855	315	70	4	71
ZR355	2012	56.9	949	355	76	5	71
ZR400	2224	62.9	1046	400	86	5	71
ZR425	2463	69.7	1162	450	98	7	72
ZR450	2664	75.4	1257	450	114	4	73
ZR500 VSD <sup>(4)</sup>	2794	79.0	1318	525	98	2-9	68-76
ZR500	2940	83.2	1387	500	124	4	73
ZR630	3659	103.6	1726	630	149	4	75
ZR750	4399	124.5	2075	750	179	5	75
ZR900 VSD <sup>(4)</sup>	5206	147.3	2456	935	184	2-9	68-78
<b>50 Hz - 10 bar(e)</b>							
ZR300	1461	41.3	689	315	67	4	71
ZR315	1622	45.9	765	315	71	5	72
ZR355	1793	50.7	846	355	78	7	73
ZR400	1990	56.3	939	400	86	7	73
ZR450	2220	62.8	1047	450	113	2	74
ZR500 VSD <sup>(5)</sup>	2438	69.0	1150	525	98	2-9	68-76
ZR500	2535	71.8	1196	500	122	2	74
ZR630	3125	88.4	1474	630	147	4	76
ZR750	3612	102.2	1704	750	166	5	76
ZR900 VSD <sup>(5)</sup>	4360	123.4	2057	935	181	2-9	68-79

## Dimensions & weight

(1) Reference Conditions:

- Dry air
- Absolute inlet pressure 14.5 psia
- Cooling and air intake temperature 68 °F
- Nominal working pressure
- Capacity of the compressor package measured according to ISO1217, Third Edition, Annex C

(2) Cooling water temp. rise of 27 °F

(3) ± 3 dB(A) according to Pneuop PN8NTC2.2 test code measured at a distance of 1 m

(4) ZR VSD: capacity at 100 psig

(5) ZR VSD: capacity at 130 psig



ZR Compressor watercooled	Weight with L.V. motor lbs.	Weight with M.V. motor lbs.	Dimensions		
			L	W	H
<b>Type</b> <b>50 Hz</b>			<b>in.</b>	<b>in.</b>	<b>in.</b>
ZR300	13670	15100	146	83	94
ZR315	13670	15100	146	83	94
ZR355	14550	15100	146	83	94
ZR400	14770	15100	146	83	94
ZR425	15210	15650	146	83	94
ZR450	-	21270	160	83	94
ZR500 VSD	18340	-	160	83	97
ZR500	-	21460	160	83	94
ZR630	-	22930	160	83	94
ZR750	-	23150	160	83	94
ZR900 VSD	26120	-	184	83	97

# Technical data

## ZR300-750 and ZR VSD compressors - 60 Hz

ZR watercooled	Free air delivery <sup>(1)</sup>			Installed motor	Cooling water consump- tion <sup>(2)</sup>	After- cooler approach temp.	Sound pressure level <sup>(3)</sup>
	cfm	m³/min	l/s				
<b>Type</b> <b>60 Hz - 8.6 bar(e)</b>				<b>hp</b>	<b>gpm</b>	<b>°F</b>	<b>dB(A)</b>
ZR300	1600	45.3	755	350	65	5	71
ZR315	1802	51.0	850	400	73	5	72
ZR355	2024	57.3	955	450	81	7	72
ZR400	2211	62.6	1043	500	89	7	720
ZR450	2773	78.5	1308	600	124	4	74
ZR500 VSD <sup>(4)</sup>	2794	79.0	1318	703	98	2-9	68-76
ZR500	3260	92.3	1538	700	141	4	74
ZR630	3610	102.2	1703	800	157	5	76
ZR750	4111	116.4	1939	900	178	7	76
ZR900 VSD <sup>(4)</sup>	5206	147.3	2556	1250	184	2-4	68-78
<b>60 Hz - 10.4 bar(e)</b>							
ZR300	1435	40.6	677	350	68	4	71
ZR315	1615	45.7	762	400	73	5	72
ZR355	1819	51.5	858	450	81	7	73
ZR400	2003	56.7	945	500	87	7	730
ZR450	2425	68.6	1144	600	122	4	74
ZR500 VSD <sup>(5)</sup>	2438	69.0	1150	703	98	2-9	68-76
ZR500	2824	79.9	1332	700	138	4	75
ZR630	3125	88.4	1474	800	149	4	76
ZR750	3687	104.3	1739	900	171	5	76
ZR900 VSD <sup>(5)</sup>	4360	123.4	2057	1250	181	2-9	68-79

(1) Reference Conditions:

- Dry air
- Absolute inlet pressure 14.5 psia
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(4) ZR VSD: capacity at 100 psig

(5) ZR VSD: capacity at 130 psig

### Dimensions & weight

ZR Compressor watercooled	Weight with L.V. motor lbs.	Weight with M.V. motor lbs.	Dimensions		
			L	W	H
<b>Type</b> <b>60 Hz</b>			<b>in.</b>	<b>in.</b>	<b>in.</b>
ZR300	13670	15100	146	83	94
ZR315	13670	15100	146	83	94
ZR355	14550	15100	146	83	94
ZR400	14550	15100	146	83	94
ZR450	-	18080	160	83	94
ZR500 VSD	18340	-	160	83	97
ZR500	-	18520	160	83	94
ZR630	-	20120	160	83	94
ZR750	-	20120	160	83	94
ZR900 VSD	26120	-	184	83	97





The face of interaction

What sets Atlas Copco apart? Our belief that, to excel, we must provide the best possible know-how and technology in ways that our customers value. Whether we're fully supporting existing products or advancing technology through innovation, we constantly focus on customer needs.

The Atlas Copco way of doing business grows from ongoing interaction, long-term relationships, and a commitment to understanding each customer's process and objectives. As a result, every compressed air solution we create helps a customer operate with greater efficiency, economy, and productivity.

Satisfying customer needs effectively has made Atlas Copco the number one compressor manufacturer in the world. We will continue to attract new business through our unwavering conviction to creating products and ideas that help our customers succeed.

Member:



Danger: Compressed air should never be supplied as breathing air unless air is properly purified for breathing. Atlas Copco assumes no responsibility or liability related to the purchaser's/user's breathing air system.

The information contained herein is general in nature and is not intended for specific construction, installation or application purposes

**Atlas Copco**

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