Oil-free air rotary screw compressors

ZR/ZT 75–160 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 over 60 years Atlas Copco has pioneered the development of oil-free air technology. Resulting in the largest range of air compressors and blowers within our industry. Through continuous research and development, we achieved a new milestone, setting the standard for air purity as the first manufacturer to be awarded ISO 8573-1 CLASS 0 certification. CLASS 0 certification means zero risk of oil contamination from our products.

100% oil-free compressed air

The ISO 8573-1 CLASS 0 certification means, zero risk of our products contaminating the compressed air. This means we won't damage your company's hard-won professional reputation due to oil contamination from our oil-free products.

Maximum energy efficiency

The ZR/ZT'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/ZT 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 or iMDG 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.

Air quality

Having the right air quality protects your production.

Why air quality?

By using our compressors and air treatment equipment you will avoid dust, water or oil in your process. It's important to have the right air quality to maximize your efficiency. If the Air Quality is too low, you will reduce the reliability of production equipment or processes. If the Air Quality is too high you're wasting energy. Therefore it's crucial to have the right Air Quality for your needs.

The perfect installation for your requirements

You have to avoid 3 things: water, dust & oil contaminants.

Water
Water in compressed air creates corrosion, rust and can damage your end product. We have Twin, Desiccant and Rotary drum dryers to remove any level of water in your air.

Dust
Dust in your compressed air creates extra friction, which leads to extra wear & tear in e.g. pneumatics. Our wide range of filtration solutions can remove all levels of dust in your system.

Oil
Oil particles entering the compressed air system can create product contamination and damage your end products. With our oil-free products and filtration solutions we can deliver Class-0 air for industries like Food & beverage, Medical & health care, Textiles, Chemical,...

Which Air Quality do you require?

CLASS 0 = As specified by the equipment user or supplier and more stringent than class 1
CLASS 1 = < 0.01
CLASS 2 = < 0.0
CLASS 3 = < 1
CLASS 4 = < 5

Current ISO 8573-1 (2010) classes (the five main classes and the associated maximum concentration in total oil content). Concentration total oil (aerosol, liquid, vapor) mg/m^3.

Contact your local Atlas Copco representative to decide the right air quality for your application needs.

Our air treatment portfolio

Refrigerant dryer

Refrigerant dryers are the most common and consist of an air-to-air heat exchanger and an air-to-Freon heat exchanger. They are used to avoid free water and corrosion in the system. A relative humidity of below 50% is enough to achieve this. Refrigerant dryers are available in a water-& air-cooled variants.

Dessicant dryer

Adsorption dryers are used when the compressed air application requires a pressure dew point below 0°C. In most cases, the dryers consist of two pressure vessels next to each other. Both vessels are filled with desiccant. When one vessel is removing moisture, the other is regenerating and vice versa.

Drum dryer

A variant on the twin tower heat of compression adsorption dryer is the rotary drum adsorption dryer. A rotary drum dryer exists of one vessel with a drum. This drum is a honeycomb structure on which the adsorption material is impregnated. ¾ of the drum is used to dry the compressed air, while the other quarter is used for regeneration. The regeneration is done with hot compressed air.

Filters

We offer a wide selection of filtration solutions for compressed air with different filter types and grades to remove any dust or oil from your compressed air system.

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.

The iMD's working principle is based on using hot compressed air from the compressor to regenerate the desiccant. The single pressure vessel is divided into two sectors: drying (75%) and regenerating (25%). Desiccant, impregnated on a honeycomb glass fiber drum, slowly rotates through these two sectors. Hot air leaving the last stage of the compressor is divided into two streams, 1 and 2. The main stream (branch 1) passes through the compressors after cooler (not visible in the image) and enters the dryer for drying. The regeneration stream (branch 2 - hot unsaturated air) is headed for desiccant regeneration. It passes through the regeneration section of the drum, removes the moisture through desorption and regenerates the desiccant. The now saturated regeneration air flow is cooled in the regeneration cooler (3), and then mixed with the main stream (branch 1).

iMDG adsorption dryer

The full flow of hot compressed air leaves the last stage of the compressor and passes through the iMDG's heat exchanger (2) and the water-cooled cooler (3). Cooled compressed air (branch 4) enters the drum for drying. Dry air comes out at the top, where it leaves the MDG at point 5. Part of the dry air (branch 6) goes into the heat exchanger (2), where it picks up the heat from incoming compressed air (branch 1). Dry and hot regeneration air (branch 7) passes through the regeneration section of the drum, where the moisture is removed. Wet and hot regeneration air is cooled in the regeneration cooler (8) and then mixed with the incoming cooled compressed air (branch 4)

Reliability

Reliable element

- Next generation world class compression element.
- Atlas Copco superior rotor coating for high durability.
- Thermal effiency reduces the expansion leading to reduces wear and increased reliability.
- More compact, improved rotor profiles and cooling jackets for maximum durability.

Advanced touch screen monitoring system

- User-friendly Elektronikon® Touch, with enhanced connectivity potential.
- Included warning indications, maintenance scheduling and online visualization of the machine's condition for increased reliabiltiy.

Highly reliable motor

- IP66 Permanent Magnet water cooled motor with oil lubricated bearings.
- Rock-solid reliability prevents dust and water entering the motor.

Realiable control - NEOS drive

- Atlas Copco NEOS inverter designed to work in the harsh conditions of the compressor house.
- Modular design allows replacement of individual components, reducing maintenance cost.
- Cubicle designed to keep the inverter cool extending the lifetime & increase operational efficiency.

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.

Zero loss drains

- Clearance of all water & contamination
- Increasing both product & system reliability.

Easy access

- Easy access to all components to minimize maintenance times.
- Hinged doors for easy routine maintenance e.g. cleaning.
- Saves valuable and often expensive floor space in a facility.
- Highest ratio flow/footprint on the market.

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.
- High quality coated canopy to prevent rust

Grouped service items

- Minimal service time because service parts are grouped together for ease of access.
- All components are designed for serviceability and long lasting lifetime.

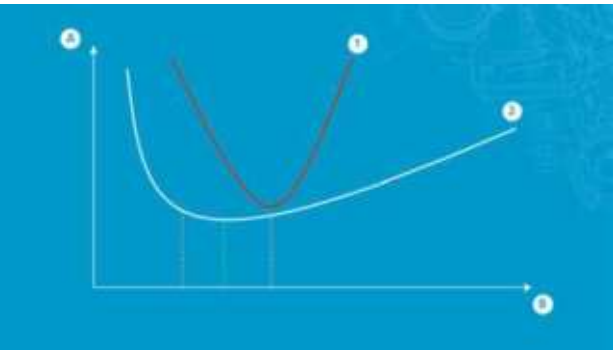
Efficiency

Design & control algorithms for optimal efficiency

Designed for efficiency

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.

The ZR/ZT 75-160 VSD+ is not only designed for reliability, but also for efficiency. Our unique and patented elements are designed in-house for maximum efficiency. The superior rotor coating, compact rotor profiles and cooling jackets guarantee maximum compression efficiency. The unique Z seal design guarantees efficient and 100% certified oil-free air for your application.



Designed for VSD

Compressors don't always run at full load, because your application often has a varying air demand. 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 elements of the ZR/ZT 75-160 VSD+ are designed for VSD machines to run efficiently at the broadest possible range. For this unit we also designed our own NEOS inverter to constantly optimize the motor speed and our own Permanent Magnet Motor for class-leading efficiency.

Legend
A = Losses
B = Speed
1 = Total losses traditional element
2 = Total losses Atlas Copco element

VSD+ concept

The ZR/ZT VSD+ range with its dual NEOS drives has the widest operating range on the market today. These units can operate from 20 to 100% load without wasting energy from unloaded operation, resulting in huge energy savings during periods of low to medium air demand.

Another advantage of the dual NEOS drives is that the ZR/ZT VSD+ always works at optimal efficiency at any pressure, when comparing to standard fixed speed and VSD machines that have a fixed gear ratio.

Optimized air flow in the machine

The ZR/ZT 75-160 VSD+ brings cool dense air into the package for optimal compression efficiency. The piping and components are strategically placed to minimize the pressure drop in the package, leading to optimal efficiency. The coolers have been carefully designed to keep the pressure drop at a bare minimum. Our zero loss drains account for zero waste of compressed air, making the ZR/ZT 75-160 VSD+ the most efficient machine on the market.

Elektronikon Mk5 touch

Our Elektronikon Mk5 touch unit controller is designed with Atlas Copco energy efficient algorithms to maximize flow and minimize power consumption. It controls both the compressor and the integrated converter, ensuring maximum machine safety within parameters.

Most production processes create fluctuating levels of demand which can create energy waste in low use periods. Using the Elektronikon® unit controller, you can switch between two different setpoints to optimize energy use and reduce costs at low use times.

Energy Recovery

You can turn your compressor into an energy source. Air compressors equipped with Energy Recovery can help you achieve your goals in becoming carbon neutral.

Compressed air is one of the most important utilities for the industry. It is also one of the largest consumers of energy. Up to 94% of the electrical energy is converted into compression heat. Without energy recovery, this heat is lost into the atmosphere via the cooling system and radiation.

You can use hot water recovered from the compressed air system for sanitary purposes and space heating. But it is particularly suitable for process applications. Using the hot water as boiler pre-feed or directly in processes requiring 70 to 90°C can save you costly energy sources such as natural gas and heating oil.

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.

Installation

Smart AIR Solutions, are a complete air or gas solution designed to provide our customers with the lowest life cycle costs for their equipment.

1. Compressors

Often people buy the same size compressor, but to optimize the system it's better to make a combination of different size compressors, technologies and controls.

2. Central controller

Having a central controller reduces the average pressure band.
It also reduces the operating pressure of your machines.
• By reducing the pressure by 1 bar (or 14.5 psi), your energy usage lowers by 7%.
• By reducing the pressure by 1 bar (or 14.5 psi) decreases air leakages by 13%.
Multiple embedded functions in the Optimizer 4.0 in which pressure, capacity and speed can be regulated.

Legend
A = Net pressure
B = Average pressure
C = Min. system pressure

3. Integrated dryers

Our full feature concept offers an integrated dryer in the compressor. This has additional benefits, reducing installation cost, time and complexity, having dryers controlled together with the compressors, reducing connecting pipes, hence the chance of leakages and extra pressure drops. Another key benefit is the space savings that a full feature machine brings.

4. Air receiver

A correctly sized air receiver brings both energy efficiency and system reliability. It allows a narrow pressure band and limits the un-& offload cycles to reduce stress on element bearings and other internal components.

5. Air treatment portfolio

Atlas Copco has a wide air treatment portfolio that matches your needs. Our portfolio ranges from removing water, oil and dust from your compressed air to generating Oxygen and Nitrogen on site.

6. AIRnet

AIRnet is a piping solution that guarantees operational excellence for compressed air, vacuum, nitrogen and other inert gas applications. Available in aluminium and stainless steel. AIRnet Aluminium is the most effective solution for your air or gas network. Its fast and easy installation gets your operations up and running in record time. AIRnet is leak-proof and corrosion-free. Its pipes and fittings come with a 10-year warranty.

smart AIR solutions

A compressor is only one component in the bigger picture of a smart AIR solution. Only a complete compressed air system is an energy-efficient solution. We designed a range of class-leading compressed air products, fully optimized to work better together. A smart AIR solution is the most efficient and reliable combination of a compressor with our air and gas equipment. This solution can include dryers, filters, controllers, energy recovery systems, nitrogen or oxygen generators, air receivers, coolers or boosters specified to your needs.

Optimize your system

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

Options

	ZR/ZT 75-160 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

Engineered solutions

With the ZR/ZT, Atlas Copco provides an all-in-one standard package incorporating the latest technology in a built-to-last design. To further optimize your ZR/ZT'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 technologies

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.

Services

Properly caring for your air compressor helps you lower your operating costs and minimizes 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.

TotalCare Plan

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 TotalCare Plan, 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 TotalCare Plan customer, you are given top priority for urgent repairs.

Fixed Budget

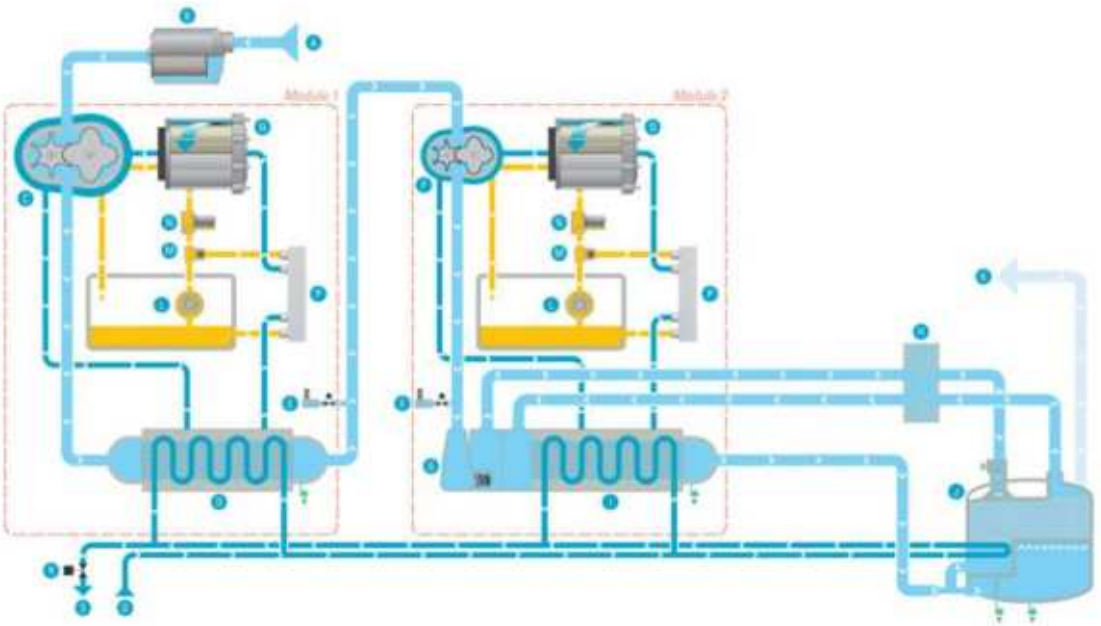
In 7 years, maintenance costs may fluctuate considerably. If an expensive repair comes up, this could seriously disrupt your budget. TotalCare Plan covers all repairs and comes with a fixed annual cost.

AIRScan

As an energy conscious buyer, you have bought the most energy efficient equipment in the market. But in time, how sure are you that your equipment is still running in the most optimal and energy efficient conditions? If that is the case, it is time to ask Atlas Copco to audit your installation.

Flowchart

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



1. Filtration & compression

The air is drawn into the compressor through the inlet filter where the air is cleaned.
It then continues to the first compression stage where the air is compressed to an intermediate pressure.

2. Cooling & second compression

After the first compression, the air is cooled down in the intercooler. Once the air is cooled down, it passes through a moisture separation system before entering the high-pressure stage. In the high-pressure stage, the pressure is brought to its final pressure.

3. Exchanging heat & cooling

The hot wet compressed air at the outlet of the high-pressure stage goes through the pulsation damper with integrated check valve to the heat exchanger. Here it transfers the heat to the integrated dryer used further in the process.

The air continues to the aftercooler where it's cooled down and the moisture get's separated and drained.

4. Integrated dryer

The cooled wet compressed air is now mixed with 40% of the cooled regeneration air and enters the dryer. The dry compressed air with guaranteed dew point is now ready for use in your application.

5. Heat exchanger

40% of the dry air goes into the heat exchanger, where it picks up the heat from the incoming hot wet compressed air. This dry and hot regeneration air enters the regeneration section of the drum, which passes through the regeneration cooler where it is cooled down and moisture is separated and drained. Afterwards it is mixed with the incoming cooled wet compressed air.

6. Oil

The yellow lines represent the oil flow of the compressor. Oil is pumped from the reservoir through a high efficiency filter to provide clean, cooled oil to the gears for lubrication. Afterwards the oil flows back into the reservoir.

There also is a bypass valve that allows the oil to flow to the oil cooler, so the optimal temperature is guaranteed, increasing efficiency and durability of our components.

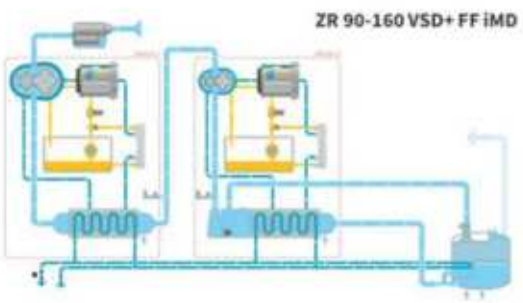
7. Water

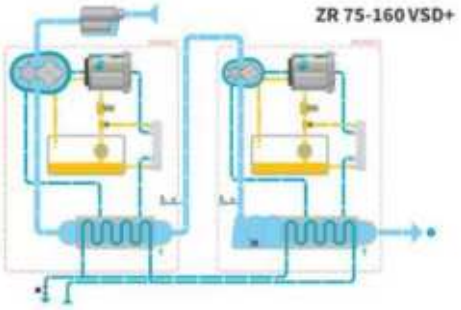
The dark blue lines represent the water flow. Cooling water is brought into the cycle and splits towards the both modules and the dryer.

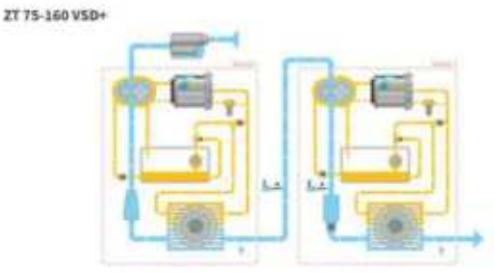
First of all, the cooling water is directed to the integrated dryer to cool the

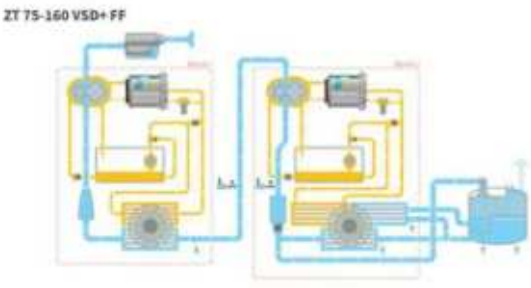
Secondly, the water is goes to both the inter- and aftercooler to reduce the temperature of the compressed air.

Lastly, the water splits to the oil coolers to reduce the temperature of the oil. It then passes through the jackets of the motor and elements to guarantee an optimal temperature. The water continues back to the cooler and is directed further to the water outlet.









Technical specifications

Data of the ZR/ZT 75-160 VSD+ (FF) range

ZR 75-160 VSD+ (FF)

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 75 VSD+ 10.4	Minimum	4	60	78.2-243	4.7-14.6	166-514	75/100	66	2500	5500	-	-	3700	8200
	Effective	7	100	78.8-230	4.7-13.8	167-487								
	Maximum	10.4	150	77.6-185	4.7-11.1	164-392								
ZR 90 VSD+ - 10.4	Minimum	4	60	78.2-298	4.7-17.9	166-632	90/120	66	2500	5500	3400	7500	3700	8200
	Effective	7	100	78.8-284	4.7-17.0	167-602								
	Maximum	10.4	150	77.6-232	4.7-13.9	164-492								
ZR 110 VSD+ - 10.4	Minimum	4	60	78.2-345	4.7-20.7	166-732	110/150	68	2500	5500	3400	7500	3700	8200
	Effective	7	100	78.8-330	4.7-19.8	167-700								
	Maximum	10.4	150	77.6-276	4.7-16.6	164-586								
ZR 132 VSD+ - 10.4	Minimum	4	60	78.2-399	4.7-24.0	166-846	132/175	69	2500	5500	3400	7500	3700	8200
	Effective	7	100	78.8-384	4.7-23.0	167-814								
	Maximum	10.4	150	77.6-329	4.7-19.8	164-698								
ZR 145 VSD+ 10.4	Minimum	4	60	78.2-431	4.7-25.8	166-912	145/200	70	2500	5500	3400	7500	3700	8200
	Effective	7	100	78.8-415	4.7-24.9	167-880								
	Maximum	10.4	150	77.6-361	4.7-21.6	164-764								
ZR 160 VSD+ - 10.4	Minimum	4	60	78.2-452	4.7-27.1	166-957	160/215	70	2500	5500	3400	7500	3700	8200
	Effective	7	100	78.8-452	4.7-27.1	167-958								
	Maximum	10.4	150	77.6-396	4.7-23.8	164-839								

Dimensions

Type	A (Length)		B (Width)		C (Height)	
	mm	inch	mm	inch	mm	inch
ZR/ZT 75-160 VSD+	2030	80	1660	65	2000	80
ZR/ZT 90-160 VSD+ FF iMD	3430	135	1660	65	2000	80
ZR/ZT 75-160 VSD+ FF iMDG	3430	135	1660	65	2000	80

ZT 75-160 VSD+ (FF)

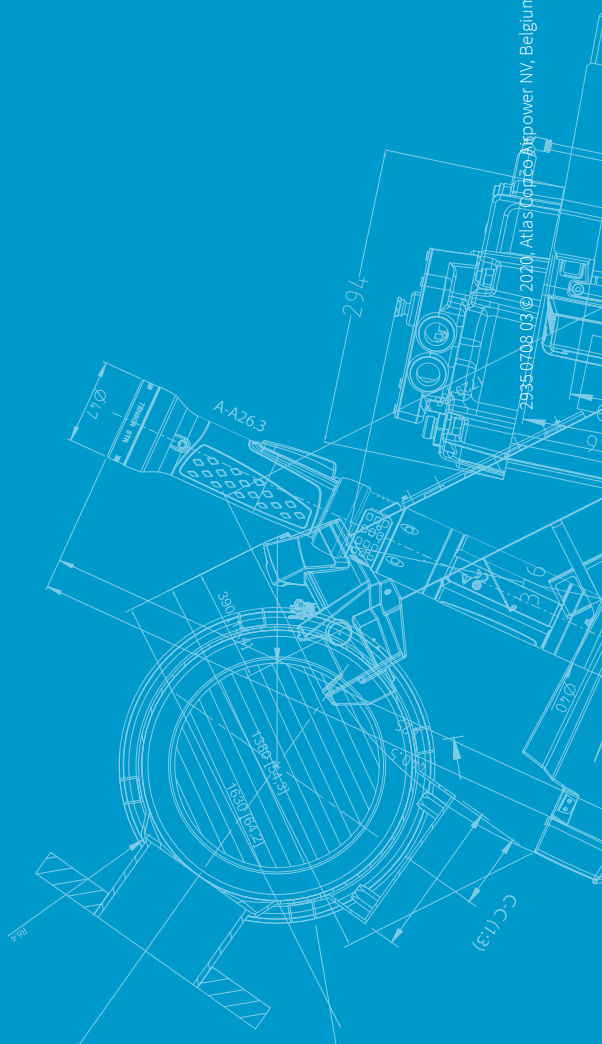
Type	Working Pressure			Free Air Delivery			Installed Motor	Noise level (3)	Weight			
									Pack		Full Feature (iMD)	
		bar(e)	psig	l/s	m^3/min	cfm	kW/hp	dB(A)	kg	lb	kg	lb
ZT 75 VSD+ - 10.4	Minimum	4	60	79-241	4.8-14.5	168-511	75/100	63	2795	6162	-	-
	Effective	7	100	79-227	4.7-13.6	167-482						
	Maximum	10.4	150	76-181	4.6-10.8	161-382						
ZT 90 VSD+ - 10.4	Minimum	4	60	79-292	4.8-17.5	168-619	90/120	65	2795	6162	3445	7595
	Effective	7	100	79-277	4.7-16.6	167-587						
	Maximum	10.4	150	76-223	4.6-13.4	161-473						
ZT 110 VSD+ - 10.4	Minimum	4	60	79-339	4.8-20.4	168-719	110/150	66	2795	6162	3445	7595
	Effective	7	100	79-323	4.7-19.4	167-685						
	Maximum	10.4	150	76-269	4.6-16.2	161-570						
ZT 132 VSD+ - 10.4	Minimum	4	60	79-394	4.8-23.6	168-834	132/175	65	2795	6162	3445	7595
	Effective	7	100	79-378	4.7-22.7	167-800						
	Maximum	10.4	150	76-322	4.6-19.3	161-682						
ZT 145 VSD+ - 10.4	Minimum	4	60	79-425	4.8-25.5	168-901	145/200	67	2795	6162	3445	7595
	Effective	7	100	79-409	4.7-24.5	167-867						
	Maximum	10.4	150	76-353	4.6-21.2	161-749						
ZT 160 VSD+ - 10.4	Minimum	4	60	79-437	4.8-26.2	168-925	160/215	69	2795	6162	3445	7595
	Effective	7	100	79-436	4.7-26.2	167-925						
	Maximum	10.4	150	76-391	4.6-23.5	161-829						

(1) For the FF variant, please consult Atlas Copco
(2) Unit performance measured according to ISO 1217, Annex 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 effective 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).
ZT variants including ducting on the outlet grating of cooling air.
The added correction factor (+/- 3 dB(A)) is the total uncertainty value

Dimensions

Type	A (Lenght)		B (Width)		C (Height)	
	mm	inch	mm	inch	mm	inch
ZT 75-160 VSD+	3400	134	1660	65	2000	80
ZT 90-160 VSD+ FF (iMD)	4085	161	1660	65	2000	80

Notes



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