# Low pressure oil-free rotary screw compressors

ZE 3S 37-90 kW / 50-120 hp

## Protecting your reputation and production

In virtually any application, oil contamination of the air supply causes serious productivity issues and increased costs. Being the first manufacturer to receive ISO 8573-1 CLASS 0 (2010) certification for its oil-free air compressors, Atlas Copco has set a standard in air purity. Focusing on the protection of critical applications as well as today's increasing quality demands, Atlas Copco offers TUV-certified 100% oil-free air.

## Keeping your process up and running

Especially in a harsh and dusty environment, a reliable supply of compressed air is critical to ensure process continuity. Every compressor is desgined, manufactured and tested to comply with ISO9001 certification. The latest innovation of screw element design, the robust gearbox and totally enclosed IP55 motor is built to ensure continuous operation and outstanding reliability even in the dustiest, hottest and most humid environment.

## Easy installation and versatility

We can deliver the compressor according to your need. Do you want to have your own starter? No problem. Do you need a ready-to-use-machine? Sure. All as standard. Designed and built for easy integration in your existing compressed air network or as new installations.

## Assuring your peace of mind

Through continuous investment in our competent, committed and efficient service organization, Atlas Copco ensures superior customer value by maximizing productivity. With a presence in over 170 countries, we offer professional and timely service through interaction and involvement. Uptime is guaranteed by dedicated technicians and 24/7 availability.

# Technical Specifications ZE 3S

## *ZE 3S VSD (No-Starter)*

| TYPE | Working pressure | | Max Capacity FAD[1] | | Min Capacity FAD[1] | | Noise level[2] | Installed motor power | | Weight | | Dimensions L/L'[3] x W x H | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | bar(g) | psig | $m^3$/hr | cfm | $m^3$/hr | cfm | dB(A) | kW | hp | kg | lb | mm | in |
| ZE 3S VSD 37 kW No-Starter | 1.5 | 21.8 | 995 | 585 | 470 | 275 | 77 | 37 | 50 | 1350 | 3000 | 1500/1850 x 1250 x 1720 | 59/73 x 49 x 68 |
| | 1.75 | 25.4 | 915 | 540 | 470 | 275 | 77 | | | | | | |
| | 2 | 29 | 845 | 495 | 470 | 275 | 77 | | | | | | |
| | 2.25 | 32.6 | 780 | 460 | 470 | 275 | 77 | | | | | | |
| | 2.5 | 36.3 | 720 | 425 | 465 | 275 | 77 | | | | | | |
| ZE 3S VSD 45 kW No-Starter | 1.5 | 21.8 | 1180 | 695 | 470 | 275 | 77 | 45 | 60 | | | | |
| | 1.75 | 25.4 | 1090 | 645 | 470 | 275 | 77 | | | | | | |
| | 2 | 29 | 1010 | 595 | 470 | 275 | 77 | | | | | | |
| | 2.25 | 32.6 | 940 | 555 | 470 | 275 | 77 | | | | | | |
| | 2.5 | 36.3 | 875 | 515 | 465 | 275 | 77 | | | | | | |
| ZE 3S VSD 55 kW No-Starter | 1.5 | 21.8 | 1385 | 815 | 470 | 275 | 78 | 55 | 75 | 1600 | 3525 | | |
| | 1.75 | 25.4 | 1295 | 765 | 470 | 275 | 78 | | | | | | |
| | 2 | 29 | 1205 | 710 | 470 | 275 | 78 | | | | | | |
| | 2.25 | 32.6 | 1130 | 665 | 470 | 275 | 78 | | | | | | |
| | 2.5 | 36.3 | 1055 | 620 | 465 | 275 | 78 | | | | | | |
| ZE 3S VSD 75 kW No-Starter | 1.75 | 25.4 | 1650 | 970 | 470 | 275 | 78 | 75 | 100 | | | | |
| | 2 | 29 | 1560 | 920 | 470 | 275 | 78 | | | | | | |
| | 2.25 | 32.6 | 1475 | 865 | 470 | 275 | 78 | | | | | | |
| | 2.5 | 36.3 | 1370 | 805 | 465 | 275 | 78 | | | | | | |
| ZE 3S VSD 90 kW No-Starter | 1.5 | 21.8 | 1640 | 965 | 465 | 275 | 78 | 90 | 120 | | | | |
| | 1.75 | 25.4 | 1640 | 965 | 465 | 275 | 78 | | | | | | |
| | 2 | 29 | 1640 | 965 | 465 | 275 | 78 | | | | | | |
| | 2.25 | 32.6 | 1640 | 965 | 465 | 275 | 78 | | | | | | |
| | 2.5 | 36.3 | 1640 | 965 | 465 | 275 | 78 | | | | | | |

# Technical Specifications ZE 3S

## ZE 3S - 50 Hz (Plug & Play and No-starter)

| TYPE | Working pressure | | Capacity FAD[1] | | Noise level[2] | Installed motor power | | Weight | | Dimensions L/L'[3] x W x H | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | bar(g) | psig | $m^3$/hr | cfm | dB(A) | kW | hp | kg | lb | mm | in |
| ZE 3S 37 kW | 1.5 | 21.8 | 955 | 560 | 77 | 37 | 50 | 1350 | 3000 | 1500/1850 x 1250 x 1720 | 59/73 x 49 x 68 |
| | 1.75 | 25.4 | 860 | 505 | 77 | | | | | | |
| | 2 | 29.0 | 630 | 370 | 77 | | | | | | |
| | 2 | 29.0 | 700 | 410 | 77 | | | | | | |
| | 2 | 29.0 | 775 | 455 | 77 | | | | | | |
| | 2.25 | 32.6 | 625 | 370 | 77 | | | | | | |
| | 2.25 | 32.6 | 700 | 410 | 77 | | | | | | |
| | 2.25 | 32.6 | 770 | 455 | 77 | | | | | | |
| | 2.5 | 36.3 | 625 | 370 | 77 | | | | | | |
| | 2.5 | 36.3 | 695 | 410 | 77 | | | | | | |
| ZE 3S 45 kW | 1.5 | 21.8 | 1065 | 625 | 77 | 45 | 60 | | | | |
| | 1.75 | 25.4 | 1060 | 625 | 77 | | | | | | |
| | 2 | 29.0 | 950 | 560 | 77 | | | | | | |
| | 2.25 | 32.6 | 855 | 505 | 77 | | | | | | |
| | 2.5 | 36.3 | 855 | 500 | 77 | | | | | | |
| ZE 3S 55 kW | 1.5 | 21.8 | 1175 | 695 | 78 | 55 | 75 | 1600 | 3525 | | |
| | 1.75 | 25.4 | 1175 | 690 | 78 | | | | | | |
| | 2 | 29.0 | 1170 | 690 | 78 | | | | | | |
| | 2.25 | 32.6 | 1055 | 620 | 78 | | | | | | |
| | 2.5 | 36.3 | 1050 | 620 | 78 | | | | | | |
| ZE 3S 75 kW | 1.5 | 21.8 | 1450 | 850 | 78 | 75 | 100 | | | | |
| | 1.75 | 25.4 | 1445 | 850 | 78 | | | | | | |
| | 2 | 29.0 | 1440 | 845 | 78 | | | | | | |
| | 2.25 | 32.6 | 1435 | 845 | 78 | | | | | | |
| | 2.5 | 36.3 | 1280 | 755 | 78 | | | | | | |
| ZE 3S 90 kW | 1.5 | 21.8 | 1595 | 940 | 78 | 90 | 120 | | | | |
| | 1.75 | 25.4 | 1590 | 935 | 78 | | | | | | |
| | 2 | 29.0 | 1585 | 930 | 78 | | | | | | |
| | 2.25 | 32.6 | 1580 | 930 | 78 | | | | | | |
| | 2.5 | 36.3 | 1575 | 930 | 78 | | | | | | |

## ZE 3S - 50Hz (without motor)

| TYPE | Working pressure | | Capacity FAD[4] | | Noise level | Installed motor power | | Weight | | Dimensions L/L'[5] x W x H | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | bar(g) | psig | $m^3$/hr | cfm | dB(A) | kW | hp | kg | lb | mm | in |
| ZE 3S 37 kW | 1.5 | 21.8 | 1450 | 850 | - | 75 | 100 | 1100 | 2425 | 1500/1850 x 1250 x 1720 | 59/73 x 49 x 68 |
| | 1.5 | 21.8 | 1595 | 940 | - | 90 | 120 | | | | |
| | 1.75 | 25.4 | 1590 | 935 | - | | | | | | |
| | 2 | 29 | 1585 | 930 | - | | | | | | |
| | 2.25 | 32.6 | 1580 | 930 | - | | | | | | |
| | 2.5 | 36.3 | 1575 | 930 | - | | | | | | |

# Scope of supply

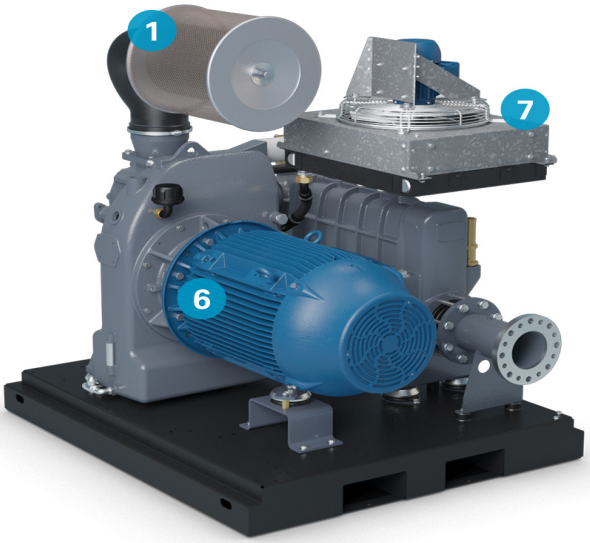
| | | ZE 3S |
|---|---|---|
| Air circuit | Air inlet filter | ✓ |
| | Coated screw element with cooling jacket | ✓ |
| | Check valve | ✓ |
| | Discharge pulsation damper | ✓ |
| | Outlet air flange DN125 DIN&ANSI | ✓ |
| Oil circuit | Supplied oil-filled | ✓ |
| | Completely pre-piped oil circuit | ✓ |
| | Integrated oil pump | ✓ |
| | Oil cooler | ✓ |
| | Oil filter | ✓ |
| | Built-in oil breather system | ✓ |
| Motor | IE3/NEMA3 induction motor, TEFC IP55 | ✓ |
| Cubicle | No starter included | ✓ |
| | Elektronikon® Touch controller with SMARTLINK | ✓ |
| | Sensors air & oil pressure & temperature | ✓ |
| | LAN or Internet control/monitoring | ✓ |
| Bodywork | Sound attenuating canopy | ✓ |
| | Frame with forklift/pallet-jack slots | ✓ |
| Mechanical approval | ASME or CE approval | ✓ |

# Customized to your need

A range of optional features are available to ensure the ZE compressor is customized to your applications' requirements.

| Selectable options | ZE 3S |
|---|---|
| Blow-down valve | ✓ |
| VSD enabled motor | ✓ |
| YD starter | ✓ |
| Test certificate | ✓ |
| Witness test | ✓ |
| Wooden case packing | ✓ |
| Full option motor (anti-condensation heaters & PT1000's) | ✓ |
| Oversized motor | ✓ |
| No motor | ✓ |
| Outdoor canopy | ✓ |
| Separate air intake | ✓ |
| Heavy duty inlet filter | ✓ |
| SPM monitoring | ✓ |
| Winterization | ✓ |

# Reliability and robustness




## 1. Process air filter

- Inlet filter is combined with a silencer to reduce noise level and protect the compression stage.
- Handy pressure drop indication on the control panel.
- Long lifetime extends the service interval.

## 2. Equiped with the best Atlas Copco oil-free screw element

- Cooling jackets improve reliability and efficiency by ensuring rotor clearances always to the absolute minimum
- Efficient shaft sealing eliminates the risk of oil leakage, reduces wear and guarantees 100% oil-free air
- High performance coated screw rotors for increased efficiency, longer lifetime and protection against corrosion

## 3. High precision gearbox drive system

- Minimized transmission losses, noise and vibration levels
- Prolonged element lifetime thanks to AGMA Q13/DIN Class 5 gears in the main drive

## 4. Integrated oil pump

- Directly driven by the gearbox
- Oil injection nozzles spray the optimal amount anf temperature of filtered oil to each bearing/gear

## 5. Silencer

- Discharge pulsation damper attenuates dynamic pulsation levels in the air flow to the minimum

## 6. High eficient totally enclosed motor

- IP55 TEFC protection against dust and humidity
- Highly efficient motors according to IE3/NEMA Premium
- Dry motor coupling requires no lubrication and eliminates service requirements

## 7. Oil cooler

- Optimal cooling in wide temperature operation range
- Easy and quick cleaning possibility in harsh environment

## 8. Electrical cubicle

- Available for built in YD starter and several options

## 9. Advanced Elektronikon® unit controller

- One integrated control system for compressor
- Overall system performance status with pro-active service indications, alarms and safety shutdowns
- Remote control and monitoring is possible with Profibus, Modbus and TCP/IP
- Several built-in energy saving algorithms
- Multi-language

## 10. Silent canopy

- Inlet baffle silencing with minimum pressure drop and high sound absorption characteristics
- Sealed canopy panels and doors

# Installation flexibility

## Installation flexibility

You will really like to install and work with our ZE 3S compressor, designed to fit into your process wherever you want.

## The smallest footprint in the flow and pressure range

Forget the difficulites of the old machines replacement. We make your life easier, replacing the outdated technology with our latest technology machines and with the smallest footprint. Building new installations with very small footprint makes you save space and thus investment cost.

## Outdoor operation

No need for a dedicated compressor room, no need for excessively long piping… You can install the ZE 3S compressor wherever you want to use the bolt-on outdoor-kit.

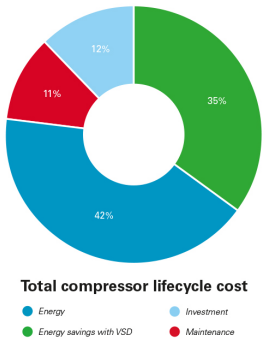
# VSD: driving down energy costs

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 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?**

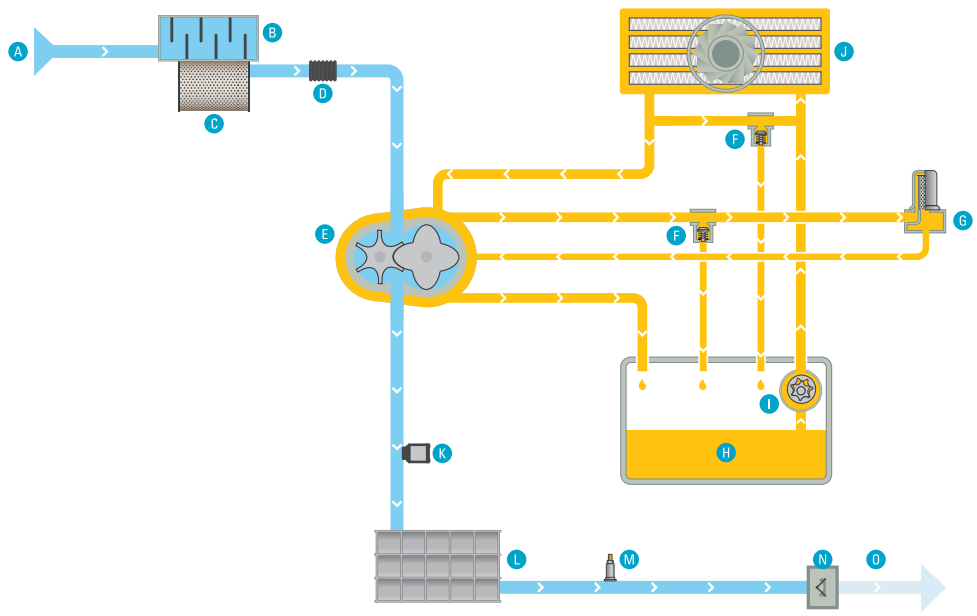



- The Elektronikon® controls both the compressor and the integrated converter, ensuring maximum machine safety within parameters.
- Flexible pressure selection with VSD reduces electricity costs.
- Specific converter and motor design (with protected bearings) for the highest efficiency across the speed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

# Flow charts ZE 3S

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

*ZE 3*



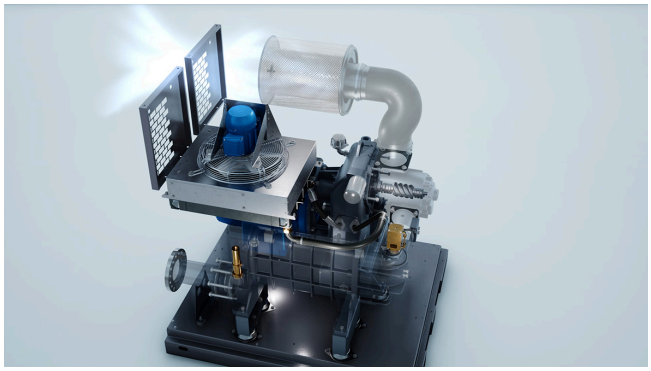

Atlas Copco

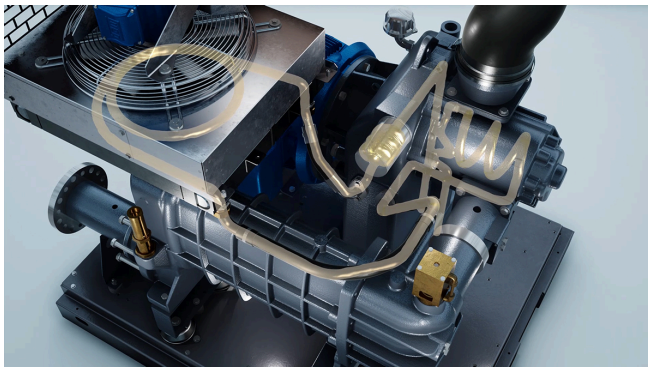
- A Air inlet
- B Integrated inlet baffling system
- C Intake filter
- D Flexible connection
- E Compressor element
- F Bypass valve
- G Oil filter
- H Gearbox
- I Oil pump
- J Aircooled oilcooler
- K Blow-down valve
- L Silencer
- M Safety valve
- N Non return valve
- O Air out

- Dry compressed air
- Air
- Oil

## Process flow

- Air intake with noise attenuating baffle system.
- Air is filtered prior to entering the oil-free screw compressor element.
- Internal compression in the oil-free screw element.
- Discharge silencer reduces the pressure pulsation levels to the minimum.
- Safety valve to protect the unit from over pressure.
- Check valve is protecting backflow from the pressure network.
- Air delivery to the system.



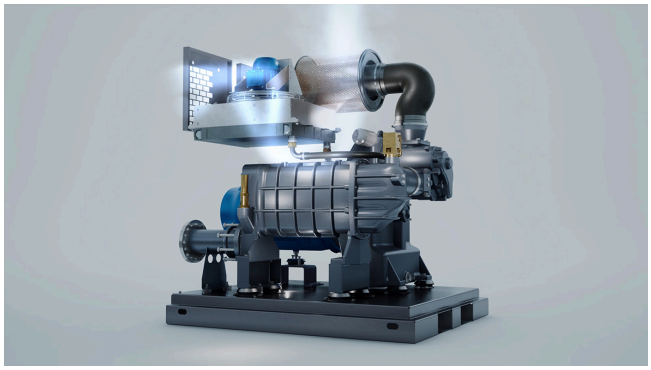


## Oil flow

- Integrated oil pump, mounted on the gearbox hence directly driven.
- Oil suction from carter, integrated in the gearbox.
- Bypass valve decides the exact amount of oil flow that is required for bearing- and gear cooling and lubrication.
- Than oil is first  pumped through the oil cooler.
- Filtered cool oil is distributed to individually tuned oil nozzles per bearing and/or gear in oil-free screw compressor element and gearbox and in the cooling jacket of the element.
- Internal drains recover all oil in the carter (in the gearbox).

## Cooling flow

- One cooling fan pulls fresh air from the back side of the unit.
- That fresh air is pushed through the oil cooler, taking away the heat of the oil.
- In parallel, the motor cooling fan also pulls fresh air from the backside of the unit. The motor fan-cowl ensures that air flows over the motor cooling fins.
- The cubicle is cooled with fresh air taken-in from the atmosphere through filters in the front door.
- Cubicle fans push the hot air out of the cubicle, in the canopy.
- The hot canopy air (oil cooling heat, motor cooling heat and cubicle heat) can leave the canopy through a roof-top grating. A noise attenuating baffle is installed.



# 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.


## 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.

## 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 reliable compressed air specified to your compressed air needs.
- Built- in remote control and notification functions provided as standard, including simple- to-use integrated webpage.
- Integrated **SMART**LINK
- Built- in remote control and notifications functions provided as standard, including simple-to-use integrated webpage.
- Support for 31 different languages, including character based languages.


## 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. By using the Elektronikon® controller, you can manually or automatically switch between two different setpoints to optimize energy use and reduce costs at low usetimes. In addition, the sophisticated algorithm runs the drive motor only when needed. As the desired setpoint is maintained while the drive motor's running 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.

## Evolving towards compressed air management

### SMARTLINK Service

A mouse-click reveals the online service log. Get quotes for parts and additional service quickly and easily.

### SMARTLINK Uptime

SMARTLINK Uptime additionally sends you an e-mail or text message whenever a warning requires your attention.

### SMARTLINK Energy

SMARTLINK Energy gives you customized reports on the energy efficiency of your compressor room, in compliance with ISO 50001.

# *Maximize your resources with a Service Plan*

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.

## Reduce your total cost of ownership and benefit from optimal performance

- Save costs - Optimal maintenance will reduce the operational cost of your compressor system.
- Increase operational efficiency - Our maintenance expertise makes your life easier when it comes to resource management.
- High uptime and performance - Specialist service keeps your equipment running and protect your investment.

## Compressor parts at your doorstep: our Parts Plan

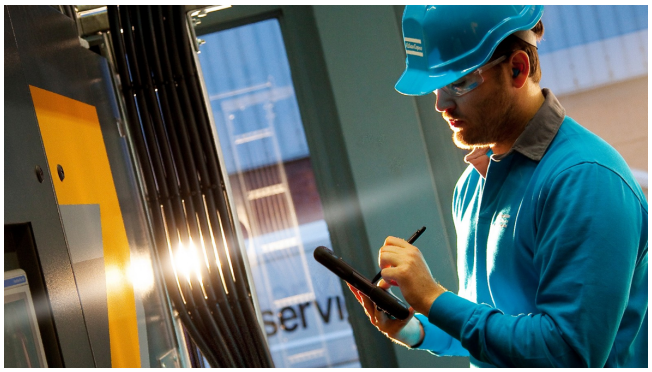
Genuine Parts, designed and produced to the exact specifications of your compressors, delivered right where and when you need them.

- All parts, one package - Always have the needed part for your service intervention at hand.
- Save money - A Service Kit costs less than the sum of its components if ordered separately
- Less administration - Every Service Kit has a single part number, allowing you to create a simple purchase order which can be easily followed-up.

## Fixed Price Services: best compressor parts & maintenance

Avoid financial surprises. Our Fixed Price Services combine the expertise of factory-trained technicians with the quality of our genuine compressor parts.

- The best compressor parts - The unrivalled quality of our genuine parts results in optimal uptime, energy consumption and reliability.
- An expert maintenance plan - Rely on the expertise of factory-trained Atlas Copco technicians.
- Clear and easy - Tailored to your installation, site conditions, and production planning, every Fixed Price Service has a clear scope and price.



## Preventive Maintenance Plan for optimal compressor uptime

Rely on trained Atlas Copco technicians and the unrivalled quality of our genuine parts.

- Service reports - We help you achieving maximum energy efficiency by keeping you up to date of the status of your system.
- Prevent breakdown - If our technicians spot an additional developing problem, they will propose a solution.
- Top-priority emergency call out system - If an urgent repair is needed, you get priority assistance.

## Complete compressor care with our Total Responsibility Plan

We take care of all your compressor maintenance, upgrades, repairs and even breakdowns at 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 high standards of compressor efficiency and reliability.

# 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. With our CLASS 0 products, no oil is added during the compression process, and thus provides you with 100% pure, clean air when the atmosphere doesn't contain any oil particles. 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.