



Atlas Copco



**Oil-free water-injected  
screw compressors**

AQ 15-55 VSD (15-55 kW/20-75 hp)



# Innovating for a sustainable future

At Atlas Copco, we have always looked ahead. Which products and services will make our customers more successful? Your future drives the Atlas Copco team every day. It is the reason why we devote so much time and so many resources to innovation. If there are technologies that will advance your productivity, we will find them. That is what we have been doing for almost 150 years now, setting new standards in compressed air reliability, efficiency, connectivity, and sustainability.

It's that last principle that now comes first. Sustainability is no longer something we should strive for, but something we must achieve. Productivity and growth will have to be built on sustainability. Atlas Copco – our products, our services, and our people – will help you get there, as we always have.

## The technology that drives energy efficiency



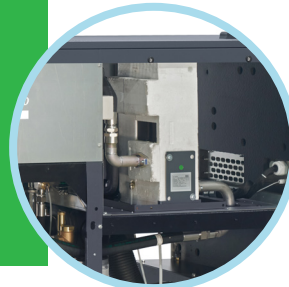
### High-efficiency element

The AQ VSD's unique water-injected screw element ensures a highly efficient compression process.



### Neos inverter

The inverter that is crucial in generating up to 35% energy savings.



### Integrated dryer

A fully integrated dryer ensures excellent air quality with up to 50% lower energy use than traditional dryers.





# AQ 15-55 VSD

## Powerful oil-free air

When it comes to clean, oil-free compressed air, you cannot afford to compromise on quality. Over the past decades, Atlas Copco has pioneered oil-free water-injected screw technology, resulting in a broad range of compressors delivering 100% oil-free, clean air. Setting the standard through ISO 8573-1 CLASS 0 certification, the AQ meets your need for pure oil-free air while offering best-in-class energy efficiency.

### Zero risk of contamination

Whether your activities are in pharmaceutical production, food & beverage, critical electronics, or in a similarly exacting industry, air quality is paramount for your end product and production process. Atlas Copco's AQ oil-free compressors eliminate any risk of oil contamination.

### Reduced energy costs

With energy amounting to up to 80% of a compressor's Total Cost of Ownership, its importance is clear. The most efficient compressed air solution optimizes the pressure, volume and air treatment equipment for each production process. Atlas Copco's AQ compressors provide you with the ultimate all-in-one package to reduce your electricity bill to a minimum.

### Renowned expertise

Drawing on vast experience and continuous technological innovations, Atlas Copco has been leading the industry in oil-free compressed air technology for many decades. With the protection of your application in mind, Atlas Copco has designed its AQ range to offer the 100% oil-free quality air you need.



# AQ 15-55 VSD

## Engineered to meet your needs

At Atlas Copco we aim to provide you with compressors that fulfill and even exceed your expectations and demands. Built as the result of decades of experience in oil-free design and manufacturing, the AQ range of oil-free screw compressors gives you all of this experience and knowledge in a class-leading package.

1

### Water-injected screw element

- Highly energy-efficient thanks to low temperatures.
- Water-lubricated, grease-free bearings.
- In-house design and manufacturing.
- Working pressure up to 13 bar.

2

### Water filter

- Ensures a constant supply of clean water.
- Filtration capability equals 10 micron throughout the filter's lifetime.

3

### Heavy-duty air filter

- Protects the compressor components by removing 99.9% of dirt particles down to 3 microns.
- Differential inlet pressure for proactive maintenance while minimizing pressure drop.

4

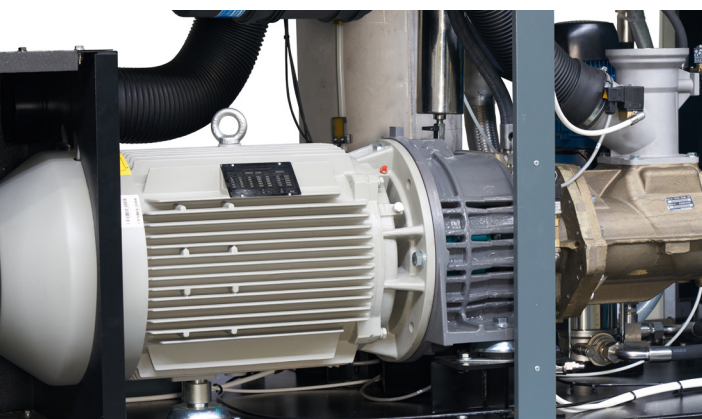
### Separator vessel

- Stainless steel water separator vessel for separation via centrifugal and gravity forces.
- Three sensors included for precise water regulation.

5

### Induction motor

- IP55 induction motor, flange-mounted for perfect alignment.
- Combined with direct driven arrangement for superior energy efficiency.





6

## Reverse osmosis system

The built-in reverse osmosis system provides a reliable supply of high-quality water to ensure autonomy and continuous operation.



7

## Air-cooled fan and water-cooler

- Air and water-cooled variants are available throughout the range.
- Small footprint and installation thanks to built-in heat exchangers.
- Water-cooled units provide a continuous air temperature at the dryer inlet of less than 55°C (131°F).

8

## Integrated highly efficient dryer

- Excellence in air quality.
- 50% reduction in energy consumption compared to traditional dryers.
- Zero ozone depletion.



9

## Elektronikon<sup>®</sup> Graphic

Advanced Elektronikon<sup>®</sup> Graphic control and monitoring system, designed for integration in a (remote) process control system.

10

## Sound insulated canopy

No separate compressor room is required as the sound insulated canopy allows for installation in most working environments.

11

## Innovative Neos inverter

- Atlas Copco's in-house-designed inverter.
- IP5x protection.
- Robust aluminum enclosure for trouble-free operation in the harshest conditions.
- Fewer components: compact, simple and user-friendly.



# Proven technology

At the heart of the new AQ range is a unique water-injected screw element providing highly efficient near isothermal compression. The polymer ceramic rotors with optimized profile are supported by water-lubricated bearings, ensuring that no oil whatsoever can contaminate the compression element. The result is pure, oil-free air.

## Rotors

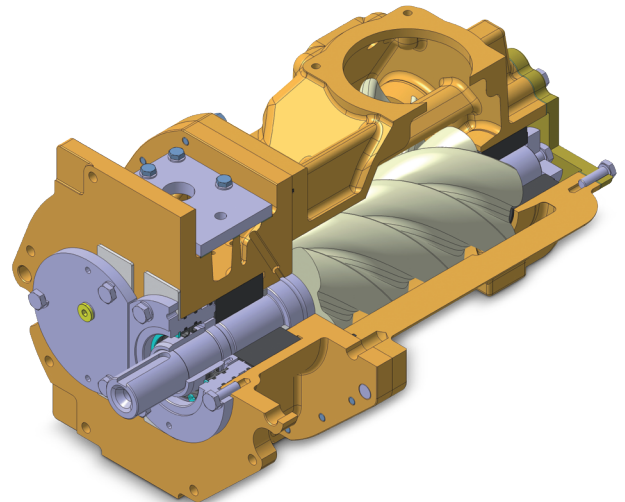
A highly efficient compression process is achieved thanks to high-quality polymer mold ceramic rotors with optimum profiling. The combination of corrosion-free, high-efficiency raw material and water lubrication results in a longer lifespan.

## Element housing

Strength and durability are ensured as a result of the aluminum bronze element housing without risk of corrosion within the element.

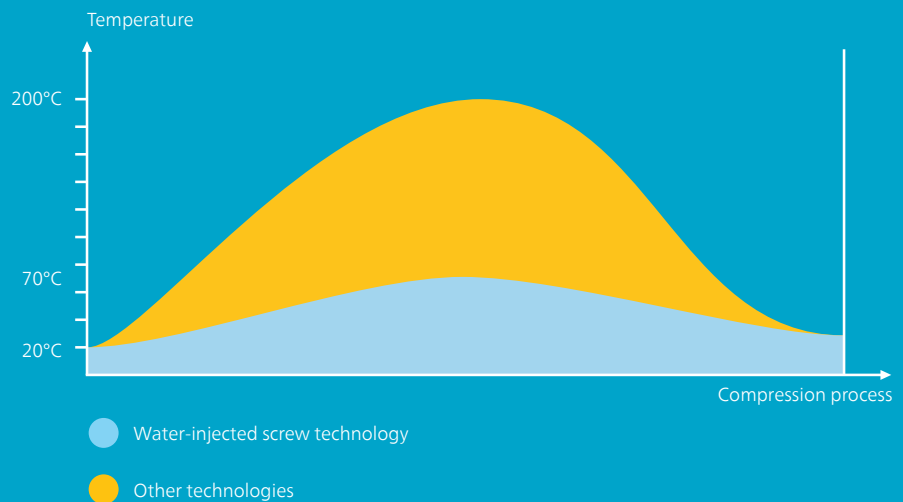
## Element bearings

The use of hydrodynamic bearings ensures a long life as no physical contact is made within the bearing itself. It simply glides on a film of water, removing the need for any oil or grease lubrication.



## Water-injected screw compression efficiency

The superior cooling capability of water ensures that the heat is removed efficiently at the source. Removing the wasted energy that heat represents gives more air per kW of power. The low temperature of the compressed air reduces the stress on components to ensure a long life.

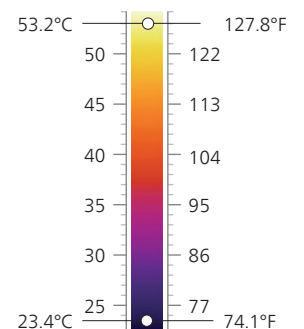


## Superior water-injected screw element

- Increased free air delivery.
- Low specific energy consumption.
- Near isothermal compression process.
- Pressure ratings of 7, 10 and 13 bar.

The highly effective cooling capabilities of water combined with precision engineering ensure the supreme energy efficiency of the Atlas Copco AQ.

49.6°C, 121.3°F





# Complete integration, compact footprint



Contrary to traditional compressor set-ups, the Atlas Copco AQ VSD effortlessly fits onto your work floor. With its compact footprint and integration of air treatment equipment, the AQ ensures optimum efficiency and reliability. Designed to give the most versatile source of compressed air, it provides you with an all-in-one package that will have your production running smoothly for years to come.

- 1 Minimal system pressure drop.
- 2 Integrated refrigerant dryer.
- 3 Reduced piping costs.
- 4 Single point connections.
- 5 Single point monitoring.
- 6 Low-noise operation

## Built-in quality air

Untreated compressed air contains moisture and aerosols which increase the risk of corrosion and compressed air system leaks. This can result in a damaged air system and contaminated end products. Maintenance costs can far exceed air treatment expenses. Our compressors provide the clean, dry air that improves your system's reliability, avoids costly downtime and production delays, and safeguards the quality of your products.

### On average 50% energy savings with newly designed integrated dryers

- Pressure dewpoint of 3°C/38°F (100% relative humidity at 20°C/68°F).
- Heat exchanger cross-flow technology with low pressure drop.
- Zero waste of compressed air thanks to no-loss condensate drain.
- Reduced operating costs.
- Environmentally-friendly characteristics; zero ozone depletion.
- Global warming potential has been lowered significantly by an average of 50% by reducing the amount of refrigerant in the new dryer.



The integrated refrigerant air dryer of the AQ VSD gives you a pressure dewpoint as low as 3°C/38°F, which means it can be used for applications that require ISO 8573-1 Class 4 air quality.

#### ISO 8573-1

Quality classes	Particle size	Maximum pressure dewpoint		Maximum oil content (droplets, aerosols, and vapor ppm)	
	microns	°C	°F	w/w	mg/m <sup>3</sup>
0	as specified	as specified		as specified	
1	0.1	-70	-94	0.008	0.01
2	1	-40	-40	0.08	0.1
3	5	-20	-4	0.8	1
4	15	3	38	4	5
5	40	7	45	21	25
6	–	10	50	–	–

\* The table values reflect the maximum limits according to the ISO quality air standard (ISO 8573-1:2010).

\*\* Water pressure dewpoint based on 100% RH at 20°C/68°F.

# ISO 8573-1 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 spray painting, textiles, 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.

### Can oil-injected compressors with oil removal filters deliver oil-free air?

Often referred to as "technically oil-free air", this system relies on air cooling devices and several stages of oil removal with multiple components. A failure of any of these components or inadequate maintenance can result in oil contamination. Therefore, with oil-injected compressors there will always be a risk of contamination and the possibility of severe consequences for your business.







## Eliminating any risk

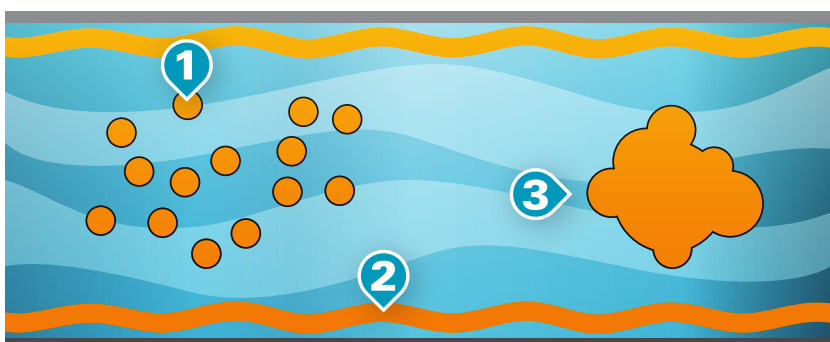
As the industry leader committed to meeting the needs of the most demanding customers, Atlas Copco requested the renowned TÜV institute to type-test its range of oil-free compressors and blowers. Using the most rigorous testing methodologies available, all possible oil forms were measured across a range 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	<b>As specified by the equipment user or supplier and more stringent than class 1</b>
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).

## The most stringent air quality testing available

Most manufacturers prefer “partial flow” testing, which targets only the center of the air flow. The Atlas Copco AQ range of oil-free water-injected screw compressors was tested using the more stringent “full flow” method. This examines the entire air flow to measure aerosols, vapors, and wall flow. Even with such rigorous testing, no traces of oil were found in the output air stream.



- 1** Aerosols  
Minute droplets of oil suspended in the air stream
- 2** Wall flow  
Oil in liquid form, which creeps along the pipe wall
- 3** Vapors or oil mist  
Vaporized oil in a cloud form

# VSD: Driving down your energy costs

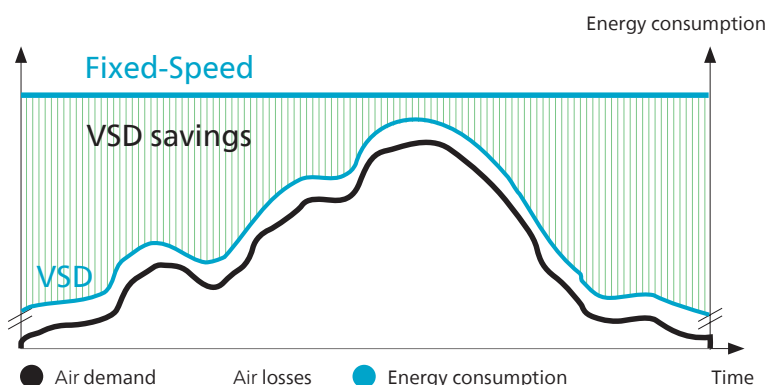
Over 80% of a compressor’s lifecycle cost is taken up by the energy it consumes. Moreover, the generation of compressed air can account for more than 40% of a plant’s total electricity bill. To cut your energy costs, Atlas Copco pioneered Variable Speed Drive (VSD) technology in the compressed air industry. VSD leads to major energy savings, while helping to protect 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.

## VSD: energy use follows fluctuating demand

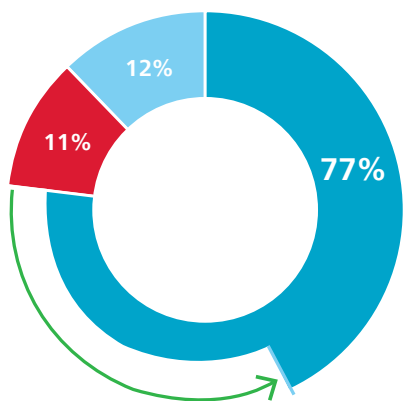
- Up to 35% energy savings during fluctuations in production demand with an extensive turndown range.
- Integrated Elektronikon Graphic controls the motor speed and high-efficiency frequency inverter.
- No wasted idling times or blow-off losses in normal operation.
- Compressor can start/stop under full system pressure without the need to unload with special VSD motor.
- Eliminates peak current penalty during start-up.
- Minimizes system leakage due to a lower system pressure.
- EMC compliance to directives (2004/108/EG).

## Fixed-speed: unadaptable energy use

Traditional fixed-speed compressors only have one speed, 100% on. The result is a lot of wasted energy when your demand is lower.



In almost every production environment, air demand fluctuates depending on different factors such as the time of the day, week or even month. Extensive measurements and studies of compressed air demand profiles show that many compressors have substantial variations in air demand. Only 8% of all installations have a more stable air demand.



## Up to 35% energy savings

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

## Total compressor lifecycle cost

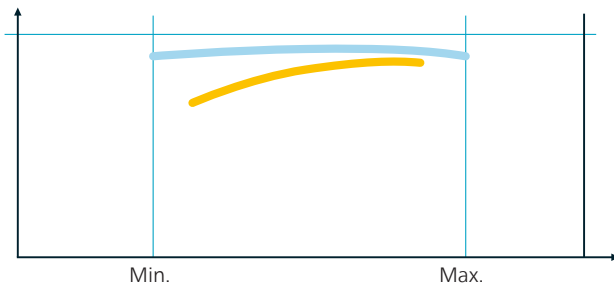
- Energy
- Investment
- Energy savings with VSD
- Maintenance



## What is unique about the integrated Atlas Copco AQ VSD?

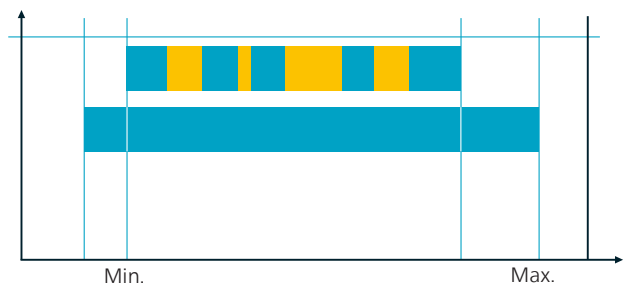
- 1 The Elektronikon controls both the compressor and the integrated converter, ensuring maximum machine safety within parameters.
- 2 Flexible pressure selection from 4 to 13 bar with electronic gearing reduces electricity cost
- 3 Electric motor specifically designed for VSD operation (inverter duty motor). Bearings are protected against induced bearing currents. Both motor and converter are perfectly tuned for highest efficiency across the entire 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 AQ VSD compressors are EMC-tested and certified. External sources do not influence compressor operation, nor does the compressor affect the operation of other instruments via emissions or via the power supply line.
- 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 cool overpressure cubicle ensures stable operation.
- 8 No 'speed windows' that can jeopardize the energy savings and the stable net pressure. Turndown capability of the compressor is maximized
- 9 The cubicle cooling booster increases the lifetime of electrical components due to a cool cubicle in overpressure and reduced dust ingress.
- 10 Offering precise control over pressure, a net pressure band is maintained within 0.10 bar, 1.5 psi.

Combined motor/converter efficiency



● Integrated VSD      ● Non-integrated VSD

Operating range



● Speed windows      ● Atlas Copco integrated solution



### How much can you save?

Contact your local Atlas Copco representative for an audit of your compressed air system. A real-time measurement simulation and audit report can be provided with recommendations for additional savings and sizing to meet your compressed air needs.

# A step ahead in monitoring and controls

## An advanced controller

The next-generation Elektronikon operating system offers a wide variety of control and monitoring features that allow you to increase your compressor's efficiency and reliability. To lower energy consumption, the Elektronikon controls the main drive motor and regulates system pressure within a predefined and narrow pressure band.



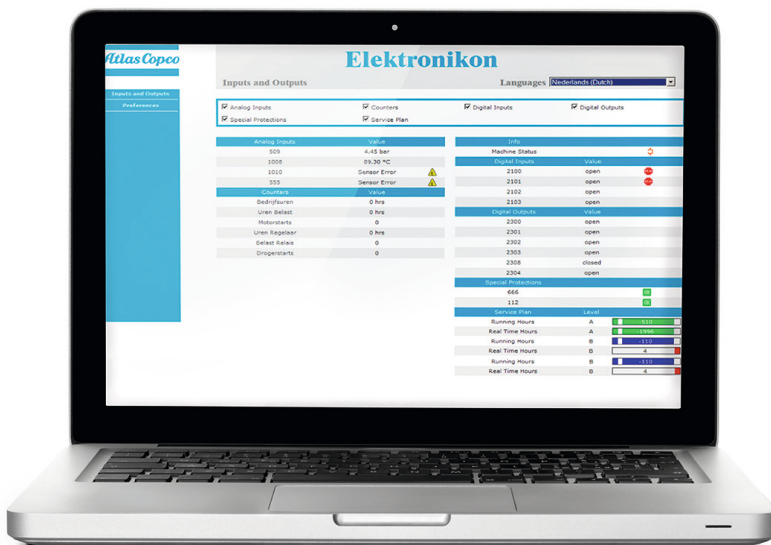
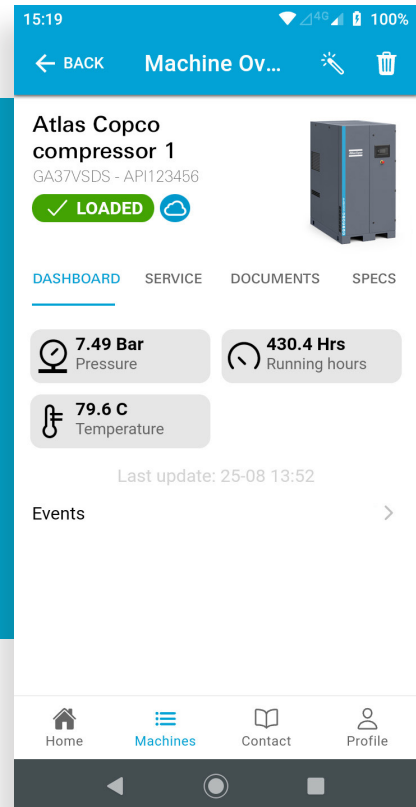
## Improved user-friendliness

- 3.5-inch high-definition color display with clear pictograms and extra 4th LED indicator for service.
- Graphical display of key parameters (day, week, month) and 32 language settings.
- Internet-based compressor visualization using a simple Ethernet connection.
- On-screen Delayed Second Stop function and VSD savings indication.
- Graphical indication of service plan, remote control and connectivity functions.
- Software upgrade available to control up to 6 compressors by installing the optional integrated compressor controller.



## SMARTLINK remote connectivity

- Real-time monitoring of your compressor's operational parameters on your computer or mobile device.
- Performance data and insights identify opportunities for optimization.
- Service timeline.
- Maintenance and service alerts.
- Online resource center with manuals, documentation and technical information.



## Multiple compressor control

Manage up to 6 compressors in one air network with the ES central controller (integrated in your compressor or as a standalone unit):

- **Reduced pressure band:** Create a narrow, predefined pressure band to save energy.
- **Optimal system performance:** Program all compressors to have equal running hours to reduce service intervals.
- **Improve reliability and efficiency:** With actionable performance reports, service warnings, and energy efficiency data.
- **Multiple compressor control:** Manage up to 6 compressors in one air network.

# Optimize your system

		AQ 15-30 VSD	AQ 37-55 VSD
Air treatment	Integrated refrigerant dryer	•	✓
Extra protection	Thermistors & anti-condensation heaters	-	•
	Water shut off valve (water-cooled version)	•	•
Public works	Main power isolator switch	•	•
Connectivity	ES4i	•	•
	ES6i	•	•
	IT ancillaries	•	•
	<b>SMARTLINK</b>	•	✓
General options	IE4 motor	-	•
	UD+ filter	-	•
	Booster pump for RO system	•	•
	Flanged inlet	•	•
	Alarm horn	-	•
	Anchor pads	•	•
	Performance test report	•	•
	On-site/virtual witness test	•	•
	EMC filter	-	•

\* FF units only.

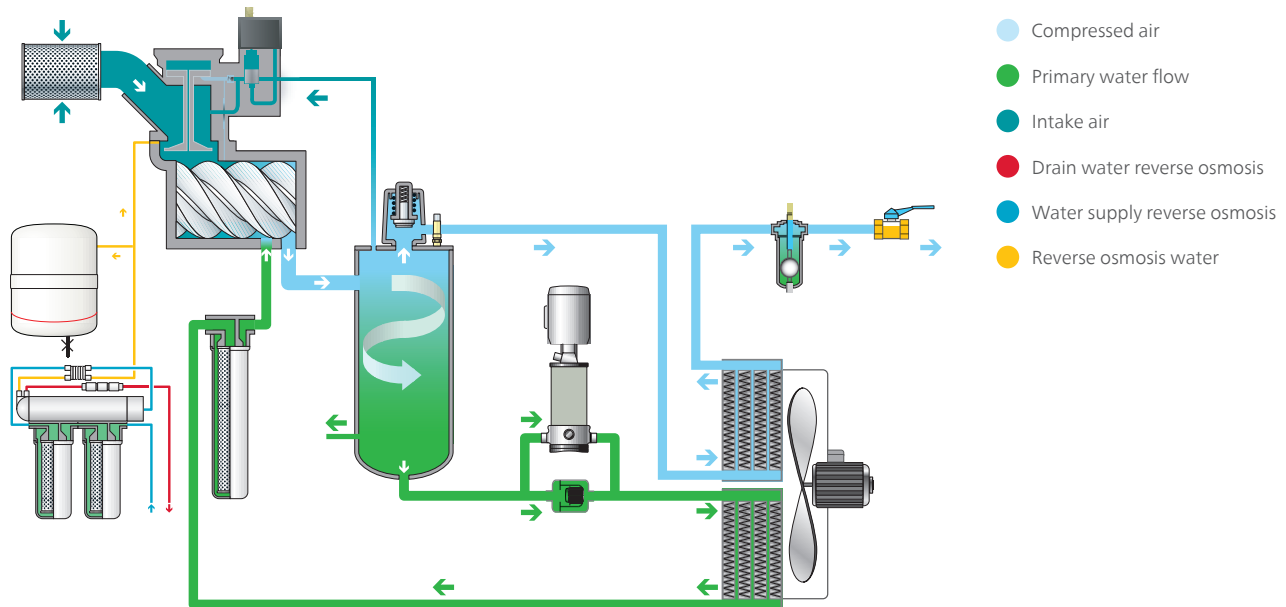
\*\* Water-cooled units only.

✓: Standard

•: Optional

-: Not available

## Flow diagram (air-cooled)



# Technical specifications

## AQ 15-55 VSD

Compressor type	Max. working pressure (bar(e)/psig)		Capacity FAD*			Installed motor power		Noise level**	Weight (kg/lbs)	
	Pack	Full Feature	l/s	m <sup>3</sup> /min	cfm	kW	hp		Pack	Full Feature
<b>Air-cooled</b>										
AQ 15 VSD	13/188	12.75/185	22-47	1.3-2.8	47-100	15	20	67	650/1433	700/1543
AQ 18 VSD	13/188	12.75/185	22-54	1.3-3.2	47-114	18	25	69	650/1433	700/1543
AQ 22 VSD	13/188	12.75/185	22-66	1.3-4.0	47-140	22	30	70	740/1631	800/1764
AQ 30 VSD	13/188	12.75/185	22-83	1.3-5.0	47-176	30	40	72	740/1631	810/1786
AQ 37 VSD	13/188	12.75/185	39-108	2.4-6.3	83-228	37	50	69	1300/2866	1410/3108
AQ 45 VSD	13/188	12.75/185	40-130	2.4-7.6	86-275	45	60	72	1300/2866	1410/3108
AQ 55 VSD	13/188	12.75/185	40-155	2.4-9.1	86-329	55	75	75	1300/2866	1410/3108
<b>Water-cooled</b>										
AQ 15 VSD	13/188	12.75/185	22-47	1.3-2.8	47-100	15	20	67	542/1195	592/1305
AQ 18 VSD	13/188	12.75/185	22-54	1.3-3.2	47-114	18	25	69	542/1195	592/1305
AQ 22 VSD	13/188	12.75/185	22-66	1.3-4.0	47-140	22	30	70	632/1393	692/1526
AQ 30 VSD	13/188	12.75/185	22-83	1.3-5.0	47-176	30	40	72	632/1393	702/1548
AQ 37 VSD	13/188	12.75/185	42-113	2.5-6.6	89-239	37	50	66	1186/2614	1296/2857
AQ 45 VSD	13/188	12.75/185	42-135	2.5-7.9	89-286	45	60	69	1186/2614	1296/2857
AQ 55 VSD	13/188	12.75/185	42-160	2.5-9.5	89-339	55	75	72	1186/2614	1296/2857

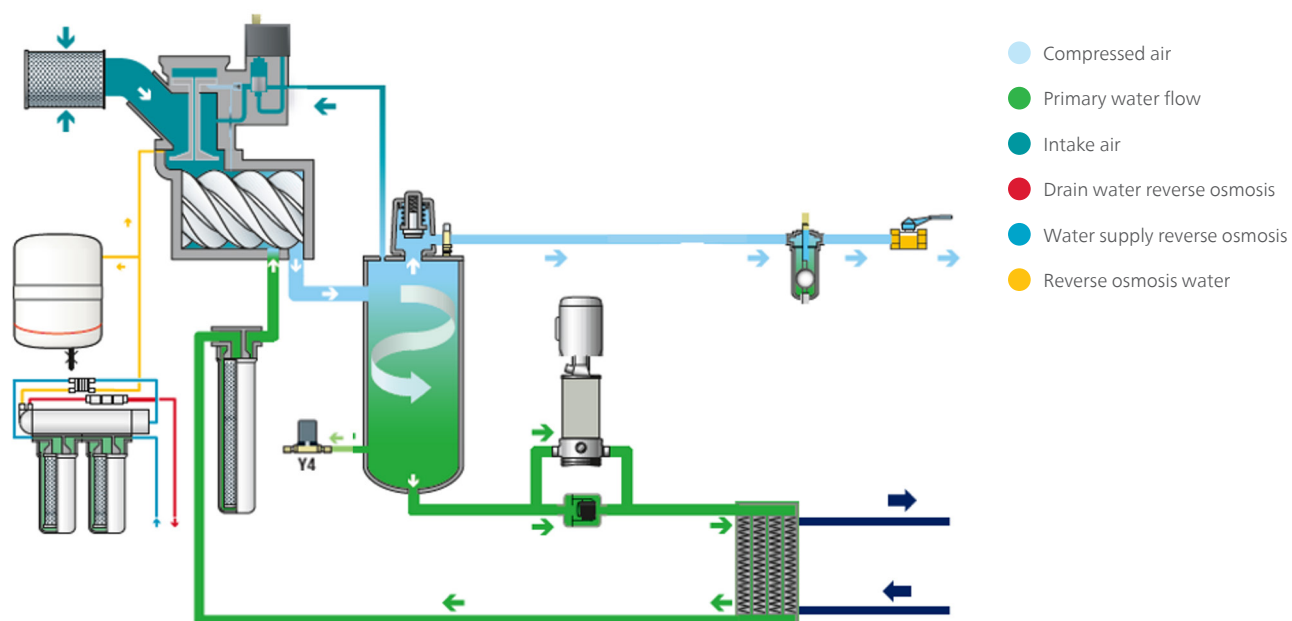
(1) Unit performance measured according to ISO 1217 Annex E, Edition 4, 2009.

(2) Mean sound pressure level according to ISO 2151, uncertainty 3 dB(A).

## Dimensions

Dimensions	Air-cooled			Water-cooled		
	L (mm)	W (mm)	H (mm)	L (mm)	W (mm)	H (mm)
AQ 15-30 VSD	1976	974	1500	1976	974	1500
AQ 37-55 VSD	2440	970	1830	2440	970	1830

## Flow diagram (water-cooled)







ISO 9001 - ISO 14001  
OHSAS 18001

**Atlas Copco**

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