



Atlas Copco



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GHS 5400 VSD<sup>+</sup>

VACUUM PUMP



# GHS 3800-5400 VSD<sup>+</sup>

Industry 4.0 oil-sealed screw vacuum pumps  
with HEX@™ connectivity and control

## GHS VSD<sup>+</sup> with HEX@™: A game changer

Clean. Silent. Energy efficient and now with HEX@™ - next generation connectivity. Our GHS VSD<sup>+</sup> range of intelligent vacuum pumps with Variable Speed Drive (VSD) technology have taken a leap ahead and raised the game with HEX@™ - Atlas Copco's new Industry 4.0 ready vacuum pump controller.



## Innovative and intelligent vacuum pumps

The GHS 3800-5400 VSD<sup>+</sup> series is a range of connected, intelligent, oil-sealed rotary screw vacuum pumps with Variable Speed Drive (VSD) technology. Based on the well known and durable plug-and-play design principles, these vacuum pumps have been designed by vacuum engineers to deliver peak performance at your operating pressure.

- ◆ High performance against benchmarked oil-sealed and dry vacuum pump technologies for the relevant applications
- ◆ Increased efficiency – advanced screw technology, Variable Speed Drive (VSD) and innovative motor design combine to produce a leap forward in efficiency
- ◆ Quiet operation – noise level is far below that of comparable technologies
- ◆ Sustainable productivity with built-in efficiency
- ◆ Reduced environmental impact due to ultra-high oil retention at all operating pressures



## Ideal for diverse markets

The GHS VSD<sup>+</sup> series of vacuum pumps are ideal for a wide range of applications in canning, glass bottle and container production, packaging, pick and place and many more. The GHS 3800-5400 VSD<sup>+</sup> is the perfect solution when you want to replace multiple point-of-use vacuum pumps with one centralized vacuum system which can be located in a utility room. This means reduced heat, noise and oil emissions from the working environment.

### Low lifecycle costs

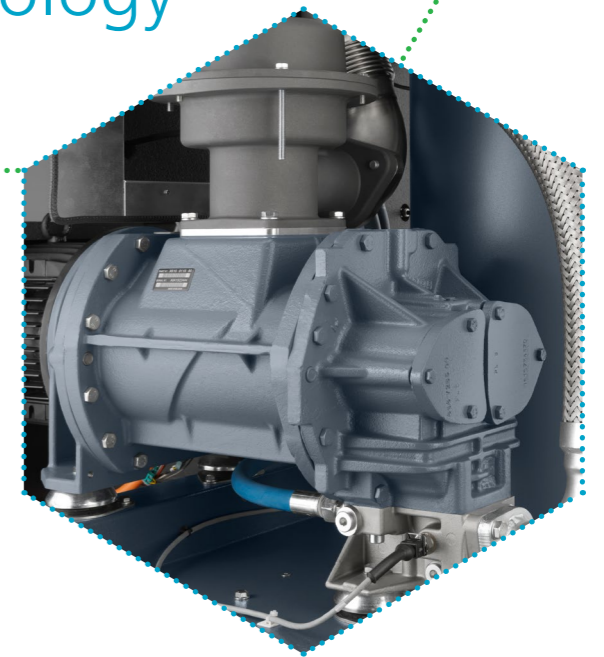
For replacement pumps, the GHS VSD<sup>+</sup> series offers a low lifecycle cost (including service activities and energy). Generally the payback time against existing oil-lubricated or multiple dry vane installations will be less than two years, considering power and maintenance costs only, without taking into account the ease of installation.

# Benefits for your vacuum installation

With these vacuum pumps you can potentially save 50%\* or more in energy costs. They are among the most energy-efficient oil-lubricated vacuum pumps in the market in the capacity range where some other technologies (e.g. oil-sealed vane and fixed speed OIS) start to become mechanically inefficient and expensive in terms of capital expenditure.

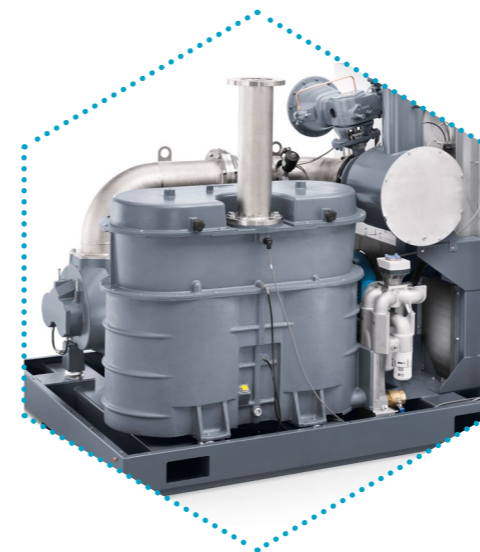


# The innovative technology that makes it work



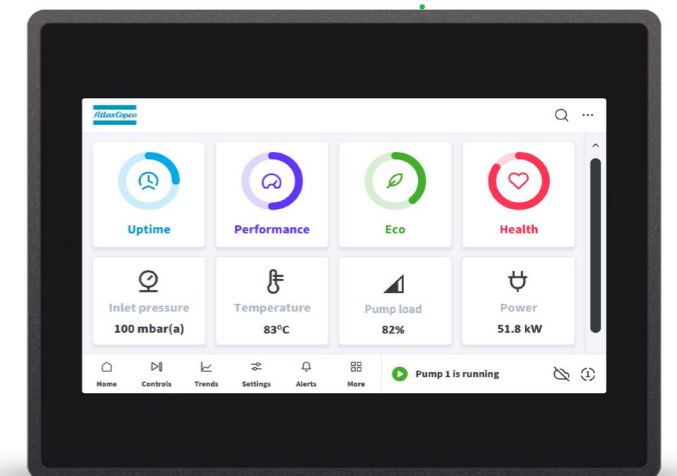
## Element

- ♦ Highly efficient oil-sealed rotary screw
- ♦ Outstanding performance in a robust design
- ♦ Element life is significantly longer than screw compressors and vane pumps



## Oil separator vessel

- ♦ The use of cyclone separation increases the total oil retention capacity of the machine without introducing excessive pressure drop resulting in a clean energy efficient vacuum pump
- ♦ The design of the vessel also keeps focus on the serviceability of the separator elements, allowing filter change without disassembly of piping



## HEX@™ monitoring system

- ♦ HEX@™ is a state-of-the-art monitoring system for your vacuum pumps. It is simple to use and comprehensive, and leads to energy savings
- ♦ It can also integrate your plant management system via a remote monitoring option

## Easy and fast installation saves time

- ♦ Space-saving – the GHS VSD+ series has one of the smallest footprints in the market
- ♦ Everything you need is delivered in a single and neat enclosure
- ♦ Plug-and-play installation
- ♦ Multiple pumps can be controlled by HEX@GRID

## Optimized working surroundings

In addition, the GHS VSD+ series offers a low noise level when compared to other vacuum pumps in the market today. Its superior oil retention also means that the quality of the exhausted air is optimal and oil spills on the factory floor are avoided. The end result is a significantly cleaner working environment.

## Guaranteed uptime and low costs

The GHS VSD+ series is designed for easy and infrequent maintenance:

- ♦ Mean Time Between Maintenance (MTBM) rates are long
- ♦ No water is needed, and HEX@™ is available to keep you informed of pump performance and maintenance requirements

## Energy recovery

As much as 90% of the electrical energy used by a vacuum solution is converted into heat. With Atlas Copco's integrated energy recovery system, it is feasible to recover up to 75% of that power input as hot water without any influence on the machine's performance. Through efficient usage of the recovered energy, you obtain important energy cost savings and a high return on investment.

*\*In most applications compared to traditional fixed speed vacuum technologies based on measurement with our Vbox energy audit tool.*

Advanced oil cooling system

- ◆ An electronic thermostatic valve (QMV) accurately controls the element temperature
- ◆ Accurate temperature control keeps the oil quality in optimal condition by reducing or eliminating water condensation in the oil
- ◆ The cooling system is completed with a variable speed fan to optimize the energy efficiency

Optimal flexibility

A unique water handling capability provides you with the versatility and flexibility you need. All the machines are available as air-cooled and water-cooled variants.



Long-lasting components

The oil separator is designed for highly efficient oil coalescing with ultra-low back pressure, which means less energy consumption. This contributes to a long oil separator life that is double that of a comparable oil-sealed vane vacuum pump. Another contribution to oil separator life is the patented design which never allows the filtration media to be overloaded, so they last much longer. This is great news for your maintenance budget.

Energy recovery option

- ◆ Allowing you to recover up to 75% of the power input
- ◆ Helping you fulfil your energy management and environmental commitments according to ISO 50001/14001



Energy savings

VSD and set-point control, lead to significant energy savings. Set-point control allows you to optimize the energy you use to maintain your process vacuum level and thereby optimize your process efficiency and performance. The lowest possible flow will be delivered to match your required vacuum level or speed – nothing is wasted.

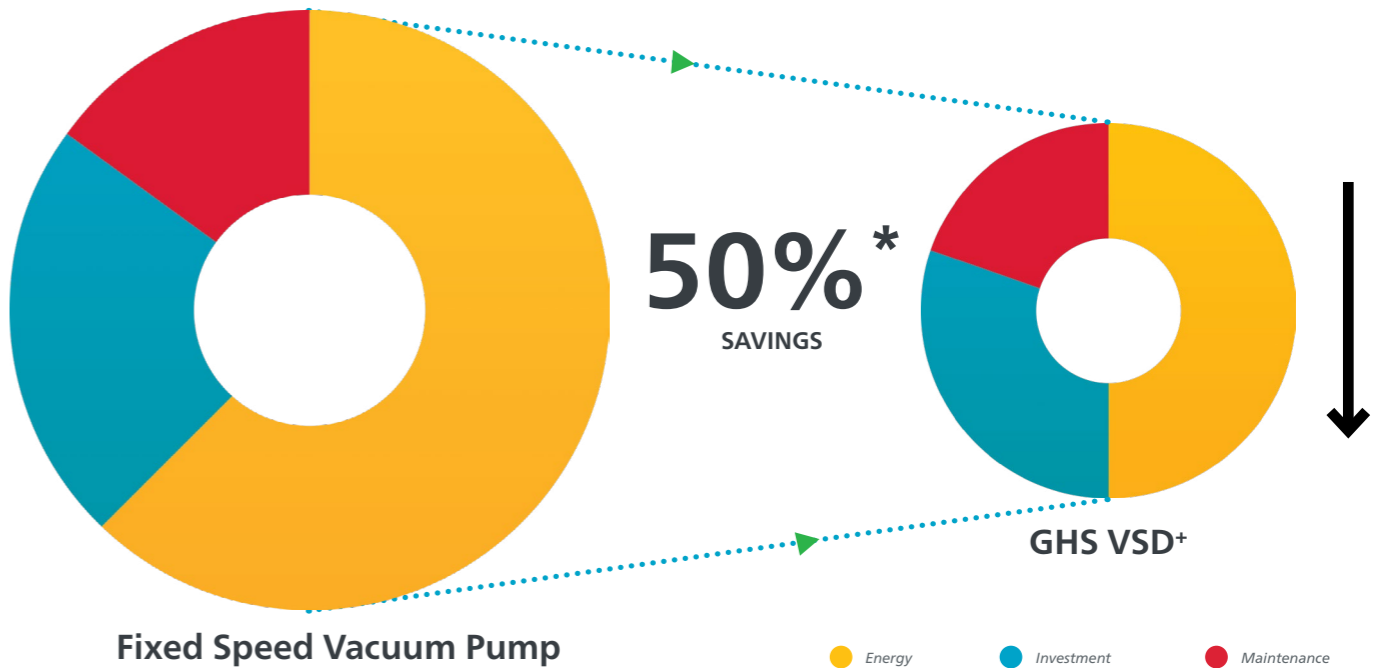
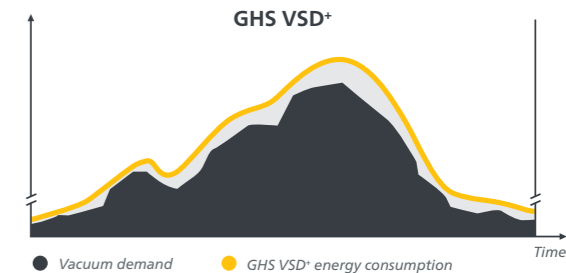
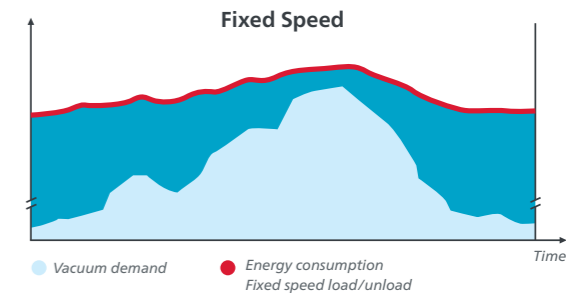
VSD+ for potential energy savings of 50%\* or more

In almost every production environment, the need for vacuum fluctuates depending on different factors such as process changes, the time of day, week or even month. Extensive measurements and studies of demand profiles show that there are many substantial variants with regards to vacuum demand.

Why Atlas Copco Variable Speed Drive (VSD) technology?

- ◆ Potential energy savings of 50%\* or more with an extensive flow range (20-100%)
- ◆ Reduced electrical installation costs (fuse and cable size)
- ◆ Integrated HEX@™ graphic controller controls the motor speed and high efficiency frequency inverter
- ◆ Eliminates peak current penalty during start-up experienced with stop-start machines

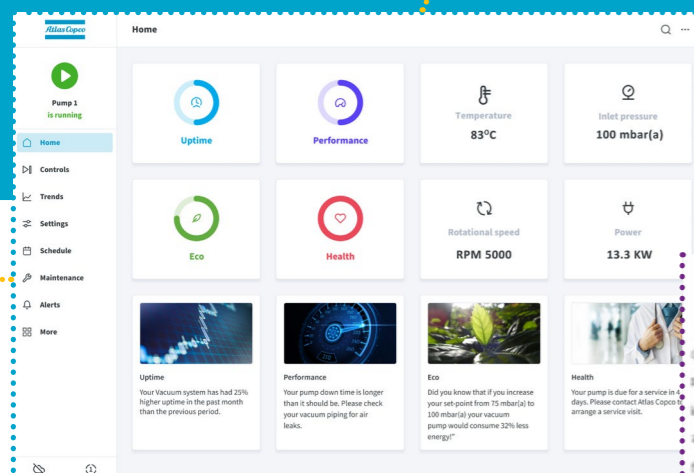
\*In most applications compared to traditional fixed speed vacuum technologies based on measurement with our Vbox energy audit tool.





# : Sixth sense intelligence through connectivity and control

With HEX@™, you can monitor and control your pump from anywhere and at any time. You can receive feedback and review pump operating status, vacuum levels and upcoming scheduled events for your vacuum system.

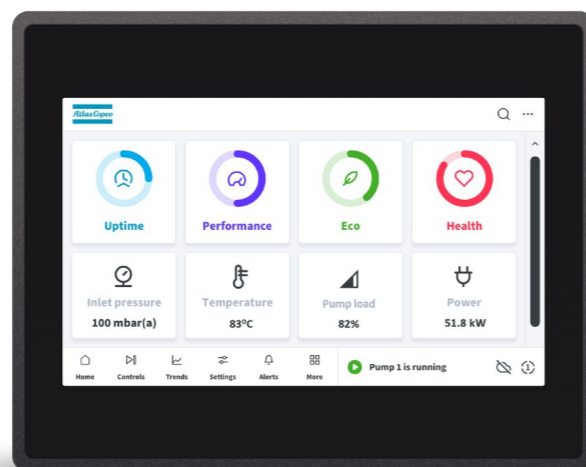


Screens showing KPIs for process optimization



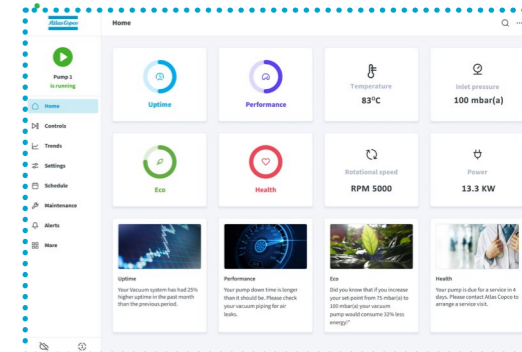
Access and visualize pump trends, such as pressure and temperature

User-friendly interface options (above and right) allowing access to functionalities of HEX@™



## Automated insights and updates

HEX@™ offers the benefits of having a connected device such as automatic software updates, access to future released functionality and increased understanding into vacuum performance. HEX@™ will also provide insights, recommendations and feedback based on pump performance both current and historical. Perhaps the energy efficiency of the vacuum pump can be improved, or your maintenance interval can be extended? HEX@™ will empower you to take proactive steps to optimize your vacuum system and maximize your production.



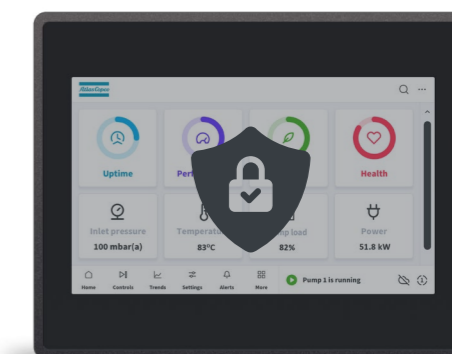
## Configurable interface

With clear presentation and intuitive layout, the HEX@™ ergonomic interface is quick and straightforward to navigate. Unlike traditional control interfaces, HEX@™ allows you to configure parts of the home screen to display the information that is most important and relevant to you.



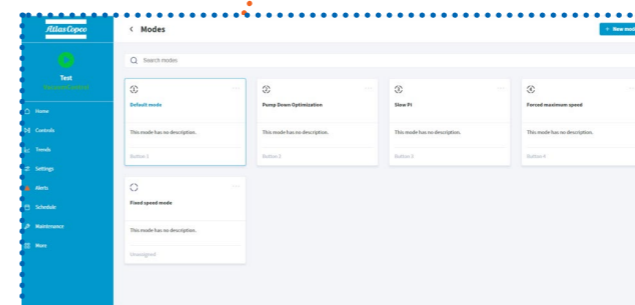
## Secure web-based interface

This is possible by accessing your secure, web-based user interface to connect directly to your pump or fleet of pumps. From your web-enabled device, PCs, laptops, tablets or smartphones, you can control and monitor your pump like you were standing right next to it.



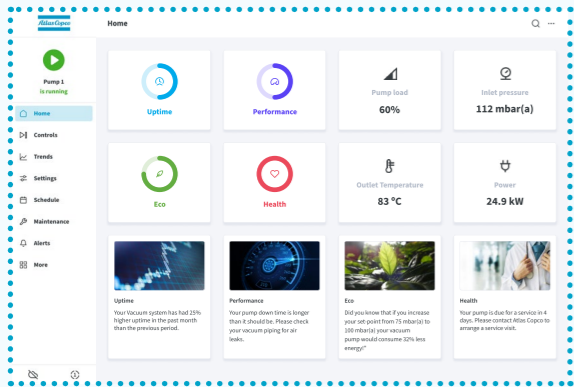
## Smart functionalities

HEX@™ also has smart functionalities which let you, for example, plan specific functions outside the production time – this can be set either on calendar day or running hours. You can also switch between operating modes which means you can save your operation settings for future convenience, moving between setting profiles according to the needs of production.



# The power of trends

## Multiple metrics



- ◆ View trends of multiple measured metrics over a period of time
- ◆ Compare different metrics to understand what is happening in relation to your process
- ◆ Can include: inlet pressure, motor speed, power consumption, oil temperature and more.

## HEX@™: Standard HMI features

### 7" Touch HMI

- ◆ Market-leading interface

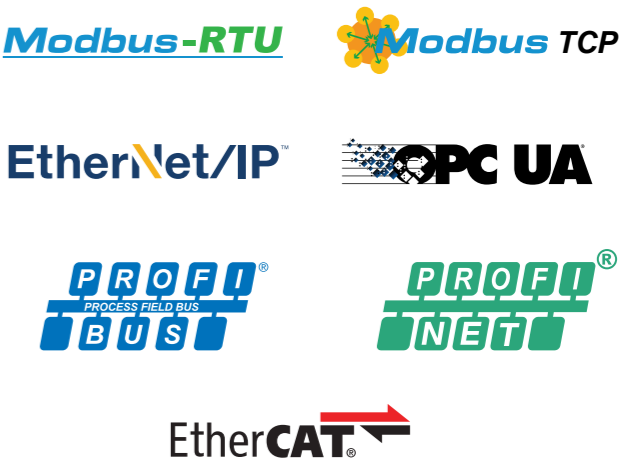
### Configurable home screen

- ◆ Display the parameters you choose and prioritize
- ◆ Flexible software means you can display different parameters over time. See what you want, when you want



## Flexible connectivity

- ◆ HEX@™ allows you to integrate your vacuum pump into your system to the level you desire using the protocols you prefer. Whether using an ethernet cable, a WiFi module or another communication protocol to integrate your vacuum system, HEX@™ can support you. You even have the option to connect using our GENIUS cellular network.
- ◆ To ensure no customer is left behind, HEX@™ fully supports the latest and most common protocols found in industrial markets today. Rest assured, we can offer you an option to connect to your vacuum pump.



## HEX@GRID: One controller, multiple pumps

Got multiple pumps? All you need is one HEX@GRID to build a truly integrated central system.

### HEX@GRID Standard

Central box to control all your vacuum pumps

- ◆ Compatible with HEX@™, MK5 and Fixed Speed machines
- ◆ Virtual machine control
  - ◆ VSD Leader pump
  - ◆ Follower pumps running to a settable speed between 60% and 100% of the max speed. The user can choose.
- ◆ 10% energy savings or more vs basic sequencers
- ◆ Connect up to 8 vacuum pumps

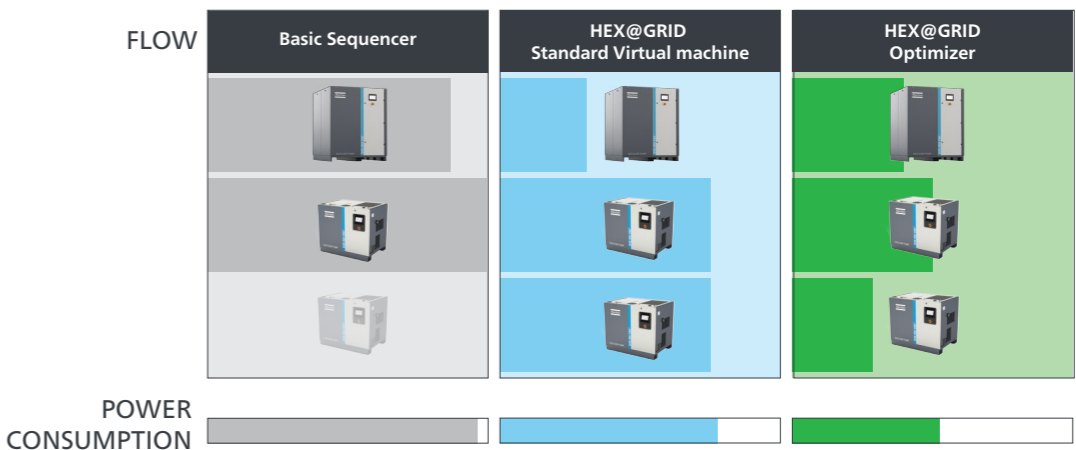
### HEX@GRID Optimizer

Unlike traditional intelligent multi-pump controllers, using combinations of pumping speeds to achieve total pumping performance, Optimizer adds an extra dimension by taking into account the actual power consumed by each individual vacuum pump at every operating point.

Optimizer not only finds the best combination of pumping speeds to meet the demand, but considers all combinations, pumping speeds and the total energy consumed.

- ◆ Compatible with HEX@™, MK5 and Fixed Speed machines
- ◆ Optimizer Control Algorithm
- ◆ 20% energy savings or more vs basic sequencers
- ◆ Connect up to 20 vacuum pumps

### HEX@GRID Central Control



# Applications

- ◆ Canning
- ◆ Glass bottle and container production
- ◆ Packaging
- ◆ Pick and place



## Numerous configurations to match your application

Choose the version that matches your specific application requirements:



### Standard

This machine focuses on delivering the exact performance you demand, at the lowest possible lifecycle cost. Ideal for applications where you need to maintain a set vacuum level (set point).



### Humid

Suitable for high water content duties, for applications such as plastics, clay molding, drying pipelines, salad cooling, freeze-drying, etc.

*Configuration for high water vapor tolerance constitutes the humid version.*



Technical specifications

Model	Nominal displacement		Ultimate pressure		Frequency range	Average absorbed power at minimal speed		Nominal motor rating		Noise level (ISO 2151)	Oil capacity	
	m³/h	cfm	mbar(a)	torr		kW	HP	kW	HP		L	Gal
GHS 3800 VSD*	3828	2253	0.35	0.26	25-97	15.4	20.6	55	75	83	85	21
GHS 4600 VSD*	4478	2636			25-117			75	100	84		
GHS 5400 VSD*	5004	2945			25-133			90	120	85		

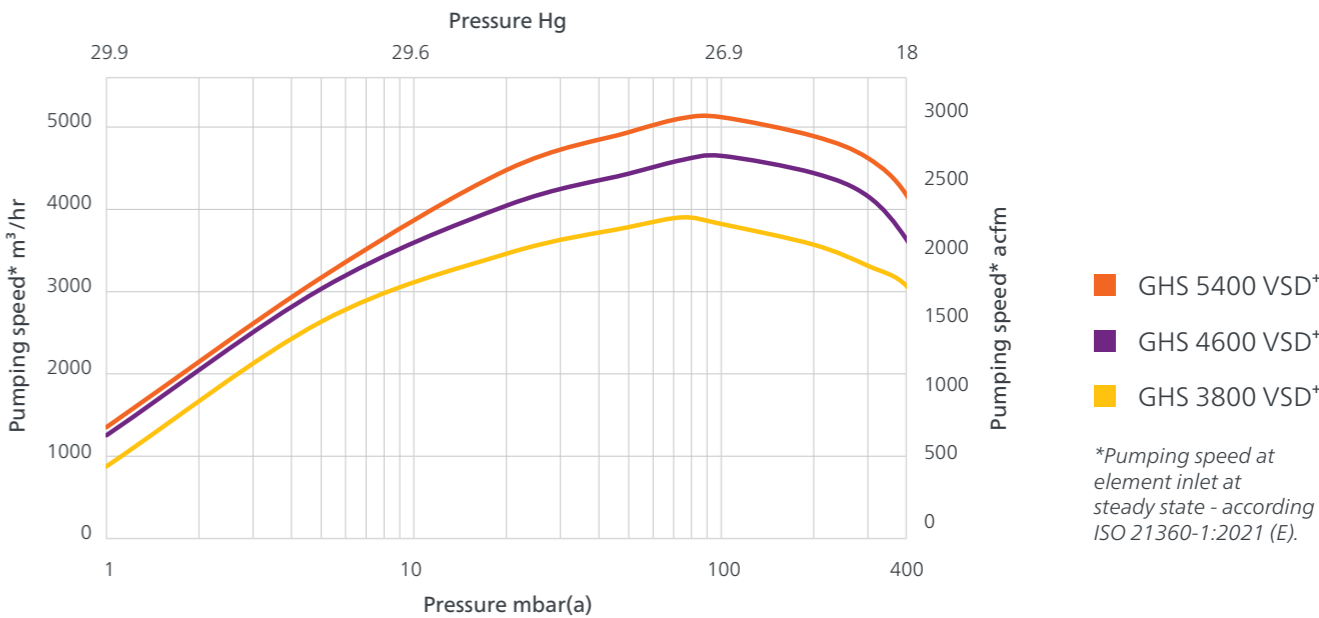
- ♦ ISO21360-2:2012
- ♦ HEX@GRID with various inlet and outlet connections and other essential vacuum accessories are available as options or accessories
- ♦ Electrical specification: 380/460V 50/60Hz IP54 cubicle CSA/UL
- ♦ 220 V/575 V: available upon request
- ♦ Available oils include mineral and synthetic
- ♦ All the machines are available as air-cooled and water-cooled version

Dimensions and weight



Dimensions	Gas inlet	Gas outlet	Length		Width		Height		Weight	
			mm	in	mm	in	mm	in	kg	lb
GHS 3800 VSD*	DN200	DN150	1939	76.3	2850	112.2	1893	74.5	3945	8697
GHS 4600 VSD*									3980	8774
GHS 5400 VSD*									4000	8818

Performance curves



Service solutions  
Preventive Care



Complete service with our Preventive Care plan

We take over the maintenance planning and responsibility for servicing your vacuum pump on a regular basis. Our Preventive Care plan is tailored to your pump's needs. As your pump is serviced with the latest technology, high levels of energy efficiency are achieved. We will also optimize service events to reduce your total cost of ownership and increase your productivity. This allows you to focus fully on your production.



Maximize lifetime of your vacuum pumps

Our vacuum specialists are well trained and experts in the field. They will help you to improve uptime and protect your processes. Regular maintenance conducted by one of our vacuum specialists reduces the risk of deterioration. Damaged or worn parts will be replaced with genuine Atlas Copco spare parts to protect your investment and increase the lifespan of your vacuum pumps.



Cost-effective approach

Regular scheduled maintenance can identify potential problems before they occur and plans can be structured around your individual production situation. Preventive Care enables cost management as you can plan your maintenance costs in advance. In this way, expenses associated with unplanned downtime are minimized.



Reliability meets non-stop productivity

We use genuine Atlas Copco spare parts and oil and our services are conducted by vacuum specialists according to manufacturer's recommendations. This enhances your vacuum pump performance, reducing the risk of downtime and enabling your production to run more smoothly.

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