

GHS VSD+ SOLUTIONS FOR CENTRALIZED VACUUM

Some key components: the engine, brains and remote communication options of your central system described in detail

Atlas Copco



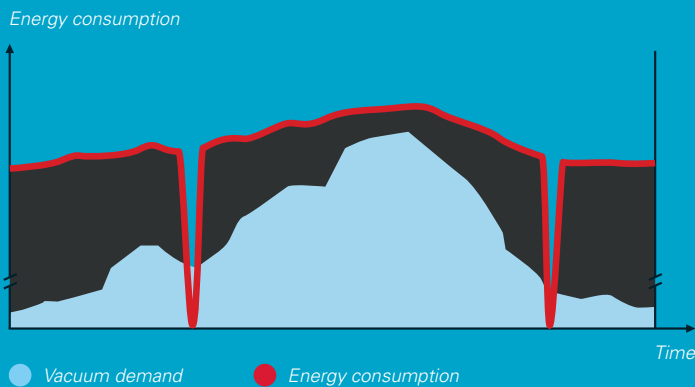
THE ENGINE OF YOUR CENTRAL SYSTEM

The engine of any central vacuum system is the vacuum pump. This brochure features Atlas Copco's flagship range, the GHS VSD+ Series. This range of new-generation, intelligent, oil-sealed rotary screw vacuum pumps features Variable Speed Drive (VSD) technology. Based on the well-known and durable plug-and-play design principles of Atlas Copco compressors, these vacuum pumps offer:

- Superior performance against benchmarked oil-sealed, claw pump, liquid ring and dry vane vacuum pump technologies.
- Increased efficiency – State-of-the-art screw technology, VSD and innovative motor design combine to produce a leap forward in efficiency.
- Quiet operation – Noise levels are around half that of comparable technologies.
- Sustainable productivity thanks to built-in efficiency.
- Reduced environmental impact due to ultra-high oil retention at all operating pressures.

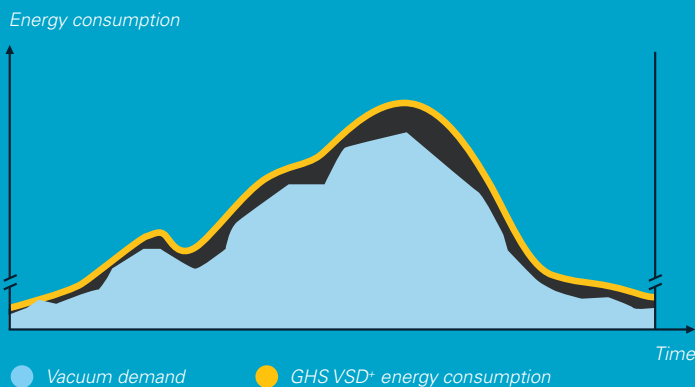


Ideal for central systems with variable demand coming from your process



The first figure shows how a fixed speed machine responds to a typical demand profile.

Variable demand from your process often leads to frequent stop-starts. These can in turn lead to mechanical and electrical motor problems such as overheating, fan breakage, oil degradation and vane delamination. Traditionally, the way to overcome these problems is to use a wide pressure band to limit the number of stop-starts. Unfortunately this is not a cost-effective solution.



A much better solution is to use a Variable Speed Drive (VSD). The second figure shows how a vacuum pump with VSD responds to the same demand profile. The pump only delivers what is required.





GHS VSD+ STAND-ALONE BENEFITS



High energy efficiency

- Variable Speed Drive (VSD) automatically delivers the desired flow, saving you money.
- Huge efficiency gains thanks to state-of-the-art screw technology and the innovative IE3 Premium Efficiency Motor.

Optimal reliability

- Screw element life is significantly longer than vane pumps.
- Canopy with hot-cool zones isolates heat producing and high temperature components from electronic components.
- Extremely long mean time between maintenance.

Sustainability and environmental friendliness

- Market-leading oil retention for optimal exhausted air quality: innovative and patented design retains oil at $<3 \text{ mg/m}^3$ even under the greatest load.
- Long lasting components: the vacuum pump never overloads the separator elements.
- Half the noise level of comparable technologies.

Easy, fast installation

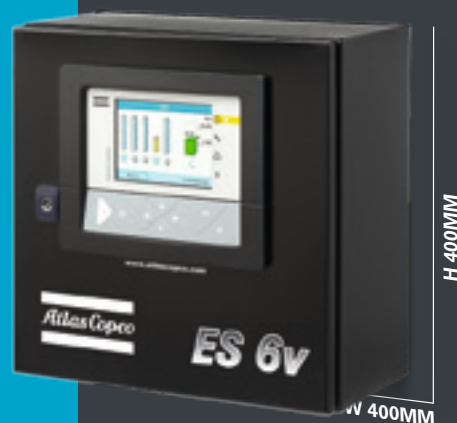
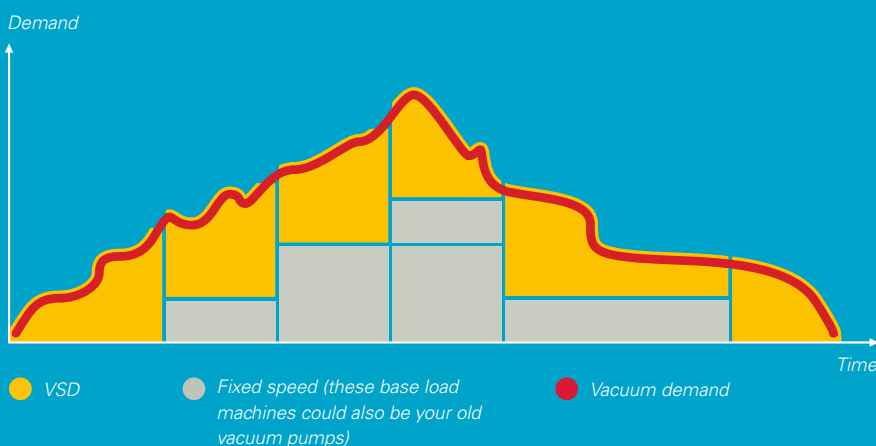
- Plug-and-play installation.
- Single, neat enclosure and small footprint (smaller than a standard pallet).

Many central systems have multiple pumps which introduces another dimension to the challenge. Atlas Copco has taken the well-known ES compressor and process management system and adapted it specifically for vacuum systems.

ESv CONTROL SOLUTIONS: THE LATEST IN CONTROL TECHNOLOGY FOR VACUUM

A properly managed centralized vacuum system saves energy, reduces maintenance, decrease downtime and improves product quality. Atlas Copco's ESv central controllers are the most efficient way to monitor and control multiple vacuum pumps simultaneously.

- Integrated controller for up to 4 or 6 VSD machines.
- External controller for up to or more than 6 machines (fixed speed/VSD mixture).



The most suitable product mix at all times

Fixed speed machines used as base load vacuum providers with VSD react quickly to demand. This maximizes your energy savings and reduces costs.

Reduced maintenance costs

Comprehensive and flexible machine sequence control lets installed machines work in groups, allowing running hours to be equalized. ESv ensures that system running hours are equal across all machines in the same group. This reduces service costs because all machines can be serviced at the same time.



The best fit for varying demands

ESv makes sure that your most efficient machines are prioritized to reduce downtime and match your requirements.

1 Machine priority sequences

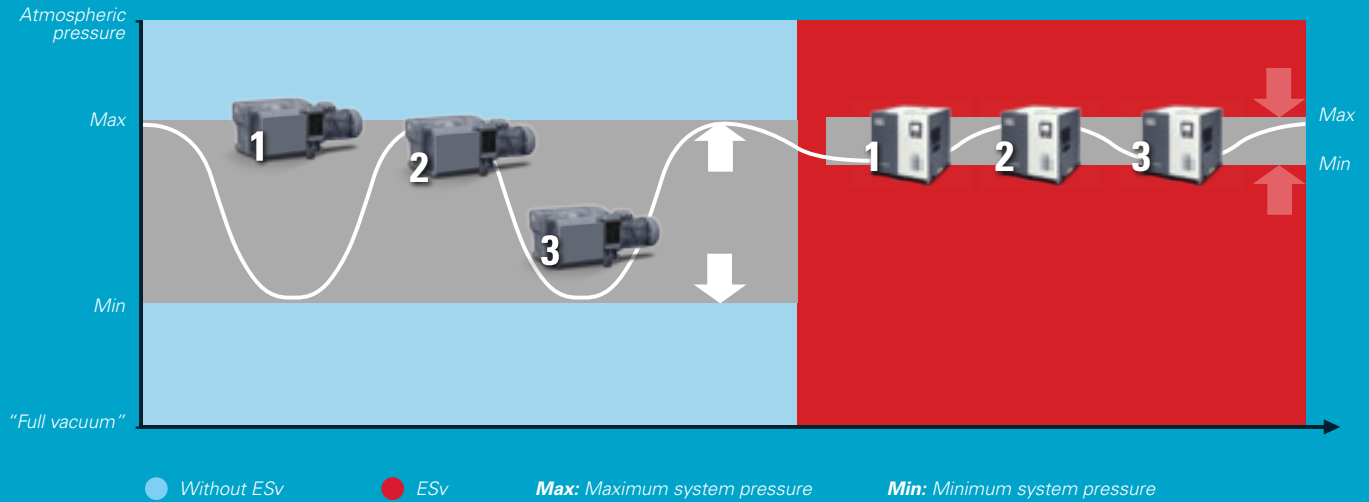
- Normal: newer machines are prioritized over older, less effective models.
- Temporary: older machines can be temporarily prioritized to avoid long periods of non-usage, reducing the risk of machine faults.

2 Workload priority settings

ESv can prioritize machines in an installation to find the most economically efficient way to suit different workload demands in different periods: day time or night time.

Stable process, lower energy consumption

ESv central controllers keep your network running within a narrow, predefined pressure band. This increases the stability of the process and optimizes overall energy consumption.



Thanks to ESv, you can control and monitor your complete vacuum network over the LAN. Features include warning indications, vacuum pump shutdown warning and maintenance scheduling.

Local monitoring and control via SCADA, DCS and ICS.

SCADA (Supervisory Control and Data Acquisition), DCS (Distributed Control System) or ICS (Industrial Control Systems) are systems operating with coded signals over communication channels so as to provide control of remote equipment. They typically use two common communication protocols: Modbus and Profibus.

Atlas Copco has created a Mk5 Gateway which translates Modbus and Profibus into CAN protocols and vice versa. This provides seamless integration of GHS VSD+ and/or fixed speed machines (including other brands) and ESv systems with local control and monitoring.

- Remote stop/start
- Control of vacuum set point or PI control modification
- External pressure control and speed control
- Purge functions
- Requested machine status
- Service indication



Of course there are many other important components within a central vacuum system and often these are bespoke. To sum it up, if you obtain the right brains and engine for your system, your financial justification will be so much easier to make.

Atlas Copco also supplies turnkey central systems including:

- Pipeworks and fittings.
- Gauges, valves and leak detectors.
- Service and spare parts on all brands of vacuum pumps.
- Rental equipment.
- **SMARTLINK** connectivity.

A lifecycle cost calculator is also available. For more information, please contact your Atlas Copco representative.

HOW MUCH WILL YOU SAVE BY USING THESE INNOVATIVE COMPONENTS FROM ATLAS COPCO?

The Vacuum Solutions App from Atlas Copco enables you to easily and quickly make a simulation of your energy savings possible through the use of centralized vacuum with the GHS VSD+ vacuum pump.

Simply open the app and follow these five easy steps:

1

Select vacuum pump(s) and pressure band – Enter your maximum operating pressure and the band that you are currently operating in.



2



Generate and/or measure energy consumption profile(s) – Either measure the energy consumption profile with V-Box or make an approximation based on data collected in our labs on typical benchmark pumps.

3

Simulation – From this the energy savings are simulated. Obviously, a more accurate output is obtained if the energy is measured at step 1.

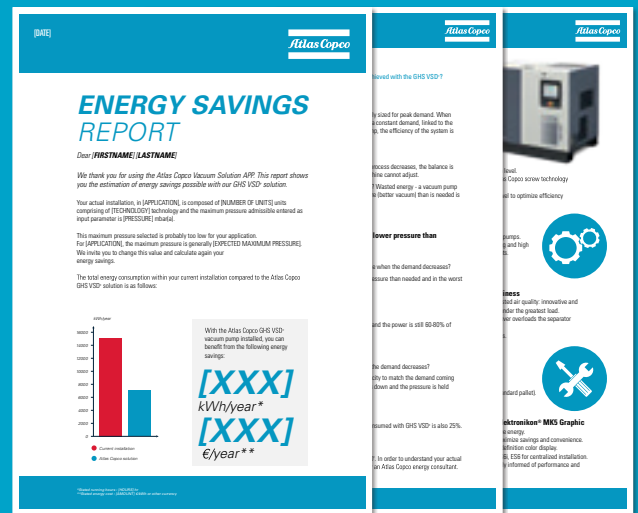


5

Report – Results are provided in an easy-to-read report.

4

Validate – Results are then validated. It is best if this is done in a meeting between Atlas Copco's energy consultant and your production/engineering people.



ATLAS COPCO CENTRAL VACUUM SYSTEMS IN PRACTICE

When applied to a centralized vacuum system, the GHS VSD⁺ will save you money.

Below we describe an example to demonstrate the cost savings possible.

For more case studies, visit <http://www.atlascopco.com/vacuumus/videogallery/ghsvsd>

Essentra saves over €8,000 per year with the GHS VSD⁺ and centralized vacuum system

Essentra Extrusion is a leading custom profile extruder located in the Netherlands. They do not make standard products, but offer their clients a complete design and production process. Extrusion is a process used to create objects with a fixed cross-sectional profile. A material is pushed or drawn through a die to create the profiles. The extrusion of plastics relies on vacuum, mainly for the evacuation of gasses from the process.

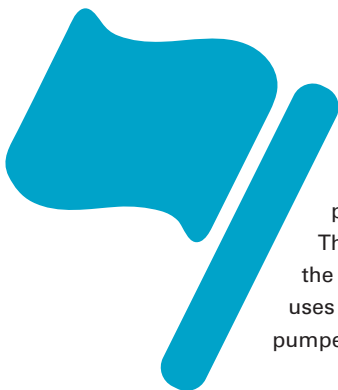
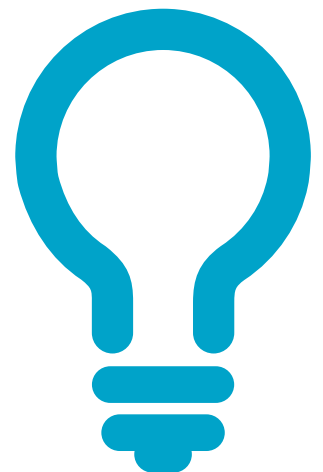


Challenge

Essentra were looking to update their vacuum pumps; each of their production lines had around 40 small oil-sealed or dry vane pumps, which led to considerable maintenance work. The vacuum solution had to be stable and reliable, as well as quiet, as the Essentra facility is located in a residential area. In addition they were looking for an environmentally friendly solution.

Solution

Essentra decided to purchase a centralized system featuring the Atlas Copco GHS 900 VSD⁺ vacuum pump. The centralized system serves many different production lines and products. The pump delivers the same performance as multiple competitive pumps used to, but needs much less space.



Outcome

The GHS VSD⁺ vacuum pump is fitted with a 15 kW VSD motor; it replaces many older pumps with small electric motors and brings energy savings of approximately 75%. This equates to over €8,000 per year. This is not the only environmental benefit from the vacuum solution; Essentra also has an Atlas Copco energy recovery system which uses the heat generated from the Atlas Copco machines to heat water. That hot water is pumped across the street to heat a municipal swimming pool.

The GHS VSD⁺ vacuum pump has proven to be reliable with no risk of overheating, as well as being quiet. Essentra can even run their production processes seven days and nights a week in the residential area, with no complaints from the neighbors.

COMMITTED TO SUSTAINABLE PRODUCTIVITY

We stand by our responsibilities towards our customers, towards the environment and the people around us. We make performance stand the test of time. This is what we call – Sustainable Productivity.



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