Rotary Screw Compressors

VARIABLE SPEED DRIVE

PS DV SERIES – VARIABLE SPEED

The use of compressed air is indispensable in all industrial applications as a utility and as raw material in the production processes. The compressed air is versatile, flexible and a safe form of energy, but it is very expensive if not used correctly if compared to traditional compressors, the advantages of these advanced new machines can be summed up as follows:

1. Elimination of electric absorption peaks in the motor's start-up phase.
2. Optimisation of the electric consumption of the compressor with a ratio directly proportional to the request for compressed air.
3. Constant regulation of the working pressure with a maximum drift of 0.2 bar as to the operating set pressure.
4. Elimination of the waste of compressed air in ON-OFF regulation determined by the need to depressurise the air-oil tank every time a vacuum is created in the machine.
5. Reduced wearing of the mechanical parts, screw bearings and motor, with consequent reduction of the maintenance costs.

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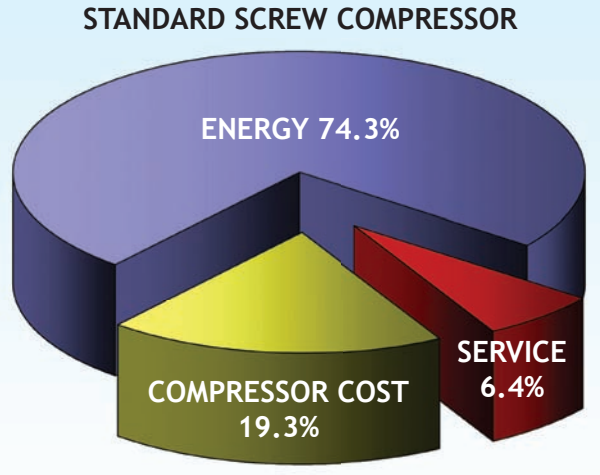
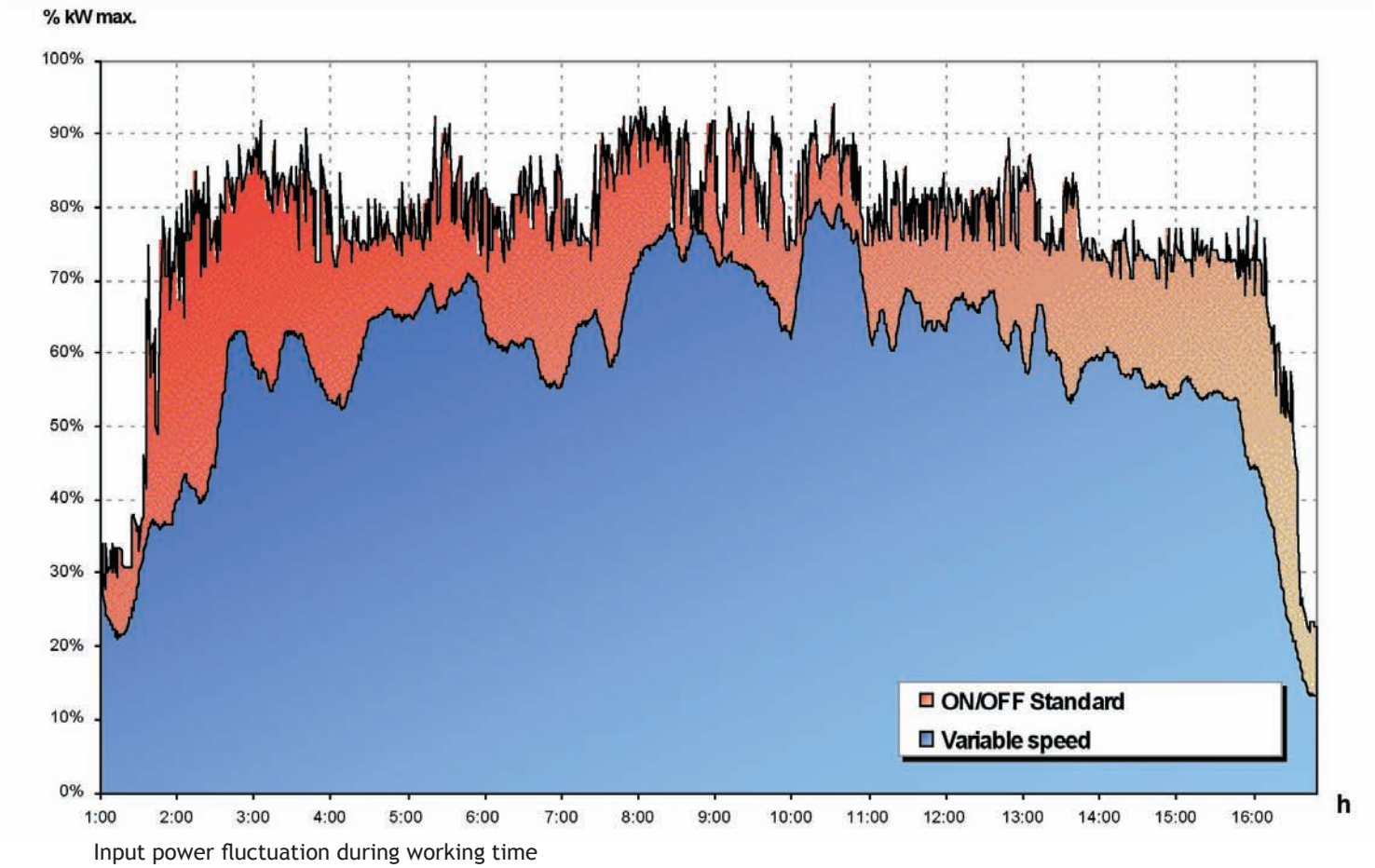
PS DV SERIES - VARIABLE SPEED

Statistical data recorded by OMEGA POWER SYSTEM over a three-year period in industries with a continuous cycle have shown the following parameters concerning the cost of compressed air in a 3 years period:

Compressor Purchase	19.3%
Maintenance	6.4%
Energy	74.3%



Today it is necessary to use flexible production systems with low energy consumption. Respect for nature and energy saving become priorities when choosing any production investment. Measurements conducted on typical application show how the air demand varies during daily or weekly cycles.



Input power fluctuation during working time

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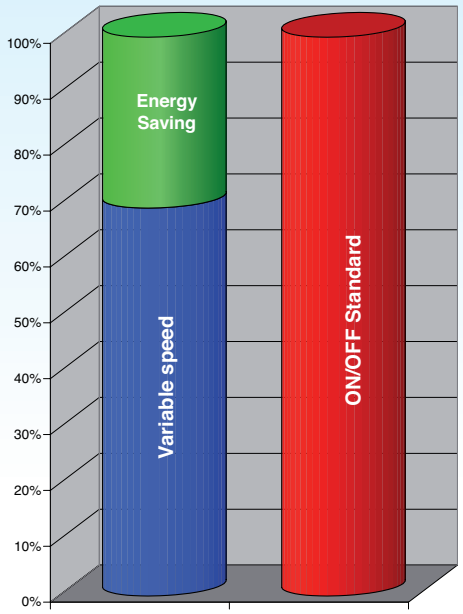
The speed regulation allowed by the motor-speed variation controller allows to tune the air delivered to the air demand. This gives an energy saving thanks to:

- lower maximum power absorbed
- no vacuum operation conditions
- reduced pressure range regulation
- no pressure losses for depressurization of air/oil tank
- less absorbed power variation

The picture on the side show the energy saving reached using variable speed.



THE PS-DV AIR-COOLED SCREW COMPRESSOR

This is a rotary screw compressor with oil injection, complete with all the typical accessories of a compression control unit such as: electric motor, starter, command and control panel, final cooler, condensate separator with timed discharge and soundproof cabinet. The control unit, which is totally air-cooled, is designed for continuous duty. The high standard in Power System design, together with the most advanced construction technology, put this series of compressors in the lead in regards to technical, functional and operating characteristics.

COMPRESSOR ELEMENT WITH HIGH YIELD

The lubricated single-stage rotary screw type; it is composed of two rotors, a male one with 5 lobes and a female one with 6 slots, with asymmetrical profiles. The forged steel rotors are cut using machines with numerical control and are fitted on roller and ball bearings which support their radial loads and axial thrust. Compression takes place in a single stage. The compression heat is taken away by the oil injected between the two rotors.

HIGH-PERFORMANCE SILENT TRANSMISSION

The compressor element is driven directly by the electric motor by means of a flexible coupling and a couple of helical gears. This drive system guarantees perfect alignment of the screw motor unit along with silent operation, lasting reliabilty and high performance.

ELECTRICAL MOTOR

The electric motor is rated in insulation class F and protection IP 55. In the description shown below it is given the definition against foreign bodies for IP 23 and IP 55 respectively:

IP 23

- Protection against the penetration of foreign bodies with a diameter larger than 12 mm.
- Protection against drops of water with incidence 60°

IP 55

- Total protection against splashes of liquids and harmful deposits of dust inside the windings.
- Total protection against jets of water shot from any direction.

TWO-STAGE AIR FILTER

This is how the filtration is accomplished

1. centrifugation and storage of dust in the container
2. filtration by means of a cartridge with degree of particle separation (99.6% at 2 µ)

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POWER SYSTEM

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PS DV SERIES - VARIABLE SPEED

HIGH EFFICIENCY CARTRIDGE OIL FILTER
Complete with by-pass

AIR-OIL COOLING UNIT
With a large radiating surface to reduce pressure drop and allow the maximum value of the unit. Air and oil gets cooled by means of an electric fan.

HIGH EFFICIENCY CONDENSATE SEPARATOR
Acts on the water-oil particles complete with timed electronic discharge, designed to reduce air loss during the discharge phase to a minimum.

THREE-STAGE AIR-OIL SEPARATOR
Is designed to guarantee the maximum efficiency of oil-air separation and to reduce to minimize the oil content in compressed air. The separation takes place in three stages: centrifugation, condensation and oil separation by means of a multistage oil-separating filter.

PRE-FILTER IN SYNTHETIC FIBRE
For protection agaist impurities in the intake air.

THE VSD
The frequency inverter is of the vectorial type and ensures the precise control of the motor speed and torque, even without using an encoder. The use of the inverter allows:

- motor starting torque up to 200% for heavy duty
- accurate torque control
- torque response time of 1-2 ms

REGULATION AND CONTROL SYSTEM
The regulation and control system allows the following:

1. Automatic determination, from time to time, of the on-off or proportional operating time of the compressor, so the energy costs of the control unit are reduced.
2. Automatic determination of any maintenance jobs, depending on the environmental and working conditions of the control unit, making the service safer and less expensive.
3. Protecting the compressor in case of no phase due to a wrong rotation (as in cases where too high pressure is arisen)
4. Protect the electrical drive motor and the fan from overload conditions.

The VSD Screw Compressors of the series PS 1300, PS 1500 and PS 2000 are equipped with control panel EPS 4.2

CONTROL PANEL EPS 4.2
An advanced electronic controller. It allows optimum compressor regulation. The system also allows a sequential network of up to six compressors. EPS 4.2 is equipped with an alphanumeric LCD display for showing the functions, the maintenance and the instructions for machine reset, together with the programming of the work parameters. The system can be remote-controlled with a serial interface connecting to a terminal. The EPS4.2 controller display the presence of misfuntioning alarm and the expiration of maintenance intervals.

EPS 3 Control Unit Equipping PS 45/250 VSD Screw compressors

ELECTRONIC CONTROLLER EPS 3
This Control Unit is an advanced electronic controller, it provides to the regulation of the compressed air control unit allowing the highest compressor regulation flexibility. The system also allows a sequential network of up to 6 compressors. It is equipped with an alphanumeric LCD display for showing the functions, the maintenance and the instructions for the machine reset, together with the programming of the working parameters. It is also equipped with a date clock and weekly timer for displaying the time and the date, together with the daily program ming of the machine start. The system can be remote-controlled with a serial interface connecting to a terminal.

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If compared to the conventional compressors, the advantages offered by those equipped with inverter are mainly the following:

1. No electrical adsorption peaks during the motor start.
2. Lowest consumption in electrical power directly comparable to the compressed air output.

Specifications

Model	Max Pressure		F.A.D.		Power		Noise lev.	Weight	
	bar max	Psig max	m3/min min/max	CFM min/max	kW	Hp	dB(A)	Kg	lbs
PS 1315-7.5DV	7.5	109	0.4/2.1	14/74	15	20	65	250	551
PS 1315-10DV	10	145	0.4/1.9	14/67	15	20	65	250	551
PS 1315-13DV	13	175	0.3/1.5	11/53	15	20	65	250	551
PS 1515-7.5DV	7.5	109	0.5/2.4	18/85	15	20	69	365	805
PS 1515-10DV	10	145	0.5/2.1	18/74	15	20	69	365	805
PS 1515-13DV	13	175	0.5/1.6	18/57	15	20	69	365	805
PS 1522-7.5DV	7.5	109	0.8/3.50	28/124	22	30	69	395	871
PS 1522-10DV	10	145	0.7/3.05	25/108	22	30	69	395	871
PS 1522-13DV	13	175	0.6/2.6	21/92	22	30	69	395	871
PS 2030-7.5DV	7.5	109	1.0/4.63	35/164	30	40	69	615	1,356
PS 2030-10DV	10	145	1.0/4.15	35/147	30	40	69	615	1,356
PS 2030-13DV	13	175	0.9/3.60	32/127	30	40	69	615	1,356
PS 2037-7.5DV	7.5	109	1.3/5.60	46/198	37	50	69	635	1,400
PS 2037-10DV	10	145	1.2/5.00	42/177	37	50	69	635	1,400
PS 2037-13DV	13	175	1.0/4.50	35/159	37	50	69	635	1,400
PS 45-8DV	7.5	109	1.8/7.4	63/261	45	60	73	1000	2,205
PS 45-10DV	10	145	1.9/6.2	67/219	45	60	73	1000	2,205
PS 45-13DV	13	175	1.4/5.5	49/194	45	60	73	1000	2,205
PS 55-8DV	7.5	109	1.8/9.1	63/321	55	75	73	1100	2,426
PS 55-10DV	10	145	2.1/8.2	74/290	55	75	73	1100	2,426
PS 55-13DV	13	175	1.9/6.2	67/219	55	75	73	1100	2,426
PS 75-8DV	7.5	109	2.4/12.1	85/427	75	100	73	1300	2,867
PS 75-10DV	10	145	2.9/10.6	103/374	75	100	73	1300	2,867
PS 75-13DV	13	175	2.1/8.9	74/314	75	100	73	1300	2,867

The air flow rates have been measured at the following working pressures:
7 bar for mod. 7.5 bar - 9.5 bar for mod. 10 bar - 12.5 bar for mod. 13 bar
The data and performances were recorded in accordance with standard ISO 1217. The sound level was measured in accordance with PNEUROP/CAGI standards.

Notes:
All models are CSA approved.
All models complete with CRN approved for Canada.
All models factory tested prior to shipment.

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