

LENTO

OIL-FREE SCREW COMPRESSORS







QUALITY AND INNOVATIONS MADE IN GERMANY.

Decades of experience and excellent performance

ALMiG is one of the leading compressed air technology system providers and has decades of experience delivering premium products in the compressed air sector. Companies all around the world trust in our customer focused solutions, our quality, innovation and flexibility. Our advanced compressor technologies combine excellence with the quietest possible running performance, optimal energy efficiency and particularly careful conservation of resources.

Ongoing development and comprehensive industry knowledge

Constant research and development form the essential foundation for the efficiency of every system manufactured by ALMiG. Only these constant enhancements and improvements enable us to react quickly and flexibly to individual customer wishes. This attitude is complemented by a comprehensive understanding of the sector: we understand the challenges that our customers are faced with and the requirements that arise as a consequence. ALMiG offers effective solutions for a wide range of applications – from small craft workshops to medium-sized companies to big industry.

Complete service and maximum availability

The highest quality technological solutions deserve an equally high level of service. The ALMiG service provisions offer our customers a complete service programme: from providing comprehensive advice to ensuring availability, improving cost-effectiveness and developing energy-saving potential. As an expert partner, ALMiG offers its customers advice and support on all issues. Our goal is to contribute to your economic success with our service offerings.

ALMiG: **Compressor Systems** **Made in Germany**

Piston compressors

Screw compressors

Turbo compressors

Scroll compressors

Special installations

Controllers

Compressed air treatment

Services

LENTO

Oil-free compressed air of outstanding quality

Our LENTO series generates 100% oil-free compressed air for all applications, where products of the highest quality are produced. Given that only water, the most natural of all raw materials, is used in the compression process, LENTO delivers maximum compressed air quality for highly sensitive areas e.g. the pharmaceutical, foodstuffs, electrical engineering and medical industries.

The speed-controlled direct drive of the LENTO series delivers maximum cost-effectiveness by precisely matching the volume flow to the respective compressed air requirement. The integrated refrigeration dryer ensures a low pressure dew point. Therefore, under certain circumstances, the customer doesn't need a separate refrigeration dryer. This avoids costs for the fresh water supply and water processing and minimises service and maintenance costs compared with other oil-free compression systems.

Clean and ecological solution:

- Clean, environmentally friendly oil-free compressed air: ISO class 0, certified in accordance with DIN ISO 8573-1:2010
- Dust particles that are drawn in are washed out by the water
- Clean condensate – pure water – can be discharged directly into the sewer system
- Very low temperatures during compression thanks to excellent heat transfer via the water. Reduced amounts of energy are therefore used to generate the compressed air

Application

100% oil-free compressed air for industrial use (pharmaceutical, food, chemical, etc.)

Power output

15 - 110 kW

Volume flow acc. to ISO 1217
(Annex C-2009)

1.01 - 19.60 m³/min

Operating pressure

5 - 10 bar

Cooling

Water-cooled (standard)

Air-cooled (option)

Only water-cooled available as of LENTO 76

Drive

Direct and speed-controlled

Motor

Energy efficiency class IE 3;
IP 55 protection, protection class F



- + 100% oil-free compressed air generation
- + Volume flow can be adapted exactly to meet compressed air requirements
- + No switching cycles or expensive idle times
- + Energy-saving soft start without current peaks
- + Operating pressure can be freely selected between p_{\min} – p_{\max} in 0.1 bar/1.5 psig increments
- + The reduction in pressure can save money



SCD direct drive

Zero-loss power transfer

Compressor

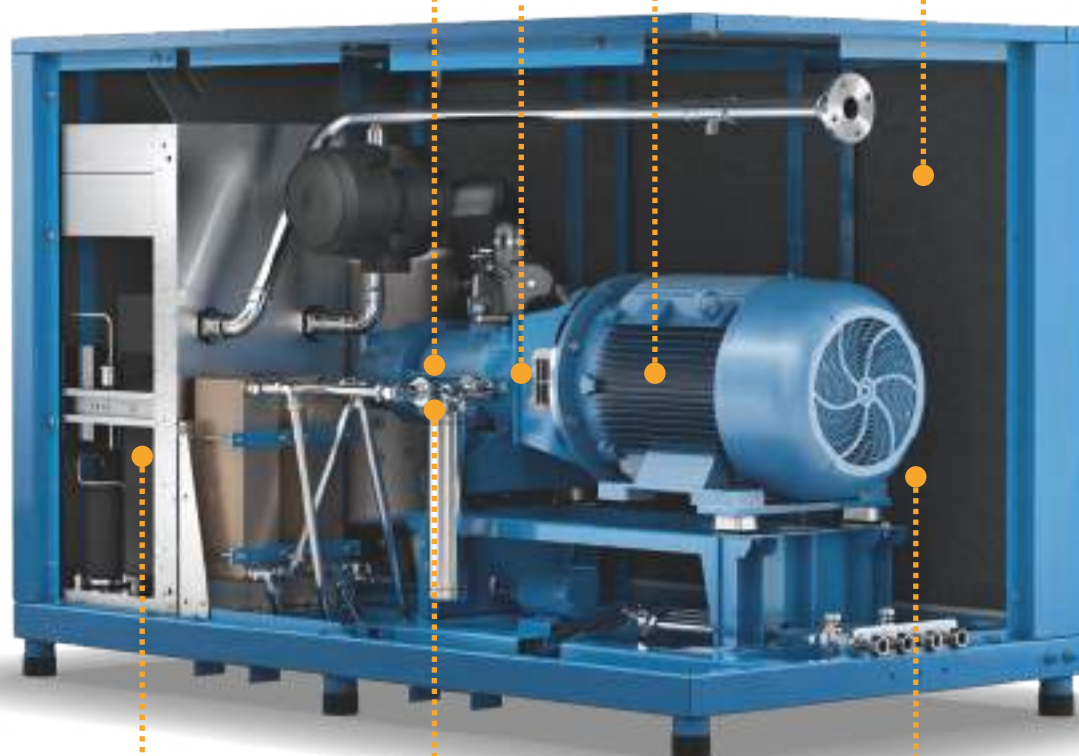
Single-stage, water-injected; very low compression temperatures of $<60^{\circ}\text{C}$, close to isothermic, economical compression

Air Control

Smart controller that monitors, visualises and documents

SCD motor

Highly efficient drive motor, IP 55 protection class ISO F; compact, powerful, reliable



Stainless steel piping

Integrated refrigeration dryer

Permanent generation and exchange of the required coolant, optimum biological and chemical water quality, for dry compressed air at the compressed air outlet

SCD frequency converter

The integrated power pack, according to EMC guidelines

Suitable controllers:

AIR CONTROL P



Standard

AIR CONTROL HE



Optional

LENTO



LENTO 15 - 55, air-cooled

50 Hz speed-controlled							
LENTO	Operating overpressure	Volume flow acc. to ISO 1217 (Annex C-2009)*		Rated motor power	Length	Width	Height
		min.	max.				
	bar	m³/min	m³/min	kW	mm	mm	mm
15	5 - 10	1.01	2.34	15	1880	850	1660
18	5 - 10	1.01	2.87	18.5	1880	850	1660
22	5 - 10	1.01	3.38	22	1880	850	1660
30	5 - 10	1.01	4.30	30	1880	850	1660
31	5 - 10	2.04	5.08	30	2300	1400	1560
37	5 - 10	2.04	6.14	37	2300	1400	1560
45	5 - 10	2.04	7.13	45	2300	1400	1560
55	5 - 10	2.04	8.19	55	2300	1400	1560
46	5 - 10	2.49	8.18	45	2674	1769	1400
56	5 - 10	2.49	9.86	55	2674	1769	1400
75	5 - 10	2.49	12.46	75	2674	1769	1400
76	5 - 10	4.06	13.82	75	3448	1500	1927
90	5 - 10	4.06	16.43	90	3448	1500	1927
110	5 - 10	4.06	19.60	110	3448	1500	1927

* V relates to an operating overpressure of 7 bar at 50 Hz / 100 psig at 60 Hz; LENTO 15–70 (15 / 20–70 / 95) water-cooled as standard, air-cooled as an option; LENTO 75 D (75 / 100 D) and LENTO 80–110 (LENTO 80 / 105–110 / 150) only available as water-cooled



LENTO 46 - 110

60 Hz speed-controlled

LENTO	Operating overpressure	Volume flow acc. to ISO 1217 (Annex C-2009)*		Rated motor power	Length	Width	Height
		min.	max.				
	psig	acfm	acfm	HP	inch	inch	inch
15	75 - 145	36	83	20	74	33.5	65.4
18	75 - 145	36	103	25	74	33.5	65.4
22	75 - 145	36	121	30	74	33.5	65.4
30	75 - 145	36	153	40	74	33.5	65.4
31	75 - 145	72	182	40	90.6	55.1	61.4
37	75 - 145	72	220	50	90.6	55.1	61.4
45	75 - 145	72	255	60	90.6	55.1	61.4
55	75 - 145	72	292	75	90.6	55.1	61.4

LENTO 46 - 110 in 60 Hz Version on request

CONTROLLERS

Smart monitoring,
reliable documentation





NETWORKING WITH AIR CONTROL

Internet-based remote monitoring

In the future it will be even easier to remotely monitor your compressed air generation thanks to visualisation via the ALMiG web server – regardless of where you happen to be at the time. The system ensures high reliability with convenient access to various parameters, prompt messages and comprehensive facts.

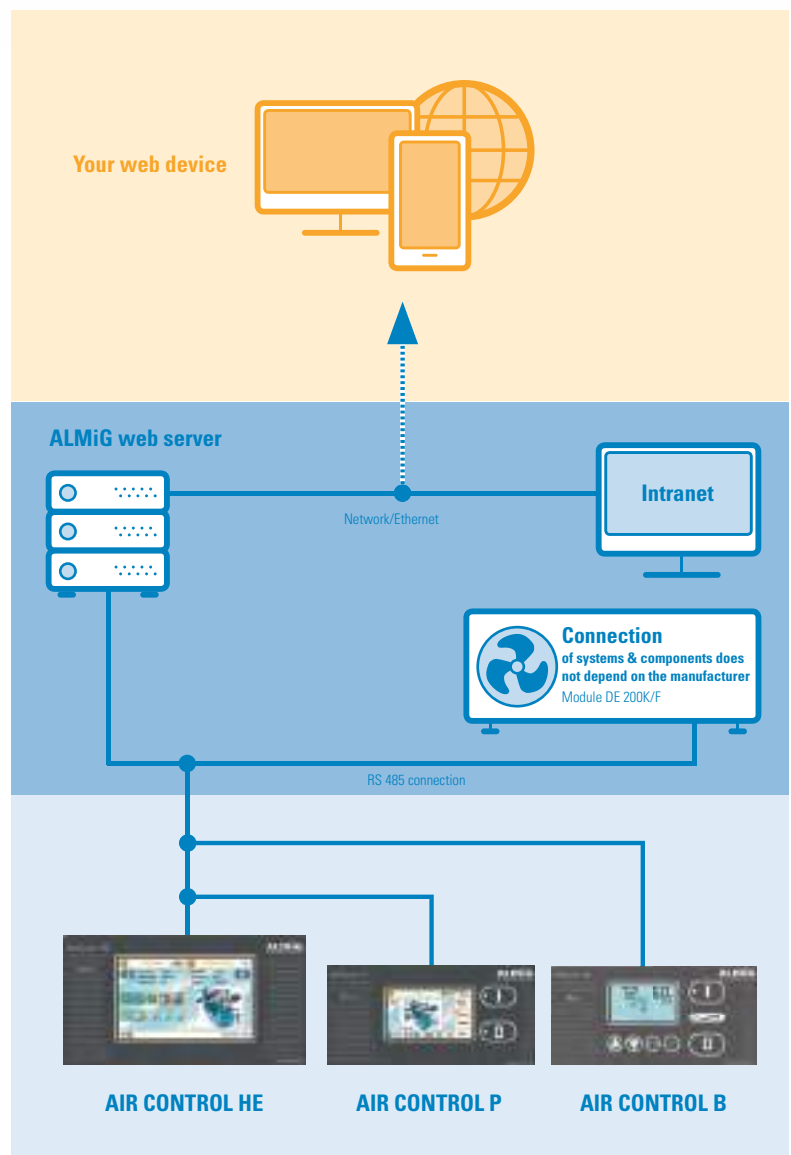
Up to ten compressors can be monitored in this way – regardless of the compressor type. The system works with both piston and screw or turbo compressors. The only prerequisite is that the web server is connected via an AIR CONTROL HE. State-of-the-art bus technology is used for the installation.

Accessible parameters:

- Energy and compressed air balance, also available to download
- Overview of the compressor station with the operating statuses of each individual compressor
- Loaded / idle mode statistics of compressors
- Data on delivery volumes, volume flows and motor starts
- Detailed information about utilisation, network pressure and specific performance data
- Data on energy efficiency and maintenance

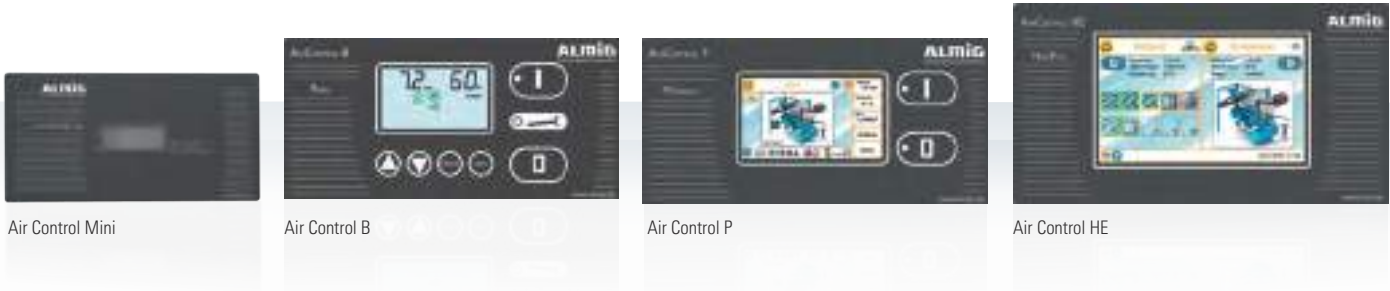
The most important benefits:

- Easy to operate via standard internet browser
- Can be accessed via company's own network or anywhere in the world via the Internet
- Dial-in protected by user ID
- Various parameters are depicted either in tables or graphs
- Continuous monitoring of all parameters of relevance to operation
- Active e-mail notification to up to 5 e-mail addresses in the event of warnings, maintenance work or faults
- Convenient transfer of all relevant data into Office programs such as MS Excel
- The parameters are displayed in a visually appealing way
- CSV files for further processing



AIR CONTROL

Monitored. Visualised. Documented.



Using the ALMiG AIR CONTROL family of controllers you can control, manage and monitor your entire compressed air supply system in the best possible way. The smart, integrated compressor controllers offer you optimum operating convenience and outstanding cost-effectiveness. They deliver maximum reliability in the supply of compressed air and plan maintenance ahead of time.

The very latest microprocessor and communications technology is used, guaranteeing you seamless integration of all compressor models as well as the entire range of accessories. And all that as standard via the RS-485 data bus. The optional connectivity to a web server enables monitoring of your compressor station from anywhere in the world.

AIR CONTROL MINI

- Icon display for the most important operating states, such as compression temperature, dew point and operating pressure
- Programmable automatic restart
- On-site operation – Remote on/off
- Fault memory (no. of positions)
- Refrigeration dryer activation

AIR CONTROL B

- Microprocessor controller
- Illuminated colour LCD display
- Navigation using number keys
- Icon display for all the important operating states, such as mains pressure, final oil and compression temperature
- Maintenance interval indicator
- Fault memory
- Link to superordinate control systems
- Refrigeration dryer activation

AIR CONTROL P

- Microprocessor controller with colour touch screen and illuminated graphic display menu
- Supported user guidance
- Simple connection to all accessory components
- Can be integrated into the customer's own management systems
- Timer programming for optimum adaptation to operational requirements
- "System pass" – the compressor's identity card
- Various language variants available
- Various graphical depictions can be accessed, e.g. volume flow produced as daily and weekly profile
- Basic load cycle switching: another 4 additional compressors (slaves) can be added as master control device
- Fault memory
- Programmable automatic restart
- Extensive statistics with data logging
- System parameters can be saved to a data medium to reduce programming effort

AIR CONTROL HE

Version: Compressor and global control system

- Integrated web server
- Can be used as a consumption-dependent global control system for up to 10 compressors
- Excellent optical display and simplest possible operation using a 7" TFT colour touch screen
- Flexible installation into the compressor or into a separate control cabinet possible
- Comprehensive statistics can be accessed using the data-logging functionality

Version: Global control system

- Quick access to information about the operating state of the connected compressors
- Graphical display of power and consumption profiles
- Leaks can be identified and displayed
- Priorities can be allocated
- Energy-saving – all the compressors operate in one pressure tolerance range
- Can be connected to higher-level control systems or a web server

Further functionality and benefits:

- + Huge potential savings by reducing idling levels and lowering pressure levels
- + Transparency when it comes to the compressors and accessories, at all times
- + Reductions in maintenance time and downtimes

SPEED CONTROL

Needs-based adaptation of delivery volumes





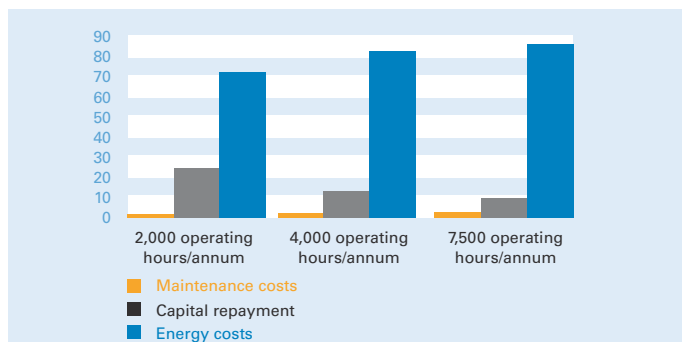
INTELLIGENT SYSTEMS YOU CAN RELY ON

Speed-controlled screw compressors

Cost-effective and sustainable: Kind to your wallet and the environment.

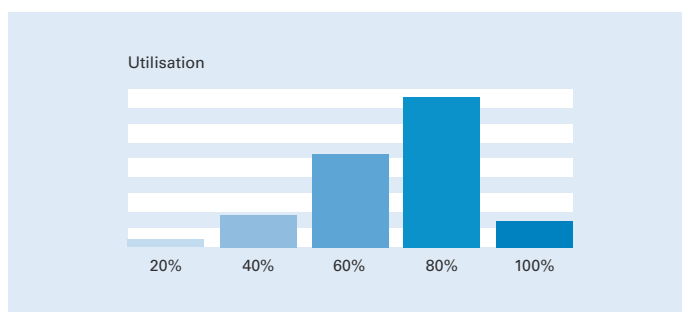
According to a study, approx. 80 billion kWh of electricity is used in compressed air systems in the EU each year, more than 10% of the electricity required in industry. So the cost-effectiveness of a compressed air system isn't about how much it costs to buy, but how much it costs to run on a day-to-day basis. And this is where speed-controlled screw compressors from ALMiG really come into their own:

- Precise adaptation of delivery volumes
- Fewer idle times
- Less load shedding
- Constant line pressure
- Direct drive
- Fewer leakages



Capacity utilisation of the compressor: Flexible tolerance for greater cost-effectiveness.

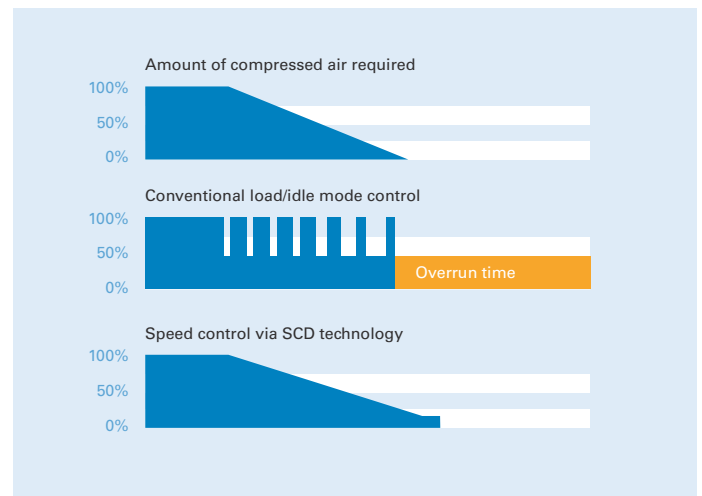
From experience, we know that most compressors are only used at between 50 and 70% of capacity. The maximum delivery volume is in most cases only used during peak times.



Speed control: The key component of your compressed air system.

By varying the system's motor speed, you automatically and sensitively adapt its delivery volume to its variable air consumption.

- If you require more compressed air, you need simply increase the motor speed and therefore the compressor speed. The delivery volume increases.
- If you require less compressed air, you need simply decrease the motor speed and therefore the compressor speed. The delivery volume decreases.



Precise adaptation of delivery volumes: No more annoying switching times.

If you're exploiting your system at 100% capacity, all compressors work at full load. If, however, you require less compressed air, the conventional compressor changes to loaded/idle mode, causing the drive motor to switch. In this situation, you have to take into account the pre-set over-run time. This has a negative impact on your energy bill.

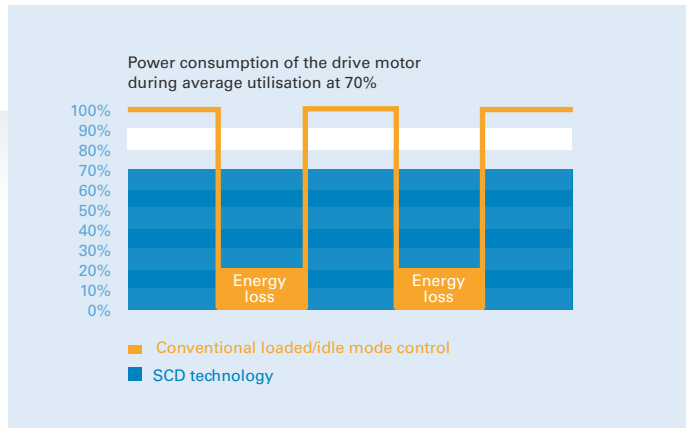
The VARIABLE and V-Drive series vary their power by gently and continually changing speeds, not by abruptly switching on and off.

Delivery volumes are continually adapted to your present requirements, so the process is kind to both your components and your wallet:

- No expensive idle mode, which consumes at least 25 – 30% of the energy consumed at full load.
- No more switching times which place a heavy mechanical load on the components.

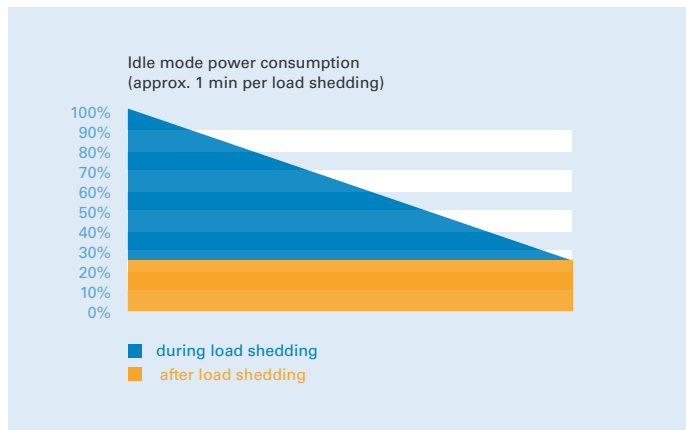
Productivity without idle mode: the ALMiG efficiency programme

In idle mode, a compressor consumes around 25 to 30% of the energy consumed at full load. Variable compressors adjust the speed of the compression element automatically and exactly to the value needed for the volume flow required. SCD (Speed Control Direct drive) technology also ensures that only the power that corresponds to the speed is used. So compressors can considerably cut energy costs even when loaded at 70% of capacity.



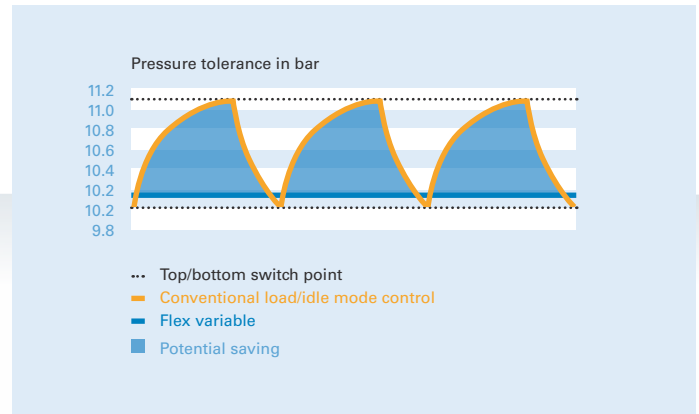
Less load shedding in fluctuating networks

Fluctuating networks cause the compressor to constantly change from loaded to idle mode (and back again). Each time the compressor changes mode, it sheds its load for around one minute.



A constant line pressure allows you to save a huge amount of energy

Speed-controlled compressors run at a constant operating pressure ($p \sim 0.1$ bar). Because high pressure always involves consuming greater amounts of energy, speed-controlled compressors allow you to make huge energy savings (1 bar higher pressure = 6 – 8% greater energy consumption).



ALMiG direct drive: The frictional connection

The compressor block is directly driven by the drive motor – and without any transmission loss.

This brings major benefits with it:

- Maximum power transfer
- Constant high efficiency of up to 99.9% over its entire working life
- Less noise and less maintenance effort than with V-belt and gear drives
- Excellent reliability.

Direct drive vs V-belt drive savings:

- V-belt drive (up to 96 – 97%)
- Direct drive (up to 99.9%) 4,000 h/year, 60 kW motor, $2.4 \text{ kW} \times 4,000 = 9,600 \text{ kWh}$

Fewer leakages thanks to reduced pressure: Speed control provides the answer

Almost all compressed air lines have leakages. The amount they leak depends on the pressure in the piping, among other things. The average leakage rate of a compressed air station is around 20 – 30%. By decreasing the pressure by just 1 bar (e.g. by controlling the speed), these leakages drop by approx. 10%.

In addition, speed-controlled compressors with direct drive are very energy-efficient (no current peaks) and are also much quieter than comparable models with a V-belt drive.



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