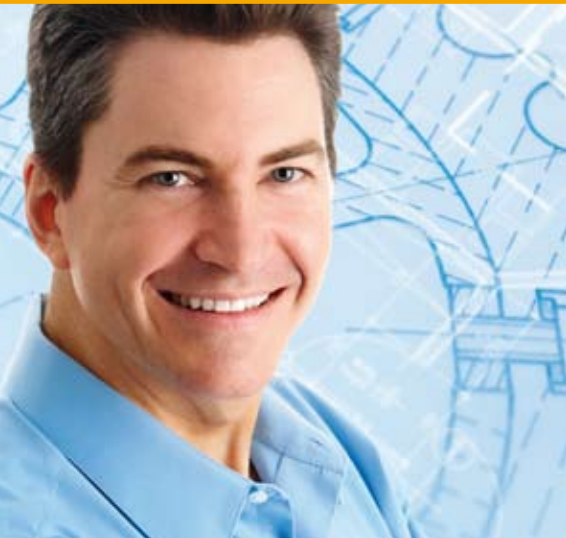


[www.almig.de](http://www.almig.de)

**ALMIG**  
since 1923

# SPEED-CONTROLLED OIL-FREE SCREW COMPRESSORS

Volume flow: 7.0 – 35.8 m<sup>3</sup>/min • 249 – 1264 acfm



**DUPL**EXX DRIVE

A stylized logo for Duplexx Drive, featuring a white staircase with a blue wave-like line running through it.

# INTELLIGENTE DRUCKLUFT MADE IN GERMANY

## ALMiG Kompressoren GmbH

A name that guarantees top-grade technology in the compressed air sector. ALMiG has emerged from a company with a long tradition, whose products in the compressed air industry have always stood for quality, innovation and consideration of its customers.

Today ALMiG is an extremely flexible company which can react fast to special customer requests. It stands by its customers as a competent partner, giving advice and practical support.

It goes without saying that, as one of the leading suppliers of advanced compressed air systems, our commitment to continuous research and development forms the basis for all the plants we manufacture.

They meet the acceptance criteria in compliance with:

- ISO 1217-3 Annex C-1996
- ASME
- OSHA

and comply with the CE guidelines.

Even the most stringent acceptance criteria such as:

- DET NORSKE VERITAS
- GERMANISCHER LLOYD
- BUREAU VERITAS
- LLOYD' s REGISTER OF SHIPPING
- ABS

is a matter of course for us.

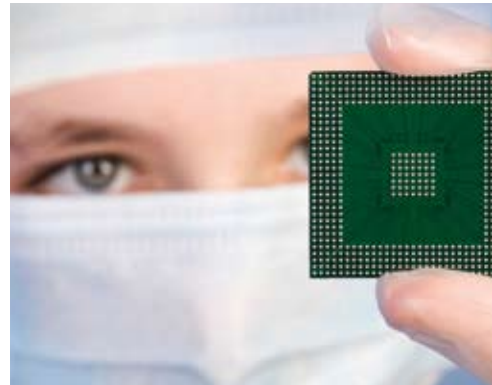
The company ALMiG is certified in compliance with:

- IRIS 02
- ISO 9001: 2008
- ISO 14001: 2004

**Our motto is:**

If you have stopped improving, you have stopped being good!

**100 % oil-free compressed air from ALMiG – generated using reliable and economic technology!**



# ISO 8573-1 CLASS 0, CLEAN COMPRESSED AIR TO SATISFY THE MOST STRINGENT REQUIREMENTS

Use economic technology to generate 100 % oil-free compressed air and guarantee high standards in the long term

There are many of factors that can influence the quality of compressed air. Oil and oil aerosols in a compressed air system, for instance, can result in lower-quality products and expensive production downtimes.

It's an incalculable risk.

Guaranteed 100 % oil-free compressed air of the highest quality is good for your pocket and the environment.

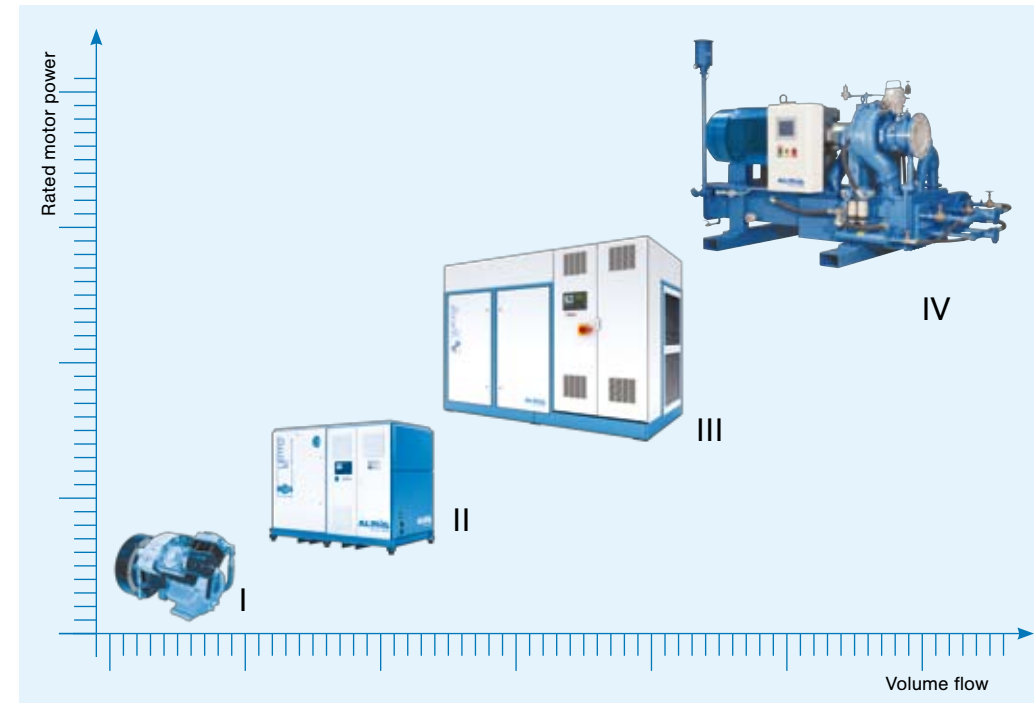
This high-quality compressed air has long since been a standard in the medical, pharmaceutical, food production and electrical engineering industries. It is increasingly used wherever high-quality and clean products and services are manufactured and contamination is to be avoided

Completely safe thanks to ISO 8573-1 CLASS 0

ISO 8573-1 CLASS 0 specifies the compressed air quality classes. It is one of the most stringent classifications for oil impurities in the form of liquids, vapours and aerosols.

TÜV Rheinland, a leading international testing and inspection institute, subjected ALMiG products to extensive, stringent tests at various temperatures and pressure ranges and certified them in accordance with ISO 8573-1 class 0.

The right compression system to satisfy all compressed air requirements



| Class | Total oil concentration (aerosol, liquid, steam) [mg/m³]   |
|-------|--|
| 0     | In accordance with system operator's or supplier's specification and more stringent than class 1 |
| 1     | ≤ 0.01   |
| 2     | ≤ 0.1  |
| 3     | ≤ 1  |
| 4     | ≤ 5  |



| ... the oil-free solutions from ALMiG |                              |                   |          |             |           |                        |           |  |
|---------------------------------------|------------------------------|-------------------|----------|-------------|-----------|------------------------|-----------|--|
|                                       | Compression system           | Rated motor power |          | Volume flow |           | Operating overpressure |           |  |
|                                       |                              | [kW]              | [HP]     | [m³/min]    | [acfm]    | [bar]                  | [psig]    |  |
| I                                     | Piston                       | 1.5–11.4          | 2–15.5   | 0.15–1.76   | 5.3–62.1  | up to 10               | up to 145 |  |
| II                                    | 1-stage water-injected screw | 15–110            | 20–105   | 0.86–19.5   | 30.3–689  | 5–13                   | 70–190    |  |
| III                                   | 2-stage dry screw            | 75–250            | 100–340  | 7.0–35.8    | 249–1264  | 4–10.5                 | 60–150    |  |
| IV                                    | TURBO                        | 200–2000          | 250–2500 | 25–350      | 900–12360 | up to 10.5             | up to 150 |  |

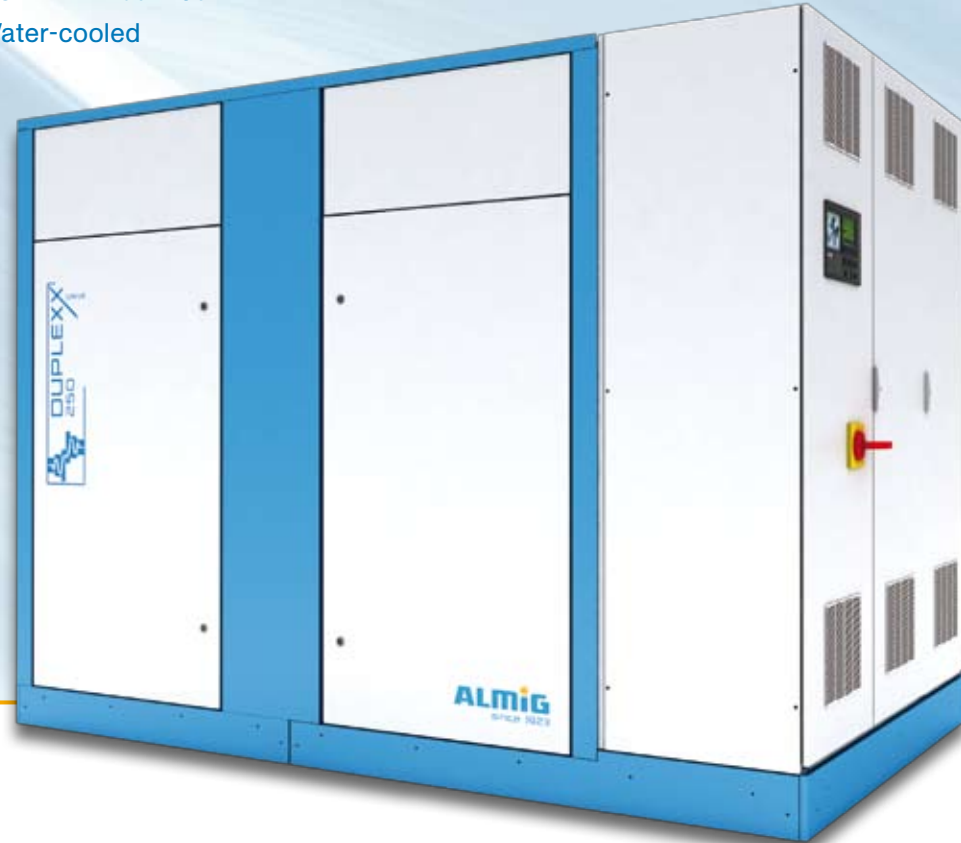


## DUPLEXX – THE FUTURE STARTS HERE ...

DUPLEXX 75–145  
Air-cooled



DUPLEXX 160–250  
Water-cooled



- ... Energy-saving speed control fitted as standard
- ... Direct drive without coupling or gears
- ... Permanent FPS coating on compressor rotors for consistently high level of efficiency
- ... Self-learning control for optimum energy-saving adjustment to meet requirements
- ... Variable, „adjustable“ compression ratio between first + second compressor stage thanks to the ALMiG TT-control®

## A DESIGN CONCEPT THAT SETS STANDARDS



DUPLEX 110-145  
Water-cooled

- |            |  |            |  |
|------------|--|------------|--|
| <b>1.1</b> | First motor stage  | <b>5.2</b> | Pulsation damper stage 2   |
| <b>1.2</b> | Second motor stage   | <b>6</b>   | Control cabinet complete with frequency converter and all of the components required |
| <b>2.1</b> | First compressor stage                                     | <b>7</b>   | AirControl with ALMiG IT-control®  |
| <b>2.2</b> | Second compressor stage                                    | <b>8</b>   | Large high-quality intake filter   |
| <b>3.1</b> | Intercooler (here: water-cooled version)                   | <b>9</b>   | Liquid-tight machine frame   |
| <b>3.2</b> | Aftercooler (here: water-cooled version)                   | <b>10</b>  | Oil cooler   |
| <b>4</b>   | Cyclone separator (behind intercooler, behind aftercooler) | <b>11</b>  | Oil pump   |
| <b>5.1</b> | Pulsation damper stage 1                                   |            |  |

# THE OIL-FREE COMPRESSOR WITH A TWIST ...

## Conventional technology – revolutionised!

For a number of years now, the compressed air market has seen virtually no changes to oil-free 2-stage screw compressors. This was reason enough for the engineers at ALMiG to aim high and develop a new and improved compressor with a twist. And they did just that!

### Highly efficient compressor stages

The compressor stages are the key component of any compressor. Over time, they are subjected to extreme loads and should therefore be of a particularly high manufacturing quality.

- The special FPS surface coating
  - Is a chemical/physical coating that penetrates as far as the microtopography of the rotors

- Is permanently abrasion-proof and therefore delivers a long-lasting, constant level of efficiency and a consistently high delivery volume
- Is temperature-stable between  $-40$  and approx  $+300^{\circ}\text{C}$  ( $-40$  to approx  $+570^{\circ}\text{F}$ )
- Is FDA-approved
- The coolant in the double-walled compressor housing guarantees even distribution and discharge of heat, whereby the temperatures of cold and hot areas are balanced and thermal stress is avoided
- Extremely low manufacturing tolerances guarantee consistently high overall stage efficiency

- Pressure balance pistons guarantee effective axial thrust balance of the bearing forces and long bearing service lives.
  - The bearing service life is engineered for power reserve, e.g. 132 kW/7 bar, 100 000 operating hours.

### Drive without gears

As there is no coolant within the compressor stages, 2-stage compression is needed to generate oil-free, dry compressed air.

Normally, the 2 compressor stages are powered by a large drive motor and a highly complex set of gears consisting of 1 main gearbox and 2 drive gears. This is not the case with ALMiG technology!

We are setting new standards in drive technology by using 2 small, speed-controlled motors that work independently of one another and power the 2 compressor stages using a coupling-free direct drive.

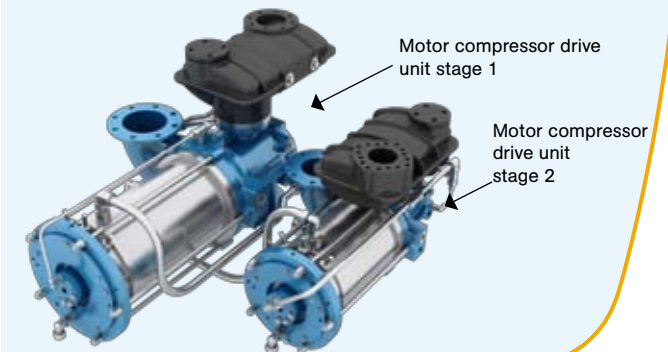
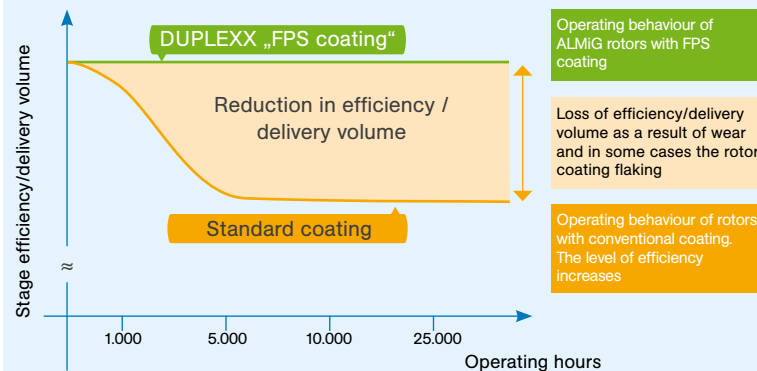
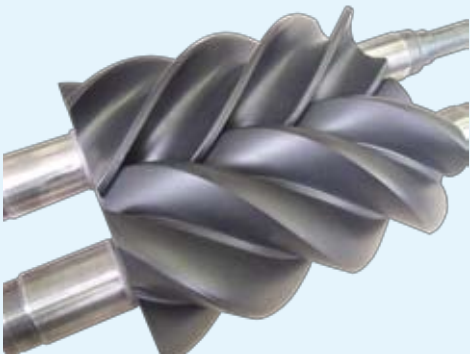
### The benefit:

- Gear-free direct drive
- Simplest drive system ever
- Completely non-sensitive and therefore low-maintenance
- Highest possible drive efficiency,  $\sim 99.9\%$

Permanently coated compressor stages ...

... with the FPS coating for constantly high level of stage efficiency

Loss-free drive motor – compressor stage



# ... TRENDSETTER IN THE COMPRESSED AIR SECTOR

## The “integrated single shaft solution”

The drive motors are directly mounted on the shaft ends of the rotors. The benefits of this structural innovation are:

- Motors are operated without A + B bearing; one step bearing is sufficient.
  - The motor support bearing does not need to be lubricated
  - No need to change bearings as a precaution
    - this saves money
    - If there is no bearing, it cannot fail
- Enhanced operating safety and minimal maintenance

## Speed-controlled, oil-cooled asynchronous motors

ALMiG is exploring new avenues here too, relying on quality and complete operating safety by using oil-cooled, speed-controlled asynchronous motors.

The benefits:

- Best possible heat discharge compared with „standard“ air-cooled motors
  - Smaller motors, yet they deliver the same power
- Motors can even be used under extreme temperature conditions

- Protection class IP 66
  - Highest possible protection class
  - Completely non-sensitive to dust and moisture
- Standard automatic direction of rotation function as the frequency converters protect the drive motors against incorrect rotation
  - Direction of rotation is automatically selected correctly
  - No damage if the incorrect electrical connection is used
- An oil cooler integrated in the system and an oil pump guarantee effective oil cooling and safe flow of cooling oil

## Maximum efficiency

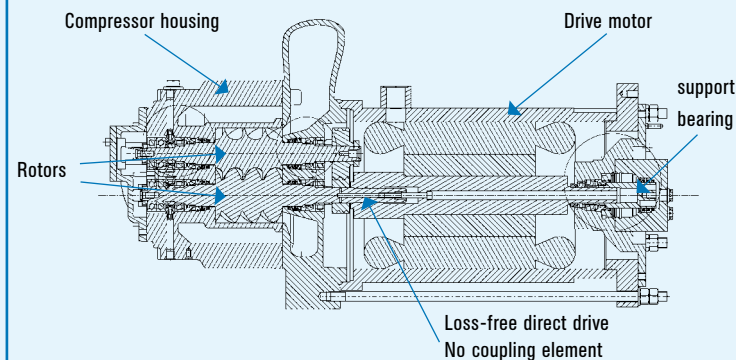
Nowadays, it is essential to use energy responsibly to conserve resources, cut CO<sub>2</sub> emissions and reduce energy costs. The electrical drives play a key role in fulfilling these requirements.

ALMiG already complies with the efficiency specifications that will come into force over the next few years.

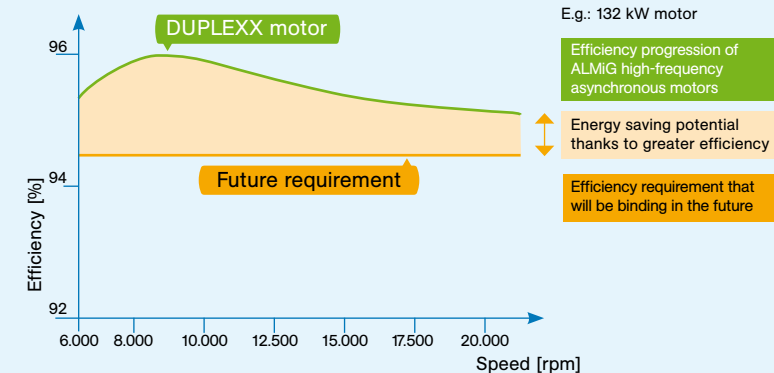
Highly efficient, oil-cooled asynchronous motors



The “integrated single shaft solution” from ALMiG



Motor efficiency



# ENERGY SAVING + COMPLETE FLEXIBILITY ...

## Energy-saving speed control as standard

We don't make any compromises when it comes to controlling compressors!

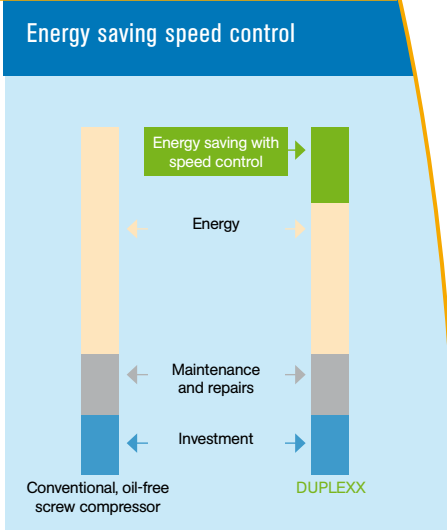
An intelligent overall concept such as this requires an energy-efficient solution and speed control, which comes as standard in the entire DUPLEXX range. The benefits:

- Volume flow can be adapted exactly to meet compressed air requirements
- No switching cycles or expensive idle times
  - During idle mode, a compressor with a fixed speed normally requires  $\geq 25\%$  energy without generating compressed air. This is not the case with DUPLEXX technology!
- Economical startup without current peaks
  - No max. motor switching cycles = drive motor can be started and stopped as often as required
  - Cables, fuses and transformers can be reduced in size

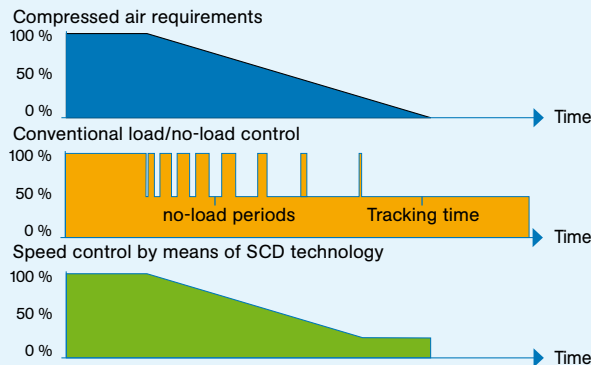
## Operating pressure can be freely selected

You are free to select the operating pressure of the compressors between 4.0–10.5 bar (60–150 psig) in incremental values of 0.1 bar (1.5 psig).

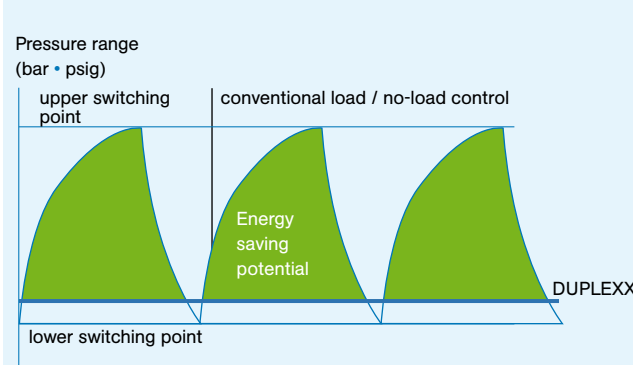
- There is no pressure variant specified, which means that the compressed air user has complete flexibility!
  - All operational requirements can therefore be optimally adapted, e.g. at the weekend or during shift operation.
- Reduction in pressure saves money, 1 bar (14.5 psig) reduction in pressure corresponds to
  - approx. 6 – 8 % energy saving for the connected compressors
  - approx. 10 % reduction in the amount of leaking compressed air



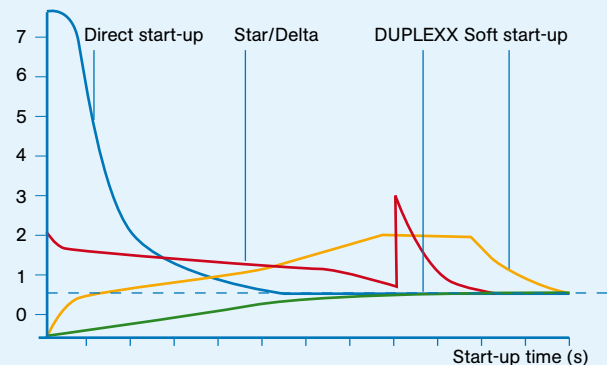
### Adjusts volumetric flow rate exactly



### Prevents switching operations



### Full-load current consumption, motor (A)





# ... THANKS TO STATE-OF-THE-ART CONTROL TECHNOLOGY

## ALMiG control technology

### AirControl 3

#### AirControl 3: “even more power – as standard”

The user-friendly microprocessor control AirControl 3 records all relevant system data, which it monitors and documents, thereby providing an optimum communication interface.

#### It features:

- Illuminated graphic display
- Menu-supported user guidance
- Timer programming for optimum adaptation to operational requirements

- Simple connection to all accessory components
  - RS 485 interface for data communication
    - Connection to superior control systems/visualisation/telemonitoring
    - Can be integrated into the customer's own management systems
  - “Base load alternating switch” (1x master, 8x slaves)
    - All of the compressors integrated in the bus system travel along the same pressure belt
- Guaranteed energy saving

### ALMiG $\pi$ -control®

#### Variable compression ratio – unique in the compressed air sector

When using conventional 2-stage oil-free screw compressors, there is always a fixed compression ratio between stage 1 and stage 2 as a result of the structural specification of a gear ratio. This compression ratio is not always within the optimum energy range.

Depending on the operating conditions, ALMiG can automatically optimise the compression ratio using the  $\pi$ -control®, which is unique on the compressed air market, thanks to the new gear-free drive.

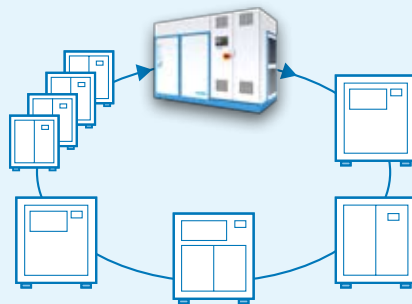
When the operating pressure is constant (optimisation phase of  $\pi$ -control®), the frequency converters measure the energy requirement of the individual compressor stages and set the compression ratio between stages 1 + 2 such that the energy requirement is always within the optimum energy range.

Depending on compressor utilisation and operating conditions, it is possible to cut energy consumption by between 2–7 % compared with conventional compressors.

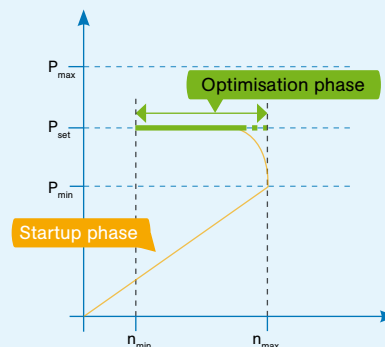
AirControl 3: the intelligence



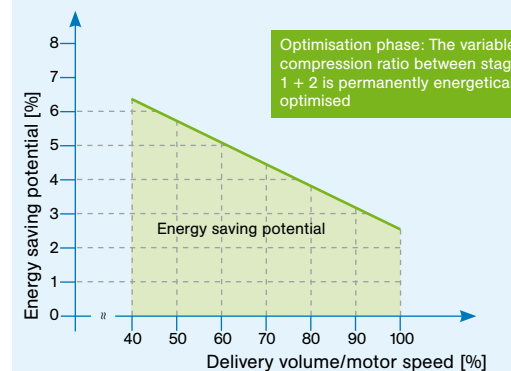
ALMiG “Master-slave network”



Optimisation phase saves money



Energy saving potential thanks to ALMiG  $\pi$ -control®



# CUSTOMER SERVICE

## ALMiG provides more than just compressed air

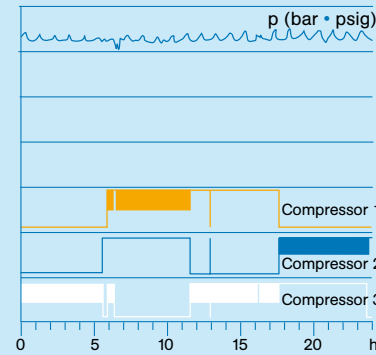
We also offer our customers a comprehensive compressed air technology service.

Highly qualified engineers will assist you in all areas of application, from the consultation and planning phase through to installation, to work out the solution that's right for you.

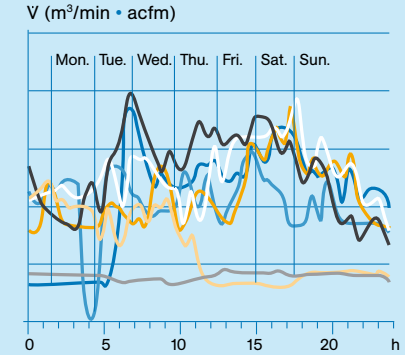
- Customised solutions – from planning through to implementation
- Complete project management to turnkey stations
- Coordinated accessories for the entire preparation stage

- Online and remote monitoring (visualisation/telemonitoring) of the entire compressed air station
- Energy-saving heat recovery systems in the form of
  - hot air to help heat rooms
  - Hot water e.g. for boosting central heating or for industrial water
- Fast service thanks to qualified specialists
- Compressed air analyses

### Operating conditions/Pressure – daily profile



### Air flow – weekly profile



## Compressed air engine audit

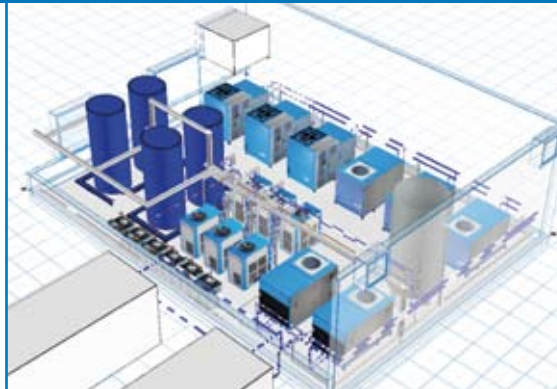
We only base our decisions on facts.

Which is why

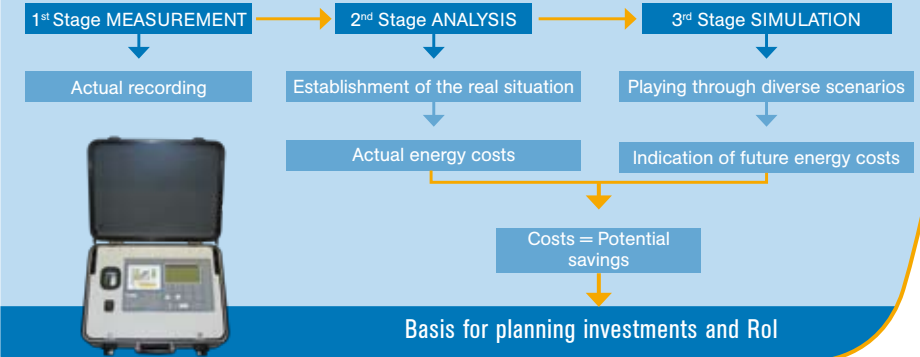
**we analyse first, then make a decision.**

ALMiG specialists will therefore use a precise consumption measurement procedure to determine your current compressed air consumption and work with you to develop an ideal system solution.

### Customised solutions from planning through to implementation



### EBS Energy Balancing System



# FACTS AND FIGURES

Generate your oil-free compressed air the energy-efficient way

| 50 Hz            |                         |   |                     |                   |        |       |        |        |
|------------------|-------------------------|---|---------------------|-------------------|--------|-------|--------|--------|
| DUPLEXX          | Operating over-pressure | Volume flow* in accordance with ISO 1217 (Annex C-1996) |                     | Rated motor power | Length | Width | Height | Weight |
|                  |                         | min.  | max.                |                   |        |       |        |        |
|                  | bar                     | m <sup>3</sup> /min                                     | m <sup>3</sup> /min | kW                | mm     | mm    | mm     | kg     |
| Speed-controlled |                         |   |                     |                   |        |       |        |        |
| 75               | 4-10.5                  | 7.5   | 12.8                | 75                | 2495   | 1530  | 1790   | 3350   |
| 90               | 4-10.5                  | 7.5   | 15.4                | 90                | 2495   | 1530  | 1790   | 3350   |
| 110              | 4-10.5                  | 7.05  | 19.3                | 110               | 2495   | 1530  | 1790   | 3500   |
| 132              | 4-10.5                  | 7.05  | 21.8                | 132               | 2495   | 1530  | 1790   | 3550   |
| 145              | 4-10.5                  | 7.05  | 23.2                | 145               | 2495   | 1530  | 1790   | 3550   |
| 160              | 4-10.5                  | 12  | 25.4                | 160               | 2940   | 1800  | 2560   | 5000   |
| 200              | 4-10.5                  | 12  | 28.7                | 200               | 2940   | 1800  | 2560   | 5200   |
| 250              | 4-10.5                  | 14.5  | 35.8                | 250               | 2940   | 1800  | 2560   | 5200   |

| 60 Hz            |                         |   |      |                   |        |       |        |        |
|------------------|-------------------------|---|------|-------------------|--------|-------|--------|--------|
| DUPLEXX          | Operating over-pressure | Volume flow* in accordance with ISO 1217 (Annex C-1996) |      | Rated motor power | Length | Width | Height | Weight |
|                  |                         | min.  | max. |                   |        |       |        |        |
|                  | psig                    | acfm  | acfm | HP                | inch   | inch  | inch   | lbs    |
| Speed-controlled |                         |   |      |                   |        |       |        |        |
| 75 / 100         | 60-150                  | 265   | 452  | 100               | 98.2   | 60.2  | 70.5   | 7385   |
| 90 / 125         | 60-150                  | 265   | 544  | 125               | 98.2   | 60.2  | 70.5   | 7385   |
| 110 / 150        | 60-150                  | 249   | 681  | 150               | 98.2   | 60.2  | 70.5   | 7716   |
| 132 / 175        | 60-150                  | 249   | 770  | 175               | 98.2   | 60.2  | 70.5   | 7826   |
| 145 / 190        | 60-150                  | 249   | 819  | 190               | 98.2   | 60.2  | 70.5   | 7826   |
| 160 / 215        | 60-150                  | 424   | 897  | 215               | 115.7  | 70.8  | 100.8  | 11025  |
| 200 / 270        | 60-150                  | 424   | 1013 | 270               | 115.7  | 70.8  | 100.8  | 11465  |
| 250 / 340        | 60-150                  | 512   | 1264 | 340               | 115.7  | 70.8  | 100.8  | 11465  |

Compressors available also with fixed speed drive. Systems water-cooled as standard, with air cooling as an option – dimensions/weight for water-cooled version

Dry your oil-free compressed air the energy-efficient way



Saving energy is the key.

DUPLEXX and ALM-HOC are perfectly matched to one another for every kW class, offering the maximum possible scope for saving energy.

ALM-HOC series pressure dew points of down to -40 °C

In the ALM-HOC (heat of compression) series, the compressed air is only dried using compression heat, **with no additional energy supplied.**

The ALM-HOC series offers:

- a stable pressure dew point, even in partial load/control mode
- great economic viability thanks to flow-optimised fittings for minimum differential pressures
- efficient cooling from the partial flow of the cold compressed air volume flow

| ALM-HOC | volume flow         | Length | Width | Height | Weight | stable pressure dew point of down to -40°C |
|---------|---------------------|--------|-------|--------|--------|--|
|         | m <sup>3</sup> /min |        |       |        |        |  |
| 900     | 13.3                | 1430   | 1050  | 2140   | 1100   |  |
| 1500    | 21.7                | 1750   | 1150  | 2100   | 1450   |  |
| 1900    | 28.3                | 1800   | 1350  | 2260   | 1850   |  |
| 2600    | 38.3                | 2050   | 1550  | 2430   | 2300   |  |
| 3300    | 48.3                | 2050   | 1570  | 2430   | 2650   |  |
| 3800    | 56.7                | 2300   | 1650  | 2500   | 2900   |  |
| 4700    | 69.2                | 2500   | 1800  | 2620   | 3450   |  |
| 5600    | 83.3                | 2800   | 1850  | 2700   | 3900   |  |
| 6700    | 100.0               | 3000   | 1950  | 2750   | 4400   |  |

- Volume flow at 20°C and 1 bar (absolute), operating pressure 7 bar (overpressure) and an adsorption temperature of 35°C (saturated).
- Water-cooled dryer / larger dryer on request

| Correction factor F depending on operating pressure in bar (overpressure) |      |   |      |      |      |
|---|------|---|------|------|------|
| 5   | 6    | 7 | 8    | 9    | 10   |
| 0.75  | 0.87 | 1 | 1.12 | 1.25 | 1.37 |

Example of how to calculate size

Inlet volume flow  $V_{\text{eff}}$ : 30 m<sup>3</sup>/min

Operating pressure: 8 bar (overpressure)

Correction factor F: 1.12

$$V_{\text{corr}} = \frac{V_{\text{eff}}}{F} = \frac{30}{1.12} = 26.8 \text{ m}^3/\text{min}$$

Size selected: ALM-HOC 1900

## INTELLIGENTE DRUCKLUFT MADE IN GERMANY

### In line with the customer's needs

With our innovative system concepts we offer customised solutions for almost all applications. Our endeavour lies not only in supplying compressors, we

offer ourselves as a competent system provider capable of offering solutions to all users of compressed air. That does not only apply to the consultation and installa-

tion phase of your new compressor(s), but naturally continues in all areas of service, maintenance and visualisation.  
**Challenge us!**

| Screw compressors<br>2,2 – 500 kW  | Piston compressors<br>1,5 – 55 kW  | Turbocompressors<br>200 – 2000 kW   | Blower<br>1,5 – 55 kW  | Complete accessories  | Control, regulate, monitor  |
|--|--|---|--|---|---|
| <ul style="list-style-type: none"> <li>• Fixed speed</li> <li>• With energy-saving speed control</li> <li>• Oil-free, with water injection</li> <li>• Oil-free, 2-stage</li> </ul> <p>Available drive types:</p> <ul style="list-style-type: none"> <li>• V-belt</li> <li>• Gearbox</li> <li>• Direct</li> </ul> | <ul style="list-style-type: none"> <li>• Oil-lubricated</li> <li>• Oil-free</li> <li>• Normal pressure, medium pressure, high-pressure</li> <li>• Booster</li> <li>• Mobile / stationary</li> </ul> <p>Available drive types:</p> <ul style="list-style-type: none"> <li>• V-belt</li> <li>• Direct</li> </ul> | <ul style="list-style-type: none"> <li>• Oil-free</li> <li>• Radial, 3-stage compression</li> <li>• With / without sound-absorbing housing</li> </ul> <p>Available drive types:</p> <ul style="list-style-type: none"> <li>• Gearbox</li> </ul> | <ul style="list-style-type: none"> <li>• Fixed speed</li> <li>• With energy-saving speed control</li> </ul> <p>Available drive types:</p> <ul style="list-style-type: none"> <li>• V-belt</li> <li>• Direct</li> </ul> | <ul style="list-style-type: none"> <li>• Refrigerant dryers</li> <li>• Desiccant dryers, heatless and heat-regenerative</li> <li>• HOC (heat of compression)</li> <li>• Activated carbon adsorbers</li> <li>• Filters, all particle sizes</li> <li>• Condensate management</li> <li>• Heat recovery systems</li> <li>• Pipework Systems</li> </ul> <p>All components are optimally matched to the compressors</p> | <ul style="list-style-type: none"> <li>• Base load changeover controls</li> <li>• Consumption-related controls</li> <li>• Visualisation (we display your compressed airstation on the PC)</li> <li>• Telemonitoring (the hotline of your compressed air station)</li> </ul> |

### Our quality standards mean you can rely on our machines



ISO 9001



ISO 14001



IRIS



Your expert advisor