Dry-Running
Rotary Screw Compressors

Two-stage, Free air delivery up to 51 m³/min, Pressure 4, 6, 8 and 10 bar

OILFREE.AIR

KAESER COMPRESSORS

OILFREE.AIR

The new dimension in oil-free compression

Two-stage dry-running KAESER rotary screw compressors not only impress with their meticulous design, but also with their many innovative details – all of course with renowned KAESER quality.

Long-term efficiency

Compressed air simply has to be available where and whenever it is needed. KAESER dry-running two-stage rotary screw compressors are therefore built to last and to ensure many years of dependable service. Comprising tried and tested components that have been developed as a result of KAESER's near century of experience in mechanical engineering, KAESER compressors deliver the durability and compressed air availability to meet even the toughest of demands.

Innovation you can trust

Using all of the advantages that KAESER's advanced Research and Development Centre in Coburg has to offer, KAESER's engineers designed every detail of the two-stage dry-running rotary screw airend with maximum efficiency and performance in mind. As a result, KAESER dry-running screw compressors, for example, are available with air-cooling for drive powers up to 355 kW.

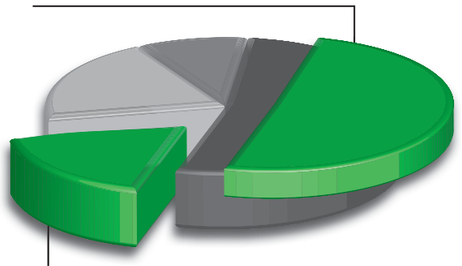
Efficiency as standard

KAESER quality and expertise really count when it comes to those all-important total system costs for asset investments such as compressors or complete compressed air supply systems. Lowest possible compressed air costs and maximum availability can be guaranteed only through a combination of perfect interplay between energy efficiency and service / maintenance, and by viewing the compressed air supply system as a whole.

Service-friendly

These versatile systems were engineered for maximum ease-of-use and servicing right from the outset of the design stage. Fewer wearing parts and the use of premium quality materials ensure reduced maintenance requirement, longer service intervals and extended service life. Excellent component accessibility as a result of generously sized maintenance doors and a swing-out cooler are just some of the features that make servicing so effortless.

Potential energy cost savings through heat recovery



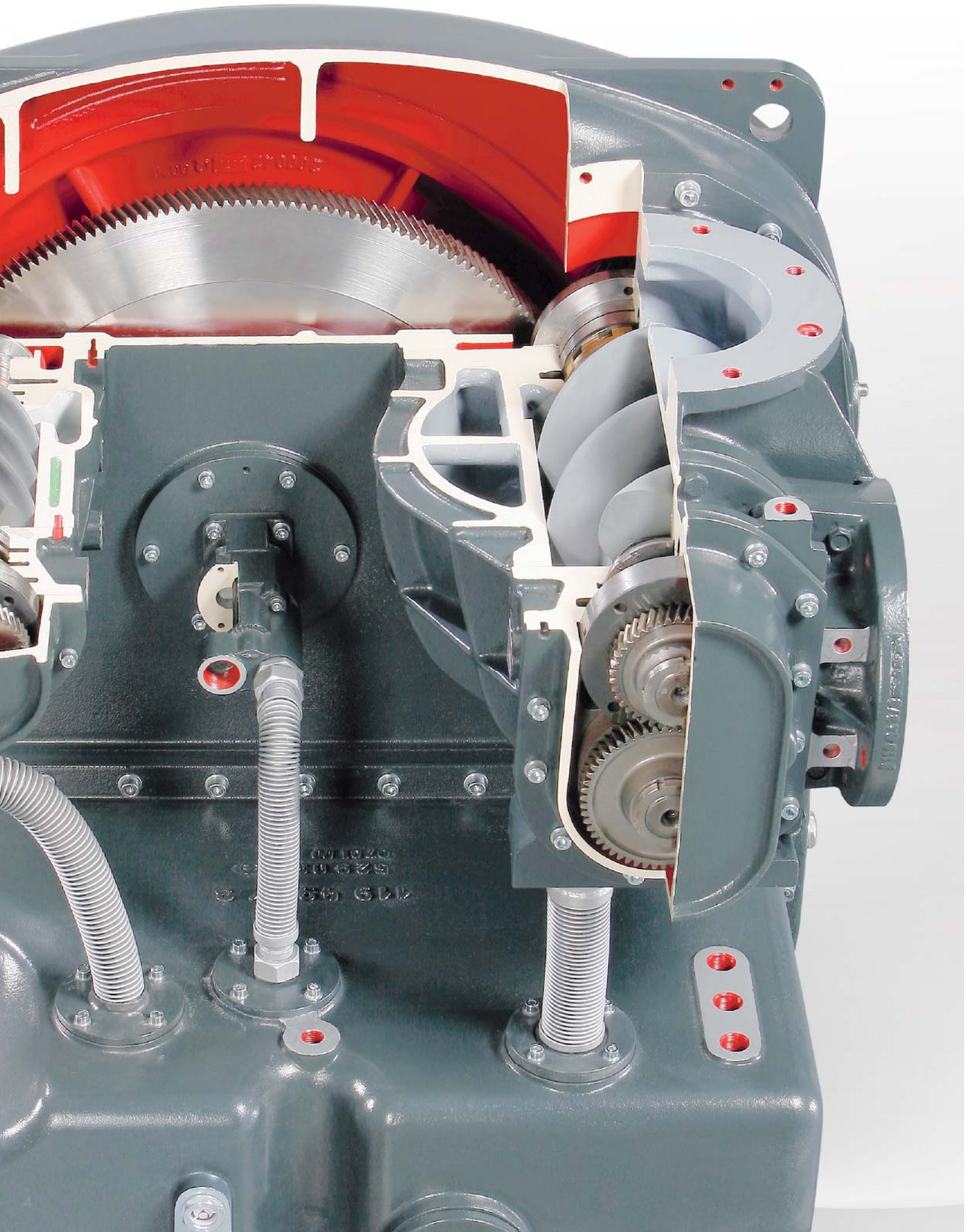
Energy cost savings through system optimisation

lower CO_2 emissions

- Compressed air system investment
- Maintenance costs
- Energy costs
- Potential energy cost savings

Dry-running rotary screw compressors with proven KAESER quality

Image: Water-cooled FSG 420-2 SFC



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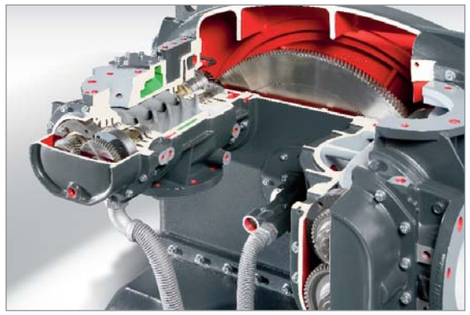
Persuasive technology



Proven airends

At the heart of every KAESER dry-running rotary screw compressor lies a tried and tested dry-running, two-stage rotary screw airend. Providing optimum performance and dependability, every airend ensures maximum efficiency throughout its entire service life.

Chromium steel rotors

The second compression stage's rotors are made from stainless chromium steel, which eliminates the risk of rotor seizing or jamming caused by corrosion.

Durable coating

The blasted and bonderised rotors are treated using the special "Ultra Coat" process to produce an innovative and durable coating which is resistant to temperatures of up to 300 °C. Since this cost-reducing coating is highly abrasion-resistant, its sealing and protection performance remains consistent even after years of operation.

Easy-access coupling

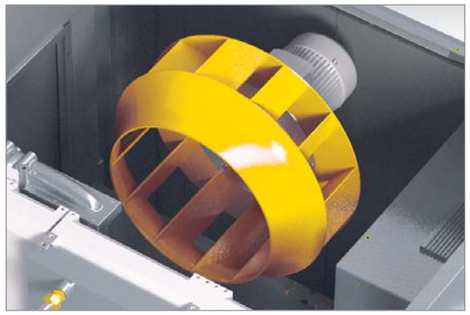
The electric motor directly drives the airend with near zero transmission loss via a maintenance-free coupling. As there is no need for complicated disassembly work, the easy-access coupling can be exchanged quickly and easily.

Dry-running compression

Optimum performance and reliability – even under the toughest of conditions

SIGMA CONTROL 2

The SIGMA CONTROL 2 ensures efficient control and system monitoring. The large display and RFID reader provide easy communication and maximum security, whilst the SD-card slot greatly simplifies fault analysis tasks.

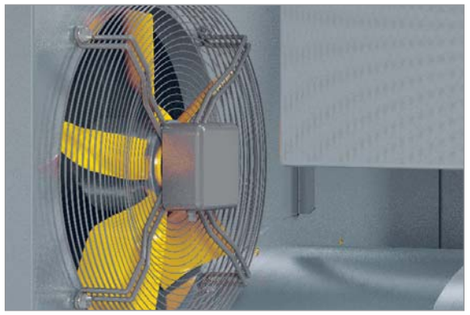


Efficient compressed air cooling

Quiet and powerful, the radial fan draws in cool ambient air through the cooler. Its high residual thrust allows connection of long exhaust duct sections. In addition, the radial fan consumes significantly less drive power than conventional axial fans, saving even more energy.

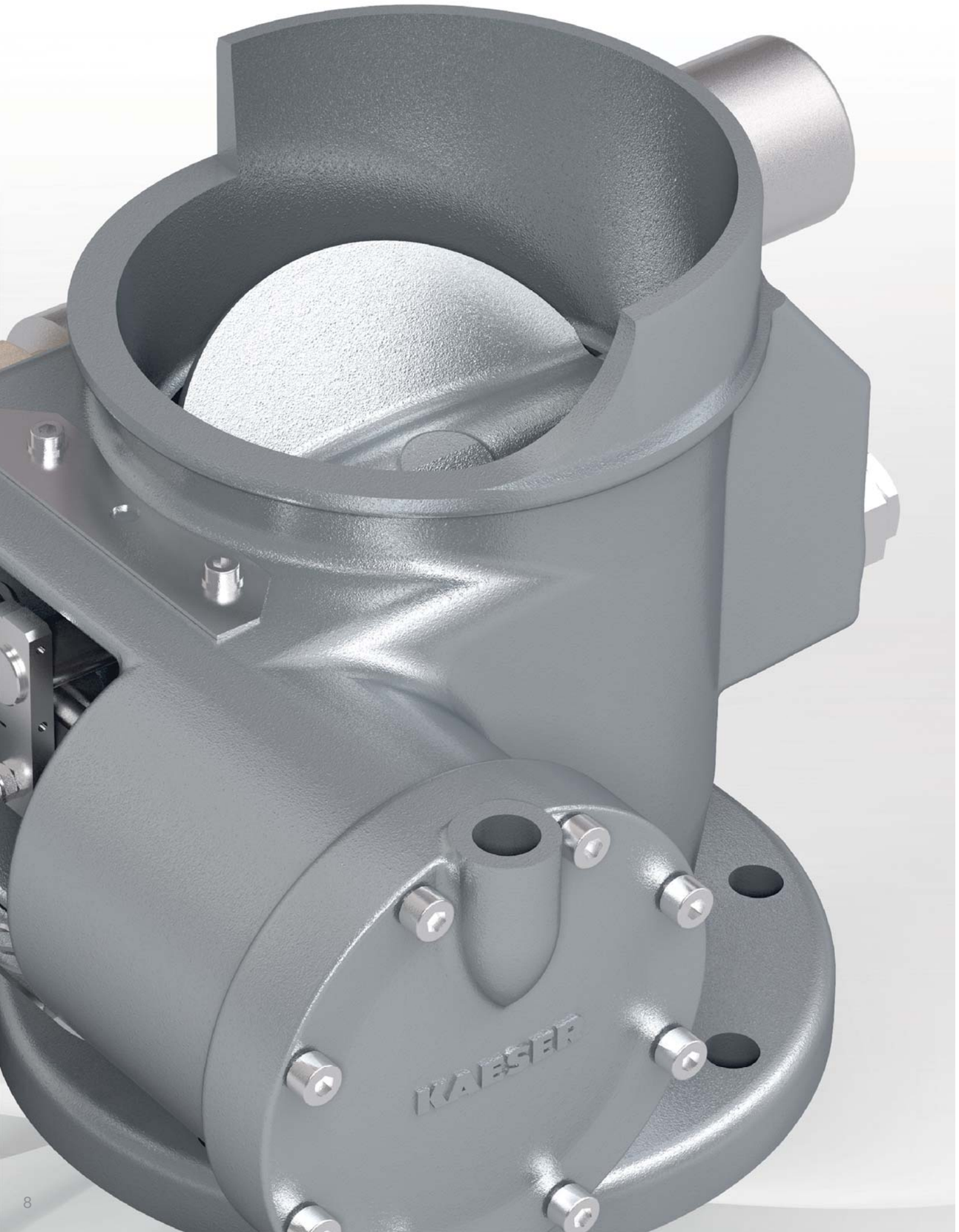
Air-cooling reduces operating costs

Air-cooled versions are designed to meet the demands of even the toughest operating environments and can be used in ambient temperatures as high as +45 °C. A combination of a stainless steel pre-cooler and an aluminium aftercooler (DSG-2, FSG-2) is installed downstream from both the low and high pressure stages. These systems also feature a gear oil cooler.



KAESER standstill fan

Due to the standstill fan, the large radial fan of air-cooled systems can be shut down when the compressor is in standby mode. Heat trapped in the compressor is then safely removed via the energy-saving, temperature-controlled standstill fan.

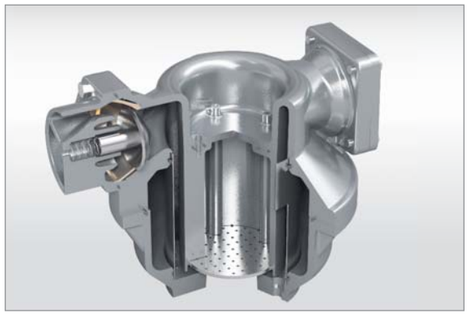


Dry-running KAESER rotary screw compressors

Quality in detail

Hydraulic inlet valve

The hydraulically operated inlet valves on KAESER dry-running rotary screw compressors are unaffected by contamination and condensate. This makes them more reliable and easier to maintain than pneumatic valves.

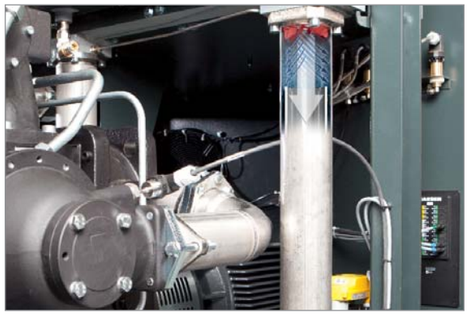


Fibre-free pulse dampers

KAESER's new fibre-free pulse dampers keep pressure losses to an absolute minimum, help maintain consistent air quality and, unlike fibre versions, do not present a source of contamination for the compressed air.

Dependable oil reservoir ventilation

The microfilter in the oil tank ventilation system prevents intake of oil-laden air. This is a key detail to ensure that compressed air quality is reliably maintained at all times.



Highly efficient condensate separator

Thanks to its flow-optimised design, the newly developed condensate separator reliably separates the condensate downstream from the air coolers, with minimal pressure loss.

Systematic energy savings

Efficient drive and cooling systems; water-cooled versions also available

Parallel heat exchanger

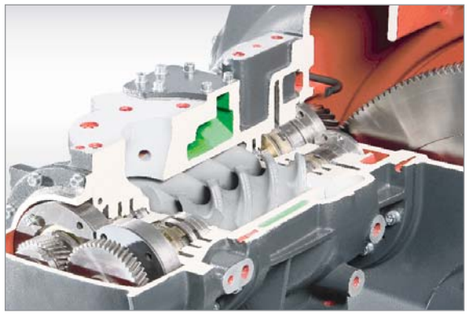
Both the low and high pressure stages of water-cooled KAESER dry-running rotary screw compressors are equipped with their own dedicated parallel heat exchanger for enhanced heat transfer. This optimised cooling results in improved specific power performance.

Optimised water cooling

Water-cooled models are equipped with high efficiency air / water heat exchangers. CuNi10Fe cooling pipes with internal lamella fins provide optimum heat transfer and lowest possible compressed air discharge temperatures with minimal pressure loss.

High efficiency IE3 drive motors

KAESER's dry-running rotary screw compressors are equipped exclusively with premium efficiency IE3 three-phase electric motors. For SFC models, KAESER uses optimised frequency converter motors with insulated motor bearings.



Jacket-cooled airend

In the places where things really heat up, i.e. in the second compression stage, coolant flows directly through the walls of the airend housing to ensure best possible heat dissipation and therefore efficiency.

KAESER COMPRESSORS

HYBRITEC

The intelligent combination for efficient, dependable compressed air drying

Most industrial applications require a source of quality, dry compressed air to prevent the accumulation of condensate in air distribution networks and to minimise the associated risk of costly system failures.

The pressure dew point (PDP) is the temperature at which compressed air reaches its humidity saturation point under pressure. Once the PDP is reached, any further reduction in temperature results in the accumulation of condensation. The required PDP for any given application should therefore be achieved as efficiently as possible.

Refrigeration drying is the preferred method of compressed air treatment for pressure dew points down to +3°C, whilst desiccant dryers, for example, are used for PDPs below +3°C, although these systems consume significantly more energy.

However, KAESER KOMPRESSOREN has developed a ground-breaking compressed air drying solution with the introduction of its “HYBRITEC” series. “HYBRITEC” dryers deliver the very best of both worlds, as they combine the energy-saving functionality of modern refrigeration dryers with the exceptionally low pressure dew points of desiccant dryers.

Available for free air deliveries from 12 m³/min and providing unrivalled efficiency for PDPs down to -40°C, “HYBRITEC” dryers are not investment-intensive bespoke systems, but comprise standard Kaeser products that can be precisely tailored to meet the needs of the specific application. Users are therefore able to benefit from optimum system reliability and cost-effective compressed air drying year-round.

Automatic temperature sensing

Equipped with a dependable thermostat control system, HYBRITEC dryers are able to automatically switch from frost protection operation at colder times of the year to pure refrigeration dryer mode during the warmer months.

Long desiccant service life

As the air entering the desiccant dryer section has already been dried to a PDP of +3°C, it burdens the desiccant to a far lesser extent than untreated compressed air. Desiccant service life of up to 10 years is therefore possible as a result and consequently reduces maintenance costs.

Image: FSG 420-2 SFC

KAESER COMPRESSORS

Dry-running KAESER rotary screw compressors

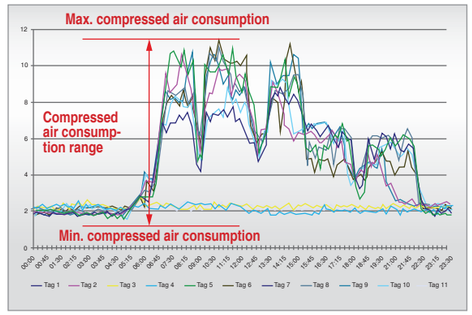
Optional variable speed control (SFC)

Comfortable even when hot

A generously-sized SFC module and efficient cooling of its separate control cabinet allows the use of KAESER variable speed compressors in ambient temperatures up to +45°C.

Siemens frequency converter

All KAESER rotary screw compressors with variable speed control are equipped with proven and highly efficient frequency converters from Siemens. The electromagnetic compatibility (EMC) of the entire system is tested and certified in accordance with all application regulations.



Precision air demand analysis

An Air Demand Analysis (ADA) provides detailed data for compressed air system optimisation. From these data, and using the the Kaeser Energy Saving System (KESS), it is possible to develop the most effective compressed air supply system from several options to suit the needs of the specific application.

Tailored solutions

In an individually tailored compressed air station, maximum efficiency is ensured through the use of a KAESER variable speed (SFC) compressor in combination with fixed-speed compressors under co-ordinated 3D-Control by a SIGMA AIR MANAGER.


KAESER
DSG 180-2
KAESER
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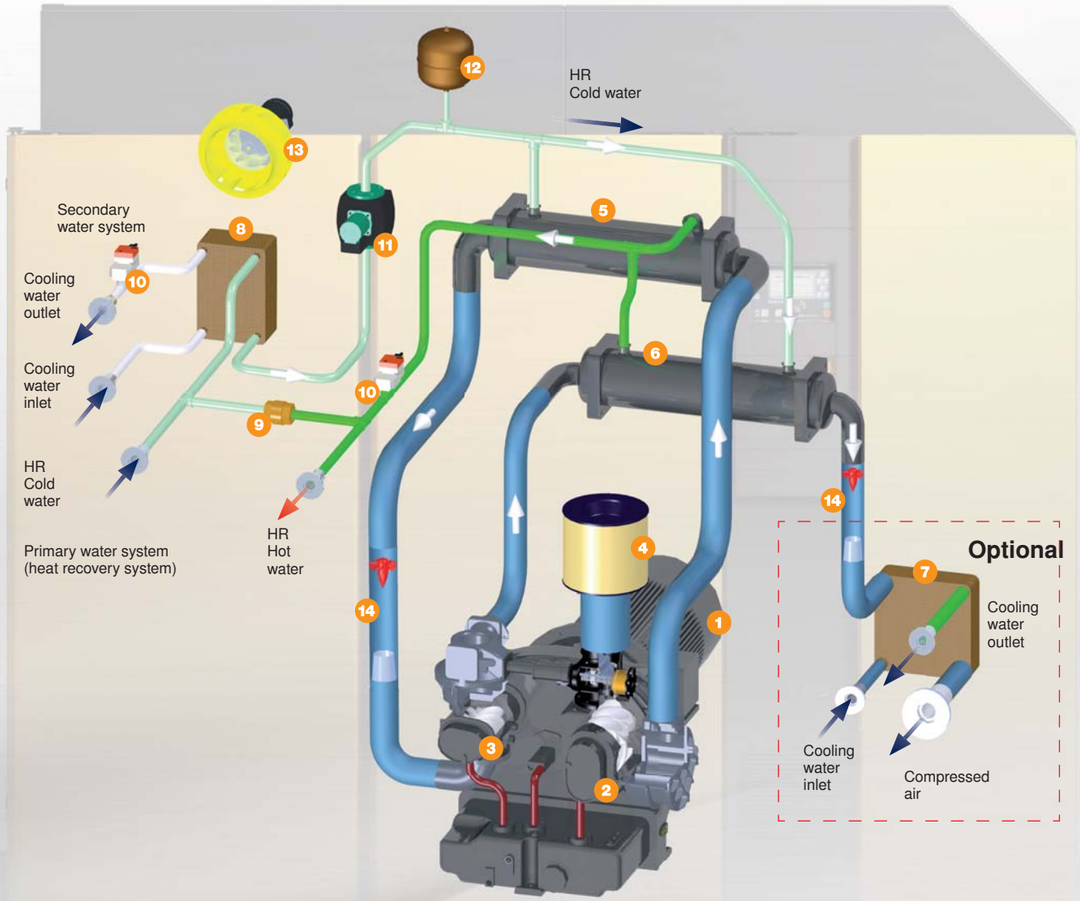
KOMPRESSOREN

Heat recovery flow diagram (HR)



1 Drive motor
2 Low pressure stage (Stage 1)
3 High pressure stage (Stage 2)
4 Inlet filter
5 Aircooler downstream from Stage 1 (air/water)
6 Aircooler downstream from Stage 2 (air/water)
7 Optional additional heat exchanger (air/water)
(Version as plate-type heat exchanger)
8 Heat exchanger (water/water)
9 Check valve
10 Water control valve
(actuated by SIGMA CONTROL 2)
11 Pump
12 Expansion tank
13 Interior cooling fan
14 Condensate separator

Optional version with heat recovery (water-cooled systems only)

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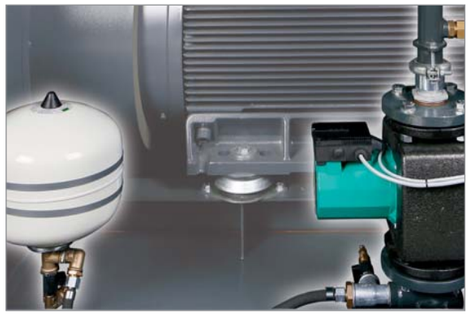
Maximum savings with energy recovery

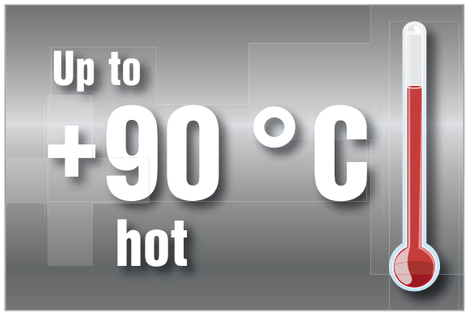


Maximum availability

An optionally available complete internal water circuit (with pump, expansion tank, pressure-relief valve etc.) ensures reliable compressor operation during maintenance work on the primary water system outside of the compressor.

Electronically controlled cooling

Water temperature is electronically controlled by the SIGMA CONTROL to ensure optimum reliability and performance. As a result, the temperature stays within the required optimal range and, in turn, improves specific power.



Hot water up to +90 °C

Recovered heat energy can be used in any number of ways. Demand-oriented, variable temperature control up to +90 °C is possible for hot water treatment.

Heat recovery a win

Amazingly, 100 percent of the electrical energy input to a compressor is converted into heat. From that, up to 96 percent is available for heat recovery purposes.

Equipment

Complete unit

Dry-running rotary screw compressor with 2-stage compression. System equipped with condensate separator, condensate drain and pulse dampers for both compression stages. Ready for operation, fully automatic, silenced.

Airend

2-stage, dry-running rotary screw airend with integrated gearing and collection tank for gear oil. Rotors feature durable coating. 2nd compression stage uses stainless steel rotors and jacket cooling. The 1st stage in CSG-2 models also features jacket cooling.
Drive:
Precision gearing as per Agma Q13/ DIN Class 5 with helical spur gears.

Drive motor

Premium efficiency (IE3) drive motor, quality manufacture, IP 55 protection, PT 100 temperature sensor in the stator windings, continuous measurement and monitoring of motor winding temperature.

Cooling

Optionally available with air- or water-cooling. Radial fan with separate drive motor, exhaust air discharged upwards.

Air-cooled version:
Up to 355 kW (SFC) with five coolers (2 cooler packages comprising a stainless steel and an aluminium cooler for compressed air, one cooler for gear oil; CSG-2 with four coolers).

Water-cooled version:
Up to 355 kW, two compressed air coolers, one gear oil cooler.

Heat recovery (Option)

Optionally available with integrated heat recovery system, parallel switched tubular heat exchanger, safety cooling system, safety pump, expansion tank, water control valves; usable heat power dependent upon cooling water temperature, discharge temperature and output moisture level.

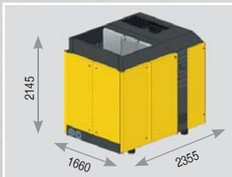
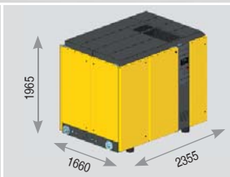
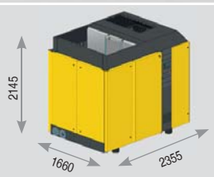
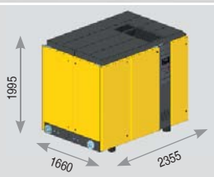
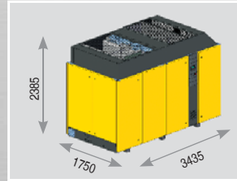
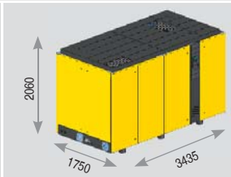
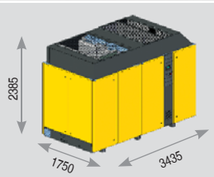
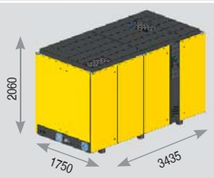
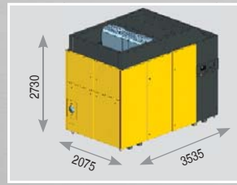
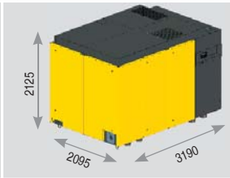
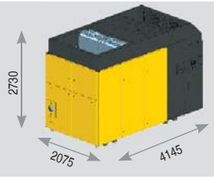
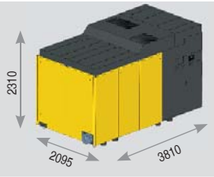
Electrical components

Ventilated control cabinet to IP 54, automatic star-delta starter, overload relay, control transformer.

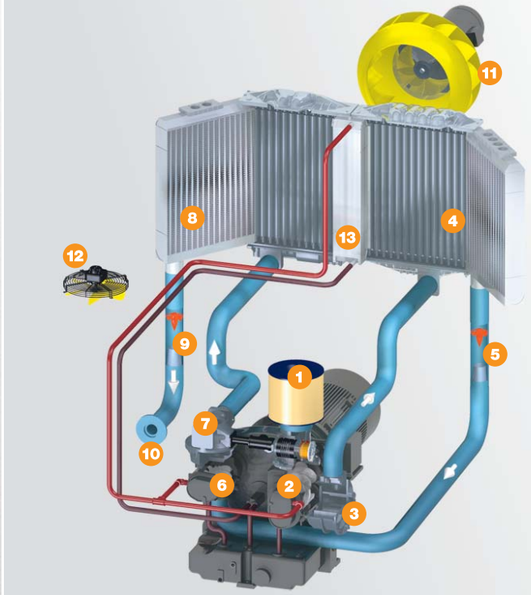
SIGMA CONTROL 2

Full-text display, 30 languages; soft touch pictogram keys; “traffic light style” LEDs to indicate operating status; fully automatic monitoring and control; Dual, Quadro, and Dynamic control modes provided as standard; SD-card slot for data logging and updates; RFID reader; web server; interfaces: Ethernet; optional communications modules for: Profibus DP, Modbus, Profinet and Devicenet.

Views

Standard (air-cooled)	Standard (water-cooled)	SFC (air-cooled)	SFC (water-cooled)
CSG-2			
			
DSG-2			
			
FSG-2			
			

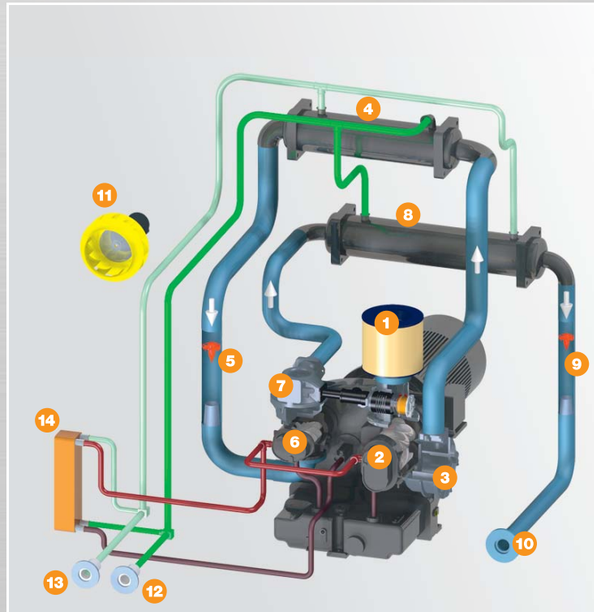
Design



Air cooling

1. Air filter / air inlet
2. Low pressure stage (Stage 1, LP)
3. Pulse damper (Stage 1)
4. Air cooler Stage 1 (with pre-cooler)
5. Condensate separator
6. High pressure stage (Stage 2, HP)
7. Pulse damper (Stage 2)
8. Air cooler Stage 2 (with pre-cooler)
9. Condensate separator
10. Compressed air outlet
11. Radial fan
12. Temperature controlled standstill fan (for package at standstill)
13. Gear oil cooler

Image: Standard version DSG-2, air-cooled



Water cooling

1. Air filter / air inlet
2. Low pressure stage (Stage 1, LP)
3. Pulse damper (Stage 1)
4. Air cooler Stage 1
5. Condensate separator
6. High pressure stage (Stage 2, HP)
7. Pulse damper (Stage 2)
8. Air cooler Stage 2
9. Condensate separator
10. Compressed air outlet
11. Interior cooling fan
12. Cooling water outlet
13. Cooling water inlet
14. Gear oil cooler

Image: Standard version DSG-2, water-cooled

Technical specifications

Air- / water-cooled

Model	Rated motor power	Max. operating pressure	Air-cooled version				Water-cooled version			
			FAD Complete package at working pressure *)	Dimensions W x D x H	Sound pressure level (without ducting) **)	Weight	FAD Complete package at max. gauge pressure *)	Dimensions W x D x H	Sound pressure level (without ducting) **)	Weight
	kW	bar	m³/min	mm	dB(A)	kg	m³/min	mm	dB(A)	kg
CSG 55-2	37	4 6 8	7.80 6.70 5.40	2355 x 1660 x 2145	71	2220	7.95 6.85 5.57	2355 x 1660 x 1965	64	2220
CSG 70-2	45	4 6 8	8.92 7.77 6.65	2355 x 1660 x 2145	71	2260	9.05 7.92 6.82	2355 x 1660 x 1965	64	2260
CSG 90-2	55	4 6 8 10	10.52 9.62 8.80 7.67	2355 x 1660 x 2145	72	2325	10.67 9.78 8.97 7.83	2355 x 1660 x 1965	65	2325
CSG 120-2	75	4 6 8 10	12.97 12.92 12.00 10.43	2355 x 1660 x 2145	73	2465	13.10 13.07 12.15 10.58	2355 x 1660 x 1965	66	2465
CSG 130-2	90	8 10	12.88 12.85	2355 x 1660 x 2145	74	2590	13.03 13.00	2355 x 1660 x 1965	68	2590
DSG 140-2	90	4 6 8 10	18.50 16.20 13.20 13.10	3435 x 1750 x 2385	77	3400	18.50 16.20 13.20 13.10	3435 x 1750 x 2060	69	3100
DSG 180-2	110	4 6 8 10	21.70 19.20 18.40 16.10	3435 x 1750 x 2385	78	3550	21.70 19.20 18.40 16.10	3435 x 1750 x 2060	70	3250
DSG 220-2	132	4 6 8 10	26.15 23.00 21.60 19.10	3435 x 1750 x 2385	78	3700	26.15 23.00 21.60 19.10	3435 x 1750 x 2060	71	3400
DSG 260-2	160	4 6 8 10	28.61 26.10 26.00 22.90	3435 x 1750 x 2385	79	3850	28.61 26.10 26.00 22.90	3435 x 1750 x 2060	74	3550
DSG 290-2	200	6 8 10	28.60 28.50 26.00	3435 x 1750 x 2385	81	4000	28.60 28.50 26.00	3435 x 1750 x 2060	75	3700
FSG 300-2	160	4 6 8	35.10 29.40 29.30	3535 x 2075 x 2730	78	5800	35.10 29.40 29.30	3190 x 2095 x 2125	74	5100
FSG 350-2	200	4 6 8 10	42.20 37.30 34.90 29.20	3535 x 2075 x 2730	79	6000	42.20 37.30 34.90 29.20	3190 x 2095 x 2125	75	5300
FSG 420-2	250	4 6 8 10	50.20 45.70 42.00 37.10	3535 x 2075 x 2730	80	6250	50.20 45.70 42.00 37.10	3190 x 2095 x 2125	75	5550
FSG 450-2	315	6 8 10	50.10 45.60 41.90	3535 x 2075 x 2730	81	6400	50.10 45.60 41.90	3190 x 2095 x 2125	75	5700
FSG 500-2	315	8 10	50.00 45.60	3535 x 2075 x 2730	82	6400	50.00 45.60	3190 x 2095 x 2125	76	5700
FSG 520-2	355	10	–	–	–	–	50.00	3190 x 2095 x 2125	76	5900

*) FAD of complete package as per ISO 1217:2009, Annex C: Absolute inlet pressure 1 bar (a), cooling and air inlet temperature 20 °C

**) Sound pressure level as per ISO 2151 and the basic standard ISO 9614-2, operation at maximum operating pressure and maximum speed; tolerance: ± 3 dB(A)

SFC versions with variable speed drive

Model	Rated motor power	Max. operating pressure	Air-cooled version				Water-cooled version			
			FAD Complete package at working pressure *)	Dimensions W x D x H	Sound pressure level (without ducting) **)	Weight	FAD Complete package at max. gauge pressure *)	Dimensions W x D x H	Sound pressure level (without ducting) **)	Weight
	kW	bar	m³/min	mm	dB(A)	kg	m³/min	mm	dB(A)	kg
CSG 90-2 SFC	55	4 6 8 10	3.32 - 10.62 3.23 - 9.45 3.47 - 8.20 –	2355 x 1660 x 2145	72	2385	3.49 - 10.85 3.62 - 9.77 3.84 - 8.58 3.96 - 7.57	2355 x 1660 x 1965	65	2385
CSG 120-2 SFC	75	4 6 8 10	3.94 - 13.23 4.51 - 12.31 5.08 - 11.20 4.81 - 10.00	2355 x 1660 x 2145	73	2525	4.20 - 13.27 4.18 - 12.61 4.21 - 11.56 4.23 - 10.52	2355 x 1660 x 1965	66	2525
CSG 130-2 SFC	90	4 6 8 10	4.23 - 13.35 4.64 - 13.26 5.05 - 13.17 5.47 - 12.57	2355 x 1660 x 2145	74	2650	4.40 - 13.48 4.33 - 13.44 4.26 - 13.40 4.20 - 13.02	2355 x 1660 x 1965	68	2650
DSG 180-2 SFC	110	4 6 8 10	8.58 - 22.52 9.46 - 20.79 8.51 - 18.56 9.54 - 16.43	3435 x 1750 x 2385	79	4150	8.58 - 22.52 9.46 - 20.79 8.51 - 18.56 9.54 - 16.43	3435 x 1750 x 2060	71	3850
DSG 220-2 SFC	132	4 6 8 10	7.84 - 22.51 8.68 - 22.45 9.51 - 21.80 9.95 - 19.50	3435 x 1750 x 2385	79	4300	7.48 - 22.51 8.68 - 22.45 9.51 - 21.80 9.95 - 19.50	3435 x 1750 x 2060	72	4000
DSG 260-2 SFC	160	4 6 8 10	8.59 - 27.71 9.36 - 27.66 9.62 - 25.44 10.30 - 23.30	3435 x 1750 x 2385	80	4450	8.59 - 27.71 9.36 - 27.66 9.62 - 25.44 10.30 - 23.30	3435 x 1750 x 2060	75	4150
DSG 290-2 SFC	200	4 6 8 10	9.07 - 30.06 10.27 - 30.01 11.47 - 30.27 12.67 - 28.23	3435 x 1750 x 2385	82	4600	9.07 - 30.06 10.27 - 30.01 11.47 - 30.27 12.67 - 28.23	3435 x 1750 x 2060	76	4300
FSG 420-2 SFC	250	4 6 8 10	14.07 - 49.19 15.38 - 45.55 16.69 - 41.85 18.00 - 38.08	4145 x 2075 x 2730	81	7050	14.79 - 51.11 14.68 - 47.81 15.54 - 44.12 17.37 - 40.05	3810 x 2095 x 2310	76	6350
FSG 500-2 SFC	315	4 6 8 10	14.07 - 51.11 15.38 - 50.11 16.69 - 46.41 18.00 - 42.71	4145 x 2075 x 2730	83	7200	14.79 - 51.11 14.68 - 51.04 15.54 - 49.00 17.37 - 45.00	3810 x 2095 x 2310	77	6500
FSG 520-2 SFC	355	4 6 8 10	14.07 - 51.11 15.38 - 51.06 16.69 - 51.01 18.00 - 49.32	4145 x 2075 x 2730	84	7450	14.79 - 51.11 14.68 - 51.06 15.54 - 51.01 17.37 - 50.95	3810 x 2095 x 2310	77	6750

*) FAD of complete package as per ISO 1217:2009, Annex C: Absolute inlet pressure 1 bar (a), cooling and air inlet temperature 20 °C

**) Sound pressure level as per ISO 2151 and the basic standard ISO 9614-2, operation at maximum operating pressure; tolerance: ± 3 dB(A)

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