

**KAESER**  
COMPRESSORS®

*Built for a lifetime.*



# Oil-free Screw Compressors

## DSG-2 and FSG-2 Series

Capacities from: 512 to 1774 cfm

Pressures from: 45 to 145 psig

**kaeser.com**

# Oil-free Rotary Screw Compressors

## When reliability and air purity matter most

*With superior engineering and exceptional attention to detail, KAESER's DSG and FSG 2-stage oil-free air compressors were designed specifically with the user in mind. KAESER's renowned quality offers peace of mind and built for a lifetime™ reliability for industries with more stringent air purity requirements.*

## Long-term reliability

Compressed air simply has to be available where and whenever it's needed. KAESER's 2-stage oil-free rotary screw compressors are built to last and ensure many years of dependable performance. With nearly a century of experience in engineering, KAESER's components are tried and tested to deliver the durability and compressed air availability needed to meet the toughest demands.

## Innovation you can trust

Using all of the advantages that KAESER's advanced Research and Development Center has to offer, KAESER's engineers have designed every detail of these oil-free air compressors with maximum efficiency and performance in mind.

## Lowest life cycle costs

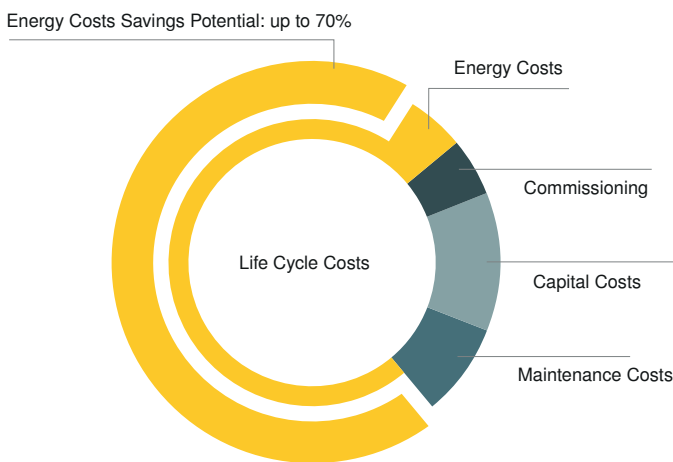
KAESER quality and expertise really count when it comes to the all-important total system costs for complete compressed air systems. Lowest possible compressed air costs and maximum availability can be guaranteed only through a combination of perfect interplay between energy efficiency and service / 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 using premium quality materials ensure reduced maintenance requirements, 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 these units so effortless.

## Energy efficiency

Capital and maintenance costs account for only a small part of a compressor's total life cycle costs. Since energy accounts for the largest portion, KAESER has been committed to minimizing your energy costs for compressed air production for over 40 years.

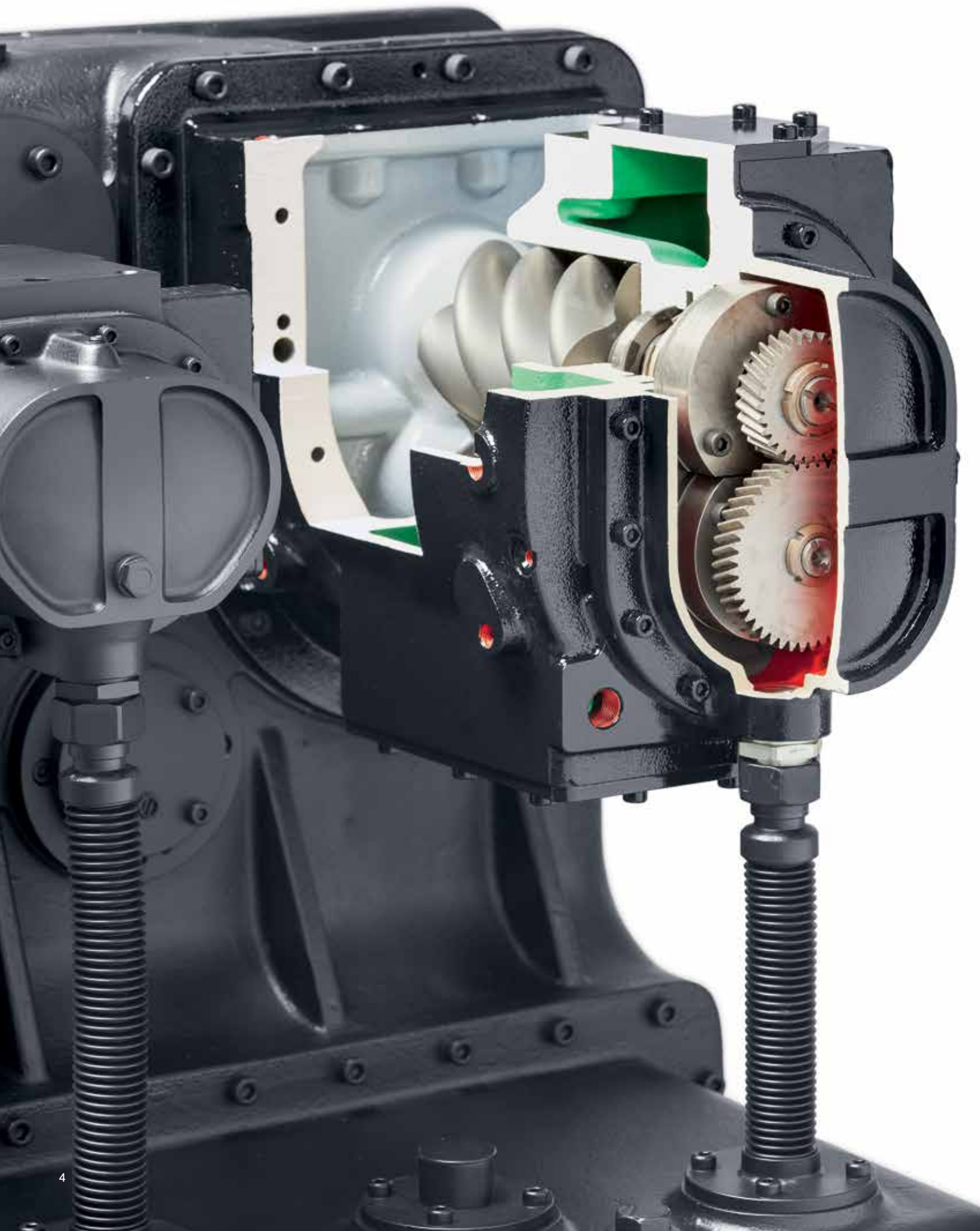




**KAESER**

**FSG 420-2**

**OILFREE.AIR** 



# KAESER airends: Precise, durable, efficient



## Proven airends

At the heart of every KAESER oil-free compressor lies a rugged, two-stage rotary screw airend proven to withstand the toughest operation. Providing optimum performance and dependability, every airend ensures maximum efficiency throughout its entire service life.



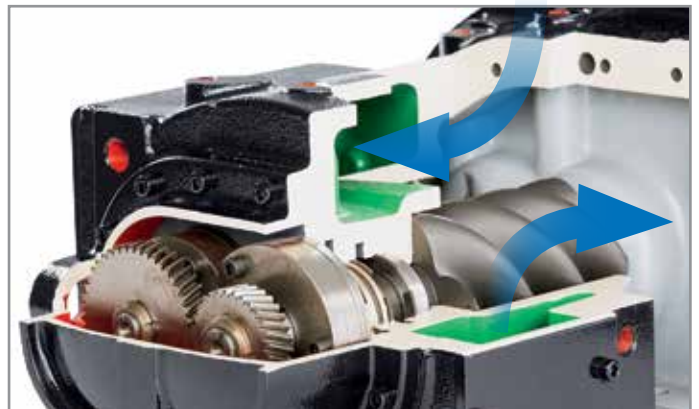
## Durable coating

The blasted and bonderized rotors are treated using a special coating process which provides an innovative and durable coating resistant to temperatures up to 575°F. Because this coating is highly abrasion-proof, its sealing and protection performance remain consistent – even after years of operation – providing additional cost savings.



## Chromium steel rotors

The second compression stage's rotors are made from stainless steel, which eliminates the risk of rotor corrosion and seizing.



## Jacket-cooled airend

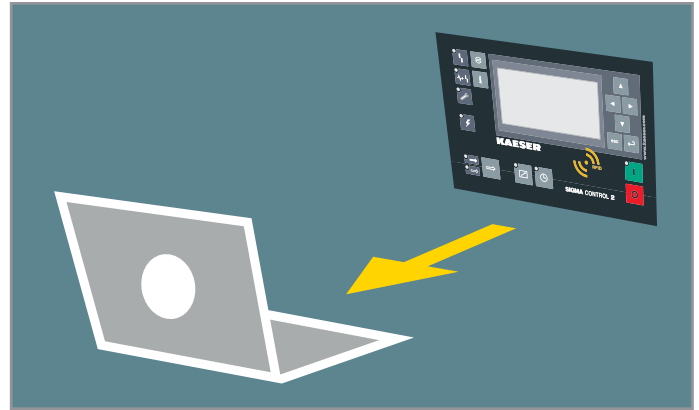
Jacket cooling is used in the high pressure compression stage of the airend to ensure optimal heat dissipation, which greatly enhances efficiency.

# Efficient drive systems with advanced control



## SIGMA CONTROL® 2

The onboard controller ensures efficient control and compressor operation monitoring. The large display and RFID reader provide easy communication and maximum security. Multiple, selectable interfaces enable seamless networking capability, while the SD card slot makes updates quick and easy.



## Integrated web server

The SIGMA CONTROL 2 is equipped with its own web server, making compressor status visualization possible via Intranet/Internet. This means that operational data and maintenance/ alarm messages can be viewed, with password protection, from any PC running a standard Internet browser. This feature benefits users by simplifying operation and maintenance.



## SIGMA AIR MANAGER® 4.0

This advanced master control system can coordinate operation of up to 16 rotary screw compressors with maximum energy efficiency and also enables seamless documentation of all operational parameters.



## KAESER Connect

The SIGMA AIR MANAGER 4.0's integrated web server provides visual display of all compressed air system data in the form of HTML pages. The information is available anytime, anywhere, and can be visualized in real-time on all network-capable devices.



120 PSIG 09:26 195°F

ON LOAD	- on	DA - Load
Key	18005h Load	17105 h
Run		1995 h
Maintenance inc.		

**KAESER**



SIGMA CONTROL 2

**KAESER**  
KOMPRESSOREN  
03/20XX

# Service-friendly



**(1) Hydraulic inlet valve**

The hydraulically operated inlet valve on KAESER oil-free rotary compressors is unaffected by contamination and condensate.



**(2) Fiber-free pulsation dampeners**

KAESER's fiber-free pulsation dampeners keep pressure losses to an absolute minimum, help maintain consistent air quality, and minimize unwanted vibration. In addition, their fiber-free design reliably eliminates the possibility of compressed air contamination.







### **(3) Easy access coupling**

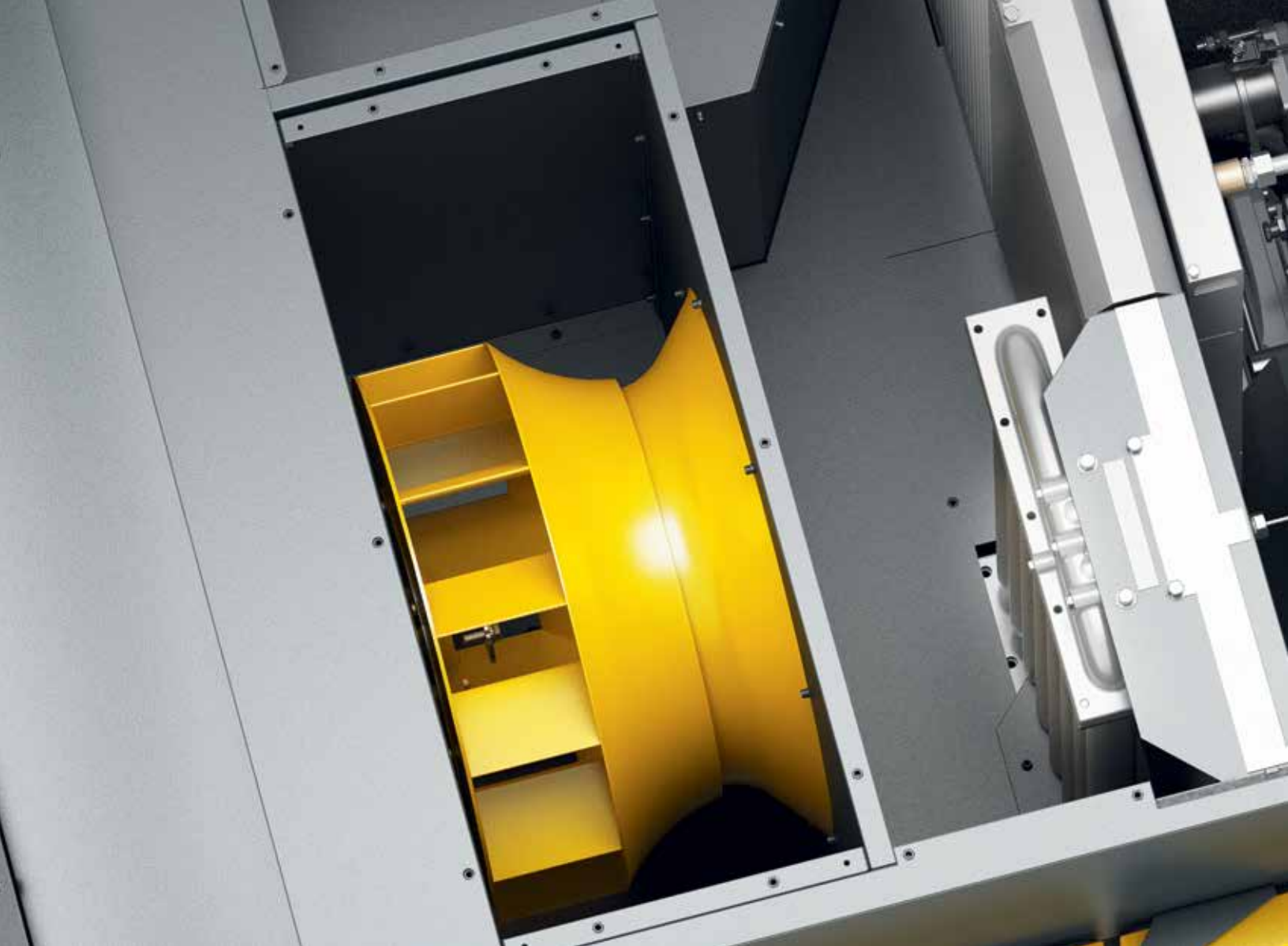
The electric motor directly drives the airend with zero transmission losses via a maintenance-free coupling. As there is no need for complicated disassembly or alignment work, the easy-access coupling can be exchanged quickly and easily.



### **(4) High efficiency condensate separator**

Thanks to its flow-optimized design, the newly developed condensate separator reliably separates the condensate downstream of the aircoolers—with minimal pressure loss.





### **Cleaning made simple**

Cleaning the aircoolers on DSG-2 and FSG-2 models is convenient and easy thanks to our unique swing-out design—no crane is needed. Service technicians can clean the coolers in considerably less time and right next to the machine, without the risk of contaminating the unit's interior.



### **Reliable operation even in extreme heat**

Air-cooled units can operate dependably in ambient temperatures up to 115°F thanks to the durable and energy-efficient radial fan.



# Air-cooling

## Dependable performance— Even under extreme conditions

### The benefits:

- Cooling water infrastructure not needed
- Meticulously designed machines with logical component layout make maintenance and service work quick and easy, ensuring further savings
- The heated cooling air can be easily re-used for space-heating



### Outstanding durability thanks to pre-cooling

Highly effective pre-cooling with a stainless steel tube cooler on the high pressure side ensures outstanding air cooler durability. Furthermore, this durable cooler combination also delivers comparably low compressed air discharge temperatures.



### Energy-saving interior ventilation

When the large radial fan in air-cooled oil-free compressors is switched off as part of the transition to standby mode, this energy-saving, temperature-controlled standstill fan reliably removes the remaining heat in the compressor package.

# Water-cooling

## Compact energy savers

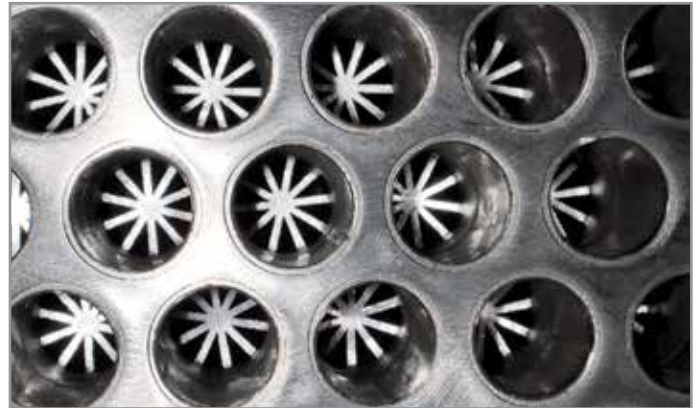
### The benefits:

- Exceptionally low compressed air discharge temperature thanks to separate high quality air coolers
- Load-dependent cooling water for optimum compressor cooling and simultaneous, efficient cooling-water usage
- Compact design



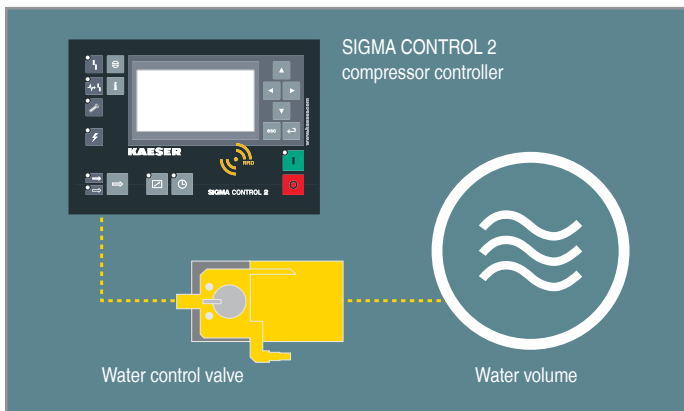
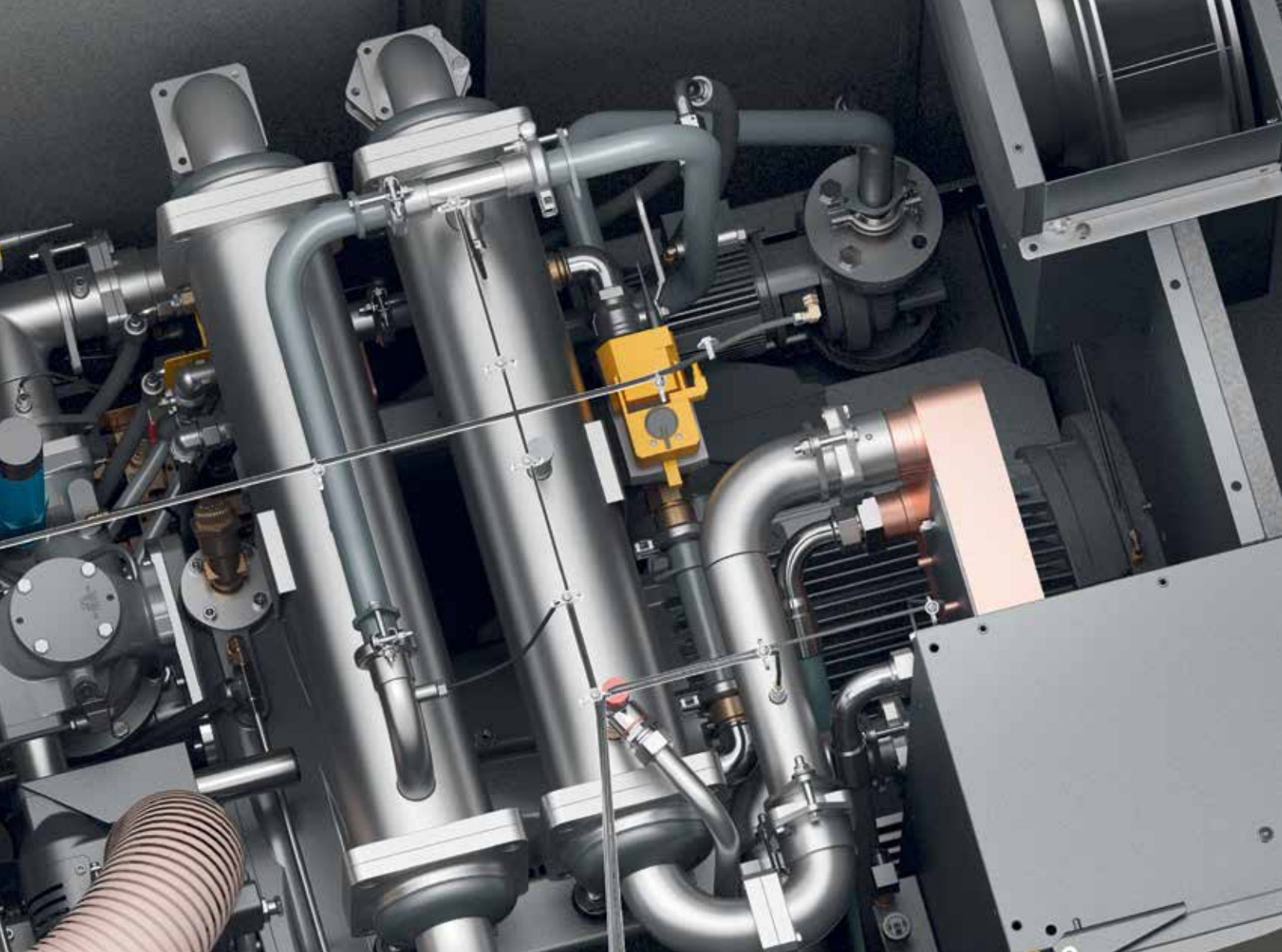
### Parallel heat exchanger

Both the low and high pressure stages of KAESER's water-cooled oil-free screw compressors are equipped with their own dedicated parallel heat exchanger for enhanced heat transfer. This optimized cooling improves specific power performance.



### Optimized water cooler

Water-cooled compressors feature highly efficient air/water heat exchangers. Stainless Steel cooling pipes with internal star lamella fins provide optimum heat transfer and the lowest possible compressed air discharge temperatures with minimal pressure loss.



### Smart control

Water-cooled oil-free compressors feature sealed water control valves that are actuated via the onboard SIGMA CONTROL 2. The controller precisely adjusts water volume to meet actual load requirement.

### Permanent adjustment

The important but time consuming task of performing hydraulic adjustment of both aircoolers is carried out continuously and automatically when the machine is in operation. Cooling performance is therefore optimally matched to the operating conditions.

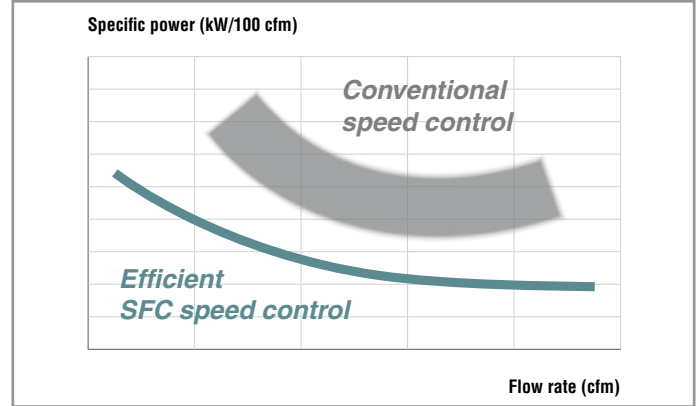
# Variable frequency drive (SFC)

KAESER's oil-free screw compressors are available with integrated SIGMA FREQUENCY CONTROL (SFC) to provide superior part load efficiency and steady pressure in applications with varying air demands. Standard features include EMI filters and line reactors for extra electrical system protection.



## VFD drive from Siemens

SFC versions feature the latest in Siemens drive technology for enhanced reliability, world-wide support, and easy integration into system controls. The Siemens frequency converter has a control algorithm adapted to the motor. With the finely turned combination of a frequency converter and a synchronous reluctance motor, KAESER achieves the "IES2" highest system efficiency class as defined by the DIN-EN 50598 standard.



## Optimized specific power

Together, the moderate maximum speed and near-constant specific power across the wide variable speed control range, achieve significant energy savings throughout the entire operating curve.



## Premium efficiency drive motors

KAESER uses premium efficiency Totally Enclosed Fan Cooled (TEFC) motors with class F insulation for extra protection from heat and contaminants. Each of the three motor windings is actively monitored through its own Pt100 temperature sensor. KAESER is currently the only compressed air systems provider to equip its compressors with super premium efficiency IE4 motors as standard. Standard voltages are 460 or 575 V (3-phase, 60 Hz). Other voltages are available.



## Safe operation even in hotter environments

A generously-sized SFC module and efficient control cabinet cooling allow KAESER variable frequency drive compressors to be used in high ambient temperatures.

# Heat recovery

## Air-cooled compressors

Recovering warm compressor exhaust air is an innovative way to seize savings potential. KAESER has the expertise to help you with everything you need to know and will be with you every step of the way.



## Process, heating, and service water

Compressor exhaust heat can be used to produce hot water with temperatures up to 195 °F, which can then be used for a wide range of applications.



## Water-cooled compressors

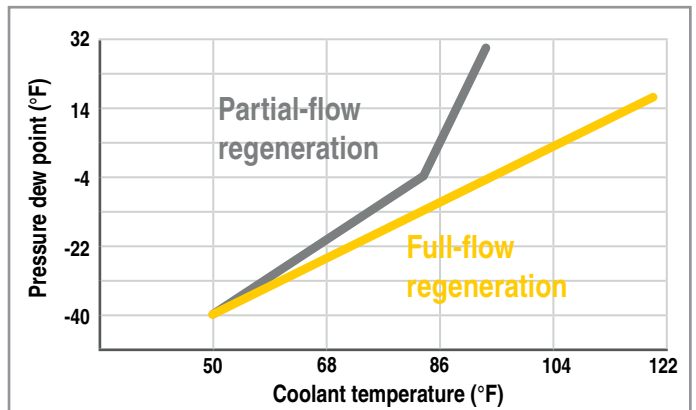
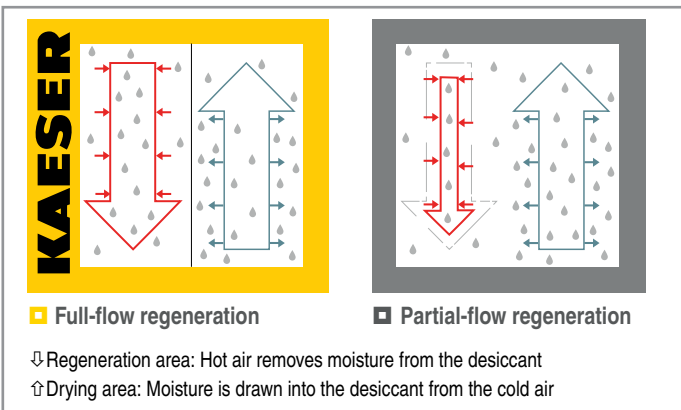
Using the compact heat recovery module integrated directly into the compressor, generating hot water for production or auxiliary heating purposes couldn't be simpler. Cost and space-intensive external infrastructure is not necessary with KAESER's solutions and the amortization period of the heat recovery module is usually less than a year (see sample calculation below).

## Space heating with warm exhaust air

Heating is made easy thanks to radial fans with high residual thrust. The reusable warm air from air-cooled oil-free screw compressors can be easily ducted away to spaces that require heating—and usually without the need for additional fans.

### Example amortization calculation water-cooled compressor

Inlet temperature	68°F
Relative humidity	30%
Cooling water inlet (primary)	68°F
Cooling water outlet (primary)	176°F
Compressor power consumption DSG-140-2 145 psi(g)	125 hp
Heat recovery potential based on total power consumption	87%
Recoverable heat capacity	109 hp
Annual operating hours	6,000 hrs
Kilowatt hours per year	487,688 kWh
Fuel costs	\$0.10 / kWh
Annual fuel cost savings	\$48,769
<b>Amortization period</b>	<b>&lt; 1 year</b>



### Full-flow regeneration

Unlike other designs, the i.HOC (Integrated Heat of Compression Dryer) system uses 100% of the heat of compression from the second compressor stage for drying purposes (full-flow regeneration). This heat is produced and available for use at no extra cost.

### Consistent drying

The advantages of full flow regeneration become obvious, especially with increased coolant temperatures. KAESER rotary drum dryers achieve outstanding drying results without additional electric heating for air regeneration.





# Integrated Heat of Compression Dryer (i.HOC®)

All KAESER oil-free compressors are available with an optional integrated heat of compression dryer. The patented i.HOC rotary drum dryer from KAESER uses up to 100% of the heat of compression for energy saving drying. Thanks to its full-flow regeneration method, these dryers deliver reliable pressure dew points as low as -22°F (-30°C) – without electrical heating or additional cooling of the regeneration air. Available either air-cooled or water-cooled on all models.

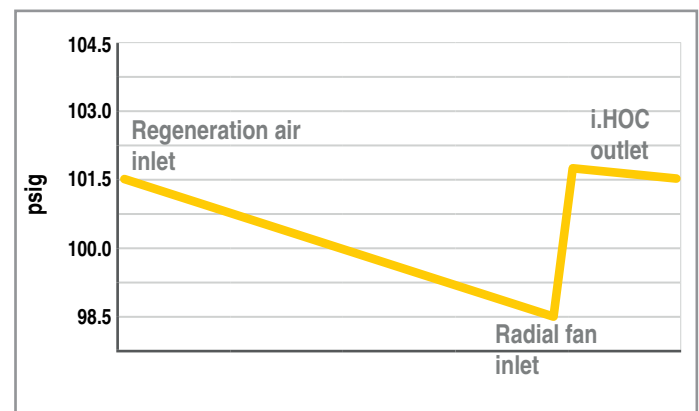
## The benefits:

- Dependable pressure dew points below freezing even with high ambient or coolant temperatures
- Pressure dew point stability even at the lowest compressor load – without the need for a partial load compensator.
- Available with pressure dew point control as required
- Highly effective drying and heat recovery with water-cooled compressors



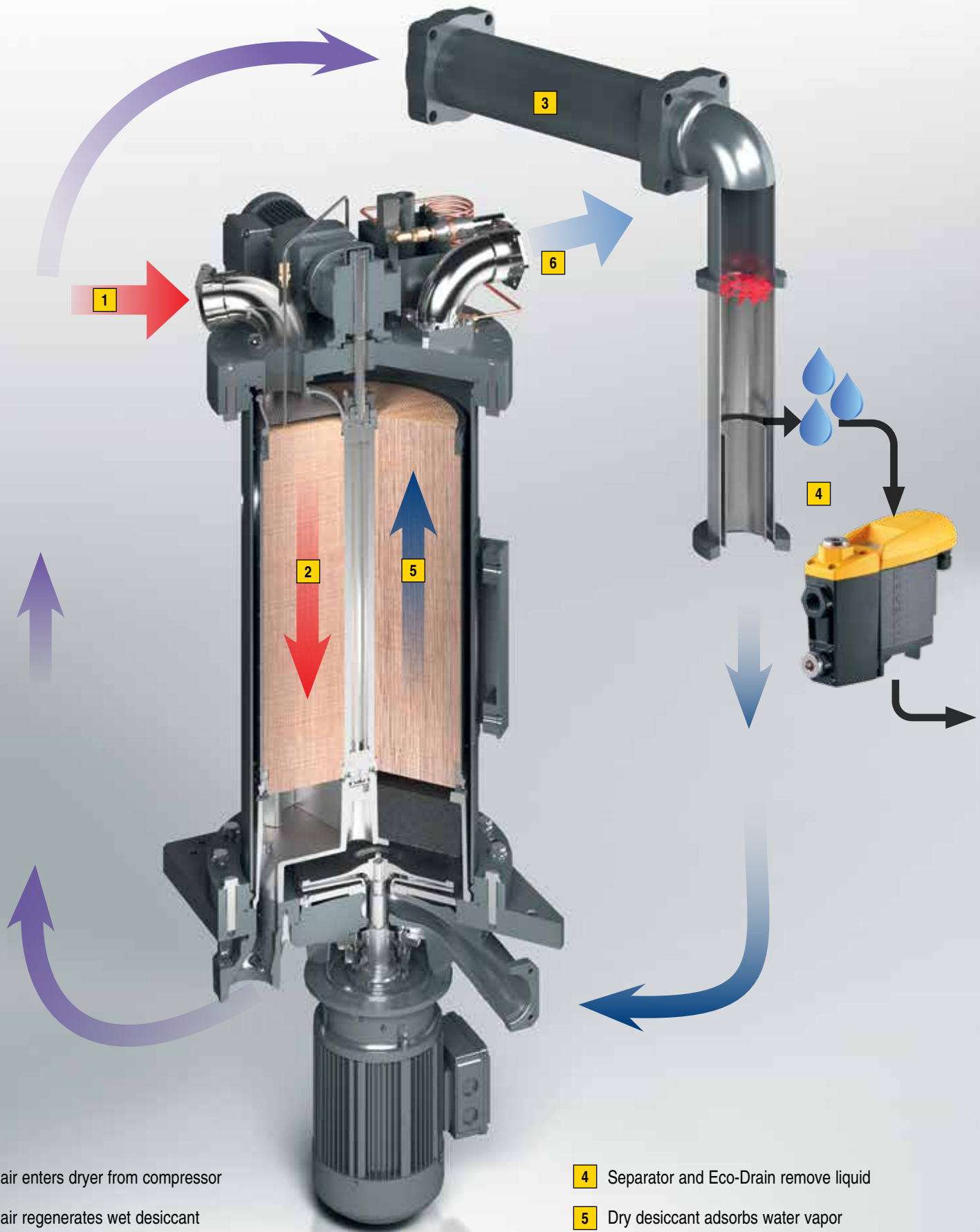
## Dew point control

The i.HOC rotary drum dryer's intelligent control ensures dew point stability even with fluctuating flow rates and at compressor partial load. The target pressure dew point is reached after just one rotation of the drum.



## No pressure loss

The radial fan at the bottom of the dryer equalizes drying process pressure losses as required, thereby guaranteeing maximum pressure dew point stability and quality – the pressure at the i.HOC dryer outlet is higher than at the inlet.

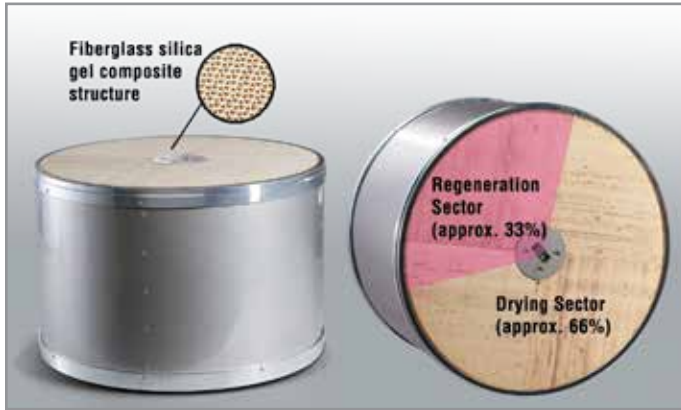


- 1** Hot air enters dryer from compressor
- 2** Hot air regenerates wet desiccant
- 3** Cooler condenses water to liquid

- 4** Separator and Eco-Drain remove liquid
- 5** Dry desiccant adsorbs water vapor
- 6** Dry air exits dryer

# i.HOC

## Ultra efficiency and low pressure dew points



### Durable, low-dust drum

The silica gel desiccant is embedded in a precisely manufactured drum with plain thrust bearings for exceptionally high run-out qualities. The superior sealing between the desiccant and the regeneration sections reduces pressure dew point fluctuations and increases energy efficiency. Low dust desiccant extends downstream filter life.



### Variable speed drum motor

The speed of the drum is automatically adjusted to actual compressor performance in order to regenerate the desiccant as effectively as possible. This is the key to ensuring consistently low pressure dew points at varying loads.



### Durable and efficient

Thanks to computational fluid dynamics optimization, the flow-optimized radial fan installed in the base of the dryer efficiently compensates for the pressure losses in the i.HOC cooling path.



### Condensate separation

A highly efficient condensate separator downstream of the second stage heat exchanger removes condensate absorbed during the regeneration process. Moisture is removed via Eco-Drain to prevent contamination and increase service life.

# Air treatment options

Depending on the pressure dew point you need, KAESER offers several options, from traditional refrigerated dryers to heatless desiccant dryers. The i.HOC dryer presents a unique combination of low dew point, space savings, and superb energy efficiency. Contact your local authorized KAESER representative to discuss your air treatment needs.



## Refrigerated dryer

For many oil-free applications, refrigerated dryers are the go-to choice for delivering the best possible energy efficiency and lowest investment cost for dew points down to 38°F. For lower dew points, a desiccant dryer is needed.

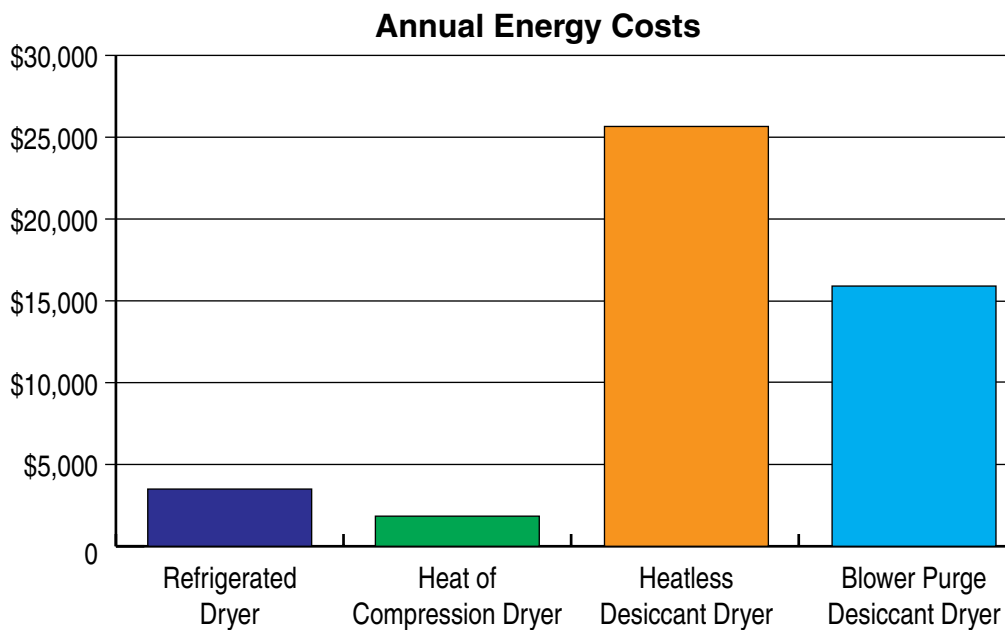
## Integrated heat of compression dryer

For dew points as low as -22°F, the optional i.HOC drum dryer is integrated into the package. The hot compressed air from the second compression stage is used to regenerate the desiccant.

38°F

-22°F

## Cost Comparisons



*Based on 8760 hours of operation, maximum ambient temperature 100°F, air pressure at dryer inlet 100 psig, maximum air temperature at dryer inlet 100°F, maximum air flow rate of 1000 scfm, and \$0.10/kWh.*



### Heated desiccant dryer

For dew points as low as  $-40^{\circ}\text{F}$ , KAESER heated exhaust or blower purge desiccant dryers (KED and KBP) are cost effective choices, especially for larger flow applications.

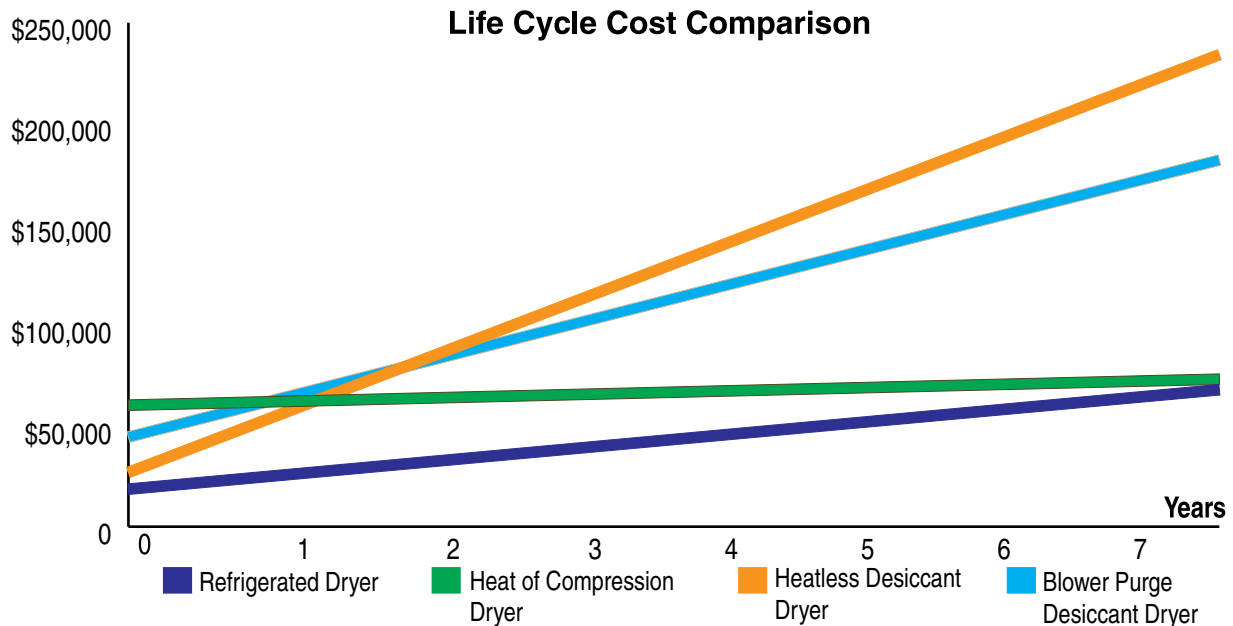


### Heatless desiccant dryer

If extremely low dew points are needed, the KAESER KAD heatless desiccant dryer can reach dew points as low as  $-100^{\circ}\text{F}$ . KAD dryers are initially less expensive than blower or exhaust purge dryers, however, they have the highest operating costs due to purge losses.

$-40^{\circ}\text{F}$

$-100^{\circ}\text{F}$



Based on 8760 hours of operation, maximum ambient temperature  $100^{\circ}\text{F}$ , air pressure at dryer inlet 100 psig, maximum air temperature at dryer inlet  $100^{\circ}\text{F}$ , maximum air flow rate of 1000 scfm, and  $\$0.10/\text{kWh}$ .

# Technical Specifications

## Fixed Speed

Model	Pressure Range <sup>(1)</sup> (psig)	Rated Motor Power (hp)	Air-cooled <sup>(4)</sup>				Water-cooled			
			Capacity (acfm) <sup>(2)</sup>	Sound (dB(A)) <sup>(3)</sup>	Dimensions W x D x H (in.)	Weight (lb.) <sup>(5)</sup>	Capacity (acfm) <sup>(2)</sup>	Sound (dB(A)) <sup>(3)</sup>	Dimensions W x D x H (in.)	Weight (lb.) <sup>(5)</sup>
DSG 140-2 DSG 140-2 i.HOC	65	125	581	80	135¼ x 68¾ x 93¾ <b>i.HOC:</b> 168½ x 68¾ x 93¾	7496 <b>i.HOC:</b> 9921	581	69	135¼ x 68¾ x 81¾ <b>i.HOC:</b> 168½ x 68¾ x 81¾	6834 <b>i.HOC:</b> 9259
	90		579				579			
	125		576				576			
	145		512				512			
DSG 180-2 DSG 180-2 i.HOC	65	150	694	81		7826 <b>i.HOC:</b> 10,251	694	70		7165 <b>i.HOC:</b> 9590
	90		692				692			
	125		689				689			
	145		576				576			
DSG 220-2 DSG 220-2 i.HOC	65	175	820	81		8157 <b>i.HOC:</b> 10,472	820	71		7385 <b>i.HOC:</b> 9811
	90		819				819			
	125		780				780			
	145		689				689			
DSG 260-2 DSG 260-2 i.HOC	65	200	966	82	8488 <b>i.HOC:</b> 10,802	966	74	7716 <b>i.HOC:</b> 10,141		
	90		964			964				
	125		908			908				
	145		816			816				
DSG 290-2 DSG 290-2 i.HOC	100	250	962	84	8819 <b>i.HOC:</b> 11,244	962	75	8157 <b>i.HOC:</b> 10,582		
	125		961			961				
	145		961			961				

For NOTES see back page

Continued next page

Specifications are subject to change without notice.

## Fixed Speed – Continued

Model	Pressure Range <sup>(1)</sup> (psig)	Rated Motor Power (hp)	Air-cooled <sup>(4)</sup>				Water-cooled			
			Capacity (acfm) <sup>(2)</sup>	Sound (dB(A)) <sup>(3)</sup>	Dimensions W x D x H (in.)	Weight (lb.) <sup>(5)</sup>	Capacity (acfm) <sup>(2)</sup>	Sound (dB(A)) <sup>(3)</sup>	Dimensions W x D x H (in.)	Weight (lb.) <sup>(5)</sup>
FSG 300-2 FSG 300-2 i.HOC	90	250	1144	82	152 x 81¾ x 107½ i.HOC: 182¼ x 81¾ x 107⅝	12,236	1144	143¾ x 81¾ x 87½ i.HOC: 176¼ x 81¾ x 87½	11,574 i.HOC: 14,110	
	125		1006			i.HOC: 14,881	1006			74
	145		795			795	74			
FSG 350-2	65	300	1391	82		12,677	1391		75	12,015
	90		1388				1388			
	125		1261				1261			
	145		1148				1148			
FSG 350-2 i.HOC	125	300	1261	82		15,322	1261		75	14,551
	145		1148				1148			
FSG 420-2	65	350	1591	83		13,118	1591		76	12,456
	90		1589		1589					
	125		1501		1501					
	145		1261		1261					
FSG 420-2 i.HOC	90	350	1589	83	15,763	1589	76	14,991		
	125		1501			1501				
	145		1261			1261				
FSG 500-2 FSG 500-2 i.HOC	125	450	1769	83	13,779	1769	76	13,118 i.HOC: 15,653		
	145		1586		i.HOC: 16,424	1586				
FSG 501-2* FSG 501-2 i.HOC*	145	450	N/A	N/A	N/A	1766	77			

For NOTES see back page

**Specifications are subject to change without notice.**

# Sigma Frequency Control (SFC)

Model	Pressure Range <sup>(1)</sup> (psig)	Rated Motor Power (hp)	Air-cooled <sup>(4)</sup>				Water-cooled <sup>(4)</sup>			
			Capacity (acfm) <sup>(2)</sup> Min/Max	Sound (dB(A)) <sup>(3)</sup>	Dimensions W x D x H (in.)	Weight (lb.) <sup>(5)</sup>	Capacity (acfm) <sup>(2)</sup> Min/Max	Sound (dB(A)) <sup>(3)</sup>	Dimensions W x D x H (in.)	Weight (lb.) <sup>(5)</sup>
DSG 180-2 SFC DSG 180-2 i.HOC SFC	65	150	310 / 795	81	135¼ x 68¾ x 93¾	9149 i.HOC: 11,574	310 / 795	70	135¼ x 68¾ x 81½	8488 i.HOC: 10,913
	90		332 / 761				332 / 761			
	125		312 / 665				312 / 665			
	145		337 / 615				337 / 615			
DSG 220-2 SFC DSG 220-2 i.HOC SFC	65	175	278 / 823	81	135¼ x 68¾ x 93¾	9370 i.HOC: 11,795	278 / 823	71	135¼ x 68¾ x 81½	8708 i.HOC: 11,133
	90		295 / 821				295 / 821			
	125		320 / 773				320 / 773			
	145		378 / 737				378 / 737			
DSG 260-2 SFC DSG 260-2 i.HOC SFC	65	200	309 / 967	82	168½ x 68¾ x 93¾	9700 i.HOC: 12,125	309 / 967	74	168½ x 68¾ x 81½	9039 i.HOC: 11,464
	90		330 / 966				330 / 966			
	125		347 / 911				347 / 911			
	145		364 / 858				364 / 858			
DSG 290-2 SFC DSG 290-2 i.HOC SFC	100	250	382 / 1059	84	152 x 81¾ x 107¾	10,141 i.HOC: 12,566	382 / 1059	75	143¾ x 81¾ x 87¾	9480 i.HOC: 11,905
	125		418 / 1058				418 / 1058			
	145		447 / 1057				447 / 1057			
FSG 420-2 SFC FSG 420-2 i.HOC SFC	100	350	553 / 1529	83	152 x 81¾ x 107¾	14,440 i.HOC: 17,086	551 / 1613	77	143¾ x 81¾ x 87¾	13,779 i.HOC: 16,314
	125		608 / 1422				608 / 1499			
	145		653 / 1334				653 / 1400			
FSG 500-2 SFC FSG 500-2 i.HOC SFC	100	450	621 / 1789	84	182¼ x 81¾ x 107¾	15,432 i.HOC: 18,078	621 / 1790	77	176¼ x 81¾ x 87¾	14,771 i.HOC: 17,306
	125		666 / 1702				666 / 1788			
	145		702 / 1612				702 / 1700			

(1) Other pressures available from 45 to 145 psig. (2) Performance rated in accordance with CAGI/ISO 1217 test code. (3) Per ISO 2151 using ISO 9614-2.

(4) Dimensional drawings for air-cooled and water-cooled units as well as i.HOC models are available on request from your local authorized KAESER distributor. (5) Weights may vary slightly depending on airtend model.

460 or 575 V, 3 ph, 60 Hz; other voltages available. Compressors are available water-cooled with stainless steel, plate type heat exchangers as standard equipment. Shell and tube heat exchangers are available on request.

**Specifications are subject to change without notice.**



**Built for a lifetime.**



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