



# Sigma Frequency Control

## SFC Series 75 - 515

Capacities from: 127 to 3133 cfm

Pressures from: 80 to 217 psig

# SFC 75 to 515

## Variable Speed Technology from Kaeser

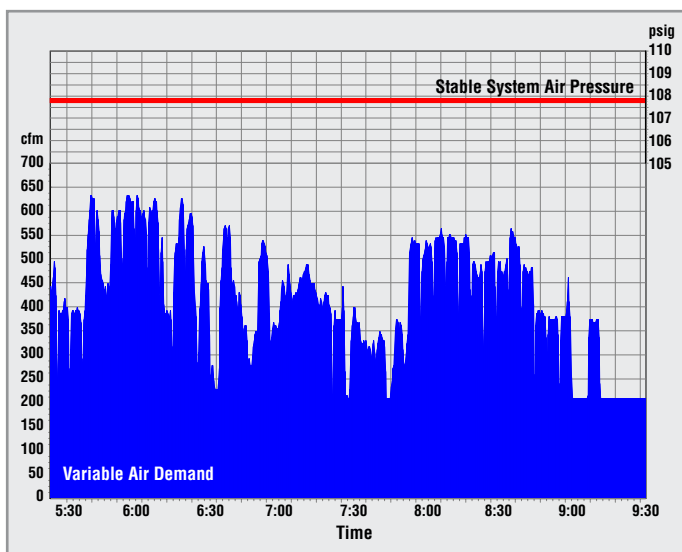
*Kaeser Sigma Frequency Control (SFC) rotary screw compressors are engineered to be the foundation of your demanding industrial application. Using the latest in Siemens drive technology, Kaeser SFC units are able to meet varying demand while maintaining stable pressure control. The result is exceptional reliability and superior energy efficiency. As a matter of fact, these units are up to 25% more efficient than the competition.*

### Meeting varying loads

Most compressed air systems have varying loads and it is often more effective and efficient to apply multiple compressors to meet changing demand. In cases where the demand profile changes more rapidly and frequently, variable frequency drive compressors may also be recommended. By varying the frequency of the input electricity to the motor, these compressors speed up and slow down to match their air output to your demand.

### Precise pressure control

Kaeser's SFC design includes highly accurate sensors to maintain stable pressure ( $\pm 1.5$  psig), without wasting air by over pressurizing the system (see Graph 1). This also increases reliability and product quality in your plant.



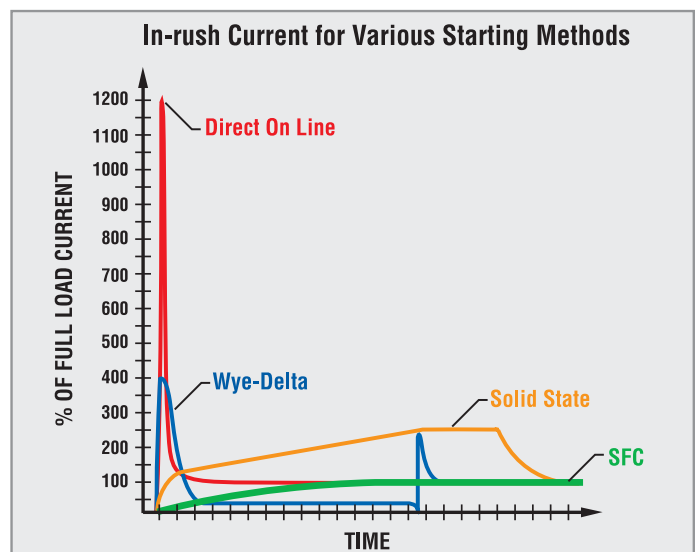
Graph 1

### Superior part-load performance

Kaeser's Sigma Frequency Control (SFC) units have superior part-load performance and make great trim load machines. They can be easily integrated into a multi-compressor system to provide faster response to variations in air consumption. At the same time, they can reduce electricity costs since their electrical consumption varies directly with air production.

### The ultimate soft start

Our frequency drives are the ultimate soft starter for your motor using the lowest start up current (see Graph 2). They eliminate heat spikes in motor windings, allowing unlimited motor starts. Of course, frequency drives usually have fewer starts/stops, which means less frequent loading and unloading, for less wear and tear on important mechanical parts.



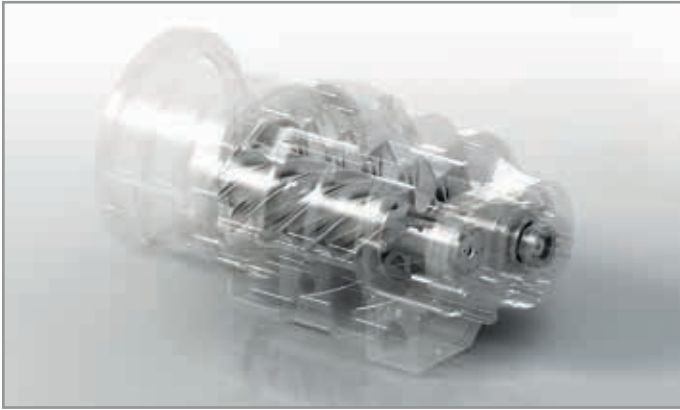
Graph 2







# Energy savings in every detail



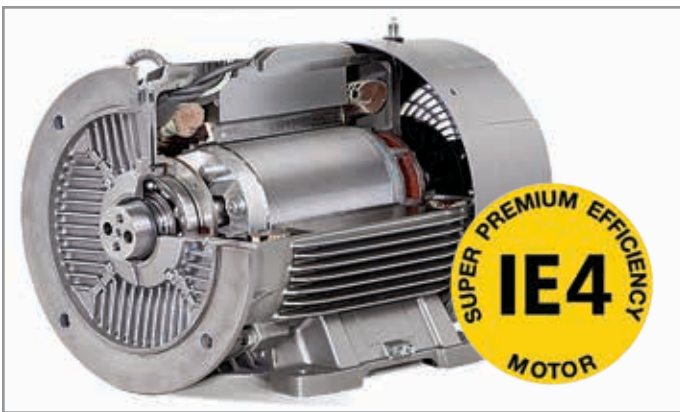
## Sigma Profile™ airend

Our single-stage, flooded rotary screw airend delivers pressures up to 217 psig and features our power saving Sigma Profile™ design. Our airends are precision machined and optimized in size and geometry to match the airend speeds with their best specific performance. Unlike the competition, Kaeser makes many different airends so that we can apply them at their optimal speed and performance.



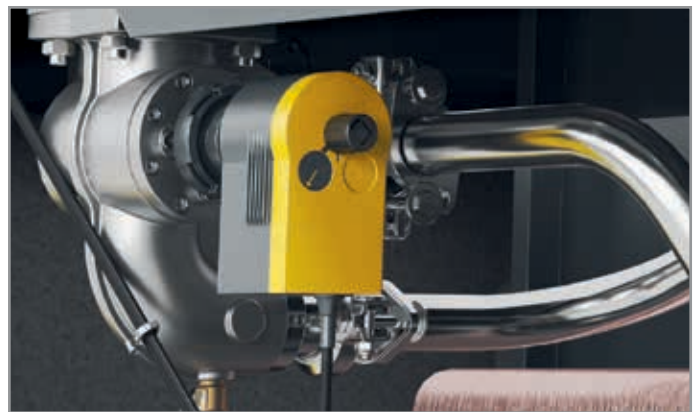
## Intelligent control: Sigma Control 2™

This intelligent controller ensures the most energy efficient compressor operation possible. An RFID sensor provides secure access and simplifies managing maintenance intervals while the SD card slot makes software updates quick and easy. An Ethernet port and built-in web-server facilitate IIoT integration. ModBus, Profinet, Profibus, Devicenet, and other industrial communications interfaces are available as plug-in options for seamless integration into plant control/monitoring systems.



## Super premium efficiency drive motor

Kaeser uses super premium efficiency Totally Enclosed Fan Cooled (TEFC) motors with class F insulation for extra protection from heat and contaminants. Remote grease fittings make maintenance a breeze. Each of the three motor windings is actively monitored through its own Pt100 temperature sensor. Standard voltages are 460 or 575 V (3-phase, 60 Hz). Other voltages are available.



## Electronic Thermal Management system

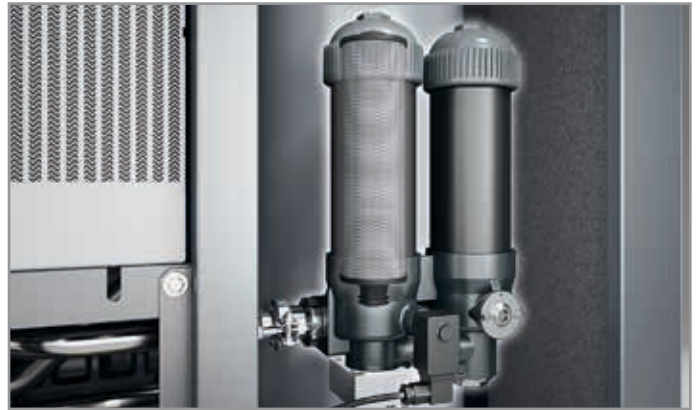
The innovative Electronic Thermal Management (ETM) system dynamically regulates fluid temperature to avoid internal condensation build up, eliminating a common cause of lubricant degradation. It ensures a lower, stable operating temperature which extends airend and cooler life and increases energy efficiency. The ETM has an adjustable temperature setting, making it perfectly suited for heat recovery applications.

# Economical in all aspects

## Integral moisture separator

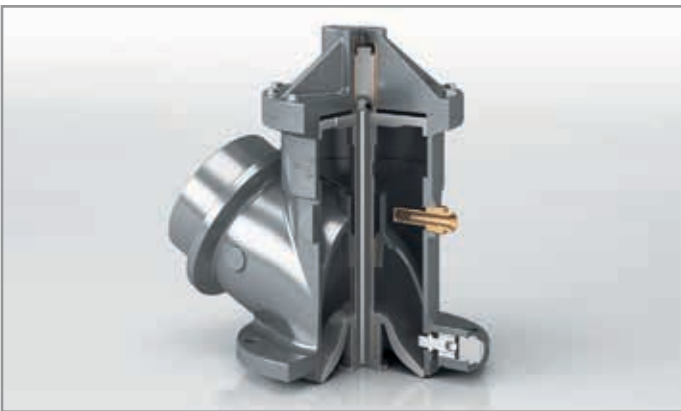


A moisture separator is integrated into the stainless steel discharge piping. Our unique design maximizes separation with minimal pressure loss—even in high ambient temperatures and humidity. A zero loss Eco-Drain is standard to automatically remove the captured moisture.



## Eco-friendly fluid filter

Our eco-friendly fluid filters feature metal-free filter elements in aluminum housings. At the end of their service life, the elements are safe for thermal disposal.



## Optimized inlet valve

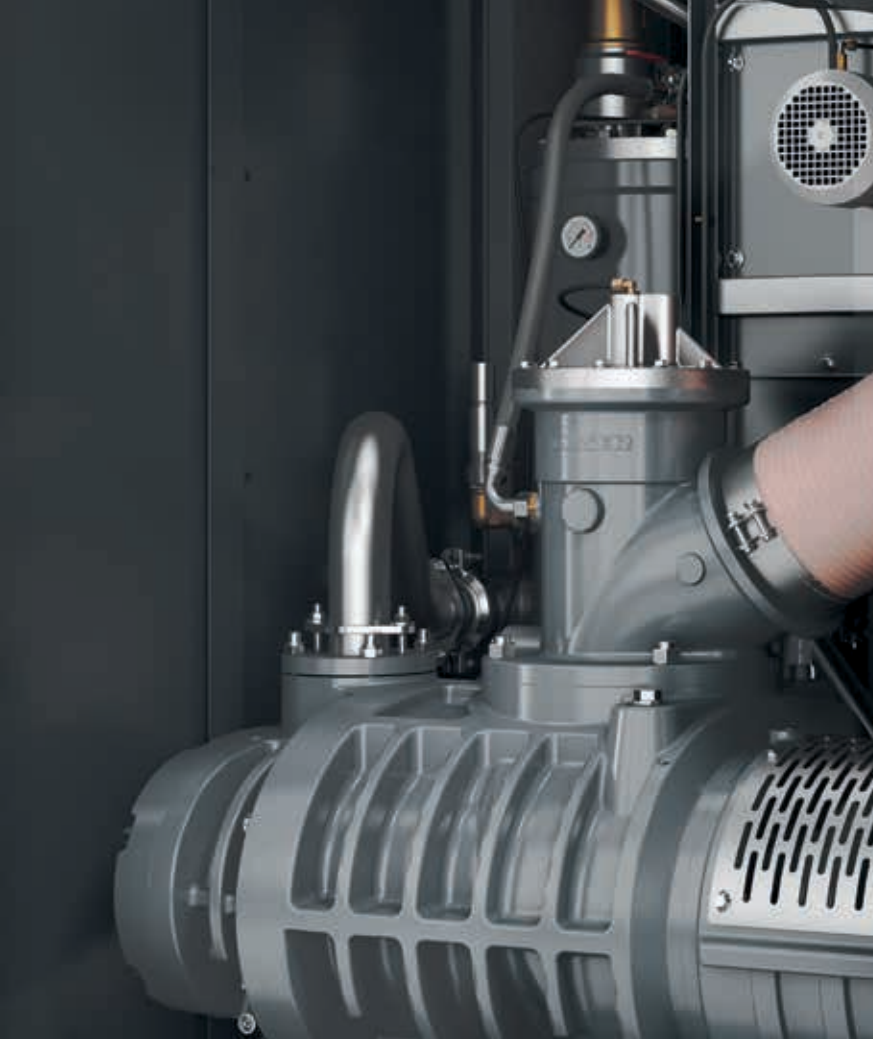
The new flow-optimized design of the inlet valve results in lower pressure loss and simplified service.



## True 1:1 direct drive

In our design, the motor is directly connected to the air end with a one-to-one coupling, providing maximum transmission efficiency. This true direct drive eliminates complex gear drive components, along with heat and power losses. It is also maintenance free, increasing reliability and uptime.





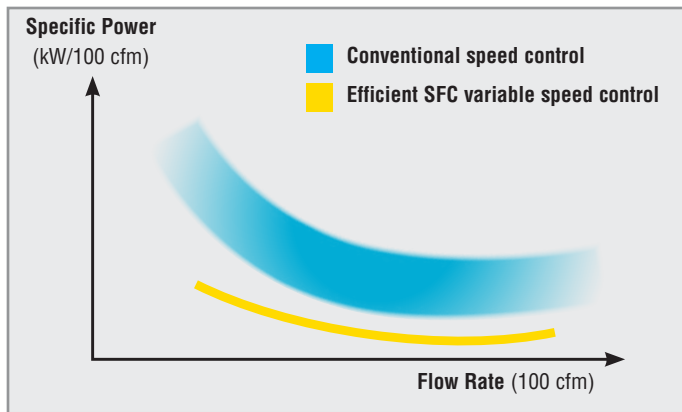


- Electromagnetic interference (EMI) filters are used to mitigate feedback and electrical noise that can be introduced into the plant electrical grid.
- Line reactors reduce the harmonic distortion that naturally occurs while operating VFDs, and improve the input current waveform to the drive.
- Safety features prevent the motor from unintentionally starting. When the unit is switched off or the emergency stop is pushed, all power is cut to the motor.
- Shielded motor cables reduce electromagnetic radiation that may affect other electrical devices.
- Siemens drives for the latest technology, reliability, world wide support, and easy integration into system controls.





# SFC drive features



## Optimized specific power

A variable speed rotary screw compressor is the most heavily loaded piece of equipment in a compressor station. Kaeser's SFC models are designed to provide maximum efficiency without running at extreme speeds. They can operate across a very wide range of flow (approximately 20 - 100%) while maintaining a safe operating temperature. This saves energy, maximizes service life, and enhances reliability.



## Precise pressure control

The volumetric flow rate can be adjusted within the control range according to pressure to meet actual compressed air demand. As a result, operating pressure is precisely maintained to within  $\pm 1.5$  psi. This allows maximum pressure to be reduced, which provides energy savings.



## Separate SFC control cabinet

The SFC variable speed drive is housed in its own separate control cabinet to protect it from heat from the compressor. A separate fan keeps operating temperatures in the optimum range to ensure maximum performance and service life.



## EMC-certified

The SFC control cabinet and Sigma Control 2 are tested and certified both as individual components and as a complete system to EMC directive EN 55011 for Class A1 industrial power supplies.

# Innovative package design

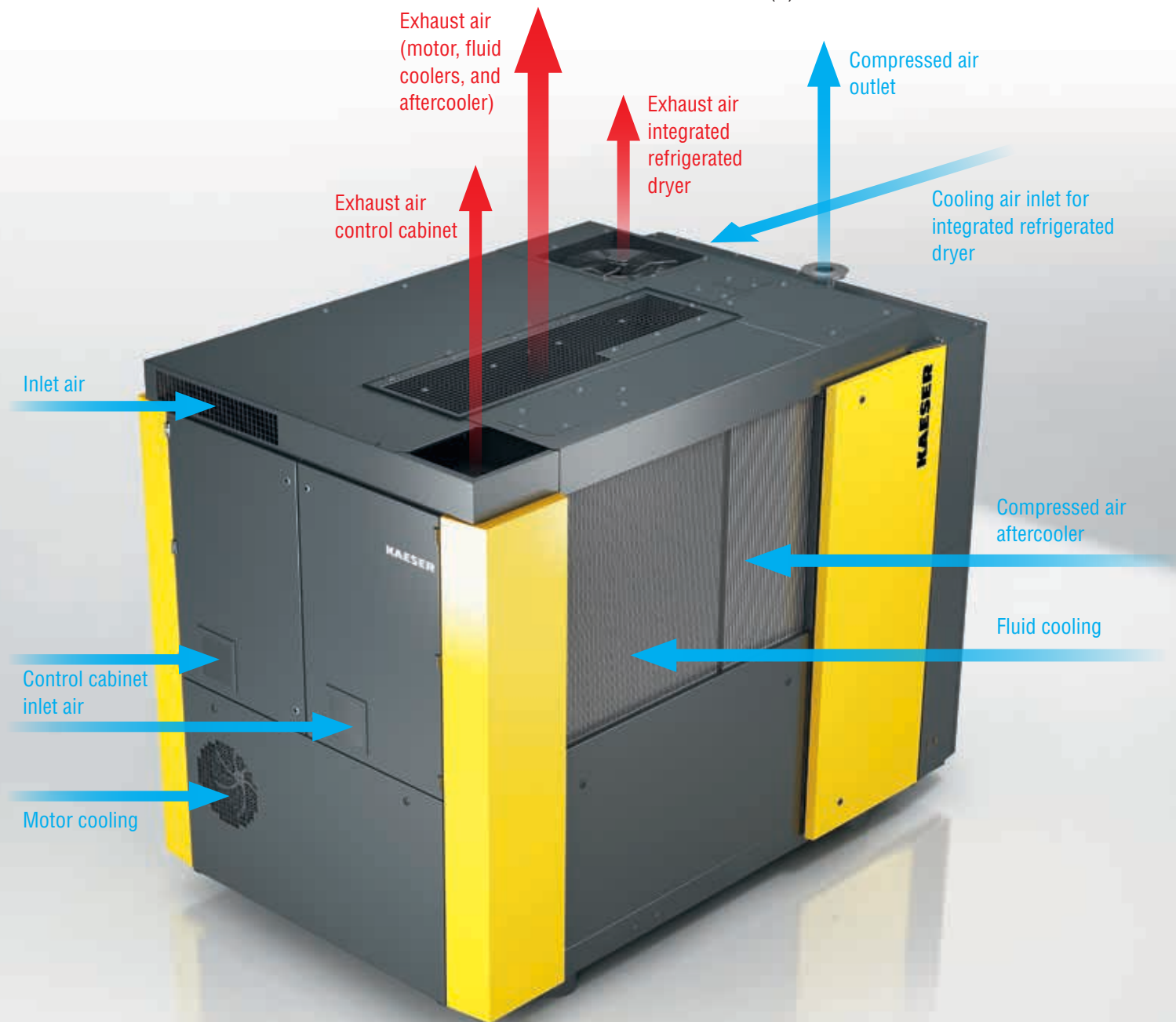
## Split cooling zones

The Kaeser package design separates inlet air flow from cooling air flows for more efficient compression. Further, drawing ambient air directly across the coolers and motor through separate zones eliminates preheating and results in longer lubricant life and a cooler running motor. This also results in much lower approach temperatures, improving moisture separation and air quality.

## Extremely low sound and vibration

All models come standard with Kaeser's superior cabinet that features complete metal enclosures with sound proofing liners and heavy-duty vibration isolation. Using one-to-one direct drive and our unique cooling airflow design with radial fans greatly reduces internal noise and vibration.

As a result, our compressors are about 10 dB(A) quieter than conventional compressors of equal performance with sound levels as low as 71 dB(A).



# Smart cooling for ultimate savings



## Low operating temperature

A VFD-driven fan on the oil cooler provides precise thermostatic control. With lower operating temperatures, only the necessary cooling air is generated, reducing the compressor's overall energy requirements.



## Low compressed air temperature

Effective aftercooling keeps the discharge temperature low. This, along with the large amount of condensate removed by the integral moisture separator, reduces the load on downstream components.



## Easy to clean coolers

To increase reliability and reduce maintenance costs, the coolers are conveniently located on the outside of the unit, where dust and dirt build-up are easily seen and can be removed without dismantling the cooler.



## Exhaust air with high residual pressure

Powerful radial fans pull air through the coolers, creating a vacuum within the cabinet that effectively cools the motor - even under severe operating conditions. The fan's design eliminates the need for an additional fan to effectively exhaust the air into ductwork. Top exhaust allows for easy heat recovery and reduces the system footprint.



# Integrated dryer option

SFC 75-132ST models are available with an integrated dryer for premium compressed air quality. The dryer is perfectly sized for the full flow of the compressor and located in a separate cabinet so it is not exposed to preheated air or contaminants from the compressor package.



## Intelligent cooling air flow

The refrigerated dryer's cooling air is warmed by the integrated exhaust air duct located in the roof of the compressor package. This allows for a significantly reduced depth for the integrated dryer.

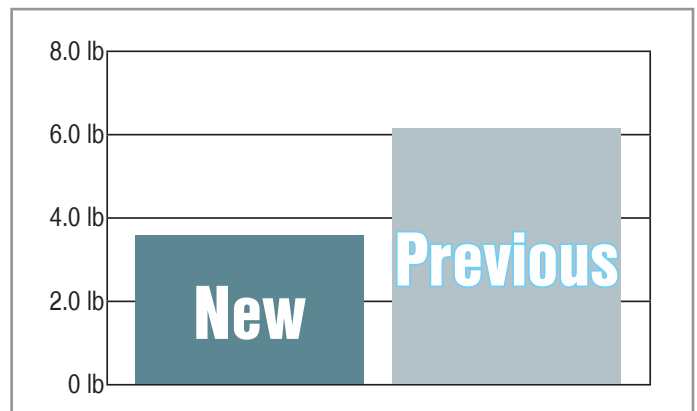
## Reduced footprint

In keeping with Kaeser's design philosophy, the models with integrated dryers are compact without compromising air flow or maintenance access. Compared to previous designs, the package footprint is reduced from 62 sq. ft. to 56 sq. ft.



## Centrifugal separator with Eco-Drain

Before flowing into the refrigerated dryer, the compressed air from the compressor passes through Kaeser's unique centrifugal separator which efficiently removes accumulating condensate. This reduces the load on the dryer as well as energy consumption.



## Reduced refrigerant requirement

The refrigerated dryer for these models requires 40% less refrigerant than previous designs. This not only saves costs, but is also more environmentally friendly.



# Service-friendly

*The SFC series rotary screw compressors feature an open package layout. All of the major components are easily accessible, reducing preventive maintenance time by as much as 50% when compared to other similarly sized units.*



## Fluid separation system

Our 3-stage separation system ensures very low fluid carry-over (1-3 ppm), and extended filter service life. Our no-leak design features rigid steel piping, flexible connections, and vibration isolators, as well as a pivoting lid on the separator tank for ease of maintenance. Each pressure vessel is ASME coded (CRN in Canada) and includes wet side/dry side fittings to check differential pressure, an easy to read fluid level indicator, and our unique quick fluid drain system.

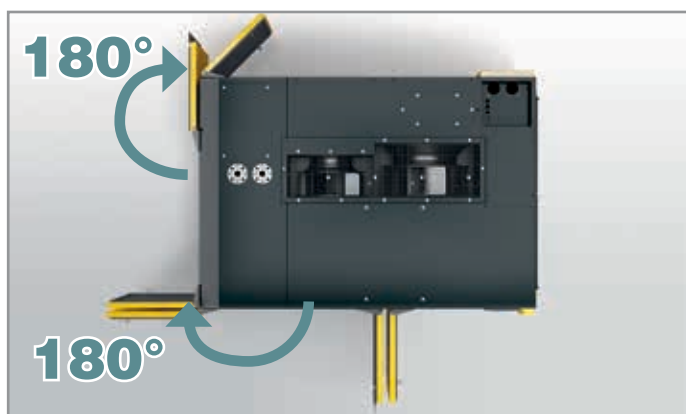


## External grease fitting lubrication

The fan and drive motors have external grease fittings for safe and easy lubrication while the compressor is running.



*When you consider the energy efficiency savings and the maintenance costs savings, it's clear that owning a Built for a lifetime™ Kaeser compressor will save you money, year after year.*



### **Service doors swing out 180°**

For installations where space is limited, both the front and back doors of the package swing out a full 180°, making it possible to perform maintenance from the front or back of the package. Each door can also be removed for even more service accessibility options. Increased accessibility simplifies maintenance work, reduces maintenance costs, and increases uptime.

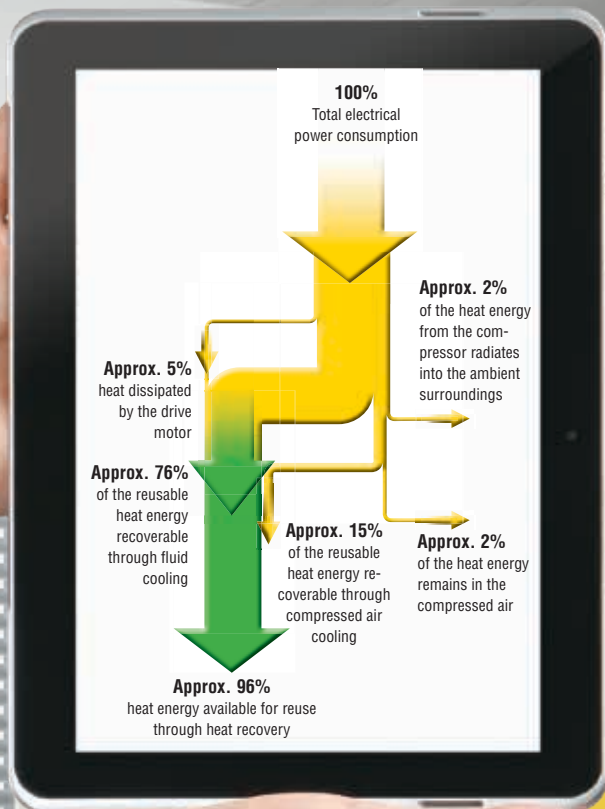


### **Easy filter access**

Intake filter is easy to access and protects the compressor from harmful contaminants. This two-stage, 1 micron filter extends air end life and fluid change intervals.

# Heat recovery ready

## The next level of energy savings



The rise in energy prices is an unwelcome reality in today's manufacturing and business environment. Fluctuating prices create uncertainty in operating costs. One certainty is that much of the energy going into compressors is wasted but can be recovered. Energy cost reduction strategies are vital to staying competitive.

Compressing air converts the electrical energy you pay for into heat. Our SFC 75-515 compressors are available with a heat recovery option to easily recover up to 76% of this energy for heating water or other process fluids. You can harness additional heat recovery by ducting exhaust air. In all, up to 96% of input energy can be recovered as heat.

When you consider that a 300 hp compressor running full time at 10 cents/kWh uses approximately \$250,000 per year in energy, the potential savings and benefits are significant.

*For additional information on heat recovery, see our whitepaper "Turning Air Compressors into an Energy Source."*

# Sigma Air Manager 4.0 and Kaeser Sigma Network

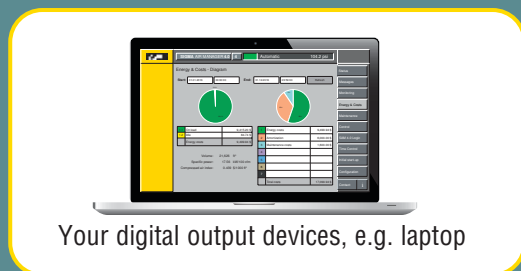
## Secure connectivity at the speed of your business

Sigma Air Manager (SAM) 4.0 is a master control system for all compressed air production and treatment components. The unique 3D<sup>advanced</sup> Control continuously analyzes the various parameters (e.g. switching and control efficiency) and calculates the ideal combination of compressors to achieve optimum efficiency.

Based on secure Ethernet technology, the Kaeser Sigma Network is a local network that connects all components within the compressed air system. Together, SAM 4.0 and the Sigma Network create the perfect infrastructure for predictive maintenance and integration into the IIoT.

SAM 4.0 features Kaeser Connect which displays your compressed air system information in real-time on your desktop or laptop computer via a standard internet browser.

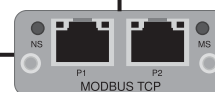
Simple HTML pages show the compressors' operational state, SAM's operating and system pressure data, as well as service and alarm messages.



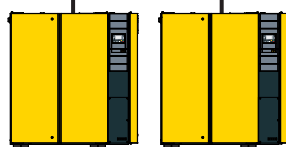
KAESER CONNECT web server



Optional Communications Module  
e.g. Modbus TCP



**KAESER SIGMA NETWORK: 100 Mbit/s**



Controller:  
Sigma Control 2



Controller:  
Sigma Control



Sigma Network  
Profibus Master



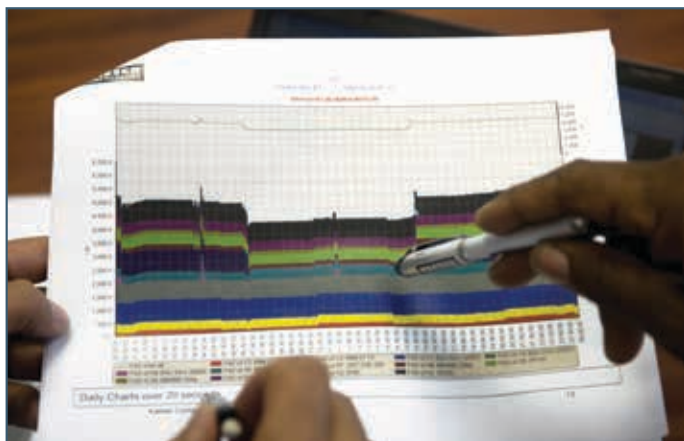
# Compressed air system design

## Analysis that goes well beyond the basics

Kaeser's team of engineers are always at your service to help design or optimize your compressed air system.

Using our Air Demand Analysis (ADA) and Kaeser Energy Saving System (KESS) we can evaluate your existing installation and demonstrate how proposed changes will improve your system performance. This helps identify solutions that will achieve the greatest efficiency without compromising pressure/flow requirements or system reliability.

*For more information, see our Energy Management Services brochure.*



*Time-stamped data logging enables more thorough analysis.*



Kaeser can also produce 2D and 3D CAD drawings of the proposed system. This is a huge benefit in project planning. It helps visualize new equipment and how it will fit into the building along with existing equipment, piping, walls, vents, etc. This facilitates installation planning.

From complex installations, to challenging environments, to limited space, Kaeser can design a system to meet your specific requirements for performance and reliability.

## CAGI

### Certified Performance

Our compressors' energy efficiency has been tested and confirmed by an independent laboratory as part of the Compressed Air and Gas Institute's **Rotary Screw Compressor Performance Verification Program**. CAGI data sheets for our screw compressor units can be found at [us.kaeser.com/cagi](https://us.kaeser.com/cagi)



# Technical specifications

## for Air-cooled units

Model	Pressure Range <sup>(1)</sup> (psig)	*Capacity for 460V <sup>(2)</sup> (cfm)		Rated Motor Power (hp)	Dimensions L x W x H (in.)	Weight <sup>(3)</sup> (lb.)	Sound Level <sup>(4)</sup> (dB(A))
		Min	Max				
SFC 75 SFC 75T	110	129	593	100	105 <sup>7</sup> / <sub>8</sub> x 68 <sup>1</sup> / <sub>8</sub> x 84 <sup>1</sup> / <sub>2</sub> 117 <sup>3</sup> / <sub>4</sub> x 68 <sup>1</sup> / <sub>8</sub> x 84 <sup>1</sup> / <sub>2</sub>	7033	71
	125	127	553			7650	
SFC 90 SFC 90T	110	129	698	125		7341	72
	125	127	655			7959	
	145	124	597				
SFC 110 SFC 110T	110	157	799	150		7363	74
	125	153	752			7981	
	145	148	689				
SFC 132S SFC 132ST	110	196	917	175		8091	75
	125	194	859			8708	
	145	188	790				
SFC 132	110	196	980	200	115 <sup>3</sup> / <sub>4</sub> x 75 <sup>1</sup> / <sub>4</sub> x 84 <sup>1</sup> / <sub>2</sub>	10,362	75
	125	194	918				
	145	197	846				
SFC 160	110	242	1161	250		10,582	75
	125	240	1090				
	145	189	1005				
SFC 200	110	303	1322	250	126 x 79 <sup>7</sup> / <sub>8</sub> x 84 <sup>1</sup> / <sub>4</sub>	12,081	76
	125	300	1257				
	145	290	1148				
SFC 250	110	374	1519	350		12,478	77
	125	370	1439				
	145	294	1338				
SFC 315S	110	374	1825	350	147 <sup>1</sup> / <sub>4</sub> x 84 <sup>1</sup> / <sub>2</sub> x 92 <sup>7</sup> / <sub>8</sub>	15,278	80
	125	370	1742				
	145	351	1625				
SFC 315	110	470	2164	450		16,094	81
	125	465	2057				
	145	456	1814				
SFC 410 <sup>(5)</sup>	110	368	2615	550	172 x 84 <sup>1</sup> / <sub>2</sub> x 92 <sup>1</sup> / <sub>2</sub>	20,091	75
	125	363	2538				
	145	299	2292				
SFC 515 <sup>(5)</sup>	110	420	3134	700		21,938	76
	125	412	3118				
	145	355	2722				

**\*Performance data values are only valid for 460V/3 ph/60 Hz. Please consult Kaeser for 575V availability and data.**

(1) Other pressures available from 80 to 217 psig. (2) Performance rated in accordance with ISO 1217, Annex E test code. (3) Weights may vary slightly depending on airtend model. (4) Per ISO 2151 using ISO 9614-2. (5) These units are only available water-cooled.

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

# The world is our home

As one of the world's largest compressed air systems providers and compressor manufacturers, Kaeser Compressors is represented throughout the world by a comprehensive network of branches, subsidiary companies and factory trained partners.

With innovative products and services, Kaeser Compressors' experienced consultants and engineers help customers to enhance their competitive edge by working in close partnership to develop progressive system concepts that continuously push the boundaries of performance and compressed air efficiency. Every Kaeser customer benefits from the decades of knowledge and experience gained from hundreds of thousands of installations worldwide and over ten thousand formal compressed air system audits.

These advantages, coupled with Kaeser's worldwide service organization, ensure that our compressed air products and systems deliver superior performance with maximum uptime.



**KAESER  
COMPRESSORS®**

*Built for a lifetime.*

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