

Rotary Screw Compressors SM Series

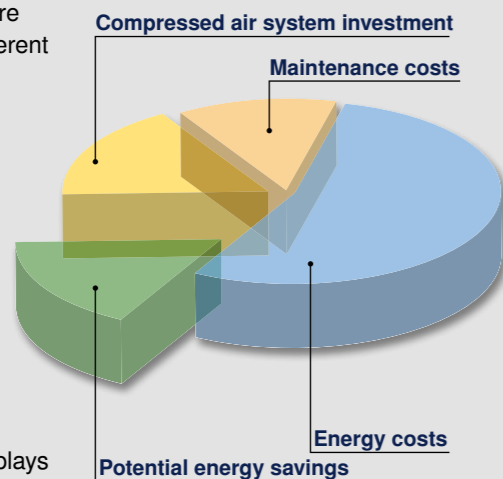
With the world-renowned SIGMA PROFILE 

Free air delivery 0.30 to 1.50 m³/min, Pressures 8 – 11 – 15 bar

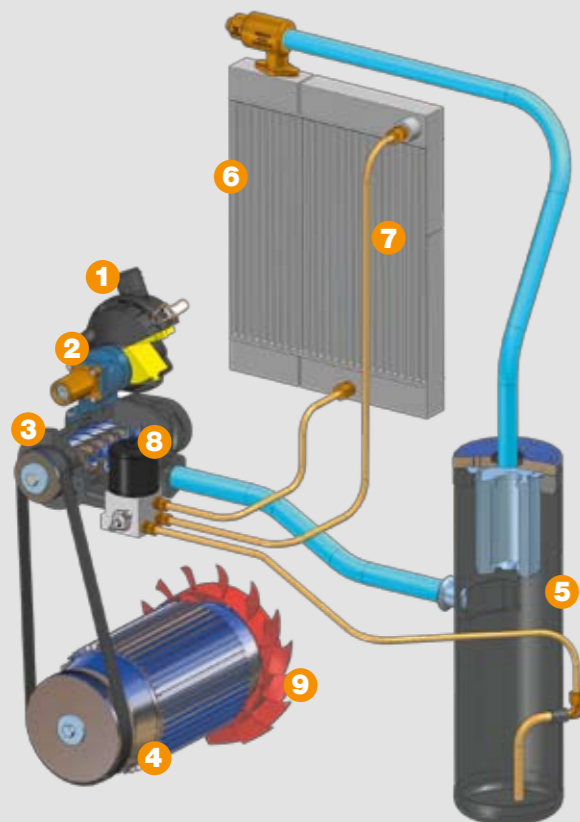


What do users expect from a compressor system?

They expect maximum efficiency and reliability. This sounds simple, but these advantages are influenced by many different factors: Energy costs, for example, taken over the lifetime of a compressor, add up to a multiple of investment costs. This not only applies to large systems, but also to smaller packages such as SM series compressors. Efficient energy consumption therefore plays a vital role in the production of compressed air. The air system must also deliver the compressed air in the correct volume, at the required quality, and provide exceptional reliability. This is essential to ensure maximum availability of compressed air powered production equipment. Last but not least, a truly efficient compressed air system should incur minimal maintenance costs. This is achieved by using high quality components and through logical design which allows excellent accessibility to all maintenance points. KAESER rotary screw compressors fulfil all of these needs and provide the basis for highly efficient compressed air production.



Function diagram



- 1 Intake filter
- 2 Inlet valve
- 3 Airend
- 4 Drive motor
- 5 Separator tank
- 6 Compressed air aftercooler
- 7 Fluid cooler
- 8 Fluid filter
- 9 Fan

SM Rotary Screw Compressors
Compact compressed air power

Intelligent design – SM Aircenter

Kaeser's SM series 'Aircenter' systems offer more than space-saving compressed air production, treatment and storage: They redefine the concept of turnkey compressed air systems, as each model features the very latest technology to ensure unrivalled user advantages and outstanding performance. All three modules – the compressor, refrigeration dryer and air receiver – are enclosed within one cabinet, so that the whole system operates as an integrated package. The components within every Kaeser 'Aircenter' are perfectly matched to provide optimum energy efficiency, ease of maintenance and unrivalled durability.



SM optionally available as an Aircenter model with refrigeration dryer and compressed air receiver



Energy-saving SIGMA PROFILE

Each KAESER rotary screw compressor airend uses SIGMA PROFILE rotors – specially developed by KAESER – that require approximately 15 percent less energy than conventional rotors of the same air delivery capacity.



Sigma Control

The SIGMA CONTROL compressor controller is a robust PC-based industrial computer with a real-time operating system and update capability. 'Traffic light' style LEDs clearly indicate system operational status.



Even quieter

The new cooling system combines optimum sound damping with enhanced cooling. Normal conversation can take place right next to the running compressor.



Dual-flow fan

The patent-pending dual-flow cooling fan produces the cooling air flow for the drive motor on one side and the cooling air for the package on the other. The crescent-shaped fanblades help to further reduce sound emissions.



Powerful – Efficient – Quiet

As the most efficient way to achieve a given drive power, KAESER uses large, low speed rotary screw airends. This ensures that the specific power is always within the optimal range. SM series units use a flexible V-belt drive system to precisely determine airend speed dependent upon the airend being used. Low airend speed also means that components are subjected to less wear and consequently last longer, whilst noise emissions are also significantly reduced in comparison with high speed airends. This is particularly important for compressors installed directly in work environments.

SM – Maximum Versatility



SM with energy-saving dryer

Kaeser's compact modular design with integrated refrigeration dryer (T version) has significant advantages: The dryer is contained in its own separate cabinet within the unit to prevent exposure to heat from the compressor package, which consequently enhances reliability. The dryer shut-down feature – which is linked to compressor operation – can also be selected via the compressor controller to further reduce energy consumption.



Variable speed control also available

The use of variable speed control can provide definite advantages for specific applications, which is why the SM 12 is also available with this feature. The SIGMA FREQUENCY CONTROL (SFC) module is integrated within the compressor control cabinet and, like the SIGMA CONTROL and SIGMA CONTROL BASIC compressor controllers, is a quality product manufactured by Siemens.



Aircenter: The integrated solution

The compact SM Aircenter series from Kaeser provides cost-effective compressed air production, treatment and storage with minimal space requirement. The compressor, dryer and 270-litre air receiver are integrated within a single housing. Each unit is optionally available with a microfilter or microfilter combination.



Standard version
SM rotary screw compressor

Maintenance friendly

All maintenance work can be carried out from one side of the unit. The left housing cover is easily removed to allow excellent component accessibility. Furthermore, there's no need to remove the housing cover to inspect fluid levels or drive belt tension, as these can be checked via a convenient inspection window. 'T' versions are also equipped with a service opening for the test button on the refrigeration dryer's electronic condensate drain.



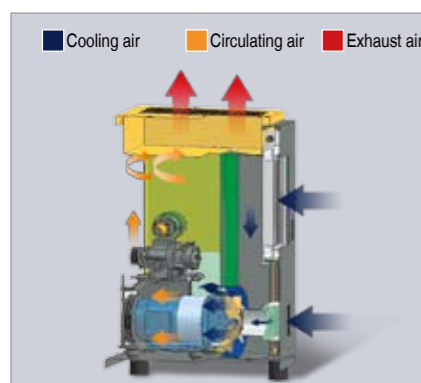
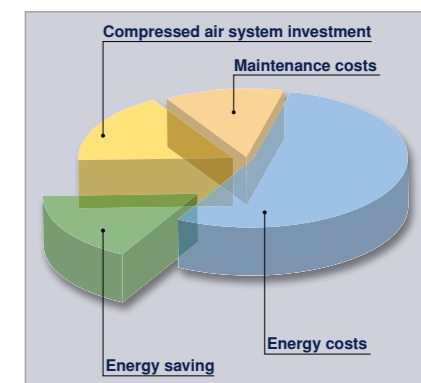
EMC tested and certified

Electromagnetic compatibility (EMC) is particularly important for compressors in order to ensure optimum system performance. The electromagnetic compatibility of the components and of the complete machine has been tested and certified in accordance with EMC guideline Class A1 (for industrial networks) and Class B (residential) as per EN 55011.



Energy savings

Energy costs account for over 70 percent of total compressed air costs. This can therefore amount to a significant sum even for smaller compressed air systems, which is why KAESER uses the very latest technology to ensure that every compressor provides best possible energy efficiency. These compressors form the basis for reliable and cost-effective compressed air production as part of a correctly planned and integrated compressed air supply system.



Cooling system with dual-flow fan

The high-efficiency cooling system uses an innovative dual-flow fan (patent pending) that not only ensures exceptional performance, but which also keeps sound emissions to an absolute minimum. The system uses separate flow paths for the compression air and for the motor and fluid cooling air to guarantee sufficient reserves even at high ambient temperatures of up to 45°C. Compression efficiency and motor cooling are enhanced by drawing in the air for motor cooling and compression from the ambient surroundings. Furthermore, sound levels are exceptionally low as the air flows through the cooling system at low speed. This system also significantly contributes to the effectiveness and reliability of refrigeration dryers in T-version packages.

Tailored control

Developed in close co-operation with Siemens, the SIGMA CONTROL BASIC multi-function controller provides all the advantages of modern compressor control technology without the additional costs associated with PC-based control systems. Using the proven 'Dual' and 'Quadro' control modes, this advanced control system will communicate with - and constantly monitor - the compressor package. If necessary, system messages can be defined as alarms and, with the addition of an easily integrated function module, can be forwarded to a master control system. The compressor can therefore be easily integrated into a compressed air station comprising multiple units.



Equipment

Complete unit

Ready for operation, fully automatic, super-silenced, vibration damped, all panels powder coated.

Sound insulation

Lined with washable foam, anti-vibration mounts, double vibration damped.

Airend

Genuine KAESER single-stage rotary screw airend with SIGMA PROFILE rotors and cooling-fluid injection for optimised rotor cooling.



Electric motor

German made premium efficiency (EFF1) electric motor to IP55 (SM 12/IP 54) and insulation class F for additional reserve.

V-belt drive with automatic belt tensioning

Durable V-belt drive with automatic tensioning device for extended belt life.

Fluid and air flow

Honeycombed dry-air filter, pneumatic inlet and vent valves, cooling fluid reservoir with three-stage separator system, pressure release valve, minimum pressure/ check valve, thermostatic valve and micro-filter in cooling fluid system.

Cooling

Air cooled, separate aluminium coolers for compressed air and cooling fluid, dual-flow fan (patent pending) fitted to motor drive shaft.

Electrical components

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

SIGMA CONTROL

Interfaces for data communication, comprising: RS 232 for a modem, RS 485 for a slave compressor in base load sequencing mode (not with SFC version), Profibus DP interface for data networks. Prepared for Teleservice.

Ergonomic control panel

Red, yellow and green LEDs show operational status at a glance. Also features a plain text display, 30 selectable languages, touch keys with icons and a duty cycle indicator.

Prime functions

Fully automatic monitoring and regulation of airend discharge temperature, motor current, direction of airend rotation, air filter, fluid filter and fluid separator cartridge, display of performance data, service intervals of primary components, operating hours, status data and event memory data. Selection of Dual, Quadro, Vario and Continuous control modes as required.



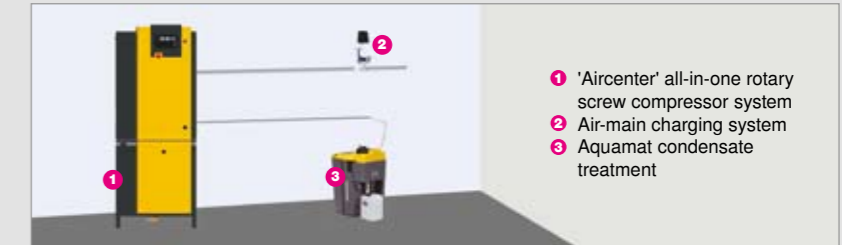
(For further information refer to SIGMA CONTROL / SIGMA CONTROL BASIC brochure 780)

Professional planning

Compressed air supply system with separate components



Compressed air supply system with Aircenter



Only properly designed air systems can meet the demands for air quality, availability and efficiency that are placed on a modern compressed air supply.

Therefore benefit from decades of compressed air engineering experience and let KAESER design your compressed air supply system.

Technical Specifications – SM

Standard version

Rated motor power kW	Model	Working pressure bar	FAD*) m³/min	Max. operating pressure bar	Sound level**) dB(A)	Dimensions W x D x H mm	Weight kg
5.5	SM 9	7.5 10 13	0.90 0.75 0.55	8 11 15	64	630 x 762 x 1100	200
7.5	SM 12	7.5 10 13	1.20 1.01 0.77	8 11 15	64	630 x 762 x 1100	210
9	SM 15	7.5 10 13	1.50 1.26 1.00	8 11 15	65	630 x 762 x 1100	220

T – Version with integrated refrigeration dryer (Refrigerant R 134a)

Model	Working pressure bar	FAD*) m³/min	Max. working pressure bar	Dryer power consumption kW	Sound level**) dB(A)	Dimensions W x D x H mm	Weight kg
SM 9 T	7.5 10 13	0.90 0.75 0.55	8 11 15	0.3	64	630 x 1074 x 1100	275
SM 12 T	7.5 10 13	1.20 1.01 0.77	8 11 15	0.3	64	630 x 1074 x 1100	285
SM 15 T	7.5 10 13	1.50 1.26 1.00	8 11 15	0.3	65	630 x 1074 x 1100	295

SFC – With variable speed drive

Rated motor power kW	Model	Working pressure bar	FAD range m³/min	Max. working pressure bar	Sound level**) dB(A)	Dimensions W x D x H mm	Weight kg
7.5	SM 12 SFC	7.5 10 13	0.34 - 1.24 0.34 - 1.04 0.30 - 0.78	8 11 15	66	630 x 762 x 1100	220

SFC – With variable speed drive

Model	Working pressure bar	FAD range m³/min	Max. working pressure bar	Dryer power consumption kW	Sound level**) dB(A)	Dimensions W x D x H mm	Weight kg
SM 12 T SFC	7.5 10 13	0.34 - 1.24 0.34 - 1.04 0.30 - 0.78	8 11 15	0.3	66	630 x 1074 x 1100	295

AIRCENTER – With refrigeration dryer and compressed air receiver

Rated motor power kW	Model	Working pressure bar	FAD*) m³/min	Max. working pressure bar	Dryer power consumption kW	Air receiver capacity	Sound level**) dB(A)	Dimensions W x D x H mm	Weight kg
5.5	AIRCENTER 9	7.5 10 13	0.90 0.75 0.55	8 11 15	0.30	270	64	630 x 1200 x 1716	390
7.5	AIRCENTER 12	7.5 10 13	1.20 1.01 0.77	8 11 15	0.30	270	64	630 x 1200 x 1716	400
9	AIRCENTER 15	7.5 10 13	1.50 1.26 1.00	8 11 15	0.37	270	65	630 x 1200 x 1716	410

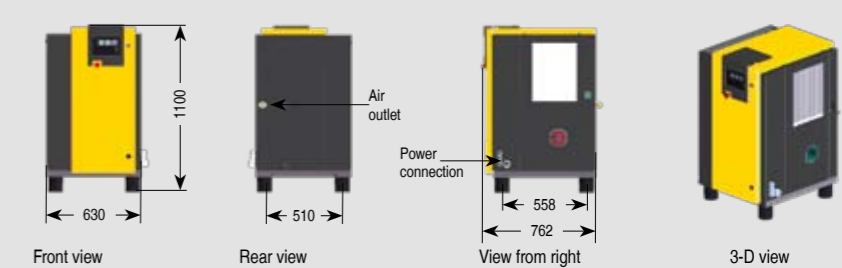
AIRCENTER SFC-With variable speed control

Model	Working pressure bar	FAD range m³/min	Max. working pressure bar	Sound level**) dB(A)	Dimensions W x D x H mm	Weight kg
AIRCENTER 12 SFC	7.5 10 13	0.34 - 1.24 0.34 - 1.04 0.30 - 0.78	8 11 15	66	630 x 1200 x 1716	410

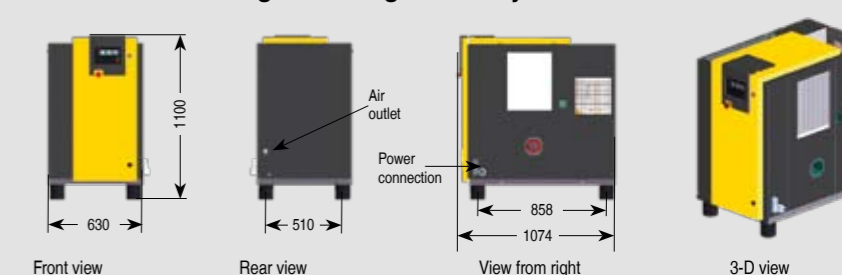
*) FAD to ISO 1217: 1996, Annex C. ** Sound level to PN8NTC 2.3 at 1m distance, free-field measurement

Dimensions

Standard version

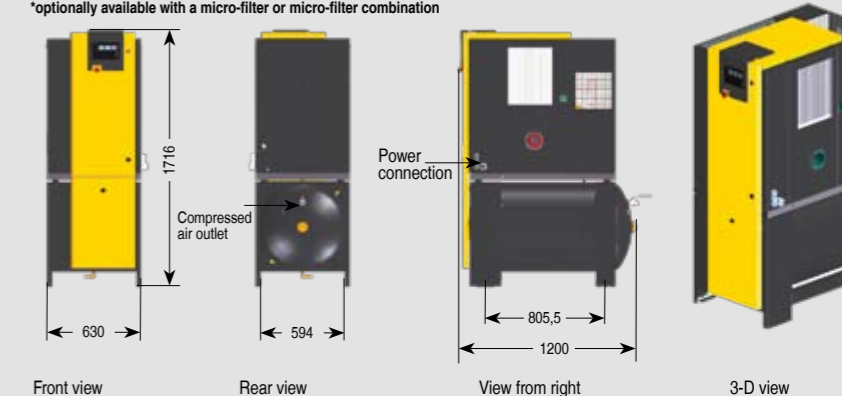


T - Version with integrated refrigeration dryer



Aircenter – With refrigeration dryer and compressed air receiver

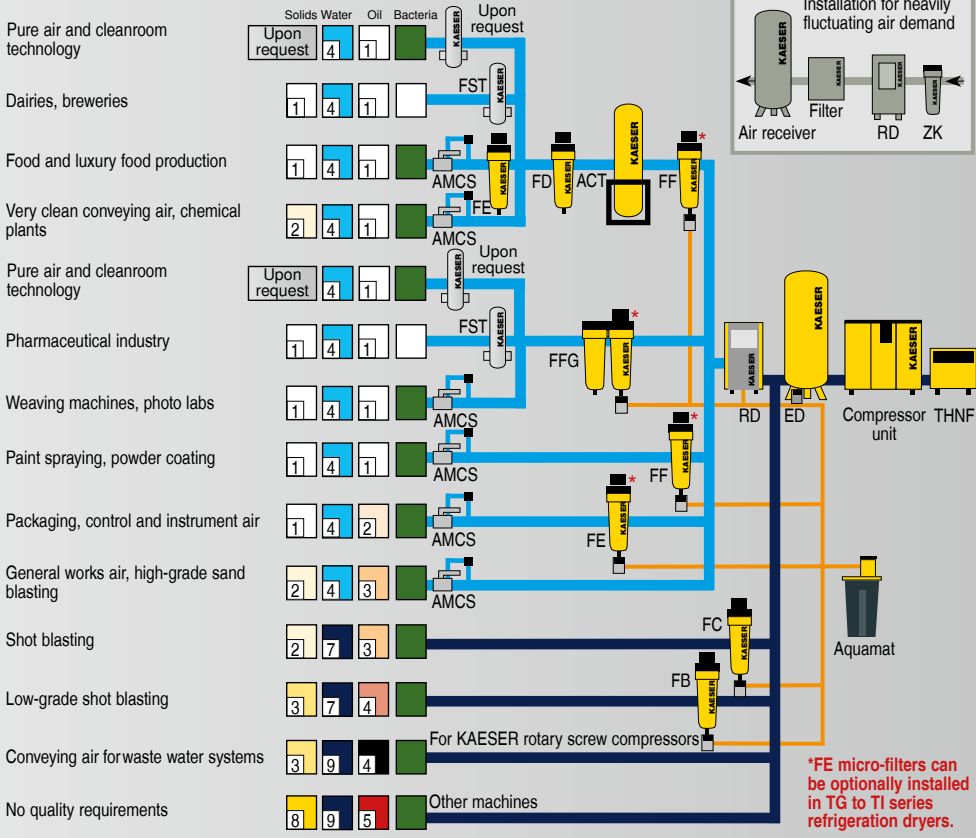
*optionally available with a micro-filter or micro-filter combination



Choose the required grade of treatment according to your field of application:

Air treatment using a refrigeration dryer (pressure dew point + 3 °C)

Examples: Selection of treatment classes to ISO 8573-1¹⁾



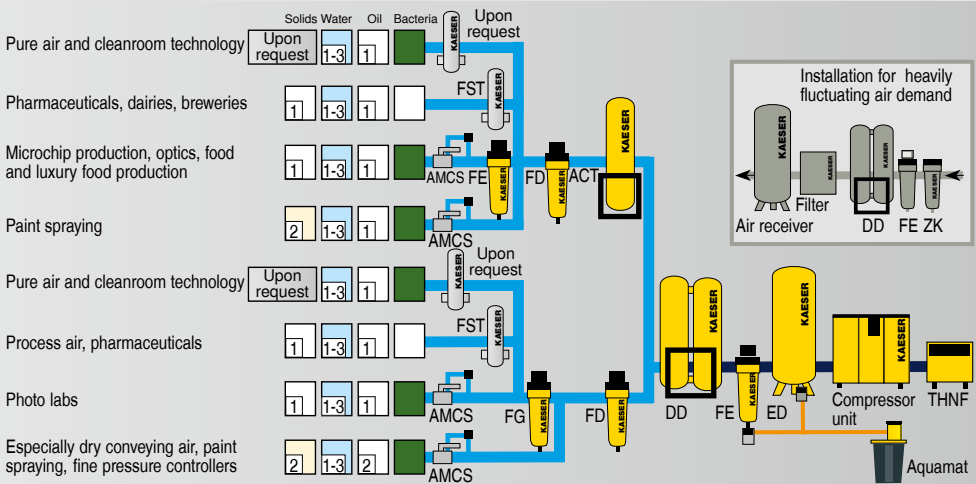
Explanation:

- THNF = Bag filter**
Cleans dusty and heavily contaminated intake air
- ZK = Centrifugal separator**
Separates accumulating condensate
- ED = Eco-drain**
Electronic level-controlled condensate drain
- FB = Pre-filter**
- FC = Pre-filter**
- FD = Particulate filter (attrition)**
- FE = Micro-filter**
Separates aerosol oil and solid particles
- FF = Micro-filter**
Separates aerosol oil and solid particles
- FG = Activated carbon filter**
For adsorption of oil vapours
- FFG = Activated carbon and micro-filter combination**
- RD = Refrigeration dryer**
For drying compressed air, pressure dew point to +3 °C
- DD = Desiccant dryer**
For drying compressed air, pressure dew point to -70 °C
- ACT = Activated carbon adsorber**
For adsorption of oil vapours
- FST = Sterile filter**
For sterile compressed air
- Aquamat = Condensate treatment system**
- AMCS = Air main charging system**

Contaminants:

+	Solids	-
+	Water/Condensate	-
+	Oil	-
+	Bacteria	-

For air mains subject to sub-zero temperatures: Compressed air treatment with a desiccant dryer (pressure dew point to -70 °C)



Degree of filtration:

Class ISO 8573-1	Solid particles ¹⁾		Humidity ²⁾	Total oil content ²⁾
	Max. particle size µm	Max. particle concentration mg/m ³	Pressure dew point (x = Liquid water in g/m ³)	mg/m ³
0	e.g. Consult KAESER regarding pure air and cleanroom technology			
1	0.1	0.1	≤ -70	≤ 0.01
2	1	1	≤ -40	≤ 0.1
3	5	5	≤ -20	≤ 1
4	15	8	≤ +3	≤ 5
5	40	10	≤ +7	-
6	-	-	≤ +10	-
7	-	-	x ≤ 0.5	-
8	-	-	0.5 < x ≤ 5	-
9	-	-	5 < x ≤ 10	-

¹⁾ As per ISO 8573-1:1991 (The specification for particle content is not measured as per ISO 8573-1:2001, as the limits defined therein for Class 1 are to be applied to 'Cleanrooms').

²⁾ As per ISO 8573-1:2001

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