KAESER COMPRESSORS

Rotary Screw Compressors

CSD Series

FAD 5.5 to 12.0 m³/min
Pressures 5.5 to 15 bar

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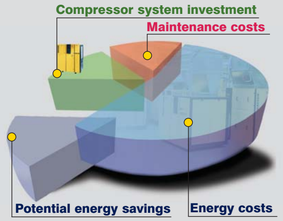
What do you expect from a compressed air system?

As a compressed air user, you expect maximum efficiency and reliability from your air system.

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.



Efficient energy consumption therefore plays a vital role in the production of compressed air, as does reliability of the compressor. In many cases, a reliable compressed air supply is essential to guarantee maximum performance from valuable production systems.

Reliability also ensures a supply of constant quality compressed air that optimises efficiency of the air treatment equipment downstream of the compressor.

With regards to sound protection, it is always better to keep noise emissions to a minimum from the outset by using a quiet compressor rather than have to retro-fit sound protection measures later on.

Last but not least, a truly efficient compressor is simple to maintain.

CSD – The new standard in efficiency

KAESER's Solution: The CSD Series

The new CSD rotary screw compressors fulfil every customer requirement: they are highly energy efficient, quieter than quiet, require minimal maintenance, are extremely reliable and deliver the very best in air quality. All of these advantages are aided through innovations in compressor design, drive systems, cooling and ventilation, silencing and maintenance methods.
In summary, the new CSD series of rotary screw compressors is a meticulously engineered and reliable product range built to KAESER's renowned high quality standards.

Savings through logical design

Direct intake ...

- ... of ambient air for cooling avoids pre-warming and ensures excellent cooling. The difference between compressed air outlet and ambient temperature is only max. 7 K, which reduces the energy requirement of downstream air drying equipment.
- ... of drive motor cooling air from the surroundings ensures reliable and effective motor cooling even under adverse conditions.
- ... of air for compression from outside the compressor cabinet improves compression efficiency; the position of the inlet opening prevents pre-warming.

Three steps to greater efficiency:

1. Energy-saving SIGMA PROFILE

KAESER's SIGMA Profile airends save up to 15% energy compared with conventional screw compressor rotor profiles. The airends in CSD units use even further refined rotors.

2. One-to-one drive

Some people talk of direct drive, but really mean geared drive. Make sure you know the difference. Maintenance costs and transmission losses are virtually eliminated, as the motor and airend on CSD units are connected via a simple coupling. Compared with compressors using small, high speed gear-driven airends, one-to-one provides optimum use of power.

One-to-one drive - ultimate efficiency

The CSD series is a range of compressors where the drive motor and the airend are designed to operate at the same low speed. This feature makes possible direct coupling of the drive and compression units via a maintenance-free coupling, consequently avoiding the transmission losses associated with gear driven units. One-to-one drive reduces the number of components needed in comparison with gear drive, significantly increasing reliability and service life. Sound levels are also considerably lower. The benefits speak for themselves: Efficient power transmission, optimal energy consumption and reduced servicing / downtime costs.

Quieter than quiet

The silent radial fan and directly coupled motor reduce noise at source. The real technical advance is in the combination of these components with the new cooling system. The separate air flow paths allow almost hermetic silencing without influencing cooling efficiency. With a sound power level of no more than 70 dB(A), the CSD series is approximately 10 dB(A) quieter than a comparable compressor. This is equivalent to a 90 percent noise reduction. Normal conversation can take place right next to the running compressor.

3. Powerful Energy-Efficient Radial Fan

The quiet and powerful radial fan draws in cool ambient air through the cooler. Its high residual thrust can deal with partial clogging of the cooler and still have enough reserve to allow connection of a long exhaust duct. In addition, the radial fan consumes significantly less drive power than conventional axial fans, saving even more energy.

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More air, more savings...

The rated motor powers given in the technical specifications below are reference points for selection of a suitable CSD compressor system.

Please contact KAESER for specific FAD and motor output data relating to other working pressures.

CSD Series - Technical Specifications

Model	Max. working pressure bar	FAD*) overall package at working pressure m^3/min	Max. working pressure bar	Sound level**) dB(A)	Rated motor power kW	Dimensions L x W x H	Weight kg
	7.5	8.25	8				
CSD 82	10	6.9	11	69	45	1650 x 1041 x 1865	1260
	13	5.5	15				
	7.5	10.2	8				
CSD 102	10	8.2	11	69	55	1650 x 1041 x 1865	1300
	13	6.75	15				
	7.5	12.0	8				
CSD 122	10	10.05	11	71	75	1650 x 1041 x 1865	1330
	13	8.07	15				

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

CSD – Eight Decisive Advantages

1 SIGMA PROFILE airend

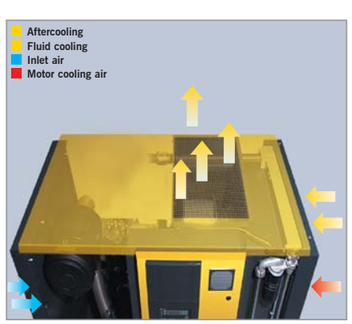
A specific drive power can be used to turn a smaller airend at high speed or a larger airend at slow speed. Larger, low speed airends are more efficient, delivering more compressed air for the same drive power. That is why KAESER developed airends especially for the CSD series that precisely match the individual drive power and motor speed of each machine in the range. The slightly higher cost of the larger airend is quickly recovered by the energy saved during operation.

2 Energy-saving one-to-one drive

The advantage of this drive is not just the elimination of transmission losses. The motor and airend are joined by the coupling and its housing to form a compact and durable unit that, apart from greasing of the motor bearings, requires no regular maintenance. Should the coupling ever need to be replaced it takes just a few minutes without any disassembly of the unit. The opening in the housing is more than large enough to replace the two coupling sections. Furthermore, the low airend speed (2980 rpm) in CSD units ensures maximum efficiency and durability, which in turn leads to low compressed air costs.

3 Innovative radial fan

Quiet and efficient – the most important features of a radial fan. Low peripheral speed means low noise. Power consumption is up to 50 percent lower than a comparable axial fan. Another advantage is the high residual thrust developed that allows the use of exhaust ducting with a pressure drop of up to 80 Pa without the need for an additional extractor fan.



4 Efficient cooling system

In addition to improved cooling efficiency, the system has other benefits to offer. The inside of the cabinet remains clean because surrounding air is drawn through the cooler into the cooler box and then exhausted directly upward out of the machine. Dirt particles in the cooling air collect mainly on the air intake side of the cooler, on CSD units that means outside the cabinet. Any clogging is easily noticed and quickly cleaned off without the need for any dismantling work. Operational reliability is improved and maintenance work significantly reduced.

5 Optimised oil separation system

CSD machines are fitted with a new, even more efficient separator system. The cooling fluid is initially separated from the compressed air by centrifugal force in the separator tank. Only a minimal amount of fluid remains to be removed by the high capacity, deep-bed filter in the separator cartridge. These two factors double the operational life of the cartridge compared with conventional systems and ensure minimum aerosol content in the compressed air delivery (< 1 mg/m³). The improved air quality eases the burden on the downstream air treatment components. The optional filter pressure drop monitoring set further enhances efficient operation.

6 Synthetic coolant and special fluid filter

The synthetic cooling medium SIGMA FLUID makes possible an extension of the fluid change interval to over 6000 hours. However, as a preventative protection measure for your equipment, we strongly recommend that a fluid analysis be carried out after 6000 operating hours due to the varied nature of environmental and intake conditions. Less SIGMA FLUID is consumed in comparison with mineral oils and its reduced emulsifying tendency simplifies condensate treatment and reduces disposal costs. A specially developed glass fibre fluid filter with enhanced contamination absorption capability is able to clean the cooling fluid more effectively, which is why the maintenance service interval has been able to be significantly increased. The fluid filter and SIGMA FLUID reduce service costs and increase operational reliability.

7 Easy maintenance

All models feature high quality, durable components that are positioned logically and contribute to the outstanding performance and reliability of these compressor packages. Component accessibility is made simple through wide opening doors, easy lift off panels and a sensible design that ensures unrivalled ease of maintenance. The rear and left side of CSD units can be positioned right next to a wall to maximise use of space.

8 SIGMA CONTROL

Based on robust PC architecture, the SIGMA CONTROL offers the possibility of Dual, Quadro, Vario and Continuous control. Clearly marked navigation and input keys on the user interface are used to move around within the menu options of the four line alpha-numeric display. This powerful compressor controller can also display information in any 1 of 30 selectable languages at just the press of a button. The SIGMA Control automatically controls and monitors the compressor package.
The Profibus interface enables exchange of data and operational parameters allowing the SIGMA Control to communicate with other air management systems such as the SIGMA Air Manager. Connection of a modem even allows maintenance and alarm messages to be sent via SMS to relevant service locations.

Equipment

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

Sound insulation
Lined with washable plastic foam; maximum 70 dB (A) to PN8NTC 2.3 at 1m distance, free-field measurement.

Vibration damping
Dual antivibration mountings using rubber bonded metal elements

Airend

Genuine KAESER rotary screw, single-stage airend with SIGMA PROFILE and cooling fluid injection.

Drive
Direct, torsional-elastic coupling, without gearing.

Electric motor
High efficiency CEMEP EFF1 motors consume less power for greater output and are standard throughout the range of KAESER compressors. The motors are protected to IP55 and conform to insulation Class F for greater power reserve.

Connection from motor to airend
Airend with integral coupling flange.

Electrical components
Control cabinet to IP 54, containing automatic star-delta starter, motor overload protection, control transformer and volt-free contacts for ventilation control.

Fluid and airflow
Dry air intake filter with initial separation, inlet and venting valves, fluid reservoir with three-stage separator system, pressure relief valve, minimum pressure/check valve, thermostatic valve and fluid microfilter, all fully piped using newly-developed elastic couplings.

Cooling
The standard version is air-cooled, separate aluminium coolers for compressed air and fluid, radial fan driven by its own motor.

SIGMA CONTROL
Interfaces for data communication comprising RS 232 for a modem or printer, RS 485 for a slave compressor in base load sequencing mode and a Profibus DP interface for data networks. Prepared for Teleservice.

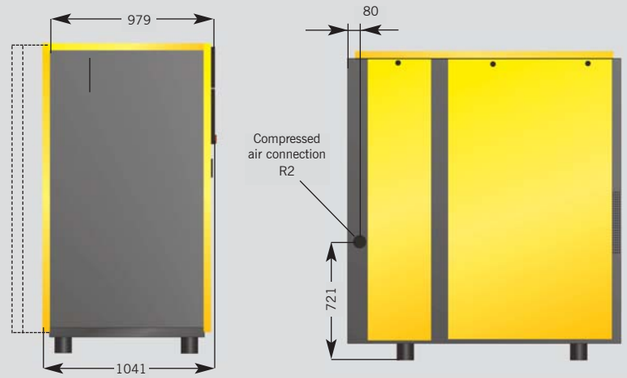
Ergonomic control panel

Red, yellow and green LEDs show the operational state of the machine at a glance. Also features a four-line plain text display, 30 selectable languages, touch keys with icons and a duty cycle indicator.

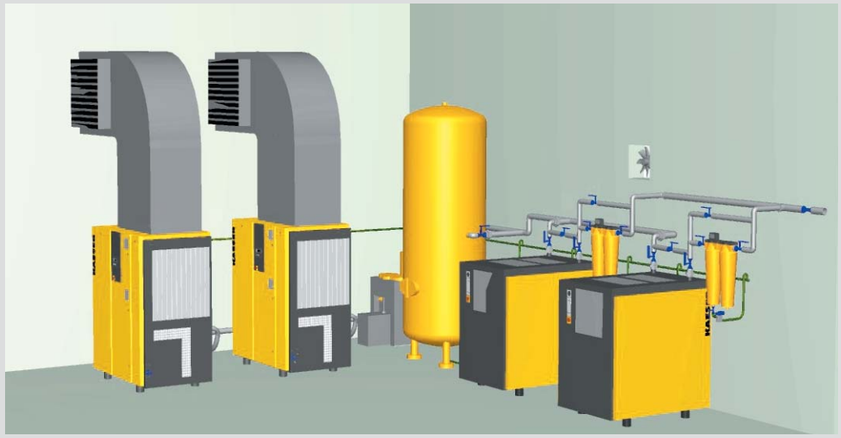
Prime functions
Fully automatic monitoring and regulation of airend discharge temperature; monitoring of motor current, direction of airend rotation, air filter, fluid filter and fluid separator cartridge, display of performance data, service intervals of primary components, operating hours, status data 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 P-780)

Dimensions:



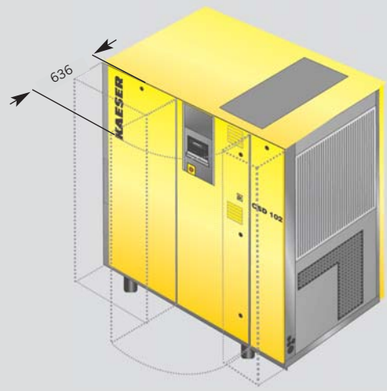
Comprehensive design know-how



Compressed air supply systems are often highly complex and can only be efficiently operated in the long term if careful planning is implemented during each stage of design, system expansion and modernisation. KESS (KAESER's Energy Saving Service) provides comprehensive analysis of your compressed air usage, enabling KAESER's experts to plan and design a system that is specially tailored to meet all of your compressed air requirements. The service combines tried and tested compressed air components, user advice and services with cutting-edge technology to ensure maximum efficiency – KAESER air systems typically operate at 95 percent load capacity or more.

Every KAESER compressed air system illustrates KAESER's commitment to producing application-specific quality compressed air at the lowest possible cost, combined with unsurpassed reliability. This standard is achieved with products of the highest quality and through decades of experience in design and construction of compressed air systems. Use this expertise to your advantage and let KAESER design your compressed air system.

Valuable information and advice regarding KAESER services, planning and analysis can be found under 'Services' on the KAESER website – **www.kaeser.com**.



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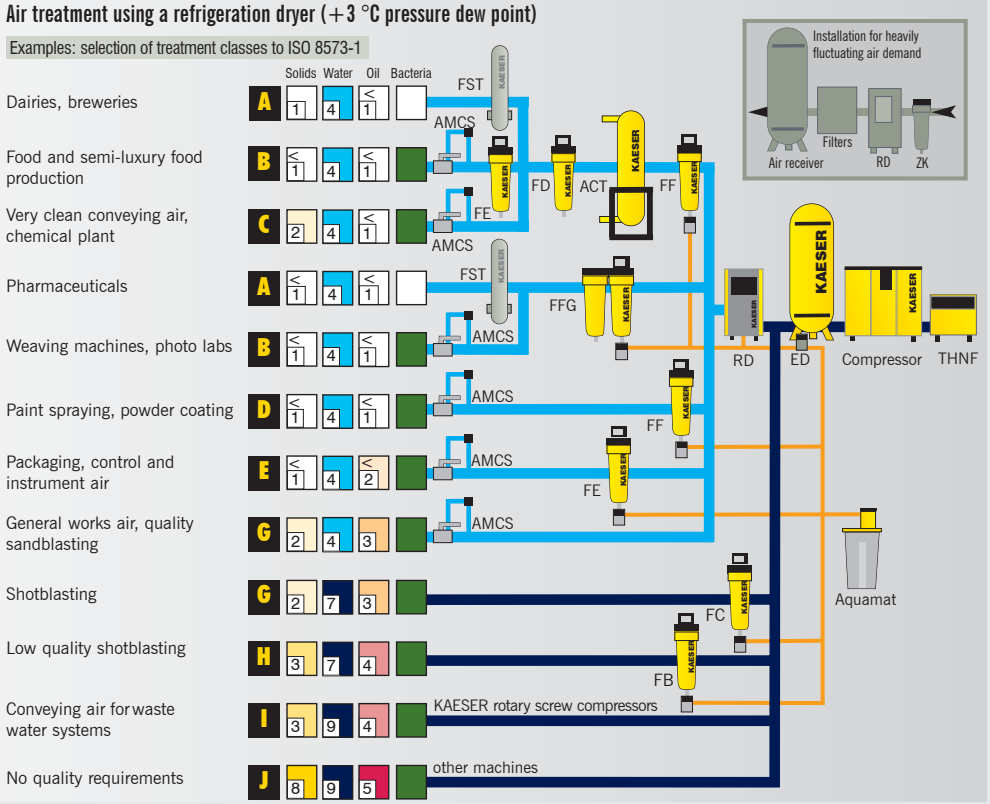
Choose the required grade of treatment according to your field of application:

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

Examples: selection of treatment classes to ISO 8573-1



Explanation:

THNF = bag filter
cleans dusty and highly contaminated intake air

ZK = centrifugal separator
removes condensate

ED = ECO Drain
electronic level-controlled condensate drain

FB = prefilter 3 µm
separates liquid droplets and solid particles >3 µm, oil content ≤5 mg/m³

FC = prefilter 1 µm
separates oil droplets and solid particles >1 µm, oil content ≤1 mg/m³

FD = particulate filter 1 µm
separates dust particles (attrition) >1 µm

FE = microfilter 0.01 ppm
separates aerosol oils and solid particles >0.01 µm, aerosol content ≤0.01 mg/m³

FF = microfilter 0.001 ppm
separates aerosol oils and solid particles >0.01 µm, oil content ≤0.001 mg/m³

FG = activated carbon filter
for adsorption of oil vapours, oil vapour content ≤0.003 mg/m³

FFG = combination filter
comprising FF and FG

RD = refrigeration dryer
pressure dew point to +3 °C

DD = desiccant dryer
for compressed air drying; DC series - heatless regeneration, pressure dew point to -70 °C; DW, DN, DTL and DTW series - heat regeneration, pressure dew point to -40 °C

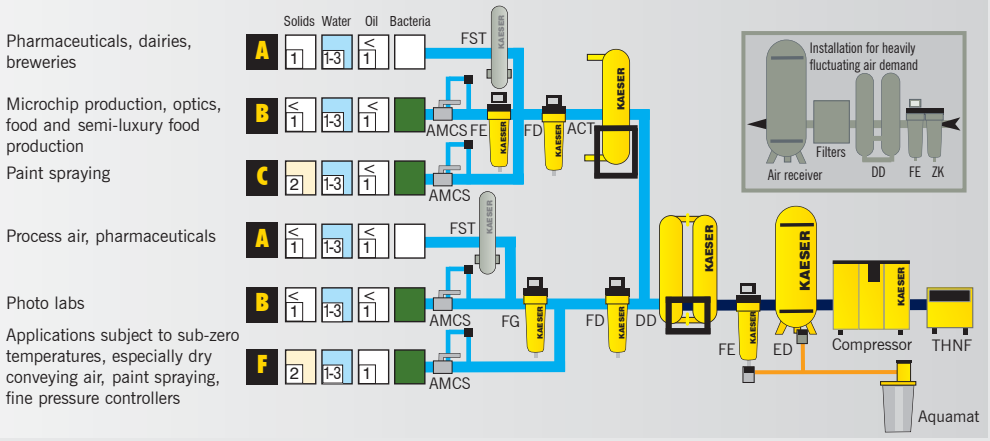
ACT = activated carbon adsorber
for adsorption of oil vapours, oil vapour content ≤0.003 mg/m³

FST = sterile filter
for bacteria-free air

Aquamat = condensate treatment system

AMCS = air-main charging system

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



Contaminants:

+ solids -
+ water -
+ oil -
+ bacteria -

Degree of filtration:

ISO 8573-1 Class	Solid particles: Max. no. of particles per m³ with size d (µm) ≤0.1	0.1<d≤0.5	0.5<d≤1.0	1.0<d≤5.0	µm	mg/m³	Humidity: Pressure dew point (x=liquid water *)	Oil concentration mg/m³
0	as specified by user							
1	–	100	1	0	–	–	≤-70 °C	≤0.01
2	–	100000	1000	10	–	–	≤-40 °C	≤0.1
3	–	–	10000	500	–	–	≤-20 °C	≤1.0
4	–	–	–	1000	–	–	≤+3 °C	≤5.0
5	–	–	–	20000	–	–	≤+7 °C	–
6			–		≤ 5	≤ 5	≤+10 °C	–
7			–		≤ 40	≤ 10	x≤0.5	–
8			–		–	–	0.5<x≤ 5.0	–
9			–		–	–	5.0<x≤10.0	–

A Aerosol oil ≤ 0.003 mg/m³, particle retention > 0.01 µm sterile, odourless and taste-free

B Aerosol oil ≤ 0.003 mg/m³, particle retention > 0.01 µm

C Aerosol oil ≤ 0.003 mg/m³, particle retention > 1 µm

D Aerosol oil≤ 0.001 mg/m³, particle retention > 0.01 µm

E Aerosol oil≤ 0.01 mg/m³, particle retention > 0.01 µm

F Aerosol oil≤ 0.01 mg/m³, particle retention > 1 µm

G Aerosol oil ≤ 1 mg/m³, particle retention > 1 µm

H Aerosol oil≤ 5 mg/m³, particle retention > 3 µm

I Aerosol oil ≤ 5 mg/m³, particle retention > 1 µm

J Untreated

LGA InterCert Certified QM-System ISO 9001:2000
LGA InterCert Certified EM-System ISO 14001

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