

## Rotary Screw Compressors CSD Series

With the world-renowned SIGMA PROFILE 

Free air deliveries 5.5 to 12 m<sup>3</sup>/min, Pressure 5.5 to 15 bar



**What do you expect from a compressor 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.

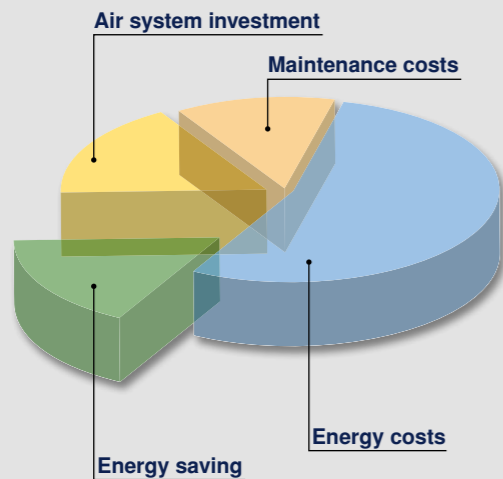
Efficient energy consumption therefore plays a vital role in the production of compressed air, as does reliability of the compressor.

In many cases, a reliable compressed air supply is essential to guarantee maximum performance from valuable production systems.

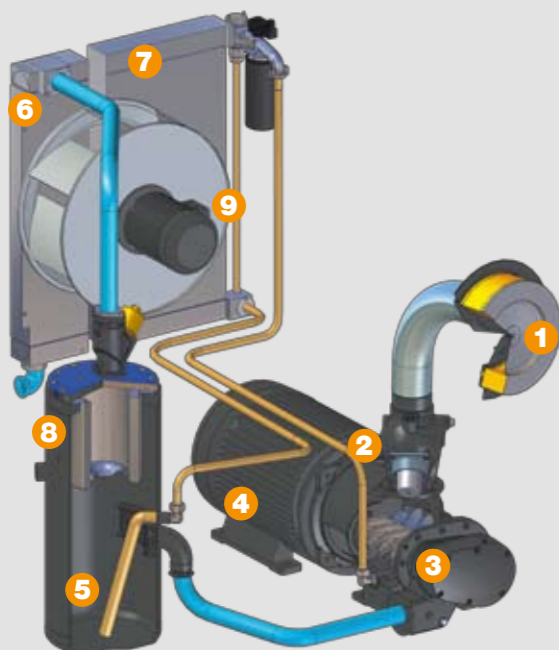
Reliability also ensures a supply of constant quality compressed air that optimises efficiency of the air treatment equipment downstream from the compressor.

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 and cost-effective to maintain.



**Function diagram:**



- 1 Inlet filter
- 2 Inlet valve
- 3 Airend
- 4 Drive motor
- 5 Fluid separator
- 6 Air aftercooler
- 7 Fluid cooler
- 8 Fluid filter
- 9 Fan

**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. As a result, the new CSD series of rotary screw compressors is a meticulously engineered and reliable product range built to KAESER's renowned high quality standards.



**SIGMA PROFILE**

The SIGMA PROFILE, developed by Kaeser Kompressoren in 1975, saves up to 15% in energy consumption compared with conventional rotor profile designs. The airends in CSD units use even further refined SIGMA PROFILE rotor versions.



**Powerful radial fan**

The quiet and powerful radial fan draws in cool ambient air through the cooler. Its high residual thrust means that the fan is not affected by contamination that is drawn in with the air and ensures sufficient power reserves to allow connection of long exhaust duct sections. In addition, the radial fan consumes significantly less drive power than conventional axial fans, saving even more energy.



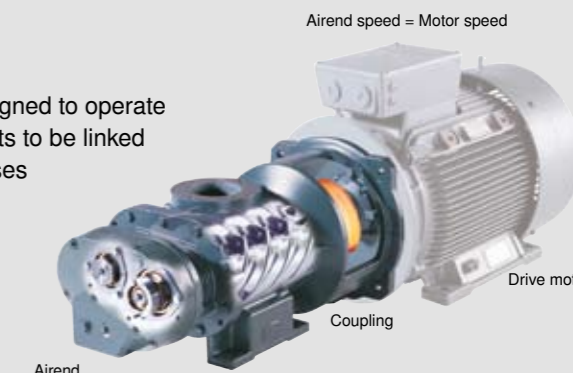
**Quieter than quiet**

The quiet radial fan and directly coupled motor reduce noise at source. Performance is further enhanced by a new cooling system that features separate cooling air flow paths to allow almost hermetic silencing without influencing cooling efficiency. With a maximum sound level of only 70 dB (A) CSD series compressors are approximately

10 dB (A), or 90 percent, quieter than comparable compressors of the same power.

**One-to-one drive — Ultimate efficiency**

The drive motor and the airend in CSD series compressors are designed to operate at the same low speed. This enables the drive and compression units to be linked via a maintenance-free coupling, which avoids 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 airend in each CSD model is designed to specifically match air demand and ensures outstanding efficiency through low-speed operation of only 2980 rpm.

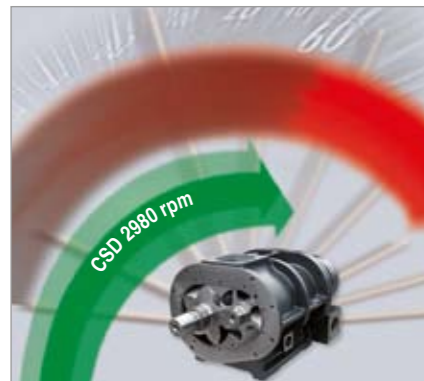


# CSD – Eight decisive advantages



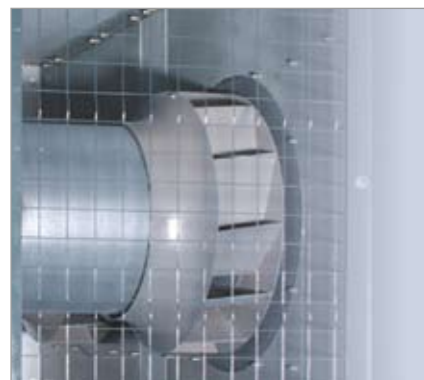
## 1 SIGMA PROFILE airend

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 are precisely matched to the individual drive power and motor speed of each machine in the range. The slightly higher investment cost of the larger airend is quickly recovered by the energy saved during operation.



## 2 Energy-saving 1:1 drive

The advantages of the 1:1 drive system are not just limited to 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, as the opening in the housing is more than large enough to replace the two coupling sections. Furthermore, the low airend speed of 2980 rpm in CSD units ensures maximum efficiency and durability, which in turn leads to reduced compressed air costs.



## 3 Innovative radial fan

Quiet and efficient – these are 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 (CSD 122: 60 Pa) without the need for an additional extractor fan.

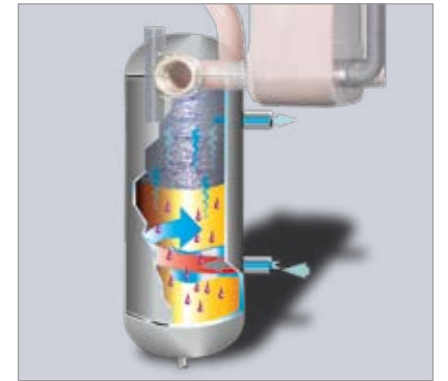


## 4 Efficient cooling system

In addition to improved cooling efficiency, the system has further 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 dust or particle build-up is therefore easily noticed and quickly cleaned off without the need for any dismantling work. Operational reliability is improved and the need for maintenance work is significantly reduced.

## 5 Optimised oil separation system

CSD machines are fitted with a new, highly 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/m<sup>3</sup>). 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

SIGMA FLUID, a KAESER synthetic coolant, allows an extended service interval of over 6000 operating hours. Nevertheless, 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. Due to its lower vapour pressure, less SIGMA FLUID is consumed in comparison with mineral oils and its reduced tendency to emulsify makes condensate treatment and disposal easier and less expensive. SIGMA FLUID therefore not only helps reduce service costs but also increases 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. Interfaces are provided as standard for connection of a modem, a second compressor in base-load sequencing mode and for connection to data networks (Profibus DP).



## 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 1 m distance, free-field measurement.

### Vibration damping

Double insulated anti-vibration mountings using rubber bonded metal elements.

### Airend

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



### Electric motor

Direct, torsional-elastic coupling, without gearing.

### Electric motor

High efficiency EFF1-rated 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. Also available with PTC thermistor sensors for full motor protection.

### 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 air flow

Dry air intake filter with pre-filtration, pneumatic inlet and venting valves, fluid reservoir with three-stage separator system, pressure relief valve, minimum pressure / check valve, thermostatic valve and micro-filter in coolant circuit, all fully piped using flexible Aeroquip 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, 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 system operational status 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)

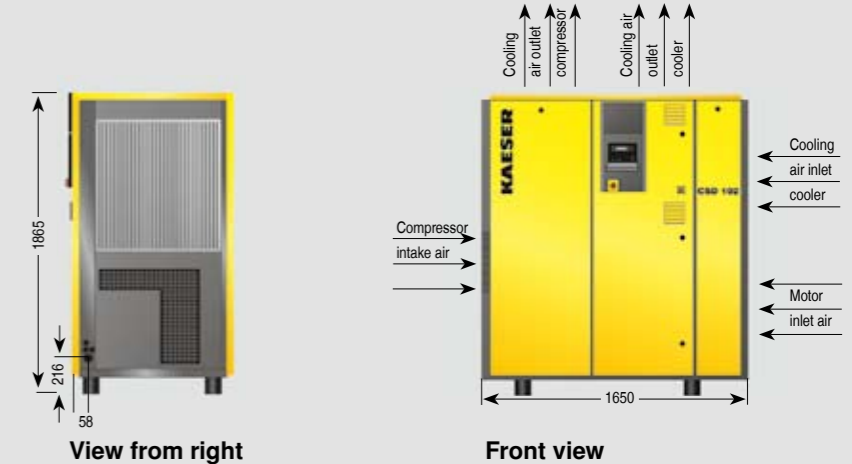
## Comprehensive design know-how



KESS (KAESER's Energy Saving System) 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 needs. Typically ensuring a 95-98 % load capacity,

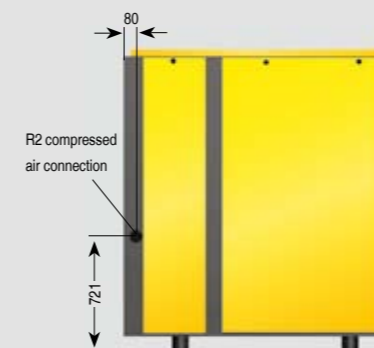
KAESER compressed air systems provide exceptional efficiency and produce application-specific quality compressed air at lowest possible cost. Use this expertise to your advantage and let KAESER design your compressed air system.

## Dimensions



## CSD Series – Technical Specifications

Model	Max. working pressure bar	FAD*) Complete package at working pressure m³/min	Max. operating pressure bar	Rated motor power KW	Dimensions W x D x H mm	Sound level **) dB(A)	Weight kg
CSD 82	7.5	8.26	8	45	1650 x 1041 x 1865	69	1226
	10	6.89	11				
	13	5.50	15				
CSD 102	7.5	10.14	8	55	1650 x 1041 x 1865	69	1288
	10	8.19	11				
	13	6.74	15				
CSD 122	7.5	12.01	8	75	1650 x 1041 x 1865	71	1370
	10	10.04	11				
	13	8.08	15				

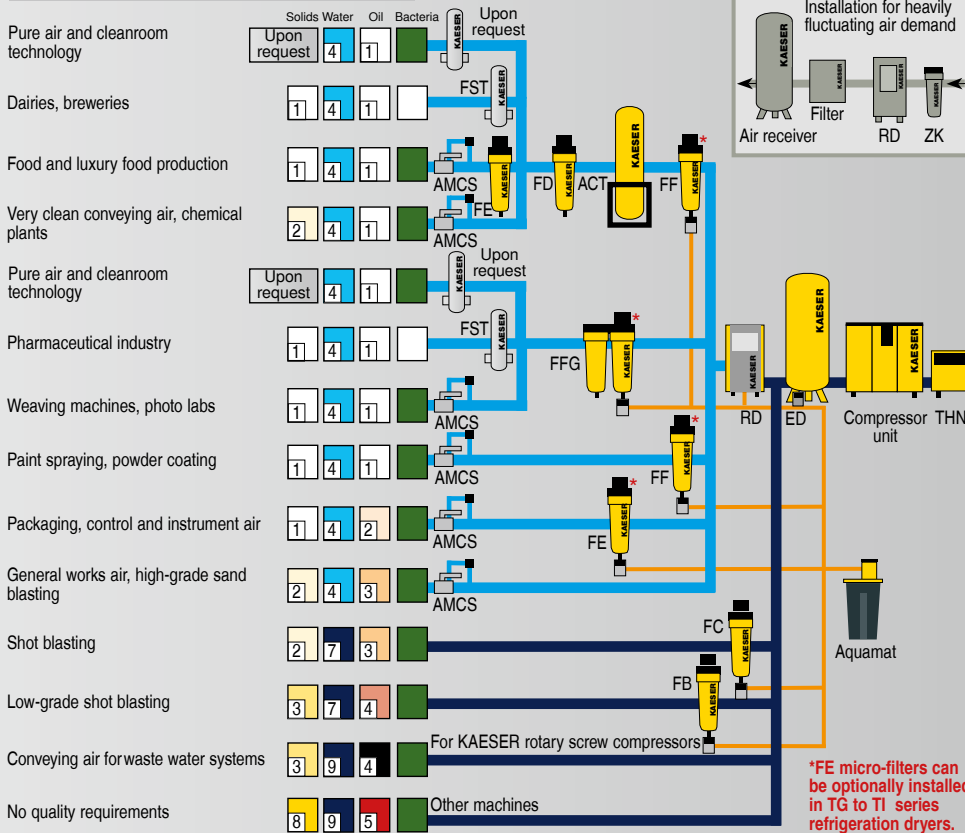


\*) FAD to ISO 1217: 1996, Annex C. \*\*) Sound level to PN8NTC2.3 at 1 m distance, free-field measurement

## 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 8573-1<sup>1)</sup>



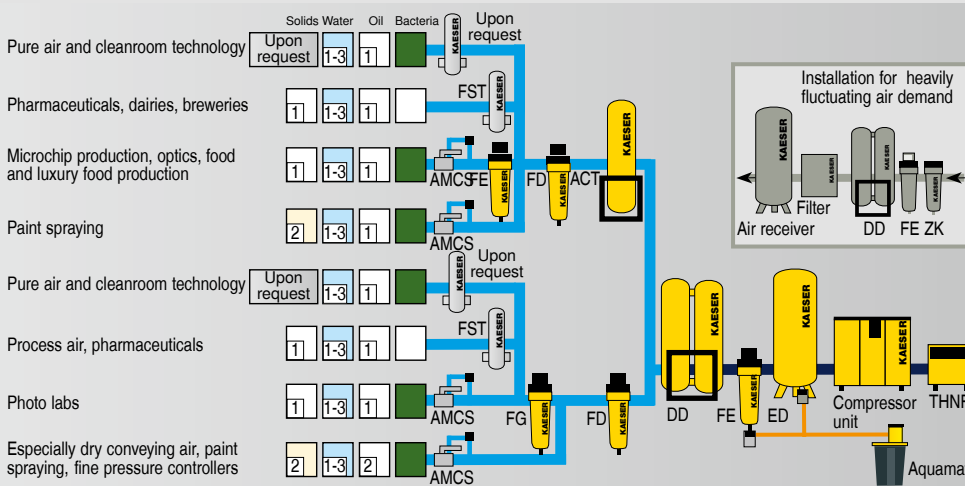
#### Explanation:

- 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	Solid particles <sup>1)</sup>		Humidity <sup>2)</sup>	Total oil content <sup>2)</sup>
	Max. particle size µm	Max. particle concentration mg/m <sup>3</sup>	Pressure dew point (x = Liquid water in g/m <sup>3</sup> )	
ISO 8573-1 Class 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	-

<sup>1)</sup> 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").

<sup>2)</sup> As per ISO 8573-1:2001

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