جهان کمپرسور
Jahan Compressor

KAESER COMPRESSORS®

# Rotary Screw Compressors

**CSD(X) Series**

With the world-renowned SIGMA PROFILE

Flow rate 1.1 to 17.5 $m^3$/min, Pressure 5.5 to 15 bar

**www.kaeser.com**

CSD / CSDX Series

# CSD(X) – Even more efficient

KAESER KOMPRESSOREN pushes the boundaries of compressed air efficiency once again with its latest generation of CSD(X) series rotary screw compressors. Not only do the further optimised CSD(X) compressors deliver more compressed air for less energy, but they also combine ease of use and maintenance with exceptional versatility and environmentally responsible design.

## CSD(X) – Multiple savings

The newly refined CSD(X) systems save energy in multiple ways: the compressor airends are equipped with the further optimised SIGMA PROFILE rotors and are controlled and monitored via the industrial-PC-based SIGMA CONTROL 2 compressor controller. This advanced controller matches compressed air delivery to actual demand and uses dynamic control to keep costly idling time to an absolute minimum.

## Variable speed control with synchronous reluctance motor

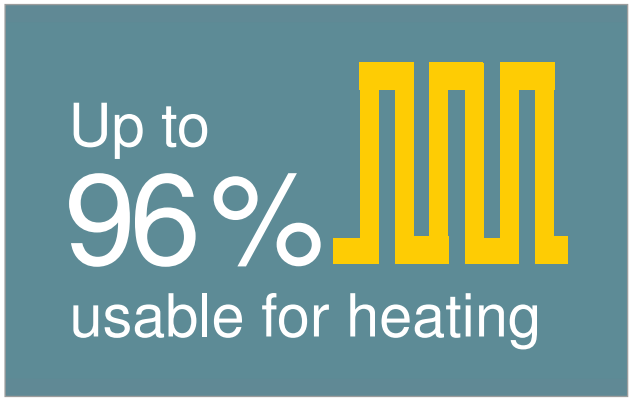
The new synchronous reluctance motor combines the advantages of asynchronous and synchronous motors in one drive system. The motor contains no aluminium, copper or costly rare earth magnets, which makes the drive durable and service-friendly. In addition, the functional principle minimises motor heat losses resulting in significantly lower bearing temperatures. This ensures significantly extended bearing and motor service life. In conjunction with the perfectly matched frequency converter, the synchronous reluctance motor also delivers superior performance compared to an asynchronous motor when it comes to losses, especially in the partial load range.

## Perfect partners

CSD(X) series rotary screw compressors are the perfect partners for high-efficiency industrial compressed air stations. The internal SIGMA CONTROL 2 compressor controller offers various communication channels, which allows seamless connection with advanced master controllers, such as KAESER's SIGMA AIR MANAGER, and in-house centralised control systems. This enables simple setup and achieves unprecedented levels of efficiency.

## Electronic Thermo Management (ETM)

Powered via an electric motor, the sensor-controlled temperature control valve integrated into the cooling circuit is the heart of the innovative Electronic Thermo Management system. The new SIGMA CONTROL 2 compressor controller monitors intake and compressor temperature in order to prevent condensate formation, even with differing air humidity conditions. Moreover, the ETM system dynamically keeps fluid temperatures as low as possible to deliver even greater energy efficiency. This system also enables end users to better adapt heat recovery systems to suit their specific needs.




## Why choose heat recovery?

The question should in fact be: Why not? Amazingly, up to 100 % of the (electrical) energy input to a compressor is converted into heat. Up to 96 % of this energy can be recovered and reused for heating purposes. This not only reduces primary energy consumption, but also improves the overall operating energy balance.

# Service-friendly design

**Image:** CSDX 140 SFC

IE4
7.8bar
09:26
75°C
ON LOAD
Key - on
Load
Run
Maintenance in:
18005h Load
17105h
1995h
ESC
www.kaeser.com
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RFID
SIGMA CONTROL 2
KAESER
KOMPRESSOREN
02/20XX

CSD / CSDX Series

# Uncompromising efficiency

## Save energy with the SIGMA PROFILE

At the heart of every CSD(X) system lies a premium quality airend featuring KAESER's SIGMA PROFILE rotors. Flow-optimised for impressive performance, these advanced rotors help KAESER CSD(X) systems set the highest standards for efficiency.

## SIGMA CONTROL 2: optimum efficiency

The internal SIGMA CONTROL 2 controller ensures efficient compressor system control, monitoring and documentation at all times, whilst the large display and RFID reader provide clear communication and maximum security. Last, but not least, variable interfaces enable seamless networking capability and the SD card slot makes updates quick and easy.

## Tomorrow's technology, today: IE4 motors

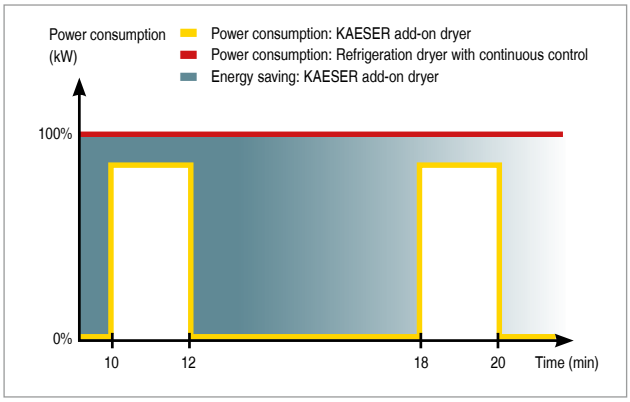
KAESER is currently the only compressed air systems provider to equip its compressors with super premium efficiency IE4 class motors as standard, thereby delivering maximum performance and energy efficiency.

## Required temperature assured

According to operating conditions, the innovative Electronic Thermo Management (ETM) system dynamically controls fluid temperature to ensure safe prevention of condensation accumulation and also boosts energy efficiency.

CSD T / CSDX T Series

# Premium compressed air quality with add-on refrigeration dryer




## Energy-saving control

The integrated refrigeration dryer in CSD(X)-T units provides high-efficiency performance thanks to its energy-saving control. The dryer is therefore active only when compressed air actually needs to be dried: this approach consequently achieves the required compressed air quality with maximum efficiency.

## Dual cooling

Two independent fans and a separate enclosure assure high thermal reserve for the integrated refrigeration dryer. This allows the required compressed air quality to be reliably maintained at all times even at high ambient temperatures.

## Dependable KAESER centrifugal separator

A KAESER centrifugal separator fitted with an electronic ECO-DRAIN condensate drain installed upstream from the refrigeration dryer ensures that condensate is reliably pre-separated and drained, even when ambient temperatures and humidity are high.

## Future-proof refrigerant

The new EU 517/2014 F-gases regulation is intended to minimise emissions of fluorinated greenhouse gases and therefore contribute to limiting global warming. KAESER's new T-systems are equipped with R-513A refrigerant, which has a very low GWP (Global Warming Potential) value. This means that these efficient dryers will be future-proof for their entire life cycle.

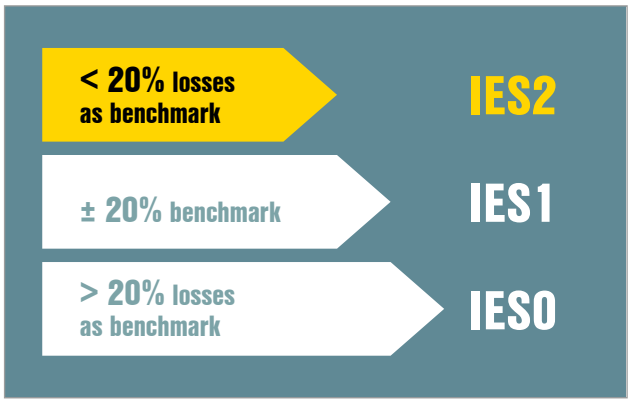
**Image:** CSD 105 T

High-efficiency drive system: Efficiency class IES2

POWER DRIVE SYSTEM
IES2
EFFICIENCY

## Standard DIN-EN 50598

The European eco-compatible design standard DIN-EN 50598 defines the requirements for drive systems in electrically driven production machines. This standard specifies system efficiency, taking into account losses from the motor and frequency converter. With 20% lower losses compared to the benchmark, KAESER systems meet this standard with ease.

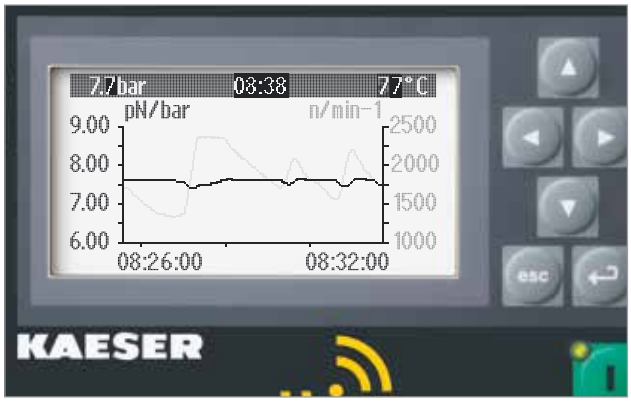



## Maximum energy efficiency

For the frequency-controlled packages in the CSD(X) series, KAESER meets the IES2 system efficiency standard, which is the highest possible class as per the EN 50598 standard. IES2 class drive systems operate with 20% lower losses compared to the benchmark.

CSD (T) SFC / CSDX (T) SFC Series

# Speed-controlled compressor with synchronous reluctance motor




## Precision pressure control

The flow rate can be adjusted within the control range according to pressure. Operating pressure is kept constant to within ±0.1 bar. This allows maximum pressure to be reduced, thereby saving both energy and money.

## Durable and service-friendly

Durable and service-friendly: the rotors of the synchronous reluctance motor do not contain aluminium, copper or rare earth magnetic materials. This therefore makes the bearings and rotors as easy to replace as those in asynchronous motors. The functional principle keeps heat losses to a minimum, resulting in significantly lower bearing temperatures. This ensures extended bearing and motor service life.

## Separate SFC control cabinet

The SFC variable speed drive is housed in its own control cabinet to shield 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

It goes without saying that the SFC control cabinet and SIGMA CONTROL 2 are tested and certified both as individual components and as a system to EMC directive EN 55011 for Class A1 industrial power supplies.

CSD (T) SFC / CSDX (T) SFC Series

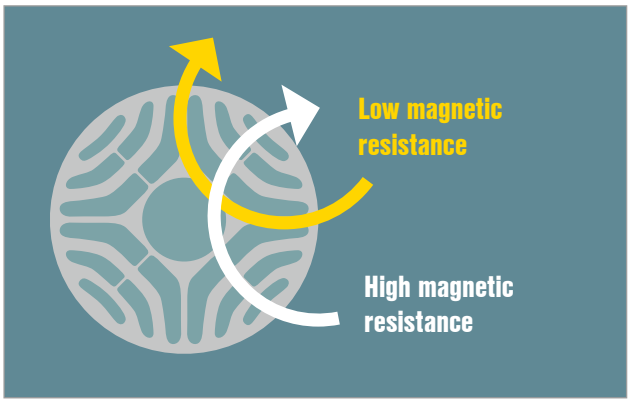
# Maximum efficiency with the frequency-controlled synchronous reluctance motor

## Efficient synchronous reluctance motor

This motor series combines the advantages of asynchronous and synchronous motors in one drive system. The rotors do not use aluminium, copper or expensive rare earth magnets. Instead they are made of electrical steel with a specialised profile and arranged in series. This makes the drive highly durable and service-friendly.

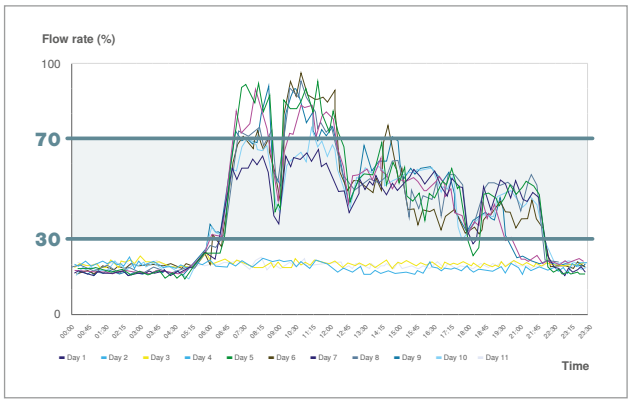
## Combined with a high-performance frequency converter

The Siemens frequency converter has a control algorithm adapted to the motor. With the fine-tuned combination of a frequency converter and a synchronous reluctance motor, KAESER achieves the top system efficiency class ‘IES2’ as defined by the EN 50598 standard.




## How the reluctance motor works

In a synchronous reluctance motor, the torque is generated by magnetic reluctance. The rotor has salient poles and is made of a soft magnetic material, such as electric steel, which is highly permeable to magnetic fields.

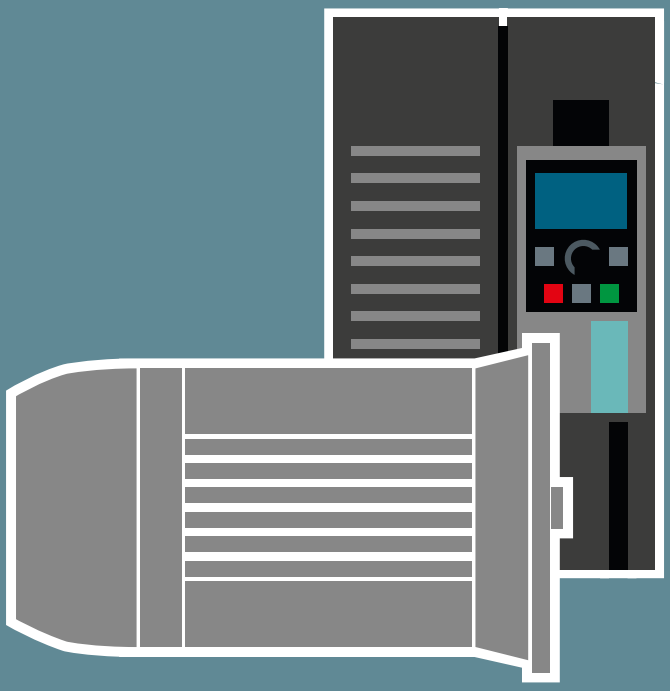


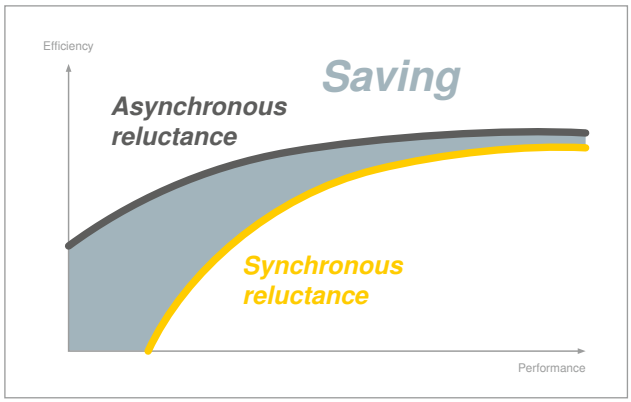

## Minimal operating costs – exceptional productivity

Considerable energy savings are made possible due to significantly greater efficiency – especially in the partial load range – than comparable systems using asynchronous drive technology. The low moment of inertia of synchronous reluctance motors allows high cycle rates, thereby boosting machine and system productivity.

# Your benefits at a glance:

- Best system efficiency: IES2 as per EN 50598
- Maximum energy efficiency throughout the control range
- Durable and service-friendly drive
- Advanced drive technology
- Minimal operating costs, high productivity and availability
- Industrie 4.0 ready
- Entire system EMC-certified






## Applications for speed-controlled compressor systems with synchronous reluctance motor

A recent study shows that the typical compressed air consumption profile is in the 30-70% range of the maximum. This is where a speed-controlled rotary screw compressor with synchronous reluctance motor technology can display its energy efficiency advantages in the partial load range to the fullest.

## High efficiency in partial load operation

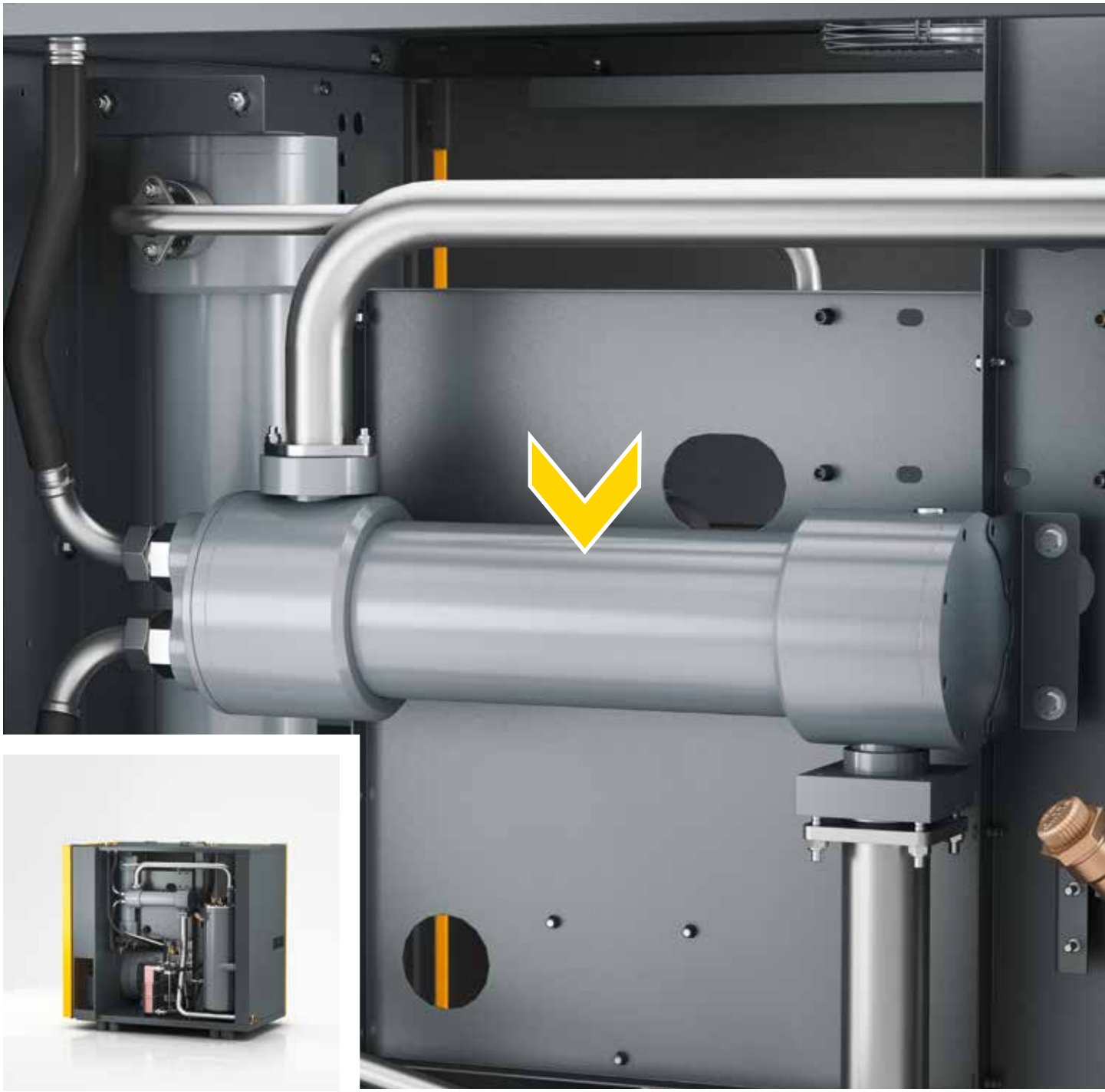
Synchronous reluctance motors achieve significantly better efficiency in the partial load range than asynchronous motors, for example. This allows savings of up to 10% compared with conventional variable-speed systems.

CSD and CSDX Series – Water-cooled...

# ...with plate heat exchanger

Two copper-soldered stainless-steel plate-type heat exchangers assure high cooling capacity thanks to the corrugated plate design with excellent heat transmission properties – the perfect choice for applications with clean compressor cooling water.

# ...with shell and tube heat exchanger





Shell and tube heat exchangers made of copper-nickel alloy (CuNi10Fe) have similar cooling performance to that of plate-type heat exchangers, but are less susceptible to contamination. The exchangeable inserts allow easy cleaning or replacement in case of contamination.

In addition they are seawater-proof, which means that they are suitable for compressors used in maritime applications. Moreover, they exhibit exceptionally low pressure loss, which in turn saves energy and money.

**Savings calculation example for warm air heat recovery in terms of fuel oil (CSDX 165)**

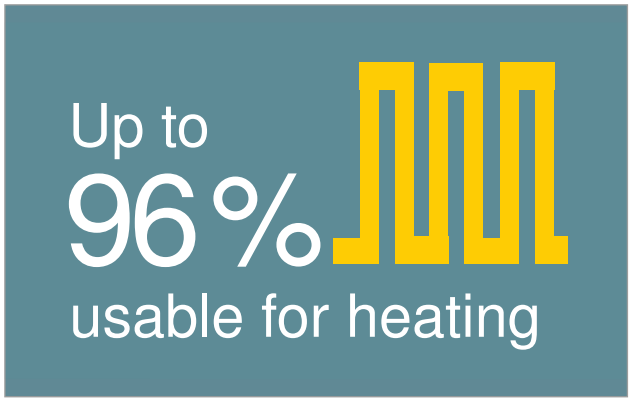
| | |
|---|---|
| Maximum available heat capacity: | 101 kW |
| Fuel value per litre of fuel oil: | 9.86 kWh/l |
| Fuel oil heating efficiency: | 90% (0.9) |
| Price per litre of fuel oil: | 0.60 €/l |

**Cost saving:** $\frac{101 \text{ kW} \times 2000 \text{ h per year}}{0.9 \times 9.86 \text{ kWh/l}}$ x 0.60 €/l **= € 13,657 per year**

Further information regarding heat recovery:
https://www.kaeser.com/int-en/products/rotary-screw-compressors/heat-recovery/

Heat recovery system

# Cost-effective heating

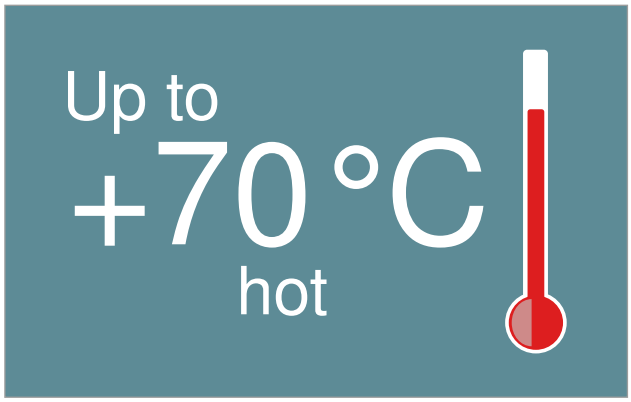


## Heat recovery is an all-round win

Amazingly, 100% of the electrical drive energy input to a compressor is converted into heat energy. Of that heat, up to 96% is available for heat recovery purposes.
Use this potential to your advantage!

## Space heating with warm exhaust air

It's heating made easy: thanks to the high residual thrust radial fan, exhaust (warm) air can be easily ducted away to spaces that require heating. This simple process is thermostatically controlled.



## Process, heating and service water

Hot water, up to +70 °C, can be produced from reusable compressor heat via PWT* heat exchanger systems. Please contact KAESER regarding higher temperature requirements.

*) optionally installed within the package

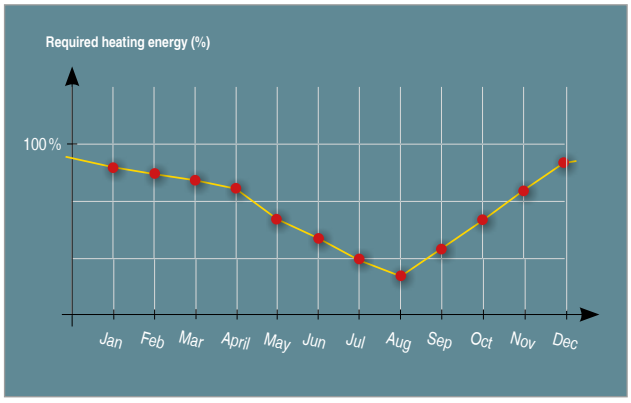
## Clean hot water

If no other water circuit is interconnected, special fail-safe heat exchangers meet the highest demands for the purity of the water being heated, as with cleaning water in the food industry, for example.

# Energy-saving, versatile and flexible

## PTG plate heat exchanger system

PTG plate-type heat exchangers consist of a package of pressed copper-soldered stainless steel plates. They provide excellent heat exchange characteristics with an impressively compact design. PTGs can be integrated into existing hot water supply systems and are well-suited for industrial applications.




## Required heating energy year-round

It goes without saying that heating is necessary during the winter months. However, it is also required to a greater or lesser extent at other times of the year, such as in spring and autumn. Heating energy is therefore actually required year-round.

## Conserve energy resources

In view of steadily rising energy prices, energy conservation is not only important for the environment, but is also becoming an economic necessity. Heat recovered from rotary screw compressors can be used not only for heating purposes during the winter months, but can also be utilised year-round in other processes.

## Feed heat energy to a heating system

Up to 76 percent of the original input electrical energy for the compressor system can be recovered for use in hot water heating systems and service water installations. This significantly reduces primary energy demand required for heating purposes.

# Equipment

## Complete unit

Ready-to-run, fully automatic, super-silenced, vibration damped, all panels powder coated. Suitable for use in ambient temperatures up to +45 °C.

## Sound insulation

Panels lined with laminated mineral wool.

## Vibration damping

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

## Airend

Genuine KAESER single stage airend with energy-saving SIGMA PROFILE and cooling fluid injection for optimised rotor cooling.

## Drive

1:1 direct drive, torsional-elastic coupling, without gearing.

## Electric motor

Standard system with premium efficiency IE4 motor, quality German manufacture, IP 55, ISO F class insulation for additional reserve; PT 100 winding temperature sensor for motor monitoring; externally lubricated bearings.

## Optional SFC frequency converter

Synchronous reluctance motor, quality German manufacture, IP 55, with Siemens frequency converter; meets IES2 system efficiency standard; externally lubricated bearings.

## Electrical components

IP 54 control cabinet, control transformer, Siemens frequency converter, floating contacts for ventilation systems.

## Fluid and air flow

Dry air filter; pneumatic inlet and venting valve; cooling fluid reservoir with three-stage separator system; pressure relief valve, minimum pressure check valve, Electronic Thermo Management (ETM) and ECO fluid filter in the cooling fluid circuit; fully piped connections, flexible line connections.

## Cooling

Air-cooled; separate aluminium cooler for compressed air and cooling fluid; radial fan with separate electric motor, Electronic Thermo Management (ETM).

## Refrigeration dryer

CFC-free, R-513A refrigerant, hermetically sealed refrigerant circuit, scroll refrigerant compressor with energy-saving shut-off feature, hot gas bypass control, electronic condensate drain, upstream centrifugal separator.

## Heat recovery (HR)

Optionally available with integrated HR system (plate-type heat exchanger).

## SIGMA CONTROL 2

“Traffic light” LED indicators show operational status at a glance, plain text display, 30 selectable languages, soft-touch keys with icons, fully automated monitoring and control. Selection of Dual, Quadro, Vario, Dynamic and continuous control as standard. Ethernet interface; additional optional communications interfaces for: Profibus DP, Modbus, Profinet and Devicenet; SD card slot for data recording and updates; RFID reader, web server.

### SIGMA AIR MANAGER 4.0

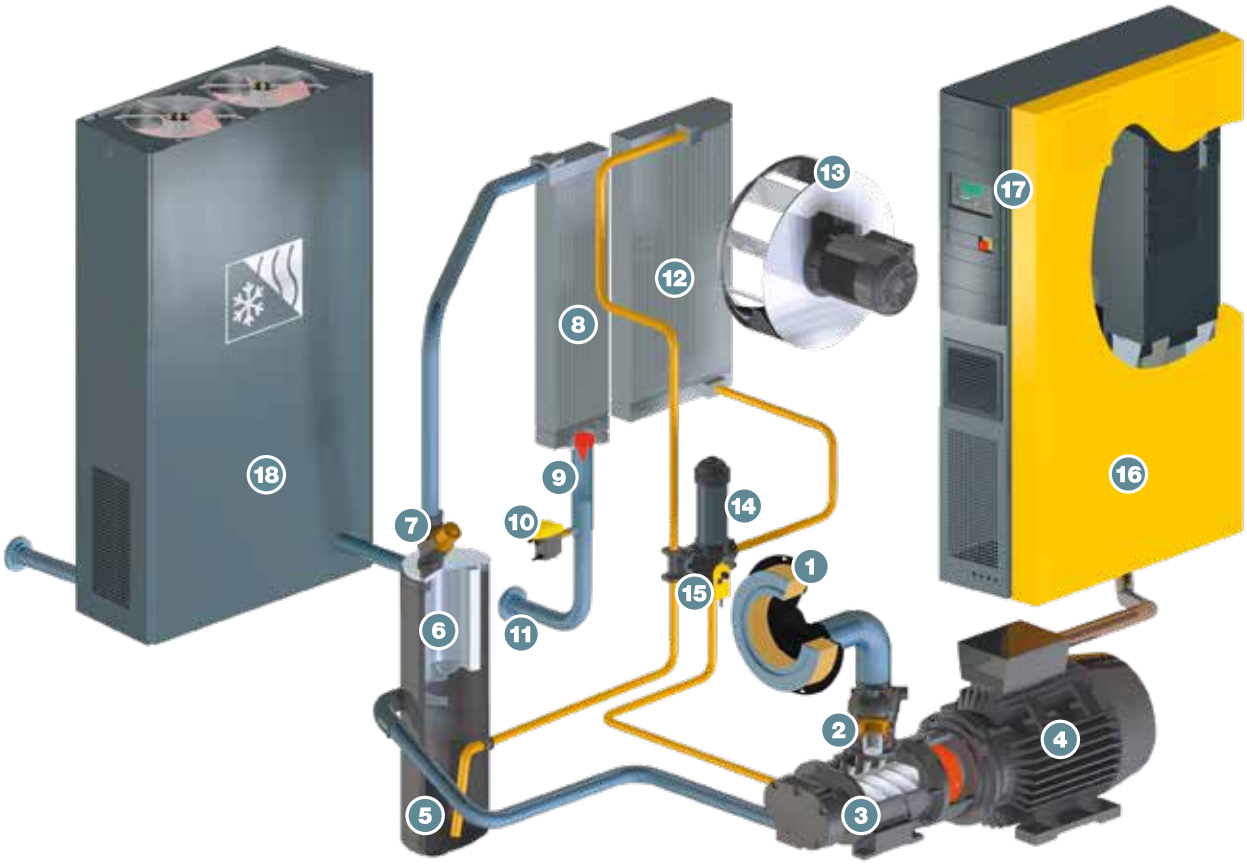
The further-refined adaptive 3-D$^{advanced}$ Control predictively calculates and compares various operating scenarios and selects the most efficient to suit the compressed air application’s specific needs. The SIGMA AIR MANAGER 4.0 therefore optimally adjusts flow rates and compressor energy consumption automatically in response to actual compressed air demand.

This powerful feature is made possible by the integrated industrial PC with multi-core processor in combination with the adaptive 3-D$^{advanced}$ Control. Furthermore, the SIGMA NETWORK bus converters (SBC) provide a host of possibilities to enable the system to be individually tailored to meet exact user requirements. The SBC can be equipped with digital and analogue input and output modules, as well as with SIGMA NETWORK ports, to enable seamless display of pressure, flow rate, pressure dew point, power or alarm message information.

# How it works

The air to be compressed passes through the intake filter (1) and the inlet valve (2) into the SIGMA PROFILE compressor airend (3). The compressor airend (3) is driven by a high efficiency electric motor (4). The cooling oil injected for cooling purposes during the compression process is re-separated from the air in the fluid separator tank (5).
The compressed air flows through the 2-stage oil separator cartridge (6) and the minimum pressure check valve (7) into the compressed air aftercooler (8). Following cooling, any accumulating condensate is removed from the compressed air by the integrated centrifugal separator (9) and is then drained away from the machine via the installed ECO-DRAIN (10) condensate drain. The condensate-free compressed air then leaves the system at the compressed air connection (11). The heat generated during the compression process is removed from the cooling oil via the fluid cooler (12) and dissipated into the environment with a separate fan with fan motor (13).
The cooling oil is then cleaned by the ECO fluid filter (14). The Electronic Thermo Management system (15) ensures lowest possible operating temperatures. The control cabinet (16) houses the internal SIGMA CONTROL 2 compressor controller (17) and, depending on the machine version, the star-delta starter or the frequency converter (SFC). Some systems also feature an optional add-on refrigeration dryer (18) that cools the the compressed air to +3 °C and thereby effectively removes all moisture.

(1) Intake filter
(2) Inlet valve
(3) SIGMA PROFILE airend
(4) IE4 drive motor
(5) Fluid separator tank
(6) Oil separator cartridge
(7) Minimum pressure check valve
(8) Compressed air aftercooler
(9) KAESER centrifugal separator
(10) ECO-DRAIN condensate drain
(11) Compressed air connection
(12) Fluid cooler
(13) Fan motor
(14) ECO fluid filter
(15) Electronic Thermo Management
(16) Control cabinet with integrated SFC frequency converter
(17) SIGMA CONTROL 2 compressor controller
(18) Add-on refrigeration dryer



# Technical specifications – CSD

### Standard version

| Model | Working pressure bar | Flow rate *) Overall package at working pressure m³/min | Max. operating pressure bar | Drive motor rated power kW | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Mass kg |
|---|---|---|---|---|---|---|---|---|
| **CSD 85** | 7.5 | 8.26 | 8.5 | 45 | 1760 x 1110 x 1900 | G 2 | 70 | 1250 |
| | 10 | 6.89 | 12 | | | | | |
| | 13 | 5.50 | 15 | | | | | |
| **CSD 105** | 7.5 | 10.14 | 8.5 | 55 | 1760 x 1110 x 1900 | G 2 | 71 | 1290 |
| | 10 | 8.18 | 12 | | | | | |
| | 13 | 6.74 | 15 | | | | | |
| **CSD 125** | 7.5 | 12.02 | 8.5 | 75 | 1760 x 1110 x 1900 | G 2 | 72 | 1320 |
| | 10 | 10.04 | 12 | | | | | |
| | 13 | 8.06 | 15 | | | | | |

### SFC - Version with variable speed drive

| Model | Working pressure bar | Flow rate *) Overall package at working pressure m³/min | Max. operating pressure bar | Drive motor rated power kW | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Mass kg |
|---|---|---|---|---|---|---|---|---|
| **CSD 85 SFC** | 7.5 | 1.99 - 8.37 | 8.5 | 45 | 1760 x 1110 x 1900 | G 2 | 72 | 1220 |
| | 10 | 1.49 - 7.21 | 12 | | | | | |
| | 13 | 1.16 - 6.15 | 15 | | | | | |
| **CSD 105 SFC** | 7.5 | 2.32 - 10.01 | 8.5 | 55 | 1760 x 1110 x 1900 | G 2 | 73 | 1280 |
| | 10 | 1.91 - 8.79 | 12 | | | | | |
| | 13 | 1.39 - 7.41 | 15 | | | | | |
| **CSD 125 SFC** | 7.5 | 2.90 - 12.22 | 8.5 | 75 | 1760 x 1110 x 1900 | G 2 | 74 | 1300 |
| | 10 | 2.22 - 10.74 | 12 | | | | | |
| | 13 | 1.81 - 8.98 | 15 | | | | | |

*) Flow rate complete system as per ISO 1217: 2009 Annex C/E: inlet pressure 1 bar (a), cooling and air inlet temperature +20 °C

**) Sound pressure level as per ISO 2151 and basic standard ISO 9614-2, tolerance: ±3 dB (A)

## T - Version with integrated refrigeration dryer (Refrigerant****) R-513A)

| Model | Working pressure bar | Flow rate *) Overall package at working pressure m³/min | Max. operating pressure bar | Drive motor rated power kW | Refrigeration dryer power consumption ***) | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Mass kg |
|---|---|---|---|---|---|---|---|---|---|
| CSD 85 T | 7.5 | 8.26 | 8.5 | 45 | 0.92 | 2160 x 1110 x 1900 | G 2 | 70 | 1410 |
| | 10 | 6.89 | 12 | | | | | | |
| | 13 | 5.50 | 15 | | | | | | |
| CSD 105 T | 7.5 | 10.14 | 8.5 | 55 | 0.92 | 2160 x 1110 x 1900 | G 2 | 71 | 1450 |
| | 10 | 8.18 | 12 | | | | | | |
| | 13 | 6.74 | 15 | | | | | | |
| CSD 125 T | 7.5 | 12.02 | 8.5 | 75 | 1.30 | 2160 x 1110 x 1900 | G 2 | 72 | 1510 |
| | 10 | 10.04 | 12 | | 0.92 | | | | |
| | 13 | 8.06 | 15 | | | | | | |

## T SFC - Version with variable speed drive and integrated refrigeration dryer (Refrigerant****) R-513A)

| Model | Working pressure bar | Flow rate *) Overall package at working pressure m³/min | Max. operating pressure bar | Drive motor rated power kW | Refrigeration dryer power consumption ***) | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Mass kg |
|---|---|---|---|---|---|---|---|---|---|
| CSD 85 T SFC | 7.5 | 1.99 - 8.37 | 8.5 | 45 | 0.92 | 2160 x 1110 x 1900 | G 2 | 72 | 1380 |
| | 10 | 1.49 - 7.21 | 12 | | | | | | |
| | 13 | 1.16 - 6.15 | 15 | | | | | | |
| CSD 105 T SFC | 7.5 | 2.32 - 10.01 | 8.5 | 55 | 0.92 | 2160 x 1110 x 1900 | G 2 | 73 | 1440 |
| | 10 | 1.91 - 8.79 | 12 | | | | | | |
| | 13 | 1.39 - 7.41 | 15 | | | | | | |
| CSD 125 T SFC | 75 | 2.9 - 12.22 | 8.5 | 75 | 1.30 | 2160 x 1110 x 1900 | G 2 | 74 | 1490 |
| | 10 | 2.22 - 10.74 | 12 | | 0.92 | | | | |
| | 13 | 1.81 - 8.98 | 15 | | | | | | |

***) Power consumption (kW) at ambient temperature +20 °C and 30 % relative humidity

****) Contains fluorinated greenhouse gases covered by the Kyoto Protocol: GWP 631, refrigerant charge 1.45 kg, $CO_2$ equivalent 0.9 t
Only with CSD 125 T (T-SFC) with 8,5 bar overpressure: GWP 631, refrigerant charge 1.65 kg, $CO_2$ equivalent 1.0 t

# Technical specifications – CSDX

### Standard version

| Model | Working pressure<br>bar | Flow rate *)<br>Overall package at working pressure<br>m³/min | Max. operating pressure<br>bar | Drive motor rated power<br>kW | Dimensions W x D x H<br>mm | Compressed air connection | Sound pressure level **)<br>dB(A) | Mass<br>kg |
|---|---|---|---|---|---|---|---|---|
| **CSDX 140** | 7.5 | 13.74 | 8.5 | 75 | 2110 x 1290 x 1950 | G 2 | 71 | 1830 |
| | 10 | 11.83 | 12 | | | | | |
| | 13 | 9.86 | 15 | | | | | |
| **CSDX 165** | 7.5 | 16.16 | 8.5 | 90 | 2110 x 1290 x 1950 | G 2 | 72 | 1925 |
| | 10 | 13.53 | 12 | | | | | |
| | 13 | 11.49 | 15 | | | | | |

### SFC - Version with variable speed drive

| Model | Working pressure<br>bar | Flow rate *)<br>Overall package at working pressure<br>m³/min | Max. operating pressure<br>bar | Drive motor rated power<br>kW | Dimensions W x D x H<br>mm | Compressed air connection | Sound pressure level **)<br>dB(A) | Mass<br>kg |
|---|---|---|---|---|---|---|---|---|
| **CSDX 140 SFC** | 7.5 | 3.46 - 13.37 | 8.5 | 75 | 2110 x 1290 x 1950 | G 2 | 72 | 1650 |
| | 10 | 2.82 - 11.60 | 10 | | | | | |
| | 13 | 2.13 - 10.04 | 13 | | | | | |
| **CSDX 165 SFC** | 7.5 | 3.87 - 16.03 | 8.5 | 90 | 2110 x 1290 x 1950 | G 2 | 73 | 1750 |
| | 10 | 3.34 - 13.91 | 12 | | | | | |
| | 13 | 2.68 - 11.84 | 13 | | | | | |

*) Flow rate complete system as per ISO 1217: 2009 Annex C/E: inlet pressure 1 bar (a), cooling and air inlet temperature +20 °C
**) Sound pressure level as per ISO 2151 and basic standard ISO 9614-2, tolerance: ±3 dB (A)

## T - Version with integrated refrigeration dryer (Refrigerant****) R-513A)

| Model | Working pressure<br>bar | Flow rate *) Overall package at working pressure<br>m³/min | Max. operating pressure<br>bar | Drive motor rated power<br>kW | Refrigeration dryer power consumption ***) | Dimensions W x D x H<br>mm | Compressed air connection | Sound pressure level **)<br>dB(A) | Mass<br>kg |
|---|---|---|---|---|---|---|---|---|---|
| CSDX 140 T | 7.5 | 13.74 | 8.5 | 75 | 1.38 | 2510 x 1290 x 1950 | G 2 | 71 | 2045 |
| | 10 | 11.83 | 12 | | | | | | |
| | 13 | 9.86 | 15 | | | | | | |
| CSDX 165 T | 7.5 | 16.16 | 8.5 | 90 | 1.38 | 2510 x 1290 x 1950 | G 2 | 72 | 2140 |
| | 10 | 13.53 | 12 | | | | | | |
| | 13 | 11.49 | 15 | | | | | | |

## T SFC - Version with variable speed drive and integrated refrigeration dryer (Refrigerant****) R-513A)

| Model | Working pressure<br>bar | Flow rate *) Overall package at working pressure<br>m³/min | Max. operating pressure<br>bar | Drive motor rated power<br>kW | Refrigeration dryer power consumption ***) | Dimensions W x D x H<br>mm | Compressed air connection | Sound pressure level **)<br>dB(A) | Mass<br>kg |
|---|---|---|---|---|---|---|---|---|---|
| CSDX 140 T SFC | 7.5 | 3.46 - 13.37 | 8.5 | 75 | 1.38 | 2510 x 1290 x 1950 | G 2 | 72 | 1865 |
| | 10 | 2.82 - 11.6 | 12 | | | | | | |
| | 13 | 2.13 - 10.04 | 15 | | | | | | |
| CSDX 165 T SFC | 7.5 | 3.87 - 16.03 | 8.5 | 90 | 1.38 | 2510 x 1290 x 1950 | G 2 | 73 | 1965 |
| | 10 | 3.34 - 13.91 | 12 | | | | | | |
| | 13 | 2.68 - 11.84 | 15 | | | | | | |

***) Power consumption (kW) at ambient temperature +20 °C and 30 % relative humidity
****) Contains fluorinated greenhouse gases covered by the Kyoto Protocol: GWP 631, refrigerant charge 1.5 kg, $CO_2$ equivalent 0.9 t

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**KAESER KOMPRESSOREN SE**
P.O. Box 2143 – 96410 Coburg – GERMANY – Tel +49 9561 640-0 – Fax +49 9561 640-130
e-mail: productinfo@kaeser.com – www.kaeser.com

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