KAESER KOMPRESSOREN®




# Rotary Screw Compressors

**DSD Series**

With the world-renowned SIGMA PROFILE

Flow rate 3.5 to 26.6 m³/min, Pressure 5.5 to 15 bar

**www.kaeser.com**

DSD series

# For optimum efficiency

KAESER KOMPRESSOREN pushes the boundaries of compressed air efficiency and availability once again with its latest generation of **DSD** series rotary screw compressors. The intelligent fusion of established basics and innovative detailed solutions in system design not only enhance ease of operation and maintenance, but also give these rotary screw compressors their distinctive modern appearance.

## DSD – Energy savings as standard

Delivering improved specific package input power, the flow-optimised and further-refined SIGMA PROFILE rotors provide the basis for the compressor's world-renowned energy efficiency. Power consumption is reduced still further through the use of highly efficient IE4 drive motors and KAESER's loss-free 1:1 direct transmission of motor power to the airend. Moreover, the radial fan meets the efficiency requirements for fans in accordance with the directive (EU) 327/2011. Last but not least, the advanced SIGMA CONTROL compressor controller achieves additional energy savings by minimising cost-intensive idle times through the use of a variety of selectable control mode options, e.g. Dynamic control.

## Service-friendly = Efficient

The distinctive, eye-catching exterior system design is complemented by intelligent internal component layout for even greater cost efficiency. For example, all service and maintenance parts are directly accessible from the front, which not only saves time and money, but also increases compressed air system availability.

## Perfect partners

DSD series rotary screw compressors are the perfect partners for high-efficiency industrial compressed air stations. The internal SIGMA CONTROL compressor controller offers numerous communications interfaces (e.g. Ethernet), which, when connected within the KAESER SIGMA NETWORK, make seamless communication with management systems such as the SIGMA AIR MANAGER 4.0 or in-house centralised control technology easier, safer and more efficient than ever before.

## Electronic Thermal Management

Powered by an electric motor, the sensor-controlled temperature control valve integrated into the cooling circuit is the heart of the innovative Electronic Thermal Management (ETM). The SIGMA CONTROL compressor controller monitors the intake and compressor temperature to ensure that condensate formation is reliably prevented, even when humidity levels are high. ETM dynamically controls the fluid temperature, which increases energy efficiency at low fluid temperatures. When the DSD machine is equipped with heat recovery, a second ETM system is fitted. This enables the heat recovery function to be better adapted to the customer's exact requirements.

Up to
96 %
usable for heating

## Why choose heat recovery?

In fact, the question should be: Why not? Ultimately, up to 100% of the (electrical) drive energy supplied to any rotary screw 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 significantly improves the company's overall energy balance.



# Service-friendly



Made in Germany

Image: DSD 240, air-cooled

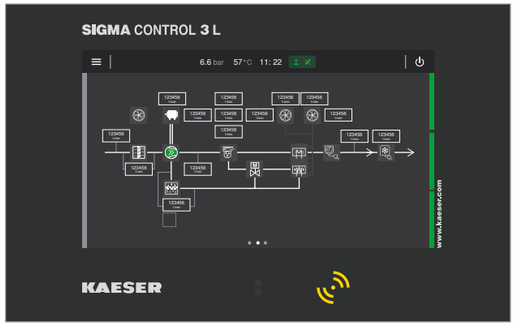
DSD series

# Energy savings in every detail



## Save energy with the SIGMA PROFILE

At the heart of every DSD system lies a rotary screw airend featuring rotors with the energy-saving SIGMA PROFILE. KAESER airends are equipped with flow-optimised rotors, which contribute significantly to the complete system's class-leading specific package input power.




## SIGMA CONTROL controller

Comprehensive overview of components and assemblies – including live values in real time. Intuitive icons show current system health status. Detailed views and settings options open at the click of a button. Clear visibility of the air, oil, cooling water and heat recovery circuits guarantees a pinpoint overview and optimal control.




## IE4 – Energy-saving motors

It goes without saying that every KAESER DSD series compressor features a highly efficient, energy-saving IE4 drive motor.



## Correct temperature assured

The innovative Electronic Thermal Management (ETM) dynamically controls fluid temperature for reliable prevention of condensate formation. This enhances energy efficiency, for example, by enabling heat recovery to be precisely tailored to meet customers' exact requirements.

DSD series

# Efficient in every way



## Dependable condensate pre-separation

Integrated as standard, the KAESER axial centrifugal separator with electronic ECO-DRAIN condensate drain provides an exceptionally high degree of separation (>99 %) with minimal pressure loss. Dependable and energy-efficient condensate separation is therefore assured, even at high ambient temperatures and humidity.



## Eco-friendly fluid filter

The eco-filter elements housed in the aluminium fluid filter enclosure are “metal-free”. They can therefore simply be disposed of thermally at the end of their service life.



## Optimised inlet valve

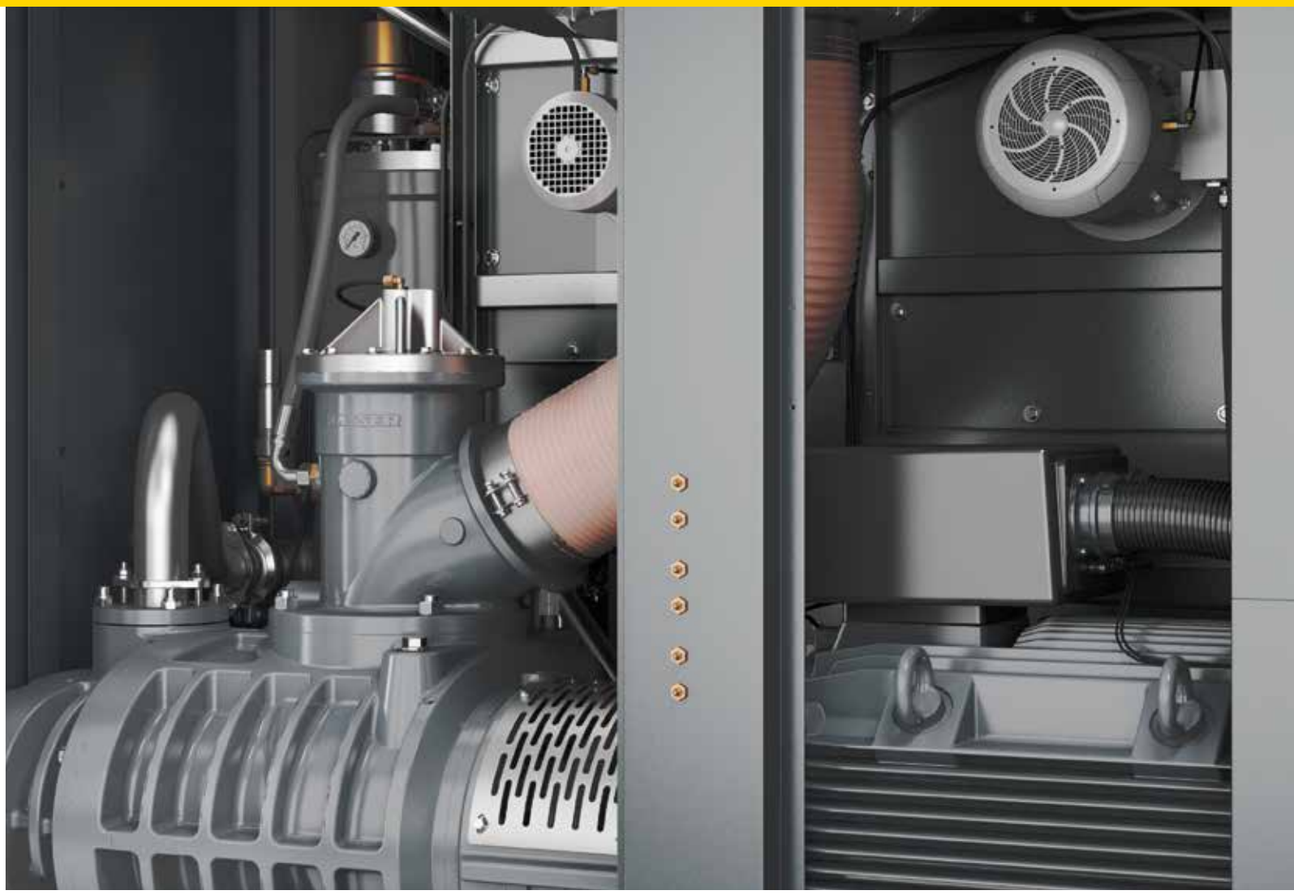
The new, flow-optimised design of the inlet valve minimises intake pressure losses and simplifies servicing.



## Energy-saving 1:1 direct drive

With 1:1 direct drive, the drive motor and airend – together with the coupling and coupling flange – form a compact, durable package with zero drive losses.







DSD series

# Clever cooling for significant savings



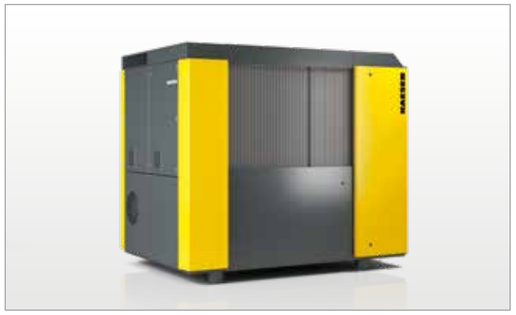
## Low operating temperature

A fan with variable-speed motor is controlled via thermostat in order to generate the precise volume of cooling air required for low operating temperatures. This significantly reduces the overall energy consumption of DSD systems.



## Low compressed air temperature

Effective aftercooling helps to maintain a low compressed air discharge temperature. In combination with the centrifugal separator, this ensures the removal of large amounts of condensate, which is then drained off without energy loss via the electronically controlled ECO-DRAIN. This in turn reduces the burden on downstream treatment components.



## Coolers cleaned from the outside

Unlike internal heat exchangers, the externally mounted coolers on all DSD systems are easily accessible and simple to clean. Operational reliability and availability are therefore enhanced, as contaminant build-up is easily spotted.



## High residual exhaust air thrust

The integrated radial fans are significantly more efficient than axial fans; their particularly high residual thrust generally enables hot air to be ducted away without need of an auxiliary fan.

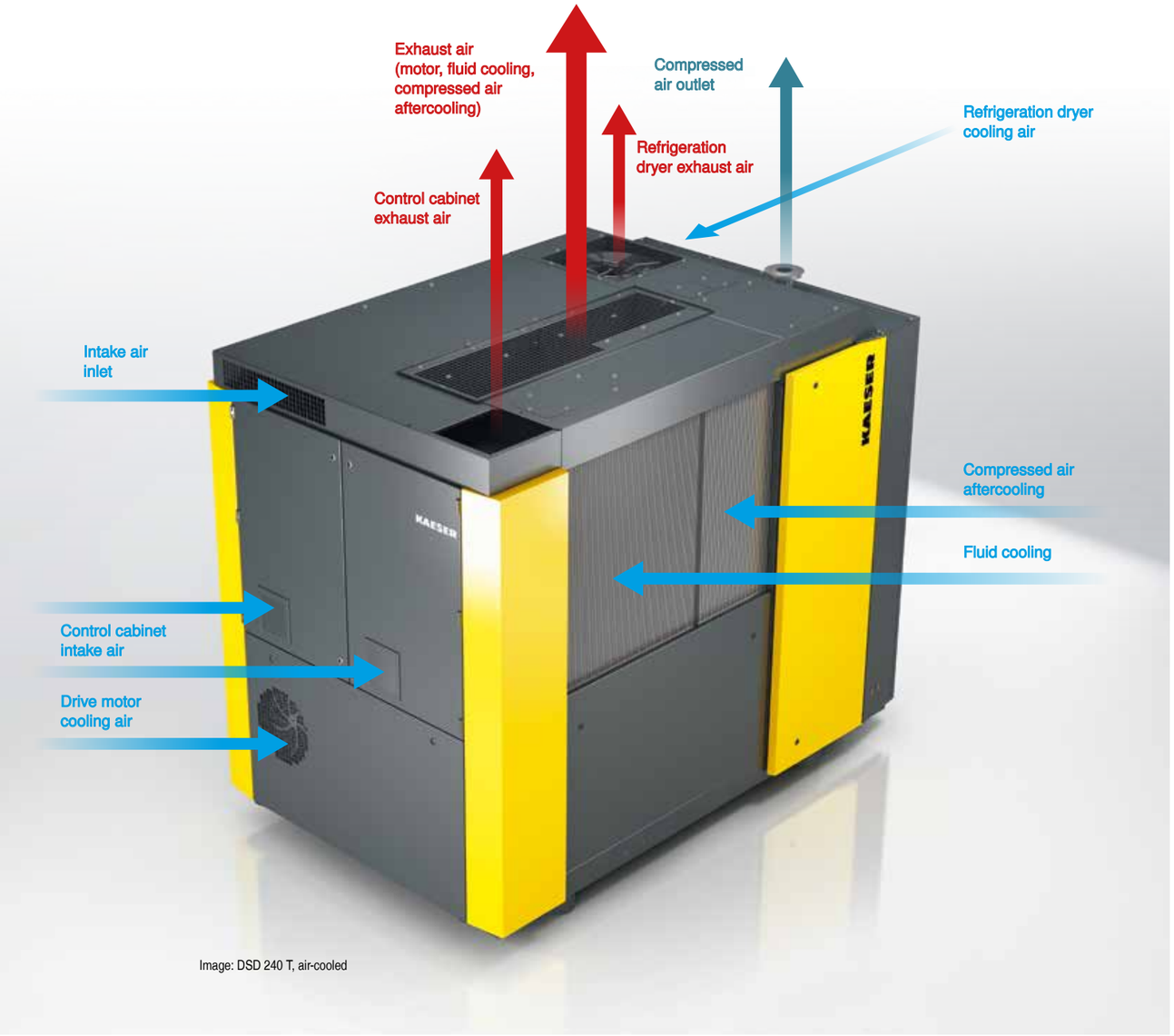



Image: DSD 240 T, air-cooled

DSD series

# Cooling air flow

In addition to improved cooling performance, KAESER's innovative cooling air flow concept provides further advantages: the air is drawn into the cooler box via the cooler and discharged directly upwards. Consequently, the inside of the system remains untouched by the main cooling air flow. Contaminant particles in the air collect on the air inlet side of the cooler, making them easily noticed and simple to clean off without having to dismantle the cooler. Operational reliability is improved and maintenance effort significantly reduced.



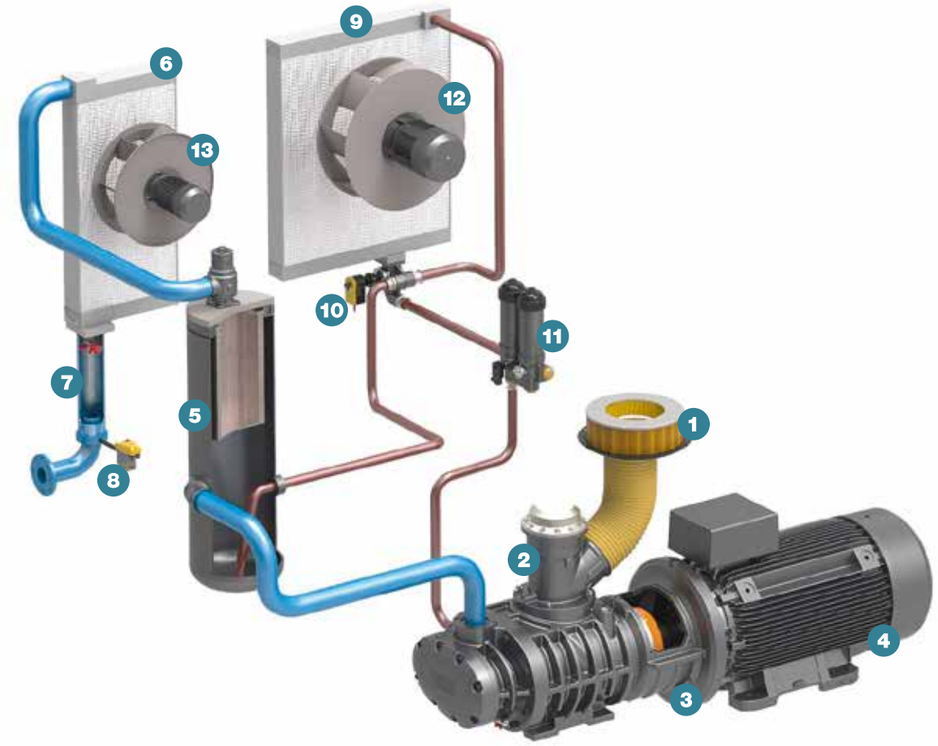
DSD series

# How it works

The rotary screw airend (3) is driven by an electric motor (4). The fluid injected primarily for cooling during compression is separated from the air again inside the fluid separator tank (5). The integrated fan ensures ventilation of the compressor system, as well as the required cooling air flow through the air-cooled fluid and compressed air aftercooler (6, 9).

The controller ensures that the system generates compressed air within the set pressure limits. Safety functions protect the compressor via an automatic shutdown in the event of a key system failure.

(1) Intake filter
(2) Inlet valve
(3) Airend with SIGMA PROFILE
(4) IE4 drive motor
(5) Fluid separator tank
(6) Compressed air aftercooler
(7) KAESER centrifugal separator
(8) Condensate drain (ECO-DRAIN)
(9) Fluid cooler
(10) Electronic Thermal Management
(11) Eco fluid filter
(12) Fluid cooler radial fan with variable speed control
(13) Compressed air aftercooler radial fan



Service-friendly

# Excellent accessibility





Image: DSD 240, air-cooled



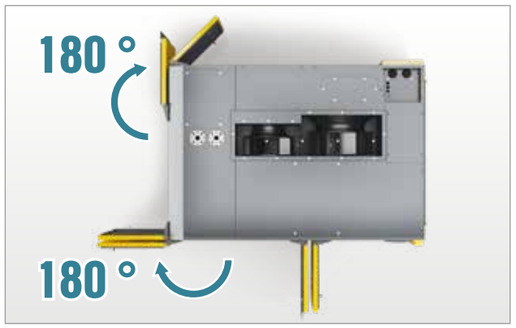
## Oil separator cartridge changes

The cartridge can be easily changed from above, with only one roof panel needing removal. Alternatively, the cartridge can be changed from inside the housing.



## External lubrication

Electric motors must be lubricated whilst running. On DSD compressors, service personnel can perform this task safely from outside the machine.




## Service doors open 180°

The wide-opening service doors allow excellent accessibility to all components for maximum ease of service. This speeds up service work, reduces operating costs, and increases availability.



## Easy replacement of maintenance parts

Just like the air filter, which is easily changed from the front of the machine, all other maintenance parts are conveniently accessible. Thanks to the additional pre-separation fleece on the intake air filter, coarse contaminants are captured and the service life of the filter element is significantly extended.

Image: DSD 240 T, air-cooled

DSD T series

# With integrated refrigeration dryer



## Intelligent cooling air flow

The heated cooling air from the refrigeration dryer is discharged through the roof of the compressor system by means of an integrated exhaust air duct. This enables the unit depth of the add-on refrigeration dryer to be reduced.



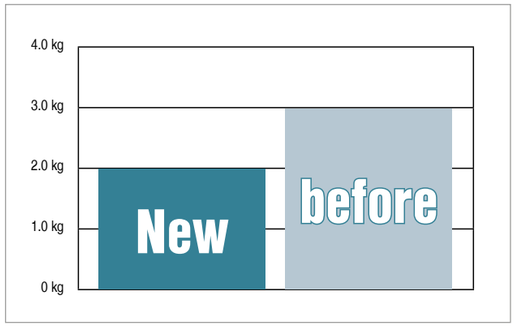

## Reduced space requirement

The refrigeration dryer in new DSD T systems provides a dependable supply of dry compressed air with a reduced space requirement of only 4.76 m² compared to the previous 5.73 m² (see dotted line).



## Seamless refrigeration dryer operation

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




## Minimal refrigerant volumes

The refrigeration dryers in KAESER's new DSD T systems require approximately a third less refrigerant than previous versions. This not only saves costs, but is also significantly more environmentally sustainable.

# Drive systems

## Fixed speed, fixed flow rate.

### DSD base load

Base load compressors from KAESER are designed to run at one optimal operating speed. Operating at maximum efficiency, they deliver a constant air volume at a fixed motor speed, making them ideally suited to applications with a constant or lightly fluctuating air demand.

### Committed to meeting your objectives

DSD base load compressors stand out for their functional, durable drive technology and supreme levels of efficiency.

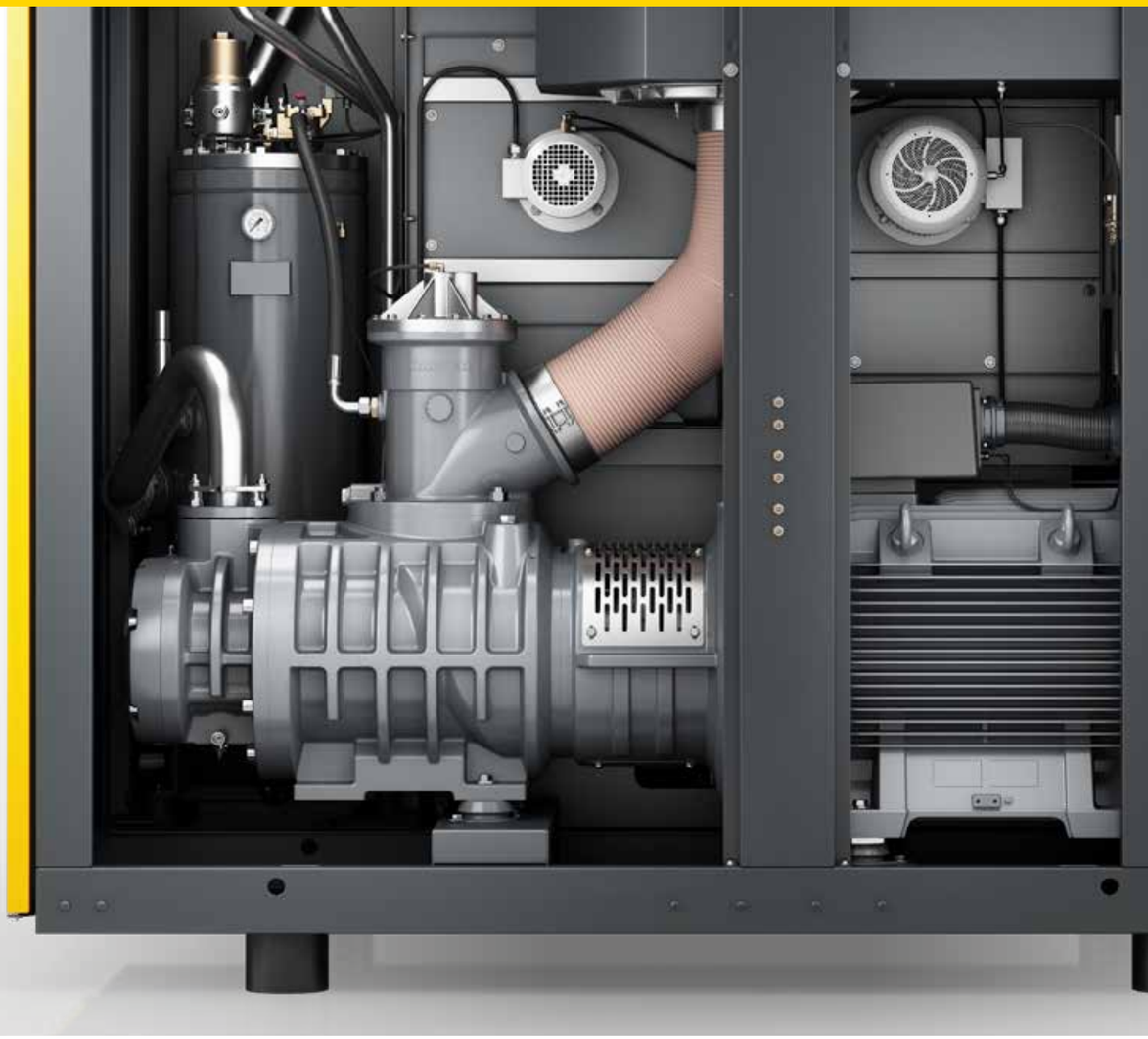
## Variable speed, variable flow rate

### DSD peak load

Maximum flexibility and sustainability: thanks to their variable-speed drive motors, DSD peak load compressors from KAESER always deliver the exact volume of compressed air that is actually required. This makes them particularly efficient in applications with variable air demand.

### Committed to meeting your objectives

DSD peak load compressors stand out with their exceptional flexibility when it comes to delivery volumes, guaranteeing impressive efficiency across the entire delivery range.





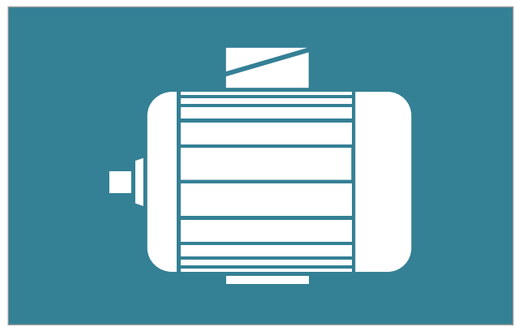

### SUPER PREMIUM EFFICIENCY IE4

When it comes to base load compressors, Super Premium Efficiency IE4 asynchronous motors guarantee best possible efficiency thanks to their well-proven, durable technology and renowned service-friendliness.




### Perfect teamwork

IE4 motors guarantee energy-efficient operation whilst at the same time fulfilling European efficiency requirements. When combined with SFC technology, speed is precisely adjusted according to compressed air requirement, thereby reducing idle times and energy costs.



### Sustainable and service-friendly

The IE4 asynchronous motors fitted by KAESER are designed to conserve resources. High-quality electrical steel and optimised windings reduce material use and enhance efficiency. This makes the drive not only highly durable, but also service-friendly.



### Efficient and economical

Super Premium Efficiency motors deliver high efficiency levels throughout their entire speed range. This helps to save energy and therefore costs, even during partial load operation.

SIGMA CONTROL internal compressor controller

# SIGMA CONTROL

Intelligent, future-oriented, and efficient – the integrated SIGMA CONTROL compressor controller represents the future of cutting-edge compressed air systems. With its innovative platform concept for hardware and software, KAESER has set new standards in control of stationary compressors. The SIGMA CONTROL not only increases energy efficiency, but also enhances reliability and simplifies operation, whilst the touch display places intuitive control right at your fingertips. Clear visualisation ensures a constant optimal overview of machine states, operating data and maintenance information. Rapid navigation provides direct access to principal functions, without time-consuming scrolling or searching.






## Maximum control with KAESER Connect

With our KAESER Connect app, you always have an eye on your compressor. All values are displayed in real time, allowing you to remain continuously informed about the current status of your compressed air system. Push notifications keep you up to speed with developments: important updates, KPIs, maintenance counter information, and machine states are delivered directly to your mobile end device. The machine report provides even more transparency and can be sent quickly and easily to your smartphone or E-mail. This way you can control your compressed air system efficiently, conveniently and with maximum security – wherever you may be.

## Future-proof

Modular system architecture with universal, configurable IoT interfaces enables flexible adaptation to new requirements and technologies.

## Higher efficiency

Intelligent control helps to significantly reduce the energy consumption of your compressed air system.

## Maximum dependability

Smart maintenance planning, early detection of deviations during operation, and detailed status messaging ensure reliable and interruption-free function.

## Comprehensive compatibility

Compatible with all KAESER compressors, whether current or previous models.

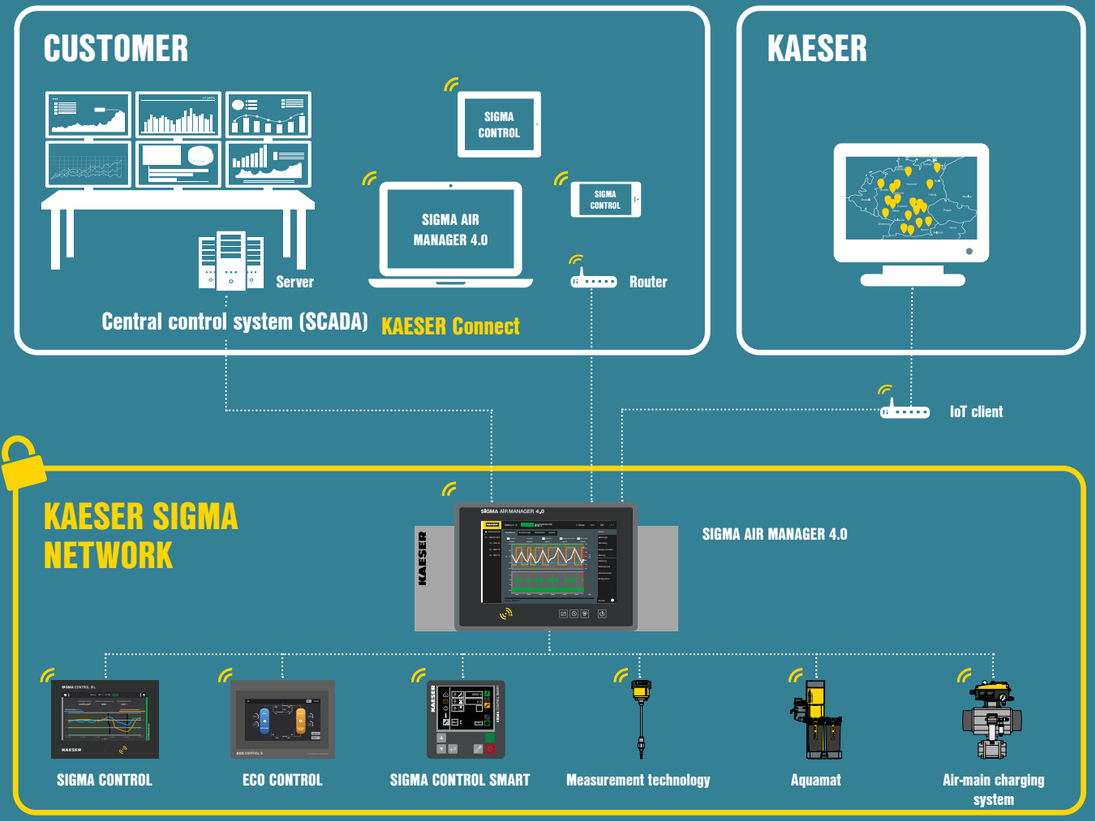


SIGMA AIR MANAGER 4.0 compressed air management system

# SIGMA AIR MANAGER 4.0

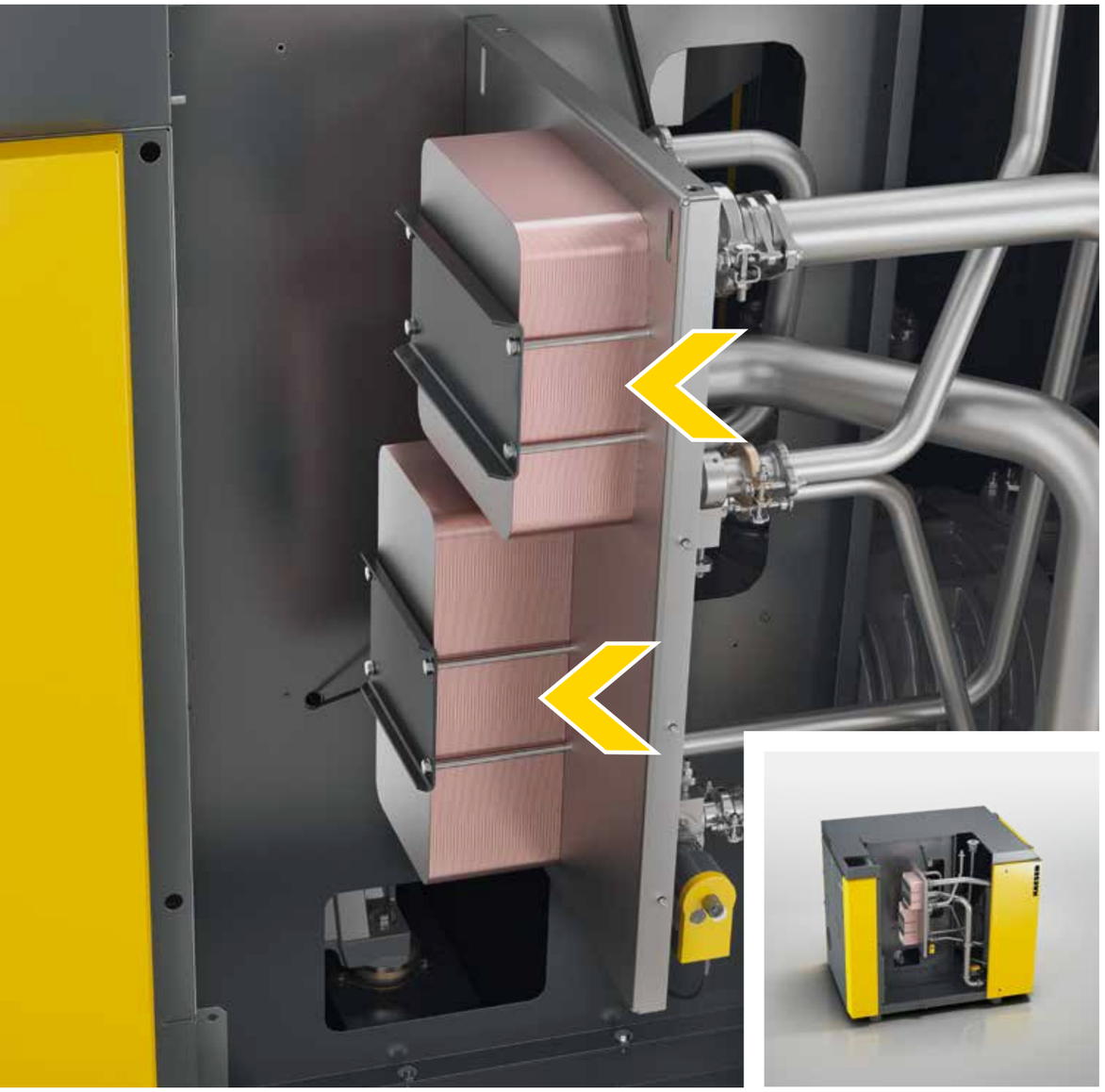
Adaptive, efficient and networked: demand-oriented compressed air management takes on a whole new meaning with the SIGMA AIR MANAGER 4.0. This advanced master controller coordinates operation of multiple compressors, as well as dryers or filters, with exceptional efficiency. A patented, simulation-based optimisation process determines future demand based on past compressed air consumption profiles. Thanks to networking of all components in the compressed air station via this intelligent master controller and the secure KAESER SIGMA NETWORK, comprehensive monitoring, energy management and predictive maintenance are all possible.



DSD series – water-cooled...

# ...with plate-type heat exchanger



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

# ...with shell-and-tube heat exchanger



Shell-and-tube heat exchangers made from copper–nickel alloy (CuNi10Fe) are less prone to contamination than plate-type heat exchangers of comparable cooling capacity, whilst being significantly more durable and mechanically cleanable. Moreover, the cooler inserts are simple to change. They are also seawater-resistant and therefore suitable for compressors in marine operations, whilst pressure losses are exceptionally low.




**Example savings calculation for hot air heat recovery with fuel oil (DSD 205)**

| | | | |
|---|---|---|---|
| Maximum available heat output: | 120 kW | | |
| Calorific value per litre of fuel oil: | 9.861 kWh/l | | |
| Fuel oil heating efficiency: | 0.9 | | |
| Price per litre of fuel oil: | € 0.60/l | 1 kW = 1 MJ/h x 3.6 | |
| **Cost saving:** | $\frac{120\ kW \times 2000\ h}{0.9 \times 9.861\ kWh/l}$ | x € 0.60/l | **= € 16,226 per year** |

Further information regarding heat recovery:
http://www.kaeser.com/products/rotaryscrewcompressors/heatrecovery/



Heat recovery

# Cost-effective heating

Up to 96 % usable for heating

## Heat recovery simply makes sense

100% of the electrical drive energy supplied to a compressor is converted into heat energy. Of that heat, up to 96% can be recovered and reused for heating purposes.
Use this potential to your advantage!



## Space heating with hot exhaust air

Heating made simple: thanks to the radial fan with high residual thrust, exhaust (hot) air from the compressor can be easily ducted away to spaces that require heating via thermostatic control.

Up to +70 °C heat

## Process, heating and service water

Thanks to the PWT*) heat exchanger system, compressor exhaust heat can be used to produce hot water with temperatures up to +70 °C. Higher temperatures are available upon request.

*) Optionally installed in the system



## Clean hot water

When no other water circuit is connected, special fail-safe heat exchangers meet the highest demands for water purity, such as those required for cleaning water in the food industry.

# Energy-saving, versatile and flexible



## Dual Thermal Management

DSD systems with integrated heat recovery are equipped with two electrically driven temperature regulating valves (ETM), one for the heat recovery and one for the fluid cooler.




## Flexible temperature

The SIGMA CONTROL controller enables precise setting of the airend discharge temperature required for the compressed air in order to achieve the desired water discharge temperature from the heat recovery system.





## Save energy with SIGMA CONTROL

Should all of the heat energy be drawn off by the heat recovery, then SIGMA CONTROL recognises that cooling is no longer required via the system cooler and consequently the fan on the fluid cooler shuts down, thereby achieving even further energy savings.




## Winter ON – Summer OFF

Should no heat recovery be required, during the summer months for example, it can simply be deactivated via the SIGMA CONTROL: this enables the system to resume operation immediately under ETM control with maximum energy efficiency and the lowest possible airend discharge temperature.





# Equipment

## Complete system

Ready for operation, fully automatic, silenced, vibration damped, all panels powder coated; can be used in ambient temperatures up to +45 °C; service-friendly design: bearings for drive and fan motors can be re-lubricated externally.

## Airend

Genuine KAESER single-stage rotary screw airend with energy-saving SIGMA PROFILE rotors and cooling-fluid injection for optimised rotor cooling; 1:1 direct drive.

## Fluid and air flow

Dry air filter with pre-separation, intake silencer, pneumatic inlet and venting valve, cooling fluid separator tank with three-stage separation system; safety valve, minimum pressure check valve, Electronic Thermal Management (ETM) and Eco fluid filter in cooling fluid circuit, fluid and compressed air aftercooler (air-cooled as standard); two fan motors (one with variable speed control); KAESER centrifugal separator with electronically controlled, energy-saving condensate drain featuring zero pressure loss; piping and centrifugal separator made from stainless steel.

## Water-cooled version

Fluid and compressed air aftercooler designed as water-cooled plate-type or optionally as shell-and-tube heat exchanger; water circuit made from stainless steel piping.

## Optimised separation system

The combination of flow-optimised pre-separation and special separator cartridges results in a minimal residual fluid content of < 2 mg/m³ for the compressed air. This separation system requires less maintenance.

## Heat recovery (option)

Optionally available with integrated fluid-water plate-type heat exchanger and equipped with additional thermostatic valve for fluid; exterior connections, additional ETM valve.

## Electrical components

Super Premium Efficiency IE4 drive motors with three Pt100 winding temperature sensors for motor monitoring, IP 54 control cabinet, control cabinet ventilation, automatic star-delta protection combination, overload relay, control transformer; frequency converter for drive motor on SFC version.

## SIGMA CONTROL

Modular system with control unit and integrated inputs/outputs, designed for use with KAESER rotary screw compressors, traffic-light operating state display, fully automatic monitoring and control; Dual, Quadro, and Vario control modes, timer for compressor functions (On, Off) or external outputs, base load sequencing function for operation of two compressors, high-performance processor hardware; all components designed for industrial conditions, capacitive touchscreen with optical bonding, Time-of-Flight and other internal sensors, SD card slot for updates, USS bus communications module adapter for frequency converter, RFID reader, Ethernet interface for connection to KAESER SIGMA NETWORK.

Connection to control technology available via optional communications modules for: Profibus DP, Modbus TCP, Profinet, and DeviceNet.

## Efficient Dynamic control

The Dynamic control mode calculates run-on times taking the measured motor winding temperature into account. This reduces idle times and cuts energy consumption. SIGMA CONTROL offers additional control modes if required.

# Technical data

## Standard versions

| Model | Working pressure bar | Flow rate, *) complete system at working pressure m³/min | Max. gauge pressure bar | Drive motor nominal power kW | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Weight kg |
|---|---|---|---|---|---|---|---|---|
| **DSD 145** | 7.5 | 14.00 | 9 | 75 | 2450 x 1730 x 2150 | DN 65 | 69 | 2950 |
| **DSD 175** | 7.5 | 16.92 | 8.5 | 90 | 2450 x 1730 x 2150 | DN 65 | 70 | 3090 |
| | 10 | 13.60 | 12 | | | | | |
| **DSD 205** | 7.5 | 21.00 | 8.5 | 110 | 2450 x 1730 x 2150 | DN 65 | 72 | 3360 |
| | 10 | 16.59 | 12 | | | | | |
| | 13 | 13.06 | 15 | | | | | |
| **DSD 240** | 7.5 | 25.15 | 8.5 | 132 | 2450 x 1730 x 2150 | DN 65 | 74 | 3430 |
| | 10 | 20.40 | 12 | | | | | |
| | 13 | 16.15 | 15 | | | | | |

## SFC versions with variable speed control

| Model | Working pressure bar | Flow rate, *) complete system at working pressure m³/min | Max. gauge pressure bar | Drive motor nominal power kW | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Weight kg |
|---|---|---|---|---|---|---|---|---|
| **DSD 145 SFC** | 7.5 | 3.67 - 15.73 | 8.5 | 75 | 2690 x 1730 x 2150 | DN 65 | 70 | 3190 |
| **DSD 175 SFC** | 7.5 | 3.67 - 18.43 | 10 | 90 | 2690 x 1730 x 2150 | DN 65 | 71 | 3330 |
| | 10 | 3.50 - 15.60 | 10 | | | | | |
| **DSD 205 SFC** | 7.5 | 4.45 - 21.22 | 10 | 110 | 2690 x 1730 x 2150 | DN 65 | 73 | 3370 |
| | 10 | 4.20 - 18.30 | 10 | | | | | |
| | 13 | 4.97 - 15.16 | 15 | | | | | |
| **DSD 240 SFC** | 7.5 | 5.57 - 23.47 | 8.5 | 132 | 2690 x 1730 x 2150 | DN 65 | 75 | 3670 |
| | 10 | 5.33 - 20.08 | 12 | | | | | |
| | 13 | 4.96 - 16.57 | 15 | | | | | |

*) Flow rate, complete system as per ISO 1217: 2009, Annexe C/E: Absolute 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 versions with integrated refrigeration dryer (refrigerant R-513A)

| Model | Working pressure bar | Flow rate, *) complete system at working pressure m³/min | Max. gauge pressure bar | Drive motor nominal power kW | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Weight kg |
|---|---|---|---|---|---|---|---|---|
| **DSD 145 T** | 7.5 | 14.00 | 9 | 75 | 2750 x 1730 x 2150 | DN 65 | 69 | 3220 |
| **DSD 175 T** | 7.5 | 16.92 | 8.5 | 90 | 2750 x 1730 x 2150 | DN 65 | 70 | 3360 |
| | 10 | 13.60 | 12 | | | | | |
| **DSD 205 T** | 7.5 | 21.00 | 8.5 | 110 | 2750 x 1730 x 2150 | DN 65 | 72 | 3630 |
| | 10 | 16.59 | 12 | | | | | |
| | 13 | 13.06 | 15 | | | | | |
| **DSD 240 T** | 7.5 | 25.15 | 8.5 | 132 | 2750 x 1730 x 2150 | DN 65 | 74 | 3700 |
| | 10 | 20.40 | 12 | | | | | |
| | 13 | 16.15 | 15 | | | | | |

## T SFC versions with variable speed control and integrated refrigeration dryer

| Model | Working pressure bar | Flow rate, *) complete system at working pressure m³/min | Max. gauge pressure bar | Drive motor nominal power kW | Dimensions W x D x H mm | Compressed air connection | Sound pressure level **) dB(A) | Weight kg |
|---|---|---|---|---|---|---|---|---|
| **DSD 145 T SFC** | 7.5 | 3.67 - 15.73 | 8.5 | 75 | 2990 x 1730 x 2150 | DN 65 | 70 | 3470 |
| **DSD 175 T SFC** | 7.5 | 3.67 - 18.43 | 10 | 90 | 2990 x 1730 x 2150 | DN 65 | 71 | 3610 |
| | 10 | 3.50 - 15.60 | 10 | | | | | |
| **DSD 205 T SFC** | 7.5 | 4.45 - 21.22 | 10 | 110 | 2990 x 1730 x 2150 | DN 65 | 73 | 3620 |
| | 10 | 4.20 - 18.30 | 10 | | | | | |
| | 13 | 4.97 - 15.16 | 15 | | | | | |
| **DSD 240 T SFC** | 7.5 | 5.57 - 23.47 | 8.5 | 132 | 2990 x 1730 x 2150 | DN 65 | 75 | 3950 |
| | 10 | 5.33 - 20.08 | 12 | | | | | |
| | 13 | 4.96 - 16.57 | 15 | | | | | |

## More compressed air for less energy

# The world is our home

As one of the world's largest manufacturers of compressors, blowers and compressed air systems, KAESER KOMPRESSOREN is represented throughout the world by a comprehensive network of wholly owned subsidiaries and authorised distribution partners in over 140 countries.

By offering innovative, efficient and reliable products and services, KAESER KOMPRESSOREN's experienced consultants and engineers work in close partnership with customers to enhance their competitive edge and to develop progressive system concepts that continuously push the boundaries of performance and technology. Moreover, decades of knowledge and expertise from this industry-leading systems provider are made available to each and every customer via the KAESER group's advanced global IT network.

These advantages, coupled with KAESER's worldwide service organisation, ensure that every product operates at the peak of its performance at all times, providing optimal efficiency and maximum availability.




TÜVRheinland CERTIFIED
Management System
ISO 9001:2015
ISO 14001:2015
www.tuv.com
ID 9108616471

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