

Rotary Screw Compressors HSD/HSD SFC Series

Free air delivery 10.1 to 86.0 m³/min – Pressure 5.5 to 15 bar

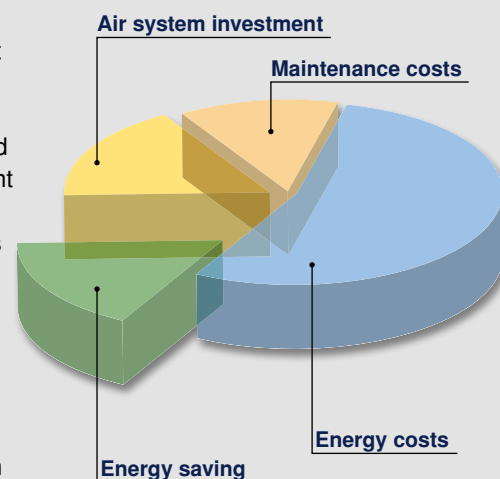


What do you expect from a compressor system?

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

That may sound 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.

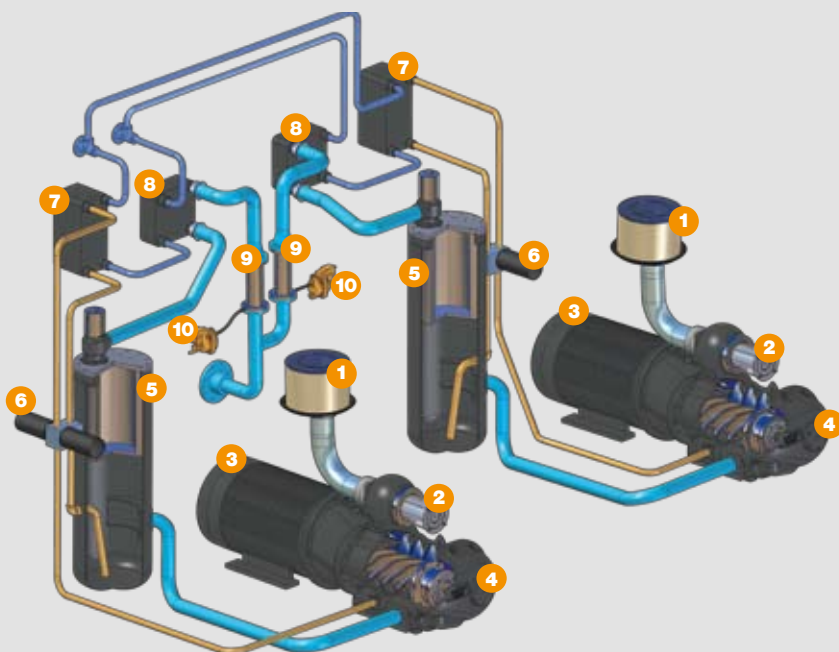
Reliability also ensures a supply of constant quality compressed air that optimises efficiency of the air treatment equipment downstream of the compressor. With regards to sound protection, it is always better to keep noise emissions to a minimum from the outset by using a quiet compressor rather than have to retro-fit sound protection measures later on. Last but not least, a truly efficient compressor is simple and cost-effective to maintain.



The HSD series from Kaeser

Comprising two self-contained compressor units installed within a single housing, these innovative systems set the new standard for compact design, high performance air delivery, reliability and efficiency.

Function diagram:



- 1 Air filter
- 2 Inlet valve
- 3 Electric motor
- 4 Rotary screw airend
- 5 Separator with cartridge
- 6 Fluid filter
- 7 Fluid cooler
- 8 Compressed air aftercooler
- 9 Centrifugal separator
- 10 ECO DRAIN condensate drain

HSD

Double dependability and power



Made in Germany!



SIGMA PROFILE

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



SIGMA CONTROL Dual flexibility

All HSD models comprise two self-contained compressor units each controlled via their own industrial PC-based "Sigma Control" compressor controller. Operational status can be determined at a glance via traffic light style LEDs.

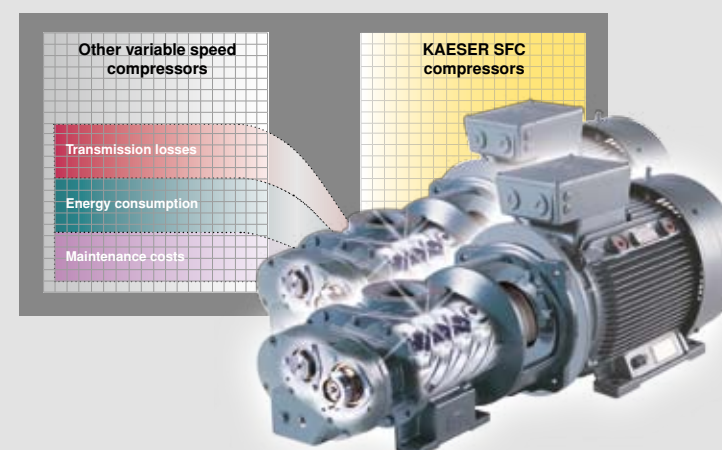


Even cooler

A ΔT of only 1 K is achieved thanks to highly efficient water-cooling with soldered plate heat exchangers, thereby further enhancing efficiency of downstream treatment components.

One-to-one drive – ultimate efficiency

The drive motor and the airend in HSD series compressors are linked via a maintenance-free coupling, which avoids the transmission losses associated with gear driven units. The airends in each HSD unit are designed to specifically match air demand and ensure outstanding efficiency through low-speed operation of only 1500 rpm. The benefits speak for themselves: efficient power transmission, optimal energy consumption and reduced servicing / downtime costs.



HSD

Twin compressor performance

Versatility and meticulous design as standard

One of the key benefits of the HSD's clever design is the ability to provide high delivery volumes of quality compressed air to meet the needs of even the most demand-intensive applications (47 to 86 m³/min). System availability is also optimised, as each compressor section operates completely independently from the other, which means that performance can be precisely adjusted to suit requirement and costly idling can be kept to an absolute minimum.

Kaeser's meticulous attention to detail, such as large double doors to ensure component accessibility, or the use of 2 large internal fans for optimised cooling performance, ensure user-friendly operation and exceptional ease of maintenance.



KAESER
COMPRESSORS



2x2 instead of 4x1

HSD systems are the perfect choice for working environments where space is at a premium: Their compact design means that only 2 units, for example, would need to be installed instead of 4, as would be the case with equivalent conventional systems.



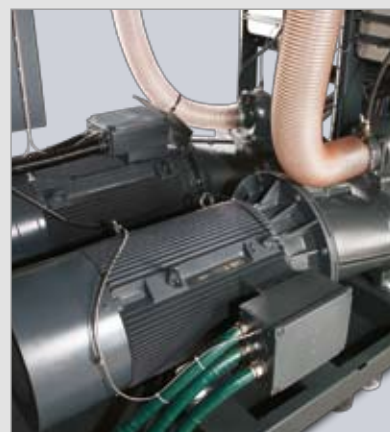
Enhanced flexibility with SAM

The two compressor systems incorporated into each HSD machine can be treated as separate compressors by the SIGMA Air Manager (SAM). Therefore, if required, it is possible to control two HSDs with a SAM 4/4 which effectively communicates with four separate compressors.



Base- and peak-load operation

Using the Master-Slave function, the "SIGMA Control" compressor controllers are able to precisely match performance of each compressor to suit current compressed air demand. This results in significant energy savings and optimum efficiency.



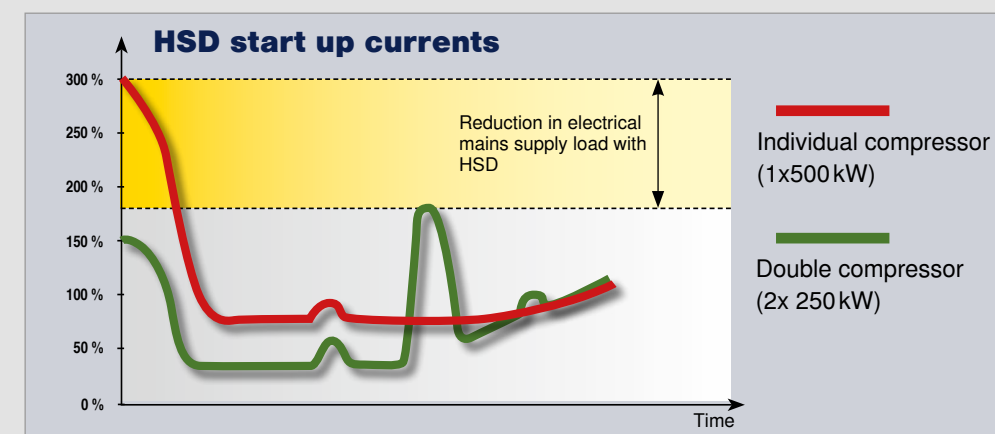
Double dependability

The use of two completely independent compressor units in HSD systems ensures maximum compressed air dependability. If one unit is shutdown, approximately 50 % of total compressed air delivery is still available.



More m³, less m²

HSD compressors provide more air and dependability with less space requirement: Up to 83 m³/min (HSD - HSD SFC up to 86 m³/min) and a footprint of only 7.45 m².



Mains-friendly start up

The two HSD compressor units are always started one after the other. This approach considerably reduces the load on the installation facility's electrical supply system and therefore eliminates the risk of network overload.

HSD

Reduced energy and maintenance costs

More air, more savings ...

Using only premium grade materials, KAESER manufactures all airend rotors and casings at its production facility in Coburg, Germany. Featuring KAESER's world renowned high efficiency "Sigma Profile" rotors, every airend is produced, tested and assembled in accordance with the strictest quality control standards to ensure outstanding performance and unrivalled energy efficiency.



KAESER
COMPRESSORS



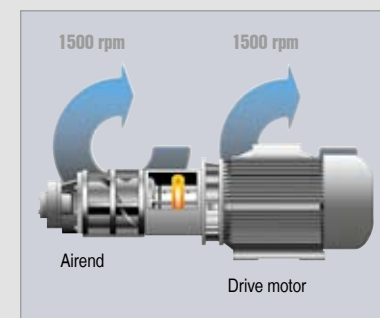
Maximum energy recovery

72 percent of the energy used for compressed air production is available for re-use via the oil coolers. The advantages of this potentially large source of energy savings speak for themselves, especially in view of today's fluctuating energy prices. Therefore, KAESER heat recovery systems more

than pay for themselves within very short time periods. Needless to say, this option also available for HSD series compressors.

Energy costs for compressed air production alone can account for up to 80% of total operating costs. Energy savings can therefore provide a highly effective way to **reduce costs, especially in times of soaring energy prices.**

Using the exhaust heat from the compressor, KAESER heat exchange systems are able to deliver hot water at temperatures of up to 70 °C. Plate heat exchanger systems are used for heating and process water applications. Fail-safe heat exchangers are used when maximum water purity is required.



Energy-saving 1:1 drive

The motor and airend are joined by the coupling and its housing to form a compact and durable unit that is virtually maintenance-free. Furthermore, energy consumption is significantly reduced through elimination of

wear and transmission losses, as 1:1 drive reduces the number of components needed in comparison with gear drive.

2x



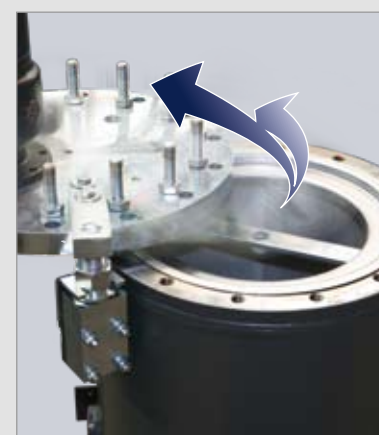
HSD – The new standard

"HSD" series rotary screw compressors are the perfect choice for users who require large volumes of quality compressed air. Moreover, these versatile units ensure maximum system availability thanks to their unique dual compressor design.



Centrifugal separator with ECO DRAIN

A centrifugal separator is installed in each compressor unit to provide pre-separation of condensate. The accumulated condensate from each unit is reliably drained off without pressure loss via an ECO DRAIN condensate drain.



Easy maintenance

The service intervals for fluid separation cartridges in HSD systems are twice as long as those for conventional cartridges. Furthermore, the cartridges are simple to change thanks to the swivelling receiver cover and maintenance openings.



Low speed operation

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. Further advantages include minimal sound levels, long service life and reduced maintenance requirement.

HSD SFC

Minimal space requirement, maximum power

What are the best uses for frequency control?

Users expect frequency controlled machines in particular to provide best possible matching of air production to air demand. This may sound fair enough, but two key aspects are required to turn this expectation into a reality: The first is detailed knowledge and experience regarding compressed air system planning and the second is a correspondingly wide range of products from which to choose in order to be able to meet the application's exact needs.

By eliminating the control gaps and excessive idling of conventionally controlled systems, installations comprising a combination of conventional and frequency controlled compressors from KAESER Kompressoren can achieve energy savings of over 50%.



KAESER
COMPRESSORS



Complete compressed air system

HSD SFC systems from KAESER KOMPRESSOREN can operate as a complete compressed air installation by providing both base- and peak-load compressor functionality. Moreover, they are exceptionally compact and ensure outstanding efficiency even with heavily fluctuating compressed air demand.



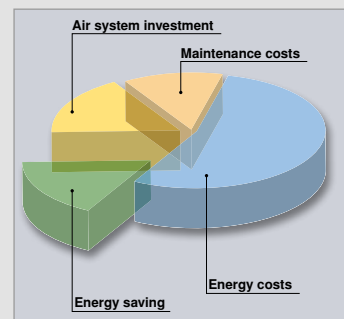
SFC module from Siemens

As with the PC-based SIGMA CONTROL compressor controller, the KAESER SFC's frequency converter is manufactured by Siemens. This enables seamless communication between the two modules to ensure optimum system performance.



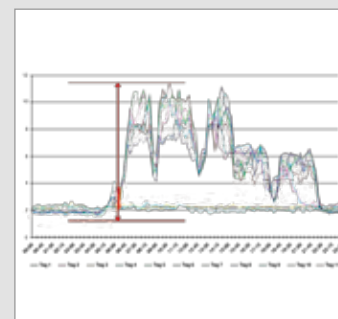
Perfect performance even in high temperatures

A generously sized frequency converter and highly effective cooling of the converter switch cabinet ensure that KAESER SFC compressors provide perfect performance even in ambient temperatures as high as +45 °C.



Exceptional efficiency

Energy costs account for up to 80 percent of compressed air costs. The larger the compressor system, the greater the cost-saving effect of efficiency enhancement measures. KAESER's engineers therefore design every compressor system with maximum efficiency in mind.



Air Demand Analysis (ADA)

Developed by KAESER, the computer-aided "Air Demand Analysis", or ADA for short, allows meaningful and accurate data to be gathered to aid compressed air system optimisation. From the resulting air consumption

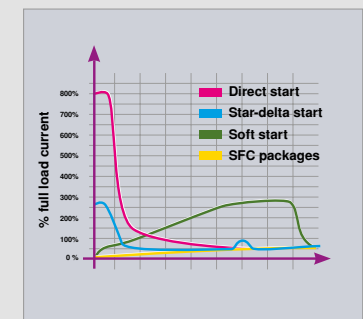
profiles, KAESER's Energy Saving System (KESS) can then help determine the best system configuration for the individual air application.



A solution to meet your needs

Based on the ADA air demand profile and the KESS evaluation, KAESER's engineers decide whether a combination of conventional and variable speed controlled machines is preferable, or a splitting concept with KAESER

standard rotary screw compressors. KAESER's wide range of SFC compressors ensures that the most efficient solution can be found for every air requirement.



Soft start with no current spikes

Soft start allows a gradual increase in drive motor current from zero to full load, enabling almost unlimited motor switching frequency i.e. the number of times the motor can be switched on within a defined time period without overheating. Current spikes that can potentially cause

damage to power systems and equipment are reliably eliminated without the need for additional expensive electronics. In addition, the continuously variable acceleration and deceleration of moving parts reduces dynamic loading.

HSD equipment

Complete unit

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

Sound insulation

Lined with glass-fibre laminated mineral wool, maximum 71-73dB (A) to PN8NTC 2.3 at 1 m distance, free-field measurement.

Vibration damping

Base frame with dual antivibration mountings using rubber bonded metal elements.

Airend

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

Drive

Direct drive via high-flex coupling, without gearing.

Electric motor

Premium quality German-made motor. High efficiency, protected to IP 55, ISO F for greater power reserve. Also available with PTC100 thermistor sensors; externally lubricated bearings.

Connection from motor to airend

Cast 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,

centrifugal separator, thermostatic valve and micro-filter in coolant circuit, all fully piped using flexible couplings.

Cooling

Water-cooling as standard, soldered plate heat exchanger, cabinet ventilation via two independently controllable fans.

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.



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

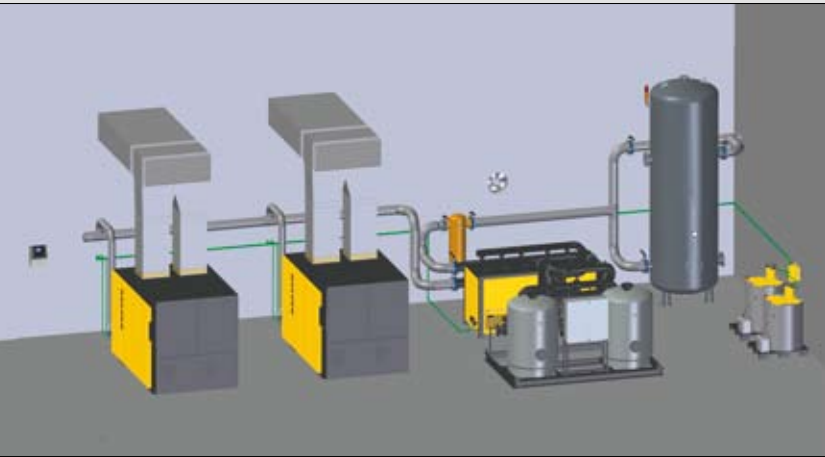
Fully automatic monitoring and regulation of airend discharge temperature; monitoring of motor current, direction of airend rotation, air filter, fluid filter and fluid separator cartridge; display of performance data, service intervals of primary components, operating hours, status data and event memory data.

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



Professional planning

Compressed air supply system with separate components



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 95-99 percent 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 KOMPRESSOREN design your compressed air system.

Technical Specifications – HSD

Standard version (Water-cooled)

| Model | Working pressure bar | FAD *) Complete package at working pressure m³/min | Max. working pressure bar | Rated motor power kW | Dimensions W x D x H mm | Sound level **) dB(A) | Weight kg |
|---------|-------------------------|--|---------------------------------|-------------------------|-------------------------------|--------------------------|--------------|
| HSD 651 | 7.5 10 13 | 66.1 53.4 43.0 | 8.5 12 15 | 360 | 3470 x 2145 x 2350 | 71 | 8100 |
| HSD 711 | 7.5 10 13 | 71.8 59.4 46.2 | 8.5 12 15 | 400 | 3470 x 2145 x 2350 | 72 | 8500 |
| HSD 761 | 7.5 10 13 | 77.6 65.1 52.3 | 8.5 12 15 | 450 | 3470 x 2145 x 2350 | 72 | 8600 |
| HSD 831 | 7.5 10 13 | 83.4 70.8 58.4 | 8.5 12 15 | 500 | 3470 x 2145 x 2350 | 73 | 8700 |

SFC-Versions with variable speed drive (water-cooled)

| Model | Working pressure bar | FAD *) Complete package at working pressure m³/min | Max. working pressure bar | Rated motor power kW | Dimensions W x D x H mm | Sound level **) dB(A) | Weight kg |
|-------------|-------------------------|--|---------------------------------|-------------------------|-------------------------------|--------------------------|--------------|
| HSD 651 SFC | 7.5 10 | 10.1 – 66.0 8.4 – 56.1 | 8.5 12 | 382 | 4370 x 2145 x 2350 | 73 | 9100 |
| HSD 761 SFC | 7.5 10 13 | 11.7 – 75.9 9.8 – 63.8 8.0 – 54.0 | 8.5 12 15 | 410 | 4370 x 2145 x 2350 | 74 | 9600 |
| HSD 831 SFC | 7.5 10 13 | 11.8 – 86.0 9.8 – 73.6 9.4 – 62.6 | 8 12 15 | 515 | 4370 x 2145 x 2350 | 75 | 10100 |

*) FAD of complete package as per ISO 1217 : 1996, Annex C: Absolute inlet pressure 1 bar (a), cooling and air inlet temperature 20 °C

Views

Standard version



Front view



Rear view



View from right



View from left



3D-View

SFC version



Front view



Rear view



View from right



View from left

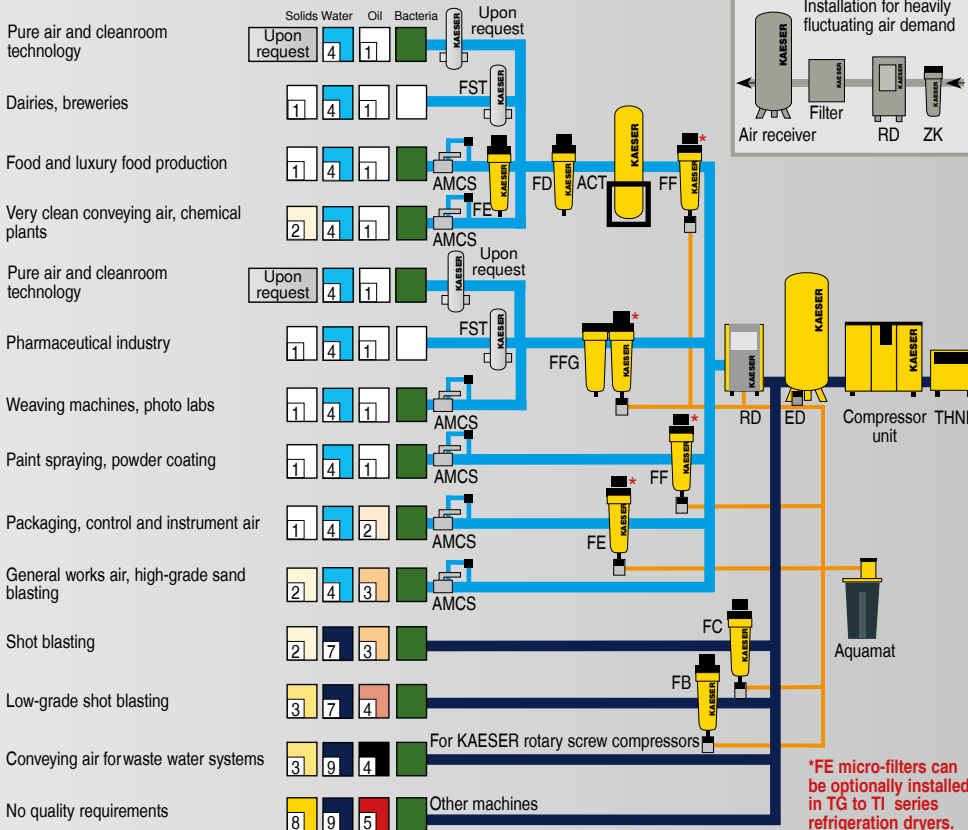


3D-View

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

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

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



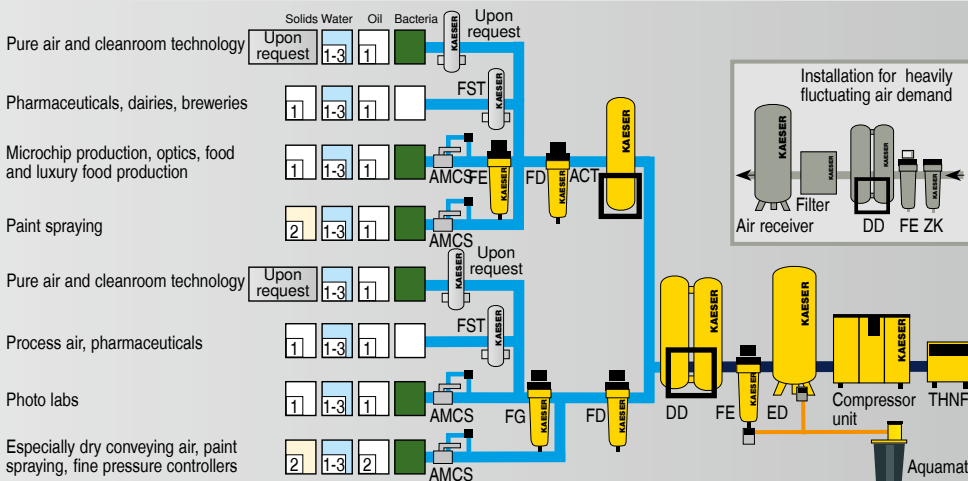
Explanation:

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

Contaminants:

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

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



Degree of filtration:

| Class ISO 8573-1 | Solid particles ¹⁾ | | Humidity ²⁾ | Total oil content ²⁾ |
|------------------|---|--------------------------------------|---|---------------------------------|
| | Max. particle size µm | Max. particle concentration mg/m³ | Pressure dew point (x = Liquid water in g/m³) | mg/m³ |
| 0 | e.g. Consult KAESER regarding pure air and cleanroom technology | | | |
| 1 | 0.1 | 0.1 | ≤ -70 | ≤ 0.01 |
| 2 | 1 | 1 | ≤ -40 | ≤ 0.1 |
| 3 | 5 | 5 | ≤ -20 | ≤ 1 |
| 4 | 15 | 8 | ≤ +3 | ≤ 5 |
| 5 | 40 | 10 | ≤ +7 | - |
| 6 | - | - | ≤ +10 | - |
| 7 | - | - | x ≤ 0.5 | - |
| 8 | - | - | 0.5 < x ≤ 5 | - |
| 9 | - | - | 5 < x ≤ 10 | - |

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

²⁾ As per ISO 8573-1:2001