

## Rotary Screw Compressors **ASD T SFC**

With the world-renowned SIGMA PROFILE 

Air delivery from 0.56 to 5.51 m<sup>3</sup>/min – Pressure 5.5 to 15 bar



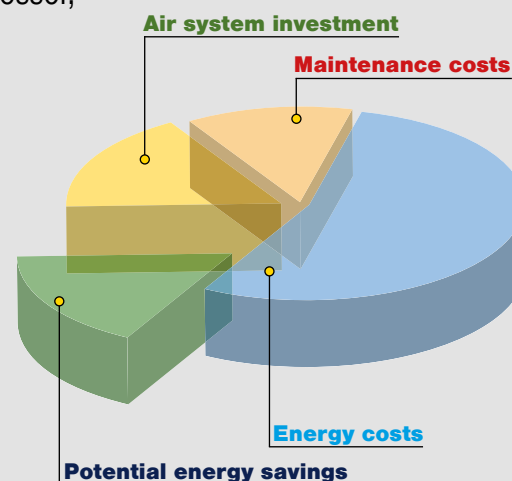
## What do you look for in a compressor with variable frequency drive and refrigeration dryer?

As a user, you expect maximum efficiency, reliability and consistent air quality from your compressed 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 every compressed air system, as does reliability.



It is also important that the compressed air system delivers condensate-free air in the correct volume and quality for the specific application. This not only increases system reliability, but also significantly reduces maintenance costs for the air distribution network, compressed air tools, pneumatic control systems and any other equipment that uses compressed air.



- 1 Inlet valve
- 2 Electric motor
- 3 SIGMA PROFILE airend
- 4 Separator with cartridge
- 5 Fluid cooler
- 6 Fluid filter
- 7 Compressed air after-cooler
- 8 Control cabinet – SFC module
- 9 PC-based control system

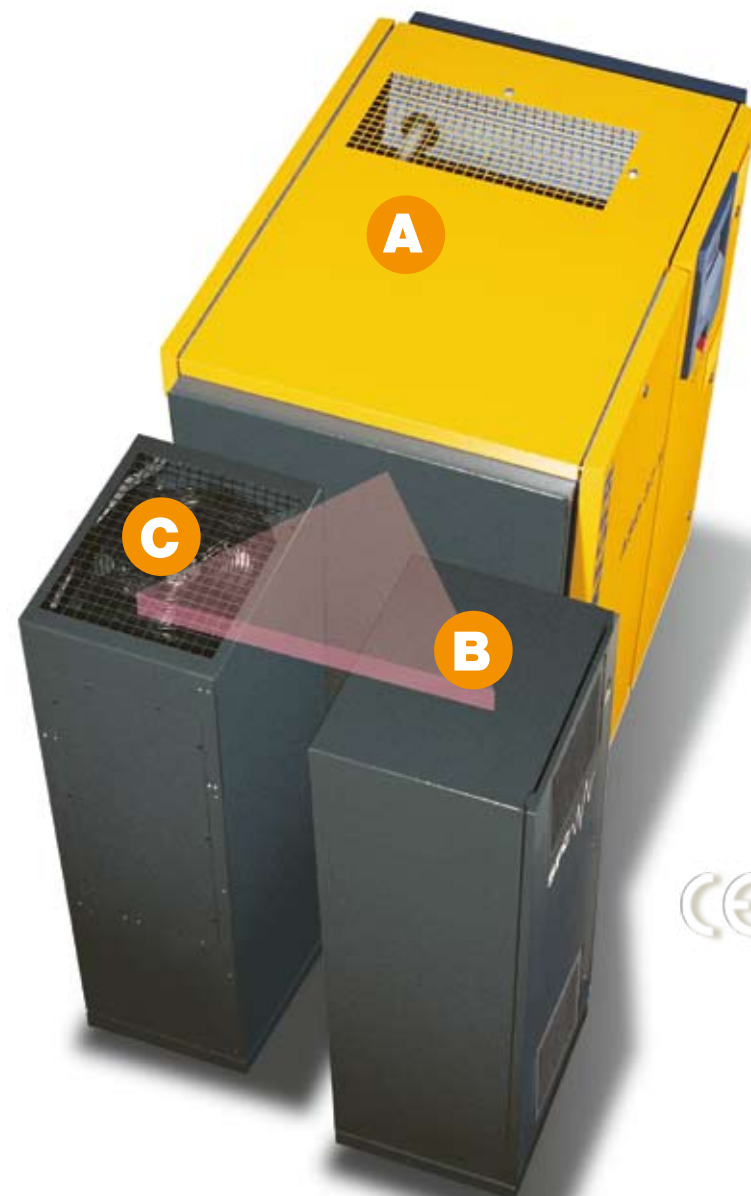
## T SFC – Integrated modular design

### KAESER's solution: Versatile modular design

Available with a modular refrigeration dryer and/ or SFC variable frequency drive, ASD 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.

Furthermore, these turnkey compressed air systems are simple to install and offer outstanding versatility.



### ASD – Efficiency as standard

ASD series compressors with energy-saving 1:1 drive form the basis for KAESER's versatile modular concept. They are particularly efficient, durable and reliable as each is equipped a generously sized low speed airend featuring SIGMA PROFILE rotors.



### T – Refrigeration dryer

ASD compressors are available with an integrated refrigeration dryer module. The compressor and dryer are housed in separate cabinets with individual cooling air apertures to increase operational reliability.



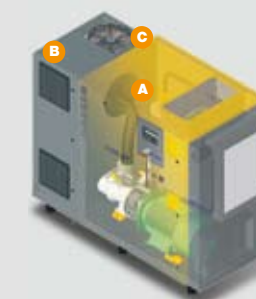
### SFC – Sigma Frequency Control

The SIGMA FREQUENCY CONTROL (SFC) variable frequency drive module is available for all ASD compressor systems. The SFC module and the compressor are seamlessly

integrated into a compact, hard-wired unit that delivers maximum performance, yet requires minimal floor space. Each package is delivered tested and ready for operation.

### Maximum Flexibility

KAESER's versatile range of modular T SFC packages ensures that a model is available to suit every compressed air need. The refrigeration dryer module (C) transforms a standard rotary screw compressor into a compact compressed air system that delivers quality dried-air in accordance with the highest standards. With the addition of the SFC module (B), the compressor speed can be automatically adjusted to meet varying air demand. All possible combinations of these three modules are available.



- A = Rotary screw compressor ASD Series
- B = SFC
- C = Refrigeration dryer (T)



# ASD T with compact refrigeration dryer

## The innovative ASD T series

Combining unrivalled reliability with exceptional efficiency, KAESER's new ASD T rotary screw compressor systems provide space-saving, energy efficient compressed air generation and treatment in a single compressor package. The addition of the integrated refrigeration dryer module transforms the high performance ASD compressor unit into a complete air supply system, which is able to operate in ambient conditions of up to +45 °C.



ASD 47 T rear view

Thermal insulation is omitted from the illustration



## Turnkey operation

Contained in its own separate cabinet, there is more than sufficient space to allow all the components in the dryer to be generously sized yet easily accessible for maintenance. This design also prevents exposure of the refrigerant dryer to any heat from the compressor package. Individual cooling air apertures and intelligent design ensure outstanding reliability in ambient temperatures of up to +45 °C, significantly increasing compressed air availability.



## Dependable centrifugal separator

A centrifugal separator with an electronically controlled ECO DRAIN is installed between the compressor and the dryer. This ensures safe, efficient initial separation and drainage of the condensate even under conditions of high ambient temperature and humidity.



## Refrigeration dryer with ECO DRAIN

The refrigeration dryer also features an ECO DRAIN. The advanced level-controlled condensate drain eliminates the compressed air losses associated with solenoid valve control. This both saves energy and considerably enhances the reliability of the compressed air supply.



## Stainless steel plate heat exchanger

The dryer's stainless steel plate heat exchanger is both corrosion- and contamination-resistant. Even with fluctuating airflow, the separate stainless steel condensate separator reliably removes the accumulating condensate from the air. The dryer's components and piping are designed to provide exceptional operational safety and reliability.

## SIGMA CONTROL

The SIGMA CONTROL compressor controller constantly monitors the compressor, refrigeration dryer and condensate drains. If required, signals from the dryer can be defined as alarms and forwarded to a centralised control centre.



# ASD SFC — Ultimate efficiency



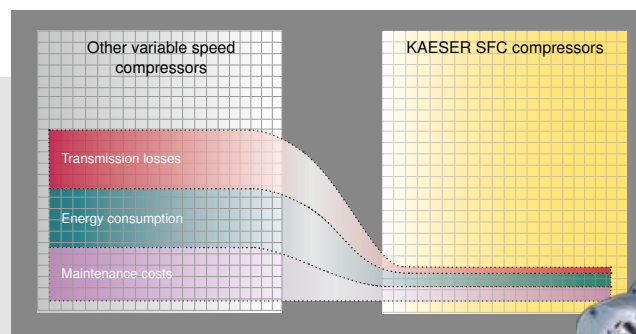
ASD 47 T SFC front view

## The advanced ASD SFC series

Every KAESER rotary screw compressor is equipped with a large, efficient airend featuring high performance SIGMA PROFILE rotors. The airends in ASD units are powered by a direct drive system that eliminates the transmission losses associated with gear drive systems, enabling these compressors to provide significant energy savings.

Considerable savings can also be achieved with the addition of a SIGMA FREQUENCY CONTROL (SFC) module.

Depending on the size of the compressor installation, energy consumption in larger compressed air systems can be reduced by over 50 %.



## Outstanding performance

ASD SFC compressor packages are highly efficient direct drive units featuring variable speed control. With high-efficiency performance throughout the entire control range, large, low speed airends featuring the energy saving SIGMA Profile have significant advantages over smaller, high speed airends.

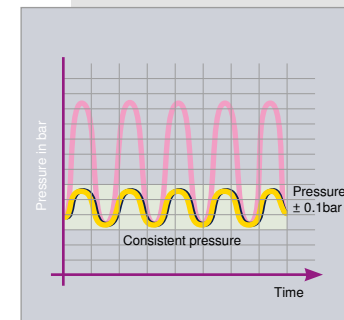


ASD SFC packages are designed to operate at full load, 7 days a week, yet require no additional maintenance. **Triple savings with 1:1 drive** – **Direct drive** reduces the number of components needed in comparison with gear drive and eliminates the associated transmission losses. This significantly increases reliability and service life; sound levels are also considerably lower. **The benefits speak for themselves: efficient power transmission, optimal power consumption and minimal servicing / downtime costs.**



## Perfect performance – even at high ambient temperatures

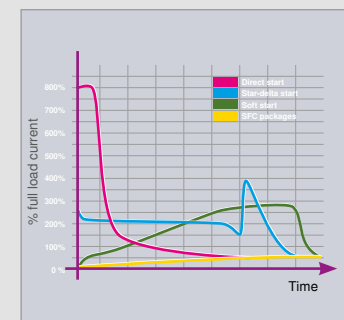
The generously-sized SFC module with its efficiently-cooled control cabinet allows trouble-free operation in ambient temperatures up to +45 °C.



## Precision pressure control

Air delivery from an ASD SFC compressor can be matched to actual air demand, according to required system pressure, by continuously adjusting drive motor speed (and therefore the airend) within its specified control range. Depending on the buffer

capacity of the downstream air network, it is therefore possible to precisely maintain working pressure to within  $\pm 0.1$  bar and, as a result, to reduce maximum system pressure. This can lead to significant savings, as each 1 bar reduction in pressure amounts to a 7 percent reduction in energy consumption.



## 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.



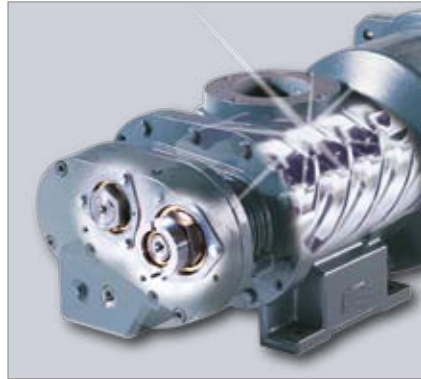
Zero Interference:

The electromagnetic compatibility (EMC) of the components and of the complete machine has been tested and certified in accordance with all applicable regulations.





# ASD T SFC – Eight decisive advantages



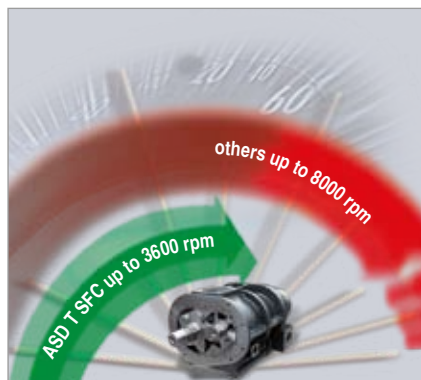
## 1 SIGMA PROFILE airend

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 ASD 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 this 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.



## 3 Low speed operation

Each ASD SFC compressor has exactly the same mechanical components as those used in KAESER's standard fixed speed compressors. This not only ensures unrivalled reliability and compressed air availability, but also guarantees optimum energy efficiency. The most efficient method of producing compressed air is by using large, low speed airends – airends in ASD SFC compressors have a typical maximum rotation speed of approximately 3600 rpm. Further advantages include long service life and reduced maintenance requirement. The use of standardised drive motors also contributes to long-term compressed air availability.

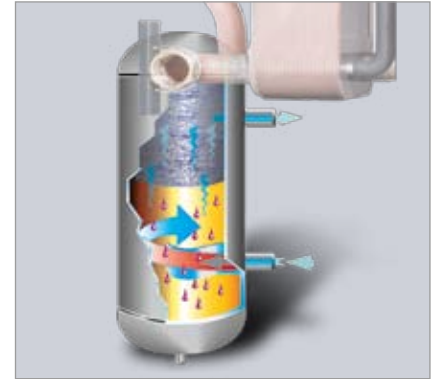


## 4 SIGMA CONTROL

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).

## 5 Efficient stainless steel condensate separator

The separator tank in the refrigeration dryer is made of stainless steel and is therefore completely corrosion resistant. A deflector plate forces the compressed air that streams into the separator into circular motion. The air then flows through a stainless steel wire mesh that ensures 99.9% water separation from the air. This figure remains almost constant – even with fluctuating airflow – reliably maintaining the required pressure dew point. Solid particles are also washed out and eliminated together with the condensate.



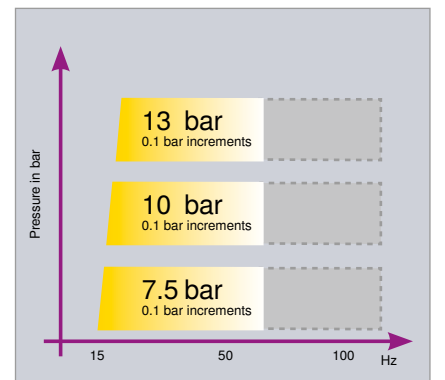
## 6 SFC module from Siemens

Siemens frequency converters are used exclusively in KAESER's speed controlled compressors for several reasons: Siemens manufactures the industrial PC-based SIGMA CONTROL compressor controller, which enables seamless communication with the SFC control cabinet. Furthermore, the worldwide presence of Siemens ensures dependable service. The SFC control cabinet and SIGMA CONTROL are tested and certified as per electromagnetic compatibility regulation EN6100-6-3, both as individual components and as an integrated system.



## 7 Flexible pressure adjustment

The wide range of available 1:1 drive airends makes it possible to select the one that works most efficiently within the pressure and performance range required. This ensures that every ASD SFC compressor operates with the most efficient pressure-frequency profile. Furthermore, the SIGMA CONTROL compressor controller is equipped with a pressure-to-frequency profile that guarantees maximum flexibility for air delivery and pressure whilst providing best possible efficiency.



## 8 Specific power is the key

Large, low speed airends are more efficient than small high speed airends because they supply more air for the same drive power. This is not just the case at full load, but also applies throughout the entire control range, which is particularly important for variable speed machines. The specific energy requirement of 6.7 kW per m<sup>3</sup>/min for a KAESER SFC compressor operating at 7.5 bar can be considered as an excellent indication of the machine's efficiency. Variable frequency controlled compressors are only truly efficient if they have low energy consumption throughout their entire control range.



Equipment

Complete unit

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

Sound insulation

Lined with glass-fibre laminated mineral wool, maximum 69 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 for optimised rotor cooling.

Drive

Direct drive via high-flex coupling, without gearing.

Premium efficiency electric motor of quality

German manufacture to IP 55 and Insulation Class F for additional reserve.

Connection from motor to airend

Airend with integral coupling flange.

Electrical components

Control cabinet to IP 54, control transformer, Siemens Masterdrive with control unit, volt-free contacts for ventilation control.

Fluid and air flow

Dry air filter, pneumatic inlet and venting valves, fluid reservoir with three-stage separator system, pressure relief valve, minimum pressure / check valve, thermostatic valve and micro-

filter, all fully piped using flexible couplings.

Cooling

Air cooled; separate aluminium coolers for compressed air and fluid, radial fan driven by its own motor.

Refrigeration dryer

CFC-free, R 134a refrigerant, fully insulated, hermetically sealed refrigerant circuit, hot-gas bypass control, electronic condensate drain and upstream centrifugal separator.

SIGMA CONTROL

Interfaces for data communication comprising: RS 232 for a modem, RS 485 for a slave compressor in base-load sequencing mode (not with SFC models), Profibus DP interface for data networks. Prepared for Teleservice.



Ergonomic control panel

Red, yellow and green LEDs show the operational state of the machine at a glance. Also features a four-line plain

text display, 30 selectable languages, touch keys with icons and a duty cycle indicator.

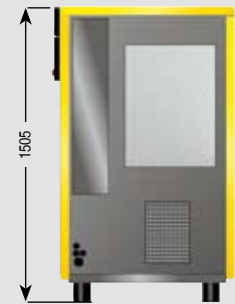
Prime functions

Fully automatic monitoring and regulation of airend discharge temperature; monitoring of motor current, direction of airend rotation, air filter, fluid filter and fluid separator cartridge; display of performance data, service intervals of primary components, operating hours, status data and event memory data. Selection of Dual, Quadro, Vario and Continuous control modes as required.

(See SIGMA CONTROL brochure P-780)



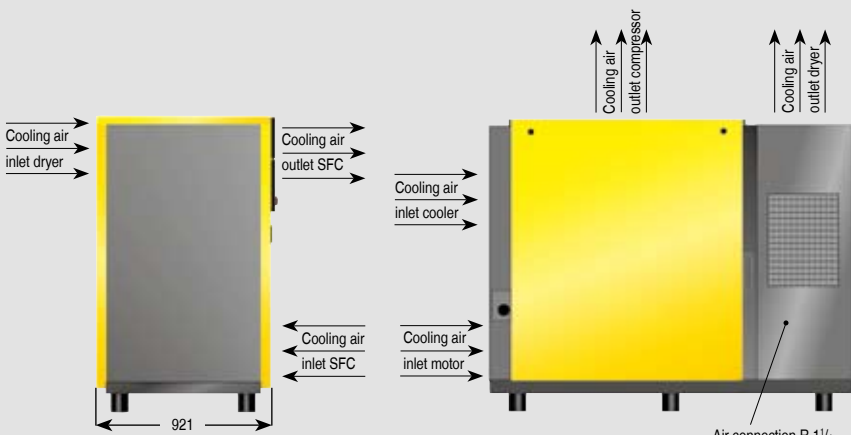
Dimensions



View from right



Front view



View from left

Rear view

Technical Specifications – ASD T SFC

| T - Version with integrated refrigeration dryer (refrigerant R134a) |          |                           |  |                             |                            |                       |           |
|---|----------|---------------------------|--|-----------------------------|----------------------------|-----------------------|-----------|
| Rated motor power kW  | Model    | Max. working pressure bar | FAD *) Complete package at working pressure m³/min | Max. operating pressure bar | Dryer power consumption kW | Sound level **) dB(A) | Weight kg |
| 18.5  | ASD 32 T | 7.5                       | 3.15   | 8                           |                            |                       |           |
|   |          | 10                        | 2.72   | 11                          | 0.5                        | 65                    | 740       |
|   |          | 13                        | 2.09   | 15                          |                            |                       |           |
| 22  | ASD 37 T | 7.5                       | 3.91   | 8                           |                            |                       |           |
|   |          | 10                        | 3.13   | 11                          | 0.5                        | 66                    | 820       |
|   |          | 13                        | 2.66   | 15                          |                            |                       |           |
| 25  | ASD 47 T | 7.5                       | 4.57   | 8                           |                            |                       |           |
|   |          | 10                        | 3.84   | 11                          | 0.8                        | 66                    | 830       |
|   |          | 13                        | 3.01   | 15                          |                            |                       |           |
| 30  | ASD 57 T | 7.5                       | 5.51   | 8                           |                            |                       |           |
|   |          | 10                        | 4.44   | 11                          | 0.8                        | 69                    | 890       |
|   |          | 13                        | 3.67   | 15                          |                            |                       |           |

| SFC - Version with variable speed drive |                           |  |                             |                       |           |  |
|---|---------------------------|--|-----------------------------|-----------------------|-----------|--|
| Model                                   | Max. working pressure bar | FAD *) Complete package at working pressure m³/min | Max. operating pressure bar | Sound level **) dB(A) | Weight kg |  |
| ASD 32 SFC                              | 7.5                       | 0.69 - 3.3   | 10                          |                       |           |  |
|   | 10                        | 0.90 - 2.86  | 10                          | 67                    | 715       |  |
|   |                           |  |                             |                       |           |  |
| ASD 37 SFC                              | 7.5                       | 0.82 - 4.05  | 8.5                         |                       |           |  |
|   | 10                        | 0.61 - 3.55  | 15                          | 68                    | 790       |  |
|   | 13                        | 0.56 - 3.17  | 15                          |                       |           |  |
| ASD 47 SFC                              | 7.5                       | 1.07 - 4.92  | 8.5                         |                       |           |  |
|   | 10                        | 0.79 - 4.12  | 11                          | 68                    | 800       |  |
|   | 13                        | 0.60 - 3.60  | 15                          |                       |           |  |
|   |                           |  |                             |                       |           |  |
|   |                           |  |                             |                       |           |  |
|   |                           |  |                             |                       |           |  |

| T SFC - Version with variable speed drive and integrated refrigeration dryer |                           |  |                             |                            |                       |           |                         |
|--|---------------------------|--|-----------------------------|----------------------------|-----------------------|-----------|-------------------------|
| Model  | Max. working pressure bar | FAD *) Complete package at working pressure m³/min | Max. operating pressure bar | Dryer power consumption kW | Sound level **) dB(A) | Weight kg | Dimensions W x D x H mm |
| ASD 32 T SFC   | 7.5                       | 0.69 - 3.3   | 10                          |                            |                       |           |                         |
|  | 10                        | 0.90 - 2.86  | 10                          | 0.5                        | 67                    | 825       | 1850 x 921 x 1505       |
|  |                           |  |                             |                            |                       |           |                         |
| ASD 37 T SFC   | 7.5                       | 0.82 - 4.05  | 8.5                         |                            |                       |           |                         |
|  | 10                        | 0.61 - 3.55  | 15                          | 0.5                        | 68                    | 900       | 1850 x 921 x 1505       |
|  | 13                        | 0.56 - 3.17  | 15                          |                            |                       |           |                         |
| ASD 47 T SFC   | 7.5                       | 1.07 - 4.92  | 8.5                         |                            |                       |           |                         |
|  | 10                        | 0.79 - 4.12  | 11                          | 0.8                        | 68                    | 910       | 1850 x 921 x 1505       |
|  | 13                        | 0.60 - 3.60  | 15                          |                            |                       |           |                         |
|  |                           |  |                             |                            |                       |           |                         |
|  |                           |  |                             |                            |                       |           |                         |
|  |                           |  |                             |                            |                       |           | 1850 x 921 x 1505       |
|  |                           |  |                             |                            |                       |           |                         |



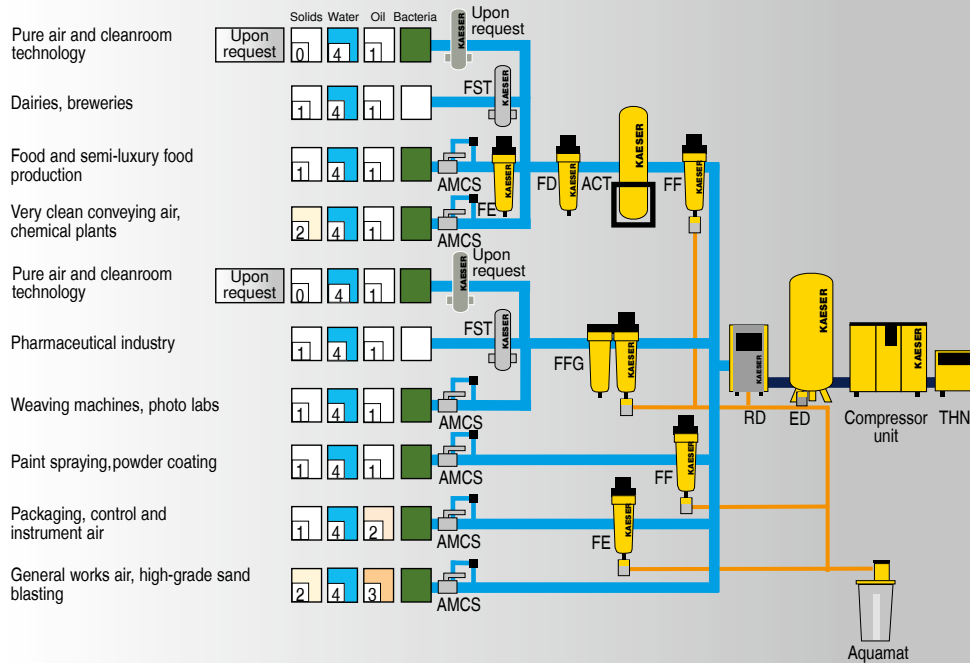
3D-View

\*) FAD to ISO 1217: 1996, Annex C; \*\*) Sound level to PN8NTC 2.3 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 (+3 °C pressure dew point)

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 3 µm**

**FC = Pre-filter 1 µm**

**FD = Particulate filter 1 µm (attrition)**

**FE = Micro-filter 0.01 ppm**  
Separates aerosol oil and solid particles

**FF = Micro-filter 0.001 ppm**  
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

**Aquamats = Condensate treatment system**

**AMCS = Air-main charging system**

### Degree of filtration:

| Class ISO 8573-1 | Solid particles <sup>1)</sup>                                   |                                   | Humidity                                    | Total oil content |
|------------------|---|-----------------------------------|---|-------------------|
|                  | Max. particle size µm   | Max. particle concentration mg/m³ | Pressure dew point (x= liquid water ing/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                                  | –                 |

<sup>1)</sup> Particle load as per ISO 8573-1:1991

<sup>2)</sup> Particle load as per ISO 8573-1:2001