

Rotary Screw Compressors ESD/FSD Series

With the world-renowned SIGMA PROFILE 

FAD 20.38 to 58 m³/min, Pressure 5.5 to 15 bar

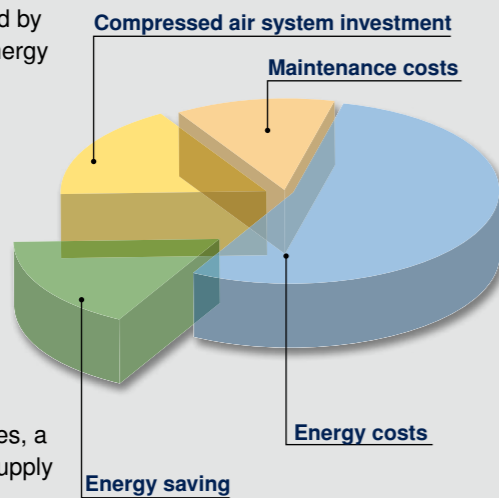


What do you expect from a compressor?

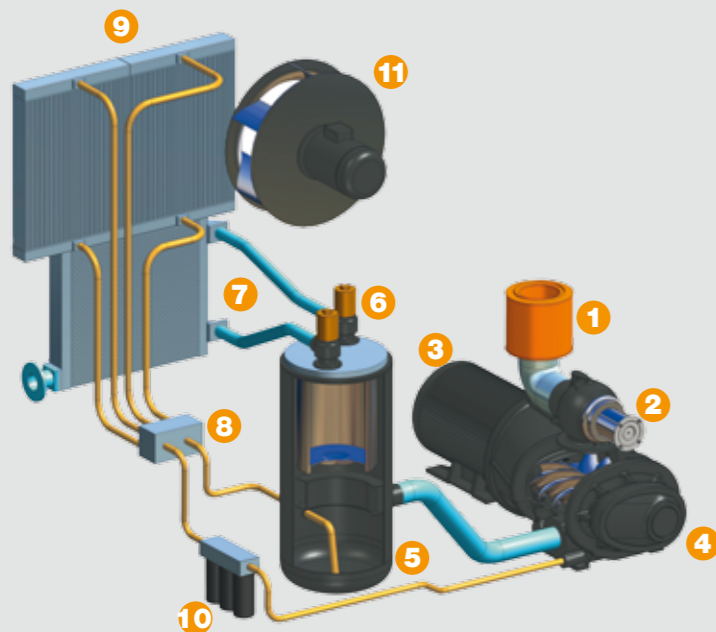
As a compressed air user, you expect maximum efficiency and reliability from your air system.

This sounds simple, but these advantages are influenced by many different factors: Energy costs, for example, taken over the lifetime of a compressor add up to a multiple of investment costs. Efficient energy consumption therefore plays a vital role in the production of compressed air, as does reliability of the compressor. In many cases, a reliable compressed air supply is essential to guarantee maximum performance from valuable production systems. Reliability also ensures a supply of constant quality compressed air that optimises efficiency of the air treatment equipment downstream from the compressor.

With regards to sound protection, it is always better to keep noise emissions to a minimum from the outset by using a quiet compressor rather than have to retro-fit sound protection measures later on. Last but not least, a truly efficient compressor is simple to maintain.



Function diagram



ESD/FSD – A revolution in efficiency



**KAESER's Solution:
The ESD/FSD Series**

The combination of KAESER's innovative cooling system and high-efficiency 1:1 direct drive now enables users to benefit from all of the advantages that air-cooled compressed air systems have to offer. Models up to 315 kW are available and each is equipped with a renowned KAESER SIGMA PROFILE airend.



- 1 Intake filter
- 2 Inlet valve
- 3 Drive motor
- 4 SIGMA PROFILE airend
- 5 Fluid separator tank
- 6 Check valve, control / vent valve
- 7 Compressed air aftercooler
- 8 Thermostatic valve
- 9 Fluid cooler
- 10 Fluid filter
- 11 Radial fan (Ventilation)



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 ESD and FSD units use even further refined SIGMA PROFILE rotor versions.



Sigma Control

The SIGMA CONTROL compressor controller is a robust PC-based industrial computer with a realtime operating system and update/ network capability. 'Traffic light' style LEDs indicate system operational status at a glance.



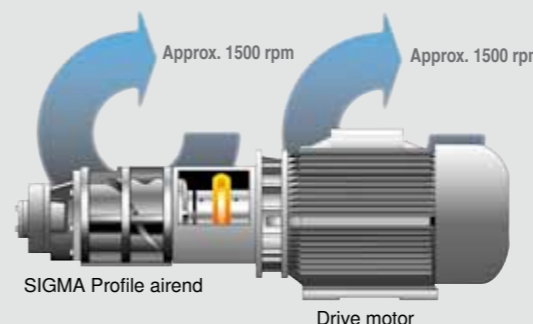
Even quieter

The new cooling system combines optimum sound damping with enhanced cooling. Normal conversation can take place right next to a running ESD / FSD compressor.



Cost-saving air cooling

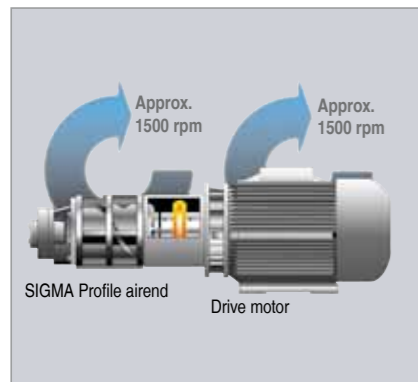
Compressors up to 315 kW can now take advantage of the significant cost savings that only air-cooled systems can achieve: There is no need for costly water consumption or additional investment in re-cooling systems.



One-to-one drive – Ultimate efficiency

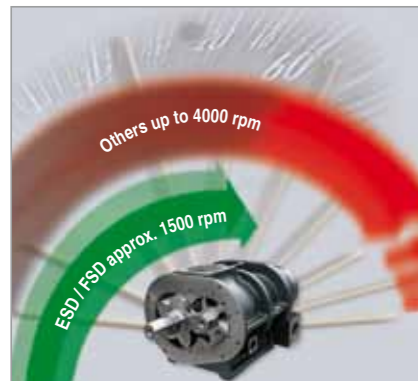
The drive motor and the airend in ESD/FSD series compressors are designed to operate at the same low speed. This enables the drive and compression units to be linked via a maintenance-free coupling, which avoids the transmission losses associated with gear driven units. The airend in each ESD/ FSD model is designed to specifically match air demand and ensures 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.

ESD and FSD – Optimum performance with minimal maintenance costs



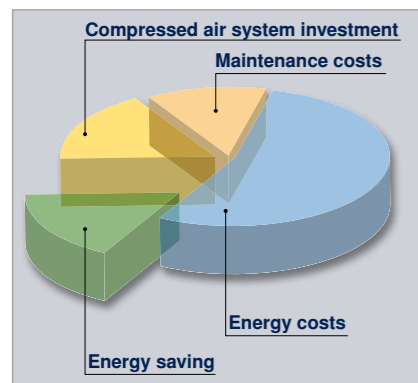
KAESER's energy-saving 1:1 drive

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, reliability and service life are increased through elimination of wear and transmission losses, as 1:1 drive reduces the number of components needed in comparison with gear drive.



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, lower speed airends are more efficient and deliver more compressed air for the same drive power. Low speed operation also means longer service life, reduced maintenance requirement and ultra-quiet performance.



Energy savings count

Investment or maintenance costs taken over the lifetime of a compressed air system amount to a fraction of the total energy costs. Reason enough therefore to make air system energy efficiency the number one priority. ESD and FSD units from KAESER have exceptionally low life cycle costs.



Optimised separation system

The combination of centrifugal separation and deep-filtration results in a minimal fluid content of less than 2 mg/m³ in the discharged compressed air. The improved air quality eases the burden on the downstream air treatment components. The differential pressure in the separator cartridge is permanently monitored via the SIGMA CONTROL.



Synthetic coolant

SIGMA FLUID, a KAESER synthetic coolant, enables an extended service interval of over 6000 operating hours (a fluid analysis should be implemented every 6000 operating hours). Due to its lower vapour pressure, less SIGMA FLUID is consumed in comparison with mineral oils and its reduced tendency to emulsify makes condensate treatment and disposal easier and less expensive.



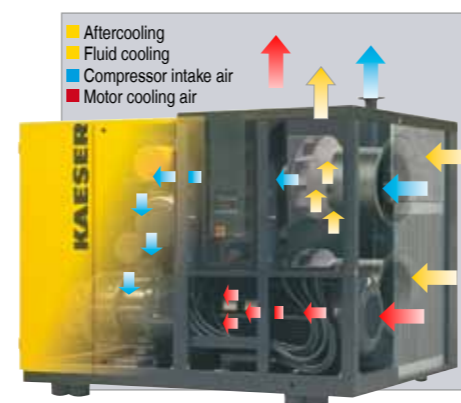
Easy maintenance

Changing the fluid separator cartridge couldn't be easier, as the separator tank is equipped with a cover that simply lifts and swings away. Furthermore, the cartridge service life is more than double that of conventional cartridges.



Setting the new standard: ESD & FSD

Sharing the same design concept, KAESER's new ESD and FSD series units are setting the new standard for reliability and energy efficiency for compressors in this air delivery class. Moreover, KAESER's innovative cooling system – fitted as standard in each model – helps to further reduce energy consumption and therefore costs.



Efficient cooling system

Exceptional cooling efficiency, maximum reliability and minimal maintenance: The KAESER air-cooling system ensures unrivalled performance. The inside of the cabinet remains clean because surrounding air is drawn through the cooler into the cooler box and then exhausted upward out of the machine. Particles suspended in the cooling air do not enter the cabinet and the coolers can therefore be easily cleaned from the outside.

Powerful radial fan

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



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 70-79 dB(A) to PN8NTC 2.3 at 1 m distance, free-field measurement.

Vibration damping

Base frame with dual anti-vibration 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

Energy-saving, premium quality motor made in Germany, IP55 compliant, ISO F for greater power reserve. PT100 temperature sensors (FSD), thermistor sensors (ESD). Motor bearings are lubricated externally.

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, thermostatic valve and microfilter in coolant circuit, all fully piped using flexible piping couplings.

Cooling

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

SIGMA CONTROL

Interfaces for data communication comprising RS 232 for a modem, RS 485 for a slave compressor in base load sequencing mode and a Profibus DP interface for data networks.



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 780)

KAESER
COMPRESSORS



KESS (KAESER's Energy Saving System) provides comprehensive analysis of your compressed air usage, enabling KAESER's experts to plan and design a system that is specially tailored to meet all of your compressed air needs.

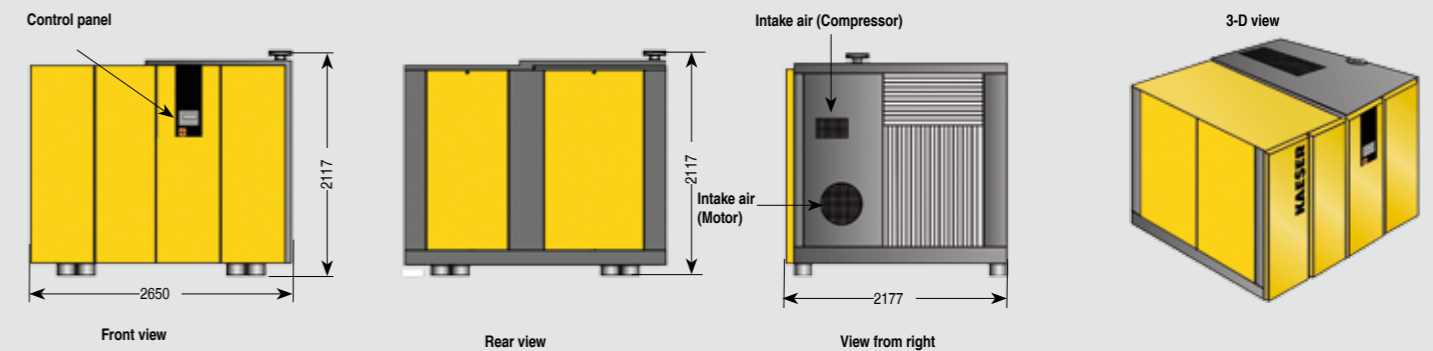
Typically ensuring a 95-98% load capacity, KAESER compressed air systems provide exceptional efficiency and produce application-specific quality compressed air at lowest possible cost. Use this expertise to your advantage and let KAESER design your compressed air system.

Technical Specifications – ESD Series

Model	Working pressure bar	FAD *) Complete package at working pressure m³/min	Max. operating pressure bar	Rated motor power kW	Dimensions W x D x H mm	Air connection	Sound pressure level **) dB(A)	Weight kg	
ESD 251	7.5	23.94	8.5	132	2650 x 2177 x 2117	DN 80	74 ***)	4920	
	7.5	30.60	8.5	160	2650 x 2177 x 2117		75	4370	
ESD 301	10	23.70	11				200	2650 x 2177 x 2117	70 ***)
	13	20.62	15	70 ***)	5150				
ESD 351	7.5	36.76	8.5	250	2650 x 2177 x 2117		DN 125	72 ***)	5350
	10	30.27	12						5180
ESD 361	7.5	35.91	8.5	250	2650 x 2177 x 2117	DN 125	72 ***)	5180	
	10	42.00	8					5180	
ESD 441	10	36.10	10	250	2650 x 2177 x 2117	DN 125	72 ***)	5180	
	13	29.92	15					5180	

Dimensions

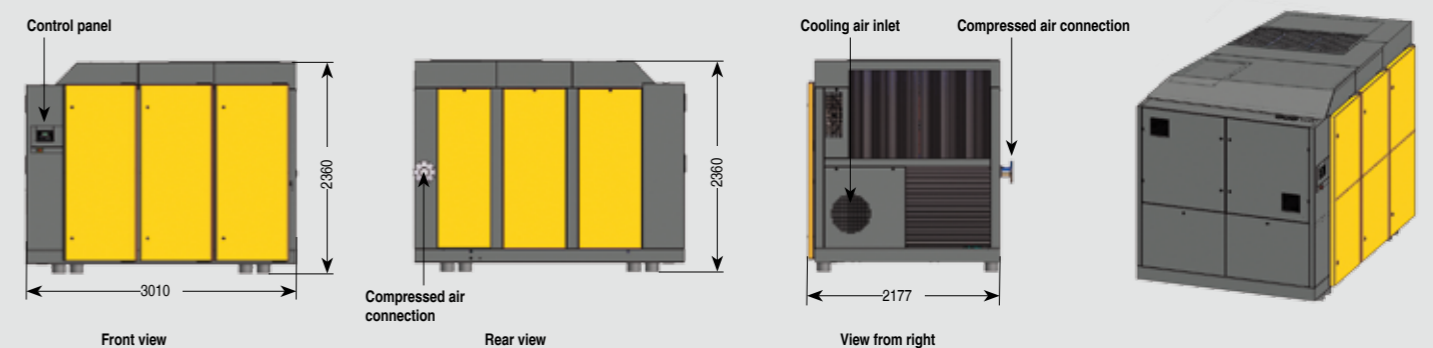
ESD Series



Technical Specifications – FSD Series

Model	Working pressure bar	FAD *) Complete package at working pressure m³/min	Max. operating pressure bar	Rated motor power kW	Dimensions W x D x H mm	Air connection	Sound pressure level **) dB(A)	Weight kg	
FSD 471	7.5	47.1	8	250	3010 x 2177 x 2360	DN 125	79	6625	
	10	40.5	10						
	12	35.5	12						
FSD 571	7.5	57.2	8	315	3010 x 2177 x 2360		DN 125	79	6900
	10	46.4	12						
	13	39.45	13.5						
	15	34.4	15						

FSD Series

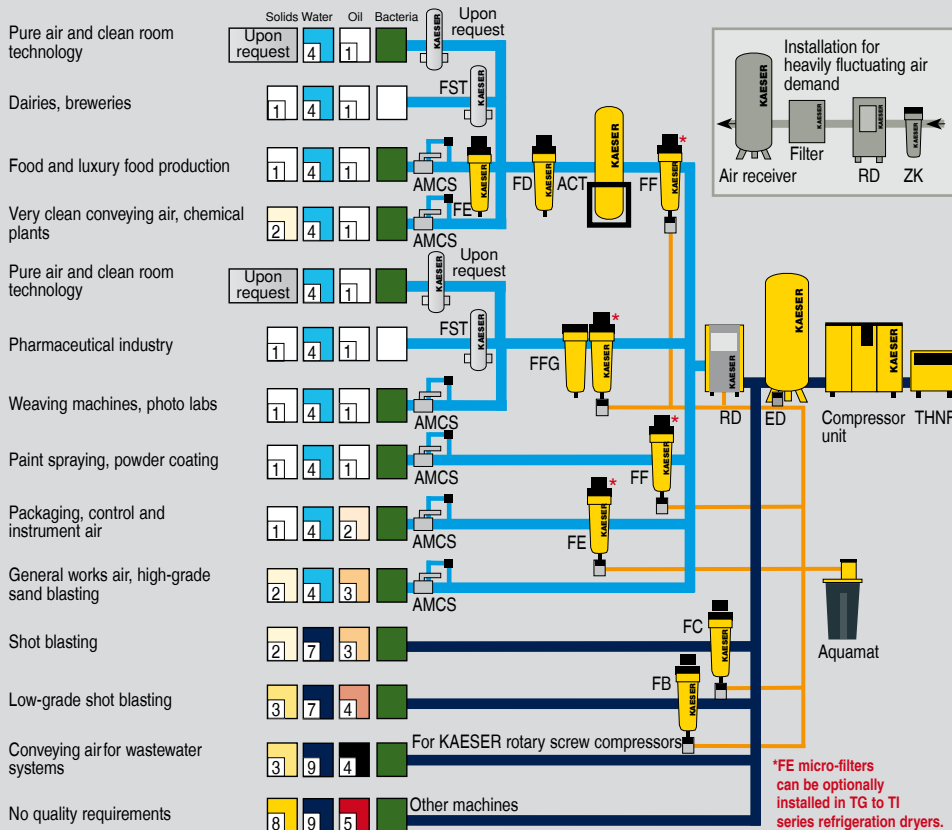


*) FAD in accordance with ISO 1217:2009, Annex C; **) Sound pressure level as per ISO 2151 and the basic standard ISO 9614-2, tolerance: ± 3 dB(A); ***) At lower fan speed

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

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

Application examples: selection of treatment classes to ISO 8573-1



Explanation	
THNF	Bag filter
ZK	Centrifugal separator
ED	ECO DRAIN
FB / FC	Pre-filter
FD	Particulate filter
FE / FF	Microfilter
FG	Activated carbon filter
FFG	Activated carbon and microfilter combination
RD	Refrigeration dryer
DD	Desiccant dryer
ACT	ACT activated carbon adsorber
FST	Sterile filters
Aquamat	Aquamat
AMCS	Air-main charging system

Compressed air quality classes to ISO 8573-1(2010):

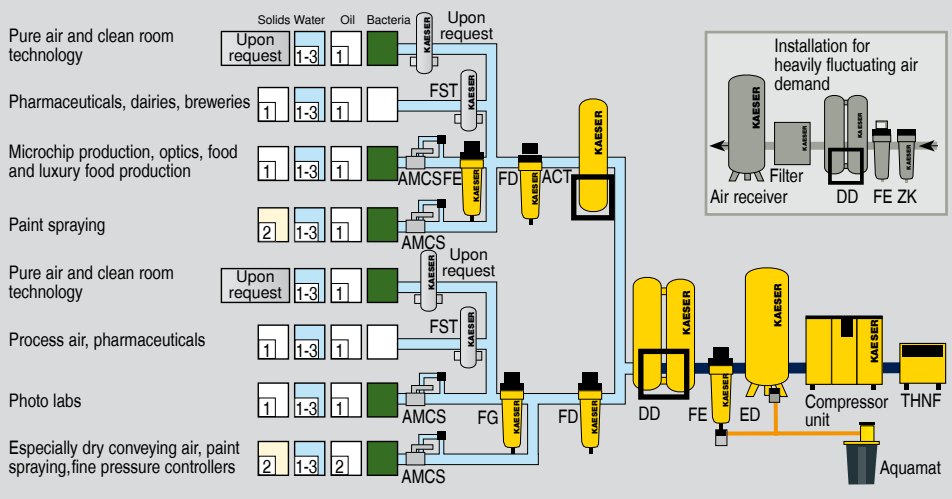
Solid particles / dust			
Class	Max. particle count per m ³ of a particle size with d [µm]*		
	0.1 ≤ d ≤ 0.5	0.5 ≤ d ≤ 1.0	1.0 ≤ d ≤ 5.0
0	e.g. Consult KAESER regarding pure air and cleanroom technology		
1	≤ 20,000	≤ 400	≤ 10
2	≤ 400,000	≤ 6,000	≤ 100
3	not defined	≤ 90,000	≤ 1,000
4	not defined	not defined	≤ 10,000
5	not defined	not defined	≤ 100,000
Particle concentration C _p [mg/m ³]*			
6	0 < C _p ≤ 5		
7	5 < C _p ≤ 10		
X	C _p > 10		

Water	
Class	Pressure dew point [°C]
0	e.g. Consult KAESER regarding pure air and cleanroom technology
1	≤ -70 °C
2	≤ -40 °C
3	≤ -20 °C
4	≤ +3 °C
5	≤ +7 °C
6	≤ +10 °C
Concentration of liquid water C _w [g/m ³]*	
7	C _w ≤ 0.5
8	0.5 < C _w ≤ 5
9	5 < C _w ≤ 10
X	C _w ≤ 10

Oil	
Class	Total oil concentration (fluid, aerosol + gaseous) [mg/m ³]*
0	e.g. Consult KAESER regarding pure air and cleanroom technology
1	≤ 0.01
2	≤ 0.1
3	≤ 1.0
4	≤ 5.0
X	> 5.0

* At reference conditions 20 °C, 1 bar(a), 0% humidity

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



Built for a Lifetime!

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