



# Boosters

## DN C (SFC) Series

Flow rate 2.9 to 19.6 m<sup>3</sup>/min – Rated motor power 22 to 45 kW

Initial pressure 3 to 13 bar – Final pressure 10 to 45 bar

# Boosters

Powerful, compact and quiet, DN C boosters from KAESER brook no compromise when it comes to performance, dependability and energy efficiency. These innovative complete systems come into play when, for technical reasons, specific points in a production process require a pressure higher than the network pressure. Wholly redesigned with a clever new layout, these compact complete machines quite literally have everything you need: not only do they provide an optimised cooling air flow, but also offer excellent maintenance and service access. SFC versions feature a speed-controlled drive motor, which delivers the exact amount of compressed air actually required for the application at hand – with a high level of efficiency across the entire control range. A further key advantage is that these new booster systems are perfectly matched for seamless networking with their “suppliers” – making them fully compatible with Industrie 4.0 environments. This means that DN C series boosters are the ideal solution for such operations as PET bottle production, process air applications, nitrogen compression and the provision of high pressure for testing facilities.

## Energy-efficient

Premium Efficiency (IE3) drive motors, fitted as standard, contribute to cost-effective energy usage, as does the generously-dimensioned axial fan, which also serves to ensure reliable temperature control. In SFC versions, the compressor flow rate is matched to the actual air demand of the application in question, which means that only as much energy is consumed as is needed to produce the exact amount of compressed air required. This makes the system as efficient as it is possible to be – especially in the partial load range. The compressor switches to Idle if air demand drops below the control range; compressor speed and therefore energy consumption are consequently kept to a minimum, achieving savings of up to 10%.

## Service-friendly

All maintenance-relevant components, such as cylinders and venting valves, filters, condensate separators, oil drain and filler openings are easily accessible thanks to large maintenance doors. The removable panel on the cooler side allows simple belt changes and provides easy access to the cooler.



## Perfect partners

DN C series boosters are the perfect team players for every compressed air station, not to be outdone by their rotary screw “colleagues”: optionally available with air or water-cooling, all units are delivered ready for perfect performance in ambient temperatures up to +45 °C. The same also applies for their networking capabilities: the SIGMA CONTROL 2 machine controller ensures full connectivity, both within the air station and with the SIGMA AIR MANAGER 4.0 master controller – and therefore with Industrie 4.0 environments.

## All-round reliability

The integrated SIGMA CONTROL 2 controller automatically monitors all key values: initial and final pressure, block discharge temperature of the individual cylinders, drive motor winding temperature, oil pressure and level, compressed air discharge temperature, compressor and control cabinet fans and status of maintenance doors (open/closed).

## “Plug & Work” complete systems

KAESER’s integrated booster systems are completely unique: all application-relevant components are provided and configured ex-works for delivery of a system that is ready for immediate operation.

## Compact design, impressive performance

KAESER DN C boosters deliver precision-tailored extra pressure, yet boast a footprint of only 2.35 m<sup>2</sup> – as opposed to the 5 m<sup>2</sup> of previous models (see dotted line). The icing on the cake is that these complete systems are factory-delivered ready for immediate operation; simply install, connect and off you go!

Image: DN C installed against a wall on one side

# Compact and accessible





**KAESER**

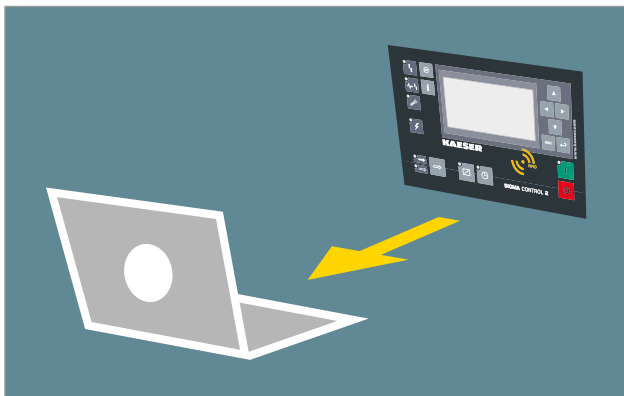


**SIGMA CONTROL 2**

35.2 bar 09:26 143°C  
Log-in successful  
Change password:  
Name: K00000100  
Level: 5  
Valid until: 02/20XX

# Designed for boosters

Based on industrial PC technology, the SIGMA CONTROL 2 compressor controller operates software developed specifically for use with boosters, so as to ensure maximum dependability and efficiency at all times. Furthermore, this internal machine controller provides new, multiple monitoring and control options with an assortment of different interfaces and is fully compatible with the SIGMA AIR MANAGER 4.0 master controller.



## Operating data storage and web server

The SIGMA CONTROL 2 stores up to 1000 messages in its event history and retains operating data for one year. This greatly simplifies the diagnostics process for precision service and maintenance work. The integrated web server allows operating data, maintenance and alarm messages to be displayed on any PC – without the need for specialised software.



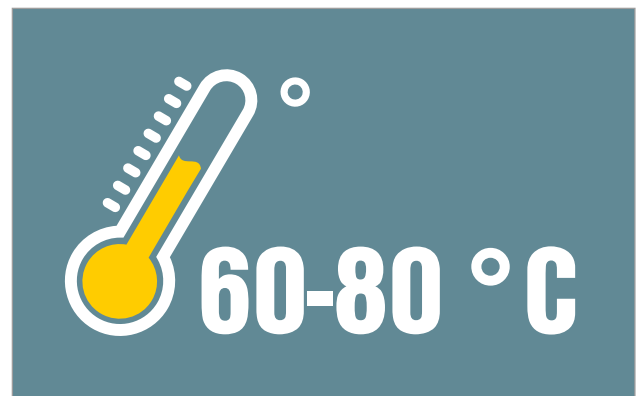
## Intelligent and dependable control

The SIGMA CONTROL 2 is designed to deliver efficient control and monitoring of compressor operation, whilst features such as the clear display and RFID reader support efficient communication and enhanced security. Variable interfaces offer outstanding flexibility and the SD card slot makes updating the special booster software a breeze.



## Your security

RFID functionality means that service work and adjustments to the booster settings can only be performed in the SIGMA CONTROL 2 by authorised personnel, such as qualified KAESER service partners. Manufacturer-provided passwords are not required.



## Precision temperature sensor

As part of its comprehensive machine management capabilities, the SIGMA CONTROL 2 also monitors operation-sensitive temperatures, including that of the drive motor, where the winding temperature is measured using an extremely precise platinum temperature sensor.

Design is in the details

# Simply service-friendly.



## Compressed air aftercooler

The unvented compressed air aftercooler ensures short switching cycles in partial load operation, thereby saving energy. Furthermore, the generously-dimensioned aluminum cooling surfaces reduce the compressed air discharge temperature to near ambient.



## Service-friendly

Just like the air filters, which are changed from the front of the unit, all other maintenance parts are easily accessible. Time-saving features such as these streamline and accelerate maintenance and service work, which translates into lower operating costs and increased availability.



### **Comprehensive sensors**

The comprehensive array of sensors and switching contacts for monitoring pressures, temperatures, oil pressure and oil level ensures reliable operation of the booster and – thanks to the SIGMA CONTROL 2 – enables remote monitoring and visualisation of operating status and all recorded data.



### **E-motors with lubrication from the outside**

Lubrication of electric motors must be performed whilst the machine is still running. This poses no problem for DN series boosters, since service personnel can easily perform this task safely from the outside of the machine. This applies both to the compressor drive motor and the fan motor.

Individualised

## Optional equipment

Every DN C SFC booster can be precisely tailored to meet the needs of a specific operation. This means that DN C series boosters can be specially equipped for any application – whether it be PET bottle production, process air applications, nitrogen compression or the provision of high pressure for testing facilities.



### Nitrogen compression

DN C boosters for nitrogen (N<sub>2</sub>) compression are sealed to prevent outside air penetration and are fitted with additional sensors. Effective pressure reduction at Idle helps to save energy, whilst ensuring high-quality nitrogen.



### Frequency converter for maximum efficiency

Thanks to the frequency converter, flow rate can be adjusted within the control range, depending on pressure. As a result, working pressure is constantly maintained within the specified range. This allows the maximum pressure to be reduced, thereby saving energy and therefore costs.



### Water-cooling

Should compressed air discharge temperatures below ambient temperature be required, DN C boosters can be specified with water-cooling. This provides the best heat dissipation and is also ideal for use with heat recovery systems.



### SIGMA AIR MANAGER 4.0

This powerful master controller provides efficient control and coordinated management of up to 16 pieces of compressed air supply equipment, whilst also monitoring the associated air treatment components. The SIGMA AIR MANAGER 4.0 also enables full compatibility of all KAESER compressed air supply systems within an Industrie 4.0 environment.







**Example savings calculation for hot air heat recovery from fuel oil (DN 45C)**

Maximum available heat capacity:  
 Calorific value per litre of fuel oil:  
 Fuel oil heating efficiency:  
 Price per litre of fuel oil:

49.9 kW  
 9,861 kWh/l  
 0.9  
 0.60 €/l

1 kW = 1 MJ/h x 3.6

$$\frac{49.9 \text{ kW} \times 2000 \text{ h}}{0.9 \times 9,861 \text{ kWh/l}} \times 0.60 \text{ €/l} =$$

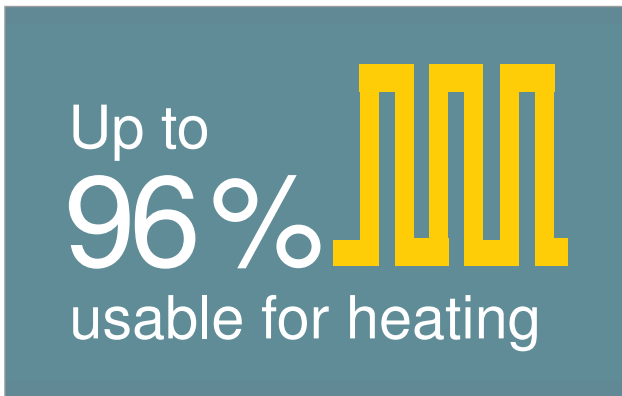
**€ 6,747 per year**

**Cost savings**

Heat recovery

# A master class in energy savings

As self-contained complete systems, boosters are particularly well suited for heat recovery systems. Direct use of the recyclable heat via an exhaust air ducting system enables up to 96 percent of the total energy input to be recovered and used for heating purposes. A company's costs for "conventional" space and water-heating can be reduced significantly by recovering and utilising exhaust heat from the compressor.



## Heat recovery pays off

Amazingly, 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. If heat recovery options are taken into account during the building design phase, production halls can completely dispense with conventional heating systems.

## Direct heat recovery

Heating made easy: Recoverable heat from air-cooled compressors is collected and distributed via flap-controlled air ducting to locations that require heating. Naturally, this reduces heating costs in winter and transitions between seasons.



## Efficient cooling

Even more recoverable heat is made available for air heating purposes, thanks to the efficient compressed air cooling performance of the aluminium aftercooler. This also serves to reduce the load on downstream treatment components and ensure a reliable operation.



## Powerful fans

The exceptionally high residual thrust of the exhaust air fan is sufficient to convey hot air to the consumption points – even over longer ducting – with no need for auxiliary fans, or the associated additional energy costs to run them.

Compressed air stations with boosters

## Optimally adapted, holistic solutions

Compressed air supply systems that continue to deliver energy efficiency and reliability over the long term are far more than the sum of their compressors and compressed air treatment components. Only a true system provider is

capable of making the whole greater than the individual parts, by effectively ensuring harmonious coordination of all components, precisely tailored to a user's individual requirements.



Image: Compressed air station: Low and high pressure

Whether for low or high-pressure applications, KAESER KOMPRESSOREN's compressed air experts draw on decades of experience when planning and designing your compressed air supply, so as to provide a holistic solution

using only the highest quality products. Your benefits? True to KAESER's slogan, you benefit from "More compressed air for less energy".



Clever temperature management

## Optimised cooling air flow

DN C boosters feature separate cooling air flows for compressor block, drive motor and control cabinet, which are taken in through openings in the right-hand side of the enclosure. Once they have been used for cooling, the streams are combined, then blown up and out through the exhaust air outlet in the top of the enclosure. This

clever design reliably prevents cool inlet air from mixing with warm exhaust air – for enhanced efficiency. Thermal overload is therefore kept to a minimum and a separate, energy-intensive cooling system for idling is therefore only necessary under extreme conditions.



### KAESER PET AIR

This all-in-one booster system combines blower and control air in a single, turnkey unit. A rotary screw compressor, blower air booster, controller and compressed air treatment components are all installed on a single base frame – ready for immediate operation. SIGMA PET AIR is available for flow rates up to 46.2 m<sup>3</sup>/min and with blower air up to 45 bar. All with the outstanding reliability, cost-effectiveness and compressed air quality you expect from KAESER.

Turnkey modules

# The new complete solution

DN series boosters are delivered as complete turnkey systems, precisely matched to the upstream compressor. Thanks to the SIGMA CONTROL 2 controller, they are ready for connection and self-monitoring – a huge advantage for keeping installation time and costs to a minimum. KAESER is therefore the first manufacturer in the booster

sector to offer such user-friendly complete solutions, all neatly contained within one compact enclosure.

**SIGMA CONTROL 2 controller**

**Fan with high residual thrust**

**Efficient cooler**

**Compact design**

**Integrated sensors**

**SFC**

**Plug and Work**

Image: DN C series booster

# Equipment

## Complete system

Ready for operation, fully automatic, soundproofed, vibration-insulated, automatic V-belt tensioning; low motor speeds for long service life and consistently high efficiency; powder-coated enclosure; suitable for ambient temperatures up to +45 °C; service-friendly design: External lubrication of drive motor bearings; high-quality materials, durable construction, meticulous assembly and test run.

## Oil circuit

The integrated oil pump is driven via the compressor block drive shaft. Pressure lubrication with integrated oil filter ensures a seamless supply of oil. Dependable operation is further ensured by continuous monitoring of the oil pressure and level.

## Nitrogen version (option)

In partial load operation, the special bypass control reliably prevents ambient air from entering the system. Care must be taken to ensure that only dry nitrogen (max. 20% relative humidity) is drawn in.

With DN C series machines, controlled actuation of the valves further reduces pressure and power consumption at Idle. Additional sensors provide enhanced operational reliability.

## Electrical components

Premium Efficiency IE3 drive motor with Pt100 windings temperature sensor for monitoring the motor, separate axial fan with high residual thrust, IP 54 control cabinet with ventilation, automatic star-delta combination, overload relay, control transformer, initial and final pressure sensors, Pt100 sensor for block discharge temperature from the individual cylinders and compressed air discharge temperature, oil pressure sensor and oil fill-level switch, limit switch on the cooler-side patch panel.

## SIGMA CONTROL 2

“Traffic light” style LEDs show operating status at a glance; clear text display, 30 selectable languages, soft-touch icon keys; fully automatic monitoring and control; interfaces: Ethernet; additional optional communications modules for: Profibus DP, Modbus, Profinet and DeviceNet. SD memory card slot (8 GB card as standard) for data storage and updates; RFID reader, web server - graphic display of measurement and operating data as well as status display (load run, idle and stop) and message history (operating, warning and alarm messages).

## SIGMA AIR MANAGER 4.0

The refined adaptive 3-D<sup>advanced</sup> Control predictively calculates and compares the various operating options and selects the most efficient one to suit the specific needs of the application.

The SIGMA AIR MANAGER 4.0 master controller is able to control operation – of both speed-controlled and fixed-speed boosters alike – in such a manner that minimal energy is consumed whilst at the same time the actual amount of air currently required always remains available. This optimisation is made possible by the integrated industrial PC with multi-core processor, in combination with the adaptive 3-D<sup>advanced</sup> Control. Furthermore, the SIGMA NETWORK bus converter (SBC) provides a host of possibilities for enabling the system to be individually tailored to meet specific user requirements. The SBC can be equipped with digital and analogue input and output modules, as well as with SIGMA NETWORK ports, in order to enable seamless display of flow rate, pressure dew point, performance or alarm message information.

Amongst other key features, the SIGMA AIR MANAGER 4.0 provides long-term data storage capacity for reporting, controlling and audits, as well as for energy management tasks as per ISO 50001.

*(See image on right)*



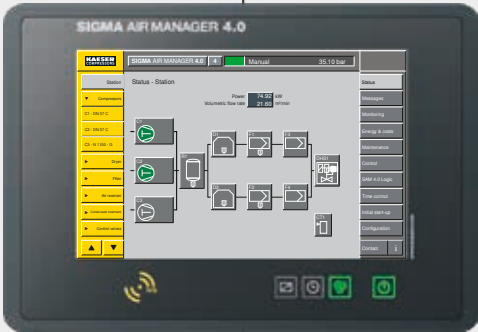


Digital output device, e.g. laptop



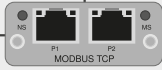
Control centre

KAESER CONNECT



SIGMA AIR MANAGER 4.0

Communications module, e.g. Modbus TCP



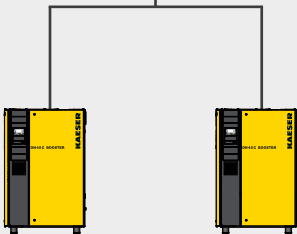
## KAESER SIGMA NETWORK



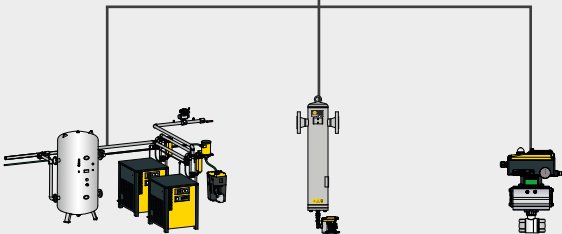
SIGMA CONTROL 2 controller



SIGMA NETWORK Bus converter



Connection to boosters with SIGMA CONTROL 2



Various connection options for treatment components



**Secure data – secure business!**

# Technical specifications

## Air-cooled version (50 Hz)

Model	Initial pressure	Final pressure	Flow rate *)	Compressor block speed	No. of cylinders	Sound pressure level **)	Compressed air connection		Dimensions W x D x H mm	Mass kg
	bar	bar	m <sup>3</sup> /min	Strokes per min		dB(A)	Inlet side	Discharge side		
DN 22 C	5	25	4.7	1315	3	78	G 2	G 1½	1280 x 1830 x 1960	1270
	7.5	30	6.2	1139						
	10	35	7.0	981						
	13	40	7.8	833						
DN 30 C	5	25	6.1	1139	3	78	G 2	G 1½	1280 x 1830 x 1960	1370
	7.5	30	8.2	1034						
	10	35	9.6	1315						
	13	40	10.8	1139						
DN 37 C	7.5	30	9.4	1183	3	78	G 2	G 1½	1280 x 1830 x 1960	1400
	10	35	10.8	1034						
	13	40	12.6	1315						
DN 45 C	7.5	25	10.7	1315	3	78	G 2	G 1½	1280 x 1830 x 1960	1410
	7.5	30	9.7	1227						
	10	35	12.9	1227						
	13	40	14.9	1095						

## Water-cooled version (50 Hz)

Model	Initial pressure	Final pressure	Flow rate *)	Compressor block speed	No. of cylinders	Sound pressure level **)	Compressed air connection		Dimensions W x D x H mm	Mass kg
	bar	bar	m <sup>3</sup> /min	Strokes per min		dB(A)	Inlet side	Discharge side		
DN 22 C	5	25	4.7	1315	3	75	G 2	G 1½	1280 x 1830 x 1960	1240
	7.5	30	6.2	1139						
	10	35	7.0	981						
	13	40	7.8	833						
DN 30 C	5	25	6.1	1139	3	75	G 2	G 1½	1280 x 1830 x 1960	1340
	7.5	30	8.2	1034						
	10	35	9.6	1315						
	13	40	10.8	1139						
DN 37 C	7.5	30	9.4	1183	3	75	G 2	G 1½	1280 x 1830 x 1960	1370
	10	35	10.8	1034						
	13	40	12.6	1315						
DN 45 C	7.5	25	10.7	1315	3	75	G 2	G 1½	1280 x 1830 x 1960	1370
	7.5	30	9.7	1227						
	10	35	12.9	1227						
	13	40	14.9	1095						

\*) 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

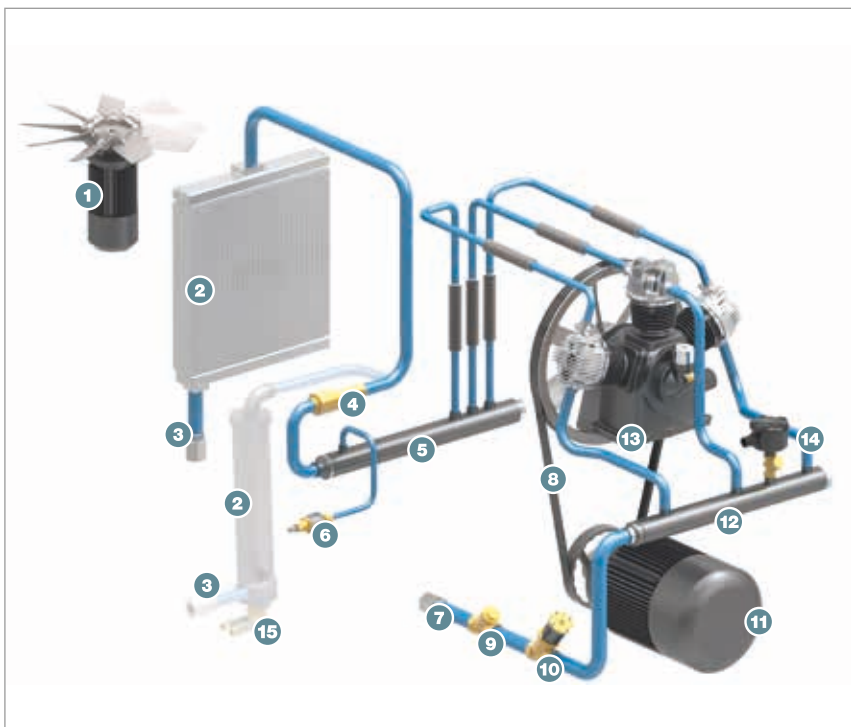
\*\*) Sound pressure level as per ISO 2151 and basic standard ISO 9614-2, tolerance: ± 3 dB (A)

## Examples for version with frequency converter

Model	Initial pressure bar	Final pressure bar	Flow rate *) m³/min	No. of cylinders	Sound pressure level **)		Compressed air connection		Dimensions W x D x H mm	Mass	
					Air-cooled dB(A)	Water-cooled	Inlet side	Discharge side		Air-cooled kg	Water-cooled
DN 22 C SFC	5	25	2.72 - 4.75	3	78	75	G2	G1 1/2	1280 x 1830 x 1960	1430	1410
DN 30 C SFC	7.5	35	3.90 - 6.44	3	78	75	G2	G1 1/2	1280 x 1830 x 1960	1530	1510
DN 37 C SFC	10	40	5.32 - 9.04	3	78	75	G2	G1 1/2	1280 x 1830 x 1960	1570	1550
	13	45	7.07 - 12.36								
DN 30 C L SFC	5	25	4.11 - 6.11	3	78	75	G2	G1 1/2	1280 x 1830 x 1960	1530	1510
DN 37 C L SFC	7.5	30	6.11 - 9.39	3	78	75	G2	G1 1/2	1280 x 1830 x 1960	1570	1550
DN 45 C SFC	10	35	8.12 - 12.90	3	78	75	G2	G1 1/2	1280 x 1830 x 1960	1580	1560
	13	35	10.87 - 15.79								

Note: Design determined on basis of project

## How it works



- 1) Fan motor
- 2) Air-cooler (air-cooled)  
Water-cooler (water-cooled)
- 3) Compressed air outlet
- 4) Check valve, discharge side
- 5) Collection tank, discharge side
- 6) Relief valve
- 7) Compressed air inlet
- 8) V-belt
- 9) Dirt trap, intake side
- 10) Inlet valve
- 11) Compressor motor
- 12) Distribution tank, intake side
- 13) Compressor block
- 14) Air filter for idling control
- 15) Cooling water connections  
(water-cooled)

Note: Lighter-coloured sections of image relate to water-cooled version

# 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 branches, 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 peak performance at all times, whilst providing maximum availability.



## KAESER KOMPRESSOREN SE

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