KAESER COMPRESSORS®

# Boosters

**DN C (SFC) Series**

Flow rate 2.9 to 19.6 m³/min – Rated motor power 22 to 45 kW
Initial pressure 3 to 13 bar – Final pressure 10 to 45 bar

**www.kaeser.com**

# Boosters

Powerful, compact and quiet, DN C boosters from KAESER deliver uncompromising performance, dependability and energy efficiency. These innovative complete systems come into their own when, due to technical reasons, specific points in a production process require compressed air at a higher pressure than that supplied by the main compressed air network. Completely redesigned with a new layout, these compact machines quite literally provide everything you need: they not only provide optimised cooling air flow, but also offer excellent maintenance and service access. SFC versions feature a speed-controlled drive system, which delivers the precise amount of compressed air required by the application with maximum efficiency throughout 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 duties such 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, equipped as standard, contribute to energy-efficient performance, as does the generously dimensioned axial fan, which also ensures reliable temperature control. In SFC versions, compressor flow rate is matched to the actual air demand of the particular application, which means that only as much energy is used as is actually required for the compressed air supply -– now that’s efficiency! The system operates with exceptional efficiency 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 true team players for every compressed air station: not to be outdone by their rotary screw counterparts, all units are optionally available with air- or water-cooling and perform perfectly in ambient temperatures up to +45 °C. The same also applies to 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 data: initial and final pressure, block discharge temperature of the individual cylinders, drive motor winding temperature, oil pressure and level, compressed air discharge temperature, compressor/control cabinet fans and maintenance doors status (open/closed).

## “Plug & Work” complete systems

KAESER’s integrated booster systems are completely unique: all operationally relevant components are provided ex works and are configured ready for immediate operation with the respective application.

## Compact design, impressive performance

Compared to the 5 m² footprint of previous models (see dotted line), KAESER DN C boosters supply precision-tailored extra pressure with a minimal space requirement of only 2.35 m². Moreover, they are delivered as turnkey complete systems: simply install, connect and you’re good to go!

Image: DN C with one-sided wall installation



# Compact and accessible

SIGMA CONTROL 2

# Designed for boosters

Based on industrial PC technology, the SIGMA CONTROL 2 compressor controller utilises software developed specifically for use with boosters, in order to assure maximum dependability and efficiency at all times. Furthermore, this internal machine controller provides new, multiple monitoring and control options with an assortment of 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, maintenance and fault 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 of 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 a high-precision platinum temperature sensor.

Design is in the details

# Service-friendly

## Highly effective compressed air aftercooler

The unvented compressed air aftercooler ensures short switching cycles in partial load operation, thereby saving energy. Furthermore, the generously dimensioned aluminium cooling surfaces reduce compressed air discharge temperatures 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 external lubrication

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.

Customisable

# Optional equipment

Every DN C SFC series booster can be precisely tailored to meet exact operational needs. 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 ($N_2$) 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 nitrogen quality.

## 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 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.

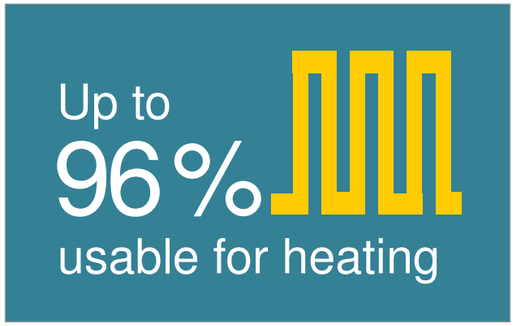
## Integrated prefilter

To protect the booster from contaminants (dirt particles and condensate), an integrated prefilter is available. This option is equipped as standard with an ECO-DRAIN automatic condensate drain.

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 layout 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. This reduces heating costs in winter and during transition 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 reduces the load on downstream treatment components and ensures 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 capable of delivering 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 able to make the whole greater than the individual parts, by effectively ensuring harmonious coordination of all components, precisely tailored to a user's individual requirements.

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, in order to provide a holistic solution that utilises only the highest quality products.

How do you benefit? True to KAESER's slogan, you benefit from "More compressed air for less energy".

Image: Compressed air station: Low and high pressure

DN 37 C XL up to a maximum of 25 bar

# Specially designed for high air demand

The DN 37 C XL is the perfect choice for applications with high air demand up to 25 bar.

Our largest compressor block is installed in the DN 37 CXL.

This model delivers the highest possible flow rate available for this product series.

Clever temperature management

# Optimised cooling air flow

DN C boosters feature separate cooling air flows for the compressor block, drive motor and control cabinet, which are drawn in through openings in the right-hand side of the housing. Once they have been used for cooling, the separate air flows are combined and then discharged upwards 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 in check and a separate, energy-consuming cooling system for idling is necessary only 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 m³/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 all-in-one 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 a single compact enclosure.

SIGMA CONTROL 2 controller

Fan with high residual thrust

Highly effective compressed air aftercooler

Integrated sensors

Compact design

Image: DN C series booster

SFC

Optionally available with frequency converter

Plug and Work

# Equipment

## Complete system

Ready for operation, fully automatic, soundproofed, vibration insulated, automatic 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 motor monitoring, separate axial fan with high residual thrust, IP54 control cabinet, control cabinet ventilation, automatic star-delta combination, overload relay, control transformer, initial and discharge pressure sensors, Pt100 sensor for 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 access 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 measured and operating data as well as status display (Load, Idle and Stop) and message history (operating, warning and fault messages).

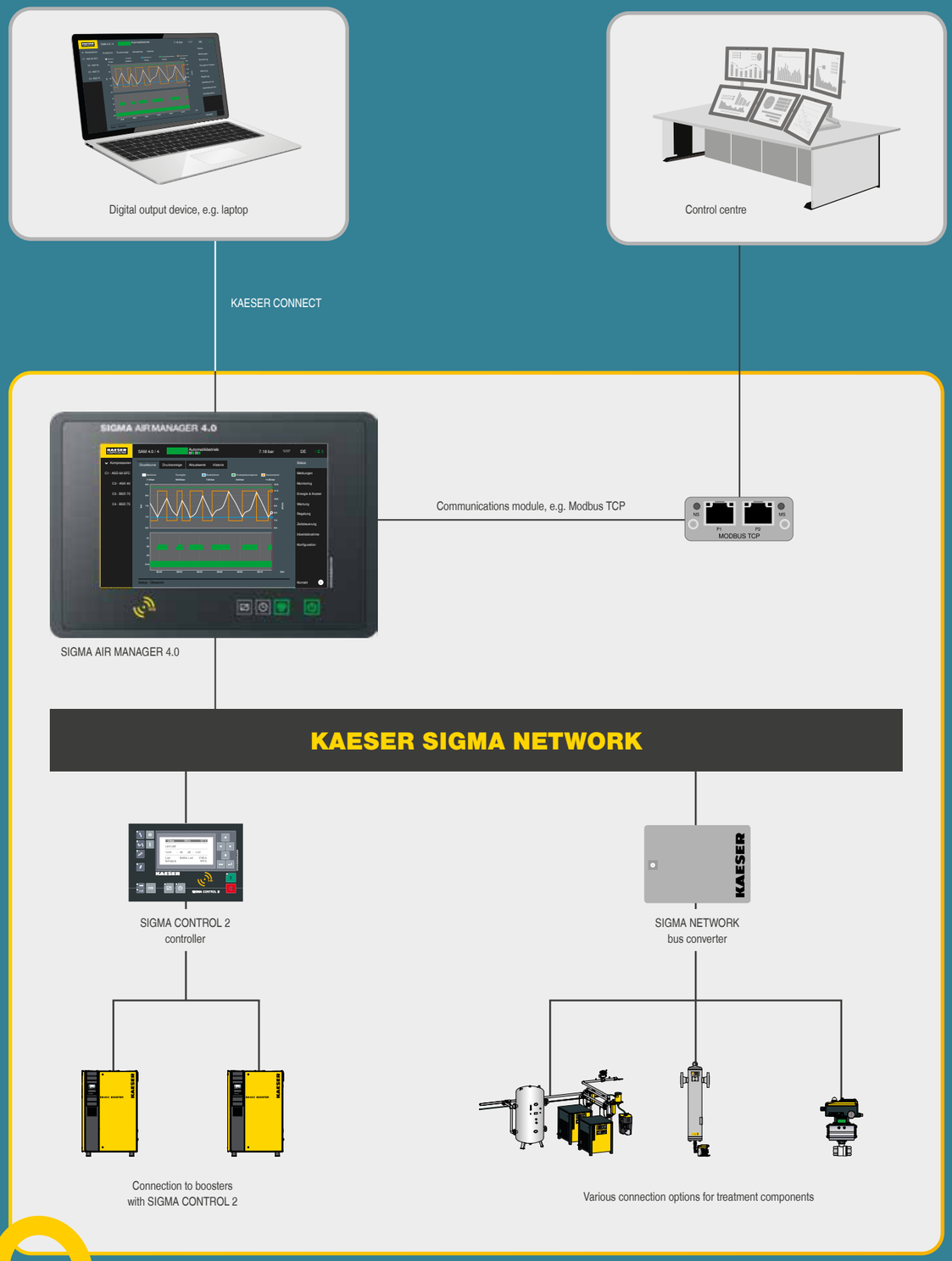
## SIGMA AIR MANAGER 4.0

The refined, adaptive 3-D$^{advanced}$ 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 frequency-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$^{advanced}$ 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 information or fault messages.

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

*(See image on right)*




**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 | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| | bar | bar | m³/min | Strokes/min | | dB(A) | Inlet side | Discharge side | mm | kg |
| 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 | | | | | | |
| DN 37 C XL | 7.5 | 25 | 11.54 | 789 | 3 | 78 | G 2 | G 1½ | 1280 x 1830 x 1960 | 1530 |
| | 13 | 25 | 18.9 | 744 | | | | | | |

### 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 | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| | bar | bar | m³/min | Strokes/min | | dB(A) | Inlet side | Discharge side | mm | kg |
| 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 | | | | | | |
| DN 37 C XL | 7.5 | 25 | 11.54 | 789 | 3 | 78 | G 2 | G 1½ | 1280 x 1830 x 1960 | 1510 |
| | 13 | 25 | 18.9 | 744 | | | | | | |

*) 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)

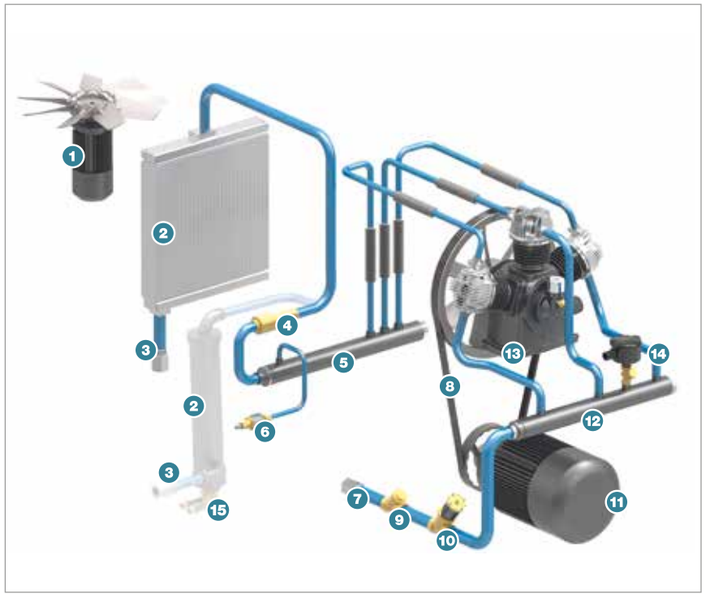


### Examples for version with frequency converter

| Model | Initial pressure | Final pressure | Flow rate *) | No. of cylinders | Sound pressure level **) | | Compressed air connection | | Dimensions W x D x H | Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | bar | bar | m³/min | | Air-cooled dB(A) | Water-cooled | Inlet side | Discharge side | mm | 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 specific to project

# How it works




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

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)

**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.

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