

GHH RAND



Air and Gas Compression Solutions and Services

IR Ingersoll Rand
Industrial Technologies



Compression with Passion

GHH RAND is one of the world's market leader's in the compressor industry. We develop, produce and deliver advanced solutions for the entire screw compressor market.

Our experienced and skilled Engineering staff is the basis for our technological leadership. In many cases our expertise and innovations opened new markets and created business opportunities for our customers. Our industrial and specialized compressed air solutions provide significant features, benefits and added value for any compressed air requirement, in particular with our total lifecycle services. That way our solutions allow OEM customers easy selling of their products to end users.

Designed to deliver efficient and profitable service year after year our screw compressors are manufactured in our modern facility in Oberhausen, Germany to the highest standards in the industry. The robust design ensures reliable operation even under most difficult conditions.

High efficiency and long service life provide a high rate of return on investment with a short payback period.

GHH RAND is completely dedicated to serve the screw compressor market and uses the latest state-of-the-art equipment and processes to assure high quality and consistent on-time delivery. Our aim is to ensure that every operation contributes to longer life and higher performance of our compressors and above all to optimum customer service.

Oil-Injected Compressor Stages

Our delivery program includes belt, direct and gear driven airends. These compressor stages are manufactured with high precision and are suited for work under the most difficult conditions 24 hours per day. Recently we added to our famous series CE and CF the newest development – the OS series.

With the new OS series we reach even higher levels of efficiency for screw compressors. Simplicity of the design increases reliability.

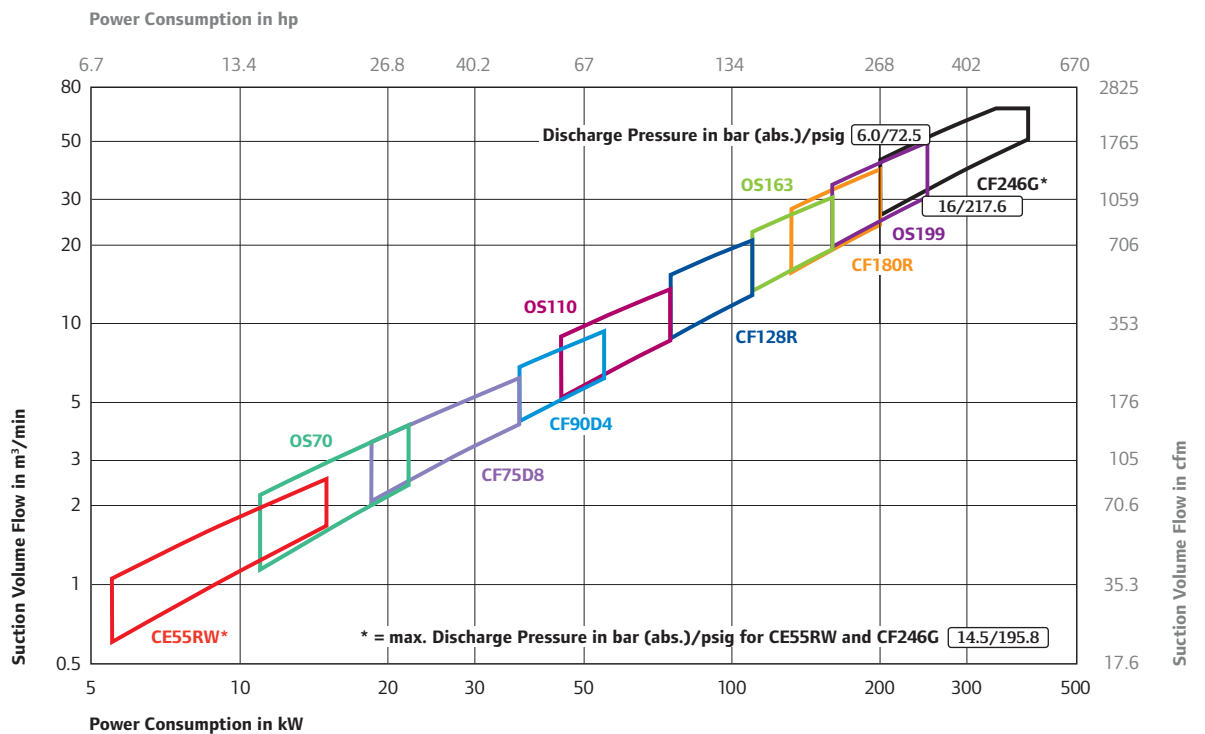


OS 70

Application areas:

- stationary and portable compressor packages
- train braking systems
- drilling applications
- welding systems
- snow making
- road painting
- auxiliary air systems in vehicles
- fire fighting applications (compressed air foam)

Operating Range of the OS, CE and CF Series



Highlights of our Oil-Injected Solutions

Highest efficiency

The proven asymmetric design of the GHH RAND rotor profiles provides maximum performance and efficiency – Resulting in savings in power consumption at high volume flow.

Long service life

The bearing arrangement has been designed to compensate radial forces in an optimum way which results in long life with low vibration level.

Greatest possible prevention of leakages

Leakage problems are eliminated through three sealing lips and a special return path to the suction side of the aircend.

Optimum solution for your requirements

- Optimum operating and power efficient conditions are provided in our gear drive solutions by a wide range of gear ratios.
- Smart design enables belt loading to be cancelled by utilising the internal compression forces.
- Economical direct drive options.

Maximum flexibility

The possibility of base and flange mounting increases the flexibility of design for your package.

LC44 and LC44K – The Solutions for Non-Industrial Applications

Applications for non-industrial use have different requirements than industrial packages. GHH RAND provides the LC44 and LC44K as cost efficient, reliable solutions. These stages operate between 3 and 7.5 kW (4 and 10 hp) with a maximum flow rate of 0.935 m³/min (33.38 cfm/min) and a maximum discharge pressure of 14 bar absolute (203 psi).



Oil-Free Compressor Blocks

We are pioneers in the sector of oil-free compressors. The first oil-free compressor was developed and produced by us. Today GHH RAND offers a wide range of oil-free compressed air products: from blocks to customized industry solutions always with the highest reliability.

Our portfolio includes oil-free compressor solutions in several configurations:

- one and two stage blocks for continuous operation
- one stage blocks for jet starter applications
- stages for conveying of bulk materials

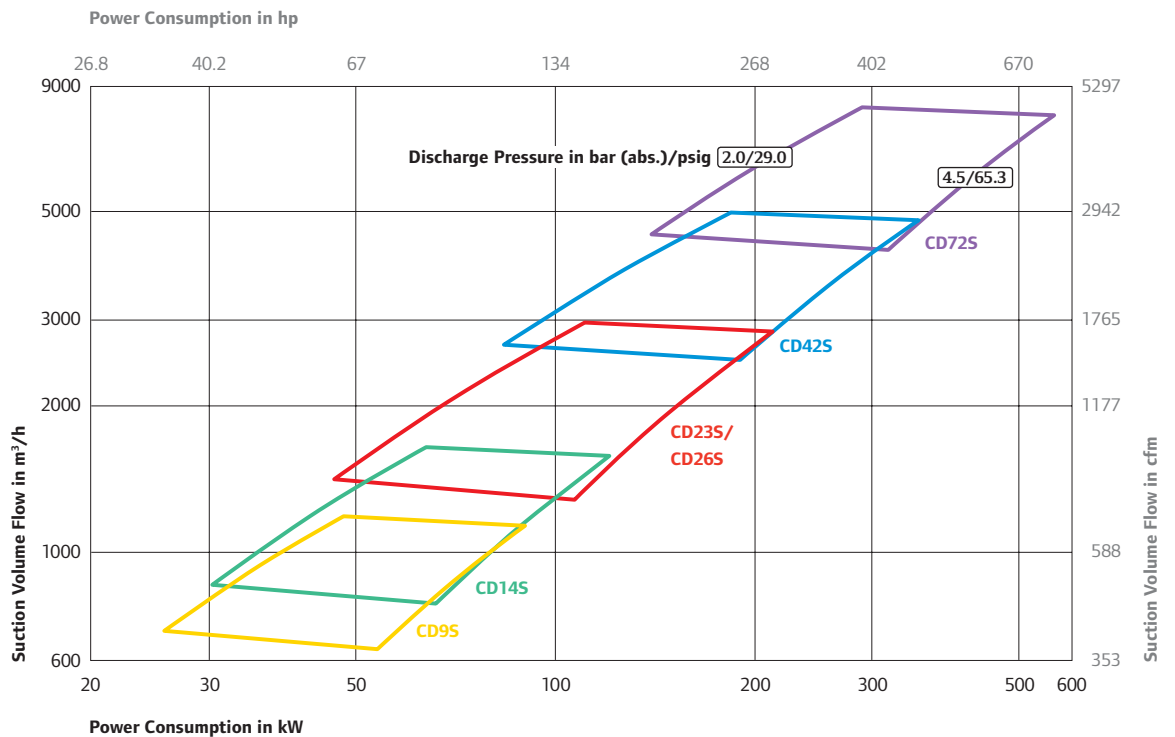


Application areas:

- Pneumatic conveying systems
- Ground support equipment
- Pharma industry
- Food industry
- Electrical industry
- Air separation systems
- Waste water treatment

Our special non-abrasive UltraCoating leads to the high reliability and long service life of our solutions.

Operating Range of the Single Stage Series CDS



Highlights of our Oil-Free Solutions

Totally oil-free air

Reliable and field proven sealing arrangement ensures separation of oil-free area from the oil needed for lubrication of gears and bearings.

Long service life

Our special bearing arrangement compensates radial forces in an optimum way which results in less vibrations.

High performance at low power consumption

GHH RAND rotor profiles have optimized asymmetric designs developed after many years of research and field tests. Our special, non-abrasive "UltraCoating" of rotors and inner parts of the housing allows reduction of clearances to a minimum. This results in high efficiency.

Low noise level

Tight rotor clearances allow low rotation of the rotors. This results in less friction and less vibrations.

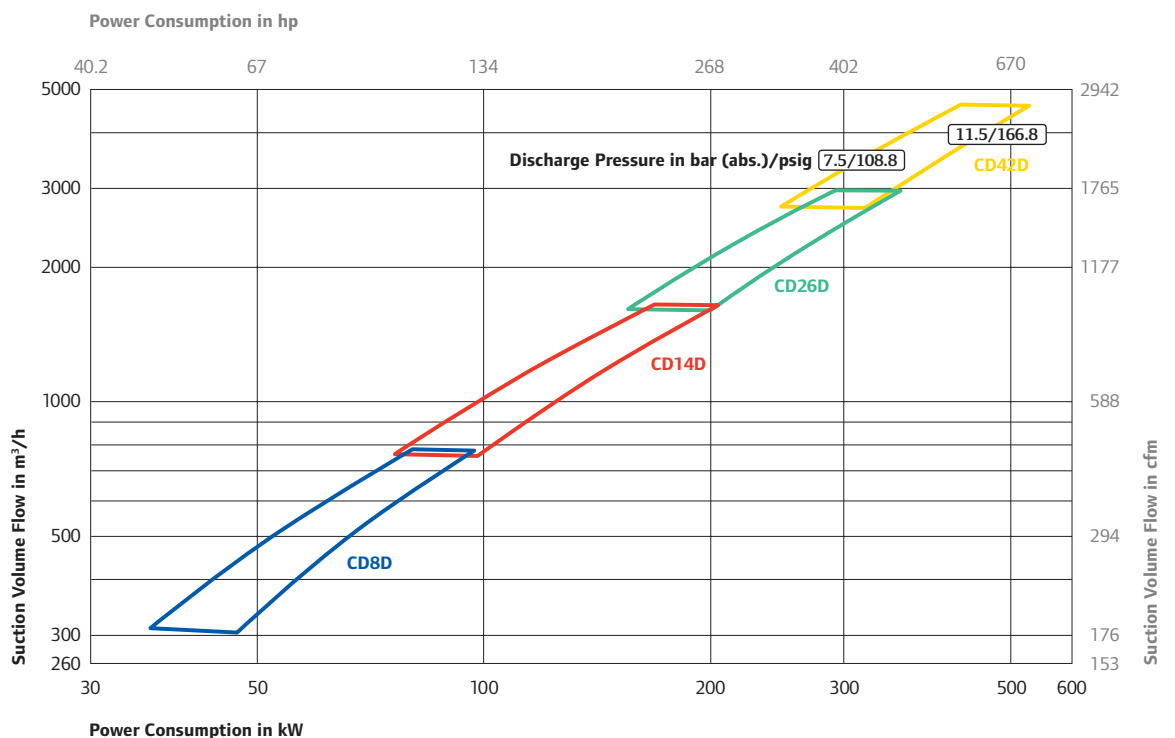
Excellent running properties

Anti-friction bearings and dynamically balanced rotors ensure smooth operation.

No corrosion

Stainless steel rotors in the high pressure stage eliminate potential damage through corrosion

Operating Range of the Double Stage Series CDD



Gas and Refrigeration Compressors

GHH RAND has a long and successful experience in the refrigeration and gas compression business. First units were built in 1967. Our gas and refrigeration solutions are successfully applied for many different processes to refrigerants, oil compatible gases, and high suction air systems.



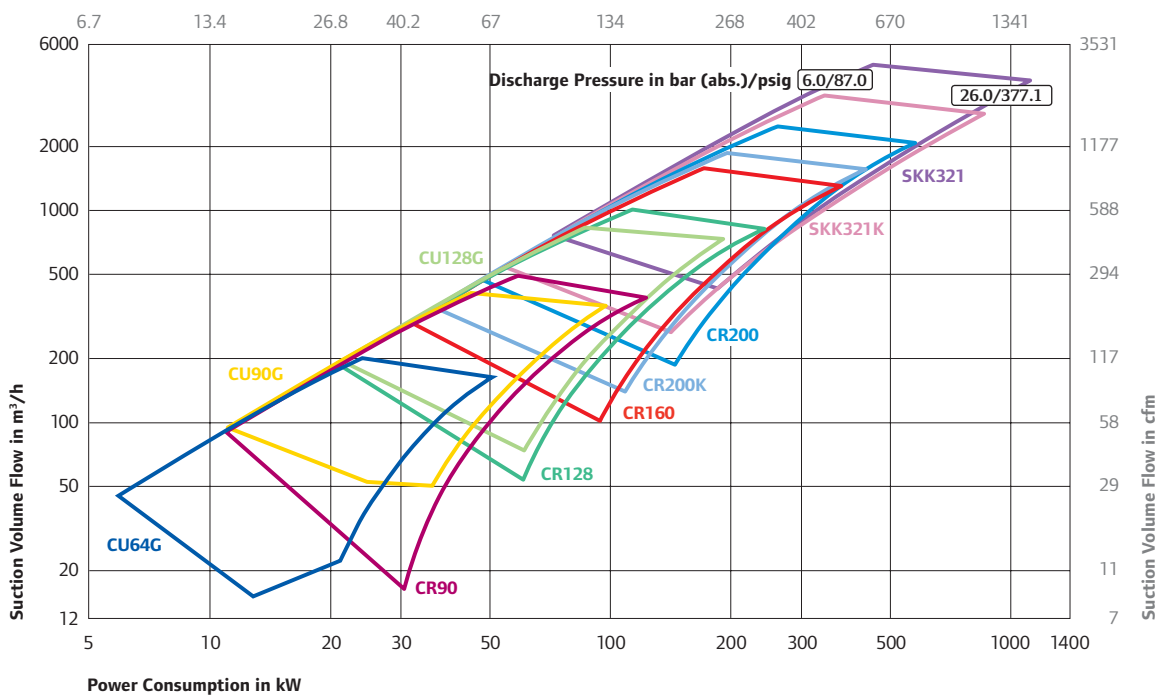
Application areas:

- Refrigeration Systems
- Air Conditioning and Heat Pump Units
- Micro turbines boosting
- Fuel Conditioning Skids
- Natural Gas Gathering
- Mine Gas
- High Pressure Air
- Fuel Gas boosters

Operating Range of the CU and CR/SKK Series

Power Consumption in hp

Medium:
 natural gas H,
 0 % rel. hum.
 suction press.:
 1 bar (abs.)/1 psig
 suction temp.:
 20 °C/68 °F
 built-in volume ratio: 4.8
 oil quality: Glygoyle 22



Highlights of the CU Series

- Simple capacity control** Mainly equipped with flanged gear drive capacity that can be controlled through speed adjustments of diesel engines or electrical frequency.
- High power efficiency** The provided selection of gear drives allows to adjust customer solutions to the optimum operating point.
- Long service life** The CU Series is completely equipped with anti-friction bearings resulting in vibrations being kept to a minimum.
- Cost saving** No separate oil pump is necessary for most applications due to the simple, intelligent design.

Highlights of the CR/SKK Series

- Stepless Capacity Control** Compressor capacity is regulated by a hydraulic actuated slide valve that can be operated by a control system monitoring suction pressure, discharge pressure, engine load or gas flow rate.
- Easy configuration** By replacing slide valves the volume ratio of the compressors can be easily configured.
- Low maintenance** Equipped with hydrodynamic radial bearings the bearings will provide you with an extremely long service life when operated with the correct lubricant.
- Suitable for high pressure applications** The GHH RAND precision rotors have optimized profiles for operation also at high compression ratios.
- Long service life** The axial load balancing system utilizes discharge pressure to reduce axial load on the male rotor axial bearing.

Customized Industry Solutions



For the different requirements of specific industry applications GHH RAND provides customized screw airends and compressor systems. These applications require a design of the screw compressor unit according to available space, difficult or constantly changing environment conditions or special drive demand. With know how and experience in customized compressed air solutions we developed optimum solutions for each of these requirements.

Depending on application our customized solution can be a special designed screw airend, pre-designed compressor package or a compressor kit including not only the screw airend, but also customized components as intake, thermostat and minimum pressure valves, air and lubricant cooling systems, separators and many other accessories. We supply not only compressors and components for our customers with specific industry requirements but also support them with engineering services at package design and production.



Our solution CD23S was specifically designed for jet start applications.



Auxilliary air for vehicles

Our compressor kits with the oil-injected air-ends LC44 or CE55RW/G for air utilization in vehicles, fulfil customers requirements regarding small space available for installation.

Ground support equipment

For our compressor kits with oil-free compressor blocks CD14S to CD72S, there are optimum variations of gear ratios available which provide best speeds for diesel engines.

Welding applications

For air gouging applications we provide compressor systems with contact cooled screw air-ends series CE and CF.

Pneumatic conveying

In food, pharma or electronic industries our oil-free blocks CD9S up to CD72S and components are suitable for pneumatic material transport.

Drilling applications

As an on-board or portable unit, our compressor kits with high pressure units CF1000H and HR2/HR2.5 can be used with drill rigs.

Train braking systems

Small contact cooled CE, CI and CF air-ends can be utilized for integration into train braking systems. We also provide compressor kits for integration into track grinding machinery.

Fire and Rescue systems

We provide compressor kits with OS, CE and CF series to be integrated into fire trucks and mobile charging units.

Components



An excellent compressor package requires not only high quality stages but also high quality components. GHH RAND provides these.

GHH RAND offers a wide selection of components that have been specifically designed in order to match the specifications of our airends in an optimum way when operating in your compressor package. These components are proven designs and can be supplied in airend kits to help reduce your costs and logistics. Besides our components simplify design, reduce product risks and cut assembly time. Below is an extract of our portfolio.



Controls

If you require electronic controls for your compressor package we can help. We have developed variations of electronic multifunctional controls in accordance with EC standards which can meet a wide variety of your requirements.

Inlet Air Filter

We offer inlet air filters for low, medium and high dust levels. Our filters are easy to maintain and are characterized by their compact design, low weight and excellent filtering properties.

Intake Valve

To enable simple design of screw compressor packages for you we designed a special intake control. Acting as a tight shut-off valve it opens and closes the intake suction of the screw compressor automatically and ensures a safe package operation.



Oil Filter

Our oil filters achieve the highest standards. The filtered dirt particles captured outside of the filter element are easy to remove after disassemble of the filter. An optional optical or electrical indicator always shows the current filter condition.



Coolers

GHH RAND oil- and air-coolers are characterized by a high specific performance, low resistance and optimum geometry.



Minimum Pressure Valve

The minimum pressure valve was designed to maintain the minimum pressure required for the lubrication of oil-injected rotary compressors. An integrated check valve prevents reverse flow from the compressed air network when the compressor is switched from on-load or partial load to off-load or shutdown.



Oil Thermostats

GHH RAND oil thermostats are designed for temperature-dependent oil flow control in screw compressor systems. They prevent condensation in the system and maintain constant lubricating oil temperature and viscosity.

Value Added Services

PrimeCare Extended Warranty Program

We are so convinced of the quality and reliability of our innovative compression solutions that we are pleased to offer an extended warranty of up to five years when program requirements are met. The benefits of this program for our OEM customers are that they can pass on this warranty to their customers, reduce product risks, increase their customer relationship and obtain an attractive competitive advantage.

Package Approval

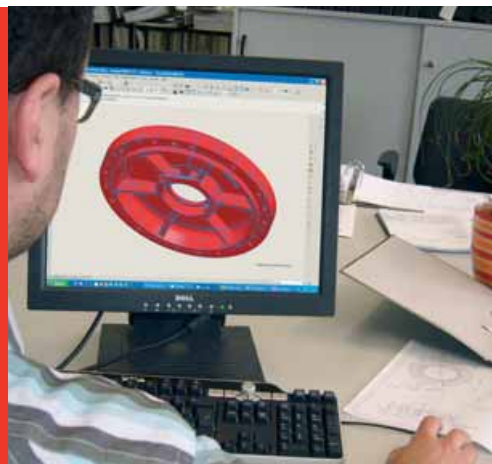
GHH RAND is globally recognized as innovative and reliable provider for compressed air solutions. With our package approval you can benefit in two ways.

- Examination and consulting by our highly qualified engineers reduce your product risks.
- Using our reputation on the final GHH RAND certificate as a marketing tool.

Training

Compression technology goes through rapid development. OEMs are confronted with new products and customer requirements continually. Users on the other hand have to maintain these new solutions. GHH RAND assists you to meet these challenges, by offering training courses globally in many different languages.

Please contact us for further information on any one of these value added services.



Our qualified engineers develop efficient standard airends and customized solutions and also support at package design.

Engineering Services

Our engineering services can help bring you peace of mind and help you to develop and improve your packages. Our experienced and very capable engineering office supports all our customers by working with their teams to find solutions for each airend and component application. Many years of experience enable us to help you achieve the optimum compressed air solution and to save costs without loss of quality or reliability.



Maintenance and Repair



Lubricants

Your compressor system will last longer and be more reliable when using our high quality mineral and synthetic lubricants. These lubricants have been specifically designed to match the different specifications and operating conditions of our airends. Engineered with excellent start up and operating lubrication characteristics they will not only provide you with long life, excellent cooling performance and improved compressor efficiency. Additionally you will benefit from extended warranty when using our lubricants.



A GHH RAND service technician inserts the male rotor within the rebuild of a CF180G.

Spare Parts

We maintain stock of original spare parts in order to meet your demand. To save costs and reduce logistics we provide many of our spare parts in kits.

Exchange Airends and Rebuilds

We have a comprehensive range of exchange airends, rebuild kits and a factory rebuild service for our entire product portfolio, along with a dedicated team of specialists to help you with any special requirements you may have.

All technical data is subject to be changed.



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Ingersoll Rand Industrial Technologies provides products, services and solutions to enhance the efficiency and productivity of our commercial, industrial and process customers. Our innovative products include air compressors, air systems components, tools, pumps, material and fluid handling systems and microturbines.

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