



CONTINENTAL INDUSTRIE
CENTRIFUGAL BLOWERS & TURBOCOMPRESSORS

Anniversary
50



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CENTRIFUGAL BLOWERS & TURBOCOMPRESSORS



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S I N G L E S T A G E T U R B O C O M P R E S S O R S

50^{Anniversary} We turn air into a tool

The best equipment for air & gas applications

Continental Industrie centrifugal blowers and turbocompressors are a benchmark in reliability and efficiency in air and gas applications. With more than 50 years of experience in research, development and manufacturing of centrifugal blowers and exhausters and more than 45.000 machines installed globally, Continental Industrie is a symbol of reliability and confidence for continuous duty and extremely rugged service, 24 hours a day, 7 days a week.

Our factory, located in the Ain department, 50 kilometers from Lyon, France, benefits from its exceptional location in centre of Europe. Over the years, Continental Industrie has set up an experienced and dynamic team and created a structure that brings together engineers, technicians and sales engineers. Its sole objective: to provide industry with the best equipment for air and gas handling.

50

Years of experience

25

Worldwide offices

80.000

Satisfied customers

45.000

Machines installed

Research and development

New blower designs for various applications, featuring higher compression ratios and capacities, are being engineered at the factory R&D department, using modern design methods.

Projects are followed by the engineering team at the factory, and products are certified at the factory test center to ensure good performance.

An advanced control system integrating microprocessors and sensors efficiently manages blower operations while swiftly addressing anomalies and adapting to customer changing requirements.

These energy-conscious design principles contribute to deliver a reliable system that operates with optimal efficiency, leading to significant energy savings and reduced operational costs.



ORIGINAL SPARE PARTS



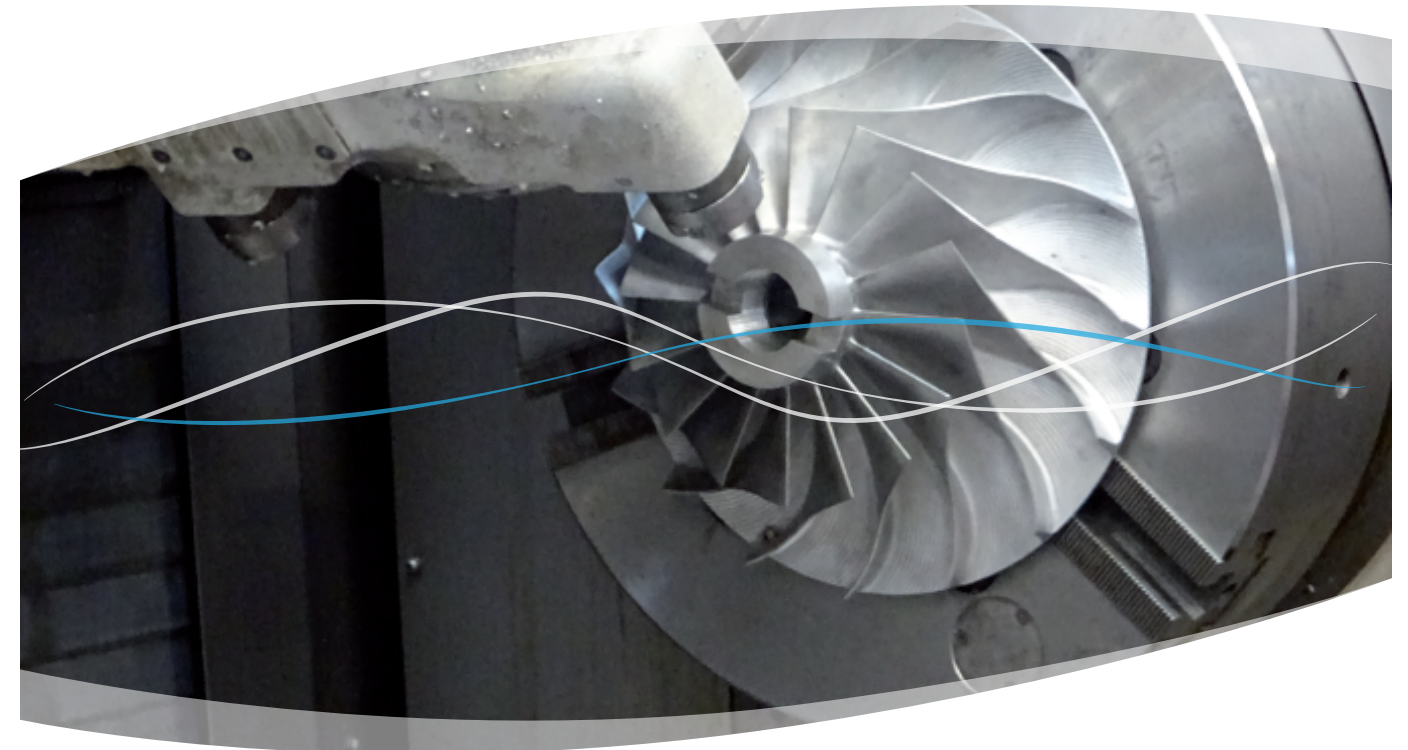
WORLD WIDE PRESENCE



CUSTOM MADE SOLUTIONS



24H MAINTENANCE SERVICE



A Quality-driven production facility

As a result of our constant interest in improving our performance and of investing a large part of our resources in research, with a commitment to quality, our plant is able to meet a wide variety of demands. Our machining area is operated by dedicated computerised digital control.



Embracing flexibility

We have excellent control over production and can ensure our customers a great flexibility and enhanced delivery times.

In addition, spare parts, technical documentation and accessories can be dispatched within 24 hours.



A new generation

The Continental Industrie TC type radial turbo compressors are modern flow machines for compression of large quantities of air or gas from 2,500 to 35,000 m³/h with pressure up to 1,3 bar g.

Thanks to high precision tolerances and continuous control of working parameters, our compressors have high reliability during operation.

Through the application of new techniques from aerospace technology, 3D machining of the impeller blades ensures high compression efficiency (over 85%) and high overall performance.

The turbocompressor is an integrally geared unit consisting of the centrifugal turbo body, transmission unit, main drive electric motor, frame, oil lubrication system and control panel.

Fields of application

- WASTE WATER TREATMENT
- FLUE GAS DESULPHURISATION
- FLOTATION
- CEMENT
- DEWATERING
- FERMENTATION
- GALVANIZING
- CARBON BLACK
- COMBUSTION
- SULPHUR RECOVERY
- FLUIDIZATION
- SULPHURIC ACID PLANTS
- OIL & GAS REFINING & PETROCHEMICAL



TCH Turbo

Hydrodynamic journal bearings
Flow range from 8,000 to 35,000 Nm³/h
Pressure up to 1,3 bar g



TCB Turbo

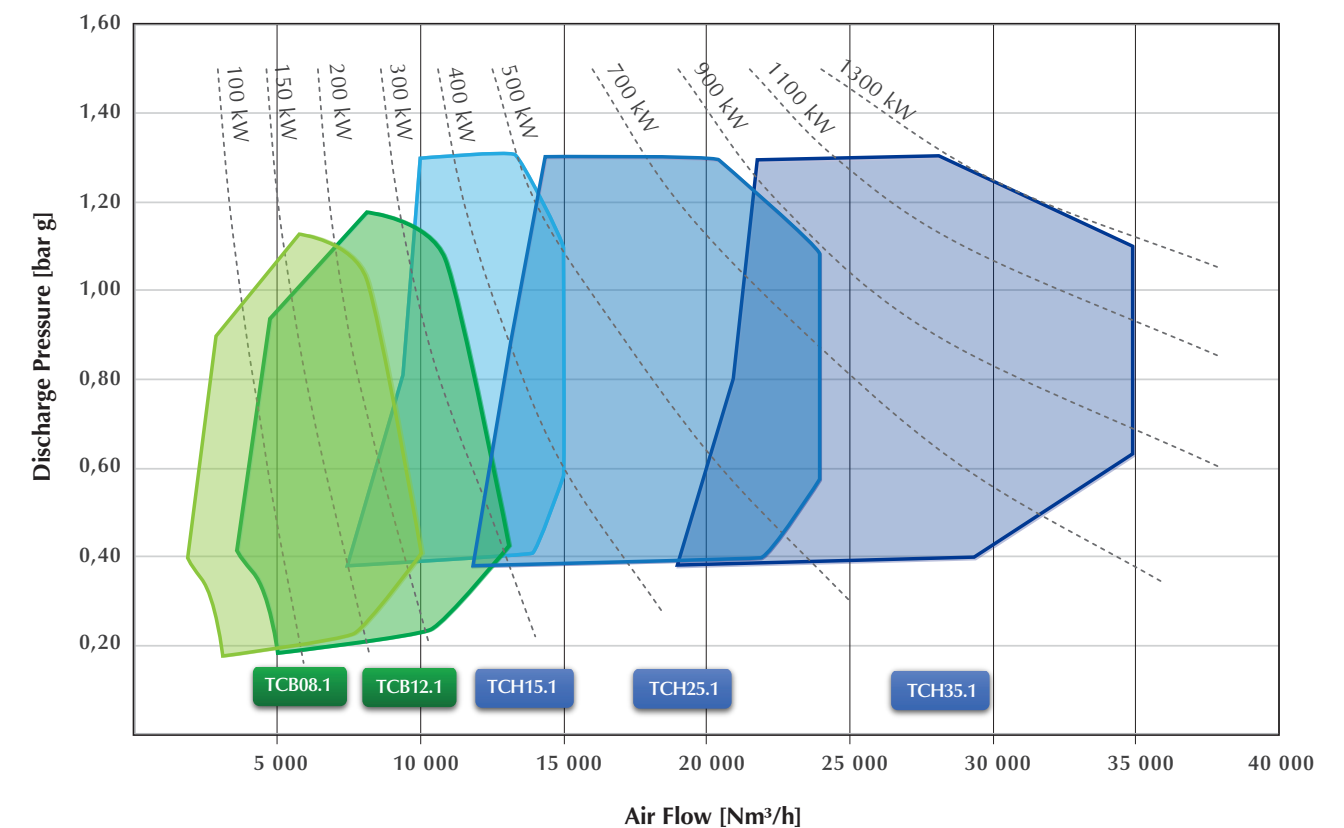
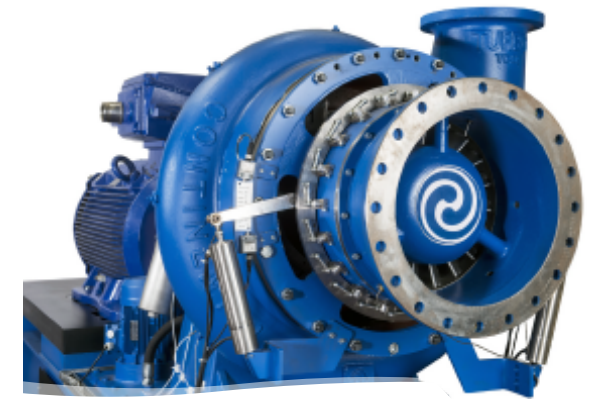
Ceramic angular ball bearing technology
Flow range from 2,500 to 14,000 Nm³/h
Pressure up to 1,2 bar g

Advantages

- Reliable
- Energy saving
- Low vibrations
- Low noise emission
- Simple and precise design
- Stable performance

Turbo compressor range

The extremely simple design of our machines guarantees maximum reliability, which is absolutely necessary in all fields of industry in which production depends on the distribution of clean and dry air at a constant pressure.



Customer requirements
We assess specific application needs, flow and pressure requirements, energy and efficiency goals.

High adaptability

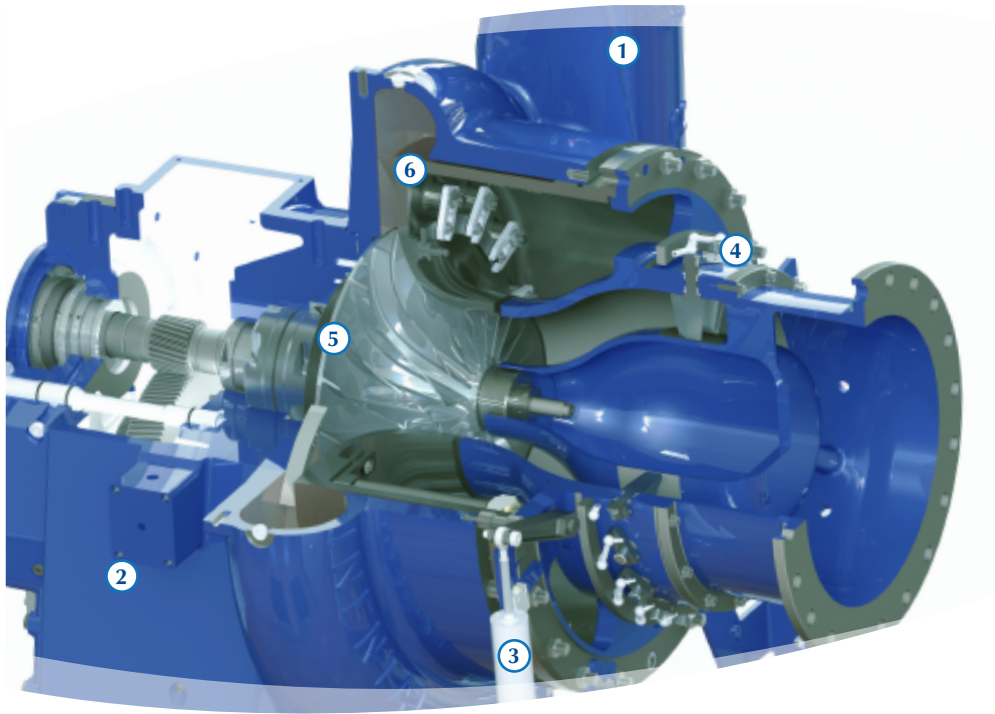
From a design perspective, our wide range of products allow us to always select the best configurations to answer customer requirements.

Optimal performance

We achieve maximum efficiency and lowest power consumption under varying operating conditions to ensure full compliance to specifications.

TCH Turbo Elements

- 1. Volute
- 2. Gearbox
- 3. Actuator VDV
- 4. Inlet Guide Vanes (IGV)
- 5. Impeller in overhung design
- 6. Variable Diffuser Vanes (VDV)



Material specification

Main castings	Cast iron EN GJL-250
Impeller	Aluminum alloy (2618A) or Stainless steel
Vaness	Aluminum alloy, Stainless steel, Bronze
Gear / Wheels	High tensile 18CrNiMo7
Fast Shaft	High tensile 18CrNiMo7
Drive Shaft	High tensile 34CrNiMo6
Journal Bearings, Fast Shaft	4/6-lobes, Steel Allow & white metal film (Babbitt)
Journal Bearings, Drive Shaft	Cylindrical, Steel Allow & white metal film (Babbitt)
Base Frame	Structural Steel
Coupling	Flexible compact type

Auxiliaries

Inlet Filter/Silencer	95% filtration as per Filter Class EU G4 & baffle type silencer
IGV/VDV Actuation	Electric linear actuator
Expansion Joints	DN500 to DN250 steel flanges with Stainless Steel or EPDM Bellows
Cone Diffuser	Inlet DN250/300 – Outlet DN350 to 800
Blow-off valve	DN 150/200, Electrically actuated
Check valve	DN350/800, dual flap wafer type
Oil for Gearbox	210 to 450 aprox.(ISO VG68/46)
Lube oil cooling	Air (water on demand)
Cooling Fan	IP55 50/60Hz

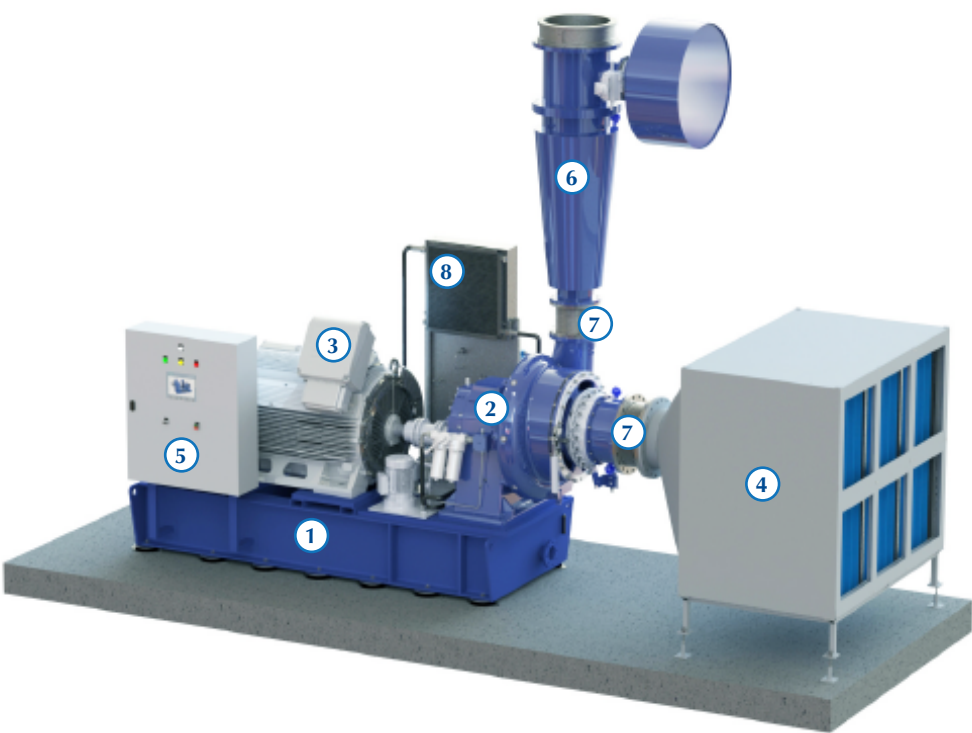
Compressor Drive

Drive	Electrical motor 2 poles
Motor Voltage	Low-medium-high voltage
Input frequency	50/60 Hz
Motor speed	3000 rpm or 3600 rpm
Protection class	IP55

Standard Qualification

Test Procedure	ISO 5389 & ASME PTC10
Mechanical Test	Internal Standard
Quality	ISO 9001:2015
Optional	API 617/672

- 1. Base Frame
- 2. Turbocompressor
- 3. Electric motor
- 4. Inlet Filter/Silencer
- 5. Local Control Panel
- 6. Cone Diffuser/Silencer
- 7. Stainless steel expansion joint
- 8. Air Cooling (Water cooling optional)



Performance data

Flow Range	8 000 to 35 000 Nm3/h (See Performance chart)
Pressure Range	0.4 to 1,3 bar (g)
Turndown	100% - 45% of rated flow with Combined control
Power Range	250 to 1.200 kW
Discharge Velocity	Below 20 m/s after Cone
Vibration Level	Max. 4.5 mm/s per ISO 20816
Noise Level	95 dB(A) Without enclosure 85 dB(A) With standard enclosure 75 dB(A) With high performance enclosure

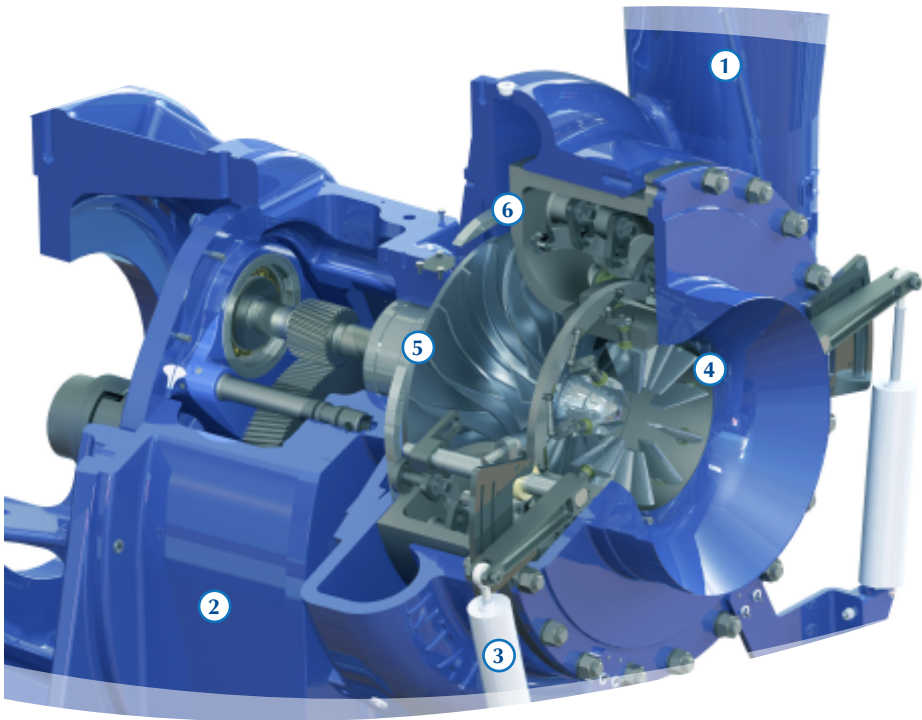
* Enclosure dimensions may be adapted based upon client specific requirements

Panels

Human Machine Interface (HMI)	Siemens KTP900 Basic 9"
Option	Siemens KTP1200 Basic 12"
Option	Allen Bradley Panel View Plus 7"
Programmable Logic Controller (PLC)	CPU Siemens SIMATIC 1510SP-1PN
Option	Allen Bradley Compact Logix 1769-L series
Instrumentation	Air Pressure transmitters 4-20 mA Air Temperature transmitters 4-20 mA Bearing Temperature RTDs Oil Temperature transmitter and thermostats switches Oil Pressure transmitter and pressure switches Oil Level Sight Glass and Alarm switch Vibration Transmitter 4-20 mA Surge Switch Fast Shaft X,Y,Z displacement surveillance (optional)

TCB Turbo Elements

- 1. Volute
- 2. Gearbox
- 3. Actuator VDV
- 4. Inlet Guide Vanes (IGV)
- 5. Impeller in overhung design
- 6. Variable Diffuser Vanes (VDV)



Material specification

Main castings	Cast iron EN GJL-250
Impeller	Aluminum alloy (2618A) or Stainless steel
Vaness	Aluminum alloy, Stainless steel, Bronze
Gear / Wheels	High tensile 18CrNiMo7
Fast Shaft	High tensile 18CrNiMo7
Drive Shaft	High tensile 34CrNiMo6
Bearings, Fast Shaft	High precision ceramic angular ball bearings
Bearings, Drive Shaft	Deep groove ball bearings
Base Frame	Structural Steel
Coupling	Flexible compact type

Auxiliaries

Inlet Filter/Silencer	95% filtration as per Filter Class EU G4 & baffle type silencer
IGV/VDV Actuation	Electric linear actuator
Expansion Joints	DN300/350 Inlet steel Stainless Steel or EPDM Bellows
Cone Diffuser	Inlet DN150/200 - Outlet DN250 to DN500
Blow-off valve	DN 100/150, Electrically actuated
Check valve	DN250/500, dual flap wafer type
Oil for Gearbox	45 to 55 liters (ISO VG46)
Lube oil cooling	Air or external liquid to oil
Cooling Fan	IP55 50/60Hz

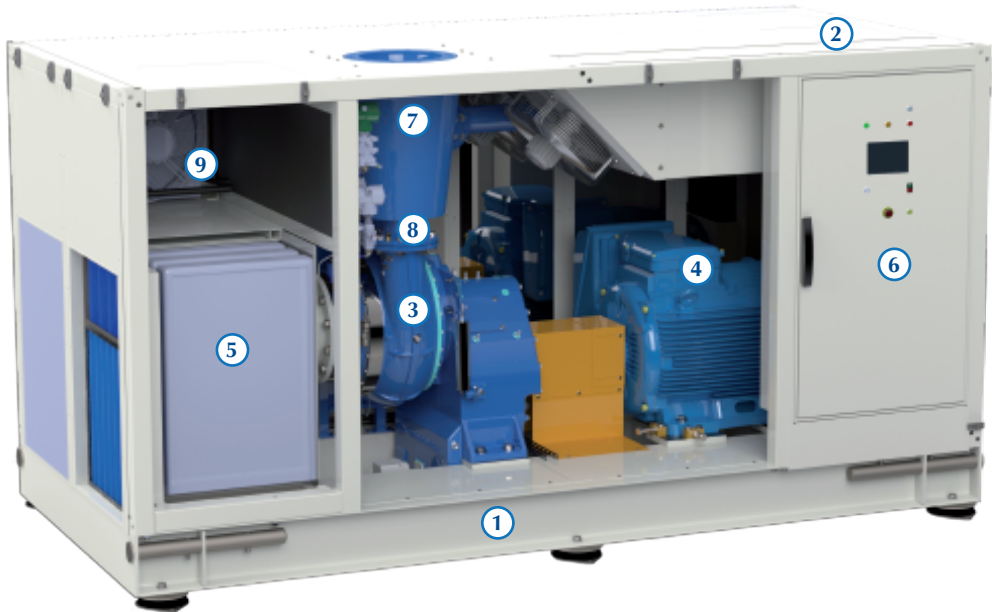
Compressor Drive

Drive	Electrical motor, 2-Pole
Motor Voltage	Low-medium voltage
Input frequency	50/60 Hz
Motor speed	3000 rpm or 3600 rpm
Protection class	IP55v

Standard Qualification

Test Procedure	ISO 5389 ASME PTC10
Mechanical Test	Internal Standard
Quality	ISO 9001:2015

- 1. Base Frame
- 2. Noise enclosure
- 3. Turbocompressor
- 4. Electric motor
- 5. Inlet Filter/Silencer
- 6. Local Control Panel
- 7. Cone Diffuser/Silencer
- 8. Stainless steel expansion joint
- 9. Air Cooling (Water cooling optional)



Performance data

Flow Range	4 000 to 14 000 Nm3/h (See Performance chart)
Pressure Range	0.4 to 1.2 bar (g)
Turndown	100% - 45% of rated flow with Combined control
Power Range	Up to 350 kW
Discharge Velocity	Below 20 m/s after Cone
Vibration Level	Max. 2.8 mm/s per ISO 20816
Noise Level	100 dB(A) Without enclosure 85 dB(A) With standard enclosure 75 dB(A) With high performance enclosure

* Enclosure dimensions may be adapted based upon client specific requirements

Panels

Human Machine Interface (HMI)	Siemens KTP900 Basic 9"
Option	Siemens KTP1200 Basic 12"
Option	Allen Bradley Panel View Plus 7"
Programmable Logic Controller (PLC)	CPU Siemens SIMATIC 1510SP-1PN
Option	Allen Bradley Compact Logix 1769-L series
Instrumentation	Air Pressure transmitters 4-20 mA Air Temperature transmitters 4-20 mA Bearing Temperature RTDs Oil Temperature transmitter and thermostats switch Oil Pressure transmitter and pressure switch Oil Level Sight Glass and Alarm switch Vibration Transmitter 4-20 mA Surge Switch Fast Shaft X,Y,Z displacement surveillance (optional)

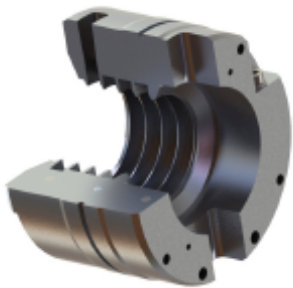
Made in Europe



Body of the Compressor

The body of the compressor is made of cast iron. Aerodynamics components have been designed with the latest Computational Fluid Dynamics (CFD) tools. The design of the body allows us to reach high compression efficiency and a low sound level. We offer flexible outlet configurations tailored to each client's unique specifications.

Main components



Impeller

The impeller is made of aluminum alloy. It is a radial type impeller with deflected blades. Backsweep angle of the blade allows to reach high polytropic efficiency (> 85%).

Labyrinth Seals

Labyrinth seals on the impeller's shaft prevents oil (gears) ingress into downstream air discharge (impeller).

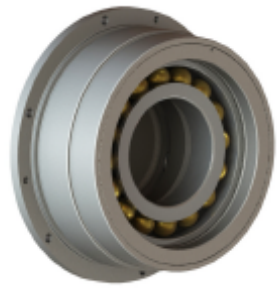
Optimization



Capacity control

A wide operating range is ensured by a dedicated impeller design optimized for specific operating requirements, along with a high-efficiency transmission and an advanced control system. Stepless capacity control between 45% and 100% at a constant rotational speed of the impeller. The operating point is controlled automatically by suitable orientation of Inlet Guide Vanes (IGV) on the inlet and/or the Variable Diffuser Vanes (VDV) on the outlet.

Bearing technologies



TCH Hydrodynamic journal bearing

TCH gearbox uses the highest quality hydrodynamic lubricated journal bearings for longer life and minimum vibration.

TCB Ceramic angular ball bearing

TCB gearbox uses the highest quality ceramic angular ball bearings. This construction results in exceptionally long life with minimum vibration.

Aerodynamic features

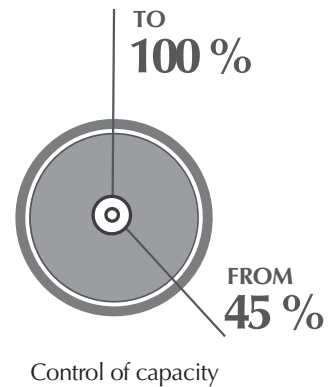


Easy operation

The control system helps to minimize the probability of accidental operator errors and uses a series of sensors to detect and quickly respond to anomalies.

This advanced automated solution is designed to adapt to various industrial processes and can be customized based on specific customer needs and requirements.

The aerodynamics actuators can be supervised and operated locally from human machine interface (HMI).



Improving efficiency

The efficiency optimization and a high level of turndown is achieved by means of a set of rotating vanes at the inlet (IGV) to adapt the pressure and another set of diffusers vanes (VDV) at the volute outlet to adapt the flow rate.

The use of this combination improves the efficiency when the operating point of the compressor has changed because of the flow, inlet temperature and pressure.



Aerodynamic vanes

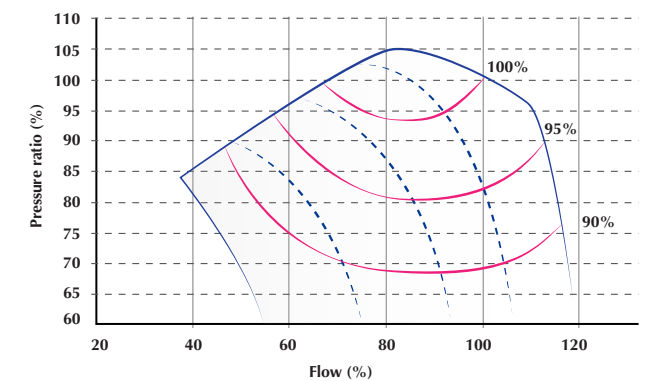
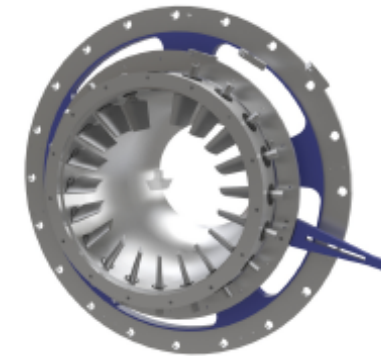
Aerodynamic design

Aerodynamic technology in compressors utilizes specially designed inlet vanes to create streamlined path for incoming air allowing it to move in orderly layers toward the impeller, and outlet vanes to start transforming air speed into pressure.

As a result, the compressor operates more efficiently and consumes less energy. That is the reason why Continental Industrie has fitted its compressor with this combination of Inlet Guide Vanes (IGV) and Variable Diffuser Vanes (VDV) to guarantee the maximum efficiency.

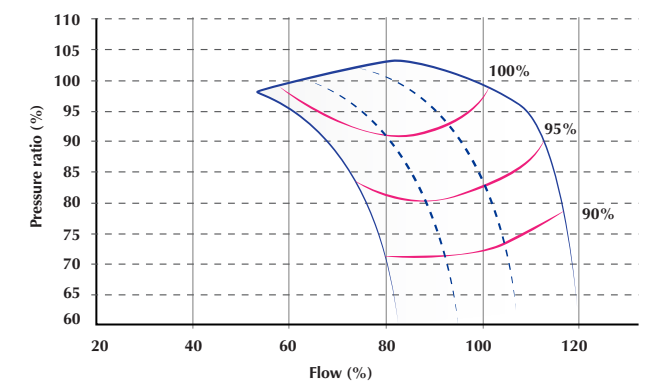
IGV Control

The Inlet Guide Vane (IGV) control optimizes the efficiency of our machines against changing operating conditions such as inlet temperature, relative humidity, outlet pressure.



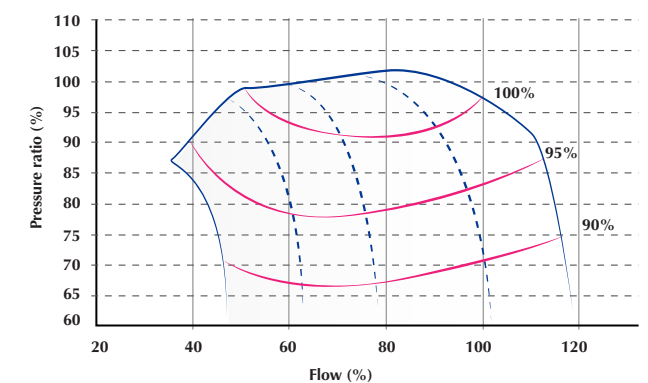
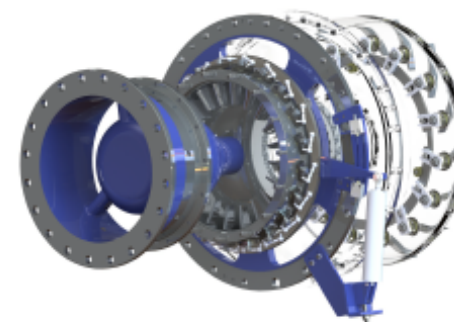
VDV Control

The Variable Diffuser Vane (VDV) control offers a wide operating flow range with excellent efficiency while maintaining a constant motor speed.



Combined Control

IGV & VDV control maintains 95% of design efficiency in almost the entire range of operation.



Pressure lubrication system

The pressure lubrication system provides a safe and reliable oil lubrication for the gear set and bearings as well as cooling for the bearings and gears.

This complete system is designed to comply with the API 614-5th and factory assembled and tested.

The oil lubrication system consists of the following components:

Main oil pump

The main oil pump is mechanically driven from the low speed shaft.

- Gear type
- Pump body in carbon steel

Auxiliary oil pump

The auxiliary oil pump is driven by electrical motor, installed vertically and submerged into the oil reservoir. It has the same capacity as the main pump and is used to prime the system before start-up and acts as a standby unit in emergency and during shutdown.

- Gear type
- Pump body in carbon steel

Oil reservoir

The oil reservoir is integrated in the base frame (TCH Series) or the Gearbox (TCB Series).

It includes fill connection, inspection opening, gauge glass and ventilation.

- Carbon steel
- Painted with an oil resistant paint
- 3 min retention time

Oil Filter

Duplex element oil filters (TCH Series) or single oil filter (TCB Series)

connected with manual switch valve.

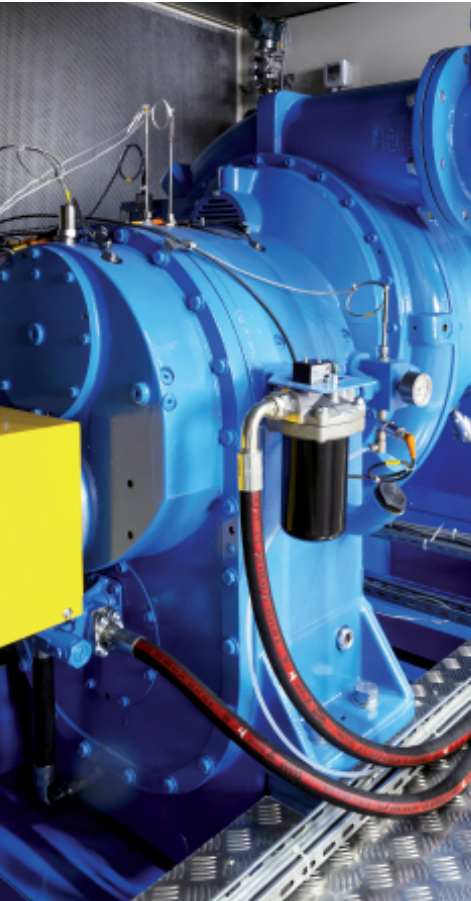
- 10 µm filtration
- Electrical & visual clogging indicator
- Casing in Aluminum

Oil cooling heat exchanger

- Air-cooled or Water-cooled

Oil heater (Optional)

The heating element will ensure that the oil maintains a minimum temperature in case of stand-still or cold site conditions.



Control panel

The control and monitoring system shall ensure correct operating conditions at start and stop of the compressor as well as during operation.

It also monitors the lubricating oil system, the activation of the blow-off valve, the IGV and VDV.

The local control panel can be mounted on the base frame or on a self-standing support.

Panel

- Carbon steel, epoxy-polyester powder painted, protection class IP54
- Operating items at the front side
- Key switch to select operation mode “Unavailable / Remote / Local”
- Push buttons (and lamps) to start / stop the compressor
- Push button “emergency stop”
- Push button “restart”
- Push button “failure acknowledgement”
- Lamps to monitor compressor status (Running / Warning / Failure)

Programmable logic controller (PLC)

- Siemens 1510SP-1 CPU, with two Profinet sockets, I/O modules and software for fully automatic start / stop sequence and monitoring the process values
- or
- Allen Bradley Compact Logix 5370, I/O modules and software for fully automatic start / stop sequence and monitoring the process values

Control

- Pressure or Flow regulation with IGV & VDV control
- Efficiency optimization through temperature and pressure reading
- Surge monitoring through turbo parameters monitoring
- Gearbox monitoring (vibration, bearing temperature, shaft displacement)
- Oil circuit monitoring including :
 - Cooling/heating control
 - Pressure and temperature safety & monitoring
 - Level indicators
 - Mechanical & electrical pump management
 - Oil filter monitoring
 - Motor monitoring (overload, winding and bearing temperature)
 - Sound enclosure fan control



Human Machine Interface (HMI)

Installed at the front side of the panel:

- Siemens KTP900 Basic PN, 9”, IP65
- or
- Allen Bradley PanelView Plus 7 STD, 7”, IP66

Communication (DSC, MCC)

Modbus TCP (the control panel is a Modbus server)

Profibus or other communication protocol on demand