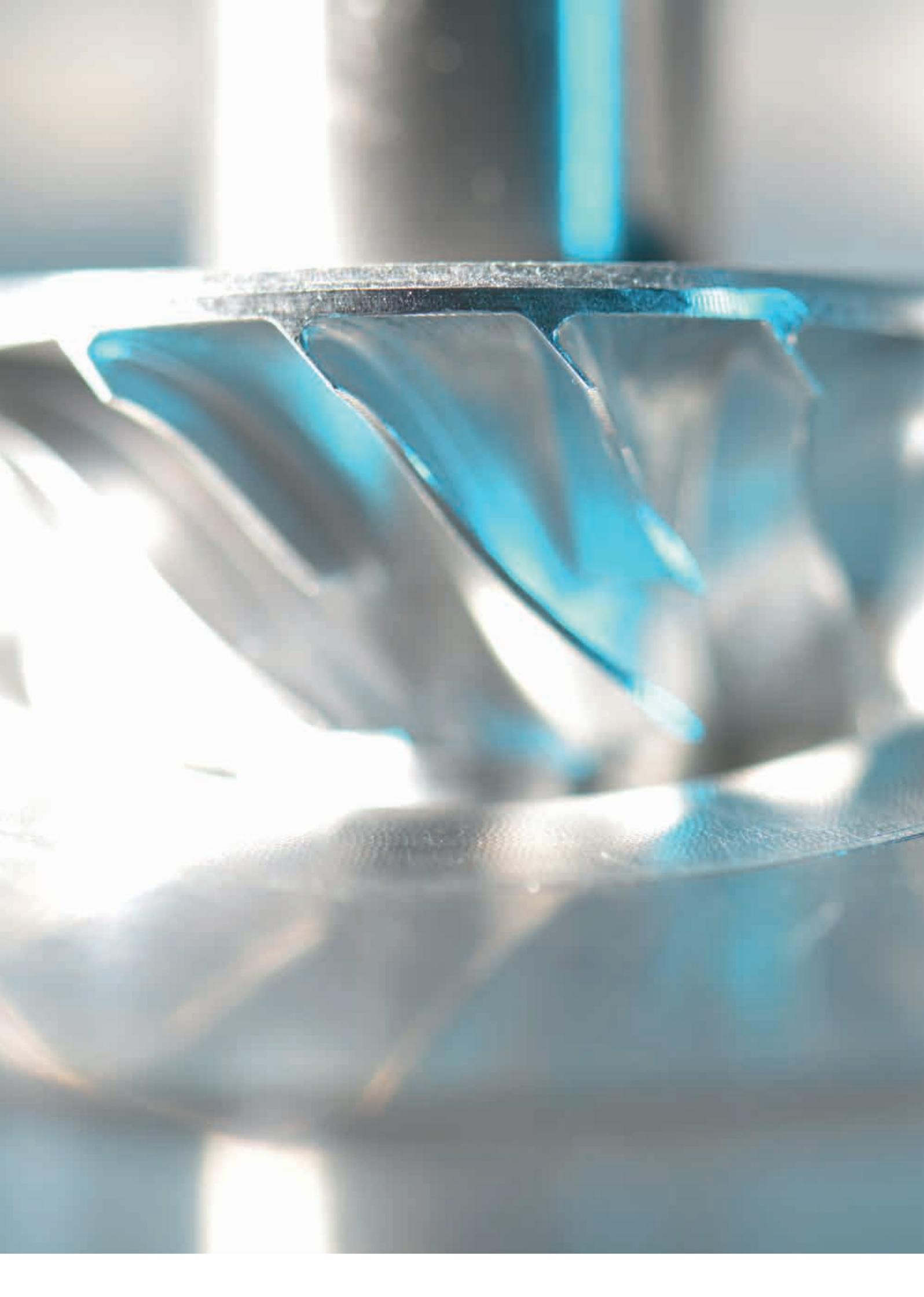


A detailed, close-up photograph of a turbo compressor. The main body is a light grey metal. A large circular inlet on the right side shows a threaded inner section leading to a central turbine wheel with several blades. A small, cylindrical component is visible on top of the main housing.

**Turbo Compressors with
Gas Bearings**



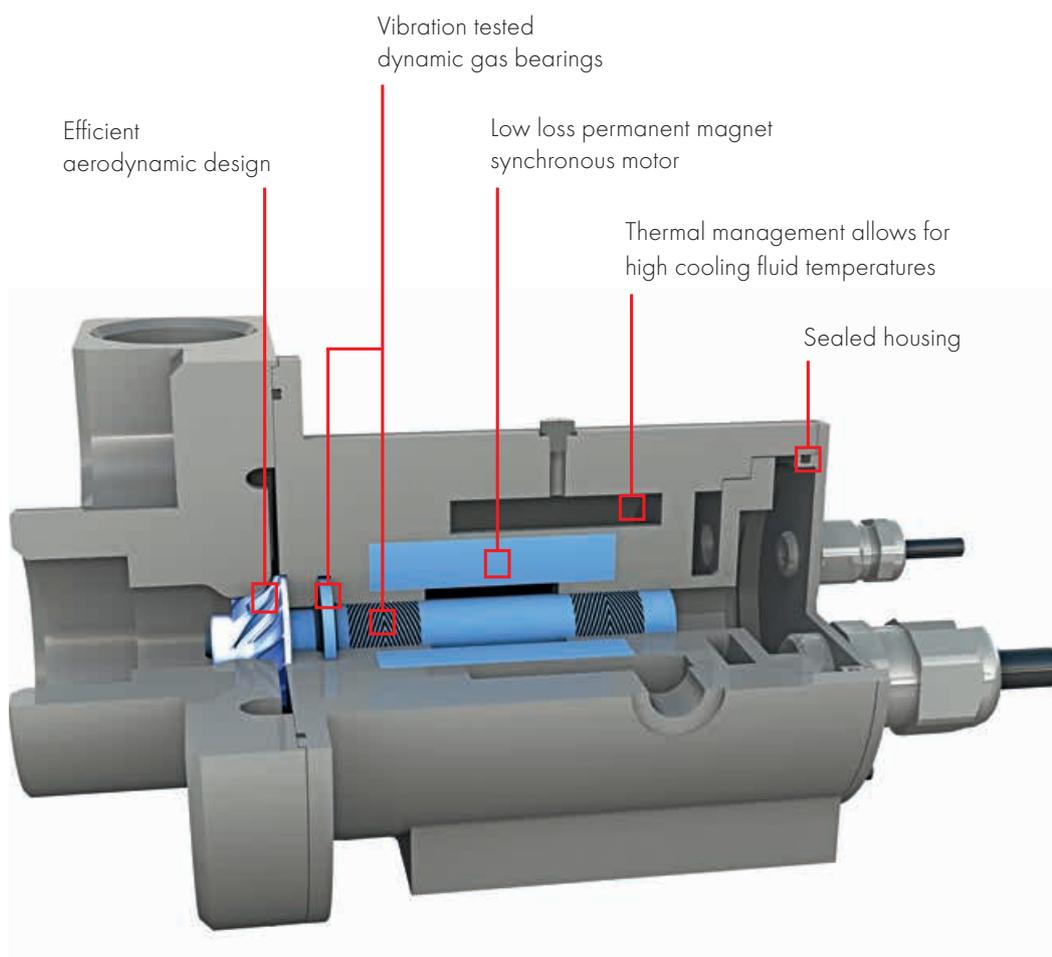
Introduction

The Swiss high-tech company Celeroton AG is the leading manufacturer of ultra-high-speed turbo compressors and electrical drive systems with speeds up to 1 million rpm.

The combination of miniature turbo machinery, ultra-high-speed motors, specialised converters and proprietary gas bearing technology results in world leading miniature turbo compressors concerning pressure and flow vs. volume and weight. Air as well as other gases can be processed with this technology.

The turbo compressors allow for unique solutions concerning efficiency, weight, size, lifetime, and oil-free flow of the fluid in various application areas such as fuel cells, air conditioning and heat pumps, respirators and oxygen concentrators, high-tech blowers and pneumatics.

Turbo Compressor Technology



Gas Bearing Technology



Design

- > Dynamic gas bearing, no external pressure supply required
- > Optimized for ultra-high-speeds (speeds beyond 100,000 rpm)
- > Adaptable for air, refrigerants and other gases
- > Patent pending gas bearing technology



Vibration

- > Vibration and shock proven design
- > No bearing fatigue due to vibration
- > Minimal noise and vibration emission



Oil-free

- > Oil-free air/gas supply
- > No oil management system needed
- > No foaming of refrigerants



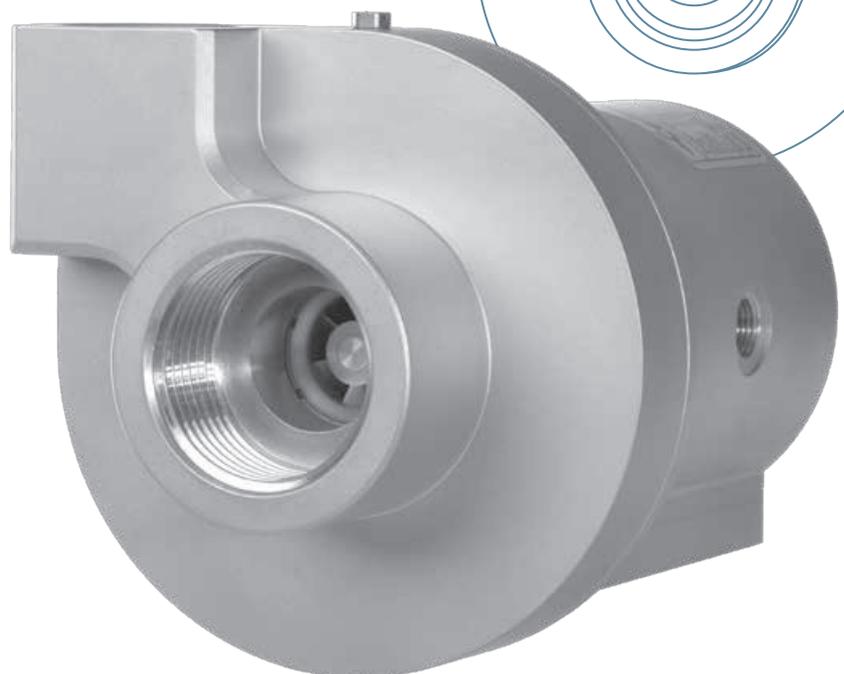
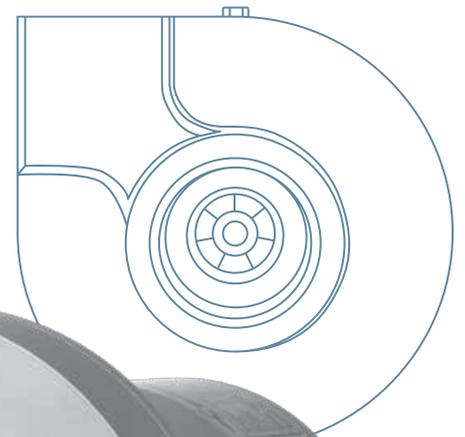
Start/Stop and Lifetime

- > Infinite bearing lifetime in continuous operation
- > Proven concept for achieving more than 100,000 start/stop cycles



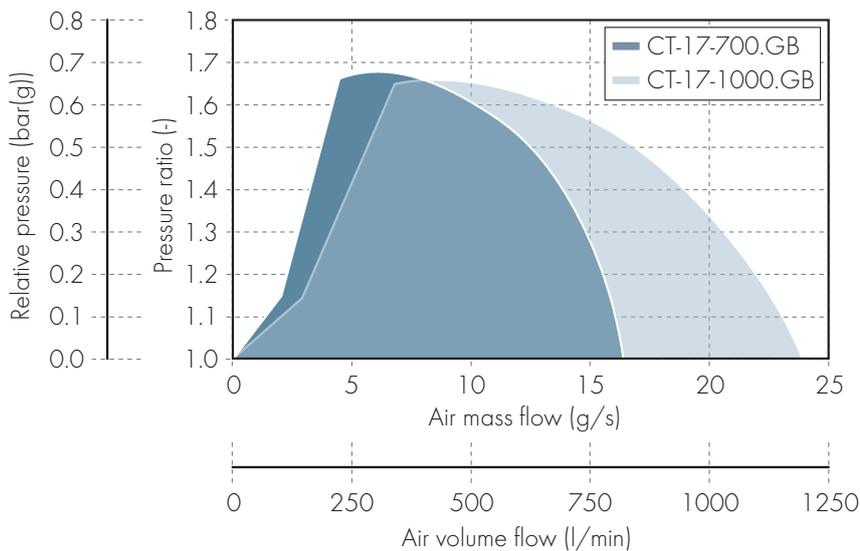
Temperature

- > System start and full speed operation over a wide air/gas inlet temperature range (e.g. -30°C to +70°C)
- > Full speed system operation up to high cooling water temperatures (e.g. +80°C)



Products

- > Highly compact, high-speed, electrically driven radial turbo compressors CT-17-700.GB and CT-17-1000.GB with air bearings for the oil-free compression and circulation of air
- > Optimized aerodynamics and electromagnetics for high efficiency
- > Compatible with converters CC-120-1000 or CC-230-3500

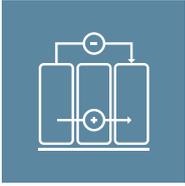


Customized compressors for different specifications (gas, pressure, flow, environmental, etc.) available

Compressor	CT-17-700.GB	CT-17-1000.GB
Pressure ratio (max.)	1.65	1.65
Mass flow (max.)	17 g/s	24 g/s
Isentropic overall efficiency	58%	59%
Rated speed (max.)	280,000 rpm	
Rated power	700 W	1,000 W
Weight	1.5 kg	
Length	183 mm	
Front diameter	90 mm	

Converter	CC-230-3500	CC-120-1000
Rated power	3,500 W	1,000 W
Input voltage	110 - 230 VAC	40 - 120 VDC
Startup from battery	No	Yes (8 - 32 VDC)
Size (L x W x H)	267 x 205 x 80 mm	150 x 130 x 45 mm

Application areas



Fuel cell

- > Oil-free air supply
- > Allows highly dynamic fuel cell pressurisation
- > Large Balance of Plant (BoP) power savings compared to existing compressor solutions



Respirators/Oxygen concentrators

- > Mobile oxygen concentrators, medical and rescue respiratory aids
- > Long lifetime and reduced maintenance
- > Increased pressure capability compared to existing blowers



Pneumatics

- > Decentralised pressure and vacuum generation
- > Substitution or simplification of compressed air piping
- > Energy savings by replacing ejectors



High-tech blowers

- > Circulation of air and other gases without contamination
- > Small outer diameter with diagonal (mixed-flow) aerodynamic design
- > Unique combination of low weight, high flow rates, high pressure and efficiency



Air conditioning/Heat pumps

- > Increased efficiency, coefficient of performance and compactness
- > Oil-free compression of refrigerants
- > HVAC and heating for stationary as well as mobile applications in hybrid and electric cars



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