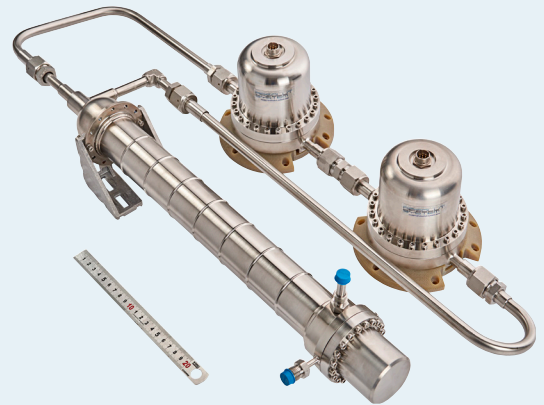


REVERSE TURBO-BRAYTON

Cryocooler for Earth observation.



The Reverse Turbo-Brayton developed by Absolut System is specially designed for space applications. It includes two compressors, a recuperator and an expansion turbine.

The cryocooler uses miniature high-speed turbomachinery and a high-efficiency heat recovery unit to ensure efficient cooling with low exported vibrations and high reliability.

This technology meets the increasingly stringent requirements for mechanical stability (without vibration). It offers the possibility of integrating cryocoolers with a different approach (cooling power distribution, cooling at different temperatures, pre-cooling).

Compatible with life expectancy requirements in excess of 10 years

Hydrodynamic gas bearings

No vibration below :

Requires no vibration-cancelling electronics or damping structure.

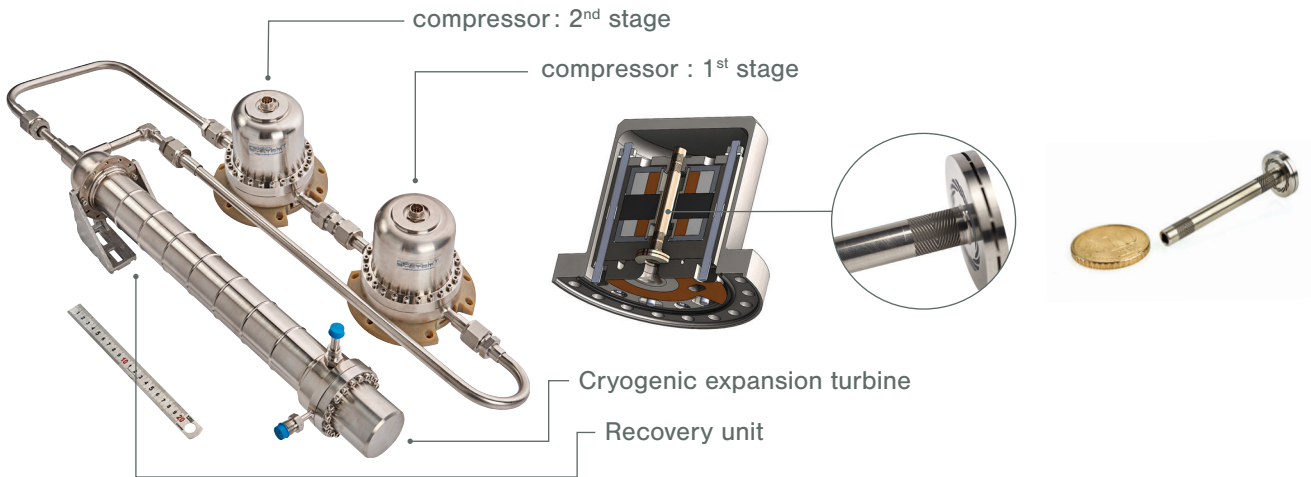
Possible thermal decoupling between the application and the cryocooler



Hydrodynamic gas bearing

30 years of heritage acquired by Absolut System through the integration of OFTTECH experts (TRL 9 technology with the MELFI project).

- ▶ Use for high-reliability systems
- ▶ Innovative frictionless technology
- ▶ Extended service life



Key points

Frequency	Operating frequency in excess of 2500 Hz with low-mass rotors.
Innovative frictionless shaft	Gas bearings for non-contact operation.
Thermodynamic cycle	High-efficiency thermodynamic cycle over the 40 K-300 K temperature range.
Modularity	Possibility to implement pre-cooling by means of radiators. Flexible integration capability with large-area or dispersed cooling.

Technical information

Engineering office

- ▶ CFD modelling to optimise hydrodynamic aspects
- ▶ FEM modelling for the motor
- ▶ Dynamic design of rotor and bearings

Power

- ▶ Cold power : > 1W @ 40K
 - ▶ Consumption: < 180W électrique
 - ▶ Rotation speed : > 100,000 RPM
 - ▶ Exported vibrations : < 20mN below 1 kHz
- Other models in development