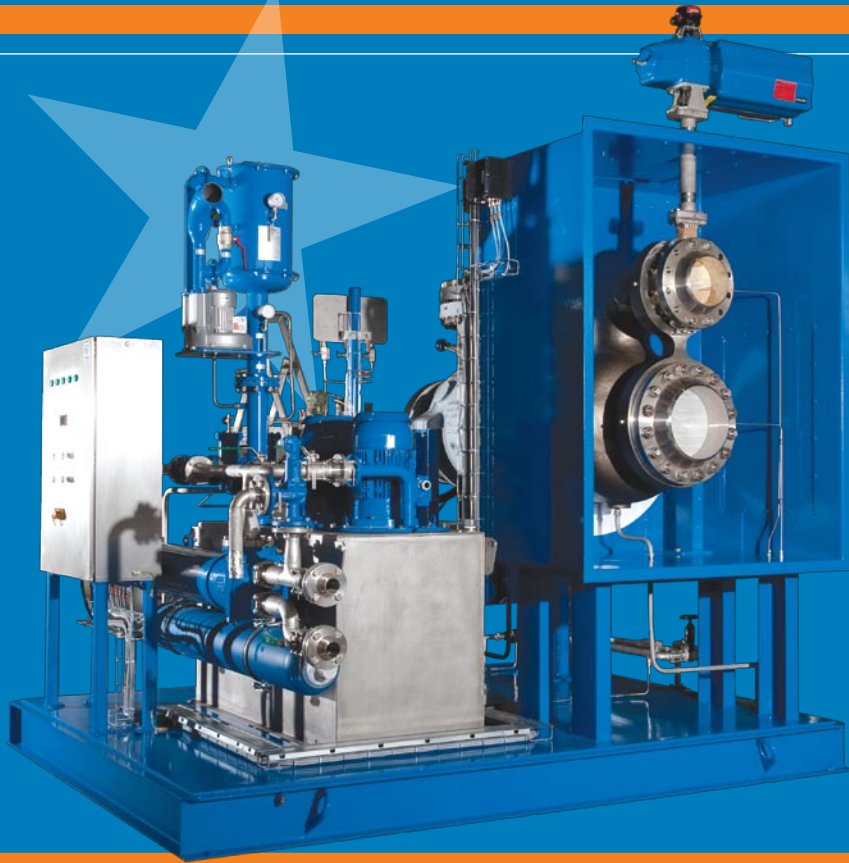


★ Turbo expander with compressor brake TC



★ Typical Application

Industrial Gas Industry (Air Separation Units) to provide refrigeration when a process booster compressor is required.

Oil and Gas Industry: Natural gas treatment (dew point control, ethane recovery, LNG production, NGL and LPG recovery) Petrochemical plant for refrigeration (Ethylene and ammonia / urea plants)

★ Usual Gases Handled

Air, Nitrogen, or waste gas from air with high oxygen or with CO, CO₂ (Sour) Natural Gas, H₂ & CH₄ mixtures, LNG, NGL, LPG.
Cryostar can accept high liquid content at outlet due to its unique expander design experience.

★ References

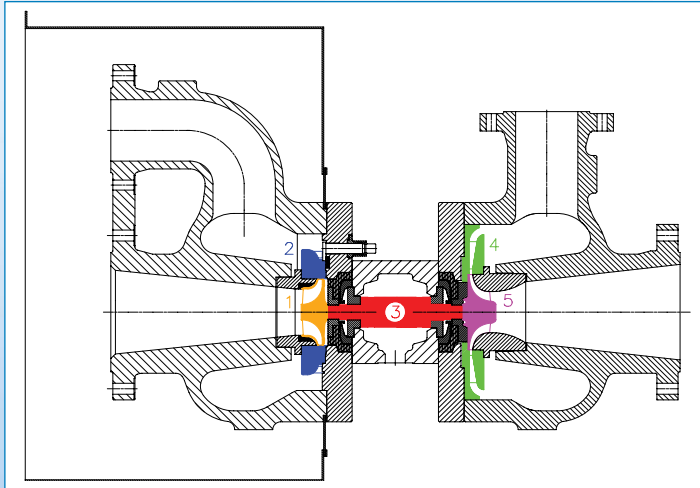
Cryostar has a long experience in the design of the TC, with the first unit built in 1976 and more than 500 units in operation sold to the major gas and hydrocarbon companies.

★ Features and benefits

- ★ Turbo expander with compressor mounted on a common shaft.
- ★ The “cartridge” design of the expander allows access to the rotating element without removing the expander casing and its cold box extension.
- ★ For easy maintenance, a spare “plug-in unit” (expander without casings usually named cartridge) allows customer to change all internal parts within a minimum of time and with maximum reliability.
- ★ Diffuser design allows low radial loads at all operating flows.
- ★ A modular lube oil system is feeding the bearings.
- ★ The standard cost effective expander package can be customized to meet the most stringent customer specifications or standards like API617 and API614.



★ TC Cross Section



- 1 High efficiency expander impeller
- 2 Variable inlet guide vanes for peak efficiency over wide operating range
- 3 Stiff shaft, sub critical (rigid) rotor
- 4 Diffuser
- 5 High efficiency compressor impeller

★ Sizes and type

Cryostar offers now TC120, TC200, TC300, TC400, TC500, TC600, TC700, TC800 depending on customer needs.

TC 300 →

T: Turbine (expander)
C: compressor
300 is the expander wheel diameter in mm

2TC

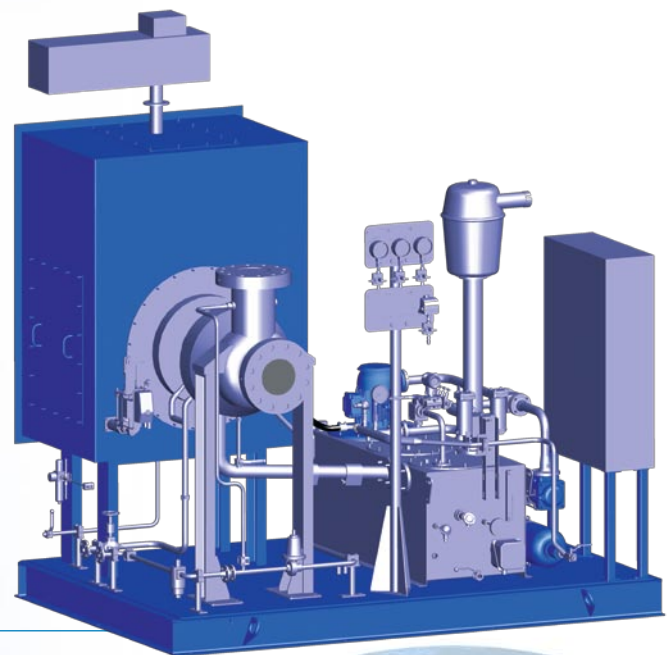
(2) Expanders can use a common lube oil system and skid

2TC120/300

The combination of one TC120 and one TC300

TC120 ECO

TC 120 without skid and usually reduced scope of supply



★ Range of operation

- ★ Flow up to 2.5 million Nm³/h (550 kg/s)
- ★ Pressures up to 200 bar
- ★ Expander temperature -270° C to +200° C
- ★ Power up to 12000 kW (16000 HP)

★ Other available Expander

- ★ **TFC, TCC:** Cryogenic expander with cryogenic compressor and possible oil brake
- ★ **MTC:** Expander with process compressor and active magnetic bearings
- ★ **ECO, TP:** Expander with oil brake
- ★ **TG:** Expander with generator and oil lubricated bearings
- ★ **MTG:** Expander with high frequency generator and active magnetic bearings
- ★ **LTP, LTG:** Cryogenic liquid expander with oil brake or generator

