

★ Turbo expander with generator brake and oil lubricated bearings TG



★ Typical Application

Industrial Gas Industry (Air Separation Units) to provide refrigeration and recover electricity.

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).

Energy recovery: Pressure Let Down stations, Geothermal Kalina, ORC cycles.

★ Usual Gases Handled

Air, Nitrogen, or waste gas from air with high oxygen content possibility

(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

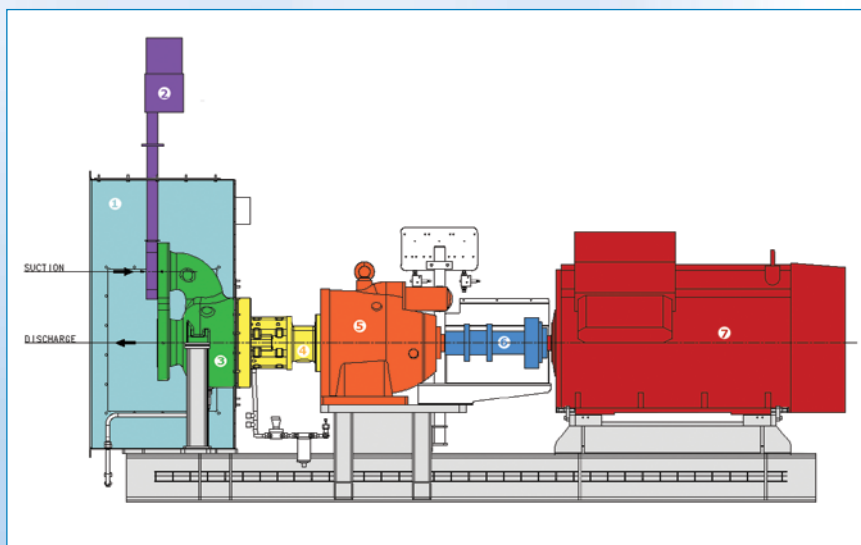
Cryostar has a unique experience in the design of the TG, with the first unit built in 1975 and more than 150 TG in operation sold to the major gas companies.

★ Features and benefits

- ★ Turbo expander and generator brake, usually with gear box.
- ★ 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 and gear box) allows customer to change all internal parts within a minimum of time and with maximum reliability.
- ★ Variable nozzles allow operating on a wide range of flows and pressures.
- ★ 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 like API614.



★ TG 2D View



- 1 Cold box extension (to bolt or weld on main cold box)
- 2 Quick Closing Valve
- 3 Expander
- 4 High Speed Coupling
- 5 Epicyclic or parallel shaft Gear Box
- 6 Low Speed Coupling
- 7 2 or 4 pole Generator

★ Sizes and type

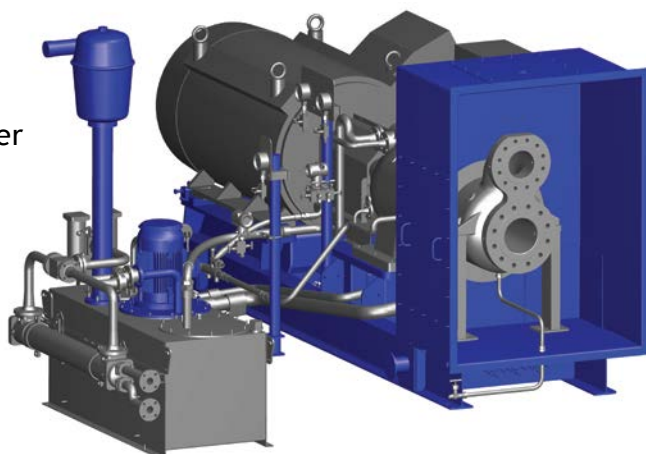


Cryostar offers now TG 120, TG 200, TG 300, TG 400, TG 500, TG 600, TG 700, TG 800 depending on customer needs.

TG 300 →

T: Turbine (expander)
G: Generator brake
300 is the expander wheel diameter in mm

Two expanders can use a common skid: 2TG
2TG 120/300 is the combination of one TG120 & one TG 300 expander on the same skid
2TG200 is the combination of two TG 200 on the same skid



★ 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 15'000 kW (20'000 HP)

★ Other available Expanders

- ★ **TC**: Expander with process compressor and oil lubricated bearings
- ★ **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
- ★ **MTG**: Expander with high frequency generator and active magnetic bearings
- ★ **LTP, LTG**: Liquid expander with oil brake or generator

