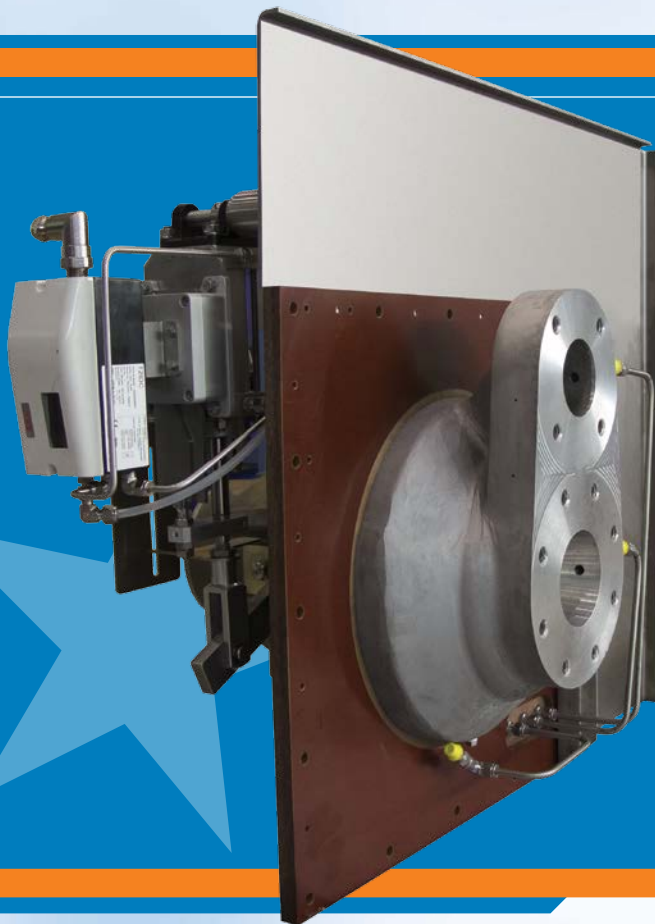


★ Turbo expander with oil brake ECO



★ Typical Application

Industrial Gas Industry (Air Separation Units : Nitrogen or Oxygen production, Nitrogen refrigeration loop) to provide refrigeration for power less than 80 kW.

★ Usual Gases Handled

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

★ References

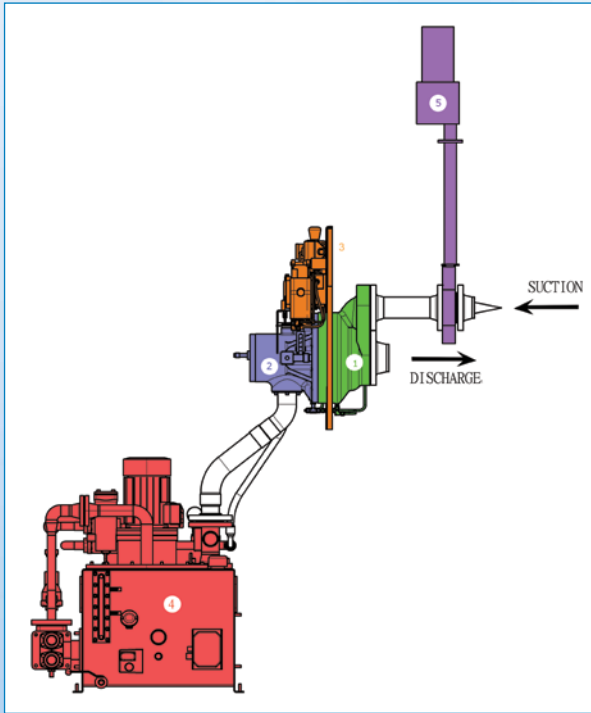
Cryostar has a long experience in the design of the ECO, with the first unit built in 1983 and more than 500 ECO in operation sold to the major gas companies.

★ Features and benefits

- ★ Turbo expander with oil shear brake mounted on a common shaft.
- ★ The “cartridge” design of the expander allows access to the rotating element without removing the expander casing.
- ★ For easy maintenance, a spare “plug-in unit” (expander without casing) 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 oil brake and bearings.
- ★ The standard cost effective expander package is very reliable and offered at a competitive pricing but can be customized on request.



★ ECO 2D View



- 1 Expander Casing
- 2 Shear Oil Brake and bearings
- 3 Annex Plate to bolt on customer cold box
- 4 Lube Oil System
- 5 Quick Closing Valve

★ Sizes and type

Cryostar offers now ECO 70, ECO 90, ECO 120, depending on customer needs.

ECO 120 →

ECO is the ECONomic Turbine designed for low pressure application (cryogenic expander) 120 is the expander wheel diameter in mm

★ Range of operation

- ★ Flow up to 13'000 Nm³/h (5 kg/s)
- ★ Design Pressure up to 16 bar and design temperature -196°C to +100°C for expander
- ★ Power generated by the expander up to **80 kW** (105 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
- ★ **TP**: Expander with oil brake (High Pressure / Flow / Power)
- ★ **TG**: Expander with generator and oil lubricated bearings
- ★ **MTG**: Expander with high frequency generator and active magnetic bearings
- ★ **LTP, LTG**: Liquid expander with oil brake or generator

