



★ TURBO-EXPANDERS FOR COLD PRODUCTION AND ENERGY RECOVERY

Everywhere in the GAS SUPPLY CHAIN
Innovation for CONTINUOUS EXPANSION



www.kstc.ir

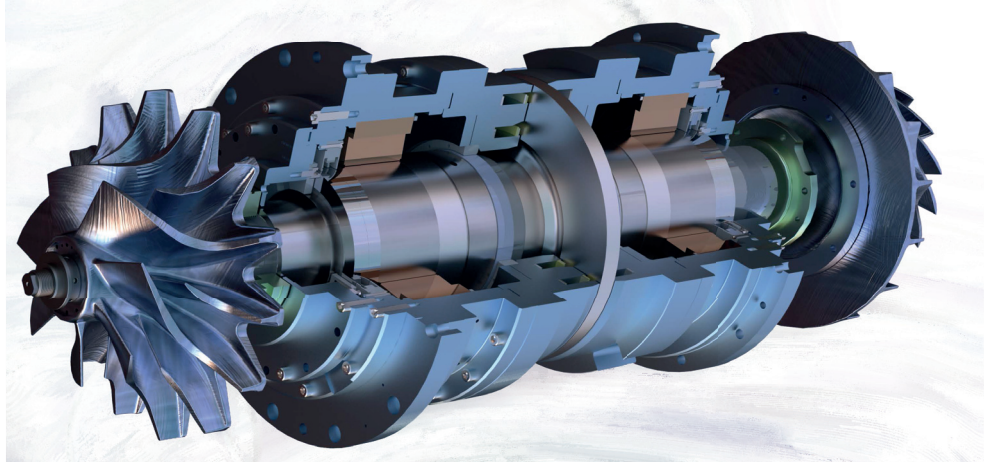
KSTC

turbo expander expertise for the gas supply chain in natural gas processing and petrochemical applications



KSTC's innovative drive and continued commitment to invest in and develop their world class engineering skills has moved them to the forefront of technological development in all their product lines. Every turbines is designed using state-of-the-art technology to ensure each customer the very best in product design. With a policy to the commitment to excellence, KSTC has earned a position as a world leader in their markets

- Basic engineering phase and FEED design.
- Customized design incorporating API and other high quality standards and strict customer requirements.
- Continuous innovation and development in the use of magnetic bearings, liquid turbo-expanders and LNG reliquifaction systems.
- Uncompromising lifetime customer support.

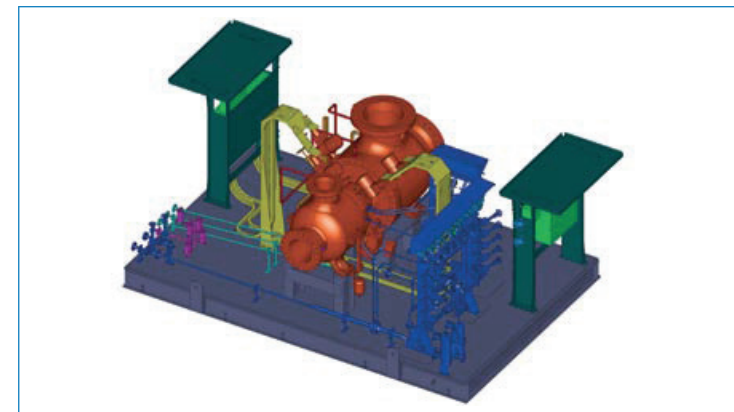




KSTC provides the best configuration to match to the application

KSTC designs all their turbo-expander packages to the strictest of industry and client requirements. Compliance to API 617 is standard and in addition, each machine can be fully customized to meet even the most stringent of client requirements. To assure customers on-time delivery to the agreed specification level, an engineering team is selected at the beginning of each project. The team includes of aero-designers, specialists in rotating machinery, instrumentation and control systems, seal gas and lube oil systems all coordinated by a project manager in conjunction with the quality department, fully involved at each step of the project.

Example of configuration of KSTC Turbo-Expander

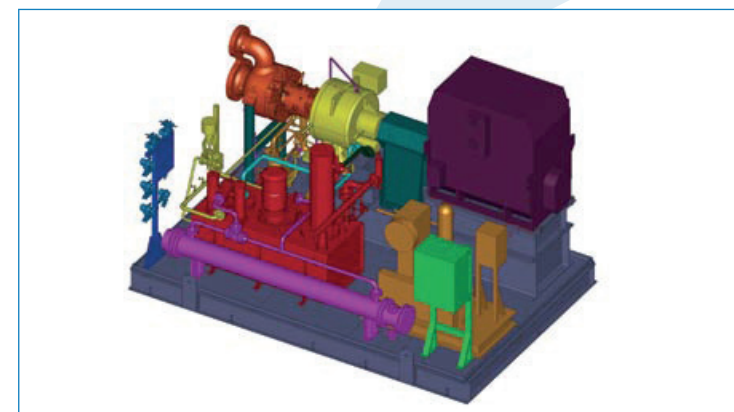
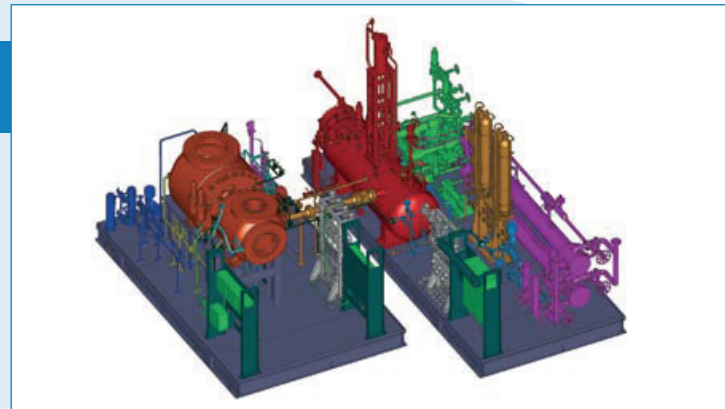


Turbo-expander/compressor equipped with active magnetic bearings.

- Main parts consisting in:**
- rotating machinery
 - electrical connections for magnetic bearings
 - seal gas system
 - local gauge board
 - local control panel
 - junction boxes panel
 - base plate

Turbo-expander / compressor equipped with oil lubricated bearings.

- | | |
|--|---|
| <p>Machine assembly with:</p> <ul style="list-style-type: none"> • rotating machinery • seal gas system • local gauge board • local control panel • junction boxes panel • base plate | <p>Oil system assembly:</p> <ul style="list-style-type: none"> • reservoir • coolers • pumps • accumulators • demister... |
|--|---|



Turbo-expander/generator equipped with oil lubricated bearings

Single skid package including machine assembly and oil lubrication system

Possibility to provide expander loaded with oil brake for application where it is not worth to recover the power available on the shaft.



General principle of cryostar hydrocarbon turbo-expander equipped with oil lubricated bearings

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| <p>1 • Expander casing
Designed and built under ASME specifications
Hydrostatic test at 1.5 times the MAWP
Material selected as per the application</p> <p>2 • Expander wheel
Open/closed 3D wheel
High efficiency up to 92%
Milled from solid
Heat treatment for maximum strength and durability
Material: aluminium alloy, SS or Titanium</p> <p>3 • Inlet guides vanes
Aerodynamically efficient design
Erosion-resistant materials
Wide operation range</p> <p>4 • Shaft/rotor
Special attachment for best moment transmission</p> | <p>5 • Labyrinth seals
Very safe and reliable system</p> <p>6 • Bearings
Combined radial tilting pad and axial tapered land bearing
Maximum stability and reliability</p> <p>7 • Compressor casing
Designed and built under ASME specifications
Hydrostatic test at 1.5 times the MAWP
Material selected as per the application</p> <p>8 • Compressor wheel
Open 3D wheel
High efficiency
Milled from solid
Heat treatment for maximum strength and durability
Material: aluminium alloy, SS or Titanium</p> |
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