

Nikkiso Hydrocarbon Expander Application Technology (NEAT)

Your Partner for Success

Product Information

NIKKISO

NEAT Hydrocarbon Turboexpanders will reduce the power consumption in your facility while delivering high efficiency in the energy recovery process.

- Design
- Repair
- Service
- Redesign
- Project review
- Feasibility
- Energy efficiency
- Geothermal
- Waste heat
- OTEC process

Taking care of the needs of today for energy efficiency and planning for the futures

Hydrocarbon Turboexpanders and energy efficiency go hand in hand to produce a high quality product while returning as much as 90% of the energy used. Processes that use pressurized gas or have pressure letdown in the process system can all benefit from the energy recovered by NEAT Hydrocarbon Turboexpanders equipment.

NEAT designs and manufactures state-of-the-art refrigeration and energy recovery equipment using 2D, 3D and flow modeling software that increases the efficiency of the product beyond what was considered possible before.

The gold standard of hydrocarbon turboexpanders

Expertise:

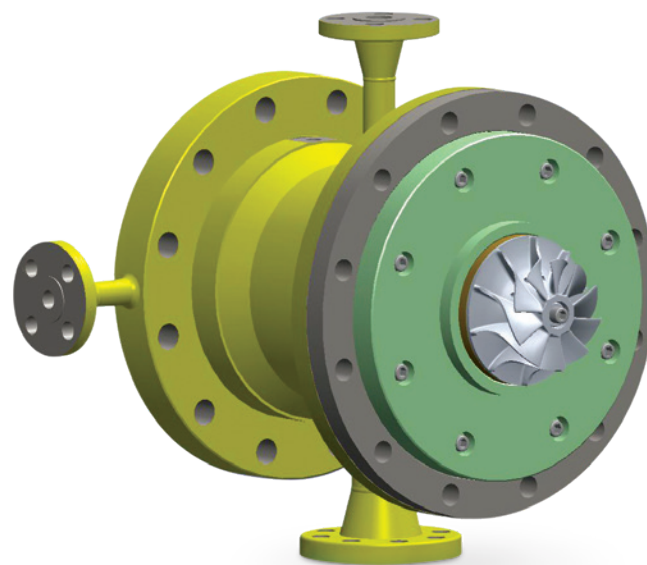
- New hydrocarbon turboexpanders
- Service/repairs/overhaul of existing turbomachines
- Rerates of existing turbomachines
- Project and feasibility studies (FEED studies)

Market focus and hydrocarbon turboexpander experience:

- Hydrocarbon gas processing (petrochemical, LNG, refineries, NGL)
- Energy recovery (gas pipeline pressure letdown, CHP)
- Power generation (geothermal, waste heat, ammonia cycles, ORC, solar)

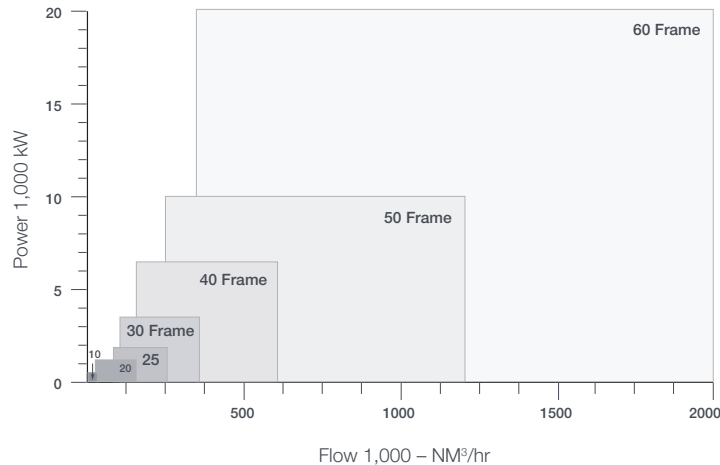
Standard hydrocarbon turboexpanders with compressor load (oil or magnetic bearings)

	SI units	English Units
Inlet pressure range	Up to 200 Bar	Up to 3,000 PSI
Inlet temperature range	-260 to +300 °C	-435 to 570 °F
Discharge liquid fraction	Any	Any
Power range	5 to 20,000 Kw	7 to 27,000 HP
Speed range	3,000 to 80,000 RPM	3,000 to 80,000 RPM
Inlet flow range per stage	5,000 to 1000,000 Nm ³ /hr	4.5 to 900 MMSCFD
Process fluid	HC	
Number of stages per units	1	
Expansion ratio per stage	Up to 15 (pending on type of fluid)	



Mechanical center section for an hydrocarbon expander-compressor with oil bearings

NEAT Hydrocarbon Turboexpander Frame Sizes



Hydrocarbon Turboexpanders with generator load

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Inlet pressure range	Up to 200 Bar	Up to 3,000 PSI
Inlet temperature range	-260 to +300 °C	-435 to 570 °F
Discharge liquid fraction	Any	Any
Power range	5 to 20,000 Kw	7 to 27,000 HP
Speed range	3,000 to 80,000 RPM	3,000 to 80,000 RPM
Inlet flow range Per stage	5,000 to 1000,000 Nm ³ /hr	4.5 to 900 MMSCFD
Process fluid	HC	
Expansion ratio per stage	Up to 15 (Pending on type of fluid)	
Number of stages per gearbox	1-4	

Addressing your need for hydrocarbon turboexpanders and their long-term reliability, predictability, and efficiency.

New Hydrocarbon Turboexpanders



New hydrocarbon turboexpanders

NEAT designs and manufactures new state-of-the-art hydrocarbon turboexpanders. We draw on the most modern engineering tools and:

- Experienced staff
- Test results and field reported results for feedback
- Well established analytic and computer models for aerodynamics (including real gas modeling), rotor dynamics, and structural mechanics

These allow us to increase the efficiency of the machine beyond currently established norms.

Our team of engineers and technicians have years of experience in hydrocarbon turboexpander design and development, and they work closely with our customers to understand their specific needs and requirements. This allows us to tailor our machines to meet each customer's specific requirements, delivering a solution that is both cost-effective and reliable.

Hydrocarbon Turboexpanders with

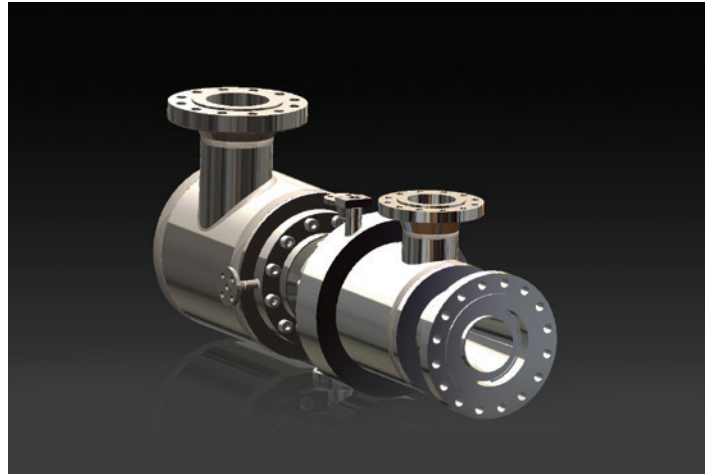
- Centrifugal compressors
- External gear generators
- Integral gear generators
- High speed generators
- Oil brakes

Each unit will be fully packaged with its own auxiliary system, including lube oil and seal gas system, control system, piping, etc. according to API-614 or customer specifications.

Rotor Assembly

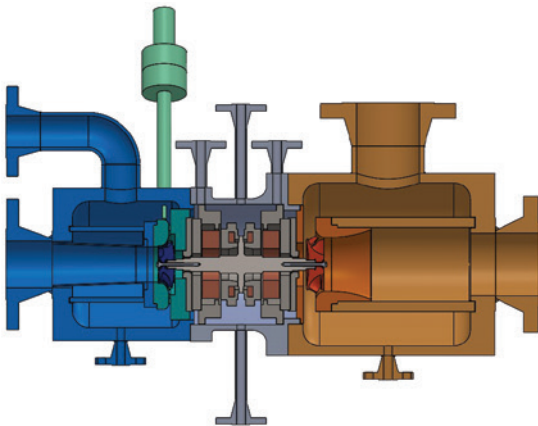


Hydrocarbon Turboexpander-Compressor Casing



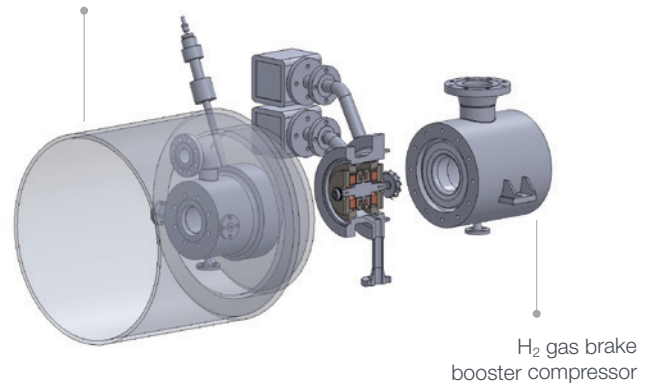
Sectional Views

Active Magnetic Bearings

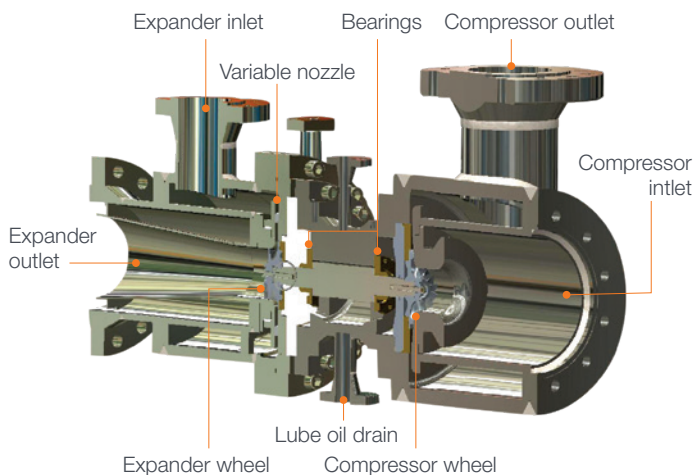


Magnetic Bearing Unit for Hydrogen Liquefaction Process

Vacuum jacketed turboexpander



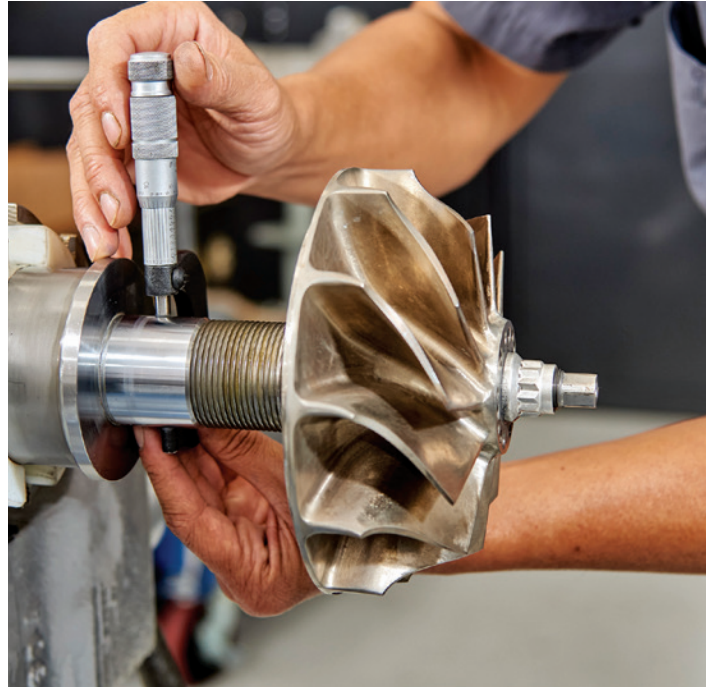
Oil Bearings



Optional Loads: The energy (heat) that is extracted by the expander wheel from a high-pressure gas stream is transferred through the shaft to the compressor wheel and then into the compressor gas stream

Power Generators: The energy (heat) that is extracted by the expander wheel from a high-pressure gas stream is transferred to a gearbox coupled to a generator or a high speed generator.

Hydraulic or Air: The energy (heat) that is extracted by the expander wheel from a high-pressure gas stream is transferred through the shaft and dissipated in an oil or air brake.



Service and repairs of existing turbomachinery

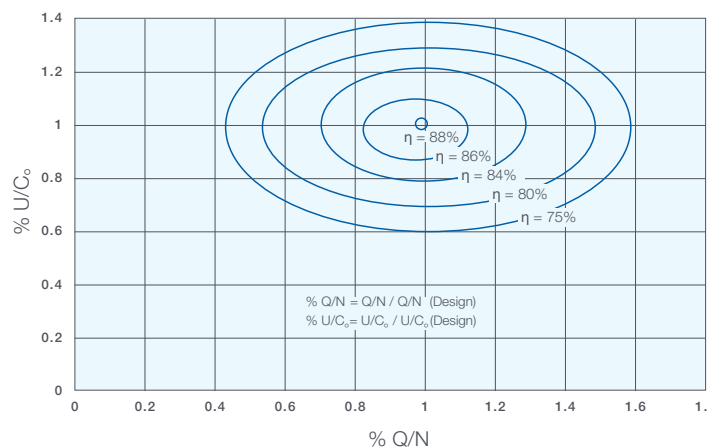
NEAT provides quality- and experienced-based repairs:

- Free inspection and preparation of repair report (inspection includes visual, photographs, analysis of any deposits, dimensional checks, run-outs, NDT, failure and metallurgical analysis if needed.)
- On-site inspection
- Repairs utilizing highly skilled staff (using API recommended practice)
- Full quality documentation of inspection and repair
- Reverse engineering of older parts (if required)

Rerate of existing turbomachinery

Process gas composition or operating conditions may change over time. Customers routinely provide NEAT Hydrocarbon Turboexpanders with revised gas conditions for existing equipment to examine if a rerate is cost-effective.

Typical Turboexpander Performance Map



In February 2023 Nikkiso Clean Energy and Industrial Gases group, acquired OC Turboexpanders.



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