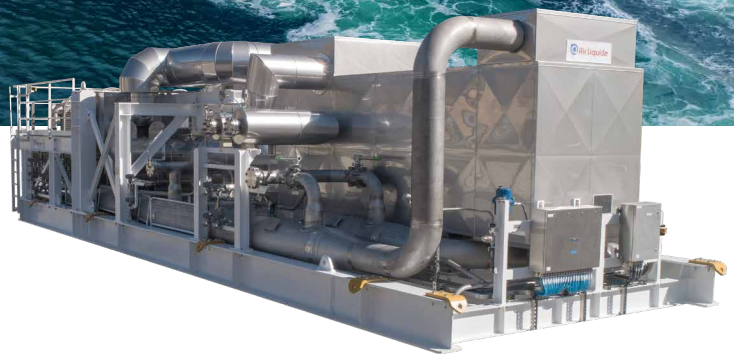


Turbo-Brayton subcooler

for Liquefied Natural Gas (LNG) boil-off reliquefaction

The Air Liquide Turbo-Brayton cooling system is an optimal solution for natural gas reliquefaction. Combining performance, reliability and compactness, it can be integrated on small or large LNG carriers to re-liquefy boil-off gases, but also on bunker barges or vessels and LNG fuelled vessels.



key benefits of the Turbo-Brayton

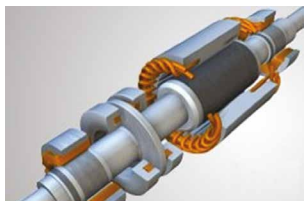
- **Single skid solution:** easy installation, plug and play design, short start-up & low foot-print,
- **Easy integration** thanks to subcooling,
- **Safety** with inert and non flammable gas, leak tight,
- **High reliability:** with contact free, oil free technology,
- **Utility free:** only water and electricity,
- **Drastically reduced maintenance:** few days each 5-years,
- **Fully automatic,** unmanned operation,
- **Turndown** between 0% and 100% and **high efficiency** on all operation range,
- **Flexibility in operation:** unlimited number of starts and stops.

Reverse Turbo-Brayton principle

Turbo-Brayton is an innovative and patented solution.



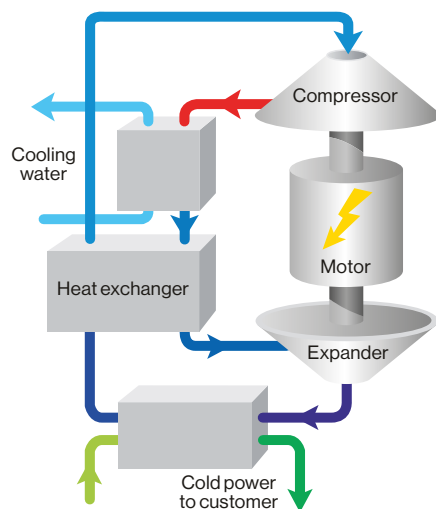
Compressor



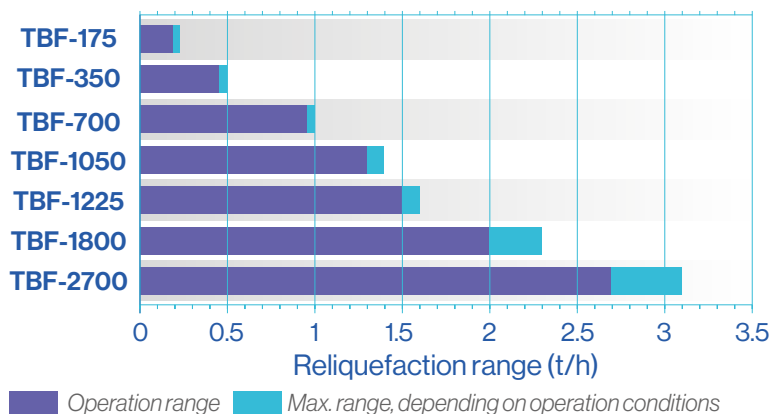
Motor on magnetic bearing (oil-free, contact-free & high reliability)



Expander



Off-shore Turbo-Brayton range



References

Air Liquide's Turbo Brayton subcooling system is a reference on the market:

- **LNG Bunker Vessel:** large part of existing fleet is equipped with Turbo-Brayton,
- **LNG Carriers:** more than 40 references,
- **Retrofit installation:** bunker vessels, 174K, FSRU... (more than 10 Turbo Brayton).



Turbo-Brayton TBF-175



Turbo-Brayton TBF-700



Turbo-Brayton TBF-1225



Turbo-Brayton TBF-350



Turbo-Brayton TBF-1050



Turbo-Brayton TBF-1800

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