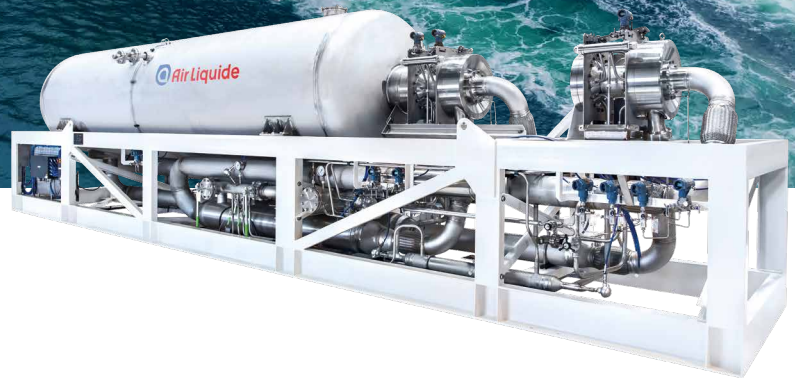


Turbo-Brayton Subcooler

For Liquefied Natural Gas (LNG) boil-off reliquefaction

LNG carriers | Bunker vessels | FSRU & FSU | LNG-fueled vessels | Small-scale LNG terminals



Key benefits

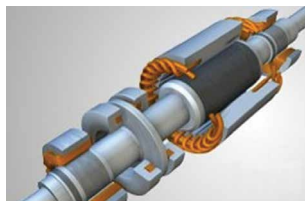
- ✓ **Single skid solution:** easy installation, plug-and-play design, rapid start-up and small footprint
- ✓ **Easy integration** thanks to subcooling
- ✓ **Safety:** inert and non-flammable gas, leak-tight
- ✓ **High reliability:** with contact-free, oil-free technology
- ✓ **Utility-free:** only water and electricity
- ✓ **Drastically reduced maintenance:** a few days every 5 years
- ✓ **Fully automatic,** unmanned operation
- ✓ **Turndown capability** between 0% and 100% and **high efficiency** across entire operating range
- ✓ **Flexibility in operation:** unlimited number of starts and stops
- ✓ **Retrofit-friendly**

Reverse Turbo-Brayton principle

Turbo-Brayton is an innovative and patented solution.



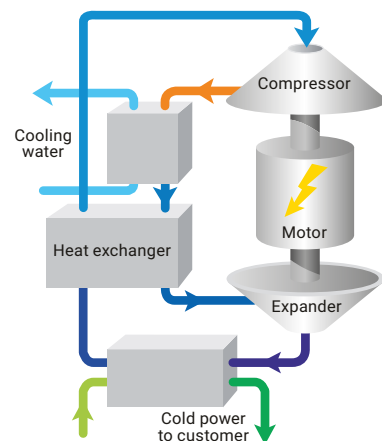
Compressor



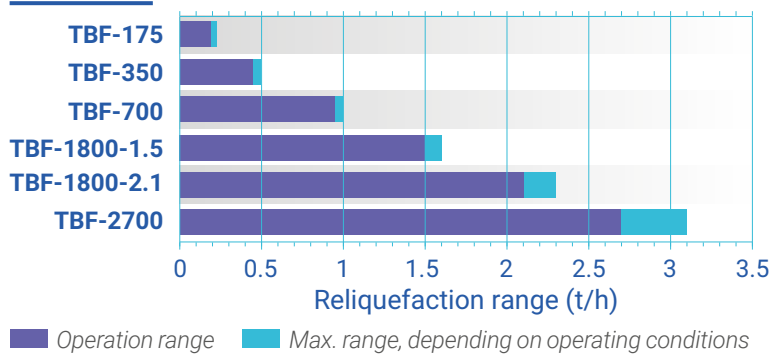
Motor on magnetic bearing
(oil-free, contact-free & high reliability)



Expander



Turbo-Brayton range



References

Air Liquide's Turbo-Brayton subcooling system sets the standard on the market:

- **LNG bunker vessels:** the majority of existing vessels are fitted with Turbo-Brayton systems
- **LNG carriers:** 210 references including 70 units in operation
- **Retrofit installations:** more than 25 references (LBV, LNGC, FSRU)



Turbo-Brayton TBF-175



Turbo-Brayton TBF-350



Turbo-Brayton TBF-700



Turbo-Brayton TBF-1800-1.5



Turbo-Brayton TBF-1800-2.1

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Air Liquide is a world leader in gases, technologies and services for industry and healthcare. Present in 60 countries with 66,300 employees, the Group serves more than 4 million customers and patients.