

Turbo-Brayton

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 Turbo-Brayton for natural gas reliquefaction

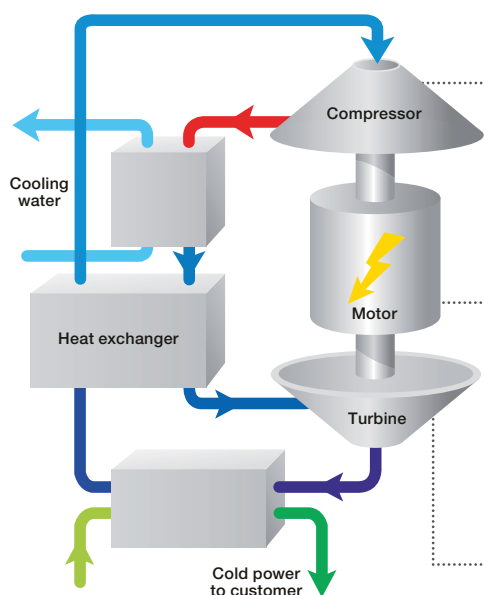
Turbo-Brayton can be installed on both **new building** and **retrofit vessels**.

- **Low installation cost and time:** plug and play, compact (low footprint and weight), few utilities (only water and electricity)
- Easy integration thanks to subcooling solution
- High efficiency on all operation range from 0 to 100% turndown
- **Maintenance-free** for 5 years
- **Unmanned operation**
- **Cold power available instantaneously** (less than 5 min) from stand-by mode
- **Oil-free system, vibration-free and utility-free:**
no compress air, no oil, no nitrogen or any process gas make-up
- Safe technology: inert process gas, no refill of process gas required, no flammable gas
- High reliability
- Fast and easy integration: **no impact on tank design**
(retrofit friendly)



Reverse Turbo-Brayton principle

Air Liquide's innovative reverse Turbo-Brayton process essential innovation concerns the assembly of all active elements on a single shaft.



1 Centrifugal compressor



- High efficiency
- Oil-free

2 High-speed synchronous motor and active magnetic bearings



- Direct drive
- No gear box
- High compacity
- Contact free
- Unsurpassed lifetime

3 Centripetal expander



- More than 50 years experience in the design and manufacture of expanders
- High efficiency

A high efficiency solution

Air Liquide's Turbo-Brayton cooling systems are designed to be both energy efficient and flexible.

- Cryogenic expander power recovery
- Centrifugal compressors and expanders
- Direct drive motors
- Motor's speed adjusts automatically to match the load and operating conditions
- Partial load: electrical consumption is linear with liquefaction production



Off-shore Turbo-Brayton range

Name	Reliquefaction range (t/h)	Electrical consumption (kW)	Weight (t)	Footprint (L x W x H) (m)
TBF-175	0 0.2 t/h	195	15	9.5 x 1.7 x 3
TBF-350	0 0.5 t/h	390	17	11 x 1.7 x 3
TBF-700	0 1 t/h	780	30	12 x 3.5 x 3.5
TBF-1050	0 1.4 t/h	1,170	40	13.5 x 4.5 x 4
TBF-1225	0 1.6 t/h	1,365	42	13.5 x 5 x 4
TBF-1400	0 1.8 t/h	1,560	45	14 x 5.5 x 4

Expected values given for 36°C cooling water, LNG latent heat: 465 kJ/kg.

Contacts

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