

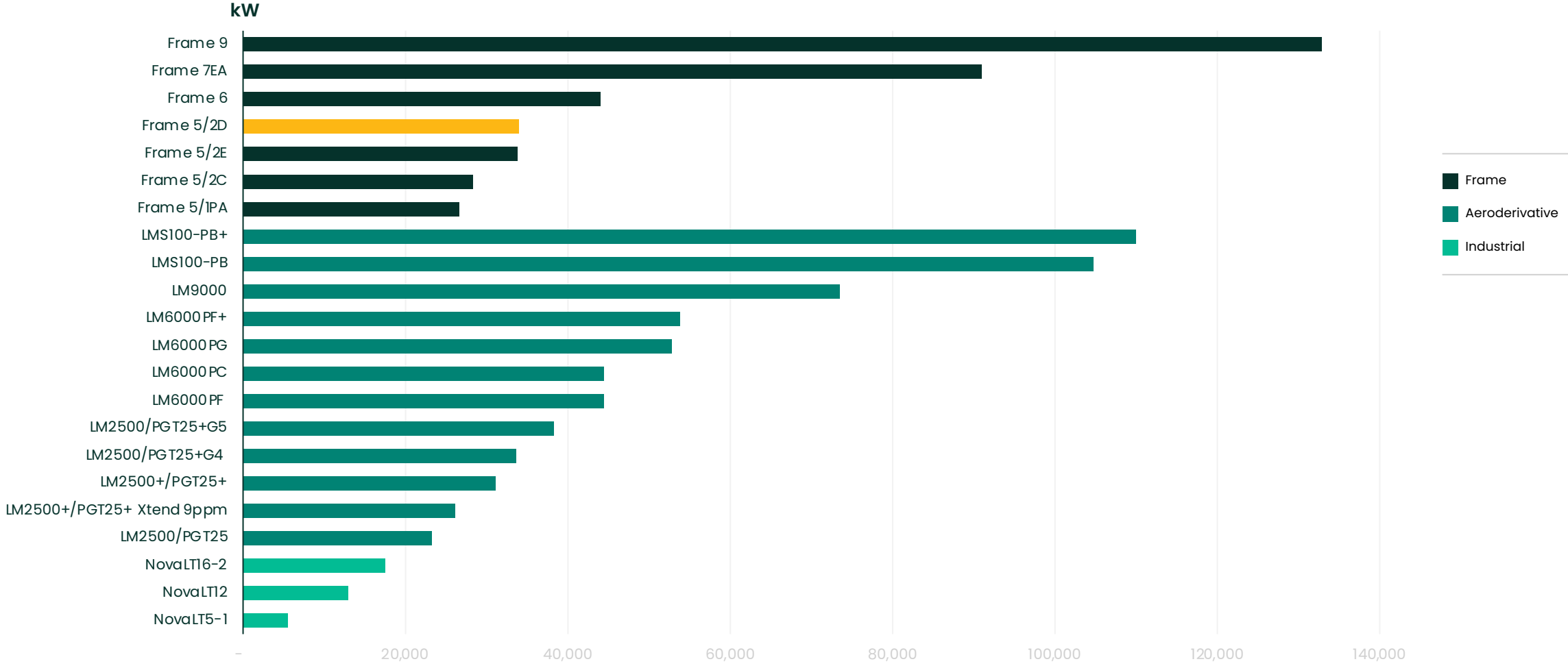
# Frame 5/2D (34 MW)

Two-shaft gas turbine with best-in-class availability and reliability in mechanical drive

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# Industry leader in gas turbine technology



# Frame 5/2D

Two-shaft, heavy-duty gas turbine designed for high operating efficiency over a wide range of speeds and loads.

The Frame 5/2 was introduced in the 1970s and has been updated and uprated over the years to meet the industry's increasing output requirements. The fleet continues to demonstrate ease of operation, and very high reliability and availability.

This turbine is designed for mechanical drive applications such as gas boosting, gas injection/re-injection, pipelines, LNG plants, and gas storage. It has a broad operating speed range to meet the requirements of the most common driven equipment (centrifugal compressors and pumps) as well as the ability to burn a wide variety of gas and liquid fuels.

Over 150 Frame 5/2D units have been sold worldwide, and 140+ are still running with more than 10.4 million cumulative fired hours and fleet averages of 97.81% availability and 99.33% reliability. The first commercial unit successfully exceeded 180,000 operating hours.

## Key technical and benefits

- Output: 34,000 kW
- Efficiency: 30.5%
- The combustion chamber system is available in both standard (diffusive) and DLN1 (Dry Low NOx) versions
- Enhanced fuel flexibility with no impact on combustor's operability or integrity

## Main applications

- LNG
- Pipeline, gas storage
- Refinery, petrochemical, fertilizer

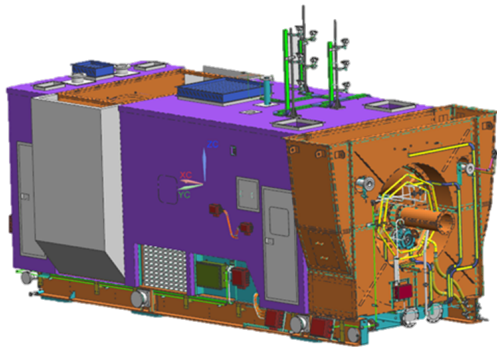


# Package

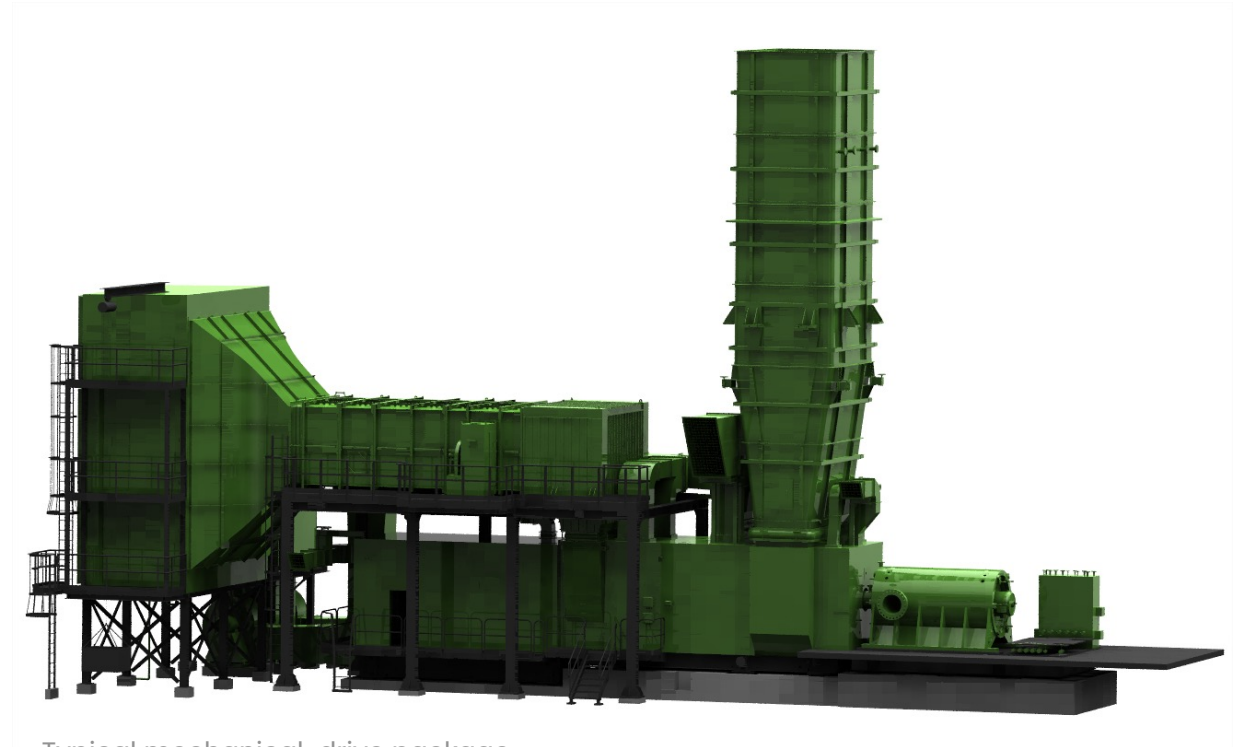
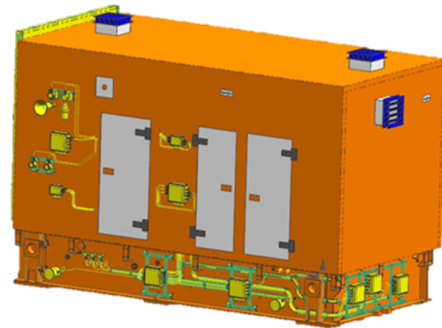
## Package design

- Suitable for mechanical drive applications
- Dual base configuration for auxiliaries and engine
- Centralized lube oil system supplies clean, cooled, pressurized oil to lubricate the gas turbine and the driven equipment including the oil required for any compressor seals

## Engine



## Auxiliaries



Typical mechanical-drive package

# Package

## Installation and maintenance

With extremely favorable operating, maintenance, and economic characteristics, the Frame 5/2, has been installed in all types of environments worldwide (artic, desert, off-shore, etc.)—always demonstrating ease of operation, and very high reliability and availability.

Its simple, robust design and horizontal mid-split casing allows easier access to gas turbine components. Complete maintenance can be performed on site with no need for specialized tooling or service shop assistance.

Optional extended major inspection interval is available—to 72k hours by fire temperature and power de-rate, using same hardware.

## Service/upgrades

To improve the performance of aged models, a wide range of upgrade kits are available, including:

- Power output increase MW
- Efficiency % increase
- Maintenance intervals extension
- Emissions reduction

## Frame 5/2D STD or LHE

**0 to 72k hours with 1 planned inspection:**

- 1 major inspection at 48k hours can be performed at site; optional full engine removal available

Note: combustion inspection interval based on which type of kit technology is installed



## Frame 5/2D Dry Low NOx (DLNI)

**0 to 72k hours with 2 planned inspections:**

- 1 combustion inspection at 24k hours can be performed at site
- 1 major inspection at 48k hours can be performed at site; optional full engine removal available



(\*) CI: combustion chamber inspection

# Datasheet

## Main architecture attributes

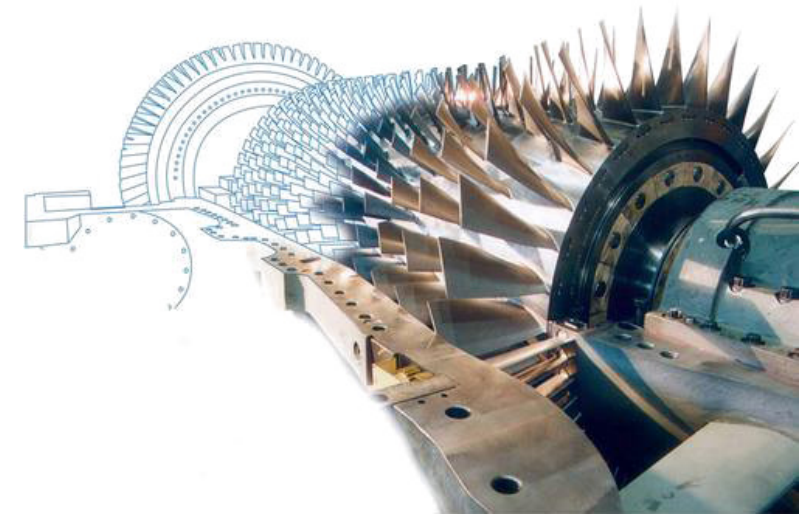
- 17-stage axial compressor
- Two-shaft gas turbine (HPT & LPT), uncooled buckets
- Variable-geometry nozzles between HPT and power turbine
- DLNI/STD/LHE combustion systems, multi-can technology with 12 chambers
- Can burn a wide range of gas and liquid fuels
- Dual-fuel capability with STD combustion system and up to 100% H<sub>2</sub> burnability

## Power generation

		STD/LHE	DLNI
<b>Power</b>	MW	34	33,5
<b>Efficiency</b>	%	30,5	30,1
<b>NOx</b>	ppm	170/125	42
<b>Exhaust</b>	°C	560	560
<b>Speed</b>	rpm	4,670	4,670

## Package (typical dimensions and weights )

		GT skid	Aux skid	CE CO skid
<b>LxWxH</b>	m	9.0x3.5x3.9	6.5x3.5x4.3	6.6x3.8x3.6
<b>Weight</b>	kg	91,000	33,000	96,000



ISO conditions with natural gas fuel, ambient temperature 15°C, no inlet or exhaust losses, sea level, 60% relative humidity. Mechanical Package dimensions driven equipment excluded, Assuming average losses for EG and GB.

# Projects

## Kazakhstan: gas re-injection

- Technology injection through upgrade kit to meet customer power output augmentation requirements



## Trinidad & Tobago: LNG

- 15+ years running



## Libya: pipeline plant

- 15+ years experience in deserts pipeline applications

