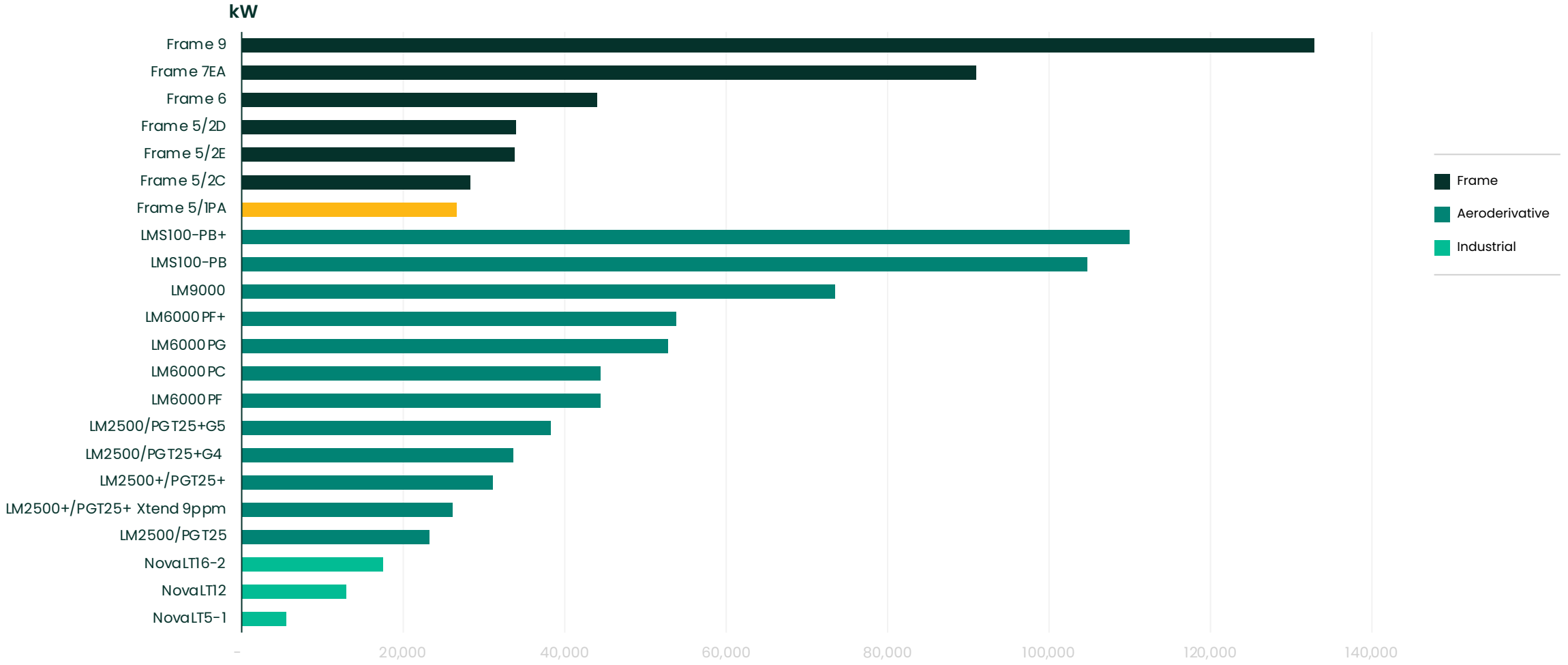
Baker Hughes

Frame 5/1PA (26.6 MW, 50/60 Hz)

Heavy-duty gas turbine with best-in-class availability and reliability

Industry leader in gas turbine technology



Baker Hughes

Frame 5/1PA

A compact and reliable prime mover, designed for long life and ease of maintenance.

The Frame 5/1PA is the most referenced gas turbine in the world—with over 350 units sold and 300+ units running with more than 38.2 million fired hours experience—and an average fleet availability of 97.56% and reliability of 98.90%.

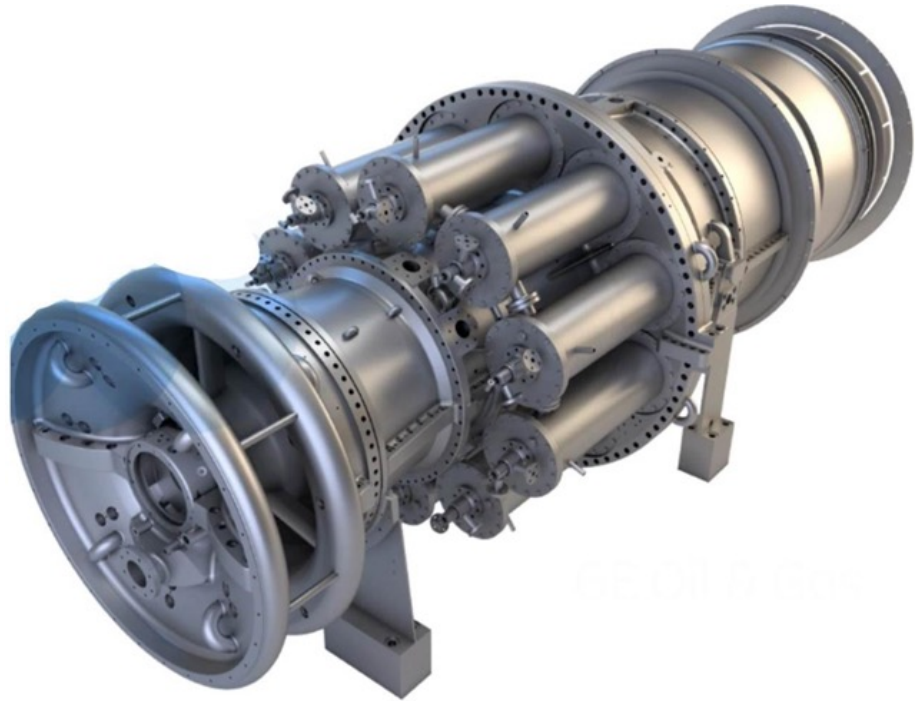
The first commercial unit successfully exceeded 300,000 operating hours. Our conversions, modifications, and upgrades (CMU) program ensures that installed units benefit from our technology injections to improve performance.

Frame 5/1PA is ideal for industrial power generation where low maintenance, reliability, and fuel economy are required.

Low investment costs make the power-plant package an economically attractive system for peak load generation.

Main applications

- Refinery, petrochemical, and fertilizer
- Industrial, and combined heat and power



Key specifications and benefits

- Output: 26,600 kWe
- Electrical efficiency: 27.7%
- Combustion system is available in both standard (diffusive) and DLN1 (Dry Low NOx) technology
- High thermal exhaust energy suitable for combined heat-power cycle
- Enhanced fuel flexibility with no impact on combustor's operability or integrity

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Package

Power generation package overview

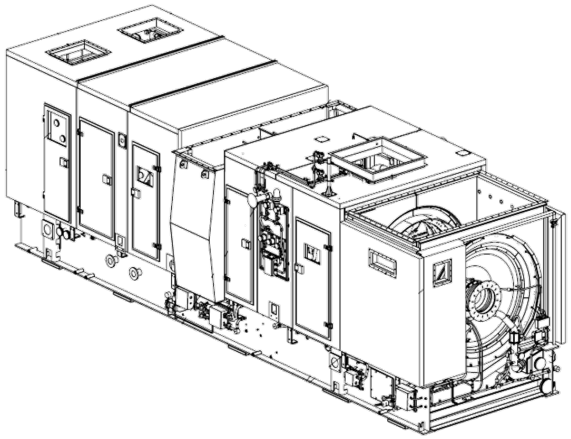
The gas turbine package consists of two compartments, one housing the auxiliaries and the other one the gas turbine engine.

Both gas turbine and auxiliaries are mounted on a common integral base-plate and have a common ventilation system.

The accessory compartment contains the mechanical auxiliaries, both mechanically (via a multi-shafts accessory gearbox and electrically driven, the lube oil system, the fuel systems, and the gas turbine starting means. The turbine compartment is partially separated from the accessory compartment by the combustion air inlet plenum.

Compact package design

Suitable for generator drive and mechanical drive applications, FR5/1PA has single lift basement for engine and auxiliaries.



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Package

Installation and maintenance

The complete turbine package is mounted on a single baseplate for faster installation at site.

The enclosure is integrated with the baseplate for maximum accessibility for gas turbine and auxiliary systems maintenance.

Horizontal mid-split casings enable easier access to gas turbine components and facilitate maintenance at site.

Services and upgrades

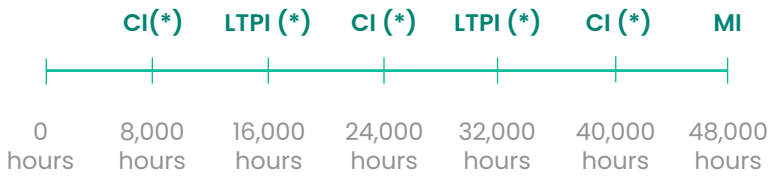
A wide range of upgrade kits are available to improve the performance of older models:

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

Frame 5/1PA DLN1

MTBM: 8,000 factored fired hours (FFH)

Full engine removal available as an option



Frame 5/1PA STD/LHE

MTBM: 24,000 factored fired hours (FFH), extended interval 35,000 (FFH) available as an option

Full engine removal available as an option

(*) CI: Combustion chamber inspection

LTPI: Combustion chamber and transition piece inspection

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Datasheet

Main architecture attributes

- 17-stages axial compressor
- Two-stage gas turbine
- DLN1/ STD/LHE combustion systems, multi-cans technology with 10 chambers.
- Able to burn a wide range of fuels including low BTU gas and residuals. It has also a fuel mix burning capability.
- Dual fuel capability with STD combustion system including operation on Heavy/Crude Oil and Up to 100% H_2 burnability

Power generation

		LHE	DLN1
Power	MWe	26,6	25,5
Efficiency	%	27,7	27,7
NOx	ppm	122	25
Exhaust	°C	560	560
Speed	rpm	Geared 50-60Hz	Geared 50-60Hz

Package (Typical dimensions & weights)

		GT skid	EG skid
LxWxH	m	11.7x3.6x3.9	7.3x3.8x3.6
Weight	kg	91,000	95,000

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.

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Projects

- The Frame 5/1 is recognized industry wide for its reliability
- Fleet units with over 40 years of operation are running worldwide
- Can run in harsh environments, from desert to arctic
- Electrical power for FPSO successfully running for 10+ years
- High-temperature turbine exhaust can be used to maximize plant efficiency for crude processing and heating
- Extended fuel flexibility with crude oil and heavy fuel oil burning capability
- Dual fuel (crude/gas) capability with diesel start-up fuel

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