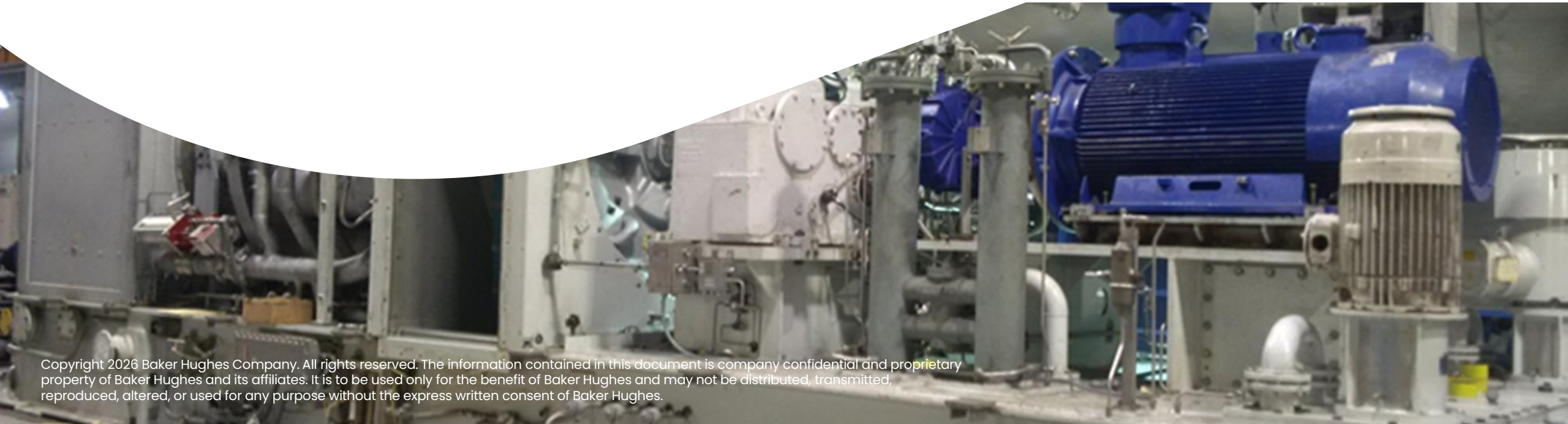


Frame 5/1PA (26.6 MW, 50/60 Hz)

Heavy Duty Gas Turbine with best-in-class availability & reliability



Frame 5/1PA

The Frame 5/1PA (single-shaft, hot end drive generator) is a compact and reliable prime mover, designed for long life and ease of maintenance.

The Frame 5/1PA gas turbine is the most referenced gas turbine in the world, it is the ideal solution for industrial power generation where low maintenance, reliability and economy of fuel utilization are required.

Low investment costs make the Frame 5/1PA package power plant an economically attractive system for peak load generation.

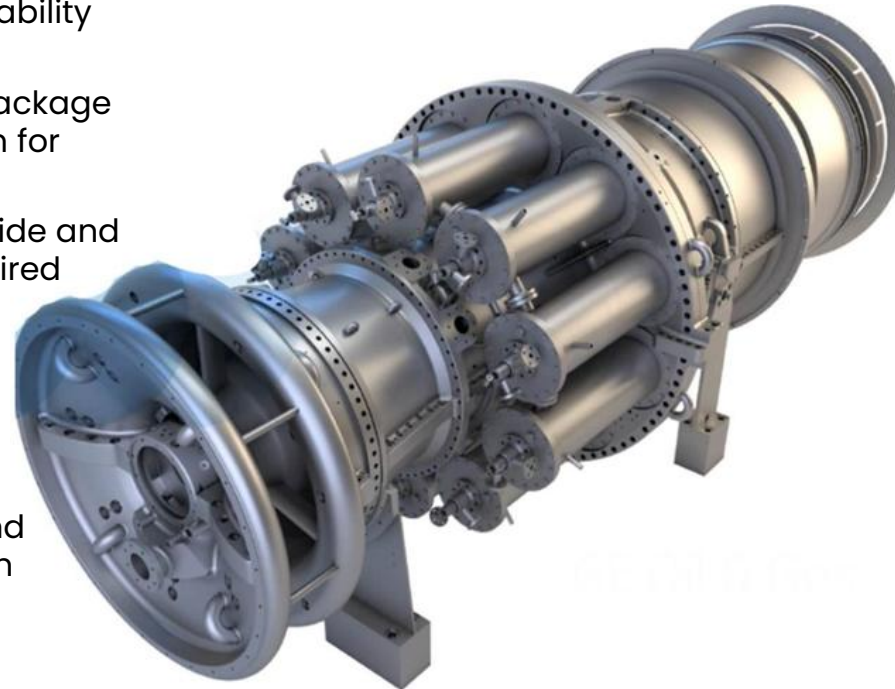
Frame 5/1PA counts over 350 units sold worldwide and 300+ units running with more than 38,200,000 fired hours experience with an Average fleet Availability of 97.56% and Average fleet Reliability of 98.90%.

First commercial unit successfully exceeded 300,000 operating hours.

Year over years a continuous improvement and technology injections have been made through Conversions, Modifications and Upgrades.

Main applications/ references/projects

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



Baker Hughes gas turbine portfolio

Frame		50 MW
LM aero		50 MW
NovaLT™		16 MW

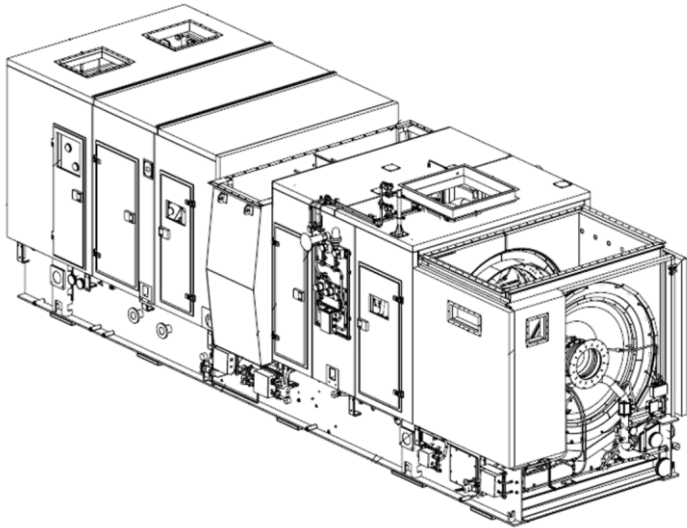
Key technical and benefits

- Output: 26,600 Kwe (assuming GB and EG average efficiencies)
- Electrical efficiency: 27.7%
- The combustion chamber system is available in both standard (diffusive) and DLN1 (Dry Low NOx) versions.
- High thermal exhaust energy suitable for application in combined heat-power cycle
- Enhanced fuel flexibility with no impact on combustor's operability or integrity.

Package

Compact Package Design

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



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 gear box 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.



Maintenance Plans ..Hours Based interval

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.

Hot Gas Path Inspection (HGPI)

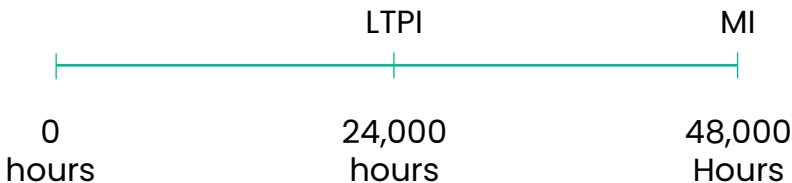
HGPI for factored hours, eliminated for units:

- operated at base load, continuous duty
- with natural gas fuel
- without steam or water injection

Frame 5/1PA DLN1

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

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



LTPI: Combustion chamber and transition piece inspection

MI: Major inspection

Datasheet

Main architecture attributes

- 17-stages axial compressor
- Two-stages 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% H2 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	LxWxH	m	11.7x3.6x3.9	Weight	kg	91,000
EG Skid	LxWxH	m	7.3x3.8x3.6	Weight	kg	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.

Project/application cases

USA, Africa Power plants

Long life examples.
Frame 5/1 units exceeded 40 years
of operation... & are still running



Italy, Morocco, Libya, Iraq, Taiwan Power Plants

More than 40 years of experience
on Crude Oil and Heavy Fuel Oil...
Latest Frame 5/1PA units installed in
Libia



Chinese FPSO application

Electrical power for FPSO is
successfully produced by 2 units
Frame /1PA since 2009
GT waste heat is used for crude
processing and heating
Frame 5/1PA Dual fuel (crude/gas)
with diesel start-up fuel.



Alaska, Russia Plant

Frame 5 /1PA Applications at very
low temperature and harsh
ambient conditions

