GE
Oil & Gas

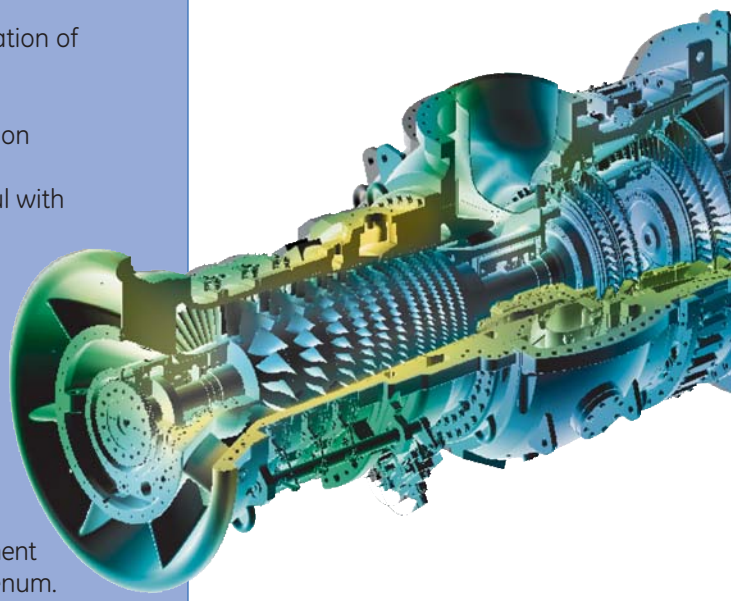
PGT10A to GE10-2 Upgrade

Benefits

■■■ **Increased production**
■□□ **Higher efficiency**
□□□ Compliance with environmental regulations
■■■ **Availability and Reliability**
■■□ **Life extension**

Customer benefits include:

- Substantial increase in shaft output power with limited modification of existing packages
- True zero-hour high pressure module; low pressure module option
- Retrofitting activities can be carried out during a major overhaul with limited cost impact
- Reduction in emission: DLN combustor available in both 25-ppm and 15-ppm NOx emission levels
- Especially if coordinated with a major overhaul, this upgrade has a relatively short pay-back period



Performance
The following table shows the comparison between expected ISO ratings of the PGT10A and the GE10/2, assuming complete replacement of high and low pressure modules, keeping the existing exhaust plenum. Performances are based on 60% relative humidity, Methane fuel gas, Standard Combustor, zero inlet/exhaust losses, new & clean conditions. Since performance gains are site condition dependent, for a more precise evaluation please contact your GE Oil & Gas representative

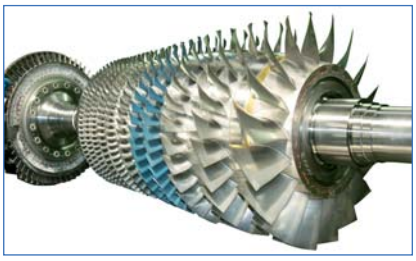
Parameter	Unit	PGT10A	GE10/2(*)	VAR.
Output	KW	10,660	11,933	11.9%
Efficiency	%	32.55	32.88	1.0%
Exhaust temperature	°C	488.3	486.1	-2.2°C
Exhaust gas flow	Kg/s	42.3	46.9	10.9%
L.P. turbine speed.	rpm	7,900	7,900	-

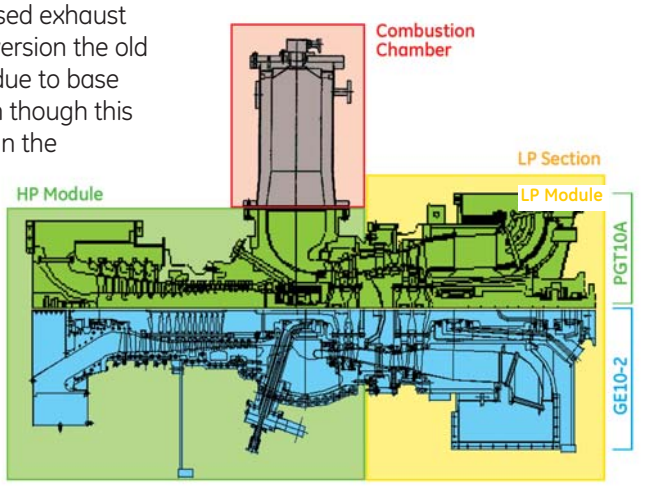
Zero inlet/exhaust pressure losses, sea level, 60% Relative Humidity Methane fuel gas, full load, new & clean conditions

(*) Expected performance of the GE10-2 (with reuse of the original exhaust plenum)

What it is

The GE10-2 gas turbine is the evolution of the PGT10A. Most of the improvements have been made to the High Pressure (HP) module (axial compressor, combustors and HP turbine), while the Low Pressure (LP) module has been fine tuned for enhanced performance and reliability. Since the overall dimensions remain nearly the same and the design is highly modular, the replacement of a PGT10A with a GE10-2 at a site usually has limited impact on the package and auxiliaries.
The GE10-2 HP module features a redesigned 11-stage axial flow compressor with a 15.2:1 pressure ratio, 46.9 kg/s mass flow at ISO conditions and increased stall margin. IGV levers are available in stainless steel for oxidation resistance. The entire rotor can be coated with GECC-1 for high resistance to oxidation especially in marine environments. Additional improvements have been made in the inlet plenum, bearing #2, transition piece, and 1st stage nozzle. The PGT10A and GE10-2 share the same LP module design so it does not need to be replaced during the conversion except in case of early design turbine casings. The GE10-2 exhaust plenum has been optimized to accommodate the increased exhaust flow. However, in the conversion the old plenum is often retained due to base plate considerations, even though this causes a small reduction in the GE10-2's performance.
The PGT10A and GE10-2 combustion chambers are interchangeable and replacement is not required unless a modification to the fuel system, such as conversion to low emission (DLN), is requested. The GE10-2 combustion chamber retains the ability to burn a wide variety of gaseous and liquid fuels, as well as the option for water or steam injection over a broad operating range. The DLN combustor is available in both 25-ppmvd and 15-ppmvd.





How it works

The GE10-2 is the natural PGT10A upgrade pathway when a customer is looking for higher shaft output power. Thanks to the commonality of the footprint, centerlines and flanges with the PGT10A, the conversion can be carried out with little modification to the PGT10A standard packages.

Scope of Supply

The basic scope of supply for a typical conversion includes the following:

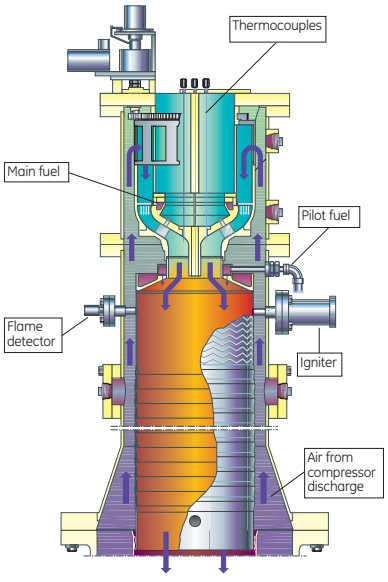
- High pressure module (combustor excluded)
- New inlet plenum and modifications to existing inlet duct
- Minor modifications to the enclosure
- New starting system (motor and torque converter)
- Minor modifications to the base plate to accomodate the new starting system and lube oil connections
- New lube oil piping

The following items must also be evaluated on a case-by-case basis:

- Inlet air system filter house to verify increased airflow capacity
- Driven equipment rating verification (load coupling, gear box, etc.)
- Turbine casing cooling line (with ejector)
- Ventilation system
- MarkVI control panel

Optional scope of supply:

- Low pressure module



GE imagination at work

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