

GE Oil & Gas

Global Headquarters

The Ark
201 Talgarth Road
Hammersmith
London
W6 8BJ

T +44 207 302 6000
customer.service.center@ge.com
UK

European Regional Headquarters

Via Felice Matteucci, 2
50127 Florence, Italy

T +39 055 423 211
F +39 055 423 2800
customer.service.center@ge.com
Nuovo Pignone S.p.A.
Nuovo Pignone S.r.l.

For complete contact information,
please refer to our website.

The information contained herein is general in nature and is not intended for specific construction, installation or application purposes. GE reserves the right to make changes in specifications or add improvements at any time without notice or obligation.

GE, the GE Monogram, and imagination at work are registered trademarks of the General Electric Company.

©2014 General Electric Company
All Rights Reserved



ge-oil-&-gas



@ge_oilandgas

geoilandgas.com



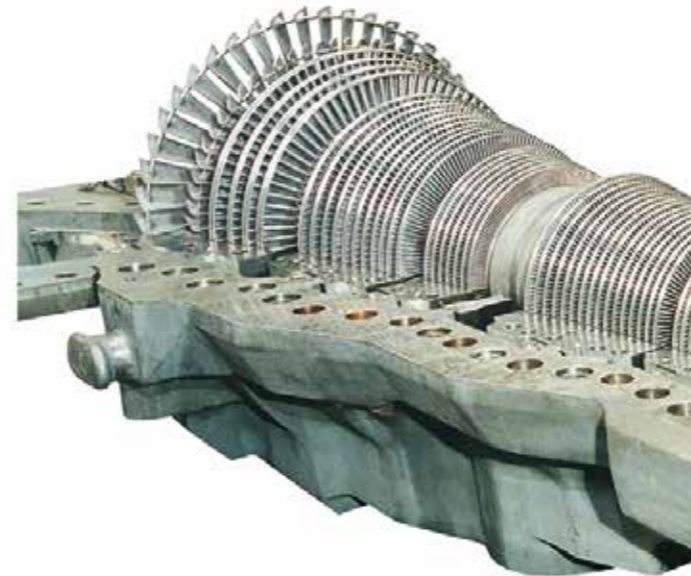
Steam Turbine Solutions for Combined Cycle Applications



ge.com/oilandgas

Modular Steam Turbines for GE LM6000

GE Oil & Gas Steam Turbines use both impulse and reaction blades technology for superior efficiency over a broad range of operating conditions. Used in condensing configurations, they virtually cover the gamut of Oil & Gas and Industrial Power Generation applications. The modular structured design permits a high degree of customization to meet the specific steam cycle needs, and can provide controlled or uncontrolled extraction/injection of steam at any possible intermediate pressure level. The inlet section has a trip valve directly mounted on the turbine casing and hydraulically actuated multi-valves for control. Steam flow is controlled by partial or full-arc admission. Controlled extractions can be handled with a multivalve system similar to that used in the inlet section, or with off-shell throttling valves or with grid valve configuration. The exhaust section is in a separate casing flanged to the high pressure section. It can be radial (upward or downward flow) or axial.



Steam Turbines for combined cycle applications

GE Oil & Gas steam turbines are a good match for combined cycle plant requirements because of their modular design that assures high reliability and superior thermodynamic and mechanical performance. This insures the right match both for standardized/modular plants and for custom tailored power plants for industrial cogeneration. These steam turbines are suitable for frequent starting-and-loading duty and are designed for high cyclic life without compromising base load capability.

Steam Turbine offerings for LM6000

GE Oil & Gas offers tailor made steam turbines specifically designed for combined cycle operation with LM6000 gas turbines. Equipped with the latest developed High Speed (HS) last stage buckets these geared, compact and factory packaged units are designed to yield the best possible combined cycle efficiency with the flexibility of frequent start and rapid loading. These machines are suitable both for 50Hz and 60Hz cycles.

Configuration	1x LM6000	2x LM6000	3x LM6000
ST Output* [MW]	15	30	45
CC Output* [MW]	60	120	180

* Note: Turbines output and efficiency indicated in this table are reference values. Actual values depend on cycle specific configuration and ambient conditions

PRODUCT CHARACTERISTICS

Power Rating:	2 to 100 MW
Speed Range:	3000 to 15000 rpm
Rated Steam Conditions:	140 bar (2030psi) 565°C (1050°F)
Arrangement:	Single casing
Condensing LP Stages:	Up to 5m ² (50 and 60Hz)
Drive:	Geared/Direct

KEY FEATURES

Single Flow
Impulse/Reaction blades
Condensing
Sliding and/or fixed pressure control
Up to two controlled extractions available
Axial or Radial (up/down) exhaust
Baseplate or Foundation mounting

Technical Information

- Power output up to 50 MW
- Live steam parameters up to 140 bar-a/540°C
- Provision for steam injection
- Controlled extraction option for cogeneration
- Last stage buckets with 13, 15 and 17 inch choices based on combined cycle configurations (1xLM6000, 2xLM6000 etc.), ambient conditions and cooling media (ACC/WCC)

Key Design Features

Steam Turbine

- Modular design from proven Oil & Gas technology
- Customized steam path for superior efficiency
- Axial exhaust configuration for single shaft config. and reduced footprint
- Baseplate mounted along with high-speed AGMA gearbox with maximum factory packaging for reduced installation time
- Quick start-up with rapid load ramps
- Start up customization based on specific plant requirements
- High efficient last stage blading with design suitable for wide-range of exhaust pressures (water/air cooled)

Generator

- 4 pole brushless excitation with PMG for both 50Hz and 60Hz with 0.8 or 0.85 PF
- Fully packaged installed directly on foundation
- TEWAC and CA/CW options
- NEMA Class F insulation with class B temperature rise

Auxiliary systems

- Separate lube and control oil consoles
- Acoustic enclosure for noise reduction
- Turning gear installed on gearbox
- Condensing system and related auxiliaries

Controls & Instrumentation

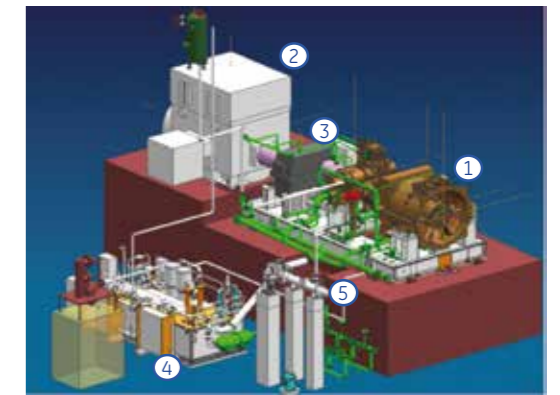
- PLC UNICOS based ST turbine control panel
- BN3500 turbine monitoring
- Generator protection integrated inside ST control panel
- Automatic/manual synchronization options

Installation & Service

- Erection and commissioning supervision
- Performance testing
- Remote monitoring aimed to reduce inspection intervals
- Overhauls and emergency repairs
- Operation and Maintenance training

Extended scope

- Turnkey capabilities for entire power plant including HRSG
- Field engineering and plant erection support



Typical dimensions: 15m(L) x 6m(W) x 7m(H)

STG Layout

- 1 - Steam Turbine
- 2 - Generator
- 3 - Gearbox
- 4 - Lube oil console
- 5 - Gland steam condenser



Recently developed HS low pressure stages for high speed and high efficiency applications



Typical STG Layout for 2xLM6000 with axial exhaust condenser... Compact layout with reduced footprint