



GRT – Geared Reaction Turbine

Highly efficient and robust turbine design

The GRT steam turbine offered by GE Oil & Gas is a highly efficient and compact geared steam turbine that is purpose built for generator drive applications. It features a flexible, modular concept in a plug-and-play package for reduced installation and commissioning time and costs.

The GRT unit's design was motivated by the ever-increasing demand of power plant operators who require flexibility, reliability, and high efficiency. Based on its modular architecture, the GRT offers customized steam extraction options that make it a great fit for industrial and fit for power generation in both industrial and utility/IPP settings.

Technical Specifications

Rated power output	5 – 80 MW, 50/60 Hz
Inlet pressure	Up to 125 bar
Inlet temperature	Up to 540° C
Turbine speed	4,200 to 11,000 rpm
Exhaust area	Up to 3.5 m ²
Blading type	Reaction with impulse control stage
Number of bleeds	Up to 5
Internally controlled extraction pressure	
HP extraction	Up to 40 bar
LP extraction	Up to 8 bar
Casing	Single casing/single shell
Rotor	One-piece forging
Generator	4 pole or 2 pole, GE or third-party vendor
Controller	GE or third-party vendor

Key Features & Benefits

Efficient

- Modern blading profiles provide superior efficiency.
- Partial arc admission with nozzle control allows for high full- and part-load efficiency.
- Unit performance is well suited to modern biomass and suited to high efficient power plants using biomass or other renewable resources, as well as to combined cycle applications.

Flexible

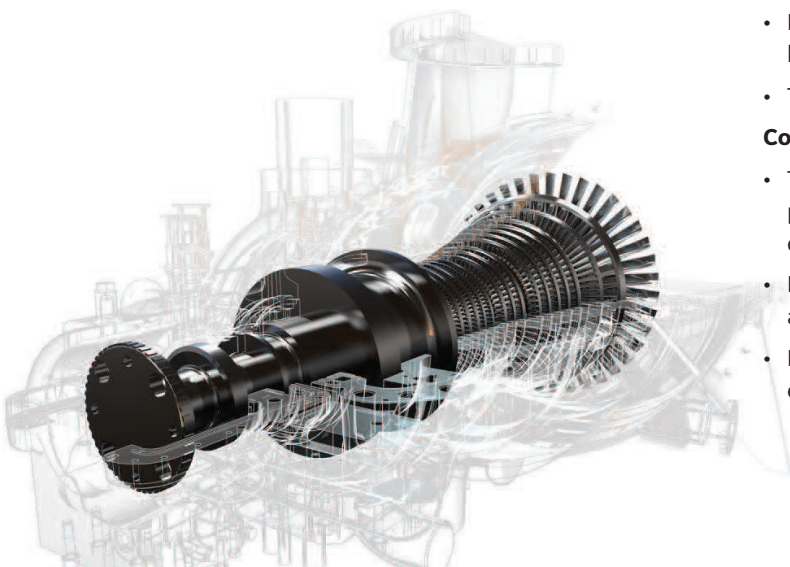
- Modular concept provides multiple options for internally controlled extractions and a wide range of applications.
- Variable inlet configuration and fully customized steam path yield optimal performance for any application.
- Short start up time and steep ramp rates provide maximum operational flexibility.

Reliable and Compact

- The GRT is designed with the latest proven technologies for reliable performance over varying operating profiles.
- Fully assembled, compact unit is easily transportable by train and by truck fitting standard container fixation points.
- The unit is suitable for floor mounting for simplified plant layout.

Cost-Effective

- Turbine and auxiliary modules are fully factory assembled and pre-tested, resulting in reduced transportation, installation and commissioning times.
- Frameless design for floor level installation minimizes civil cost and building height.
- Rotor dynamics are optimized for a rigid foundation block to eliminate the need for a costly spring-mounted turbine table.



Scope of Offering

Base Scope

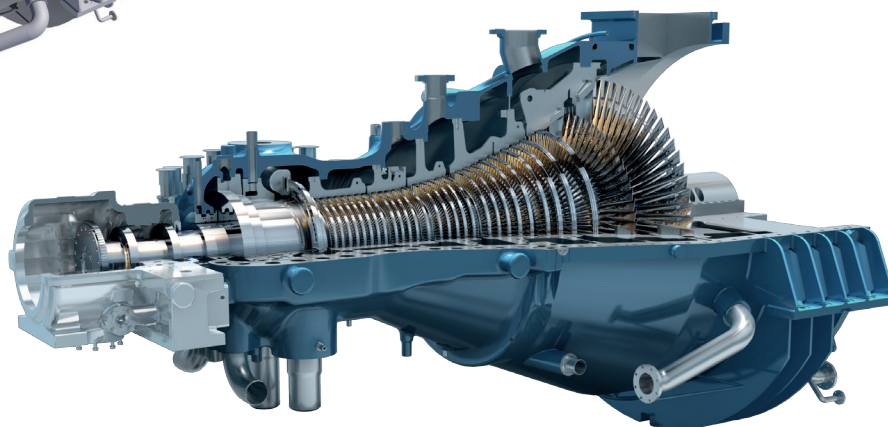
Equipment	Service
Steam turbine	<ul style="list-style-type: none"> Project management, engineering, documentation, QA/QC services
Generator	
Gearbox	<ul style="list-style-type: none"> Technical field advisory and commissioning advisory services
Turbine control and protection system	
Admission/extraction control valves	<ul style="list-style-type: none"> Comprehensive documentation for rapid installation, commissioning, operation and maintenance
Lube and control oil system	
Gland sealing system (piping, gland steam-condenser)	

Extended Scope

Equipment	Service
Noise hood	<ul style="list-style-type: none"> Onsite delivery of all materials and equipment
Water-cooled condenser	
Feed water pre-heaters	<ul style="list-style-type: none"> Documentation for plant permitting
Condensate pumps	
Steam bypass system	<ul style="list-style-type: none"> Capital spare parts ENG, PM+ on-site support services for installation and commission of extended scope
Interconnecting piping	

GRT Steam Turbine Applications

Renewable Energy	Conventional Power Generation	Captive and Industrial
<ul style="list-style-type: none"> Biomass Concentrated Solar Power Waste to Energy 	<ul style="list-style-type: none"> Combined cycle plant Fossil boiler plant Sea water desalination Combined heat & power (CHP) 	<ul style="list-style-type: none"> Pulp and paper Metals and mining Chemicals Sugar and ethanol Cement General manufacturing



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