Steam Turbines
Excellent Reliability and Performance, in Every Size and Application
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Steam turbines from GE deliver excellent customer value, as they are specifically configured to convert the exhaust energy of GE gas turbines in varied plant and site conditions. A combination of highly developed steam path technology, advanced sealing features, compact turbine sections and a broad portfolio of last-stage buckets means superb power generation performance.

In every size and application, GE steam turbines provide high reliability, sustained high efficiency and ease of maintenance. Our advanced technologies—including abradable coatings, steam path aerodynamics, and welded rotor construction—contribute to world-class plant operability and combined cycle performance. On-demand startup and turnaround assure ease of cycling on and off the grid in sync with fluctuating demands.

GE has developed and applied advanced steam turbine technology since 1901, and has deployed more than 50 GW of steam turbine capacity in more than 6,000 installed units since then. With tremendous applications flexibility, our steam turbines operate in combined cycle, fossil-fired, integrated gasification combined cycle, and multiple seal teeth at each stage.

Features and Benefits

All models deliver exceptional performance, reliability and availability in today’s demanding energy environment. In addition:

- Last stage buckets, in 50 Hz up to 55 inches and in 60 Hz up to 45 inches, are effective in many combined cycle configurations and provide a wide range of annulus areas to accommodate a range of steam flows and site conditions. These axially entry last stage buckets have elevated exhaust pressure capability.
- A650 steam turbine plant layouts are compact and cost-effective in both multi-shaft and single-shaft configuration.
- The single-shaft configuration incorporates a clutch that enables high operational flexibility.

A650 and D600 steam turbines offer efficiencies up to 4.1 and 4.2 percent, respectively. They are developed to run at up to 2,400 psia main steam inlet pressure and are sized around F- and HA-class gas turbines. Offering efficiencies up to 39.5 and 40 percent, respectively, the A650 and D600 steam turbines, which also are sized around F- and HA-class gas turbines, are targeted to run at up to 1,800 psia main steam inlet pressures. The A200 and D200 non-reheat steam turbines (up to 35.5 and 36.5 percent efficiency, respectively) are applied to combined cycle plants with low-cost fuel and at low annual operating hours. They sync up with GE’s B- and E-class gas turbines.

**Leading Technology for Superior Performance**

The mix of advanced steam turbine technologies delivers world-class overall performance. The inner carriers of the double shell architecture are designed to reduce thermal distortion during startup and shutdown, so radial clearances and performance are maintained over time. Drum rotor construction with high reaction blading sets the steam path diameter to deliver high performance for a given steam flow. In addition, the rotor shaft diameter can be maintained for reduced rotor flexibility, stable rotor dynamics, and improved clearance control.

To achieve high performance, radial clearances and sealing must be maintained. GE steam turbines reduce leakage and control clearances within the steam path through a combination of labyrinth, brush, abradable and active retractable sealing technologies. Integral cover buckets (ICBs) are used throughout the turbine sections to maintain efficient bucket and nozzle sealing and provide superior mechanical damping and tip sealing control. The ICBs also provide continuous circumferential sealing and multiple seal teeth at each stage.

### Steam Turbo Product Overview

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<th>Model</th>
<th>Features</th>
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| A650  | HP inlet pressure up to 2,400 psia  
|       | HP inlet temperature up to 1,112°F  
|       | IP inlet temperature up to 1,112°F  
|       | Shaft efficiency >41%  
|       | Output up to 120 MW  |

| D600  | HP inlet pressure up to 2,400 psia  
|       | HP inlet temperature up to 1,112°F  
|       | IP inlet temperature up to 1,112°F  
|       | LP Section with either side or down exhaust  
|       | Shaft efficiency >42%  
|       | Up to 600 MW  |

| D650  | Modular, three casing, four bearing configuration  
|       | Supporting up to 2,400 psia HP throttle pressures  
|       | HP and IP inlet temperatures from 1,060°F to 1,112°F  
|       | Output from 200-600 MW  
|       | Shaft efficiency >42.5%  |

| HP Section | High reaction technology  
| Advanced aero and sealing  
| High power density  
| IP and LP Sections | Advanced aero and sealing  
| Axial entry last stage buckets with elevated exhaust pressure capability  
| 2-Flow and 4-Flow LP arrangements  
| Side or down exhaust configuration  |

| High Pressure (HP) and Intermediate Pressure (IP) Modules | High reaction technology  
| Advanced aero and sealing  
| Increased power density  
| Low Pressure (LP) Module | High reaction drum rotor  
| Advanced aero and sealing  
| Axial entry last stage buckets with elevated exhaust pressure capability  
| Cooling tower or air-cooled condensing configurations  
| 2-Flow and 4-Flow LP arrangements  
| Side or down exhaust configuration  |

- **A650, D650 and D650 steam turbines have less-than-30-minute plant starts, and allow for daily starts and stops.**
- **Turbines operate at high-pressure (HP) and intermediate-pressure (IP) inlet temperatures up to 1,112°F.**
- **D650 steam turbines have the flexibility to adapt to a variety of bottoming cycle conditions.**
- **A200 and D200 non-reheat steam turbines have HP and LP sections that are intended for main inlet steam pressure up to 1,550 psia and main steam temperature up to 1,000°F.**
- **D600 steam turbines incorporate enhanced features which improve constructability and reduce installation time by allowing the performance of parallel operations.**

- **The single-shaft configuration incorporates a clutch that enables high operational flexibility.**

- **A660, D600 and D650 steam turbines have less-than-30-minute plant starts, and allow for daily starts and stops.**

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- **D650 steam turbines have the flexibility to adapt to a variety of bottoming cycle conditions.**

- **A200 and D200 steam turbines have HP and LP sections that are intended for main inlet steam pressure up to 1,550 psia and main steam temperature up to 1,000°F.**

- **D600 steam turbines incorporate enhanced features which improve constructability and reduce installation time by allowing the performance of parallel operations.**

- **The single-shaft configuration incorporates a clutch that enables high operational flexibility.**
To find out more about this offering, contact your GE Power & Water sales representative or visit www.powergen.gepower.com