



SST-900 industrial steam turbines

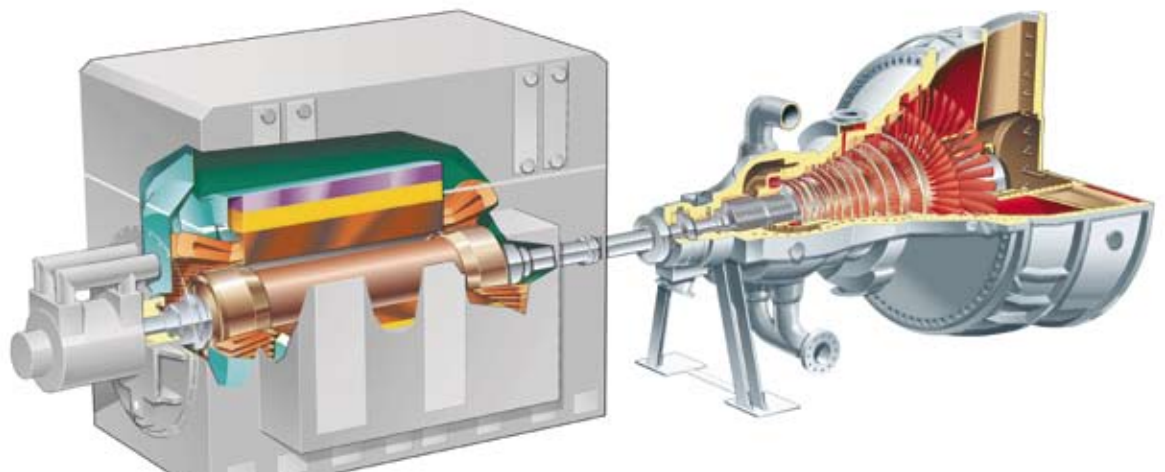
Up to 250 MW

The SST-900 is a mid-range single-casing steam turbine designed and manufactured to meet the specific demands of power generation in condensing and back-pressure applications. For increased efficiency, the SST-900 can also be used in a reheat configuration.



The SST-900 provides direct drive of a 3,000 or 3,600 rpm generator in a variety of applications including:

- Combined-cycle plants
- Solar thermal plants
- Fossil-fuel steam plants
- Waste-to-energy plants
- Cogeneration and district heating plants
- Oil and gas industry
- Industrial plants



Industrial Steam Turbines

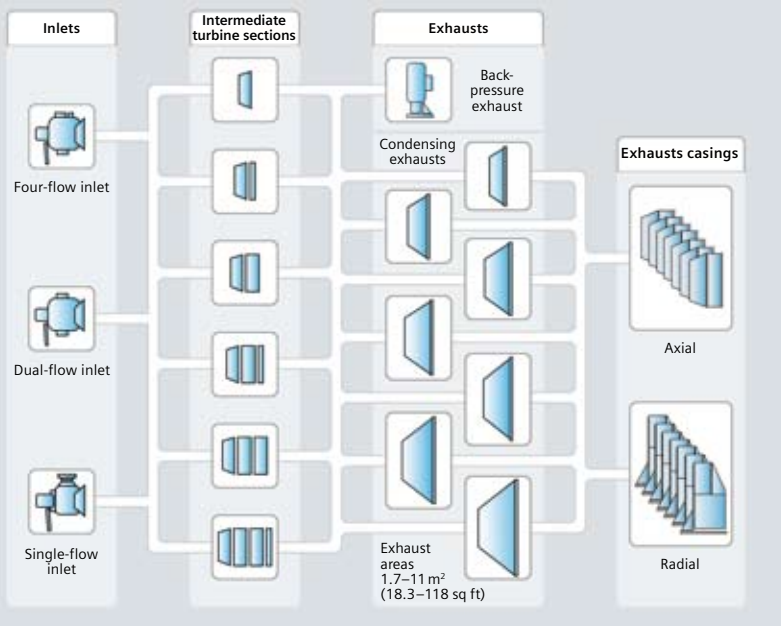
Answers for energy.

SIEMENS

Design features

The SST-900 is a steam turbine with inherent flexibility. Each turbine is built from a series of proven standard components, each of which contributes to high reliability and availability. The combination of standard components, such as inlet and exhaust sections, results in a very versatile turbine, covering a wide field of applications and a broad power range.

Turbine modularity



Standard modules:

- Turbine casing
- Exhaust
- Generator

Customized modules:

- Steam path (impulse blading)

Optional:

- Double extraction

Inlet systems and steam extractions

Although the turbine components are selected from standardized building blocks, the steam path, extraction/admission location, size and inlet systems are customized to fit the specific requirements of each project.

SST-900 offers several options both for inlet systems and for internally controlled process steam extractions. The different inlet systems, based on external control valves and either one, two or four separate inlet pipes, enable us to find optimal solutions for project-specific live steam and load conditions. Volute for even steam distribution to the first turbine stage or nozzle groups around a control stage protect the main turbine casing from very hot inlet steam.

Depending on volume flow, a single, dual or quadruple inlet volute provides optimal performance for combined-cycle sliding pressure operation. Internal valve arrangements, controlling the steam flow to the back end of the turbine, are used to maintain constant process steam extraction pressures over a wide flow range.

Internally controlled process steam extraction provides a constant extraction-steam pressure over a broad range of steam flows, a feature that makes the SST-900 steam turbines both flexible and easy to operate. Bleed extractions are also available and can be equipped with external pressure-control valves.

Turbine casing

The SST-900 has a horizontally split casing, built for high thermo-flexibility. Its symmetrical casing and small hot-part dimensions enable the SST-900 to accept short start-up times and rapid load changes.

Exhaust

Condensing turbines feature as standard an axial exhaust firmly flanged to an in-line water-cooled condenser or connected to an air-cooled condenser. The axial exhaust saves foundation height and cost and improves the efficiency.

Downward-directed exhausts for underslung condensers are available as an option.

The exhaust connections of back-pressure turbines are directed either downwards or upwards.

The turbine exhaust end is fixed to the water-cooled condenser inlet flange or to the foundation, while the turbine front is supported by flex plates allowing thermal expansion without use of friction elements.

Rotor and blading

The rotor is normally a solid forging with integral disks: only the largest are welded. The turbine blades are attached to the disks via side entry slots.

The stationary blading is fixed into diaphragms. Special diaphragms contain the internal extraction control arrangement (controlled by external servomotors). The use of the latest blading-manufacturing technology enhances the performance capability.

High efficiency is also obtained by the use of advanced and proven condensing last-stage blades, covering a range of 1.7–11 m² (18.3–118.4 sq.ft.).

Technical data



Technical data

- Power output up to 250 MW
 - Speed 3,000–3,600 rpm
 - Live steam conditions (non-reheat)
 - Pressure up to 140 bar/2,030 psi
 - Temperature up to 560°C/1,040°F
 - Live steam conditions (reheat)
 - Pressure up to 165 bar/2,393 psi
 - Temperature up to 585°C/1,085°F
 - Reheat temperature up to 580°C/1,080°F
 - Bleed up to 60 bar/870 psi
 - Controlled extraction (single or double)
 - Pressure up to 55 bar/798 psi
 - Temperature up to 480°C/895°F
 - Exhaust steam conditions
 - Back pressure up to 16 bar/230 psi
 - Condensing up to 0.6 bar/8.5 psi
 - District heating up to 3 bar/45 psi
- (All data are approximate and project-related.)



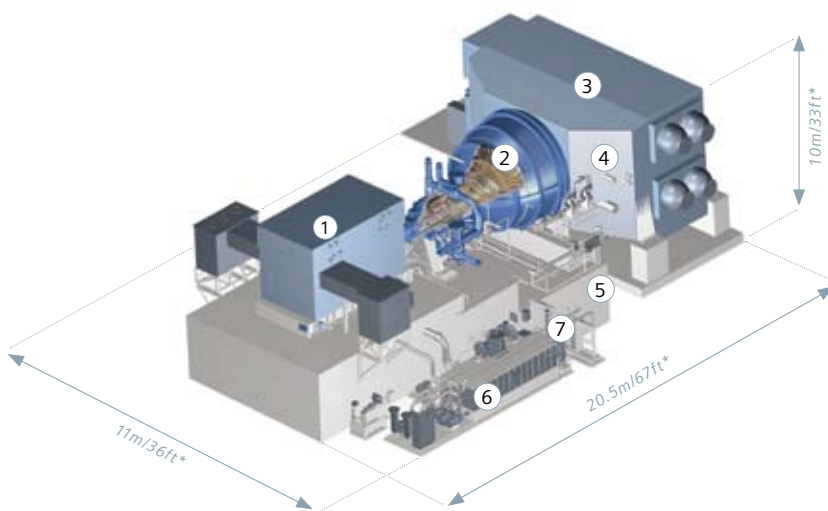
Design features

Single-casing, direct-drive
 Customized steam path
 Axial or radial exhaust
 Thermoflexible design
 Modular
 Flexible
 Proven

Benefits

Compact plant layout
 Wide application range
 High efficiency
 High reliability/availability
 Simple foundation
 Short start-up time
 Excellent load-following capability.

Modular package layout



- | | |
|-------------------------|--------------------|
| 1 Generator | 5 Gland steam unit |
| 2 Steam turbine | 6 Lube oil unit |
| 3 Condenser | 7 Hydraulic unit |
| 4 Gland steam condenser | |

* The dimensions are typical figures, they can vary from case to case.



SST-900 steam turbine in the workshop in Finspong, Sweden.

Installation and maintenance

Our proven installation and maintenance concept lowers maintenance cost by enabling easy access to the installed components – the turbine, generator and auxiliaries.

For maximum availability, the equipment is enhanced by the simplicity of design and minimum maintenance requirement. The turbine normally leaves our factory completely assembled, minimizing the time and manpower required for field erection work. The 2-pole direct-driven generator used with the SST-900 steam turbine is delivered completely assembled, ready to place on the foundation. Bearings can be inspected without lifting the turbine casing.

As all SST-900 turbines are prepared for remote monitoring, Siemens offers service contracts for condition-based maintenance, customized for the specific operating status of each machine to reduce outage and overhaul costs. The remote monitoring technology gives customers fast telephone and online help from expert personnel.

Additionally, we offer comprehensive and rapid spare-part service, repairs and maintenance solutions designed to increase the reliability and availability of the plant. Long-term maintenance contracts assure prolonged plant operation at predefined costs.

Our service solutions are based on long experience gained from a substantial global fleet. This experience is incorporated systematically into our design and manufacturing as well as our service and maintenance practice, ensuring that we remain your reliable partner.



Axial exhaust of a SST-900 steam turbine.

Reference examples

SST-900 has been sold for a rich variety of applications around the world. The following references exemplify this versatility of application.



The Rya CHP plant in Gothenburg, Sweden, is powered by three SGT-800 gas turbines and one 137 MW SST-900 steam turbine.



In the Walnut Energy Center CCPP in Turlock, California, a 100 MW SST-900 dual-casing steam turbine in reheat configuration uses the heat from two gas turbines.

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