



Siemens Steam Turbines (SST)

SST-900 steam turbine for economical production of heat and power

Whether you need power generation for independent power production or for any industrial application, the SST-900 offers you the flexibility, reliability and economy of operation you demand.

The SST-900 range: proven design for a wide range of applications

The SST-900 is a single casing steam turbine in the medium size range, normally providing direct drive of a 3,000 or 3,600 rpm generator. The SST-900 steam turbine is designed and manufactured to meet the specific demands of power generation in condensing and back-pressure applications, including:

- Combined cycle plants
- Fossil fuel steam plants
- Waste-to-energy plants
- District heating plants
- Oil and gas industry
- Industrial plants

Design features

The SST-900 single casing steam turbine can be equipped with a single valve or a multi-valve inlet as well as with a variety of extraction control arrangements. This Siemens turbine type can also be used in reheat application for increased efficiency.

The SST-900 turbine utilizes a horizontally split casing, built for a high thermoflexibility. With a symmetrical casing and small dimensions of the hot parts, the SST-900 turbine can accept short start-up times and quick load changes.

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.

Operational flexibility

SST-900 offers several options both for inlet systems and for internally controlled process steam extractions.

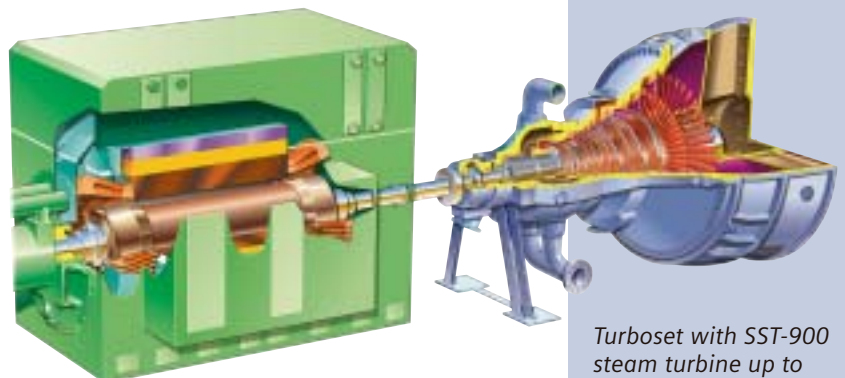
The different inlet systems, based on external control valves and one single or four separate inlet pipes, enable us to find optimal solutions for project-specific live steam and load conditions. Volute for even steam distribution to the first turbine stage or nozzle groups around a control stage protect the main turbine casing from very hot inlet steam.

A single 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.



Barranco, Gran Canaria, 82 MW SST-900 for combined cycle power generation



Turboset with SST-900 steam turbine up to 180 MW

Flexible design for individual customer needs

Modular arrangements

The SST-900 is a steam turbine with inherent flexibility, which can be delivered in back pressure or condensing versions for a wide range of uses.

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.

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

Optimum performance

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.

The use of 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 1.7–9.6m².

Compactness and ease of installation

The 2-pole direct driven generator, used with the SST-900 steam turbine, is delivered completely assembled, ready to place on the foundation.

The entire turbine also leaves our factory completely assembled, minimizing the time and manpower required for field erection work.

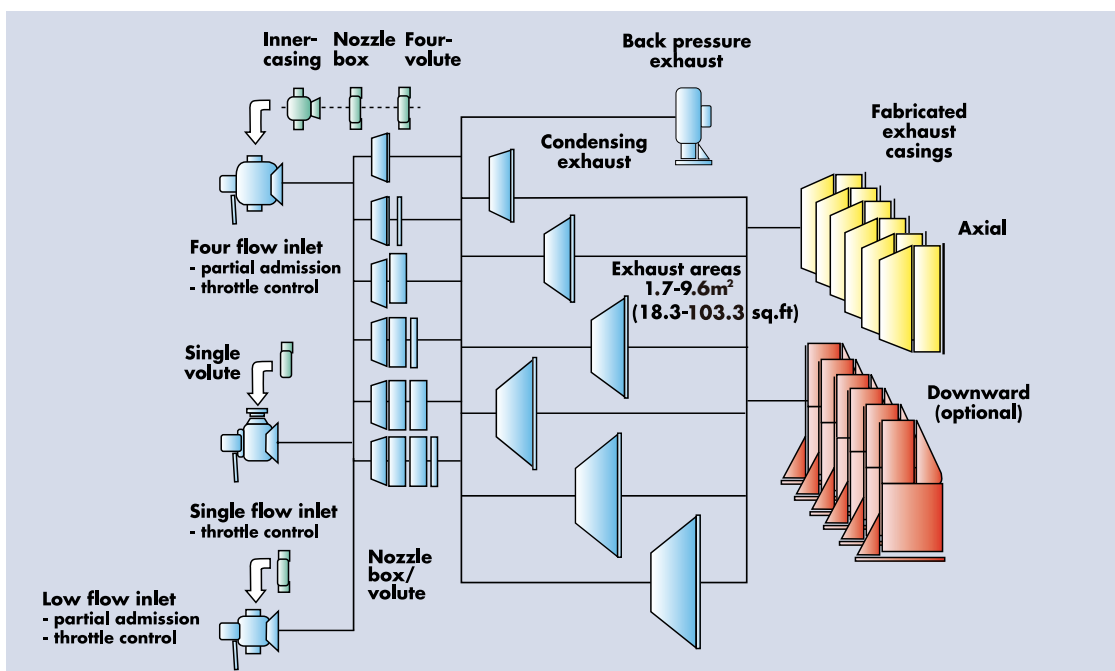
Easy maintenance

The availability of the equipment is enhanced by the simplicity in design and minimum requirement for maintenance.

The rotor is made from a solid forging with integral disks and 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).

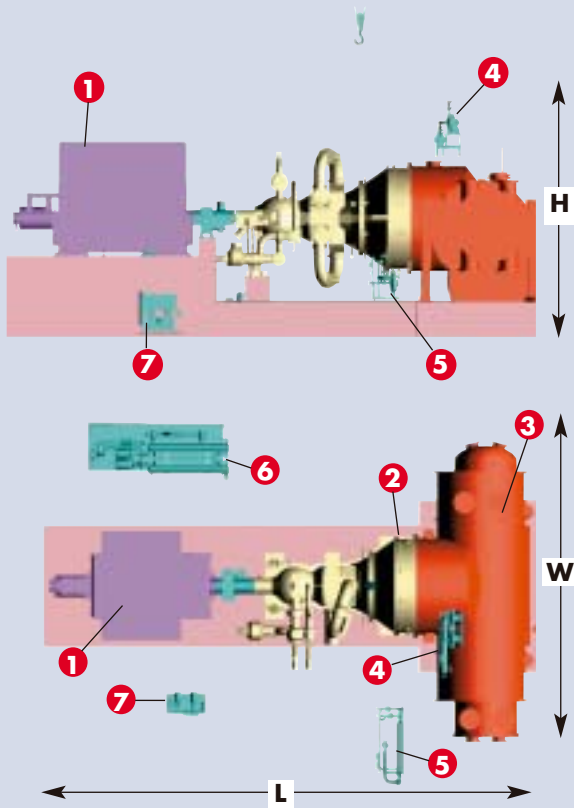
Bearings can be inspected without lifting the turbine casing.



Turbine casing modularity

Compact layout for ease of installation

Typical layout for turboset with a SST-900 steam turbine



SST-900 technical data

Power output.....up to180 MW

Speed.....3000 / 3600 rpm

Live steam conditions (non-reheat)

pressureup to140 bar / 2030 psi

temperatureup to540°C / 1004°F

Live steam conditions (reheat)

pressureup to165 bar / 2393 psi

temperatureup to585°C / 1085°F

reheat tempup to565°C / 1050°F

Bleed.....up to60 bar / 870 psi

Controlled extraction (single or double)

pressureup to55 bar / 798 psi

temperatureup to480°C / 895°F

Exhaust steam conditions

back pressureup to16 bar / 232 psi

condensingup to0.6 bar / 8.7 psi

district heating.....up to3 bar / 43 psi

All data are approximate and project-related.

Legend

1 Generator

2 Steam turbine

3 Condenser

4 Gland steam condenser

5 Gland steam unit

6 Lube oil unit

7 Hydraulic unit

Typical dimensions

L Length..... 20.5m / 67 ft

W Width.....11m / 36 ft

H Height.....10m / 32.5 ft

Features and benefits

Design features

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

Customer benefits

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



Reference examples

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



Redbank, Hunter Valley, NSW, Australia.
Condensing application, 151 MW



Suncor, Fort McMurray, Alberta, Canada. Extraction
back pressure condensing application, 76.5 MW

Quality and experience in one product family

Type	Steam parameters	Output (MW)					
		10	30	50	70	130	150 +
SST-100	65 bar, 480°C	■					
SST-200	80 bar, 480°C	■					
SST-300	120 bar, 520°C		■	■			
SST-400	120 bar, 520°C			■	■		
SST-500	30 bar, 350°C			■	■	■	
SST-600	140 bar, 540°C			■	■	■	
SST-700	165 bar, 565°C			■	■	■	
SST-800	140 bar, 540°C			■	■	■	
SST-900	165 bar, 585°C			■	■	■	■

Additional features for SST-900: Single casing/non-reheat, Dual casing/reheat

SST-900 steam turbines are part of a modern range of Siemens steam turbines developed to meet the most demanding customer requirements for cost-efficient power generation and mechanical drive applications in power plants and industrial environments.

This is achieved by using a highly modularized system of state-of-the-art components with well proven design features. Its development is based on experience accumulated during a century of steam turbine design, manufacturing and operation.

The SST range of our turbines cover the complete spectrum from 2 to 180 MW and are available in back pressure, condensing and extraction design. The table above shows the Siemens full range of industrial steam turbines and their most important parameters.

Whether you need a generator drive for power generation or a mechanical drive for compressors, blowers and pumps just tell us your needs and together we can select the optimum turbine or turboset which is most suited to respond to them.



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Siemens AG
Power Generation
Freyeslebenstrasse 1
91058 Erlangen, Germany
e-mail: contact@pg.siemens.com
www.siemens.com/powergeneration

Siemens AG
Power Generation
Industrial Applications
Wolfgang-Reuter-Platz
47053 Duisburg, Germany
e-mail: welcome.pgi@siemens.com
www.siemens.com/powergeneration

Siemens Industrial Turbomachinery Inc.
10730 Telge Road
Houston, Texas 77095, USA

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The information in this document contains general descriptions of the technical options available which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.