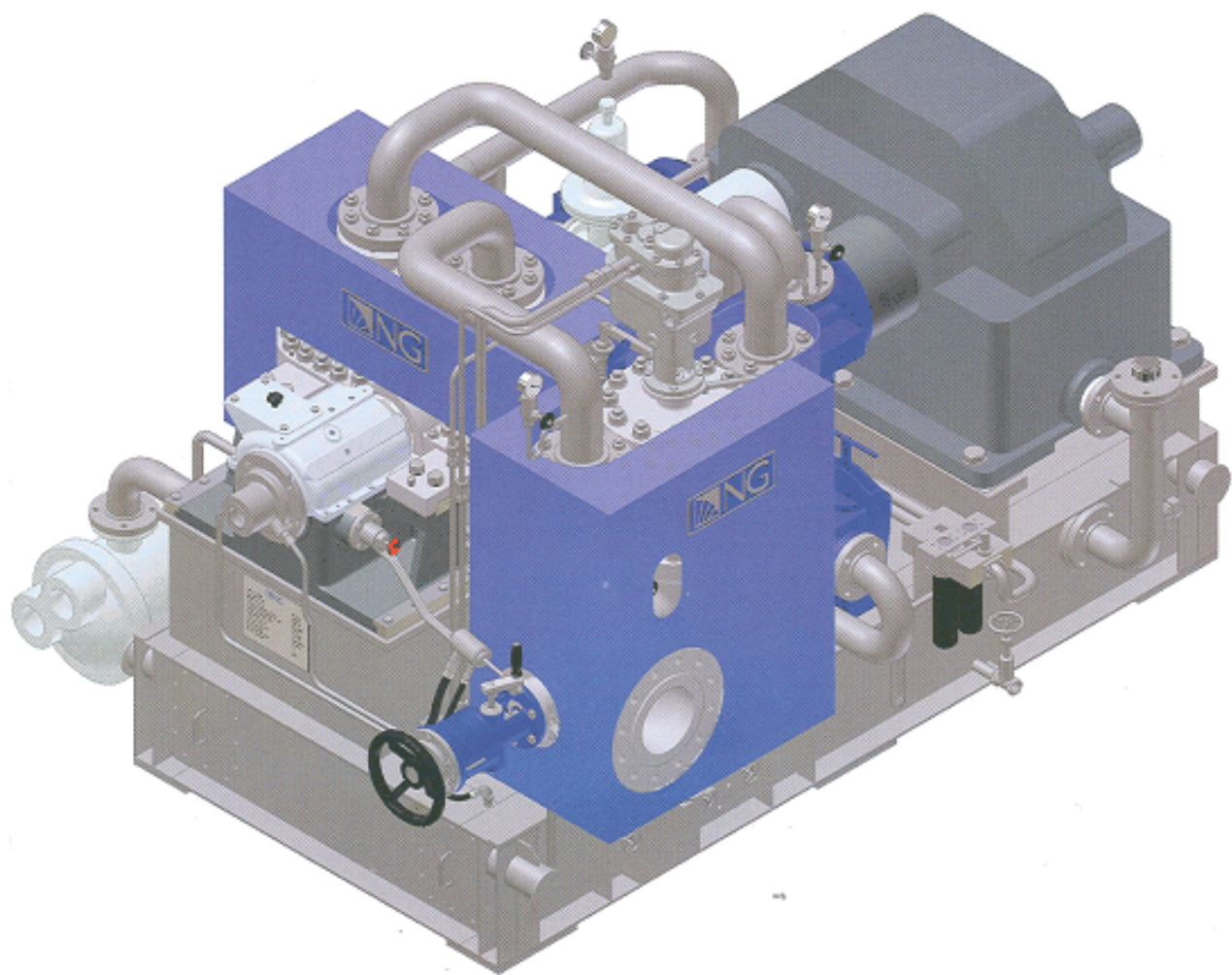


# High Performance Single Stage Turbines HST Series

ENERGY



## A new high efficiency single stage turbine line.

A new project developed by the Engineering Department, resulted in the new HST (High performance, Single stage, Total admission) series of turbines.

This new line, developed to comply with the requirements of high efficiency, high reliability, robust design and low operational cost, incorporates three frame sizes according the mean diameter of the wheel – HST 400, HST 500 and HST 700.

The main characteristic – the high thermodynamic efficiency – is obtained due to a suitable design for the steam path components.

Automatic control multi valves guarantee the steam admission in the total wheel circumference (total admission) and permit to optimize the efficiency during operation at partial loads.

Nozzles, of the aerofoil type profile and rotor blades of the low reaction type provide a better equipment performance.

Depending on the operational conditions, the efficiencies obtained with HST turbines are equivalent to the ones obtained on the small multi stage machines in the range up to 4 MW.

The casing, designed for steam conditions up to 45 bar / 450 deg C at the turbine admission and 9 bar at the exhaust, is horizontally splitted and center line supported.

The bearing pedestals assure an excellent operational stability, allowing for the proper thermal expansion of the turbine and maintaining the turbine internal alignment.

The thrust bearing, installed at the front bearing housing, is of the tilting pad type, with high capacity for supporting axial loads in both directions.

The bearing housings are provided with an efficient oil sealing system to avoid contamination in case of an eventual steam leakage through the shaft sealing. This oil sealing can be provided either by metallic labyrinths or "inpro-seal" type sealings.

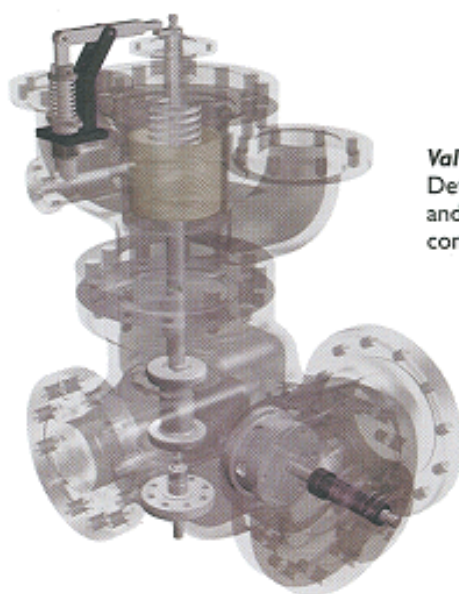
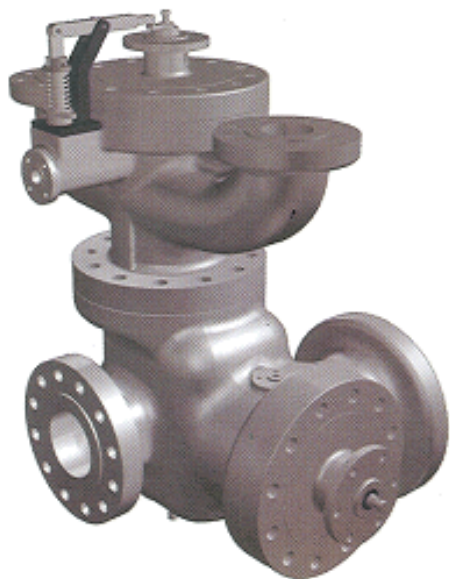
The single stage rotor with a Curtis wheel is designed to obtain a better efficiency and can be either of the built up or integral type, depending on the rotational speeds employed, which, in general, are higher than the used on the conventional turbines.

The steam shaft sealing system, suitable for high back pressures, as well as for condensing application (below atmospheric pressure), can be of the metallic labyrinths, carbon rings or mechanical seal.

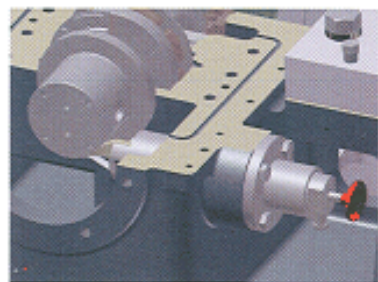
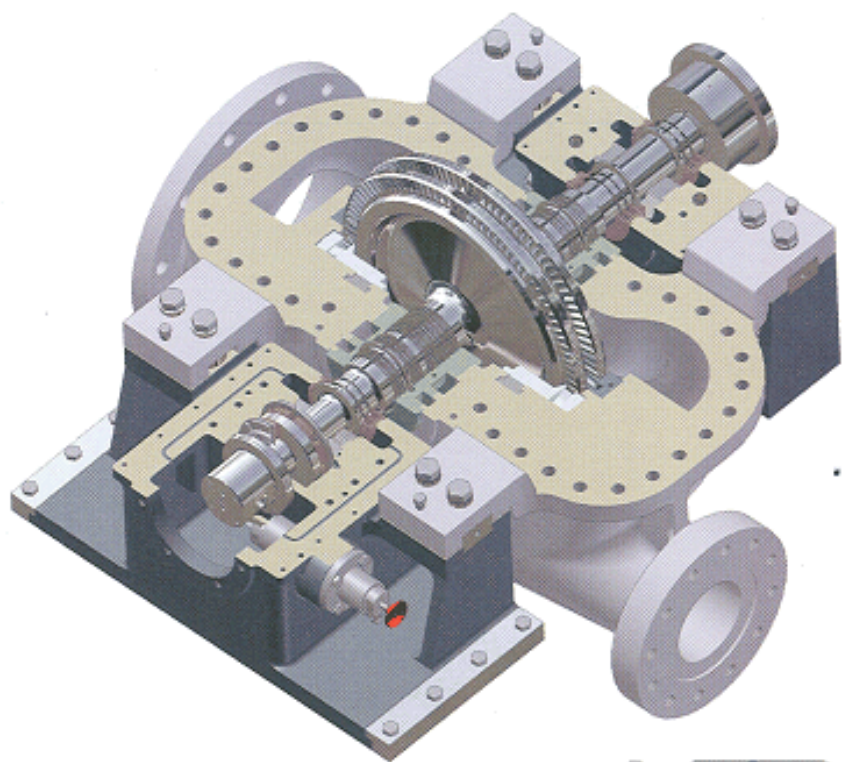
The valve body includes the automatic multi control valves and the combined stop and emergency valve. This last one, of the spring loaded positive shut off type, can have its spindle moved, for test, while the turbine is in operation.

The turbine control system can include either the hydraulic or the electronic (digital or analogue) type governors.

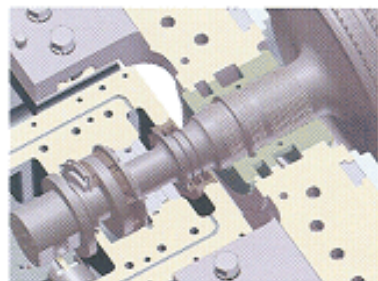
The HST series of turbines can be mounted on metallic baseplates extended to the speed reduction gearbox and may incorporate the oil reservoir, resulting in a compact skid for the complete lube and control oil system, making easy the transport and the installation of the unit, at site.



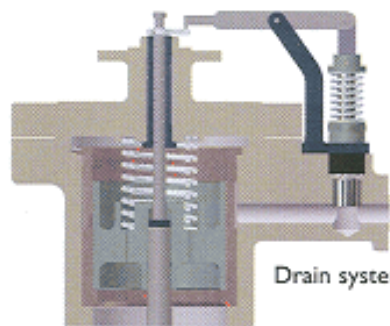
**Valve Body Assembly**  
Details of trip valve  
and automatic multi  
control valves



Trip Mechanism

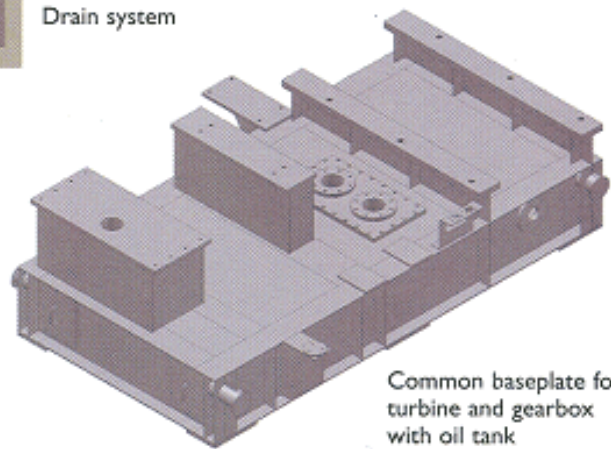
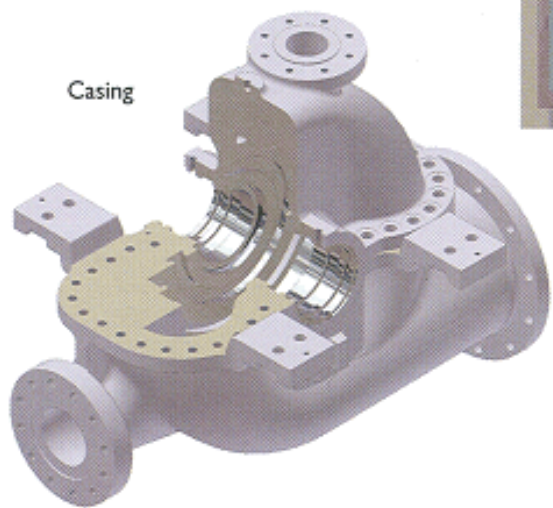


Bearing House



Drain system

Casing



Common baseplate for turbine and gearbox with oil tank

Model	HST - 400	HST - 500	HST - 700
SPEED	7800 to 9000 rpm	7000 to 8000 rpm	5000 to 5800 rpm
INLET FLANGE	6"	8"	10"
EXHAUST FLANGE	12"	14"	16"
POWER	1300 to 1800 kWe	2000 to 2600 kWe	3000 to 4000 kWe