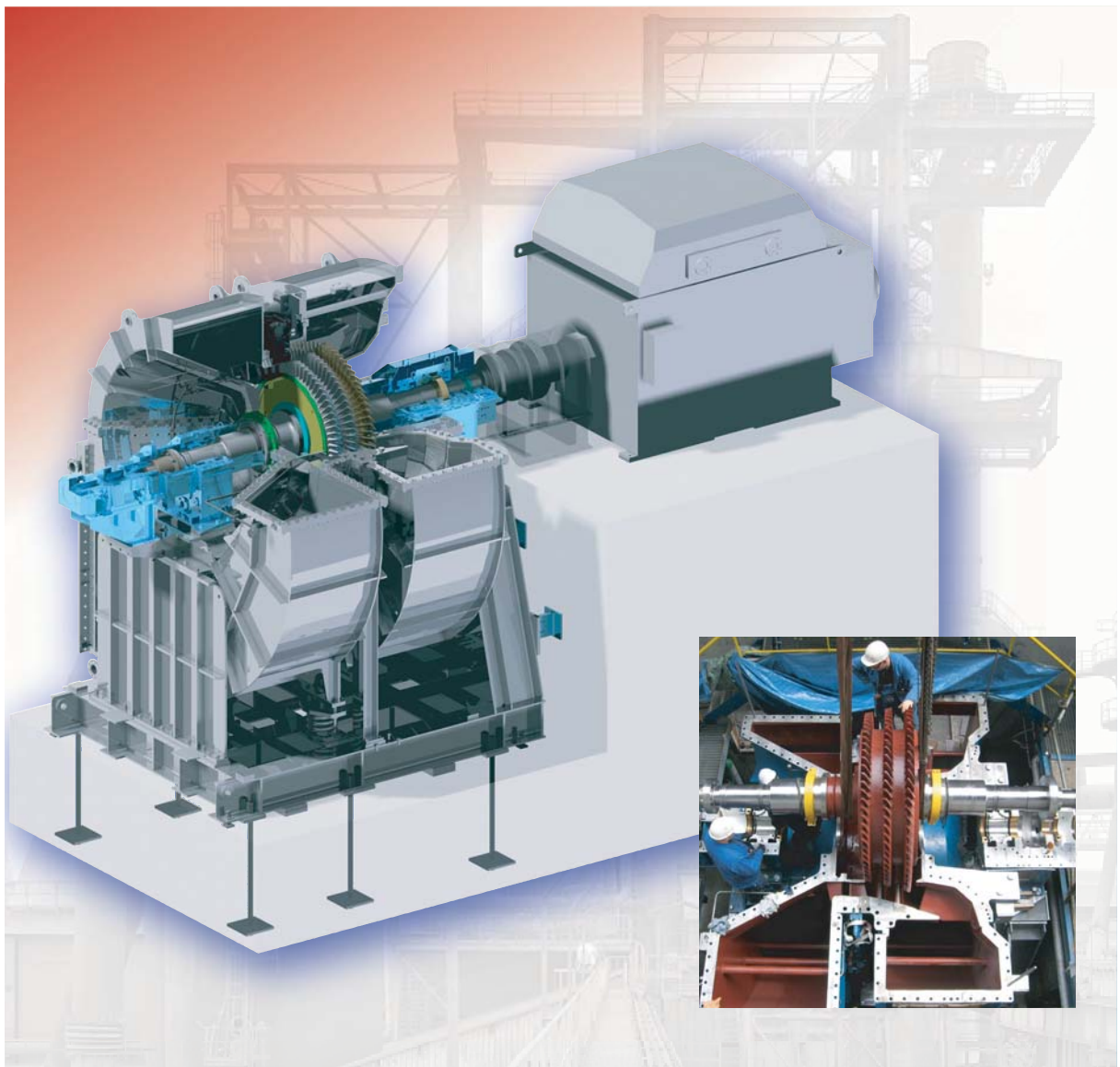




RACO

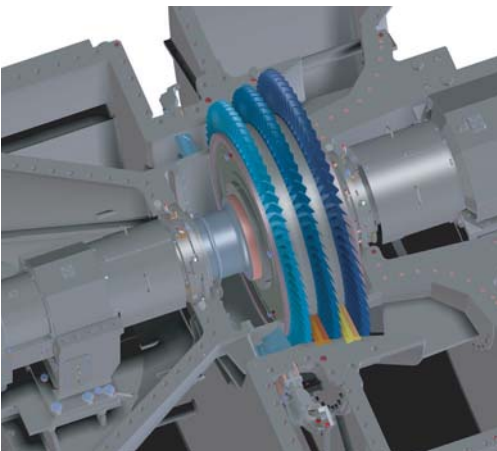
ZIMMERMANN & JANSEN

TRT Top Gas Energy Recovery Turbines

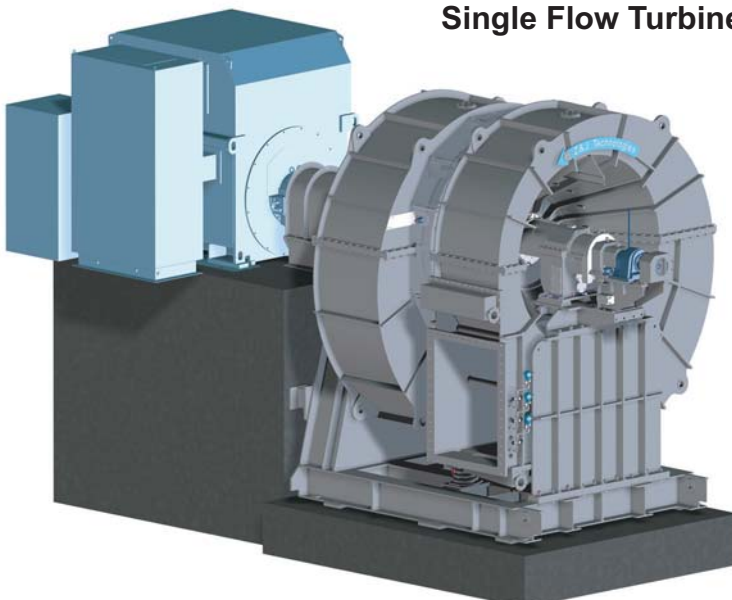


Key Features of Z&J Turbine Machines

- Low revolution of 1500/min (50Hz)
1800/min (60Hz)
- Low pressure difference over the stages
- Low dust deposit at the blades
- All internals coated including blades and nozzles
- Gas sealing device with low N₂ consumption
- Bearings outside of gas chambers
- Double Flow Design compensates axial loads
- Fast and exact Top Gas Pressure controlling
- Long maintenance intervals
- Less energy losses (no gearbox is necessary)
- Long lifetime
- 30 years experience in TRT business



Single Flow Turbine



Single-/Double-Flow / Dual Duty Type Turbine

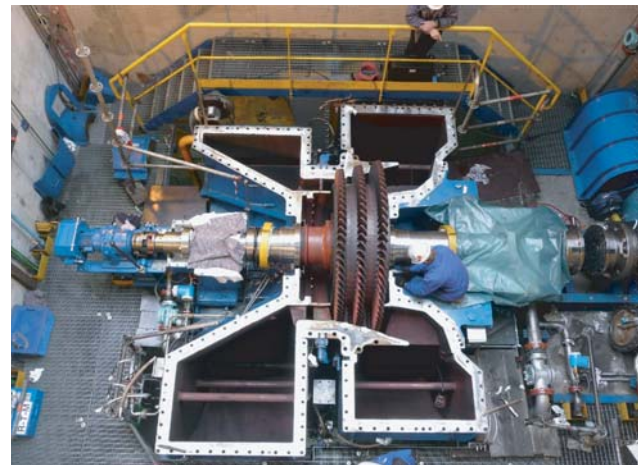
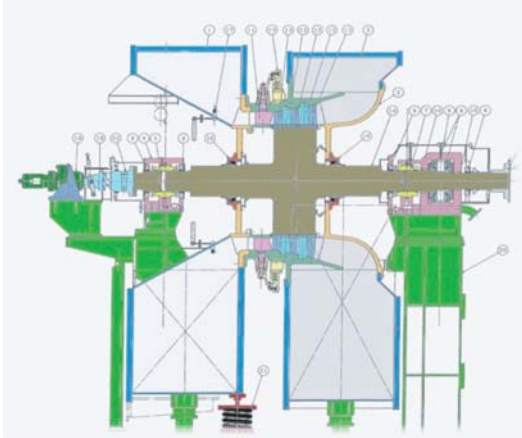
Expander Turbine

Z&J Technologies GmbH has more than 30 years of experience in building TRT-Systems. Turbines for different applications in use of

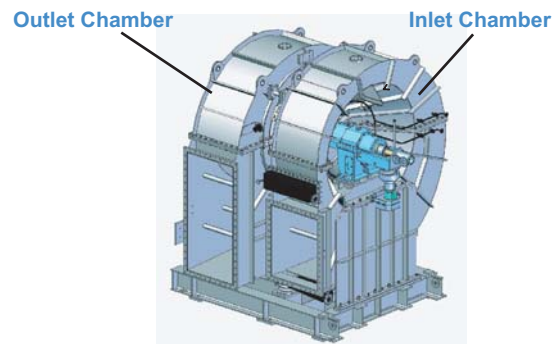
- Ring Split Washer
- Septum Valves

are supplied. Even a solution for one turbine connected to two BF's was realised (Dual Duty Turbine).

Single Flow Turbine up to 500.000 Nm³/h and 2.5 bar (g)

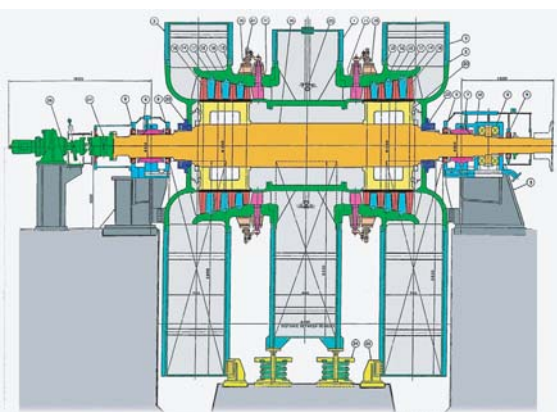


Rotor and Casing Single Flow Turbine



Single Flow Turbine

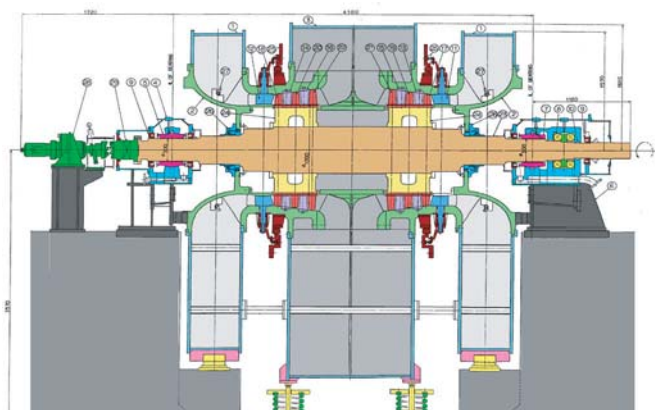
Double-Flow Multi Stage Turbine up to 1.000.000 Nm³/h and 2.5 bar (g)



Dual Duty Multi Stage Turbine up to 1.000.000 Nm³/h and 2.5 bar (g)

Z&J's Dual Duty Turbine enables the simultaneous support of two Blast Furnaces. The production of 2 x 13 MW in combination with less maintenance and long service periods provides the advantage of less investment to our customers. Only one TRT-Plant for two Blast Furnaces has to be built.

Both BF's use independent Top Pressure Controls.



Services and Components

All Services and Main Components Manufactured or Supplied by Z&J

- Basic Engineering
- Electrical Engineering
- Turbine
- Valves
- Lube Oil System
- MCC System
- Transformator
- Seal Gas system
- Cooling Water System
- Drain Water System
- Steel Structures
- Detail Engineering
- Commissioning
- Generator
- Hydraulic System
- Control System
- Medium Voltage System
- Main Breaker
- Purge System
- Spray Water System
- Piping
- Buildings

**TRT Plant Financing
and Overall Service for Complete Supply**



Outlet Duct



Main Stop Valve



Sub Bypass Valve



Main Stop Valve (detail)

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