

# MODEL R™

## MULTI-STAGE STEAM TURBINE

The Dresser-Rand Model R™ multi-stage steam turbine is a versatile, API 612-compliant turbine engineered to meet demanding applications up to 25,000 kW. The multi-stage Model R turbine is designed to drive generators for independent power plants, compressors and other mechanical equipment for industrial processing and institutional power plants. These efficient steam turbines also are used in food processing, ethanol, waste-to-energy, and biomass applications.

### CASING DESIGN

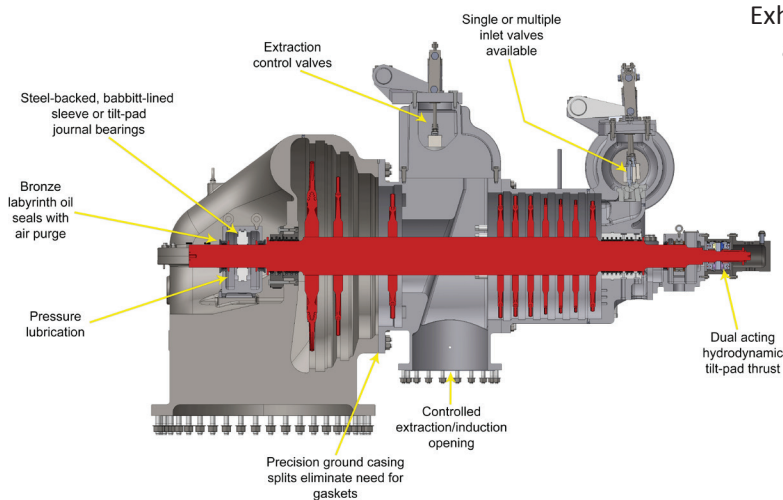
Casing splits (horizontal or vertical) are precision-ground with metal-to-metal joints, eliminating the need for gaskets. Casings conform to ASME Section VIII standards and NEMA standards for allowable stress levels; each section of the turbine casing is hydrostatically tested to meet API 612 requirements.

Exhaust orientation is available in up, down, side, or axial configurations in condensing or non-condensing designs.

### OVERSPEED TRIP SYSTEM

The overspeed trip system is a two-out-of-three electronic system with dual solenoid activation of an independent trip-and-throttle valve.

The trip-and-throttle valve functions as a quick-closing valve (manual or automatic) using electronic trip actuators. It also functions as a manually operated throttle valve for bringing the steam turbine up to speed. Choose from a D-R mechanical trip-and-throttle valve, or a Dresser-Rand Gimpel® oil-operated trip-and-throttle valve.



### GOVERNORS

The Model R turbine is typically supplied with an electronic governor control system. It provides tight control of speed (NEMA D) and includes an input for a 4-20 mA remote speed control signal that can be used for a process-generated input to control the speed setting. Other features include dual-speed control dynamics and overspeed trip test capabilities.

## MULTI-VALVE INLETS

The Model R turbine is available with multiple- governor-controlled inlet valves that optimize the steam turbine’s performance throughout the operating range.

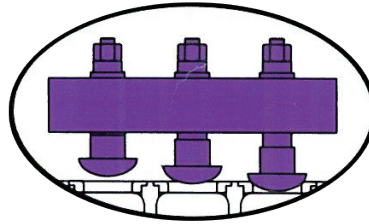


Illustration of two open inlet valves

Multi-inlet valves are opened and closed in sequence by the turbine governor controlling the flow of steam to separate groups of nozzles. These valves are opened and closed to minimize losses at partial loads and are able to maintain higher efficiencies to be maintained under all load conditions.

Dresser-Rand recommends multi-valve construction for turbines driving synchronous generators that are paralleled with other generators or a utility.

## SINGLE-VALVE INLETS

The Model R turbine is also available with single-valve governor controlled inlets, with manual or solenoid operated load valves. When multi-valve governing control is not a functional requirement, the single-valve option provides a lower cost construction and maintains acceptable control for multiple load points. This configuration is often preferred for smaller mechanical drive and power generation units.

## ROTORS, SEALS AND BEARINGS

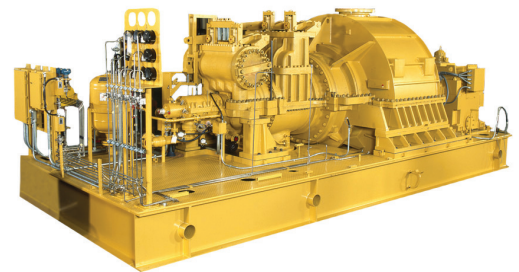
Rotors are available in a forged or built-up design with a flexible or stiff shaft for up to 15 stages. Labyrinth gland or inter-stage steam seals are provided to accommodate operating conditions or client preference.

Labyrinth-type oil seals retain pressure-fed lubrication in the bearing housings and prevent contamination from foreign material. Steam slingers also protect bearing housings from steam and condensate.

The Model R turbine incorporates a dual-acting, hydrodynamic, tilting pad thrust-bearing to position the rotor axially and absorb internal thrust; spherically seated or tilting pad-type journal bearings are standard. Exhaust- and steam-end bearing covers allow easy access to the bearing housing without removing the casing cover.

## ADDITIONAL DESIGN FEATURES:

- Controlled extraction / induction
- Back-pressure / condensing
- Non-automatic extraction (bleed)
- Up to 20” (508 mm) inlet (for pressures as low as atmospheric)
- Up to 78” (1,830 mm) exhaust
- Full arc of admission



## SPECIFICATIONS

Model	Power HP (kW)	Inlet Pressure psig. (bar)	Inlet Temp °F (°C)
R	33,500 (25,000)	950 (66)	950 (510)
Exhaust psig (bar)	Speed (RPM)	Inlet Diameter In (mm)	Exhaust Diameter In (mm)
400 (28)	15,000	20 (508)	78 (1,981)
Stages	Casing Design	Inlet Options	
15	Horizontally split	Multi-valve Single-valve	

<sup>1</sup>Pressure capability increases well above 950 psig as application temperature is reduced.

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