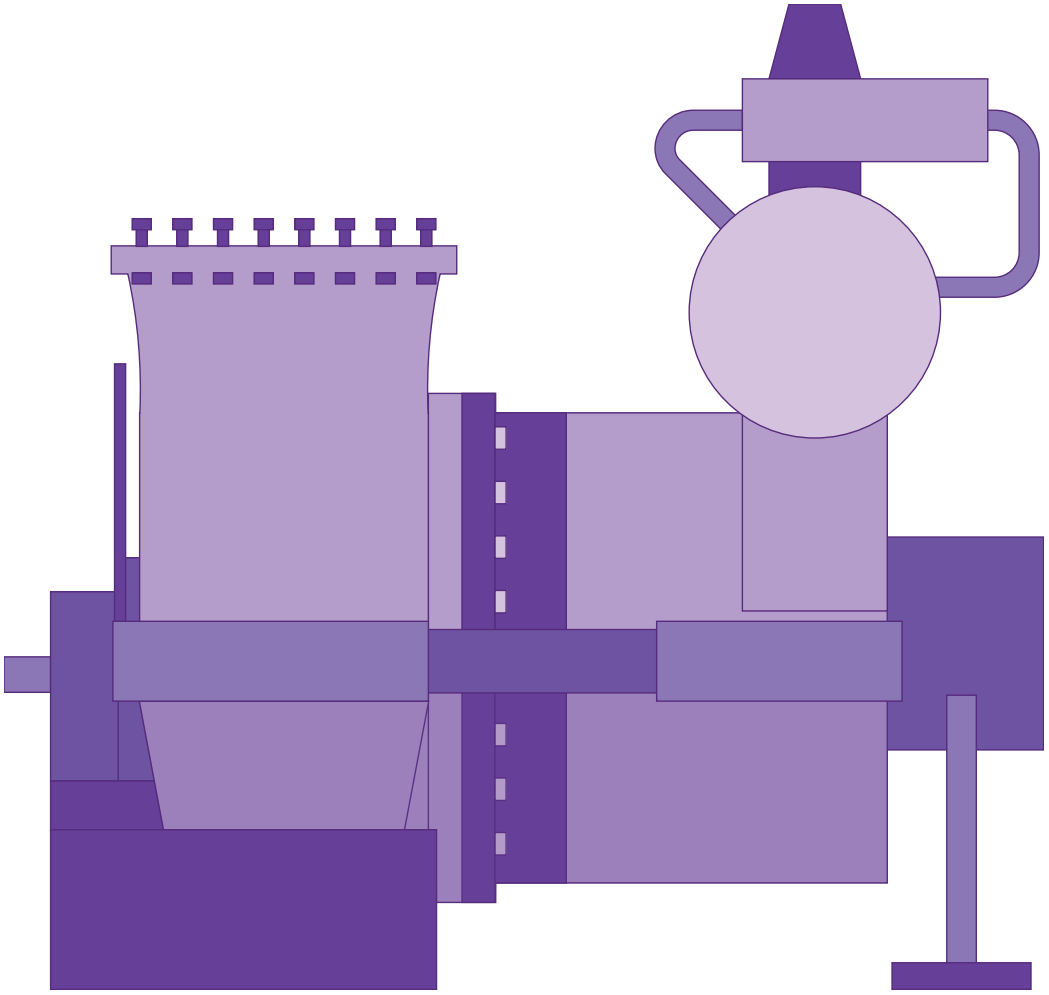
Efficiency: More value to your facility

Dresser-Rand Steam Turbines



omterra.com/steamturbines

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Reliable Steam Turbines

With over a century of experience and continuous development in steam turbine technology, Omterra has stayed at the forefront of development and is a prime partner for your business. With a fleet of more than 100,000 steam turbines world wide, Omterra is a reliable and experienced partner.

Omterra Steam Turbines are an essential piece of turbomachinery to many power plants worldwide. They are applied either as a generator drive or a mechanical drive for pumps and compressors. The modular design concept of all steam turbines ensures high flexibility, availability and a reduction of time-to-market.

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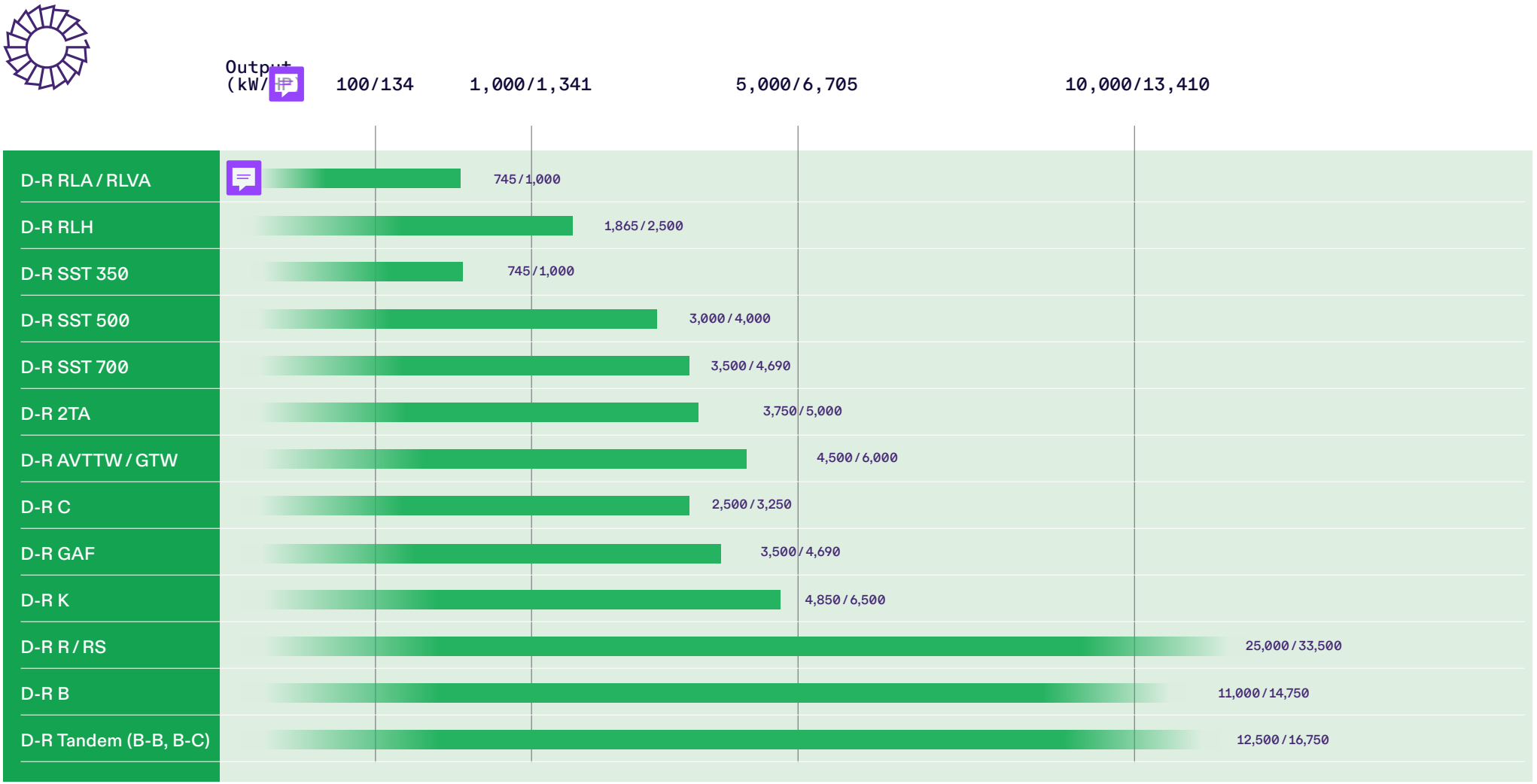
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D-R Steam Turbines Overview



Dresser-Rand – An Omterra Business

With the D-R steam turbine portfolio Siemens has the most comprehensive range of API turbines available on the market, including:

- Standard single stage turbines for pump, fan & small compressor drives according to API 611 General Purpose (GP) standard
- Standard and engineered steam turbines as generator drives for industrial or commercial on-site power generation
- Engineered single stage turbines for applications according to API 611 (General Purpose—GP) or API 612 (Special Purpose—SP) standards
- Standard multistage turbines for larger pumps, fans & compressors to API 611 or API 612 standards, or for power generation
- Turbines for geothermal plants
- Turbines for expansion of ORC and process fluids
- As required either bare ST drivers to OEMs, or complete packages including gears, lube oil systems and controls are supplied.

Benefits:

- Highest levels of quality & reliability for the most critical services in the business
- All units factory tested in accordance with API and customer requirements
- Units with modular designs, but engineered to order, according to customer project specifications & standards and local environmental requirements

D-R SST 350 / 500 / 700

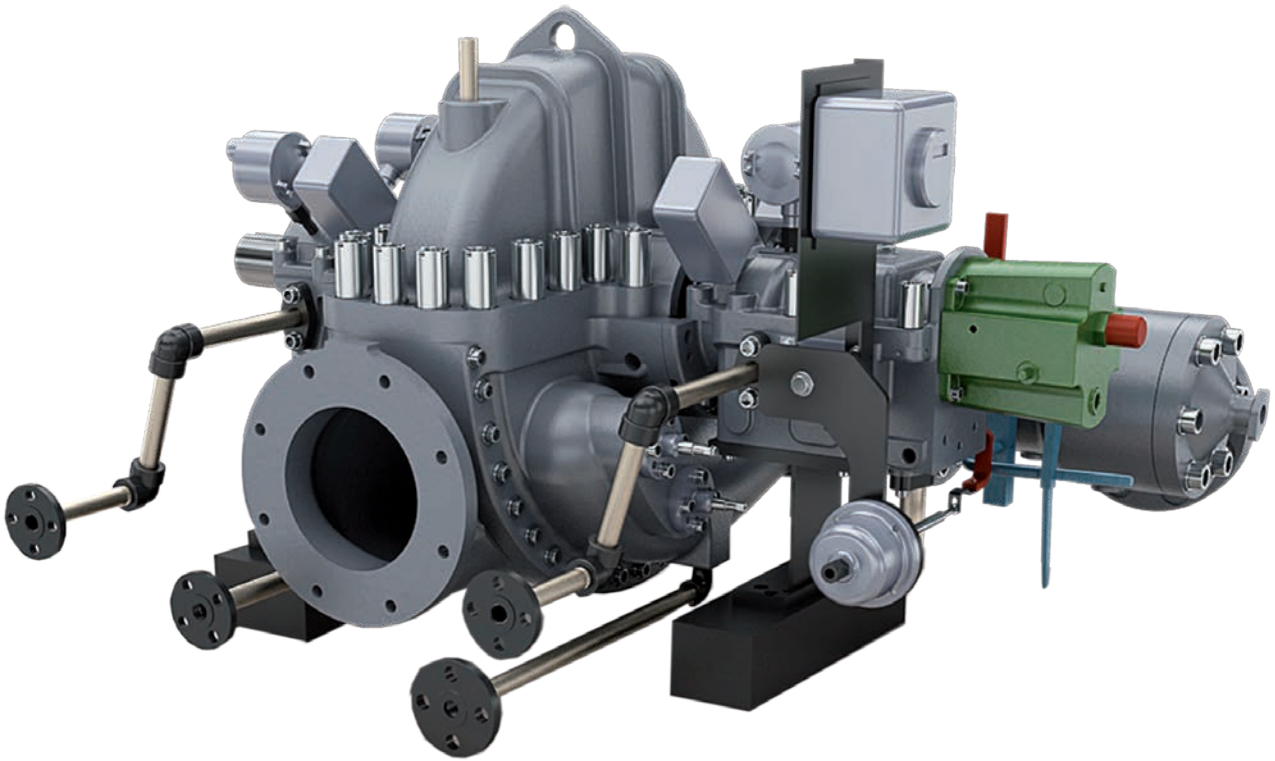
Standard single stage steam turbine

- Rugged, versatile design
- Woodward TG Oil Relay NEMA Class A constant speed governor or electronic governor
- Horizontally split casing with centerline support
- Overspeed mechanical trip valve, separated from governor valve
- Carbon ring or labyrinth sealing glands
- Built-in, removable steam strainer
- API style blanket lagging / insulation (API applications)
- Multiple bearing cooling options including water cooled, oil ring lubricated with force feed or circulating oil cooling
- Rolling element or Tiltpad thrust bearings
- Broad range of controls and accesories available
- WORTHINGTON heritage

D-R SST 350 / 500 / 700	
Max. power output	3,500 kW / 4,690 HP
Turbine seEed	≤ 12,000 rpm
Inlet steam temperature	≤ 482 °C / 900 °F
Inlet Steam pressure	≤ 63 bar(a) / 900 psi(g)
Back-pressure	≤ 22 bar(a) / 300 psi(g)
Type of wheel / blades	Curtis / Impulse
API 611 and API 612	Yes
Bearings	Sleeve, Ball or Tiltpad







Typical applications

- Refineries
- Petrochemical plants
- Palm oil plants
- Food processing
- Steel industry
- Pulp & Paper
- Institutional
- Process waste heat recovery
- Feed water pumps
- Process pump drives
- Cooling water pumps
- Fans
- Compressors
- Generators

D-R RLA / D-R RLVA

Standard single stage steam turbine

RLA

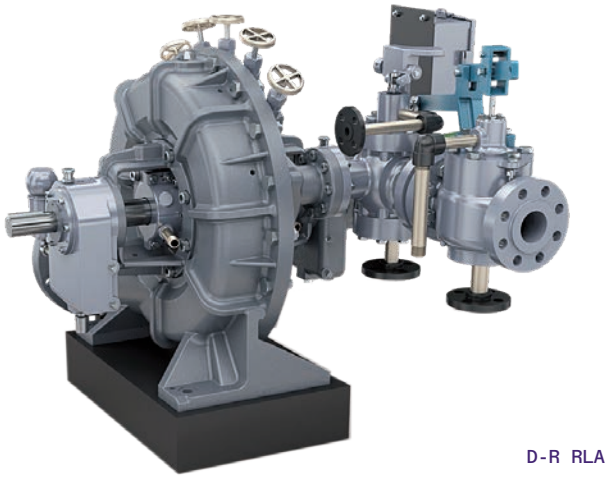
- Rugged, versatile design
- Radially split casing with centerline support
- Woodward TG Oil Relay NEMA Class A constant speed governor
- API 611 compliant, positive seating, mechanical overspeed trip valve
- Separate double seated governor valve
- Built-in removable steam strainer
- Removable carbon ring sealing glands
- API style blanket lagging / insulation (API applications)
- Multiple bearing cooling options including water cooled, oil ring lubricated with force feed or circulating oil cooling
- Broad range of controls and accessories available
- COPPUS heritage

Typical applications

- Refineries
- Petrochemical and chemical plants
- Food processing
- Institutional
- Process pump drives
- Process waste heat recovery
- Replacement of steam pressure reduction valve
- Lube oil pumps

D-R RLA / RLVA

Max. power output	745 kW / 1,000 HP
Turbine speed	up to 6,000 rpm
Inlet steam temperature	≤ 440 °C / 825 °F
Inlet steam pressure	≤ 47 bar(a) / 670 psi(g)
Back-pressure	≤ 12 bar(a) / 165 psi(g)
Type of wheel / blades	Curtis / Impulse
API 611 compliant	Yes
Bearings	Ball bearing journal & thrust



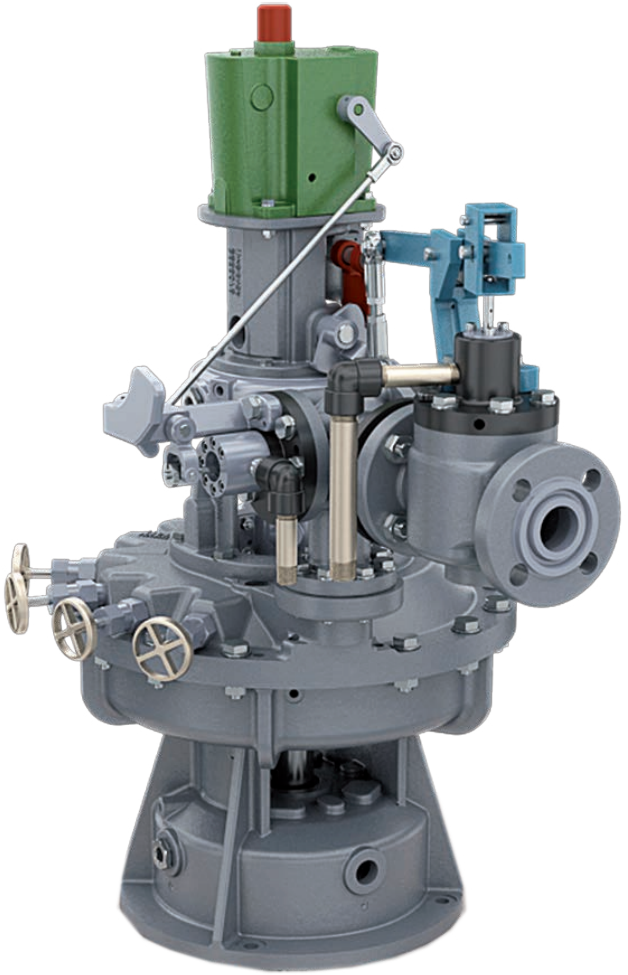
D-R RLA

RLVA

- Rugged, versatile design
- Radially split casing
- Vertical shaft design with NEMA motor mounting flange & various ball thrust bearing configurations
- Woodward TG Oil Relay NEMA Class A constant speed governor
- API 611 compliant, positive seating, mechanical overspeed trip valve
- Separate double seated governor valve
- Built-in removable steam strainer
- Removable carbon ring sealing glands
- API style blanket lagging / insulation (API applications)
- Grease lubricated with circulating oil options
- Broad range of controls and accesories available
- COPPUS heritage

Typical applications

- Refineries
- Petrochemical and chemical plants
- Institutional
- Process pump drives
- Lube oil pump drives
- Fan drives



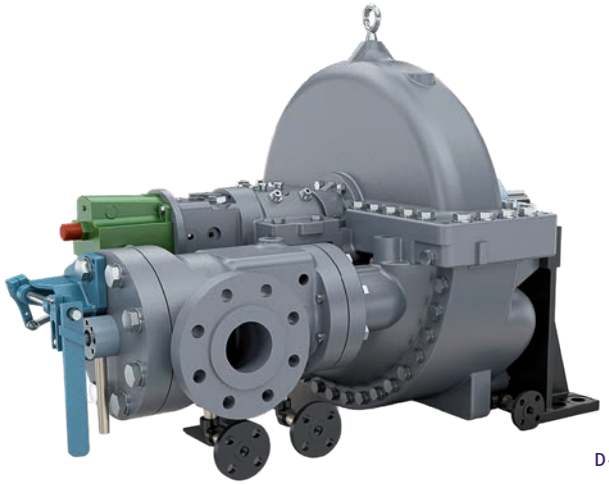
D-R RLVA

D-R RLH

Standard single stage steam turbine

- Rugged, versatile design
- Woodward TG Oil Relay NEMA Class A constant speed governor or electronic governor
- Horizontally split casing with centerline support
- API 611 compliant, positive seating, mechanical over-speed trip valve
- Separate double seated governor valve
- Built-in removable steam strainer
- Carbon ring sealing glands
- API style blanket lagging / insulation (API applications)
- Carbon ring sealing glands
- Multiple bearing cooling options including water cooled, oil ring lubricated with force feed or circulating oil cooling
- Broad range of controls and accesories available
- COPPUS heritage

D-R RLH	
Max. power output	1,865 kW / 2,500 HP
Turbine speed	up to 6,000 rpm
Inlet steam temperature	≤ 510 °C / 950 °F
Inlet steam pressure	≤ 97 bar(a) / 1.400 psi(g)
Back-pressure	≤ 22 bar(a) / 300 psi(g)
Type of wheel / blades	Curtis / Impulse
API 611 compliant	Yes
Bearings	Ball and sleeve bearing designs



D-R RLA

Typical applications

- Refineries
- Petrochemical plants
- Food processing
- Institutional
- Process waste heat recovery
- Process pump drives
- Feed water pumps
- Lube oil pumps

D-R 2TA

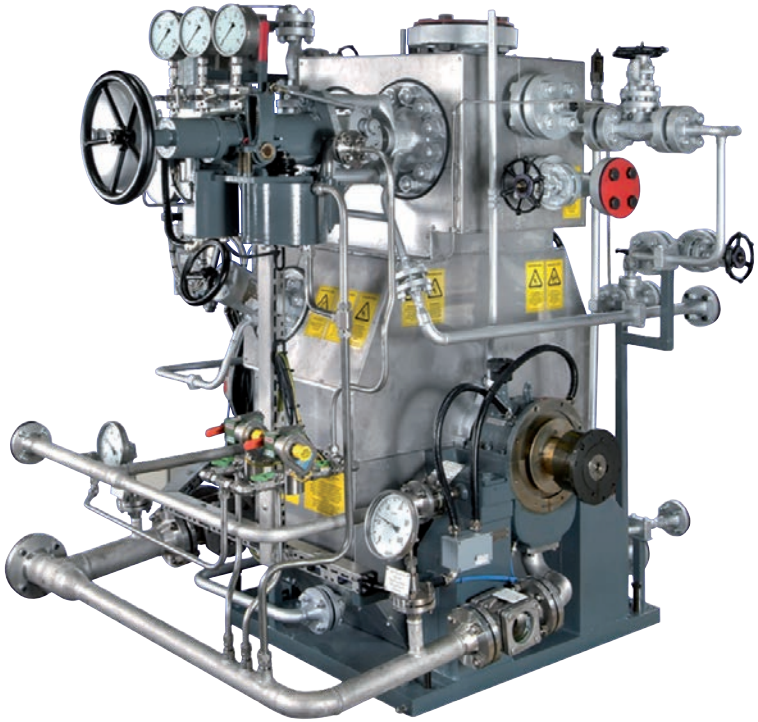
Standard single stage steam turbine

- Horizontally split casings
- Between bearing design
- Multi-Valve or Single Valve Inlet
- Solid or built-up rotor
- Carbon ring or labyrinth glands
- Electronic governor
- Electronic overspeed trip
- Separate mechanical or hydraulic trip and throttle valves (option w / o exerciser)
- Auto / quick start capability
- Terry heritage

D-R 2TA	
Max. power output	3,750 kW / 5,000 HP
Turbine speed	≤ 12,500 rpm
Inlet steam temperature	≤ 530 °C / ≤ 986 °F
Inlet Steam pressure	≤ 104 bar(a) / ≤ 1,500 psi(g)
Back-pressure [bar(a)]	≤ 33 bar(a) / ≤ 465 psi(g)
Type of wheel / blades	Curtis / Rateau impulse
API 611 & 612 compliant	Yes
Bearings	Tiltpad / Sleeve

Typical applications

- Pumps and fans drives
- Compressors drives



D-R 2TA

D-R AVTTW / GTW

Single stage steam turbine

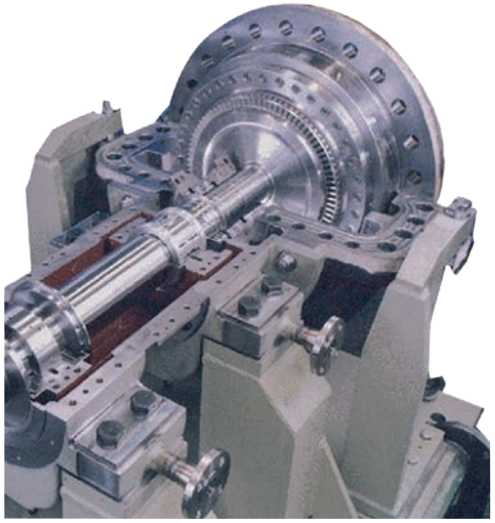
- Integrally geared or direct drive overhung turbine design
- Available in horizontal or vertical configuration (AVTTW)
- Axially split casing
- Multivalve or single valve inlet
- Derivative GTW frame used for compressor drives
- GTW overhung turbine design, direct drive
- Electronic governor
- Electronic overspeed trip
- Terry heritage

Typical applications

- Pump and fan drives
- Compressor drives

D-R AVTTW / GTW

Max. power output	4,500 kW / 6,000 HP
Turbine speed	≤ 14,500 rpm
Inlet steam temperature	≤ 550 °C / ≤ 1,022 °F
Inlet Steam pressure	≤ 125 bar(a) / ≤ 1,800 psi(g)
Back-pressure [bar(a)]	≤ 40 bar(a) / ≤ 565 psi(g)
Type of wheel / blades	Curtis / Rateau Impulse
API 611 compliant	Yes (with comments)
Bearings	Tiltpad / Sleeve



D-R RLA

D-R C

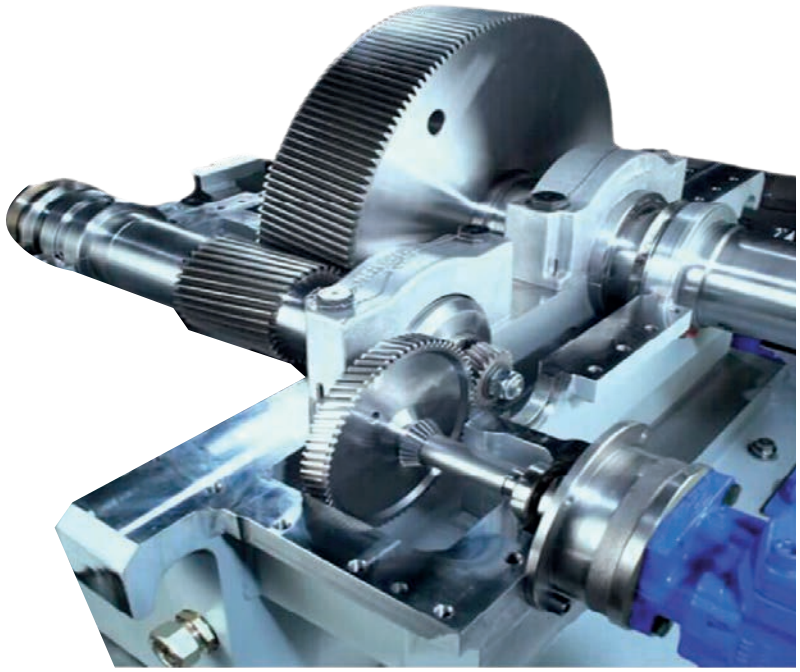
Single stage steam turbine

- Radially split casings
- Direct drive or Integral Gear operation
- Overhung rotor design
- Multi-Valve or Single Valve Inlet
- Marine Classification approval
- Auto / Quick start ability
- Carbon ring or labyrinth glands
- Nadrowski heritage

D-R C	
Max. power output	2,500 kW / 3,250 HP
Turbine speed	≤ 8,500 rpm
Inlet steam temperature	≤ 520 °C / 968 °F
Inlet steam pressure	≤ 121 bar(a) / 1,740 psi(g)
Back-pressure	21 bar(a) / 290 psi(g)
Condensing pressure	vacuum
Type of wheel / blades	Curtis / Rateau Impulse
API 611 & 612 compliance	with exception
Bearings	Tiltpad / Sleeve

Typical applications

- Pump and fan drives
- Compressor drives

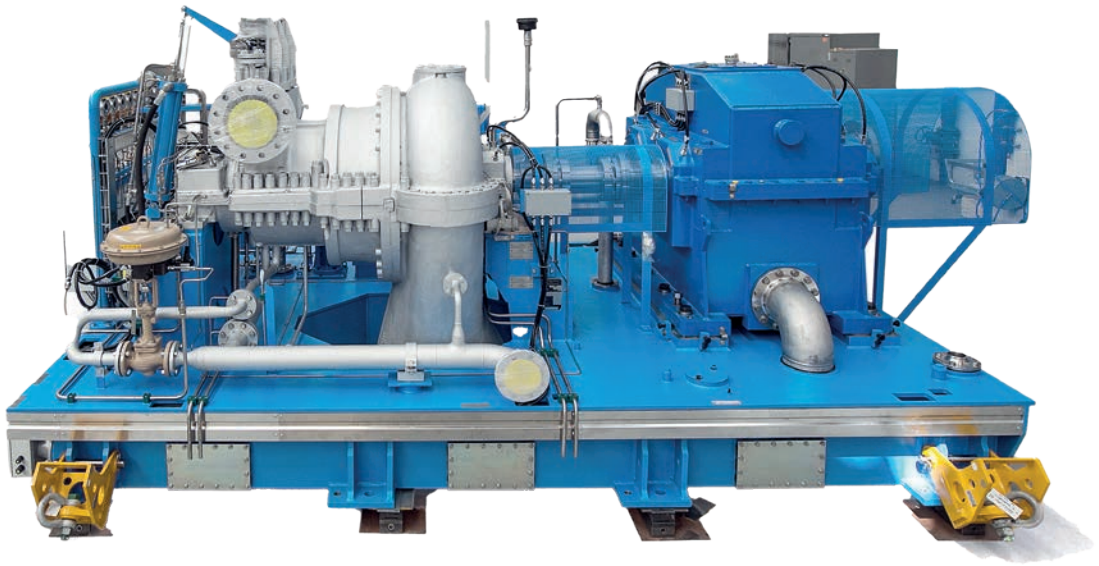


D-R C

D-R B

Standard multi-stage steam turbine

- Low cost design for high efficiency
- Multivalve inlets
- Multiple uncontrolled bleeds
- External controlled induction
- Double shaft end
- Available as single casing or multiple (tandem) casing machine
- Compact integral package designs
- Multiple externally controlled bleeds
- Single automatically controlled extraction



Typical applications

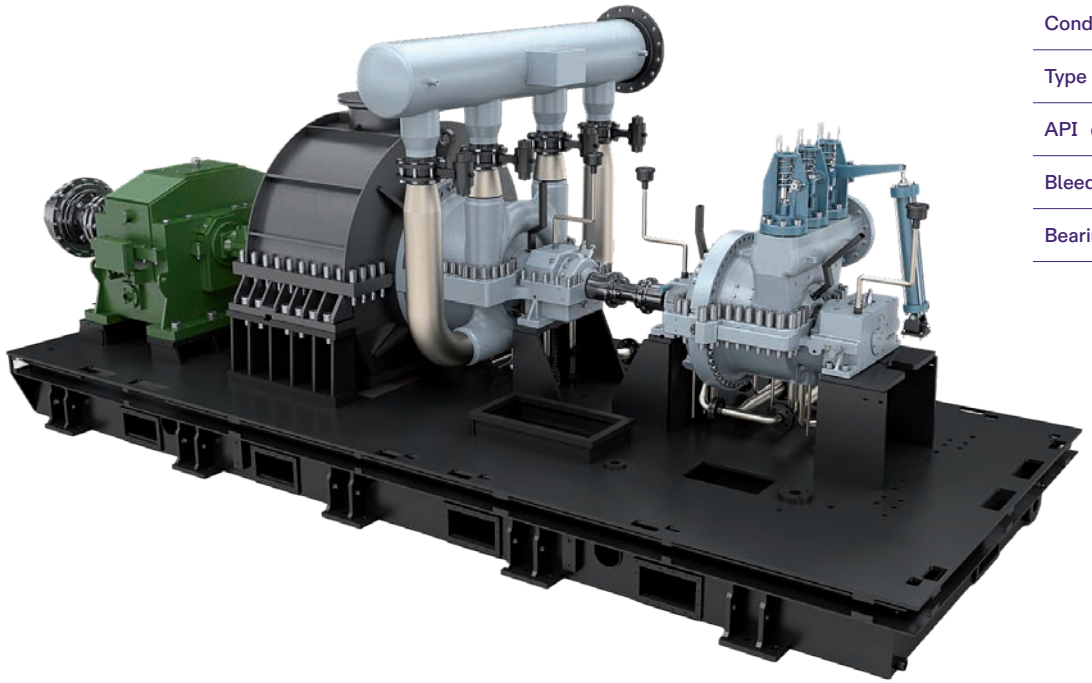
- Turbogenerator sets
- Mechanical drives
- Sugar mills
- Pulp and paper mills
- Metall & Steel
- Waste to energy plants
- Marine applications
- Waste heat recovery

D-R B

Standard multi-stage steam turbine

D-R B Tandem

- Multivalve inlets
- Multiple uncontrolled bleeds
- Single automatic controlled extraction / induction
- Extraction pressure up to 40 bar
- Nadrowski heritage



	D-R B	D-R Tandem
Max. power output	11 MW / 14,750 HP	12,5 MW / 16,750 HP
Turbine speed	≤ 9,500 rpm	≤ 8,500 rpm
Inlet steam temperature	≤ 500 °C / 932 °F	≤ 530 °C / 986 °F
Inlet Steam pressure	≤ 65 bar(a) / 930 psi(g)	≤ 121 bar(a) / 1,740 psi(g)
Back-pressure	13 bar(a) / 175 psi(g)	≤ 13 bar(a) / 175 psi(g)
Condensing pressure	vacuum	vacuum
Type of wheel / blades	Impulse	Impulse
API 611 & 612 compliant	No	No
Bleedings / Extractions	Multiple / one	Multiple / one
Bearings	Tiltpad or Sleeve	Tiltpad or Sleeve

D-R GAF

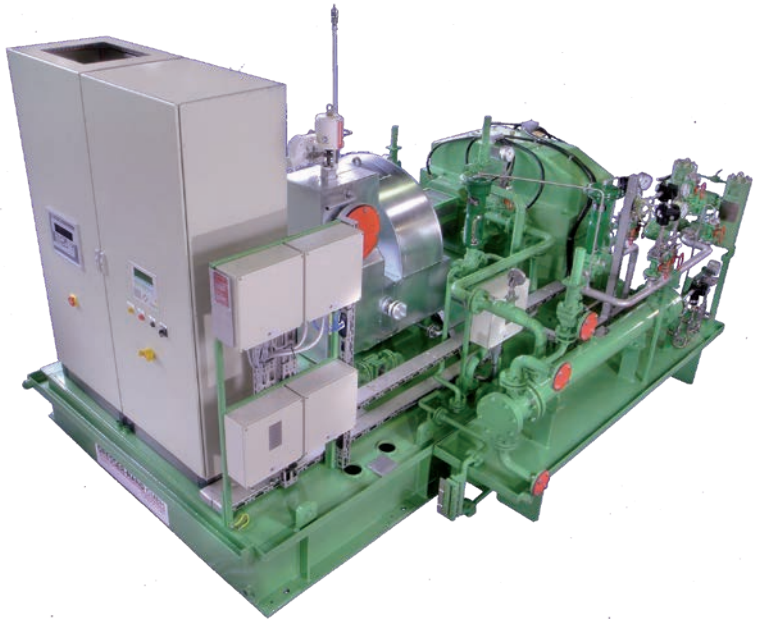
Standard multi-stage steam turbine

- Condensing or back pressure steam turbine
- Horizontal casing split
- Between bearings rotor design
- Max. 6 stages
- Single valve inlet
- API 611 or 612 design
- Terry heritage

D-R GAF	
Power output z	3,500 kW / 4,690 HP
Turbine speed	≤ 6,000 rpm
Inlet steam temperature	≤ 440 °C / 825 °F
Inlet steam pressure	≤ 49 bar(a) / 700 psi(g)
Back-pressure	≤ 6 bar(a) / ≤ 75 psi(g)
Condensing pressure	vacuum
Type of Blading	Impulse
API 611 & 612 compliance	Yes
Bearings	Tiltpad / Sleeve

Typical applications

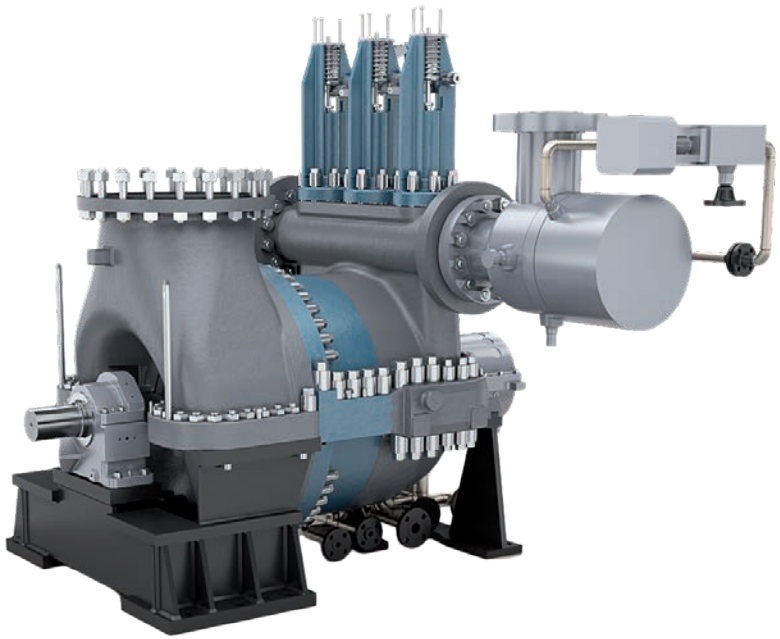
- API mechanical drive (e. g. pumps, fans or compressors)
- Turbogenerator sets



D-R R/RS

Standard multi-stage steam turbines

- Single valve or multivalve inlets
- Multiple uncontrolled bleeds
- Single automatic controlled extraction / induction
- Dual-acting, hydrodynamic, Tiltpad thrust-bearing
- Spherically seated or Tiltpad-type journal bearings
- Interchangeable parts
- Standard assemblies and components
- API and non-API options
- Condensing or back pressure
- Up to 15 stages
- Murray heritage



Typical applications

- API 611 / 612 compressor, fan and pump drives
- Turbogenerator sets, oil & gas and industrial
- Oil & gas, refineries
- Chemical plants
- Food and beverage
- Sugar mills
- Pulp & paper mills
- Waste to energy plants
- Biomass / palm oil plants
- Waste heat recovery

D-R R/RS

Max. power output	25,000 kW / 33,500 HP
Turbine speed	≤ 15,000 rpm
Inlet steam temperature	≤ 510 °C / ≤ 950 °F
Inlet steam pressure	≤ 67 bar(a) / ≤ 955 psi(g)
Back-pressure	23 bar(a) / ≤ 320 psi(g)
Condensing pressure	vacuum
Type of Blading	Impulse
API 611 & 612 compliance	Yes
Bearings	Tiltpad or sleeve
Bleedings / extractions	Multiple / one

Pressure capability increases above 1,250 psi(g) at reduced temperature.

D-R K

Standard multi-stage steam turbine

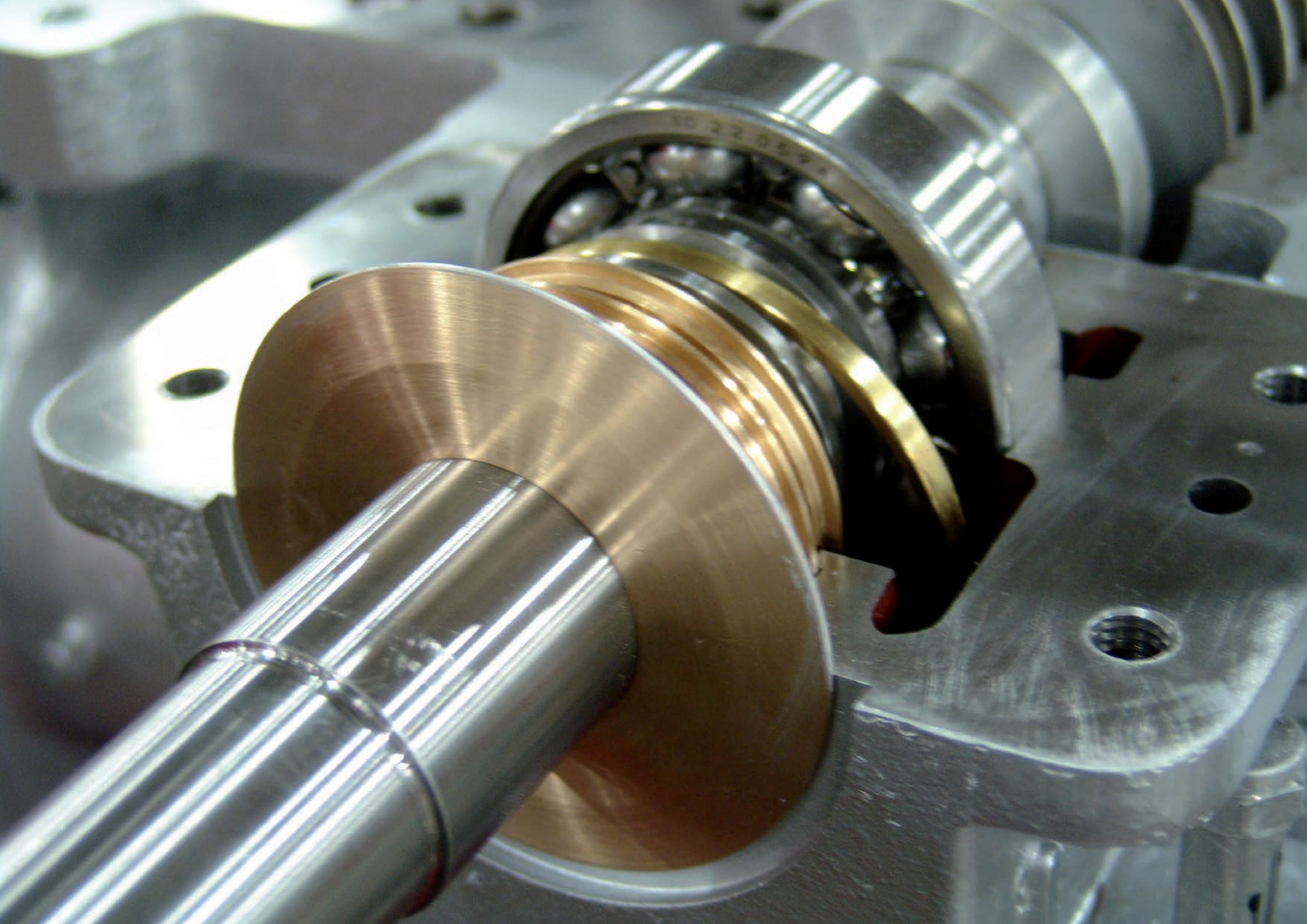
- Condensing or back pressure
- Low cost applications
- Single valve inlet
- For wide range of speeds throughout continuous operation
- Up to 12 stages
- Murray heritage

D-R K	
Max. power output	4,850 kW / 6,500 HP
Turbine speed	≤ 10,000 rpm
Inlet steam temperature	≤ 399 °C / ≤ 750 °F
Inlet steam pressure	≤ 28,5 bar(a) / ≤ 400 psi(g)
Back-pressure	≤ 6 bar(a) / ≤ 75 psi(g)
Condensing pressure	vacuum
Type of Blading	Impulse
API 611 & 612 compliance	No
Bearings	Tiltpad, Sleeve



Typical applications

- Non-API mechanical drive (e. g. pump fans)
- Air conditioning chiller / compressor drives
- Small, low pressure turbogenerator sets



Reference examples

Dresser-Rand Steam Turbines



Morning Star Packing, 24 Single Stage Steam Turbines California, USA

- Application: Mechanical drive for feed water pumps, boiler fans, hydraulics, generators, slurry pumps, fire systems.
- The tomato processing window in the US is May through October. Six months of non-stop production requires rugged, reliable equipment which is the reputation the RLH24 has earned over the years.
- Scope of Supply: 24 Single Stage Turbines
- Model: RLH 24
- Shipped: 2014



KNPC New Refinery Single Stage, Mechanical Drive steam turbines Kuwait

The construction of Al Zour Refinery in Kuwait was one of the largest grassroot refinery projects of the country. Latest technology was invested in order to produce ultra-low sulfur fuels meeting most stringent environmental regulations. Various Dresser-Rand Steam Turbines were supplied contributing to the success of this project.

- Scope of Supply: 57 SSTs for process and water pump drives
- Models: Variety of models to meet power and steam condition
- Const. year: 2018



Steam Turbine Applied as a Gas Expander Emergency Shut Down Drive More than 85 world wide

Dresser-Rand supplied special expander turbines which operate only when a power outage or other mechanical fault causes tripping of the process compressor and / or the main motor drive. When a “kill cycle” is initiated polyethylene or polypropylene reactor gases are routed from the compressor discharge to the turbine inlet (the turbine exhausts to flare) which starts the turbine and drives the compressor train through an SSS clutch at reduced speed and load for 10 minutes or less. This is adequate time for the process to be poisoned by a “kill gas” which is injected into the reactor vessel thus preventing “solidification” which would require personnel with jackhammers to enter and clean the reactor vessel at a cost of millions in lost production.



Performance data overview

Steam turbine type	**Power output** *kW / HP*	**Inlet Pressure** *bar(a) / psi(g)*	**Inlet Temperature** *°C / °F*	**Rotational Speed** *rpm*	**Controlled / Uncontrolled extraction**	**Exhaust Pressure (back)** *bar(a) / psi(g)*	**Exhaust Pressure (cond.)**	**Bearings**	**Tpye of wheel / blades**	**API compliant**	**Max. No. of stages**
D-R RLA / RLVA	745 1,000	47 / 670	440 / 825	4,300– 6,000		12 / 165		Ball bearing journal & thrust	Curtis / Impulse	611	1
D-R RLH	1,865 2,500	97 / 1,400	510 / 950	6,000		22 / 300		Ball and sleeve bearing designs	Curtis / Impulse	611	1
D-R SST 350 / 500 / 700	3,500 4,690	63 / 900	482 / 900	12,000		22 / 300		Tiltpad / Ball / Sleeve	Curtis / Impulse	611 / 612	1
D-R 2TA	3,750 5,000	104 / 1,500	530 / 986	12,500		33 / 465		Tiltpad / Sleeve	Curtis / Rateau Impulse	611 / 612	1
D-R AVTTW / GTW	4,500 6,000	125 / 1,800	550 / 1,022	14,500		40 / 565		Tiltpad / Sleeve	Curtis / Rateau Impulse	611 / 612	1
D-R C	2,500 3,250	121 / 1,740	520 / 968	8,500		21 / 290	vacuum	Tiltpad / Sleeve	Impulse	611 with exceptions	1
D-R GAF	3,500 4,690	49 / 700	440 / 825	6,000		6 / 75	vacuum	Tiltpad / Sleeve	Impulse	611 / 612	6
D-R R / RS	25,000 33,500	67 / 955	510 / 950	15,000	1 / multiple	23 / 320	vacuum	Tiltpad / Sleeve	Impulse	611 / 612	15
D-R K	4,850 6,500	28.5 / 400	399 / 750	10,000		6 / 75	vacuum	Tiltpad / Sleeve	Impulse	no	12
D-R B	11,000 14,750	65 / 930	500 / 932	9,500	1 / multiple	13 / 175	vacuum	Tiltpad / Sleeve	Impulse	611 with exceptions	7
D-R B Tandem	12,500 16,750	121 / 1,740	530 / 986	8,500	1 / multiple	13 / 175	vacuum	Tiltpad / Sleeve	Impulse	no	

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