Howden

Pre-designed KK&K® steam turbines

The comprehensive product range up to 12 megawatts

Revolving Around You™

Whatever your need for a prime mover, Howden can provide you with versatile, reliable and proven industrial steam turbines.

One of the leading turbo machinery manufacturers (formerly AG Kuehnle, Kopp & Kausch / Siemens Turbomachinery Equipment GmbH), with over 100 years of experience and continuous development, and a fleet of more than 20,000 installed turbines, we are a prime partner for your business.

A full range of world-class industrial steam turbines

Howden offers a comprehensive range of pre-designed steam turbines up to 12 MW. These innovative but economical machines have a simple modular design which facilitates optimisation of performance for the required application. For optimal configuration, we have different but fully compatible design series to draw upon, enabling us to match your needs as exactly as possible.

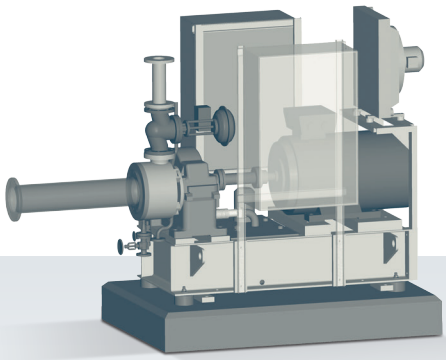
Our pre-designed steam turbines meet customer requirements for economic installation and operation as well as providing excellent flexibility for complex industrial processes. So, whether you need a generator drive for power generation or a mechanical drive for compressors, blowers and pumps, just talk to us and together we can select the turbine or turboset which is optimally suited to your needs.

Of course we strictly adhere to the guidelines laid down in the quality standards ISO 9001 and ISO 14001.

Fields of application

Howden steam turbines increase the efficiency of power generation and improve the profitability of industrial as well as mechanical drives e.g. pumps and compressors.

Industries	Applications
Chemistry	Biomass power plants
Food & beverage	Captive power plants
Independent power producers	Cogeneration/CHP
Manufacturing industries, producers of pumps and compressors	Gas expansion
Petrochemistry/refineries	Geothermal plants
Smelters/steel	Heat-recovery
Sugar/palmoil	Mechanical drives
Utilities	Ships/offshore
Wood-working industry/paper mills	Solar thermal plants
	Waste incineration plants



BASE

Turbogenerator up to 1000 kW

The BASE is a single-stage impulse turbine. The favourably priced turbine was designed as a generator drive for the 75-1000 kW power range and can be used in small combined heat and power (CHP) plants, in decentralised solar facilities as well as for waste-heat recovery, e.g. used in bottoming cycles attached to gas engines and biogas engines or for the utilisation of residual process steam.

Technical data

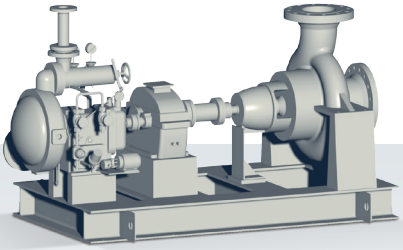
Power output up to 1,000 kW
Inlet pressure up to 40 bar(a)/580 psi
Inlet temperature dry saturated steam up to 400°C/750°F
Generator 50 Hz/60Hz
Backpressure up to 11 bar(a)/160 psi or vacuum

Typical dimensions

Length 2.5 m/8.2 ft*
Width 1.5 m/4.9 ft*
Height 2 m/6.5 ft*

Features

Backpressure or condensing type
Package unit design, oil unit integrated in base frame
Extremely small and compact design
Only minimal foundation work required
Largely maintenance-free, robust construction
High availability thanks to resilient and sure technology
Quick start without preheating of the turbine
Favourably priced thanks to proven components
Quick installation and commissioning



BASE

Mechanical drive up to 750 kW

The BASE for mechanical drives is a single-stage, backpressure steam turbine in which the flow passes axially through the blading. It is mainly used as a power source for pumps or fans and especially as a stand-by unit with quick-start capability.

Technical data

Power output up to 750 kW
Inlet pressure up to 101 bar(a)/1,465 psi
Inlet temperature dry saturated steam up to 500°C/930°F
Speed acc. to driven machine
Exhaust pressure: back pressure up to 11 bar(a)/160 psi

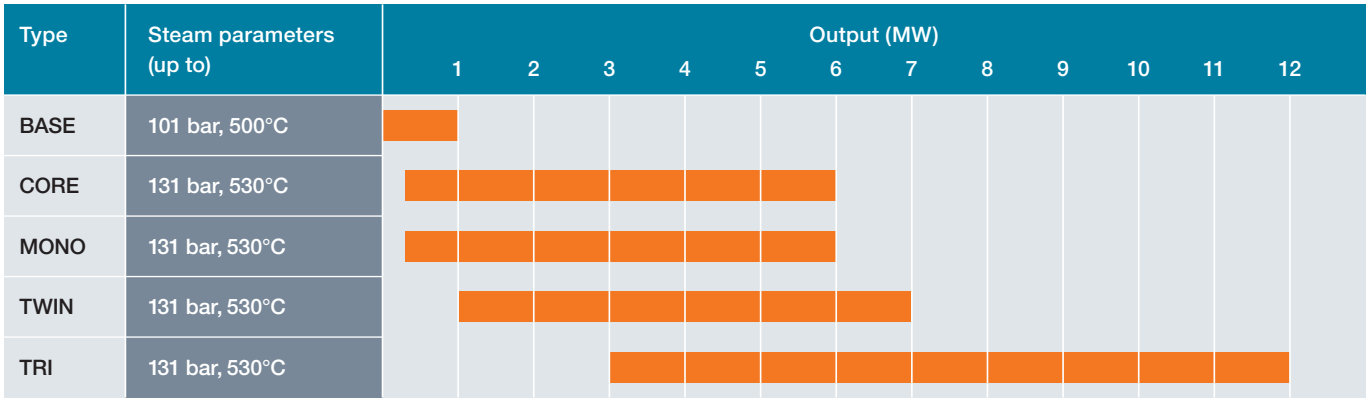
Typical dimensions

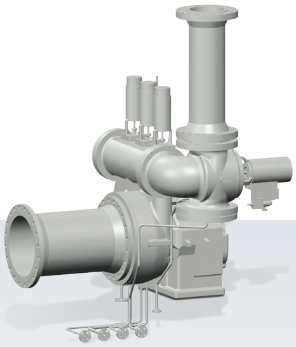
Length 1 m/3.3 ft*
Width 1 m/3.3 ft*
Height 1.3 m/4.3 ft*

Features

Low-maintenance because of the simple design
Extremely failure safe
Quick-start compatible
Turbine with integral oil supply
Meet requirements of API 611/612**
ATEX version available

*Turbine only.
**If overhung design and integral gear is accepted.





CORE

Up to 6 MW

The CORE is perfectly suitable for packaging companies / EPCs who complete the unit for their customers. We deliver the core unit with gear only.

Technical data

Power output up to 6 MW
Inlet pressure up to 131 bar(a)/1,900 psi
Inlet temperature dry saturated steam up to 530°C/985°F
Speed acc. to driven machine
Exhaust pressure: back pressure up to 29 bar(a)/420 psi or vacuum

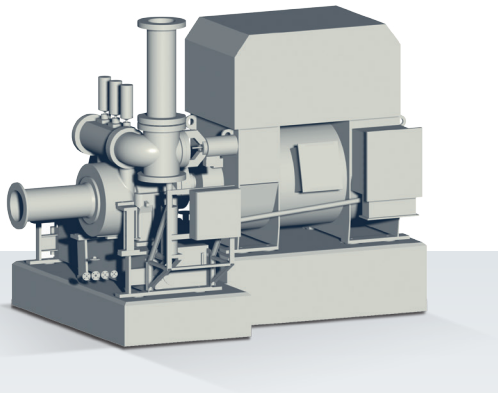
Typical dimensions

Depends on scope of complete package

Features

Backpressure or condensing type
Nozzle group control valves available
Quick-start without pre-heating
Meet requirements of API 611/612*

*If overhung design and integral gear is accepted



MONO

Up to 6 MW

The MONO stand out by their rugged design and renowned reliability even under the most severe operating conditions. They are ideal for saturated steam service. Their suitability for use as condensation or back-pressure turbines in combination with various integral gears modules opens up a broad application range.

Technical data

Power output up to 6 MW
Inlet pressure up to 131 bar(a)/1,900 psi
Inlet temperature dry saturated steam up to 530°C/985°F
Speed acc. to driven machine
Exhaust pressure: back pressure up to 29 bar(a)/420 psi or vacuum

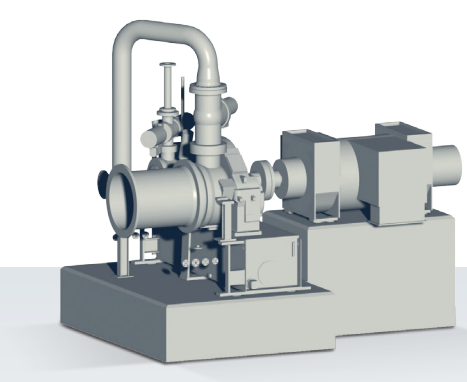
Typical dimensions

Length 1.5 m/4.9 ft* (turbine only, approx. 6 m/20ft incl. generator)
Width 2.5 m/8.2 ft*
Height 2.5 m/8.2 ft*

Features

Backpressure or condensing type
Package unit design
Oil unit integrated in base frame
Nozzle group control valves available
Quick-start without pre-heating
Tailor made

*Turbine only.



TWIN

Up to 7 MW

The TWIN provides highest cost efficiency and high performance. It allows to reduce high heat gradients while providing a controlled extraction capability. The TWIN is a dual casing turbine on one gearbox which can run on different steam lines.

Technical data

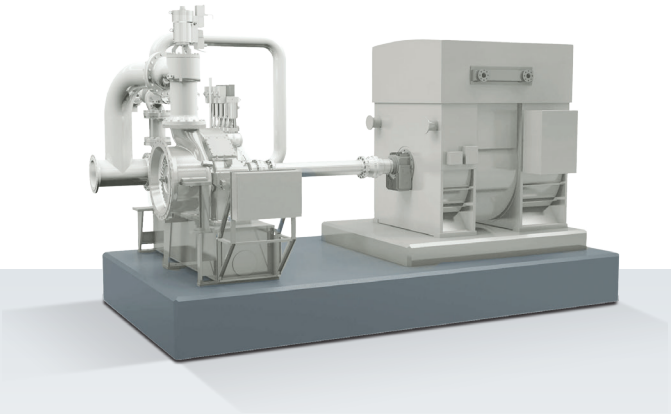
Power output up to 7 MW
Inlet pressure up to 131 bar(a)/1,900 psi
Inlet temperature dry saturated steam up to 530°C/985°F
Speed acc. to driven machine
Exhaust pressure: back pressure or vacuum

Typical dimensions

Length approx. 6 m/20 ft (incl. generator)
Width 2.8 m/9.2 ft
Height 3.2 m/10.5 ft

Features

Backpressure, condensing type
Package unit design
Oil unit integrated in base frame
Nozzle group control valves available
Quick-start without pre-heating
Extremely compact construction
Pressure controlled extraction
High pressure/low pressure applications



TRI

Up to 12 MW

The TRI is a triple casing steam turbine with an integrated gearbox, designed for flexible operation and high efficiency. The multi-casing design allows for up to two controlled extractions as well as for operation on different steam supply systems.

Technical data

Power output up to 12 MW
Inlet pressure up to 131 bar(a)/1,900 psi
Inlet temperature up to 530°C/985°F
Exhaust pressure: up to 0.06 bar (a)/8.7 psi condensation

Typical dimensions

Length approx. 8 m/26.2 ft (incl. generator)
Width 4 m/13.1 ft
Height 4 m/13.1 ft

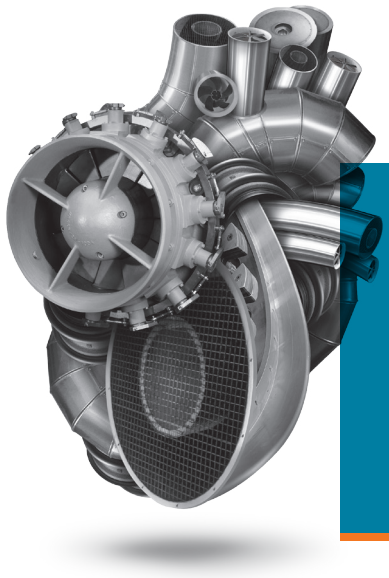
Features

Condensing type
Package unit design
Oil unit integrated in base frame
Nozzle group control valves available
Quick-start without pre-heating
Extremely compact construction
Pressure controlled extraction
High pressure/low pressure applications
Reheat possible

The KK&K Steam Turbines MONO, TWIN and TRI are also available as part of a special engineered and tailor made solution.

We can customise our steam turbines to optimally suite your needs. Any requirements or specifications like ATEX or API 611/612 (with comments) are possible with no limits in complexity.

For example COMBI trains with multiple extractions or EXP (expanders) for gas expansion, also tailor made solutions for ORC processes (Organic Rankine Cycle).



At the heart of your operations

Howden people live to improve our products and services and for over 160 years our world has revolved around our customers. This dedication means our air and gas handling equipment adds maximum value to your operations. We have innovation in our hearts and every day we focus on providing you with the best solutions for your vital operations.

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