C5 Frame Steam Turbine

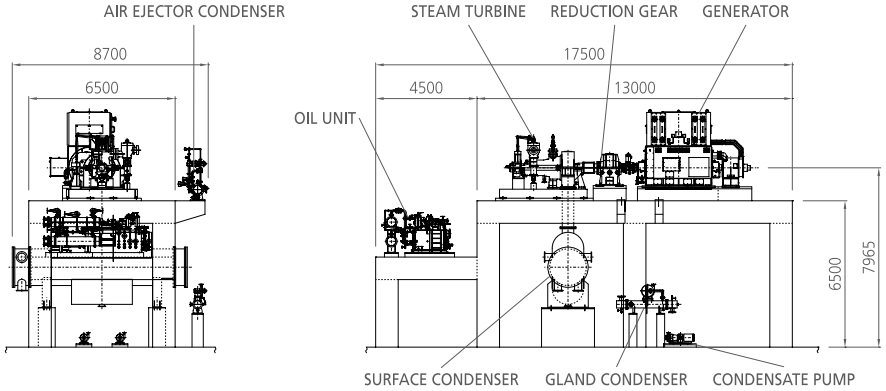
SNM
SHIN NIPPON MACHINERY CO.,LTD.

With turbine exhaust pressure a vacuum, the condensing multistage turbine is a high-efficiency, high out put model capable of fully converting the thermal energy of steam to velocity, without loss.
Subject to the number of stages chosen, the nozzle, blades, rotor discs, shaft and casing may be varied, but other essential components are fully standardized and have been engineered to fit easily to and model. SNM has a comprehensive inventory of standardized components, stock controlled to ensure prompt and reliable supply.

MODEL INFORMATION

- **Model** : C5
- **Power output** : up to 20MW
- **Turbine speed** : up to 9800rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Down or upper exhaust
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Baseplate under turbine for easy installation

TYPICAL LAYOUT



C6 Frame Steam Turbine

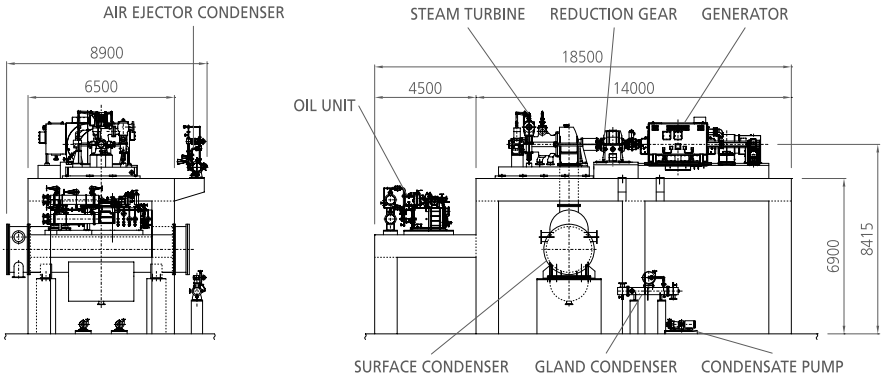
SNM
SHIN NIPPON MACHINERY CO.,LTD.

With turbine exhaust pressure a vacuum, the condensing multistage turbine is a high-efficiency, high out put model capable of fully converting the thermal energy of steam to velocity, without loss.
Subject to the number of stages chosen, the nozzle, blades, rotor discs, shaft and casing may be varied, but other essential components are fully standardized and have been engineered to fit easily to and model. SNM has a comprehensive inventory of standardized components, stock controlled to ensure prompt and reliable supply.

MODEL INFORMATION

- **Model** : C6
- **Power output** : up to 30MW
- **Turbine speed** : up to 7800rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Down or upper exhaust
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Baseplate under turbine for easy installation

TYPICAL LAYOUT



C8 Frame Steam Turbine

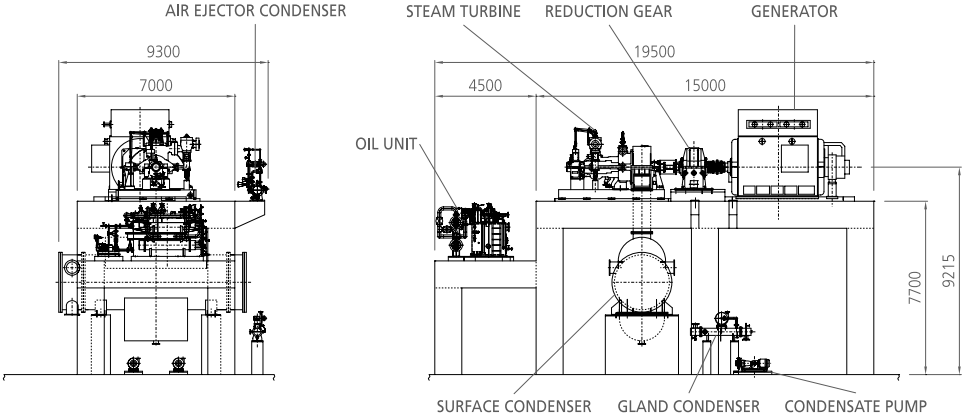
SNM
SHIN NIPPON MACHINERY CO.,LTD.

With turbine exhaust pressure a vacuum, the condensing multistage turbine is a high-efficiency, high out put model capable of fully converting the thermal energy of steam to velocity, without loss.
Subject to the number of stages chosen, the nozzle, blades, rotor discs, shaft and casing may be varied, but other essential components are fully standardized and have been engineered to fit easily to and model. SNM has a comprehensive inventory of standardized components, stock controlled to ensure prompt and reliable supply.

MODEL INFORMATION

- **Model** : C8
- **Power output** : up to 40MW
- **Turbine speed** : up to 6200rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Down or upper exhaust
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Baseplate under turbine for easy installation

TYPICAL LAYOUT



C9 Frame Steam Turbine

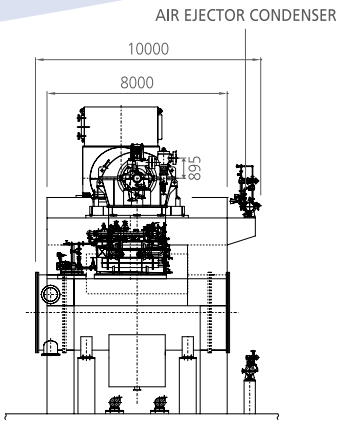
SNM
SHIN NIPPON MACHINERY CO.,LTD.

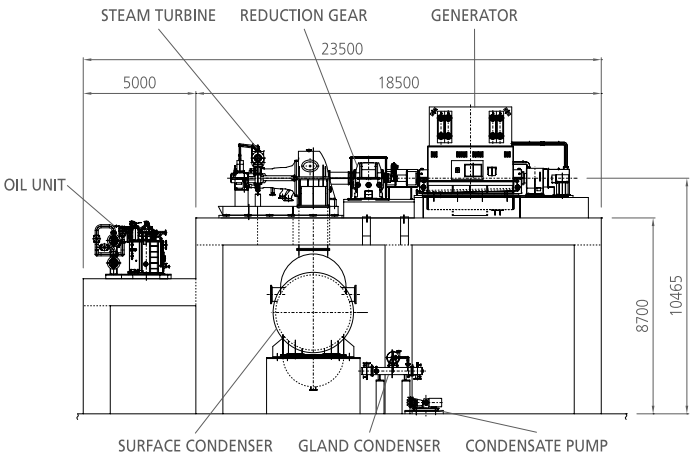
With turbine exhaust pressure a vacuum, the condensing multistage turbine is a high-efficiency, high out put model capable of fully converting the thermal energy of steam to velocity, without loss.
Subject to the number of stages chosen, the nozzle, blades, rotor discs, shaft and casing may be varied, but other essential components are fully standardized and have been engineered to fit easily to and model. SNM has a comprehensive inventory of standardized components, stock controlled to ensure prompt and reliable supply.

MODEL INFORMATION

- **Model** : C9
- **Power output** : up to 50MW
- **Turbine speed** : up to 4900rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Down or upper exhaust
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Baseplate under turbine for easy installation

TYPICAL LAYOUT





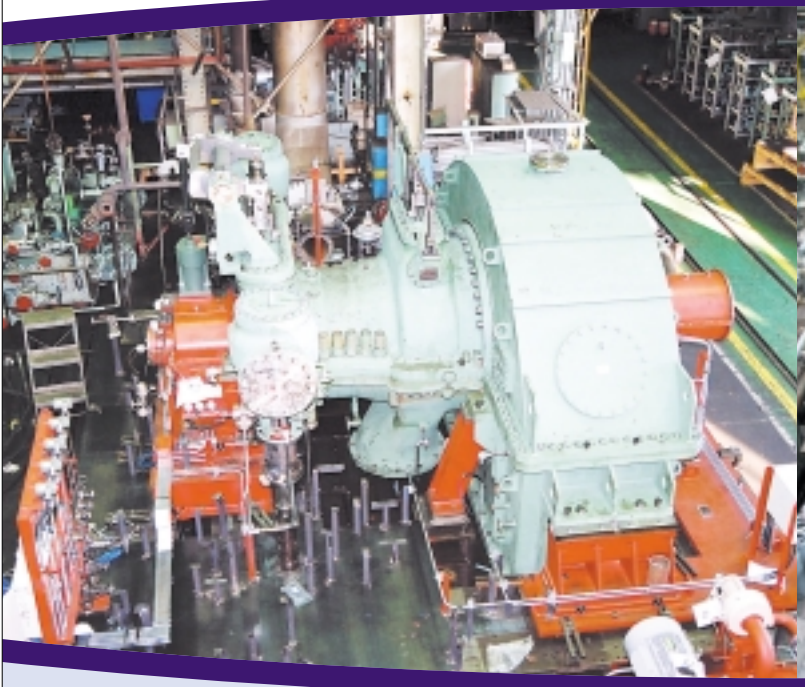
C10 Frame Steam Turbine

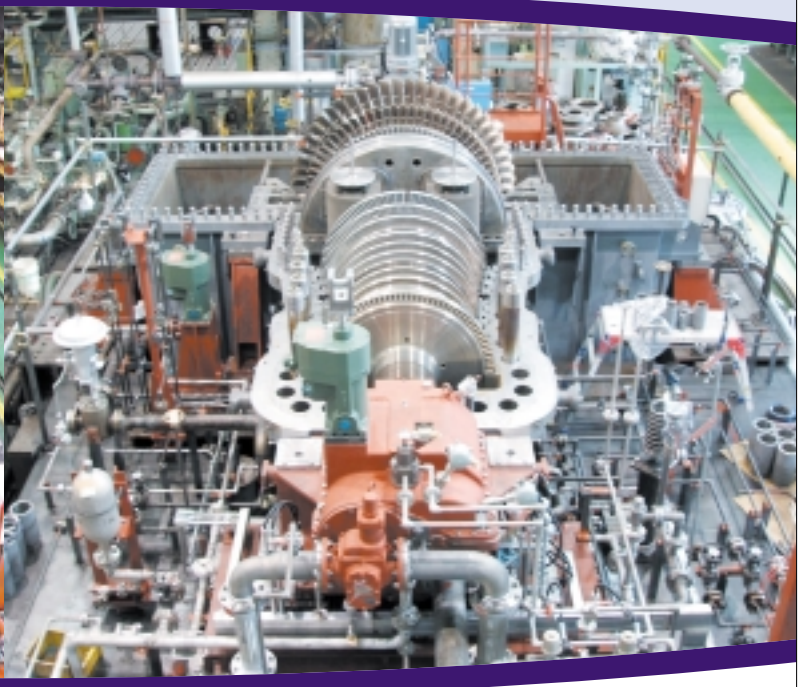
SNM
SHIN NIPPON MACHINERY CO.,LTD.

With turbine exhaust pressure a vacuum, the condensing multistage turbine is a high-efficiency, high out put model capable of fully converting the thermal energy of steam to velocity, without loss.
Subject to the number of stages chosen, the nozzle, blades, rotor discs, shaft and casing may be varied, but other essential components are fully standardized and have been engineered to fit easily to and model. SNM has a comprehensive inventory of standardized components, stock controlled to ensure prompt and reliable supply.

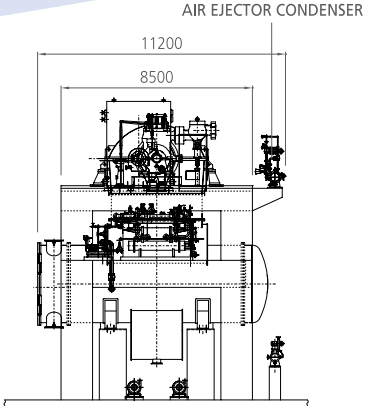
MODEL INFORMATION

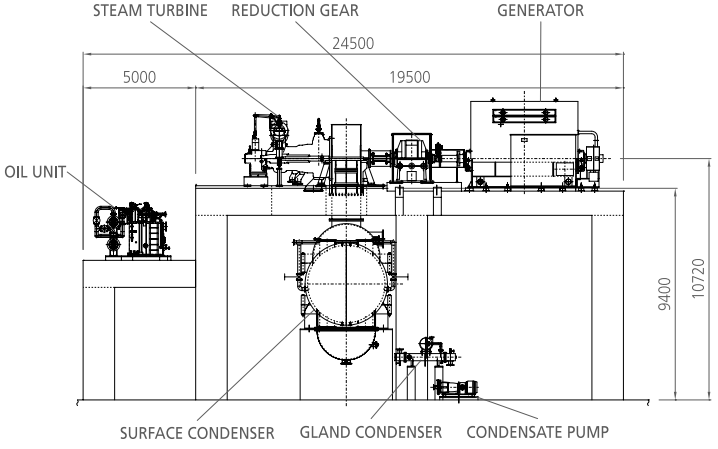
- **Model** : C10
- **Power output** : up to 70MW
- **Turbine speed** : up to 3900rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Down or upper exhaust
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared or direct drive to generator





TYPICAL LAYOUT





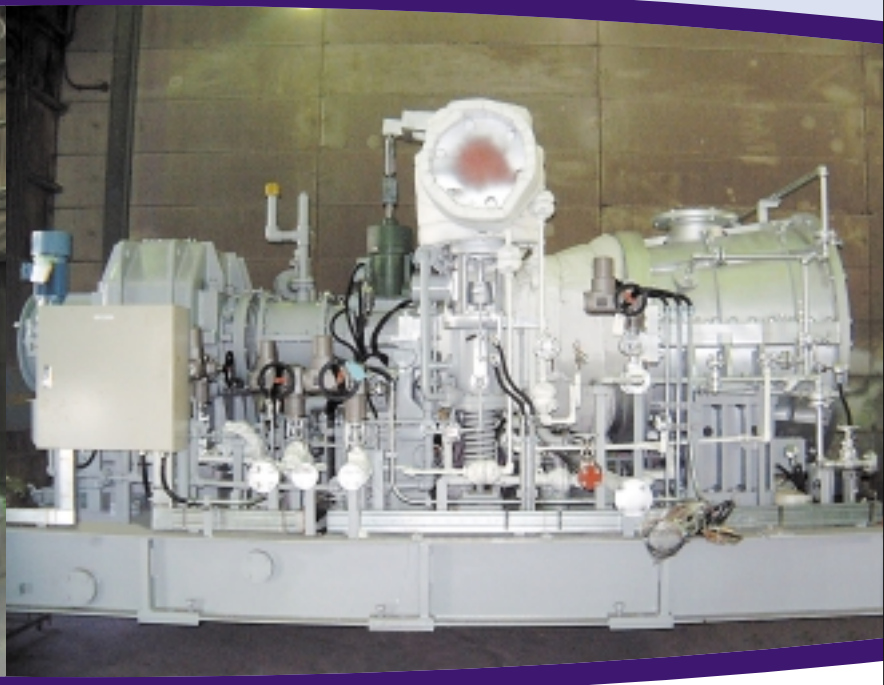
C6X Frame Steam Turbine

SNM
SHIN NIPPON MACHINERY CO.,LTD.

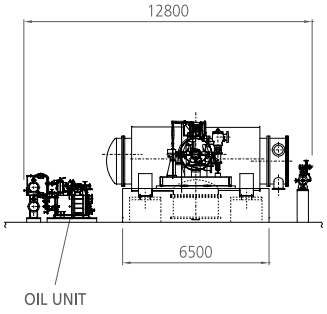
The axial exhaust model has been developed as an advanced model of the condensing steam turbine. To return exhaust to the condenser, the traditional condensing steam turbine typically expels exhaust upward or downward in a direction at right angles to the shaft. This means, however, that in the layout of units there must be provision for adequate space in the upward or downward direction.
The SNM axial exhaust turbine has been designed to expel exhaust in the direction of the shaft, to which the condenser may then be directly coupled. The simple layout has substantially reduced construction costs and contributed significantly to cutting the cost and time of inspection and maintenance.

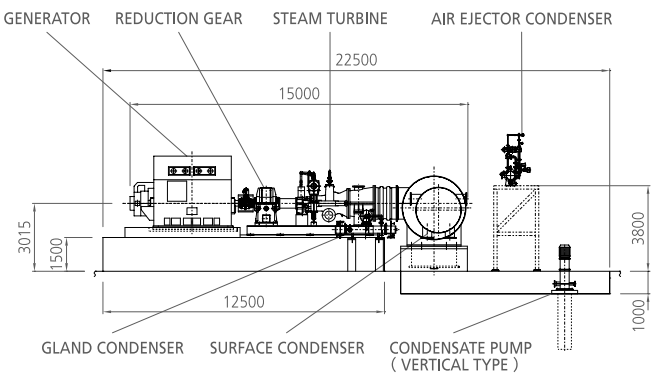
MODEL INFORMATION

- **Model** : C6X
- **Power output** : up to 30MW
- **Turbine speed** : up to 7800rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Axial exhaust, φ1400mm
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Baseplate under turbine for easy installation
- Low level installation for cost reduction of foundation and building



TYPICAL LAYOUT





C8X Frame Steam Turbine

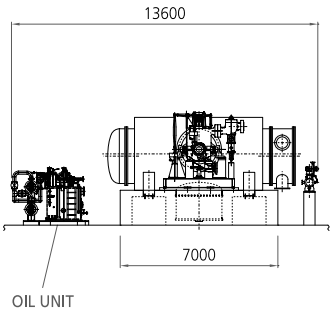
SNM
SHIN NIPPON MACHINERY CO.,LTD.

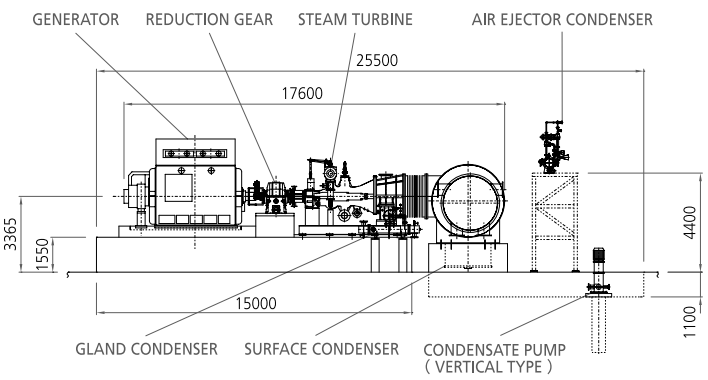
The axial exhaust model has been developed as an advanced model of the condensing steam turbine. To return exhaust to the condenser, the traditional condensing steam turbine typically expels exhaust upward or downward in a direction at right angles to the shaft. This means, however, that in the layout of units there must be provision for adequate space in the upward or downward direction.
The SNM axial exhaust turbine has been designed to expel exhaust in the direction of the shaft, to which the condenser may then be directly coupled. The simple layout has substantially reduced construction costs and contributed significantly to cutting the cost and time of inspection and maintenance.

MODEL INFORMATION

- **Model** : C8X
- **Power output** : up to 40MW
- **Turbine speed** : up to 6200rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Axial exhaust, ϕ1800mm
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Baseplate under turbine for easy installation
- Low level installation for cost reduction of foundation and building

TYPICAL LAYOUT





C9X Frame Steam Turbine

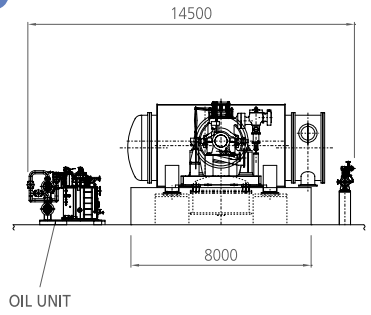
SNM
SHIN NIPPON MACHINERY CO.,LTD.

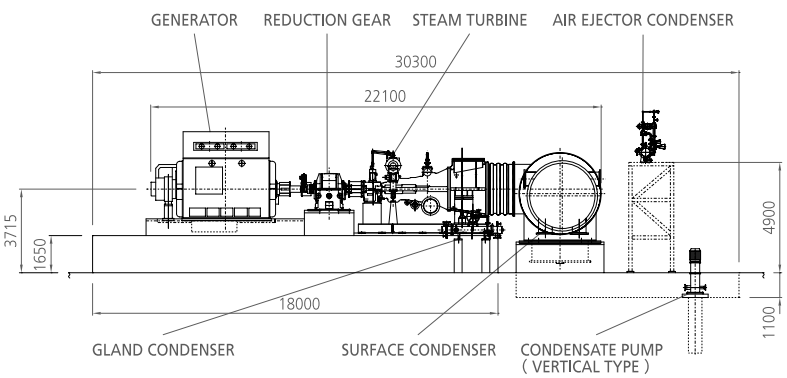
The axial exhaust model has been developed as an advanced model of the condensing steam turbine. To return exhaust to the condenser, the traditional condensing steam turbine typically expels exhaust upward or downward in a direction at right angles to the shaft. This means, however, that in the layout of units there must be provision for adequate space in the upward or downward direction.
The SNM axial exhaust turbine has been designed to expel exhaust in the direction of the shaft, to which the condenser may then be directly coupled. The simple layout has substantially reduced construction costs and contributed significantly to cutting the cost and time of inspection and maintenance.

MODEL INFORMATION

- **Model** : C9X
- **Power output** : up to 50MW
- **Turbine speed** : up to 4900rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Axial exhaust, ϕ2200mm
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Low level installation for cost reduction of foundation and building

TYPICAL LAYOUT





C10X Frame Steam Turbine

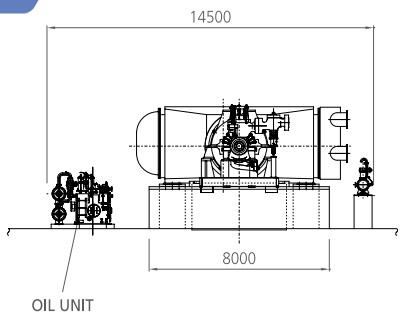
SNM
SHIN NIPPON MACHINERY CO.,LTD.

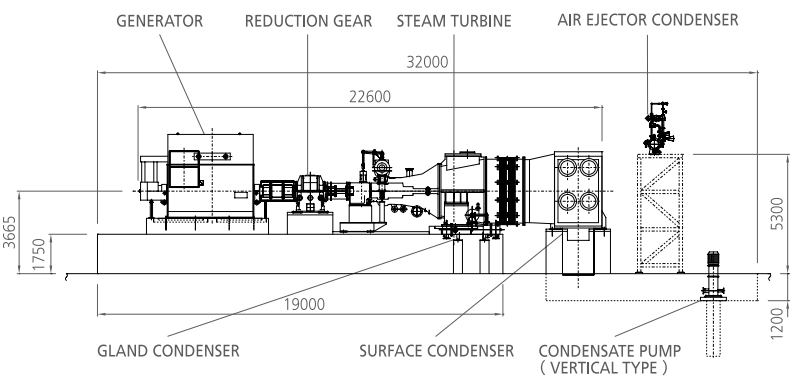
The axial exhaust model has been developed as an advanced model of the condensing steam turbine. To return exhaust to the condenser, the traditional condensing steam turbine typically expels exhaust upward or downward in a direction at right angles to the shaft. This means, however, that in the layout of units there must be provision for adequate space in the upward or downward direction.
The SNM axial exhaust turbine has been designed to expel exhaust in the direction of the shaft, to which the condenser may then be directly coupled. The simple layout has substantially reduced construction costs and contributed significantly to cutting the cost and time of inspection and maintenance.

MODEL INFORMATION

- **Model** : C10X
- **Power output** : up to 70MW
- **Turbine speed** : up to 3900rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Axial exhaust, ϕ2800mm
- Multiple extraction / admission
- Controlled extraction : up to 2
- Geared or Direct drive to generator
- Low level installation for cost reduction of foundation and building

TYPICAL LAYOUT





C11X Frame Steam Turbine

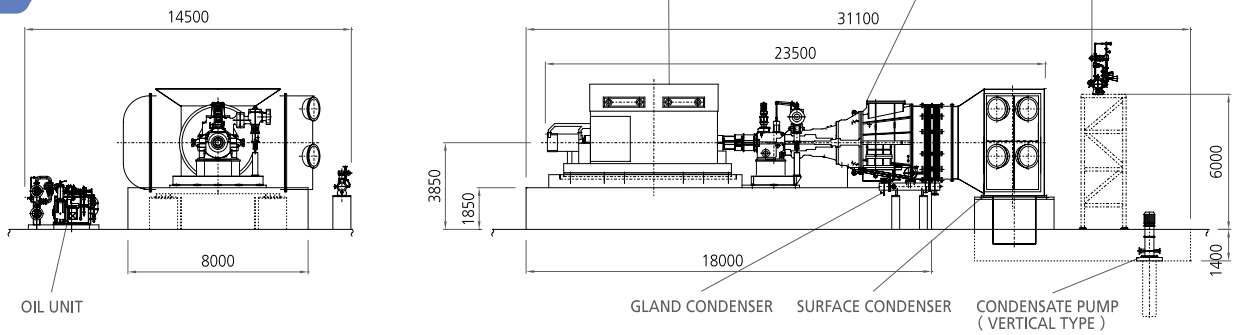
SNM
SHIN NIPPON MACHINERY CO.,LTD.

The axial exhaust model has been developed as an advanced model of the condensing steam turbine. To return exhaust to the condenser, the traditional condensing steam turbine typically expels exhaust upward or downward in a direction at right angles to the shaft. This means, however, that in the layout of units there must be provision for adequate space in the upward or downward direction.
The SNM axial exhaust turbine has been designed to expel exhaust in the direction of the shaft, to which the condenser may then be directly coupled. The simple layout has substantially reduced construction costs and contributed significantly to cutting the cost and time of inspection and maintenance.

MODEL INFORMATION

- **Model** : C11X
- **Power output** : up to 100MW
- **Turbine speed** : up to 3600rpm
- **Inlet pressure** : up to 13MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : Condensing
- **Exhaust nozzle** : Axial exhaust, φ3200mm
- Multiple extraction / admission
- Controlled extraction : up to 2
- Direct drive to 3000 or 3600rpm generator
- Low level installation for cost reduction of foundation and building

TYPICAL LAYOUT



B Type Back-Pressure Steam Turbine

SNM
SHIN NIPPON MACHINERY CO.,LTD.

Back-pressure turbines utilize the pressure differential between inlet and outlet steam to efficiently convert a portion of the thermal energy of the steam into mechanical energy. The exhaust pressure is designed to be higher than the atmospheric pressure, so that the thermal energy of the exhaust steam can be reutilized in a variety of industrial processes. This series of products are known as 'multistage' steam turbines and are characterized by two or more rotor discs mounted on the shaft. The number of stages and the average pitch circle diameter (PCD) of the rotor discs are optimized to suit output, revolutions, inlet steam pressure, temperature and exhaust pressure.

MODEL INFORMATION

- **Model** : B4, B5, B6, B8, B10
- **Power output** : up to 50 MW
- **Turbine speed** : up to 14000 rpm
- **Inlet pressure** : up to 13 MPaG
- **Inlet temperature** : up to 550℃
- **Exhaust pressure** : up to 3.5 MPaG
- **Exhaust nozzle** : Down, upper or side exhaust
- Multiple extraction
- Controlled extraction : up to 2
- Geared drive to 1500 or 1800rpm generator
- Baseplate under turbine for easy installation

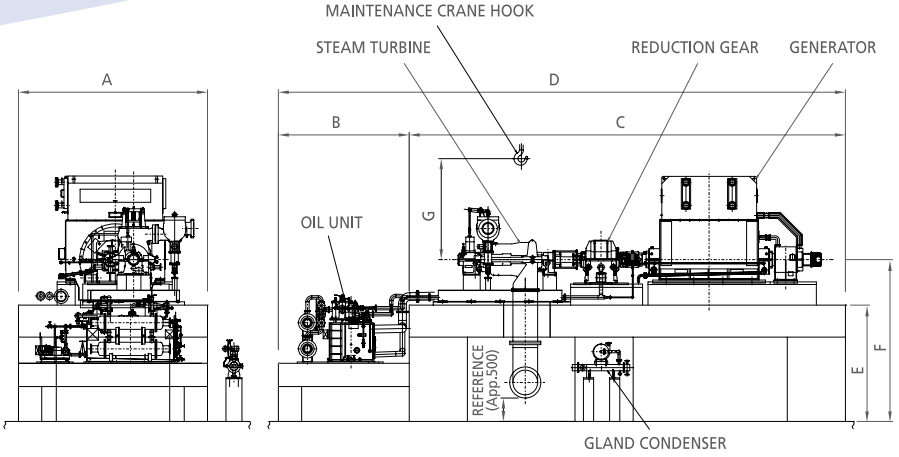
B6-R6-R

B6-R6-ER

TYPICAL LAYOUT

TYPE	POWER	A	B	C	D	E	F	G
B4	10MW	6000	4500	12000	16500	2650	3915	4200
B5	15MW	6500	4500	13000	17500	3000	4415	4700
B6	25MW	6500	4500	14000	18500	3200	4615	4900
B8	40MW	6500	4500	15000	19500	3900	5465	5200
B10	50MW	7000	5000	17000	22000	4300	5865	5500

UNIT : mm



Single-stage Steam Turbine API 611/612 Application

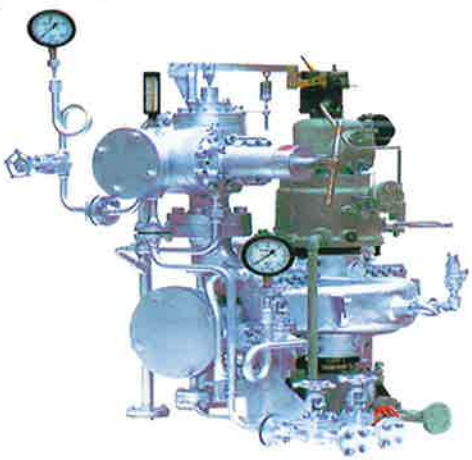
Overview

Both the H series and the high-output, high-speed compatible HO series are single-stage, horizontally-installed compact general-purpose turbines. Our product range also includes the high-speed rotation-compatible CC series (also single-stage and horizontally-installed) for use with compressors, etc. The vertical-type V series is also available.

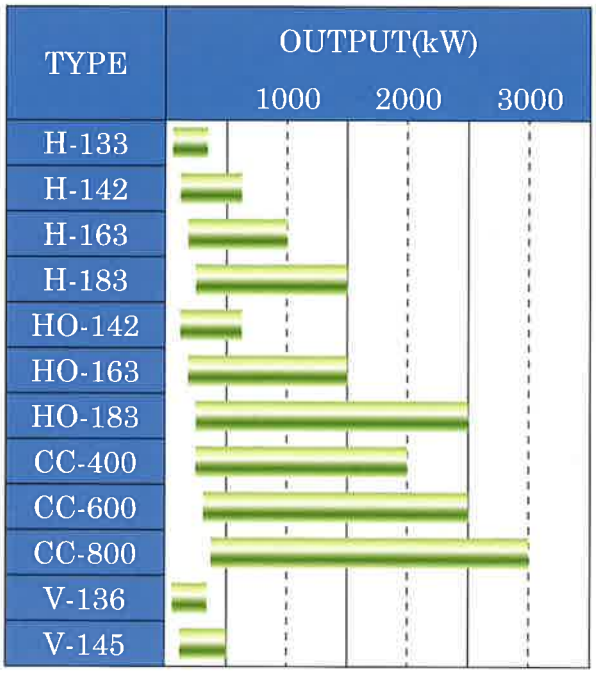
Uses

Mainly used for pumps, fans, compressors, mills, and shredders in various factories such as petroleum plants, chemical plants, sugar mills, and power plants. The H, HO, V series are suitable for use with the API 611 standard, while the CC series is suitable for use with the API 612 standard.

H, HO, CC
Horizontal Type
Back-Pressure Steam Turbine



V
Vertical Type
Back-Pressure Steam Turbine



Specification

Item / Type		HO-142	HO-163	HO-183	CC-600	CC-800	V-136	V-145
Type		Horizontal					Vertical	
Maximun Speed	(rpm)	9000	7200	5500	7500	6200	4200	4200
Maximun Output	(kw)	600	1500	2500	3000	3000	300	500
Maximun Inlet Steam Press.	(kgf/cm2g)	67	67	67	67	67	45	45
Maximun Inlet Steam Temp.	(°C)	500	500	500	500	500	450	450
Maximun Exhaust Press.	(kgf/cm2g)	15	15	15	15	12	7	7
Normal Rorot Dia.	(mm)	400	600	800	600	800	300	400
Inlet Bore (min./max.)	(mm)	80/150	80/200	80/250	100/250	100/250	80	80/150
Exhaust Bore	(mm)	200	250	300	300	350	150	200
Hand Nozzle Valve (max)		2	2	2	2	2	1	1
Weight	(kg)	800	1300	1700	2100	2400	480	750

Introduction and API chart & Index
Multistage Between Bearings Pumps (Double Casing)
Multistage Between Bearings Pumps (Single Casing)
1&2 stage Between Bearings Pumps
Vertical Pumps
Overhung Pumps
Steam Turbine

SHIN NIPPON MACHINERY CO., LTD.
http://www.snm.co.jp/

TOKYO HEAD OFFICE
ThinkPark Tower, 1-1, Osaki 2-Chome, Shinagawa-ku, Tokyo, 141-6025, Japan
TEL. +81-3-6737-2630 FAX. +81-3-6866-5120

KURE WORKS
2-10, Hirosuehiro 1-chome, Kure-shi, Hiroshima Prefecture, 737-0133, Japan
TEL. +81-823-71-1111 FAX. +81-823-72-5267

AMAGASAKI WORKS
93-3 Nishi Mukojima-cho, Amagasaki-shi, Hyogo, 660-0857, Japan
TEL. +81-6-6430-7266 FAX. +81-6-6430-7296

SNM
SHIN NIPPON MACHINERY CO., LTD.

Process Pump
Pocket Guide

Introduction and API chart & Index
Multistage Between Bearings Pumps (Double Casing)
Multistage Between Bearings Pumps (Single Casing)
1&2 stage Between Bearings Pumps
Vertical Pumps
Overhung Pumps
Steam Turbine

What is a Pump?

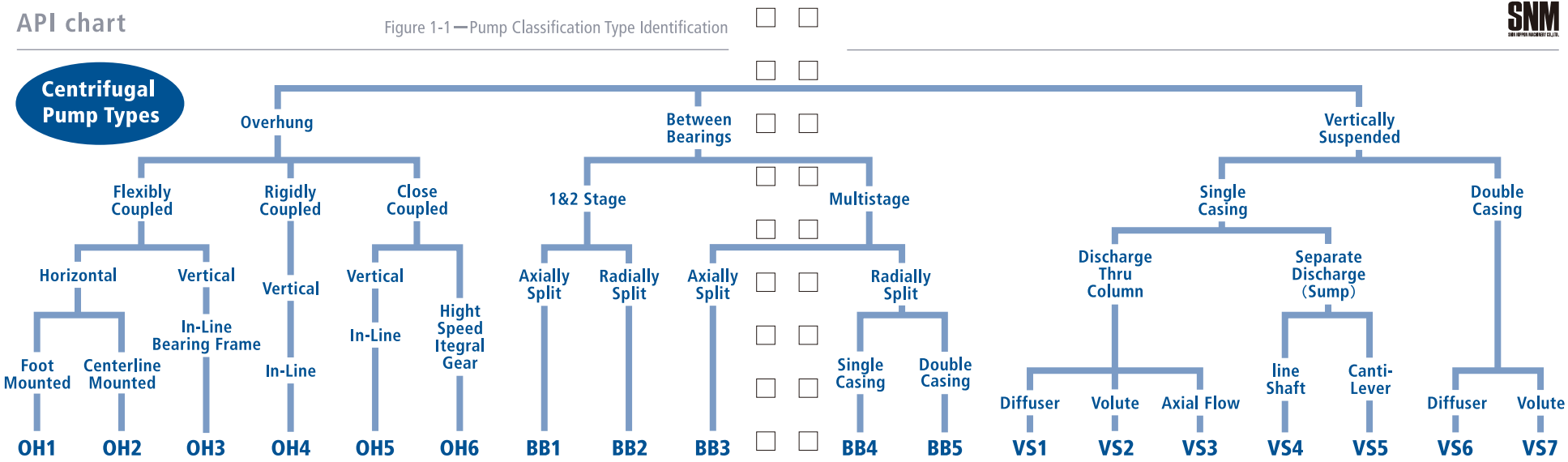
A pump is a mechanical device for moving a fluid from a lower to a higher location, or from a lower to a higher pressure area.
The fluid can be any type of liquid or gas, and pumps may be classified in many number of ways according to their purpose, specifications, environment, design, etc.

Process Pumps

Oil refineries process crude oil into fuels such as gasoline, kerosene, diesel oil, heavy oil, and into other petroleum products such as naphtha, lubricating oil, and asphalt. Then, using petroleum products and natural gas as raw materials the petrochemical industry produces a wide variety of other chemical products.
Process pumps play a crucial role in transporting both the raw materials and the products of the production processes at these refineries and petrochemical plants.
Petrochemical production involves three different phases of processing: the conversion of oil and other raw materials into more easily usable form; the separation and refining of the desired substances from these converted materials; and the final processing of these substances into petrochemical products. Process pumps are an indispensable part of each of these three phases.
Process pumps handle a wide range and variety of fluids, often at the extremes of temperature (high and supercooled), pressure (high and low), and corrosive potential. In addition, since suspension of production due to equipment malfunction at a major plant can have an enormous impact on operations, these pumps must be highly dependable. For this reason, the American Petroleum Institute 610 Standard is applied to many process pumps.
Today reduction of CO_2 and promotion of energy conservation are being advocated throughout the world in order to prevent global warming. Even in aging refineries and plants, replacement of old process pumps with the latest high-efficiency equipment has been pointed to as an effective and promising means for conserving energy.

Introduction

Figure 1-1—Pump Classification Type Identification



API chart

Index

Solutions and Products
Process Pump / Steam Turbine

SNM

Multistage Between Bearings Pumps (Double Casing)	BTBF [BB5] (Diffuser)	Pump Type (API Class)
	BTBF [BB5] (Volute)	Pump Type (API Class)
Multistage Between Bearings Pumps (Single Casing)	HTB [BB3]	Pump Type (API Class)
	MTB [BB3]	Pump Type (API Class)
1&2 stage Between Bearings Pumps	HDV [BB2]	Pump Type (API Class)
	RTV [BB2]	Pump Type (API Class)
	SD-S [BB1]	Pump Type (API Class)
	RTH [BB1]	Pump Type (API Class)

Vertical Pumps	CZ [VS1/VS6]	Pump Type (API Class)
	BTV [VS6]	Pump Type (API Class)
	SIW [VS4]	Pump Type (API Class)
Overhung Pumps	NSI [OH2]	Pump Type (API Class)
	NSI-V [OH3/OH4]	
Steam Turbine	Single Stage [HO]	
	Single Stage [CC]	
	Multi Stage [B/C]	
	Vertical [V]	

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Multistage Between Bearings Pumps

Pump Type (API Class)

BTBF [BB5]

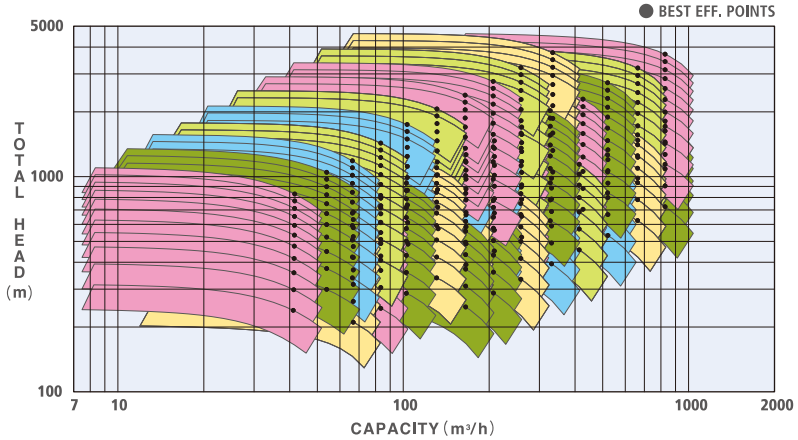
(Diffuser)

Construction	Radial split, Multistage, Between Bearings, Centerline Support, Double Casing, Diffuser Type, Single or Double Suction Impeller
Specification	Max. flow rate : 1100m^3/h Max. operating pressure : 2500# flange rating Max. operating temperature : 400℃

BTBF [BB5]

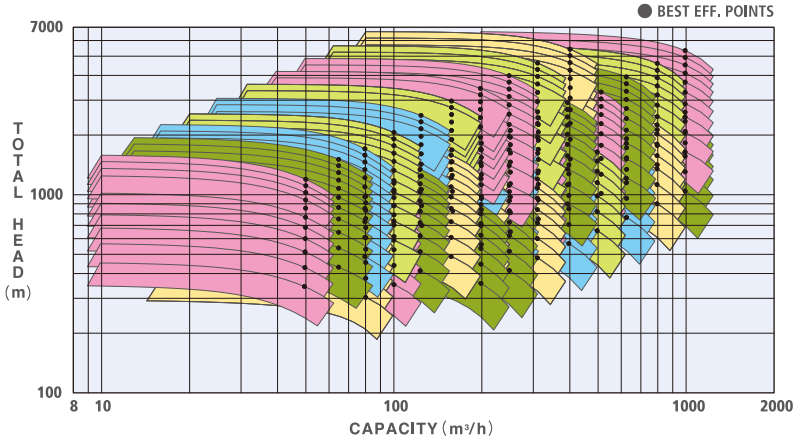
Model BTBF (Diffuser) Performance chart

Coverage : 50HZ

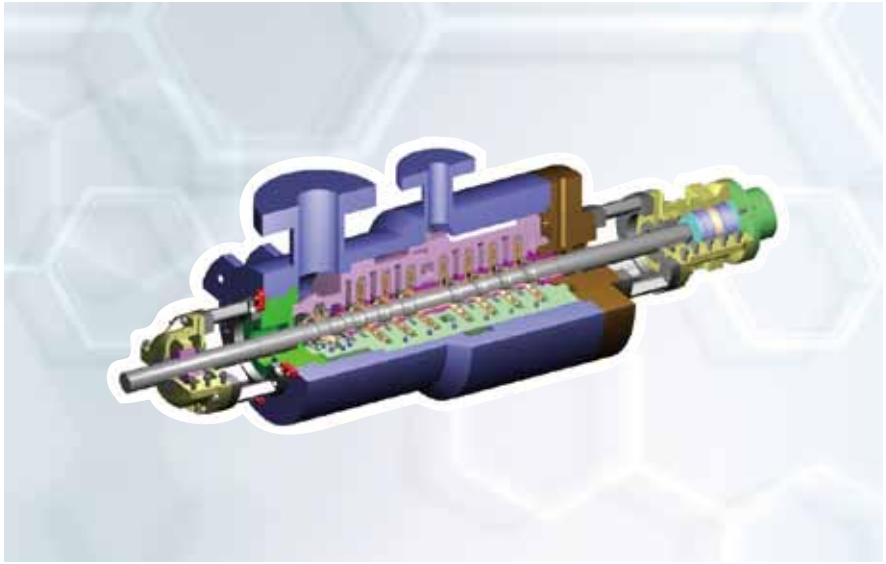


Model BTBF (Diffuser) Performance chart

Coverage : 60HZ



BTBF [BB5]



Multistage Between Bearings Pumps

Pump Type (API Class)

BTBF [BB5]

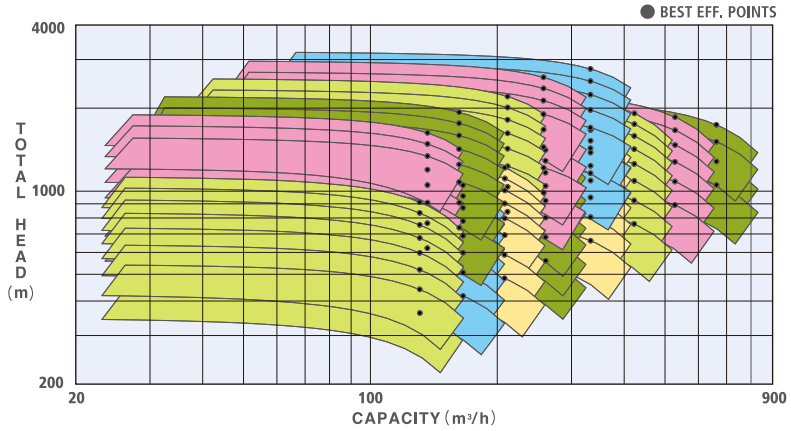
(Volute)

Construction	Radial split, Multistage, Between Bearings, Centerline Support, Double Casing, Double Volute Type, Double Suction Impeller
Specification	Max. flow rate : 1000m^3/h Max. operating pressure : 2500# flange rating Max. operating temperature : 400℃

BTBF [BB5]

Model BTBF (Volute) Performance chart

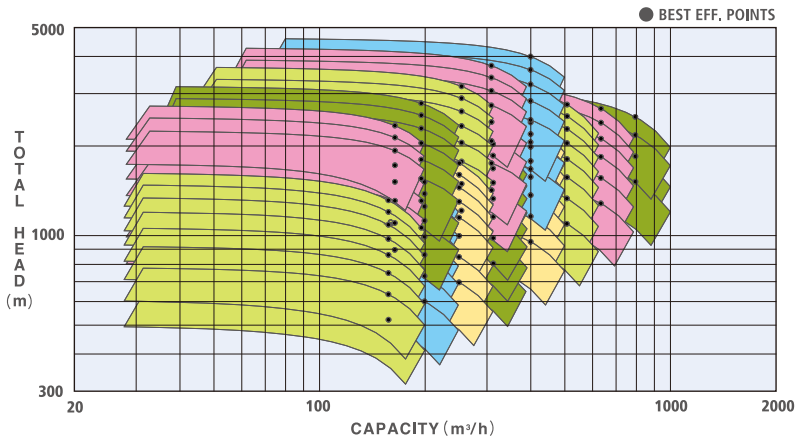
Coverage : 50HZ



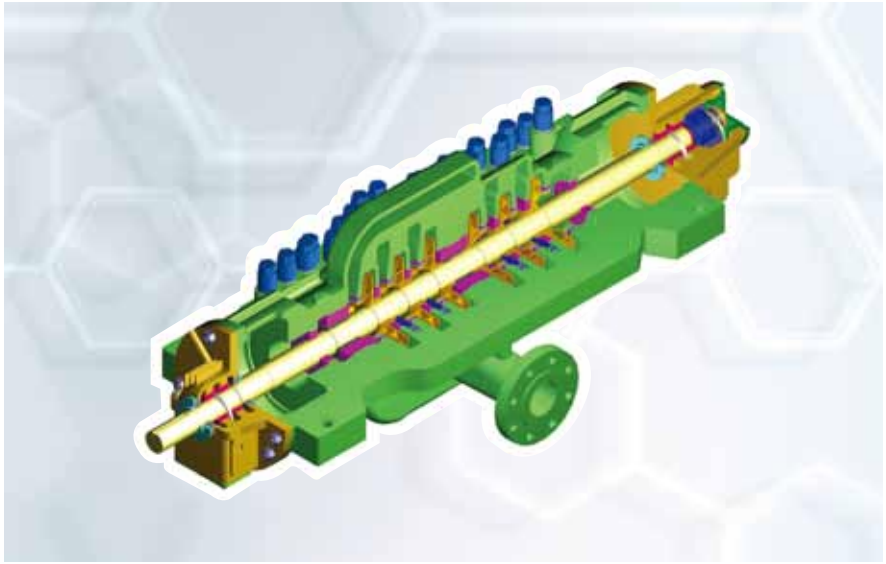
Model BTBF (Volute) Performance chart

SNM

Coverage : 60HZ



BTBF [BB5]



Multistage Pumps

Pump Type (API Class)

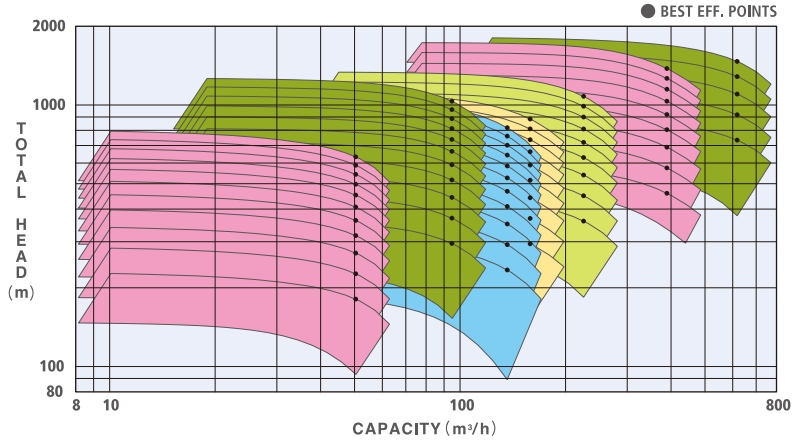
HTB [BB3]

Construction	Axial split, Multistage, Between Bearings, Centerline Support, Double Volute Type, Single or Double Suction Impeller
Specification	Max. flow rate : 750m^3/h Max. differential head : 2200m Max. operating temperature : 200℃

HTB [BB3]

Model HTB Performance chart

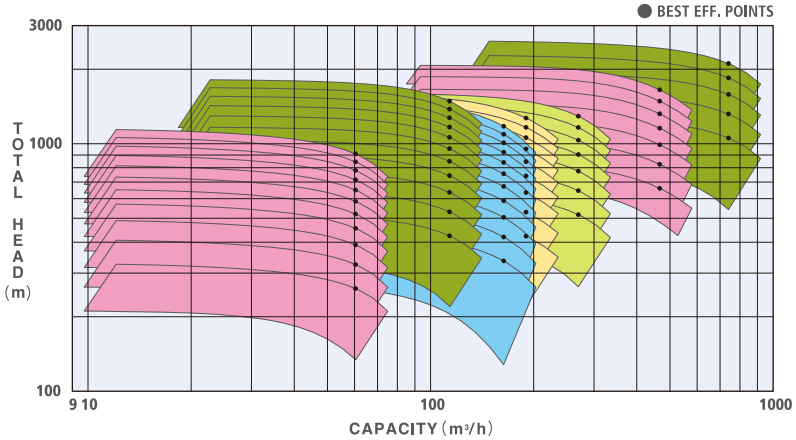
Coverage : 50HZ



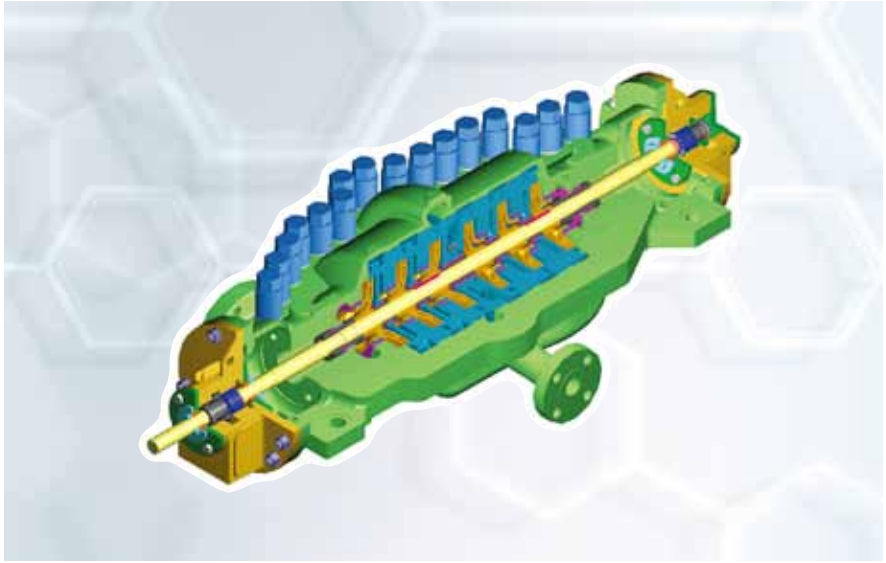
Model HTB Performance chart

SNM

Coverage : 60HZ



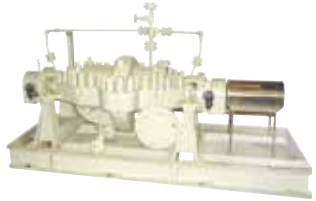
HTB [BB3]



Multistage Pumps

Pump Type (API Class)

MTB [BB3]

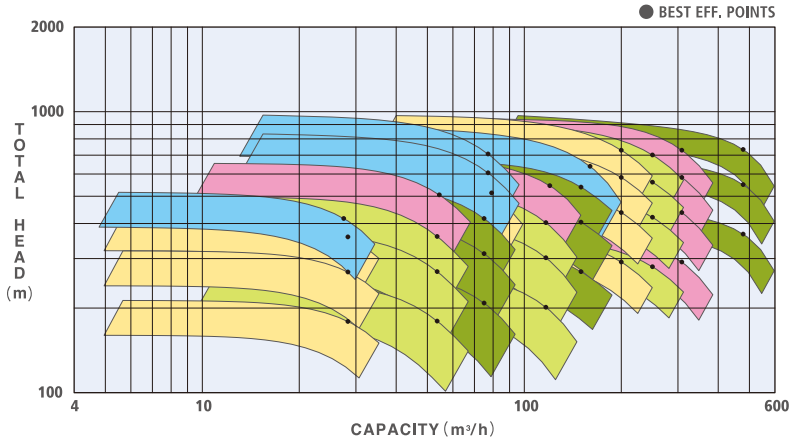


Construction	Axial split, Multistage, Between Bearings, Centerline Support, Diffuser Type, Single Suction Impeller
Specification	Max. flow rate : 650m^3/h Max. differential head : 1500m Max. operating temperature : 200℃

MTB [BB3]

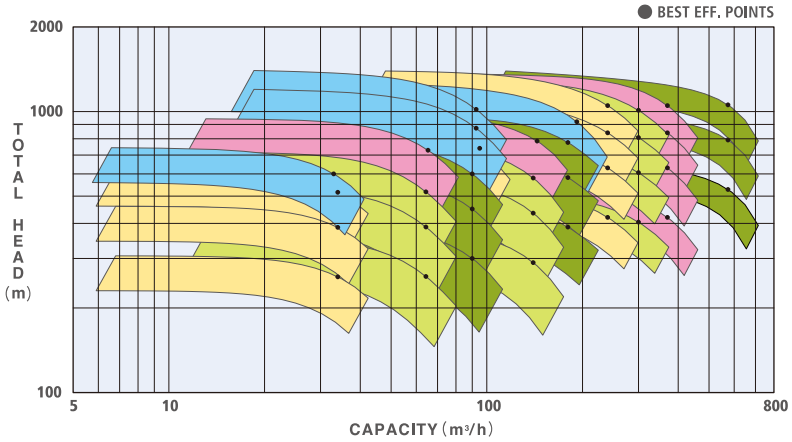
Model MTB Performance chart

Coverage : 50HZ

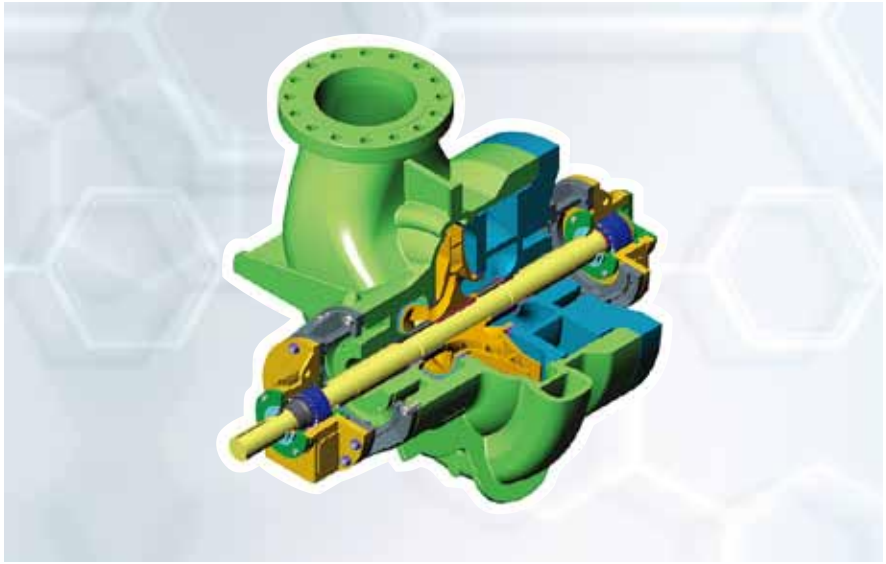


Model MTB Performance chart

Coverage : 60HZ



MTB [BB3]



1&2 stage Between Bearings Pumps

Pump Type (API Class)

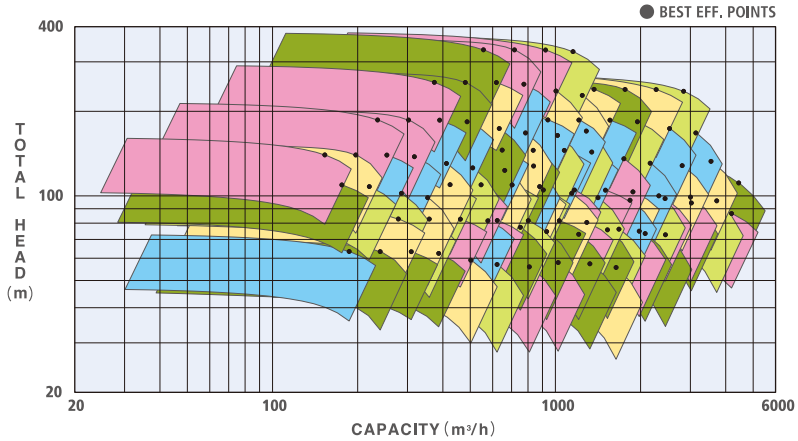
HDV [BB2]

Construction	Radial split, Single Stage, Between Bearings, Centerline Support, Double Volute Type, Double Suction Impeller
Specification	Max. flow rate : 3500m^3/h Max. differential head : 600m Max. operating temperature : 400℃

HDV [BB2]

Model HDV Performance chart

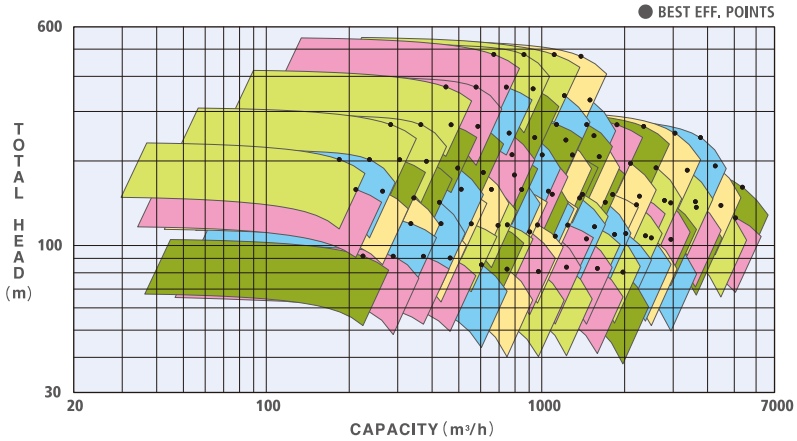
Coverage : 50HZ



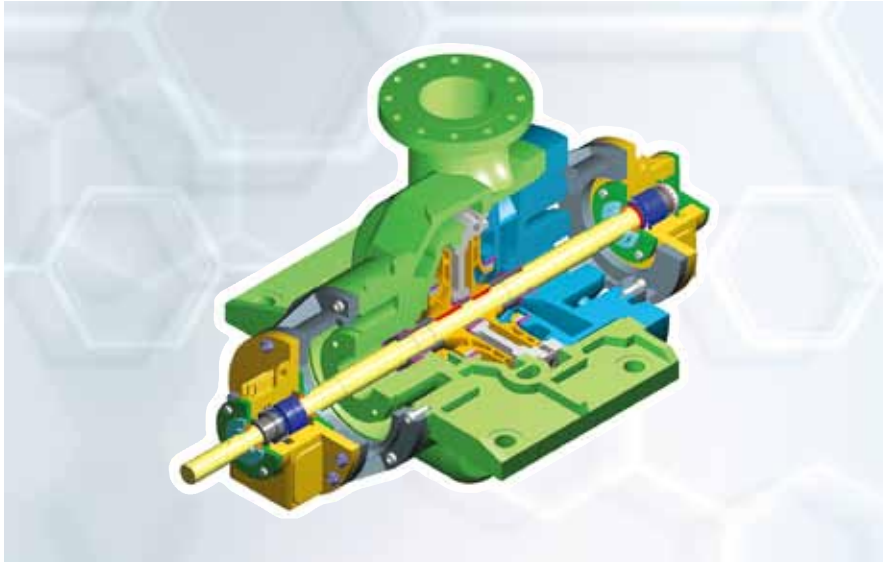
Model HDV Performance chart

SNM

Coverage : 60HZ



HDV [BB2]



1&2 stage Between Bearings Pumps

Pump Type (API Class)

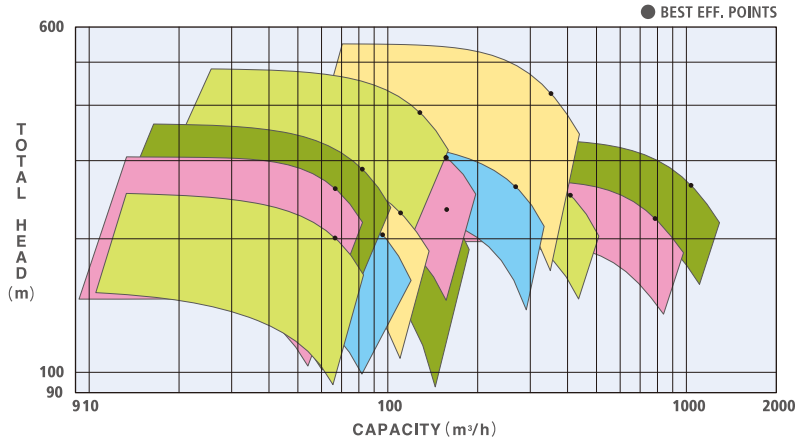
RTV [BB2]

Construction	Radial split, Two Stages, Between Bearings, Centerline Support, Diffuser (1st Stage) and Volute (2nd Stage) Type, Single or Double Suction Impeller
Specification	Max. flow rate : 500m³/h Max. differential head : 750m Max. operating temperature : 400℃

RTV [BB2]

Model RTV Performance chart

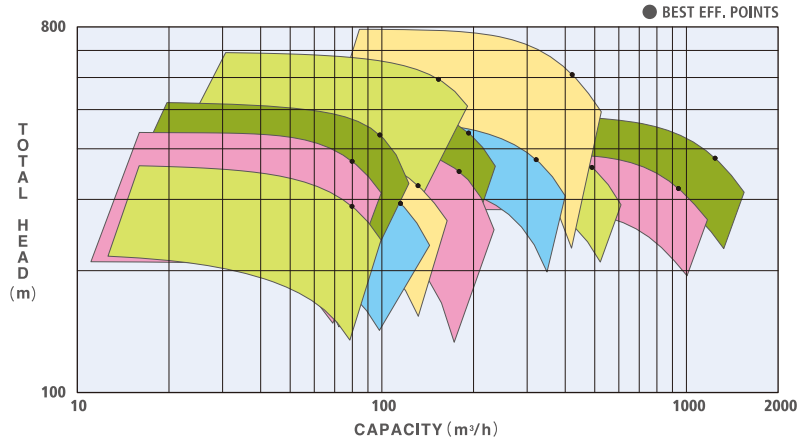
Coverage : 50HZ



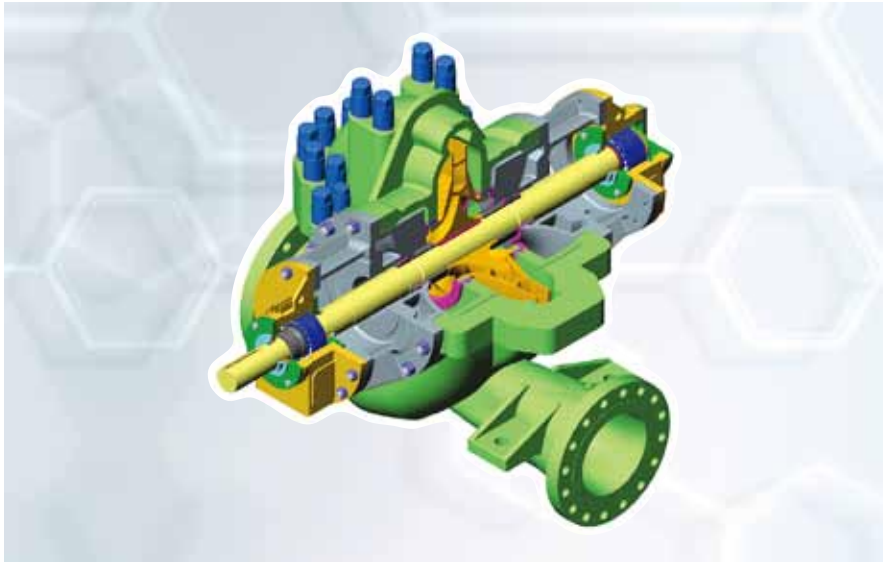
Model RTV Performance chart

SNM

Coverage : 60HZ



RTV [BB2]



1&2 stage Between Bearings Pumps

Pump Type (API Class)

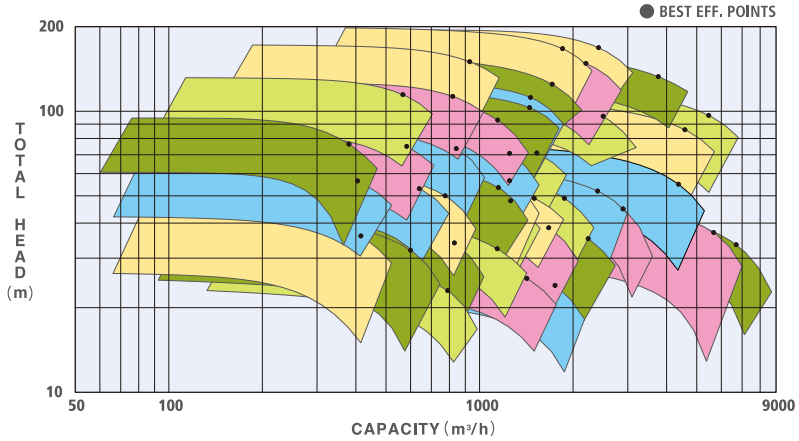
SD-S [BB1]

Construction	Axial split, Single Stage, Between Bearings, Foot Mount, Double Volute Type, Double Suction Impeller
Specification	Max. flow rate : 9000m³/h Max. differential head : 250m Max. operating temperature : 150℃

SD-S [BB1]

Model SD-S Performance chart

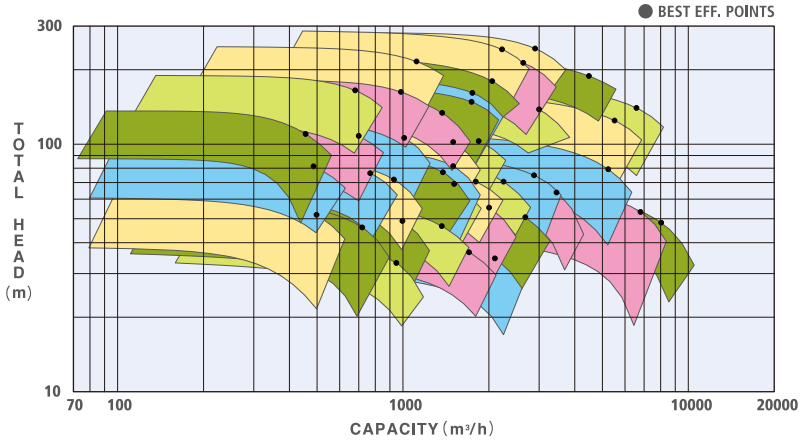
Coverage : 50HZ



Model SD-S Performance chart

SNM

Coverage : 60HZ



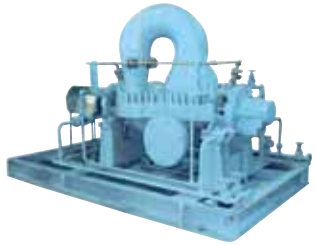
SD-S [BB1]

1&2 stage Between Bearings Pumps

SNM

Pump Type (API Class)

RTH [BB1]

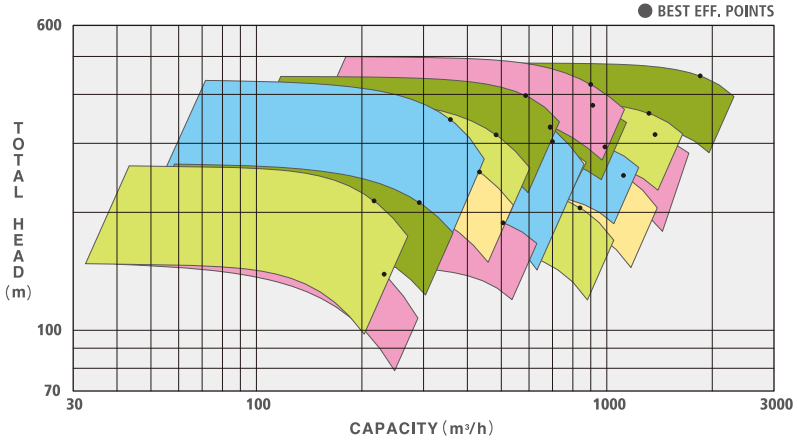


Construction	Axial split, Two Stages, Between Bearings, Centerline Support, Double Volute Type, Single or Double Suction Impeller
Specification	Max. flow rate : 1800m^3/h Max. differential head : 700m Max. operating temperature : 200℃

RTH [BB1]

Model RTH Performance chart

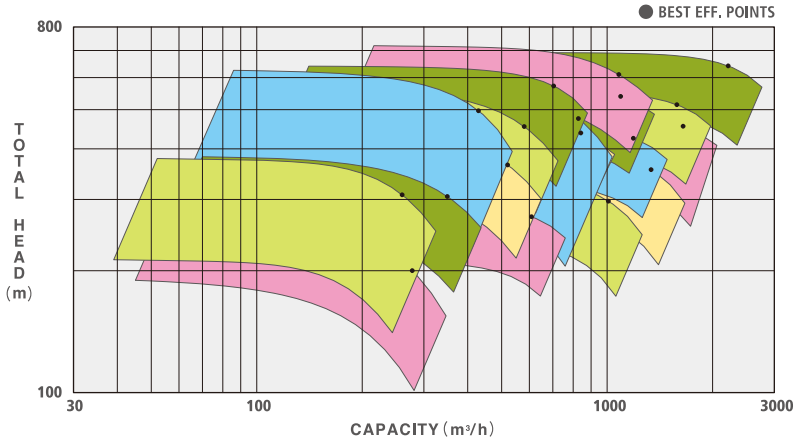
Coverage : 50HZ



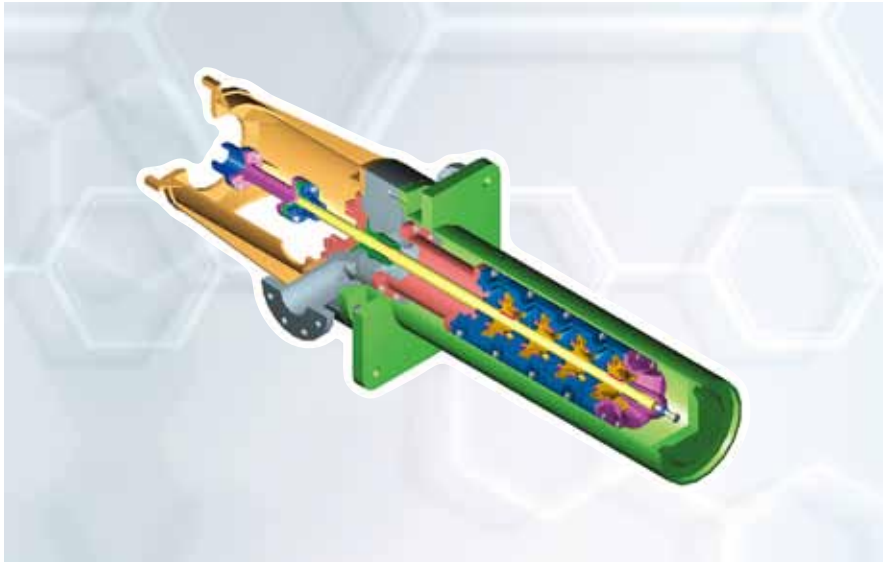
Model RTH Performance chart

SNM

Coverage : 60HZ



RTH [BB1]



O Vertical Pumps

Pump Type (API Class)

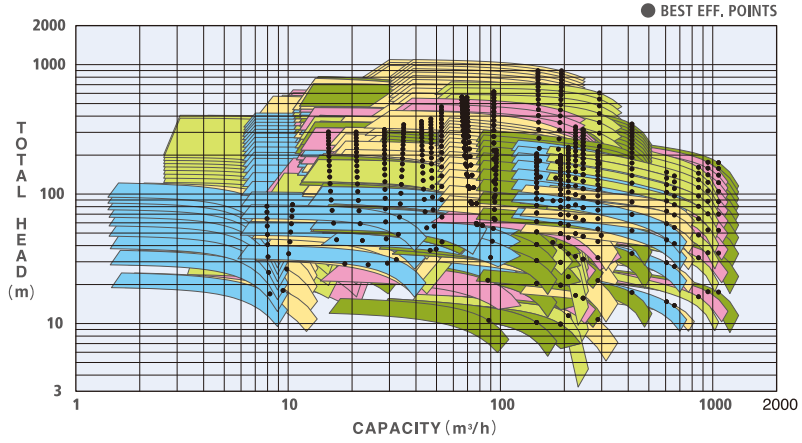
CZ [VS1/VS6]

Construction	Vertical Suspended, Multistage, Submerged (VS1) or Double Casing (VS6), Diffuser Type, Single Suction Impeller
Specification	Max. flow rate : 1200m³/h Max. differential head : 1500m Min. operating temperature : -120℃ Max. operating temperature : 150℃

CZ [VS1/VS6]

Model CZ Performance chart

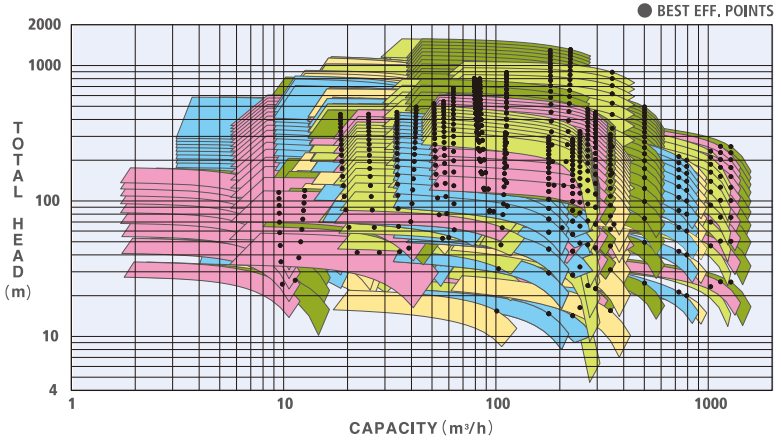
Coverage : 50HZ



Model CZ Performance chart

SNM

Coverage : 60HZ



CZ [VS1/VS6]

O Vertical Pumps

Pump Type (API Class)

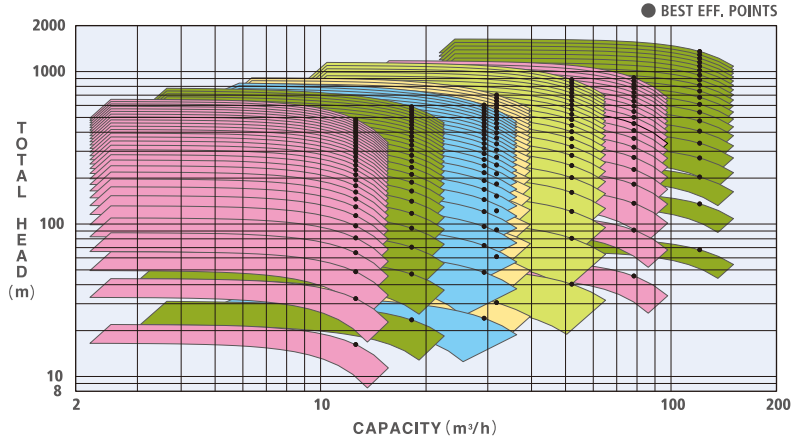
BTV [VS6]

Construction	Vertical Suspended, Multistage, Double Casing, Diffuser Type, Single Suction Impeller
Specification	Max. flow rate : 150m^3/h Max. differential head : 2200m Min. operating temperature : -120℃ Max. operating temperature : 150℃

BTV [VS6]

Model BTV Performance chart

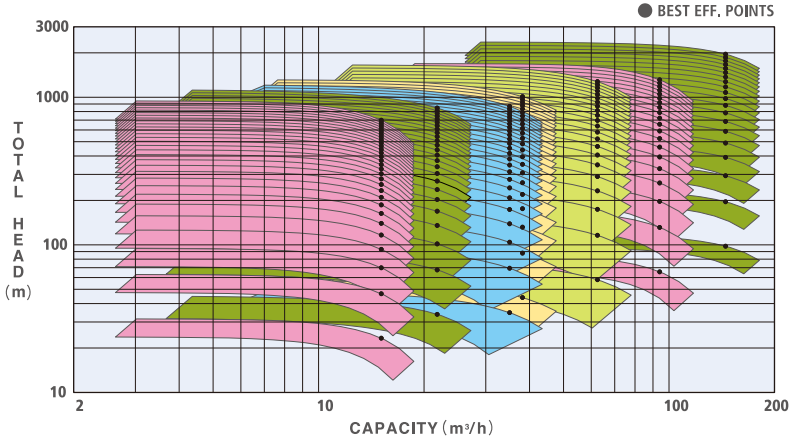
Coverage : 50HZ



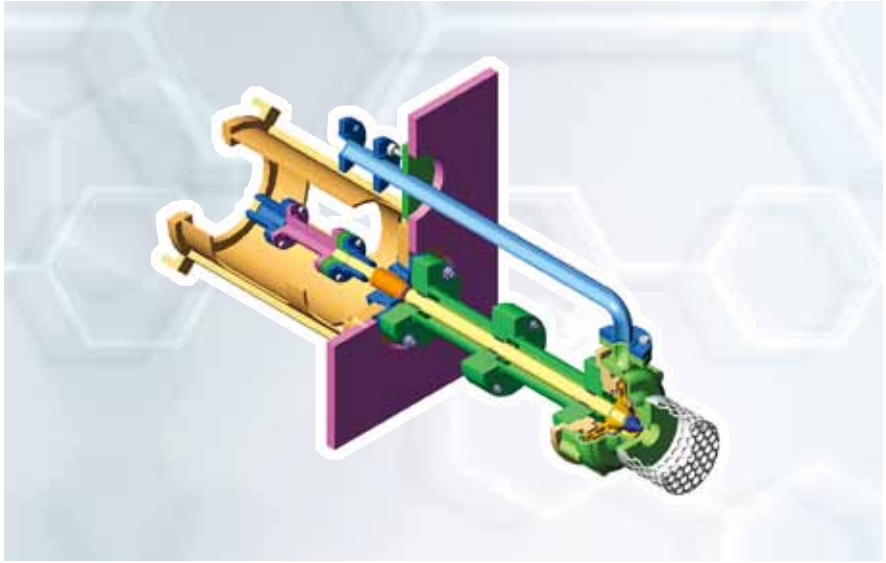
Model BTV Performance chart

SNM

Coverage : 60HZ



BTV [VS6]



O Vertical Pumps

Pump Type (API Class)

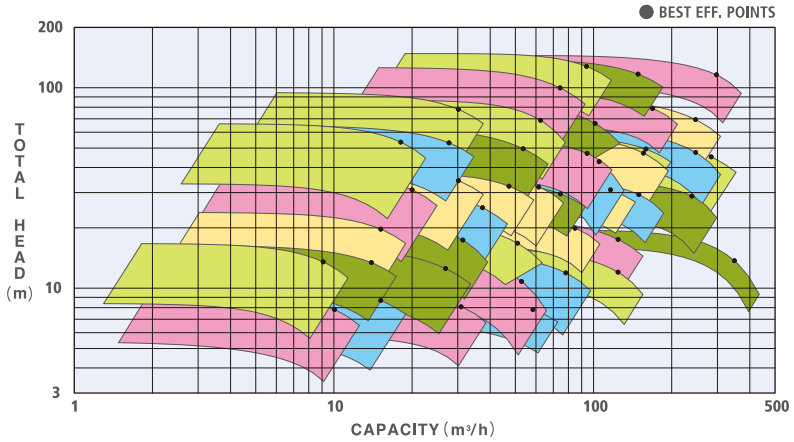
SIW [VS4]

Construction	Line Shaft, Vertically Suspended, Single Stage, Single or Double Volute Type Single Suction Impeller
Specification	Max. flow rate : 420m^3/h Max. differential head : 130m Max. operating temperature : 200℃

SIW [VS4]

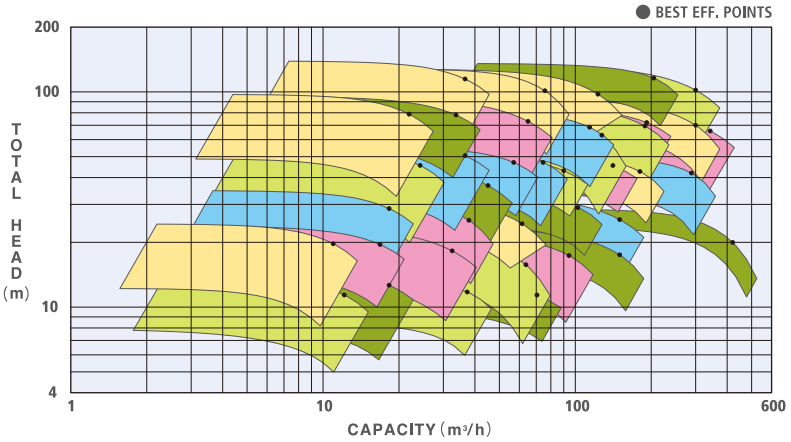
Model SIW Performance chart

Coverage : 50HZ

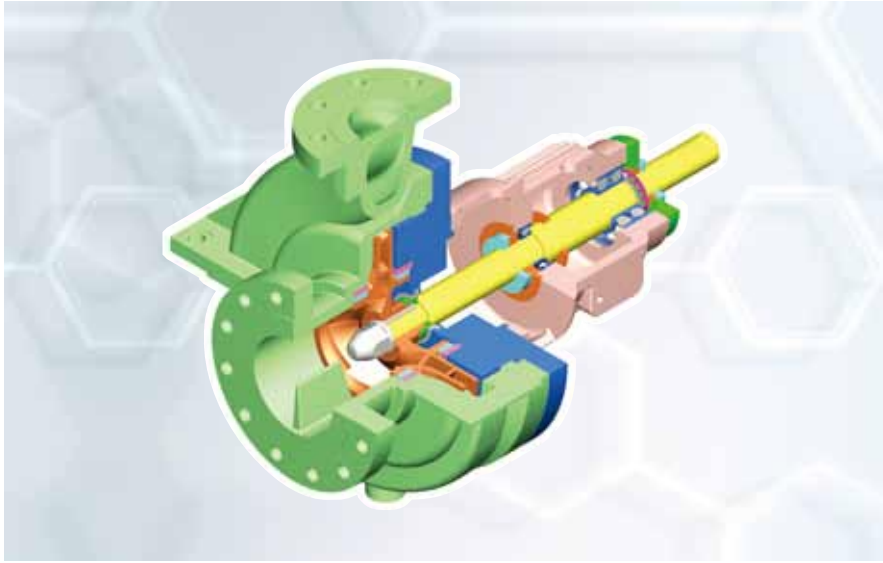


Model SIW Performance chart

Coverage : 60HZ



SIW [VS4]



Overhung Pumps

Pump Type (API Class)

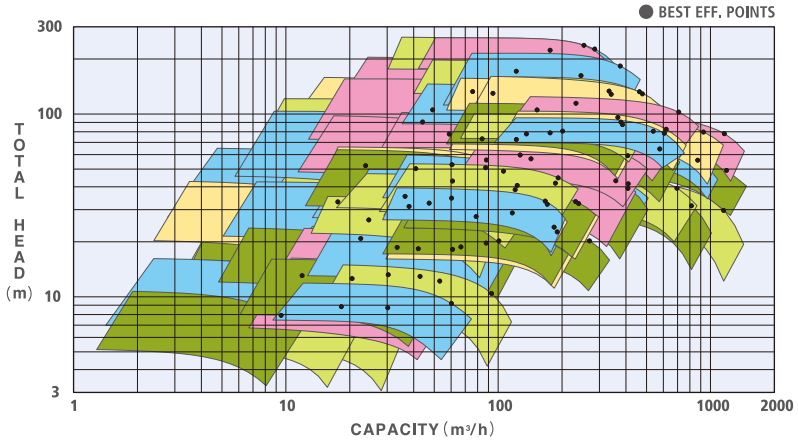
NSI [OH2]

Construction	Radial split, Single Stage, Overhung, Centerline Support, Single or Double Volute Type, Single Suction Impeller
Specification	Max. flow rate : 1500m^3/h Max. differential head : 400m Max. operating temperature : 400℃

NSI [OH2]

Model NSI Performance chart

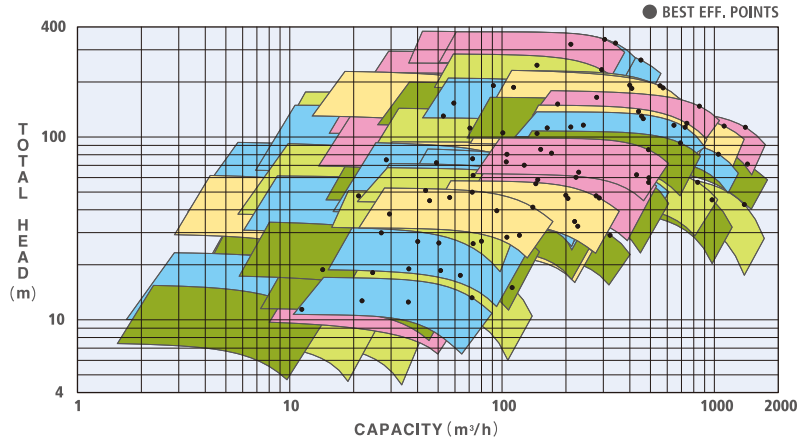
Coverage : 50HZ



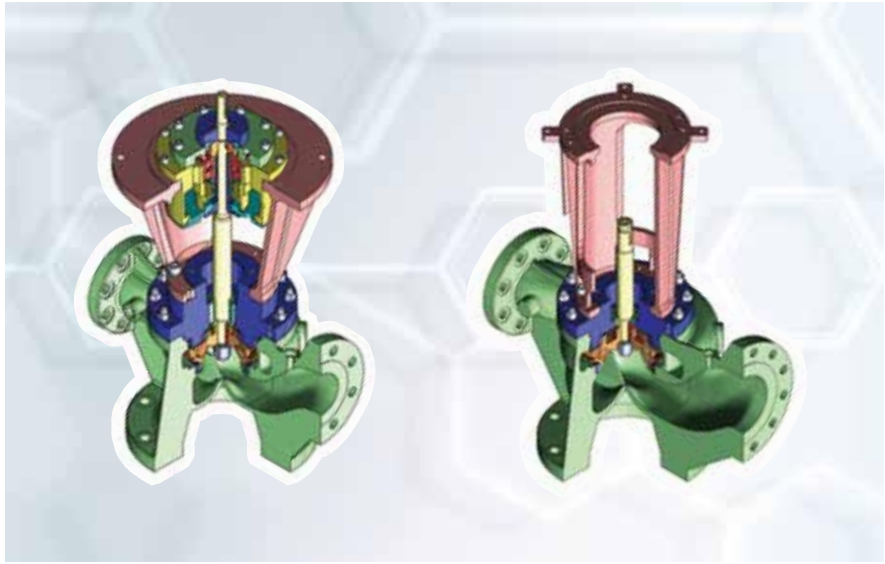
Model NSI Performance chart

SNM

Coverage : 60HZ



NSI [OH2]



Overhung Pumps

Pump Type (API Class)

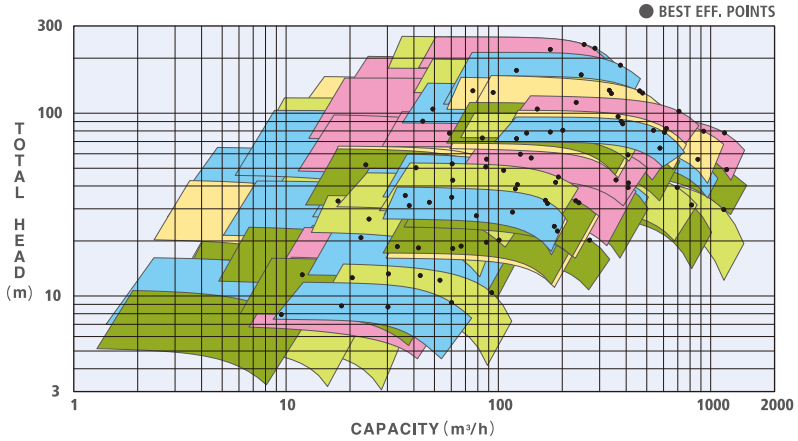
NSI-V [OH3/OH4]

Construction	Vertical In-line, Single Stage, Single or Double Volute Type, Single Suction Impeller
Specification	Max. flow rate : 1000m³/h Max. differential head : 250m Max. operating temperature : 250℃

NSI-V [OH3/OH4]

Model NSI-V Performance chart

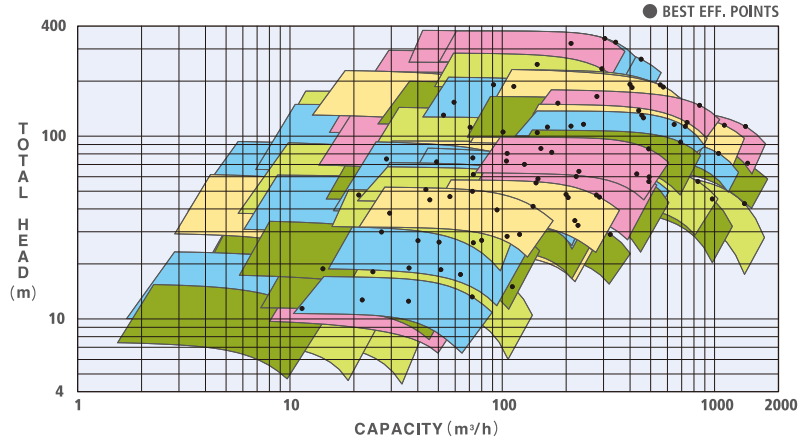
Coverage : 50HZ



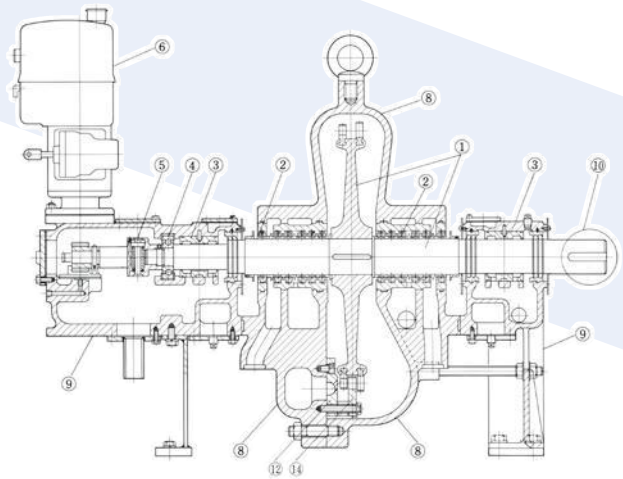
Model NSI-V Performance chart

SNM

Coverage : 60HZ



NSI-V [OH3/OH4]



Typical cross-section

① Rotor
② Gland seal
③ Radial bearing
④ Thrust bearing
⑤ Overspeed trip device
⑥ Governor
⑧ Turbine casing
⑨ Bearing pedestal
⑩ Shaft end
⑫ Nozzle
⑬ Moving blade
⑭ Stationary blade

Steam Turbine

Single Stage [HO]

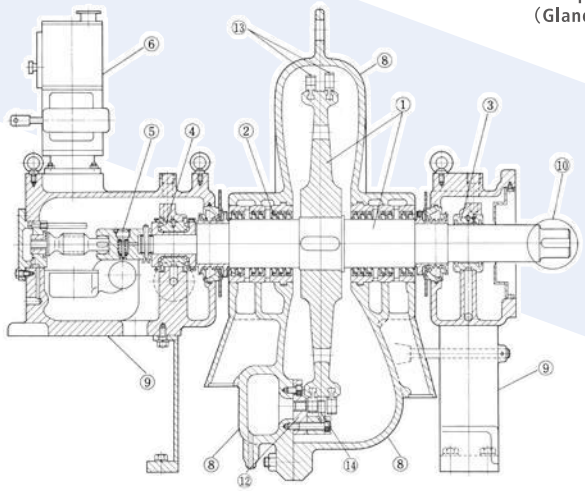
Specification

Item \ Type	HO-142	HO-163	HO-183
Maximum Speed (rpm)	9,000	7,200	5,500
Maximum Output (kW)	600	1,500	2,500
Maximum Inlet Steam Pressure (kgf/cm²g)	67	67	67
Maximum Inlet Steam Temperature (°C)	500	500	500
Maximum Exhaust Pressure (From vacuum to max.) (kgf/cm²g)	15	15	12
Nom. Rotor Dia. (mm)	400	600	800
Inlet Bore (min./max.) (mm)	80/150	80/200	80/250
Exhaust Bore (mm)	200	250	300
Hand Nozzle Valve Available (max.)	2	2	2
Weight (max.) (kg)	800	1,300	1,700

Notes

1. Direction of rotation can be either to the right or left. Please specify.
2. Steam inlet and exhaust flanges of standard turbine are located right side viewed from governorend. If left side is required, please specify.
3. Maximum output depends on steam condition. Values in the table show maximum outputs on mechanical strength.

Single Stage [HO]



Typical cross-section

Example of shrunk on rotor
(Gland seal : Carbon packing type)

① Rotor
② Gland seal
③ Bearing
④ Thrust bearing
⑤ Overspeed trip device
⑥ Governor
⑧ Turbine casing
⑨ Bearing pedestal
⑩ Shaft end
⑫ Nozzle
⑬ Moving blade
⑭ Stationary blade

Steam Turbine

Single Stage [CC]

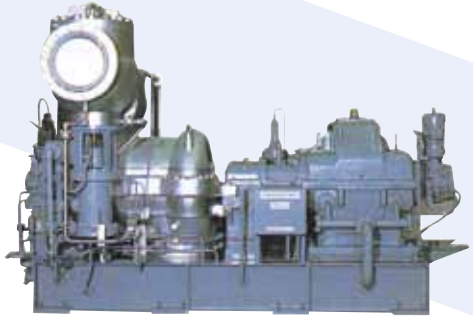
Specification

Item \ Type	CC-600	CC-800
Maximum Speed (rpm)	7,500	6,200
Maximum Output (kW)	3,000	3,000
Maximum Inlet Steam Pressure (kgf/cm^2g)	67	67
Maximum Inlet Steam Temperature (°C)	500	500
Maximum Exhaust Pressure (From vacuum to max.) (kgf/cm^2g)	15	12
Nom. Rotor Dia. (mm)	600	800
Inlet Bore (min./max.) (mm)	100/250	100/250
Exhaust Bore (mm)	300	350
Hand Nozzle Valve Available (max.)	2	2
Weight (max.) (kg)	2,100	2,400

Notes

1. Direction of rotation can be either to the right or left. Please specify.
2. Steam inlet and exhaust flanges of standard turbine are located right side viewed from governorend. If left side is required, please specify.
3. Maximum output depends on steam condition. Values in the table show maximum outputs on mechanical strength.

Single Stage [CC]



B6-R5-R（Typical example）

C9-R12-ER（Typical example）

Steam Turbine

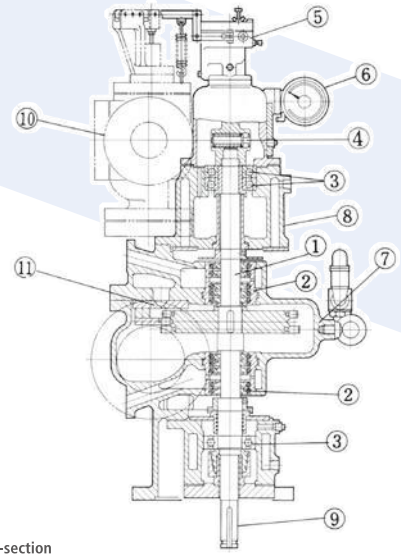
Multi Stage [B/C]

C type turbine（C9-R12-ER）with upper casing removed.
（Typical example）

Specification

Item \ Type	B Back Pressure Type	C Condensing Type
Maximum Speed （rpm）	14,000	14,000
Maximum Output （kW）	100,000	100,000
Maximum Inlet Steam Pressure （kgf/cm²g）	130	130
Maximum Inlet Steam Temperature （°C）	540	540
Maximum Exhaust Pressure （kgf/cm²g）	35	1

Multi Stage [B/C]

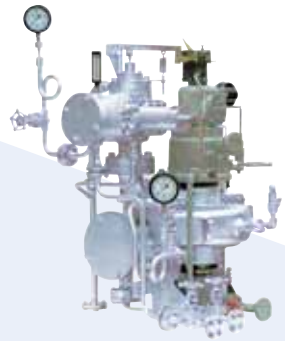


Typical cross-section

① Rotor
② Gland seal
③ Bearing
④ Overspeed trip device
⑤ Governor
⑥ Tachomater
⑦ Turbine casing
⑧ Bearing pedestal
⑨ Shaft end
⑩ Emergency stop valve and governor valve
⑪ Nozzle

Steam Turbine

Vertical [V]



Specification

Item \ Type	V-136	V-145
Maximum Speed (rpm)	4,200	4,200
Maximum Output (kW)	300	500
Maximum Inlet Steam Pressure (kgf/cm²g)	45	45
Maximum Inlet Steam Temperature (°C)	450	450
Maximum Exhaust Pressure (From vacuum to max.) (kgf/cm²g)	7	7
Nom. Rotor Dia. (mm)	300	400
Inlet Bore (min./max.) (mm)	80	80/150
Exhaust Bore (mm)	150	200
Hand Nozzle Valve Available (max.)	1	1
Weight (max.) (kg)	480	750

Notes
1. Direction of rotation can be either to the right or left. Please specify.
2. Maximum output depends on steam condition. Values in the table show maximum outputs on mechanical strength.

Vertical [V]