INDUSTRIAL BOILERS LTD.

www.indboilers.com

For enquiries: mktg@indboilers.com

IB TURBO PRIVATE LIMITED

www.ibturbo.com

For enquiries: mktg@ibturbo.com

iBL Group of Companies

Mumbai

701-C, Poonam Chambers,
Dr. Annie Besant Road,
Worli, Mumbai - 400 018. **INDIA**
Tel.: (022) 6660 2236, 6660 7738
Fax - (022) 2493 7505
email : mumbai@indboilers.com

Vapi

227 - 228,
Vapi Industrial Township,
Vapi - 396 195. **INDIA**
Tel.:(0260) 2431 549,
2432 899, 2422 614, 2400 491
Fax - (0260) 2421 102
email : vapi@indboilers.com

New Delhi

79-80 Satkar,
Nehru Place,
New Delhi - 110 019. **INDIA**
Tel.: (011) 2641 7983, 2645 3194/95.
Fax. (011) 2645 3197
email : delhi@indboilers.com

Kolkata

"Topaz", 23,
Gobinda Banerjee Lane
(on Tollygunge-Anwar Shah Crossing)
Kolkata - 700 0333. **INDIA**
Tel. : 9350169010
9312801531
email : kol@indboilers.com

Marketing Offices:

- Ahmedabad
- Amritsar
- Bhilwara
- Bharuch
- Chandigarh - Mohali
- Chennai
- Gorakhpur
- Hyderabad
- Kanpur
- Pali
- Panipat
- Rajahmundry
- Surat
- Uttaranchal

International Network :

- Colombo - Sri Lanka
- Dhaka - Bangladesh
- Uufa - Russia
- Toronto - Canada
- Nairobi - Kenya
- Dar es Salaam - Tanzania
- Bangkok - Thailand
- Jakarta - Indonesia
- Sharjah - UAE
- Yangon - Myanmar

Ver.: 2.0 - 2021

2021
TURBINE RANGE

IB TURBO PRIVATE LIMITED

POWERING THE FUTURE

*The IBL Group of companies is a one-stop solution for power generation comprising of **Industrial Boilers Limited** and **IB Turbo Private Limited.** The group enjoys a strong reputation in the market of being leading companies with cutting edge technology, innovation and highly trained and efficient engineers.*

The Group is a Research driven, industrial organisation specialising in Design and Manufacturer of Process Steam Boilers, Industrial Boilers, Power Boilers, Steam Turbines, Pressure Reducing Steam Turbines (PRT), Mini Power Plants, Autoclaves and Vulcanisers, Solar Thermal systems, Electrostatic Precipitators (ESP), Bag Filters, Wet Scrubbers and other Pollution Control Equipment.

IBL Group of Companies focuses on providing superior products and impeccable service to every customer.

INDUSTRIAL BOILERS LTD.

Industrial Boilers Ltd. is one of the largest manufacturers of Boilers in India. Today IBL caters to a range of companies across various industries in India and globally owing to its rich history, efficiency and strength.
IBL is one of the Largest exporter of Process Boilers from India. 30 to 40% of IBL Boilers are exported Worldwide.
IBL focuses on building great products, innovating rapidly to improve them and keep them both affordable and highly efficient.

IB TURBO PRIVATE LIMITED

IB Turbo has consistently delivered efficient and reliable steam turbines in India and has supplied over 4200 MW of net electricity generating equipment with more than 650 turbines running in over 25 countries.
IB Turbo has earned a strong reputation of being a trusted and respected name in mini power plants in India.
IB Turbo range includes Pressure Reducing, Single Stage, Multistage Back Pressure and Multistage Condensing Turbines .

IB TURBO PRIVATE LIMITED

COMPANY OVERVIEW

Ever since it's inception, IB Turbo has consistently delivered efficient and reliable steam
turbines and is well known in the industry for its impeccable customer service and quality .

A rich history coupled with highly trained, loyal and skilled staff, constant innovation and superior quality products is what makes IB Turbo a leading company for Turbines in India,

IB Turbo Caters to a variety of industries including textile, sugar mills, rice mills, F&B, Oil & Gas, Pharmaceuticals,

Here at IB Turbo, we value every customer relationship and we have long lasting relationships with our partners as well as our skilled emplyees.

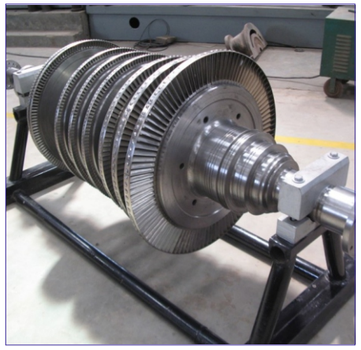
We manufacture and supply industry specific custom made steam turbines that have been known for its reliability and service.

IB Turbo is the market leader in co-generation turbines with a strong market share in India across over 12 Industries and over 800 turbine installations globally.

The superior electronics and software in the company's synchronised turbines, provides effortless operation under fluctuating steam conditions to generate maximum possible power.

IB TURBO
PRIVATE LIMITED

COMPANY INSIGHTS



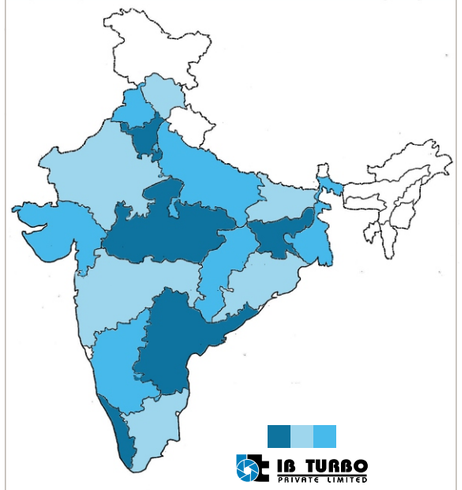
Advantages of purchasing from IB Turbo

- One Point source for complete Cogeneration package.
- Proper System integration.
- One Point Guarantee and Responsibility.
- Steam Pipe Line design assistance.
- Electrification and Grid
- Synchronisation assistance.
- One Point for Boiler and Turbine Service.

IB TURBO
PRIVATE LIMITED

OUR PRESENCE

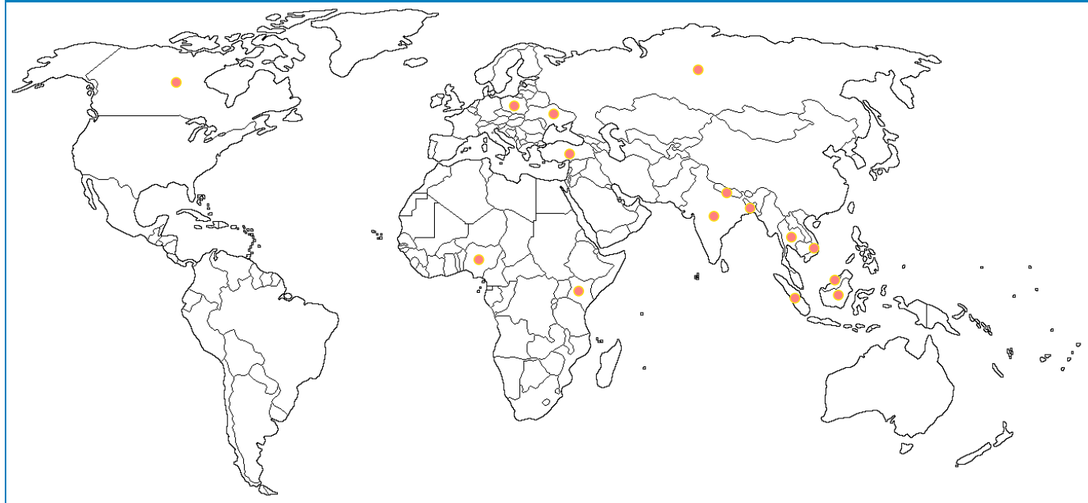
INDIAN FOOTPRINT



With Domestic operations begining in 2001, IB Turbo expanded its footprint rapidly accross India and today, has a strong presence across the country with hundreds of installations across prominent states in India.

In 2002, IB Turbo entered the global market. And created a strong and significant global footprint. IB Turbo continues to focus on expansion and growth globally.

GLOBAL FOOTPRINT



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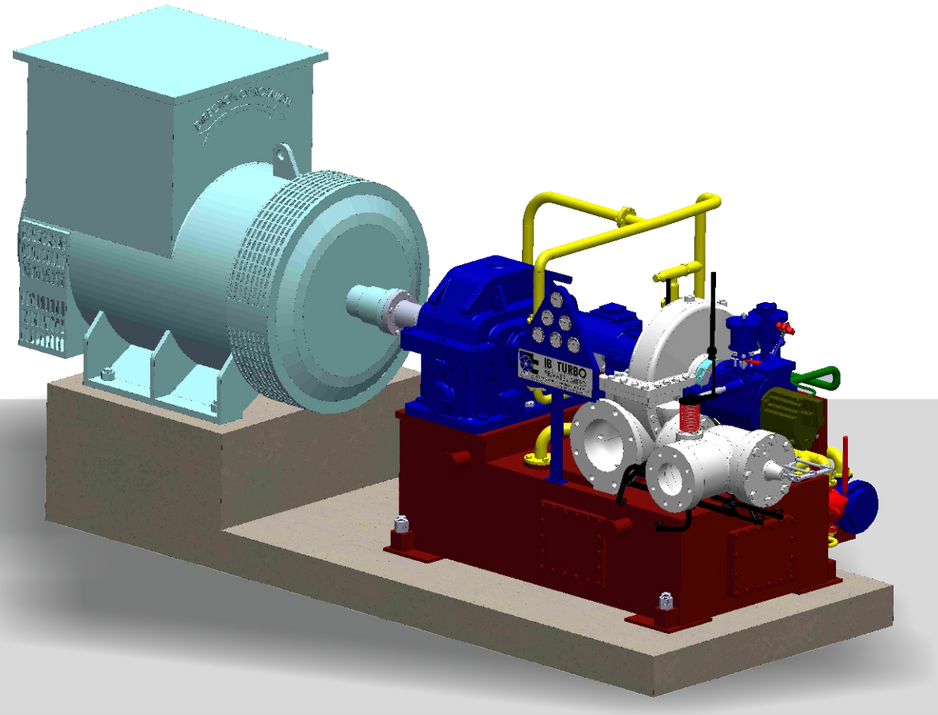
BT- 4 : BACK PRESSURE CURTIS TURBINE

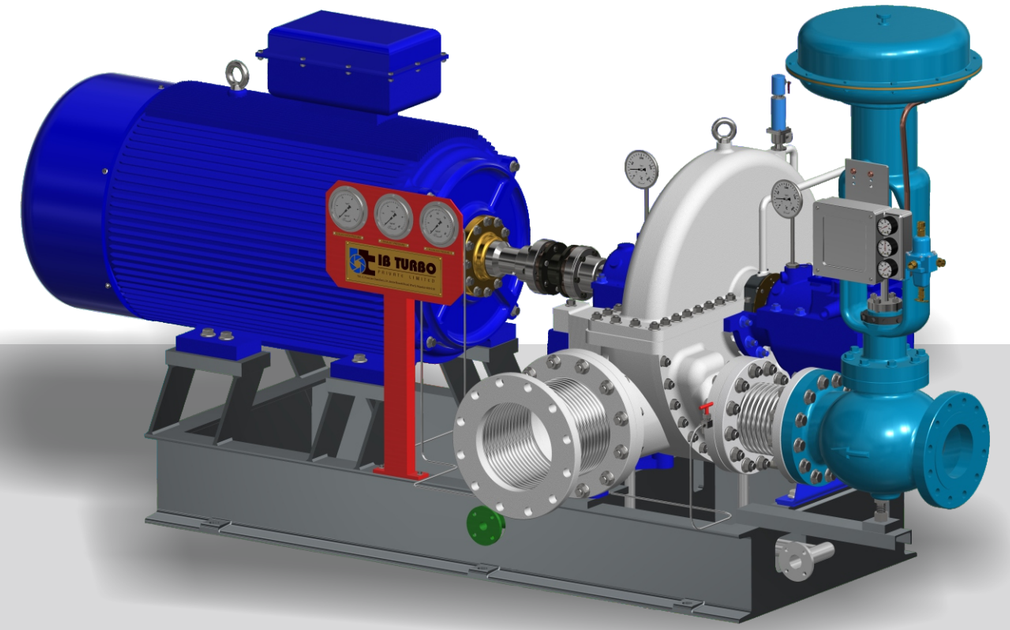


FEATURES

- BT-4 is a Curtis design turbine that has a low CF rotor. The rotor is supported on both sides by high speed bearings.
- The BT Series has been specially designed for continuous operation as repeated startup and shutdown cycles.
- As a synchronised turbine, it can be fitted with induction generators or alternators and can meet varying steam loads effortlessly to deliver constant back pressure.
- Can be provided with Hydro-Mechanical or Electronic Governors.
- No requirement for Control Oil System.
- As a base load turbine, it meets the exacting performance of a work horse.
- Suitable for Mechanical drive Operation.
- A highly proven, rugged and reliable design, it can be adopted for all small Cogen applications.
- High level of standardisation has ensured that parts are available immediately, reducing turbine downtime.
- Suitable for quick start operation.

IB TURBO
PRIVATE LIMITED

PRT : PRESSURE REDUCING TURBINE

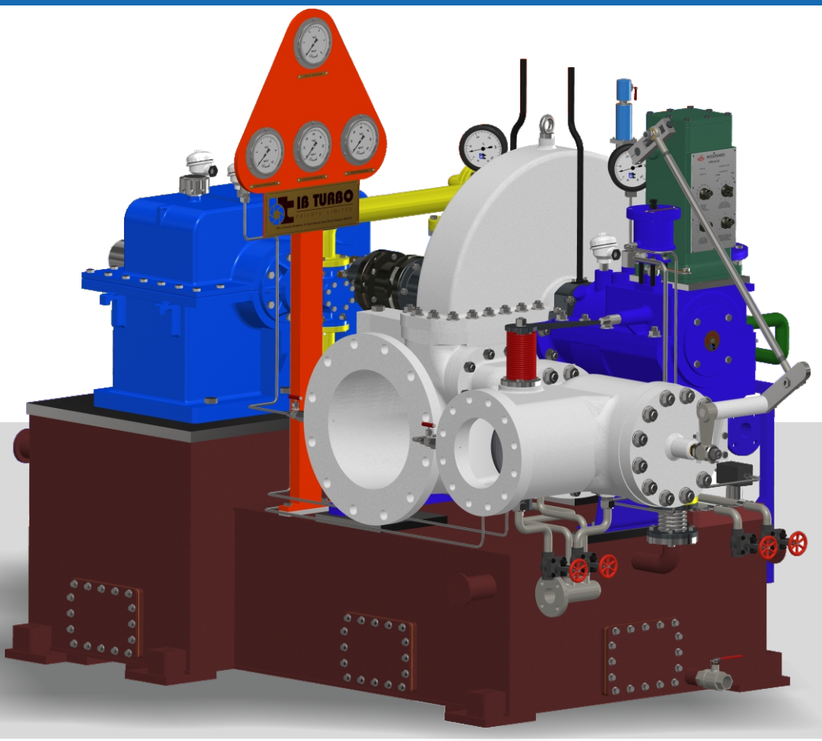


FEATURES

- Robust double bearing rotor with 3000 RPM design ensures highest operation reliability.
- Horizontally Split Steam casing ensures easy inspection of the internals without disturbing the steam lines.
- Suitable for operation with saturated steam
- Ring Lubricated bearings ensures no requirement for Pressurised oil system.
- Can handle large variations in process steam demand and Boiler pressure .
- Touchscreen Panel ensures ease of maintaining process pressure.
- Induction Generator ensures easy synchronising with Grid.

IB TURBO
PRIVATE LIMITED

6SS



FEATURES

- The 6SS is a large diameter Single Stage Curtis wheel design. The rotor shaft is supported by double bearings.
- The BT Series has been specially designed for continuous operation as repeated startup and shutdown cycles.
- As a synchronised turbine, it can be fitted with induction generators or alternators and can meet varying steam loads effortlessly to deliver constant back pressure.
- Can be provided with Hydro-Mechanical or Electronic Governors.
- No requirement for Control Oil System.
- Suitable for Mechanical drive Operation.
- Ideal for Power Plants operating at Intermediate pressures upto 45 Bar.
- A highly proven, rugged and reliable design, it can be adopted for all small Cogen applications.
- High level of standardisation has ensured that parts are available immediately, reducing turbine downtime.

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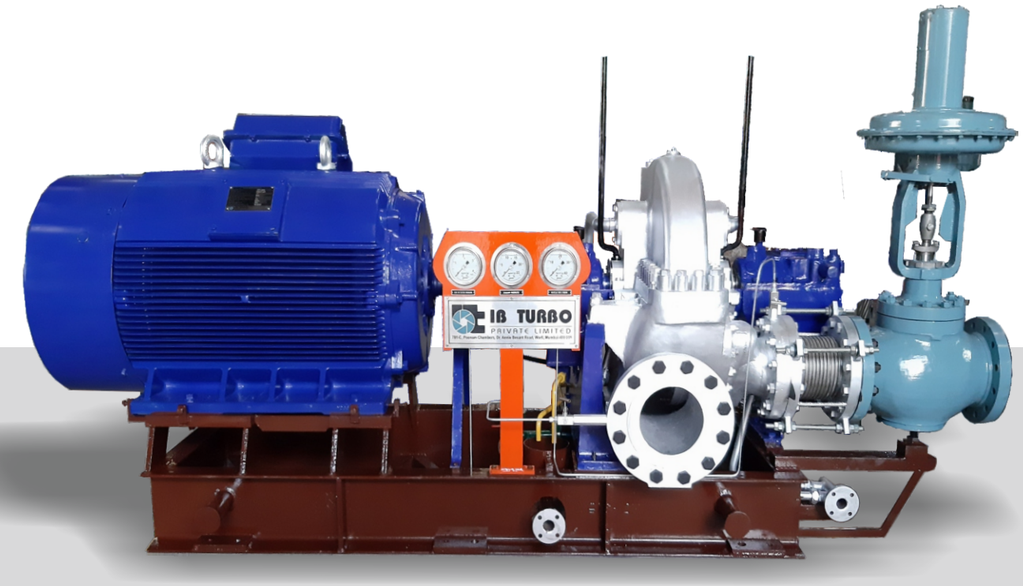
HBP 6SS



FEATURES

- Single Stage High Back Pressure Turbine that can be operated at 3000 / 5000 / 6000 RPM.
- Suitable upto 45 Bar of Inlet Pressure.
- Designed for High Back Pressure Applications upto 10 Bar.
- Hybrid Labyrinth and Carbon Ring type steam seals.
- Can be provided with Hydro-Mechanical or Electronic Governors.
- No requirement for Control Oil System.
- Available with ring lubrication and forced lubrication options.
- 2 nos Hand Valve for Optimized operation at Part Load conditions.
- Available with Options of Alternator Drive And Induction Generator Drive for seamless synchronizing and Back Pressure Control.
- Suitable for Mechanical drive Operation.
- Horizontally Split Steam casing ensures easy inspection of the internals without disturbing the steam line.

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MBT - 6

IB TURBO
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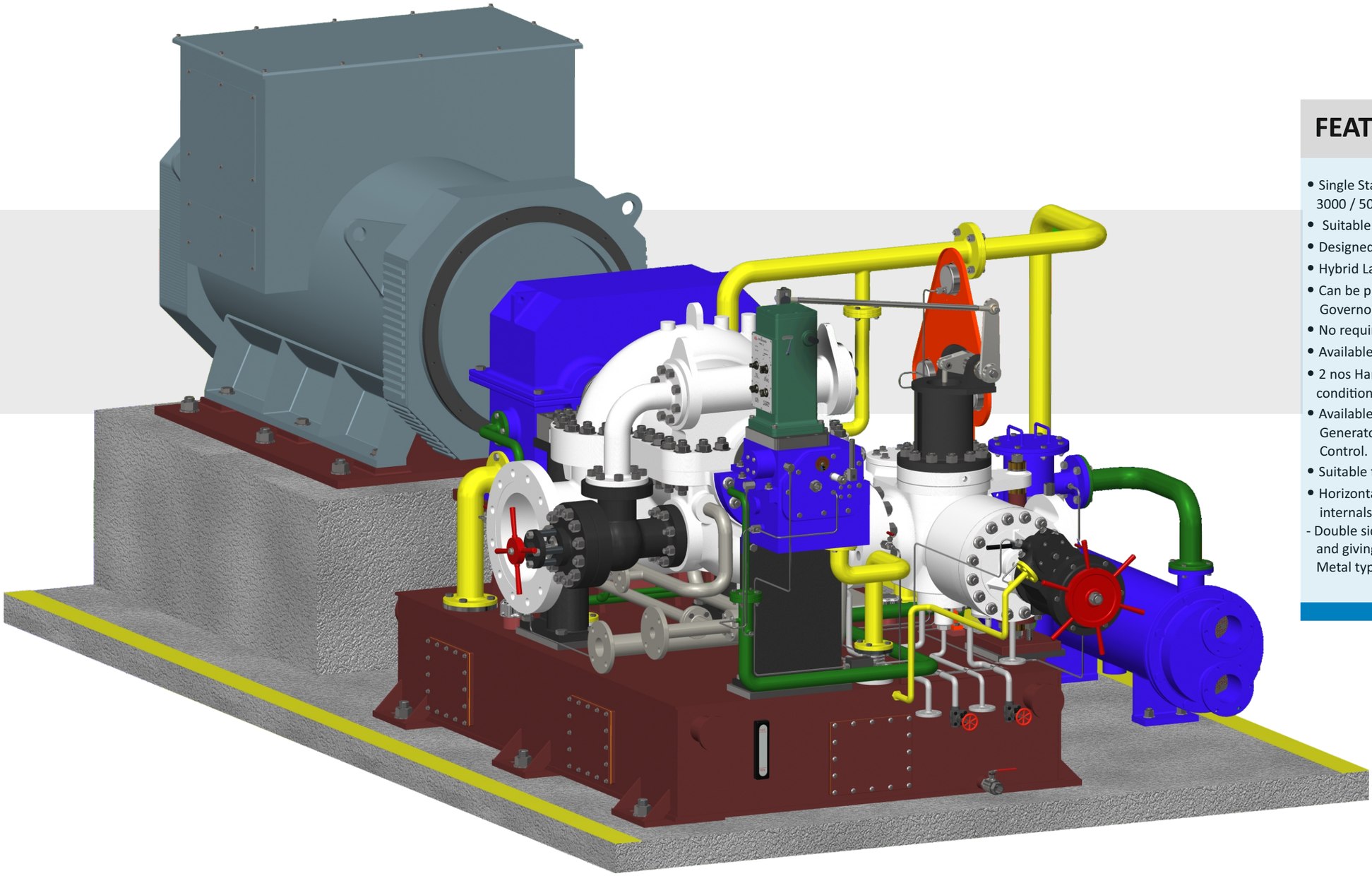
MBT - 6



FEATURES

- Single Stage High Back Pressure Turbine that can be operated at 3000 / 5000 / 6000 RPM.
- Suitable upto 45 Bar of Inlet Pressure.
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- Hybrid Labyrinth and Carbon Ring type steam seals.
- Can be provided with Hydro-Mechanical or Electronic Governors.
- No requirement for Control Oil System.
- Available with ring lubrication and forced lubrication options.
- 2 nos Hand Valve for Optimized operation at Part Load conditions.
- Available with Options of Alternator Drive And Induction Generator Drive for seamless synchronizing and Back Pressure Control.
- Suitable for Mechanical drive Operation.
- Horizontally Split Steam casing ensures easy inspection of the internals without disturbing the steam line.

- Double side Bearings of the turbine shaft, increasing the stability and giving long life to the operation. The bearings are white Metal type Journal Bearings.

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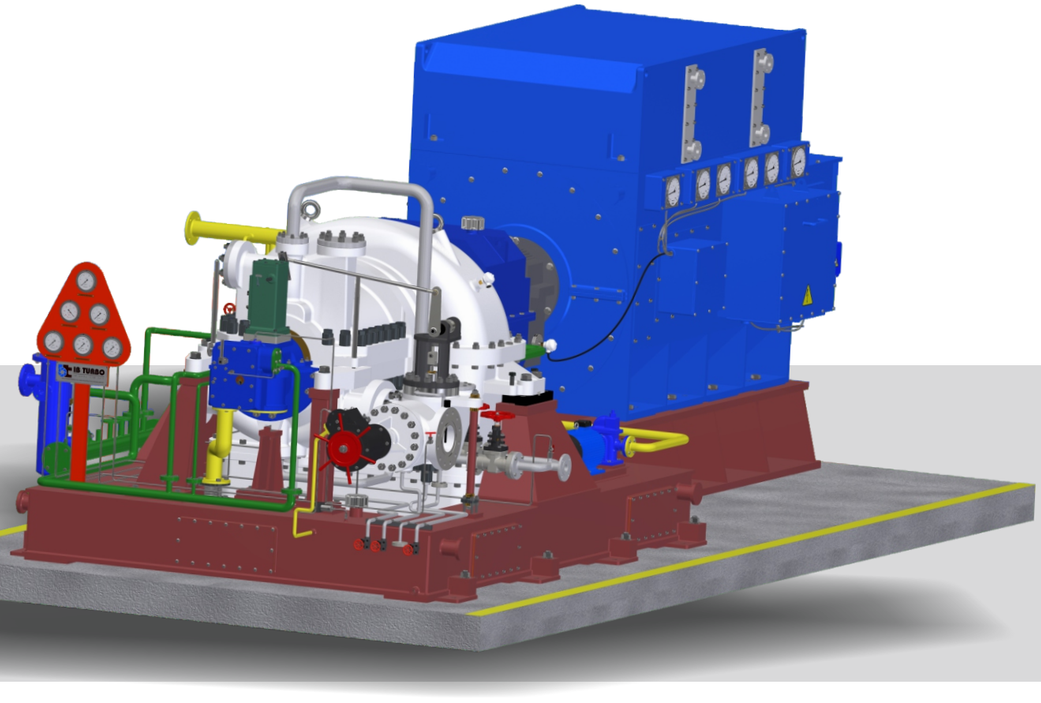
BT - 6X

FEATURES

- Single Stage High Back Pressure Turbine that can be operated upto 7500 RPM.
- The BT Series has been specially designed for continuous operation as repeated startup and shutdown cycles.
- Suitable upto 69 Bar of Inlet Pressure.
- Designed for High Back Pressure Applications upto 18 Bar.
- Labyrinth type steam seals.
- Can be provided with Hydro-Mechanical or Electronic Governors.
- 2 nos Hand Valve for Optimized operation at Part Load conditions.
- Available with Options of Alternator Drive And Induction Generator Drive for seamless synchronizing and BacK Pressure Control.
- Suitable for Mechanical drive Operation.
- Suitable for Quick start Operation.

IB TURBO
PRIVATE LIMITED

BCT-6



FEATURES

- Reliable and rugged condensing turbine designed for steam flows upto 25 TPH, and 3.5 MW Shaft power.
- Rated speed of 7000 RPM Turbine ensures a balance between ease of operation and efficiency.
- Upto Nine Stage of blade rows for maximum efficiency.
- Provision for steam Extraction.
- Horizontally Split Steam casing ensures easy inspection of the internals without disturbing the steam lines.
- Rigid rotor construction ensures no requirement of Barring Gear.
- Can be provided with tilting pad white metal lined gearbox bearings.
- Can be provided with Hydro-Mechanical or Electronic Governors.
- No requirement for Control Oil System
- Ideal for captive power plants, solar thermal systems and waste to energy plants
- Suitable for Low Pressure, Low enthalpy steam sources.

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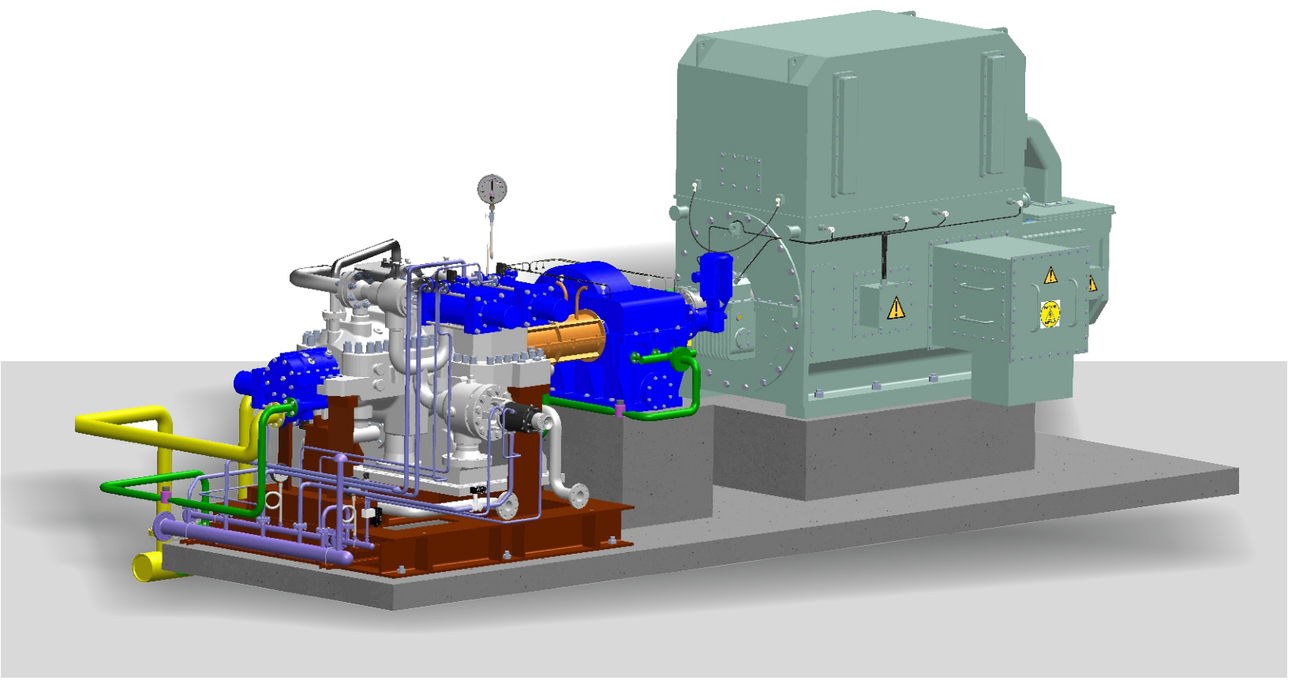
REACTION TURBINE



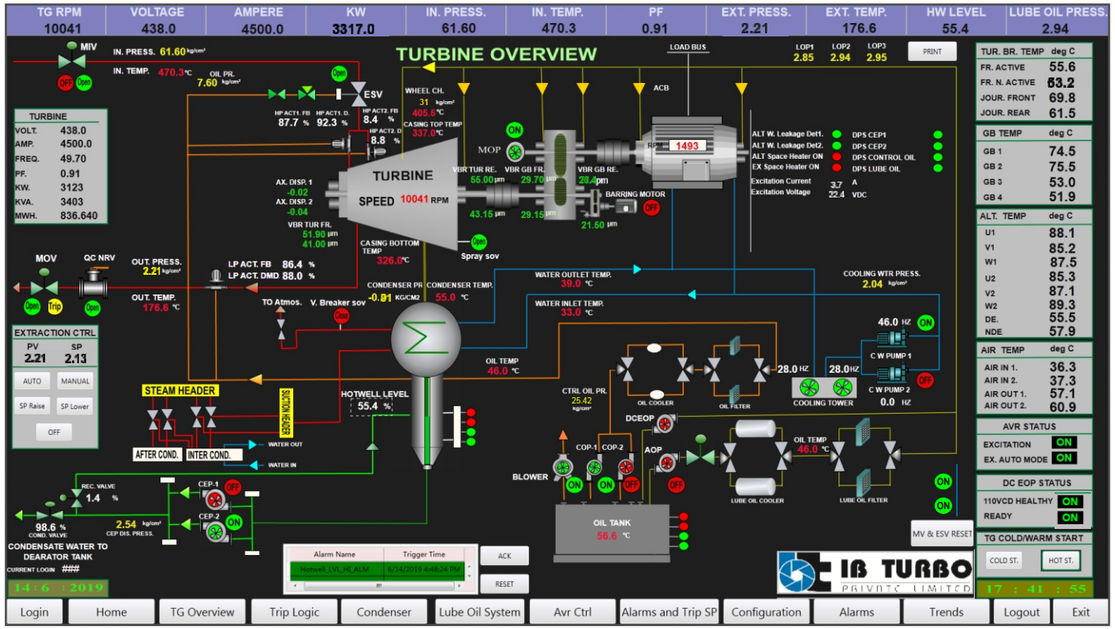
FEATURES

- High efficiency reaction blades with upto 19 stages mean better efficiency, leading to lower specific steam and fuel consumption .
- Electronic Speed Control Actuation system with direct electronic output instead of Hydraulic output from converter, results in superior speed and Frequency control.
- Fly-by-Wire Actuation System Fully electronic Actuation System ensures no springs for turbine control system. available with Back Pressure and Condensing Configurations.
- Controlled extraction of upto 12 Bar(g) permits us to maintain process pressure and power as per requirement.
- Provision for extraction of steam at upto 3 different pressures.
- Tilting pad white metal lined bearings for complete high speed train.
- Sophisticated Vibration Monitoring system.
- A highly proven design, it can be adopted for all small Cogen applications.
- High level of standardisation has ensured that parts are available immediately, reducing turbine downtime.

IB TURBO
PRIVATE LIMITED

CONTROL PANEL

SCADA ENABLED TURBINE CONTROL



PLC BASED TOUCH SCREEN DISPLAY

FEATURES

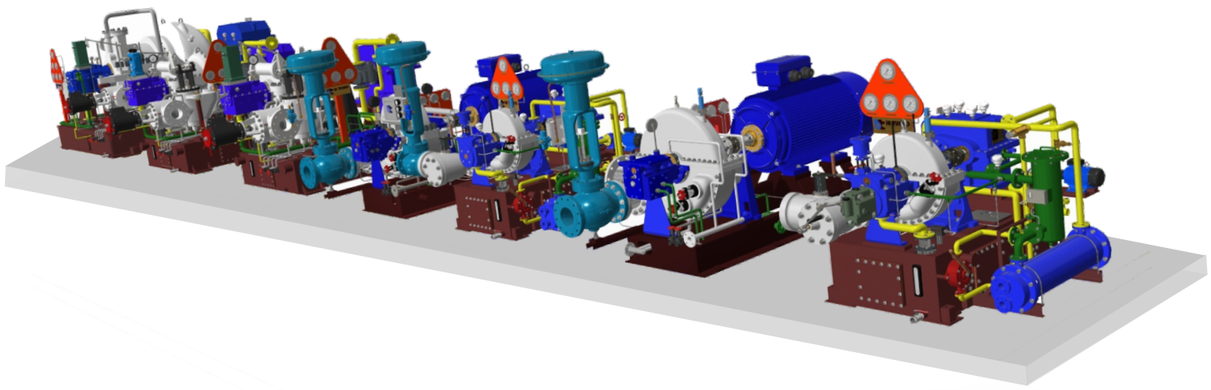
- All IBT turbines come equipped with a touchscreen Infographic Panel, operated by inbuilt panel allowing live monitoring of all parameters at a single location.
- These systems allow easy communication with any Plant level Operation using MODBUS Protocol.
- Provision for Online Monitoring of Live data on Mobile devices and Pcs.
- Power generation and electrical synchronizing options with Systems operating at following voltages – 380 V / 415 V / 440 V / 690 V / 3300 V/ 6600 V / 11000 V / 13800 V
- Synchronization can by done to operate at standalone mode, back pressure mode as well as fixed power mode.

IB TURBO PRIVATE LIMITED

OUR RANGE

PARAMETERS OF IBT TURBINE FRAMES

Model	Type	Max. No. Of Stages	Rated Speed	Gearbox	Forced Lubrication System	Inlet Pressure	Inlet Temperature	Max Bleed/ Extraction Pressure	Outlet Pressure Maximum	Power
			RPM			Kg/cm^2 (a)	^oC	Kg/cm^2 (a)	Kg/cm^2 (a)	KW
BT-4	Back Pressure	1	7000	Yes	Yes	33	400	N. A.	6	700
BT-6	Back Pressure	1	7000	Yes	Yes	33	400	N. A.	6	700
6-SS	Back Pressure	1	5000/ 6000	Yes	Yes	45	450	N. A.	6.5	2000
PRT-6SS- G	Back Pressure	1	5000/ 6000	Yes	Yes	21	300	N. A.	8.5	900
PRT-4	Pressure Reducing Turbine	1	3000	No	No	21	300	N. A.	6	250
PRT-6	Pressure Reducing Turbine	1	3000	No	No	21	300	N. A.	8	500
PRT-8	Pressure Reducing Turbine	1	3000	No	No	14	300	N. A.	8	500
PRT-6SS	Pressure Reducing Turbine	1	3000	No	Yes	21	400	N. A.	8	900
HBPRT - 6	Back Pressure	1	3000	No	Yes	30	400	N. A.	10	1000
HBP - 6SS	Back Pressure	1	5000	Yes	Yes	45	450	N. A.	10	1600
HBP 6	Back Pressure Overhang	1	7500	Yes	Yes	69	490	N. A.	17	3500
MBT 6	Back Pressure with Bleed	5	9000	Yes	Yes	69	490	19	8.5	3500
BCT 6	Condensing with Bleed	8	7000	Yes	Yes	45	490	12	- 0.9 (Vacuum)	3000
RECT 8 BP	Back Pressure with Bleed & Extraction	(Reaction) 12	10000	Yes	Yes	87	510	30	11	8000
RECT 8 Cond	Condensing with Bleed & Extraction	(Reaction) 16	10000	Yes	Yes	87	510	30	- 0.9 (Vacuum)	8000
RECT 10 BP	Back Pressure with Bleed & Extraction	(Reaction) 16	8000	Yes	Yes	87	510	30	11	15000
RECT 10 Cond	Condensing with Bleed & Extraction	(Reaction) 18	8000	Yes	Yes	87	510	30	- 0.9 (Vacuum)	15000
RECT 12 BP	Back Pressure with Bleed & Extraction	(Reaction) 13	7000	Yes	Yes	87	510	30	11	30000
RECT 12 Cond	Condensing with Bleed & Extraction	(Reaction) 19	7000	Yes	Yes	87	510	30	- 0.9 (Vacuum)	30000



IB TURBO PRIVATE LIMITED

ECONOMICS OF CO GENERATION

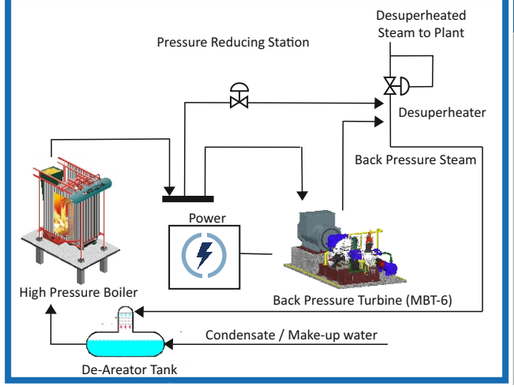
As the word CO - GEN goes, it signifies two separate generations, co- existing at the same time.
Steam is a basic need for the process industry. Generating it at higher pressure adds just 5 to 25% on the fuel cost, but Premium Energy (Power) is generated by the Turbine.

1 kg of Coal = 5000 kcal = Rs. 9.00
5000 kcal of Electricity = 5.81 units = Rs. 43.00

Cogen turbines are considered to be near isentropic processes, in which the entropy of the steam entering the turbine is almost equal to the entropy of the steam leaving the turbine.

Cogeneration cycles have efficiencies over 80% compared to conventional thermal plants operating att just 40%. This leads to inexpensive and environment friendly power generation, a fundamental requirement in today's times.

CO - GENERATION

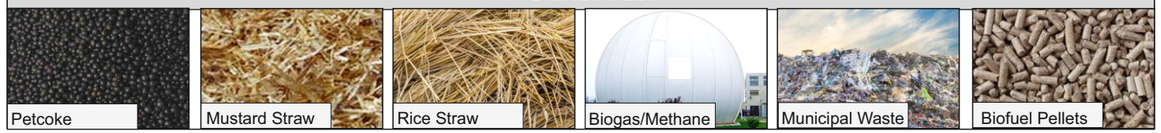


BENEFITS FLOWING OUT FROM AN EFFICIENT COGENERATION SYSTEM

- Reduction in Fuel, thereby reducing Green House Gas emissions
- Use of Biomass and other Carbon Neutral Fuels to generate electricity
- Low Power generation cost
- Accelerated depreciation
- Reduced dependency on local grid supply
- In house source of reliable , uninterrupted and high quality power
- Government Incentives and subsidies

STANDARD FUELS

SPECIAL FUELS



IB TURBO
PRIVATE LIMITED

TURBINE INSTALLATIONS

600+

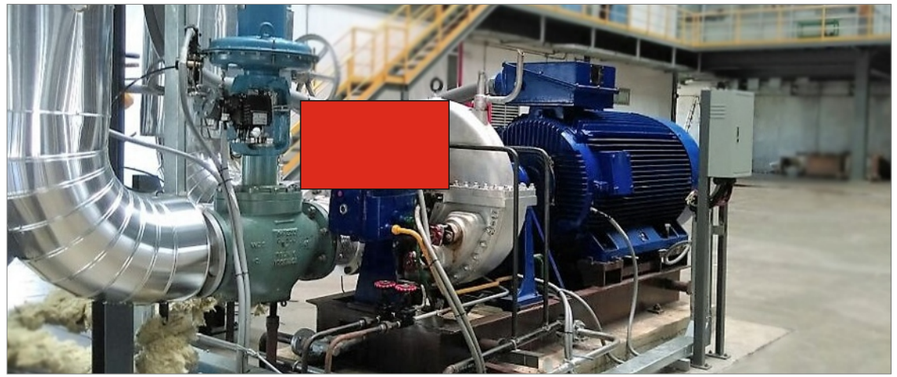
INSTALLATIONS

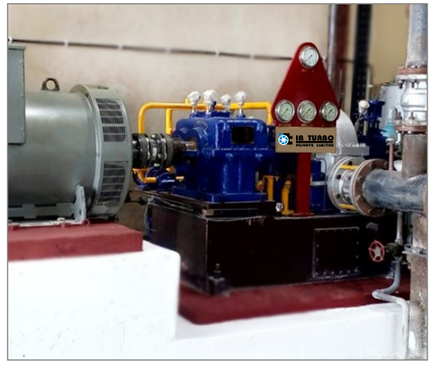
33

INDUSTRIES

42

COUNTRIES





IB TURBO
PRIVATE LIMITED

RESEARCH & DEVELOPMENT

DETAILS OF R&D ACTIVITIES AT IB TURBO

- **2001 :** Back Pressure Steam Turbine developed.
- **2005 :** Multistage Back Pressure Steam Turbine developed.
- **2007 :** Condensing Turbines developed.
- **2010 :** Solar Steam Generators developed with Fresnel Mirror technology.
- **2013 :** Sterling Steam engine.
- **2014 :** Multiple Effect Evaporator.
- **2015 :** Trigeneration Project with IIT-Delhi and Aston University –UK.
- **2016 :** PRT Turbines developed to replace Pressure Reducing Valves.
- **2018 :** Reaction Turbine developed.
- **2019 :** oint Development of vertical wind axis turbines with IIT Delhi.

At IB Turbo, our research is 5 - 10 years ahead of its
time to provide our customers with the latest and best technology. Our research is just a stepping