

Eco - Tur
Saturated Steam Turbine

eco-Tur - Opportunity to Gain

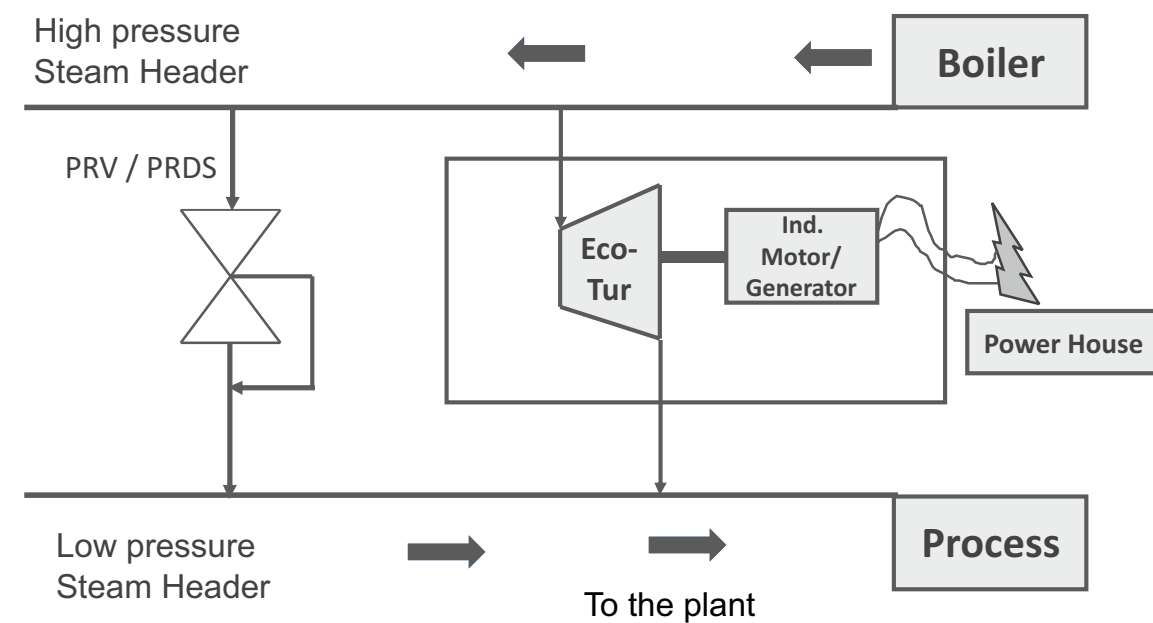
The Rotary Reducer

All Process Industries use the steam at pressure lower than the pressure at which steam is generated. The pressure is dropped using "Passive Devices" such as "Pressure Reducing Valves" (PRVs). This results in the wastage of useful steam energy and hence wastage of Important Revenue. Use of KEPL Eco-Tur in parallel with the existing Pressure Reducing Valves (PRVs) provides an excellent opportunity to generate appreciable revenue through electricity generation. The use of Eco-Tur helps in reducing the cost of overall operations and hence directly adds to the "Bottom Line" of every P&L statement. All this is achievable without disturbing the Most Important Process.

ECO-TUR: SATURATED STEAM TURBINE

KEPL, with the background of specialization in Design & Manufacturing of API (American Petroleum Institute) 611 (General Purpose) & 612 (Special Purpose) compliant Steam Turbines, now also offers Energy Saving Eco-Tur which even caters the Dry Saturated Steam along with Superheated Steam. Eco-Tur is a Single Stage Back Pressure Turbine useful in small Combined Heat & Power plants (CHPs), Process Industries such as Chemical, Textile, Cement, Steel, Paper & Pulp, Tyre manufacturing, Fertilizers, Dairy and Food Industry.

KEPL Eco-Tur Diagram



KEPL Features

- Quick Start
- Compact, Modular & Robust
- High Degree of Operational Reliability
- Low Cost of Ownership
- User Friendly Control Systems
- Suitable for Hazardous Area Classification
- Automatic Accommodation of variable Steam flow

KEPL ECO-TUR is the most reliable and best technology driven choice due to the following USPs

Technical Parameters	Features	Advantages	Benefits
Mechanical Design	1 Direct Drive	No gear box and associated accessories	Reduced package cost and maintenance
	2 Self Lubrication	No separate LOS, pump etc	Compact design and requires smaller footprint
	3 Ability to quick start from Cold condition	Operational flexibility	High up-time
	4 Skid mounted compact system	Compact unit for easy installation	Quick erection and commissioning with minimal civil work
Turbine Control	1 PLC based design with HMI to ensure smooth take over by PRV	Prompt change over to PRV	Uninterrupted Process
Induction Generator	1 Customised IG selection	Higher efficiency	Fast payback
	2 IG protection	Overspeed protection, overload protection, reverse power protection	Longer operating life overload protection,
Power/Electrical Control	As per Application Requirement		

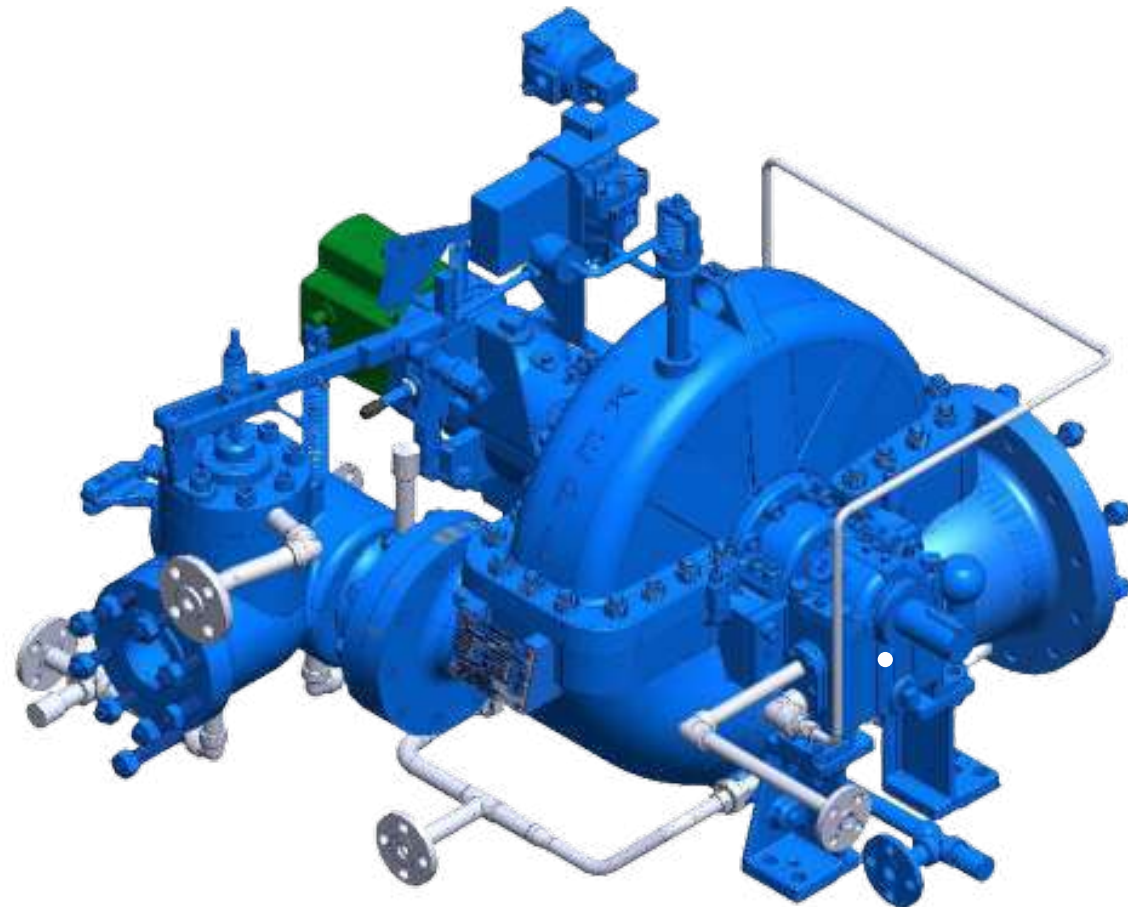
System Engineering Capabilities

Performance based on evaluation of varying flow pattern, the offered power rating is achieved and Installed Turbines are proving the same.

Process Intactness

No Disturbance in the existing process

Concept – Analysis - Commissioning- Strong After Sales Support



Technical Parameters

Inlet Steam Pressure	: Upto 62 bar
Inlet Steam Temp	: Upto 480 Deg C
Exhaust Pressure	: Upto 25 bar
Power Output	: Upto 3000 kW
Governor Type	: Programmable Logic Controller (PLC)
Lubrication type	: Self Lubricated (Ring Oil) / Pressurized

Sample Economic Opportunity Calculation/ Revenue Generation Opportunity:

Sample case For 100 kW/hr generation

= 100 X 24 hrs. X INR 8 per unit X 330 days

= Approx. INR 63,00,000/- per year

Design

The Eco-Tur features single stage steam turbine optimised for use with saturated steam. The steam is impinged on the rotor blades resulting into a torque that turns the generator thereby producing electricity. The turbine casing and rotor assembly manufacturing follows precise material selection to ensure high reliability. The rotor is dynamically balanced ensuring minimal vibrations and hence long service life.

The motorised controlled inlet valves ensures quick opening and closing.to suit varying steam conditions.

Generator

The Eco-Tur uses a highly efficient low-voltage Induction Generator or synchronous generator for power generation. The Induction generators are very rugged and require negligible maintenance. These are manufactured as per KEPL specifications and are optimised for specific power range. These are provided with the necessary protective devices so as to ensure safe operation at all times.

Monitoring and Power Circuit Breaker

The control and protection unit is in-built with all necessary monitoring functions. A screen displays all the relevant data. The control panel may be provided with Programmable Logic Controllers (PLC) for networking with an existing system. The generated power is fed to the grid through PLC controlled circuit breakers.

Packaged Unit

The Eco-Tur is mounted entirely on a single base plate with all the necessary accessories like gear, generator, control and protection unit as well as circuit breaker. This arrangement requires minimal foundation and can be put into service instantaneously.

Installation, Control and Maintenance

The Eco-Tur is designed and manufactured as per the emerging Do-It-Yourself (DIY) philosophy which makes it easy to install and put into service. (If needed a KEPL technician can provide the necessary supervision, erection and commissioning).



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