



## EXPANSION TURBINE – AN ELECTRIC POWER GENERATION UNIT AS A PART OF JET-REACTIVE AND VORTEX TURBINES



Expansion turbine - an electric power generation unit as a part of jet-reactive (ET-JRT) and vortex (ET-VT) turbines is used to produce electric power out of compressed gas or steam due to numerous power leaks in places where regulators and pressure reducers are mounted.

ET-JRT unit consists of:

- an expansion turbine as a part of a jet-reactive turbine;
- one-stage reducer;
- three- phase generator of alternating current performed by an asynchronous electric engine;
- systems of automatic control, checking and protection;
- system of power connection and control of the produced energy.

A paddle-free jet-reactive turbine (JRT) is a main ET-JRT element which makes it perspective and determines the main advantages. JRT transforms the potential energy of compressed gas into kinetic jet energy which flows from a tractive nozzle and is at some distance from the rotation axis. As a result, the reactive thrust force on the tractive nozzle and the running torque on the turbine shaft form. The mechanical work is carried out during the shaft rotation. The energy flows from the turbine shaft through the reducer to the generator shaft and transforms into electric power.

The advantages of JRT enable to develop the ET with the payback period of 1-2 years. It is cheaper, of simple technology and design, safe and easy to use as compared to the ET on the basis of the conventional paddle turbines.

It is also possible to develop the turbine generators with the power up to 500 kW on the basis of the vortex turbine which is simple in design, easy to operate, and cheap in production. But it has a nominal working mode with much lower speed of rotation. Due to this fact the turbine generators without reducer can be developed.

### Specifications of the Expansion Turbine

Characteristic	Value
Power, kW	100
Input pressure: max., psi	64
Input pressure: nom., psi	55
Pressure input: min.,psi	6
Gas flow for heating., kg / s	1.1 ... 1.4
Turbine weight, kg	1670
Dimensions, mm	1500 x 700 x 880