

Examples

General principals

Turbivo operates without friction in the work volume and supports:

- low, medium and high pressures;
- low, medium and high temperatures.

It is a sealed machine which runs without internal lubrication.

Depending on the structure of the added components Turbivo can generally be used for:

- gas pumps or compressors: air, oxygen, nitrogen, town gas, methane, propane, chemicals;
- pumps for non-charged liquids: water, oil, wine, alcohol, petrol, fuel oil, diesel oil, petrol, chemicals, perfumes;
- hydraulic or pneumatic machinery on building sites or quarries, agricultural machinery, in the lifting gear fitted to certain lorries;
- external combustion heat engines: land, sea and air transport.

Turbivo can also be used in assemblies of two or more, possibly different-sized Turbivos with a common shaft.

For instance:

- a group of two or more different capacity Turbivos working as a staged compressor;
- a group of two different capacity Turbivos, one operating as a compressor and the other as a pressure reducer in an assembly forming an external combustion heat engine. In this case, there must be a separate combustion chamber and at least one heat exchanger, not including the essential accessories.

As the Turbivo operates without friction in the work volume, mechanical losses are low to very low. They are limited to the friction generated in the shaft bearings and the distribution.

Heat engines work according to the Joule cycle and so they have no cooling or exhaust system.

Losses currently experienced in exhaust and cooling systems are therefore mainly converted into mechanical energy.

Examples

Figures

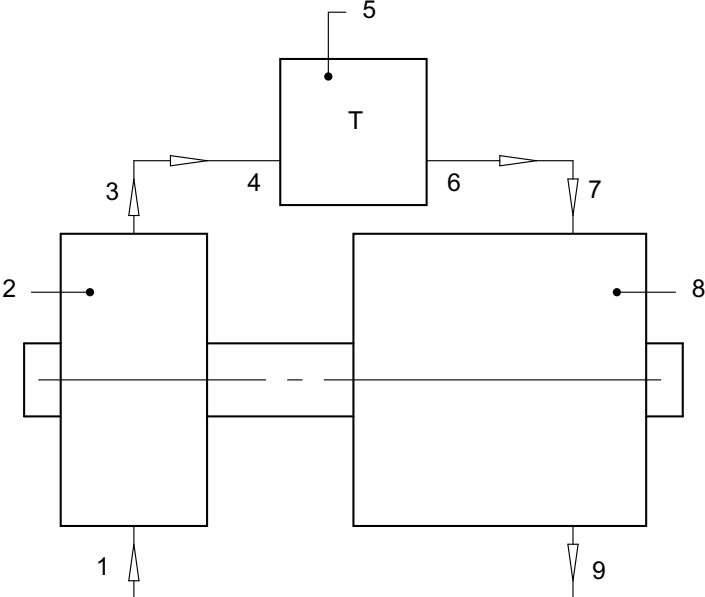


Figure 1 - Conventional Joule cycle diagram

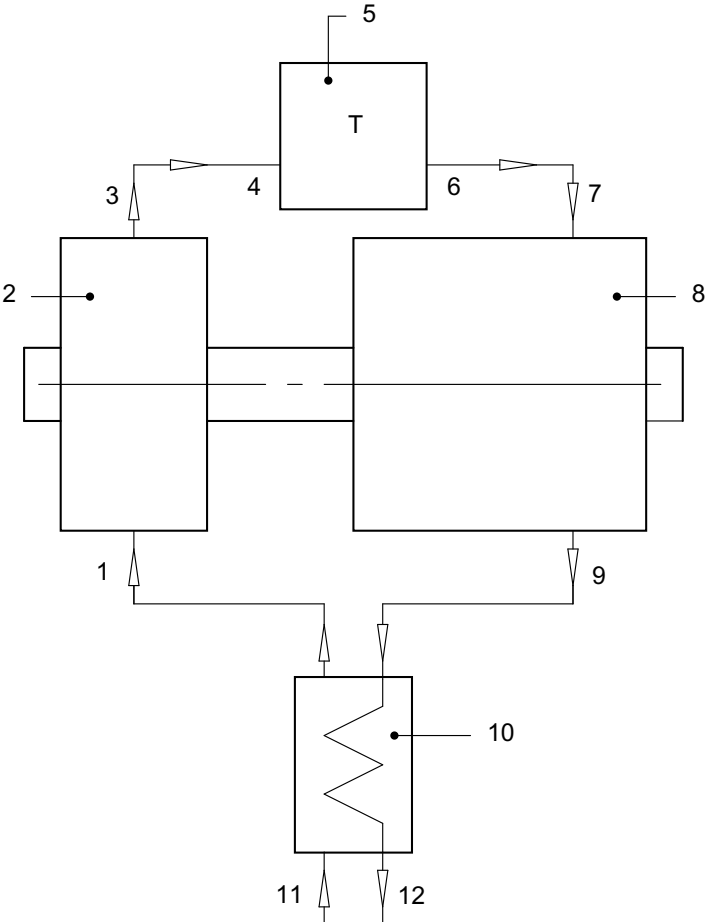


Figure 2 - Improved conventional diagram

Examples

Figure 1 shows the simplest model of Turbivo application to an external combustion engine with no heat exchanger.

It is based on the Joule cycle as used in modern gas turbines.

Consider the classic case of air as the combustive fluid.

Air enters the compressor (2) through (1) at ambient temperature and exits compressed through (3).

It then enters the combustion chamber (5) through (4) in order to supply oxygen to the fuel and form a gas that increases in temperature and therefore volume.

It exits through (6) and enters the pressure reducer valve (8) through (7) with a greater volume than the volume in the compressor (2) in a ratio equal to the volume of gases in combustion and their initial volume.

It exits through (9) at a temperature as close as possible to ambient temperature.

Figure 2 shows the simplest model of turbivo application to an external combustion with heat exchanger.

It is based on the Joule cycle as used in modern gas turbines.

Consider the classic case of air as the combustive fluid.

The air enters heat exchanger (10) through (11) at ambient temperature to then enter the compressor (2) at the exchange temperature and exit compressed through (3). It enters the combustion chamber (5) through (4) to supply oxygen to the fuel, forming a gas which, on changing, will increase the temperature and thus the volume.

It exits through (6) and enters the pressure reducer valve (8) through (7) with a greater volume than the volume in the compressor (2) in a ratio equal to the ratio between the volume of combustion gases and their initial volume.

It exits through (9) at a temperature as close as possible to ambient temperature to enter the heat exchanger and release most of its residual heat into the combustive air and exit in principal at ambient temperature.

Items:

- | | |
|-------------------------------|-------------------------------|
| 1 - air inlet | 7 - pressure reducer inlet |
| 2 - compressor | 8 - pressure reducer |
| 3 - compressor outlet | 9 - pressure reducer outlet |
| 4 - combustion chamber inlet | 10 - heat exchanger |
| 5 - combustion chamber | 11 - exchanger air inlet |
| 6 - combustion chamber outlet | 12 - exchanger exhaust outlet |