Expansion Turbine - Type MTG

PRODUCT INFORMATION

Serving the Gas Industry Worldwide

Honeywell

How to make the energy accessible

The latent but unused energy potential of the expansion plant is converted by the thermodynamic process in the turbine of the direct coupled generator into electric and refrigeration energy. To pre-heat the gas, surplus thermal energy from a block-type thermal power station or distributed heat can be utilized. Depending on system design, the by-pass connected turbine takes over part or all of the expansion work from the existing and remaining gas pressure regulating station.

This power supply is useful not only for the customer but also for the environment and it is an important contribution to the implementation of the climatic protection goals all over the world. These goals are flanked by the german CHP* law and the minimum purchase obligation of CHP* power.

*Combined heat and power
(Cogeneration)

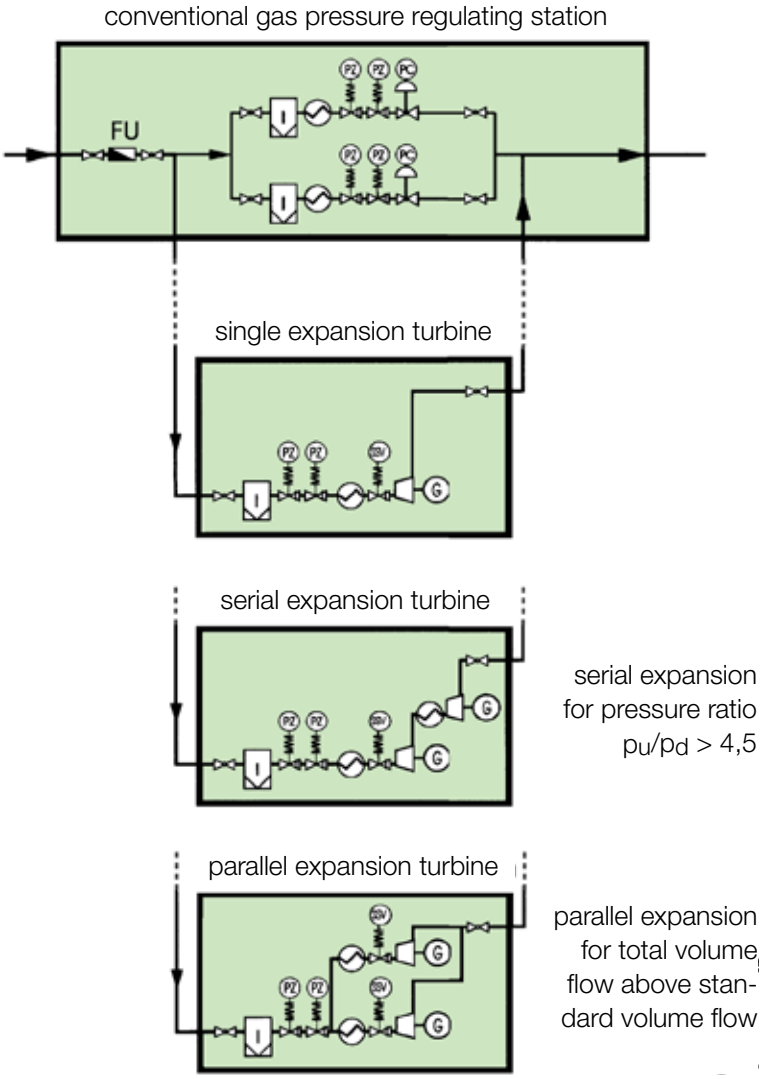
Expand not only your gas but also your opportunities

The expansion turbine immediately opens many possible applications for the recovered energy, also in combination:

- Feeding the main power grid, self-supply
- Reduction of peak loads
- Supply of the emergency power line (similar to UPS)

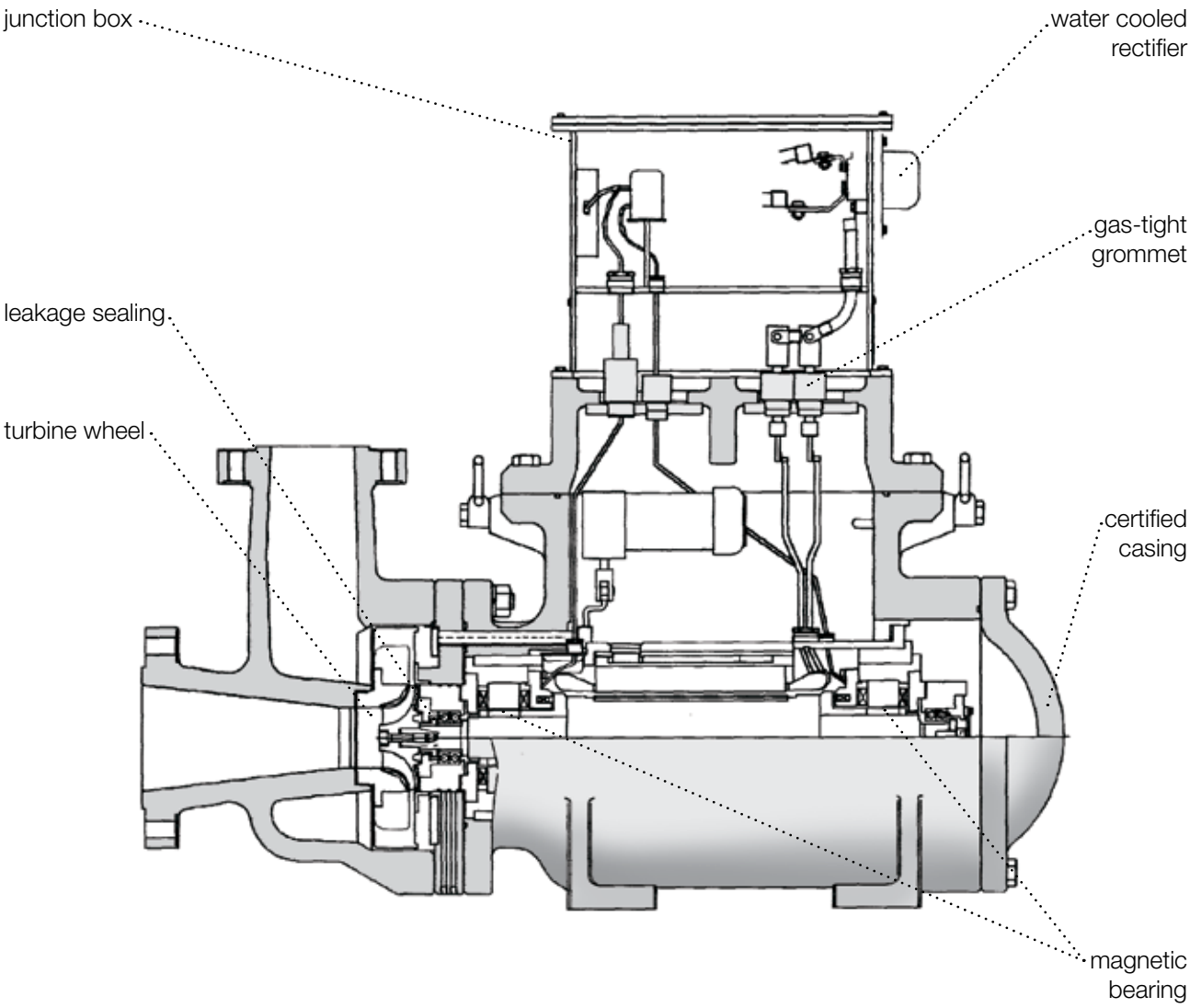
further special utilizations

- Utilization of the refrigeration energy for air-conditioning systems and process cooling
- Re-use of surplus heat



Magnetic bearing turbine generator for energy regeneration

- Oil-free, no gas contamination
- Working life over 20 years (magnetic bearings)
- Emission-free turbine generator
- No wearing parts, no material intensive maintenance intervals required
- Low vibration and noise, no noise insulation required
- High operating convenience, integration into remote control systems, remote diagnostics
- Process control system to control all operating parameters
- Generator rotor with permanent magnets and special bandage designed for peripheral speeds up to 270 m/s
- Digital control of magnetic bearing
- Guide vane control integrated in the machine



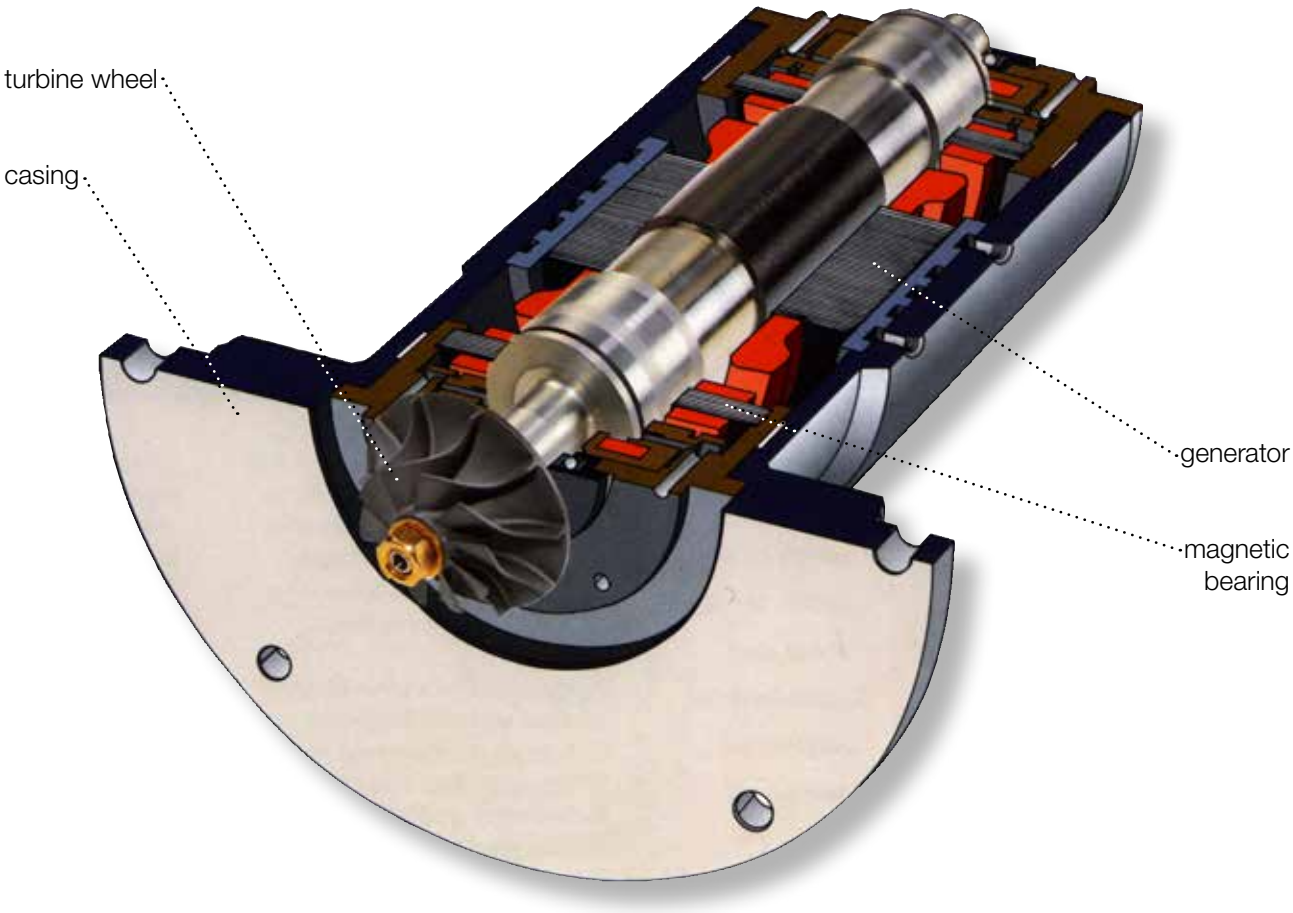
Turbine and generator direct coupled

- Turbine wheel
  It is exactly designed to the existing system-dependent gas pressure and the flow rate.

- Magnetic bearings
  This guarantees the rotor running with no wearing parts and extremely low losses. Any load and power variation on the rotor during operation, are completely equalized by the magnetic field. Emergency support is provided (catch rings).

- Generator
  The generator is constructed as a 2-way synchron machine. The rotor is a gas-cooled armature with permanent magnets. The stator is stacked from low loss electric sheet steel.

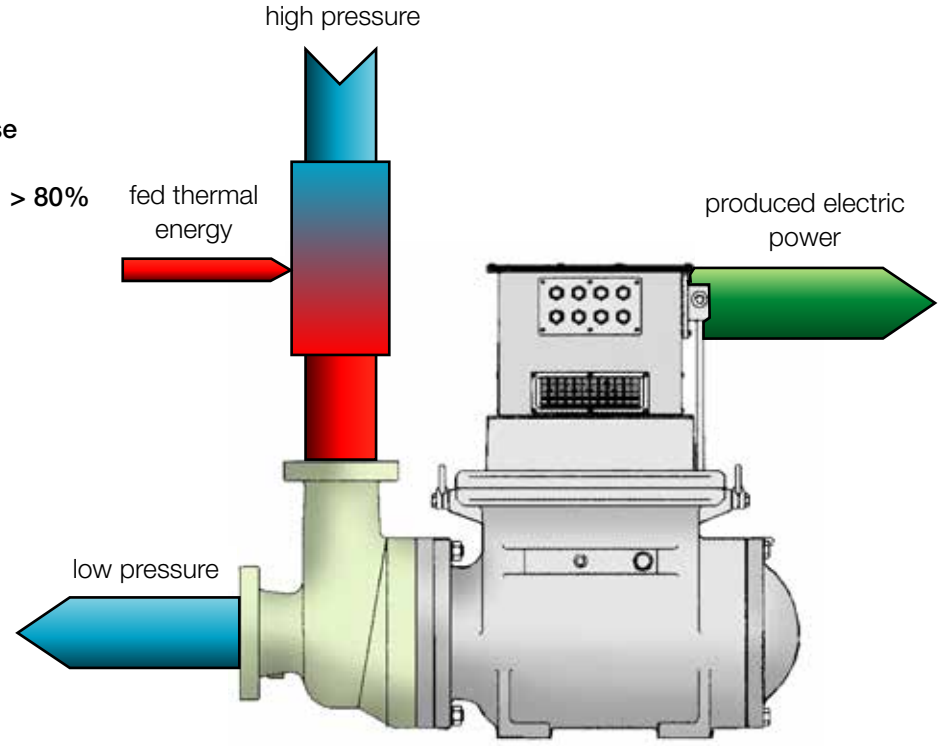
- Housing
  It is gas proof and leakage-free because of no exiting shafts. It is water- and gas-cooled. The expanson turbine is CE-certified and is suitable for use according to ATEX 95.



MTG – natural gas expansion turbine

turbine generator
+ heat
+ expansion
= efficient energy use

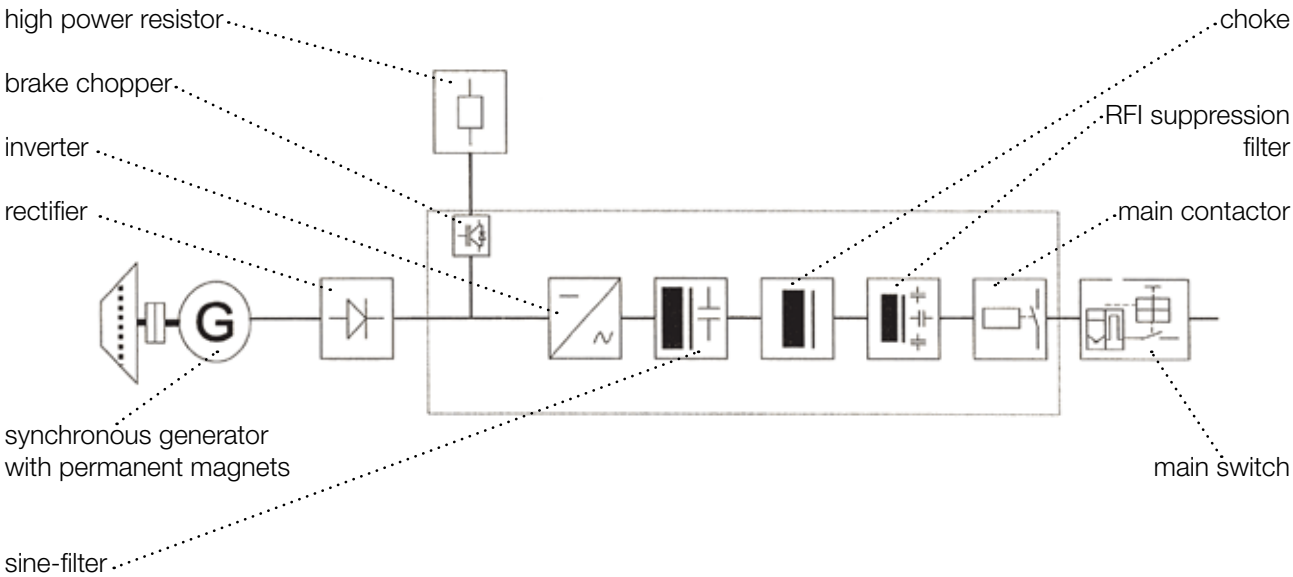
efficiency factor: η > 80%



Frequency inverter and grid connection

- Rectification of the high-frequency alternating current into the DC-bus.

- Utility suitable conditioning to feed into the grid (e.g. 400V / 50Hz). Connection to the medium voltage grid as option. Mains contamination is prevented by sine-filter, mains chokes and RFI-filter. In case of emergency a brake chopper with external high power resistor takes the remaining energy from the system. Safety relevant functions are part of the MC (Measurement and Control) protection system. The heat loss of the power electronics is fed back into the process heat circuit.



TECHNICAL SPECIFICATIONS			
Turbine	**MTG 160**	**MTG 450**	**MTG 550**
type	radial turbine with vane adjustment	radial turbine with vane adjustment	radial turbine with vane adjustment
inlet pressure	max. 40 bar	max. 70 bar	max. 70 bar
max. gas flow rate	10000 Nm^3/h	25000 Nm^3/h	30000 Nm^3/h
min. gas flow rate	3000 Nm^3/h	4500 Nm^3/h	5000 Nm^3/h
pressure p_{ein}/p_{aus}	2.5 to 4.5	2.5 to 4.5	2.5 to 4.5
at serial expansion	6.25 to 20.25	6.25 to 20.25	6.25 to 20.25
Generator			
type	permanent synchronous generator	permanent synchronous generator	permanent synchronous generator
bearings	digital magnetic bearings	digital magnetic bearings	digital magnetic bearings
cooling	water cooling process gas cooling	water cooling process gas cooling	water cooling process gas cooling
nominal power	160 kW	450 kW	550 kW
nominal speed	45000 U/min	32000 U/min	32000 U/min
efficiency	~ 96 %	~ 96 %	~ 96 %
pressure level	PN 40	PN 70	PN 70
dimensions	l = 1,093 mm, w = 955 mm, h = 735 mm	l = 1,800 mm, w = 800 mm, h = 1,500 mm	l = 1,800 mm, w = 800 mm, h = 1,500 mm
weight of MTG	approx. 800 kg	approx. 2,650 kg	approx. 2,750 kg
Control system and inverter			
power electronics	PWM inverter in IGBT - technology	PWM inverter in IGBT - technology	PWM inverter in IGBT - technology
nominal voltage	400 V	400 V	400 V
nominal power	160 kW	450 kW	550 kW
frequency	50 Hz	50 Hz	50 Hz
power factor	1	1	1
efficiency	98 %	98 %	98 %
cooling	water-cooling and air-cooling	water-cooling and air-cooling	water-cooling and air-cooling
protection	IP 44 (switchboard), IP 20 (brake resistor)	IP 44 (switchboard), IP 20 (brake resistor)	IP 44 (switchboard), IP 20 (brake resistor)
dimensions	w = 2,400 mm, h = 2,400 mm (+400 mm), d = 600 mm	w = 3,600 mm, h = 2,400 mm (+400 mm), d = 600 mm	w = 2,400 mm, h = 2,400 mm (+400 mm), d = 600 mm

Also available as turn-key container version !

For More Information

To learn more about Honeywell's Advanced Gas Solutions, visit www.honeywellprocess.com or contact your Honeywell account manager

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