

Energy saving ensured by high total efficiency attained by the supply of heat and power.

# Gas Turbine Co-generation Plant Unit

## Features

- The gas turbine co-generation plant unit converts fuel, such as natural gas, into electricity and heat simultaneously, thus making it possible to realize an energy system with a total efficiency of at least 80% and reduce the energy consumption and CO<sub>2</sub> emissions of facilities where the energy system is introduced.
- A gas turbine is lightweight and compact, and generates little vibration compared with diesel and gas engines, which ensures ease of installation with minimal restrictions. Furthermore, a gas turbine has so good startup characteristics that it can be used for an emergency generator as well.
- With the adoption of a thermo-electric variable system, the power generation efficiency of the gas turbine will increase by approximately 30%, because the thermo-electric variable system injects surplus steam into the gas turbine so that the gas turbine will be driven with a blend of the steam and combustion gas.

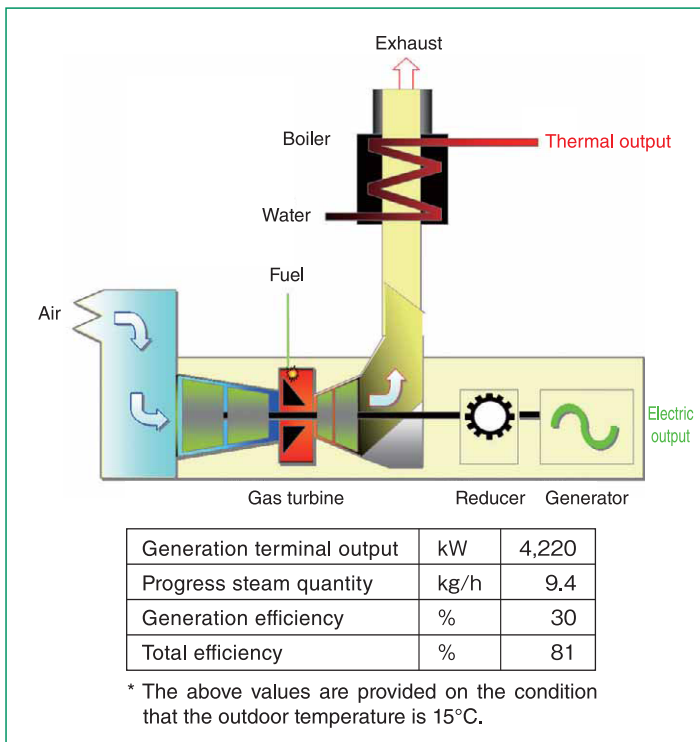
## Overview

(Technical principles, actions, etc.)

### Co-generation System

The co-generation system incorporates a gas turbine that is driven by fuel, such as natural gas, and the gas turbine in operation rotates a generator so that electric output will be obtained. The heat of exhaust gas from the gas turbine is recovered by a boiler to obtain thermal output at the same time.

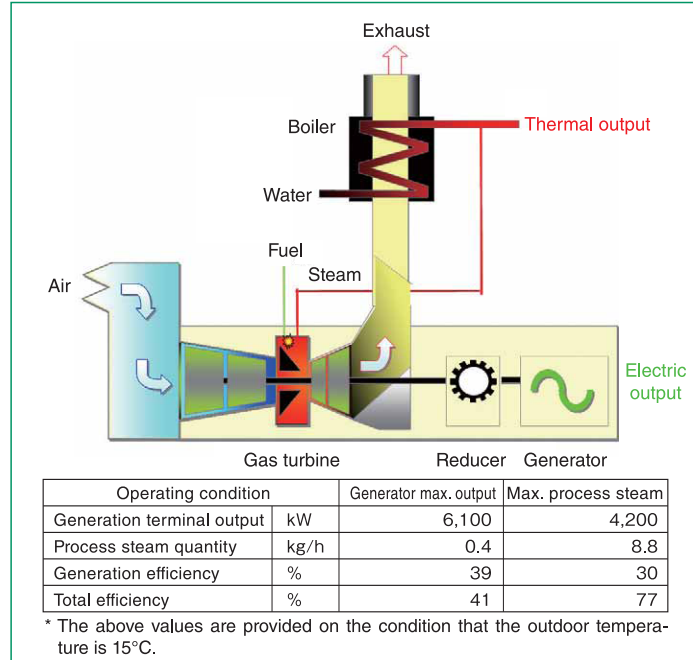
The electric output will cover part of the power consumption of facilities while the thermal output will cover part of heat sources for steam and hot water required by the production stages and air conditioners of the facilities.



Co-generation system

### Variable Heat and Power System

Hitachi Zosen's variable heat and power system (Variable Heat and Power 6MW: VHP6) is provided for consumers in high demand of electric power. The system uses high-temperature steam obtained as a result of thermal collection and injects all or part of the steam into the combustion chamber of a gas turbine to adjust the heat-and-power ratio.



Variable Heat and Power System

### Introductory Track Record

- Hitachi Zosen installed the system to the following plants.  
**48 Japanese plants: 60 units for a total of 627,080 kW**  
**8 overseas plants: 21 units for a total of 108,100 kW**

### Effects

- ◎Promotes energy saving and ensures high economic efficiency**  
 The co-generation system provides heat and power for the destination that is adjacent to the system, which causes little transportation loss, thus ensuring high total efficiency and promoting energy saving. Furthermore, the system requires only a small quantity of heat input, thus ensuring high economic efficiency.
- ◎Contributes to environmental preservation**  
 The system injects a small quantity of heat with CO<sub>2</sub> and NO<sub>x</sub> emissions suppressed, thus contributing to environmental preservation.
- ◎Realizes the stable maintenance of energy**  
 The system provides energy for the destination that is adjacent to the system. The short energy supply line is less influenced by disasters, and the line makes it possible to reduce the risk of power supply suspension that may result from an emergency interruption of the system.
- ◎Energy demand leveling**  
 The co-generation system makes energy demand leveling possible by operating the system during the day, when the load of the destination of consumption is high. Besides, energy demand leveling is possible as well by utilizing the performance of the variable heat and power system.

Applicable field  
Plants, hospitals, hotels or other facilities with a contracted power of 4,000 kW in high demand of heat or air conditioning energy (heat and cold energy)

Water

Energy saving/Energy recovery

Energy storage/Energy creation

New energy

Waste disposal/Recycling/Resource saving

Air

Soil

Other

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