

State-of-the-art energy-saving air compressor incorporating a steam motor and compression heat recovery unit

Compression Heat Recovery Type Steam-driven Air Compressor

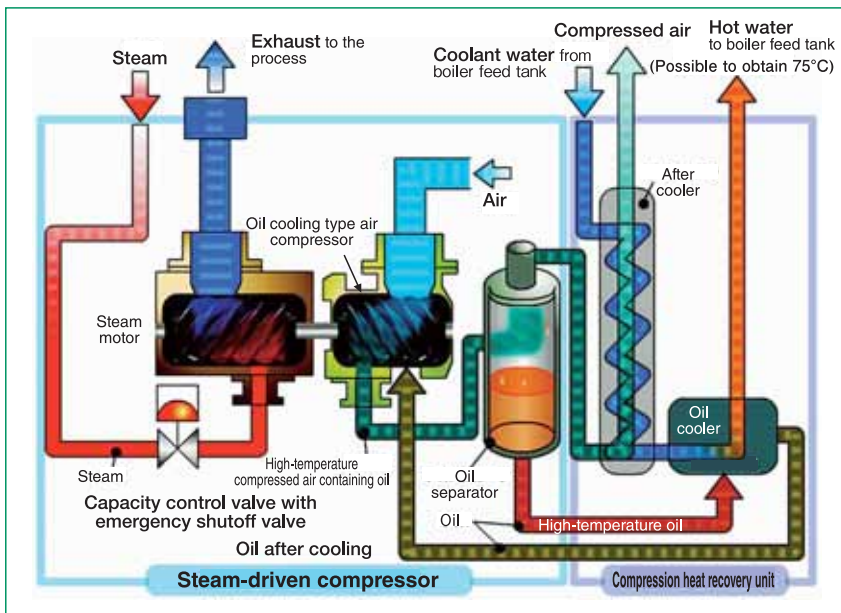
Features

- An excellently economical compressor driven by a steam motor with low CO₂ emissions without electric power required.
- Recovers and utilizes compression heat, which was radiated into the air the past, for the preheating of boiler water.
- The running cost is 85% less expensive and the quantity of CO₂ emissions is 90% lower compared with those of conventional electric-driven compressors.

Overview

(Technical principles, actions, etc.)

The world's first compression heat recovery type steam-driven air compressor consists of an air compressor unit driven by a steam motor in combination with a compression heat recovery unit. When this air compressor is used for a steam plant, the air compressor unit utilizes a pressure difference caused by the reducing valve at the decompression process of the plant, rotates the steam motor with the pressure difference, and drive the air compressor with the axial force of the steam motor. The compression heat recovery unit collects the compression heat generation of the air compressor, which was radiated into the air in the past, for the preheating of boiler water. The air compressor is driven by steam generated with a fuel at a comparatively low unit price with low CO₂ emissions, which saves the running cost and total CO₂ emissions of the system. Furthermore, the compression heat returns with hot water to the steam boiler, thus reducing the fuel consumption of the boiler and contributing to an overwhelming improvement in the utility system efficiency of the plant. Furthermore, the peak cut of power consumption will be possible. As a result, the running cost is 85% less expensive and the quantity of CO₂ emissions is 90% lower compared with those of conventional electric-driven compressors. This equipment is a state-of-the-art energy-saving air compressor.



Internal Configuration of Kobelion SD



Steam-driven compressor unit Compression heat recovery unit
Compression heat recovery type steam-driven air compressor

Introductory Track Record

On sale in April 2009

- In Japan: One unit was already delivered. Five orders have been received.

Effects

- The reduction of boiler fuel cost realized by the excellently economical steam motor and compressor heat recovery, the running cost is 85% less expensive and the quantity of CO₂ emissions is 90% lower compared with those of conventional electric-driven compressors.
- The annual electric bill for an electric-driven compressor is 6,026,000 yen (on the condition that the compressor is of air cooling type operated for 6,000 hours per year at an electric rate of 12 yen/kWh), which is converted into CO₂ emissions of 279 tons (on the condition that the CO₂ basic unit is 0.555 kg-CO₂/kWh). With the introduction of this air compressor, a running cost reduction of 5,120,000 yen (6,026,000 yen x 0.85) and a CO₂ reduction of 251 tons (279 tons x 0.9) will be expected annually.

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※Note: This publication introduces examples of technologies and products believed useful towards solving environmental and energy issues. In no way does it constitute guarantees concerning their transfer or sale.

Applicable field
Plants utilizing steam and compressed air

Water

Energy saving/Energy recovery

Energy storage/Energy creation

New energy

Waste disposal/
Recycling/
Resource saving

Air

Soil

Other

ENERGY