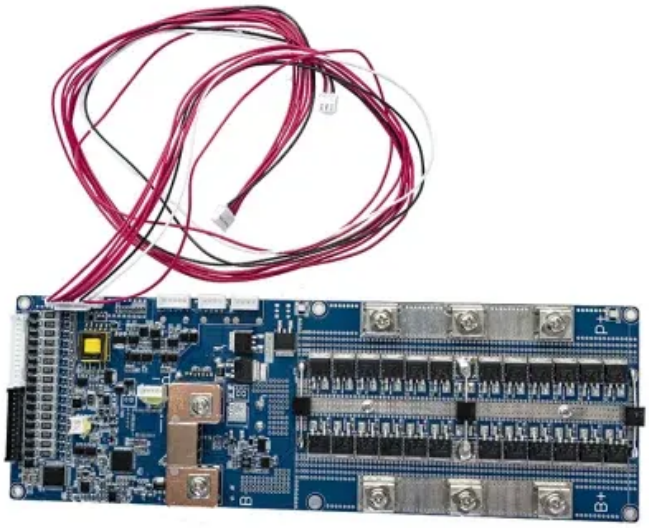
Solar Energy South Africa

Air inlet temperature of air-cooled generator



Overview

Turbine inlet air cooling is a group of technologies and techniques consisting of cooling down the intake air of the gas turbine. The direct consequence of cooling the turbine inlet air is power output augmentation. It may also improve the energy efficiency of the system. This technology is widely used in hot climates.

take in filtered, fresh ambient air and compress it in the compressor stage. The compressed air is mixed with fuel in the combustion chamber and ignited. This produces a high-temperature and high-pressure flow.

In areas where there is demand cooling, daily summer on-peak periods coincide with the highest atmospheric temperatures, which may reduce the efficiency and power gas turbines. With the vapor mechanical compression technologies, cooling.

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Different technologies are available in the market. Each particular technology has its advantages and inconveniences according to different factors such as ambient conditions, investment cost and payback time, power output increase and cooling capacity.

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What is turbine inlet air cooling?

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What is inlet air cooling?

Inlet air cooling improves performance of cooled gas turbine based combined cycle. Vapor compression inlet air cooling is superior to vapor absorption inlet cooling. For every turbine inlet temperature, there exists an optimum pressure ratio. The optimum compressor inlet temperature is found to be 293 K.

Can a novel inlet air cooling system increase power output?

A novel inlet air cooling system for intercooled gas turbines is proposed. The proposed system is able to increase power output by 19% and efficiency by 2.3%. The novel system offers 8–18% better efficiency than existing designs in literature. The new system generates substantial annual profits.

How to select the optimal inlet air cooling system for intercooled gas turbines?

It is important to note that the optimal inlet air cooling system for intercooled gas turbines can be selected through a thermo-economic analysis that factors in different ambient temperatures and the ISO relative humidity level of 60%. Fig. 9. Required cooling capacity for an inlet air cooling system. 6.2. Inlet air temperature drop.

Does inlet air cooling increase power?

The addition of inlet air cooling has been reported to enhance power by 3.9–25.7% and efficiency by 2.1–5.2% while the pay back period was increased by 3.7 years. Another promising inlet air cooling method is vapor absorption cooling, as it uses a low grade thermal energy source to drive the system and generate the cooling effect.

What happens if the inlet air temperature increases?

Increasing the inlet air temperature causes a reduction in the air mass flow rate, and the efficiency and output power of a gas power plant will reduced. To compensate this power and efficiency decrease, different cooling systems can be applied to the inlet air flow.

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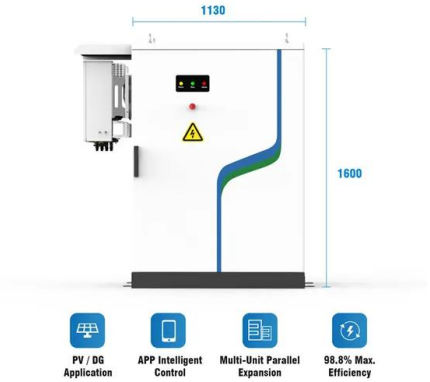
A Review of Effect of Inlet Air Temperature on Gas Turbine Power ...

power and high electricity occur, the inlet air cooling techniques are very useful for reducing the inlet air temperature and thus improving power output and efficiency. It is observed that an ...

Effect of gas compressibility on fluid field of air-cooled turbo-generator

The effect of gas compressibility on the fluid flow characteristics of a 350 MW air-cooled turbo-generator is investigated in this paper. with the capacity of the air-cooled ...



air cooled vs liquid cooled generator: which one ...

Air-cooled generator is a type of generator that uses air as a cooling medium to dissipate the heat generated during operation. This type of design is prevalent in portable and standby generators. Higher operating ...

The energy analysis of GE-F5 gas turbines inlet ...

To reduce inlet air temperature of the gas turbine, an absorption cooling system is used, in

which a heat-recovery steam generator is used to feed the chilling system. The results showed that using a lithium ...

Effect of end air-inlet arrangement method on temperature field for air

In the ventilation design of a air-cooled turbo-generator rotor with air-inlet at the end arc section and air-compensation at the straight section, in order to investigate the effect ...

Air-cooled VW Beetle Engine: The Complete Guide

An internal combustion engine works in 4 phases: Intake stroke: cool air inlet through the piston at the top, the intake valve opens, and the piston moves down and sucks the gasoline / air mixture from the intake manifold into ...

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