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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Binary power generation systems with capacity less than 100
kW - Performance test methods**

容量小于100kW的双循环发电系统 性能测试方法

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document adopts IEC 63277:2021 "Performance test method for dual-cycle power generation systems with a capacity of less than 100kW".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the China Electrical Equipment Industry Association.

Introduction

This document relates to performance testing methods for dual-cycle power generation systems.

This system utilizes the heat from the heat source, transferring it to the working medium via a heat transfer medium, rather than directly heating the working medium.

Therefore, it is called a "dual circulation system", "dual working medium system", or

"organic Rankine dual circulation system".

Dual-cycle power generation systems can utilize relatively low-temperature heat sources, such as factory waste heat, as well as renewable energy sources like hot spring water, geothermal energy, and solar energy.

And so on, can also generate electricity.

By standardizing the performance measurement methods for dual-cycle power generation systems, energy-saving performance can be evaluated in a standardized manner, and it can also be tailored to actual usage conditions.

This is reflected in energy-saving measures. Suppliers are expected to be more motivated to achieve high energy efficiency, and energy-saving products will gain wider acceptance globally.

Promotion.

In addition, global demand for dual-cycle power generation systems is rising and is expected to grow rapidly in the future.

Dual-cycle power generation system with a capacity of less than 100kW Performance testing methods

1 Scope

This document specifies the performance testing method for a dual-cycle power generation system, where the heating medium is unpressurized hot water and the maximum temperature is below [temperature missing].

The temperature is 100°C, generated from waste heat from renewable energy sources or industrial applications, and the cooling medium is cold water. Performance testing, standard conditions, and measurement procedures are also specified.

A trial method was used to determine the power output and generation efficiency of the dual-cycle power generation system. This included heating conditions (temperature, flow rate) and cooling conditions (temperature...).

(degree, flow rate).

This document defines standardized test conditions and verifies the power generation efficiency of a dual-cycle power generation system.

This document applies to dual-cycle power generation systems with a generating capacity of less than 100kW.

The testing and rating requirements in this document are based on the use of matched components. This document does not cover dual-cycle generators with a generating capacity exceeding 100kW.

The ring power generation system. The main heating medium here is unpressurized hot water with a temperature below 100°C.

2 Normative references

This document has no normative references.

3 Terms and Definitions

The following terms and definitions apply to this document.

It consists of five main components (evaporator, condenser, working fluid pump, expander, and generator). The system uses a low-boiling-point working medium.

Heated and evaporated by hot water, the expander is driven by the working medium to generate electricity.

Working fluid

The medium used in a thermodynamic cycle absorbs heat from a heat source through a heat transfer medium and generates power through the expansion of the medium.

heat source

Provides heat to drive the system.

Note: This power generation system utilizes waste heat from the factory, hot spring water, geothermal energy, and solar energy as heat sources. It extracts heat from these sources using hot water (the heat transfer medium) and then heats the water through an evaporator.

The working medium generates steam.

cold source

Release the heat that has been carried away from the system by the cooling medium.

Note: In this system, the working medium is cooled by cold water through a heat exchanger (condenser), generating a condensate; the heat absorbed from the system is released into the ground.

In cold sources such as water, river water, and atmosphere.

evaporator

A heat exchanger that uses hot water to heat and evaporate the liquid working medium.