Intelligent Heating and Dehumidification Principle of Distribution Box



Overview

CN215645723U The utility model aims to provide a constant-temperature dehumidification type intelligent distribution box which can control the temperature.

Key Takeaways

Intelligent heating and dehumidification in distribution boxes maintain a dry, safe environment by combining controlled heating, airflow, and moisture removal through sensors and automated systems.

Principle Overview

Intelligent dehumidification systems for distribution boxes are designed to prevent moisture-related issues such as insulation degradation, electrical flashover, corrosion, and mold growth, which can compromise the safety and reliability of electrical equipment. These systems integrate heating elements, fans, dehumidifiers, and sensors to actively control the internal environment of the cabinet.

Key Components and Operation

Sensors and Control UnitsHumidity and temperature sensors continuously monitor the internal conditions of the distribution box. The control box processes sensor data and triggers heating or dehumidification actions when thresholds are exceeded.



© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

Heating Mechanism

Enclosure heaters raise the internal temperature, reducing relative humidity and preventing condensation. The heater can operate automatically, starting when humidity exceeds a set value and stopping once the desired dryness is achieved.

Airflow and Fan Systems

Fans circulate air within the cabinet, ensuring uniform temperature and moisture distribution. In some designs, air passes through filters and cooling or condensing units to remove dust and water vapor before being recirculated.

Dehumidification Devices

Intelligent dehumidifiers use semiconductor or condensation-based technology to extract moisture from the air. Moist air is drawn into the dehumidifier, condensed into water, and expelled through a drainage system, maintaining a low-humidity environment.

Automated Operation

The system can start and stop automatically based on real-time humidity readings. Some designs maintain a slightly pressurized internal environment, which helps prevent external moisture from entering the cabinet.

Advantages Over Traditional Methods

Traditional heaters alone often fail to remove internal moisture effectively, as condensation can occur at the top of the cabinet, leaving humidity trapped inside. Intelligent systems combine heating, airflow, and active dehumidification, achieving faster and more uniform moisture removal. They extend the service life of electrical components and improve operational safety, especially in high-humidity environments or during summer heat.

Summary

The intelligent heating and dehumidification principle relies on sensor-driven automation, controlled heating, air circulation, and active moisture extraction. By integrating these elements, distribution boxes maintain a dry, stable internal environment, preventing insulation failure, corrosion, and other moisture-related hazards, ensuring reliable and safe operation of electrical systems.

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

Article Content

CN215645723U

The utility model aims to provide a constant-temperature dehumidification type intelligent distribution box which can control the temperature and the humidity in the distribution box to...

CN216750698U

The purpose of the present invention is to provide an intelligent dehumidification device for a power distribution box, so as to solve the problem of poor centralized heat dissipation in...

Analysis of Two Dehumidification Solutions for Power Distribution

Using ordinary heaters, the water seeping into the box is gasified, and the hot and humid water vapor rises to the top, resulting in excessive humidity at the top of the box and easy to form condensation.

Two Dehumidification Solutions for Power Distribution

As for dehumidification solutions, you can choose an enclosure heater or electrical cabinet dehumidifier for power distribution. Today, this article

Design and Research on temperature and humidity Controller system

In this paper, the temperature and humidity monitoring system of terminal box is designed, which can not only reduce the quantity of manual monitoring, but also improve the accuracy and real time of

How to prevent condensation in switchgear? Switchgear

To address this industry pain point, the 150W Intelligent Dehumidifier (Aluminum Dehumidifier) was developed to solve the problem of condensation inside electrical cabinets at the

Low-voltage power distribution cabinet with automatic dehumidification ...

Due to factors such as weather and environment, the power distribution cabinet located outdoors often has a lot of water vapor inside, which is easy to form condensation on the electrical equipment,

Intelligent Dehumidifier Temperature and Humidity Condensation ...

The temperature and humidity condensation controller is a device used for preventing low temperature, high temperature and humidity in middle and high voltage switchgear, mechanism box,

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

Industrial temperature and humidity control dehumidifiers: An ...

In distribution rooms, excessive humidity can cause condensation on equipment, short circuits, and even flashover accidents; abnormal temperatures accelerate component aging.

Intelligent power distribution cabinet dehumidification system for ...

The invention discloses an intelligent power distribution cabinet dehumidification system for a power system and a dehumidification method of the intelligent power distribution cabinet dehumidification

Intelligent control and experimental study of a semiconductor cooling ...

Ventilation- and heating-based dehumidification methods are typically climate-dependent and often accompanied by considerable heat loss, while heat-pump and adsorption/absorption

A fundamental study of intelligent building envelope systems capable

The thermodynamic-potential-based fundamental principle of the intelligent skin system, which performs passive dehumidification and solar collection, was explained based on non

CN114784650B

The invention discloses a power distribution box with a dehumidification function, which relates to the technical field of power distribution and comprises a distribution box, a ventilation fan assembly, a

CN212258137U

The utility model relates to a special intelligent distribution box for a constant temperature dehumidification type distribution area, which is provided with a box body; a controller, a ventilator

Smart Function Intelligent Dehumidifier with RS485 Interface for ...

Smart Function Intelligent Dehumidifier with RS485 Interface for Electrical Cabinet Dehumidifying, Find Details and Price about Dehumidification Device and Smart Dehumidification Device from Hangzhou

Sustainable humidity control in the built environment: Recent research ...

In thermoelectric dehumidification, the working principle, applications, operating conditions, and recent development were reviewed. Researchers have focused on improving

Walton WT-H300 Intelligent Moisture-Proof Dehumidifier

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved

The Walton WT-H300 intelligent moisture-proof dehumidifier uses Peltier technology to remove moisture from small distribution boxes, control cabinets & telecom enclosures. Low-power, maintenance-free

CN115714308A

The invention discloses a dehumidification device for a distribution box, which comprises a first dehumidification unit and a second dehumidification unit, wherein a heat dissipation fan in the first

Contact Us

Continue your research online:

Website: https://cgweb.co.za
Technical inquiry: https://cgweb.co.za/project-enquiry.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 CGWEB NETWORK INFRASTRUCTURE - All rights reserved