

High-quality heat dissipation holes in the distribution box



Overview

The utility model provides a power distribution box with heat dissipation holes and high heat dissipation performance, comprising a box body and a box door hinged on the box body,...

Key Takeaways

High-quality heat dissipation holes in distribution boxes are strategically designed, obliquely oriented, and combined with protective cavities to maximize airflow while preventing water and dust ingress. Design and Orientation High-quality heat dissipation holes are typically obliquely arranged on the side panels of the distribution box. This angled design prevents rainwater from flowing back into the box while allowing hot air to escape efficiently.

The holes are often paired with a dustproof and waterproof cavity, which captures any water that enters and channels it safely to a drain outlet, improving both thermal performance and environmental protection.

Size and Arrangement

The diameter and number of holes directly affect heat dissipation efficiency. Larger or more numerous holes increase airflow but may compromise structural integrity or allow dust ingress. A balanced approach ensures sufficient ventilation without weakening the box or reducing safety.

Common arrangements include square, diamond, concentric circle, or matrix layouts, which promote uniform heat diffusion and prevent hotspots.

Thermal Management Principles

Heat dissipation holes work in conjunction with natural convection. By arranging components to create a chimney effect, hot air rises and exits through the holes, reducing internal temperatures by 10-15% without additional energy costs. For more demanding applications, phase change panels or heat sinks can be integrated to absorb and release heat efficiently.

The combination of vertical airflow through holes and horizontal heat spreading across metal panels ensures optimal thermal performance.

Material and Safety Considerations

The distribution box should use thermally stable, flame-retardant materials such as PA66 nylon or metal with high thermal conductivity. High-purity conductive components inside the box, like tin-plated copper blocks, reduce internal heat generation and maintain low resistance, complementing the effect of heat dissipation holes. Proper design ensures that even under rated current, the box remains cool, prolonging the lifespan of insulation and internal components.

Practical Recommendations

Oblique hole orientation to prevent water ingress. Protective cavity for dust and rainwater management. Balanced hole size and density to optimize airflow without compromising structural integrity.

Component layout to enhance natural convection and chimney effects. Integration with heat sinks or phase change materials for high-load scenarios. By combining these design strategies, distribution boxes can achieve efficient heat dissipation, improved safety, and longer operational life.

Article Content

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Techniques and practical methods for arranging heat dissipation holes ...

Heat dissipation holes play a crucial role in high-power devices and high-density layouts. It not only enhances thermal management capabilities, but also affects the overall manufacturing quality and

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Today's focus is primarily on PCB heat dissipation holes, including their design, size, and important considerations to keep in mind. When designing a PCB, in many cases we need to provide

Thermal Management

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For the heat radiation, separate the components from the heat source or provide a heat insulating plate to shield the components from heat. For the thermal conduction, the heat is conducted mainly

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Distribution box cooling method

This method is usually suitable for distribution boxes with larger power or places with higher ambient temperature. Heat sink or heat sink: heat sink or heat sink can be

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What is the heat dissipation performance of the outdoor

The heat dissipation performance of the metal electrical enclosure box is closely related to the materials used. Generally speaking, metal materials

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How to deal with PCB heat dissipation

Arrange components and heat dissipation areas reasonably to avoid heat source concentration to reduce hot spots. Heat dissipation area planning: According to the distribution of

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