

# 三相直流智慧照明系统规格书

## PRODUCT SPECIFICATION

### 用户手册

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## 1. 三相直流智能照明系统的特性

### Characteristics of Three-Phase DC Intelligent Lighting System

- **极限延长灯具使用寿命** Extremely Extends the Lifespan of Lighting Fixtures

（高空部分灯具采用集成封装模式，不含电解电容及其他易损元件，理论寿命超过 15 年，质保期 8-12 年）

(For high-altitude fixtures, an integrated packaging mode is adopted, excluding electrolytic capacitors and other vulnerable components. The theoretical lifespan exceeds 15 years, with a warranty period of 8-12 years.)

- **极限降低线路损耗及线材成本** Extremely Reduces Line Loss and Cable Costs

（采用三相集中控电技术，实现实时三相平衡，提升变压器转换效率，大幅降低线路损耗。输出电压为隔离直流，对地电压为零，无需铺设地线）

(Utilizes three-phase centralized power control technology to achieve real-time three-phase balance, improving transformer conversion efficiency and significantly reducing line loss. The output voltage is isolated DC, with zero voltage to ground, eliminating the need for grounding wires.)

- **极限降低灯具光衰，显著提升照明舒适度。** Extremely Reduces Light Decay and Significantly Enhances Lighting Comfort

采用高密度 COB 封装与光学玻璃透镜相结合的设计，不仅能够适应各种恶劣照明环境的需求，还能有效抑制灯具光衰。同时，单光源 COB 技术的应用减少了重影现象，显著提升了视觉体验和环境舒适度

(Combines high-density COB packaging with optical glass lenses, enabling adaptation to various harsh lighting environments while effectively suppressing light decay. The application of single-source COB technology reduces ghosting, significantly improving visual experience and environmental comfort.)

- **全面提升用电安全性能** Comprehensively Enhances Electrical Safety Performance

（1. THD 电流失真率<5%，有效保护同一电网中的其他电气设备，显著降低通信产品信号干扰，同时延长其他电器使用寿命。隔离直流设计提升生产安全，降低高空作业风险）

(1. THD (Total Harmonic Distortion) <5%, effectively protecting other electrical equipment on the same grid, significantly reducing signal interference in communication products, and extending the lifespan of other appliances. Isolated DC design enhances production safety and reduces risks in high-altitude operations.)

- **全面降低用户运营成本** **Comprehensively Reduces User Operating Costs**

（降低线路功耗，延长灯具寿命，减少更换成本。节省线材更换费用，延长其他设备使用寿命，降低更换成本）

(Reduces line power consumption, extends fixture lifespan, and lowers replacement costs.

Saves on cable replacement expenses, extends the lifespan of other equipment, and reduces replacement costs.)

### 3 、三相直流系统功能介绍 **Three-Phase DC System Function Introduction**

- **物联网远程设备控制与监控及可视化操作**

**IoT Remote Device Control, Monitoring, and Visualized Operation**

本系统支持基于物联网技术的远程设备控制、实时监控及可视化操作，帮助用户实现智能化管理，提升操作便捷性与管理效率。

The system supports IoT-based remote device control, real-time monitoring, and visualized operations, enabling intelligent management for users. This enhances operational convenience and management efficiency.

- **三相实时平衡技术** **Three-Phase Real-Time Balancing Technology**

系统支持三相输入功率动态平衡，输入功率范围覆盖 10%-100% (L1、L2、L3)，确保电力分配均匀，提升系统稳定性与能源利用率。N 项电流为零。

The system supports dynamic balancing of three-phase input power, with an input power range of 10%-100% (L1, L2, L3), ensuring uniform power distribution and improving system stability and energy utilization. The N-phase current is zero.

- **精准碳排放监控，数据计算贴近真实值**

**Accurate Carbon Emission Monitoring with Data Calculation Close to Real Values**

系统具备碳排放监控功能，采用接近真实数据的计算方式，确保监测结果的准确性。作为一款经济型解决方案，能够满足绝大多数用户需求，是节能环保的最佳选择。碳排放量计算公式碳排放量 (KG) = [工作回路定义功率总和 (KWH) - 网 1-N 实际功率总和 (KWH)] / 0.87 × 0.6205 通过该公式，可准确计算节约的碳排放量，助力绿色环保。

Carbon Emission (KG) = [Total Defined Power of Working Circuits (KWH) - Total Actual Power of Grid 1-N (KWH)] / 0.87 × 0.6205

This formula accurately calculates the saved carbon emissions, contributing to green environmental protection.

### ● 大功率 LED 照明领域的标杆系统，性能难以超越

A Benchmark System in High-Power LED Lighting, with Unmatched Performance

本系统代表了大功率 LED 照明技术的巅峰水平，其卓越的性能与高效的能源利用率将使其成为未来行业标杆。

This system represents the pinnacle of high-power LED lighting technology. Its exceptional performance and high energy efficiency make it a future industry benchmark.

### ● 有效照度下实现灯具超长寿命 Achieving Ultra-Long Fixture Lifespan Under Effective Illumination

系统在确保有效照度的同时，显著延长灯具使用寿命，减少维护频率与成本，为用户提供持久稳定的照明体验。

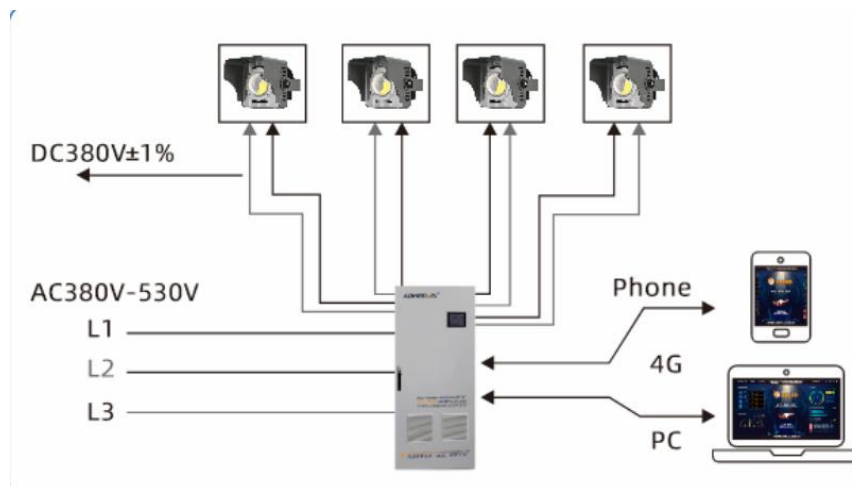
While ensuring effective illumination, the system significantly extends the lifespan of lighting fixtures, reducing maintenance frequency and costs, and providing users with a durable and stable lighting experience.

### ● 数字化工厂管理的理想之选 The Ideal Choice for Digital Factory Management

作为数字化工厂管理的首选解决方案，本系统可无缝集成于智能制造环境，助力提升生产效率与管理水平，推动工厂数字化转型。

As the preferred solution for digital factory management, this system can seamlessly integrate into smart manufacturing environments, enhancing production efficiency and management levels, and driving the digital transformation of factories.

## 4、三相直流系统示意图(英文) Three-Phase DC System Schematic Diagram (in English)



## 5. 智能配电柜产品介绍。

### Introduction to Intelligent Power Distribution Cabinet

#### (1) 主要特点: Key Features:

- **高效率 High Efficiency**

减少能耗损耗，符合节能减排要求，为客户节省电费。

Reduces energy consumption losses, complies with energy-saving and emission reduction requirements, and helps customers save on electricity costs.

- **高功率密度 High Power Density**

可节省客户空间，降低系统成本。

Saves customer space and lowers system costs.

- **DSP 数字控制 DSP Digital Control**

更少的器件，更高的环境稳定性，更高的可靠性，更便捷的扩容。

Fewer components, higher environmental stability, greater reliability, and more convenient capacity expansion.

- **低输入谐波 Low Input Harmonic**

减少对电网的污染，更高的电网适应能力。

Reduces grid pollution and enhances grid adaptability.

- **宽输入电压范围，宽输出电压范围 Wide Input Voltage Range and Wide Output Voltage Range**

适合绝大多数不同输入、输出电压场合。

Suitable for the vast majority of input and output voltage scenarios.

- **宽工作温度范围 Wide Operating Temperature Range**

宽工作温度范围满足大多数严酷的工作环境

Meets the demands of most harsh working environments.

- **完善的故障自检测提示 Comprehensive Fault Self-Detection and Alerts**

丰富的故障检测，方便客户维护

Rich fault detection capabilities, making maintenance easier for customers.

## (2) 智能配电柜产品参数指标

## Intelligent Power Distribution Cabinet Product Parameter Specifications

Model	TNZN4W-ZK2.2P
Load Power	20000W / 30000W / 40000W
Cabinet Dimensions (LWH*Thickness)	Door: 6005001200mm
Cabinet Material	Galvanized sheet with spray coating (standard electrical cabinet process)
Input Voltage	Three-phase AC 330V~530V
Output Voltage Range	DC 380V $\pm$ 1%
Frequency	45~65Hz
Power Factor (PF)	0.99
Operating Temperature	-40~+50℃
Efficiency	95%
Current Distortion (THD)	THD <5%
Alarm Functions	Input undervoltage / Input overvoltage / Output overvoltage / Output undervoltage / Module fault / Fan fault
Operating Temperature	-40~+50℃
Surge Protection Level	40KV