

10kV Reactive Power Compensation Cabinet

A Comprehensive Introduction



High Efficiency



Safety & Reliability



Smart Control

Product Overview



Definition

A 10kV reactive power compensation cabinet is a complete set of equipment used in medium-voltage power systems to compensate for reactive power generated by inductive loads.

Core Objective

Improve power factor, reduce line losses, stabilize grid voltage, and enhance power quality.

Application Value

It is a key device for energy saving, consumption reduction, and safe and stable operation of the power system.

Technical Parameters

Parameter Name	Unit	Typical Value Range
Rated Voltage	kV	10 (Phase Voltage: 5.77kV)
Rated Frequency	Hz	50
Rated Total Capacity	kvar	200-1600 (Single Bank: 50-200kvar, combinable)
Number of Phases	-	3
Connection Method	-	Star (Ungrounded Neutral)
Switching Method	-	Vacuum Contactor Switching
Switching Response Time	ms	≤500 (Vacuum Contactor)
Protection Degree	-	IP3X
Insulation Level	kV	Lightning Impulse: 75; Power Frequency Withstand: 42 (1min)
Control Accuracy	-	Power Factor: ±0.02 (Setting Range: 0.90-1.0)
Cooling Method	-	Natural Cooling + Forced Air Cooling (Temperature Interlocked)

Core Functions



Reactive Power Compensation

Automatically switch capacitor banks to offset inductive reactive power, raising the power factor above 0.95.



Harmonic Suppression

Effectively suppress 5th, 7th and other high-order harmonics through series reactors to prevent amplification.



Voltage Stabilization

Regulate reactive power output to smooth grid voltage fluctuations and maintain stable bus voltage.



Energy Saving & Reduction

Reduce line current and losses, improving the utilization rate of power generation and supply equipment.



Comprehensive Protection

Equipped with multiple protection functions such as overvoltage, undervoltage, overcurrent, short circuit, and harmonic overlimit.



无功补偿



谐波抑制



电压稳定



节能降耗



节能降耗



完善保护

Structure Analysis



Vacuum Circuit Breaker

Main switching device for circuit control.



Isolation Switch

Provides a visible break point for maintenance safety.



Fuse

Protects capacitors from short-circuit faults.



Series Reactor

Limits inrush current and suppresses harmonics.



Power Capacitor

Core component for reactive power compensation.



Surge Arrester

Limits overvoltage to protect equipment insulation.



Intelligent Controller

Automatically controls capacitor switching based on PF.



CT/PT

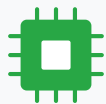
Collects current/voltage signals for measurement and protection.

Working Principle



Signal Acquisition

CT/PT collect real-time voltage and current signals from the grid.



PF Calculation

The intelligent controller processes signals and calculates real-time power factor.



Switching Decision

The controller compares calculated PF with preset target (e.g., 0.95).



Command Execution

Sends commands to switch on appropriate capacitor banks via vacuum contactors.



State Feedback

Continuously monitors PF and repeats the process to maintain desired range.

Technical Advantages



High Reliability

Utilizes high-quality components and a proven design architecture for stable and long-term operation.



Fast Response

The microprocessor-based intelligent controller ensures rapid and accurate switching of capacitor banks.



Low Loss

Incorporates low-loss capacitors and reactors to minimize internal energy consumption and heat generation.



Easy Operation

Features a user-friendly HMI for both local and remote control and monitoring.



Long Service Life

Robust mechanical construction and comprehensive protective measures ensure a long operational lifespan.



Application Scenarios



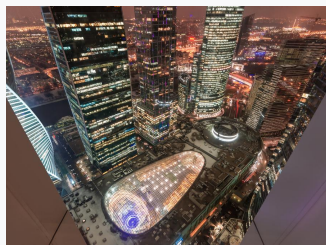
Industrial & Mining

Steel mills, mines, chemical plants, and other heavy industrial sites with large inductive loads.



Power Distribution Networks

Urban and rural substations, industrial parks, and large-scale residential communities.



Commercial Buildings

Shopping malls, high-rise offices, hotels, and data centers with significant AC and lighting loads.



Infrastructure

Airports, railway stations, hospitals, and other critical public facilities requiring high power quality.

Installation & Maintenance



Installation Requirements

- ✓ Should be installed by qualified professional electricians.
- ✓ Ensure correct wiring according to the schematic diagram and reliable grounding.
- ✓ Follow the detailed steps in the manufacturer's installation manual.



Maintenance Procedures

- ✓ Regular visual inspections of capacitors, reactors, and contactors for damage.
- ✓ Keep the cabinet clean and well-ventilated to prevent dust and overheating.
- ✓ Periodically check and tighten all electrical connections to prevent loose contacts.
- ✓ Monitor the controller's display for any fault alarms and address them promptly.

THANK YOU

For more information, please contact us.



www.chnjn-electric.com



+86 18107120816



export@chnjn.com