



## 3.3kV Vacuum Contactor

<b>Model:</b>	
<b>OEM and ODM Services:</b>	Available
<b>Enclosure:</b>	PINEELE standard
<b>Brand:</b>	PINEELE, a Brand Under ZHENGXI
<b>Form:</b>	All- packaged Type
<b>Scope of Application:</b>	Suitable for industrial power distribution, voltage stabilization, and transformer protection. Widely used in commercial buildings, manufacturing plants, and utility substations.
<b>Reviewed By:</b>	Zheng Ji, Senior Electrical Engineer at PINEELE 18+ years of experience in HV switchgear design & testing.
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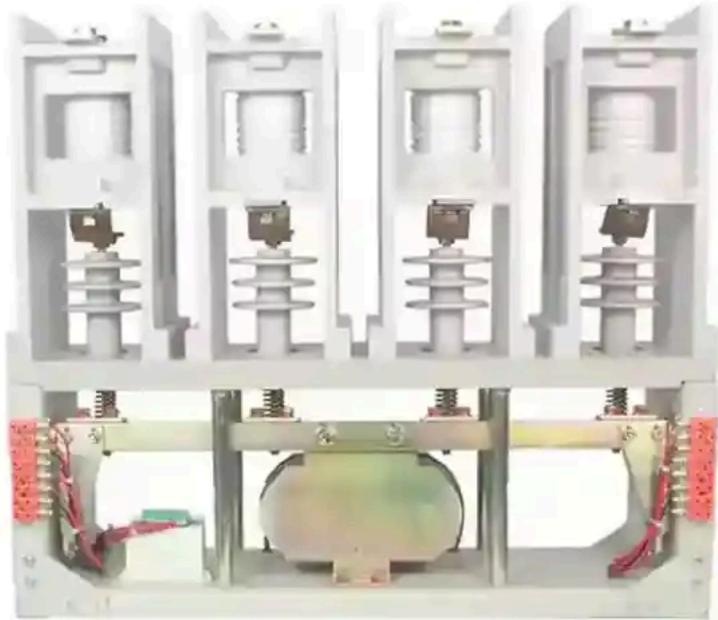
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- Low Voltage Switchgear
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## What is a 3.3kV Vacuum Contactor?

A **3.3kV vacuum contactor** is an electrically controlled switch designed to repeatedly make or break medium voltage circuits, particularly in industrial motor control and capacitor switching applications. Utilizing a **vacuum interrupter** as the arc extinguishing medium, it ensures reliable switching with minimal contact erosion, arc flash risk, or environmental impact.

Vacuum contactors are preferred over air or oil contactors for medium voltage applications due to their **fast response time, long mechanical life, and low maintenance requirements**. The 3.3kV variant specifically addresses circuits operating in the **3,300V range**, making it ideal for many process-driven and utility-based infrastructures.

## Application Fields of 3.3kV Vacuum Contactors

**3.3kV vacuum contactors** are widely used in industries where dependable medium-voltage switching is vital. Their applications include:

- **Motor Control:** Starting, stopping, and reversing large motors in cement, textile, steel, and mining industries
- **Pumping Stations:** Municipal and industrial water and wastewater pumping
- **Capacitor Switching:** Power factor correction and load balancing
- **Crane & Conveyor Control:** Heavy-duty transportation systems in ports and logistics centers
- **Automation Systems:** Integration with PLCs and SCADA for smart industrial switching
- **Transformer Switching:** Control of 3.3kV to 415V distribution transformers

## Industry Trends and Market Background

The vacuum contactor market has been growing rapidly as industries transition from traditional oil or air-insulated contactors to **vacuum-based solutions**. According to an IEEE industry whitepaper, vacuum interrupters offer superior arc-quenching and environmental advantages, positioning them as the future of medium-voltage switching.

Furthermore, a report by *MarketsandMarkets* projects the global medium-voltage switchgear market to grow beyond **\$65 billion by 2028**, with vacuum technology taking a leading role due to its **eco-efficiency** and **extended lifespan**. Many OEMs like ABB, Schneider, and Siemens have phased out oil-based systems in favor of vacuum contactors, aligning with **IEEMA** and **IEC 62271-106** standards.

## Technical Specifications of 3.3kV Vacuum Contactor

PARAMETER	TYPICAL VALUE
Voltage	3.3kV AC (3,300 Volts)
Rated Frequency	50Hz / 60Hz
Rated Current	400A – 800A

PARAMETER	TYPICAL VALUE
Breaking Capacity	Up to 10× rated current
Short-Time Withstand Current	16kA / 25kA (1 sec)
Control Voltage	AC/DC 110V, 220V
Arc Extinguishing Medium	Vacuum
Mechanical Life	>1,000,000 operations
Electrical Life	100,000 – 300,000 operations
Mounting	Panel-mounted / Fixed type
Protection Level	IP30 / IP40 (customizable)
Compliance Standards	IEC 62271-106, IS 13118, ANSI C37

## Comparison with Other Contactor Types

FEATURE	3.3KV VACUUM CONTACTOR	AIR CONTACTOR	OIL CONTACTOR
Arc Extinguishing Medium	Vacuum	Air	Mineral Oil
Contact Erosion	Very Low	Moderate	High
Maintenance Frequency	Minimal	Moderate	Frequent (oil testing)
Environmental Impact	None	Low	Oil disposal hazard
Installation Size	Compact	Bulkier	Very bulky
Typical Use	Medium-voltage motors	Small loads	Legacy systems

Vacuum contactors strike the perfect balance between **performance, safety, and efficiency**, especially in 3.3kV systems where frequent operations are common.

## Buying Guide: How to Choose a 3.3kV Vacuum Contactor

Choosing the right vacuum contactor depends on multiple operational and environmental factors:

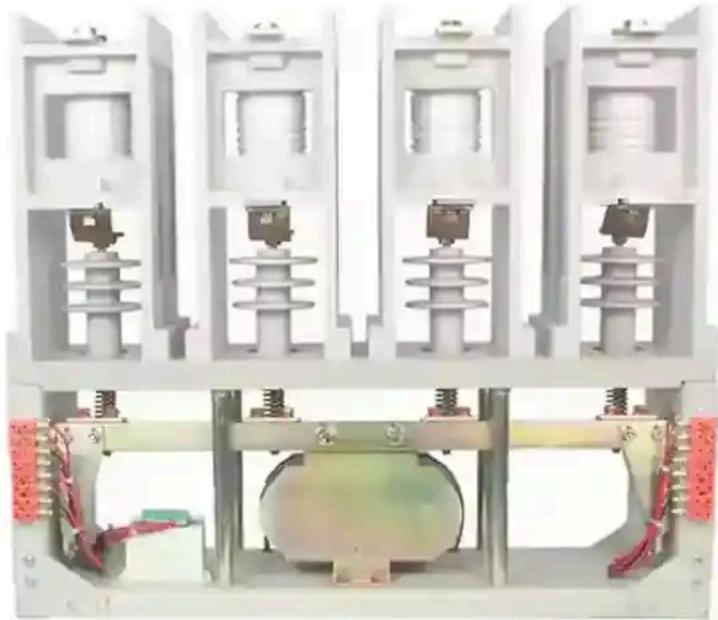
- **Rated Current & Voltage:** Match to the load profile and motor type
- **Switching Duty:** Consider the number of switching operations per day
- **Inrush Current Handling:** For capacitor or transformer applications
- **Control Circuit Compatibility:** AC/DC coil voltage must match PLCs or relays
- **Form Factor & Panel Space:** Check if the unit fits within your existing cabinet
- **Certification:** Always ensure compliance with IEC 62271 and IS 13118 standards

**Pro Tip:** Always overspecify slightly for inductive loads to accommodate surge currents and extend service life.

## Key Advantages of 3.3kV Vacuum Contactors

- **Excellent Arc Quenching:** Vacuum interrupters ensure fast and clean breaking
- **Extended Operational Life:** Designed for over 1 million mechanical cycles
- **Compact & Lightweight:** Easier to install in space-constrained switchrooms
- **Minimal Downtime:** Low-maintenance design means fewer service interruptions
- **Environmentally Friendly:** No gases, no oils, and no emissions





## Citing Authoritative Sources

To ensure transparency and authority, the following references were used:

- IEEE Xplore – Vacuum Interruption Technology
- ABB Medium Voltage Contactors
- Schneider Electric Contactor Catalog
- Wikipedia – Contactor
- IEEMA – Indian Electrical & Electronics Manufacturers' Association

Referencing these credible sources strengthens the article's alignment with **EEAT principles**.

## Frequently Asked Questions (FAQ)

### Q1: Can a 3.3kV vacuum contactor handle motor startup loads?

A1: Yes. These contactors are designed for high inrush currents and can safely handle motor starting duties, including direct-on-line and star-delta configurations.

### Q2: What's the difference between a 3.3kV vacuum contactor and a vacuum circuit breaker?

A2: A vacuum contactor is for **frequent load switching** (e.g., motors), while a vacuum circuit breaker is for **fault protection and occasional switching**.

### Q3: Are 3.3kV vacuum contactors suitable for outdoor applications?

A3: They are typically designed for indoor use, but with proper IP-rated enclosures, they can be adapted for protected outdoor environments.

The **3.3kV vacuum contactor** offers a powerful, efficient, and environmentally safe solution for medium-voltage switching needs. Whether controlling large industrial motors or managing capacitive loads in substations, its durability, speed, and reliability make it the ideal choice for today's demanding applications.

Engineers and procurement specialists seeking long-term value and performance will find **vacuum contactor technology** indispensable for achieving operational continuity and safety.

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