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A CHNT COMPANY



# NGC5 Low voltage switchgear

# CHINT GLOBAL



CHINT was established in 1984. Over the years, thanks to our rapid development, CHINT has become the world's leading provider of intelligent energy solution for the entire industrial chain, offering the most comprehensive range of products, from Plant to Plug. In 2023, our annual sales revenue exceeded 22.1 billion dollars, with total assets surpassing 25 billion dollars.

Over three decades of global expansion, our business network has grown to cover more than 140 countries and regions worldwide. We operate in various areas including low-voltage, power transmission and distribution, water, gas and electricity metering, and green energy sectors such as solar. CHINT employs more than 50,000 people worldwide, creating over 500,000 jobs in the supply chains.

Through the integration of businesses and continuous upgrading, CHINT Global has further established its supply chain. This market localization has also enabled us to adopt flexible business models such as smart operation and maintenance, financing, and other integrated technical services for the global market.



USD 22.1 Billion

Annual Sales Revenue of CHINT Group



USD 25 Billion

Annual Total Assets of CHINT Group



**Business Covering** 

140+

Countries and Regions



3%-12%

Annual R&D Investment
Obtained from the Percentage
of Sales



40 +

Global Subsidiaries



**24**%

YoY Revenue Growth in 2023, CHINT Global



**50,000**+

Employees Worldwide



10,000+

Accumulated Authorized



66%+

Localization Rate of CHINT Global Employees















































# ABOUT CHINT LOW VOLTAGE

Zhejiang CHINT Electrics Co., Ltd. is a wholly owned subsidiary of CHINT Group. Cultivating R&D, manufacturing and sales of low-voltage products, we provide system solutions for building, power supply, hoisting, HVAC, telecommunication and other industrial customers. For nearly 40 years since its founding, CHINT Electrics has provided reliable products and services to over 140 countries and regions. Today, CHINT has grown to be one of the world's renowned low-voltage brands.

### **CHINT Honors**

### 2022

- "AAAAA" standardized good behavior certificate
- "Global Partnership" and "Countries along the Belt and Road" in the "2021 Best
- Practices for Realizing the Sustainable Development Goals".
   CSR Impact Leading Enterprise

#### 2021

- No. 1 in " China's Top 100 Private Enterprises with Social Responsibility" in 2021
- For 8 consecutive years, CHINT has won the sales champion of Tmall double
   11 in electrical and hardware industry
- No. 92 in "2021 China's Top 500 Private Enterprises".
- No. 244 in "2021 Top 500 Chinese Enterprises"
- The intelligent manufacturing factory of low-voltage electrical appliances was selected as the national "2021 Intelligent Manufacturing Demonstration Factory".

#### 2020

- CHINT was selected in the 2020 Zhejiang Province "Future Factory" recognized list, and was rated as the leading "Leading Goose Factory".
- The key inverter technology of CHINT won the second prize of China Electric Power Science and Technology.
- CHINT Astrometry was selected as the smart PV demonstration enterprise list of the Ministry of Industry and Information Technology and won the honor of "Influential PV cell/module brand", "Influential PV EPC / End User", "Influential PV power station operation and maintenance brand".

#### 2019

- National Green Factory
- National Industrial Design Center of the MIT
- Global Top 20 PV Enterprise
- China's Top 10 Successful PV Enterprise
- Top 100 Innovative Enterprises in Zhejiang Province
- Technology innovation system was awarded the 2018 Science and Technology Progress Award in Zhejiang

### **Qualification Certification**

The products have been accredited through China Compulsory Certification (CCC) as well as UL of US, CE of EU, VDE and TÜV of Germany, KEMA of Netherlands, RCM of Australia, RCC of South Africa and other international product certifications.













RCC









### Rooted Locally, Serving the Globe



**Sunlight** Singapore & Malaysia Main Products: Low-voltage Switchgears



Uganda

Metering Factory
Main Products: Meters



**Solar Factory**Main Products: PV Module, PV Cell



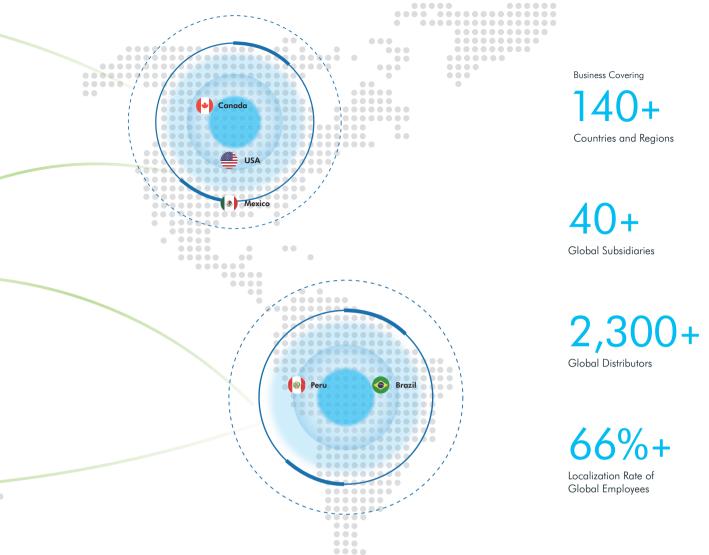
Sunlight Vietr Main Products: MSB, MCC, SDB, DB, CU, Fire Pump Panel, Weatherproof Panel, String Combine Box, Solar Switchboard



SchneiTec CHINT Cambo
Main Products: MV Equipment including
22kV Distribution Transformer, Switchgear,
Smart RMU, Capacitor Bank



CHINT – EGEMAC Egypt
Main Products: Full Series of Low-voltage
Switchgears



After more than 30 years of overseas expansion, CHINT Global has subsidiaries and offices in Europe, North America, Asia-Pacific, West Asia & Africa and Latin America. Its business footprint covers more than 140 countries and regions worldwide, continuously providing the world with more efficient smart electricity and clean energy.



Haining Solar China
Intelligent Factory
Main Products: PV Module, PV Cell



Wenzhou Low-voltage China Intelligent Factory

Main Products: Low-voltage Components



Jiaxing Factory
Main Products: MV and LV Switchgear,
C-GIS, MV Circuit Breaker, Prefabricated
Substation



CHINT ATC
Saudi Arabia
Main Products: RMU and Intelligent Power
T&D Products of 33kV and below



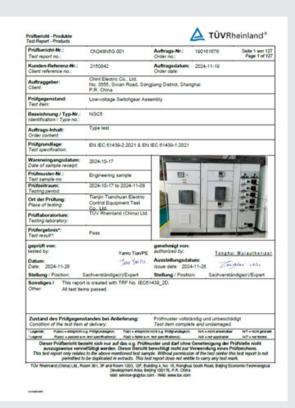
Power T&D China Shanghai Factory Main Products: Power Transformer, GIS, MV and LV Switchgear, HGIS, HV Circuit Breaker, Disconnector



CHINT-AJLAN & Bros Saudi Arabia
Main Products: Low-voltage Components

### **Product certification and test report**







### TEST REPORT

Low-voltage Switchgear Assemblies
NGC5
Zhejiang CHINT Electric Technology Co., Ltd
Commission test









中国认可 国际亚认 检测 TESTING CNAS L1855

Report No.: 2024XHRT04016-E

### 检测报告 TEST REPORT

产品名称: Name of products:	Low-voltage Switchgear Assemblies
型号規格: Type/Model:	NGC5
委托人: Applicant	Zhejiang CHINT Electric Technology Co., Ltd.
检测类别: Kind of test:	Commission test



## **CONTENTS**

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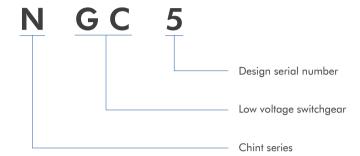
### **Product general description**

The NGC5 series is centered around the design of standardized and modular functional units and integrates networked and intelligent communication monitoring functions, thus customizing suitable power distribution solutions for customers and ensuring the reliable supply of electricity. As a newly developed standardized low-voltage switchgear by CHINT, it absorbs the technical essences of well-known domestic and foreign brands and possess the characteristics of 'safety, reliability, and environmental friendliness'. It complies with the standards of IEC61439-2: 2020, with a maximum protection degree of IP43, comprehensively meeting the diverse power requirements such as power distribution, and motor control in segments such as building, industry, and data center, and vigorously promoting the efficient and stable operation of power systems.



## 2.0

### Model number and meaning



# 3.0

### **Product positioning**

NGC5 is a Modularized, Standardized and Intellectualized product.

## 4.0

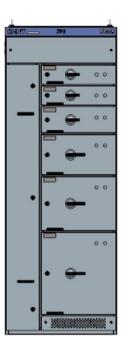
### Main panel schemes

NO.	Panel Scheme	Panel Width/(mm)
1	Incoming Panel	600/800/1000/1200
2	Fixed Separation Panel	600/800/1000
3	Drawer Panel	600/800/1000
4	Capacitor Panel	600/800/1000/1200
5	Bus Tie Panel	600/800/1000/1200
6	VFD Panel	600/800/1000
7	MCC Panel	600/800/1000

### **Product general description**

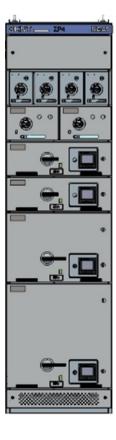
Item	Parameters
Standard	IEC61439-2: 2020
Incoming and outgoing methods	Top / Bottom / Side
Maintenance mode	Rear / Front
Rated ingress protection	IP30~IP43
Internal separation form	1/2a/2b/3a/3b/4a/4b
Width (mm)	600/800/1000/1200
Depth (mm)	600/800/1000
Height (mm)	2200/2400
Surface treatment	Epoxy resin powder spraying>50 $\mu$ m
Rated insulation voltage (Ui)	1000V
Rated operating voltage (Ue)	400V/690V
Rated frequency	50/60Hz
Rated impulse withstand voltage (Uimp)	Up to 12kV
Pollution level	3
Main busbar rated current	Up to 6300A
Distribution busbar rated current	Up to 3200A (Fixed panel) Up to 1800A (Drawer panel)
Main busbar rated short-time withstand current lcw	Up to 100kA/1s
Main busbar rated peak withstand current lpk	Up to 220kA
Distribution busbar rated short-time withstand current lcw	Up to 85kA/1s
Distribution busbar rated peak withstand current lpk	Up to 187kA
Drawer maximum current	630A
Internal fault arc resistance capability	100kA/1s

### **Scheme introduction**



### Fixed separation panel scheme

- The maximum current of the distribution busbar can be up to 3200A.
- It has strict internal separation, which is safer for the person.
- The main busbar is uniformly arranged on the top of the switchgear, with a higher degree of standardization.
- The distribution busbar can be arranged in front of the panel and behind the panel, which is simple and convenient for installation and maintenance.



### Drawer panel scheme

- It can achieve the compactness, diversity, and flexibility of panel solutions.
- The minimum can be 8E/4 drawers, a single drawer can be installed with a maximum of 36 units, the maximum distribution busbar current can be up to 1800A.
- The configuration is flexible, can achieve front and rear maintain, and can realize the mixed structure of drawers and fixed separation units.



### Fixed panel scheme

- Mainly used as incoming panel, outgoing panel, tie panel.
- The maximum main busbar current can be up to 6300A, and the rated short-time withstand current can be up to 100kA/1s.
- The entry mothed can be top/bottom.



### SVC panel scheme

- It can realize intelligent harmonic removal, dynamic reactive power compensation, and balanced three-phase load functions.
- Modular design for easy commissioning and maintenance.
- Easy to use, easy to operate and maintain.
- Has a good cooling channel device.

### Drawer unit series



NO.	Drawer specification	Drawer height(mm)	
1	8E/4	200	
2	8E/2	200	
3	6E	150	
4	8E	200	
5	16E	400	
6	24E	600	

### Busbar system



≤4000A (Rectangular)



≤6300A (Rectangular)



### Busbar system

The busbar system is made of high conductivity T2 copper, the relative conductivity reaches 99.90%, which can improve the strength of the busbar and install quickly.

### Main busbar

The maximum current can be up to 6300A, the main bus and the branch busbar adopt non-hole connection technology, which can realize single panel prefabrication.

### Distribution busbar system

The distribution busbar is made of 6mm thickness rectangular copper bars, and a dedicated busbar clamp is used to fix the copper bars. The modular installation allows the maximum current to reach 3200A.

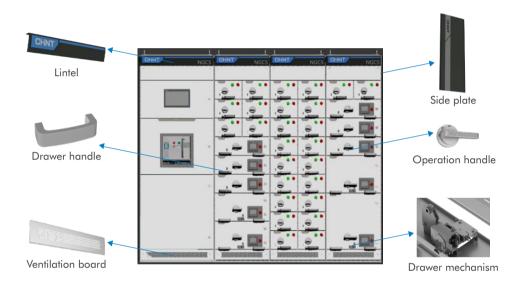
### Protective conductor

All the protective conductors are connected to the panel, and the vertical conductors are used for the connection of power cables, protective conductors, and ground wires. The cross-section of the protective conductors can be made of standard copper busbars of corresponding specifications according to the actual current size.

### **Product feature introduction**

### Product advantages:

- Patented technology, with patented curved operating handle.
- Interlocking operation mechanism with circuit breaker tripping and handle self-reset function avoid risks during operation.
- Friendly operation interface matching dark gray theme color.



### Product details 1: Flexible main busbar system

- Convenient and rational: The main busbar is placed at the top of the panel, consisting of one or more copper bars. This not only minimizes the temperature rise effect of the copper bars on the functional units but also provides a safe and convenient operating space for panel connection. The main busbar is placed in front of the panel top when it is installed against the wall.
- Variety of specifications: The main busbar system current levels range from 630A to 6300A, composed of single or multiple copper bars with different cross-sectional sizes, suitable for distribution systems of various power grid systems.
- Safe and reliable: The main busbar system is completely enclosed within an isolated busbar compartment, fully independent from other functional units. The rated short-time withstand current can be up to 100kA/1s, with a rated peak withstand current value of 220kA, ensuring the dynamic and thermal stability of the busbar system under short circuit fault conditions.
- Low resistance and low consumption: All copper bars inside the panel are made of high-quality
  electrolytic copper with a purity of up to 99.90%; the connection between copper bars is secured by
  high-strength bolts, effectively reducing contact impedance and minimizing losses.



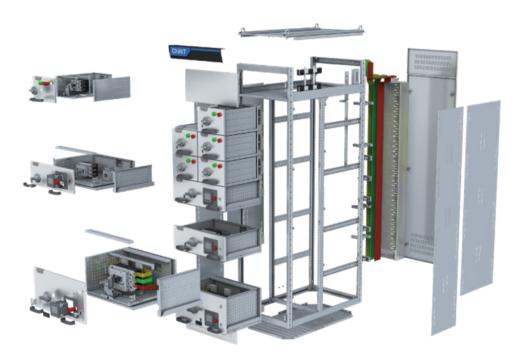
### Product details 2: High-strength frames and enclosures

- The frame is made of reinforced section bar formed with ribs and bent, consisting of preset modular holes, which facilitates expansion and panel assembly. The standard module is 1E=25mm, and various standard sizes can meet the needs of different solutions.
- The frame adopts an antimagnetic structure, and the magnetic breaking parts are made of stainless steel material, effectively preventing the generation of eddy current effects.
- The frame, partition, and mounting plates are made of high-quality aluminum zinc plate to prevent corrosion.
- The shell uses epoxy resin powder electrostatic spraying for surface treatment. Before spraying, it undergoes degreasing and phosphating processes to enhance the adhesion of the coating material and provide strong corrosion resistance, ensuring high durability.



### Product details 3: Unit drawer

- The side plate adopts double folding process to eliminate burrs and avoid scratching the human body.
- Drawer side plate, bottom plate, mechanism plate and other parts stamping molding, high precision, achieving high replaceability.
- Aluminum alloy drawer beam to avoid scratching the secondary wiring in the instrument plate.
- The high-current drawer adopts a metal rocking mechanism, which is easy to operate and saves labor to meet the application requirements of products in harsh distribution room environments such as low temperature and high altitude.
- The smartly designed U-shaped guide achieves accurate and smooth advancement of drawer entry and isolated.



### Product details 4: Distribution busbar channel system

- Modular ventilation cover plate, smooth ventilation, fast manufacturing.
- The ventilation cover plate is once-stamped , with high precision and no burrs.
- The primary and secondary outgoing circuit is separated from each other, achieving safe uses.
- The vertical channel is made of iron plate, with high structural strength to prevent safety hazards.



Product details 5: A full range of standardized panels

- A full range of standardized low-voltage panel solutions to meet customers' various application needs.
- A maximum of three air circuit breakers can be installed in the outgoing panel.
- The highest protection level of the fixed panel can be up to IP43.
- The frame of the high current panel is specially strengthened, and the clamp bracket is made of anti magnetic conductive material to inhibit the generation of eddy current.
- It can realize the mixed installation of fixed separation units and drawer units.



### Intelligent power distribution solutions

### Intelligent system integration

- Intelligent circuit breaker direct connection: remote communication, remote metering, remote control, remote adjustment.
- Intelligent incoming plug-in wiring: installed in the drawer, built-in primary and secondary fusion transformer and line connector temperature sensor.
- Comprehensive monitoring device: supports voltage, current, active power, reactive power, apparent power, frequency, active power, reactive power and other electrical measurements; can be connected to 3-way wired temperature measurement.
- Wireless temperature sensor: measuring the temperature of the busbar or terminal.
- Intelligent communication components: can collect power distribution equipment data through RS485, communicate with the fusion end point through HPLC/RF (external RF antenna), and provide all-round electrical parameter monitoring, energy efficiency monitoring, and power quality detection; integrate electrical parameter measurement and circuit breaker status monitoring functions in level 2 and 3 power distribution panels, and can expand access to environmental monitoring (temperature and humidity, smoke, water immersion, etc.); with residual current, power distribution panel door monitoring, ground wire disconnection monitoring, support replacement, for 4G modules.

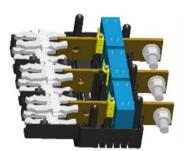


### Intelligent Components

### Fully intelligent connector

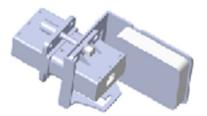
- Designed for the monitoring and measurement needs of power systems, telecom industries, building, etc., it integrates connectors, power measurement, temperature monitoring, telecom, and event alarms.
- Secondary fusion technology with high measurement accuracy.
- Comprehensive temperature monitoring, temperature measurement close to the touchpoint.
- Monitoring and prediction, operation monitoring and prediction of incoming and outgoing connectors
  and molded case circuit breakers, from responsive operation and maintenance to preventive
  operation and maintenance + predictable operation and maintenance.





### High-speed independent communication port

- Configurable communication exclusive connector with shielding function.
- Unlike traditional communication connections, dedicated connectors for communication can effectively
  reduce the impact of external electromagnetic wave interference on communication cables at the
  interface, providing reliable communication connections with high speed and low latency to meet the
  needs of intelligent power distribution components for uploading and downloading information.



### Intelligent power distribution terminal

- Integrate the different protocols of Chint's intelligent power distribution MCCB, ACB, digital display meter, RCD, temperature controller, intelligent connector and other equipment into the standard MQTT protocol.
- Support 7-way RS485 reading at the same time, improving the communication response speed.
- Equipped with the function of edge computing gateway, it can automatically identify the faults, events, and operating data of the connected equipment, and quickly report important data.
- Integrated environmental monitoring sensor access such as temperature and humidity, smoke, water immersion, pyroelectric infrared, etc., supports access to wireless temperature sensors.
- Support WeChat Mini Program configuration for quick installation and configuration.
- Suitable for solving communication problems in level 1 distribution (substation level).
- Support the configuration and query of cloud and mobile terminals of Taiwuyou operation and maintenance platform, reduce operation and maintenance costs and improve operation and maintenance efficiency.

### **Function satisfaction**

It can achieve protection for multi-scenario applications such as IP30 $\sim$  IP43

IEC 60529 standard defines the IP code, which is expressed numerically and provided by the enclosure degree of protection.

- 1st number: Protection against the penetration of solid objects
- 2nd number: Protection against liquids

### 1st number:

### Protection against the penetration of solid objects

### 2nd number:

Protection against liquids

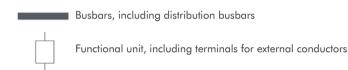
0	-	No protection	0		No protection
1	φ50mm	Protected against solid objects larger than 50 mm	1	8	Protected against vertically falling drops of water (condensation)
2	φ12mm	Protected against solid objects larger than 12.5 mm	2	115.	Protected against dripping water up to 15° from the vertical
3	© <sup>φ2.5mm</sup>	Protected against solid objects larger than 2.5 mm	3	\$ C	Protected against rainwater up to 60° from the vertical
4	O <sup>φ1mm</sup>	Protected against solid objects larger than 1 mm	4	0	Protected against water sprayed from all directions
5	<u></u>	Protected against dust (no harmful deposits)	5	渁	Protected against water jets from all directions
6	0	Totally protected against dust	6	*	Totally protected against powerful water jets similar to heavy seas
			7	O	Protected against the effects of immersion
			8	O	Protected against the effects of prolonged immersion under specified conditions

### Separations inside an assembly

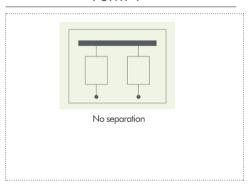
Standard IEC 61439-2 defines the separations inside an assembly according to 4 types of form, each form being divided into two groups, 'a' and 'b'. These internal separations are created using barriers or screens made of metal or insulating material.

- Form 1: No separation.
- Form 2: Separation of busbars from functional units.
- Form 3: Separation of busbars from functional units and separation of all functional units from each other. Separation of terminals for external conductors from functional units.
- Form 4: Separation of busbars from functional units and separation of all functional units from each other. Separation of terminals for external conductors from busbars.

### Cutline:

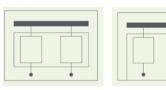


### Form 1



### Form 2

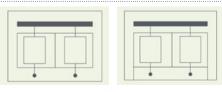
Form 4



Form 2a: Separation of busbars from functional units. Terminals for external conductors do not need to be separated from busbars.

Form 2b: Separation of busbars from functional units. Terminals for external conductors are separated from busbars.

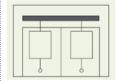
### Form 3



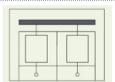
Form 3a: Separation of busbars from functional units and separation of all functional units from each other. Terminals for external conductors do not need to be separated from busbars.



Form 3b: Separation of busbars from functional units and separation of all functional units from each other. Separation of terminals for external conductors from functional units but no separation between terminals.



Form 4a: Separation of busbars from functional units and separation of all functional units from each other, including the terminals for external conductors which are an integral part of the functional unit. Terminals for external conductors are in the same compartment as the functional unit.



Form 4b: Separation of busbars from functional units and separation of all the functional units from each other including terminals for external conductors. Terminals for external conductors are not in the same compartment as the functional unit but in separate individual compartments.



### **Product Solutions**

### Rigorous experiment

- IEC 61439-2: 2020
- IEC 61641: 2014

### Laboratory authority certification

- Resistance to corrosion
- Thermal stability
- Mechanical operation
- Degree of protection of assemblies
- Clearances and creepage distances
- Protection against electric shock and integrity of protective circuits
- Dielectric properties
- Temperature-rise
- Short-circuit withstand strength
- Electromagnetic compatibility (EMC)

### Intelligent control system

iPMS6000 intelligent distribution monitoring and management system provides monitoring and management of electrical parameters and electrical safety in low-voltage distribution room. Through real-time data acquisition and remote control of intelligent distribution equipment such as integrated microcomputer protection, mounted digital display meter, guideway meter, power quality monitor, temperature and humidity controller, power factor controller, video camera device, environmental monitoring sensor, etc., the application of computer technology is statistical and analysis of electricity consumption and distribution environment data. Help users realize real-time online management of power distribution links, prevent power distribution accidents, and improve the safety and intelligent management level of power consumption.



### **Typical segments**



Data Center



Power System



Rail Transit



New Energy



Mining



Commercial



Building



Oil and Gas

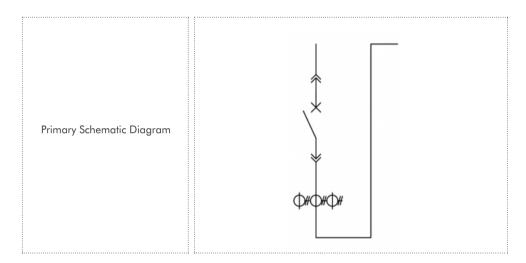


### **Typical schemes**

NGC5 switchgears have the following representative schemess. Meet the different applications in various segments.

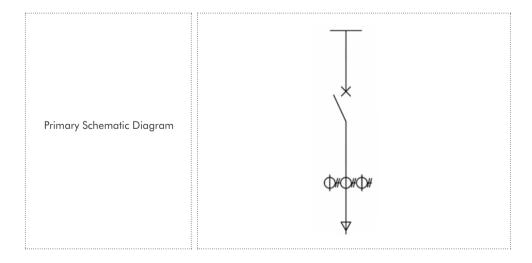
**12.**1

### **Incoming solution**



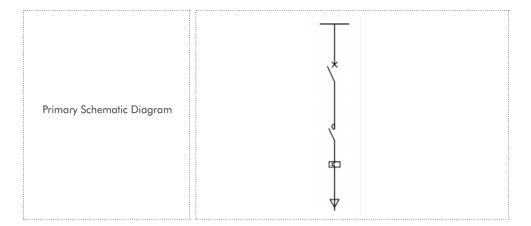
12.2

### **Outgoing solution**



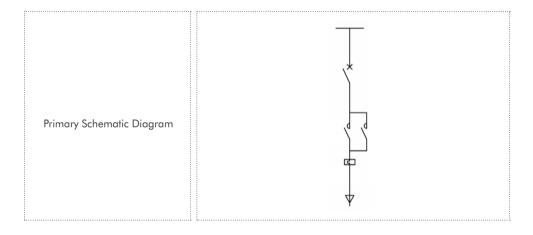


### **Direct start**



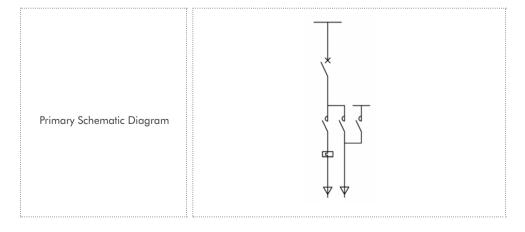


### Forward/Reverse DOL





### Star-delta start





### **CHINT** intelligent factory introduction

• Main products: medium and low voltage switchgear

• Total construction area: 350,000 square meters

• Established: 2021



CHINT's integrated power distribution industry is centered on its Jiaxing factory and radiates to factories in regions such as Xianyang, Wenzhou, Hefei, Shenyang, and Nanyang.

Jiaxing factory mainly focuses on manufacturing of advanced low-voltage and medium-voltage intelligent integrated power distribution panels, intelligent medium-voltage circuit breakers, and other products and solutions. It began construction in October 2019, covering a construction area of 72,000 square meters, and investing in 1136 sets of advanced digital production equipment.



Sheet-metal production line



Panel assembly line

### Highlight:

- Intelligent integrated factory
- Top manufacturers with large scale and high standardization in delivery capability
- Complete verification facilities
- Full coverage of all processes

### Asia Pacific

### China | Global HQ

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