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NXGEAR

Armored Cabinet Fixed Type Metal Enclosed Switchgear

HZM® POWER

THE POWER OF ENGINEERING

Belief in the power of technical engineering

Be the master of knowledge, become the leader of technology and manufacturing engineering, achieve the sustainable development of the enterprise, and continuously meet the needs of power users.

NXGEAR

Armored Cabinet Fixed Type Metal Enclosed Switchgear

Overview of Characteristics

NXGEAR armored cabinet fixed type metal enclosed switchgear is a fixed type circuit breaker mounted switchgear, which is applicable to substations and distribution stations, and has a complete switchgear system with reliable logic mechanical interlocking; Based on HERTZMAN's advanced design concept of 3I technology, its new product features of independent compartment, independent locking and independent channel are consistent with the customer demand trend of compactness, intelligence and modularization, and can meet the value needs of users in the power distribution field.

Air insulated type switchgear, one of NXGEAR armored cabinet fixed type metal enclosed switchgears, is used for three-phase AC single busbar and single busbar sectionalized system, and is suitable for primary and secondary power distribution; The primary wiring scheme is various to meet the different needs of users and the regulatory requirements of power supply departments in various regions. NXGEAR has a particularly compact design, with a cabinet width of 550 mm, and is also suitable for outdoor switching stations or prefabricated substation.

Characteristic

The clear distance of air insulation between phases and ground is 125mm
Electrified body to door 155mm, cabinet width 550mm
The armored cabinet is designed with beauty and high precision, and the protection grade of cabinet door is IP4X
It is convenient for maintenance. The overall removable maintenance concept is designed to improve the fault removal ability and power supply recovery ability in the case of actual serious faults.
There are four independent compartments: busbar compartment, circuit breaker compartment, cable compartment and low-voltage compartment. The protection level of the compartments is PM IP2X.
There are independent pressure relief channel. The busbar compartment, circuit breaker compartment and cable compartment have independent pressure relief channels. Under normal conditions, the pressure relief window is closed and has the same protection level as the switch cabinet. Under fault conditions, the pressure relief window automatically opens for pressure relief.
It is with Original locking mechanism
The type of cabinet is equipped with a patented MIDLOCK independent locking mechanism. The unique locking mechanism developed based on the principle of spindle locking is used to completely avoid possible mis-operation and reliably solve the "five prevention" logic locking between circuit breakers, disconnectors, grounding switches and cabinet doors.
Grounding ON-OFF capacity
Fast earthing switch with E2 short circuit ON/OFF capacity
Configure large capacity transformer 10VA capacity current transformer


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Product quality standards and management

ISO Quality Assurance System
Progressiveness technology and process
Switch characteristic detection
Insulation test
Mechanical operation test
Resistance test
Mechanical interlocking test
Protection level test

Relevant standards

NXGEAR complies with Chinese national GB standards and relevant IEC standards of the International Electrotechnical Commission, including but not limited to the design and manufacture of switchgear in the following aspects Breaking, isolation, insulation and partial discharge performance of switchgear

- Transformer
- Low voltage control equipment
- Power supply
- Cable
- Wire
- Fuse
- Graphics and Symbols
- Test
- Electrical terminology

Hertzman has been committed to meeting the high quality standards of users for many years, and has passed the following certifications:
ISO 9001：2000
ISO 14001：2004
OHSAS 18001
CNAS

NXRING conforms to existing Chinese National Standards and IEC standards1

Equipment	IEC standard	GB/Tstandard
Switch equipment	IEC 62271-1	GB/T 11022
	IEC 62271-200	GB/T 3906，DL/T 404
Grounding switch	IEC 62271-102	GB/T 1985
solating switch	IEC 62271-102	GB/T 1985
Breaker	IEC 62271-100	GB/T 1984，DL/T 402
Current Transformer	IEC 61869-2	GB/T 20840.2
voltage transformer	IEC 61869-3	GB/T 20840.3
Prevent accidental contact, foreign matters and water	IEC 60529	GB/T 4208

Operating conditions

Indoor	Satisfied IEC62271-1,GB/T11022-2011
Environment temp.	From -25° C to +40℃ (Optional: -25℃)
Humidity: Condensation level: Altitude Environmental pollution level Earthquake resistance	Not more than 95% (daily average Ch class The design specified altitude of insulation level shall not exceed 1000m c class 8 degree

The following service conditions and environments shall be informed and negotiated with the manufacturer
Above 1000 meters above sea level
Large temperature difference is liable to condensation
Extremely strong salt fog and characteristics of marine climate
Exceeding the normal conditions specified in GB3906

Technical parameter

project	unit	data
Rated voltage	KV	12
Rated insulation 1min power frequency withstand voltage interphase and ground break	KV	42/48
Lightning impulse interphase to ground, fracture	KV	75/85
Rated frequency	HZ	50
Rated current	A	630 1250
Rated current of main bus	A	630 1250
Rated current of branch bus	A	630 1250
Rated short-time withstand current (4S)	KA	25 31.5
Rated peak withstand current	KA	50 63 80
Degree of protection	\	Enclosure IP4X, other compartments IP2X
Overall dimensions (W * D * H)	mm	550*1000(1200)*2200
weight	KG	600-1000

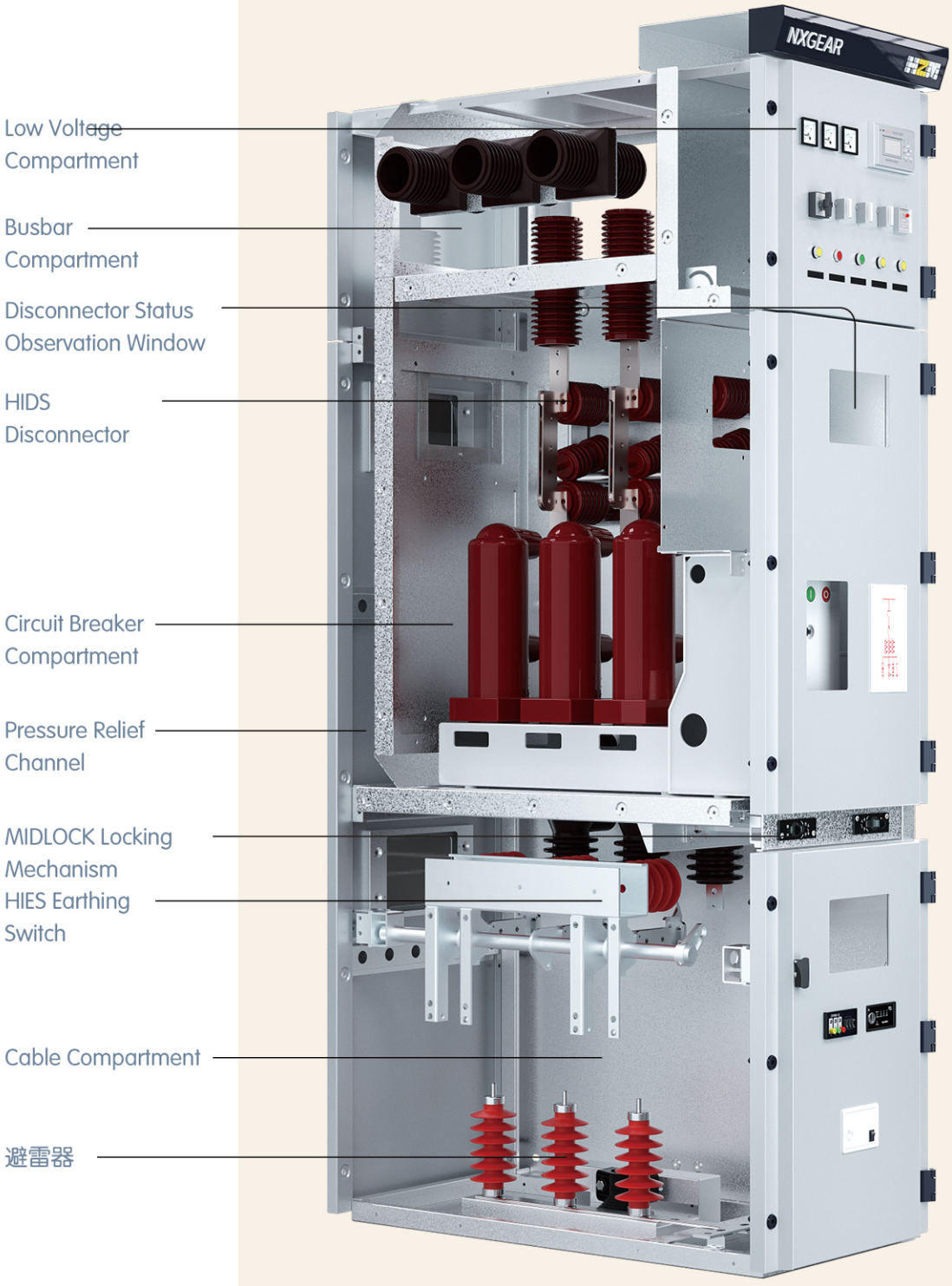
Technical characteristics of cabinet

*NXGEAR cabinet adopts high-strength armored assembly structure, independent functional compartment design and fixed connection of primary circuit.
*Each compartment has an independent pressure release channel
*The cabinet body and functional compartment are precision machined by CNC process from aluminum zinc coated steel plate
*The cabinet door panel and side sealing plate adopt cold rolled steel plate and plastic spraying surface treatment process, and the cabinet door adopts double-layer sealing dust-proof process
*The enclosure protection grade is IP4X, and the protection grade of each compartment is IP2X
*The incoming and outgoing lines of the cabinet type can be divided into: overhead incoming and outgoing lines at the top, incoming and outgoing lines at the bottom and incoming and outgoing lines at the left and right sides.
*Front human-machine operation, commissioning, operation and maintenance, wall mounted
*Design of integral movable cabinet structure of reinforced base.
Structure Performance
Protection grade shall comply with IEC 60529 and GB 4208 standards
The protection grade is IP4X for enclosure and IP2X for compartment.
Loss of operational continuity category LSC-2B
Entering the cable compartment to maintain the main busbar can operate with electricity.
Diaphragm PM level, the diaphragms between all compartments are metal.
Accessible type of compartment - tool based accessible compartment
Internal combustion arc grade, IAC A FLR 31.5KA 1S

NXGEAR
Cabinet Design

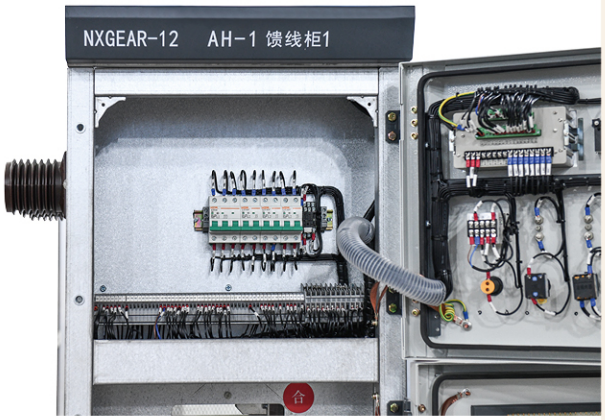
Cabinet Structure

Cabinet Structure Diagram

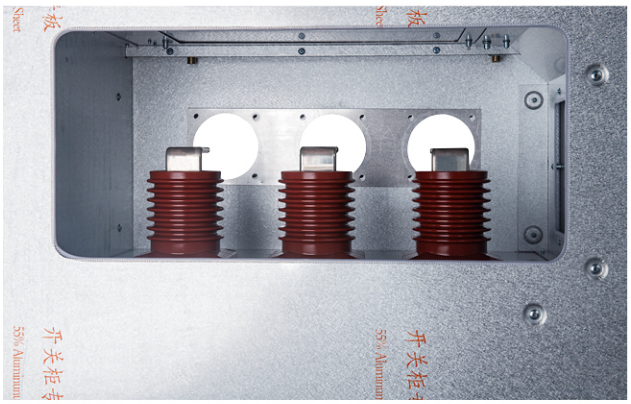


NXGEAR
Compartment

Low Voltage Compartment

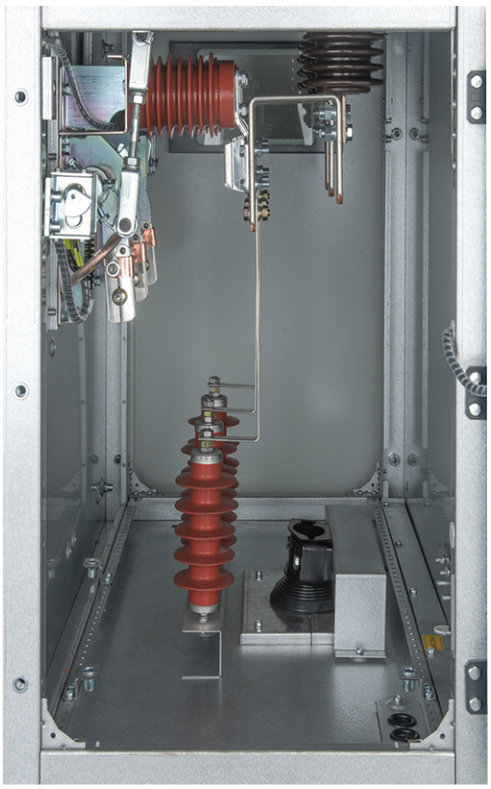


Busbar Compartment



Circuit Breaker Compartment

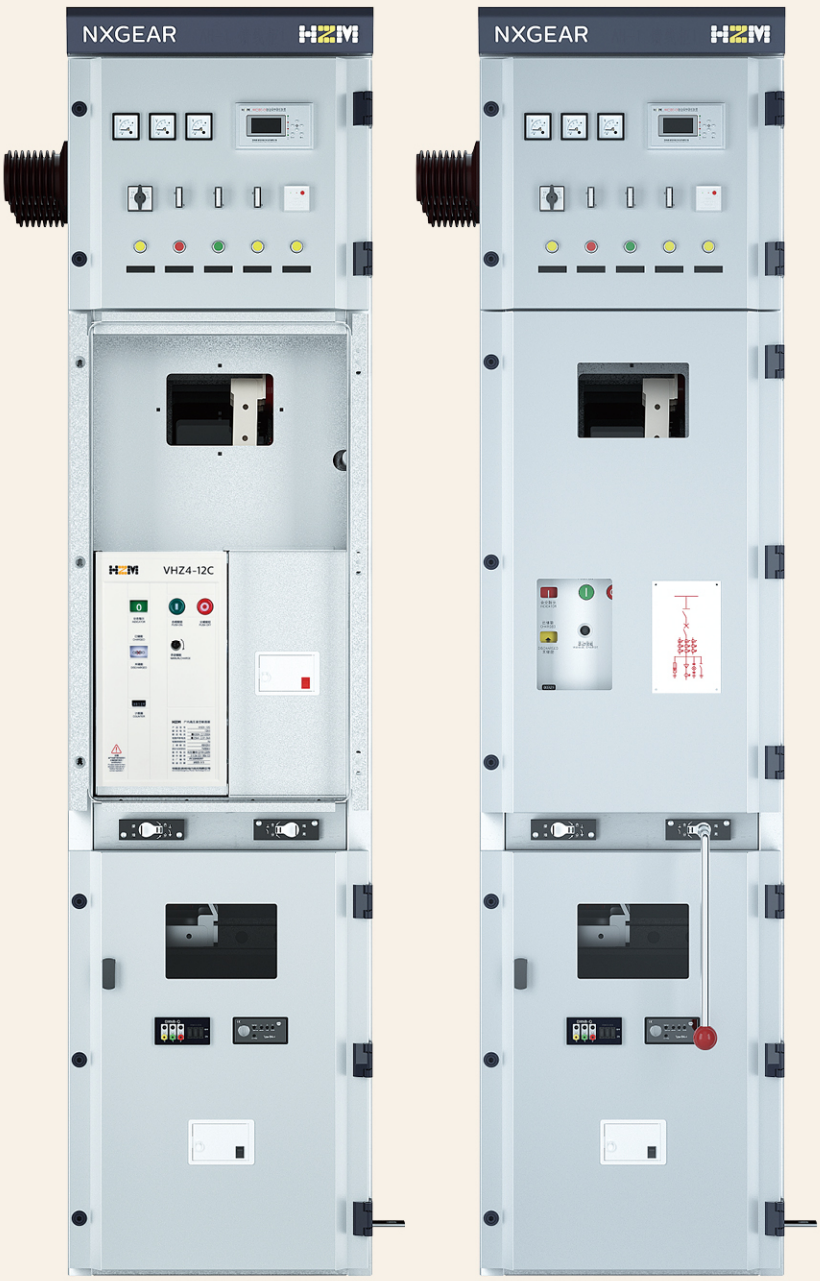
Cable Compartment



NXGEAR
Cabinet Design

Human–machine interface and operation

The basic scheme of fixed type switchgear is that the coordinated action of disconnector, circuit breaker and grounding switch can achieve the function of safe power distribution
Manual Operation
Electric Operation
Remote Operation
Automatic Operation
MIDLOCK five prevention locking mechanism and relevant accessories are connected between disconnector, circuit breaker and grounding switch

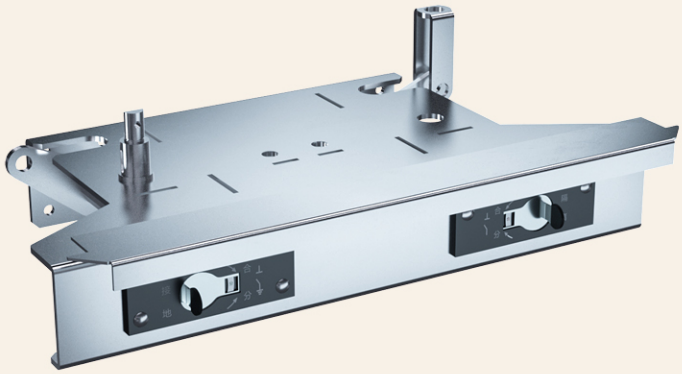


NXGEAR
Locking Mechanism

MIDLOCK Locking Mechanism

NXGEAR adopts the MIDLOCK five prevention locking operating mechanism with the unique technical concept of the invention patent (202010310100.X). Its design concept has greatly improved with the conventional universal locking habit. It has changed the conventional "first maloperation, then correction" anti-maloperation locking design habit and the unique main shaft locking concept to avoid the maloperation of the locking mechanism when the locking logic does not allow, and to ensure the circuit breaker, disconnector, and grounding switch, Only when the cabinet door is in the correct logical position can it be operated according to the correct operation logic. MIDLOCK five prevention locking mechanism has a mechanical structure designed according to the operation logic of the five prevention requirements. Operations not in the logical sequence will be physically locked or isolated by the internal mechanism of MIDLOCK five prevention locking mechanism; When the specified procedure operation is not completed, the operation cannot be continued; Operation cannot continue when non-program operation is performed. At the same time, it has a good tolerance for the operator to exert abnormal operating force during non-standard operation or non-program operation, to prevent cabinet failures caused by brutal operation to a certain extent.

MIDLOCK Mechanical Locking Operating Mechanism

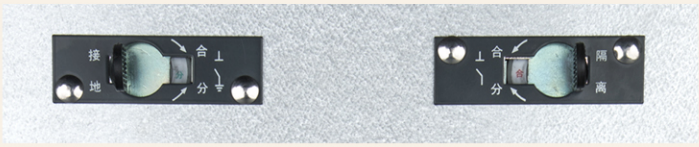


MIDLOCK locking human-machine interface

MIDLOCK five proof mechanical locking device is a mistake-proof device for NXGEAR fixed type switchgear;
Ensure the safety of operators
Ensure equipment safety
Prevent power supply failure
Prevent false of circuit breaker
Prevent opening and closing disconnectors under on-load state
Prevent opening and closing of grounding switch under electrified state
Prevent power transmission in closing state of grounding switch
Prevent from entering the electrified space by mistake

Disconnector operation
Push the protective cover
Insert the operating handle and rotate it anticlockwise to operate it for 90 degrees, which means it is closed
Turn clockwise to operate for 90 degrees as opening
Although the disconnecting switch has a boost spring, attention shall be paid to the force when opening and closing, and the rear travel shall be accelerated.
After opening and closing, visual inspection shall be conducted to confirm whether the opening and closing are in place
Operate grounding switch
Close the observation cabinet door
Push the protective cover
Insert the operating handle and rotate it anticlockwise to operate for 90 degrees as opening
Turn clockwise to operate for 90 degrees as closing
The disconnector is designed for fast closing, attention shall be paid to the force when opening and closing, and the rear travel shall be accelerated.
The cabinet door locking mechanical latch is connected with the grounding switch lock

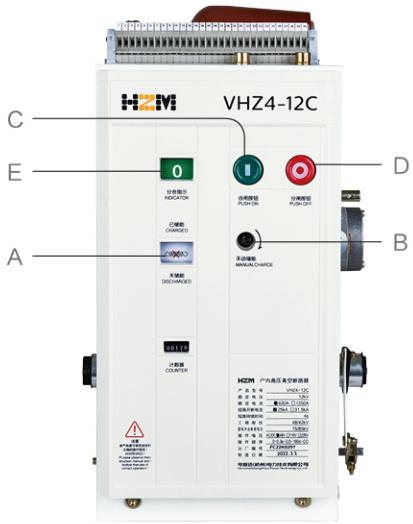
MIDLOCK Mechanical Locking Operating Mechanism Operating Hole



Grounding switch operation

Disconnector operating hole

NXGEAR
Operating procedures



Circuit breaker operation procedure

Manual operation

Manual energy storage
Observe that the energy storage indication is a red mark (Figure A), Insert the energy storage handle into the hole position of the energy storage hole (Figure B), turn it clockwise to the damping release force, and the energy storage indication changes to a green mark (Figure A), indicating that the circuit breaker has completed energy storage.
The circuit breaker can store energy manually under any state.

Opening and closing operation
Press the mechanical manual closing button (Figure C) to close.
Press the mechanical manual opening button (Figure D) to open.

The opening and closing status is shown as (Figure E)
Manual operation is preferred. In case of manual operation, the electric control circuit fails.

Electric operation

Electric energy storage
COGEAR spring operating mechanism configured for VHZ4F circuit breaker is equipped with motor drive for electric energy storage.
The button for controlling the energy storage motor is located on the panel of the secondary room,Press the energy storage button, and the energy storage circuit is connected to the starting motor to drive the energy storage.
Opening and closing operation
The control buttons for opening and closing are located on the panel of the secondary room,

Press the electric closing button to close.
Press the electric opening button to open.

Closing Procedure

When the circuit breaker is in the opening position, disconnect the grounding switch, close the disconnector, and close the circuit breaker
b. Close the grounding switch, open the front (rear) cabinet door, close the rear (front) cabinet door, and open the grounding switch.

Opening and Closing Procedure

When the circuit breaker is in the closing position, open the circuit breaker, close the grounding switch and open the disconnector.

Test procedure

Open the circuit breaker. When the circuit breaker is in the opening position, close the grounding switch, open the disconnector and test the circuit breaker.

Observation Procedure

Observe the opening and closing position of the disconnector in the compartment through the front and rear sight glasses.

Door opening Maintenance Procedure

When the circuit breaker is in the closing position, open the circuit breaker, close the grounding switch, open the disconnector, unlock the door lock and open the door.

C–LOCK mechanical program lock

C–LOCK mechanical program lock device is used to establish the interlocking relationship between separated (non–mechanically connected) components or equipments

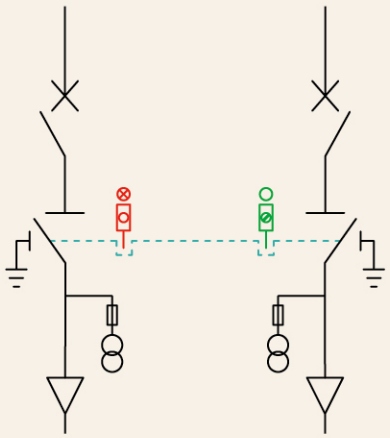
C–LOCK key interlock device
R–AIR can be equipped with C–LOCK key interlocking device to realize functional interlocking of the system.
The load switch (circuit breaker) is interlocked by two locks and one key. Cabinet A and cabinet B are equipped with key interlocking devices respectively, but one key is configured. The key is configured on the cabinet unit to be closed. When the unit is closed, the key cannot be removed or rotated; When the other cabinet has no key, the operating shaft cannot operate. Thus, the "two locks and one key" interlocking function is realized, that is, cabinet A and cabinet B can only close one of them.
The load switch (circuit breaker) is interlocked with three locks and two keys. Cabinet A, cabinet B and cabinet C are equipped with key interlocking devices respectively, but one key is configured. The key is configured on the two cabinet units to be closed. When the two units are closed, the key cannot be removed or rotated; When the other cabinet has no key, the operating shaft cannot operate. Thus, the "three locks and two keys" interlocking function is realized, that is, cabinet A, cabinet B and cabinet C can only be closed the two of three.
The load switches (circuit breakers) of different cabinets are interlocked with the grounding switches by two locks and one key, and the outgoing cables of cabinet A and cabinet B are interconnected. According to the system function requirements, the two cabinets are respectively equipped with two locks and one key for interlocking, respectively locking their load switches (circuit breakers) and grounding switches, to prevent one cabinet from closing the grounding switch of the other cabinet by mistake when the load switches (circuit breakers) of one cabinet are not disconnected; This function can evolve other functions required by the system function according to the above logic.
The switchgear cabinet and the transformer are interlocked by two locks and one key. The grounding switch of the switchgear cabinet and the protective door of the transformer outer chamber are respectively equipped with a key interlock device, but one key is configured. When the grounding switch is in the opening state, the key cannot be removed or rotated, and the protective door of the transformer outer chamber cannot be opened without a key. Thus, the "two locks and one key" interlocking function is realized to prevent the door from accidentally opening and touching the transformer when the primary side of the transformer is not grounded.

C–LOCK interlocking application

C–LOCK key interlock device

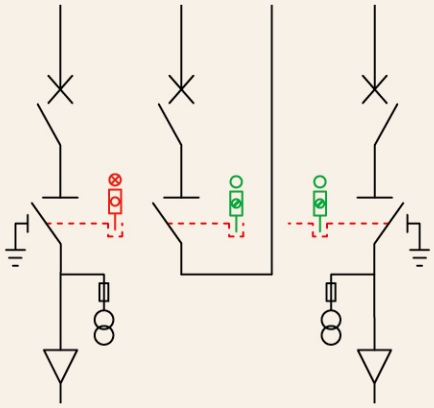
V circuit breaker cabinet
Interlocking of two incoming lines (two locks and one key)

When the disconnecting switch of 1 # incoming switch is disconnected at the time position, turn the key to lock the knife switch off, and operate the 2 # incoming knife switch to close position after taking out the key, it is allowed to close the 2 # switch.



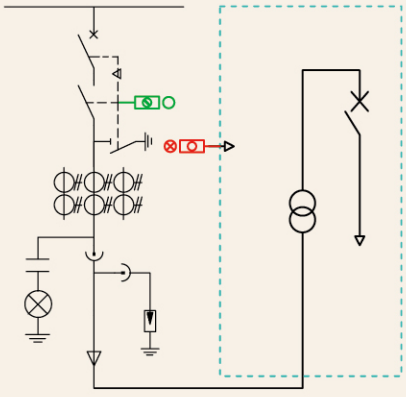
V circuit breaker cabinet
Two incoming lines+contact cabinet interlock (Three locks and two keys)

When the disconnecting switch of 1 # incoming switch is disconnected at the time position, turn the key to lock the knife switch opening, and operate the incoming knife switch of the contact cabinet to the closing position after taking out the key, then it is allowed to close the contact switch.



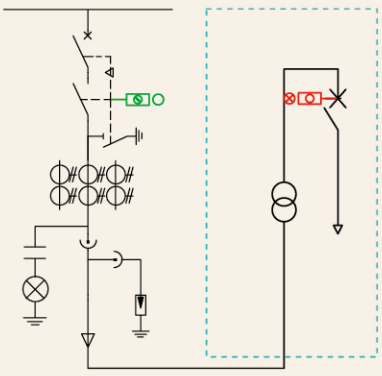
Locking transformer door of circuit breaker cabinet (two locks and one key)

When the V cabinet is in the OFF position and the disconnector is in the ON position, turn the key to lock the grounding position. Only after the key is taken out the transformer reticular door can be opened for maintenance.



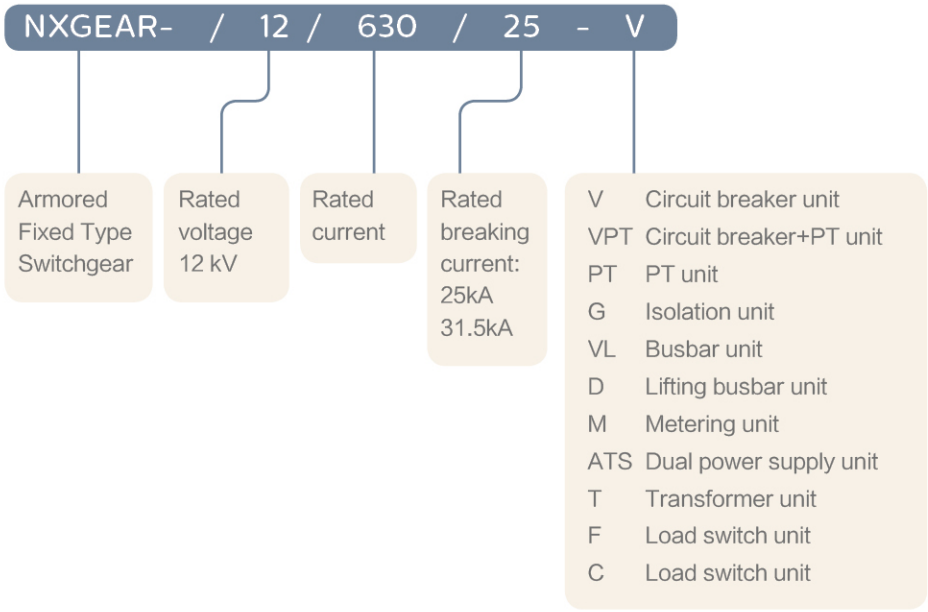
Circuit breaker cabinet locks the low–voltage side circuit breaker of transformer (two locks and one key)

When the circuit breaker at the low–voltage side is disconnected, turn the key to lock the low–voltage circuit breaker position. After the key is taken out to prevent reverse power transmission at the low–voltage side, the high–voltage side disconnecting switch can be operated.



Keyless equipment locking status
Unlock status of keyed equipment

NXGEAR
Model definition



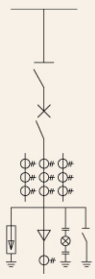
NXGEAR Standard unit

V	Circuit breaker unit
VPT	Circuit breaker+PT unit
PT	PT unit
G	Isolation unit
VL	Busbar unit
D	Lifting busbar unit
M	Metering unit
ATS	Dual power supply unit
T	Transformer unit
F	Load switch unit
C	Load switch unit

Typical scheme

Circuit breaker unit NXGEAR–V

Bottom cable inlet

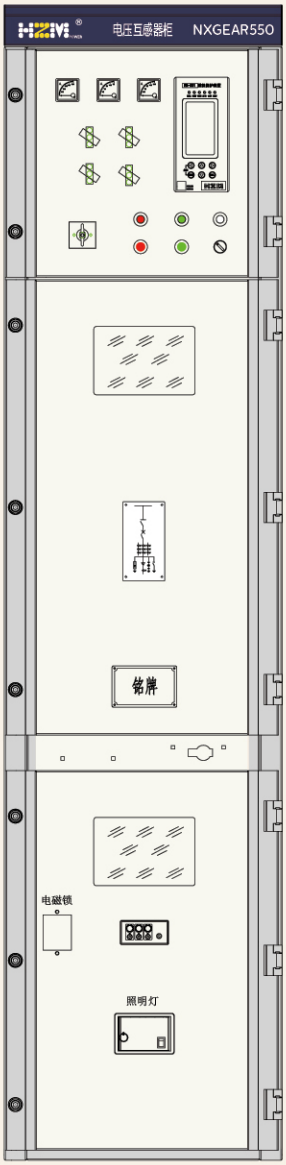


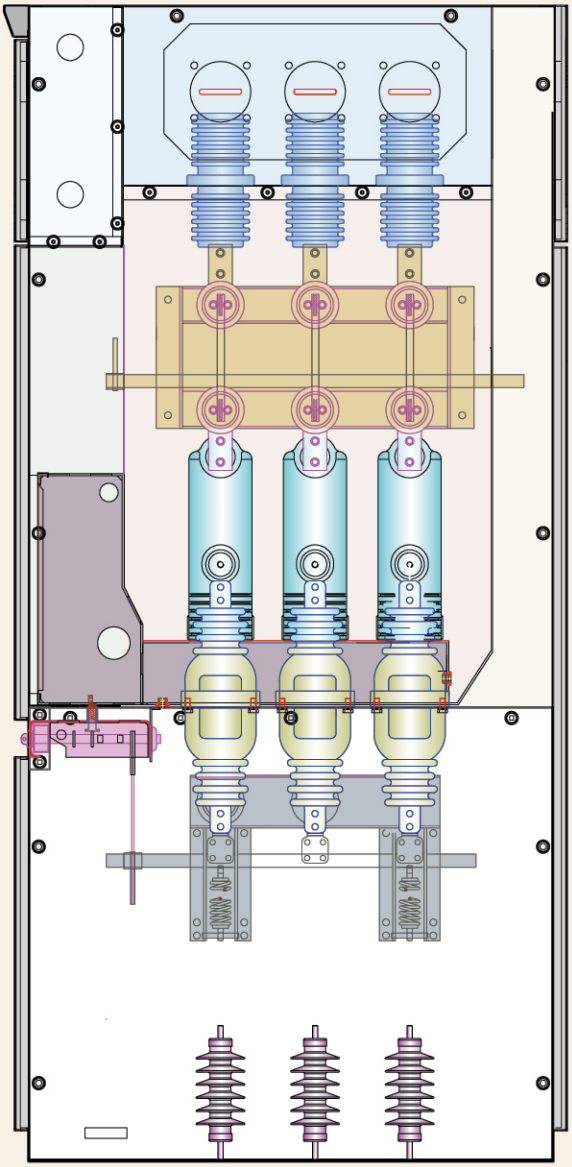
Standard configuration

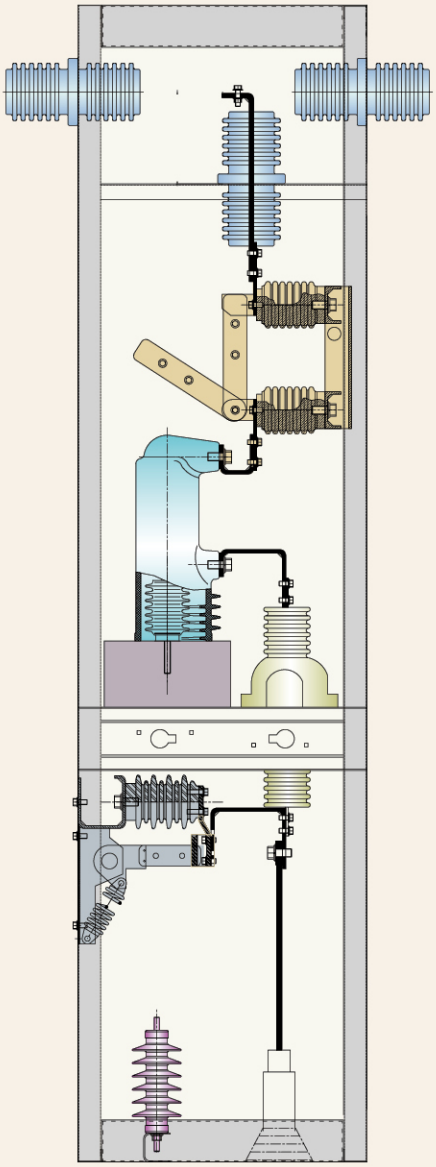
- VHZ4F Vacuum Circuit Breaker
- HIDS Disconnector
- HIES Earthing Switch
- MIDLOCK Anti mis–locking Operating Mechanism
- HICPT Current Transformer and Instrument
- MIC300 Microcomputer Protection
- Busbar and Grounding Busbar
- Electrified Display
- Temperature and Humidity Control and Drying Device

Optional

- Arrester
- Small Busbar
- Short Circuit and Earth Fault Indicator
- Status Display and Controller
- Cable Joint Temperature Measuring Device
- Infrared Observation Window of Cable Cabinet Door
- C–LOCK Key Interlock



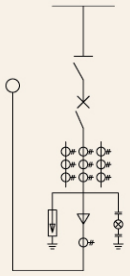




Typical scheme

Circuit Breaker+ PT Unit NXGEAR–V

Incoming line of upper overhead cable

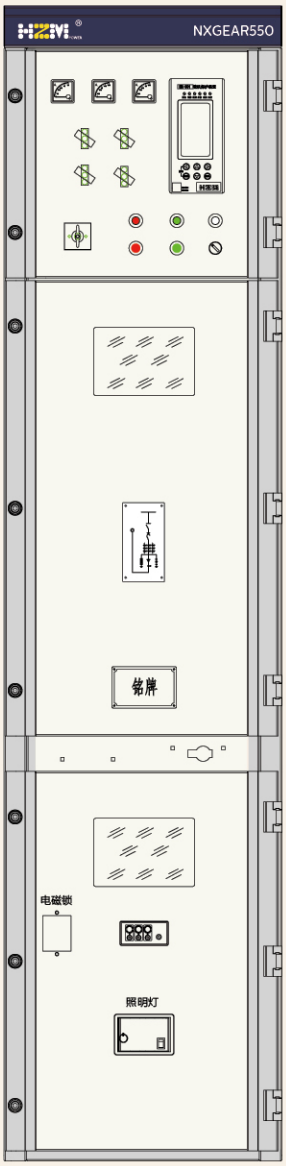


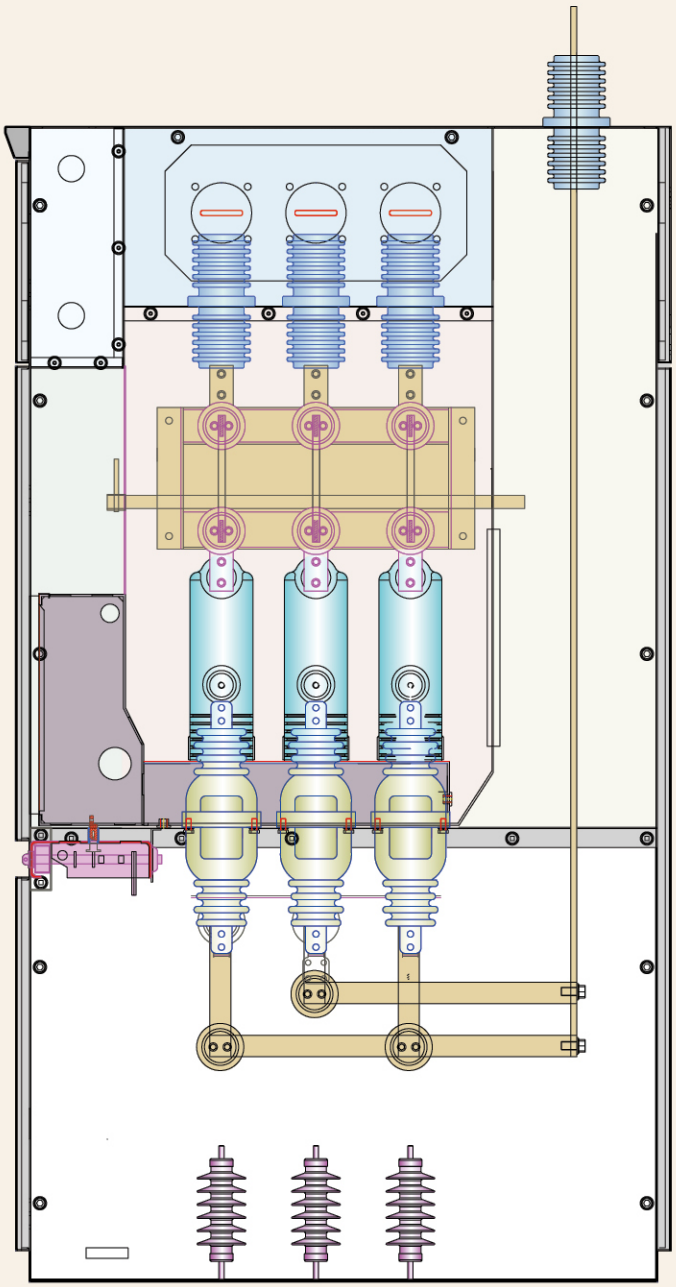
Standard configuration

VHZ4F Vacuum Circuit Breaker
HIDS Disconnector
HIES Earthing Switch
MIDLOCK Anti mis–locking Operating Mechanism
HICPT Current Transformer and Instrument
MIC300 Microcomputer Protection
Busbar and Grounding Busbar
Electrified Display Temperature and Humidity Control and Drying Device

Optional

Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint Temperature Measuring Device
Infrared Observation Window of Cable Cabinet Door
C–LOCK Key Interlock

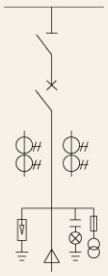


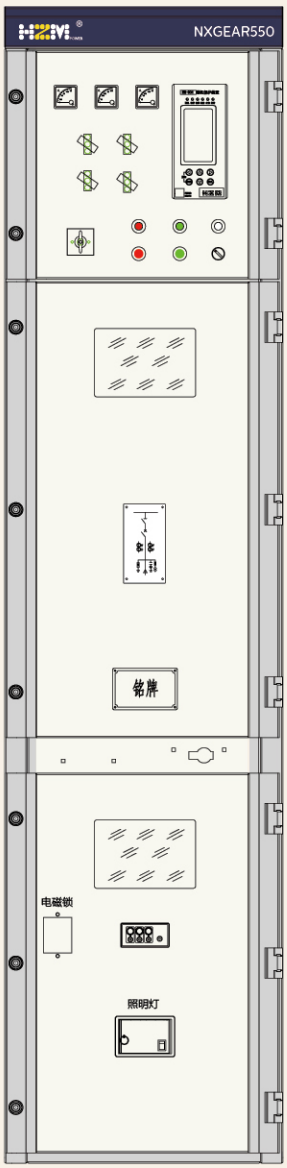


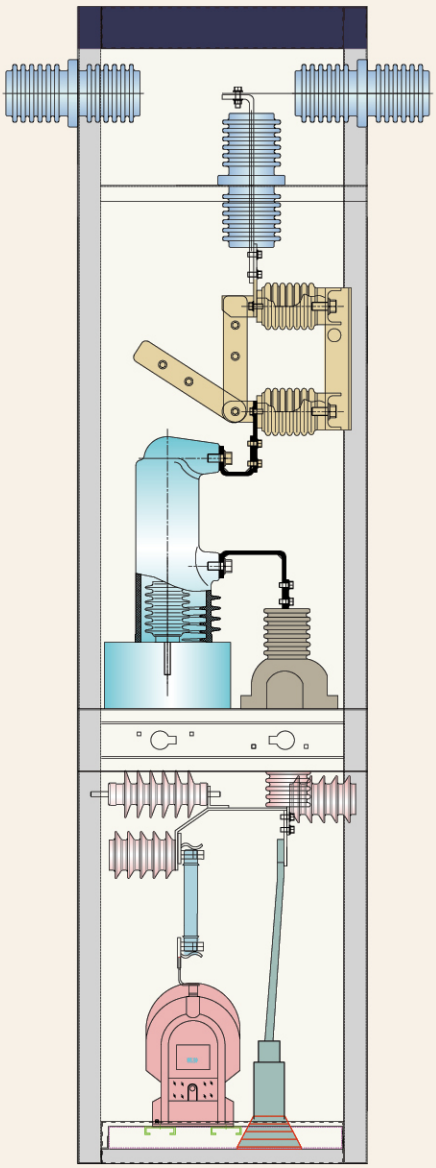
NXGEAR
Standard unit

Typical scheme

Circuit Breaker+ PT Unit NXGEAR–VPT







Standard configuration

VHZ4F Vacuum Circuit Breaker
HIDS Disconnector
HIES Earthing Switch
MIDLOCK Anti mis–locking Operating Mechanism
HICPT Current Transformer and Instrument
HICPT Voltage Transformer
MIC300 Microcomputer Protection
Busbar and Grounding Busbar
Electrified Display
Temperature and Humidity Control and Drying Device

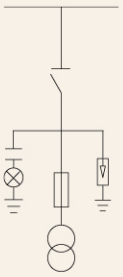
Optional

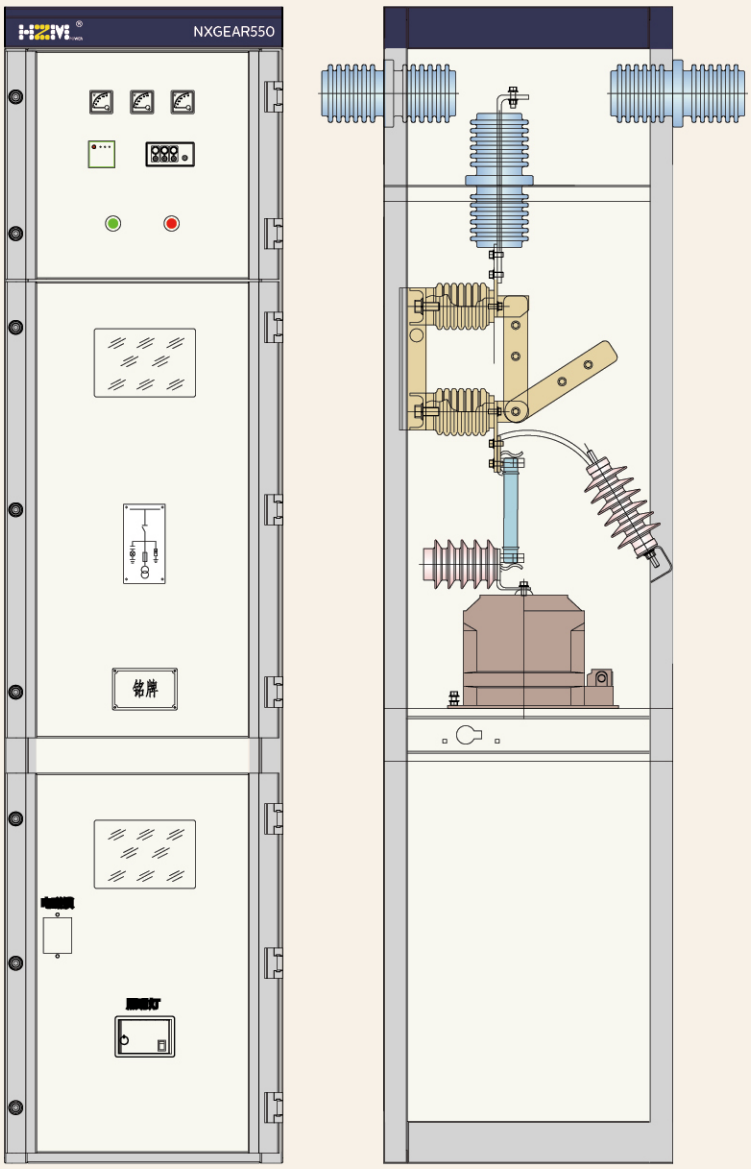
Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint Temperature Measuring Device
Infrared Observation Window of Cable Cabinet Door
C–LOCK Key Interlock

NXGEAR
Standard unit

Typical scheme

PT Unit NXGEAR–PT





Standard configuration

HIDS Disconnector
MIDLOCK MIDLOCK Anti mis–locking Operating Mechanism
HICPTVoltage Transformer and Instrument Arrester
Busbar and Grounding Busbar
Electrified Displa
Temperature and Humidity Control and Drying Device

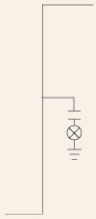
Optional

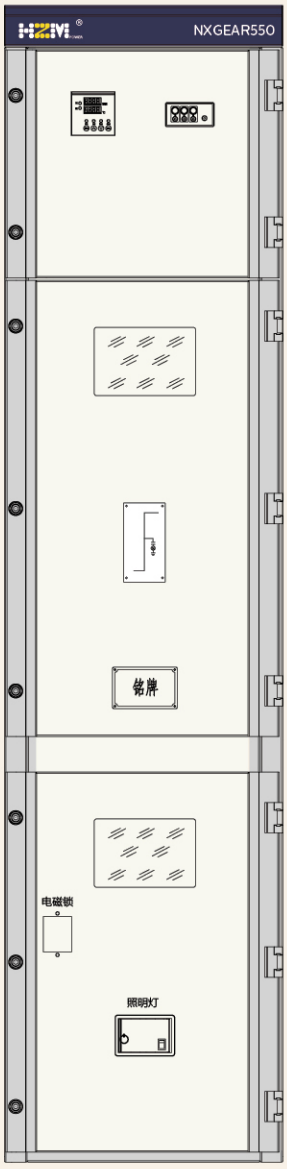
Short Circuit and Earth Fault Indicator
Status Display and Controller
Infrared Observation Window of Cable Cabinet Door
DC Power Supply System

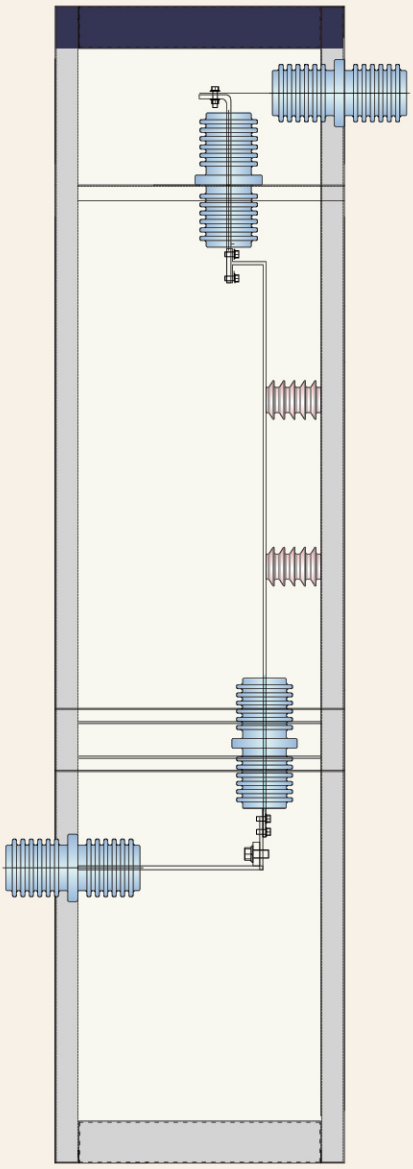
NXGEAR
Standard unit

Typical scheme

Lifting Busbar Unit NXGEAR–D







Standard configuration

Lifting Busbar
Ground Busbar
Electrified display
Temperature and Humidity Control and Drying Device

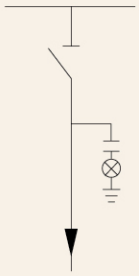
Optional

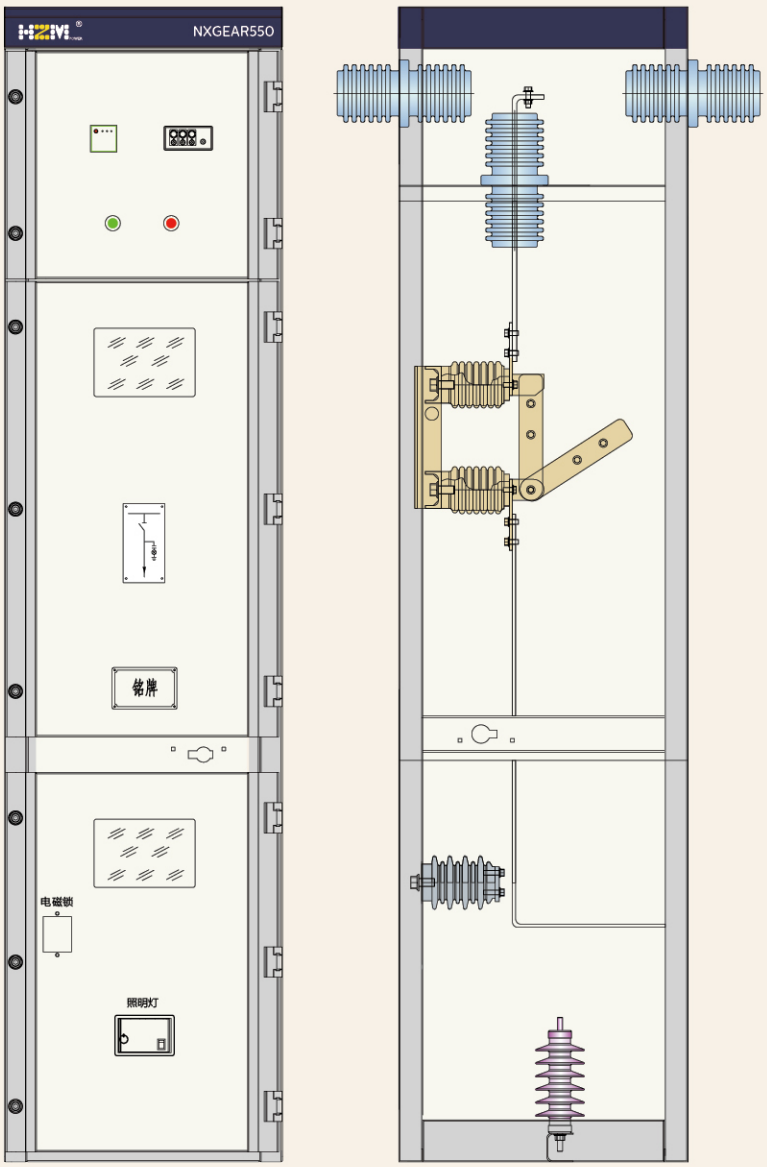
Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint Temperature Measuring Device
Infrared Observation Window of Cable Cabinet Door

NXGEAR
Standard unit

Typical scheme

Isolation Unit NXGEAR–G





Standard configuration

HIDS Disconnector
MIDLOCK Anti mis–locking Operating Mechanism
Busbar and Grounding Busbar
Electrified Display
Temperature and Humidity Control and Drying Device

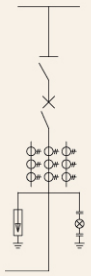
Optional

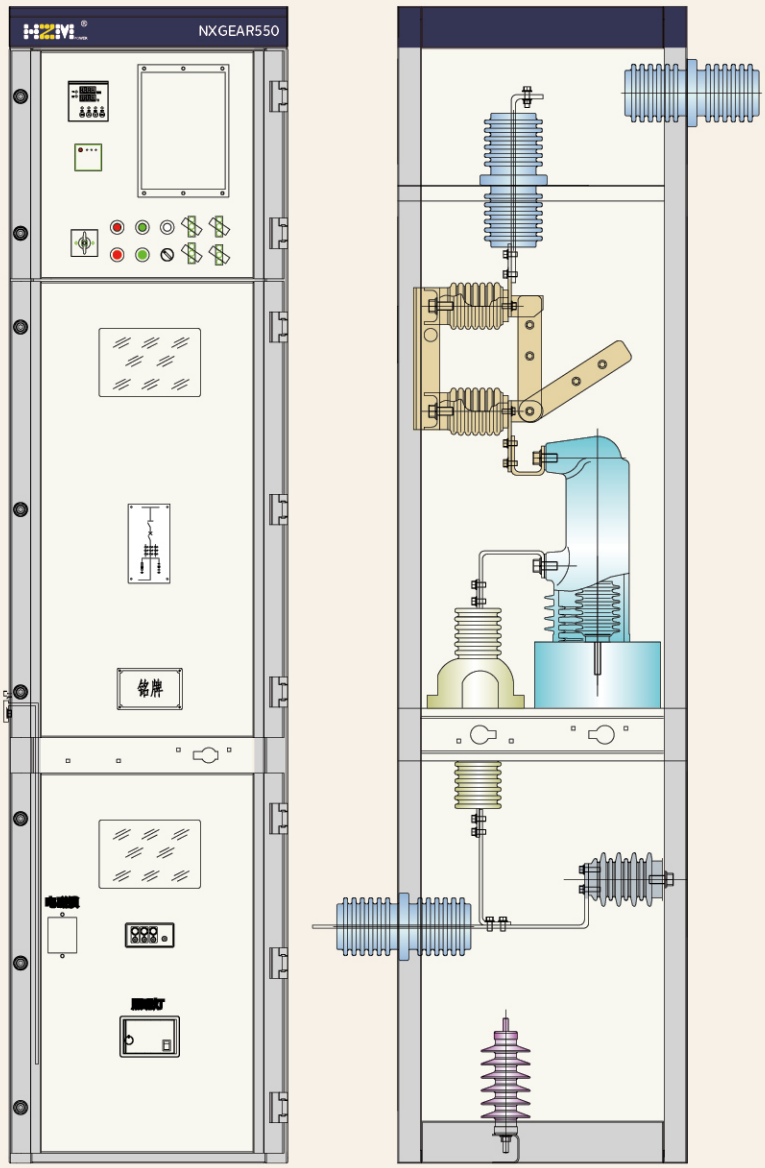
Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint Temperature Measuring Device
Infrared Observation Window of Cable Cabinet Door

NXGEAR
Standard unit

Typical scheme

Bus–couple Unit NXGEAR–VL





Standard configuration

VHZ4F Vacuum Circuit Breaker
HIDS Disconnector
HIES Earthing Switch
MIDLOCK Anti mis–locking Operating Mechanism
HICPT Current Transformer and Instrument
MIC300 Microcomputer Protection
Lifting Busbar
Busbar and Grounding Busbar
Electrified Display
Temperature and Humidity Control and Drying Device

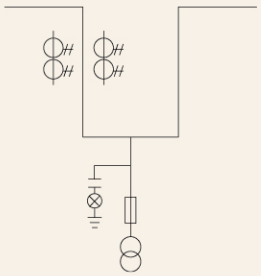
Optional

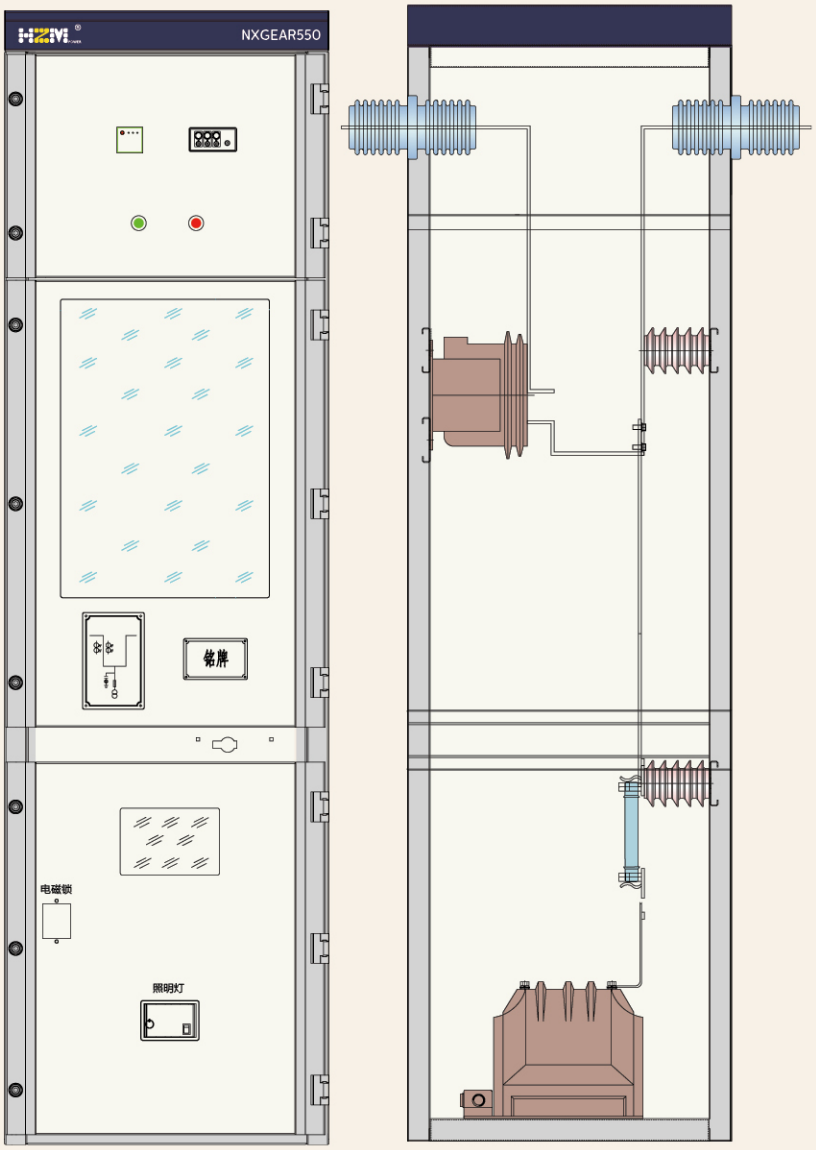
Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint Temperature Measuring Device
Infrared Observation Window of Cable Cabinet Door
C–LOCK Key Interlock

NXGEAR
Standard unit

Typical scheme

Metering Unit NXGEAR–M





Standard configuration

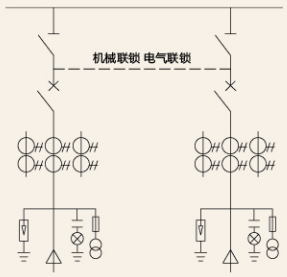
Voltage Transformer and Instrument Current Transformer
Busbar and Grounding Busbar
Electrified Display
Temperature and Humidity Control and Drying Device

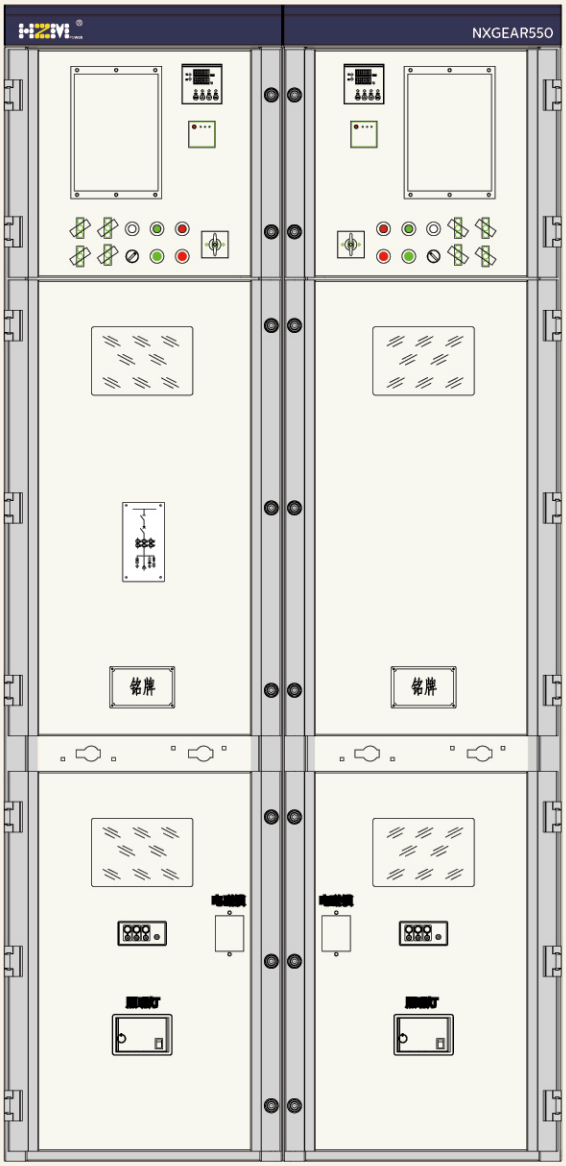
Optional

Meter
Status Display and Controller

Typical scheme

Dual Power Supply Unit NXGEAR–ATS





Standard configuration

VHZ4F Vacuum Circuit Breaker
HIDS Disconnector
HIES Earthing Switch
MIDLOCK Anti mis–locking Operating Mechanism
COLOCK Double Power Locking Mechanism
HICPT Current Transformer
Voltage Transformer
MIC500–663G Standby Automatic Transfer Device and Microcomputer Protection
Busbar and Grounding Busbar
Electrified Display
Temperature and Humidity Control and Drying Device

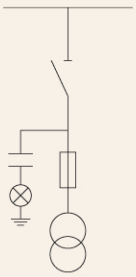
Optional

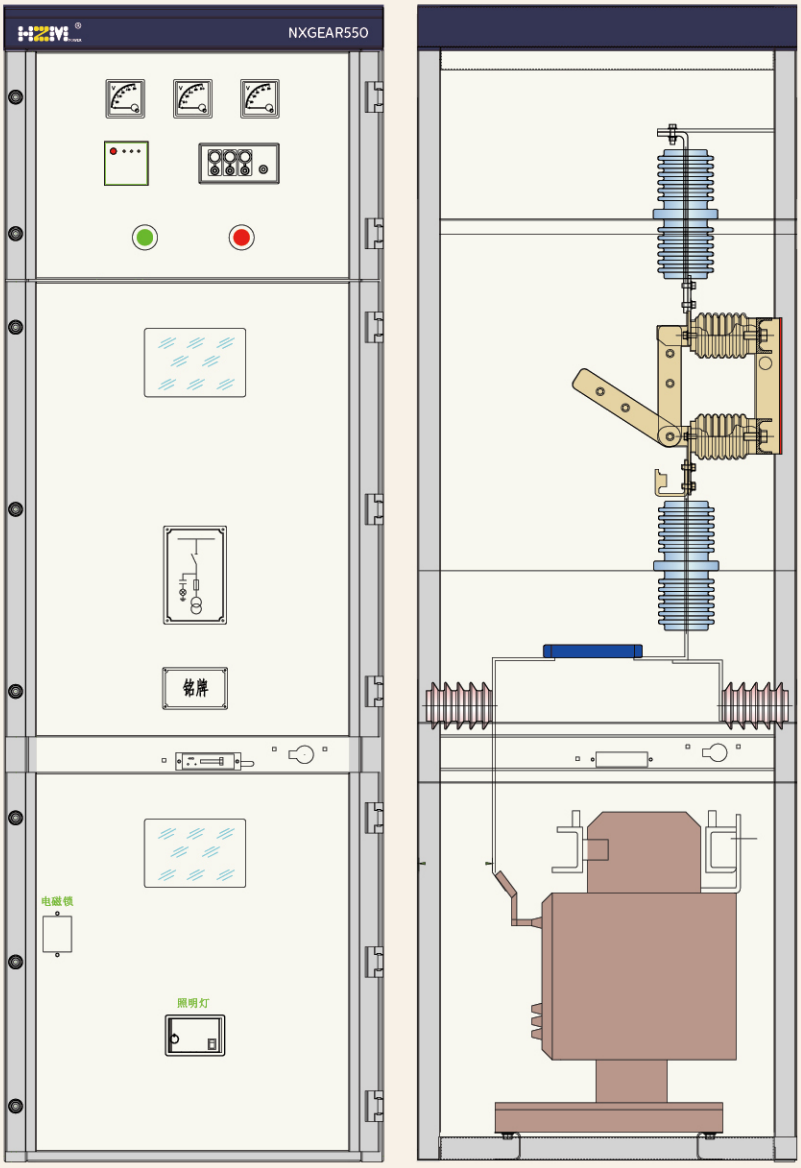
Voltage Sensor
Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint Temperature Measuring Device
Infrared Observation Window of Cable Cabinet Door

NXGEAR
Standard unit

Typical scheme

Transformer Unit NXGEAR–T





Standard configuration

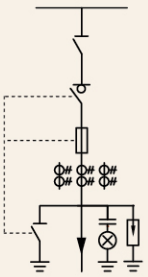
Transformer
Busbar and Grounding Busbar
Electrified Display
Electromagnetic lock

Optional

Voltage Sensor
Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint Temperature Measuring Device
Infrared Observation Window of Cable
Cabinet Door

Typical scheme

Load switch unit NXGEAR–F
Load switch unit NXGEAR–C

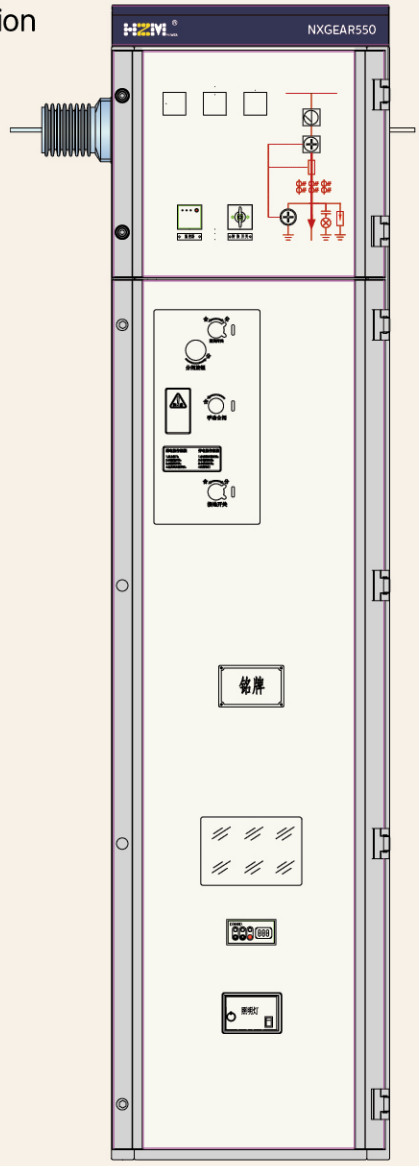


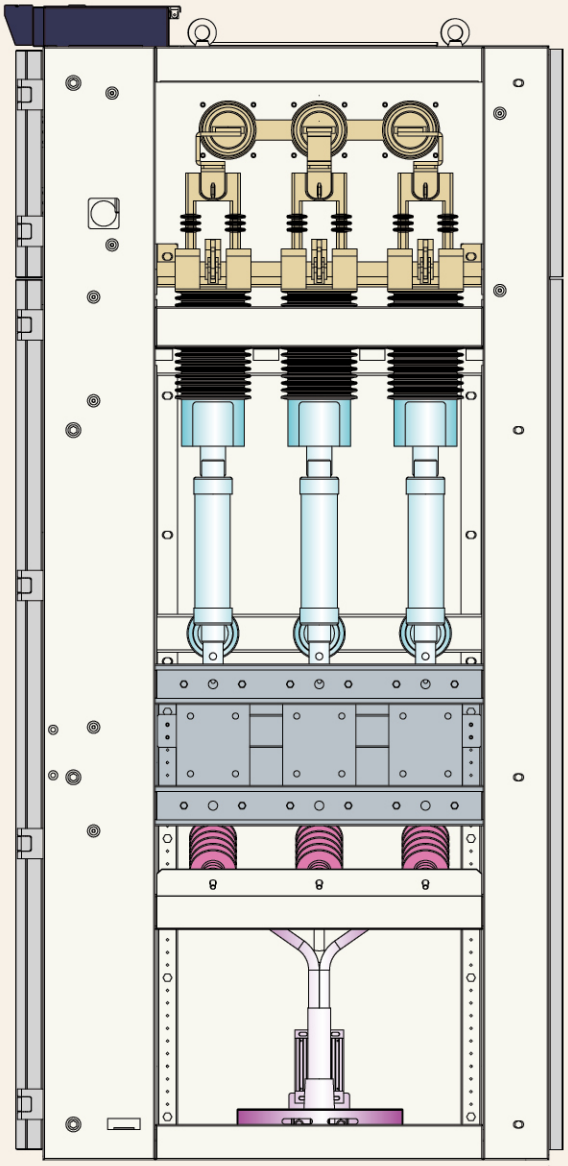
Standard configuration

Load switch
Busbar and Grounding Busbar
Electrified Display
Electromagnetic lock

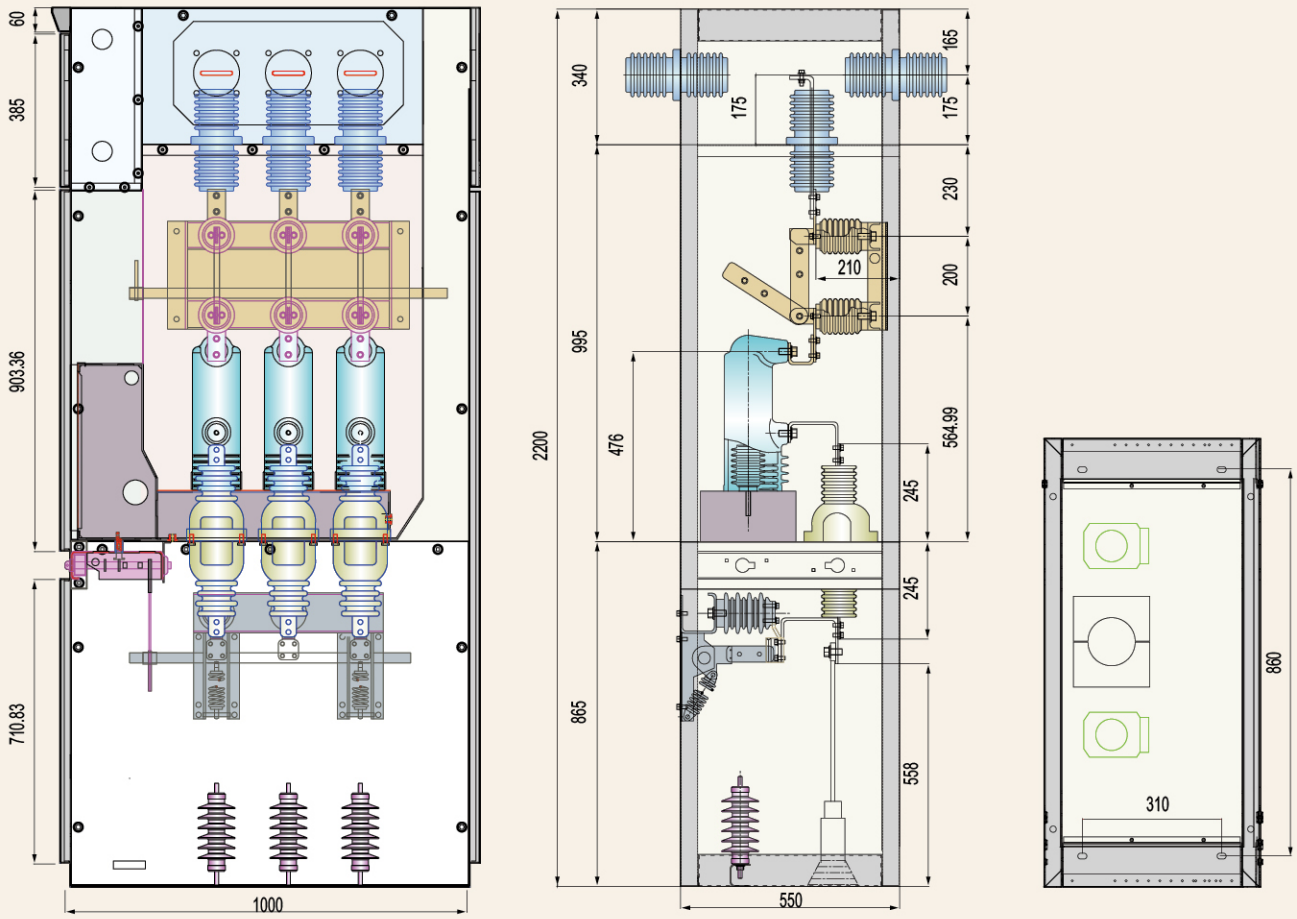
Optional

Voltage Sensor
Arrester
Small Busbar
Short Circuit and Earth Fault Indicator
Status Display and Controller
Cable Joint
Temperature Measuring Device
Infrared Observation Window of Cable
Cabinet Door





NXGEAR
size



NXGEAR Standard unit size

V	Circuit Breaker	width = 550 mm	depth = 1000 mm	height = 2200 mm
VPT	Circuit Breaker+ PT Unit	width = 550 mm	depth = 1000mm	height = 2200mm
PT	PT Unit	width = 550 mm	depth = 1000mm	height = 2200mm
G	Isolation Unit	width = 550 mm	depth = 1000mm	height = 2200mm
VL	Bus-couple Unit	width = 550 mm	depth = 1000mm	height = 2200mm
D	Lifting Busbar Unit	width = 550 mm	depth = 1000mm	height = 2200mm
M	Metering Unit	width = 750 mm	depth = 1000mm	height = 2200mm
ATS	Dual Power Supply Unit	width = 2*550 mm	depth = 1000mm	height = 2200mm
T	Transformer Unit	width = According to transformer capacity	depth = 1000mm	height = 2200mm
F	Load switch unit	width = 550 mm	depth = 1000mm	height = 2200mm
C	Load switch unit	width = 550 mm	depth = 1000mm	height = 2200mm

Remarks: When the switchgear is configured with the upper cable incoming scheme, after the additional cable cabinet is added with the depth of 200mm, the depth of the pressure relief channel is 1200mm; If HIDS separated type disconnecting switch cabinet is selected, its height is 2000mm.

VHZ4C Circuit Breaker

The vacuum circuit breaker is the main functional component of the switchgear. Its main components are composed of the solid sealing pole of the vacuum interrupter encapsulated with insulating materials, the mechanical operating mechanism and the control system. The circuit breaker has mechanical components and locking mechanism, as well as the interlocking of disconnector and grounding switch. Fixed installation is adopted.

The circuit breaker can be opened and closed by means of electrical control, or by means of the mechanical button on the panel of the operating mechanism.

The circuit breaker can be electrically controlled for electric spring energy storage, or manually stored through the energy storage link on the panel of the manual crank drive mechanism.

Characteristic

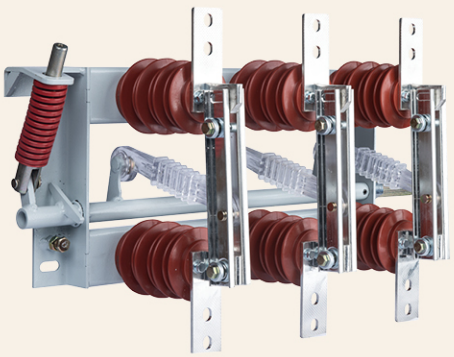
Width 240 mm, compact structure
Side Mounted Structure
Modular Spring Operating Mechanism
Pole of Fixed Arc Extinguishing Chamber

Technical Parameter

Project		Unit	Data
Rated voltage		KV	12
Rated Insulation Level	1min power frequency withstand voltage	KV	42
	Lightning impulse withstand voltage	KV	75
Rated frequency		HZ	60
Rated current		A	630 1250
Rated Symmetrical Short-circuit Breaking Current (Effective Value)		KA	25 31.5
Asymmetric Short-circuit Breaking Current (Effective Value)		KA	27.3 34.3
Rated Peak Withstanding Current (Peak Value)		KA	40 50 63 80
Rated Short-time Withstanding Current (Effective Value) 4S		KA	20 25 31.5 40
Rise Value in Transient Recovery Voltage		KA/ms	0.345 0.415
Peak Value of Transient Recovery Voltage		KV	20.6 30
Rated Operating Sequence			Opening 0.3S-Closing Opening 180S-Closing Opening
Mechanical Operating Life		Nos	30000
Closing Time		ms	≦ 70
Opening Time		ms	≦ 45
Arcing Time		ms	≦ 15
Breaking Time		ms	<60
Closing Coil Current		A	1.2
Opening Coil Current		A	1.2
Control Voltage		V	DC/AC 220 110 48

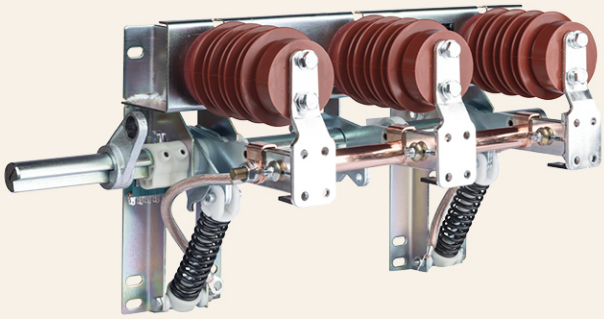
Isolating Switch

Technical Parameters of Disconnector
HIDS−12 Disconnector is only used for operation No−load
Rated Short−time Withstanding Current/ Time 31.5/3 KA/S
Mechanical Life 3000 times



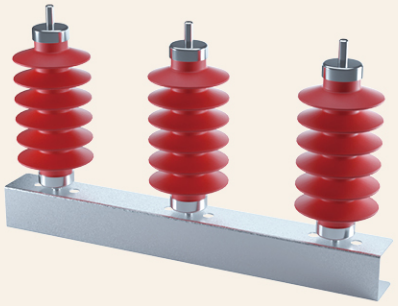
Grounding Switch

HIES−12 Grounding Switch
Rated Short−time Withstanding Current/ Time 31.5kA/3s
Rated Peak Withstanding Current 80KA
Rated Making Current 80KA
Rated Closing Times 5 times
Mechanical Life 3000 times



Arrester

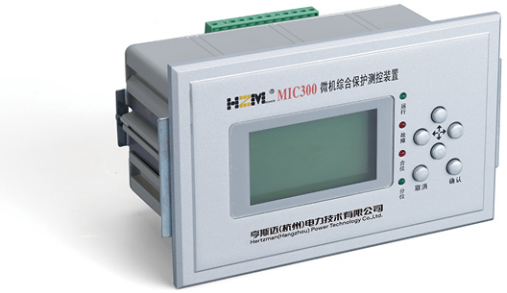
Metal Oxide Arrester with Composite Insulation
Rated voltage 17/12KV
Continuous Operation Voltage 13.6/9.6KV
Nominal Discharge Current 5KA



NXGEAR
Transformer Protection

Transformer Protection

NXGEAR's transformer protection adopts two methods: microcomputer protection and fuse protection.



MIC300 series protection measurement and control device

Microcomputer protection is suitable for circuit breaker V unit The m role of icrocomputer protection, monitoring and monitoring.
Transformer overload, short circuit and other fault protection, ground fault protection Installed in a low-voltage box, collecting signals through current transformers or sensors

Working power	ACIDC: 85~265V; can be specially customized DC24V, DC48V, etc.
Exchange volume collection	8-way, PT/4-way, and 8-way voltage in parallel; other protections are 4-way current, 4-way voltage
Switch value acquisition	8, which are defined non-electrical quantities, and are ordinary switching quantities after being turned off during protection switching.
Relay export	6, of which 2 are alarm/trip signal outlets.
485 communication port	1 channel, Modbus-RTU standard protocol.。
Anti-jump circuit	Not included

MIC300Protection setting

Serial number	Code	Fixed Name	Setting value	Setting value description	Remarks
00		Protection value sets	1~3	1	Normally 1
01	Kv1	Primary PT ratio/10	0.01~300.00	Set according to voltage level	If 10kV is set to 10
02	Ki1	Primary PT ratio/10	0.01~300.00	Transformer ratio/10	If 300/5 is set to 6
03	Idz0	Current speed cut-off value speed limit value	0.1~100A	Secondary rating 4-8 times	Less than the total load value of the superior
04	Idz1	Time-limited speed off delay	0.1~100A	Secondary rating 3-4 times	
05	Tzd1	Overcurrent setting	0~100s	0.20-0.40S	The incoming line delay is less than the previous level
06	Idz2	Overcurrent delay	0.1~100A	Secondary rating 1.5-3 times	Usually 2 times setting
07	Tzd2	Overload setting	0~100s	0.30-0.50S	The incoming line delay is less than the previous level
08	Idz3	Overload delay	0.1~100A	Secondary rated value 1-1.2 times	
09	Tzd3	Zero-sequence overcurrent stage 1 setting	0~100s	Usually the delay does not exceed 10S	The protection sampling can be set according to the requirements,
10	I0dz1	Zero-sequence overcurrent stage I delay	0.1~100A	10A/zero cross ratio	and the sampling does not exceed 7A
11	TI0zd1	Zero-sequence overcurrent stage II setting	0~100s	0.00-0.10S	shorter time
12	I0dz2	Zero sequence overcurrent stage II delay	0.1~100A	9-10A/ zero cross ratio	Protection sampling does not exceed 7A
13	TI0zd2	Zero-sequence overcurrent III section setting	0~100s	0.10-0.30S	longer time
14	I0dz3	Zero sequence overcurrent III segment delay	0.1~100A	8-9AJ/zero cross ratio	Protection sampling does not exceed 7A
15	TI0zd3	Zero sequence overcurrent setting	0~100s	0.30-0.50S	longer time
16	I0dz4	Zero sequence overcurrent delay	0.01~100A	6-8A/zero cross ratio	
17	TI0zd4	Line no voltage threshold	0~100s	Greater than 0.50S	Can be set upon request
18	Udz0	Line voltage threshold	0.00 - 120V	5-30V	Usually 30V
19	Udz1	Line No-Flow Threshold	0.00 - 120V	30-50V	The pressure value must be greater than
20	Idz4	Line flow threshold	0.00 - 6A	0.05 or more	the no pressure value greater than zero drift
21	Idz5	Prepared for automatic	0.00 - 6A	0.10-0.50 is better	Large load can be set above 0.1A
22	Btzd0	jumping into the line delay	0~100s	0.10-0.50 is better	Can be set upon request
23	Btzd1	Closing circuit breaker delay	0~100s	The default is 5S. If the closing time of the circuit breaker or load switch is long, the setting value is the actual closing	Can be set upon request
24	Tjx1	Check signal delay	1.00~20.00S	time plus 5S.	It is used when the self-switching protection drives the closing outlet.
25	TKZDX	Control loop disconnection delay	0~100s	10-20S	Usually no modification is required.
					higher than the switch contact closing time

NXGEAR

变压器保护 transformer protection

NXGEAR transformer protection adopts microcomputer protection mode.

The microcomputer protection is applicable to the overload, short circuit and other fault protection of transformer under the function of microcomputer protection, monitor–controlling and monitoring of circuit breaker in V unit. The grounding fault protection is installed in the low–voltage cabinet, and signals are collected through current transformers or sensors

MIC500 Series Protection and Monitoring Device

MIC500 is applicable to the line protection and measurement and control devices of ungrounded system, resistance grounding system and direct grounding system of the operating power system. It can be installed in a panel or locally in the low–voltage chamber of the V cabinet.

Protect information function

Remote viewing of device description.
Remote viewing of equipment parameter settings.
Remote viewing and modification of protection settings and area codes.
Remote viewing, remote controlling and local on/off functions of soft pressing plate status.
Remote view of device protection input status.
Remote viewing of device operation status (including the status of protective action elements, self–inspection alarm information, etc.).
Reset the device signal remotely

Communication function

Communication interface:
22–way Ethernet port
1–way 485 port
Communication protocol:
Network 103 communication protocol,
MODBUS RTU protocol.

MIC500 protection setting

Fixed value serial number	Fixed value name	Setting menu	Setting value ---setting reference
01	Quick break setting	0.1~100A	
02	Time limit quick break setting	0.1~100A	
03	Time limit quick break delay	0~100s	
04	Overcurrent setting	0.1~100A	
05	Overcurrent delay	0~100s	
06	Overload setting	0.1~100A	
07	Overload delay	0~100s	
08	Fixed value of 0 phase overcurrent section I	0.00~100A	The actual setting can`t exceed 6A
09	Delay of 0 phase overcurrent section I	0~100s	
10	Fixed value of 0 phase overcurrent section II	0.00~100A	The actual setting can`t exceed 6A
11	Delay of 0 phase overcurrent section II	0~100s	
12	Fixed value of 0 phase overcurrent section III	0.00~100A	The actual setting can`t exceed 6A
13	Delay of 0 phase overcurrent section III	0~100s	
14	0phase overcurrent setting	0.00~100A	The actual setting can`t exceed 6A
15	0 phase overcurrent delay	0~100S	
16	Overvoltage setting	50~600V	
17	Overvoltage delay	0~100s	
18	Low voltage setting	30~400V	
19	Low voltage delay	0~100s	
20	Current lockout low voltage setting	0 –100A	
21	Busbar insulation monitoring setting	0.1~100V	
22	Busbar insulation monitoring delay	0~100s	
23	Under frequency load shedding setting	35–64.99HZ	
24	Under frequency load shedding delay	0~100s	
25	Reclosing current free setting	0.1–5A	
26	Reclosing delay	0~100s	
27	PT disconnection delay	0~100s	
28	Control circuit disconnection delay	0~100s	

HiCVT electronic voltage sensor

Comply with IEC60044-8 standard
Matching connection with cable
pulling plug
Capacitive voltage divider technology
Collect three-phase voltage
Collect zero sequence voltage

Three-phase independent sensor
Configuring Low Voltage Signal
Modulators
There are no shortcomings such as
saturation, ferromagnetic resonance, and secondary
open circuit of electromagnetic transformers.
No fuse protection required Wide input range

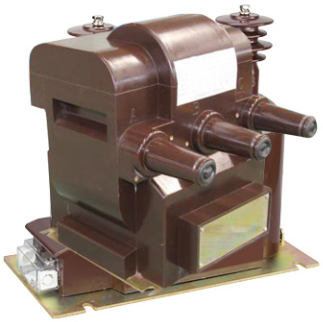
Voltage Indicator Adaptation Capacitor Parameter Table

Rated voltage class (KV)	Rated phase voltage				Adapted sensor capacity (pF)
	Working voltage (V)	Working current (UA)	Phase-to-phase Voltage when the phases between test points match (V)	Phase-to-phase voltage (V) when the phases etween the test points do not match	
3.6	80-100	117	<Ac30	> Ac60	185 (±15)
7.2	80-100	196			150 (±15)
12	80-100	250			115 (±15)
12	60-100	32-65			15-30
24	80-100	348			80 (±10)
40.5	80-100	330			45 (±10)

Parameter category	Technical indicators
Voltage level	10kV
Primary input voltage	10KV √3
Secondary output voltage	3.25V/√3(Phase voltage) 6.5V/3(zero sequence voltage)
Accuracy class (three-phase voltage)	0.5
Accuracy level (zero sequence voltage)	1
Rated frequency	50Hz
Insulation level (1min power frequency withstand voltage)	42kV
Lightning impulse withstand voltage (peak)	75kV
Partial Discharge	≤ 10pC 14.4kV
Executive standard	IEC 60044-7; GB/T20840.7-2007; GB/T20840.1-2010
Rated load	≥ 5MΩ

NXGEAR

Power collection and measurement



voltage transformer

Comply with GB/T20840.l and standard IEC61869–l, 3 standards

Electromagnetic induction single–phase Electromagnetic induction three–phase, Y/delta connection Pluggable Fuse protection Capacity optional 1KVA, 2KVA, 3KVA, etc.

Technical Data Sheet

Name	Unit	parameter	parameter
Structure type	–	Epoxy resin casting insulation type	
Rated voltage	kV	12	
Rated frequency	Hz	50	
Primary side voltage	kV	10	
Secondary side voltage	V	Busbar PT: $\frac{100}{\sqrt{3}}/\frac{220}{\sqrt{3}}/\frac{100}{\sqrt{3}}$	incoming line PT: 100/220
Rated Capacity	VA	busbarPT:30/300/100	incoming line PT:30/500
output capacity	KVA	1	1
impedance	–	15% (3kVA)	15% (3kVA)
precision	1v	busbarPT:1/3/3P	incoming line PT:1/3
Fuse Type	–	XRNP–12	XRNP–12
Rated current of fuse	A	1	1
PT cabinet group screen requirements	1) When the busbar PT adopts the Y/Y sequence port delta or VV wiring PT fixed form to be installed in an independent group cabinet, it is equipped with an isolating switch and a replaceable fuse. 2)The incoming line PT adopts two incoming lines and two groups of three–phase PT (optional VV wiring or YY wiring). When the fixed form independent group cabinet is installed on the upper and lower floors, the two groups of PTs are divided into two independent compartments, and the PT incoming cables are arranged in a dislocation with independent passage compartments. The secondary grounding wire can be separated (when one PT is overhauled, it will not affect the live running of the other PT). 3)The door of the incoming PT cabinet should be equipped with an observation window and an electromagnetic lock. If the PT is powered on, the cabinet door cannot be opened. If the PT is not powered, the cabinet door can be opened.		

NXGEAR

Power collection and measurement

Current Transformer

Comply with
IEC-60044-1
"Current Transformer"

Technical Data Sheet

S/N	CONTENT	UNIT	Three-phase CT parameters	Zero sequence CT parameters
1 2 3	Rated voltage Rated freq-uency Ratio	V HZ A	12 50 Entry and exit cabinet: 600/5 (protection,measurement) Distribution cabinet: 600/5 (protection), 200/5 (measurement)	12 50 100/5 or 20/1 (customized)
4	Accurate class combination	Iv	10P20 (protection), 0.5 Iv (measurement)	0-5 A error <=3% 5-60 A error <=5% 100/5:60A-600A error less than 10% The error changes linearly, and the secondary output is required to be >=3A 20/1: 60A~120A, and the error is less than 10%. The error changes linearly, and the secondary output is required to be >=3A
5	Capacity	VA	⩾ 2.5	When CT ratio is 20/1, ⩾ 0.5; CT transformation ratio ⩾ 2.5 at 100/5
6	Others	Configure three-phase protection CT, measuring CT and independent zero sequence CT, and independently collect three-phase current and zero sequence current The CT shall be of casing type, and the zero sequence CT shall be of through center or open type.		

Metering current transformer

S/N	Content	Unit	Data	
1	Voltage	kV	Rated voltage	10
			Maximum voltage	12
			Rated short-time power frequency withstand	42/30，（28）
			voltage (root mean square value)	75，（60）
2	Rated frequency	Hz	Rated lightning impulse withstand voltage	
3	Ratio	A	(peak)	
4	level of accuracy	pole	0.2S	
5	secondary load	VA	Rated load ⩾ 15, lower limit load 3.75	

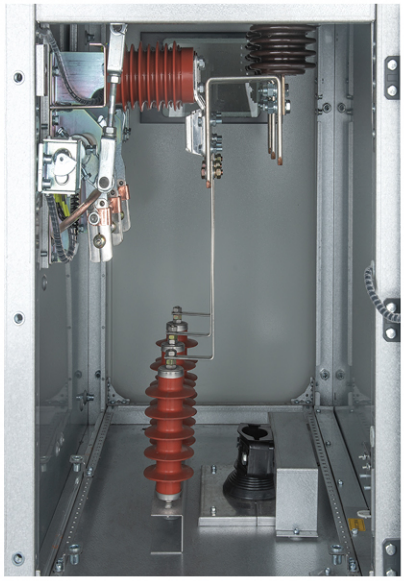
current sensor

Rogowski coil
Comply with
IEC60044-8 standard

There are no shortcomings such as saturation, ferromagnetic resonance,and secondary open circuit of electromagnetic transformers. Wide input range
Output 0-10mV signal

NXGEAR

Cable chamber and cable connection



Cable Compartment

The cable cabinet door can only be opened when the isolation is disconnected and grounded
Use matching M12 bolts
Standard cable bracket
Optional cable sealing plug
Optional cable door with infrared temperature measurement observation port
Single cable is applicable
Two cables are applicable
Three cables are applicable
Lightning arrester is configurable
Standard cable height: 550mm (from bushing center point to cable cabinet bottom plate)

Cables and cable accessories

7.2–17.5KV Copper core and aluminum core cables
Single cores, three cores
XLPE insulated cable, armored XLPE insulated cable
Cable accessories
Terminals

Charged Displays and Sensors

Comply with IEC61243-5 standard
Panel type live display
With 485 communication
Voltage indication
The live indicator has the function of electricity inspection and secondary phase verification, and the red LED flashes.

When the operating voltage is applied, the live indicator flashes to ensure that it is clearly visible in bright or dark environments, and reminds the staff to pay attention to the live equipment.
The output voltage is between 20V and 36V.
The live indicator can be replaced live.
The live indicator is a plug-in indicator light

cable fault indicator

Short circuit or ground fault indication
Short circuit or ground fault location
Ring network power supply and distribution network
Radiated power distribution network
Neutral grounding system

Internal three-phase composite ground Optional with cable temperature test
Optional models with 485 communication for distribution automation
Optional models with fiber optic communication for distribution automation.

Technical parameter

Applicable voltage level	6-35kV
Applicable load	0-600A
Applicable lead current	I ⩽ 1000A
Applicable wire path	25mm2 ⩽ d ⩽ 300mm2
Action response time	0.06S ⩽ T ⩽ 3S
Static power	⩽ 10μA
Action reset time	6、8、12、24、36hours optional
Use ambient temperature	-40℃⩽ T ⩽ 75℃
number of actions	> 4000 Times
Ground fault limit start value	50A(The specific number can be communicated with the manufacturer)
Short-circuit fault pickup value	800A

Electromagnetic lock

Operating power

System operating power

Depending on the needs of the system, NXRING can adopt various secondary control loop and operating mechanism power supply modes such as PT power supply, power distribution room DC power supply, power distribution room AC power supply, and distributed DC power supply.

DC power supply

Distributed direct current can be used as the power supply for the secondary control circuit of the switchgear and the operating mechanism.
DC220V, DC110V, DC48V and other DC voltage specifications.
The battery capacity can be configured according to the system requirements, commonly used are 20AH, 40AH and so on With charge and discharge power management function, with communication function The power module is installed in the upper space of the PT cabinet.

Standard battery pack and power module

Content	Unit	Parameters
Battery pack type or model		Lead-acid batteries
Battery rated voltage	V	48
Battery rated capacity	Ah	40
Power Module Instantaneous Power	W	500
Power Module Rated Input Voltage	V	AC220/DC48
Power Module Rated Output Voltage	V	DC48

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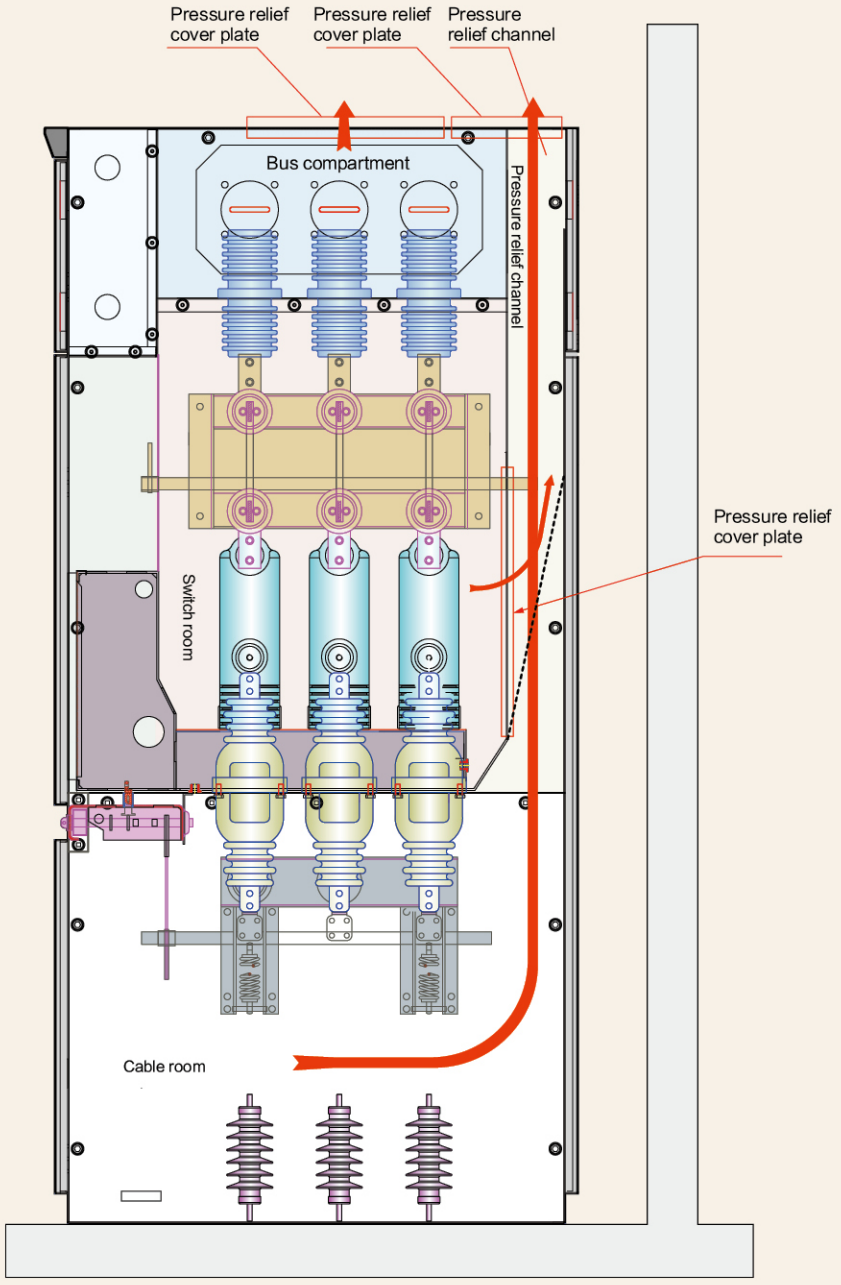
pressure relief channel

Conform to GB/T 3906 and IEC/EN62271–200

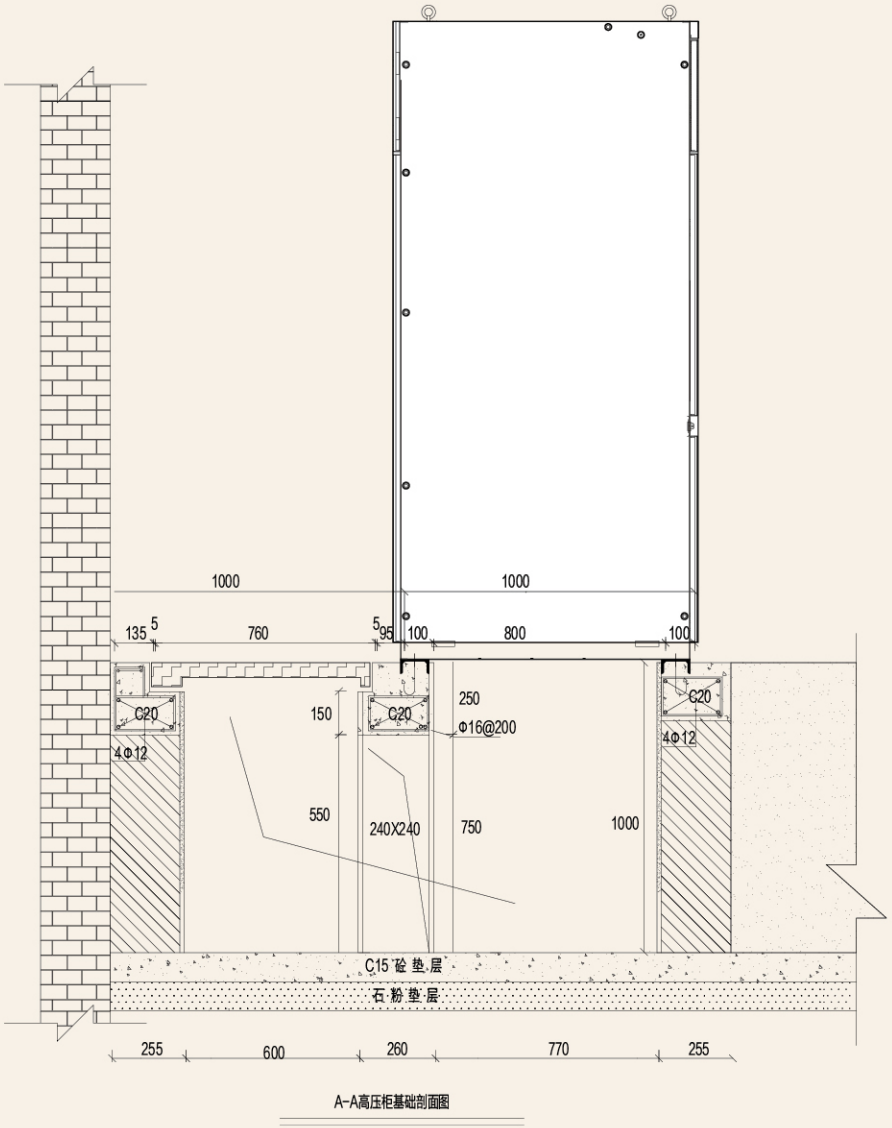
The pressure can be released upward through the pressure relief channel at the rear of the cabinet, and the pressure absorption device can be configured

The pressure relief channel is on the top of the switchgear, and the minimum height of the power distribution room

Height of switch cabinet	Height of power distribution room
2200mm	⩾ 2500mm



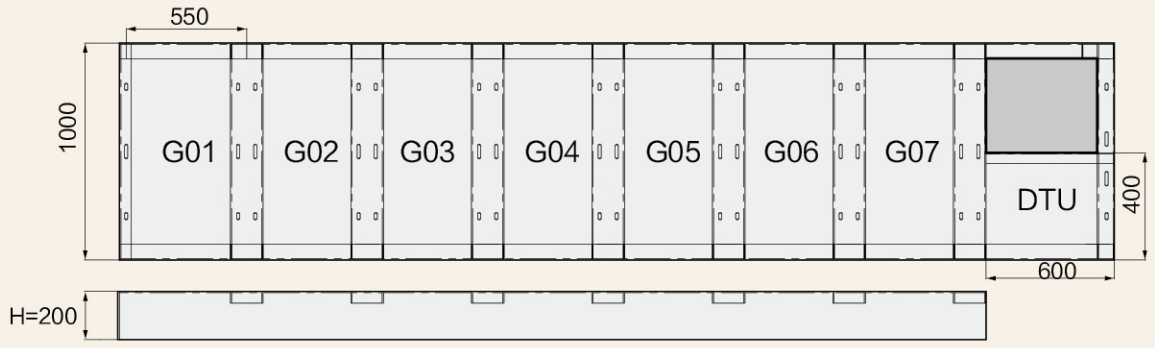
Installation dimension



A-A高压柜基础剖面图

Raised base

The switchgear can be equipped with an independent raised base to be used in field scenes without cable trenches or special occasions. The height of the base is H=200mm, 300mm, 400mm optional; special specifications can be customized when ordering.



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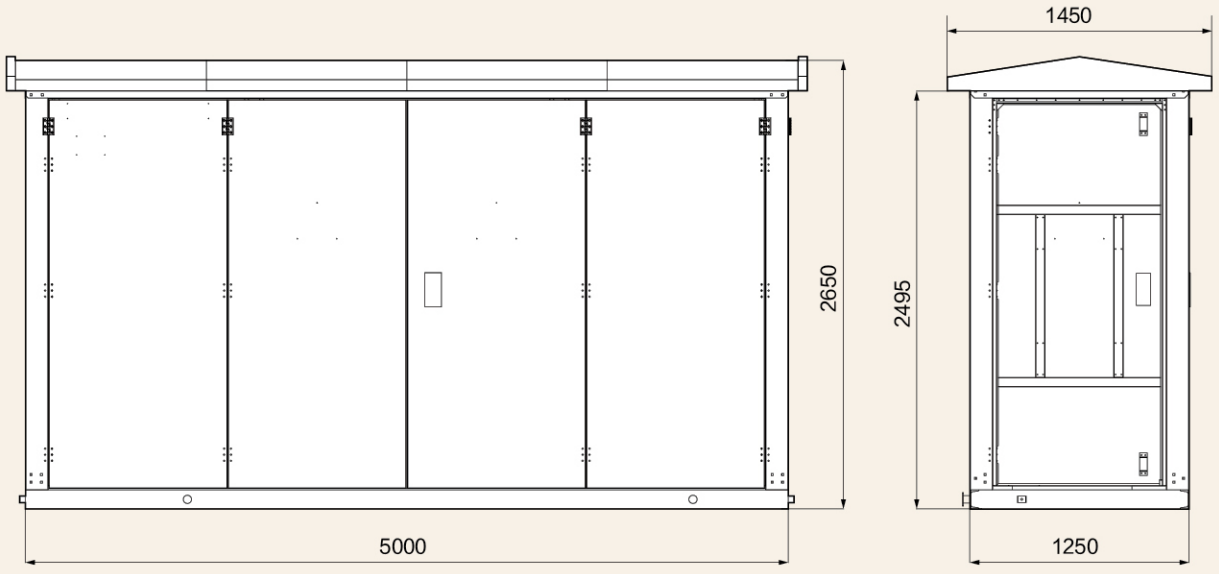
Outdoor box

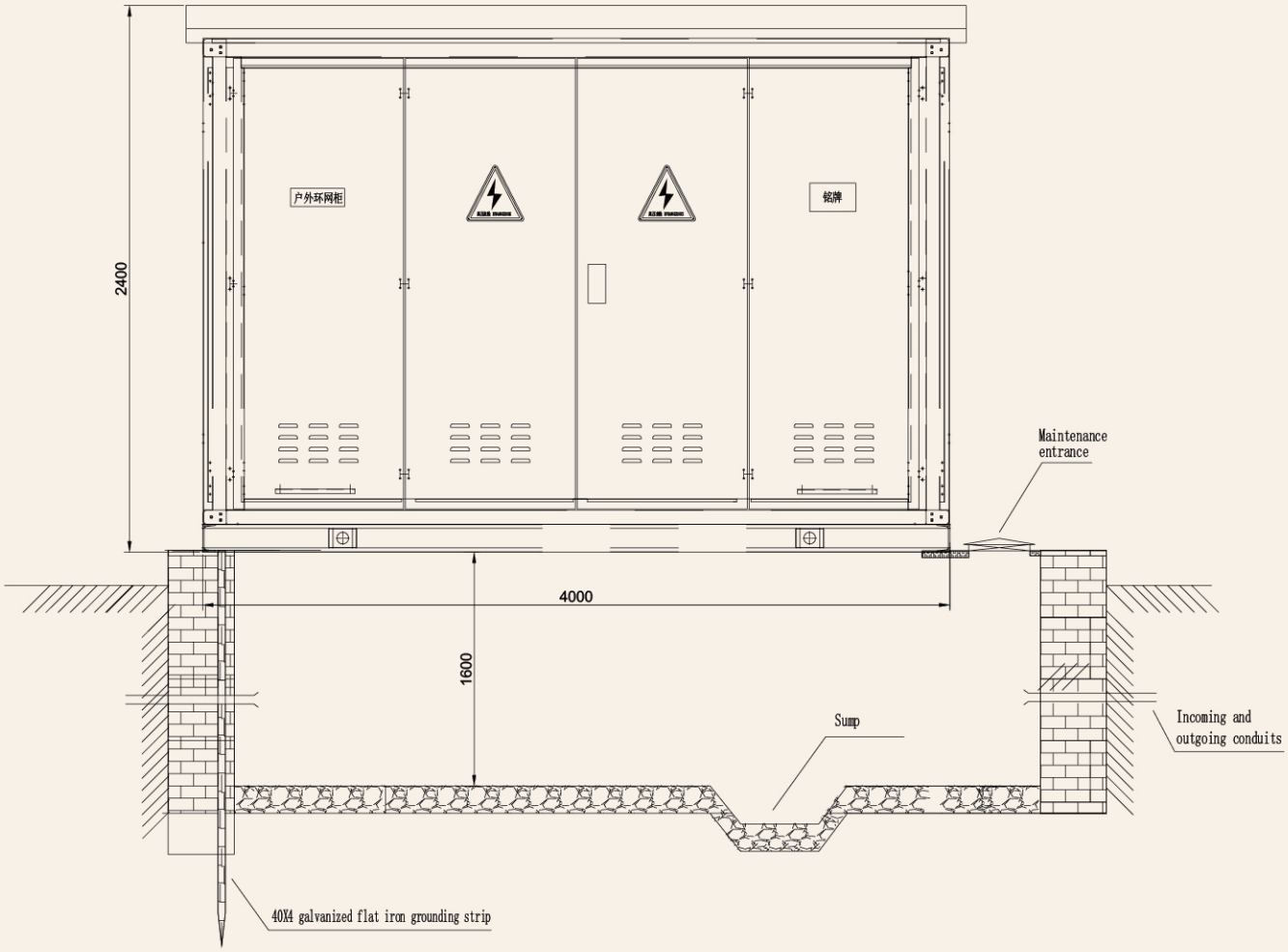
NXGEAR outdoor switch station is composed of NXGEAR gas-insulated switchgear and control equipment assembled with outdoor box. The box body can be made of stainless steel, aluminum-zinc-coated steel plate, SMC, GRC cement and other materials to meet the outdoor application requirements of weather resistance, corrosion resistance and high protection The box body process adopts the form of components, riveted or bolted. The overall protection level is IP4X A convection channel is set inside the box, which has the effects of heat insulation, cooling and ventilation.
Top cover design drainage slope ⩾ 3°
Optional cable sealing plug can effectively prevent moisture intrusion of cable trenches
Adopt outdoor special padlock, optional smart padlock
Easy to hoist and install

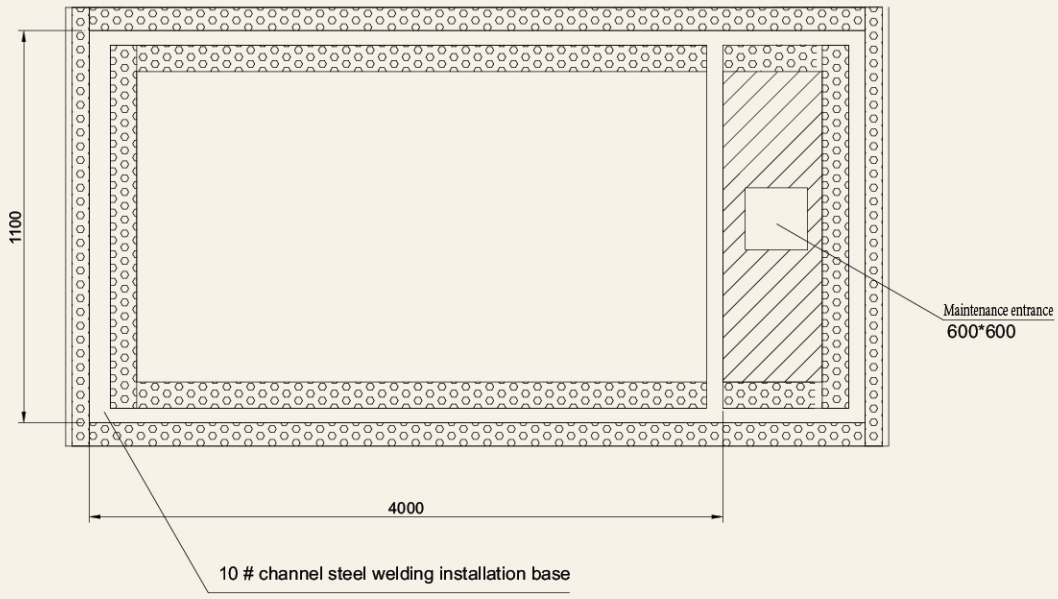
Common size of outdoor switch station



Outdoor box width: The sum of the width of a single ring network cabinet + DTU width (standard 600mm) + reserved space (400mm)
Outdoor box height: <2650mm
Outdoor box depth: 1250mm

Basic diagram of outdoor box



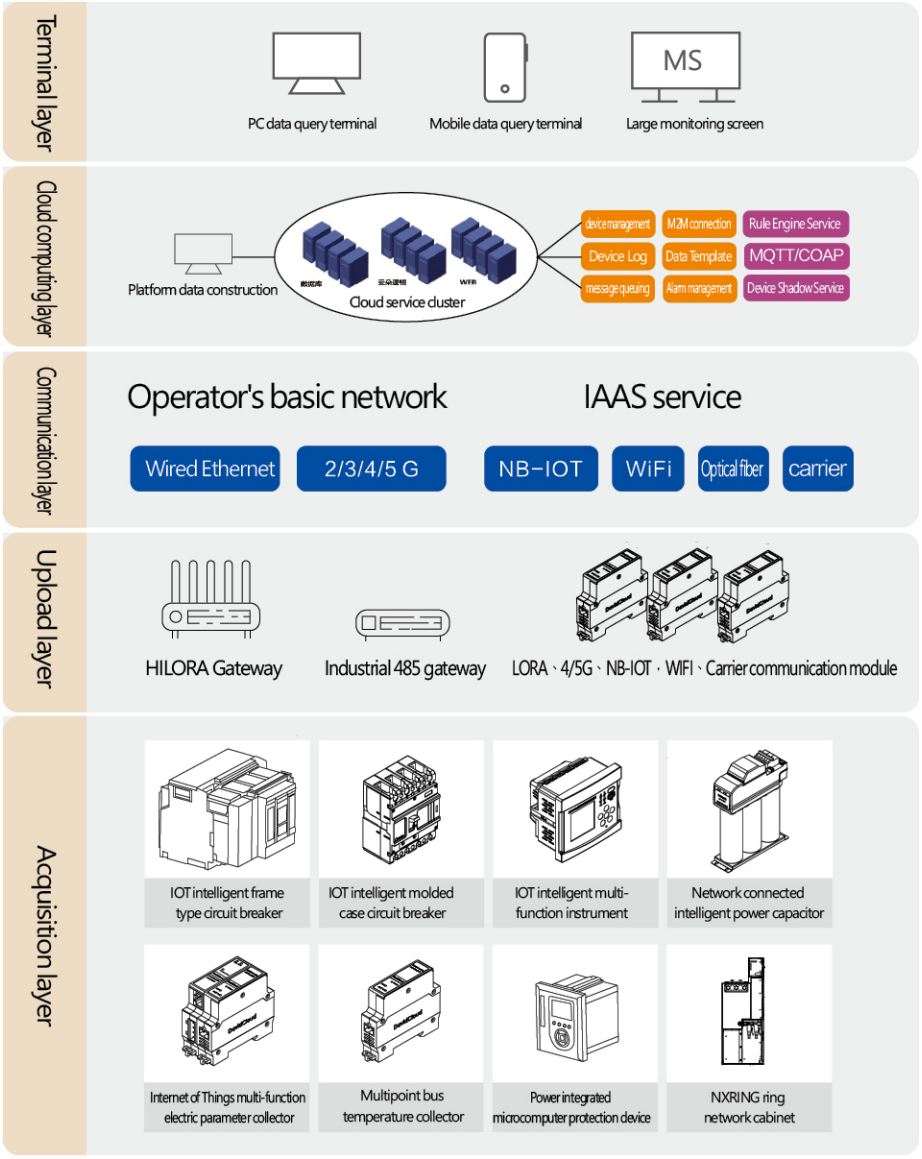


NXGEAR

Smart Power Distribution Solution

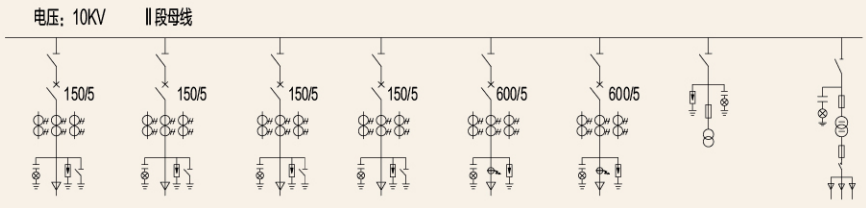
DAVID CLOUD intelligent power distribution management platform based on IoT technology and cloud computing

DAVIDCLOUD power generation and maintenance cloud intelligent operation and maintenance system is an overall package solution for intelligent operation and maintenance of power equipment based on Internet of Things technology, cloud computing technology and edge computing technology. It adopts wireless transmission physical sensor and wireless transmission power collector. The data is collected and calculated by the edge computing terminal and communicated to the cloud computing
center. Taking the DAVIDCLOUD system of the cloud platform as the operation center, through the application of professional operation and maintenance knowledge and the implementation of service capabilities, the overall security reliability and operation efficiency of equipment and systems are improved. NXRING is the main component of medium voltage power distribution of DAVIDCLOUD power generation and maintenance cloud intelligent operation and maintenance system.

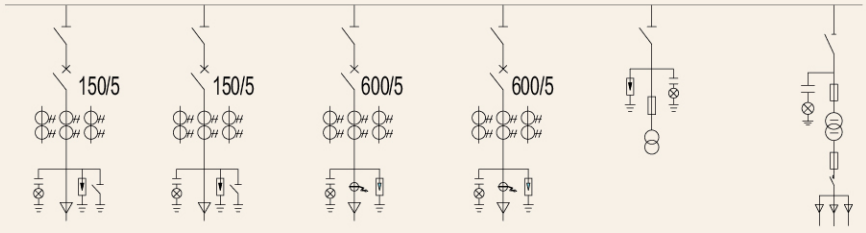


Typical project application

Application of Double Circuit System in 10KV Substation of Commercial Center



Application of six circuit secondary distribution switching station system



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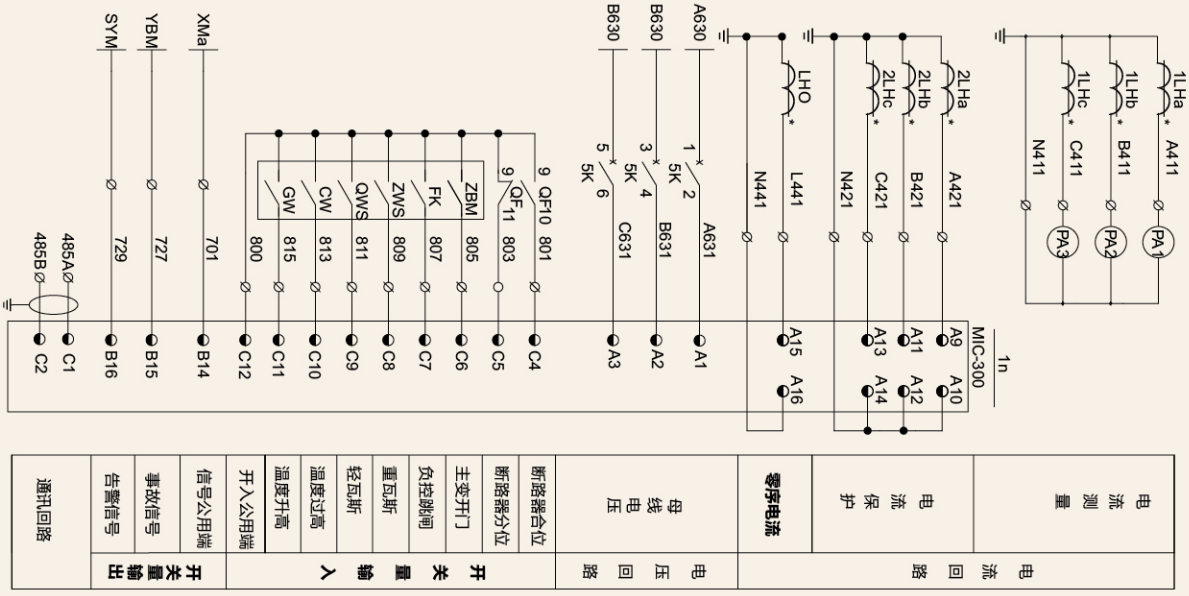
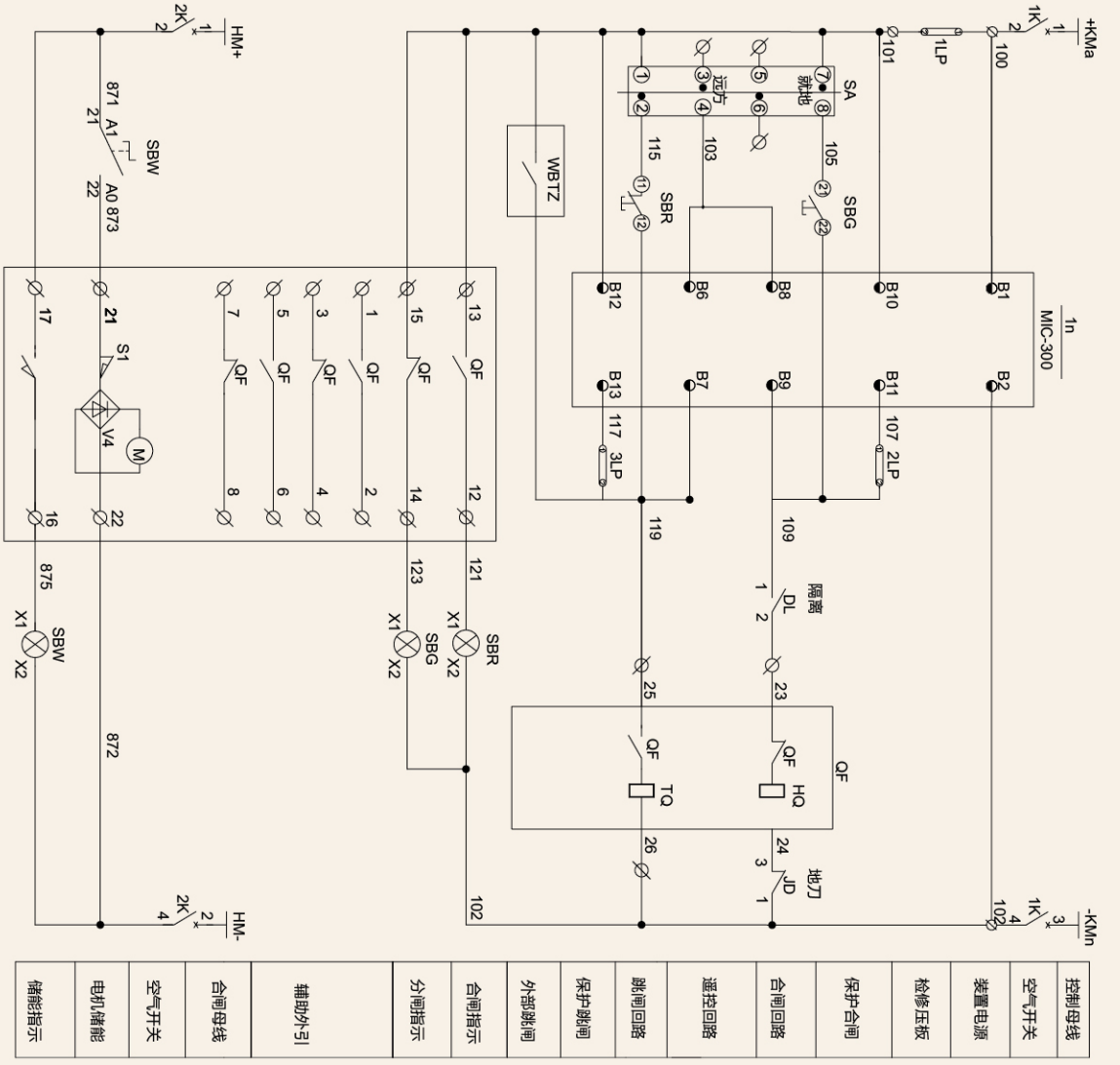
Typical secondary schematic diagram





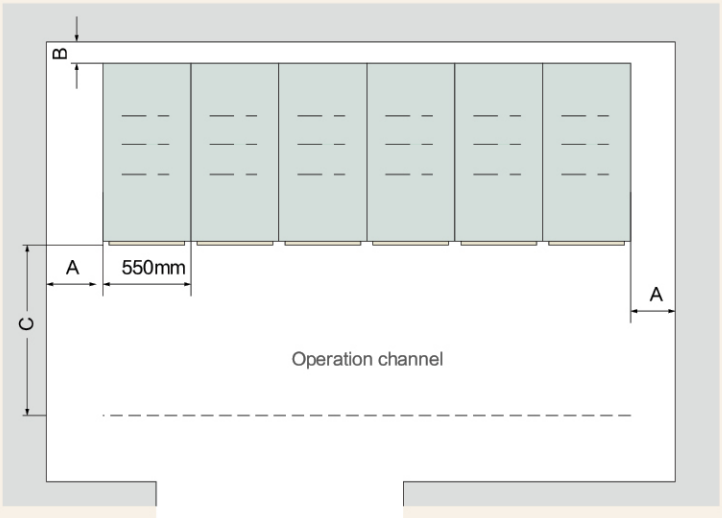
NXGEAR

Install

The construction of qualified personnel with professional skills shall comply with the relevant provisions of the Technical Code for Construction and Acceptance of Electric Power Construction.
The switchgear is installed on the installation steel components, which can be assembled and welded by angle steel, channel steel or square steel. The components are embedded in the civil concrete. The finished concrete floor (or ceramic tile) should be 3–5 mm lower than the installation components of the switchgear. The completed installation components should meet the horizontal standard of ± 1mm/m2.
When the cabinet is arranged in a single row, an operation channel no less than 1.5m shall be reserved in front of the cabinet. When the double row is arranged opposite to each other, an operation channel no less than 2m shall be reserved in front of the cabinet.

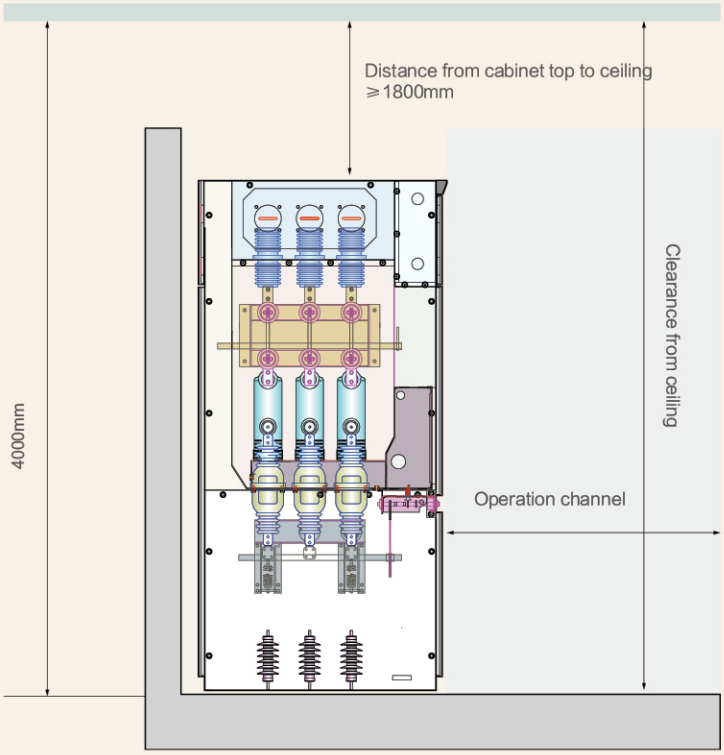
NXGEAR installation space

vertical view



Distance between functional unit and wall

	Functional unit and distance		spacing(mm)
A	Side plate of end cabinet and Distance between walls		500
B	When installing against the wall Back plate and wall Distance between	Back up pressure relief	300
C	Channel in front of cabinet		> 1500mm



Minimum operating clearance channel in front of the switch cabinet when the switch cabinet is against the wall (m)
Single row layout ≥ 1.5m
Double row face–to–face arrangement ≥ 2.0m
Double row back–to–back layout ≥ 1.5m

Maintenance

Inspection

The inspection work is to patrol the switchgear under normal operation conditions, and the switchgear does not need to be powered off.
Whether the voltage and polarity of control power supply and energy storage power supply are normal.
Whether the status and position indicators of the circuit breaker, grounding knife status indicators and other indicators are normal.
Whether the indication of current meter and voltmeter are correct.
Whether the power indicators of the protection relay are normal
Whether all pre-alarm or alarm indicators are normal.
Whether there is abnormal sound, odor, glow, etc. in the switch cabinet.
Check whether the heater power supply and its indicator in the cabinet are normal.
In case of the above abnormal phenomena, please analyze the causes in time, eliminate the fault or replace the components.
Whether there is partial discharge trace on insulating parts
Whether there are traces of leakage current on insulating parts

Maintenance

Safety measures: when the switch cabinet is powered off for maintenance, it is necessary to isolate the area where the work is to be carried out and ensure that the power supply will not be switched on again. Grounding work should be done well and special personnel should be assigned for supervision.

Open the main busbar cabinet and check the fastening of each connecting bolt
Check whether the main bus and branch bus are damp and rusty.
Check whether the side plates are damp and rusty.

Check whether there are sundries in the main busbar cabinet.
Check the fastening and surface condition of the static contacts
Open the cable cabinet and check the cable connections
Check the sealing of primary and secondary cable holes.
Check whether the heaters heat normally.
Check whether there are sundries in each compartment.
Check whether the secondary wiring of current transformer is tightened.
Check the current terminals in the low-voltage compartment to ensure that the secondary current circuit is not open, and ensure that the secondary loads of current transformers such as protective relays, ammeters, and watt hour meters are put into use.
Carry out single drive and overall drive for each switch cabinet.
Check whether various functions of the protection relay are normal
Verify that the intermediate relay coil is intact and the contacts are normal
For lubricating grease on sliding parts and bearing surfaces in the cabinet, please refer to the operation manual of each switchgear.
Remove the pollutants in the cabinet, especially the surface of each insulating material
Check whether the secondary wiring of the terminal is loose

NXGEAR

Environmental protection and service

Environmental Protection

- Environmental protection design to reduce the impact of products on the environment
- No greenhouse gases
- Strengthen environmental management and environmental safety
- Provide renewable energy support and promote green and clean energy
- Reduce material and energy consumption during manufacturing
- Meet the requirements of all ecological environments during use

- Follow the ISO14001 standard environmental management system throughout the life cycle
- Materials with known chemical hazards and environmental hazards are not used in the manufacturing process
- End of product life cycle, and some materials can be recycled
- The product life cycle ends, and some non-recyclable materials are harmless to the environment
- The product has no fluid material
- The metal is recyclable
- Thermosetting plastics and thermoplastics
- No-toxic materials

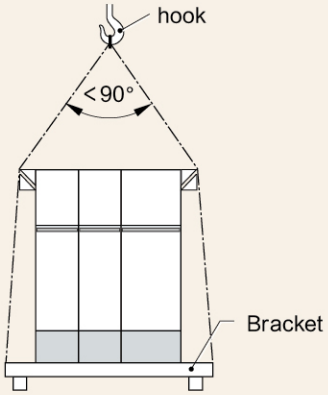
Recycling and disassembly

Type	Recycling main body	Mode
No gas	No-recycle	Not handle
Steel and stainless steel	Local renewable resources company	Chopping, sorting and recycling
Non-ferrous metals	Local renewable resources company	Chopping, sorting and recycling
Epoxy resin	Local renewable resources company	General solid waste treatment
Thermoplastic	Local renewable resources company	Recycling for secondary use
Protective equipment	Local renewable resources company	Recycle and destroy
Cable	Local renewable resources company	Jacket and wire separation

Services and upgrades

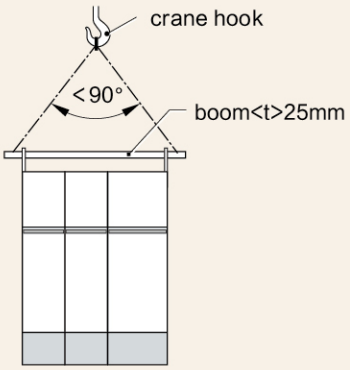
Provide life-cycle services
consulting service
Design
install
test
Put into operation
inspect
maintain
repair
replace
recovery
NXGEAR can upgrade the configuration of DAVIDCOULD intelligent distribution management system
Remote operation and maintenance software and services of

shipment



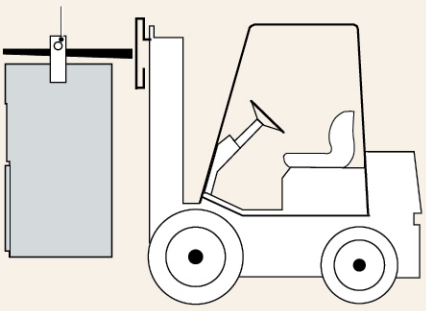
Lift with pallet

vertical handling
When transporting by forklift, it must be transported with a bottom bracket
When hoisting, the sling angle is less than 90°
Do not directly lift the spliced switchgear

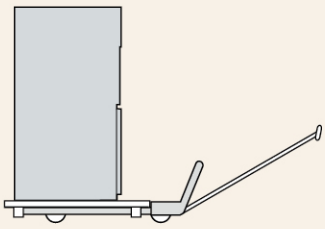


Lift with boom

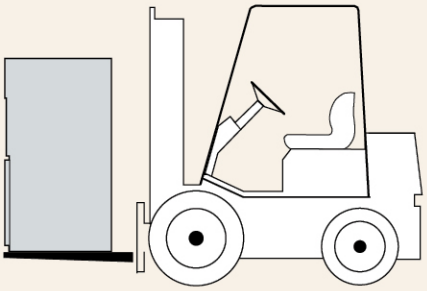
Boom 中25mm
（Pay attention to the weight of the switch cabinet and the counterweight of the forklift）



Suspended Forklift Handling



Manual forklift handling



Forklift handling

Storage

The following situations are strictly prohibited：
roll over
upside down
vibrate
Fire source
stacking
rain
moist