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R-AIR

Atmospheric Sealed Air Insulated 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.

R-AIR

Atmospheric Sealed Air Insulated Switchgear

The commissioning of atmospheric sealed air insulated switchgear is Huntsman's self-challenge to its own business and technology level, and is Hertzman's phased achievement in striving to achieve the concept goal of "non SF6" for medium voltage power distribution equipments.

R-AIR atmospheric sealed air insulated switchgear is a fully insulated &fully enclosed switchgear that uses clean dry air as the insulating medium, uses vacuum arc extinguishing as the arc extinguishing method, and has been type tested.

R-AIR atmospheric sealed air insulated switchgear not only meets the basic needs of power users for the safety, reliability and continuity of power equipment, but also provides users with new value in compact, intelligent and environmental protection; It is suitable for public distribution network primary and secondary distribution stations, intelligent buildings, industries, infrastructure and other occasions.

Characteristic

Environmentally friendly design

The treated dry clean air is used as the insulating medium, and the electrical clearance in the cabinet is 125mm to ensure the electrical performance and compliance.

Fully insulated and fully enclosed design

The main primary electrified devices and components are enclosed in the stainless-steel welded gas cabinet, completely eliminating the contact of personnel and preventing the impact of dust, moisture, foreign matters, small animals, etc. It has the design of atmospheric fully enclosed and fully sealed gas cabinet, which can be used in high altitude areas. The design of the air cabinet with pressure relief valve and the high-strength armored outer sheet metal cabinet with pressure relief channel ensures the safety of operators.

High altitude adaptive design

There are two kinds of air cabinet pressure design, namely, atmospheric and 150KPa. According to the needs, the design mode with pressure can be selected in high altitude areas.

Large current redundancy design

Combined application of 1250A/25KA and 630A/25KA should be more leisurely for high-capacity systems.

High reliability design

The driving form of the steel spindle of the circuit breaker ensures the stability of the mechanical characteristics of the circuit breaker in the whole life cycle. The operating mechanism with a mechanical life of 20000 times ensures the high reliability of the overall switchgear.

Compact design

The width of standard circuit breaker cabinet is 460mm, which can easily meet the requirements of switching posts or other compact applications.

Multiple expansion mode design

Side expansion and top expansion, shared air cabinet and independent air cabinet and other various expansion and combination modes can better adapt to various electric field combinations.

Intelligent design

The intelligent control system and sensors are combined and applied, and the communication function of the device could be used to connect with the DAVID CLOUD system based on Internet of Things technology and cloud computing, or with other systems required by users.


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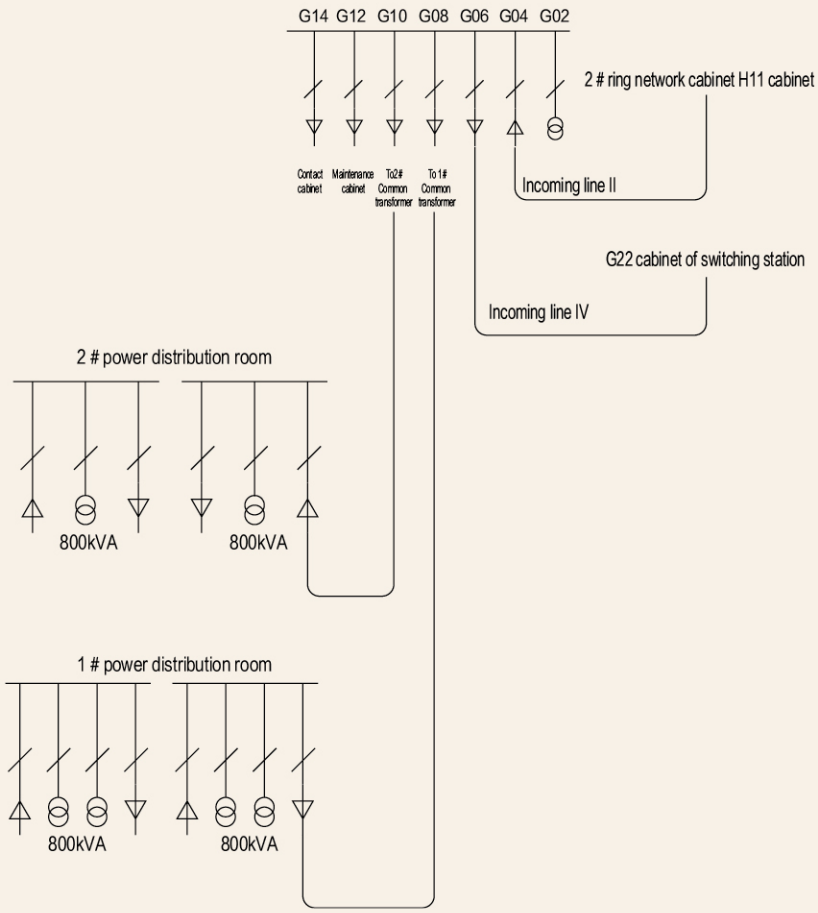
Application

Power distribution and protection functions of transformers

Transformer Protection Function of Circuit Breaker Scheme Combined with Microcomputer
Application of prefabricated cabin type substation and prefabricated cabin type substation

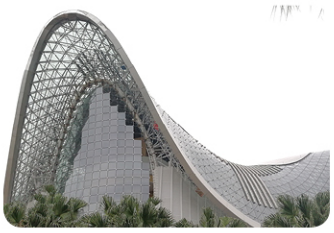


Application Site

It is applied to secondary distribution of public distribution grid, infrastructure, photovoltaic new energy, industry, fan tower, offshore oil platform and other fields.

Compact secondary substation

Wind power generation

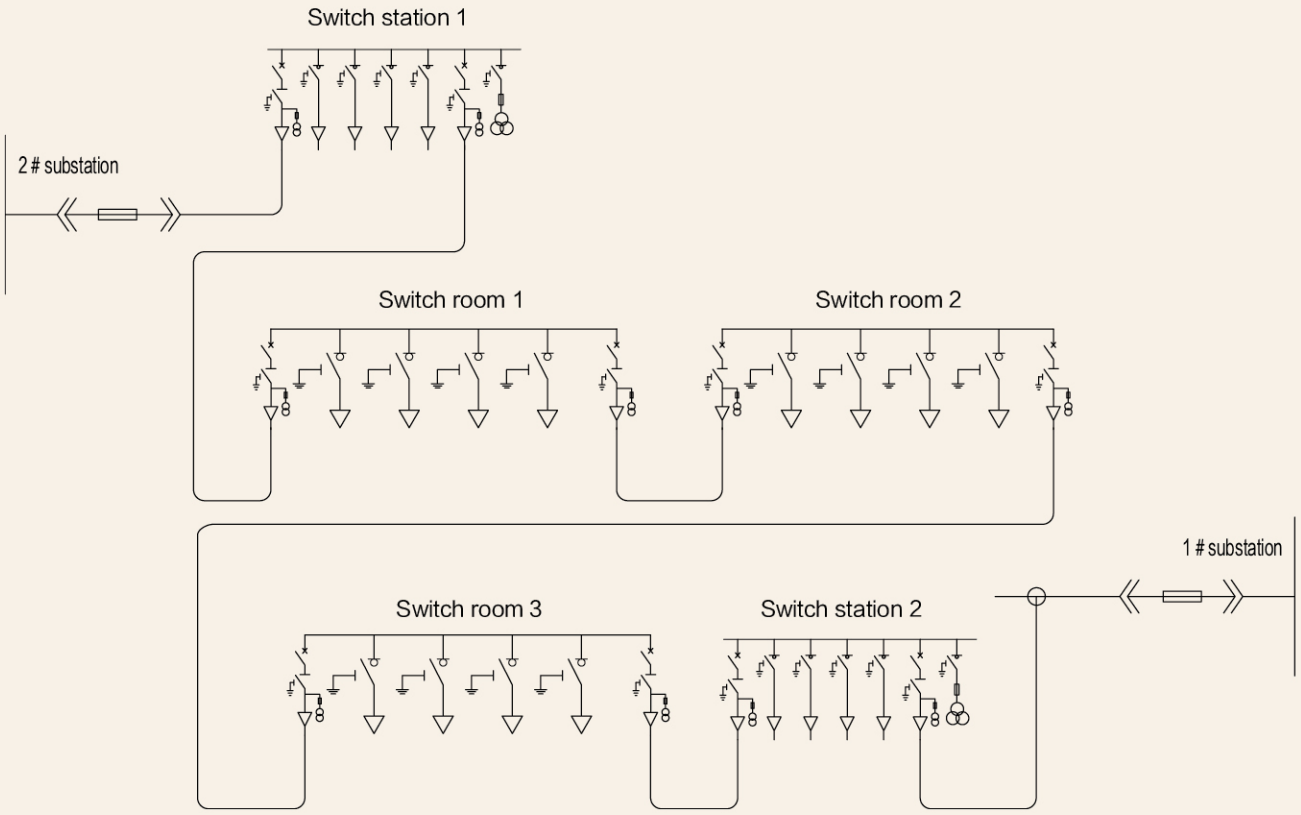


Hotels, business centers and office buildings

Metro

Line distribution function of secondary distribution network

Secondary distribution function of tree power supply and ring network power supply
Segmentation, recovery and isolation functions of distribution network automation
Switching post
Cable branch box with switches



R-AIR
Standard

Product quality standards and management

ISO Quality Assurance System
Advanced technology and process
Robot welding process and air tightness test
Switch running in and switch characteristic detection
Insulation test
Partial discharge test
Resistivity test

Relevant standards

R-AIR conforms to Chinese National Standards and IEC related standards, including but not limited to the following
Design and manufacture of switchgear
Breaking, isolation, insulation and partial discharge performance of switchgear

- Transformer
- Low voltage control equipment
- Power supply equipment
- Cables
- Conductor
- Fuse link
- Graphics and symbols
- Testing
- Electrotechnical 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

R-AIR conforms to existing Chinese National Standards and IEC standards

Project	IEC Standards	GB/T Standards
Switchgear Equipment	IEC 62271-1	GB/T 11022
	IEC 62271-200	GB/T 3906，DL/T 404
Earthing switch	IEC 62271-102	GB/T 1985
Isolating switch	IEC 62271-102	GB/T 1985
Circuit 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
Protection against accidental contact, foreign matter, water and degree of protection	IEC 60529	GB/T 4208

Operating conditions

Indoor	Satisfied IEC62271-1,GB/T11022-2011
Ambient air temperature	Maximum 40 ℃ Minimum -25 ℃
Humidity：	Not more than 95% (daily average
Condensation level：	Class Ch
Altitude	The design specified altitude of insulation level shall not exceed 3000m
Environmental pollution level	Grade C
Earthquake resistance	Magnitude 8

The following service conditions and environments shall be informed and negotiated with the manufacturer
Above 3000 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

Parameter

Table of Technical Parameters (Common Parameters of Ring Main Unit)

Name		Unit	Standard parameter
Rated voltage		kV	12
Insulating medium			Dry air
Type of arc extinguishing chamber			Vacuum
Rated frequency		Hz	50
Rated current		A	630/1250
Temperature rise test current			1.1Ir
Rated power frequency withstand voltage 1min (phase to ground)		kV	42
Peak value of rated lightning impulse withstand voltage (1.2/50s) (phase to ground)		kV	75
Rated short-circuit breaking current		kA	20/25
Rated short-circuit making current		kA	50
Rated short-time withstand current		kA/s	20/4
Rated peak withstand current		kA	50
Arc current and arc duration time		kA/s	⩾ 20/0.5
Breaking times under rated active load		次	100
Short time power frequency withstand voltage of auxiliary and control circuits		kV	2
Control power	Control loop (independent)	V	DC 48/DC110
	Auxiliary circuit	V	DC 48/DC110
	Energy storage circuit (independent)		DC 48/DC110
Service life		year	⩾ 40
Degree of protection	Cabinet enclosure		IP4X
	Air Cabinet		IP67
Operator configuration			Electric motor operation, with manual operation function
Spare auxiliary contact		pair	6 Dynamic closing 6 Dynamic opening
Automated configuration			Distribution automation interface

R-AIR

Cabinet type design

Cabinet type structure

Cabinet type structure characteristics

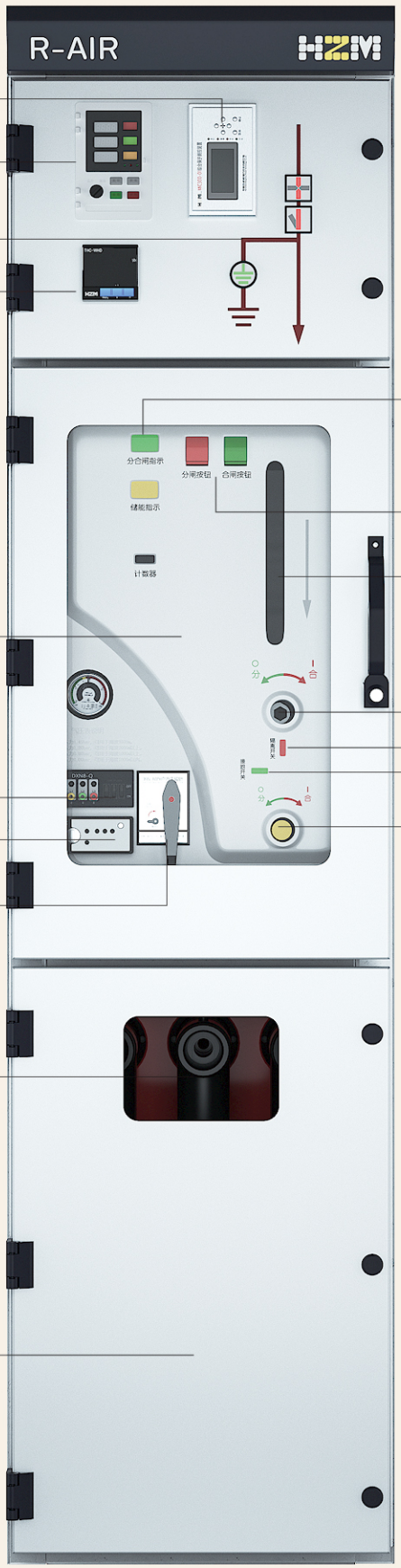
High strength armored assembly structure is adopted, and the aluminum zinc coated steel plate is precision processed by CNC process

Double protections of circuit breaker panel and protective door panel

Cold rolled steel plate and plastic spraying surface treatment process for the cabinet door panel. The cabinet door adopts a double-layer dust-proof process with sealing

The enclosure protection grade is IP4X, and the air chamber grade is IP67

R-AIR
interface



Microcomputer protection

Instrument/control

Low voltage chamber panel indication

Temperature and humidity controller

Switch chamber

Charged display

Cable fault indicator

Electromagnetic lock

Observation window

Cable chamber

Circuit breaker status indication

Manual opening/closing button
of circuit breaker

Circuit breaker/load switch
energy storage handle

Disconnector operating hole

Disconnector status indication

Status indication of grounding switch

Operating hole of grounding switch

Operating hole of grounding switch

Cable chamber interlock

Circuit breaker and isolation interlocking device

Isolation and grounding interlocking device

Cable fault indicator

R-AIR
Compartment

Air chamber

Adopted 3mm S304 stainless steel plate
Robot welding process
Gas tightness guarantee after helium inspection
Protection grade of IP67
Dry clean air with moisture content ⩽ 250PPM
Spindle sleeve with double sealing structure
With pressure relief flange device

Low voltage chamber

With 360 &450 size
Degree of protection
Control
Secondary channel
Small busbar channel

R-AIR
Mechanical interlock

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

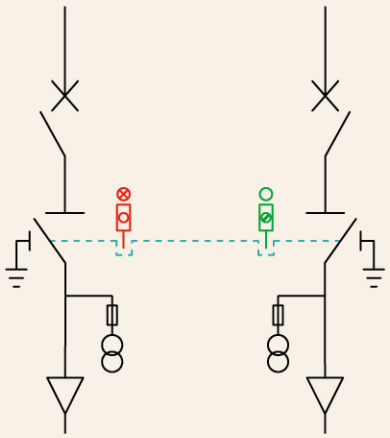
C–LOCK key interlock device
R–AIR can be equipped with C–LOCK key interlocking device to realize functional interlocking of the system.
The load switch (circuit breaker) is interlocked by two locks and one key. Cabinet A and cabinet B are equipped with key interlocking devices respectively, but one key 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

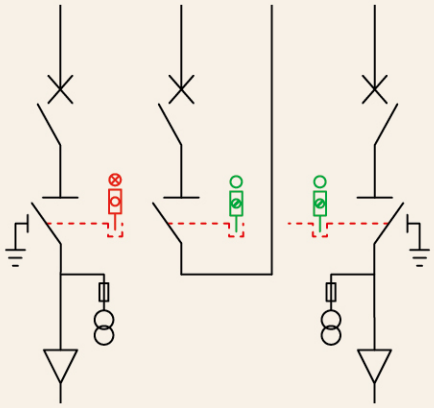
V circuit breaker cabinet
Interlocking of two incoming lines (two locks and one key)

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.



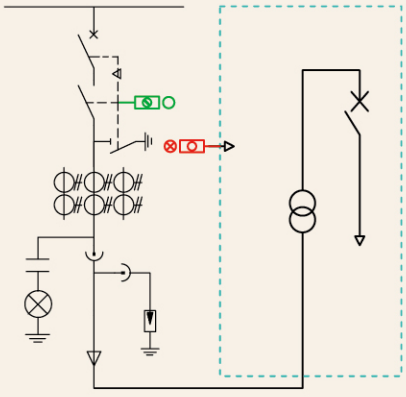
V circuit breaker cabinet
Two incoming lines+contact cabinet interlock (Three locks and two keys)

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.



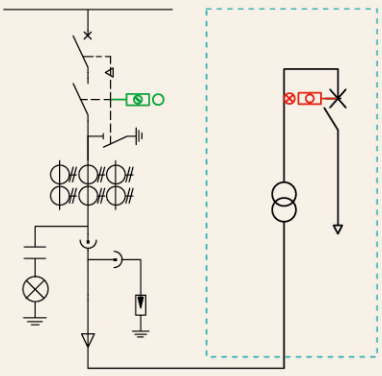
Locking transformer door of circuit breaker cabinet (two locks and one key)

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)

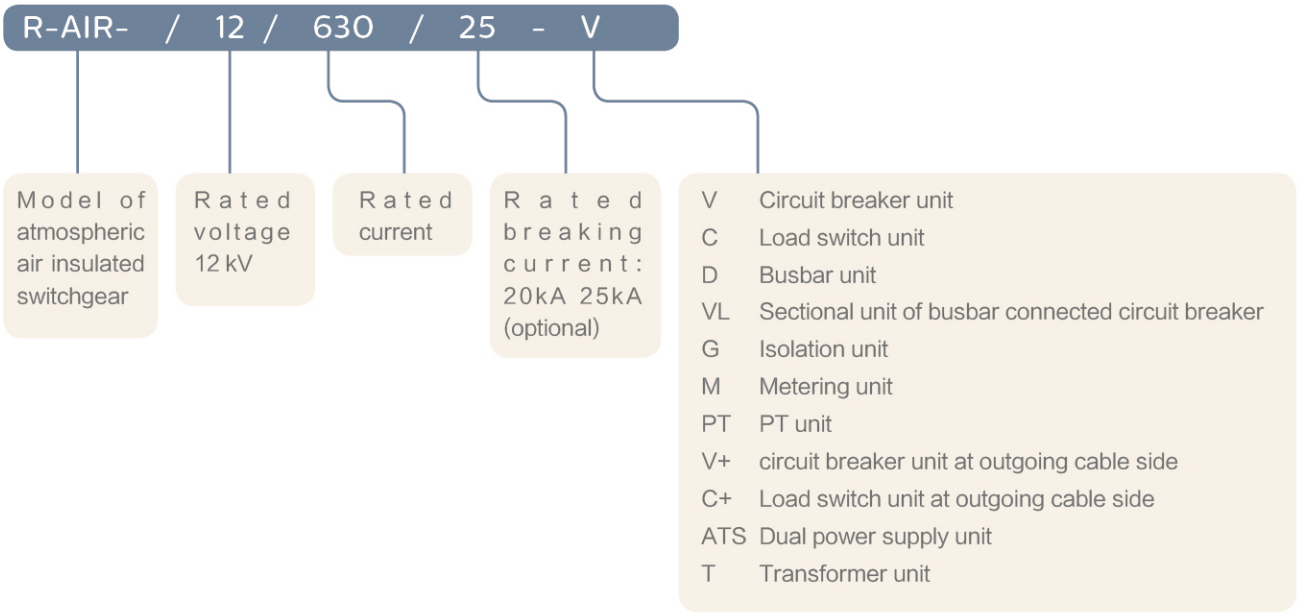
When the circuit breaker at the low–voltage side is disconnected, turn the key to lock the low–voltage circuit breaker position. After the key is taken out to prevent reverse power transmission at the low–voltage side, the high–voltage side disconnecting switch can be operated.



Keyless equipment locking status
Unlock status of keyed equipment

R-AIR
Model definition

Model definition



R-AIR standard unit

V	Circuit breaker unit
C	Load switch unit
D	Busbar unit
VL	Sectional unit of busbar connected circuit breaker
G	Isolation unit
M	Metering unit
PT	PT unit
V+	circuit breaker unit at outgoing cable side
C+	Load switch unit at outgoing cable side
ATS	Dual power supply unit
T	Transformer unit

R-AIR
standard unit

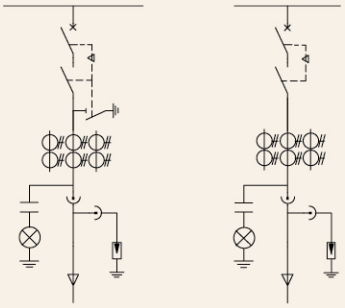
Standard configuration

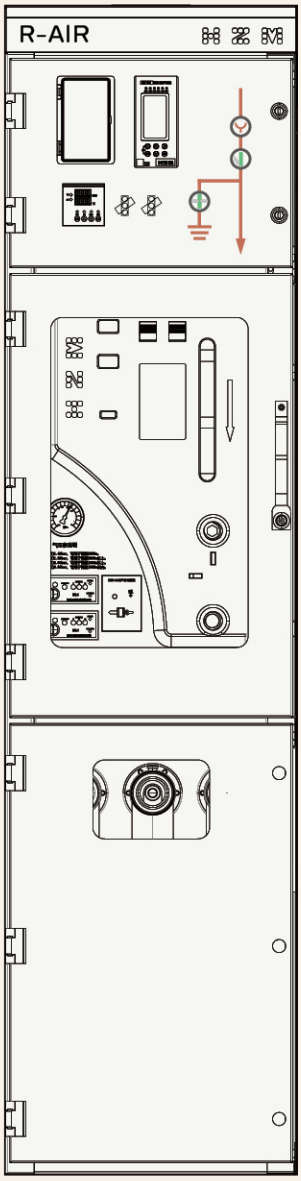
Standard 460mm cabinet
1250A/630A Vacuum circuit breaker
Three positions grounding/disconnecting switch
Modular two in one electric operating mechanism
Live display sensor/bushing
Transformer
Live display
Side expansion insulated busbar
Grounding busbar

Optional configuration

500mm Cabinet
Microcomputer protection device
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Current sensor
Cable termination
Arrester
Top expansion insulated busbar
Cable sleeve with temperature sensor
Metering transformer and watt hour meter
Measuring transformer and ammeter
Heighten Low voltage chamber
Air pressure gauge (selected for using at an altitude of more than 1000m)

Circuit breaker unitR-AIR/V





R-AIR
standard unit

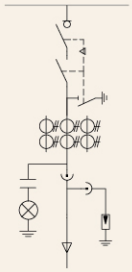
Standard configuration

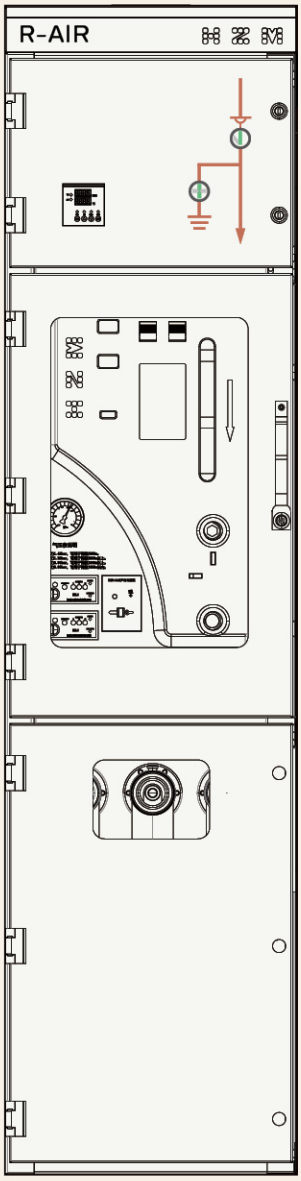
Standard 460mm cabinet
1250A/630A vacuum load switch
Three position grounding/disconnecting switch
Modular two in one operating mechanism
Live display sensor/bushing
Live display
Side expansion insulated busbar
Grounding busbar

Optional configuration

460mm Cabinet
Electric operating mechanism
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Transformer
Cable termination
Arrester
Top expansion insulated busbar
Cable bushing with temperature sensor
Heighten Low voltage chamber
Air pressure gauge (selected for using at an altitude of more than 1000m)

Load switch unit R-AIR/C





R-AIR
standard unit

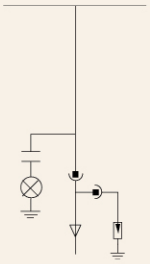
Standard configuration

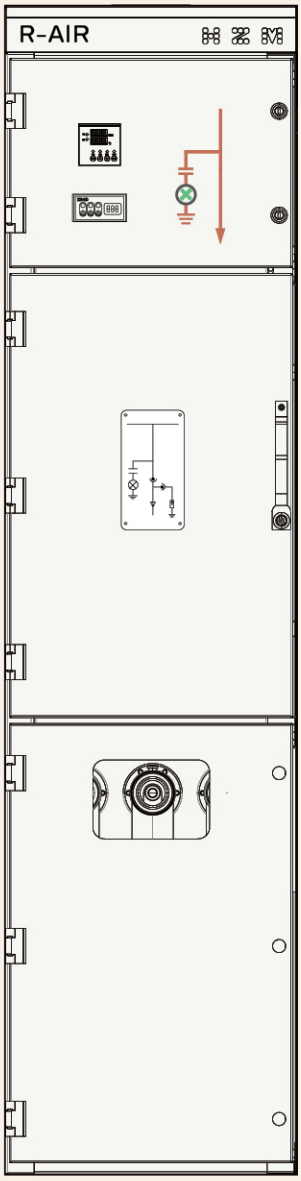
Busbar
Live display sensor/bushing
Live display
Side expansion insulated busbar
Grounding busbar

Optional configuration

Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Current sensor
Cable termination
Arrester
Top expansion insulated busbar
Cable bushing with temperature sensor
Heighten Low voltage chamber
Air pressure gauge (selected for using at an altitude of more than 1000m)

Busbar unit R-AIR/D





R-AIR
standard unit

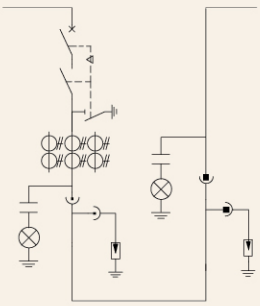
Standard configuration

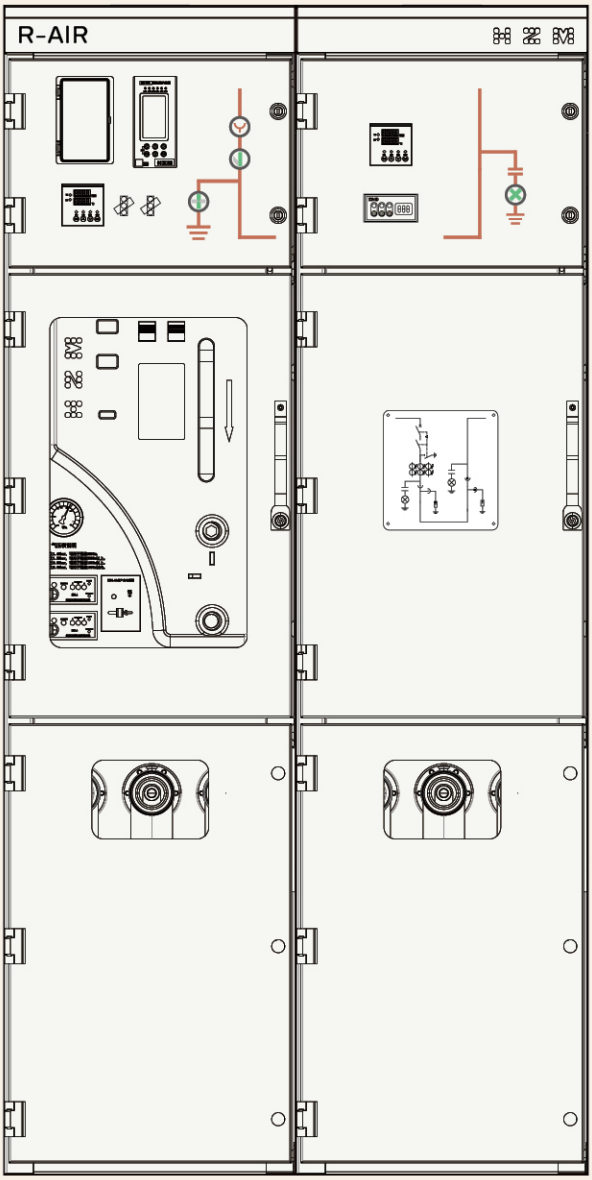
Standard 2 * 460mm Cabinet
1250A/630A Vacuum circuit breaker
Three positions grounding/disconnecting switch
Modular two in one electric operating mechanism
Error-proof mechanical locking device
Live display sensor/bushing
Transformer
Live display
Side expansion insulated busbar
Grounding busbar

Optional configuration

2 * 500mm Cabinet
Microcomputer protection device
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Current sensor
Cable termination
Arrester
Top expansion insulated busbar
Cable bushing with temperature sensor
Metering transformer and KWH meter
Measuring transformer and ammeter
Heighten Low voltage chamber
Air pressure gauge (selected for using at an altitude of more than 1000m)

Sectional unit of busbar connected circuit breaker R-AIR/DV





R-AIR
standard unit

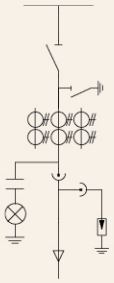
Standard configuration

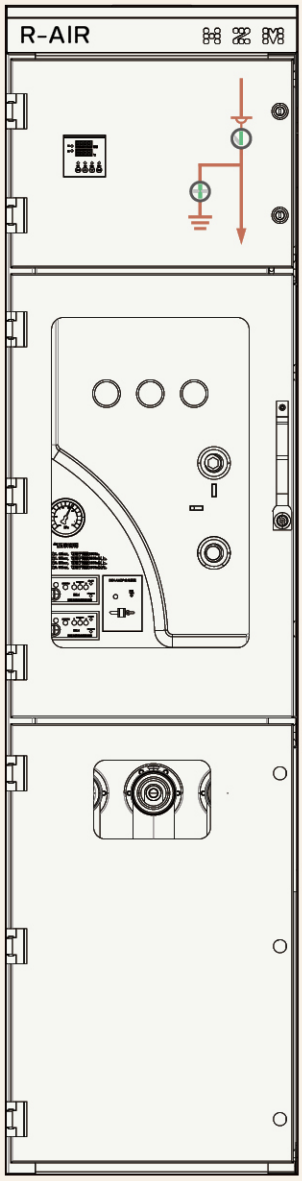
Standard 460mm cabinet
Three positions grounding/disconnecting switch
Manual operating mechanism
Error proof mechanical locking device
Live display sensor/bushing
Live display
Side expansion insulated busbar
Grounding busbar

Optional configuration

500mm cabinet
Electric operating mechanism
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Transformer
Cable termination
Arrester
Top expansion insulated busbar
Cable bushing with temperature sensor
Heighten Low voltage chamber
Air pressure gauge (selected for using at an altitude of more than 1000m)

Isolation unit R-AIR/G





R-AIR
standard unit

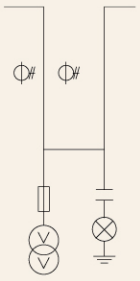
Standard configuration

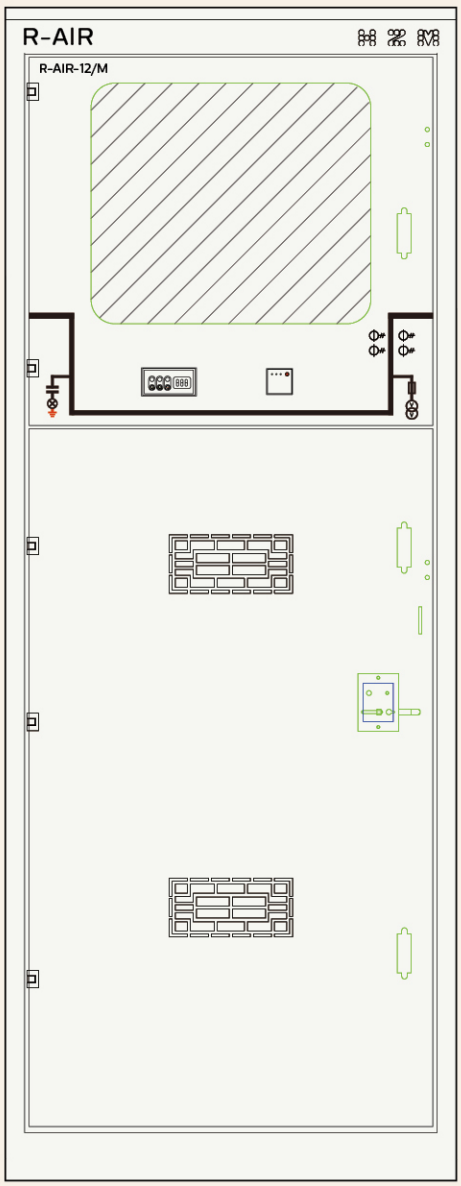
Standard 750mm cabinet
Three positions grounding/disconnecting switch
Manual operating mechanism
Metering 2 PT
Metering 2 CT
Meter
Live display sensor/bushing
Live display
Side expansion insulating bushings
Grounding busbar
Heighten Low voltage chamber

Optional configuration

Non-standard cabinet
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Metering 3 PT
Metering 3 CT
Cable termination
Arrester
Top expansion insulated busbar
Cable bushing with temperature sensor

Metering unit R-AIR/M





R-AIR
standard unit

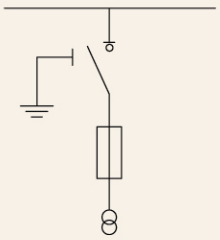
Standard configuration

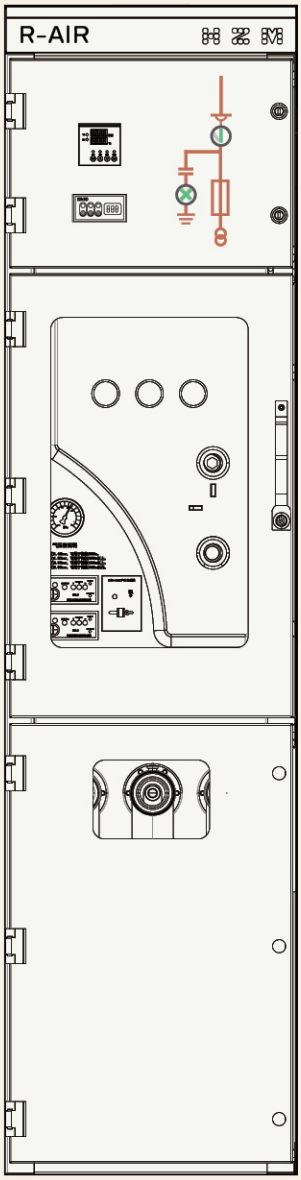
Standard 500mm cabinet
Three positions grounding/disconnecting switch
Manual operating mechanism
Measure 2PT
Meter
Live display sensor/bushing
Live display
Side expansion insulating bushing
Grounding busbar
Heighten Low voltage chamber

Optional configuration

Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Measuring 3PT
Cable termination
Arrester
Top expansion insulated busbar
Cable bushing with temperature sensor
Battery and charging device
Air pressure gauge (selected for using at an altitude of more than 1000m)

PT unit R-AIR/PT





R-AIR
standard unit

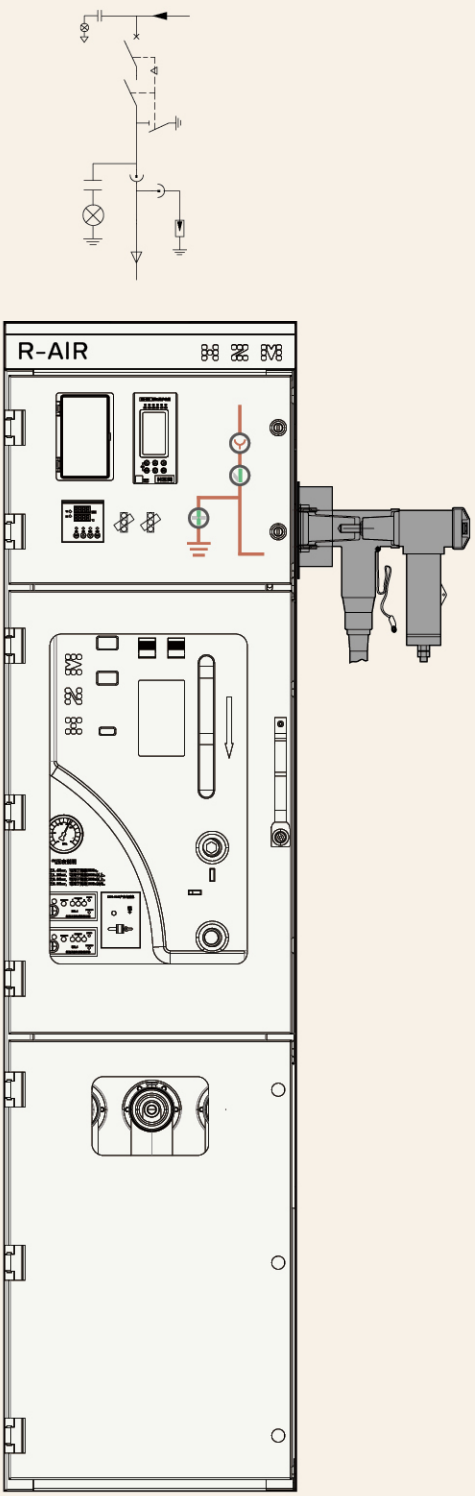
Standard configuration

Standard 460mm cabinet
1250A/630A Vacuum circuit breaker
Three positions grounding/disconnecting switch
Modular two in one electric operating mechanism
Live display sensor/bushing
Transformer
Live display
Side expansion insulating bushing
Grounding busbar
Multiple groups of cable terminals

Optional configuration

500mm Cabinet
Microcomputer protection device
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Current sensor
Arrester
Cable bushing with temperature sensor
Metering transformer and KWH meter
Measuring transformer and ammeter
Heighten Low voltage chamber
Air pressure gauge (selected for using at an altitude of more than 1000m)

circuit breaker unit at outgoing cable side R-AIR/V+



R-AIR
standard unit

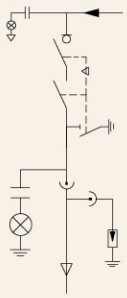
Standard configuration

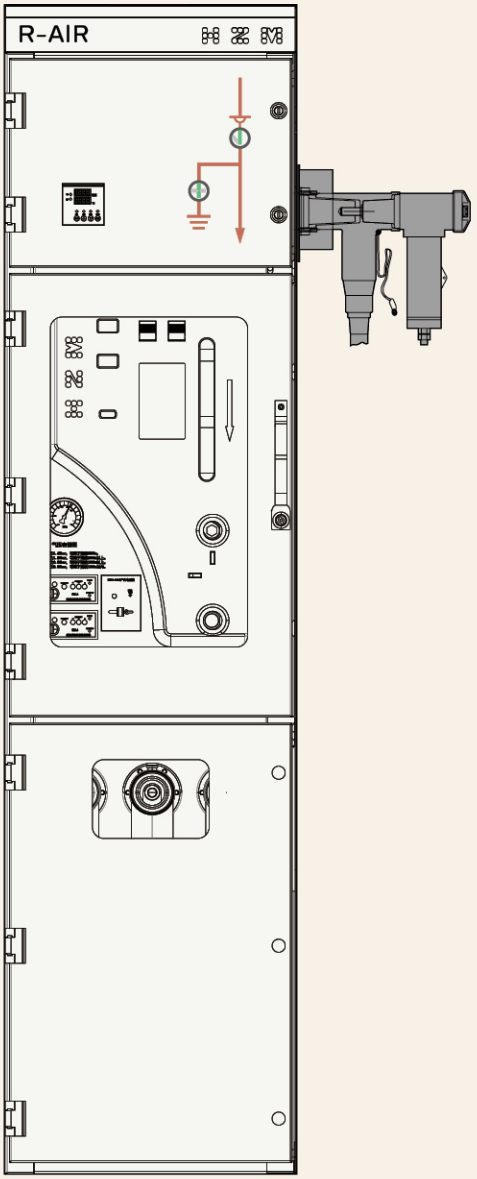
Standard cabinet
1250A/630A Vacuum load switch
Three positions grounding/disconnecting switch
Modular two in one operating mechanism
Live display sensor/bushing
Live display
Side expansion insulating bushing
Grounding busbar
Multiple groups of cable terminals

Optional configuration

500mm Cabinet
Electric operating mechanism
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Transformer
Arrester
Cable bushing with temperature sensor
Heighten Low voltage chamber
Air pressure gauge (selected for using at an altitude of more than 1000m)

Load switch unit at outgoing cable side R-AIR/C+





R-AIR
standard unit

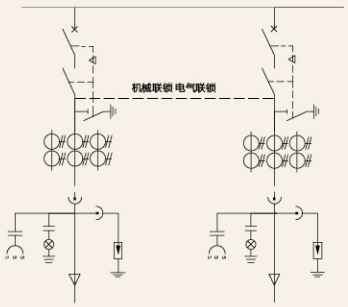
Standard configuration

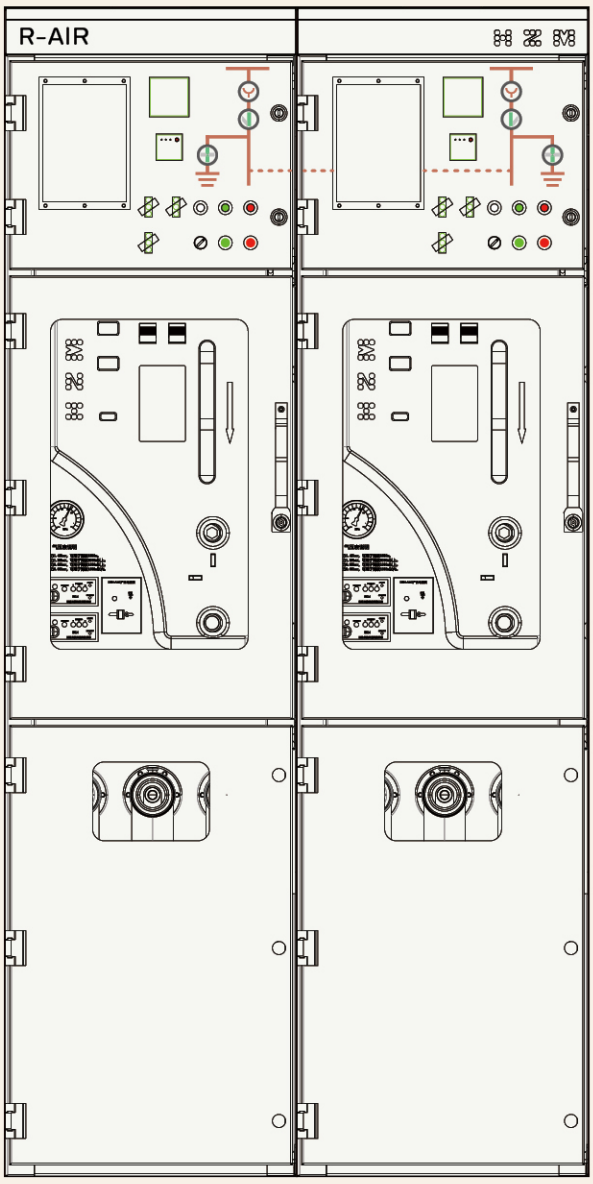
Standard 2 * 460 mm cabinets
2 * 1250A/630A Vacuum circuit breaker
Three positions grounding/disconnecting switch
Modular 2-in-1 electric operating mechanism with locking
Standby automatic switching device
Microcomputer protection device
Live display sensor/bushing
Transformer
Live display
Side expansion insulated busbar
Grounding busbar
Heighten Low voltage chamber

Optional configuration

2 * 500 mm Cabinets
Standard type short circuit and cable fault indicator
Intelligent short circuit and cable fault indicator
Current sensor
Cable termination
Arrester
Top expansion insulated busbar
Cable bushing with temperature sensor
Metering transformer and KWH meter
Measuring transformer and ammeter
Air pressure gauge (selected for using at an altitude of more than 1000 m)

Dual power supply unit R-AIR/ATS





R-AIR
standard unit

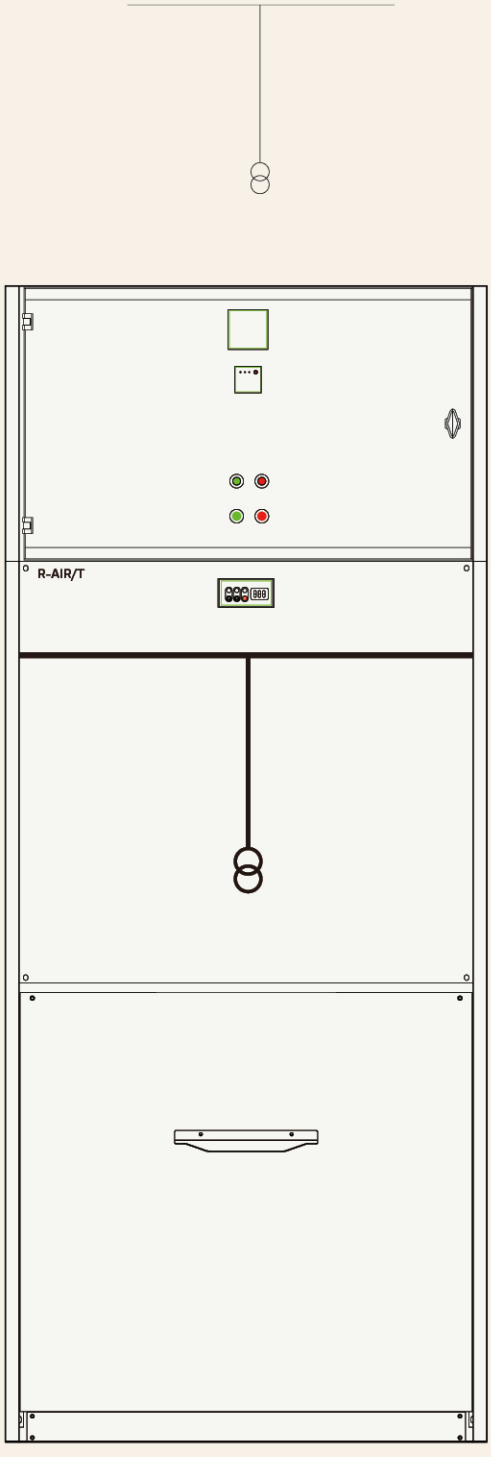
Standard configuration

Air type connecting bushing
Transformer
Live display
Grounding busbar
Electromagnetic lock
Standard cable chamber door
Temperature and humidity controller and drying device

Optional configuration

Cabinet door with infrared temperature measuring window

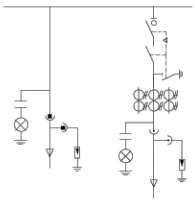
Transformer unit R-AIR/T



R-AIR

Combined unit

DC



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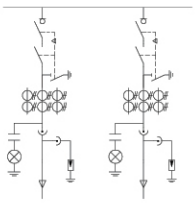

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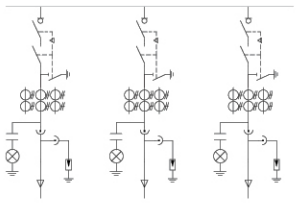

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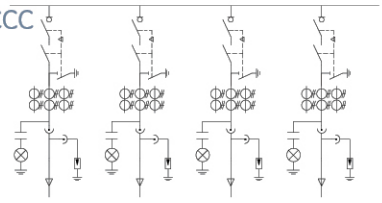
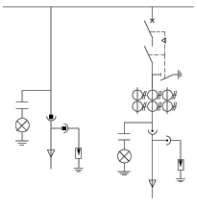
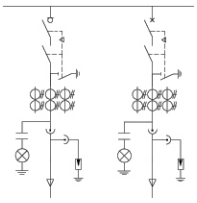


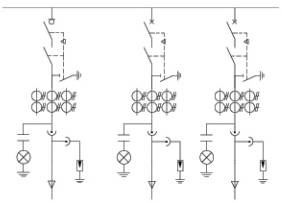
DV



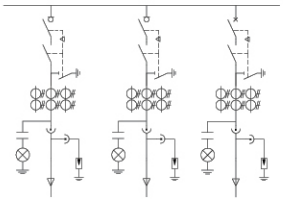
CV



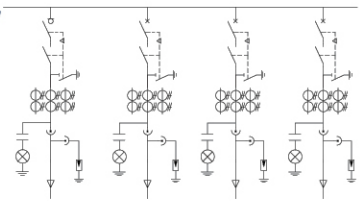
CVV



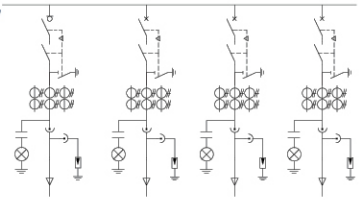
CCV



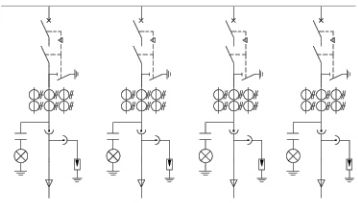
CVVV



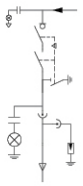
CCVV



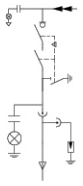
VVVV



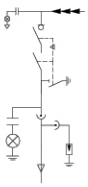
C+



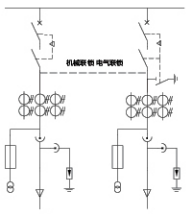
C++



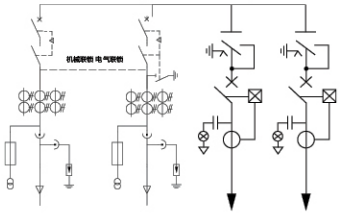
C+++



ATS



ATSVV



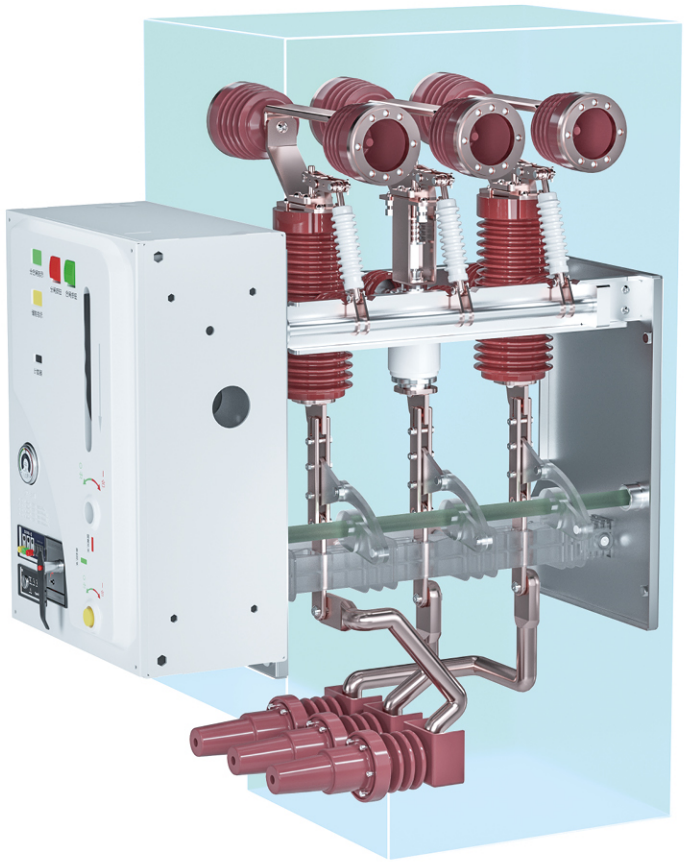
R-AIR

Primary main component

Circuit breaker and operating mechanism

The vacuum circuit breaker and the three positions isolating grounding switch are matched with related mechanisms and interlocks in the gas cabinet which is airtight welded. The atmospheric dry clean gas in the gas cabinet performs the insulation function, and the vacuum arc extinguishing chamber performs the arc extinguishing function.
The main shaft of the circuit breaker is made of steel, and it is connected with the external operating mechanism in a sealed type.
30000 times mechanical life high reliability spring vacuum circuit breaker operating mechanism
Operating mechanism of isolating earthing switch
Mechanical interlock

Electric motor type, control voltage DC48V, AC/DC110V, AC/DC220V, AC380V
The opening and closing speed of the mechanism is independent of the operating speed
Energy storage type operating mechanism, mechanical button opening and closing operation
Equipped with shunt tripping device
Configure 4NO 4NC auxiliary contacts
Three positions isolating grounding switch ensures the reliability of operation
Earthing switch with earthing closing–opening capacity



R-AIR
Transformer protection

R-AIR 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

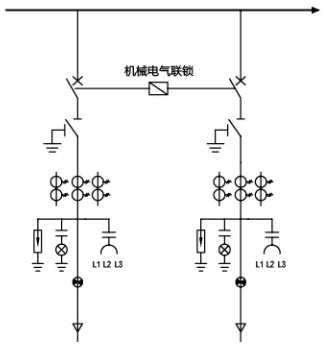
Fixed value serial number	Fixed value name	Setting menu	Setting value ---setting reference
01	Quick break setting	0.1~100A	
02	Time limit quick break setting	0.1~100A	
03	Time limit quick break delay	0~100s	
04	Overcurrent setting	0.1~100A	
05	Overcurrent delay	0~100s	
06	Overload setting	0.1~100A	
07	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	

R-AIR

Dual power system

R-AIR 为 better guarantees the power supply continuity of important loads and secondary distribution network systems, and provides dual power switching solutions.It has the function combination and setting of dual power supply automatic switching and automatic recovery, dual power delay automatic switching without automatic recovery, dual power delay automatic switching and automatic recovery, two incoming lines and one bus tie automatic switching, which can meet the needs of users in different application scenarios. demand to ensure the continuity of power supply.

R-AIR-ATS



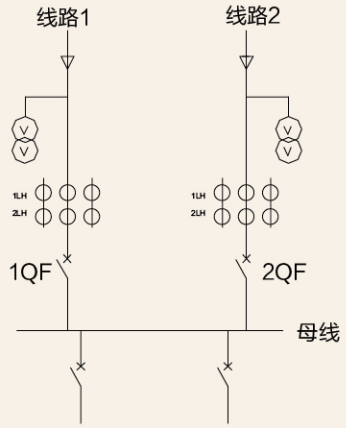
Voltage sensor
mechanical lock
millisecond switching
Intelligent BZT device
automatic charge and automatic recovery
Quick cut and limited time quick cut
Overcurrent protection
automatic phase verification
Delay function
clock
communication

Two-way incoming line power auto-charing logic

The automatic charge logic of the two-way incoming power supply is considered as the main supply line of line I. If line II is used as the main supply line, adjust accordingly.

Daul power ATS

Switching between two medium voltage network power supplies. 2 working modes (can be selected from the MIC500 unit)



I、IQF automatic charge and automatic recovery or 2QF automatic charge and automatic recovery mode

If line 1 is the main supply line (1QF), and line 2 is in the hot standby state (2QF), when there is a voltage loss on line 1, the ATS will switch to the standby line 2QF after a delay T1 after the MIC500 judges it. (1QF open, 2QF closed). If line 1 restores the voltage, the ATS will return to the main line (2QF open, 1QF closed) after a delay (T2).

If line 2 is the main supply line (2QF), and line 1 is in the hot standby state (1QF), when there is a voltage loss on line 2, the ATS will switch to the standby line 1QF after a delay T1 after being judged by the MIC500. (open 2QF, close 1QF). If line 2 restores the voltage, the ATS will return to the main line (1QF open, 2QF closed) after a delay (T2).

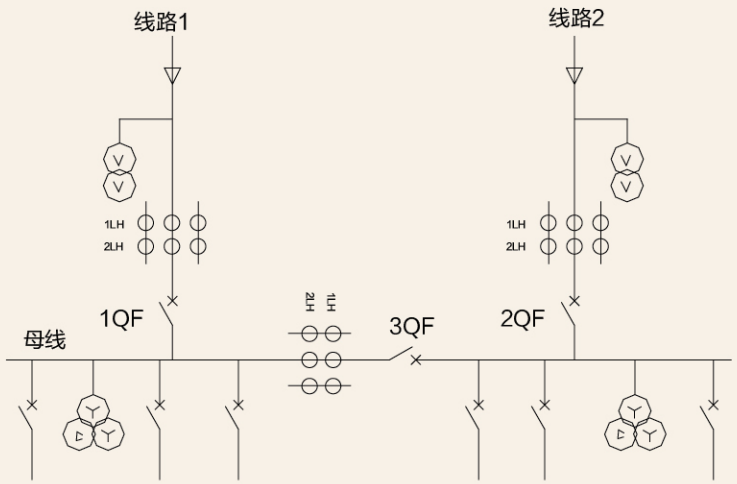
2、IQF,2QFmutual mapping mode

This mode does not distinguish between primary and backup operation.
If line 1 is the power supply line (1QF) at this time, line 2 is in the hot standby state (2QF). If there is a voltage loss on line 1 (1QF), the ATS will switch to the standby line 2QF (open 1QF, close 2QF) after a delay T1 after the MICSOO judgment. If line 1 regains voltage, the ATS will not return to the main line.

If line 2 is a power supply line (2QF) at this time, line 1 is in a hot standby state (1QF). If there is a voltage loss on line 2 (2QF), the ATS will switch to the standby line 1QF after a delay T1 after being judged by the MIC500 (2QF is disconnected, 1QF is closed). If line 2 regains voltage, the ATS will not return to the main line.

R-AIR
Dual power system

Busbar connection ATS



Power switching between 2 incoming lines (1QF and 2QF) and bus tie switch (3QF). 4 working modes (can be selected from the MIC500 unit)

1 . Mode 1 self − switching and self − recovery (I Q Fclosed state, 2 Q F open state , 3 Q F closed state)

Line 1 with full load,IQF closed state, 2QF open state, 3QF closed state. If line 1 is the main supply line (1QF), and line 2 is in the hot standby state (2QF), when there is a voltage loss on line 1, the ATS will switch to the standby line 2QF after a delay T1 after being judged by the MIC500. (open 1QF, close 2QF). If line 1 restores voltage, the ATS will return to the main line after a delay (T2) (2QF open, 1QF closed).

2. Mode 2: self−switching and self− ecovery (IQF open state, 2QF closed state, 3QF closed state)

Line 1 with full load, IQF open state, 2QF closed state,3QF closed state. If line 2 is the main supply line (2QF),and line 1 is in the hot standby state (1QF), when there is a voltage loss on line 2, the ATS will switch to the standby line 1QF after a delay T1 after being judged by the MIC500. (open 2QF, close 1QF). If line 2 restores voltage, the ATS will return to the main line (1QF open, 2QF closed) after a delay (T2). The above mode 1 and mode 2 can choose the daul−switching mode regardless of the active and standby mode.

If line 1 is a power supply line (1QF) at this time, line 2 is in a hot standby state (2QF). If there is a voltage loss on line 1 (1QF), the ATS will switch to the standby line 2QF
after a delay T1 after being judged by the MIC500 (open 1QF, close 2QF). If line 1 regains voltage, the ATS will not return to the main line.

If line 2 is a power supply line (2QF) at this time, line 1 is in a hot standby state (1QF). If there is a voltage loss on line 2 (2QF), the ATS will switch to the standby line 1QF after a delay T1 (disconnect 2QF, close 1QF) after being judged by the IC500. If line 2 regains voltage, the ATS will not return to the main line.

3. Mode 3 self−switching and self−recovery
(IQF closed state, 2QF close state, 3QF
open state)

Line 1 carries the corresponding busbar load, and Line 2 carries the corresponding busbar load. That is, 1QF is closed, 2QF is closed, and 3QF is open. When there is a
voltage loss on line 1, the ATS will switch to the standby line 2QF after a delay T1 after being judged by the MIC500. (1QF open, 3QF closed). If line 1 restores the voltage, the ATS will return to the main line after a delay (T2) (open 3QF, close 1QF).

4. Mode 4 self−switching and self−recovery
(IQF closed state, 2QF close state, 3QF open state)

Line 1 carries the corresponding busbar load, and Line 2 carries the corresponding busbar load. That is, 1QF is in position, 2QF is in position, and 3QF is divided. When there is a voltage loss on line 2, the ATS will switch to the standby line 1QF after a delay T1 after being judged by the MIC500. (open 2QF, close 3QF). If line 2 restores the voltage, TS will return to the main line after a delay (T2) (open 3QF, close 2QF).

R-AIR

Power collection and measurement

HiCVT electronic voltage sensor

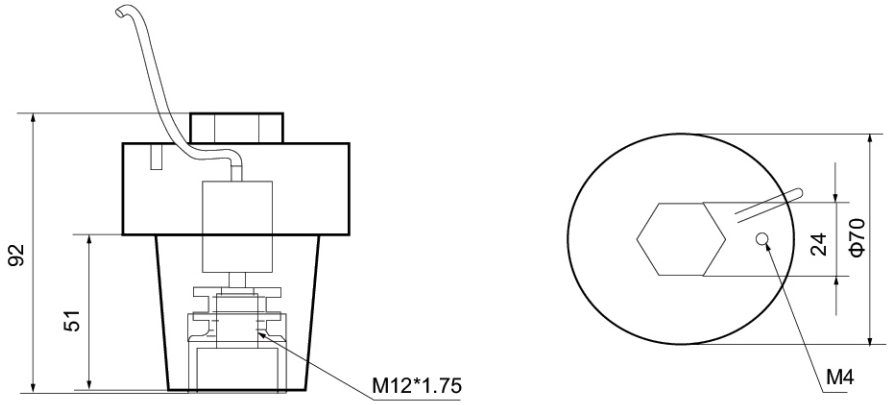
Comply with IEC60044-8 standard
Matching connection with cable
pulling plug
Capacitive voltage divider technology
Collect three-phase voltage
Collect zero sequence voltage

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



R-AIR

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.	

R-AIR

Power collection and measurement

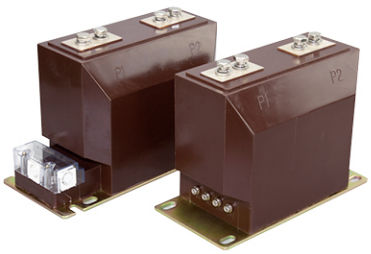
Current Transformer

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 voltage (root mean square value)	42/30，（28） 75，（60）
2	Rated frequency	Hz	Rated lightning impulse withstand voltage (peak)	
3	Ratio	A		
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

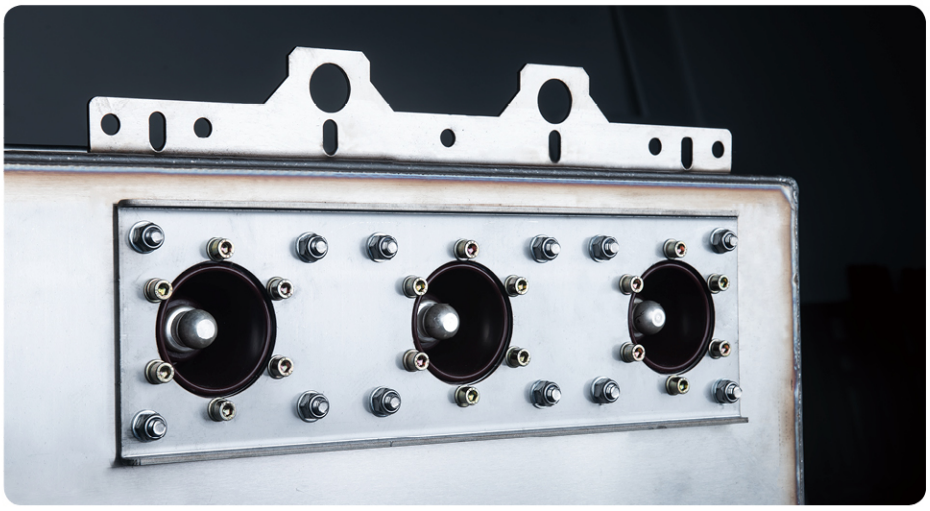
R-AIR

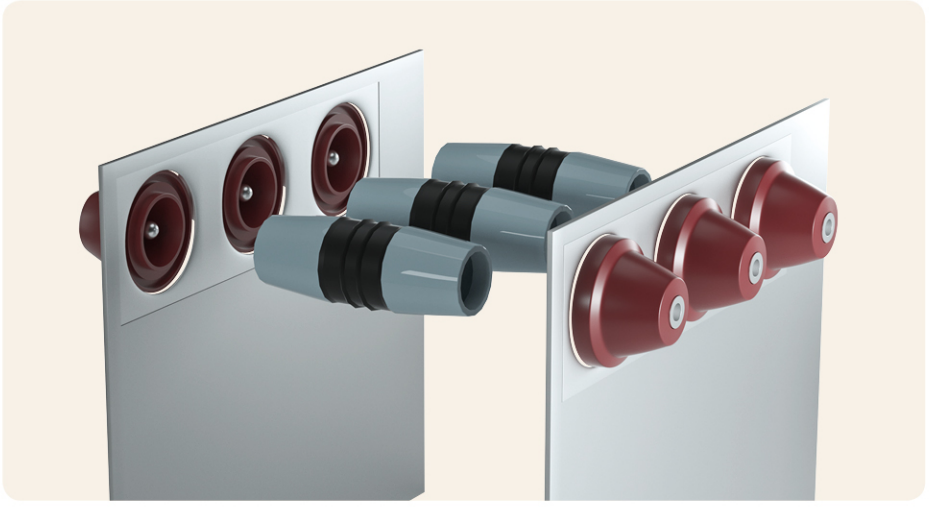
Consolidation method

The R-AIR full-insulation method has two ways: side expansion connection and top expansion connection. When it is combined with air-insulated cabinets such as metering cabinets, the air-insulated side expansion type can be used.
The side expansion connection is suitable for occasions with high requirements on the ground foundation and limited cabinet height; the top expansion connection is convenient for later replacement. For the reserved expansion port, the later expansion unit must follow the principle that the current of the main bus with the newly added circuit does not exceed 630A.

Fully insulated cabinet side expansion connector method

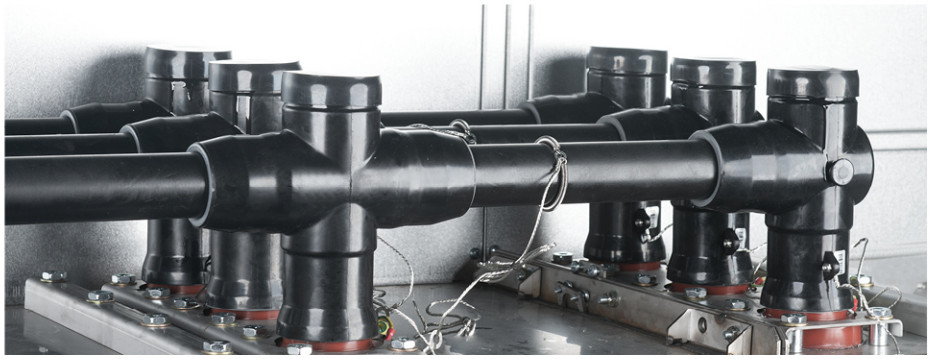
Cabinet-type modular connection device
Complies with standards IEC60137 and DIN EN 50181
Optional side expansion connector when ordering
On-site installation, cabinet combination, replacement, etc., do not require SF6 gas related technical processes.
The cabinet can be configured on the left, right and both sides of the cabinet.
Contains copper conductor connections and silicone rubber insulation.
The fixed parts and moving parts of the copper conductive connectors have a certain allowable margin in the axial direction.
Silicone rubber insulation has a pressure tolerance within a certain range.
The silicone rubber piece has a shielding layer and connecting wires, and must be connected to the ground reliably during installation.
Primary busbar paralleling through side expansion connectors
Positioning screws to achieve accurate positioning of adjacent cabinets
The spacer bolts between the cabinets ensure the preset gap between adjacent cabinets, and at the same time ensure that the pressure bearing of the expander is within the preset range.
The reserved side busbars must be installed with shielded insulating plugs, and must be equipped with metal protective side sealing plates with warning signs.





R-AIR
Consolidation method

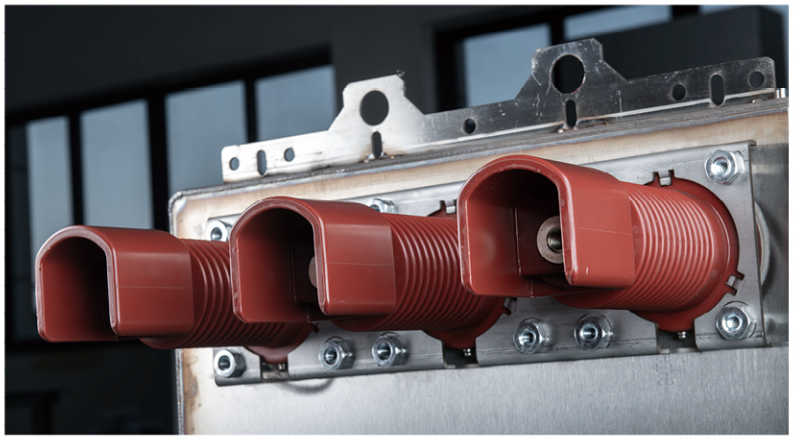
Fully insulated top extension busbar



C type outer cone bushing
Complies with standards IEC60137 and DIN EN 50181
Cabinet-type modular connection device
Optional top extension busbar when ordering
On-site installation, cabinet merging, replacement, etc., do not require SF6 gas-related technical processes. The top casing of the cabinet air box is matched.
Contains copper conductor busbars and silicone rubber insulation.
The silicone rubber parts have shielding layers and connecting wires, and must be connected to the ground reliably during installation.
The primary busbar is combined with the cabinet through the top extension connector.
The busbar is a customized type, which must be customized strictly according to the center distance of adjacent casings.

Air Insulated Side Cable/Busbar Connection Sleeve Method

Complies with standards IEC60137 and DIN EN 50181
with insulating cover
Applicable to ordinary air-insulated cable terminals
Suitable for hard copper busbars (for metering cabinets, etc.)
Cable mounting bolt specification M16
Pre-installed live display supporting voltage sensor

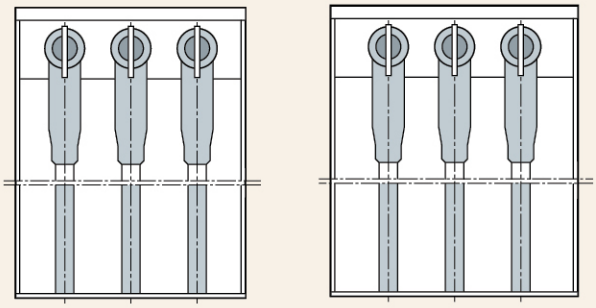


R-AIR

Cable compartment and cable connection

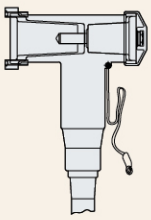
Cable room layout

- The cable compartment door can only be opened when the isolation is disconnected and grounded
- Cable head matching IEC60137 standard C-type cable gland
- Matching M16 bolts
- Suitable for elbow cable head
- Suitable for T-cable head
- Standard cable bracket
- Optional cable glands
- Optional protruding cable door (when the depth of the cable room needs to be increased).
- Optional cable door with infrared temperature measurement observation port
- For single cable
- For double cables
- Configurable plug-in snow protector
- Standard cable height 750mm
- (Central point of bushing to cable compartment bottom plate)
- Insulation cap (cover) for reliable grounding is provided when there is no cable head installed
- When the cable enters the cable, it must be equipped with a rear cable sub-cabinet (backpack), and the depth of the cable-attached cabinet is 240mm.

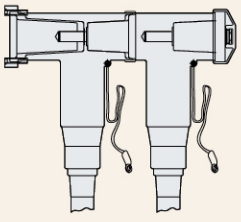


Cabinet width 460　　Cabinet width 500

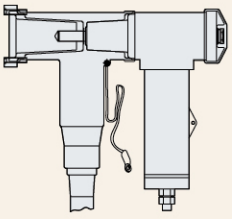
Cable head combination



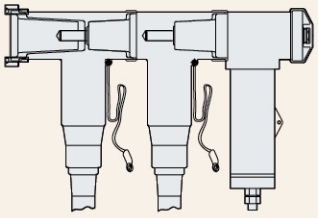
单根电缆



双根电缆

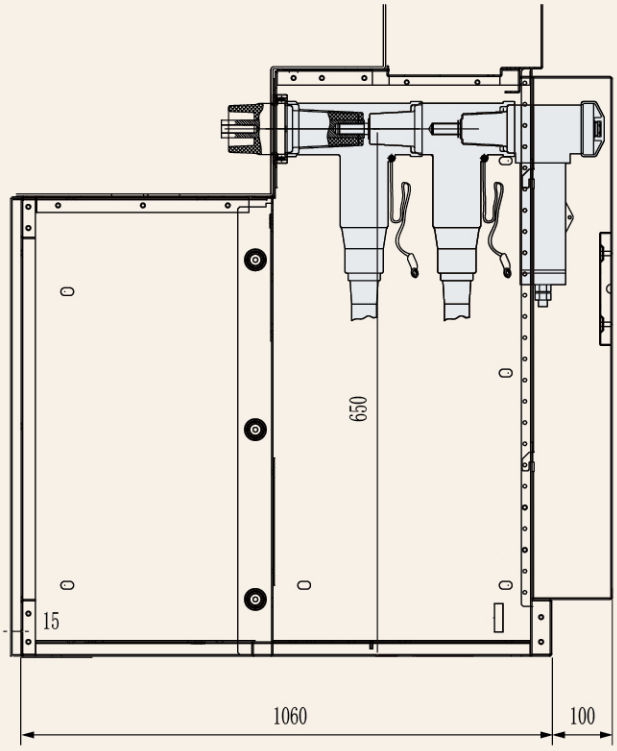


单根电缆加避雷器



双根电缆加避雷器

Deepened cable compartment door



R-AIR

Cable compartment and cable connection

connection sleeve

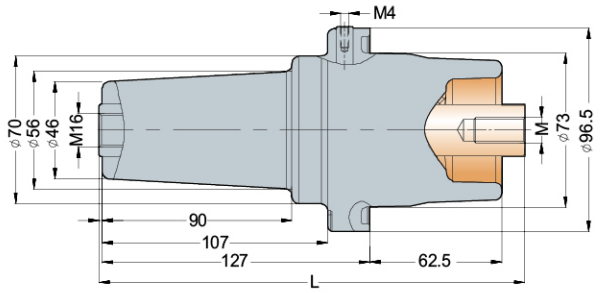
Cable head connection sleeve

Comply with DIN EN 50181 standard, IEC60137 standard definition

- C type outer cone cable bushing
- Standard current 630A and 1250A two specifications
- Suitable for elbow and T cable glands
- Cable mounting bolt specification M16
- Pre-installed live display supporting voltage sensor
- Meet the withstand voltage and partial discharge test

Technical parameter

Power frequency withstand voltage	48kV/min
Partial Discharge	13.2kV ⩽ 5pC、26.4kV ⩽ 5pC
Rated current	630A/1250A
Capacitance value	18 ± 2PF
Equipped sealing ring specifications	Φ73*06 (Inner Diameter * Wire Diameter)



Side outlet cable branch connection sleeve

Comply with DIN EN 50181 standard, IEC60137 standard definition

- C type outer cone cable bushing
- Standard current 630A
- Suitable for elbow and T cable glands
- Second line out
- Three line out
- Four line out
- Cable mounting bolt specification M16
- Pre-installed live display supporting voltage sensor
- Meet the withstand voltage and partial discharge test

R-AIR

Cable compartment and cable connection

T-cable connector

Compliant with IEC 60502
GB/T12706-2008 standard
GB/T4109-1999 standard
IEEE592-1990 standard

Applicable to C type outer cone cable bushing
Standard current 630A and 1250A two specifications
Cable mounting bolt specification M16
Insulation and protection are made of EPDM rubber
Double-layer shielding inside and outside, zero potential on the surface of the cable head

Technical parameter

Rated voltage	15kV
Applicable sleeve type	C type
Power frequency withstand voltage (AC)	39kV/5min
Partial Discharge	15kV, ⩽ 10pC
Impulse voltage (10 times for positive and negative polarities)	95kV
Shield resistance	⩽ 5000Ω
Applicable cable cross section	25-630mm^2

Structure size

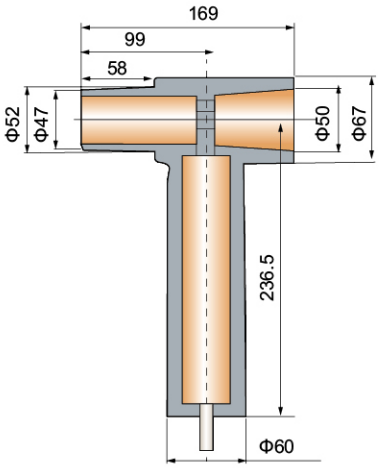
Rated current (A)	630	1250
Cable specification(mm^2)	25-300	400-630
Outer diameterL (mm)	71~108	79
Height H (mm)	242±5	272±5

Cable

7.2-17.5KVcopper core, aluminum core cable
single core, three cores
XLPE insulated cable, armored XLPE insulated cable

R-AIR

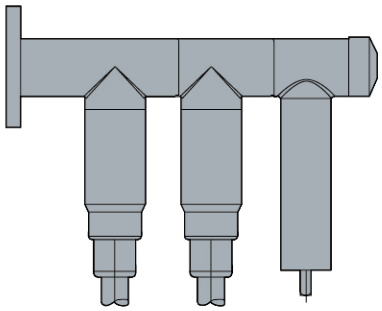
Cable compartment and cable connection



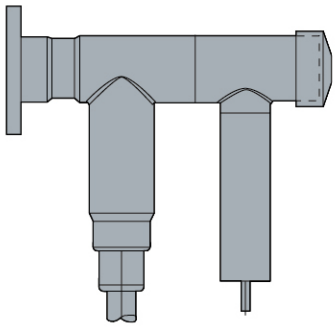
Plug-in arrester

Comply with GB11032-2010 standard

Insulation and protection are made of EPDM rubber Using high-performance zinc oxide resistor chip core, it has the characteristics of excellent nonlinear volt-ampere characteristics, good steep wave response, strong current capacity, etc.
Suitable for 6/10kV, 8.7/10kV, 8.7/15kV voltage levels



Assembly drawing of front plug, rear plug and arrester



Front plug and arrester assembly drawing

Technical parameter

Content	Unit	Parameter
Rated voltage	kV	17
Continuous operating voltage	kV	13.6
Nominal discharge current	kA	5
Residual voltage under steep surge current (1/5μs 5kA)	kV	≤51.8
Current residual voltage under lightning impulse (8/20 μs 5kA)	kV	≤ 45
Residual voltage under operating inrush current (30/60 μS 500A)	kV	≤38.3
DC 1mA reference voltage (kV)	kV	≥ 24
Drowning current mt(A) under 75% DC 1mA reference voltage	A	≤ 50

Cable head temperature monitoring device

Built-in online monitoring device plug

The system consists of wireless temperature measurement device for equipment plug, intelligent gateway (or communication management machine) and DAVID-Cloud platform.In the plug wireless temperature measurement device, the wireless temperature measurement sensor is installed inside the plug to directly monitor the easy hot spots at the lap joint of the cable. The monitored temperature information is transmitted to the wireless temperature measurement device in real time through wireless, he wireless temperature measurement device collects the temperature data to the intelligent gateway through the RS485 interface and the standard Modbus-RTU protocol. The intelligent gateway subscribes the data to the cloud platform through the wireless 4G or wired network, and the cloud platform analyzes and judges to realize intelligent monitoring without any duty.

R-AIR
Attachment

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

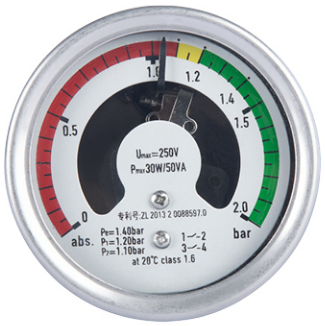
Short circuit or ground fault indication
Short circuit or ground fault location
Ring network power supply and distribution network
Radiated power distribution network
Neutral grounding system

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

SF6Gas Density Meter



Display the air pressure in the air box and configure the electrical contacts
Switch configuration SF6 gas density relay with scale value.
Reserved inflation valve, SF6 gas complies with relevant regulations of GB12022
The SF6 gas pressure gauge has auxiliary contacts, and performs alarm and low-pressure opening and closing
locking functions when the air pressure is low.

External dimensions	Φ64
Measuring range	Customized
Measurement accuracy	Grade 1.6
Protection class	IP65
Working environment	-40~+60℃
Leak rate	1×10-8mbar.l/s
Shell material	304
Pressure sensing element	Bourdon tube
Pressure port	Customized

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

R-AIR
Grounding

Meet the requirements of GB/T 50064–2014. The metal parts that may be touched, such as the shell, switchgear shell, etc., are reliably grounded. Ground conductors and ground connections are rated for short elbow and peak withstand currents for ground loops.

· According to the DL/T404 standard, the maximum short-time withstand current that the grounding circuit can withstand is not less than 87% of the rated shorttime withstand current of the main circuit.
· All parts in the main circuit that are specified or need to be accessible by people are reliably grounded and comply with the regulations in DL/T 621;
· The grounding busbar is provided with no less than two terminals connected to the grounding system, and there are obvious grounding signs;
· The main circuit is provided with a reliable copper ground terminal suitable for specified fault conditions. The copper terminal and the grounding system of the equipment are connected by M12 bolts, and the contact area is not less than 160mm^2
· All ground connection points are marked with the protective grounding symbol specified in GB/T 5465.2, and the part of the metal casing connected to the grounding system can be regarded as a grounding conductor;
· Prefabricated cable accessories and cable head are coated with semi-conductive shielding layer and reliably grounded
· The surface of side extender or top insulated busbar between cabinets is coated with semi-conductive shielding layer and reliably grounded
· Reliably connected to the metal shell and grounded after connection;
· The grounding conductor adopts copper busbar. Under the specified grounding fault conditions, when the rated short-circuit duration is 2s, the current density shall not exceed 110A/mm^2
· The ground bus extends out of the housing for easy connection to the basic ground electrode
· The housing of each functional unit is connected to the ground conductor
· The secondary control instrument room is provided with a dedicated independent grounding conductor

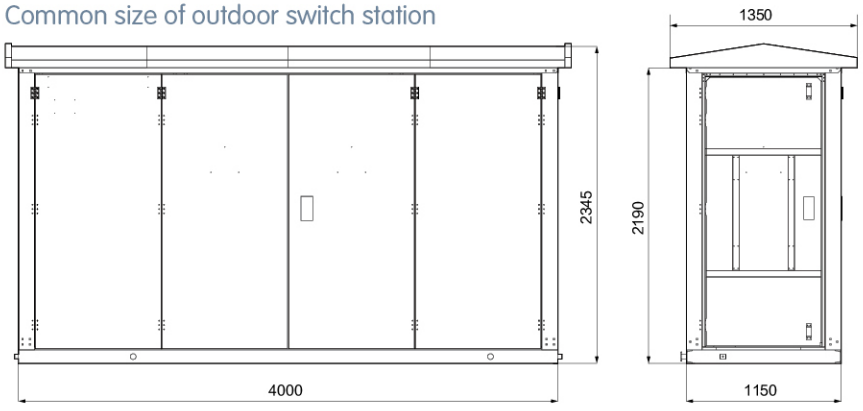
Ground busbar parameters

Content	Unit	Unit Parameters
Material		Copper
Rated short-time withstand current and duration	kA/s	20/4
Rated peak withstand current	kA	50
Conductor cross section	mm^2	160

R-AIR
Outdoor box

R-AIR outdoor switch station is composed of R-AIR 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

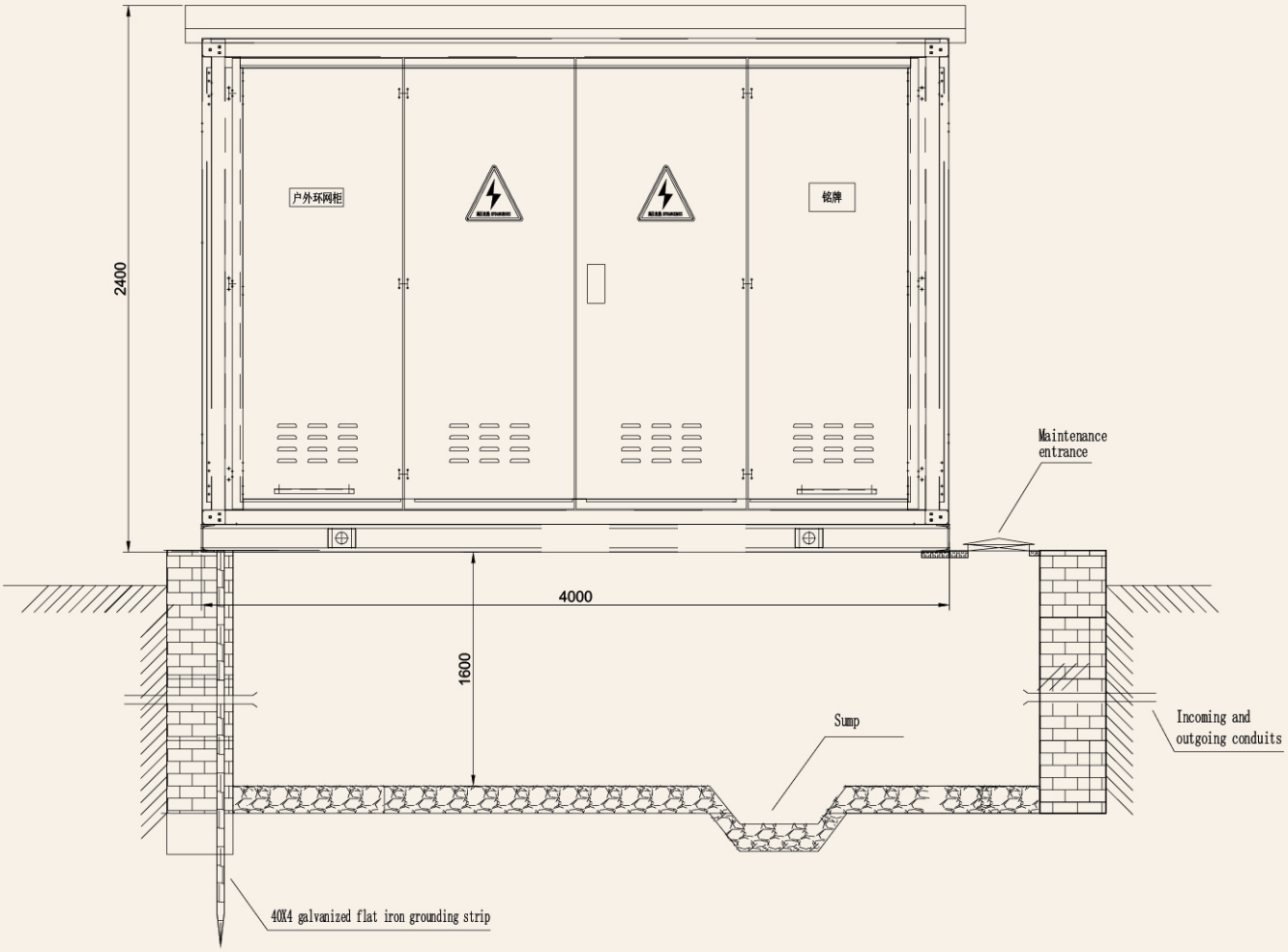


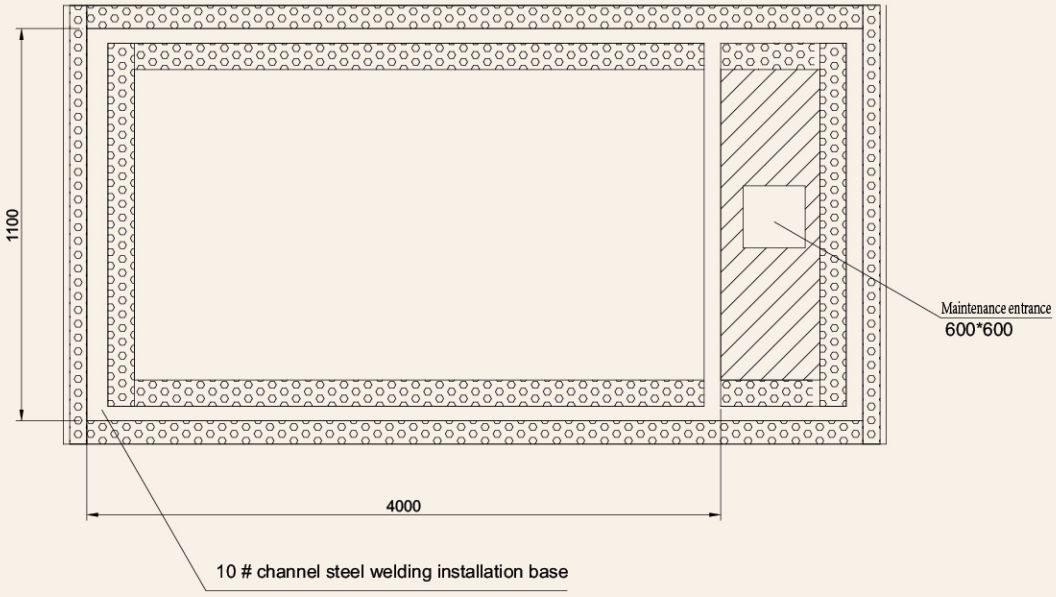
Outdoor box width: The sum of the width of a single ring network cabinet + DTU width (standard 600mm) + reserved space (400mm)
Outdoor box height: <2450mm
Outdoor box depth: 1150mm

R-AIR

Outdoor Box

Basic diagram of outdoor box





Distribution network automation solution

Based on the requirements of distribution network automation, NXRING can be equipped with a distribution automation system. The system consists of a comprehensive measurement and control communication unit and multiple independent protection measurement and control units (one protection measurement and control unit corresponds to one interval).

The protection measurement and control unit is equipped with protection and measurement and control function modules. It is responsible for realizing the functions of remote signaling, telemetry, remote control, and protection logic (conventional protection, voltage and current feeder automation, intelligent distributed feeder automation) at the corresponding interval, and realizes information interconnection with the integrated measurement and control communication unit through the data busbar.

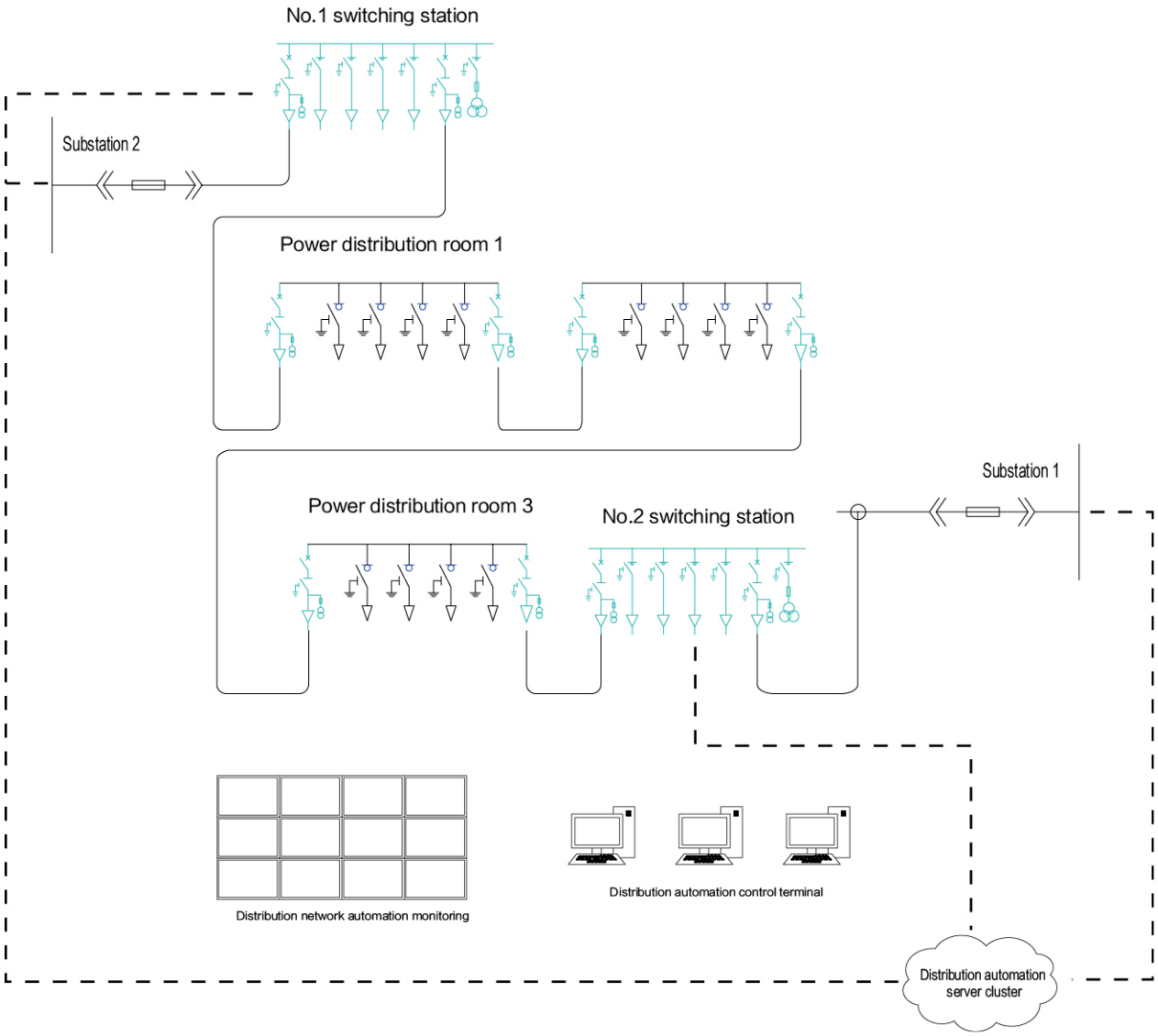
The automation can realize the collection and transmission of the following data: circuit breaker position, knife switch position, remote/local selection control switch position, protection (including quick-break, separable phase and segmental overcurrent, grounding) action, reclosing action, device fault (Terminal abnormality or failure), spring not charged, control circuit disconnection, temperature and humidity out-of-limit signal, DC system monitoring, SF6 low air pressure alarm signal and other signals, and send them to the main station of distribution automation.

It can collect busbar voltage (Uab, Ube, 3UO), current (Ia, Ib, Ic, 3I0), and two incoming line voltages and currents, to realize the calculation of active power, reactive power and power factor; short circuit in case of feeder failure Current, zero sequence current or zero sequence voltage.

Receive and execute remote control commands from the distribution automation master station to achieve fault isolation and recovery of nonfaulty areas, and improve power supply reliability.

The communication protocol supports the relevant technical standards of State Grid, China Southern Power Grid and IEC.

The application in the power grid can also adopt communication protocols such as IEC61850Modibus DNP V3.0.

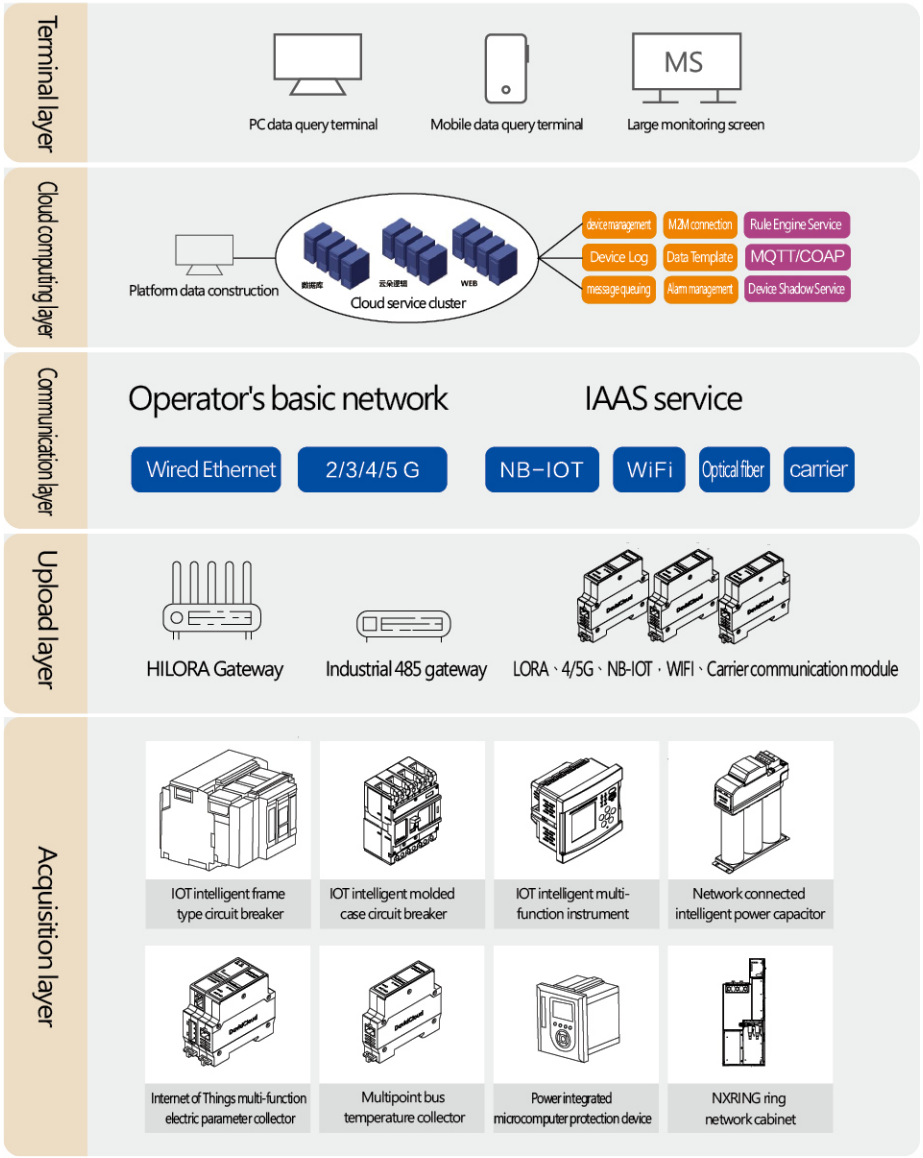


R-AIR

Smart Power Distribution Solution

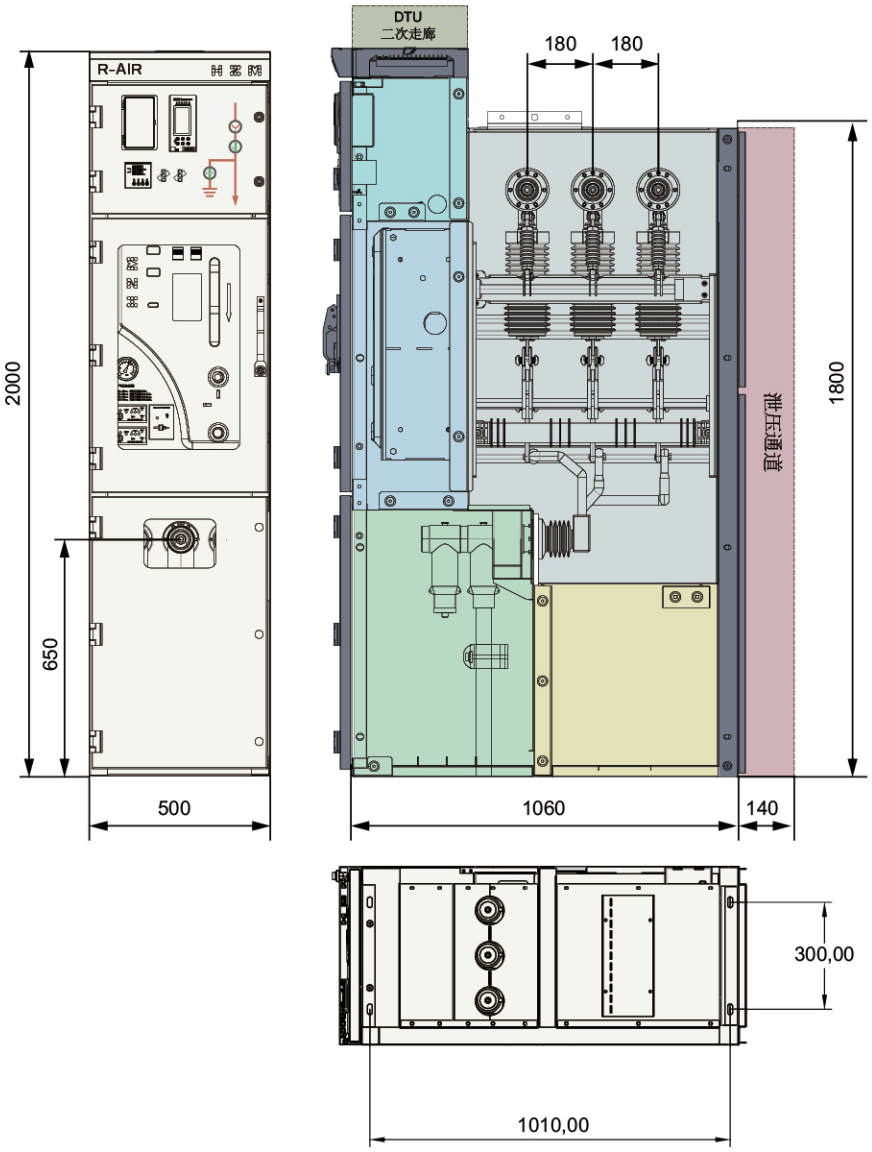
DAVID CLOUD intelligent power distribution management platform based on IoT technology and cloud computing

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.



R-AIR
Dimensions

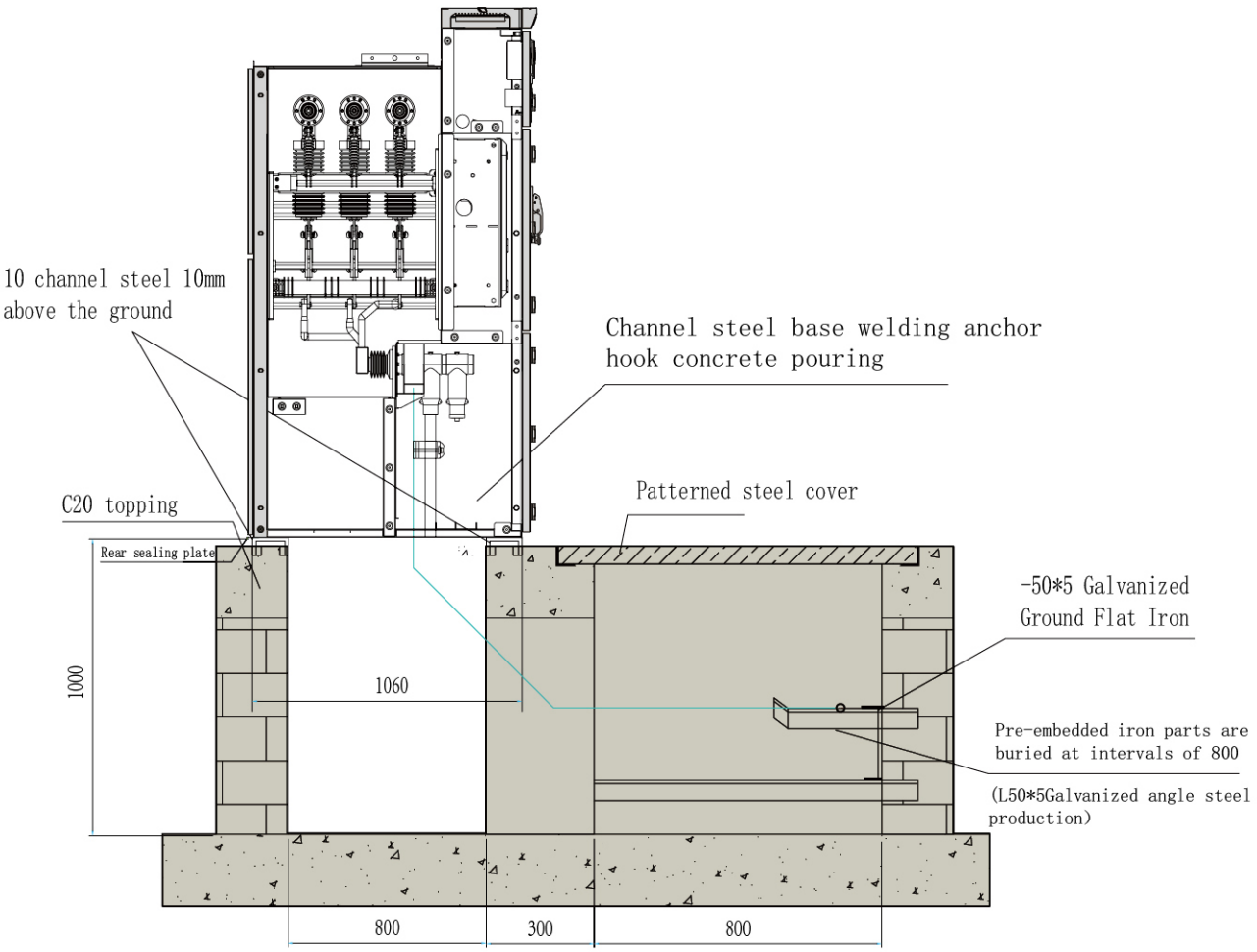
Outline dimension drawing



R–AIR Standard unit size

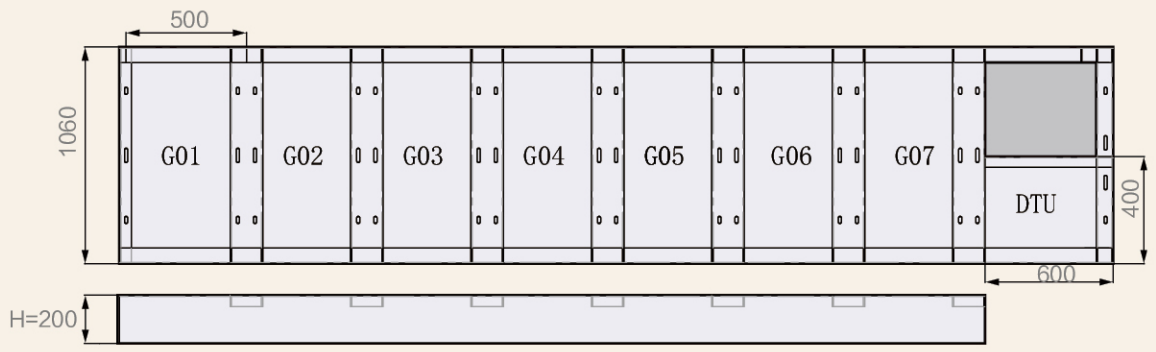
V	Circuit breaker unit	width = 460 mm (Optional 500mm)	Depth = 1060 mm	height = 2000 mm
C	Load switch unit	width = 460 mm (500mm)	Depth = 1060mm	height = 2000mm
D	Busbar unit	width = 460 mm (500mm)	Depth = 1060mm	height = 2000mm
VL	Sectional unit of busbar connected circuit breaker	width = 2*460 mm (2*500mm)	Depth = 1060mm	height = 2000mm
G	Isolation unit	width = 460 mm (500mm)	Depth = 1060mm	height = 2000mm
M	Metering unit	width = 750 mm	Depth = 1060mm	height = 2000mm
PT	PT unit	width = 500 mm (600mm)	Depth = 1060mm	height = 2000mm
V+	circuit breaker unit at outgoing cable side	width = 460 mm (500mm)	Depth = 1060mm	height = 2000mm
C+	Load switch unit at outgoing cable side	width = 460 mm (500mm)	Depth = 1060mm	height = 2000mm
ATS	Dual power supply unit	width = 2*460 mm (2*500mm)	Depth = 1060mm	height = 2000mm
T	Transformer unit	width = According to transformer capacity	Depth = 1060mm	height = 2000mm

Installation dimension



Raised base

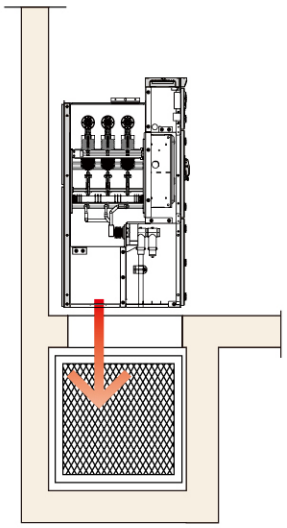
The switchgear can be equipped with an independent raised base to be used in field scenes without cable trenches or special occasions. The height of the base is H=200mm, 300mm, 400mm optional; special specifications can be customized when ordering.



R-AIR
pressure relief channel

In line with the national standard GB/T 3906 standard, IEC/EN62271-200 standard
Through the bottom plate of the cabinet, the pressure is released downward to the cable trench. The size of the cable trench must be no less than
the cross-sectional area as shown in the figure.
Through the pressure relief channel at the rear of the cabinet, the pressure is released upward, and the pressure absorption device is equipped. The
power distribution room must meet the size not less than the size shown

Switchgear installation, pressure relief channel downwards (standard) or backwards (optional)

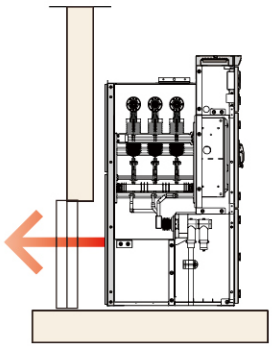


1. Ground hole
2. Pressure release direction
3. Metal network board (provided on site)
4. Pressure-resistant bottom plate (dividing plate used when working with cables)
5. Pressure absorbing device with pressure relief channel

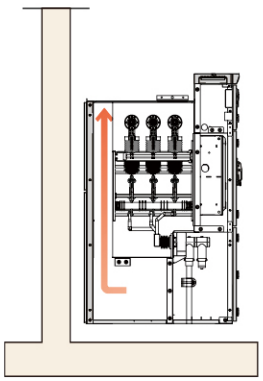
The total hole size is not less than 0.5m
The pressure relief channel is at the rear of the open cabinet,the minimum height of the power distribution room

Switchgear height 1950mm	power distribution room height ⩾ 2300mm

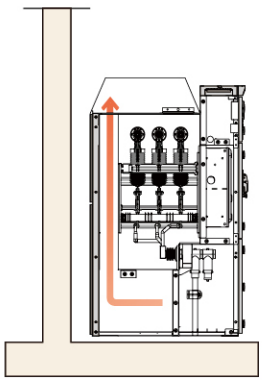
The switchgear discharges the pressure upward through the rear pressure relief channel (optional)



The switchgear discharges the pressure upwards through the base and the rear pressure relief channel (optional)



Wall mounted,
excluding metering cabinet



Metering cabinets mounted away from the wall, or against the wall

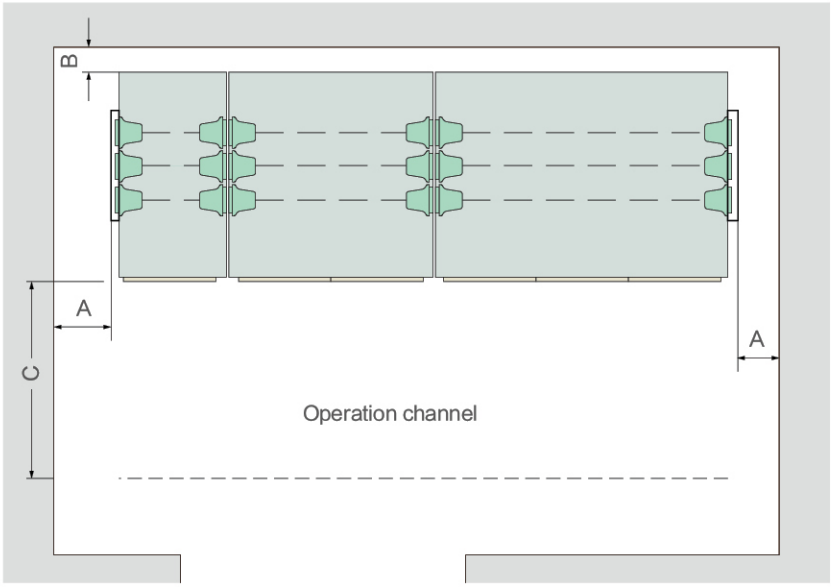
R-AIR
Installation space

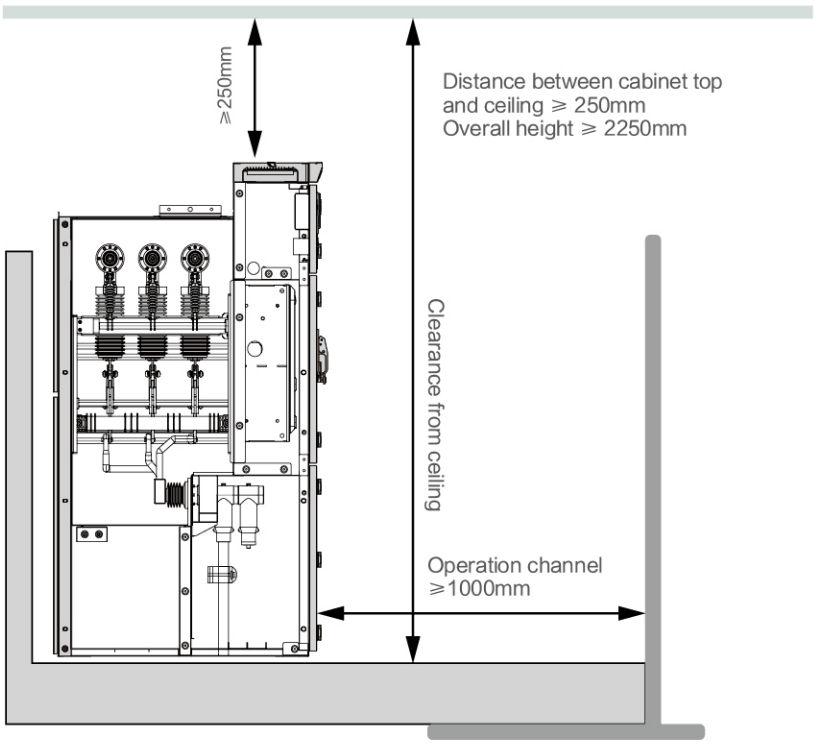
Functional units and distances

	Functional units and distances		Spacing (mm)
A	The distance between the side panel and the wall of the spare side expansion end cabinet		500
B	The distance Relieve pressure between the rear panel and the wall when installed against the wall	Relieve pressure towards the bottom	20
		Relieve pressure towards the top	100
		Relieve pressure towards the back	140
C	Cabinet front channel		> 1000mm

R–AIR Installation space

Top view





R-AIR
Environmental friendly

Environmental protection

· Environmentally friendly design to reduce the impact of products on the environment
· No greenhouse effect
· Strengthen environmental management and environmental safety
· Provide renewable energy support and promote green and clean energy
· Reduce the consumption of materials and energy in the manufacturing process
· Comply with all ecological environment requirements during use

· The whole life cycle follows the provisions of the 1S014001 standard environmental management system
· Manufacturing without the use of materials known to be chemically and environmentally hazardous
· End of product life cycle, some materials can be recycled
· End of product life cycle, some non-recyclable and some materials are environmentally friendly

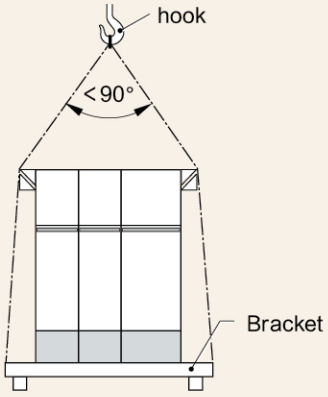
· Product without fluid material
· Metal can be recycled
· Thermosets and thermoplastics
· No toxic materials

Recycling and dismantling

Type	Recycling subject	Method
Air	Do not recycle	discharge
Steel and Stainless Steel	local renewable resource company	Shredding, sorting and recycling
Non-ferrous metals	local renewable resource company	Shredding, sorting and recycling
Epoxy resin	local renewable resource company	General solid waste treatment
Thermoplastic	local renewable resource company	recycling for secondary use
Protective equipment	local renewable resource company	recycle and destroy
Cable	local renewable resource company	Sheath and wire separation

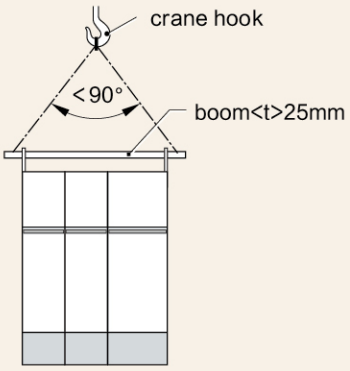
R-AIR
Hoisting

shipment



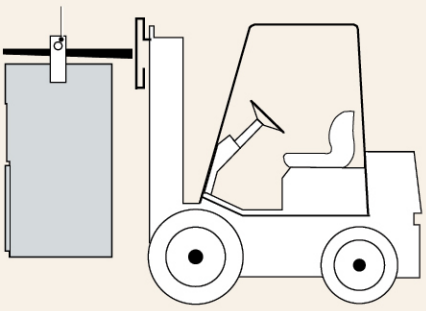
Lift with pallet

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

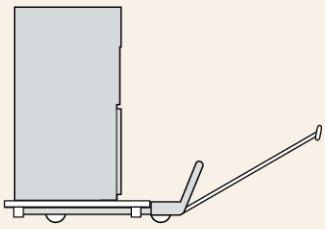


Lift with boom

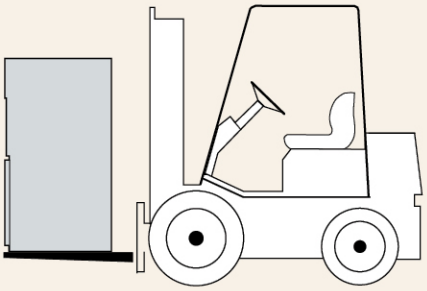
Boom 中25mm
（Pay attention to the weight of the switch cabinet and the counterweight of the forklift）



Suspended Forklift Handling



Manual forklift handling

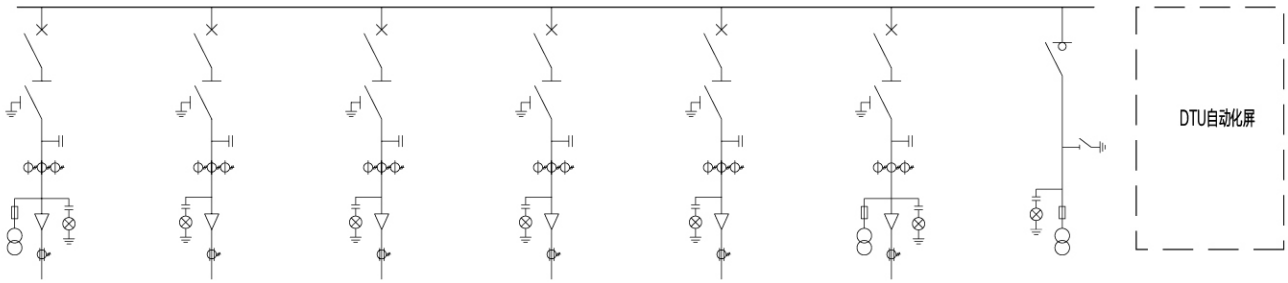


Forklift handling

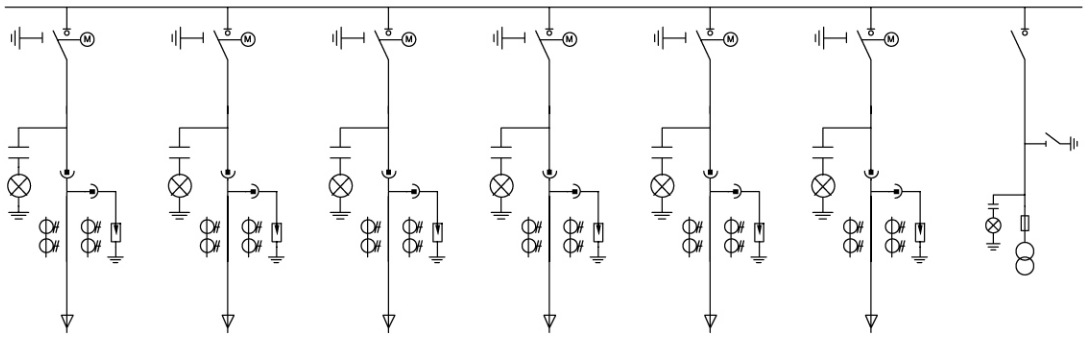
Storage

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

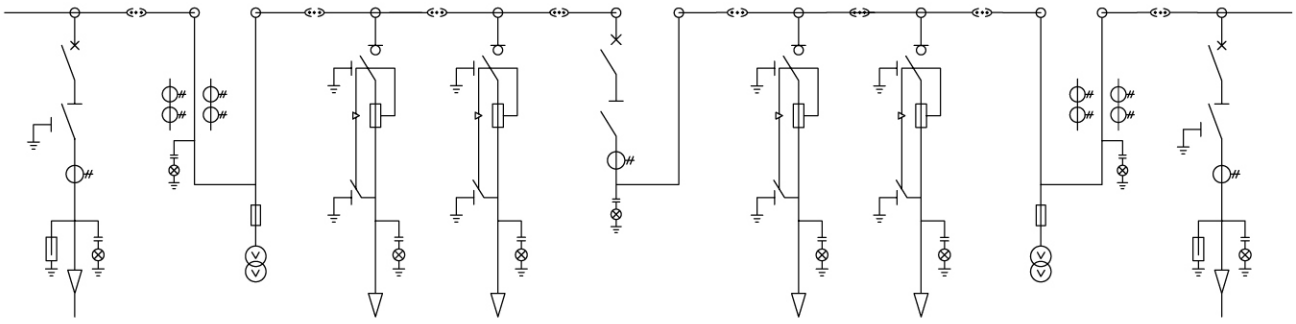
Typical application of distribution automation switching station



Typical application of grid switching station



Typical application of double incoming line with contact belt metering



Typical Application of Transformer Incoming Line