



Alpha Series SF₆ Gas Insulated Ring Main Unit

12kv~24kV, 1250A, 25kA



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Overview

The core unit of Alpha series 12/24kV series SF₆ gas insulated RMU uses patented rotary load switch, vacuum circuit breaker with ultra-low resistance and primary live parts, which are sealed in a stainless steel air tank fully filled with SF₆ to isolate with the outside, ensuring that the switchgear and all live parts in the air tank will not be affected by the outside environment. This exempts the unit from maintenance, improves the reliability of power supply, enhances personal safety and meets the needs of economic and reliable operation.

Field of Application

- Urban distribution network
- Residential districts
- Schools
- Airport, port and rail transit
- Municipal engineering, commercial complex, urban center, etc.

Technical Features

Technical Features

- Alpha series series 12kV and 24kV RMU are standardized based on the same platform, compact and reliable;
- SF₆ gas isolated;
- Rated voltage: 12kV and 24kV;
- All primary live parts are sealed in a stainless steel air tank fully filled with SF₆;
- Resistance to internal arc fault;
- Earthing switch has earthing making capacity;
- With mechanical interlocking, ensuring correct and reliable sequential operation;
- All primary devices are sealed in a stainless steel air tank, applicable to the distribution sites with salt mist, moisture or susceptible to contamination;
- 360/450/500mm*wide, compact, light-weight, saving occupation area;
- Designed based on a full-metal, full-seal, and modular concept, achieving a whole life cycle of primary live equipment maintenance free.

Note: *The width of 500mm is suitable for 12kV 1250A circuit breaker(D cabinet).

References and Standards

References and Standards

- IEC_62271-100 Alternating-current high-voltage circuit-breakers
- IEC_62271-102 High-voltage alternating-current disconnectors and earthing switches
- IEC_62271-200 A.C. metal-enclosed switchgear and controlgear
- IEC_60265 High-voltage switches
- GB 3906 A.C. metal-enclosed switchgear and controlgear for rated voltages of 3.6kV - 40.5kV
- GB 3804 A.C. high voltage switches for rated voltages from 6kV to 40.5kV
- GB 1984 Alternating-current high-voltage circuit-breakers
- GB 1985 High-voltage alternating-current disconnectors and earthing switches
- GB 16926 High-voltage alternating current switch-fuse combinations
- GBT 11022 Common specifications for high-voltage switchgear and controlgear standards
- GBT 4208 Degrees of protection provided by enclosure (IP code)
- GB 15166.2 Alternating-current high-voltage fuses--Current-limiting fuses



Environment and Operating Conditions



Environment and Operating Conditions

- Temperature: -25°C
- Average within 24 hours (max.): 40 °C
- Rated voltage: 12kV and 24kV
- Operating temperature: -25°C ~ +40 °C
- Altitude: 2000m
- Degrees of protection: core unit (gas tank) IP68
Cabinet shell IP4X
- Insulating gas: SF₆
Relative pressure at 20 °C 0.03Mpa

For special operating conditions different from the normal ones above in the use environment, the manufacturer and the end user must reach an agreement. If special severe operating environment is involved, please do consult with the manufacturer and supplier.

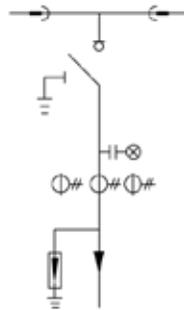
Technical Features

Model	C Load Switch	T Combinations	D Vacuum Circuit Breaker
Rated voltage (kV)	12/24	12/24	12/24
Rated current (A)	630	125	630 (1250) /630
Rated withstand current (kA/s)	20/20		20 (25) /20
Rated short circuit making current (peak) (KA)	50		50 (63) /50
Electrical endurance (times)	E3/E2		E2/E2
Rated short circuit breaking current (kA)		31.5	20 (25) /20
Short-circuit making capacity of earthing switch (times)	E2/E2		E2/E2
Internal arc rating	20kA/1s		20 (25) kA/1s
Mechanical life of circuit breaker (times)			10000/10000
Mechanical life of disconnecter (times)			5000/5000
Mechanical life of load switch (times)	5000/5000	5000/5000	
Mechanical life of earthing switch (times)	3000/3000	3000/3000	3000/3000
Power frequency withstand voltage (across the Isolating distance) kV	48/79	48/79	48/79
Power frequency withstand voltage (common value) kV	42/65	42/65	42/65
Lightning impulse voltage (across the Isolating distance) kV	85 (110) /145	85 (110) /145	85 (110) /145
Lightning impulse voltage (common value) kV	75 (95) /125	75 (95) /125	75 (95) /125
Annual leakage rate (%/year)	0.01%	0.01%	0.01%
Degrees of protection	IP68	IP68	IP68
Width mm	360 (450)	360	360(450), (500*)

Note: *The width of 500mm is suitable for 12kV 1250A breaker cabinet (D cabinet).

Functional Units

C Load Switch



Standard Configuration

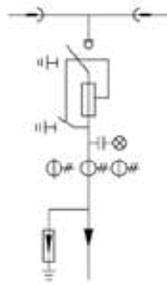
- Rotary load switch
- Manual operation mechanism for rotary load switch
- Earthing switch
- Manual operation mechanism for earthing switch
- Pressure gauges without auxiliary contacts
- Charge indicator (indicating that the cable outlet bushing is charged)
- 630A internal busbar
- Cable room with interlocking with earthing switch
- Earthing busbar

Optional Accessories for Additional Charges

- Electric operation mechanism for rotary load switch
- Inlet line arrester
- Single cable outlet bushing (630A)
- Short circuit and earthing fault indicator
- Twin cable outlet bushing (630A)
- Reserved external bus extension, bus coupler
- Density meter with alarm contacts (1NO)
- Bushing CT or feed-through CT
- Low pressure tank (400mm in height)

Functional Units

T Load switch-fuse Combinations



Standard Configuration

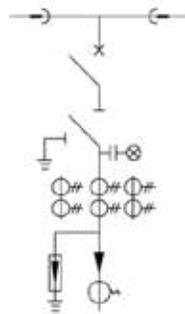
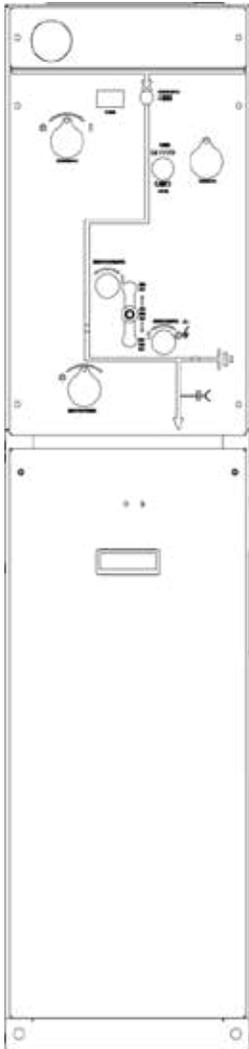
- Rotary load switch
- Manual operation mechanism for rotary load switch
- Earthing switch
- Manual operation mechanism for earthing switch
- Pressure gauges without auxiliary contacts
- Charge indicator (indicating that the cable outlet bushing is charged)
- 630A internal busbar
- Cable room with interlocking with earthing switch
- Earthing busbar
- Fuse tube
- 12kV, max. 125A fuse; 24kV, max. 63A fuse

Optional Accessories for Additional Charges

- Electric operation mechanism for rotary load switch
- Inlet line arrester
- Single cable outlet bushing (630A)
- Short circuit and earthing fault indicator
- Twin cable outlet bushing (630A)
- Reserved external bus extension, bus coupler
- Density meter with alarm contacts (1NO)
- Bushing CT or feed-through CT
- Low pressure tank (400mm in height)

Functional Units

D Vacuum Circuit Breaker



Standard Configuration

- 630A/1250A vacuum circuit breaker
- Manual operation mechanism for vacuum circuit breaker
- Three-position isolated earthing switch
- Manual operation mechanism for three-position isolated earthing switch
- Charge indicator (indicating that the cable outlet bushing is charged)
- Pressure gauges without auxiliary contacts
- 630A/1250A internal bus
- Cable room with interlocking with earthing switch
- Earthing bus

Optional Accessories for Additional Charges

- Electric operation mechanism for vacuum circuit breaker
- Inlet line arrester
- Single cable outlet bushing (630A/1250A)
- Short circuit and earthing fault indicator
- Twin cable outlet bushing (630A)
- AP330-R series microcomputer integrated protection device
- Reserved external bus extension, bus coupler
- Density meter with alarm contacts (1NO)
- Bushing CT or feed-through CT
- Low pressure tank (400mm in height)

Functional Units

R Cable/Bus-riser without Earthing Switch

1

Alpha Smart RMU



Standard Configuration

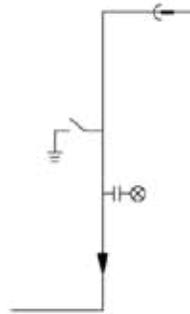
- 630A/1250A internal bus
- Outlet bushing in front of the unit 630A/1250A
- Charge indicator (indicating that the cable outlet bushing is charged)
- Pressure gauges without auxiliary contacts
- Earthing bus

Optional Accessories for Additional Charges

- Inlet line arrester
- Short circuit and earthing fault indicator
- Reserved external bus extension, bus coupler (bus)
- Density meter with alarm contacts (1NO)
- Bushing CT or feed-through CT
- Low pressure tank

Functional Units

Cable/Bus-riser with Earthing Switch



Standard Configuration

- 630A/1250A internal bus
- Earthing switch
- Operation mechanism for earthing switch
- Outlet bushing in front of the unit 630A/1250A
- Charge indicator (indicating that the cable outlet bushing is charged)
- Pressure gauges without auxiliary contacts
- Earthing bus

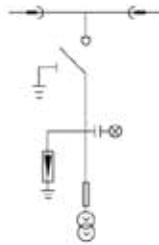
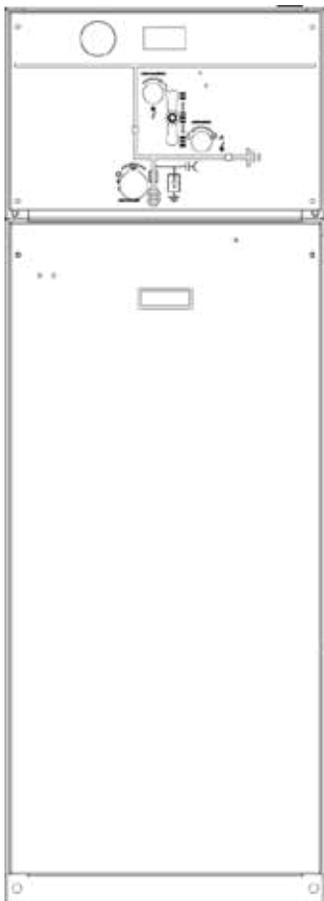
Optional Accessories for Additional Charges

- Electric operation mechanism for vacuum circuit breaker
- Inlet line arrester
- Short circuit and earthing fault indicator
- Reserved external bus extension, bus coupler (bus)
- Density meter with alarm contacts (1NO)
- Bushing CT or feed-through CT
- Low pressure tank

Functional Units

PT with Load Switch

Alpha Smart RMU



Standard Configuration

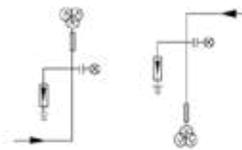
- 630A rotary load switch
- Manual operation mechanism for rotary load switch
- Earthing switch
- Manual operation mechanism for earthing switch
- Pressure gauges without auxiliary contacts
- Charge indicator (indicating that the cable outlet bushing is charged)
- 630A internal bus
- Cable room with interlocking with earthing switch
- Earthing bus
- Auxiliary insulation T head
- Body (550mm in width)

Optional Accessories for Additional Charges

- Electric operation mechanism for rotary load switch
- Inlet line arrester
- Short circuit and earthing fault indicator
- Reserved external bus extension, bus coupler
- Density meter with alarm contacts (1NO)
- 2 or 3 voltage transformers (JDZ11-10 or JDZ11-20)
- 3 fuses to protect PT
- 1 voltmeter with change-over switch

Functional Units

PT without Earthing Switch



Standard Configuration

- Charge indicator (indicating that the cable outlet bushing is charged)
- 630A internal bus
- Earthing bus
- Auxiliary insulation T head
- Cabinet (550mm in width)

Optional Accessories with for Additional Charges

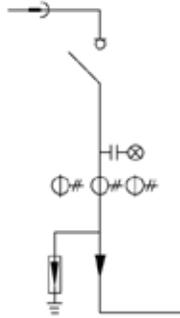
- Inlet line arrester
- 3 630A bus couplers for the connection of other functional units
- 2 or 3 voltage transformers (JDZ11-10 or JDZ11-20)
- 3 fuses to protect PT
- 1 voltmeter with change-over switch

Functional Units

Cb Bus Section (Load Switch)

1

Alpha Smart RMU



Standard Configuration

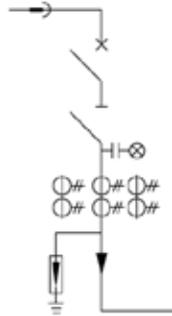
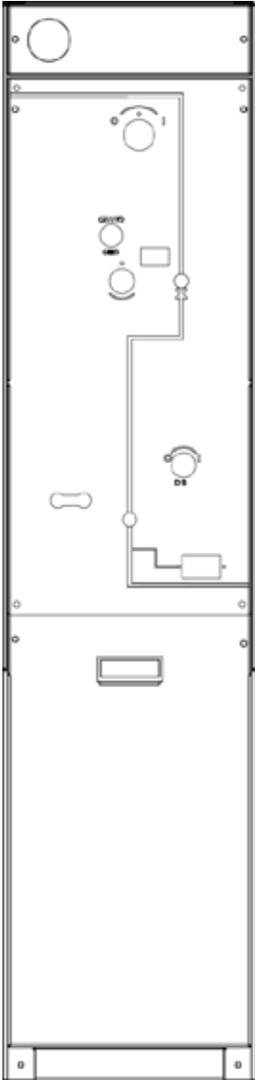
- Rotary load switch
- Manual operation mechanism for rotary load switch
- Earthing switch
- Manual operation mechanism for earthing switch
- Pressure gauges without auxiliary contacts
- Charge indicator (indicating that the cable outlet bushing is charged)
- 630A internal bus
- Cable room with interlocking with earthing switch
- Earthing bus

Optional Accessories for Additional Charges

- Electric operation mechanism for rotary load switch
- Short circuit and earthing fault indicator
- Reserved external bus extension, bus coupler
- Density meter with alarm contacts (1NO)
- Bushing CT or feed-through CT
- Low pressure tank

Functional Units

Db Bus Section (Vacuum Circuit Breaker)



Standard Configuration

- 630A vacuum circuit breaker
- Manual operation mechanism for vacuum circuit breaker
- Three-position isolated earthing switch
- Manual operation mechanism for three-position isolated earthing switch
- Charge indicator (indicating that the cable outlet bushing is charged)
- Charge indicator (indicating that the cable outlet bushing is charged)
- Pressure gauges without auxiliary contacts
- 630A internal bus
- Cable room with interlocking with earthing switch
- Earthing bus

Optional Accessories for Additional Charges

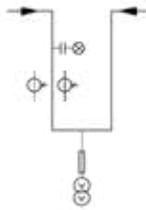
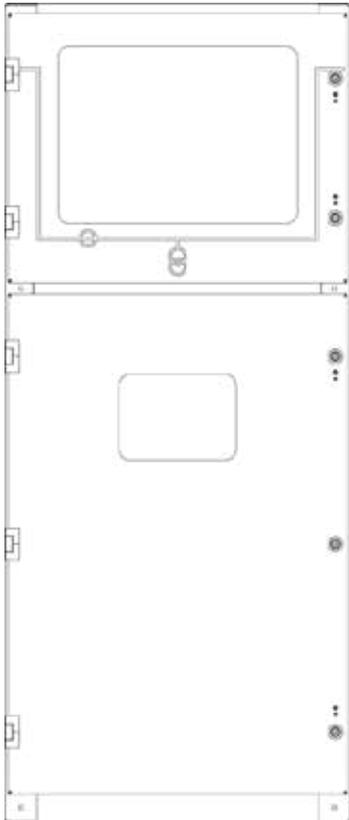
- Electric operation mechanism for vacuum circuit breaker
- Inlet line arrester
- Short circuit and earthing fault indicator
- AP330-R series microcomputer integrated protection device
- Reserved external bus extension, bus coupler
- Density meter with alarm contacts (1NO)
- Bushing CT or feed-through CT
- Low pressure tank (400mm in height)

Functional Units

M Measurement

1

Alpha Smart RMU



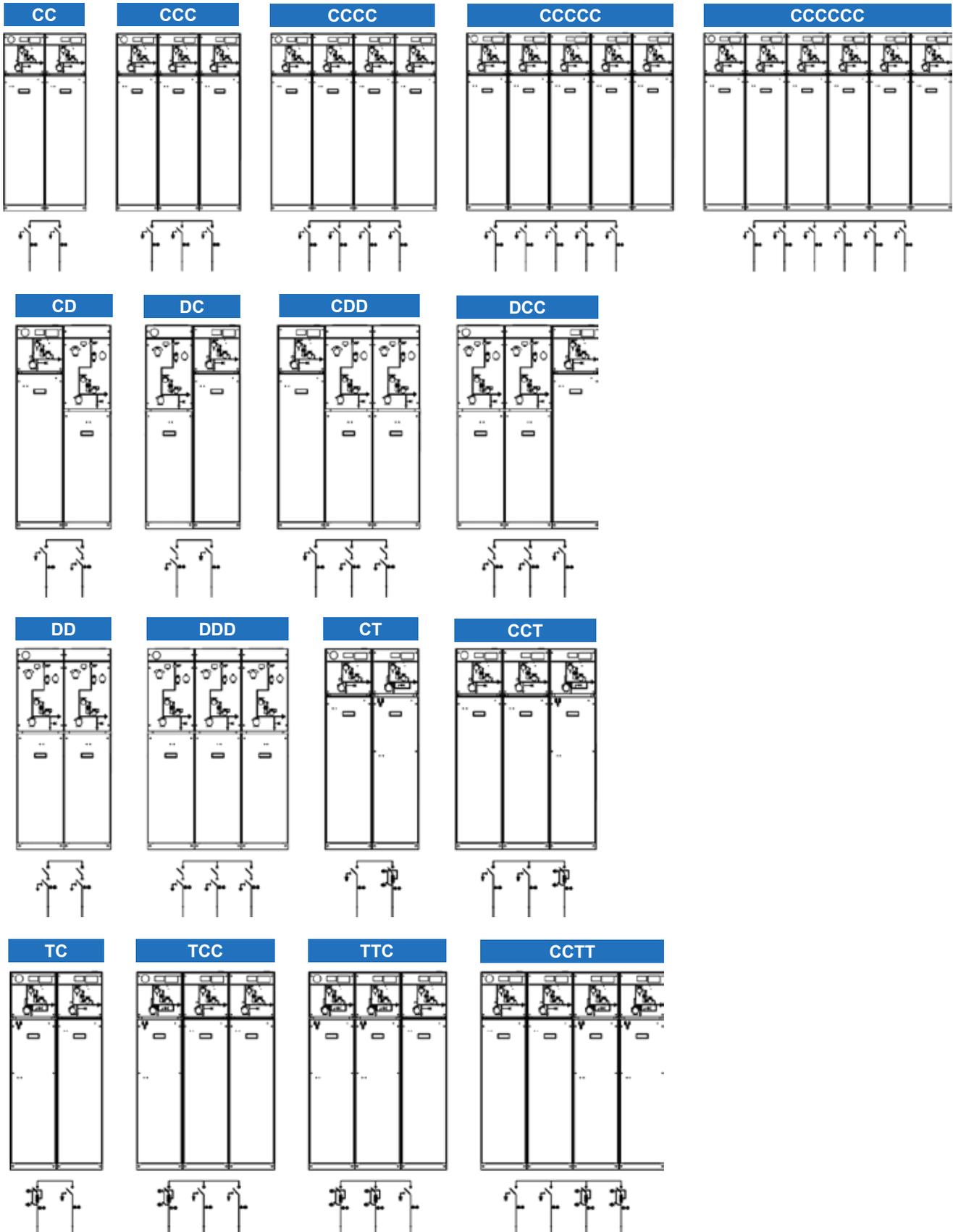
Standard Configuration

- 630A/1250A internal bus
- Auxiliary insulation T head
- **Charge indicator**
- Cabinet (650mm in width)

Optional Accessories for Additional Charges

- 2 or 3 voltage transformers (JDZ11-10 or JDZ11-20)
- 2 or 3 current transformers (LZZBJ9-12 or LZZBJ9-24)
- 3 fuses to protect PT
- Watt-hour meter
- 1 voltmeter with change-over switch
- 1 ammeter with change-over switch

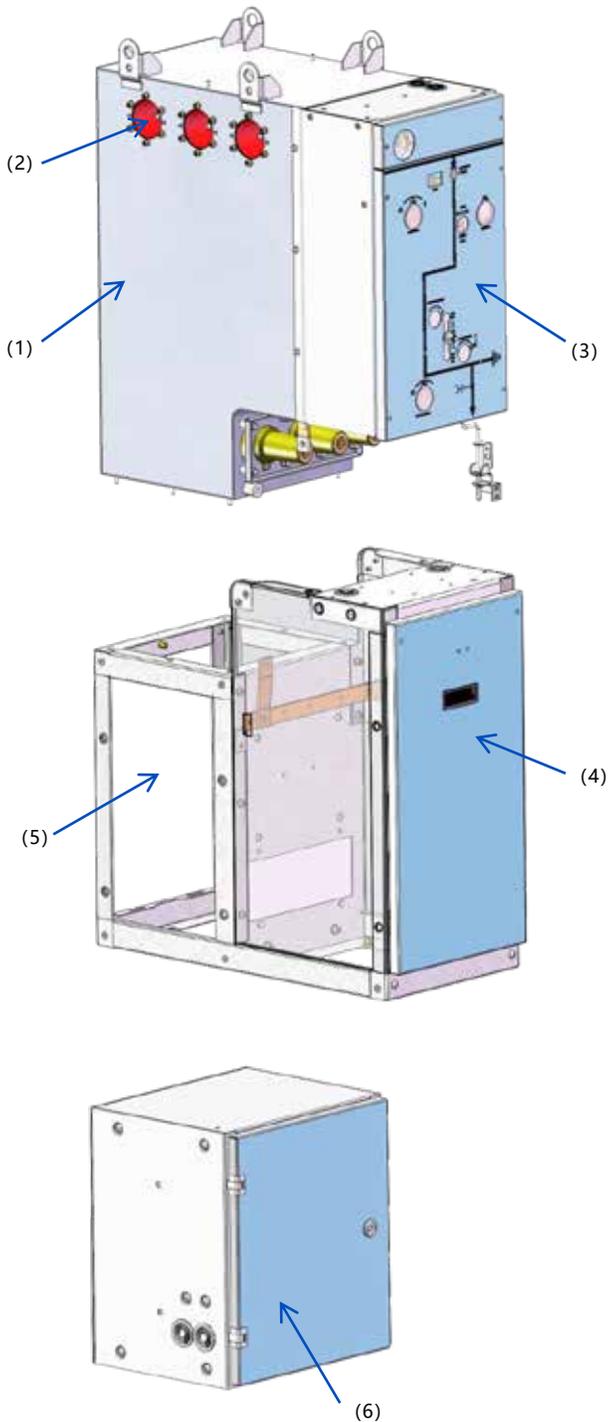
Standard Combination



Introduction

Alpha series 12/24kV Series SF₆ Gas Insulated Ring Main Unit

Alpha Smart RMU



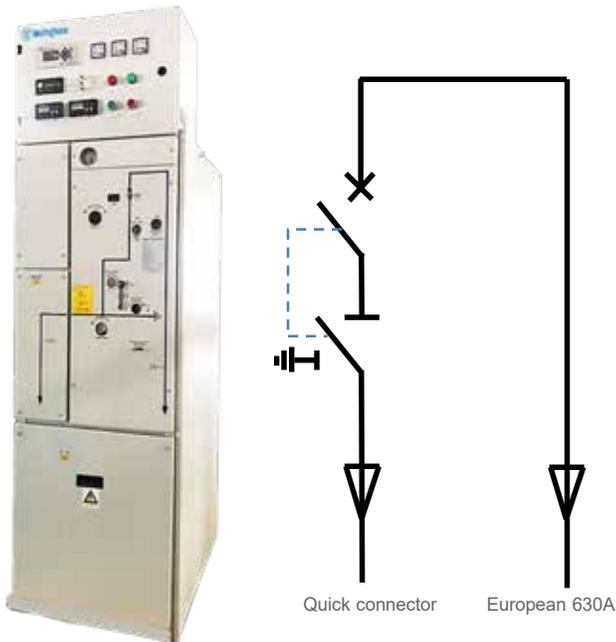
Alpha series 12/24kV series SF₆ gas insulated RMU has the self-energized load switch, vacuum circuit breaker with ultra-low resistance, and primary live part sealed in a stainless steel air tank fully filled with SF₆ to isolate with the outside, ensuring that the switchgear and all live parts in the air tank will not be affected by the outside environment; the air tank is installed on the base of cable room made of aluminium zinc plate; the operation mechanism and the door plate of the cable room are interlocked to realize reliable and safe sequential operation; with over 90% of metal materials, it exempts the unit from maintenance, improves the reliability of power supply, enhances personal safety and meets the needs of economic and reliable operation.

Note:

- (1) Stainless steel air tank filled with SF₆
- (2) Bus connection expansion bushing
- (3) Operation mechanism and door plate
- (4) Door plate of cable room
- (5) Base of cable room
- (6) Secondary instrument box

Application Scheme

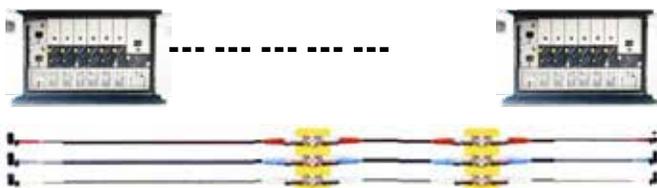
Bypass fast access application scheme (Maintenance without power failure)



Bypass operation system

Bypass operation system refers to the line maintenance operation system where the fault or maintenance line section is crossed with the bypass switches and bypass power cables as temporary bypass power supply lines, the power supply is led to the temporary power supply line of bypass through the operation of bypass switch to keep uninterrupted power supply to users, and then the power supply of fault or maintenance line section is disconnected to enter the power failure state.

Bypass live working is to cut off the equipment to be repaired from the power grid at a fixed point by building a temporary bypass power supply system, so as to repair the equipment under the state of uninterrupted power supply to users, which is the fourth type of operation method at the highest level for live working. We will gradually expand the use of bypass live working method without power outage, and strive to achieve the goal of live working without power outage, so as to ensure the reliability of power supply and improve the quality of power supply.

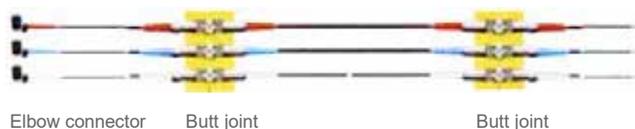


Temporarily take power from another RMU to supply power to RMU



RMU or live pluggable cable branch box

Mobile box transformer with low voltage load



Elbow connector

Butt joint

Butt joint

Temporary power supply from RMU to mobile box transformer

Technical principle of bypass fast access scheme

It is impossible to directly carry out line operation by live working method due to the characteristics of distribution network lines, and the outgoing line of bypass cable operation method provides a new solution and development direction for solving the problem of long power outage time caused by optimal planned maintenance and fault repair of distribution cable network lines.

The concept of cable transfer is put forward in the new bypass cable operation, i.e. the original incoming and outgoing cables of RMU, the load is transferred to a temporary RMU through the cable transfer device, and this RMU is used to temporarily replace the RMU to be overhauled or replaced. See the figure for the operation principle.

Microcomputer Protection

AP330 Microcomputer Protection Measurement & Control Device

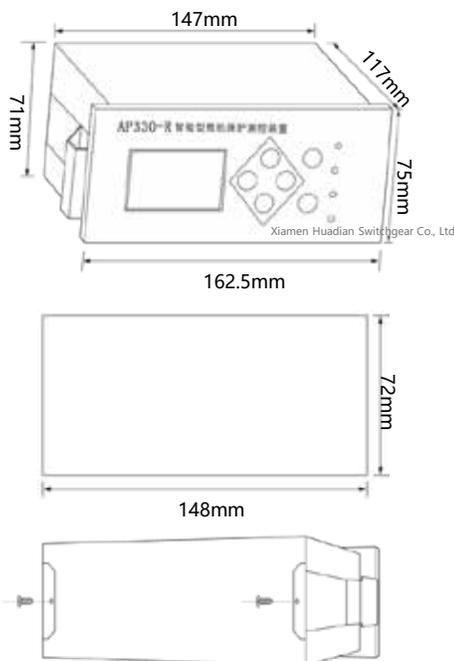
AP330

- Voltage classes of 110kV and below;
- ARM9 core-based 32-bit flash MCU, independently, developed and produced;
- Fashionable appearance, delicate structure and large LCD;
- Four-directional navigation panel, easy and quick to operate;
- Powerful function integration: integrating protection, measurement, control, monitoring, communication, fault recording, event recording and other functions;
- High precision measurement of current, voltage, power, power factor, frequency, zero-sequence current, zero sequence voltage, calculated kilowatt-hour;
- Number of on-line event records up to 256, dynamic refresh based on FIFO, records with time stamp to prevent loss in case of power down;
- This series unit can be installed in parts or in combination;

AP330-R

AP330-R Intelligent microcomputer protection measurement & control device is a distribution network automation terminal developed mainly for the application of RMU system.

- Multi - power, remote signalling, telemetering, remote control and other measurement & control functions
- Inter-phase current instantaneous trip protection, overcurrent protection, inverse-time over current protection of three action characteristic curves, zero-sequence overcurrent protection, reclosing protection, overvoltage protection and low voltage protection
- Non - power protection trip function



Overall Dimensions

Alpha series 12/24kV Series SF₆ Gas Insulated Ring Main Unit

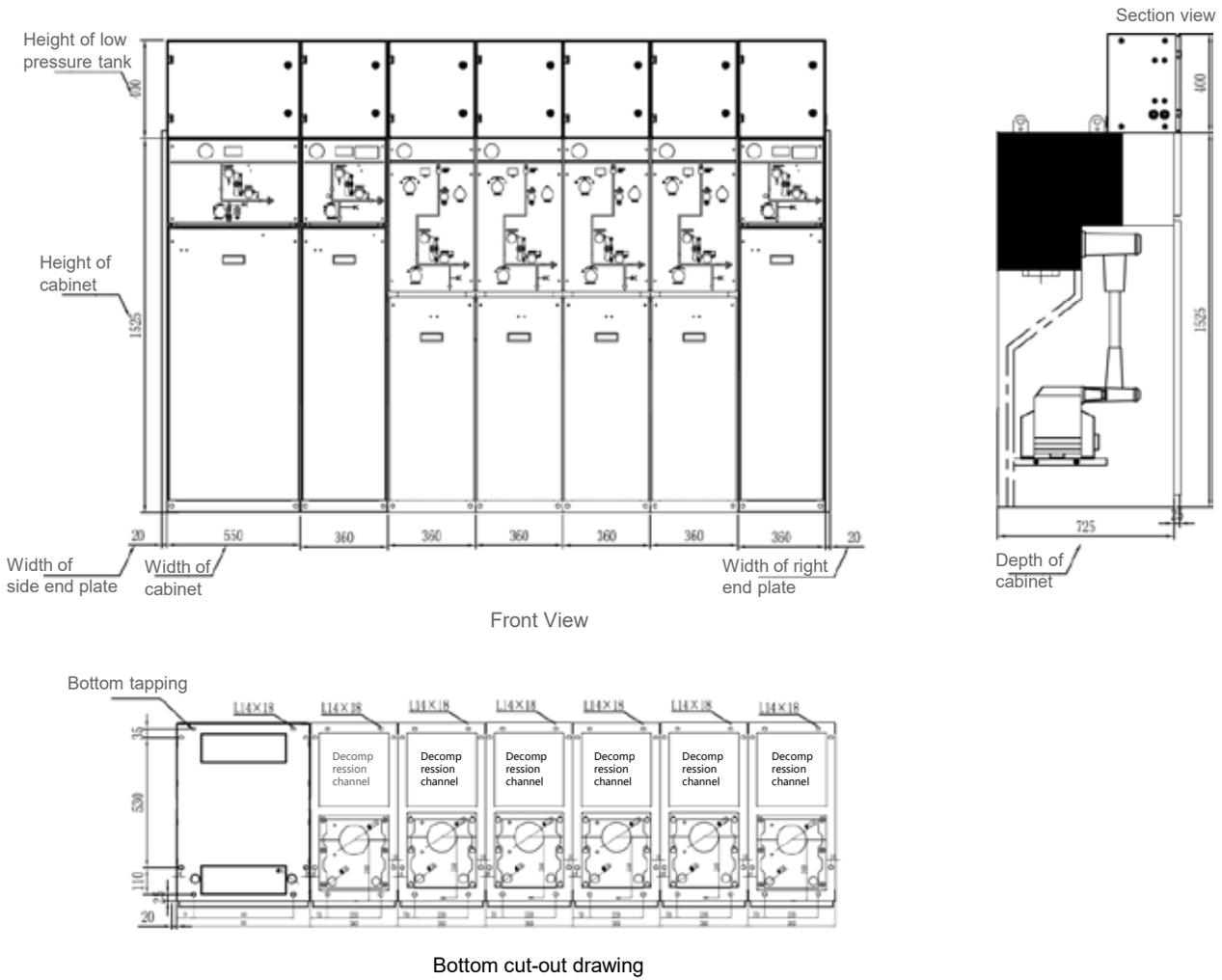
Features

With compact and small size, it greatly reduces occupation area and is easy to be installed in basement and outdoor switching room, which facilitates site installation, shortens construction period and improves economic benefits.

Functional Units	Functional Scheme	Width (mm)	Depth (mm)	Height (mm)
C	Load switch cabinet	360 (450)	755	1350 (1525)
T	Combined electrical cabinet	360	755	1350 (1525)
D	630A circuit breaker cabinet	360 (450)	755	1350 (1525)
D	1250A circuit breaker unit	500	755	1350 (1525)
R	Cable/Bus-riser cabinet without earthing switch	360	755	1350 (1525)
Re	Cable/Bus-riser cabinet with earthing switch	360	755	1350 (1525)
PT	PT cabinet with load switch	360 (550)	755	1350 (1525)
P	PT cabinet without three-position switch	550	755	1350 (1525)
Cb	Bus sectional cabinet with load switch	360	755	1350 (1525)
Db	Bus sectional cabinet with vacuum circuit breaker	360	755	1350 (1525)
M	Measurement cabinet	650	755	1350 (1525)

Diagram of Installation Foundation

PT+C+4×D+C



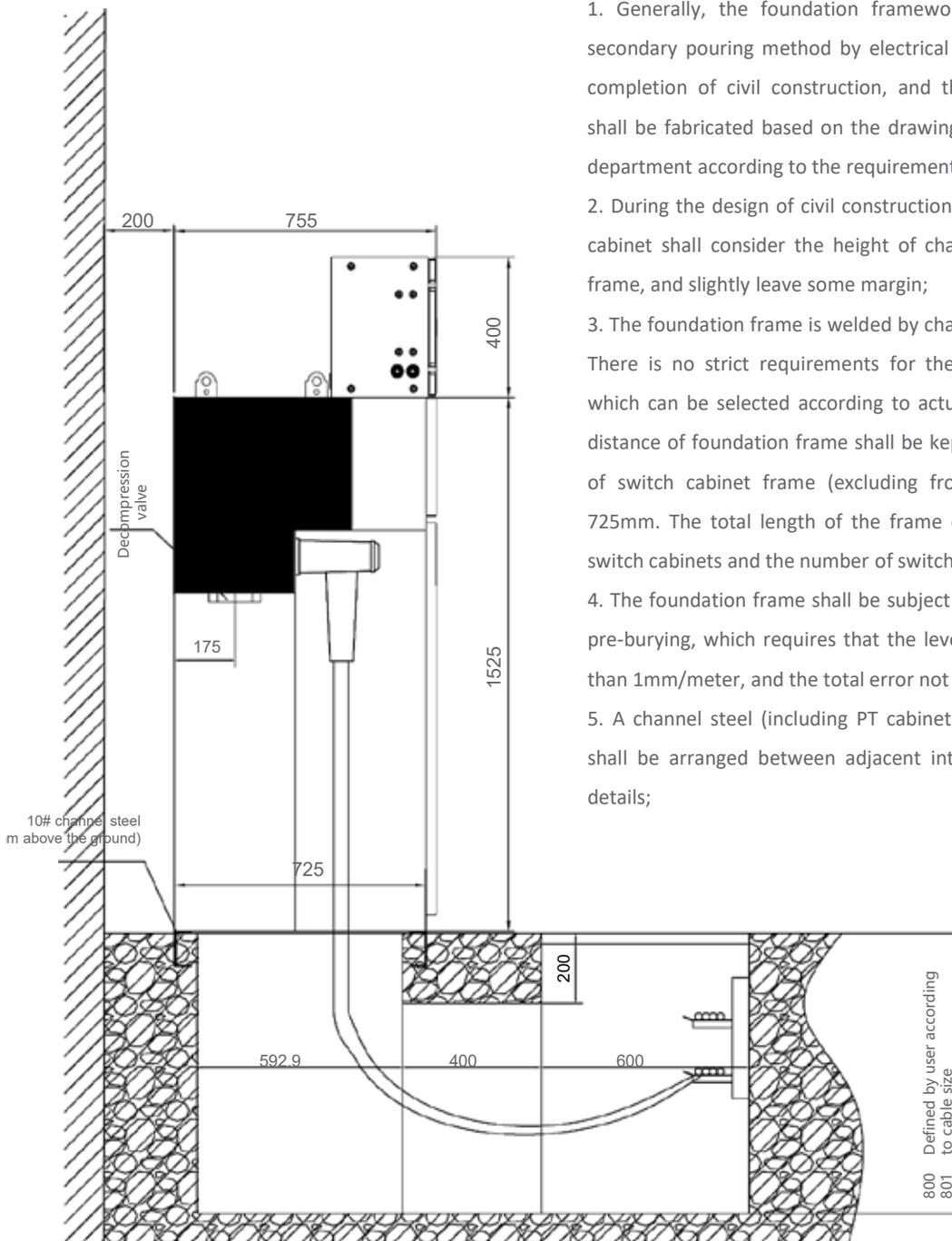
Note:

1. Mark the side of left and right end blanking plates, 20mm in thickness, respectively.

Diagram of Installation Foundation

A-A

Size unit: mm



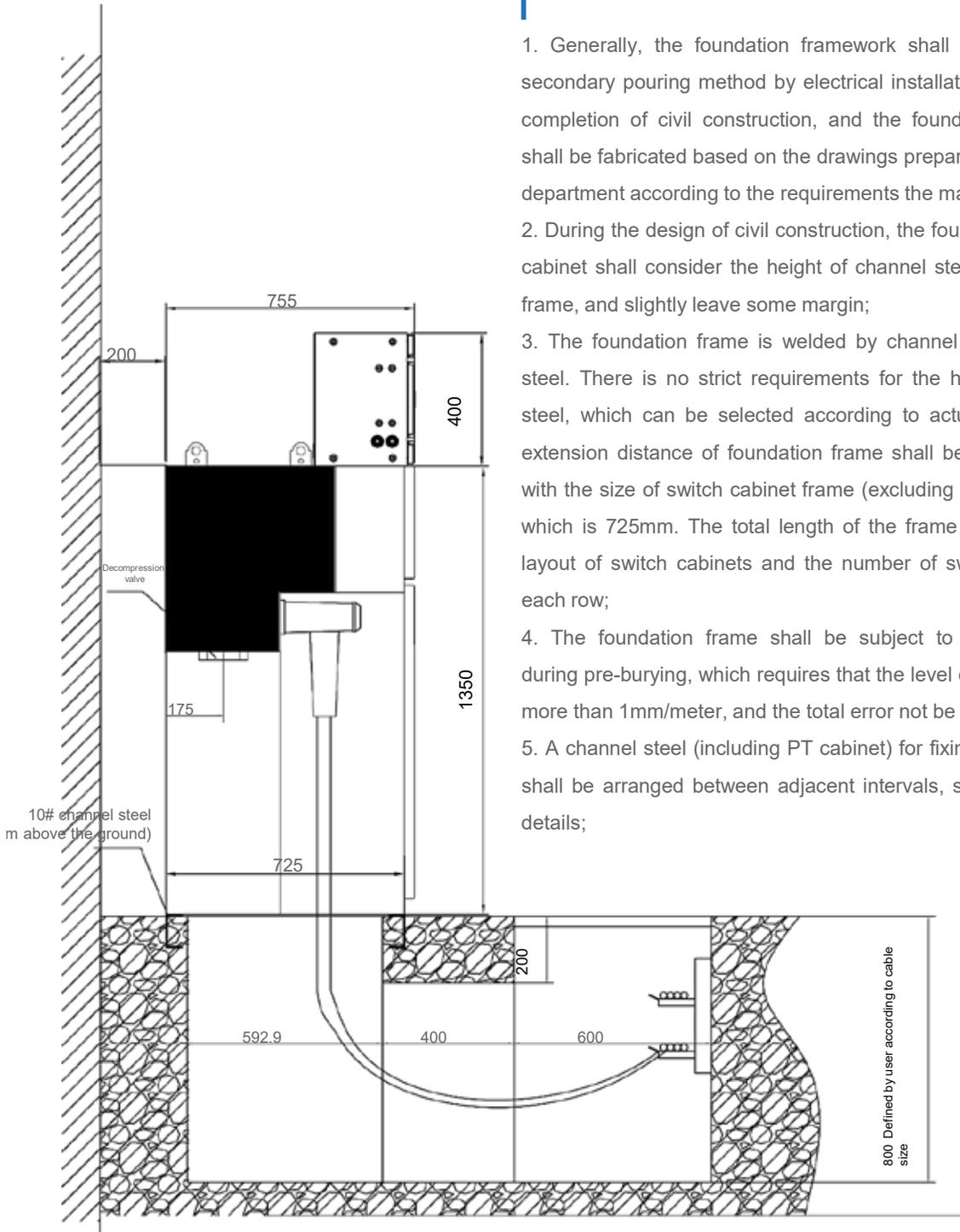
1. Generally, the foundation framework shall be buried using secondary pouring method by electrical installation unit after the completion of civil construction, and the foundation framework shall be fabricated based on the drawings prepared by the design department according to the requirements the manufacturer;
2. During the design of civil construction, the foundation of switch cabinet shall consider the height of channel steel for foundation frame, and slightly leave some margin;
3. The foundation frame is welded by channel steel and angle steel. There is no strict requirements for the height of channel steel, which can be selected according to actual bearing. The extension distance of foundation frame shall be kept consistent with the size of switch cabinet frame (excluding front door plate), which is 725mm. The total length of the frame depends on the layout of switch cabinets and the number of switch cabinets in each row;
4. The foundation frame shall be subject to level calibration during pre-burying, which requires that the level error shall not be more than 1mm/meter, and the total error not be more than 2mm;
5. A channel steel (including PT cabinet) for fixing switch cabinet shall be arranged between adjacent intervals, see floor plan for details;

Diagram of Installation Foundation

A-A

Size unit: mm

Alpha Smart RMU



1. Generally, the foundation framework shall be buried using secondary pouring method by electrical installation unit after the completion of civil construction, and the foundation framework shall be fabricated based on the drawings prepared by the design department according to the requirements the manufacturer;
2. During the design of civil construction, the foundation of switch cabinet shall consider the height of channel steel for foundation frame, and slightly leave some margin;
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5. A channel steel (including PT cabinet) for fixing switch cabinet shall be arranged between adjacent intervals, see floor plan for details;

Order Information

Order Information

Order Information

- Model, name and scheme of RMU
- Rated voltage, rated current and required quantity
- Manual operation mechanism or electric operation mechanism, and indicate the voltage for electric operation
- Name and quantity of spare parts
- Other special requirements shall be put forward before ordering

Accompanying Documents and Attachments

- Certificate of Conformity (factory test report)
- Operation Manual
- Packing List
- Operation Handle



Worldwide



OUR PROMISE

Westinghouse is built upon a tradition of dependability and innovation.

Today, we strive to make everyday life a little better by offering a wide range of quality products and services you can trust.



WHY WESTINGHOUSE ?

Since 1886, Westinghouse has brought the best to life. Today, Westinghouse Electric Corporation remains a trusted name globally in consumer and industrial products. Built on a heritage of innovation and entrepreneurial spirit. Today, Westinghouse continues to grow its diverse portfolio, which includes a wide range of product categories, including home appliances, consumer electronics. Lighting and power generation.





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