



# Alpha Series SF<sub>6</sub> Gas Insulated Ring Main Unit

40.5 kV, 1250A, 25kA





# Westinghouse

## Leading The Future of Electrification

- A Global Heritage Brand with 130 Years of Product Innovation
- Perfect Products, Creative Services, and Competitive Price

## Since 1886, Westinghouse Has Brought The Best To Life.

Westinghouse remains a trusted name globally in consumer and industrial products. Built on a heritage of innovation and entrepreneurial spirit, Westinghouse products were the first to supply the United States with AC electric power, transmit a commercial radio broadcast and capture man's first step on the moon. Today, Westinghouse continues to grow its diverse portfolio with a wide range of product categories that include home appliances, consumer electronics, lighting and power generation.

## Contents

---

Overview .....	1
Technical Features .....	2
References and Standards .....	3
Environment and Operating conditions .....	4
Technical Parameters .....	5
Functional Units .....	6
Standard Combination .....	9
Application Scheme .....	10
Product Introduction .....	11
Protection relay .....	12
Overall Dimensions .....	13
Diagram of Installation Foundation .....	14
Order Information .....	16

## Overview



The core unit of Alpha+ 40.5kV series SF<sub>6</sub> gas insulated RMU uses patented self-energized 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 SF<sub>6</sub> 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

- Onshore/offshore wind farms
- Medium and large photovoltaic power stations
- Small medium voltage substation
- Industrial enterprises
- Large buildings and venues
- Airport, port and rail transit
- Municipal engineering, commercial complex, urban center, etc.

## Technical Features



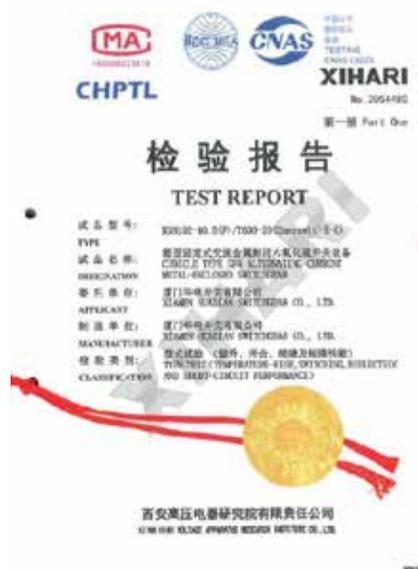
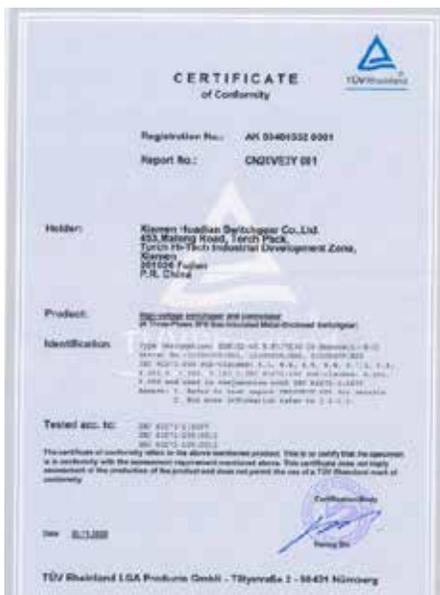
### Technical Features

- Alpha series RMU is standardized based on the same platform, compact and reliable;
- SF<sub>6</sub> gas isolated;
- Rated voltage: 40.5kV;
- All primary live parts are sealed in a stainless steel air tank fully filled with SF<sub>6</sub>;
- 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;
- 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.

## 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 62271-103 High voltage load switch
- GB/T 3906 A.C. metal-enclosed switchgear and controlgear for rated voltages of 3.6kV - 40.5kV
- GB/T 3804 A.C. high voltage switches for rated voltages from 6kV to 40.5kV
- GB/T 1984 Alternating-current high-voltage circuit-breakers
- GB/T 1985 High-voltage alternating-current disconnectors and earthing switches
- GB/T 16926 High-voltage alternating current switch-fuse combinations
- GB/T 11022 Common specifications for high-voltage switchgear and controlgear standards
- GB/T 4208 Degrees of protection provided by enclosure (IP code)
- GB/T 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
- Rated voltage: 40.5kV
- Operating temperature: -25°C~+40
- Altitude: 2000m
- Degrees of protection: core unit (gas tank) IP68  
Operation mechanism room IP4X  
Cable room IP4X
- Insulating gas: SF<sub>6</sub>  
Relative pressure at 20     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

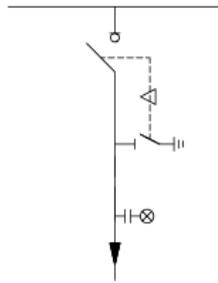
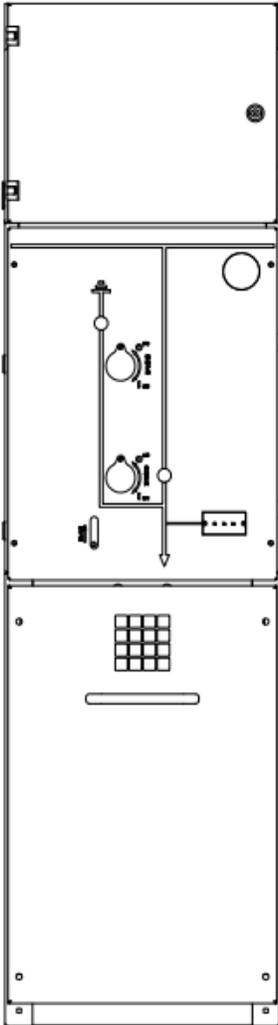
1

Alpha Smart RMU

Model	C Load Switch	D Vacuum Circuit Breaker
Rated voltage (kV)	40.5	40.5
Rated current (A)	630	630/1250
Rated withstand current (kA/s)	20/4	20/4 (25/4)
Rated short circuit making current (peak) (KA)	50	50 (63)
Electrical endurance (times)	E2	E2
Rated short circuit breaking current (kA)		20 (25)
Short-circuit making capacity of earthing switch	E1	E1
Internal arc rating	25kA/1s	
Mechanical life of circuit breaker (times)		10000
Mechanical life of disconnect (times)		5000
Mechanical life of load switch (times)	5000	
Mechanical life of earthing switch (times)	3000	3000
Power frequency withstand voltage (across the Isolating distance) kV	118	118
Power frequency withstand voltage (common value) kV	95	95
Lightning impulse voltage (across the Isolating distance) kV	215	215
Lightning impulse voltage (common value) kV	185	185
Annual leakage rate (%/year)	0.01	0.01
Degrees of protection	IP68	IP68
Width mm	450	450 (500)

## Functional Units

### C Load Switch



#### Standard Configuration

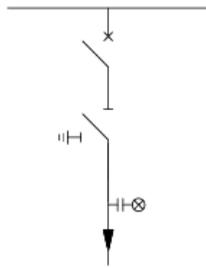
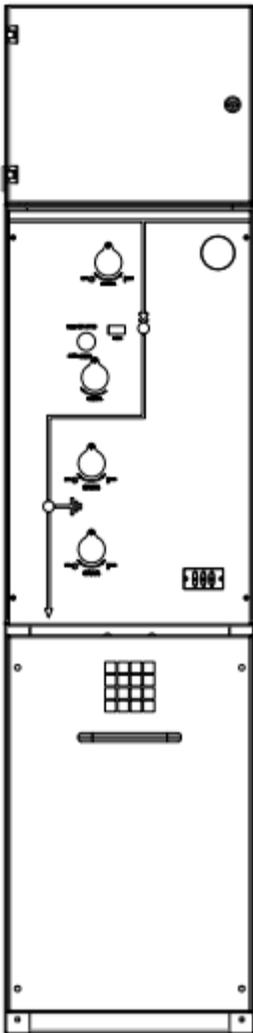
- Self-energized load switch
- Manual operation mechanism for self-energized load switch
- Earthing switch
- Manual operation mechanism for earthing switch
- Density meter
- Potential indicator (indicating that the cable outlet bushing is charged)
- 630A internal busbar
- Cable room with interlocking with earthing switch
- Earthing busbar

#### Optional Accessories for Additional Charges

- Electric operation mechanism for self-energized load switch
- Inlet line arrester
- Single cable outlet bushing (630A)
- Short circuit and earthing fault indicator
- Reserved external bus extension, bus coupler
- 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
- Potential indicator (indicating that the cable outlet bushing is charged)
- Density meter
- 630A/1250A internal busbar
- Cable room with interlocking with earthing switch
- Earthing busbar

#### 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
- AP330-R series microcomputer integrated protection device
- Reserved external bus extension, bus coupler
- Bushing CT or feed-through CT
- Low pressure tank (400mm in height)

## Functional Units

### R Cable/Bus riser without earthing switch



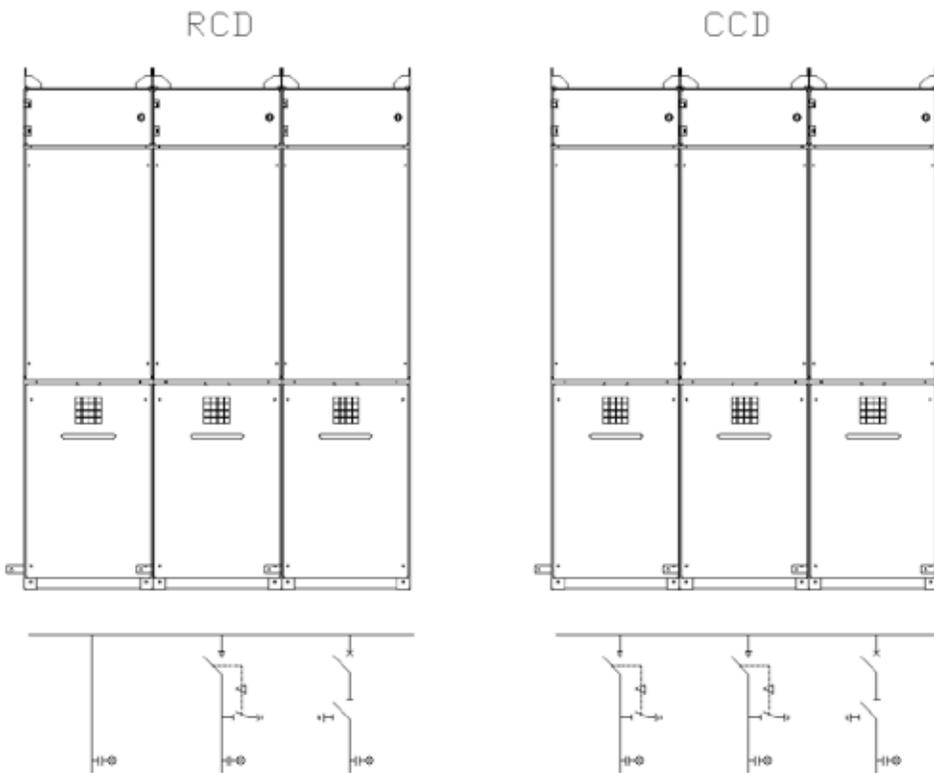
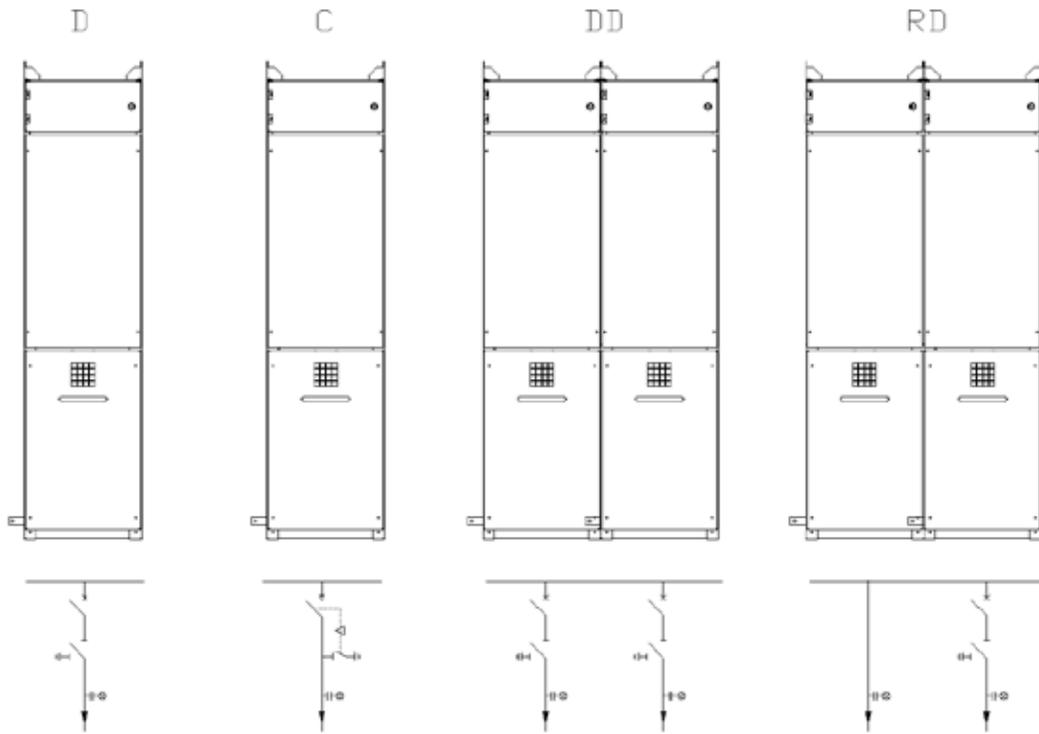
#### Standard Configuration

- 630A/1250A internal bus
- Outlet bushing in front of the unit 630A/1250A
- Potential indicator (indicating that the cable outlet bushing is charged)
- Density meter
- Earthing busbar

#### Optional Accessories for Additional Charges

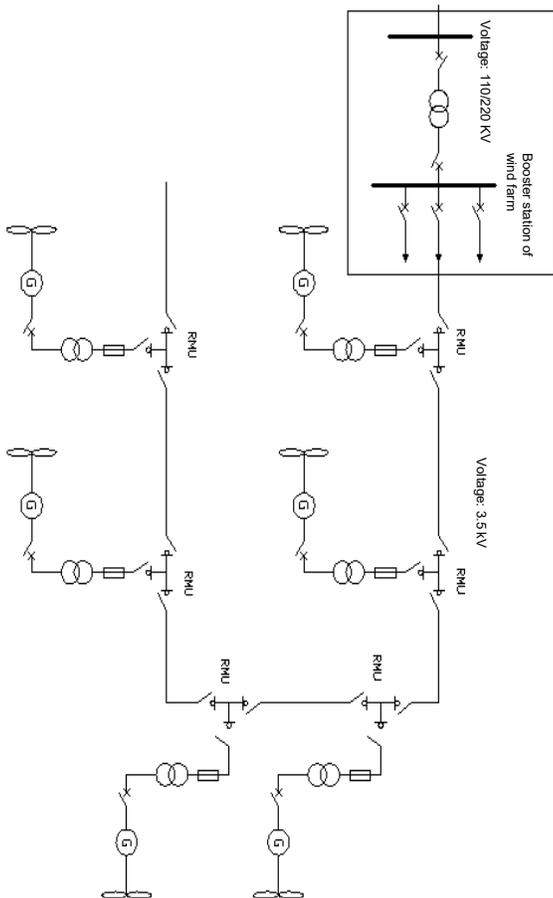
- Inlet line arrester
- Short circuit and earthing fault indicator
- Reserved external bus extension, bus coupler (bus)
- Low pressure tank

Functional Units



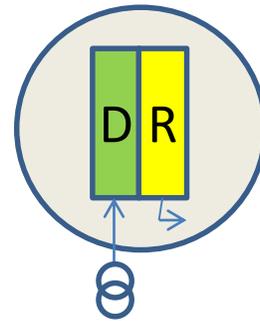
## Functional Units

### Combined application scheme suitable for wind turbine tower cabin



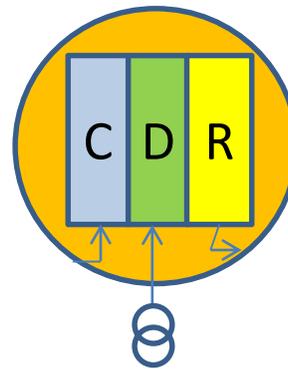
#### Alpha 40.5 DR

Fan transformer to protect the circuit breaker cabinet + outgoing cabinet



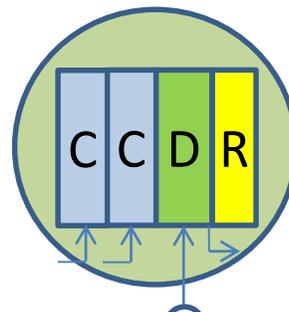
#### Alpha 40.5 CDR

Fan transformer to protect the circuit breaker cabinet + outgoing cabinet + load switch incoming cabinet



#### Alpha 40.5 CDDR

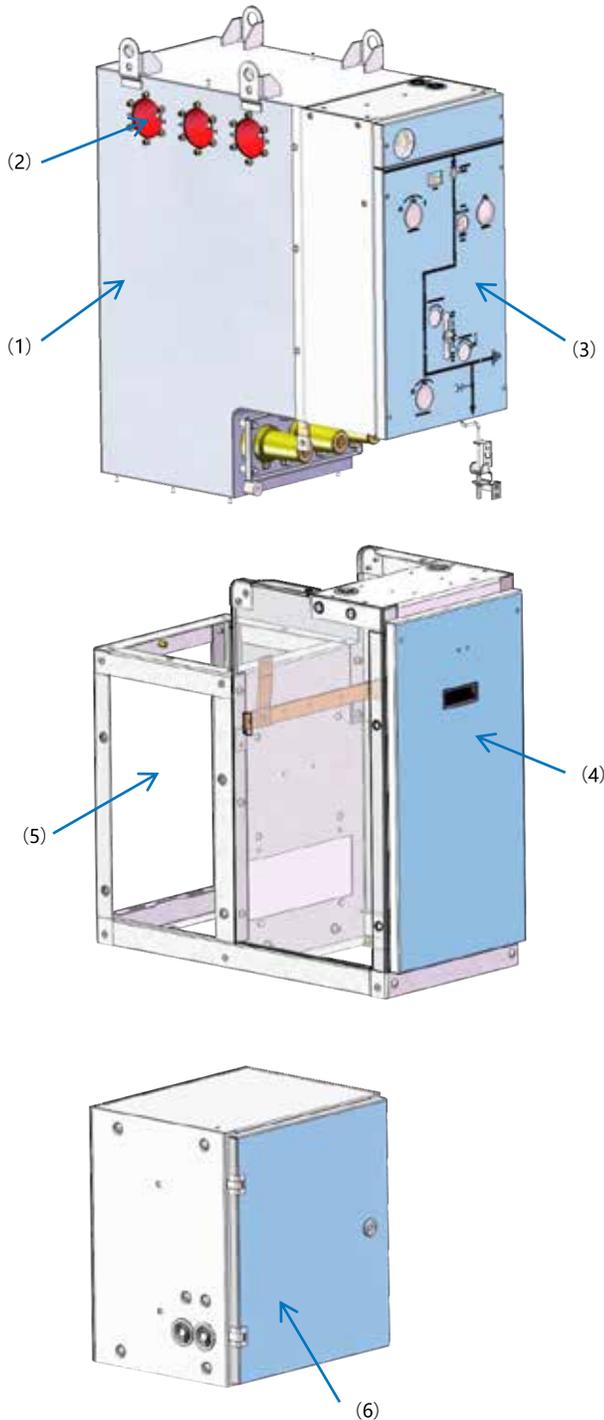
Fan transformer to protect the circuit breaker cabinet + outgoing cabinet+2-way load switch incoming cabinet



## Functional Units

### Alpha 40.5kV Series SF<sub>6</sub> Gas Insulated Ring Main Unit

Alpha Smart RMU



Alpha 40.5kV series SF<sub>6</sub> 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 SF<sub>6</sub> 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 SF<sub>6</sub>
- (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

## Functional Units

### 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;

## Functional Units

### Enerswit+40.5kV Series SF<sub>6</sub> Gas Insulated Ring Main Unit

1

Alpha Smart RMU

#### Features

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

The height of product is increased by 200mm or 400mm according to the configuration of the low-pressure room.

Functional Units	Functional Scheme	Width (mm)	Depth (mm)	Height (mm)
C	Load switch cabinet	450	850	1800
D	Vacuum circuit breaker cabinet	450 (500)	850	1800
R	Cable/Bus riser without earthing switch	450	850	1800
PT	PT cabinet with load switch	450	850	1800

# Functional Units

C+C+D+R

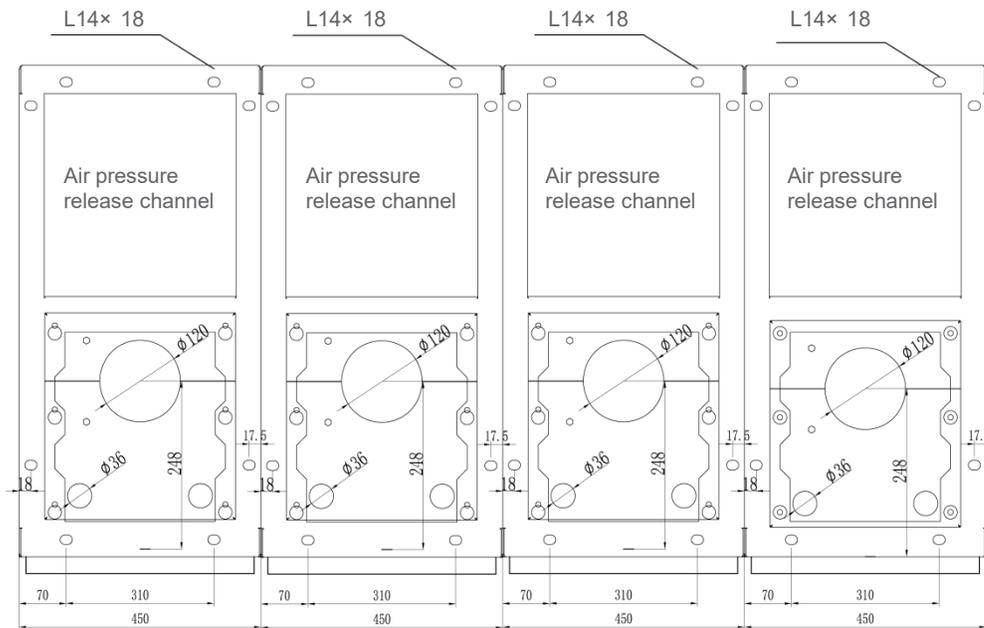
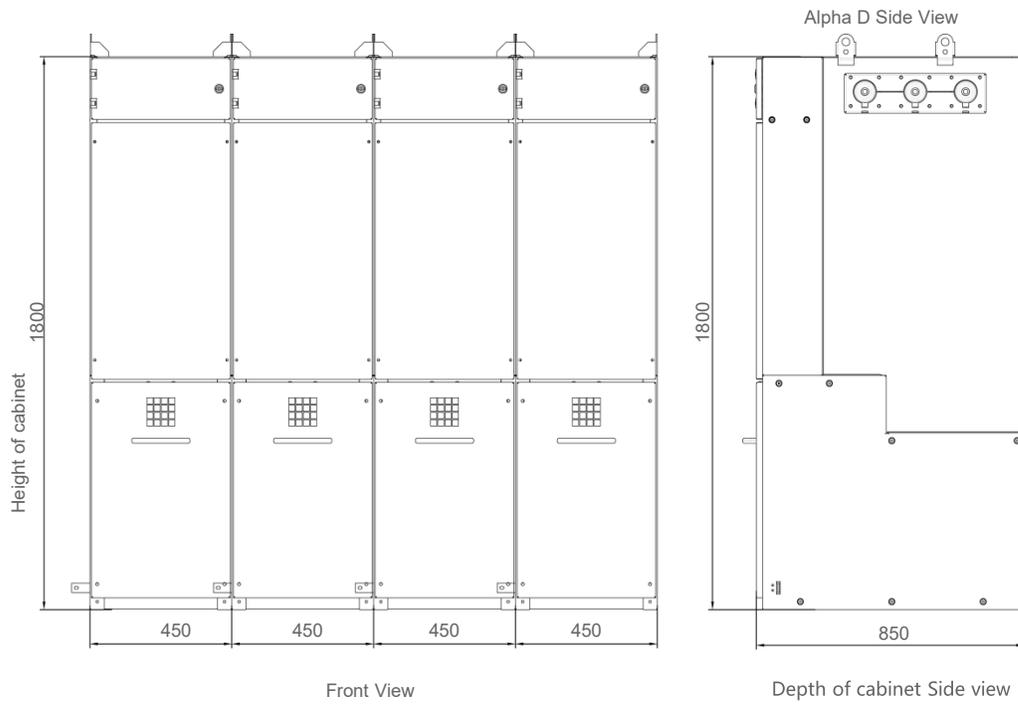


Diagram of Bottom Tapping

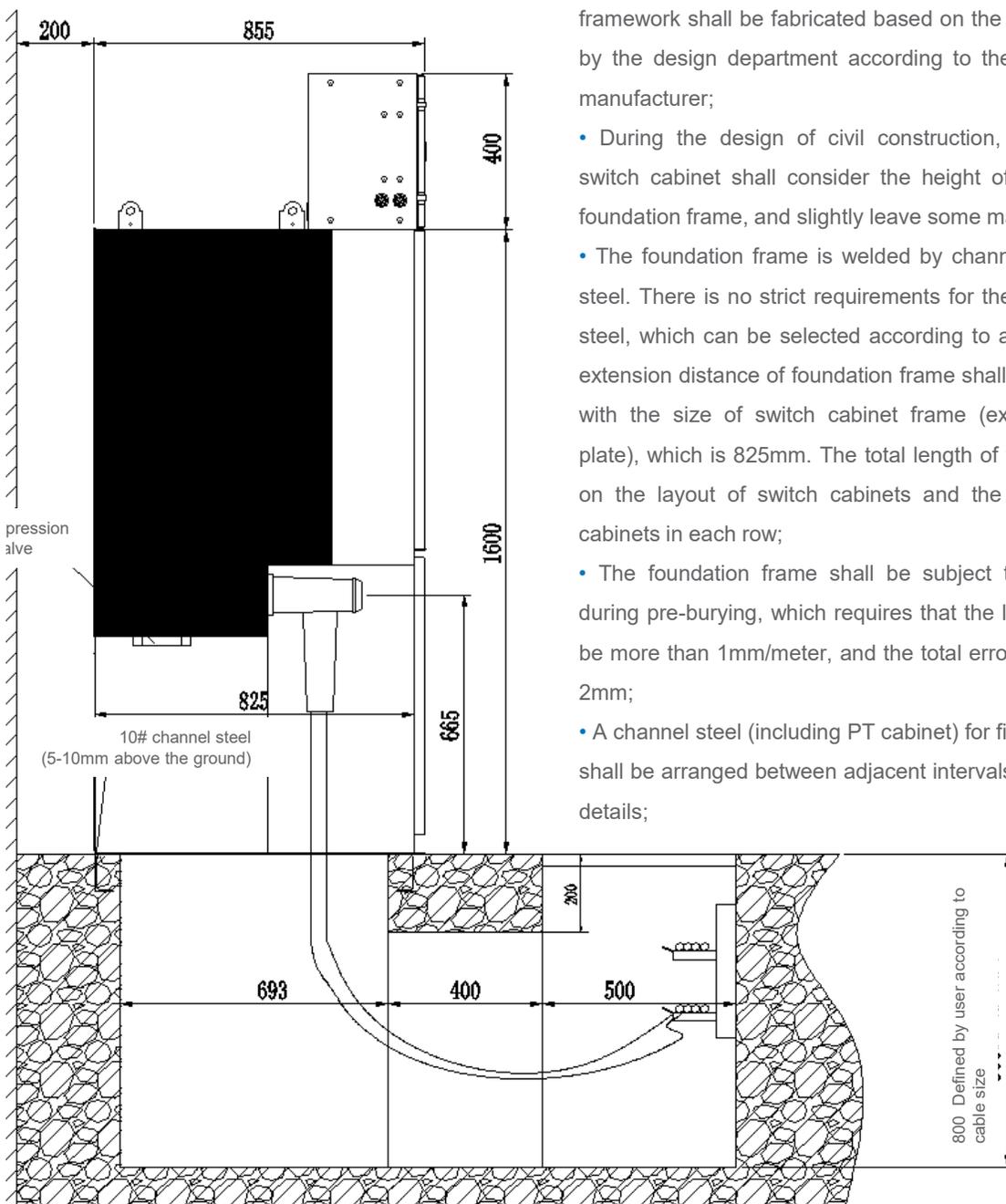
## Functional Units

A-A

Size unit : mm

1

Alpha Smart RMU



- 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;
- 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;
- 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 825mm. The total length of the frame depends on the layout of switch cabinets and the number of switch cabinets in each row;
- 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;
- A channel steel (including PT cabinet) for fixing switch cabinet shall be arranged between adjacent intervals, see floor plan for details;

## Standard Combination

### 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.





**Westinghouse**  
Pennsylvania , USA

**Westinghouse LV MV Product sp. z o.o.**  
Warsaw, Poland

**Westinghouse Lv Mv Product Sdn. Bhd.**  
Penang, Malaysia

**Westinghouse LV MV Product**  
Dubai, UAE

**Westinghouse LV MV Product**  
Istanbul, Turkey

**[WWW.westinghouselvmv.com](http://WWW.westinghouselvmv.com)**  
**Email: [info@westinghouselvmv.com](mailto:info@westinghouselvmv.com)**

™ & © 2023 Westinghouse Electric Corporation. All Rights Reserved.

V.35.11.2023



We reserve the right to make technical changes or modify the contents of this document without prior notice. All the agreed particulars shall prevail . All rights reserved.