



## Enerswit<sup>+</sup>

### RMU for Secondary Distribution

40.5kV,... 630A,...31.5kA, SF<sub>6</sub> Insulated

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The core unit of Enerswit<sup>+</sup> 40.5kV series SF<sub>6</sub> gas insulated RMU uses patented pneumatic 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

- Enerswit+ series 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
- 450mm 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
- IEC 62271-1 High-voltage switchgear and controlgear-Part 1: Common specifications for alternating current switchgear and controlgear
- EN IEC 61000-6-4 Electromagnetic compatibility (EMC)-Part 6-4: Generic standards-Emission standards for industrial environments
- EN IEC 61000-6-2 Electromagnetic compatibility (EMC)-Part 6-2: Generic standards-Immunity standards for industrial environments
- EMC Directive 2014/30/EU
- 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 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

- Temperature: -25℃
- Average within 24 hours (max.): 40℃
- Operating temperature: -25℃ ~ +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.

| Climatic conditions |   | 40℃ | 45℃ | 50℃ | 55℃ | 60℃ |
|---------------------|---|-----|-----|-----|-----|-----|
| Bus 630A            | A | 630 | 600 | 570 | 540 | 510 |
| Function C/D        | A | 630 | 600 | 570 | 540 | 510 |

## Technical Parameters

| Model                                                                  | C Load Switch | D Vacuum Circuit Breaker |
|------------------------------------------------------------------------|---------------|--------------------------|
| Rated Voltage (kV)                                                     | 40.5          | 40.5                     |
| Rated Frequency (Hz)                                                   | 50/60         | 50/60                    |
| Rated Current (A)                                                      | 630           | 630                      |
| Rated Withstand Current (kA/4s)                                        | 20、 25        | 31.5                     |
| Rated Short-Circuit Making Current (Peak) (kA)                         | 50、 63/65     | 80/82                    |
| Electrical Endurance (Times)                                           | -             | E2                       |
| Rated Short-Circuit Breaking Current (kA)                              |               | 31.5                     |
| Internal Arc Test AFLR (kA/1s)                                         | 25            | 25                       |
| Mechanical Life of Circuit Breaker (Times)                             |               | 10000                    |
| Mechanical Life of Disconnecter (Times)                                |               | 5000                     |
| Mechanical Life of Load Switch (Times)                                 | 5000          |                          |
| Mechanical Life of Earthing Switch (Times)                             | 3000          | 5000                     |
| Power Frequency Withstand Voltage (Across the Lsolation Distance) (kV) | 118           | 118                      |
| Power Frequency Withstand Voltage (Common Value) (kV)                  | 95            | 95                       |
| Lightning Impulse Voltage (Across the Lsolation 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                      |

## C Load Switch

### Standard Configuration

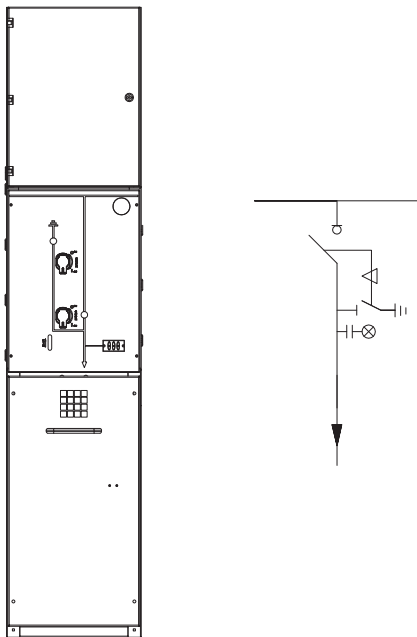
- Pneumatic load switch
- Manual operation mechanism for pneumatic load switch
- Earthing switch
- Manual operation mechanism for earthing switch
- Densimeter with 1no auxiliary contact
- Potential indicator (indicating that the cable outlet bushing is charged)
- 630A internal busbar
- Cable room with interlocking with earthing switch
- Earthing busbar
- Low pressure tank

### Optional Accessories for Additional Charges

- Electric operation mechanism for pneumatic load switch
- Lightning arrester
- Cable T-head(630A)
- Short circuit and earthing fault indicator
- Reserved external bus extension, bus coupler
- Bushing CT or feed-through CT

### Standard Size / Weight

- W450mm×D850mm ×H(1505+600\*)mm
- 268kg



## D Vacuum Circuit Breaker

### Standard Configuration

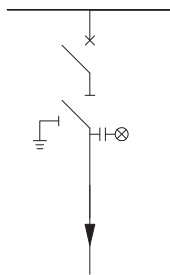
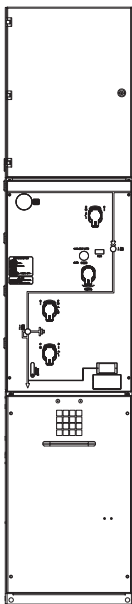
- 630A vacuum circuit breaker
- Manual operation mechanism for vacuum circuit breaker
- Three-position isolated earthing switch
- Manual operation mechanism for three-position isolated earthing switch
- Potential indicator (indicating that the cable outlet bushing is charged)
- Densimeter with 1no auxiliary contact
- 630A internal busbar
- Cable room with interlocking with earthing switch
- Earthing busbar
- Low pressure tank

### Optional Accessories for Additional Charges

- Electric operation mechanism for vacuum circuit breaker
- Lightning arrester
- Cable T-head(630A)
- Short circuit and earthing fault indicator
- AP330 series microcomputer integrated protection device
- Reserved external bus extension, bus coupler
- Bushing CT or feed-through CT

### Standard Size / Weight

- W450mm×D850mm ×H(1505+600\*)mm
- 315kg



# Functional Units

## R Cable Connection Cabinet

### Standard Configuration

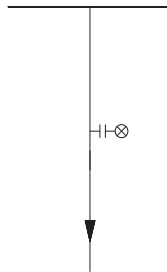
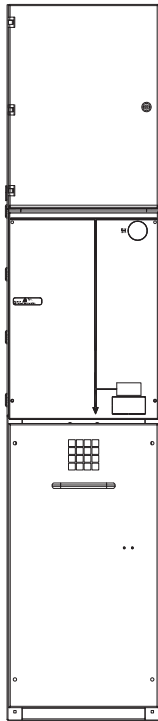
- 630A internal bus
- Outlet bushing in front of the unit 630A
- Potential indicator (indicating that the cable outlet bushing is charged)
- Densimeter with 1no auxiliary contact
- Earthing busbar
- Low pressure tank

### Optional Accessories for Additional Charges

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

### Standard Size / Weight

- W450mm×D850mm ×H(1505+600\*)mm
- 115kg



# Functional Units

## L Cable Connection Cabinet

### Standard Configuration

- Air insulation
- Latching electromagnet
- Live indicator
- Earthing busbar

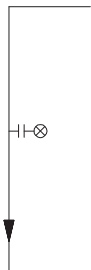
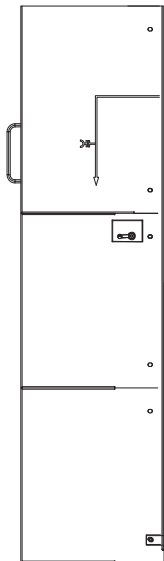
### Optional Accessories for Additional Charges

- Lightning arrester
- Short circuit and earthing fault indicator

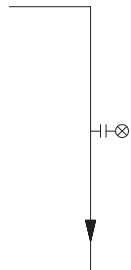
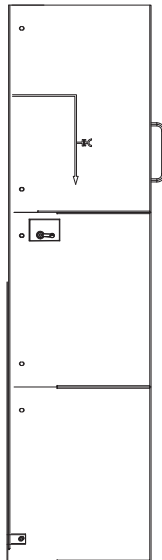
### Standard Size / Weight

- W450mm×D638mm ×H1738\*\*mm
- 85kg

Left Cable Connection



Right Cable Connection



# Functional Units

## PT Cabinet

### Standard Configuration

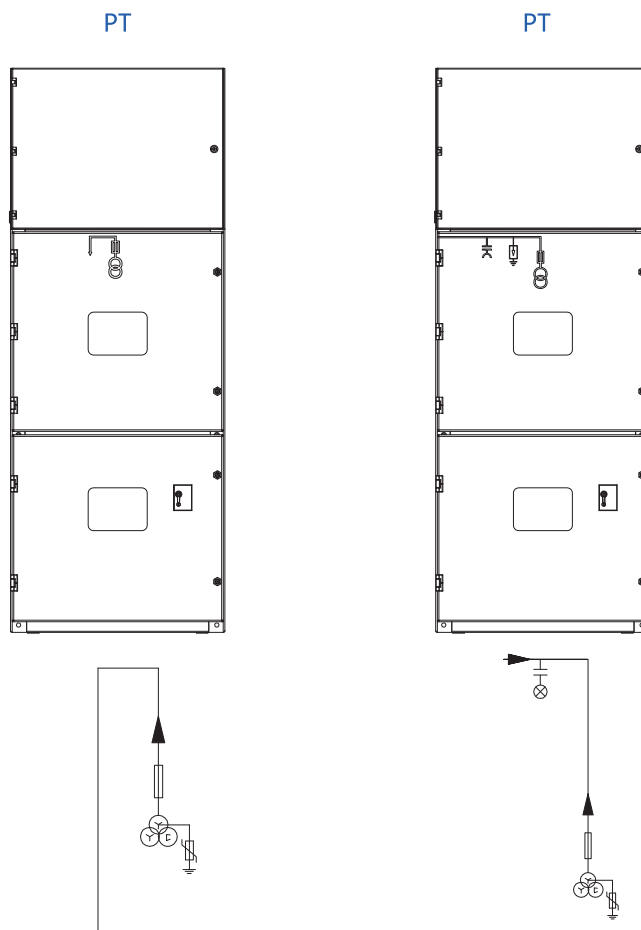
- Air insulation
- Latching electromagnet
- Live indicator
- Earthing busbar

### Optional Accessories for Additional Charges

- Lightning arrester
- PT (Voltage transformer)

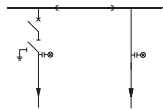
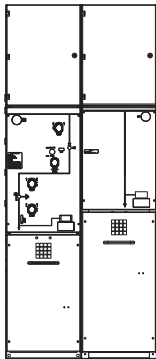
### Standard Size / Weight

- W800mm×D850mm ×H (1505+600\*) mm
- 530kg

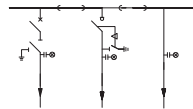
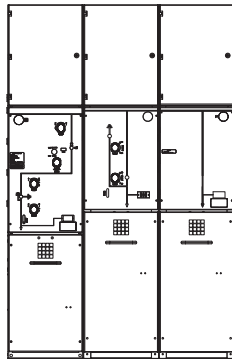


# Typical Cabinet Combination Scheme

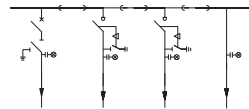
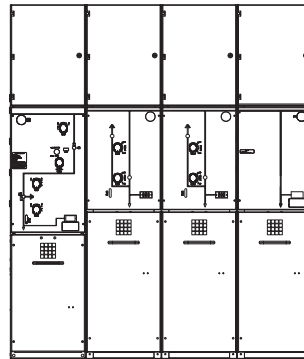
D+R



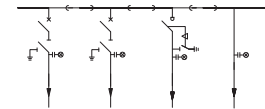
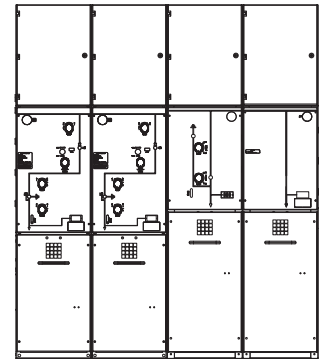
D+C+R



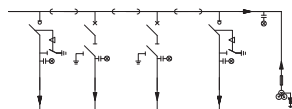
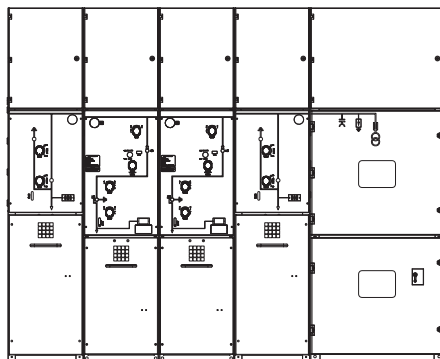
D+C+C+R



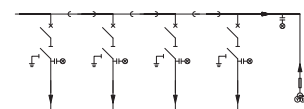
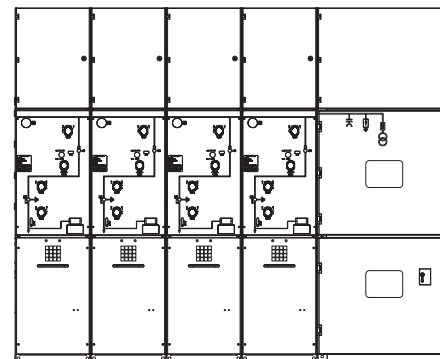
D+D+C+R



C+D+D+C+P

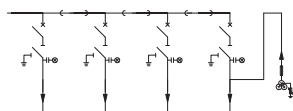
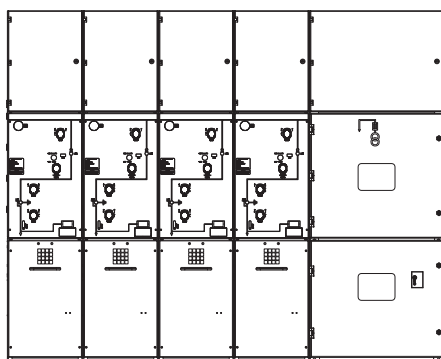


D+D+D+D+P

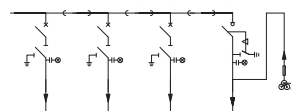
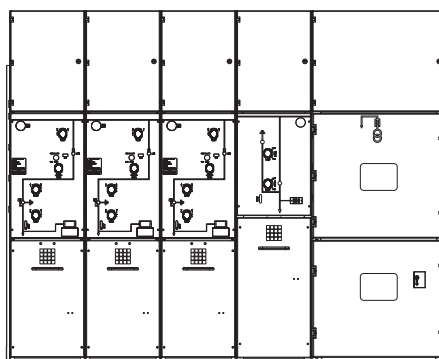


## Typical Cabinet Combination Scheme

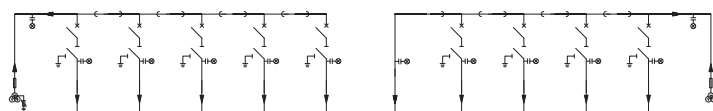
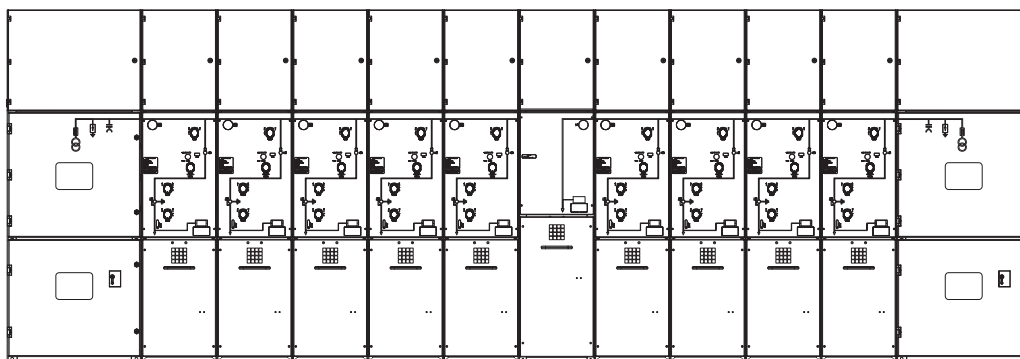
D+D+D+D+P



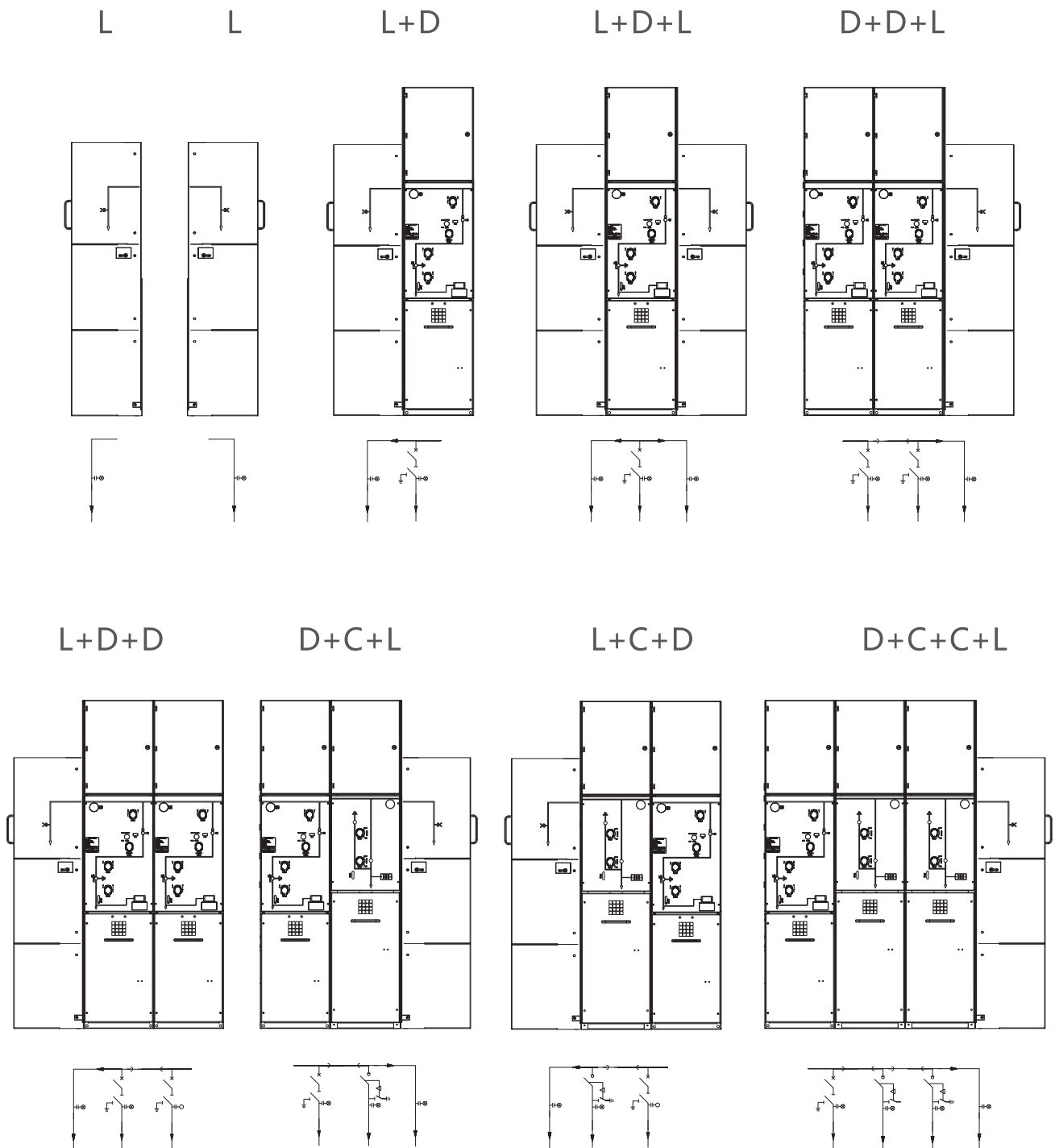
D+D+D+C+P



P+D+D+D+D+D+R+D+D+D+D+P



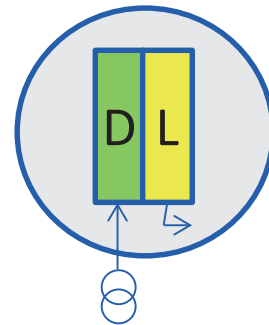
# Typical Cabinet Combination Scheme



## Combined Application Scheme Suitable for Wind Turbine Tower Cabin

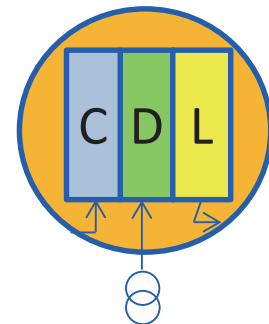
### Enerswit+ - DL

Fan transformer to protect the circuit breaker cabinet + outgoing cabinet



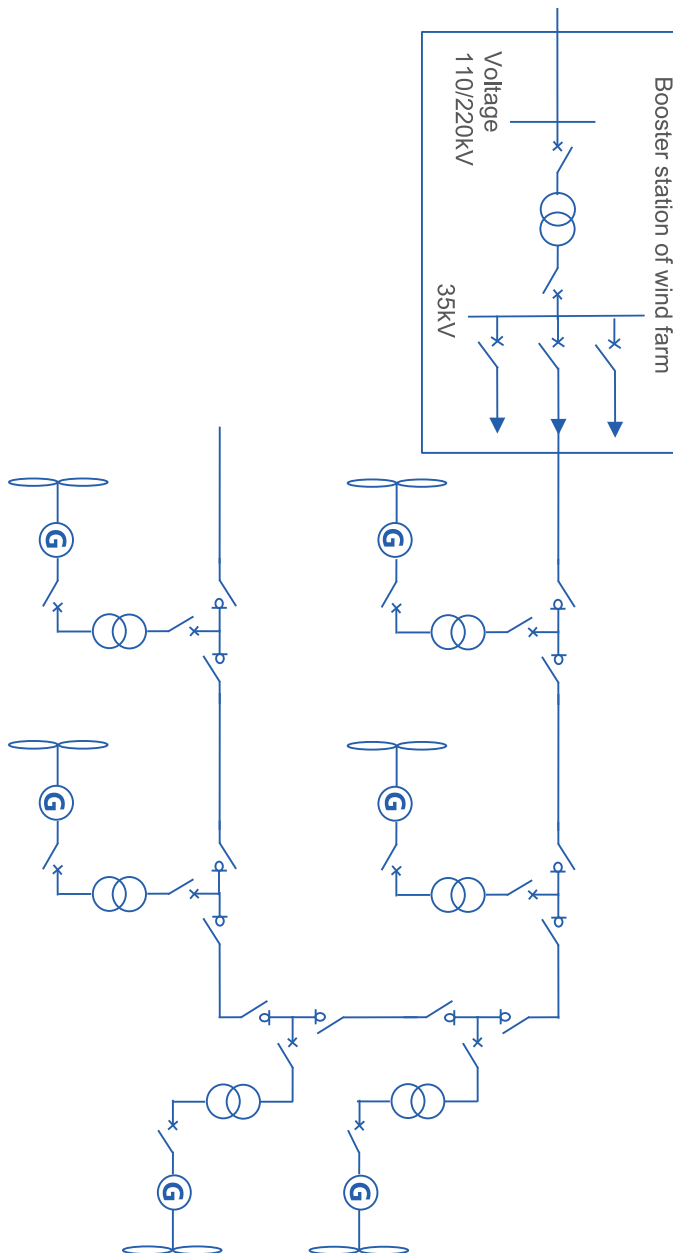
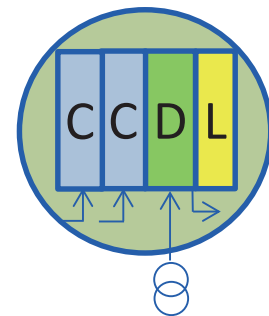
### Enerswit+ - CDL

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



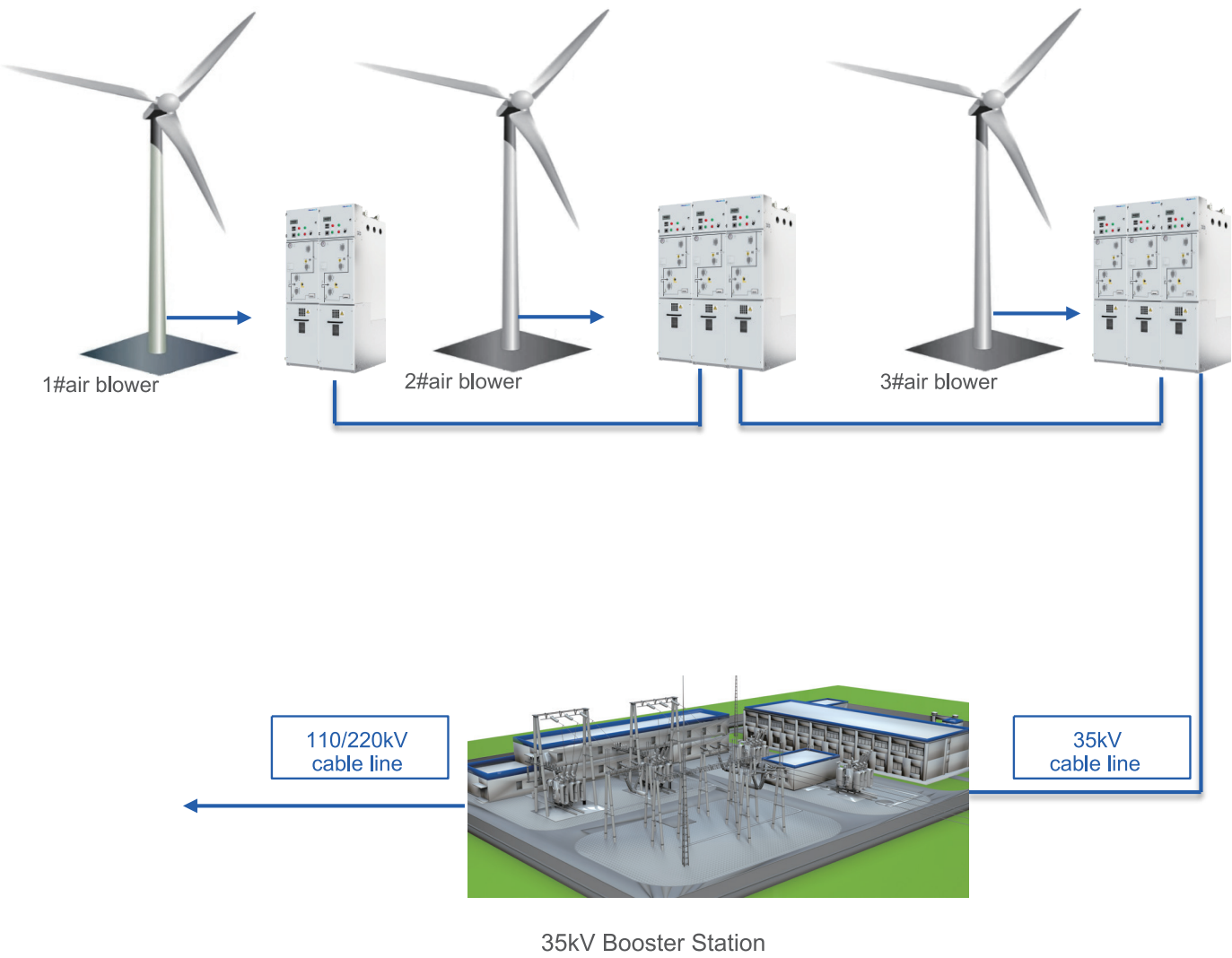
### Enerswit+ - CCDL

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



## Combined Application Scheme Suitable for Wind Turbine Tower Cabin

Single Collecting Line



## Combined Application Scheme Suitable for Wind Turbine Tower Cabin

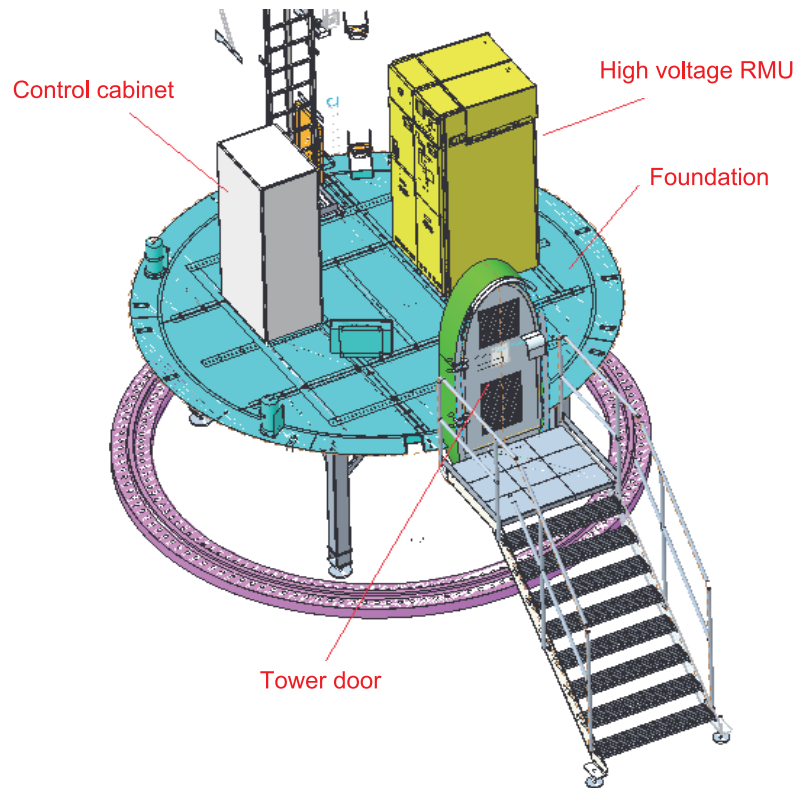


Fig1: Inside Layout of Tower

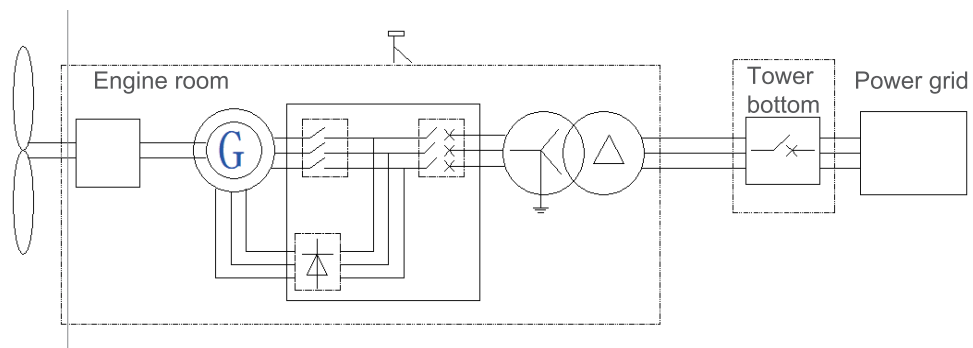
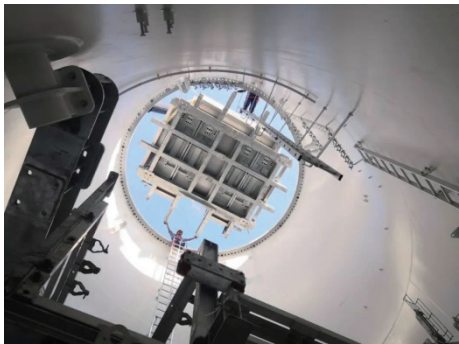


Fig2: Cable Connection

## Overall Dimensions

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



#### 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.

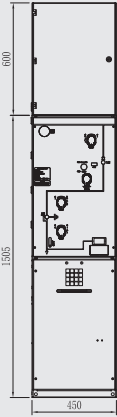
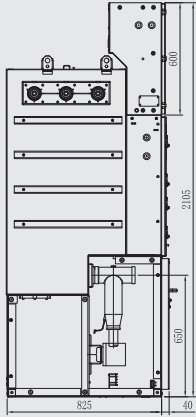
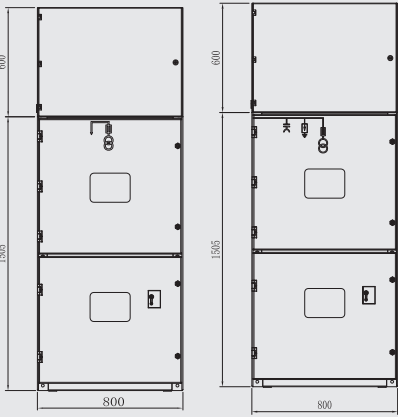
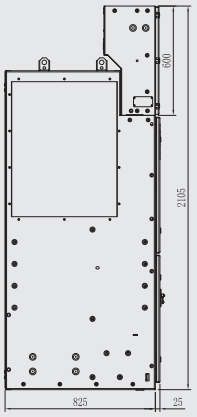
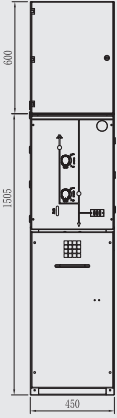
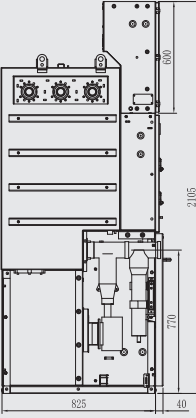
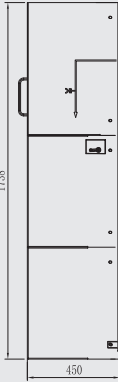
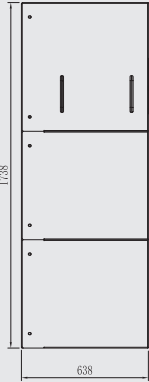
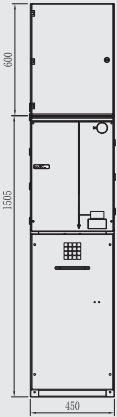
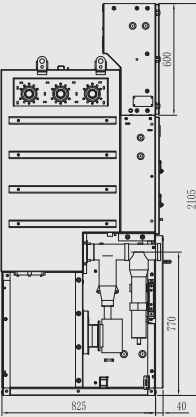
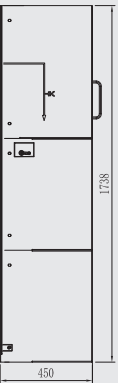
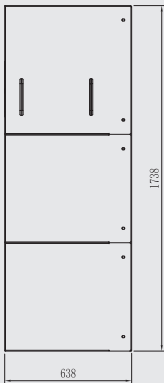


| Functional Units | Functional Scheme              | W (mm) | D (mm) | H (mm) |
|------------------|--------------------------------|--------|--------|--------|
| C                | Load switch cabinet            | 450    | 850    | 2105   |
| D                | Vacuum circuit breaker cabinet | 450    | 850    | 2105   |
| R                | Cable connection cabinet       | 450    | 850    | 2105   |
| L                | Cable connection cabinet       | 450    | 638    | 1738** |
| P                | PT cabinet                     | 800    | 850    | 2105   |
| CDC              | LBS+VCB+LBS                    | 1350   | 850    | 2105   |



# Overall Dimensions

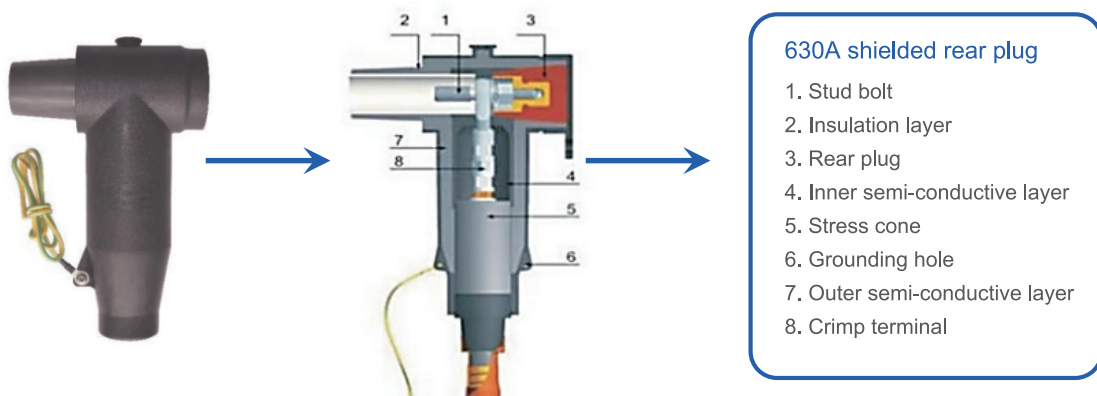
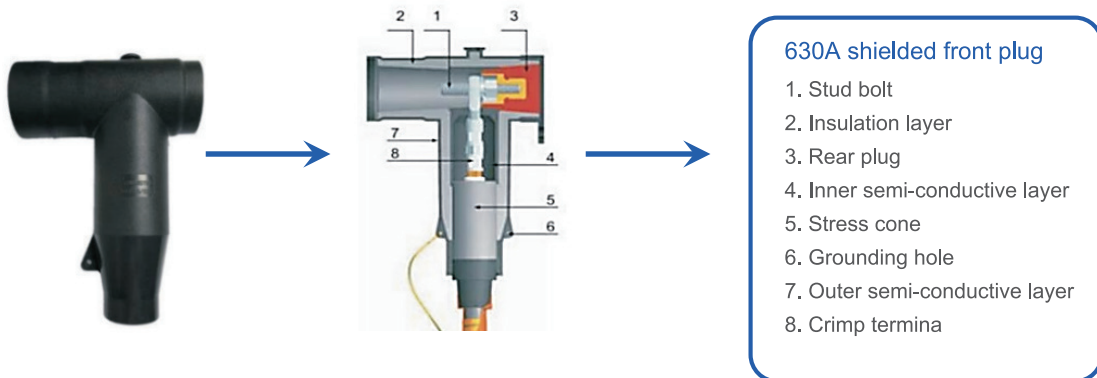
## Enerswit+40.5kV Series SF<sub>6</sub> Gas Insulated Ring Main Unit

| Function | Front View                                                                          | Side View                                                                           | Function | Front View                                                                           | Side View                                                                             |
|----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| D        |    |    | P        |    |    |
| C        |   |   | L        |  |  |
| R        |  |  | L        |  |  |

## Cable Bushing and Cable Terminal Head

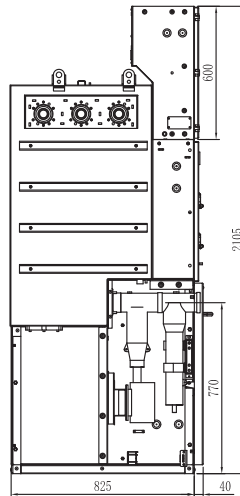
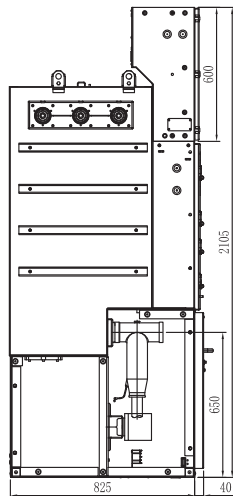
### Cable Bushing and Cable Terminal Head

The primary high-voltage cable is connected to the cabinet through a cable bushing. Various types of cables can be connected via T-type cable sockets or terminal connectors, with the maximum cross-sectional area of the cable reaching 630mm<sup>2</sup>. Each cable bushing can connect up to 2 T-type cable sockets or terminal connectors, with a current capacity of 630A. The T-type cable socket or cable head can be adapted to plug in and unplug the arrester.



# Cable Bushing and Cable Terminal Head

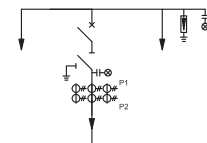
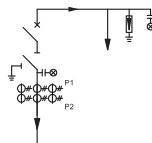
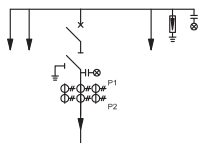
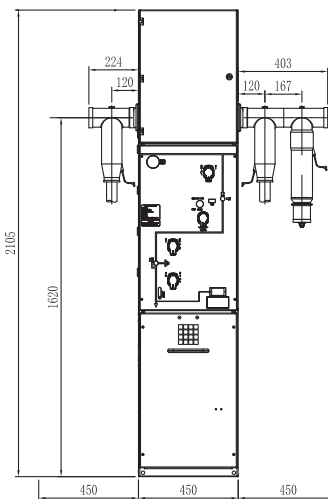
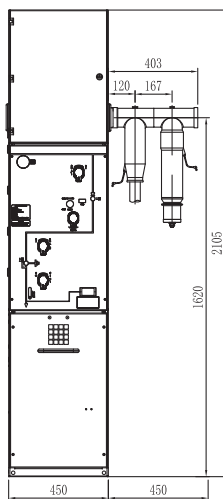
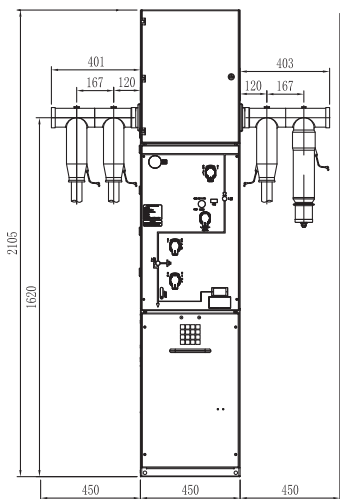
## Schematic Diagram of Cable Bushing Height



L+D+L

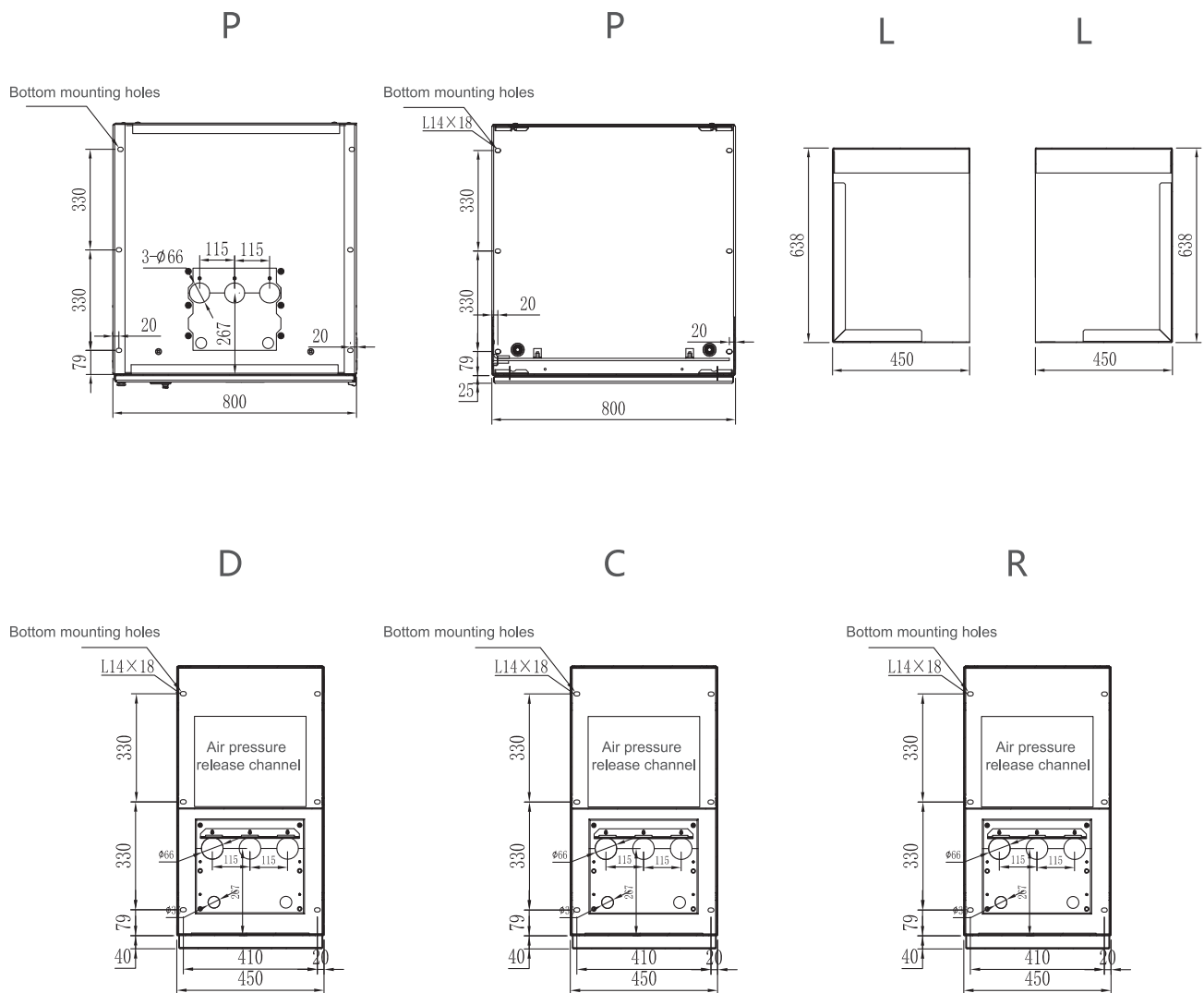
D+L

L+D+L



# Installation Foundation Schematic Diagram

## D、C、P、R、L

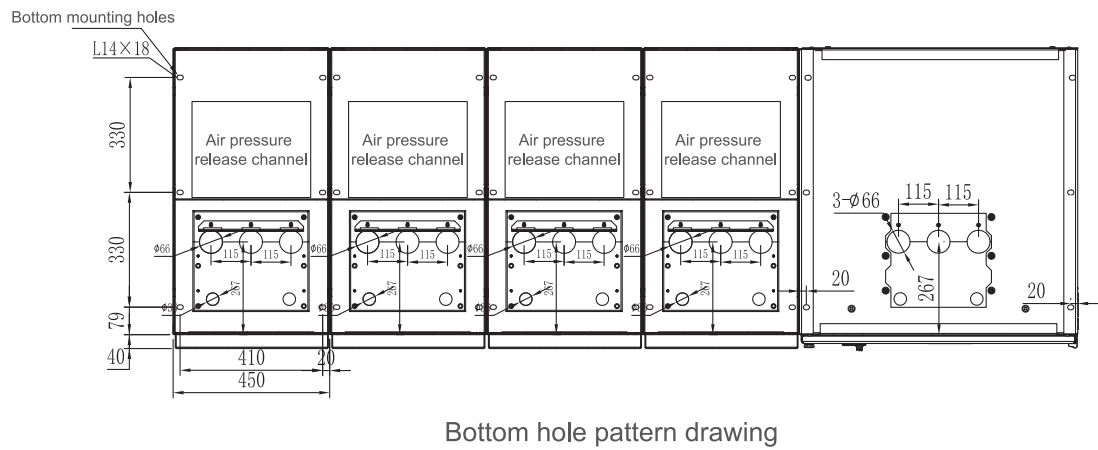
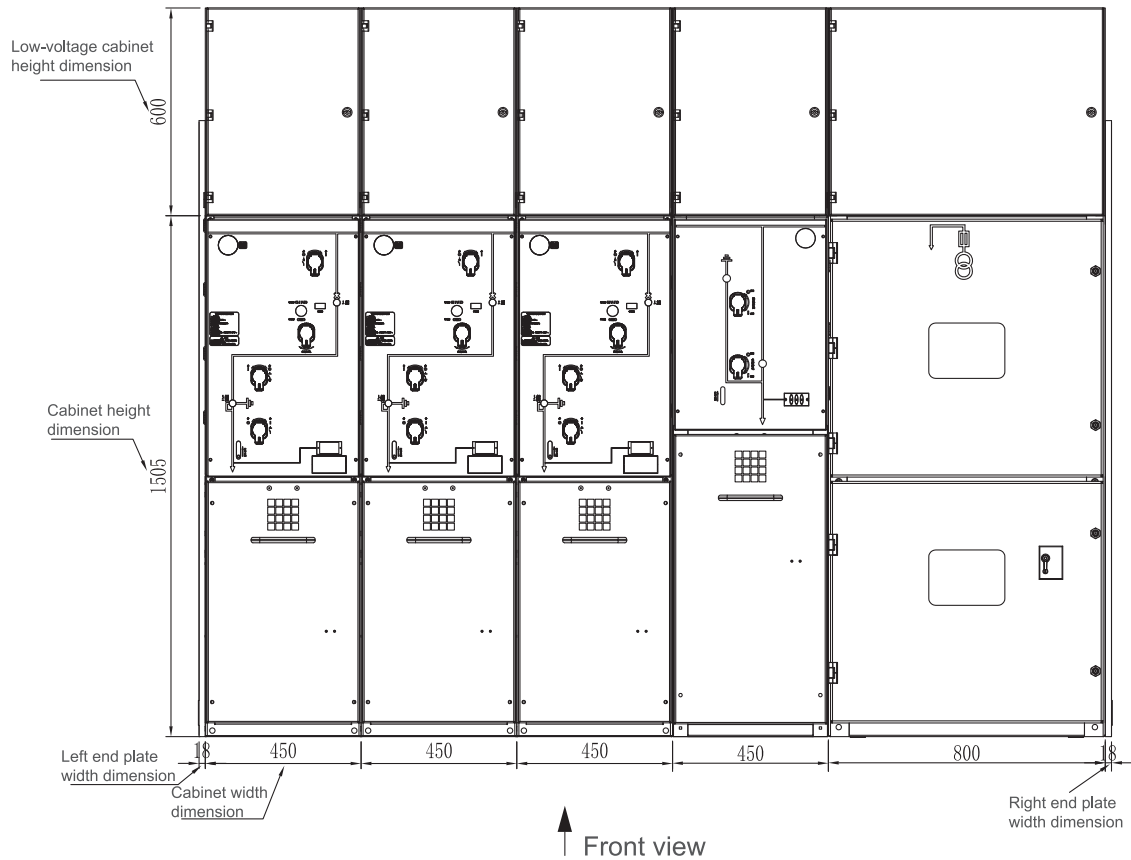


### Note:

The dimensions of the left and right end plates must be individually labeled, both with a thickness of 20mm.

# Installation Foundation Schematic Diagram

D+D+D+C+P



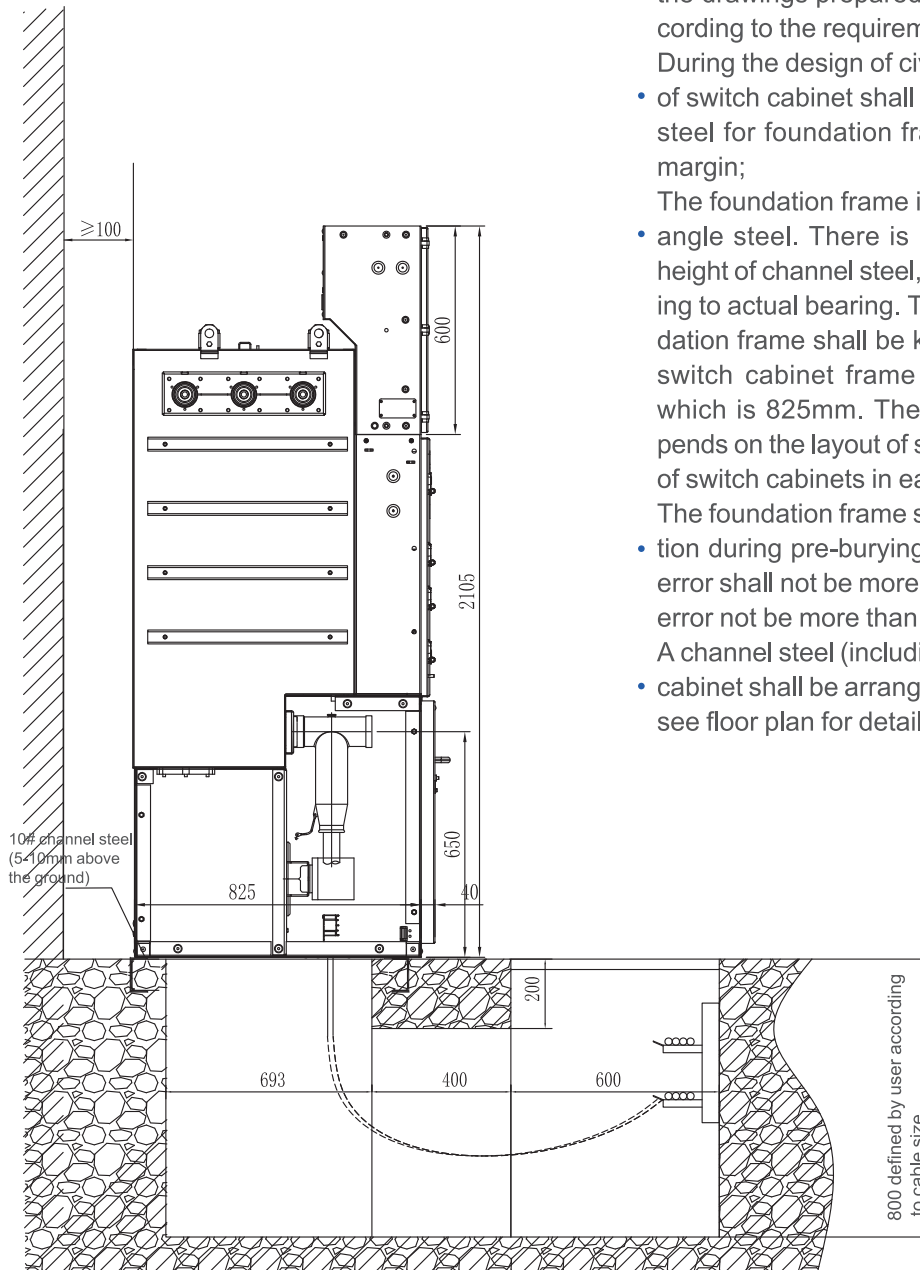
## Note:

The dimensions of the left and right end plates must be individually labeled, both with a thickness of 20mm.

# Installation Foundation Schematic Diagram

Enerswit+40.5 A-A

mm



- 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;

### 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

## CONTACT US

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2026.10