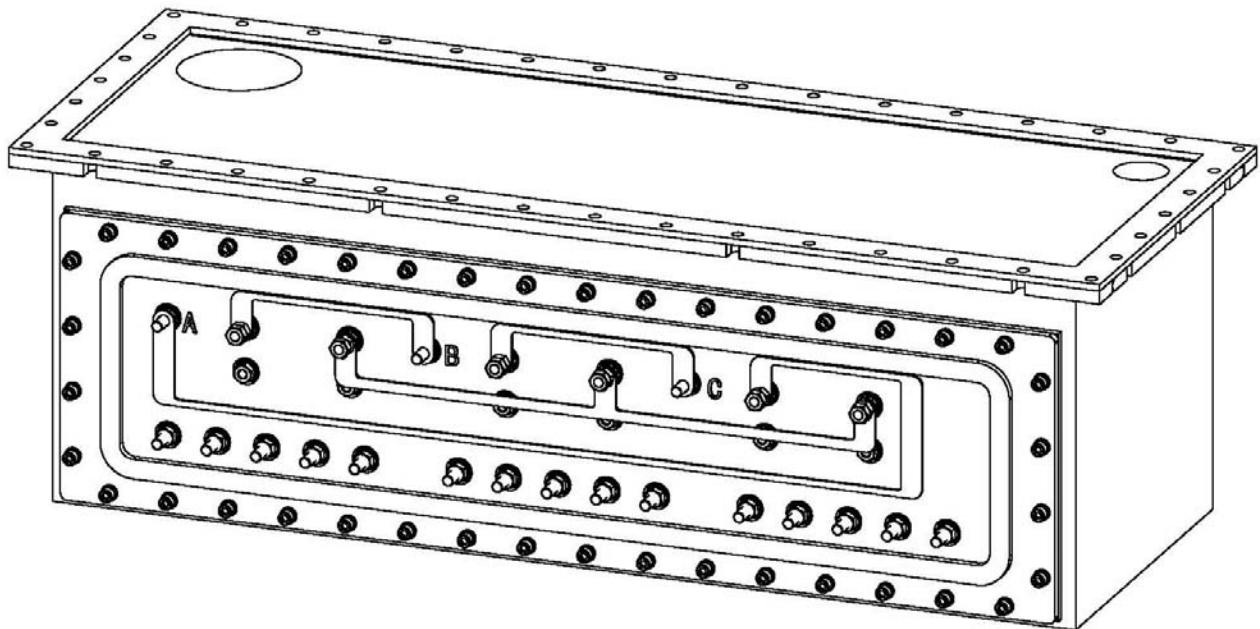


# On-load capacity-adjusting and voltage-regulating tap-changer manual v2 · Horizontal type ·



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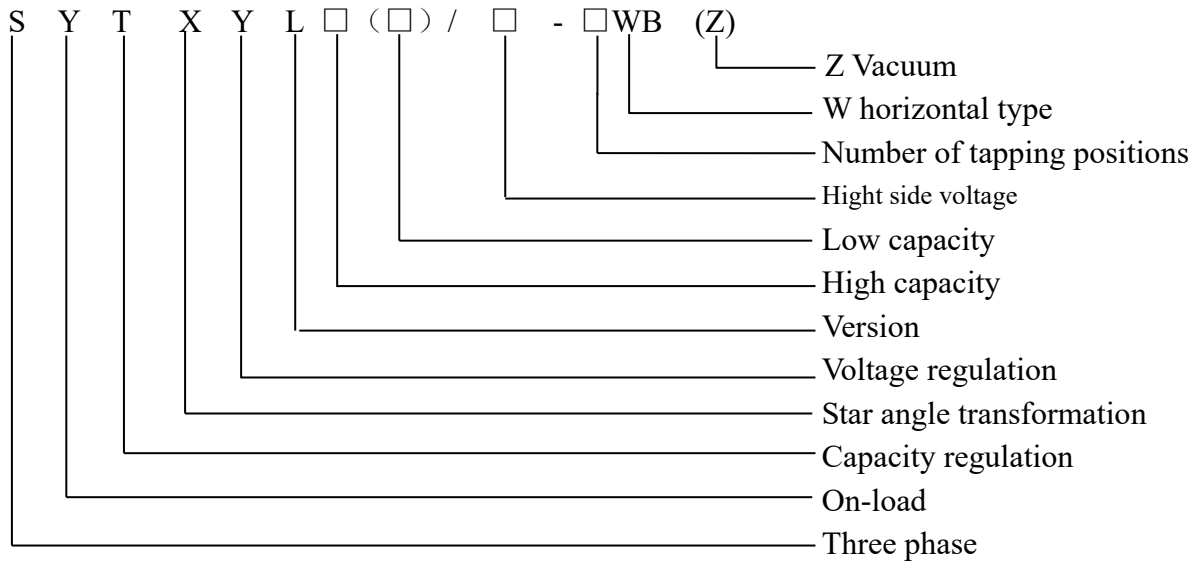
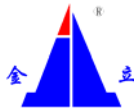
Before using the tap changer you purchased, please be sure to read our company's instruction manual carefully. And keep it properly for reference during use.

Thanks!

## LiaoNing Jinli Electric Power Electrical Appliance Co., Ltd.

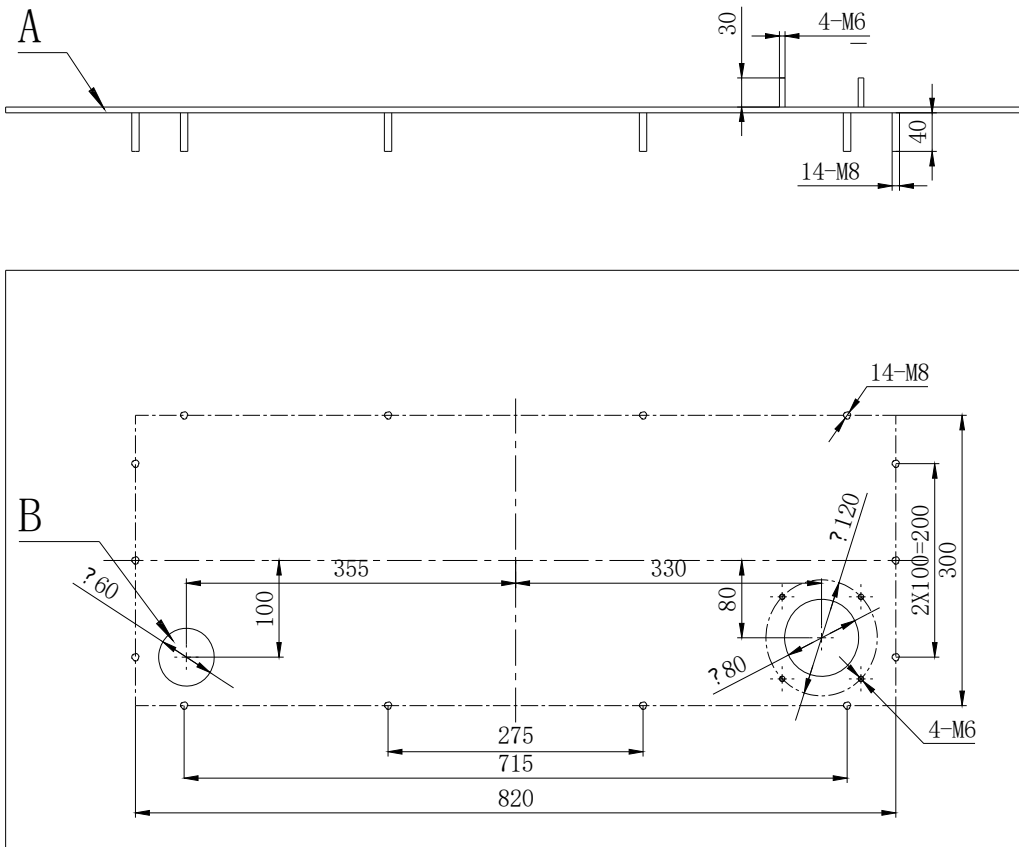
### 一： General principles

- 1.1 This instruction manual is applicable to series of on-load capacity and voltage regulating tap-changers with a rated voltage of 10KV and a rated capacity of 630KVA (and 315KVA) or below.
- 1.2 Rated voltage 10KV on-load capacity regulating tap changer, suitable for AC 50HZ, primary side line rated voltage 10KV, rated through current 60A (and 30A) and below, equipped with oil-immersed transformer, is an on-load capacity regulating tap changer. An integral part of the voltage transformer. This switch should use the corresponding supporting intelligent power distribution terminal of our factory as the switch operation control mechanism. The basic function of this switch is to connect the tap of the switch to the corresponding tap of the coil of the capacity-adjusting and voltage-regulating transformer. When the transformer is under load, it can automatically switch the tap position and adjust the tap position according to the signal sent by the distribution terminal. The high-voltage coil performs star-angle switching and the low-voltage side series-parallel switching, thereby adjusting the transformer capacity, ensuring voltage quality, improving the system power factor, and reducing reactive power consumption. One of the effective measures. Intelligent power distribution terminals can be operated manually or automatically operate switches to complete switching tasks based on the secondary side current and voltage signals.
- 1.3 The basic technical data of this switch are as follows:  
Rated working current is 630KVA: High voltage side 60A、 low voltage side below 550A;  
315KVA: High voltage side 30A、 low voltage side 300A and below 300A;  
Rated working voltage is 10KV;
- 1.4 This on-load tap capacity adjusting switch is suitable for the following working conditions:  
The lowest temperature of the surrounding air is  $-25^{\circ}\text{C}$ , and the highest temperature is  $+40^{\circ}\text{C}$ .  
The minimum temperature of transformer oil is  $-25^{\circ}\text{C}$ , the maximum temperature is  $+100^{\circ}\text{C}$ , and it cannot be affected by moisture.  
The inclination between the switch installation site and the vertical plane shall not exceed 5 degrees.
- 1.5 This on-load tap-changer is not suitable for the following working conditions:  
Dielectric environment full of conductive dust;  
In an environment where the concentration of corrosive gas or vapor is sufficient to destroy metal and insulating media;  
There is a risk of explosion.
- 1.6 On-load capacity regulating and voltage regulating tap changer model description:



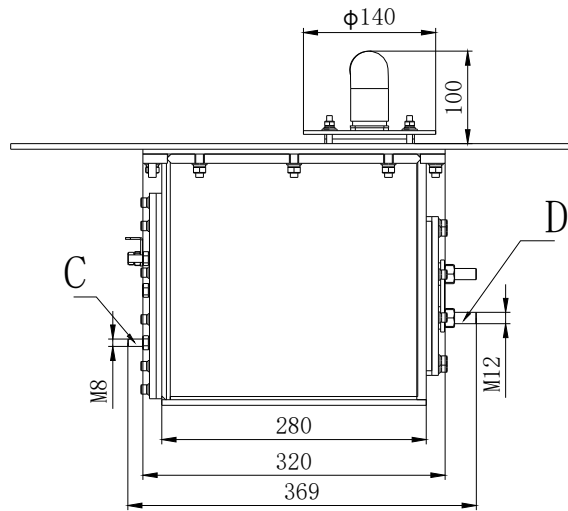
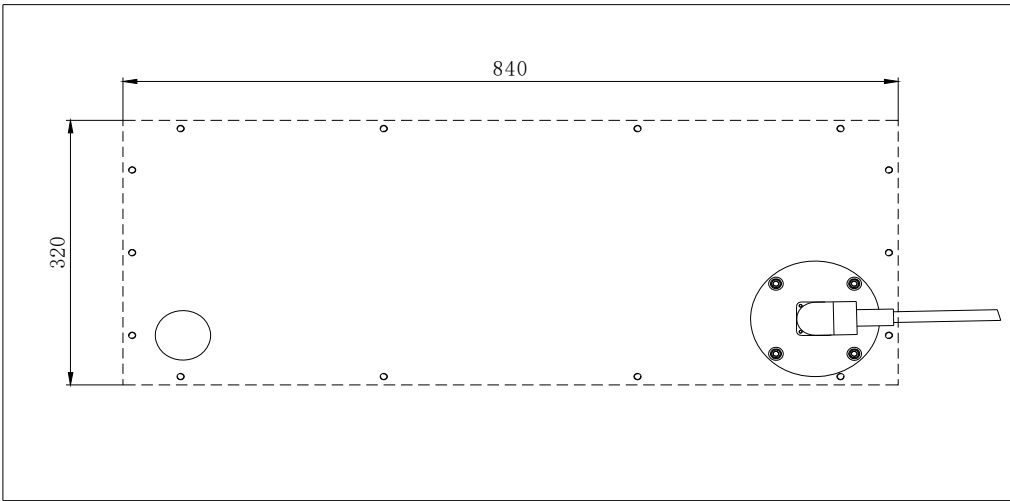
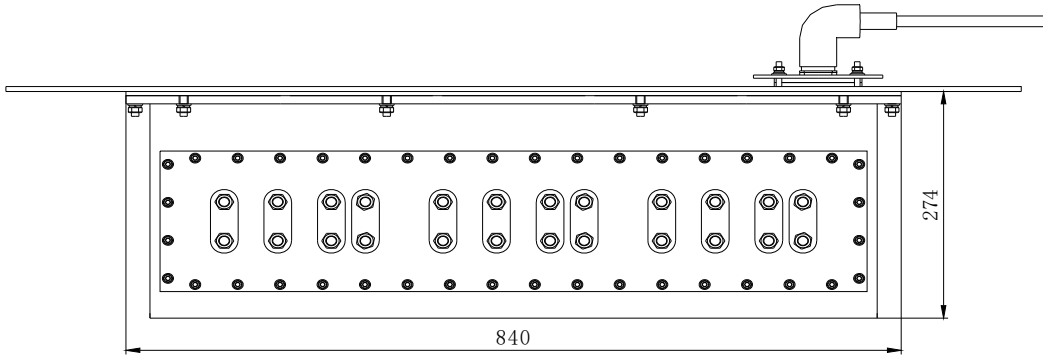
For example: SYTXYL—315 (100) /10-5WB indicates a three-phase on-load capacity-regulated and voltage-regulated star-angle change tap-changer. The rated capacity of the switch is 315KVA (100KVA when star connected), the rated voltage is 10KV (high voltage side), Horizontal switch with 5 gears tap changer.

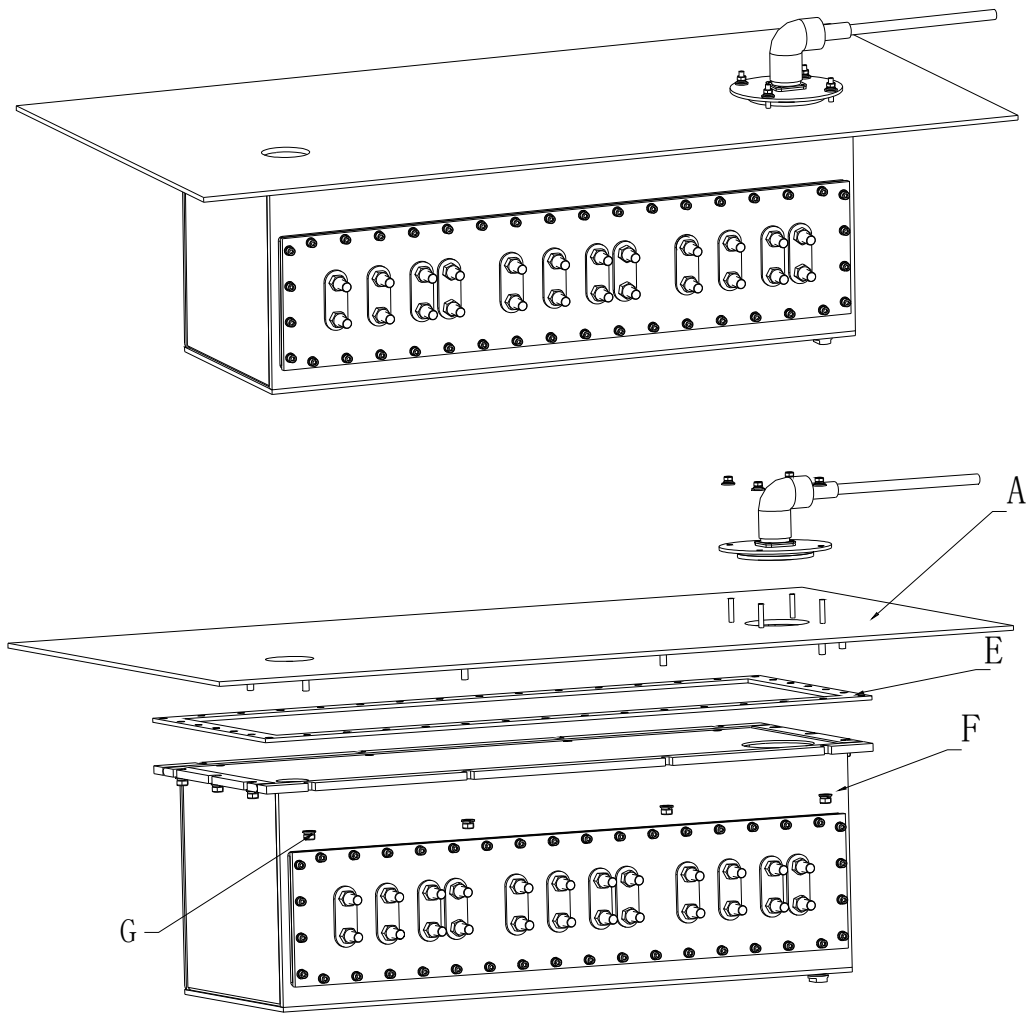
二： Dimensions and wiring of on-load capacity regulating and voltage regulating tap changer



- A: Transformer tank cover
- B: Tap changer oil drain hole

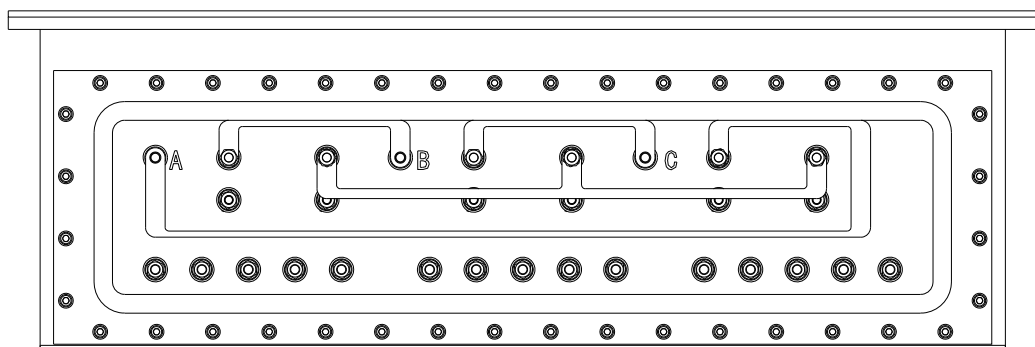
**Schematic diagram of transformer opening and stud welding**



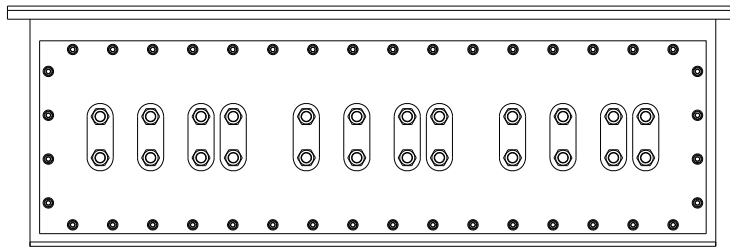


- A: Transformer tank cover
- C: High voltage side terminal block
- D: Low voltage side terminal block
- E: Tap changer gasket
- F: Tap changer body

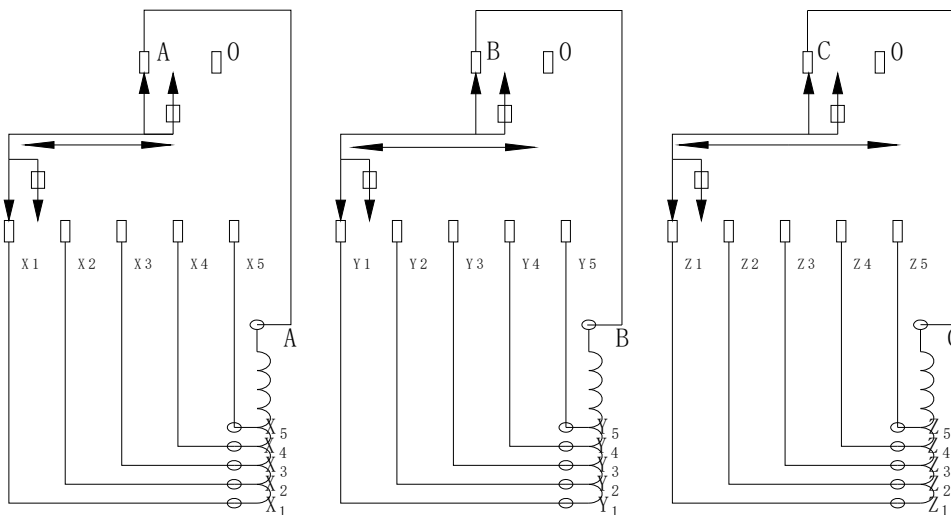
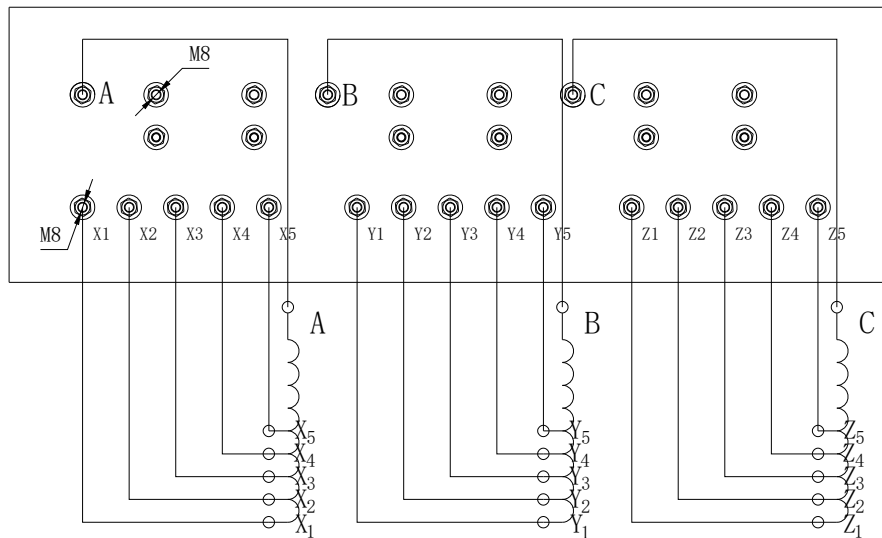
**Switch and transformer assembly diagram**



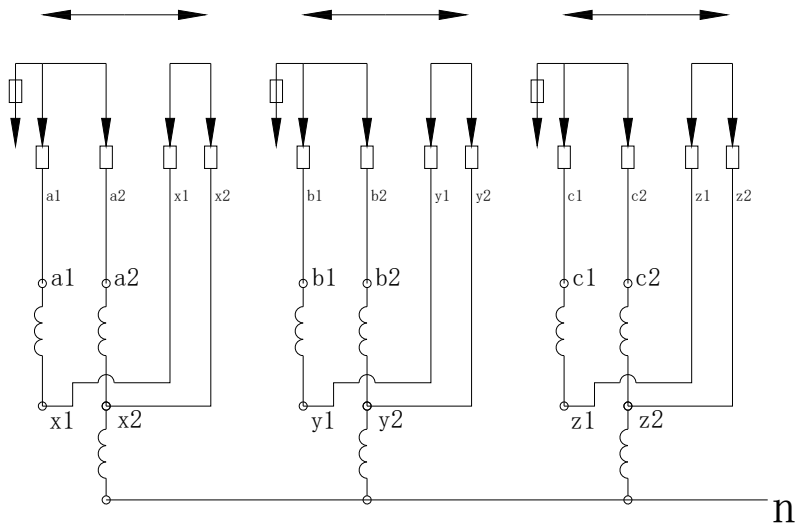
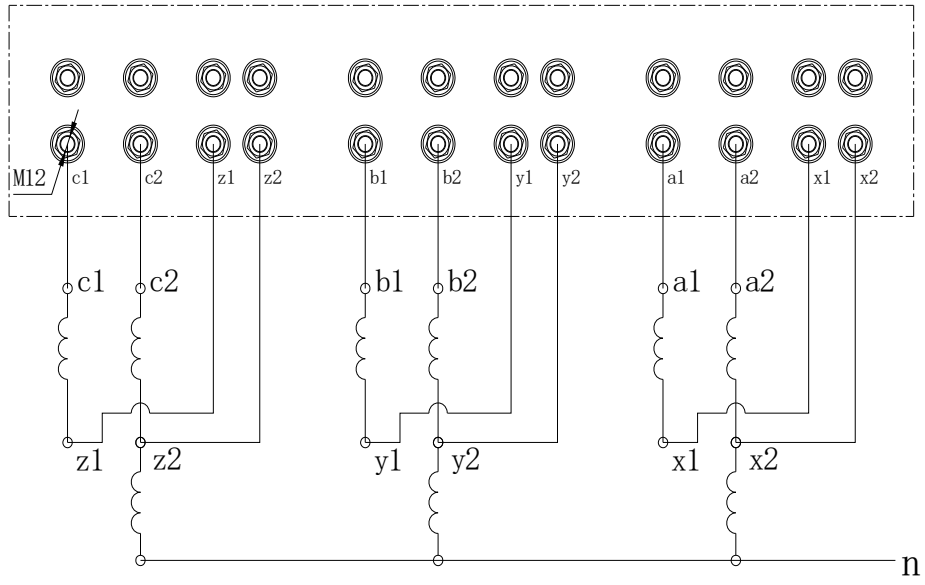
**High voltage side front view**



**Low voltage side front view**



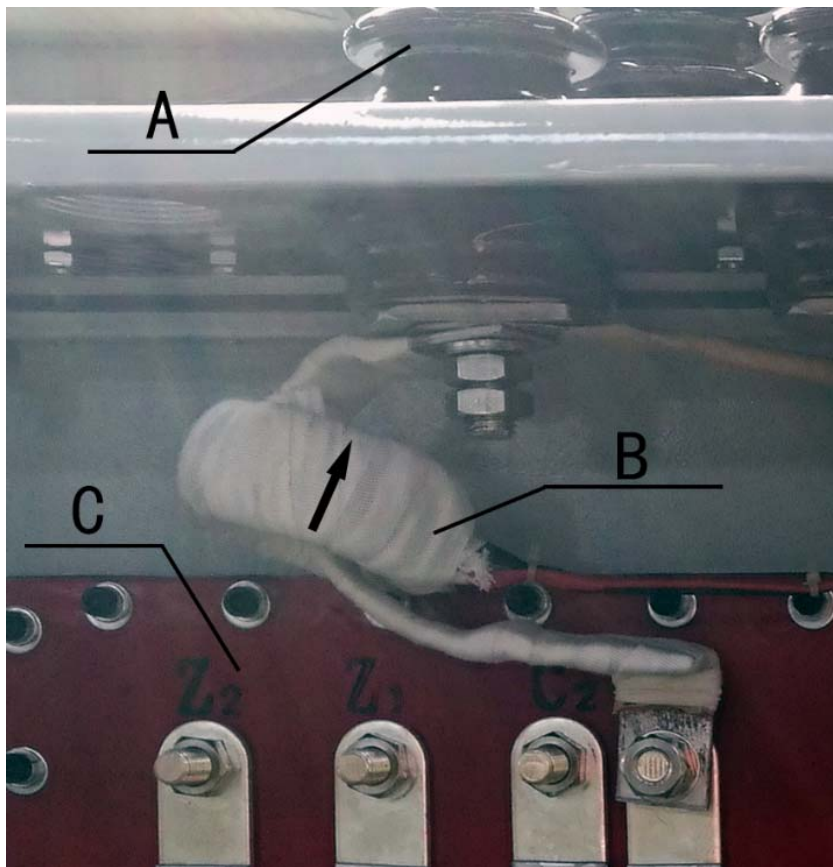
**Capacity-adjusted high-voltage side and voltage-regulating part wiring diagram**



**Capacity adjustment low voltage side wiring diagram**



## Current transformer fixed



**A: low-voltage insulator**

**B: current transformer**

**C: tap changer**

- ① Tools/materials: white cloth tape/shrink tape, current transformer  $\times 3$ ;
- ② The current transformer is placed between the low-voltage porcelain bottle and the tap-changer, and is tied with white cloth tape and tied firmly;
- ③ When fixing the current transformer, keep it away from the movable parts of the switch to avoid interference with the movable parts of the switch.;
- ④ Set the current transformer with the arrow pointing upward, paying attention to the same direction.;

三： Electrical and mechanical structure of on-load capacity-regulated and voltage-regulated tap-changer

3.1 Tap changer flight plug number:

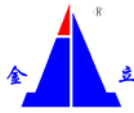
Flight plug number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Function	1 tap	2 tap	3 tap	4 tap	5 tap						Gear common terminal	Low capacity location	High capacity location			Capacity upgrade	Capacity reduce	Motor common terminal	Rise voltage	Reduce voltage

3.2 This switch is a composite resistance transition embedded on-load capacity-adjusting tap-changer.

The switch has a separate oil chamber isolated from the transformer.

Transformer oil is used as insulation and arc extinguishing medium. It has a simple structure and compact size, making it easy for users to repair and change oil. The internal driving device of the switch is a permanent magnet driving mechanism. The switch is switched by the instantaneous opening and closing of the permanent magnet mechanism. A transition resistor is added between the active contact and the auxiliary contact of the moving contact bracket to ensure that the switching process is uninterrupted; the switch The dynamic and static contacts are inlaid with copper-tungsten alloy, so that the electrical life of the switch is sufficient to complete the specified technical indicators.

四： Installation



- 4.1 The connection between the switch and the transformer tank plane relies on the bolts welded on the tank. The transformer tank cover is opened as required and the bolts are welded. During installation, first install the switch sealing gasket and the tank cover, and then install the switch body close to the gasket on the tank cover. Below, note that the switch mounting holes must correspond to the welding bolts of the box cover. Finally, install fastening nuts on the welding bolts to tighten the switch, sealing gasket and box cover. After the switch and the box cover are installed and tightened, it is necessary to install the aviation plug flange and sealing gasket of the box cover. First, take out the aviation plug from the switch and connect it with the aviation plug on the box cover flight flange. Then install the aviation plug on the box cover. The flange and sealing ring are fastened to the box cover. When tightening the nuts, the force should be even.  
**Note that the fastening nuts of the high and low voltage terminals of the switch must not be loose.**
- 4.2 The switch should be dried before installation. The drying time is 2 to 3 hours and the temperature is  $100\pm 5^{\circ}\text{C}$ . It is best to do it under vacuum. The AC withstand voltage standard after drying and the insulation of the switch carrier fluid to ground should meet the power frequency resistance. The requirement is to press 35KV for one minute (during the test, the switch should be immersed in 35KV transformer oil with dielectric strength). After drying, the fasteners must be checked to see if they are loose. If they are found to be loose, they must be retightened and stopped to prevent loosening;
- 4.3 Please perform wiring according to the labels in the switch dimension diagram.
- 4.5 Transformer oil with good quality should be injected into the switch before use. The oil level should reach the level of the switch oil hole. The insulation strength of the oil is required to be above 40KV;
- 4.6 When the switch leaves the factory with the transformer and is used by the user, the plug-in protective cover must be installed to prevent water from entering and causing the electrical part of the switch to get damp.

## 五： Use of tap changer

- 5.1 Before the switch is put into operation, 10 cycle operations should be carried out to check whether the mechanical action of the switch is flexible and whether the limit is reliable. The limit screw on the switch is the mechanical limit that will be used after the controller electrical chain failure. It is not used under normal circumstances;
- 5.2 The DC resistance of the high and low voltage side coils of the transformer (after connecting this switch) at each tap and at the high and low capacitance positions should be measured and compared with the factory data to determine whether it is normal;
- 5.3 Check if the oil quality is good.

## 六： Switch operation and maintenance

Before operating the transformer, you must check whether the connections of the switch and accessories are well sealed.

- 6.1 After the switch is put into operation, the user should regularly check the oil quality of the transformer. The oil withstand voltage is required to be maintained above 25KV. Every year the switch works, oil samples must be taken at least once for micro-water and voltage breakdown experiments; oil samples can be collected from the unloader. Lower the release valve.

When the oil breakdown voltage is lower than 25 kV, the internal transformer oil should be replaced

6.2 Users should keep records of operation and maintenance situations. If there are special circumstances, please contact our factory at any time to exchange operation and maintenance experience with each other.

6.3 Please see the packing list for details of switch accessories.

### 七: Order requirements

When placing an order, the user must provide the following data:

The capacity of the equipped transformer;

Rated voltage of primary side and secondary side;

Graded voltage regulation amplitude;

The length of the cable connecting the switch and controller is generally 3 meters;

If the user needs to supply the switch controller separately, special instructions are required.

If you have any orders or special requirements, please contact our  
company's technical department.

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