46kV Station Service Voltage Transformer

MT-SSVT-R7-1P-GTA-50KVA-SLZ-AA-Z6-AM-CZ-Z-M1

Instruction Manual

SYSMS/SSVT/04

Safety Instructions

1.1 General Safety Instructions



WARNING

This electrical equipment contains hazardous voltages as long as it has not been earthed and short-circuited.

Non-observance of the safety instructions can result in grievous injury or extensive damage to property.

Only qualified personnel are authorized to work on，with or near an electrical installation.

These personnel shall be instructed the safety requirements，safety rules，company instructions and National Legislation applicable to their work.

The work location，especially where installation，commissioning，repair and maintenance are carried out，shall be defined and marked clearly.

Appropriate tools，equipment and devices，e.g. protective helmets，safety boots，protective clothing，insulated and insulating tools，signs must be used for all above-mentioned works.

Suitable precautions shall also be taken to prevent injury to persons from other sources of danger such as mechanical or pressure systems or falls.

1.2 Definitions

1.2.1 Qualified Person

As used in these instructions and in the warnings on the products themselves a **“ Qualified Person”** is a person with relevant education and Experience to enable him or her to install， assemble，commission，maintain，repair and operate the equipment and to avoid dangers which the called duties may create. He or she must have the following competence.

- Knowledge of electricity, experience of electrical word
- Understanding of the installation to be operated and worked on and practical experience of that work
- Understanding the hazards which can arise during the work and the precautions to be observed
- Emergency treatment training

1.2.2 Danger

The warning of danger used in this Instruction Manual means if you don't take appropriate preventive measures, serious injury, death or major property damage may occur.

1.2.3 Warning/Caution

The warning of danger and Caution used in this Instruction Manual and on the product means if you don't take appropriate preventive measures serious injury, death or major property damage may occur.

User Notice

1. Keep this Station service voltage transformer (hereinafter referred to as SSVT) instruction manual in a safe and handy place in order that anyone operating or maintaining the equipment can quickly and easily refer to it when necessary. For guarantee or detail of the equipment, refer to all documents concerned except the instruction manual.

2. Requirement of operator: Only people familiar with and skilled in handling this equipment should be allowed to operate and/or handle it.

3. Please read the content concerned carefully in the instruction manual before installing, operating and maintaining the equipment. Familiarize yourself with all information of the equipment and safety precautions before using the SSVT, and then operate and handle it in accordance with the requirements.

4. Keep the following cases from happening when using the instrument transformer:

a) Operate or handle the SSVT in any manner that is not specifically explained in this instruction manual.
b) No checks and maintenance.
c) Operate the instrument transformer without transformer oil or abnormally run it.
d) Do not connect or install the SSVT when it is live. All must be done by only quantified personnel to perform maintenance and checks on the equipment. Don't touch live parts (including porcelain bushing). Always, open circuits and earth the main circuit before starting checks. Otherwise, it will lead to the risk of electric shock.

5. If anything in this instruction manual remains unclear, please contact our company.

6. If some other form of trouble occurs with the equipment, please contact our company in time and provide the following information.

----- Nameplate content and specifications of the said equipment (Name, Serial No., Type and Date of manufacture)
----- Descriptions of the trouble (As details as possible, including the situation immediately before and after the trouble occurred).

1 Description

1.1 Model and name of the equipment

SSVT - 72.5 - MT-SSVT-R7-1P-GTA-50KVA-SLZ-AA-Z6-AM-CZ-Z-M1

SS: Station Service

VT: Voltage Transformer

72.5: Highest voltage of equipment, kV

1.2 Normative reference

The design, manufacture and test of this SSVT shall be in accordance with the latest version of the following standards. Some provisions from standards below are quoted in this manual. If there is any discrepancy of performance rated value in the quoted clauses, the higher required value is the priority.

IEC61869-1, IEC61869-3, ANSI/IEEE C57.13 Instrument transformers, and IEC60076-1.

1.3 Application and Service condition

1.3.1 Application

The SSVT shall be suitable for measurement control and relay protection in the outdoor AC power system of nominal voltage 46 kV, BIL72.5/140/350kV and frequency of 50 or 60Hz.

1.3.2 Service condition

1.3.2.1 Installation place: outdoor

1.3.2.2 Surrounding Temperature

Max. temperature: +50℃, min. temperature :-50℃.

1.3.2.3 Altitude

Altitude will not exceed 2000m. (The installation site is near sea level, which is near Indian Ocean water area or seaside.)

1.3.2.4 Relative Humidity

Max. 96%/ Min. 35%

1.3.2.5 Other service conditions of the instrument transformer are as following:

a) 24h average ambient temperature shall not exceed 35℃.

b) Solar radiation level reaching 1000W/m^2 (sunshine at noon) shall be considered.

c) Pollution Level of the area can be Ⅳ. The ambient air is polluted by dust, smoke, corrosive gas, corrosive steam and salt.

d) Wind pressure shall not exceed 0.7kPa (equal to wind speed 34m/s)

1.3.3 Seismic Intensity

a) Anti-seismic level AG2 (Seismic Intensity＜X).

b) Horizontal Acceleration 0.5g.

c) Vertical Acceleration 0.3g.

d) Testing seismic is of sine wave with time duration of 3 cycles. The safety factor is 1.67.

1.3.4 System Earthed

Neutral point solidly earthed system.

2 Structure and use

2.1 Structure

SSVT- type voltage transformers are oil immersed electromagnetic station service voltage transformer. The core was used cold-rolled silicon steel strip to folded single-column and three pairs of the same potential with the ground. High voltage coil main insulation chose sheet paper, small oil clearance and large structures. It was wounded as pagoda-shaped segments. High-voltage leads were insulated by a condenser bushing. We select corrugated metal expander as oil temperature variation compensator and can inspect the oil level through window. Fuel tank and the lower tank welded together, and all the other seals are made of sealed limit, effectively preventing the leakage of oil. Outline dimensions drawing and structure shown in Figure 1.

2.2 Product features: Neither filtration oil and replacement oil nor other special treatments.

This instrument transformer manufactured by our company is oil-filled and sealed. Do not need any special treatment, such as filtration oil and replacement oil ect to maintain the original electric capability. Do not undermine the tightness of the capacitor voltage divider, if have to take oil sample from the electromagnetic unit, please remember that you have to complement the oil in time. Please take oil according to figure 4, Note that the oil level is not less than the minimum line expander oil level inspection window scale. Do complement how much oil you'll take. There is no need to do oil sample-test during inspection and failure-free operation, or there will be some adverse factors.

2.3 Full-sealed Oil-sampling Diagram (see fig.4)

Unscrew the cap when to take oil samples, then with about Φ4 transparent silicone rubber tube 200mm end of the nozzle in the sleeve, tighten the top sub belt tightening side and let transformer oil spill slowly after about 50mL. And then silicone rubber tube the other end of the sleeve in a clean take oil (typically using a syringe) on the outlet mouth of the head, to obtain the desired amount of oil, unscrew the top with square sub-let the nozzle to stop the oil, and finally put unscrew the valve cap.

2.4 Packing, Transportation, Installation, Use, Maintenance and Store

2.4.1 Packing and transportation

2.4.1.1 The power transformers are packing with wooden packages, and must always stand up according to the direction mark of the packages (except for the products which packing and transporting by lying down).

2.4.1.2 You must remove the wood plates of the top and obverse when you open the package, and then dismantle the 6 pcs M16 bolts which fix in the frame of the package, lift up the voltage transformer vertically and slowly from the package.

2.4.1.3 On receiving the products, all of them should be inspected for their appearance based on the packing list prior to acceptance. And then unpack the cases (remove the top and side plates of the package while special caution must be taken not to damage the porcelain bushing) to inspect the equipment carefully, you should check whether there are damages during transportation such as porcelain bushing broken, oil leakage or deformation and so on. And also check whether the spare parts and technical data or documents are complete. Please contact our company immediately if you find something wrong, so we can investigate the cause and properly handle it in a timely manner. After the inspection, please place the equipment vertically as best possible to store it safely. Please note that, before installation, the products shall be erected and kept standstill for at least three days. This is to make sure the insulation oil completely static.

2.4.2 Check before installation

2.4.2.1 The type and the specification of the power transformers are accord with your orders.

2.4.2.2 The power transformers are all with every kind of documents.

2.4.3.3 The earthing for the power transformer must be firmed; the secondary terminals shall not allow to be short-circuit; The leads' marks of the secondary windings are correct and clear.

2.4.3 Installation and use

2.4.3.1 When you connect the secondary terminals, you must do it according to the marks of the secondary terminals and connection sketch in the secondary terminals box.

2.4.3.2 Maintenance: This kind of power transformers needn't any special maintenance as their excellent seal performances, the insulation of the insulating oil shall not absorb humidity and affect its electric performance.

2.4.3.4 Storage: There have to be no corrosive gas or material around the stockpile space, and there is a shield for the power transformers, the ambient temperature does not less than -40℃. When you want to store the products for a long time, you must keep the packages intact.

2.4.3.5 The SSVT shall be fixed horizontally in the packing box. The transportation only can be performed after the packing is completed. The equipment injuries when dropped down or toppled over in transportation, do not transport the equipment in any other than the specified way, and collision and other mechanical damages shall be prevented.

2.4.3.6 The equipment shall be stored in the places with a ambient air temperature of 0℃～+50℃, and there shall be no fire goods, explosive substances, corrosively and serious concussion.

2.4.3.7 Remove the bolts for fixing the SSVT to the bottom plate of the packing case, and fasten 4 wire ropes of same length to the lifting hooks on the oil tank (don't lift the SSVT on the top of it). Upright the SSVT, add two more wire ropes with the same length, then plug the load hook into the circle hole. The main wire ropes must be bound by using another rope or strap to avoid the main ropes loosening. The SSVT's top cover should be protected from damage by felt rings or rubber cushions. And then slowly lift the SSVT and move it to the supporting structure. Fix the SSVT by the attached mounting bolts. The hoisting shall be performed slowly and stably to prevent the action of impact force.

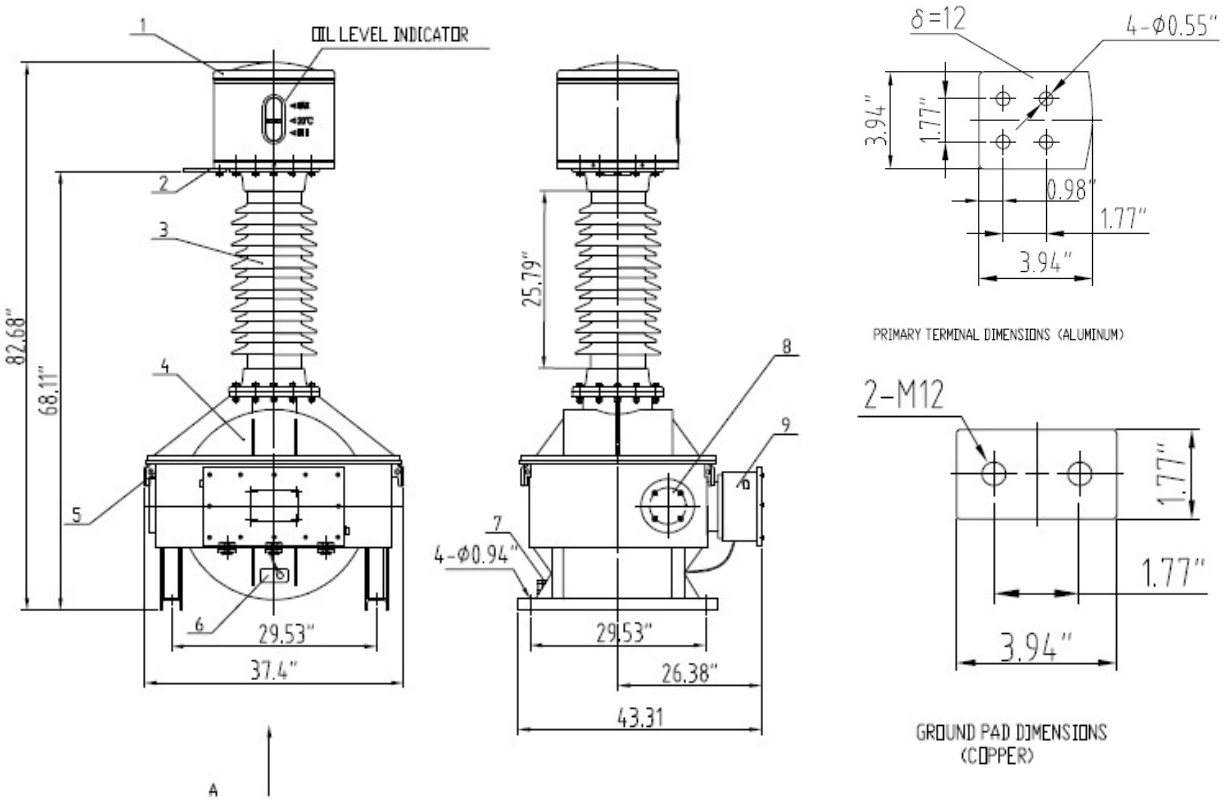
2.4.3.7 Secondary leading cable must pass through the outlet tube below the secondary terminal box (a round lid on the middle of the oil tank). The diameter of the cable shall be less than 15mm. After the cable getting through the tube should be connected with the secondary terminal, and then fasten the lid tightly. Use insulated tape to bind up the tips of the cable and fix it firmly with the clamp.

2.4.3.8 When making any power or metering connections, exercise extreme care to avoid partial or full short circuits on any of the SSVT secondary windings. Such short circuits can cause the SSVT to rapidly overheat, potentially leading to catastrophic failure, posing serious risks to personnel safety and causing significant equipment damage.



Caution: Never short the secondary windings of any station service voltage transformer.

Fig.1 Outline Dimensions and Structure Drawing



1. Expander
2. Primary terminal
3. Porcelain Insulator(Gray)
4. Oil tank
5. Lifting lugs
6. Earthing terminal pad
7. Oil drain valve
8. Pressure Relief device
9. Sec. Terminal box, Nameplate

Fig.2 Nameplate Drawing of SSVT-72.5

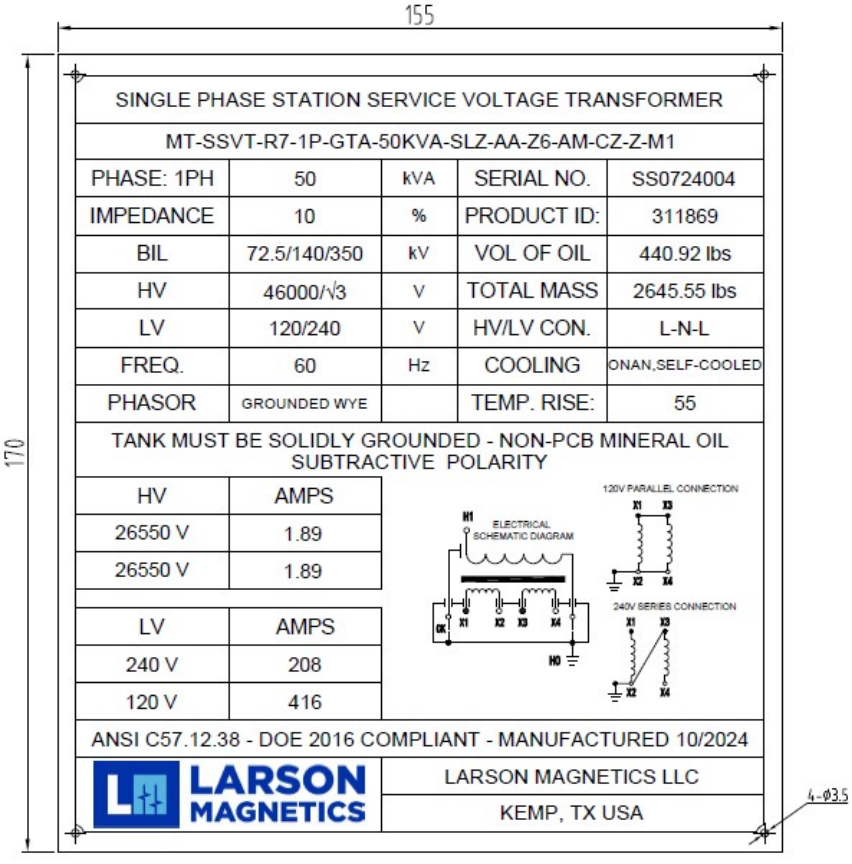
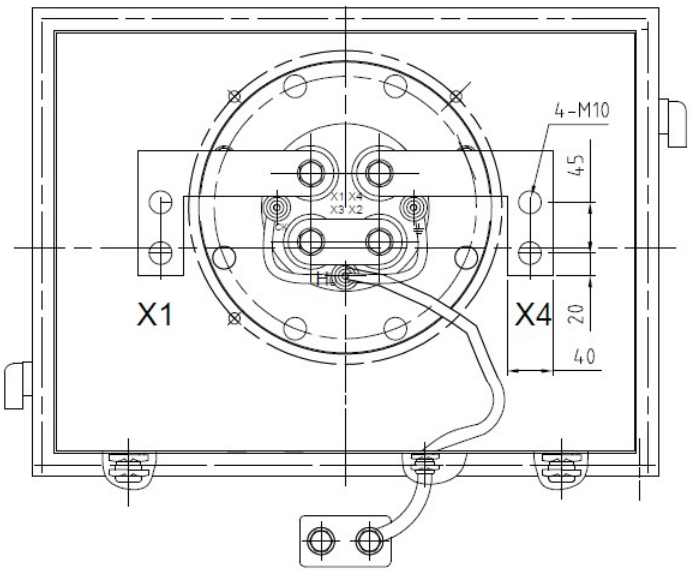
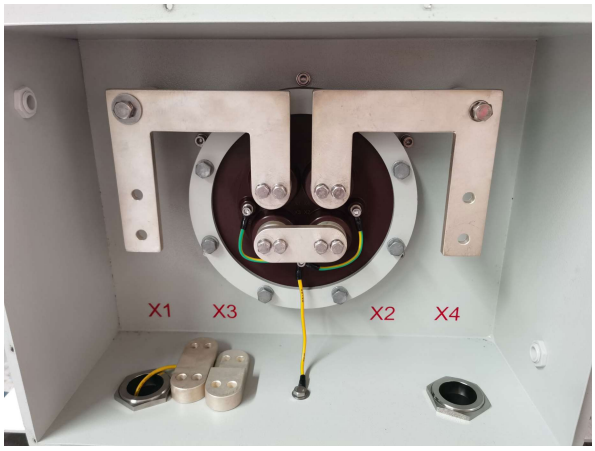


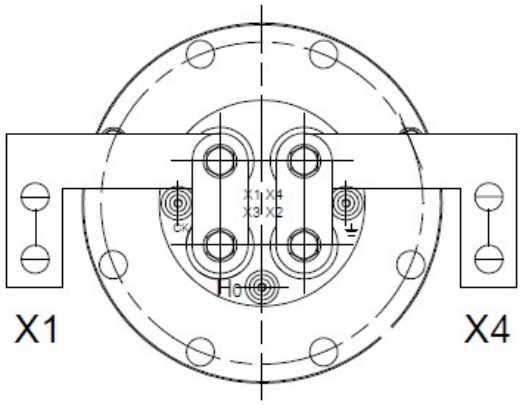
Fig.3 Secondary Terminal Box Drawing

X1-X4 Series Connection: 240V 50kVA





X1-X4 Parallel Connection: 120V 50kVA



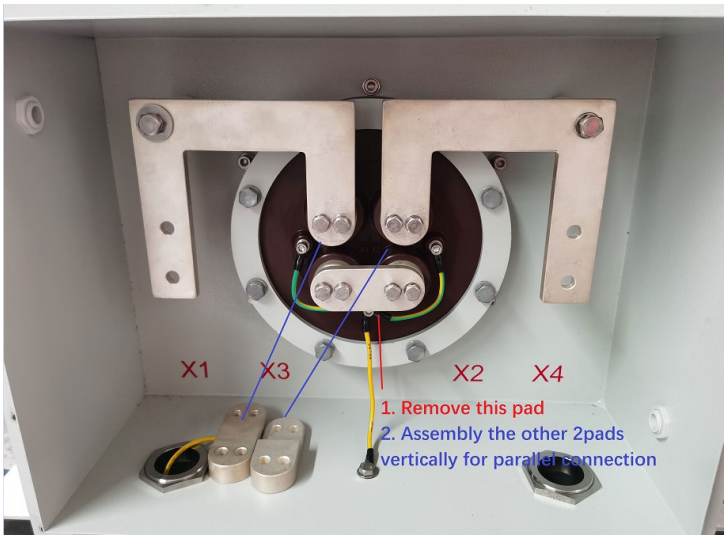
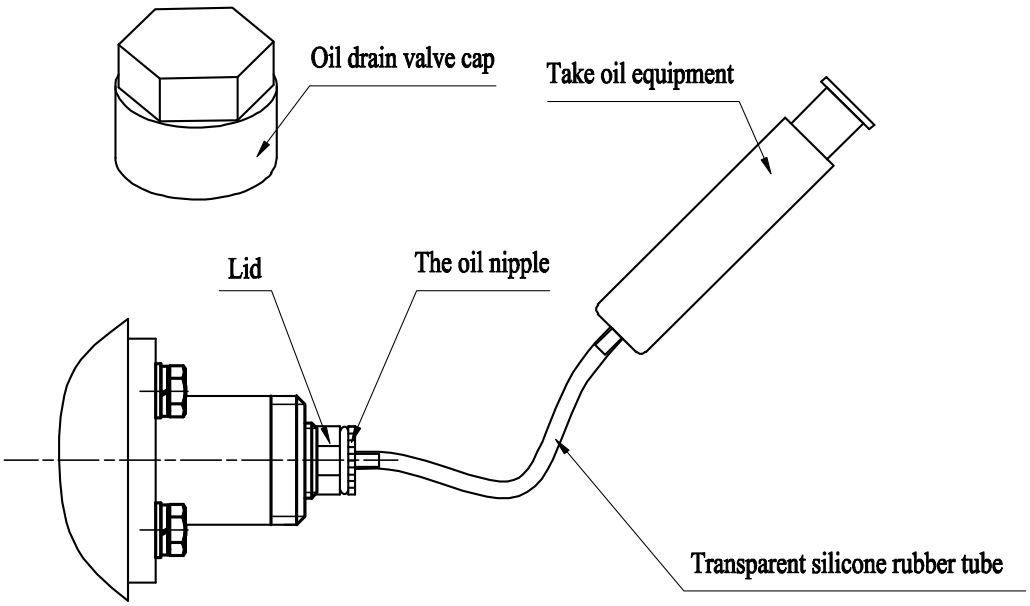


Fig.4 Oil taking installations



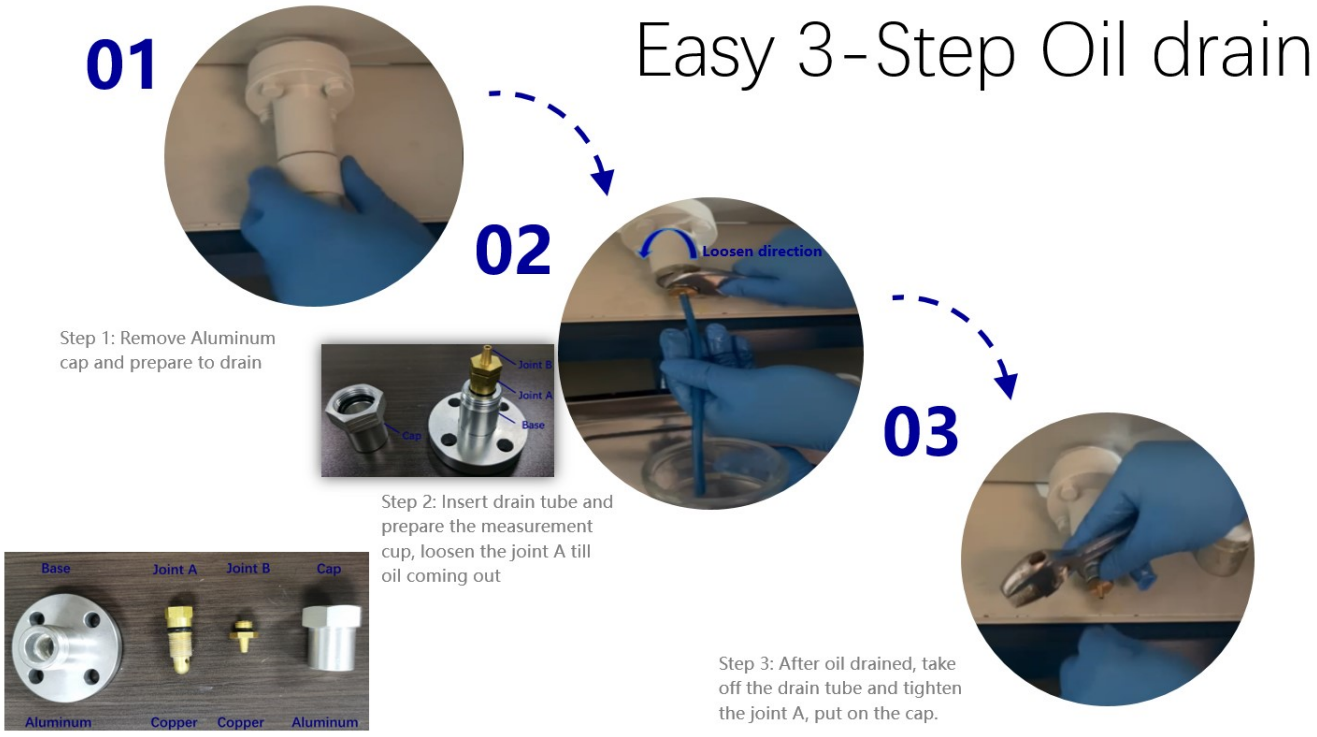
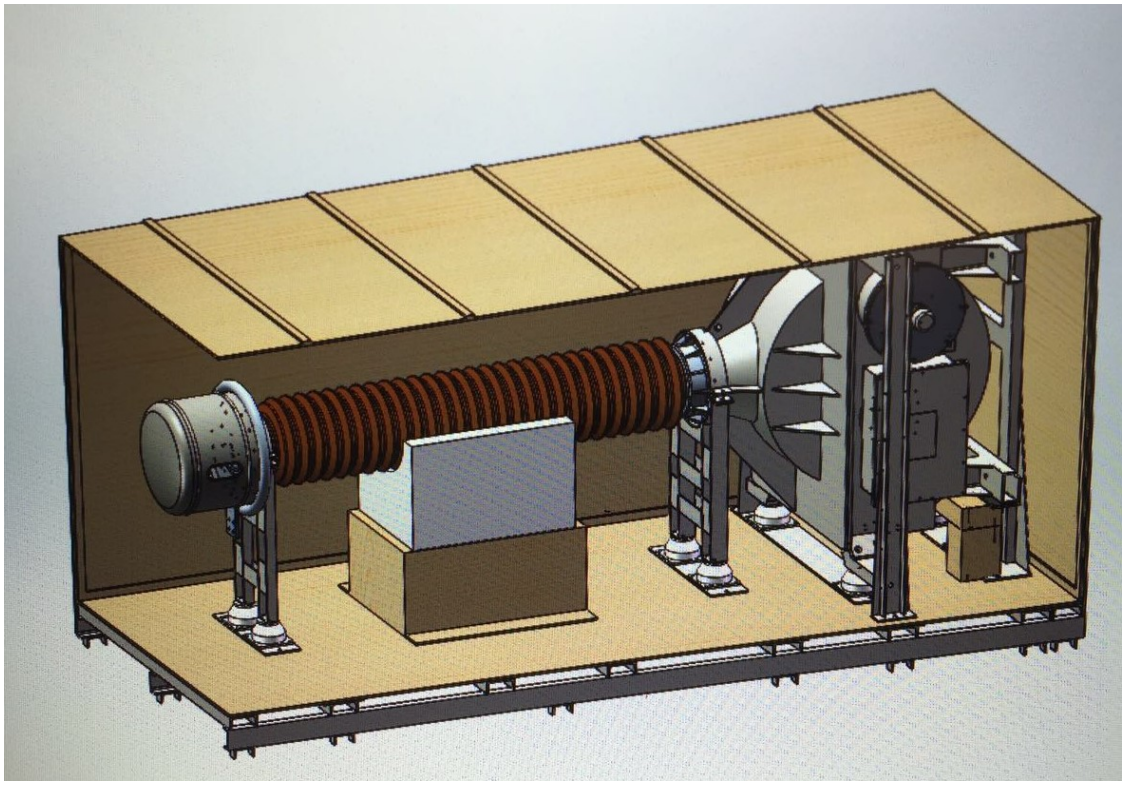


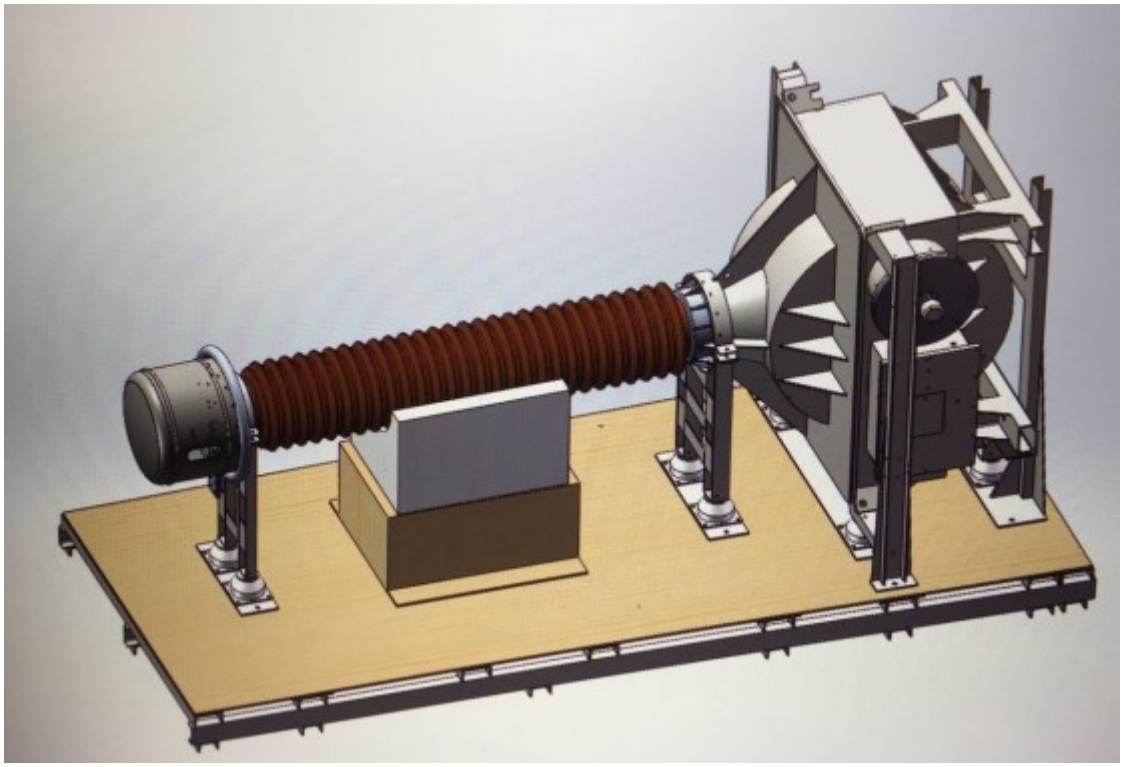
Fig.5 Pressure release device



Lifting and Handling Procedures for SSVT - 72.5

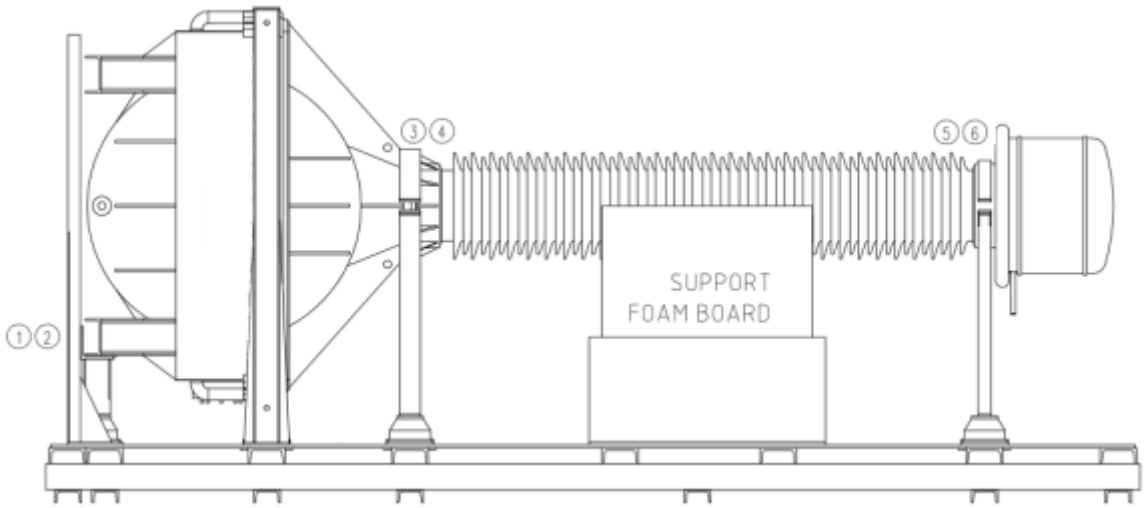
First step: Unpack the side plates and top cover plate



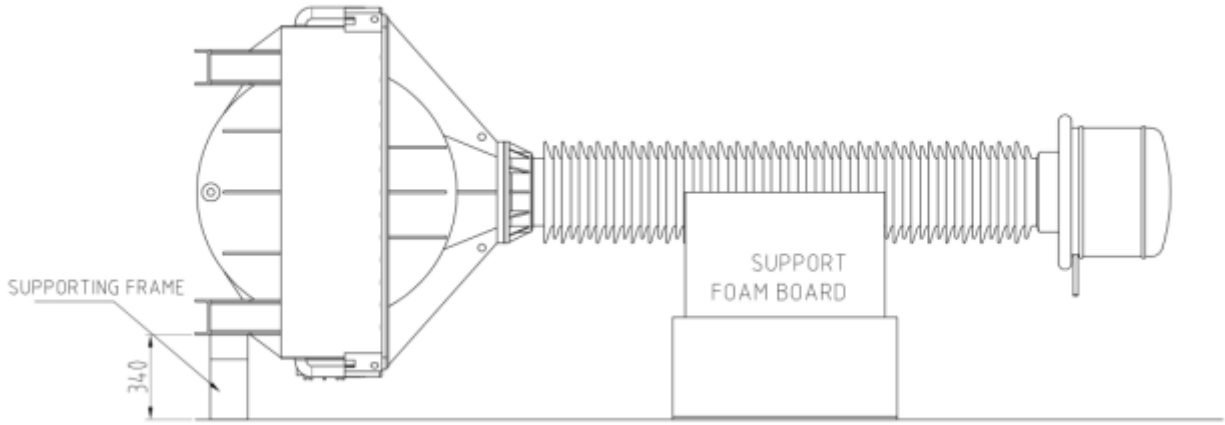


Step 2: Remove the bolts (6bolts as indicated in below picture with serial No. 1--6)for fixing the product on the packing frame structure

Note: Please do check the number of bolts carefully to make sure that all bolts have been removed before lifting the products.

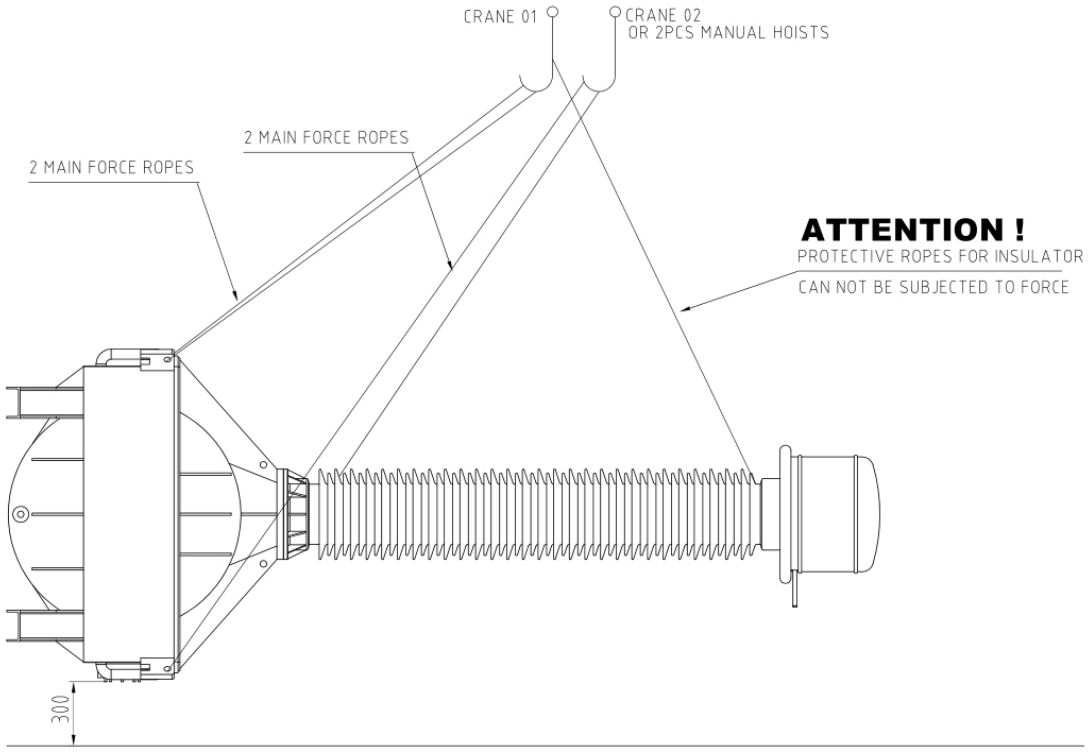


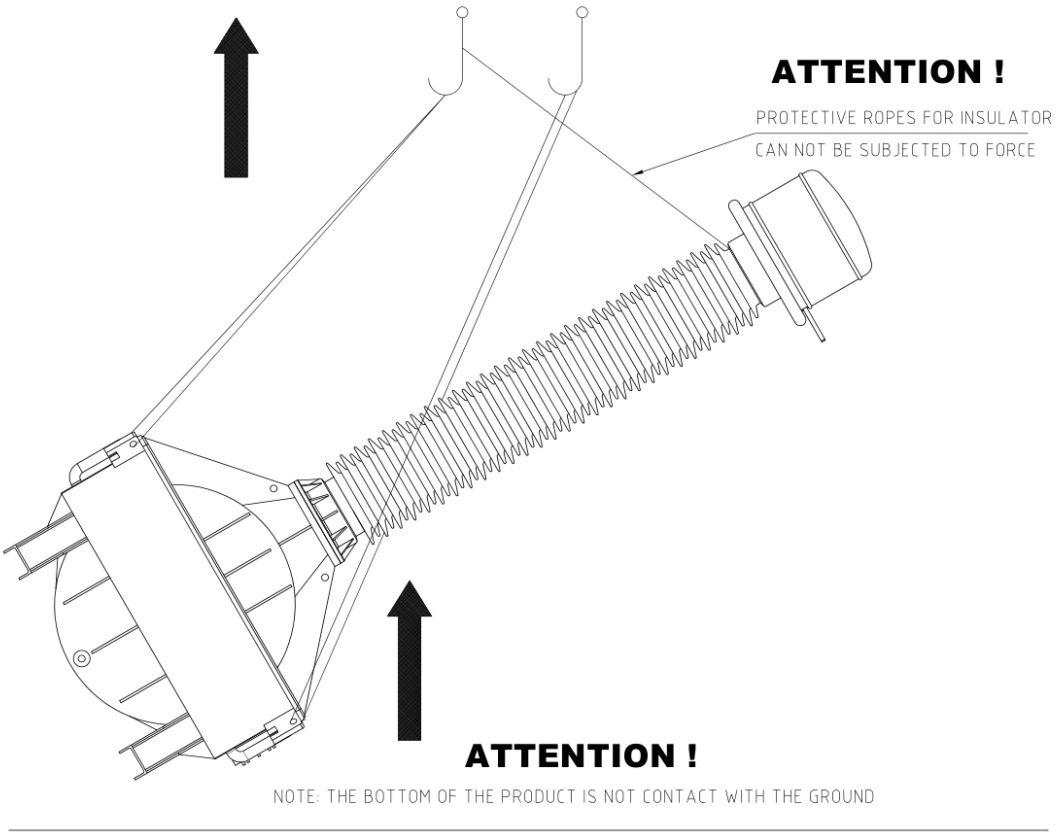
Step 3: Lift the product out of the packing frame structure



Step 4: Lift the product off the ground and remove the supporting device. The rope of crane 1 is main force accept rope, and the rope of crane 2 (or manual hoist) is auxiliary rope.

Note: The rope for the porcelain bushing is to protect the rope, it can not accept any force.

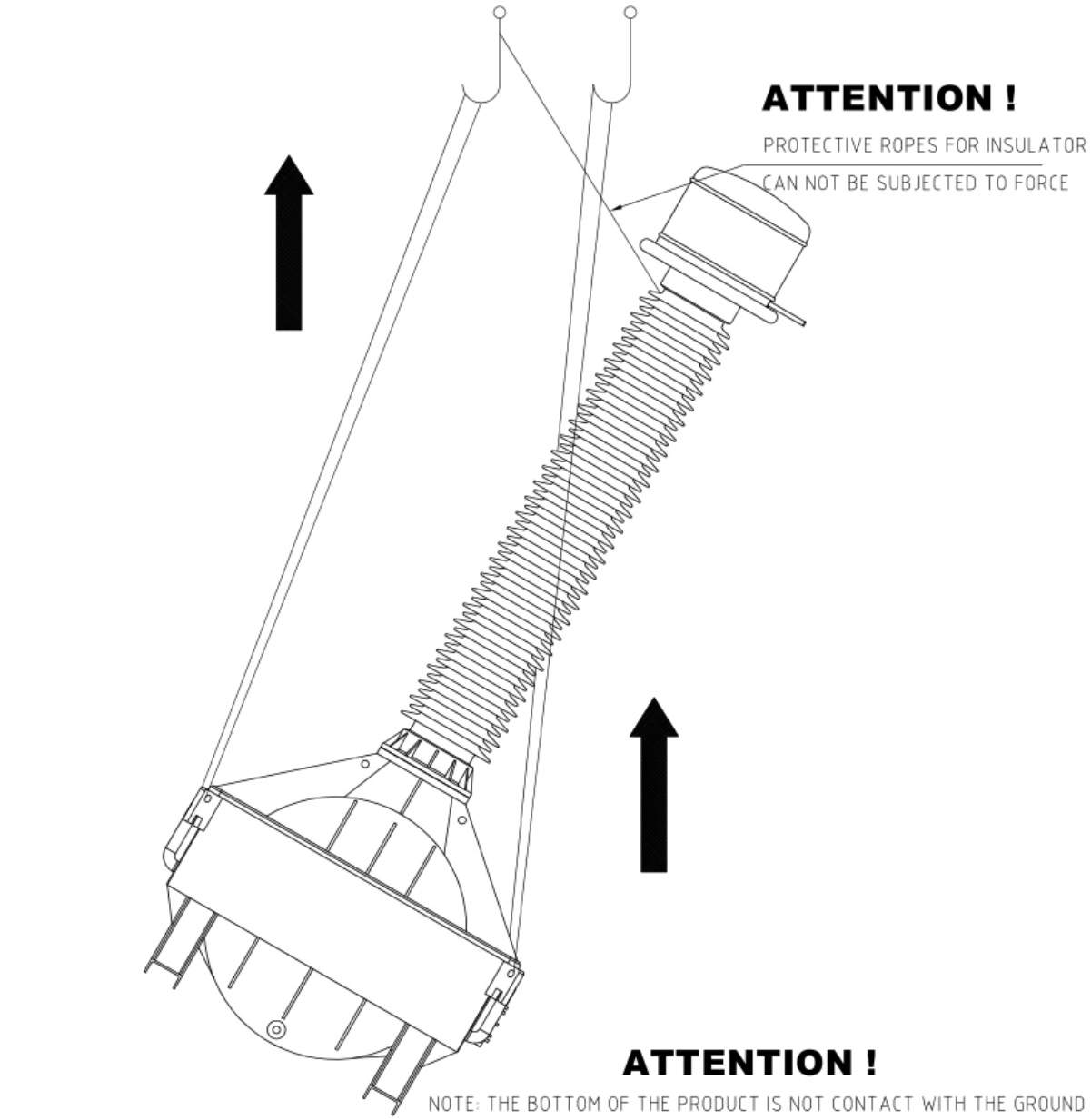




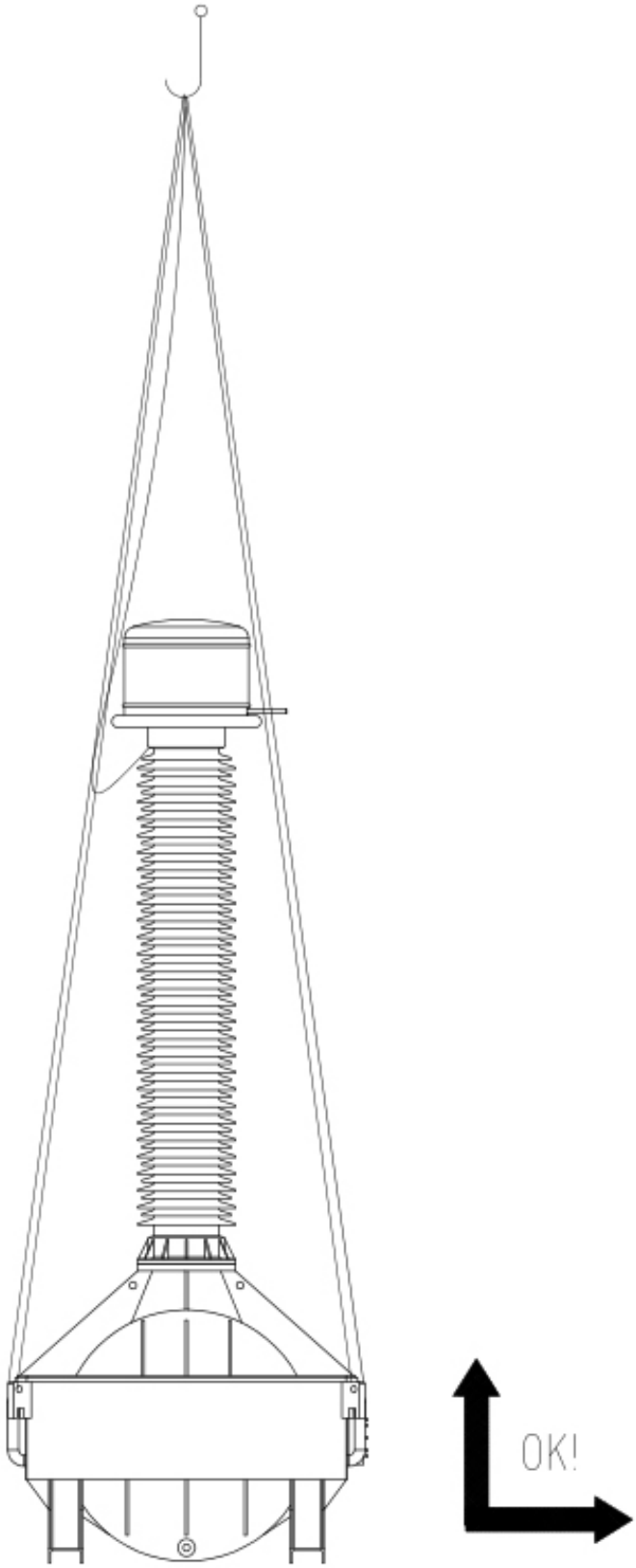
Note: The bottom of the product is not allowed to contact with the ground.

The main rope of crane 1 is moved slowly upward (force acceptor); The auxiliary rope of crane 2 (or two manual hoist) is also slowly moving upward. (force acceptor)

The porcelain bushing protection rope moving upward slowly but can not accept any force.



Note: The bottom of the product is not allowed to contact with the ground.


OK!

SSVT-72.5 Port Loading and Unloading Precautions

When the goods arrive at the port and the packings are to be transported out of the container, please be noted to pay attention to the length of the forklift fork, which should be 2 meters long at least.
Pay attention to the gravity center of the packing when applying the crane to lift the box,.



When carry the equipment out from the container, try to avoid damaging the inner wall of the container. Check the bottom of the container and the bottom of the packing to see whether there is any trace of oil leakage, if there is a lot of trace of oil, indicating that the equipment porcelain have been damaged, then it is necessary to take pictures to keep evidence for the claims to the shipping company
It is recommended that your company arrange some personnel to go to the port supervising the equipment loading and unloading matters, this project is very important for all of us.
Please pay attention to the transport safety and speed of the truck to avoid the any damage to the equipment aroused by the bumping on the way.





