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Jiangsu Tianwei Transformer Ltd., is a comprehensive enterprise, combining research, manufacture, sales and service and built up a complete service system.

Our company locates in Hai'an city, Jiangsu province, China which lay in north of beautiful and rich Yangtze River delta, east of the Yellow sea, south of Yangtze, and close to Nantong, Yangzhou, Taizhou, Shanghai airports. 204 and 308 national ways are passing through our factory. The obvious regional advantages prove that we are suitable for water, land and air transportation.

Our factory specializes in the manufacture of dry type transformer, rectifier transformer, Box-type transformer and oil immersed transformer. We occupy an area of 60000 m<sup>2</sup>; fixed investment is RMB 80,000,000; 280 employees. We have many engineering equipment and full sets of inspection equipment, such as vacuum drying system, automatic vacuum casting system, slitting line, horizontal cutting line and automatic foil winding machine and son on. Our technology is strong, manufacture process is advanced, equipment are excellent and testing modes are complete. Meanwhile, a professional team that everyone has sense of responsibility, exploiting and innovating. With ISO9001 quality management system, ISO14001 environment management system and PCCC certification, our products performances are superior to national standards and IEC standards. We have got the approval of National Transformer Quality Supervision and Inspection Center. We have won the honored certificates like Jiangsu High and New Technology Enterprise and Jiangsu Quality Believable products.

We mainly manufacture the transformer with voltage up to 35KV which is energysaving and eco-friendly(S11/S13), on-load regulating transformer, rectifier transformer, amorphous alloy transformer(SBH15), dry type transformer (SCB, SGB), combined transformer and wind power transformation and so on. The capacity is up to 31500KVA and our products are in series and diversification, with salient of good preference, novel

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structure, low loss, loss temperature rising, low noise, impact resistance, anti-short-circuit, of which can meet the demand of different clients.



We have built up diverse sales network and complete service system. Our products are widely used for urban and rural power grids, petrochemical, metallurgy, iron and steel enterprises, mining and real estate and so on. Our distribution is all over China, mainly in East of China, partly in North, North east and middle west area. Some products have been exported to other countries and regions, such as Thailand, Philippines, Malaysia.

We insist on the enterprise concepts of honesty, professional, "mutual-win", customers and quality first. We develop the products according to science and technology, develop the market according to quality and develop the clients according to credibility with innovating constantly. We hope to go forward with the clients and seek for common development and create the splendid future of transformer industry.



# **Oil immerged transformer**

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#### Product Introduction

#### **Products structure and technical features**

The oil-immersed transformer produced by our factory have these advantages: low loss, low noise, high short circuit strength and good appearance. We company create these prefect products of that each parameter has reached to advanced level among domestic related products by combining advanced manufacture equipment and technology.

#### Structure features:

Core and main body: it is used iron core cutting line, all inclined ladder joints and improving flux trend to eliminate flux saturation phenomenon of iron core in joints. By doing these, it reduces the no-load loss, no-load current and noise of transformers. Adopting pulling-plank structure, to strengthen the ability of withstanding short-circuit, we put many nails around pressing planks and bracing plates are used as support between H.V and L.V yoke, make the iron core be a whole. The iron core sheet is coated by glue which are specialized for silicon steel, so that all silicon steels can be bonded together to make the iron core be integral one, this effectively enhances mechanical strength and plays a positive role in the core anti-rust. The low part of the body and the oil tank are supported through bracing plates adopt" high intensity electric laminated" technology, to guarantee the low part of oil-immersed transformer's body safe and reliable.

Coil: The high-voltage(HV) coil adopts an interleaved-continuous structure, The low-voltage(LV) coil adopts an interleaved-continuous or spiral structure, are independently provided with voltage-regulating winding to balance the ampere turn of each winding-up,

effectively lower the mechanical force to minimal level. In the transformer winding, there is a zigzag oil guide structure to fully cool all areas inside the winding, lower the temperature rise of the winding and the hot points of the winding and prolong the service life of insulation.

Oil tank: the tank's structure of oil-immersed transformer is bell jar type or suspended type, have a good looking and high mechanical strength. It adopts" flanged joint" technology in every key point (such as annular tubes, pressure valves, switches, etc.), which effectively avoid leaking oil.

#### **Technical Parameter and features**

Technical specification

- 1. voltage:35kV
- 2. voltage regulation: on load tap regulation, off circuit tap regulation
- 3. capacity range:<31500kVA
- 4. frequency: 50Hz
- 5. phase: 3-phase
- 6. vector group: Yd11, YNd11, Dy11, Dyn11, YNyn1
- 7. short circuit impedance: according to customer requirements or national standard
- 8. operation environment: according to customer requirements or national standard
- 9. cooling method: ONAN/ONAF

10. Insulation level: power frequency withstand AC-85kV, impulse withstand voltage LI-200kV

# Dry type transformer

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#### Product Introduction

Our company's dry type transformer is made of epoxy resin and adopts foreign advanced technology and CAD design. The core is manufactured with high quality cold rolled grainoriented silicon steel and steps overlapping structure is also adopted for the core design, thus to greatly reduce no-load loss. Winding is manufactured with high quality epoxy resin; coil casting process is completed by automatic vacuum casting equipment. The epoxy resin is with characteristics of good penetrability and no bubbles, so its partial discharging volume is small. Dry-type transformers with advantages of strong overload ability, good thermal stability, small size, light weight, easy to install, exemption from maintenance can be widely used in high-rise buildings, commercial centers, airports, railway stations, docks, subways, factories and underground distribution stations.

#### **Products structure**

Core: The core is manufactured with high quality cold rolled grain-oriented silicon steel and step overlapping structure is also adopted for the core design. Magnetic circuit structure is improved and the magnetic flux density of steps overlapping joints is lowered. Because of first-class equipment, high quality silicon steel and advanced technology, the no-load capacity is greatly improved. Compared with normal cores, no-load loss, no-load current and noise are respectively reduced by 5-6%, 20-30%, 6%.

Coil: HV winding is casted with high quality epoxy resin at vacuum state with pressure; LV winding is manufactured with high quality foil conductor. Advanced technology guarantees the small partial discharging volume, high capacity of short circuit impendence. The regulation range of H.V winding is  $Un\pm 5\%$  and  $Un\pm 2x2.5\%$ , on-load regulation range is wider.

Temperature controlling device: Function with fault alarm, over-temperature alarm, overtemperature trip, three-phase inspection, start and stop air cooling devices, etc.

Cooling devices: Using axial fan with low noise, uniform wind and easy to install, etc. Installation of cooling fan can overload about 40% in the long term.

#### **Technical features**

- Noise of transformers come from cores. Our factory makes use of advanced Step-Lap technology to improve magnetic distribution in core. With its special advantages, lower transformers' noise.
- 2. Design of products adopts CAD. Choose high quality silicon steel and low flux density which can leave far away from the saturation point, so number of harmonics will be decreased, then noise will be lowered.
- 3. All clamping parts are made of silicone rubber and elastic element to butter, so can reduce the amplitude, noise, while the outer of core is coated with a certain thickness of the resin, it plays a sound effect.
- 4. Small partial discharging volume and high electric strength. Solid insulation combined with high quality epoxy and glass fiber has very high electric strength (breakdown strength is not less than 34kV/mm). Partial discharging volume is small, can be controlled within 10pc.
- 5. Flame retardant and no pollution to the environment. The heat produced when resin epoxy and glass fiber composite insulation materials burn is very small (about 6.5mJ/KG), so it is hard to flame and can extinguish automatically.
- 6. Damp proof, can safely work under conditions of 100% damp. Dry type transformer's core is coated with epoxy and its winding is completely casted by epoxy resin, so it can work under 100% damp and has strong corrosion protection capacity.

#### Specification

Voltage level: 6-35kV Capacity: 30-20000kVA Regulation mode and tapping range: Un±2x2.5% (or±5%) no excitation, Un±4x2.5% (or ±5%) on -load voltage regulation Frequency: 50Hz

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#### Phase: three-phase

Vector group: Yyno; Dyn11; YNd11 (or according to customers' requirements)

Short-circuit impedance: standard impedance (see specification table)

Working environment: altitude less than 1000 meters; environment temperature lower than 40°C. (If the working surrounding exceeds these limits, exceptional design and manufacturing process should be involved according to related standards)

Insulation and heat resisting level: F, the upper limit of temperature is 155 °C, and the limit of temperature rise of the winding is 100K.

Cooling mode: natural air cooling (AN), forced air cooling (AF)

Insulation level:

A. 6kV-type transformer: main frequency withstand voltage is 25kV, impulse withstand voltage id 60kV

B. 10kV-type transformer: main frequency withstand voltage is 35kV, impulse withstand voltage id 75kV

C. 20kV-type transformer: main frequency withstand voltage is 50kV, impulse withstand voltage id 125kV

D. 35kV-type transformer: main frequency withstand voltage is 70kV, impulse withstand voltage id 170kV

# **Rectifier transformer**

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#### Product Introduction

#### **Product Introduction:**

Rectifier transformer is for power transformer with rectifier device. Its role is to provide AC power for the rectifier. Then the rectifier will change AC power to DC power supply. It's mainly used in the metallurgy, chemical industry and some other industry. It's low-loss, low-noise, shock resistant, and short-circuit resistant. Rectifier transformer also has the advantages of strong ability of over-load, compact structure, small size, reliability of power supply.

#### **Product Features:**

Stable electrical performance: combing the load feature and the status of fluctuation of electric grid and voltage, atmospheric over-voltage, according to the rectifier transformer load conditions, determine a reasonable and reliable insulation level and insulation model, to ensure the reliable and stable electric performance of the product. Environmentally safe coefficient of the product≥1.67.

High degree of dynamic stability: the winding has a high mechanical strength, with a strong ability of ant- contingencies, to meet the severe environment of load. During the process of design and manufacture, it eliminates the dynamic unstable source caused by magnetic leakage or non-normal transportation. The product has high dynamic stability. The resistance is 30% higher than the power transformer with same capacity.

Good thermal stability: advanced product design. The heating part and temperature rise of the hottest dot are strictly controlled, with sufficient temperature margin. If necessary, additional axial oil duct can be added in the coil. Cooling way can be chosen according the load loss value of the coil, then to allocate the oil flow reasonably to reach the best cooling effect. Main temperature rising index is at least 5°C lower than national standard. Copper wire is used as coil and down-lead, selecting low current density.

High ability of overload: the product comes with strong capacity of over-load and overvoltage. It can be operated safely in long-term under the condition of rated load. It can be operated safely in long-term under the condition of 100% full load (environment temperature 40°C); the terminal on the transformer connected with the motor can bear 1.5 times the rated current, which is 5S. Load character is fully considered during the product design and manufacturing. Temperature rising, insulation properties and choice if attachment are considered to meet the overload requirements.

Superior performance index: no-load current design. Manufacturing capacity is lower than that of normal transformers with same capacity that regulated by national standards.

Obvious energy-saving, low noise

Simplified structure, elegant appearance. The oil tank adopts the technology of antileakage to avoid the leakage, eliminating the fuel tank leakage.

#### **Product structure**

Core: it adopts high magnetic silicon steel sheet. Meanwhile, it adopts the three-six step lap core stacking stepping style. No-load, no-current and noise are reduced effectively.

Winding: we use high conductive non-oxygen copper wire as the electric magnetic wire. The structure of cylinder type, double-cake type and new spiral type with whole set of new technology is used for the winding. Thus, our product structure is more compact and the main insulation to be able to get effective guarantee. Layers on both has been strengthened which improved the insulation performance. We enwind the high strength constructive belt to the outer surface of the winding which improve its mechanical capability. Its anti-impact ability and anti-short circuit are improved largely.

Body: insulation pad with both high strength laminated wood and laminated cardboard support is used for the body. The support area of the winding end reaches more than 95%, which improves its anti-short circuit further and improves its operation stability. The connection of the body and cover is the plate with buffer structure to overcome the phenomenon of "impending" and "coping". Insulation material is coiled with high-intensity, high-density cable package of which the allowed pressure is 45 Mpa.

Tank: Heating radiation oil pipe (double row and three rows of pipe with inserting slice type) or using ladder Chip radiator is used for the tank. The ability is increased under the same area of the tank wall. According to customers' requirements, we can also install chip radiator or corrugated tank, and oil-cooled or water-cooled radiator. Treatment of the tank surface: coat paint of the transformer id "three resistance paint" (anti-salt spray, anti-humidity and anti-mildew). The adhesion of the out paint and inner paint is strong. The decoration is good. The oil resistance of film, corrosion resistance and light fastness are good. It also comes with good covering strength.

#### **Applies for Rectifier circuit:**

Normal rectifier circuit used is single-phase half-wave, single-phase full –wave, half wave three-phase, three-phase full-wave(Y or  $\triangle$ ) bridge, three-phase flexural type(the Zo-shape),six-phase Y-shape (mid-point wiring), the six-phase Fork shape(also flexural shape), six Y-shaped parallel bridge type(with a balance reactor),the six-phase  $\triangle$  type, Y-shaped series-wound bridge type, 12-phase four flexural type with balance reactor, the six-phase Y-shape or  $\triangle$ type, six phase(12,24 phase) double anti-star with a balance reactor, or more sets of parallel bridge type, double anti-star circuit. DC current can be up to 25kA, the DC voltage from tens of volts to several hundred volts, the valve side is often used in parallel with the inverse method to qualify.

### **Amorphous Alloy Transformer**

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#### Product Introduction

#### Products structure and technical features

Electricity is transferred to users from power stations through transmission and distribution system's voltage conversion. Firstly, transferred via high voltage transmission lines, then lower the voltage in substations, lastly be fit to use. Distribution transformer locates closely to terminal users will lower voltage at a suitable level. Transformer, lower voltage at a level which is suitable for electrical equipment, is called distribution transformer, used in daily lighting and factory producing, low voltage is usually less than 0.4kv. In addition , distribution transformer's capacity is small, usually less than 3150kVA; and primary voltage is also low, at less than 35kV.

Our distribution transformer adopts "CAD" design concept and its performance is accord with IEC60076, GB1094, GB/T6451. The core is manufactured with high quality cold rolled grain-oriented silicon steel, and steps overlapping structure is used for core manufacture, after overlapping, brush special hardener to make cores solid, thus to effectively reduce no-load loss and noise. The oil tank is corrugated structure, produced by our factory's oil tank automatic production line; surface pre-treatment solution and coated powder all use high-quality brand products; firstly, be shot blasted, then spray powder, at last solidified in high temperature, so our oil tank has strong corrosion resistance. Winding is manufactured with high strength enameled wires (or paper covered wires), ampere-turns evenly distribute, insulation structure is reasonable, so winding's short circuit impedance is excellent. The body of distribution transformer adopts suspended structure, all sealing surface use quality acrylic rubber, can effectively prevent cold aging.

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# Box type transformer

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The prefabricated substation, also called USA-type transformer substation, is a newmode complete set of power distribution equipment that absorbs foreign advanced technology and design concept. It is also can be used in our national power girds, including these distribution systems of industrial and mining enterprises, high-rise buildings, residential areas, stations, port terminals, especially suitable for alteration of urban and rural power grids, not only reduces engineering investment and occupying area, but also shortens the installation period.

#### **Products features**

Novel design, innovative structure, smaller volume

• The high voltage overload switch, plug-in fuse and backup protection fuses are placed in transformer insulating oil tank, thus substation's volume becomes smaller whose occupying area is only 1/3-1/5 of normal products.

• Fully enclosed, fully insulating, safe and reliable

Transformer oil tank is fully enclosed structure without conservator. The high voltage inlet wire adopts connections of elbow-type cable plug and high voltage bushing, live parts sealed within the insulator, shape a fully insulating structure. Terminal surface is zero potential which can guarantee human safety.

Advanced protection principle, economic and reliable, easy to operate

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Using full range protection mode of double fuse in high voltage side and supplemented by low voltage under voltage protection to make operation reliable and easy. The body of transformer is used with S11, S13 series, its winding adopts Dyn11, with characteristics of neutral point not drifting, good lightning performance, low loss, low noise, etc.