



TGT

TGT00D distribution transformer

Catalogue

2017

TGT

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TDT, TGOOD distribution transformer

Distribution transformer, manufactured by TGOOD, adopts advanced electromagnetism design software to automatically optimized the transformer's performance and structure, comply with the correction factors accumulated by rich experience, elaborately designed and developed the new products with unique technology, fully meet the latest standard GB1094.1 ~ 2-2013, GB1094.3-2003, GB1094.5 ~ 2003 and the IEC - 60076.

Feature

TDT transformer features:

Low loss:

- High magnetic cold rolled-oriented silicon steel sheet and reasonable magnetic flux density have been adopted in the design, and the burr has been strictly controlled less than 0.02mm during processing, manufactured according to technic requirement to ensure the flatness and verticality of the core, furthermore, its clamp strength met the requirement as well.
- Select reasonable current density, control wire width and thickness ratio, and especially control the wire thickness to reduce eddy current loss and stray loss.

Low temperature-rise:

Product's cooling way is ONAN, there is a longitudinal oil path inside the coil to increase the coil radiating surface, which makes oil flow direction is more reasonable to avoid of partial overheating.

Low noise:

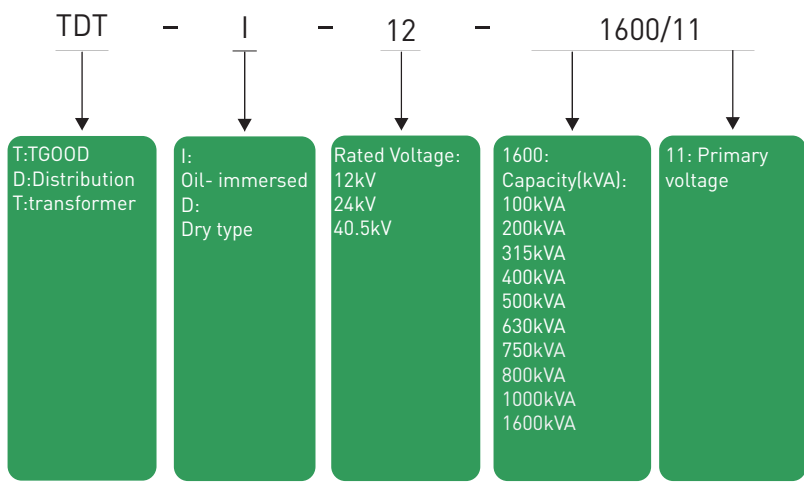
The noise is mainly from the core, outspread through the transformer's body and oil tank. Meanwhile, the noise would be increased due to the cooling devices accessories. In order to reduce the noise, following measures have been taken:

- Reasonable magnetic flux density and high permeability, low magnetostrictive high quality silicon steel sheet have been adopted in the design to ensure a certain margin available under normal working voltage, the core does not appear magnetic saturation phenomenon when the system voltage is high, which can reduce the hysteresis vibration of silicon steel sheet itself.
- The structural parts are designed with reasonable vibration reduction and anti-loose measures such as the insulation rubber on the core cushion.
- All fasteners adopt the anti-release button and disc type spring washer.
- Control the appropriate clamping force.
- The transformer completely adopts the structure of strong short-circuit withstand capacity and technic measurements to avoid the transmission of mechanical noise.

Strong short-circuit withstand capacity:

One of the hazards of sudden short-circuit of transformer is the rapid heating of winding and all current-carrying conductors, causing the winding temperature to increase sharply. Second, make the winding and its structure components suffer from huge electromagnetic force when the mechanical strength of winding structural components is not high. Under the action of electromagnetic force, winding and its structure components are likely to be damaged, so that the transformer stops operating.

Type description



Application condition

- Altitude:** ≤ 1000m (Note: Higher altitude is optional)
- Temperature:** -30℃ ~40℃ (Note: Higher performance is optional)
- Humidity:** 95% per year
- Solar radiation- maximum:** 1.1 kW/m²
- Pollution level:** From Light to Very Heavy.ESDD 0.2 to 0.5 mg/cm²

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TDT-I, oil-immersed type transformer

Oil-immersed transformer, manufactured by TGOOD, adopts advanced electromagnetism design software to automatically optimized the transformer's performance and structure, comply with the correction factors accumulated by rich experience, elaborately designed and developed the new products with unique technology, fully meet the latest standard GB1094.1 ~ 2-2013, GB1094.3-2003, GB1094.5 ~ 2003 and the IEC - 60076. This series of transformers have the characteristics of low loss, low noise, strong short-circuit withstanding, no leakage, no lifting core and maintenance-free, etc.



TDT-D, dry type transformer

The vacuum cast coil dry type transformer is suitable for indoor installation.

The following standards shall be applied, at least:

IEC 60076-11 Dry Type transformers

Vacuum cast coil dry transformers are suitable for operation in humid or heavily polluted environments. They are the ideal transformer for operation in environments with humidity higher than 95% as well as at temperatures down to -30°C .

Structure

1. The iron core

The iron core adopts three-phase three-column structure, the material is high magnetic conductive silicon steel sheet, 7110 glue has painted on its surface. A solid frame is formed with the core, clamps and block, fully filled with stepped blocks to keep the iron core from loose, and enhance the shock resistance and stable capacity. As for the application of the cushioning block, it can ensure the low noise during transformer's operating on. Fillet processing has been used in all iron core structures, garden integration in high field area, effectively decreases NQN.

2. Coil and insulation

High quality coil: using high quality oxygen-free copper conductor effectively reduces the eddy current losses of the coil, which is beneficial to the heat dissipation and short-circuit withstand capability of the coil.

LV coil adopts continuous type, close to the core side. HV coil adopts continuous type as well, placed on the outside of the LV coil. There is oil duct in each winding, so that the inner parts of the windings can be fully cooled, reducing the temperature-rise and hotspots of windings, and extending the insulation life.

3. Transformer's body and leads assembly

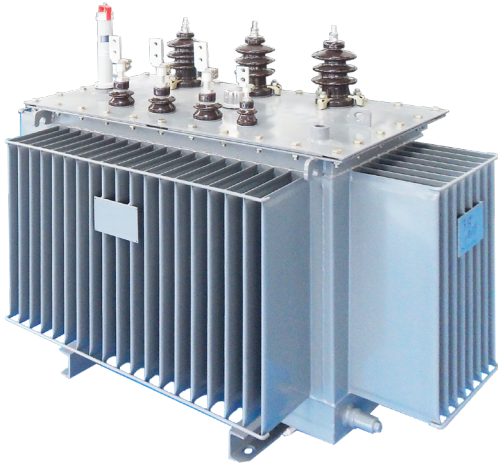
The coil adopts overall package under hot state to ensure the gap as small as possible. After the coil assembly is completed, the automatic control of the imported kerosene vapor phase drying equipment is carried out many times during drying process, to guarantee the insulation is fully contracted, which can improve the short circuit withstand capability. In order to meet the requirement of no-lift core, the following measures are adopted in the positioning of the transformer's body and oil tank: two or four points solid positioning is used in the upper part of transformer's body and top of oil tank, lower part of the body has been screwed by four points with the bottom in the vertical direction, which can avoid the displacement of the body in all directions with the above measures.

4.Oil tank

(1) Tank cover, rim along the entire fillet processing, using curved folding enclosure, reduced the welding, increased the mechanical intensity, enlarged the radiating surface, improved the heat dissipation effect, meanwhile, it has the divergent effect to reduce the noise.

(2) Advanced surface treatment technology, using the advanced shot peening equipment to polish the oil tank, so it has a bumpy surface evenly, increased the adhesion of the paint, adopted the special treatment with high quality paint at the same time, ensured that the product is beautiful and durable for a long time.

(3) To ensure the welding quality of the oil tank, no seepage and leakage, the automatic submerged arc welding, mixed with gas shielded welding technology have been used to guarantee the welding without false and leak, , improved the welding quality, at the same time, adopted special agent for steam pressure and fluorescence test, etc., to eliminate the occur of leakage.



Standard design

Manufacturing standards		IEC 60076, GB 1094
Voltage level	kV	10/ 35
HV/LV coils		HV /LV dipped into the oil
Rated power	kVA	100~1600 (for IEC) 1600~4000 (for GB)
Winding material		According to manufacturer optimization (Cu)
Phases		Three-phase
Cooling system		Standard: • AN (natural air) Option: • AF (air forced)
Maximum T°C/altitude		40°C at any time/1000 m
Temperature rise	K	100
Rated frequency	Hz	50 or 60
Impedance voltage Uk	%	From 4 to 6
Vector groups		Dyn, YNd
Rated HV insulation	kV	12 (IEC) 24/ 35 (GB)
HV tapping		$\pm 4 * 2.5\%; \pm 3 * 2.5\%; \pm 2 * 2.5\%; \pm 5\%$
HV terminals		Standard HV connections
Switching medium		Liquid insulation
LV terminals		• Standard LV connections • Top or bottom entry (on request)

Structure



1. High short-circuit withstand capability

Full length foil in LV windings, axial forces during short-circuit are minimized because its ends free from helix angle. The impregnated resin in DMD will experience a process of melting(80°C) and re-curing(130°C) which will bond the copper foils of LV winding into one complete piece, thus improved withstand capability to compression due to radial forces during short-circuit.

HV winding is reinforced by glass net in both inner and outer side, which improves mechanical strength of HV winding and keeps HV winding have a good performance during short-circuit.

2. Low partial discharge value

It is easier than designs to keep the distance between key turns of HV winding and foil disks, which avoid the problem from happening inside HV winding with big electric strength in partial area. In addition, partial discharge of transformer is lower because of lower electric strength between turns of winding. Therefore partial discharge value of standard products is below 5 pC.

Horizontal vacuum casting is applied, epoxy impregnated better. Effectively avoid forming air bubble.

Partial discharge taken place in both sides of narrow foils can be avoided because no burr is existed and round edge is made carefully in these areas.

3. Good performance of lightning impulse withstand voltage of HV winding

There is high series capacitance existed in the HV winding due to separate and continuous disks applied inside. The lightning impulse voltage is in linear distribution. Therefore, HV windings have excellent lightning impulse voltage-resistance characteristic.

4. High capacity to withstand overloads

High capacity to withstand overloads due to high thermal inertia. The capability can be increased by 40% when fans are in forced cooling status.

5. Low dielectric ageing

Phase voltage uniformly distributes along the winding height, operation voltages are lower than one tenth of corona inception voltage. There is no special area in which insulation material easily become ageing and deteriorating.

Standard design

Manufacturing standards		IEC 60076, GB 1094
Voltage level	kV	10 (for IEC) 35 (for GB)
HV/LV coils		HV encapsulated in cast resin/LV impregnated
Rated power	kVA	100~1000 (for IEC) 1000~4000 (for GB)
Winding material		According to manufacturer optimization (Cu)
Phases		Three-phase
Cooling system		Standard: • AN (natural air) Option: • AF (air forced)
Maximum T°C/altitude		40°C at any time/1000 m
Temperature rise	K	100
Rated frequency	Hz	50
Impedance voltage Uk	%	From 4 to 6
Vector groups		Dyn, YNd
Rated HV insulation	kV	12 (IEC) 35 (GB)
HV tapping		Off-circuit tapping links: 3 or 5 positions, +/- 2.5%
HV terminals		Standard HV connections
Switching medium		Soild insulation
LV terminals		• Standard LV connections • Top or bottom entry (on request)

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A large variety of applications need technologies which contribute to high safety, cost savings and environmental friendliness.

TG00D has expertise in producing transformers for optimum space utilization, special requirements and the most strict conditions.

TG00D has the broadest experience in all applications, segments and customized projects:

- Wind
- Solar
- Railways
- Utility
- Buliding
- Oil and gas
- Industry
- Infrastructure
- Metal and mining
- Water

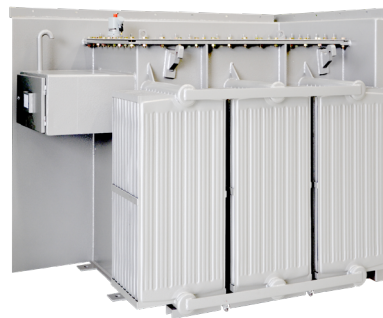
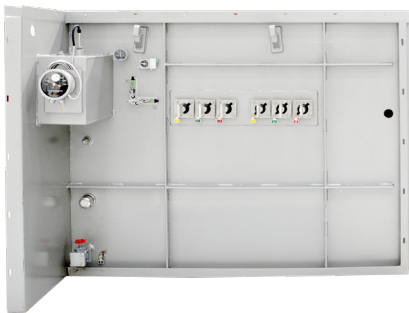


Overview

Photovoltaic(PV) power generation, as a kind of clean energy production method, rapidly develops at home and abroad, TDT-I series with the voltage range from 10 kV to 40.5kV is a kind of transformer which is suitable for the PV power generation system, and is independently researched and developed by our company with the advanced technology.

Structural features

- Install the transformer, load switch, high-voltage fuse into the transformer, the load switch has an independent oil compartment, which is insulated with transformer's insulating oil, in avoid of polluting it, effectively prolong the service life with the characteristics of small volume, land occupation and easy installation.
- The structure of the product adopts the axial splitting structure, which guarantees the electrical and mechanical properties of the transformer with special structure and process, and has high capacity of short-circuit withstand.
- The appearance is powder coating after sand blasting, which is anti- corrosive and esthetic.
- The product is stable and reliable
- Low loss with significant energy saving.





Overview

Wind power transformer has 12kV and 40.5kV voltage levels, which can transform 690V power generated by wind generator to high voltage levels through stepping-up, and then deliver to grid or users. Intelligent wind substation consists of the primary and secondary equipment of high voltage side and 690V side, such as circuit-breaker, mutual inductors, transformers, temperature control, remote controller, transformer protection and indicating instrument, and fan monitoring protection equipment, all of them are pre-assembled into a movable, sealed, damp-proof and rustproof double-layer cabinet, to realize the integration of the primary and secondary systems during the wind power construction, the modularization of the assembly, the industrialization of the construction process, and the simplification of the on-site shorten construction period, reduced the project cost and enhanced the reliability of grid operation.

Structural features

- The wind power plant sets up a central power distribution substation.
- Set a number of wind tower substation, the capacity depends on turbine capacity.
- The low-voltage of the wind power tower substation is 690V, and the high voltage is 36kV or 12kV.
- The wind tower substation is installed near the center distribution station, and the turbine monitoring and protection equipment is installed in the wind tower substation.
- 36kV outlets are connected with the nearest substations, and finally connect the center power distribution substation.
- 36kV circuit breaker for each wind power substation would be installed with the protection of overcurrent, quick break and transformer.
- 36kV/220V auxiliary transformer with capacity of 5kVA installed in the center power distribution substation connects a UPS power supply.
- UPS power supply adopt online and industrial type with 3kVA capacity.
- All 36kV circuit-breaker's operation and protective power supply of each wind tower power substation comes from UPS in the center power distribution.

Overview

Resin-insulated dry type transformer adopted advanced technology, TGOOD self-developed TDT-D series dry type transformer is, widely used in the need of fireproof and harsh environment as great fluctuation and damp.

The core of dry type transformer selects the high quality of cold rolled grain oriented silicon steel sheet, the core column uses F grade adhesive tape binding, the surfaces adopt insulated resin sealing for damp-proof, anticorrosive and anti-rust, it reduces no-load loss, no-load current, and the core noise, clamp parts and fasteners with special surface treatment make the appearance and quality further improved.

Structural features

- Safe, fireproof and pollution-free, it can be operated directly at load center.
- Adopt domestic advanced technology with high mechanical strength, high short-circuit withstand capacity, small partial discharge, good thermal stability, long service life.
- Low loss and noise, obvious energy saving.
- Excellent heat dissipation performance, strong over-load ability, capacity can be increased when forced air cooling.
- Good moisture-proof performance, it can adapt to high humidity and other harsh environment, which can operate normally in 100 % humidity, and can be put into operation after shutdown without pre-drying.
- Dry type transformer can be equipped with perfect temperature detection and protection system. The intelligent signal temperature control system can automatically detect and show the working temperature of the three-phase windings, which can automatically start and stop the fan, and have the function of alarm, tripping and so on.
- Small size, light weight, less land occupation with low installation cost.
- Maintenance-free, easy installation with low operating on cost.



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Pakistan photovoltaic power generation project of ZTE Energy Co. LTD.

Time of operation: 2015/ 05/ 15

Quantity: 200 units

Rated HV insulation: 33.5kV/ 0.315 kV

Rated capacity: 1000kVA



Zhangshang Wind Power Plant Project of State Grid

Time of operation: 2013/ 09/ 15

Quantity: 35 units

Rated HV insulation: 38.5kV/ 0.69 kV

Rated capacity: 2200kVA



Xiping Railway Jingchuan, Long qingqiao Project

Time of operation: 2017/ 10/ 24

Rated HV insulation: 10kV/ 0.4 kV

Rated capacity: 200kVA (1 set)
400kVA (1 set)



Re-constructing Sino-Korean Residential Area in Laoshan District, Qingdao

Time of operation: 2015/ 05/ 15

Rated HV insulation: 10kV/ 0.4 kV

Rated capacity: 400kVA (4 sets)
630kVA (3 sets)



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