Power and Distribution Transformers

GÜVEN-İŞ®
Continuous Solution

GÜVENİŞ ELEKTRİK ELEKTRONİK MAK. SAN. VE TİC. LTD. ŞTİ.

GUVENIS GROUP COMPANIES
www.guvenisregulator.com.tr

GÜVENİŞ TEKNOLOJİ ELEKTRONİK SİSTEMLER SAN. TİC. LTD. ŞTİ.

Oil Immersed Distribution Transformers

Distribution Transformers are individually designed and manufactured to meet and even exceed the highest industry standards according to the exact specifications for the particular appli- cations. Special options and features are planned into the original design and accordingly built in our transformers design.
Distribution Transformers are liquid-oil immersed transformers providing the most efficient and reliable long-life operation for wide variety of utility and industrial applications.

Distribution Transformers are liquid-oil immersed with rated power range from 25kVA up to 5000 kVA including both types of hermetically sealed and with conservator

Distribution Transformers are individually designed and manufactured in accordance with local and international standards and fully adapted for mounting inside complete transformer substa- tions and steel-lattice poles.

The windings of our transformers can be made in aluminum or copper depending on customer require- ments and needs within different series of losses according to IEC 60076, EU 548/2014 & 2021, EN 50464-1, ANSI, BSI, IEEE, NEMA, TS EN60076

Applications

- Generation Step-up Units (GSU)
- Transmission Substations
- Distribution Substations
- Industrial Plants
- Oil & Gas Industry
- Cement Industry
- Chemicals & Petrochemicals
- Rolling Mills
- Mining
- Desalination Plants

Main Characteristics

- Power Rating : from 25kVA up to 5000kVA
- Voltage Level : from 1kV up to 66kV
- Frequency : 50 or 60Hz
- Vector Group : single phase or three phase transformers with possibility of star, zig-zag or delta connections in any of its windings.
- Number Of Windings : Possibility to manufacture transformers with primary + secondary, double secondary, or triple second- ary and any other type according to requirements of customer.
- Cooling : According to UNE-EN/IEC 60076, ONAN, ONAF, KNAN, KNAF

Oil Immersed Medium Power Transformers

The medium power Transformers are individually designed and manufactured to meet and even exceed the highest industry standards according to the exact specifications for the particular applications. Special options and features are planned into the original design and accordingly built in our transformers' design. The Power Transformers are liquid-oil immersed transformers providing the most efficient and reliable long-life operation for wide variety of utility and industrial applications.

In addition to expand our product line, we have also developed a technological, administrative and marketing infrastructure that is comparable with some of the finest manufacturers of similar products worldwide.

The Transformer focuses on becoming one of the most valued global suppliers of electrical power & distribution products for utilities and industries.

Applications

- Applications
- Generation Step-up Units (GSU)
- Transmission Substations
- Distribution Substations
- Industrial Plants
- Oil & Gas
- Cement Industry
- Chemicals & Petrochemicals
- Rolling Mills
- Mining
- Desalination Plants

Main Characteristics

- Power Rating : from 4MVA up to 50MVA
- Voltage Level : from 3,3kV up to 66kV
- Frequency : 50 or 60Hz
- Vector Group : Single phase or three phase transformers with possibility of star and/or delta connections in any of its windings.
- Number Of Windings : Possibility to manufacture tranformers with primary + secondary, double secondary, or triple secondary and any other type according to requirements of customer.
- Cooling :according to EN/IEC 60076, ONAN, ONAF, KNAN, KNAF, OFAF
- Tap Changer : OLTC or OFFCIRCUIT

Oil Immersed Transformers With Conservator

The free breathing transformers are equipped with air cushion under the cover or with a conservator to allow the oil to expand, at the temperature variations. As it is not hermetic, the oil is always in contact with the air. Moisture is kept at bay through the use of dehydrating salts contained in special filters (breather). The tank can be with finwalls or raditors. This design applies to all powers, but especially from 4000kVA and upper power rates. For higher power rates, in order to avoid contact between the oil and air, a rubber separator (rubber bag) or a nitrogen cushion is used.

This type of transformer is equipped with an expansion tank or conservator mounted above the main tank. The expansion of the insulating liquid is compensated inside the conservator by raising of the oil level. In the conservator, the top of the oil is in contact with the air which must remain dry to avoid any oxidation. This is achieved by admitting the outside air in the conservator through a desiccating device containing silica-gel crystals.

Standard Features

- HV bushings according to DIN 42531 or EN 50180
- Buchholz Relay (upon request or from 800 kVA)
- LV bushings according to DIN 42530 or EN 50386
- Lifting lugs
- Off-Circuit tap changer in 5 positions
- Rating plate
- Tank made of corrugated walls
- Earthing terminals
- Thermometer pocket
- Oil filling plug and drain valve
- Contact thermometer (recommended up-to 630 kVA)
- Bi-Directional rollers - 90°

Oil Immersed Hermetically Sealed Transformers

The hermetically sealed oil transformers are usually manufactured with a sealed tank equipped with fin walls that allow the expansion at the temperature variations. The tightness of the tank is up to 0.5 Bar. This type of transformer is the most widely used one in the world. In the hermetically sealed transformers, the oil does not contact with the air and its electrical properties are therefore not compromised ensuring a long life span of the transformer. For powers exceeding 3150kVA, or in case of a transformer with radiators, the transformer can still be hermetically sealed by means of a nitrogen cushion.

For this type of transformers the expansion of the insulating liquid is compensated by the elastic deformation of the radiators cooling attached to the tank. The protection against internal faults is ensured by means of a hermetical relay: Detection of Gas, Internal Over Pressure and Oil Over Temperature.

Standard Features

- HV bushings according to DIN 42531 or EN 50180
- LV bushings according to DIN 42530 or EN 50386
- Off-Circuit tap changer in 5 positions
- Tank made of corrugated walls
- Thermometer pocket
- Contact thermometer (for transformers up-to 630 kVA)
- Safety Pressure Valve
- Lifting lugs
- Rating plate
- Earthing terminals
- Oil filling plug & drain valve
- Bi-Directional rollers - 90°
- Hermetical relay (recommended from 800 kVA

Eco-Design Transformers

Güveniş undertakes to respect the Eco-Design directive by manufacturing transformers that strictly comply with the technical specifications and requirements of standard EU 548/2014, with 'CE' marking and checked by a certified and calibrated laboratory test.

Rated Power (Kva)	Tier 2 : From 1st July 2021	
	No Load Loss (W)	Load Loss (W)
≤25	63 (A0-10%)	600(AK)
50	81(A0-10%)	750(AK)
100	130 (A0-10%)	1250(AK)
160	189 (A0-10%)	1750(AK)
250	270 (A0-10%)	2350(AK)
315	324 (A0-10%)	2800(AK)
400	387 (A0-10%)	3250(AK)
500	459 (A0-10%)	3900(AK)
630	540 (A0-10%)	4600(AK)
800	585 (A0-10%)	6000(AK)
1000	693 (A0-10%)	7600(AK)
1250	855 (A0-10%)	9500(AK)
1600	1080 (A0-10%)	12000(AK)
2000	1305 (A0-10%)	15000(AK)
2500	1575 (A0-10%)	18500(AK)
3150	1980 (A0-10%)	23000(AK)

Power and Distribution Transformers

Single-Phase Transformers

A single-phase transformer is frequently used for power distribution and voltage reduction for residential and lighter commercial applications.
Single phase transformers are most commonly used in non-urban areas, where it is not economical to have a three-phase transformer.

Rectifier Transformer

This type of transformers are specially designed in order to feed 12, 18 or 24 pulse rectifier circuits. Rectifier transformers are used for industrial processes which require a significant direct current (dc) supply.

Earthing Transformers

A grounding (also known as earthing) transformer is a three-phase transformer connected to the power system to provide a missing neutral connection for earthing. Grounding transformer provides a relatively low-impedance path to ground, thereby maintaining the system neutral at or near ground potential.

Tailor made (customized) transformer

For some applications, the transformer whether hermetically sealed or conservator, with fin walls or radiators has a customised tank design to allow the connection of other components present in the transformation cabin. For some applications, the transformer whether hermetically sealed or conservator, with finwalls or radiators has a customised tank design to allow the connection of other components present in the transformation cabin.

Production Process

Transformers are manufactured to provide a high quality and reliable transformer to the end user. We are using Quality-Oriented Manufacturing (QMS) platform, which defines design standards, equipment and processes used in our facilities. Use of this Common Technology enables us to guarantee customers a high quality and consistent product.

The transformer is a static inductive device that can step the voltage up and down to transfer electrical power efficiently. Winding types and methods that offer the least loss were selected using magnetic field analysis, and also used in the Transformator to ensure high levels of efficiency.

Moreover, by selecting the optimal insulating structure through the electric field analysis of insulation between turns, sections, windings and phases,The Transformer's electrical stability is achieved. Güveniş's fluent analysis technology has enabled the realization of an optimal cooling system, and 3 structure strength analysis has enabled a structural design that can withstand internal mechanical power short-circuits caused by system faults, seismic conditions according to external impacts, and the impact of transportation.

Our factory is equipped with the latest core processor machines, the latest winding machines, high capacity vacuum heat drying equipment, state of the art cleaning facilities, and has the best available laboratory conditions test room.

Production Process

Magnetic Core

The magnetic circuit is of column type with mi- tred joints. It is manufactured with first rate, grain oriented magnetic cold-rolled silicon steel lamination or amorphous steel. The mounted core is clamped down to reduce vibrations and minimize noise level. Further noise level and no load losses decreasing are achieved by step lap core construction

Tank and Cover

Tank fin walls are made of corrugated cooling surfaces. The welds are tested for oil tight- ness. The complete tank is tested and approved according to BS EN 50588-1:201 7 standard.

LV & MV Windings

The windings are made of two components conductor and the insulation materials. The conductors used are high grade electrolytic copper or aluminum materials and are insulated with pure cellulose or double enamel.

The MV windings are wound either with round, double enamel insulated or rectangular, paper insulated wire. The LV windings are wound with rectangular, paper insulated wire, enameled wire or foil.

Transformer for Solar Power Plant

We export all over the world by producing special transformers for Solar Park Projects.

Our Transformers give privilege to not consuming world resources while generating energy resources…

Testing Process

All transformers are tested prior to the deliveries in our test room according to IEC 60076 standards. Our laboratory is globally accredited in scope of TS EN ISO/IEC17025 certification. All transformers are delivered with maintenance manual, test report, technical drawing and all necessary certifications after tested in our accredited laboratory.Our transformator has test room with high technology equipment.

We are able to make all routine tests, without any exception. Our test room is equipped with a special converter 400 A up to 12000V with frequency ranging from 50 Hz up to 400 Hz. Furthermore there is an impulse test device which guarantees lighting impulse test up to 400kV.

Routine Tests

- Measurement Of Winding Resistance
- Measurement Of Voltage Ratio And Check Of Phase Displacement
- Measurement Of Short-Circuit Impedance and Load Loss
- Measurement Of No-Load Loss and Current
- Dielectric Routine Tests (IEC 60076-3)
- Test On OLTC, Where Applicable
- Oil Leakage Test Under Pressure For Oil-Immersed Transformers
- Tightness Tests and Pressure Tests For Tanks For Gas-Filled Transformers
- Check of Ratio and Polarity of Build-in Current Transformers

Type Tests

- Temperature Rise Type Test (IEC 60076-2)
- Dielectric Type Tests
- Determination of Sound Level For Each Method Of Cooling
- Measurement Of The Power Taken By Fan and Liquid Pump Motors
- Measurement Of No-Load Loss and Current at 90% and 110% of Rated Voltage

Special Tests

- Measurement of Zero-Sequence Impedances On Three-Phase Transformers
- Measurement of D.C. Insulation Resistance Each Winding, Winding to Earth and Between Windings

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