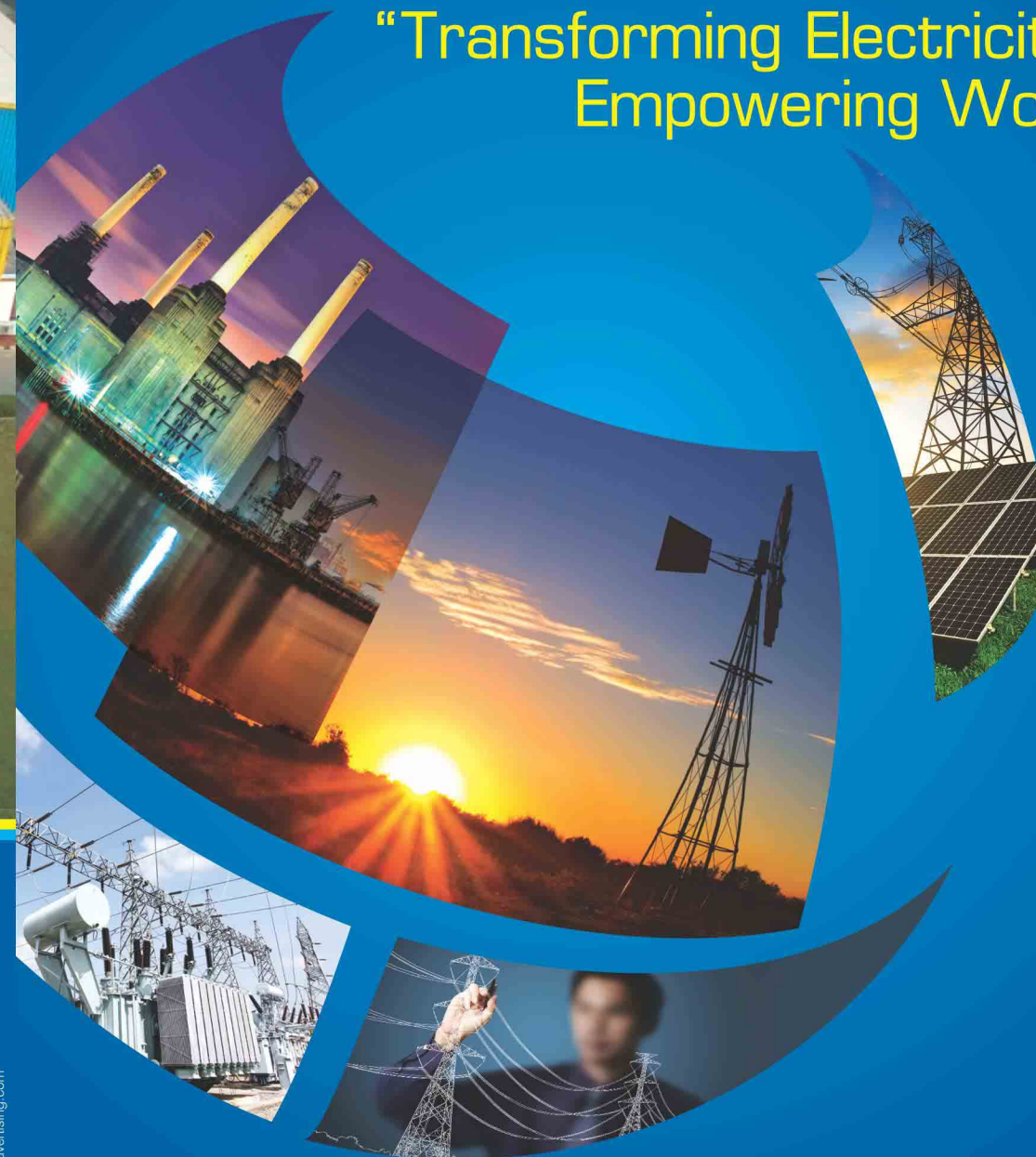




KOTSONS
POWER & DISTRIBUTION TRANSFORMERS

“Transforming Electricity
Empowering World”



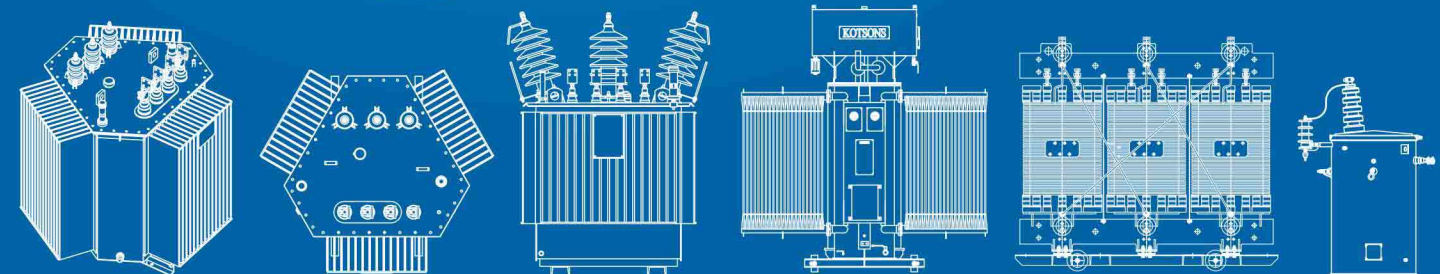
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POWER & DISTRIBUTION TRANSFORMERS

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ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007 Certified Company

Message from Chairman

With expertise spanning almost four decades in transforming power into efficient energy that's safe for users and the environment, KOTSONS has emerged as the undisputed leader in providing quality and reliable transformer manufacturing. At par with latest trends and internationally certified quality standards, KOTSONS has been instrumental in formulating short and long term plans to contribute in the development and promotion of the Nation's key industries, particularly in the field of power and distribution.

KOTSONS with its cost effective yet premium products and Total Quality Management (TQM), backed by a strong R&D team of engineers, together pave the path of continuous development that in turn contributes to an ever increasing graph of both sales and profit.

An ever growing geographical reach, market size and product range, coupled with efficient technology transfer programs, enables KOTSONS to offer the most adapted solution for every need, everywhere and with the same top class level of quality.

Our aim at KOTSONS is to pick up these varied power requirements and transform them into convincing solutions with maximum quality.

Mr. Pawan Kumar Jain
(Chairman & MD)

Objective

- To provide competitiveness in price with continuous improvement in quality.
- Assurance to deliver goods on time.
- To provide optimum productivity through improved working methods and motivation of the employees.
- Ensure involvement and cooperation of our employees through effective communication and training on a regular basis.

Quality, Environmental & Safety Policy

"We at KOTSONS are committed to design, manufacture & supply transformers of agreed quality on time, every time to the satisfaction of our customers

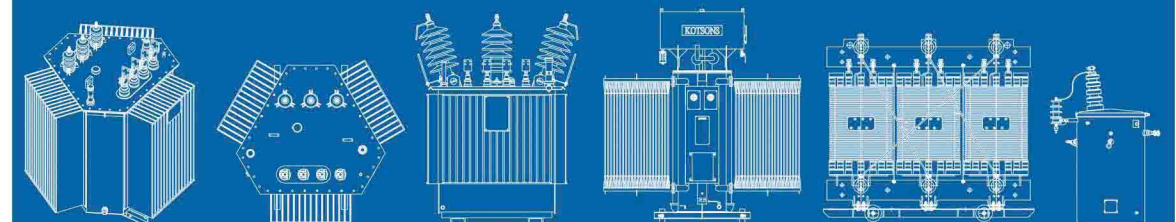
KOTSONS is further committed to prevention of pollution in all forms from its operations and will comply to all applicable legal requirements.

KOTSONS cares for the occupational Health & Safety and is committed to prevention of injury and ill health of its employees as well as other interested parties and will comply with all applicable legal requirements

KOTSONS shall continually improve the effectiveness of the integrated management system."

Our Achievements

- **1979** - First Manufacturing Plant at Alwar
- **1991** - Second Manufacturing Plant at Agra
- **1997** - First Export Order
- **1998** - ISO:9001 Certification
- **1998** - Export House Recognition
- **2002** - Transformer from 100kVA to 1000kVA type tested at KEMA, The Netherlands
- **2003** - Niryat Shree Award for year 2000-01 & Excellence Export Performance Award for the year 2001-02 by Honorable Vice President of India
- **2004** - Manufacturing Plant of Dry Type Transformers with Dupont
- **2004** - Manufacturing Plant of Single Phase Wound Core Transformers at Alwar
- **2005** - Manufacturing Plant for Amorphous Metal Core Transformers at Alwar
- **2005** - Manufacturing Plant for Transformer Tanks at Agra
- **2006** - Manufacturing Plant for Transformers at Bazpur (Uttaranchal)
- **2007** - ISO 14001:2004 Certification
- **2008** - New Manufacturing Plant at Alwar
- **2008** - Among the first manufacturers to get Bureau of Energy Efficiency (BEE) Labeling for 25kVA & 63 kVA
- **2009** - First manufacturer to get 5 star labeling from Bureau of Energy Efficiency for 25 kVA & 63kVA Transformers
- **2013** - Largest capacity wound core Transformers manufactured in India
- **2015** - State-of-the-art Manufacturing Plant for 3D Core Transformers
- **2015** - Development & Manufacturing of higher rating energy efficient Amorphous Core Transformers upto 5MVA
- **2015** - Manufacturing Plant for Transformer Tanks with state-of-art Machinery (Robotic Welding, HD Plasma Cutting & CNC Corrugation Line) at Alwar
- **2015** - OHSAS 18001:2007 Certification
- **2016** - Penetrating into New Technology Market with Innovative & Energy Efficient Transformers for Solar & Wind Applications
- **2016** - Transformers type tested from KEMA, The Netherlands
 - 1000 kVA - 11 kV 3D Design
 - 1000 kVA - 33 kV EU Eco Design
 - 1600 kVA - 11 KV

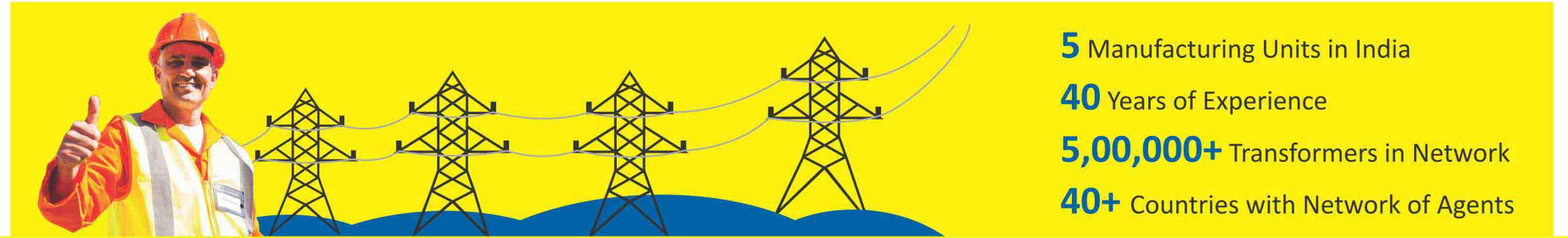


Manufacturing Process

KOTSONS PVT. LTD. certified for ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 by DNV-GL THE NETHERLANDS, is setting new benchmarks in quality and versatility. The state-of-the-art KOTSONS manufacturing units are fully equipped with the latest automated machinery and backed by a proficient team of well experienced engineers practicing processes that produce best in class quality, leaving almost no room for insufficiencies. Whether Single/Three phase, Distribution & Power Transformers, Dry Type Nomex Transformer or Oil Filled CRGO Steel and Amorphous Metal Transformers, each product is uniquely designed according to individual factors such as voltage, power, climate, system topography, sound level and many more.

Enforcing stringent safety measures at every step, KOTSONS offers a safe working environment for all its employees that in turn contributes to increased efficiency and quality produce. The in-house team focuses not only on manufacturing but continuously endeavors design and innovate cutting edge technology to deliver solutions that surpass customer expectations.

Manufactured as per internationally recognised standards, KOTSONS are largest Indian suppliers of Oil-filled and Dry Type Nomex® CRGO Silicon Steel and Amorphous Metal Transformers.



5 Manufacturing Units in India

40 Years of Experience

5,00,000+ Transformers in Network

40+ Countries with Network of Agents



Design

KOTSONS has a team of highly qualified, skilled and well experienced design engineers, software engineers and drafters, who are fully trained in advanced 2D & 3D CAD software and other areas. All 3D models are analyzed for dimensional accuracy & less mechanical stresses. Later shop floor drawings are auto generated from these 3D models. These drawings are compatible to our CNC HD Plasma Cutting machines and other most modern machines to manufacture the right component at first go.

Software wing of our engineering department has successfully developed computer programs for Electrical design calculations enabling millions of iterative calculations converging to a very optimum design. This is done exclusively for National and International tenders where capitalization of losses parameters is vital. Kotsons vision is to achieve complete set of design calculations, bill of materials and constructional drawings, all with a single click of a mouse.

KOTSONS has a variety of design options for different types of conductor and core materials. A massive data bank has already been established based on the previous test results.





1. CORE - Amorphous (Wound)

The core is of high quality amorphous ribbon imported from Hitachi Metals (USA), having very low loss formed into wound cores of rectangular shape, bolted together to the frames firmly to prevent vibration and noise. The core is designed to ensure permanency of the core loss with continuous working of transformers. Suitable provisions are made in the bottom core clamp / bottom plate of the transformer to arrest the movement of active part.

1. With the use of Berger machine, Precise dimensional control is achieved in core cutting along with stacking, resulting in bonded edge for core integrity and thereby increasing the transformer's reliability.
2. The assembled amorphous cores are then annealed in inert atmosphere for stress relieving and lower eddy current losses.
3. All assembled cores are tested for pre no load losses before proceeding for core coil assembly process.



2. CORE - CRGO (Stacked/Wound/3D Wound)

The core is of high quality silicon steel (Si-Fe) coated with carlite procured from internationally reputed brands, having low loss and formed into wound cores of rectangular shapes or cut-to-length stacked form with step-lap construction, bolted together to the frames firmly to prevent vibration and noise. The core is designed to ensure permanency of the core loss with continuous working of the transformers. Suitable provisions are made in the bottom core clamp / bottom plate of the transformer to arrest the movement of active part.

1. With the use of Uni-Core machine for wound cores, diagonal slitting & close core loops Winding machine for 3D wound cores & CNC cut-to-length machine for stacked cores with precise dimensional control is achieved in core cutting / forming along with winding / stacking resulting in burr-free edge for core integrity and thereby increasing the transformer's reliability.
2. The assembled wound cores are then annealed in inert atmosphere for stress relieving and lower eddy current losses.
3. All assembled cores are tested for pre no load losses before proceeding for core coil assembly process.

Windings can be made with Copper / Aluminum with Foil / Strip / Round wire of any combination to suit customer requirements. Accurately located taps and a large winding cross section keeps unbalanced ampere-turns to minimum. Unbalanced ampere-turns create forces during short circuits that push the high voltage and low voltage coils apart vertically. By minimizing the ampere-turn unbalance, vertical forces are correspondingly reduced, thus making the design stronger under short circuit stresses. The large areas are presented by the layer-type winding result in a low ground capacity, which gives a nearly straight line surge distribution throughout the winding.

All windings are checked and tested for all quality parameters and quality reports for windings & material characteristics data are maintained for verification.

3. Winding

HV and LV windings are wound from Copper / Aluminum conductors with polyesterimide enamel (Class B) insulation / DPC. The enamel covering conform to IEC 63017 Part-8. The windings are progressively wound (HV over LV) in single one piece rectangular / circular construction for better voltage regulation and mechanical strength. The inter layer insulation is of Epoxy Dotted Paper. Winding are done in clean atmosphere to prevent possible accumulation of dust particles. The coils are further processed for dimensional control through automatic roller pressing winding machine, which improves bonding and short circuit withstanding capability. The provision of ducts in winding are made in order to control temperature gradient and rise for both winding & oil.





4. Core Coil Assembly

Core Coil Assembly is done in two methods, according to shape of the core. In stack core construction, core is kept steady in vertical direction and coils are lowered from the top. Whereas in wound core construction, coils are kept steady in horizontal direction and core is inserted into the coils. In case of 3D core coil assembly, the core is fixed on a special winding machine and the winding takes place on each core limb individually.

Core & Coil assembly for distribution / power transformers uses special insulating materials like crepe paper tubes & multi paper covered conductors for Oil-filled and fiberglass & Nomex® insulation for Dry Type and are very strong and robust in construction to withstand short-circuit forces. They are adequately clamped with the tank so that no movement is possible within the tank because of transport jerks or short-circuit forces.

After CCA is ready then HV/LV routing is done in accordance with the required Vector Group and type of bushing / cable termination.

5. Tank Up

Oil-filled - The core and coil assembly is dried in an oven at a temperature of 90°C - 110°C, to improve insulation resistance and remove ingress of moisture in the insulation materials. The dried core coil assembly is boxed up in a pre-fabricated MSTank, and vacuum process is applied for filling oil in the transformer tanks. Oil-filled in transformer will be PCB free Mineral oil / Midel 7131 / Silicon oil / Ester oil / Nynas Nytro etc. as per customer's requirements.

Dry Type - The core and coil assembly is enclosed in metallic enclosure designed and fabricated in accordance with NEMA or customer's specification and HV/LV connections are covered with heat shrinkable sleeves & epoxy terminal boards.

6. Testing & Inspection

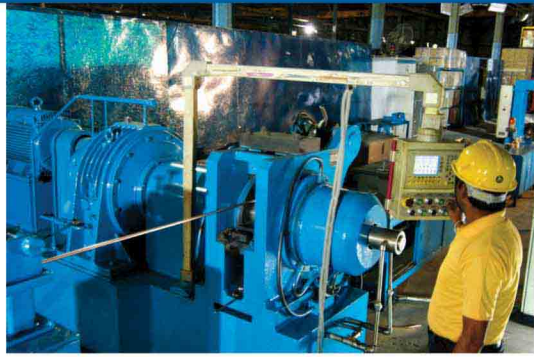
All Routine / Type tests as per the relevant standards / customer specifications are conducted. Every transformer is pressure tested, and then, the job is finished and kept ready for dispatch. Special tests like noise test / seismic test / partial discharge etc. can be done at third party labs like KEMA / CPRI / ERDA etc. as per customer requirements.

7. Packing & Dispatch

KOTSONS has complete in-house facilities for packing the finished goods with modern machinery compatible for any kind of transport (i.e. road / rail / sea etc.). Third Party inspection as per customer requirements and fumigation in containers and according to International Standards for Phytosanitary Measures-15 (ISPM-15) is done for all our exports.



Backward Integration Process



1. Conductor Plant

In a fast growing, competitive and diverse electrical equipment industry quality often becomes the most distinguishing product feature. In order to achieve and sustain high quality standards, we have full-fledged in-house conductor processing facilities to meet all types of design requirements and expectations of our customers with various types of shapes and sizes.

We have imported latest machinery from wire drawing to enamel coating, heat treatment to paper covering everything. We have fully skilled and trained workforce, who ensures proper processing with complete QC checking.

Our production facilities have the expertise in manufacture of winding wire of all types – copper, aluminum, round and rectangular. Our production systems are often customized to meet our design department's complete needs.

Our product line includes Enameled Copper Wire (ECW), Enameled Copper Strips (ECS), Bare Copper Strips (BCS), Bare Copper Wire (BCW) and Enameled Aluminum Wire (EAW). Our end products meet all of the well-known Indian and International standards including IS, IEC, JS and NEMA. This provides utmost confidence to our Indian and overseas customers regarding the reliability and consistent quality of Conductors processed by us.

We use Electrolytic grade copper conductor and high conductivity copper conductors and best in class insulating materials and enamel which guarantees the desired High-Voltage, Elongation & Insulation thickness and other quality parameters.

2. Fabrication (The back bone of KPL)

We have full-fledged in-house fabrication facilities to meet day to day increased expectations of our customers with various types of shapes and sizes. We have imported latest machinery from HD Plasma to Robotic welding with fully skilled and trained workforce.

Core Clamps to Tanks and Corrugation Wall Panels to Cables Boxes all are manufactured in different sizes and from different materials. Reliable welded joints are guaranteed even for different materials. As with all the fittings, our modern manufacturing plants ensure precise positioning and highest fitting accuracy. All our welders are well qualified and are trained by ESAB Welding Institution at regular intervals to acquire up-to-date welding techniques.

Leak-Proof Welding (QC/QA)

Thanks to the latest UV technology for ensuring proper welding with 100% leak-proof. KOTSONS has developed economic leak testing methods to ensure perfect welding by Magna-Flux DP Testing system.

Sheet Metal Work Shop

We have imported latest press brake fully programmable CNC type. High bending accuracy, bending any complex shape, 160 tonnage.....etc.

Corrugation Wall Panel

One of the best cooling systems for natural cooling of the transformer is achieved by Corrugation. KOTSONS has imported Full Automatic CNC Line for making these panels from folding to bending, everything on conveyor.

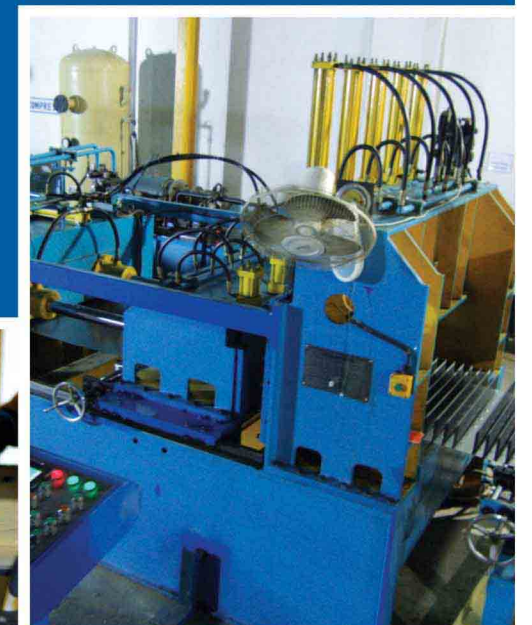
3. Surface Treatment & Corrosion Protection

KPL's surface technology is subject to very high standards since many of the constructions such as corrugated tanks for offshore plants have to stand extremely hard conditions in their later operational area (up to C5-M class).

This is why we sand-blast steel components in our blasting plant to 100% to assure absolute surface cleanliness and paint adhesion. For obtaining optimum corrosion protection, we have several painting plants, using different coating procedures depending on the product's geometry or the requirements:

- Spray Coating
- Flow Coating
- Powder Coating
- Hot Zinc Spray

KPL's most modern painting plants are equipped with suspended rail systems (conveyor) for passing through the painting booth and heating chamber. Interactions with our paint supplier and their training system help us to keep our workforce to stay up to date with technology.



Product Description



Completely Self Protected Distribution Transformers

Applicable Standards : IEC / ANSI / BS / IS / EN / GOST

Wide range of CSP transformers in accordance to above standards with different combinations can be manufactured. The CSP transformers are generally designed and manufactured to comply with the IEC publications 60076. CSP feature can be provided in the following range of transformers.

- Single Phase: 5kVA-167 kVA,
- Three Phase: 10 kVA-400 kVA,

Insulation level $\leq 12\text{ KV} \leq 24\text{ KV} \leq 36\text{ KV}$

- Indoor / Outdoor installation
- Conductor : Copper or Aluminum as per customer requirement
- CRGO / Amorphous as per customer requirement
- Hermetically sealed type (with gas cushion / fully filled) / Conventional type (with Conservator)
- Color : as per customer requirement
- Cooling arrangement : Corrugation or Pressed steel Radiators
- Maximum ambient temperature : as per customer specification
- Top oil Temperature rise : as per customer specification
- Average winding temperature rise : as per customer specification

Concept of CSP transformers

CSP technology is more known for high performance distribution transformers which mitigate the operation and maintenance problems associated with conventional transformers. CSP technology enables a transformer to protect itself from secondary faults, lightning protection, persistent severe overloads, and provides visual warning of the overload conditions. CSP technology also protects the distribution system to which it is connected, in case of its failure. This means, that in case of failure of the transformer, it gets isolated from the system.

Components and benefits of the CSP System

CSP System has four essential components. They are:

1. Oil immersed Circuit Breaker for overload and secondary fault protection
2. Signal Light for indication during overload condition on transformer
3. HV Fuse for over-current, protection by isolating a failed transformer from the system
4. Surge Arrester for lightning protection

Oil Immersed Secondary (Low Voltage) Circuit Breaker

The oil immersed circuit breaker is installed on the secondary (low voltage) side of the transformer. It provides the entire over current protection to the transformer and responds to secondary faults external to the transformer by tripping and prevents any thermal damage occurring to the transformer.

Besides protecting from secondary fault, the breaker also provides thermal protection to the transformer. It is an electro mechanical device with three major elements. These elements are:

- Temperature sensing through the use of bimetallic strips which are built into the breaker such that the load current flows through them. The bimetallic strips responds thermally to the temperature of the transformer oil and also to the temperature changes created by the flow of the load current through them
- Latching and tripping functions
- The signal light latch
- The emergency control assembly
- The magnetic trip device
- It works as Current interrupter

Signal Light

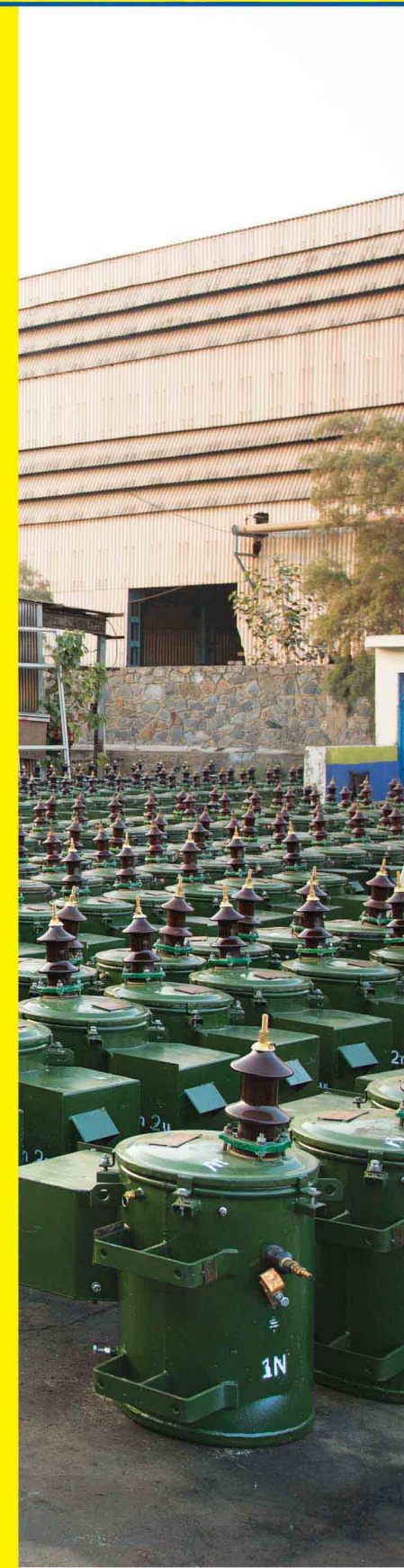
The signal circuit is mechanically connected to the circuit breaker latching and bimetal systems through an auxiliary contact. A signal light is mounted on the wall of the transformer tank. It gives a visual external indication when the transformer oil temperature reaches a specified preset value of temperature during overload condition. Once the signal light glows then it can be turned off only by manually operating the external handle of the circuit breaker.

Primary (High Voltage Fuse) Expulsion Fuse for System Protection

In a CSP transformer, the primary fuse is placed in oil and connected in series with the primary winding. This expulsion fuse is to protect that part of the electrical distribution system, which is ahead of the transformer from faults which occur inside of the distribution transformer. If a fault occurs in the windings or some other part of the transformer, it will cause abnormally large currents to flow, resulting in the fuse to melt open and clear the circuit. Thus, the fault is limited only to those customers who are served by this particular transformer and service is maintained on the rest of the system.

Surge Arrester

The surge arrester are mounted near to the high voltage bushings to shorten the ground lead connection between the arrester and the transformer reducing the lightning impulse voltage stress on the transformer winding. The surge arrester diverts the flow of surge to earth by changing its impedance characteristics from high resistance to low resistance.





Three Phase Distribution Transformers (Ground Mounted / Pad Mounted / Pole Mounted)

KOTSONS manufactures a wide range of distribution and medium power transformers. These transformers can be free breathing or hermetically sealed. Conventional transformers are fitted with a conservator with breather for free breathing while hermetically sealed are without breathing with bolted cover.

- **Applicable standards : IEC / ANSI / BS / IS / SABS/ CENELEC / GOST**

Wide range of transformers in accordance to above standards with different combinations can be manufactured. The transformers are generally designed and manufactured to comply with the IEC publications 60076.



Range : 25 kVA - 3150 kVA,

Insulation level $\leq 12\text{ KV} \leq 24\text{ KV} \leq 36\text{ KV}$

- Indoor / Outdoor installation
- Conductor : Copper or Aluminum as per customer requirement
- Core : CRGO / Amorphous as per customer requirement
- 3 D Core type can also be supplied
- CSP (Completely Self Protected) feature can be provided up to 400 kVA
- Maximum ambient temperature : as per customer's specification
- Top oil Temperature rise : as per customer's specification
- Average winding temperature rise : as per customer's specification
- Hermetically sealed type (with gas cushion / fully filled) / Conventional type (with Conservator)
- Color : as per customer's requirement
- Cooling : ONAN/ONAF as per customer's requirement
- Cooling arrangement : Corrugation or Pressed Steel Radiators
- On Load Tap Changer with RTCC & AVR, can be provided above 500 kVA, if required
- Safety devices can also be provided upon request
- Other optional fittings as required can be provided upon request





Power Transformers

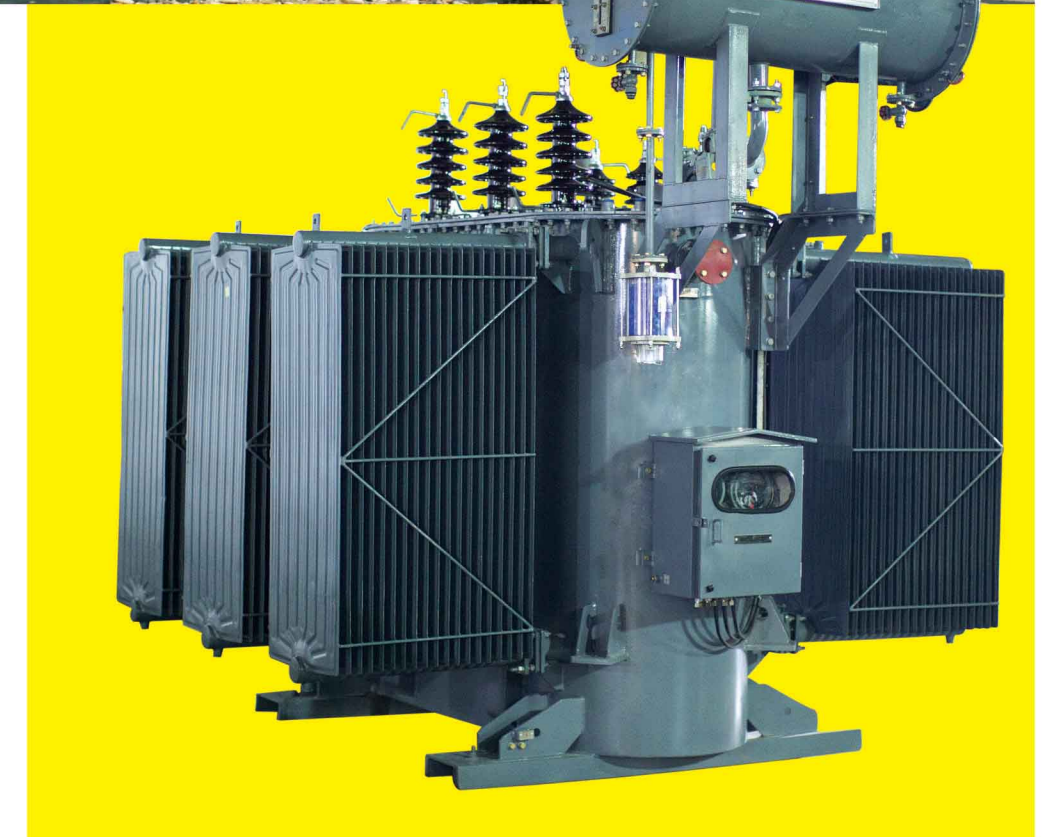
Applicable Standards : IEC / ANSI / BS / IS / SABS / CENELEC / GOST

KOTSONS manufactures wide range of power transformers upto 25 MVA with voltage class of 36 kV. These transformers are generally free breathing type. Oil filled in transformer is PCB free Mineral Oil / Midel 7131 / Silicon Oil / Nynas Nytro, etc. as per customer's requirements. Wide range of transformers in accordance to above standards with different combinations can be manufactured. The transformers are generally designed and manufactured to comply with the IEC publications 60076.

From 3150 kVA to 25000 kVA

Insulation level $\leq 24 \text{ kV} \leq 36 \text{ kV}$

- Indoor / Outdoor installation
- Conductor : Copper or Aluminum as per customer's requirement
- Core : Generally CRGO type
- Amorphous core type can be supplied up to 5000 kVA
- 3 D Core type can be supplied up to 5000 kVA
- Maximum ambient temperature : as per customer's specification
- Top Oil Temperature rise : as per customer's specification
- Average winding temperature rise : as per customer's specification
- Conventional Conservator Free Breathing type [with dehumidifier / with air cell (Bladders)]
- Color : as per customer's requirement
- Cooling : ONAN/ONAF as per customer's requirement
- Cooling arrangement : Corrugation or Pressed Steel Radiators
- Altitude : as per customer's requirement
- On Load Tap Changer with RTCC & AVR, can be provided above 500 kVA, if required
- Safety devices can also be provided upon request
- Other optional fittings as required can be provided upon request





Amorphous Core Transformers

KOTSONS has set up state of the art amorphous metal core transformer manufacturing facility by importing the latest amorphous metal cores manufacturing equipment. This plant has the latest equipment in India to produce energy efficient amorphous metal transformer cores that are annealed under absolute inert atmosphere to get at most lower losses thereby enhancing the energy savings in comparison with the similar manufacturing facilities in India.

Amorphous metal exhibits a unique random molecular structure unlike the rigid grain structure of the silicon steel. This, in turn, enables easy magnetization & demagnetization, thereby reducing hysteresis loss. Further processing of amorphous metal in very thin lamination (approximately 1/10th of silicon steel lamination thickness) enables significant reduction in eddy current losses.

Advantages of Amorphous Metal Transformers over Transformers with CRGO Silicon Steel :

1. The thickness of Amorphous Metal is 0.025mm against CRGO silicon sheet steel thickness 0.23-0.3 mm. Lesser in thickness in sheet results in lower eddy current loss
2. Random molecular structure of amorphous metal causes less friction than CRGO when a magnetic field is applied. This allows easy magnetization and demagnetization significantly lowers hysteresis losses, thus amorphous core significantly reduces core losses which is about 65-75%
3. Saves energy and therefore reduces greenhouse gases and other pollution
4. Excellent option to reduce distribution losses and improve efficiency
5. Superior electrical performance under harmonic condition. Possible to improve power quality and mitigate harmonics
6. Lower temperature rise, slower deterioration of insulations and hence longer life
7. Increase in use of power electronics has resulted in considerable amount of higher harmonics distortion in electrical power system. Higher frequency harmonics lead to increase in transformer core losses whereas amorphous alloy provides lower loss under high frequency
8. Easy for repair and replacement of coils

A comparison between typical silicon steel distribution transformers, high-efficiency silicon steel distribution transformers & amorphous metal distribution transformers (AMDT):

Transformer Rating 3 Phase, 11 KV	Core losses with best grade of CRGO (Watts)	Typical core loss with Amorphous metal (Watts)	% Loss reduction/ Energy saving
25 kVA	80	28	65%
100 kVA	260	66	75%
250 kVA	520	150	71%
1000 kVA	1800	350	77%
2500 kVA	3000	750	75%
5000 kVA	5000	1200	76%

General Description

Applicable Standards : IEC / ANSI / BS / IS / SABS / CENELEC / GOST

Wide range of transformers in accordance to above standards with different combinations can be manufactured. The transformers are generally designed and manufactured to comply with the IEC publications 60076.

Single Phase: 5kVA-167 kVA,

Three Phase: 10 kVA-5000 kVA,

Insulation level ≤ 12 kV ≤ 24 kV ≤ 36 kV

- Indoor / Outdoor installation
- Conductor: Copper or Aluminum as per customer's requirement
- Hermetically sealed type (with gas cushion / fully filled) / Conventional type (with Conservator)
- Color : as per customer's requirement
- Cooling : ONAN/ONAF as per customer's requirement
- Cooling arrangement : Corrugation or Pressed steel Radiators
- Maximum ambient temperature : as per customer's specification
- Top oil Temperature rise : as per customer's specification



3D Core Transformers

KOTSONS Pvt. Ltd., as a part of their continuous efforts towards promotion of energy efficient and green technology environment has added a new product to their portfolio, the 3D Core transformers.

3D Core is a structure with 3 identical single frame continuously wound by several trapezoid tape; three pillars of the core shape a equilateral triangle and the 3 phases are symmetrical. 3-phase magnetic circuits of the core are completely balanced; the magnetization direction is identical with the direction of rolling of silicon steel, magnetic flux distribution is even with neither lap nor seam; there is neither obvious high resistance area nor distortion of density of magnetic flux at the seams.



Advantages of 3D Transformers over conventional stack core / wound core type transformers:

3D Core transformer is an energy-saving transformer with better structure and performance. It has the following outstanding benefits:

- Reduced Material- Less Weight
- 3-Phase Equilibrium- Equal Load
- Low Noise - Installation anywhere
- Strong Emergent Short-circuit Protection
- Low Current Harmonic Spectrum
- Reduced Energy Loss-Energy Saver
- Low No-load Current
- Overload Capacity-Natural Cooling
- Low Strength of Electromagnetic Field
- Anti-theft



Applicable standards : IEC / ANSI / BS / IS / SABS / CENELEC / GOST

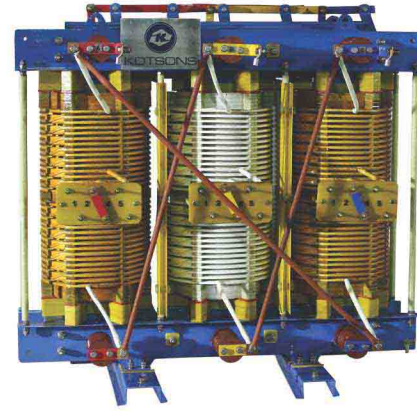
Wide range of transformers in accordance to above standards with different combinations can be manufactured. The transformers are generally designed and manufactured to comply with the IEC publications 60076.

Range : From 50 kVA to 5000 kVA

Insulation level $\leq 12 \text{ kV} \leq 24 \text{ kV} \leq 36 \text{ kV}$

- Indoor / Outdoor installation
- Conductor : Copper or Aluminum as per customer's requirement
- CSP (Completely Self Protected) feature can be provided up to 400 kVA
- Maximum ambient temperature : as per customer's specification
- Top Oil Temperature rise : as per customer's specification
- Average winding temperature rise : as per customer's specification
- Hermetically sealed type (with gas cushion / fully filled) / Conventional type (with Conservator)
- Color : as per customer's requirement
- Cooling : ONAN/ONAF as per customer's requirement
- Cooling arrangement : Corrugation or Pressed steel Radiators
- On Load Tap Changer with RTCC & AVR, can be provided above 500 kVA, if required
- Safety devices can also be provided upon request
- Other optional fittings as required can be provided upon request





Dry Type Transformers

Open Ventilated Dry Type (OVDT) Vacuum Pressure Impregnated (VPI) Eco Friendly Transformers

KOTSONS was one of the first Indian manufacturer to use the DuPont ReliatraN® branded solution and develop Ventilated Dry Type Transformers in collaboration with E. I. du Pont de Nemours and Company, U.S.A.

KOTSONS Eco Friendly VPI transformer coils are vacuum pressure impregnated in high temperature varnish. The process includes complete submersion in varnish under vacuum and pressure and regulated curing using PLC controlled equipment to ensure consistency. The finished coils are effectively protected against moisture, dirt, and most industrial contaminants. A 220°C Class NOMEX® Listed insulation system is used on KOTSONS OVDT VPI transformers regardless of specified temperature rating. This system accommodates a standard temperature rise of 155°C. Optional temperature rises of 90°C and 115°C and fan cooling allow for unsurpassed overload capacity.

Salient Features & Advantages of OVDT VPI Dry Transformers:

1. Excellent mechanical and short-circuit strength due to the VPI Process
2. No danger of fire or explosion. No liquids to leak hence no flammable liquid & no oil pollution
3. Less weight than comparable cast resin units
4. Low total ownership costs and low initial costs
5. Use of NOMEX® UL® Certified Insulation Materials, listed 220°C insulation system, regardless of temperature rating
6. VPI transformers are non-explosive with high resistance to flame and do not require vaults, containment dikes, or expensive fire suppression systems
7. Low Partial Discharge - VPI process ensures void free insulation system
8. Moisture Ingress Resistant & Immune to polluted atmosphere
9. Easy to repair (open coils) due to OVDT Design
10. Eco Friendly, No harm to environment at the end of Life

Temperature Rise / Overload Capacity:

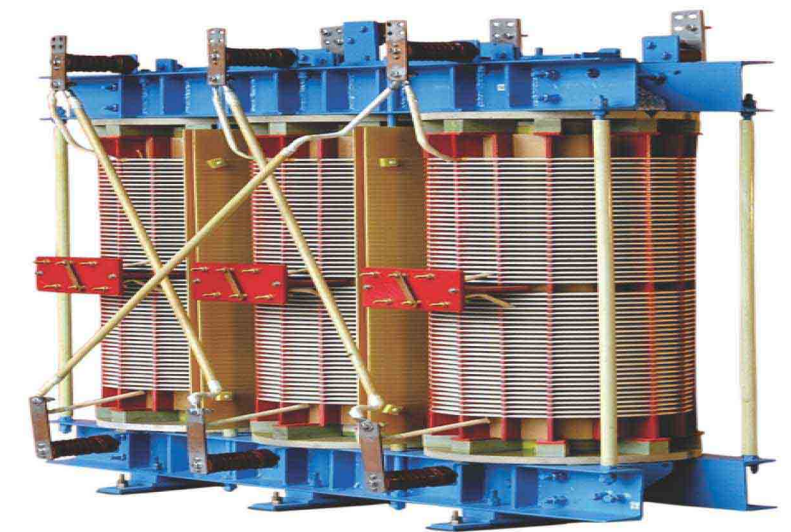
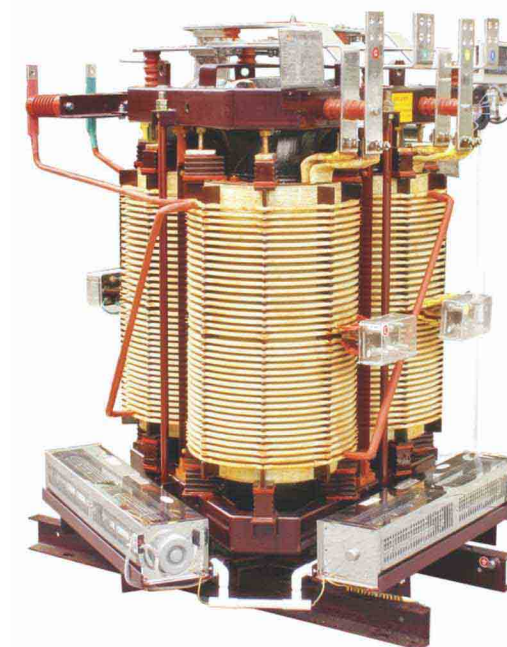
Temperature Rise	Based Rated kVA	Rated kVA at 155°C	Fan Cooled kVA
155°C	1000	1000	1333
115°C	1000	1150	1530
90°C	1000	1350	1800

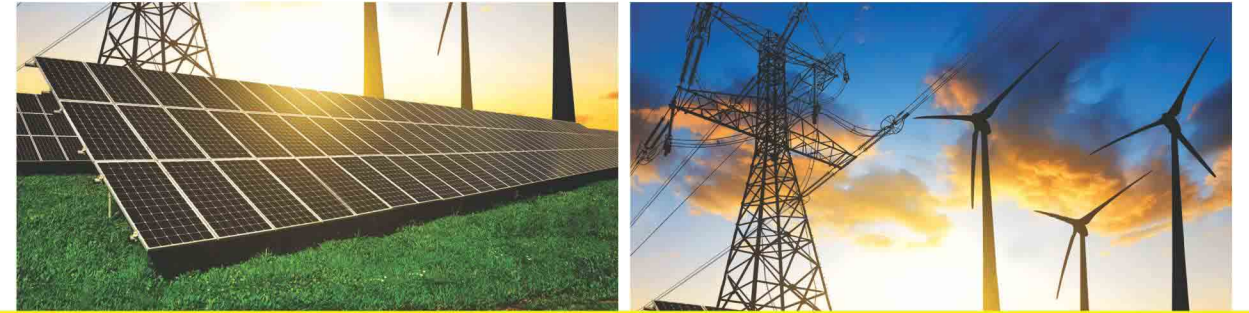
Standard VPI Range & Features:

- Up to 5000kVA & up to 33kV
- Aluminum / Copper Windings
- With Dry Type On Load Tap Changer
- Step-Lap mitered Core / Amorphous Metal Core
- 220°C insulation system - 155°C average temperature rise
- Vacuum pressure impregnation with high temperature varnish
- Vibration isolation pads between Core, Coil and Enclosure
- Base equipped with Jacking Pads and designed for Rolling or Skidding the Enclosure in any direction
- Suitable for Package Substation installation
- 100% QC Partial Discharge Test

Options & Accessories

- UL listing
- IEEE 344 - Seismic Certification
- NEMA 3R enclosure
- 90°C or 115°C average temperature rise
- Copper windings
- Provisions for Future Fan Cooling (FFA)
- Electronic temperature monitor
- Increased basic impulse levels
- Loss optimized designs
- Air-filled terminal chambers
- Special paint colors





Special Purpose Transformers

Special Purpose Transformers (SPMs) are explained by its name itself, these are made for a specific purpose / application. From designing to manufacturing everything is special and specific. Few types of SPMs are listed below :

- Dual Ratio Transformers
- Auto Transformers
- Rectifier Transformers
- Reactor Transformers
- Earthing Transformers
- LT – LT Transformers
- Dual Secondary Transformer for Solar PV Application
- Package Sub Station Transformer with RMU & LVDB

KOTSONS designs and manufactures custom designed special transformers for industrial and power applications. We offer customized maintenance and service solutions for transformers with state-of-the-art machinery & equipment and testing facilities.

In KOTSONS each transformer is designed as a new product and customized to comply with specific customer requirements. The KOTSONS engineering team covers the complete design of a transformer, from designing of core and coils to the tank and the supporting structures with proper cooling system and full protection.

Transformer engineering begins from electromagnetic and thermal design of core and windings. This activity is performed by means of standardized calculation sheets developed by our Design Department over the years. 2D and 3D FEM software tools are used for particular studies, such as: short-circuit impedances of phase-shifted multi-winding transformers, eddy current and stray losses calculation due to harmonics, hot-spots calculation and localization on windings and carpentry, mechanical stresses due to short-circuit, insulation assessment.

Transformer mechanical design is carried out using 3D software tools allowing dimensions optimization, mechanical stress evaluation and taking into account special external conditions (Seismic Zone, Low Noise Level).

Each transformer is supplied with a set of basic documents describing its features and functionalities, such as fabrication drawings, HV/LV connection drawings, auxiliary circuit / schematic wiring diagrams, cooling system drawings, user's manual.



Certifications



Type Tested From

KEMA Laboratories
THE NETHERLANDS

DNV-GL

Complete Type Test for
1600 kVA - 11 kV
Oil Immersed Distribution Transformer

KEMA

Type Tested From

KEMA Laboratories
THE NETHERLANDS

DNV-GL

Complete Type Test for
1000 kVA - 11 kV
Oil Immersed Distribution Transformer

KEMA

Achilles Power & Tech Global

Certificate of Qualification

This is to certify that
KOTSONS PVT LTD
Supplier Number: 123249

Is now fully registered as a supplier in the Achilles Power & Tech Supply chain management community for the following products/services

3.5.19 Power Transformers	3.5.34 Medium Distribution Transformer (MDT), Dry-type
3.5.23 Distribution Transformers, Oil	3.5.35 Small Distribution Transformer (SDT), Oil-filled
3.5.31 Small Power Transformer (SPT), Oil-filled	3.5.33 Small Power Transformer (SPT), Dry-type
	3.5.36 Power Transformer (PT), Dry-type

Chris Homung
Group Operations Director
Achilles Group Limited
Expiry Date: 28 August 2016

Achilles Power & Tech Global
QUALIFIED

Achilles Information (India) Pvt. Ltd.
30 Western Avenue, Midon Park, Abingdon, OX14 4SH, United Kingdom
T: +91 22 6128 79 00 F: +91 022 2525 87 12 E: PowerandTech@achilles.com www.achilles.com

Achilles UVDB

Achilles UVDB

Certificate of Registration

This is to certify that
Kotsons PVT Limited
Supplier Number: 163000

are now fully registered as a supplier on UVDB for the following products/services

3.5.2 Transformers - Distribution Ground Mounted (2000kVA & Below)	3.5.8 Dry-type or encapsulated-winding distribution transformers
3.5.3 Transformers - Distribution Pole Mounted (315kVA & Below)	3.5.27 Transformers - Primary (Below 10kVA)
3.5.6 Power Transformers	3.5.28 Transformers - Primary (10MVA to 100MVA)
3.5.7 Oil and silicon distribution transformers	

Melanie Cox
Procurement Manager
Bournemouth Water
Registration Expiry Date: 11 September 2016

Achilles Information Limited
30 Western Avenue, Midon Park, Abingdon, OX14 4SH, United Kingdom
T: +44 (0)1235 901114 E: UVDB@achilles.com www.achilles.com

Achilles ABB

Type Tested From

KEMA Laboratories
THE NETHERLANDS

DNV-GL

Dielectric Performance Test &
Temperature Rise Performance Test
1000 kVA - 33 kV
Oil Immersed Distribution Transformer

KEMA

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No: 18000-2013-40-IND-004 Initial certification date: 05, January, 2013 Valid: 05, July, 2015 - 04, July, 2018

This is to certify that the management system of
Kotsons Private Limited
Unit 1: 217A, 218 to 220, 230 A, M.I.A., Alwar - 301 030, Rajasthan, India

has been found to conform to the Occupational Health and Safety Management System standard:
OHSAS 18001:2007

This certificate is valid for the following scope:
Design, manufacture and marketing of distribution, power and custom built transformers

For the issuing office:
DNV GL - Business Assurance
DNV GL, No. 28, 607 Road, Alwar,
Chennai, PIN - 600 016, India

DNV-GL
Business Assurance
Management Representative

OHSAS 18001

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No: 18000-2013-40-IND-004 Initial certification date: 05, January, 2013 Valid: 05, December, 2013 - 03, December, 2016

This is to certify that the management system of
Kotsons Private Limited
C-21, U.P.S.I.D.C., Site - C, Sikandra, Agra - 282 007, Uttar Pradesh, India

has been found to conform to the Quality Management System standard:
ISO 9001:2008

This certificate is valid for the following scope:
Design, manufacture and marketing of distribution, power and custom built transformers

For the issuing office:
DNV GL - Business Assurance
DNV GL, No. 28, 607 Road, Alwar,
Chennai, PIN - 600 016, India

DNV-GL
Business Assurance
Management Representative

ISO 9001

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No: 18000-2013-40-IND-004 Initial certification date: 05, January, 2013 Valid: 12, December, 2013 - 11, December, 2016

This is to certify that the management system of
Kotsons Private Limited
Unit 1: 217A, 218 to 220, 230A, M.I.A., Alwar - 301 030, Rajasthan, India

has been found to conform to the Environmental Management System standard:
ISO 14001:2004

This certificate is valid for the following scope:
Design, manufacture and marketing distribution, power & custom built transformers











For the issuing office:
DNV GL - Business Assurance
DNV GL, No. 28, 607 Road, Alwar,
Chennai, PIN - 600 016, India

DNV-GL
Business Assurance
Management Representative

ISO 14001

Our Customers

International Customers

 <p>Schneider Electric UK, Spain, Greece</p>	 <p>Power Holding Company of Nigeria</p>	 <p>Central Electricity Board Mauritius</p>	 <p>Nepal Electricity Authority Nepal</p>
 <p>Rural Energy Agency Tanzania</p>	 <p>Communaute Electrique du Benin</p>	 <p>Public Electricity Corporation Yemen</p>	 <p>Rural Electrification Board Bangladesh</p>
 <p>Zambia Electricity Supply Corporation Limited</p>	 <p>Zimbabwe Electricity Supply Authority</p>	 <p>Tanzania Electric Supply Company Limited</p>	 <p>Public Utilities Corporation Seychelles</p>
 <p>General Electricity Company of Libya</p>	 <p>National Integrated Power Project Nigeria</p>	 <p>Electricity Company of Ghana</p>	 <p>Ministry of Electricity Iraq</p>
 <p>Compagnie Energie Electrique du Togo</p>			

Domestic Customers

Our Presence

*With Wide Network of Partners
across the Globe Over 40 Countries*

EUROPE

United Kingdom
Greece
Spain
Ireland

MIDDLE EAST

Dubai
Qatar
Iraq
Jordan
Oman
Syria
Yemen

ASIA

India
Bangladesh
Bhutan
Japan
Maldives
Nepal
Philippines
Thailand

AFRICA

Angola
Benin
Burkina Faso
Ghana
Gambia
Guiana
Ivory Coast
Libya
Malawi
Mauritius
Mozambique
Nigeria
Rwanda
Senegal
Seychelles
Tanzania
Togo
Zambia
Zimbabwe

SOUTH AMERICA

Suriname

OCEANIA

Australia

