



LTL Transformers (Pvt) Ltd

A subsidiary of LTL Holdings (Pvt) Ltd



Vision

To achieve and maintain best in class standard energy transformation solutions to power the human value chain globally.

Mission

To be recognized globally as a leading provider of energy transformation and distribution solutions by:

- providing innovative products and services with high efficiency and reliability
- consistently achieving high standards for the quality of products and business processes.
- recognizing customer requirements and becoming a collaborative partner through strong relationships
- investing in people and technology to achieve operational excellence through a committed workforce



Our Values



Innovation

We value and recognize innovative technology, which enables us to create market leadership. We remain committed towards the development of new products and lean manufacturing processes.

Excellence

We consistently focus on the best quality, best manufacturing processes, best supply chain, best sales processes. This mix guarantees success and ensures that qualitative standards of the products that we market are maintained consistently.

Leadership

We value and strive for market leadership as it is a critical factor which will generate increased profits and create sustainability for our stakeholders.



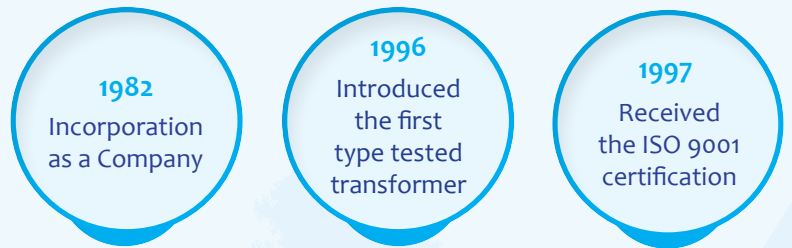
Our Journey

About Us

LTL Transformers (Pvt) Ltd commenced business in 1980 as a small transformer repair shop. From humble beginnings the Company has evolved to be the largest Sri Lankan manufacturer of power and distribution transformers.

Founded in 1982 as a joint venture between the Ceylon Electricity Board and Bonar Long of Scotland the Company has steadily captured its market position as a trusted name in the industry both locally and globally. Today it is a Group Company of LTL Holdings which is the largest power sector engineering company in Sri Lanka.

The Company's ethos of reinvesting its profits towards the progress of the business and its commitment towards the people, technology, assets and production have yielded significant results. By converging technology and innovation we offer our customers a wide range of products and services.



2003

Completed our first export order

2004

Commenced operating as a Sri Lankan entity

2006

Completed the first export of compact SS

2007

Received the ISO 14001 certification

2009

Received the OHSAS 18001 certification

2016

Successfully completed the type testing of 5MVA Transformer

Product Portfolio

LTL Transformers (Pvt) Ltd offers a complete range of power and distribution transformers designed to deliver reliability, durability, and efficiency required in utility, industrial, and commercial applications.



Oil-Filled Transformers



LV Distribution Products

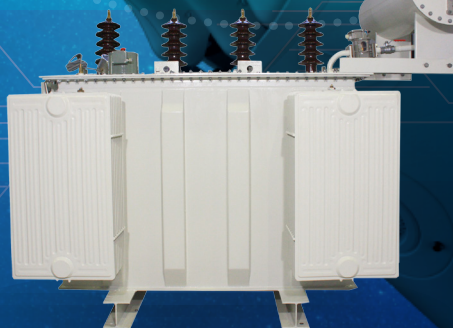
Dry Type Transformers



Pre-fabricated Compact MV Substations



Special Transformers





Oil-Filled Transformers



LTL offers a complete range of power and distribution transformers designed to grant the reliability, durability, and efficiency required in utility, industrial, and commercial applications. LTL's liquid-filled transformers are manufactured in accordance with the most demanding industry and international standards. Transformers can be used for indoor or outdoor applications. These products form a critical part of electrical distribution networks and ensure reliable supply of electricity to homes and industry.

| Technical Specifications | |
|--------------------------|----------------------------------------------------|
| Ratings | 1 phase up to 33kV 5kVA 3 phase up to 33kV 5MVA |
| Frequency | 50Hz/60Hz |
| Winding | Copper/Aluminum |
| Insulating Fluid | Mineral Oil or Ester Oil |
| Class of Insulation | Class A |
| Tap Changer | OCTC, OLTC as per customer requirement |



Dry Type Transformers

LTL offers a full range of dry-type transformers with primary voltages up to 33 kV built according to all major standards including IEC and ANSI.

To minimize environmental contamination and fire hazard, customers are specifying dry type transformers more frequently.

These transformers meet strict parameters with respect to electrical system demands and functioning in areas with extreme climatic conditions. LTL's dry type transformers are virtually maintenance free and are manufactured in accordance with industry and international standards.



| Technical Specifications | |
|------------------------------|-----------------------------------------|
| Ratings | 3 phase up to 33kV 2.5 MVA |
| Frequency | 50Hz/60Hz |
| Winding | Copper/Aluminum |
| Class of Insulation | Class H,F |
| Tap Changer | OCTC, OLTC as per customer requirement |
| Degree of ingress protection | IP 21 to 32 as per customer requirement |

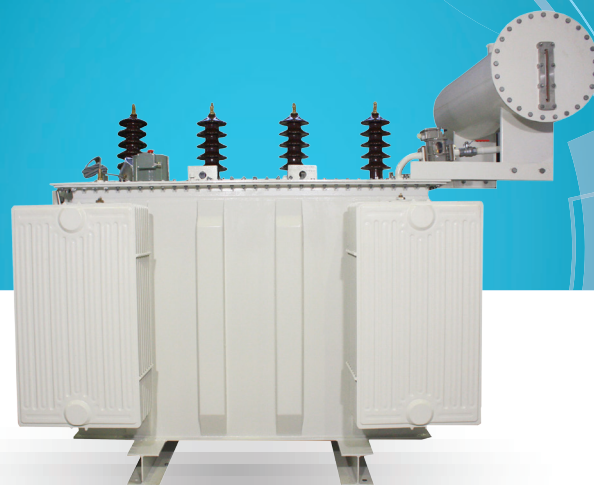


Special Transformers

In addition to standard types of transformers used for distribution applications, we build special transformers for industrial applications.

Our product range includes the following special distribution transformers:

- Rectifier / Converter Duty Transformers
- Earthing / Grounding Transformers
- Isolation Transformers
- Completely Self Protected Transformers
- Dual Voltage Ratio Transformers
- Multi Winding Transformers
- Auto Transformers
- Low Voltage Air Cooled Transformers
- Pad Mounted Transformers (Dead Front) as per ANSI standards



These non-standard types used in electrical and/or mechanical applications, are the result of extensive product development based on constant monitoring and evaluation of evolving customer needs encompassing varied market segments.



Pre-Fabricated Compact MV Substations



Our compact MV substations are designed and manufactured for standard and specific customer requirements that are widely used in areas where underground power distribution is required, such as in residential, commercial and industrial developments. LTL produces standard and specialized compact MV substations ranging in size from 100kVA up to 2,000kVA. The fully enclosed transformer, HV and LV connections or switchgear are all fully assembled and tested in the factory

prior to shipping to site. The standard design methodologies have been subject to extensive design review and subsequent in field review. Many standard and customized compact MV substation arrangements are available. All configurations are fully rated in their enclosures.

| Technical Specifications | | |
|---------------------------------------------------------|-------------------------|------------------------------------------------|
| Ratings | Voltage | 11kV or 33kV |
| | Frequency | 50Hz/60Hz |
| | Insulation level | 28 kVRMS 50Hz 1min 75 kV impulse, 1.2/50 uS |
| Compartmented | Yes | |
| Ventilation | Natural | |
| Degree of Ingress Protection | MV and LV Compartment | IP 34 & IP 33 |
| | Transformer Compartment | IP 23D |
| Degree of Protection against external mechanical impact | IK10 | |
| Class of Enclosure | Class 10 | |
| Internal Arc Classification | Type B | |



LV Distribution Products

We offer a comprehensive range of low voltage distribution products. We can design a solution that suitably fits your site setup and requirements.

LV distribution products are paramount to the security, safety and management of commercial and industrial LV installations. It ensures your LV equipment runs efficiently, protects it from faults, and isolates the equipment in order for it to be maintained safely.

Our products range includes:

Feeder Pillars

A feeder pillar provides local isolation to your electrical distribution equipment, protecting both the cabling allow simple and local maintenance to your equipment, reducing site downtime and reducing overall maintenance costs.



We offer a comprehensive range of feeder pillars which are fully assembled to meet your specifications, allowing easy onsite installation. Our feeder pillars provides an unrivalled know-how to respond to the following needs in the best possible way:

- Energy distribution from multiple LV outputs
- Protection of LV outputs downstream of a transformer
- Ensuring operational safety of goods and persons

Busbar Chambers

Busbar chambers are designed to provide compact, easily assembled switchboards. Every facility is provided to enable all switchgear and distribution gear to be mounted easily and economically to busbar chambers. Busbar chambers are produced in 100 to 1600Amps ratings and fabricated from rust-protected sheet steel or aluminium with a paint finish.

Process



TANK FABRICATION

The Sealed type Transformer tanks are made of high quality preformed imported corrugated fin walls made out of cold rolled steel. The vertical bending machine helps to form the corrugated tanks only with one welded seam, which is a specialty in our products. This helps to reduce the risk of welding leaks. All the tanks are hot dip galvanized and for further durability, tanks are powder painted. In order to assure the withstand ability for cyclic expansions, the transformer tanks are subjected to endurance test.

ACTIVE PART PREPARATION

The core is made from high-quality; grain-oriented silicon steel sheets which are cut to length by the latest GEORG cutting line. Low sound levels and reduction of localized high flux density areas are achieved through step lap technology. Core is stacked using stacking pins to reduce the air gaps. The low voltage winding is done with foil along with DDP insulation. The high voltage winding is wound on LV winding using fully automated Tuboly winding machine. The high voltage winding is of layered winding construction with enameled insulated round or rectangular conductors. The insulation between layers consists of thin strip insulation papers which give more compact winding design.



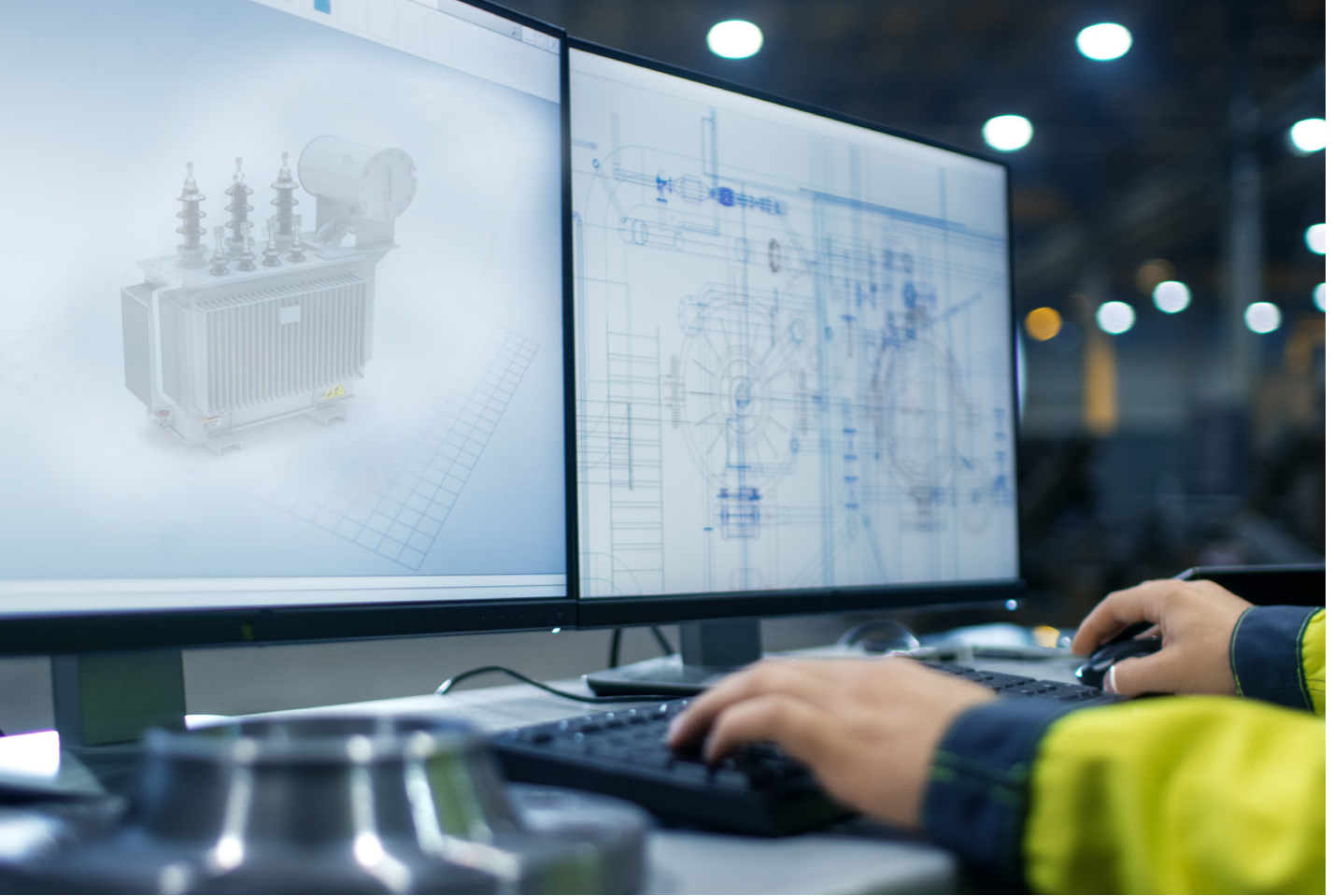
ASSEMBLING

The active part of the transformer is assembled with the magnetic core; windings and other accessories such as tap selectors etc. All the high and low voltage leads are supported rigidly so that there will be no dangerous movements during severe faulty conditions. High quality pre-fabricated steel clamps are used for clamping. The design and the process ensure adequate clearance between various components and parts to ensure uniform and optimum electric field distribution which guarantees long life of the transformer. The active part of the transformer is completely installed into the transformer tank and subsequently dried and oil impregnated in one process. The complete process is performed under low vacuum thus ensuring a significantly improved drying quality and reduced de-polymerization of the insulation material compared with conventional drying processes.

TESTING AND DISPATCH

All transformers are subjected to the full range of specified routine tests as per international standards such as IEC, BS and ANSI. Our test facilities are equipped with high quality test apparatus. The quality of each product is guaranteed before its release for dispatch.

Transportation options and customer requirements are carefully evaluated and determined by our well experienced staff in the field, and the products are appropriately packed and delivered to the final destination.

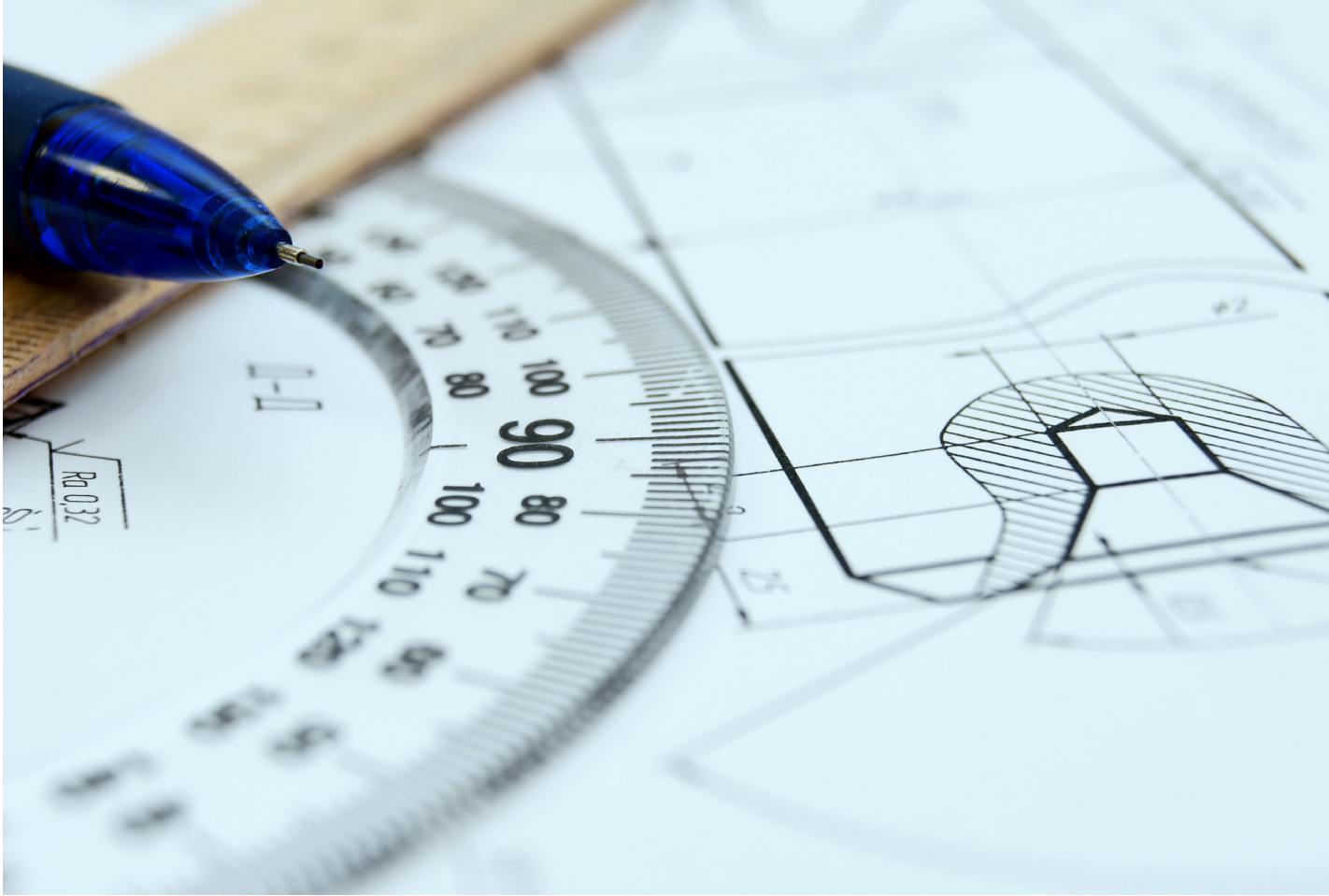


OUR DESIGN CAPABILITIES

With over three decades of experience in manufacturing transformers we ensure that our designs meet the dynamic requirements of our clients whilst ensuring the requirements of international standards including IEC, ANSI & BS.

We strive to ensure that the designs of the transformers manufactured meet the dielectric strength, mechanical endurance, dynamic and thermal withstand of winding in the event of short circuits. We also place great emphasis on the mechanical design and final finish of the transformers.

Recognizing this we rely on the latest software for calibration and optimization of our transformer designs. The software that is used was developed in-house with the technical collaboration of expertise in the fields of Transformer Manufacturing. This helps to guarantee a technically and economically suitable transformer for a diverse array of customers with varying needs and requirements.



RESEARCH & DEVELOPMENT ACTIVITIES

We are committed to develop our product range to meet the ever increasing environmental and increased efficiency requirements. We take into account a holistic view of the entire life cycle, resulting in the most environmentally friendly products, systems and solutions being used in the production of the transformers.

Our research teams focus on amorphous metals, natural ester fluids and higher thermal insulation based transformer designs to reduce total ownership cost and environmental impact. Further, our aim is to produce a smart distribution transformer incorporating Dynamic Voltage Control to the Future Distribution Transformer.

Our R&D activities along with highly flexible design tools, provide our customers high efficiency and environmentally friendly sustainability solutions for liquid-filled distribution transformer solutions.



OUR COMMITMENT TO OPTIMIZE COST FOR OUR CUSTOMERS

Transformers are a high value investment where one needs to recognize not only the acquisition cost but also the operating costs. Installation and maintenance costs may need to be added to this formula.

Therefore transformer with the lowest Transformer Ownership Cost (TOC) is the best economic choice in the long term.

P_o = Guaranteed No Load Losses (Watts)

P_k = Guaranteed Load Losses (Watts)

CP_o = Capitalization value for no-load losses stated by customer (\$/Watts)

CP_k = Capitalization value for load losses stated by customer (\$/Watts)

$$TOC = \text{Transformer Manufacturing cost} + P_o * (CP_o) + P_k * (CP_k)$$

Evaluation of two distribution transformers, each with a nominal rating of 400 kVA but with different loss levels:

| | Po/Watt | P _k /Watt | Price/\$ | Po*CPo/\$ | P _k *CP _k / | T. O. C./\$ |
|-----------------|---------|----------------------|----------|-----------|-----------------------------------|-------------|
| Tr. 1 : 400 kVA | 680 | 3 550 | 9 200 | 3 060 | 6 390 | 18 650 |
| Tr. 2 : 400 kVA | 840 | 4 000 | 8 800 | 3 780 | 7 200 | 19 780 |

$CP_o = 4.5$ \$/Watt

$CP_k = 1.8$ \$/Watt



COMPREHENSIVE AFTER-SALES SERVICE

After sales service is a critical feature in the business of transformers. Our service and repair team reacts promptly to your requests and provide practical support to ensure reliable, fault free operations throughout the entire lifecycle of the transformers.

Our services range from simple technical support through maintenance to on-site intervention. Our after sales service ensures that you are worry free from your transformer related issues not during the warranty period, but after the warranty has lapsed.

The comprehensive after sales services we offer are:

- Transportation, installation, commissioning and testing of power and distribution transformers together with associated protection and firefighting systems

- Oil filtration and oil testing in transformers
- Maintenance of power installations in industrial and commercial buildings, power utilities, hospital complexes and other such institutions under an Annual Maintenance Contract or other terms as required by customers
- Repairs & servicing of distribution transformers
- Hiring of transformers for emergency short-term requirements as substitutes

Our clients are assigned a dedicated engineer with experiences support staff to provide speedy response time within 6 hours or less for our clients who are based locally. Our global clients will have a response time within 24 hours or less through our branch offices or agents.



QUALITY ASSURANCE PRACTICE STANDARDS AND CERTIFICATIONS



We strive to offer superior quality products and services to meet or exceed customers' expectations. With continuous improvement we are geared to deliver defect free products and services, at competitive prices whilst meeting timely delivery standards.

All transformers are tested at the manufacturing facility prior to shipment. They meet very stringent quality criteria through a comprehensive range of tests prior to dispatching the transformer to a customer.

Our manufacturing facility has implemented ISO 9001 quality management systems. ISO 9001 includes all processes affecting quality, customer satisfaction and continuous

improvement. Our customers can be assured of the integrity and quality of all LTL guaranteed transformer products.

All our products conform to the relevant International Standards such as IEC, ANSI, and BS. We serve our customers with continuous learning and innovation combined with operational excellence and superior leadership. Our Integrated Management System conforms to ISO 9001, ISO 14001 & OHSAS 18001 and has been certified by DNV-GL of the Netherlands. Furthermore, all our transformers are tested by a renowned test laboratories such as KEMA Netherlands and CPRI India.



OUR GLOBAL PRESENCE

Since commencement of our first export order in 2003 we have established ourselves a recognized and trusted source of transformers. We export our products to over 25 countries.





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