TRANSFORMING NEPAL THROUGH POWER

NEEP
CELEBRATING
27
years
OF EXCELLENCE

नेपाल ईकरात इनजिनियरिङ्ग क. प्र. लि.
NEPAL EKARAT ENGINEERING CO. PVT. LTD

www.neek-transformer.com
COMPANY’S CORE VALUES

VISION:

To be market leader of Power & Distribution Transformer in Nepal with sound technical excellence.

MISSION:

1. Develop customer relationships which provide services tailored to specific customer needs;
2. Provide employees with on-going training to enhance knowledge and skills, develop problem solving and decision making abilities, and offer opportunities for advancement;
3. Apply cost effective production systems and sound fiscal planning;
4. Utilize Continuous Process Improvement strategies to ensure the highest quality products and services.
NEEK was established in a joint venture between young Nepalese Entrepreneurs and "Ekarat Engineering Public Co. Ltd." of Thailand in the year 1990. With continued support from our valued customers over the years, we have been able to serve for the last twenty-five years in the manufacturing and supply of Distribution Transformers.

NEEK has a capacity to manufacture up to 10 MVA and up to 132 kV class Distribution Transformers. The manufacturing plant at Hetauda is equipped with state-of-art equipment and a highly skilled technical work force. From 1992, we have manufactured various ratings of distribution transformers and supplied to the electricity utilities, hydropower projects, small hydro powers, hospitals, shopping complex and industries. We have also completed the successful repair and maintenance work of Power Transformers up to 10MVA 3-Phase, 33/11 kV and Power Transformers up to 30 MVA 3-Phase, 132/11 kV. This gives us the extra insight while manufacturing our product, for our customers.

The first product of NEEK was launched in August 1992 and with that, NEEK has been consistent in quality and continues to make the most sought after transformers in the country. Out of the installed Distribution Transformers in Nepal, most of the quantities have been supplied by NEEK. The total production capacity and its product range makes NEEK the largest and the most efficient manufacturer of Distribution Transformers in the country.

To keep pace with the changing technology and upgrades, regular training is provided to NEEK employees at all levels. Our refresher programs allow workers to benefit from local or foreign experts and our Engineers are sent abroad for training in related fields to be updated with present technological upgrades.

Nepal Ekarat Engineering has been exclusive in being able to offer products manufactured according to customer requirements in a clean, healthy and safe environment.

All incoming raw materials are carefully chosen, inspected and tested before it is used for these long-life products. From core laying, coil winding, tank fabrication and assembly, each step is carefully monitored by experts and tested by the latest equipment for the quality and in accordance with the international standards.

NEEK is certified with the ISO 9001: 2015, as an adherence in the manufacturing of quality products in a clean, healthy and safe environment that follows the principle and procedures of QMS in every aspect of our manufacturing process for the continual improvements of quality in our products. We have recently achieved the NS Standard नस. नामः ९६४५ for our transformers.
While choosing a transformer, the buyer should not only consider the initial price of the transformer but also the estimated maintenance costs, the cost of no-load losses in the iron core, the cost of load losses of the windings, the quality of raw materials used and the effectiveness of the after-sales services offered.

In order to determine the most economical design for a particular application, it is important to know the capitalized value that is affected by a particular kind of loss. This value can then be compared to the initial cost. It is found that higher initial cost caused by the use of high-grade CRGO silicon steel sheets and copper windings are counterbalanced by lower operational costs.

NEEK transformers are manufactured using quality material and by the most modern and reliable technology and methods, hence resulting in a superior product. Custom designs that offer optimum results as per individual customer needs are available upon request.

The purpose of testing is to prove the validity of all technical data and to ensure the sound performance of the transformer. NEEK transformers are subjected to Routine tests which are carried out on all transformers and Type Tests are carried out on all of the new designs of the Distribution Transformers.

**TYPE TESTS**
- Temperature Rise Test
- Impulse Test

**SPECIAL TESTS**
- Short-Circuit Test

**ROUTINE TESTS**
- Ratio Test
- Resistance Measurement
- Polarity and Phase Relation Test
- No Load Loss Test
- Excitation Current Test
- Impedance and Load Loss Test
- Applied Potential Test
- Induced Potential Test
- Oil Test
- Insulation Resistance Test
- Leakage Test
Transportation of NEEK Transformers by Helicopter to Diktel, Nepal during the year 1998

NEEK TR being heli-lifted to Kyanjin, Gompa, Langtang

12.6 MVA 132/6.6 kV Power Transformer being repaired Kulekhani-II Hydropower

Transportation of NEEK Transformer in Ramechhap, Nepal
One method of illustrating how AMDTs provide economic savings is by evaluating on a Total Owning Cost (TOC) basis. TOC encompasses both the initial cost of the transformer, plus the future cost of the energy losses over the life of the equipment. The essence of transformer loss evaluation is to recognize that there is a cost of losses associated with the distribution transformer purchase decision that is just as important as the initial price. A user who saves on the initial purchase price of the transformer may in fact be losing money by not properly considering the value of the energy losses over the transformer’s active life.

TOC = Initial Purchase Price + Cost of Future Energy Losses

The chart illustrates that despite a higher initial cost, the use of AMDTs results in overall financial savings for the utilities over the life of the transformer; compared with the use of conventional silicon steel core transformers.
NEEK Transformer being lifted in rural area of Bhutan
IRON CORE

Cold Rolled Grain Oriented (CRGO) magnetic silicon steel sheets of high quality are used to make the iron core. The most practical transfer of magnetic flux from the limbs to the yoke is achieved by inter-leaving the alternate joints, thus reducing no load losses.

HV & LV WINDINGS

Round enamel-insulated copper conductors are wound to form layer type, disc type-high voltage coils. The coils are wound with constant tension directly onto a pressboard cylinder. The layer insulation papers adapted according to electrical requirements. Paper-insulated rectangular copper conductors are used to form wound layer type low-voltage coils, wound with constant tension directly onto a pressboard cylinder. Ample measures are taken to ensure the mechanical rigidity and the electrical soundness of both the HV and LV coils.

CORRUGATED TANK

The tank and cover are made of high quality sheet steel, which has to pass a stringent quality test. The tank is fabricated on a rigid bottom with an oil drainage outlet, corrugated sidewalls and a upper frame. After the components are welded together, the first leakage test is performed on the tank. Internal surfaces are prepared for painting by sand blasting. The standard paint finish is a two-coast process of rust inhibiting primer followed by a high specification finish coating. The tank provides structural strength to the complete product and the design has the main influence on heat dissipation.

BUSHINGS

HT bushings shall have full wave impulse withstand voltage or basic impulse insulation level (BIL) as per the IEC Standard / DIN Standard / IS Standard.

TAP-CHANGER

In order to provide a constant output voltage despite of the voltage fluctuation on the input system the high voltage windings are provided with the tapings connected to an off-circuit tap-changer mounted on the tank cover and operated externally. The tapping positions are fixed by means of locking pins. On-load tap changer can be upon request and also the tapping position for the off-circuit tap changer can be adjusted upon customer's requirement.

VACUUM DRYING

The core-cost assembly and tanks are placed in a vacuum oven chamber to extract the accumulated moisture. Immediately after drying, the transformers are tanked and filled with pre-dried, degassed transformer oil. The required quality of the oil is confirmed by the laboratory tests.

BUCHHOLZ RELAY

This protects the transformer from damage due to internal short circuits and faults. The alarm contact in the double float design signals oil sinkage and formation of gas, while a trip contact is activated in the event of server malfunctions. This can be available upon customer request for a lower rating Distribution Transformers below 1500 kva also.

DIAL THERMOMETER

It shows the actual oil temperature. Alarm and Signals are provided as protection against overloading.

TRANSFORMER OIL

Each Transformer shall be supplied with high quality, clean, dry and tested oil, which complies with the BS 148/84, IEC 296 standards.
OUR PRODUCTS
NEEK DISTRIBUTION TRANSFORMERS
• Distribution Transformers
• Ultra efficient low loss Transformers using amorphous metal core
• Low voltage dry type Transformers
• Furnace Transformers
• Welding Transformers
• Rolling contact type - LT. Automatic Voltage Stabilizer HT Automatic Voltage Stabilizer
• HT Transformer with built in Automatic Voltage Stabilizer
ACCESSORIES

- HV bushing with terminal connectors
- Dehydrating breather with silica gel (for conservator tank)
- Magnetic oil level indicator with contacts (upon customer requirements)
- On load tap changer, OLTC (upon customer requirements, on 11Kv & 33Kv system)
- Mechanical pressure relief device (for 800 Kva and above)
- Winding Temperature indicator & Oil Temperature Indicator, WTI and OTI (upon customer requirements)
- Double-float Buchholz relay (for conservator type transformers of 1500 Kva and above)
- Corrugated Tank
- Dial-type thermometer with alarm and trip contacts (for 1000 Kva and above)
- Bi-Directional wheels for (500-3000 Kva)
- Name Plate with connections diagram
- Oil check valve with drain plug
- Earth Terminal
POWER RANGE

1 - 50 kVA (Single Phase)
25 - 10000 kVA (Three Phase)

VOLTAGE SYSTEM

11 kV, 33 kV, 66kV and 132kV, 50Hz.

STANDARDS

The Transformers shall be manufactured and tested in accordance with:

- The Latest IEC 76 Standards.
- The Latest ANSI, VDE and DIN Standards if requested by the customer.

SERVICE CONDITION AND INSTALLATION

Altitude: Up to 1000 m above sea level, other altitude can be designed upon customer requested. Ambient air temp: 40 to 45°C

GENERAL SPECIFICATIONS AND SCOPE

The specifications outlined below cover core type, oil immersed, natural self cooled, single phase and three phase distribution transformers suitable for both outdoor and indoor installation.

<table>
<thead>
<tr>
<th>POWER KVA</th>
<th>VOLTAGE SYSTEM 11000-400 V</th>
<th>VOLTAGE SYSTEM 33000-400 V</th>
<th>LOSSES (WATTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L (mm)</td>
<td>W (mm)</td>
<td>H (mm)</td>
</tr>
<tr>
<td>25 3 Phase</td>
<td>470</td>
<td>1010</td>
<td>90</td>
</tr>
<tr>
<td>50 3 Phase</td>
<td>520</td>
<td>1070</td>
<td>120</td>
</tr>
<tr>
<td>100 3 Phase</td>
<td>770</td>
<td>1230</td>
<td>190</td>
</tr>
<tr>
<td>150 3 Phase</td>
<td>1210</td>
<td>1320</td>
<td>240</td>
</tr>
<tr>
<td>200 3 Phase</td>
<td>1420</td>
<td>1390</td>
<td>270</td>
</tr>
<tr>
<td>250 3 Phase</td>
<td>1560</td>
<td>1470</td>
<td>350</td>
</tr>
<tr>
<td>300 3 Phase</td>
<td>1540</td>
<td>1490</td>
<td>350</td>
</tr>
<tr>
<td>400 3 Phase</td>
<td>1670</td>
<td>1630</td>
<td>410</td>
</tr>
<tr>
<td>500 3 Phase</td>
<td>1820</td>
<td>1640</td>
<td>520</td>
</tr>
<tr>
<td>630 3 Phase</td>
<td>1870</td>
<td>1780</td>
<td>470</td>
</tr>
<tr>
<td>800 3 Phase</td>
<td>1970</td>
<td>1840</td>
<td>630</td>
</tr>
<tr>
<td>1000 3 Phase</td>
<td>2030</td>
<td>1940</td>
<td>670</td>
</tr>
<tr>
<td>1250 3 Phase</td>
<td>2220</td>
<td>2090</td>
<td>980</td>
</tr>
<tr>
<td>1600 3 Phase</td>
<td>2320</td>
<td>2170</td>
<td>1350</td>
</tr>
<tr>
<td>2000 3 Phase</td>
<td>3070</td>
<td>2290</td>
<td>1430</td>
</tr>
<tr>
<td>2500 3 Phase</td>
<td>2750</td>
<td>2250</td>
<td>1670</td>
</tr>
<tr>
<td>3000 3 Phase</td>
<td>2890</td>
<td>2290</td>
<td>1850</td>
</tr>
</tbody>
</table>

These figures are approximate for estimation purpose for SILICON Steel Core Type Distribution Transformer. Technical data for transformers above 3000 kva can be provided upon request of the customer.

Note: For indoor installation cable box on HV & LV side is provided and standard / additional accessories can be provided upon customer requirement

*Market items are as per NS Standard for power transformers ए. कुण १६६
TO PROVIDE A COMPLETE SOLUTION TO **VOLTAGE FLUCTUATIONS**

With the expertise in the manufacturing of distribution Transformers under the brand name NEEK, Nepal Ekarat Engineering Co. Pvt. Ltd. Now introduces to our valued customers with the rolling contact type automatic Voltage Stabilizer for the complete protection against voltage fluctuation.

NEEK Rolling contact type automatic Voltage Stabilizer is safe, precise and reliable. Voltage control equipment required essentially for sites have fluctuating voltage conditions that can damage or affect the performances of sophisticated Industrial, Medical, Electronic, Printing or Photographic equipment etc, with output voltage accuracies. It has a silent operation free from the gear tricks of conventional stabilizers.

With the new microprocessor controlled control system, which NEEK is developing for the Rolling contact type automatic Voltage Stabilizer and with its digital system. NEEK stands incomparable from the other manufactures of the Rolling contact type automatic Voltage Stabilizer in the country.

NEEK provides customized range for the Rolling contact type automatic Voltage.

**INPUT & OUTPUT REQUIREMENTS**

**Input Voltage:**
- 240-460 Volts
- 280-460 Volts
- 300-460 Volts
- 320-460 Volts

**Output Voltage:**
- 400/415/440 Volts

**TYPE:**
- Balance Input & Balance Load
- Unbalance Input & Unbalanced Load

**PHASE:**
- Single Phase
- Three Phase

**COMPARISON BETWEEN NEEK & THE CONVENTIONAL MAKE AUTOMATIC VOLTAGE CONTROLLER**

**NEEK Make Roller Type Regulator**
- Power consumption is 0.5 to 1.5% depending upon the model and input voltage variation.
- Suitable for continuous 100% duty cycle
- The carbon (graphite) Roller goes on changing which prolongs the life of the rollers.
- Life at full load is 15-20 years.
- Negligible losses in full Buck/Boost

**Conventional Make with Carbon Brush Regulator**
- Power consumption is 2 to 7% depending upon the model and input voltage variation.
- Suitable for continuous 30% to 40% duty cycle
- Since the contact is by brush having flat surface, wear and tear of the brush is more and requires frequent replacement.
- Maximum life at full load is 2-3 years.
- Max losses in full Buck/Boost Condition.

**ADVANTAGES**
- Reduction in breakdown of electrical equipments.
- Improvement in power factor (only in case of high voltage).
- Power saving (reduction in power bills). Uniform quality of end products.

**L.T. AUTOMATIC VOLTAGE STABILIZER**

L.T. Automatic Voltage Stabilizer holds its potential for units having either L.T. Supply or Low capacity H.T. Connections. The same can be manufactured for Balanced Supply and Unbalanced Loads or Unbalanced Supply for Unbalanced Loads.

The range of input supply that the stabilizer is designed for depends upon the voltage condition at the supply point. However some standard ranges for L.T. Stabilizers are as under.

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>360-450V</th>
<th>350-460V</th>
<th>320-460V</th>
<th>300-460V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency (as calculated)</td>
<td>99.60%</td>
<td>99.50%</td>
<td>99.35% - 99.00%</td>
<td>98.70%</td>
</tr>
<tr>
<td>Output Voltage</td>
<td>400V 3 Phase, 50Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling</td>
<td>Naturally Oil Cooled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Indoor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>35 degrees C above ambient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting</td>
<td>On unidirectional Wheel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave from distortion</td>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>100% Continuous</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SOME OF OUR PARTNERS IN 27 YEARS OF BUSINESS
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