2. INDUCTIVE VOLTAGE TRANSFORMERS
Oil-paper insulation
Gas insulation
2. INDUCTIVE VOLTAGE TRANSFORMERS > Oil-paper and gas insulation

INTRODUCTION

Inductive voltage transformers are designed to provide a scaled down replica of the voltage in the HV line and isolate the measuring instruments, meters, relays, etc., from the high voltage power circuit.

Model UT up to 550 kV.
Model UG up to 550 kV.
2. INDUCTIVE VOLTAGE TRANSFORMERS > Oil-paper and gas insulation

SECTIONS
1. Oil level indicator
2. Primary terminal
3. Oil volume compensating system
4. Capacitive bushing
5. Oil-paper insulation
6. Compensation windings
7. Primary windings
8. Secondary windings
9. Core
10. Insulator (porcelain or silicone rubber)
11. Tangent delta measuring tap
12. Secondary terminal box
13. Oil sampling valve
14. Grounding terminal
15. Pressure relief device
16. HV Electrode
17. LV Electrode
18. Manometer
19. Gas filling valve
**APPLICATIONS**

Ideal for installation at metering points due to its very high accuracy class.

Suitable for the discharge of high-voltage lines and capacitor banks.

Excellent frequency response; ideal for monitoring power quality and measuring harmonics.

**Examples of applications:**

1. Revenue metering.

2. **Discharge of capacitor lines and banks.**

3. **Protection for high voltage lines and substations.**

4. **Supply for auxiliary services.**

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1. **123 kV Inductive voltage transformers (Bosnia).**

2. **123 kV Inductive voltage transformers. Transpower (New Zealand).**

3. **420 kV Inductive voltage transformers. Rede Eléctrica Nacional (Portugal).**

4. **420 kV Inductive voltage transformer. R.E.E. (Spain).**
DESIGN AND MANUFACTURE

Voltage transformers can have several secondary windings for metering and/or protection. The primary winding and all the secondary windings are wound around the same core, which is loaded with the total burden.

The core and the windings are located inside a metallic tank. The windings have an anti-resonant design, which makes the transformer work properly both at power frequency and during temporary high frequency transients.

ADVANTAGES

› Very high and invariable accuracy (up to 0.1%) steady for the operational life of the equipment, with maximum reliability.
› Anti-resonant winding design.
› Safe design in case of internal fault thanks to:
  - Active parts located inside metallic tank, separated from the insulator.
  - Pressure relief devices.
  - Electrical connections resistant to short circuit.
› Robust mechanical strength and reduced size due to a compact design that is easy to transport, store and install, and which reduces visual impact.
› Hermetically sealed to guarantee complete water tightness with the minimum volume of oil or gas (Each unit is tested individually).
› Maintenance-free throughout their lifespan.
› Excellent response under extreme weather conditions, altitudes over 1,000 m.a.s.l., seismic hazard areas, violent winds, etc.
› Each transformer is routine tested for partial discharges, tangent delta (DDF), insulation and accuracy and designed to withstand all the type tests included in the standards.
› Compliance to any international standards: IEC, IEEE, UNE, BS, VDE, SS, CAN/CSA, AS, NBR, JIS, GOST, NF.
› Officially homologated in-house testing facilities.
› May be transported and stored horizontally or vertically.

OPTIONS:

› Wide range of primary and secondary terminals.
› Sealable secondary terminals.
› Secondary terminal protection devices inside the terminal box.

High and steady accuracy, combined with safe design and maximum reliability.
2. INDUCTIVE VOLTAGE TRANSFORMERS > Oil-paper and gas insulation

**OIL-PAPER INSULATION:**

› Oil level compensating system that effectively regulates changes in oil volume mainly caused by temperature.
› Oil sampling valve for periodic analysis.
› Environmental-friendly design through the use of high quality insulating oils free of PCB. The materials used are recyclable and resistant to the elements.

**OPTIONS:**

› Silicone rubber insulator.
› Oil compensation system with metallic bellows. Option for rubber diaphragm up to 170 kV.
› Current through connection to the HV: line.

**GAS INSULATION:**

› Total safety in case of internal arc: Overpressure is relieved by the pressure relief device (rupture disc) in the top part of the transformer.
› Designed to minimize gas volume, pressure and leaks, with a leakage rate <0.5%/year (lower values available upon request), thus reducing its environmental impact.
› Online monitoring of the insulation status with a manometer alarm.
› Tanks and insulators are designed, manufactured and tested according to international pressure vessel standards.
› Designed to withstand rated voltage with internal atmospheric gas pressure.
ARTECHE inductive voltage transformers are named with the letters (UT oil-paper or UG gas) followed by 1 additional letter (oil paper only), and 2 or 3 numbers indicating the maximum voltage of the network for which they are designed.

The table on the next page shows the range of both types of transformers currently manufactured by ARTECHE. These characteristics are merely indicative; ARTECHE can manufacture inductive voltage transformers to comply with any domestic or international standard.

**Standard accuracy classes and burdens:**
- According to IEC standards
  - 100 VA Class 0.2 / 3P
  - 250 VA Class 0.5 / 3P
- According to IEEE standards
  - 0.3 WXYZ
  - 1.2 WXYZ, ZZ

Higher accuracy classes and burdens available.
## Oil-paper insulation > Model UT

<table>
<thead>
<tr>
<th>Model</th>
<th>Highest voltage (kV)</th>
<th>Power frequency (kV)</th>
<th>Lightning impulse (BIL) (kVp)</th>
<th>Switching impulse (kVp)</th>
<th>Thermal burden (VA)</th>
<th>Standard creepage distance (mm)</th>
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Approximate dimensions and weights. For special requirements, please consult.

## Gas insulation > Model UG

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<th>Power frequency (kV)</th>
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