

2. INDUCTIVE VOLTAGE TRANSFORMERS

Dry and oil-paper insulation



2. INDUCTIVE VOLTAGE TRANSFORMERS > Dry and oil-paper insulation

INTRODUCTION

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

- > UR model are single-phase transformers with epoxy resin internal insulation and cycloaliphatic resin external insulation. Up to 72.5 kV.
- > VR model are two-phase transformers with epoxy resin internal insulation and cycloaliphatic resin external insulation. Up to 52 kV.
- > UJ model are single-phase transformers with epoxy resin internal insulation, a metal-covered main body and silicone rubber insulators. Up to 36 kV.
- > VJ model are two-phase transformers with epoxy resin internal insulation, a metal-covered main body and silicone rubber insulators. Up to 36 kV.
- > UZ and UT model are single-phase transformers with oil-paper internal insulation and porcelain or silicone rubber insulators. Up to 72.5 kV.
- > VZ model are two-phase transformers with oil-paper internal insulation and porcelain or silicone rubber insulators. Up to 36 kV.



> Model UR



> Model VJ



> Model VZK



> Model UTB

Models UR/UT up to 72.5 kV.

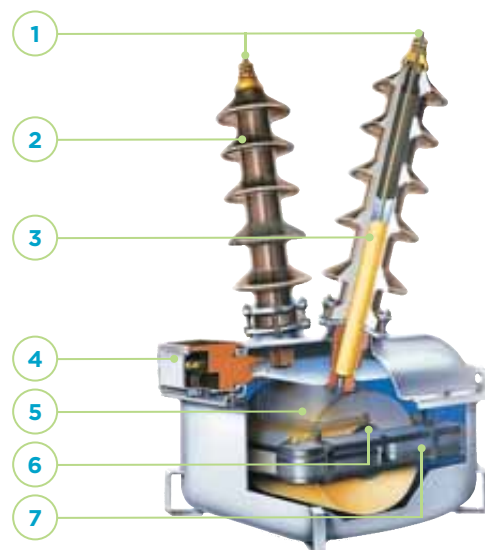
Model VR up to 52 kV.

Models UJ/VJ up to 36 kV.

Models UZK/VZK up to 36 kV.

SECTION

1. Primary terminals
2. Porcelain or silicone rubber insulator
3. Oil-paper insulation
4. Secondary terminal box
5. Primary windings
6. Secondary windings
7. Magnetic core



> Model VZK

APPLICATIONS

Voltage transformers for outdoor service have several applications.

Examples of applications:

1. Revenue metering.
2. Protection for substations and distribution lines.
3. Protection for capacitor banks.
4. Discharge of lines and capacitor banks.
5. Power supply for auxiliary services.
6. Power supply for switching equipment in distribution automation (reclosers, disconnects or switches).



- > 72.5 kV Current transformers (CX) and voltage transformers (UT) for power transformer protection. Iberdrola (Spain).



- > 24 kV Voltage transformers (VJ). Auxiliary power supply for switching equipment in distribution automation.



- > 36 kV Current transformers (CR) and voltage transformers (UR). Revenue metering. Electronet Services (New Zealand).

2. INDUCTIVE VOLTAGE TRANSFORMERS > Dry and oil-paper insulation

DESIGN AND MANUFACTURE

ARTECHE voltage transformers with dry insulation are vacuum cast with epoxy resin, which fix and isolates the active parts, creating a rigid body with high mechanical resistance, excellent thermal performance and dielectric withstand capability.

UR/VR models are housed in a cycloaliphatic resin body. This insulator provides for long creepage distance, robust mechanical strength, excellent arc tracking properties and resistance to UV exposure.

UJ/VJ have their resin body coated with a grounded external metallic layer to control their electrical fields. The pole(s) have external silicone rubber insulation with superior resistance to the elements.

ARTECHE's voltage transformers with oil-paper insulation (UZ/VZ, UT) have their core and windings (active parts) inside a metal tank. The internal insulation is made by oil impregnated paper. The external insulator may be porcelain or silicone rubber. The voltage transformer is hermetically sealed.

The U models have one single pole for phase-earth connections while the V models have two poles for phase-phase connection.

> 72.5 kV UT Transformers. Panama.

> 36 kV UZK Transformers. Transpower (New Zealand).



ADVANTAGES

- › Variety of designs for greater adaptation to client needs.
- › Cast in high dielectric strength resin (UR/VR, UJ/VJ).
- › Very high exact and invariable accuracy (up to 0.1%) for the service life of the equipment.
- › Option for double primary ratio.
- › Compliance with a wide range of creepage distances, depending on customer specifications.
- › Excellent response under extreme weather conditions such as temperatures of -55°C or +50°C; UV radiation; altitudes over 1,000 m.a.s.l., saline or polluted environments, earthquakes, seismic hazard areas, etc
- › Compact design for easy handling.
- › Maintenance free. No spare parts needed throughout its lifespan.
- › May be transported, stored and installed vertically or horizontally.
- › The materials used for construction are recyclable and resistant to the elements, adhering to environmental regulations.
- › Each transformer is routine tested for partial discharges, tangent delta (DDF), insulation and accuracy. Designed to withstand all the type test included in the standards.
- › Compliance to any international standard: IEC, IEEE, UNE, BS, VDE, SS, CAN, AS, NBR, JIS, GOST, NF and others.
- › Officially homologated In-house testing facilities.

OPTIONS:

- › Wide range of primary and secondary terminals.
- › Brown or gray insulators.
- › Porcelain or silicone rubber insulators (models UZ/VZ, UT).
- › Sealable secondary box.
- › Corrosion-resistant metallic components, and stainless steel washers, nuts and bolts.
- › Different cable glands available in the secondary terminal box.
- › Oil sampling valve for periodic analysis (models UZ/VZ, UT).



- › Detail of cable glands designed based on customer specifications.
- › 36 kV Voltage transformers (URS) installed horizontally.
- › Oil sampling valve for quick and safe operation.



ARTECHE transformers
are installed in over 150
countries.

2. INDUCTIVE VOLTAGE TRANSFORMERS > Dry and oil-paper insulation

RANGE

ARTECHE voltage transformers with dry or oil-paper insulation are named using three letters and two numbers, which indicate their maximum service voltage.

The first two letters indicate the type of transformer and the third letter indicates the model within the product line.

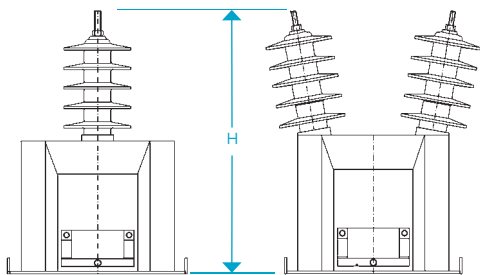
Voltage transformers with the letters VR, VJ or VZ are for phase-phase connections; and those with UR, UJ, UZ or UT are for phase-earth.

Standard accuracy classes and burdens:

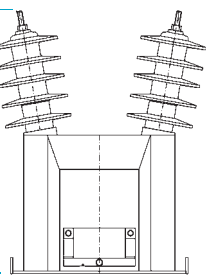
- > In accordance with IEC standards:
 - 100 VA Class 0,2 / 3P
 - 250 VA Class 0,5 / 3P
- > In accordance with IEEE standards:
 - 0.3 WXYZ
 - 1.2 WXYZ, ZZ

Higher accuracy classes and burdens available.

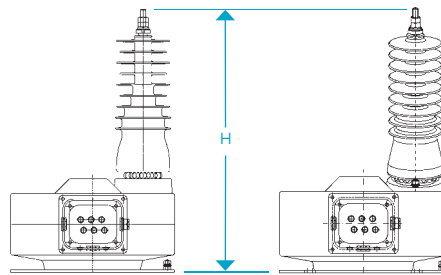
The following tables show the range currently available. These characteristics are merely indicative; ARTECHE can manufacture these transformers to comply with any domestic or international standard.



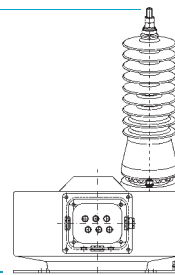
> Fig. 5 - Model UR



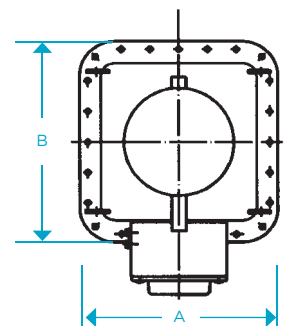
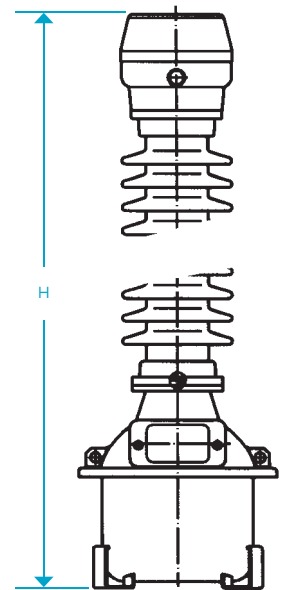
> Fig. 6 - Model VR



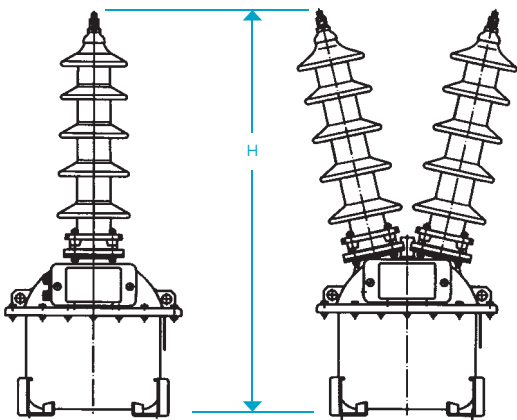
> Fig. 7 - Model UJ



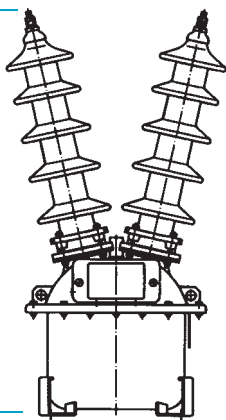
> Fig. 8 - Model VJ



> Fig. 11 - Model UT



> Fig. 9 - Model UZK



> Fig. 10 - Model VZK

2. INDUCTIVE VOLTAGE TRANSFORMERS > Dry and oil-paper insulation

Voltage transformers										
Model	Highest voltage (kV)	Rated insulation level		Standard creepage distance (mm)	Thermal burden (VA)	Dimensions				Weight (kg)
		Power frequency (kV)	Lightning impulse (kVp)			Fig.	A (mm)	B (mm)	H (mm)	
Cycloaliphatic resin insulation										
URJ-17	17.5	38	95	550	400	5	254	219	453	41
URL-17	17.5	38	95	545	450	5	254	219	453	33
URN-17	17.5	38	95	570	1,500	5	254	219	500	55
URJ-24	24	50	125	910	400	5	254	219	575	43
URL-24	24	50	125	765	450	5	254	219	533	35
URN-24	24	50	125	800	600	5	254	219	570	57
URN-36	36	70	170	1,340	600	5	254	219	708	60
URS-36	36	70	170	1,260	1,500	5	350	200	715	68
URU-52	52	95	250	1,640	2,500	5	500	400	1,030	152
URU-72	72.5	140	325	2,360	2,500	6	500	400	1,130	173
VRJ-17	17.5	38	95	615	400	6	254	219	450	43
VRL-17	17.5	38	95	610	600	6	254	219	435	38
VRN-17	17.5	38	95	620	1,500	6	254	219	570	59
VRJ-24	24	50	125	955	750	6	254	219	560	45
VRL-24	24	50	125	955	750	6	254	219	515	40
VRN-24	24	50	125	790	750	5	254	219	570	59
VRN-36	36	70	170	1,055	750	6	254	219	630	60
VRS-36	36	70	170	1,140	1,500	5	350	200	696	83
VRU-52	52	95	250	1,552	4,000	6	500	400	986	179
Silicone rubber insulation										
UJL-24	24	50	125	760	450	7	220	320	565	49
UJN-36	36	70	170	1,360	600	7	220	320	787	85
VJL-24	24	50	125	760	500	8	220	320	550	60
VJN-36	36	70	170	1,360	600	8	220	320	765	100
Oil-paper insulation										
UZK-17	17.5	38	95	790	1,500	9	300	300	970	85
UZK-24	24	50	125	790	1,500	9	300	300	970	85
UZK-36	36	70	170	790	1,500	9	300	300	970	85
UTB-52	52	95	250	2,355	1,500	11	300	300	1,340	100
UTD-52	52	95	250	2,355	2,500	11	300	300	1,410	150
UTB-72	72.5	140	325	2,355	1,500	11	300	300	1,340	100
UTD-72	72.5	140	325	2,355	2,500	11	300	300	1,410	150
UTE-72	72.5	140	325	2,355	3,000	11	450	450	1,425	250
VZK-17	17.5	38	95	790	1,500	10	300	300	940	100
VZK-24	24	50	125	790	1,500	10	300	300	940	100
VZK-36	36	70	170	790	1,500	10	300	300	940	100
UTD-72	72.5	140	325	1,825	2,000	7	300	300	1,395	150

Approximate dimensions and weights. For special requirements, please consult.