1. CURRENT TRANSFORMERS
Dry insulation
INTRODUCTION

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

› CR model transformers with epoxy resin internal insulation, cycloaliphatic resin external insulation and active parts located in the central part of the transformer. Up to 72.5 kV.

› CE model transformers with epoxy resin internal insulation, cycloaliphatic resin external insulation and active parts located in the top part of the transformer. Up to 72.5 kV.

› CX model transformers with epoxy resin internal insulation, porcelain or silicone rubber external insulation and active parts located in the central part of the transformer. Up to 72.5 kV.

› CPE model transformers with epoxy resin internal insulation, cycloaliphatic resin external insulation and active parts located around the pass-through primary conductor. Up to 36 kV.
SECTIONS

1. Primary terminals
2. Equipotential ring
3. Porcelain or silicone rubber insulator
4. Cycloaliphatic resin insulator
5. Epoxy resin
6. Primary windings
7. Cores and secondary windings
8. Secondary terminal box
APPLICATIONS

Current transformers for outdoor service have several applications.

**Examples of applications:**

1. Revenue metering.
2. Protection for substations and distribution lines.
3. Protection for power transformers.
4. Protection for capacitor banks.
5. Outdoor-outdoor wall bushings (model CPE).

› 24 kV Current transformers (CX). Protection for substation. Iberdrola (Spain).

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

› 72.5 kV Current transformer (CX) used for wind farm substation protection. Iberdrola (Spain).
ARTECHE current 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.

CR, CE and CPE 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.

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CX models have a resin body inside a hollow porcelain or silicone rubber insulator which provides for long creepage distance and superior resistance to the elements. The chamber between the resin body and the insulator is hermetically sealed with nitrile rubber gaskets; this space is filled with oil for insulation levels above 36 kV.

For CE models, the active parts are located in the top part of the transformer, which is coated with an external metallic layer for a better electrical field control.

For CPE models, the active parts form a toroidal transformer around the primary conductor. It’s a wall bushing current transformer with or without integrated primary bar.

The active parts in models CR and CX are located approximately in the center of the resin body.

For all models, the secondary outputs are located in the bottom part. Rings or deflector shields are used to properly distribute the electrical field throughout the insulator.

The equipotential ring significantly extends the service life of the transformer by preventing the deterioration of the resin in the transformer head because the ring prevents the resin from being subjected to any potential gradient. This can be seen in the figure included here, which shows the distribution of the field lines with or without equipotential ring.

This equipotential ring is a standard accessory in all ARTECHE MV Current transformers with either cycloaliphatic resin, porcelain or silicone rubber insulation.
ADVANTAGES

› Variety of designs for greater adaptation to client needs.
› Cast in high dielectric strength resin.
› Very high and invariable accuracy (up to 0.1%) for the service life of the equipment.
› Ratio change by primary or the secondary tapping.
› Primary winding with spark gap for overvoltage protection (CX, CR).
› 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.
› 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 (model CX).
› Sealable secondary box.
› Corrosion-resistant metallic components, and stainless steel washers, nuts and bolts.
› Different cable glands available in the secondary terminal box.
1. CURRENT TRANSFORMERS > Dry insulation

RANGE

ARTECHE current transformers with dry 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. Current transformers are named using the letters CX (porcelain or silicone rubber insulator), CR (cycloaliphatic resin insulation), CE (inverted, cycloaliphatic resin insulation) or CPE (cycloaliphatic resin insulation with toroidal transformer).

Current ratios: all types of combinations possible in a single device.

Secondary windings for:

› Protection: all protection types, including: low induction linear cores, etc.
› Metering: accuracy classes for any type of metering and billing (including extra-high accuracy class 0.1 / 0.15 with extended current range).

Number of secondary windings: as per customer needs, up to 4 secondary windings are possible in a single device.

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. 1 - Model CE

Fig. 2 - Models CX / CR

Fig. 3 - Model CPE
### Current transformers

<table>
<thead>
<tr>
<th>Model</th>
<th>Highest voltage (kV)</th>
<th>Rated insulation level</th>
<th>Standard creepage distance (mm)</th>
<th>Dimensions</th>
<th>Weight (kg)</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Fig.</td>
<td>A (mm)</td>
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<td><strong>Cycloaliphatic resin insulation</strong></td>
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| **Cycloaliphatic resin insulation** | | | |
| **Porcelain or silicone rubber insulation** | | | |
| **Cycloaliphatic resin insulation** | | | |

* T dimension.
Approximate dimensions and weights. For special requirements, please consult.