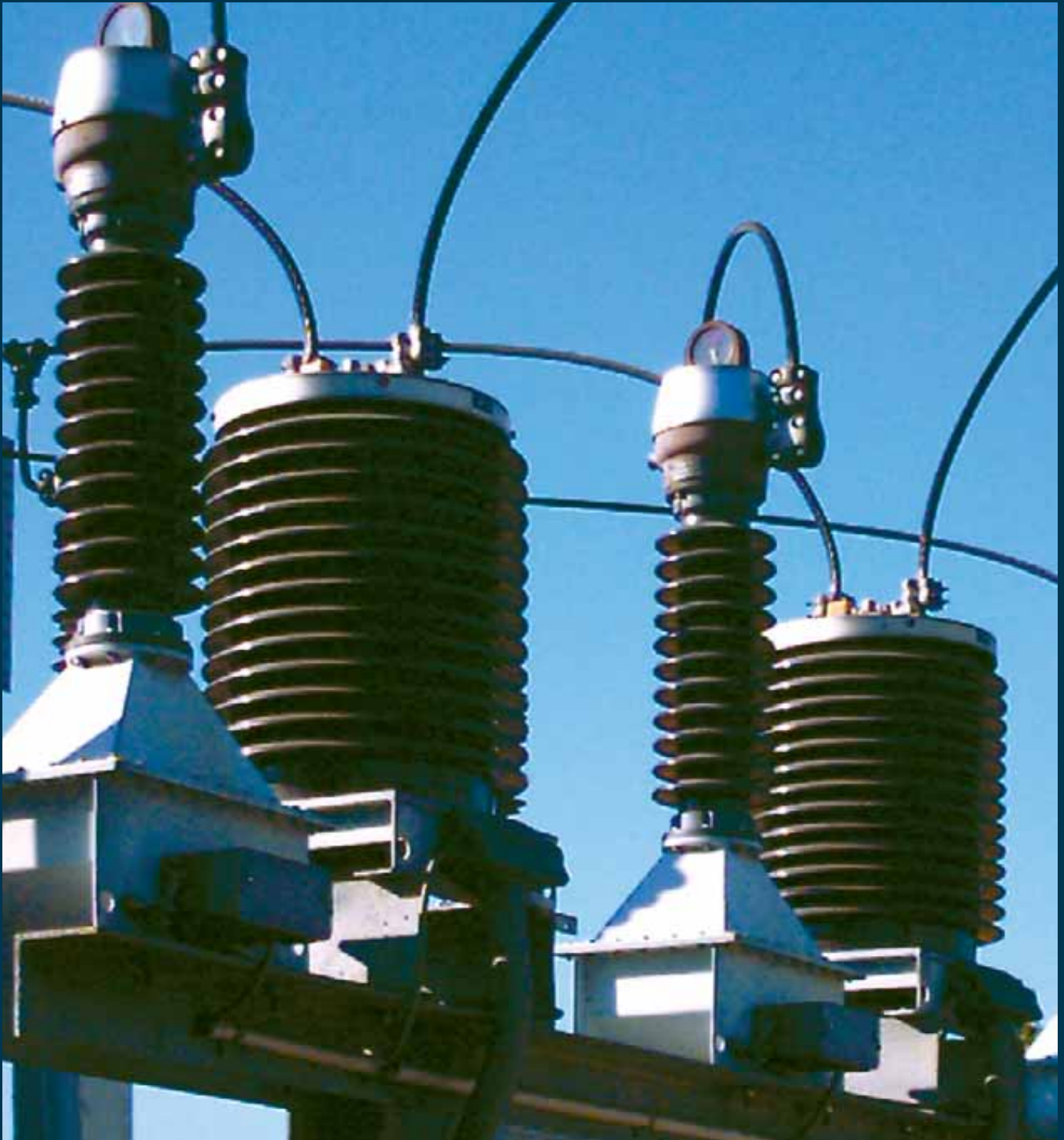


1. CURRENT TRANSFORMERS

Dry insulation



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.



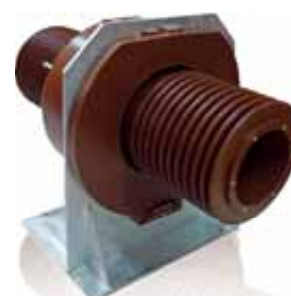
> Model CX



> Model CR



> Model CE



> Model CPE

Model CX up to 72.5 kV.

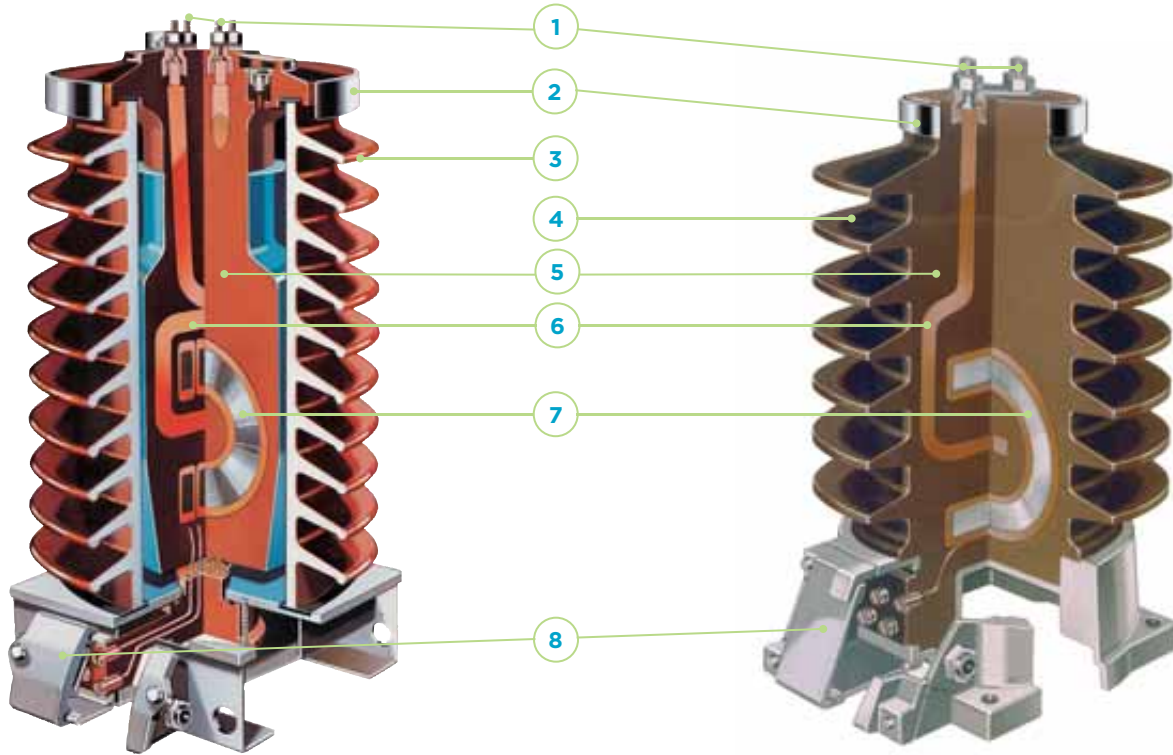
Model CR up to 72.5 kV.

Model CE up to 72.5 kV.

Model CPE up to 36 kV.

SECTIONS

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



> Model CX

> Model CR



> 36 kV Current transformers (CR).
Electronet Services (New Zealand).

1. CURRENT TRANSFORMERS > Dry insulation

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).

DESIGN AND MANUFACTURE

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.

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.

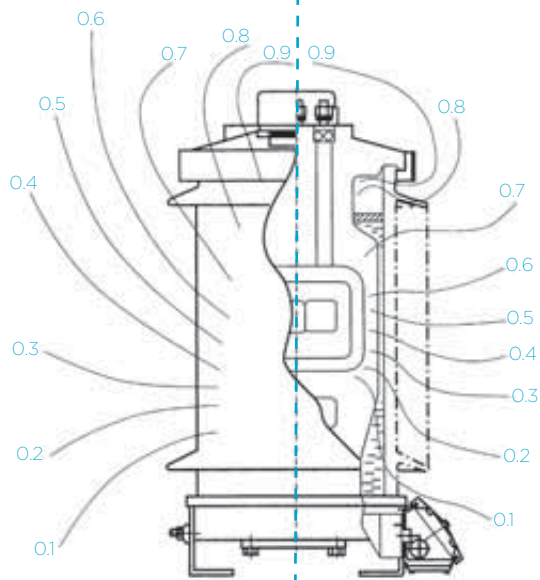
For CPE models, the active parts form a toroidal transformer around the primary conductor. It's a wall bushing current transformer with or without integrated primary bar.

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 ELECTRICAL FIELD IN A CURRENT TRANSFORMER

WITHOUT EQUIPOTENTIAL RING | WITH EQUIPOTENTIAL RING



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.

1. CURRENT TRANSFORMERS > Dry 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.
- > 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 (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.



> Option for silicon rubber insulator.



> Detail of cable glands designed based on customer specifications.



> Wide range of primary terminals.



> Detail of the spark gap in a CX for protecting the primary winding.

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).

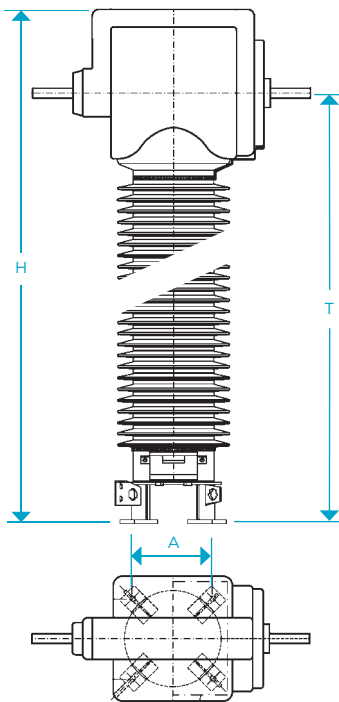
Current ratios: all types of combinations possible in a single device.

Secondary windings for:

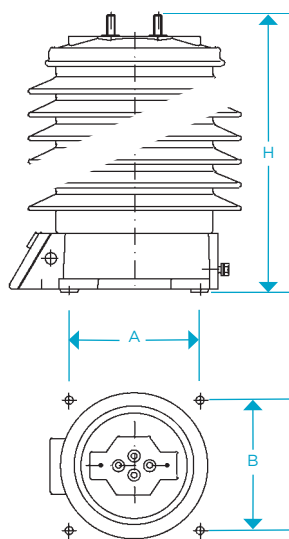
- > Protection: all protection types, including: low induction linear cores, etc.
- > Metering: accuracy classes for any type of metering and billing (including extra-high accuracy class 0.1 / 0.15 with extended current range).

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

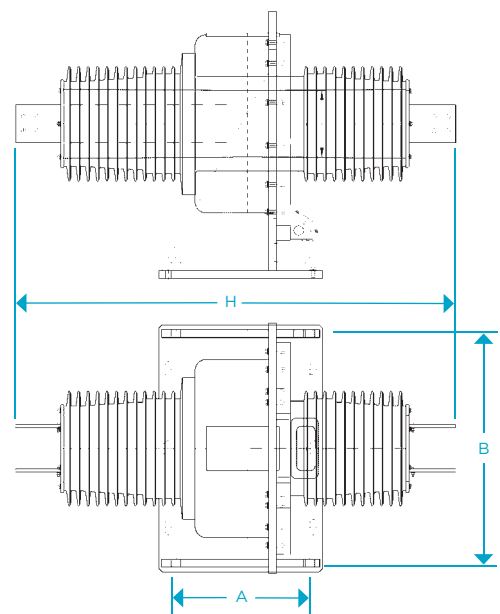
The following tables show the range currently available. These characteristics are merely indicative; ARTECHE can manufacture these transformers to comply with any domestic or international standard.



> Fig. 1 - Model CE



> Fig. 2 - Models CX / CR



> Fig. 3 - Model CPE

1. CURRENT TRANSFORMERS > Dry insulation

Current transformers									
Model	Highest voltage (kV)	Rated insulation level		Standard creepage distance (mm)	Dimensions				Weight (kg)
		Power frequency (kV)	Lightning Impulse (kVp)		Fig.	A (mm)	B (mm)	H (mm)	
Cycloaliphatic resin insulation									
CRB-17	17.5	38	95	420	2	219	254	335	22
CRE-17	17.5	38	95	440	2	219	254	300	35
CRB-24	24	50	125	590	2	219	254	371	24
CRE-24	24	50	125	620	2	219	254	370	40
CRF-24	24	50	125	810	2	219	254	370	45
CRE-36	36	70	170	925	2	219	254	475	45
CRF-36	36	70	170	915	2	219	254	440	50
CRH-36	36	70	170	1,250	2	250	250	625	115
CRK-36	36	70	170	1,135	2	350	350	551	146
CRH-52	52	95	250	1,785	2	250	250	797	135
CRK-52	52	95	250	1,815	2	350	350	690	185
CRH-72	72.5	140	325	1,785	2	250	250	797	135
CRK-72	72.5	140	325	1,815	2	350	350	877	235
CE-034	36	70	170	920	1	250	250	1,135/855*	265
CE-046	52	90	250	1,300	1	250	250	1,340/1,070*	270
CE-069	72.5	140	325	1,815	1	350	350	1,576/1,305*	350
Porcelain or silicone rubber insulation									
CXD-24	24	50	125	744	2	210	210	462	43
CXE-36	36	70	170	900	2	250	250	532	80
CXE-52	52	95	250	1,440	2	250	250	712	111
CXG-52	52	95	250	1,560	2	250	250	798	186
CXH-52	52	95	250	1,560	2	330	330	800	263
CXG-72	72.5	140	325	1,860	2	250	250	918	190
CXH-72	72.5	140	325	1,860	2	330	330	920	305
Cycloaliphatic resin insulation									
CPE-36	36	70	170	1,080	3	500	460	1,395	270

* T dimension.

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



> 72.5 kV Current transformer (CX). Yuandon Textil Co. (Taiwan).

> 72.5 kV Current transformer (CX). Nuon (The Netherlands).