



CT TOROIDAL CURRENT TRANSFORMER

GENERALITY

The toroidal current transformer CT line allow the remark of homopolar differential current disperse in the earth direction. The toroidal current transformer CT are designed to be combined with relays of maximum differential current ELR line.

The current transformer must be installed at the beginning of line or load to protect or to supervise, all the active conductor (phase and neutral) of the single phase and three phase line. The current transformer read the vectorial sum of the current in the way to transmit at the secondary coil the earth leakage current.

For other applications of current transformer CT it's necessary to see specific documentation (for example the reading of the earth homopolar current on supplying transformer).

INTRODUCTION

The current transformer CT are built with a core of sheet iron of excellent magnetic quality that allows to read fault currents a lot of low. On the core are wrapped two coils, one to read the fault signal, the other to make a test of functionality.

Using specific models of relays it's possible to do the test that use this second coil, the differential relay give a signal at the test coil, this signal creates a flow like that of a failure, that the first coil notice and it send at the relay that tripped. The choice of the toroidal current transformer depends by the dimensions of the conductors or the bar that must pass inside. It's possible to install a current transformer without to disconnect the cable of wiring, using the models with the core that can be opened.



MODELS

The dimension of the hole of passage of the cable and the type of the core (closed or that can be opened) are the features to differentiate the various models:

CT-1/35	useful diameter 35mm	closed core	CT-1/210	useful diameter 210mm	closed core
CT-1/60	useful diameter 60mm	closed core	CTA-1/60	useful diameter 60mm	core can be opened
CT-1/80	useful diameter 80mm	closed core	CTA-1/110	useful diameter 110mm	core can be opened
CT-1/110	useful diameter 110mm	closed core	CTA-1/160	useful diameter 160mm	core can be opened
CT-1/160	useful diameter 160mm	closed core	CTA-1/210	useful diameter 210mm	core can be opened

INSTALLATION

The toroidal current transformers must be installed in the way that all the conductors of the line (phase and neutral if distribute) pass inside. The earth conductors, instead, must not pass inside.

The direction of the passage must be the same for all the conductors and in the application where the current transformer in parallel are not used, it's not necessary to respect the sense of the introduction (P1).

From the 1 (S1) and 2 (S2) terminals must be taken the signal of output to connect ad the differential relay for the measure, the 3-4 terminals must be connected at the output test of the relay that have this option; at contrary they must be disconnected.

It's better to use conductor twisted or shielded for this connection, and possibly far from cable of power. The minimum section of the wire of the connection should have a maximum resistance of 3 Ω; approximately it's possible to take a section of 0,5 mm² max 20 meters and of 2,5 mm² max 100 meters.

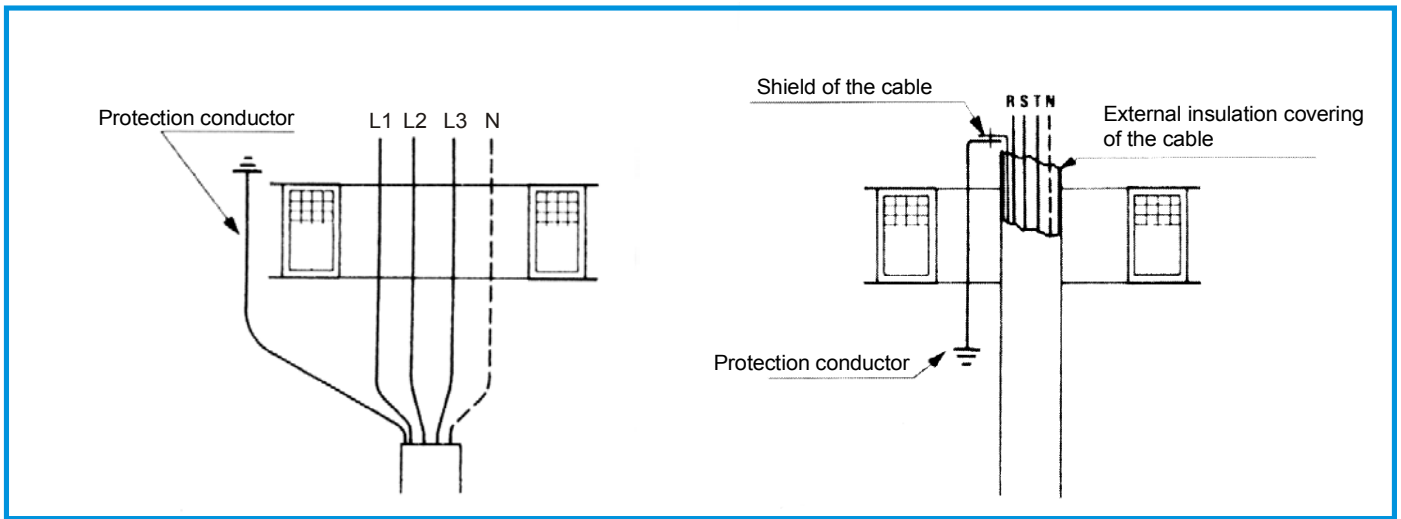
The fixing of the current transformer can be done on the bottom of the electric panel, on section or on cable.

For the current transformer tha can be opened it's necessary to verify that the contact surface of the two half-core is cleaned, the correct closing of the bolts and the connection of the cable that join the two parts.

If present, the shield, must be connected at earth after toroidal current transformer or if the shield pass inside, the connection at earth of the shield must pass another time in opposite sense inside the toroidal current transformer (see the figure).

In presence of specific over current, at the starting of big motor, the transformer are turned on, that can cause the tripping untimely of differential relays, it's necessary to observe the following indications:

to install a current transformer on a stretch rectilinear cable, to centre the positioning of the cable inside the toroidal current transformer, to use current transformer bigger than the necessary (also 2 time of diameter of cables).



APPLICATIONS

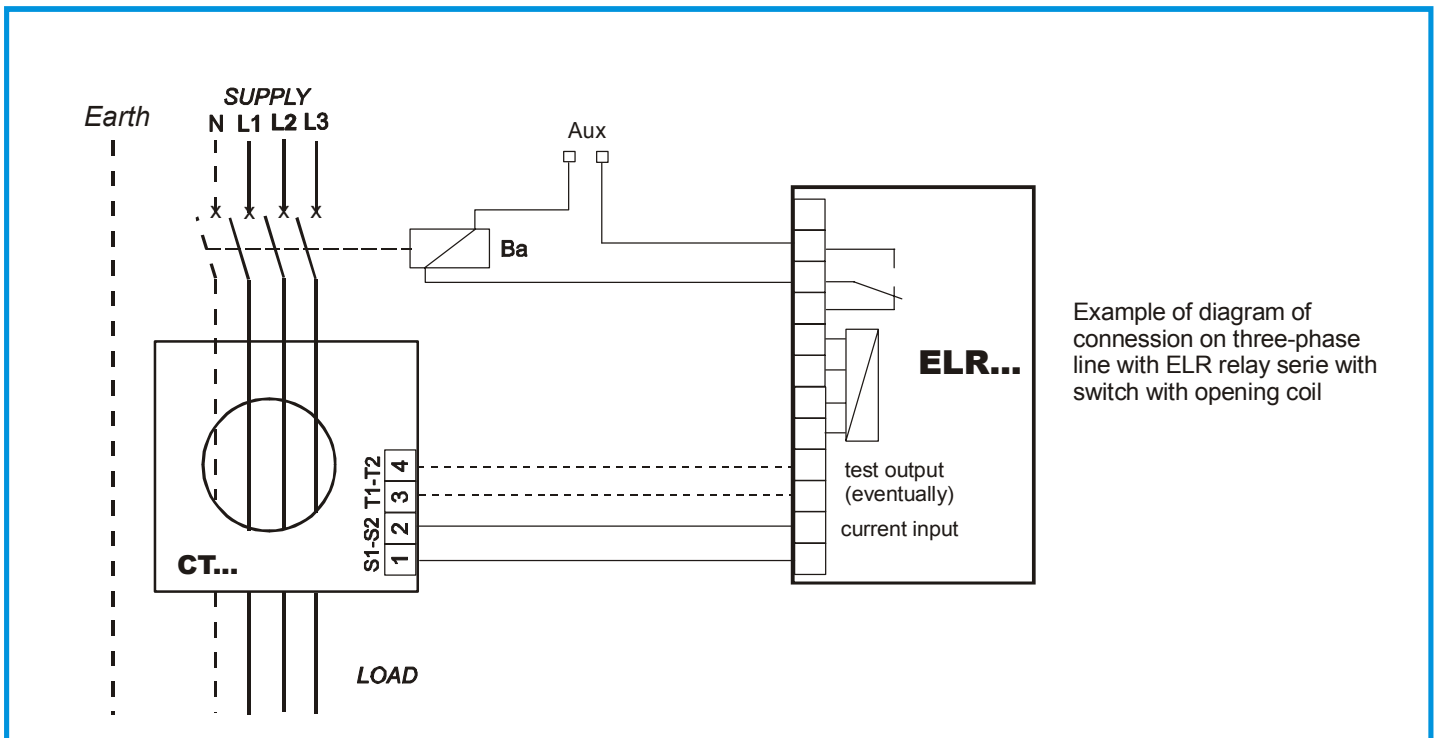
The typical application of the current transformer is the detecting of the differential current but it's possible to use it to the detecting the leakage current in particular application, like:

parallel lines, section lines, detecting the leakage current on the connection neutral / earth of the transformer or by line current transformers, the last used when the largest current transformer is not capable to contain all the conductors.

To use this current transformers serie with instruments different from ELR serie differential relays, the maximum load must be 600Ω.

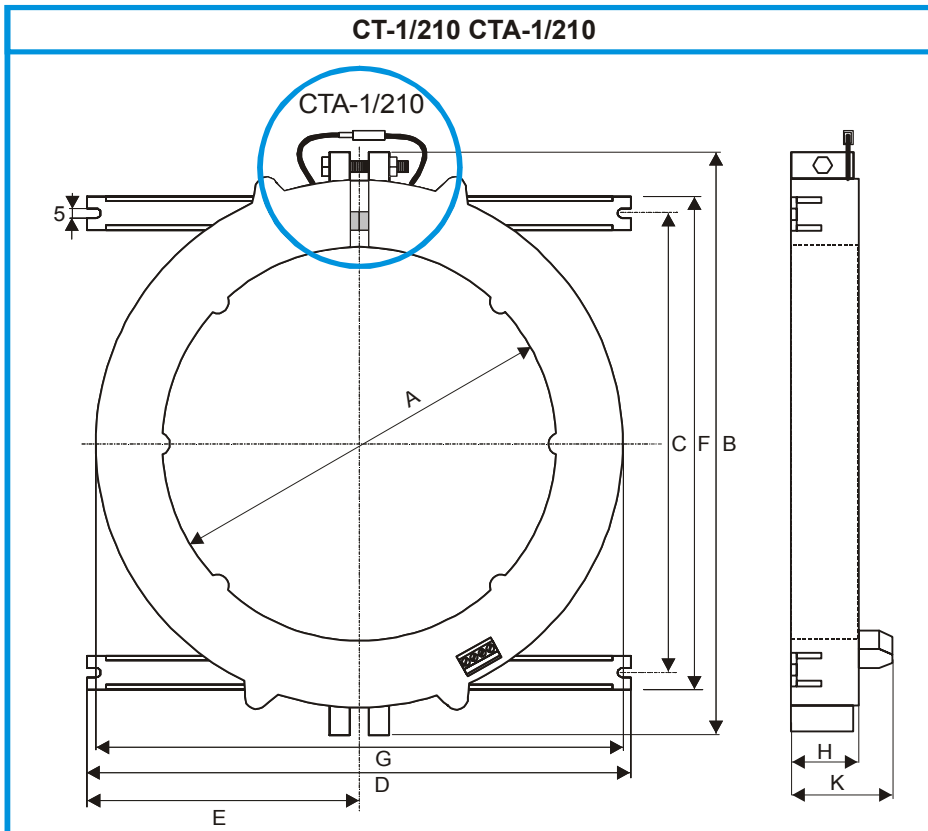
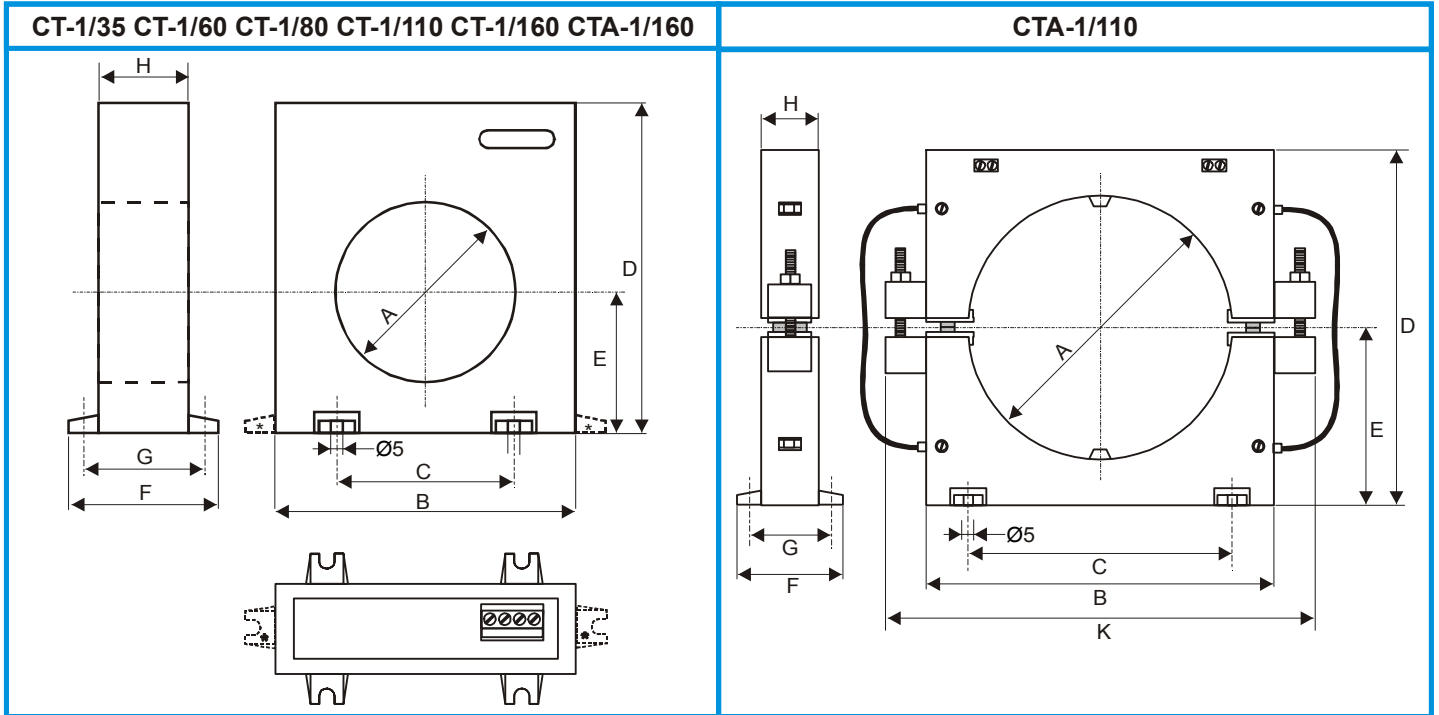
For information concerning this application please contact our technical support.

WIRING CONNECTION



Example of diagram of connexion on three-phase line with ELR relay serie with switch with opening coil

DIMENSIONS



* fixing buttonhole available only on CT-1/160 and CTA-1/160 models

the dimension of the CT-1/160 and CTA-1/160 models are the same

the dimension of the CT-1/210 and CTA-1/210 are the same

Type	Dimensions (mm)								
	A	B	C	D	E	F	G	H	K
CT-1/35	35	100	60	110	47	50	43	30	-
CT-1/60	60	100	60	110	47	50	43	30	-
CT-1/80	80	150	110	160	70	50	43	30	-
CT-1/110	110	150	110	160	70	50	43	30	-
CTA-1/110	110	145	110	150	75	45	38	25	180
CT-1/160	160	220	156	236	110	64	50	34	-
CTA-1/160	160	220	156	236	110	64	50	34	-
CT-1/210	210	310	240	290	145	260	280	36	55
CTA-1/210	210	310	240	290	145	260	280	36	55

TECHNICAL FEATURES

type	CT-1/35	CT-1/60	CT-1/80	CT-1/110	CTA-1/110	CT-1/160	CTA-1/160	CT-1/210	CTA-1/210
core type	closed	closed	closed	closed	can be opened	closed	can be opened	closed	can be opened
useful internal diameter	35 mm	60 mm	80 mm	110 mm	110 mm	160 mm	160 mm	210 mm	210 mm
weight	0,22 kg	0,28 kg	0,45 kg	0,52 kg	0,6 kg	1,35 kg	1,6 kg	1,45 kg	1,85 kg
min. measurable current	25 mA	25 mA	100 mA	100 mA	250 mA	250 mA	500 mA	250 mA	500 mA
mounting position	whatever								
application	for the use with ELR series differential relays								
working temperature	-10÷70°C								
storing temperature	-20÷80 °C								
transformation ratio	500/1								
insulation	2,5 kV for 60 sec.								
permanent over load	1000A								
thermic over load	40kA for 1 second								
terminals	with screw for cable max 2,5 mm ²								
protection degree	IP20								
standards	electromagnetic compatibility CEI-EN 50081-2 CEI-EN50082-2 safety CEI 41.1 CEI-EN 60255-								

Contact the technical assistance or refer at specific document for application don't described in this manual.

NOTE

At reason of the evolution of standards and products, the company reserves to modify in every time the features of the product described in this document, that it's necessary to verify preventively.

The liability of the producer for damage caused by defect of the product "can be reduced or deleted (...) when the damage is caused joint by a defect of product or for blame of the damaged or a person of which the damaged is responsible" (Article 8, 85/374/CEE).