

## **Current Transformers**

A current transformer (CT) is a type of “instrument transformer” designed to produce in its secondary winding a reduced current proportional to the current flowing in its primary winding for convenient connection to measuring and controlling instruments. CTs are commonly used with metering and protective relays in the electrical power industry to facilitate safe and accurate measurement of large currents and reliable monitoring of the operation of the power system.

Similar to voltage transformers, a CT has a primary winding, a magnetic core and a secondary winding. The alternating current flowing in the primary winding produces a magnetic field in the core, which then induces a small current flowing in the secondary circuit for metering or protection purposes.

CTs often consist of a well-insulated toroidal steel core wrapped with a secondary winding of many hundred turns. The primary winding has a single turn of conductor or a copper bar and may be a permanent part of the CT. The primary winding forms part of the primary circuit and carries the primary current through the magnetic core of the CT. Window-type CTs are also common which allow a primary circuit cable to run through an opening in the middle of the magnetic core. The circuit cable will then become the single-turn primary winding of the CT.

The rated secondary current of a CT is commonly standardized at 1 or 5 amperes. For example, a 400/5 CT would provide an output current of 5 amperes with a primary input current of 400 amperes.

Care must be taken not to disconnect the secondary circuit of a CT from its load while current is flowing in the primary circuit as the secondary side of the CT will produce a dangerously high voltage across the open ends of the secondary circuit, and may result in an arcing.

[The Electrical Blog is contributed by the Electrical Division. If you would like to know more about this topic, please contact the Division Hon Secretary, Ir K.M. LEUNG at 'kmleung@emsd.gov.hk'](#)