

## OIL COOLED INSTRUMENT TRANSFORMERS



### CURRENT TRANSFORMERS

#### APPLICATION

Direct measurement of current in High Voltage System is Not possible because of insulation problem of measuring instruments. It is also not possible to use current flowing through the system directly for protection purpose due to its high insulation problem.

#### BASIC FUNCTIONS OF CURRENT TRANSFORMERS ARE:

1. To reduce the line current to a value which is suitable for standard measuring instruments relays etc.
2. To isolate the measuring instruments, meters, relays etc. from high voltage side an installation.
3. To protect measuring instruments against short circuit currents.
4. To sense abnormalities in current and give current signals to protective relays to isolate the defective system

There are four main factors which determine the capability of current transformer i.e.

- ◆ Insulation Level (Service Voltage)
- ◆ Rated primary current
- ◆ Short time withstand current
- ◆ Burden and Accuracy

#### THE CURRENT TRANSFORMER MUST:

1. Withstand operational voltage and over voltage in the network
2. Withstand rated primary current in continuous operation without exceeding maximum allowed temperature rise.
3. Be capable o sustain thermal and mechanical stresses developed due to system fault current
4. Feed current to external circuit with specified accuracy at specified primary currents.

#### CONSTRUCTION :

##### CORE & SECONDARY WINDING :

High permeability, CRGO silicon steel is used as core material. Toro dial cores from continuous strips are made and annealed in controlled atmosphere to achieve best quality secondary

cores. Secondary winding is done on automatic winding machine and is distributed equally on the periphery of the core to minimize leakage reactance. Best quality enameled wire with adequate inter-layer insulation is provided to avoid secondary winding short circuiting in most adverse condition .

##### PRIMARY WINDING :

Primary winding is braided electrolytic copper conductor with double cotton covering. Varnishing fiberglass sleeve is provided as an additional insulation on this conductor. Incase of Live Tank ,the Primary is wound on insulated secondary. The Primary is positioned properly to sustain dynamic forces developed during short circuit condition. In case of DEAD TANK ,the primary is encapsulated in circular rigid fibre glass ring and aluminum pipe to form EYE BOLT construction.

##### INSULATION :

Crape Paper of High quality is used to build up main insulation of the CT. In live tank design, insulation is built up on secondary core and secondary leads are brought out through a metallic galvanized pipe. In dead Tank CT primary Winding is encapsulated in fibre glass ring and Aluminum Pipe Main Insulation is built up on primary winding with fine grading of insulation. Semi conducting shield is used give linear distribution of Electric stress along the length of the bushing. The paper insulation is dried in oven under very high vacuum and strictly controlled conditions. Filtered and de-aerated EHV grade oil is filled in CT while CT is under vacuum. To seal it, the space left for expansion on the top is filled with dry and pure nitrogen through non-returnable valve at pre-determined pressure.



11 kV C.T.



33 kV C.T.



66 kV C.T.



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