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What is a General Protection Class CT?

Transforming | Measuring | Technology

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Difference between metering & protection:

Metering CTs are built for measurement accuracy while protection type CTs have a higher burden and need a higher knee point voltage to protect from electrical faults.

A note on CT saturation

CT saturation is a term used to describe the state where a CT is no longer able to reproduce an output current in proportion to its primary current or as per its defined ratio.

Sr. No.		Measuring Class CTs	Protection Class CTs
A	Purpose	For measurement	For protection of main circuit.
		The purpose of metering CT is to read the actual current, so it has less class of accuracy.	The purpose of protection CTs is to protect the equipment by identifying the abnormalities at the initial stage itself by measuring value of current.
		CT should saturate at the earliest so that measuring instrument is protected against heavy inrush of current.	CT should not saturate so that corresponding current will flow to relay.
B	Accuracy Class	Metering needs high accuracy at load current	Protection need not have that high accuracy.
C	Design	Designed at a point not far from knee point on the CT saturation curve.	Designed at much lower point on the CT saturation curve.
		Designed for use with analog or digital meters.	Designed for use with the protective devices, such as relays.
		CT should provide Accurate current for measurement at normal loading condition.	CT should provide accurate secondary current to relay measurement for satisfactory operation on faults.

Protection Class CTs.

Protection class CTs are classified into two types viz. General Protection Class & Special Protection Class CTs.

General Protection Class CTs:

These CTs can be specified as 5P10, 5P20, 10P20, 15P20 and so on.

Understanding classifications: An example of 5P10 CT
The figure '5' in '5P' indicates the accuracy limit in percentage points expressed in terms of composite error. (eg.5%, 10% for 10P)

Note: The ratio error (current error) is quite significant for relaying purpose because the currents are high during short-circuit conditions. The percentage ratio error increases with increase in primary current. Take a look at the following table:

Table: Limits of Error

Accuracy Class	Current Error at Rated Primary Current	Phase Displacement Error at Rated Current	Composite Error Rated Accuracy Limit Factor
5P	±1%	±60 minutes	5
10P	±3%	-	10
15P	±5%	-	15

Accuracy Limit Factor in protection type CTs:

Accuracy limit factor (A.L.F.) is the ratio of the largest value of current to CT rated current, up to which the CT must retain the specified accuracy.

Example: Take a CT of 5P20, 5VA. In this case, ALF = 20 and composite error is < 5 % up to 20 times rated current for burden of 5VA. If the actual burden is < 5VA, the composite error is less than 5%, even for currents > 20 times rated current. Specifying ALF > 20 is not useful as relay operating time characteristic flattens out at 20 times the rated current.

A.L.F. is relevant only for a protection class CT since this CT is required to retain specified accuracy at current values above normal rating to faithfully reflect the fault currents. A.L.F. s is not relevant for CTs mounted on neutral circuit in medium and high resistance grounded systems and for metering class.

Conclusion

Unlike the measuring type CTs, Protection type CTs are built for use with protective devices. They must have a higher saturation point than the metering CTs so that the current flows smoothly to the relay.

Comprehensive Range of CT/PTs and Multi-Function Meters (MFMs)

Current Transformer Nylon Casing

Metering Type CT'S

- Window Type CT'S
- (Bus Bar)
- WPL Type
- Round ID Type CT'S

Protection Type CT'S

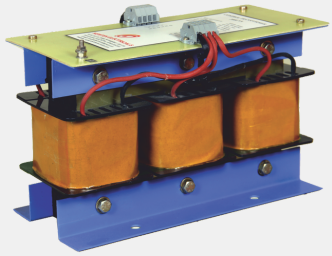
- Nylon Casing- Protective Type Bus Bar

Resin Cast-Round ID

Metering Type CT'S

- Resin Cast - WPL
- Resin Cast - Bus Bar
- Resin Cast - Round ID

Control Transformer



- Single-phase Resin Cast
- Three-phase Resin Cast

Digital Meter

- Energy Meter
- MFM Meter
- VAF Meter
- DPM Meter

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