



SPM Primary Current Rating Calculations

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To calculate the SPM direct current CT (200:50 mA) primary rating setting (**DC CT PRIM**) for different numbers of turns through the aperture, please note that DC CT accuracy limitations require that the total current not exceed 200 A. The aperture size also limits the number of turns, do not be tempted reduce the conductor size since it reduce the current rating.

To use the DC CT in its design range, the secondary current should be in the 50 mA range. This is achieved by looping multiple turns through the CT and by compensating with the **DC CT PRIM** setting.

For a rotor current of 200 A and the 200/0.05 CT, the **DC CT PRIM** setting should be 200 A. This means that the SPM relates 50 mA secondary to 200 A primary

Consider a motor with rotor rating of 14 A. For sensitivity a decision is made to loop the conductor ten times through the CT. If the **DC CT PRIM** setting remains 200 A, earlier the SPM will incorrectly interpret the current as:

$$I_{SPM} = I \times \text{Number of Turns} \times \frac{\text{DC CT PRIM}}{200 \text{ A}} = 14 \text{ A} \times 10 \times \frac{200}{200} = 140 \text{ A} \quad (\text{EQ 1})$$

However, this result is out with a factor of 10 which is the number of turns. The correct answer should be 14 A

To avoid this situation, the **DC CT PRIM** setting must be divided by the number of turns:

$$\text{DC CT PRIM} = \frac{\text{CT Primary}}{\text{Number of Turns}} = \frac{200 \text{ A}}{10} = 20 \text{ A} \quad (\text{EQ 2})$$

The SPM now correctly equates 50 mA with 20 A, and therefore:

$$I_{SPM} = I \times \text{Number of Turns} \times \frac{\text{DC CT PRIM}}{200 \text{ A}} = 14 \text{ A} \times 10 \times \frac{20}{200} = 14 \text{ A} \quad (\text{EQ 3})$$