

Convert from lg:

$$I_a = 10^{\lg I_a} \quad (3)$$

Calculate a second arc current equal to 85% of I_a , so that a second arc duration can be determined (see 9.10.4).

5.3 Incident energy

First find the \log_{10} of the incident energy normalized. This equation is based on data normalized for an arc time of 0.2 seconds and a distance from the possible arc point to the person of 610 mm.

$$\lg E_n = K_1 + K_2 + 1.081 \lg I_a + 0.0011 G \quad (4)$$

where

- E_n is incident energy (J/cm^2) normalized for time and distance ¹³
- K_1 is -0.792 for open configurations (no enclosure) and
is -0.555 for box configurations (enclosed equipment)
- K_2 is 0 for ungrounded and high-resistance grounded systems and
is -0.113 for grounded systems
- G is the gap between conductors (mm) (see Table 4)

Then:

$$E_n = 10^{\lg E_n} \quad (5)$$

Finally, convert from normalized:¹⁴

$$E = 4.184 C_f E_n \left(\frac{t}{0.2} \right) \left(\frac{610^x}{D^x} \right) \quad (6)$$

where

- E is incident energy (J/cm^2)
- C_f is a calculation factor
1.0 for voltages above 1kV, and
1.5 for voltages at or below 1kV
- E_n is incident energy normalized ¹⁵
- t is arcing time (seconds)
- D is distance from the possible arc point to the person (mm)
- x is the distance exponent from Table 4.

The other cases are handled similarly.

¹³Measurement utilized in test laboratories was cal/cm^2 .

¹⁴See E.3.1 for calculation using cal/cm^2 .

¹⁵See Footnote 1.