

## Overcurrent Protection

### Overloads

- Short Term
- Continuous

### Short Circuits

- AIC (Amperes Interrupting Capacity)
- kA
- Fuse Rating

### Ground Faults

### Arc Faults

### Fuses

- Voltage Rating
- Amp Rating
- kA
- Time Delay
- Non-Time Delay
- Instantaneous
- Short Term
- Long Term

<https://www.youtube.com/watch?v=qgz1lskyYDU>

<https://www.youtube.com/watch?v=wGFnooeA6lw>

[https://www.youtube.com/watch?v=ewD2FHev\\_pk](https://www.youtube.com/watch?v=ewD2FHev_pk)

### Circuit Breaker or Fuse

- Physical Size
- Branch Circuit Protection or Supplementary

### Time Delay or Fast Acting

- Ampere Rating
- Voltage
- Coordination

## Selective Coordination

**Basic 2:1 ratio idea**

**3:1 for Non-Time Delay**

**Time Delay Coordination**

**Current limiting fuses**

<https://www.youtube.com/watch?v=ZrYH4he-Bbo>

150 kVA Transformer, 3 Phase, 480 VAC Primary, 240/120 VAC Secondary

Primary Amperes, for 3Ø Transformer = **180.4** =  $(150 \times 1000) / (480 \times 1.732) = (KVA \times 1000) / (P_{L-L} \times 1.732)$

Secondary Amperes, for 3Ø Transformer = **360.9** =  $(150 \times 1000) / (240 \times 1.732) = (KVA \times 1000) / (S_{L-L} \times 1.732)$

<http://www.risingedgeservices.com/lowVoltageTransformers.html>

**250% x 180 = 450 A MAX Primary Fuse**

**125% x 361 = 451A, or a 500 A MAX Secondary Fuse**

**I<sub>pri</sub> Fuse A = Largest isec Fuse A x 240/480**

**I<sub>pri</sub> Fuse A = 20 x (240/480) = 10**

**10 x 2, since it is a 2:1 ratio, = 20 A, the minimum primary fuse size.**

**Overcurrent protection practice:**

**Residential loads**

**Motor loads**

**Loads on cords**

**Continuous Loads**

**Non Continuous Loads**