

## TIP SHEET

# HOW MANY FUSES WILL OPEN ON A SHORT CIRCUIT?

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### How many fuses will open on a short circuit?

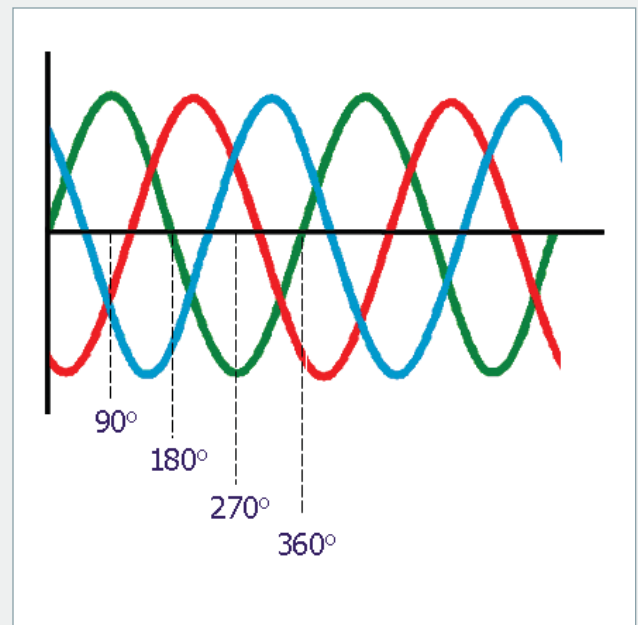
In a three phase system typically only 2 fuses will open on a line to line short circuit. Since all three line currents are offset from each other (see below), each fuse will see the full fault at different times. Therefore the fuses will open at different times, once the first two fuses open, the circuit is disconnected and the third one typically never sees the full fault current. The third line can only conduct current directly to ground.

### How many fuses will open on an overload?

Similar to a short circuit typically 2 fuses will open on an overload. Typically one fuse opening will not be adequate to disconnect all three phase so the two remaining phase will conduct the overcurrent until one of them opens. At this point the last fuse is will only be able to conduct current directly to ground so it most likely will not open.

### Is it OK to replace only the open fuses?

It is always recommended to replace all three fuses. In both short circuit and overload conditions the third fuse might not be opened but there is no way to tell how much of the element may have melted due to the overcurrent. Not replacing the third fuse can lead to issues in the future such as nuisance openings which can result in costly downtime.



### Is there a life expectancy on my fuse?

A fuse does not have a “mean time between failures” because theoretically a fuse only needs to be replaced once it opens on an overcurrent. Fuses are 100% tested before leaving the factory to ensure that they will perform as intended. In the real world there are factors such as temperature and humidity which can cause a fuse to need replacement. Mersen suggests using ten years for replacing both fuses installed and in inventory.