Arc Flash Calculator and Warning Label Creator

A free online calculator based on IEEE 1584 Guide for Performing Arc-Flash Hazard Calculations was developed as an easy to use and comprehensive tool for calculating arc incident energy, flash protection boundary and risk category required by N.E.C when work is to be performed on or near the energized equipment.

The calculator takes equipment configuration, gap between electrodes, grounding type, short circuit fault current value and system voltage on input, and determines the arcing fault current at a potential point of fault. Next, the incident energy, flash protection boundary and level of personnel protective equipment are determined based on equipment configuration, arc duration and working distance. As a bonus, our IEEE 1584 based arc flash online tool will calculate the hazards and create detailed warning label similar to the one below.

For protective devices operating in the steep portion of their time-current curves, a small change in current causes a significant change in operating time. Incident energy is linear with time, so arc current variation may have a huge effect on incident energy. The solution is to make two arc current and energy calculations; one using the calculated expected arc current and one using a reduced arc current that is 15% lower. The calculator makes both calculations possible for each case considered. It requires that an operating time be determined for both the expected arc current and the reduced arc current. Incident energy is calcuated for both sets of arc currents and operating times and the larger incident energy is taken as the model result.

The IEEE 1584 empirically derived model was chosen for the analyzing arc flash faults since the model is able to accurately account for a variety of setup parameters: open and box equipment configurations, grounding of all types, gap between conductors of 3 to 152 mm, bolted fault currents in the range of 700A to 106kA, system voltages in the range of 208V to 15kV, and working distances. Reference data listing most typical configurations and detailed procedure for IEEE 1584 based arc flash calculations are provided. Besides input data validation, the calculator comes accompanied with a novel online short-circuit calculator which allows one to quickly obtain accurate potential short circuit currents at each bus in a radial electric power distribution system.

The IEEE 1584 Guide complements and generalizes existing procedures suitable when specifying the manufacturer's protective devices only or limited to 600V systems and most typical set parameters only.
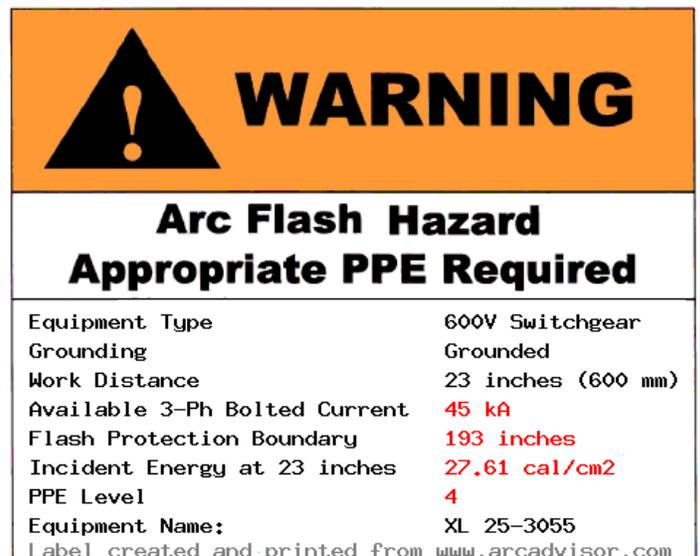

Fig. 1. Arc-Flash Calculator Output Screen

Fig. 2. Warning Label generated from www.arcadvisor.com