

ELECTRICAL HAZARD ⚡ BOUNDARIES



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FLASH PROTECTION

(for when an increased likelihood of injury from an arc flash hazard exists)

FLASH PROTECTION BOUNDARY



<1.2 cal/cm²



<8 cal/cm²



<40 cal/cm²

The energy (cal/cm²) available at the working distance is indicated on the label. Use this value to choose flash PPE. The above pictures are examples.

2nd or 3rd degree burns possible in this area

WORKING DISTANCE (NORMALLY 18")

The energy (cal/cm²) available inside the working distance is greater than indicated on the label.



Electrical Equipment



VOLTAGE RATED TOOLS ONLY

SHOCK PROTECTION

(for *exposed & energized* conductors)

RESTRICTED APPROACH BOUNDARY



NO un-qualified persons unless continuously escorted by a qualified person.

Approach Boundaries

Nominal Voltage	Limited (exposed fixed circuit part)	Restricted
50VAC - 150VAC	42 inches	Avoid Contact
151VAC - 750VAC	42 inches	12 inches

LIMITED APPROACH BOUNDARY

Extreme caution and flash PPE should be utilized when interacting with equipment having an incident energy rating higher than 8 cal/cm². This includes turning equipment on or off.

cal/cm ²	Recommended PPE for Flash and Shock
less than 1.2	Long Sleeve Natural Fiber, i.e. 100% cotton Shirt and Pants, Safety Glasses or Goggles, Hard Hat, Hearing Protection, Rubber Insulating Gloves as Required, Leather Gloves (as needed), Leather Work Boots (EH)
1.2 and greater up to 8.0	Clothing with an arc rating greater than the incident energy. i.e. Shirt and Pants, Hard Hat with Face Shield & Balaclava (or hood), Safety Glasses or Goggles, Hearing Protection, Rubber Insulating Gloves with Leather Protectors, Leather Footwear (EH)
8.0 and greater up to 40.0	Clothing with an arc rating greater than the incident energy. i.e. Arc Flash Suit, Hood, Hard Hat, Safety Glasses or Goggles, Hearing Protection, Rubber Insulating Gloves with Leather Protectors, Leather Footwear (EH)
greater than 40.0	Danger! Wear PPE rated for the available incident energy at the corresponding working distance. There is an increased likelihood of injury from an arc flash while working on this equipment.

! WARNING

ARC FLASH AND SHOCK HAZARD

FLASH PROTECTION	SHOCK PROTECTION
<1.2	480 VAC
cal/cm ² Flash Hazard at 18 inches	Glove Class 0 Limited Aprch. Boundary 42 inches Restricted Aprch. Boundary 12 inches
Flash Protection Boundary 18 inches	

(FOR WHEN AN INCREASED LIKELIHOOD OF INJURY FROM AN ARC FLASH HAZARD EXISTS) (FOR EXPOSED ENERGIZED CONDUCTORS)

Recommended PPE for Flash and Shock:
Long Sleeve Natural Fiber, i.e. 100% cotton Shirt and Pants, Safety Glasses or Goggles, Hard Hat, Hearing Protection, Rubber Insulating Gloves as Required, Leather Gloves (as needed), Leather Work Boots (EH)

September 25, 2017

How to Read an Arc Flash and Shock Hazard Label

Labels are divided into two parts: Arc Flash *and* Shock Hazard
Machines with these labels have the potential to produce both flash and shock injuries

Flash Protection

(for when an Increased Likelihood of Injury from an Arc Flash Hazard Exists)

Amount of energy available at the working distance. Wear PPE rated to at least this calorie rating when within the Flash Protection Boundary (including verification if it is energized).

Flash Protection Boundary

Distance from the source that a person could receive a second degree burn if a flash occurred. All parts of your body in this boundary must be protected from flash.

Available fault current supplied from the device's source (used for service equipment or non-generic labels)

ARC FLASH AND SHOCK HAZARD	
FLASH PROTECTION <1.2 cal/cm ² Flash Hazard at 18 inches	SHOCK PROTECTION 480 VAC
Flash Protection Boundary 18 inches Available Fault Current 29.62 kA (FOR WHEN AN INCREASED LIKELIHOOD OF INJURY FROM AN ARC FLASH HAZARD EXISTS)	Glove Class 0 Limited Aprch. Boundary 42 inches Restricted Aprch. Boundary 12 inches (FOR EXPOSED ENERGIZED CONDUCTORS)
Recommended PPE for Flash and Shock: Long Sleeve Natural Fiber, i.e. 100% cotton Shirt and Pants, Safety Glasses or Goggles, Hard Hat, Hearing Protection, Rubber Insulating Gloves as Required, Leather Gloves (as needed), Leather Work Boots (EH)	
September 25, 2017	

A recommended list of PPE for Shock and Flash that should be worn when working on equipment that is not placed in an electrically safe work condition.

Shock Protection

(for Exposed Energized Conductors)

Voltage of the labeled equipment

Minimum glove rating (Voltage Dependent)

Limited Approach Boundary

Minimum distance that un-qualified persons must remain unless advised and continuously escorted by a qualified person.

Restricted Approach Boundary

All parts of your body in this boundary must be protected from shock - only qualified persons allowed.

Definitions:

Arc Flash – An explosion caused from an uncontrolled electrical arc within equipment. A slip of a wrench or dropping a wire while working on live equipment can start this event. The explosion can be of varying severity depending on the power supplied.

NFPA 70E – National Fire Protection Association Standard for Electrical Safety in the Workplace – 2018 Edition

PPE – Personal Protective Equipment

Flash Boundary

Flash Protection Boundary
(distance independent from shock boundaries)

Shock Boundaries

Limited Approach
Restricted Approach

Exposed Energized Conductor

