Simplifying NFPA 70E Compliance While Decreasing Downtime and Operating Costs

Kris Kamakian

Meltric Corporation

SAFETY & COMPLIANCE

UL & CSA Switch-Rated Plugs and Receptacles

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SAFETY ISSUES

with standard plugs & receptacles

- Disconnection of plug while energized could result in an arc flash event
- Potential for exposure of live conductors when the plug is removed from the receptacle
- Connection while energized may weld contacts together damaging plug and receptacle
- Mechanical interlocking may fail resulting in an energized plug and receptacle
- Verification of zero energy requires testing of disconnect switch

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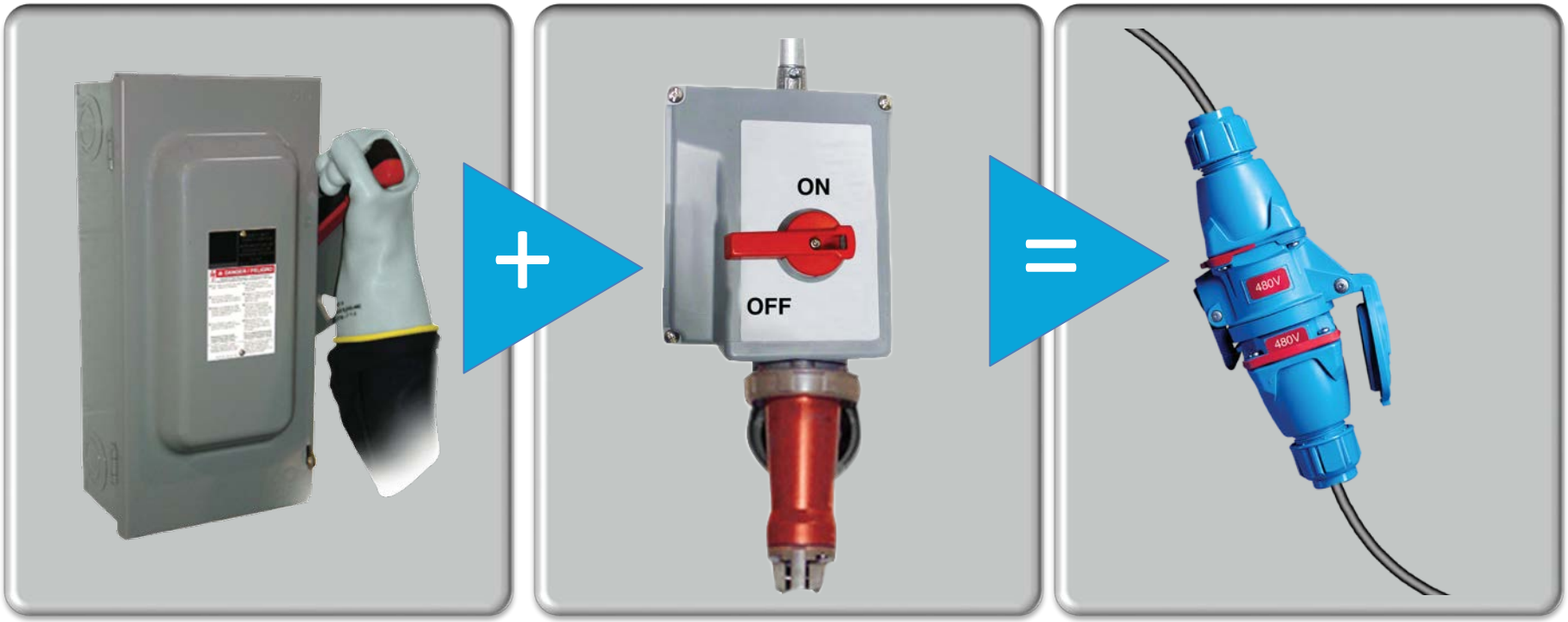
The safety of the switch

with the convenience of a plug & receptacle



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Designed to safely make and break under full load up to 75HP and 200A

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Plant Engineering PRODUCT of the YEAR© Winner 2014

New Product!

DSN150

Switch-Rated up to 75HP

Up to 6 Auxiliary Outputs

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Decontactors are NEC approved ‘Line of Sight’ disconnects

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Decontactors

are NEC approved 'Line of Sight' disconnects

Article 430.102
A disconnecting means must be located in sight from the motor and driven equipment

Article 430.107
The disconnecting means must be readily accessible

Article 430.109
The disconnecting means must be an approved switch or horsepower rated plug & receptacle

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Numerous Mounting Configurations

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Motor Change Out

Process Comparison

Process with a Bladed Disconnect Switch

1. Electrician actuates disconnect switch
2. Determine PPE requirements and obtain
3. Remove disconnect cover
4. Voltmeter test to verify de-energization
5. Apply Lockout-Tagout
6. Disconnect motor from hard-wiring
7. Mechanic removes old/installs new motor
8. Electrician connects motor to hard wiring

Process with Meltric Decontactors

1. Mechanic or Electrician removes plug from receptacle
2. Apply Lockout-Tagout as required
3. Mechanic removes old/installs new motor
4. Mechanic inserts plug into receptacle

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Key UL Performance Tests

- **Electrical Overload -** 50 operations @ 150% of rated current & voltage, p.f. <.8
- **Electrical Endurance –** 6,000 operations at rated current & voltage, p.f. <.8
- **HP Locked Rotor Overload -** 50 operations @ 600% of max motor FLA, p.f. <.5
- **Short Circuit Closing & Withstand –** HP rated: 100kA, 600V, p.f. <.15, RKI fuses @ > 400% max FLA

  Other: 65kA, 600V, p.f. .15, RK5 td fuses @ > 100% of rated A

UL & CSA

Performance Approvals

Applicable UL Standards

UL Subject 2682 (switch rated plug & receptacle)

- UL 1682 (plug & receptacle)
- UL 98 (enclosed switches)
- UL 508 (manual motor controller)

Applicable CSA Standards

CSA 22.2 No. 182.1 (plug & receptacle)

UL Subject 2682 (switch-rated plug & receptacle)

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The Difference Is In The Design

- Silver-nickel spring loaded contacts
- Quick-break operating mechanisms
- Integral lockout provisions
- Dead-front safety shutter
- Optional auxiliary contacts
- Spring assisted terminals
- Washdown rated type 4X

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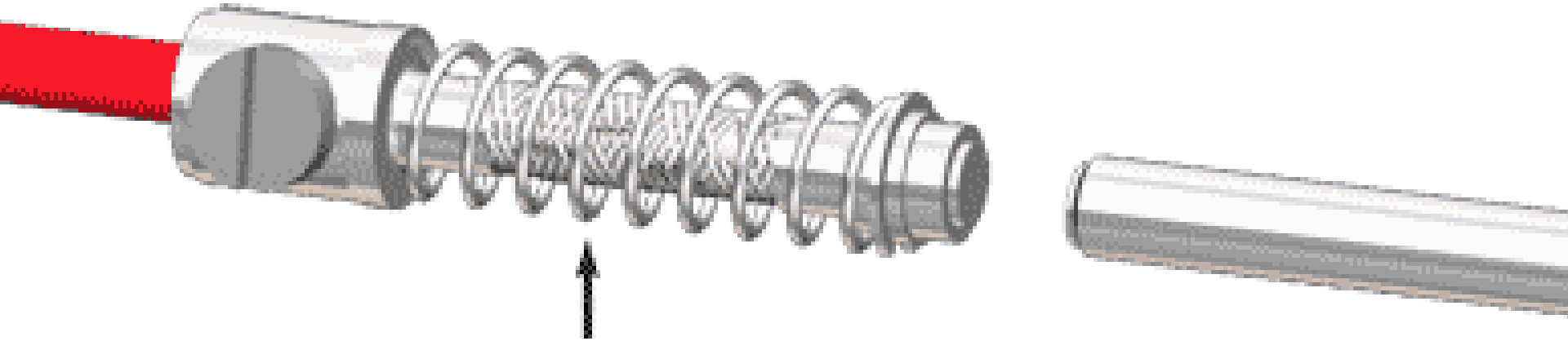
Silver-Nickel Contact Material



Flexible Metallic Braid

- 20X more conductive than brass
- Resists welding & wear
- Withstands arcing
- Better corrosion resistance

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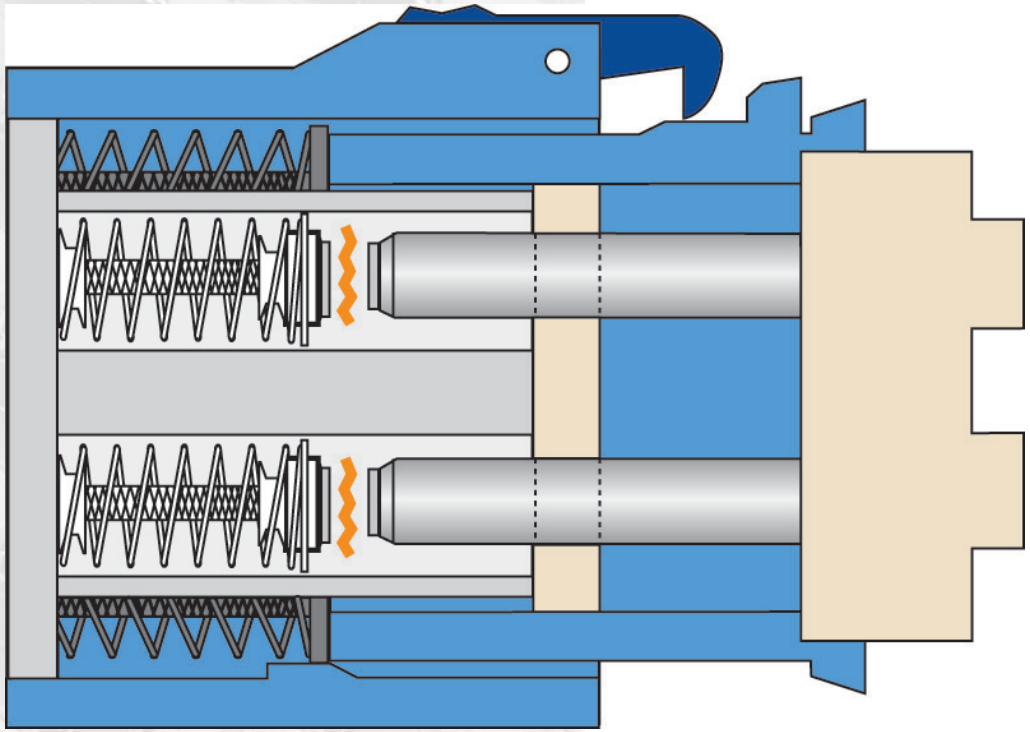
Quick-Break Mechanisms



Decontactor contacts break in about 15 milliseconds

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Safety Shutter On Receptacle

- Shutter automatically closes before the plug can be removed
- Eliminates unintended access to live parts and arc flash
- Shutter can only be opened by an electrically compatible plug

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Easy Lockout-Tagout

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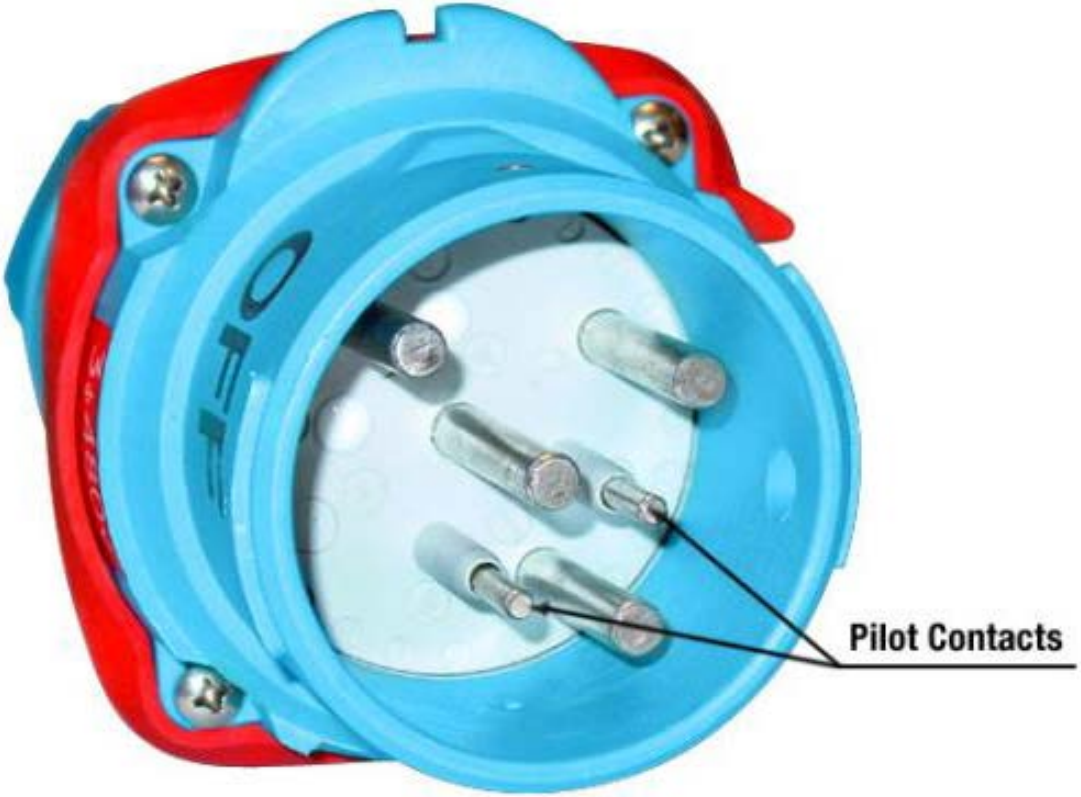
Optional Auxiliary Contacts



- Provides a single connection for power and control circuits
- Up to 6 auxiliary contacts
- Make last, break first

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Spring Assisted Terminals

Elliptical deforming ring prevents loosening by compensating for:

- Conductor yield
- Strand settlement
- Vibration
- Thermal cycling

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Washdown & Watertight Rated

- Type 3R / 4X
- IP 66/67

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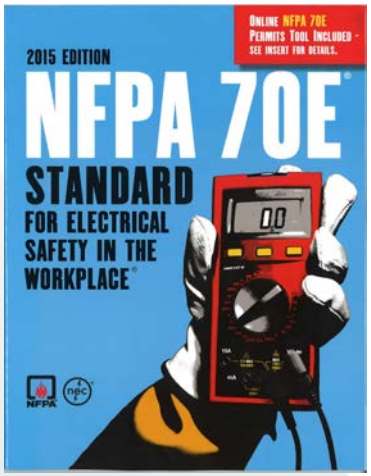
Simplify Compliance with NFPA 70E



- Make and break connections without exposure to live parts or arc flash
- Removal of the plug provides visual verification of de-energization, without voltage testing
- Integral provisions make LOTO easy
- Zero risk under “normal operation”
- No PPE is required!

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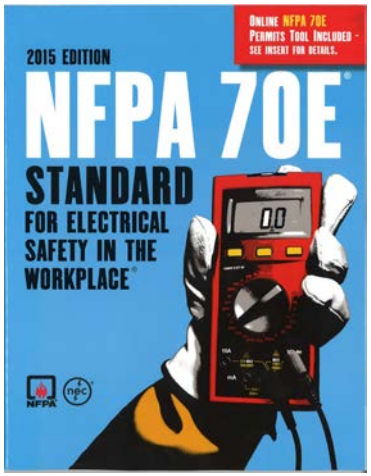
Simplify Compliance with NFPA 70E



Significant change from the 2012 edition

Deletion of HRC 0 & Clarifying "Normal Operation"

Reference: 2015 NFPA 70E **Article 130.7**

Arc Flash PPE is **NOT** required if:

Task: Normal operation of a circuit breaker, (CB), **SWITCH**, contactor, or starter

No PPE if the following criteria is met:

- The equipment is properly installed;
- The equipment is properly maintained;
- All equipment doors are closed and secured
- All equipment covers are in place and secured; and
- There is no evidence of impending failure.

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Simplify Compliance with NFPA 70E

Significant change from the 2012 edition

Arc Flash PPE **IS** required if:

Work on **energized electrical connectors** and circuit parts, including **voltage testing**.

Page 40 130.7 (C)(16) PPE Level 1 Requirements:

Arc-Rated Clothing, Minimum Arc Rating of 4 cal/cm2

Arc-rated long sleeve shirt and pants or arc-rated coverall

Arc-rated face shield or arc flash suit hood

Arc-rated jacket, parka, rainwear, or hard hat liner (AN)

Protective Equipment Required:

Hard Hat

Safety glasses or safety goggles

Hearing protection (ear canal inserts)

Heavy-duty leather gloves

Leather footwear

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Simplify Compliance with NFPA 70E

Arc Flash PPE is **NOT** required if:

- Normal ON/OFF of a disconnect switch
- Normal ON/OFF of a Meltric switch –rated plug and receptacle

Hazard Risk Cat. 1-4 Arc Flash PPE **IS** required if:

- Disconnecting a pin and sleeve, twist lock, interlock, or bladed disconnect from a driven motor or piece of equipment.
- Maintenance, removing hard wiring, or moving a piece of equipment connected to one or more of the above connection types.

Arc Flash PPE is **NOT** required if:

- Maintenance or moving a piece of equipment connected with a Meltric switch-rated plug and receptacle.

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USES & BENEFITS

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Common Decontactor Applications

- Welding Machines
- Motors
- Pumps
- Generators
- Conveyors
- Portable Lighting
- Power Distribution
- Mobile Facilities
- Hoists
- MCC's

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Welding

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Motors / Pumps

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Conveyors / Processing

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Portable Equipment

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Generators/ Power Distribution

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Motor Control Centers

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Hoists / Cranes

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Trailer Plugs

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COMMON DECONTACTOR INDUSTRIES

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General Industrial / Fabrication

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Food & Beverage Processing

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Power Plants

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Aggregate / Concrete

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Water / Wastewater

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Mining / Oil & Gas

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Automotive

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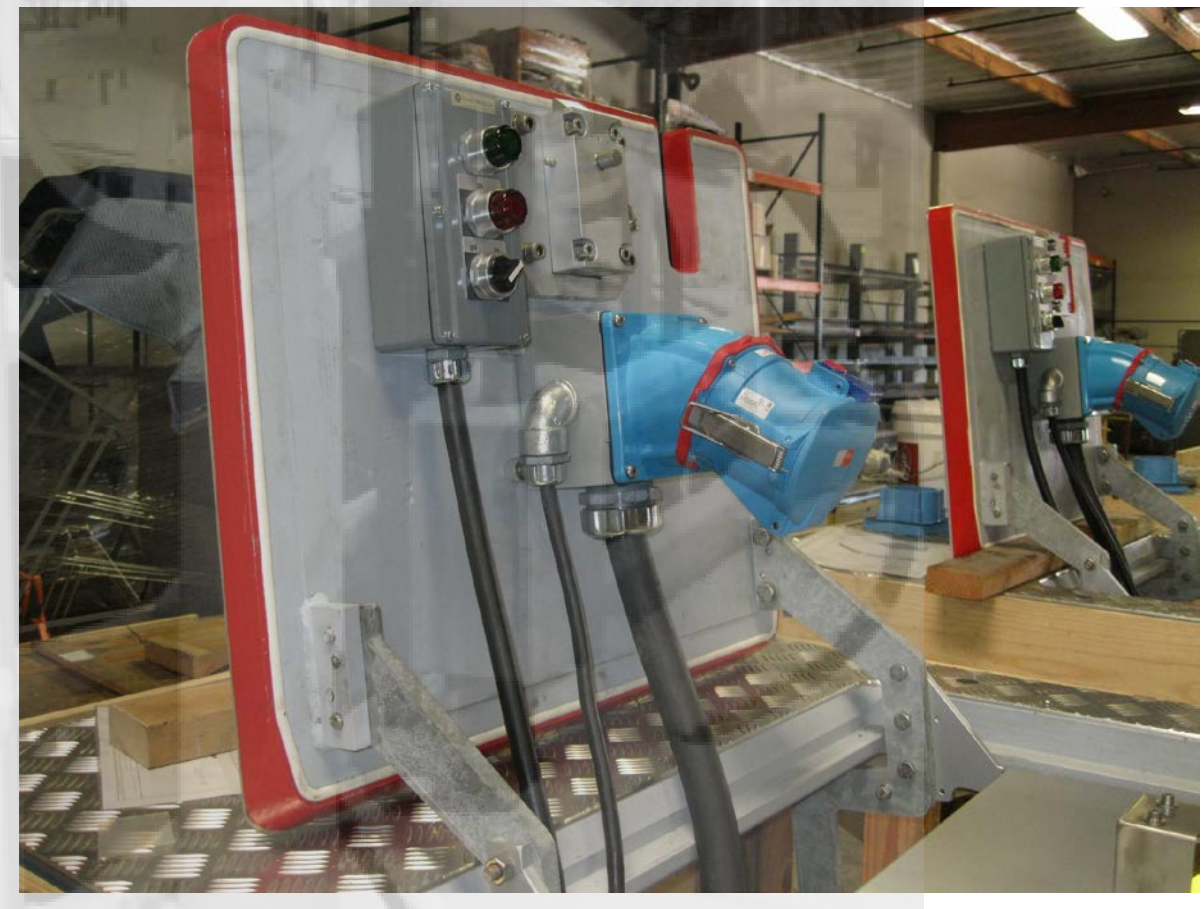

Airports

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Military

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ACCESSORIES

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Handles, Wall Boxes and Mounting Angles

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Adapters Plates

Make Retrofits Easy

Meltric offers many standard plates & custom designs

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Other Meltric Products

Hazardous Duty

- CSA Class I, Div 2 & Class II, Div 2
- ATEX Zone 1 - II G/D Eex IIC T6
- Available in 20, 30, 60, 100A sizes
- Optional Auxiliary contacts on 30 &
- Light, but robust polymeric casing

Multi-Pin Devices

- Silver-Nickel Butt Contacts
- From 7 to 37 contacts
- 2A to 150A
- Some are load-break rated
- Polyester, Aluminum & SS housings

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High Ampacity Connectors

300A, 400A and 600A Multi-pole solutions for Power Distribution

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Power Distribution

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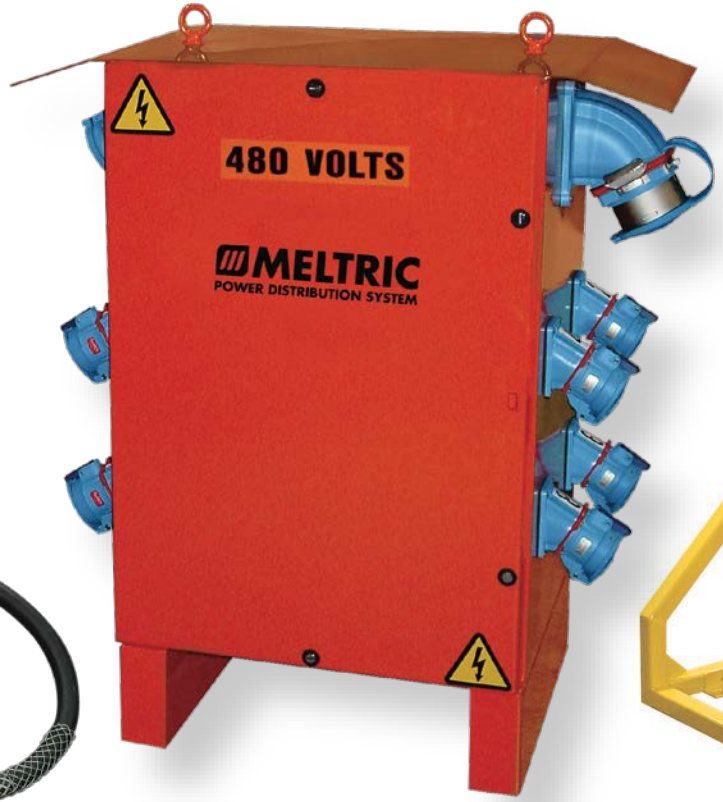
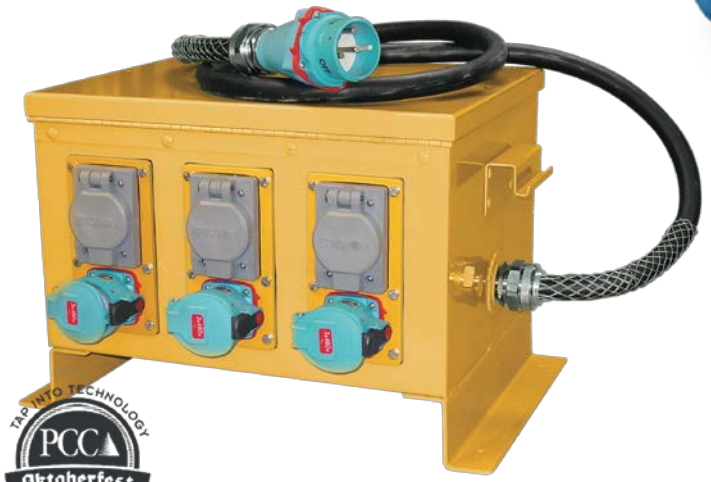
Custom Power Distribution





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- **Next Day Shipping**
- **Worldwide Availability**
- **5 Year Electrical Warranty**

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