BIF - 2011

Arc Flash

Power Panels

&

Best Practice

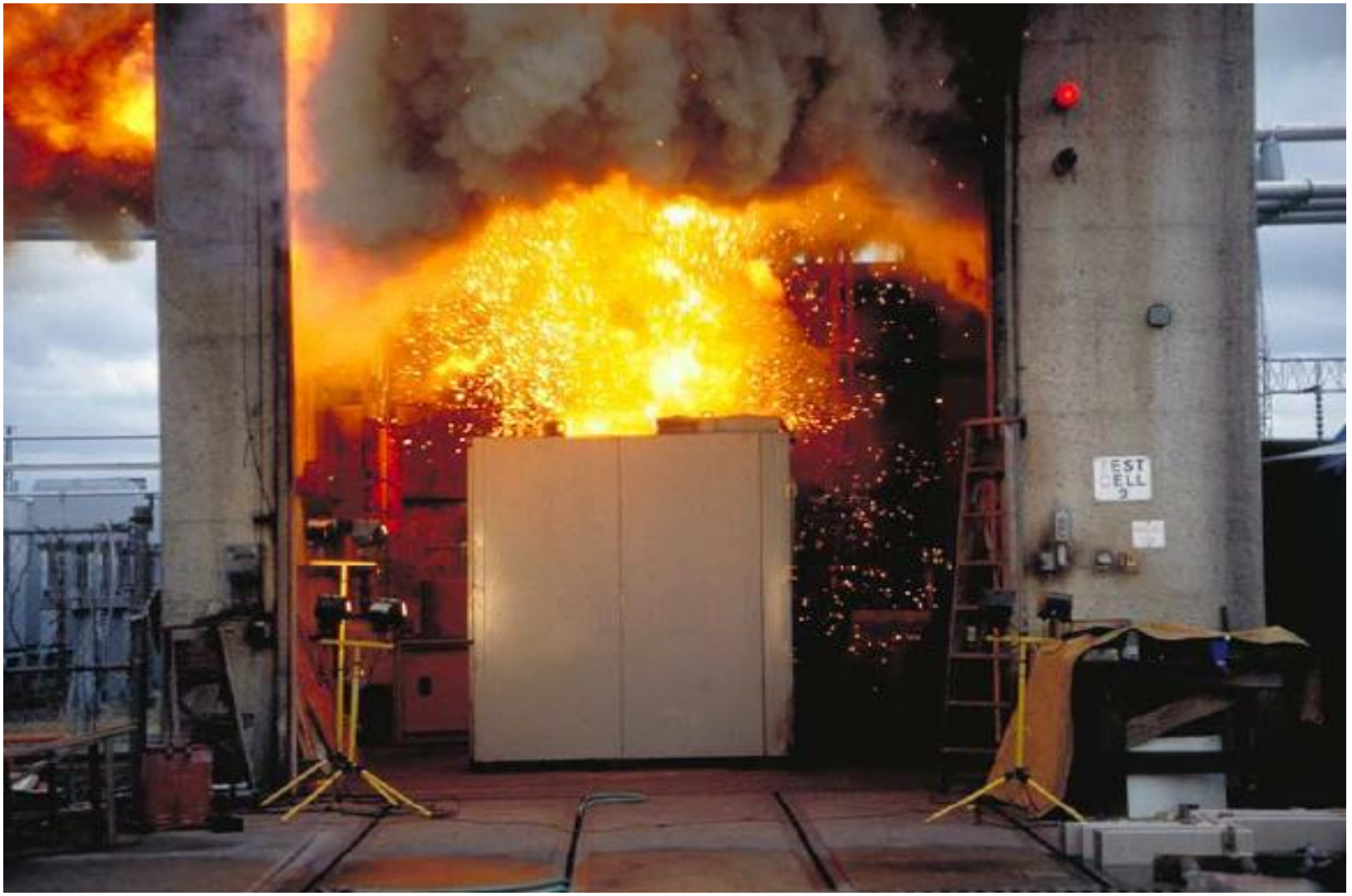
"Wrong movie reference, Burnie. And don't call me Houston."

ARC Flash

- What is it?
- Where does it come from?
- What can it cost you?
- How do you protect your self, your employees and your company?

What is Arc Flash?

What is Arc Flash?



What can happen?

What is it?

- A Dangerous explosive release of energy
  - Associated with :
    - Phase to ground
    - Phase to phase fault
  - What can cause this?

What can Cause it

- Dropped tools
- Accidental Contact with electrical Systems
- Conductive Dust
- Corrosion
- Improper work conditions
- Poorly trained employees

Who Cares?

- Bakers
- Equipment manufactures
- Employees
- Contract Workers

- Lawyers

- Oh ……And OSHA (I think you know them)

What Must I do?

- New equipment installations
  - Proper design of control panels and switch gear
  - But the Requirements are:
    - not specifically spelled out by OSHA
- Existing panels and switch gear
  - OSHA regulations state an employer must identify and assess the electrical hazards for employees and protect them from those hazards.

What is Required

- Hazard Risk Assessment
  - Before working on energized parts above 50V
    - Probably every panel in your plant
    - or that you manufacture to old standards
  - If a hazard exist
    - An employer must select and require employees to use protective apparel (PPE) (including special underwear!!!)
      - Yea Right I can see that happening when a break down occurs
    - If you do that ….. you MIGHT be compliant

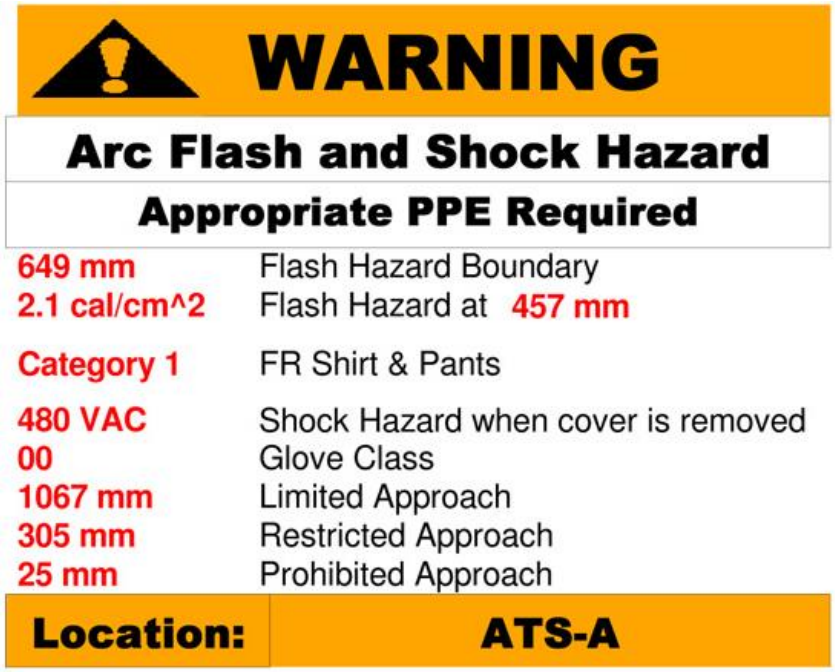

Photo Courtesy of Oberon Company

Can you be cited by OSHA

- OSHA has been issuing citations to companies for failure to assess and identify the hazards present.

- The envelopes please:
  - Open panel during an inspection $7,500
  - Someone working in an open panel $30,000

Labels on a Panel that has been Risk Assessed



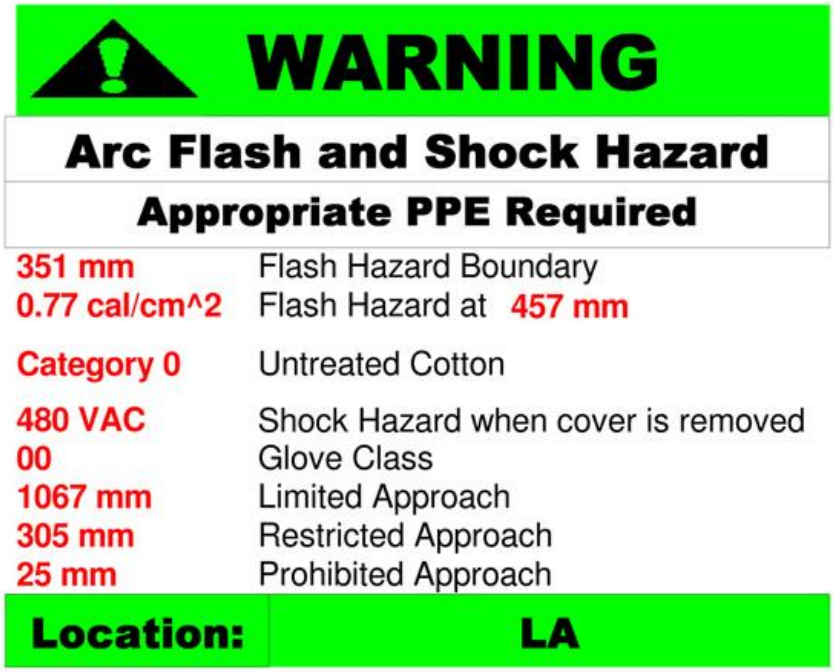
WARNING

Arc Flash and Shock Hazard

Appropriate PPE Required

649 mm	Flash Hazard Boundary
2.1 cal/cm^2	Flash Hazard at 457 mm
Category 1	FR Shirt & Pants
480 VAC	Shock Hazard when cover is removed
00	Glove Class
1067 mm	Limited Approach
305 mm	Restricted Approach
25 mm	Prohibited Approach

Location: ATS-A



WARNING

Arc Flash and Shock Hazard

Appropriate PPE Required

351 mm	Flash Hazard Boundary
0.77 cal/cm^2	Flash Hazard at 457 mm
Category 0	Untreated Cotton
480 VAC	Shock Hazard when cover is removed
00	Glove Class
1067 mm	Limited Approach
305 mm	Restricted Approach
25 mm	Prohibited Approach

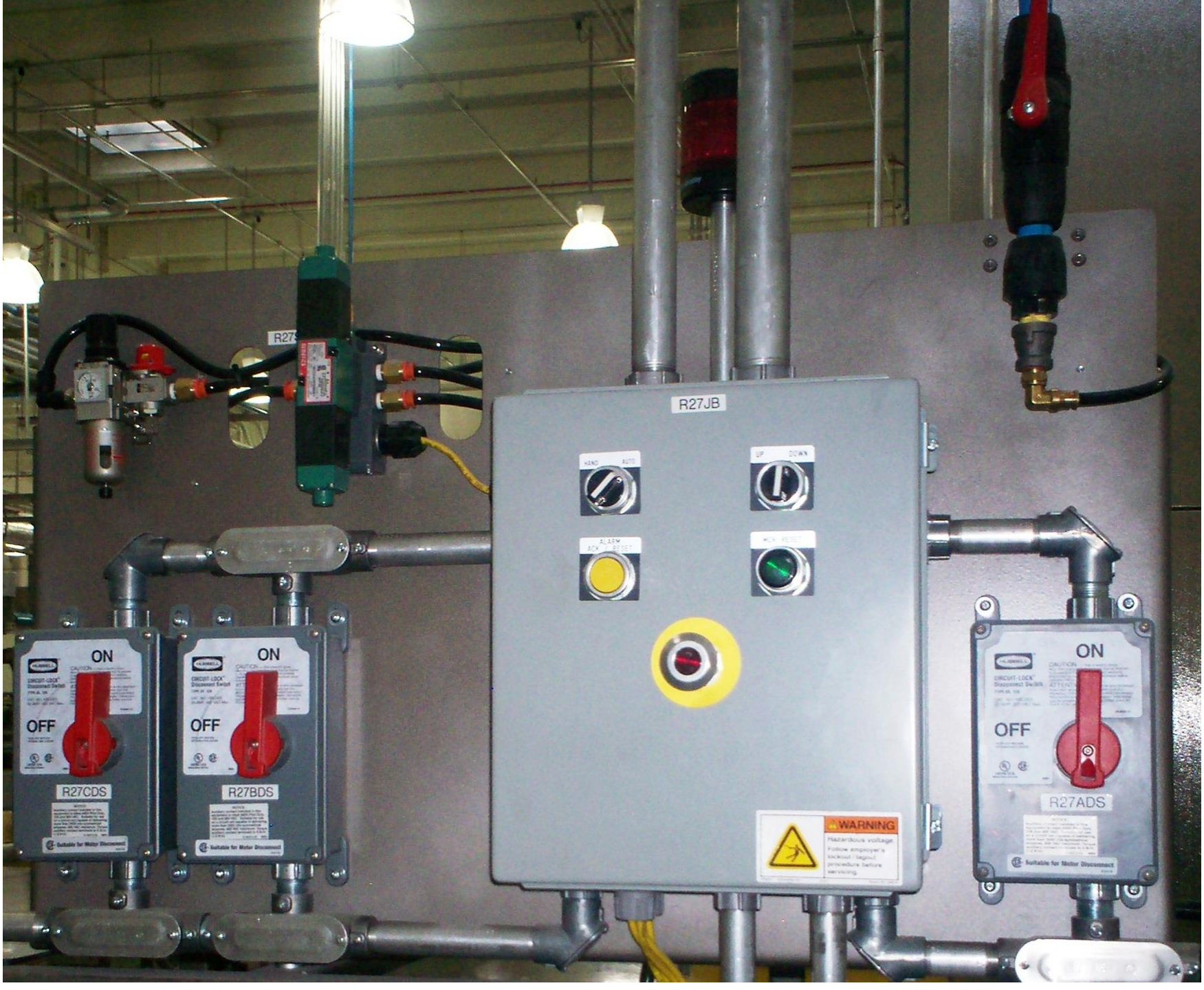
Location: LA

You have other choices

Other Options and Methods


DANGER RISK OF ELECTRIC SHOCK
FUSE COVER MUST BE INSTALLED FOR SAFE OPERATION
OFF
05/11/2011 00:33

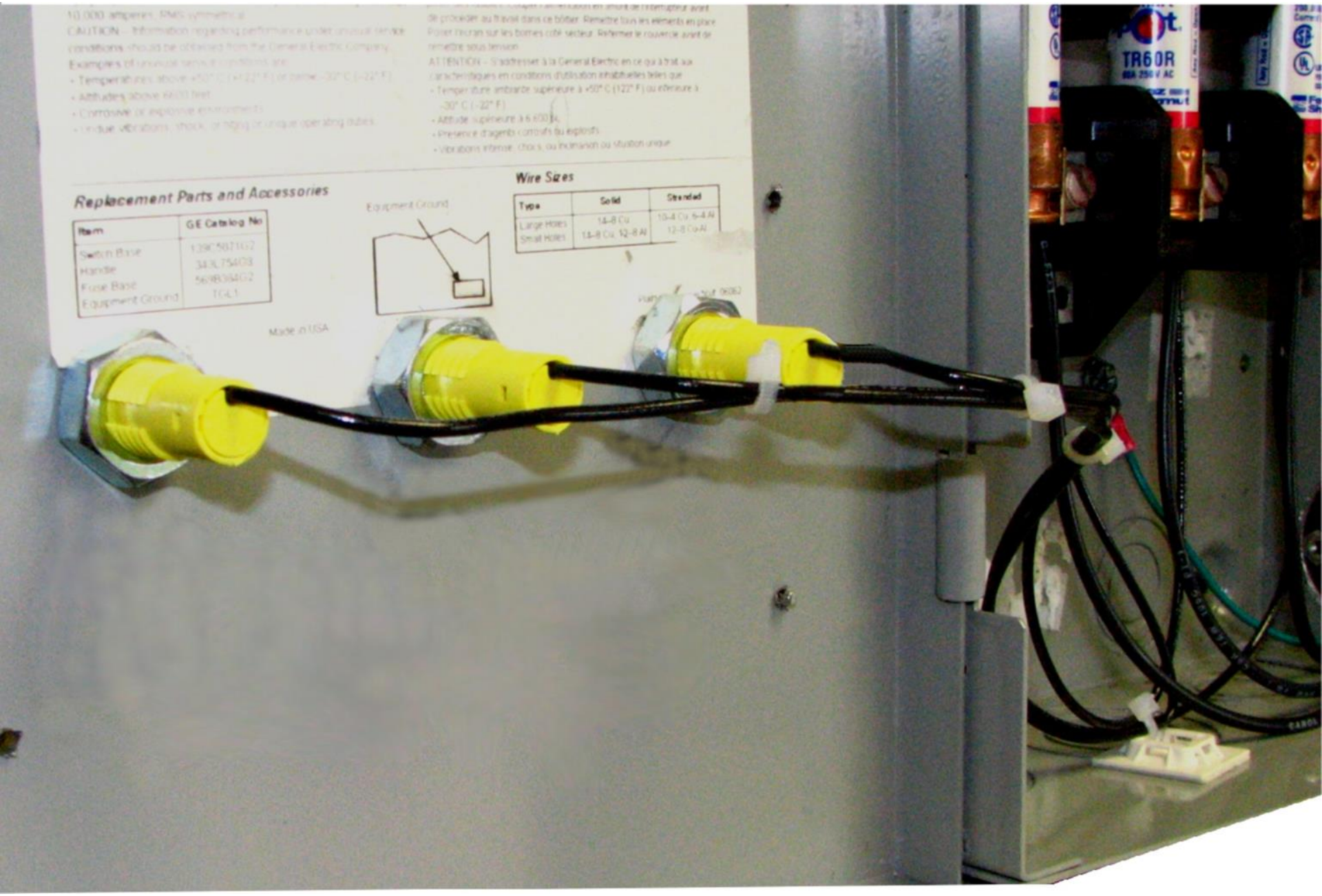

240W
PSSR-SG24
05/11/2011 00:33


R27JB
HAND
AUTO
UP
DOWN
ALARM
ACK
RESET
ON
OFF
R27CDS
ON
OFF
R27BDS
ON
OFF
R27ADS
WARNING
Hazardous voltage
Follow employer's
lockout / tagout
procedure before
servicing.


CAUTION
VORSICHT
ADVERTENCIA
440/460/480 VAC
50/60 HZ
3 PHASE
DANGER VOLTAGE IF FLASHING
SAFETY PROCEDURES STILL APPLY.
TEST BEFORE TOUCHING.
VAC VDC
POWER
DANGER
WARNING!
OFF
DANGER VOLTAGE
VOLTAGE PRE-TEST POINT
L1
L2
L3
Follow Safety Procedures

R-1A0033W-NPLPH


VAC
VDC
L2
L3
POWER
L1
GND
DANGER
40-750 VAC, 30-1000 VDC, 3 Ø
RED YEL BLU GRN
AØ BØ CØ GND
GRACE
ENGINEERED
PRODUCTS, INC
WWW.GRACE-ENG.COM


TR60R
Replacement Parts and Accessories
Item
GE Catalog No
Switch Base
Handle
Fuse Base
Equipment Ground
TC4J1
Made in USA
Equipment Ground
Wire Sizes
Type
Solid
Stranded
Large Holes
Small Holes
14-8 Cu
14-8 Cu, 12-8 Al
10-4 Cu, 6-4 Al
12-8 Cu-Al


F
DANGER VOLTAGE
VOLTAGE PRE-TEST POINTS
L1
L2
L3
Follow Safety Procedures
Read Instructions
Procedure: Non Contact Voltage Detector (NCVD) Specifications Apply
1.) Verify NCVD to known voltage source.
2.) Open isolator.
3.) Insert NCVD and test ALL points.
4.) Re-verify NCVD to known voltage source.
ANGER

Goto www.GracePort.com for more information

Features:

- Redundant Circuitry / Long Life LED' - either flashing or non-flashing
- 40-750VAC / 30-1000VDC
- Potted Construction with 6' Leads
- Phase Insensitive
- 30MM Pushbutton or Pilot Hole
- High Surge Immunity
- UL type 4X Listed

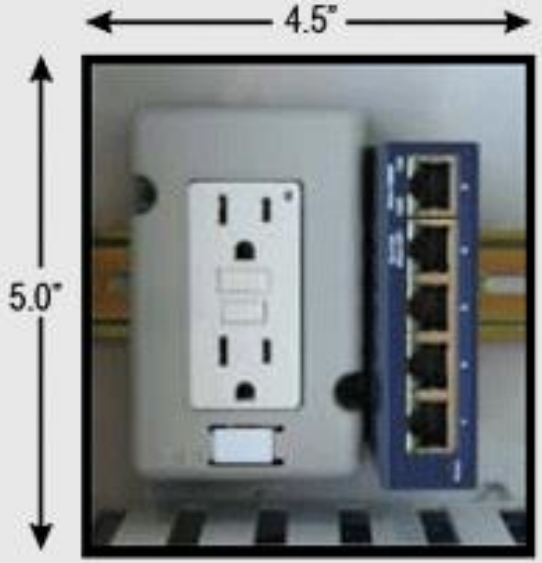
Applications:

- Circuit Breaker Disconnects - No Visible Blades
- High Energy Panels (NFPA 70e Category III and IV)
- Frequently Accessed Panels
- Mechanical LOTO: Indicating Zero Energy
- Panels with Multiple Power Sources

FRONT

REAR

PANEL SPACE SAVINGS



P-E5P11-M3RF0: Ethernet Switch with Port **P1** on front, Type A USB, and our patented Inside-Outlet® in a UL Type 4 Enclosure.

P-E5-M3RF3: Interior View Ports **P2** - **P5**, Inside-Outlet® ,3A Circuit Breaker in a UL Type 4 Enclosure.

SPECIFICATIONS: ELECTRICAL OUTLET

Low voltage (data), limited to 30 VDC
High voltage supply (for computer use only)
120 VAC, 15A (UL), 5A (CSA)
230-240 VAC, 16A (CE only)

SPECIFICATIONS: HOUSING

Housing: Cast aluminum base
Latch: Type 304 Stainless Steel (1CR18NI19)
Cover: Polycarbonate, UV rated, V-O Flame rated
Gasket: Thermoplastic elastomer
Insert Material: Acrylic UL94HB


GracePort® Interface
P-B9-H3R3
DH+
GRACE
ENGINEERED
PRODUCTS, INC.
WWW.GRACEPORT.COM
3 AMP
120VAC, 5A
E207344
LR110645
ENC.
TYPE 4
FOR COMPUTER USE ONLY

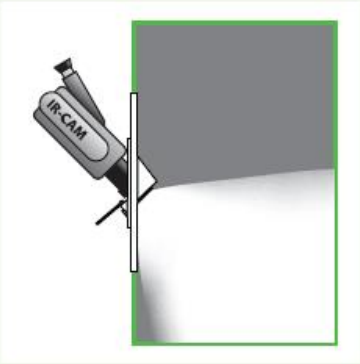

GracePort® Interface
P-PJP5-B3RX
KEYBOARD
MOUSE
ENC.
TYPE 4
E207344
LR110643
GRACE
ENGINEERED
PRODUCTS, INC
WWW.GRACE-ENG.COM

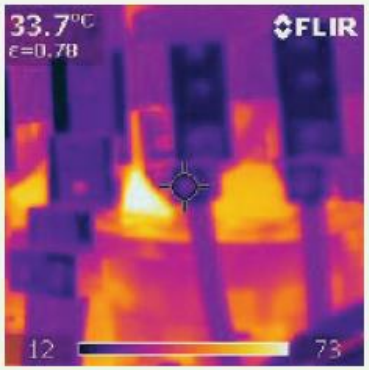

ETHERNET


GracePort® Interface
GFCI Inside - Outlet®
P-R2-K3RF3
120VAC, 3A
FOR COMPUTER USE ONLY
E207344
LR110845
ENC. TYPE 4
GRACE ENGINEERED PRODUCTS, INC
WWW.GRACEPORT.COM
ETHERNET
3 AMP

POWERSMITHS

POWERSMITHS INTERNATIONAL CORP. 10 Devon Road, Brampton, Ontario L6T 5B5 Canada
Phone: (905) 791-1493 Toll-free: (800) 747-9627 Fax: (905) 791-8870 Email: info@powersmiths.com
www.powersmiths.com



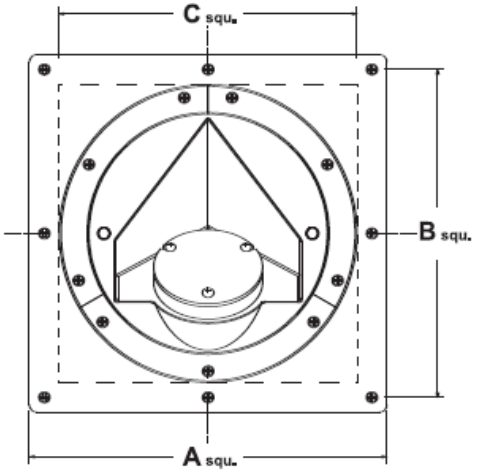


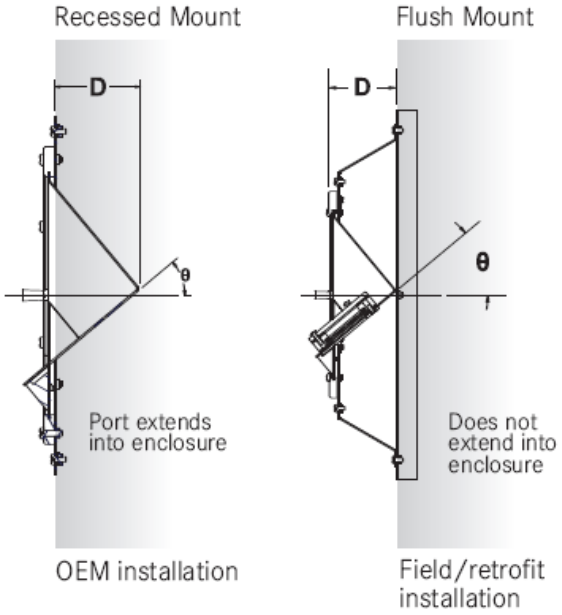
Above shows one view taken by an IR camera through the Powersmiths Rotatable IR Viewing Port.

- Enables thorough thermographic inspections without exposing personnel to live electrical components and associated Arc Flash hazards
- Substantially increases the viewing area compared to fixed IR windows
- Makes preventative and predictive maintenance programs easier and less costly to implement
- Safeguards equipment assets
- Helps avoid operational disruptions

The unit comprises three components:

- A fixed base that is mounted to the enclosure wall
- A rotatable (360°) assembly mounted to the base via a bezel
- An IR viewing port mounted to a rotatable assembly for the actual thermographic imaging





AVAILABLE MODELS

RECESSED-MOUNT PORT

Model	A	B	C	D	⊖
IRP - *240	12	11	10	2.8	40˚
IRP - *250	12	11	10	2.3	50˚
IRP - *340	14	13	12	3.6	40˚
IRP - *350	14	13	12	3.0	50˚
IRP - *360	14	13	12	3.1	60˚
IRP - *460	14	13	12	3.1	60˚

* Window type R or C

FLUSH-MOUNT PORT

Model	A	B	C	D	⊖
IRP - *250F	16.6	16	15.3	2.9	50˚
IRP - *350F	19.5	18.8	18	3.67	50˚
IRP - *360F	19.5	18.8	18	3.67	60˚
IRP - *460F	19.5	18.8	18	3.67	60˚

* Window type R or C

IRP CERTIFICATIONS: UL and cUL recognized to UL50. File No E329179

VIEWING WINDOW CERTIFICATIONS: UL recognized to UL 508A and CSA C222.2 No. 14

Questions

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Thank you