Eaton's solution to arc flash

For years, electrical equipment has been designed to withstand and deal with the issue of bolted faults, where the current spikes to a dangerously high level but is safely interrupted by the protective devices contained in the equipment (breakers, fuses and relays). However, these devices typically do not detect and interrupt dangerous internal arcing faults, which have a lower current level, but can generate a far more dangerous scenario for operating personnel.

Arc faults can be caused by a breakdown of insulation materials, objects coming into close proximity with the energized bus assembly, even entry of rodents or other animals into the equipment. The thermal energy created by these events can get as high as 35,000°F, melting materials and clothing from several feet away. Also consider that the arc blast produced by a lineup of 480 Vac switchgear rated at 85 kA can be equivalent to 20.7 lbs of TNT!

So, what is the solution?

Eaton's solution: arc-resistant low voltage switchgear

Eaton introduces the addition of an ANSI Type 2 arc-resistant low voltage switchgear offering to its current product line. This is the latest release in arc-safe equipment from Eaton's Electrical Sector.

The arc-resistant low voltage switchgear protects operating and maintenance personnel from dangerous arcing faults by redirecting or channeling the arc energy out the top of the switchgear, regardless of the origination location of the arc.

Eaton's arc-resistant low voltage switchgear has been successfully tested to ANSI C37.20.7 at KEMA-Powertest, and has been UL® witnessed and certified.

Standard features

- Ratings:
  - Up to 100 kA short circuit at 508 Vac maximum and up to 85 kA short circuit at 635 Vac maximum
  - Up to 10 kA horizontal main bus continuous current
  - Up to 5 kA vertical bus continuous current
  - Magnum™ DS power circuit breaker frame ratings between 800A and 6000A
- ANSI Type 2 arc-resistant design protects the operator around the entire perimeter of the equipment
- Floor-to-ceiling height of 10 feet required whether exhausting into a room or through an arc plenum
- Strengthened one-piece breaker door and latches
- Dynamic flap system on rear ventilation openings that remain open under normal operating conditions, but close during an arcing event to prevent dangerous gasses from escaping
- Patented bellows design allowing drawout of breaker into the disconnected position with the door closed, while simultaneously protecting the operator from any dangerous gasses during an arc event
- Patented venting system that directs arc gasses out the top of the enclosure, regardless of the arc origination location
- Up to four-high breaker configuration with no additional layout restrictions
- Strengthened side and rear panels with standard split rear covers for cable access
- NEMA® 1 enclosure, with either top or bottom cable or bus duct entry
- Cable compartment floor plates

Optional features

- Zone selective interlocking protection
- ANSI Type 2B arc-resistant design protects the operator even with the low voltage instrument compartment door open
- Arcflash Reduction Maintenance System™
- Safety shutters
- One-piece hinged and bolted rear panel
- Insulated bus
- Vented bus/cable compartment barrier
- Cable compartment segregation barrier

Benefits

- Superior protection against arcs in breaker, bus or cable compartments
- No increase in footprint over regular Magnum DS switchgear
- Closed door racking

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Standards

- UL 1558 and UL 891
- ANSI C37.20.1, ANSI C37.13, ANSI C37.51 and ANSI C37.20.7
- CSA® standard—CSA C22.2 No. 31-04
- Third-party (UL/CSA) witness tested
- Seismic certification 2006-IBC

Testing

Testing procedures were completed per ANSI C37.20.7 standards with arcs initiated in:

- Breaker compartment
- Vertical and horizontal bus
- Cable termination compartments

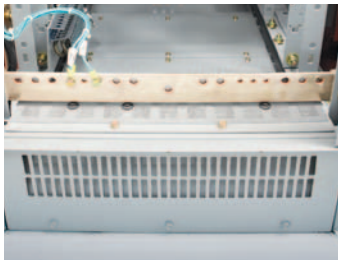
Additionally, the tested arc duration was up to the full 0.5 seconds recommended by ANSI C37.20.7, with no dependence on the tripping speed of an upstream breaker.

The rigor of Eaton's testing protocol provides a level of protection unmatched in the industry.

Strengthened One-Piece Breaker Door

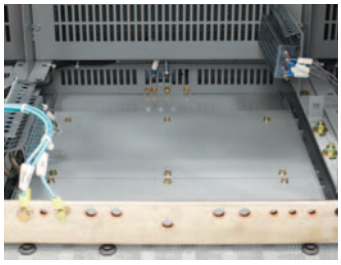
Bellows and Two-Point Door Latch

Rear Top Vent w/Dynamic Flap



Rear Bottom Vent w/Dynamic Flap

Hinged Bolted Rear Panel



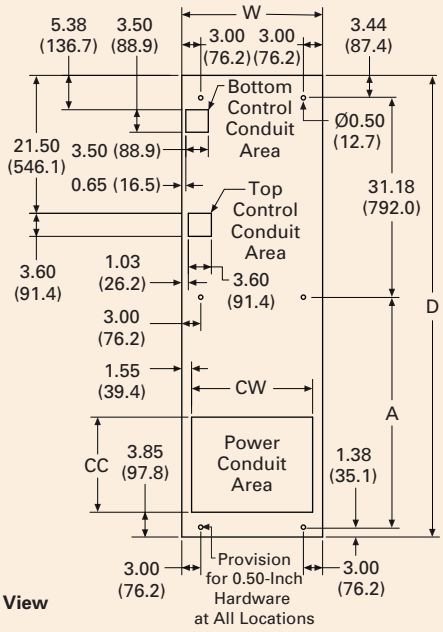
Cable Compartment Floor Plates

Dimensions in Inches (mm)—See Section Plan View

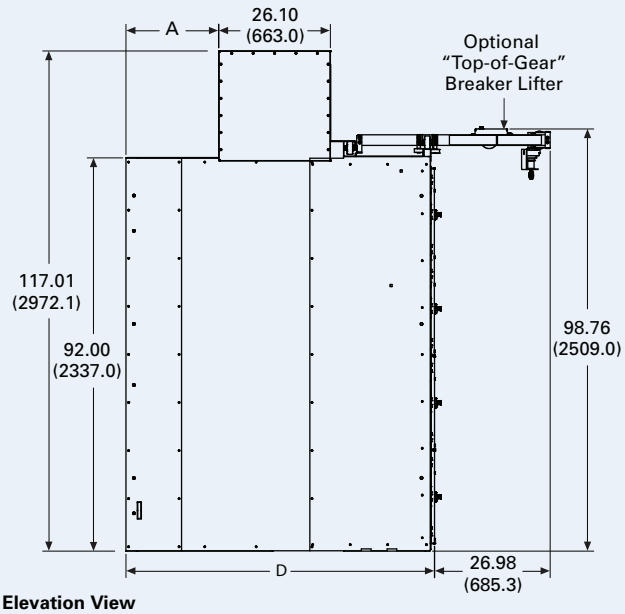
W	CW	D	A	CC (Top)	CC (Bottom)
22.00 (558.8)	18.90 (480.1)	72.00 (1828.8) 78.00 (1981.2) 84.00 (2133.6) 90.00 (2286.0)	36.00 (914.4) 42.00 (1066.8) 48.00 (1219.2) 54.00 (1371.6)	14.90 (378.5) 20.90 (530.9) 26.90 (683.3) 32.90 (835.7)	23.80 (604.5) 29.80 (756.9) 35.80 (909.3) 41.80 (1061.7)
30.00 (762.0)	26.90 (683.3)	72.00 (1828.8) 78.00 (1981.2) 84.00 (2133.6) 90.00 (2286.0)	36.00 (914.4) 42.00 (1066.8) 48.00 (1219.2) 54.00 (1371.6)	14.90 (378.5) 20.90 (530.9) 26.90 (683.3) 32.90 (835.7)	23.80 (604.5) 29.80 (756.9) 35.80 (909.3) 41.80 (1061.7)

Dimensions in Inches (mm)—See Elevation View

D	A
72.00 (1828.9)	21.67 (550.4)
78.00 (1981.2)	27.67 (702.8)
84.00 (2133.6)	33.67 (855.2)
90.00 (2286.0)	39.67 (1007.6)



Section Plan View



Elevation View

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