

Ensuring the One World Trade Center is UL 977 Compliant



Case Study: One World Trade Center

In 2013 Boltswitch, Inc. partnered with Electrotech Service Equipment Corp. to provide switches and switchgear for the new One World Trade Center in New York City. More than 150 bolted pressure contact switches were specified for the project based on their reputation of outstanding performance. Boltswitch was honored and remains humbled by this opportunity to have even a small stamp on such a profound and historical project.

Overview of the Case

Following the devastation cause by the September 11 attacks, the future of the site where the World Trade Center once stood was uncertain. Five years after the destruction, in April of 2006, the final plans and building permits were approved and construction began. The goal was not only to rebuild the landmark, but to memorialize the events that occurred that fateful day and symbolize the resiliency of the American people.

This case study will review:

- Problem
- Options
- Solution
- Benefits
- Product Overview



The Problem

Proposals of the reconstruction of the original World Trade Center were raised almost immediately after the attacks took place. By 2002 multiple designs had already been reviewed and were not well received by viewers. A second competition featuring a round of new designs included one by Daniel Libeskind that resonated with the public and in December of that year his design was selected as the winner. While aesthetically the building had the approval of the people, it would need to go under significant revisions and it would not be until 2005 when the final design for the "Freedom Tower" was unveiled. Following this announcement, it would not be approved for construction until April of the following year due to disputes over money and security as well as the pending approval from the Port Authority of both New York and New Jersey.

With the initial construction underway, it was estimated that the rebuild would be complete by 2012. However, there was still a significant amount of work to be done to ensure that the new building was up to code. This included being in accordance with not only the current codes, but any new and relevant requirements that happen to go into effect during the 6 year projected construction period.

On April 30th of 2012 the National Electrical Code (NEC) released the UL 977 5th Edition - UL STANDARD FOR SAFETY Fused Power-Circuit Devices. This meant that the new building would be required to employ devices that met the new standards, forcing them to look for fused power-circuit devices to be implemented in accordance with the recent updated from the NEC.

Evaluation of their Options

When looking for fused power-circuit devices, as covered by these requirements, their two main options were to install either bolted pressure contact switches or high-pressure butt-type contact switches.

Option 1: Bolted Pressure Contact Switches

Bolted-pressure contact switches are devices in which the blade-jaw connections have an additional pressure or clamping action provided at both ends of the switch blades when the blades are in the fully closed.

Option 2: High-pressure Butt-type Contact Switches

High-pressure butt-type contact switches are devices having butt-type contacts and a spring-charged mechanism.

The Solution

Ultimately, the panel builders from Electrotech, along with the contractors and engineers on the project decided that Option 1 was the best solution for the building. They determined that for this particular application Bolted-pressure contact switches were best suited as they allow for maximum power control in a minimum space while providing numerous options for construction and arrangement. In order to maintain their long-standing relationships with the largest electrical contracting, architectural, and engineering firms in New York, Electrotech needed to commission the best for components and partners for this immense job. Boltswitch was specified for their ability to exceed their customers' expectations in quality, delivery, and cost. Their switches have a longstanding industry reputation of quality, reliability, and ability to withstand numerous stressful situations. Together Electrotech and Boltswitch were able to determine the specific project needs in accordance with plans and specifications.

The Benefits

Boltswitch offers a wide range of solutions, including their Single Throw Fusible Bolted Pressure Contact Switches which are their fuse power-circuit devices rated from 600 - 8000 A. This line of UL 977 approved switches were the ones chosen to ensure that the One World Trade center was compliant with the UL 977 standard and UL 977 tested at 100% of their rating. These switches were the ideal choice for the application and cover the requirements with features such as:

- Top feed and bottom feed solutions are available to allow for feed accommodation for any switchboard design same compact design and footprint
- Electrically tripped devices can be either manually or electrically operated that incorporate electrical tripping means where the whose contact closing is performed manually or electrically but contact opening is performed by a release energized by a separate source of voltage
- Have the ability for mounting (or are intended to be used with upstream) using Class L fuses rated more than 600 A
- The Boltswitch Bolted pressure contacts are engineered to run cool with a very low resistance
- Acceptable for ground-fault protection when combined with ground-fault sensing and relaying equipment
 - Ground-Fault Relays Series GFR (listed as ground-fault sensing and relaying equipment) comes standard with:
 - Main Service Disconnect protection
 - Interlock available
 - Very compact
 - Adjustable time delay
 - Trip indicator

All of the Boltswitch solutions are designed for safe operation and feature a handle that indicates actual switch position, and the visible blades allow confirmation of an open or closed state. Additionally, switches have a load-make, load-break design and are manufactured to ensure reliability, ease of operation and maintenance. With fuses installed (AC only), they have a high fault current withstand with up to 200 kAIC rating. There are many variations and customizations that the user can make to the switch such as adding a shunt trip, motorized shunt trip or integral ground fault; as well as the option to have the switch open, or enclosed in a NEMA rated enclosure allowing for the solution to be tailored to the specific application and user needs.

Boltswitch Components

Made in the United States, Boltswitch has been an industry leading manufacturer of bolted pressure contact switches since 1967. After the initial 400 amp switch performed well in tests, the team quickly started to produce their 600, 800 and 1200 amp versions and the 30 through 200 amp sizes. After successfully providing the industry's first UL listed switch marked as to its suitability for use on circuits having high available fault currents, Boltswitch continued to expand their efforts to pioneer new and innovative solutions to the market coming out with the first Quick-Make, Quick-Break operators on all sizes of switches through 4000 amperes and their larger switches were the first to pass the UL tests at 600 volts. Their reputation for innovation, safety and quality proceeds them and is evident in their work. These attributes as well as their dedication to providing first class service to their customers have allowed for them to supply components for a variety of applications worldwide.

Product Overview

Single Throw Fusible Bolted Pressure Contact Switches

Solutions Used in this Application:

- **Series VL & VLB** 800 - 3000 A
- **Series SL & SLB** 4000-6000 A

The Boltswitch Single Throw Bolted Pressure Contact Switches are UL 977 "Fuse Power-Circuit Devices" with a 600 VAC and 800 to 6000 A rating. They are 200,000 AIC with Class L fuses installed and have the ability to add integral ground fault protection, a shunt-trip or motorized operator and NEMA enclosures.

Main Advantages:

- High safety
- Customization options
- Easy maintenance
- cULus tested and approved
- High current and SCCR
- Made in the USA



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"We strive to exceed our customers' expectations in quality, delivery, and cost."

Electrotech is the largest independent manufacturer of electrical service equipment for residential and commercial buildings in the New York metropolitan area.

The Company primarily manufactures switchboards and panel boards, which are UL listed and produced to meet specific project requirements, in accordance with applicable national and local standards.

Additionally, Electrotech supplies customers with complementary products such as transformers, busway, and other products that are sourced from third parties. These products are produced for a diverse set of end users such as residential and commercial real estate, federal government institutions, hospitals and municipal transportation. Their technical expertise allows us to assist contractors and engineers in determining specific project needs in accordance with plans and specifications.

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