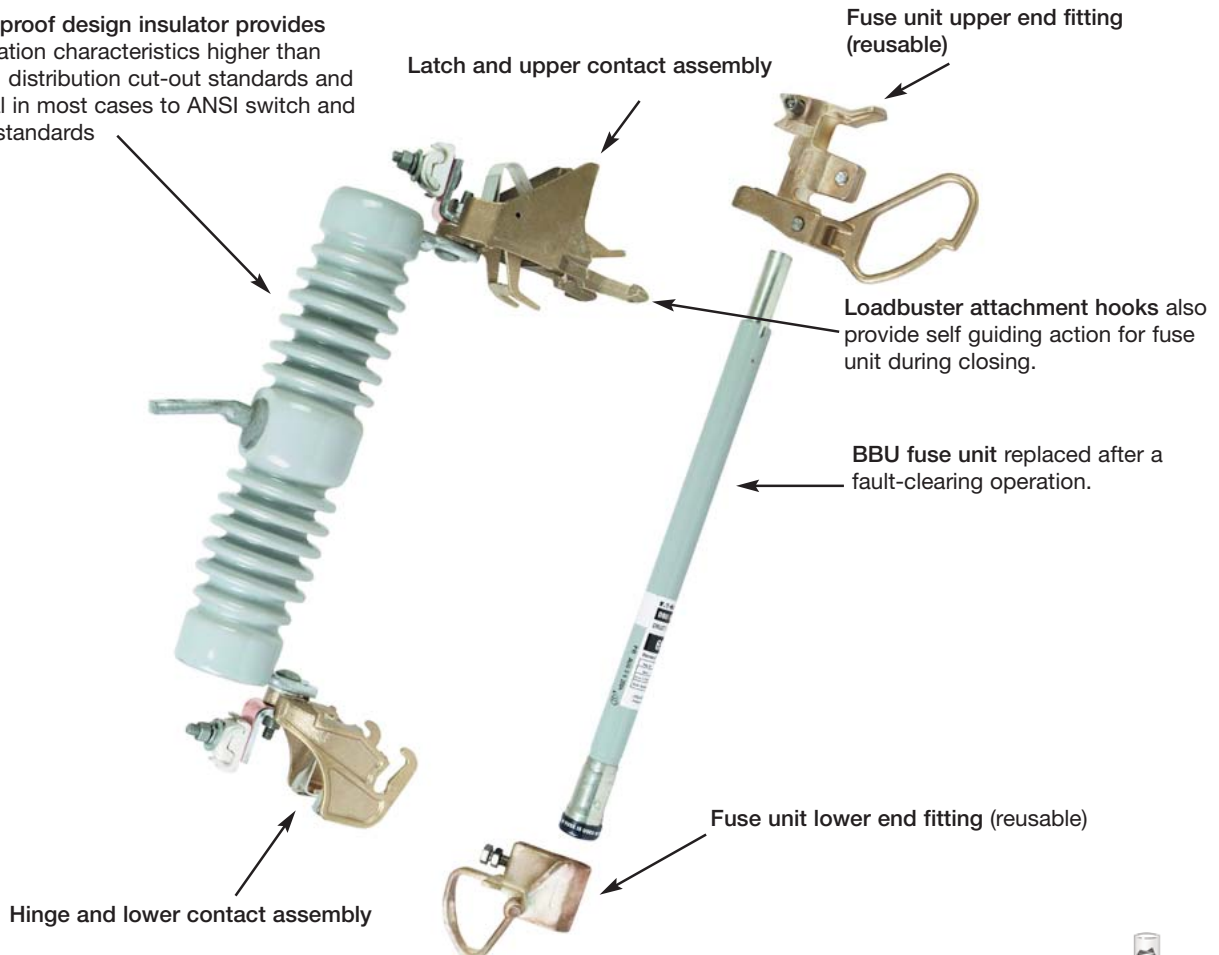


Boric Acid Fuse Links

BBU Fuse Link Mount Construction

Bird proof design insulator provides insulation characteristics higher than ANSI distribution cut-out standards and equal in most cases to ANSI switch and bus standards



BBU Fuse construction

Principle parts of the replaceable BBU fuse unit are shown in the cross section view. Main operating parts are the silver element, arcing rod, boric acid cylinder and spring. A glass epoxy tube encloses the assembly.

The use of a pure silver element and Nichrome wire stain element makes the BBU less susceptible to outages caused by vibration, corona corrosion, and aging of the fuse elements. It is not damaged by transient faults or overloads which approach the minimum melt point.

The components are housed in a fiberglass reinforced resin tube with plated copper contacts. Positive connection is maintained between the arcing rod and contact with a sliding tulip contact.



BBU End Fittings



Fuse unit lower end fitting
Part number (including Muffler): BBU-EFID



Fuse unit upper end fitting
Part number (including Muffler): BBU-EFID



Muffler:
Part number-BBU-MFLR

Boric Acid Fuse Links

Operation

BBU expulsion fuse links utilise the proven performance of boric acid to create the de-ionizing action needed to interrupt the current. Fault interruption is achieved by the action of an arcing rod and a charged spring, elongating the arc through a boric acid chamber upon release by the fuse element.

At high temperatures, boric acid decomposes, producing a blast of water vapor and inert boric anhydride. Electrical interruption is caused by the steam extinguishing the arc, as the arc is being elongated through the cylinder.

Higher particle turbulence of the boric acid causes the rate of de-ionization in the cylinder to exceed the ionization of the electrical arc. Both high and low current faults are interrupted in the same manner with no foreign material other than the boric acid required. This enables the fuse to interrupt short-circuit within one half cycle and prevents the arc from restriking after a current zero.

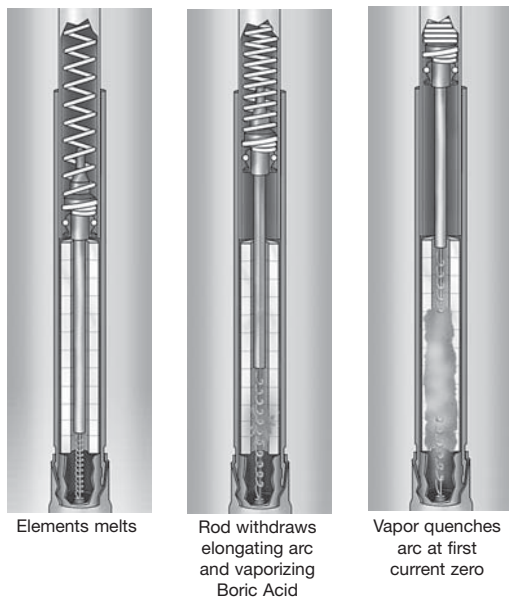
After interruption, the gases are expelled from the bottom of the fuse.

The arcing rod is prevented from falling back into its original position by a friction stop at the top of the fuse unit.

When the fuse operates, the upward motion of the spring forces the top of the arcing rod to penetrate the upperseal, striking the latch mechanism.

On indoor applications, this action caused the blown fuse indicator to actuate.

When replacing the blown fuse link, the end fittings should be removed from the operated fuse unit, and if undamaged, clamped onto the new fuse unit.



Application

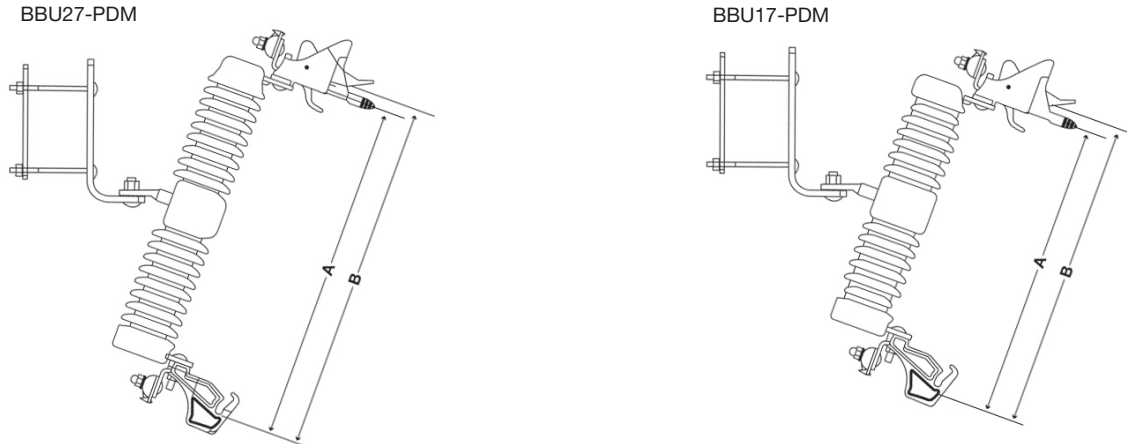
The BBU Boric acid fuse provides effective protection for circuits and equipment which operate on voltage system up to 34.5kV. They can be used on industrial distribution systems and all fuses are designed for use on the following:

- Power transformers
- Feeder circuits
- Distribution transformers
- Metal-enclosed switchgear
- Pad mount switches

BBU fuse units can be used in indoor applications, and can be used to directly replace competitive equivalent units.

Boric Acid Fuses

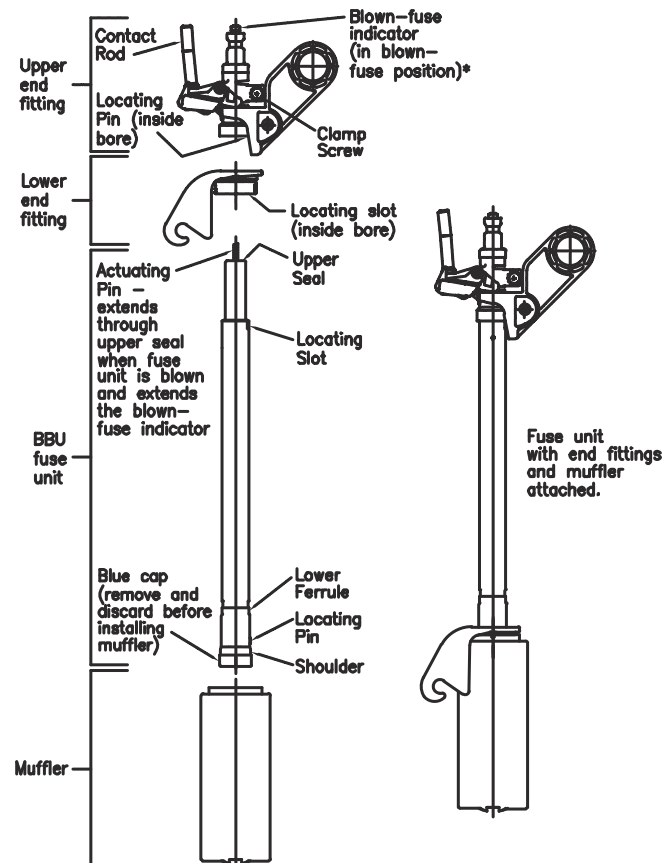
Outdoor BBU Mount



| Part Number | 1Min High Voltage Withstand Test kV | Total Insulator Length Inches (mm) | A Inches (mm) | B Inches (mm) | Approximate Weight (kg) |
|-------------|-------------------------------------|------------------------------------|---------------|---------------|-------------------------|
| BBU27-PDM | 42 | 18.3 (465) | 20.4 (516.9) | 21 (534) | 20 |
| BBU17-PDM | 35 | 14.8 (375) | 16.8 (426.9) | 17.5 (444) | 17.5 |

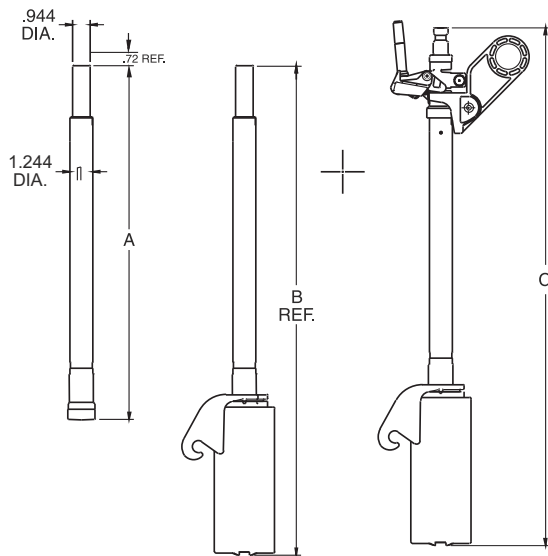
Outdoor BBU Fuse Fitting

Outdoor end fittings are made of a cast-copper plated alloy. A large hook eye on the upper fitting allows for easy installation into pole-top mountings with a hook stick. The pivotal design of this hook eye provides for proper engagement of the upper live part. The positive locking action of the latch mechanism prevents detachment from the mounting due to shock or vibration. In the event of a fault, the arcing rod will penetrate through the upper end of the fuse unit, and cause the latch to release. Once released, the fuse will rotate down into the drop-out position to indicate a blow fuse condition. The lower end fitting has two cylindrical posts that insert into the lower live part of the mounting. These posts allow the fuse to rotate into the proper engaged position, and suspend the fuse during a blown, drop-out condition.



Boric Acid Fuse Links

Fuse Dimensions



| kV max | Fuse Unit Fitting inches (mm) | | |
|--------|-------------------------------|-------------|-------------|
| | A | B | C |
| 17 | 19.08 (484) | 27.19 (690) | 28.82 (732) |
| 27 | 22.58 (573) | 30.69 (779) | 32.32 (821) |
| 38 | 28.76 (730) | 36.87 (936) | 38.50 (978) |

Application Notes

Low currents, usually referred to as overload currents, must be considered as BBU fuses have a rather low thermal capacity. They cannot carry overloads of the same magnitude/duration as motors and transformers of equal continuous currents. For this reason, the BBU fuse must be sized with the load current in mind so the fuse does not open on otherwise acceptable overloads and inrush conditions. Coordination should be considered to help determine what type of fuse is applied. The BBU fuse interrupts at a natural current zero in the current wave and allows minimum of a half-cycle of fault current to flow before the fault is cleared. The time-current characteristics associated with a BBU fuse has a rather gradual slope making it easier to coordinate with downstream equipment. In addition, the BBU is ideal for higher voltage (up to 38kV) and high current applications (up to 200A). It is important to examine the minimum melting and total clearing time-current characteristics of this fuse.

Standards

Cooper Bussmann does not compromise when performance, quality and safety are involved. Exacting standards have been established relative to the design, testing and application of expulsion type power fuses. Compliance with these standards ensures the best selection and performance. The BBU Power Fuses are designed and tested for compliance to global standards such as ANSI and Australian Standard AS1033.1 1990. ANSI (American National Standards Institute) is a non-profit privately funded membership organization that coordinates the development of the US voluntary national standards.

Testing

Cooper Bussmann BBU Power fuse links and fuse mounts were tested in compliance to the standards listed below. This testing was carried out in independent test laboratories in Canada and in Australia by recognised independent power testings laboratories. Thermal and interrupting testing was conducted at 17, 27kV. The entire series of tests was conducted in a specific sequence as stipulated by governing standards without any maintenance being performed. All tests results are verified by laboratory tabulations and oscillogram plots.

- ANSI C37.40 - Service conditions and definitions
- ANSI C37.41 - Power fuse design and testing
- ANSI C37.42 - Distribution fuse ratings and specification
- ANSI C37.46 - Power fuse ratings and specifications
- ANSI C37.48 - Power fuse application, operation and maintenance
- AS1033.1 1990 - Australian standard high voltage fuses expulsion type

Boric Acid Fuse Links

Specifications

Description: Expulsion fuse link style fuse, complete with a single pole porcelain fuse mount offering medium voltage protection for indoor and outdoor applications.

Ratings:

Rated Voltage: 17 - 38kV (for the fuse link)
17 and 27kV (for the fuse mount)

Amps: 3 - 200A (for the fuse link)

IR: 10, 12 or 14kA

Time-Current Curves: see curves on CD at the back of the catalogue.

Part Numbers

| Part Number | Rated Current (A) | Voltage kV | Breaking Capacity kA | Fuse Type |
|-------------|-------------------|------------|----------------------|-----------|
| BBU17-3K | 3 | 17 | 14 | K |
| BBU17-6K | 6 | | | |
| BBU17-8K | 8 | | | |
| BBU17-10K | 10 | | | |
| BBU17-12K | 12 | | | |
| BBU17-15K | 15 | | | |
| BBU17-20K | 20 | | | |
| BBU17-25K | 25 | | | |
| BBU17-30K | 30 | | | |
| BBU17-40K | 40 | | | |
| BBU17-50K | 50 | | | |
| BBU17-65K | 65 | | | |
| BBU17-80K | 80 | | | |
| BBU17-100K | 100 | | | |
| BBU17-140K | 140 | | | |
| BBU17-200K | 200 | | | |
| BBU17-5E | 5 | 17 | 14 | E |
| BBU17-7E | 7 | | | |
| BBU17-10E | 10 | | | |
| BBU17-13E | 13 | | | |
| BBU17-15E | 15 | | | |
| BBU17-20E | 20 | | | |
| BBU17-25E | 25 | | | |
| BBU17-30E | 30 | | | |
| BBU17-40E | 40 | | | |
| BBU17-50E | 50 | | | |
| BBU17-65E | 65 | | | |
| BBU17-80E | 80 | | | |
| BBU17-100E | 100 | | | |
| BBU17-125E | 125 | | | |
| BBU17-150E | 150 | | | |
| BBU17-175E | 175 | | | |
| BBU17-200E | 200 | | | |

Agency Information: refer to the 'Standards' paragraph page 106.

Typical Applications:

- Power transformers
- Feeder circuits
- Distribution transformers
- Metal enclosed switchgear
- Pad mount switches

| Part Number | Rated Current (A) | Voltage kV | Breaking Capacity kA | Fuse Type |
|-------------|-------------------|------------|----------------------|-----------|
| BBU17-15SE | 15 | 17 | 14 | SE |
| BBU17-20SE | 20 | | | |
| BBU17-25SE | 25 | | | |
| BBU17-30SE | 30 | | | |
| BBU17-40SE | 40 | | | |
| BBU17-50SE | 50 | | | |
| BBU17-65SE | 65 | | | |
| BBU17-80SE | 80 | | | |
| BBU17-100SE | 100 | | | |
| BBU17-125SE | 125 | | | |
| BBU17-150SE | 150 | | | |
| BBU17-175SE | 175 | | | |
| BBU17-200SE | 200 | | | |

The BBU fuse is offered in three constructions to meet specific melt curves for an application. The construction is designated in the part number suffix: E (Standard), K (Fast) and SE (Slow). Contact Cooper Bussmann for application details: buletechnical@cooperindustries.com

Boric Acid Fuse Links

Part Numbers

| Part Number | Rated Current (A) | Voltage kV | Breaking Capacity kA | Fuse Type |
|-------------|-------------------|------------|----------------------|-----------|
| BBU27-3K | 3 | 27 | 12.5 | K |
| BBU27-6K | 6 | | | |
| BBU27-8K | 8 | | | |
| BBU27-10K | 10 | | | |
| BBU27-12K | 12 | | | |
| BBU27-15K | 15 | | | |
| BBU27-20K | 20 | | | |
| BBU27-25K | 25 | | | |
| BBU27-30K | 30 | | | |
| BBU27-40K | 40 | | | |
| BBU27-50K | 50 | | | |
| BBU27-65K | 65 | | | |
| BBU27-80K | 80 | | | |
| BBU27-100K | 100 | | | |
| BBU27-140K | 140 | | | |
| BBU27-200K | 200 | | | |
| BBU27-5E | 5 | 27 | 12.5 | E |
| BBU27-7E | 7 | | | |
| BBU27-10E | 10 | | | |
| BBU27-13E | 13 | | | |
| BBU27-15E | 15 | | | |
| BBU27-20E | 20 | | | |
| BBU27-25E | 25 | | | |
| BBU27-30E | 30 | | | |
| BBU27-40E | 40 | | | |
| BBU27-50E | 50 | | | |
| BBU27-65E | 65 | | | |
| BBU27-80E | 80 | | | |
| BBU27-100E | 100 | | | |
| BBU27-125E | 125 | | | |
| BBU27-150E | 150 | | | |
| BBU27-175E | 175 | | | |
| BBU27-200E | 200 | | | |
| BBU27-15SE | 15 | 27 | 12.5 | SE |
| BBU27-20SE | 20 | | | |
| BBU27-25SE | 25 | | | |
| BBU27-30SE | 30 | | | |
| BBU27-40SE | 40 | | | |
| BBU27-50SE | 50 | | | |
| BBU27-65SE | 65 | | | |
| BBU27-80SE | 80 | | | |
| BBU27-100SE | 100 | | | |
| BBU27-125SE | 125 | | | |
| BBU27-150SE | 150 | | | |
| BBU27-175SE | 175 | | | |
| BBU27-200SE | 200 | | | |

| Part Number | Rated Current (A) | Voltage kV | Breaking Capacity kA | Fuse Type |
|-------------|-------------------|------------|----------------------|-----------|
| BBU38-3K | 3 | 38 | 10 | K |
| BBU38-6K | 6 | | | |
| BBU38-8K | 8 | | | |
| BBU38-10K | 10 | | | |
| BBU38-12K | 12 | | | |
| BBU38-15K | 15 | | | |
| BBU38-20K | 20 | | | |
| BBU38-30K | 30 | | | |
| BBU38-40K | 40 | | | |
| BBU38-50K | 50 | | | |
| BBU38-65K | 65 | | | |
| BBU38-80K | 80 | | | |
| BBU38-100K | 100 | | | |
| BBU38-140K | 140 | | | |
| BBU38-200K | 200 | | | |
| BBU38-5E | 5 | | | |
| BBU38-7E | 7 | | | |
| BBU38-10E | 10 | | | |
| BBU38-13E | 13 | | | |
| BBU38-15E | 15 | | | |
| BBU38-20E | 20 | | | |
| BBU38-25E | 25 | | | |
| BBU38-30E | 30 | | | |
| BBU38-40E | 40 | | | |
| BBU38-50E | 50 | | | |
| BBU38-65E | 65 | | | |
| BBU38-80E | 80 | | | |
| BBU38-100E | 100 | | | |
| BBU38-125E | 125 | | | |
| BBU38-150E | 150 | | | |
| BBU38-175E | 175 | | | |
| BBU38-200E | 200 | | | |
| BBU38-15SE | 15 | 38 | 10 | SE |
| BBU38-20SE | 20 | | | |
| BBU38-25SE | 25 | | | |
| BBU38-30SE | 30 | | | |
| BBU38-40SE | 40 | | | |
| BBU38-50SE | 50 | | | |
| BBU38-65SE | 65 | | | |
| BBU38-80SE | 80 | | | |
| BBU38-100SE | 100 | | | |
| BBU38-125SE | 125 | | | |
| BBU38-150SE | 150 | | | |
| BBU38-175SE | 175 | | | |
| BBU38-200SE | 200 | | | |

The BBU fuse is offered in three constructions to meet specific melt curves for an application. The construction is designated in the part number suffix: E (Standard), K (Fast) and SE (Slow). Contact Cooper Bussmann for application details: buletechnical@cooperindustries.com