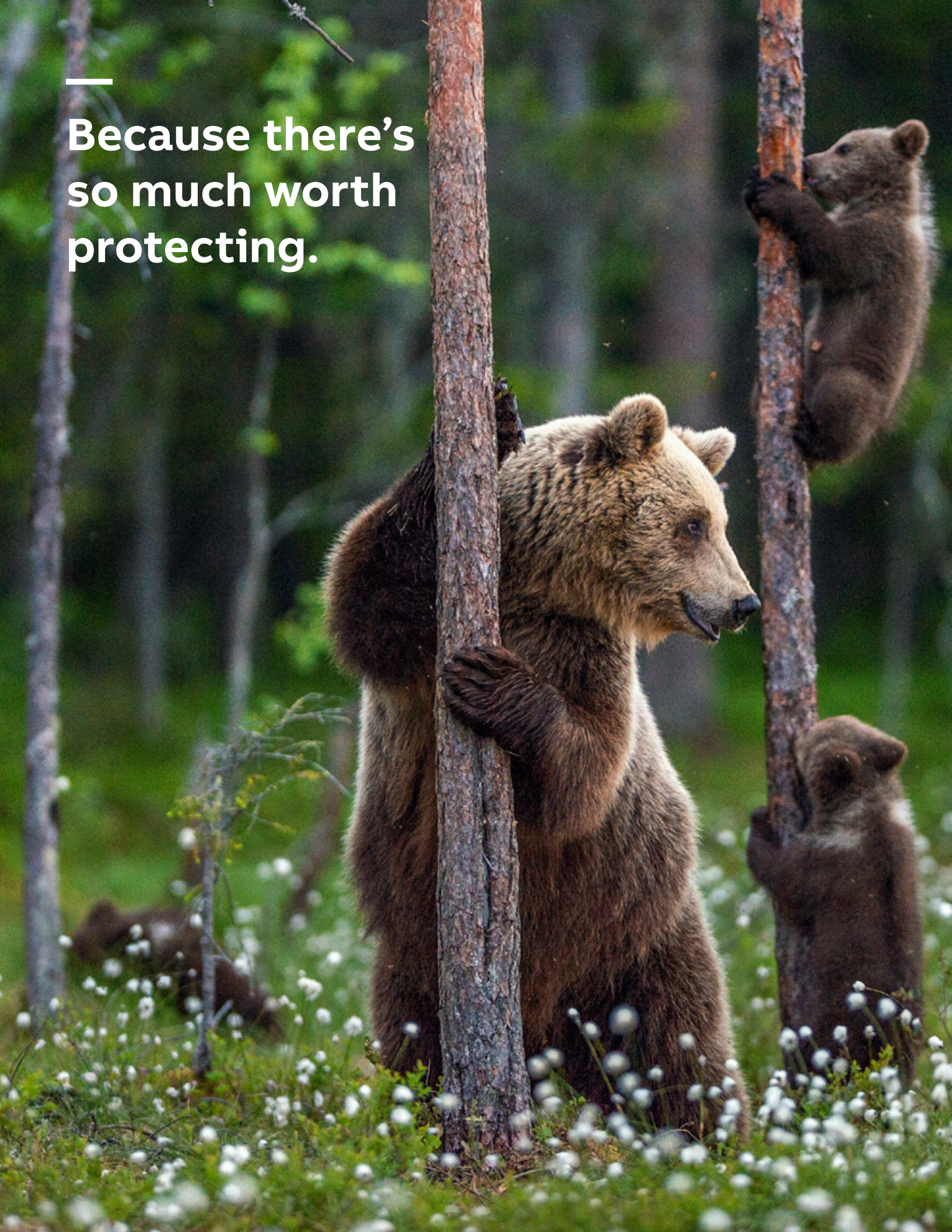

PRODUCT BROCHURE

Hi-Tech Valiant™ fuse for fire mitigation

Protect what matters most.



—
**Because there's
so much worth
protecting.**



Hi-Tech Valiant full-range current-limiting fuse A CAL FIRE exempt fire-mitigation dropout fuse.

Each year, devastating wildfires in the U.S. and Canada burn millions of acres, causing billions of dollars in property damage as well as injury and loss of life. No one wants to be the cause of a wildfire.

That's why ABB's Hi-Tech engineers developed the Hi-Tech Valiant current-limiting fuse for fire mitigation. This new fuse incorporates over 20 years of field-tested Hi-Tech full-range fuse technology combined with a new visual indicating mechanism. The Hi-Tech Valiant current-limiting fuse's special construction contains the explosive fragments that could otherwise be emitted during fuse operation — fragments that could fall on dry vegetation and ignite a wildfire.



Features and benefits

- Hermetically sealed design to contain explosive showers during operation
- Meets the exemption requirements listed in the California Code of Regulations, Title 14, Section 1255 (10)
- Designed and 100% leak tested in the USA
- Fits into an industry-standard cutout fuse mounting bracket
- Meets the IEEE C37.41-2016 standard

Special advantages

- Hi-Tech damage sensor included as standard — helps protect against undetected damage to the fuse that could compromise equipment protection
- Unique, patent-pending engagement pin for easy vertical and rotational alignment during installation
- Actuating pin remains external to the fuse after operation — eliminating the possibility of reclosure
- Multi-seal design seal to prevent water intrusion
- Provides robust electrical contact
- Uses a mechanical spring for operation — contains no black powder or other explosive material
- High fault interrupting capability up to 50 kA symmetrical

Hi-Tech Valiant full-range current-limiting fuse

Delivering value.



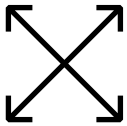
Safety

- CAL FIRE exempt
- Non-expulsion
- Provides visible indication after fuse operation



Reliability

- Incorporates over 20 years of field-tested Hi-Tech full-range fuse technology
- 100% leak tested in the USA to ensure hermetic sealing
- Multi-seal design to prevent water intrusion
- Machined versus stamped components for added strength and durability
- Engagement pin for consistent alignment
- Assembled, tested and shipped from North Carolina, USA



Flexibility

- Full range of current ratings available
- Fits into an industry-standard cutout fuse mounting bracket
- Easily hot-stick installed using standard field installation procedures

California had 9,279 fire incidents that burned nearly 4.2 million acres in 2020.¹



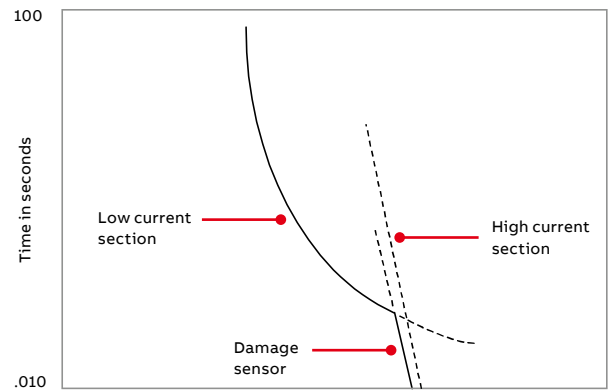
In the U.S., 58,950 wildfires burned about 10.1 million acres in 2020.²



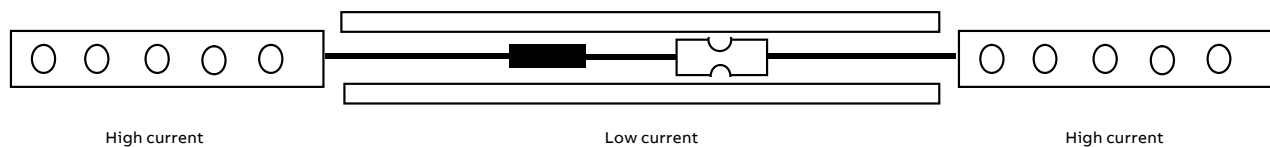
Damage sensor further reduces the risk of fuse failure

The damage sensors inside Hi-Tech full-range fuses greatly increase the likelihood that any melting or arcing that occurs as a result of fuse damage, either immediately or at some later time, will be initiated in the low current section rather than the high current element. This occurs because any surge that melts or damages the element restrictions also melts or damages the damage sensor to an equal or greater extent. This makes it more likely that any subsequent fuse melting will occur in the low current section, at the damage sensor, which is better equipped to interrupt the current that causes the melting.

Damage sensor melting characteristics



Full-range fuse element



In 2020, Colorado experienced three of the largest fires in state history and had nearly 700,000 acres burned.¹

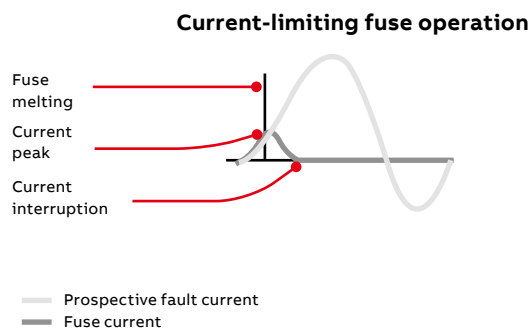
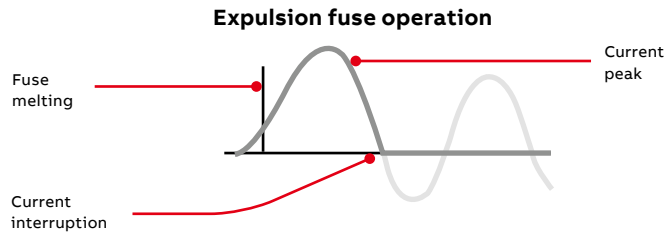


Hi-Tech Valiant full-range current-limiting fuse installed in a standard cutout for overhead installation.

Sources for wildfire statistics:
1. Center for Disaster Philanthropy, <https://disasterphilanthropy.org/disaster/2020-california-wildfires/>
2. Insurance Information Institute, <https://www.iii.org/fact-statistic/facts-statistics-wildfires>



Why use current-limiting fuses?



- **To minimize the risk of eventful/catastrophic failure of distribution equipment** by limiting the energy and peak current let-through during a fault. Neither expulsion fuses nor breakers limit the energy let-through during a fault and sometimes take several cycles to interrupt. Expulsion fuses and breakers also do not limit the peak current during a fault.
- **To interrupt high fault currents** (up to 50,000 A rms symmetrical) and remove faulted equipment in areas where the available fault current level exceeds the interrupting capability of other protective devices.
- **To improve system safety** by addressing concerns for potential fire safety hazards or safety issues associated with populated areas where expulsion gases are not acceptable. The noiseless operation of a current-limiting fuse also alleviates concerns for the loud noise (“bang”) during fuse operation.
- **To improve power quality** by supporting the system voltage and reducing the “blink” time during faults.

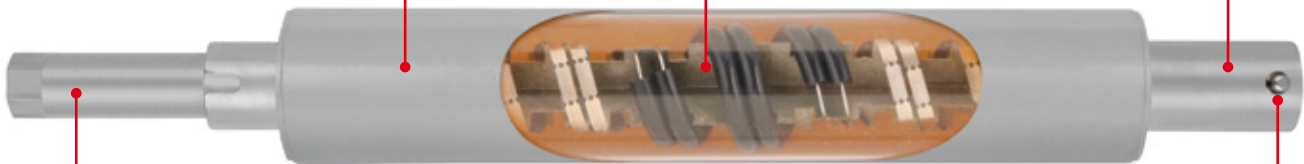


Hi-Tech Valiant fuse construction

Centrally located low-current coils aid in heat distribution

Gray UV-resistant epoxy paint for durability and aesthetics

Tin-plated adapters and caps for increased corrosion resistance



Latch actuating pin remains external to the fuse after operation — eliminating the possibility of reclosure



Unique, patent-pending engagement pin for easy vertical and rotational alignment during installation



Benefits of all Hi-Tech current-limiting fuses

- Superior performance — Clears high current faults by modifying the circuit conditions, resulting in clearing faults before the naturally occurring zero crossing for tremendous reduction of the I²t let-through to which the system would otherwise have been subjected
- High fault interrupting capability — As high as 50 kA symmetrical
- Durable, robust design — Extends outdoor life and includes machined brass end caps and filament-wound epoxy, centerless ground tubular bodies, ground and coated with oven-baked acrylic paint
- Current-limiting action — Improves power quality by reducing voltage dip time during a fault and reduces flame discharge and noise associated with the operation of the series-connected cutout fuse
- Hermetically sealed— 100% leak tested to ensure hermetic sealing
- Minimal equipment damage— Current-limiting action minimizes the internal damage to the transformer during a primary fault condition; therefore, helping to reduce equipment repair expense

Fuse ratings and ordering information



Electrical characteristics — Single fuses

Nominal fuse voltage rating (kV)	Fuse diameter (in.)	Current rating (amps)	Fuse cat. no. (N1)	Rated maximum voltage (kV)	Maximum continuous current (in air) (N5) (N6) (amps)			Peak arc voltage (N4) (kV)	Minimum melt I ² t (amp ² -sec)	Maximum melt I ² t (N2) (N3) (amp ² -sec)
					25 °C	40 °C	55 °C			
15.5	2.2	6	HTFM241006	17.2	11	10.5	10	54	620	2,600
		8	HTFM241008		13.5	13	12.5	46	800	3,700
		10	HTFM241010		16	15.5	15	46	800	3,700
		12	HTFM241012		20.5	19.5	19	43	920	6,500
		18	HTFM241018		23.5	22.5	22	45	1,310	8,000
		20	HTFM241020		27.5	26.5	25.5	45	1,620	10,000
		25	HTFM241025		37	35.5	34.5	45	3,660	22,000
		30	HTFM241030		41	39.5	38.5	45	5,250	30,000
		40	HTFM241040		50	48.5	47	45	8,700	50,000
		50	HTFM241050		53	51.5	50	45	12,800	70,000

Notes:

N1. Ratings have maximum interrupting capability of 50 kA.

N2. Tabulated maximum total I²t values are for currents of 50,000 A at the nominal voltage of the fuse (except for fuses having a rated maximum voltage of 8.8 kV, in which case the maximum total I²t values are at 8.8 kV). Fuses that have a rated maximum voltage higher than their nominal voltage rating will have a higher I²t let-through when applied at voltages up to these higher values. For example, maximum total I²t values are increased by approximately 30% when 8.3 kV fuses are applied at 10 kV and approximately 25% when 15.5 kV fuses are used at 17.2 kV.

N3. Maximum total I²t values are reduced for currents below 50,000 A. For example, at 10,000 A, maximum total I²t values are approximately 15% less than the published values.

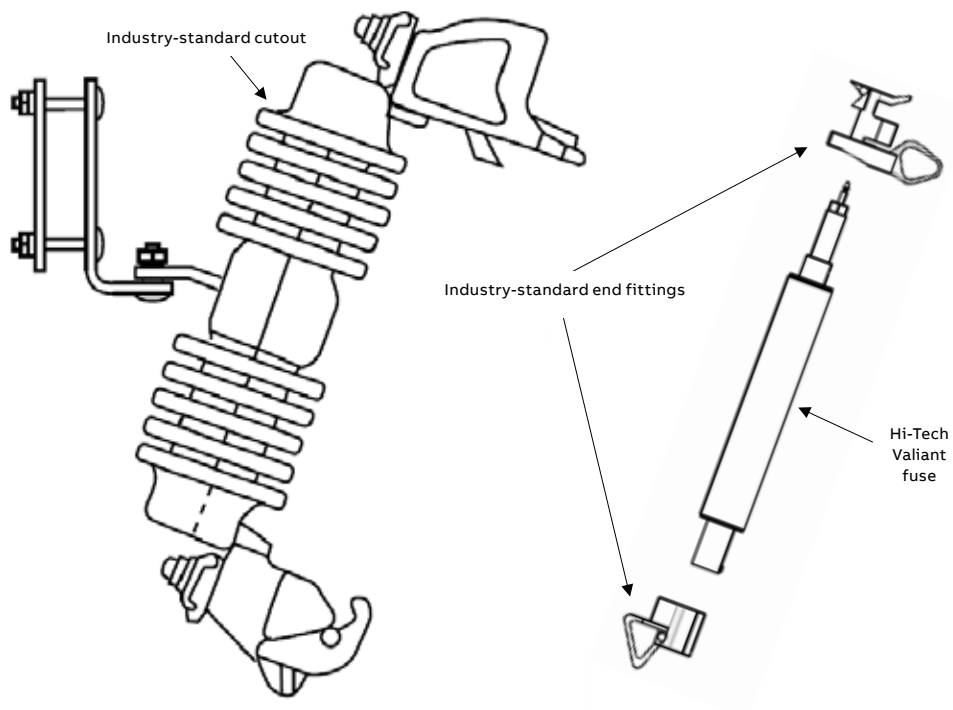
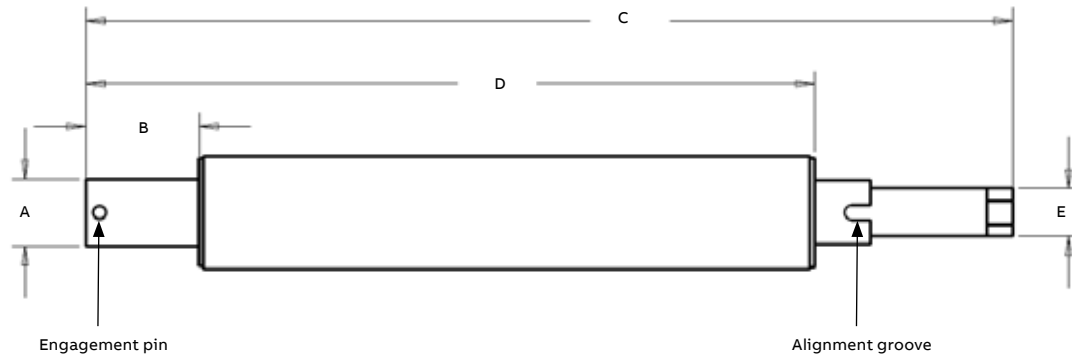
N4. Peak arc voltages quoted are for 50,000 A currents at the rated maximum voltage listed. Reduced currents and voltages will reduce the peak arc voltage. Consult the factory for further information.

N5. Maximum continuous currents at higher ambient temperatures:

- These may be determined by derating the fuses by 0.2% per °C over 25 °C (for example, at 85 °C the derating would be 60 x 0.2 = 12%, making the maximum continuous current of a 30 A fuse 41 x .88 = 36.1 A).

N6. Reduction in the long time melting current of the fuses (approximately one hour and longer) due to higher ambient temperatures and use in enclosures is the same as described above for "Maximum Continuous Current." See time-current characteristics for melting characteristics in this time region.

Fuse dimensional and mounting drawings



ABB's Hi-Tech Valiant fuse is not supplied with end fittings.

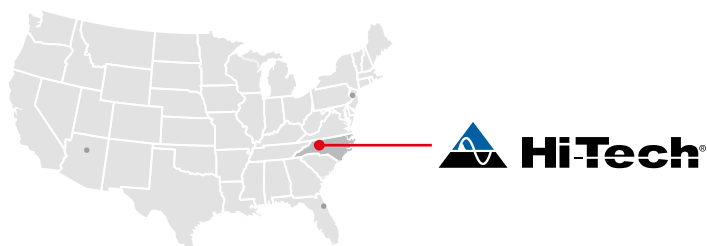
Dimensional information

A (in.)	B (in.)	C (in.)	D (in.)	E (in.)
1.30	2.22	18.13	14.25	0.93

US

ABB Installation Products Inc.
Electrification business

electrification.us.abb.com



Hi-Tech® fuses are assembled,
tested and shipped from Hickory,
North Carolina.

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