PRODUCT BROCHURE

Hi-Tech® Trans-Guard™ EXT current-limiting backup fuse 46 kV–138 kV systems

Application for 46 kV–138 kV systems

138 kV EXT current-limiting backup fuse in series with power expulsion fuse offers state-of-the-art protection. When properly coordinated, the Trans-Guard EXT current-limiting backup fuse always allows sufficient let-through current to cause the power expulsion fuse to melt and drop open, making it easy to visually pinpoint where the fault occurred.

Field tested and proven to reduce the energy let-through during a fault, the Trans-Guard EXT current-limiting backup fuse family now includes options at 46 kV, 69 kV and 138 kV. All coordinate with existing power explusion fuses to create an ideal two-fuse protection scheme.

In addition to increasing the interrupting capabilities of the standalone expulsion fuse, the Trans-Guard EXT drastically decreases the amount of energy let-through and peak currents during a high current fault condition. The two-fuse combination provides a safe and effective solution for protecting high-value infrastructure and personnel in proximity to a substation.

Features	Benefits/descriptions
Superior performance	Clears high current faults by modifying the circuit conditions, resulting in clearing faults before the naturally occurring zero crossing, results in tremendous reduction in I^2t let-through the system would have been subjected to otherwise.
High fault interrupting capability	As high as 50 kA symmetrical. (see Table 1)
Durable, robust design	Extends outdoor life and includes machined brass endcaps 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, making equipment repair less expensive.
Matched-melt coordination	Ensures sufficient energy let-through to melt open series-connected expulsion fuse, providing visual indication of the fault.

Minimize energy let-through.
Maximize equipment protection.

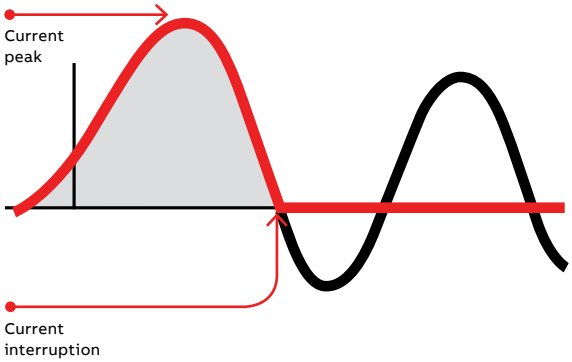
Commonly used on 34.5 kV and lower systems to enhance protection, external current-limiting backup fuses coordinate with series expulsion fuse to offer very high interrupting capability and reduce energy let-through during a fault. The proven benefits of the two-fuse approach widely used on distribution systems is now available for application up to 138 kV that traditionally only protected by a standard expulsion fuse.

Safety
- Offers a higher interrupting capability than a stand-alone expulsion fuse
- Significant reduction in energy let-through

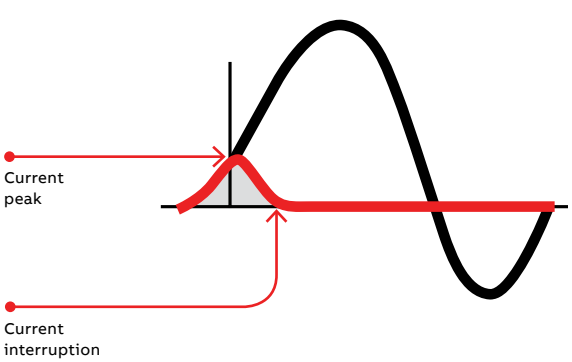
Environmentally friendly
- Lessens the chance of an oil leakage by reducing the energy let-through during a short circuit fault condition
- Fully sealed design ensures that no contaminates are released into the environment during operation

Lifecycle cost reduction
- Minimizes transformer damage during an internal fault condition, thus making repairs less costly
- Minimizes effects to transformer and surrounding infrastructure

Expulsion fuse operation



Current-limiting fuse operation

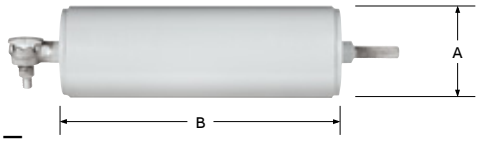


Fuse current

Fault current

Energy let-through

Trans-Guard EXT current-limiting backup fuse for 46 kV systems and 69 kV–138 kV systems

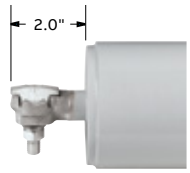


Ordering 46 kV

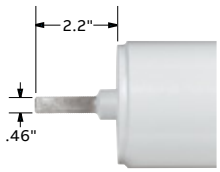
Base catalog number*	Nominal voltage rating (kV)	Current rating (kA)	Dimension 'A' (in.)	Dimension 'B' (in.)	Weight (lbs.)
46 kV catalog numbers					
HTDE37*010	38.0	10	3.3	18.3	12.5
HTDE37*015	38.0	15	3.3	18.3	12.5
HTDE37*025	38.0	25	3.3	18.3	12.5
HTDE37*030	38.0	30	3.3	18.3	12.5
HTDE37*050	38.0	50	3.3	21.0	13.5

*When ordering, replace (*) in the base catalog number with the appropriate hardware code from the chart below.

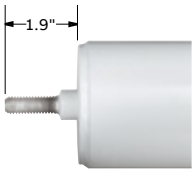
Hardware for 10 kA–50 kA ratings



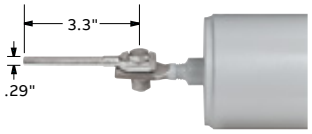
Eyebolt
(accepts #8 – 2/0 AWG)



Knurled stud



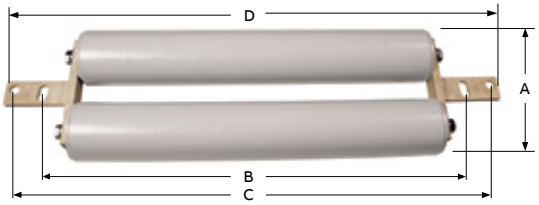
Threaded stud
(½" – 13 threads)



Universal adapter
rotatable through 180˚

Hardware code: 10 kA–50 kA

Hardware code (*)	1st end hardware	2nd end hardware
A	Threaded stud	Threaded stud
E	Eyebolt	Knurled stud
F	Eyebolt	Eyebolt
U	Eyebolt	Universal adapter



Ordering 69 kV

Base catalog number	Nominal voltage rating (kV)	Current rating (kA)	Dimension 'A' (in.)	Dimension 'B' (in.)	Dimension 'C' (in.)	Dimension 'D' (in.)	Weight (lbs.)
For 69 kV application: 1x HTDE37X100 module							
HTDE37X100	38.0	100	7.9	25.1	28.6	29.6	32

Ordering 115 kV–138 kV

For 115 / 138 kV application: 2x HTDE37X100 modules in series required

For 115 / 138 kV applications, two (2) HTDE37X100 are required and ordered individually. The modules should be assembled in series during field installation. Reference the 69 kV table above for individual dimensions of each module. The overall length will depend on installation.

EXT selection

Voltage selection
Each EXT current-limiting backup fuse is suitable for use in both single-phase and three-phase applications where the system voltage does not exceed the maximum system voltage listed. For single-phase applications on delta systems, one fuse is needed in each line.

Current-rating selection
Each EXT current-limiting backup fuse will coordinate with any link having a rating no greater than that listed. For link types not listed in Table 2, please contact ABB for assistance. For additional coordination information, please consult application guide FS-10.

Hardware selection
Many different hardware options are available. Some options vary depending on the size of the current-limiting backup fuse required. Please refer to ordering information for available options.

Table 1: Electrical characteristics

Nominal voltage rating (kV)	Current rating (kA)	Rated max. interrupting current (kA)	Rated max. voltage (kV)	Max. system voltage (kV)	Peak arc voltage (kV)	Min. melt I^2t (A^2sec)	Max total I^2t (A^2sec)
38.0	10	50	38.0	48.3	110	2,600	12,100
38.0	15	50	38.0	48.3	110	5,600	23,500
38.0	25	50	38.0	48.3	110	13,900	55,000
38.0	30	50	38.0	48.3	110	19,300	70,000
38.0	50	50	38.0	48.3	110	43,500	155,000
38.0	100	20	42.5	69.0*	106	172,000	830,000

*Maximum system voltage increased to 138 kV when two (2) 100 kA modules are used in series.

Table 2: Expulsion fuse link coordination

Trans-Guard EXT fuse rating (kA)	S&C SMD standard speed (TCC 153-1)	S&C SMD slow speed (TCC 119-1)
10	10E	–
15	15E	15E
25	25E	25E
30	30E	30E
50	50E	40E
100	100E	80E

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7TKK000147 10.2018