

Hi-Tech®

Trans-Guard® OS Shorty backup CLF

Trans-Guard OS Shorty fuse

ABB Hi-Tech OS Shorty is a back-up type current-limiting fuse designed for application within distribution transformers. Its ability to significantly reduce fault energy and its very high interrupting capabilities provide state-of-the-art protection against rising available fault currents.

As a back-up current-limiting fuse (refer to IEEE C37.40 for fuse definitions), the Trans-Guard OS Shorty must always be applied in series with a properly sized low-current protective device. This device is typically an under-oil expulsion fuse (i.e., bay-o-net or load sensing link, terminal board weak link, etc.). The expulsion and current-limiting fuse are each selected to provide fault protection over a certain range of currents. The expulsion fuse is chosen to clear the low-magnitude currents such as those caused by faults that occur external to the transformer, high-impedance faults within the transformer, and in the case of load sensing links, transformer overloads. Such currents are generally below the minimum interrupting current of the current-limiting fuse. The back-up current-limiting fuse is selected as to clear all other faults up to maximum interrupting capability.

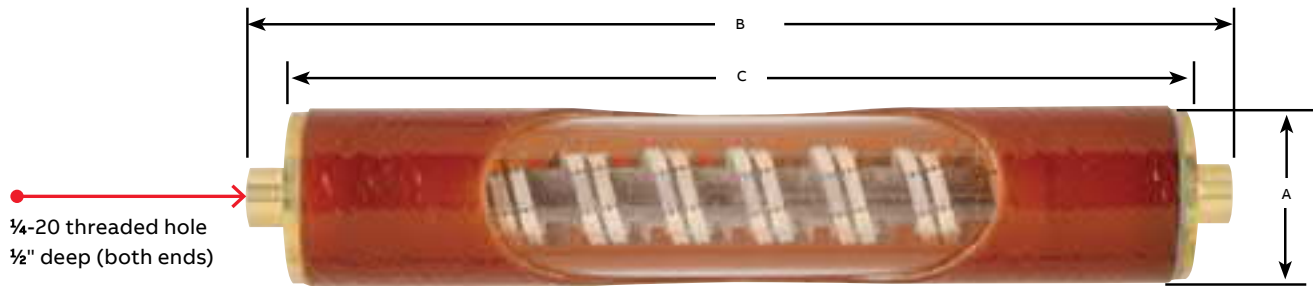
In addition to interrupting the fault currents resulting from low-impedance faults within the transformer, the back-up current-limiting fuse serves the very important function of limiting the amount of energy that is let through to the source of the fault to a value below the withstand capability of the transformer tank. By doing this the current-limiting fuse minimizes the likelihood of disruptive equipment failures (i.e. transformer tank ruptures, accessories being damaged or broken loose from their mountings, etc.). No other protective device is available to similarly reduce the risk of disruptive transformer failures.

OS Shorty fuses are manufactured in the United States and compact in size, which is especially critical in small single phase distribution transformers. Distribution transformers protected solely by an expulsion fuse have very low interrupting capacity, ranging between 600 and 3,500 A, and are subjected to higher risk of tank damage during an internal fault condition. These units also are subjected to large amounts of additional arcing and energy during an internal fault that may affect additional equipment on the distribution system. If a fault occurs that exceeds the expulsion fuse interrupting capability, the fault will continue to arc within the transformer until another protective device has time to react. This situation can increase the number of affected customers while extending the time required to restore service. The OS Shorty's high interrupting capabilities not only reduce the duration of arcing inside the transformer, but also isolate the fault to the transformer which minimizes the effects of the event.



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**Dimensional information**

Nominal fuse voltage rating (kV)	Current rating (amps)	Fuse cat. no. (N1)	Overall diameter A in. (mm)	Overall length B in. (mm)	Body length C in. (mm)	Fuse weight lb. (kg)
8.3	30	HTSS132030	1.5	6.24	5.2	0.90
	40	HTSS132040	(38.1)	(162.6)	(132.1)	0.14
	50	HTSS132050				
	65	HTSS232065	2.2	7.5	6.3	2.0
	80	HTSS232080	(55.9)	(190.5)	(160.0)	0.91
	100	HTSS232100				
	125	HTSS232125		11.0	9.9	3.25
	150	HTSS232150		(279.4)	(251.5)	1.45
	165	HTSS232165				
	200	HTSS232200				
17.2	30	HTSS142030	1.5	9.8	8.6	1.3
	40	HTSS142040	(38.1)	(248.9)	(218.4)	0.54
	50	HTSS242050	2.2"	9.0	7.8	2.5
			(55.9)	(228.6)	(198.12)	1.1
	65	HTSS242065		11.8	10.6	3.25
	80	HTSS242080		(299.7)	(269.2)	1.48
	100	HTSS242100				
	125	HTSS242125		16.6	15.5	4.75
15.5	150	HTSS242150		(421.6)	(393.7)	2.15
	165	HTSS242165				
23.0	30	HTSS152030	1.5	11.7	10.5	1.5
	40	HTSS152040	(38.1)	(297.2)	(266.7)	0.68
	50	HTSS252050	2.2	12.5	11.3	3.25
			(55.9)	(317.5)	(287.0)	1.48
	65	HTSS252065		16.1	15.25-15.33	4.75
	80	HTSS252080		(408.9)	(378.5)	2.15
38.0	100	HTSS252100				
	65	HTSS372065	3.3	19.4	18.3	12.0
	80	HTSS372080	(83.8)	(492.8)	(464.8)	5.4
	100	HTSS372100				
	125	HTSS372125				
	140	HTSS372140		22.1	21.0	13.5
	165	HTSS372165		(561.3)	(533.4)	6.1
	200	HTSS372200				

Note: N1. HTSS372200 is a parallel fuse application only and requires 2 HTSS372200 fuses connected in parallel per phase.

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Electrical characteristics (single fuses)

Nominal fuse voltage rating (kV)	Current rating (amps)	Fuse cat. no. (N1)	Rated maximum voltage (kV)	Rated maximum interrupting current (kA)	Peak arc voltage (kV) (N3)	Minimum I/C (amps)	Minimum melt I ² t (amp ² -sec)	Maximum total I ² t (amp ² -sec) (N1) (N2)
8.3	30	HTSS132030	8.3	50.0	25	250	1,300	7,100
	40	HTSS132040				340	2,550	8,000
	50	HTSS132050				400	3,500	13,200
	65	HTSS232065				350	3,700	18,000
	80	HTSS232080				430	6,300	31,000
	100	HTSS232100				570	12,800	66,000
	125	HTSS232125	8.3		26	850	39,000	120,000
	150	HTSS232150			24.5	900	23,000	110,000
	165	HTSS232165			24	1,020	39,500	175,000
	200	HTSS232200				1,120	54,500	225,000
17.2	30	HTSS142030	17.2	44.0	49	250	1,300	7,800
	40	HTSS142040				340	2,550	9,000
	50	HTSS242050				440	4,440	17,000
	65	HTSS242065		50.0		360	3,700	22,000
	80	HTSS242080				440	6,300	36,000
	100	HTSS242100				580	12,800	76,000
	125	HTSS242125				540	14,800	66,000
	150	HTSS242150				700	34,800	137,000
15.5	165	HTSS242165	15.5		48	780	51,200	195,000
23.0	30	HTSS152030	23.0	31.0	63	270	1,300	8,800
	40	HTSS152040			63	360	2,550	10,000
	50	HTSS252050	25.5	50.0	71	570	3,200	20,000
	65	HTSS252065			70	360	3,700	17,000
	80	HTSS252080				440	6,300	28,000
	100	HTSS252100				575	12,800	70,000
38.0	65	HTSS372065	38.0	50.0	110	390	2,600	12,100
	80	HTSS372080				490	5,600	23,500
	100	HTSS372100				675	13,900	55,000
	125	HTSS372125				785	19,300	70,000
	140	HTSS372140				715	25,000	99,000
	165	HTSS372165				1,200	43,500	155,000
	200	HTSS372200				1,180	51,000	180,000

Notes:

N1. HTSS372200 is a parallel fuse application only and requires 2 HTSS372200 fuses connected in parallel per phase.

N2. Tabulate maximum total I²t values are at the nominal voltage of the fuse. Values for 17.2 kV fuses at 15.5 kV are reduced by approximately 12%, while values for 8.3 kV and 23 kV fuses at 10 kV and 25.5 kV are increased by approximately 30% and 13% respectively.

N3. Maximum total I²t values are reduced for currents below bellow Max IC. For example, at 10,000 A, max I²t values are approximately 15% less than published values.

N4. Peak arc voltages quoted are for Max IC at the rated maximum voltage listed. Reduced voltage and currents will reduce the peak arc voltage. Consult the factory for information.

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Electrical characteristics (fuses tested for use in parallel)

Nominal fuse voltage rating (kV)	Current rating (amps) (N1)	Fuse cat. no. (Order two fuses)	Rated maximum voltage (kV)	Rated maximum interrupting current (kA)	Peak arc voltage (kV) (N4)	Minimum I/C (amps)	Minimum melt I ² t (amp ² -sec)	Maximum total I ² t (amp ² -sec) (N2) (N3)
8.3	130	HTSS232065	8.3	–	25	420	14,800	65,000
	160	HTSS232080				500	25,200	114,000
	200	HTSS232100				630	51,200	240,000
	300	HTSS232150				1,900	92,000	425,000
	330	HTSS232165				2,150	158,000	675,000
	400	HTSS232200				2,380	218,000	850,000
17.2	130	HTSS242065	17.2	50.0	49	420	14,800	92,000
	160	HTSS242080				500	25,200	162,000
	200	HTSS242100				630	51,200	310,000
	250	HTSS242125				1,130	59,200	265,000
15.5	300	HTSS242150	15.5	44.0		1,500	139,200	515,000
	330	HTSS242165				1,670	204,800	733,000
23.0	130	HTSS252065	25.5	50.0	69	360	14,800	68,000
	160	HTSS252080				450	25,200	115,000
	200	HTSS252100				560	51,200	280,000

Notes:

N1. Current ratings shown are achieved by using a parallel combination of two fuses (order two fuses). To facilitate equal sharing of the interrupting duty, the two fuses should be resistance matches (+/- 2%) and be mounted such that current paths to and from each fuse are symmetrical.

N2. Tabulate maximum total I²t values are at the nominal voltage of the fuse. Values for 17.2 kV fuses at 15.5 kV are reduced by approximately 12%, while values for 23 kV fuses at 25.5 kV are increased by approximately 13% respectively.

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

N4. Peak arc voltages quoted are for Max IC at the rated maximum voltage listed. Reduced voltage and currents will reduce the peak arc voltage. Consult the factory for information.

Fuse Selection:

For a detailed explanation on selecting the appropriate backup current-limiting fuse for a given application, please refer to Hi-Tech Fuses Application Bulletin FS-10.

For a quick and convenient method of selecting the proper Trans-Guard OS Shorty fuse for coordination with under oil expulsion fuses, please visit Hi-Tech's fuse application coordination tool located at <http://www.tnb.com/Hi-TechFACT>.