

The H-J Family of Companies

Current Limiting Fuses



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Transformer Protection

In recent years, the electric utility industry has become increasingly aware of the need for improved protection of individual transformers against high-fault currents. The current-limiting and energy-limiting characteristics of Current Limiting Fuses are such that they prevent disruptive transformer failure by limiting the fault energy to a value the protected equipment can easily withstand.

To help this function, H-J offers a complete line of oil-submersible Current Limiting Fuses, applied in series with various under-oil expulsion fuses to provide nearly complete transformer protection.

The two-fuse scheme offers some distinct advantages: The use of the dual fuse arrangement on distribution transformers provides highly desirable performance characteristics since each fuse operates in its optimum range. The two-fuse combination results in a lower fuse replacement cost since the Current Limiting Fuse operates only in the event of transformer failure.

The number of Current Limiting Fuse sizes is minimized, since a given fuse size can be matched with a range of expulsion fuse links.

Description

The backup oil-submersible distribution Current Limiting Fuse provides partial-range fault protection. This fuse is defined in IEEE C.37.40-2003 (4.1.6) as a backup Current

Limiting Fuse capable of interrupting all currents from the rated maximum interrupting current down to the rated minimum interrupting current.

Since it is a partial-range fuse, another over-current protective device must be used in series to give protection through the complete range. For internal transformer protection, these fuses are sealed against the ingress of oil. Each fuse is given a helium mass spectrometer leak test to prove the integrity of the seal.

Operation

The oil-submersible, Current Limiting Fuse is designed to interrupt only currents above the minimum interrupting current (shown on the fuse nameplate and the characteristic curve) through its maximum interrupting capacity, 50,000 amperes rms symmetrical.

To provide protection below the minimum interrupting current of the oil-submersible protector another series connected over-current protective device must be used.

Normally in distribution transformers, this device takes the form of an under-oil expulsion fuse. The oil-submersible, Current Limiting Fuse interrupts the high-fault currents while the expulsion fuse interrupts low-fault currents.

These 2 fuses are coordinated to protect each fuse beyond its capability and to achieve full range protection of the transformer.



The oil submerged protection (OSP) backup Current Limiting Fuse is designed to be used in series with another protective device.



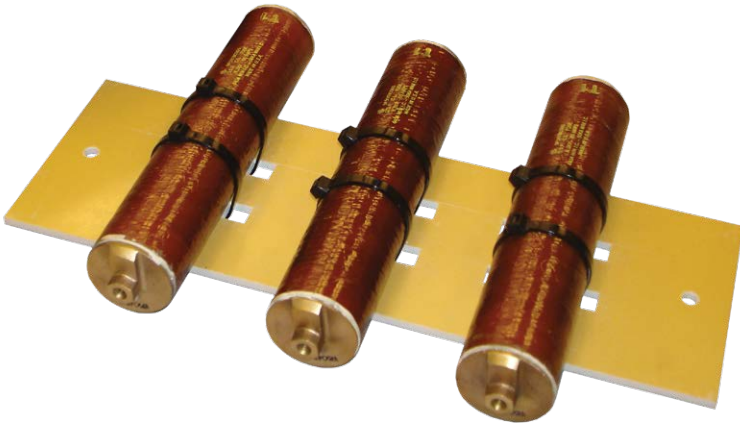
H-J offers Fuses pre-mounted utilizing a Universal CL Fuse Holder with Stainless Steel clamps.

Shorty Fuses

The H-J Family of Companies has expanded its line of “Shorty” Current Limiting Fuses to complete the entire range. The General Electric (GE) line of Current Limiting Fuses now offered by Mersen is a well established fuse line specified by many utility customers. This expanded line of “Shorty” Current Limiting Fuses further enhances H-J’s ability to offer a complete package of components and accessories required in today’s Distribution Transformer and Switchgear markets.

Pre-Mounted Fuses

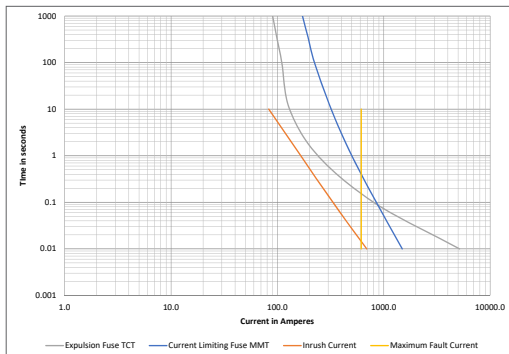
Continuing H-J’s commitment to providing value added options that benefit our customers, H-J is able to pre-mount our entire line of Current Limiting Fuses, including the “Shorty” line, in various configurations and mounting styles. We can mount a single fuse on a standard H-J “Universal” mounting block or a single fuse or multiple fuses can be mounted on various styles of mounting boards for 3 Phase and Parallel applications.



Fuses pre-mounted in 3 phase configuration.

Fuse & Breaker Coordination

The H-J Family of Companies is pleased to offer a fuse coordination tool at www.h-j.com/fuse-coordination for customers to find fuses that match their needs depending on the padmount transformer characteristics.



OSP Features:

- 8.3 kV - 38 kV Class Range
- Wide range of current ratings (30 AMP – 300 AMP).
- 100% factory-tested for resistance and hermetic seal.
- Current Limiting Fuse experience dating back to 1938.

Shorty OSP Features:

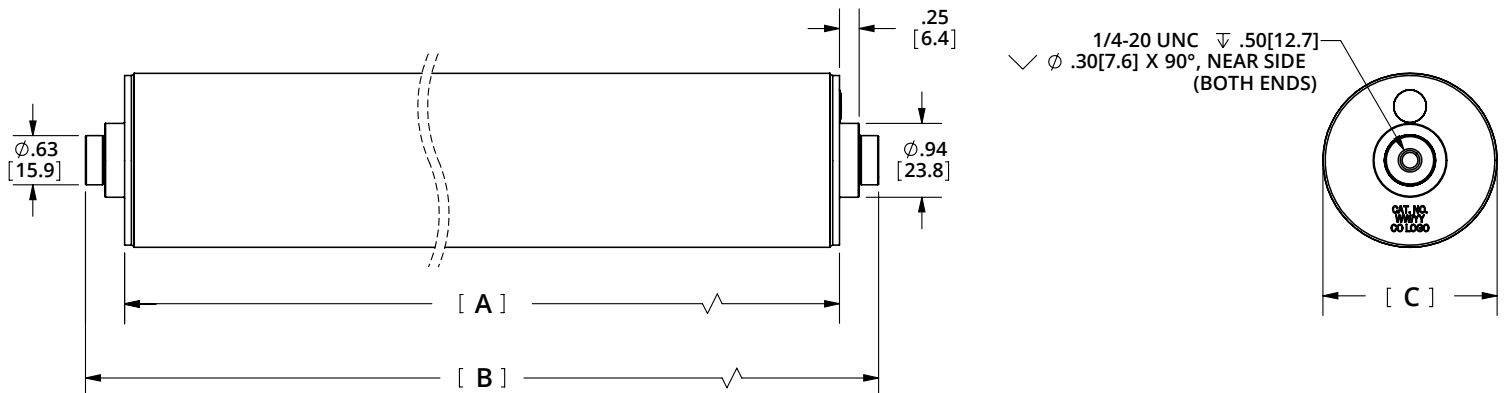
- The “Shorty” design allows for maximum space utilization in today’s optimized transformer designs.
- 8.3 kV - 38 kV Class Range
- Wide range of current ratings (30 to 200 AMP).
- Fuses can be paralleled for higher ratings.
- 100% factory test for resistance and hermetic seal.
- Tested to meet ANSI/IEEE standards.



Shorty OSP Fuses

Shorty Fuses 9F59C Series

Max Voltage	Continuous Current Rating	H-J Cat. #	Fuse Diameter "C"	Body Length "A"	Overall Length "B"	Minimum Interrupting Rating	Minimum Melting I ² t	Maximum Total I ² t	Peak Arc Voltage	Maximum Interrupting Rating
kV	RMS AMPS	-	Inch	Inch	Inch	RMS AMPS	A ² s	A ² s	kV	RMS AMP Sym
8.3	30	9F59CBC030	2.21	6.09	7.09	260	1890	10000	25	50,000
	40	9F59CBC040				415	3180	12800		
	125	9F59CBC125		9.89	10.92	850	39690	136000	23	
	150	9F59CBC150				900	24200	130000		
	165	9F59CBC165				1020	40590	200000		
	200	9F59CBC200				1120	56250	267000		
10.0	50	9F59CBC050	6.68	7.70	300	2600	21500	24		
	65	9F59CBC065			350	3870	31000			
	80	9F59CBC080			430	6490	51000			
	100	9F59CBC100			570	13290	101000			
15.5	165	9F59CBD165	2.21	15.49	16.53	780	53150	194000	43	50,000
17.2	30	9F59CBD030	2.21	8.17	9.17	240	1280	6200	49	50,000
	40	9F59CBD040				330	2430	10500		
	50	9F59CBD050				440	4410	17700		
	65	9F59CBD065		11.01	12.01	360	3870	27500	45	
	80	9F59CBD080				440	6490	39000		
	100	9F59CBD100		15.49	16.49	580	13290	67800	47	
	125	9F59CBD125				540	15490	66200		
	150	9F59CBD150				700	36000	132000		
25.5	30	9F59CBE030	2.21	11.68	12.68	300	970	6900	64	50,000
	40	9F59CBE040				390	1620	10300		
	50	9F59CBE050		15.29	16.29	570	3320	21600		
	65	9F59CBE065				360	3870	29700		
	80	9F59CBE080				440	6490	43900		
	100	9F59CBE100				575	13290	87500		
38.0	65	9F59CCF065	3.29	18.32	19.32	440	2600	12500	105	50,000
	80	9F59CCF080				550	5800	24200		
	100	9F59CCF100				700	9000	38900		
	125	9F59CCF125		20.97	21.97	950	19300	74500		
	*140	9F59CCF140				710	24300	105000		
	165	9F59CCF165				1200	43500	164000		
	200	9F59CDF200				1100	52600	230000		



Shorty Fuses Cross-Reference Chart

Description	H-J Cat. #	Cooper Cat. #	Hi-Tech Cat. #
8.3 kV Class			
30 AMP	9F59CBC030	CBUC080030C100	HTSS132030
40 AMP	9F59CBC040	CBUC08040C100	HTSS132040
50 AMP	9F59CBC050	CBUC08050C100	HTSS132050
65 AMP	9F59CBC065	CBUC08065C100	HTSS232065
80 AMP	9F59CBC080	CBUC08080C100	HTSS232080
100 AMP	9F59CBC100	CBUC08100C100	HTSS232100
125 AMP	9F59CBC125	CBUC08125C100	HTSS232125
150 AMP	9F59CBC150	CBUC081500C100	HTSS232150
165 AMP	9F59CBC165	CBUC081650C100	HTSS232165
200 AMP	9F59CBC200	-	HTSS232200
15.5 kV Class			
165 AMP	9F59CBD165	CBUC15165C100	HTSS242165
17.2 kV Class			
30 AMP	9F59CBD030	CBUC17030C100	HTSS142030
40 AMP	9F59CBD040	CBUC17040C100	HTSS142040
50 AMP	9F59CBD050	CBUC17050C100	HTSS242050
65 AMP	9F59CBD065	CBUC17065C100	HTSS242065
80 AMP	9F59CBD080	CBUC15080C100 (15.5kV Class)	HTSS242080
100 AMP	9F59CBD100	CBUC15100C100 (15.5kV Class)	HTSS242100
125 AMP	9F59CBD125	CBUC15125C100 (15.5kV Class)	HTSS242125
150 AMP	9F59CBD150	CBUC15150C100 (15.5kV Class)	HTSS242150
25.5 kV Class			
30 AMP	9F59CBE030	CBUC23030C100 (23kV)	HTSS152030 (23kV)
40 AMP	9F59CBE040	CBUC23040C100 (23kV)	HTSS152040 (23kV)
50 AMP	9F59CBE050	CBUC23050C100 (23kV)	HTSS252050 (23kV)
65 AMP	9F59CBE065	CBUC23065C100 (23kV)	HTSS252065 (23kV)
80 AMP	9F59CBE080	CBUC23080C100 (23kV)	HTSS252080 (23kV)
100 AMP	9F59CBE100	CBUC23100C100 (23kV)	HTSS252100 (23kV)
38 kV Class			
65 AMP	9F59CCF065	CBUC38050D100 / CBUC38065D100	HTSS372065
80 AMP	9F59CCF080	CBUC38080D100	HTSS372080
100 AMP	9F59CCF100	CBUC38100D100	HTSS372100
125 AMP	9F59CCF125	CBUC38120D100	HTSS372125
140 AMP	9F59CCF140	CBUC38140D100	HTSS372140
165 AMP	9F59CCF165	Not Available	HTSS372165
200 AMP	9F59CDF200	Not Available	HTSS372200

Warning: This chart is for reference purposes only. Fusing requirements MUST be coordinated for proper protection.



9F59CDF200, 38 kV 200 Amp Fuse



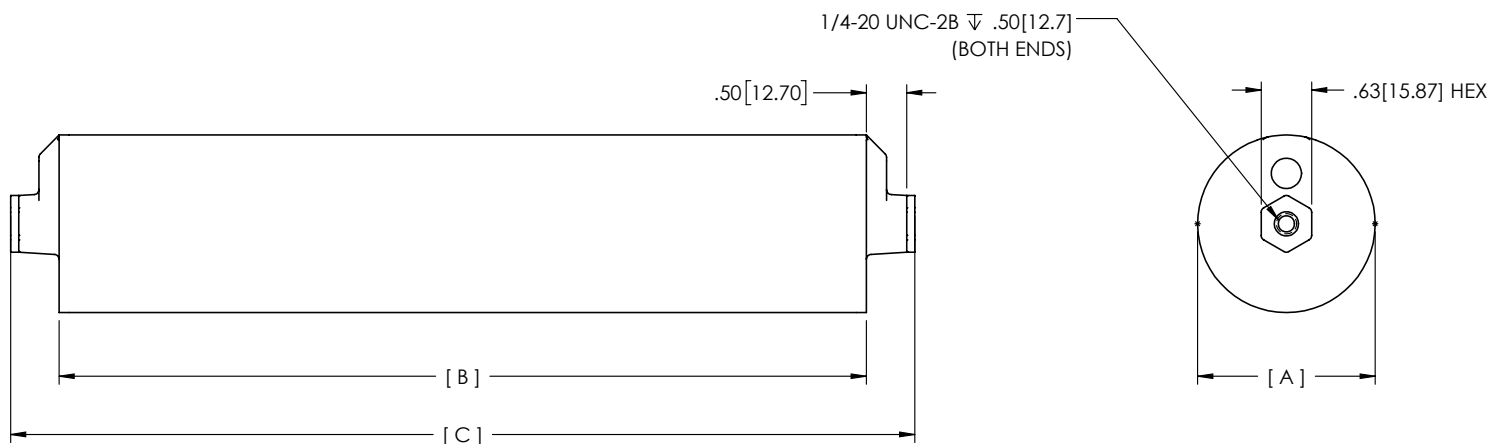
9F59CBD165, 17.2 kV 165 AMP Shorty Fuse



Standard OSP Fuses

OSP Ratings and Dimensional Data

9F59T Series - Standard Fuses									
Maximum Rating kV	Continuous Current Rating rms Amperes	Interrupting Rating Amperes (rms symmetrical)	H-J Cat. #	Shipping Weight (lbs.)	Dimensions (inches)				
					A	B	C		
8.3 kV	40	50,000	9F59TBC040	2.7	2.2	10.0	11.2		
	50	50,000	9F59TBC050	2.7	2.2	10.0	11.2		
	65	50,000	9F59TBC065	2.7	2.2	10.0	11.2		
	80	50,000	9F59TBC080	2.7	2.2	10.0	11.2		
	100	50,000	9F59TBC100	2.7	2.2	10.0	11.2		
	125	50,000	9F59TCC125	6.4	3.3	10.0	11.2		
	150	50,000	9F59TCC150	6.4	3.3	10.0	11.2		
	200	50,000	9F59TCC200	6.4	3.3	10.0	11.2		
	250	50,000	This rating is achieved by paralleling 2-9F59TCC125 fuses.						
	300	50,000	This rating is achieved by paralleling 2-9F59TCC150 fuses.						
15.5 kV	40	50,000	9F59TBD040	4.4	2.2	15.42	16.62		
	50	50,000	9F59TBD050	4.4	2.2	15.42	16.62		
	65	50,000	9F59TBD065	4.4	2.2	15.42	16.62		
	80	50,000	9F59TBD080	4.4	2.2	15.42	16.62		
	100	50,000	9F59TCD100	9.6	3.3	15.42	16.62		
	125	50,000	9F59TCD125	9.6	3.3	15.42	16.62		
	150	50,000	9F59TCD150	9.6	3.3	15.42	16.62		
	250	50,000	This rating is achieved by paralleling 2-9F59TCD125 fuses.						
	300	50,000	This rating is achieved by paralleling 2-9F59TCD150 fuses.						
	23.0 kV	40	50,000	9F59TBE040	4.4	2.2	15.42	16.62	
50		50,000	9F59TBE050	4.4	2.2	15.42	16.62		
65		50,000	9F59TBE065	4.4	2.2	15.42	16.62		



OSP Cross Reference Chart

Description	H-J Cat. #	Cooper Cat. #	Hi-Tech Cat. #
8.3 kV 40 AMP	9F59TBC040	3543040M61M	HTDS232040
8.3 kV 50 AMP	9F59TBC050	3543050M61M	HTDS232050
8.3 kV 65 AMP	9F59TBC065	3543065M61M	HTDS232065
8.3 kV 80 AMP	9F59TBC080	3543080M71M	HTDS232080
8.3 kV 100 AMP	9F59TBC100	3543100M71M	HTDS232100
8.3 kV 125 AMP	9F59TCC125	3543125M71M	HTDS332125
8.3 kV 150 AMP	9F59TCC150	3543150M71M	HTDS332150
8.3 kV 200 AMP	9F59TCC200	(2-100A Fuses)	HTDS332200
15.5 kV 40 AMP	9F59TBD040	3544040M61M	HTDS242040
15.5 kV 50 AMP	9F59TBD050	3544050M61M	HTDS242050
15.5 kV 65 AMP	9F59TBD065	3544065M61M	HTDS242065
15.5 kV 80 AMP	9F59TBD080	3544080M71M	HTDS242080
15.5 kV 100 AMP	9F59TCD100	3544100M71M	HTDS242100
15.5 kV 125 AMP	9F59TCD125	3544125M71M	HTDS342125
15.5 kV 150 AMP	9F59TCD150	3544150M71M	HTDS342150
23.0 kV 40 AMP	9F59TBE040	3545040M61M	HTDS252040
23.0 kV 50 AMP	9F59TBE050	3545050M61M	HTDS252050
23.0 kV 65 AMP	9F59TBE065	3545065M61M	HTDS252065

Warning: This chart is for reference purposes only. Fusing requirements MUST be coordinated for proper protection.

