Oil Immersed Dual Sensing Weak Link Cartridge

GENERAL

The RTE® oil-immersed dual sensing weak link cartridge fuse is an internal, "weak link" expulsion fuse, designed for use in transformer oil or approved equivalent on the high voltage or primary side of distribution transformers. It provides an economical means of fusing because it protects distribution systems from failed transformers, and also protects transformers from excessive overloads and fault conditions.

Dual sensing links both internal fault currents and transformer fluid temperature. They will limit long-term transformer heating caused by overloads and high temperature environments.

Dual sensing cartridge fuses can be used alone or combined in a two-fuse protection system where high fault currents may be encountered. In a two-fuse system, the cartridge fuse is connected in series and coordinated with the primary current-limiting fuse. This arrangement allows low current faults and overloads to be cleared by the internal cartridge fuse, while high-current-limiting faults are cleared by the current-limiting fuse.

INSTALLATION

No special tools are required. The cartridge fuse is either bushing or terminal board-mounted inside the transformer tank with the fuse lead end downward at least 2.0 inches (51 mm) beneath the level of the dielectric fluid. The minimum required distance from ground is:

8.3 kV	2.0 in. (51 mm)
15.5 kV	3.5 in. (89 mm)

Refer to Installation Instruction Sheet 5000050712 for details.

PRODUCTION TESTS

Tests are conducted in accordance with Cooper Power Systems requirements

- Physical Inspection
- Periodic Dissection

Figure 1.
Dual Sensing Cartridge Fuse.

TABLE 1
Electrical Ratings and Characteristics

Maximum Rated Voltage (kV)	Maximum Continuous Current Ratings (A)	Maximum Single-Phase Interrupting Ratings (A Symmetrical) (A)
8.3	8-140	2000
15.5	8-140	1000
Element Melting Temperature is 145°C.		

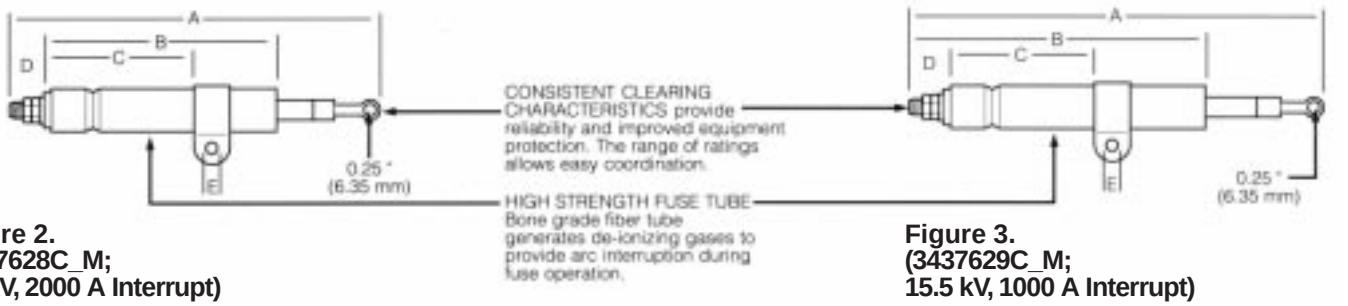

Figure 2.
(3437628C_M;
8.3 kV, 2000 A Interrupt)

Figure 3.
(3437629C_M;
15.5 kV, 1000 A Interrupt)

Figure 4.
(3437723C_M;
15.5 kV, 1000 A Interrupt)

Figure 5.
(3437722C_M;
8.3 kV, 2000 A Interrupt)

NOTE: Dimensions are for reference only.

TABLE 2
Dimensional Information

Figure	Dimensional Information In./(mm)					
	A	B	C	D	E	Dia.
2	9.37 (237.0)	5.62 (142.7)	4.00 (101.6)	0.62 (15.7)	0.34 (8.6)	0.75 (19.1)
3	11.18 (284.0)	6.80 (172.7)	4.00 (101.6)	0.62 (15.7)	0.34 (8.6)	0.75 (19.1)
4	6.37 (161.8)	4.06 (103.1)	0.87 (22.1)	0.87 (22.1)	0.24 (6.1)	0.50 (12.7)
5	5.18 (131.6)	3.12 (79.2)	0.87 (22.1)	0.87 (22.1)	0.24 (6.1)	0.50 (12.7)

NOTE: Thread size is 1/4 in. — 20-0.75 in.

ORDERING INFORMATION

To order an RTE dual sensing internal cartridge fuse, determine the amperage and voltage requirements of the application and specify the fuse required from Table 3.

TABLE 3
Dual Sensing Cartridge Fuses

Continuous Current Rating (A)	Catalog Number
8.3 kV, 2000 A Interrupting	
8	3437722C05M
15	3437722C08M
25	3437722C10M
40	3437722C12M
100	3437628C16M
140	3437628C18M
15.5 kV, 1000 A Interrupting	
8	3437723C05M
15	3437723C08M
25	3437723C10M
40	3437723C12M
100	3437629C16M
140	3437629C18M

METHOD A

Using the Correlation Tables

To order an RTE dual sensing internal cartridge fuse for transformer primary voltages up to 8.32 kV, complete catalog number 3437722_M using the white portion of Table 4, or catalog number 3437628_M, using the shaded portion.

To order a dual sensing cartridge fuse for transformer primary voltages from 12.0 kV and up complete catalog number 3437723_M using the white portion of Table 4, or Catalog Number 3437629_M from the shaded portion.

Correlation is based on ANSI/IEEE C57.92 Loading Guide and C57.109 Through-Fault Guide, and RTE Fusing Application Guide CP7662A.

TABLE 4
Internal Current Sensing Cartridge Fuses

Transformer kVA	Transformer Primary Voltage (kV)								
	2.4	**4.16**	**4.8**	**7.62**	**8.32**	**12.0**	**12.47**	**13.2, 14.4**	**24.9***
Single-Phase Transformers (Phase-to-Ground)									
10	C05	C05	C05	C05	C05	–	–	–	–
15	C08	C05	C05	C05	C05	–	–	–	–
25	C10	C08	C08	C05	C05	–	–	–	–
37.5	C12	C10	C08	C08	C08	C05	C05	C05	–
50	C12	C10	C10	C08	C08	C05	C05	C05	–
75	C16	C12	C12	C10	C10	C08	C08	C08	–
100	C16	C12	C12	C10	C10	C08	C08	C08	–
167	C18	C16	C16	C12	C12	C10	C10	C10	–
250	–	C18	C16	C16	C16	C12	C12	C12	–
333	–	C18	C18	C16	C16	C12	C12	C12	–
500	–	–	–	C18	C16	C16	C16	C16	–
Transformer kVA	**2.4**	**4.16**	**4.8**	**7.2, 7.62**	**8.32**	**12.0**	**12.47**	**13.2, 14.4**	**24.9***
Three-Phase Transformers (Phase-to-Phase)									
45	C10	C08	C08	C05	C05	–	–	–	–
75	C12	C10	C10	C08	C08	–	–	–	–
112.5	C16	C12	C12	C10	C08	C08	C08	C08	C05
150	C16	C12	C12	C10	C10	C08	C08	C08	C05
225	G18	C16	016	C12	C12	C10	C10	C10	C08
300	C18	C16	C16	C16	C12	C12	C12	C10	C08
500	–	C18	C18	C16	C16	C16	C12	C12	C10
750	–	–	C18	C18	C18	C16	C16	C16	C12
1000	–	–	–	C18	C18	C16	C16	C16	C12

NOTE: All recommendations are based on fuse melting at 200% transformer rating at 2 hours and 160% transformer rating at 7 hours (75% preload, 35°C ambient temperature).
Recommended fuses meet inrush current requirement of 12 times transformer rated current for 0.1 second.

*Recommended fuse is limited to gnd Y/gnd Y transformer with no more than 25% delta connected secondary load and with neutral internally grounded.

METHOD B

To determine or confirm the dual sensing cartridge fuse that will coordinate with upstream and downstream system requirements, use time-current characteristic curves and specify the fuse indicated from Table 3.

Long-term overload curves for selected transformer ratings are also available. Request ”Long-Term Overload Fuse Melting Curves,” CP7609 for three-phase applications, and CP7610 and CP7612 for single-phase applications.

For full size TCC Curves, contact your Cooper Power Systems representative.

COOPER Power Systems

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