Catalog Data **CA132013EN**

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COOPER POWER SERIES

ELSP current-limiting backup fuse

General

Eaton offers its Cooper Power™ series ELSP current-limiting backup fuse that is used in series with low current primary protection devices such as a Bay-O-Net fuse or its Cooper Power series MagneX™ interrupter.

The ELSP fuse is designed for use in transformer oil, Envirotemp™ FR3™ fluid, or an approved equivalent.

The fuse's highly efficient current-limiting section minimizes the effects of high fault current stresses on equipment and the distribution system. Its minimum interrupting rating is coordinated with that of a low current interrupter to avoid undesirable low current operation; yet its maximum interrupting rating will clear the highest fault currents likely to occur. Higher continuous current ratings can be achieved by connecting two fuses in parallel.

Application

The ELSP fuse is used in transformers to protect and isolate faulted equipment. When connected in series with a low current primary protection device, the fuse becomes an element of a two-part protection system that gives a full range of fault protection.

This two-part system provides low current protection with the replaceable expulsion fuse or resettable MagneX interrupter, and it adds the energy-limiting protection of a current-limiting fuse. Together, they coordinate easily with upstream and downstream devices.

Powering Business Worldwide

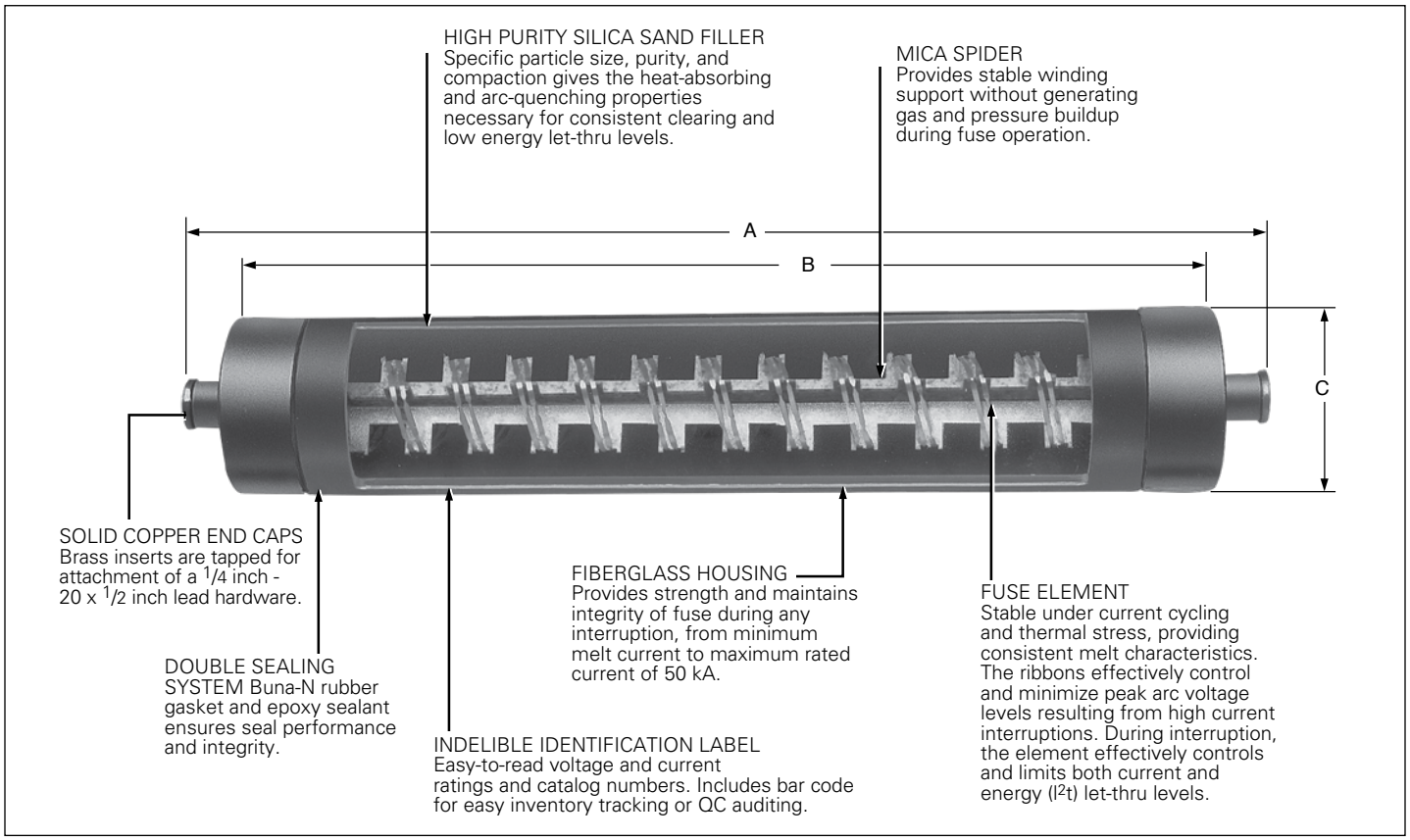

Figure 1. 2 inch diameter ELSP current-limiting backup fuse cutaway shows design characteristics

Note: Dimensions given are for reference only.

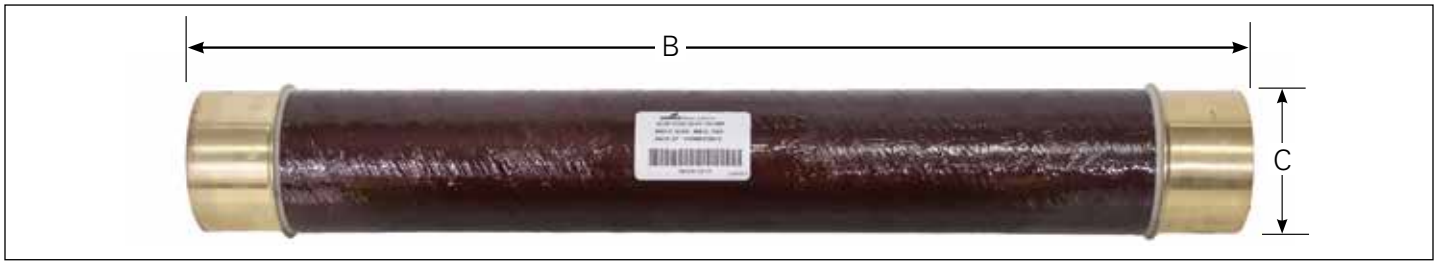

Figure 2. 3 inch diameter ELSP current-limiting backup fuse photograph shows design characteristics

See **Table 3** for dimensional values.

Note: Dimensions given are for reference only.

Installation

No special tools are required. The fuse is liquid immersed, mounted as near as possible to the incoming primary bushing to which it is connected. Normal liquid dielectric clearances should be used. Refer to *Service Information MN132001EN ELSP Current-Limiting Backup Fuse Installation Instructions* for details.

Production tests

Tests are conducted on 100 percent of production in accordance with Eaton requirements.

- Physical Inspection
- I²t Testing
- Resistance Testing
- Helium Mass Spectrometer Leak Testing

Table 1. Electrical ratings and characteristics

Fuse type	Maximum interrupting current
8.3 kV–15.5 kV backup "C" rated	50,000 A rms symmetrical
17.2 kV backup "C" rated	43,000 A rms symmetrical
23 kV backup "C" rated	31,000 A rms symmetrical ①
38 kV backup "C" rated	50,000 A rms symmetrical ②

① 23 kV, 150 A fuse is rated to 50,000 A rms symmetrical.

② 38 kV, 200 A fuse is rated to 26,000 A rms symmetrical due to test lab limitations.

Table 2. Interrupting ratings

	8.3 kV			9.9 kV			15.5 kV		
Continuous current rating (A)	Minimum interrupting capacity (A)	Minimum melt I^2t (A^2•s)	Maximum clear I^2t (A^2•s)	Minimum interrupting capacity (A)	Minimum melt I^2t (A^2•s)	Maximum clear I^2t (A^2•s)	Minimum interrupting capacity (A)	Minimum melt I^2t (A^2•s)	Maximum clear I^2t (A^2•s)
30	200	1,800	9,400	200	1,800	9,500	200	1,800	10,000
40	250	2,900	14,000	250	2,900	14,000	250	2,900	19,000
50	330	6,300	30,000	330	6,300	30,000	330	6,300	33,000
65	400	9,300	33,000	400	9,300	34,000	400	9,300	40,000
80	300	11,600	56,000	300	11,600	56,000	350	11,600	62,000
100	450	20,600	76,000	450	20,600	76,000	450	20,600	116,000
125	470	32,100	120,000	—	—	—	500	32,100	150,000
150	700	58,500	290,000	—	—	—	700	58,500	260,000
165	800	82,200	395,000	—	—	—	800	82,200	365,000
180	900	103,100	485,000	—	—	—	900	103,100	445,000
250	1,000	148,500	690,000	—	—	—	—	—	—
250 ①	—	—	—	—	—	—	1100	128,500	500,000
300 ①	1,300	234,200	1,280,000	—	—	—	1230	234,200	1,300,000
330 ①	1,500	328,900	1,700,000	—	—	—	—	—	—
360 ①	1,800	412,500	2,100,000	—	—	—	—	—	—
500 ①	2,000	594,000	2,500,000	—	—	—	—	—	—

	17.2 kV			23 kV			38 kV		
Continuous current rating (A)	Minimum interrupting capacity (A)	Minimum melt I^2t (A^2•s)	Maximum clear I^2t (A^2•s)	Minimum interrupting capacity (A)	Minimum melt I^2t (A^2•s)	Maximum clear I^2t (A^2•s)	Minimum interrupting capacity (A)	Minimum melt I^2t (A^2•s)	Maximum clear I^2t (A^2•s)
30	200	1,800	10,000	200	1,800	12,000	—	—	—
40	250	2,900	19,500	250	2,900	20,000	—	—	—
50	330	6,300	34,000	330	6,300	39,000	450	3,870	30,600
65	400	9,300	42,000	400	9,300	44,000	490	7,160	39,300
80	350	11,600	62,000	300	11,600	70,000	625	11,450	60,700
100	450	20,600	116,000	450	20,600	120,000	635	16,100	80,500
120	—	—	—	—	—	—	700	21,200	118,000
125	500	32,100	150,000	465	32,100	180,000	—	—	—
140	—	—	—	—	—	—	800	36,240	163,000
150	—	—	—	700	58,500	320,000	—	—	—
165	—	—	—	900	82,200	430,000	—	—	—
200 ①	—	—	—	—	—	—	900	95,400	496,100
250 ①	—	—	—	900	128,500	650,000	—	—	—
300 ①	—	—	—	1200	234,200	1,300,000	—	—	—
330 ①	—	—	—	1500	328,900	1,700,000	—	—	—

Notes: 1. The 8.3 kV, 80 A and 100 A ratings have been tested and approved for application at 9.9 kV.

2. The 15.5 kV, 80 A through 125 A ratings have been tested and approved for application at 17.2 kV.
The maximum interrupting rating for the 15.5 kV fuse, 80 A through 125 A at 17.2 kV is 43 kA. For the 23 kV, 250 A fuse (parallel 125 A) the maximum interrupting rating is 12 kA.

① Parallel fuses (200 A, 38 kV rated fuse consists of two 120 A, 38 kV fuses (P/N CBUC38120D100) in parallel.

Ordering information

To order an ELSP current-limiting fuse, determine the amperage and voltage ratings of the application and specify the fuse required from **Table 3**. For parallel fusing, order two fuses.

New part numbering guide

C	=	Cooper
B	=	Backup
U	=	Under-oil
C	=	Clamp-mounted
XX	=	Voltage rating
XXX	=	Current rating
C	=	2 inch
D	=	3 inch
1	=	Single-barrel design
00	=	Revision code
M	=	Metric end connection

Table 3. Dimensional information

Voltage (kV)	Current rating (A)	ELSP part numbers	Dimension A (See Figure 1) Inches (mm)	Diameter tube Dimension B (See Figures 1, 2) Inches (mm)	Dimension C (See Figures 1, 2) Inches (mm)	Description
8.3	30	**CBUC08030C100**	7.2 (183)	6.0 (152)	2.1 (53)	8.3 kV 30 A
	40	**CBUC08040C100**	7.2 (183)	6.0 (152)	2.1 (53)	8.3 kV 40 A
	50	**CBUC08050C100**	7.2 (183)	6.0 (152)	2.1 (53)	8.3 kV 50 A
	65	**CBUC08065C100**	7.2 (183)	6.0 (152)	2.1 (53)	8.3 kV 65 A
	80	**CBUC08080C100**	9.6 (244)	8.4 (214)	2.1 (53)	8.3/9.9 kV 80 A
	100	**CBUC08100C100**	9.6 (244)	8.4 (214)	2.1 (53)	8.3/9.9 kV 100 A
	125	**CBUC08125C100**	9.6 (244)	8.4 (214)	2.1 (53)	8.3 kV 125 A
	150	**CBUC08150D100**	—	11.4 (289)	3.0 (76)	8.3 kV 150 A
	165	**CBUC08165D100**	—	11.4 (289)	3.0 (76)	8.3 kV 165 A
	180	**CBUC08180D100**	—	11.4 (289)	3.0 (76)	8.3 kV 180 A
	250	**CBUC08250D100**	—	11.4 (289)	3.0 (76)	8.3 kV 250 A
9.9	30	**CBUC09030C100**	9.6 (244)	8.4 (214)	2.1 (53)	9.9 kV 30 A
	40	**CBUC09040C100**	9.6 (244)	8.4 (214)	2.1 (53)	9.9 kV 40 A
	50	**CBUC09050C100**	9.6 (244)	8.4 (214)	2.1 (53)	9.9 kV 50 A
	65	**CBUC09065C100**	9.6 (244)	8.4 (214)	2.1 (53)	9.9 kV 65 A
15.5	30	**CBUC15030C100**	9.7 (247)	8.5 (216)	2.1 (53)	15.5 kV 30 A
	40	**CBUC15040C100**	9.7 (247)	8.5 (216)	2.1 (53)	15.5 kV 40 A
	50	**CBUC15050C100**	9.7 (247)	8.5 (216)	2.1 (53)	15.5 kV 50 A
	65	**CBUC15065C100**	9.7 (247)	8.5 (216)	2.1 (53)	15.5 kV 65 A
	80	**CBUC15080C100**	14.0 (356)	12.8 (325)	2.1 (53)	15.5/17.2 kV 80 A
	100	**CBUC15100C100**	14.0 (356)	12.8 (325)	2.1 (53)	15.5/17.2 kV 100 A
	125	**CBUC15125C100**	16.9 (429)	15.6 (396)	2.1 (53)	15.5/17.2 kV 125 A
	150	**CBUC15150D100**	—	15.95 (405)	3.0 (76)	15.5 kV 150 A
	165	**CBUC15165D100**	—	15.95 (405)	3.0 (76)	15.5 kV 165 A
	180	**CBUC15180D100**	—	15.95 (405)	3.0 (76)	15.5 kV 180 A
17.2	30	**CBUC17030C100**	14.0 (356)	12.8 (325)	2.1 (53)	17.2 kV 30 A
	40	**CBUC17040C100**	14.0 (356)	12.8 (325)	2.1 (53)	17.2 kV 40 A
	50	**CBUC17050C100**	14.0 (356)	12.8 (325)	2.1 (53)	17.2 kV 50 A
	65	**CBUC17065C100**	14.0 (356)	12.8 (325)	2.1 (53)	17.2 kV 65 A
23	30	**CBUC23030C100**	12.7 (323)	11.5 (292)	2.1 (53)	23 kV 30 A
	40	**CBUC23040C100**	12.7 (323)	11.5 (292)	2.1 (53)	23 kV 40 A
	50	**CBUC23050C100**	12.7 (323)	11.5 (292)	2.1 (53)	23 kV 50 A
	65	**CBUC23065C100**	12.7 (323)	11.5 (292)	2.1 (53)	23 kV 65 A
	80	**CBUC23080C100**	16.9 (429)	15.6 (396)	2.1 (53)	23 kV 80 A
	100	**CBUC23100C100**	16.9 (429)	15.6 (396)	2.1 (53)	23 kV 100 A
	125	**CBUC23125D100**	—	18.9 (480)	3.0 (76)	23 kV 125 A
	150	**CBUC23150D100**	—	18.9 (480)	3.0 (76)	23 kV 150 A
	165	**CBUC23165D100**	—	18.9 (480)	3.0 (76)	23 kV 165 A
38	50	**CBUC38050D100**	—	15.95 (405)	3.0 (76)	38 kV 50 A
	65	**CBUC38065D100**	—	15.95 (405)	3.0 (76)	38 kV 65 A
	80	**CBUC38080D100**	—	19.2 (487)	3.0 (76)	38 kV 80 A
	100	**CBUC38100D100**	—	19.2 (487)	3.0 (76)	38 kV 100 A
	120	**CBUC38120D100**	—	21.9 (556)	3.0 (76)	38 kV 120 A
	140	**CBUC38140D100**	—	24.7 (627)	3.0 (76)	38 kV 140 A

Method A

Correlation information

Use the correlation information in **Table 4**, **Table 5** and **Table 6** to determine the amperage and voltage ratings of the ELSP fuse combination required for the application. Then use **Table 3** to determine the appropriate ELSP fuse catalog number.

Correlation is based on IEEE Std C57.92™ Standard Loading Guide and IEEE Std C57.109™ Standard Through-Fault Guide, and the Pad-mounted Transformer Fusing Philosophy Reference Document, TD132004EN.

Tables

Table 4 through **Table 8** indicate the recommended Bay-O-Net fuse link or MagneX Interrupter and ELSP combination for each application.

Ordering

- To order a current sensing Bay-O-Net fuse, complete catalog number 4000353____
- To order a dual sensing Bay-O-Net fuse, complete catalog number 4000358____
- To order a dual element Bay-O-Net fuse, complete catalog number 4038108____
- To order a high ampere overload Bay-O-Net fuse link, complete catalog number 4038361____CB
- To order a 38 kV Bay-O-Net fuse link, complete catalog number 4000380____CB

Examples

To order an ELSP and dual element Bay-O-Net fuse combination for a single-phase, 7.2 kV phase-to-ground, 50 kVA transformer, specify:

- 1—50 A ELSP fuse CBUC08050C100
- 1—Bay-O-Net fuse 4038108C07

Method B

Time current curves

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

For full size TCC curves R240-91-167 (8.3/9.9 kV), R240-91-168 (15.5/17.2 kV), R240-91-169 (23.0 kV), and R240-91-170 (38 kV), contact your Eaton representative.

Table 4. Recommended single-phase transformer Bay-O-Net and ELSP combinations

	8.3 kV								
	Nominal single-phase voltage (kV) phase-to-ground								
	2.4			4.16–4.8			7.2–7.96		
Single-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①									
5	1.90	30	C04	1.90	30	C04	1.90	30	C04
10	1.90	30	C06	1.90	30	C04	1.90	30	C04
15	2.02	40	C08	1.90	30	C06	1.90	30	C04
25	1.90	80	C10	1.94	50	C08	1.90	30	C06
37.5	1.90	100	C10	1.90	50	C08	1.90	30	C06
50	2.03	125	C12	1.90	80	C10	1.90	50	C08
75	1.90	150	C14	1.90	125	C12	1.90	80	C10
100	2.00	165	C14	2.00	150	C12	2.00	100	C10
167	2.60	300	C17	2.60	150	C14	2.60	125	C12
250	4.00	—	—	4.00	165	C16	4.00	150	C14
333	5.00	—	—	5.00	300	C17	5.00	165	C16
500	5.00	—	—	5.00	—	—	5.00	300	C17
ELSP and dual sensing Bay-O-Net fuse combinations ②									
5	1.90	30	C03	1.90	30	C03	1.90	30	C03
10	1.90	30	C05	1.90	30	C05	1.90	30	C03
15	1.90	80	C08	1.90	30	C05	1.90	30	C03
25	1.90	100	C10	1.90	80	C08	1.90	30	C05
37.5	1.90	150	C12	1.90	100	C10	1.90	80	C08
50	1.90	165	C12	1.90	100	C10	2.11	80	C08
75	1.90	300	C14	1.90	165	C12	1.90	100	C10
100	2.00	—	—	2.00	165	C12	2.00	125	C10
167	2.60	—	—	2.60	300	C14	2.60	150	C12
250	4.00	—	—	4.00	330	C16	4.00	250	C14
333	5.00	—	—	5.00	—	—	5.00	250	C16
500	5.00	—	—	5.00	—	—	5.00	330	C18
ELSP and dual element Bay-O-Net fuse combinations ②									
5	1.90	30	C03	1.90	30	C03	1.90	30	C03
10	1.90	30	C05	1.90	30	C04	1.90	30	C03
15	1.90	50	C07	1.90	30	C05	1.90	30	C03
25	1.90	80	C09	1.90	40	C06	1.90	30	C04
37.5	1.90	100	C11	1.90	80	C09	1.90	30	C06
50	1.90	125	C12	1.91	80	C09	1.90	50	C07
75	1.90	150	C14	1.90	125	C12	1.90	80	C09
100	2.00	—	—	2.06	125	C12	2.00	100	C09
167	2.60	—	—	2.60	—	—	2.60	125	C12
250	4.00	—	—	4.00	—	—	4.00	125	C12
333	5.00	—	—	5.00	—	—	5.00	—	—
500	5.00	—	—	5.00	—	—	5.00	—	—
High amp overload Bay-O-Net/ELSP combinations ③									
5	1.90	—	—	1.90	—	—	1.90	—	—
10	1.90	—	—	1.90	—	—	1.90	—	—
15	1.90	—	—	1.90	—	—	1.90	—	—
25	1.90	—	—	1.90	—	—	1.90	—	—
37.5	1.90	—	—	1.90	—	—	1.90	—	—
50	1.90	—	—	1.90	—	—	1.90	—	—
75	1.90	—	—	1.90	—	—	1.90	—	—
100	2.00	165	C03CB	2.00	—	—	2.00	—	—
167	2.60	180	C04CB	2.60	165	C03CB	2.60	—	—
250	4.00	250	C05CB	4.00	165	C04CB	4.00	—	—
333	5.00	—	—	5.00	250	C05CB	5.00	165	C03CB
500	5.00	—	—	5.00	—	—	5.00	165	C04CB

Indicates parallel fuse application.

Notes: The following tables show minimum recommended ELSP fuse ratings. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second. If a different transformer impedance is used, a different ELSP Fuse rating may be required. If a larger percent impedance is used, a smaller ELSP may coordinate.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the transformer initially carrying 75% of rated load at ambient temperature of 35 °C.

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

Table 4. Recommended single-phase transformer Bay-O-Net and ELSP combinations, continued

	15.5 kV									23 kV		
	Nominal single-phase voltage (kV) phase-to-ground											
	12–12.47			13.2–14.4			16–17.2			19.92		
Single-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①												
5	1.90	30	C04	1.90	30	C04	1.90	30	C04	1.90	30	C04
10	1.90	30	C04	1.90	30	C04	1.90	30	C04	1.90	30	C04
15	1.90	30	C04	1.90	30	C04	1.90	30	C04	1.90	30	C04
25	1.90	30	C04	1.90	30	C04	1.90	30	C04	1.90	30	C04
37.5	1.90	30	C06	1.90	30	C06	1.90	30	C04	1.90	30	C04
50	1.90	30	C06	1.90	30	C06	1.90	30	C06	1.90	30	C06
75	1.90	40	C08	1.90	40	C08	1.90	30	C06	1.90	30	C06
100	2.00	50	C08	2.00	50	C08	2.02	40	C08	2.00	40	C08
167	2.60	80	C10	2.60	80	C10	2.60	80	C10	2.60	80	C10
250	4.00	100	C12	4.00	100	C12	4.00	80	C10	4.00	80	C10
333	5.00	150	C14	5.00	150	C14	5.00	80	C12	5.00	80	C12
500	5.00	150	C14	5.00	150	C14	5.00	125	C14	5.00	150	C14
ELSP and dual sensing Bay-O-Net fuse combinations ②												
5	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
10	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
15	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
25	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
37.5	1.90	30	C05	1.90	30	C05	1.90	30	C03	1.90	30	C03
50	1.90	30	C05	1.90	30	C05	1.90	30	C05	1.90	30	C05
75	1.90	80	C08	1.90	80	C08	1.90	80	C08	1.90	30	C05
100	2.00	80	C08	2.00	80	C08	2.00	80	C08	2.00	30	C05
167	2.60	100	C10	2.60	100	C10	2.60	100	C10	2.60	80	C08
250	4.00	125	C12	4.00	125	C12	4.00	100	C10	4.00	100	C10
333	5.00	150	C12	5.00	150	C12	5.00	125	C12	5.00	125	C10
500	5.00	250	C14	5.00	250	C14	5.00	150 ④	C12	5.00	150	C10
ELSP and dual element Bay-O-Net fuse combinations ②												
5	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
10	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
15	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
25	1.90	30	C03	1.90	30	C03	1.90	30	C03	1.90	30	C03
37.5	1.90	30	C05	1.90	30	C04	1.90	30	C03	1.90	30	C03
50	1.90	30	C06	1.90	30	C05	1.90	30	C04	1.90	30	C03
75	1.90	50	C07	1.90	40	C06	1.90	30	C06	1.90	30	C05
100	2.00	80	C09	2.00	80	C09	2.00	50	C07	2.00	30	C06
167	2.60	100	C11	2.60	80	C11	2.60	50	C07	2.60	50	C07
250	4.00	100	C12	4.00	100	C12	4.00	—	—	4.00	—	—
333	5.00	100	C12	5.00	100	C12	5.00	—	—	5.00	—	—
500	5.00	—	—	5.00	—	—	5.00	—	—	5.00	—	—
High amp overload Bay-O-Net/ELSP combinations ③												
5	1.90	—	—	1.90	—	—	1.90	—	—	1.90	—	—
10	1.90	—	—	1.90	—	—	1.90	—	—	1.90	—	—
15	1.90	—	—	1.90	—	—	1.90	—	—	1.90	—	—
25	1.90	—	—	1.90	—	—	1.90	—	—	1.90	—	—
37.5	1.90	—	—	1.90	—	—	1.90	—	—	1.90	—	—
50	1.90	—	—	1.90	—	—	1.90	—	—	1.90	—	—
75	1.90	—	—	1.90	—	—	1.90	—	—	1.90	—	—
100	2.00	—	—	2.00	—	—	2.00	—	—	2.00	—	—
167	2.60	—	—	2.60	—	—	2.60	—	—	2.60	—	—
250	4.00	—	—	4.00	—	—	4.00	—	—	4.00	—	—
333	5.00	—	—	5.00	—	—	5.00	—	—	5.00	—	—
500	5.00	165	C03CB	5.00	165	C03CB	5.00	—	—	5.00	—	—

Indicates parallel fuse application.

Notes: The following tables show minimum recommended ELSP fuse ratings. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second. If a different transformer impedance is used, a different ELSP Fuse rating may be required. If a larger percent impedance is used, a smaller ELSP may coordinate.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the transformer initially carrying 75% of rated load at ambient temperature of 35 °C.

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

④ Use 23.0 kV Rated ELSP fuse for this application range. (See Table 2, Note 2, Page 3 of this catalog section.)

Table 5. Recommended three-phase transformer Bay-O-Net and ELSP combinations with grounded wye-grounded wye-connected primary windings

	8.3 kV ELSP fuse (phase-to-ground)														
	Nominal three-phase voltage (kV)														
	4.16			7.2–7.96			12–12.47			13.2			14.4		
Three-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①															
45	1.60	50	C08	1.60	30	C06	1.60	30	C04	1.60	30	C04	1.60	30	C04
75	1.60	80	C10	1.60	40	C06	1.60	30	C06	1.60	30	C06	1.60	30	C06
112.5	1.80	100	C10	1.80	80	C08	1.80	40	C06	1.80	30	C06	1.80	30	C06
150	2.00	150	C12	2.00	80	C10	2.00	50	C08	2.12	50	C08	2.00	40	C08
225	3.00	150	C14	3.00	80	C10	3.00	80	C10	3.00	80	C10	3.00	80	C10
300	3.50	150	C14	3.50	125	C12	3.57	80	C10	3.50	80	C10	3.50	80	C10
500	4.00	300	C17	4.00	150	C14	4.00	100	C12	4.00	100	C12	4.00	100	C12
750	5.75	300	C17	5.75	165	C16	5.75	150	C14	5.75	125	C14	5.75	150	C14
1000	5.75	—	—	5.75	300	C17	5.75	165	C16	5.75	150	C14	5.75	150	C14
1500	5.75	—	—	5.75	—	—	5.75	300	C17	5.75	300	C17	5.75	300	C17
2000	5.75	—	—	5.75	—	—	5.75	—	—	5.75	300	C17	5.75	300	C17
2500	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
ELSP and dual sensing Bay-O-Net fuse combinations ②															
45	1.60	80	C08	1.60	30	C05	1.60	30	C03	1.60	30	C03	1.60	30	C03
75	1.60	125	C10	1.83	80	C08	1.60	30	C05	1.60	30	C05	1.60	30	C05
112.5	1.80	150	C12	1.80	80	C08	1.80	80	C08	1.80	80	C08	1.80	80	C08
150	2.00	165	C12	2.00	100	C10	2.00	80	C08	2.00	80	C08	2.00	80	C08
225	3.00	250	C14	3.00	150	C12	3.00	100	C10	3.00	80	C10	3.00	80	C10
300	3.50	300	C14	3.50	150	C12	3.50	100	C10	3.50	100	C10	3.50	80	C10
500	4.00	330	C16	4.00	250	C14	4.00	150	C12	4.13	125	C12	4.00	125	C12
750	5.75	360	C18	5.75	330	C18	5.75	250	C14	5.75	250	C14	5.75	250	C14
1000	5.75	—	—	5.75	330	C18	5.75	250	C14	5.75	250	C14	5.75	250	C14
1500	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
ELSP and dual element Bay-O-Net fuse combinations ②															
45	1.60	50	C07	1.60	30	C04	1.60	30	C03	1.60	30	C03	1.60	30	C03
75	1.66	80	C09	1.60	40	C06	1.60	30	C04	1.60	30	C04	1.60	30	C04
112.5	1.80	100	C11	1.80	65	C07	1.80	40	C06	1.80	30	C06	1.80	30	C06
150	2.00	125	C12	2.00	80	C09	2.00	50	C07	2.00	50	C07	2.00	50	C07
225	3.00	125	C14	3.00	100	C11	3.00	80	C09	3.00	80	C09	3.00	80	C09
300	3.50	—	—	3.50	100	C12	3.50	80	C09	3.50	80	C09	3.50	80	C09
500	4.00	—	—	4.00	—	—	4.00	100	C12	4.00	100	C12	4.00	100	C12
750	5.75	—	—	5.75	—	—	5.75	125	C14	5.75	125	C14	5.75	125	C14
1000	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—	5.75	—	—
High amp overload Bay-O-Net/ELSP combinations ③															
45	1.60	—	—	1.60	—	—	1.60	—	—	1.60	—	—	1.60	—	—
75	1.60	—	—	1.60	—	—	1.60	—	—	1.60	—	—	1.60	—	—
112.5	1.80	—	—	1.80	—	—	1.80	—	—	1.80	—	—	1.80	—	—
150	2.00	—	—	2.00	—	—	2.00	—	—	2.00	—	—	2.00	—	—
225	3.00	—	—	3.00	—	—	3.00	—	—	3.00	—	—	3.00	—	—
300	3.50	165	C03CB	3.50	165	C03CB	3.50	—	—	3.50	—	—	3.50	—	—
500	4.00	180	C04CB	4.00	165	C03CB	4.00	—	—	4.00	—	—	4.00	—	—
750	5.75	250	C05CB	5.75	165	C04CB	5.75	165	C03CB	5.75	—	—	5.75	—	—
1000	5.75	—	—	5.75	180	C05CB	5.75	165	C03CB	5.75	165	C03CB	5.75	165	C03CB
1500	5.75	—	—	5.75	—	—	5.75	165	C04CB	5.75	165	C04CB	5.75	165	C04CB
2000	5.75	—	—	5.75	—	—	5.75	250	C05CB	5.75	250	C05CB	5.75	250	C05CB
2500	5.75	—	—	5.75	—	—	5.75	250[d]	C05CBd	5.75	250	C05CB	5.75	250	C05CB

Indicates parallel fuse application.

Notes: Table shows minimum recommended ELSP fuse rating. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults.
Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second.
The Bay-O-Net fuse cannot be used on grounded wye-grounded wye transformers above 23 kV if there is more than a 50% delta load. If that is the case, the recovery voltage on the fuse can exceed the 23 kV rating of the Bay-O-Net fuse.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the transformer initially carrying 75% of rated load at ambient temperature of 35 °C.

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

④ The use of these fuses will provide slightly less than 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

Table 5. Recommended three-phase transformer Bay-O-Net and ELSP combinations with grounded wye-grounded wye-connected primary winding, continued

	15.5 kV ELSP fuse (phase-to-ground)								
	Nominal three-phase voltage (kV)								
	20.8			22.86			24.94		
Three-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①									
45	1.60	30	C04	1.60	30	C04	1.60	30	C04
75	1.60	30	C04	1.60	30	C04	1.60	30	C04
112.5	1.80	30	C06	1.80	30	C04	1.80	30	C04
150	2.00	30	C08	2.00	30	C06	2.00	30	C06
225	3.00	30	C08	3.00	30	C06	3.00	40	C08
300	3.63	40	C08	3.50	30	C08	3.50	30	C08
500	4.00	80	C10	4.00	80	C10	4.00	80	C10
750	5.75	80	C12	5.75	80	C12	5.75	80	C12
1000	5.75	150	C14	5.75	80	C12	5.75	80	C12
1500	5.75	150	C14	5.75	150	C14	5.75	150	C14
2000	5.75	250	C16	5.75	165	C16	5.75	165	C16
2500	5.75	300	—	5.75	—	—	5.75	—	—
ELSP and dual sensing Bay-O-Net fuse combinations ②									
45	1.60	30	C03	1.60	30	C03	1.60	30	C03
75	1.60	30	C03	1.60	30	C03	1.60	30	C03
112.5	1.80	30	C05	1.80	30	C05	1.80	30	C05
150	2.00	30	C05	2.00	30	C05	2.00	30	C05
225	3.00	80	C08	3.00	80	C08	3.00	80	C08
300	3.50	80	C08	3.50	80	C08	3.50	80	C08
500	4.00	80	C10	4.00	80	C10	4.00	80	C10
750	5.75	100	C10	5.75	100	C10	5.75	125	C12
1000	5.75	100	C10	5.75	100	C10	5.75	125	C12
1500	5.75	250	C14	5.75	250	C14	5.75	250	C14
2000	5.75	—	—	5.75	—	—	5.75	250	C14
2500	5.75	—	—	5.75	—	—	5.75	—	—
ELSP and dual element Bay-O-Net fuse combinations ②									
45	1.60	30	C03	1.60	30	C03	1.60	30	C03
75	1.60	30	C03	1.60	30	C03	1.60	30	C03
112.5	1.80	30	C05	1.80	30	C04	1.80	30	C04
150	2.00	30	C06	2.00	30	C05	2.00	30	C05
225	3.00	40	C07	3.00	30	C06	3.00	30	C06
300	3.50	80	C09	3.50	40	C07	3.50	40	C07
500	4.00	80	C11	4.00	—	—	4.00	—	—
750	5.75	100	C12	5.75	—	—	5.75	—	—
1000	5.75	100	C14	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—	5.75	—	—
High amp overload Bay-O-Net/ELSP combinations ③									
45	1.60	—	—	1.60	—	—	1.60	—	—
75	1.60	—	—	1.60	—	—	1.60	—	—
112.5	1.80	—	—	1.80	—	—	1.80	—	—
150	2.00	—	—	2.00	—	—	2.00	—	—
225	3.00	—	—	3.00	—	—	3.00	—	—
300	3.50	—	—	3.50	—	—	3.50	—	—
500	4.00	—	—	4.00	—	—	4.00	—	—
750	5.75	—	—	5.75	—	—	5.75	—	—
1000	5.75	—	—	5.75	165	C03CB	5.75	—	—
1500	5.75	165	C03CB	5.75	165	C03CB	5.75	165	C03CB
2000	5.75	165	C04CB	5.75	165	C03CB	5.75	165	C04CB
2500	5.75	165	C04CB	5.75	165	C04CB	5.75	165	C04CB

Indicates parallel fuse application.

Notes: Table shows minimum recommended ELSP fuse rating. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second.
The Bay-O-Net fuse cannot be used on grounded wye-grounded wye transformers above 23 kV is there is more than a 50% delta load. If that is the case, the recovery voltage on the fuse can exceed the 23 kV rating of the Bay-O-Net fuse.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the trans former initially carrying 75% of rated load at ambient temperature of 35 °C.

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

Table 5. Recommended three-phase transformer Bay-O-Net and ELSP combinations with grounded wye-grounded wye-connected primary winding, continued

	23 kV ELSP fuse (phase-to-ground)					
	Nominal three-phase voltage (kV)					
	27.6			34.5		
Three-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①						
45	1.60	30	C04	1.60	30	C04
75	1.60	30	C04	1.60	30	C04
112.5	1.80	30	C04	1.80	30	C04
150	2.00	30	C06	2.00	30	C04
225	3.00	30	C06	3.00	30	C06
300	3.50	30	C08	3.50	30	C06
500	4.00	80	C10	4.00	30	C08
750	5.75	80	C10	5.75	80	C10
1000	5.75	80	C12	5.75	80	C12
1500	5.75	150	C14	5.75	80	C12
2000	5.75	150	C14	5.75	150	C14
2500	5.75	—	—	5.75	—	—
ELSP and dual sensing Bay-O-Net fuse combinations ②						
45	1.60	30	C03	1.60	30	C03
75	1.60	30	C03	1.60	30	C03
112.5	1.80	30	C05	1.80	30	C03
150	2.00	30	C05	2.00	30	C05
225	3.00	80	C08	3.00	30	C05
300	3.50	80	C08	3.50	30	C05
500	4.00	80	C10	4.00	80	C08
750	5.75	80	C10	5.75	80	C10
1000	5.75	125	C10	5.75	80	C10
1500	5.75	—	C14	5.75	125	C12
2000	5.75	—	—	5.75	250	C14
2500	5.75	—	—	5.75	—	—
ELSP and dual element Bay-O-Net fuse combinations ②						
45	1.60	30	C03	1.60	30	C03
75	1.60	30	C03	1.60	30	C03
112.5	1.80	30	C03	1.80	30	C03
150	2.00	30	C04	2.00	30	C04
225	3.00	30	C06	3.00	30	C05
300	3.50	40	C07	3.50	30	C06
500	4.00	—	—	4.00	40	C07
750	5.75	—	—	5.75	—	—
1000	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—
High amp overload Bay-O-Net/ELSP combinations ③						
45	1.60	—	—	1.60	—	—
75	1.60	—	—	1.60	—	—
112.5	1.80	—	—	1.80	—	—
150	2.00	—	—	2.00	—	—
225	3.00	—	—	3.00	—	—
300	3.50	—	—	3.50	—	—
500	4.00	—	—	4.00	—	—
750	5.75	—	—	5.75	—	—
1000	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—

Indicates parallel fuse application.

Notes: Table shows minimum recommended ELSP fuse rating. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second.
The Bay-O-Net fuse cannot be used on grounded wye-grounded wye transformers above 23 kV if there is more than a 50% delta load. If that is the case, the recovery voltage on the fuse can exceed the 23 kV rating of the Bay-O-Net fuse.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the trans former initially carrying 75% of rated load at ambient temperature of 35 °C

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

Table 6. Recommended three-phase transformer Bay-O-Net and ELSP combinations with delta connected primary windings

	8.3 kV ELSP fuse (phase-to-ground)					
	Nominal three-phase voltage (kV)					
	4.16			7.2–7.96		
Three-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①						
45	1.60	50	C08	1.60	30	C06
75	1.60	80	C10	1.60	40	C06
112.5	1.80	100	C10	1.80	65	C08
150	2.00	125	C12	2.00	80	C10
225	3.00	150	C14	3.00	80	C10
300	3.50	150	C14	3.50	125	C12
500	4.00	300	C17	4.00	150	C14
750	5.75	300	C17	5.75	165	C16
1000	5.75	—	—	5.75	300	C17
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—
ELSP and dual sensing Bay-O-Net fuse combinations ②						
45	1.60	80	C08	1.60	30	C05
75	1.60	125	C10	1.83	80	C08
112.5	1.80	150	C12	1.80	80	C08
150	2.00	165	C12	2.00	100	C10
225	3.00	250	C14	3.00	150	C12
300	3.50	300	C14	3.50	150	C12
500	4.00	330	C16	4.00	250	C14
750	5.75	360	C18	5.75	300	C18
1000	5.75	—	—	5.75	330	C18
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—
ELSP and dual element Bay-O-Net fuse combinations ②						
45	1.60	50	C07	1.60	30	C04
75	1.66	80	C09	1.60	40	C06
112.5	1.80	100	C11	1.80	65	C07
150	2.00	125	C12	2.00	80	C09
225	3.00	150	C14	3.00	100	C11
300	3.50	—	—	3.50	100	C12
500	4.00	—	—	4.00	—	—
750	5.75	—	—	5.75	—	—
1000	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—
High amp overload Bay-O-Net/ELSP combinations ③						
45	1.60	—	—	1.60	—	—
75	1.60	—	—	1.60	—	—
112.5	1.80	—	—	1.80	—	—
150	2.00	—	—	2.00	—	—
225	3.00	—	—	3.00	—	—
300	3.50	165	C03CB	3.50	165	C03CB
500	4.00	180	C04CB	4.00	165	C03CB
750	5.75	250	C05CB	5.75	165	C04CB
1000	5.75	—	—	5.75	180	C05CB
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—

Indicates parallel fuse application.

Notes: Table shows minimum recommended ELSP fuse rating. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the trans former initially carrying 75% of rated load at ambient temperature of 35 °C.

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

Table 6. Recommended three-phase transformer Bay-O-Net and ELSP combinations with delta connected primary windings, continued

	15.5 kV ELSP fuse (Phase-to-Phase)								
	Nominal three-phase voltage (kV)								
	12–12.47			13.2			14.4		
Three-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①									
45	1.60	30	C04	1.60	30	C04	1.60	30	C04
75	1.60	30	C06	1.60	30	C06	1.60	30	C06
112.5	1.80	40	C06	1.80	30	C06	1.80	30	C06
150	2.00	50	C08	2.12	50	C08	2.00	40	C08
225	3.00	80	C10	3.00	80	C10	3.00	80	C10
300	3.57	80	C10	3.50	80	C10	3.50	80	C10
500	4.00	100	C12	4.00	100	C12	4.00	100	C12
750	5.75	150	C14	5.75	150	C14	5.75	150	C14
1000	5.75	165	C16	5.75	150	C14	5.75	150	C14
1500	5.75	300	C17	5.75	300	C17	5.75	300	C17
2000	5.75	—	—	5.75	300	C17	5.75	300	C17
2500	5.75	—	—	5.75	—	—	5.75	—	—
ELSP and dual sensing Bay-O-Net fuse combinations ②									
45	1.60	30	C03	1.60	30	C03	1.60	30	C03
75	1.60	30	C05	1.60	30	C05	1.60	30	C05
112.5	1.80	80	C08	1.80	80	C08	1.80	80	C08
150	2.00	80	C08	2.00	80	C08	2.00	80	C08
225	3.00	100	C10	3.00	80	C10	3.00	80	C10
300	3.50	100	C10	3.50	100	C10	3.50	80	C10
500	4.00	150	C12	4.13	125	C12	4.00	125	C12
750	5.75	250	C14	5.75	250	C14	5.75	250	C14
1000	5.75	250	C14	5.75	250	C14	5.75	250	C14
1500	5.75	—	—	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—	5.75	—	—
ELSP and dual element Bay-O-Net fuse combinations ②									
45	1.60	30	C03	1.60	30	C03	1.60	30	C03
75	1.60	30	C04	1.60	30	C04	1.60	30	C04
112.5	1.80	40	C06	1.80	30	C06	1.80	30	C06
150	2.00	50	C07	2.00	50	C07	2.00	50	C07
225	3.00	80	C09	3.00	80	C09	3.00	80	C09
300	3.50	80	C09	3.50	80	C09	3.50	80	C09
500	4.00	100	C12	4.00	100	C12	4.00	100	C12
750	5.75	125	C14	5.75	125	C14	5.75	125	C14
1000	5.75	—	—	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—	5.75	—	—
High amp overload Bay-O-Net/ELSP combinations ③									
45	1.60	—	—	1.60	—	—	1.60	—	—
75	1.60	—	—	1.60	—	—	1.60	—	—
112.5	1.80	—	—	1.80	—	—	1.80	—	—
150	2.00	—	—	2.00	—	—	2.00	—	—
225	3.00	—	—	3.00	—	—	3.00	—	—
300	3.50	—	—	3.50	—	—	3.50	—	—
500	4.00	—	—	4.00	—	—	4.00	—	—
750	5.75	165	C03CB	5.75	—	—	5.75	—	—
1000	5.75	165	C03CB	5.75	165	C03CB	5.75	165	C03CB
1500	5.75	165	C04CB	5.75	165	C04CB	5.75	165	C04CB
2000	5.75	250	C05CB	5.75	250	C05CB	5.75	250	C05CB
2500	5.75	250 ④	C05CB ④	5.75	250	C05CB	5.75	250	C05CB

Indicates parallel fuse application.

Notes: Table shows minimum recommended ELSP fuse rating. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the trans former initially carrying 75% of rated load at ambient temperature of 35 °C.

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

④ The use of these fuses will provide slightly less than 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

Table 6. Recommended three-phase transformer Bay-O-Net and ELSP combinations with delta connected primary windings, continued

	23 kV ELSP fuse (phase-to-phase)					
	Nominal three-phase voltage (kV)					
	20.8			22.86		
Three-phase transformer (kVA)	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number	Assumed transformer impedance (%)	ELSP rating (A)	Link catalog number
ELSP and current sensing Bay-O-Net fuse combinations ①						
45	1.60	30	C04	1.60	30	C04
75	1.60	30	C04	1.60	30	C04
112.5	1.80	30	C06	1.80	30	C04
150	2.00	30	C08	2.00	30	C06
225	3.00	30	C08	3.00	30	C06
300	3.63	40	C08	3.50	30	C08
500	4.00	80	C10	4.00	80	C10
750	5.75	80	C12	5.75	80	C12
1000	5.75	150	C14	5.75	80	C12
1500	5.75	150	C14	5.75	150	C14
2000	5.75	250	C16	5.75	165	C16
2500	5.75	300	—	5.75	—	—
ELSP and dual sensing Bay-O-Net fuse combinations ②						
45	1.60	30	C03	1.60	30	C03
75	1.60	30	C03	1.60	30	C03
112.5	1.80	30	C05	1.80	30	C05
150	2.00	30	C05	2.00	30	C05
225	3.00	80	C08	3.00	80	C08
300	3.50	80	C08	3.50	80	C08
500	4.00	80	C10	4.00	80	C10
750	5.75	100	C10	5.75	100	C10
1000	5.75	100	C10	5.75	100	C10
1500	5.75	250	C14	5.75	250	C14
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—
ELSP and dual element Bay-O-Net fuse combinations ②						
45	1.60	30	C03	1.60	30	C03
75	1.60	30	C03	1.60	30	C03
112.5	1.80	30	C05	1.80	30	C04
150	2.00	30	C06	2.00	30	C05
225	3.00	40	C07	3.00	30	C06
300	3.50	—	—	3.50	40	C07
500	4.00	—	—	4.00	—	—
750	5.75	—	—	5.75	—	—
1000	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—
High amp overload Bay-O-Net/ELSP combinations ③						
45	1.60	—	—	1.60	—	—
75	1.60	—	—	1.60	—	—
112.5	1.80	—	—	1.80	—	—
150	2.00	—	—	2.00	—	—
225	3.00	—	—	3.00	—	—
300	3.50	—	—	3.50	—	—
500	4.00	—	—	4.00	—	—
750	5.75	—	—	5.75	—	—
1000	5.75	—	—	5.75	—	—
1500	5.75	—	—	5.75	—	—
2000	5.75	—	—	5.75	—	—
2500	5.75	—	—	5.75	—	—

Indicates parallel fuse application.

Notes: Table shows minimum recommended ELSP fuse rating. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet inrush criterion of 12 times transformer full load current for 0.1 second.

① Current sensing Bay-O-Net fuse is selected to melt at 3 to 4 times transformer full load in 300 seconds.

② Dual sensing and dual element Bay-O-Net fuses are selected to limit transformer load to approximately 160% for 7 hours and 200% for 2 hours with the trans former initially carrying 75% of rated load at ambient temperature of 35 °C.

③ The use of these fuses will provide 175% of rated load for 2 hours and 150% of rated load for 7 hours. Contact your Eaton representative for specific overload capability.

Table 6. Recommended three-phase transformer Bay-O-Net and ELSP combinations with delta connected primary windings, continued

		38 kV ELSP fuse (phase-to-phase)							
		Nominal three-phase voltage (kV)							
		24.94		26.4		27.6		34.5	
Transformer kVA rating	Assumed transformer impedance (%)	Link catalog number	ELSP rating (A)	Link catalog number	ELSP rating (A)	Link catalog number	ELSP rating (A)	Link catalog number	ELSP rating (A)
ELSP and 38 kV Bay-O-Net Fuse combination ①									
150	2	C06CB	50	C06CB	50	C06CB	50	C06CB	50
225	3	C06CB	50	C06CB	50	C06CB	50	C06CB	50
300	3.5	C08CB	50	C08CB	50	C08CB	50	C06CB	50
500	4	C10CB	65	C10CB	65	C10CB	65	C08CB	50
750	5.75	C10CB	65	C10CB	65	C10CB	65	C10CB	65
1000	5.75	C12CB	100	C11CB	100	C11CB	80	C10CB	65
1100	5.75	C12CB	100	C12CB	100	C12CB	100	C11CB	80
1250	5.75	C12CB	100	C12CB	100	C12CB	100	C11CB	80
1500	5.75	C14CB	140	C12CB	100	C12CB	100	C12CB	100
1750	5.75	C14CB	140	C14CB	140	C14CB	140	C12CB	100
1850	5.75	C14CB	140	C14CB	140	C14CB	140	C12CB	100
2000	5.75	C14CB	140	C14CB	140	C14CB	140	C12CB	100
2250	5.75	C14CB	140	C14CB	140	C14CB	140	C14CB	140
2500	5.75	—	—	—	—	C14CB	140	C14CB	140
2850	5.75	—	—	—	—	—	—	C14CB	140
3000	5.75	—	—	—	—	—	—	C14CB	140
3200	5.75	—	—	—	—	—	—	C14CB	140

Indicates parallel fuse application.

Notes: Table shows minimum recommended ELSP fuse rating. Recommended ELSP backup fuse will coordinate with protecting fuse and melt only on internal transformer faults. Recommended Bay-O-Net fuses meet criterion of 12 times transformer full load current for 0.1 second.

① 38 kV Bay-O-Net fuse is selected to melt at 2 to 3 times transformer full load in 300 seconds.

Table 7. ELSP and MagneX combinations for three-phase gounded-y–grounded-y transformers only

4.16 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E10	50
75	1.60	E18	80
112.5	1.80	E25	100
150	2.00	E30	125
225	3.00	E40	150
300	3.50	E50	150
500	4.00	—	—
750	5.75	—	—
1000	5.75	—	—
1500	5.75	—	—
2000	5.75	—	—
2500	5.75	—	—

7.2–7.96

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E06	30
75	1.60	E10	50
112.5	1.80	E12	80
150	2.00	E18	80
225	3.00	E25	100
300	3.50	E30	100
500	4.00	E50	150
750	5.75	—	—
1000	5.75	—	—
1500	5.75	—	—
2000	5.75	—	—
2500	5.75	—	—

12–12.47 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E03	30
75	1.60	E06	30
112.5	1.80	E10	40
150	2.00	E12	50
225	3.00	E18	80
300	3.50	E25	80
500	4.00	E30	100
750	5.75	E50	125
1000	5.75	—	—
1500	5.75	—	—
2000	5.75	—	—
2500	5.75	—	—

13.2 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E03	30
75	1.60	E06	30
112.5	1.80	E10	40
150	2.00	E10	40
225	3.00	E12	50
300	3.50	E18	80
500	4.00	E30	100
750	5.75	E40	100
1000	5.75	—	—
1500	5.75	—	—
2000	5.75	—	—
2500	5.75	—	—

20.8 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E06	30
75	1.60	E06	30
112.5	1.80	E10	30
150	2.00	E12	40
225	3.00	E18	80
300	3.50	E25	80
500	4.00	E25	80
750	5.75	E40	100
1000	5.75	E50	100
1500	5.75	—	—
2000	5.75	—	—
2500	5.75	—	—

22.86 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E03	30
75	1.60	E06	30
112.5	1.80	E06	30
150	2.00	E10	40
225	3.00	E12	50
300	3.50	E18	80
500	4.00	E40	100
750	5.75	E40	100
1000	5.75	E50	125
1500	5.75	—	—
2000	5.75	—	—
2500	5.75	—	—

24.94 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E01	30
75	1.60	E03	30
112.5	1.80	E03	30
150	2.00	E06	30
225	3.00	E10	40
300	3.50	E12	40
500	4.00	E18	80
750	5.75	E25	80
1000	5.75	E30	80
1500	5.75	E50	125
2000	5.75	E50	150
2500	5.75	—	—

27.6 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E01	30
75	1.60	E03	30
112.5	1.80	E03	30
150	2.00	E06	30
225	3.00	E06	30
300	3.50	E10	30
500	4.00	E18	80
750	5.75	E25	80
1000	5.75	E30	80
1500	5.75	E40	100
2000	5.75	E50	125
2500	5.75	—	—

34.5 kV

MagneX to ELSP combinations

kVA	Assumed transformer impedance (%)	MagneX	ELSP rating (Cu element) (A) without EO
45	1.60	E01	30
75	1.60	E03	30
112.5	1.80	E03	30
150	2.00	E06	30
225	3.00	E06	30
300	3.50	E10	30
500	4.00	E12	40
750	5.75	E18	80
1000	5.75	E25	80
1500	5.75	E40	100
2000	5.75	E50	125
2500	5.75	E50	125

Notes: Recommended MagneX interrupter primary breakers will allow approximately 140% of rated load current for 4 hours, before operating, with the transformer carrying 75% of its rated current prior to the overload in 35 °C ambient temperature around the transformer.
Recommended Bay-O-Net links are shown in the table.
Recommended ELSP backup fuse links will operate only on faults within the transformer; to maintain this coordination, if a smaller transformer percent impedance is specified, a larger ELSP may be needed; with a larger percent impedance, a smaller ELSP may be usable.

Table 8. ELSP and MagneX interrupter combinations for three-phase delta transformers only

4.16 kV				7.2–7.96				12–12.47 kV			
MagneX to ELSP combinations				**MagneX to ELSP combinations**				**MagneX to ELSP combinations**			
kVA	**Assumed transformer impedance (%)**	**MagneX**	**ELSP rating (Cu element) (A) without EO**	**kVA**	**Assumed transformer impedance (%)**	**MagneX**	**ELSP rating (Cu element) (A) without EO**	**kVA**	**Assumed transformer impedance (%)**	**MagneX**	**ELSP rating (Cu element) (A) without EO**
45	1.60	E10	65	45	1.60	E06	40	45	1.60	E03	30
75	1.60	E18	100	75	1.60	E10	65	75	1.60	E06	40
112.5	1.80	E25	125	112.5	1.80	E12	80	112.5	1.80	E10	50
150	2.00	E30	150	150	2.00	E18	100	150	2.00	E12	65
225	3.00	E50	150	225	3.00	E25	100	225	3.00	E18	80
300	3.50	E50	165	300	3.50	E30	125	300	3.50	E25	80
500	4.00	—	—	500	4.00	E50	150	500	4.00	E30	100
750	5.75	—	—	750	5.75	—	—	750	5.75	E50	150
1000	5.75	—	—	1000	5.75	—	—	1000	5.75	—	—
1500	5.75	—	—	1500	5.75	—	—	1500	5.75	—	—
2000	5.75	—	—	2000	5.75	—	—	2000	5.75	—	—
2500	5.75	—	—	2500	5.75	—	—	2500	5.75	—	—

13.2 kV				20 kV—typical of IEC systems				22 kV—typical of IEC systems			
MagneX to ELSP combinations				**MagneX to ELSP combinations**				**MagneX to ELSP combinations**			
kVA	**Assumed transformer impedance (%)**	**MagneX**	**ELSP rating (Cu element) (A) without EO**	**kVA**	**Assumed transformer impedance (%)**	**MagneX**	**ELSP rating (Cu element) (A) without EO**	**kVA**	**Assumed transformer impedance (%)**	**MagneX**	**ELSP rating (Cu element) (A) without EO**
45	1.60	E03	30	100	1.80	E06	40	100	1.80	E06	40
75	1.60	E06	40	160	2.00	E10	50	160	2.00	E06	40
112.5	1.80	E10	50	200	2.00	E10	50	200	2.00	E10	50
150	2.00	E10	50	250	3.00	E12	65	250	3.00	E12	65
225	3.00	E12	65	400	4.00	E18	80	400	4.00	E18	80
300	3.50	E18	80	500	4.00	E25	80	500	4.00	E18	80
500	4.00	E30	100	630	4.00	E30	100	630	4.00	E25	80
750	5.75	E40	125	800	5.75	E40	100	800	5.75	E30	100
1000	5.75	E50	150	1000	5.75	E50	100	1000	5.75	E40	100
1500	5.75	—	—	1250	5.75	E50	150	1250	5.75	E50	125
2000	5.75	—	—	—	5.75	—	—	—	5.75	—	—
2500	5.75	—	—	—	5.75	—	—	—	5.75	—	—

Notes: Recommended MagneX interrupter primary breakers will allow approximately 140% of rated load current for 4 hours, before operating, with the transformer carrying 75% of its rated current prior to the overload in 35 °C ambient temperature around the transformer.
Recommended Bay-O-Net links are shown in the table.
Recommended ELSP backup fuse links will operate only on faults within the transformer; to maintain this coordination, if a smaller transformer percent impedance is specified, a larger ELSP may be needed; with a larger percent impedance, a smaller ELSP may be usable.

Application peak let-through current

Maximum peak let-through curves provide the opportunity of comparing an unprotected system of one protected with an expulsion fuse, boric acid fuse or recloser to a system protected with ELSP current-limiting backup fuse. For example, as shown in **Figure 4**, an unprotected circuit with a 10,000 A available fault current can deliver a maximum peak current to a fault of about 28,000 A (find the intersection of the 10,000 A available current line with the peak current line, and read the result on the left maximum let-through axis). This would be the current delivered, regardless of the size of any expulsion fuse that could be applied.

Protecting this apparatus with a 15.5 kV, 80 A, ELSP fuse however, would limit the peak let-through current to the apparatus to about 8000 A. This is the same peak let-through delivered to a fault by a system having only 4800 A available current.

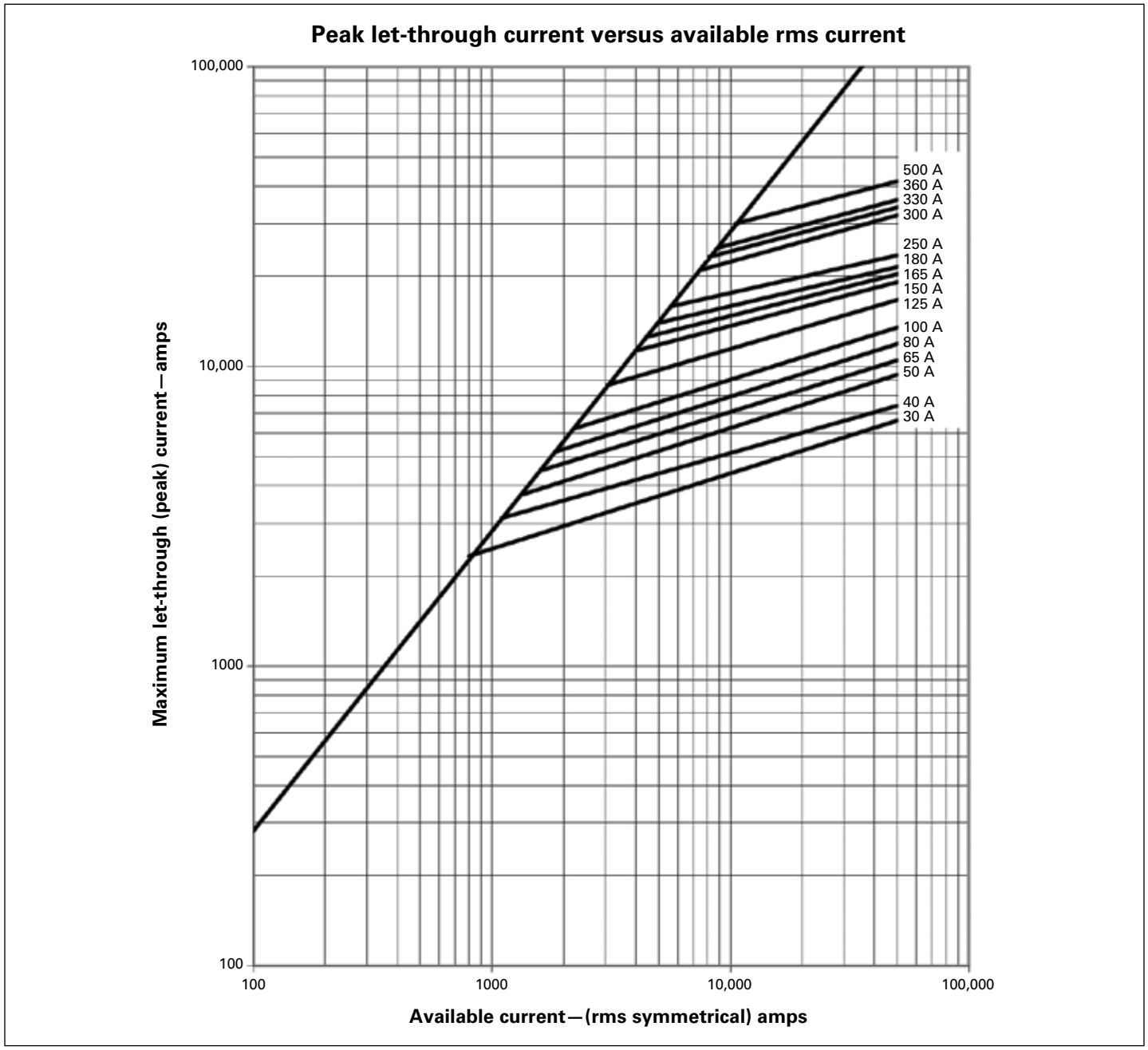

Figure 3. Peak let-through curves for 8.3 kV, 9.9 kV, 15.5 kV, 17.2 kV, and 23 kV ELSP backup current-limiting fuse

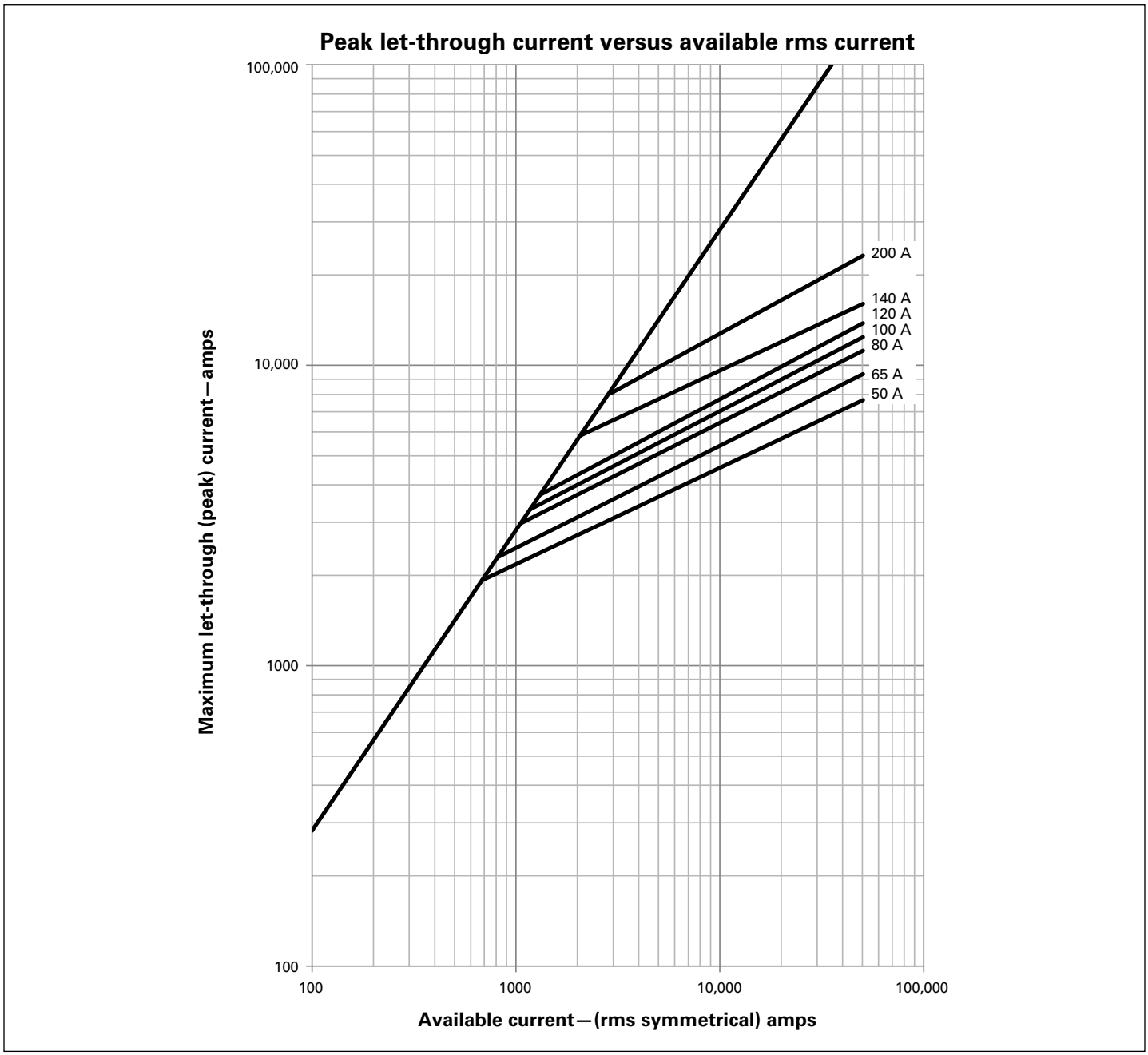

Figure 4. Peak let-through curves for 38 kV ELSP backup current-limiting fuse

Table 9. Recommended MagneX interrupter and ELSP current-limiting fuse combinations

Nominal single-phase (kV phase-to-ground)	8.3 kV			15.5 kV		23 kV
	2.4	4.16–4.8	6.9–8.0	12.0–14.4	16.34	19.92
10 kVA						
ELSP rating without emergency overload	30	30	30	30	30	30
ELSP rating with emergency overload	30	30	30	30	30	30
MagneX element	E06	E03	E03	E01	E01	E01
15 kVA						
ELSP rating without emergency overload	40	30	30	30	30	30
ELSP rating with emergency overload	50	30	30	30	30	30
MagneX element	E10	E06	E03	E03	E01	E01
25 kVA						
ELSP rating without emergency overload	80	40	30	30	30	30
ELSP rating with emergency overload	80	50	30	30	30	30
MagneX element	E18	E10	E06	E03	E03	E03
37.5 kVA						
ELSP rating without emergency overload	100	65	40	30	30	30
ELSP rating with emergency overload	100	80	50	30	30	30
MagneX element	E18	E12	E10	E06	E03	E03
50 kVA						
ELSP rating without emergency overload	150	80	50	30	30	30
ELSP rating with emergency overload	150	100	50	30	30	30
MagneX element	E30	E18	E12	E06	E06	E03
75 kVA						
ELSP rating without emergency overload	150	100	80	40	30	30
ELSP rating with emergency overload	150	125	100	40	30	30
MagneX element	E40	E25	E18	E10	E06	E06
100 kVA						
ELSP rating without emergency overload	180	150	100	50	40	30
ELSP rating with emergency overload	250	165	100	50	40	30
MagneX element	E50	E40	E18	E12	E10	E06
167 kVA						
ELSP rating without emergency overload	—	165	125	80	80	50
ELSP rating with emergency overload	—	180	150	80	80	50
MagneX element	—	E50	E40	E18	E18	E12

Notes: The MagneX interrupter recommendations are based on:

- Deration factor of 0.5% per °C above 25 °C.
- Allowable loading greater than 140% for four hours in accordance with IEEE Std C57.91™-1981 standard guide for Loading Distribution Transformers, Table 6.
- If using a MagneX interrupter equipped without emergency overload, a smaller ELSP rating may be used.
- The Bay-O-Net fuse cannot be used on grounded wye-grounded wye transformers above 23 kV if there is more than a 50% delta load. If that is the case, the recovery voltage on the fuse can exceed the 23 kV rating of the Bay-O-Net fuse.

Additional information

Refer to the following reference literature for additional information:

- CA132029EN ELSP Fuse Holder
- CA132015EN 23 kV and 38 kV Sidewall-Mounted and 23 kV Cover-Mounted Bay-O-Net Fuse Assembly
- CA132009EN Current Sensing Bay-O-Net Fuse Link
- CA132010EN Dual Sensing Bay-O-Net Fuse Link
- CA132011EN Dual Element Bay-O-Net Fuse Link
- CA132007EN High Ampere Overload Bay-O-Net Fuse Link
- CA132006EN 38 kV Bay-O-Net Fuse Link
- CA132016EN MagneX Interrupter
- CA132017EN Two- and Three-Phase MagneX Interrupter
- TD132004EN Pad-mounted Transformer Fusing Philosophy
- R240-91-50 Bay-O-Net Fuse 353C Fuse Link Time Current Characteristic Curves
- R240-91-51 Bay-O-Net Fuse 358C Fuse Link Time Current Characteristic Curves
- R240-91-53 Bay-O-Net Fuse 361C Fuse Link Time Current Characteristic Curves
- R240-91-57 Bay-O-Net Fuse 108C Fuse Link Time Current Characteristic Curves
- R240-91-310 MagneX Interrupter Time Current Characteristic Curves
- R240-91-167 ELSP 8.3/9.9 kV Time Current Characteristic Curves
- R240-91-168 ELSP 15.5/17.2 kV Time Current Characteristic Curves
- R240-91-169 ELSP 23.0 kV Time Current Characteristic Curves
- R240-91-170 ELSP 38 kV Time Current Characteristic Curves
- TC132004EN 38 kV Bay-O-Net Fuse Link time Current Characteristic Curves
- MN132001EN ELSP Current-Limiting Backup Fuse Installation Instructions
- CP1101 ELSP 8.3 kV-23 kV Certified Test Report
- CP1403 ELSP 38 kV Certified Test Report
- WP132001EN Optimized Overcurrent Protection for Pad-mounted Under-oil Transformers
- PA132008EN Defend the Backbone of Your Distribution System

Contact your Eaton representative for further information or other applications.

For Eaton's Cooper Power series ELSP fuse product information, call

1-877-277-4636 or visit

Eaton.com/cooperpowerseries

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

Eaton's Power Systems Division
2300 Badger Drive
Waukesha, WI 53188
United States
Eaton.com/cooperpowerseries

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