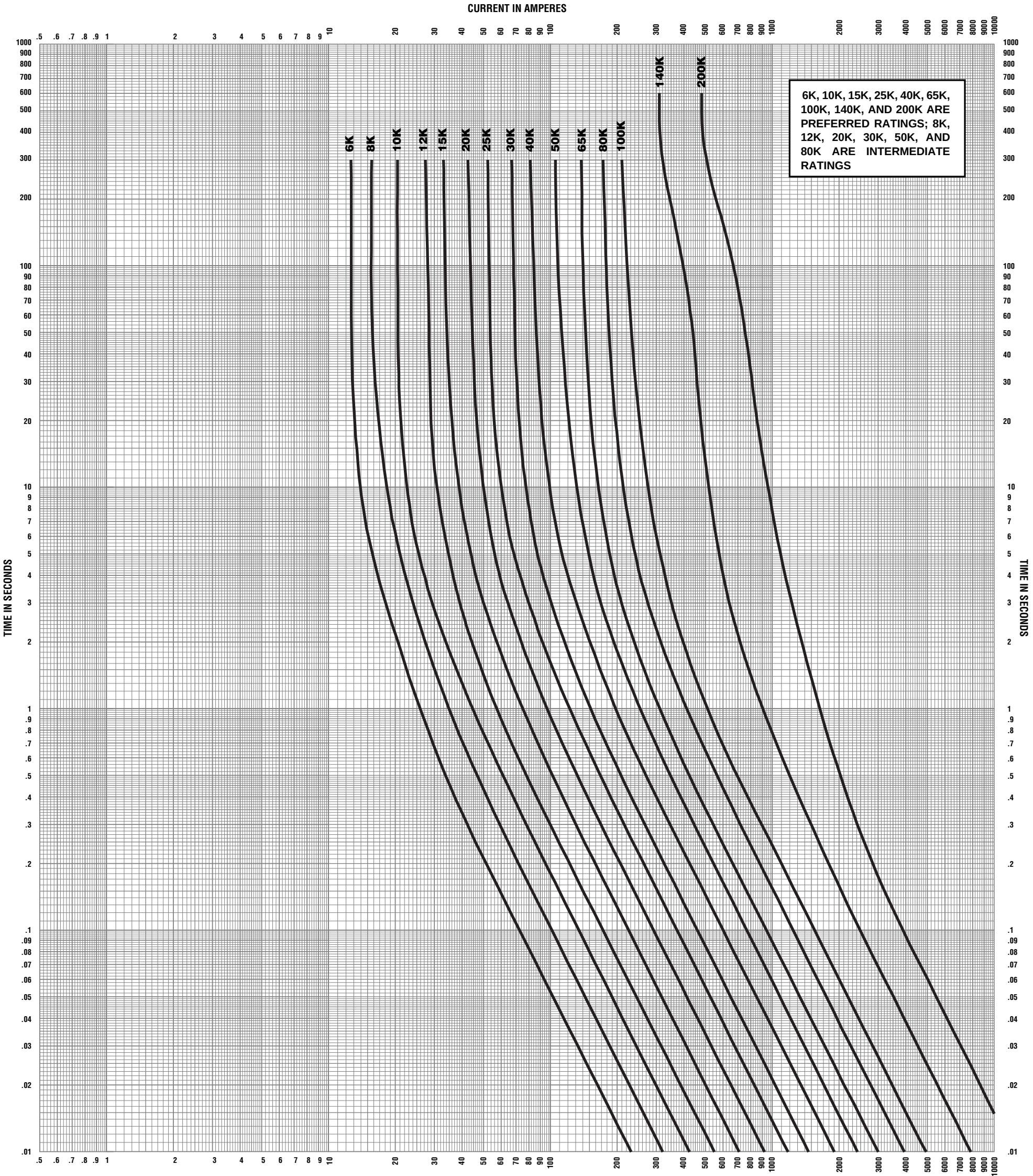

CURRENT IN AMPERES

MINIMUM MELTING TIME-CURRENT CHARACTERISTIC CURVES

POSITROL® FUSE LINKS—S&C "K" SPEED

BASIS—These fuse links are tested in accordance with the procedures described in ANSI Standard C37.41-1981, to comply with ANSI Standard C37.42-1981. As required by these standards, the minimum melting current is not less than 200% of fuse-link ampere rating, and the minimum melting curves are based on tests starting with the fuse link at an ambient temperature of 25°C and no initial load.

CONSTRUCTION—Fusible elements for fuse links rated 6K through 100K amperes are silver, helically coiled; fusible elements for fuse links rated 140K and 200K amperes are silver-tin. All are of solderless construction.

TOLERANCES—Curves are plotted to minimum test points. Maximum variations within the coordinating range (melting times less than 10 seconds) expressed in current values are:

Plus 10% for fuse links rated 6K through 100K amperes;
Plus 20% for fuse links rated 140K and 200K amperes.

APPLICATION—Like all high-voltage fuses, these fuse links are intended to accommodate overloads, not to interrupt them. Accordingly, they feature fusible elements which are designed with a minimum melting current of 200% of the fuse-link ampere rating (for fuse links rated 100K amperes or less) or 220% of the fuse-link ampere rating (for fuse links rated over 100K amperes). As a result, these fuse links have considerable peak-load capabilities; however, they should never be exposed to loading in excess of the peak-load capabilities listed in S&C Data Bulletin 350-190.

Since fuse links having silver element construction are not subject to damage by aging or transient overcurrents, it is unnecessary to replace unblown fuse links of such construction in single-phase or three-phase installations when one or more fuse links have blown. However, it is advisable to replace unblown silver-tin element fuse links under the same conditions, since—while not subject to aging—they may be damaged by transient overcurrents.

COORDINATION—Any preloading reduces melting time. While this phenomenon is especially pronounced in fuse links having minimum melting currents appreciably less than 200% of rating, the effect of preloading (as described in S&C Data Bulletin 350-195) must nonetheless be determined for the fuse links represented by these curves and adjustments to these curves must be made:

1. When close coordination is required;
2. When automatic circuit reclosers or three-shot cutouts are involved;
3. When, regardless of the preciseness of coordination, the fuse link is subjected to temporary overloads.

If close coordination is to be achieved, overloading must be avoided since it causes a significant shift in time-current characteristics.

Because of the damageability of silver-tin element fuse links (rated 140K and 200K amperes), setback allowances must be used in coordinating these fuse links as "protected" devices. These are applied by reducing the current value in the above curves by 10%. On the other hand, silver-element fuse links (rated 6K through 100K amperes) are nondamageable, and no such setback allowances are necessary.

The exclusive use of S&C Positrol Fuse Links—because of their inherently narrower tolerance band and because of their nondamageability—will expand the scope of coordination as follows:

1. Coordination of preferred with adjacent intermediate ratings, giving twice as many sectionalizing points. This is true for the sequence operation of fuse links alone, or for the sequence operation of fuse links coordinated with automatic circuit reclosers.
2. Coordination of a larger number of fuse-link ratings with a given automatic circuit recloser between the fast and retarded curves.
3. Coordination through a greater range, and to higher levels of fault current, with respect to automatic circuit reclosers.
4. Coordination to higher levels of fault current with respect to sequence operation of fuse links.

The breadth of coordination described above can be obtained only by the use of S&C Positrol Fuse Links. No fuse link of low-temperature element construction (tin, lap-joint) can provide similar performance.

NOTE—A coordination scheme designed to take full advantage of the nondamageability and the superior coordination capabilities of S&C Positrol Fuse Links may not function satisfactorily if fuse links of the same speed but of other makes are substituted. However, S&C "K" Speed Positrol Fuse Links can replace, on a one-for-one basis, other manufacturers' "K" speed fuse links in existing coordination schemes. Such replacements, unlike tin-element fuse links, are not subject to nuisance fuse operations ("sneakouts") due to damage from surge currents, load cycling, vibration, and aging.

FUSE LINKS AVAILABLE—

Style	Ampere Ratings
Universal	6K through 200K
Extra-Performance	6K through 200K

Supersedes TCC No. 165-6 dated 12-17-84

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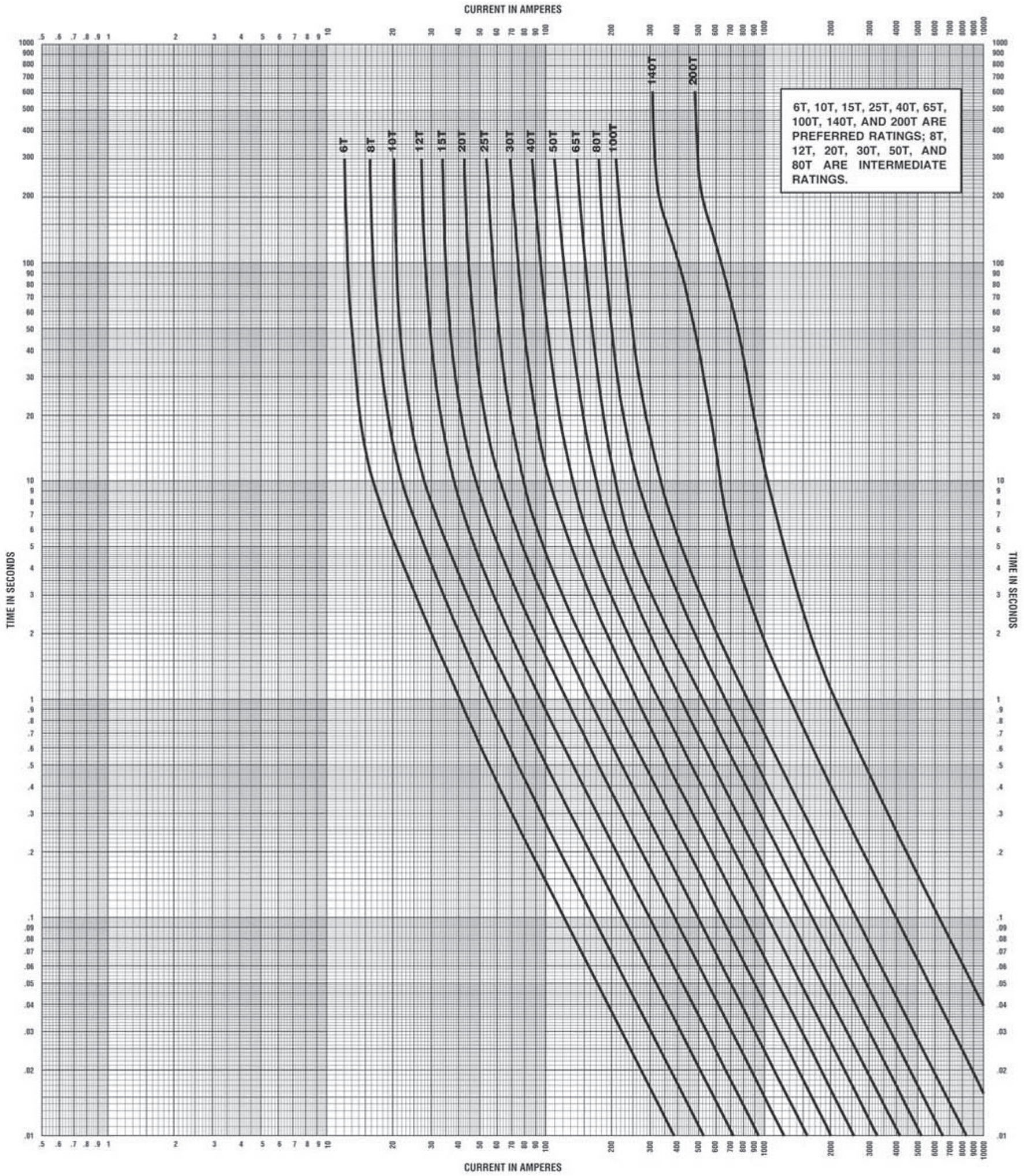

Minimum Melting Time–Current Characteristic Curves

Positrol® Fuse Links–S&C "T" Speed

BASIS–These fuse links are tested in accordance with the procedures described in IEEE Standard C37.41 to comply with IEEE Standard C37.42. As required by these standards, the minimum melting current is not less than 200% of the fuse link ampere rating, and the minimum melting curves are based on tests starting with the fuse link at an ambient temperature of 25°C (77°F) and no initial load.

CONSTRUCTION–Fusible elements for fuse links coiled; fusible elements for fuse links rated 140T and 200T amperes are cast tin. All are of solderless construction.

TOLERANCES–Curves are plotted to minimum test points. Maximum variations within the coordinating range (melting times less than 10 seconds) expressed in current values are:

- Plus 10% for fuse links rated 6K through 100K amperes
- Plus 20% for fuse links rated 140K and 200K amperes

APPLICATION–Like all high–voltage fuses, these fuse links are intended to accommodate overloads, not to interrupt them. Accordingly, they feature fusible elements designed with a minimum melting current of 200% of the fuse–link ampere rating (for fuse links rated 100T amperes or less) or 220% of the fuse link ampere rating (for fuse links rated over 100T amperes). As a result, these fuse links have considerable peak-load capabilities; however, they should never be exposed to loading in excess of the peak-load capabilities listed in S&C Information Bulletin 352-190.

Because fuse links having silver-copper eutectic element construction are not subject to damage by aging or transient overcurrents, it is unnecessary to replace unblown fuse links of such construction in single-phase or three-phase installations when one or more fuse links have blown. However, it is advisable to replace unblown silver-tin element fuse links under the same conditions because, while not subject to aging, they may be damaged by transient overcurrents.

COORDINATION–Any preloading reduces melting time. While this phenomenon is especially pronounced in fuse links having minimum melting currents appreciably less than 200% of rating, the effect of preloading (as described in S&C Information Bulletin 352–195) must nonetheless be determined for the fuse links represented by these curves and adjustments to these curves must be made:

- When close coordination is required
- When automatic circuit reclosers or three-shot cutouts are involved
- When, regardless of the preciseness of coordination, the fuse link is subjected to temporary overloads

If close coordination is to be achieved, overloading must be avoided because it causes a significant shift in time–current characteristics.

Because of the damageability of silver-tin element fuse links (rated 140T and 200T amperes), setback allowances must be used in coordinating these fuse links as "protected" devices. These are applied by reducing the current value in the above curves by 10%. On the other hand, silver–element fuse links (rated 6K through 100K amperes) are nondamageable, and no such setback allowances are necessary.

The exclusive use of S&C Positrol Fuse Links–because of their inherently narrower tolerance band and because of their nondamageability–will expand the scope of coordination as follows:

- Coordination of preferred with adjacent intermediate ratings, giving twice as many sectionalizing points (This is true for the sequence operation of fuse links alone, or for the sequence operation of fuse links coordinated with automatic circuit reclosers.)
- Coordination of a larger number of fuse–link ratings with a given automatic circuit recloser between the fast and slow curves
- Coordination through a greater range, and to higher levels of fault current, with respect to automatic circuit reclosers
- Coordination to higher levels of fault current with respect to sequence operation of fuse links

The breadth of coordination described above can be obtained only by the use of S&C Positrol Fuse Links. No fuse link of low–temperature element construction (tin, lap–joint) can provide similar performance.

NOTE: A coordination scheme designed to take full advantage of the nondamageability and the superior coordination capabilities of S&C Positrol Fuse Links may not function satisfactorily if fuse links of the same speed but of other makes are substituted. However, S&C "T" Speed Positrol Fuse Links can replace, on a one–for–one basis, other manufacturers' "T" speed fuse links in existing coordination schemes. Such replacements, unlike tin-element fuse links, are not subject to nuisance fuse operations ("sneakouts") due to damage from surge currents, load cycling, vibration, and aging.

FUSE LINKS AVAILABLE

Style	Ampere Ratings
Universal	6T through 200T
Extra–Performance●	6T through 200T

● No longer available, listed for reference only.

THE FUSE SELECTION TABLES

TABLE 7—Transformers Rated 7.2 Kv Single-Phase① or 12.47 Kv Three-Phase

S&C Positrol Fuse Link Speed →			S&C Standard Speed—TCC No. 123-6						S&C "K" Speed—TCC No. 165-6					
Transformer Rating, Kva ↓		Transformer Full-Load Current, Amperes ↓	Fuse-Link Peak-Load Capability,② Percent of Transformer Kva Rating			Transformer Protection Index, Percent of Transformer Kva Rating (see text, page 4)		Fuse-Link Rating, Amperes	Fuse-Link Peak-Load Capability,② Percent of Transformer Kva Rating			Transformer Protection Index, Percent of Transformer Kva Rating (see text, page 4)		Fuse-Link Rating, Amperes
Single-Phase	Three-Phase		Continuous Load	Hot-Load Pickup	Cold-Load Pickup	1φ and Δ–Δ / Y–Y	Δ–Y		Continuous Load	Hot-Load Pickup	Cold-Load Pickup	1φ and Δ–Δ / Y–Y	Δ–Y	
5	15	0.69	175 350 520	160 345 520	95 190 285	375 790 1380	380 900 —	1 2 3						
10	30	1.39	175 260 430	130 260 430	95 140 235	370 560 1020	375 600 —	2 3 5	645 865	670 935	280 380	1150 2170	— —	6K 8K
15	45	2.08	175 290 405 625	145 290 480 720	95 155 230 335	375 620 780 1700	380 670 — —	3 5 7 10	435 575 675	410 610 770	185 255 325	690 970 1390	760 1410 —	6K 8K 10K
25	75	3.47	175 240 375 550	135 290 430 605	95 140 200 305	370 445 660 1160	370 455 800 —	5 7 10 15	260 345 405 550	165 320 450 605	110 155 195 260	405 530 670 1000	410 565 760 1450	6K 8K 10K 12K
37½	112½	5.21	160 250 365 480	165 290 405 555	95 135 205 270	295 420 650 960	295 440 760 —	7 10 15 20	230 270 365 420	130 250 370 480	100 130 175 220	345 425 600 770	350 445 660 920	8K 10K 12K 15K
50	150	6.94	185 275 360 445	205 300 420 505	100 155 205 240	315 475 660 820	315 510 760 1140	10 15 20 25	200 275 315 420	120 240 345 485	100 130 165 205	320 430 540 730	320 455 590 815	10K 12K 15K 20K
75	225	10.4	180 240 300 355	200 280 335 405	100 135 160 195	315 425 525 640	320 445 545 720	15 20 25 30	210 280 335 375	170 285 385 430	110 140 175 225	345 455 580 780	365 485 650 940	15K 20K 25K 30K
100	300	13.9	180 225 265 315	185 250 300 365	100 120 145 205	315 395 475 670	315 395 490 770	20 25 30 40	210 250 280 340	160 255 325 395	105 130 170 220	335 410 550 730	345 445 610 850	20K 25K 30K 40K
167	500	23.1	160 190 230 335	135 220 270 390	90 120 155 195	285 380 490 650	285 395 520 730	30 40 50 65	170 205 265 345	130 240 305 425	100 130 165 210	315 410 555 750	335 435 620 860	30K 40K 50K 65K
250	750	34.7	155 220 265 305	180 260 300 360	105 130 165 210	315 415 515 680	325 435 560 800	50 65 80 100	175 230 285 315	185 280 330 360	110 140 175 210	340 460 580 760	370 490 650 920	50K 65K 80K 100K
333	1000	46.3	165 200 225 380	145 225 270 400	100 120 155 220	310 380 490 1100	315 395 530 —	65 80 100 125	175 215 240 420	155 250 270 455	105 130 155 245	335 420 540 1400	350 445 590 —	65K 80K 100K 140K
500	1500	69.4	150 250 305 380	180 265 325 430	105 145 175 230	315 540 900 1400	325 740 1200 —	100 125 150 200	160 280 410	180 300 430	105 165 260	345 780 2030	360 930 —	100K 140K 200K

① Phase-to-neutral or phase-to-phase.

② These values reflect the inherent peak-load capabilities of the fuse links themselves—not the peak-load capabilities of the transformers which, in many cases, are much lower. For derivation of these values, see text, page 4.

Note: Refer to "How to Use the Fuse Selection Tables" on page 48 (foldout).

Table 7. S&C 'T' Speed Fuse Links (TCC No 170-6), Based on Preloading of Source-Side Fuse Link

Load-Side Fuse Link Ampere Rating ↓	Maximum Fault Current in Amperes, RMS①																	
Source-Side Fuse Link Ampere Rating →	**6T**	**8T**	**10T**	**12T**	**15T**	**20T**	**25T**	**30T**	**40T**	**50T**	**65T**	**80T**	**100T**	**101●**	**102●**	**103●**	**140T**	**200T**
1■	250	365	530	700	930	1 200	1 550	2 000	2 550	3 250	4 050	5 100	6 500	5 200	8 900	15 000	8 900	15 000
2■	240	355	520	690	920	1 200	1 550	2 000	2 550	3 250	4 050	5 100	6 500	5 200	8 900	15 000	8 900	15 000
3■	225	350	520	690	910	1 200	1 550	2 000	2 550	3 250	4 050	5 100	6 500	5 200	8 900	15 000	8 900	15 000
5■	150	330	510	680	900	1 200	1 550	2 000	2 550	3 250	4 050	5 100	6 500	5 200	8 900	15 000	8 900	15 000
6T		145	410	620	860	1 150	1 500	1 950	2 500	3 200	4 000	5 100	6 500	5 100	8 900	14 500	8 900	14 500
8T			175	520	790	1 100	1 450	1 900	2 500	3 200	4 000	5 100	6 500	5 100	8 900	14 500	8 900	14 500
10T				210	640	1 000	1 400	1 900	2 500	3 200	4 000	5 100	6 500	5 100	8 900	14 500	8 900	14 500
12T					295	800	1 250	1 750	2 400	3 100	3 900	5 000	6 400	5 000	8 800	14 500	8 900	14 500
15T						315	1 000	1 600	2 250	2 950	3 800	4 900	6 300	5 000	8 800	14 500	8 800	14 500
20T							360	1 300	2 050	2 800	3 700	4 800	6 300	4 850	8 600	14 500	8 700	14 500
25T								570	1 700	2 600	3 600	4 700	6 100	4 700	8 500	14 500	8 600	14 500
30T									820	2 100	3 200	4 400	6 000	4 450	8 400	14 500	8 500	14 500
40T										640	2 500	4 000	5 600	3 950	8 200	14 000	8 300	14 500
50T												3 300	5 200	3 250	7 900	14 000	8 000	14 000
65T												1 400	4 200	1 550	7 100	13 500	7 300	14 000
80T													1 900		6 100	13 000	6 300	13 000
100T															3 250	12 500	3 800	13 000
101●																13 000	6 600	15 000
102●																6 200		10 000
140T																4 400		4 650

① The maximum fault-current values are based on published total clearing time-current characteristic curves and on minimum melting time-current characteristic curves adjusted for pre-loading of the source-side fuse link to its ampere rating.

● S&C Coordinating Speed Fuse Links, TCC No. 172-6.

■ S&C Standard Speed Positrol Fuse Links, TCC No. 123-6.

Preferred ampere rating

Intermediate ampere ratings