Installation

Table of Contents

★ Cooper Power Systems, LLC reclosers and recloser controls and Cooper Power Series (McGraw-Edison) hydraulic reclosers are manufactured by Eaton Corporation.

Introduction

Basis—Average-tripping time-current characteristic (TCC) curves for TripSaver II Cutout-Mounted Reclosers are shown in this publication. They were developed using the following equation,

$$T_i = \left\{ \frac{A}{\left(\frac{i_{nominal}}{i_{min.\,pickup}} \right)^p - C} + B \right\} \times TM + TS$$

Where:

T_i is the average tripping time, in seconds;

A, B, C, and ***p*** coefficients are provided later for each time-current characteristic curve;

TM is the time multiplier (time dial);

i nominal is the nominal power frequency (fundamental) current in amperes, measured by the TripSaver II recloser;

i min. pickup is the minimum power frequency (fundamental) pickup current, in amperes, at which the TCC curve begins timing

TS is the time adder.

TripSaver II recloser TCC curves are applicable to both 50- and 60-Hz systems. They are also applicable over TripSaver II recloser's entire operating temperature range of -40°C to +50°C (-40°F to +122°F). No adjustments need to be made to these curves for ambient temperatures within this temperature range.

Tolerances—TCC curves for TripSaver II Cutout-Mounted Reclosers are plotted to *average* test points. Tolerance, expressed in terms of current is ±3 amperes or ±10%, whichever is larger. Tolerance, expressed in terms of time, is ±0.0167 seconds. Interrupting time is 0.03 seconds.

Coordination—When coordinating TripSaver II Cutout-Mounted Reclosers with other protective devices, it will be necessary to develop both minimum-tripping and total-clearing TCC curves.

The minimum-tripping curve is used when coordinating TripSaver II reclosers with load-side protective devices such as a transformer primary fuse.

It's constructed by subtracting negative tolerances in both time ***and*** current from the average-tripping TCC curves shown in this publication. The absolute minimum tripping time is 0.0167 seconds.

The total-clearing curve is used when coordinating TripSaver II reclosers with source-side protective devices such as the substation feeder circuit breaker or recloser. It's constructed by adding interrupting time to the maximum-tripping curve. The maximum-tripping curve is constructed first by adding positive tolerances in both time ***and*** current to the average-tripping curves shown in this publication.

Sample minimum-tripping and total-clearing TCC curves for a TripSaver II recloser emulating a Cooper Form 4, 5, 6, and FX recloser control are shown beginning on page 28.

Power-up Time—If the TripSaver II Cutout-Mounted Recloser is closed into a fault from the **Dropped Open** position, it will take a small but finite amount of time for the control to power up and issue a trip signal. This time can be determined as follows:

$$T_{power\text{-}up} = \frac{X}{I}$$

Where:

$T_{power\text{-}up}$ is the minimum time the control will take to power up, in seconds (or 0.0216 seconds, whichever is larger);

I is the fault-current value, in amperes;

X is:

5 for 40-A TripSaver II reclosers;

13 for 100-A TripSaver II reclosers;

25 for 200-A TripSaver II reclosers.

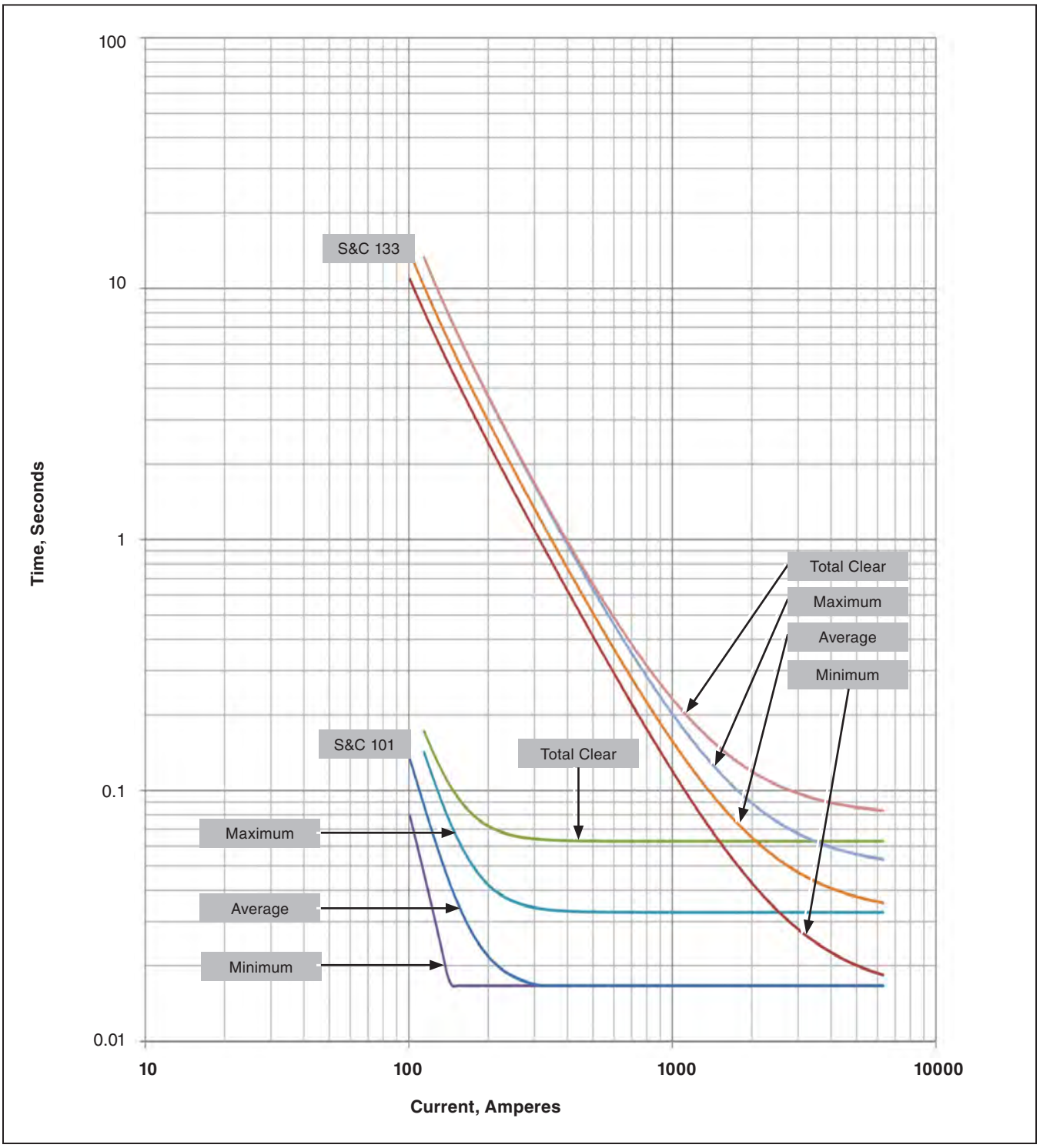
The power-up time only affects TCC curves having fast response times at high levels of current. It has no affect on slower TCC curves. This is illustrated on page 28 for a TripSaver II recloser emulating a Cooper Form 4, 5, 6, and FX recloser control with a 101 (fast) curve and a 133 (slow) curve.

Wake-Up Current—The wake-up current is the current needed to wake the TripSaver II recloser from its sleep state.

Continuous Current Rating of TripSaver II Recloser, Amperes	Wake Up Current, Amperes
40	1
100	4
200	8

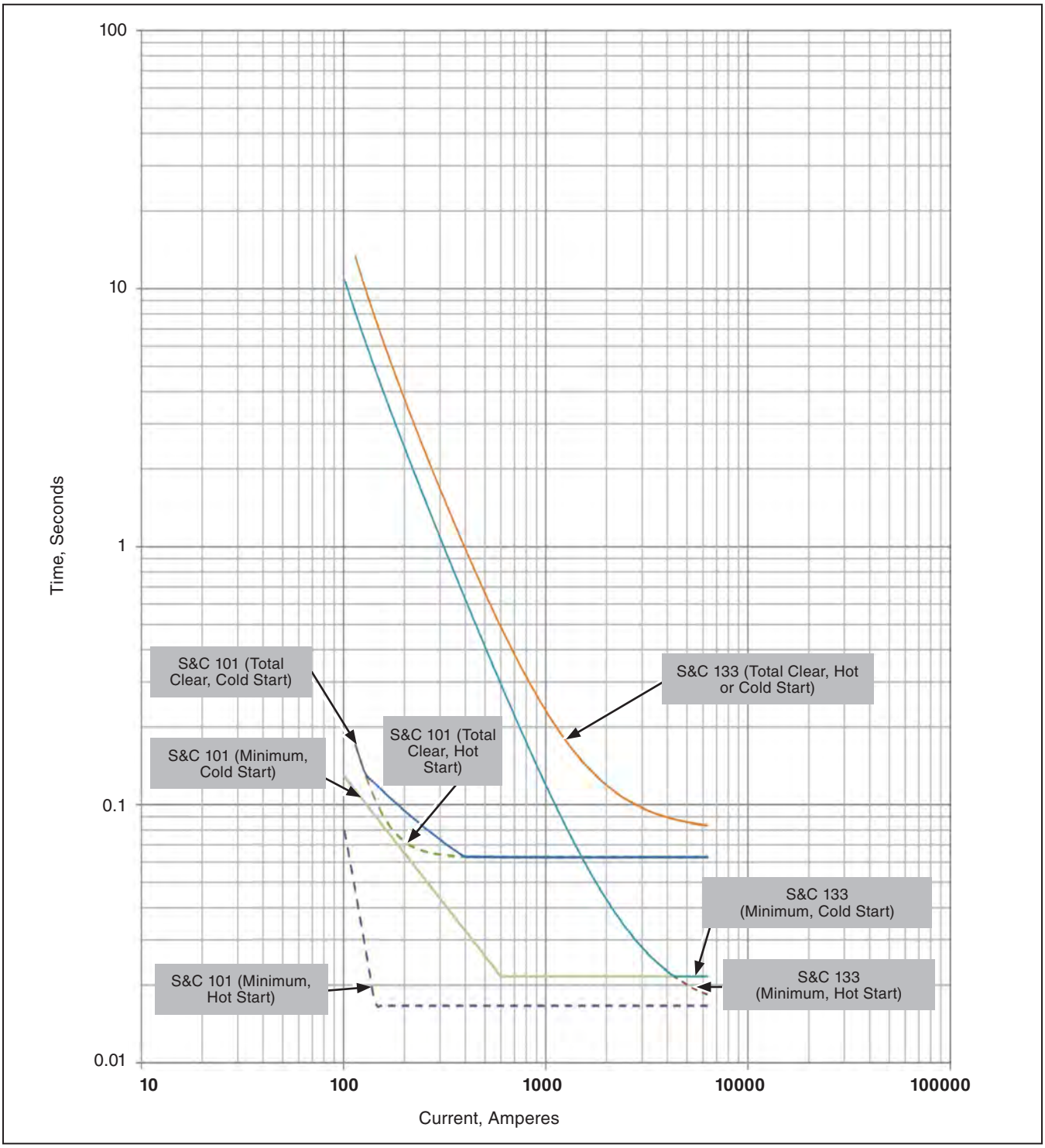
Application—The 15- and 25-kV TripSaver II reclosers are available in 40, 100, and 200 ampere continuous current ratings.

Example Showing Effects of Tolerances on Fast (S&C 101) and Slow (S&C 133) TCC Curves①



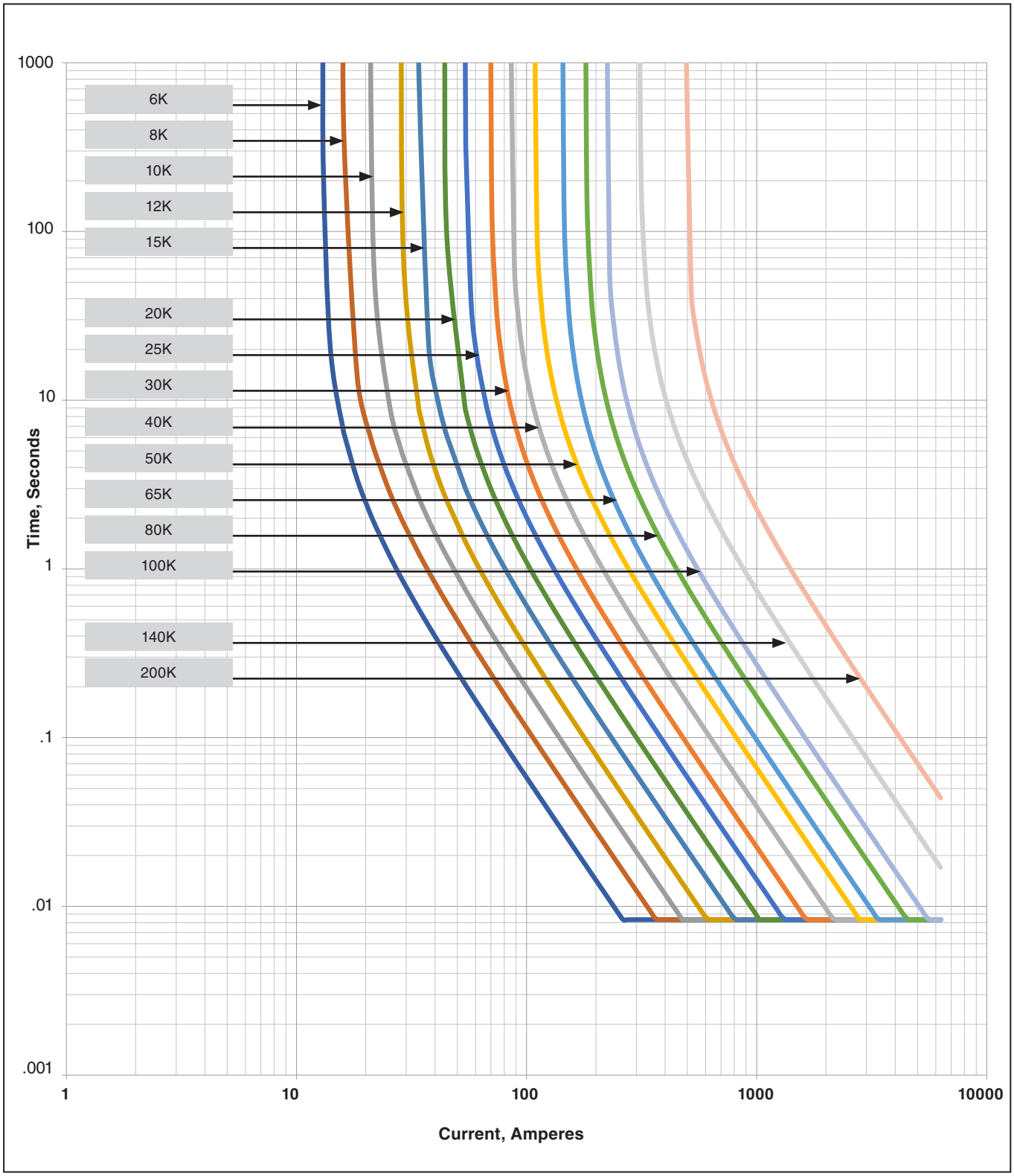
① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Example Showing Effects of Power-Up Time on Fast (S&C 101) and Slow (S&C 133) TCC Curves①



① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

S&C "K" Speed Fuse Links①②

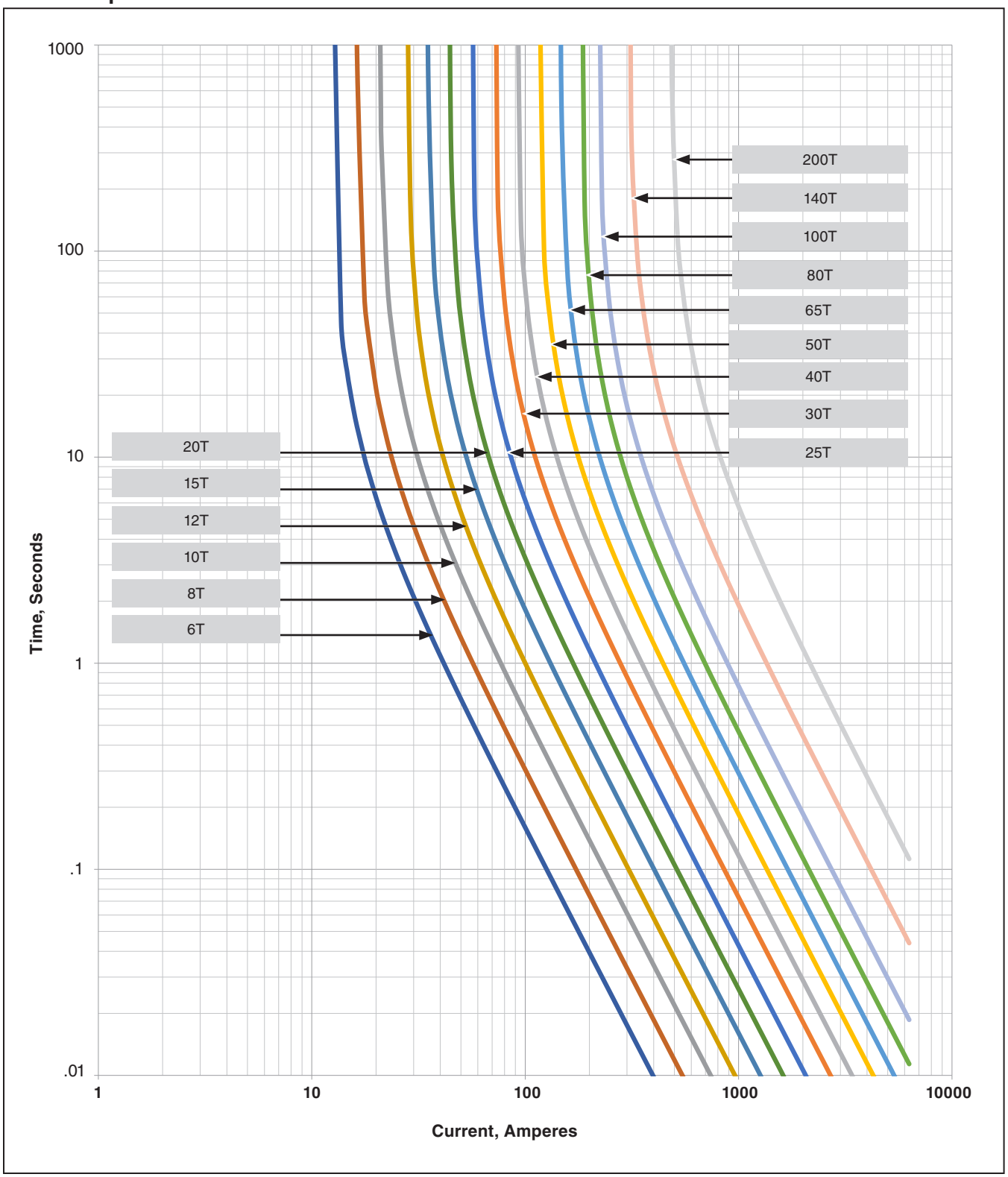


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.
② Emulates S&C K-speed Positrol® Fuse Link.

Table 1. TCC Curve Parameter for "K" Speed Fuse Links

Ampere Rating	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-6K	13	3.37282	0	1	2
Fuse-8K	16	4.34162	0	1	2
Fuse-10K	21	4.263	0	1	2
Fuse-12K	28.4	3.833	0	1	2
Fuse-15K	34	4.63226	0	1	2
Fuse-20K	44	4.5596	0	1	2
Fuse-25K	54	4.9229	0	1	2
Fuse-30K	69.5	4.6323	0	1	2
Fuse-40K	85	5.35886	0	1	2
Fuse-50K	108	5.60106	0	1	2
Fuse-65K	143	4.6323	0	1	2
Fuse-80K	180	5.2135	0	1	2
Fuse-100K	219.5	5.3589	0	1	2
Fuse-140K	309	7.033346	0	1	2
Fuse-200K	479.787	7.540324	0	1	2

S&C "T" Speed Fuse Links①②

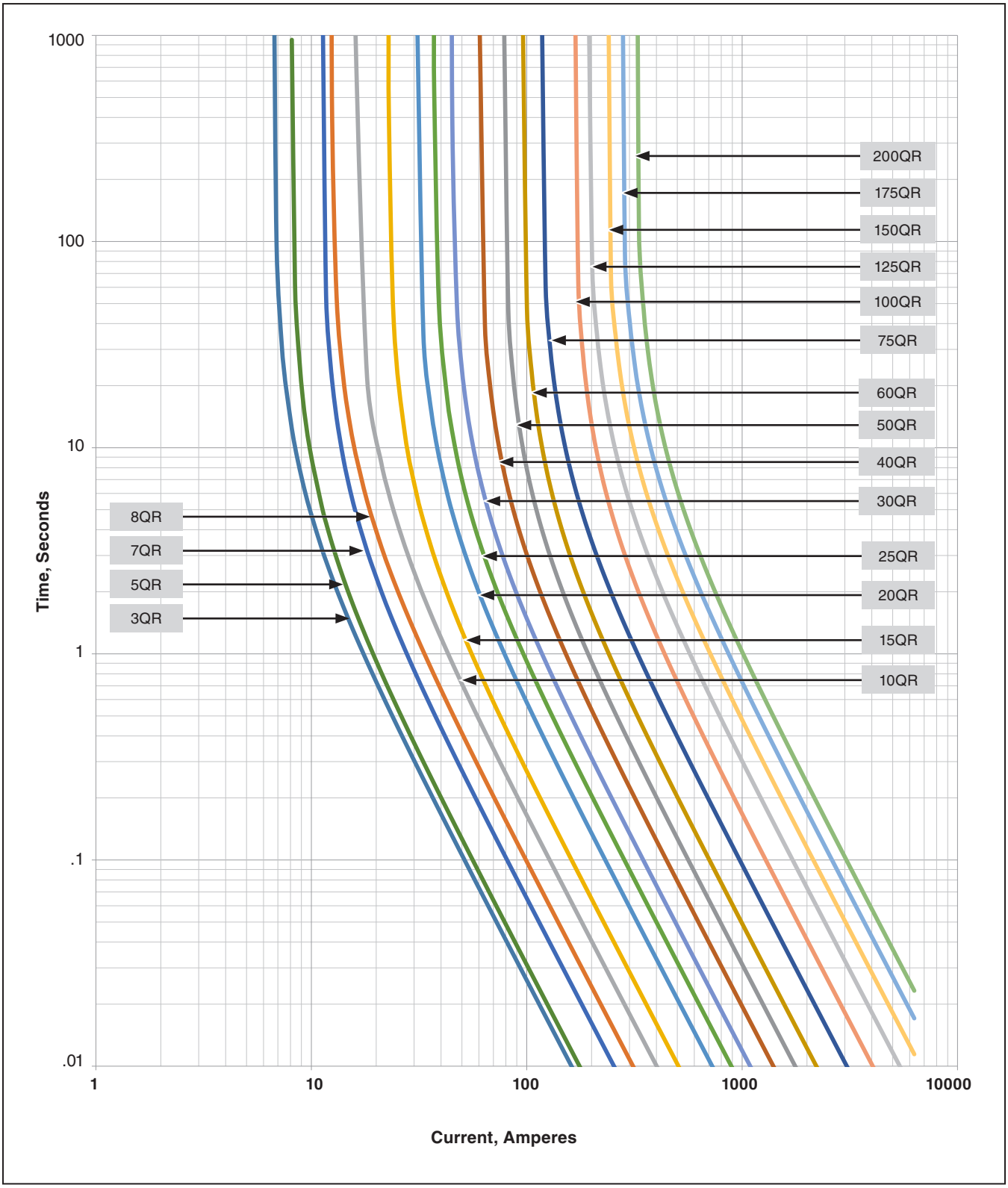


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.
② Emulates T-speed Positrol® Fuse Link.

Table 2. TCC Curve Parameter S&C "T" Speed Fuse Links

Ampere Rating	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-6T	12.4	10.22708	0	1	2
Fuse-8T	16.2	11.31698	0	1	2
Fuse-10T	20.8	12.64908	0	1	2
Fuse-12T	28	11.7716	0	1	2
Fuse-15T	34.8	13.23036	0	1	2
Fuse-20T	44	13.521	0	1	2
Fuse-25T	55.8	13.66632	0	1	2
Fuse-30T	71.8	14.10228	0	1	2
Fuse-40T	91	13.95696	0	1	2
Fuse-50T	115	13.81164	0	1	2
Fuse-65T	146	13.4483	0	1	2
Fuse-80T	183	13.444	0	1	2
Fuse-100T	220	15.241	0	1	2
Fuse-140T	307.459	18.36754	0	1	2
Fuse-200T	480.267	19.20729	0	1	2

S&C "QR" Speed Fuse Links①②

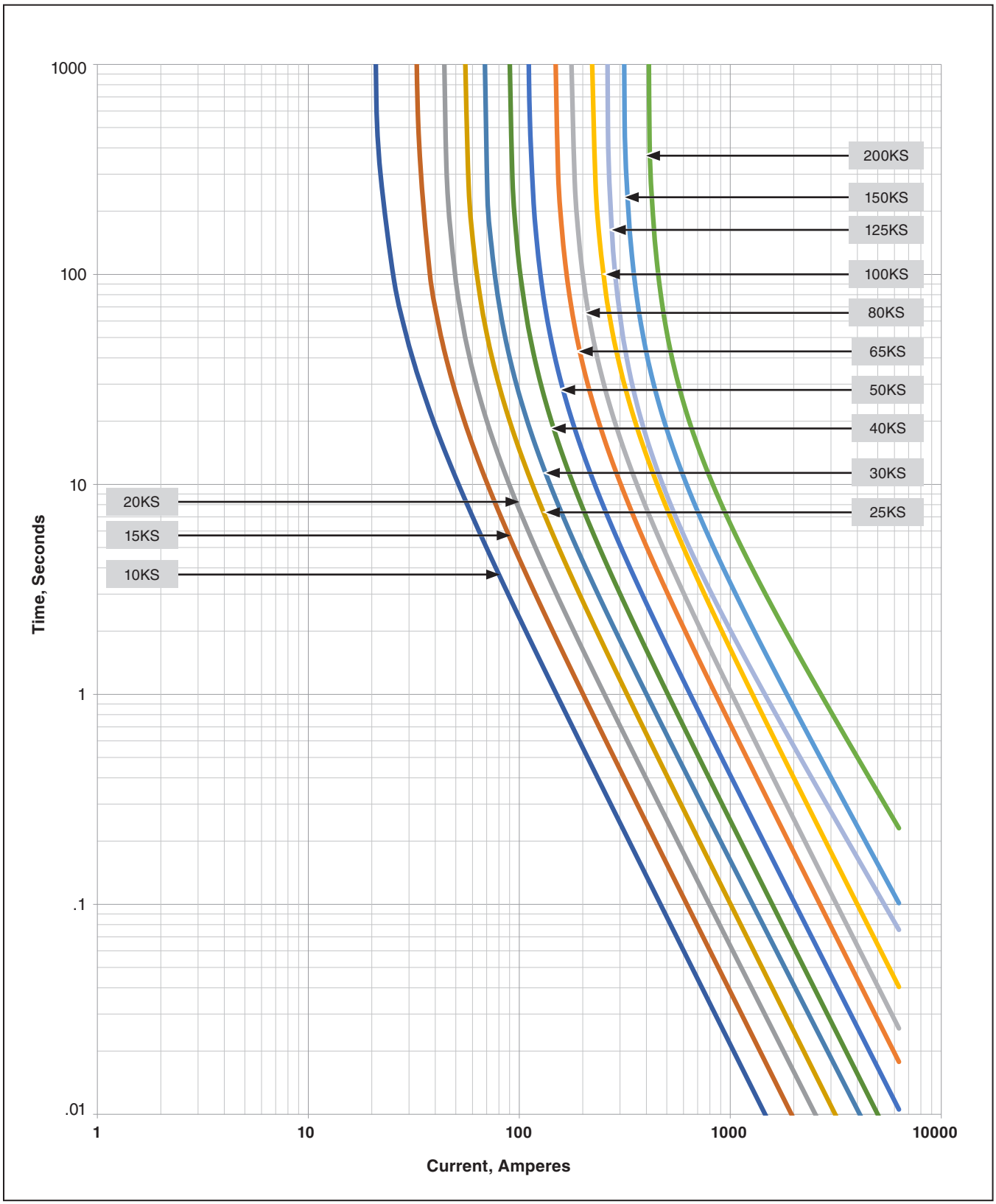


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.
② Emulates QR-speed Positrol Fuse Link and the Cooper Power™ series Kearney™ QA Fuse Link manufactured by the Eaton Corporation.

Table 3. TCC Curve Parameter for S&C "QR" Speed Fuse Links

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-3QR	6.7	5.79482	0	1	2
Fuse-5QR	8.1	4.70492	0	1	2
Fuse-7QR	11.2	5.14088	0	1	2
Fuse-8QR	12.4	6.30344	0	1	2
Fuse-10QR	16	6.27922	0	1	2
Fuse-15QR	22.8	4.9229	0	1	2
Fuse-20QR	30.8	5.55262	0	1	2
Fuse-25QR	37	5.79482	0	1	2
Fuse-30QR	44.8	5.91592	0	1	2
Fuse-40QR	60	5.4073	0	1	2
Fuse-50QR	78	5.1024	0	1	2
Fuse-60QR	95	5.4073	0	1	2
Fuse-75QR	116	6.95738	0	1	2
Fuse-100QR	166	5.91592	0	1	2
Fuse-125QR	191.587	7.92363	0	1	2
Fuse-150QR	232.373	8.384928	0	1	2
Fuse-175QR	271.875	9.145414	0	1	2
Fuse-200QR	319.687	8.995344	0	1	2

S&C "KS" Speed Fuse Links①②

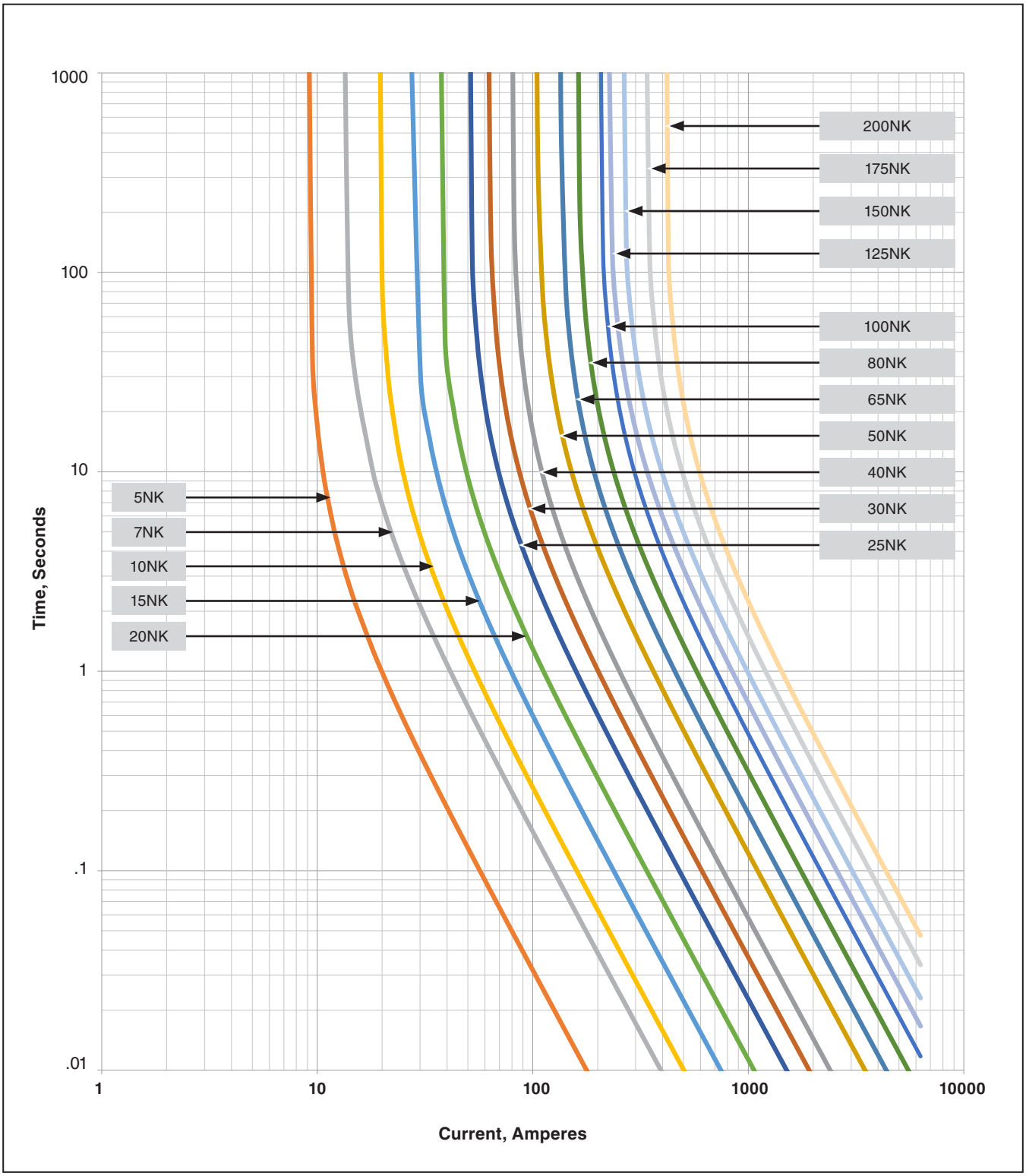


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.
② Emulates Cooper Power™ series Kearney™ KS Speed Fuse Links manufactured by the Eaton Corporation.

Table 4. TCC Curve Parameter for S&C "KS" Speed Fuse Links

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-10KS	20.2	55.9864	0	1	2.0157
Fuse-15KS	32	39.3855	0	1	2.0145
Fuse-20KS	43	32.9955	0	1	1.9885
Fuse-25KS	54	36.04	0	1	2.0157
Fuse-30KS	66	33.7215	0	1	1.9665
Fuse-40KS	88	31.9348	0	1	1.9978
Fuse-50KS	109	33.1566	0	1	1.9853
Fuse-65KS	145	33.5518	0	1	2.0002
Fuse-80KS	173	33.284	0	1	1.9943
Fuse-100KS	217	32.737	0	1	1.9886
Fuse-125KS	257.4726	19.20055	0	1	1.733114
Fuse-150KS	307.5944	26.48513	0	1	1.844898
Fuse-200KS	401.4434	23.78439	0	1	1.687669

S&C "NK" Speed Fuse Links①②



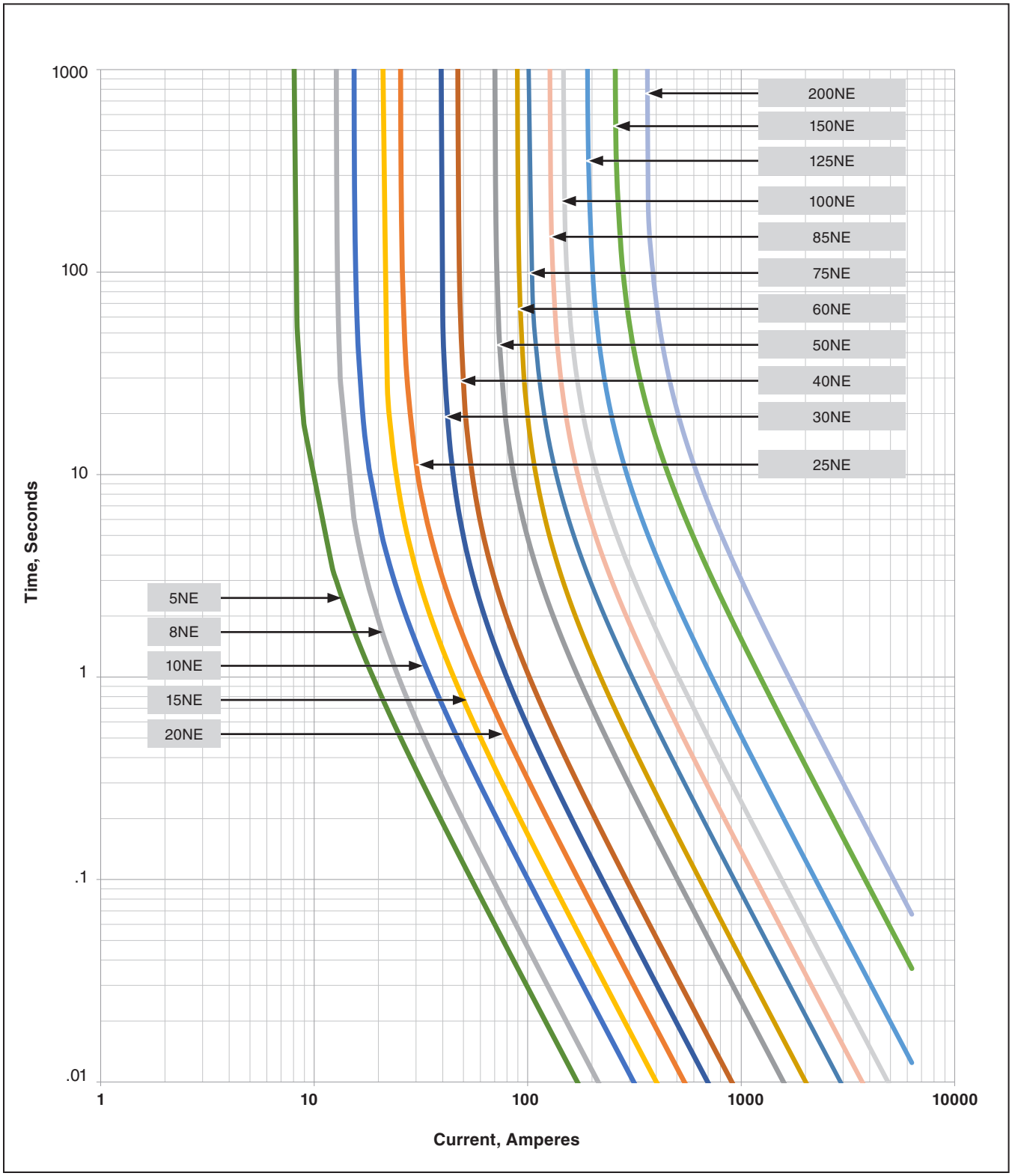
① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

② Emulates Cooper Power™ series Kearney™ N Speed (Type 200™) Fuse Links manufactured by the Eaton Corporation.

Table 5. TCC Curve Parameter for S&C "NK" Speed Fuse Links

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-5NK	9.0375	3.849812	0	1	2
Fuse-7NK	13.2096	8.83525	0	1	2
Fuse-10NK	19.2878	6.761892	0	1	2
Fuse-15NK	26.9031	7.672831	0	1	2
Fuse-20NK	35.9588	8.712602	0	1	2
Fuse-25NK	50.5	8.87076	0	1	2
Fuse-30NK	62	9.5247	0	1	2
Fuse-40NK	80	8.96764	0	1	2
Fuse-50NK	104	11.17166	0	1	2
Fuse-65NK	134	10.59038	0	1	2
Fuse-80NK	161	11.75294	0	1	2
Fuse-100NK	203	11.26854	0	1	2
Fuse-125NK	222.3579	13.31954	0	1	2
Fuse-150NK	258.5462	13.6215	0	1	2
Fuse-175NK	332.1848	12.0811	0	1	2
Fuse-200NK	406.8616	11.30384	0	1	2

S&C "NE" Speed Fuse Links①②

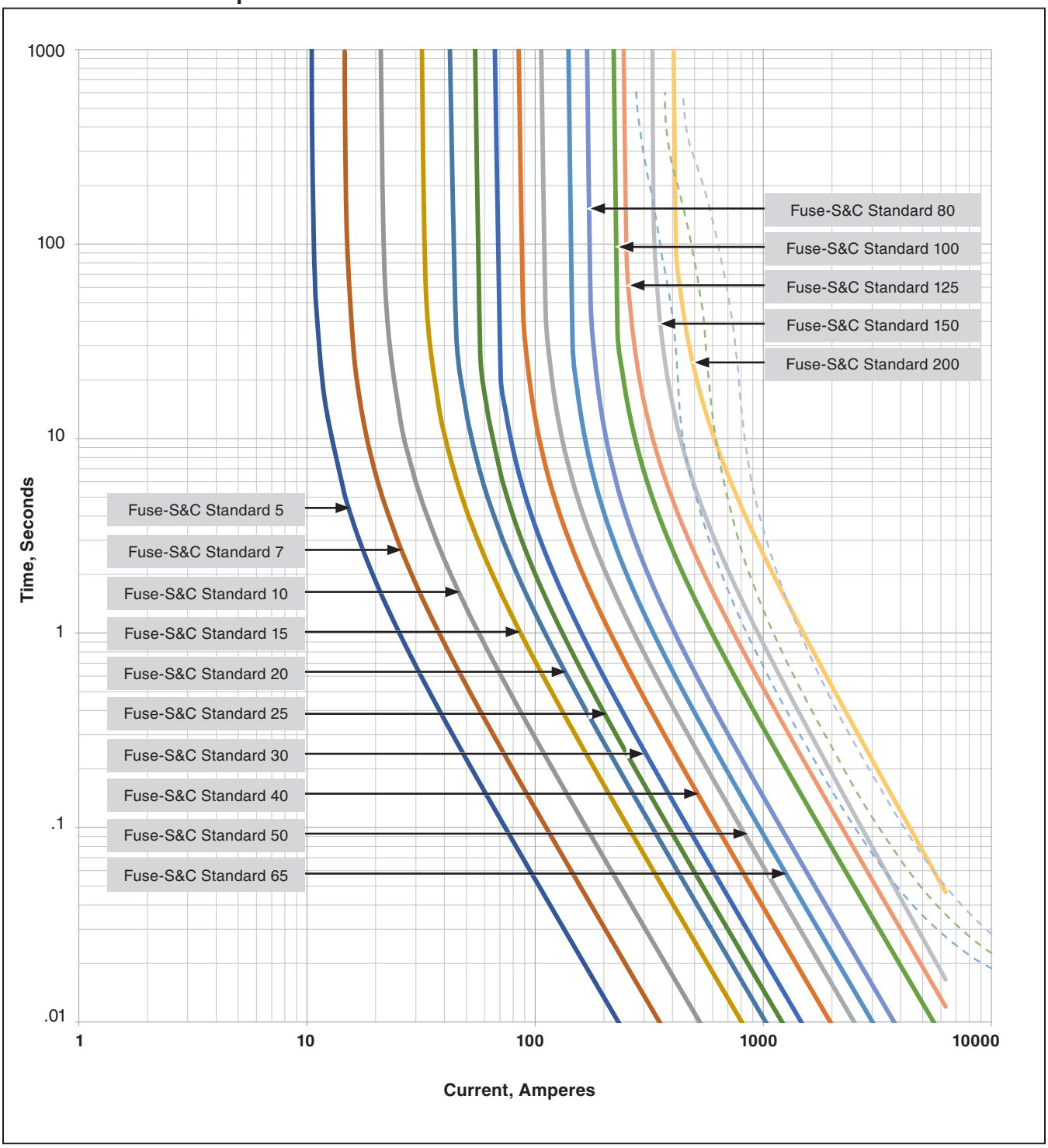


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.
② Emulates Cooper Power™ Edison™ (McGraw Edison) N-Speed Fuse Links manufactured by the Eaton Corporation.

Table 6. TCC Curve Parameter for S&C "NE" Speed Fuse Links

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-5NE	8	4.548256	0	1	2
Fuse-8NE	12.6759	2.831509	0	1	2
Fuse-10NE	15.3342	4.174996	0	1	2
Fuse-15NE	20.6601	3.74657	0	1	2
Fuse-20NE	25.3349	4.563635	0	1	2
Fuse-25NE	39	3.17906	0	1	2
Fuse-30NE	47	3.68768	0	1	2
Fuse-40NE	70	5.06822	0	1	2
Fuse-50NE	89	5.06822	0	1	2
Fuse-60NE	100	8.50746	0	1	2
Fuse-75NE	126	8.5559	0	1	2
Fuse-85NE	145	11.26854	0	1	2
Fuse-100NE	189	13.81164	0	1	2
Fuse-125NE	212.9142	16.41576	0	1	2
Fuse-150NE	252.7601	22.53992	0	1	2
Fuse-200NE	349.9399	21.74291	0	1	2

S&C "ST" Standard Speed Fuse Links①②

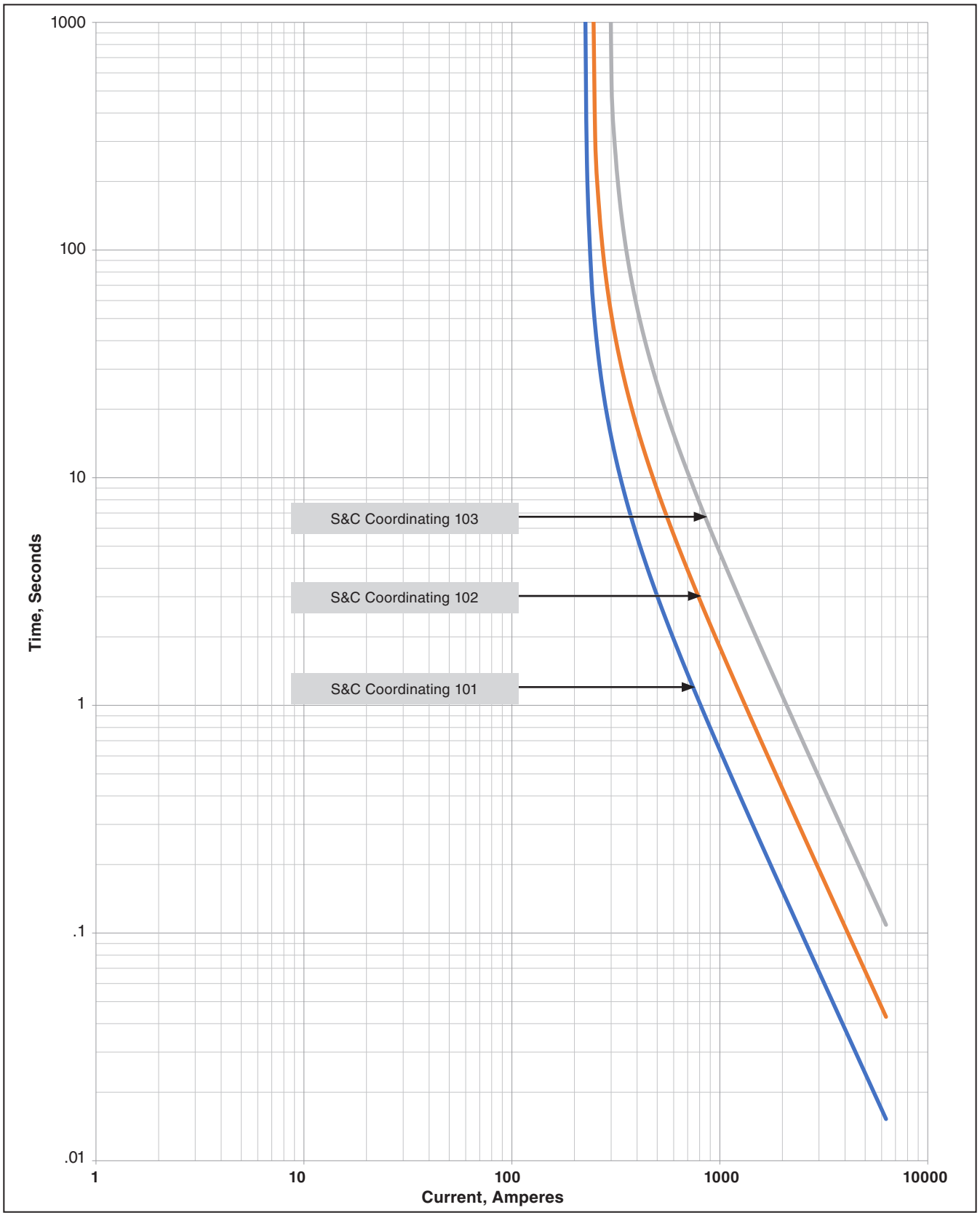


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.
② Emulates S&C Standard speed Positrol® Fuse Link.

Table 7. TCC Curve Parameter for S&C "ST" Standard Speed Fuse Links

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-S&C Standard 5	10.45561	4.899698	0	1	2
Fuse-S&C Standard 7	14.58702	5.772373	0	1	2
Fuse-S&C Standard 10	20.94992	6.302797	0	1	2
Fuse-S&C Standard 15	31.47323	6.5266	0	1	2
Fuse-S&C Standard 20	41.60153	6.060289	0	1	2
Fuse-S&C Standard 25	52.62212	5.265401	0	1	2
Fuse-S&C Standard 30	62.93711	5.418705	0	1	2
Fuse-S&C Standard 40	83.60772	5.52543	0	1	2
Fuse-S&C Standard 50	104.7038	5.698427	0	1	2
Fuse-S&C Standard 65	135.386	4.941261	0	1	2
Fuse-S&C Standard 80	167.0235	5.015378	0	1	2
Fuse-S&C Standard 100	209.7953	7.065718	0	1	2
Fuse-S&C Standard 125	240.1182	8.744472	0	1	2.018157
Fuse-S&C Standard 150	321.2223	8.793709	0	1	2.109537
Fuse-S&C Standard 200	384.573	16.34509	0	1	2.09684

S&C "CO" Coordinating Speed Fuse Links①②

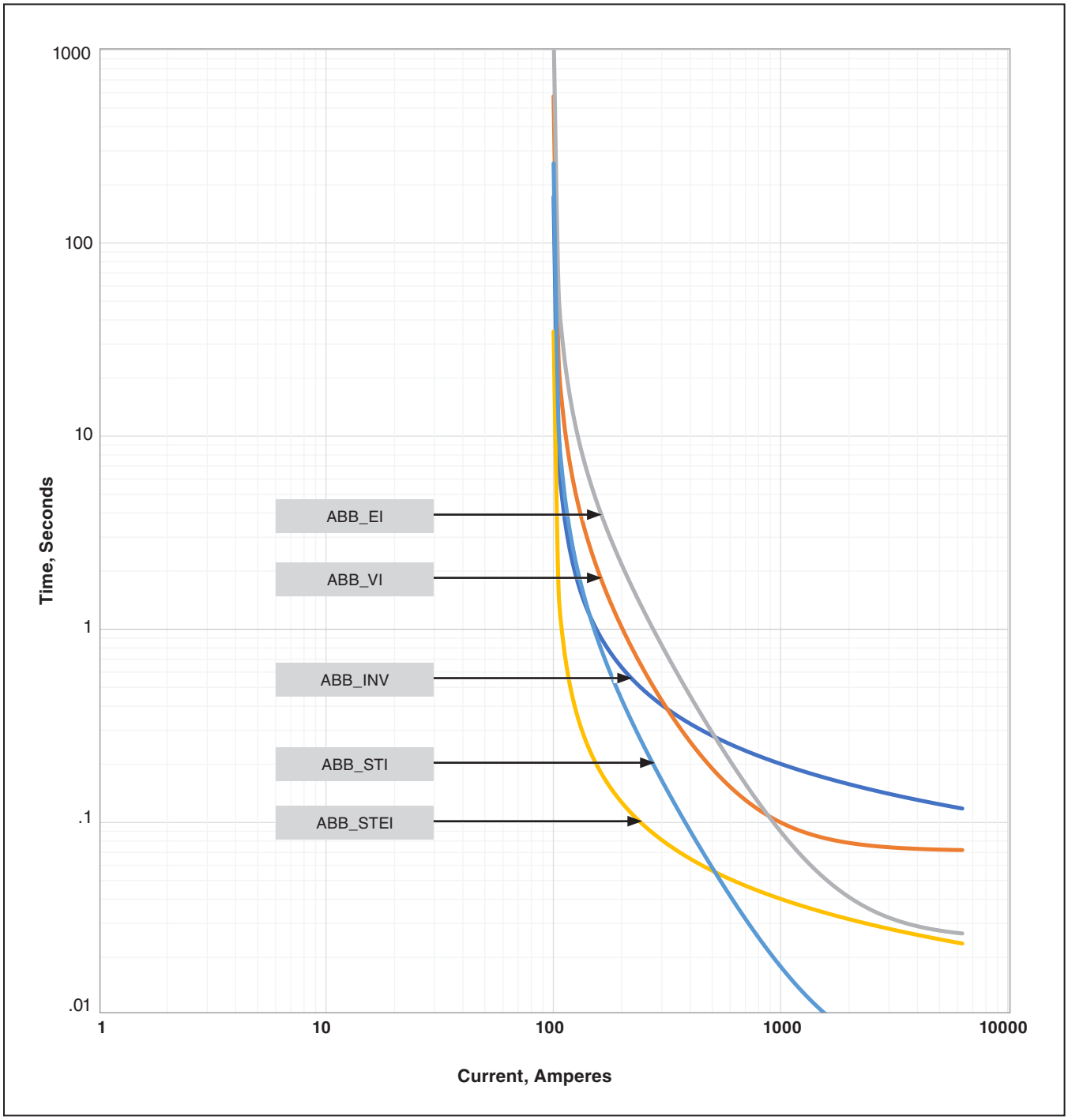


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.
② Emulates S&C Coordinating speed Positrol® Fuse Link.

Table 8. TCC Curve Parameter for S&C "CO" Coordinating Speed Fuse Links

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
Fuse-S&C Coordinating 101	224.1089	12.02901	0	1	2
Fuse-S&C Coordinating 102	240.5991	29.32772	0	1	2
Fuse-S&C Coordinating 103	288.0491	51.87	0	1	2

ABB DPU 2000R Recloser Control①

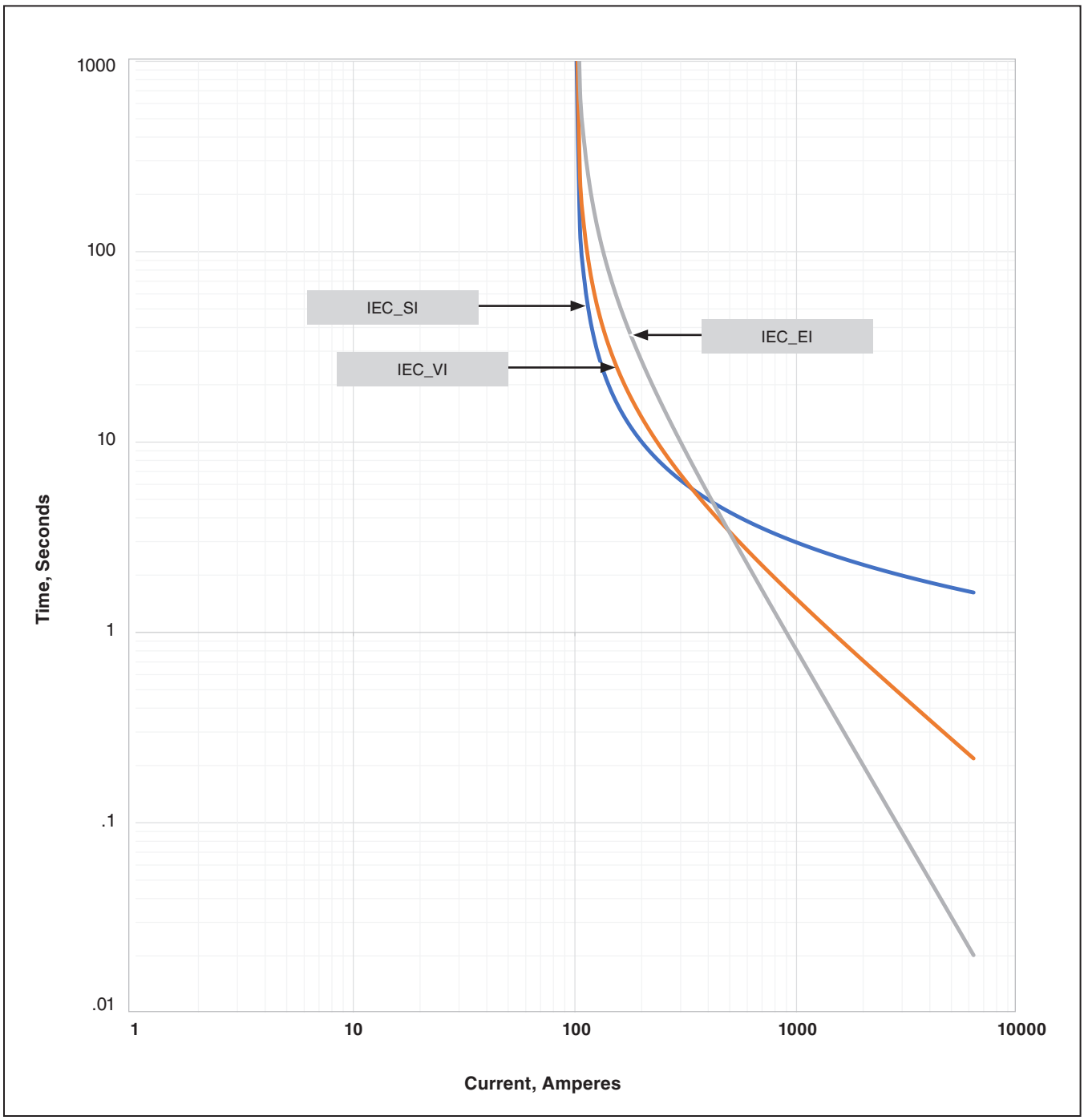


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 9. TCC Curve Parameter for ABB DPU 2000R Recloser Control

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
ABB_INV	100	0.0086	0.0185	1	0.02
ABB_VI	100	2.855	0.0712	1	2
ABB_EI	100	6.4070001	0.025	1	2
ABB_STI	100	0.00172	0.0037	1	0.02
ABB_STEI	100	1.281	0.005	1	2

IEC Standard Curve①

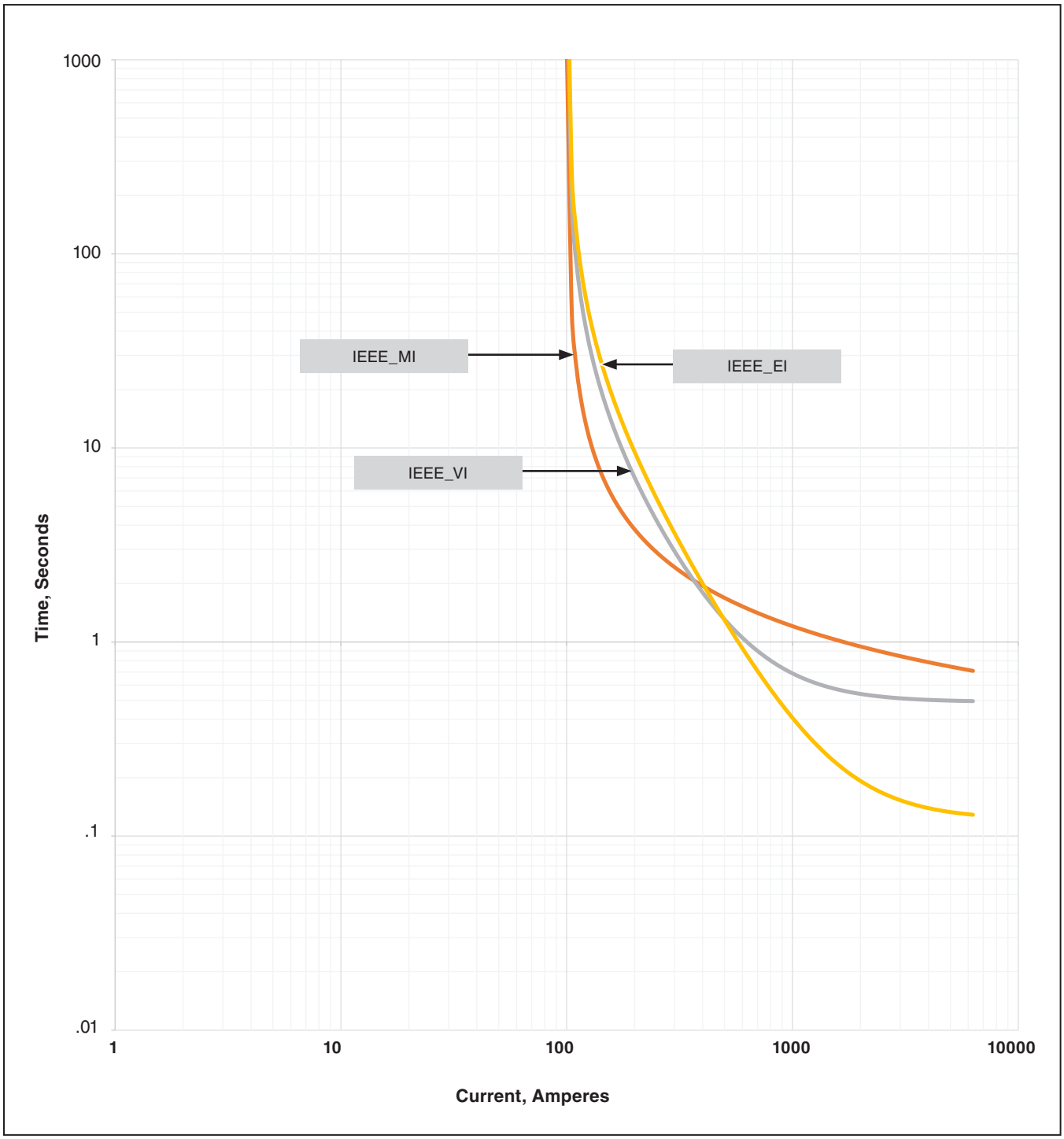


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 10. TCC Curve Parameter for IEC Standard Curve

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
IEC_SI	100	0.14	0.00	1.00	0.02
IEC_VI	100	13.5	0.00	1.00	1.00
IEC_EI	100	80.0	0.00	1.00	2.00

IEEE Standard Curve①

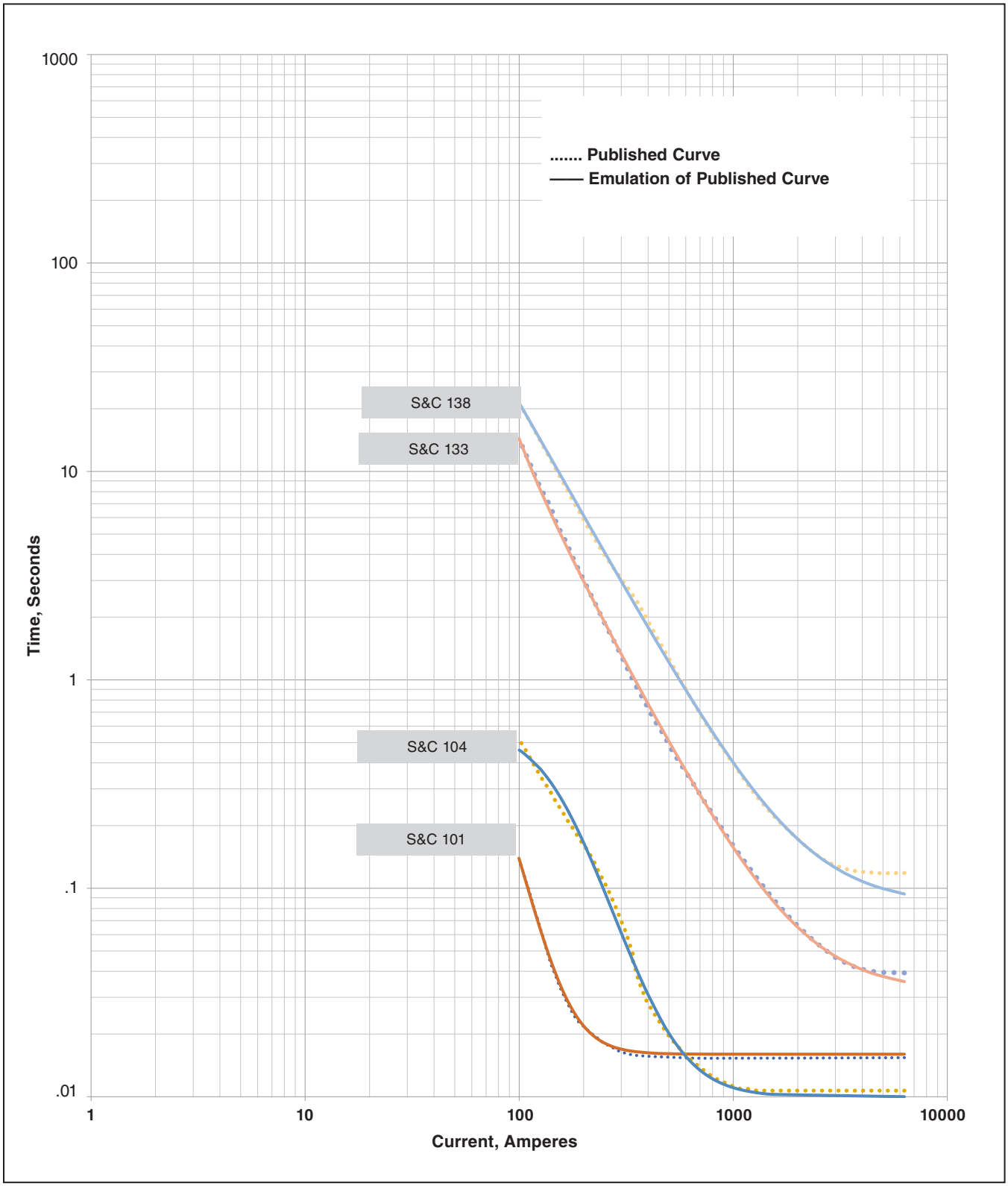


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 11. TCC Curve Parameter for IEEE Standard Curve

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
IEEE_EI	100	28.20000080	0.1217	1.00	2.00
IEEE_MI	100	0.05150000	0.1140	1.00	0.02
IEEE_VI	100	19.61000060	0.4910	1.00	2.00

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

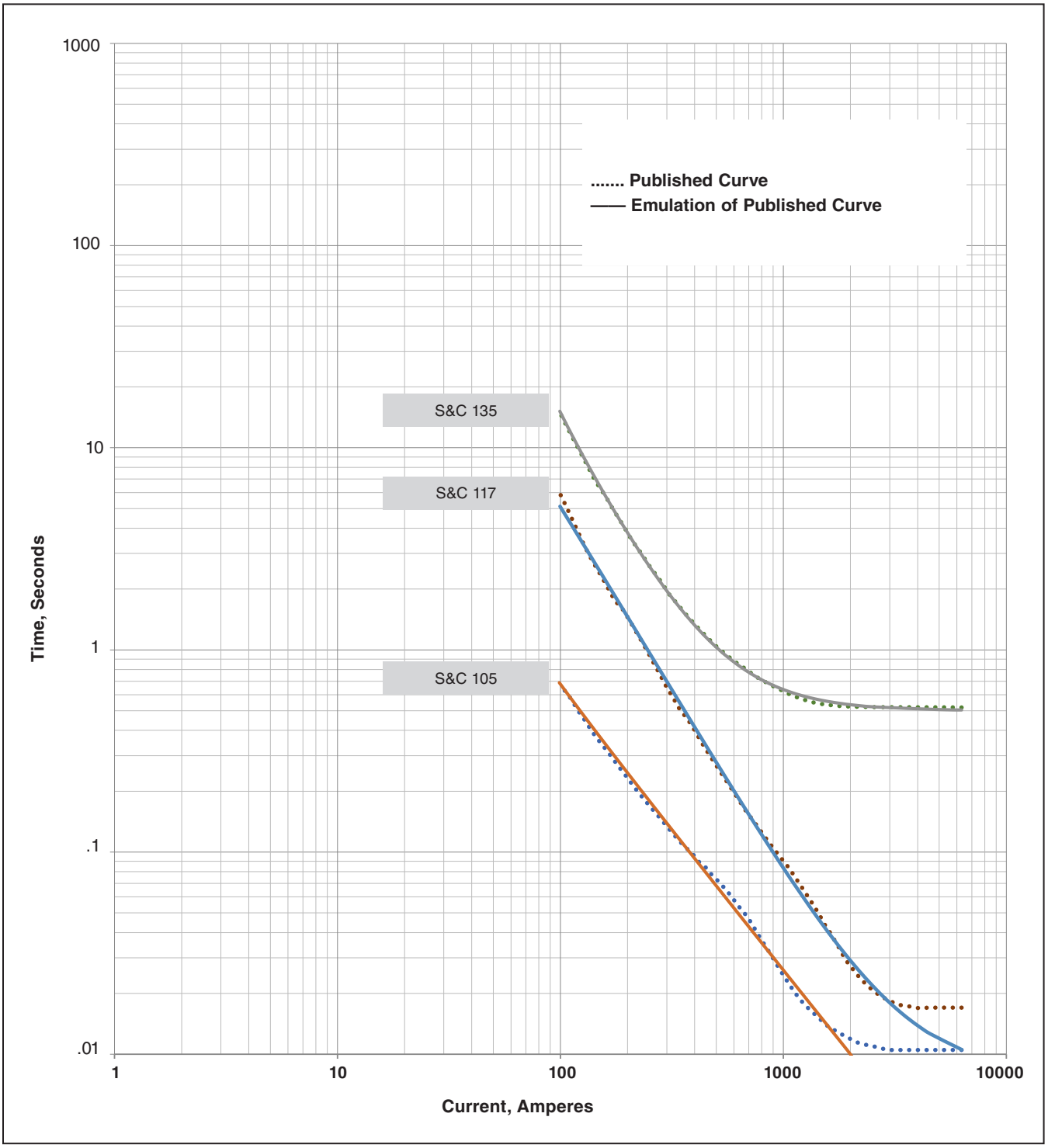


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 12. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 101	100	0.144000	0.016	-0.179	4.6090002
S&C 104	100	2.098000	0.010	-3.658	3.2990000
S&C 133	100	10.2510004	0.032	0.282	1.9150000
S&C 138	100	21.7169991	0.083	-0.023	1.8340000

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

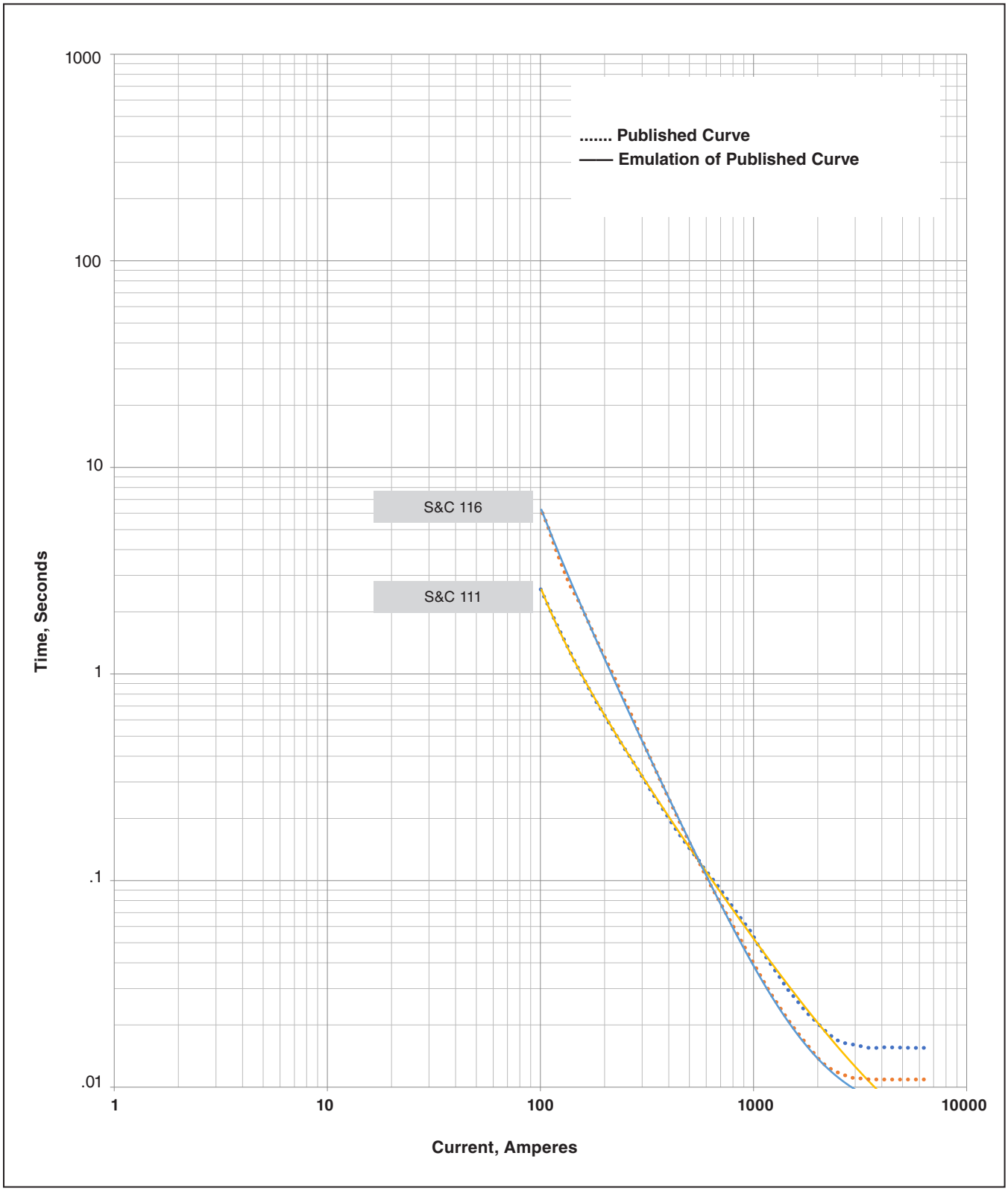


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 13. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 105	100	0.620000	0.000	0.084	1.378
S&C 117	100	5.243000	0.008	-0.031	1.842
S&C 135	100	12.3549995	0.501	0.145	1.960

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

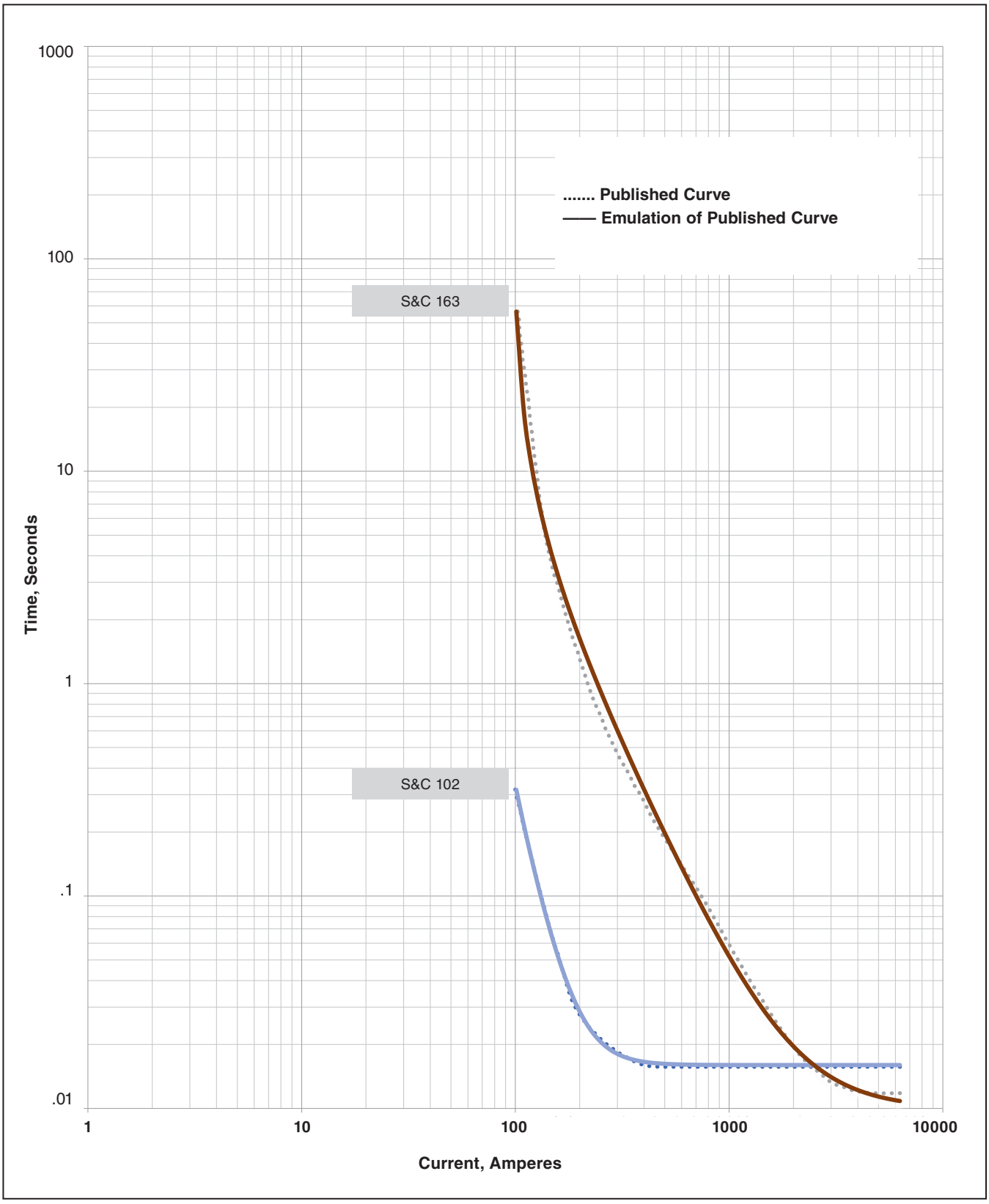


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 14. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 111	100	1.4840000	0.003	0.436	1.484
S&C 116	100	5.2950001	0.007	0.174	2.224

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

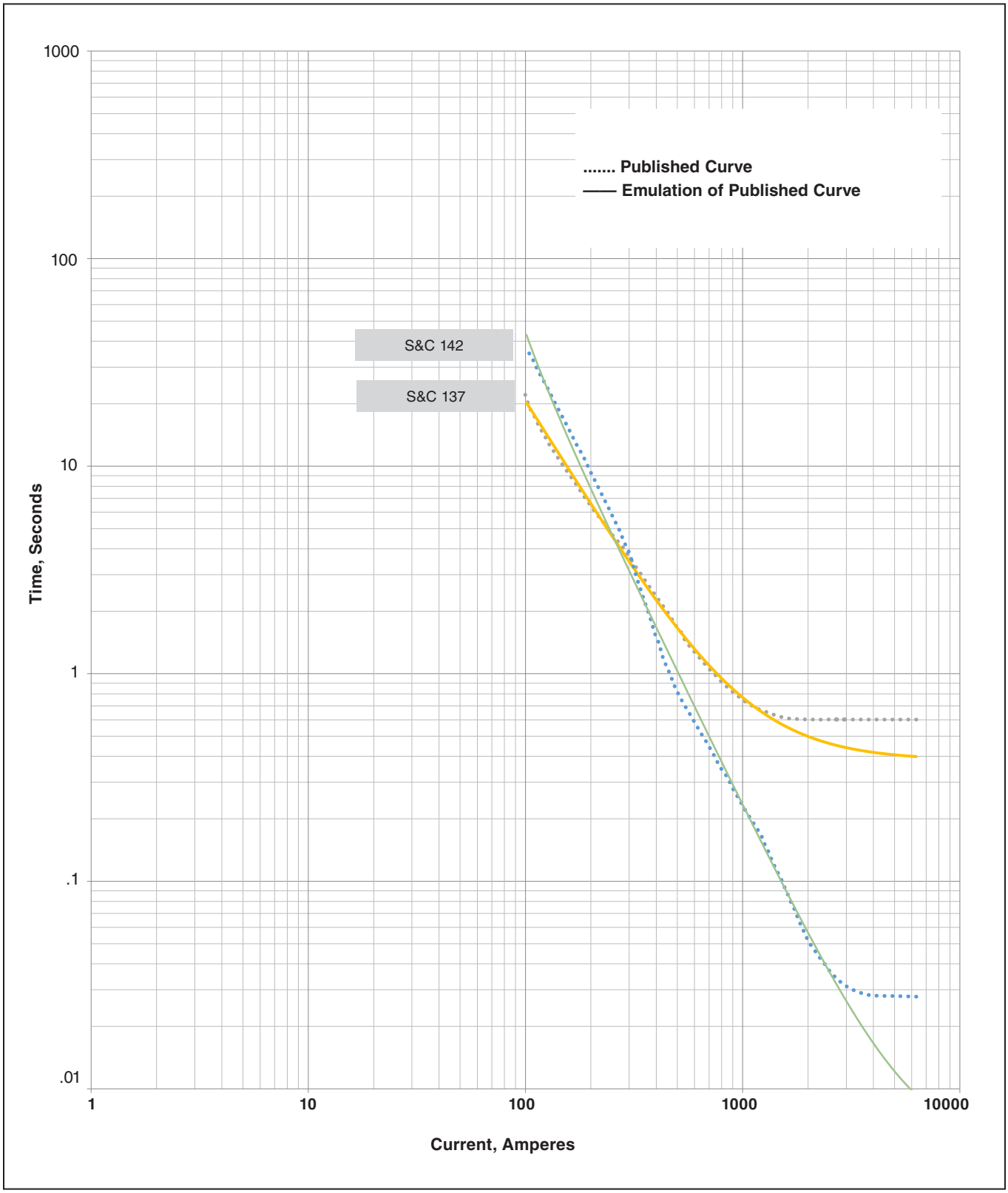


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 15. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 102	100	0.271	0.016	0.144	4.441
S&C 163	100	5.561	0.010	0.923	2.124

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

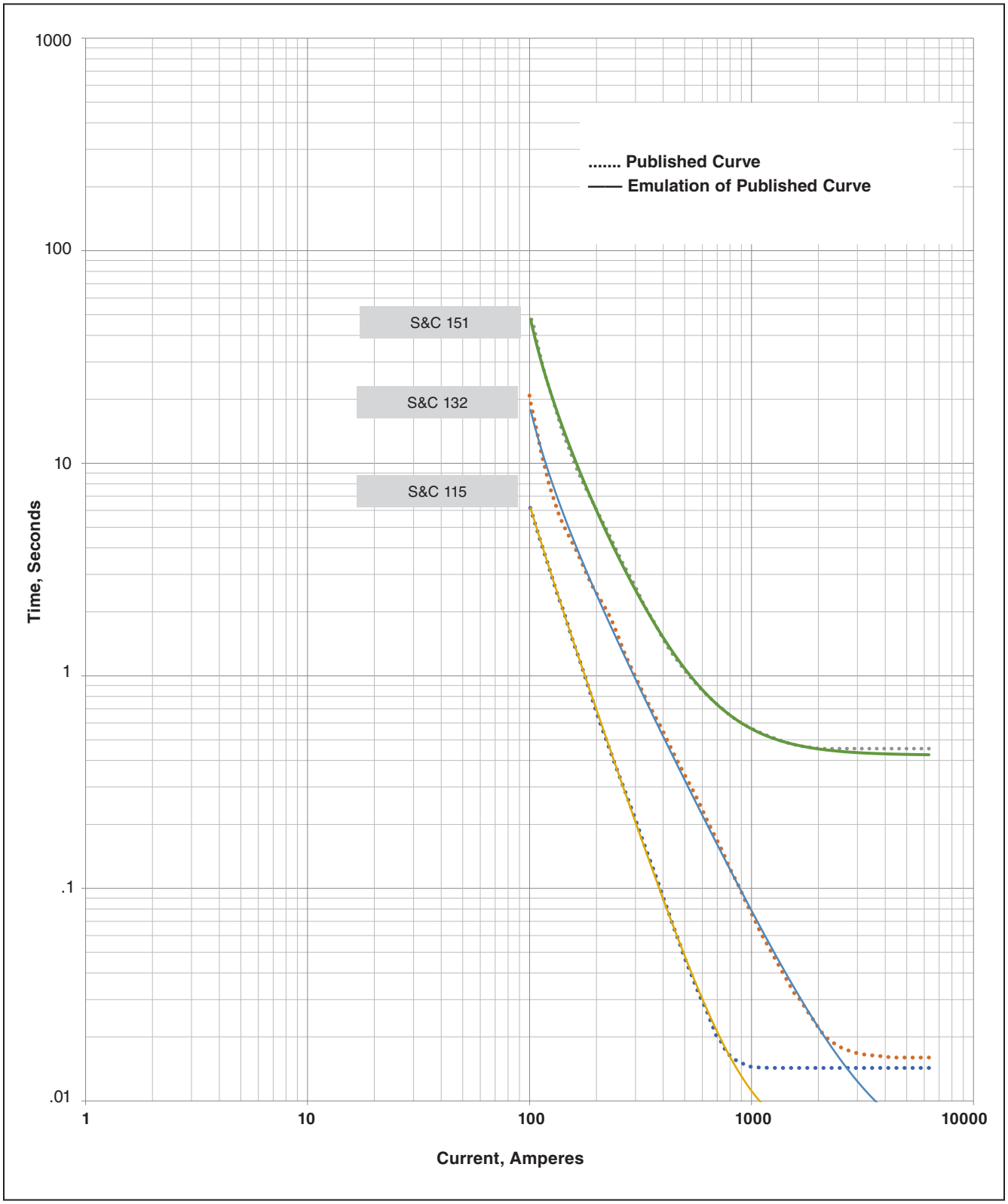


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 16. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 137	100	20.882	0.383	-0.033	1.734
S&C 142	100	32.548	0.005	0.264	2.153

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

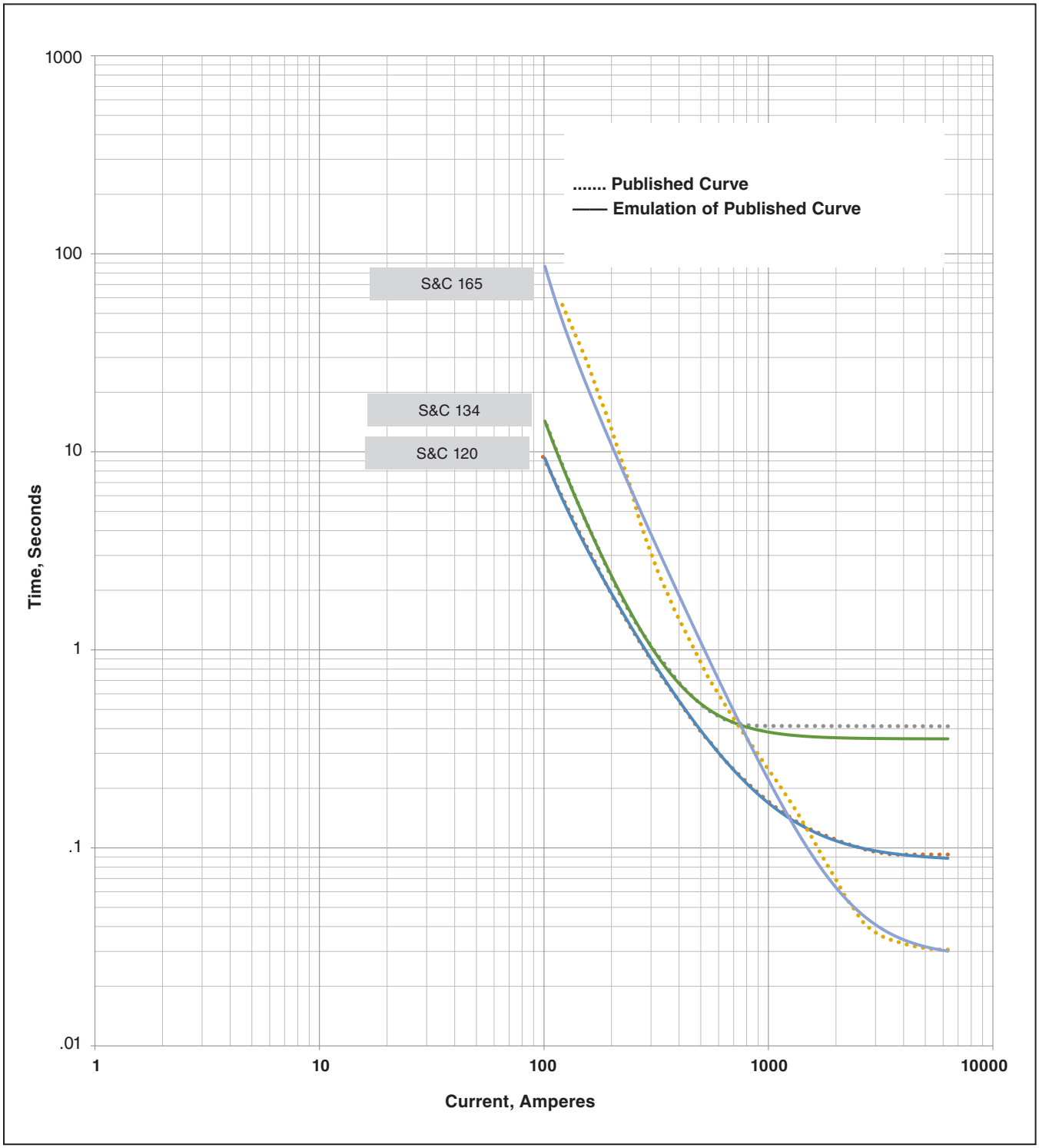


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 17. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 115	100	5.5440001	0.006	0.130	3.032
S&C 132	100	9.0810003	0.005	0.511	2.092
S&C 151	100	22.9950008	0.423	0.535	2.217

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

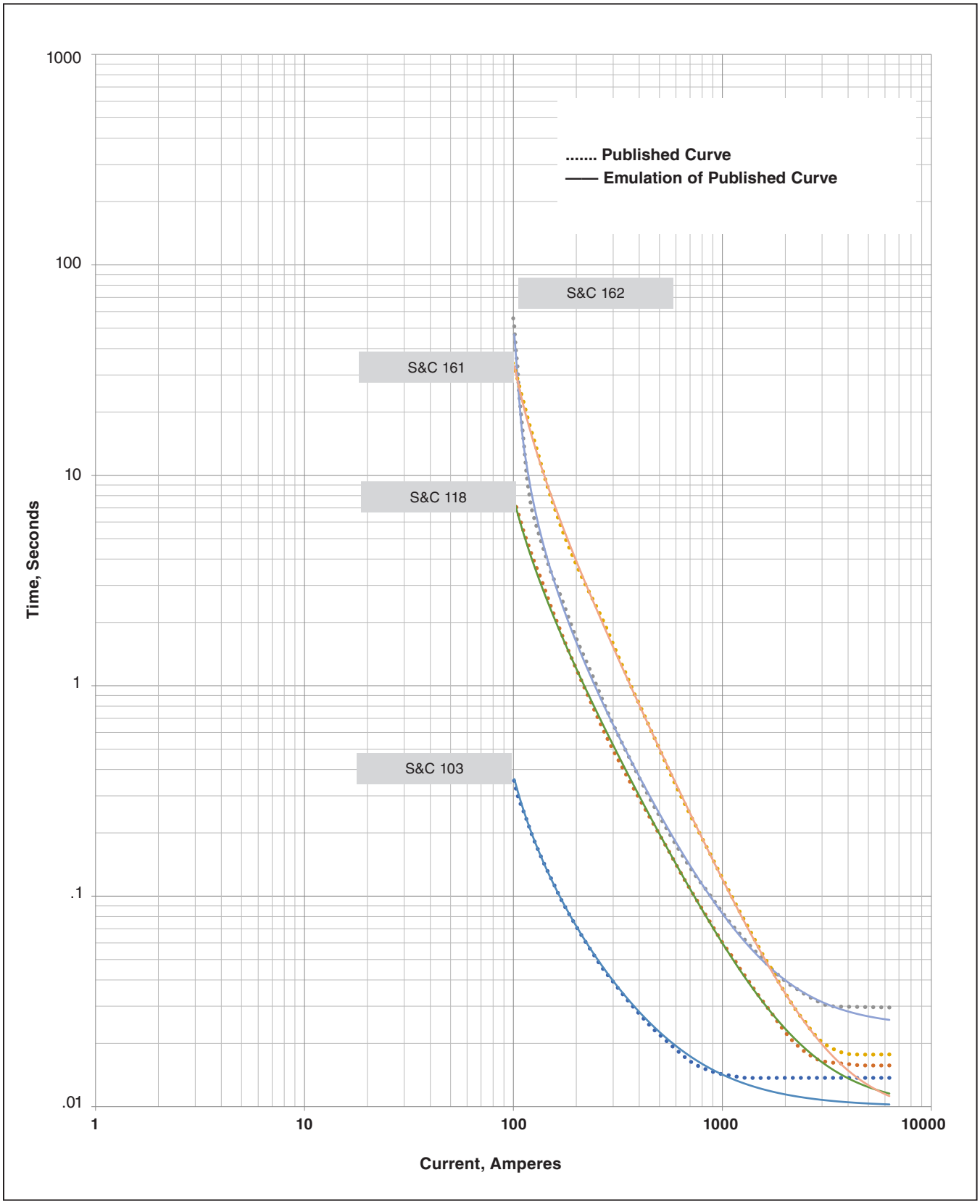


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 18. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 120	100	6.040	0.086	0.362	1.867
S&C 134	100	11.906	0.355	0.172	2.610
S&C 165	100	55.159	0.028	0.387	2.458

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

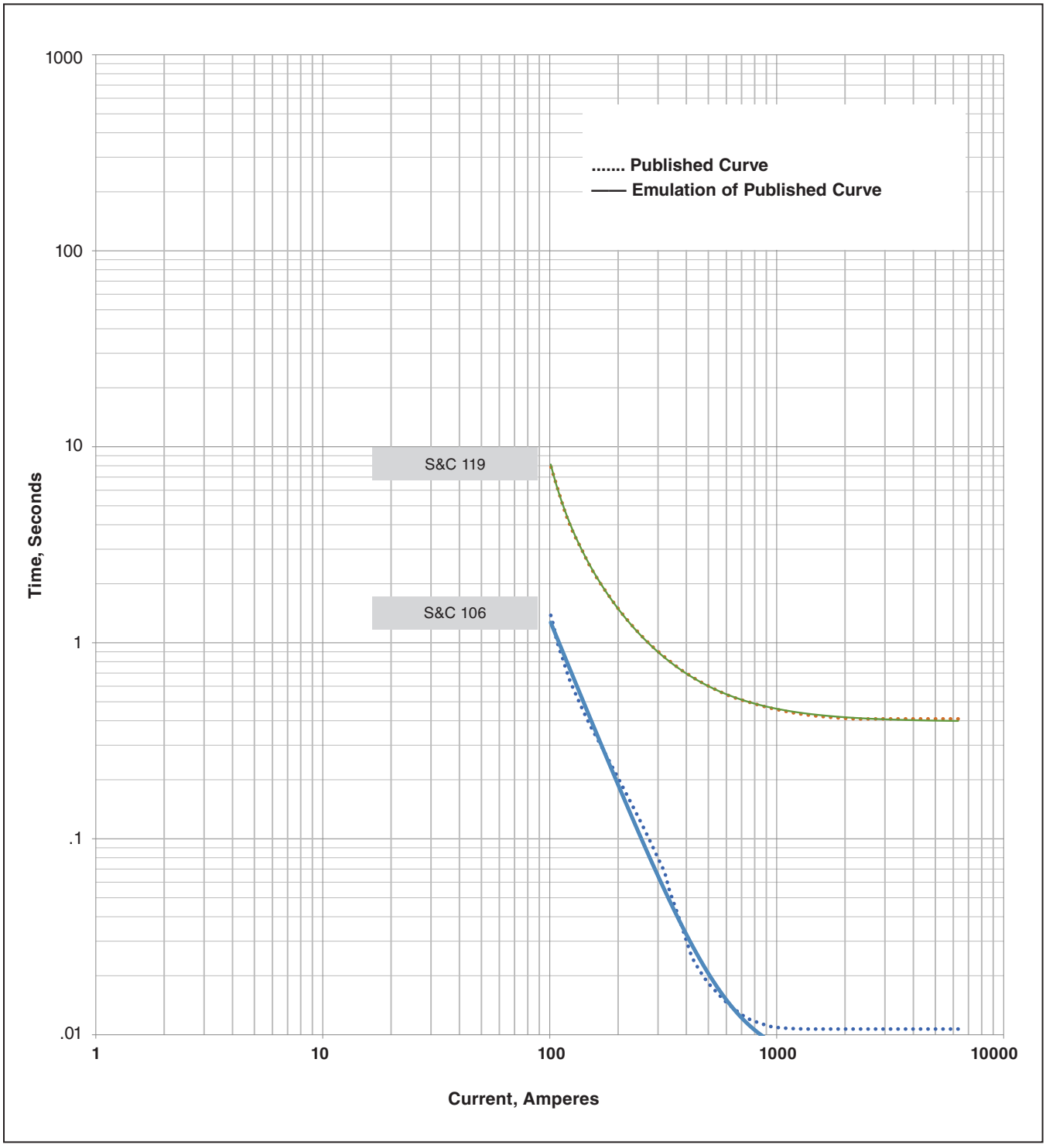


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 19. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 103	100	0.142	0.009	0.610	1.536
S&C 118	100	3.802	0.010	0.513	1.885
S&C 161	100	4.341	0.024	0.926	1.874
S&C 162	100	14.774	0.009	0.574	2.124

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

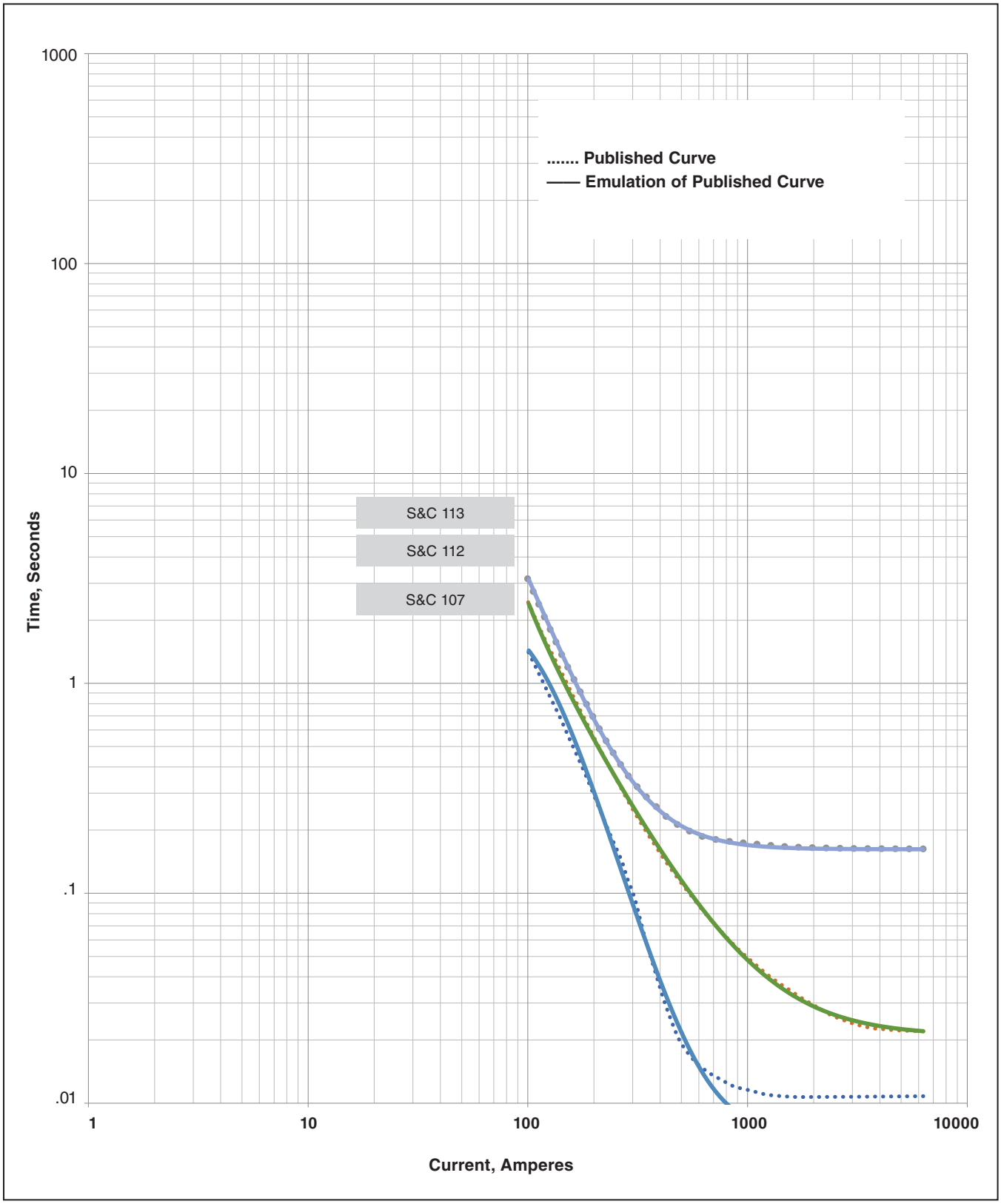


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 20. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 106	100	1.298	0.007	0.000	2.835
S&C 119	100	2.616	0.396	0.678	1.615

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

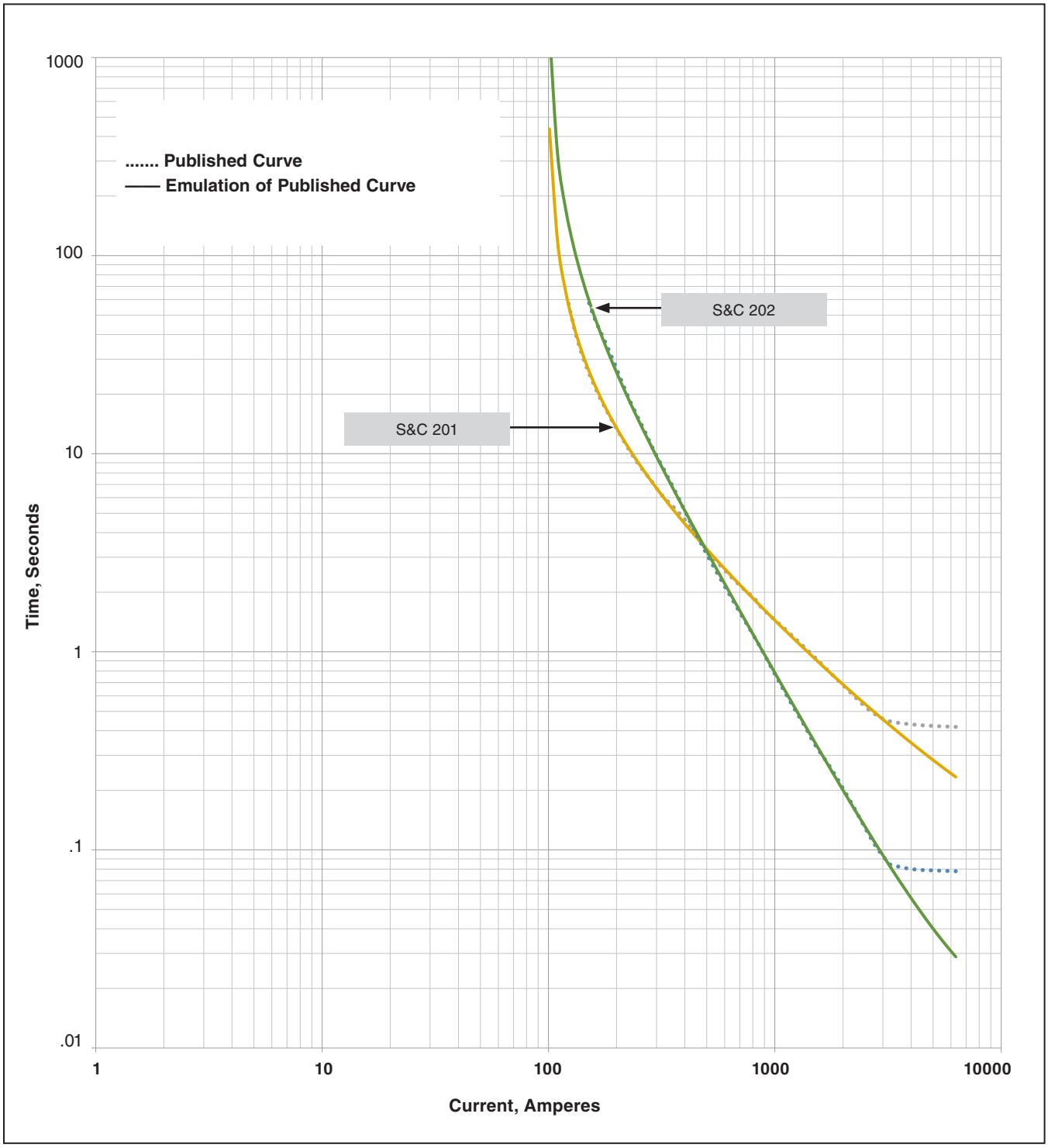


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 21. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 107	100	3.602	0.007	-1.496	3.411
S&C 112	100	1.598	0.021	0.343	1.773
S&C 113	100	3.132	0.162	-0.032	2.606

Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls①

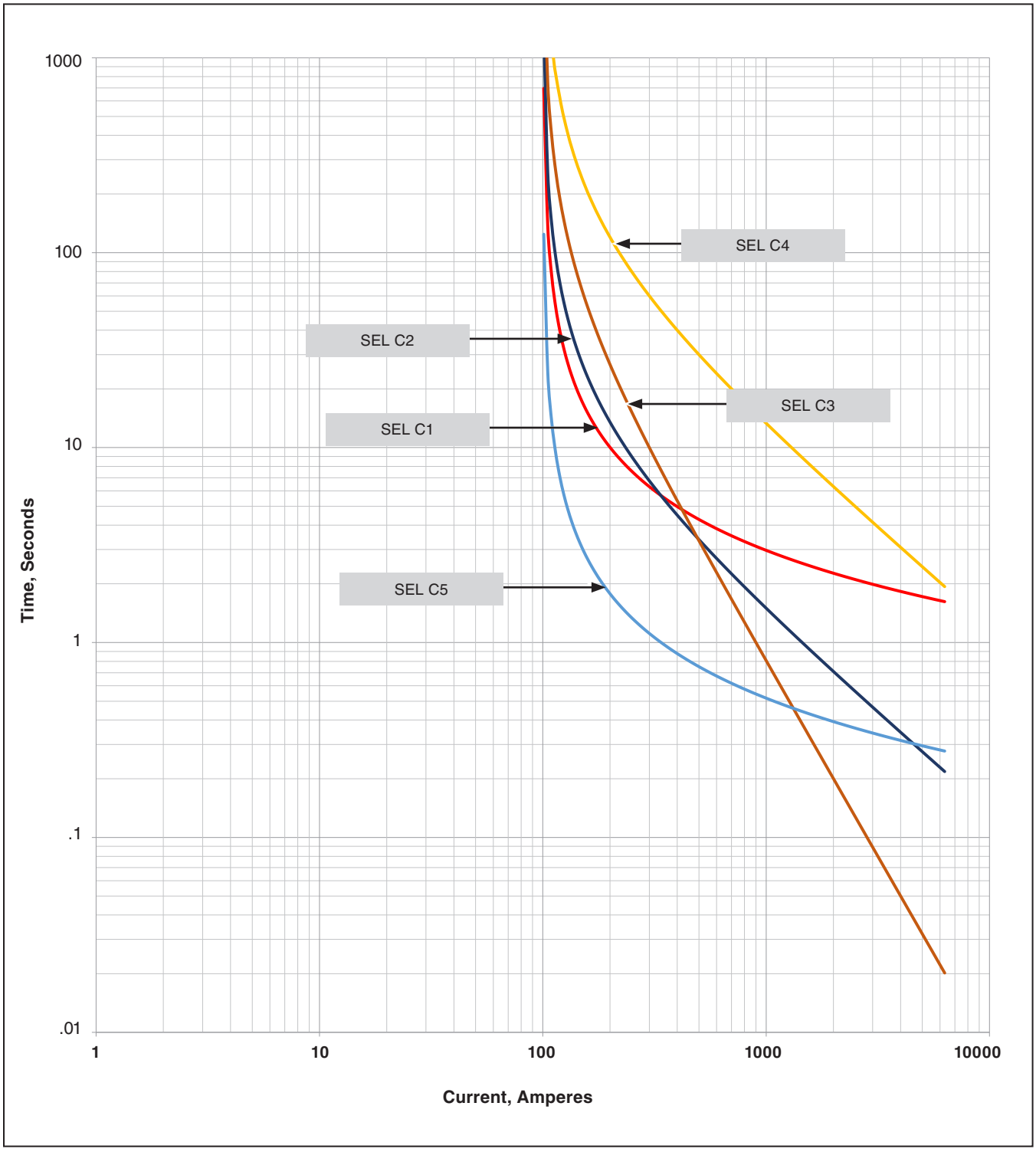


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 22. TCC Curve Parameter for Cooper Power Systems Form 4, 5, 6, and FX Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
S&C 201	100	15.2049999	0.056	0.976	1.077
S&C 202	100	78.9759979	0.01	0.962	2.013

Schweitzer Engineering Laboratories (SEL) 351R/651R Recloser Controls①

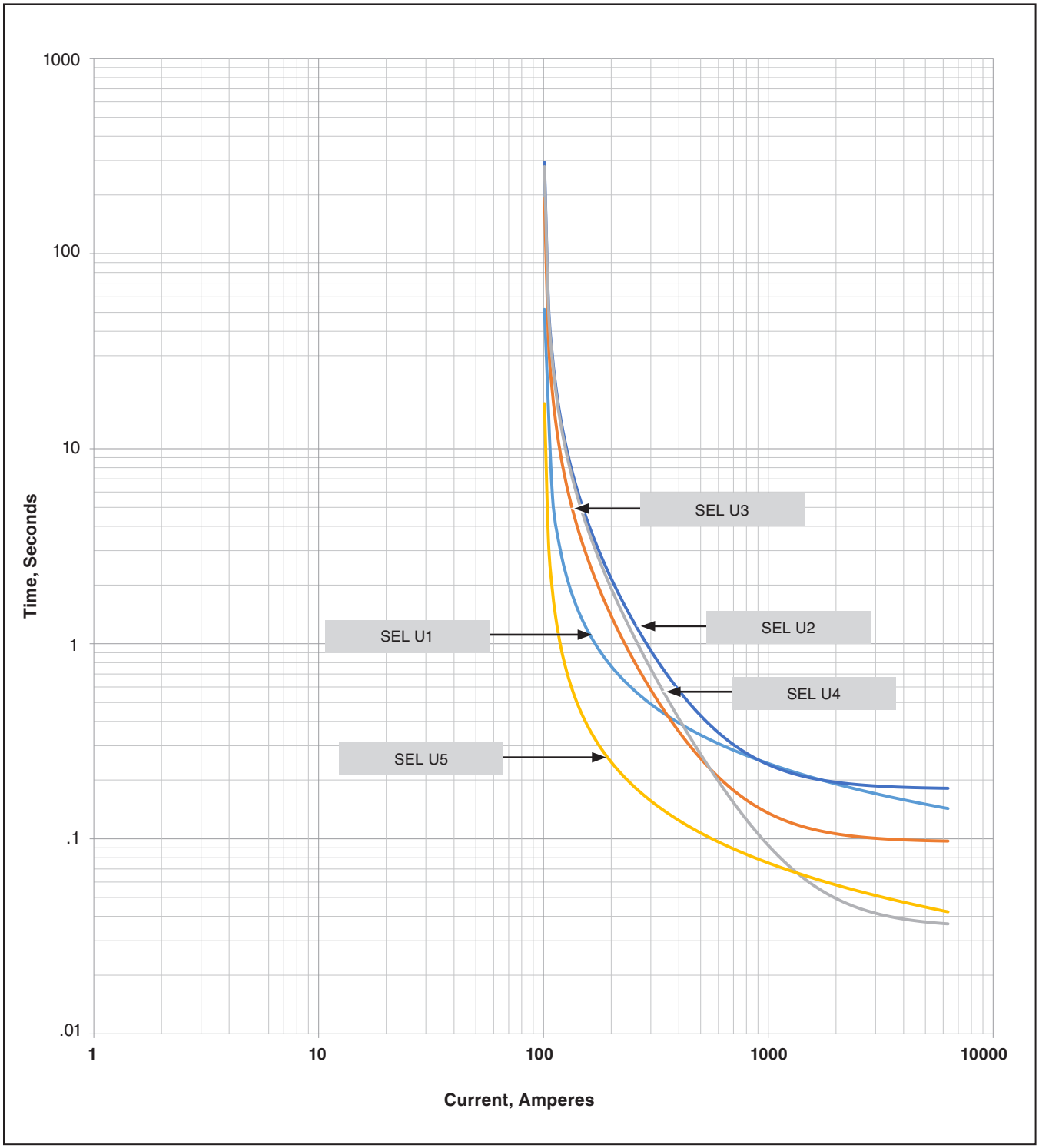


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 23. TCC Curve Parameter for Schweitzer Engineering Laboratories (SEL) 351R/651R Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
SEL_C1	100	0.14	0.0	1.0	0.02
SEL_C2	100	13.50	0.0	1.0	1.0
SEL_C3	100	80	0.0	1.0	2.0
SEL_C4	100	120	0.0	1.0	1.0
SEL_C5	100	0.05	0.0	1.0	0.04

Schweitzer Engineering Laboratories (SEL) 351R/651R Recloser Controls①

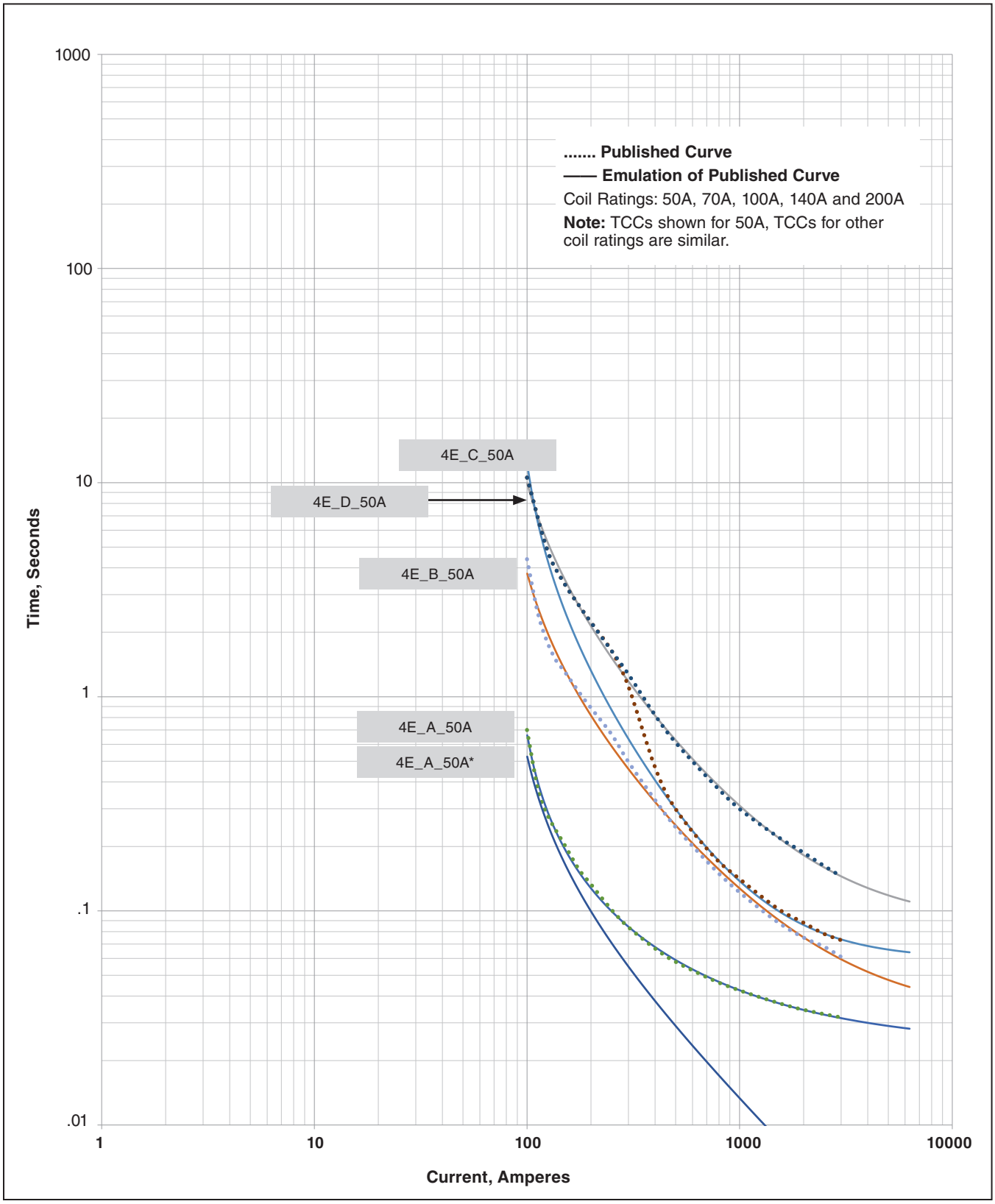


① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 24. TCC Curve Parameter for Schweitzer Engineering Laboratories (SEL) 351R/651R Recloser Controls

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
SEL_U1	100	0.0104	0.0226	1.0	0.02
SEL_U2	100	5.9500	0.1800	1.0	2.00
SEL_U3	100	3.8800	0.0963	1.0	2.00
SEL_U4	100	5.6700	0.0352	1.0	2.00
SEL_U5	100	0.0034	0.00262	1.0	0.02

Cooper Power Series (McGraw Type) 4E Hydraulic Recloser①



① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

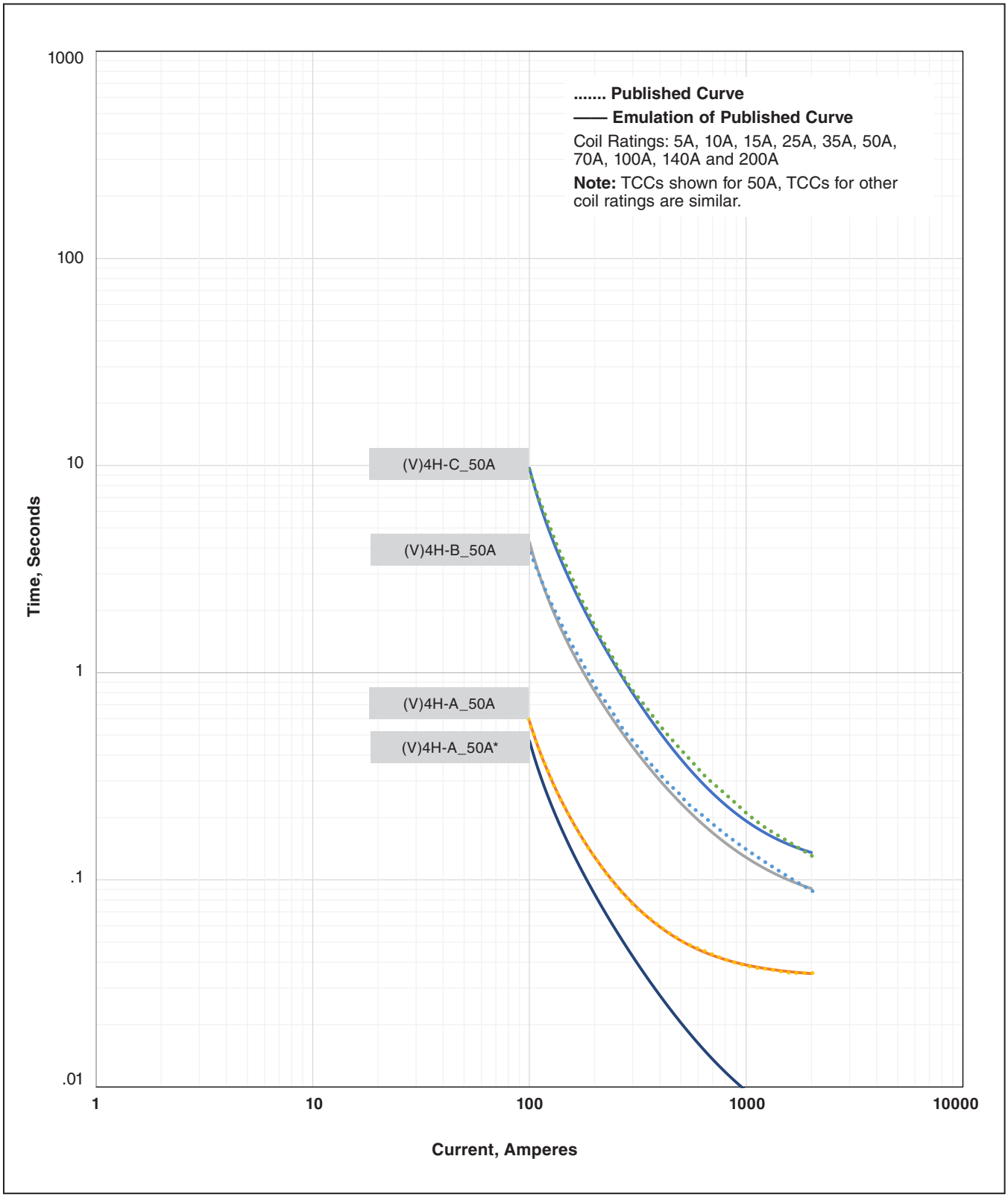
Table 25. TCC Curve Parameters for Cooper Power Series (McGraw Type) 4E Hydraulic Recloser

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
4E_A_50A●	100	0.074441700	0.0234364	0.884929200	0.678676600
4E_A_50A*■	100	0.121403053	0.0000000	0.771446703	0.994312031
4E_B_50A	100	1.136819000	0.0321950	0.697809000	1.102053000
4E_C_50A	100	3.318539000	0.0865470	0.6641902	1.190806
4E_D_50A	100	2.716365000	0.0596500	0.779800000	1.551124000

● Emulates Cooper Power Series maximum clearing time.

■ Emulates Cooper Power Series average clearing time.

Cooper Power Series (McGraw Type) (V)4H Hydraulic Recloser①



① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

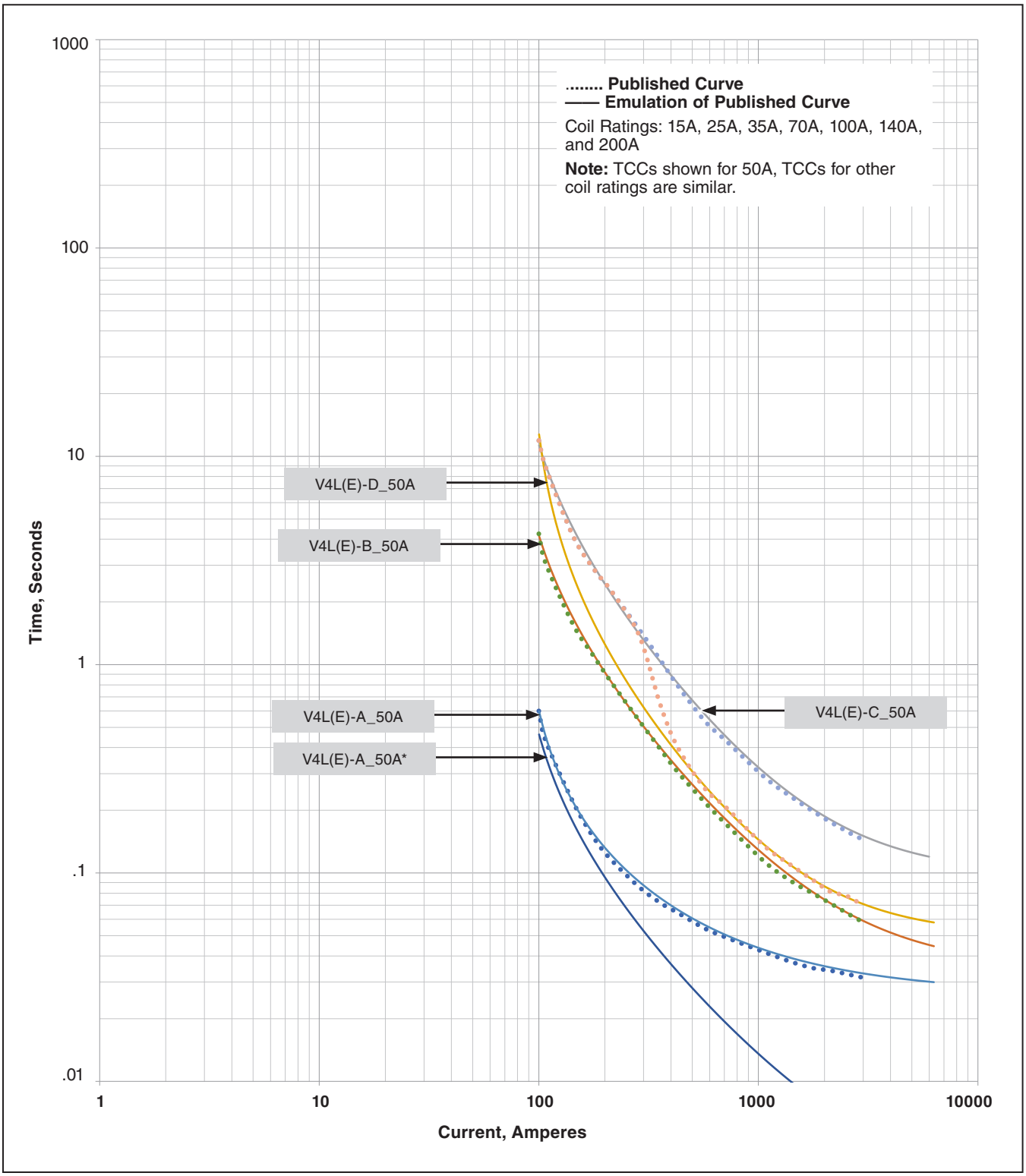
Table 26. TCC Curve Parameters for Cooper Power Series (McGraw Type) (V)4H Hydraulic Recloser

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
(V)4H-A_50A●	100	0.264229600	0.033751000	0.519079000	1.721096000
(V)4H-A_50A*■	100	0.194725467	0.004381548	0.581514308	1.580522812
(V)4H-B_50A	100	1.504806000	0.068800000	0.642100000	1.414342000
(V)4H-C_50A	100	3.961621000	0.110100000	0.587200000	1.687608000

● Emulates Cooper Power Series maximum clearing time.

■ Emulates Cooper Power Series average clearing time.

Cooper Power Series (McGraw Type) V4L(E) Hydraulic Recloser①



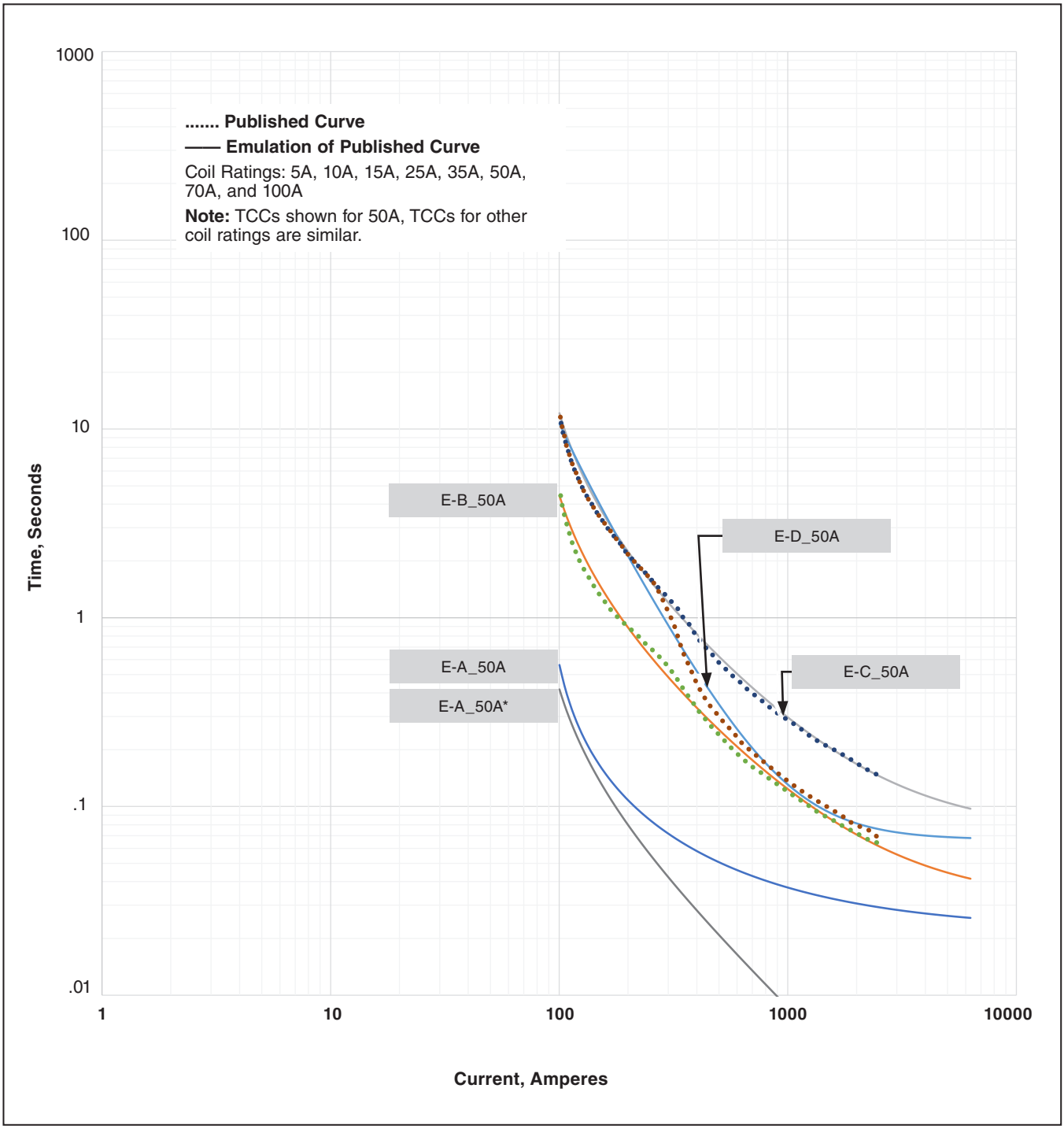
① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 27. TCC Curve Parameters for Cooper Power Series (McGraw Type) V4L(E) Hydraulic Recloser

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
V4L(E)-A_50A●	100	0.097738800	0.026433	0.830815000	0.810978000
V4L(E)-A_50A*■	100	0.135739459	0.002650948	0.707635966	1.118552864
V4L(E)-B_50A	100	1.481741000	0.034778000	0.642580000	1.213101000
V4L(E)-C_50A	100	4.333998000	0.098785000	0.615457000	1.302735000
V4L(E)-D_50A	100	2.075000000	0.050450000	0.840000000	1.359510000

● Emulates Cooper maximum clearing time.
■ Emulates Cooper average clearing time.

Cooper Power Series (McGraw Type) E Hydraulic Recloser①



① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

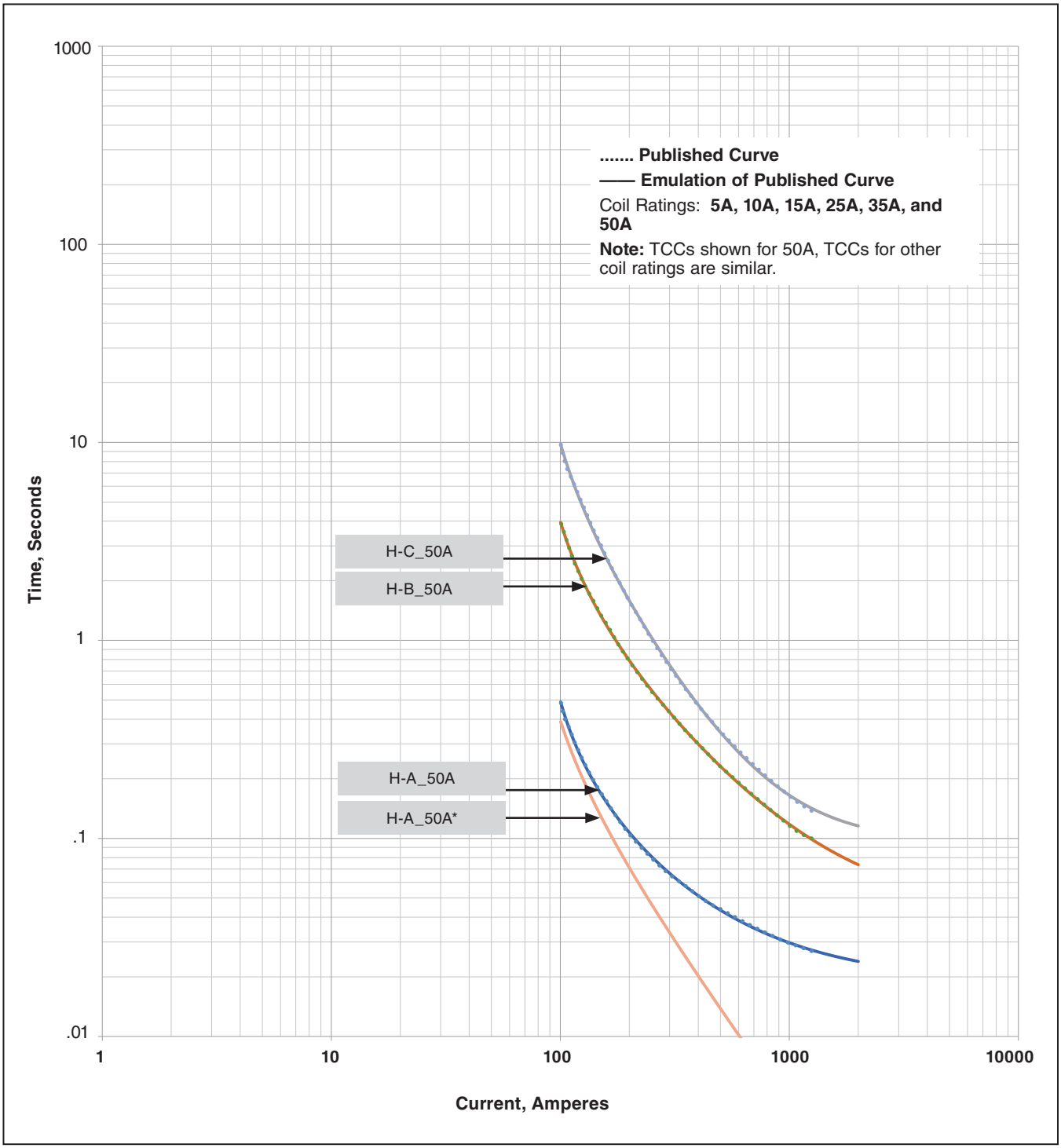
Table 28. TCC Curve Parameters for Cooper Power Series (McGraw Type) E Hydraulic Recloser

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
E-A_50A●	100	0.066975000	0.022283	0.877796000	0.72977600
E-A_50A*■	100	0.124889733	0.000000	0.703838159	1.18092983
E-B_50A	100	1.353311000	0.031452	0.695400000	1.18622000
E-C_50A	100	3.484758000	0.074458	0.714239000	1.21446000
E-D_50A	100	8.589697000	0.066784	0.197590000	2.12832000

● Emulates Cooper Power Series maximum clearing time.

■ Emulates Cooper Power Series average clearing time.

Cooper Power Series (McGraw Type) H Hydraulic Recloser①



① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

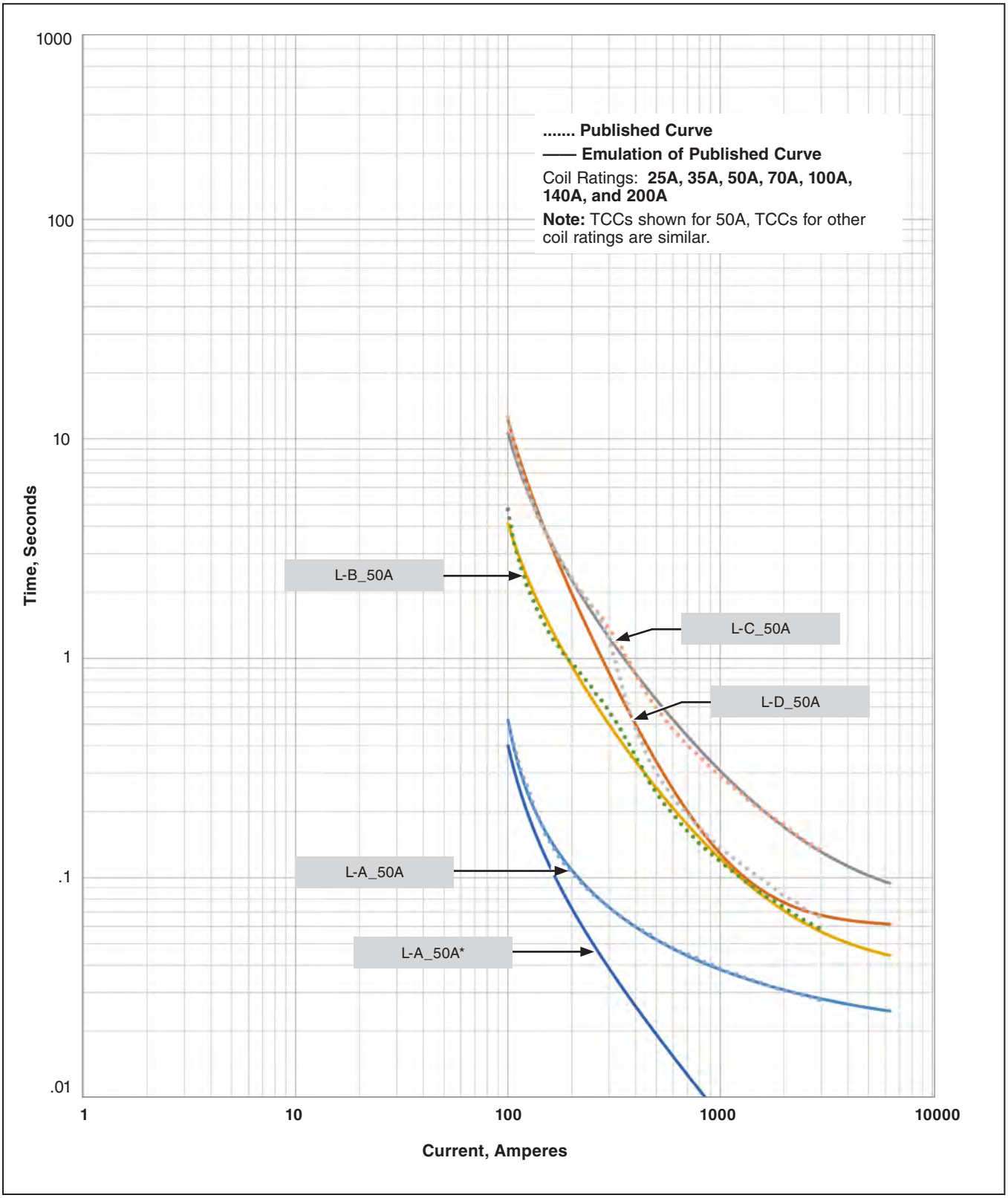
Table 29. TCC Curve Parameters for Cooper Power Series (McGraw Type) H Hydraulic Recloser

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
H-A_50A●	100	0.120515000	0.019049	0.745970000	1.080737000
H-A_50A*■	100	0.180753611	0.000000	0.539320692	1.622219592
H-B_50A	100	1.261481000	0.042423	0.679768000	1.240701000
H-C_50A	100	4.413898000	0.096043	0.548737000	1.809324000

● Emulates Cooper Power Series maximum clearing time.

■ Emulates Cooper Power Series average clearing time.

Cooper Power Series (McGraw Type) L Hydraulic Recloser①



① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

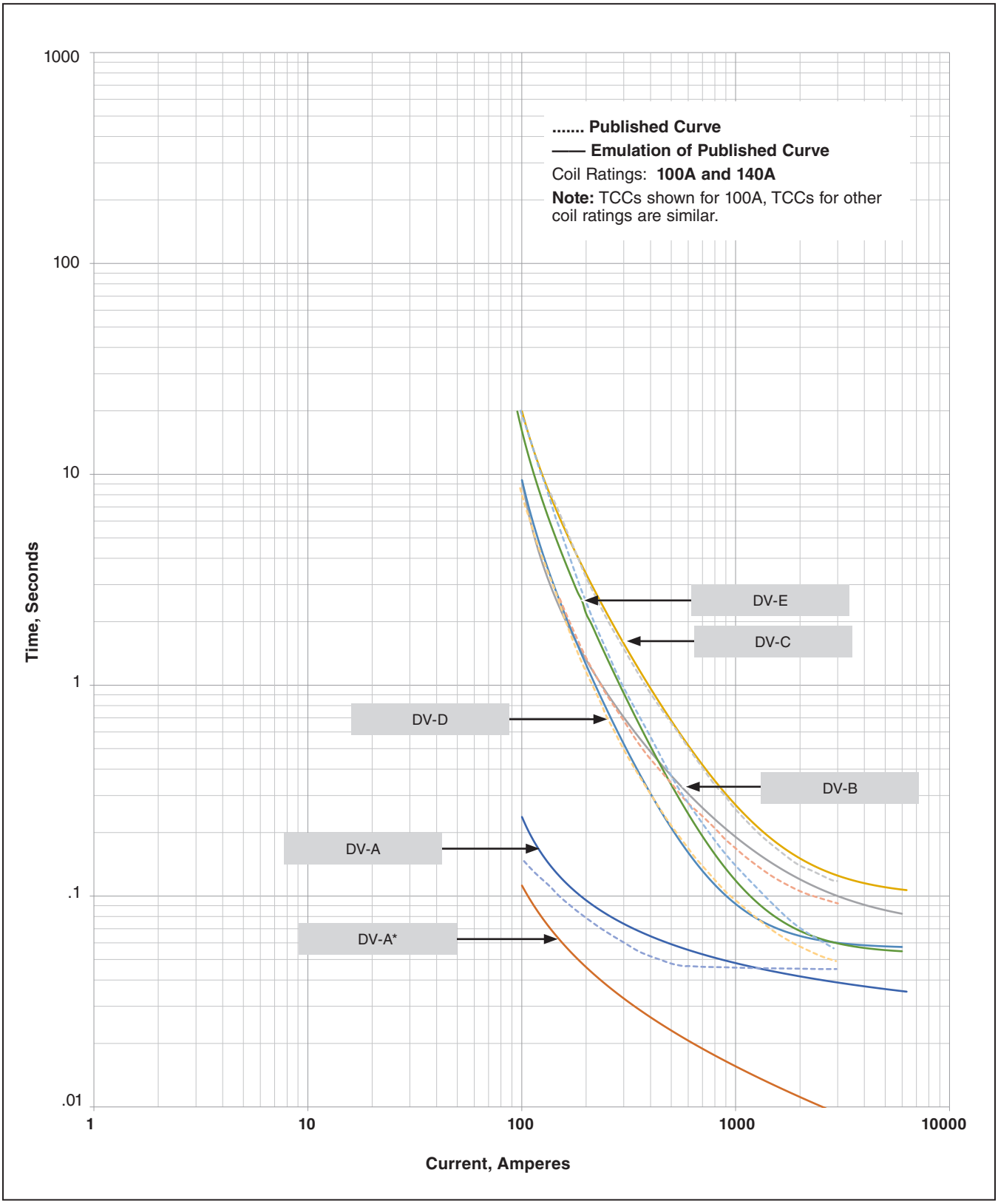
Table 30. TCC Curve Parameters for Cooper Power Series (McGraw Type) L Hydraulic Recloser

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
L-A_50A●	100	0.0479717	0.0186627	0.90594	0.527317
L-A_50A*■	100	0.105647	0.000000	0.73763	1.133463
L-B_50A	100	1.64993700	0.036685	0.596892000	1.298670000
L-C_50A	100	3.58782700	0.069009	0.662254000	1.196899000
L-D_50A	100	6.721710200	0.059650	0.449500000	1.988588000

● Emulates Cooper Power Series maximum clearing time.

■ Emulates Cooper Power Series average clearing time.

Cooper Power Systems D, DV Hydraulic Recloser①



① Curves are applicable to a TripSaver II Cutout-Mounted Recloser that is energized and carrying greater than or equal to the wake-up current.

Table 31. TCC Curve Parameters for Cooper Power Systems D, DV Hydraulic Recloser

Curve	Curve Parameters				
	Pickup Current (Amperes)	A	B	C	P
DV-A_100A●	200	0.000004	0.016409	0.999982	0.00047
DV-A_100A*■	200	0.017855	0	0.841584	0.298357
DV-B_100A	200	1.919375	0.069412	0.796609	1.220675
DV-C_100A	200	9.056495	0.099701	0.546637	1.729385
DV-D_100A	200	4.546237	0.056565	0.518134	2.113536
DV-E_100A	200	9.214447	0.053234	0.540156	2.106391

● Emulates Cooper Power Systems maximum clearing time.

■ Emulates Cooper Power Systems average clearing time.