



Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167C

Page 1

May 1994
Supersedes Application Data 29-164,
pages 1-36, dated April 1983, and
Application Data 29-165, pages 1-20,
dated February 1986
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Current Limit-R® Circuit
Breakers and Tri-Pac® Circuit Breakers

Westinghouse AB DE-ION® Current Limiting Circuit Breakers

Voltages shown in curve headings are
maximum at which the breaker may be
applied. Interrupting capacity of individual
breaker is tabulated on each curve.

Breaker Description	Curve No.	Page
Current Limit-R® Circuit Breakers		
Type FCL 15 Amperes	SC-4340-80A	2
Type FCL 20 Amperes	SC-4341-80A	3
Type FCL 25 Amperes	SC-4342-80A	4
Type FCL 30 Amperes	SC-4343-80A	5
Type FCL 35 Amperes	SC-4344-80A	6
Type FCL 40 Amperes	SC-4345-80A	7
Type FCL 45 Amperes	SC-4346-80A	8
Type FCL 50 Amperes	SC-4347-80A	9
Type FCL 60 Amperes	SC-4348-80A	10
Type FCL 70 Amperes	SC-4349-80A	11
Type FCL 80 Amperes	SC-4350-80A	12
Type FCL 90 Amperes	SC-4351-80A	13
Type FCL 100 Amperes	SC-4352-80A	14
Types LCL and LCLG 125-250 Amperes	SC-3624-81A	15
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Types LCL and LCLG 200-400 Amperes	SC-3626-81A	17
Types LCLA and LCLGA 200-400 Amperes	SC-3627-81A	18
Ground Fault Pick-up Curves for Types LCLG and LCLGA	SC-3906-86A	19
Tri-Pac® Current Limiting Circuit Breakers		
Type FB 15 Amperes	SC-3572-76A	20
Type FB 20 Amperes	SC-3573-76A	21
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Type FB 50 Amperes	SC-3576-76A	24
Type FB 70 Amperes	SC-3577-76A	25
Type FB 90 Amperes	SC-3578-76A	26
Type FB 100 Amperes	SC-3579-76A	27
Type LA 70 Amperes	SC-3580-76A	28
Type LA 90 Amperes	SC-3581-76A	29
Type LA 100 Amperes	SC-3582-76A	30
Type LA 125 Amperes	SC-3583-76A	31
Type LA 150 Amperes	SC-3584-76A	32
Type LA 175 Amperes	SC-3585-76A	33
Type LA 200 Amperes	SC-3586-76A	34
Type LA 225 Amperes	SC-3587-76A	35
Type LA 250 Amperes	SC-3588-76A	36
Type LA 300 Amperes	SC-3589-76A	37
Type LA 350 Amperes	SC-3590-76A	38
Type LA 400 Amperes	SC-3591-76A	39
Type NB 300 Amperes	SC-3592-76B	40
Type NB 350 Amperes	SC-3593-76B	41
Type NB 400 Amperes	SC-3594-76B	42
Type NB 500 Amperes	SC-3595-76B	43
Type NB 600 Amperes	SC-3596-76B	44
Type NB 700 Amperes	SC-3597-76B	45
Type NB 800 Amperes	SC-3598-76B	46
Type PB 600 Amperes	SC-3599-76B	47
Type PB 800 Amperes	SC-3600-76B	48
Type PB 1000 Amperes	SC-3601-76B	49
Type PB 1200 Amperes	SC-3602-76B	50
Type PB 1400 Amperes	SC-3603-76B	51
Type PB 1600 Amperes	SC-3604-76B	52

Additional copies of this application data
may be ordered from the Westinghouse
Printing Division, Trafford, PA 15085.
Order Application Data 29-167C.

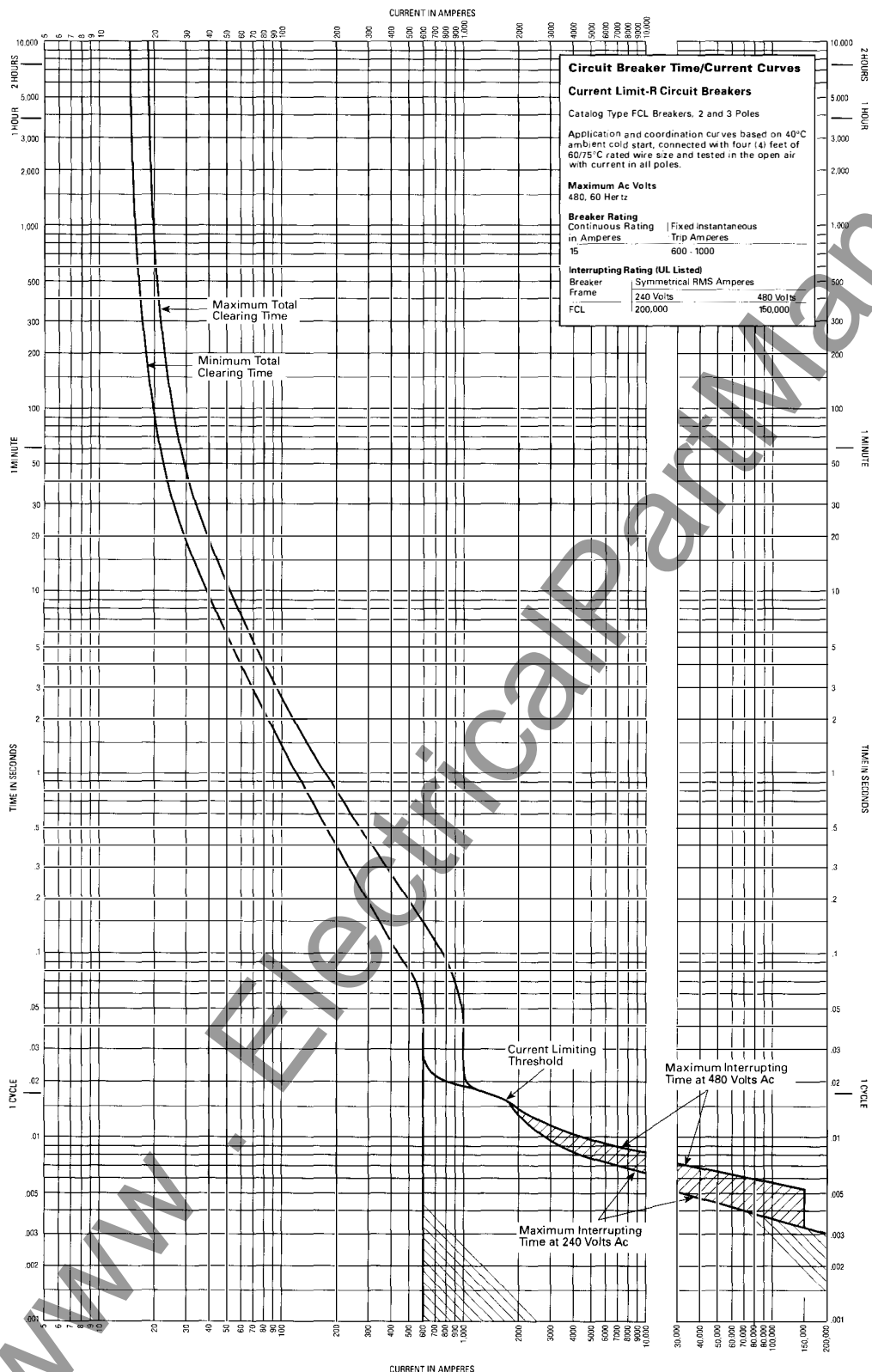
Individual oversize copies of curves listed
above printed on onion-skin paper are
available in limited quantity from:

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use num-
ber at bottom of page where curve appears,
i.e., SC-4340-80A. **Requests for full sets of
curves will not be honored.**

AB DE-ION Current Limit-R® Circuit Breakers

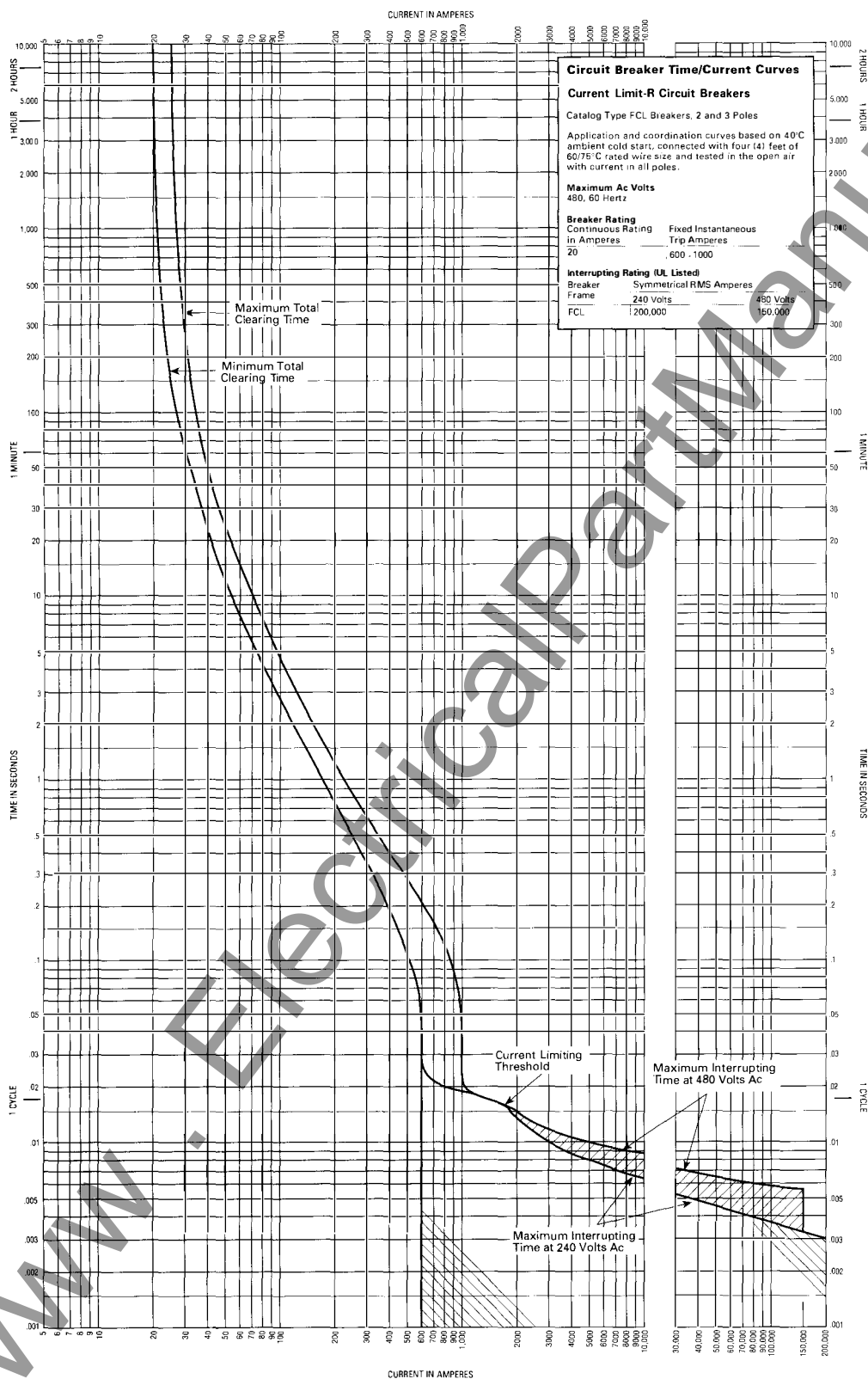
Type FCL, 15 Amperes, 2 and 3 Poles





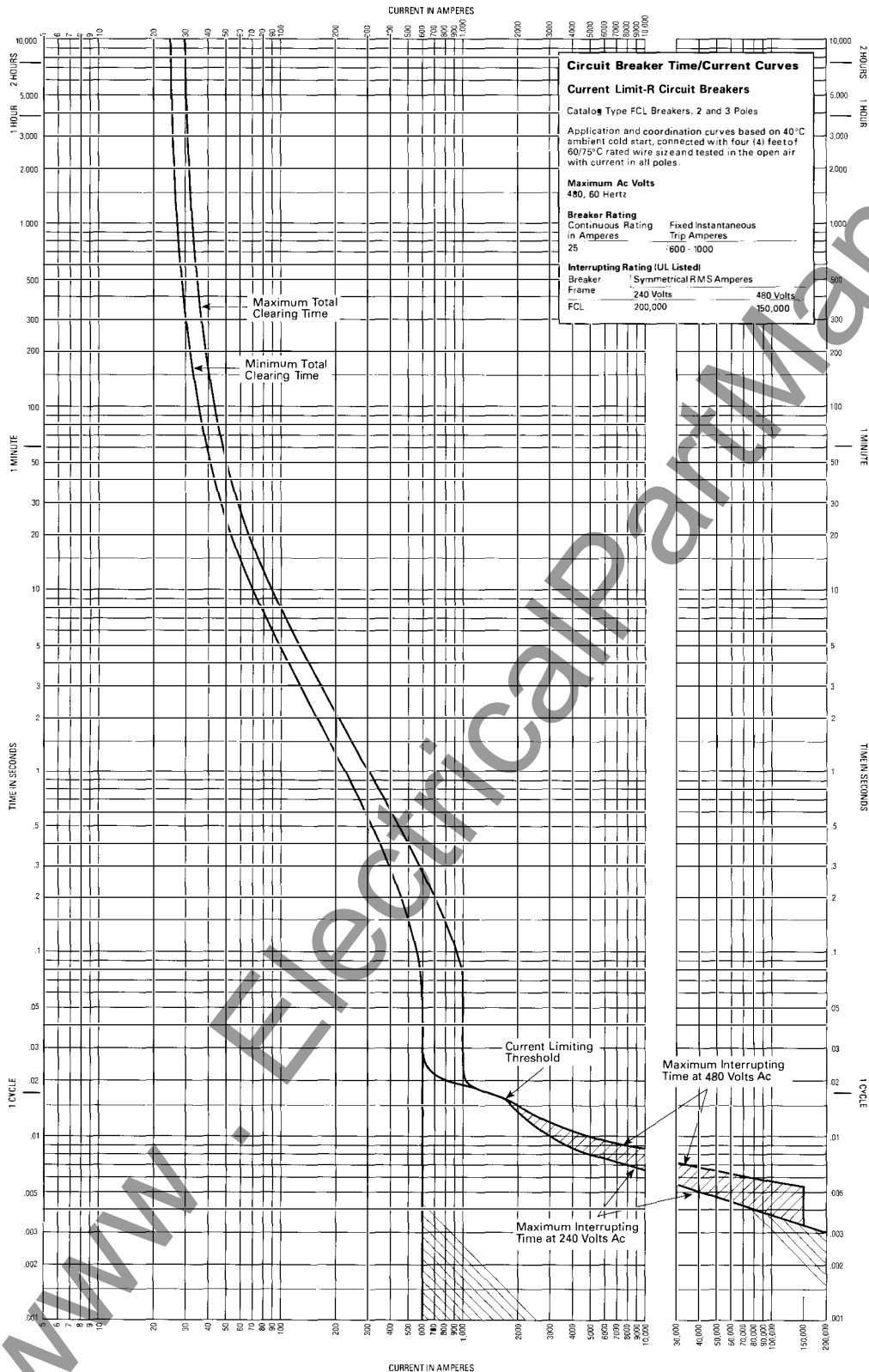
AB DE-ION Current Limit-R® Circuit Breakers

Type FCL, 20 Amperes, 2 and 3 Poles



AB DE-ION Current Limit-R® Circuit Breakers

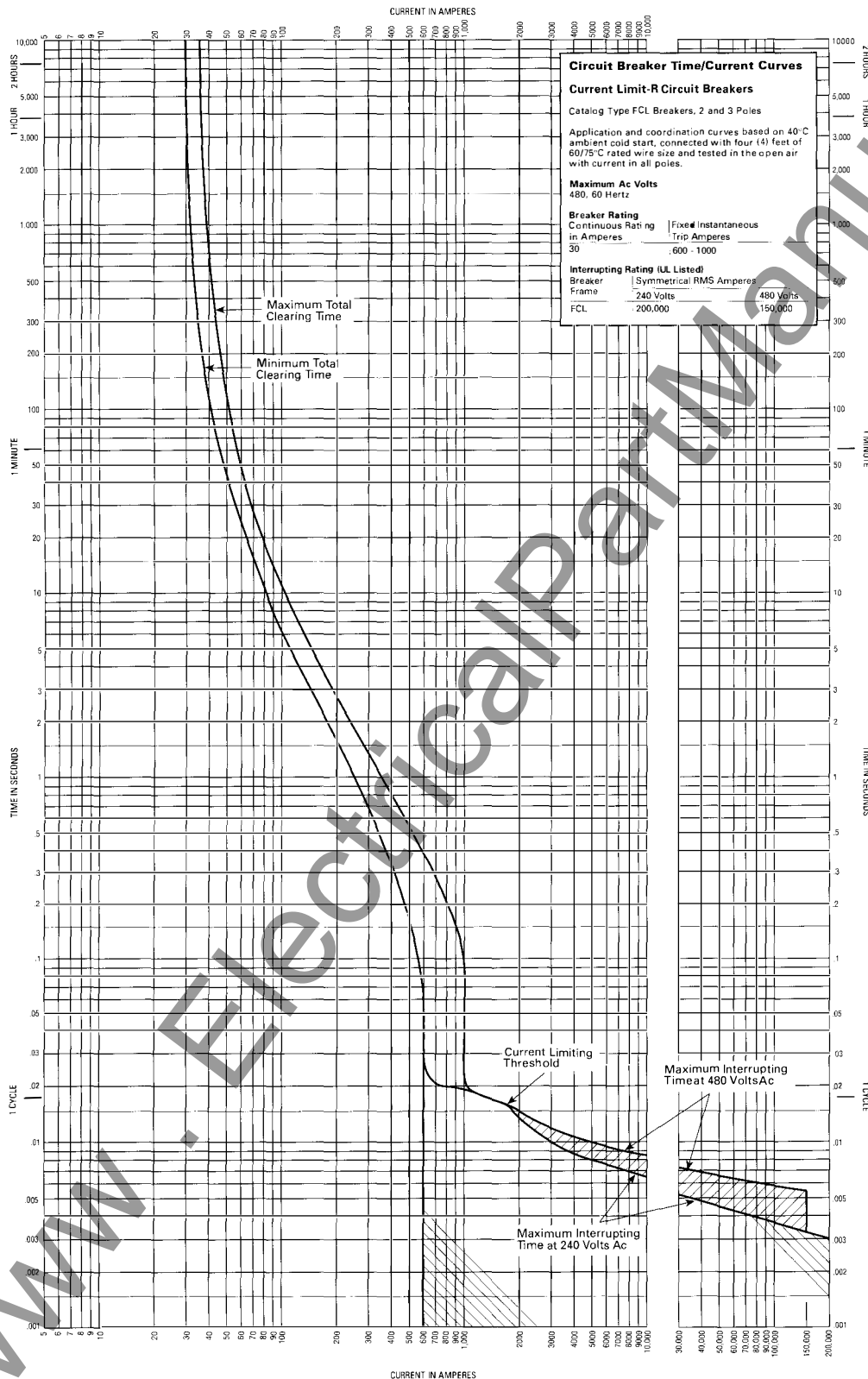
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AB DE-ION Current Limit-R® Circuit Breakers

Type FCL, 30 Amperes, 2 and 3 Poles



Curve No. SC-4343-80A

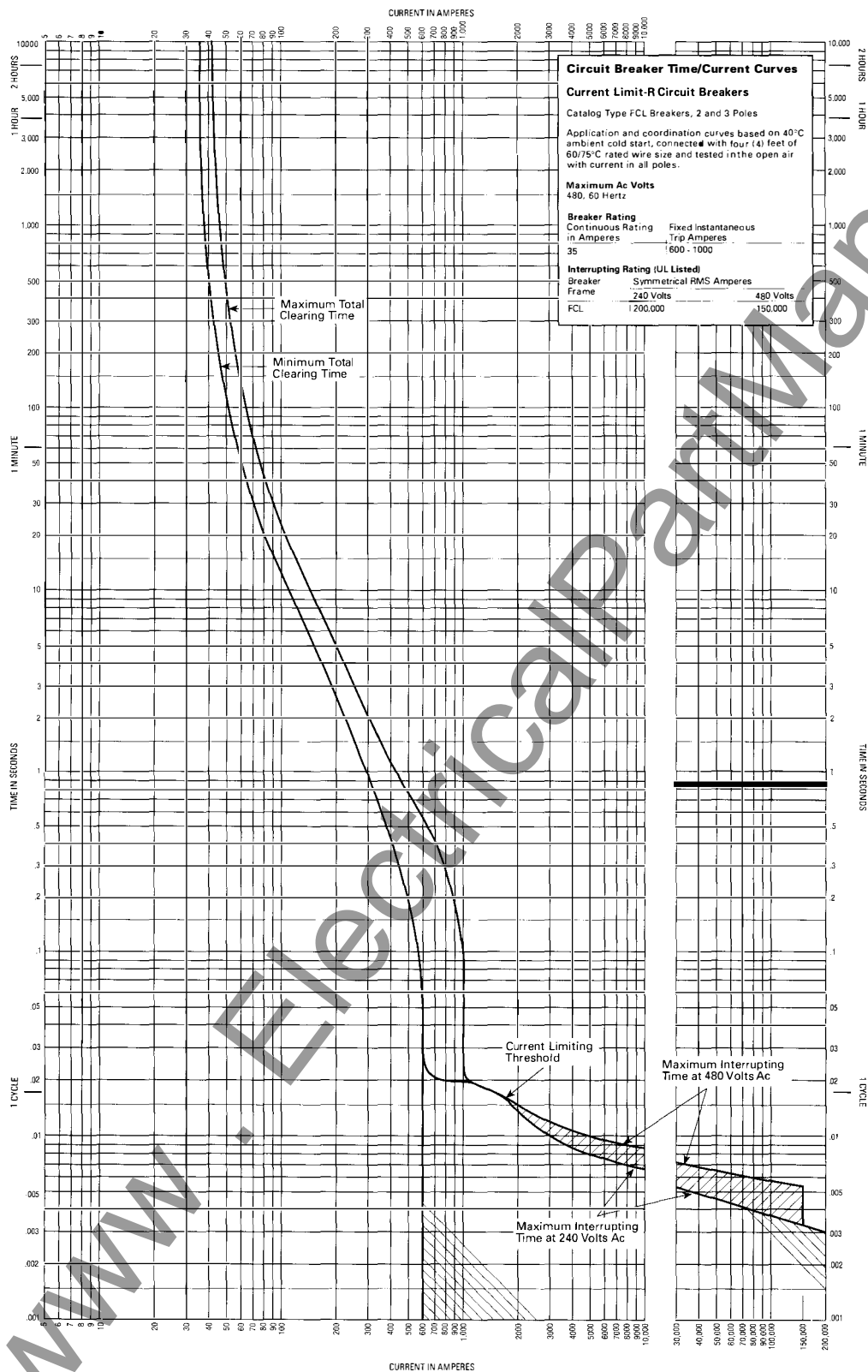
EATON

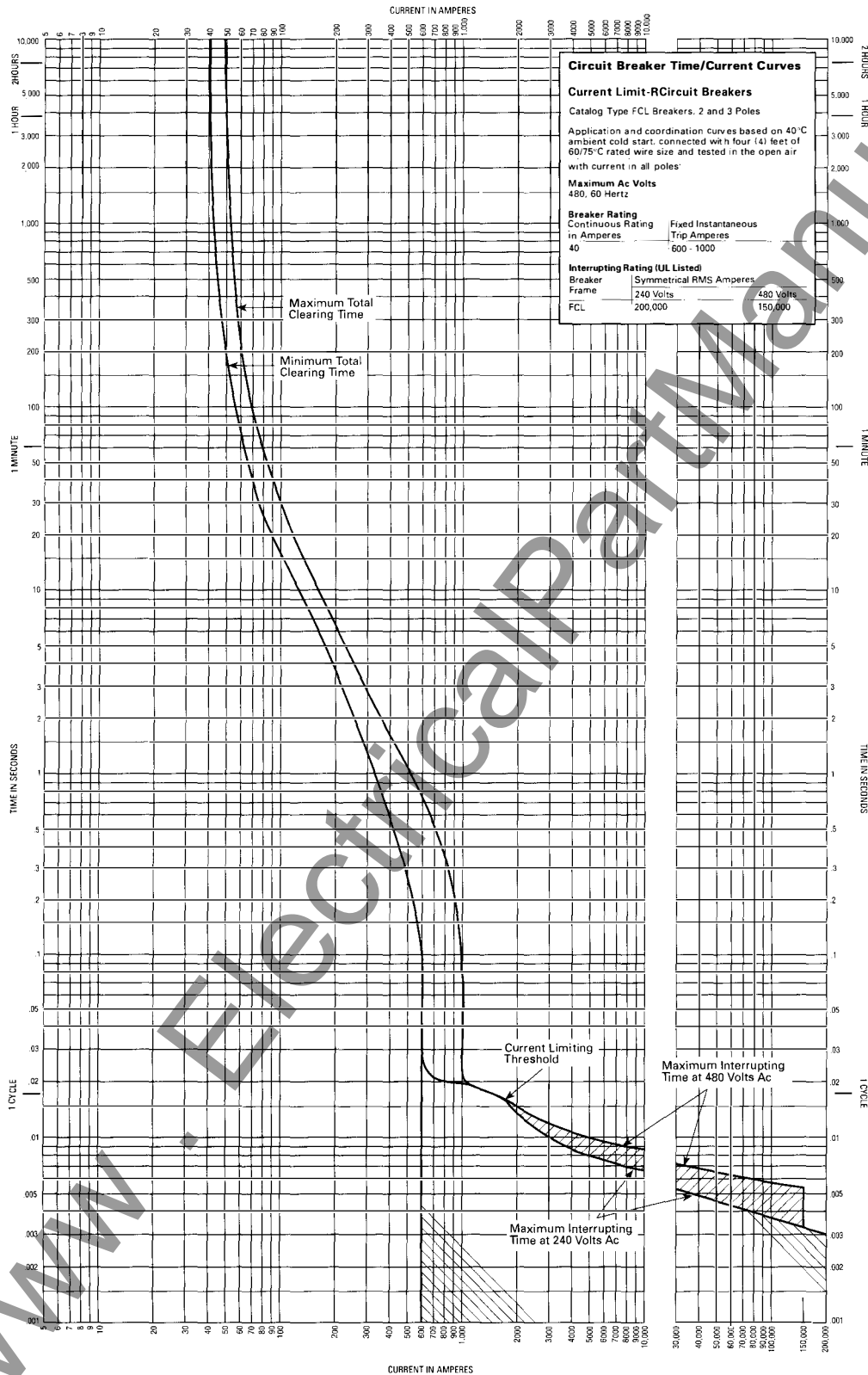
May 1994



AB DE-ION Current Limit-R® Circuit Breakers

Type FCL, 35 Amperes, 2 and 3 Poles

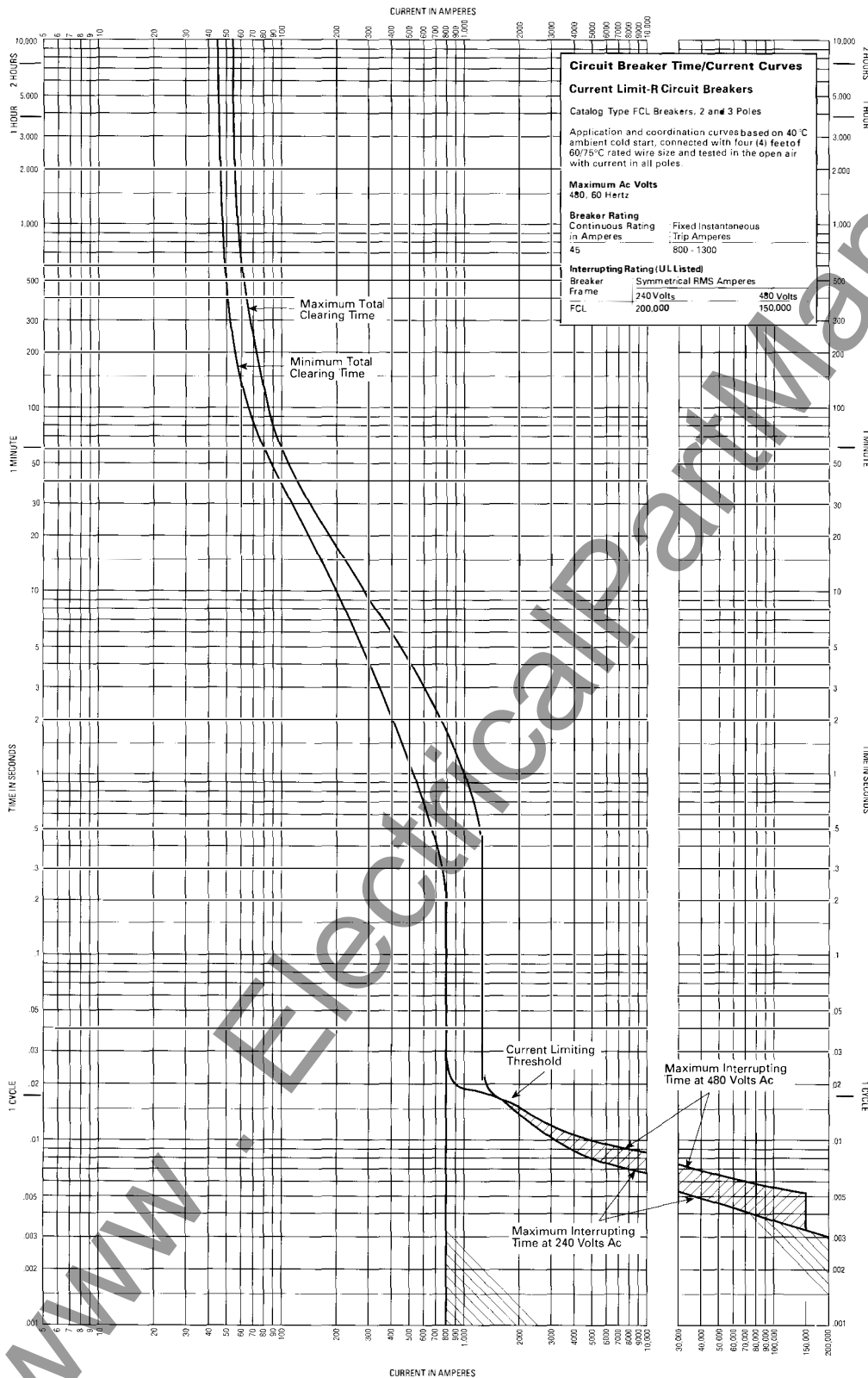


**AB DE-ION Current Limit-R® Circuit Breakers****Type FCL, 40 Amperes, 2 and 3 Poles**



AB DE-ION Current Limit-R® Circuit Breakers

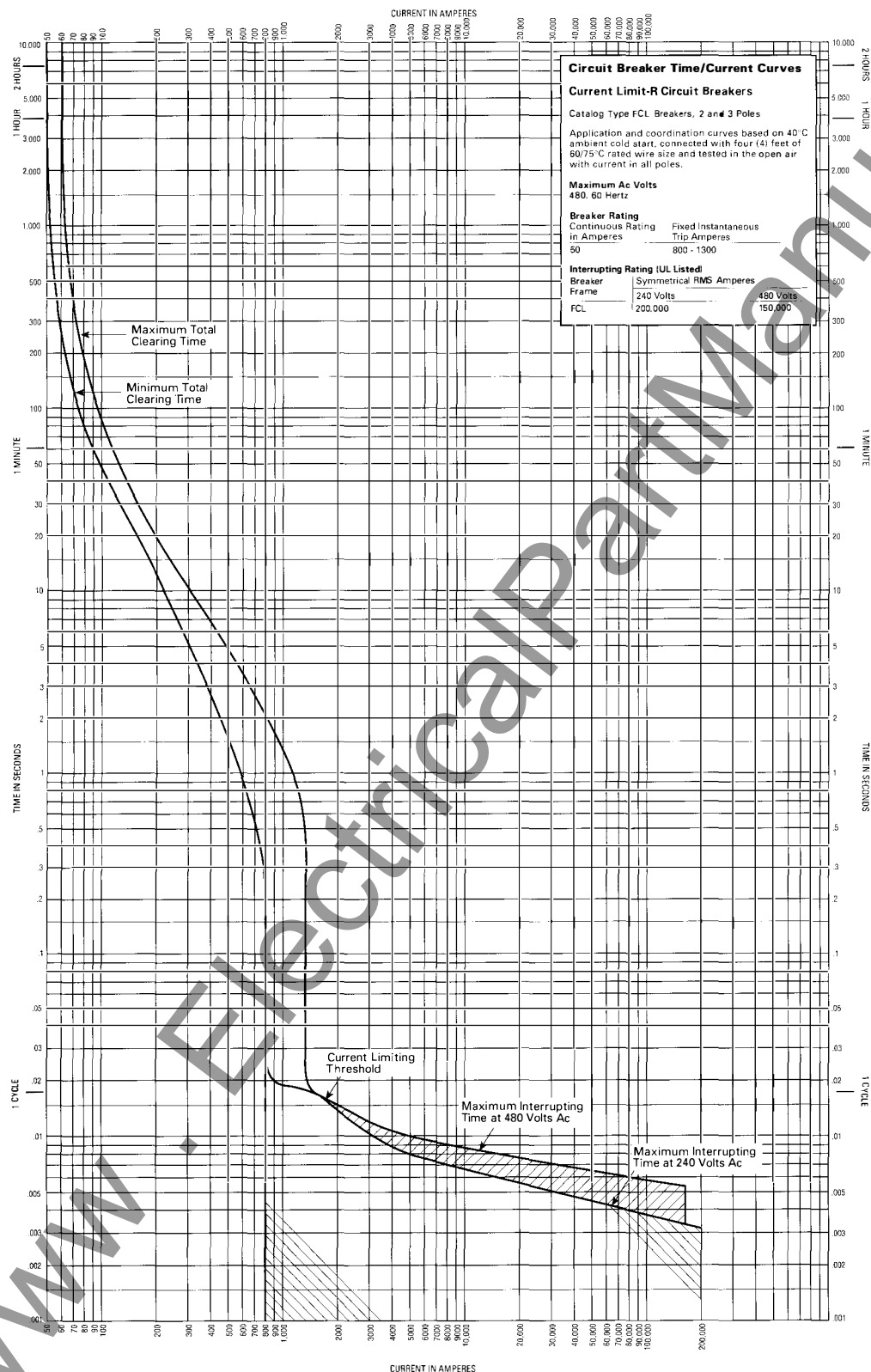
Type FCL, 45 Amperes, 2 and 3 Poles





AB DE-ION Current Limit-R® Circuit Breakers

Type FCL, 50 Amperes, 2 and 3 Poles

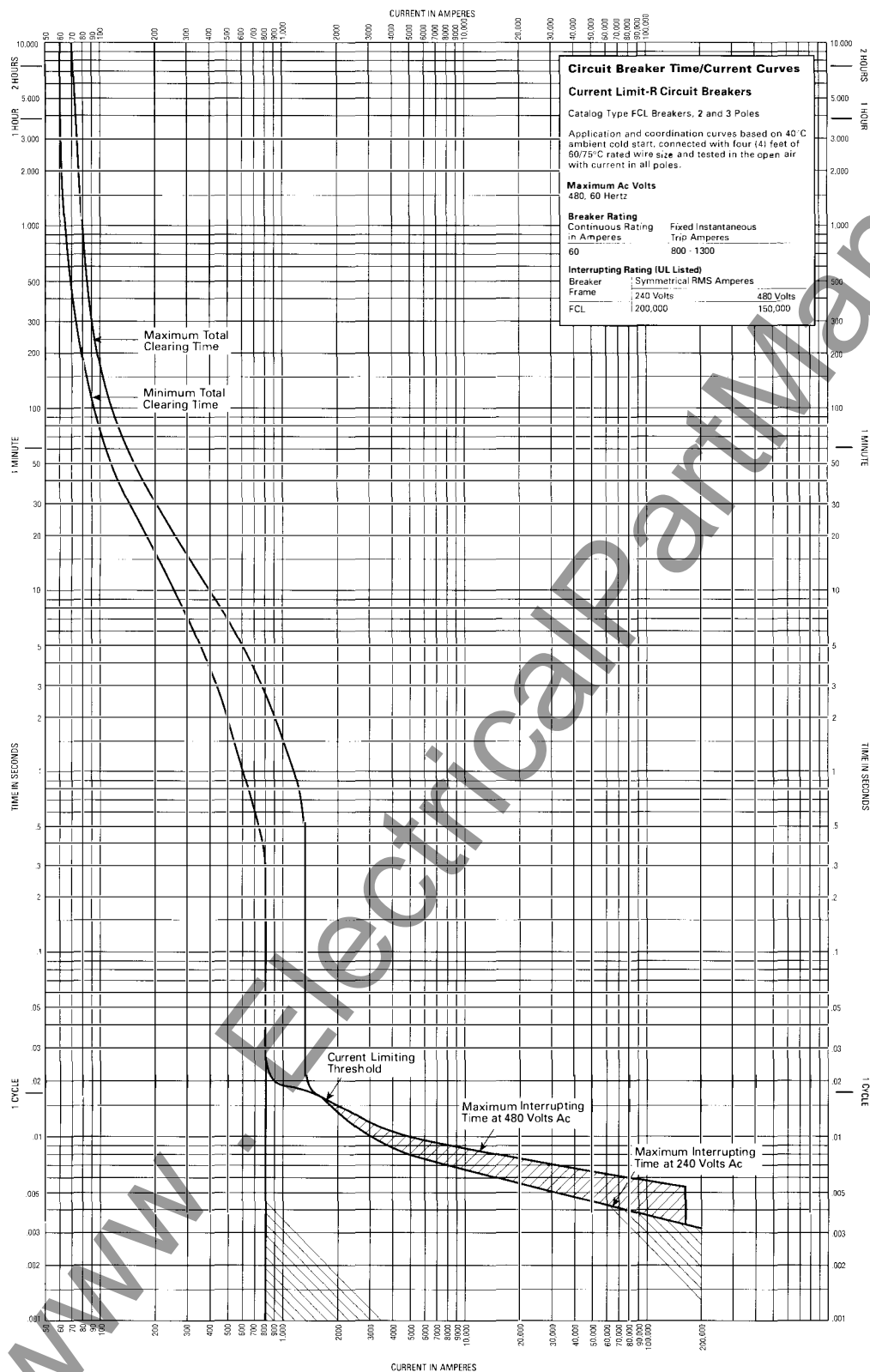


Curve No. SC-4347-80A

EATON

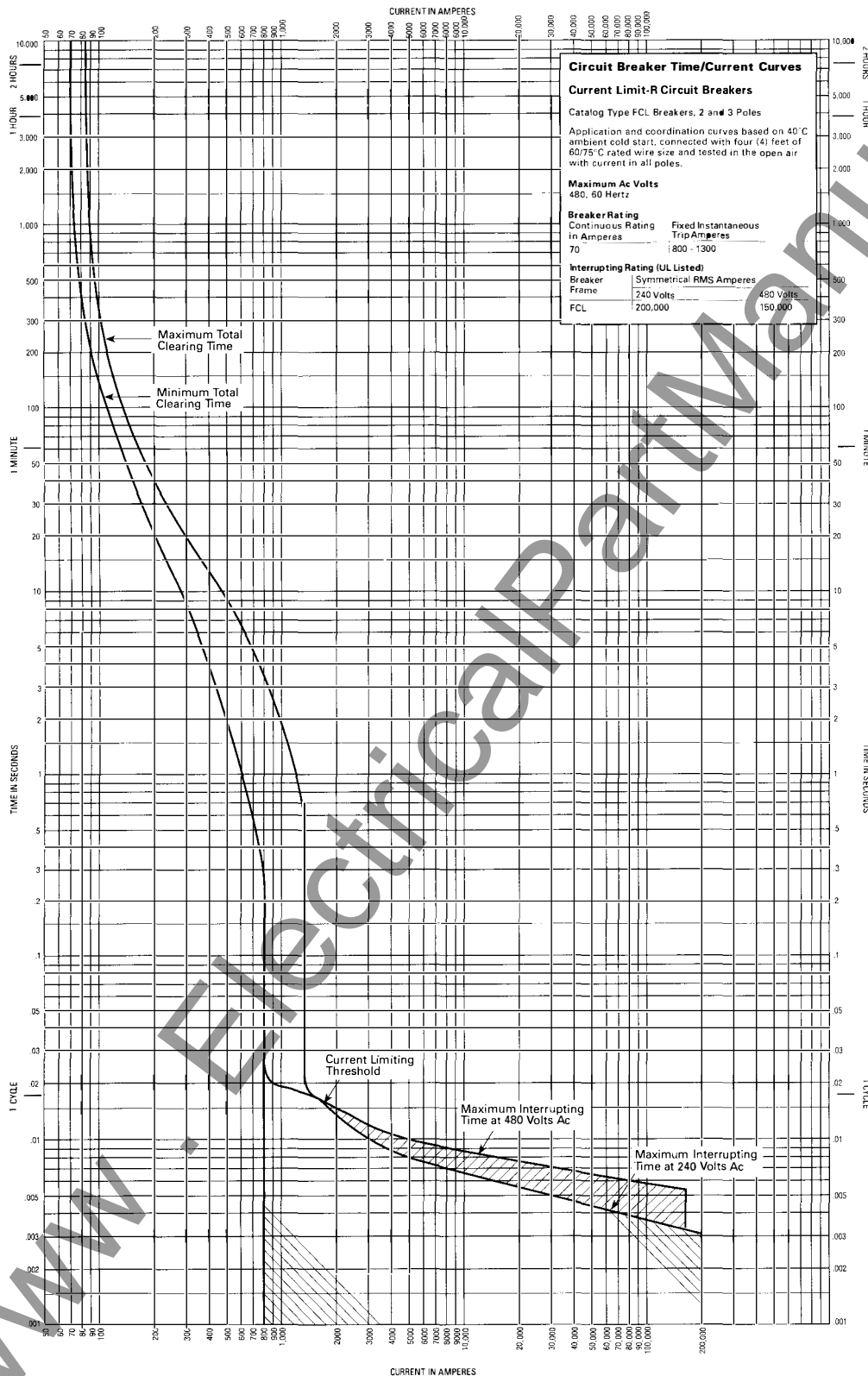
AB DE-ION Current Limit-R® Circuit Breakers

Type FCL, 60 Amperes, 2 and 3 Poles



**AB DE-ION Current Limit-R® Circuit Breakers**

Type FCL, 70 Amperes, 2 and 3 Poles



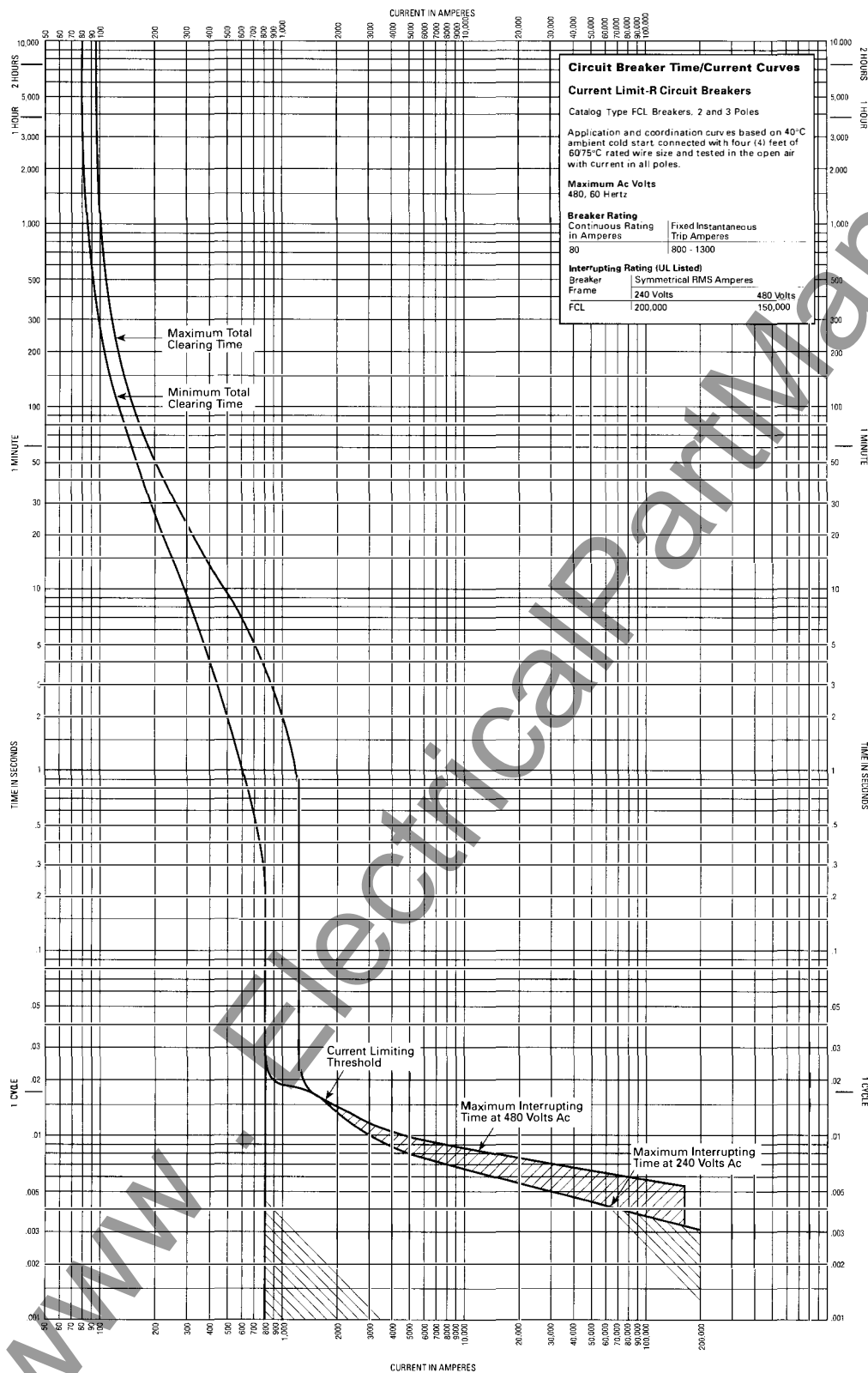
Curve No. SC-4349-80A

EATON



AB DE-ION Current Limit-R® Circuit Breakers

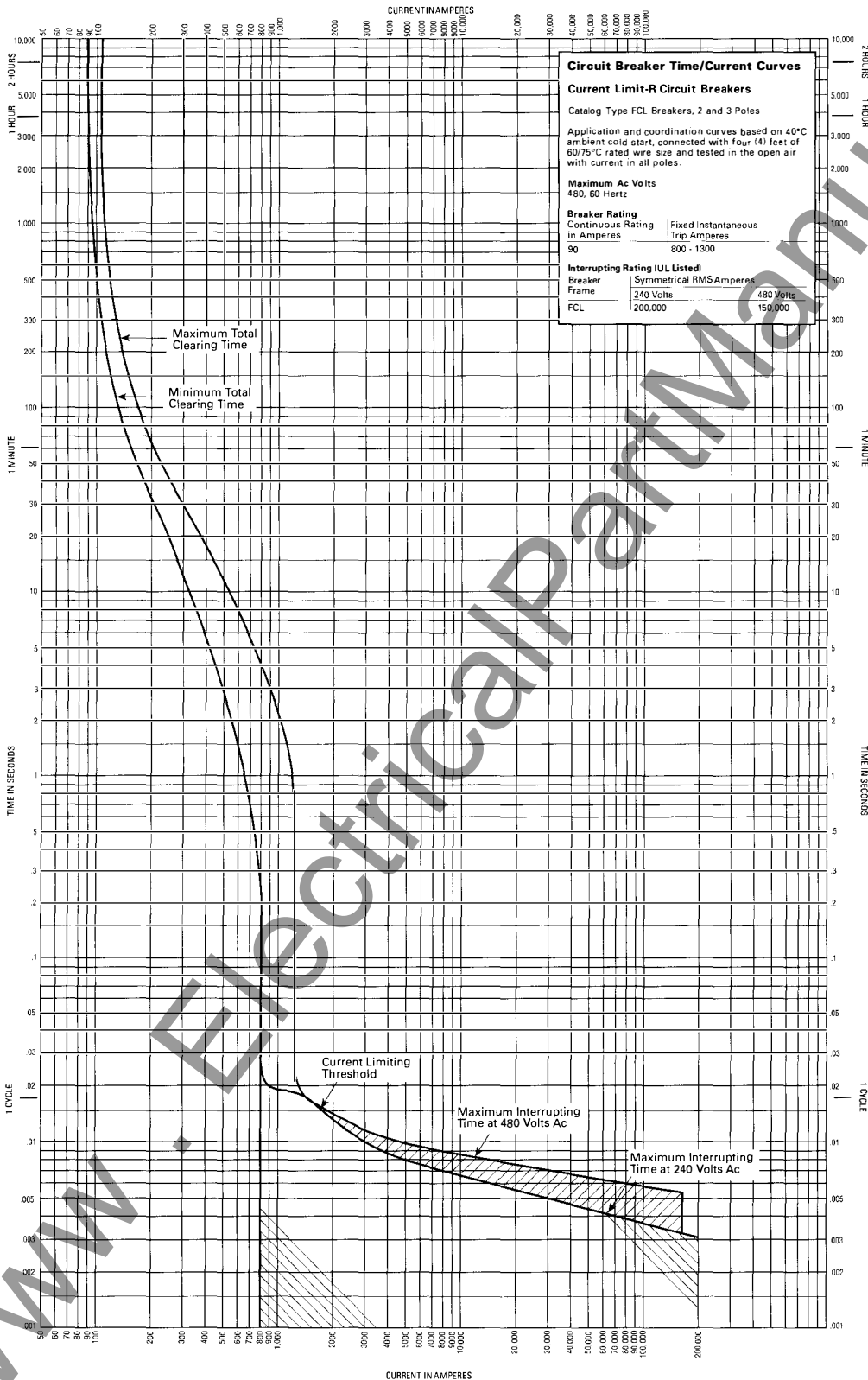
Type FCL, 80 Amperes, 2 and 3 Poles





AB DE-ION Current Limit-R® Circuit Breakers

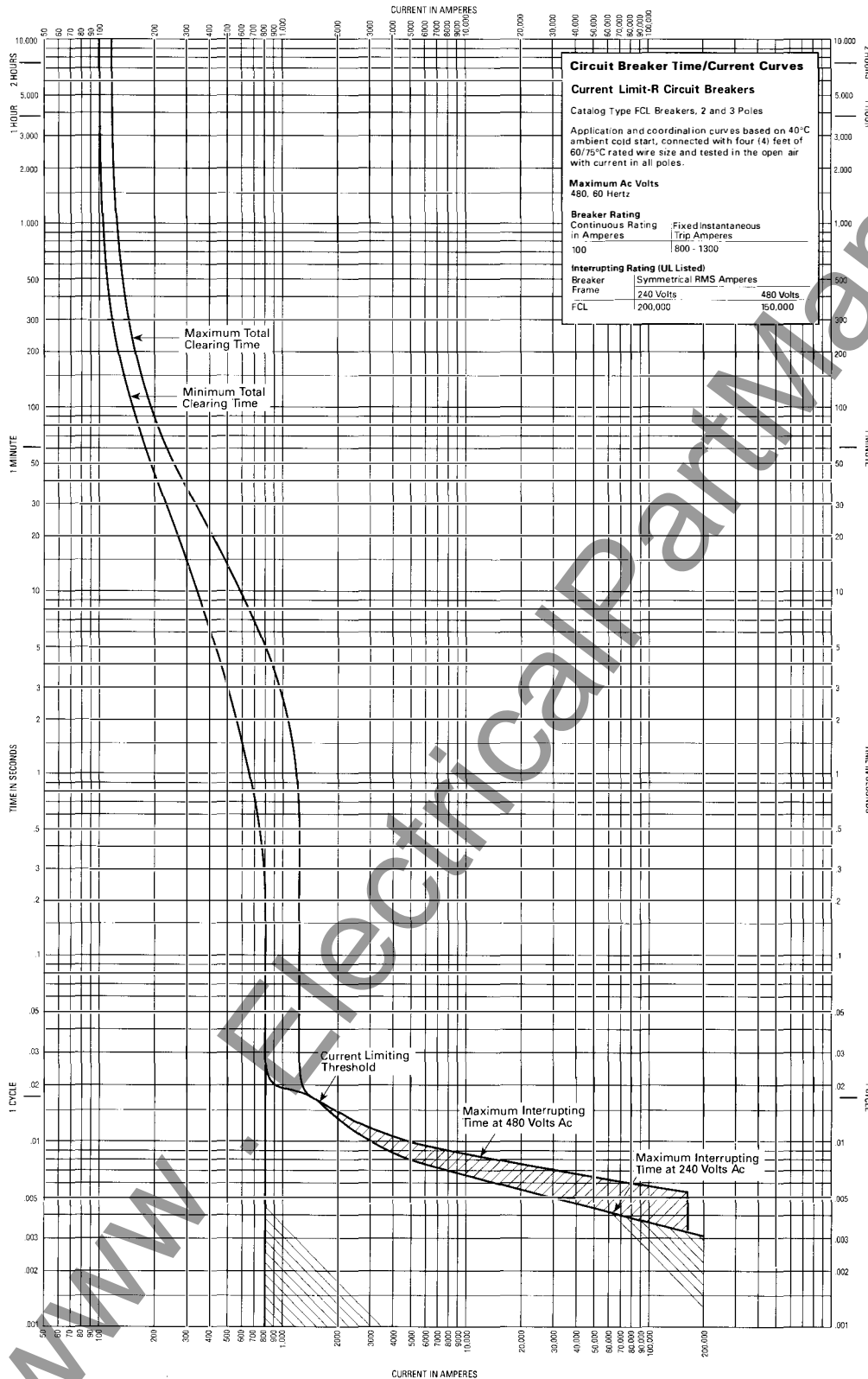
Type FCL, 90 Amperes, 2 and 3 Poles





AB DE-ION Current Limit-R® Circuit Breakers

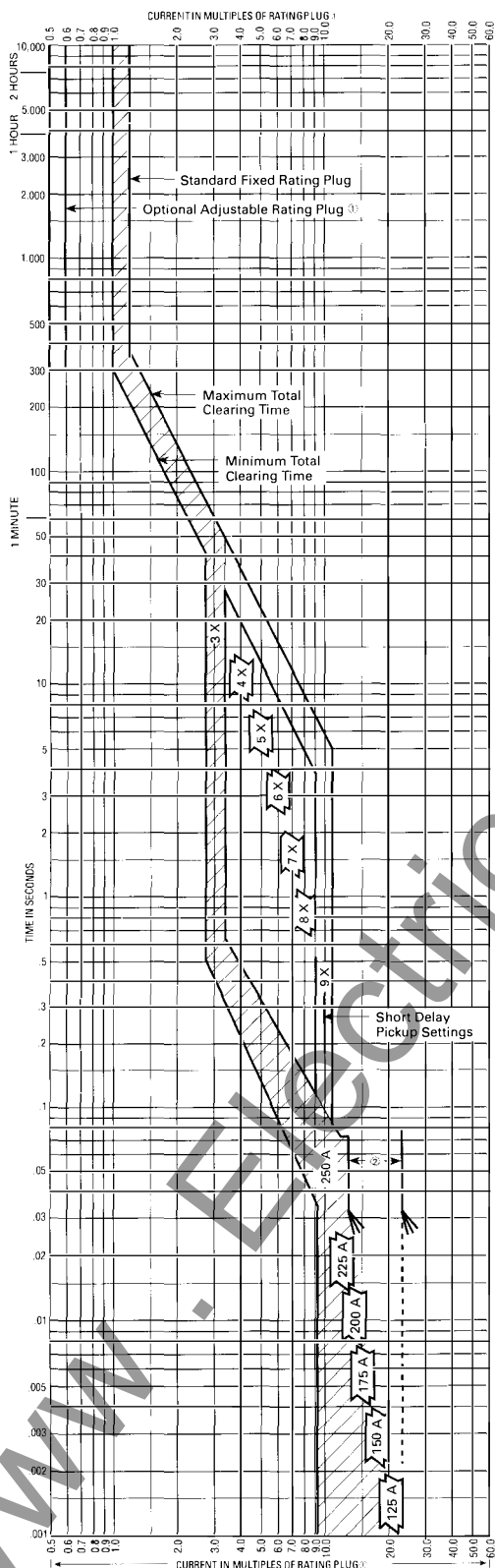
Type FCL, 100 Amperes, 2 and 3 Poles





AB DE-ION Current Limit-R® Circuit Breakers

Types LCL and LCLG, 125-250 Amperes, 2 and 3 Poles



Circuit Breaker Time/Current Curves

Current Limit-R Circuit Breakers

Catalog Type LCL, LCLG Breakers, 2 and 3 Poles

Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambients above +40°C refer to Cutler-Hammer.

Maximum Ac Volts

600, 50/60 Hertz

Breaker Ratings

Continuous Amperes	Short Delay Pickup Settings
125-250	3X to 9X rating plug value with calibration settings as shown on curve (Tol. $\pm 10\%$)

Interrupting Rating (UL/CSA Listed)

Frame	240 Volts	480 Volts	600 Volts
LCL, LCLG ¹	200,000	200,000	100,000

Rating Plugs Available

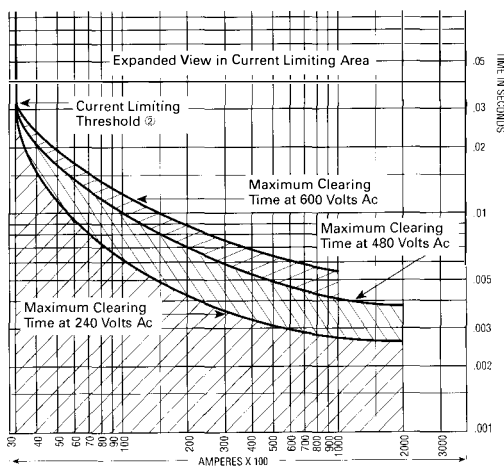
Continuous Amperes Range of Adjustment

Continuous Amperes	Range of Adjustment
250 Amp	Fixed 100%
250 Amp	50-100%
225 Amp	Fixed 100%
225 Amp	70-100%
200 Amp	Fixed 100%
200 Amp	70-100%
175 Amp	Fixed 100%
175 Amp	75-100%
150 Amp	Fixed 100%
125 Amp	Fixed 100%

¹ When adjustable rating plugs are used, short delay pickup settings track the selected position of the adjustable rating plug. For example, with an adjustable 250 amp rating plug set at 50% and the short delay pickup set at 4X, the short delay pickup is 250 X 50% X 4 = 500 amps.

² The threshold point changes with the ampere value of the rating plug.

³ For ground fault time-current characteristics of LCLG, see Curve No. SC-3605-65.



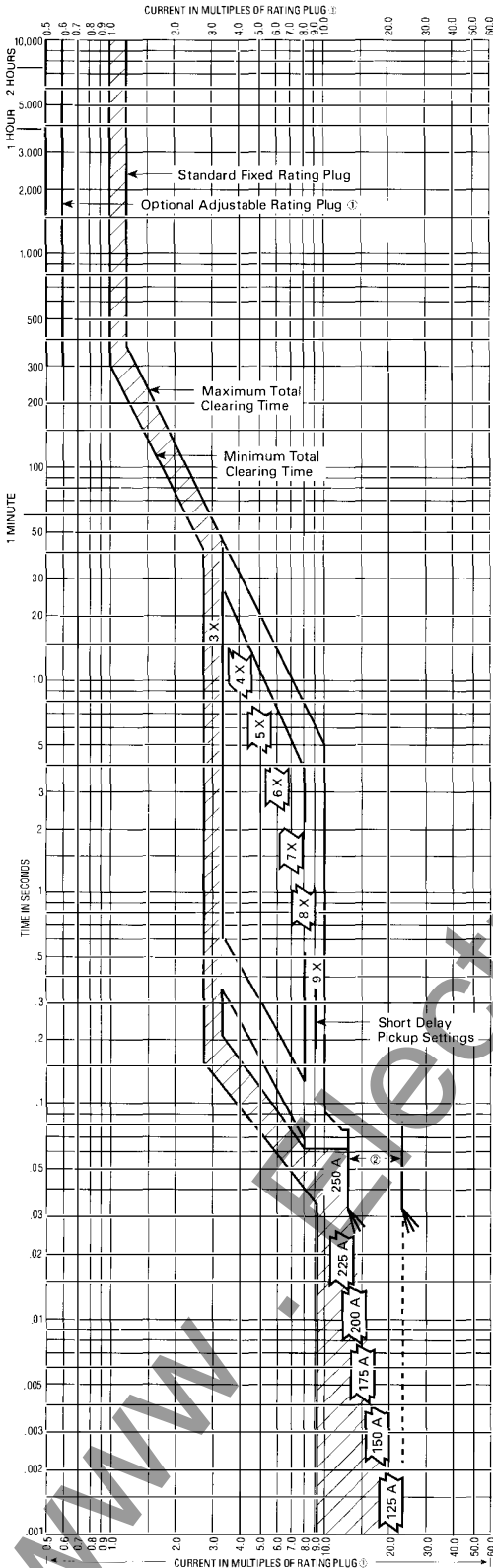
Curve No. SC-3624-81A

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AB DE-ION Current Limit-R® Circuit Breakers

Types LCLA and LCLGA, 125-250 Amperes, 2 and 3 Poles



Circuit Breaker Time/Current Curves

Current Limit-R Circuit Breakers

Catalog Type LCLA, LCLGA Breakers, 2 and 3 Poles

Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambients above +40°C refer to Cutler-Hammer.

Maximum Ac Volts
600, 50/60 Hertz

Breaker Ratings

Continuous Amperes	Short Delay Pickup Settings
125-250	3X to 9X rating plug value with calibration settings as shown on curve (Tol. ±10%)

Interrupting Rating (UL/CSA Listed)

Frame	240 Volts	480 Volts	600 Volts
LCLA, LCLGA	200,000	200,000	100,000

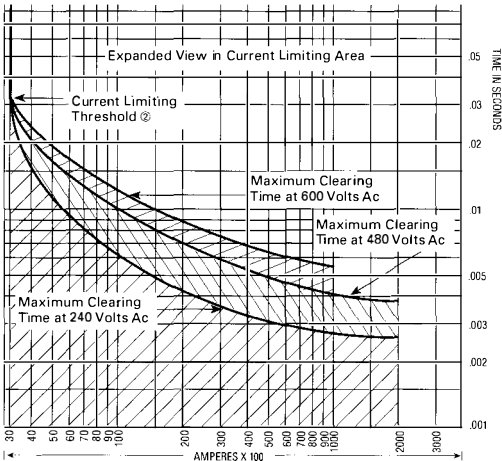
Rating Plugs Available

Continuous Amperes	Range of Adjustment
250 Amp	Fixed 100%
250 Amp	50-100%
225 Amp	Fixed 100%
225 Amp	70-100%
200 Amp	Fixed 100%
200 Amp	70-100%
175 Amp	Fixed 100%
175 Amp	75-100%
150 Amp	Fixed 100%
125 Amp	Fixed 100%

① When adjustable rating plugs are used, short delay pickup settings track the selected position of the adjustable rating plug. For example, with an adjustable 250 amp rating plug set at 50% and the short delay pickup set at 4X, the short delay pickup is 250 X 50% X 4 = 500 amps.

② The threshold point changes with the ampere value of the rating plug.

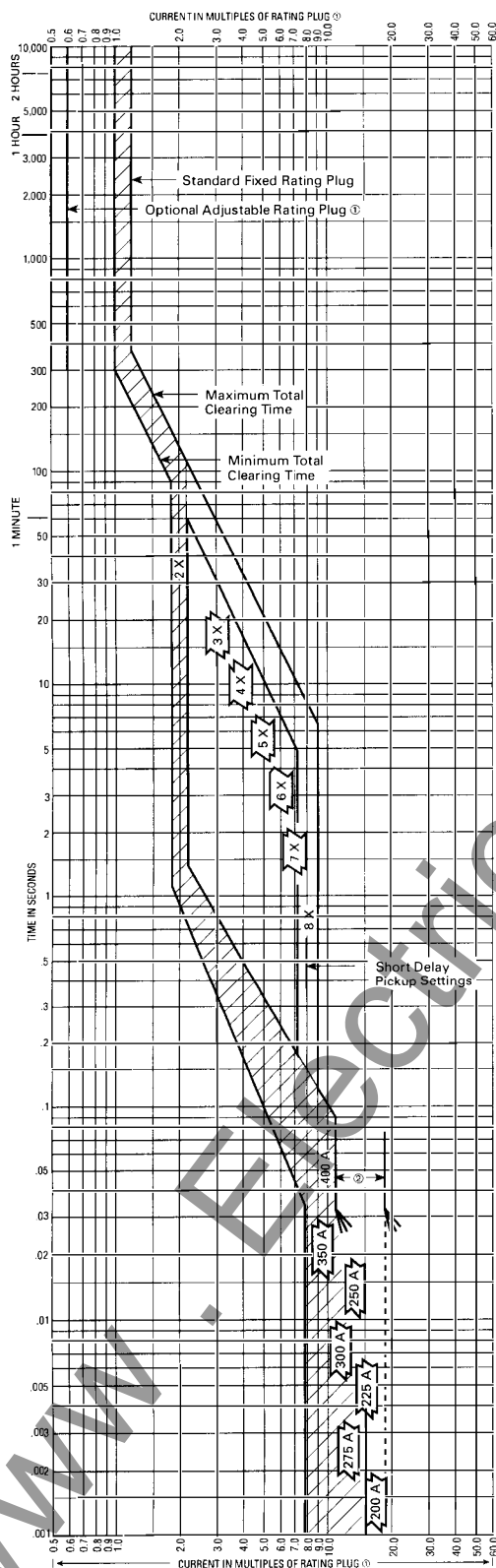
③ For ground fault time-current characteristics of LCLGA, see Curve No. SC-350686.





AB DE-ION Current Limit-R® Circuit Breakers

Types LCL and LCLG, 200-400 Amperes, 2 and 3 Poles



Circuit Breaker Time/Current Curves

Current Limit-R Circuit Breakers

Catalog Type LCL, LCLG Breakers, 2 and 3 Poles

Curve accuracy applies from -20° C to +55° C ambient. For possible continuous ampere derating for ambients above +40° C refer to Cutler-Hammer.

Maximum Ac Volts
600, 50/60 Hertz

Breaker Ratings	Short Delay Pickup Settings		
Continuous Amperes	2X to 8X rating plug value with calibration settings as shown on curve (Tol. ±10%)		
200-400			
Interrupting Rating (UL/CSA Listed)			
Frame	240 Volts	480 Volts	600 Volts
LCL, LCLG ^①	200,000	200,000	100,000

Rating Plugs Available

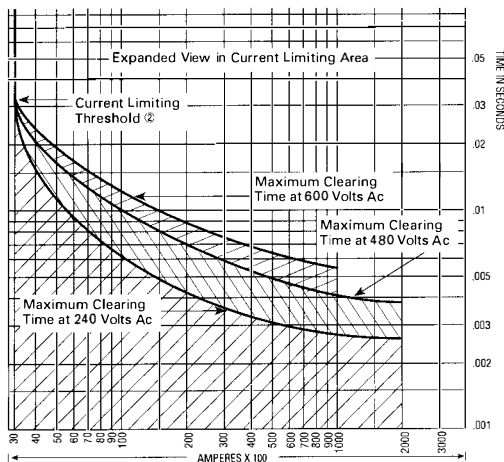
Continuous Amperes Range of Adjustment

400Amp	Fixed 100%
400Amp	50-100% ^②
350Amp	Fixed 100%
350Amp	70-100% ^②
300Amp	Fixed 100%
300Amp	75-100% ^②
275Amp	Fixed 100%
250Amp	Fixed 100%
225Amp	Fixed 100%
200Amp	Fixed 100%

① When adjustable rating plugs are used, short delay pickup settings track the selected position of the adjustable rating plug. For example, with an adjustable 400 amp rating plug set at 50% and the short delay pickup set at 4X, the short delay pickup is 400 X 50% X 4 = 800 amps.

② The threshold point changes with the ampere value of the rating plug.

③ For ground fault time-current characteristics of LCLG, see Curve No. SC-3906-86.

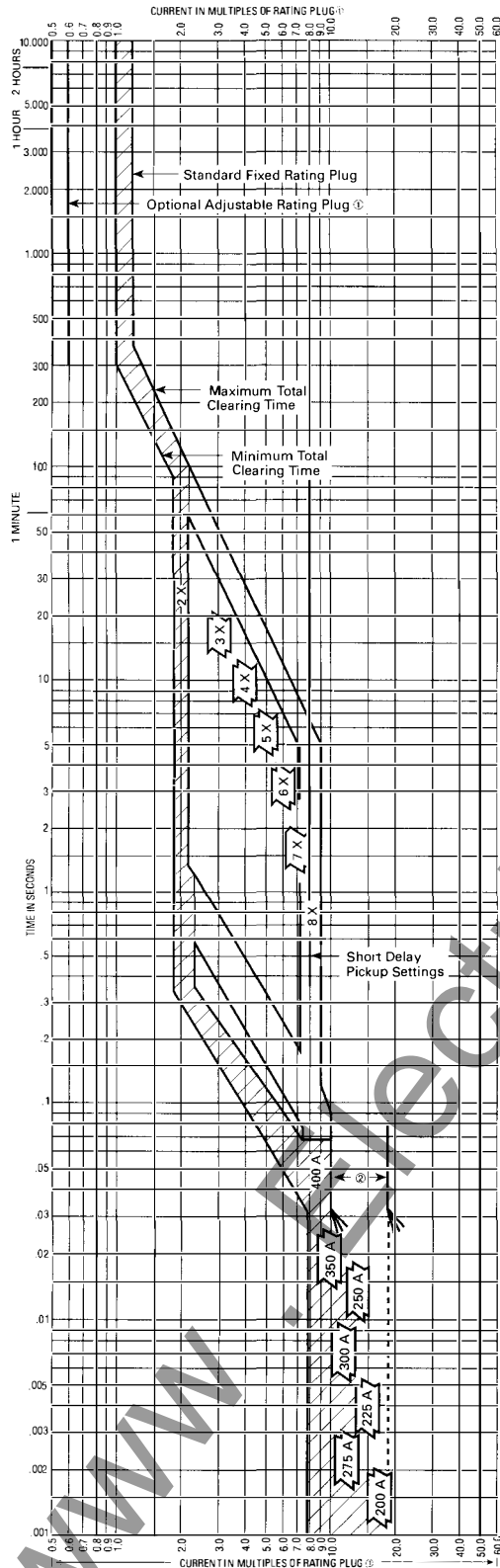


Curve No. SC-3626-81A

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AB DE-ION Current Limit-R® Circuit Breakers

Type LCLA and LCLGA, 200-400 Amperes, 2 and 3 Poles



Circuit Breaker Time/Current Curves

Current Limit-R Circuit Breakers

Catalog Type LCLA, LCLGA Breakers, 2 and 3 Poles

Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambients above +40°C refer to Cutler-Hammer.

Maximum Ac Volts
600, 50/60 Hertz

Breaker Ratings	Short Delay Pickup Settings
Continuous Amperes	
200-400	2X to 8X rating plug value with calibration settings as shown on curve (Tol. ±10%)

Interrupting Rating (IUL/CSA Listed)

Frame	240 Volts	480 Volts	600 Volts
LCLA, LCLGA	200,000	200,000	100,000

Rating Plugs Available

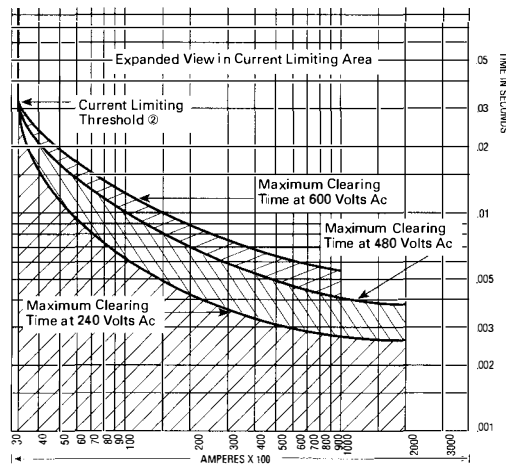
Continuous Amperes Range of Adjustment

400 Amp	Fixed 100%
400 Amp	50-100%
350 Amp	Fixed 100%
350 Amp	70-100%
300 Amp	Fixed 100%
300 Amp	70-100%
275 Amp	Fixed 100%
250 Amp	Fixed 100%
225 Amp	Fixed 100%
200 Amp	Fixed 100%

① When adjustable rating plugs are used, short delay pickup settings track the selected position of the adjustable rating plug. For example, with an adjustable 400 amp rating plug set at 50% and the short delay pickup set at 4X, the short delay pickup is 400 X 50% X 4 = 800 amps.

② The threshold point changes with the ampere value of the rating plug.

③ For ground fault time-current characteristics of LCLGA, see Curve No. SC-390C-86.



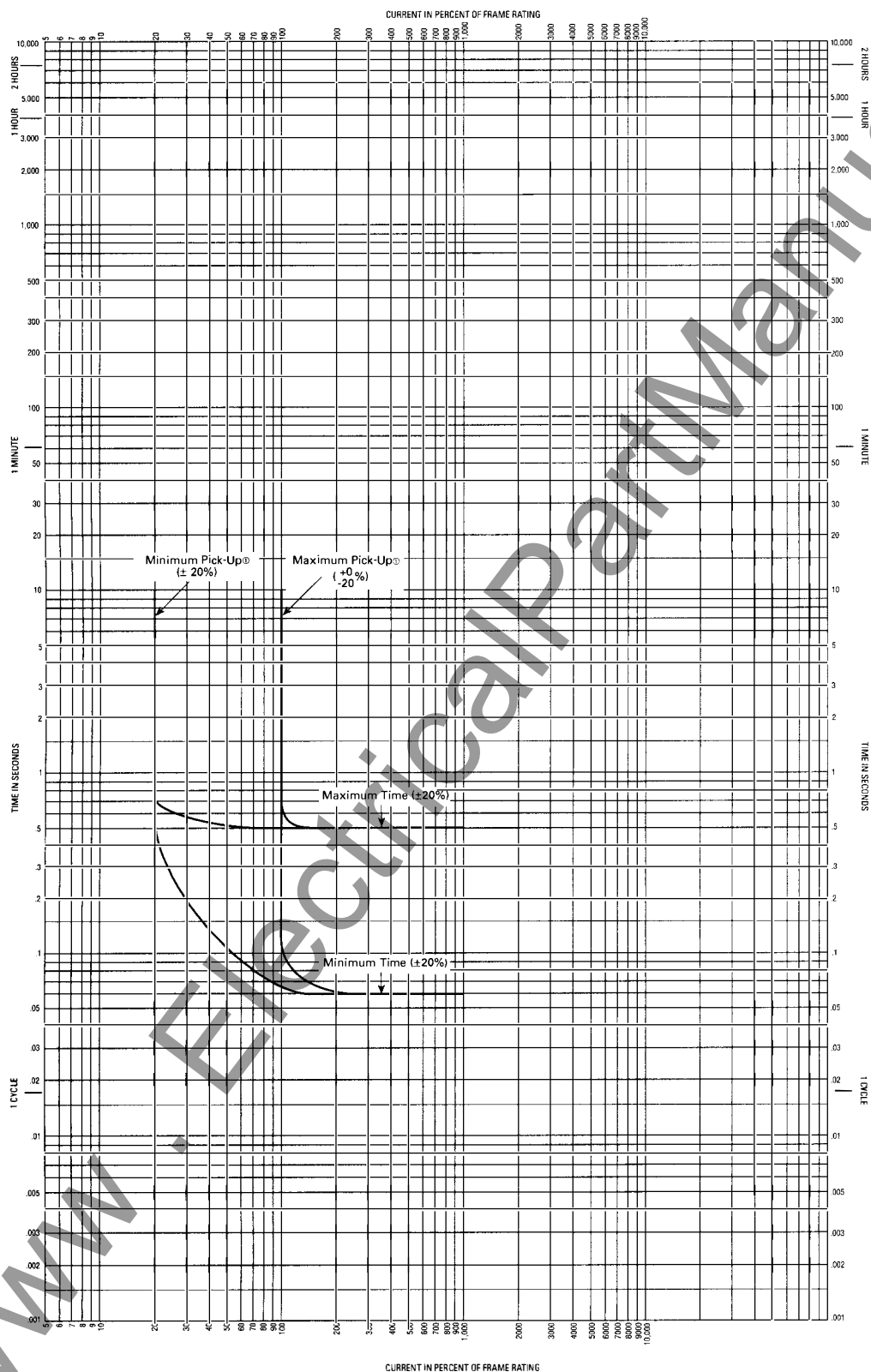
Curve No. SC-3627-81A

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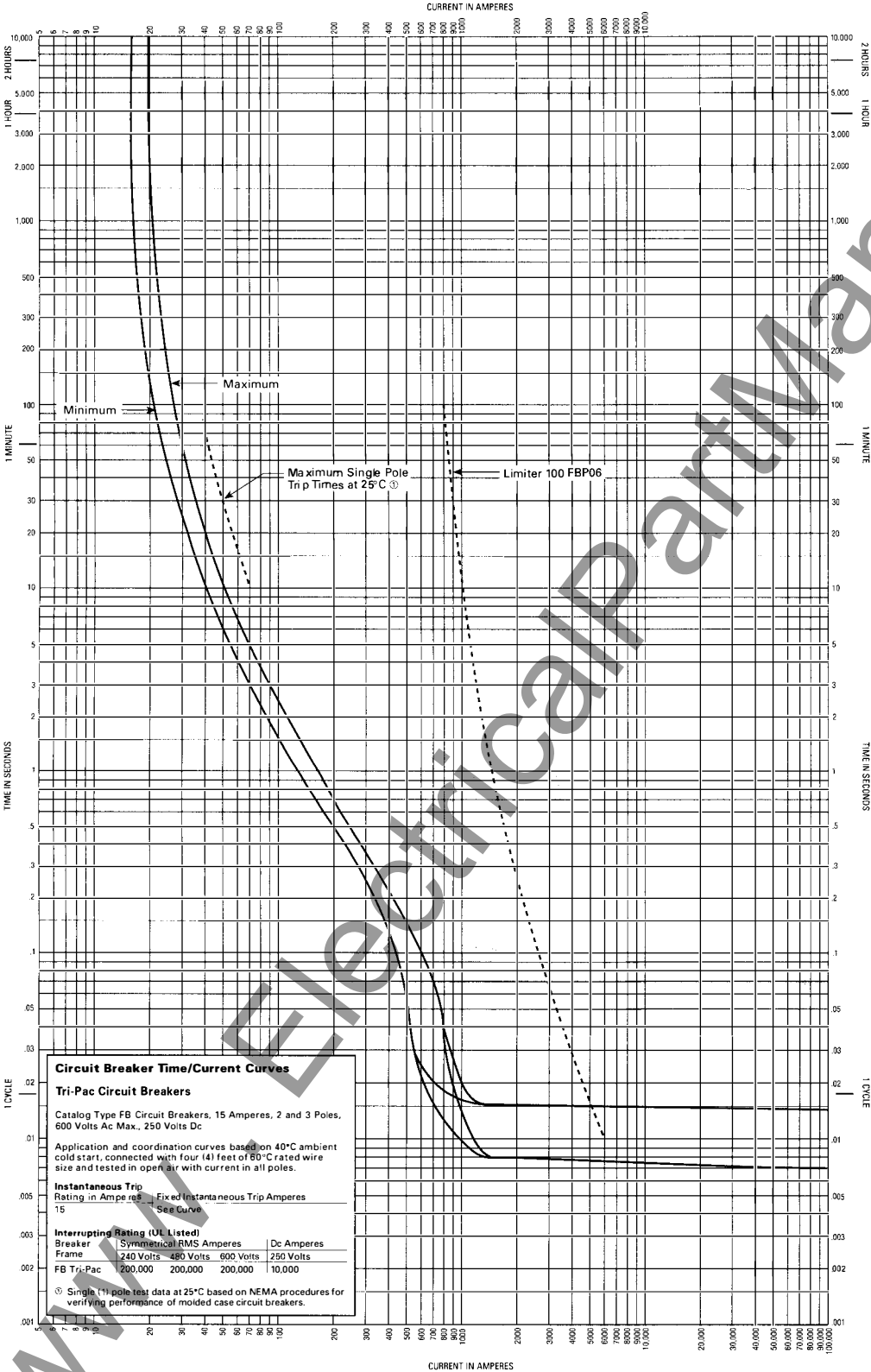
AB DE-ION Current Limit-R® Circuit Breakers

Ground Fault Pick-up Curves for Types LCLG and LCLGA





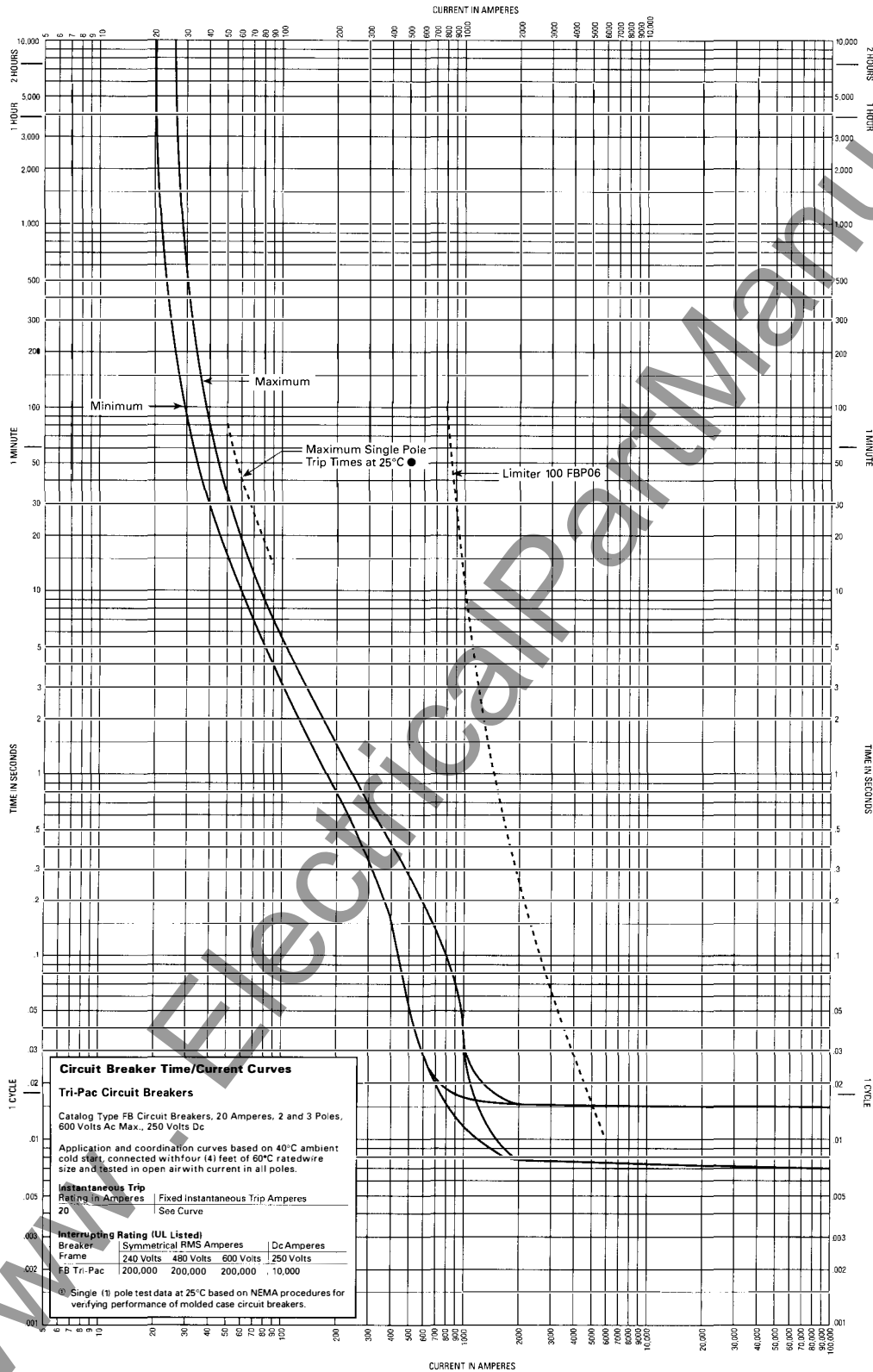
AB DE-ION Tri-Pac® Circuit Breakers
Type FB, 15 Amperes, 2 and 3 Poles





AB DE-ION Tri Pac® Circuit Breakers

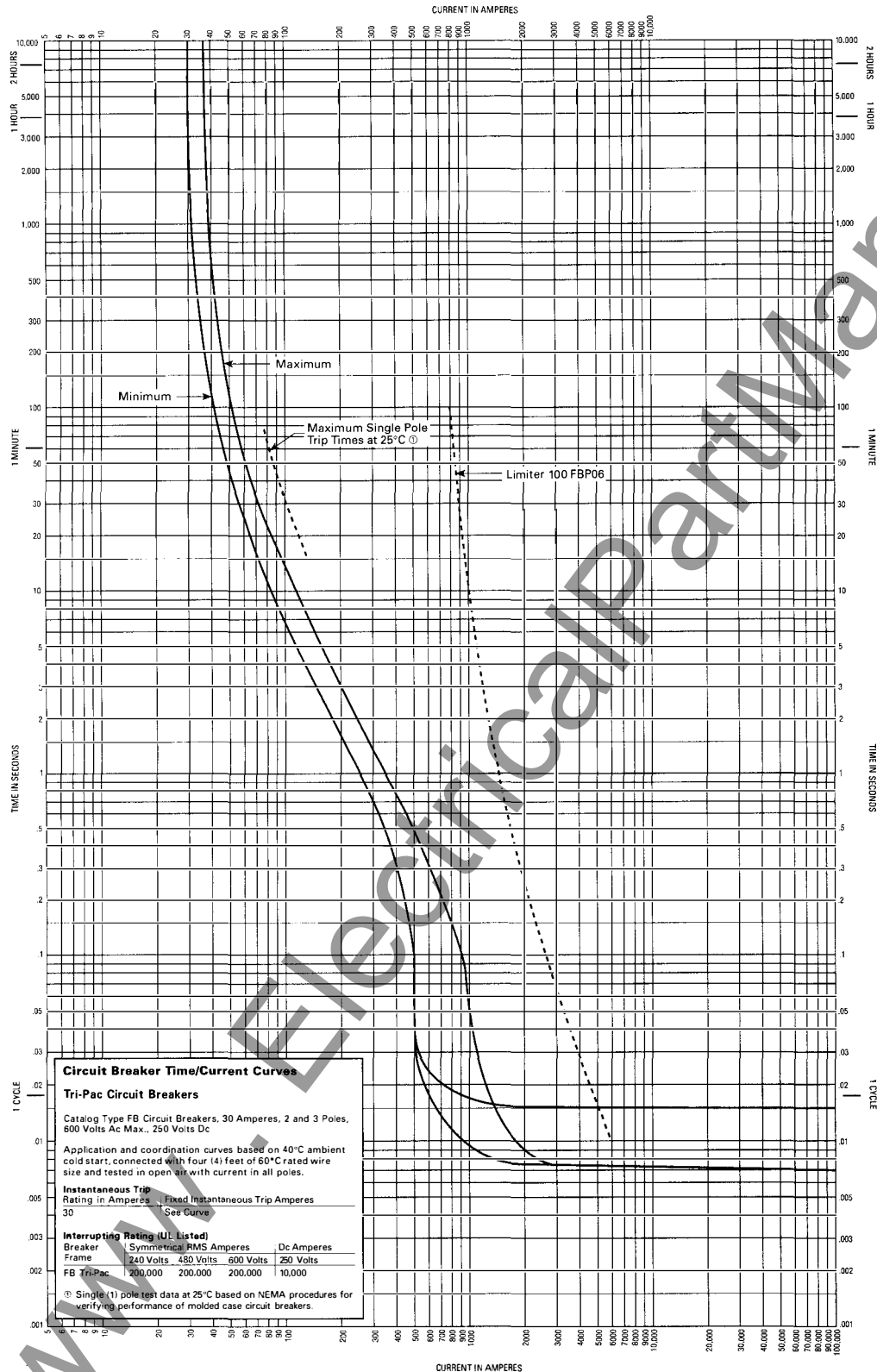
Type FB, 20 Amperes, 2 and 3 Poles





AB DE-ION Tri-Pac® Circuit Breakers

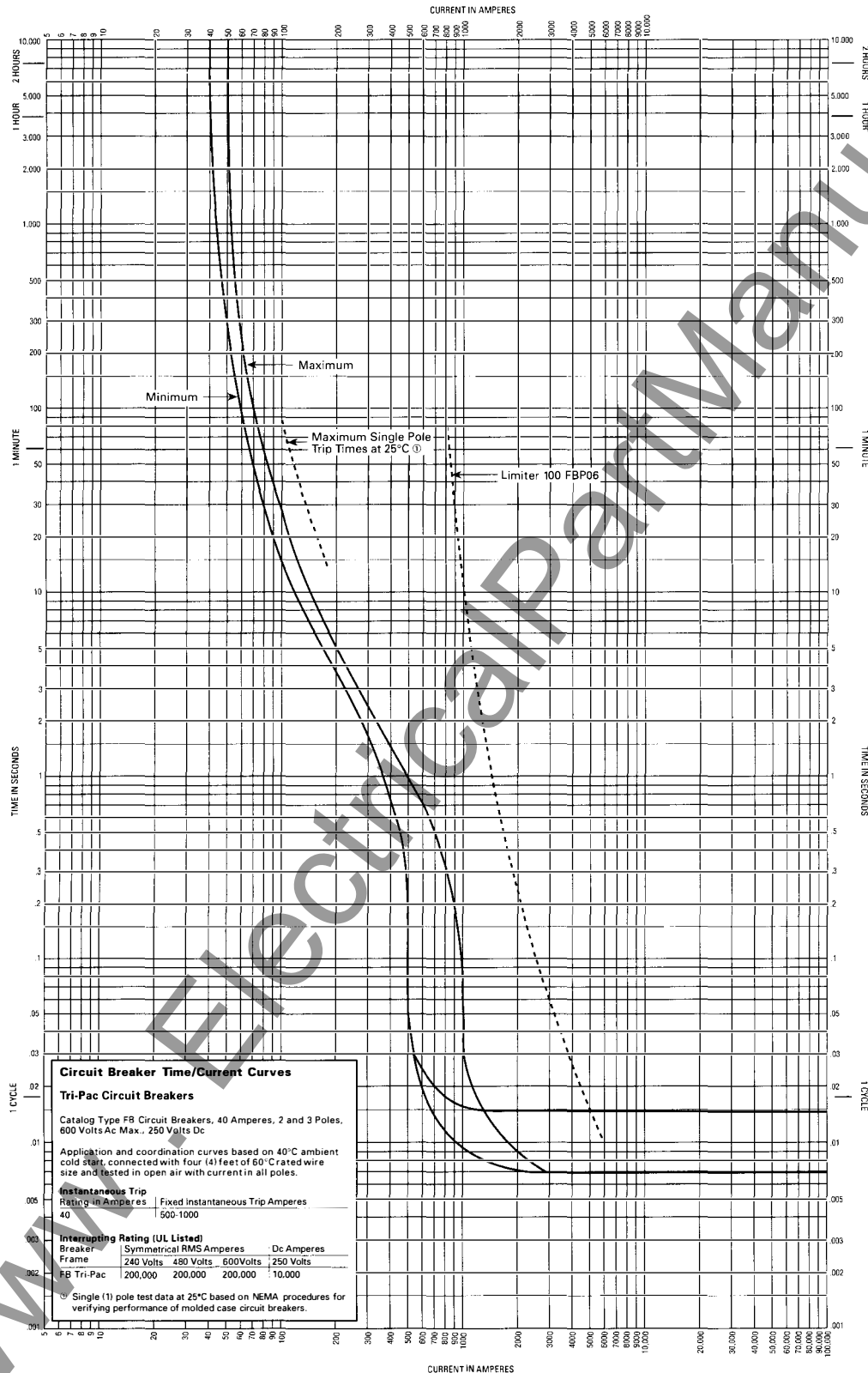
Type FB, 30 Amperes, 2 and 3 Poles





AB DE-ION Tri Pac® Circuit Breakers

Type FB, 40 Amperes, 2 and 3 Poles



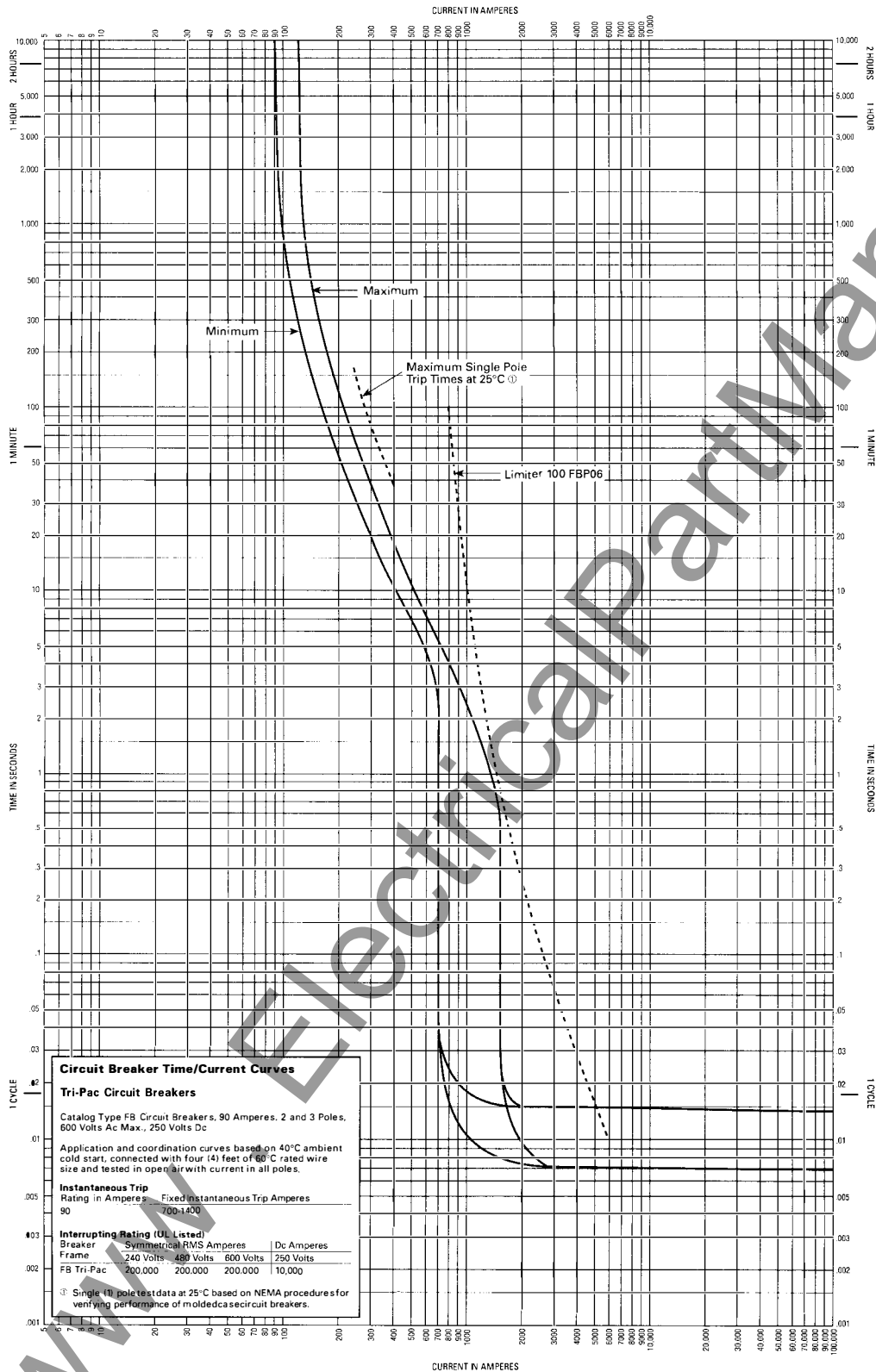
Curve No. SC-3575-76A





AB DE-ION Tri-Pac® Circuit Breakers

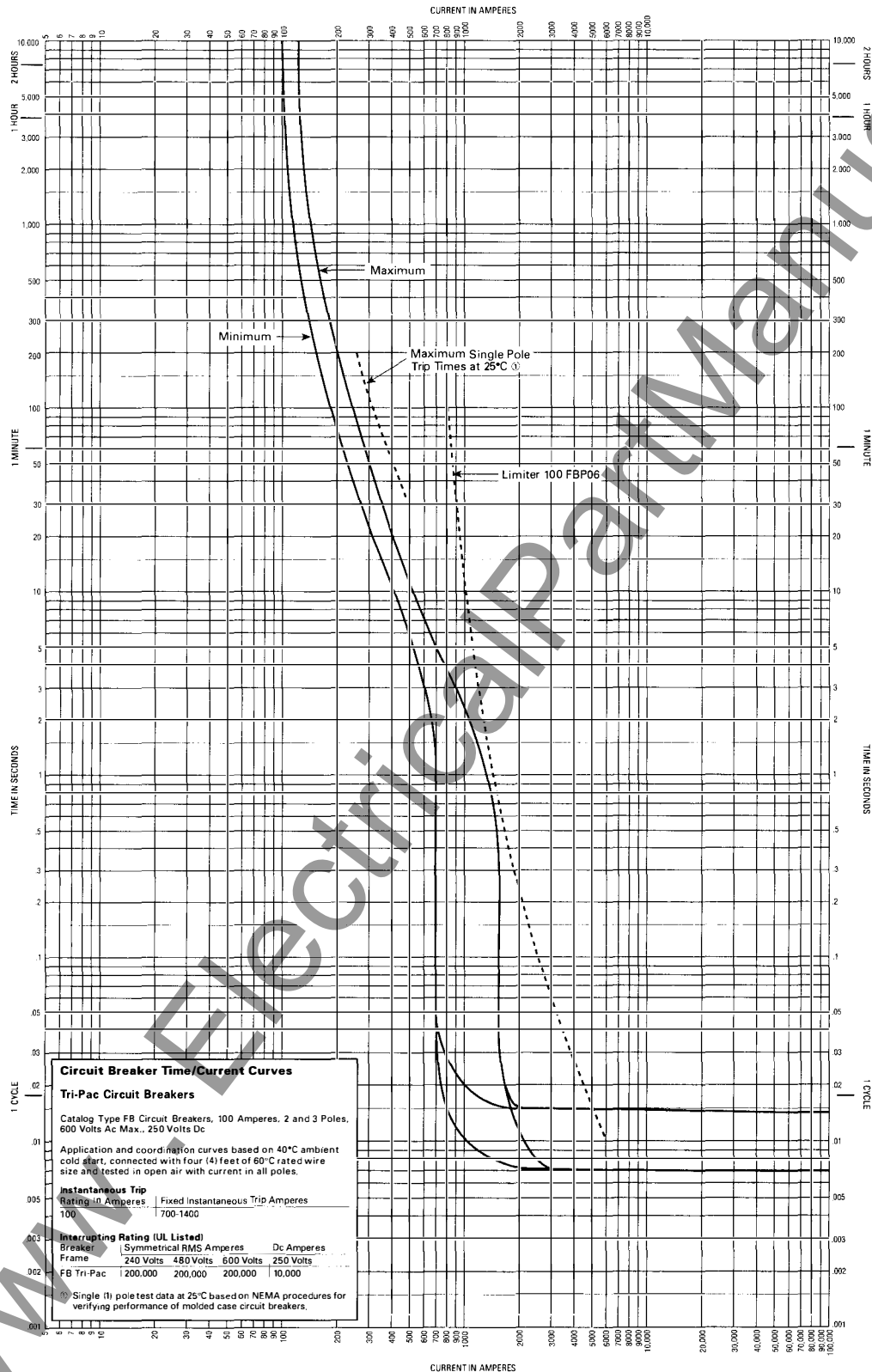
Type FB, 90 Amperes, 2 and 3 Poles





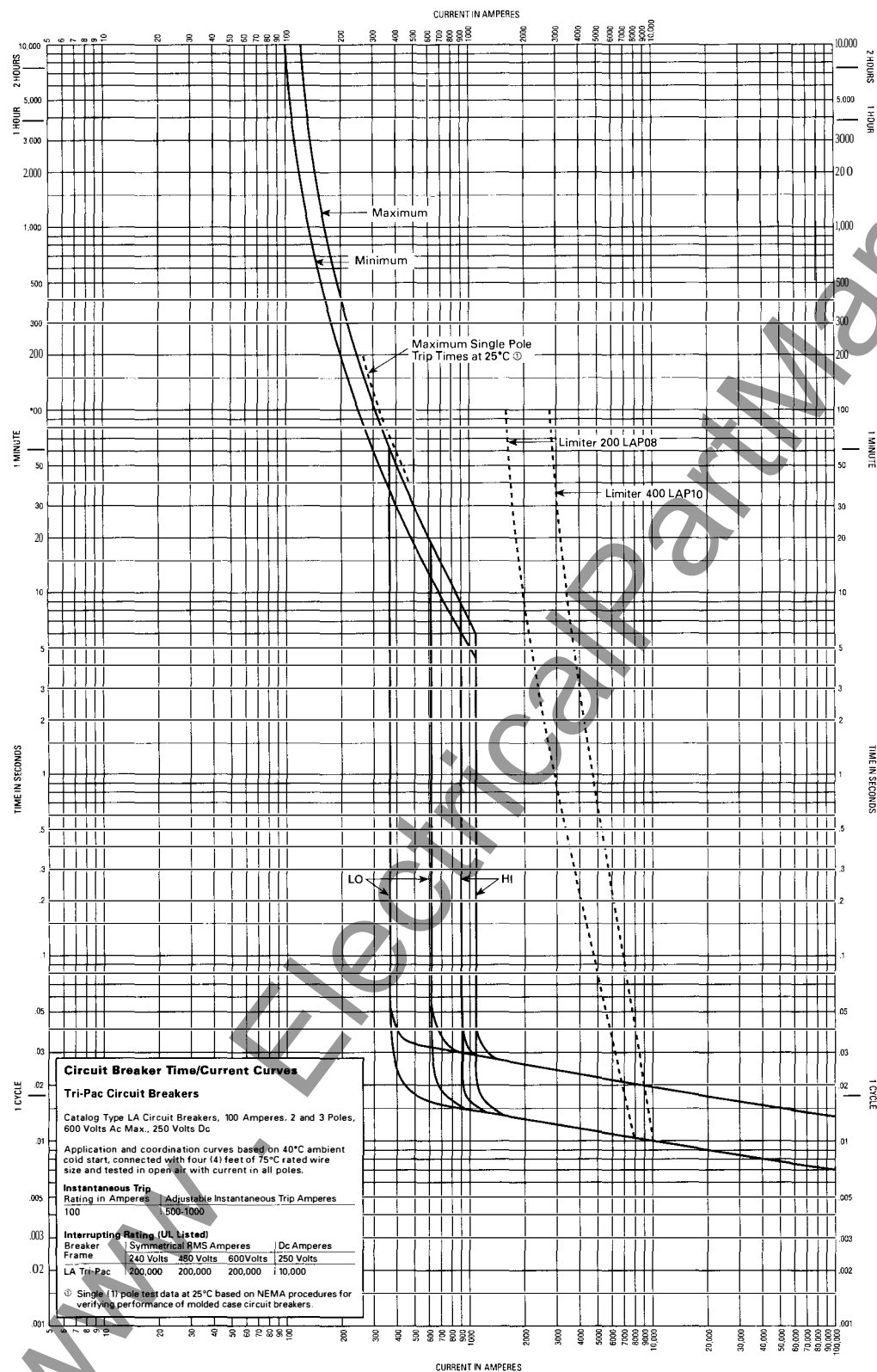
AB DE-ION Tri Pac® Circuit Breakers

Type FB, 100 Amperes, 2 and 3 Poles



AB DE-ION Tri-Pac® Circuit Breakers

Type LA, 100 Amperes, 2 and 3 Poles



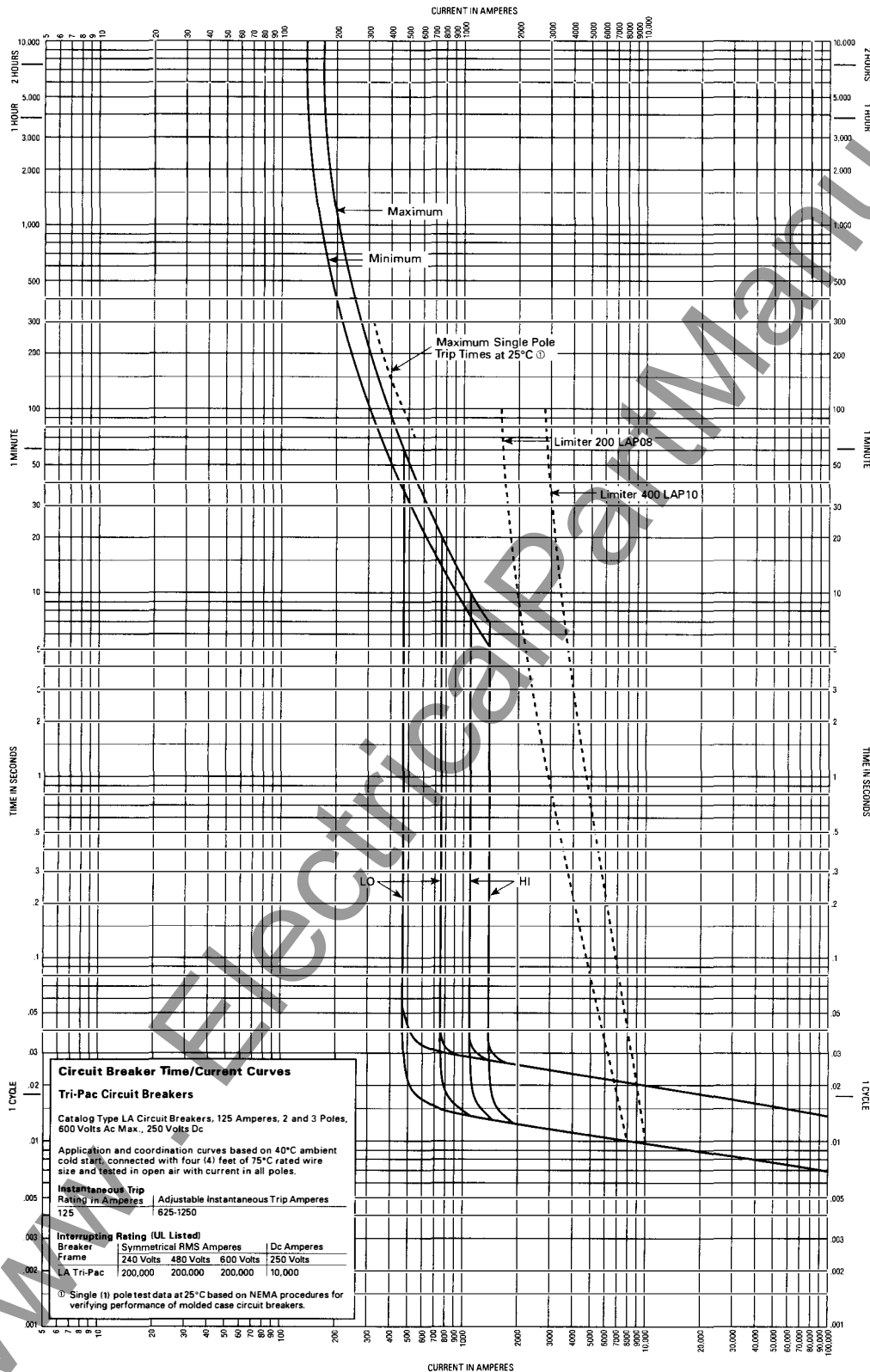
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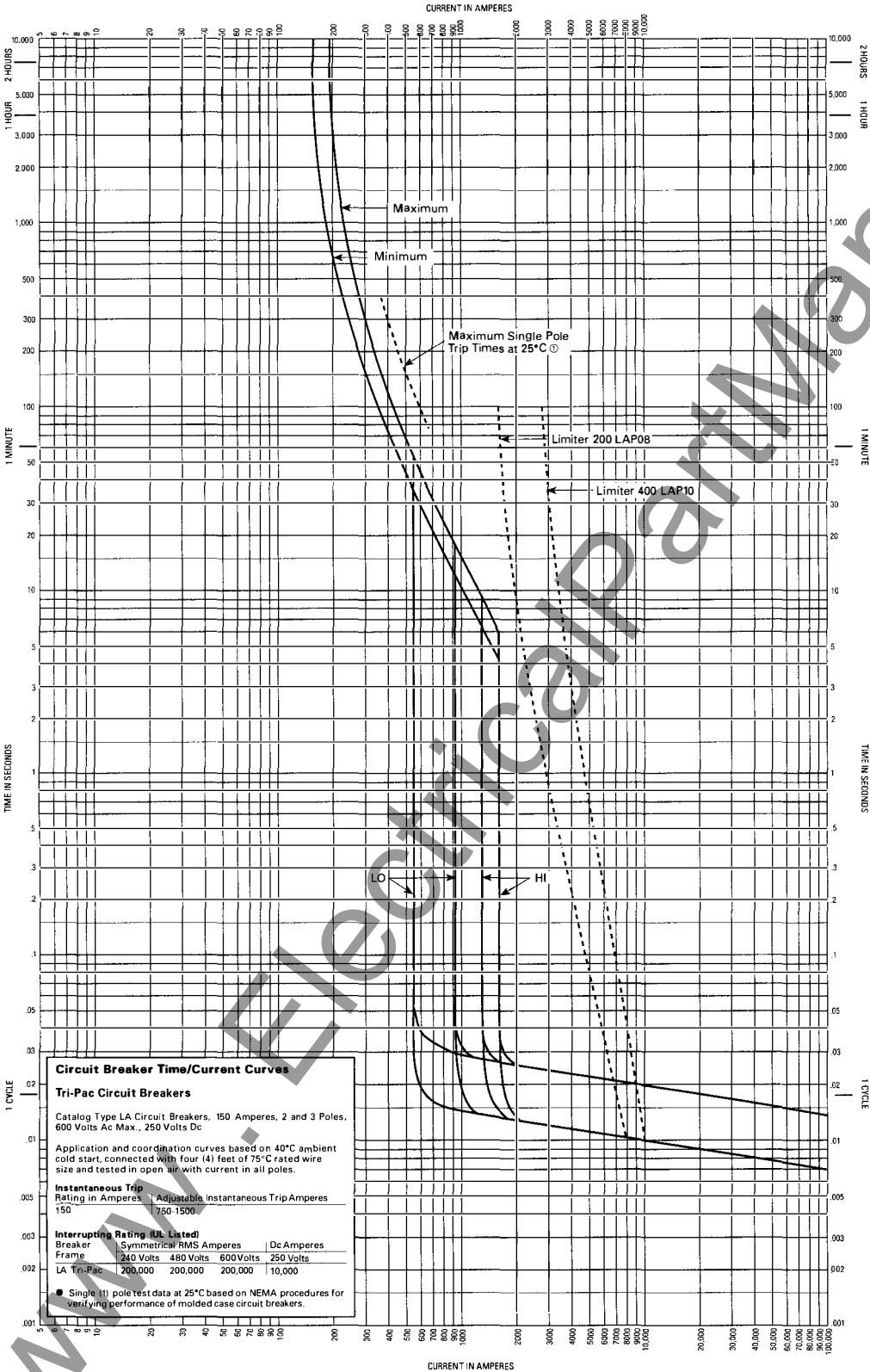
AB DE-ION Tri Pac® Circuit Breakers

Type LA, 125 Amperes, 2 and 3 Poles





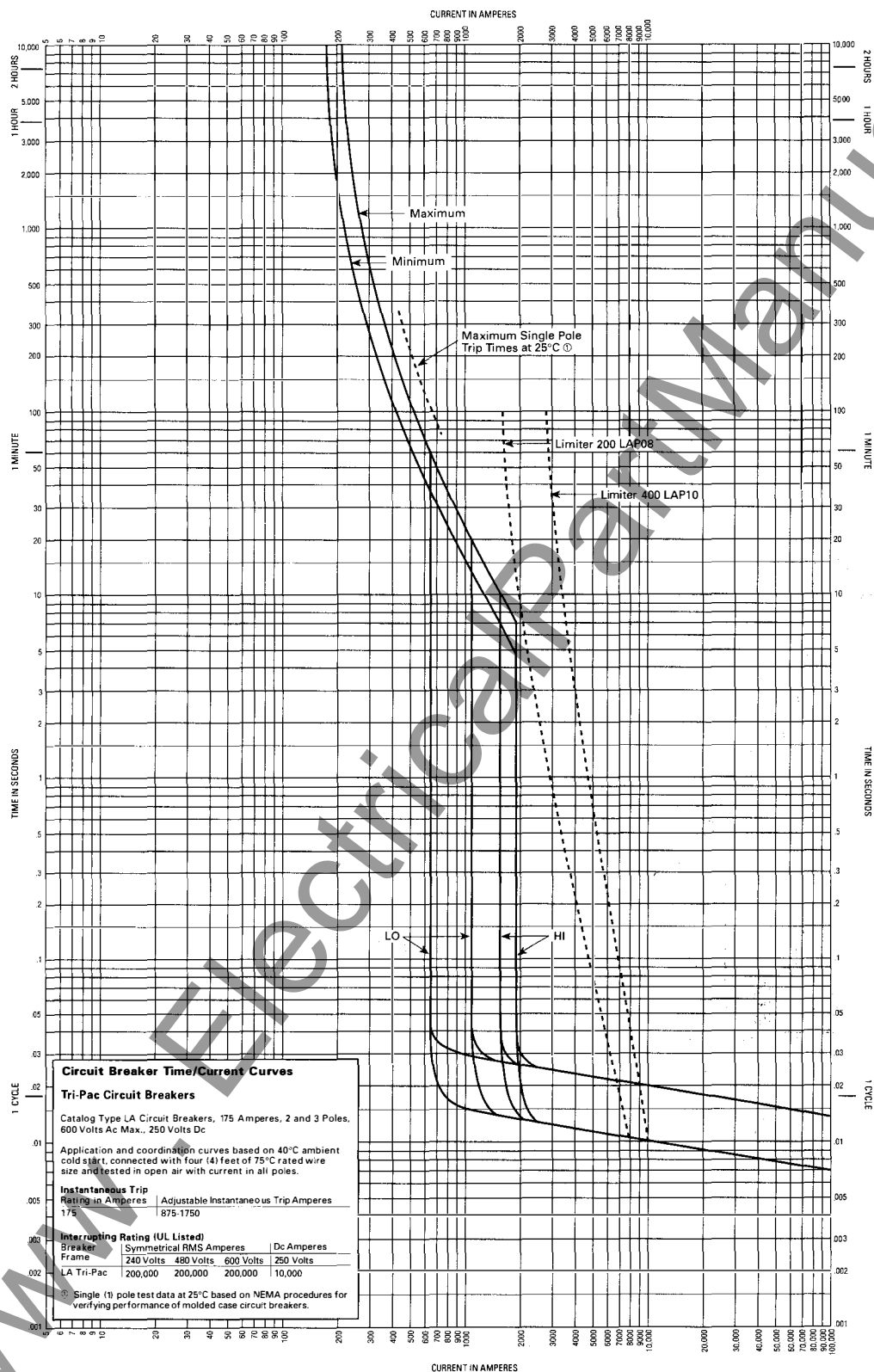
AB DE-ION Tri-Pac® Circuit Breakers
Type LA, 150 Amperes, 2 and 3 Poles





AB DE-ION Tri Pac® Circuit Breakers

Type LA, 175 Amperes, 2 and 3 Poles



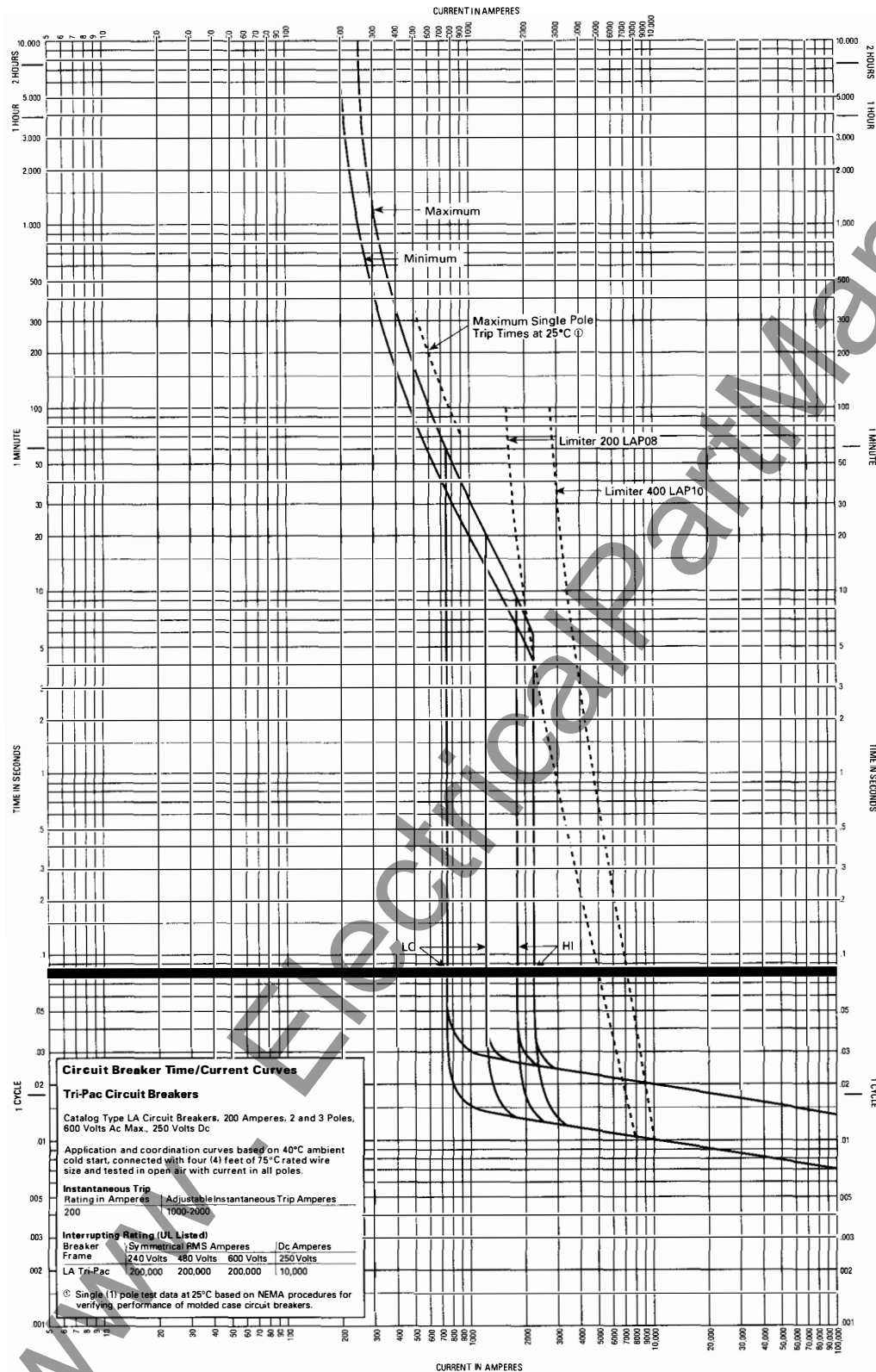
Curve No. SC-3585-76A

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AB DE-ION Tri-Pac® Circuit Breakers

Type LA, 200 Amperes, 2 and 3 Poles



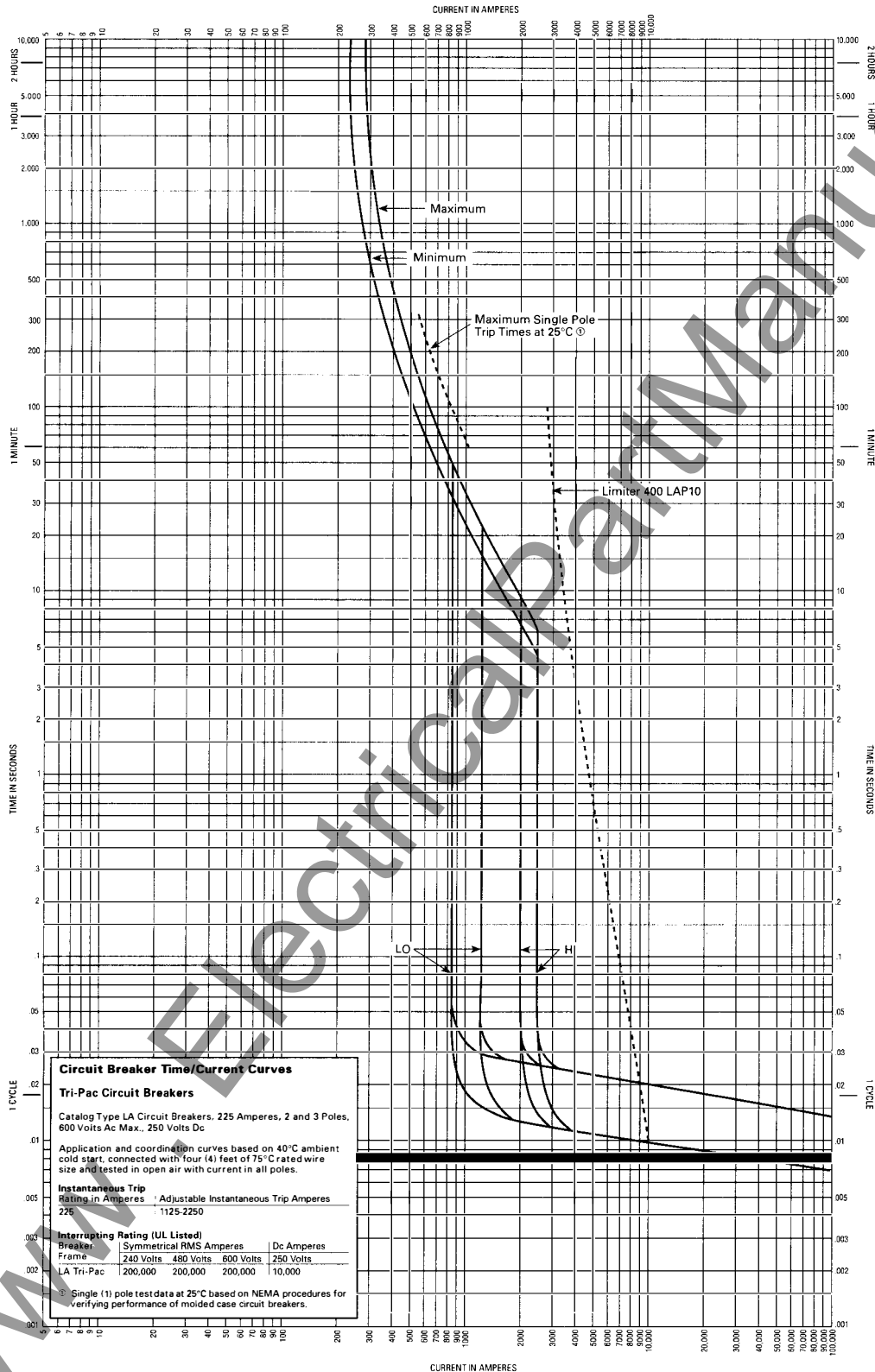
Curve No. SC-3586-76A

May 1994



AB DE-ION Tri Pac® Circuit Breakers

Type LA, 225 Amperes, 2 and 3 Poles



Curve No. SC-3587-76A

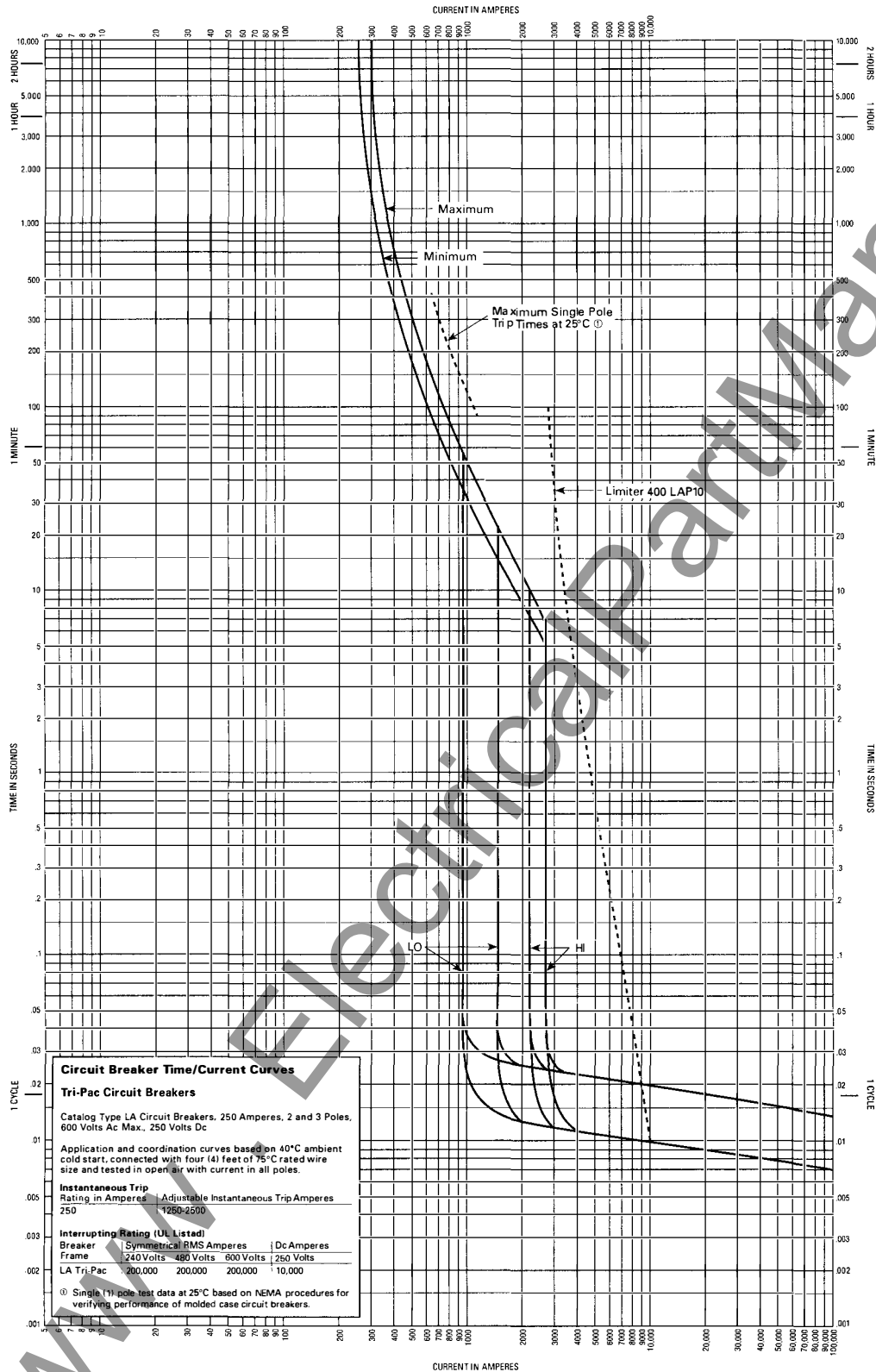
May 1994

EATON



AB DE-ION Tri-Pac® Circuit Breakers

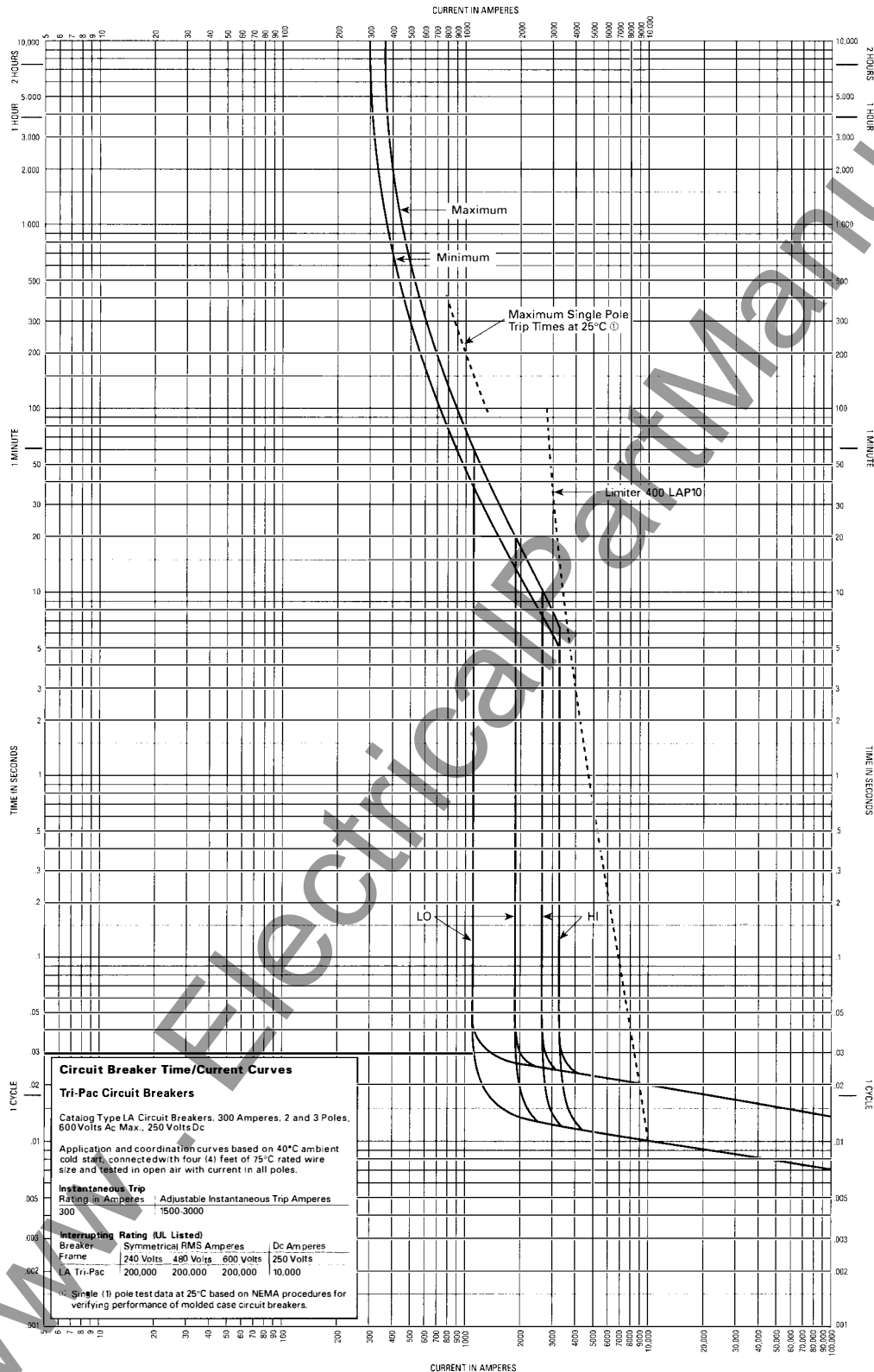
Type LA, 250 Amperes, 2 and 3 Poles





AB DE-ION Tri Pac® Circuit Breakers

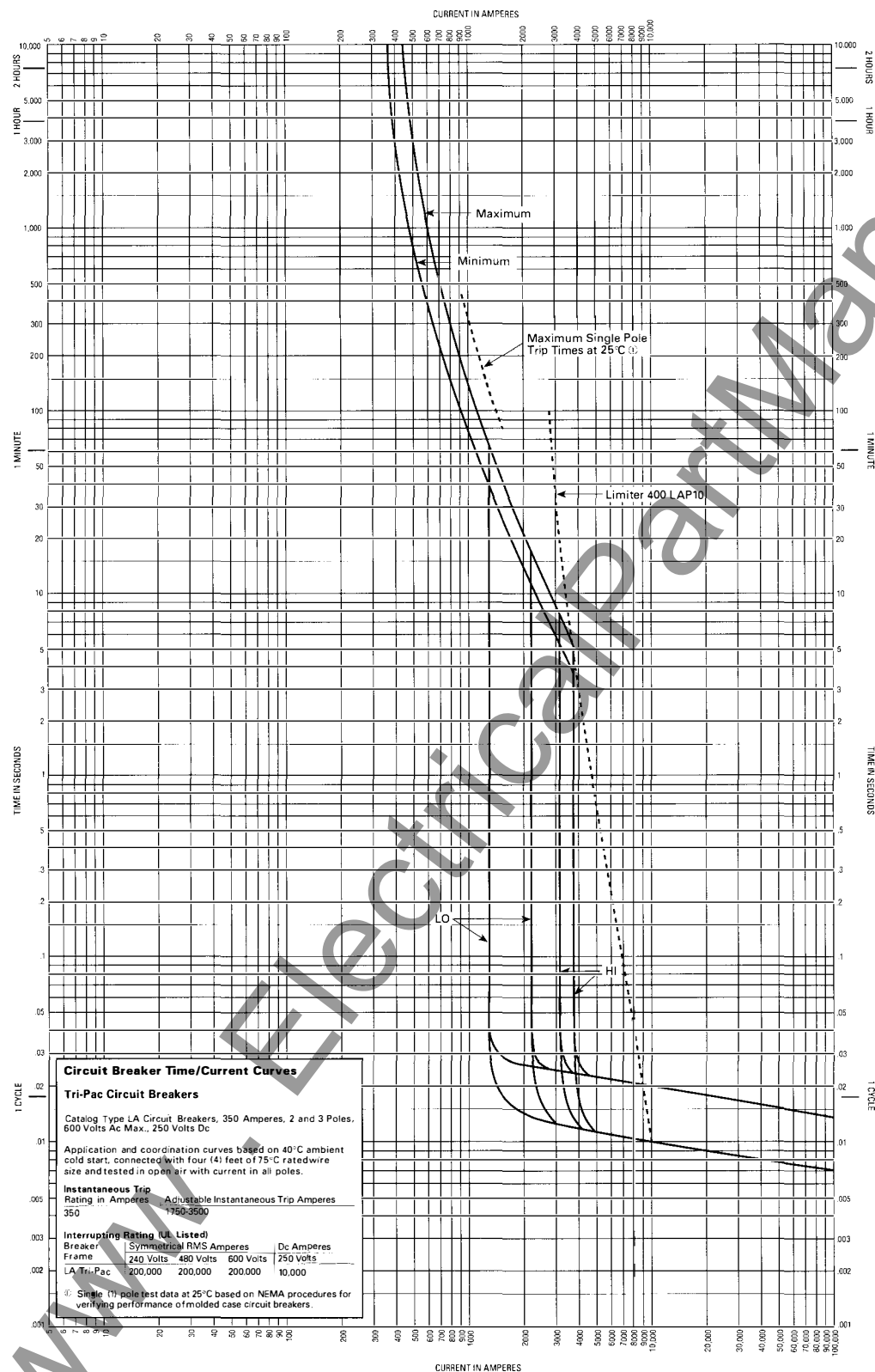
Type LA, 300 Amperes, 2 and 3 Poles





AB DE-ION Tri-Pac® Circuit Breakers

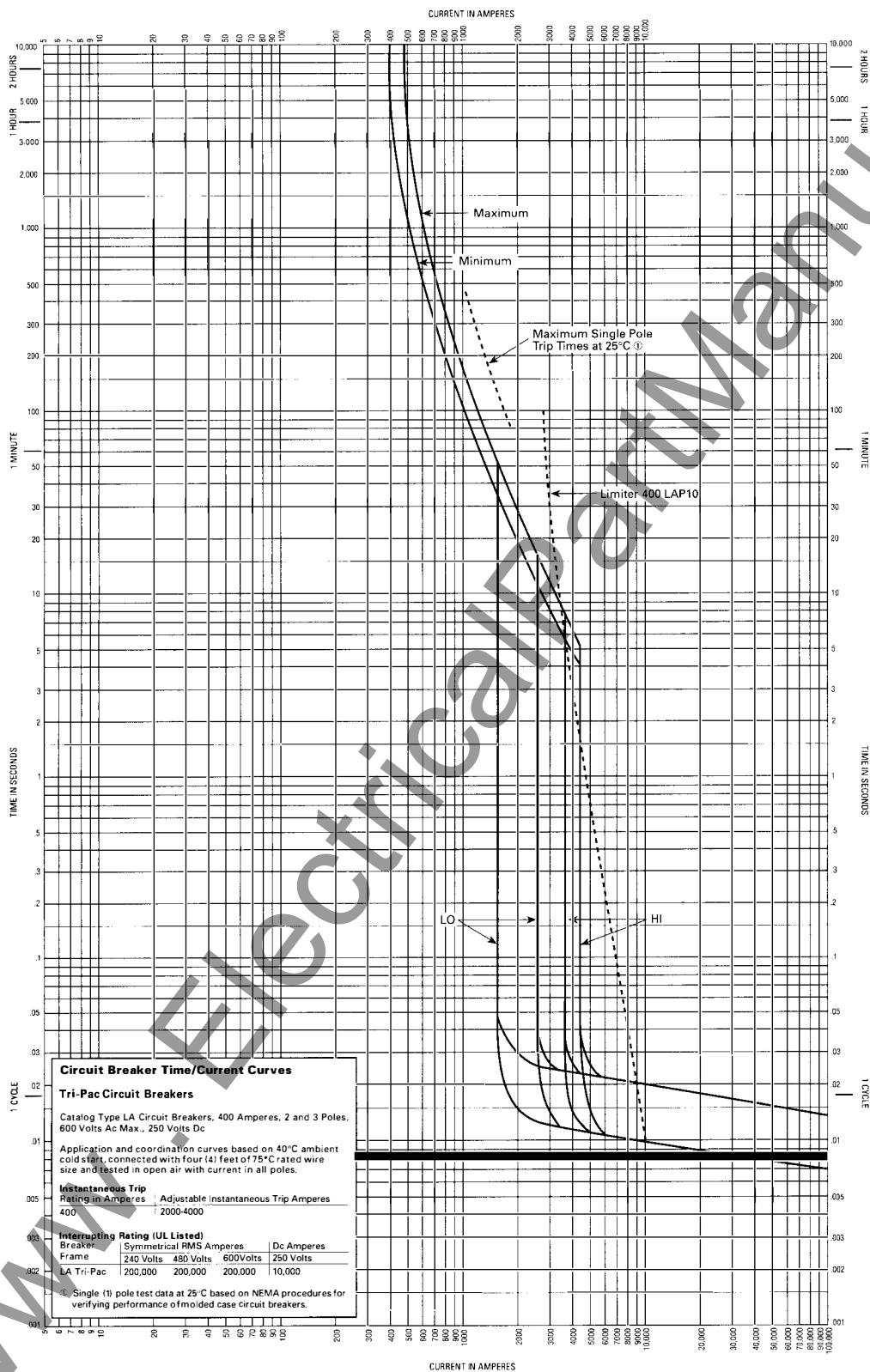
Type LA, 350 Amperes, 2 and 3 Poles





AB DE-ION Tri Pac® Circuit Breakers

Type LA, 400 Amperes, 2 and 3 Poles



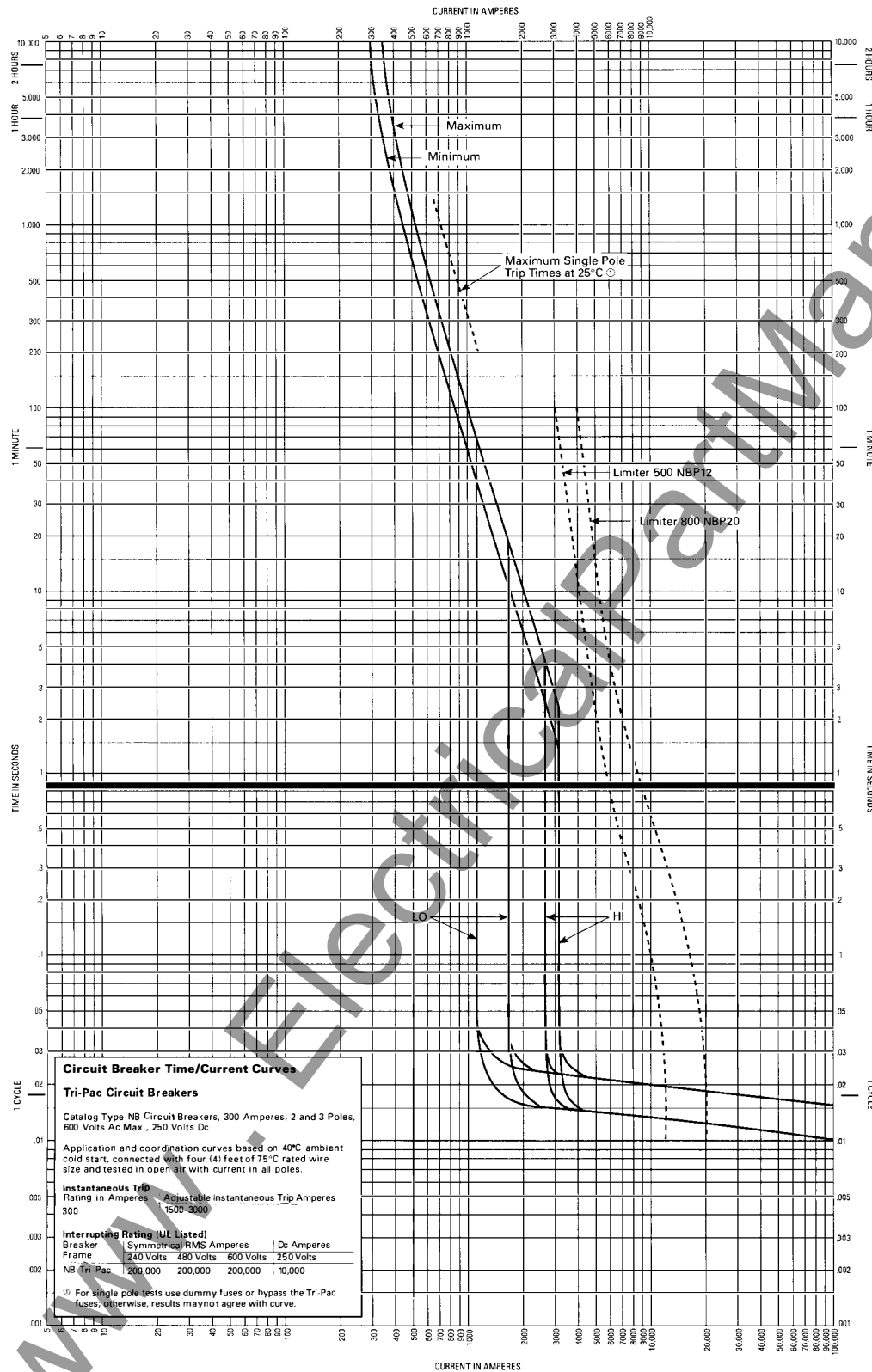
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EATON



AB DE-ION Tri-Pac® Circuit Breakers

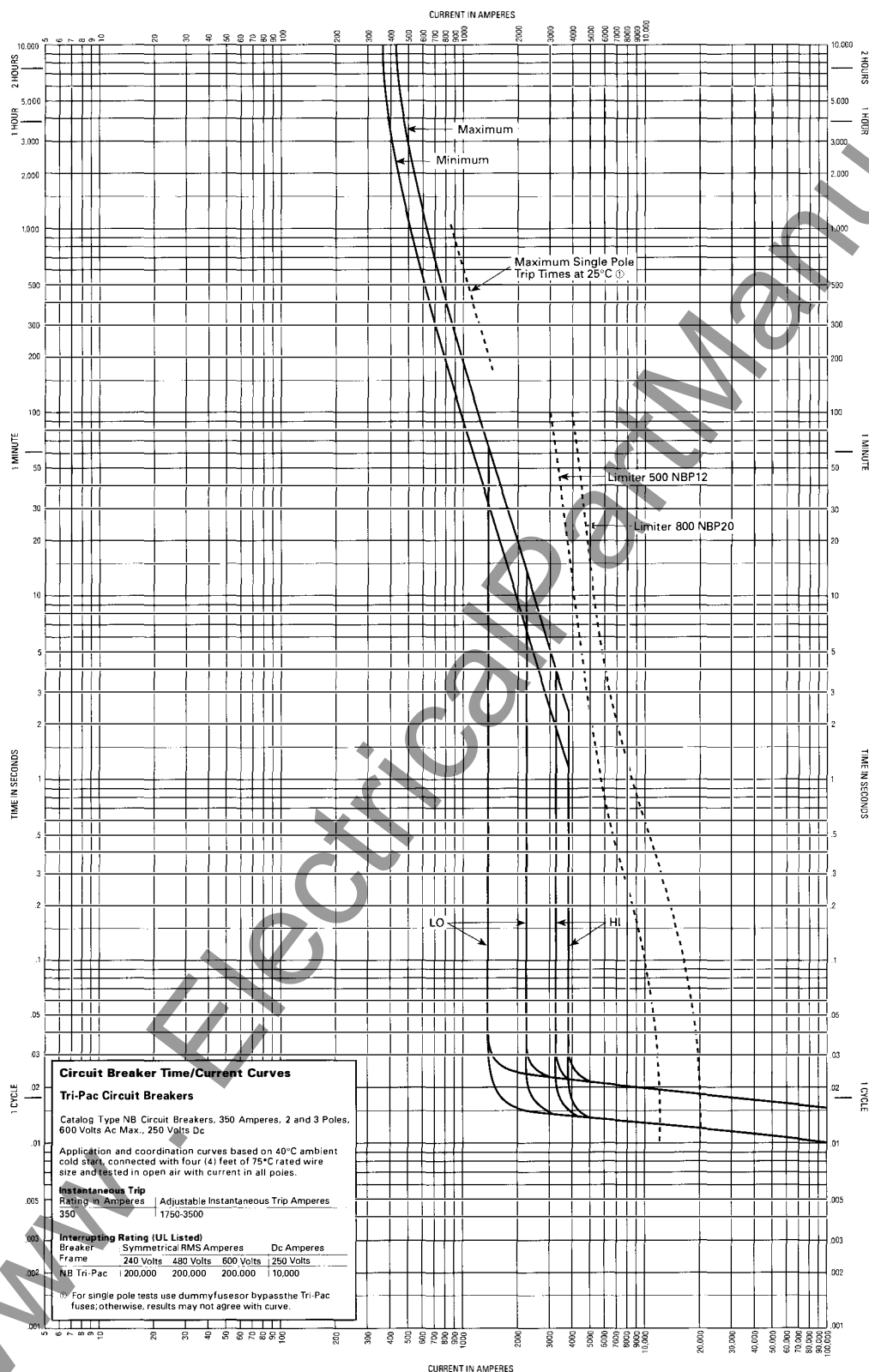
Type NB, 300 Amperes, 2 and 3 Poles





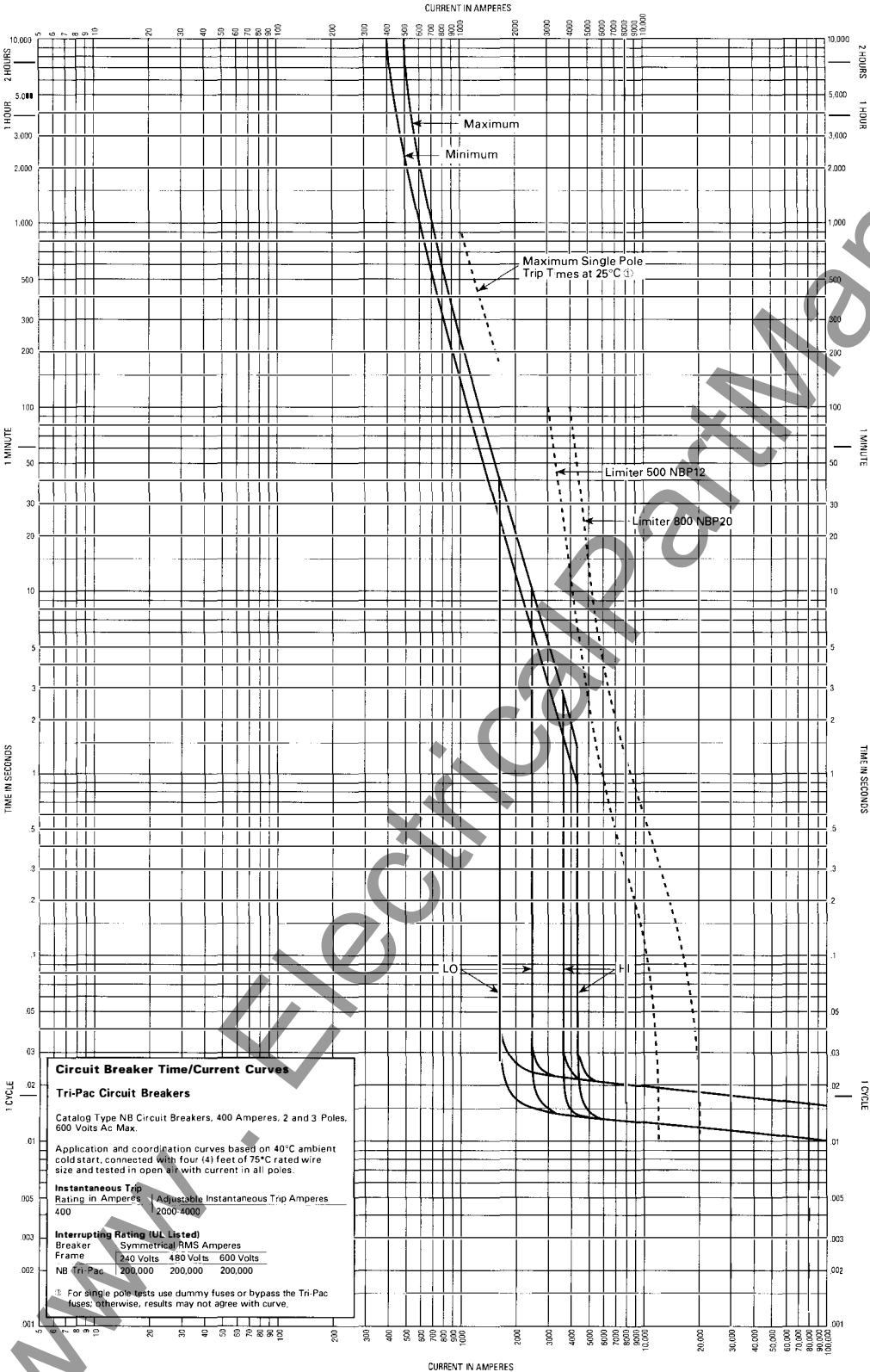
AB DE-ION Tri Pac® Circuit Breakers

Type NB, 350 Amperes, 2 and 3 Poles





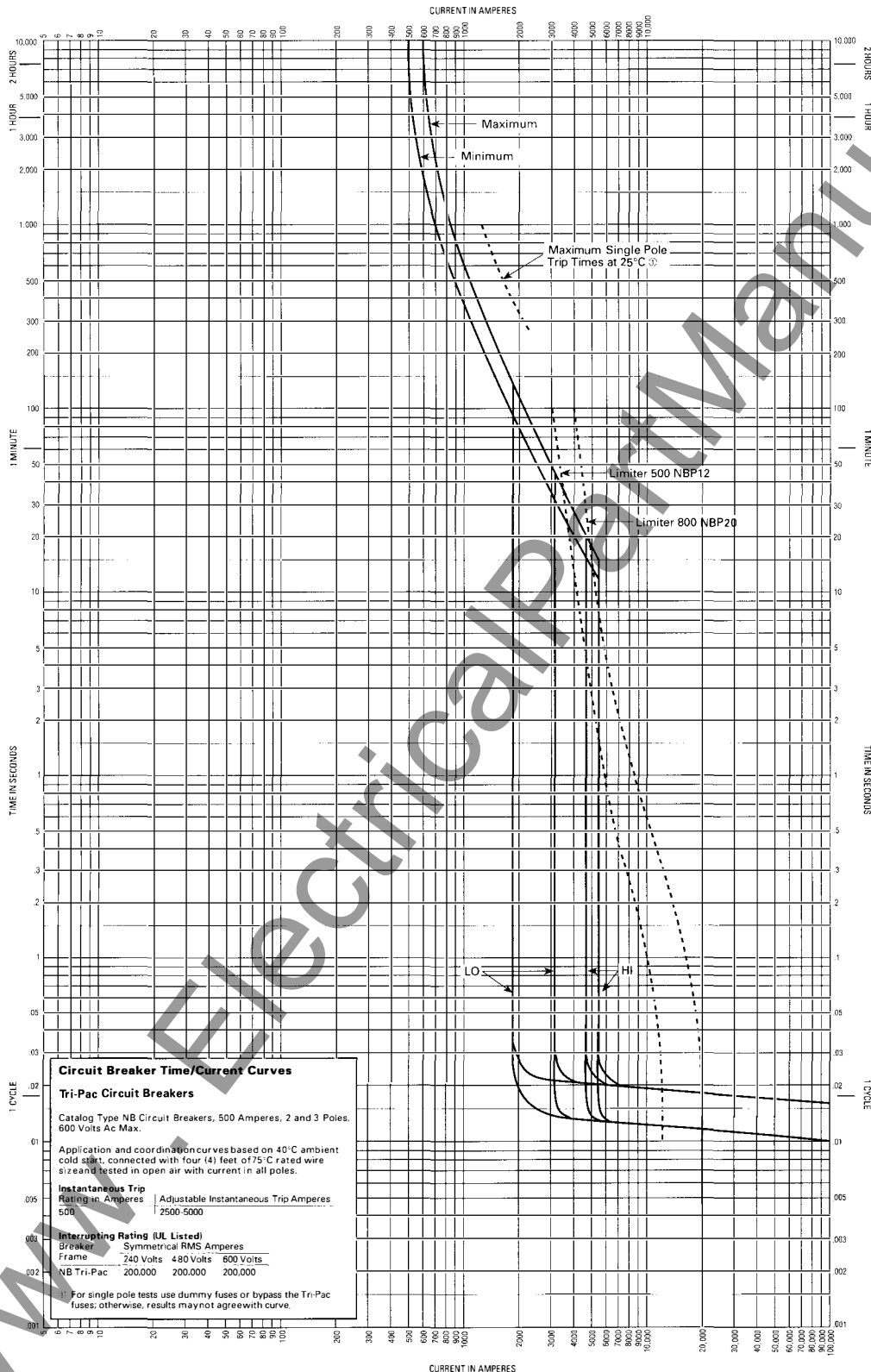
AB DE-ION Tri-Pac® Circuit Breakers
Type NB, 400 Amperes, 2 and 3 Poles





AB DE-ION Tri Pac® Circuit Breakers

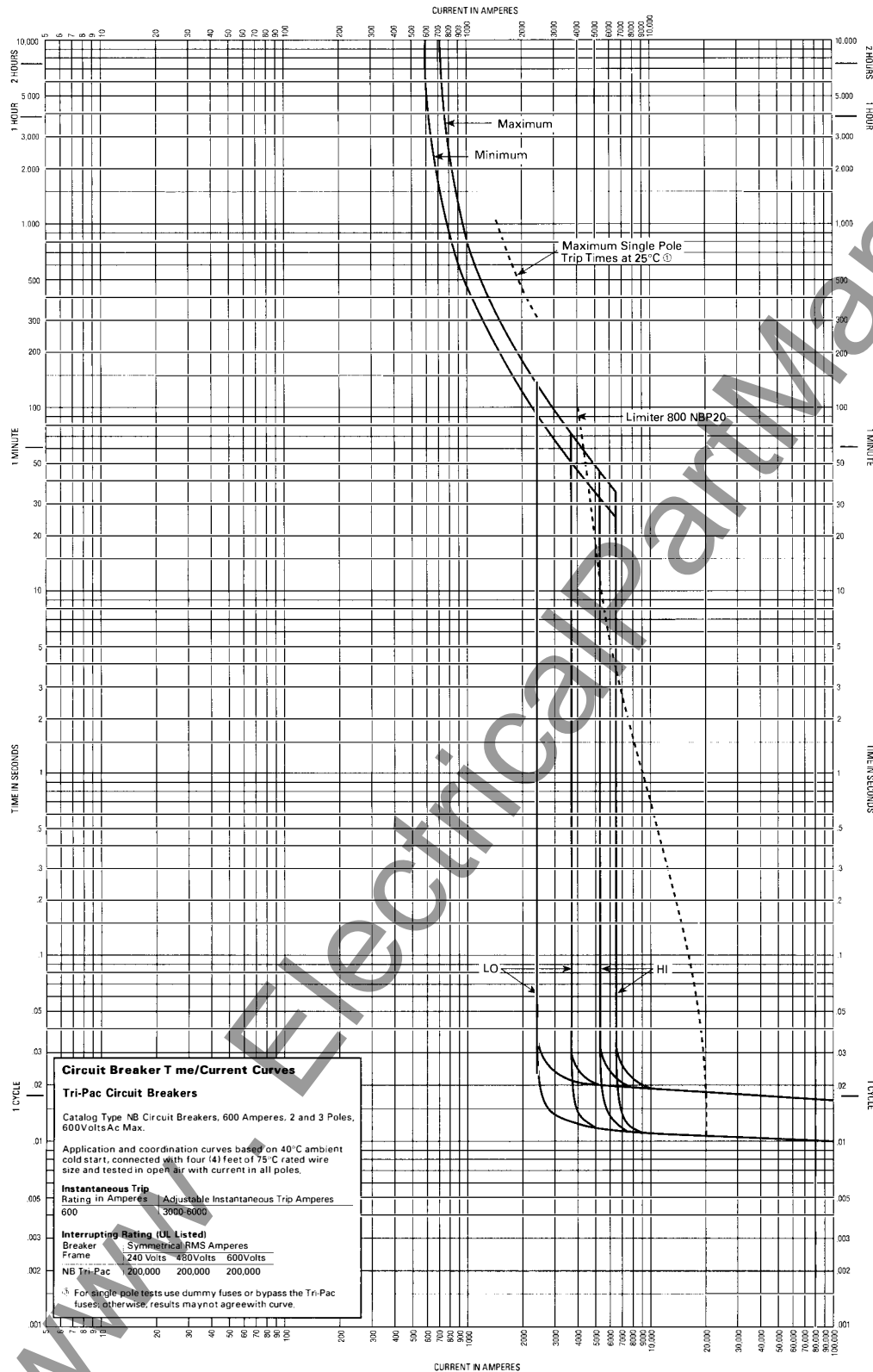
Type NB, 500 Amperes, 2 and 3 Poles





AB DE-ION Tri-Pac® Circuit Breakers

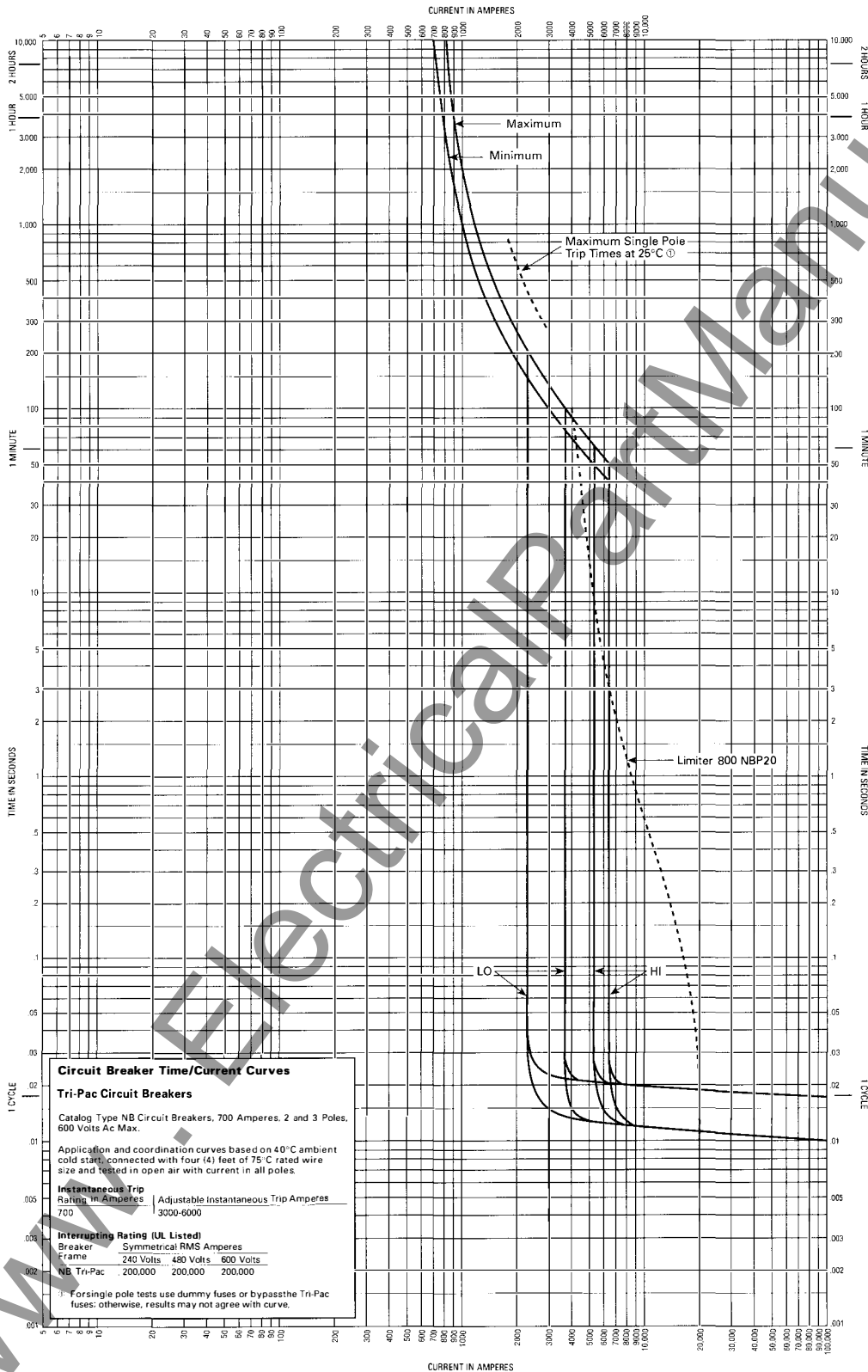
Type NB, 600 Amperes, 2 and 3 Poles





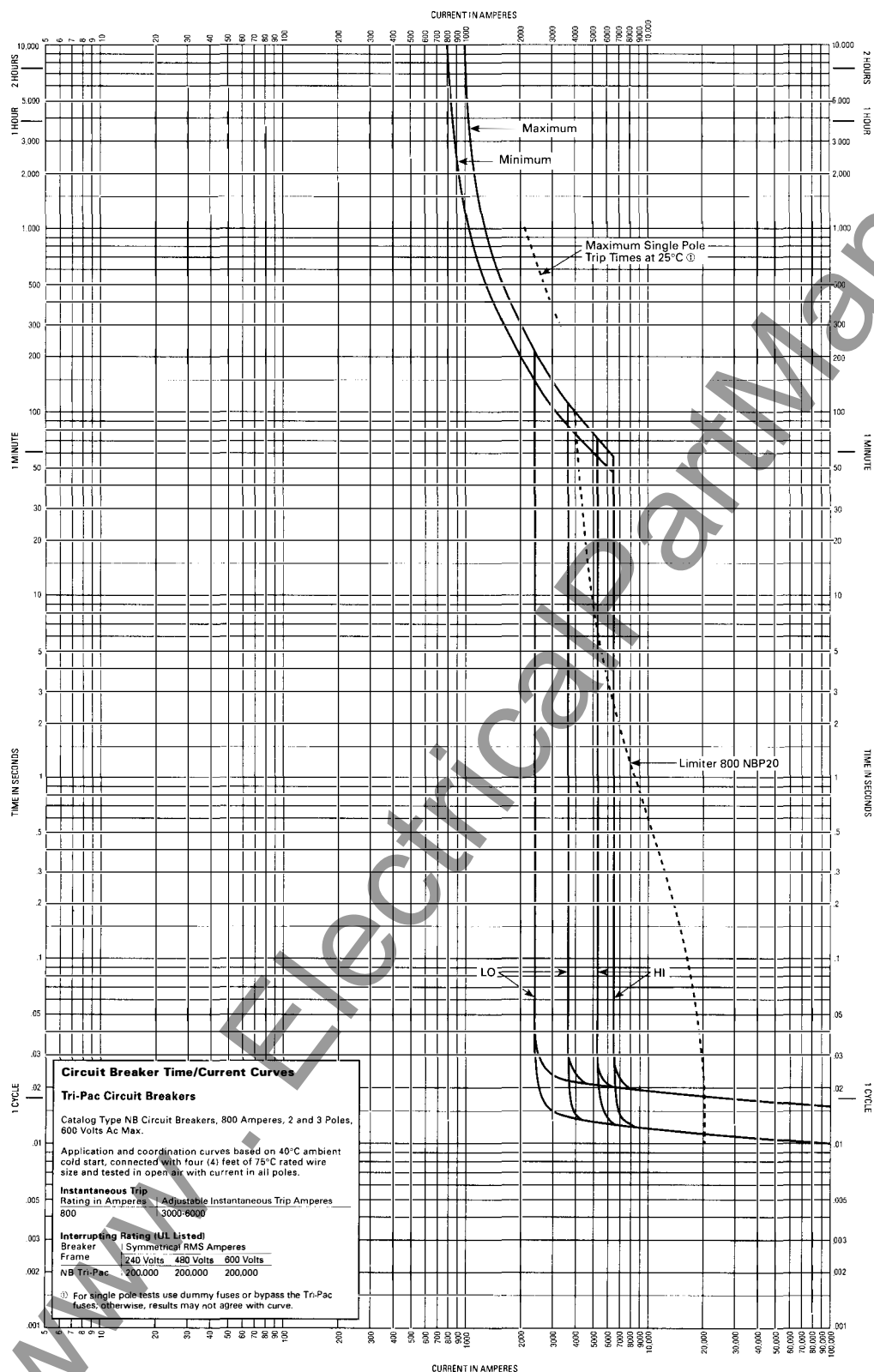
AB DE-ION Tri Pac® Circuit Breakers

Type NB, 700 Amperes, 2 and 3 Poles



AB DE-ION Tri-Pac® Circuit Breakers

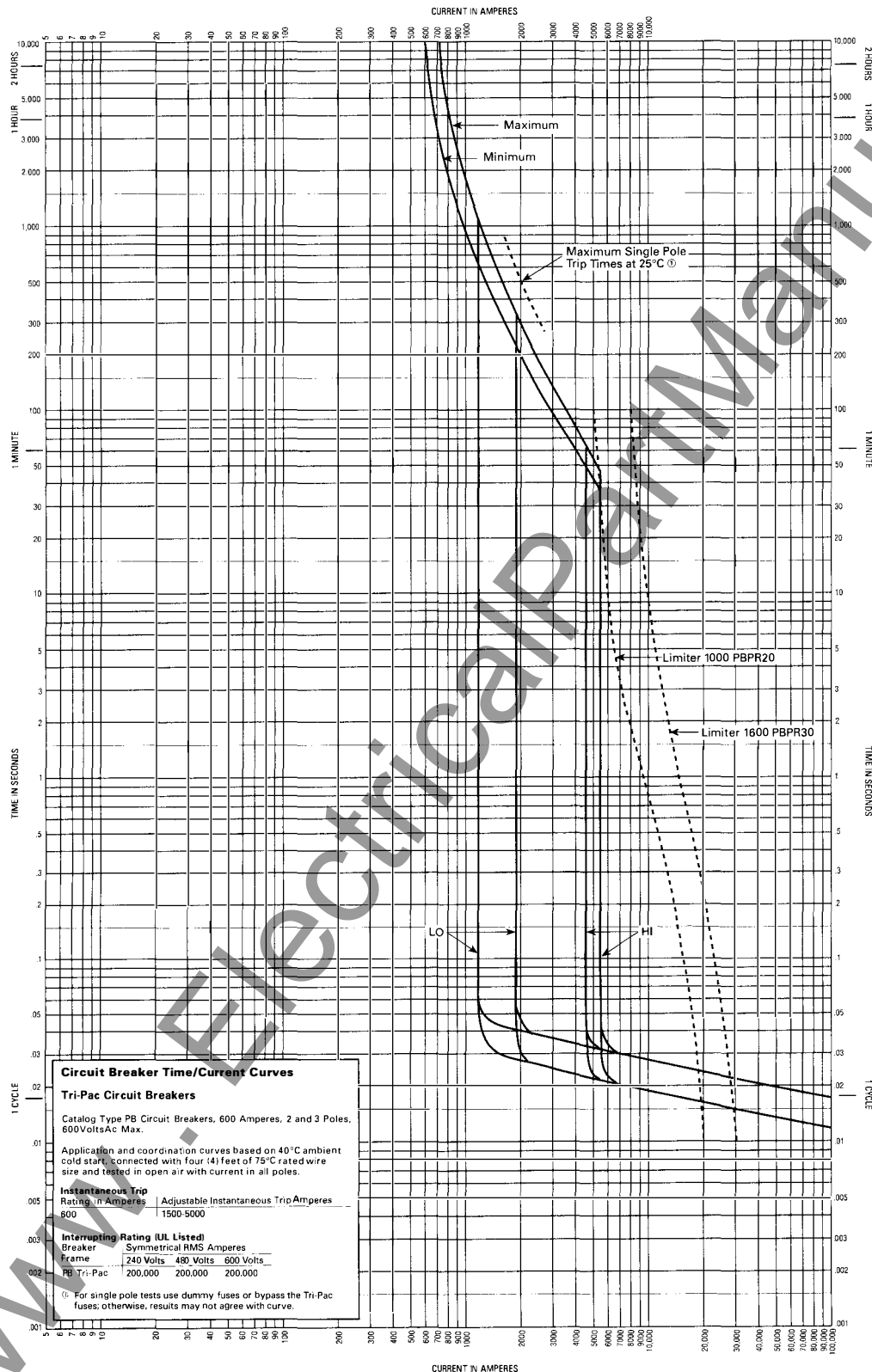
Type NB, 800 Amperes, 2 and 3 Poles





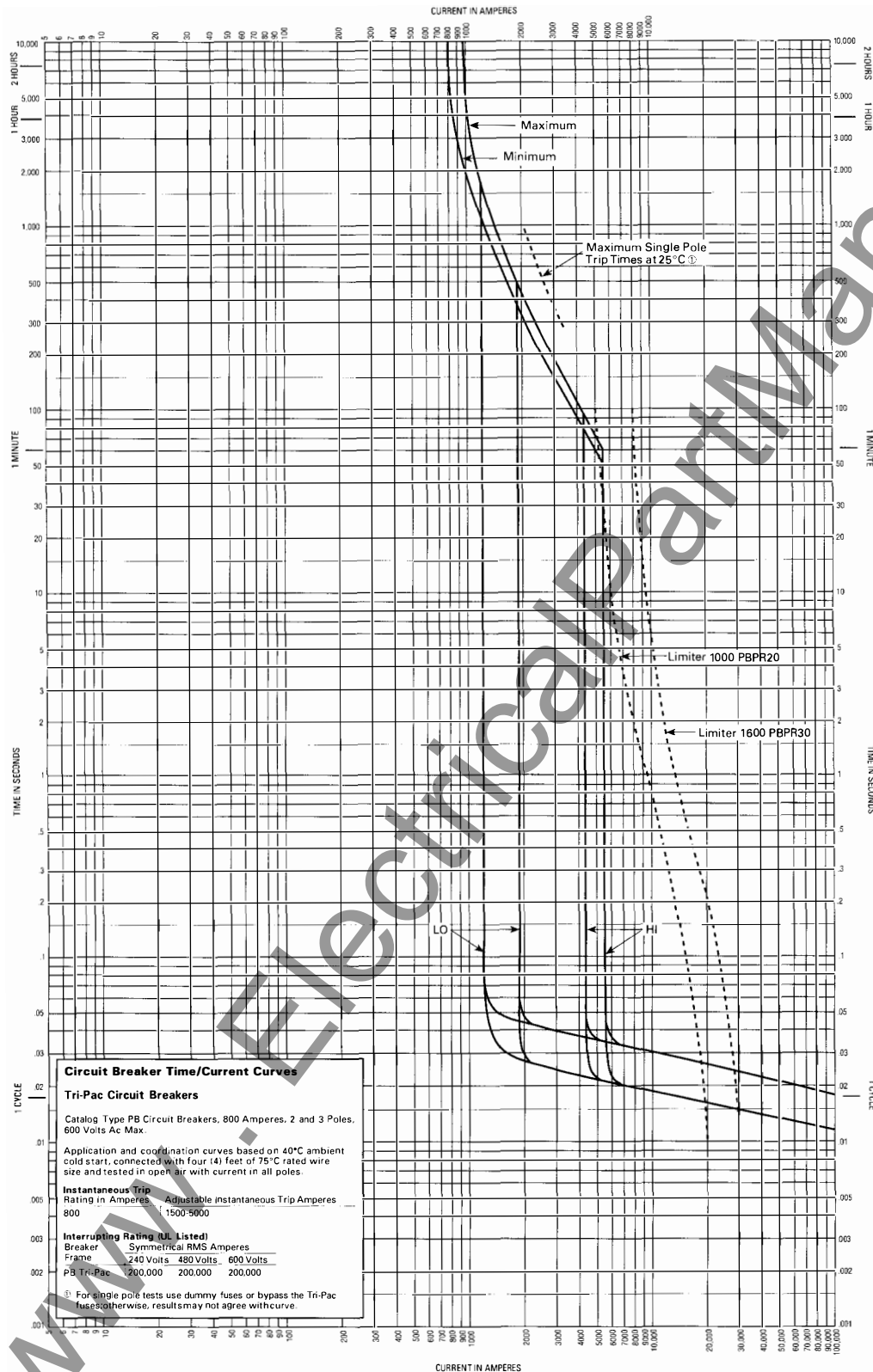
AB DE-ION Tri Pac® Circuit Breakers

Type PB, 600 Amperes, 2 and 3 Poles



AB DE-ION Tri-Pac® Circuit Breakers

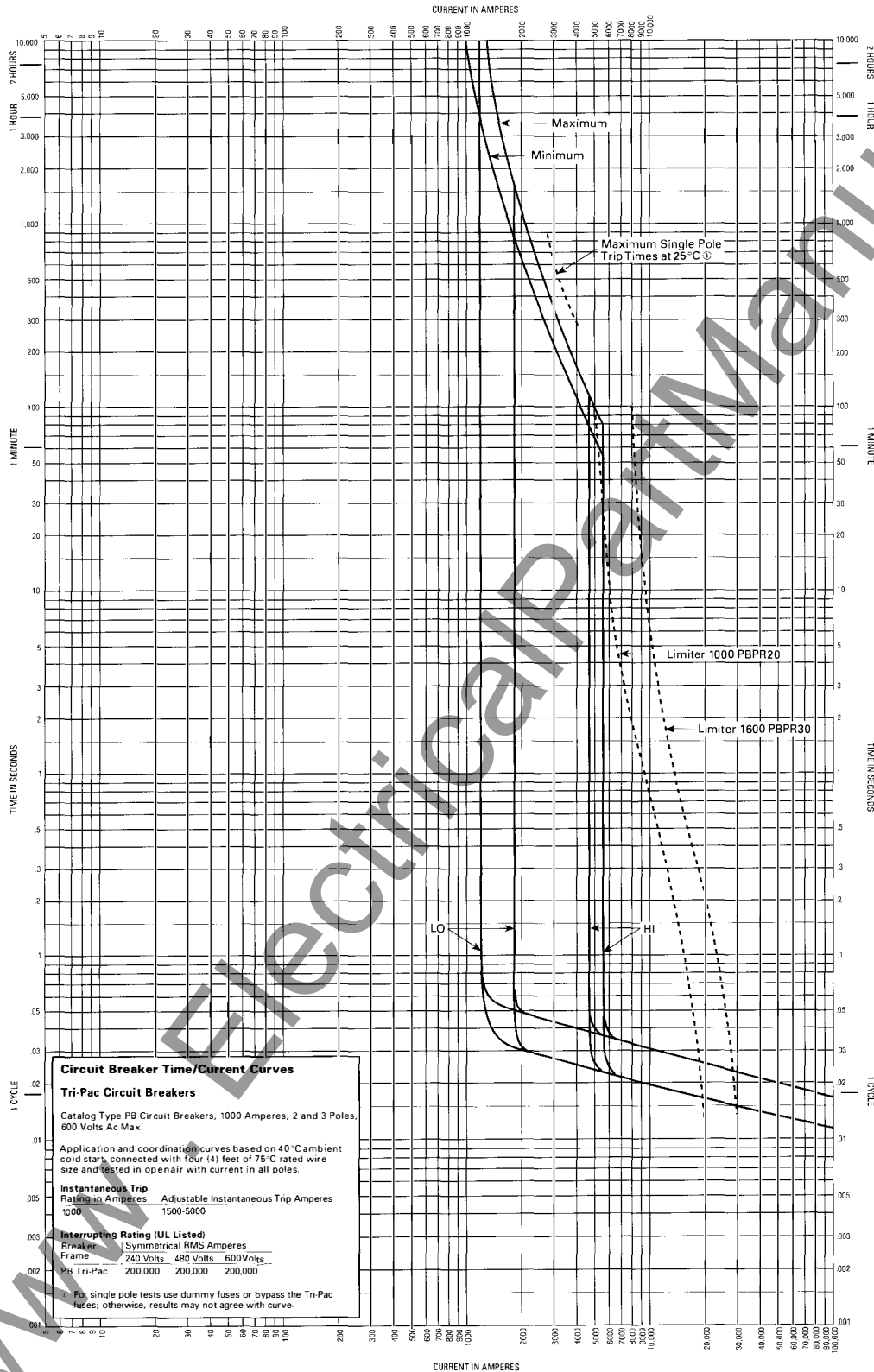
Type PB, 800 Amperes, 2 and 3 Poles





AB DE-ION Tri Pac® Circuit Breakers

Type PB, 1000 Amperes, 2 and 3 Poles

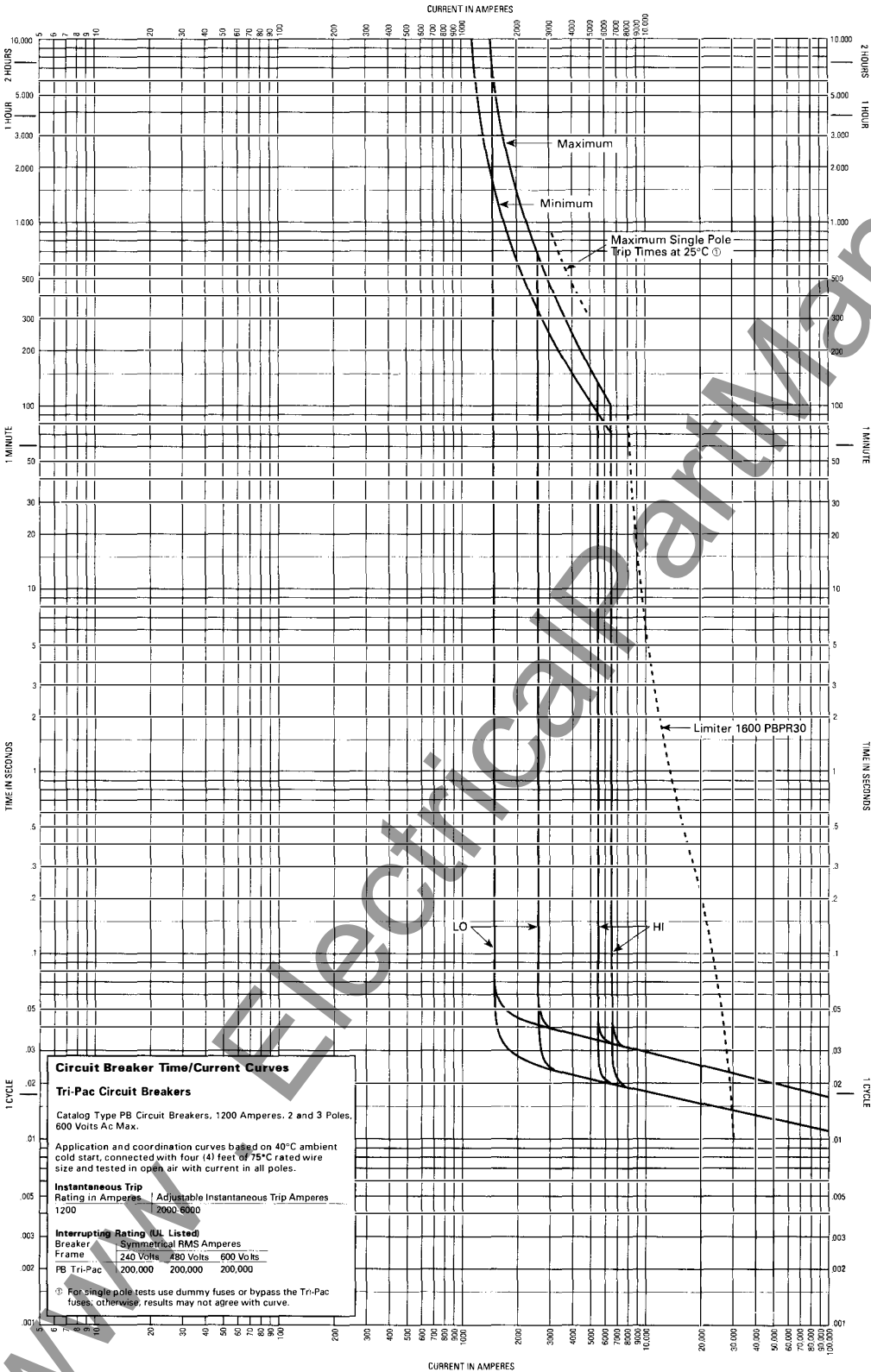


Curve No. SC-3601-76B

EAT•N



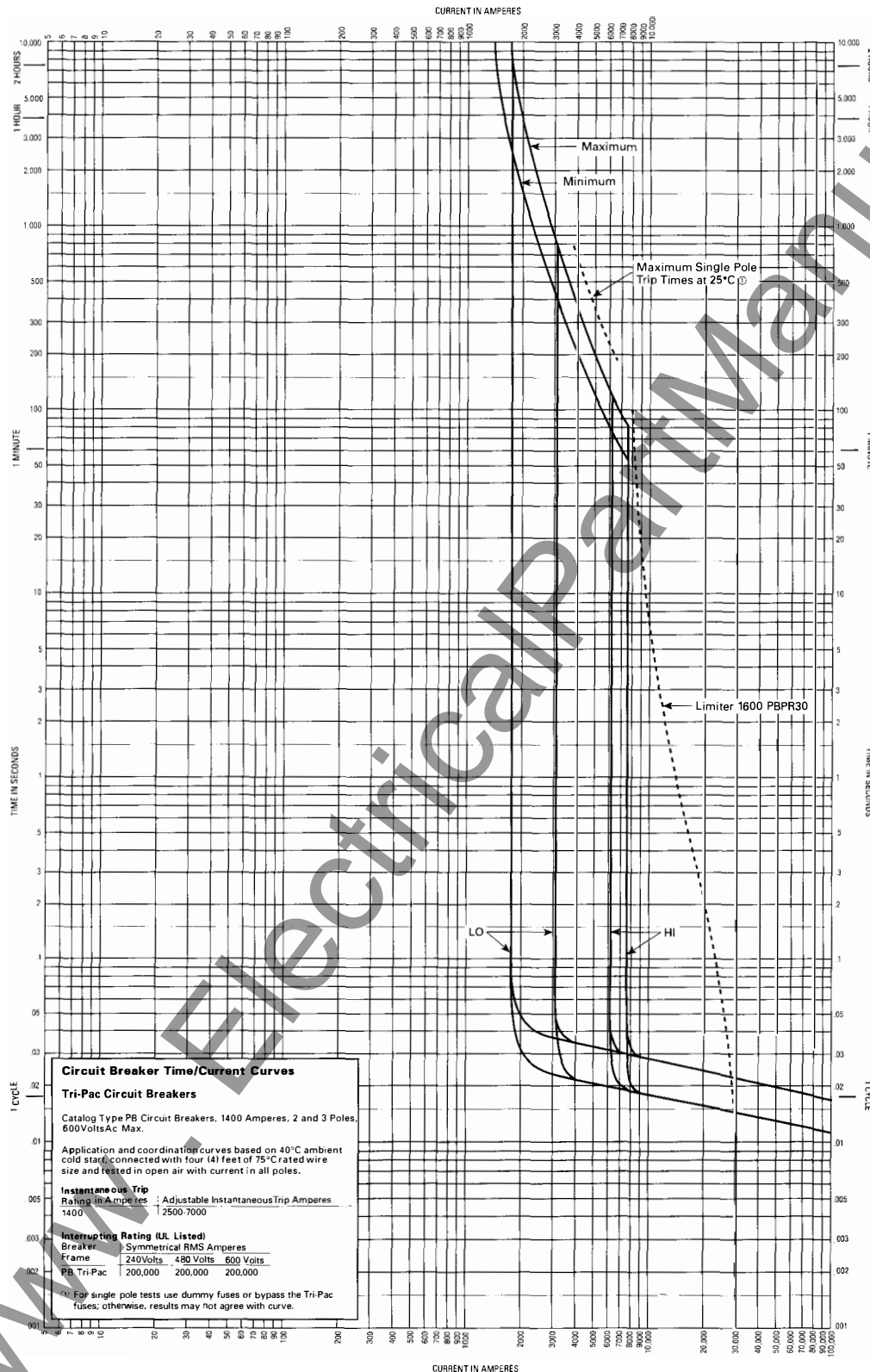
AB DE-ION Tri-Pac® Circuit Breakers
Type PB, 1200 Amperes, 2 and 3 Poles





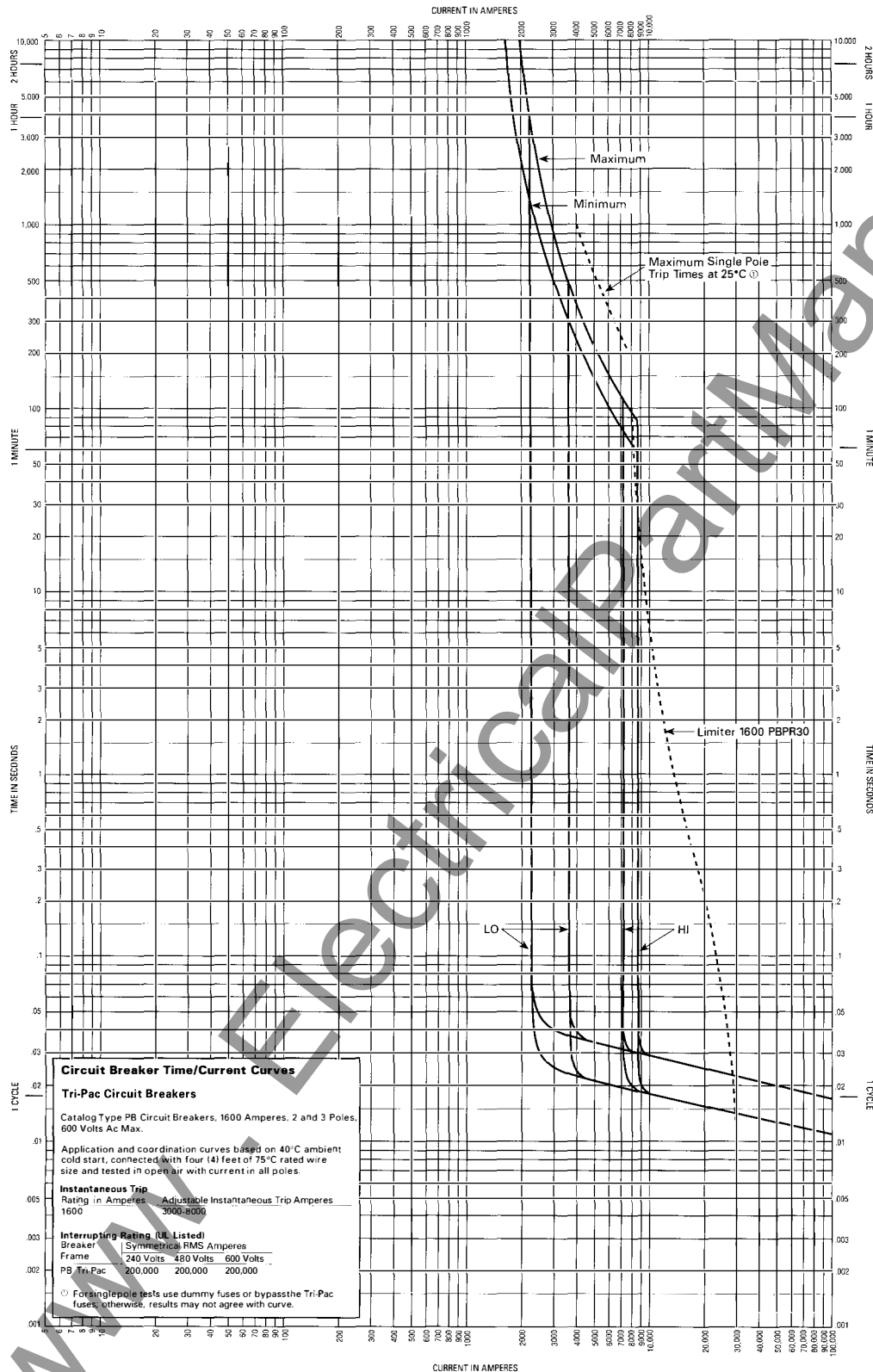
AB DE-ION Tri Pac® Circuit Breakers

Type PB, 1400 Amperes, 2 and 3 Poles



AB DE-ION Tri-Pac® Circuit Breakers

Type PB, 1600 Amperes, 2 and 3 Poles





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Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

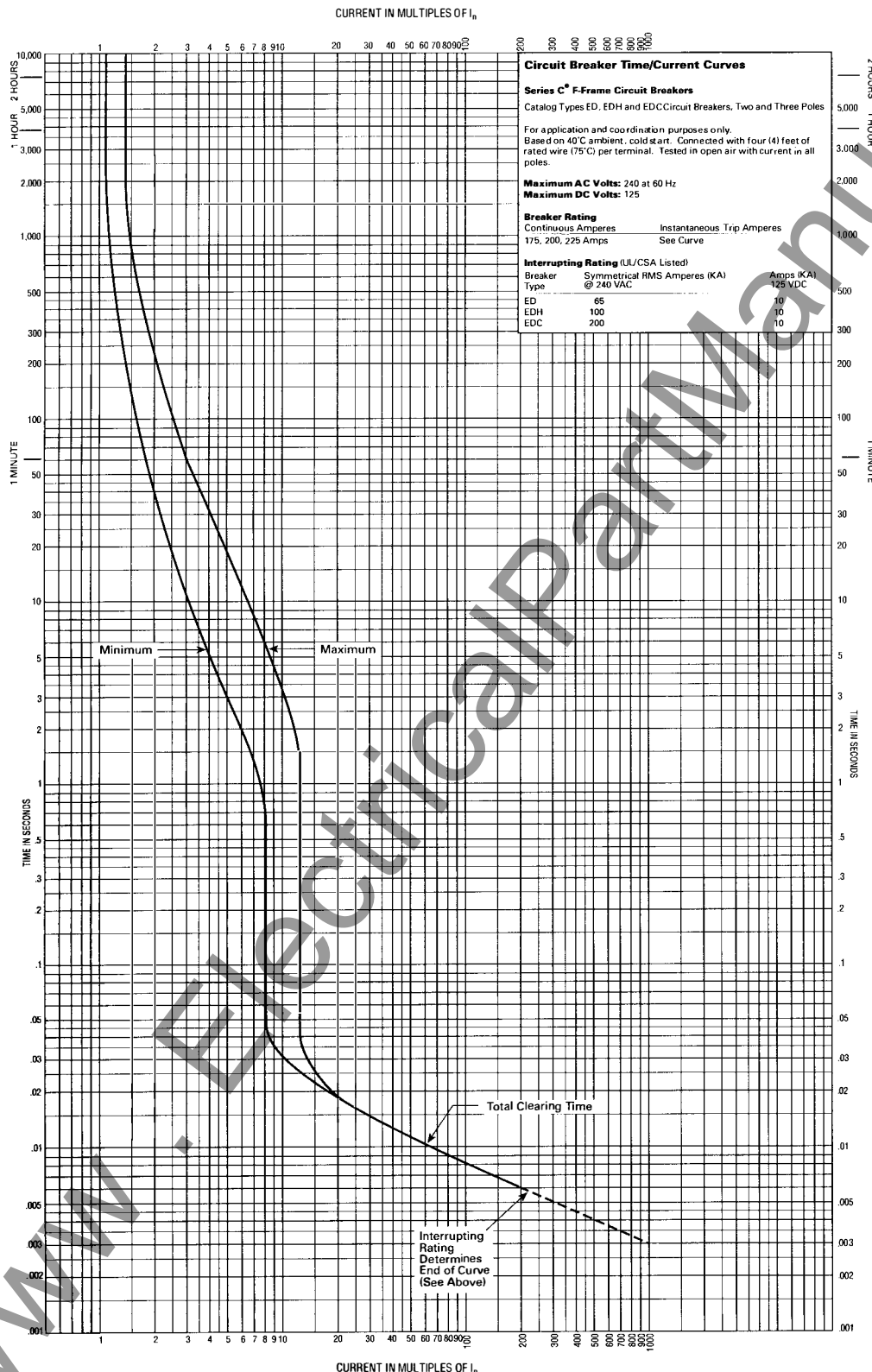
Application Data
29-167F

Page 53

New Information
Mailed to: E/29-100A

Types ED, EDH and EDC

AB DE-ION Circuit Breakers



Curve No. SC-5805-94

August 1994

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Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167G
Page 1

May 1994
Supersedes Application Data 29-161A,
pages 5-6, dated December 1988
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® G-Frame
Circuit Breakers

Westinghouse AB DE-ION® Circuit Breakers

Voltages shown in curve headings are maximum at which the breaker may be applied. Interrupting capacity of individual breaker is tabulated on each curve.

Breaker Description	Curve No.	Page
Types GB, GHB, GC, GHC 15-100 Amperes, 1 Pole	SC-3500-83B	2
Types GB, GHB, GC, GHC 15-100 Amperes, 2, 3 Poles	SC-3501-83B	3
Type GHBS 15 and 20 Amperes, 1 Pole	SC-5695-93A	4

Additional copies of this application data may be ordered from the Westinghouse Printing Division, Trafford, PA 15085. Order Application Data 29-167G.

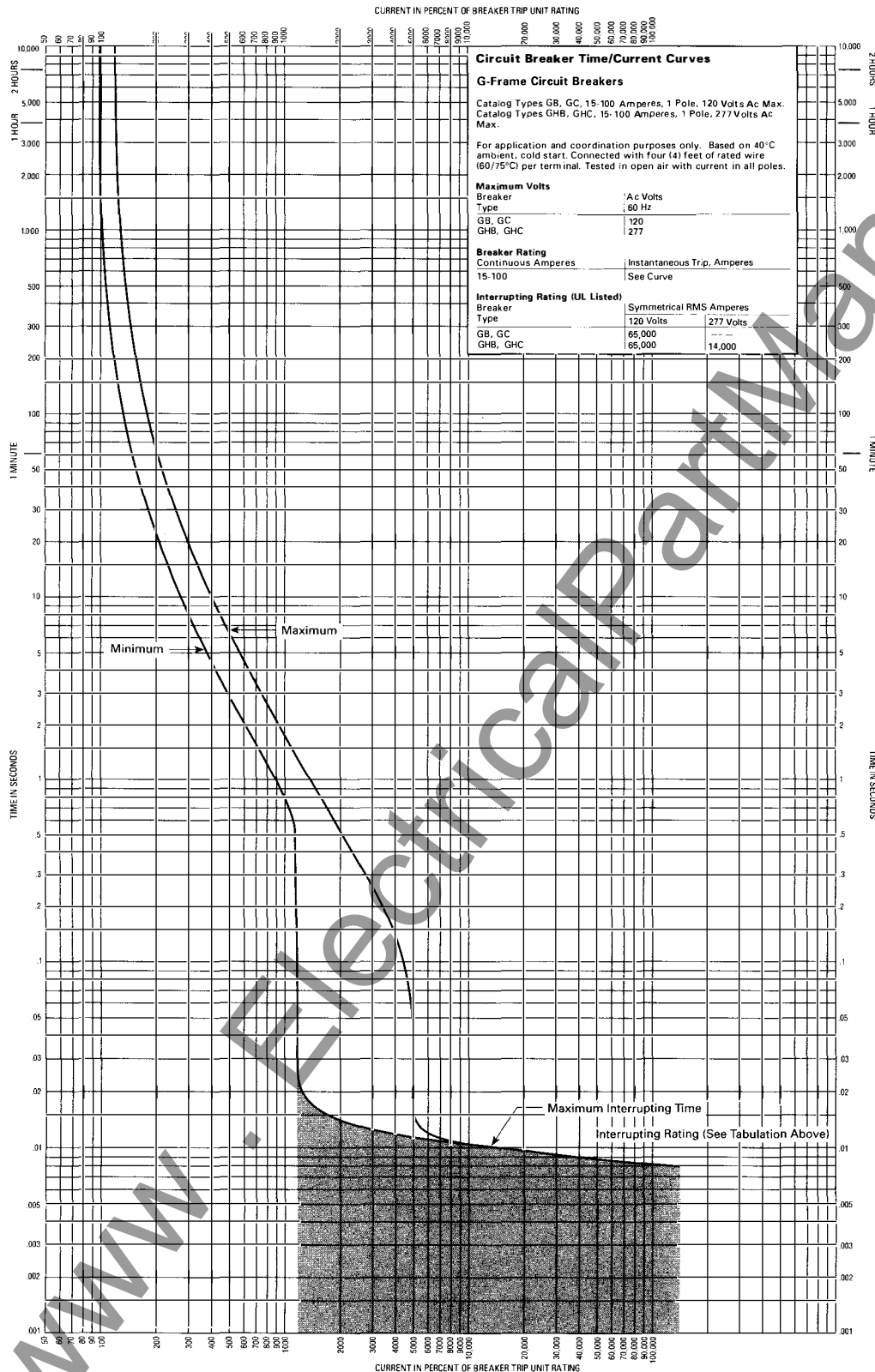
Individual oversize copies of curves listed above printed on onion-skin paper are available in limited quantity from:

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears, i.e., SC-3500-83B. **Requests for full sets of curves will not be honored.**

AB DE-ION Circuit Breakers

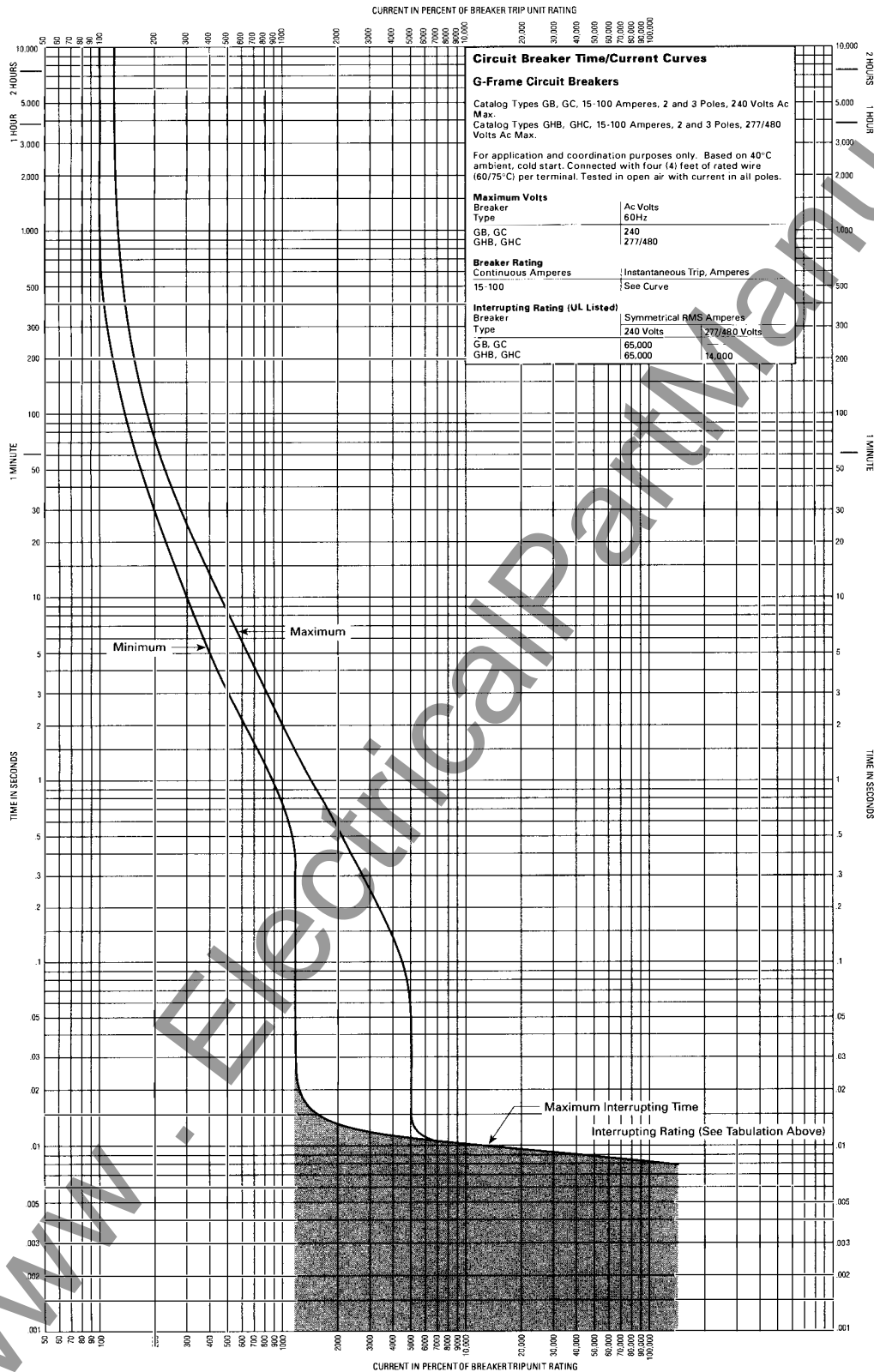
Types GB, GHB, GC, GHC 15-100 Amperes, 1 Pole



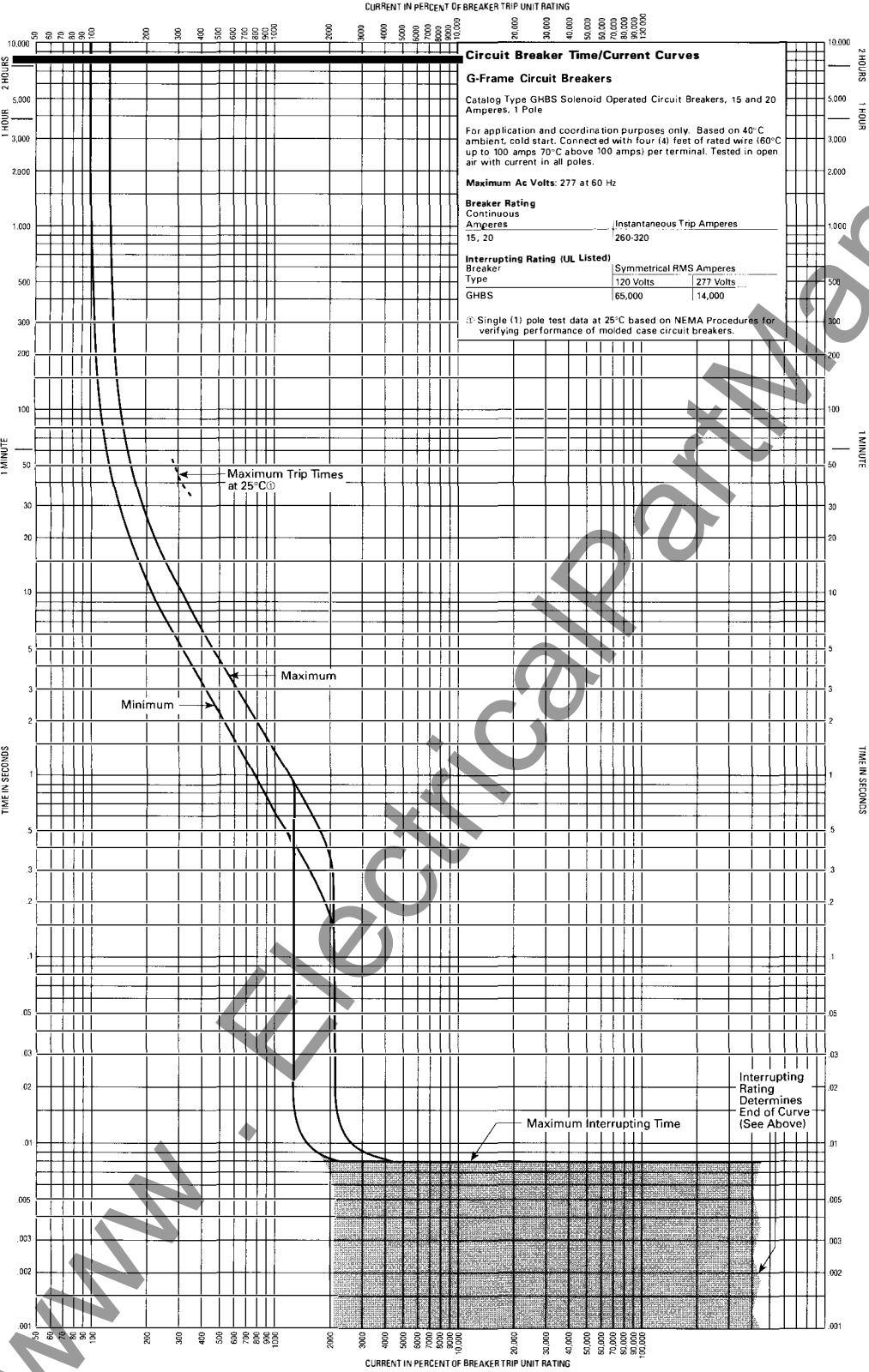


AB DE-ION Circuit Breakers

Types GB, GHB, GC, GHC 15-100 Amperes, 2 and 3 Poles



AB DE-ION Circuit Breakers
Type GHBS 15 and 20 Amperes, 1 Pole





Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167J

Page 1

May 1994
Supersedes Application Data 29-167B,
dated September 1991
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® J-Frame
Circuit Breakers

Westinghouse AB DE-ION® Circuit Breakers

Breaker Description	Curve No.	Page
Series C Types JDB, JD, HJD Equipped With Type JT Thermal-Magnetic Trip Unit	SC-4247-87B	2
Series C Types JDC Equipped With Type JT Thermal-Magnetic Trip Unit	SC-4248-87B	3

Additional copies of this application data may be ordered from the Westinghouse Printing Division, Trafford, PA 15085. Order Application Data 29-167J.

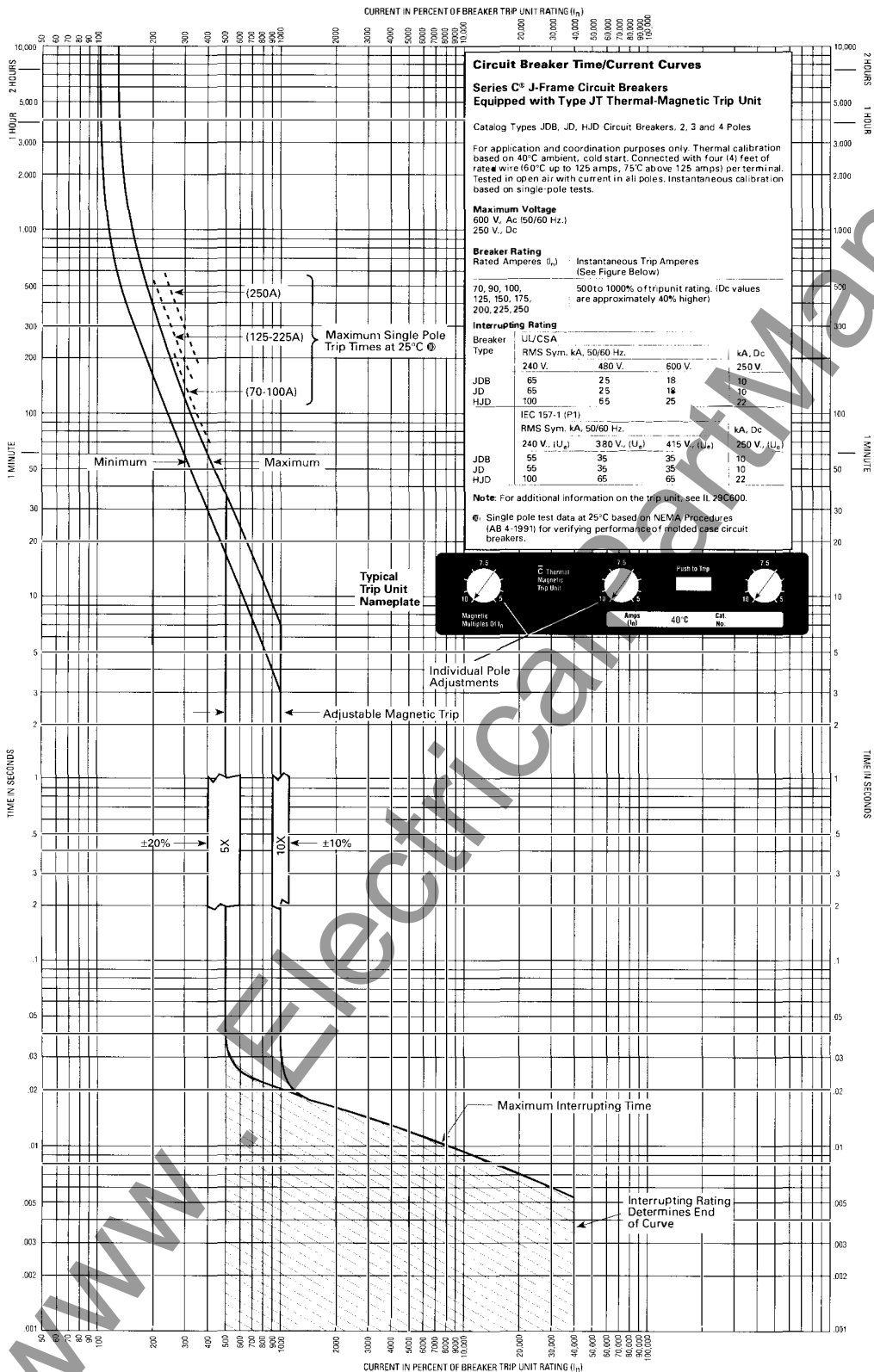
Individual oversize copies of curves listed above printed on onion-skin paper are available in limited quantity from:

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Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears, i.e., SC-4547-87B. **Requests for full sets of curves will not be honored.**

AB DE-ION Circuit Breakers

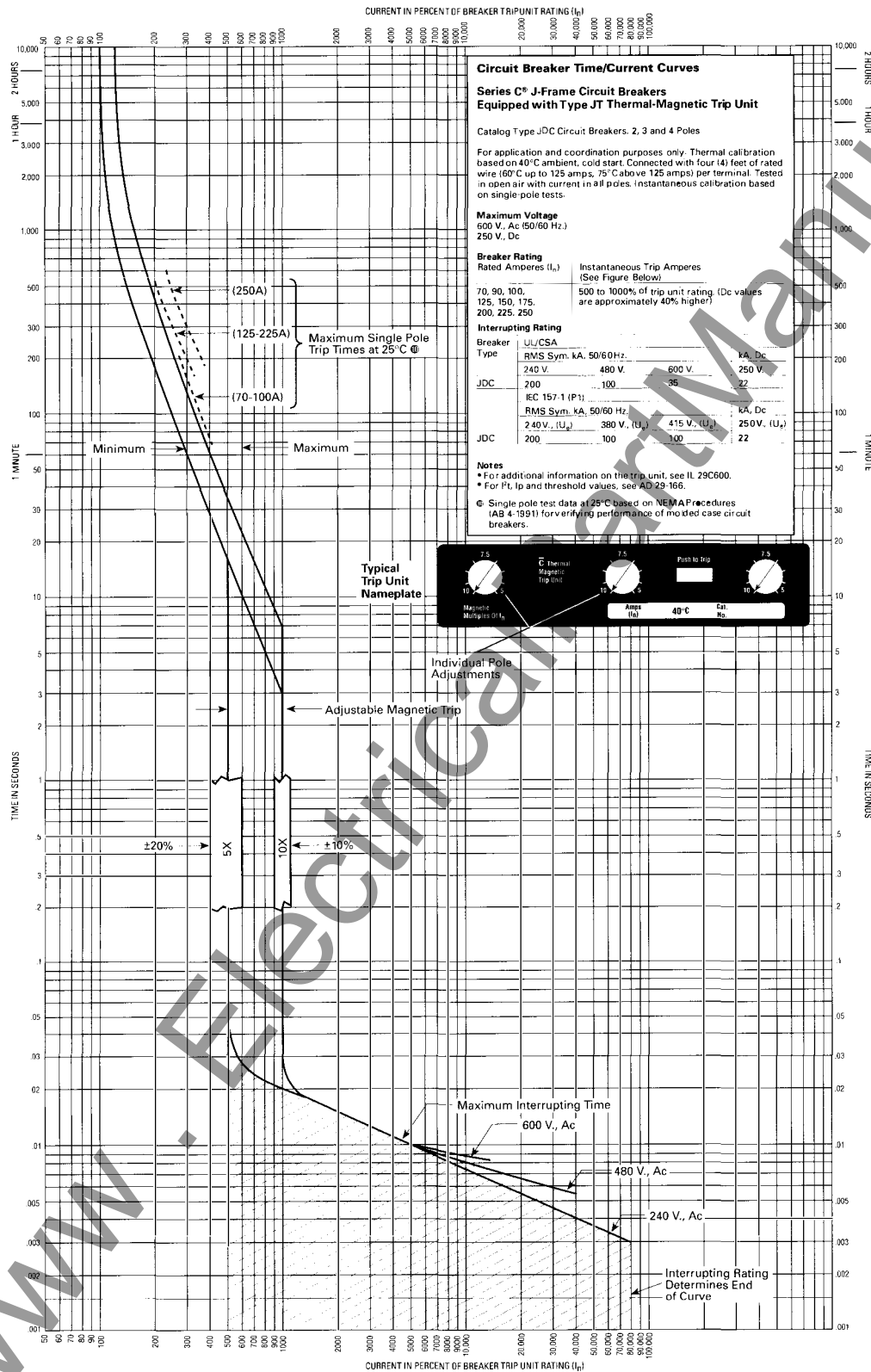
Series C Types JDB, JD, HJD Equipped With Type JT Thermal-Magnetic Trip Unit





AB DE-ION Circuit Breakers

Series C Type JDC Equipped With Type JT Thermal-Magnetic Trip Unit





AB DE-ION Circuit Breakers

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Pittsburgh, Pennsylvania, U.S.A. 15220



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Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167H

Page 1

May 1994
Supersedes Application Data 29-167E,
dated April 1993
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C• Types HMCP,
GMCP 63 Amperes and HMCP 150, 250,
400 and 600 Amperes Motor Circuit
Protectors

Westinghouse Motor Circuit Protector

Breaker Description	Curve No.	Page
Series C Type GMCP Motor Circuit Protector 63 Amperes	SC-5670-93	2
Series C Type HMCP Motor Circuit Protector 150 Amperes	SC-4121-87B	3
Series C Type HMCP Motor Circuit Protector 250 Amperes	SC-4419-88B	4
Series C Type HMCP Motor Circuit Protector 400 Amperes	SC-4420-88B	5
Series C Type HMCP Motor Circuit Protector 600 Amperes	SC-5373-93A	6

Additional copies of this application data may be ordered from the Westinghouse Printing Division, Trafford, PA 15085. Order Application Data 29-167H.

Individual oversize copies of curves listed above printed on onion-skin paper are available in limited quantity from:

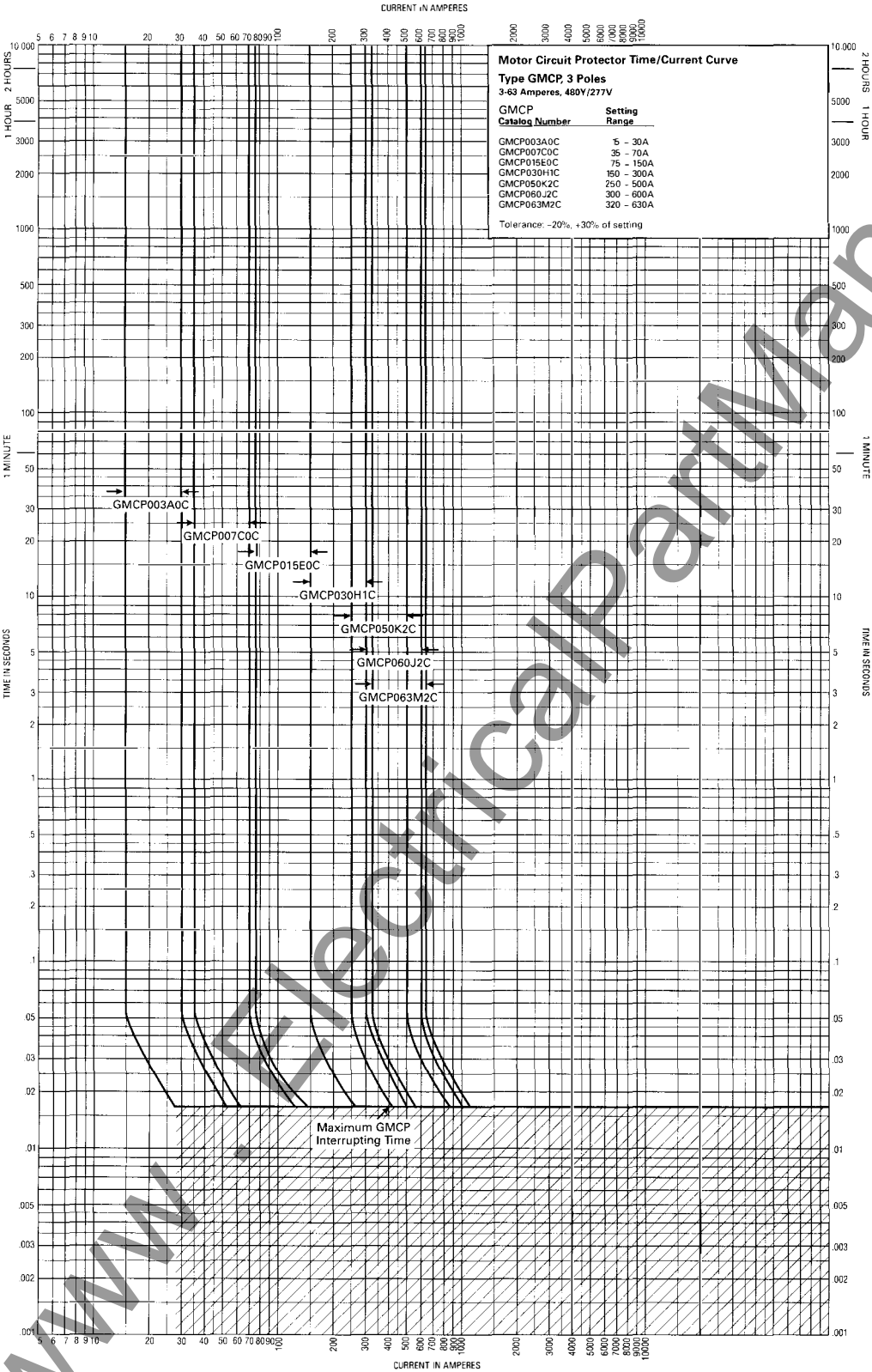
Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears, i.e., SC-5670-93. **Requests for full sets of curves will not be honored.**



Motor Circuit Protector

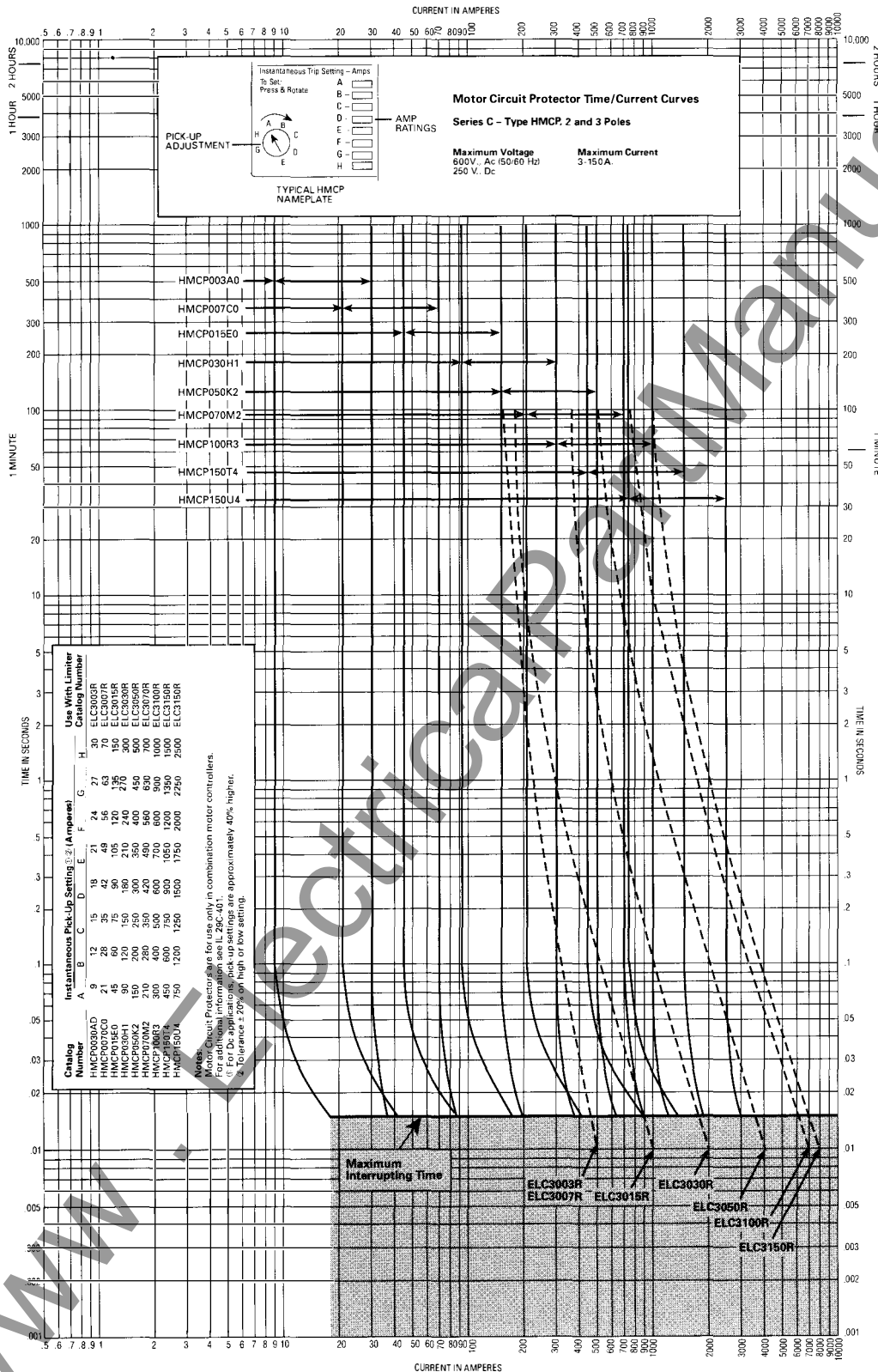
Type GMCP Motor Circuit Protector 63 Amperes



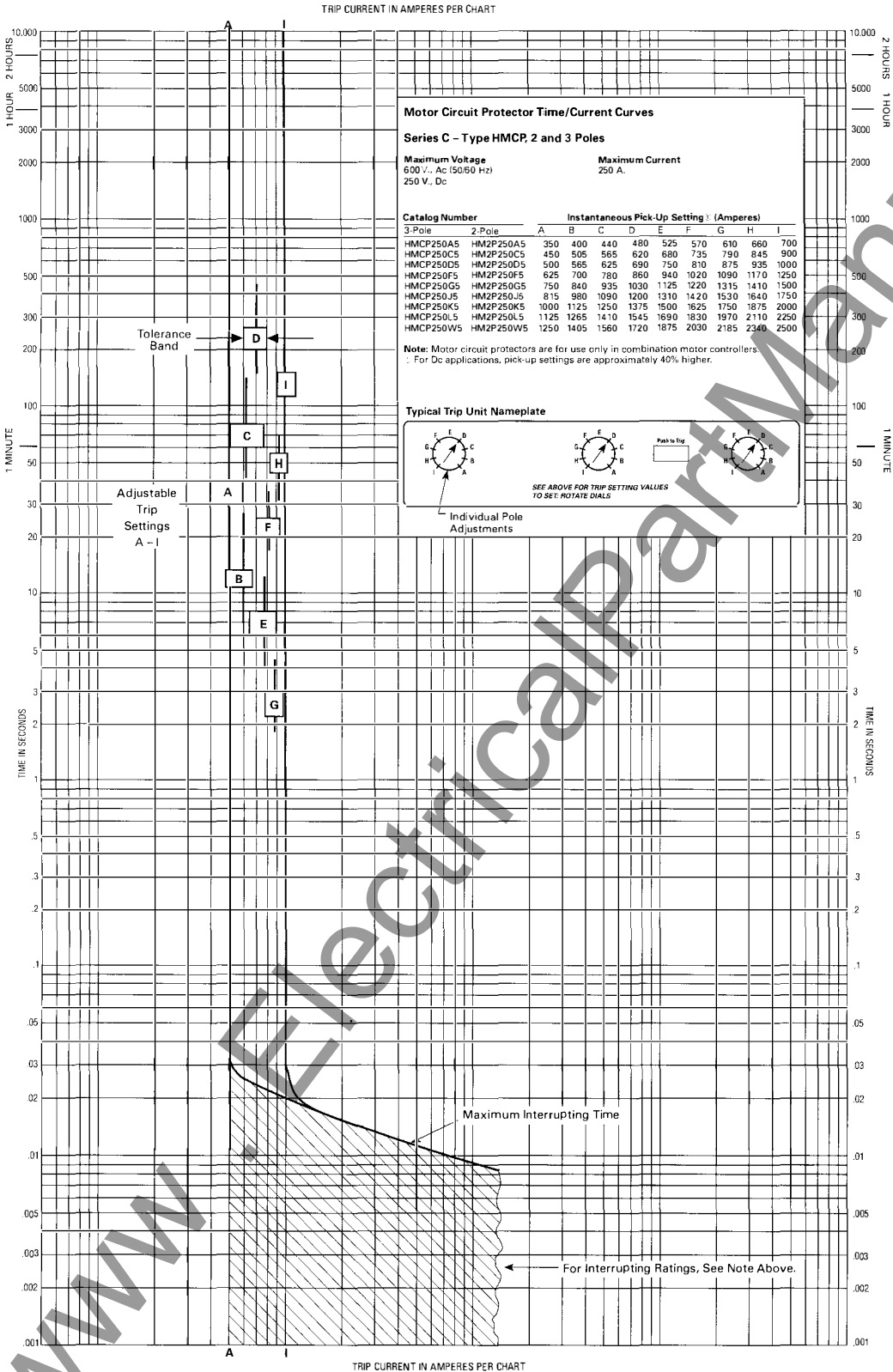


Motor Circuit Protector

Type HMCP Motor Circuit Protector 150 Amperes



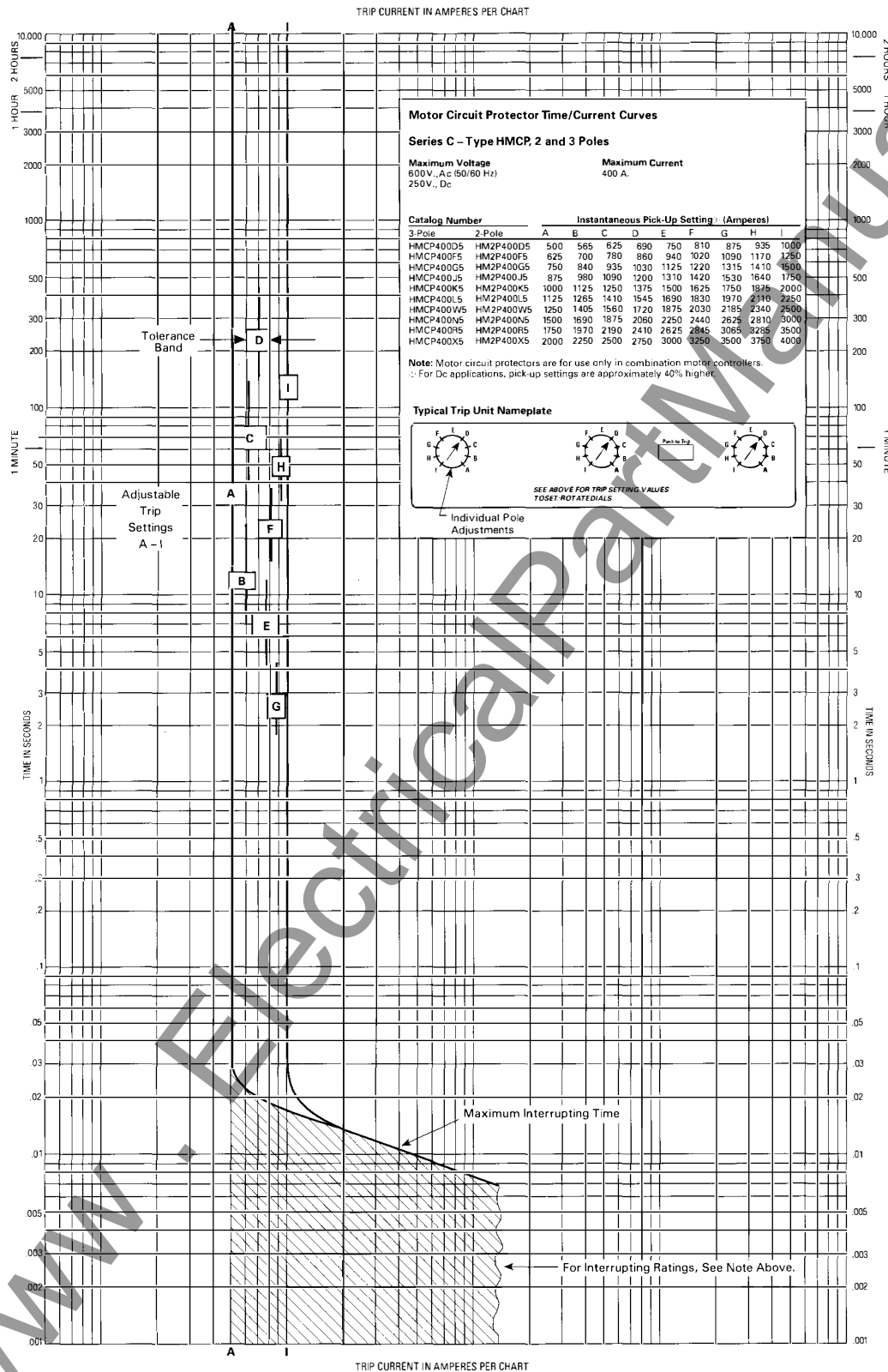
Motor Circuit Protector
Type HMCP Motor Circuit Protector 250 Amperes



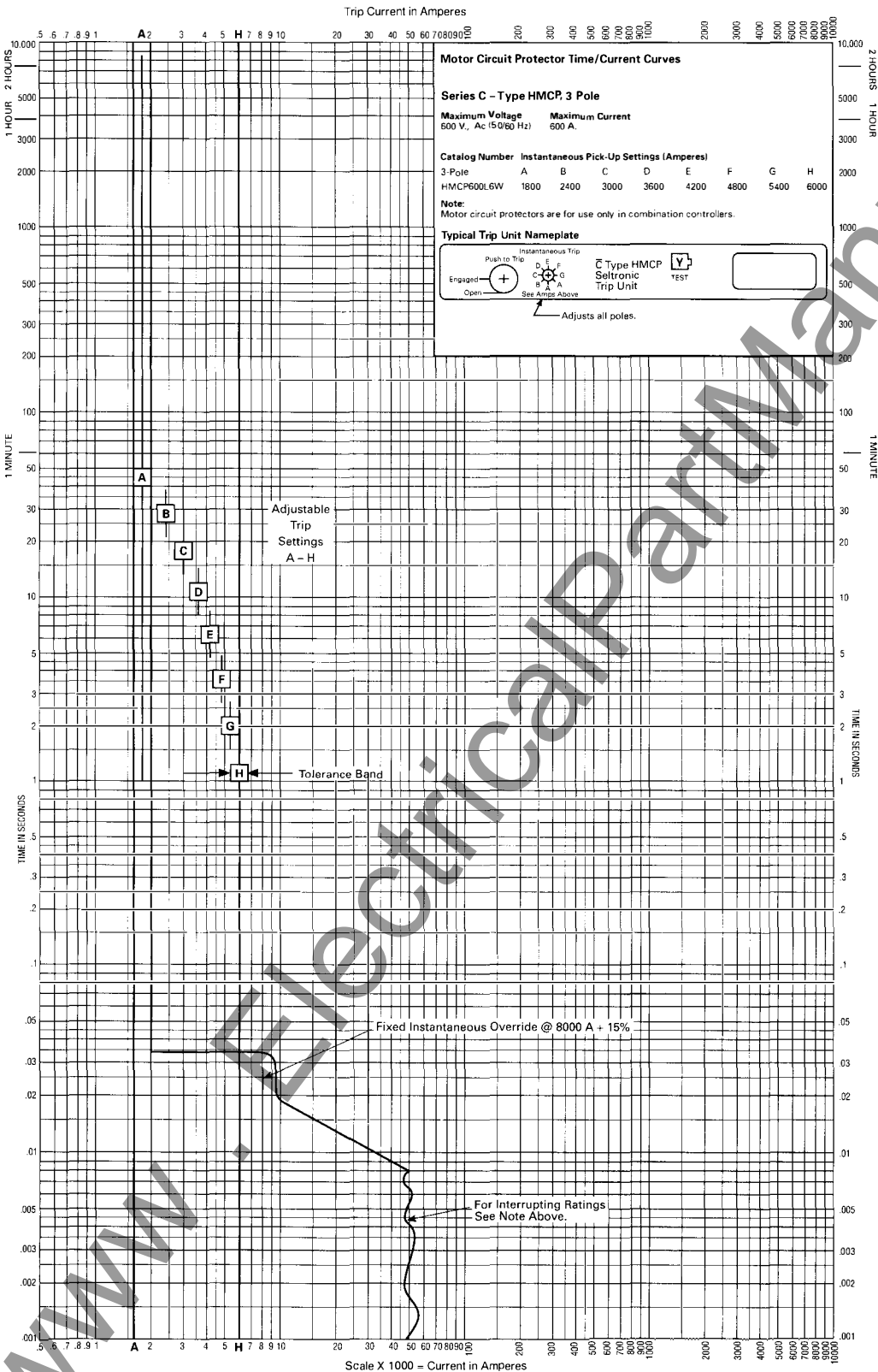


Motor Circuit Protector

Type HMCP Motor Circuit Protector 400 Amperes



Motor Circuit Protector
Type HMCP Motor Circuit Protector 600 Amperes





Motor Circuit Protector

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Motor Circuit Protector

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E•T•N



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Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167K

Page 1

May 1994
Supersedes Application Data 29-167,
dated March 1993, and Application Data
29-167C, dated September 1991
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® K-Frame
Circuit Breakers

Westinghouse AB DE-ION® Circuit Breakers

Breaker Description	Curve No.	Page
Series C Type DK Circuit Breakers	SC-4117-87B	2
Series C Types KDB, KD, HKD Circuit Breakers Equipped with Type KT Thermal-Magnetic Trip Unit	SC-4118-87B	3
Series C Type KDC Circuit Breakers Equipped with Type KT Thermal-Magnetic Trip Unit	SC-4119-87B	4
Series C Types KD, CKD, HKD, CHKD Circuit Breakers Equipped with Type KES Digitrip RMS 310 Trip Units		
Types KES3400LS, KES3400LSG	SC-5638-93	5
Types KES3400LSI, KES3400LSIG	SC-5639-93	6
Types KES3250LS, KES3250LSG	SC-5640-93	7
Types KES3250LSI, KES3250LSIG	SC-5641-93	8
Types KES3125LS, KES3125LSG	SC-5642-93	9
Types KES3125LSI, KES3125LSIG	SC-5643-93	10
Series C Type KDC Circuit Breakers Equipped with Type KES Digitrip RMS 310 Trip Units		
Types KES3400LS, KES3400LSG	SC-5644-93	11
Types KES3400LSI, KES3400LSIG	SC-5645-93	12
Types KES3250LS, KES3250LSG	SC-5646-93	13
Types KES3250LSI, KES3250LSIG	SC-5647-93	14
Types KES3125LS, KES3125LSG	SC-5648-93	15
Types KES3125LSI, KES3125LSIG	SC-5649-93	16
Ground Fault Protection (KES3400LSG, KES3400LSIG)①	SC-5650-93	17
Ground Fault Protection (KES3250LSG, KES3250LSIG)②	SC-5651-93	18
Ground Fault Protection (KES3125LSG, KES3125LSIG)③	SC-5652-93	19

① Use in conjunction with SC-5638-93, SC-5639-93, SC-5644-93, or SC-5645-93.

② Use in conjunction with SC-5640-93, SC-5641-93, SC-5646-93, or SC-5647-93.

③ Use in conjunction with SC-5642-93, SC-5643-93, SC-5648-93, or SC-5649-93.

Additional copies of this application data may be ordered from the Westinghouse Printing
Division, Trafford, PA 15085. Order Application Data 29-167K.

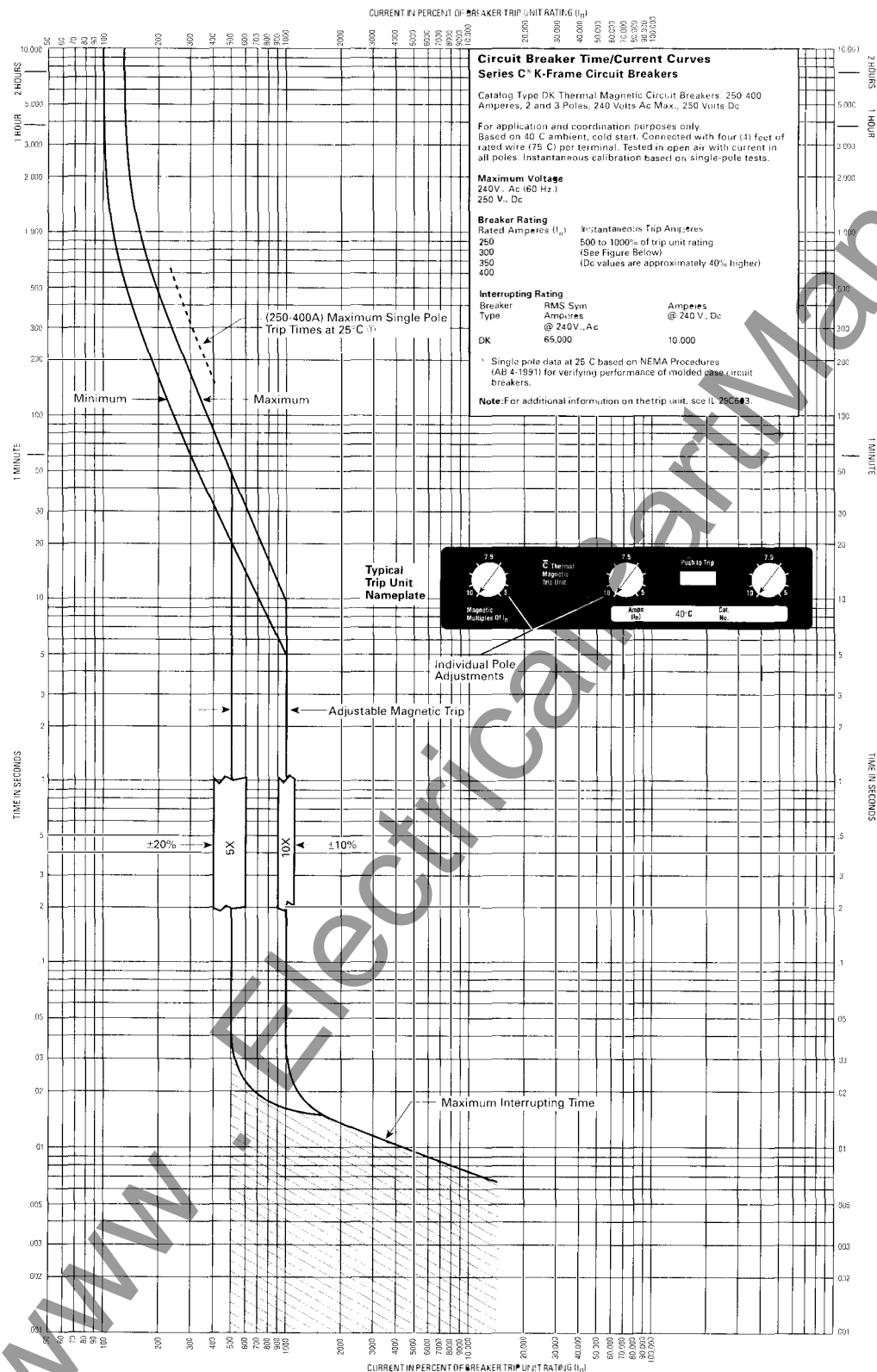
Individual oversize copies of curves listed above printed on onion-skin paper are available
in limited quantity from:

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears,
i.e., SC-4117-87B. **Requests for full sets of curves will not be honored.**

AB DE-ION Circuit Breakers

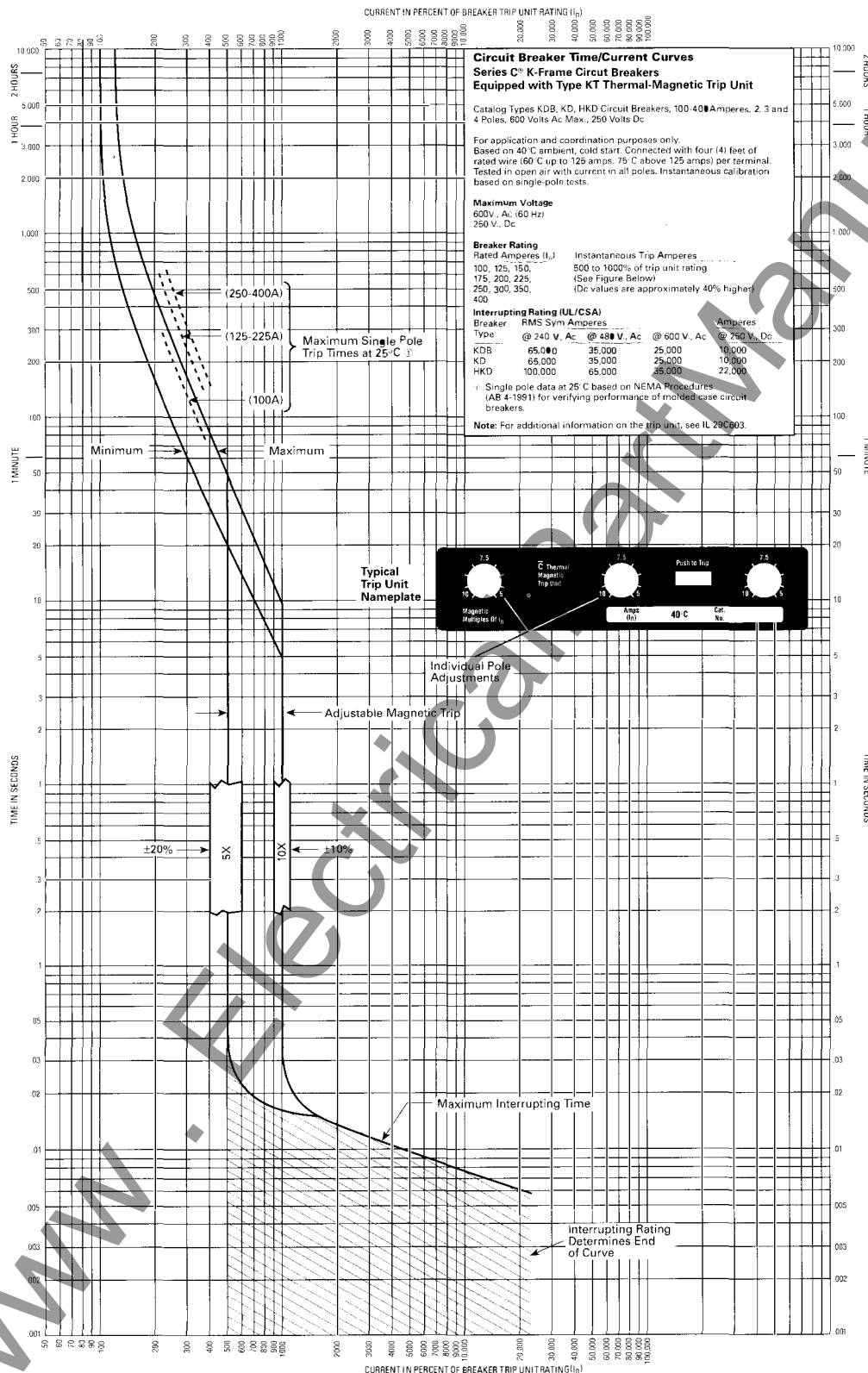
Type DK





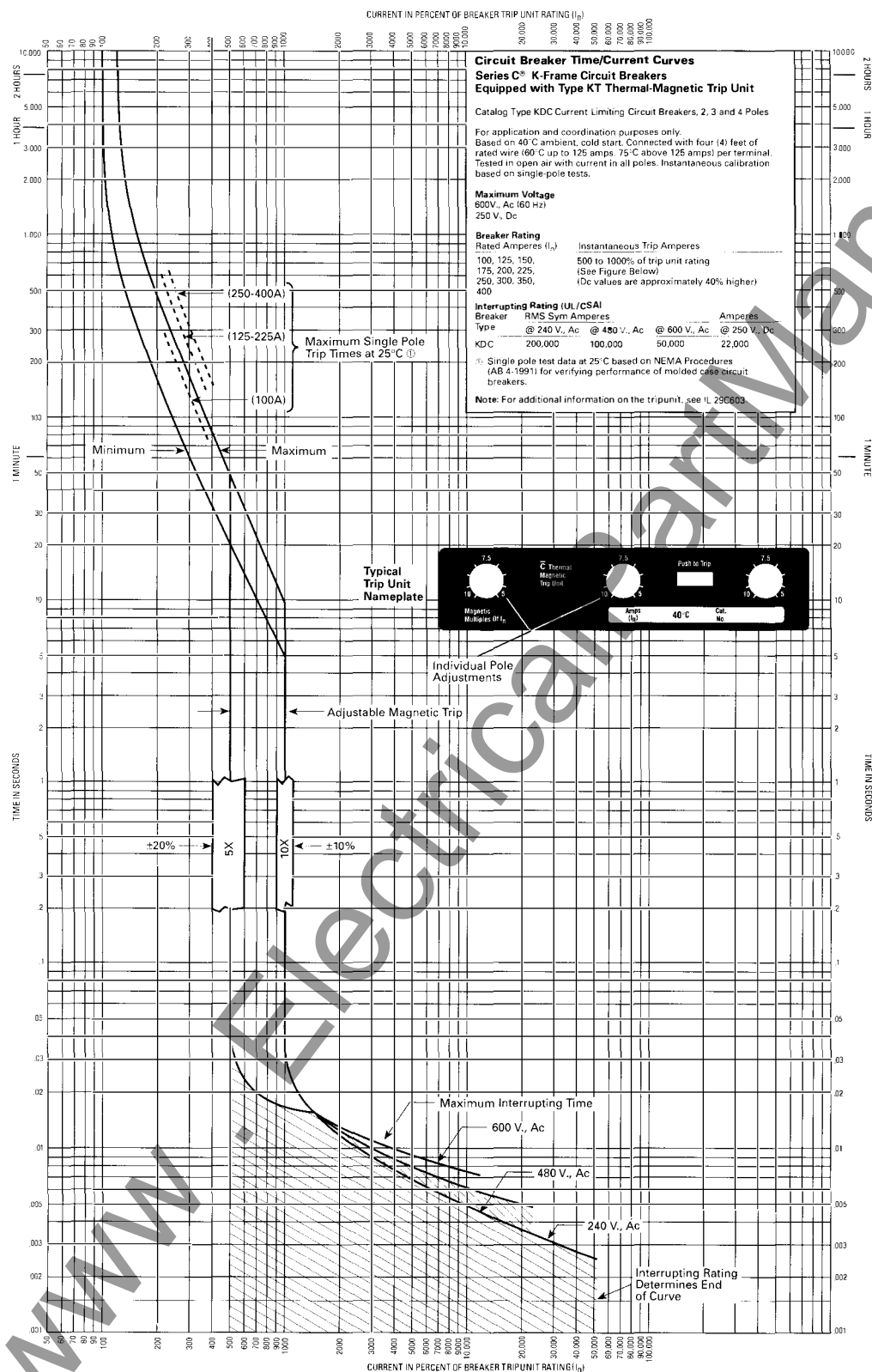
AB DE-ION Circuit Breakers

Types KDB, KD, HKD Equipped with Type KT Thermal-Magnetic Trip Unit





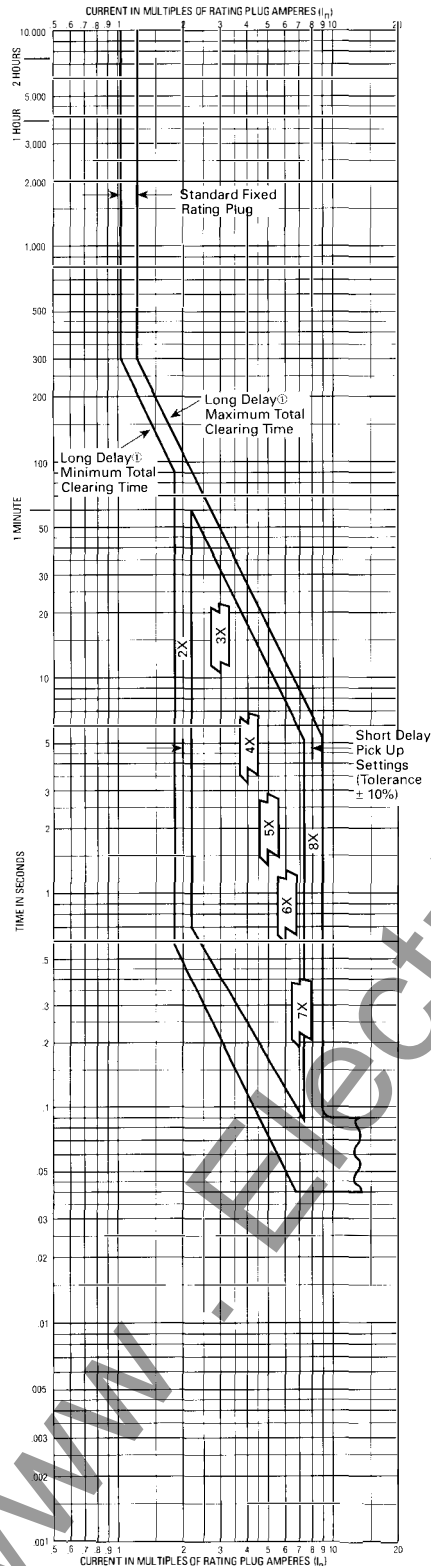
Type KDC Equipped with Type KT Thermal-Magnetic Trip Unit

**May 1994**



AB DE-ION Circuit Breakers

Types KD, CKD, HKD, CHKD Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3400LS, KES3400LSG

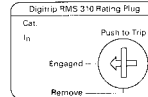


Circuit Breaker Time/Current Curves (Phase Current) 4/

Series C® K-Frame Circuit Breakers Equipped With Type KES Digitrip RMS 310 Trip Units

Catalog Types KES3400LS, KES3400LSG Digitrip RMS 310 Trip Units for use with Circuit Breaker Types KD, HKD, CKD, and CHKD, 400A, max.

Fixed Short Delay Time



Typical Trip Unit Nameplate



Available Rating Plugs

Ampere Rating (I_n)	Type	Catalog Number	Short Delay Pick-up Range Amperes
400	Fixed	4KES 400T	800-3200
350	Fixed	4KES 350T	700-2800
300	Fixed	4KES 300T	600-2400
250	Fixed	4KES 250T	500-2000
225	Fixed	4KES 225T	450-1800
200	Fixed	4KES 200T	400-1600
200, 250, 300, 400	Adjustable	A4KES 400T1	400-3200
250, 300, 350, 400	Adjustable	A4KES 400T3	500-3200

Interrupting Ratings - 50/60Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA 240V	480V	600V
KD, CKD	65	35	25
HKD, CHKD	100	65	35

Breaker Type	IEC 947-2 240V	380V	415V
KD, CKD	65	40	40
HKD, CHKD	100	65	65

Notes

1. Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

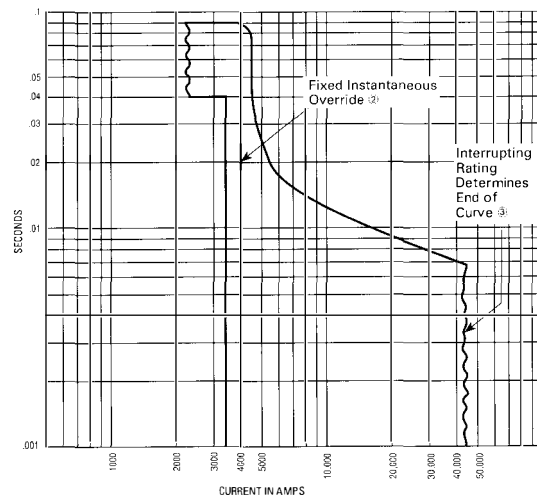
2. There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

3. Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

4. For high fault current levels a fixed instantaneous override is provided at 4000A. (Tolerance ±15%).

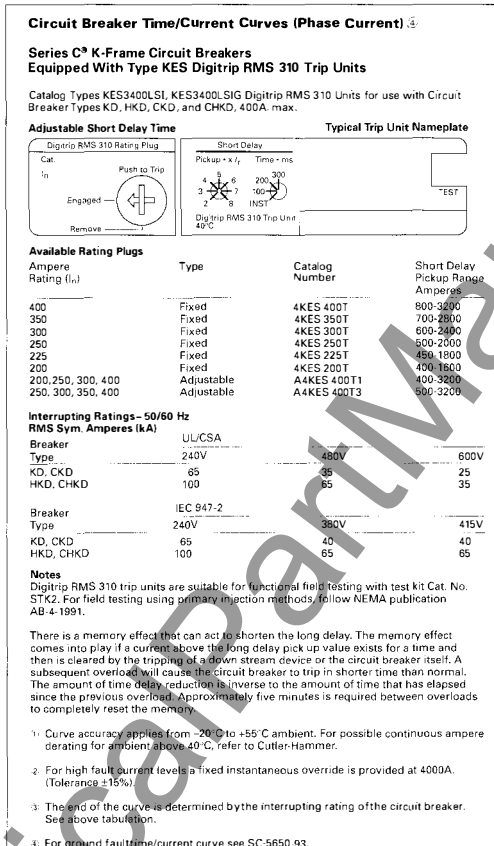
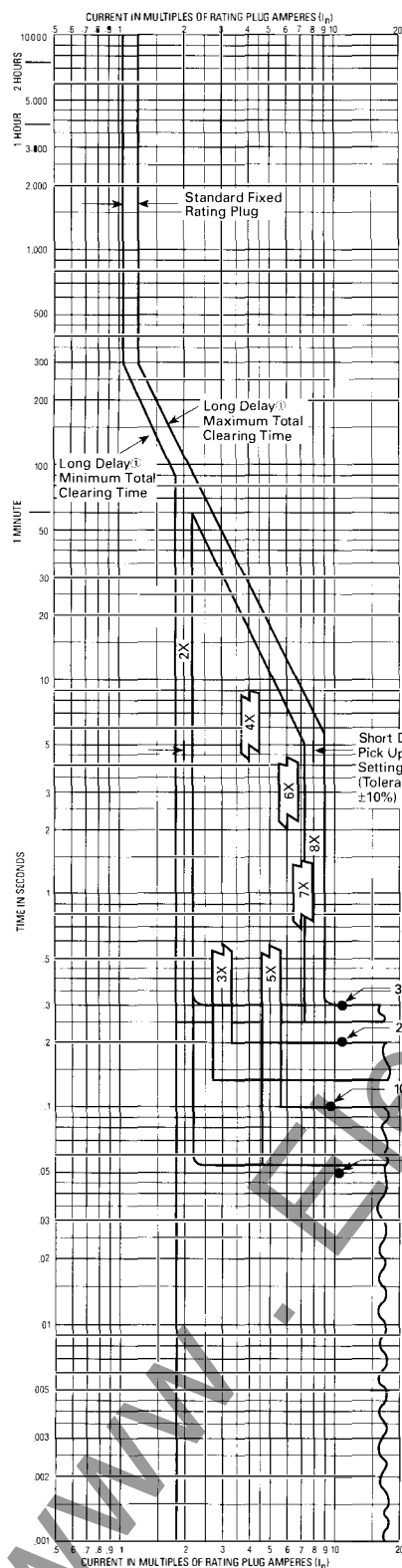
5. The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

6. For ground fault time/current curve see SC-5650-93.



AB DE-ION Circuit Breakers

Types KD, CKD, HKD, CHKD Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3400LSI, KES3400LSIG

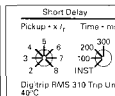
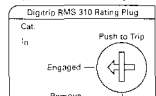


Circuit Breaker Time/Current Curves (Phase Current)

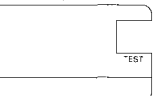
Series C³ K-Frame Circuit Breakers Equipped With Type KES Digitrip RMS 310 Trip Units

Catalog Types KES3400LSI, KES3400LSIG Digitrip RMS 310 Units for use with Circuit Breaker Types KD, HKD, CKD, and CHKD, 400A. max.

Adjustable Short Delay Time



Typical Trip Unit Nameplate



Available Rating Plugs

Ampere Rating (I_p)	Type	Catalog Number	Short Delay Pickup Range Amperes
400	Fixed	4KES 400T	800-3200
350	Fixed	4KES 350T	700-2800
300	Fixed	4KES 300T	600-2400
250	Fixed	4KES 250T	500-2000
225	Fixed	4KES 225T	450-1800
200	Fixed	4KES 200T	400-1600
200, 250, 300, 400	Adjustable	A4KES 400T1	400-3200
250, 300, 350, 400	Adjustable	A4KES 400T3	500-3200

Interrupting Ratings—50/60 Hz RMS Sym. Amperes (kA)

Breaker	UL/CSA	480V	600V
Type	240V	480V	600V
KD, CKD	65	35	25
HKD, CHKD	100	65	35

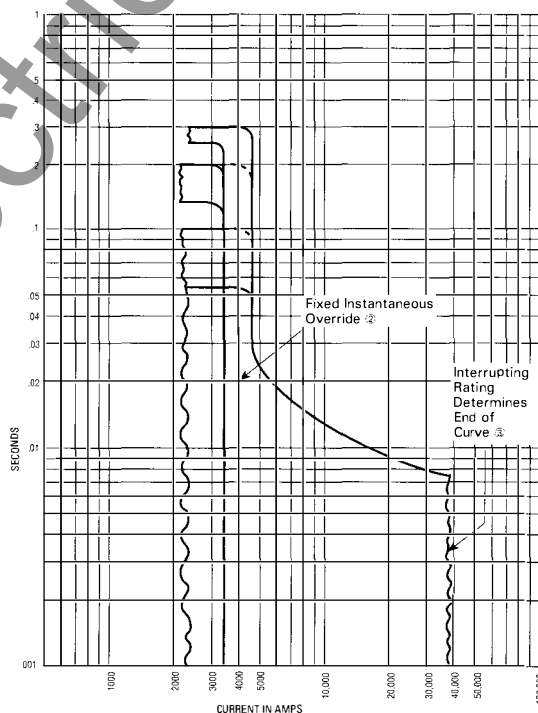
Breaker	IEC 947-2	380V	415V
Type	240V	380V	415V
KD, CKD	65	40	40
HKD, CHKD	100	65	65

Notes

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

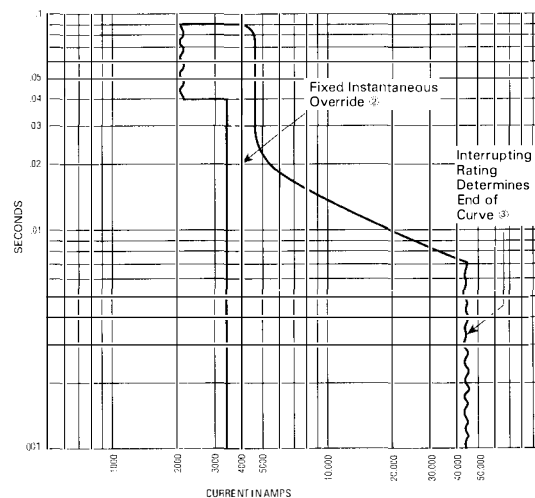
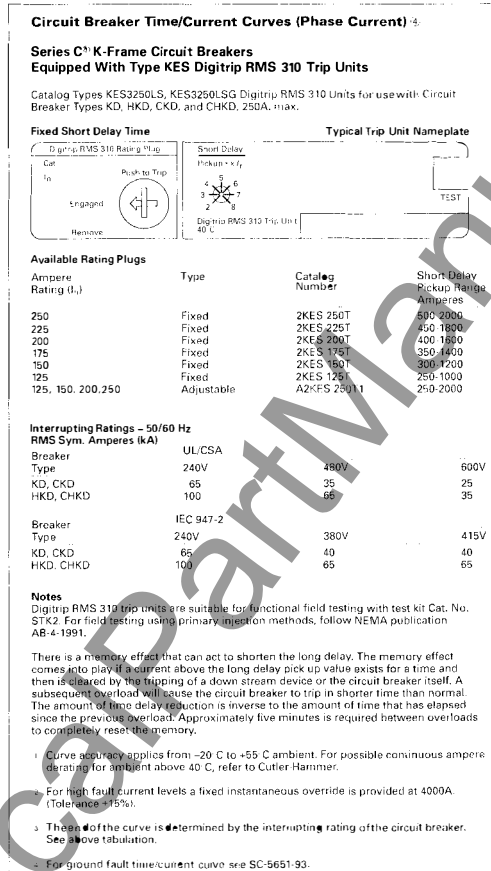
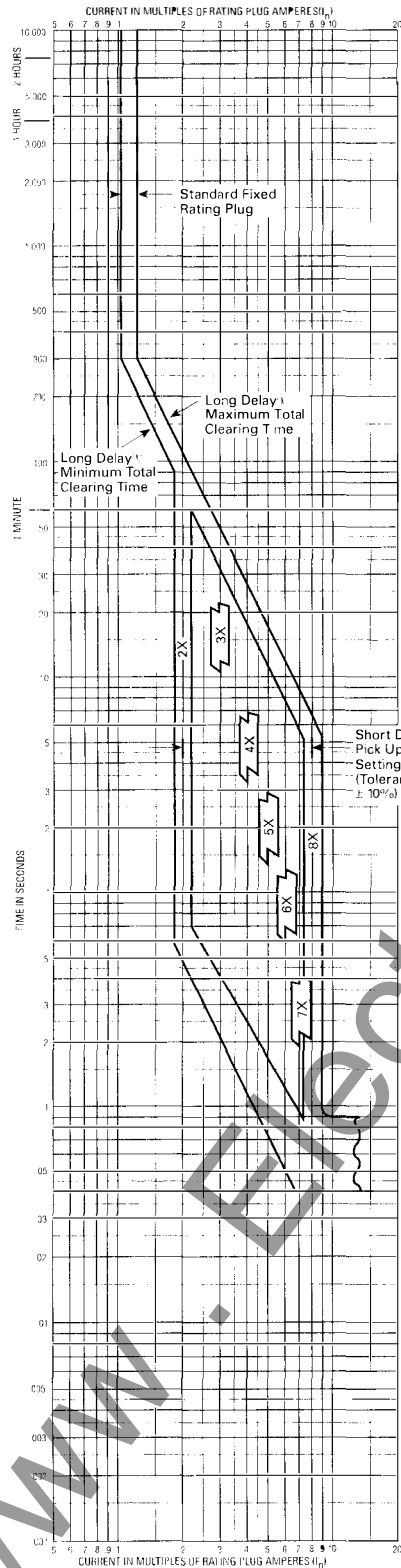
- Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.
- For high fault current levels a fixed instantaneous override is provided at 4000A. (Tolerance $\pm 15\%$).
- The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.
- For ground fault time/current curve see SC-5650 93.





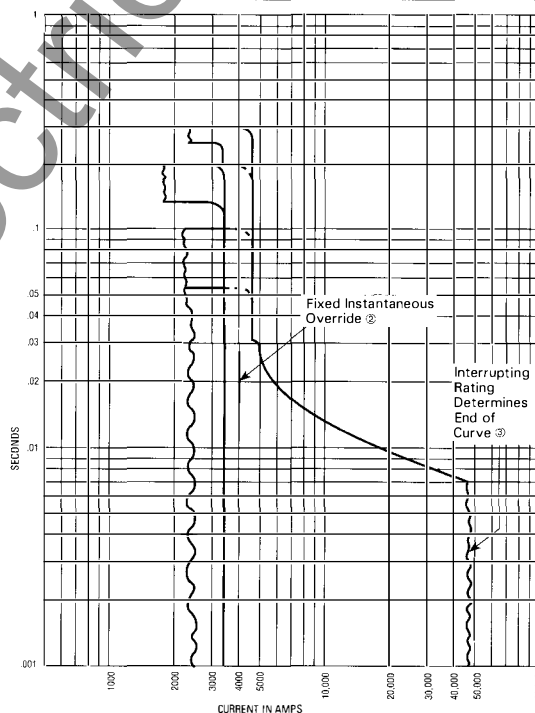
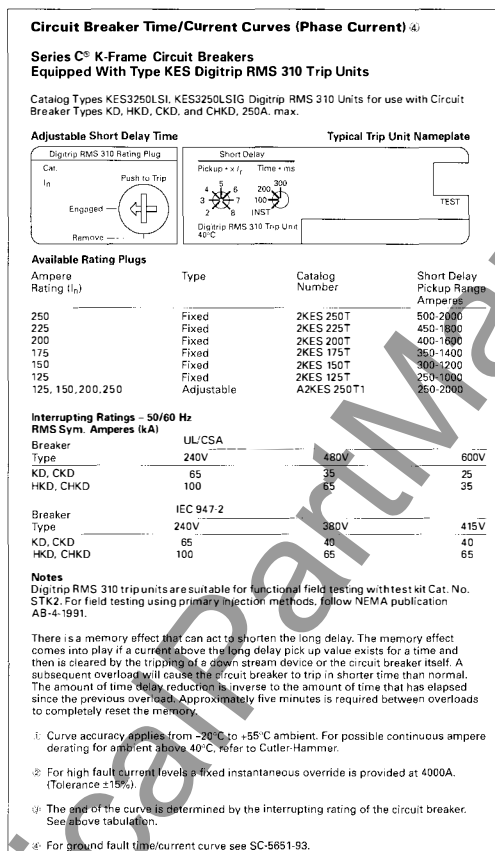
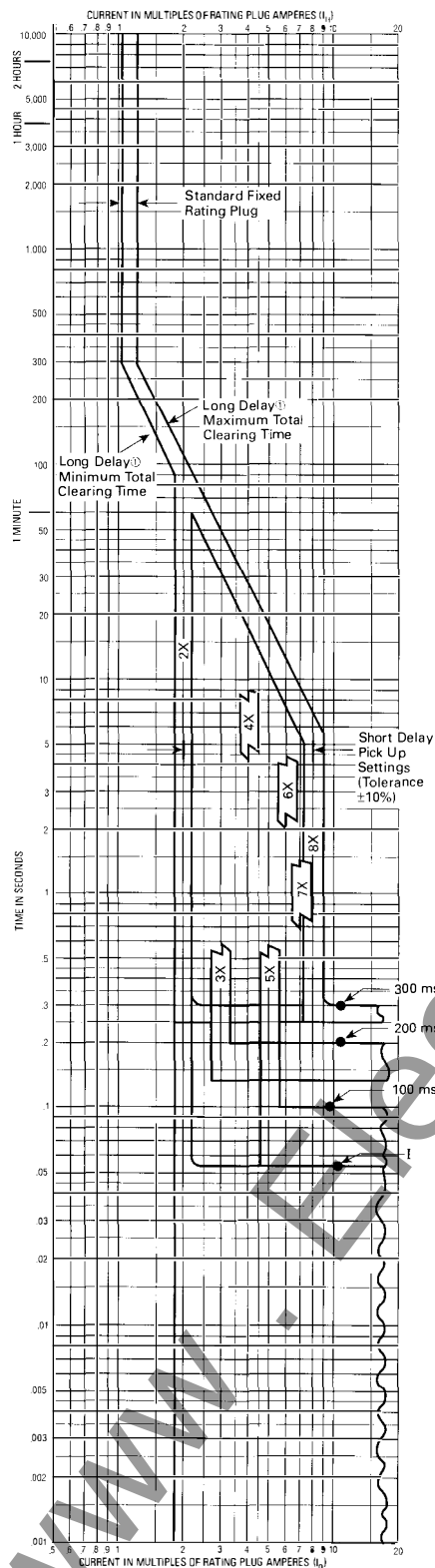
AB DE-ION Circuit Breakers

Types KD, CKD, HKD, CHKD Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3250LS, KES3250LSG





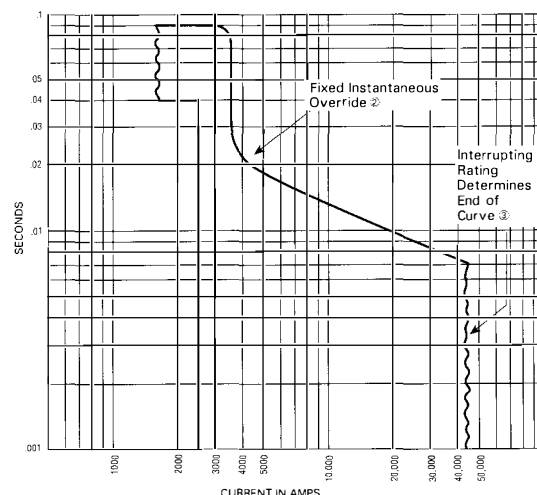
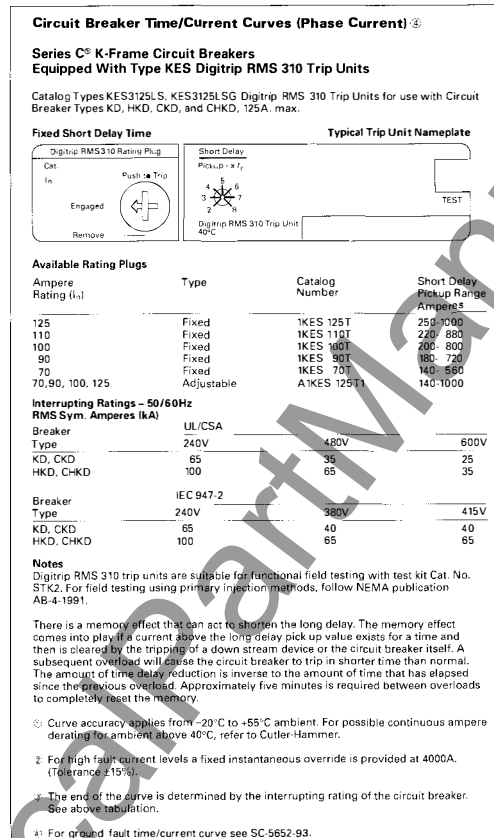
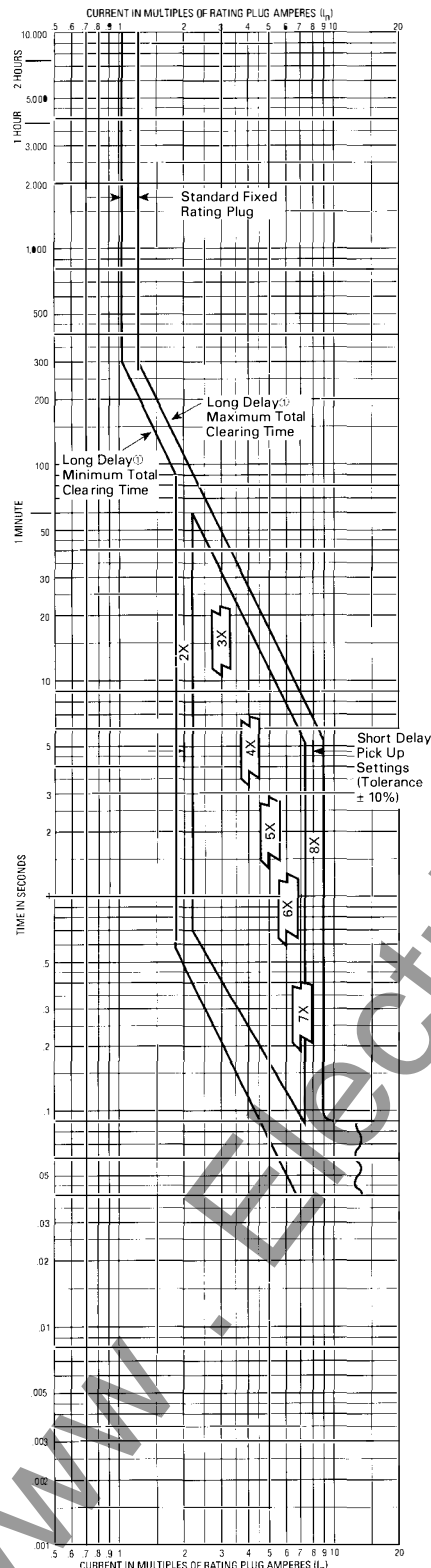
Types KD, CKD, HKD, CHKD Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3250LSI, KES3250LSIG





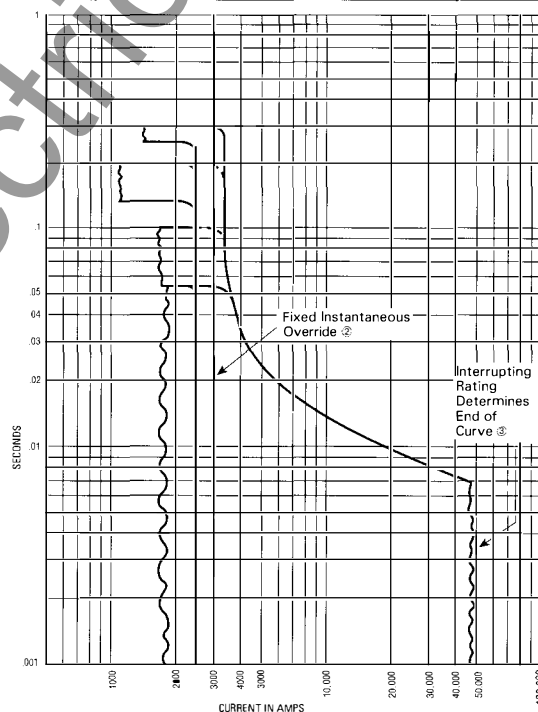
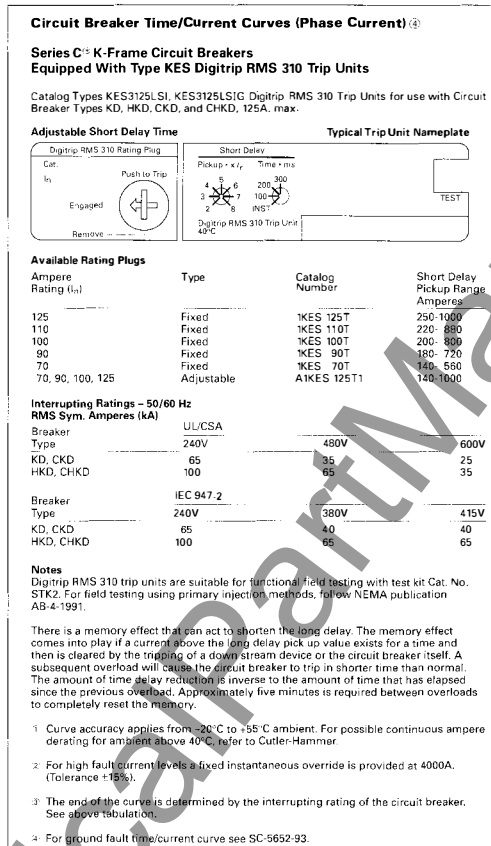
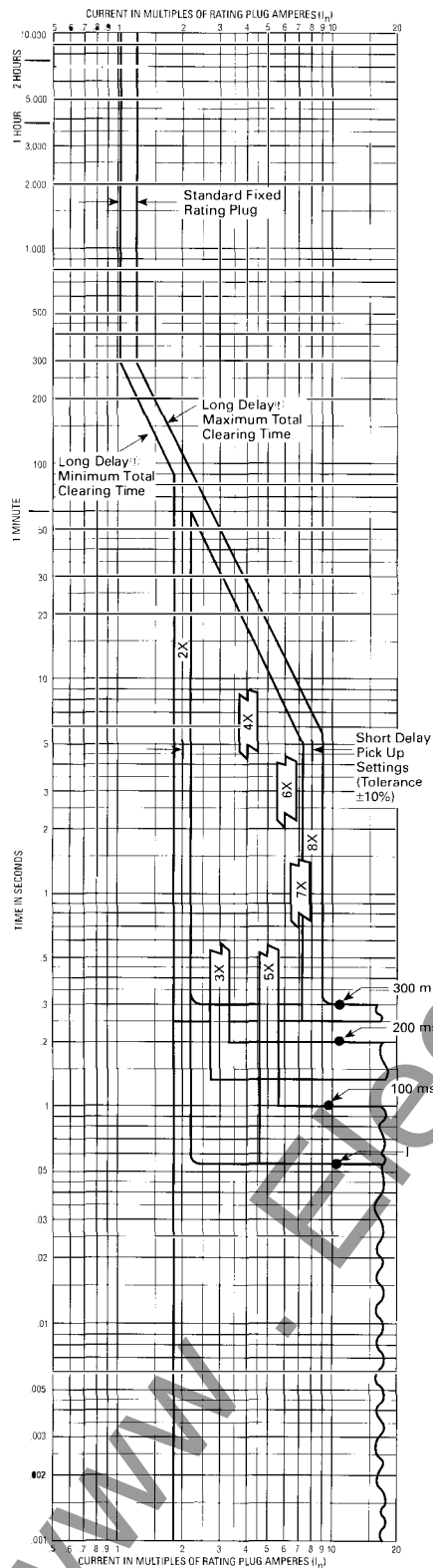
AB DE-ION Circuit Breakers

Types KD, CKD, HKD, CHKD Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3125LS, KES3125LSG



AB DE-ION Circuit Breakers

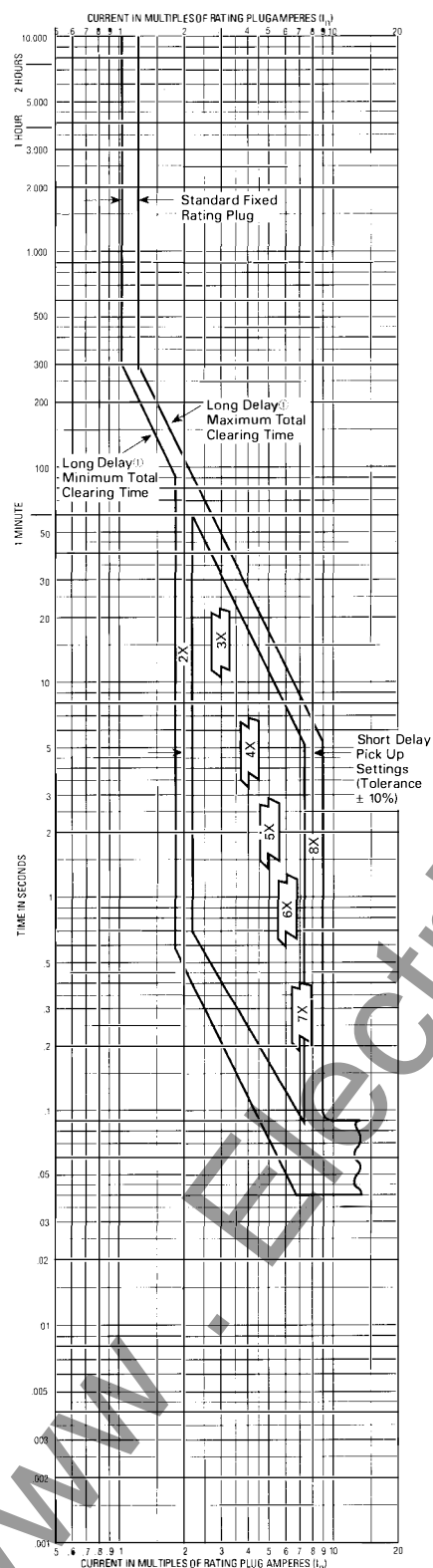
Types KD, CKD, HKD, CHKD Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3125LSI, KES3125LSIG





AB DE-ION Circuit Breakers

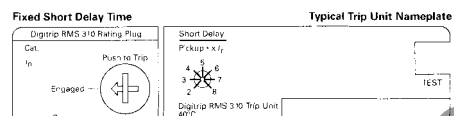
Type KDC Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3400LS, KES3400LSG



Circuit Breaker Time/Current Curves (Phase Current) ④

Series C® K-Frame Circuit Breakers
Equipped With Type KES Digitrip RMS 310 Trip Units

Catalog Types KES3400LS, KES3400LSG Digitrip RMS 310 Trip Units for use with Circuit Breaker Type KDC, 400A max.



Available Rating Plugs			
Ampere Rating (I _n)	Type	Catalog Number	Short Delay Pickup Range Amperes
400	Fixed	4KES 400T	800-3200
350	Fixed	4KES 350T	700-2800
300	Fixed	4KES 300T	600-2400
250	Fixed	4KES 250T	500-2000
225	Fixed	4KES 225T	450-1800
200	Fixed	4KES 200T	400-1600
200, 250, 300, 400	Adjustable	A4KES 400T1	400-3200
250, 300, 350, 400	Adjustable	A4KES 400T3	500-3200

Interrupting Ratings - 50/60 Hz

RMS Sym. Amperes (kA)			
Breaker	UL/CSA	480V	600V
Type	240V	100	50
KDC	200	100	50

IEC 947-2			
Breaker	240V	380V	415V
Type	200	100	100
KDC	200	100	100

Notes

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

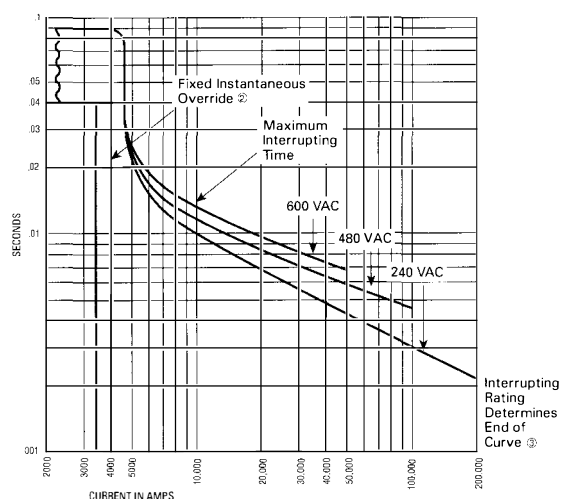
There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

① Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

② For high fault current levels a fixed instantaneous override is provided at 4000A. (Tolerance ±15%.)

③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

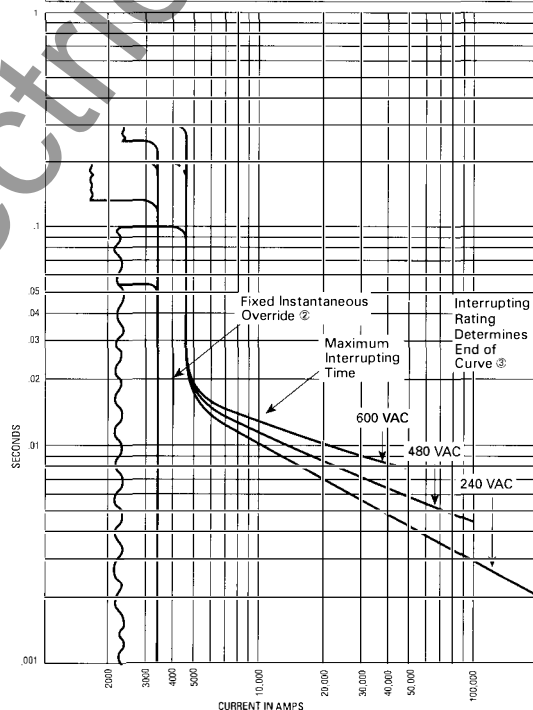
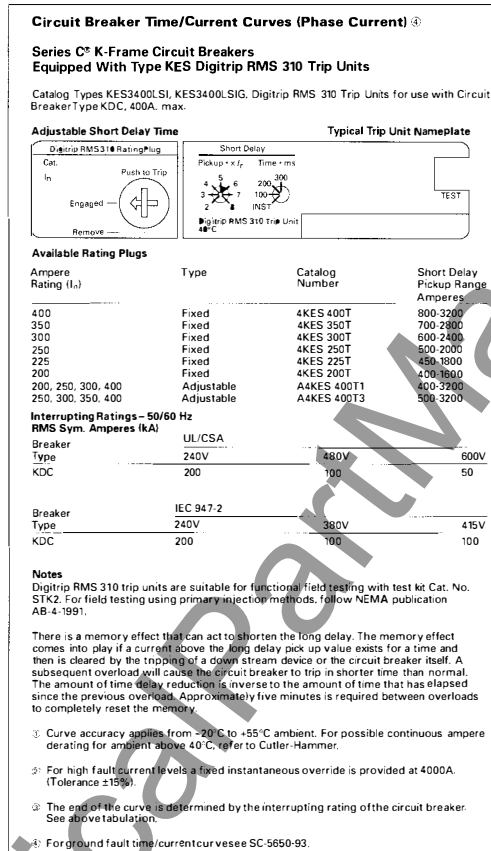
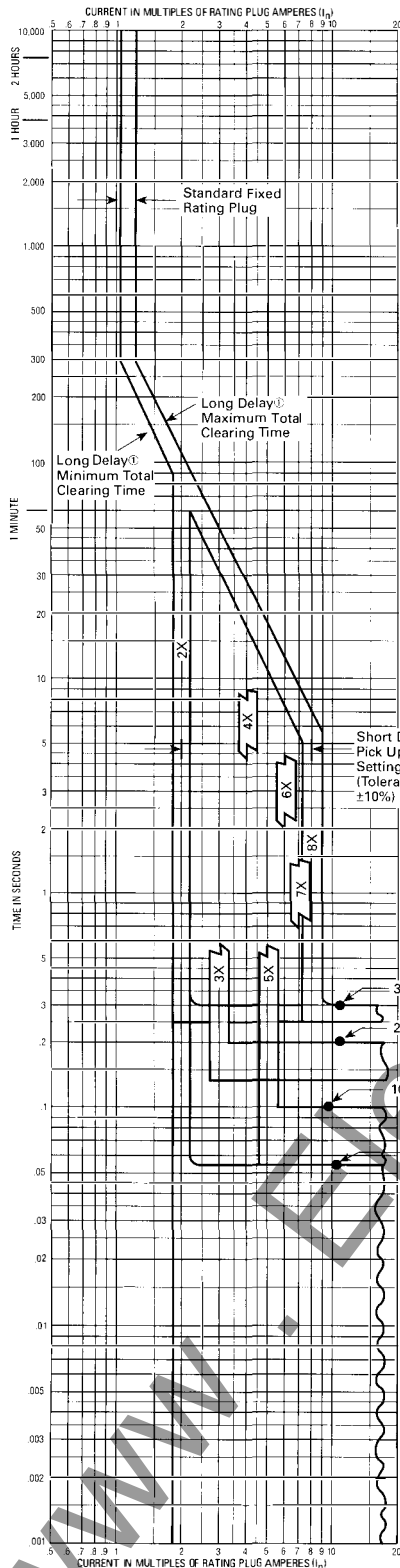
④ For ground fault time/current curve see SC-5650-93.





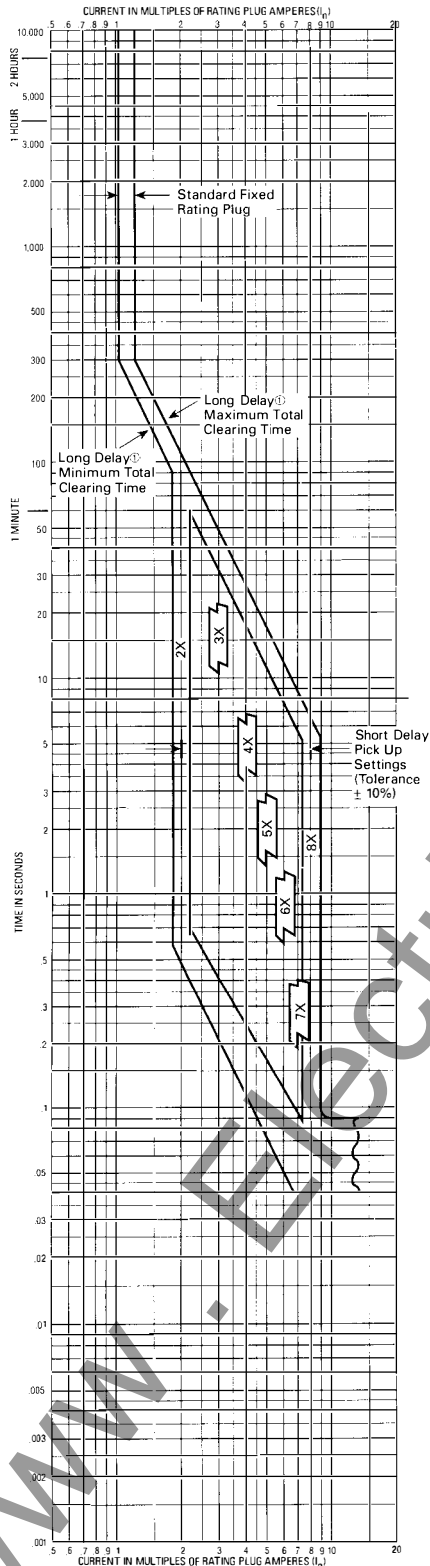
AB DE-ION Circuit Breakers

Type KDC Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3400LSI, KES3400LSIG





AB DE-ION Circuit Breakers

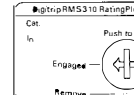
Type KDC Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3250LS,
KES3250LSG

Circuit Breaker Time/Current Curves (Phase Current) ④

Series C® K-Frame Circuit Breakers
Equipped With Type KES Digitrip RMS 310 Trip Units

Catalog Types KES3250LS, KES3250LSG Digitrip RMS 310 Units for use with Circuit Breaker Type KDC, 250A. max.

Fixed Short Delay Time



Short Delay



Typical Trip Unit Nameplate



Available Rating Plugs

Ampere Rating (I _n)	Type	Catalog Number	Short Delay Pickup Range Amperes
250	Fixed	2KES 250T	500-2000
225	Fixed	2KES 225T	450-1800
200	Fixed	2KES 200T	400-1600
175	Fixed	2KES 175T	350-1400
150	Fixed	2KES 150T	300-1200
125	Fixed	2KES 125T	250-1000
125, 150, 200, 250	Adjustable	A2KES 250T1	250-2000

Interrupting Ratings - 50/60Hz
RMS Sym. Amperes (kA)

Breaker Type	UL/CSA	480V	600V
KDC	200	100	50

Breaker Type	IEC 947-2	380V	415V
KDC	200	100	100

Notes

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

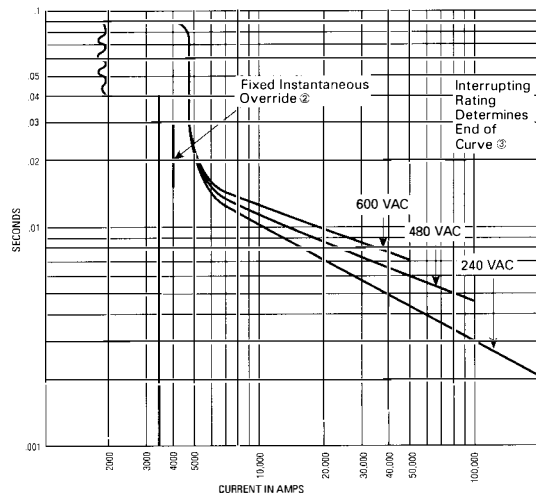
There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

① Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

② For high fault current levels a fixed instantaneous override is provided at 4000A. (Tolerance ±15%).

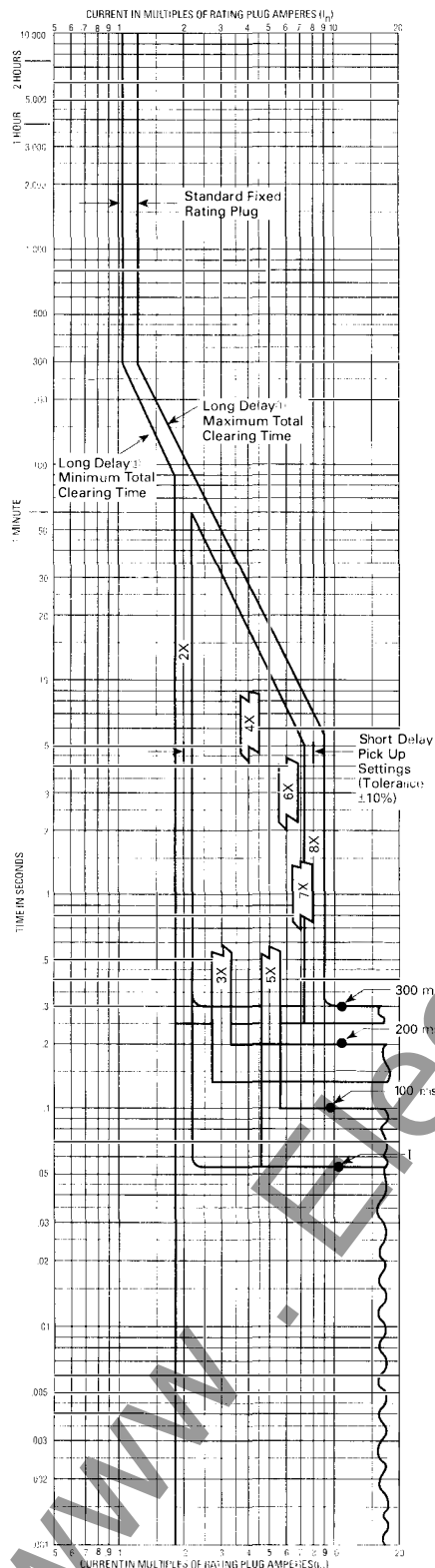
③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

* For ground fault time/current curve see SC-5651-93.



AB DE-ION Circuit Breakers

Type KDC Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3250LSI, KES3250LSIG

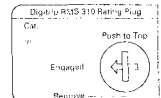


Circuit Breaker Time/Current Curves (Phase Current)

Series C K-Frame Circuit Breakers Equipped With Type KES Digitrip RMS 310 Units

Catalog Types KES3250LSI, KES3250LSIG Digitrip RMS 310 Trip Units for use with Circuit Breaker Type KDC, 250A, max.

Adjustable Short Delay Time



Typical Trip Unit Nameplate



Available Rating Plugs

Ampere Rating (I _a)	Type	Catalog Number	Short Delay Pickup Range Amperes
250	Fixed	2KES 250T	500-2600
225	Fixed	2KES 225T	450-1800
200	Fixed	2KES 200T	400-1600
175	Fixed	2KES 175T	350-1400
150	Fixed	2KES 150T	300-1200
125	Fixed	2KES 125T	250-1000
125, 150, 200, 250	Adjustable	A2KES 250T1	250-2300

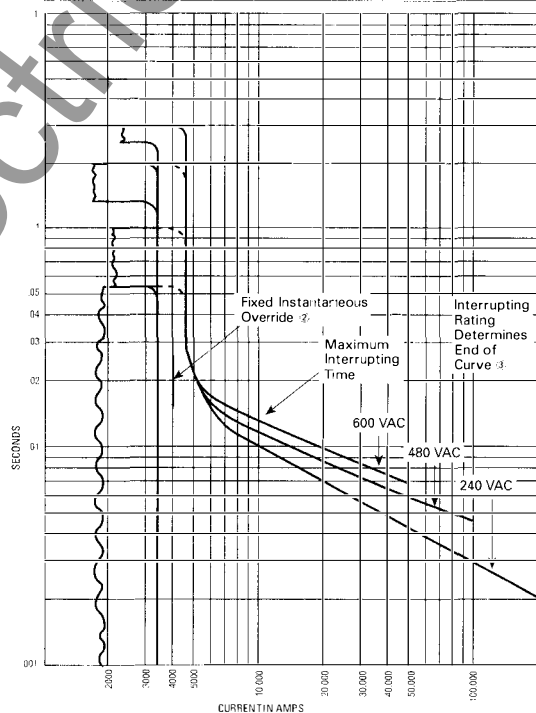
Interrupting Ratings - 50/60 Hz

RMS Sym. Amperes (kA)	UL/CSA	480V	600V
Breaker Type	240V	100	50
KDC	200	100	50

IEC 947-2	240V	415V
Breaker Type	240V	100
KDC	200	100

Notes

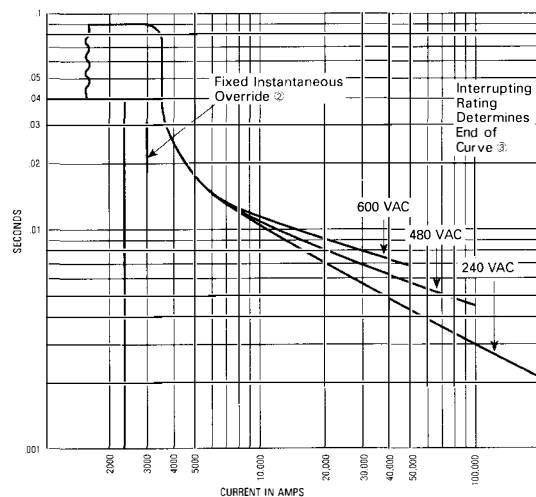
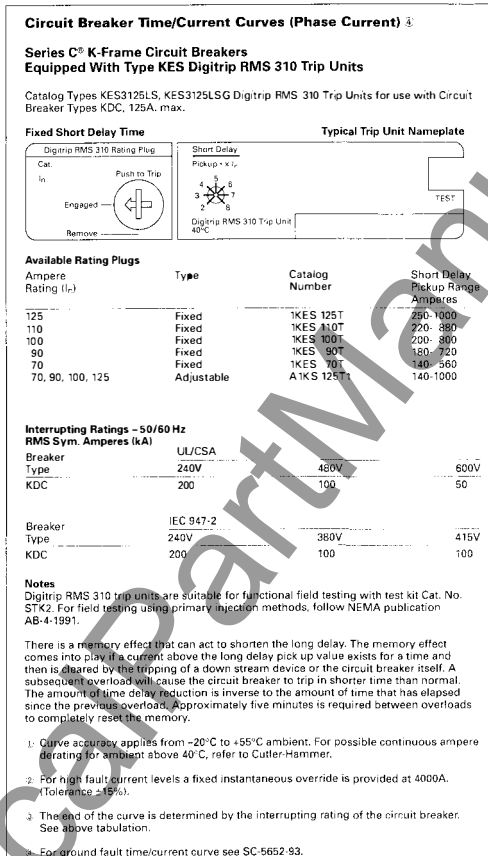
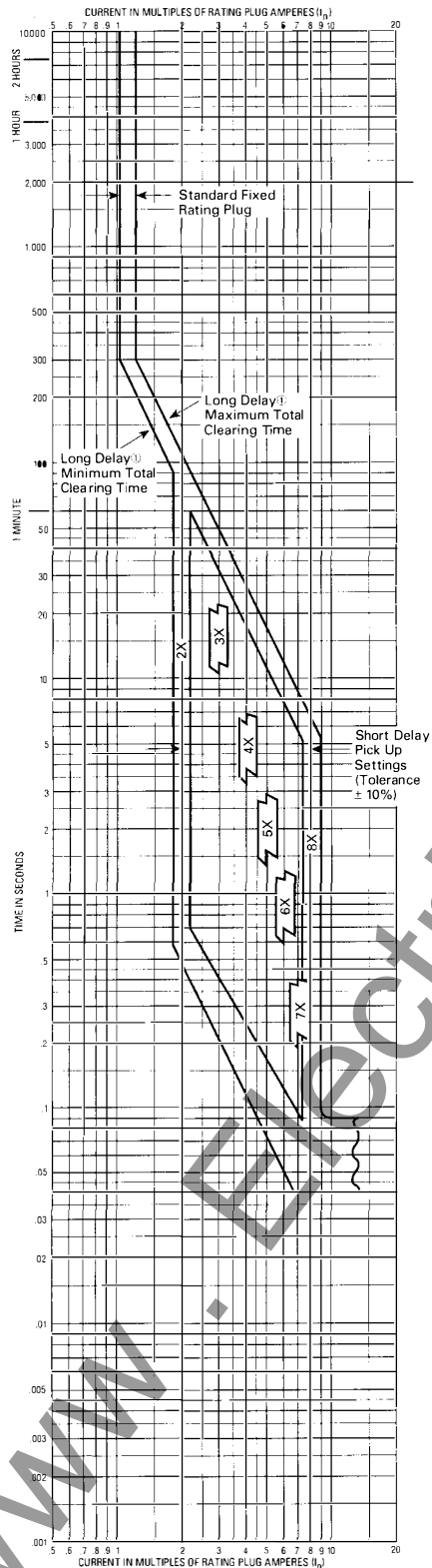
- Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.
- There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.
- Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler Hammer.
- For high fault current levels a fixed instantaneous override is provided at 4000A. (Tolerance ±15%.)
- The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.
- For ground fault time/current curve see SC-5651-93.





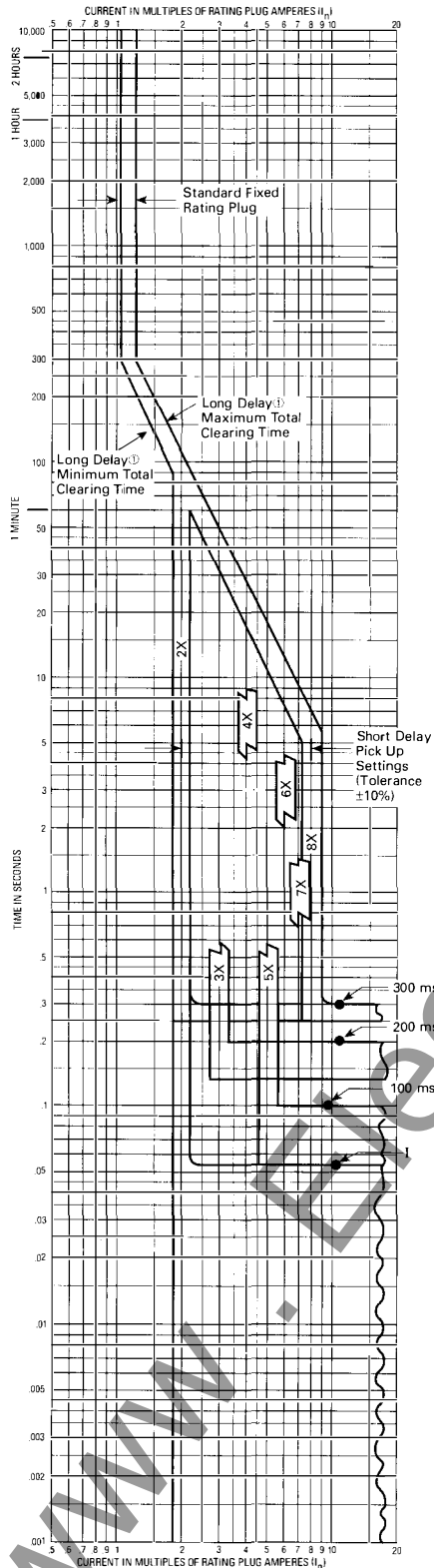
AB DE-ION Circuit Breakers

Type KDC Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3125LS, KES3125LSG



AB DE-ION Circuit Breakers

Type KDC Equipped with Type KES Digitrip RMS 310 Trip Units, Types KES3125LSI, KES3125LSIG

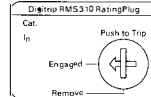


Circuit Breaker Time/Current Curves (Phase Current) ①

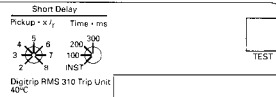
Series C[®] K-Frame Circuit Breakers
Equipped With Type KES Digitrip RMS 310 Trip Units

Catalog Types KES3125LSI, KES3125LSIG Digitrip RMS 310 Trip Units for use with Circuit Breaker Type KDC, 125A, max.

Adjustable Short Delay Time



Typical Unit Nameplate



Available Rating Plugs

Ampere Rating (I _n)	Type	Catalog Number	Short Delay Pickup Range Amperes
125	Fixed	1KES 125T	250-1000
110	Fixed	1KES 110T	220-880
100	Fixed	1KES 100T	200-800
90	Fixed	1KES 90T	180-720
70	Fixed	1KES 70T	140-560
70, 90, 100, 125	Adjustable	AKES 125T1	140-1000

Interrupting Ratings - 50/60 Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA	480V	600V
KDC	240V	100	50
	200	100	50

Breaker Type	IEC 947-2	380V	415V
KDC	240V	100	100
	200	100	100

Notes

① Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1891.

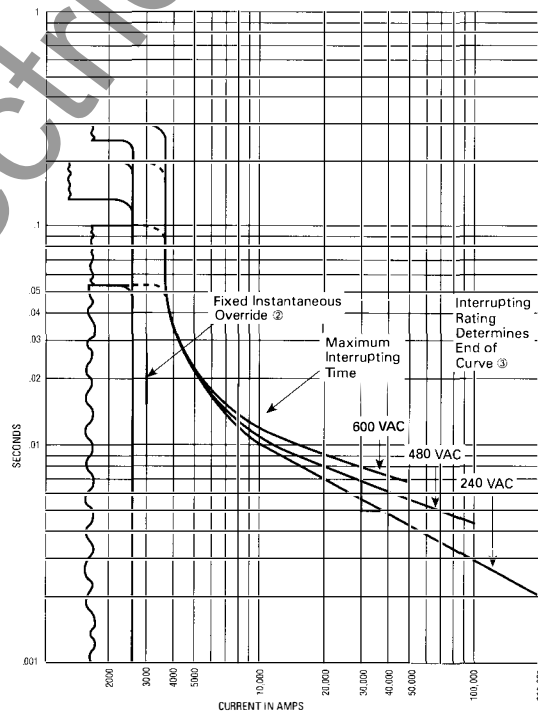
There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

② Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

③ For high fault current levels, a fixed instantaneous override is provided at 4000A. (Tolerance ±15%.)

④ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

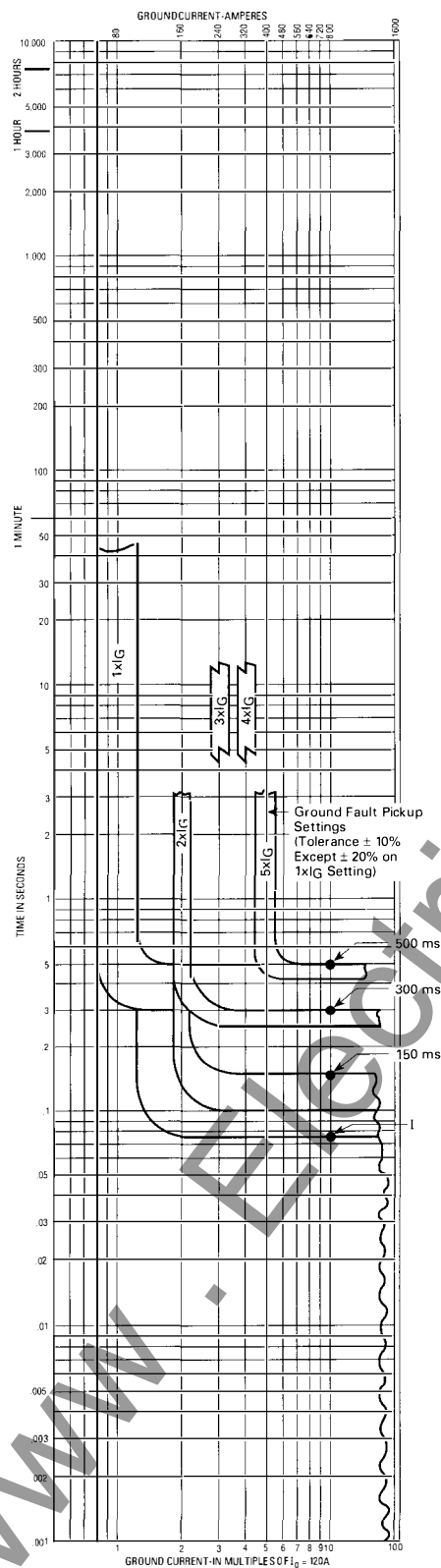
⑤ For ground fault time/current curve see SC-5652-93.





AB DE-ION Circuit Breakers

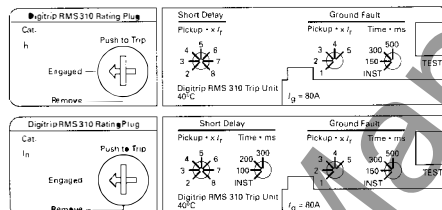
Ground Fault Protection (KES3400LSG, KES3400LSIG)



Circuit Breaker Time/Current Curves (Ground Current) ①

Series C® K-Frame Circuit Breakers Equipped With Type KES Digitrip RMS 310 Trip Units For Ground Fault Protection

Type Digitrip RMS 310 Trip Unit for use with Circuit Breaker Types KD, HKD, KDC, CKD, and CHKD
For use with Trip Unit Catalog Numbers
KES3400LSG
KES3400LSIG



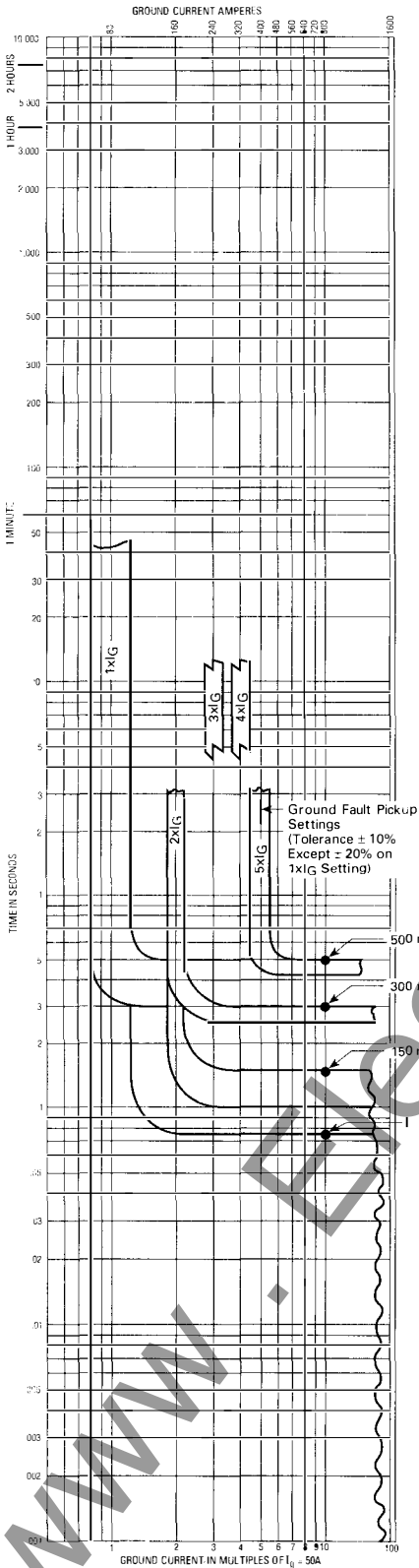
Notes
Curve accuracy applies from $-20^\circ C$ to $+55^\circ C$ ambient. For possible continuous ampere derating for ambient above $40^\circ C$, refer to Cutler-Hammer.

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB 4-1991.

① For phase time/current curves see SC 5638-93, SC 5639-93, SC 5644-93, or SC 5645-93.

AB DE-ION Circuit Breakers

Ground Fault Protection (KES3250LSG, KES3250LSIG)



Circuit Breaker Time/Current Curves (Ground Current)

Series C® K-Frame Circuit Breakers
Equipped With Type KES Digitrip RMS 310 Trip Units
For Ground Fault Protection

Type Digitrip RMS 310 Trip Unit for use with Circuit Breaker Types KD, HKD, KDC, CKD, and CHKD
For use with Trip Unit Catalog Numbers
KES3250LSG
KES3250LSIG

Digitrip RMS 310 Rating Plug

Cat. In

Push to Trip

Engaged

Remove

Short Delay

Pickup $\times I_f$

Time $\times ms$

Digitrip RMS 310 Trip Unit 40°C

Ground Fault

Pickup $\times I_f$

Time $\times ms$

TEST

$I_g = 50A$

Digitrip RMS 310 Rating Plug

Cat. I_A

Push to Trip

Engaged

Remove

Short Delay

Pickup $\times I_f$

Time $\times ms$

Digitrip RMS 310 Trip Unit 40°C

Ground Fault

Pickup $\times I_f$

Time $\times ms$

TEST

$I_g = 50A$

Notes
Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

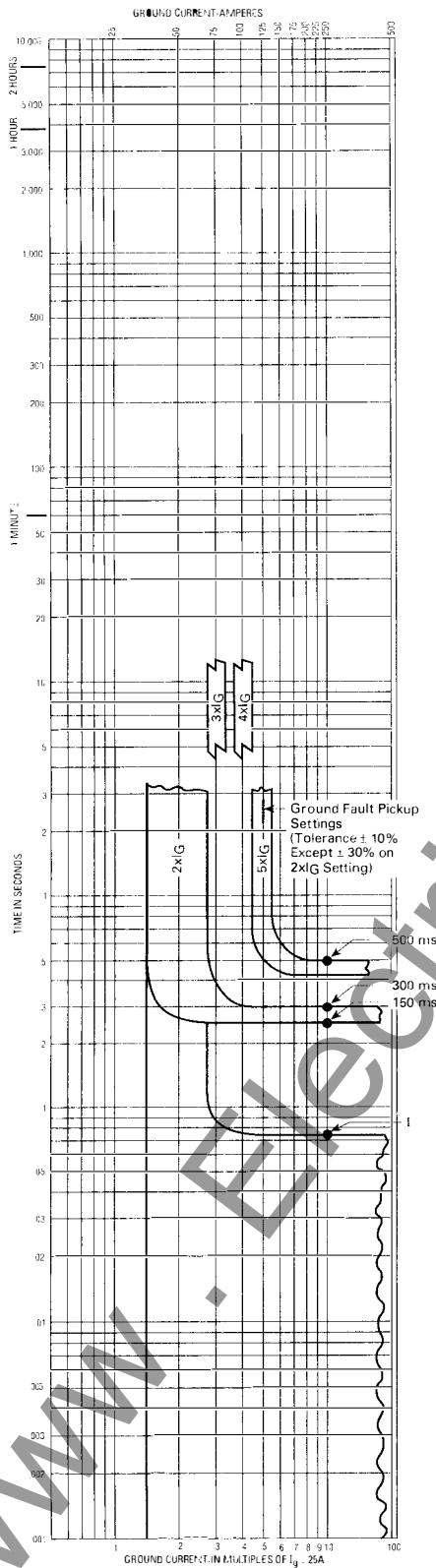
Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

For phase time/current curves see SC-5640-93, SC-5641-93, SC-5646-93, or SC-5647-93.



AB DE-ION Circuit Breakers

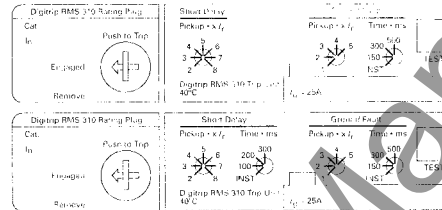
Ground Fault Protection (KES3125LSG, KES3125LSIG)



Circuit Breaker Time/Current Curves (Ground Current)

Series C[®] K-Frame Circuit Breakers
Equipped With Type KES Digitrip RMS 310 Units
For Ground Fault Protection

Type Digitrip RMS 310 Trip Unit for use with Circuit Breaker Type: KED, KED, KED, KED, and
For use With Trip Unit Catalog Numbers
KES3125LSG
KES3125LSIG



Notes
Curve accuracy applies from -20°C to $+55^{\circ}\text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , refer to Cutler-Hammer.

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB 4-1991.

For phase time/current curves see SC 5642-93, SC 5643-93, SC 5648-93, or SC 5649-93.



AB DE-ION Circuit Breakers

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220



Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167L

Page 1

May 1994
Supersedes Application Data 29-167G,
dated February 1993, and Application
Data 29-167H, dated September 1991
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® L-Frame Circuit
Breakers

Westinghouse AB DE-ION® Circuit Breakers

Breaker Description	Curve No.	Page
Series C Types LDB, LD, HLD Circuit Breakers Equipped With Type LT Thermal-Magnetic Trip Unit	SC-4547-89B	2
Series C Type LDC Circuit Breakers Equipped With Type LT Thermal-Magnetic Trip Unit	SC-5760-94	3
Series C Types LD, HLD, CLD, and CHLD Circuit Breakers Equipped With Type LES Digitrip RMS 310 Trip Units		
Catalog Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, LES4600LSP	SC-5653-93	4
Catalog Types LES3600LSI, LES3600LSIG, LES4600LSI, LES4600LSIP	SC-5654-93	5
Ground Fault Protection	SC-5661-93	6
Series C Types LDC and CLDC Circuit Breakers Equipped With Type LES Digitrip RMS 310 Trip Units		
Catalog Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, LES4600LSP	SC-5657-93	7
Catalog Types LES3600LSI, LES3600LSIG, LES4600LSI, LES4600LSIP	SC-5658-93	8
Ground Fault Protection	SC-5661-93	6

Additional copies of this application data may be ordered from the Westinghouse Printing
Division, Trafford, PA 15085. Order Application Data 29-167L.

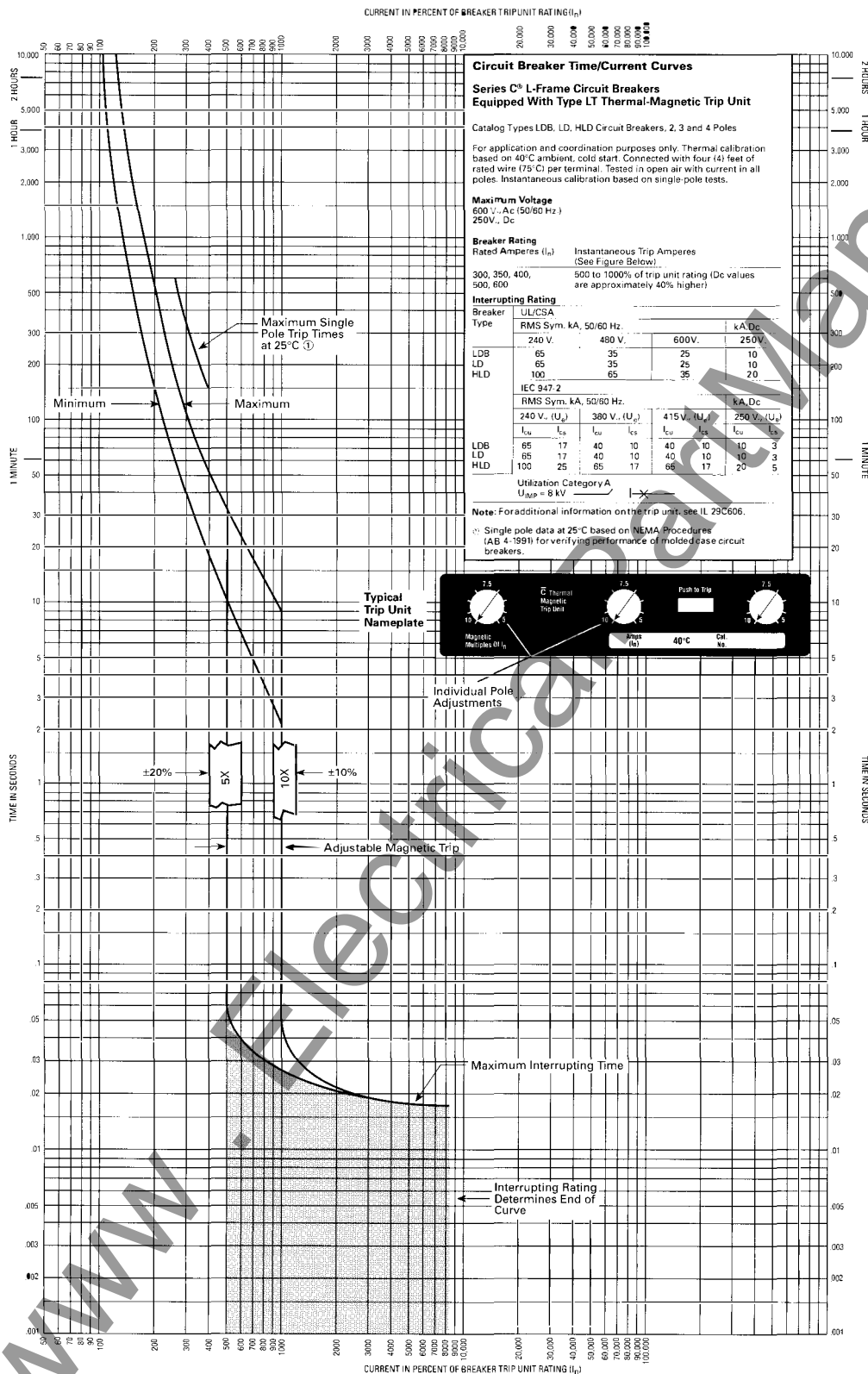
Individual oversize copies of curves listed above printed on onion-skin paper are available
in limited quantity from:

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears,
i.e., SC-4547-89B. **Requests for full sets of curves will not be honored.**

AB DE-ION Circuit Breakers

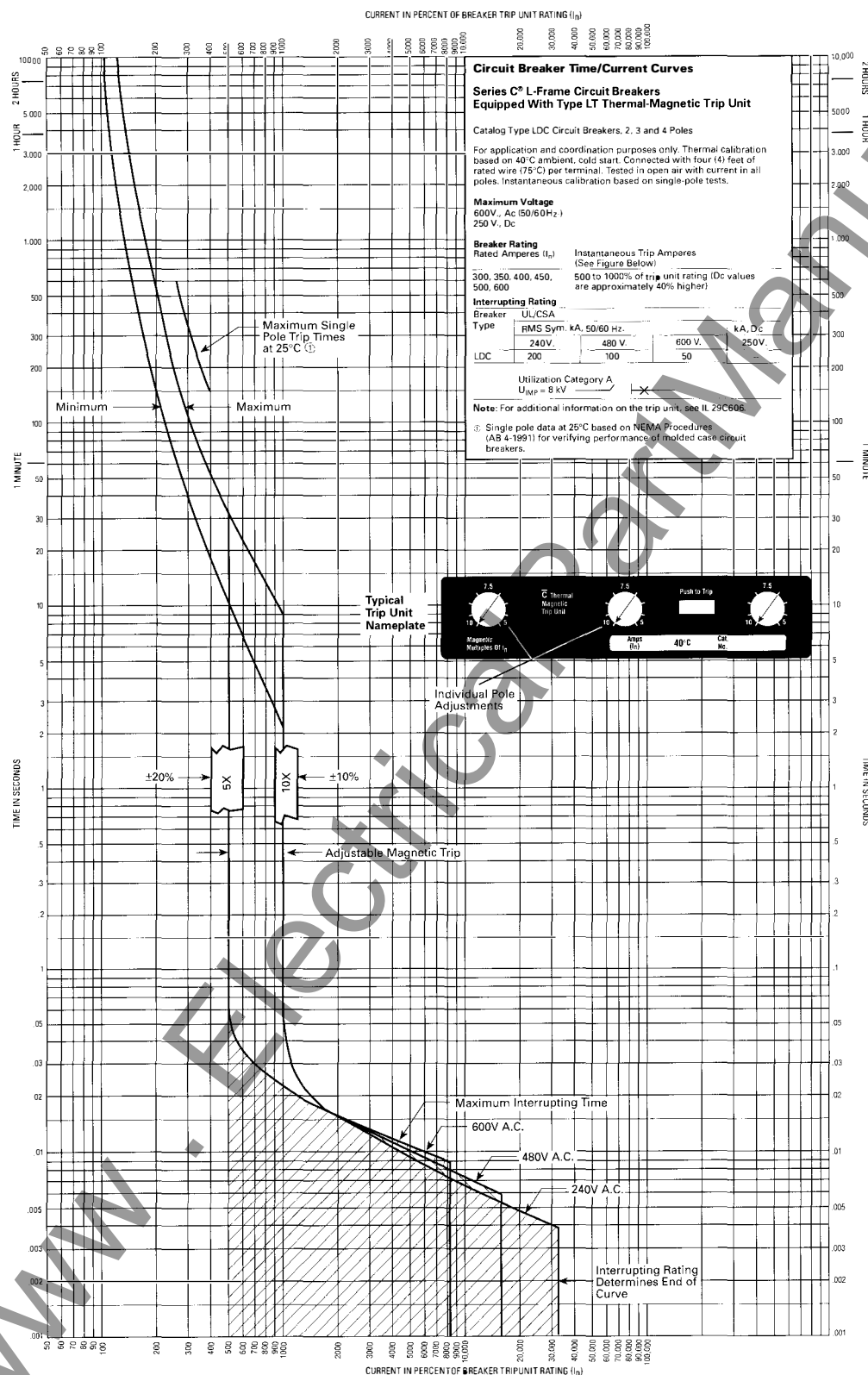
Types LDB, LD, HLD Equipped With Type LT Thermal-Magnetic Trip Unit





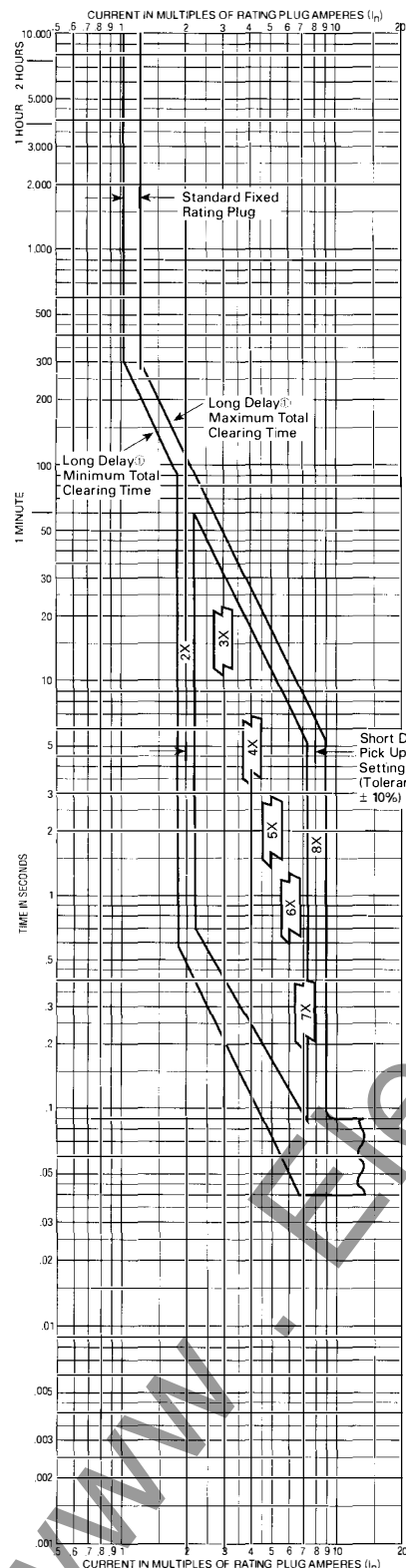
AB DE-ION Circuit Breakers

Type LDC Equipped With Type LT Thermal-Magnetic Trip Unit



AB DE-ION Circuit Breakers

Types LD, HLD, CLD, and CHLD Equipped With Type LES Digitrip RMS 310 Trip Units,
Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, LES4600LSP



Circuit Breaker Time/Current Curves (Phase Current) ④

Series C® L-Frame Circuit Breakers
Equipped With Type LES Digitrip RMS 310 Trip Units

Catalog Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, and LES4600LSP
Digitrip RMS 310 Trip Units for use with Circuit Breaker Types LD, HLD, CLD, and CHLD
3 and 4 Poles

Fixed Short Delay Time **Typical Trip Unit Nameplate**

Available Rating Plugs

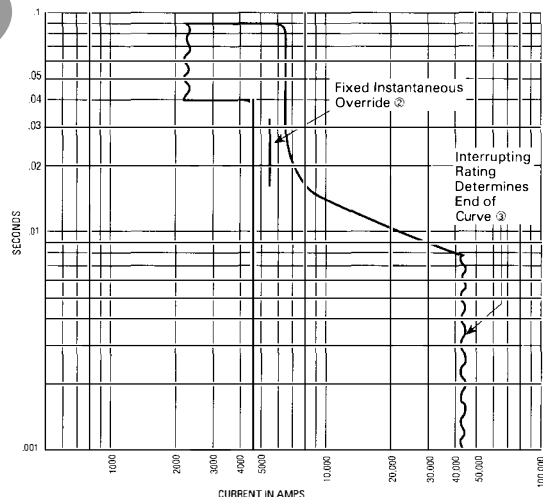
Ampere Rating (I _n)	Type	Rating Plug Catalog Number	Short Delay Pickup Range Amperes
600	Fixed	6LES600T	1200-4800
500	Fixed	6LES500T	1000-4000
400	Fixed	6LES400T	800-3200
350	Fixed	6LES350T	700-2800
300	Fixed	6LES300T	600-2400
300, 400, 500, 600	Adjustable	A6LES600T1	800-4800

Interrupting Ratings @ 50/60 Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA			IEC 947-2		
	Volts	kA	Rating	Volts (U _g)	kA	Rating
LD, CLD	240	65	100	240	65	100
HLD, CHLD	480	35	100	380	33	100
	600	25	100	415	20	100

Utilization Category A
U_{imp} = 8kV

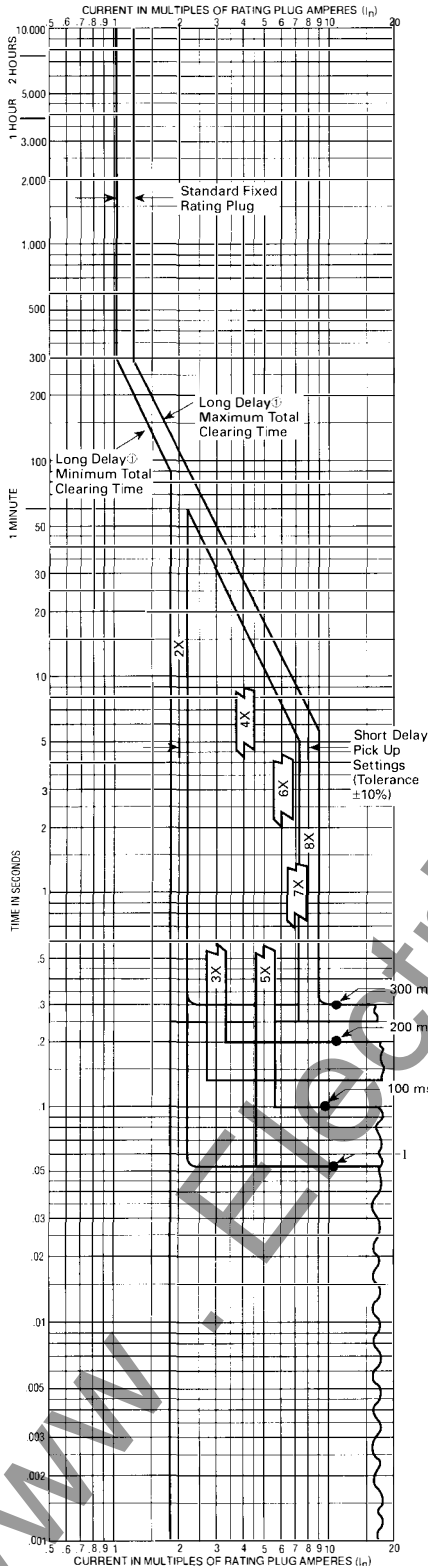
Notes
Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA AB4-1991 publications.
Calibration response in short delay pick-up range is same for 1, 2 or 3 poles in series.
There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick-up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.
① Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.
② For high fault current levels a fixed instantaneous override is provided at 5500A. (Tolerance ±15%).
③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.
④ For ground fault time/current curves see SC-5661-93.





AB DE-ION Circuit Breakers

Types LD, HLD, CLD, and CHLD Equipped With Type LES Digitrip RMS 310 Trip Units,
Types LES3600LSI, LES3600LSIG, LES4600LSI, LES4600LSIP



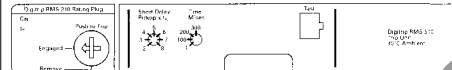
Circuit Breaker Time/Current Curves (Phase Current) ①

Series C[®] L-Frame Circuit Breakers Equipped With Type LES Digitrip RMS 310 Trip Units

Catalog Types LES3600LSI, LES3600LSIG, LES4600LSI, and LES4600LSIP
Digitrip RMS 310 Trip Units for use with Circuit Breaker Types LD, HLD, CLD, and CHLD
3 and 4 Poles

Adjustable Short Delay Time

Typical Trip Unit Nameplate



Available Rating Plugs

Ampere Rating (I _n)	Type	Rating Plug Catalog Number	Short Delay Pick-up Range Amperes
600	Fixed	6LES600T	1200-4800
500	Fixed	6LES500T	1000-4000
400	Fixed	6LES400T	800-3200
350	Fixed	6LES350T	700-2800
300	Fixed	6LES300T	600-2400
300, 400, 500, 600	Adjustable	A6LES600T1	600-4800

Interrupting Ratings @ 50/60 Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA Volts (U _o)	240	480	600
LD, CLD	kA	65	35	25
HLD, CHLD	kA	100	65	35

Rating	240	380	415
LD, CLD	I _{cu} 65, I _{cs} 33	I _{cu} 40, I _{cs} 20	I _{cu} 40, I _{cs} 20
HLD, CHLD	I _{cu} 100, I _{cs} 50	I _{cu} 65, I _{cs} 33	I _{cu} 65, I _{cs} 33

Utilization Category A
U_{imp} = 8kV

Notes

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2.
For field testing using primary injection methods, follow NEMA AB4-1991 publications.

Calibration response in short delay pick-up range is same for 1, 2 or 3 poles in series.

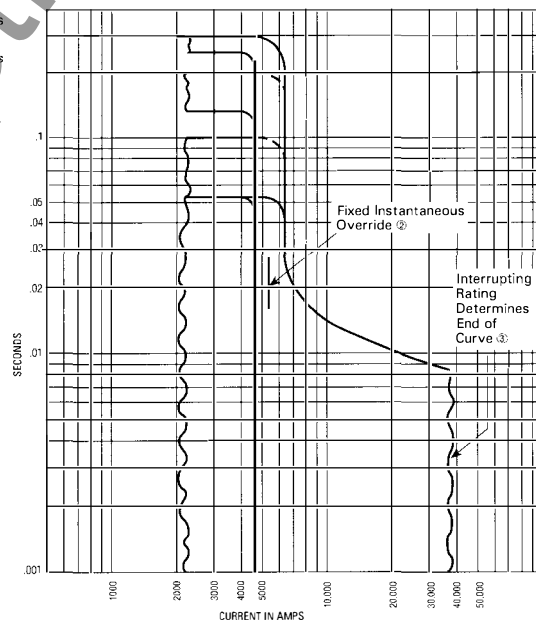
There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick-up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

① Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

② For high fault current levels a fixed instantaneous override is provided at 5500A. (Tolerance ±15%.)

③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

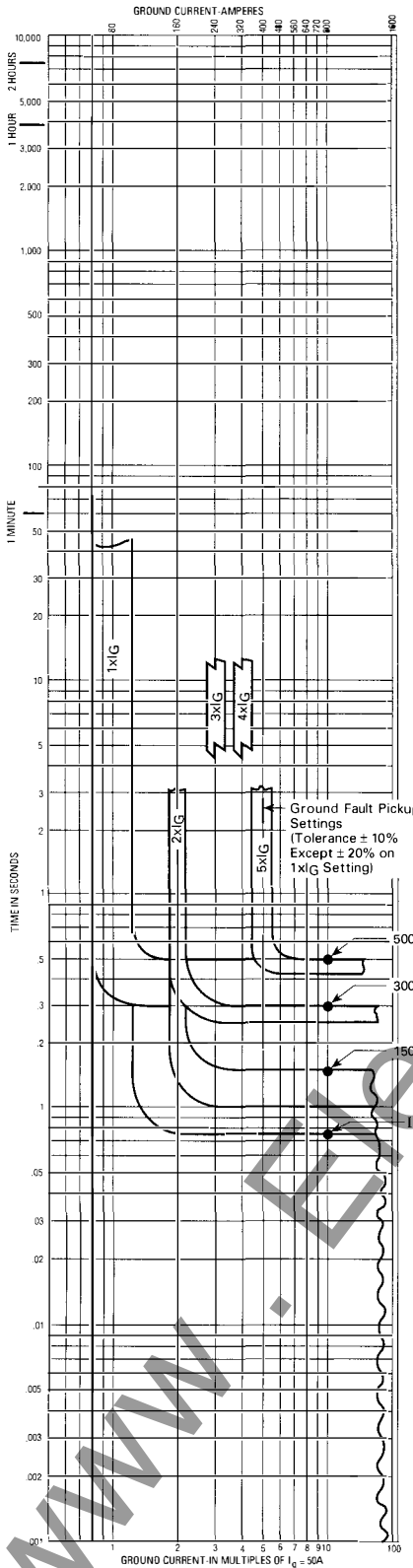
④ For groundfault time/current curves see SC-5661-93.





AB DE-ION Circuit Breakers

Types LD, LCD, HLD, CLD, CHLD, and CLDC Equipped With Type LES Digitrip RMS 310 Trip Units, Ground Fault Protection



Circuit Breaker Time/Current Curves (Ground Current)

Series C® L-Frame Circuit Breakers
Equipped With Type LES Digitrip RMS 310 Trip Units
for Ground Fault Protection

Catalog Types LES3600LSG and LES3600LSIG Digitrip RMS 310 Trip Units for use with Circuit Breaker Types LD, HLD, LDC, CLD, CHLD, and CLDC

Fixed Short Delay Time

Typical Trip Unit Nameplate

Adjustable Short Delay Time

Typical Trip Unit Nameplate

Notes
Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambient above 40°C, refer to Cutler-Hammer.

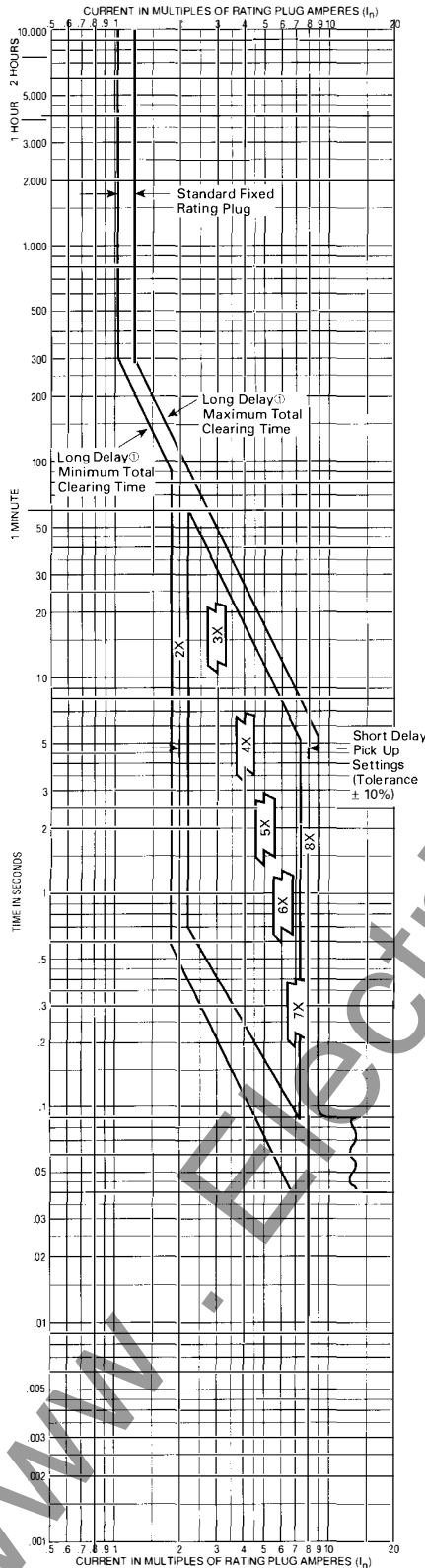
Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication (AB4-1991).

For phasetime/current curves see:
SC-5653-93
SC-5654-93
SC-5657-93
SC-5658-93



AB DE-ION Circuit Breakers

Types LDC and CLDC Equipped With Type LES Digitrip RMS 310 Trip Units, Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, LES4600LSP

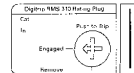


Circuit Breaker Time/Current Curves (Phase Current) ④

Series C[®] L-Frame Circuit Breakers
Equipped With Type LES Digitrip RMS 310 Trip Units

Catalog Types LES3600LS, LES3600LSG, LES4600LS, LES4600LSE, and LES4600LSP
Digitrip RMS 310 Trip Units for use with Circuit Breaker Types LDC and CLDC
3 and 4 Poles

Fixed Short Delay Time



Typical Trip Unit Nameplate



Available Rating Plugs

Amperes Rating (I_n)	Type	Rating Plug Catalog Number	Short Delay Pickup Range Amperes
600	Fixed	6LES600T	1200-4800
500	Fixed	6LES500T	1000-4000
400	Fixed	6LES400T	800-3200
350	Fixed	6LES350T	700-2800
300	Fixed	6LES300T	600-2400
300, 400, 500, 600	Adjustable	A6LES600T1	600-4800

Interrupting Ratings @ 50/60 Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA Vols	240	480	600
LDC, CLDC	kA	200	100	50
IEC 947-2				
Vols (U_p)				
Rating				
LDC, CLDC	kA	200	100	50
Utilization Category A				
$U_{imp} = 8kV$				

Notes

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA AB4-1991 publications.

Calibration response in short delay pick-up range is same for 1, 2 or 3 poles in series.

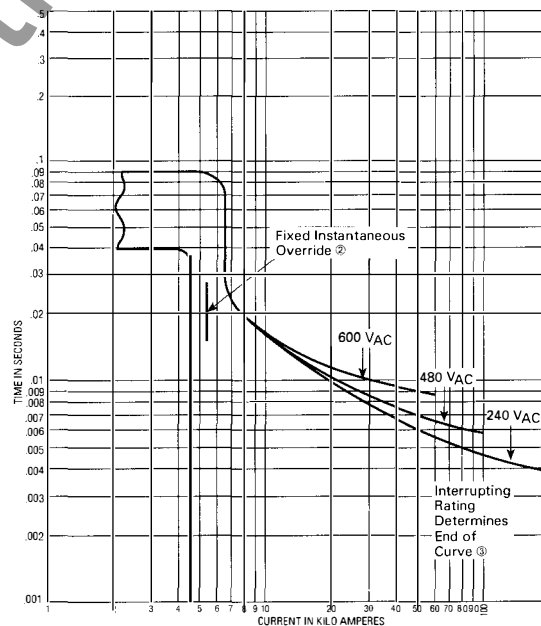
There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick-up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

① Curve accuracy applies from $-20^{\circ}C$ to $+55^{\circ}C$ ambient. For possible continuous ampere derating for ambient above $40^{\circ}C$, refer to Cutler-Hammer.

② For high fault current levels a fixed instantaneous override is provided at 5500A. (Tolerance $\pm 15\%$).

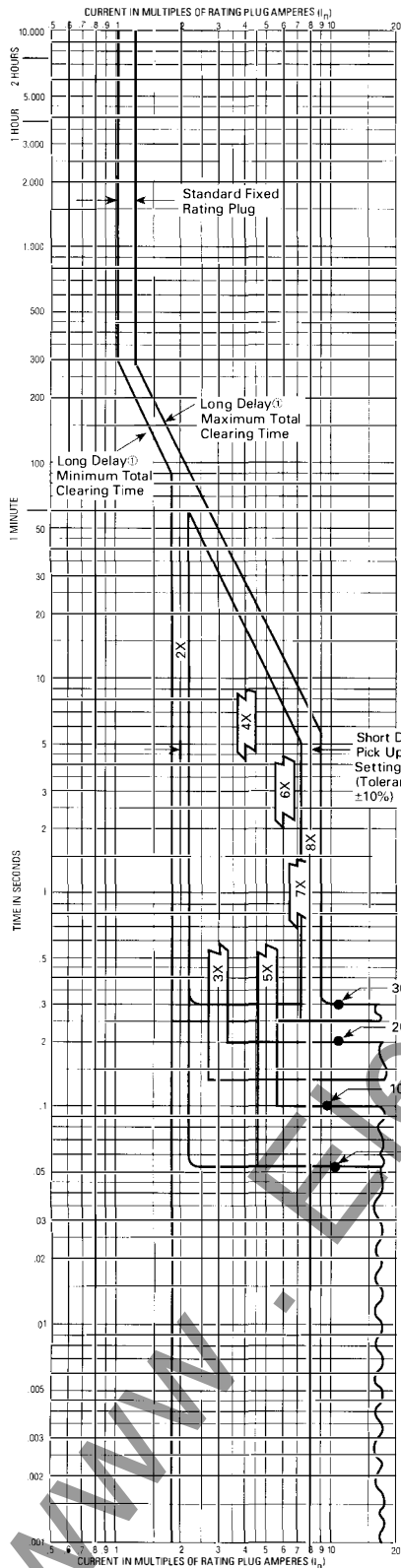
③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

④ For ground fault time/current curves see SC-5661-93.



AB DE-ION Circuit Breakers

Types LDC and CLDC Equipped With Type LES Digitrip RMS 310 Trip Units, Types LES3600LSI, LES3600LSIG, LES4600LSI, LES4600LSIP



Circuit Breaker Time/Current Curves (Phase Current) ④

Series C[®] L-Frame Circuit Breakers
Equipped With Type LES Digitrip RMS 310 Trip Units

Catalog Types LES3600LSI, LES3600LSIG, LES4600LSI, and LES4600LSIP
Digitrip RMS 310 Trip Units for use with Circuit Breaker Types LDC and CLDC
3 and 4 Poles

Adjustable Short Delay Time

Typical Trip Unit Nameplate



Ampere Rating (I_R)	Type	Rating Plug Catalog Number	Short Delay Pickup Range Amperes
600	Fixed	6LES600T	1200-4800
500	Fixed	6LES500T	1000-4000
400	Fixed	6LES400T	800-3200
350	Fixed	6LES350T	700-2800
300	Fixed	6LES300T	600-2400
300, 400, 500, 600	Adjustable	A6LES600T1	600-4800

Interrupting Ratings @ 50/60 Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA			
	Volts	240	480	600
LDC, CLDC	kA	200	100	50
IEC 947-2				
	Volts (U_n)	240	380	415
	Rating	I_{cu}	I_{cs}	I_{cu}
LDC, CLDC	kA	200	100	50
Utilization Category A				
$U_{imp} = 8kV$				

Notes
Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2.
For field testing using primary injection methods, follow NEMA AB4-1991 publications.

Calibration response in short delay pick-up range is same for 1, 2 or 3 poles in series.

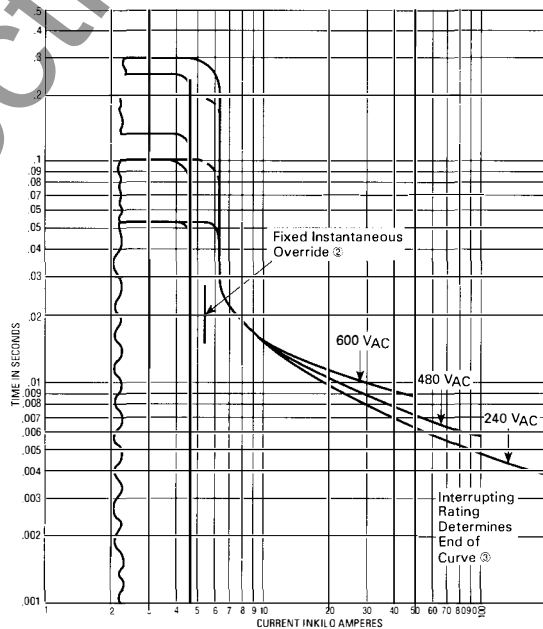
There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick-up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

① Curve accuracy applies from $-20^{\circ}C$ to $+55^{\circ}C$ ambient. For possible continuous ampere derating for ambient above $40^{\circ}C$, refer to Cutler-Hammer.

② For high fault current levels a fixed instantaneous override is provided at 5500A. (Tolerance $\pm 15\%$).

③ The end of the curves is determined by the interrupting rating of the circuit breaker. See above tabulation.

④ For ground fault time/current curves see SC-5661-93.





Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167M

Page 1

May 1994
New Information
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® M-Frame
Circuit Breakers

Westinghouse AB DE-ION® Circuit Breakers

Breaker Description	Curve No.	Page
Series C Type MD Circuit Breakers, 125-600 Amperes	SC-5702-94	2
Series C Type MD Circuit Breakers, 700-800 Amperes	SC-5703-94	3
Series C Type MDS Circuit Breakers, 400-800 Amperes	SC-5704-94	4
Series C Types MDSA , MDSGA Circuit Breakers, 400-800 Amperes	SC-5705-94	5
Series C Types MDSG , MDSGA Ground Fault Pick-up Curves	SC-5706-94	6

Additional copies of this application data may be ordered from the Westinghouse Printing Division, Trafford, PA 15085. Order Application Data 29-167M.

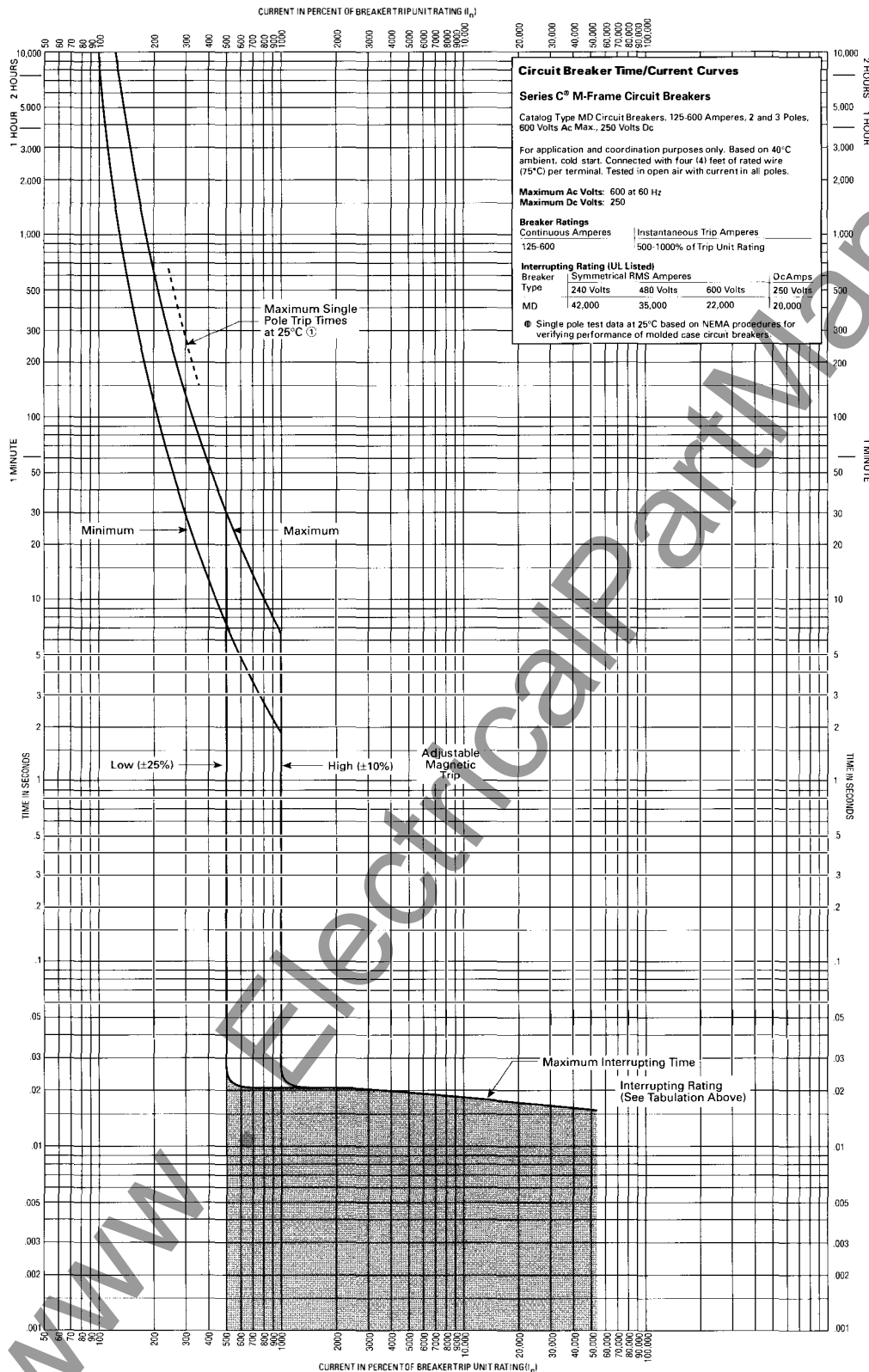
Individual oversize copies of curves listed above printed on onion-skin paper are available in limited quantity from:

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears, i.e., SC-5702-94. **Requests for full sets of curves will not be honored.**

AB DE-ION Circuit Breakers

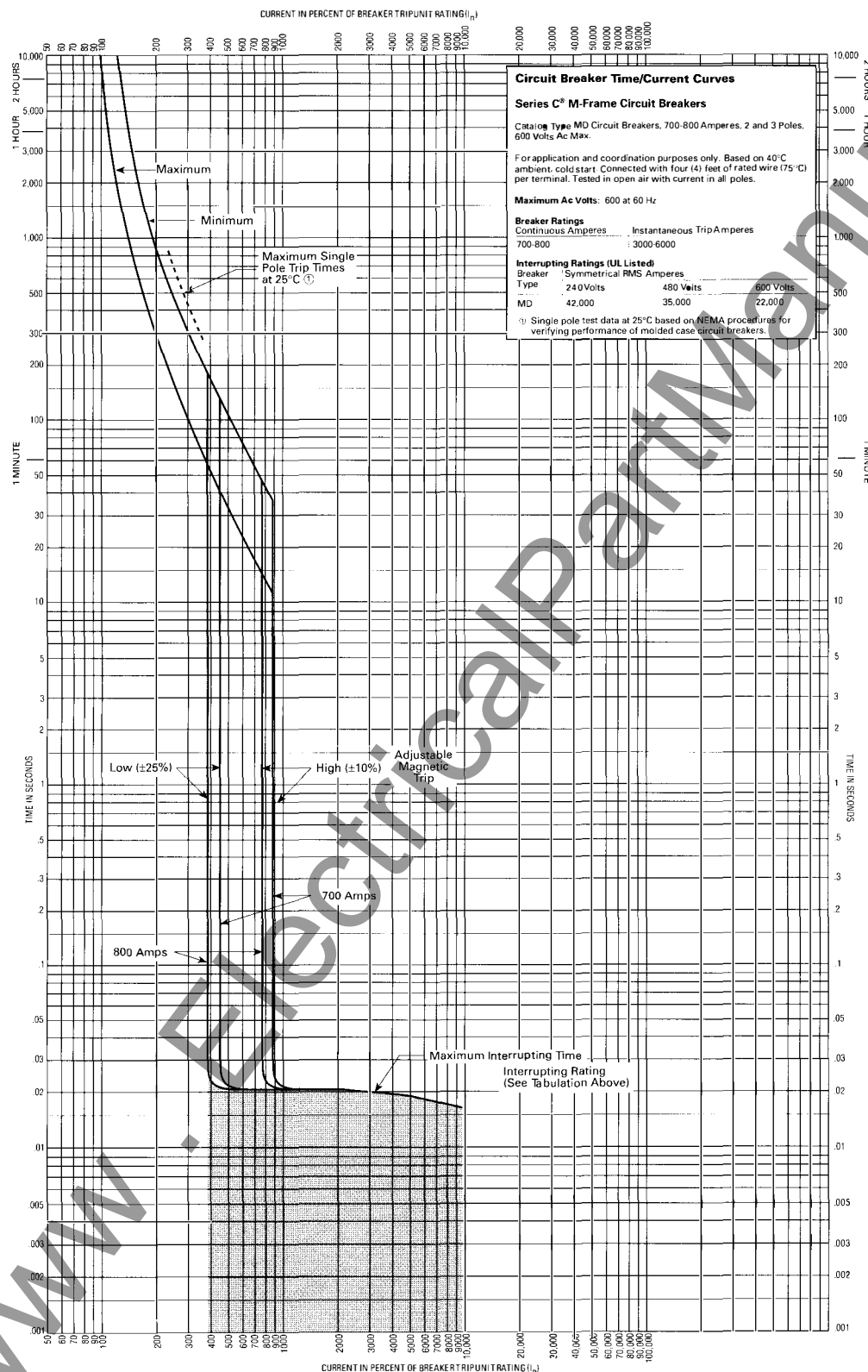
Type MD, 125-600 Amperes





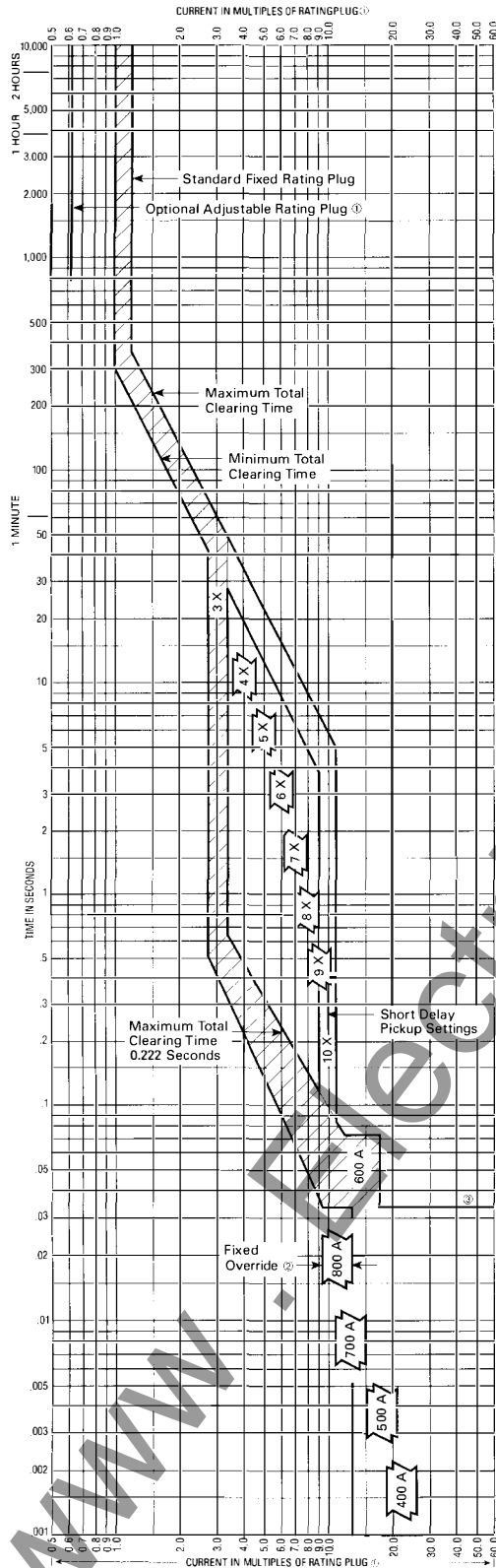
AB DE-ION Circuit Breakers

Type MD, 700-800 Amperes



AB DE-ION Circuit Breakers

Type MDS, 400-800 Amperes



Circuit Breaker Time/Current Curves

Series C* M-Frame Circuit Breakers

Catalog Type MDS Circuit Breakers, 400-800 Amperes, 2 and 3 Poles

Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambients above +40°C refer to Cutler-Hammer.

Maximum Ac Volts: 600 at 50/60 Hz

Breaker Ratings	Short Delay Pickup Settings
Continuous Amperes	3x to 10x Rating Plug Value with Calibration Settings as Shown on Curve (Tol. ±10%)
400-800	

Interrupting Rating (UL/CSA Listed)

Breaker	Symmetrical RMS Amperes
Frame	240 Volts 480 Volts 600 Volts
MDS	42,000 35,000 22,000

Rating Plugs Available

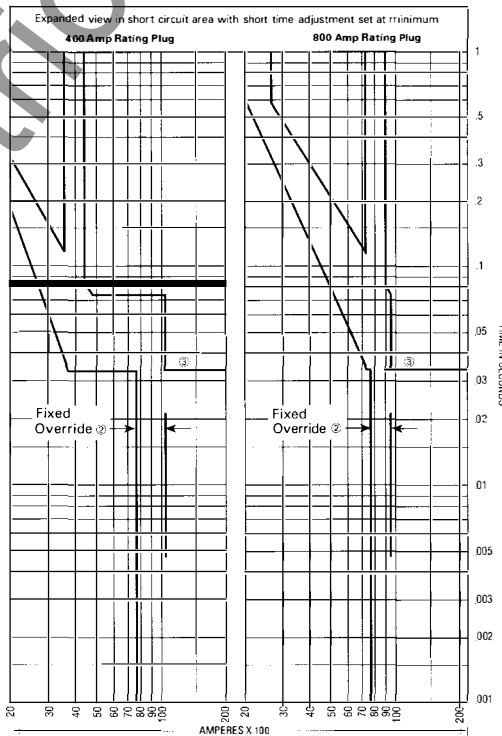
Continuous Amperes	Range Adjustment
800 Amp	Fixed 100%
800 Amp	50 - 100% ①
700 Amp	Fixed 100%
700 Amp	70 - 100% ①
600 Amp	Fixed 100%
600 Amp	70 - 100% ①
500 Amp	Fixed 100%
500 Amp	80 - 100% ①
400 Amp	Fixed 100%

① When adjustable rating plugs are used, short delay pickup settings track the selected position of the adjustable rating plug. For example, with an adjustable 800 amp rating plug set at 50%, and the short delay pickup set at 4x, the short delay pickup is 800 x 50% x 4 = 1600 amps.

② For high fault current levels, a fixed instantaneous override is provided. The trip level for each rating plug is as shown. (Tolerance ±15%)

③ The end of the curve is determined by the interrupting rating and/or the specific application.

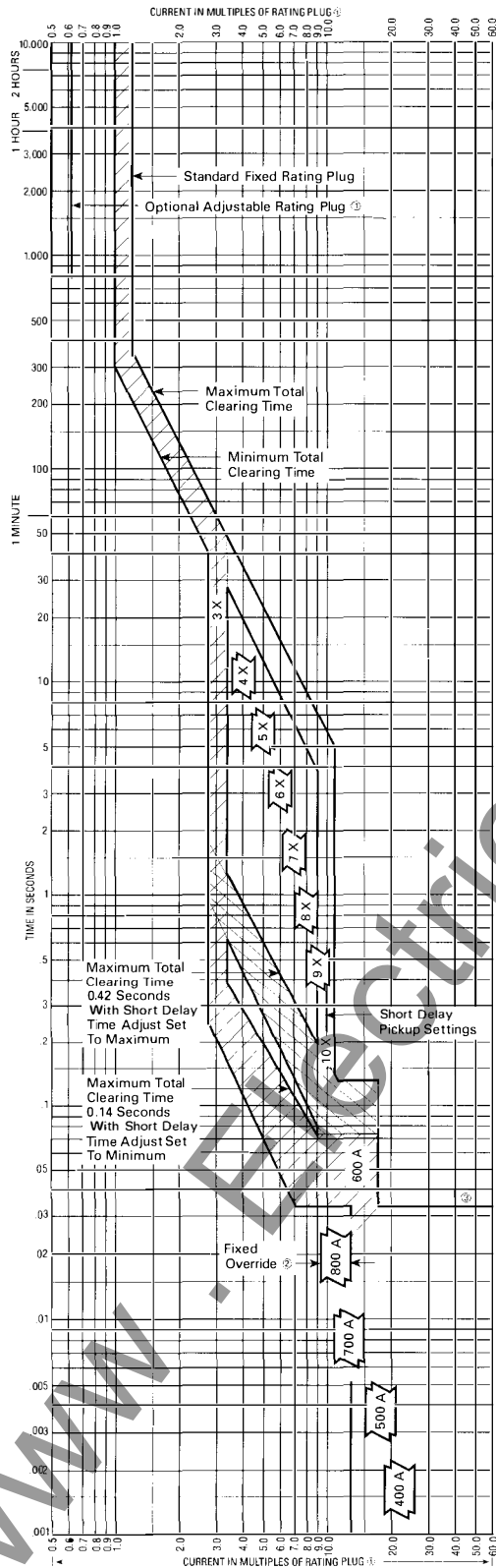
④ For ground fault time-current characteristics of MDSG see Curve No. SC 5706-94.





AB DE-ION Circuit Breakers

Types MDSA, MDSGA, 400-800 Amperes



Circuit Breaker Time/Current Curves

Series C[®] M-Frame Circuit Breakers

Catalog Types MDSA, MDSGA Circuit Breakers, 400-800 Amperes, 2 and 3 Poles

Curve accuracy applies from -20°C to +55°C ambient. For possible continuous ampere derating for ambients above +40°C refer to Cutler-Hammer.

Maximum Ac Volts: 600, at 50/60 Hz

Breaker Ratings

Continuous Amperes	Short Delay Pickup Settings
400-800	3x to 10x Rating Plug Value with Calibration Settings as Shown on Curve (Tol. $\pm 10\%$)

Interrupting Rating (UL/CSA Listed)

Breaker	Symmetrical RMS Amperes
Frame	240 Volts 480 Volts 600 Volts
MDSA	42,000 35,000 22,000
MDSGA	

Rating Plugs Available

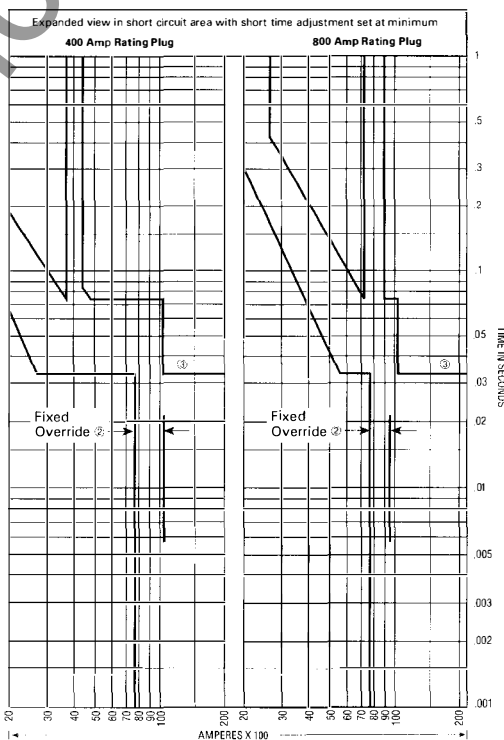
Continuous Amperes	Range of Adjustment
800 Amp	Fixed 100%
800 Amp	50 - 100% ①
700 Amp	Fixed 100%
700 Amp	70 - 100% ①
600 Amp	Fixed 100%
600 Amp	70 - 100% ①
500 Amp	Fixed 100%
500 Amp	80 - 100% ①
400 Amp	Fixed 100%

① When adjustable rating plugs are used, short delay pickup settings track the selected position of the adjustable rating plug. For example, with an adjustable 800 amp rating plug set at 50%, and the short delay pickup set at 4x, the short delay pickup is $800 \times 50\% \times 4 = 1600$ amps.

② For high fault current levels, a fixed instantaneous override is provided. The trip level for each rating plug is as shown. (Tolerance $\pm 15\%$.)

③ The end of the curve is determined by the interrupting rating and/or the specific application.

④ For ground fault time-current characteristics of MDSGA see Curve No. SC-5706-94.



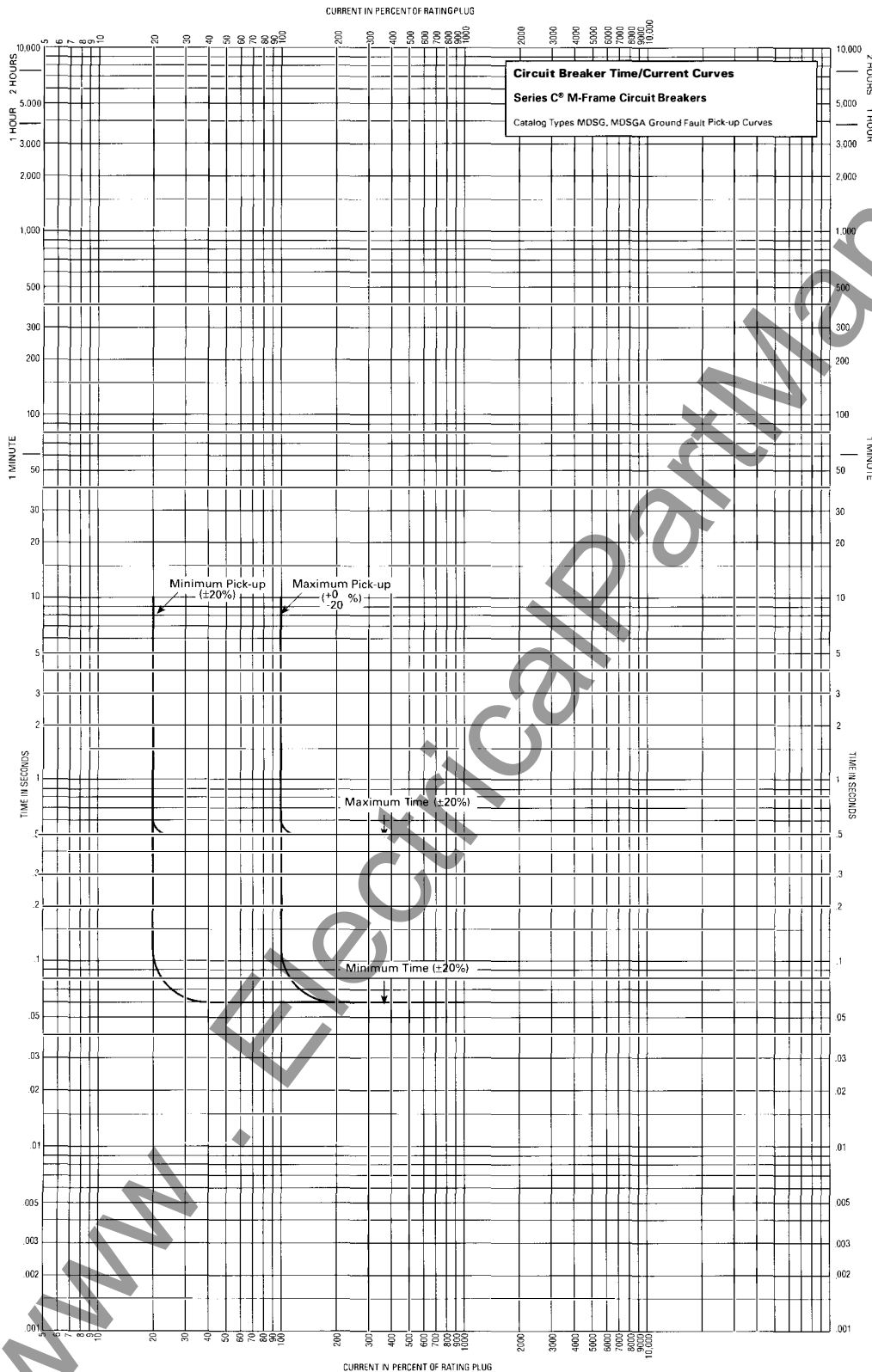
Curve No. SC-5705-94





AB DE-ION Circuit Breakers

Types MDSG, MDSGA Ground Fault Pick-up Curves





AB DE-ION Circuit Breakers

www.ElectricalPartManuals.com



AB DE-ION Circuit Breakers

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Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167N

Page 1

May 1994
Supersedes Application Data 29-167K,
dated January 1993
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® N-Frame Circuit
Breakers with Type NES Digitrip RMS 310
Trip Units

Westinghouse AB DE-ION® Circuit Breakers

Breaker Description	Curve No.	Page
Series C Types ND, CND, HND, CHND, NDC, CNDC Circuit Breakers Equipped With Type NES Digitrip RMS 310 Trip Units With		
I ² t Ramp Short Time Delay (Phase Protection)	SC-5375-92A	2
Adjustable Short Time Delay (Phase Protection)	SC-5376-92A	3
Ground Fault Protection●	SC-5377-92A	4

Additional copies of this application data may be ordered from the Westinghouse Printing Division, Trafford, PA 15085. Order Application Data 29-167N.

Individual oversize copies of curves listed above printed on onion-skin paper are available in limited quantity from:

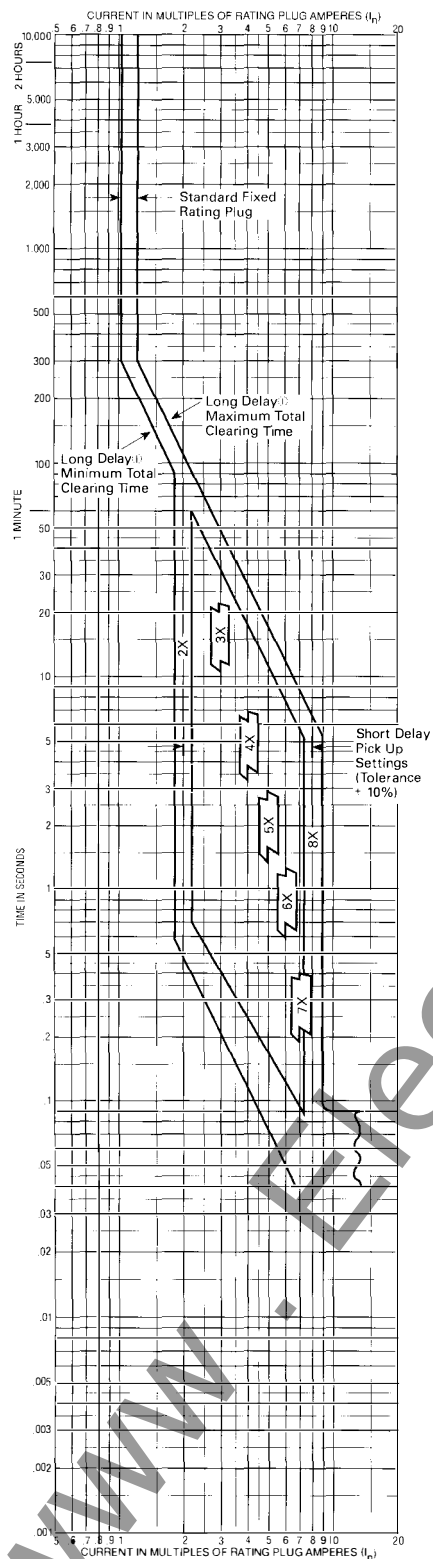
Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears, i.e., SC-5375-92A. **Requests for full sets of curves will not be honored.**

① Use in conjunction with SC-5375-92A or SC-5376-92A.

AB DE-ION Circuit Breakers

Types ND, CND, HND, CHND, NDC, CNDC Equipped With Type NES Digitrip RMS 310 Trip Units With I²t Ramp Short Time Delay (Phase Protection)



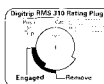
Circuit Breaker Time/Current Curves (Phase Current)

Series C[®] N-Frame Circuit Breakers

Equipped With Type NES Digitrip RMS 310 Trip Units

The NES Digitrip RMS 310 Trip Units are AC only devices that employ microprocessor based technology that provides true RMS current sensing means for proper correlation with thermal characteristics of conductors and equipment. They are used with Circuit Breaker Types ND, CND, HND, CHND, NDC, and CNDC.

I²t Ramp Short Time Delay



Typical Trip Unit Nameplate



Frame Rating Amperes (Max.)	Available Rating Plugs Ampere Rating (In)	Type	Catalog Number	Short Delay Pickup Range Amperes
800	800	Fixed	8NES800T	1600-6400
	700	Fixed	8NES700T	1400-5600
	630	Fixed	8NES630T	1250-5000
	600	Fixed	8NES600T	1200-4800
	550	Fixed	8NES550T	1100-4400
	500	Fixed	8NES500T	1000-4000
	450	Fixed	8NES450T	900-3600
	400	Fixed	8NES400T	800-3200
	400, 500, 600, 800	Adj.	A8NES800T1	800-6400
	400, 500, 630, 800	Adj.	A8NES600T2	800-6400
1200	1200	Fixed	12NES1200T	2400-9600
	1000	Fixed	12NES1000T	2000-8000
	900	Fixed	12NES900T	1800-7200
	800	Fixed	12NES800T	1600-6400
	700	Fixed	12NES700T	1400-5600
	630	Fixed	12NES630T	1260-5040
	600	Fixed	12NES600T	1200-4800
	600, 800, 1000, 1200	Adj.	A12NES1200T1	1200-9600

Interrupting Ratings - 50/60 Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA	480V	600V	IEC 947 2	220-240V	380-415V
ND, CND	65	50	25	65	50	50
HND, CHND	100	65	35	100	65	65
NDC, CNDC	200	100	50	200	100	100

I_{CS} = .25 I_{CU}
I_{CU} = 15 kA @ 5S
U_{imp} = 8kV

Notes

Curve accuracy applies from -20 C to +55 C ambient. For possible ampere derating for ambient above 40 C, refer to Catalog Hammer.

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1891.

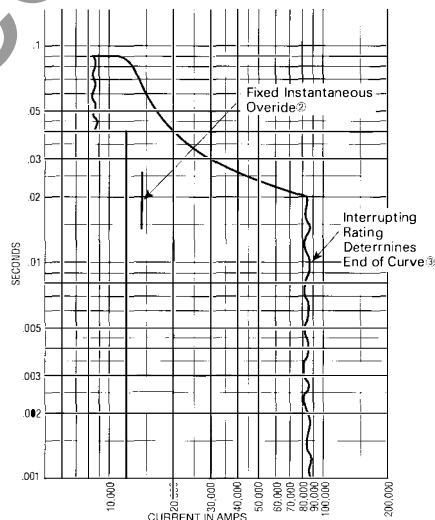
For ground fault time-current curves see SC 5377-92A.

There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pick up value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time delay reduction is inversely the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.

For high fault current levels a fixed instantaneous override is provided at 14000A (Tolerance +15%).

The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

Not UL/CSA Listed.

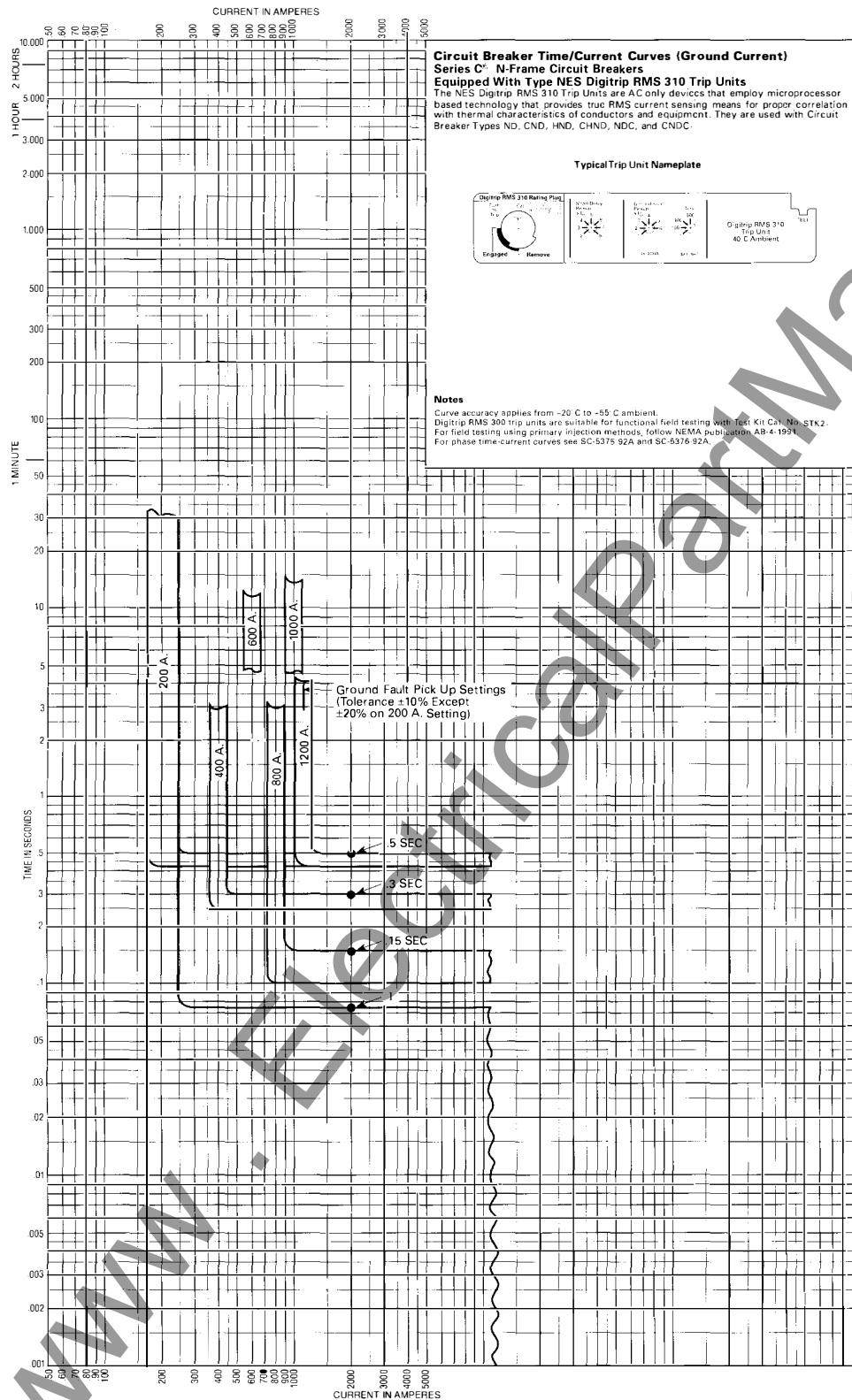






AB DE-ION Circuit Breakers

Types ND, CND, HND, CHND, NDC, CNDC Equipped With Type NES Digitrip RMS 310 Trip Units With Ground Fault Protection





Cutler-Hammer
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Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167R
Page 1

May 1994
New Information and Supersedes
Application Data 29-167D, dated
March 1993, and Application Data 29-167J,
dated August 1990
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® R-Frame
Circuit Breakers

Westinghouse Series C® Molded Case Circuit Breakers R-Frame

Breaker Description	Curve No.	Page
Series C Types RD, CRD, RDC, CRDC Circuit Breakers Equipped With Digitrip RMS 310 Trip Units		
Typical Instantaneous Time-Phase Current Characteristic Curve Based on I_n	SC-5629-93	2
Typical Long Delay/Short Delay Time-Phase Current Characteristic Curve Based on I_n	SC-5630-93	3
Typical Ground Fault/Protection Time/Current Characteristic Curve Based on I_n	SC-5631-93	4
Series C Types RD, CRD, RDC, CRDC Circuit Breakers Equipped With Digitrip RMS 510/610/810 Trip Units		
Typical Instantaneous Time-Phase Current Characteristic Curve Based on I_n	SC-5626-93	5
Typical Long Delay/Short Delay Time-Phase Current Characteristic Curve Based on I_r	SC-5627-93	6
Typical Ground Fault/Protection Time/Current Characteristic Curve Based on I_n	SC-5628-93	7

Definitions

I_n is the maximum value of continuous current for which the trip unit can be set.
 I_n is the basis (or reference) for both the Instantaneous and the Ground protection current settings.
The value of the rating plug is printed on the Rating Plug.

I_r is the basis for both the Long Delay and the Short Delay (if provided) protection current settings.
The value of I_r is the Long Delay Current Setting $\times I_n$.

Additional copies of this application data may be ordered from the Westinghouse Printing Division, Trafford, PA 15085. Order Application Data 29-167R.

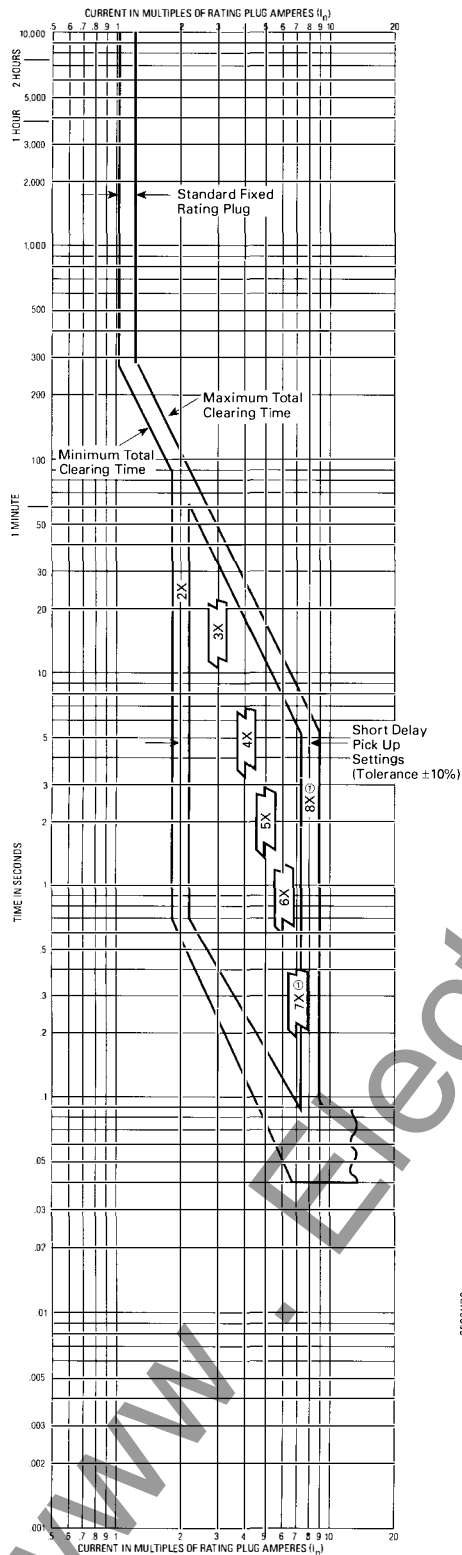
Individual oversize copies of curves listed above printed on onion-skin paper are available in limited quantity from:

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears, i.e., SC-5629-93. **Requests for full sets of curves will not be honored.**

AB DE-ION Circuit Breakers

Types RD, CRD, RDC, CRDC Equipped With Digitrip RMS 310 Trip Units. Typical Instantaneous Time-Phase Current Characteristic Curve Based on I_n



Circuit Breaker Time/Current Curves (Phase Current) ④

Series C® R-Frame Circuit Breakers
Equipped With Type Digitrip RMS 310 Trip Units

Typical Trip Unit Nameplate

For use with Trip Unit Catalog Numbers

1600A Max.	2000A Max.	2500A Max.
RES1600LS	RES2000LS	RES2500LS
RES1600LSG	RES2000LSG	RES2500LSG
RES1600LS	RES2000LS	RES2500LS

Frame Rating Amperes (Max.)	Available Rating Plugs		Type	Catalog Number	Short Delay Pickup Range Amperes
	Ampere Rating (I _N)				
1600	1600	Fixed	16RES16T	3200-12800	
	1400	Fixed	16RES14T	2800-11200	
	1250	Fixed	16RES125T3	2500-10000	
	1200	Fixed	16RES12T	2400-9600	
	1000	Fixed	16RES10T	2000-8000	
	800	Fixed	16RES08T	1600-6400	
	800, 1000, 1200, 1600	Adj.	A16RES16T1	1600-12800	
	800, 1000, 1250, 1600	Adj.	A16RES16T2	1600-12800	
2000	2000	Fixed	20RES20T	4000-16000	
	1600	Fixed	20RES16T	3200-12800	
	1400	Fixed	20RES14T	2800-11200	
	1250	Fixed	20RES125T3	2500-10000	
	1200	Fixed	20RES12T	2400-9600	
	1000	Fixed	20RES10T	2000-8000	
	1000, 1200, 1600, 2000	Adj.	A20RES20T1	2000-16000	
	1000, 1250, 1600, 2000	Adj.	A20RES20T2	2000-16000	
2500	2500	Fixed	25RES25T	5000-15000	
	2000	Fixed	25RES20T	4000-12000	
	1600	Fixed	25RES16T	3200-9600	
	1250	Fixed	25RES125T3	2500-7500	
	1200	Fixed	25RES12T	2400-7200	
	1200, 1600, 2000, 2500	Adj.	A25RES25T1	2400-15000	
	1250, 1600, 2000, 2500	Adj.	A25RES25T2	2500-15000	

Interrupting Ratings - 50/60 Hz RMS Sym. Amperes (kA)

Breaker Type	UL/CSA 240V	480V	600V	IEC 947-2 220-240V	380-415V	500V
RD, CRD	125	65	50	125	65	42
RDC, CRDC	200	100	65	200	100	65

Utilization Category A

$I_{CS} = 0.25 I_{CU}$

$U_{imp} = 8 \text{ kV}$

Notes
Curve accuracy applies from -20°C to +55°C ambient. For possible ampere derating for ambient above 40°C, refer to Cutler-Hammer.

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

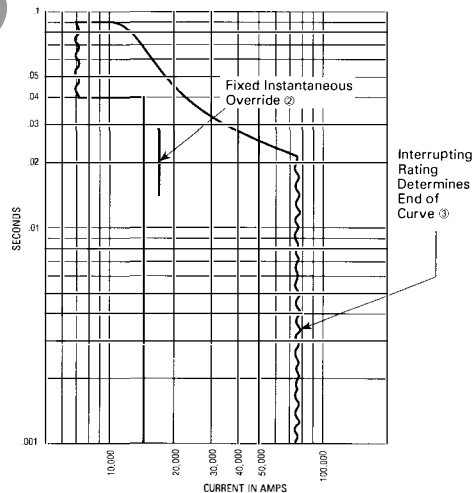
① For 2500A styles, maximum short delay pickup setting = 6X.

② For high fault current levels a fixed instantaneous override is provided at 17,500A (Tolerance +15%).

③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

④ For ground fault time-current curves see SC-5631-93.

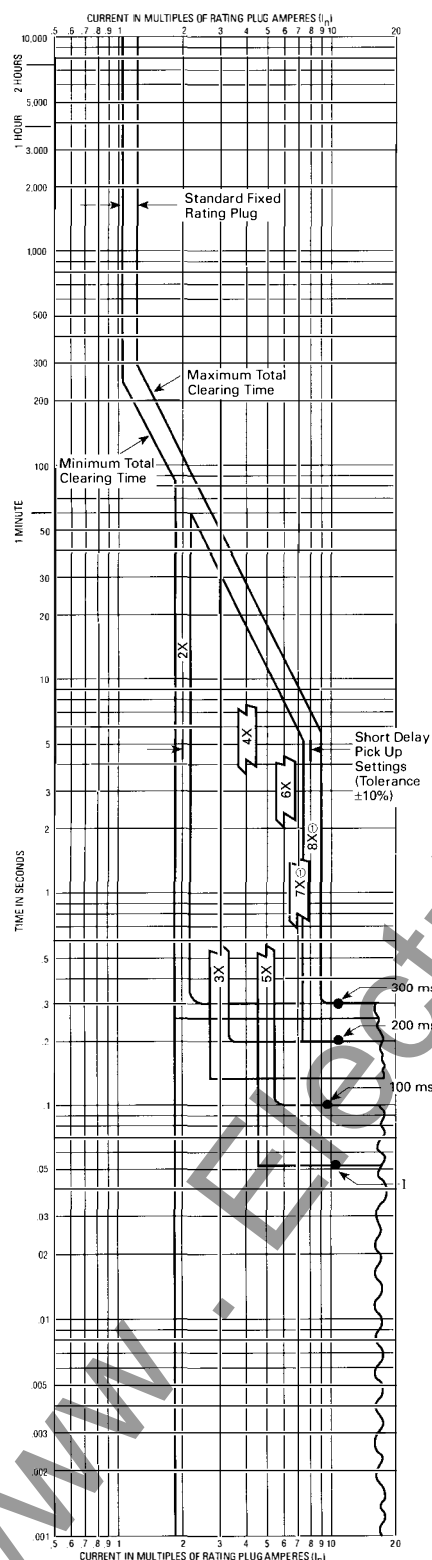
⑤ Not UL/CSA Listed.





AB DE-ION Circuit Breakers

Types RD, CRD, RDC, CRDC Equipped With Digitrip RMS 310 Trip Units. Typical Long Delay/Short Delay Time-Phase Current Characteristic Curve Based on I_n



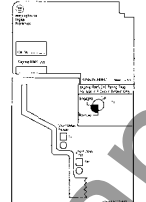
Circuit Breaker Time/Current Curves (Phase Current) ④

Series C® R-Frame Circuit Breakers
Equipped With Type Digitrip RMS 310 Trip Units

For use with Trip Unit Catalog Numbers

1600A Max.	2000A Max.	2500A Max.
RES1600LSI	RES2000LSI	RES2500LSI
RES1600LSIG	RES2000LSIG	RES2500LSIG
RES1600LSI	RES2000LSI	RES2500LSI

Typical Trip Unit Nameplate



Frame Rating Amperes (Max.)	Available Rating Plugs Amperes (Rating I_n)	Type	Catalog Number	Short Delay Pickup Range Amperes
1600	1600	Fixed	16RS16T	3200-12800
	1400	Fixed	16RS14T	2800-11200
	1250	Fixed	16RS125T ⁵	2500-10000
	1200	Fixed	16RS12T	2400-9600
	1000	Fixed	16RS10T	2000-8000
	800	Fixed	16RS08T	1600-6400
	800, 1000, 1200, 1600	Adj.	A16RS16T1	1600-12800
	800, 1000, 1250, 1600	Adj.	A16RS16T2 ⁵	1600-12800
	2000	Fixed	20RS20T	4000-16000
	1600	Fixed	20RS16T	3200-12800
2000	1400	Fixed	20RS14T	2800-11200
	1250	Fixed	20RS125T ⁵	2500-10000
	1200	Fixed	20RS12T	2400-9600
	1000	Fixed	20RS10T	2000-8000
	1000, 1200, 1600, 2000	Adj.	A20RS20T1	2000-16000
	1000, 1250, 1600, 2000	Adj.	A20RS20T2 ⁵	2000-16000
	2500	Fixed	25RS25T	5000-15000
	2000	Fixed	25RS20T	4000-12000
	1600	Fixed	25RS16T	3200-9600
	1250	Fixed	25RS125T ⁵	2500-7500
2500	1200	Fixed	25RS12T	2400-7200
	1200, 1600, 2000, 2500	Adj.	A25RS25T1	2400-15000
	1250, 1600, 2000, 2500	Adj.	A25RS25T2 ⁵	2500-15000

Interrupting Ratings—50/60 Hz
RMS Sym. Amperes (kA)

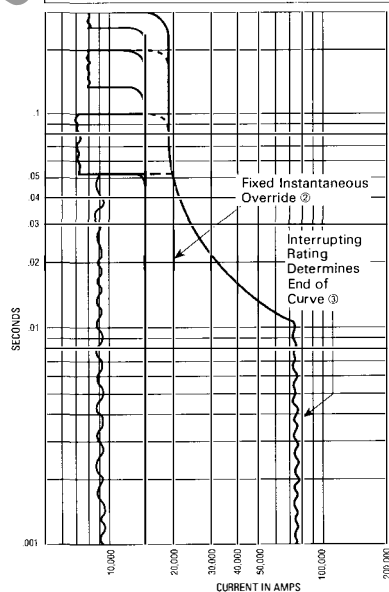
Breaker Type	UL/CSA	480V	600V	IEC 947-2	380-415V	I_{cu}
RD, CRD	125	65	50	125	65	42
RDC, CRDC	200	100	65	200	100	65

Utilization Category A
 $I_{cs} = 0.25 I_{cu}$
 $U_{imp} = 8 \text{ kV}$

Notes
Curve accuracy applies from -20°C to $+55^\circ\text{C}$ ambient. For possible ampere derating for ambient above 40°C , refer to Cutler-Hammer.

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

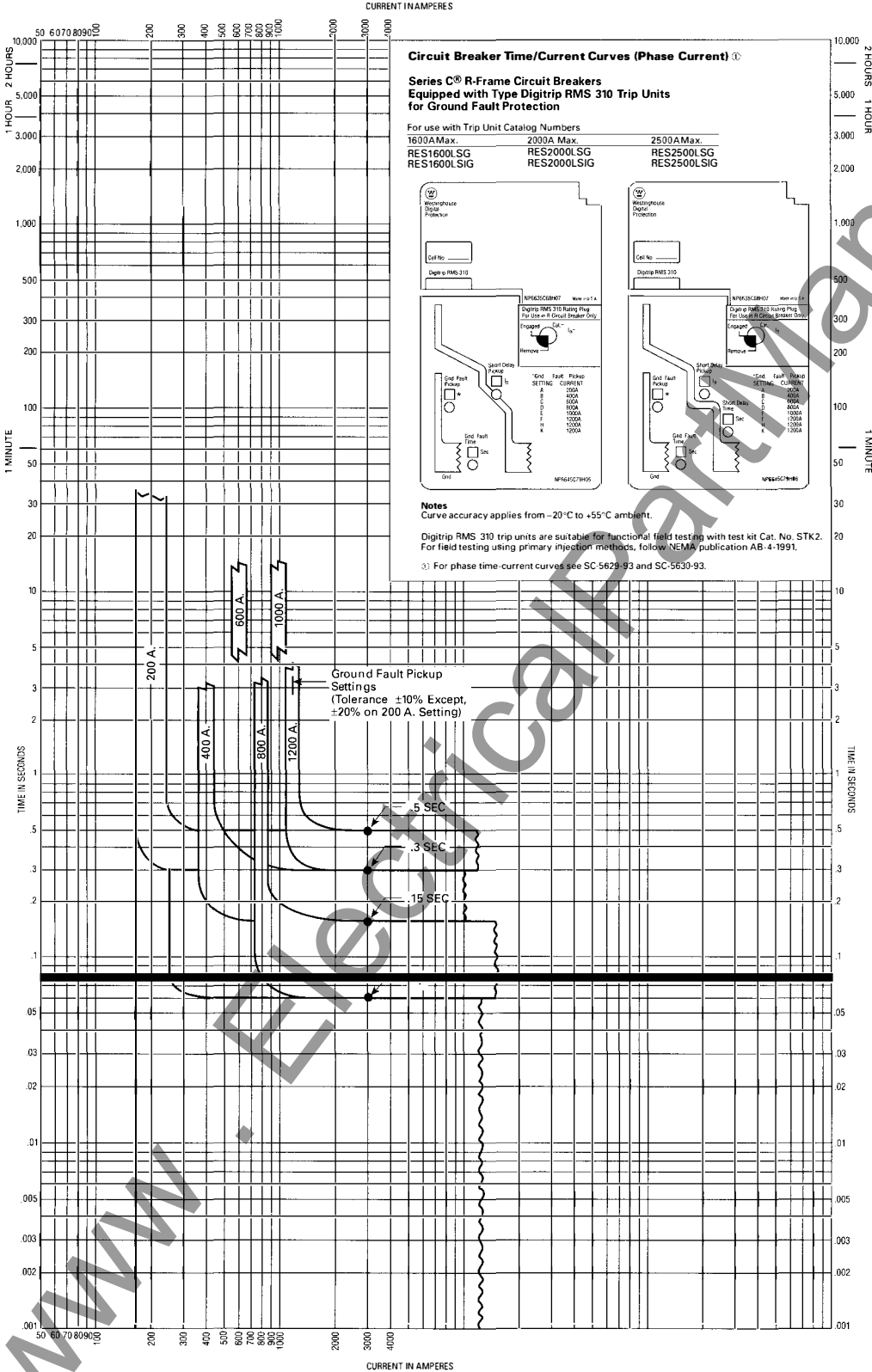
- ① For 2500A styles, maximum short delay pickup setting = 6X.
- ② For high fault current levels a fixed instantaneous override is provided at 17,500A (Tolerance $\pm 15\%$).
- ③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.
- ④ For ground fault time-current curves see SC-5631-93.
- ⑤ Not UL/CSA Listed.





AB DE-ION Circuit Breakers

Types RD, CRD, RDC, CRDC Equipped With Digitrip RMS 310 Trip Units. Typical Ground Fault/Protection Time/Current Characteristic Curve Based on I_n





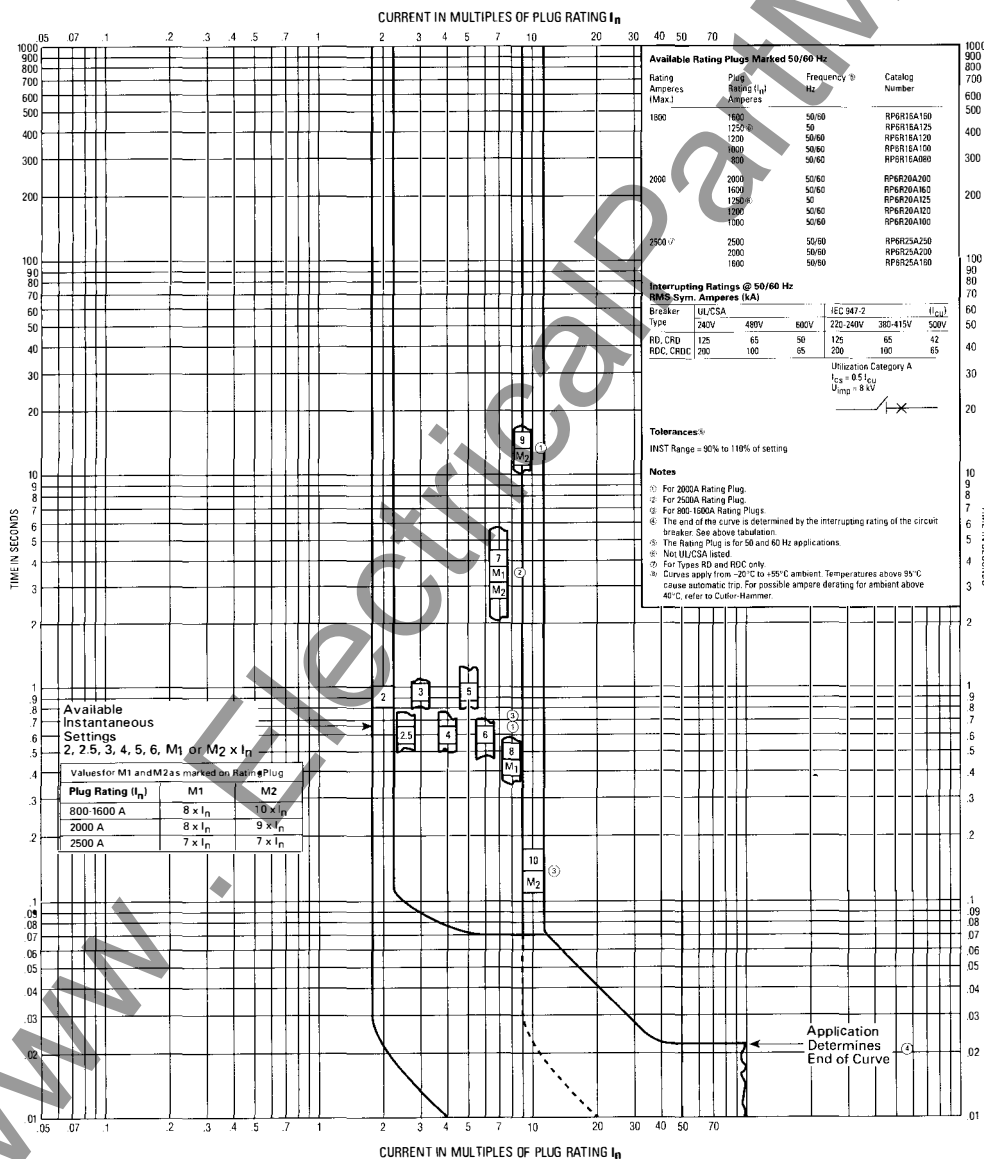
AB DE-ION Circuit Breakers

Types RD, CRD, RDC, CRDC Equipped With Digitrip RMS 510/610/810 Trip Units. Typical Instantaneous Time-Phase Current Characteristic Curve Based on I_n

IMPORTANT

TRIP UNITS ARE NOT AVAILABLE WITH ONLY INSTANTANEOUS PROTECTION. THIS CURVE MUST BE USED in conjunction WITH Curve No. SC-5627-93 for LONG DELAY (and if applicable SHORT DELAY) PROTECTION to obtain the complete time-current characteristic.

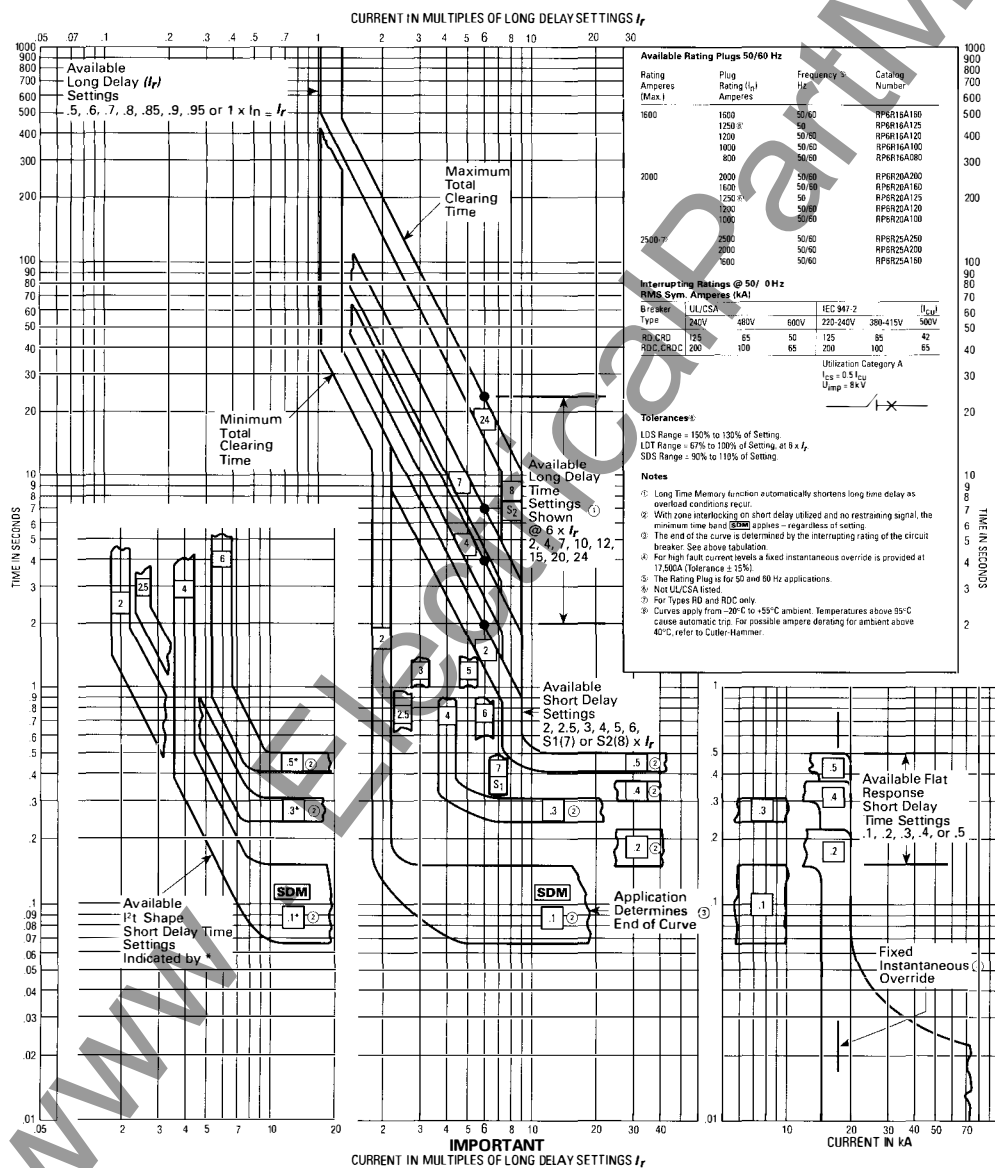
Series C[®] R-Frame Circuit Breakers with DIGITRIP RMS 510/610/810 Trip Units Typical Instantaneous Time-Phase Current Characteristic Curve (I)



AB DE-ION Circuit Breakers

Types RD, CRD, RDC, CRDC Equipped With Digitrip RMS 510/610/810 Trip Units. Typical Long Delay/Short Delay Time-Phase Current Characteristic Curve Based on I_r

Series C[®]R-Frame Circuit Breakers with DIGITRIP RMS 510/610/810 Trip Units Typical Long Delay and Short Delay Time-Phase Current Characteristic Curve (LS)

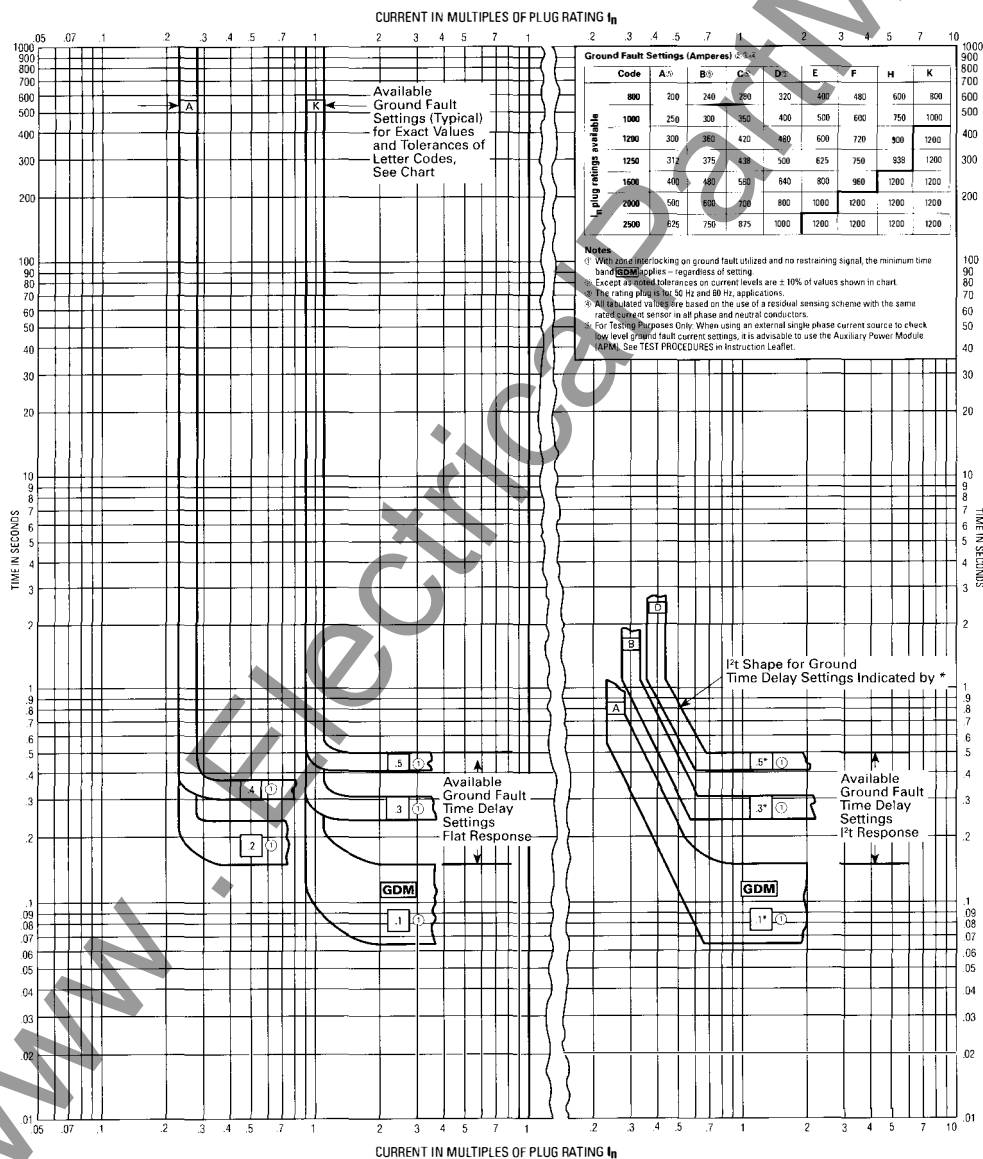




AB DE-ION Circuit Breakers

Types RD, CRD, RDC, CRDC Equipped With Digitrip RMS 510/610/810 Trip Units. Typical Ground Fault/Protection Time/Current Characteristic Curve Based on I_n

Series C[®] R-Frame Circuit Breakers with
DIGITRIP RMS 510/610/810 Trip Units
Typical Time-Ground Current Characteristic Curve (G)





AB DE-ION Circuit Breakers

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220



Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167G

Page 1

May 1994
Supersedes Application Data 29-161A,
pages 5-6, dated December 1988
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® G-Frame
Circuit Breakers

Westinghouse AB DE-ION® Circuit Breakers

Voltages shown in curve headings are maximum at which the breaker may be applied. Interrupting capacity of individual breaker is tabulated on each curve.

Breaker Description	Curve No.	Page
Types GB, GHB, GC, GHC 15-100 Amperes, 1 Pole	SC-3500-83B	2
Types GB, GHB, GC, GHC 15-100 Amperes, 2, 3 Poles	SC-3501-83B	3
Type GHBS 15 and 20 Amperes, 1 Pole	SC-5695-93A	4

Additional copies of this application data may be ordered from the Westinghouse Printing Division, Trafford, PA 15085. Order Application Data 29-167G.

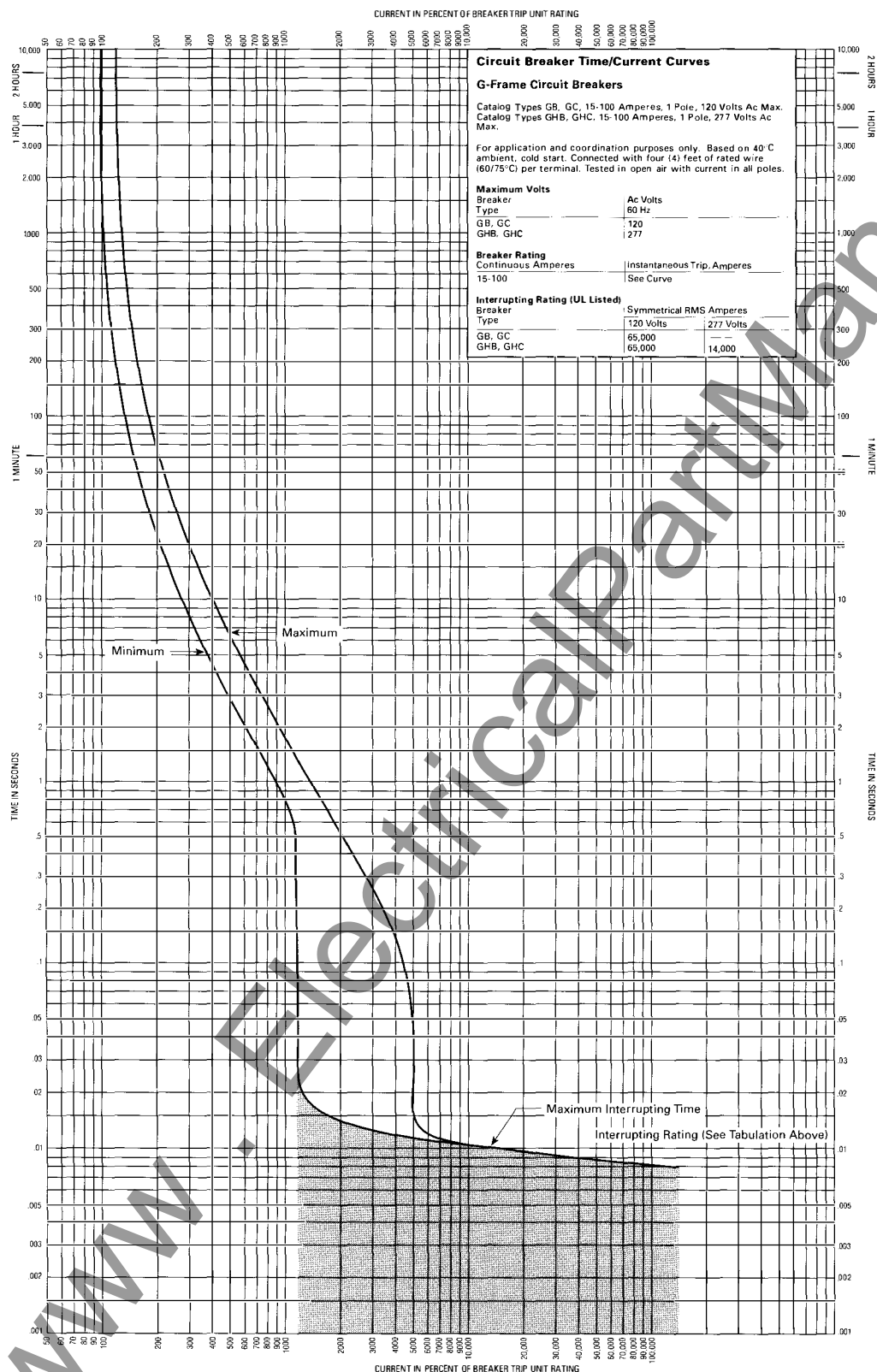
Individual oversize copies of curves listed above printed on onion-skin paper are available in limited quantity from:

Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, PA 15220

When ordering onion-skin curves, use number at bottom of page where curve appears, i.e., SC-3500-83B. **Requests for full sets of curves will not be honored.**

AB DE-ION Circuit Breakers

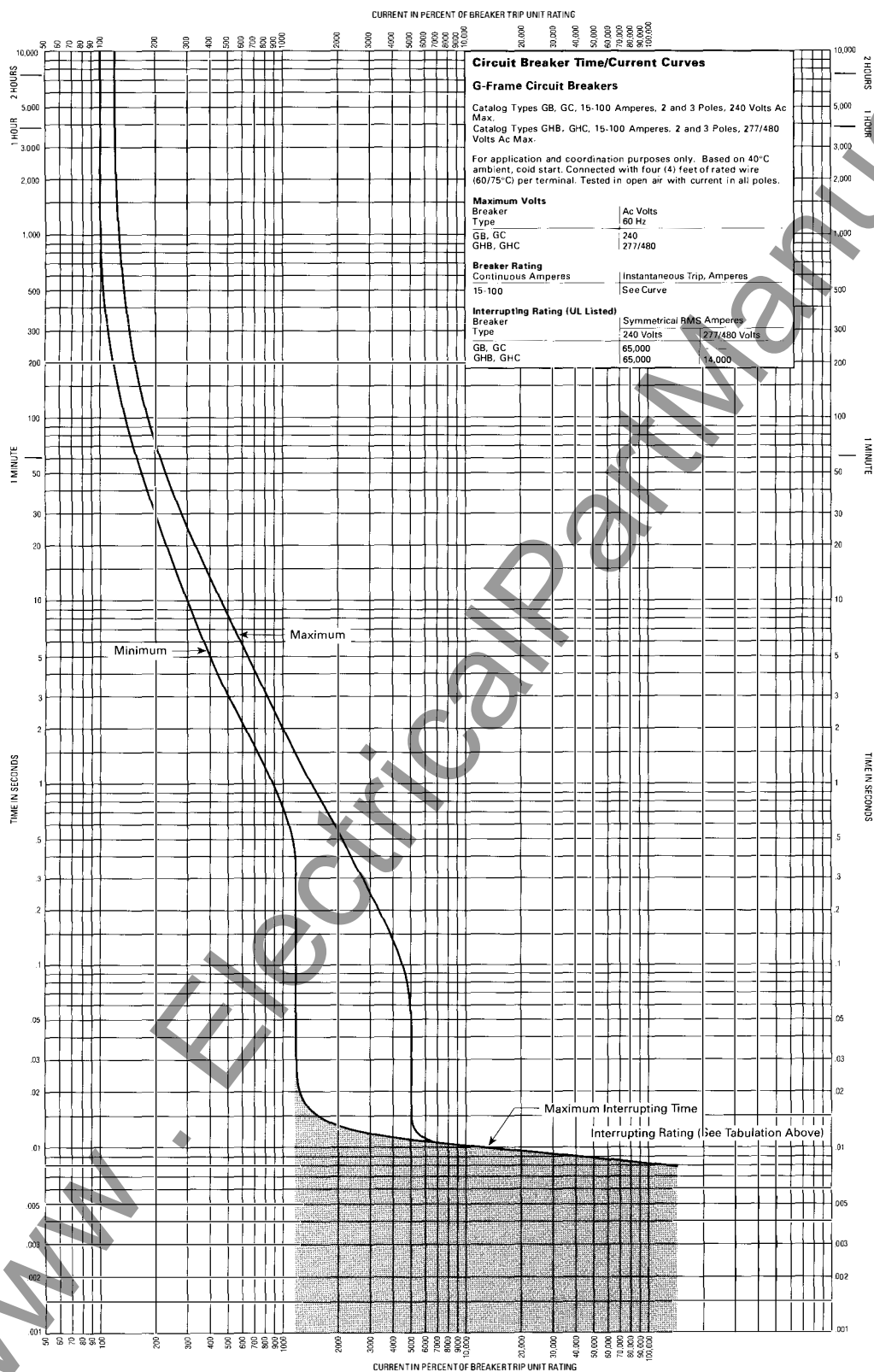
Types GB, GHB, GC, GHC 15-100 Amperes, 1 Pole





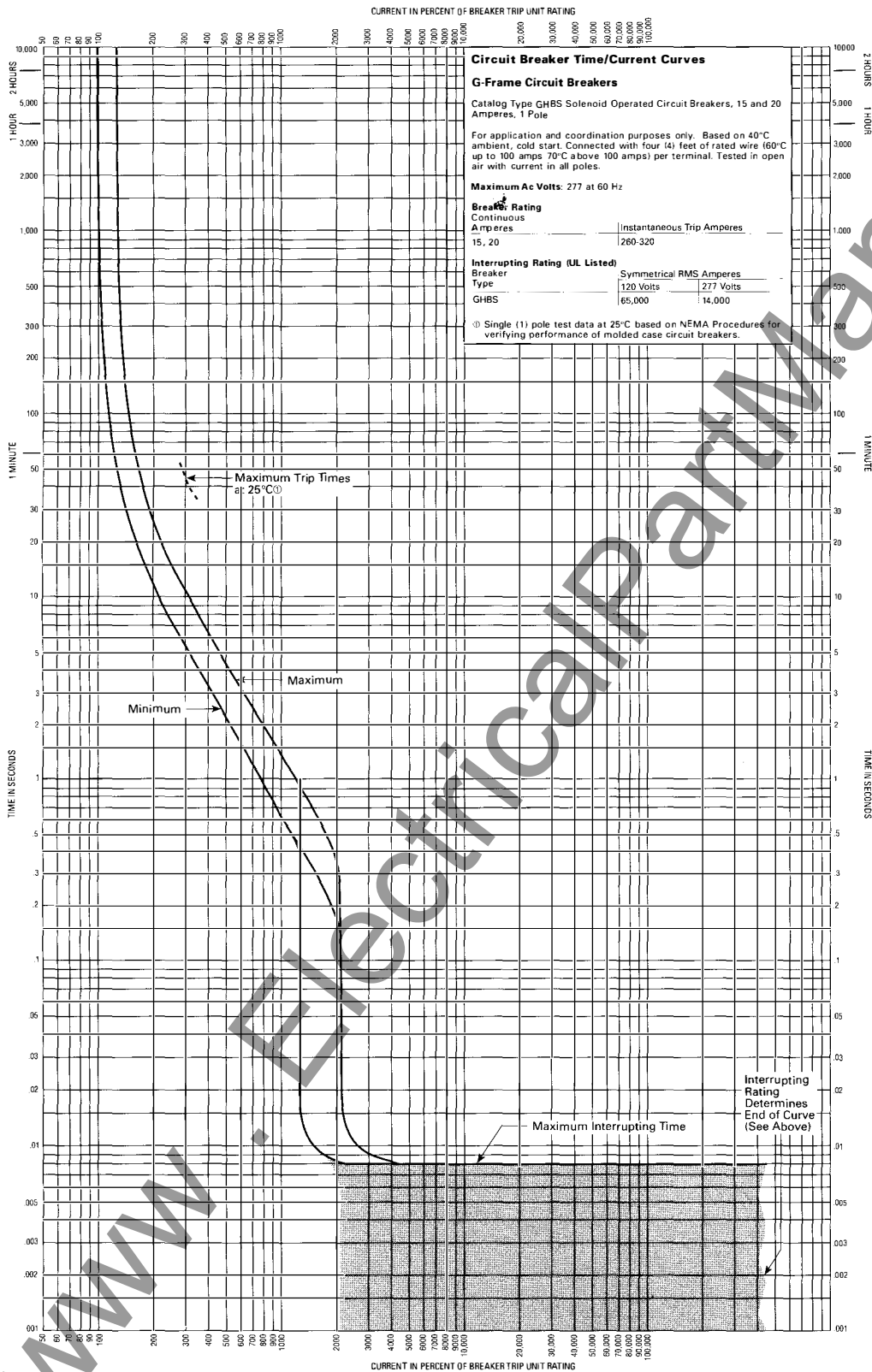
AB DE-ION Circuit Breakers

Types GB, GHB, GC, GHC 15-100 Amperes, 2 and 3 Poles





Type GHBS 15 and 20 Amperes, 1 Pole





Cutler-Hammer
Westinghouse &
Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data
29-167F

Page 1

May 1994
Supersedes Application Data 29-167A,
dated August 1993, and Application
Data 29-167F, pages 1-20, dated
November 1988
Mailed to: E/29-100A

Time/Current Characteristic Curves for
Westinghouse Series C® F-Frame
Circuit Breakers

Westinghouse AB DE-ION® Circuit Breakers

Voltages shown in curve headings are
maximum at which the breaker may be
applied. Interrupting capacity of individual
breaker is tabulated on each curve.

Breaker Description	Curve No.	Page
Single Pole		
Series C Types EHD, FD & HFD 15 Amperes	SC-4423-88A	2
Series C Types EHD, FD & HFD 20 Amperes	SC-4424-88A	3
Series C Types EHD, FD & HFD 25 Amperes	SC-4425-88A	4
Series C Types EHD, FD & HFD 30 Amperes	SC-4426-88A	5
Series C Types EHD, FD & HFD 35 Amperes	SC-4427-88A	6
Series C Types EHD, FD & HFD 40 Amperes	SC-4428-88A	7
Series C Types EHD, FD & HFD 45 Amperes	SC-4429-88A	8
Series C Types EHD, FD & HFD 50 Amperes	SC-4430-88A	9
Series C Types EHD, FD & HFD 60 Amperes	SC-4431-88A	10
Series C Types EHD, FD & HFD 70 Amperes	SC-4432-88A	11
Series C Types EHD, FD & HFD 80 Amperes	SC-4433-88A	12
Series C Types EHD, FD & HFD 90 Amperes	SC-4434-88A	13
Series C Types EHD, FD & HFD 100 Amperes	SC-4435-88A	14
Series C Types FD & HFD 110 Amperes	SC-4436-88A	15
Series C Types FD & HFD 125 Amperes	SC-4437-88A	16
Series C Types FD & HFD 150 Amperes	SC-4438-88A	17
Two, Three, and Four Poles		
Series C Types EHD, FDB, FD & HFD 15 Amperes	SC-4134-87B	18
Series C Types EHD, FDB, FD & HFD 20 Amperes	SC-4135-87B	19
Series C Types EHD, FDB, FD & HFD 25 Amperes	SC-4136-87B	20
Series C Types EHD, FDB, FD & HFD 30 Amperes	SC-4137-87B	21
Series C Types EHD, FDB, FD & HFD 35 Amperes	SC-4138-87B	22
Series C Types EHD, FDB, FD & HFD 40 Amperes	SC-4139-87B	23
Series C Types EHD, FDB, FD & HFD 45 Amperes	SC-4140-87B	24
Series C Types EHD, FDB, FD & HFD 50 Amperes	SC-4141-87B	25
Series C Types EHD, FDB, FD & HFD 60 Amperes	SC-4142-87B	26
Series C Types EHD, FDB, FD & HFD 70 Amperes	SC-4143-87B	27
Series C Types EHD, FDB, FD & HFD 80 Amperes	SC-4144-87B	28
Series C Types EHD, FDB, FD & HFD 90 Amperes	SC-4145-87B	29
Series C Types EHD, FDB, FD & HFD 100 Amperes	SC-4146-87B	30
Series C Types FDB, FD & HFD 110 Amperes	SC-4147-87B	31
Series C Types FDB, FD & HFD 125 Amperes	SC-4148-87B	32
Series C Types FDB, FD & HFD 150 Amperes	SC-4149-87B	33
Series C Type FDC 15 Amperes	SC-5516-93A	34
Series C Type FDC 20 Amperes	SC-5517-93A	35
Series C Type FDC 25 Amperes	SC-5518-93A	36
Series C Type FDC 30 Amperes	SC-5519-93A	37
Series C Type FDC 35 Amperes	SC-5520-93A	38
Series C Type FDC 40 Amperes	SC-5521-93A	39
Series C Type FDC 45 Amperes	SC-5522-93A	40
Series C Type FDC 50 Amperes	SC-5523-93A	41
Series C Type FDC 60 Amperes	SC-5524-93A	42
Series C Type FDC 70 Amperes	SC-5525-93A	43
Series C Type FDC 80 Amperes	SC-5526-93A	44
Series C Type FDC 90 Amperes	SC-5527-93A	45
Series C Type FDC 100 Amperes	SC-5528-93A	46
Series C Type FDC 110 Amperes	SC-5529-93A	47
Series C Type FDC 125 Amperes	SC-5530-93A	48
Series C Type FDC 150 Amperes	SC-5531-93A	49

Additional copies of this application data
may be ordered from the Westinghouse
Printing Division, Trafford, PA 15085.
Order Application Data 29-167F.

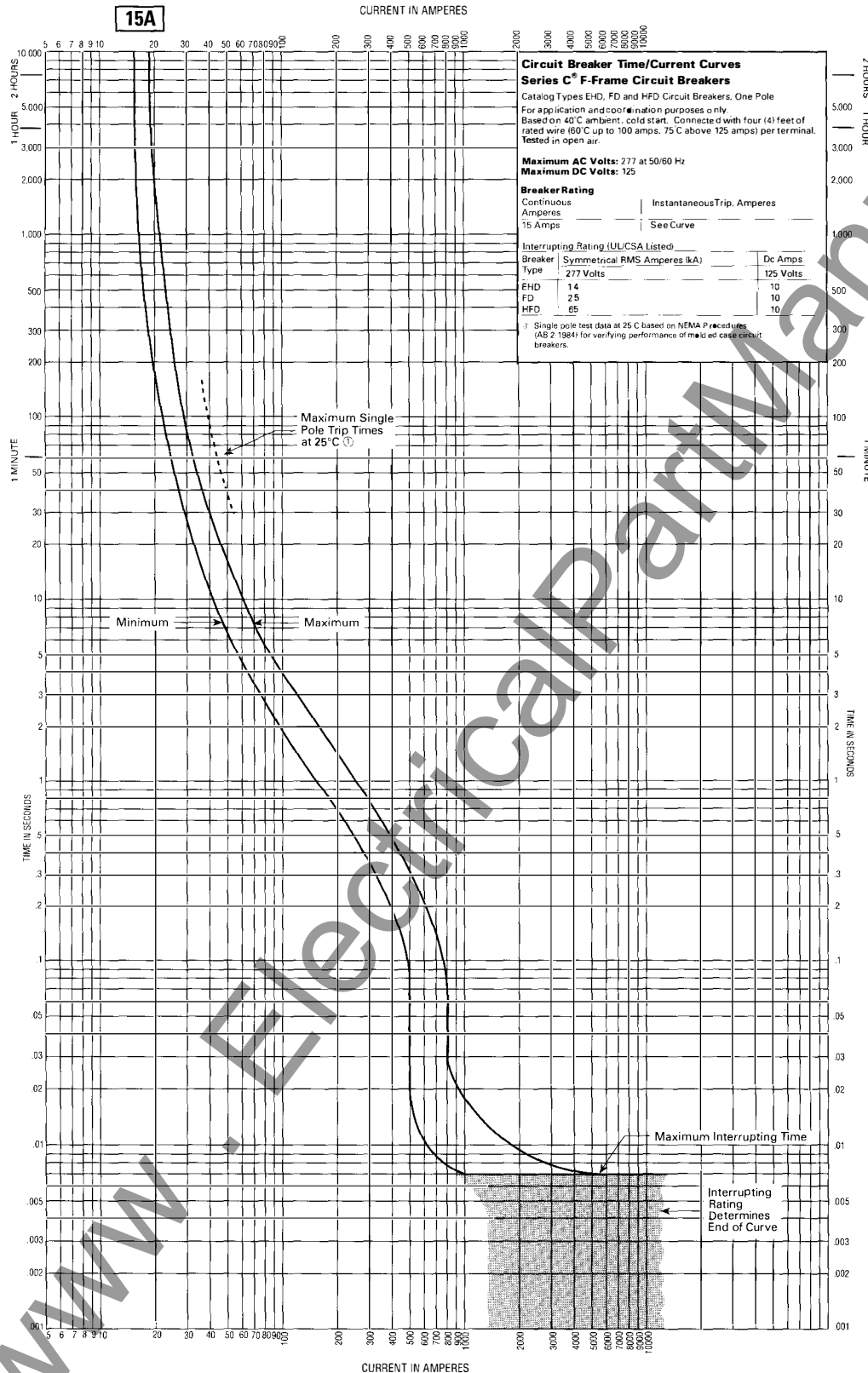
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ber at bottom of page where curve appears,
i.e., SC-4423-88A. **Requests for full sets of
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AB DE-ION Circuit Breakers

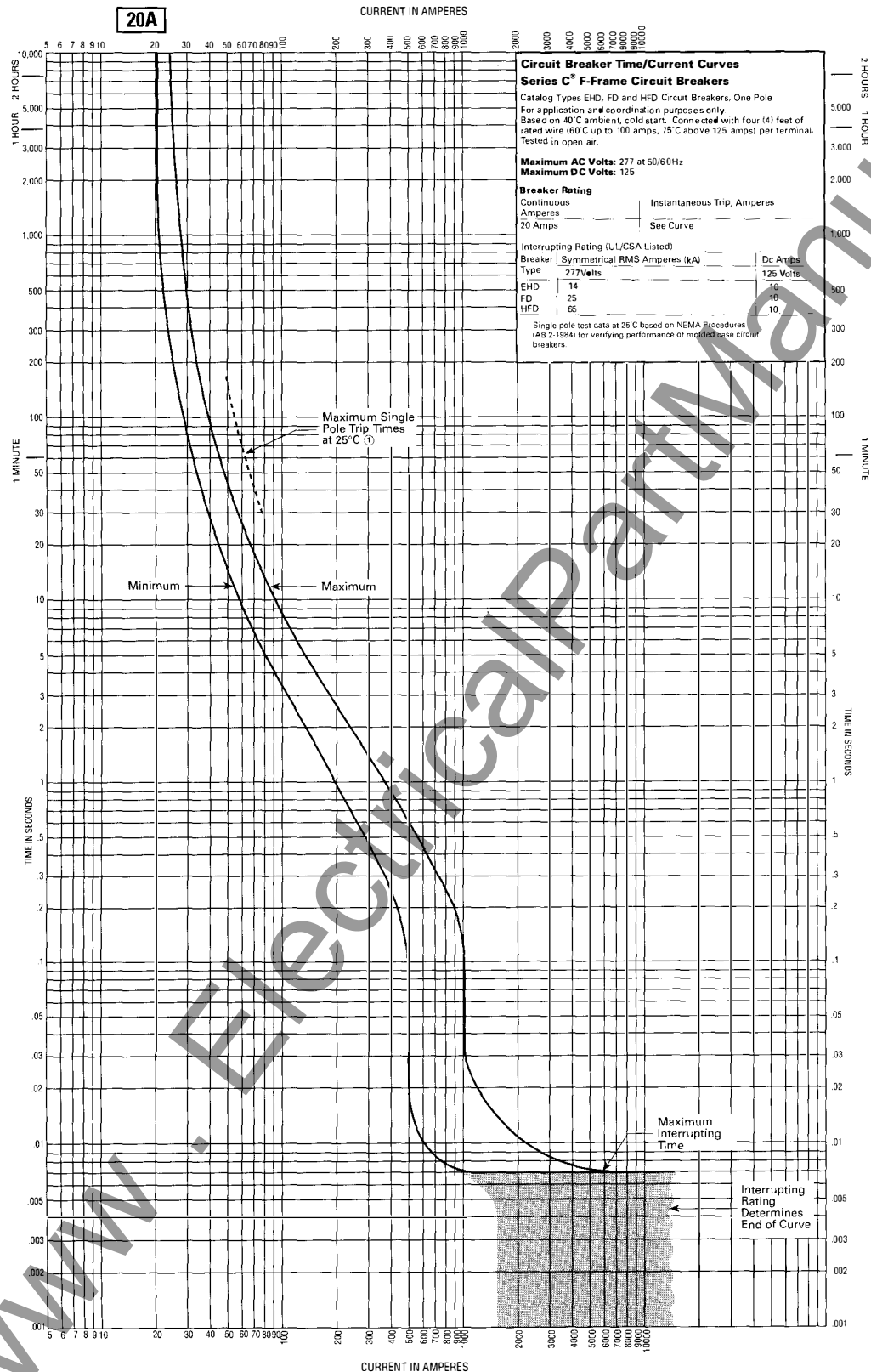
Types EHD, FD and HFD 15 Amperes





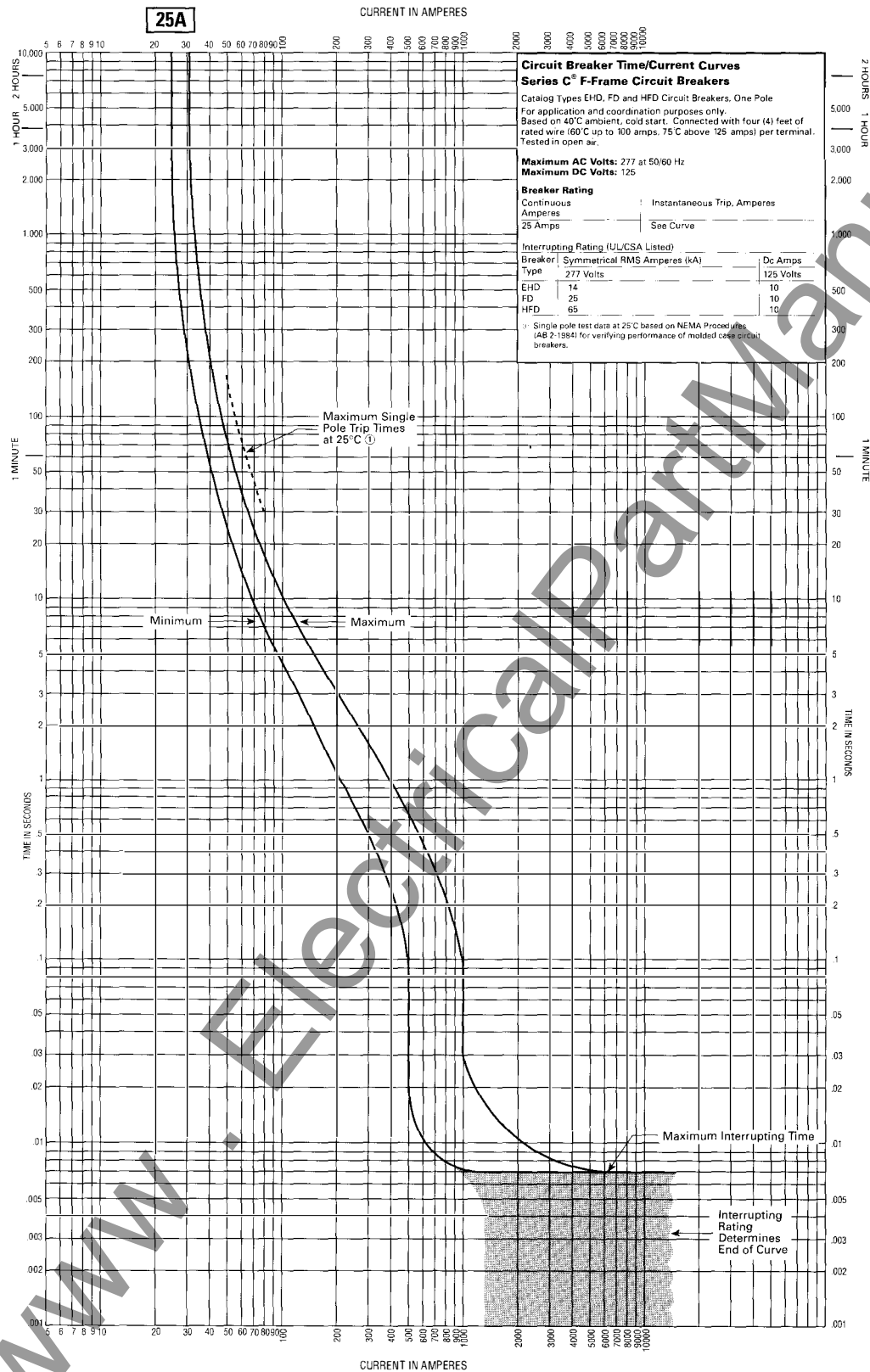
AB DE-ION Circuit Breakers

Types EHD, FD and HFD 20 Amperes



AB DE-ION Circuit Breakers

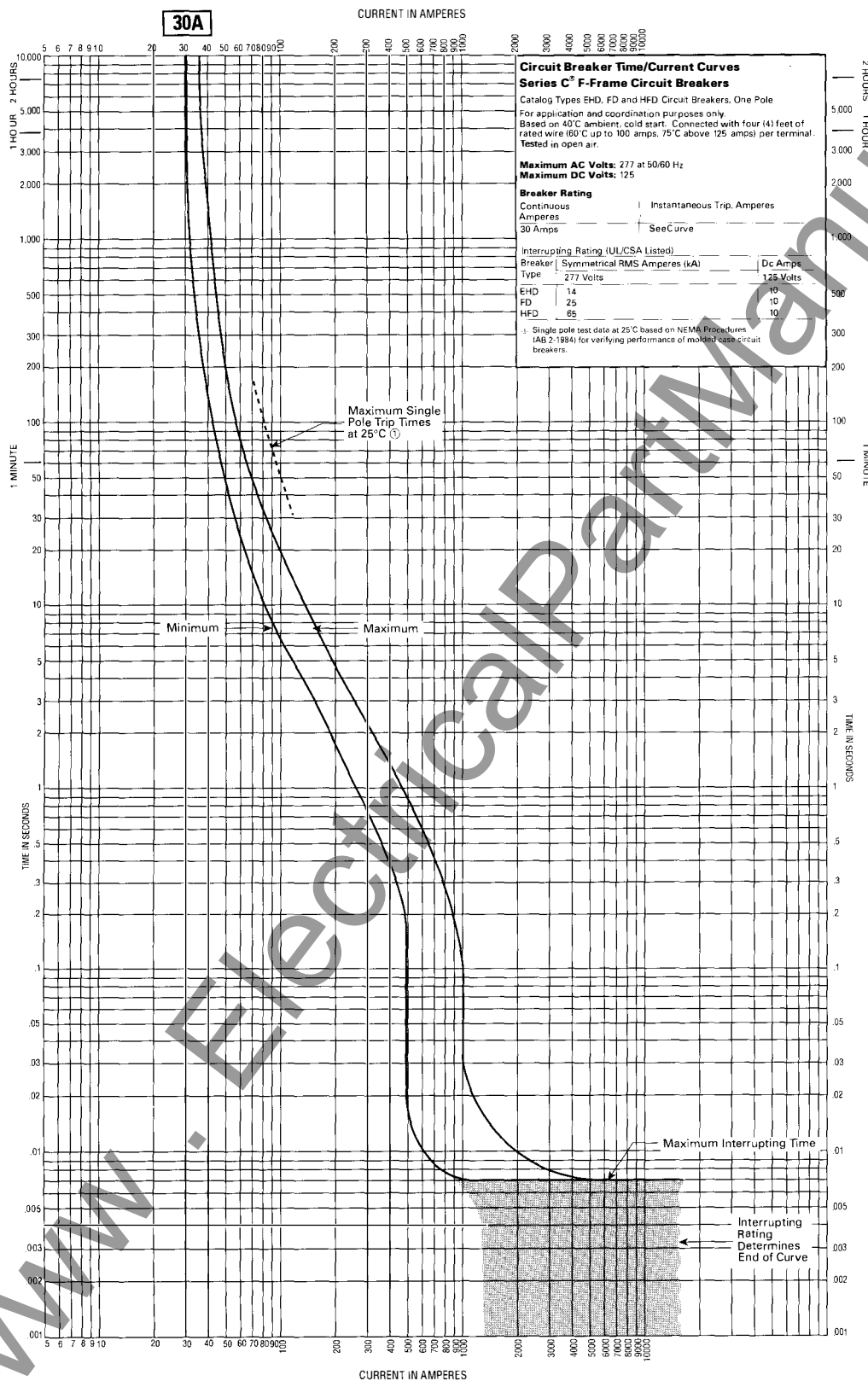
Types EHD, FD and HFD 25 Amperes





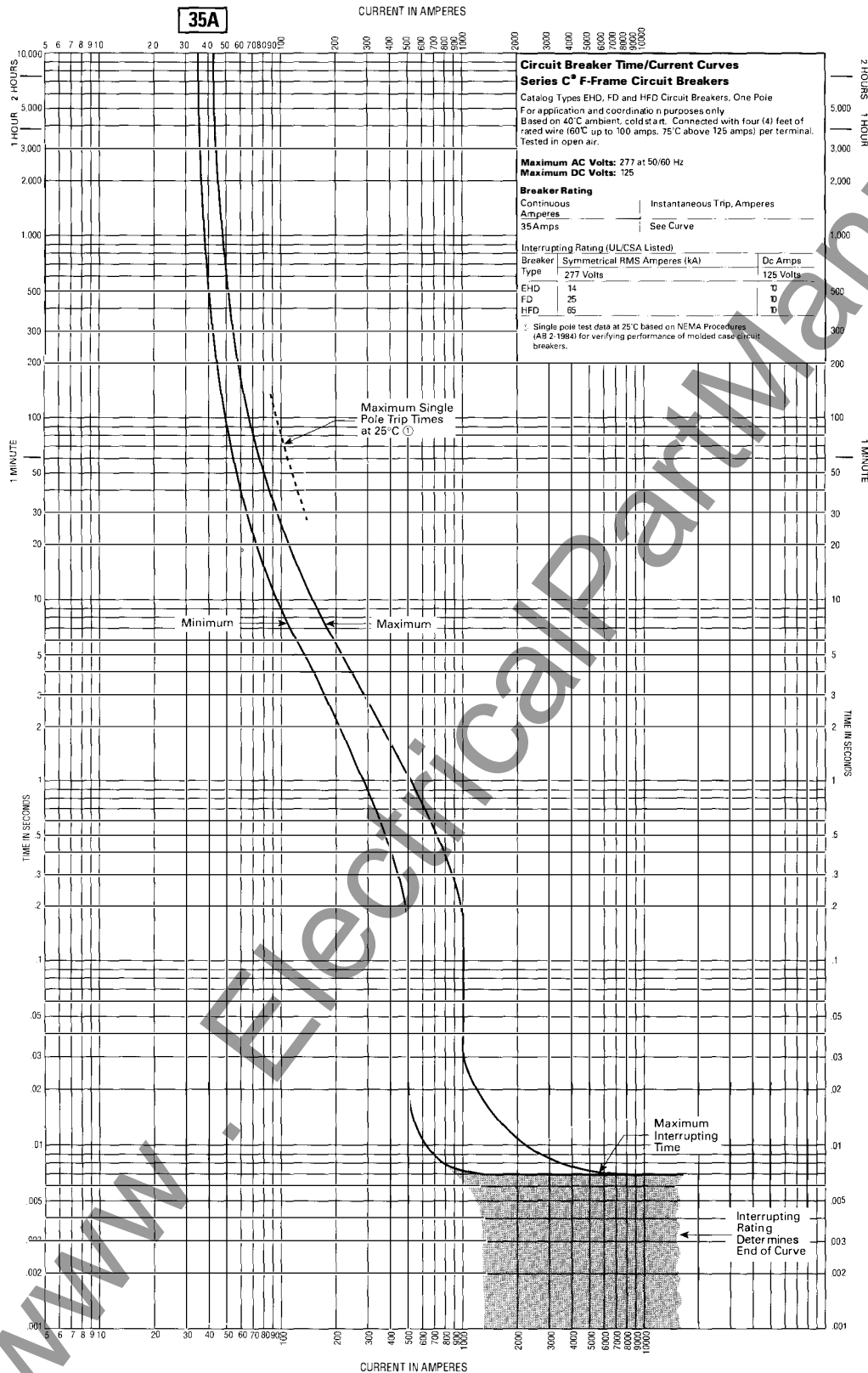
AB DE-ION Circuit Breakers

Types EHD, FD and HFD 30 Amperes



AB DE-ION Circuit Breakers

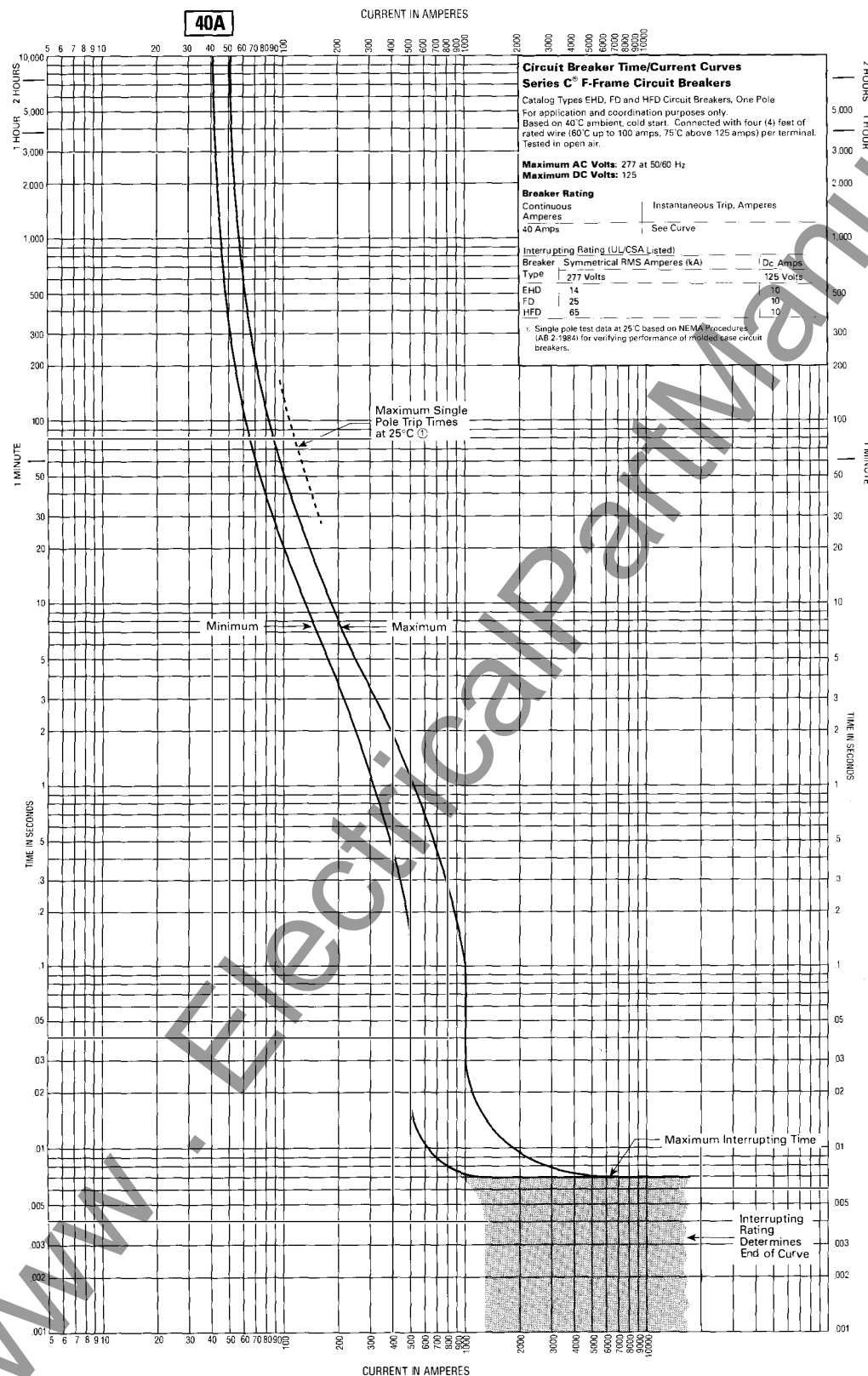
Types EHD, FD and HFD 35 Amperes





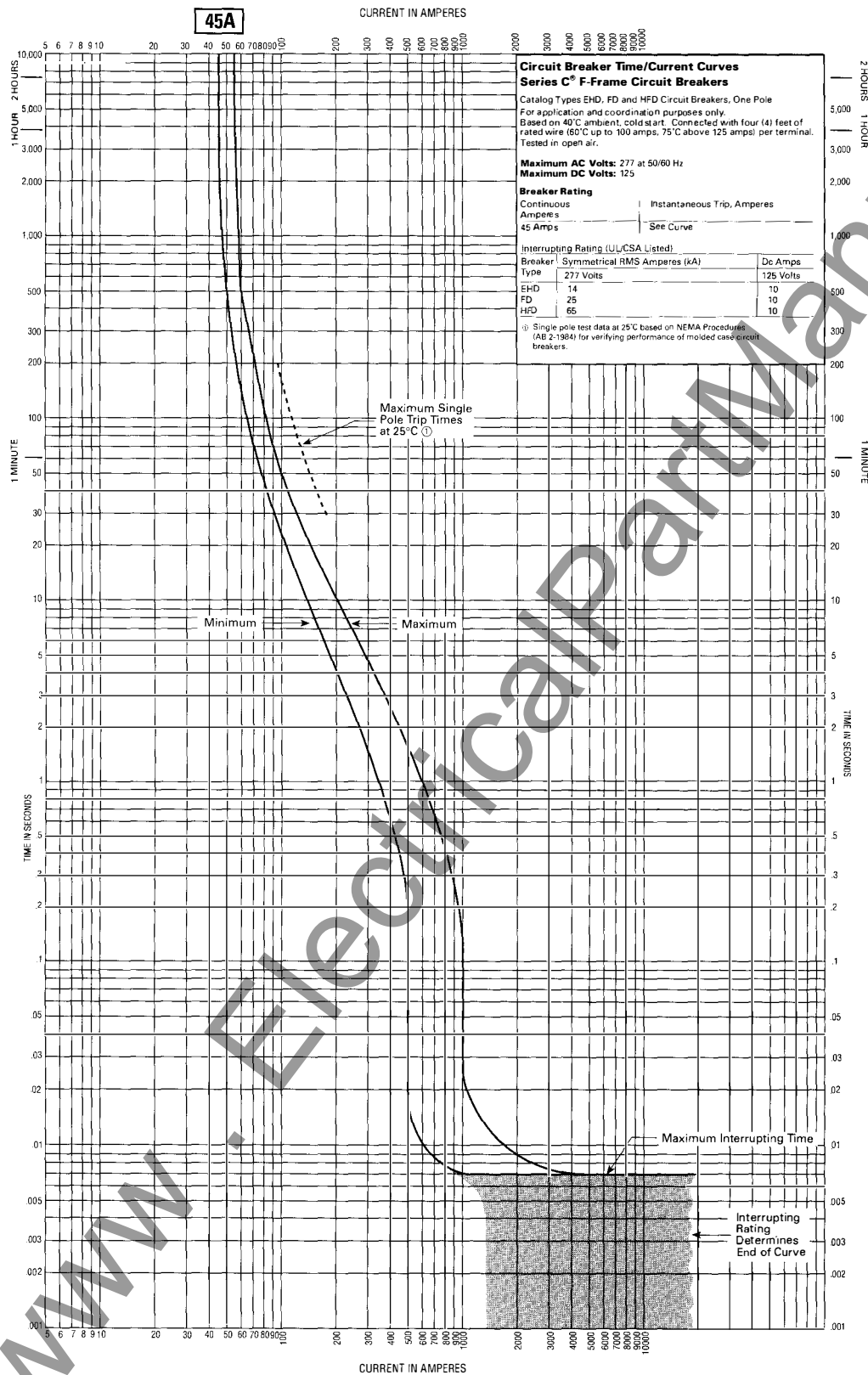
AB DE-ION Circuit Breakers

Types EHD, FD and HFD 40 Amperes



AB DE-ION Circuit Breakers

Types EHD, FD and HFD 45 Amperes



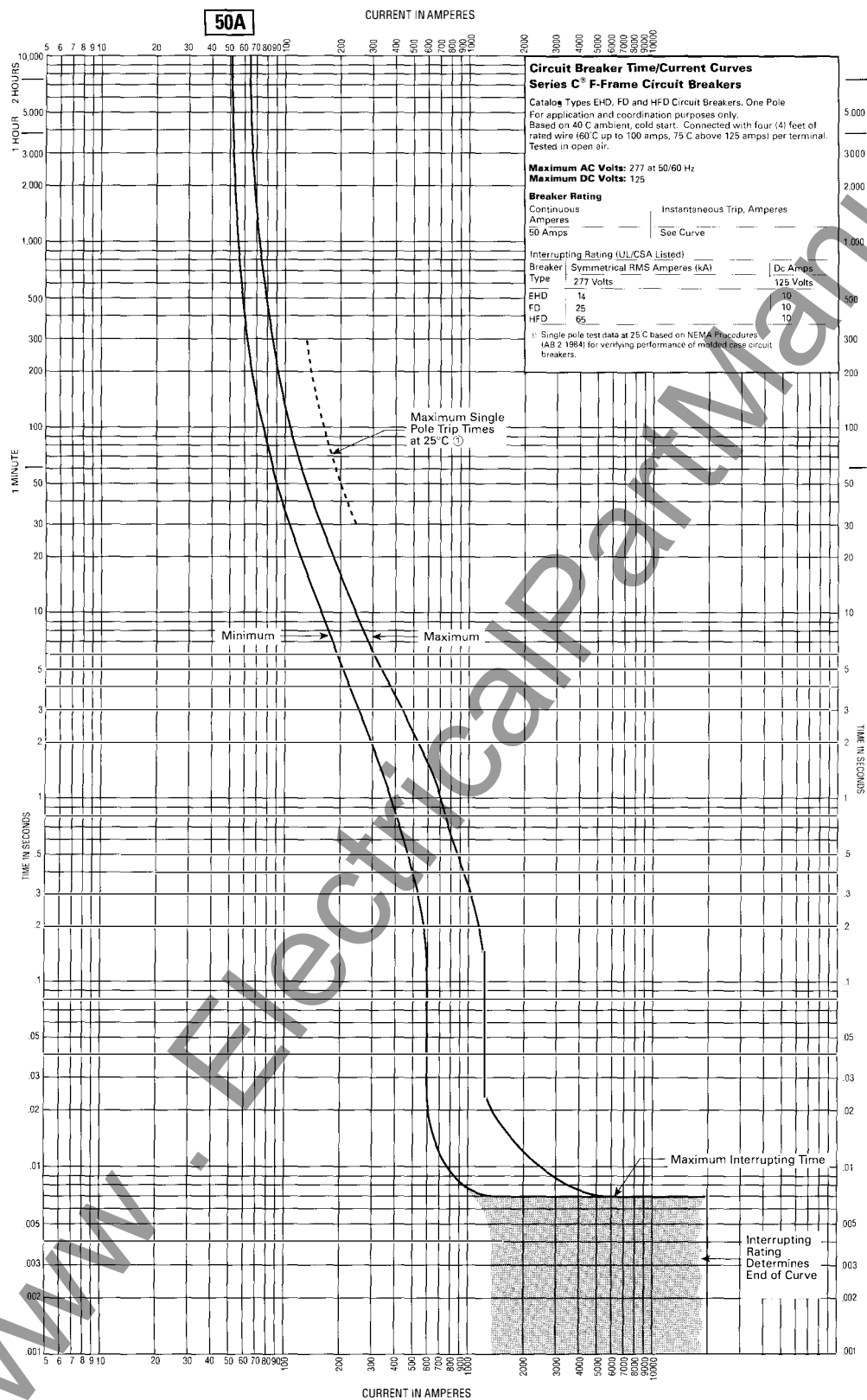
Curve No. SC-4429-88A

May 1994



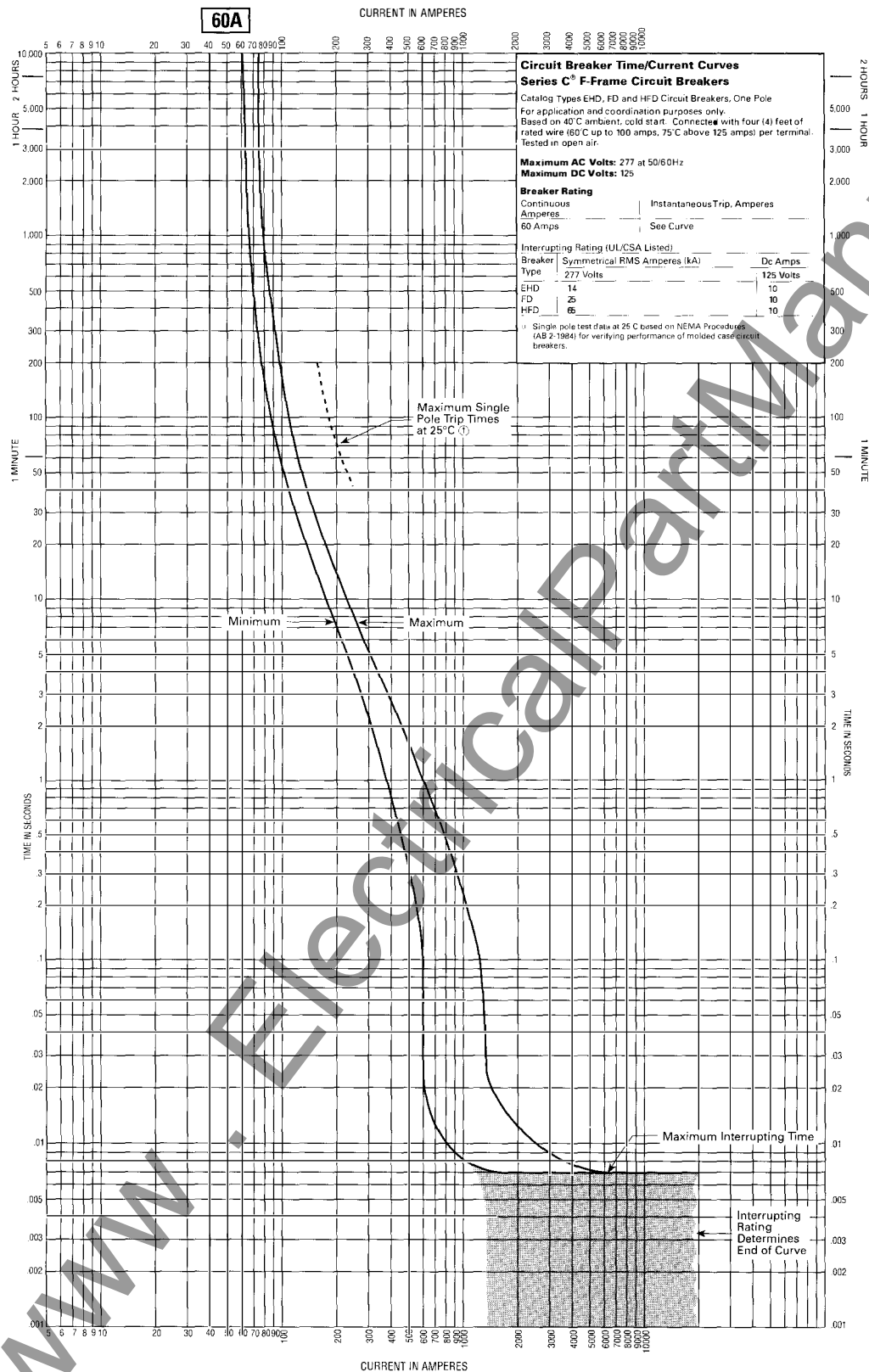
AB DE-ION Circuit Breakers

Types EHD, FD and HFD 50 Amperes



AB DE-ION Circuit Breakers

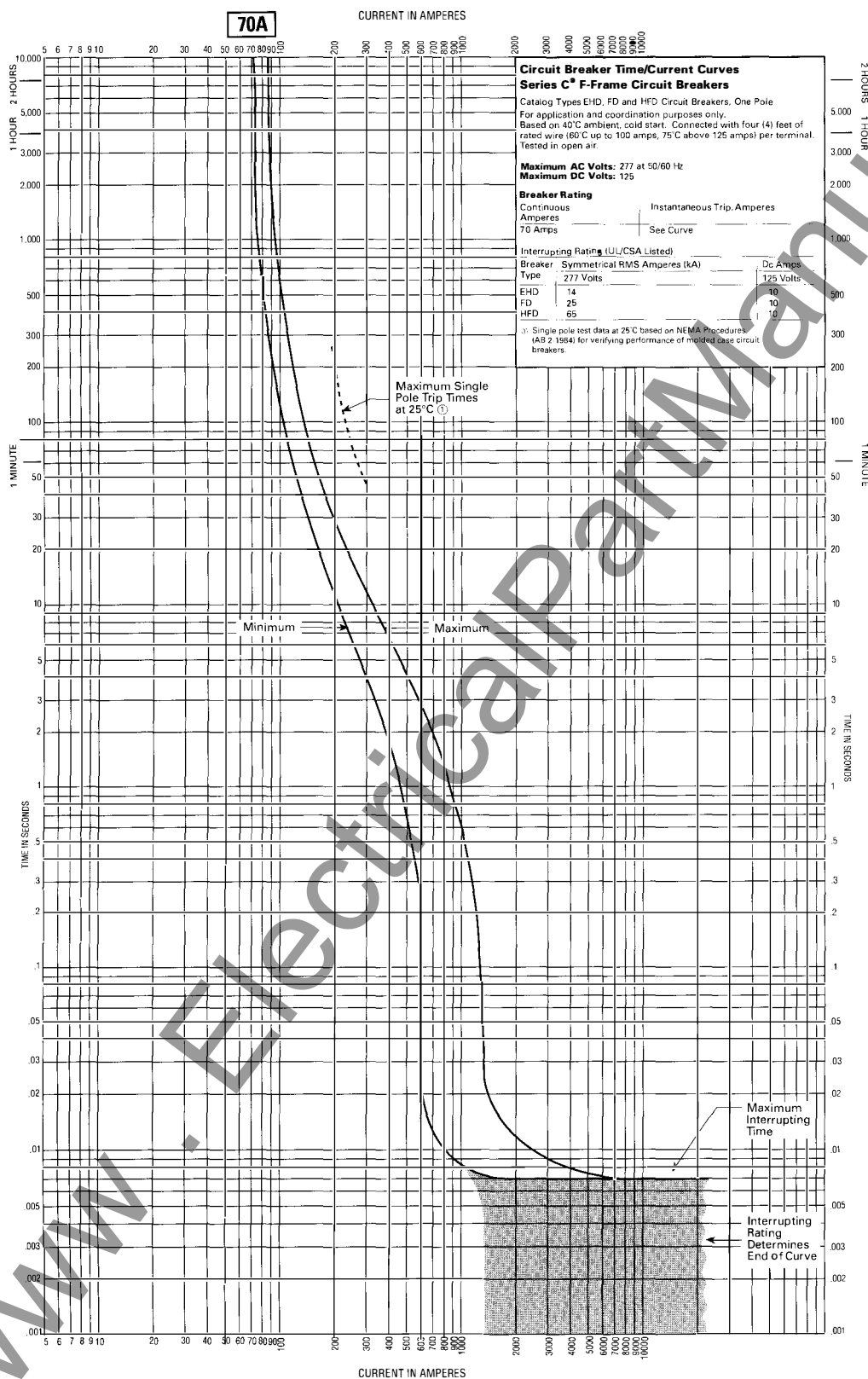
Types EHD, FD and HFD 60 Amperes





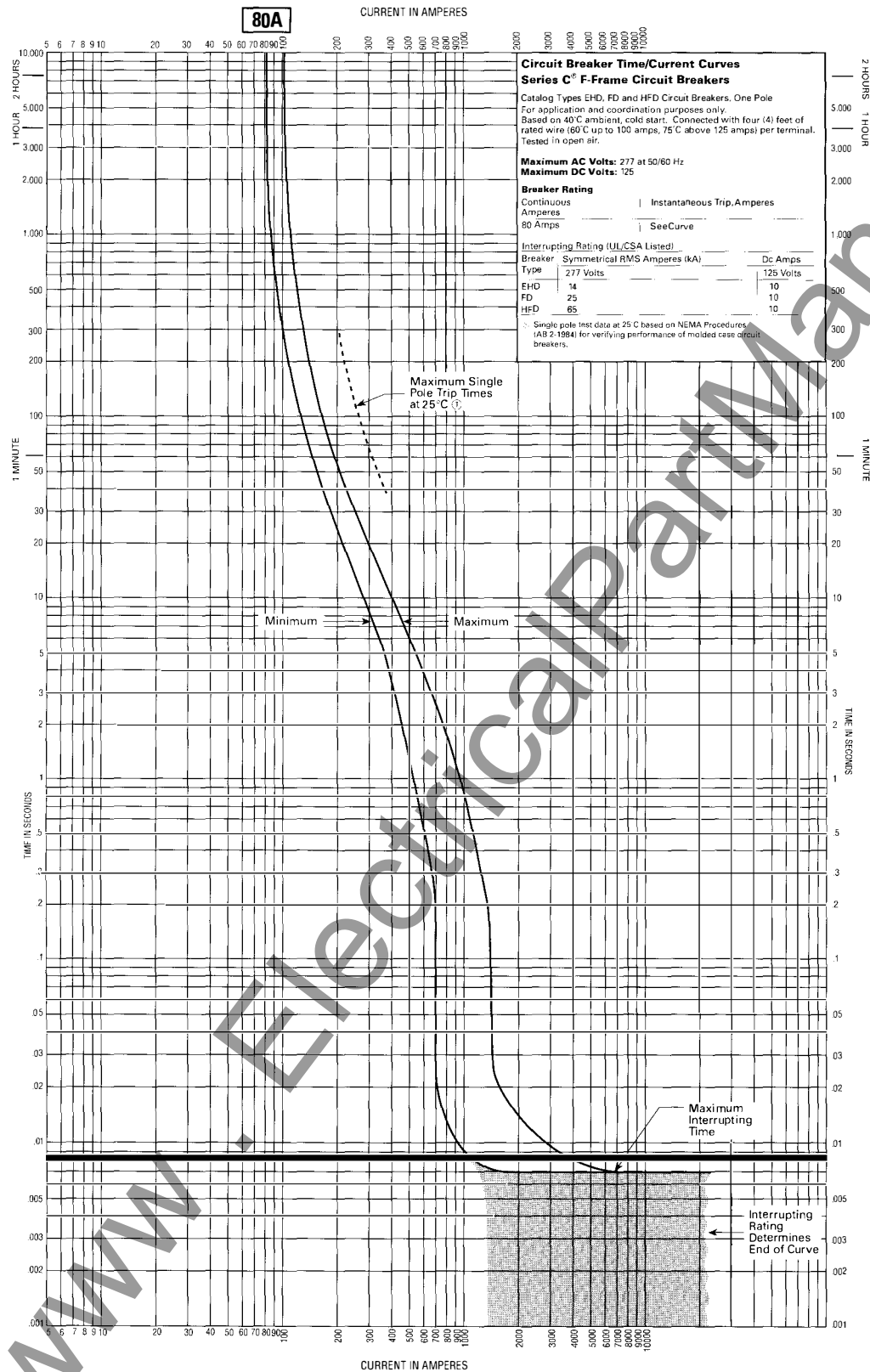
AB DE-ION Circuit Breakers

Types EHD, FD and HFD 70 Amperes



AB DE-ION Circuit Breakers

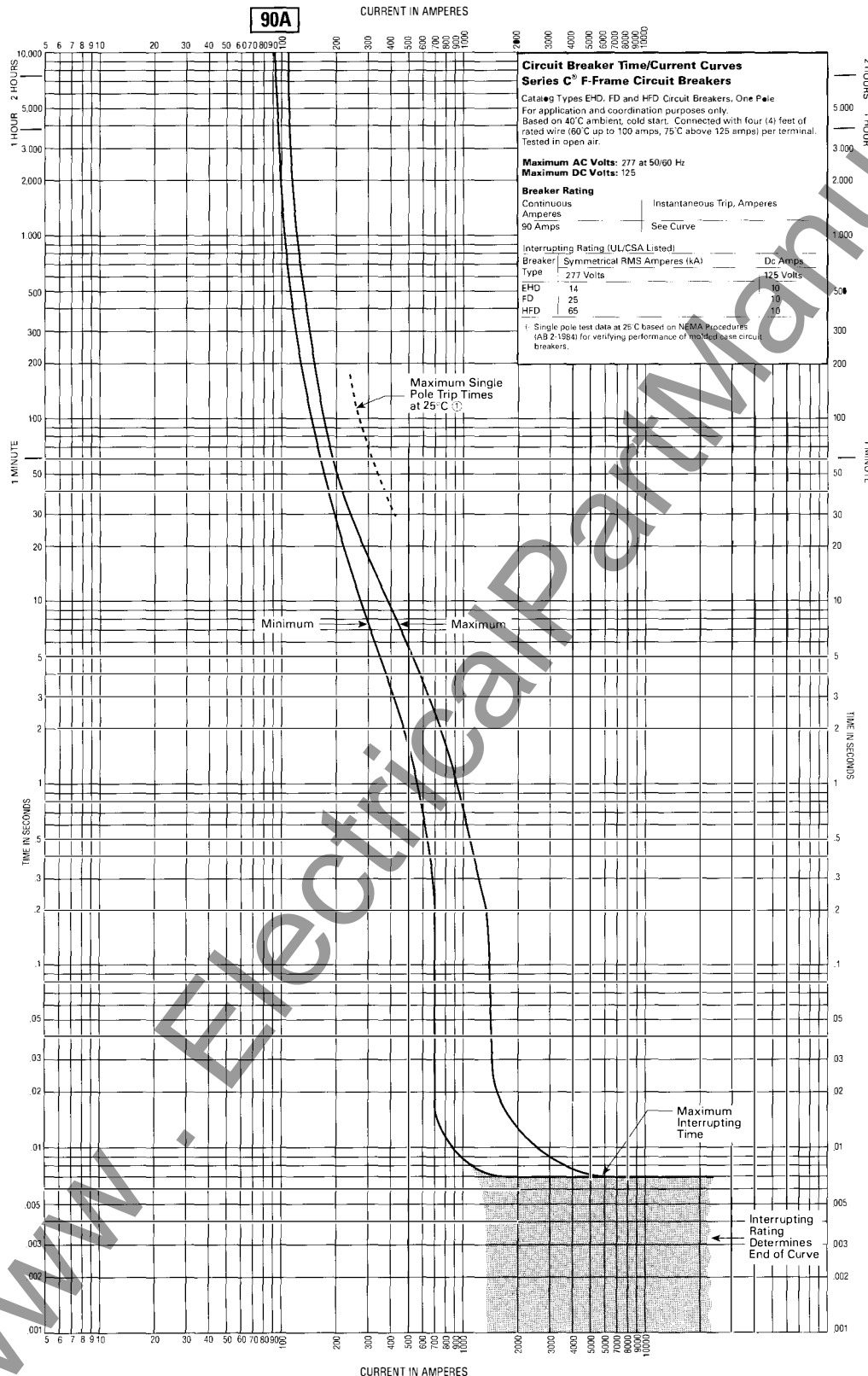
Types EHD, FD and HFD 80 Amperes





AB DE-ION Circuit Breakers

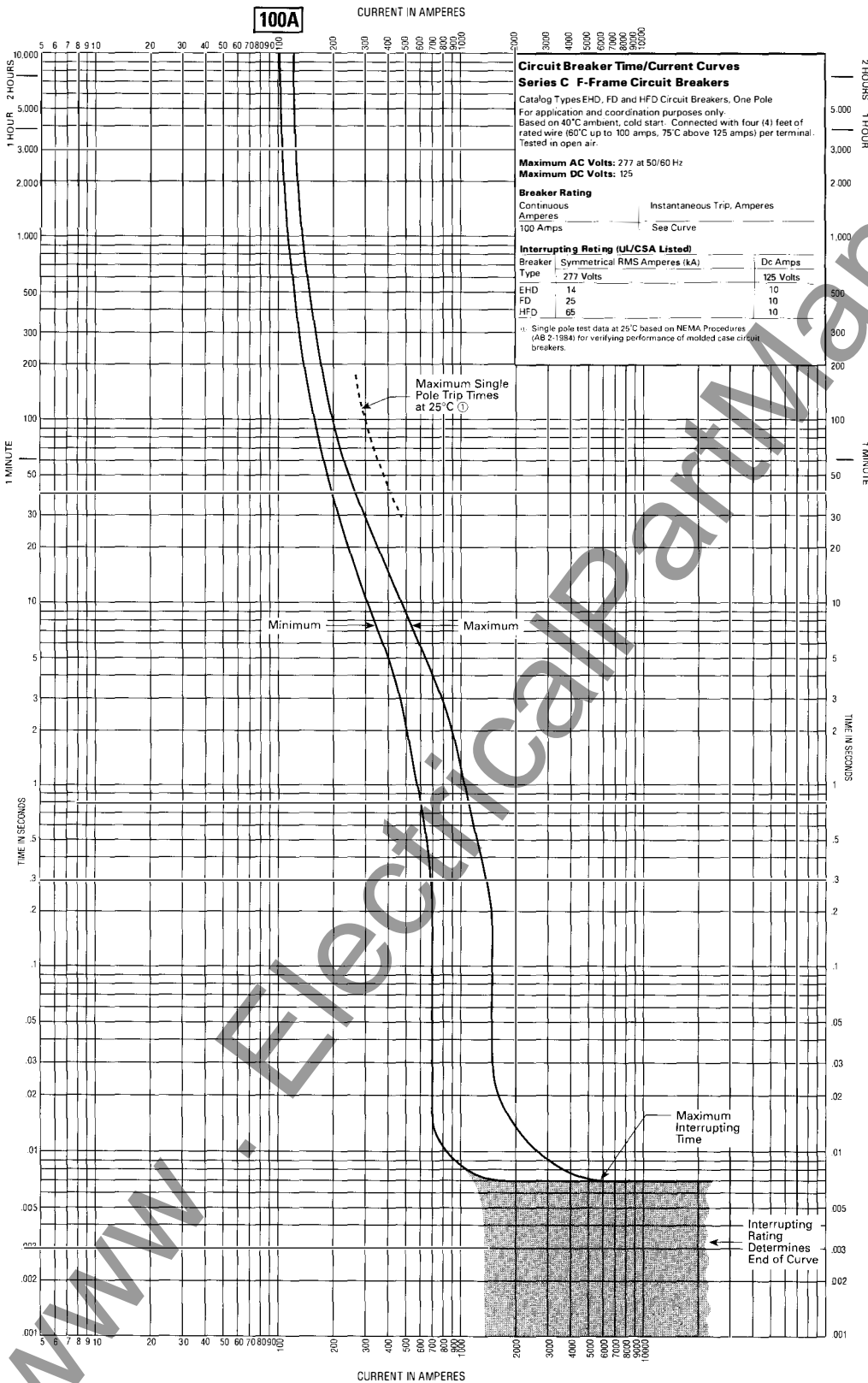
Types EHD, FD and HFD 90 Amperes





AB DE-ION Circuit Breakers

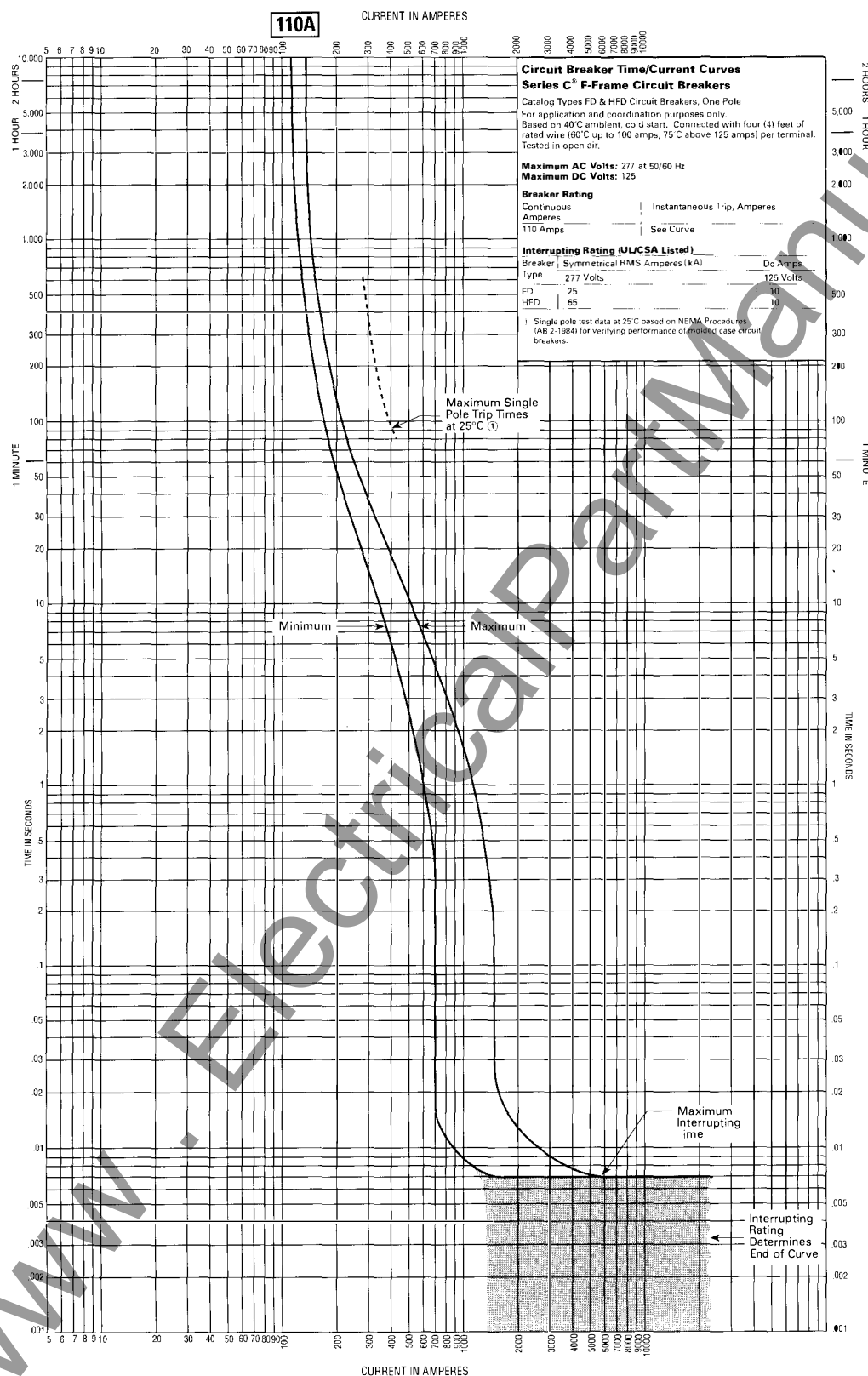
Types EHD, FD and HFD 100 Amperes





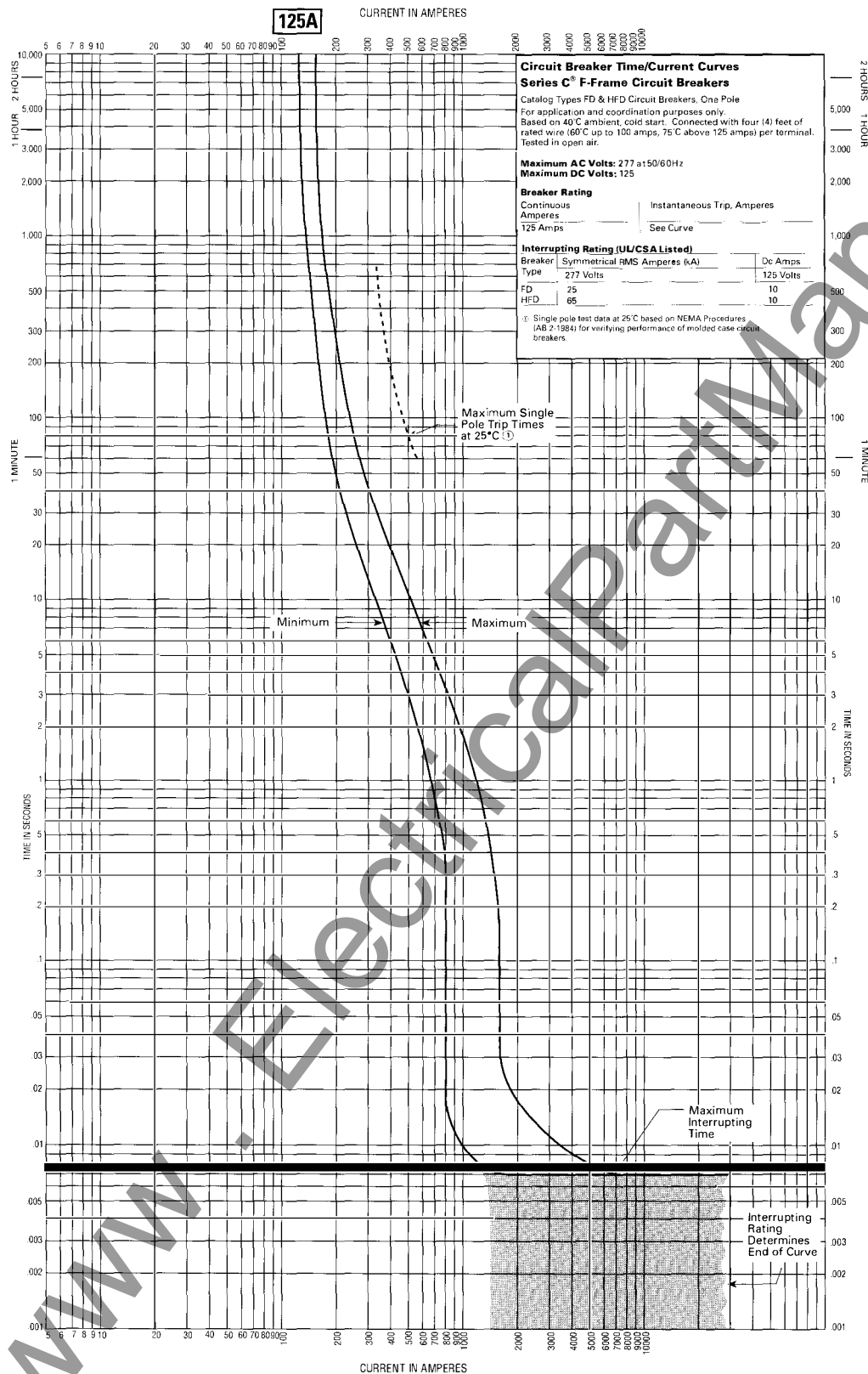
AB DE-ION Circuit Breakers

Types FD and HFD 110 Amperes



AB DE-ION Circuit Breakers

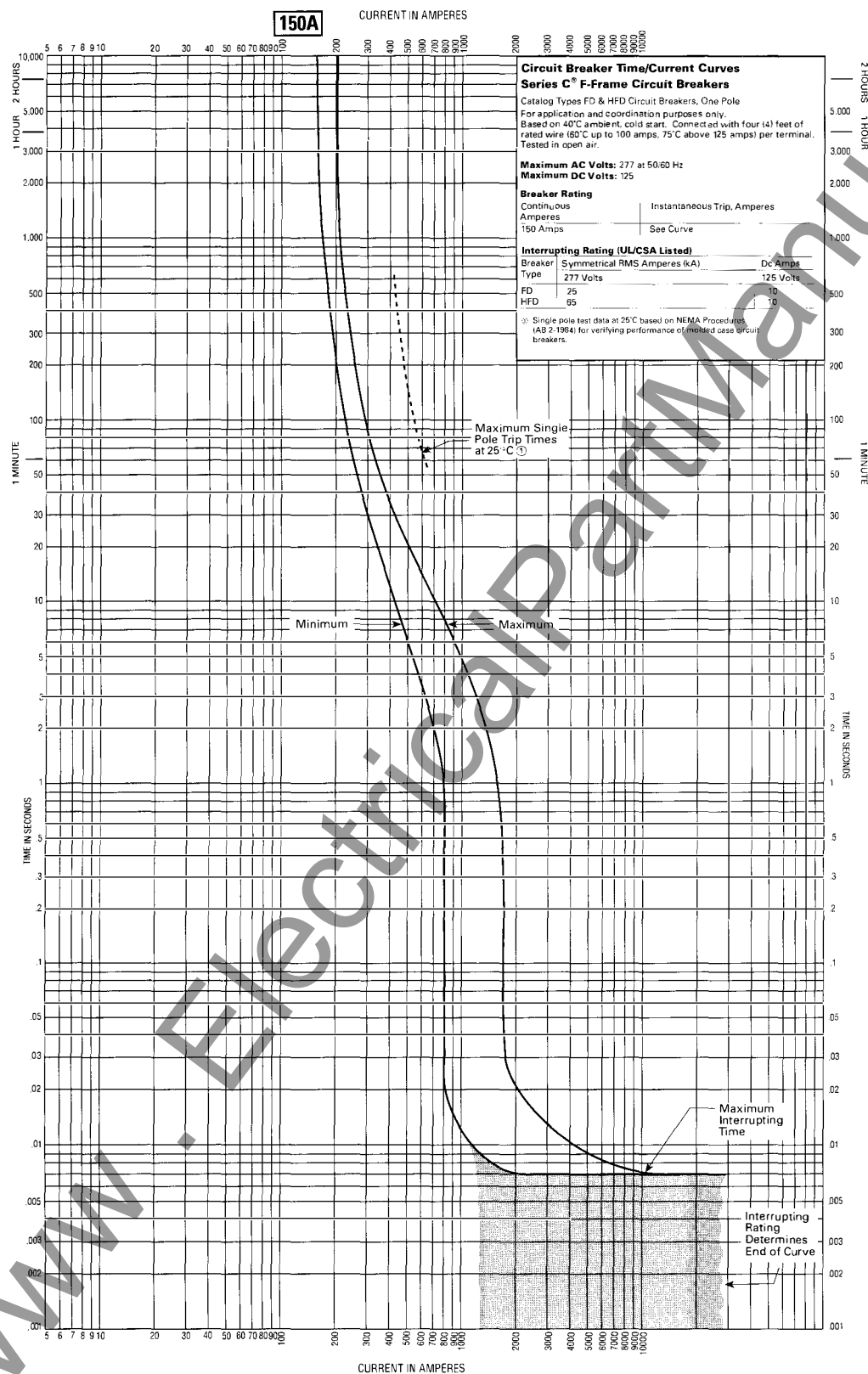
Types FD and HFD 125 Amperes





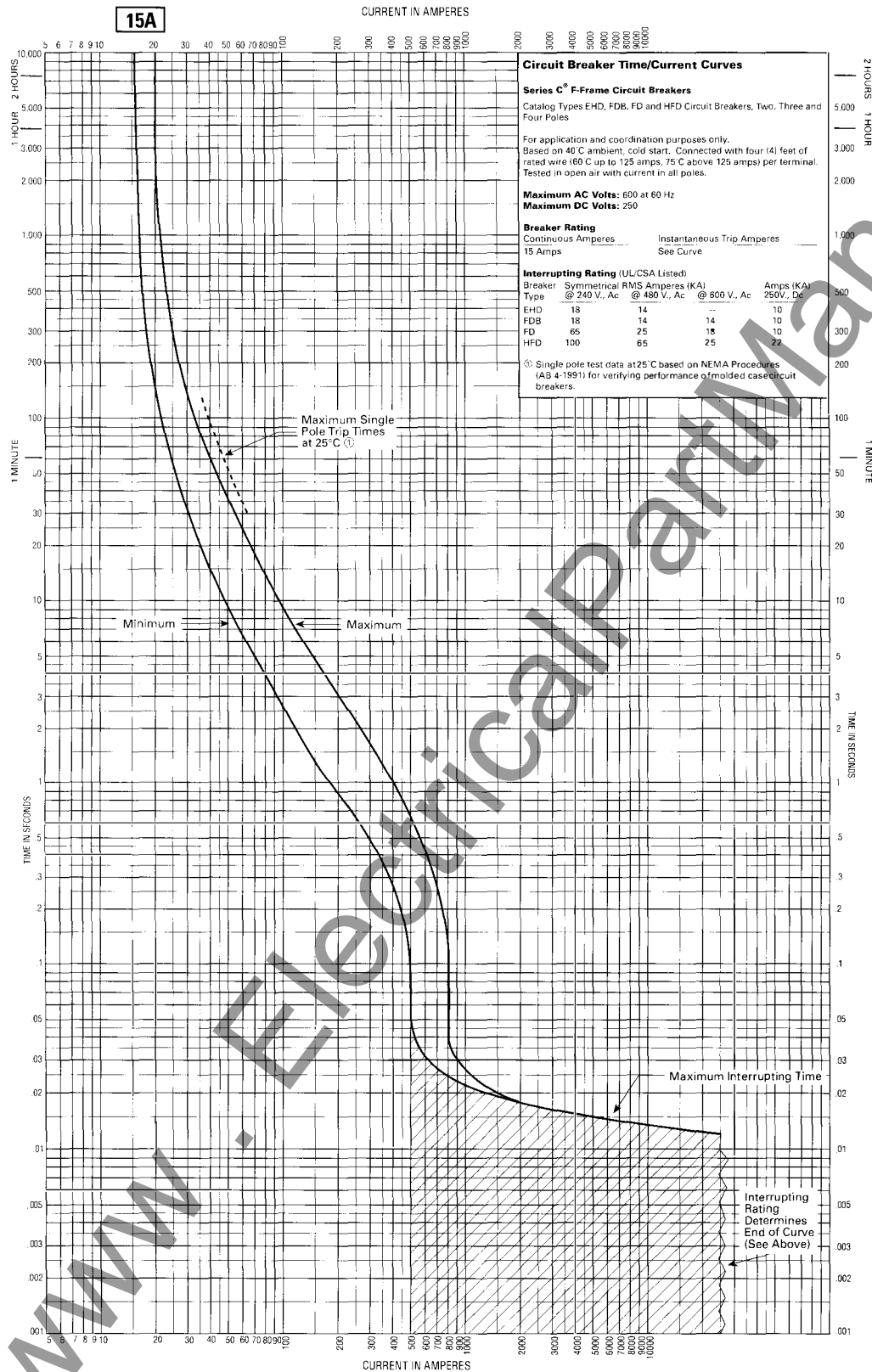
AB DE-ION Circuit Breakers

Types FD and HFD 150 Amperes



AB DE-ION Circuit Breakers

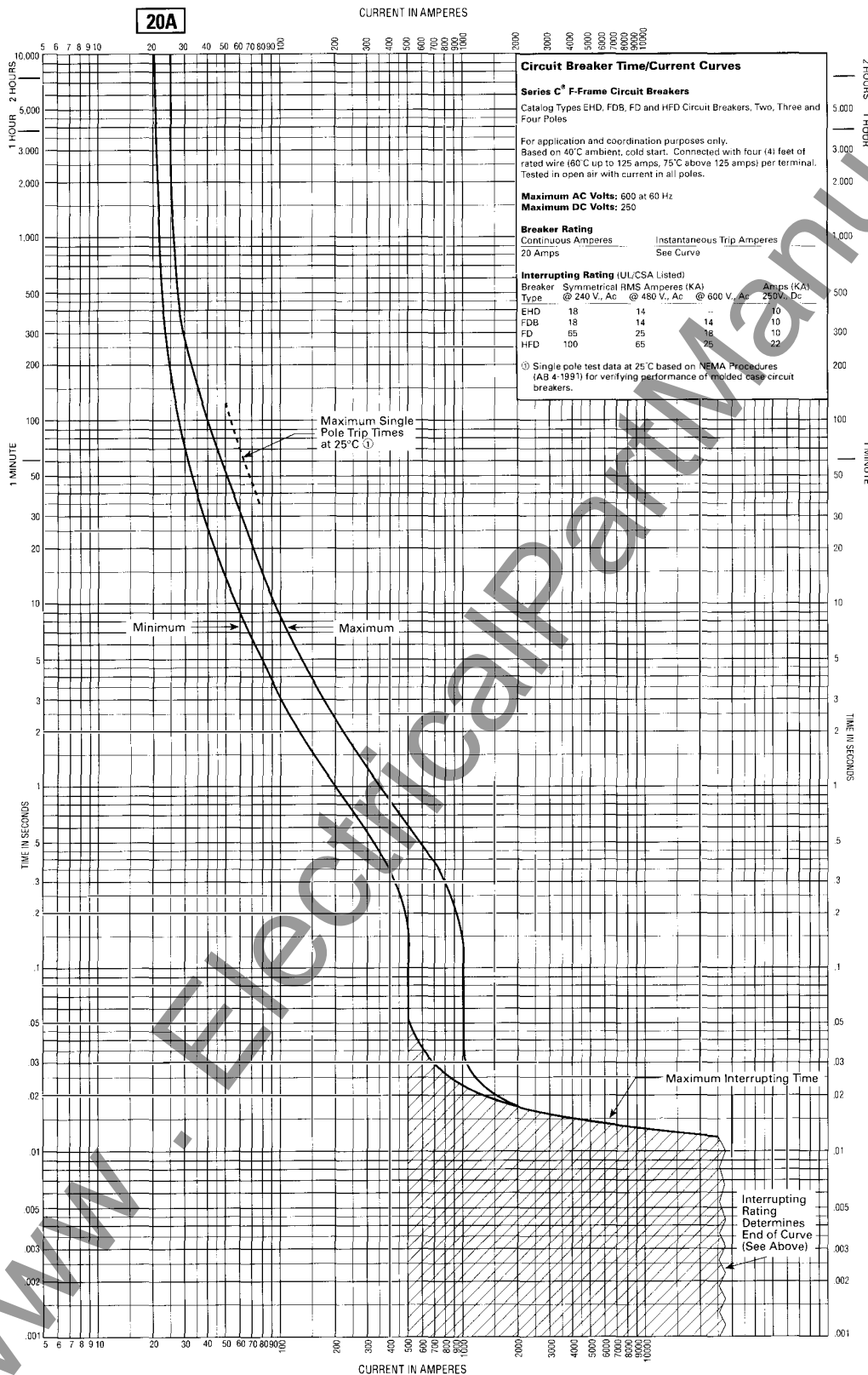
Types EHD, FDB, FD and HFD 15 Amperes





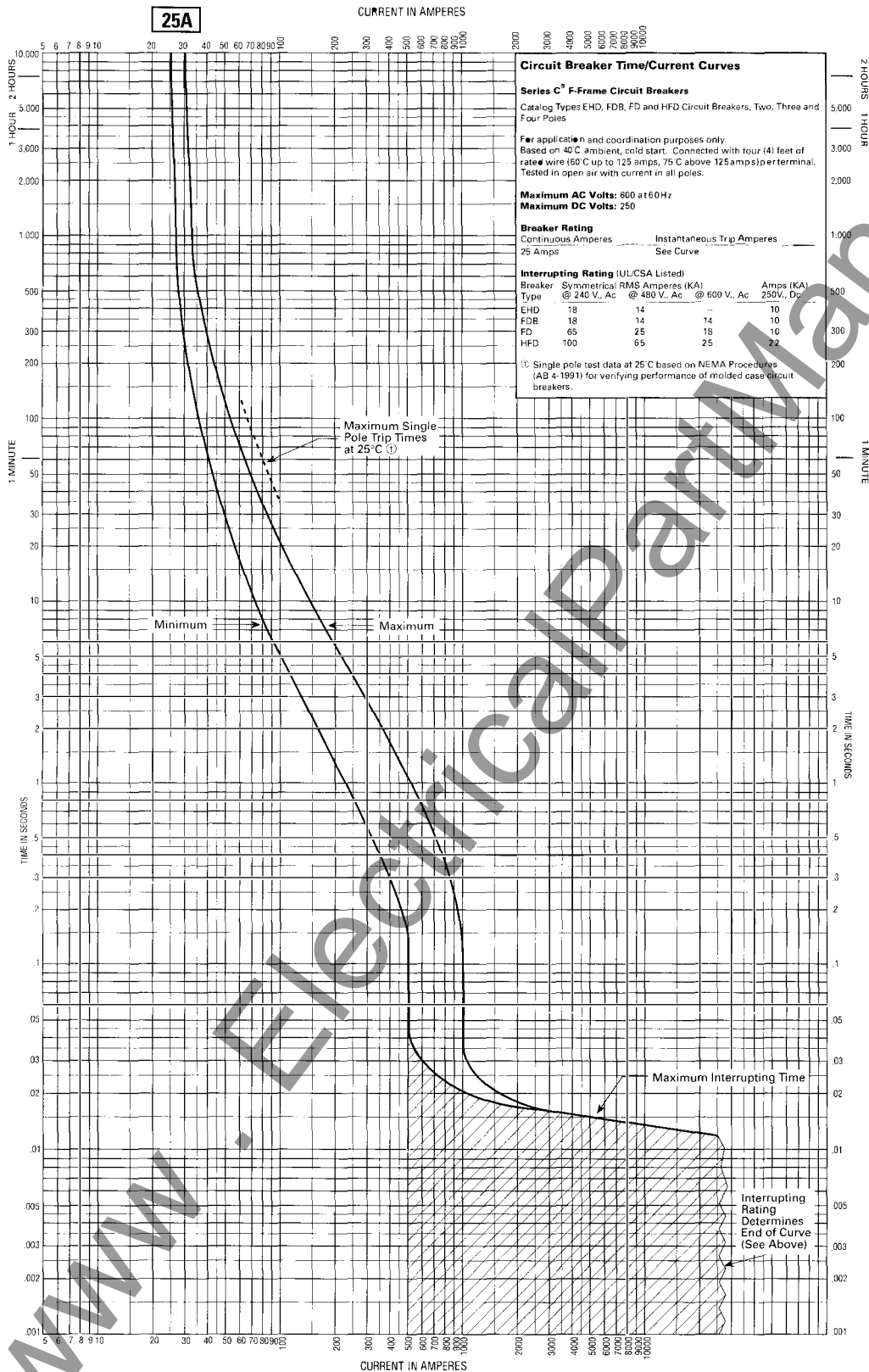
AB DE-ION Circuit Breakers

Types EHD, FDB, FD and HFD 20 Amperes



AB DE-ION Circuit Breakers

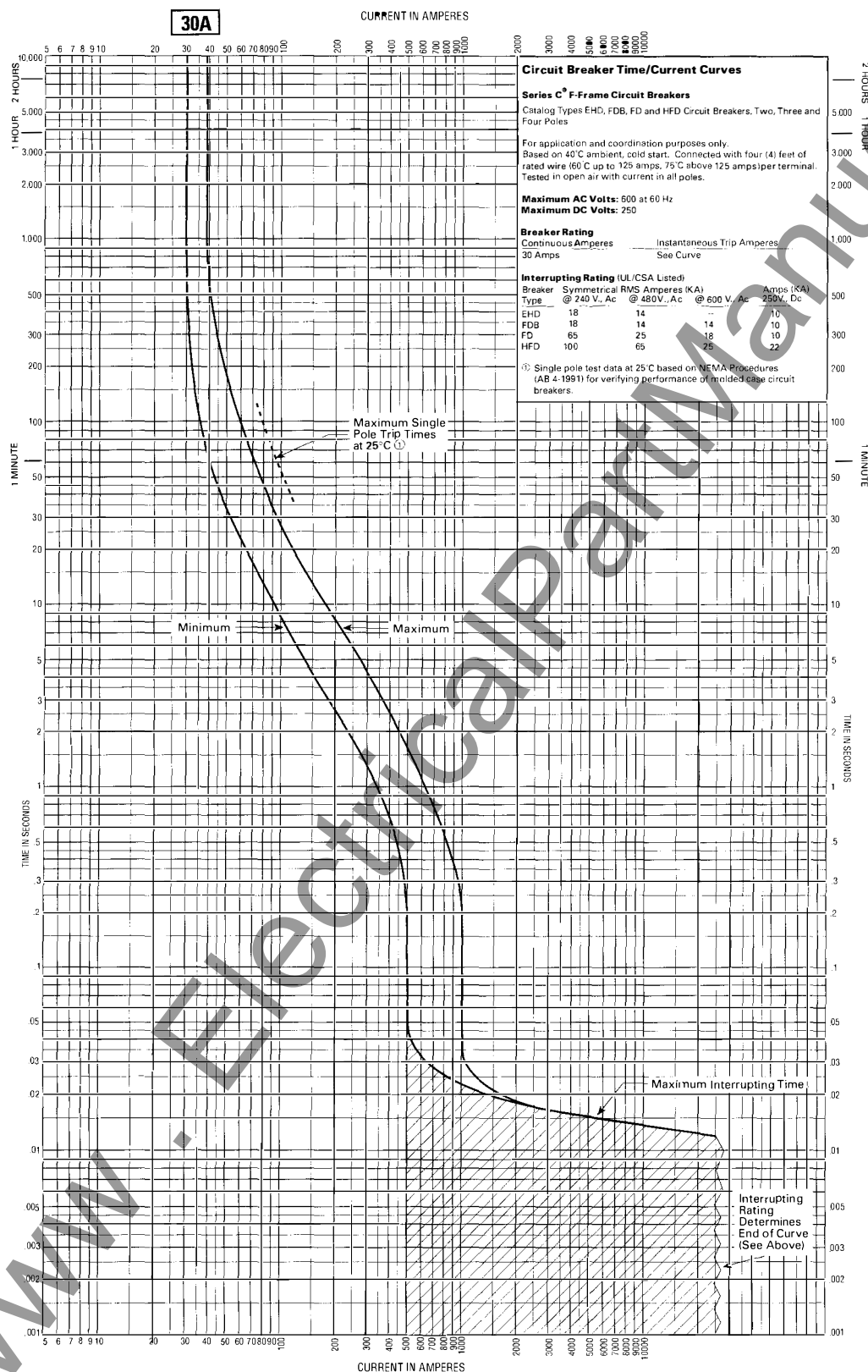
Types EHD, FDB, FD and HFD 25 Amperes





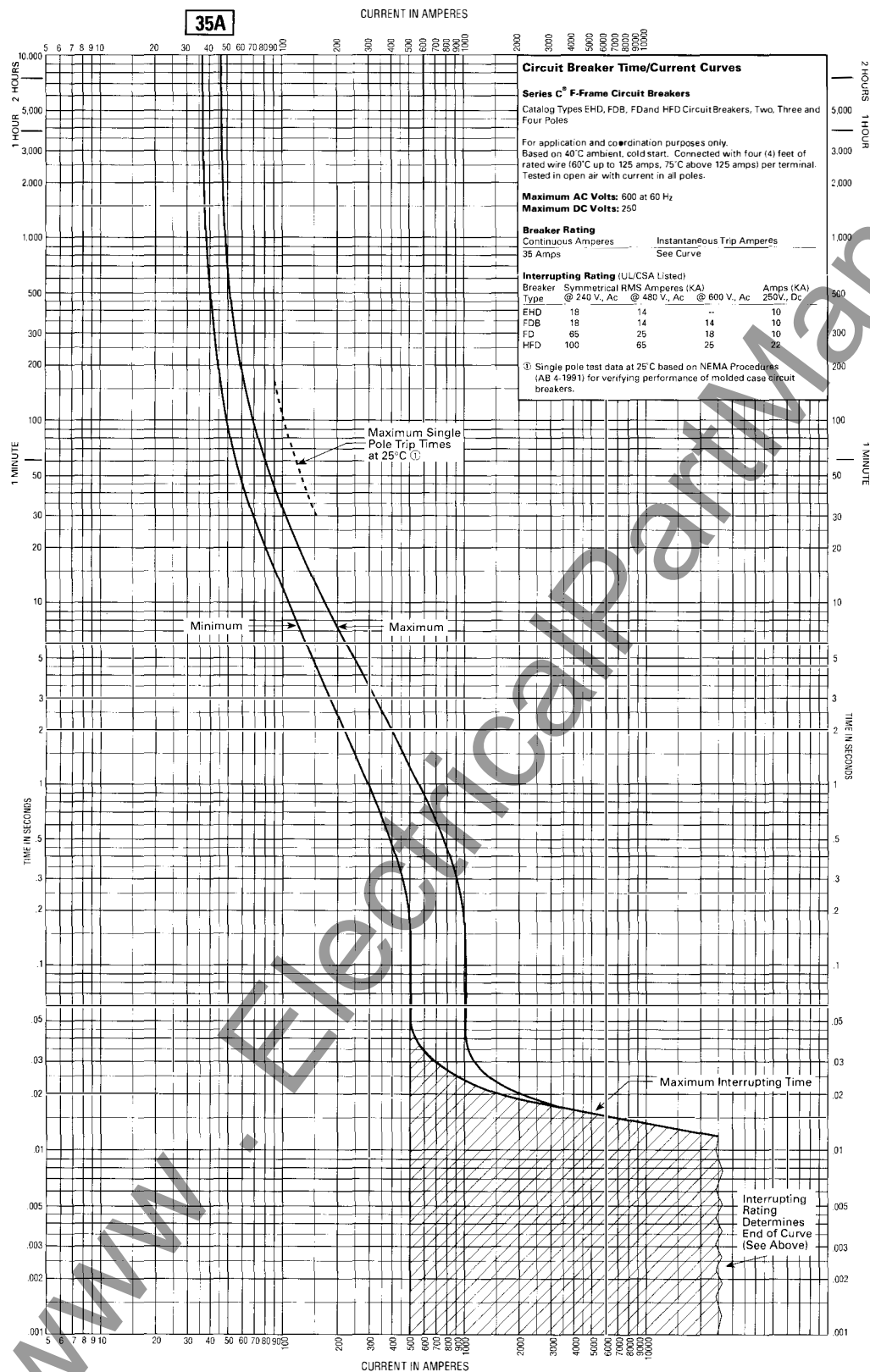
AB DE-ION Circuit Breakers

Types EHD, FDB, FD and HFD 30 Amperes



AB DE-ION Circuit Breakers

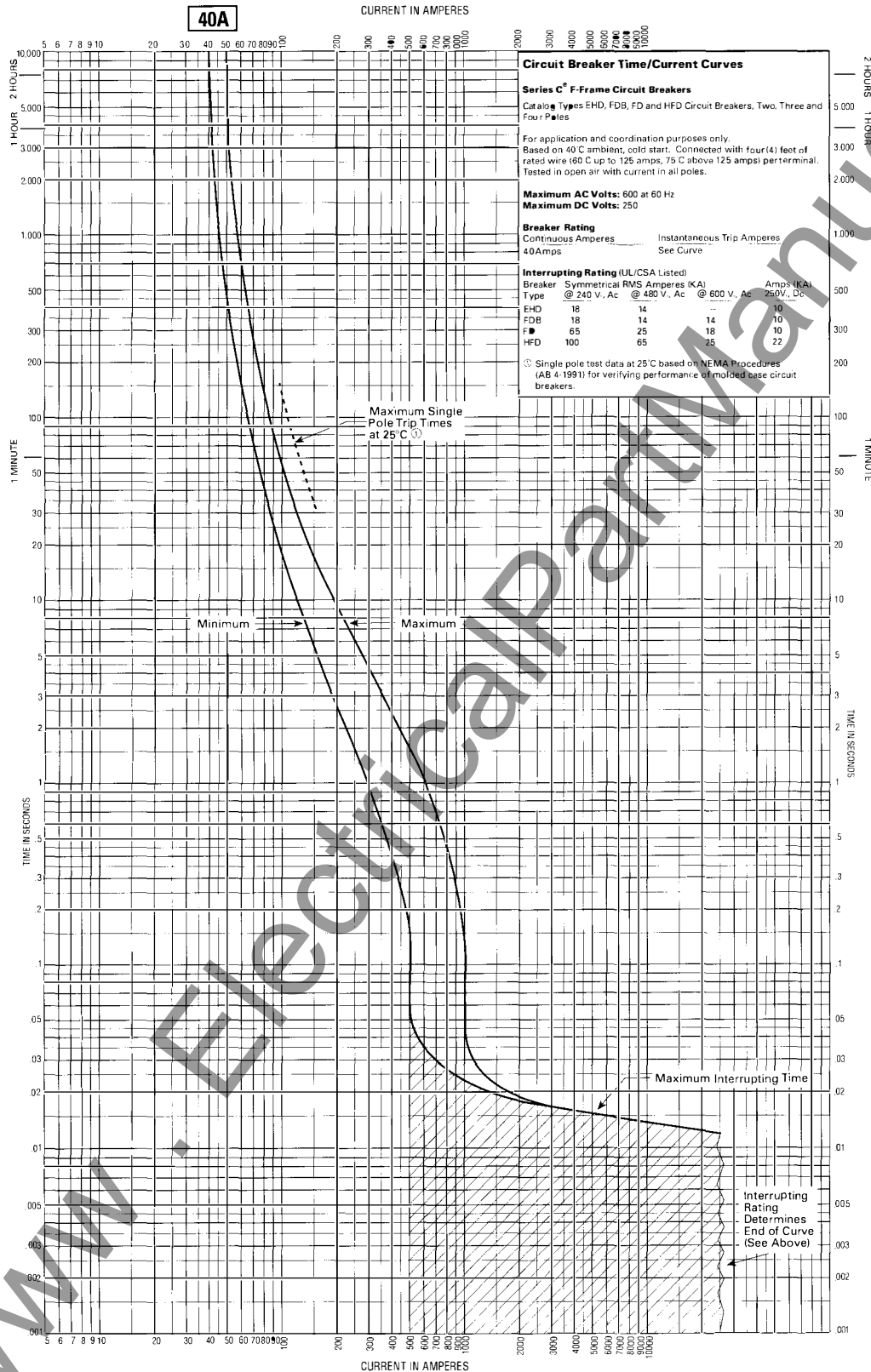
Types EHD, FDB, FD and HFD 35 Amperes





AB DE-ION Circuit Breakers

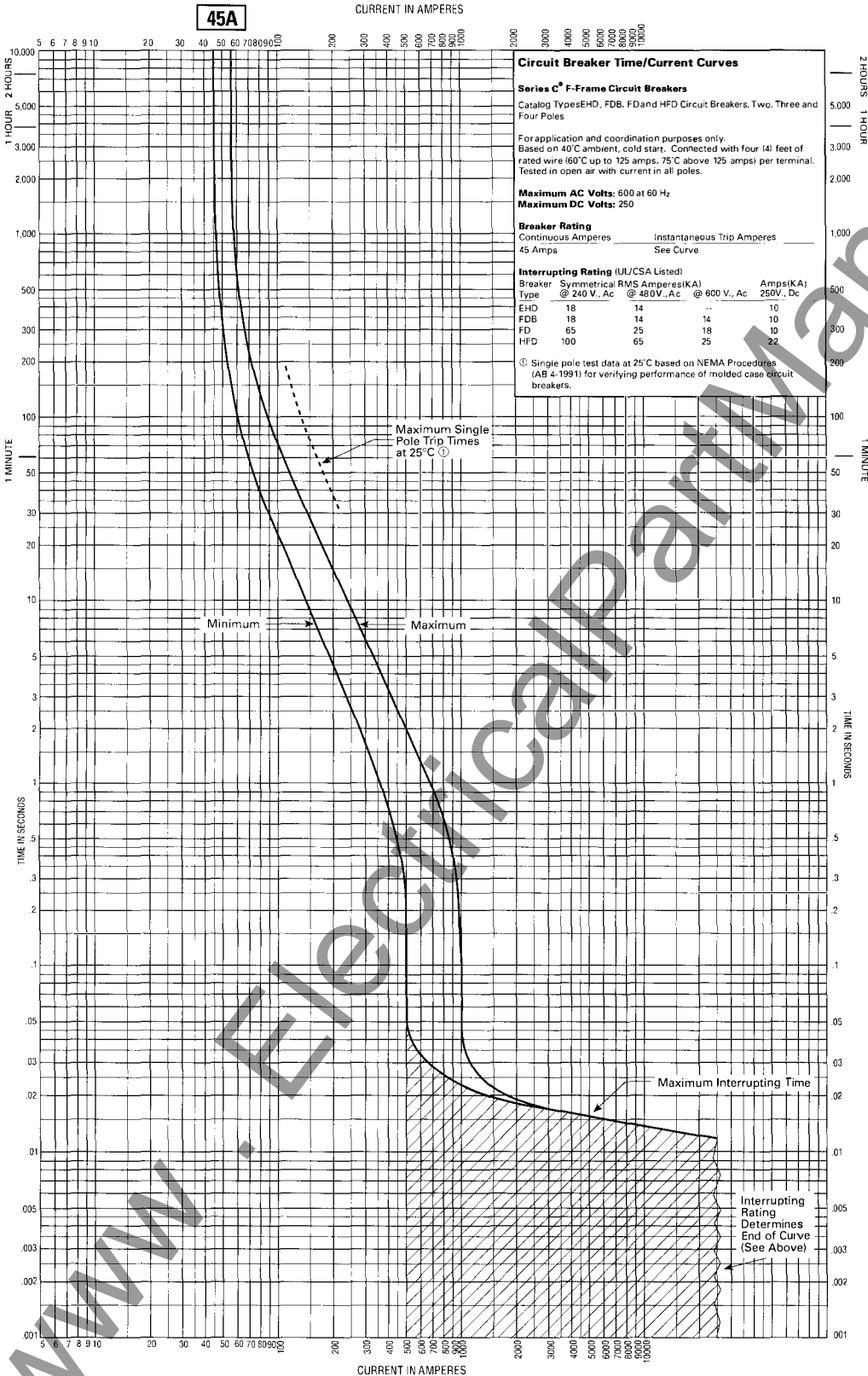
Types EHD, FDB, FD and HFD 40 Amperes





AB DE-ION Circuit Breakers

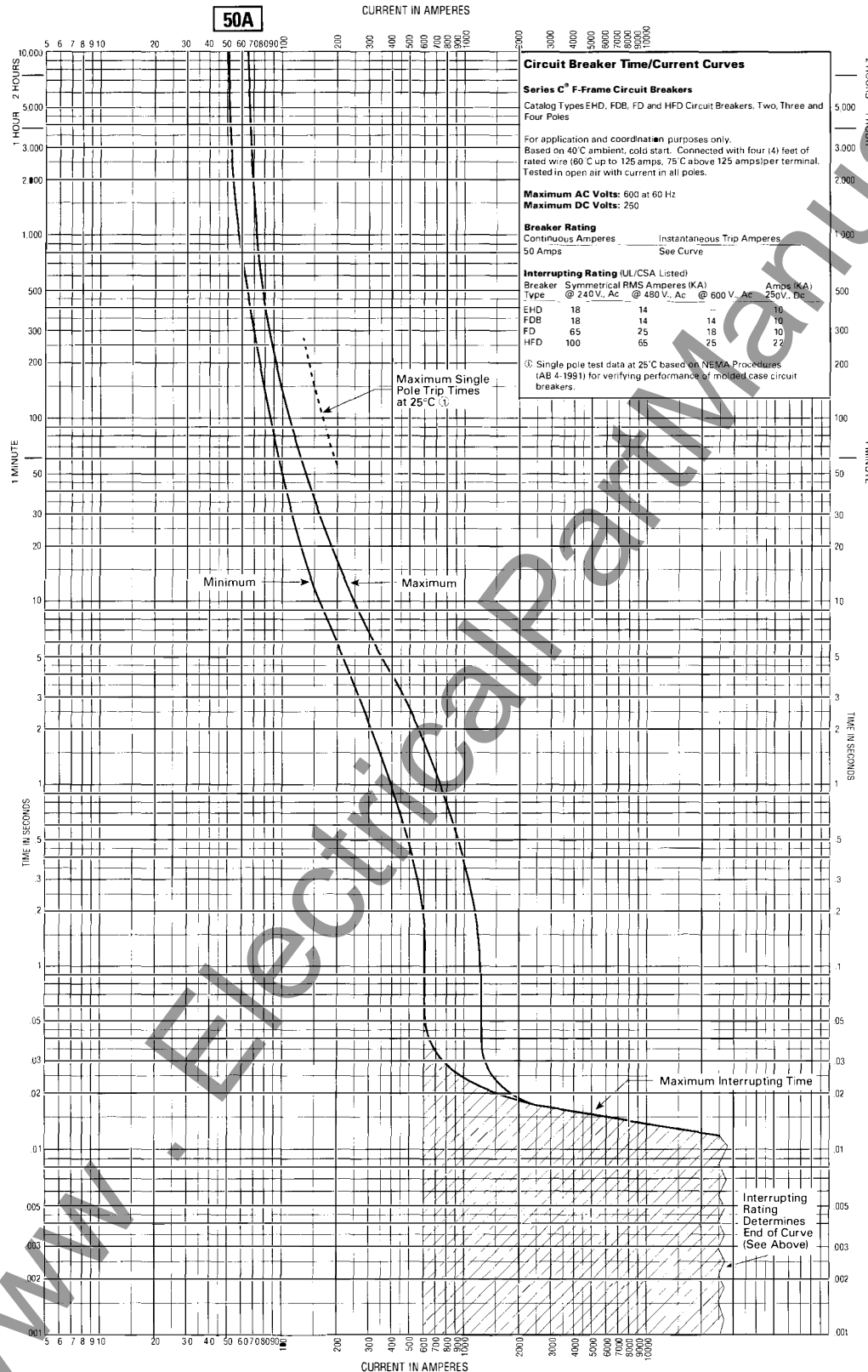
Types EHD, FDB, FD and HFD 45 Amperes





AB DE-ION Circuit Breakers

Types EHD, FDB, FD and HFD 50 Amperes



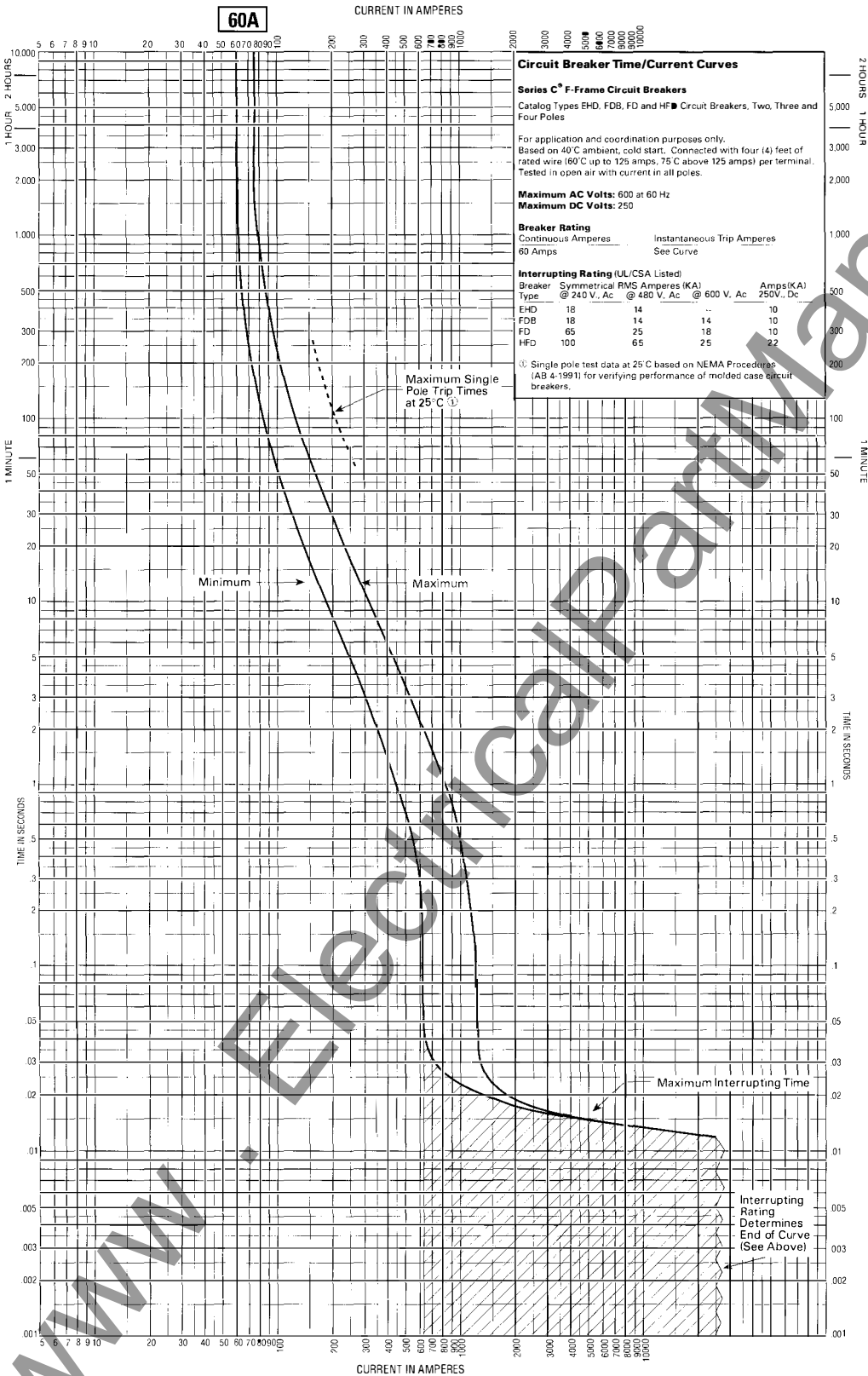
Curve No. SC-4141-87B

May 1994

EATON



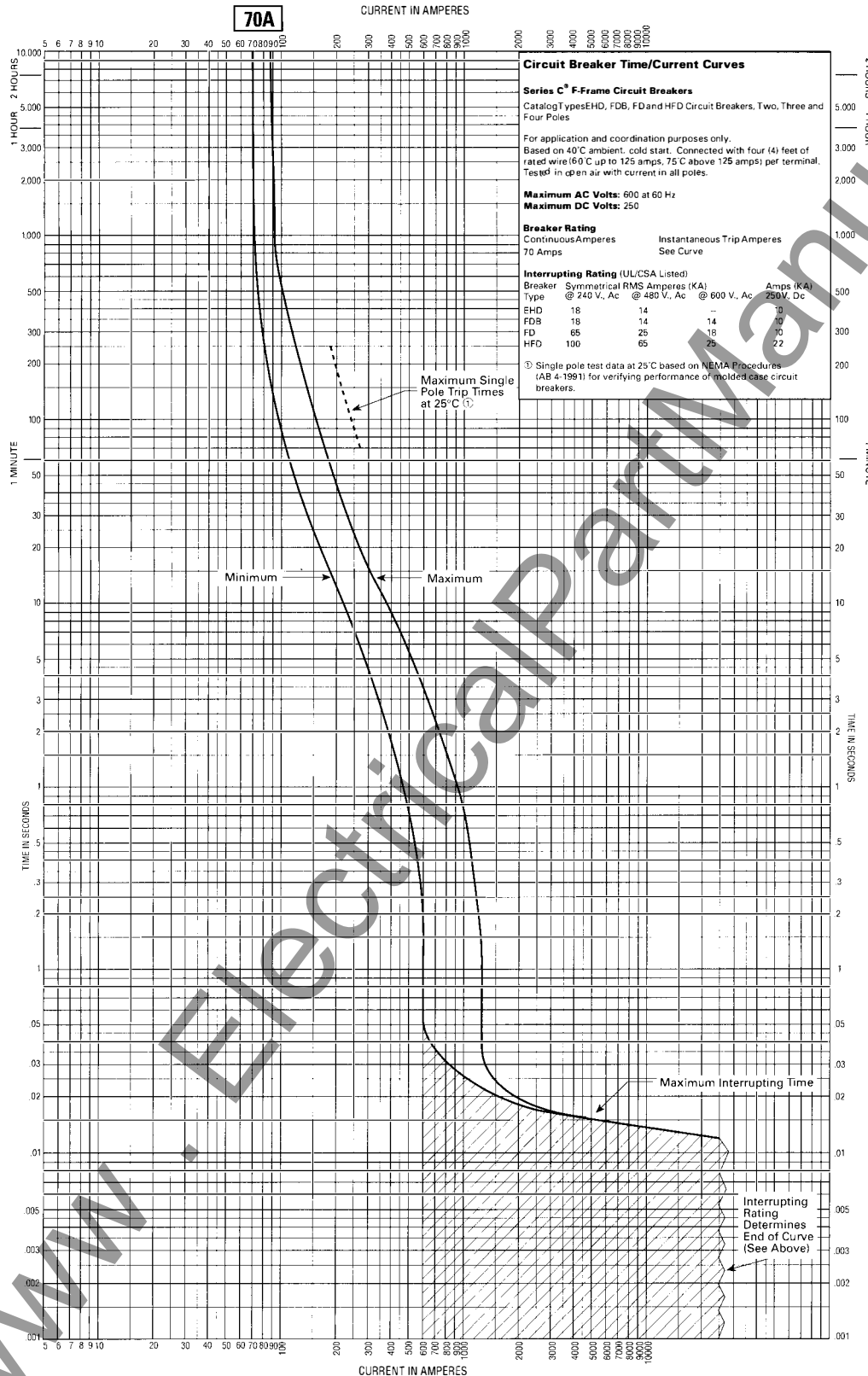
AB DE-ION Circuit Breakers
Types EHD, FDB, FD and HFD 60 Amperes





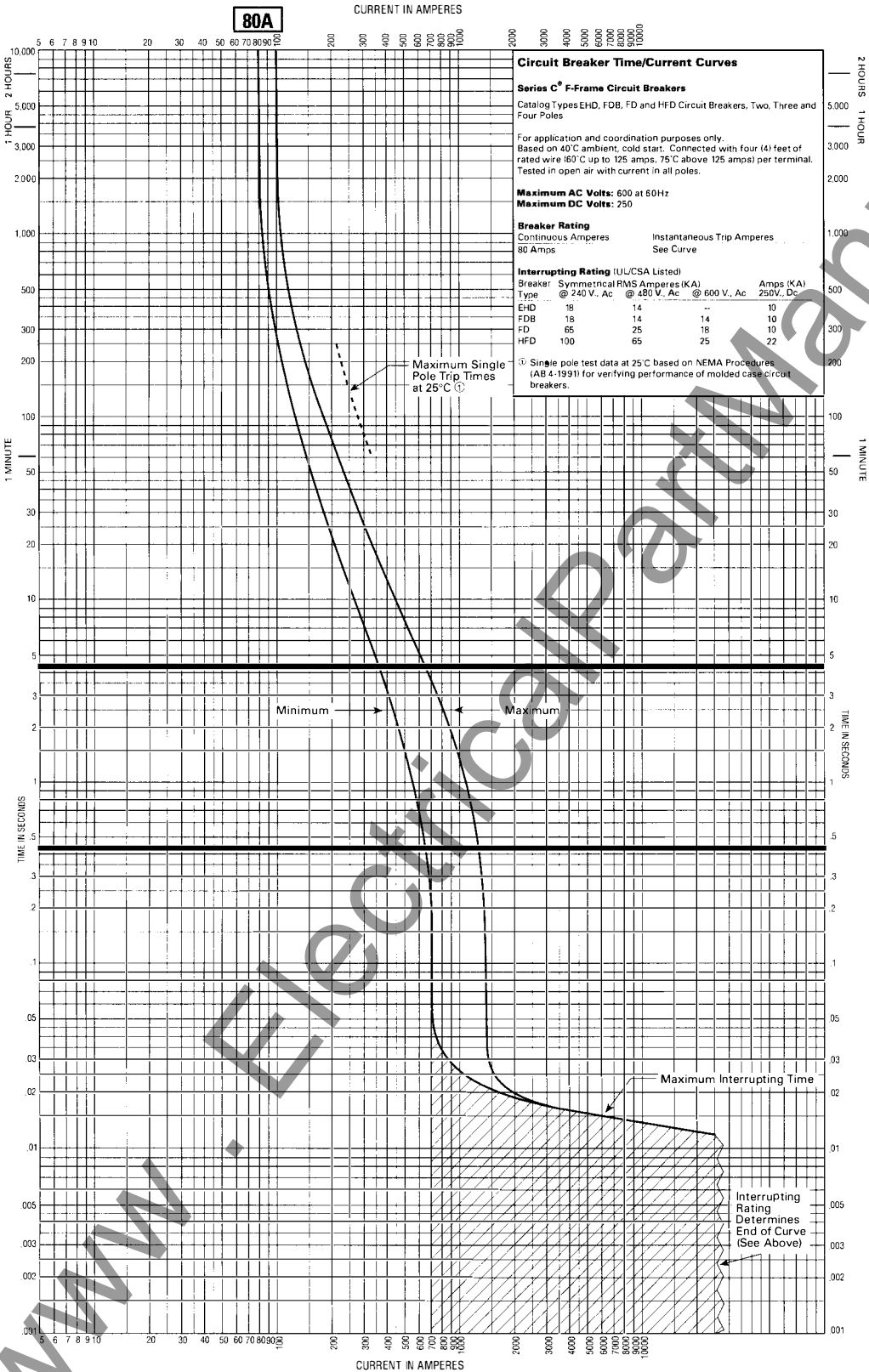
AB DE-ION Circuit Breakers

Types EHD, FDB, FD and HFD 70 Amperes



AB DE-ION Circuit Breakers

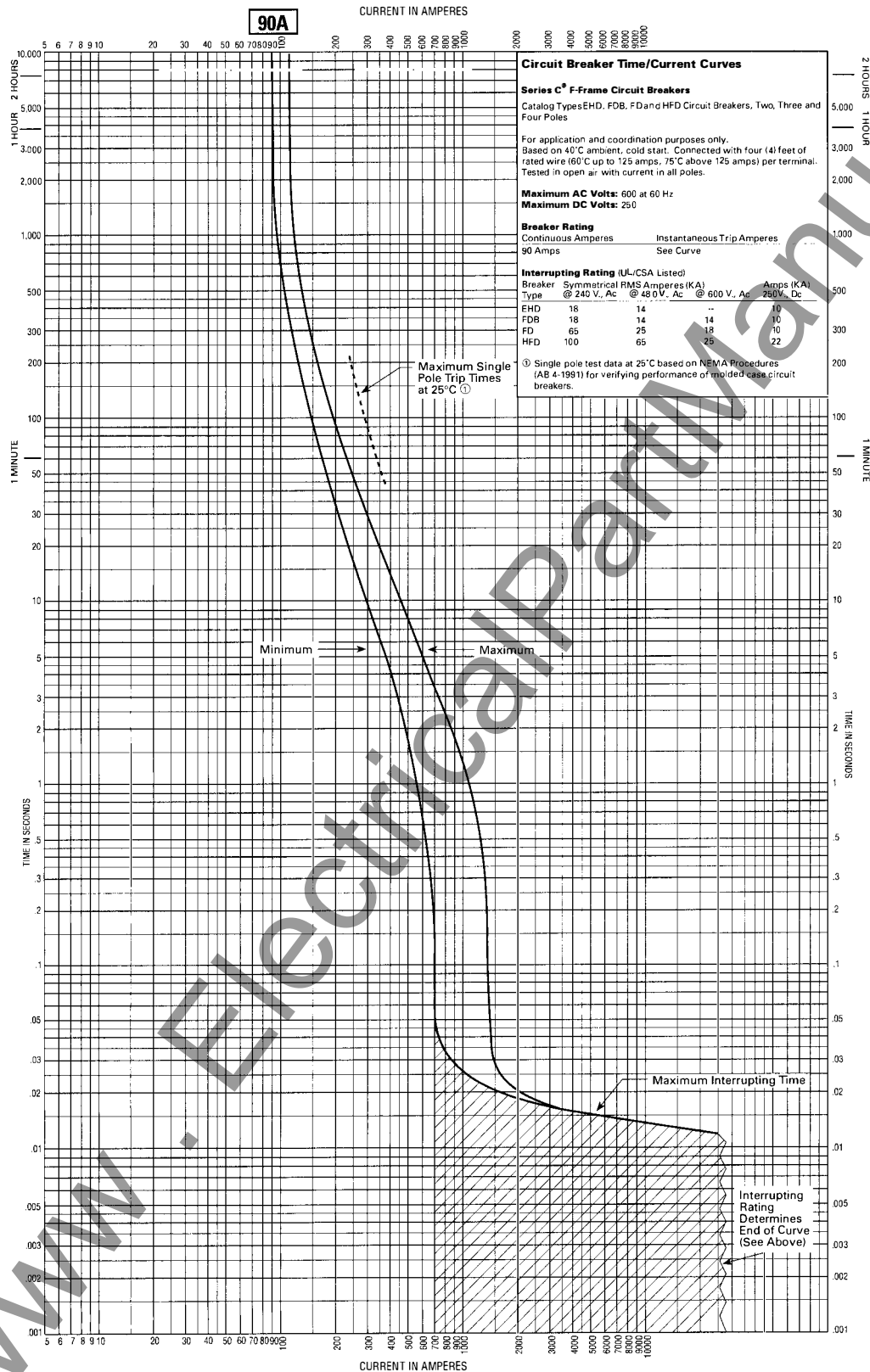
Types EHD, FDB, FD and HFD 80 Amperes





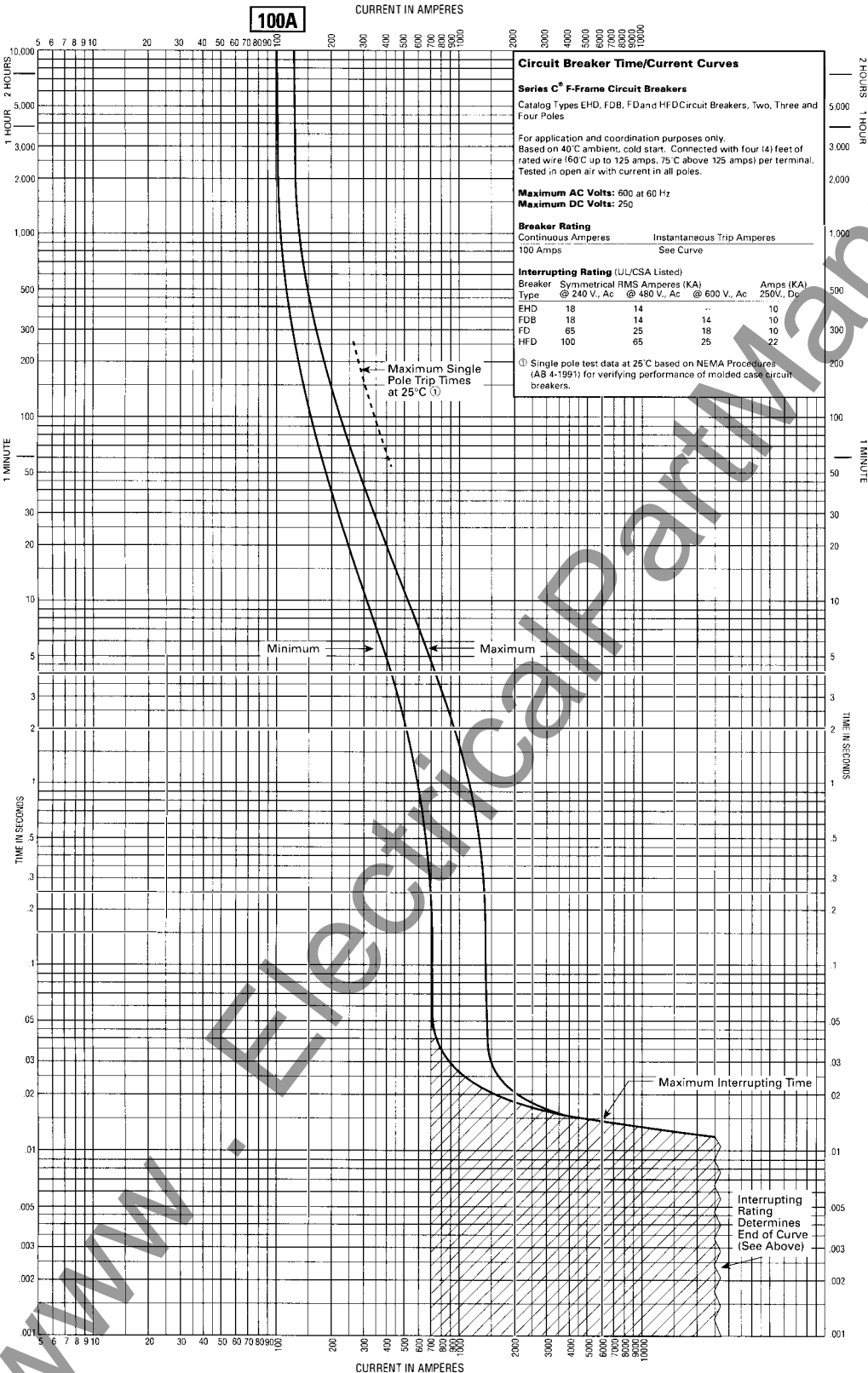
AB DE-ION Circuit Breakers

Types EHD, FDB, FD and HFD 90 Amperes



AB DE-ION Circuit Breakers

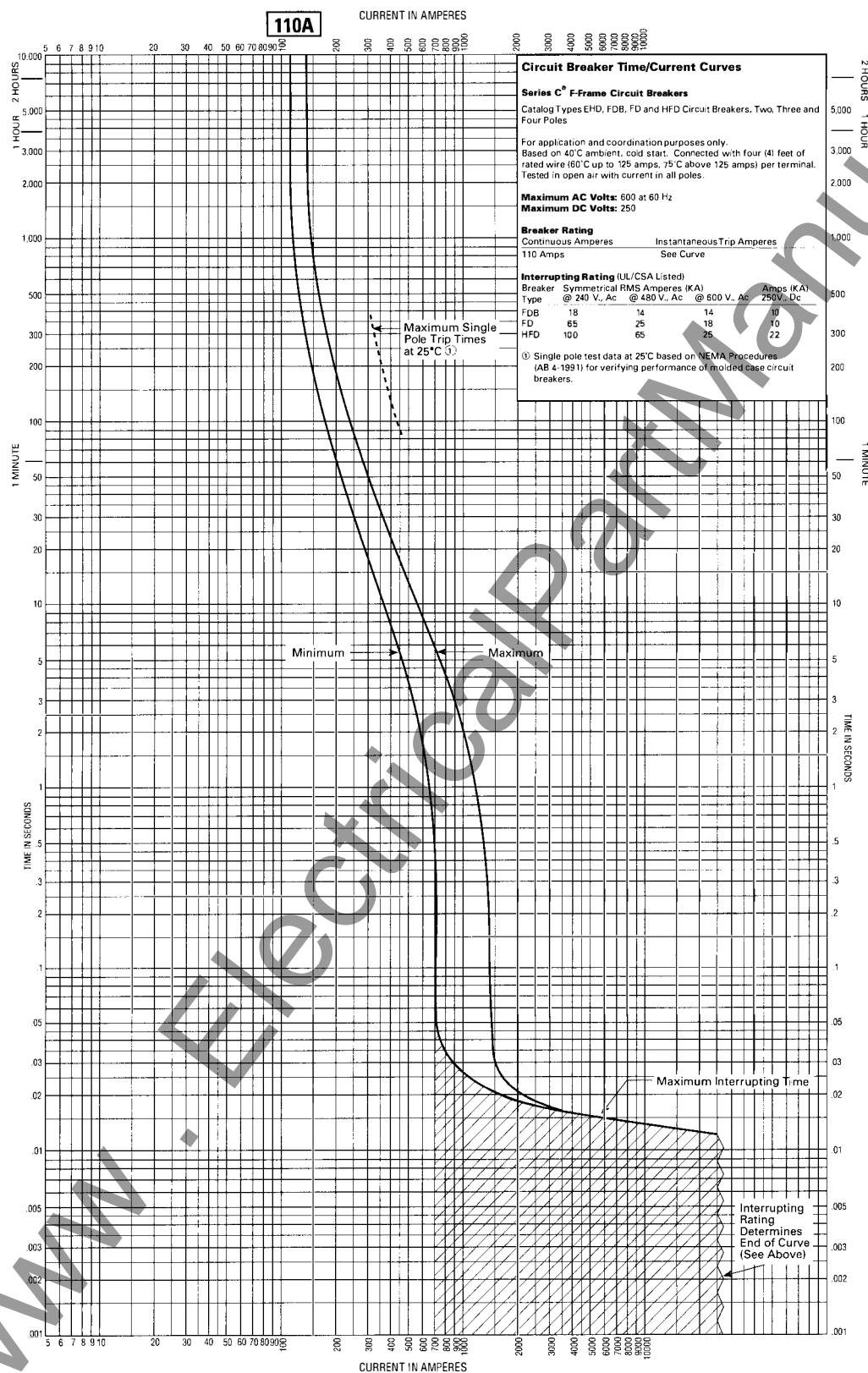
Types EHD, FDB, FD and HFD 100 Amperes





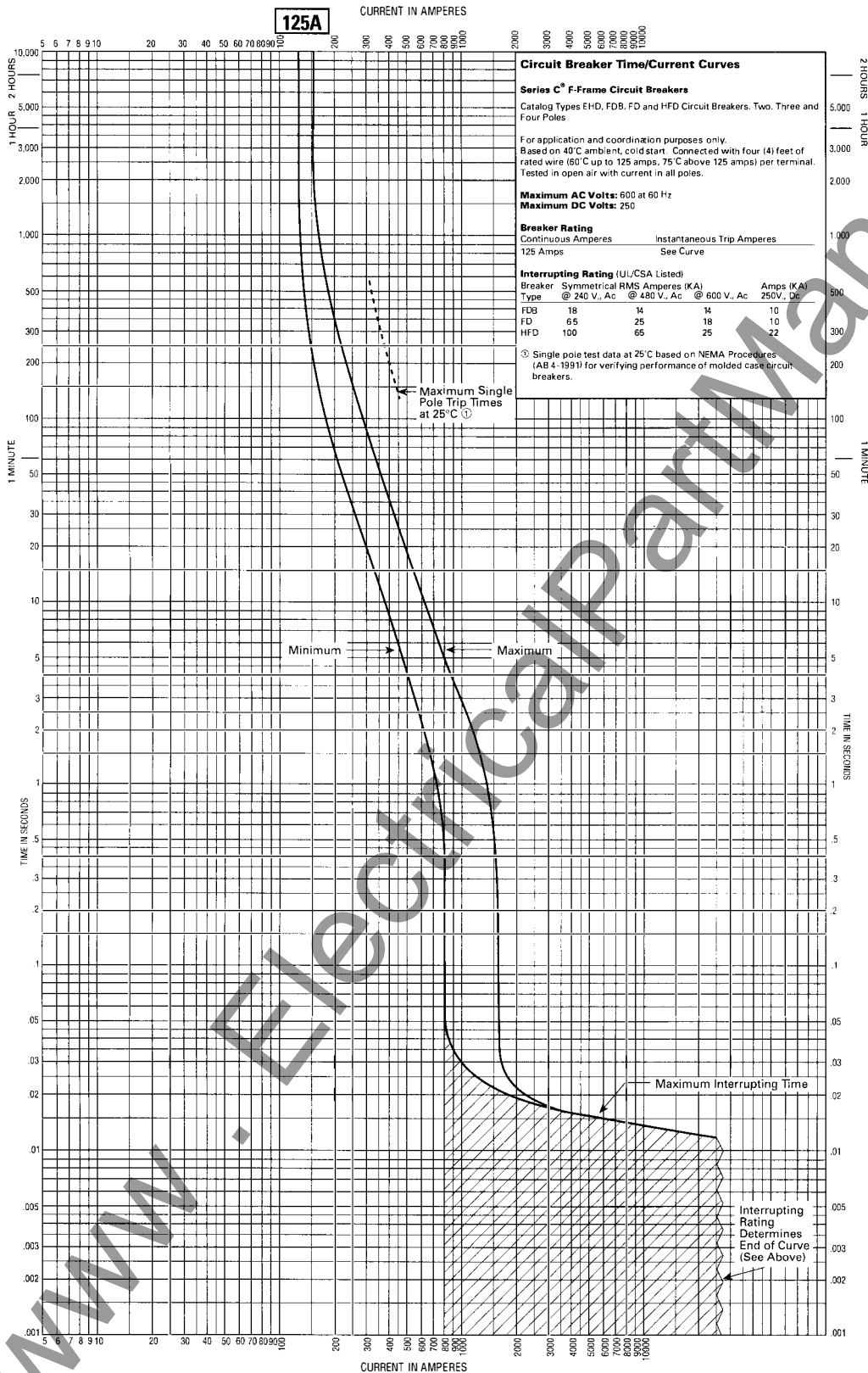
AB DE-ION Circuit Breakers

Types FDB, FD and HFD 110 Amperes



AB DE-ION Circuit Breakers

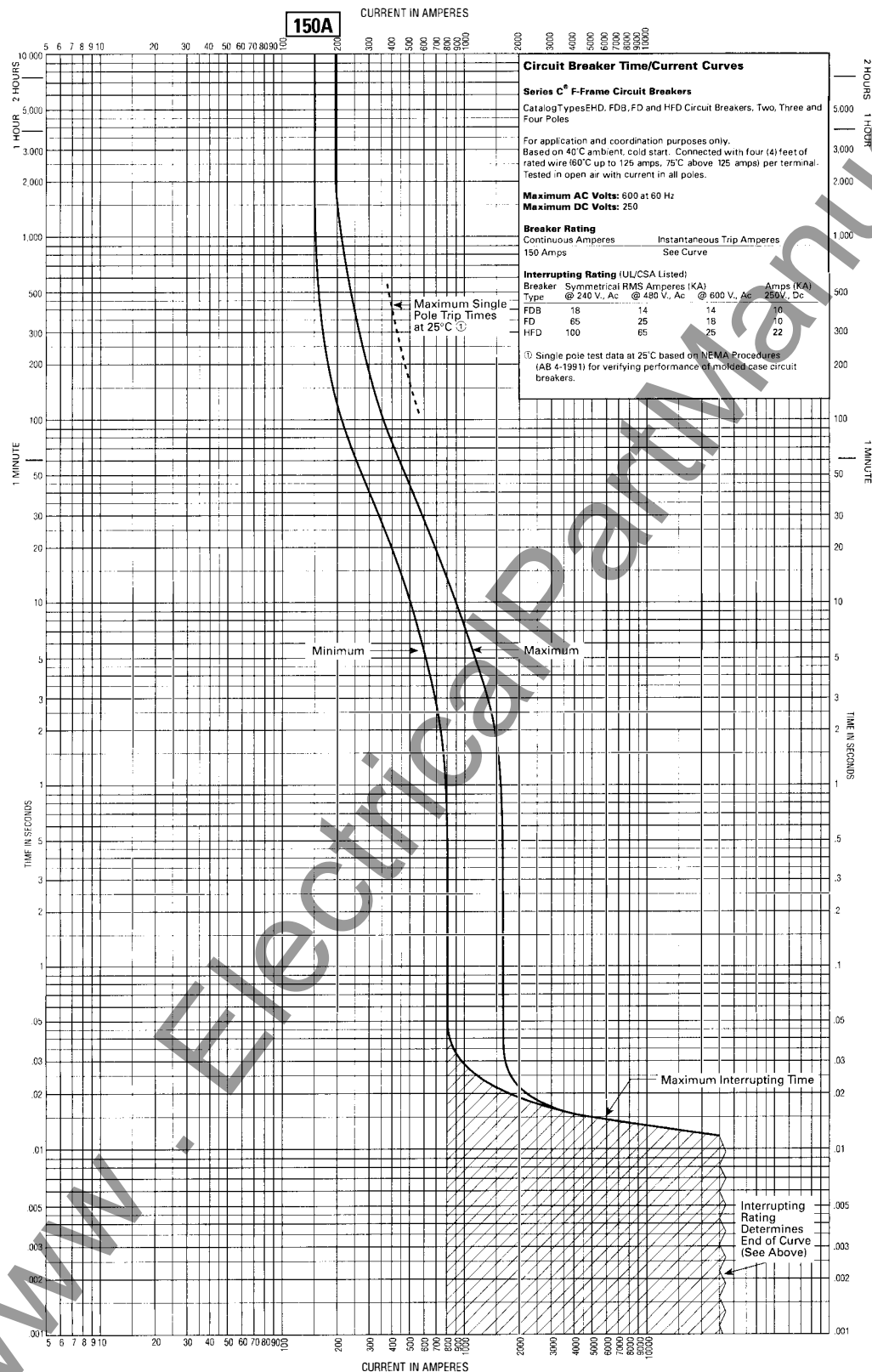
Types FDB, FD and HFD 125 Amperes





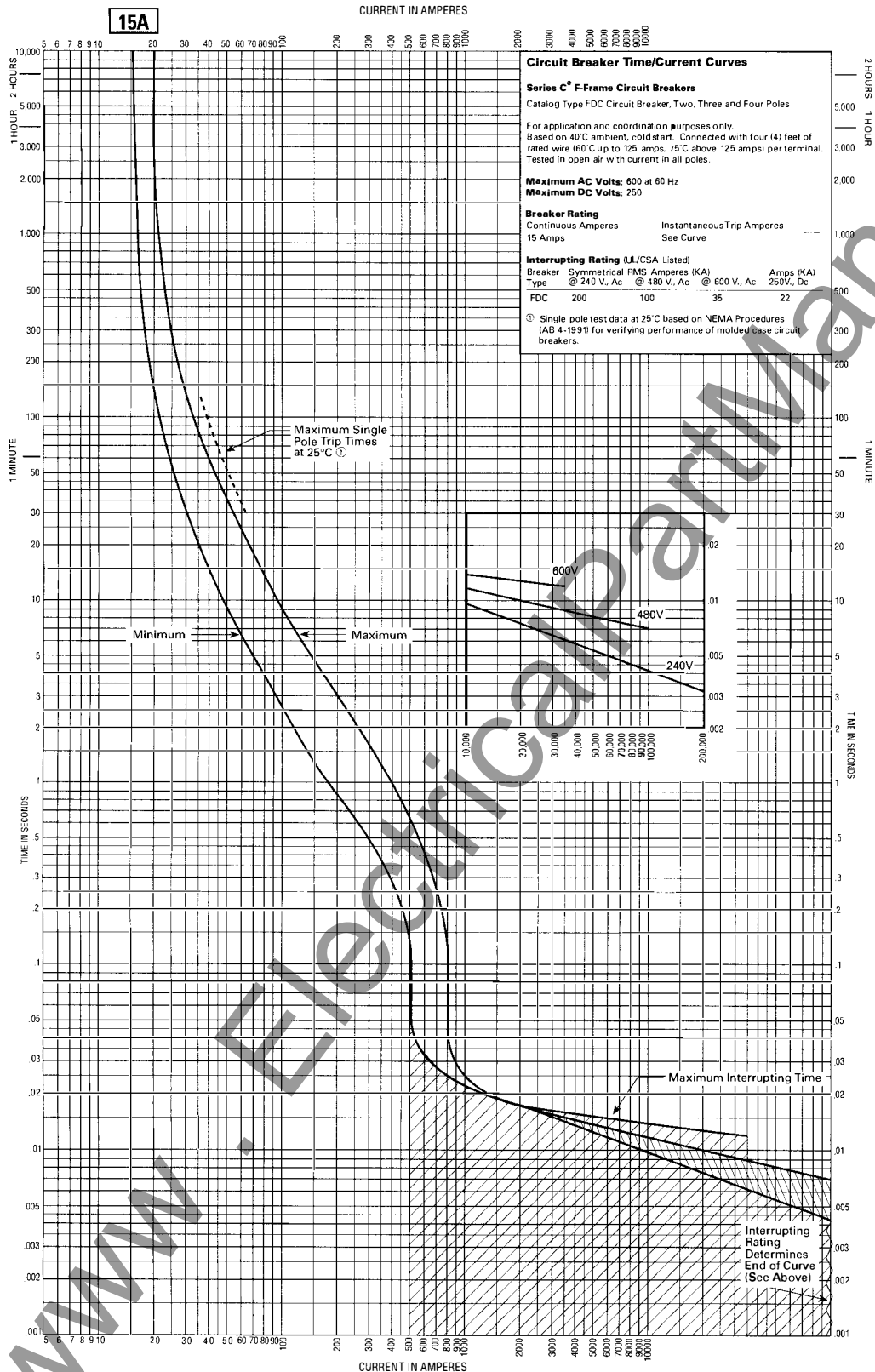
AB DE-ION Circuit Breakers

Types FDB, FD and HFD 150 Amperes



AB DE-ION Circuit Breakers

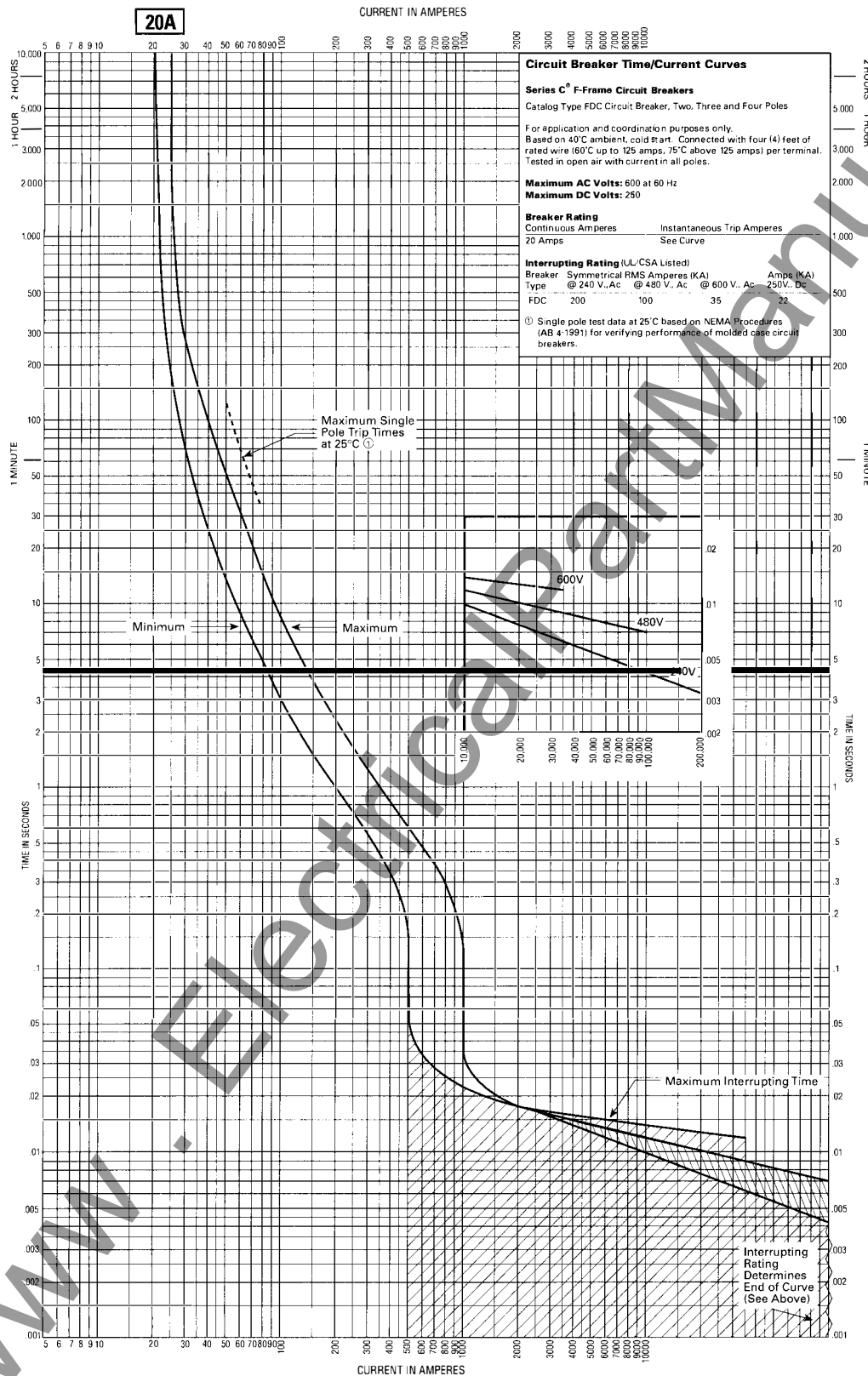
Type FDC 15 Amperes





AB DE-ION Circuit Breakers

Type FDC 20 Amperes



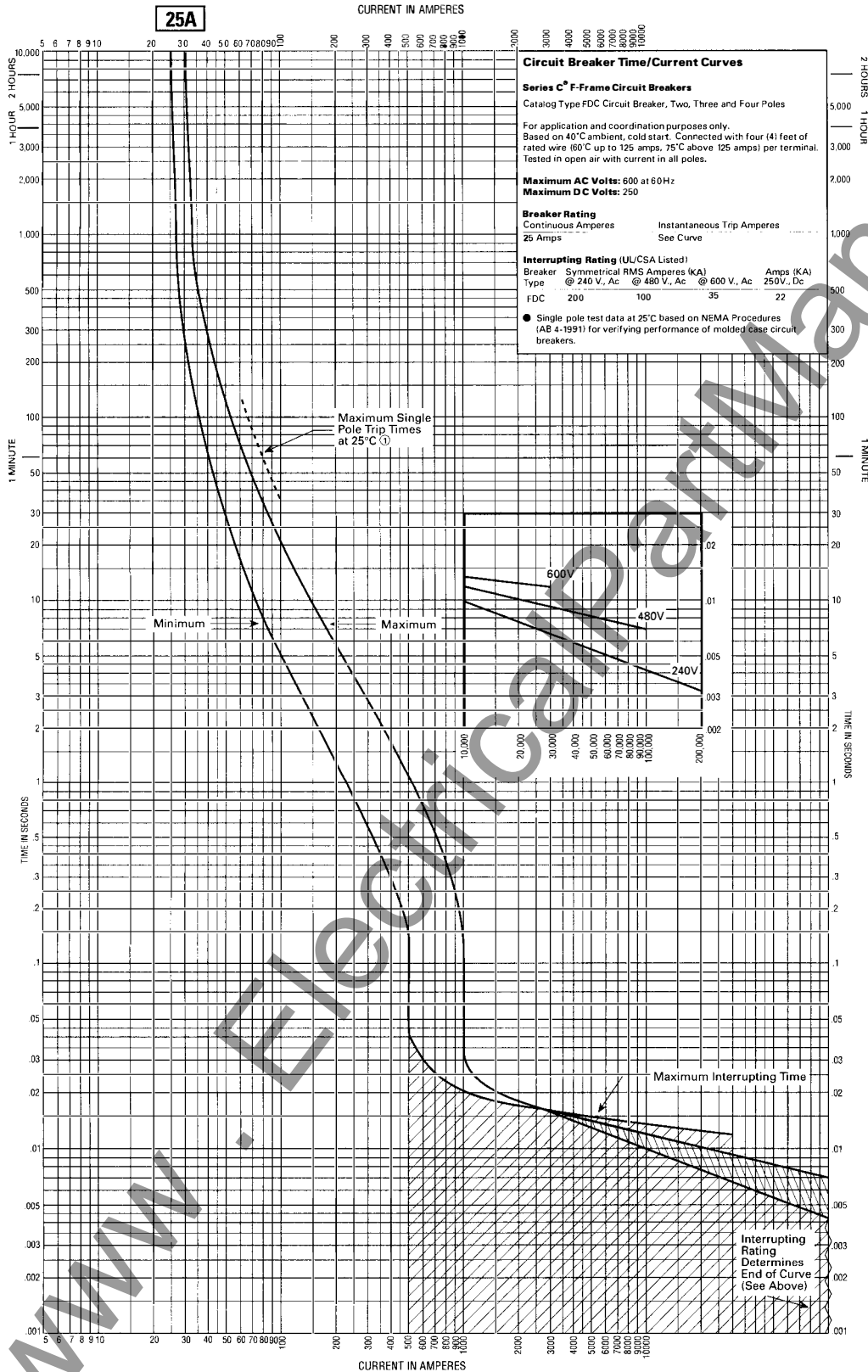
Curve No. SC-5517-93A

May 1994

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AB DE-ION Circuit Breakers

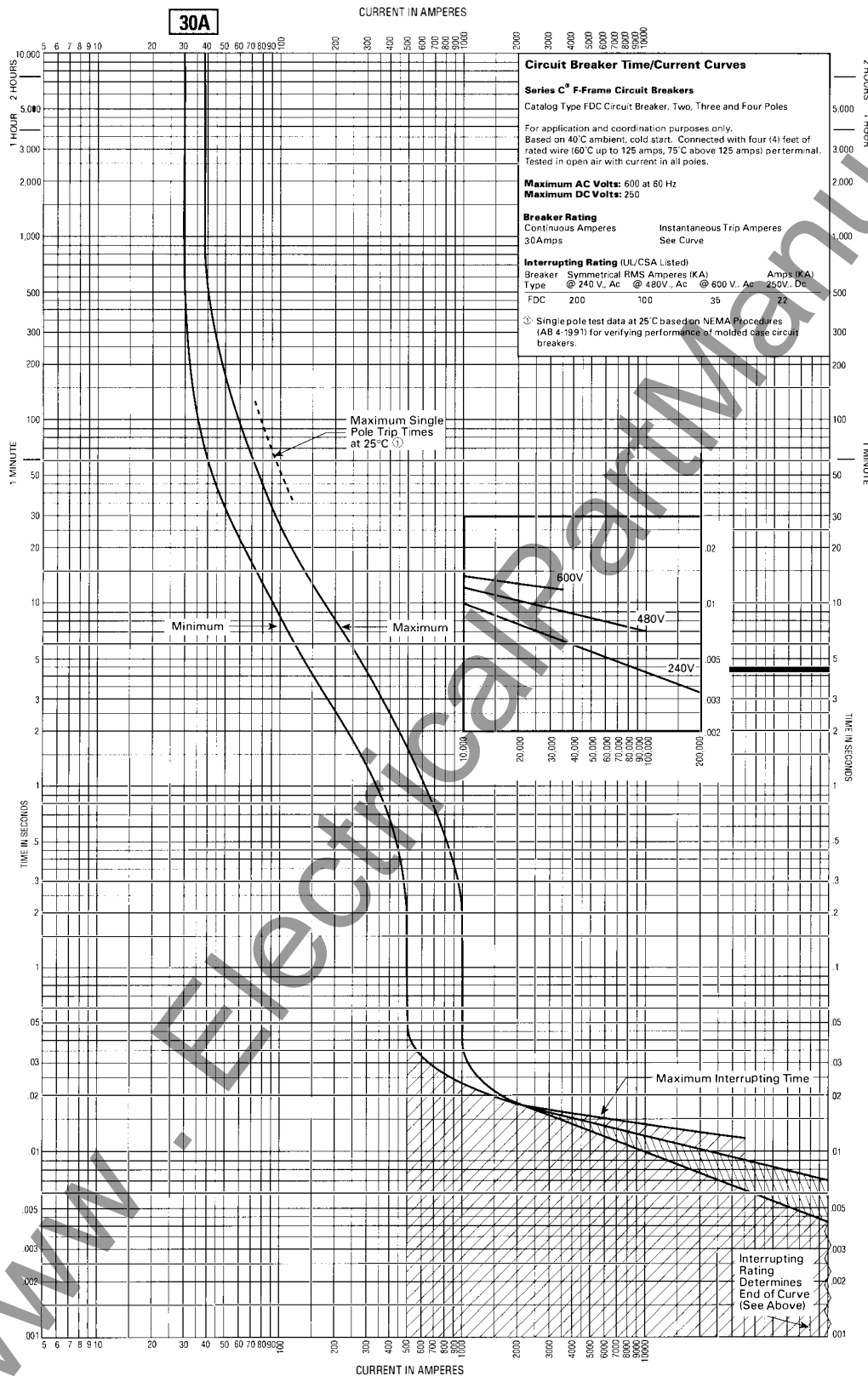
Type FDC 25 Amperes





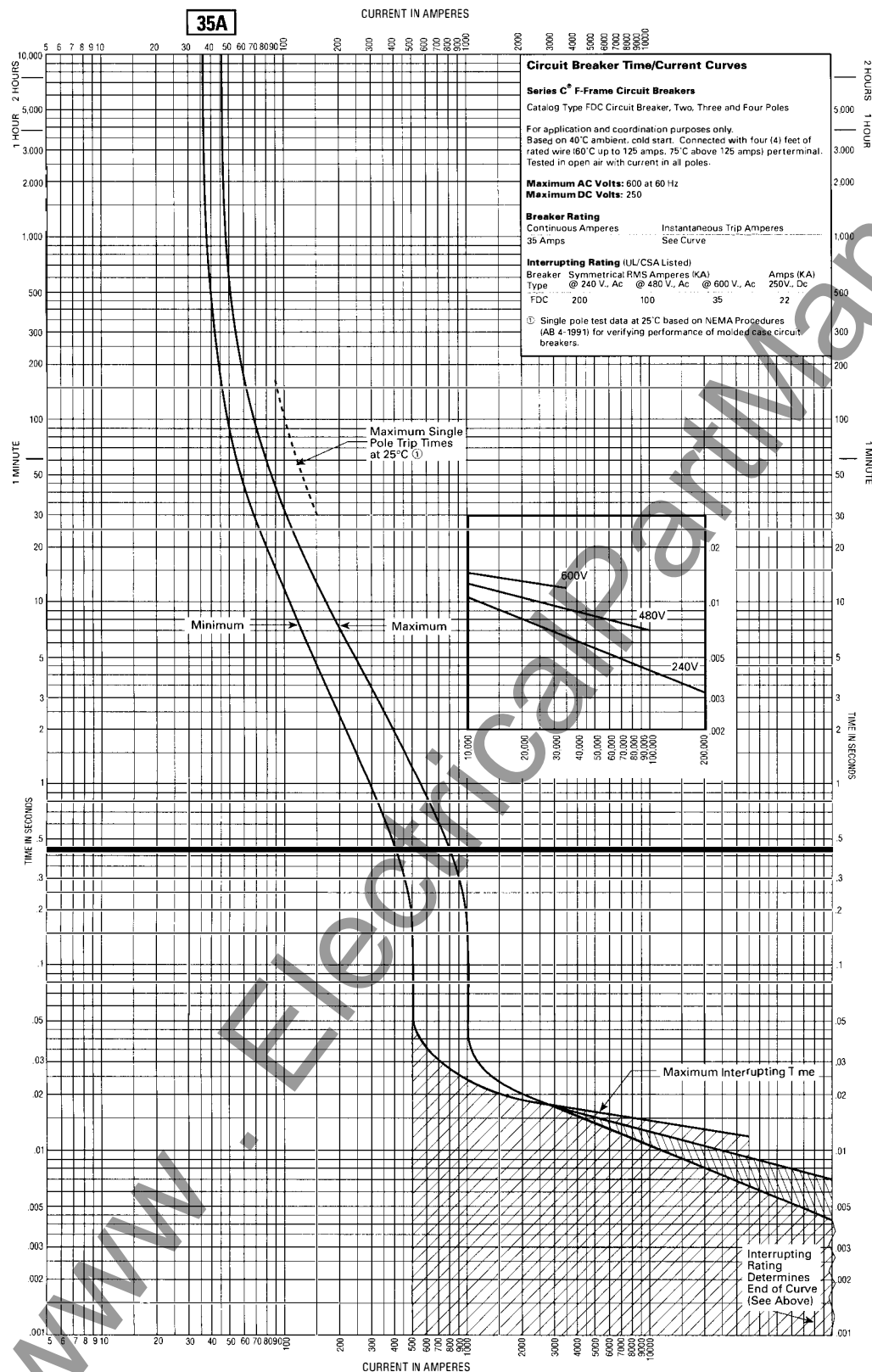
AB DE-ION Circuit Breakers

Type FDC 30 Amperes



AB DE-ION Circuit Breakers

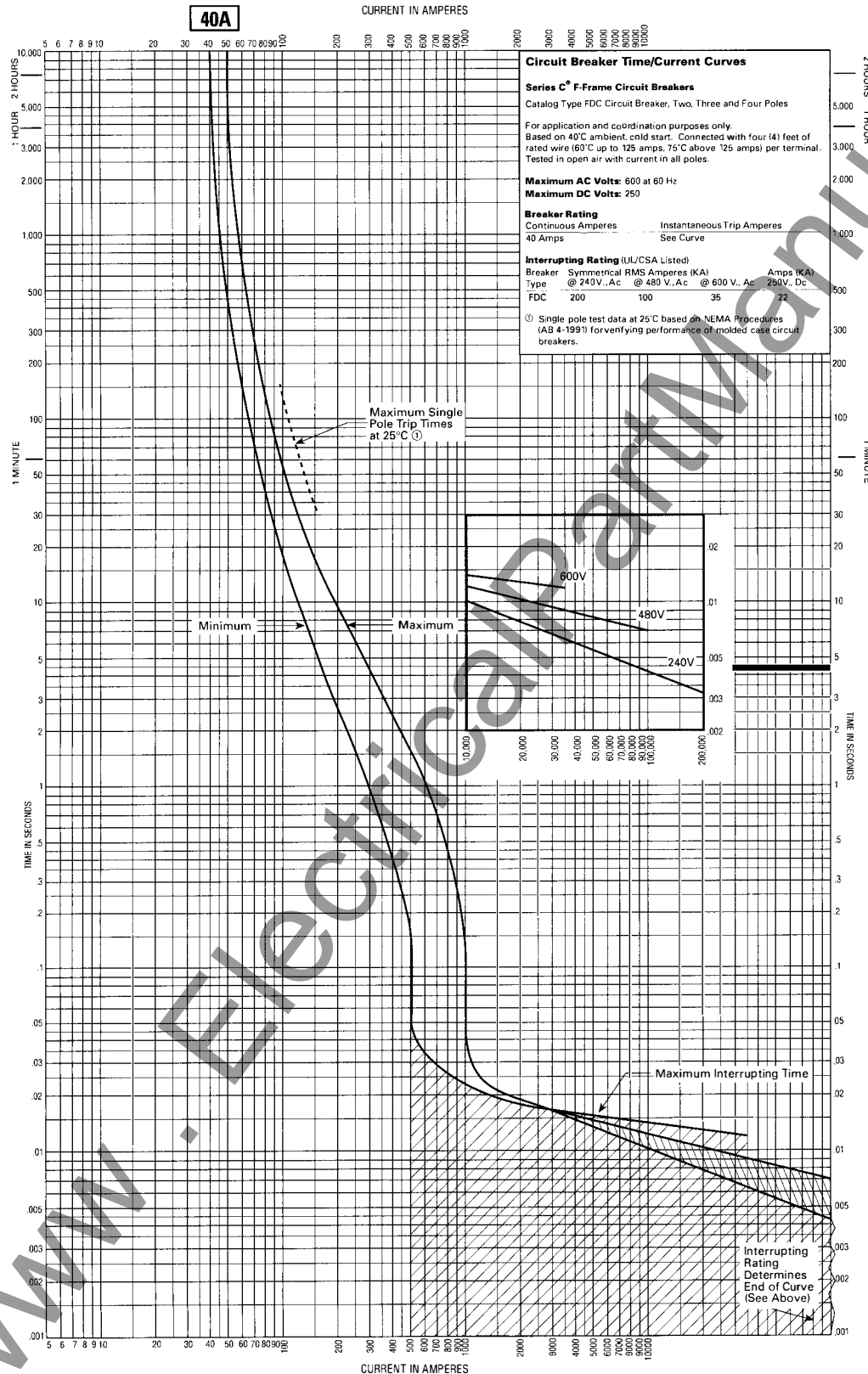
Type FDC 35 Amperes





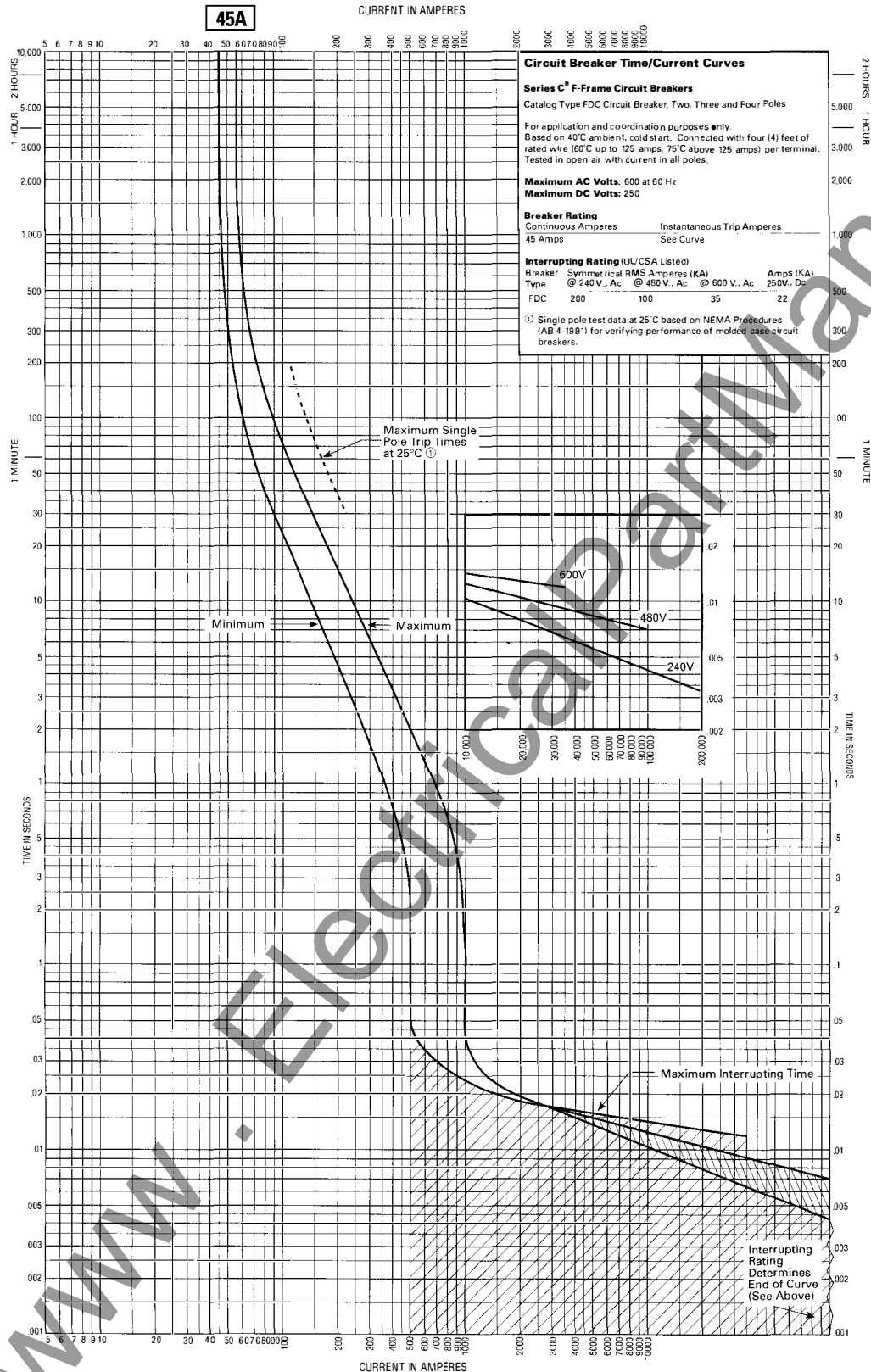
AB DE-ION Circuit Breakers

Type FDC 40 Amperes



AB DE-ION Circuit Breakers

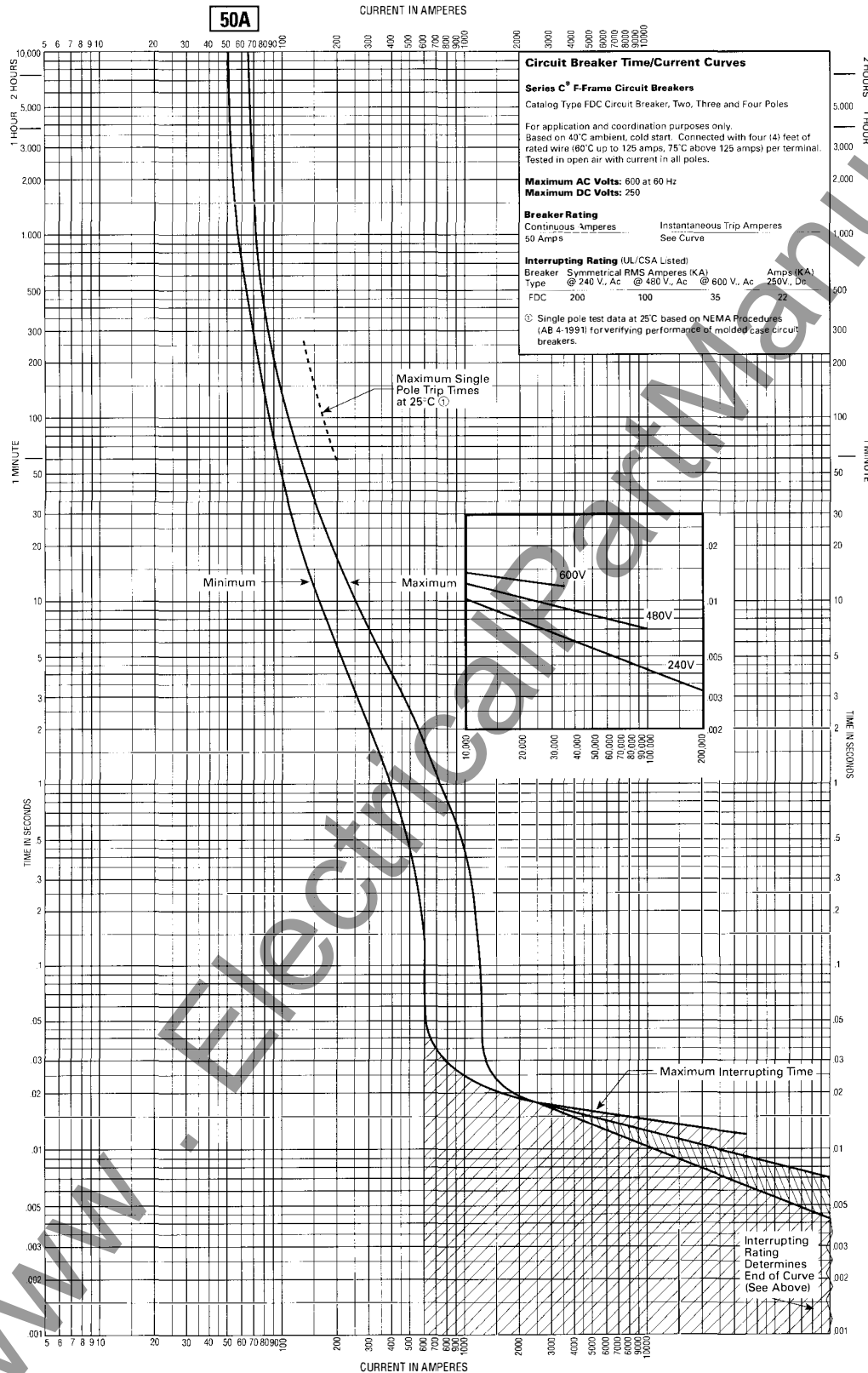
Type FDC 45 Amperes





AB DE-ION Circuit Breakers

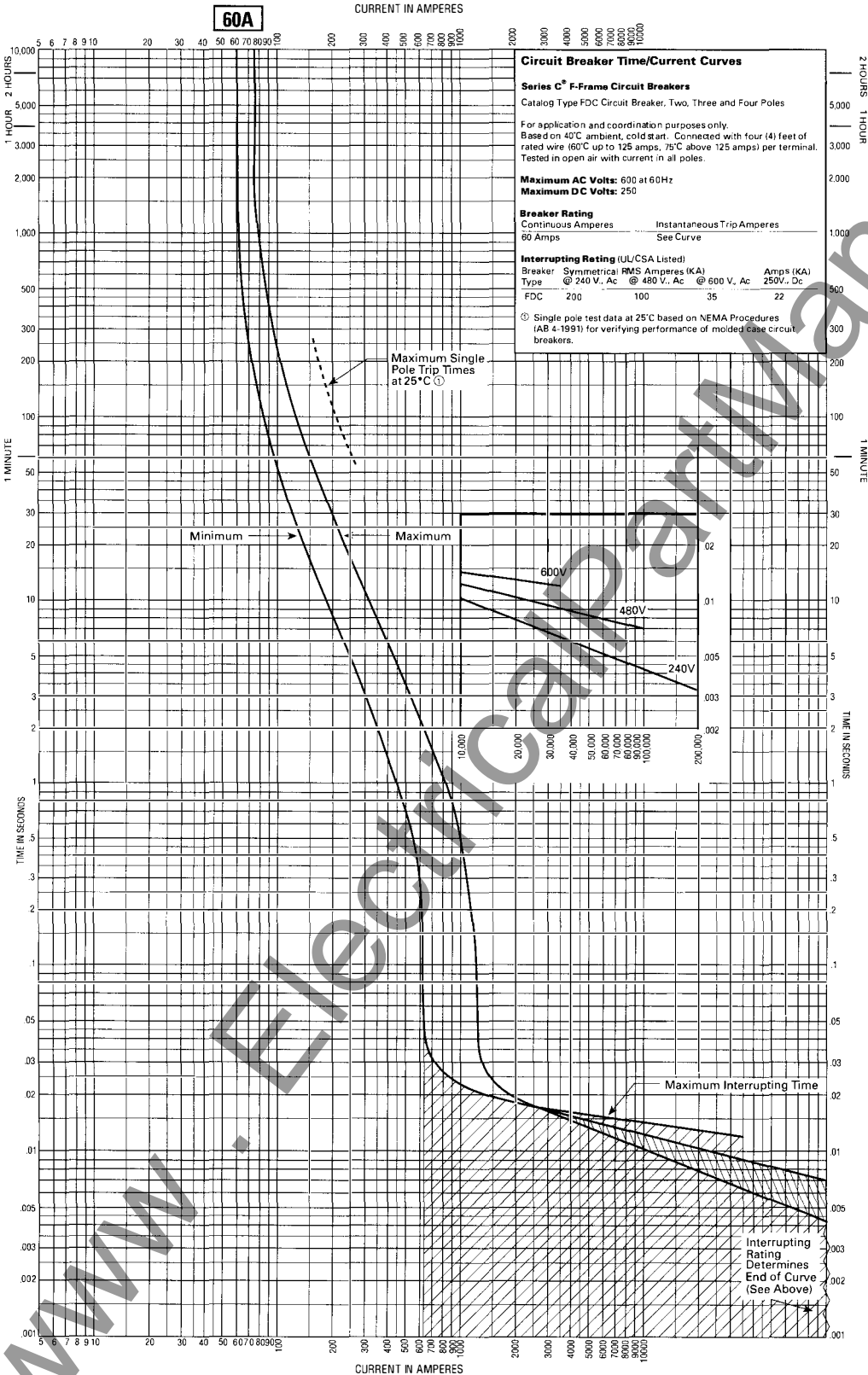
Type FDC 50 Amperes





AB DE-ION Circuit Breakers

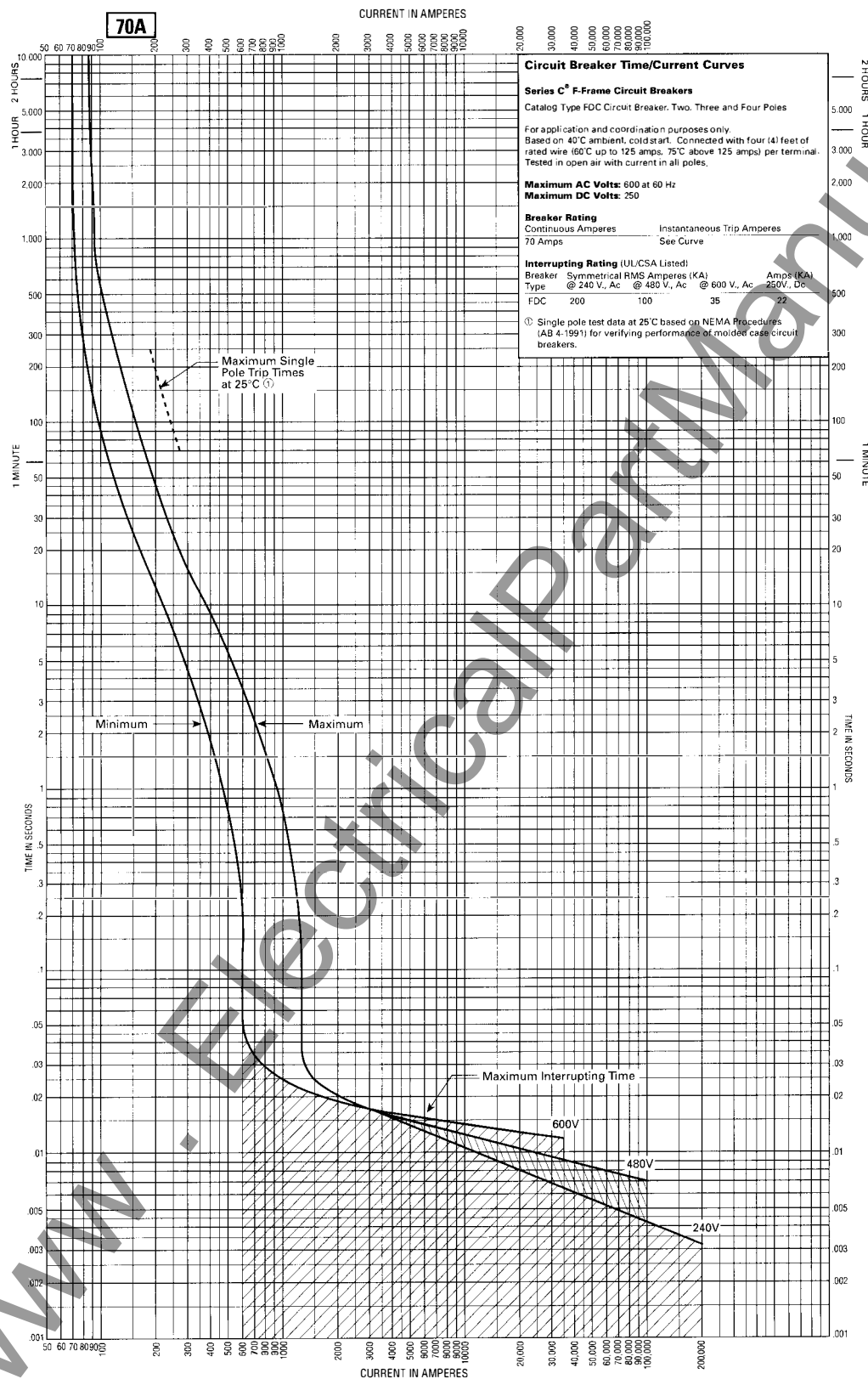
Type FDC 60 Amperes





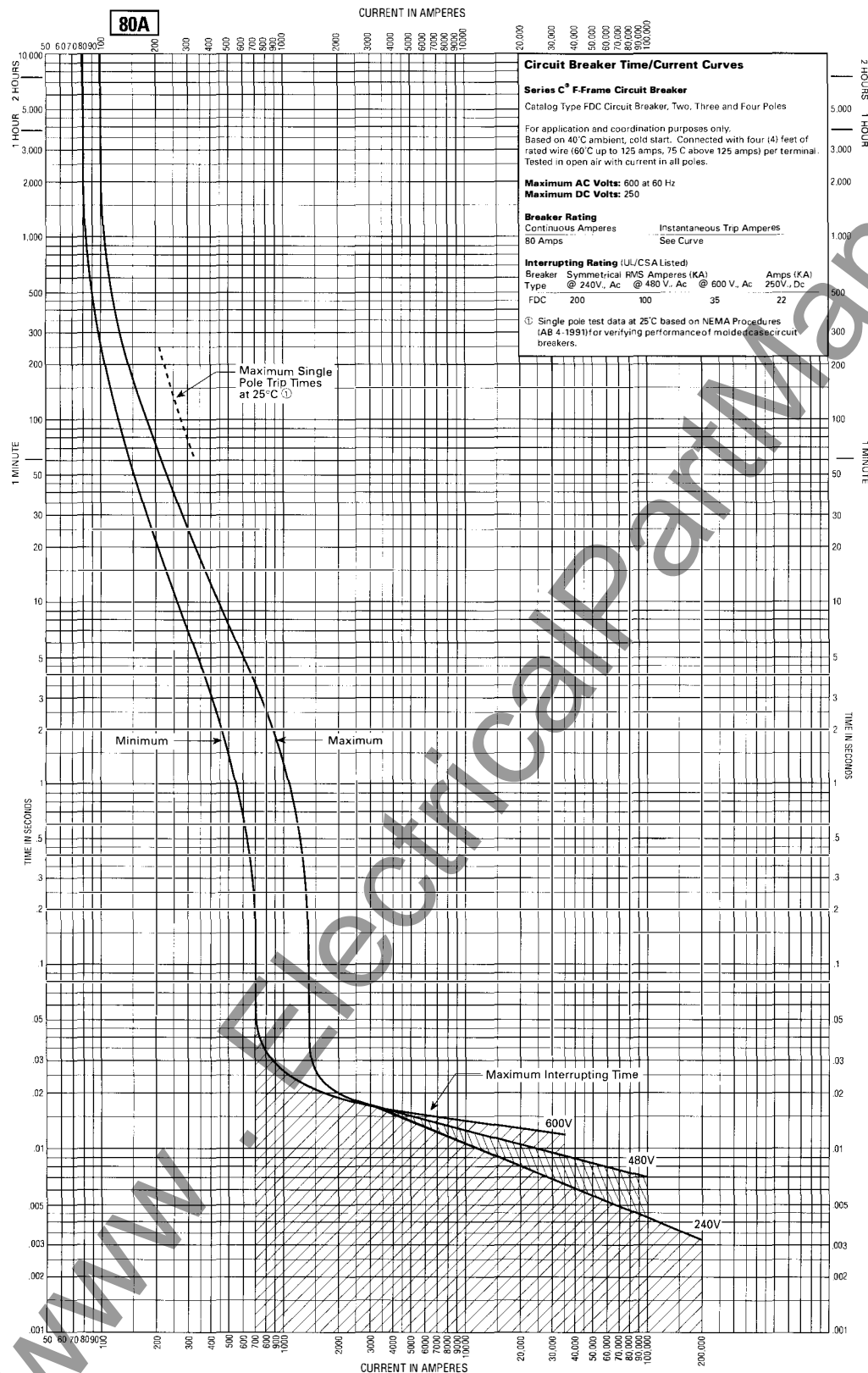
AB DE-ION Circuit Breakers

Type FDC 70 Amperes



AB DE-ION Circuit Breakers

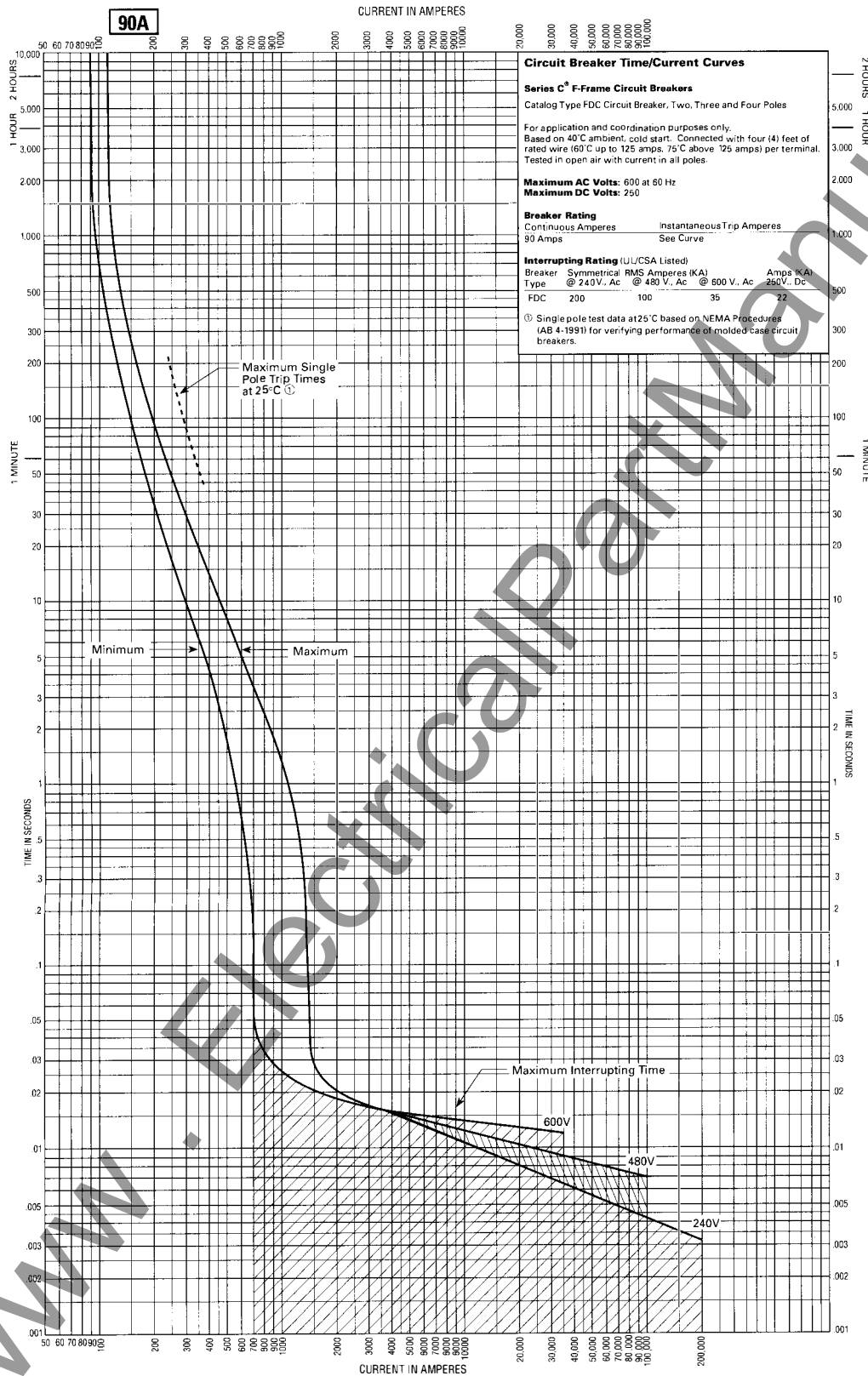
Type FDC 80 Amperes





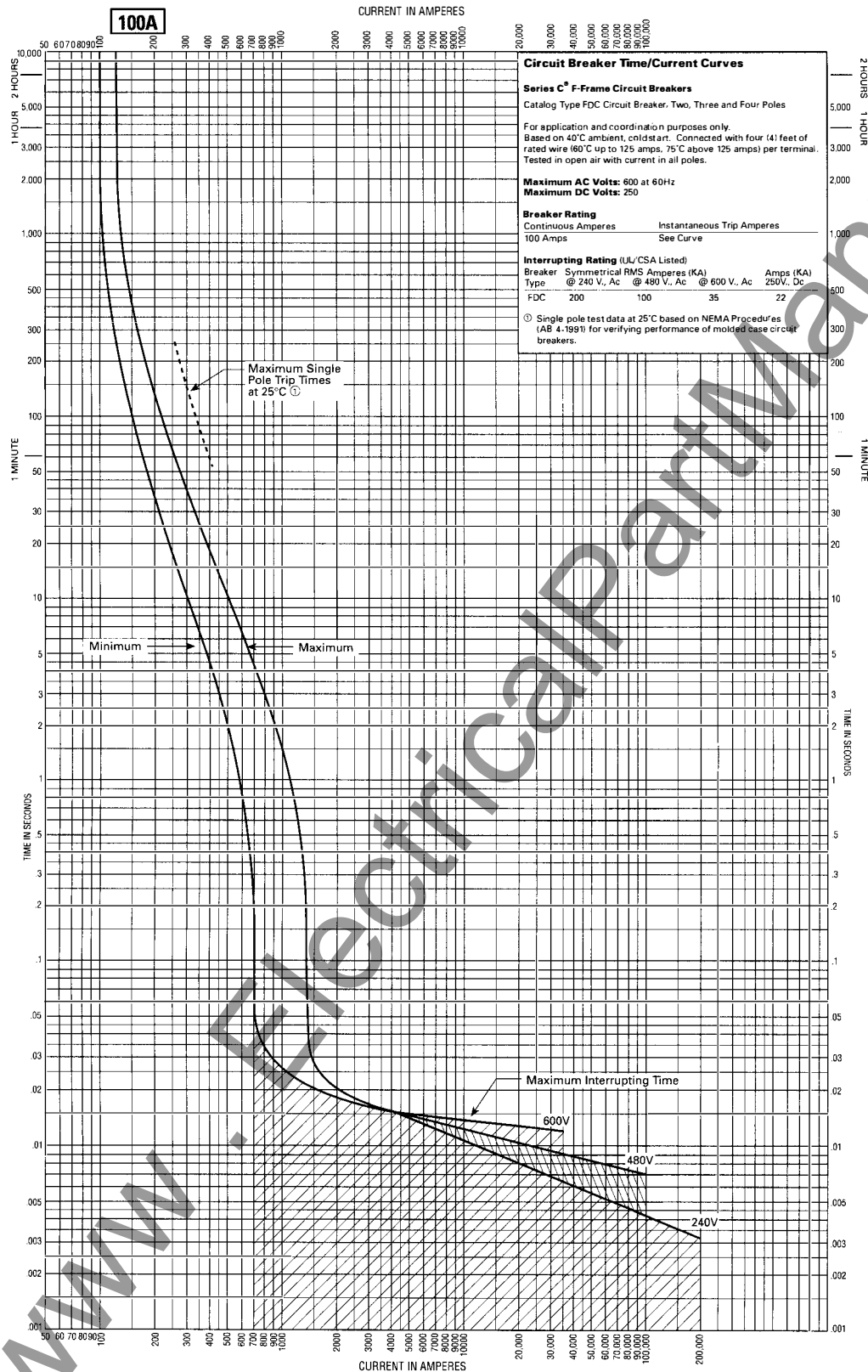
AB DE-ION Circuit Breakers

Type FDC 90 Amperes



AB DE-ION Circuit Breakers

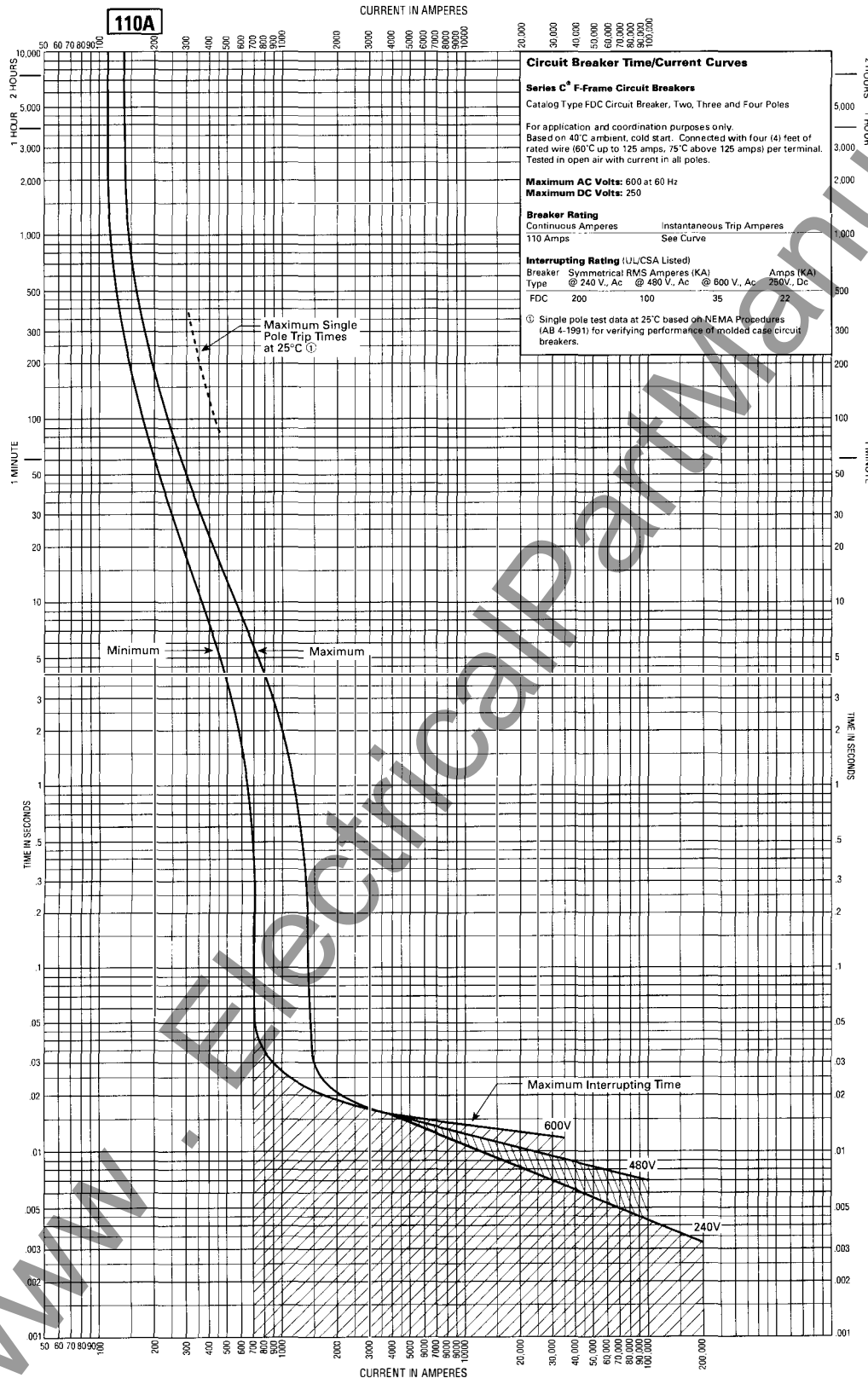
Type FDC 100 Amperes





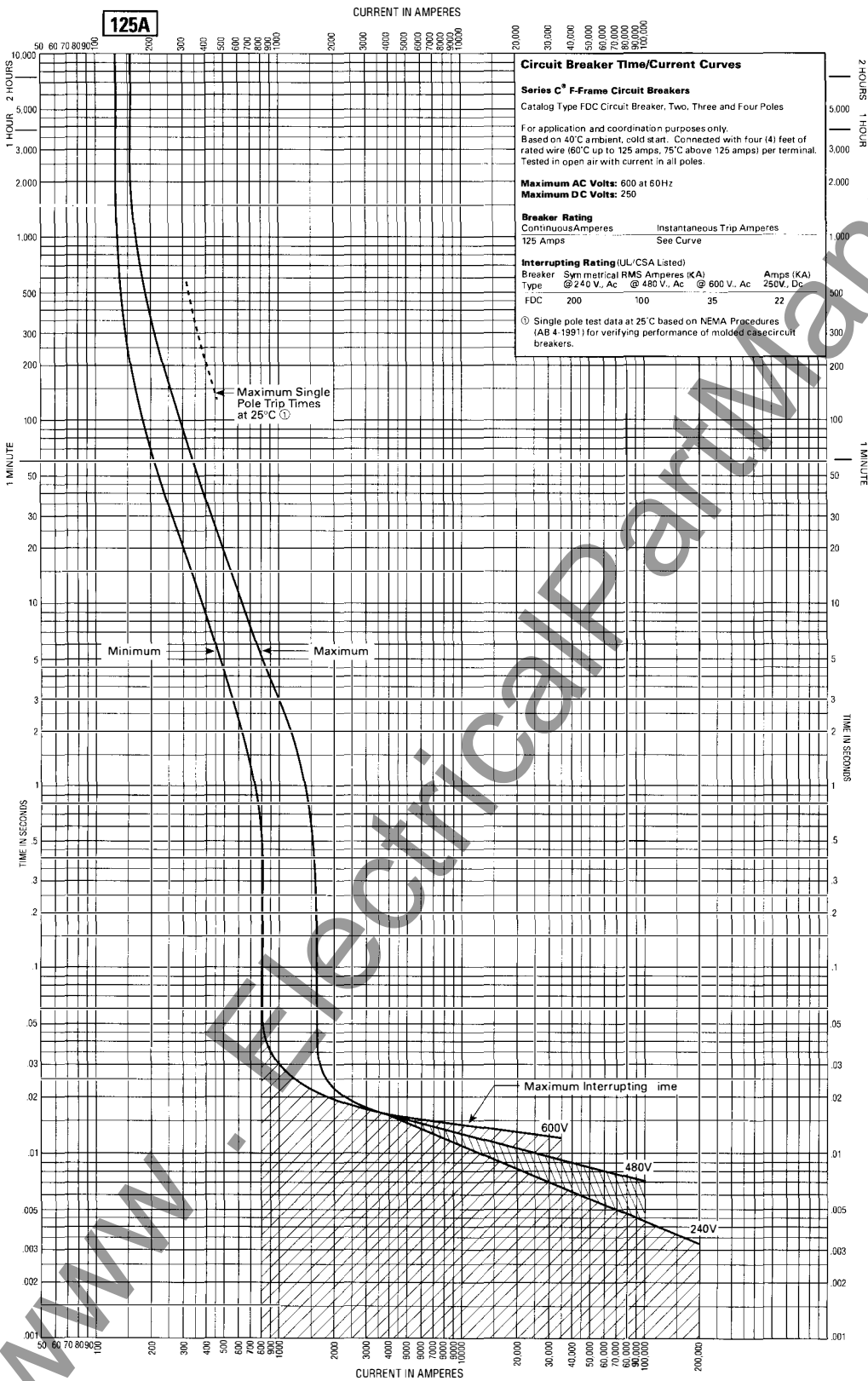
AB DE-ION Circuit Breakers

Type FDC 110 Amperes



AB DE-ION Circuit Breakers

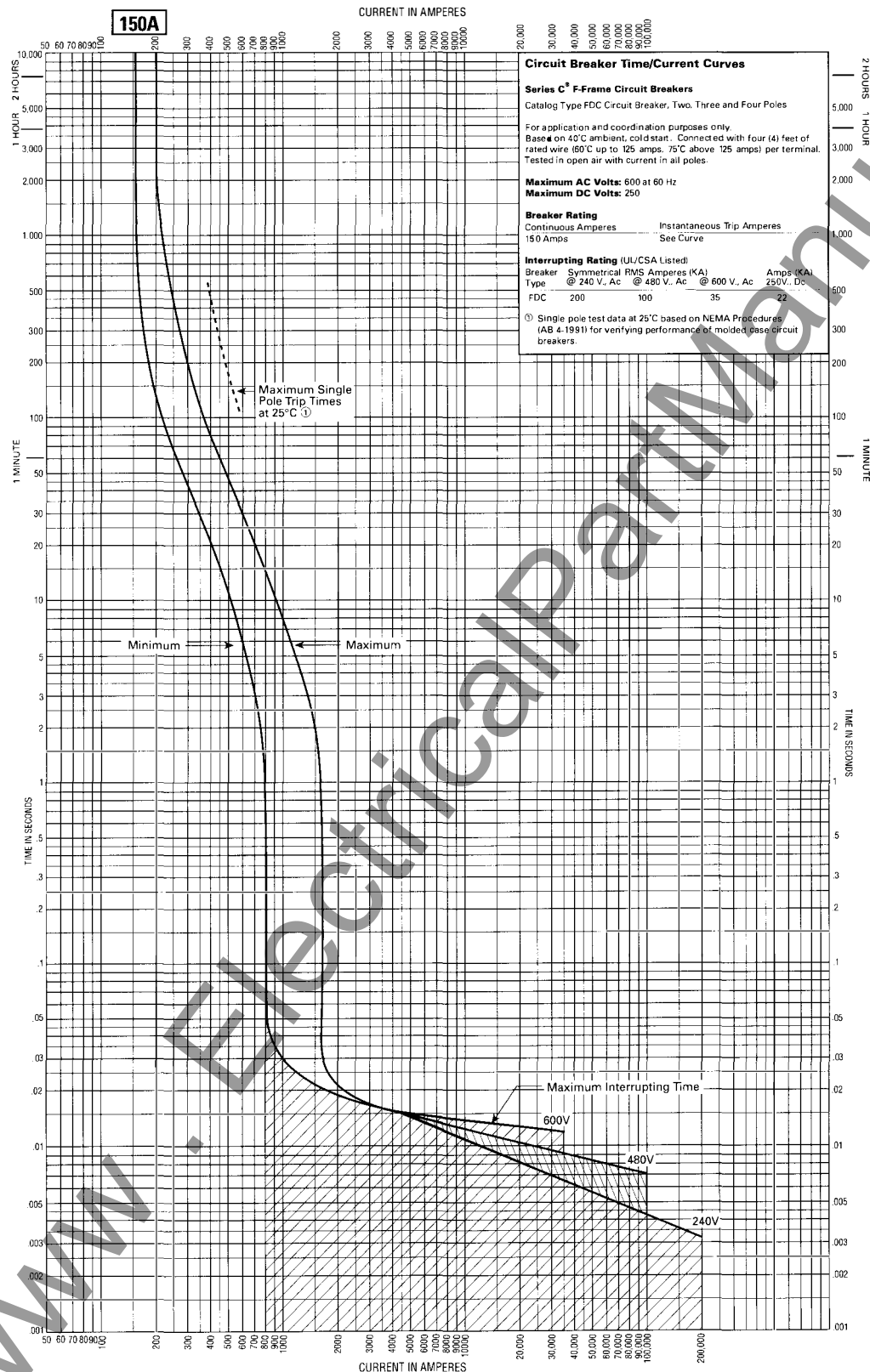
Type FDC 125 Amperes





AB DE-ION Circuit Breakers

Type FDC 150 Amperes



Curve No. SC-5531-93A

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AB DE-ION Circuit Breakers

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Westinghouse &
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Pittsburgh, Pennsylvania, U.S.A. 15220



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Cutler-Hammer Products
Five Parkway Center
Pittsburgh, Pennsylvania, U.S.A. 15220

Application Data

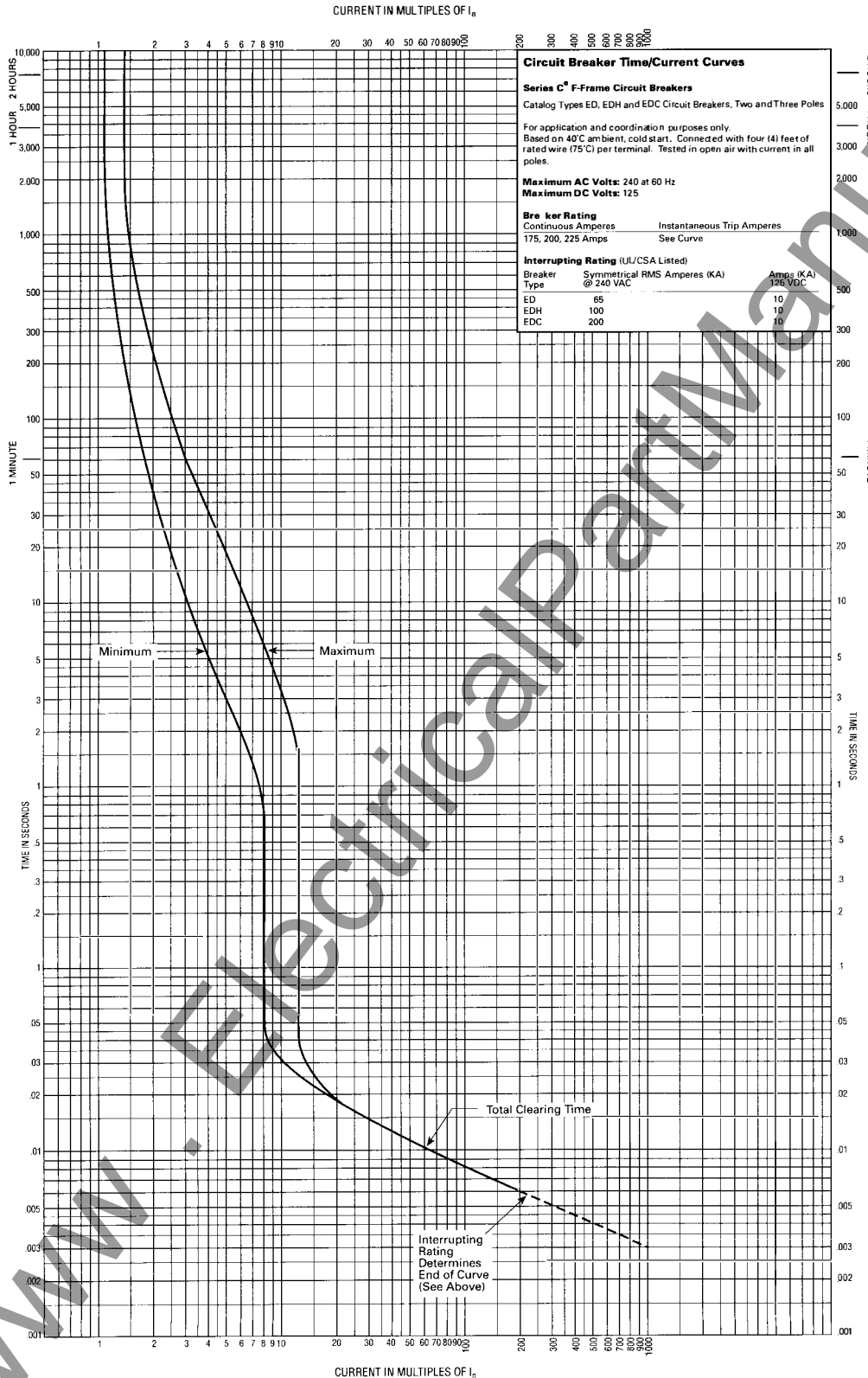
29-167F

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New Information
Mailed to: E/29-100A

Types ED, EDH and EDC

AB DE-ION Circuit Breakers



Curve No. SC-5805-94

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August 1994

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