

Digitrip 310+ Circuit Breaker Time/Current Curves (Phase Current)

Series C F-Frame Circuit Breakers

Catalog Types: TMQF, TMQV

Trip Unit Types: 32 (LSI), 36 (LSIG)

Available Sensors (I<sub>n</sub>): 80A, 160A, 225A

Long Delay (LD) and Short Delay (SD) with Flat Response

(I <sub>r</sub> ) / (I <sub>n</sub> )	80A	160A	225A
A	15A	60A	100A
B	20A	70A	110A
C	30A	80A	125A
D	40A	90A	150A
E	50A	100A	160A
F	60A	125A	175A
G	70A	150A	200A
H	80A	160A	225A

Interrupting Rating—50/60 Hz

Breaker Type	Symmetrical RMS amperes (kAS) UL/CSA		
	240V	480V	600V
TMQF	65	35	18
TMQV	200	100	25

Notes:

1. Curve accuracy applies from -20C to +55C ambient. Temperatures above +85C cause an overtemperature protection trip. For possible continuous ampere derating for ambient above 40C, refer to Eaton.
2. Application frequency is 50/60 Hz.
3. 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 memory.
4. The right portion of the curve is determined by the interrupting rating of the circuit breaker.
5. The left portion of the curve is shown as a multiple of the long delay setting (long delay pick up = 115% of I<sub>n</sub>). Range is 110%–120%.
6. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
7. The short delay pick up has nine settings/positions, 2–8, 10, 12.
8. For high fault current levels an additional fixed instantaneous hardware override is provided (corresponding to SDPU position 9) at 12x (I<sub>n</sub>) and designated as 12I<sub>n</sub>. Instantaneous tolerance is +/–20%.
9. For LD response and SD with flat response (this curve): TC01203015E.
10. For LD response and SD with I<sup>2</sup>T response curve, see: TC01203016E.
11. For ground fault delay response curve, see: TC01203017E.
12. Digitrip RMS 310+ trip units are suitable for functional field testing with test kit Cat. No. MTS120V. For field testing using primary injection methods, follow NEMA publication AB-4-2003.

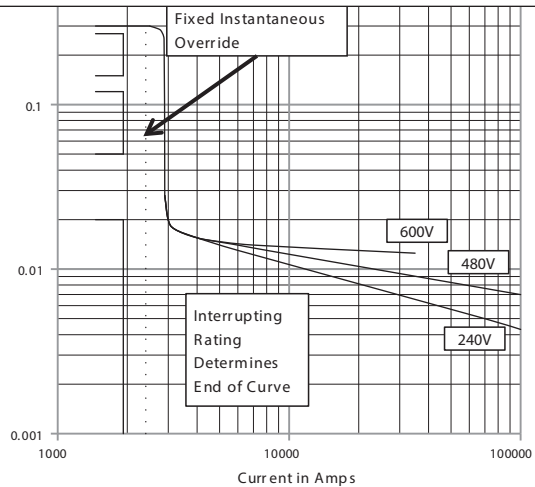


Figure 3. Types TMQF & TMQV 225A -Long/Short Delay—Curve Number TC01203015E



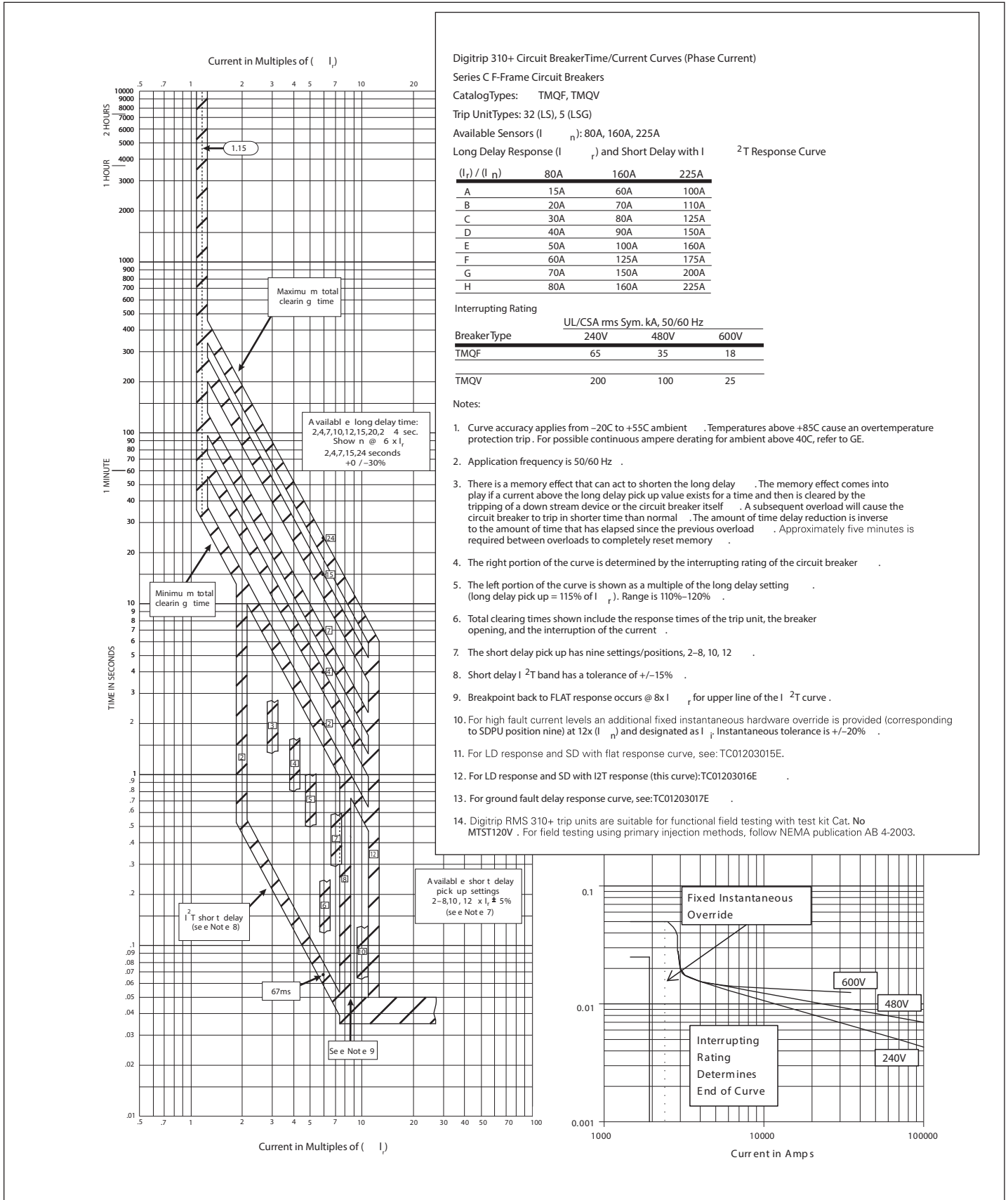
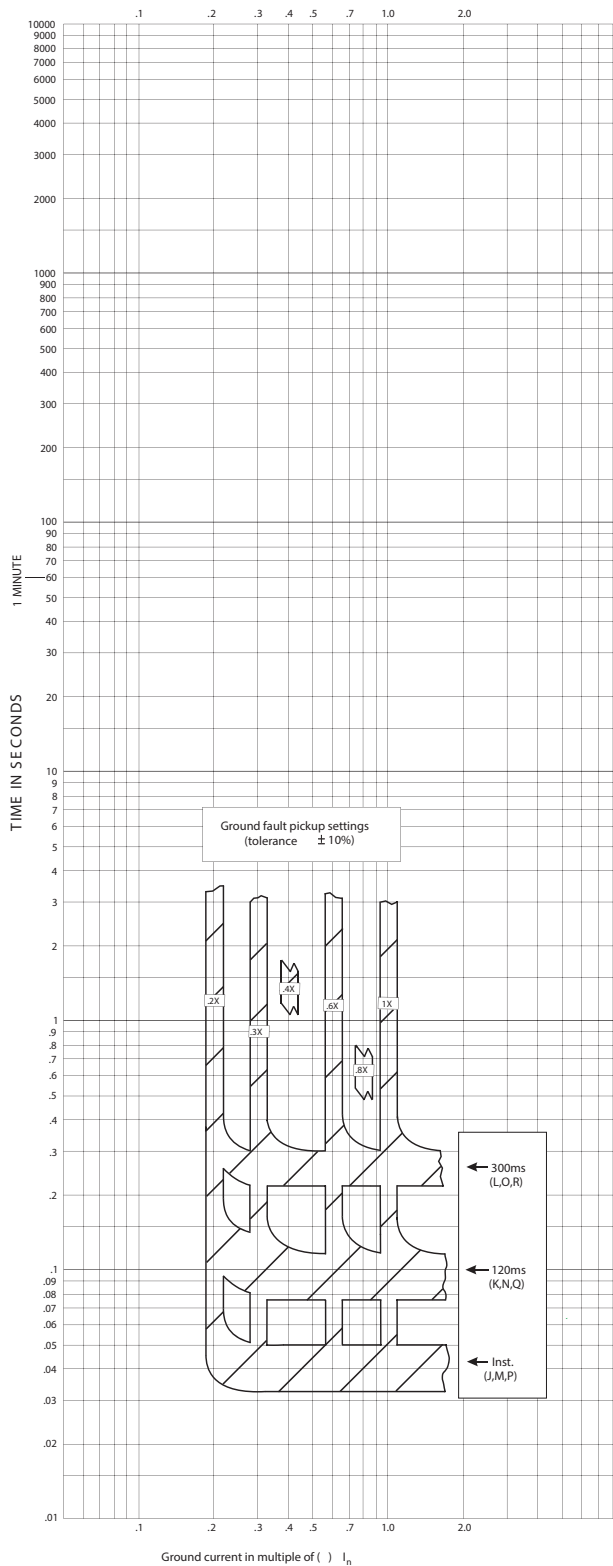


Figure 4. Types TMQF and TMQV 225A—Long Short Delay and  $I_{SD}^{2T}$ —Curve Number TC01203016E



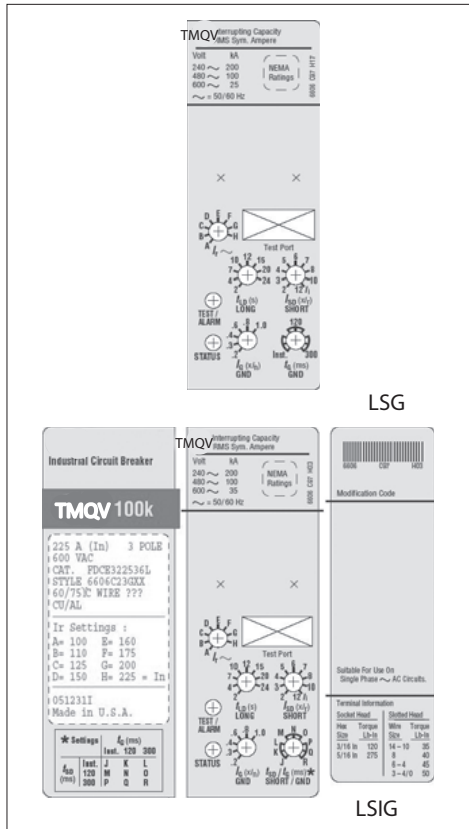


Digitrip 310+ Circuit breaker time/current curves (ground current)

Series C F-Frame Circuit Breakers

Catalog Types: TMQF, TMQV, industrial circuit breakers

Ground fault delay response



Switch Setting	$t_{SD}$	$t_{GF}$	$(I_T / I_n)$	80A	160A	225A
J	Inst.	Inst.	A	15A	60A	100A
K	Inst.	120	B	20A	70A	110A
L	Inst.	300	C	30A	80A	125A
M	120	Inst.	D	40A	90A	150A
N	120	120	E	50A	100A	160A
O	120	300	F	60A	125A	175A
P	300	Inst.	G	70A	150A	200A
Q	300	120	H	80A	160A	225A
R	300	300				

Notes:

1. Curve accuracy applies from  $-20^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$  ambient. Temperatures above  $+85^{\circ}\text{C}$  cause an overtemperature protection trip. For possible continuous ampere derating for ambient above  $40^{\circ}\text{C}$ , refer to GE.
2. Application frequency is 50/60 Hz.
3. Trip units are suitable for functional field testing with test kit style # 70C1056G52.
4. For LD response and SD with flat response curve, see: TC01203015E.
5. For LD response and SD with  $I^2T$  response curve, see: TC01203016E.
4. For ground fault delay response (this curve): TC01203017E.

Figure 5. Types TMQF and TMQV 225A—LSIG—Curve Number

TC01203017E



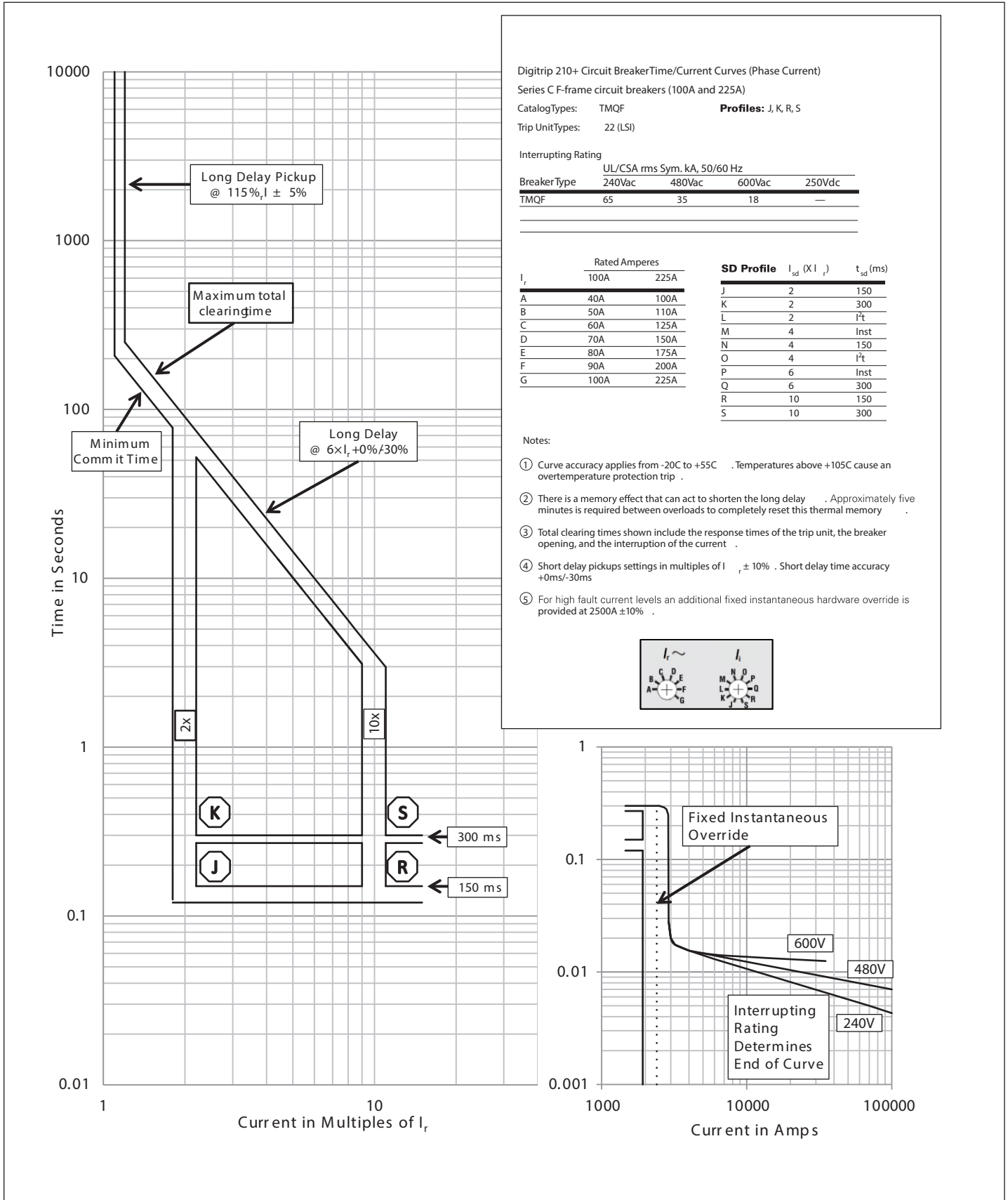


Figure 6. Digitrip 210+ Trip Units (100 & 225A), Long Delay and Short Delay with Flat Response and Override (LSI, Profiles K, J, S, R)  
Curve Number TD012001EN, June 2015



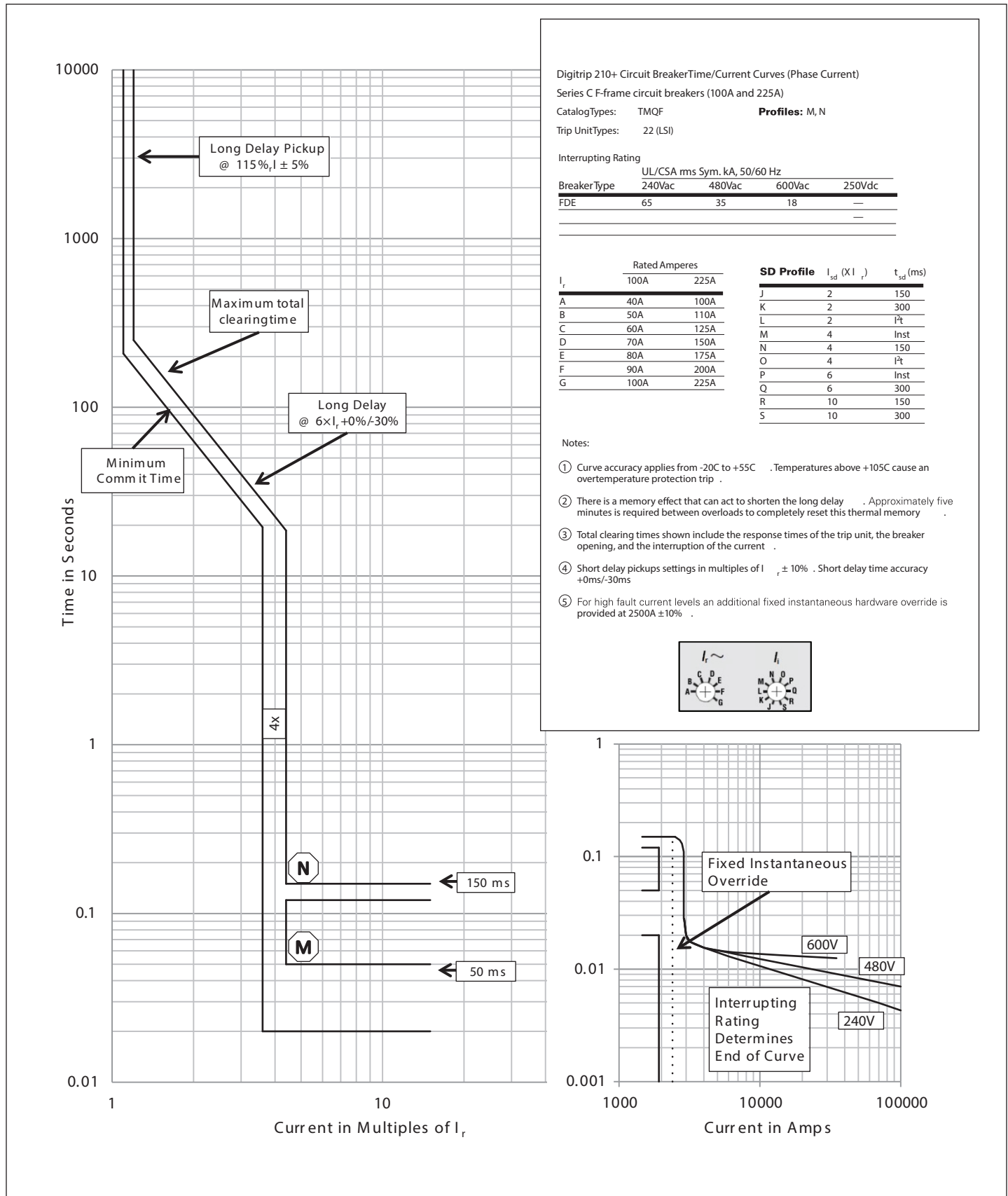


Figure 7. Digitrip 210+ Trip Units (100 & 225A), Long Delay and Short Delay with Flat Response and Override (LSI, Profiles N, M)  
Curve Number TD012002EN, June 2015



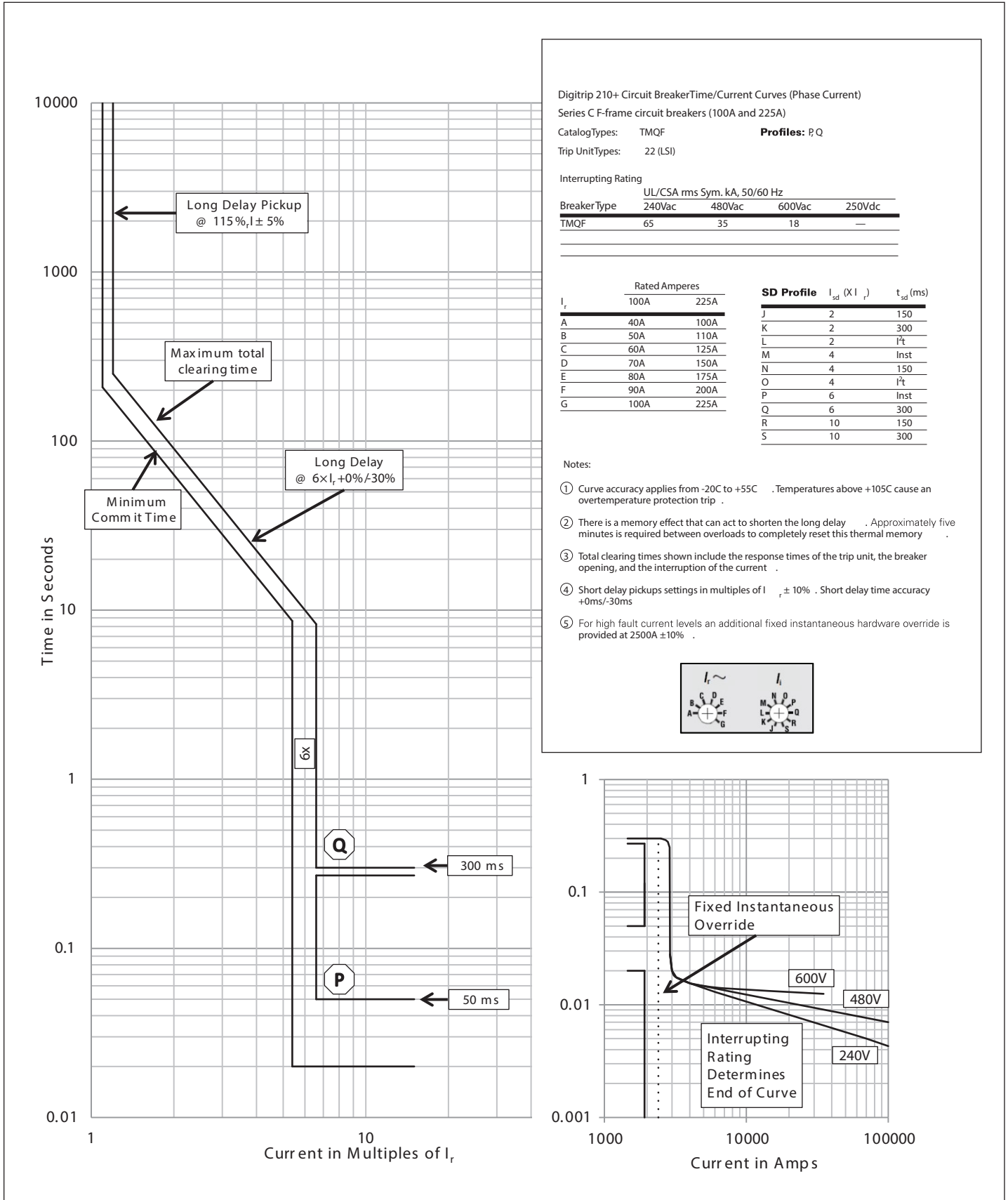


Figure 8. Digitrip 210+ Trip Units (100 & 225A), Long Delay and Short Delay with Flat Response and Override (LSI, Profiles Q, P)  
Curve Number TD012003EN, June 2015



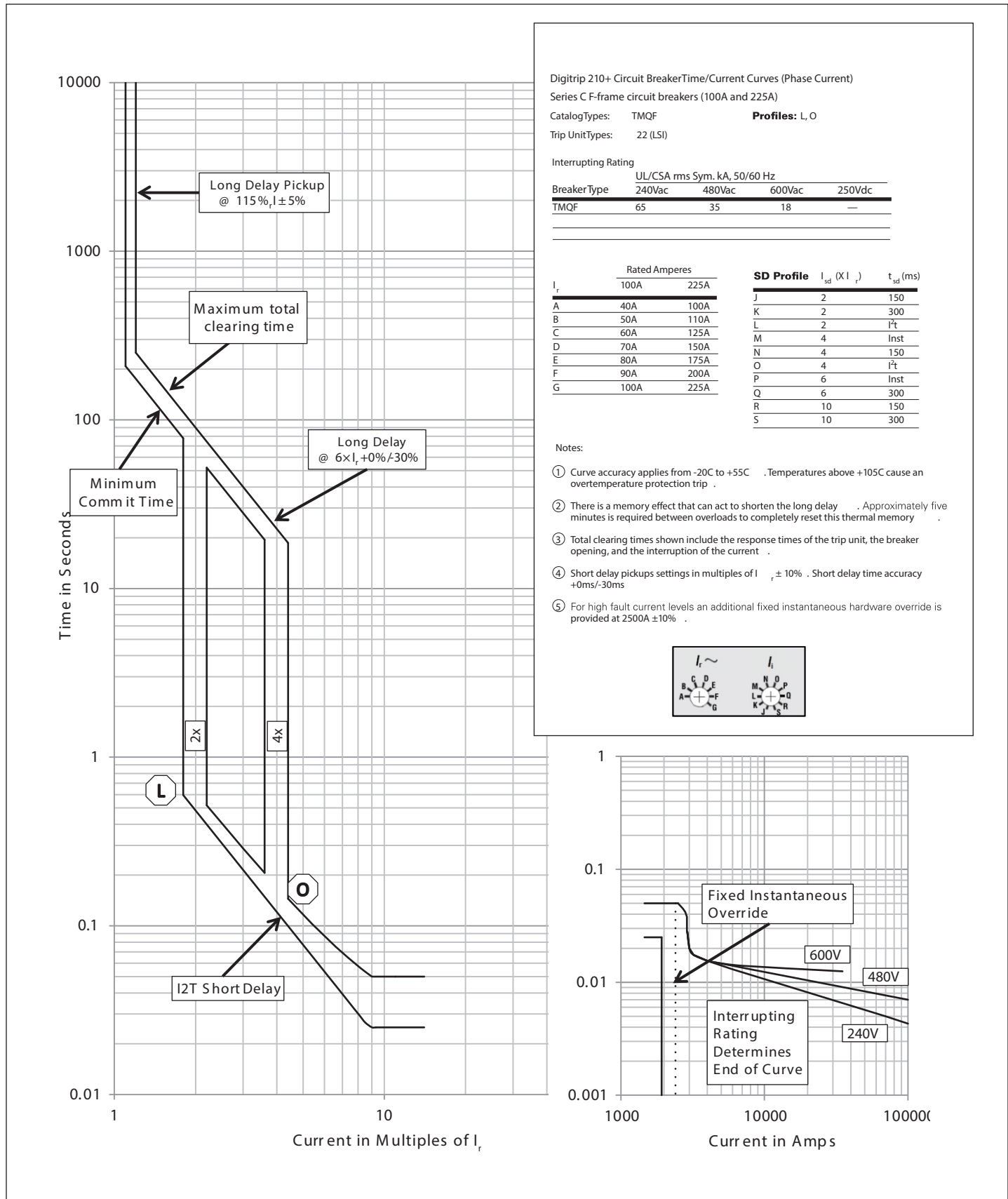


Figure 9. Digitrip 210+ Trip Units (100 & 225A), Long Delay and Short Delay with I<sub>2</sub>t Response and Override (LSI, Profiles L, O)  
Curve Number TD012004EN, June 2015

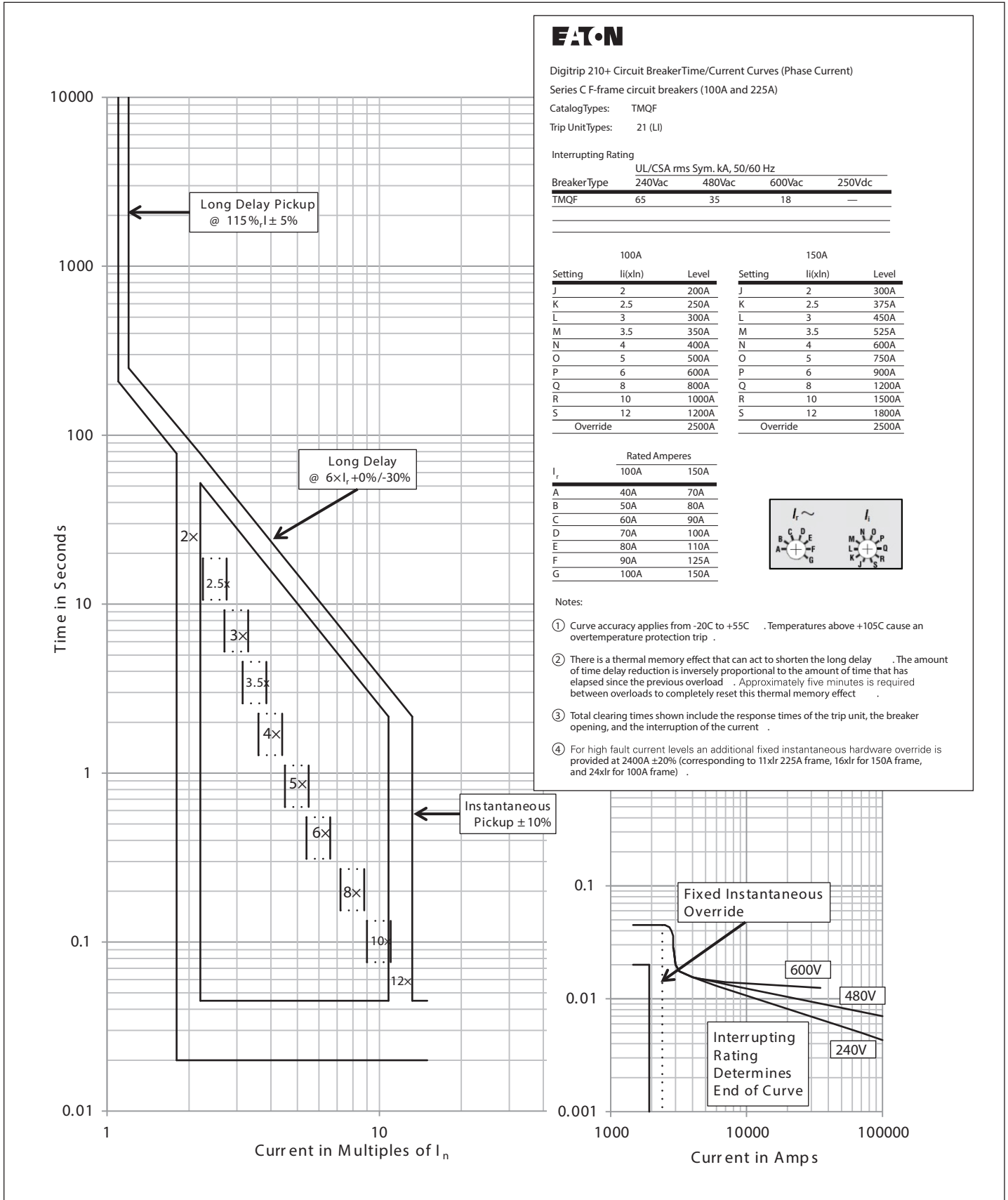


Figure 10. Digitrip 210+ Trip Units (100 & 150A), Long Delay, Instantaneous Pickups and Override (LI)  
Curve Number TD012005EN, June 2015



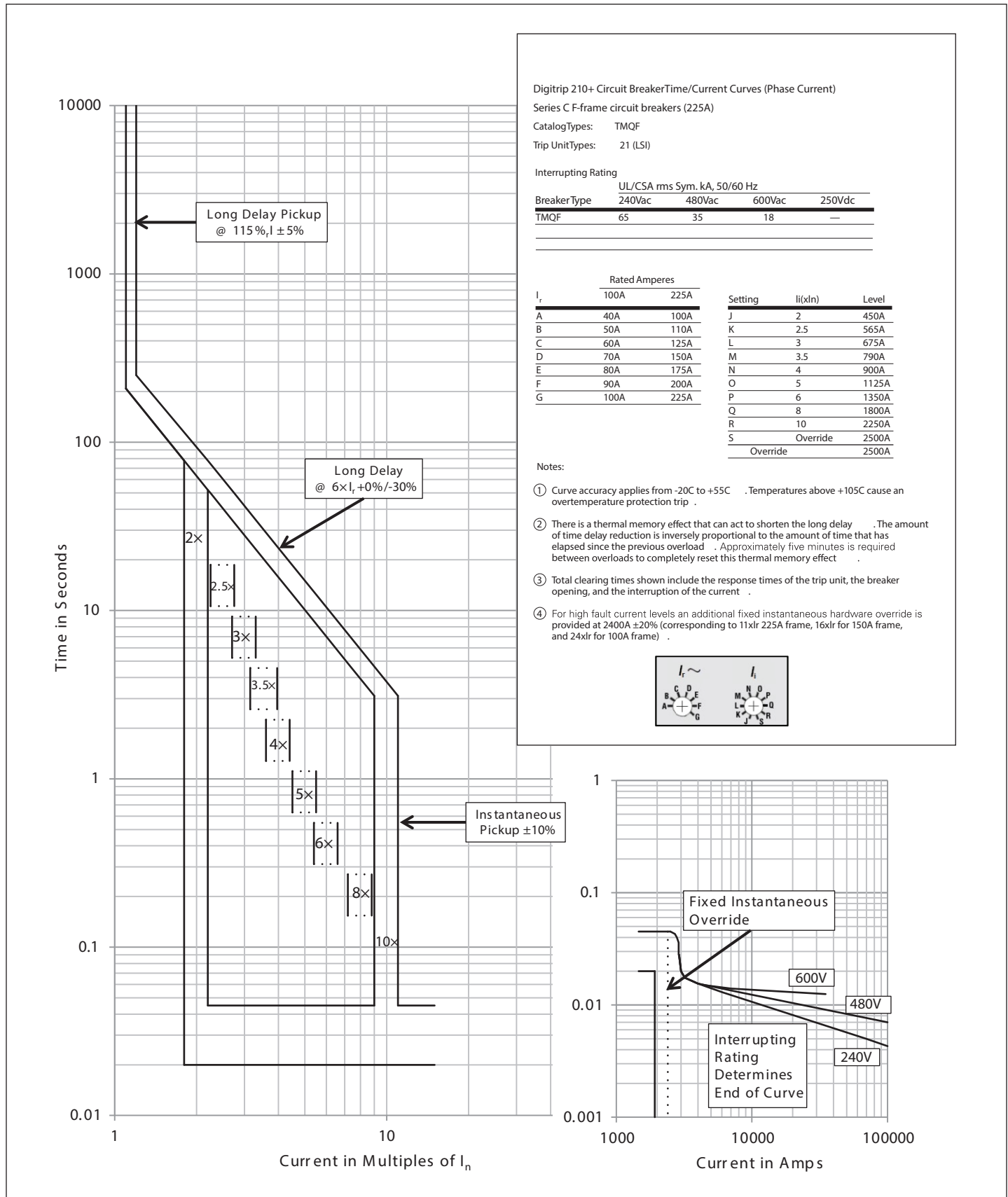


Figure 11. Digitrip 210+ Trip Units (225A), Long Delay, Instantaneous Pickups and Override (LI) Curve Number TD012006EN, June 2015

AB DE-ION Circuit Breakers— two and three pole breakers

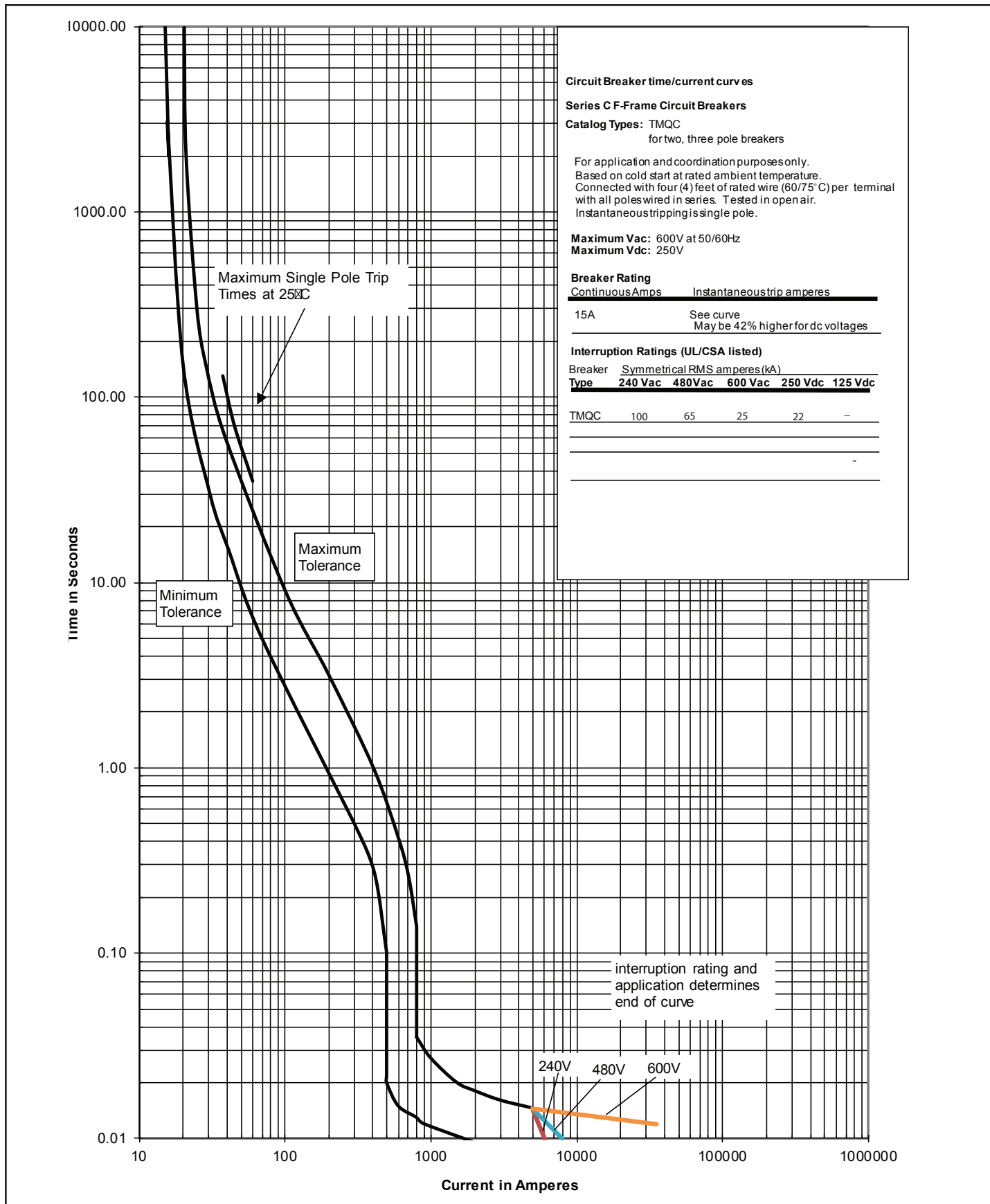


Figure 28. Types TMQC 15A 2 & 3 pole—Curve Number TC012036EN



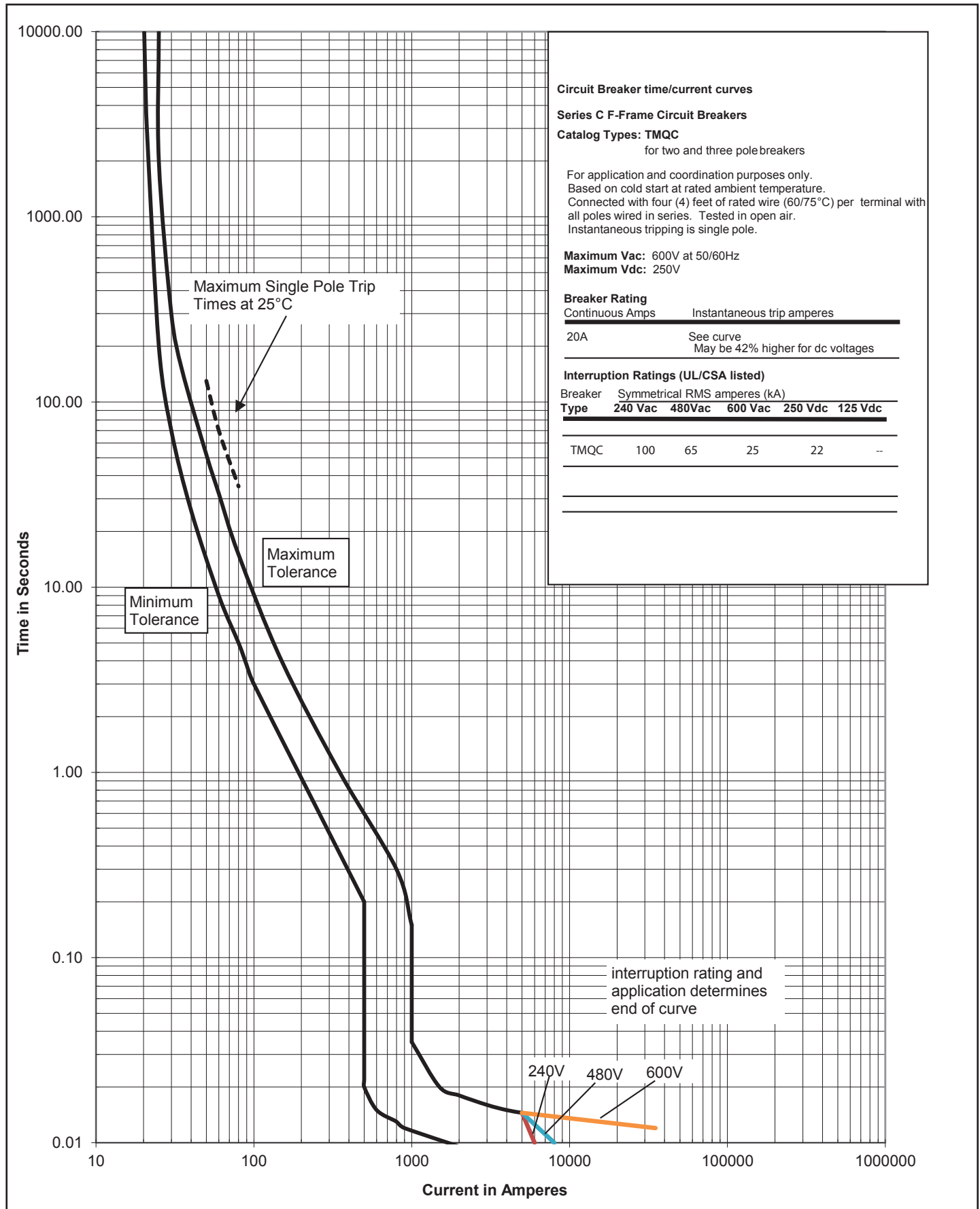


Figure 29. Types TMQC 20A 2 & 3 pole

—Curve Number TC012037EN



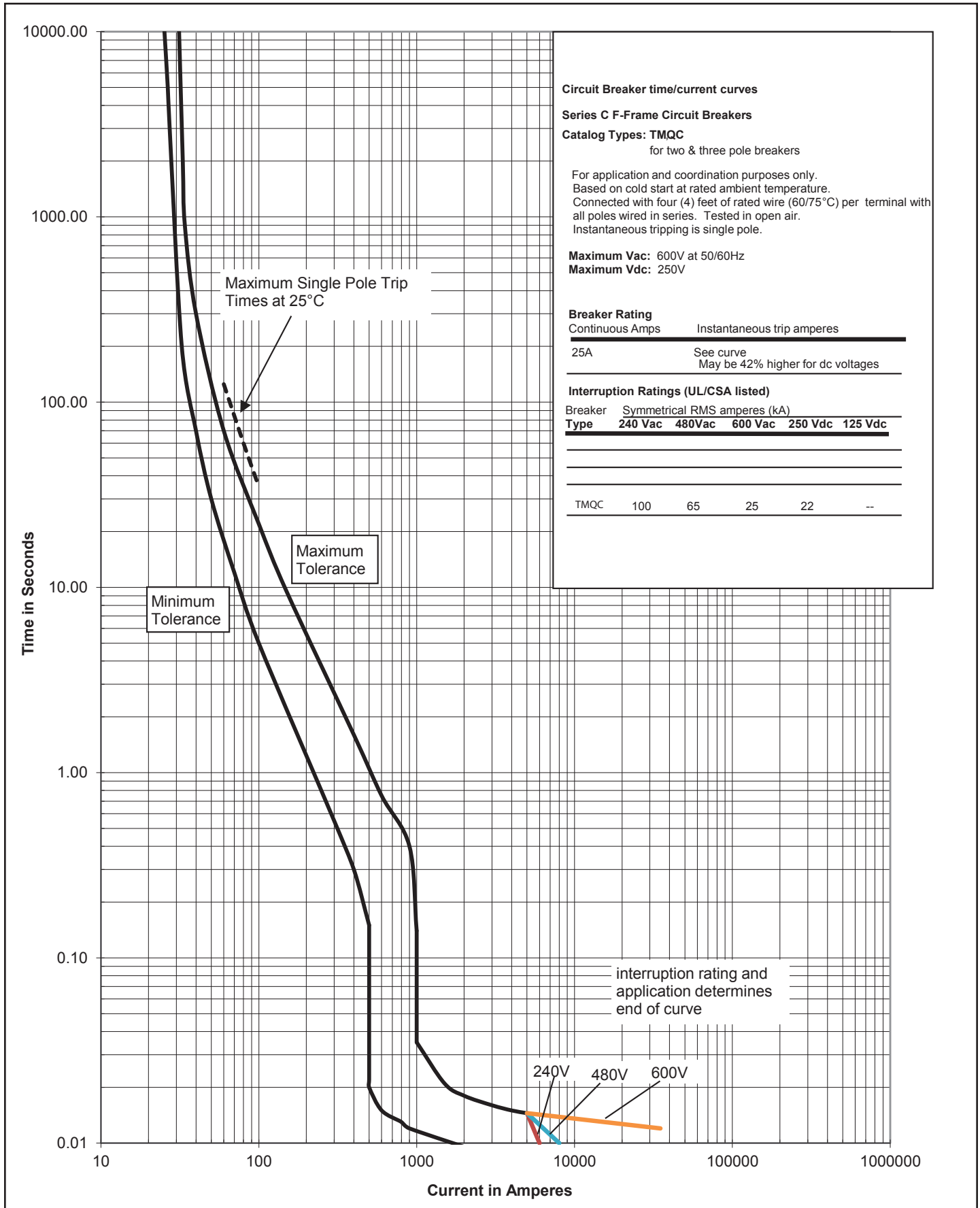


Figure 30.Types TMQC 25A 2 & 3 pole-- Curve Number TC012038EN





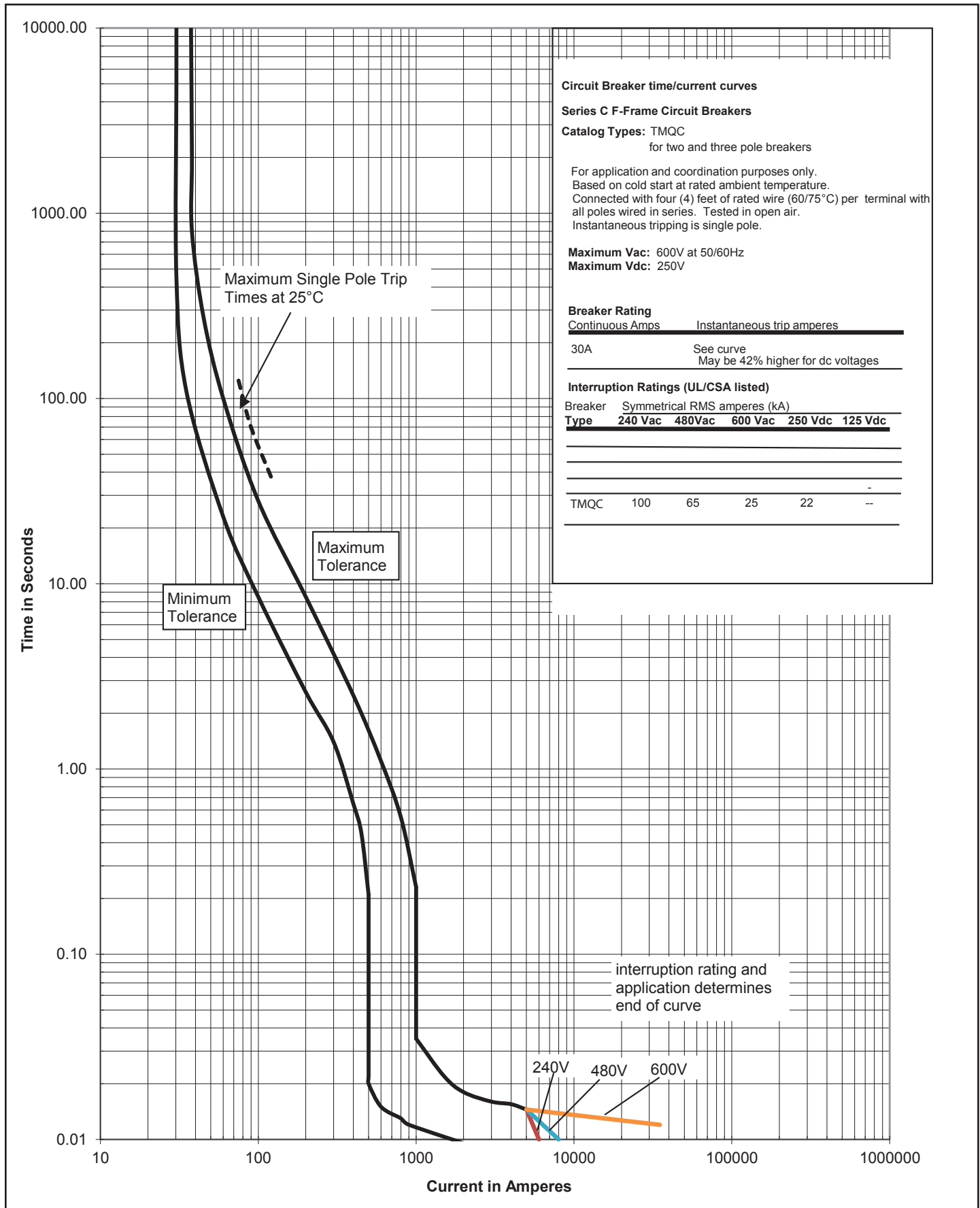


Figure 31.TypesTMQC 30A 2 &3 pole -Curve NumberTC012039EN



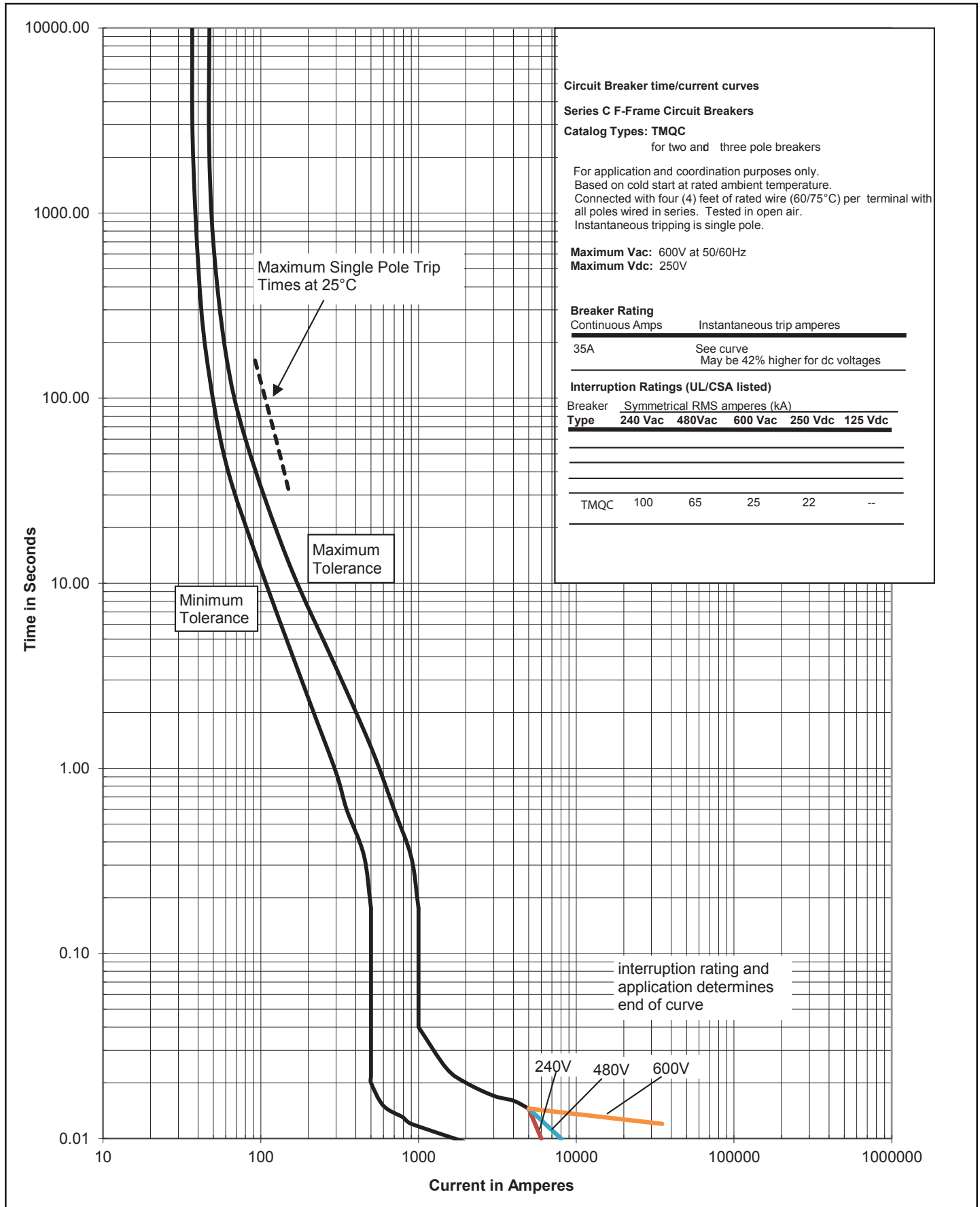


Figure 32.Types **TMQC** 2 & 3 pole -- Curve Number TC012040EN



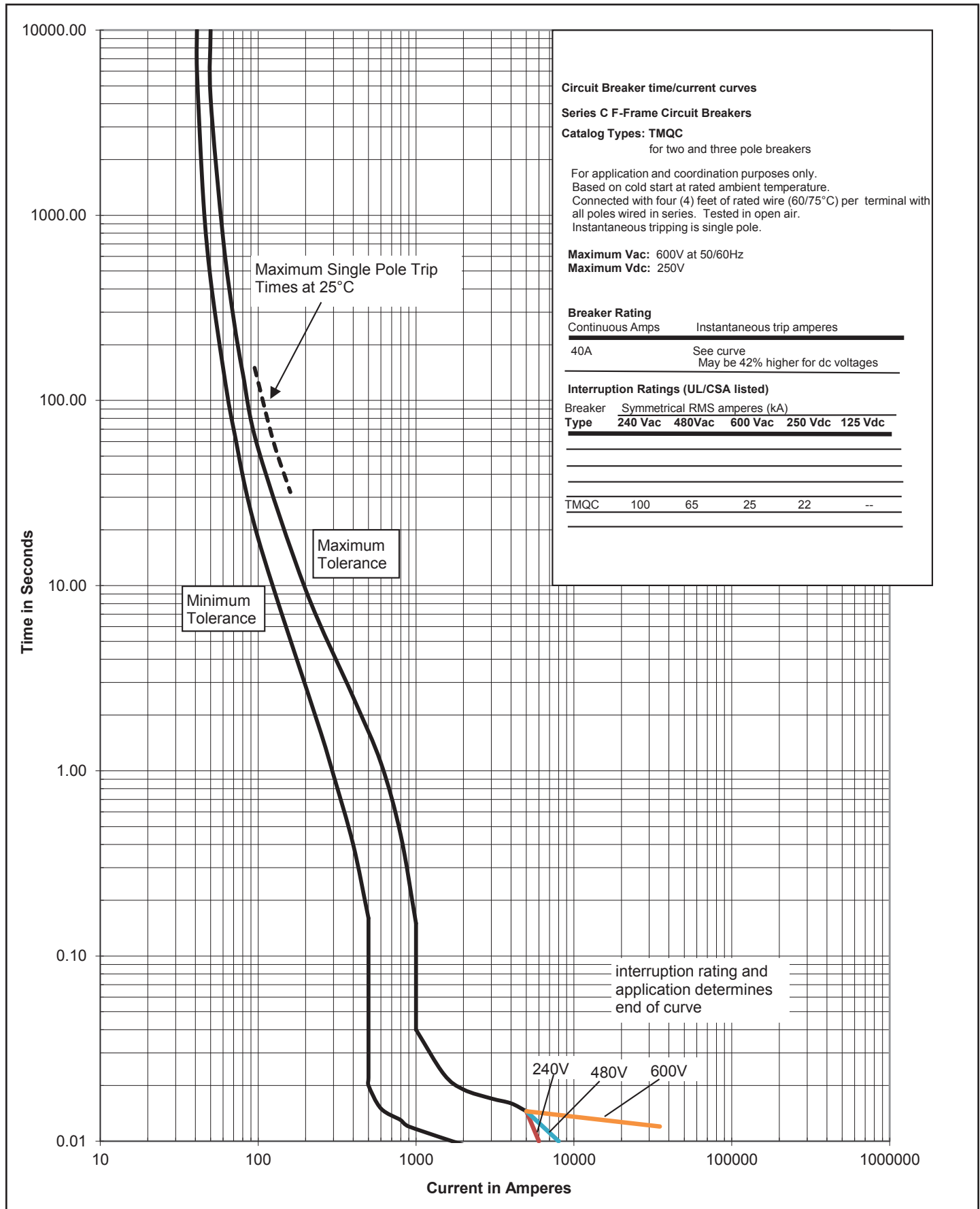


Figure 33.Types **TMQC** 40A 2 & 3 pole—Curve NumberTC012041EN



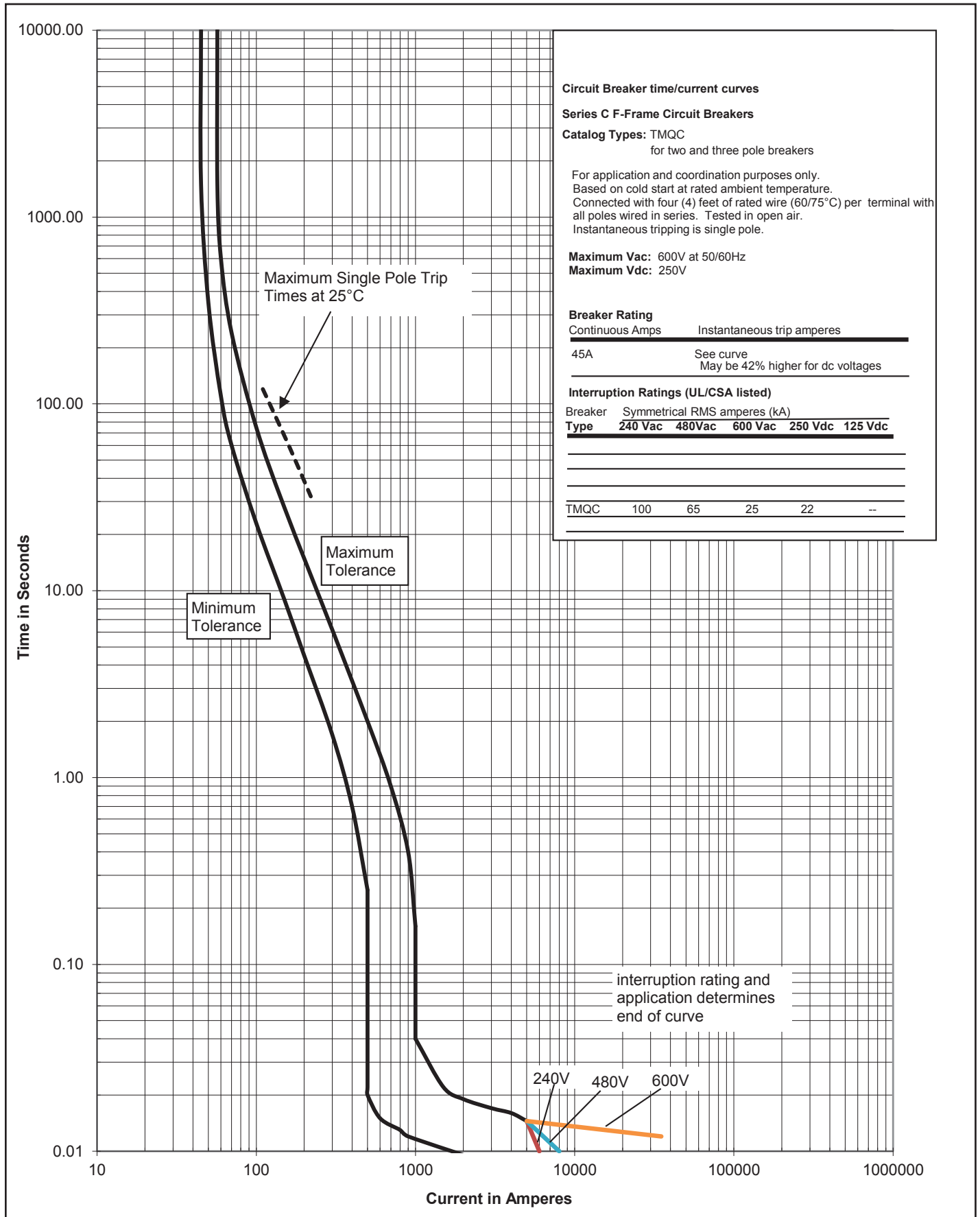


Figure 34.Types TMQC 45A 2 & 3 pole—Curve NumberTC012042EN



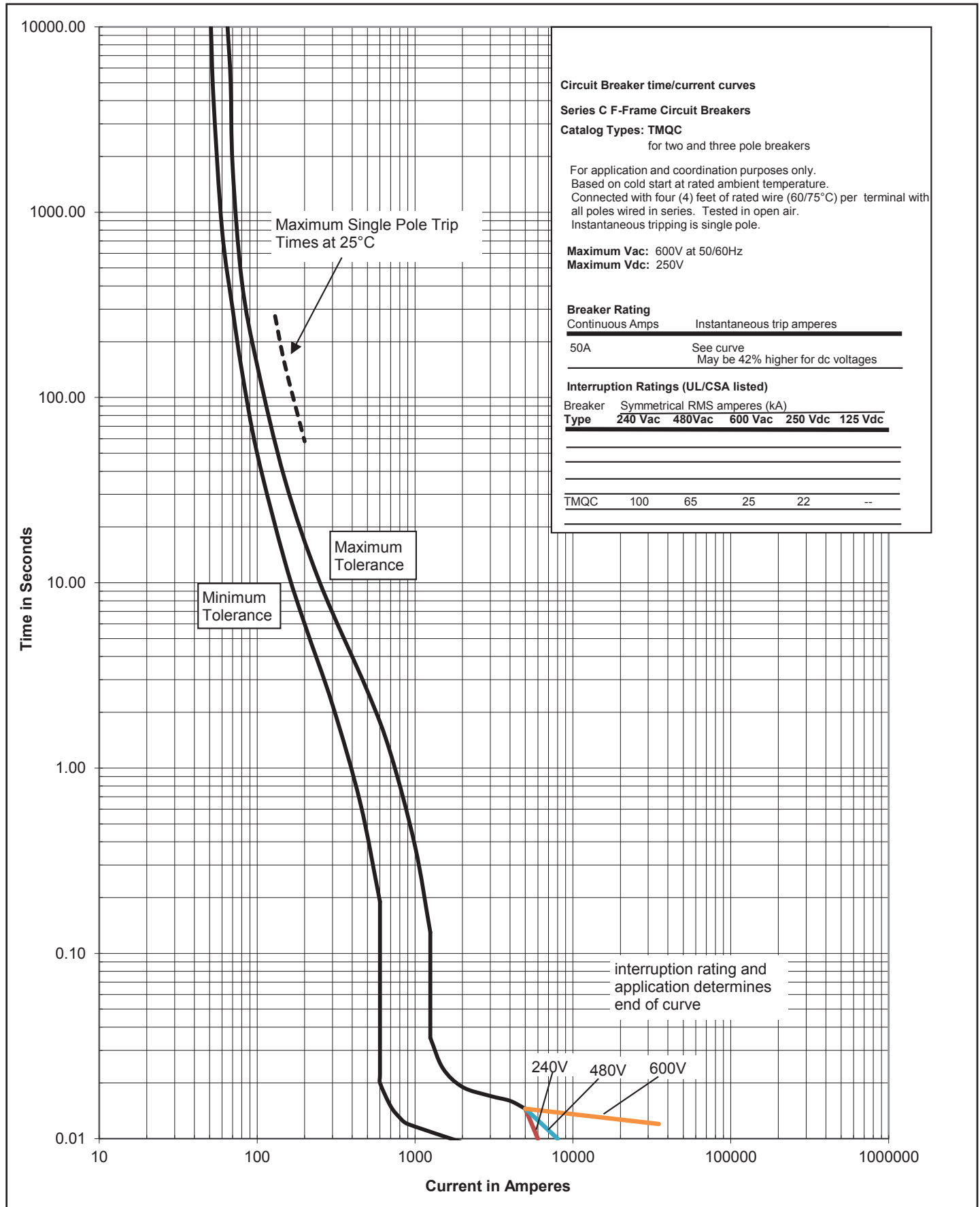


Figure 35.Types TMQC 50A 2 & 3 pole—Curve NumberTC012043EN



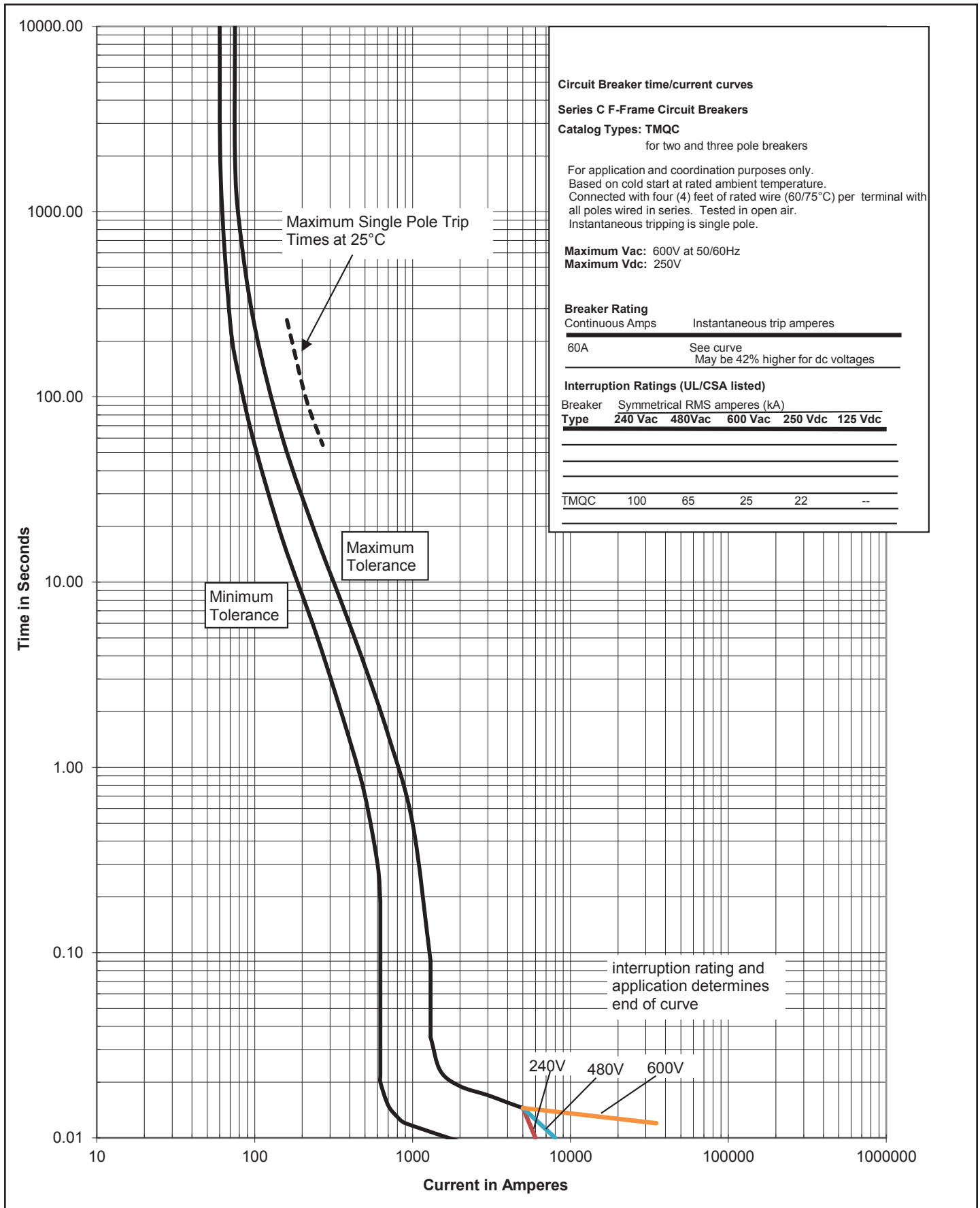


Figure 36.Types TMQC 60A 2 & 3 pole—Curve NumberTC012044EN



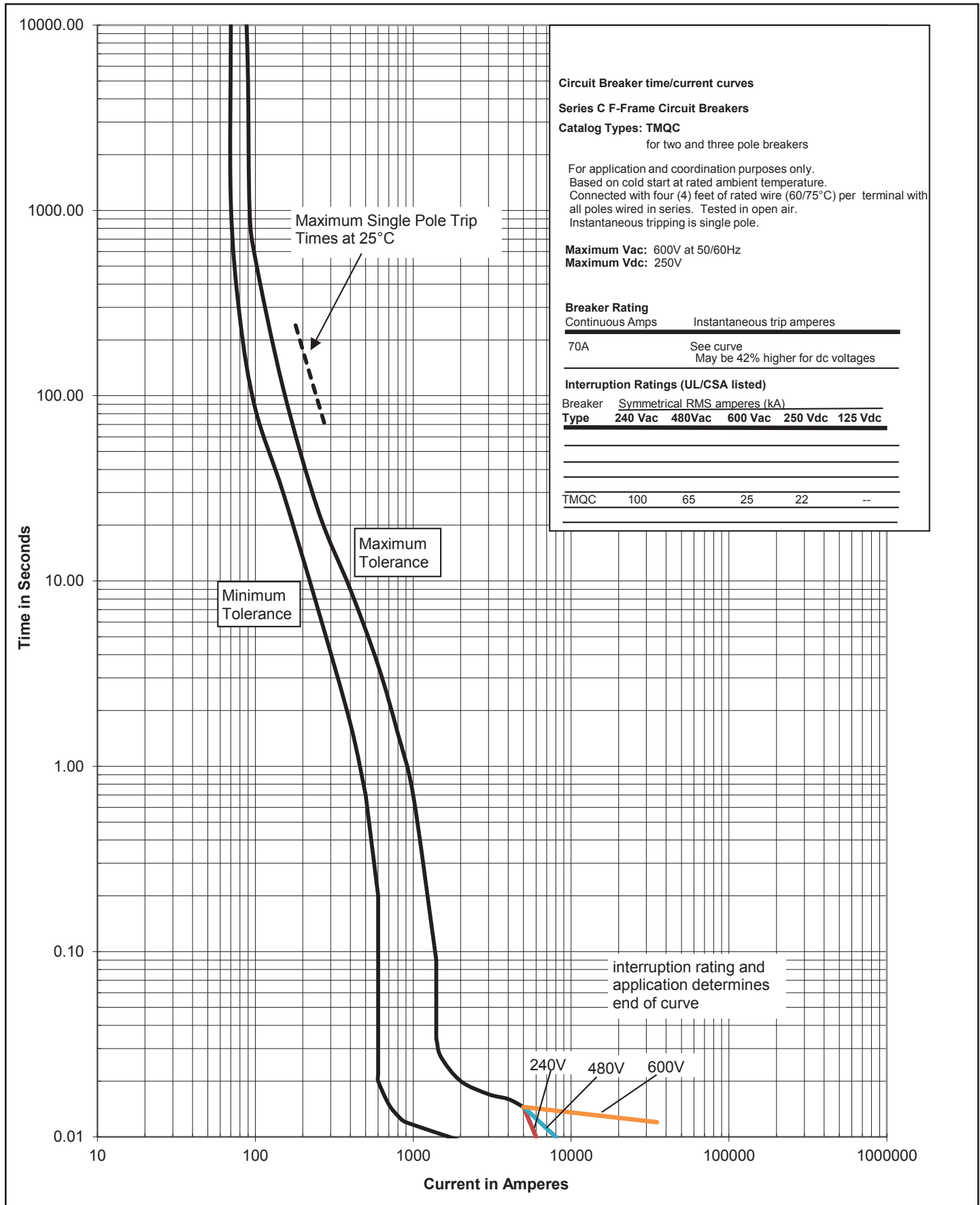


Figure 37.Types **TMQC** 70A 2 & 3 pole—Curve Number TC012045EN



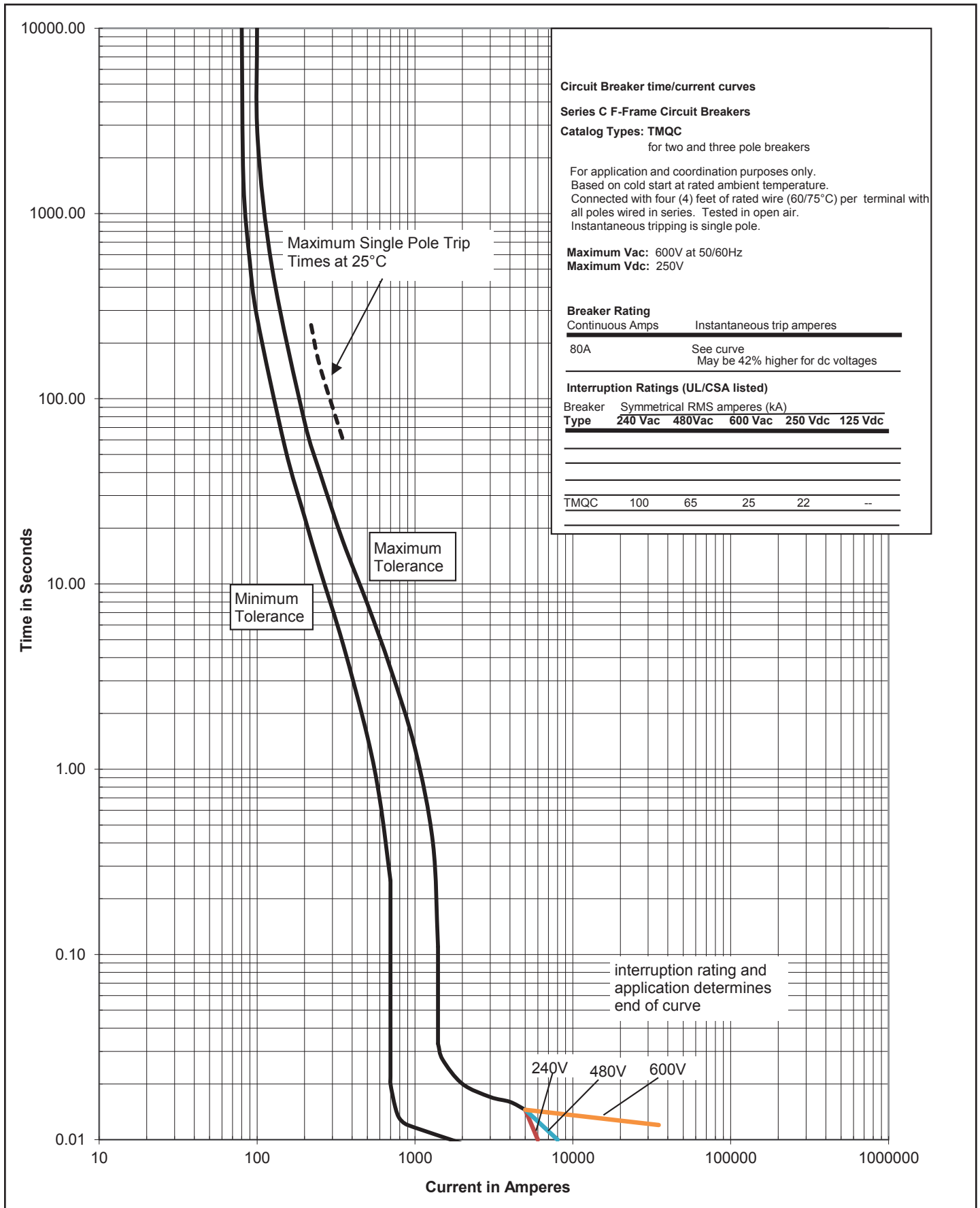


Figure 38.Types TMQC 80A 2 & 3 pole—Curve Number TC012046EN





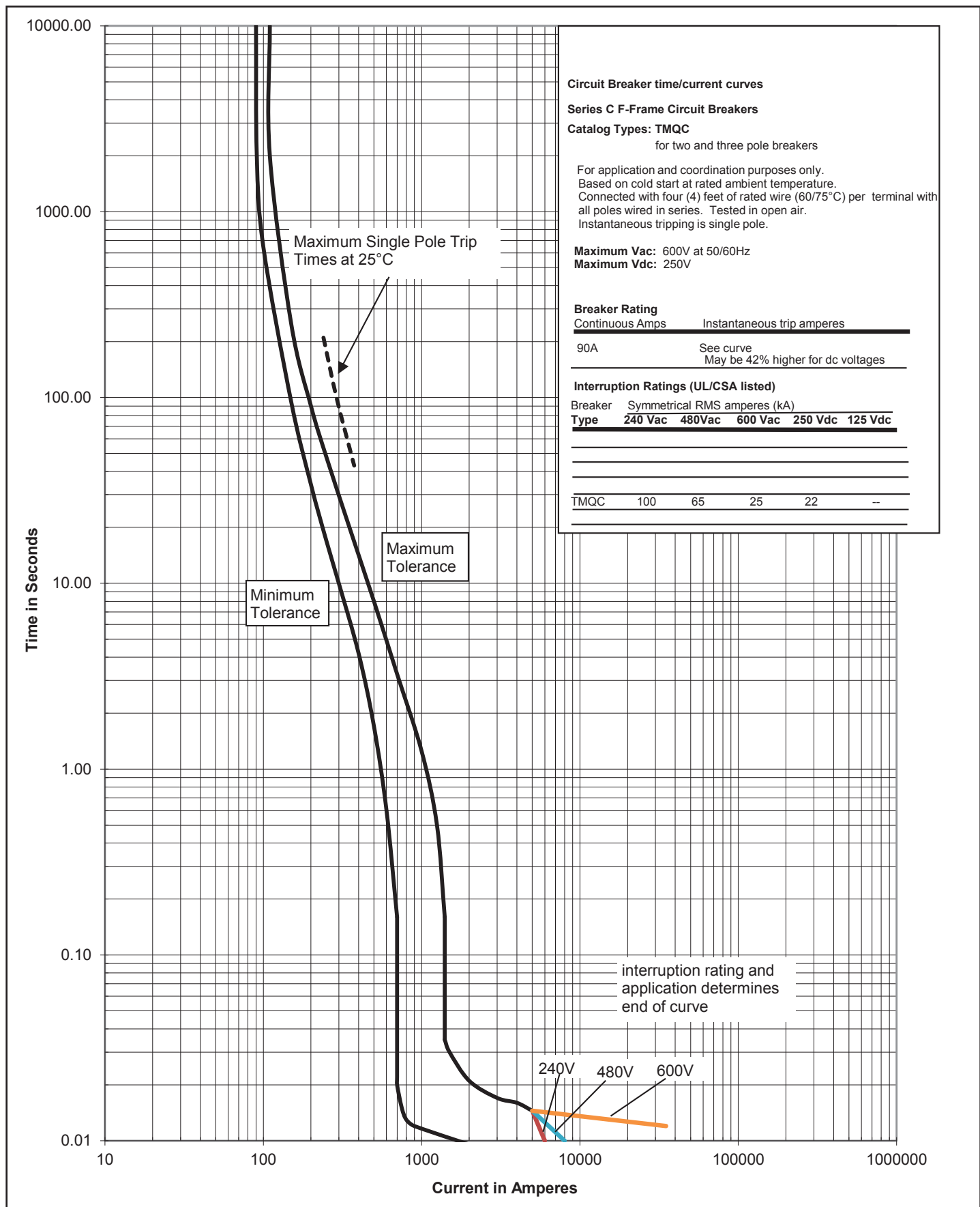


Figure 39.Types **TMQC** 90A 2, 3 pole—Curve NumberTC012047EN



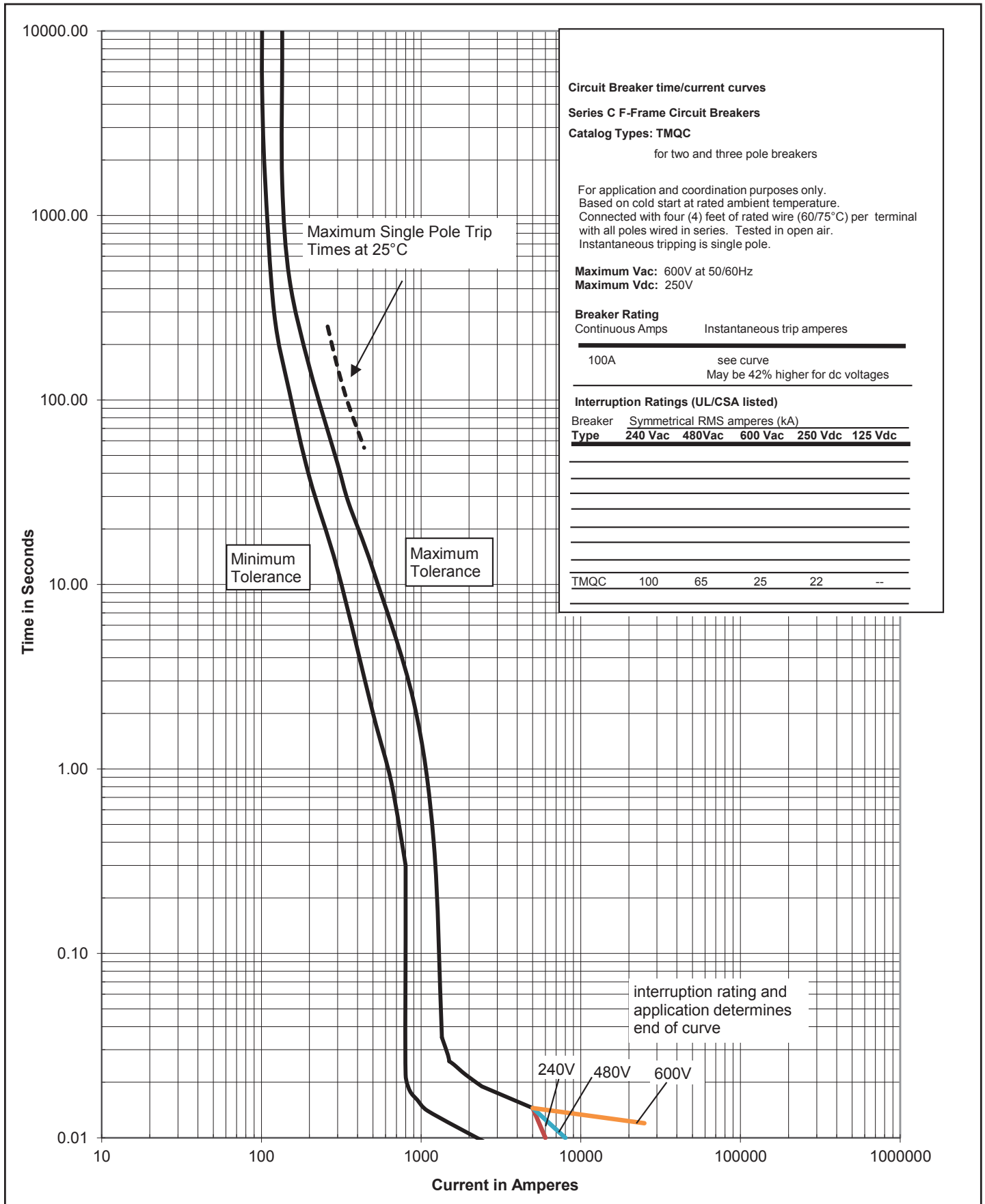


Figure 40.Types TMQC 100A 2 & 3 pole—Curve Number TC012029EN



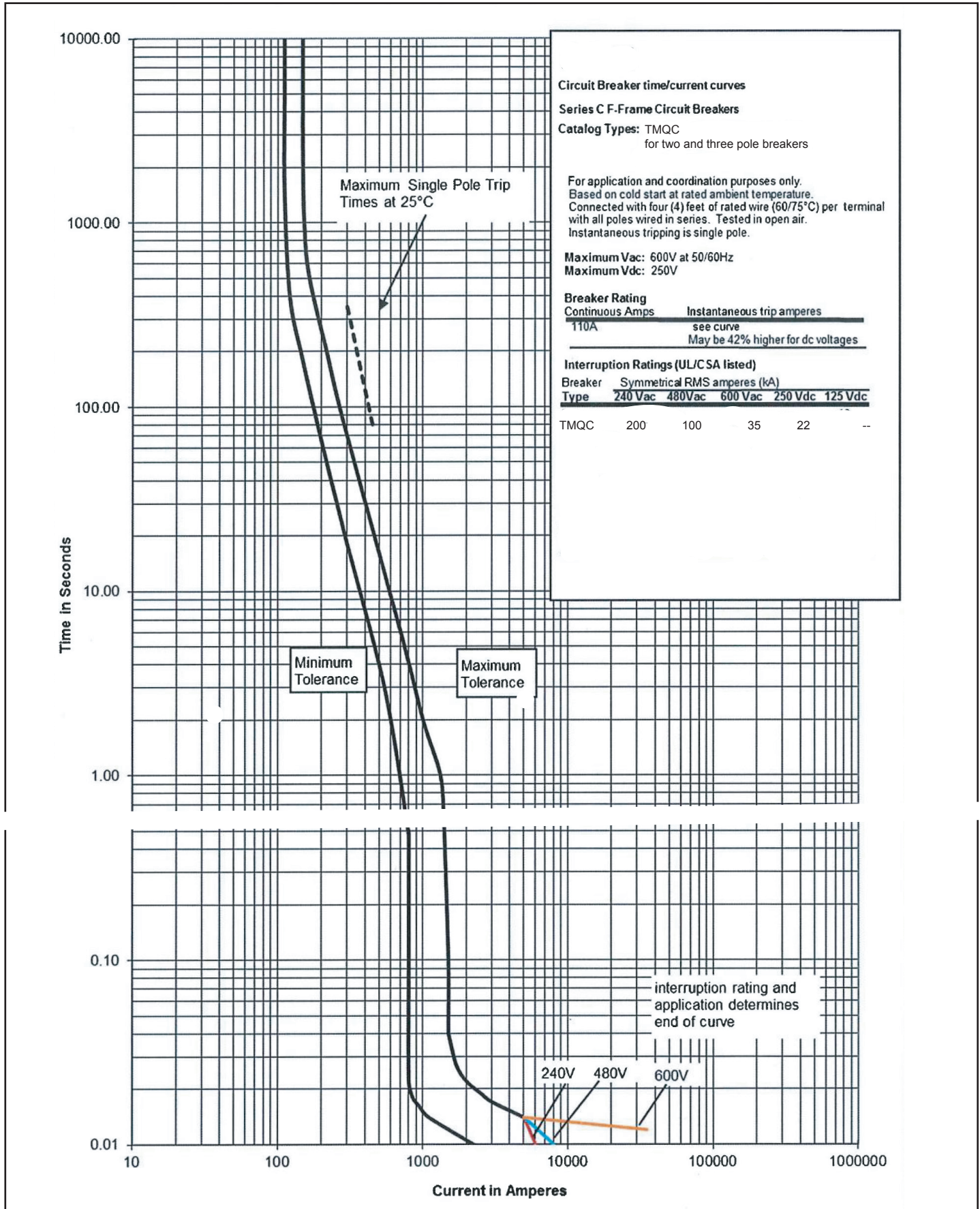


Figure 41.Types **TMQC110A 2&3 pole**—Curve NumberTC012030EN





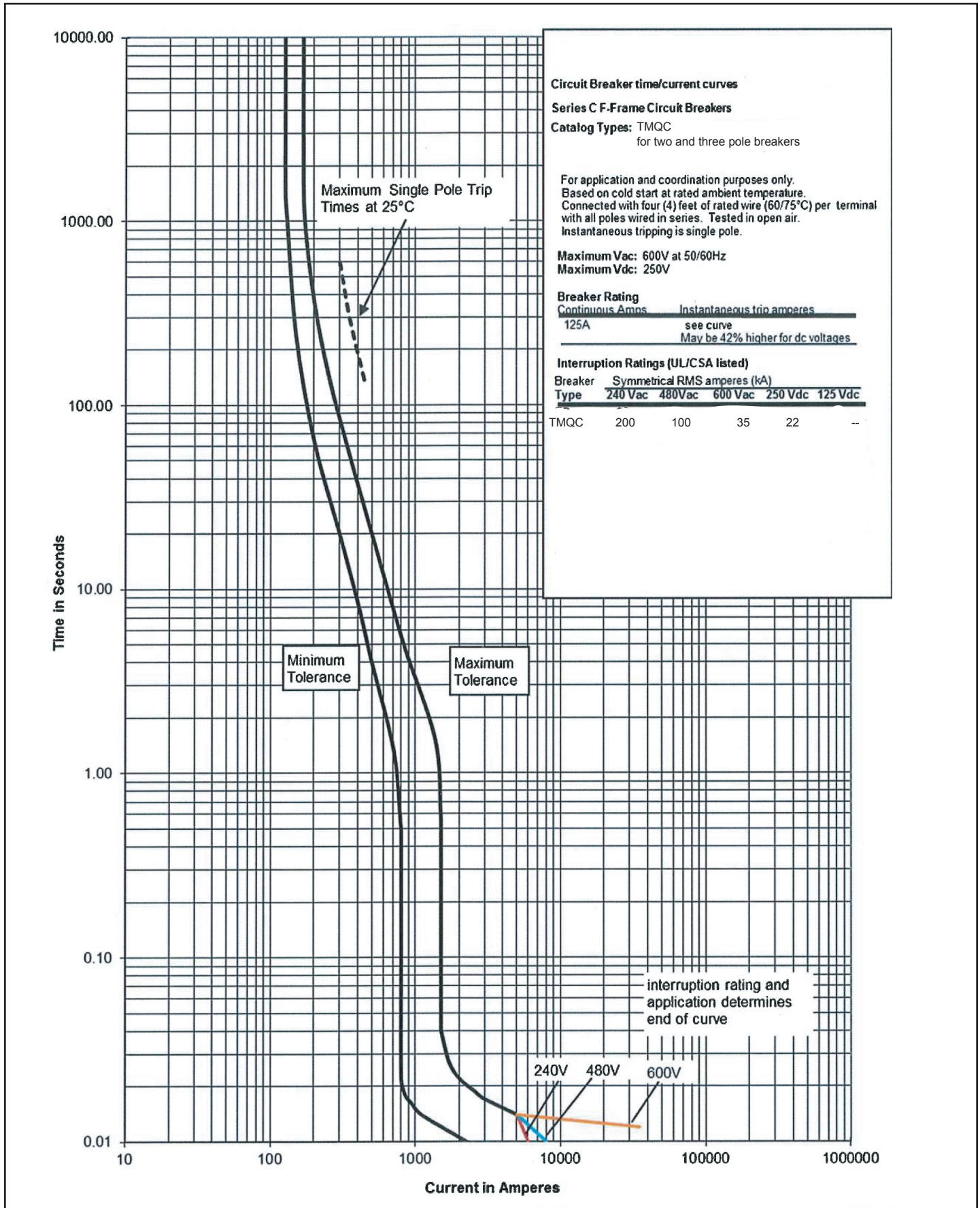


Figure 42.Types **TMQC** 125A 2 & 3 pole—Curve Number TC012031EN



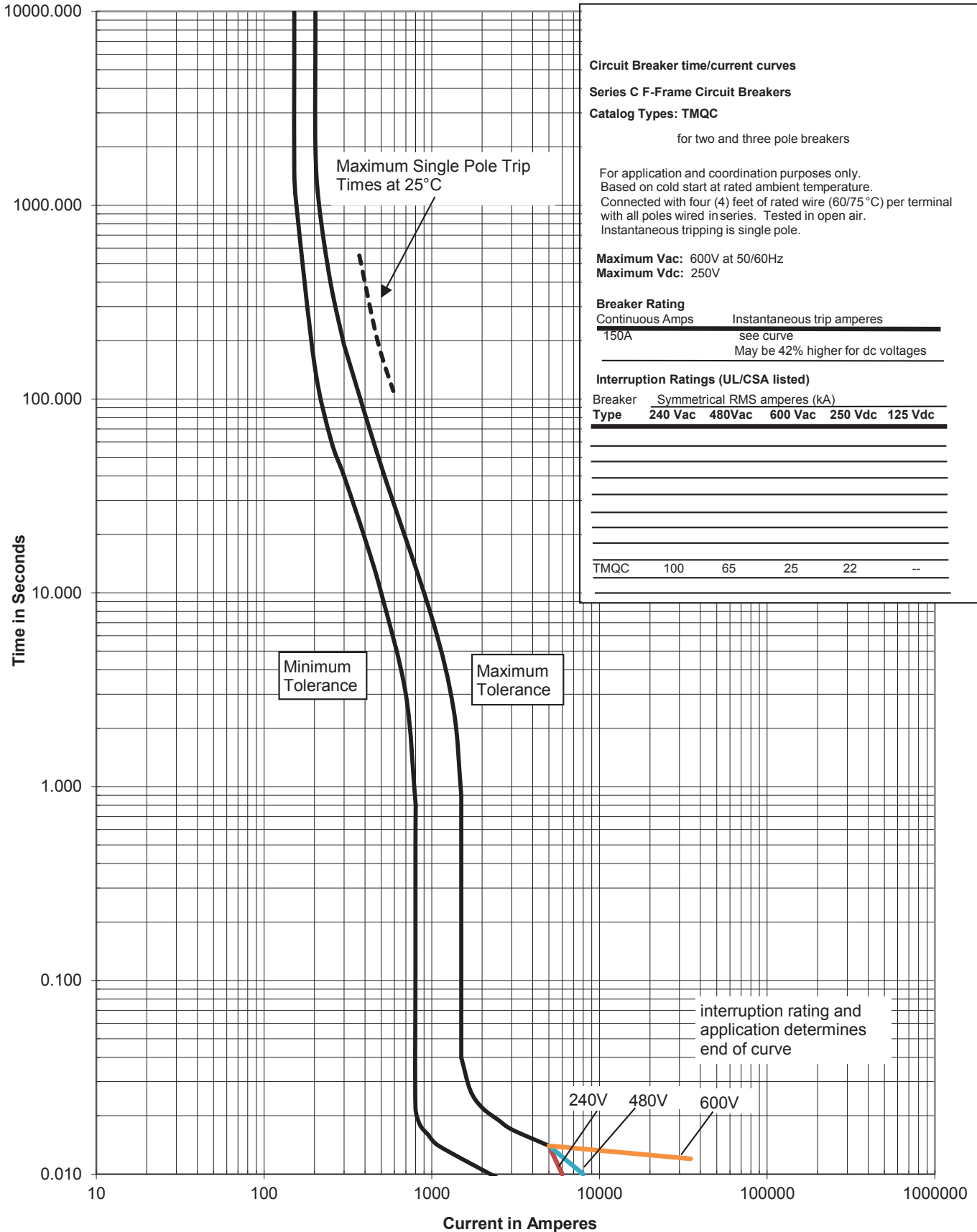
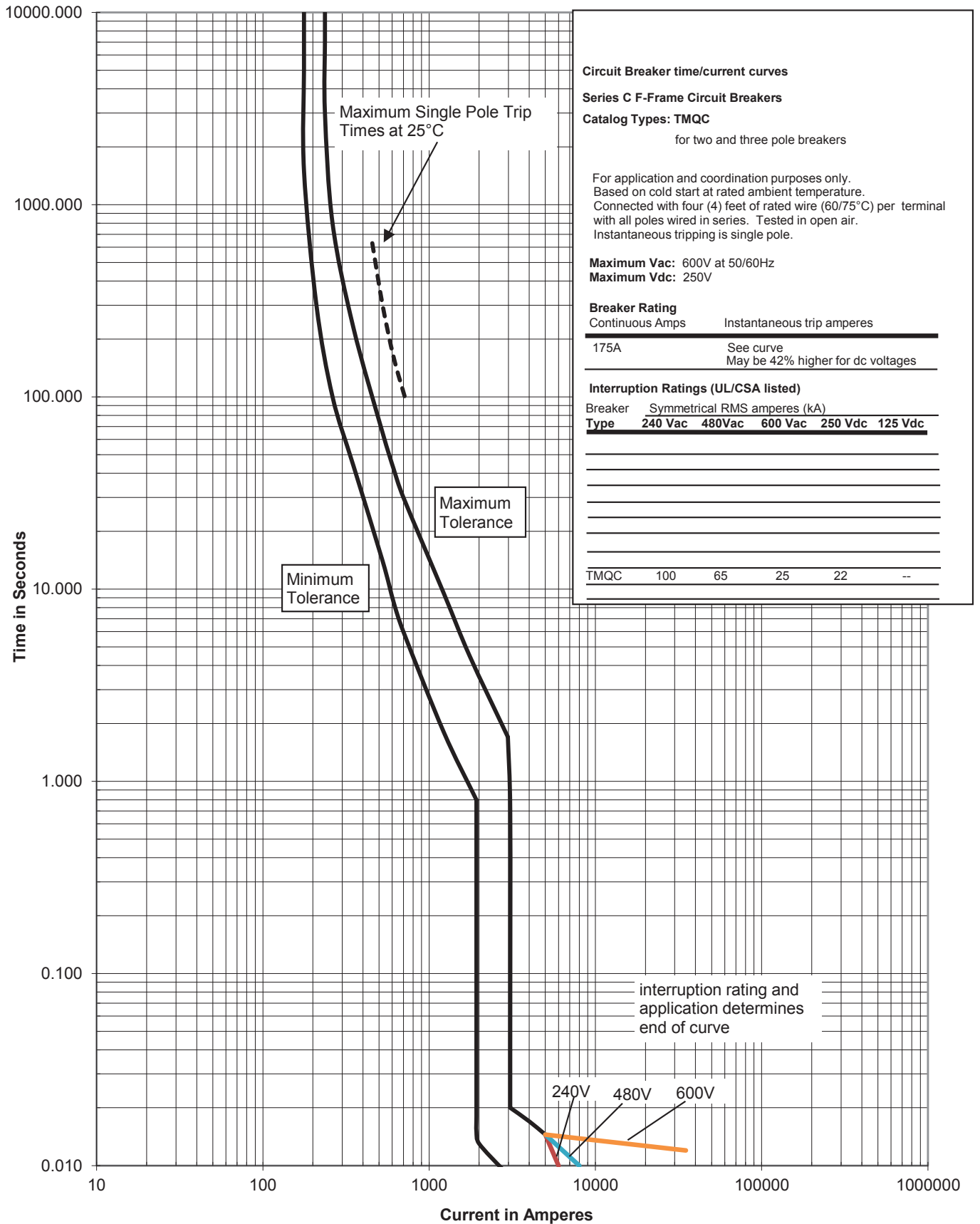


Figure 43.Types **TMQC 150A 2 & 3 pole**—Curve Number TC012032EN





**Circuit Breaker time/current curves**  
**Series C F-Frame Circuit Breakers**  
**Catalog Types: TMQC**  
 for two and three pole breakers

For application and coordination purposes only. Based on cold start at rated ambient temperature. Connected with four (4) feet of rated wire (60/75°C) per terminal with all poles wired in series. Tested in open air. Instantaneous tripping is single pole.

**Maximum Vac:** 600V at 50/60Hz  
**Maximum Vdc:** 250V

Breaker Rating	
Continuous Amps	Instantaneous trip amperes
175A	See curve May be 42% higher for dc voltages

Interruption Ratings (UL/CSA listed)						
Breaker Type	Symmetrical RMS amperes (kA)	240 Vac	480Vac	600 Vac	250 Vdc	125 Vdc
TMQC	100	65	25	22	--	--

Figure 44.Types **TMQC 175A 2 & 3 pole**—Curve NumberTC012033EN



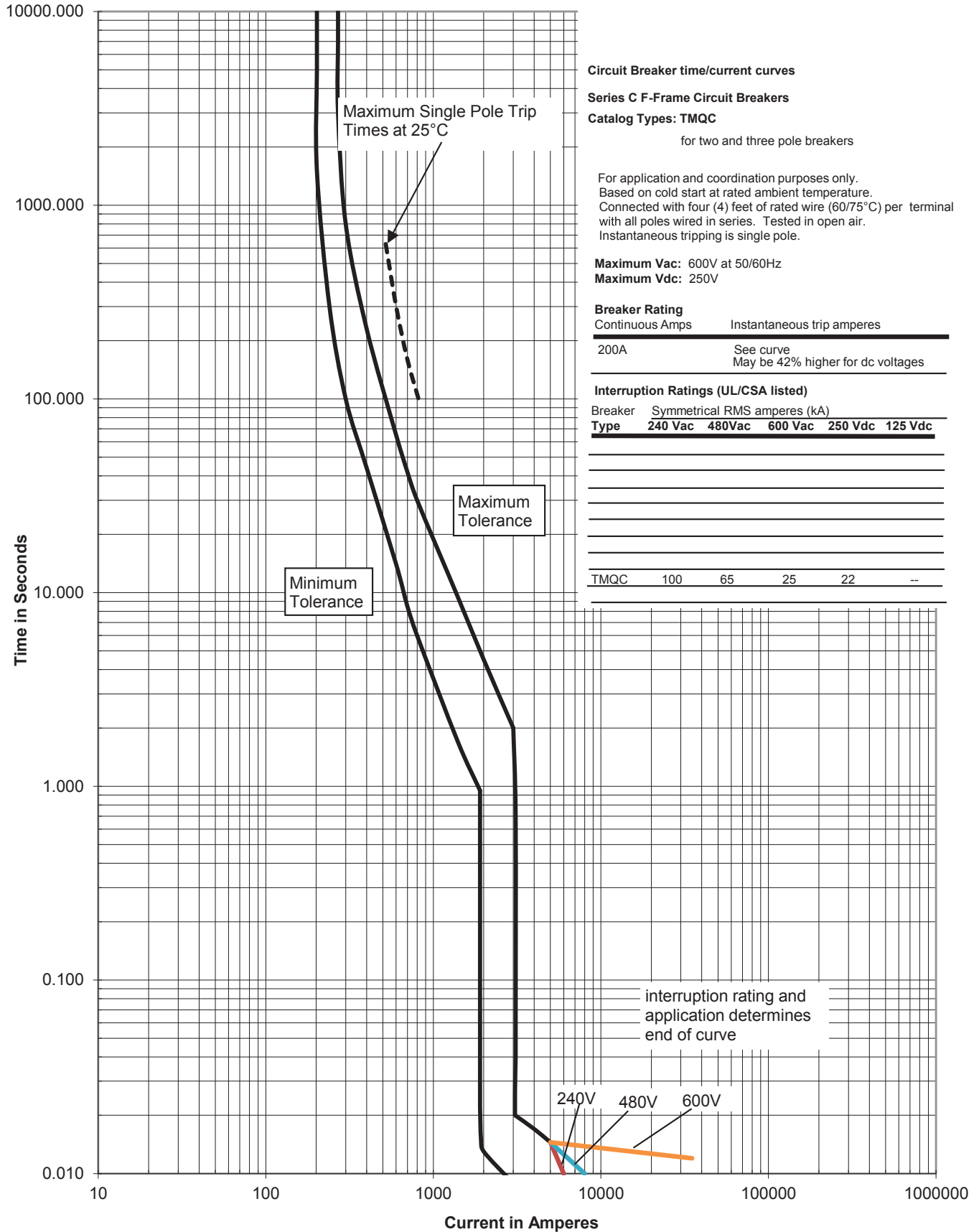


Figure 45.Types **TMQC** 200A 2 & 3 pole—Curve Number TC012034EN



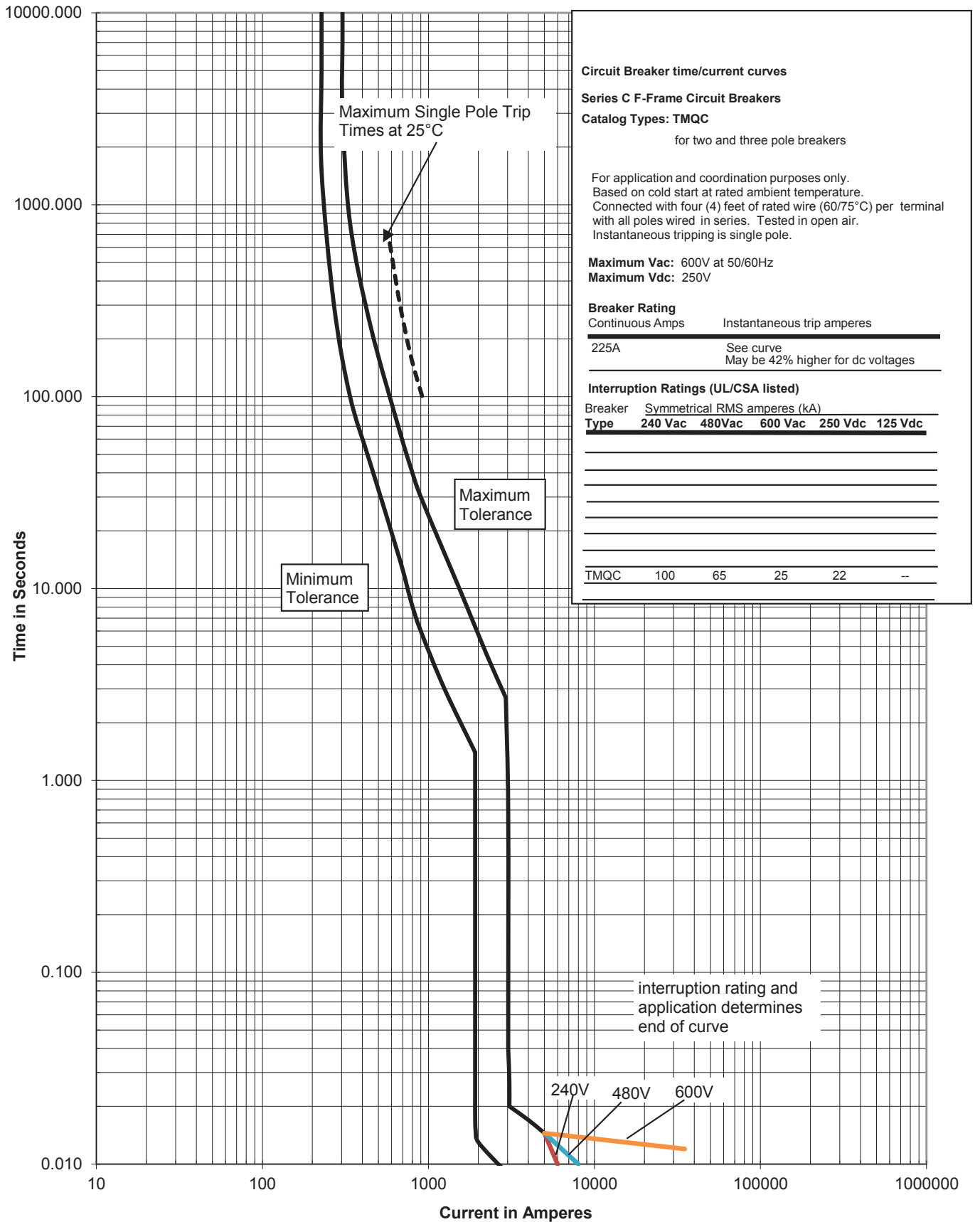


Figure 46.Types **TMQC** 225A 2 & 3 pole—Curve Number TC012035EN







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