Series G RG-Frame 310+ circuit breaker time current curves

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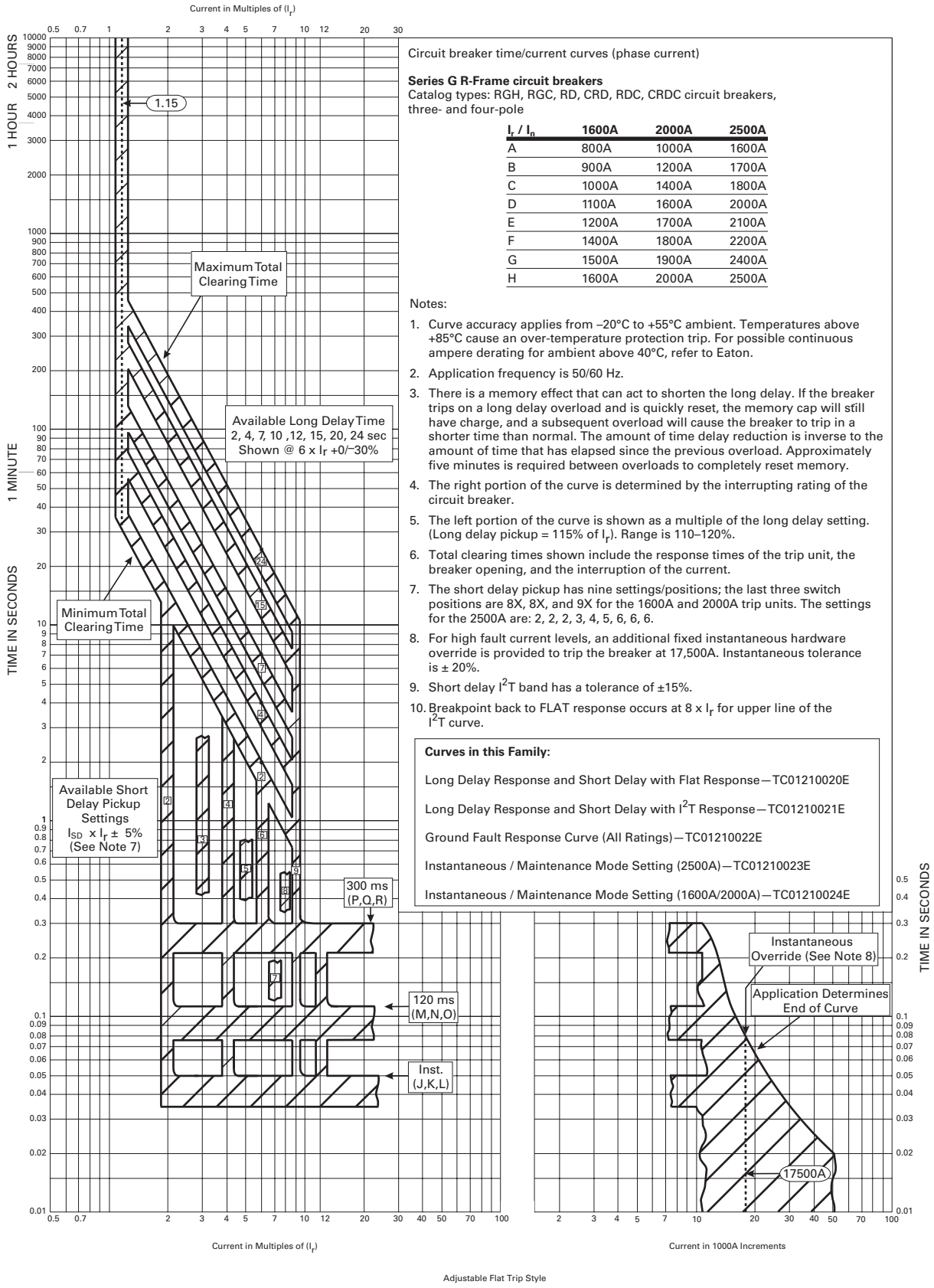
Long delay (LD) and short delay (SD) with flat response and override



Circuit breaker time/current curves (phase current)

Series G R-Frame circuit breakers
Catalog types: RGH, RGC, RD, CRD, RDC, CRDC circuit breakers, three- and four-pole

I_r / I_n	1600A	2000A	2500A
A	800A	1000A	1600A
B	900A	1200A	1700A
C	1000A	1400A	1800A
D	1100A	1600A	2000A
E	1200A	1700A	2100A
F	1400A	1800A	2200A
G	1500A	1900A	2400A
H	1600A	2000A	2500A

Notes:

1. Curve accuracy applies from –20°C to +55°C ambient. Temperatures above +85°C cause an over-temperature protection trip. For possible continuous ampere derating for ambient above 40°C, refer to Eaton.
2. Application frequency is 50/60 Hz.
3. There is a memory effect that can act to shorten the long delay. If the breaker trips on a long delay overload and is quickly reset, the memory cap will still have charge, and a subsequent overload will cause the breaker to trip in a 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 pickup = 115% of I_r). 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 pickup has nine settings/positions; the last three switch positions are 8X, 8X, and 9X for the 1600A and 2000A trip units. The settings for the 2500A are: 2, 2, 2, 3, 4, 5, 6, 6, 6.
8. For high fault current levels, an additional fixed instantaneous hardware override is provided to trip the breaker at 17,500A. Instantaneous tolerance is ± 20%.
9. Short delay I^2T band has a tolerance of ±15%.
10. Breakpoint back to FLAT response occurs at 8 x I_r for upper line of the I^2T curve.

Curves in this Family:

Long Delay Response and Short Delay with Flat Response—TC01210020E

Long Delay Response and Short Delay with I^2T Response—TC01210021E

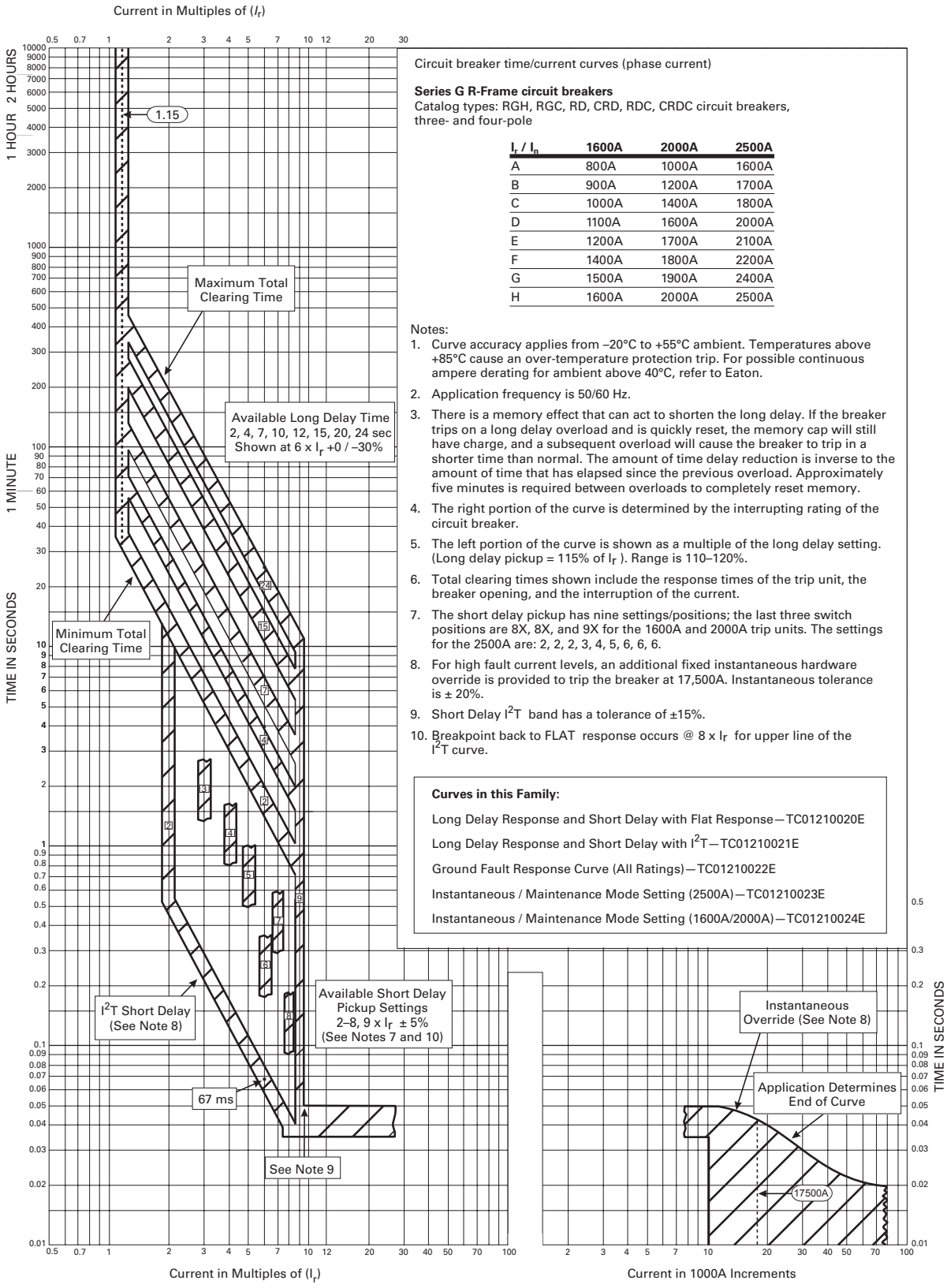
Ground Fault Response Curve (All Ratings)—TC01210022E

Instantaneous / Maintenance Mode Setting (2500A)—TC01210023E

Instantaneous / Maintenance Mode Setting (1600A/2000A)—TC01210024E

Figure 1. Series G® R-Frame Circuit Breakers—Curve Number TC01210020E

Long delay response and short delay with I²T response curve and override



Circuit breaker time/current curves (phase current)

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Catalog types: RGH, RGC, RD, CRD, RDC, CRDC circuit breakers, three- and four-pole

I_r / I_n	1600A	2000A	2500A
A	800A	1000A	1600A
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D	1100A	1600A	2000A
E	1200A	1700A	2100A
F	1400A	1800A	2200A
G	1500A	1900A	2400A
H	1600A	2000A	2500A

Notes:
1. Curve accuracy applies from –20°C to +55°C ambient. Temperatures above +85°C cause an over-temperature protection trip. For possible continuous ampere derating for ambient above 40°C, refer to Eaton.
2. Application frequency is 50/60 Hz.
3. There is a memory effect that can act to shorten the long delay. If the breaker trips on a long delay overload and is quickly reset, the memory cap will still have charge, and a subsequent overload will cause the breaker to trip in a 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 pickup = 115% of I_r). 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 pickup has nine settings/positions; the last three switch positions are 8X, 8X, and 9X for the 1600A and 2000A trip units. The settings for the 2500A are: 2, 2, 2, 3, 4, 5, 6, 6, 6.
8. For high fault current levels, an additional fixed instantaneous hardware override is provided to trip the breaker at 17,500A. Instantaneous tolerance is ± 20%.
9. Short Delay I²T band has a tolerance of ±15%.
10. Breakpoint back to FLAT response occurs @ 8 x I_r for upper line of the I²T curve.

Curves in this Family:

Long Delay Response and Short Delay with Flat Response—TC01210020E

Long Delay Response and Short Delay with I²T—TC01210021E

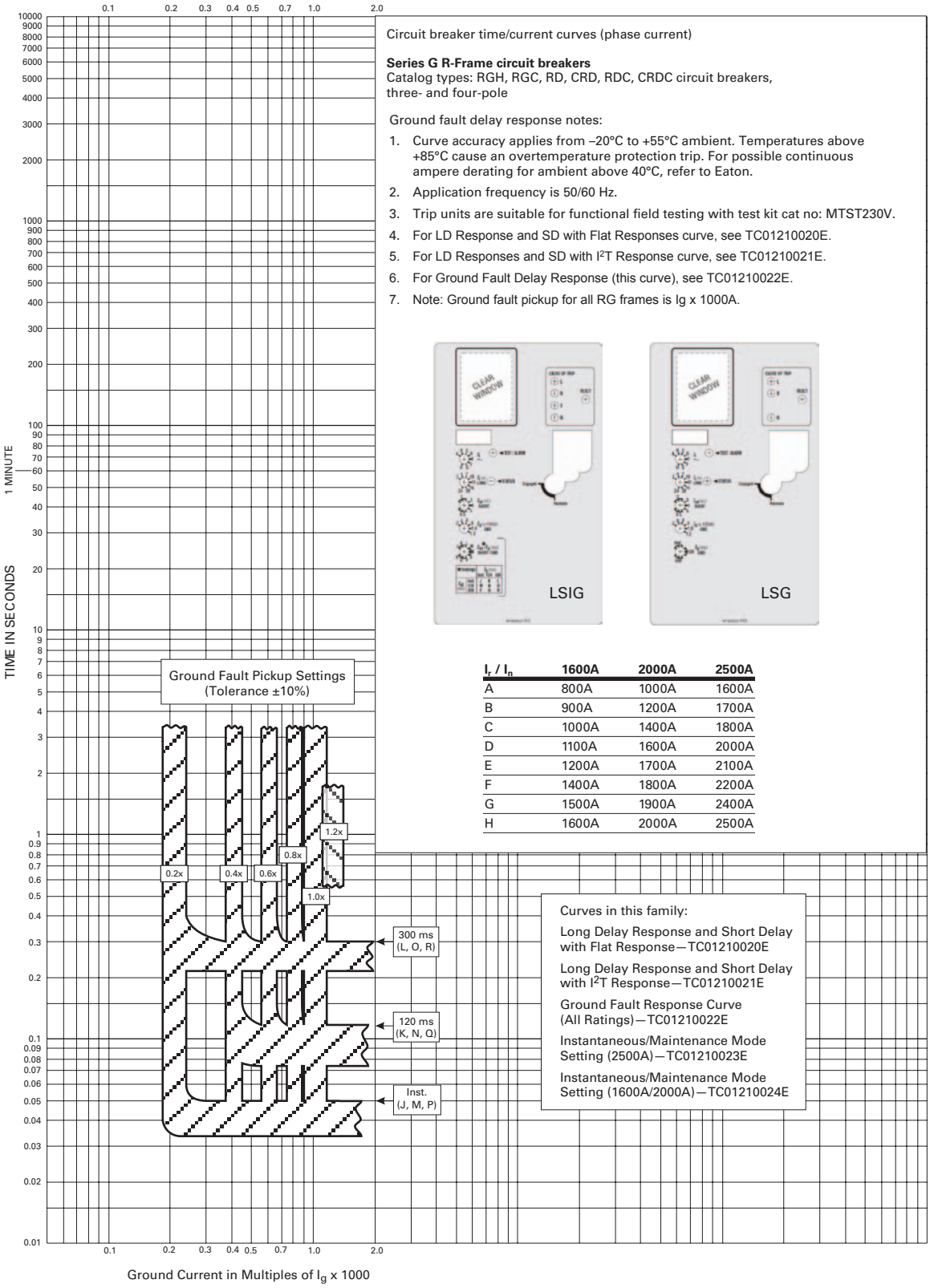
Ground Fault Response Curve (All Ratings)—TC01210022E

Instantaneous / Maintenance Mode Setting (2500A)—TC01210023E

Instantaneous / Maintenance Mode Setting (1600A/2000A)—TC01210024E

Figure 2. Series G R-Frame Circuit Breakers—Curve Number TC01210021E

Ground fault delay response curve (for all ratings)



Circuit breaker time/current curves (phase current)

Series G R-Frame circuit breakers
Catalog types: RGH, RGC, RD, CRD, RDC, CRDC circuit breakers, three- and four-pole

Ground fault delay response notes:

1. Curve accuracy applies from –20°C to +55°C ambient. Temperatures above +85°C cause an overtemperature protection trip. For possible continuous ampere derating for ambient above 40°C, refer to Eaton.
2. Application frequency is 50/60 Hz.
3. Trip units are suitable for functional field testing with test kit cat no: MTST230V.
4. For LD Response and SD with Flat Responses curve, see TC01210020E.
5. For LD Responses and SD with I^2T Response curve, see TC01210021E.
6. For Ground Fault Delay Response (this curve), see TC01210022E.
7. Note: Ground fault pickup for all RG frames is Ig x 1000A.

I_r / I_n	1600A	2000A	2500A
A	800A	1000A	1600A
B	900A	1200A	1700A
C	1000A	1400A	1800A
D	1100A	1600A	2000A
E	1200A	1700A	2100A
F	1400A	1800A	2200A
G	1500A	1900A	2400A
H	1600A	2000A	2500A

Figure 3. Series G R-Frame Circuit Breakers—Curve Number TC01210022E

Instantaneous/maintenance mode setting 2500A

Maintenance Mode Characteristic

Trip unit—Series G R-Frame with Maintenance Mode and Instantaneous Mode circuit breakers

Response: Series G R-Frame electronic Maintenance Mode trip and Instantaneous Mode trip (2500A frame)

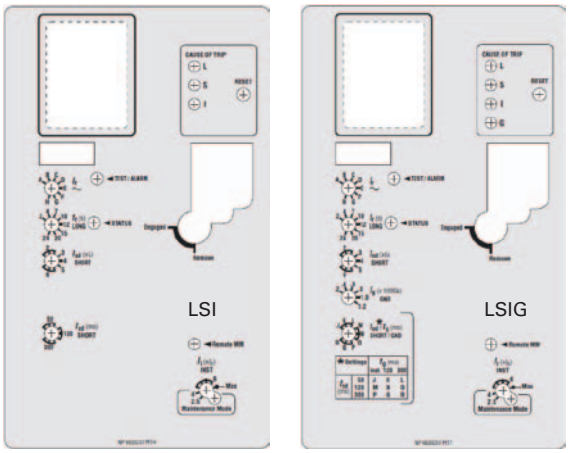
This curve is for 50 Hz and 60 Hz applications.

Notes:

1. The Maintenance Mode feature must be ENABLED via Maintenance Mode switch for these curves to apply. The window indicator is blue when in Maintenance Mode.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
4. Nominal values (pickup) (tolerance is ±15%) 2.5 x I_n, 4 x I_n, 6 x I_n, 6 x I_n, 6 x I_n x I_n and max. (7x).
5. These curves are comprehensive for the complete family of Series G R-Frame electronic breakers, including all frame sizes, ratings, and constructions. The total clearing times shown are conservative and consider the maximum response times of the trip unit, the circuit breaker opening, and the interruption of the current in worst case conditions such as: maximum rated voltages, single-phase interruption, and minimum power factor. Faster clearing times are possible depending on the specific system conditions.
6. The last Instantaneous value (max.) for the 2500A style is 7x. This corresponds to a value of 17,500A.

Contact Eaton for additional information.

Series G R-Frame Trip Unit Nameplates



LSI/LSIG with Maintenance Mode 2500A

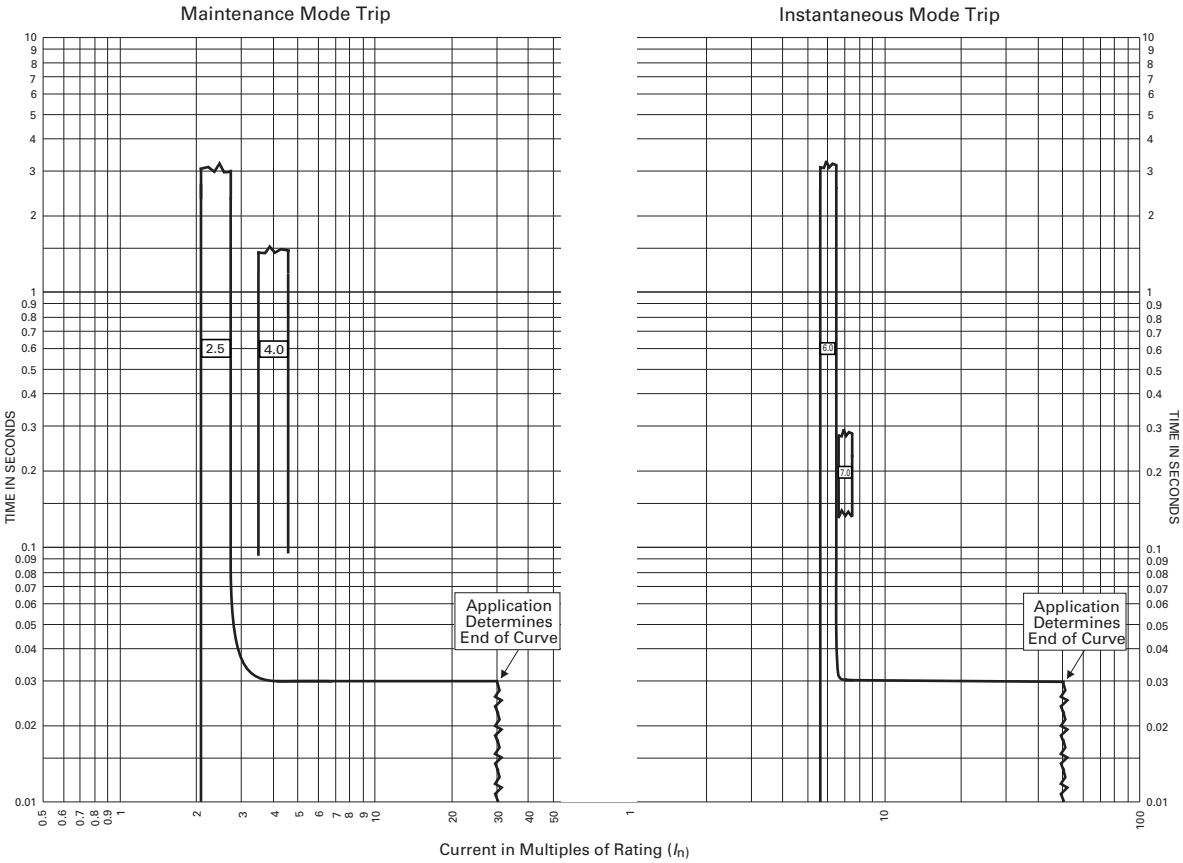


Figure 4. Series G R-Frame Circuit Breakers—Curve Number TC01210023E

Instantaneous/maintenance mode setting 1600A/2000A

Maintenance Mode Characteristic

Trip unit—Series G R-Frame with Maintenance Mode and Instantaneous Mode circuit breakers

Response: Series G R-Frame electronic Maintenance Mode trip and Instantaneous Mode trip (1600A/2000A frame)

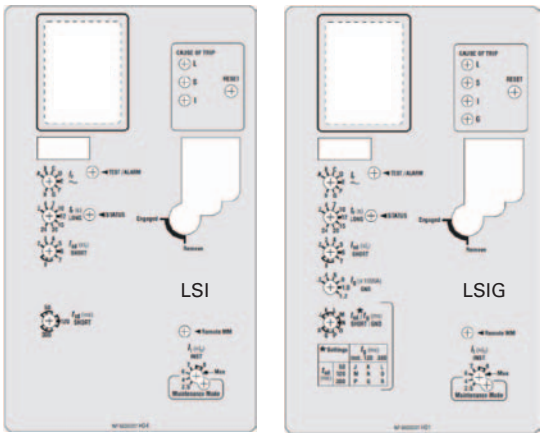
This curve is for 50 Hz and 60 Hz applications.

Notes:

1. The Maintenance Mode feature must be ENABLED via Maintenance Mode switch for these curves to apply. The window indicator is blue when in Maintenance Mode.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
4. Nominal values (pickup) (tolerance is ±15%) 2.5 x I_n, 4 x I_n, 6 x I_n, 7 x I_n, 8 x I_n, 8 x I_n and max. (9x max. for 2000A Frame, 11x max. for 1600A frame).
5. These curves are comprehensive for the complete family of Series G R-Frame electronic breakers, including all frame sizes, ratings, and constructions. The total clearing times shown are conservative and consider the maximum response times of the trip unit, the circuit breaker opening, and the interruption of the current in worst case conditions such as: maximum rated voltages, single-phase interruption, and minimum power factor. Faster clearing times are possible depending on the specific system conditions.
6. The last Instantaneous value for the 1600A/2000A style is 11x.

Contact Eaton for additional information.

Series G R-Frame Trip Unit Nameplates



LSI/LSIG with Maintenance Mode (1600A/2000A)

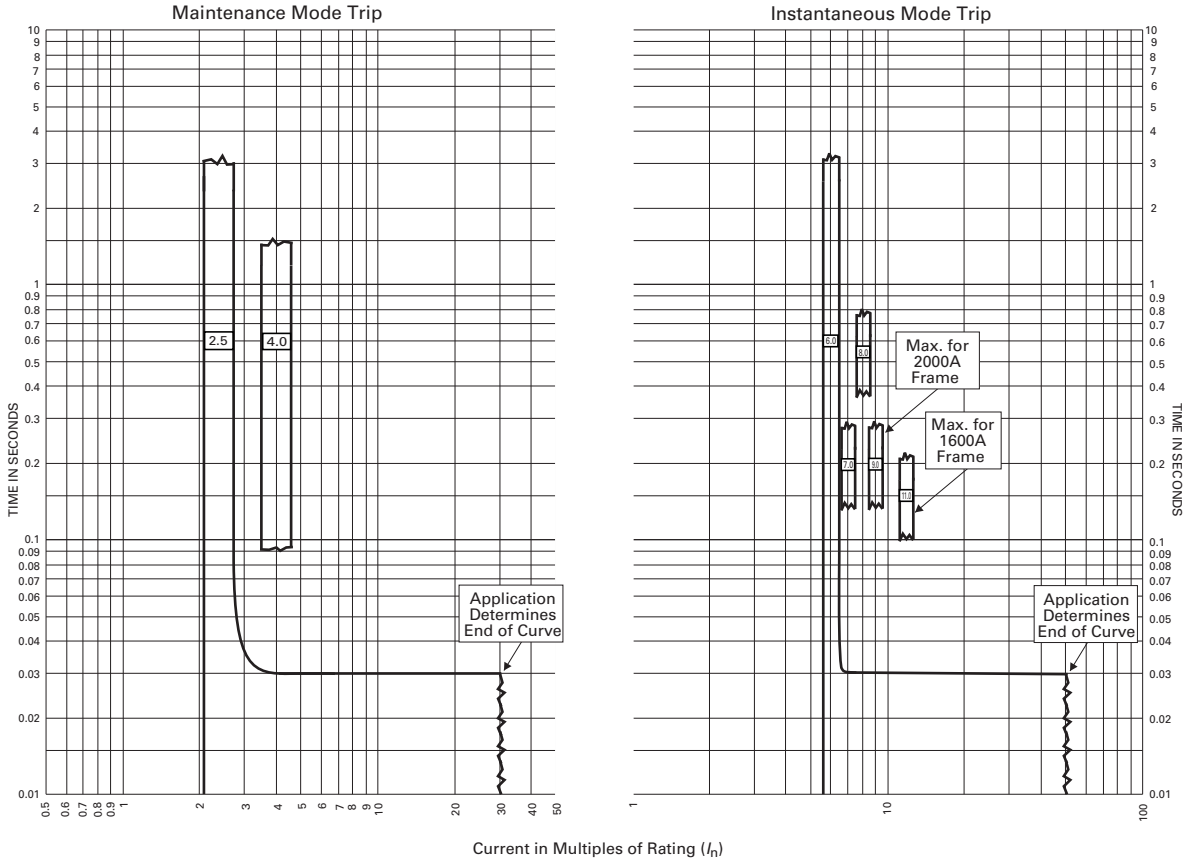


Figure 5. Series G R-Frame Trip Unit—Curve Number TC01210024E

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