
INSTALLATION INSTRUCTIONS

Original Issue Date: **10/94**

Model: **20-1600 kW**

Market: **Standby**

Subject: **Merlin Gerin Circuit Breaker Trip Parameter Adjustments**

Merlin Gerin circuit breakers are used on 20-1600 kW generator sets. These circuit breakers feature adjustment pots to provide specific trip and time delay characteristics to match many applications.

This instruction defines these pots and provides information on each adjustments.

This document gives no specific adjustment instructions due to the variable load possibilities and the unique characteristics of multiple motor starting applications.

Because generator sets are subjected to different types of loads, the manufacturer sets the circuit breakers to the following parameters:

- Long time current setting is adjusted to full load ampacity ratings of the generator set.
- All other adjustments are set to their maximum settings.

Final adjustment must be made in the field after the generator set is installed.



**Accidental starting.
Can cause severe injury or death.**

Disconnect battery cables before working on generator set (negative lead first and reconnect it last).

Accidental starting can cause severe injury or death.

Turn generator set master switch to OFF position, disconnect power to battery charger, and remove battery cables (remove negative lead first and reconnect it last) to disable generator set before working on any equipment connected to generator set. The generator set can be started by automatic transfer switch or remote start/stop switch unless these precautions are followed.

⚠ WARNING



**Hazardous voltage.
Can cause severe injury or death.**

Do not open enclosure until all power sources are disconnected.

(under 600 Volt)

Hazardous voltage can cause severe injury or death.

Short circuits can cause bodily injury and/or equipment damage. Do not contact electrical connections with tools or jewelry while adjustments are made. Remove wristwatch, rings, and jewelry that can cause short circuits.

Use Figure 1 to determine the circuit breaker style number used in the application by either the Merlin Gerin part number or by the circuit breaker dimensions. Figure 1 also displays the available trip point setting and the minimum and maximum settings for the different circuit breaker styles.

Short Time Pickup Pot

The short time pickup pot adjusts the instantaneous inrush current. The setting trips the circuit breaker if a short circuit occurs and the inrush current is the number on the setting times the rated current of the circuit breaker (i.e., instantaneous inrush current pot set at 7 with a circuit breaker rated at 2000 amps; the circuit breaker will trip at $7 \times 2000 = 14,000$ amps).

Long Time Current Setting Pot

The long time current setting pot adjusts the current rating of the circuit breaker. The setting adjusts the trip setting of the circuit breaker to the number on the pot times the rated current of the circuit breaker (i.e., long time pot set at 0.7 with a circuit breaker rated at 2000 amps; the circuit breaker will trip at $0.7 \times 2000 = 1400$ amps).

Ground Fault Current Pickup Pot

The ground fault current pickup pot adjusts the amount of current allowed to ground before for the circuit breaker will trip. The setting adjusts the trip setting of the circuit breaker to the number on the pot times the circuit breaker rating (i.e., ground fault pickup pot set at 0.2 with a circuit breaker rated at 2000 amps; the amount of ground fault current that will trip the circuit breaker is $0.2 \times 2000 = 400$ amps).

Short Time Delay Pot

The short time delay pot adjusts the tripping time delay of the circuit breaker when the current is above the instantaneous inrush current. The adjustment on the control unit is in seconds (i.e., instantaneous inrush current pot set at 7 and inrush current time pot set a 0.2

with a circuit breaker rated at 2000 amps, the circuit breaker will trip 0.2 seconds after the circuit breaker is at $7 \times 2000 = 14,000$ amps).

Ground Fault Time Delay Pot

The ground fault time delay pot adjusts the tripping time delay of the circuit breaker when the current is above the ground fault current. The adjustment on the control unit is in seconds (i.e., ground fault pickup pot at 0.2 and ground fault current trip time pot at 0.3 with a circuit breaker rated at 2000 amps; the circuit breaker will trip 0.3 seconds after the amount of the ground fault current is above $0.2 \times 2000 = 400$ amps).

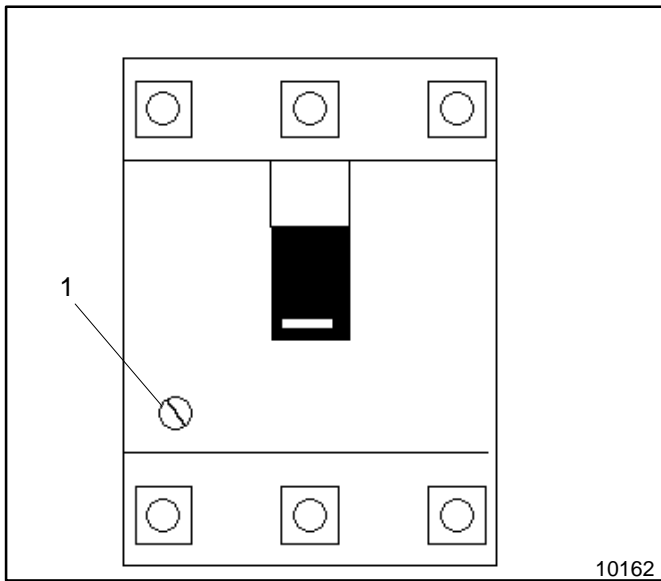
Figures 2 through 5 show the location of the available adjustment pots and Figures 6 through 12 display the time current curves for the available circuit breakers.

Breaker Style Number	Merlin Gerin Circuit Breaker Number	Trip Unit Part Number	Dimensions H x W x D in. (mm)	Number of Adjustment Pots	Short Time Pickup Adj. Range (x Rated Amps)	Short Time Delay	Long time Current (x Rated Amps)	Ground fault Current (x Rated Amps)	Ground Fault Current Trip Delay (Sec)
101	CE 104N		5.0 x 4.1 x 3.7 (127 x 104 x 94)	None					
250	CF 250N		5.0 x 5.5 x 4.3 (127 x 140 x 109)	1	6 to 10				
401	CJ 400N CJ 600N		11.4 x 6.2 x 4.3 (290 x 157 x 109)	1	5 to 10				
801	CK 800N CK 1200N	STR25DP	14.7 x 8.3 x 4.5 (373 x 211 x 114)	2	1.5 to 10		0.8 to 1 *		
1600	CM 1600 HE CM 2000 HE CM 2500 HE	ST 206D	16.9 x 16.5 x 10.4 (429 x 419 x 264)	2	3 to 6		0.5 to 1**		
1601	CM 1600 HE CM 2000 HE CM 2500 HE	ST 306ST	16.9 x 16.5 x 10.4 (429 x 419 x 264)	5	2 to 8	0 to 0.3	0.5 to 1**	0.2 to 0.5	0.1 to 0.4

*Times the Installed Rating Plug

**Times the Continuous Rating of Frame

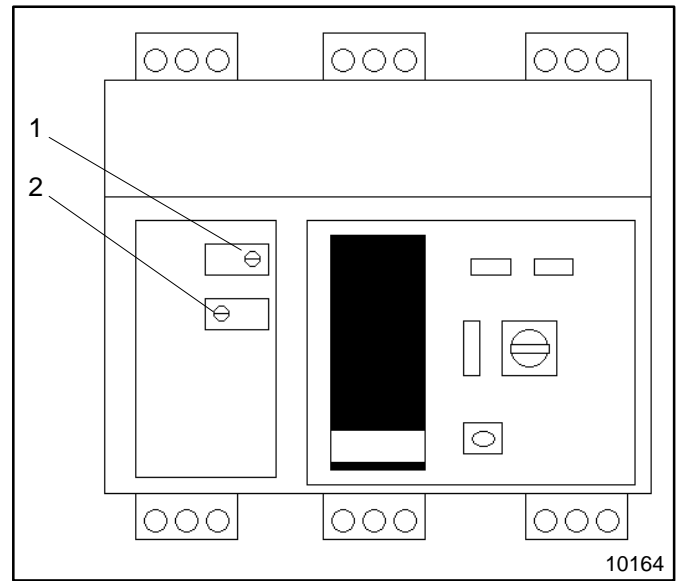
Figure 1. Breaker Types



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1. Short Time Pickup Adjustment Pot

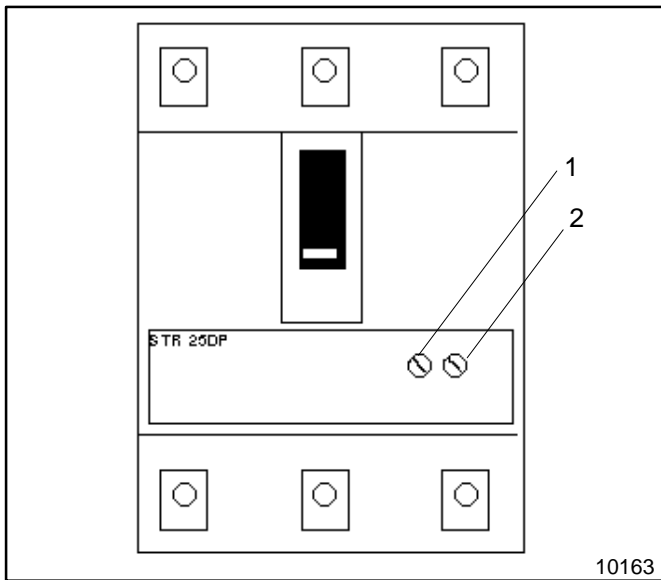
Figure 2. Style 250 and 401



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1. Long Time Current Setting Pot
2. Short Time Pickup Adjustment Pot

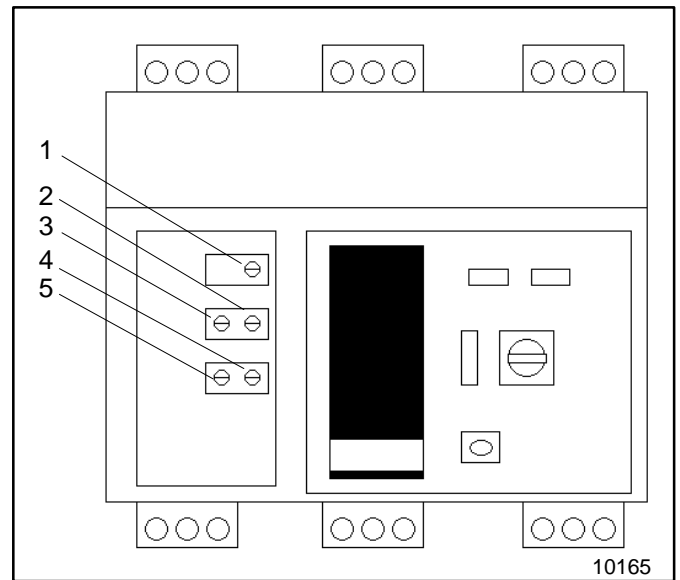
Figure 4. Style 1600



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1. Long Time Current Pickup Setting Pot
2. Short Time Pickup Adjustment Pot

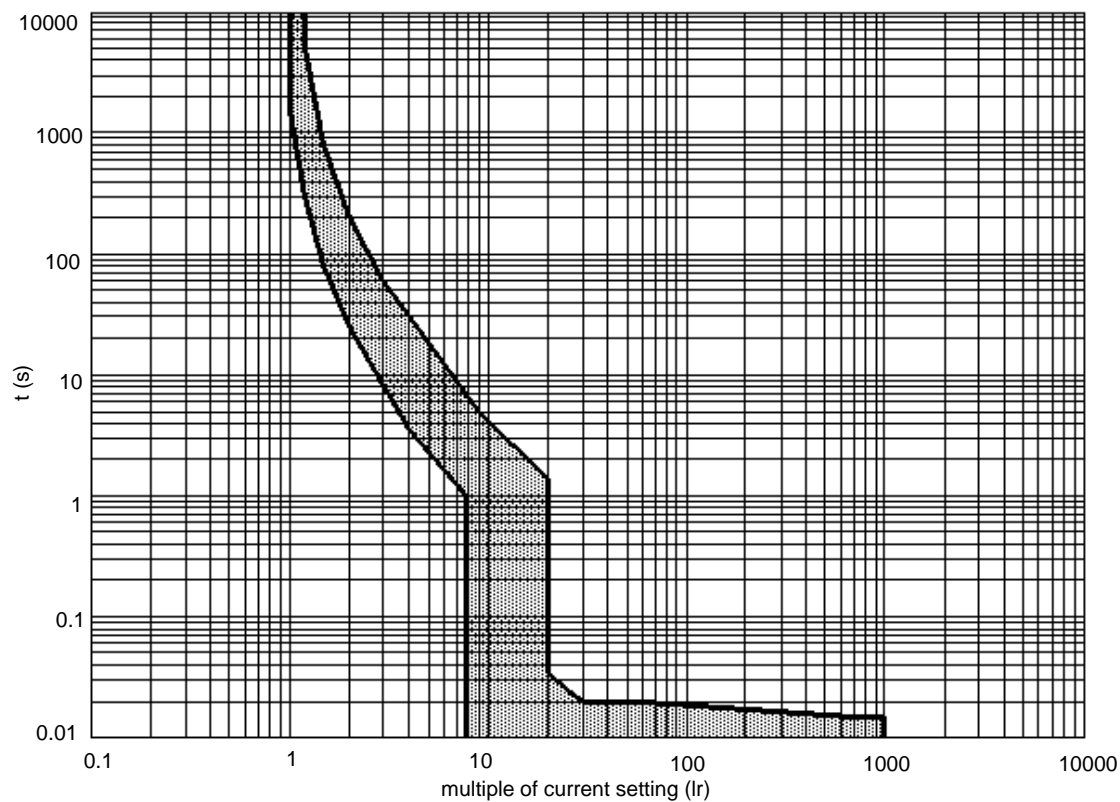
Figure 3. Style 801



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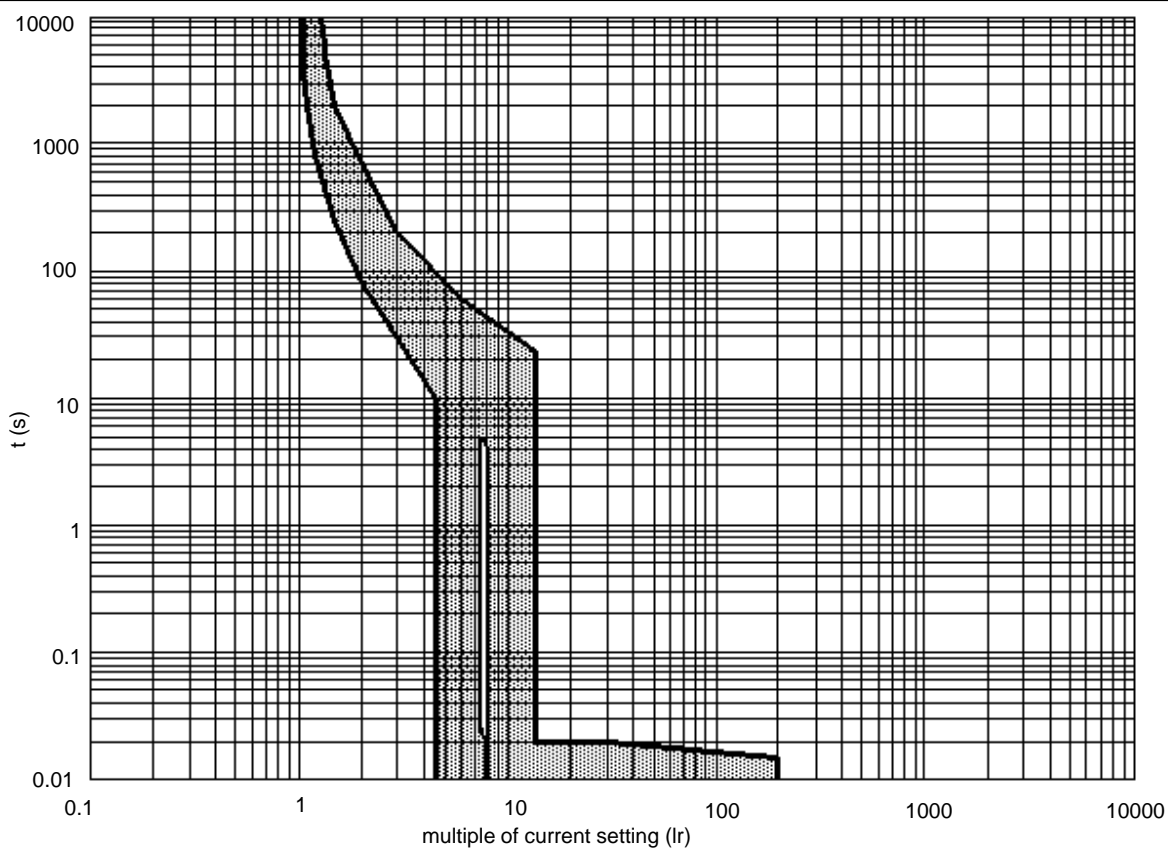
1. Long Time Current Setting Pot
2. Short Time Delay Adjustment Pot
3. Short Time Pickup Adjustment Pot
4. Ground Fault Time Delay Pot
5. Ground Fault Current Pickup Pot

Figure 5. Style 1601



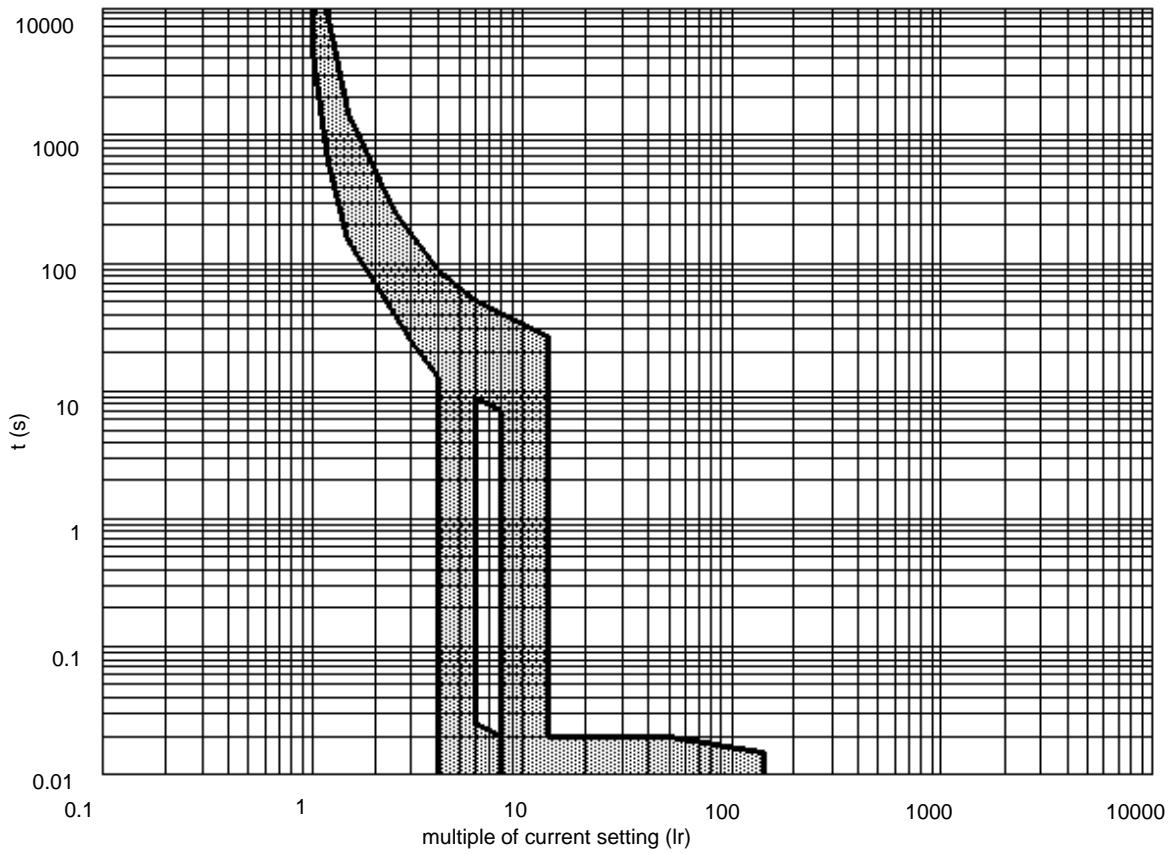
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Figure 6. Time Current Curves, Circuit Breaker Style 101



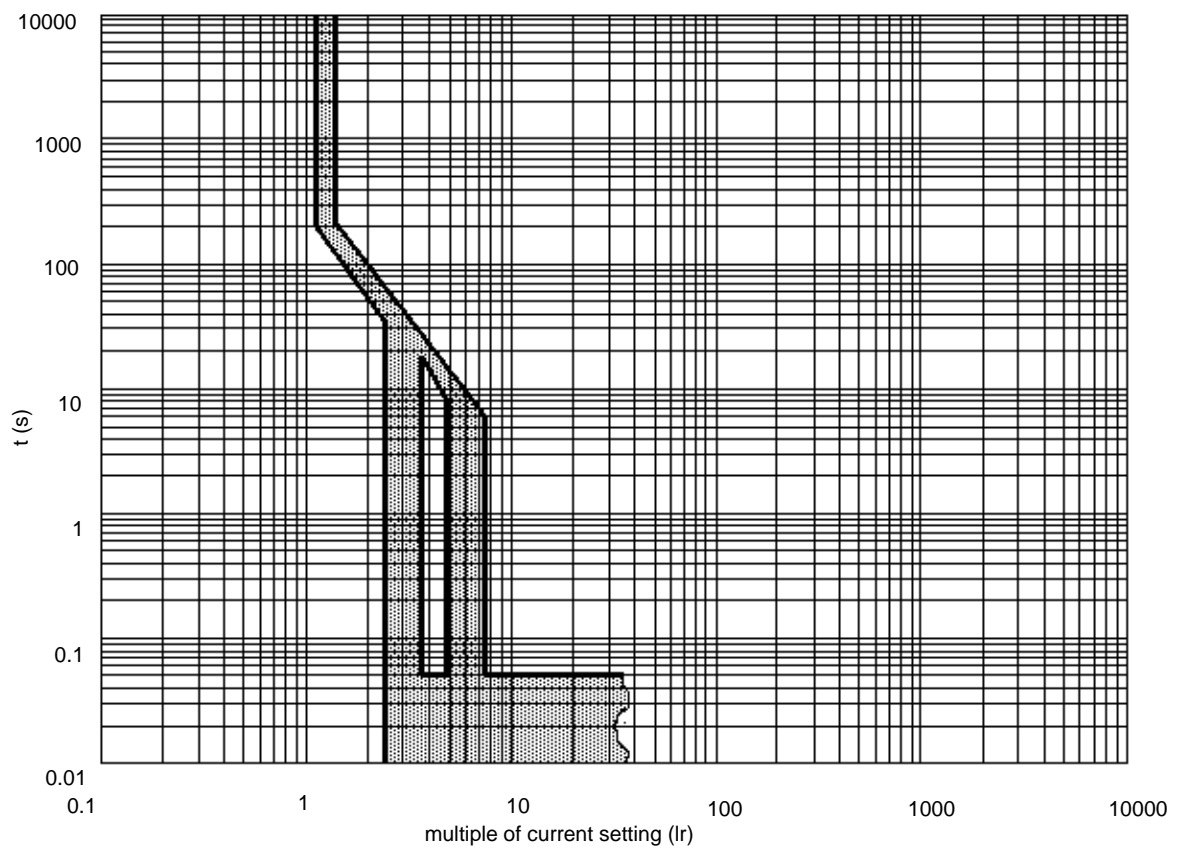
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Figure 7. Time Current Curves, Circuit Breaker Style 250



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Figure 8. Time Current Curves, Circuit Breaker Style 401



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Figure 9. Time Current Curves, Circuit Breaker Style 801

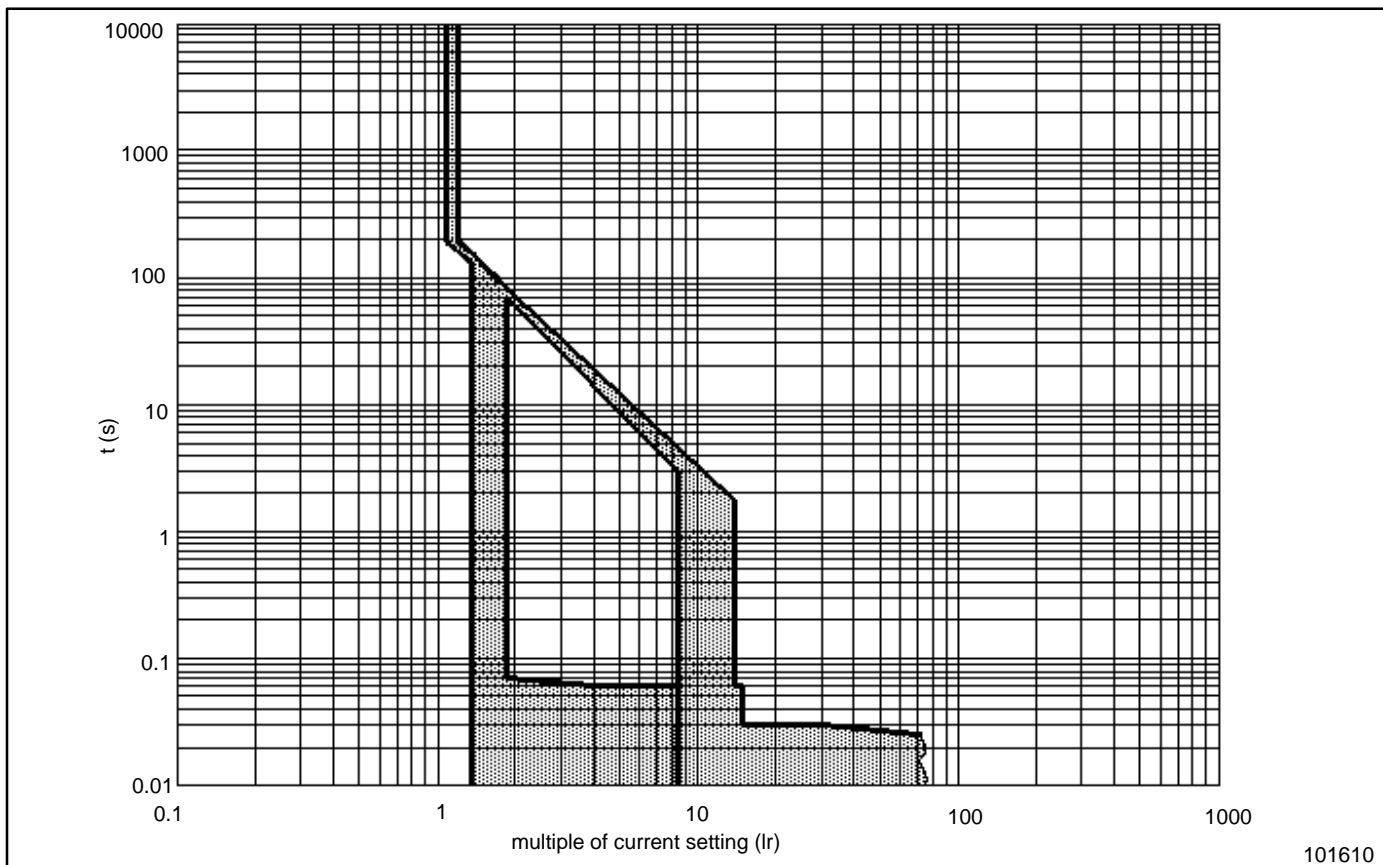


Figure 10. Time Current Curves, Circuit Breaker Style 1600

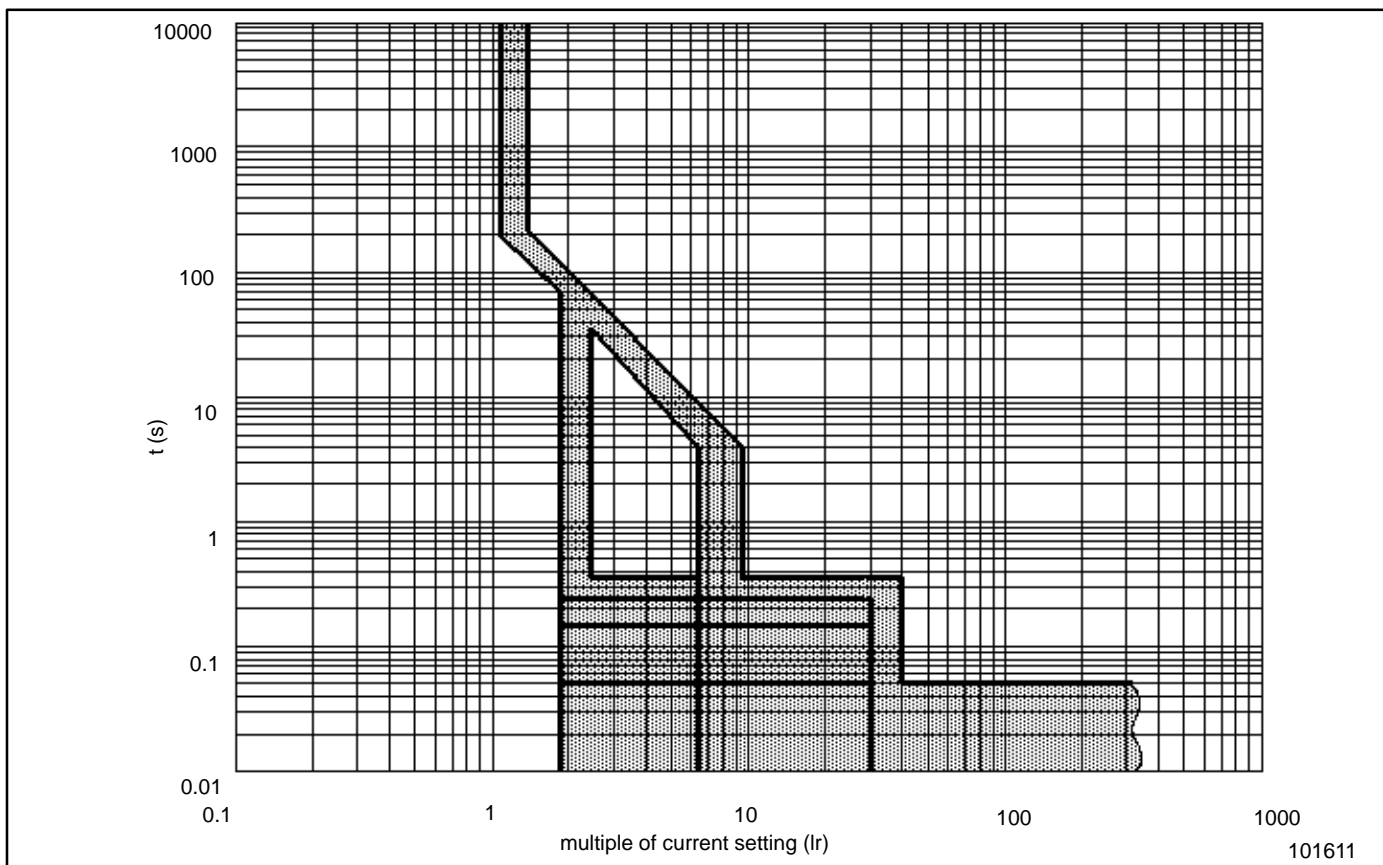


Figure 11. Time Current Curves, Circuit Breaker Style 1601

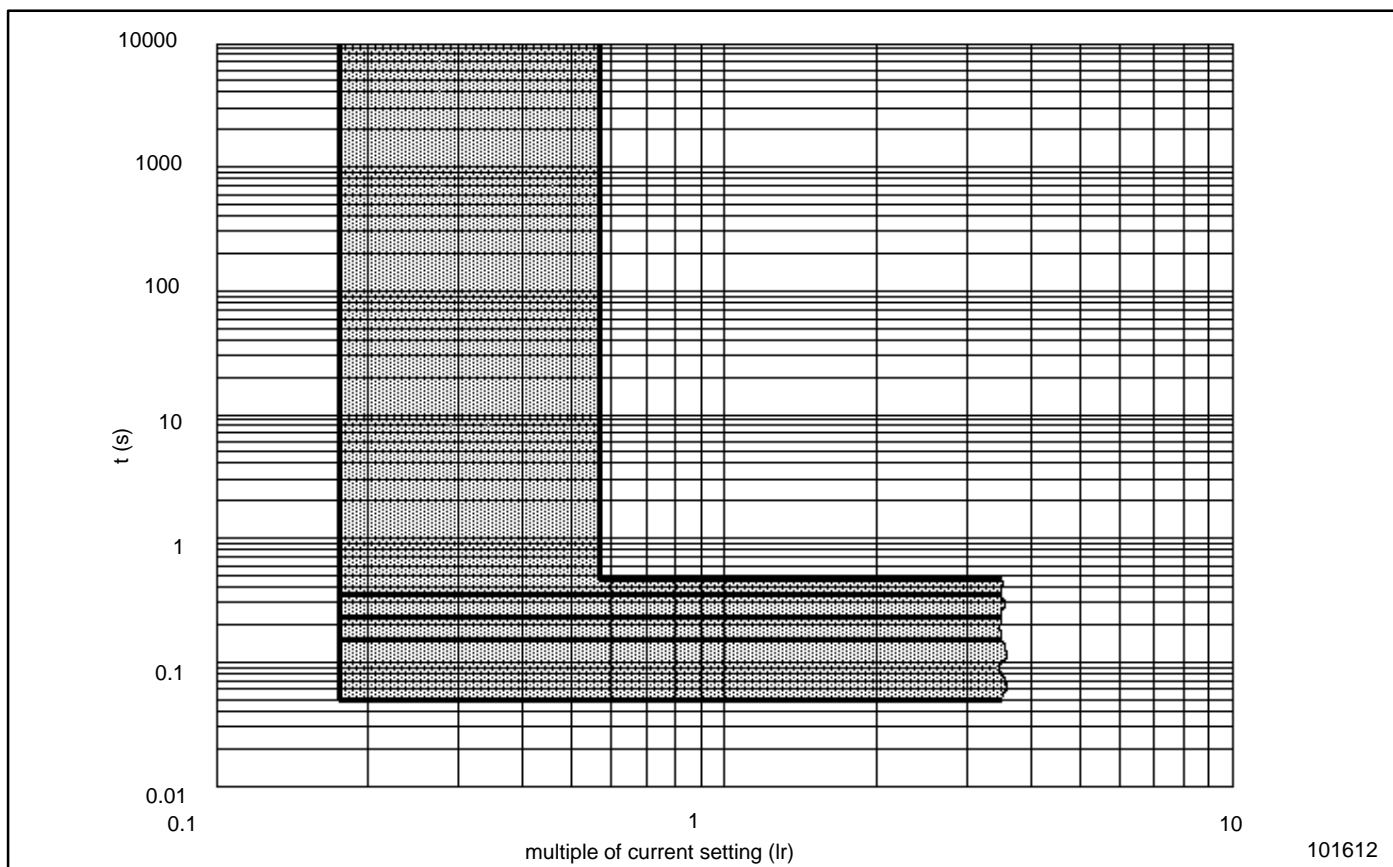


Figure 12. Time Current Curves, Circuit Breaker Style 1601 Ground Fault Current