



## INSULATED CASE CIRCUIT BREAKERS: 1600A – 5000A

Masterpact® NW\*

### FEATURES

- Moisture and fungus protection
- Clear indication of breaker status
- Reinforced insulation
- Shunt trip
- Auxiliary contacts
- Load side extension bars
- 100% rated
- Maintenance-free operation
- Exceptional characteristics under short-circuit conditions
- Adjustable trip settings
- Electrically operated

### CONFORMITY WITH INTERNATIONAL STANDARDS

Masterpact® Circuit Breakers have been designed to comply with the following international standards:

Japanese Standards J 15 160 and C 8372  
France NF C63-120  
Germany VDE 0660  
United Kingdom BS 4752  
Australia AS 2184  
Italy CEI EN 60947-2

**Additionally, UL Breakers comply with the following:**

UL 489 (UL listed)  
NEMA AB1  
CSA 22.2 NO 5.1  
NMX J-266-ANCE  
UL1008 listed

**In addition to the listed International Standards, IEC Breakers comply with the following:**

IEC 60947-2  
IEC 60947-3

Masterpact® Circuit Breakers have been approved for marine application by American Bureau of Shipping, Bureau Veritas, Lloyd's Register of Shipping, Registro Italiano Navale, Germanischer Lloyd, and Det Norske Veritas.

## STANDARD FEATURES

### SHUNT TRIP

The shunt trip provides a means of tripping the circuit breaker electronically. Shunt trip ratings are as follows:

- Voltage: 24VDC
- Coil Burden (Holding/Inrush): 4.5/200 VA
- Power Consumption: 4.5 VA

### AUXILIARY CONTACTS

The auxiliary contacts provide a means of remote circuit breaker position indication and consist of four (4) Form C Contacts (4 Normally open and 4 Normally closed contact) with the following Current Ratings:

- 10A @ 240-480 VAC, 50/60 Hz

### MANUAL BREAKER OPERATION

Includes a “push-to-trip” button, which allows the user to manually trip the circuit breaker without risking exposure to live parts.

### ELECTRICAL BREAKER OPERATION

This feature includes a two-step stored-energy mechanism. The closing time for the circuit breaker is less than five cycles. Closing and opening operations can be initiated by remote control or by push buttons on the front cover.

### CUSTOMER CABLE CONNECTIONS

Masterpact® circuit breakers are equipped with load side extension bus bars, as standard, with ANSI or IEC standard hole patterns, as appropriate. The provided bus bars are designed to accommodate the following cable sizes:

Ampere Rating	# of Cables	Cable Size
1600 – 3200	10	500 MCM
4000 – 5000	15	500 MCM

## OPTIONAL FEATURES

### TRIP UNITS

All circuit breakers come equipped with **True RMS Current Sensing**. The trip units for each of the circuit breaker ratings sample the current waveform to provide true RMS protection through the 15th harmonic. This true RMS sensing gives accurate values for the magnitude of a nonsinusoidal waveform. Therefore, the heating effects of harmonically distorted waveforms are accurately evaluated.

The trip system comes equipped with a set of current transformers (CTs) to sense current, a trip unit to evaluate the current, and a tripping solenoid to trip the circuit breaker. Additionally, each trip unit comes equipped with Active Thermal Imaging, which is active 20 minutes before and after tripping.

Masterpact® circuit breakers come equipped with a MICROLOGIC electronic trip device, which serves to protect power circuits and loads. Optional trip devices are as follows:

Model	Trip Features
5.0 A	LSI
5.0 P	LSIA (UL-IEC breakers only)
6.0 A	LSIG
6.0 P	LSIG
6.0 H	LSIG (UL-IEC breakers only)

A – Ammeter

P – Power

H – Harmonics

LSI – Long-Time, Short-Time, Instantaneous

LSIA – Long-Time, Short-Time, Instantaneous, Ground Fault Annunciation (no trip)

LSIG – Long-Time, Short-Time, Instantaneous, Ground Fault Trip and Annunciate

## TRIP UNIT FEATURES

Features provided with each of the previously listed Trip Units is shown in the following chart:

Feature	Trip Unit Features				
	5.0A	6.0A	5.0P	6.0P	6.0H
LSI	X		X		
LSIG/ground fault trip (1, 2)		X		X	X
Ground-fault alarm/no trip (2)			X		
Ground-fault alarm and trip			X		
Adjustable rating plug	X	X	X	X	X
True RMS sensing	X	X	X	X	X
UL listed	X	X	X	X	X
Thermal imaging	X	X	X	X	X
Phase-load bar graph	X	X	X	X	X
LED for long-time pick-up	X	X	X	X	X
LED for trip indication	X	X	X	X	X
Digital ammeter	X	X	X	X	X
Zone-selecting interlocking	X	X	X	X	X
Communications			X	X	X
LCD dot matrix display			X	X	X
Advanced user interface			X	X	X
Protective relay functions			X	X	X
Neutral protection			X	X	X
Contact wear indication			X	X	X
Incremental fine tuning of settings			X	X	X
Selectable long-time delay bands			X	X	X
Power measurement			X	X	X
Power quality measurements					X
Waveform capture					X

### Notes:

- (1) Includes neutral current transformer on 3-phase 4-wire systems
- (2) Includes M6C programmable contact module

## CIRCUIT BREAKER CHARACTERISTICS

UL/CSA Breakers		Masterpact® NW					
Number of poles		3					
Voltage rating (VAC)		600					
Rated current (amps)		<b>1600</b>	<b>2000</b>	<b>2500</b>	<b>3000</b>	<b>4000</b>	<b>5000</b>
Interrupting rating (60 Hz) (kA RMS)	240V	65	65	100	100	100	100
	480V	65	65	100	100	100	100
	600V	50	50	85	85	85	85
Short-time withstand current (kA RMS)	50/60 Hz, 1 s	42	42	65	65	75	75
Built-in instantaneous override (kA RMS ± 10%)		40	40	65	65	75	75
Close and latch ratings (kA RMS)		50/60 Hz	40	40	40	40	40
Breaking time		25 to 30 ms with no intentional delay					
Closing time		70 ms					

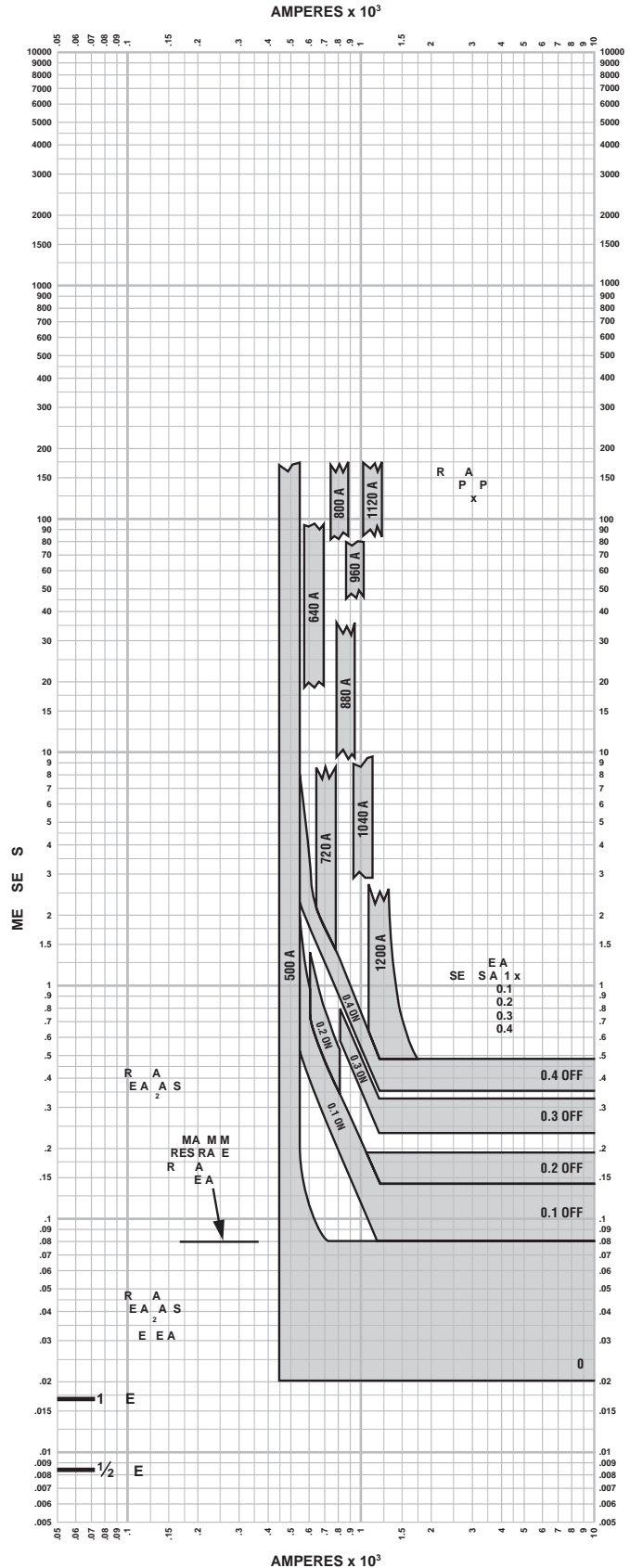
IEC Breakers			Masterpact® NW				
Number of Poles			3/4				
Voltage Rating (VAC)			690				
Rated Current (amps)			<b>2000</b>	<b>2500</b>	<b>3200</b>	<b>4000</b>	<b>5000</b>
Ultimate Breaking Capacity (kA RMS)	$I_{cu}$	240/415V	65	65	65	65	100
		440V	65	65	65	65	100
		525V	65	65	65	65	100
		690V	65	65	65	65	100
Service Breaking Capacity	$I_{cs}$	% $I_{cu}$	100 % $I_{cu}$				
Short-time Withstand Current (kA RMS)	$I_{ow}$	50/60 Hz, 1 s	65	65	65	65	100
		50/60 Hz, 2 s	36	65	65	65	100
Close and Latch Ratings (kA RMS) 50/60 Hz	$I_{cm}$	220/415V	62	62	62	62	96
		440V	62	62	62	62	96
		525V	62	62	62	62	81
		690V	62	62	62	62	81
Break Time			25 ms				
Closing Time			< 70 ms				

## TRIP CURVES MASTERPACT® MICROLOGIC 6.0 A/P/H TRIP UNITS WITH ADJUSTABLE GROUND-FAULT PICKUP AND DELAY

Characteristic Trip Curve No. 613-3  
Ground Fault I<sub>2t</sub> OFF and ON  
I<sub>n</sub> > 1200 A

### Notes:

1. The time-current curve information is to be used for application and coordination purposes only.
2. Curves apply from -30° C to +60° C (-22° F to +140° F) ambient temperature.



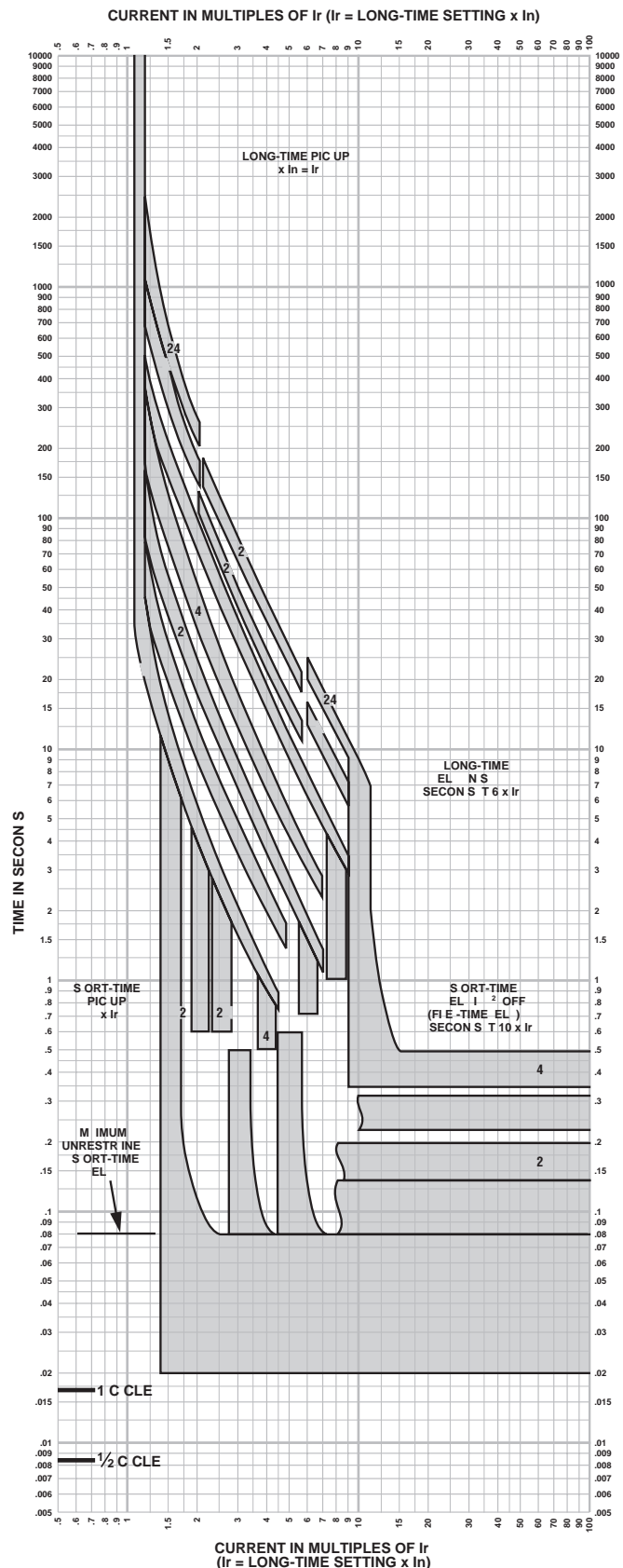
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## MICROLOGIC 5.0/6.0 A/P/H TRIP UNIT

Characteristic Trip Curve No. 613-4  
 Long-time Pickup and Delay  
 Short-time Pickup and I<sup>2</sup>t OFF Delay

### Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time 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 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 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selecting interlocking ON, short-time delay utilized, and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of the current.
5. For a withstand circuit breaker, instantaneous can be turned OFF. See trip curve 613-7 for instantaneous trip curve.
6. Overload indicator illuminates at 100%
7. The time-current curve information is to be used for application and coordination purposes only.
8. Curves apply from -30° C to +60° C (-22° F to +140° F) ambient temperature.



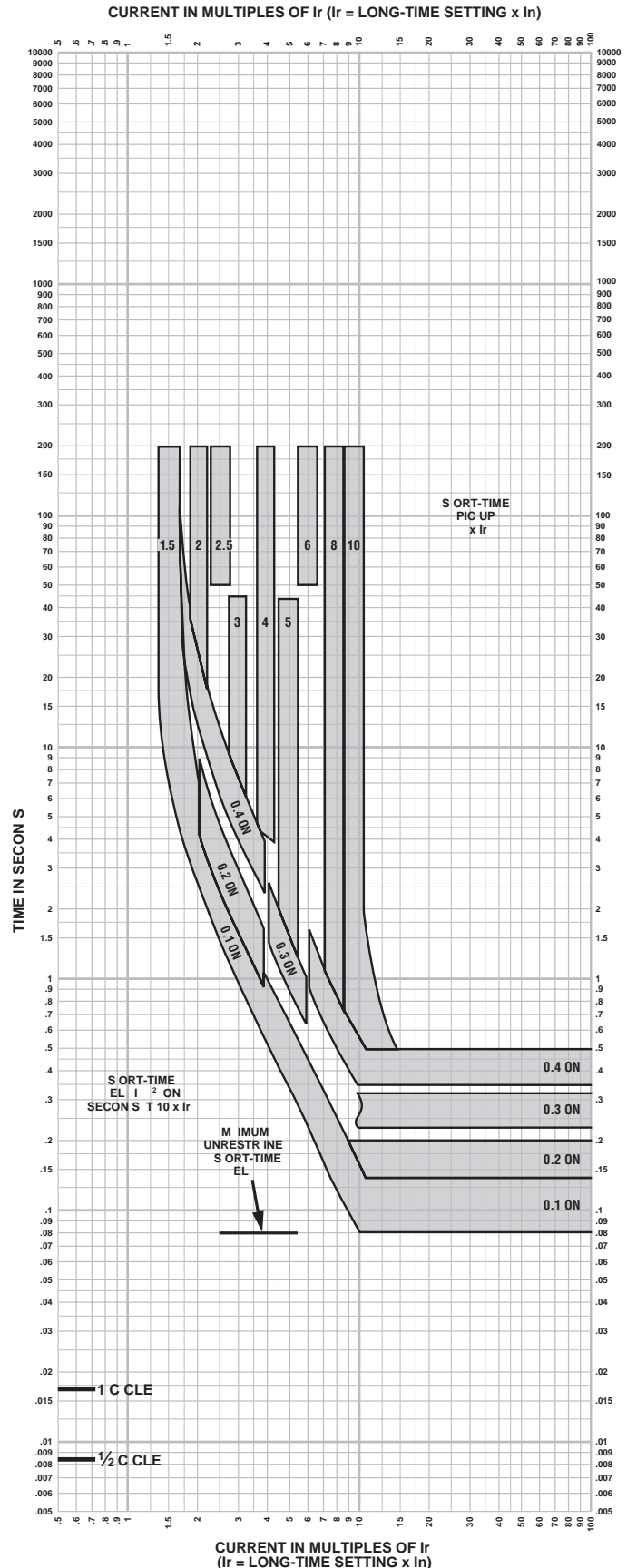
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## MICROLOGIC 5.0/6.0 A/P/H TRIP UNIT

Characteristic Trip Curve No. 613-5  
Short-time Pickup and I<sup>2</sup>t ON Delay

### Notes:

1. There is a thermal-imaging effect that can act to shorten the long-time delay. The thermal imaging effect comes into play if a current above the long-time 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 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 20 minutes is required between overloads to completely reset thermal-imaging.
2. The end of the curve is determined by the interrupting rating of the circuit breaker.
3. With zone-selecting interlocking ON, short-time delay utilized, and no restraining signal, the maximum unrestrained short-time delay time band applies regardless of the setting.
4. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of current.
5. For withstand circuit breaker, instantaneous can be turned OFF. See trip curve 613-7 for instantaneous trip curve.
6. See Trip Curve 613-4 for long-time pickup and delay trip curve.
7. The time-current curve information is to be used for application and coordination purposes only.
8. Curves apply from -30° C to +60° C (-22° F to +140° F) ambient temperature.



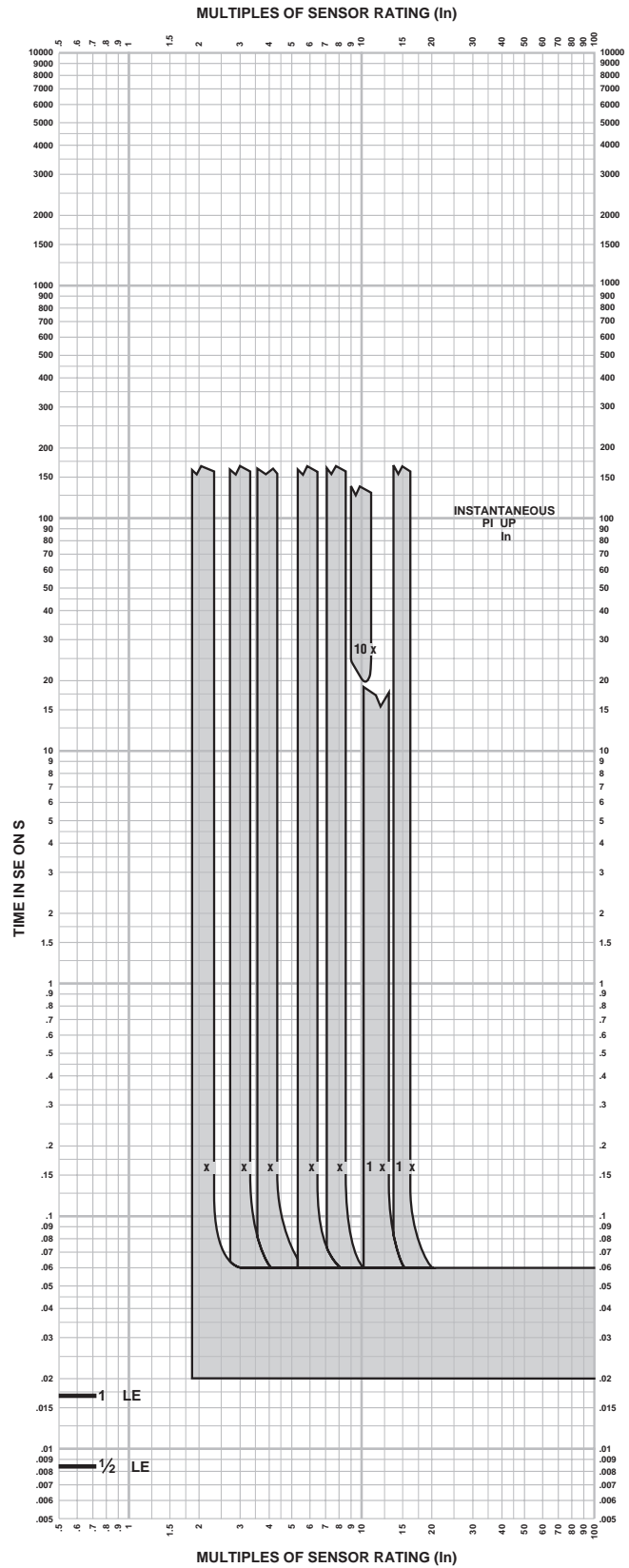
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## MICROLOGIC 5.0/6.0 A/P/H TRIP UNITS

Characteristic Trip Curve No. 613-7  
Instantaneous Pickup, 2X to 15X and OFF

### Notes:

1. The end of the curve is determined by the interrupting rating of the circuit breaker.
2. Total clearing times shown include the response times of the trip unit, the circuit breaker opening, and the extinction of current.
3. The instantaneous region of the trip curve shows maximum total clearing times. Actual clearing times in this region can vary depending on the circuit breaker mechanism design and other factors. The actual clearing time can be considerably faster than indicated.
4. For withstand circuit breaker, instantaneous can be turned OFF. See trip curve 613-7 for instantaneous trip curve.
5. See Trip Curve 613-4 for long-time pickup and delay trip curve.
6. See trip curve 613-4 and trip curve 613-5 for long-time delay, short-time pickup and short-time delay trip curves.
7. The time-current curve information is to be used for application and coordination purposes only.
8. Curves apply from  $-30^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  ( $-22^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$ ) ambient temperature.



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