



Series G Moulded Case Circuit Breakers

Product Guide – Second Edition

- Up to 690 Vac
- 18kA to 100kA I_{cu}
- 16-2500 Amperes
- IEC 60947-2



Safety, Reliability
and Performance
verified with the
KEMA KEUR mark

<i>Description</i>	<i>Page</i>
Standards	1
General Information	1
Electrical Characteristics	2
Multi-Function Electronic Trip Units	8
Electronic Trip Unit Selection Guide	9
Frame Size Selection Guide & Ordering Information/ Termination Accessories	
GE-Frame, 16 – 160 Amperes	11
GJ-Frame, 20 – 250 Amperes	13
GL-Frame, 100 – 630 Amperes	15
GN-Frame, 400 – 1600 Amperes	17
GR-Frame, 800 – 2500 Amperes	21
Motor Circuit Protectors	25
Earth Leakage Modules	26
Optional Features and Accessories	27
Plug-in Blocks & Drawout Cassette	30
Handle Mechanisms	31
Time Current Curves	34
Current Limiting Curves	40
Dimensions	41

Standards

Eaton's Moulded Case Circuit Breakers are designed to conform with the following international standards:

- International Electrotechnical Commission Recommendations IEC 60947-2 Circuit Breakers. **CE**
- Australian Standard AS 2184 and AS 3947-2 Moulded Case Circuit Breakers.
- Swiss Electro-Technical Association Standard SEV 947.2, Safety Regulations for Circuit Breakers.
- Union Technique de l'Electricite Standard NF C 63-120, Low Voltage Switchgear and Control Gear Circuit Breaker Requirements.
- Verband Deutscher Elektrotechnike (Association of German Electrical Engineers) Standard VDE 0660, Low Voltage Switchgear and Control Gear, Circuit Breakers.

General Information

The "G" signifies global applications. Other advantages include:

- Field-fit accessories.
- Common accessories through 630 amperes.
- Electronic trip units from 20 to 2500 amperes.
- Earth leakage modules.
- Built-in fault protection down to 20 amperes.

The Eaton Series G family includes five frame sizes in ratings from 16 to 2500 amperes. Series G offers a choice of several interrupting capacities up to 100 kA at 690 volts ac.

Standard calibration is 40°C. For applications in high ambient temperature conditions, 50°C factory calibration is available on thermal magnetic breakers.

Global Third Party Certification

Certification marks ensure product compliance with the total standard via the third party witnessing of tests by globally recognised independent certification organisations.

KEMA is a highly recognised, independent international organisation that offers certification and inspection facilities for equipment in many industries. The KEMA-KEUR mark is the highest certification an electrical product can receive from KEMA. Our IEC 60947-2 Moulded Case Circuit Breakers are KEMA tested and certified. These breakers are also available in accordance with UL® 489, as well as CSA C22.2 No. 5-02.

KEMA and UL provide ongoing follow-up testing and inspections to ensure that Eaton's Moulded Case Circuit Breakers continue to meet their exacting standards.

The Most Logically Designed Contact Assembly

The flexibility and outstanding performance characteristics of Eaton Circuit Breakers are made possible by the best contact designs in circuit breaker history. Our patented technology creates a high-speed "opening force" action using the electromechanical forces produced by high-level fault currents.

Eaton Circuit Breakers are operated by a toggle-type mechanism that is mechanically trip-free from the handle so that the contacts cannot be held closed against short circuit currents. Tripping due to overload or short circuits is clearly indicated by the position on the handle. This remarkably fast and dependable contact action is designed to enhance safety.

Thorough In-Plant Testing

The quality, dependability and reliability of every Eaton Circuit Breaker is ensured by a thorough program of in-plant testing. Two calibration tests are conducted on every pole of every circuit breaker to verify the trip mechanism, operating mechanism, continuity and accuracy.

ISO Certification

Eaton Circuit Breakers are manufactured in ISO® certified facilities.

Current Limiting Characteristics

Eaton Series G Circuit Breakers are current limiting because of their high repulsion contact arrangement and use of state-of-the-art arc extinguishing technology.

Operating Mechanisms

Eaton Circuit Breakers have a toggle handle operating mechanism, which also serves as a switching position indicator. The indicator shows the positions of: ON, OFF and TRIPPED.

The toggle handle snaps into the TRIPPED position if the breaker is tripped by one of its overcurrent, short circuit, shunt or undervoltage releases. Before the circuit breaker can be reclosed following a trip-out, the toggle handle must be brought beyond the OFF position (RESET). The circuit breaker can then be reclosed.

As an additional switching position indicator for GE- to GR-Frame circuit breakers, there are two windows on the right and on the left of the toggle handle, in which the switching state is indicated by means of the colours red, green and white corresponding to the ON, OFF and TRIPPED positions respectively.

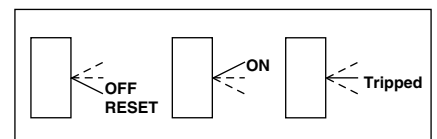





Figure 1. Positions of the Toggle Handle Drive

Series G Frame Sizes GE through GL

Electrical Characteristics

Table 1. Electrical Characteristics

Frame size and page number		GE (p. 11)				GJ (p. 13)				GL (p. 15)						
																
Maximum Rated Current (Amperes)		125				160	125	250				400, 630				
Breaker Type		B		E		S	H	S	H	C ①		S	H	C ①		
Number of Poles		1	2, 3		1	3, 4 ^④		3, 4 ^④	3, 4 ^④		3, 4 ^④		3, 4 ^④			
Breaking Capacity (kA rms) ac 50 – 60 Hz																
IEC 60947-2	220 – 240 Vac	<i>I_{CU}</i>	18	25	25	35	85	100	85	100	200	85	100	200		
		<i>I_{CS}</i>	12	13	13	18	43	50	85	100	150	85	100	150		
	380 – 415 Vac	<i>I_{CU}</i>	—	18	—	25	40	70	40	70	100	50	70	100		
		<i>I_{CS}</i>	—	12	—	13	30	35	40	70	75	50	70	75		
	660 – 690 Vac	<i>I_{CU}</i>	—	—	—	—	4	6	12	14	20	20	25	35		
		<i>I_{CS}</i>	—	—	—	—	3	3	6	7	10	10	13	18		
	250 Vdc ^②	<i>I_{CU}</i>	10	10	10	10	35	42	35	42	42	22	42	42		
		<i>I_{CS}</i>	10	10	10	10	35	42	35	42	42	22	42	42		
Ampere Range		16 – 160 A						20 – 250 A				100 – 630 A				
Trip Units F= Fixed A= Adjustable T= Thermal M= Magnetic		FT-FM AT-FM						AT-AM Electronic (Digitrip RMS 310)				AT-AM Electronic (Digitrip RMS 310)				
Thermal Magnetic	Fixed Thermal		■						—				—			
	Adjustable Thermal		■						■				■			
	Magnetic		Fixed						Adjustable				Adjustable			
Electronic rms ^③	LSI		—						■ ^③				■ ^③			
	LSIG		—						■ ^③				■ ^③			
Dimensions mm		H		W		D		H	W	D	H	W	D			
		1-Pole		25.4		81.1		—	—	—	—	—	—			
		2-Pole		50.8		—		—	—	—	—	—	—			
		3-Pole		76.2		—		177.8	105.0	87.4	258.0	140.0	104.0			
		4-Pole		101.6		—		—	135.6	—	—	183.0	—			
Weight (approximate) kg		1-Pole	2-Pole	3-Pole	4-Pole	3-Pole	4-Pole	3-Pole	4-Pole	3-Pole	4-Pole					
		0.5	0.9	1.4	1.8	5.2	7.0	7.3	9.1							
Utilisation Category		A						A				A				

① Contact your Eaton representative for availability.

② Two poles in series.



③ Not suitable for dc application. 4-pole earth fault not available.

④ Neutral on left side.

■ Available

— Not Available

Table 1. Electrical Characteristics (Continued)

Frame size and page number		GN (p. 17)			GR (p. 21)			
								
Maximum Rated Current (Amperes)		800, 1250			1600	1600, 2000, 2500		
Breaker Type		S	H	C	S	H	C	
Number of Poles		3, 4 ^④			3, 4 ^④	3, 4 ^④		
Breaking Capacity (kA rms) ac 50 – 60 Hz								
IEC 60947-2	220 – 240 Vac	I_{cu}	85	100	200	85	135	200
		I_{cs}	85	100	100	85	100	100
	380 – 415 Vac	I_{cu}	50	70	100	50	70	100
		I_{cs}	50	50	50	50	50	50
	660 – 690 Vac	I_{cu}	20	25	35	20	25	35
		I_{cs}	10	13	18	10	13	18
	250 Vdc	I_{cu}	—	—	—	—	—	—
		I_{cs}	—	—	—	—	—	—
Ampere Range		400 – 1250 A			1600 A	800 – 2500 A		
Trip Units		Electronic (Digitrip RMS 310)			Electronic (Digitrip RMS 310, 610 and 910)			
Electronic ^③	LSI	■ ^③			■ ^③			
	LSIG	■ ^③			■ ^③			
Dimensions mm		H	W	D	H	W	D	
		1-Pole	—	—	—	—	—	—
		2-Pole	—	—	—	—	—	—
		3-Pole	406.0	210.0	140.0	406.0	394.0	229.0
	4-Pole		280.0			508.0		
Weight (approximate) kg		3-Pole		4-Pole	3-Pole		4-Pole	
		21.3		28.3	47.0		54.0	
Utilisation Category		A			A			

③ Not suitable for dc application. 4-pole earth fault not available.

④ Neutral on right side.

■ Available

— Not Available

Series G Frame Sizes GE through GR

Table 2. GE through GR Electrical Characteristics

Technical Data	GE		GJ		GL		GN	GR
Maximum Rated Current I_n Depending on the Version	160 A		250 A		400, 630 A		800, 1250, 1600 A	1600, 2000, 2500 A
Rated Insulation Voltage U , According to IEC 60947-2 Main Conducting Paths Auxiliary Circuits	690 Vac 690 Vac		750 Vac 690 Vac		750 Vac 690 Vac		750 Vac 690 Vac	750 Vac 690 Vac
Rated Impulse Withstand Voltage U_{imp} Main Conducting Paths Auxiliary Circuits	6 kV 4 kV		8 kV 4 kV		8 kV 4 kV		8 kV 4 kV	8 kV 4 kV
Rated Operational Voltage U_e IEC	690 Vac		690 Vac		690 Vac		690 Vac	690 Vac
Permissible Ambient Temperature	-20 to +70°C		-20 to +70°C		-20 to +70°C		-5 to +60°C	-5 to +60°C
Permissible Load for Various Ambient Temperatures Close to the Circuit Breaker, Related to the Rated Current of the Circuit Breaker								
<ul style="list-style-type: none"> ■ Circuit Breakers for Plant Protection <ul style="list-style-type: none"> - At 40°C - At 50°C - At 55°C - At 60°C - At 70°C ■ Circuit Breakers for Motor Protection <ul style="list-style-type: none"> - At 40°C - At 50°C - At 55°C - At 60°C - At 70°C ■ Circuit Breakers for Starter Combinations and Isolating Circuit Breakers <ul style="list-style-type: none"> - At 40°C - At 50°C - At 55°C - At 60°C - At 70°C 	①	②	①	②	①	②	—	—
	100%	100%	100%	100%	100%	100%	100%	100%
	96%	92%	96%	94%	96%	91%	91%	91%
	93%	87%	94%	90%	93%	86%	85%	85%
	91%	83%	92%	87%	90%	82%	81%	81%
	86%	73%	88%	80%	84%	70%	—	—
	—	—	100%	—	100%	—	—	—
	—	—	100%	—	100%	—	—	—
	—	—	100%	—	100%	—	—	—
	—	—	100%	—	100%	—	—	—
	—	—	90%	—	90%	—	—	—
	100%	—	100%	—	100%	—	100%	100%
	100%	—	100%	—	100%	—	91%	91%
	96%	—	96%	—	95%	—	85%	85%
	91%	—	82%	—	90%	—	81%	81%
	86%	—	88%	—	84%	—	—	—
Rated Short Circuit Breaking Capacity (dc) Not for Circuit Breakers for Motor Protection (Time Constant $\tau = 10$ rms) 2 Conducting Paths in Series For GE to GL up to 250 Vdc	42 kA Max.		42 kA Max.		42 kA Max.		③	③
Main Switch Characteristics According to IEC 60947-2 in Combination with Lockable Rotary Drives	Yes		Yes		Yes		Yes	Yes
Endurance (Operating Cycles)	10,000		10,000		8,000		3,000	3,000
Maximum Switching Frequency	300 1/h		240 1/h		240 1/h		60 1/h	20 1/h

① Thermal overload release set to the lower value.

② Thermal overload release set to the upper value.

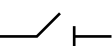
③ Not suitable for dc switching.

Table 2. GE through GR Electrical Characteristics (Continued)

Technical Data	GE	GJ	GL	GN	GR	
Conductor Cross Sections and Terminal Types for Main Conductors <ul style="list-style-type: none"> ■ Solid or Stranded ■ Finely Stranded with End Sleeve ■ Bus Bar Tightening Torque for Box Terminals Tightening Torque for Bus Bar Connection Pieces	Box Terminals 2.5 to 70 mm ² 2.5 to 50/70 mm ² — 5.6 Nm 5.6 Nm	Box Terminals 50 to 150 mm ² 35 to 120 mm ² — 20 Nm 15 Nm	Box Terminals 95 to 240 mm ² 70 to 150 mm ² — 42 Nm 30 Nm	Flat Bar Terminals — — 600 A 31 Nm 6 Nm	Flat Bar Terminals — — Optional 31 Nm 50 Nm	Flat Bar Terminals — — Optional — 20 Nm
Conductor Cross Sections for Auxiliary Circuits with Terminal Connection or Terminal Strip <ul style="list-style-type: none"> ■ Solid ■ Finely Stranded with End Sleeve ■ With Brought-out Cable Ends ■ Tightening Torque for Fitting Screws 	0.75 to 2.5 mm ² 0.75 to 2.5 mm ²	0.75 to 2.5 mm ² 0.75 to 2.5 mm ² 0.82 (AWG 18) mm ² 0.8 to 1.4 Nm	0.75 to 2.5 mm ² 0.75 to 2.5 mm ² 0.82 (AWG 18) mm ² 0.8 to 1.4 Nm	Up to 2x4 mm ² Up to 2x2.5 mm ² 0.82 (AWG 18) mm ² 0.8 to 1.4 Nm	Up to 2x4 mm ² Up to 2x2.5 mm ² 0.82 (AWG 18) mm ² 0.8 to 1.4 Nm	
Power Loss per Circuit Breaker at Maximum Rated Current I _n (The Power Losses of the Undervoltage Releases ("r" Releases) Must Be Observed if Necessary) at Three-Phase Symmetrical Load) <ul style="list-style-type: none"> ■ For Plant Protection ■ As Isolating Circuit Breaker ■ For Starter Combinations ■ For Motor Protection 	40 W 40 W 40 W —	45 W 45 W 45 W 45 W	65 W 65 W 65 W 65 W	87/210 W 87/210 W — —	220/270/400 W 220/270/400 W — —	
Permissible Mounting Position						
Arc Spacing — Suitable for Reverse-Feed Applications	Yes (Except HMCPE)	Yes	Yes	Yes	Yes	

Series G Frame Sizes GE through GR

Table 2. GE through GR Electrical Characteristics (Continued)

Technical Data	GE	GJ	GL	GN	GR
Auxiliary Switches					
Rated Thermal Current I_{th} Rated Making Capacity	6 A 20 A	6 A 20 A	6 A 20 A	6 A 20 A	6 A 20 A
ac (ac-15) ■ Rated Operational Voltage ■ Rated Operational Current	230/400/600 V 6/3/0.25 A	230/400/600 V 6/3/0.25 A	230/400/600 V 6/3/0.25 A	600 V 6 A	600 V 6 A
dc (dc-13) ■ Rated Operational Voltage ■ Rated Operational Current	125/250 V 0.5/0.25 A	125/250 V 0.5/0.15 A	125/250 V 0.5/0.15 A	125/250 V 0.5/0.25 A	125/250 V 0.5/0.25 A
Releases					
Undervoltage Releases Response Voltage: ■ Drop (Breaker Tripped) ■ Pickup (Breaker May Be Switched on)	35 – 70% 85 – 110%	35 – 70% 85 – 110%	35 – 70% 85 – 110%	35 – 70% 85 – 110%	35 – 70% 85 – 110%
Power Consumption in Continuous Operation at: ■ 50/60 Hz 12 Vac ■ 50/60 Hz 24 Vac ■ 50/60 Hz 48 – 60 Vac ■ 50/60 Hz 110 – 127 Vac ■ 50/60 Hz 208 – 240 Vac ■ 50/60 Hz 380 – 500 Vac ■ 50/60 Hz 525 – 600 Vac ■ 12 Vdc ■ 24 Vdc ■ 48 – 60 Vdc ■ 110 – 125 Vdc ■ 220 – 250 Vdc Maximum Opening Time	0.95 VA 0.72 VA 1.15 – 1.78 VA 0.96 – 1.25 VA 1.28 – 1.68 VA 2.2 – 3.9 VA 3.4 – 4.3 VA 0.88 W 0.70 W 1.12 – 1.76 W 0.94 – 1.21 W 1.45 – 1.86 W 50 ms	1.9 VA 3.9 VA 2.5 – 3.8 VA 1.8 – 2.4 VA 2.7 – 3.8 VA 3.4 – 5.8 VA 3.4 – 4.3 VA 1.6 W 3.1 W 2.0 – 3.1 W 1.6 – 2.2 W 3.1 – 4 W 50 ms	1.9 VA 3.9 VA 2.5 – 3.8 VA 1.8 – 2.4 VA 2.7 – 3.8 VA 3.4 – 5.8 VA 3.4 – 4.3 VA 1.6 W 3.1 W 2.0 – 3.1 W 1.6 – 2.2 W 3.1 – 4 W 50 ms	1.9 VA 2.4 VA 2.3 – 4.1 VA 3.4 – 4.2 VA 4.8 – 6.5 VA 6.8 – 12.0 VA — 2.6 W 3.6 W 3.5 – 5.5 W 2.9 – 3.6 W 4.8 – 6.3 W 62 ms	2.9 VA 3.1 VA 3.4 – 6.0 VA 3.3 – 3.8 VA 4.2 – 7.2 VA 3.8 – 10.0 VA — 3.4 W 4.3 W 4.8 – 7.2 W 3.3 – 3.8 W 6.6 – 7.5 W 62 ms
Shunt Trips					
Shunt Trips Response Voltage: ■ Pickup (Breaker Tripped)	70 – 110%	70 – 110%	70 – 110%	70 – 110%	70 – 110%
Power Consumption in (Short Time) at: ■ 50/60 Hz 24 Vac ■ 50/60 Hz 48 – 60 Vac ■ 50/60 Hz 48 – 127 Vac ■ 50/60 Hz 110 – 240 Vac ■ 50/60 Hz 380 – 440 Vac ■ 50/60 Hz 380 – 600 Vac ■ 50/60 Hz 480 – 600 Vac ■ 12 – 24 Vdc ■ 48 – 60 Vdc ■ 110 – 125 Vdc ■ 220 – 250 Vdc Maximum Load Duration Maximum Opening Time	10 – 41 VA 139 – 210 VA — 83 – 360 VA — 418 – 1080 VA — 29 – 120 W 475 – 720 W 99 – 121 W — Interrupts Automatically 50 ms	87 – 405 VA 710 – 1105 VA — 66 – 432 VA 127 – 188 VA — 34 – 60 VA 164 – 631 W 830 – 1580 W 112 – 150 W 40 – 58 W — 70 2500	87 – 405 VA 710 – 1105 VA — 66 – 432 VA 127 – 188 VA — 34 – 60 VA 164 – 631 W 830 – 1580 W 112 – 150 W 40 – 58 W — 70 6300	98 – 475 VA 24 – 50 VA — 67 – 432 VA 76 – 110 VA — 19 – 42 VA 145 – 610 W 67 – 102 W 121 – 150 W 46 – 55 W — 70 12,500	612 VA 403 – 666 VA — 396 – 1896 VA 1596 – 2156 VA — 230 – 384 VA 396 W 341 – 528 W 264 – 350 W 374 – 475 W — 70 20,000
Moulded Case Switch (with High Magnetic Trip)					
Breaking capacity (kA) at 415 Vac Self-Protected, Will Trip Above: 	25 1250 for GE125; 1600 for GE160	70 2500	70 6300	70 12,500	70 20,000

January 2005

Series G Frame Sizes GE through GL

dc Switching Duty

The GE- to GL-Frame circuit breakers are also suitable for switching dc currents.

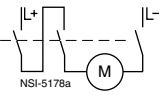
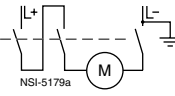
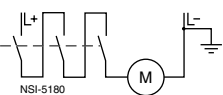
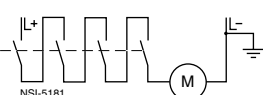
The GN- and GR-Frame circuit breakers are not suitable for dc currents due to the solid-state overcurrent release system.

For switching dc currents, however, the maximum permissible dc voltage per conducting path has to be considered.

For voltages higher than 250 volts, the series connection of two or three conducting paths is required.

As the current has to flow through all conducting paths so as to maintain the thermal tripping characteristics, the following circuit arrangements are recommended. With dc, the trip values of the instantaneous short circuit release ("n" release) are increased by 30 to 40%.

Table 3. For 3- and 4-Pole Circuit Breakers

Proposed Circuit	Maximum Permissible Vdc U _e	Remarks
 <p>NSI-5178a</p>	250 Vdc	Double-pole switching. If there is no risk of an earth fault, or if any earth fault which occurs is immediately eliminated (earth fault monitoring), the maximum permissible dc voltage can be 600 volts.
 <p>NSI-5179a</p>	440 Vdc	Double-pole switching (earth system). The earthed pole must always be assigned to the individual conducting path, so that two paths are always in series in the event of an earth fault.
 <p>NSI-5180</p>	600 Vdc	Single-pole switching (earthed system). Three conducting paths in series. The earthed pole must be assigned to the nonswitched conducting path.
 <p>NSI-5181</p>	750 Vdc	Single-pole switching (earthed system). Four conducting paths in series. The earthed pole must be assigned to the nonswitched conducting path.

Series G Frame Sizes GJ through GR

Multi-Function Electronic Trip Units for All Applications

Digitrip RMS Trip Units

True rms Sensing

Digitrip RMS Trip Units utilise our patented microprocessor-based intelligence to provide true rms sensing, permitting increased accuracy and reliable system protection. True rms sensing is not susceptible to nuisance tripping when waveforms containing high harmonic currents are present.

Digitrip RMS 310

Digitrip RMS 310 Electronic Trip Units are available with Eaton Circuit Breakers GJ-, GL-, GN- and GR-Frames 20 through 2500 amperes. Digitrip RMS 310 Trip Units are available in four styles with either fixed or adjustable rating plugs which establishes the continuous ampere rating of the breaker.

Note: GJ- and GL-Frames have selectable long time delay (t_{LD}) and pickup settings (I_r). A rating plug is not required.

Rating Plugs

If rating plugs are needed, they are marked for 50/60 Hz applications. Both fixed and adjustable rating plugs are available, providing further flexibility when applied to selectively coordinated systems.

Note: Digitrip RMS rating plugs are not interchangeable with Seltronic™ rating plugs.

Curve Shaping

When selectively coordinated systems are called for, Digitrip RMS 310 will provide a cost-effective solution for a variety of applications.

The standard Digitrip RMS 310 includes an adjustable short time pickup setting encompassing an I^2t ramp function which provides the basic LS curve shaping function. GJ- and GL-Frames have an adjustable long time delay.

The optional Digitrip RMS 310 provides additional flat response short time delay adjustments on an instantaneous setting to provide LSI curve shaping capability.

Digitrip RMS 310 Trip Units are available with earth fault pickup and flat response earth fault delay which provides the trip unit with full function LSIG curve shaping flexibility.

Digitrip RMS 310 Trip Units can effec-

tively coordinate with both sophisticated upstream power breakers as well as downstream thermal magnetic breakers...making Digitrip RMS 310 Trip Units the cost-effective reliable choice for selectively coordinated systems.

Thermal Memory

All Digitrip RMS Trip Units incorporate a long delay. Thermal memory prevents the system from cumulative overheating due to repeated overcurrent events that may occur in quick succession.

Field Testing

A field test kit is available for Digitrip RMS 310 trip units.

Digitrip RMS 610 and 910



RMS 610

RMS 910

Digitrip RMS 610 and 910 Trip Units are available with Eaton GR-Frame Circuit Breakers 800 through 2500 amperes. Digitrip 610 and 910 Trip Units provide unparalleled system protection with the added convenience of a local display.

Curve Shaping

Digitrip RMS 610 and 910 Trip Units are available with up to nine curve shaping choices achieved by adjusting up to seven switches on the front of the unit for optimum system coordination. Maximum curve shaping flexibility is provided by dependent long and short delay adjustments that are long delay pickup (I_r) based, depicted on the front of the unit by the blue portion of the time-current curve.

Additional coordination capability can be provided by utilising the short delay and earth fault zone selective interlocking features available on these trip units.

System Diagnostics

Digitrip RMS 610 and 910 models of trip units provide long delay, short delay, instantaneous, and earth fault cause of trip LEDs on the front of the unit. Their display shows a magnitude of trip information, as well as remote signal contacts, for improved system alarming.

System Monitoring

Digitrip 610 and 910 Trip Units have the capability to monitor phase currents, as well as neutral or ground currents. This information is displayed on a large digital display mounted on the unit.

Digitrip RMS 910 Trip Units can also provide the user with power and energy monitoring capability. Peak power demand, present power demand, and total energy, as well as forward and reverse energy can be monitored with this unit.

Digitrip RMS 910 Trip Units have the additional capability of monitoring line-to-line voltage, as well as system power factor. Both parameters are displayed in the digital display window and are supported by LEDs to indicate which parameter is being displayed.

Harmonics Monitoring

Digitrip RMS 910 Trip Units are capable of displaying values of current harmonics in the digital display window. Percentage of harmonic content can be monitored for each phase, up to the 27th harmonic. Additionally, a total harmonic distortion value can be calculated and displayed.

Communications

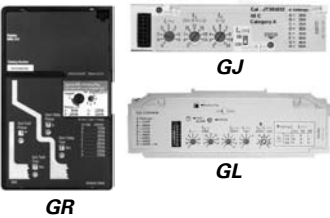


Digitrip RMS 910 units have built-in communications options to allow all protection, monitoring, and control information to be transmitted back to a central location via the PowerNet™ system.

Field Testing

Integral field testing capability is provided on all 610 and 910 Trip Units. No additional test set is needed to perform both trip and no trip field testing.

Digitrip RMS Electronic Trip Unit Selection Guide

Table 4. Digitrip RMS Electronic Trip Unit Selection Guide

Digitrip	RMS 310	RMS 610	RMS 910
	 <p style="text-align: center;">GJ GL GR</p>		

Breaker Type			
Frame(s)	GJ-, GL-, GN- and GR-Frames	GR-Frame	GR-Frame
Ampere Rating	20 – 2500 A	800 – 2500 A	800 – 2500 A
Interrupting Rating at 415 V	40, 50, 70, 100 kA	70, 100 kA	70, 100 kA

Trip Unit Sensing			
rms Sensing	Yes	Yes	Yes

Protection and Coordination				
Protection	Ordering Options	LSI, LSIG	LSI, LSIG	
	Fixed Rating Plug (I_n) ^①	Yes	Yes	
	Overtemperature Trip	Yes	Yes	
Long Delay	Adjustable Rating Plug (I_n) ^①	Yes	No	
	Long Delay Setting	0.5 – 1.0 (I_n) ^②	0.5 – 1.0 x (I_n)	0.5 – 1.0 x (I_n)
	Long Delay Time I^2t at 6x	10 Seconds ^②	2 – 24 Seconds	2 – 24 Seconds
	Long Delay Thermal Memory	Yes	Yes	Yes
	High Load Alarm	No	0.85 x I_r	0.85 x I_r
Short Delay	Short Delay Setting	200 – 800% x (I_n) ^③	200 – 600% S1 & S2 x (I_r)	200 – 600% S1 & S2 x (I_r)
	Short Delay Time I^2t	No	100, 300, 500 ms	100, 300, 500 ms
	Short Delay Time Flat	1 – 300 ms	100 – 500 ms	100 – 500 ms
	Short Delay Time ZSI	No	Yes	Yes
Instantaneous	Instantaneous Setting	200 – 800% x (I_n) ^④	200 – 600% M1 & M2 x (I_n)	200 – 600% M1 & M2 x (I_n)
	Discriminator	No	Yes	Yes
	Instantaneous Override	Yes	Yes	Yes
Earth Fault	Earth Fault Setting	Var/Frame ^⑤	25 – 100% x (I_n) ^⑤	25 – 100% x (I_n) ^⑤
	Earth Fault Delay I^2t at 62x	No	100, 300, 500 ms	100, 300, 500 ms
	Earth Fault Delay Flat	1 – 500 ms ^⑥	100 – 500 ms	100 – 500 ms
	Earth Fault ZSI	No	Yes	Yes
	Earth Fault Thermal Memory	No	Yes	Yes

System Diagnostics			
Cause of Trip LEDs	No	Yes	Yes
Magnitude of Trip Information	No	Yes	Yes
Remote Signal Contacts	No	Yes	Yes

System Monitoring			
Digital Display	No	Yes	Yes
Current	No	Yes	Yes
Voltage	No	No	Yes
Power and Energy	No	No	Yes
Power Quality — Harmonics	No	No	Yes
Power Factor	No	No	Yes

System Communications			
PowerNet	No	No	Yes

Field Testing			
Testing Method	Test Set	Integral	Integral

① GJ- and GL-Frames have selectable settings instead of a rating plug.

② GJ- and GL-Frames have adjustable long delay times of 2 – 24 seconds.

③ 2500 ampere GR-Frame 200 – 600% x (I_n).

④ GJ-Frame also has a 14X setting.

⑤ Not to exceed 1250 amperes.

⑥ GJ- and GL-Frames are Instantaneous, 120 ms. GN- and GR-Frames are Instantaneous, 100, 300 and 500 ms.

Note: I_n = Rating plug rating.
 I_r = Long delay setting.

GE-Frame, 160 Amperes — Selection Guide & Ordering Information



Table 5. Complete Circuit Breaker — Incl. Frame, Trip Unit, Standard Terminals and Mounting Hardware

Maximum Continuous Ampere Rating at 40°C	1-Pole		2-Pole		3-Pole	
	Fixed Thermal, Fixed Magnetic		Fixed Thermal, Fixed Magnetic		Fixed Thermal, Fixed Magnetic	
Breaking Capacity 18 kA at 240 Vac			Breaking Capacity 18 kA at 415 Vac			
16	GEB1016FFG		GEB2016FFG		GEB3016FFG	
20	GEB1020FFG		GEB2020FFG		GEB3020FFG	
32	GEB1032FFG		GEB2032FFG		GEB3032FFG	
40	GEB1040FFG		GEB2040FFG		GEB3040FFG	
50	GEB1050FFG		GEB2050FFG		GEB3050FFG	
63	GEB1063FFG		GEB2063FFG		GEB3063FFG	
80	GEB1080FFG		GEB2080FFG		GEB3080FFG	
100	GEB1100FFG		GEB2100FFG		GEB3100FFG	
125	GEB1125FFG		GEB2125FFG		GEB3125FFG	
Breaking Capacity 25 kA at 240 Vac			Breaking Capacity 25 kA at 415 Vac			
16	GEE1016FFG				GEE3016FFG	
20	GEE1020FFG				GEE3020FFG	
32	GEE1032FFG				GEE3032FFG	
40	GEE1040FFG				GEE3040FFG	
50	GEE1050FFG				GEE3050FFG	
63	GEE1063FFG				GEE3063FFG	
80	GEE1080FFG				GEE3080FFG	
100	GEE1100FFG				GEE3100FFG	
125	GEE1125FFG				GEE3125FFG	

Maximum Continuous Ampere Rating at 40°C ④	3-Pole		4-Pole ①		
	Adjustable Thermal, Fixed Magnetic		Thermal Range (A)	Adjustable Thermal, Fixed Magnetic	Thermal Range (A)
Breaking Capacity 40 kA at 415 Vac					
20	GES3020AFG		16 – 20	GES4020AFG	
25	GES3025AFG		20 – 25	GES4025AFG	
32	GES3032AFG		25 – 32	GES4032AFG	
40	GES3040AFG		32 – 40	GES4040AFG	
50	GES3050AFG		40 – 50	GES4050AFG	
63	GES3063AFG		50 – 63	GES4063AFG	
80	GES3080AFG		63 – 80	GES4080AFG	
100	GES3100AFG		80 – 100	GES4100AFG	
125	GES3125AFG		100 – 125	GES4125AFG	
160	GES3160AFG		160 – 125	GES4160AFG	
Breaking Capacity 70 kA at 415 Vac					
20	GEH3020AFG		16 – 20	GEH4020AFG	
25	GEH3025AFG		20 – 25	GEH4025AFG	
32	GEH3032AFG		25 – 32	GEH4032AFG	
40	GEH3040AFG		32 – 40	GEH4040AFG	
50	GEH3050AFG		40 – 50	GEH4050AFG	
63	GEH3063AFG		50 – 63	GEH4063AFG	
80	GEH3080AFG		63 – 80	GEH4080AFG	
100	GEH3100AFG		80 – 100	GEH4100AFG	
125	GEH3125AFG		100 – 125	GEH4125AFG	

① Neutral protection is indicated by the fourth character: 4=0%, 7=100%. Neutral pole on left side.

Table 6. Moulded Case Switches

Ampere Rating	Number of Poles	Catalogue Number	Number of Poles	Catalogue Number
100	3	GEK3100KSG	4	GEK4100KSG
125	3	GEK3125KSG	4	GEK4125KSG
160	3	GEK3160KSG	4	GEK4160KSG

Series G Frame Size GE, 160 Amperes

Line and Load Terminals

GE-Frame circuit breakers and moulded case switches have 3T125EF line and load terminals as standard equipment.

Table 7. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	Metric Wire Range mm ²	AWG Wire Range	Catalogue Number Package of 3 Terminals
Standard Cu/Al Pressure Type Terminals					
125	Steel	Cu/Al	2.5-70	#14-3/0	3T125EF ①
125	Aluminium	Cu/Al	2.5-50	#14-1/0	3TA125EF
125	Aluminium	Cu/Al	16-70	#6-3/0	3TA150EF
160	Aluminium	Cu/Al	35-120	#3-250	3TA160EFK ②
160	Aluminium	Cu/Al	35-120	#3-250	4TA160EFK ③

① Standard line and load terminals included with GE-Frame MCCBs.

② 3 terminals with terminal shield.

③ 4 terminals with terminal shield.

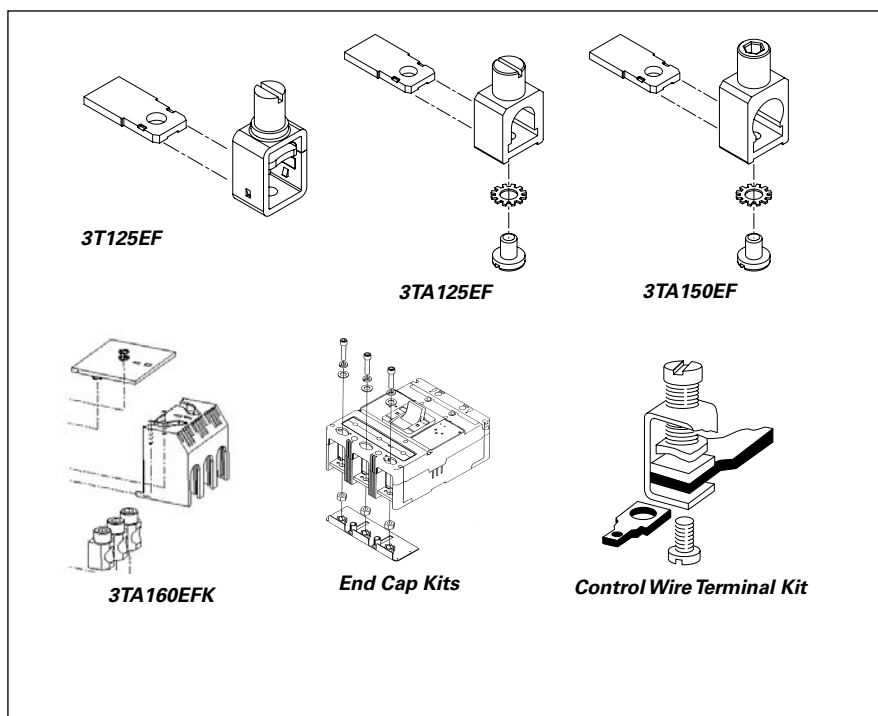


Figure 2. Line and Load Terminals, End Cap Kits and Control Wire Terminal Kit

Insert collar enclosing conductor as shown in **Figure 2**. Locate nut on top of conductor and tighten securely with screw and washer.

Caution: Collar must surround conductor.

Insert collar enclosing conductor and centre on extrusion. Tighten securely with screw and washer.

Control Wire Terminal Kit

For use with steel or stainless steel terminals only.

Note: Standard line and load terminals included with GE-Frame MCCBs.

End Cap Kits – for Line or Load

Kits are used on GE Frame breaker line side to connect bus bar or similar electrical connections. Includes hardware.

Table 8. End Cap Kits

Number of Poles	Catalogue Number
3	EF3RTWK
4	EF4RTWK

Add suffix 'M' to breaker catalogue number to include End Cap kit or order separately using above catalogue numbers.

Table 9. Control Wire Terminal Kit

Description	Catalogue Number
Package of 12 (Priced Individually)	EFCWTK

Interphase Barriers

The interphase barrier is available for extended insulation between circuit breaker poles. Specify quantity when ordering.

Table 10. Interphase Barriers

Description	Catalogue Number
Package of 1	EIPBK

Base Mounting Hardware

Base mounting hardware is included with a circuit breaker or moulded case switch. A DIN rail adapter is available.

Table 11. Base Mounting Hardware

DIN Rail Adapter	Catalogue Number
3- or 4-Pole	EF34DIN

Terminal Shields (IP30 Protection)

The terminal shield is available for 1-, 2-, 3- and 4-pole circuit breakers.

Table 12. Terminal Shields

Number of Poles	Catalogue Number
1P (Load end)	EFTS1KA
1P (Line end)	EFTS1KB
3	EFTS3K
4	EFTS4K

Terminal Extensions

Table 13. Terminal Extensions

Number of Poles	Catalogue Number
3	EFTES3
4	EFTES4

Terminal Spreaders

Table 14. Terminal Spreaders

Number of Poles	Catalogue Number
3	EFTEW3
4	EFTEW4

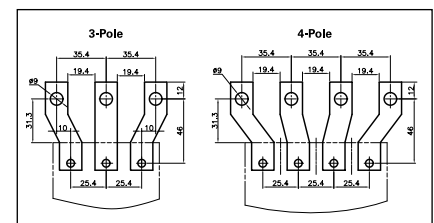


Figure 3. Terminal Spreaders

GJ-Frame, 250 Amperes — Selection Guide & Ordering Information



Table 15. Complete Circuit Breaker with Thermal-Magnetic Trip Unit — Incl. Frame, Thermal-Magnetic Trip Unit, Standard Box Clamp Terminals and Mounting Hardware ①

Maximum Continuous Ampere Rating at 40°C	Magnetic Range (A)	3-Pole		4-Pole	
		Adjustable Thermal Adjustable Magnetic ②	Thermal Range (A)	Adjustable Thermal Adjustable Magnetic ②	Thermal Range (A)
Breaking Capacity 40 kA at 415 Vac					
80	400 – 800	GJS3080AAG	64 – 80	GJS4080AAG	64 – 80
100	500 – 1000	GJS3100AAG	80 – 100	GJS4100AAG	80 – 100
125	625 – 1250	GJS3125AAG	100 – 125	GJS4125AAG	100 – 125
160	800 – 1600	GJS3160AAG	128 – 160	GJS4160AAG	128 – 160
200	1000 – 2000	GJS3200AAG	160 – 200	GJS4200AAG	160 – 200
250	1250 – 2500	GJS3250AAG	200 – 250	GJS4250AAG	200 – 250
Breaking Capacity 70 kA at 415 Vac					
80	400 – 800	GJH3080AAG	64 – 80	GJH4080AAG	64 – 80
100	500 – 1000	GJH3100AAG	80 – 100	GJH4100AAG	80 – 100
125	625 – 1250	GJH3125AAG	100 – 125	GJH4125AAG	100 – 125
160	800 – 1600	GJH3160AAG	128 – 160	GJH4160AAG	128 – 160
200	1000 – 2000	GJH3200AAG	160 – 200	GJH4200AAG	160 – 200
250	1250 – 2500	GJH3250AAG	200 – 250	GJH4250AAG	200 – 250

① Suffix “G” represents box clamp type terminals. Change “G” to “M” for screw/keeper nut type termination suitable for cable lug. See page 14.
② Neutral protection is indicated by the fourth character: 4 = 0%, 8 = adjustable 0 or 60% and 9 = 0 or 100%.

Table 16. Complete Circuit Breaker with Electronic Trip Unit — Incl. Frame, Electronic Trip Unit, Standard Box Clamp Terminals and Mounting Hardware ①②

Ampere Rating	LSI	LSIG ③	Neutral CT ③④ for LSG & LSIG	Ampere Rating	LSI	LSIG ③	Neutral CT ③④ for LSG & LSIG
3-Pole ⑤ — IC Rating: 40 kA at 415 Vac				3-Pole ⑤ — IC Rating: 70 kA at 415 Vac			
50	GJS305032G	GJS305036G	JGFCT050	50	GJH305032G	GJH305036G	JGFCT050
100	GJS310032G	GJS310036G	JGFCT100	100	GJH310032G	GJH310036G	JGFCT100
160	GJS316032G	GJS316036G	JGFCT160	160	GJH316032G	GJH316036G	JGFCT160
250	GJS325032G	GJS325036G	JGFCT250	250	GJH325032G	GJH325036G	JGFCT250
4-Pole ⑥ — IC Rating: 40 kA at 415 Vac				4-Pole ⑥ — IC Rating: 70 kA at 415 Vac			
50	GJS405032G	GJS405036G	JGFCT050	50	GJH405032G	GJH405036G	JGFCT050
100	GJS410032G	GJS410036G	JGFCT100	100	GJH410032G	GJH410036G	JGFCT100
160	GJS416032G	GJS416036G	JGFCT160	160	GJH416032G	GJH416036G	JGFCT160
250	GJS425032G	GJS425036G	JGFCT250	250	GJH425032G	GJH425036G	JGFCT250

① Suffix “G” represents box clamp type terminals. Change “G” to “M” for screw/keeper nut type termination suitable for cable lug. See page 14.
② For ac use only.
③ Neutral CT for LSG and LSIG applied to 4-wire applications must be ordered as a separate item.
④ Required for 4-wire systems if neutral protection is desired.
⑤ For 2-pole applications, use two outer poles.
⑥ Neutral protection 4 = 0%, 6 = 60%, 7 = 100% electronic trip unit neutral protection is not adjustable. Neutral pole on left side.

Note: Long time pick up — no rating plug.
250 Ampere Settings — 250, 200, 160, 125, 100.
160 Ampere Settings — 160, 125, 100, 80, 63.
100 Ampere Settings — 100, 80, 63, 50, 40.
50 Ampere Settings — 50, 40, 32, 25, 20.

Note: Adjustable long time delay — 2 – 24 seconds at 6 x I_r.
Adjustable short time delay — Inst., 120, 300 ms.

Table 17. Moulded Case Switches ①

Ampere Rating	Number of Poles	Catalogue Number
160	3	GJK3160KSG
	4	GJK4160KSG
200	3	GJK3200KSG
	4	GJK4200KSG
250	3	GJK3250KSG
	4	GJK4250KSG

① Suffix “G” represents box clamp type terminals. Change “G” to “M” for screw/keeper nut type termination suitable for cable lug.

Series G Frame Size GJ, 250 Amperes

Line and Load Terminals

GJ-Frame circuit breakers include Cu/Al terminals T250FJ as standard. When optional copper only terminals are required, order by catalogue number.

Table 18. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	Metric Wire Range mm ²	AWG Wire Range/Number of Conductors	Catalogue Number
250	Stainless Steel	Cu	25 – 185	#4 – 350 (1)	T250FJ ①②
250	Aluminium	Cu/Al	25 – 185	#4 – 350 (1)	TA250FJ ①

① Single terminals individually packed.
② Standard line and load terminals.

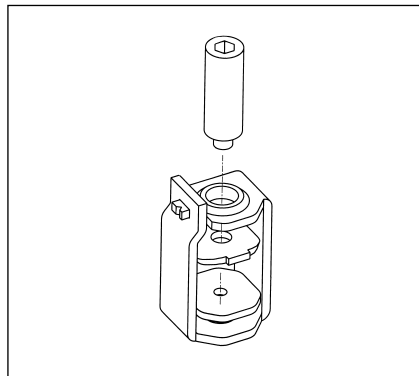


Figure 4. Standard Pressure Type Terminal T250FJ

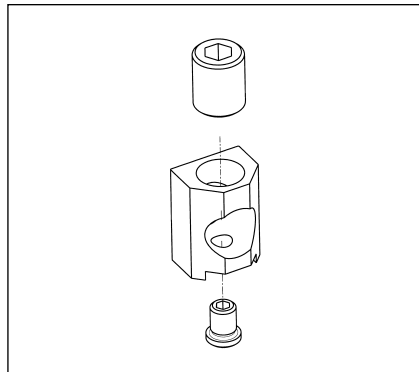


Figure 5. Standard and Optional Pressure Type Terminal TA250FJ/TC250FJ

Control Wire Terminal Kit

For use with aluminium or copper terminals only.

Table 19. Control Wire Terminal Kit

Description	Catalogue Number
Package of 14 (Priced Individually)	FJCWTK

Base Mounting Hardware

Base mounting hardware is included with a circuit breaker or moulded case switch.

Table 20. Terminal Shields IP30

Location	Number of Poles	Catalogue Number
Line or Load	3	FJTS3K
	4	FJTS4K

Table 21. Interphase Barriers

Number of Poles	Catalogue Number
3 (pack of 2)	FJIPBK
4 (pack of 3)	FJIPBK4

End Cap Kit

End cap kits are used on GJ-Frame breaker line side to connect bus bar or similar electrical connections. Includes hardware.

Table 22. Kit Catalogue Number — for Line or Load

Number of Poles	Catalogue Number
3	FJ3RTWK
4	FJ4RTWK

Note: Add suffix "M" to Breaker catalogue number to include End Cap kit or order separately using above catalogue numbers.

Terminal Extensions

Table 23. Terminal Extensions

Number of Poles	Catalogue Number
3	FJTES3
4	FJTES4

Plug-in test kit



Digitrip 310+ Test Kit



Digitrip 310+ Test Kit Shown with GJ MCCB



GJ Digitrip 310+ Electronic Trip Unit

Table 24. Plug-in test kit

Voltage	Catalogue Number
120 Vac	MTST120V
230 Vac	MTST230V

Terminal Spreaders

Table 25. Terminal Spreaders

Number of Poles	Catalogue Number
3	FJTEW3
4	FJTEW4

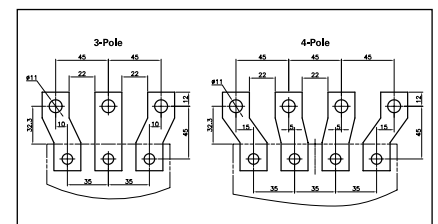


Figure 6. Terminal Spreaders

GL-Frame, 630 Amperes — Selection Guide & Ordering Information



Table 26. Complete Circuit Breaker — Incl. Frame, Thermal Magnetic Trip Unit, Standard Box Clamp Terminals & Mounting Hardware ①

Maximum Continuous Ampere Rating at 40°C	Magnetic Range (A)	3-Pole ②	Thermal Range (A)	4-Pole (0%) ③	Thermal Range (A)
		Adj. Thermal Adj. Magnetic		Adj. Thermal Adj. Magnetic	
Breaking Capacity 50 kA at 415 Vac					
250	1250-2500	GLS3250AAG	200-250	GLS4250AAG	200-250
320	1600-3200	GLS3320AAG	250-320	GLS4320AAG	250-320
400	2000-4000	GLS3400AAG	320-400	GLS4400AAG	320-400
500	2500-5000	GLS3500AAG	400-500	GLS4500AAG	400-500
630	3150-6300	GLS3630AAG	500-630	GLS4630AAG	500-630
Breaking Capacity 70 kA at 415 Vac					
250	1250-2000	GLH3250AAG	200-250	GLH4250AAG	200-250
320	1600-3200	GLH3320AAG	250-320	GLH4320AAG	250-320
400	2000-4000	GLH3400AAG	320-400	GLH4400AAG	320-400
500	2500-5000	GLH3500AAG	400-500	GLH4500AAG	400-500
630	3150-6300	GLH3630AAG	500-630	GLH4630AAG	500-630

- ① Suffix "G" represents box clamp type terminals. Change "G" to "M" for screw/keeper nut type termination suitable for cable lug. See page 16.
- ② For 2-pole applications, use two outer poles.
- ③ Neutral protection is indicated by the fourth character: 4 = 0%, 7 = 100%, 8 = adjustable 0 – 60% and 9 = 0 – 100%.

Table 27. Complete Circuit Breaker with Electronic Trip Unit — Incl. Frame, Electronic Trip Unit, Standard Box Clamp Terminals & Mounting Hardware ①②

Maximum Continuous Ampere Rating at 40°C	LSI	LSIG	Neutral CT for LSG & LSIG ③④
3-Pole ⑤ — Breaking Capacity 50 kA at 415 Vac			
250	GLS325032G	GLS325036G	LGFACT250
400	GLS340032G	GLS340036G	LGFACT400
630 ④	GLS363032G	GLS363036G	LGFACT630
4-Pole ⑥ — Breaking Capacity 50 kA at 415 Vac			
250	GLS425032G	GLS425036G	LGFACT250
400	GLS440032G	GLS440036G	LGFACT400
630 ④	GLS463032G	GLS463036G	LGFACT630
3-Pole ⑤ — Breaking Capacity 70 kA at 415 Vac			
250	GLH325032G	GLH325036G	LGFACT250
400	GLH340032G	GLH340036G	LGFACT400
630 ④	GLH363032G	GLH363036G	LGFACT630
4-Pole ⑥ — Breaking Capacity 70 kA at 415 Vac			
250	GLH425032G	GLH425036G	LGFACT250
400	GLH440032G	GLH440036G	LGFACT400
630 ④	GLH463032G	GLH463036G	LGFACT630

- ① Suffix "G" represents box clamp type terminals. Change "G" to "M" for screw/keeper nut type termination suitable for cable lug. See page 16.
- ② For ac use only.
- ③ Neutral CT for LSG and LSIG applied to 4-wire applications must be ordered as a separate item.
- ④ Required for 4-wire systems if neutral protection is desired.
- ⑤ For 2-pole applications, use two outer poles.
- ⑥ Neutral protection 4 = 0%, 6 = 60%, 7 = 100% electronic trip unit neutral protection is not adjustable. Neutral pole on left side.

Table 28. Moulded Case Switches

Ampere Rating	Number of Poles	Catalogue Number ①
250	3	GLK3250KSG
	4	GLK4250KSG
320	3	GLK3320KSG
	4	GLK4320KSG
400	3	GLK3400KSG
	4	GLK4400KSG
630	3	GLK3630KSG
	4	GLK4630KSG

Plug-in test kit



Digitrip 310+ Test Kit

Table 29. Plug-in test kit

Voltage	Catalogue Number
120 Vac	MTST120V
230 Vac	MTST230V

Note: Long time pick up—no rating plug needed.
630 Ampere Settings—630, 600, 500, 400, 350, 315, 300, 250 (315, 630 are IEC ratings only). 400 Ampere Settings—400, 350, 315, 300, 250, 225, 200, 160 (315 is IEC rating only).
250 Ampere Settings—250, 225, 200, 175, 160, 150, 125, 100 (160 is IEC rating only).

Note: Adjustable long time delay — 2 – 24 seconds at 6 x I_r.
Adjustable short time delay — Inst., 120, 300 ms.

Series G Frame Size GL, 630 Amperes

Line and Load Terminals

Table 30. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/ Number of Conductors	Metric Wire Range (mm ²)	Number of Terminals Included	Catalogue Number
400	Aluminium	Cu/Al	2 – 500 (1)	35 – 240 (1)	3	3TA400UK ①
400	Aluminium	Cu/Al	2 – 500 (1)	35 – 240 (1)	4	4TA400UK ①
630	Aluminium	Cu/Al	2 – 500 (2)	35 – 240 (2)	3	3TA632LK ②③
630	Aluminium	Cu/Al	2 – 500 (2)	35 – 240 (2)	4	4TA632LK ②③
630	Copper	Cu	2 – 500 (2)	35 – 240 (2)	3	3T632LK ③
630	Copper	Cu	2 – 500 (2)	35 – 240 (2)	4	4T632LK ③

① Standard terminal included with complete breaker up to 400A.

② Standard terminal included with complete breaker 630A.

③ Includes LTS3K (3-pole) or LTS4k (4-pole) terminal covers.

Table 31. Terminal Covers

Description	Catalogue Number
3-Pole Terminal Cover ④	LTS3K
4-Pole Terminal Cover ④	LTS4K

④ Included in TA631L, T631L, TA632L kits listed above.

Table 32. End Cap Kits

Number of Poles	Catalogue Number ①
3	L3RTWK
4	L4RTWK

① Add suffix "M" to Breaker catalogue number to include End Cap kit or order separately using these catalogue numbers.

Table 33. Terminal Spreaders

Number of Poles	Catalogue Number
3	LGTEW3
4	LGTEW4

Table 34. Terminal Extensions

Number of Poles	Catalogue Number
3	LGTES3
4	LGTES4

Table 35. Interphase barriers

Description	Catalogue Number
3 (pack of 2)	IPB3
4 (pack of 3)	IPB34

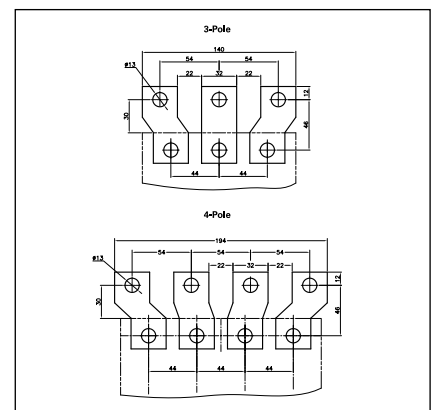


Figure 7. Terminal Spreaders

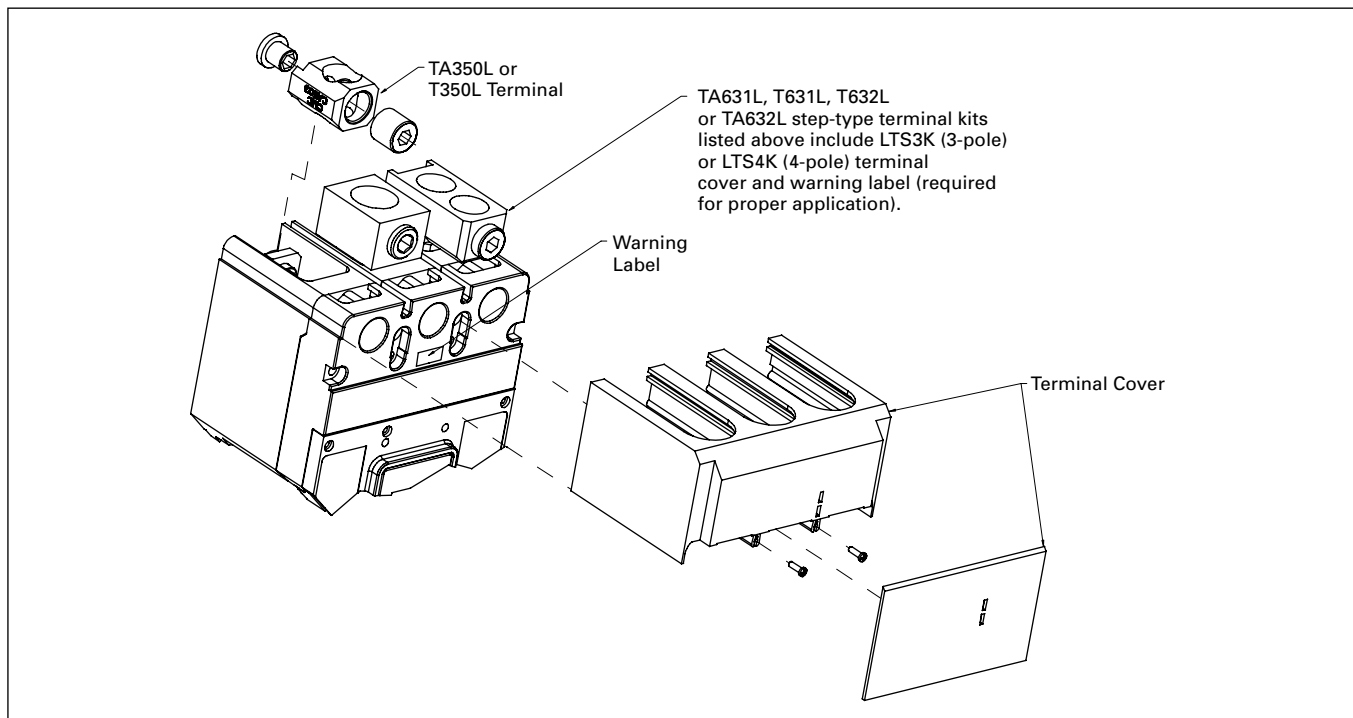


Figure 8. Terminals and Terminal Cover for the GL Breaker — Includes LTS3K (3-Pole) or LTS4K (4-Pole) Terminal Covers

Note: Extended terminal covers add 54.0 mm to breaker length.

GN-Frame, 1250 Amperes — Selection Guide and Ordering Information



Table 36. Type GNS Standard Interrupting Capacity — U_e Max. 690 Vac, 50 kA I_{CU} at 415 Vac

Maximum Continuous Ampere Rating at 40°C ①②	Number of Poles	Circuit Breaker Frame Including Digitrip RMS 310 Electronic Trip Unit with Adjustable Rating Plugs — Catalogue Number ③		Interchangeable Rating Plugs (Order as Individual Component)		Included with Breaker as standard
		L – Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I^2t Response) or Adjustable Short Delay Time (Flat Response) I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G – Adjustable Earth Fault Pickup with Adjustable Earth Fault Delay (Flat Response)				
		LSI	LSIG	Fixed Rating Plug	Adj. Rating Plug	
Short Time Range Short Time Delay Earth Fault Pickup Earth Fault Delay		2 – 8 x I_n 1 – 300 ms — —	2 – 8 x I_n 1 – 300 ms 200 – 1200 A 1 – 500 ms	Ampere Rating	Catalogue Number	Adjustable Ampere Settings Catalogue Number
800	3-Pole	GNS3800T32WP19	GNS3800T36WP19	400 450 500 550 600 630 700 800	8NES400T 8NES450T 8NES500T 8NES550T 8NES600T 8NES630T 8NES700T 8NES800T	400/500/630/800 A8NES800T2
	4-Pole⑥	GNS4800T32WP19	—	400 450 500 550 600 630 700 800	8NES400T 8NES450T 8NES500T 8NES550T 8NES600T 8NES630T 8NES700T 8NES800T	400/500/630/800 A8NES800T2
1250	3-Pole	GNS312T32WP09	GNS312T36WP09 ⑤	600 630 700 800 900 1000 1200	12NES600T 12NES630T 12NES700T 12NES800T 12NES900T 12NES1000T 12NES1200T	630/800/ 1000/1250 A12NES12T2
	4-Pole⑥	GNS412T32WP09	—	600 630 700 800 900 1000 1200	12NES600T 12NES630T 12NES700T 12NES800T 12NES900T 12NES1000T 12NES1200T	630/800/ 1000/1250 A12NES12T2

① For ac use only.

② GN MCCBs are suitable for 40°C or 50°C applications.

③ Order terminals separately. See page 20

Note: Rating plugs included with above MCCBs.

Table 37. Moulded Case Switches ④⑤

Ampere Rating	Number of Poles	U_e Max. 690 Vac Catalogue Number	
800	3-Pole	GNKS3800KSW	MCS Only without Line and Load Terminals
	4-Pole	GNKS4800KSW	MCS Only without Line and Load Terminals
1250	3-Pole	GNKS312KSW	MCS Only without Line and Load Terminals
	4-Pole	GNKS412KSW	MCS Only without Line and Load Terminals

④ For ac use only.

⑤ For 2-pole applications, use outer poles of 3-pole moulded case switch.

⑥ Neutral pole on right side.

Series G Frame Size GN, 1250 Amperes 70 kA at 415 Vac

Table 38. Type GNH High Interrupting Capacity — U_e Max. 690 Vac, 70 kA I_{cu} at 415 Vac

Maximum Continuous Ampere Rating at 40°C ①②	Number of Poles	Circuit Breaker Frame Including Digitrip RMS 310 Electronic Trip Unit with Adjustable Rating Plugs — Catalogue Number ③		Interchangeable Rating Plugs (Order as Individual Component)		Included with Breaker as standard	
		L – Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I^2t Response) or Adjustable Short Delay Time (Flat Response) I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G – Adjustable Earth Fault Pickup with Adjustable Earth Fault Delay (Flat Response)		Fixed Rating Plug			
Short Time Range Short Time Delay Earth Fault Pickup Earth Fault Delay		LSI	LSIG	Ampere Rating	Catalogue Number	Adjustable Ampere Settings Catalogue Number	
800	3-Pole	GNH3800T32WP19	GNH3800T36WP19	400	8NES400T	400/500/630/800 A8NES800T2	
				450	8NES450T		
	500	8NES500T					
	550	8NES550T					
4-Pole④	GNH4800T32WP19	—	—	600	8NES600T	400/500/630/800 A8NES800T2	
				630	8NES630T		
	700	8NES700T					
	800	8NES800T					
1250	3-Pole	GNH312T32WP09	GNH312T36WP09	600	12NES600T	630/800/ 1000/1250 A12NES12T2	
				630	12NES630T		
				700	12NES700T		
				800	12NES800T		
	4-Pole④	GNH412T32WP09	—	—	900	12NES900T	630/800/ 1000/1250 A12NES12T2
					1000	12NES1000T	
					1200	12NES1200T	
					600	12NES600T	
				630	12NES630T		
				700	12NES700T		
				800	12NES800T		
				900	12NES900T		
				1000	12NES1000T		
				1200	12NES1200T		

① For ac use only.

② GN MCCBs are suitable for 40°C or 50°C applications.

③ Order terminals separately. See page 20.

④ Neutral pole on right side.

Note: Rating plugs included with above MCCBs.

Table 39. Type GNC Very High Capacity — U_e Max. 690 Vac, 100 kA I_{cu} at 415 Vac

Maximum Continuous Ampere Rating at 40°C ①②	Number of Poles	Circuit Breaker Frame Including Digitrip RMS 310 Electronic Trip Unit with Adjustable Rating Plugs — Catalogue Number ③		Interchangeable Rating Plugs (Order as Individual Component)		Included with Breaker			
		L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)	S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I^2t Response) or Adjustable Short Delay Time (Flat Response)	I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous	G – Adjustable Earth Fault Pickup with Adjustable Earth Fault Delay (Flat Response)		Fixed Rating Plug	Adjustable Rating Plug	
Short Time Range	Short Time Delay	Earth Fault Pickup	Earth Fault Delay	LSI	LSIG	Ampere Rating	Catalogue Number	Adjustable Ampere Settings Catalogue Number	
800	3-Pole	GNC3800T32WP19	GNC3800T36WP19	2 – 8 x I_n 1 – 300 ms	2 – 8 x I_n 1 – 300 ms 200 – 1200 A 1 – 500 ms	400	8NES400T	400/500/630/800 A8NES800T2	
						450	8NES450T		
	500	8NES500T							
	550	8NES550T							
800	4-Pole④	GNC4800T32WP19	—	—	—	600	8NES600T	400/500/630/800 A8NES800T2	
						630	8NES630T		
	700	8NES700T							
	800	8NES800T							
1250	3-Pole	GNC312T32WP09	GNC312T36WP09	2 – 8 x I_n 1 – 300 ms	2 – 8 x I_n 1 – 300 ms 200 – 1200 A 1 – 500 ms	600	12NES600T	630/800/ 1000/1250 A12NES12T2	
						630	12NES630T		
						700	12NES700T		
						800	12NES800T		
	1250	4-Pole④	GNC412T32WP09	—	—	—	900	12NES900T	630/800/ 1000/1250 A12NES12T2
							1000	12NES1000T	
		1200	12NES1200T						
		600	12NES600T						
1250	4-Pole④	GNC412T32WP09	—	—	—	630	12NES630T	630/800/ 1000/1250 A12NES12T2	
						700	12NES700T		
	800	12NES800T							
	900	12NES900T							
1250	4-Pole④	GNC412T32WP09	—	—	—	1000	12NES1000T	630/800/ 1000/1250 A12NES12T2	
						1200	12NES1200T		

① For ac use only.
 ② GN MCCBs are suitable for 40°C or 50°C applications.
 ③ Order terminals separately. See page 20.
 ④ Neutral Pole on right side.

Note: Rating plugs included with above MCCBs.

Series G Frame Size GN, 1600 Amperes 50 kA at 415 Vac

Table 40. Type GNS Standard Interrupting Capacity — U_e Max. 690 Vac, 50 kA I_{cu} at 415 Vac

Maximum Continuous Ampere Rating at 40°C ①②	Number of Poles	Circuit Breaker Frame Including Digitrip RMS 310 Electronic Trip Unit and Rating Plugs		Adjustable Rating Plug
		LSI	LSIG	
		L – Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I^2t Response) or Adjustable Short Delay Time (Flat Response) I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G – Adjustable Earth Fault Pickup with Adjustable Earth Fault Delay (Flat Response)		
Short Time Range Short Time Delay Earth Fault Pickup Earth Fault Delay		2 – $8 \times I_n$ 1 – 300 ms — —	2 – $8 \times I_n$ 1 – 300 ms 200 – 1200 A 1 – 500 ms	
1600	3-Pole 4-Pole	GNS316T32WP35 GNS416T32WP35	GNS316T36WP35 —	800/1000/1250/1600

① For ac use only.

② GN MCCBs are suitable for 40°C or 50°C applications.

Note: Rating plugs included with above MCCBs.

Line and Load Terminals

N-Frame circuit breakers do not include terminals as standard. When copper or Cu/Al terminals are required, order by catalogue number.

Table 41. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	Metric Wire Range mm ²	AWG Wire Number of Conductors	Catalogue Number ③
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Standard Cu/Al Pressure-Type Terminals

1250 ④	Aluminium	Cu/Al	120 – 300	4/0 – 500 (3)	TA1200NB3M
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Optional Copper and Cu/Al Pressure Type Terminals

1250 ④	Copper	Copper	95 – 185	3/0 – 400 (4)	T1200NB3M
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③ Single terminals individually packed.

④ Not suitable with 1600 ampere frame version.

Terminal Extensions

Table 42. Terminal Extensions

Maximum Breaker Amperes	Number of Poles	Catalogue Number
800	3	GN8TES3
800	4	GN8TES4
1600	3	GN16TES3
1600	4	GN16TES4

Base Mounting Hardware

Base mounting hardware is included with a circuit breaker or moulded case switch.

Table 43. Base Mounting Hardware

Number of Poles	Description	Catalogue Number
3- & 4-pole	Metric Hardware: M8 Pan-Head Steel Screws and Lock Washers	BMH5M

Keeper Nut

Not required on N-Frame. Terminals are threaded.

Handle Extension

Included with breaker. Additional handle extensions are available.

Table 44. Handle Extension

Description	Catalogue Number
Single Handle Extension	HEX5

Interphase Barriers

The interphase barriers provide additional electrical clearance between circuit breaker poles for special termination applications. Barriers are high dielectric insulating plates that are installed in the moulded slots between the terminals. (Field installation only.)

Table 45. Interphase Barriers

Number of Poles	Catalogue Number
3 (pack of 2)	IPB5
4 (pack of 3)	IPB54

GR-Frame, 2500 Amperes — Selection Guide and Ordering Information



Table 46. Type GRH with Digitrip 310 High Interrupting Capacity — U_e Max. 690 Vac, 70 kA I_{CU} at 415 Vac

Maximum Continuous Ampere Rating at 40°C ①	Number of Poles	Circuit Breaker Frame Including Digitrip RMS 310 Electronic Trip Unit with Adjustable Rating Plugs — Catalogue Number ②		Interchangeable Rating Plugs (Order as Individual Component)		Included with Breaker as standard
		L – Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I^2t Response) or Adjustable Short Delay Time (Flat Response) I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G – Adjustable Earth Fault Pickup with Adjustable Earth Fault Delay (Flat Response)				
		LSI	LSIG	Fixed Rating Plug		Adjustable Rating Plug
Short Time Range Short Time Delay Earth Fault Pickup Earth Fault Delay		2 – 8 x I_n I – 300 ms — —	2 – 8 x I_n I – 300 ms 200 – 1200 A I – 500 ms	Ampere Rating	Catalogue Number	Adjustable Ampere Settings Catalogue Number
1600 ①	3-Pole	GRH316T32WP08	GRH316T36WP08	800	16RES08T	800/1000/ 1250/1600 A16RES16T1
				1000	16RES10T	
				1200	16RES12T	
				1250	16RES125T	
				1400	16RES14T	
				1500	16RES15T	
				1600	16RES16T	
2000		GRH320T32WP16	GRH320T36WP16	1000	20RES10TA	1000/1250/ 1600/2000 A20RES20T1
				1200	20RES12T	
				1250	20RES125T	
				1400	20RES14T	
				1600	20RES16T	
				2000	20RES20T	
2500		GRH325T32WP39	GRH325T36WP39	1200	25RES12T	1250/1600/ 2000/2500 A25RES25T1
				1250	25RES125T	
				1600	25RES16T	
				2000	25RES20T	
				2500	25RES25T	
1600 ①	4-Pole ③	GRH416T32WP08	—	800	16RES08T	800/1000/ 1250/1600 A16RES16T1
				1000	16RES10T	
				1200	16RES12T	
				1250	16RES125T	
				1400	16RES14T	
				1500	16RES15T	
				1600	16RES16T	
2000		GRH420T32WP16	—	1000	20RES10TA	1000/1250/ 1600/2000 A20RES20T1
				1200	20RES12T	
				1250	20RES125T	
				1400	20RES14T	
				1600	20RES16T	
				2000	20RES20T	
2500		GRH425T32WP39	—	1250	25RES125T	1250/1600/ 2000/2500 A25RES25T1
				1200	25RES12T	
				1600	25RES16T	
				2000	25RES20T	
				2500	25RES25T	

① For SCR application, use 2000 ampere frame.

② Order terminals separately. Mounting hardware not included. See page 24.

③ Neutral pole on right side.

Note: Rating plugs included with above MCCBs.

Series G Frame Size GR, 2500 Amperes 100 kA at 415 Vac — Digitrip 310 Trip Unit

Table 47. Type GRC with Digitrip 310 Very High Interrupting Capacity — U_e Max. 690 Vac, 100 kA I_{cu} at 415 Vac

Maximum Continuous Ampere Rating at 40°C ^①	Number of Poles	Circuit Breaker Frame Including Digitrip RMS 310 Electronic Trip Unit with Adjustable Rating Plugs — Catalogue Number ^②		Interchangeable Rating Plugs (Order as Individual Component)		Included with Breaker ^②
		L – Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I^2t Response) or Adjustable Short Delay Time (Flat Response) I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G – Adjustable Earth Fault Pickup with Adjustable Earth Fault Delay (Flat Response)		Fixed Rating Plug		
Short Time Range Short Time Delay Earth Fault Pickup Earth Fault Delay		LSI	LSIG	Ampere Rating	Catalogue Number	Adjustable Ampere Settings Catalogue Number
1600 ^①	3-Pole	GRC316T32WP08	GRC316T36WP08	800	16RES08T	800/1000/ 1250/1600 A16RES16T1
				1000	16RES10T	
				1250	16RES125T	
				1400	16RES14T	
				1500	16RES15T	
				1600	16RES16T	
2000	3-Pole	GRC320T32WP16	GRC320T36WP16	1000	20RES10TA	1000/1250/ 1600/2000 A20RES20T1
				1250	20RES125T	
				1400	20RES14T	
				1600	20RES16T	
				2000	20RES20T	
1600 ^①	4-Pole ^③	GRC416T32WP08	—	800	16RES08T	800/1000/ 1250/1600 A16RES16T1
				1000	16RES10T	
				1250	16RES125T	
				1400	16RES14T	
				1500	16RES15T	
				1600	16RES16T	
2000	4-Pole ^③	GRC420T32WP16	—	1000	20RES10TA	1000/1250/ 1600/2000 A20RES20T1
				1250	20RES125T	
				1400	20RES14T	
				1600	20RES16T	
				2000	20RES20T	

① For SCR application, use 2000 ampere frame.

② Order terminals separately. Mounting hardware not included. See page 24.

③ Neutral pole on right side.

Note: Rating plugs included with above MCCBs.

Table 48. Moulded Case Switches

Ampere Rating	Number of Poles	Catalogue Number
1600 2000	3-Pole	GRK316WK GRK320WK
1600 2000	4-Pole	GRK416WK GRK420WK

Table 49. Type GR with Digitrip 610 and 910

Maximum Continuous Ampere Rating at 40°C	Number of Poles	Circuit Breaker Frame Including Digitrip RMS 610 and 910 Electronic Trip Unit with Rating Plugs Order as Individual Component — Catalogue Number ①		Digitrip RMS Interchangeable Rating Plug (Order as Individual Component)	
		LSI	LSIG	Fixed Rating Plug	
		L – Adjustable Long Delay Pickup (I_r) with Adjustable Long Delay Time S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I^2t or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Earth Fault Pickup with Adjustable Earth Fault Time Delay (I^2t or Flat Response)		Ampere Rating	Catalogue Number
Long Delay Pickup		0.5 – 1.0 x I_n	0.5 – 1.0 x I_n		
Long Delay Time		2 – 24 Seconds	2 – 24 Seconds		
Short Time Range		2 – 6 x I_r	2 – 6 x I_r		
Short Time Delay		100 – 500 ms	100 – 500 ms		
Instantaneous		2 – 6 x M1 & M2	2 – 6 x M1 & M2		
Earth Fault Pickup		—	0.25 – 1.0 x I_n ②		
Earth Fault Delay		—	100 – 500 ms		
Type GRH with Digitrip 610 High Interrupting Capacity — U_e Max. 690 Vac, 70 kA I_{cu} at 415 Vac					
1600	3-Pole	GRH316T62WP44	GRH316T66WP44	800 1000 1250 1600	RP6R16A080 RP6R16A100 RP6R16A125 RP6R16A160
2000		GRH320T62WP49	GRH320T66WP49	1000 1250 1600 2000	RP6R20A100 RP6R20A125 RP6R20A160 RP6R20A200
2500		GRH325T62WP53	GRH325T66WP53	1600 2000 2500	RP6R25A160 RP6R25A200 RP6R25A250
Type GRC with Digitrip 610 Very High Interrupting Capacity — U_e Max. 690 Vac, 100 kA I_{cu} at 415 Vac					
1600	3-Pole	GRC316T62WP44	GRC316T66WP44	800 1000 1250 1600	RP6R16A080 RP6R16A100 RP6R16A125 RP6R16A160
2000		GRC320T62WP49	GRC320T66WP49	1000 1250 1600 2000	RP6R20A100 RP6R20A125 RP6R20A160 RP6R20A200
2500		GRC325T62WP53	GRC325T66WP53	1600 2000 2500	RP6R25A160 RP6R25A200 RP6R25A250
Type GRH with Digitrip 910 High Interrupting Capacity — U_e Max. 690 Vac, 70 kA I_{cu} at 415 Vac					
1600	3-Pole	GRH316T92WP44	GRH316T96WP44	800 1000 1250 1600	RP6R16A080 RP6R16A100 RP6R16A125 RP6R16A160
2000		GRH320T92WP49	GRH320T96WP49	1000 1250 1600 2000	RP6R20A100 RP6R20A125 RP6R20A160 RP6R20A200
2500		GRH325T92WP53	GRH325T96WP53	1600 2000 2500	RP6R25A160 RP6R25A200 RP6R25A250
Type GRC with Digitrip 910 Very High Interrupting Capacity — U_e Max. 690 Vac, 100 kA I_{cu} at 415 Vac					
1600	3-Pole	GRC316T92WP44	GRC316T96WP44	800 1000 1250 1600	RP6R16A080 RP6R16A100 RP6R16A125 RP6R16A160
2000		GRC320T92WP49	GRC320T96WP49	1000 1250 1600 2000	RP6R20A100 RP6R20A125 RP6R20A160 RP6R20A200
2500		GRC325T92WP53	GRC325T96WP53	1600 2000 2500	RP6R25A160 RP6R25A200 RP6R25A250

① Order terminals separately. Mounting hardware not included. See page 24.

Note: Rating plugs included with above MCCBs.

Series G Frame Size GR, 800 – 2500 Amperes

Line and Load Terminals

GR-Frame circuit breakers use Cu/Al terminals as standard and copper only terminals as an option. Specify if factory installation is required.

Table 50. Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	Hardware	AWG/kcmil Wire Range/ Number of Conductors	Metric Wire Range mm ²	Catalogue Number
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Wire Terminals

1600	Aluminium	Cu/Al	Metric	500 – 1000 (4)	300 – 500	TA1600RDM ①
1600	Copper	Cu	Metric	1 – 600 (4)	50 – 300	T1600RDM ①
2000	Aluminium	Cu/Al	Metric	2 – 600 (6)	35 – 300	TA2000RDM ②

Rear Connectors

2000	Copper	—	Metric	—	—	B2016RDM ①
2000	Copper	—	Metric	—	—	B2016RDLM ①
2500	Copper	—	Metric	—	—	B2500RDM ①

- ① Order one per pole — single terminals individually packed.
- ② Order one TA2000RD kit per 3-poles. Catalogue number includes bus connection, terminals and hardware for either line side or load side of 3-pole breaker.

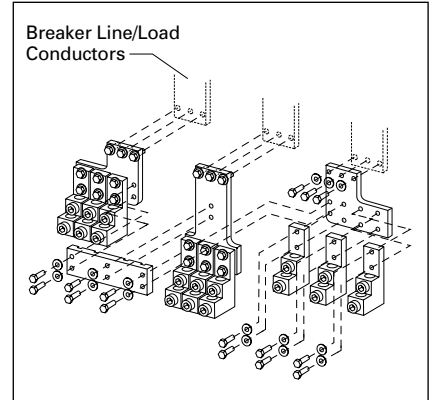


Figure 10. TA2000RD Wire Terminal

Note: Order one TA2000RDM kit per 3-poles. Catalogue number includes bus connection, terminals and hardware for either line side or load side of 3-pole breaker.

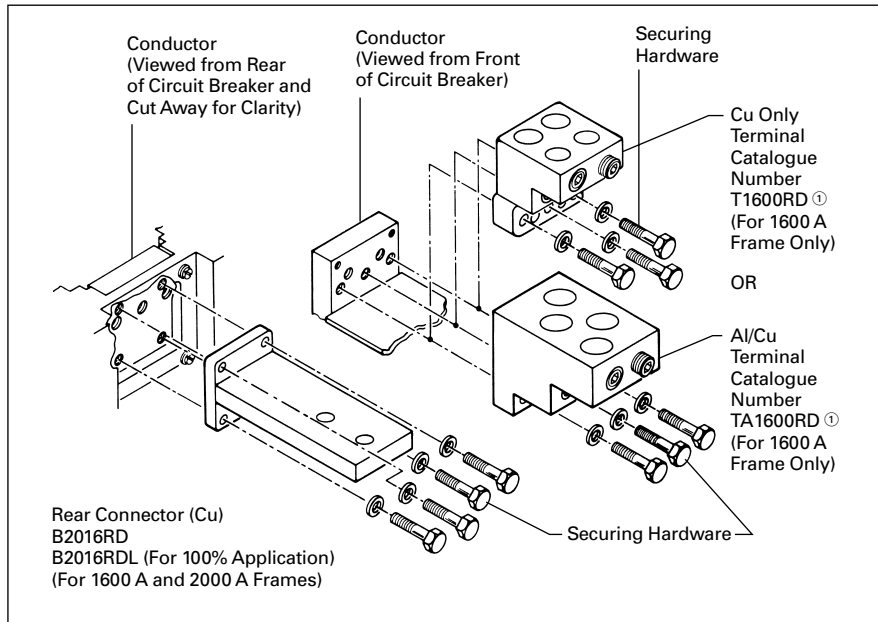


Figure 9. GR Rear Connector Exploded View

- ① Order one per pole (or two per pole if line and load terminals are required) — single terminals individually packed.

Base Mounting Hardware

Supplied by customer.

Handle Extension

Included with breaker. Additional handle extensions are available.

Table 51. Handle Extension

Description	Catalogue Number
Single Handle Extension	HEX6

Motor Circuit Protectors — Selection Guide and Ordering Information

Table 52. GE Frame — 600Y/347 Vac Maximum, 250 Vdc Maximum

Continuous Amperes	Cam Setting	Motor Full Load Current Amperes ^①	MCP Trip Setting ^②	MCP Catalogue Number
3	A	.69 – .91	9	HMCPE003A0C
	B	1.1 – 1.3	15	
	C	1.6 – 1.7	21	
	D	2.0 – 2.2	27	
	E	2.3 – 2.5	30	
	F	– 2.6	33	
7	A	1.5 – 2.0	21	HMCPE007C0C
	B	2.6 – 3.1	35	
	C	3.7 – 3.9	49	
	D	4.8 – 5.2	63	
	E	5.3 – 5.7	70	
	F	5.8 – 6.1	77	
15	A	3.4 – 4.5	45	HMCPE015E0C
	B	5.7 – 6.8	75	
	C	8.0 – 9.1	105	
	D	10.4 – 11.4	135	
	E	11.5 – 12.6	150	
	F	12.7 – 13.0	165	
30	A	3.9 – 9.1	90	HMCPE030H1C
	B	11.5 – 13.7	150	
	C	16.1 – 18.3	210	
	D	20.7 – 22.9	270	
	E	23.0 – 25.2	300	
	F	25.3 – 26.1	330	
50	A	11.5 – 15.2	150	HMCPE050K2C
	B	19.2 – 22.9	250	
	C	26.9 – 30.6	350	
	D	34.6 – 38.3	450	
	E	38.4 – 42.1	500	
	F	42.2 – 43.5	550	
70	A	16.1 – 30.6	210	HMCPE070M2C
	B	26.9 – 32.2	350	
	C	37.6 – 42.9	490	
	D	48.4 – 53.7	630	
	E	53.8 – 59.1	700	
	F	59.2 – 60.9	770	
100	A	23.0 – 30.6	300	HMCPE100R3C
	B	38.4 – 46.0	500	
	C	53.8 – 61.4	700	
	D	69.2 – 76.8	900	
	E	76.9 – 84.5	1000	
	F	84.6 – 87.0	1100	
100	A	38.4 – 46.0	500	HMCPE100T3C
	B	57.6 – 65.2	750	
	C	76.9 – 84.5	1000	
	D	③	1250	
	E	③	1375	
	F	③	1500	

- ① Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.
- ② For dc applications, actual trip levels are approximately 40% higher than values shown.
- ③ Settings above 10xI_n are for special applications. Where the ampere rating of the disconnecting means cannot be less than 115% of the motor full load ampere rating.

Table 53. GJ Frame — 600 Vac Maximum, 250 Vdc Maximum

Continuous Amperes	MCP Trip Range (Amperes)	MCP Catalogue Number
250	500 – 1000 625 – 1250 750 – 1500	HMCPJ250D5L HMCPJ250F5L HMCPJ250G5L
	875 – 1750 1000 – 2000 1125 – 2250 1250 – 2500	HMCPJ250J5L HMCPJ250K5L HMCPJ250L5L HMCPJ250W5L

Table 54. GL Frame — 600 Vac Maximum, 250 Vdc Maximum ^④

Continuous Amperes	MCP Trip Range (Amperes)	MCP Catalogue Number
600	1125 – 2250 1500 – 3000 1750 – 3500	HMCL600L HMCL600N HMCL600R
	2000 – 4000 2250 – 4500 2500 – 5000 3000 – 6000	HMCL600X HMCL600Y HMCL600P HMCL600M

④ Equipped with an electronic trip device.

Table 55. GN Frame — 600 Vac Maximum ^⑤

Continuous Amperes	Cam Setting	Motor Full Load Current Amperes	MCP Trip Setting	MCP Catalogue Number
800	A	123.1 – 184.5	1600	HMCP800X7W
	B	184.6 – 246.1	2400	
	C	246.2 – 307.6	3200	
	D	307.2 – 369.1	4000	
	E	369.2 – 430.7	4800	
	F	430.8 – 492.2	5600	
	G	492.3 – 553.7	6400	
1200	A	184.6 – 276.8	2400	HMCP12Y8W
	B	276.9 – 369.1	3600	
	C	369.2 – 461.4	4800	
	D	461.5 – 553.7	6000	
	E	553.8 – 646.1	7200	
	F	646.2 – 738.4	8400	
	G	738.5 – 830.7	9600	

⑤ Equipped with an electronic trip device.

Series G Earth Leakage Modules

Earth Leakage Modules



Clockwise from Left: GJ, GL, GE MCCBs Shown with Earth Fault (Earth Leakage) Modules

Eaton offers a 3- and 4-pole 30 mA earth fault (earth leakage) protection module for GE, GJ and GL breakers. The module does not restrict the use of other breaker accessories. The IEC-rated GE module is side mounted for circuits up to 125 amperes, while the GJ and GL modules are both bottom mounted for circuits up to 160 and 250 amperes (GJ), or 400 and 630 amperes for the GL.

The module is completely self-contained since the current sensor, relay and power supply are located inside the product. Current pickup settings are selectable from 0.03 – 10 amperes for all IEC-rated modules. Time delays are also selectable from Instantaneous – 1.0 seconds for 0.10 ampere settings and above. A current pickup setting of 0.03 amperes defaults to an Instantaneous time setting regardless of the time dial's position. Two alarm contacts come as standard: a 50% pretrip and a 100% after trip, both based only on earth leakage current levels.

Product Selection

Table 56. GE Frame Earth Leakage Modules, IEC (Side Mounted, 230 – 415 Vac, 50/60 Hz)

Amperes	Poles	Catalogue Number
125	3	ELESE3125W
125	4	ELESE4125W

Table 57. GJ Frame Earth Leakage Modules, IEC (Bottom Mounted, 230 – 415 Vac, 50/60 Hz)

Amperes	Poles	Catalogue Number
160	3	ELJBE3160W
160	4	ELJBE4160W
250	3	ELJBE3250W
250	4	ELJBE4250W

Table 58. GL Frame Earth Leakage Modules, IEC (Bottom Mounted, 230 – 415 Vac, 50/60 Hz)

Amperes	Poles	Catalogue Number
400	3	ELLBE3400W
400	4	ELLBE4400W
630	3	ELLBE3630W
630	4	ELLBE4630W

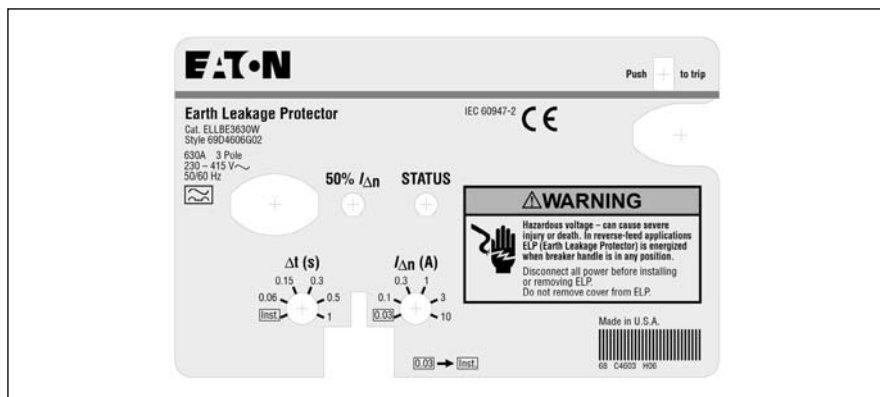


Figure 11. IEC-Rated GL Frame Earth Leakage Module Faceplate

Optional Features and Accessories

Internal Accessories

Alarm Switch

The alarm switches operate when the circuit breaker is tripped by a short circuit or overcurrent, but also when it is tripped by a shunt trip or under-voltage release.

Auxiliary Switches

Auxiliary switches are used for signalling and control purposes. The various functions of the auxiliary switches (changeover) are shown in **Figure 13**.

Shunt Trips

The shunt trip is used for remote tripping.

The coil of the shunt trip is rated only for short-time operation.

It is not permissible with the circuit breaker open to apply a continuous opening command to the shunt trip in order to prevent the breaker from closing. This means that interlocking circuits with continuous commands may not be set up with shunt trips.

Undervoltage Releases

The circuit breaker cannot be closed until the undervoltage release is energized. If the release is not energized, the circuit breaker can only perform an idle switching operation.

Frequent idle switching actions should be avoided as they shorten the endurance of the circuit breaker.

Accessory Configurations for GE – GR Circuit Breakers

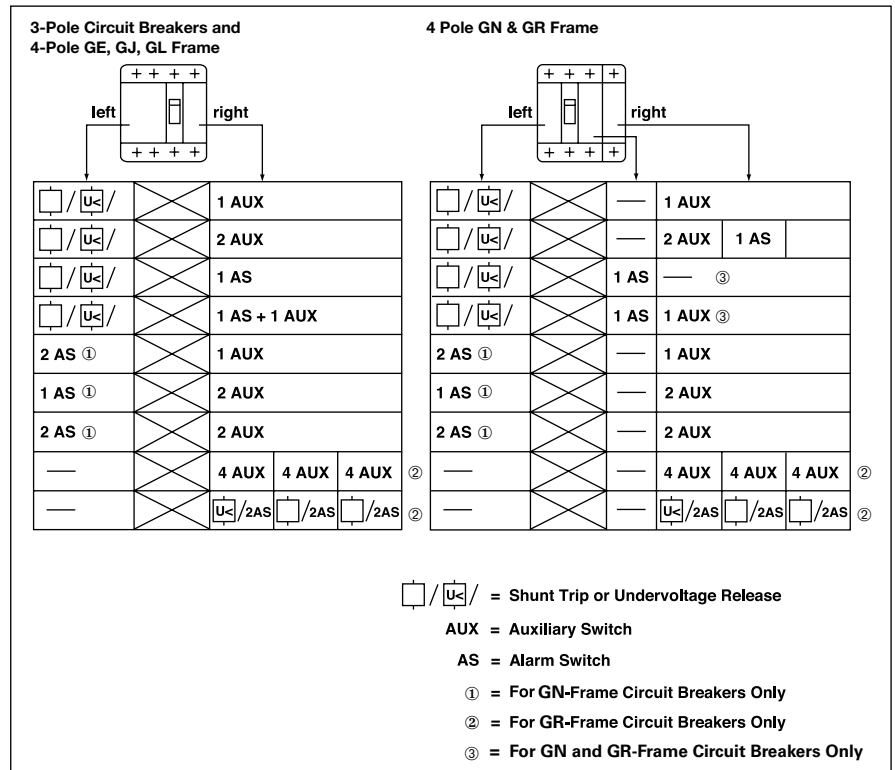


Figure 12. Internal Accessory Configurations

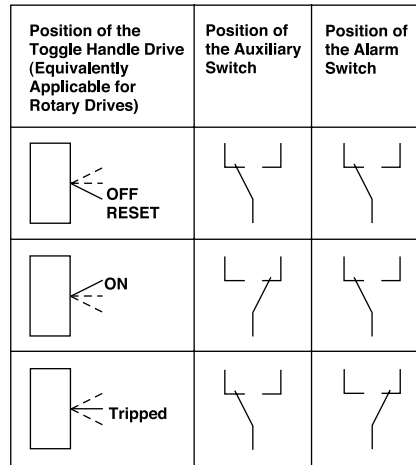






Figure 13. Contact Making by the Auxiliary and Alarm Switches as a Function of the Switching Position of the Circuit Breaker

Series G Accessories

Table 59. Accessories

Description	Pole Location	Frame				
		GE,	GJ, GL	GN	GR	
Field Fit Kit Catalogue Numbers						
Alarm Switch 	Make/Break	Left	—	—	—	—
		Right	ALM1M1BEPK	ALM1M1BJPKL	A1L5RPK	A1L6RPK
	2 Make/2 Break	Left	—	—	—	—
		Right	ALM2M2BEPK	ALM2M2BJPK	A2L5RPK	A2L6RPK
Auxiliary Switch 	1A, 1B	Left	—	—	—	—
		Right	AUX1A1BPK	AUX1A1BPK	A1X5PK	—
	2A, 2B	Left	—	—	—	—
		Right	AUX2A2BPK	AUX2A2BPK	A2X5PK	A2X6RPK
	3A, 3B	Left	—	—	—	—
		Right	—	—	A3X5RPK	—
	4A, 4B	Left	—	—	—	—
		Right	—	—	—	A4X6RPK
Auxiliary Switch /Alarm Switch	Left	—	—	AA115LPK	—	
	Right	AUXALRMEPK	AUXALRMJPK	AA115RPK	—	
Shunt Trip — Standard 	120 Vac	Left	SNT120CPK	SNT120CPK	SNT5LP11K	—
		Right	—	—	—	SNT6P11K
	240 Vac	Left	SNT120CPK	SNT120CPK	SNT5LP11K	—
		Right	—	—	—	SNT6P11K
	24 Vdc	Left	SNT060CPK	SNT060CPK	SNT5LP03K	—
		Right	—	—	—	SNT6P03K
	48 Vdc	Left	SNT060CPK	SNT060CPK	SNT5LP23K	—
		Right	—	—	—	SNT6P23K
	380 – 600 Vac	Left	SNT480CPK	SNT480CPK	—	—
		Right	—	—	—	—
	220 – 250 Vdc or 380 – 440 Vac	Left	—	—	SNT5LP14K	SNT6P14K
		Right	—	—	SNT5LP18K	SNT6P18K
480 – 600 Vac	Left	—	—	—	—	
	Right	—	—	—	—	
Shunt Trip — Low Energy	Left	—	—	LST5LPK	—	
	Right	—	—	—	LST6RPK	
Undervoltage Release Mechanism 	120 Vac	Left	UVR120APK	UVR120APK	UVH5LP08K	—
		Right	—	—	—	UVH6RP08K
	208 – 240 Vac	Left	UVR240APK	UVR240APK	UVH5LP11K	—
		Right	—	—	—	UVH6RP11K
	24 Vdc, Vac	Left	UVR024CPK	UVR024CPK	UVH5LP21K	—
		Right	—	—	—	UVH6RP21K
	48 Vdc	Left	UVR048DPK	UVR048DPK	UVH5LP23K	—
		Right	—	—	—	UVH6RP23K
	12 Vdc, Vac	Left	UVR012CPK	UVR012CPK	—	—
		Right	—	—	—	—
	48 Vac	Left	UVR048APK	UVR048APK	UVH5LP05K	—
		Right	—	—	—	UVH6RP05K
	120 Vdc	Left	UVR125DPK	UVR125DPK	UVH5LP26K	—
		Right	—	—	—	UVH6RP26K
	220 – 250 Vdc	Left	UVR250DPK	UVR250DPK	UVH5LP28K	—
		Right	—	—	—	UVH6RP28K
	380 – 500 Vac	Left	UVR480APK	UVR480APK	UVH5LP29K	—
		Right	—	—	—	UVH6RP29K
	525 – 600 Vac	Left	UVR600APK	UVR600APK	—	—
		Right	—	—	—	—
12 Vdc	Left	—	—	UVH5LP20K	—	
	Right	—	—	—	UVH6RP20K	
12 Vac	Left	—	—	UVH5LP02K	—	
	Right	—	—	—	UVH6RP02K	

Series G Optional Features and Accessories

Table 60. External Accessories and Test Kit

Description	Fit Type	Frame				
		GE	GJ	GL	GN	GR
External Accessories						
Non-Padlockable Handle Block	Field	EFHB	—	—	LKD4	—
Padlockable Handle Block	Field	EFPHB	FJPHB	LBHP	—	—
Padlockable Handle Block Off-Only	Field	EFPHBOFF	FJPHBOFF	LBHPOFF	—	—
Padlockable Handle Lock Hasp	Field	EFPHL	FJPHL	LPHL	PLK5N	HLK6
Padlockable Handle Lock Hasp Off-Only	Field	EFPHLOFF	FJPHLOFF	LPHLOFF	—	—
Cylinder Lock	Factory	Order by Description				
Key Interlock Kit (Castell) ^③	Field	—	—	—	CYK4	CYK6
Key Interlock Kit (Kirk) ^①	Field	—	KYKFJ	KYKL	KYK4	KYK6
Slide Bar Interlock ^②	Field	EFSBI	FJSBI	SBKL3	SBK5	—
Walking Beam Interlock ^②	Factory	EFWBI	FJWBI	WBLL3630	WBL5	WBL6
Electrical Operator	120 Vac	EOPEF240C	EOPFJ240C	EOPLG240C	EOP5T07	EOP6T08K
	240 Vac	EOPEF240C	EOPFJ240C	EOPLG240C	EOP5T11	EOP6T11K
	380 Vac	—	—	—	—	—
	24 Vdc	EOPEF24D	EOPFJ24D	EOPLG24D	EOP5T21	EOP6T19K
	48 Vdc	EOPEF48D	EOPFJ48D	EOPLG48D	EOP5T22	EOP6T21K
Plug-In Adapters	125 Vdc	EOPEF240C	EOPFJ240C	EOPLG240C	EOP5T26	—
	3-Pole	PAD3E	PAD3J	PAD3L	PAD53	—
Rear Connecting Studs	4-Pole	PAD4E	PAD4J	PAD4L	PAD54	—
	Field	EFRCWSW (83mm) EFRCSWL (128mm)	FJRCWSW (107mm) FJRCSWL (184mm)	LRCS3WK (3-Pole 1 end) LRCS4WK (4-Pole 1 end)	373B375G04 (139mm) 373B375G03 (266mm)	—

Test Kit

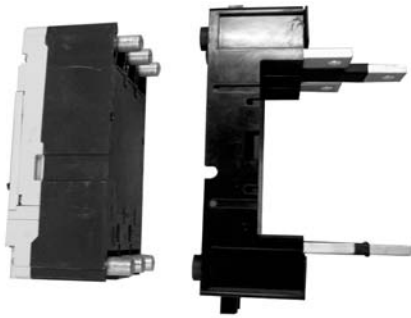
Electronic Portable Test Kit ^④	—	⑤	⑤	STK2	STK2
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- ① Provision only.
- ② Requires two breakers – 3- pole only.
- ③ Contact Eaton for catalogue numbers.
- ④ Digitrip 310 only.
- ⑤ Catalogue Numbers **MTST120V** (120 Vac) and **MTST230V** (230 Vac).

Series G Plug-in Blocks and Drawout Cassettes

Plug-in Blocks

Plug-in adapters simplify installation and front removal of circuit breakers. Plug-ins are available for rear connection applications on 3- and 4-pole circuit breakers. Trip on drawout interlock kits are included. Use terminal shields for IP30 protection.



GL Breaker with Plug-in Block

Product Selection

Table 61. Plug-in Blocks

Breaker Frame	Poles	Catalogue Number
---------------	-------	------------------

GE-, GJ- and GL-Frame Plug-in Blocks

GE	3	PAD3E
GE	4	PAD4E
GJ	3	PAD3J
GJ	4	PAD4J
GL	3	PAD3L
GL	4	PAD4L

Trip-on Drawout Interlock Kit ^①

GE	3, 4	PIILEG
GJ	3, 4	PIILJG
GL	3, 4	PIILLG

Terminal Shields IP30

GE	3	EFTS3K
GE	4	EFTS4K
GJ	3	FJTS3K
GJ	4	FJTS4K
GL	3	LTS3K
GL	4	LTS4K

^① Included with plug-in block. Trips the breaker when breaker is removed from plug-in block.

Drawout Cassette



Drawout Cassette

The Drawout Cassette is currently for use with the standard 3-pole 65 and 100 kA/480 Vac, 1600 ampere and 2000 ampere GR circuit breakers only. It consists of two separate components: the movable mechanism which is factory mounted to the circuit breaker frame (shown in photo above) and the stationary mechanism which is housed in the cassette and shipped separately.

The drawout mechanism has four positions.

- Connected — The breaker is fully connected to the primary stabs and secondary contacts.
- Test — The breaker is not connected to the primary stab but is connected to the secondary contacts.
- Disconnected — Both the primary stabs and the secondary contacts are disconnected.
- Withdraw — The breaker can be removed from the cassette.

Table 62. GR Drawout Cassette

Description	Catalogue Number
65 kA/480 Vac Version	
Movable Mechanism	RG20DOM ^②
Stationary Mechanism	RG20DOS (without shutters) RG20DOSS (with shutters)
100 kA/480 Vac Version	
Movable Mechanism	RG20DOM ^②
Stationary Mechanism	RG20DOS (without shutters) RG20DOSS (with shutters)

^② List price included in price of the stationary mechanism.

Movable mechanism must be ordered with GR circuit breaker and is shipped mounted to circuit breaker frame. Stationary mechanism is ordered separately.

All internal accessories must be factory installed for use with drawout.

Handle Mechanisms Overview

Handle mechanisms are used to operate moulded case circuit breakers, moulded case switches and motor circuit protectors. They are available in three basic configurations — Flange Mounted, Through-the-Door and Direct (Close-Coupled) — providing safe, dependable operation and ease of installation.

Flange Mounted

- Flex Shaft

Through-the-Door

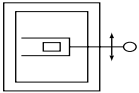
- Universal Rotary

Direct (Close Coupled)

- Universal Direct
- Euro IEC

Handle mechanisms are typically used on enclosed circuit breakers, control panels and motor control centres in many different applications. Eaton has a handle mechanism for virtually any need.

Flange Mounted Handle Mechanisms



The Flex Shaft™

Flange Mounted handle mechanisms mount on the flange of an enclosure door. The Flex Shaft is an extra heavy-duty mechanism that includes a flexible shaft in various lengths, 0.9m through 3m for use with various size enclosures.

The Flex Shaft handle will accept up to three padlock shackles, each with a maximum diameter of 9.5mm. Can be used with IP54 fabricated enclosures. An optional handle is available for Flex Shaft that is suitable for use with IP66 environments.

Flex Shaft comes preset from the factory, requiring only minor field adjustments on installation, which takes about 10 minutes — a significant time savings compared to installation of other types of flange handle mechanisms. The Flex Shaft mechanism also takes up less interior enclosure space than competitive designs and the handle fits standard flange cutouts. Flex Shaft handle can be remotely mounted from breaker, where an operator can use it by “funneling” the cable through conduit.

Note: When selecting the length of shaft, ensure minimum bending radius of 102mm is maintained to operate properly.

The standard method of shipment includes the mechanism preset at the factory; however, minor field adjustments may be required.

Flex Shaft Ordering Information

Table 63. Flex Shaft Ordering Information

Breaker Frame	Flexible Shaft Length in m							
	Catalogue Number							
	0.9m	1.2m	1.3m	1.8m	2.1m	2.4m	2.7m	3.1m
GE	EHMFS03	EHMFS04	EHMFS05	EHMFS06	EHMFS07	EHMFS08	EHMFS09	EHMFS10
GJ	JHMFS03	JHMFS04	JHMFS05	JHMFS06	JHMFS07	JHMFS08	JHMFS09	JHMFS10
GL	—	LHMFS04	—	—	LHMFS07	—	—	LHMFS10
GN	N/A	F5S04CI	F5S05CI	F5S06CI	N/A	N/A	N/A	F5S10CI
GR	N/A	F6S04	F6S05	F6S06	N/A	N/A	N/A	N/A

Note: Add Suffix L to the complete Catalogue Number for 152mm handle.

Flex Shaft Accessories (GE- through GR-Frame)

Table 64. Standard Door Hardware (Required Adapter Kit)

Latch	Panel Height mm	Catalogue Number
2 Point	Up to 762.0	DH1R
2 Point	Up to 1016.0	DH2R
3 Point	Over 1016.0	DH3R

Table 65. Door Hardware Adapter Kit (Required on Standard Door Hardware)

Description	Catalogue Number
Door Hardware Adapter Kit	AMTDHA

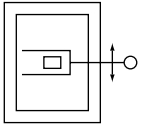
Table 66. IP54 Safety Door Hardware for Flex Shaft ①

Handle Length in mm	Catalogue Number ②
102	C361KJ4
152	C361KJ6
Roller Latch ③	C361KR

- ① Customer: Consult with box manufacturer for correct door hardware and any adapters required for assembly.
- ② The 6.35 x 12.7mm standard mill rectangular locking bar is not supplied with these kits.
- ③ Third roller latch for use with 102 or 152mm handle when 3 point latching is required.

Series G Handle Mechanisms

Through-the-Door Handle Mechanisms



Universal Rotary

All rotary handle mechanisms include a handle "Lock Off," to prevent turning the breaker ON while in the OFF position. All Rotary handles indicate ON/OFF/Tripped/Reset positions, however, Universal Rotary has the added feature of international markings for ON (I) and OFF (O). The Universal Rotary is made of moulded material.

The Universal Rotary mechanisms for GE, GJ and GL MCCBs can be operated by hand with the door open or "locked off" to prevent operation with the door open.

Table 67. Universal Rotary Ordering Information

Shaft Length in mm	Handle Colour	Complete Catalogue Number ^①
GE-Frame		
152	Black	EHMVD06B
304	Black	EHMVD12B
609	Black	EHMVD24B
152	Red	EHMVD06R
304	Red	EHMVD12R
609	Red	EHMVD24R
GJ-Frame		
152	Black	FJHMVD06B
304	Black	FJHMVD12B
609	Black	FJHMVD24B
152	Red	FJHMVD06R
304	Red	FJHMVD12R
609	Red	FJHMVD24R
GL-Frame		
152	Black	KLHMVD06B
304	Black	KLHMVD12B
609	Black	KLHMVD24B
152	Red	KLHMVD06R
304	Red	KLHMVD12R
609	Red	KLHMVD24R
GN-Frame		
152	Black	HMVD5B
GR-Frame		
235	Black	HMVD6B

^① Complete catalogue number includes handle, mechanism, shaft and mounting hardware.

Series G Handle Mechanisms

**Direct (Close-Coupled)
Handle Mechanisms**



Universal Direct (GE – GL)

Direct (Close-Coupled) Handle Mechanisms mount directly to the circuit breaker. They are used in shallow enclosures where the standard variable depth Through-the-Door type mechanism is not practical or cannot be used. They are typically for applications where high volume, standardized enclosures are being fabricated.

The Direct handle mechanism is designed exclusively for the Eaton GE, GJ and GL circuit breakers. It is available as standard with a door interlock to

prevent opening the enclosure while the circuit breaker is in the ON position. It is also available without a door interlock.

Table 68. Universal Direct Ordering Information

Frame			Red Handle Colour
	with Interlock	without Interlock	without Interlock
	Catalogue Number		
GE	EHMCCBI	EHMCCB	EHMCCR
GJ	JHMCCBI	JHMCCB	JHMCCR
GL	LHMCCBI	LHMCCB	LHMCCR

Series G

Time-Current Curves

Tripping Characteristics

The operating values specified for the inverse time overcurrent releases (thermal overload releases, "a" releases) are mean values of the scatter bands of all setting ranges from the cold state and with uniform current loading of the conducting paths.

The tripping characteristics of the instantaneous (electromagnetic) short circuit releases ("n" releases) are based on the rated phase current I_N which in the case of circuit breakers with adjustable thermal overload releases is also the upper value of the setting range. With a lower setting current, a correspondingly higher multiple is obtained for the operating current of the "n" release.

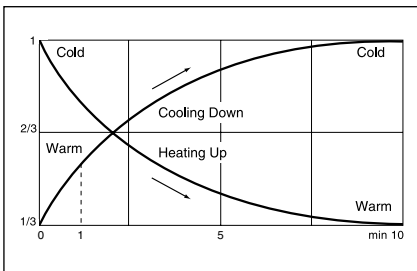


Figure 14. Tripping Time Characteristics (Thermal Memory)

Type GE

Tripping characteristics of GE circuit breakers for plant protection, "n" release fixed setting = 400 – 600 for breaker 15 – 45 A; over 50 A = 10x I_N .

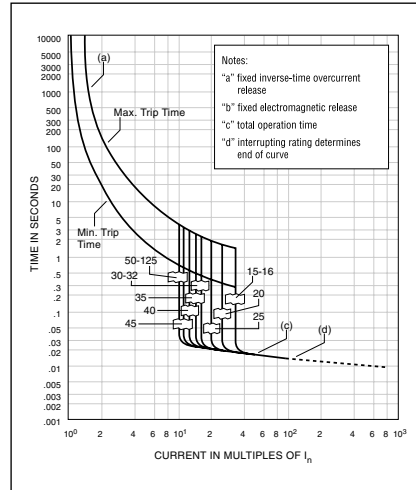


Figure 15. GE Time Current Curve

Type GJ

Tripping characteristics of GJ circuit breakers for plant protection, "n" release adjustable.

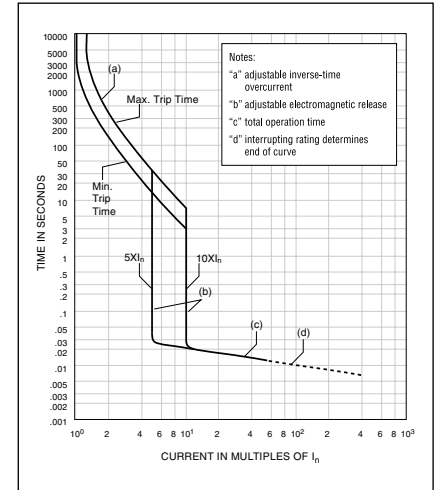


Figure 16. GJ Time Current Curve for Thermal Magnetic Trip Units

Type GL

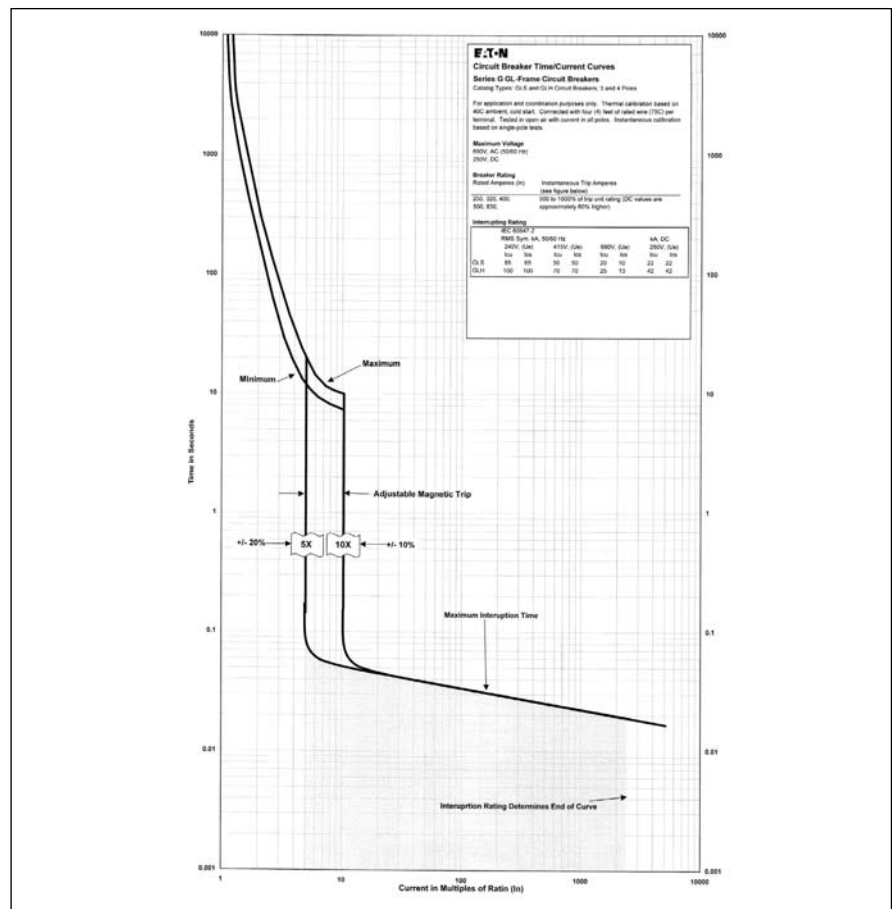


Figure 17. GL Time Current Curve for Thermal Magnetic Trip Units

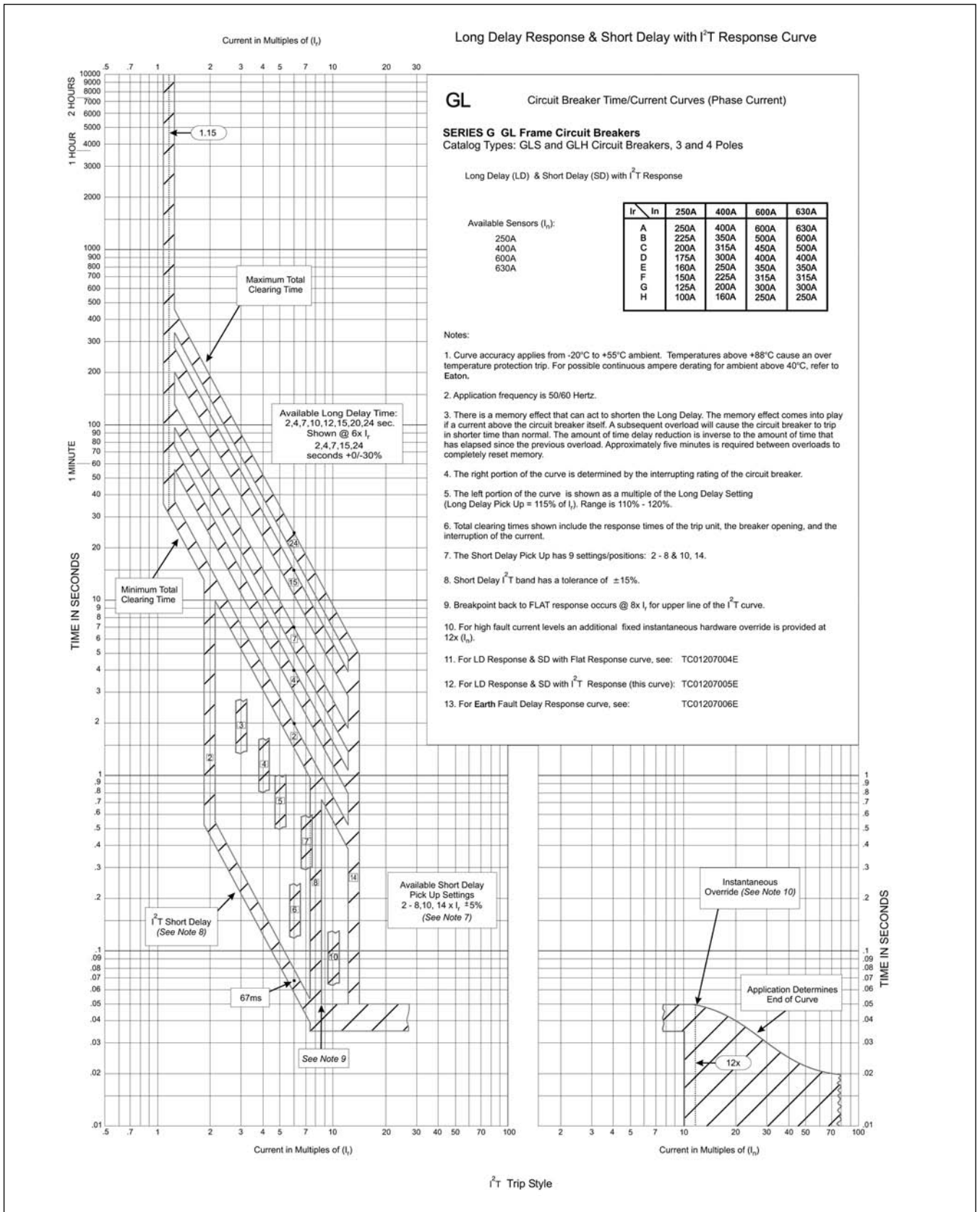


Figure 18. GL Electronic Trip Unit Long Delay Response and Short Delay with I²T Response Curve

Series G

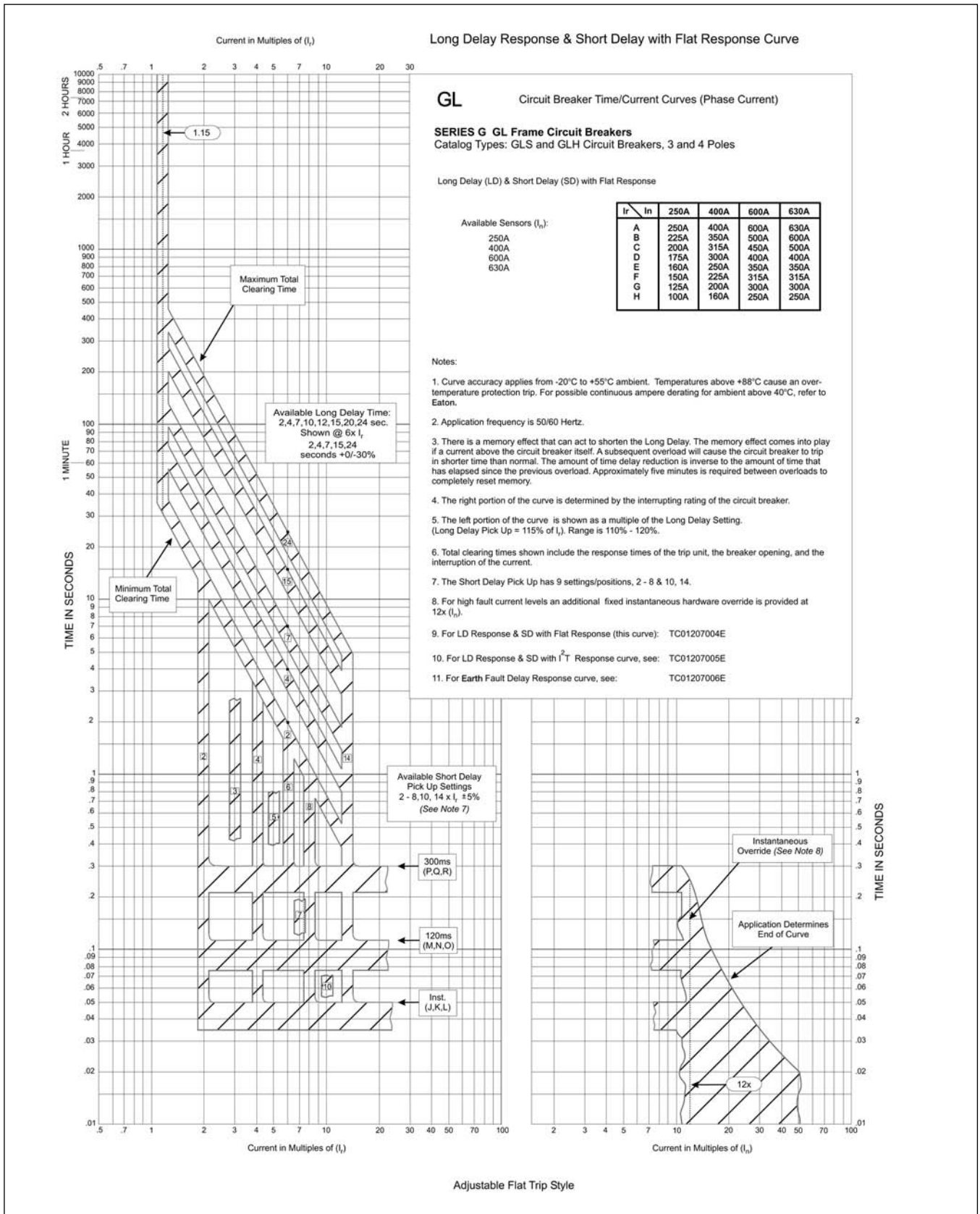


Figure 19. GL Electronic Trip Unit Long Delay Response and Short Delay with Flat Response Curve

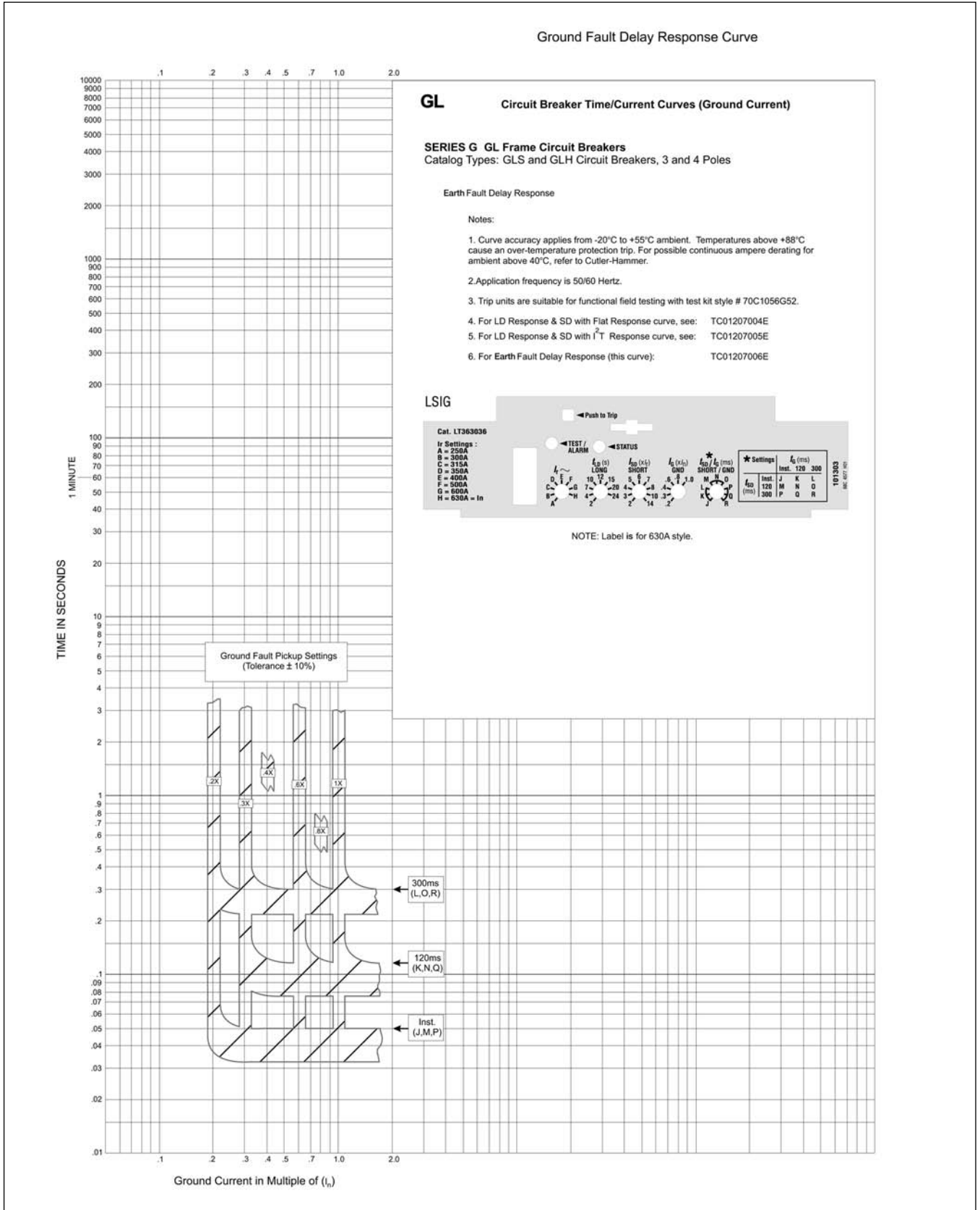


Figure 20. GL Electronic Trip Unit Earth Fault Delay Response Curve

Series G

Type GN

Tripping characteristics of GN circuit breakers with solid-state overcurrent release.

Working Temperature Range

The tolerance bands shown are applicable to an ambient temperature range of -5 to +60°C at the circuit breaker.

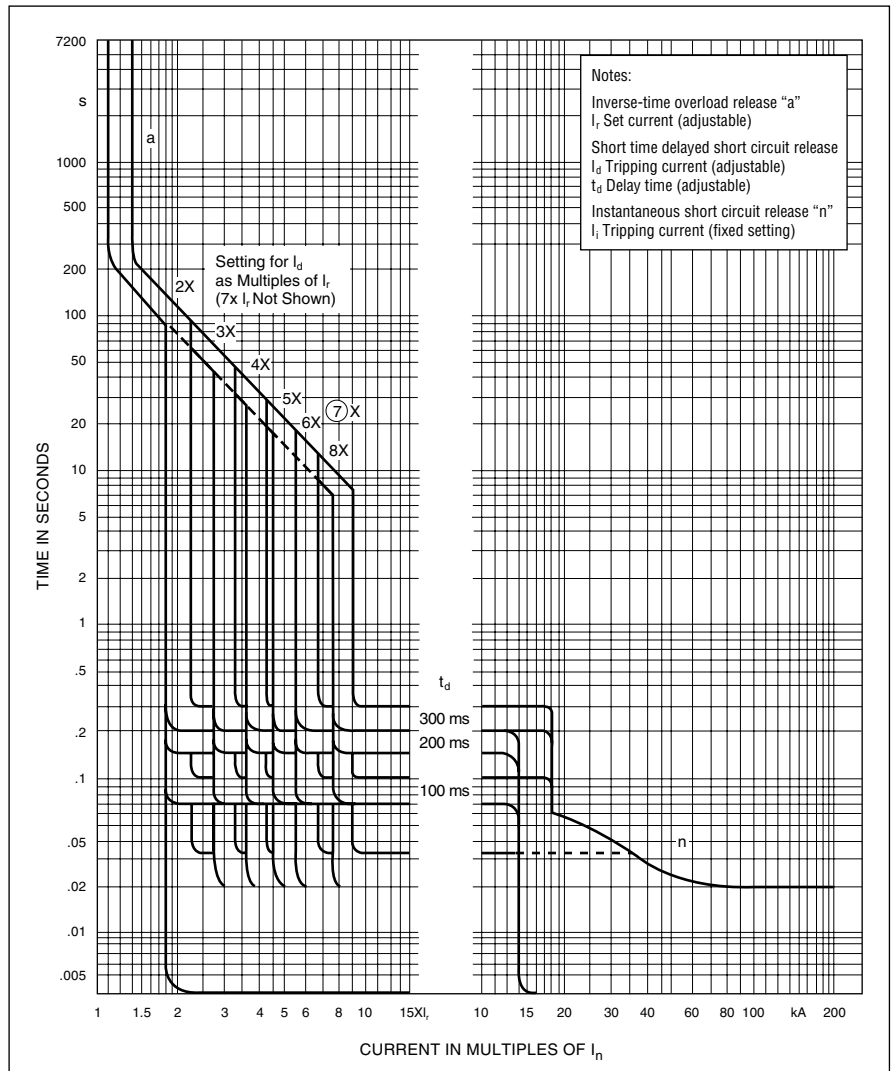


Figure 21. GN Time Current Curve for Digitrip 310 Trip Unit

January 2005

Series G

Type GR

Tripping characteristics of GR circuit breakers with solid-state overcurrent release.

Working Temperature Range

The tolerance bands shown are applicable to an ambient temperature range of -5 to +60°C at the circuit breaker.

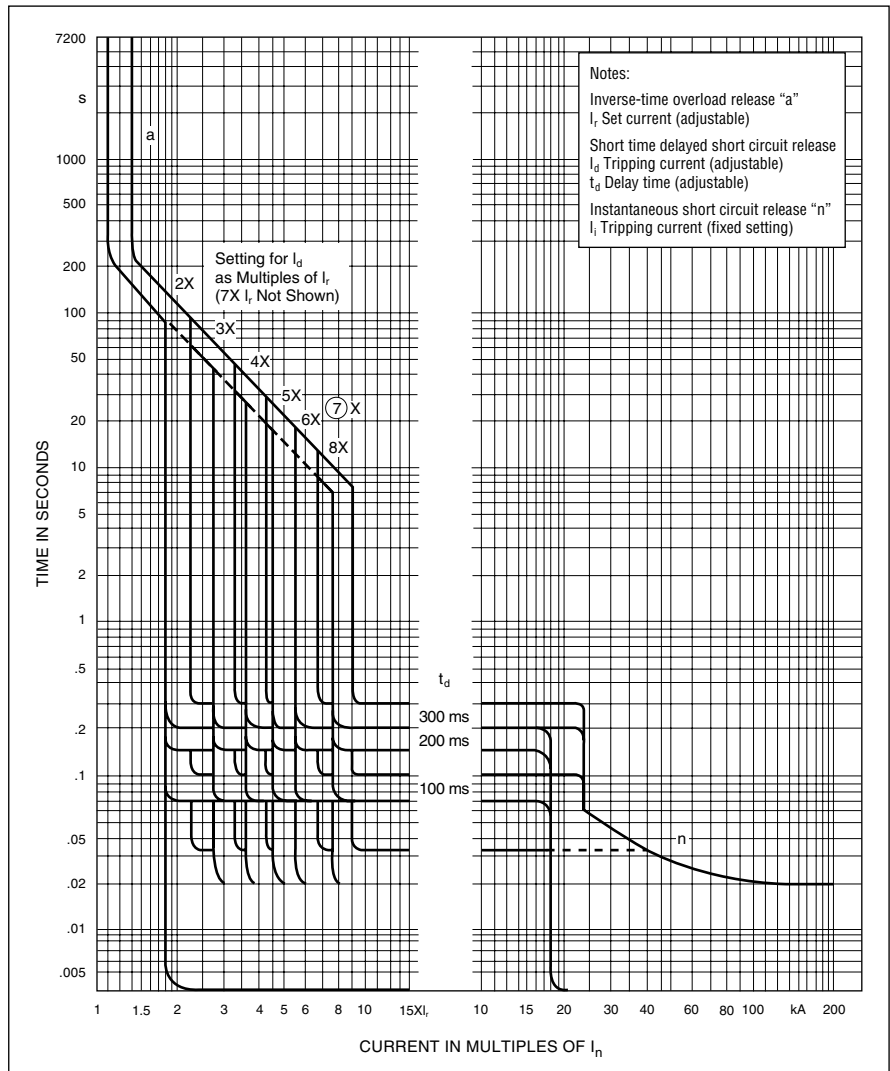


Figure 22. GR Time Current Curve for Digitrip 310 Trip Unit

Series G Frame Sizes GE through GR

Current Limiting Curves

Current Limiting Characteristics and Maximum I^2t Values

Type GE/GJ/GL

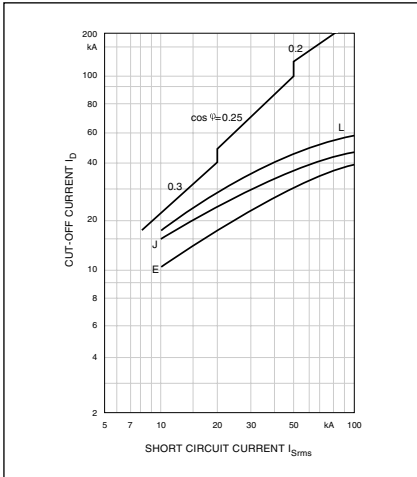


Figure 23. Current Limiting Characteristics for GE to GL, 50/60 Hz 380/415/480 Vac

Type GE/GJ/GL

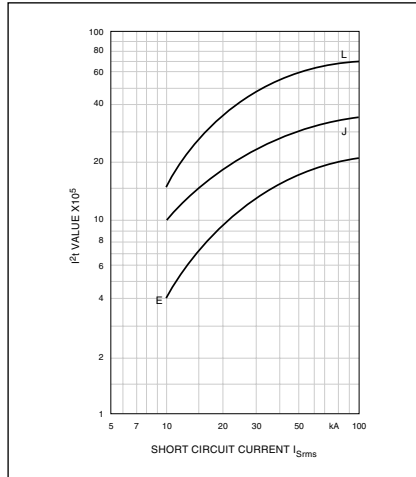


Figure 25. Maximum I^2t Values for GE to GL, 50/60 Hz 380/415/480 Vac

Type GN/GR

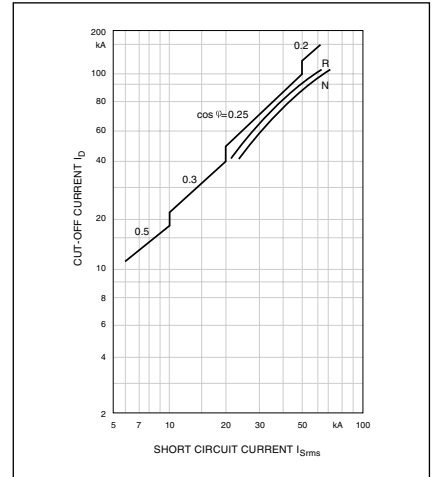


Figure 27. Current Limiting Characteristics I_p for GN to GR, 50/60 Hz 380/415/480 Vac

Type GE/GJ/GL

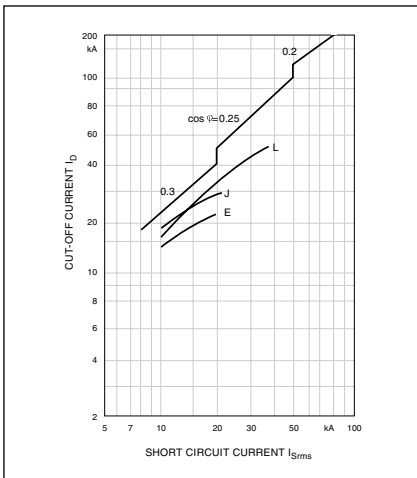


Figure 24. Current Limiting Characteristics for GE to GL, 50/60 Hz 600/660/690 Vac

Type GE/GJ/GL

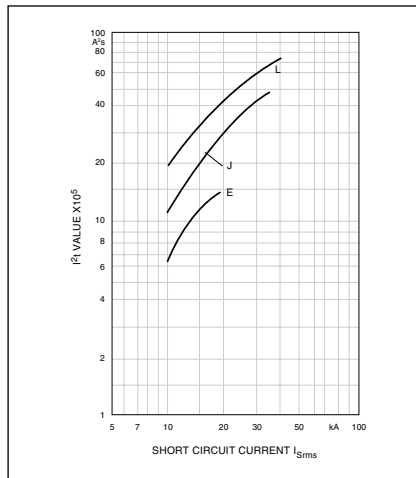


Figure 26. Maximum I^2t Values for GE to GL, 50/60 Hz 600/660/690 Vac

Type GN/GR

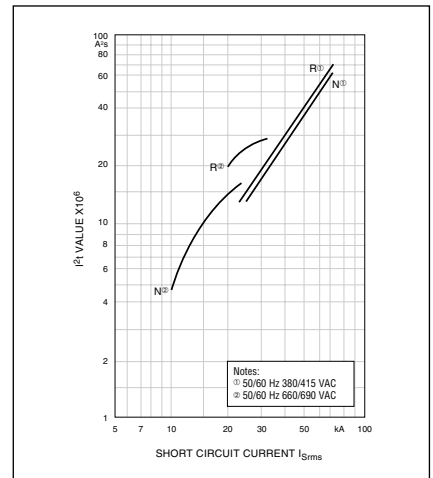


Figure 28. Maximum I^2t Values for GN to GR, 50/60 Hz 600/660/690 Vac

Dimensions

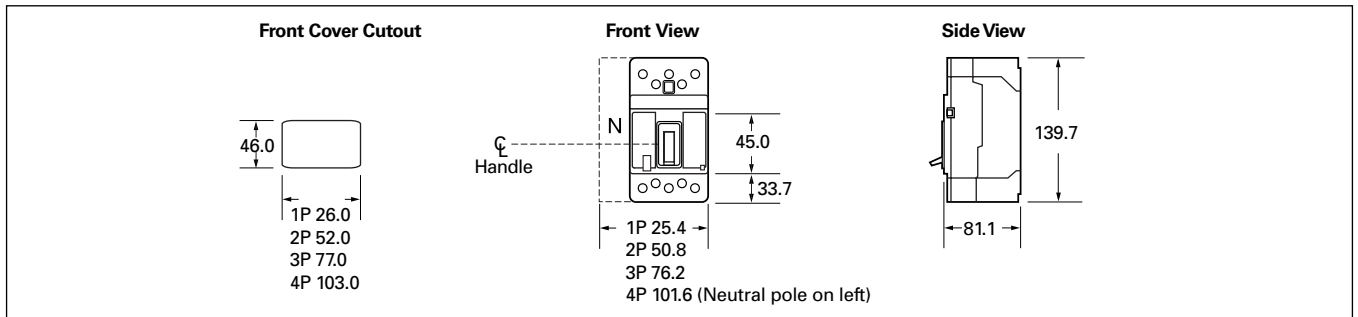


Figure 29. GE Frame — Dimensions in mm

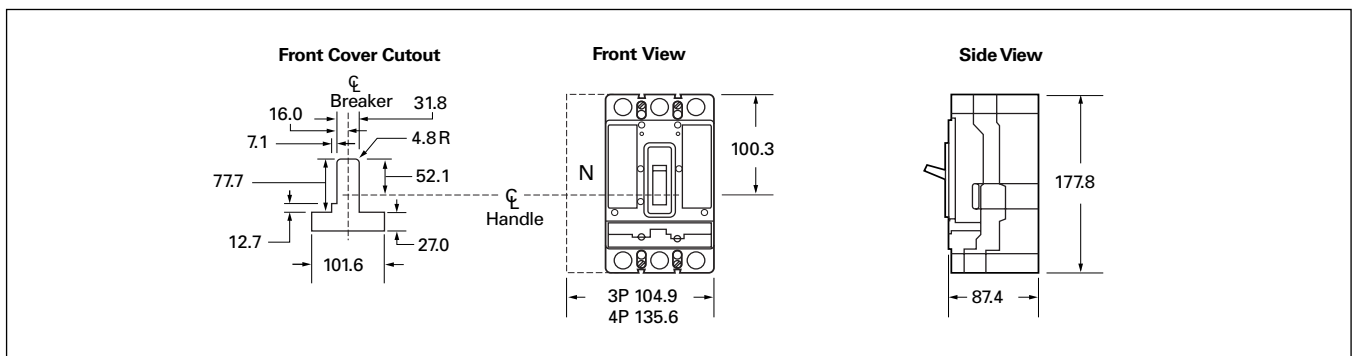


Figure 30. GJ Frame — Dimensions in mm

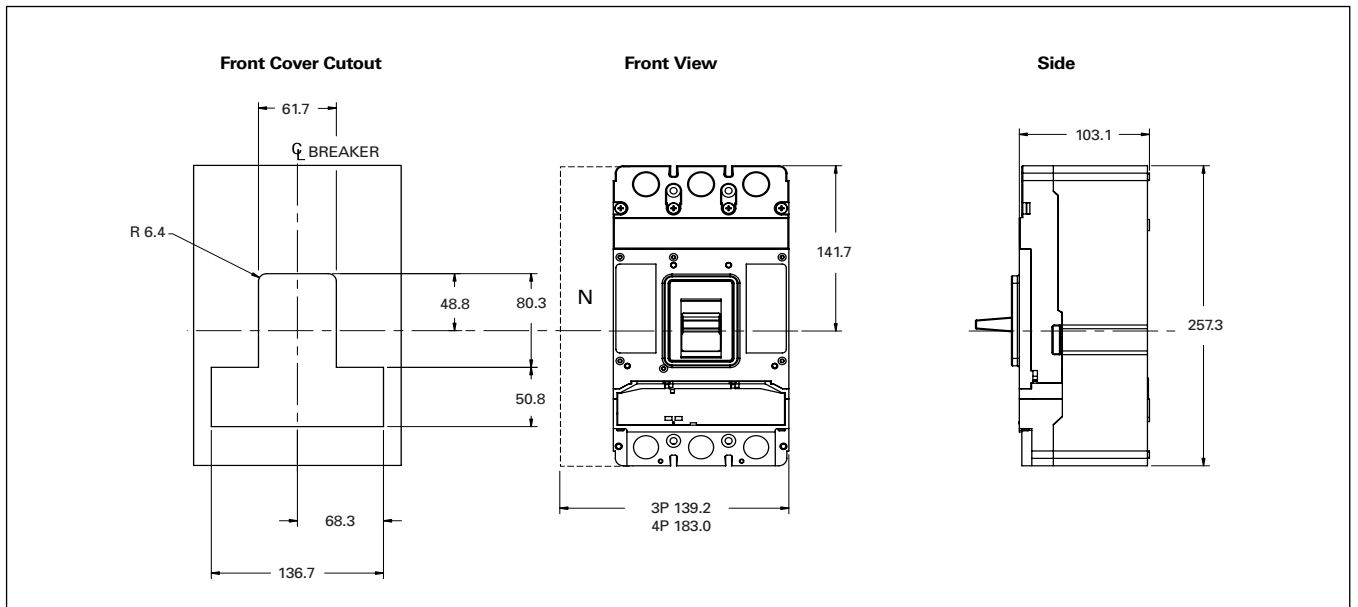


Figure 31. GL-Frame — Dimensions in mm

Note: TA63IL, T63IL, T632L, TA632L terminals add 30.2mm to line or load side of GL. LTS3K or LTS4K terminal covers add 54.1 mm to line or load side of GL.

Series G Frame Sizes GL through GR

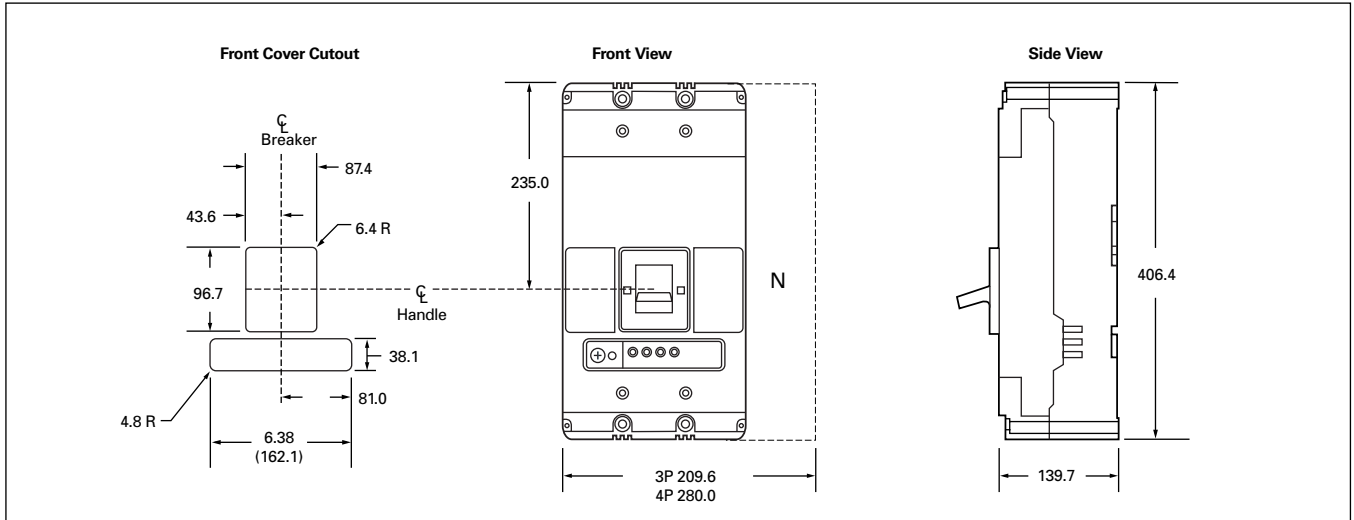


Figure 32. GN-Frame — Dimensions in mm

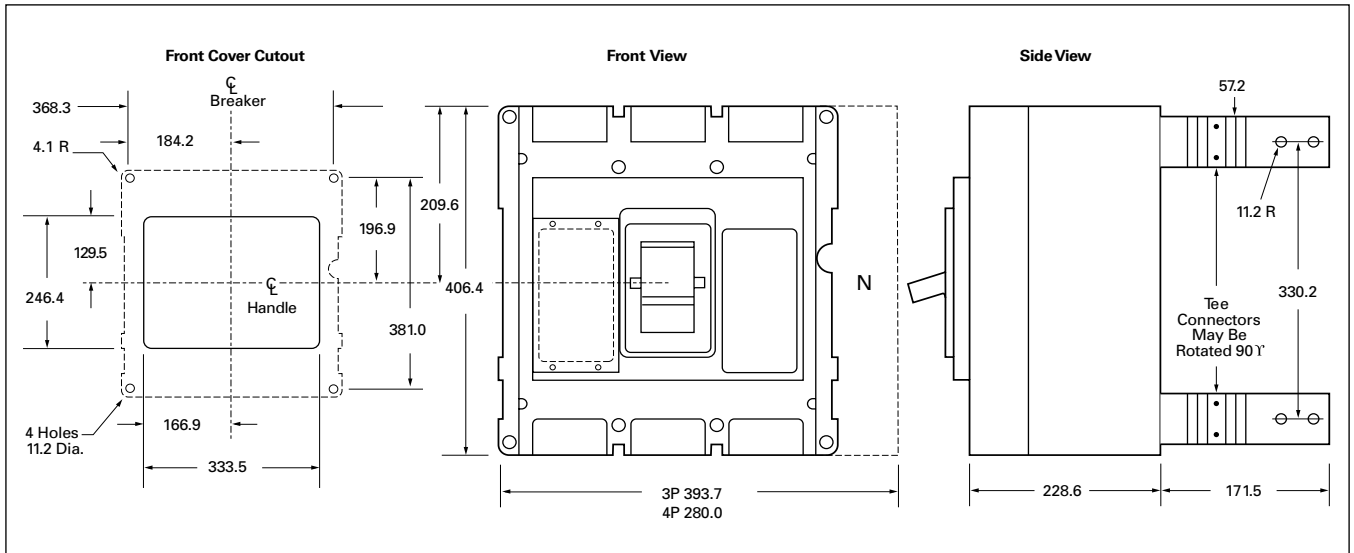


Figure 33. GR-Frame — Dimensions in mm

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Eaton Electric Limited

Reddings Lane
Birmingham B11 3EZ
United Kingdom

Customer Support Centre

Tel: +44 (0)8700 545 333
Fax: +44 (0)8700 540 333
email: ukcommorders@eaton.com

Eaton Electric NV

PO Box 23
7550 AA Hengelo
The Netherlands

Customer Support Centre

Tel: +31 (0)74 246 7066
Fax: +31 (0)74 246 7070
email: c-heuropesupport@eaton.com

