

Product Guide 2011

# Series C and Special Application Moulded Case Circuit Breakers



**EATON**

*Powering Business Worldwide*

# Series C and Special Application Moulded Case Circuit Breakers

## Moulded Case Circuit Breaker Family



## Series C Moulded Case Circuit Breakers

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## Special Application Moulded Case Circuit Breakers

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## Product Line Description

Eaton's Moulded Case Circuit Breakers are designed to provide circuit protection for low voltage distribution systems. They are described by NEMA as, "a device for closing and interrupting a circuit between separable contacts under both normal and abnormal conditions," and furthermore as, "a breaker assembled as an integral unit in a supporting and enclosing housing of insulating material." The NEC describes them as, "A device designed to open and close a circuit by non-automatic means, and to open the circuit automatically on a predetermined overload of current, without injury to itself when properly applied within its rating."

So designed, Eaton circuit breakers protect conductors against overloads and conductors and connected apparatus, such as motors and motor starters, against short circuits.

In low voltage distribution systems, there are many varied applications of moulded case circuit breakers. Eaton offers the most comprehensive family of moulded case circuit breakers in the industry.

This section of circuit breakers includes:

- Thermal Magnetic Trip Breakers
- Electronic rms Trip Breakers
- Moulded Case Switches
- Motor Circuit Protectors
- Current Limiting Breakers
- Special Application Breakers

## Modified Breakers

Eaton breakers can be ordered with internal accessories installed. These modified breakers will be subject to an additional charge.

## Special Calibration

Special non-CSA/UL-listed calibrations are available for certain ambient temperatures other than 40°C and for frequencies other than 50/60 Hz or DC.

Reduced interrupting ratings will apply for 400 Hz applications. Please refer to Eaton's Consulting Application Guide, (CA08104001E) pages 28.2 - 16 for details.

Suffix **H01** 400 Hz ①

## 50°C Calibration

Add suffix **V** to Catalogue Number for complete breaker, when ordering listed ampere ratings for breakers to be used in 50°C ambients.

Suffix **V** 50°C Calibration ①

## Moisture-Fungus Treatment

All circuit breaker cases are moulded from glass-polyester which does not support the growth of fungus. Any parts which are susceptible to the growth of fungus will require special treatment.

Suffix **J01** Fungus Treated ①

## Freeze-Tested Circuit Breakers

The circuit breakers may be ordered with freeze testing. This option uses special lubrication and mechanical operation is verified at -40°C.

Suffix **F01** Freeze Tested ①

## Marine Applications

F- to R-Frame circuit breakers can be supplied to meet the following marine specifications:

- U.S. Coast Guard CFR 46 ABS — American Bureau of Shipping IEEA 45; DNV; Lloyds; and ABS/NVR

These specifications generally require moulded case circuit breakers to be supplied with special nameplating, and plug-in adapter kits. When plug-in adapter kits are used, no terminals need be supplied.

Circuit breakers can also be supplied to meet UL489 Supplement SA (Marine Use) and UL489 Supplement SB (Naval Use).

UL489 Supplement SA applies to vessels over 65 feet (19.8 m) in length. Requirements include 40°C ambient calibration, special labeling, and no use of aluminum conductors or terminals.

Suffix **H08** "Marine"

Or you can choose to add 50°C ambient but then there is no "UL" mark.

Suffix **VH08** "Marine" with 50°C ambient calibration

UL 489 Supplement SB requires partial 50°C ambient calibration, vibration testings, special nameplating and no use of aluminum conductors or terminals. Eaton chooses to always fully calibrate to 50°C ambient. ("Naval" labelled per UL and UL now allows 50°C label here).

Suffix **VH09** "Naval" with 50°C ambient calibration

## Certified Test Reports

Eaton breakers can be ordered with certified test reports at the time of order entry for an additional charge. Test report documents the thermal and magnetic or electronic tripping characteristics of the individual breaker. Breaker and test reports must be ordered together.

Add suffix 12 to breaker catalogue number and enter separate line item on order for certified test report.

## Standards and Certifications

Moulded case circuit breakers are designed to conform with the following standards:

- Underwriters Laboratories, Inc., Standard UL489, Moulded Case Circuit Breakers and Circuit Breaker Enclosures
- National Electrical Manufacturers Association Standards Publication No. AB1-1993, Moulded Case Circuit Breakers
- Australian Standard AS 2184, Moulded Case Circuit Breakers
- British Standards Institution Standard BS 4752: Part 1, Switchgear and Control Gear Part 1: Circuit Breakers
- Canadian Standards Association Standard C22.2 No. 5, Moulded Case Circuit Breakers and Circuit Breaker Enclosures.
- International Electrotechnical Commission Recommendations IEC 60947-2, Circuit Breakers
- Japanese T-Mark Standard Moulded Case Circuit Breakers
- South African Bureau of Standards, Standard SABS 156, Standard Specification for Moulded Case Circuit Breakers
- Swiss Electro-Technical Association Standard SEV 157-1, 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 Elektrotechniker (Association of German Electrical Engineers) Standard VDE 0660, Low Voltage Switchgear and Control Gear, Circuit Breakers

Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.

Moulded case circuit breakers equal or exceed Federal Specification Classification W-C-375b requirements for the particular class associated with the circuit breaker frame being considered.

Open breakers do not have service entrance ratings. Service entrance rating is part of the enclosure.

① Circuit breaker manufactured with this option will be supplied without the CSA/UL certification label.

## Quick Reference

## Industrial Circuit Breakers

Circuit Breaker Type	Cont. Amp. Rating @ 40°C	No. Poles	Volts		Type of Trip ①	CSA/UL Listed Interrupting Ratings rms Symmetrical Amperes (kA)												Section Page Number
			AC	DC		AC Ratings Volts						DC ②						
						120	120/240	240	277	347	480Y/277	480	600Y/347	600	125	250	125/250	
<b>G-Frame</b>																		
GHQ	15–30	1	277	—	N.I.T.	—	—	—	14	—	—	—	—	—	—	—	<b>G-3</b>	
HGHB	15–30	1	277	125	N.I.T.	—	—	—	14	—	—	—	—	14	—	—	<b>G-3</b>	
GHB	15–100	1	277	125	N.I.T.	65	—	—	14	—	—	—	—	14	—	—	<b>G-3</b>	
GHB	15–100	2,3	480Y/277	125/250	N.I.T.	—	—	65	—	—	14	—	—	—	—	14	<b>G-3</b>	
GBH ③	15–100	1	347	125	N.I.T.	65	—	—	14	10	—	—	—	14	—	—	<b>G-3</b>	
GBH ③	15–100	2,3	600Y/347	125/250	N.I.T.	—	—	65	—	—	14	—	10	—	—	14	<b>G-3</b>	
HGHC	15–30	1	277	125	N.I.T.	—	—	—	14	—	—	—	—	14	—	—	<b>G-4</b>	
GHC	15–100	1	277	125	N.I.T.	65	—	—	14	—	—	—	—	14	—	—	<b>G-4,5</b>	
GHC	15–100	2,3	480Y/277	125/250	N.I.T.	—	—	65	—	—	14	—	—	—	—	14	<b>G-4,5</b>	
GCH ③	15–100	1	347	125	N.I.T.	65	—	—	14	10	—	—	—	14	—	—	<b>G-4</b>	
GCH ③	15–100	2,3	600Y/347	125/250	N.I.T.	—	—	65	—	—	14	—	10	—	—	14	<b>G-4</b>	
GD	15–50	2	480	125/250	N.I.T.	—	—	65	—	—	—	14	—	—	—	10	<b>G-2</b>	
GD	15–100	3	480	250	N.I.T.	—	—	65	—	—	—	22	—	—	—	10	<b>G-2</b>	
GHGCFEP ④	15–60	1	277	—	N.I.T.	—	—	—	14	—	—	—	—	—	—	—	<b>G-6</b>	
GHGCFEP ④	15–60	1	277	—	N.I.T.	—	—	—	14	—	—	—	—	—	—	—	<b>G-6</b>	
<b>F-Frame</b>																		
ED	100–225	2,3	240	125	N.I.T.	—	—	65	—	—	—	—	—	10	—	—	<b>F-4</b>	
EDH	100–225	2,3	240	125	N.I.T.	—	—	100	—	—	—	—	—	10	—	—	<b>F-4</b>	
EDC	100–225	2,3	240	125	N.I.T.	—	—	200	—	—	—	—	—	10	—	—	<b>F-4</b>	
EHD	15–100	1	277	125	N.I.T.	—	—	—	14	—	—	—	—	10	—	—	<b>F-4</b>	
EHD	15–100	2,3	480	250	N.I.T.	—	—	18	—	—	—	14	—	—	10	—	<b>F-4</b>	
FDB ③	15–150	1	347	125	N.I.T.	—	—	—	—	14	—	—	—	10	—	—	<b>F-4</b>	
FDB ③	15–225	2,3	600	250	N.I.T.	—	—	18	—	—	—	14	—	14	10	—	<b>F-4</b>	
FDB ③	15–225	4	600	250	N.I.T.	—	—	18	—	—	—	14	—	14	10	—	<b>F-4</b>	
FD	15–150	1	347	125	N.I.T.	—	—	—	35	18	—	—	—	10	—	—	<b>F-4</b>	
FD	15–225	2,3	600	250	N.I.T.	—	—	65	—	—	—	35	—	18	10	—	<b>F-4</b>	
FD	15–225	4	600	250	N.I.T.	—	—	65	—	—	—	35	—	18	10	—	<b>F-4</b>	
FDE	15–225	3	600	—	N.I.T.	—	—	65	—	—	—	35	—	18	—	—	<b>F-5</b>	
HFD	15–30	1	347	125	N.I.T.	—	—	—	65	25③	—	—	—	10	—	—	<b>F-5</b>	
HFD	15–225	2,3	600	250	N.I.T.	—	—	100	—	—	—	65	—	25	—	22	<b>F-5</b>	
HFD	15–225	4	600	250	N.I.T.	—	—	100	—	—	—	65	—	25	—	22	<b>F-5</b>	
HFDE	15–225	3	600	—	N.I.T.	—	—	100	—	—	—	65	—	25	—	—	<b>F-5</b>	
FDC ⑤	15–30	1	347	125	N.I.T.	—	—	—	—	30③	—	—	—	10③	—	—	<b>F-5</b>	
FDC ⑤	15–225	2,3	600	250	N.I.T.	—	—	200	—	—	—	100	—	35	—	22	<b>F-5</b>	
FDC ⑤	15–225	4	600	250	N.I.T.	—	—	200	—	—	—	100	—	35	—	22	<b>F-5</b>	
FDCE ⑤	15–225	3	600	—	N.I.T.	—	—	200	—	—	—	100	—	25	—	—	<b>F-5</b>	

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.

② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250V DC.

③ CSA listed only. Not UL listed.

④ UL listed only. Not CSA listed.

⑤ Current limiting.

⑥ The 175A 200A and 225A 2, 3 and 4 pole FDB breakers are CSA listed only, not UL listed.



# 1.4

## Series C Moulded Case Circuit Breakers

### Product Line Overview

#### Industrial Circuit Breakers (Continued)

Circuit Breaker Type	Cont. Amp. Rating @ 40°C	No. Poles	Volts		Type of Trip ①	CSA/UL Listed Interrupting Ratings rms Symmetrical Amperes (kA)									Section Page Number
			AC	DC		AC Ratings Volts					DC ②				
						120	120/240	240	277	480	600	125	250	125/250	
<b>J-Frame</b>															
JD	70 – 250	2, 3, 4	600	250	I.T.	—	—	65	—	35	18	—	10	—	J-3
HJD	70 – 250	2, 3, 4	600	250	I.T.	—	—	100	—	65	25	—	22	—	J-3
JDC ③	70 – 250	2, 3, 4	600	250	I.T.	—	—	200	—	100	35	—	22	—	J-3
<b>K-Frame</b>															
DK	250 – 400	2, 3	240	250	I.T.	—	—	65	—	—	—	—	10	—	K-6
KD	100 – 400	2, 3, 4	600	250	I.T.	—	—	65	—	35	25	—	10	—	K-4,5,9,10
CKD	100 – 400	2, 3, 4	600	250	I.T.	—	—	65	—	35	25	—	10	—	K-7,11,12
HKD	100 – 400	2, 3, 4	600	250	I.T.	—	—	100	—	65	35	—	22	—	K-4,5,9,10
CHKD	100 – 400	2, 3, 4	600	250	I.T.	—	—	100	—	65	35	—	22	—	K7,11,12
KDC ③	100 – 400	2, 3, 4	600	250	I.T.	—	—	200	—	100	65	—	22	—	K-4,5,9,10
<b>L-Frame</b>															
LD	300 – 600	2, 3, 4	600	250	I.T.	—	—	65	—	35	25	—	22	—	L-4,5,7
CLD	300 – 600	2, 3, 4	600	250	I.T.	—	—	65	—	35	25	—	22	—	L-5,9
HLD	300 – 600	2, 3, 4	600	250	I.T.	—	—	100	—	65	35	—	25	—	L-4,5,7
CHLD	300 – 600	2, 3, 4	600	250	I.T.	—	—	100	—	65	35	—	25	—	L-5,9
LDC ③	300 – 600	2, 3, 4	600	250	I.T.	—	—	200	—	100	50	—	25	—	L-4,5,8
CLDC ③	300 – 600	2, 3, 4	600	250	I.T.	—	—	200	—	100	50	—	25	—	L-5,10
<b>MDL-Frame</b>															
MDL	300 – 800	2, 3	600	250	I.T.	—	—	65	—	50	25	—	22	—	M-4,5
CMDL	300 – 800	2, 3	600	250	I.T.	—	—	65	—	50	25	—	22	—	M-5
HMDL	300 – 800	2, 3	600	250	I.T.	—	—	100	—	65	35	—	25	—	M-4,5
CHMDL	300 – 800	2, 3	600	250	I.T.	—	—	100	—	65	35	—	25	—	M-5
<b>N-Frame</b>															
ND	600 – 1200	3, 4	600	—	N.I.T.	—	—	65	—	50	25	—	—	—	N-4,10
CND	600 – 1200	3, 4	600	—	N.I.T.	—	—	65	—	50	25	—	—	—	N-7,11
HND	600 – 1200	3, 4	600	—	N.I.T.	—	—	100	—	65	35	—	—	—	N-5,10
CHND	600 – 1200	3, 4	600	—	N.I.T.	—	—	100	—	65	35	—	—	—	N-8,11
NDC	600 – 1200	3, 4	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	N-6,10
CNDC	600 – 1200	3, 4	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	N-9,11

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.

② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250V DC.

③ Current limiting.

## Industrial Circuit Breakers (Continued)

Circuit Breaker Type	Cont. Amp Rating @ 40°C	No. Poles	Volts		Type of Trip ①	CSA/UL Listed Interrupting Ratings rms Symmetrical Amperes (kA)									Section Page Number
			AC	DC		AC Ratings Volts					DC ②				
						120	120/240	240	277	480	600	125	250	125/250	
<b>R-Frame</b>															
RD 1600	800 – 1600	3, 4	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	R-4,7,9,11,13,15
CRD 1600	800 – 1600	3, 4	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	R-6,8,10,12,14,16
RD 2000	1000 – 2000	3, 4	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	R-4,7,9,11,13,15
CRD 2000	1000 – 2000	3, 4	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	R-6,8,10,12,14,16
RD 2500	1000 – 2500	3, 4	600	—	N.I.T.	—	—	125	—	65	50	—	—	—	R-4,7,9,11,13,15
RDC 1600	800 – 1600	3, 4	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	R-5,7,9,11,13,15
CRDC 1600	800 – 1600	3, 4	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	R-6,8,10,12,14,16
RDC 2000	1000 – 2000	3, 4	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	R-5,7,9,11,13,15
CRDC 2000	1000 – 2000	3, 4	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	R-6,8,10,12,14,16
RDC 2500	1000 – 2500	3, 4	600	—	N.I.T.	—	—	200	—	100	65	—	—	—	R-5,7,9,11,13,15
<b>HMCP Motor Circuit Protectors</b>														<b>MCP-1</b>	
<b>Current Limit R Current Limiting Circuit Breakers — Non-Fused Type</b>															
FCL	15 – 100	2, 3	480	—	N.I.T.	—	—	200	—	150	—	—	—	—	CLCP-1
LCL	125 – 400	2, 3	600	—	N.I.T.	—	—	200	—	200	100	—	—	—	CLCP-2
<b>Tri-Pac Current Limiting Circuit Breakers — Fused Type</b>															
FB	15 – 100	2, 3	600	250	N.I.T.	—	—	200	—	200	200	—	—	100	CLCP-4
LA	70 – 400	2, 3	600	250	I.T.	—	—	200	—	200	200	—	—	100	CLCP-5
NB	300 – 800	2, 3	600	250	I.T.	—	—	200	—	200	200	—	—	100	CLCP-7
PB	600 – 1600	2, 3	600	250	I.T.	—	—	200	—	200	200	—	—	100	CLCP-9

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.

② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250V DC.

### Product Description

- All two- and three-pole circuit breakers are of the common trip type. On all 3-phase Delta (240V) Grounded B phase applications, refer to Eaton.
- Single-pole circuit breakers, 15 and 20 amperes. Switching duty rated (SWD) for fluorescent lighting applications.
- All G-frame circuit breakers are suitable for reverse feed use.
- HACR rated.

### Technical Data and Specifications

#### CSA C22.2 No. 5 and UL489 Interrupting Capacity Ratings

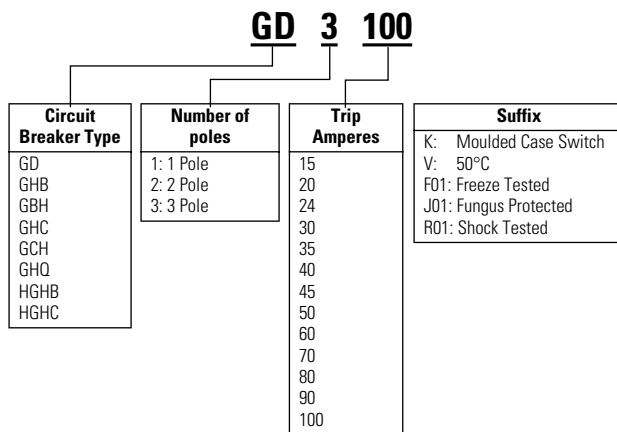
Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)						Section Page Number
		Volts Ac (50/60 Hz)				Volts Dc		
		120	240	277	480	125/250 <sup>②</sup>	250 <sup>①②</sup>	
GD	2	–	65	–	14	10	–	G-2
	3	–	65	–	22	–	10	

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)							Section Page Number	
		Volts Ac (50/60 Hz)					Volts Dc			
		120	240	277	347	480Y/277	600Y/347	125		125/250 <sup>①②</sup>
GHQ	1	–	–	14	–	–	–	–	–	G-3
HGHB	1	–	–	25	–	–	–	14	–	G-3
GHB	1	65	–	14	–	–	–	14 <sup>③</sup>	–	G-3
	2, 3	–	65	–	–	14	–	–	14	G-3
GBH <sup>④</sup>	1	65	–	14	10	–	–	14 <sup>③</sup>	–	G-3
	2, 3	–	65	–	–	14	10	–	14	G-3
HGHC	1	–	–	25	–	–	–	14	–	G-4
GHC	1	65	–	14	–	–	–	14 <sup>③</sup>	–	G-4
	2, 3	–	65	–	–	14	–	–	14	G-4
GCH <sup>④</sup>	1	65	–	14	10	–	–	14 <sup>③</sup>	–	G-4
	2, 3	–	65	–	–	14	10	–	14	G-4
GHBGFEP <sup>⑤</sup>	1	–	–	14	–	–	–	–	–	G-6
GHCGFEP <sup>⑤</sup>	1	–	–	14	–	–	–	–	–	G-6

### Catalogue Numbering System

This information is presented only as an aid to understanding catalogue numbers. It is not to be used to build catalogue numbers for circuit breakers or trip units.

#### Circuit Breaker/Frame Catalogue Number



### Terminal Types

Circuit Breaker Amperes	Terminal Type Material	Screw Head Type	Wire Type	AWG Wire Range	Metric Wire <sup>®</sup> Range (mm <sup>2</sup> )
<b>Standard</b>					
15-20	Clamp (Plated Steel)	Slotted	Cu/Al	#14-10	2.5-4
25-100	Pressure (Aluminum Body)	Slotted	Cu/Al	#10-1/0	4-50
<b>Optional - GD Only</b>					
15-100	Pressure (Steel Body)	Slotted	Cu	#14 - #3	–

### Terminal Torque Values

AWG Wire Range	Torque Value bl-in	Torque Value N.m.
#14-#10	20	2.26
#8	40	4.52
#6-#4	45	5.09
#3-1/0	45	5.09

① Two poles of 3-pole circuit breaker. Two poles in series for 250 VDC application.  
 ② Time constant is 8 milliseconds minimum.  
 ③ 15 through 70A breakers only.  
 ④ CSA listed only, Not UL listed.  
 ⑤ UL listed only, not CSA listed.  
 ⑥ Not CSA and UL listed sizes.

## Type GD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

### Type GD Circuit Breaker



## Standards and Certifications

- UL/CSA.

## Product Description

- Cable in, cable out.
- Includes mounting hardware and BMHE.

## Product Selection

### Type GD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip-Units

Maximum Continuous Ampere Rating @ 40°C	480 Vac Maximum, 250 Vdc		
	14 kAIC @ 480 Vac 10 kAIC @ 125/250 Vdc <sup>②</sup>		22 kAIC @ 480 Vac 10 kAIC @ 250 Vdc <sup>①②</sup>
	Catalogue Number (Includes Line and Load Terminals)		Catalogue Number (Includes binding head screws and clamps 10-32 x .312)
	2-Pole	3-Pole	3-Pole
15	GD2015	GD3015	GD3015D
20	GD2020	GD3020	GD3020D
25	GD2025	GD3025	GD3025D
30	GD2030	GD3030	GD3030D
35	GD2035	GD3035	GD3035D
40	GD2040	GD3040	GD3040D
45	GD2045	GD3045	GD3045D
50	GD2050	GD3050	GD3050D
60	-	GD3060	GD3060D
70	-	GD3070	GD3070D
80	-	GD3080	GD3080D
90	-	GD3090	GD3090D
100	-	GD3100	GD3100D

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## Type GD Moulded Case Switches

Maximum Continuous Ampere Rating @ 40°C	480 Vac Maximum, 250 Vdc	
	Catalogue Number (Includes Line and Load Terminals)	
3-Pole		
60	GD3060K	
100	GD3100K	
60	GD3060KC <sup>③</sup>	
60	GD3060KD <sup>④</sup>	
100	GD3100KD <sup>④</sup>	

**Note:** Moulded Case Switches may open above 1300A

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<sup>①</sup> Two poles of 3-pole circuit breaker. Two poles in series for 250 VDC application.

<sup>②</sup> Time constant is 8 milliseconds minimum.

<sup>③</sup> Includes line and load steel terminals.

<sup>④</sup> Includes binding head screws.

### Types GHB, GBH, GHQ and HGHB Bolt-On Panelboard Circuit Breakers

Type GHB, 277 and 480Y/277V  
 Type GBH, 347 and 600Y/347V  
 Type GHQ, 277V  
 Type HGHB, 277V

Typical GBH



### Type GHB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units<sup>④</sup>

Continuous Ampere Rating @ 40°C	277 Vac Maximum, 125 Vdc Maximum <sup>①</sup>		480Y/277 Vac Maximum, 125/250 Vdc Maximum		480Y/277 Vac Maximum, 125/250 Vdc Maximum <sup>②</sup>	
	1-Pole		2-Pole		3-Pole	
	Catalogue Number					
15	GHB1015 <sup>③</sup>		GHB2015 <sup>③</sup>		GHB3015 <sup>③</sup>	
20	GHB1020 <sup>③</sup>		GHB2020 <sup>③</sup>		GHB3020 <sup>③</sup>	
25	GHB1025		GHB2025		GHB3025	
30	GHB1030		GHB2030		GHB3030	
35	GHB1035		GHB2035		GHB3035	
40	GHB1040		GHB2040		GHB3040	
45	GHB1045		GHB2045		GHB3045	
50	GHB1050		GHB2050		GHB3050	
60	GHB1060		GHB2060		GHB3060	
70	GHB1070		GHB2070		GHB3070	
80	GHB1080		GHB2080		GHB3080	
90	GHB1090		GHB2090		GHB3090	
100	GHB1100		GHB2100		GHB3100	

### Type GBH Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units<sup>⑤</sup>

Continuous Ampere Rating @ 40°C	347 Vac Maximum, 125 Vdc Maximum <sup>①</sup>		600Y/347 Vac Maximum, 125/250 Vdc Maximum		600Y/347 Vac Maximum, 125/250 Vdc Maximum <sup>②</sup>	
	1-Pole		2-Pole		3-Pole	
	Catalogue Number					
15	GBH1015 <sup>③</sup>		GBH2015 <sup>③</sup>		GBH3015 <sup>③</sup>	
20	GBH1020 <sup>③</sup>		GBH2020 <sup>③</sup>		GBH3020 <sup>③</sup>	
25	GBH1025		GBH2025		GBH3025	
30	GBH1030		GBH2030		GBH3030	
35	GBH1035		GBH2035		GBH3035	
40	GBH1040		GBH2040		GBH3040	
45	GBH1045		GBH2045		GBH3045	
50	GBH1050		GBH2050		GBH3050	
60	GBH1060		GBH2060		GBH3060	
70	GBH1070		GBH2070		GBH3070	
80	GBH1080		GBH2080		GBH3080	
90	GBH1090		GBH2090		GBH3090	
100	GBH1100		GBH2100		GBH3100	

Instruction Leaflet Number 15547.

### Type GHQ Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

Continuous Ampere Rating @ 40°C	277V AC Maximum 14 KAIC, No DC Rating (HID & SWD)	
	1-Pole	
	Catalogue Number	
15	GHQ1015	
20	GHQ1020	

### Type HGHB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

Continuous Ampere Rating @ 40°C	277V AC Maximum, 125V DC Maximum	
	1-Pole	
	Catalogue Number	
15	HGHB1015	
20	HGHB1020	
25	HGHB1025	
30	HGHB1030	

① 15 through 70 ampere circuit breakers only.

② Use (2) outside poles. Two poles in series for 250VDC application.

③ Uses .190-32 screw type clamp terminals.

④ 480Y/277V, circuit breakers (Type GHB) not suitable for 3-phase Delta (480V).

⑤ 600Y/347V, circuit breakers (Type GBH) not suitable for 3-phase Delta (600V). CSA listed only. Not UL listed

**Types GHC, GCH and HGCH Circuit Breakers**

Type CHC, 277 and 480Y/277V  
 Type GCH, 347 and 600Y/347V  
 Type HGHC, 277V

Typical GCH

**Type GHC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units<sup>④</sup>**

Continuous Ampere Rating @ 40°C	277 Vac Maximum, 125 Vdc Maximum <sup>①</sup>	480Y/277 Vac Maximum, 125/250 Vdc Maximum	480Y/277 Vac Maximum, 125/250 Vdc Maximum <sup>②</sup>
	1-Pole	2-Pole	3-Pole
	Catalogue Number		
15	GHC1015 <sup>③</sup>	GHC2015 <sup>③</sup>	GHC3015 <sup>③</sup>
20	GHC1020 <sup>③</sup>	GHC2020 <sup>③</sup>	GHC3020 <sup>③</sup>
25	GHC1025	GHC2025	GHC3025
30	GHC1030	GHC2030	GHC3030
35	GHC1035	GHC2035	GHC3035
40	GHC1040	GHC2040	GHC3040
45	GHC1045	GHC2045	GHC3045
50	GHC1050	GHC2050	GHC3050
60	GHC1060	GHC2060	GHC3060
70	GHC1070	GHC2070	GHC3070
80	GHC1080	GHC2080	GHC3080
90	GHC1090	GHC2090	GHC3090
100	GHC1100	GHC2100	GHC3100

**Type GCH Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units<sup>⑤</sup>**

Continuous Ampere Rating @ 40°C	347 Vac Maximum, 125 Vdc Maximum <sup>①</sup>	600Y/347 Vac Maximum, 125/250 Vdc Maximum	600Y/347 Vac Maximum, 125/250 Vdc Maximum <sup>②</sup>
	1-Pole	2-Pole	3-Pole
	Catalogue Number		
15	GCH1015 <sup>③</sup>	GCH2015 <sup>③</sup>	GCH3015 <sup>③</sup>
20	GCH1020 <sup>③</sup>	GCH2020 <sup>③</sup>	GCH3020 <sup>③</sup>
25	GCH1025	GCH2025	GCH3025
30	GCH1030	GCH2030	GCH3030
35	GCH1035	GCH2035	GCH3035
40	GCH1040	GCH2040	GCH3040
45	GCH1045	GCH2045	GCH3045
50	GCH1050	GCH2050	GCH3050
60	GCH1060	GCH2060	GCH3060
70	GCH1070	GCH2070	GCH3070
80	GCH1080	GCH2080	GCH3080
90	GCH1090	GCH2090	GCH3090
100	GCH1100	GCH2100	GCH3100

Instruction Leaflet Number 15548.

**Type HGHC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

Continuous Ampere Rating @ 40°C	277V AC Maximum, 125V DC Maximum
	1-Pole
	Catalogue Number
15	HGHC1015
20	HGHC1020
25	HGHC1025
30	HGHC1030

<sup>①</sup> 15 through 70 ampere circuit breakers only.

<sup>②</sup> Use (2) outside poles. Two poles in series for 250VDC application.

<sup>③</sup> Uses .190-32 screw type clamp terminals.

<sup>④</sup> 480Y/277V, circuit breakers (Type GHC) not suitable for 3-phase Delta (480V).

<sup>⑤</sup> 600Y/347V, circuit breakers (Type GCH) not suitable for 3-phase Delta (600V). CSA listed only. Not UL listed.



### Special Purpose GHC Circuit Breakers

This is Type GHC circuit breaker with binding head screw-type terminals on line and load side. This circuit breaker with screw-type terminals (.190-32) will be marked "Special purpose breaker not for general use." To order this special breaker, use the catalogue number below.

### Type GHC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

Continuous Ampere Rating @ 40°C	277 Vac Maximum, 125 Vdc Maximum	480Y/277 Vac Maximum, 125/250 Vdc Maximum	480Y/277 Vac Maximum, 125/250 Vdc Maximum ①
	1-Pole	2-Pole	3-Pole
	Catalogue Number		
25	GHC1025D	GHC2025D	GHC3025D
30	GHC1030D	GHC2030D	GHC3030D
35	GHC1035D	GHC2035D	GHC3035D
40	GHC1040D	GHC2040D	GHC3040D
45	GHC1045D	GHC2045D	GHC3045D
50	GHC1050D	GHC2050D	GHC3050D
55	GHC1055D	GHC2055D	GHC3055D
60	GHC1060D	GHC2060D	GHC3060D
70	GHC1070D	GHC2070D	GHC3070D
80	GHC1080D	GHC2080D	GHC3080D
90	GHC1090D	GHC2090D	GHC3090D
100	GHC1100D	GHC2100D	GHC3100D

Instruction Leaflet Number 15548

### Type GHB and GHC Thermal-Magnetic Circuit Breakers with Non-interchangeable Trip Units for HID Lighting Applications

Type	Continuous Ampere Rating@ 40°C	277 Vac Maximum
		1-Pole Catalogue Number
Cable-In	15	GHC1015HID
	20	GHC1020HID
Bolt-On	15	GHB1015HID
	20	GHB1020HID

Instruction Leaflet Number 15547 for Bolt-On type; 15548 for Cable-In type.

① Use (2) outside poles. Two pole in series for 250VDC application.

## Types GHBGFEP Bolt-on Panelboard 30mA Industrial Ground Fault Circuit Protectors

15-60 Amperes, 277 Volt AC, 50/60 Hz

Single Phase (Requires 2 Poles Spaces)



These circuit breakers meet the requirements of UL489 and UL1053.

Operational voltage 240V to 305V.

### Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) 277 Volts Ac (50/60 Hz)
GHBGFEP	1	14,000

### Type GHBGFEP Bolt-on Panelboard 30mA Industrial Ground Fault Circuit Protectors with Non-Interchangeable Trip Units

Continuous Ampere Rating @40°C	One Phase (Requires 2 Poles) 277 Vac, 30mA Catalogue Number
15	GHBGFEP1015
20	GHBGFEP1020
30	GHBGFEP1030
40	GHBGFEP1040
50	GHBGFEP1050
60	GHBGFEP1060

Instruction Leaflet Number 29C193

## Types GHCGFEP Cable In/Cable Out 30mA Industrial Ground Fault Circuit Protectors

15-60 Amperes, 277 Volt AC, 50/60 Hz

Single Phase (Requires 2 Poles Spaces)



These circuit breakers meet the requirements of UL489 and UL 1053.

Operational voltage 240V to 305V.

### Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) 277 Volts Ac (50/60 Hz)
GHCGFEP	1	14,000

### Type GHCGFEP Cable In/Cable Out 30mA Industrial Ground Fault Circuit Protectors with Non-Interchangeable Trip Units

Continuous Ampere Rating @40°C	One Phase (Requires 2 Poles) 277 Vac, 30mA Catalogue Number
15	GHCGFEP1015
20	GHCGFEP1020
30	GHCGFEP1030
40	GHCGFEP1040
50	GHCGFEP1050
60	GHCGFEP1060

Instruction Leaflet Number 29C193

### Dimensions/Weights

#### Dimensions, Inches (mm)

Number of Poles	Width	Height	Depth
1	1.0 (25.33)	4.88 (123.95)	2.81 (71.41)
2	2.0 (50.78)	4.88 (123.95)	2.81 (71.41)
3	3.0 (76)	4.88 (123.95)	2.81 (71.41)

#### Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Number of Poles		
	1	2	3
GHB/GBH/GHC/GCH	1.0 (.454)	1.5 (.680)	2.25 (1.021)
GHBGFEP	—	1.2 (.545)	—
GHCGFEP	—	1.1 (.499)	—
GHB/GBH	Carton Quantity		
	24	12	8
	16 (7.264)	16 (7.264)	16 (7.264)
GHC/GCH	Carton Quantity		
	24	12	8
	18 (8.172)	18 (8.172)	18 (8.172)

### Accessories

#### Internal

Alarm Switch . . . . .	INTA-2
Alarm Switch and Auxiliary Switch Combination . . . . .	INTA-2
Auxiliary Switch . . . . .	INTA-5
Shunt Trip . . . . .	INTA-10
Undervoltage Release Mechanism . . . . .	INTA-16

#### External

Control Wire Terminal Kit . . . . .	EXTA-3
Multiwire Connectors . . . . .	EXTA-4
Base Mounting Hardware . . . . .	EXTA-5
Base Mounting Plate . . . . .	EXTA-9
DIN Rail Adapter . . . . .	EXTA-9
Key Operated Attachment . . . . .	EXTA-9
Lock Dog (non-padlockable) . . . . .	EXTA-10
Padlockable Handle . . . . .	EXTA-10
Handle Mechanisms . . . . .	EXTA-21

Typical F-Frame Breaker



F-Frame Breaker with Electronic Trip Unit



## Product Description

- All F-frame circuit breakers are HACR rated.
- All circuit breakers 10 through 30 amperes are suitable for HID (high intensity discharge) use. 480 VAC max.
- All F-frame circuit breakers are suitable for reverse feed use.

## Technical Data and Specifications

### CSA C22.2 No. 5 and UL489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)							Section Page Number
		Volts Ac (50/60 Hz)					Volts Dc <sup>①</sup>		
		240	277	347	480	600	125	250 <sup>②③</sup>	
<b>ED</b>	2, 3	65	—	—	—	—	10	—	F-4
<b>EDH</b>	2, 3	100	—	—	—	—	10	—	F-4
<b>EDC</b>	2, 3	200	—	—	—	—	10	—	F-4
<b>EHD</b>	1	—	14	—	—	—	10	—	F-4
	2, 3	18	—	—	14	—	—	10	F-4
<b>FDB</b>	1	—	—	14 <sup>④</sup>	—	—	10 <sup>④</sup>	—	F-4
	2, 3, 4	18	—	—	14	14	—	10	F-4
<b>FD</b>	1	—	35	18	—	—	10	—	F-4
	2, 3, 4	65	—	—	35	18	—	10	F-4
<b>FDE<sup>⑤</sup></b>	3	65	—	—	35	18	—	—	F-5
<b>HFD</b>	1	—	65	25 <sup>④</sup>	—	—	10	—	F-5
	2, 3, 4	100	—	—	65	25	—	22	F-5
<b>HFDE<sup>⑤</sup></b>	3	100	—	—	65	25	—	—	F-5
<b>FDC<sup>⑥</sup></b>	1	—	—	30 <sup>④</sup>	—	—	10 <sup>④</sup>	—	F-5
	2, 3, 4	200	—	—	100	35	—	22	F-5
<b>FDCE<sup>⑤⑥</sup></b>	3	200	—	—	100	25	—	—	F-5

### IEC 157-1 (P1) Interrupting Capacity Ratings (P1)

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)						Section Page Number
		Volts Ac (50/60 Hz)				Volts Dc <sup>①</sup>		
		220, 240	380, 415	440	500	125	250 <sup>②③</sup>	
<b>ED</b>	2, 3	65	—	—	—	10	—	F-4
<b>EDH</b>	2, 3	100	—	—	—	10	—	F-4
<b>EDC</b>	2, 3	200	—	—	—	10	—	F-4
<b>FDB</b>	2, 3, 4	18	14	14	14	—	10	F-4
<b>FD</b>	1	25	—	—	—	10	—	F-4
	2, 3, 4	65	35	35	18	—	10	F-4
<b>HFD</b>	1	65	—	—	—	10	—	F-5
	2, 3, 4	100	65	65	25	—	22	F-5
<b>FDC</b>	2, 3, 4	200	100	100	35	—	22	F-5

### Digitrip Electronic Trip Units

Circuit Breaker Type	Frame	Ratings
<b>FDE, HFDE, FDCE</b>	225	100, 110, 125, 150, 160, 175, 200, 225
<b>FDE, HFDE, FDCE</b>	160	60, 70, 80, 90, 100, 125, 150, 160
<b>FDE, HFDE, FDCE</b>	80	15, 20, 30, 40, 50, 60, 70, 80

- ① Dc ratings apply to substantially non-inductive circuits.
- ② 2-pole circuit breaker, or two poles of 3-pole circuit breaker.
- ③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.
- ④ CSA listed only. Not UL listed.
- ⑤ Electronic Circuit Breakers available in 3-pole only.
- ⑥ Current limiting.

#### F-Frame Digitrip Specifications

Trip Unit Type	Digitrip RMS 310+	
rms Sensing	Yes	
<b>Breaker Type</b>		
Frame	FDE, HFDE, FDCE	
Ampere Range	15 – 225 A	
Interrupting Rating at 600 V	18, 25, 25 (kA)	
<b>Protection</b>		
Ordering Options	LS LSG	LSI LSIG
Fixed Rated Plug ( $I_N$ )	No	
Overtemperature Trip	Yes	
<b>Long Delay Protection (L)</b>		
Adjustable Rating Plug ( $I_N$ )	No	
Long Delay Pickup Setting ( $I_T$ )	40 – 100% Frame ①	40 – 100% Frame ①
Long Delay Time $I^2t$	2 – 24 Seconds	2 – 24 Seconds
Long Delay Time $I^4t$	No	
Long Delay Thermal Memory	Yes	
High Load Alarm	Yes	
<b>Short Delay Protection (S)</b>		
Short Delay Pickup Setting	2 – 8, 10, 12 x ( $I_T$ )	2 – 8, 10, 12 x ( $I_T$ )
Short Delay Time $I^2t$	Yes	
Short Delay Time Flat	No	
Short Delay Time Z.S.I.	No	
<b>Instantaneous Protection (I)</b>		
Instantaneous Pickup Setting	No	2 – 8, 10, 12 x ( $I_T$ ) ③
Discriminator	No	
Instantaneous Override	Yes	
<b>Ground Fault Protection (G)</b>		
Ground Fault Alarm	No	
Ground Fault Pickup	20 – 100% Frame	20 – 100% Frame
Ground Fault Delay $I^2t$	No	
Ground Fault Delay Flat	Inst – 300 ms	
Ground Fault Z.S.I.	No	
Ground Fault Thermal Memory	Yes	
<b>System Diagnostics</b>		
Cause of Trip LEDs	No	
Magnitude of Trip Information	No	
Remote Signal Contacts	No	
<b>System Monitoring</b>		
Digital Display	No	
Current	No	
Voltage	No	
Power and Energy	No	
Power Quality Harmonics	No	
Power Factor	No	
<b>Communications</b>		
PowerNet	No	
<b>Testing</b>		
Testing Method	Test Kit (MTST120V/ MTST230V)	Test Kit (MTST120V/ MTST230V)

① Trip unit has selectable  $I_T$  Settings.

② Z.S.I. (Zone Selective Interlock) is optional. Must order with ZSI. Standard 310+ does not come with ZSI.

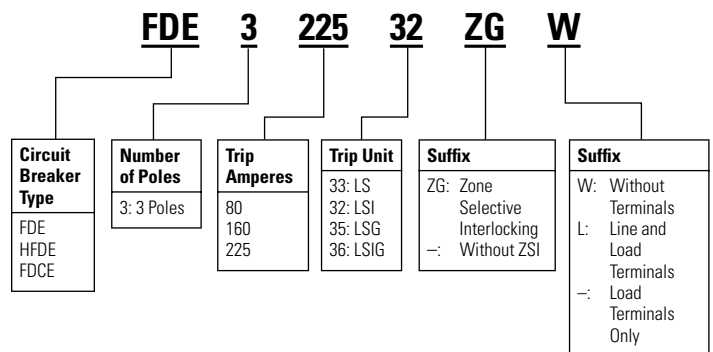
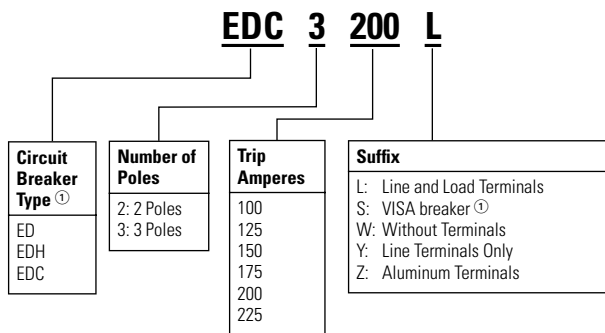
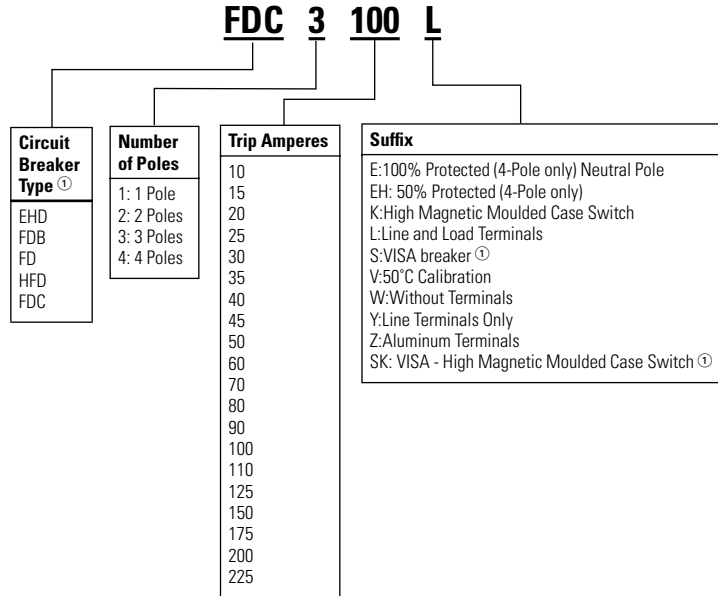
③ Occurs with Short Delay Time adjustment set at INST setting.

$I_N$  = Frame Rating (80/160/225)  
 $I_T$  = LDPU Setting

### Catalogue Numbering System

This information is presented only as an aid to understanding Catalogue numbers. It is not to be used to build Catalogue numbers for circuit breakers or trip units.

#### Circuit Breaker Catalogue Number



### Dimensions/Weights

#### Dimensions, Inches (mm)

Number of Poles	Width	Height	Depth
1	1.375 (35)	6 (152)	3.375 (86)
2	2.75 (70)	6 (152)	3.375 (86)
3	4.125 (105)	6 (152)	3.375 (86)
4	5.5 (140)	6 (152)	3.375 (86)

#### Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Number of Poles			
	1	2	3	4
<b>ED, EDH, EDC</b>	–	3 (1.361)	4.5 (2.041)	–
<b>EHD, FDB, FD, HFD, FDC</b>	2 (.907)	3 (1.361)	4.5 (2.041)	6 (2.721)
<b>FDE, HFDE, FDCE</b>	–	–	4.5 (2.041)	–

① "VISA" option is available. CSA listed only.



### Product Selection

#### Types ED, EDH, and EDC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	240 Vac Maximum, 125 Vdc					
	65 kAIC @ 240 Vac		100 kAIC @ 240 Vac		200 kAIC @ 240 Vac	
	Type ED ②		Type EDH ②		Type EDC Current Limiting ②	
	2-Pole	3-Pole	2-Pole	3-Pole	2-Pole	3-Pole
Catalogue Number (Includes Terminals on Load End Only)						
100	ED2100	ED3100	EDH2100	EDH3100	EDC2100	EDC3100
125	ED2125	ED3125	EDH2125	EDH3125	EDC2125	EDC3125
150	ED2150	ED3150	EDH2150	EDH3150	EDC2150	EDC3150
175	ED2175	ED3175	EDH2175	EDH3175	EDC2175	EDC3175
200	ED2200	ED3200	EDH2200	EDH3200	EDC2200	EDC3200
225	ED2225	ED3225	EDH2225	EDH3225	EDC2225	EDC3225

Instruction Leaflet Number 29C101

#### Type EHD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	277 Vac Maximum, 125 Vdc			480 Vac Maximum, 250 Vdc		
	14 kAIC @ 277 Vac		14 kAIC @ 480 Vac			
	Type EHD ②					
	1-Pole	2-Pole		3-Pole		
Catalogue Number (Includes Terminals on Load End Only)						
10	—	—		—		
15	EHD1015①	EHD2015		EHD3015		
20	EHD1020①	EHD2020		EHD3020		
25	EHD1025	EHD2025		EHD3025		
30	EHD1030	EHD2030		EHD3030		
35	EHD1035	EHD2035		EHD3035		
40	EHD1040	EHD2040		EHD3040		
45	EHD1045	EHD2045		EHD3045		
50	EHD1050	EHD2050		EHD3050		
60	EHD1060	EHD2060		EHD3060		
70	EHD1070	EHD2070		EHD3070		
80	EHD1080	EHD2080		EHD3080		
90	EHD1090	EHD2090		EHD3090		
100	EHD1100	EHD2100		EHD3100		

Instruction Leaflet Number 29C101

#### Type FDB and FD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	347 Vac Maximum, 125 Vdc				347 Vac Maximum, 125 Vdc			
	600 Vac Maximum, 250 Vdc		600 Vac Maximum, 250 Vdc		600 Vac Maximum, 250 Vdc		600 Vac Maximum, 250 Vdc	
	14 kAIC @ 347 Vac		14 kAIC @ 600 Vac		18 kAIC @ 347 Vac		18 kAIC @ 600 Vac	
	Type FDB ②				Type FD ②			
1-Pole③	2-Pole	3-Pole	4-Pole	1-Pole	2-Pole	3-Pole	4-Pole	
Catalogue Number (Includes Terminals on Load End Only)								
10	—	—	—	—	—	—	—	
15	FDB1015①	FDB2015	FDB3015	FDB4015	FD1015①	FD2015	FD3015	FD4015
20	FDB1020①	FDB2020	FDB3020	FDB4020	FD1020①	FD2020	FD3020	FD4020
25	FDB1025	FDB2025	FDB3025	FDB4025	FD1025	FD2025	FD3025	FD4025
30	FDB1030	FDB2030	FDB3030	FDB4030	FD1030	FD2030	FD3030	FD4030
35	FDB1035	FDB2035	FDB3035	FDB4035	FD1035	FD2035	FD3035	FD4035
40	FDB1040	FDB2040	FDB3040	FDB4040	FD1040	FD2040	FD3040	FD4040
45	FDB1045	FDB2045	FDB3045	FDB4045	FD1045	FD2045	FD3045	FD4045
50	FDB1050	FDB2050	FDB3050	FDB4050	FD1050	FD2050	FD3050	FD4050
60	FDB1060	FDB2060	FDB3060	FDB4060	FD1060	FD2060	FD3060	FD4060
70	FDB1070	FDB2070	FDB3070	FDB4070	FD1070	FD2070	FD3070	FD4070
80	FDB1080	FDB2080	FDB3080	FDB4080	FD1080	FD2080	FD3080	FD4080
90	FDB1090	FDB2090	FDB3090	FDB4090	FD1090	FD2090	FD3090	FD4090
100	FDB1100	FDB2100	FDB3100	FDB4100	FD1100	FD2100	FD3100	FD4100
110	FDB1110	FDB2110	FDB3110	FDB4110	FD1110	FD2110	FD3110	FD4110
125	FDB1125	FDB2125	FDB3125	FDB4125	FD1125	FD2125	FD3125	FD4125
150	FDB1150	FDB2150	FDB3150	FDB4150	FD1150	FD2150	FD3150	FD4150
175	—	FDB2175③	FDB3175③	FDB4175③	—	FD2175	FD3175	FD4175
200	—	FDB2200③	FDB3200③	FDB4200③	—	FD2200	FD3200	FD4200
225	—	FDB2225③	FDB3225③	FDB4225③	—	FD2225	FD3225	FD4225

Instruction Leaflet Number 29C101

① CSA and UL listed for SWD applications.

② When a "VISA" type breaker is required, add suffix 'S' to circuit breaker catalogue number, i.e., FD3150S. Available for 1-,2-,3-pole breakers.

③ CSA listed only. Not UL listed.

**Types HFD and FDC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

Maximum Continuous Ampere Rating @ 40°C	347 Vac Maximum, 125 Vdc				347 Vac Maximum, 125 Vdc			
	600 Vac Maximum, 250 Vdc		600 Vac Maximum, 250 Vdc		600 Vac Maximum, 250 Vdc		600 Vac Maximum, 250 Vdc	
	25 kAIC @ 347 Vac		25 kAIC @ 600Vac		30 kAIC @ 347		35 kAIC @ 600 Vac	
	Type HFD ③				Type FDC ③			
	1-Pole	2-Pole	3-Pole	4-Pole	1-Pole	2-Pole	3-Pole	4-Pole
	Catalogue Number (Includes Terminals on Load End Only)							
15	HFD1015 <sup>①②</sup>	HFD2015	HFD3015	HFD4015	FDC1015 <sup>①②</sup>	FDC2015	FDC3015	FDC4015
20	HFD1020 <sup>①②</sup>	HFD2020	HFD3020	HFD4020	FDC1020 <sup>①②</sup>	FDC2020	FDC3020	FDC4020
25	HFD1025 <sup>②</sup>	HFD2025	HFD3025	HFD4025	FDC1025 <sup>②</sup>	FDC2025	FDC3025	FDC4025
30	HFD1030 <sup>②</sup>	HFD2030	HFD3030	HFD4030	FDC1030 <sup>②</sup>	FDC2030	FDC3030	FDC4030
35	—	HFD2035	HFD3035	HFD4035	—	FDC2035	FDC3035	FDC4035
40	—	HFD2040	HFD3040	HFD4040	—	FDC2040	FDC3040	FDC4040
45	—	HFD2045	HFD3045	HFD4045	—	FDC2045	FDC3045	FDC4045
50	—	HFD2050	HFD3050	HFD4050	—	FDC2050	FDC3050	FDC4050
60	—	HFD2060	HFD3060	HFD4060	—	FDC2060	FDC3060	FDC4060
70	—	HFD2070	HFD3070	HFD4070	—	FDC2070	FDC3070	FDC4070
80	—	HFD2080	HFD3080	HFD4080	—	FDC2080	FDC3080	FDC4080
90	—	HFD2090	HFD3090	HFD4090	—	FDC2090	FDC3090	FDC4090
100	—	HFD2100	HFD3100	HFD4100	—	FDC2100	FDC3100	FDC4100
110	—	HFD2110	HFD3110	HFD4110	—	FDC2110	FDC3110	FDC4110
125	—	HFD2125	HFD3125	HFD4125	—	FDC2125	FDC3125	FDC4125
150	—	HFD2150	HFD3150	HFD4150	—	FDC2150	FDC3150	FDC4150
175	—	HFD2175	HFD3175	HFD4175	—	FDC2175	FDC3175	FDC4175
200	—	HFD2200	HFD3200	HFD4200	—	FDC2200	FDC3200	FDC4200
225	—	HFD2225	HFD3225	HFD4225	—	FDC2225	FDC3225	FDC4225

Instruction Leaflet Number 29C101

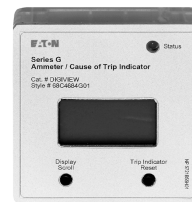
**Types FDE, HFDE and FDCE Electronic Circuit Breakers with Non-Interchangeable Trip Units**

Maximum Ampere Rating	Neutral ④ CT for LSG and LSIg	LS Catalogue Number	LSI Catalogue Number	LSI w/ZSI ⑤ Catalogue Number	LSG Catalogue Number	LSIG Catalogue Number	LSIG w/ZSI ⑤ Catalogue Number
<b>IC Rating 18 kAIC at 600 Vac</b>							
80	CTF080	FDE308033	FDE308032	FDE308032ZG	FDE308035	FDE308036	FDE308036ZG
160	CTF160	FDE316033	FDE316032	FDE316032ZG	FDE316035	FDE316036	FDE316036ZG
225	CTF225	FDE322533	FDE322532	FDE322532ZG	FDE322535	FDE322536	FDE322536ZG
<b>IC Rating 25 kAIC at 600 Vac</b>							
80	CTF080	HFDE308033	HFDE308032	HFDE308032ZG	HFDE308035	HFDE308036	HFDE308036ZG
160	CTF160	HFDE316033	HFDE316032	HFDE316032ZG	HFDE316035	HFDE316036	HFDE316036ZG
225	CTF225	HFDE322533	HFDE322532	HFDE322532ZG	HFDE322535	HFDE322536	HFDE322536ZG
<b>IC Rating 25 kAIC at 600 Vac</b>							
80	CTF080	FDCE308033	FDCE308032	FDCE308032ZG	FDCE308035	FDCE308036	FDCE308036ZG
160	CTF160	FDCE316033	FDCE316032	FDCE316032ZG	FDCE316035	FDCE316036	FDCE316036ZG
225	CTF225	FDCE322533	FDCE322532	FDCE322532ZG	FDCE322535	FDCE322536	FDCE322536ZG

**Breaker Mount Ammeter**

Description	Catalogue Number
Breaker Mount Ammeter and Cause of Trip Display	DIGIVIEW
Remote Mount Ammeter and Cause of Trip Display	DIGIVIEWR06

**Note:** Use on FDE, HFDE and FDCE electronic trip only.



**Ammeter**

① CSA and UL listed for SWD applications.  
 ② 1-pole circuit breaker interrupting ratings @ 347 Vac are listed with CSA only. Not UL listed.  
 ③ When a "VISA" type breaker is required, add suffix 'S' to circuit breaker catalogue number, i.e., HFD2020S. Available for 1-,2-,3-Pole breakers except 2-,3-Pole only for type FDC breaker.  
 ④ Required for ground fault measurement in 3 phase 4 wires system with phase to neutral load. Not supplied with the breaker, must be ordered separately.  
 ⑤ FDE, HFDE, FDCE Electronic Circuit Breakers with optional Zone Selective Interlocking function.

#### Moulded Case Switches ①

Moulded case switches are used as compact switches in applications requiring high current switching capabilities. Moulded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Moulded case switches are listed in accordance with CSA C22.2 No. 5 and UL 489 suitable for reverse feed use, and as 100% rated devices.

**Note: Note:** Moulded Case Switches may open above 1800 amperes.

Maximum Continuous Ampere Rating @ 40°C	480 Vac Maximum, 250 Vdc		600 Vac Maximum, 250 Vdc	
	Complete MCS with Load Side Terminals Only	Catalogue Number	Complete MCS with Load Side Terminals Only	Catalogue Number
<b>2-Pole</b>				
100	EHD2100K		FD2100K	HFD2100K
150	—		FD2150K	HFD2150K
225	—		FD2225K	HFD2225K
<b>3-Pole</b>				
100	EHD3100K		FD3100K	HFD3100K
150	—		FD3150K	HFD3150K
225	—		FD3225K	HFD3225K
<b>4-Pole</b>				
100	—		FD4100K	HFD4100K
150	—		FD4150K	HFD4150K
225	—		FD4225K	HFD4225K

Instruction Leaflet Number 29C101

Moulded Case Switch Type	Number of Poles	Unfused Short Circuit Withstand Rating (Symmetrical Amperes) (kA)			
		Volts AC (50/60 Hz)		Volts DC	
		240	480	600	250
EHD	2,3	18	14	—	10
FD	2,3,4	65	25	18	10
HFD	2,3,4	100	65	25	22

① When a "VISA" type MCS is required, change the suffix of the MCS catalogue number from "K" to "SK". i.e., FD3225SK.

### Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. Except as noted, terminals comply with Canadian Standard Association standard C22.2 No. 65 and UL Standard UL486A and UL486B. Unless otherwise specified, F-frame circuit breakers are factory equipped with load terminals only.

### Ordering Information

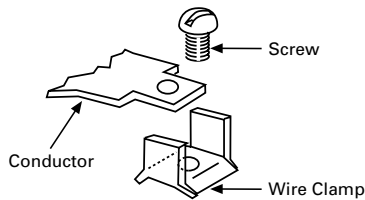
F-frame circuit breakers and moulded case switches have load terminals only as standard equipment. When standard line-end terminals (same as standard load-end terminals) are required, add suffix L to the circuit breaker catalogue number.

When non-standard or optional line and/or load terminals are required, order by style number. Specify if factory installation is required.

### Line and Load Terminals

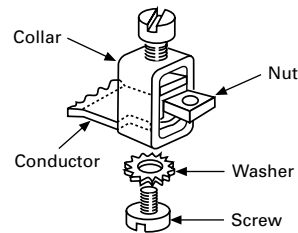
Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range	Metric Wire Range mm <sup>2</sup>	Package of 3 Terminals
					Catalogue Number
<b>Standard Pressure Type Terminals</b>					
20 (EHD)	Steel	Cu/Al	#14-#10	2.5-4	<b>3T20FB</b> ①
100	Steel	Cu/Al	#14-1/0	2.5-50	<b>3T100FB</b>
225	Aluminum	Cu/Al	#4-4/0	25-95	<b>3TA225FD</b>
<b>Optional Pressure Terminals</b>					
50	Aluminum	Cu/Al	#14-#4	2.5-25	<b>3TA50FB</b> ①
100	Aluminum	Cu/Al	#14-1/0	2.5-50	<b>3TA100FD</b>
150	Stainless Steel	Cu	#4-4/0	25-95	<b>3T150FB</b>
225	Aluminum	Cu/Al	#6-300 kcmil	16-150	<b>3TA225FDK</b> ②

#### 3T20FB



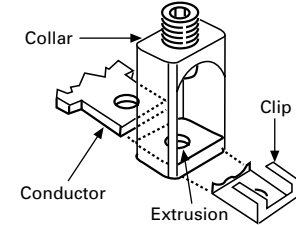
Assemble wire clamp to bottom of conductor as shown.

#### 3T100FB, 3T150FB



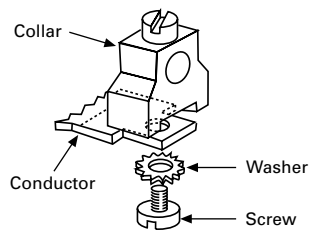
Insert collar enclosing conductor as shown. Locate nut on top of conductor and tighten securely with screw and washer. Caution: Collar must surround conductor.

#### 3TA225FD



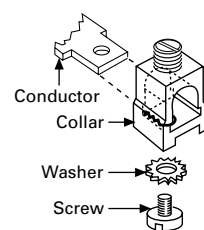
Insert collar enclosing conductor and centre on extrusion on collar. Install clip with legs on top of conductor and snap end around bottom of collar.

#### 3TA50FB



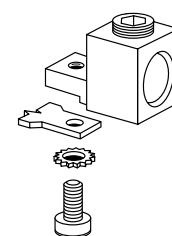
Assemble collar on top of conductor as shown. Tighten securely with screw and washer.

#### 3TA100FD



Collar slides onto conductor and is held in position by a screw and lock washer.

#### 3TA225FDK



Assemble collar on top of conductor as shown. Tighten securely with screw and washer. Terminal shield must be used with this collar.

**Note:** For 185 mm<sup>2</sup> wire, use 3TA225FDK1. (IEC Application)

① Not for use with ED, EDH, EDC breakers.

② Includes terminal shield kit. Adds approximately 3 inches to breaker height. Available for use on 3-pole breaker only. Not for use on line side of F frame breaker rated 150A or less.

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

	Reference Page	1-Pole		2-Pole			3-Pole			3-Pole (FDE, HFDE, FDCE)			4-Pole		
		Centre	Left	Right	Left	Centre	Right	Left	Centre	Right	Left	Centre	Right	Neu.	
<b>Internal Accessories (Only One Internal Accessory Per Pole)</b>															
Alarm Lockout Switch (Make Only)	INTA-2	■													
Alarm Lockout (Make/Break)	INTA-2			■	□	□	■②								
Alarm Lockout (2Make/2Break)	INTA-2			■	□	□	■①②								
Auxiliary Switch (1A, 1B)	INTA-5			■	■	■	■			■③				■	
Auxiliary Switch (2A, 2B)	INTA-5			■	■	■	■①							■	
Auxiliary Switch and Alarm Switch Combination	INTA-8			■	□	□	■①②								
Shunt Trip – Standard	INTA-11			■	■	■	■							■	
Shunt Trip – Low Energy	INTA-15			■	■	■	■								
Undervoltage Release Mechanism	INTA-17			■	■	■	■②								
<b>External Accessories</b>															
End Cap Kit	EXTA-2		●	●	●	●	●	●	●	●	●	●	●	●	
Keeper Nut	EXTA-2	●	●	●	●	●	●	●	●	●	●	●	●	●	
Control Wire Terminal Kit	EXTA-3	●	●	●	●	●	●	●	●	●	●	●	●	●	
Multiwire Connectors	EXTA-4	●	●	●	●	●	●	●	●	●	●	●	●	●	
Base Mounting Hardware	EXTA-5	●	●	●	●	●	●	●	●	●	●	●	●	●	
Terminal Shields	EXTA-7	●	●	●	●	●	●	●	●	●	●	●	●	●	
Terminal End Covers	EXTA-8				●	●	●	●	●						
Interphase Barriers	EXTA-8		●	●	●	●	●	●	●	●	●	●	●	●	
Non-Padlockable Handle Block	EXTA-10	■	■							■			■		
Snap-on Padlockable Handle Lock Hasp	EXTA-10	■	■							■			■		
Padlockable Handle Lock Hasp	EXTA-11			■	□	□	■				□		□		
Cylinder Lock	EXTA-11				■		■								
Key Interlock Kit	EXTA-12			■	□	□	■				□		□		
Sliding Bar Interlock – Requires Two Breakers	EXTA-13				●	●	●	●	●	●					
Walking Beam Interlock – Requires Two Breakers	EXTA-13				●	●	●	●	●	●	●	●	●	●	
Electrical (Solenoid)/(Motor) Operator	EXTA-14				●	●	●	●	●	●	●	●	●	●	
Plug-in Adapters	EXTA-16		●	●	●	●	●	●	●	●	●	●	●	●	
Rear Connecting Studs	EXTA-17	●	●	●	●	●	●	●	●	●	●	●	●	●	
Panelboard Connecting Straps	EXTA-20	●	●	●	●	●	●	●	●	●	●	●	●	●	
Handle Mechanisms	EXTA-21				●	●	●	●	●	●					
LFD Current Limiter	EXTA-28				●	●	●	●	●						
IQ Energy Sentinel	EXTA-28		●	●	●	●	●	●	●						
<b>Modifications (Refer to Eaton)</b>															
Special Calibration	1.2	●	●	●	●	●	●	●	●	●	●	●	●	●	
Moisture Fungus Treatment	1.2	●	●	●	●	●	●	●	●	●	●	●	●	●	
Freeze-Tested Circuit Breakers	1.2	●	●	●	●	●	●	●	●	●	●	●	●	●	
Marine Application	1.2	●	●	●	●	●	●	●	●	●	●	●	●	●	

■ Applicable in indicated pole position      □ May be mounted on left or right pole – not both      ● Accessory available/Modification available

① Not for use with Ground Fault styles (LSG, LSiG) Electronic Circuit Breakers and Electronic Circuit Breakers complete with Zone Selective Interlocking (ZSI) option.

② A special interface barrier is required. To be installed by the factory in U.S. or Perth only.

③ A special 1A/1B auxiliary switch is required. To be installed by the factory in U.S. only.

To specify a 1A/1B auxiliary switch be installed in the Right Pole with pigtail leads exit to **same side** of the breaker, add suffix '**A30**' to circuit breaker catalogue number.

To specify a 1A/1B auxiliary switch be installed in the Right Pole with pigtail leads exit to **rear** of the breaker, add suffix '**A31**' to circuit breaker catalogue number.

To specify a 1A/1B auxiliary switch be installed in the Right Pole with pigtail leads exit to **opposite side** of the breaker, add suffix '**A32**' to circuit breaker catalogue number.

Typical J-Frame Circuit Breaker



## Technical Data and Specifications

### CSA C22.2 No. 5 and UL489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)					Page Number
		Volts Ac (50/60 Hz)				Volts Dc	
		240	480	600	125	250 <sup>①②</sup>	
JD	2, 3, 4	65	35	18	—	10	J-3
HJD	2, 3, 4	100	65	25	—	22	J-3
JDC <sup>③</sup>	2, 3, 4	200	100	35	—	22	J-3

### IEC 157-1 (P1) Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)					Page Number	
		Volts Ac (50/60 Hz)				Volts Dc		
		240	380	415	600	125		250 <sup>①②</sup>
JD	2, 3, 4	65	35	35	—	—	10	J-3
HJD	2, 3, 4	100	65	65	—	—	22	J-3
JDC	2, 3, 4	200	100	100	—	—	22	J-3

## Product Description

- All J-frame Circuit Breakers are HACR rated.
- J-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- J-frame circuit breakers are suitable for reverse feed use.

<sup>①</sup> 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.

<sup>②</sup> Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

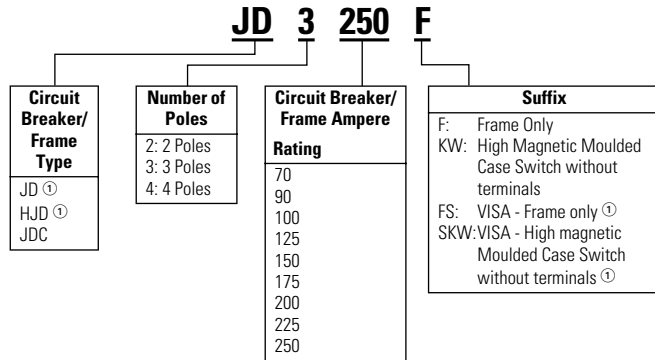
<sup>③</sup> Current limiting.



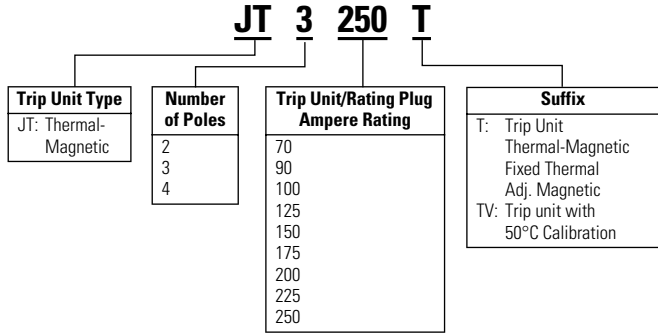
### Catalogue Numbering System

This information is presented only as an aid to understanding Catalogue numbers. It is not to be used to build Catalogue numbers for circuit breakers or trip units.

#### Circuit Breaker/Frame Catalogue Number



#### Trip Unit Catalogue Number



### Dimensions/Weights

#### Dimensions, Inches (mm)

Number of Poles	Width	Height	Depth
2, 3	4.125 (105)	10 (255)	4.063 (103)
4	5.5 (140)	10 (254)	4.063 (103)

#### Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Complete Breaker			Frame Only			Trip Unit		
	2	3	4	2	3	4	2	3	4
JD	11.25 (5.103)	12.5 (5.670)	13.25 (6.010)	9 (4.082)	10 (4.536)	10.5 (4.763)	2 (.907)	2 (.907)	2.25 (1.021)
HJD	11.25 (5.103)	12.5 (5.670)	13.25 (6.010)	9 (4.082)	10 (4.536)	10.5 (4.763)	2 (.907)	2 (.907)	2.25 (1.021)
JDC	12.25 (5.103)	13.5 (6.124)	14.25 (6.470)	10 (4.536)	11 (4.990)	11.5 (5.217)	2 (.907)	2 (.907)	2.25 (1.021)

① "VISA" option available. CSA listed only.

## Product Selection

## Types JD, HJD, and JDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	Standard Interrupting Capacity 600 Vac Rated 18 kAIC @ 600 Vac		High Interrupting Capacity 600 Vac Rated 25 kAIC @ 600 Vac		Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 35 kAIC @ 600 Vac		Thermal Magnetic Trip Unit Only ⑥  For Use With: Standard or High or Ultra High Interrupting Frames	Standard Terminals Only  See Page J-5 for Optional Terminals
	Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals		Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals		Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals			
	Frame Only⑤	Frame Only⑤	Frame Only⑤	Frame Only⑤	Frame Only	Frame Only		
Catalogue Number								
<b>2-Pole④</b>								
70	JD2070	JD2250F	HJD2070	HJD2250F	JDC2070	JDC2250F	JT2070T	TA250KB①
90	JD2090		HJD2090		JDC2090		JT2090T	
100	JD2100		HJD2100		JDC2100		JT2100T	
125	JD2125		HJD2125		JDC2125		JT2125T	
150	JD2150		HJD2150		JDC2150		JT2150T	
175	JD2175		HJD2175		JDC2175		JT2175T	
200	JD2200		HJD2200		JDC2200		JT2200T	
225	JD2225		HJD2225		JDC2225		JT2225T	
250	JD2250		HJD2250		JDC2250		JT2250T	
<b>3-Pole</b>								
70	JD3070	JD3250F	HJD3070	HJD3250F	JDC3070	JDC3250F	JT3070T	TA250KB①
90	JD3090		HJD3090		JDC3090		JT3090T	
100	JD3100		HJD3100		JDC3100		JT3100T	
125	JD3125		HJD3125		JDC3125		JT3125T	
150	JD3150		HJD3150		JDC3150		JT3150T	
175	JD3175		HJD3175		JDC3175		JT3175T	
200	JD3200		HJD3200		JDC3200		JT3200T	
225	JD3225		HJD3225		JDC3225		JT3225T	
250	JD3250		HJD3250		JDC3250		JT3250T	
<b>4-Pole②③</b>								
125	JD4125	JD4250F	HJD4125	HJD4250F	JDC4125	JDC4250F	JT3125T	TA250KB①
150	JD4150		HJD4150		JDC4150		JT3150T	
175	JD4175		HJD4175		JDC4175		JT3175T	
200	JD4200		HJD4200		JDC4200		JT3200T	
225	JD4225		HJD4225		JDC4225		JT3225T	
250	JD4250		HJD4250		JDC4250		JT3250T	

Instruction Leaflet Number 29C103 for Breaker; 29C600 for Thermal Magnetic Trip Unit

① Individually packed.

② Fully rated neutral pole with no protection.

③ Neutral is in right pole.

④ 2-pole circuit breaker supplied in 3-pole frame

⑤ When a "VISA" frame is required, add suffix 'S' to circuit breaker frame catalogue number, i.e. JD3250FS. JD and HJD only.

⑥ Magnetic trip adjustable 5 - 10 times continuous ampere rating.

### Moulded Case Switches<sup>②</sup>

Moulded case switches are used as compact switches in applications requiring high current switching capabilities. Moulded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Moulded case switches are listed in accordance with CSA C22.2 No. 5 and UL 489, suitable for reverse feed use, and as 100% rated devices.

Maximum Continuous Ampere Rating @ 40°C	600 Vac Maximum, 250 Vdc		Standard Terminals Only
	Complete MCS Only Without Line and Load Terminals	Catalogue Number	See page J-5 for Optional Terminals
<b>2-Pole</b>			
250	JD2250KW	HJD2250KW	TA250KB <sup>①</sup>
<b>3-Pole</b>			
250	JD3250KW	HJD3250KW	TA250KB <sup>①</sup>
<b>4-Pole</b>			
250	JD4250KW	HJD4250KW	TA250KB <sup>①</sup>

**Note: Note:** Moulded case switches may open above 2500 amperes.

Instruction Leaflet Number 29C103

Moulded Case Switch Type	Number of Poles	Unfused Short Circuit Withstand Rating (Symmetrical Amperes) (kA)			
		Volts Ac (50/60 Hz)			Volts Dc
		240	480	600	250
JD	2,3	65	35	18	10
HJD	2,3	100	65	25	22

<sup>①</sup> Individually packed.

<sup>②</sup> When a "VISA" type Moulded Case Switch is required, change the suffix of the MCS catalogue number from "KW" to "SKW", i.e. JD3250SKW.

## Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with CSA Standard C22.2 No. 65 and UL Standards UL486A and UL486B. Unless otherwise specified, J-frame circuit breaker line and load terminals are shipped separately for field installation.

The bottom of the standard TA250KB terminal contains a recess which is positioned over the J-frame circuit breaker terminal conductor.

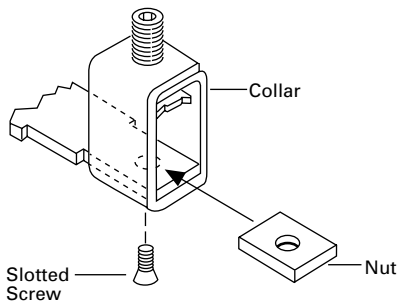
## Ordering Information

J-frame circuit breakers use Cu/Al terminals as standard. When optional copper-only terminals are required, order by Catalogue number. Specify if factory installation is required.

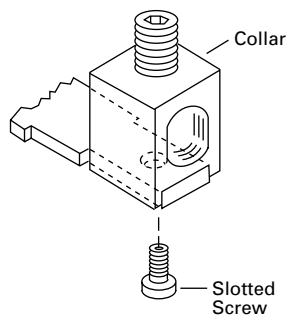
## Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/ No. Conductors	Metric Wire Range mm <sup>2</sup>	Catalogue Numbers
<b>Standard Cu/Al Pressure Terminals</b>					
250	Aluminum	Cu/Al	#4-350 kcmil	25-185	<b>TA250KB</b>
250	Stainless Steel	Cu	#4-350 kcmil	25-185	<b>T250KB</b>

### T250KB Terminal



### TA250KB Terminal



### J-Frame Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

Description	Reference Page	2-, 3-Pole			4-Pole			
		Left	Centre	Right	Left	Centre	Right	Neu.
<b>Internal Accessories (Only One Internal Accessory Per Pole)</b>								
Alarm Lockout (Make/Break)	INTA-3	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Auxiliary Switch (1A, 1B)	INTA-6	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Auxiliary Switch and Alarm Switch Combination	INTA-8	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Shunt Trip – Standard	INTA-11	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Shunt Trip – Low Energy	INTA-15	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Undervoltage Release Mechanism	INTA-18	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
<b>External Accessories</b>								
End Cap Kit	EXTA-2	●	●	●	●	●	●	●
Plug Nut	EXTA-3	●	●	●	●	●	●	●
Control Wire Terminal Kit	EXTA-3	●	●	●	●	●	●	●
Multiwire Connectors	EXTA-4	●	●	●	●	●	●	●
Base Mounting Hardware	EXTA-5	●	●	●	●	●	●	●
Terminal Shields	EXTA-7	●	●	●	●	●	●	●
Interphase Barriers	EXTA-8	●	●	●	●	●	●	●
Non-Padlockable Handle Block	EXTA-10		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		
Padlockable Handle Block	EXTA-10		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		
Padlockable Handle Lock Hasp	EXTA-11	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Cylinder Lock	EXTA-11	<input type="checkbox"/>		<input type="checkbox"/>				
Key Interlock Kit	EXTA-12	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
Sliding Bar Interlock – Requires Two Breakers	EXTA-13	●	●	●				
Electrical (Solenoid) Operator	EXTA-14	●	●	●	●	●	●	●
Plug-in Adapters	EXTA-16	●	●	●	●	●	●	●
Rear Connecting Studs	EXTA-18	●	●	●	●	●	●	●
Panelboard Connecting Straps	EXTA-20	●	●	●	●	●	●	●
Handle Mechanisms	EXTA-21	●	●	●	●	●	●	●
Handle Extension	EXTA-27	●	●	●	●	●	●	●
IQ Energy Sentinel	EXTA-28	●	●	●				
<b>Modifications (Refer to Eaton)</b>								
Special Calibration	1.2	●	●	●	●	●	●	●
Moisture Fungus Treatment	1.2	●	●	●	●	●	●	●
Freeze-Tested Circuit Breakers	1.2	●	●	●	●	●	●	●
Marine/Naval Application	1.2	●	●	●	●	●	●	●

Applicable in indicated pole position

May be mounted on left or right pole – not both

● Accessory available/Modification available

Typical K-Frame Circuit Breaker complete with the "VISA" option



## Product Description

- All K-frame Circuit Breakers are HACR rated.
- K-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers. OPTIM circuit breakers are available as factory assembled only.
- K-frame circuit breakers are suitable for reverse feed use.

## Technical Data and Specifications

### CSA C22.2 No. 5 and UL489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles <sup>③</sup>	Interrupting Capacity (Symmetrical Amperes) (kA)					Volts Dc	Section Page Number
		Volts Ac (50/60Hz)						
		240	277	480	600	250 <sup>①②</sup>		
DK	2, 3	65	—	—	—	10	K-6	
KD	2, 3, 4	65	—	35	25	10	K-4,5,9,10	
HKD	2, 3, 4	100	—	65	35	22	K-4,5,9,10	
KDC <sup>④</sup>	2, 3, 4	200	—	100	65	22	K-4,5,9,10	
CKD	3	65	—	35	25	—	K-7,11,12	
CHKD	3	100	—	65	35	—	K-7,11,12	

### IEC 157-1 (P1) Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles <sup>③</sup>	Interrupting Capacity (Symmetrical Amperes) (kA)						Volts Dc	Section Page Number
		Volts Ac (50/60Hz)							
		240	380	415	440	500	600		
DK	2, 3	65	—	—	—	—	—	10	K-6
KD	2, 3, 4	65	40	40	—	—	—	10	K-4,5,9,10
HKD	2, 3, 4	100	65	65	—	—	—	22	K-4,5,9,10
KDC	2, 3, 4	200	100	100	—	—	—	22	K-4,5,9,10

① 2-pole circuit breaker or two outside poles of 3-pole circuit breaker. Thermal-magnetic trip units only, DK, KD, HKD, KDC breakers with electronic trip unit are not DC rated.

② Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

③ Protected neutral pole in 4-pole circuit breaker available only with optional Electronic Trip Units.

④ Current limiting.

### K-Frame Digitrip Specifications

Trip Unit Type	Digitrip RMS 310		Digitrip OPTIM 550	Digitrip OPTIM 1050
RMS Sensing	Yes		Yes	Yes
<b>Breaker Type</b>				
Frame	K		K	K
Ampere Range	70-400A		70-400A	70-400A
Interrupting Rating at 600 Vac	25, 35, 65 (kA)		25, 35, 65 (kA)	25, 35, 65 (kA)
<b>Protection</b>				
Ordering Options	LS, LSG	LSI, LSIG	LSI, LSI(A), LSIG	LSI(A), LSIG
Fixed Rated Plug ( $I_n$ )	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes
<b>Long Delay Protection (L)</b>				
Adjustable Rating Plug ( $I_n$ )	Yes	Yes	No	No
Long Delay Pickup	0.5-1.0 ( $I_n$ ) <sup>①</sup>	0.5-1.0 ( $I_n$ ) <sup>①</sup>	0.4-1.0 x ( $I_n$ )	0.4-1.0 x ( $I_n$ )
Long Delay Time I <sup>2</sup> t	12 Seconds	12 Seconds	2-24 Seconds	2-24 Seconds
Long Delay Time I <sup>4</sup> t	No	No	1-5 Seconds	1-5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes
High Load Alarm	No	No	0.5-1.0 x $I_r$	0.5-1.0 x $I_r$
<b>Short Delay Protection (S)</b>				
Short Delay Pickup	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )	150-800% x ( $I_r$ )	150-800% x ( $I_r$ )
Short Delay Time I <sup>2</sup> t	100 ms	No	100-500 ms	100-500 ms
Short Delay Time Flat	No	Inst-300 ms	100-500 ms	100-500 ms
Short Delay Time Zone Selective Interlocking	No	No	Yes <sup>④</sup>	Yes
<b>Instantaneous Protection (I)</b>				
Instantaneous Pickup	No	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )
Discriminator	No	No	Yes	Yes
Instantaneous Override	Yes	Yes	Yes	Yes
<b>Ground Fault Protection (G)</b>				
Ground Fault Alarm	No	No	20-100% x ( $I_s$ )	20-100% x ( $I_s$ )
Ground Fault Pickup	Varies by Frame <sup>⑤</sup>	Varies by Frame <sup>⑤</sup>	20-100% x ( $I_s$ )	20-100% x ( $I_s$ )
Ground Fault Delay I <sup>2</sup> t	No	No	100-500 ms	100-500 ms
Ground Fault Delay Flat	Inst-500 ms	Inst-500 ms	100-500 ms	100-500 ms
Ground Fault Zone Selective Interlocking	No	No	Yes <sup>④</sup>	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes
<b>System Diagnostics</b>				
Status LEDs	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes
Magnitude of Trip Information	No	No	Yes	Yes
Remote Signal Contact – Ground Alarm	Yes <sup>⑥</sup>	Yes <sup>⑥</sup>	Yes <sup>④⑥</sup>	Yes <sup>⑥</sup>
Local Auxiliary and Bell Alarm Contact	Optional	Optional	Optional <sup>⑦</sup>	Included
<b>System Monitoring</b>				
Digital Display	No	No	Yes <sup>②</sup>	Yes <sup>②</sup>
Current	No	No	Yes	Yes
Power and Energy	No	No	No	Yes
Power Quality-Harmonics	No	No	No	Yes
Power Factor	No	No	No	Yes
<b>Communications</b>				
Eaton PowerNet	No	No	Yes <sup>③</sup>	Yes
<b>Testing</b>				
Testing Method	Test Set		OPTIMizer, BIM, Eaton PowerNet	

- ① Adjust by rating plug.
- ② By OPTIMizer/BIM.
- ③ Require Eaton PowerNet kit.
- ④ Require Zone interlock kit.

- ⑤ 400 ampere frame 1 - 5 x 1g (80A)  
250 ampere frame 1 - 5 x 1g (50A)  
125 ampere frame 1 - 5 x 1g (25A)
- ⑥ With Separate ground fault alarm unit (GFAU).
- ⑦ Must be mounted on left pole.

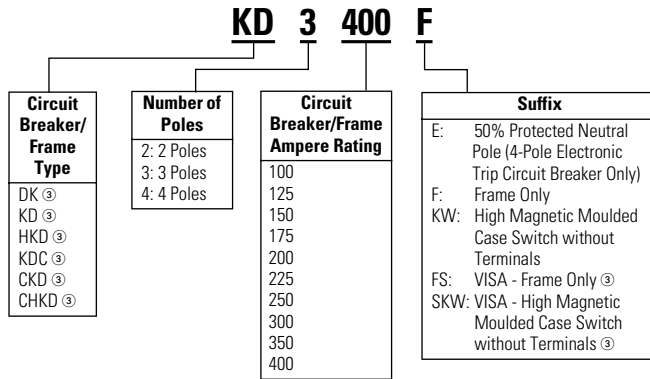
**Legend:**  
 BIM = Breaker Interface Module  
 (A) = GF Alarm

$I_s$  = Sensor Rating  
 $I_n$  = Rating Plug  
 $I_r$  = Long Delay Pickup Setting

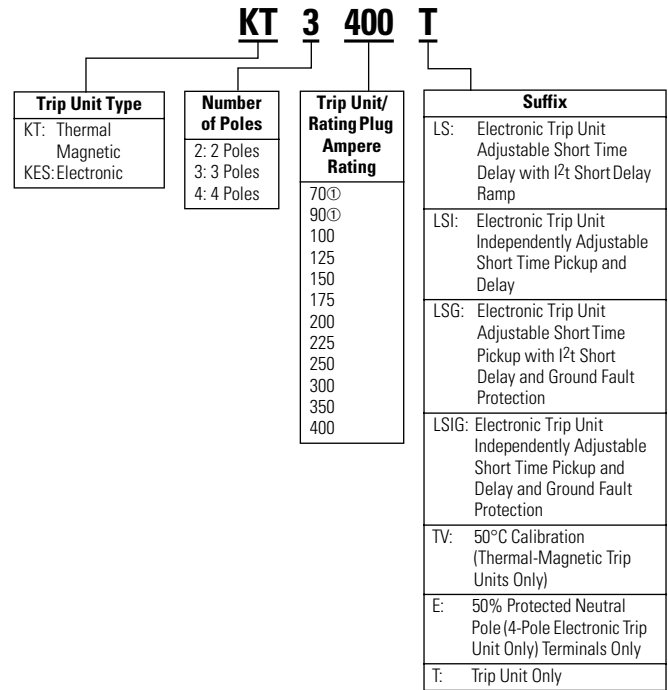
## Catalogue Numbering System

This information is presented only as an aid to understanding Catalogue numbers. It is not to be used to build Catalogue numbers for circuit breakers or trip units.

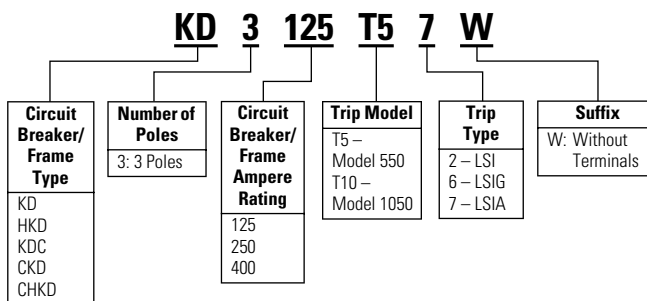
### Circuit Breaker/Frame Catalogue Number



### Trip Unit Catalogue Number



### OPTIM Circuit Breaker/Frame Catalogue Number



## Dimensions/Weights

### Dimensions, Inches (mm)

Number of Poles	Width	Height	Depth
2, 3	5.5 (140)	10.125 (257)	4.063 (103)
4	7.219 (183)	10.125 (257)	4.063 (103)

### Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Complete Breaker		Frame Only		Trip Unit ②	
	Number of Poles					
	2	3	2	3	2	3
DK	10 (4.536)	11.5 (5.216)	–	–	–	–
KD	10 (4.536)	11.5 (5.216)	7.5 (3.402)	8.5 (3.856)	1.5 (.680)	1.5 (.680)
HKD	10 (4.536)	11.5 (5.216)	7.5 (3.402)	8.5 (3.856)	1.5 (.680)	1.5 (.680)
KDC	10 (4.536)	11.5 (5.216)	7.5 (3.402)	8.5 (3.856)	1.5 (.680)	1.5 (.680)

① Ampere rating available with electronic trip unit only.

② Weights shown are for thermal magnetic trip units. 3-pole electronic trip units weight 2.5 lbs. (1.134 kg).

③ "VISA" option is available. CSA listed only.



### Product Selection

#### Types KD, HKD, and KDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	Standard Interrupting Capacity 600 Vac Rated 25 kAIC @ 600 Vac		High Interrupting Capacity 600 Vac Rated 35 kAIC @ 600 Vac		Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 65 kAIC @ 600 Vac		Thermal Magnetic Trip Unit Only  For Use With: Standard or High or Ultra High Interrupting Frames	Standard Terminals Only  See Section Page Number K-13 for Optional Terminals
	Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals		Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals		Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals			
	Frame Only <sup>③</sup>	Frame Only <sup>③</sup>	Frame Only <sup>③</sup>	Frame Only <sup>③</sup>	Frame Only <sup>③</sup>	Frame Only <sup>③</sup>		
Catalogue Number								
<b>2-Pole<sup>④</sup></b>								
100	KD2100	KD2400F	HKD2100	HKD2400F	KDC2100	KDC2400F	KT2100T	TA300K <sup>①</sup>
125	KD2125		HKD2125		KDC2125		KT2125T	TA300K <sup>①</sup>
150	KD2150		HKD2150		KDC2150		KT2150T	TA300K <sup>①</sup>
175	KD2175		HKD2175		KDC2175		KT2175T	TA300K <sup>①</sup>
200	KD2200		HKD2200		KDC2200		KT2200T	TA300K <sup>①</sup>
225	KD2225		HKD2225		KDC2225		KT2225T	TA300K <sup>①</sup>
250	KD2250		HKD2250		KDC2250		KT2250T	TA350K <sup>①</sup>
300	KD2300		HKD2300		KDC2300		KT2300T	TA350K <sup>①</sup>
350	KD2350		HKD2350		KDC2350		KT2350T	TA350K <sup>①</sup>
400	KD2400		HKD2400		KDC2400		KT2400T	2TA400K <sup>②</sup>
<b>3-Pole</b>								
100	KD3100	KD3400F	HKD3100	HKD3400F	KDC3100	KDC3400F	KT3100T	TA300K <sup>①</sup>
125	KD3125		HKD3125		KDC3125		KT3125T	TA300K <sup>①</sup>
150	KD3150		HKD3150		KDC3150		KT3150T	TA300K <sup>①</sup>
175	KD3175		HKD3175		KDC3175		KT3175T	TA300K <sup>①</sup>
200	KD3200		HKD3200		KDC3200		KT3200T	TA300K <sup>①</sup>
225	KD3225		HKD3225		KDC3225		KT3225T	TA300K <sup>①</sup>
250	KD3250		HKD3250		KDC3250		KT3250T	TA350K <sup>①</sup>
300	KD3300		HKD3300		KDC3300		KT3300T	TA350K <sup>①</sup>
350	KD3350		HKD3350		KDC3350		KT3350T	TA350K <sup>①</sup>
400	KD3400		HKD3400		KDC3400		KT3400T	3TA400K <sup>②</sup>
<b>4-Pole</b>								
100	KD4100	KD4400F	HKD4100	HKD4400F	KDC4100	KDC4400F	KT3100T	TA300K <sup>①</sup>
125	KD4125		HKD4125		KDC4125		KT3125T	TA300K <sup>①</sup>
150	KD4150		HKD4150		KDC4150		KT3150T	TA300K <sup>①</sup>
175	KD4175		HKD4175		KDC4175		KT3175T	TA300K <sup>①</sup>
200	KD4200		HKD4200		KDC4200		KT3200T	TA300K <sup>①</sup>
225	KD4225		HKD4225		KDC4225		KT3225T	TA300K <sup>①</sup>
250	KD4250		HKD4250		KDC4250		KT3250T	TA350K <sup>①</sup>
300	KD4300		HKD4300		KDC4300		KT3300T	TA350K <sup>①</sup>
350	KD4350		HKD4350		KDC4350		KT3350T	TA350K <sup>①</sup>
400	KD4400		HKD4400		KDC4400		KT3400T	4TA400K <sup>②</sup>

Instruction Leaflet Number 29C104 for Breaker; 29C603 for Thermal Magnetic Trip Unit

① Individually packed.  
 ② 2TA400K, 3TA400K and 4TA400K terminal kits contain one terminal for each pole and one terminal cover.  
 ③ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number.  
 ④ 2-pole circuit breaker supplied in 3-pole frame.

## Types KD, HKD, and KDC Electronic Circuit Breakers with Interchangeable Trip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C <sup>①</sup>	Circuit Breaker Frame Only <sup>②</sup>			Digitrip RMS 310 Trip Unit Only <sup>②</sup>				Digitrip 310 Rating Plug Only			Standard Terminals Only See Section Page Number K-13 for Optional Terminals
	Standard Interrupting Capacity 600 Vac Rated 25 kAIC @ 600 Vac	High Interrupting Capacity 600 Vac Rated 35 kAIC @ 600 Vac	Ultra High Interrupting Capacity Limiting 600 Vac Rated 65 kAIC @ 600 Vac	Standard LS	Options LSI	LSG	LSIG	Adjustable Rating Plugs	Ampere Rating Catalogue Number	Fixed Rating Plug	
				Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection				
<b>3-Pole<sup>③</sup></b>											
125	KD3400F	HKD3400F	KDC3400F	KES3125LS	KES3125LSI	KES3125LSG	KES3125LSIG	70	1KES070T	70/90/100/125	TA300K <sup>④</sup>
								90	1KES090T	A1KES125T1	TA300K <sup>④</sup>
								100	1KES100T		TA300K <sup>④</sup>
								110	1KES110T		TA300K <sup>④</sup>
								125	1KES125T		TA300K <sup>④</sup>
250	KD3400F	HKD3400F	KDC3400F	KES3250LS	KES3250LSI	KES3250LSG	KES3250LSIG	70	2KES070T	125/150/200/250	TA300K <sup>④</sup>
								100	2KES100T	A2KES250T1	TA300K <sup>④</sup>
								125	2KES125T		TA300K <sup>④</sup>
								150	2KES150T		TA300K <sup>④</sup>
								160	2KES160T		TA300K <sup>④</sup>
								175	2KES175T		TA300K <sup>④</sup>
								200	2KES200T		TA300K <sup>④</sup>
								225	2KES225T		TA300K <sup>④</sup>
250	2KES250T		TA350K <sup>④</sup>								
400	KD3400F	HKD3400F	KDC3400F	KES3400LS	KES3400LSI	KES3400LSG	KES3400LSIG	200	4KES200T	200/250/300/400	TA300K <sup>④</sup>
								225	4KES225T	A4KES400T1	TA300K <sup>④</sup>
								250	4KES250T	220/240/260/280	TA350K <sup>④</sup>
								300	4KES300T	A4KES200T5	TA350K <sup>④</sup>
								350	4KES350T	320/340/360/380	TA350K <sup>④</sup>
								400	4KES400T	A4KES300T5	3TA400K <sup>⑤</sup>
<b>4-Pole<sup>⑥⑦</sup></b>											
125	KD4400F	HKD4400F	KDC4400F	KES4125LS	KES4125LSI	-	-	70	1KES070T	70/90/100/125	TA300K <sup>④</sup>
								90	1KES090T	A1KES125T1	TA300K <sup>④</sup>
								100	1KES100T		TA300K <sup>④</sup>
								110	1KES110T		TA300K <sup>④</sup>
								125	1KES125T		TA300K <sup>④</sup>
250	KD4400F	HKD4400F	KDC4400F	KES4250LS	KES4250LSI	-	-	70	2KES070T	125/150/200/250	TA300K <sup>④</sup>
								100	2KES100T	A2KES250T1	TA300K <sup>④</sup>
								125	2KES125T		TA300K <sup>④</sup>
								150	2KES150T		TA300K <sup>④</sup>
								160	2KES160T		TA300K <sup>④</sup>
								175	2KES175T		TA300K <sup>④</sup>
								200	2KES200T		TA300K <sup>④</sup>
								225	2KES225T		TA300K <sup>④</sup>
250	2KES250T		TA350K <sup>④</sup>								
400	KD4400F	HKD4400F	KDC4400F	KES4400LS	KES4400LSI	-	-	200	4KES200T	200/250/300/400	TA300K <sup>④</sup>
								225	4KES225T	A4KES400T1	TA300K <sup>④</sup>
								250	4KES250T	220/240/260/280	TA350K <sup>④</sup>
								300	4KES300T	A4KES200T5	TA350K <sup>④</sup>
								350	4KES350T	320/340/360/380	TA350K <sup>④</sup>
								400	4KES400T	A4KES300T5	4TA400K <sup>⑤</sup>

Instruction Leaflet Number 29C104 for Breaker; 29C614 for Electronic Trip Unit

- ① Ampere rating is established by rating plug.
- ② For AC use only.
- ③ 3-pole KES Trip Units are for use in 3-pole frames only.
- ④ Individually packed.
- ⑤ 3TA400K and 4TA400K terminal kits contain one terminal for each pole and one terminal cover.
- ⑥ Trip unit includes protected neutral pole. Use corresponding 3-pole trip unit if protected neutral pole is not required.
- ⑦ Fully rated neutral pole protection is standard. For 50% rated protection on neutral pole, add suffix E to 4-pole trip unit Catalogue number.
- ⑧ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number.

### Types DK Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	Standard Interrupting Capacity 65 kAIC @ 240 Vac			Standard Terminals Only	
	Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals			Thermal Magnetic Trip Unit Only	See Section Page Number K-13 for Optional Terminals
	Frame Only ③				
	Catalogue Number				
<b>2-Pole④</b>					
100	DK2100	DK2400F	KT2100T	TA300K ①	
125	DK2125		KT2125T	TA300K ①	
150	DK2150		KT2150T	TA300K ①	
175	DK2175		KT2175T	TA300K ①	
200	DK2200		KT2200T	TA300K ①	
225	DK2225		KT2225T	TA300K ①	
250	DK2250		KT2250T	TA350K ①	
300	DK2300		KT2300T	TA350K ①	
350	DK2350		KT2350T	TA350K ①	
400	DK2400		KT2400T	2TA400K ②	
<b>3-Pole</b>					
100	DK3100	DK3400F	KT3100T	TA300K ①	
125	DK3125		KT3125T	TA300K ①	
150	DK3150		KT3150T	TA300K ①	
175	DK3175		KT3175T	TA300K ①	
200	DK3200		KT3200T	TA300K ①	
225	DK3225		KT3225T	TA300K ①	
250	DK3250		KT3250T	TA350K ①	
300	DK3300		KT3300T	TA350K ①	
350	DK3350		KT3350T	TA350K ①	
400	DK3400		KT3400T	3TA400K ②	

Instruction Leaflet Number 29C104

### Type DK Electronic Circuit Breakers with Interchangeable Type KES Digitrip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals

Max. Continuous Ampere Rating @ 40°C ⑤	Circuit Breaker Frame Only ③		Digitrip RMS 310 Trip Unit Only ⑥			Digitrip 310 Rating Plug Only			
	Standard Interrupting Capacity 65 kAIC @ 240 Vac	Catalogue Numbers	Standard	Options		Ampere Rating	Fixed Rating Plugs	Adjustable Rating Plugs	Standard Terminals Only
			Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection				
<b>3-Pole④</b>									
125	DK3400F	KES3125LS	KES3125LSI	KES3125LSG	KES3125LSIG	70	1KES070T	70/90/100/125	TA300K ①
						90	1KES090T	A1KES125T1	TA300K ①
						100	1KES100T		TA300K ①
						110	1KES110T		TA300K ①
						125	1KES125T		TA300K ①
250	DK3400F	KES3250LS	KES3250LSI	KES3250LSG	KES3250LSIG	125	2KES125T	125/150/200/250	TA300K ①
						150	2KES150T	A2KES250T1	TA300K ①
						160	2KES160T		TA300K ①
						175	2KES175T		TA300K ①
						200	2KES200T		TA300K ①
						225	2KES225T		TA300K ①
						250	2KES250T		TA350K ①
400	DK3400F	KES3400LS	KES3400LSI	KES3400LSG	KES3400LSIG	200	4KES200T	200/250/300/400	TA300K ①
						225	4KES225T	A4KES400T1	TA300K ①
						250	4KES250T	220/240/260/280	TA350K ①
						300	4KES300T	A4KES200T5	TA350K ①
						350	4KES350T	320/340/360/380	TA350K ①
400	4KES400T	A4KES300T5	3TA400K ②						

① Individually packed.

② 2TA400K and 3TA400K, terminal kits contain one terminal for each pole and one terminal cover.

③ When a "Visa" frame is required, add suffix "S" to circuit breaker frame catalogue number.

④ 2-pole circuit breaker supplied in 3-pole frame.

⑤ Ampere rating is established by rating plug.

⑥ For AC use only.

## 100% Rated Types CKD and CHKD Electronic Circuit Breakers

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units.

Maximum Continuous Ampere Rating @ 40°C <sup>⑤</sup>	Circuit Breaker Frame Only <sup>③</sup>		Digitrip RMS 310 Trip Unit Only <sup>④</sup>				Digitrip 310 Rating Plug Only											
	Standard Interrupting Capacity	High Interrupting Capacity	Standard		Options		Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug	Standard Terminals Only								
			Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection												
	25 kAIC @ 600 Vac	35 kAIC @ 600 Vac	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection				See Section Page Number K-13 for Optional Terminals								
<b>3-Pole</b>																		
125	CKD3400F	CHKD3400F	KES3125LS	KES3125LSI	KES3125LSG	KES3125LSIG	70	1KES070T	70/90/100/125	TA300K <sup>①</sup>								
							90	1KES090T			A1KES125T1	TA300K <sup>①</sup>						
							100	1KES100T					TA300K <sup>①</sup>					
							110	1KES110T						TA300K <sup>①</sup>				
							125	1KES125T							TA300K <sup>①</sup>			
250	CKD3400F	CHKD3400F	KES3250LS	KES3250LSI	KES3250LSG	KES3250LSIG	70	2KES070T	125/150/200/250	TA300K <sup>①</sup>								
							100	2KES100T			A2KES250T1	TA300K <sup>①</sup>						
							125	2KES125T					TA300K <sup>①</sup>					
							150	2KES150T						TA300K <sup>①</sup>				
							160	2KES160T							TA300K <sup>①</sup>			
							175	2KES175T								TA300K <sup>①</sup>		
							200	2KES200T									TA300K <sup>①</sup>	
							225	2KES225T										TA300K <sup>①</sup>
							250	2KES250T										
400	CKD3400F	CHKD3400F	KES3400LS	KES3400LSI	KES3400LSG	KES3400LSIG	200	4KES200T	200/250/300/400	TA300K <sup>①</sup>								
							225	4KES225T			A4KES400T1	TA300K <sup>①</sup>						
							250	4KES250T					220/240/260/280	TA350K <sup>①</sup>				
							300	4KES300T							A4KES200T5	TA350K <sup>①</sup>		
							350	4KES350T									320/340/360/380	TA350K <sup>①</sup>
							400	4KES400T										

Instruction Leaflet Number 29C104 for Breaker; 29C614 for KES Trip Unit

① Individually packed.  
 ② 3TA400K terminal kits contain one terminal for each pole and one terminal cover.  
 ③ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number.  
 ④ For AC use only.  
 ⑤ Ampere rating is established by rating plug.

### Moulded Case Switch <sup>①</sup>

Moulded case switches are used as compact switches in applications requiring high current switching capabilities. Moulded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Moulded case switches are listed in accordance with CSA C22.2 No. 5 and UL 489, suitable for reverse feed use and are 100% rated devices.

Maximum Continuous Ampere Rating @ 40°C	240 Vac Maximum, 250 Vdc	600 Vac Maximum, 250 Vdc	
	Complete MCS without Line and Load Terminals	Complete MCS without Standard Line and Load Terminals	
	Catalogue Number		
<b>2-Pole</b>			
400	<b>DK2400KW</b>	<b>KD2400KW</b>	<b>HKD2400KW</b>
<b>3-Pole</b>			
400	<b>DK3400KW</b>	<b>KD3400KW</b>	<b>HKD3400KW</b>
<b>4-Pole</b>			
400	-	<b>KD4400KW</b>	<b>HKD4400KW</b>

**Note:** Note: Moulded case switches may open above 4000 amperes.

Instruction Leaflet Number 29C104

Moulded Case Switch Type	Number of Poles	Unfused Short Circuit Withstand Rating (Symmetrical Amperes) (kA)			
		Volts Ac (50/60 Hz)			Volts DC
		240	480	600	250
<b>DK</b>	2,3	65	-	-	10
<b>KD</b>	2,3,4	65	35	25	10
<b>HKD</b>	2,3,4	100	65	35	22

<sup>①</sup> When a "VISA" type Moulded Case Switch is required, change the suffix of the MCS catalogue number from "KW" to "SKW". ie. KD3400SKW

**Digitrip OPTIM 550 Electronic Circuit Breakers with Interchangeable Rating Plug**

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only			Digitrip OPTIM Rating Plug Only	
	<b>L – Adjustable Long Delay Pickup (<math>I_L</math>) with Adjustable Long Delay Time (<math>I^2t</math> or <math>I^4t</math> Response) ①</b> <b>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (<math>I^2t</math> or Flat Response)</b> <b>I – Adjustable Instantaneous Pickup</b> <b>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (<math>I^2t</math> or Flat Response)</b> <b>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (<math>I^2t</math> or Flat Response)</b>				
	OPTIM 550 ②				
	LSI	LSIG	LSIA	Ampere Rating	Fixed Rating Plug
Catalogue Number					
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac</b>					
125	KD3125T52W	KD3125T56W	KD3125T57W	70	ORPK125A70
				90	ORPK125A90
				100	ORPK125A100
				110	ORPK125A110
				125	ORPK125A125
250	KD3250T52W	KD3250T56W	KD3250T57W	125	ORPK025A125
				150	ORPK025A150
				175	ORPK025A175
				200	ORPK025A200
				225	ORPK025A225
				250	ORPK025A250
400	KD3400T52W	KD3400T56W	KD3400T57W	200	ORPK40A200
				225	ORPK40A225
				250	ORPK40A250
				300	ORPK40A300
				350	ORPK40A350
				400	ORPK40A400
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac</b>					
125	HKD3125T52W	HKD3125T56W	HKD3125T57W	70	ORPK125A70
				90	ORPK125A90
				100	ORPK125A100
				110	ORPK125A110
				125	ORPK125A125
250	HKD3250T52W	HKD3250T56W	HKD3250T57W	125	ORPK025A125
				150	ORPK025A150
				175	ORPK025A175
				200	ORPK025A200
				225	ORPK025A225
				250	ORPK025A250
400	HKD3400T52W	HKD3400T56W	HKD3400T57W	200	ORPK40A200
				225	ORPK40A225
				250	ORPK40A250
				300	ORPK40A300
				350	ORPK40A350
				400	ORPK40A400
<b>3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>					
125	KDC3125T52W	KDC3125T56W	KDC3125T57W	70	ORPK125A70
				90	ORPK125A90
				100	ORPK125A100
				110	ORPK125A110
				125	ORPK125A125
250	KDC3250T52W	KDC3250T56W	KDC3250T57W	125	ORPK025A125
				150	ORPK025A150
				175	ORPK025A175
				200	ORPK025A200
				225	ORPK025A225
				250	ORPK025A250
400	KDC3400T52W	KDC3400T56W	KDC3400T57W	200	ORPK40A200
				225	ORPK40A225
				250	ORPK40A250
				300	ORPK40A300
				350	ORPK40A350
				400	ORPK40A400

Instruction Leaflet Number 29C092

① Long delay  $I^4t$  response selection limits short delay time to flat response.

② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes ZG, PN or ZGP respectively to above Catalogue Number. (A factory assembly charge will be applied, please refer to the Breaker Accessories/Modifications section in the Eaton MCCB Price List for details)

### Digitrip OPTIM 1050 Electronic Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only		Digitrip OPTIM Rating Plug Only	
	L – Adjustable Long Delay Pickup (I <sub>l</sub> ) with Adjustable Long Delay Time (I <sub>2t</sub> or I <sub>4t</sub> Response) ① S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sub>2t</sub> or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sub>2t</sub> or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sub>2t</sub> or Flat Response)			
	OPTIM 1050 ②③			
	LSIG	LSIA	Ampere Rating	Fixed Rating Plug
Catalogue Number				
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac</b>				
125	KD3125T106W	KD3125T107W	70	ORPK125A70
			90	ORPK125A90
			100	ORPK125A100
			110	ORPK125A110
			125	ORPK125A125
250	KD3250T106W	KD3250T107W	125	ORPK025A125
			150	ORPK025A150
			175	ORPK025A175
			200	ORPK025A200
			225	ORPK025A225
			250	ORPK025A250
400	KD3400T106W	KD3400T107W	200	ORPK40A200
			225	ORPK40A225
			250	ORPK40A250
			300	ORPK40A300
			350	ORPK40A350
			400	ORPK40A400
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac</b>				
125	HKD3125T106W	HKD3125T107W	70	ORPK125A70
			90	ORPK125A90
			100	ORPK125A100
			110	ORPK125A110
			125	ORPK125A125
250	HKD3250T106W	HKD3250T107W	125	ORPK025A125
			150	ORPK025A150
			175	ORPK025A175
			200	ORPK025A200
			225	ORPK025A225
			250	ORPK025A250
400	HKD3400T106W	HKD3400T107W	200	ORPK40A200
			225	ORPK40A225
			250	ORPK40A250
			300	ORPK40A300
			350	ORPK40A350
			400	ORPK40A400
<b>3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>				
125	KDC3125T106W	KDC3125T107W	70	ORPK125A70
			90	ORPK125A90
			100	ORPK125A100
			110	ORPK125A110
			125	ORPK125A125
250	KDC3250T106W	KDC3250T107W	125	ORPK025A125
			150	ORPK025A150
			175	ORPK025A175
			200	ORPK025A200
			225	ORPK025A225
			250	ORPK025A250
400	KDC3400T106W	KDC3400T107W	200	ORPK40A200
			225	ORPK40A225
			250	ORPK40A250
			300	ORPK40A300
			350	ORPK40A350
			400	ORPK40A400

Instruction Leaflet Number 29C092

① Long delay I<sub>4t</sub> response selection limits short delay time to flat response.

② Factory sealed.

③ Eaton PowerNet, Zone Interlock functions, one Form C auxiliary switch and one Form C bell alarm switch are supplied with breakers as standard and are mounted on the right pole.

**100% Rated Digitrip OPTIM 550 Electronic Circuit Breakers with Interchangeable Rating Plug**

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only			Digitrip OPTIM Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response) ① S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time ( $I^2t$ or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time ( $I^2t$ or Flat Response)				
	OPTIM 550 ②				
	LSI	LSIG	LSIA	Ampere Rating	Fixed Rating Plug
Catalogue Number					
3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac					
125	CKD3125T52W	CKD3125T56W	CKD3125T57W	70	ORPK125A70
				90	ORPK125A90
				100	ORPK125A100
				110	ORPK125A110
				125	ORPK125A125
250	CKD3250T52W	CKD3250T56W	CKD3250T57W	125	ORPK025A125
				150	ORPK025A150
				175	ORPK025A175
				200	ORPK025A200
				225	ORPK025A225
400	CKD3400T52W	CKD3400T56W	CKD3400T57W	200	ORPK40A200
				225	ORPK40A225
				250	ORPK40A250
				300	ORPK40A300
				350	ORPK40A350
400	ORPK40A400				
3-Pole High Interrupting Capacity 600 Volt AC Rated 35 kAIC @ 600 Vac					
125	CHKD3125T52W	CHKD3125T56W	CHKD3125T57W	70	ORPK125A70
				90	ORPK125A90
				100	ORPK125A100
				110	ORPK125A110
				125	ORPK125A125
250	CHKD3250T52W	CHKD3250T56W	CHKD3250T57W	125	ORPK025A125
				150	ORPK025A150
				175	ORPK025A175
				200	ORPK025A200
				225	ORPK025A225
400	CHKD3400T52W	CHKD3400T56W	CHKD3400T57W	200	ORPK40A200
				225	ORPK40A225
				250	ORPK40A250
				300	ORPK40A300
				350	ORPK40A350
400	ORPK40A400				

Instruction Leaflet Number 29C092

① Long delay  $I^4t$  response selection limits short delay time to flat response.② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes **ZG**, **PN** or **ZGP** respectively to above Catalogue Number.



### 100% Rated Digitrip OPTIM 1050 Electronic Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only		Digitrip OPTIM Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_t$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response) ① S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time ( $I^2t$ or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time ( $I^2t$ or Flat Response)			
	OPTIM 1050 ②③			
	LSIG	LSIA	Ampere Rating	Fixed Rating Plug
Catalogue Number				
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac</b>				
125	CKD3125T106W	CKD3125T107W	70	ORPK125A70
			90	ORPK125A90
			100	ORPK125A100
			110	ORPK125A110
			125	ORPK125A125
250	CKD3250T106W	CKD3250T107W	125	ORPK025A125
			150	ORPK025A150
			175	ORPK025A175
			200	ORPK025A200
			225	ORPK025A225
			250	ORPK025A250
400	CKD3400T106W	CKD3400T107W	200	ORPK40A200
			225	ORPK40A225
			250	ORPK40A250
			300	ORPK40A300
			350	ORPK40A350
			400	ORPK40A400
<b>3-Pole High Interrupting Capacity 600 Volt AC Rated 35 kAIC @ 600 Vac</b>				
125	CHKD3125T106W	CHKD3125T107W	70	ORPK125A70
			90	ORPK125A90
			100	ORPK125A100
			110	ORPK125A110
			125	ORPK125A125
250	CHKD3250T106W	CHKD3250T107W	125	ORPK025A125
			150	ORPK025A150
			175	ORPK025A175
			200	ORPK025A200
			225	ORPK025A225
			250	ORPK025A250
400	CHKD3400T106W	CHKD3400T107W	200	ORPK40A200
			225	ORPK40A225
			250	ORPK40A250
			300	ORPK40A300
			350	ORPK40A350
			400	ORPK40A400

Instruction Leaflet Number 29C092

① Long delay  $I^4t$  response selection limits short delay time to flat response.

② Factory sealed.

③ Eaton PowerNet, Zone Interlock functions, one Form C auxiliary switch and one Form C bell alarm switch are supplied with breakers as standard and are mounted on the right pole.

## Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with CSA Standard C22.2 No. 65 and UL Standard UL486A and UL486B.

Unless otherwise specified, K-frame circuit breaker line and load terminals are shipped separately for field installation.

## Ordering Information

K-frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by Catalogue number. Specify if factory installation is required.

## Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/ No. Conductors	Metric Wire Range mm <sup>2</sup>	Terminal Catalogue Number	Figure	Terminals with Control Wire Termination Catalogue	
							Number	Figure
<b>Standard Cu/Al Pressure Terminals</b>								
225	Aluminum	Cu/Al	3-350/(1)	35-185	<b>TA300K</b> ①⑦	4	—	—
350	Aluminum	Cu/Al	250-500/(1)	120-240	<b>TA350K</b> ①⑦	3	—	—
400	Aluminum	Cu/Al	3/0-250/(2)	95-120	<b>2TA400K</b> ④②⑦	2	<b>2TA400KCW</b> ④②⑦	5
					<b>3TA400K</b> ⑤②⑦	2	<b>3TA400KCW</b> ⑤②⑦	5
					<b>4TA400K</b> ⑥③⑦	2	<b>4TA400KCW</b> ⑥③⑦	5
<b>Optional Copper and Cu/Al Pressure Type Terminals</b>								
225	Copper	Cu	3-350/(1)	35-185	<b>T300K</b> ①	4	—	—
350	Copper	Cu	250-500/(1)	120-240	<b>T350K</b> ①	3	—	—
400	Copper	Cu	3/0-250/(2)	95-120	<b>2T400K</b> ④②	2	<b>2T400KCW</b> ④②	5
					<b>3T400K</b> ⑤②	2	<b>3T400KCW</b> ⑤②	5
					<b>4T400K</b> ⑥③	2	<b>4T400KCW</b> ⑥③	5
400	Aluminum	Cu/Al	2/0-250/(2) or 2/0-500/(1)	70-120 70-240	<b>2TA401K</b> ④②⑦	1	<b>2TA401KCW</b> ④②⑦	5
					<b>3TA401K</b> ⑤②⑦	1	<b>3TA401KCW</b> ⑤②⑦	5
					<b>4TA401K</b> ⑥③⑦	1	<b>4TA401KCW</b> ⑥③⑦	5
400	Aluminum	Cu/Al	500-750/(1)	300-400	<b>2TA402K</b> ④②⑦	6	—	—
					<b>3TA402K</b> ⑤②⑦	6	—	—
					<b>4TA402K</b> ⑥③⑦	6	—	—
400	Copper	Cu	500-750/(1)	—	<b>2T402K</b> ④②	6	—	—
					<b>3T402K</b> ⑤②	6	—	—
					<b>4T402K</b> ⑥③	6	—	—

Figure 1. TA401K

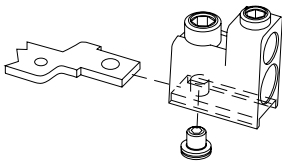


Figure 2. TA400K, T400K

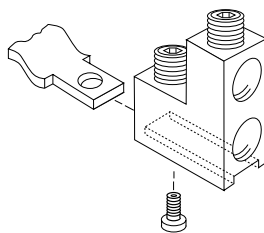


Figure 3. TA350K, T350K

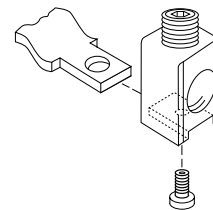


Figure 4. TA300K, T300K

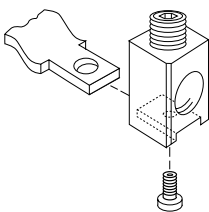


Figure 5. T400KCW, TA400KCW, TA401KCW

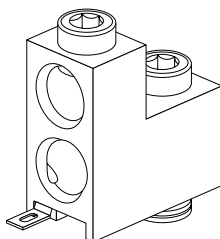
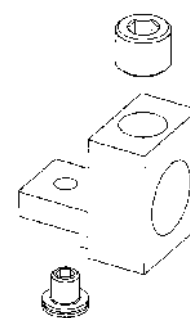


Figure 6. TA402K, T402K



- ① Individually packed.
- ② Terminal kits contain one terminal for each pole and one terminal cover.
- ③ Terminal kits contain one terminal for each pole and three interphase barriers.
- ④ 2-Pole Kit.
- ⑤ 3-Pole Kit.
- ⑥ 4-Pole Kit.
- ⑦ Terminal is marked with AL9CU to indicate the 90°C temperature rating.

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

Description	Reference Page	2-Pole <sup>①</sup>		3-Pole			4-Pole			
		Left	Right	Left	Centre	Right	Left	Centre	Right	Neu.
<b>Internal Accessories (Only One Internal Accessory Per Pole) ④</b>										
Alarm Lockout (Make/Break)	INTA-3		■	□		□ <sup>③</sup>	■			
Alarm Lockout (2Make/2Break)	INTA-3			□		□ <sup>③</sup>	■			
Auxiliary Switch (1A, 1B)	INTA-6		■	■		■ <sup>③</sup>	■		■	
Auxiliary Switch (2A, 2B)	INTA-6			■		■ <sup>③</sup>	■		■	
Auxiliary Switch (3A, 3B)	INTA-6			■		■ <sup>③</sup>	■		■	
Auxiliary Switch and Alarm Switch Combination	INTA-9			□		□ <sup>③</sup>	□		□	
Shunt Trip – Standard <sup>②</sup>	INTA-12		■	■		■	■		■	
Shunt Trip – Low Energy <sup>②</sup>	INTA-15			■		■	■			
Undervoltage Release Mechanism <sup>②</sup>	INTA-19		■	■		■	■			
Eaton PowerNet and Zone Interlock Kit (OPTIM 550)	INTA-23					■				
<b>External Accessories</b>										
End Cap Kit	EXTA-2	●	●	●	●	●	●	●	●	●
Keeper Nut	EXTA-2	●	●	●	●	●	●	●	●	●
Terminal Adaptor	EXTA-3	●	●	●	●	●	●	●	●	●
Control Wire Terminal Kit	EXTA-3	●	●	●	●	●	●	●	●	●
Multewire Connectors	EXTA-4	●	●	●	●	●	●	●	●	●
Base Mounting Hardware	EXTA-5	●	●	●	●	●	●	●	●	●
Terminal Shields	EXTA-7	●	●	●	●	●	●	●	●	●
Interphase Barriers	EXTA-8	●	●	●	●	●	●	●	●	●
Non-Padlockable Handle Block	EXTA-10	■			■			■		
Padlockable Handle Block	EXTA-10				■					
Padlockable Handle Lock Hasp	EXTA-11		■	□		□	□		□	
Cylinder Lock	EXTA-11	□	□	□		□				
Key Interlock Kit	EXTA-12	■	□	□		□	□		□	
Sliding Bar Interlock – Requires Two Breakers	EXTA-13			●	●	●				
Walking Beam Interlock – Requires Two Breakers	EXTA-13			●	●	●	●	●	●	●
Electrical (Solenoid) Operator	EXTA-14			●	●	●	●	●	●	●
Plug-in Adapters	EXTA-16	●	●	●	●	●	●	●	●	●
Rear Connecting Studs	EXTA-18	●	●	●	●	●	●	●	●	●
Panelboard Connecting Straps	EXTA-20	●	●	●	●	●	●	●	●	●
Handle Mechanisms	EXTA-21	●	●	●	●	●	●	●	●	●
Handle Extension	EXTA-27	●	●	●	●	●	●	●	●	●
IQ Energy Sentinel	EXTA-28			●	●	●	●	●	●	●
Solid-State (Electronic) Portable Test Kit	EXTA-28			●	●	●	●	●	●	●
Ground Fault Alarm Unit	EXTA-28			●	●	●	●	●	●	●
<b>OPTIM System Components 3-Poles</b>										
Breaker Interface Module (BIM)	EXTA-29									
Digitrip OPTIMizer	EXTA-29									
Auxiliary Power Module	EXTA-29									
Potential Transformer Module	EXTA-29									
<b>Modifications (Refer to Eaton)</b>										
Special Calibration	1.2	●	●	●	●	●	●	●	●	●
Moisture Fungus Treatment	1.2	●	●	●	●	●	●	●	●	●
Freeze-Tested Circuit Breakers	1.2	●	●	●	●	●	●	●	●	●
Marine Application	1.2	●	●	●	●	●	●	●	●	●

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame. Current carrying parts omitted from centre pole.

② Shunt trip and UVR cannot be mounted in right poles on KES or OPTIM trip units.

③ Alarm Switch, Auxiliary Switch, Alarm Switch and Auxiliary Switch Combination cannot be mounted on right pole of OPTIM 550 K-Frame circuit breaker.

④ OPTIM 1050 K-Frame circuit breaker is factory sealed and does not have right pole space available for accessories.

Typical L-Frame Circuit Breaker



### Product Description

- All L-frame circuit breakers are HACR rated.
- L-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers. OPTIM circuit breakers are available as factory assembled only.
- L-frame circuit breakers are suitable for reverse feed use.

### Technical Data and Specifications

#### CSA C22.2 No. 5 and UL489 Interrupting Capacity Ratings ①

Circuit Breaker Type	Number of Poles	Interrupting Capacity (RMS Symmetrical Amperes) (kA)					Section Page Number	
		Volts Ac (50/60 Hz)						Volts Dc
		240	277	480	600	125		
LD	2, 3, 4	65	—	35	25	—	22	L-4,5,7
CLD ④	2, 3, 4	65	—	35	25	—	—	L-5,9
HLD	2, 3, 4	100	—	65	35	—	25	L-4,5,7
CHLD ④	2, 3, 4	100	—	65	35	—	—	L-5,9
LDC ⑤	2, 3, 4	200	—	100	50	—	30	L-4,5,8
CLDC ④⑤	2, 3, 4	200	—	100	50	—	—	L-5,10

#### IEC 947-2 Interrupting Capacity Ratings ①

Circuit Breaker Type	Number of Poles		Interrupting Capacity (Symmetrical Amperes) (kA)				Section Page Number
			Volts Ac (50/60 Hz)			Volts Dc	
			240	415	690		
LD	2, 3, 4	$I_{cu}$	85	45	20	20	L-4,5,7
		$I_{cs}$	85	45	10	10	
CLD ④	2, 3, 4	$I_{cu}$	85	45	20	—	L-5,9
		$I_{cs}$	85	45	10	—	
HLD	2, 3, 4	$I_{cu}$	100	70	25	20	L-4,5,7
		$I_{cs}$	100	70	13	10	
CHLD ④	2, 3, 4	$I_{cu}$	100	70	25	—	L-5,9
		$I_{cs}$	100	70	13	—	
LDC	2, 3, 4	$I_{cu}$	200	100	35	20	L-4,5,8
		$I_{cs}$	100	75	18	10	
CLDC ④	2, 3, 4	$I_{cu}$	200	100	35	—	L-5,10
		$I_{cs}$	100	75	18	—	

① Utilization category A circuit breakers.

② L/R = 8 milliseconds minimum.

③ 2-pole circuit breaker or two poles of 3-pole circuit breaker. Incorporating Thermal-Magnetic trip unit only.

④ 100% rated breakers.

⑤ Current limiting.

## L-Frame Digitrip Specifications

Trip Unit Type	Digitrip RMS 310		Digitrip OPTIM 550	Digitrip OPTIM 1050
RMS Sensing	Yes		Yes	Yes
<b>Breaker Type</b>				
Frame	L		L	L
Ampere Range	300-600A		200-600A	70-600A
Interrupting Rating @ 600V	25, 35, 50 (kA)		25, 35, 50 (kA)	25, 35, 50 (kA)
<b>Protection</b>				
Ordering Options	LS, LSG	LSI, LSIG	LSI, LSI(A), LSIG	LSI(A), LSIG
Fixed Rated Plug ( $I_n$ )	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes
<b>Long Delay Protection (L)</b>				
Adjustable Rating Plug ( $I_n$ )	Yes	Yes	No	No
Long Delay Pickup	0.5-1.0 ( $I_n$ ) <sup>①</sup>	0.5-1.0 ( $I_n$ ) <sup>①</sup>	0.4-1.0 x ( $I_n$ )	0.4-1.0 x ( $I_n$ )
Long Delay Time $I^2t$	12 Seconds	12 Seconds	2-24 Seconds	2-24 Seconds
Long Delay Time $I^4t$	No	No	1-5 Seconds	1-5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes
High Load Alarm	No	No	0.5-1.0 x $I_r$	0.5-1.0 x $I_r$
<b>Short Delay Protection (S)</b>				
Short Delay Pickup	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )	150-800% x ( $I_r$ )	150-800% x ( $I_r$ )
Short Delay Time $I^2t$	100 ms	No	100-500 ms	100-500 ms
Short Delay Time Flat	No	Inst-300 ms	100-500 ms	100-500 ms
Short Delay Time Zone Selective Interlocking	No	No	Yes <sup>④</sup>	Yes
<b>Instantaneous Protection (I)</b>				
Instantaneous Pickup	No	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )
Discriminator	No	No	Yes	Yes
Instantaneous Override	Yes	Yes	Yes	Yes
<b>Ground Fault Protection (G)</b>				
Ground Fault Alarm	No	No	20-100% x ( $I_s$ )	20-100% x ( $I_s$ )
Ground Fault Pickup	1-5 x 1g (120A)	1-5 x 1g (120A)	20-100% x ( $I_s$ )	20-100% x ( $I_s$ )
Ground Fault Delay $I^2t$	No	No	100-500 ms	100-500 ms
Ground Fault Delay Flat	Inst-500 ms	Inst-500 ms	100-500 ms	100-500 ms
Ground Fault Zone Selective Interlocking	No	No	Yes <sup>④</sup>	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes
<b>System Diagnostics</b>				
Status LEDs	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes
Magnitude of Trip Information	No	No	Yes	Yes
Remote Signal Contact – Ground Alarm	Yes <sup>⑤</sup>	Yes <sup>⑤</sup>	Yes <sup>④⑤</sup>	Yes <sup>⑤</sup>
Local Auxiliary and Bell Alarm Contact	Optional	Optional	Optional	Included
<b>System Monitoring</b>				
Digital Display	No	No	Yes <sup>②</sup>	Yes <sup>②</sup>
Current	No	No	Yes	Yes
Power and Energy	No	No	No	Yes
Power Quality-Harmonics	No	No	No	Yes
Power Factor	No	No	No	Yes
<b>Communications</b>				
Eaton PowerNet	No	No	Yes <sup>③</sup>	Yes
<b>Testing</b>				
Testing Method	Test Set		OPTIMizer, BIM, Eaton PowerNet	

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Require Eaton PowerNet kit.

④ Require Zone interlock kit.

⑤ With separate ground fault alarm unit (GFAU).

Legend:

BIM = Breaker Interface Module

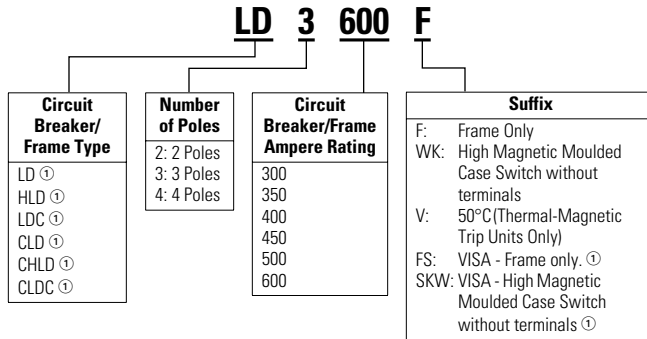
(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting

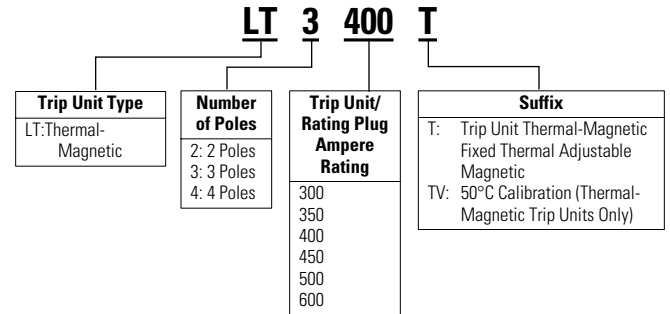
## Catalogue Numbering System

This information is presented only as an aid to understanding Catalogue numbers. It is not to be used to build Catalogue numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalogue Number

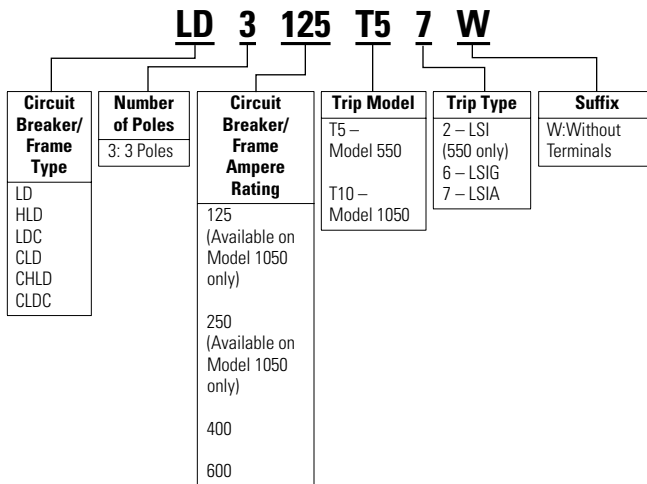


### Thermal-Magnetic Trip Unit Catalogue Number

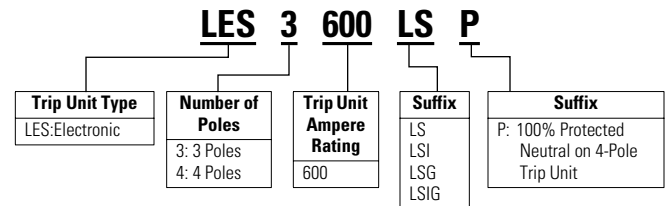


① "VISA option is available. CSA listed only.

### OPTIM Circuit Breaker/Frame Catalogue Number



### Digitrip RMS 310 Trip Unit Catalogue Number



## Dimensions/Weights

### Dimensions, Inches (mm)

Number of Poles	Width	Height	Depth
2, 3	8.25 (210)	10.75 (274)	4.062 (103)
4	11 (279)	10.75 (274)	4.062 (103)

### Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Complete Breaker			Frame Only			Trip Unit		
	Number of Poles								
	2	3	4	2	3	4	2	3	4
LD, HLD, LDC	18 (8.172)	20 (9.080)	25 (11.340)	14 (6.356)	15 (6.810)	20 (9.072)	3 (1.361)	4 (1.814)	5 (2.268)

## Product Selection

### Types LD, HLD, and LDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	Standard Interrupting Capacity 600 Vac Rated 25 kAIC @ 600 Vac		High Interrupting Capacity 600 Vac Rated 35 kAIC @ 600 Vac		Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 50 kAIC @ 600 Vac		Thermal Magnetic Trip Unit Only	
	Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals		Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals		Factory Assembled Circuit Breaker Consisting of Frame, Trip Unit, and Terminals		For Use With: Standard or High or Ultra High Interrupting Frames	Standard Terminals Only
	Frame Only ①	Frame Only ①	Frame Only ①	Frame Only ①	Frame Only	Frame Only	Magnetic Trip Range is 5-10 x Continuous Ampere Rating	See Section Page Number L-11 for Optional Terminals
	Catalogue Number							
<b>2-Pole ②</b>								
300	LD2300	LD2600F	HLD2300	HLD2600F	LDC2300	LDC2600F	LT2300T	TA602LD ④
350	LD2350		HLD2350		LDC2350		LT2350T	TA602LD ④
400	LD2400		HLD2400		LDC2400		LT2400T	TA602LD ④
450	LD2450		HLD2450		LDC2450		LT2450T	TA602LD ④
500	LD2500		HLD2500		LDC2500		LT2500T	TA602LD ④
600	LD2600		HLD2600		LDC2600		LT2600T	2TA603LDK ⑤
<b>3-Pole</b>								
300	LD3300	LD3600F	HLD3300	HLD3600F	LDC3300	LDC3600F	LT3300T	TA602LD ④
350	LD3350		HLD3350		LDC3350		LT3350T	TA602LD ④
400	LD3400		HLD3400		LDC3400		LT3400T	TA602LD ④
450	LD3450		HLD3450		LDC3450		LT3450T	TA602LD ④
500	LD3500		HLD3500		LDC3500		LT3500T	TA602LD ④
600	LD3600		HLD3600		LDC3600		LT3600T	3TA603LDK ⑤
<b>4-Pole ③</b>								
300	LD4300	LD4600F	HLD4300	HLD4600F	LDC4300	LDC4600F	LT4300T	TA602LD ④
350	LD4350		HLD4350		LDC4350		LT4350T	TA602LD ④
400	LD4400		HLD4400		LDC4400		LT4400T	TA602LD ④
450	LD4450		HLD4450		LDC4450		LT4450T	TA602LD ④
500	LD4500		HLD4500		LDC4500		LT4500T	TA602LD ④
600	LD4600		HLD4600		LDC4600		LT4600T	4TA603LDK ⑤

Instruction Leaflet Number 29C105 for Breaker; 29C607 for Thermal Magnetic Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. LD and HLD only.

② 2-pole circuit breaker supplied in 3-pole frame.

③ Neutral is in right pole.

④ Individually packed.

⑤ Terminal kits contain one terminal for each pole and one terminal cover.

## Types LD, HLD, and LDC Electronic Circuit Breakers with Interchangeable Trip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

Circuit Breaker Frame Only ①				Digitrip RMS 310 Trip Unit Only ②				Digitrip RMS 310 Rating Plug Only			
Maximum Continuous Ampere Rating @ 40°C ③	Standard Interrupting Capacity	High Interrupting Capacity	Ultra High Interrupting Capacity	Standard	Options					Adjustable Rating Plug	Standard Terminals Only
	600 Vac Rated	600 Vac Rated	600 Vac Rated	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection	Ampere Rating	Fixed Rating Plug	Ampere Rating Catalogue Number	See Section Page Number L-11 for Optional Terminals
	25 kAIC @ 600 Vac	35 kAIC @ 600 Vac	50 kAIC @ 600 Vac	(I <sup>2</sup> t Response)	Response)	Protection	Protection	Rating	Plug	Number	
Catalogue Number											
<b>3-Pole ④</b>											
600	LD3600F	HLD3600F	LDC3600F	LES3600LS	LES3600LSI	LES3600LSG	LES3600LSIG	300	6LES300T	300/400/500/600	TA602LD ⑥
								350	6LES350T	A6LES600T1	TA602LD ⑥
								400	6LES400T	420/440/460/480	TA602LD ⑥
								450	6LES450T	A6LES400T5	TA602LD ⑥
								500	6LES500T	520/540/560/580	TA602LD ⑥
								600	6LES600T	A6LES500T5	3TA603LDK ⑦
<b>4-Pole ⑤</b>											
600	LD4600F	HLD4600F	LDC4600F	LES4600LS	LES4600LSI	-	-	300	6LES300T	300/400/500/600	TA602LD ⑥
								350	6LES350T	A6LES600T1	TA602LD ⑥
								400	6LES400T	420/440/460/480	TA602LD ⑥
								450	6LES450T	A6LES400T5	TA602LD ⑥
								500	6LES500T	520/540/560/580	TA602LD ⑥
								600	6LES600T	A6LES500T5	4TA603LDK ⑦

Instruction Leaflet Number 29C105 for Breaker; 29C615 for LES Trip Unit

## 100% Rated Types CLD, CHLD, and CLDC Electronic Circuit Breakers with Interchangeable Trip Units

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units. Order as individual components: Breaker Frame, Trip Unit, Rating Plug and Terminals.

Circuit Breaker Frame Only ①				Digitrip RMS 310 Trip Unit Only ②				Digitrip RMS 310 Rating Plug Only			
Maximum Continuous Ampere Rating @ 40°C ③	Standard Interrupting Capacity	High Interrupting Capacity	Ultra High Interrupting Capacity	Standard	Options					Adjustable Rating Plug	Standard Terminals Only
	600 Vac Rated	600 Vac Rated	600 Vac Rated	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection	Ampere Rating	Fixed Rating Plug	Ampere Rating Catalogue Number	See Section Page Number L-11 for Optional Terminals
	25 kAIC @ 600 Vac	35 kAIC @ 600 Vac	50 kAIC @ 600 Vac	(I <sup>2</sup> t Response)	Response)	Protection	Protection	Rating	Plug	Number	
Catalogue Number											
<b>3-Pole ④</b>											
600	CLD3600F	CHLD3600F	CLDC3600F	LES3600LS	LES3600LSI	LES3600LSG	LES3600LSIG	300	6LES300T	300/400/500/600	TA602LD ⑥
								350	6LES350T	A6LES600T1	TA602LD ⑥
								400	6LES400T	420/440/460/480	TA602LD ⑥
								450	6LES450T	A6LES400T5	TA602LD ⑥
								500	6LES500T	520/540/560/580	TA602LD ⑥
								600	6LES600T	A6LES500T5	3TA603LDK ⑦

Instruction Leaflet Number 29C105 for Breaker; 29C615 for LES Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. CLD & CHLD only.  
 ② For AC use only.  
 ③ Ampere rating is established by rating plug.

④ 3-pole LES Trip Units are for use in 3-pole frame only.  
 ⑤ Trip unit includes unprotected right neutral pole. For 100% protected right pole neutral, add "P" to catalogue number. ie. LES4600LSP  
 ⑥ Individually packed.  
 ⑦ Terminal kits contain one terminal for each pole and one terminal cover.



### Moulded Case Switches ①

Moulded case switches are used as compact switches in applications requiring high current switching capabilities. Moulded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Moulded case switches are listed in accordance with CSA C22.2 No. 5 and UL 489, suitable for reverse feed use, and as 100% rated devices.

Maximum Continuous Ampere Rating @ 40°C	600 Vac Maximum, 250 Vdc		Standard Terminals Only
	MCS Only Without Line and Load Terminals Catalogue Number		See Section Page Number L-11 for Optional Terminals
<b>2-Pole</b>			
600	LD2600WK	HLD2600WK	2TA603LDK ②
<b>3-Pole</b>			
600	LD3600WK	HLD3600WK	3TA603LDK ②
<b>4-Pole</b>			
600	LD4600WK	HLD4600WK	4TA603LDK②

**Note:** Note: Moulded Case Switch may trip above 6000 amperes.

Instruction Leaflet Number 29C105 for Moulded Case Switch

Moulded Case Switch Type	Number of Poles	Unfused Short Circuit Withstand Rating (Symmetrical Amperes) (kA)			
		Volts Ac (50/60 Hz)			Volts DC
		240	480	600	250
LD	2,3,4	65	35	25	22
HLD	2,3,4	100	65	35	25

① When a "VISA" type Moulded Case Switch is required, change the suffix of the MCS catalogue number from "WK" to "SKW". ie. LD3600SKW

② Terminal kits contain one terminal for each pole and one terminal cover.

**Digitrip OPTIM Electronic Circuit Breaker with Interchangeable Rating Plug**

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Circuit Breaker Frame Only						Digitrip OPTIM Rating Plug Only	
L – Adjustable Long Delay Pickup ( $I_1$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response) ① S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time ( $I^2t$ or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time ( $I^2t$ or Flat Response)							
Maximum Continuous Ampere Rating @ 40°C	OPTIM 550 ②			OPTIM 1050 ③④		Ampere Rating	Fixed Rating Plug
	LSI	LSIG	LSIA	LSIG	LSIA		
Catalogue Number							
3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac							
125	LD3125T52W	LD3125T56W	LD3125T57W	LD3125T106W	LD3125T107W	70	ORPL125A070
						90	ORPL125A090
						100	ORPL125A100
						110	ORPL125A110
						125	ORPL125A125
250	LD3250T52W	LD3250T56W	LD3250T57W	LD3250T106W	LD3250T107W	125	ORPL025A125
						150	ORPL025A150
						175	ORPL025A175
						200	ORPL025A200
						225	ORPL025A225
400	LD3400T52W	LD3400T56W	LD3400T57W	LD3400T106W	LD3400T107W	200	ORPL40A200
						225	ORPL40A225
						250	ORPL40A250
						300	ORPL40A300
						350	ORPL40A350
600	LD3600T52W	LD3600T56W	LD3600T57W	LD3600T106W	LD3600T107W	300	ORPL60A300
						350	ORPL60A350
						400	ORPL60A400
						500	ORPL60A500
						600	ORPL60A600
3-Pole High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac							
125	HLD3125T52W	HLD3125T56W	HLD3125T57W	HLD3125T106W	HLD3125T107W	70	ORPL125A070
						90	ORPL125A090
						100	ORPL125A100
						110	ORPL125A110
						125	ORPL125A125
250	HLD3250T52W	HLD3250T56W	HLD3250T57W	HLD3250T106W	HLD3250T107W	125	ORPL025A125
						150	ORPL025A150
						175	ORPL025A175
						200	ORPL025A200
						225	ORPL025A225
400	HLD3400T52W	HLD3400T56W	HLD3400T57W	HLD3400T106W	HLD3400T107W	200	ORPL40A200
						225	ORPL40A225
						250	ORPL40A250
						300	ORPL40A300
						350	ORPL40A350
600	HLD3600T52W	HLD3600T56W	HLD3600T57W	HLD3600T106W	HLD3600T107W	300	ORPL60A300
						350	ORPL60A350
						400	ORPL60A400
						500	ORPL60A500
						600	ORPL60A600

Instruction Leaflet Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① Long delay  $I^4t$  response selection limits short delay time to flat response.

② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes ZG, PN or ZGP respectively to above Catalogue Number. (A factory assembly charge will be applied, please refer to the Breaker Accessories/Modifications section in the MCCB Price List for details)

③ One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard on model 1050.

④ Factory sealed.

### Digitrip OPTIM Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Circuit Breaker Frame Only						Digitrip OPTIM Rating Plug Only	
Maximum Continuous Ampere Rating @ 40°C	L – Adjustable Long Delay Pickup (I <sub>1</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response) ①					Ampere Rating	Fixed Rating Plug
	S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)						
	I – Adjustable Instantaneous Pickup						
G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)							
A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)							
	OPTIM 550 ②			OPTIM 1050 ③④			
	LSI	LSIG	LSIA	LSIG	LSIA		
	Catalogue Number						
<b>3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>							
125	LDC3125T52W	LDC3125T56W	LDC3125T57W	LDC3125T106W	LDC3125T107W	70	ORPL125A070
						90	ORPL125A090
						100	ORPL125A100
						110	ORPL125A110
						125	ORPL125A125
250	LDC3250T52W	LDC3250T56W	LDC3250T57W	LDC3250T106W	LDC3250T107W	125	ORPL025A125
						150	ORPL025A150
						175	ORPL025A175
						200	ORPL025A200
						225	ORPL025A225
						250	ORPL025A250
400	LDC3400T52W	LDC3400T56W	LDC3400T57W	LDC3400T106W	LDC3400T107W	200	ORPL40A200
						225	ORPL40A225
						250	ORPL40A250
						300	ORPL40A300
						350	ORPL40A350
						400	ORPL40A400
600	LDC3600T52W	LDC3600T56W	LDC3600T57W	LDC3600T106W	LDC3600T107W	300	ORPL60A300
						350	ORPL60A350
						400	ORPL60A400
						500	ORPL60A500
						500	ORPL60A500
						600	ORPL60A600

Instruction Leaflet Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① Long delay I<sup>4</sup>t response selection limits short delay time to flat response.

② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes ZG, PN or ZGP respectively to above Catalogue Number.

③ One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard on model 1050.

④ Factory sealed.

**100% Rated Digitrip OPTIM Circuit Breakers with Interchangeable Rating Plug**

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only					Digitrip OPTIM Rating Plug Only	
	L – Adjustable Long Delay Pickup (L) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response) ① S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time ( $I^2t$ or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time ( $I^2t$ or Flat Response)						
	OPTIM 550 ②		OPTIM 1050 ③④			Ampere Rating	Fixed Rating Plug
LSI	LSIG	LSIA	LSIG	LSIA			
Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac</b>							
125	CLD3125T52W	CLD3125T56W	CLD3125T57W	CLD3125T106W	CLD3125T107W	70	ORPL125A070
						90	ORPL125A090
						100	ORPL125A100
						110	ORPL125A110
						125	ORPL125A125
250	CLD3250T52W	CLD3250T56W	CLD3250T57W	CLD3250T106W	CLD3250T107W	125	ORPL025A125
						150	ORPL025A150
						175	ORPL025A175
						200	ORPL025A200
						225	ORPL025A225
						250	ORPL025A250
400	CLD3400T52W	CLD3400T56W	CLD3400T57W	CLD3400T106W	CLD3400T107W	200	ORPL40A200
						225	ORPL40A225
						250	ORPL40A250
						300	ORPL40A300
						350	ORPL40A350
						400	ORPL40A400
600	CLD3600T52W	CLD3600T56W	CLD3600T57W	CLD3600T106W	CLD3600T107W	300	ORPL60A300
						350	ORPL60A350
						400	ORPL60A400
						500	ORPL60A500
						500	ORPL60A500
						600	ORPL60A600
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac</b>							
125	CHLD3125T52W	CHLD3125T56W	CHLD3125T57W	CHLD3125T106W	CHLD3125T107W	70	ORPL125A070
						90	ORPL125A090
						100	ORPL125A100
						110	ORPL125A110
						125	ORPL125A125
250	CHLD3250T52W	CHLD3250T56W	CHLD3250T57W	CHLD3250T106W	CHLD3250T107W	125	ORPL025A125
						150	ORPL025A150
						175	ORPL025A175
						200	ORPL025A200
						225	ORPL025A225
						250	ORPL025A250
400	CHLD3400T52W	CHLD3400T56W	CHLD3400T57W	CHLD3400T106W	CHLD3400T107W	200	ORPL40A200
						225	ORPL40A225
						250	ORPL40A250
						300	ORPL40A300
						350	ORPL40A350
						400	ORPL40A400
600	CHLD3600T52W	CHLD3600T56W	CHLD3600T57W	CHLD3600T106W	CHLD3600T107W	300	ORPL60A300
						350	ORPL60A350
						400	ORPL60A400
						500	ORPL60A500
						500	ORPL60A500
						600	ORPL60A600

Instruction Leaflet Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① Long delay  $I^4t$  response selection limits short delay time to flat response.

② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes ZG, PN or ZGP respectively to above Catalogue Number.

③ One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard on model 1050.

④ Factory sealed.

### 100% Rated Digitrip OPTIM Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Circuit Breaker Frame Only						Digitrip OPTIM Rating Plug Only		
L – Adjustable Long Delay Pickup (L) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response) ① S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)								
Maximum Continuous Ampere Rating @ 40°C	OPTIM 550 ②			OPTIM 1050 ③④			Ampere Rating	Fixed Rating Plug
	LSI	LSIG	LSIA	LSIG	LSIA			
	Catalogue Number							
<b>3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
125	CLDC3125T52W	CLDC3125T56W	CLDC3125T57W	CLDC3125T106W	CLDC3125T107W	70	ORPL125A070	
						90	ORPL125A090	
						100	ORPL125A100	
						110	ORPL125A110	
						125	ORPL125A125	
250	CLDC3250T52W	CLDC3250T56W	CLDC3250T57W	CLDC3250T106W	CLDC3250T107W	125	ORPL025A125	
						150	ORPL025A150	
						175	ORPL025A175	
						200	ORPL025A200	
						225	ORPL025A225	
						250	ORPL025A250	
400	CLDC3400T52W	CLDC3400T56W	CLDC3400T57W	CLDC3400T106W	CLDC3400T107W	200	ORPL40A200	
						225	ORPL40A225	
						250	ORPL40A250	
						300	ORPL40A300	
						350	ORPL40A350	
						400	ORPL40A400	
600	CLDC3600T52W	CLDC3600T56W	CLDC3600T57W	CLDC3600T106W	CLDC3600T107W	300	ORPL60A300	
						350	ORPL60A350	
						400	ORPL60A400	
						500	ORPL60A500	
						500	ORPL60A500	
						600	ORPL60A600	

Instruction Leaflet Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① Long delay I<sup>4</sup>t response selection limits short delay time to flat response.

② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes ZG, PN or ZGP respectively to above Catalogue Number.

③ One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard on model 1050.

④ Factory sealed.

## Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B and CSA Standard C22.2 No. 65. Unless otherwise specified, L-frame circuit breaker line and load terminals are shipped separately for field installation.

The wire connecting terminal is secured with two pan-head, slotted screws and lock washers which can be checked for the correct torque loading or retightened from the front of the circuit breaker before installation of the conductors. (Applies to all styles.) The circuit breaker line/load terminal conductors are positioned in the conducting holes in the wire connecting terminal and are secured

with recessed socket screws which are tightened to the correct torque loading from the front of the circuit breaker.

## Ordering Information

L-frame circuit breakers use Cu/Al terminals as standard. When optional copper terminals are required, order by Catalogue number. Specify if factory installation is required.

## Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/ Number of Conductors	Metric Wire Range mm <sup>2</sup>	Terminal Catalogue Number	Terminals with Control Wire Termination Catalogue Numbers
<b>Standard Cu/Al Pressure Terminals</b>						
400	Aluminum	Cu/Al	4/0-600 (1)	120-300	<b>2TA401LDK- 2-Pole Kit</b> ①③ <b>3TA401LDK- 3-Pole Kit</b> ①③ <b>4TA401LDK- 4-Pole Kit</b> ①③	- - -
450	Aluminum	Cu/Al	4-4/0 (2)	25-95	<b>TA450LD</b> ②③	-
500	Aluminum	Cu/Al	3/0-350 (2)	95-150	<b>TA602LD</b> ②③	<b>TA602LDCW</b> ③
600	Aluminum	Cu/Al	400-500 (2)	185-240	<b>2TA603LDK- 2-Pole Kit</b> ①③ <b>3TA603LDK- 3-Pole Kit</b> ①③ <b>4TA603LDK- 4-Pole Kit</b> ①③	<b>2TA603LDCW</b> ③ <b>3TA603LDCW</b> ③ <b>4TA603LDCW</b> ③
<b>Optional Copper and Cu/Al Pressure Type Terminals</b>						
600	Copper	Cu	250-350 (2)	120-150	<b>T602LD</b> ②	<b>T602LDCW</b>

TA401LD or TA603LD Terminal (Step-Type Terminal Requires Terminal Cover and Warning Label. See Inset.)

Pan-Head Screws and Lockwashers

TA450LD or TA602LD or T602LD Terminal

Pan-Head Screws and Lockwashers (Installed before Cable Clamping Screws)

Terminal Cover

Warning Label

Retainer

Screws

Circuit Breaker Line Terminal Cover

- ① Terminal kits contain one terminal for each pole and one terminal cover.
- ② Individually packed.
- ③ Terminal is marked with AL9CU to indicate the 90°C temperature rating.

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

Description	Reference Page	2-Pole ①, 3-Pole			4-Pole			
		Left	Centre	Right	Left	Centre	Right	Neu. ②
<b>Internal Accessories (Only One Internal Accessory Per Pole) ③</b>								
Alarm Lockout (Make/Break)	INTA-3	■		■	■		■	
Alarm Lockout (2Make/2Break)	INTA-3	■		■	■		■	
Auxiliary Switch (1A, 1B)	INTA-7	■		■	■		■	
Auxiliary Switch (2A, 2B)	INTA-7	■		■	■		■	
Auxiliary Switch (3A, 3B)	INTA-7	■		■	■		■	
Auxiliary Switch (1A, 1B) and Alarm Switch Combination	INTA-9	■		■	■		■	
Auxiliary Switch (2A, 2B) and Alarm Switch Combination	INTA-9	■		■	■		■	
Shunt Trip – Standard ④	INTA-12	■		■	■		■	
Shunt Trip – Low Energy ④	INTA-15	■		■	■		■	
Undervoltage Release Mechanism ④	INTA-20	■		■	■		■	
Eaton PowerNet and Zone Interlock Kit (OPTIM 550)	INTA-23			■				
<b>External Accessories</b>								
End Cap Kit	EXTA-2	●	●	●	●	●	●	●
Control Wire Terminal Kit	EXTA-3	●	●	●	●	●	●	●
Base Mounting Hardware	EXTA-5	●	●	●	●	●	●	●
Terminal Shields	EXTA-7	●	●	●	●	●	●	●
Interphase Barriers	EXTA-8	●	●	●	●	●	●	●
Non-Padlockable Handle Block	EXTA-10		■			■		
Padlockable Handle Lock Hasp	EXTA-11	□		□	□		□	
Key Interlock Kit	EXTA-12	□		□	□		□	
Sliding Bar Interlock – Requires Two Breakers	EXTA-13	●	●	●				
Walking Beam Interlock – Requires Two Breakers	EXTA-13	●	●	●	●	●	●	●
Electrical (Motor) Operator	EXTA-15	●	●	●	●	●	●	●
Plug-in Adapters	EXTA-16	●	●	●	●	●	●	●
Rear Connecting Studs	EXTA-19	●	●	●	●	●	●	●
Panelboard Connecting Straps	EXTA-20	●	●	●	●	●	●	●
Handle Mechanisms	EXTA-21	●	●	●	●	●	●	●
Handle Extension	EXTA-27	●	●	●	●	●	●	●
Solid-State (Electronic) Portable Test Kit	EXTA-28	●	●	●	●	●	●	●
Ground Fault Alarm Unit	EXTA-28	●	●	●	●	●	●	●
<b>OPTIM System Components 3-Poles</b>								
Breaker Interface Module (BIM)	EXTA-29							
Digitrip OPTIMizer	EXTA-29							
Auxiliary Power Module	EXTA-29							
Potential Transformer Module	EXTA-30							
<b>Modifications (Refer to Eaton)</b>								
Special Calibration	1.2	●	●	●	●	●	●	●
Moisture Fungus Treatment	1.2	●	●	●	●	●	●	●
Freeze-Tested Circuit Breakers	1.2	●	●	●	●	●	●	●
Marine Application	1.2	●	●	●	●	●	●	●

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame. Current carrying parts omitted from centre pole.

② Refer to Eaton for appropriate neutral pole accessory combinations.

③ OPTIM model 1050 is factory sealed and does not have the right pole space available for accessories.

④ Shunt trip and VVR cannot be mounted in right poles on LES trip units or OPTIM trip units.

Typical M-Frame Circuit Breaker complete with the "VISA" option



## Technical Data and Specifications

### CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings <sup>①</sup>

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)				Section Page Number
		Volts Ac (50/60 Hz)			Volts Dc <sup>②③</sup>	
		240	480	600	250	
<b>MDL</b>	2, 3	65	50	25	22	M-4,5
<b>CMDL</b>	2, 3	65	50	25	-	M-5
<b>HMDL</b> <sup>④</sup>	2, 3	100	65	35	25	M-4,5
<b>CHMDL</b> <sup>④</sup>	2, 3	100	65	35	-	M-5

### IEC 947-2 Interrupting Capacity Ratings <sup>①</sup>

Circuit Breaker Type	Number of Poles	Interrupting Capacity – RMS Symmetrical Amperes (kA) $I_{cu} \neq I_{cs}$				Section Page Number
		Volts Ac (50/60 Hz)			Volts Dc <sup>②③</sup>	
		240	480	600	250	
<b>MDL</b>	2, 3	65/65	50/50	20/10	20/10	M-4,5
<b>CMDL</b>	2, 3	65/65	50/50	20/10	-	M-5
<b>HMDL</b>	2, 3	100/100	70/50	25/13	20/10	M-4,5
<b>CHMDL</b>	2, 3	100/100	70/50	25/13	-	M-5

## Product Description

- All M-frame circuit breakers are HACR rated.
- MDL-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- M-frame circuit breakers are suitable for reverse feed use.

<sup>①</sup> Utilization category A circuit breakers.

<sup>②</sup> 2-pole circuit breaker or two poles of 3-pole circuit breaker. Thermal-magnetic trip units only, MDL, HMDL breakers with electronic trip unit are not DC rated.

<sup>③</sup> Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds at 22 kA.

<sup>④</sup> 100% rated breakers.



**MDL-Frame Digitrip Specifications**

<b>Trip Unit Type</b>	<b>Digitrip RMS 310</b>	
RMS Sensing	Yes	
<b>Breaker Type</b>		
Frame	MDL, CMDL, HMDL, CHMDL	
Ampere Range	400-800A	
Interrupting Rating @ 600 Vac	25, 35 (kA)	
<b>Protection</b>		
Ordering Options	LS, LSG	LSI, LSIG
Fixed Rated Plug ( $I_n$ )	Yes	Yes
Overtemperature Trip	Yes	Yes
<b>Long Delay Protection (L)</b>		
Adjustable Rating Plug ( $I_n$ )	Yes	Yes
Long Delay Pickup	0.5-1.0 ( $I_n$ ) ①	0.5-1.0 ( $I_n$ ) ①
Long Delay Time $I^2t$	12 Seconds	12 Seconds
Long Delay Time $I^4t$	No	No
Long Delay Thermal Memory	Yes	Yes
High Load Alarm	No	No
<b>Short Delay Protection (S)</b>		
Short Delay Pickup	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )
Short Delay Time $I^2t$	100 ms	No
Short Delay Time Flat	No	Inst-300 ms
Short Delay Time Zone Selective Interlocking	No	No
<b>Instantaneous Protection (I)</b>		
Instantaneous Pickup	No	200-800% x ( $I_n$ )
Discriminator	No	No
Instantaneous Override	Yes	Yes
<b>Ground Fault Protection (G)</b>		
Ground Fault Alarm	No	No
Ground Fault Pickup	1-5 x 1g (160A)	1-5 x 1g (160A)
Ground Fault Delay $I^2t$	No	No
Ground Fault Delay Flat	Inst-500 ms	Inst-500 ms
Ground Fault Zone Selective Interlocking	No	No
Ground Fault Thermal Memory	Yes	Yes
<b>System Diagnostics</b>		
Status LEDs	Yes	Yes
Cause of Trip LEDs	No	No
Magnitude of Trip Information	No	No
Remote Signal Contacts – Ground Alarm	Yes②	Yes ②
<b>System Monitoring</b>		
Digital Display	No	No
Current	No	No
Power and Energy	No	No
Power Quality – Harmonics	No	No
Power Factor	No	No
<b>Communications</b>		
Eaton PowerNet	No	No
<b>Testing</b>		
Testing Method	Test Set (STK2)	

**Legend:**  
 $I_n$  = Rating Plug

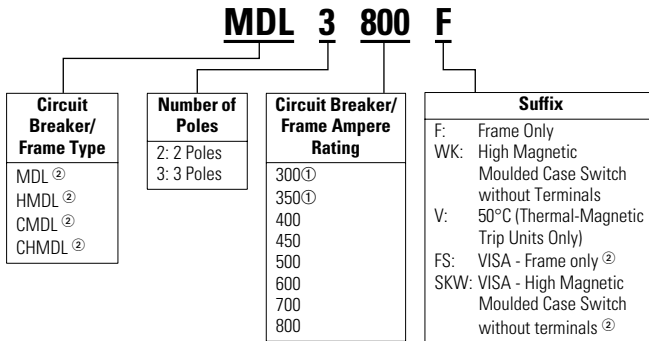
① Adjust by rating plug.

② With separate ground fault alarm unit (GFAU).

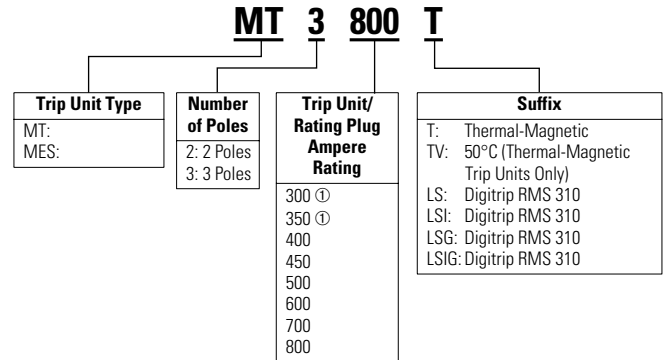
## Catalogue Numbering System

This information is presented only as an aid to understanding Catalogue numbers. It is not to be used to build Catalogue numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalogue Number



### Thermal-Magnetic Trip Unit Catalogue Number



## Dimensions/Weights

### Dimensions, Inches (mm)

Number of Poles	Width	Height	Depth
2, 3	8.250 (210)	16.000 (406)	4.062 (103)

### Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Complete Breaker		Frame Only		Trip Unit ①	
	Number of Poles		2	3	2	3
<b>MDL, HMDL (T/M T.U.)</b>	26.5 (12.0)	29 (13.2)	24.5 (11.1)	26 (11.8)	2.5 (1.1)	3 (1.4)
<b>MDL, HMDL (Elec. T.U.)</b>	–	30 (13.6)	–	26 (11.8)	–	4 (1.8)

① Thermal-Magnetic only.

② "VISA" option is available. CSA listed only.

### Product Selection

#### Types MDL and HMDL Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C	Standard Interrupting Capacity 600 Vac Rated 25 kAIC @ 600 Vac		High Interrupting Capacity 600 Vac Rated 35 kAIC @ 600 Vac		Thermal Magnetic Trip Unit Only	
	Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals		Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals		For Use With: Standard or High Interrupting Frames	Magnetic Trip Range is 5-10 up through 600A; 4-8 on 700 and 800A x Continuous Ampere Rating
	Frame Only ①	Frame Only ①	Frame Only ①	Frame Only ①	Standard Terminals Only ②	See Section Page Number M-7 for Optional Terminals
	Catalogue Number					
<b>2-Pole</b>						
300	MDL2300	MDL2800F	HMDL2300	HMDL2800F	MT2300T	TA700MA1
350	MDL2350		HMDL2350		MT2350T	TA700MA1
400	MDL2400		HMDL2400		MT2400T	TA700MA1
450	MDL2450		HMDL2450		MT2450T	TA700MA1
500	MDL2500		HMDL2500		MT2500T	TA700MA1
600	MDL2600		HMDL2600		MT2600T	TA700MA1
700	MDL2700		HMDL2700		MT2700T	TA700MA1
800	MDL2800		HMDL2800		MT2800T	TA800MA2
<b>3-Pole</b>						
300	MDL3300	MDL3800F	HMDL3300	HMDL3800F	MT3300T	TA700MA1
350	MDL3350		HMDL3350		MT3350T	TA700MA1
400	MDL3400		HMDL3400		MT3400T	TA700MA1
450	MDL3450		HMDL3450		MT3450T	TA700MA1
500	MDL3500		HMDL3500		MT3500T	TA700MA1
600	MDL3600		HMDL3600		MT3600T	TA700MA1
700	MDL3700		HMDL3700		MT3700T	TA700MA1
800	MDL3800		HMDL3800		MT3800T	TA800MA2

Instruction Leaflet Number 29C111 for Breaker; 29C607 for MT Trip Unit.

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie. MDL3800FS

② Two terminals are required per pole.

**Types MDL and HMDL Electronic Circuit Breakers with Interchangeable Trip Units**

Order as Individual Components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

Circuit Breaker Frame Only ②		Digitrip RMS 310 Trip Unit Only ③				Digitrip RMS 310 Rating Plug Only				Terminals
Maximum Continuous Ampere Rating @ 40°C ①	Standard Interrupting Capacity 600 Vac Rated 25 kAIC @ 600 Vac	High Interrupting Capacity 600 Vac Rated 35 kAIC @ 600 Vac	Standard		Options		Ampere Rating	Fixed Rating Plug	Adjustable Rating Plugs	
			Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection				Ampere Rating Catalogue Number
<b>3-Pole</b>										
800	MDL3800F	HMDL3800F	MES3800LS	MES3800LSI	MES3800LSG	MES3800LSIG	400 500 600 700 800	8MES400T 8MES500T 8MES600T 8MES700T 8MES800T	400/500/600/800 A8MES800T 620/640/660/680 A8MES600T5 720/740/760/780 A8MES700T5	See Section Page Number M-7 for Standard and Optional Terminals

Instruction Leaflet Number 29C111 for Breaker; 29C615 for MES Trip Unit

**100% Rated Types CMDL and CHMDL Electronic Circuit Breakers with Interchangeable Trip Units**

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units. Order as individual components: breaker frame, trip unit, rating plug and terminals.

Circuit Breaker Frame Only ②		Digitrip RMS 310 Trip Unit Only ③				Digitrip RMS 310 Trip Unit Only				Terminals
Maximum Continuous Ampere Rating @ 40°C ①	Standard Interrupting Capacity 25 kAIC @ 600 Vac	High Interrupting Capacity 35 kAIC @ 600 Vac	Standard		Options		Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug	
			Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection				Ampere Rating Catalogue Number
<b>3-Pole</b>										
800	CMDL3800F	CHMDL3800F	MES3800LS	MES3800LSI	MES3800LSG	MES3800LSIG	400 500 600 700 800	8MES400T 8MES500T 8MES600T 8MES700T 8MES800T	400/500/600/800 A8MES800T 620/640/660/680 A8MES600T5 720/740/760/780 A8MES700T5	See Section Page Number M-7 for Standard and Optional Terminals

Instruction Leaflet Number 29C111 for Breaker; 29C615 for MES Trip Unit

① Ampere rating is established by rating plug.  
 ② When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie. MDL3800FS  
 ③ For Ac use only.

#### Moulded Case Switches ①

Moulded case switches are used as compact switches in applications requiring high current switching capabilities. Moulded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Moulded case switches are listed in accordance with CSA C22.2 No. 5.2 and Underwriters Laboratories, Inc., Standard UL 489 suitable for reverse feed use and as 100% rated devices.

Maximum Continuous Ampere Rating @ 40°C	600 Vac Maximum, 250 Vdc	
	Moulded Case Switches Only without Line and Load Terminals	
	Catalogue Number	
<b>2-Pole</b>		
800	MDL2800WK	HMDL2800WK
<b>3-Pole</b>		
800	MDL3800WK	HMDL3800WK

**Note:** Moulded case switch may trip above 6000 amperes.

Instruction Leaflet Number 29C111

Moulded Case Switch Type	Number of Poles	Unfused Short Circuit Withstand Rating (Symmetrical Amperes) (kA)			
		Volts Ac (50/60 Hz)			Volts Dc
		240	480	600	250
MDL	2,3	65	50	25	22
HMDL	2,3	100	65	35	25

① When a "VISA" type moulded case switch is required, change the suffix of the moulded case switch catalogue number from "WK" to "SKW". ie. MDL3800SKW.

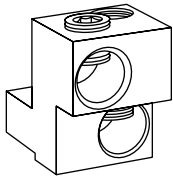
## Line and Load Terminals

M-Frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by Catalogue number. Specify if factory installation is required.

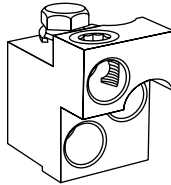
### Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/ No. Conductors	Terminal Catalogue Number	Terminals with Control Wire Termination Catalogue Number
<b>Standard Cu/Al Pressure Terminals</b>					
600	Aluminum	Cu/Al	(2) #1-500 kcmil	<b>TA700MA1</b>	<b>TA700MA1CWT</b>
800	Aluminum	Cu/Al	(3) 3/0-400 kcmil	<b>TA800MA2</b> ①	<b>TA800MA2CWT</b> ①
800	Aluminum	Cu/Al	(2) 500-750 kcmil	<b>TA801MA</b>	<b>TA801MACWT</b>
<b>Optional Copper and Cu/Al Pressure Type Terminals</b>					
600	Copper	Cu	(2) 2/0-500 kcmil	<b>T600MA1</b>	—
800	Copper	Cu	(3) 3/0-300 kcmil	<b>T800MA1</b>	—

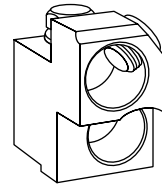
**TA700MA1**



**TA800MA2**



**TA801MA**



① Terminal is marked with AL9CU to indicate the 90°C temperature rating.

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

Description	Reference Page	2-Pole ①		3-Pole		
		Left	Right	Left	Centre	Right
<b>Internal Accessories (Only One Internal Accessory Per Pole)</b>						
Alarm Lockout (Make/Break)	INTA-3	■		■		■
Alarm Lockout (2Make/2Break)	INTA-3	■		■		■
Auxiliary Switch (1A, 1B)	INTA-7	■		■		■
Auxiliary Switch (2A, 2B)	INTA-7	■		■		■
Auxiliary Switch (3A, 3B)	INTA-7	■		■		■
Auxiliary Switch (1A, 1B) and Alarm Switch Combination	INTA-9	■		■		■
Auxiliary Switch (2A, 2B) and Alarm Switch Combination	INTA-9	■		■		■
Shunt Trip – Standard ②	INTA-12	■		■		■
Shunt Trip – Low Energy ②	INTA-15	■		■		■
Undervoltage Release Mechanism ②	INTA-20	■		■		■
<b>External Accessories</b>						
Base Mounting Hardware	EXTA-5				●	
Terminal Shields	EXTA-7				●	
Interphase Barriers	EXTA-8				●	
Non-Padlockable Handle Block	EXTA-10				■	
Padlockable Handle Lock Hasp	EXTA-11	□		□		□
Key Interlock Kit	EXTA-12	□		□		□
Sliding Bar Interlock – Requires Two Breakers	EXTA-13	●	●	●	●	●
Walking Beam Interlock – Requires Two Breakers	EXTA-13	●	●	●	●	●
Electrical (Motor) Operator	EXTA-15	●	●	●	●	●
Plug-in Adapters	EXTA-16	●	●	●	●	●
Rear Connecting Studs	EXTA-19	●	●	●	●	●
Panelboard Connecting Straps	EXTA-20	●	●	●	●	●
Handle Mechanisms	EXTA-21	●	●	●	●	●
Handle Extension	EXTA-27	●	●		●	
Solid-State (Electronic) Portable Test Kit	EXTA-28	●	●	●	●	●
Ground Fault Alarm Unit	EXTA-28	●	●	●	●	●
<b>Modifications (Refer to Eaton)</b>						
Special Calibration	1.2	●	●	●	●	●
Moisture Fungus Treatment	1.2	●	●	●	●	●
Freeze-Tested Circuit Breakers	1.2	●	●	●	●	●
Marine Application	1.2	●	●	●	●	●

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame. Current carrying parts omitted from centre pole.

② Shunt trip and UVR cannot be mounted in right poles on MES trip units.

Typical N-Frame Circuit Breaker



### Product Description

- All N-frame circuit breakers are suitable for reverse feed use.
- All N-frame circuit breakers are HACR rated.

### Technical Data and Specifications

#### CSA C22.2 No. 5 and UL489 Interrupting Capacity Ratings ①

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)					Section Page Number
		Volts Ac (50/60 Hz)					
		240	277	480	600	125	
<b>ND</b>	2, 3, 4	65	—	50	25	—	N-4, 10
<b>CND</b> ②	2, 3, 4	65	—	50	25	—	N-7, 11
<b>HND</b>	2, 3, 4	100	—	65	35	—	N-5, 10
<b>CHND</b> ②	2, 3, 4	100	—	65	35	—	N-8, 11
<b>NDC</b>	2, 3, 4	200	—	100	65	—	N-6, 10
<b>CNDC</b> ②	2, 3, 4	200	—	100	65	—	N-9, 11

#### IEC 947-2 Interrupting Capacity Ratings ①

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)			Section Page Number
		Volts Ac (50/60 Hz)			
		240	415	690	
<b>ND</b>	2, 3, 4				N-4, 10
<b>I<sub>cu</sub></b>		85	50	20	
<b>I<sub>cs</sub></b>		85	50	10	
<b>CND</b> ②	2, 3, 4				N-7, 11
<b>I<sub>cu</sub></b>		85	50	20	
<b>I<sub>cs</sub></b>		85	50	10	
<b>HND</b>	2, 3, 4				N-5, 10
<b>I<sub>cu</sub></b>		100	70	25	
<b>I<sub>cs</sub></b>		100	50	13	
<b>CHND</b> ②	2, 3, 4				N-8, 11
<b>I<sub>cu</sub></b>		100	70	25	
<b>I<sub>cs</sub></b>		100	50	13	
<b>NDC</b>	2, 3, 4				N-6, 10
<b>I<sub>cu</sub></b>		200	100	35	
<b>I<sub>cs</sub></b>		100	50	18	
<b>CNDC</b> ②	2, 3, 4				N-9, 11
<b>I<sub>cu</sub></b>		200	100	35	
<b>I<sub>cs</sub></b>		100	50	18	

① Utilization Category A circuit breakers.

② 100% rated breakers.



### N-Frame Digitrip Specifications

Trip Unit Type	Digitrip RMS 310		Digitrip OPTIM 550	Digitrip OPTIM 1050
RMS Sensing	Yes		Yes	Yes
<b>Breaker Type</b>				
Frame	N		N	N
Ampere Range	400A-1200A		400A-1200A	400A-1200A
Interrupting Rating @ 600V	25, 35, 65 (kA)		25, 35, 65 (kA)	25, 35, 65 (kA)
<b>Protection</b>				
Ordering Options	LS, LSG	LSI, LSIG	LSI, LSIG, LSI(A)	LSI(A), LISG
Fixed Rated Plug ( $I_n$ )	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes
<b>Long Delay Protection (L)</b>				
Adjustable Rating Plug ( $I_n$ )	Yes	Yes	No	No
Long Delay Pickup	0.5-1.0 ( $I_n$ ) ①	0.5-1.0 ( $I_n$ ) ①	0.4-1.0 x ( $I_n$ )	0.4-1.0 x ( $I_n$ )
Long Delay Time $I^2T$	12 Seconds	12 Seconds	2-24 Seconds	2-24 Seconds
Long Delay Time $I^4T$	No	No	1-5 Seconds	1-5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes
High Load Alarm	No	No	No	0.5-1.0 x $I_r$
<b>Short Delay Protection (S)</b>				
Short Delay Pickup	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )	150-800% x ( $I_r$ )	150-800% x ( $I_r$ )
Short Delay Time $I^2T$	100 ms	No	100-500 ms	100-500 ms
Short Delay Time Flat	No	Inst-300 ms	100-500 ms	100-500 ms
Short Delay Time Zone Selective Interlocking	No	No	Yes ④	Yes
<b>Instantaneous Protection (I)</b>				
Instantaneous Pickup	No	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )	200-800% x ( $I_n$ )
Discriminator	No	No	Yes	Yes
Instantaneous Override	Yes	Yes	Yes	Yes
<b>Ground Fault Protection (G)</b>				
Ground Fault Alarm	No	No	20-100% x ( $I_s$ )	20-100% x ( $I_s$ )
Ground Fault Pickup	Varies by Frame	Varies by Frame	20-100% x ( $I_s$ )	20-100% x ( $I_s$ )
Ground Fault Delay $I^2T$	No	No	100-500 ms	100-500 ms
Ground Fault Delay Flat	Inst-500 ms	Inst-500 ms	100-500 ms	100-500 ms
Ground Fault Zone Selective Interlocking	No	No	Yes④	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes
<b>System Diagnostics</b>				
Status LEDs	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes
Magnitude of Trip Information	No	No	Yes	Yes
Remote Signal Contact – Ground Alarm	Yes ⑤	Yes ⑤	Yes ④⑤	Yes ⑤
Local Auxiliary and Bell Alarm Contact	Optional	Optional	Optional	Included
<b>System Monitoring</b>				
Digital Display	No	No	Yes ②	Yes ②
Current	No	No	Yes	Yes
Power and Energy	No	No	No	Yes
Power Quality-Harmonics	No	No	No	Yes
Power Factor	No	No	No	Yes
<b>Communications</b>				
Eaton PowerNet	No	No	Yes ③	Yes
<b>Testing</b>				
Testing Method	Test Set (STK2)		OPTIMizer, BIM, Eaton PowerNet	OPTIMizer, BIM, Eaton PowerNet

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Require Eaton PowerNet kit.

④ Require Zone interlock kit.

⑤ With separate ground fault alarm unit (GFAU).

BIM = Breaker Interface Module

(A) = GF Alarm

$I_s$  = Sensor Rating

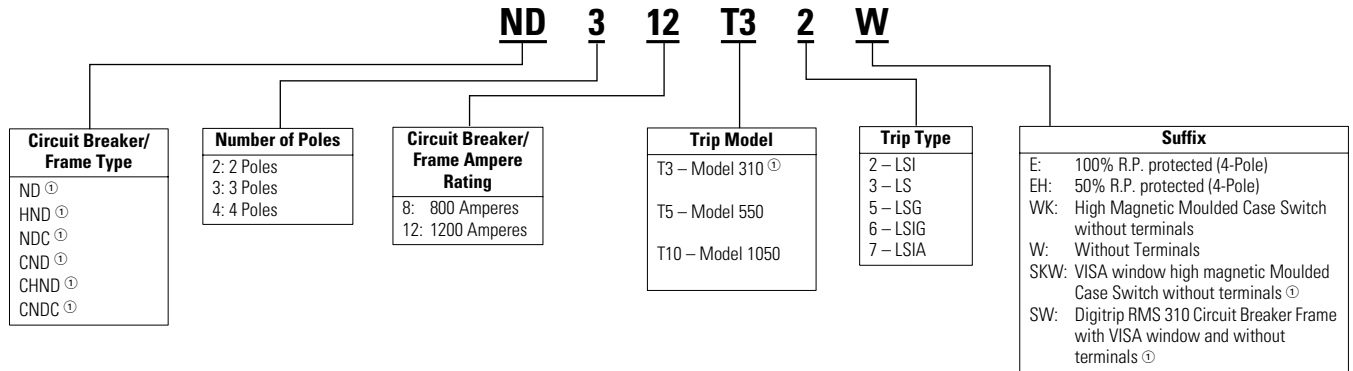
$I_n$  = Rating Plug

$I_r$  = Long Delay Pickup Setting

## Catalogue Numbering System

This information is presented only as an aid to understanding Catalogue numbers. It is not to be used to build Catalogue numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalogue Number



① "VISA" option is available. CSA listed only.

## Dimensions/Weights

### Dimensions, Inches (mm)

Number of Poles	Width	Height	Depth
2, 3	8.25 (210)	16 (407)	5.5 (140)
4	11.125 (283)	16 (407)	5.5 (140)

### Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Complete Breaker		
	Number of Poles		
	2	3	4
ND, HND, NDC	37 (16.783)	45 (20.412)	58 (26.308)

### Product Selection

#### Type ND Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

		Digitrip RMS 310 Circuit Breaker Frame Only ③				Digitrip RMS 310 Rating Plug Only			
		Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac				Adjustable Rating Plug			
		L - Adjustable Long Delay Pickup (by Adjustable Rating Plug) S - Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response) I - Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G - Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response)							
Maximum Continuous Ampere Rating @ 40°C	Standard	Options			Ampere Rating	Fixed Rating Plugs	Adjustable Ampere Ratings Catalogue Number	Standard Terminals Only ①	
	Catalogue Number	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection					Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection
<b>2-Pole</b>									
800	ND2800T33W	ND2800T32W	ND2800T35W	ND2800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1	
					450	8NES450T		TA700NB1	
					500	8NES500T		TA700NB1	
					600	8NES600T		TA700NB1	
					700	8NES700T		TA700NB1	
					800	8NES800T		TA1000NB1	
<b>3-Pole</b>									
800	ND3800T33W	ND3800T32W	ND3800T35W	ND3800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1	
					450	8NES450T		TA700NB1	
					500	8NES500T		TA700NB1	
					600	8NES600T		TA700NB1	
					700	8NES700T		TA700NB1	
					800	8NES800T		TA1000NB1	
<b>4-Pole ②</b>									
800	ND4800T33W	ND4800T32W	-	-	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1	
					450	8NES450T		TA700NB1	
					500	8NES500T		TA700NB1	
					600	8NES600T		TA700NB1	
					700	8NES700T		TA700NB1	
					800	8NES800T		TA1000NB1	
<b>2-Pole</b>									
1200	ND212T33W	ND212T32W	ND212T35W	ND212T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1	
					700	12NES700T		TA700NB1	
					800	12NES800T		TA1000NB1	
					900	12NES900T		TA1000NB1	
					1000	12NES1000T		TA1000NB1	
					1200	12NES1200T		TA1200NB1	
<b>3-Pole</b>									
1200	ND312T33W	ND312T32W	ND312T35W	ND312T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1	
					700	12NES700T		TA700NB1	
					800	12NES800T		TA1000NB1	
					900	12NES900T		TA1000NB1	
					1000	12NES1000T		TA1000NB1	
					1200	12NES1200T		TA1200NB1	
<b>4-Pole ②</b>									
1200	ND412T33W	ND412T32W	-	-	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1	
					700	12NES700T		TA700NB1	
					800	12NES800T		TA1000NB1	
					900	12NES900T		TA1000NB1	
					1000	12NES1000T		TA1000NB1	
					1200	12NES1200T		TA1200NB1	

Instruction Leaflet Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

③ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie. ND3800T33SW.

## Type HND Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

Digitrip RMS 310 Circuit Breaker Frame Only ③					Digitrip RMS 310 Rating Plug Only			
High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac					Adjustable Rating Plug			
L - Adjustable Long Delay Pickup (by Adjustable Rating Plug) S - Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response) I - Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G - Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response)								
Maximum Continuous Ampere Rating @ 40°C	Standard		Options		Ampere Rating	Fixed Rating Plugs	Adjustable Ampere Ratings Catalogue Number	Standard Terminals Only ①
	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection				
Catalogue Number								
<b>2-Pole</b>								
800	HND2800T33W	HND2800T32W	HND2800T35W	HND2800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1
					450	8NES450T		TA700NB1
					500	8NES500T		TA700NB1
					600	8NES600T		TA700NB1
					700	8NES700T		TA700NB1
					800	8NES800T		TA1000NB1
<b>3-Pole</b>								
800	HND3800T33W	HND3800T32W	HND3800T35W	HND3800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1
					450	8NES450T		TA700NB1
					500	8NES500T		TA700NB1
					600	8NES600T		TA700NB1
					700	8NES700T		TA700NB1
					800	8NES800T		TA1000NB1
<b>4-Pole ②</b>								
800	HND4800T33W	HND4800T32W	-	-	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1
					450	8NES450T		TA700NB1
					500	8NES500T		TA700NB1
					600	8NES600T		TA700NB1
					700	8NES700T		TA700NB1
					800	8NES800T		TA1000NB1
<b>2-Pole</b>								
1200	HND212T33W	HND212T32W	HND212T35W	HND212T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1
					700	12NES700T		TA700NB1
					800	12NES800T		TA1000NB1
					900	12NES900T		TA1000NB1
					1000	12NES1000T		TA1000NB1
					1200	12NES1200T		TA1200NB1
<b>3-Pole</b>								
1200	HND312T33W	HND312T32W	HND312T35W	HND312T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1
					700	12NES700T		TA700NB1
					800	12NES800T		TA1000NB1
					900	12NES900T		TA1000NB1
					1000	12NES1000T		TA1000NB1
					1200	12NES1200T		TA1200NB1
<b>4-Pole ②</b>								
1200	HND412T33W	HND412T32W	-	-	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1
					700	12NES700T		TA700NB1
					800	12NES800T		TA1000NB1
					900	12NES900T		TA1000NB1
					1000	12NES1000T		TA1000NB1
					1200	12NES1200T		TA1200NB1

Instruction Leaflet Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

③ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie. HND3800T33SW.

### Type NDC Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

		Digitrip RMS 310 Circuit Breaker Frame Only <sup>③</sup>				Digitrip RMS 310 Rating Plug Only			
		Ultra High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac				Adjustable Rating Plug			
		L - Adjustable Long Delay Pickup (by Adjustable Rating Plug) S - Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response) I - Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G - Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response)							
Maximum Continuous Ampere Rating @ 40°C	Standard	Options			Ampere Rating	Fixed Rating Plugs	Adjustable Ampere Ratings Catalogue Number	Standard Terminals Only <sup>①</sup>  See Section Page Number N-12 for Optional Terminals	
	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection					Catalogue Number
<b>2-Pole</b>									
800	NDC2800T33W	NDC2800T32W	NDC2800T35W	NDC2800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 <b>A8NES800T1</b>	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1	
					450	8NES450T			
					500	8NES500T			
					600	8NES600T			
					700	8NES700T			
					800	8NES800T			
<b>3-Pole</b>									
800	NDC3800T33W	NDC3800T32W	NDC3800T35W	NDC3800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 <b>A8NES800T1</b>	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1	
					450	8NES450T			
					500	8NES500T			
					600	8NES600T			
					700	8NES700T			
					800	8NES800T			
<b>4-Pole <sup>②</sup></b>									
800	NDC4800T33W	NDC4800T32W	-	-	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 <b>A8NES800T1</b>	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1	
					450	8NES450T			
					500	8NES500T			
					600	8NES600T			
					700	8NES700T			
					800	8NES800T			
<b>2-Pole</b>									
1200	NDC212T33W	NDC212T32W	NDC212T35W	NDC212T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 <b>A12NES1200T1</b>	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1	
					700	12NES700T			
					800	12NES800T			
					900	12NES900T			
					1000	12NES1000T			
					1200	12NES1200T			
<b>3-Pole</b>									
1200	NDC312T33W	NDC312T32W	NDC312T35W	NDC312T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 <b>A12NES1200T1</b>	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1	
					700	12NES700T			
					800	12NES800T			
					900	12NES900T			
					1000	12NES1000T			
					1200	12NES1200T			
<b>4-Pole <sup>②</sup></b>									
1200	NDC412T33W	NDC412T32W	-	-	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 <b>A12NES1200T1</b>	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1	
					700	12NES700T			
					800	12NES800T			
					900	12NES900T			
					1000	12NES1000T			
					1200	12NES1200T			

Instruction Leaflet Number 29C106

<sup>①</sup> Two terminals are required per pole.

<sup>②</sup> Neutral is in right pole.

<sup>③</sup> When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie: NDC312T36SW.

## 100% Rated Type CND Electronic Circuit Breakers with Non-Interchangeable Trip Units

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

Maximum Continuous Ampere Rating @ 40°C	Digitrip RMS 310 Circuit Breaker Frame Only ③				Digitrip RMS 310 Rating Plug Only			
	Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac				Adjustable Rating Plug			
	L - Adjustable Long Delay Pickup (by Adjustable Rating Plug) S - Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response) I - Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G - Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response)							
	Standard	Options						Standard Terminals Only ①
Catalogue Number	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection	Ampere Rating	Fixed Rating Plugs	Adjustable Ampere Ratings Catalogue Number	See Section Page Number N-12 for Optional Terminals
<b>2-Pole</b>								
800	CND2800T33W	CND2800T32W	CND2800T35W	CND2800T36W	400 450 500 600 700 800	8NES400T 8NES450T 8NES500T 8NES600T 8NES700T 8NES800T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1
<b>3-Pole</b>								
800	CND3800T33W	CND3800T32W	CND3800T35W	CND3800T36W	400 450 500 600 700 800	8NES400T 8NES450T 8NES500T 8NES600T 8NES700T 8NES800T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1
<b>4-Pole ②</b>								
800	CND4800T33W	CND4800T32W	-	-	400 450 500 600 700 800	8NES400T 8NES450T 8NES500T 8NES600T 8NES700T 8NES800T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA700NB1 TA1000NB1
<b>2-Pole</b>								
1200	CND212T33W	CND212T32W	CND212T35W	CND212T36W	600 700 800 900 1000 1200	12NES600T 12NES700T 12NES800T 12NES900T 12NES1000T 12NES1200T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1
<b>3-Pole</b>								
1200	CND312T33W	CND312T32W	CND312T35W	CND312T36W	600 700 800 900 1000 1200	12NES600T 12NES700T 12NES800T 12NES900T 12NES1000T 12NES1200T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1
<b>4-Pole ②</b>								
1200	CND412T33W	CND412T32W	-	-	600 700 800 900 1000 1200	12NES600T 12NES700T 12NES800T 12NES900T 12NES1000T 12NES1200T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1 TA700NB1 TA1000NB1 TA1000NB1 TA1000NB1 TA1200NB1

Instruction Leaflet Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

③ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie. CND3800T33SW.

### 100% Rated Type CHND Electronic Circuit Breakers with Non-Interchangeable Trip Units

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

Digitrip RMS 310 Circuit Breaker Frame Only ③					Digitrip RMS 310 Rating Plug Only			
High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac					Adjustable Rating Plug			
L - Adjustable Long Delay Pickup (by Adjustable Rating Plug) S - Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response) I - Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G - Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response)								
Standard		Options						
Maximum Continuous Ampere Rating @ 40°C	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection	Ampere Rating	Fixed Rating Plugs	Adjustable Ampere Ratings Catalogue Number	Standard Terminal Only ①
	Catalogue Number							
<b>2-Pole</b>								
800	CHND2800T33W	CHND2800T32W	CHND2800T35W	CHND2800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1
					450	8NES450T		TA700NB1
					500	8NES500T		TA700NB1
					600	8NES600T		TA700NB1
					700	8NES700T		TA700NB1
					800	8NES800T		TA1000NB1
<b>3-Pole</b>								
800	CHND3800T33W	CHND3800T32W	CHND3800T35W	CHND3800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1
					450	8NES450T		TA700NB1
					500	8NES500T		TA700NB1
					600	8NES600T		TA700NB1
					700	8NES700T		TA700NB1
					800	8NES800T		TA1000NB1
<b>4-Pole ②</b>								
800	CHND4800T33W	CHND4800T32W	-	-	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1
					450	8NES450T		TA700NB1
					500	8NES500T		TA700NB1
					600	8NES600T		TA700NB1
					700	8NES700T		TA700NB1
					800	8NES800T		TA1000NB1
<b>2-Pole</b>								
1200	CHND212T33W	CHND212T32W	CHND212T35W	CHND212T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1
					700	12NES700T		TA700NB1
					800	12NES800T		TA1000NB1
					900	12NES900T		TA1000NB1
					1000	12NES1000T		TA1000NB1
					1200	12NES1200T		TA1200NB1
<b>3-Pole</b>								
1200	CHND312T33W	CHND312T32W	CHND312T35W	CHND312T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1
					700	12NES700T		TA700NB1
					800	12NES800T		TA1000NB1
					900	12NES900T		TA1000NB1
					1000	12NES1000T		TA1000NB1
					1200	12NES1200T		TA1200NB1
<b>4-Pole ②</b>								
1200	CHND412T33W	CHND412T32W	-	-	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1
					700	12NES700T		TA700NB1
					800	12NES800T		TA1000NB1
					900	12NES900T		TA1000NB1
					1000	12NES1000T		TA1000NB1
					1200	12NES1200T		TA1200NB1

Instruction Leaflet Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

③ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie. CHND3800T33SW.

## 100% Rated Type CNDC Electronic Circuit Breakers with Non-Interchangeable Trip Units

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

		Digitrip RMS 310 Circuit Breaker Frame Only <sup>③</sup>				Digitrip RMS 310 Rating Plug Only			
		Ultra High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac				Adjustable Rating Plug			
		L - Adjustable Long Delay Pickup (by Adjustable Rating Plug) S - Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response) I - Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G - Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response)							
		Standard		Options					
Maximum Continuous Ampere Rating @ 40°C	Catalogue Number	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response)	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response)	Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) and Ground Fault Protection	Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) and Ground Fault Protection	Ampere Rating	Fixed Rating Plugs	Adjustable Ampere Ratings Catalogue Number	Standard Terminals Only <sup>①</sup> See Section Page Number N-12 for Optional Terminals
		<b>2-Pole</b>							
800	CNDC2800T33W	CNDC2800T32W	CNDC2800T35W	CNDC2800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1	TA700NB1
					450	8NES450T			
					500	8NES500T			
					600	8NES600T			
					700	8NES700T			
					800	8NES800T			
<b>3-Pole</b>									
800	CNDC3800T33W	CNDC3800T32W	CNDC3800T35W	CNDC3800T36W	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1	TA700NB1
					450	8NES450T			
					500	8NES500T			
					600	8NES600T			
					700	8NES700T			
					800	8NES800T			
<b>4-Pole <sup>②</sup></b>									
800	CNDC4800T33W	CNDC4800T32W	-	-	400	8NES400T	Adjustable Settings are: 400, 500, 600, 800 A8NES800T1	TA700NB1	TA700NB1
					450	8NES450T			
					500	8NES500T			
					600	8NES600T			
					700	8NES700T			
					800	8NES800T			
<b>2-Pole</b>									
1200	CNDC212T33W	CNDC212T32W	CNDC212T35W	CNDC212T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1	TA700NB1
					700	12NES700T			
					800	12NES800T			
					900	12NES900T			
					1000	12NES1000T			
					1200	12NES1200T			
<b>3-Pole</b>									
1200	CNDC312T33W	CNDC312T32W	CNDC312T35W	CNDC312T36W	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1	TA700NB1
					700	12NES700T			
					800	12NES800T			
					900	12NES900T			
					1000	12NES1000T			
					1200	12NES1200T			
<b>4-Pole <sup>②</sup></b>									
1200	CNDC412T33W	CNDC412T32W	-	-	600	12NES600T	Adjustable Settings are: 600, 800, 1000, 1200 A12NES1200T1	TA700NB1	TA700NB1
					700	12NES700T			
					800	12NES800T			
					900	12NES900T			
					1000	12NES1000T			
					1200	12NES1200T			

Instruction Leaflet Number 29C106

<sup>①</sup> Two terminals are required per pole.

<sup>②</sup> Neutral is in right pole.

<sup>③</sup> When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number. ie: CNDC312T33S.W.



### Digitrip OPTIM Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only					Digitrip OPTIM Rating Plug Only	
	L- Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response) ① S- Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response) I- Adjustable Instantaneous Pickup G- Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) A- Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)					Ampere Rating	Fixed Rating Plug
	OPTIM 550 ②	OPTIM 550 ②	OPTIM 550 ②	OPTIM 1050 ③④	OPTIM 1050 ③④		
LSI	LSIG	LSIA	LSIG	LSIA			
	Catalogue Number						
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac</b>							
800	ND3800T52W	ND3800T56W	ND3800T57W	ND3800T106W	ND3800T107W	400	ORPN80A400
						450	ORPN80A450
						500	ORPN80A500
						550	ORPN80A550
						600	ORPN80A600
						700	ORPN80A700
800	ORPN80A800						
1200	ND312T52W	ND312T56W	ND312T57W	ND312T106W	ND312T107W	600	ORPN12A600
						700	ORPN12A700
						800	ORPN12A800
						1000	ORPN12A100
						1200	ORPN12A120
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac</b>							
800	HND3800T52W	HND3800T56W	HND3800T57W	HND3800T106W	HND3800T107W	400	ORPN80A400
						450	ORPN80A450
						500	ORPN80A500
						550	ORPN80A550
						600	ORPN80A600
						700	ORPN80A700
800	ORPN80A800						
1200	HND312T52W	HND312T56W	HND312T57W	HND312T106W	HND312T107W	600	ORPN12A600
						700	ORPN12A700
						800	ORPN12A800
						1000	ORPN12A100
						1200	ORPN12A120
<b>3-Pole Ultra High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>							
800	NDC3800T52W	NDC3800T56W	NDC3800T57W	NDC3800T106W	NDC3800T107W	400	ORPN80A400
						450	ORPN80A450
						500	ORPN80A500
						550	ORPN80A550
						600	ORPN80A600
						700	ORPN80A700
800	ORPN80A800						
1200	NDC312T52W	NDC312T56W	NDC312T57W	NDC312T106W	NDC312T107W	600	ORPN12A600
						700	ORPN12A700
						800	ORPN12A800
						1000	ORPN12A100
						1200	ORPN12A120

Instruction Leaflet Number 29C106 for Breaker; 29C891 for OPTIM Trip

① Long delay  $I^4t$  response selection limits short delay time to flat response.

② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes ZG, PN or ZGP respectively to above Catalogue Number. (A factory assembly charge will be applied, please refer to the Breaker Accessories/Modifications section in the Eaton MCCB Price List for details)

③ Factory sealed.

④ 1 Form C auxiliary switch and 1 Form C bell (trip) alarm switch supplied with breaker as standard on model 1050.

Circuit Breaker Frame Only						Digitrip OPTIM Rating Plug Only	
L- Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response) ① S- Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response) I- Adjustable Instantaneous Pickup G- Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) A- Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)							
Maximum Continuous Ampere Rating @ 40°C	OPTIM 550 ②	OPTIM 550 ②	OPTIM 550 ②	OPTIM 1050 ③④	OPTIM 1050 ③④	Ampere Rating	Fixed Rating Plug
	LSI	LSIG	LSIA	LSIG	LSIA		
Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 25 kAIC @ 600 Vac</b>							
800	CND3800T52W	CND3800T56W	CND3800T57W	CND3800T106W	CND3800T107W	400	ORPN80A400
						450	ORPN80A450
						500	ORPN80A500
						550	ORPN80A550
						600	ORPN80A600
						700	ORPN80A700
1200	CND312T52W	CND312T56W	CND312T57W	CND312T106W	CND312T107W	600	ORPN12A600
						700	ORPN12A700
						800	ORPN12A800
						1000	ORPN12A100
						1200	ORPN12A120
						<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 600 Vac</b>	
800	CHND3800T52W	CHND3800T56W	CHND3800T57W	CHND3800T106W	CHND3800T107W	400	ORPN80A400
						450	ORPN80A450
						500	ORPN80A500
						550	ORPN80A550
						600	ORPN80A600
						700	ORPN80A700
1200	CHND312T52W	CHND312T56W	CHND312T57W	CHND312T106W	CHND312T107W	600	ORPN12A600
						700	ORPN12A700
						800	ORPN12A800
						1000	ORPN12A100
						1200	ORPN12A120
						<b>3-Pole Ultra High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>	
800	CNDC3800T52W	CNDC3800T56W	CNDC3800T57W	CNDC3800T106W	CNDC3800T107W	400	ORPN80A400
						450	ORPN80A450
						500	ORPN80A500
						550	ORPN80A550
						600	ORPN80A600
						700	ORPN80A700
1200	CNDC312T52W	CNDC312T56W	CNDC312T57W	CNDC312T106W	CNDC312T107W	600	ORPN12A600
						700	ORPN12A700
						800	ORPN12A800
						1000	ORPN12A100
						1200	ORPN12A120

Instruction Leaflet Number 29C106 for Breaker; 29C891 for OPTIM Trip

① Long delay  $I^4t$  response selection limits short delay time to flat response.

② Zone Interlocking, PowerNet, or both features can be added at the factory by adding Suffixes ZG, PN or ZGP respectively to above Catalogue Number. (A factory assembly charge will be applied, please refer to the Breaker Accessories/Modifications section in the Eaton MCCB Price List for details)

③ Factory sealed.

④ 1 Form C auxiliary switch and 1 Form C bell (trip) alarm switch supplied with breaker as standard on model 1050.

# N-12

## Series C Moulded Case Circuit Breakers

400-1200 Amperes N-Frame

### Type ND Moulded Case Switches ①

Moulded case switches are used as compact switches in applications requiring high current switching capabilities. Moulded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Moulded case switches are listed in accordance with CSA C22.2 No. 5 and Underwriters Laboratories, Inc., Standard UL 489 suitable for reverse feed use and as 100% rated devices.

Continuous Ampere Rating @ 40°C	Catalogue Number				Moulded Case Switch Type	Number of Poles	Unfused Short Circuit Withstand Rating (Symmetrical Amperes) (kA)			
	3-Pole	4-Pole ②	3-Pole	4-Pole ②			Volts Ac (50/60 Hz)		Volts Dc	
	Moulded Case Switch Only without Line & Load Terminals						240	480	600	250
	Standard Unfused S.C. Withstand Capacity		High Unfused S.C. Withstand Capacity							
800	ND3800WK	ND4800WK	HND3800WK	HND4800WK	ND	3,4	65	50	25	-
1200	ND312WK	ND412WK	HND312WK	-	HND	3,4	100	65	35	-

Moulded case switch may trip above 14,000 amperes.

Instruction Leaflet Number 29C106

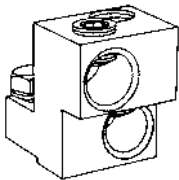
### Line and Load Terminals

#### Ordering Information

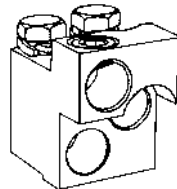
N-frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalogue number. Specify if factory installation is required.

Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/No. Conductors	Metric Wire Range mm <sup>2</sup>	Catalogue Number
<b>Standard Cu/Al Pressure Terminals</b>					
700	Aluminum	Cu/Al	(2) 1-500 kcmil	50-300	TA700NB1
1000	Aluminum	Cu/Al	(3) 3/0-400 kcmil	95-185	TA1000NB1 ③
1200	Aluminum	Cu/Al	(4) 4/0-500 kcmil	120-300	TA1200NB1 ③
1200	Aluminum	Cu/Al	(3) 500-750 kcmil	300-400	TA1201NB1
<b>Optional Copper and Cu/Al Pressure Type Terminals</b>					
700	Copper	Cu	(2) 2/0-500 kcmil	70-300	T700NB1
1000	Copper	Cu	(3) 3/0-500 kcmil	95-300	T1000NB1
1200	Copper	Cu	(4) 3/0-400 kcmil	95-185	T1200NB3

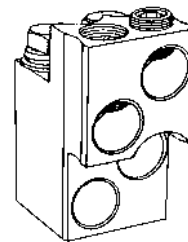
TA700NB1



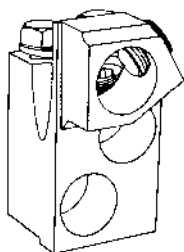
TA1000NB1



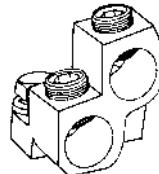
TA1200NB1



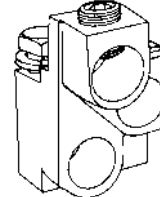
TA1201NB1



T700NB1



T1000NB1



① When a "VISA" type Moulded Case Switch is required, change the suffix of the MCS catalogue number from "WK" to "SKW". ie. ND312SKW

② Neutral is in right pole.

③ Terminal is marked with AL9CU to indicate the 90°C temperature rating.

## Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

Description	Reference Page	3-Pole			4-Pole			
		Left	Centre	Right	Left	Centre	Right	Neu.
<b>Internal Accessories (Only One Internal Accessory Per Pole) ①</b>								
Alarm Lockout (Make/Break)	INTA-4	■		■	■		■	
Alarm Lockout (2Make/2Break)	INTA-4	■		■	■		■	
Auxiliary Switch (1A, 1B)	INTA-7	■		■	■		■	
Auxiliary Switch (2A, 2B)	INTA-7	■		■	■		■	
Auxiliary Switch (3A, 3B)	INTA-7	■		■	■		■	
Auxiliary Switch (1A 1B) and Alarm Switch Combination	INTA-9	■		■	■		■	
Auxiliary Switch (2A 2B) and Alarm Switch Combination	INTA-9	■		■	■		■	
Shunt Trip – Standard	INTA-13	■			■			
Shunt Trip – Low Energy	INTA-15	■			■			
Undervoltage Release Mechanism	INTA-21	■			■			
Eaton PowerNet and Zone Interlock Kit (OPTIM 550)	INTA-23			■				
<b>External Accessories</b>								
Base Mounting Hardware	EXTA-5	●			●			
Interphase Barriers	EXTA-8	●			●			
Non-Padlockable Handle Block	EXTA-10		■			■		
Padlockable Handle Lock Hasp	EXTA-11	□		□	□		□	
Key Interlock Kit	EXTA-12	□		□	□		□	
Sliding Bar Interlock – Requires Two Breakers	EXTA-13	●	●	●				
Walking Beam Interlock – Requires Two Breakers	EXTA-13	●	●	●	●	●	●	●
Electrical (Motor) Operator	EXTA-15	●	●	●	●	●	●	●
Plug-in Adapters	EXTA-16	●	●	●	●	●	●	●
Rear Connecting Studs	EXTA-19	●	●	●	●	●	●	●
Panelboard Connecting Straps	EXTA-20	●	●	●	●	●	●	●
Handle Mechanisms	EXTA-21	●	●	●	●	●	●	●
Handle Extension	EXTA-27	●	●	●	●	●	●	●
Solid-State (Electronic) Portable Test Kit	EXTA-28	●	●	●	●	●	●	●
Ground Fault Alarm Unit	EXTA-28							
<b>OPTIM System Components 3-Poles</b>								
Breaker Interface Module (BIM)	EXTA-29							
Digitrip OPTIMizer	EXTA-29							
Auxiliary Power Module	EXTA-29							
Potential Transformer Module	EXTA-30							
Modifications (Refer to Eaton)								
<b>Special Calibration</b>	1.2	●	●	●	●	●	●	●
Moisture Fungus Treatment	1.2	●	●	●	●	●	●	●
Freeze-Tested Circuit Breakers	1.2	●	●	●	●	●	●	●
Marine Application	1.2	●	●	●	●	●	●	●
<b>■</b> Applicable in indicated pole position		<b>□</b> May be mounted on left or right pole – not both			<b>●</b> Accessory available/Modification available			

① OPTIM 1050 is factory sealed and does not have the right pole available for accessories.

### R - Frame Circuit Breaker



### Product Description

- R-frame circuit breakers are available as frame (which includes trip unit), rating plug and terminals.
- All R-frame circuit breakers are suitable for reverse feed use.

### Technical Data and Specifications <sup>③</sup>

#### CSA C22.2 No. 5 and UL489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)				Circuit Breaker Type	Page Numbers					
		Volts Ac (50/60 Hz)					Trip Unit Types <sup>①</sup>					
		240	277	480	600		310	510	610	810	910	OPTIM 1050
RD	3, 4	125	—	65	50	RD	R-4	R-7	R-9	R-11	R-13	R-15
CRD <sup>②</sup>	3, 4	125	—	65	50	CRD	R-6	R-8	R-10	R-12	R-14	R-16
RDC	3, 4	200	—	100	65	RDC	R-5	R-7	R-9	R-11	R-13	R-15
CRDC <sup>②</sup>	3, 4	200	—	100	65	CRDC	R-6	R-8	R-10	R-12	R-14	R-16

#### IEC 947-2 Interrupting Capacity Ratings <sup>③</sup>

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)			Circuit Breaker Type	Page Numbers					
		Volts Ac (50/60 Hz)				Trip Unit Types <sup>①</sup>					
		240	415	690		310	510	610	810	910	OPTIM 1050
RD	3, 4				RD	R-4	R-7	R-9	R-11	R-13	R-15
<i>I<sub>cu</sub></i>		135	70	25							
<i>I<sub>cs</sub></i>		100	50	13							
RDC	3, 4				RDC	R-5	R-7	R-9	R-11	R-13	R-15
<i>I<sub>cu</sub></i>		200	100	35							
<i>I<sub>cs</sub></i>		100	50	18							

<sup>①</sup> See page R-2 for Trip Unit Specifications.

<sup>②</sup> 100% Rated breakers.

<sup>③</sup> Utilization Category A circuit breakers.

## R-Frame Digitrip Specifications

Trip Unit Type	Digitrip RMS 310		Digitrip RMS 510	Digitrip RMS 610	Digitrip RMS 810	Digitrip RMS 910	Digitrip OPTIM 1050
RMS Sensing	Yes		Yes	Yes	Yes	Yes	Yes
<b>Breaker Type</b>							
Frame	R		R	R	R	R	R
Ampere Range	800A-2500A		800A-2500A	800A-2500A	800A-2500A	800A-2500A	800A-2500A
Interrupting Rating @ 600Vac	50, 65 (kA)		50, 65 (kA)	50, 65 (kA)	50, 65 (kA)	50, 65 (kA)	50, 65 (kA)
<b>Protection</b>							
Ordering Options	LS, LSG	LSI, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LI, LS, LSI, LIG, LSG, LSIG	LSI(A), LISG
Fixed Rated Plug ( $I_n$ )	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Long Delay Protection (L)							
Adjustable Rating Plug ( $I_n$ )	Yes	Yes	No	No	No	No	No
Long Delay Pickup	0.5-1.0 ( $I_n$ ) <sup>①</sup>	0.5-1.0 ( $I_n$ ) <sup>①</sup>	0.5-1.0 x ( $I_n$ )	0.5-1.0 x ( $I_n$ )	0.5-1.0 x ( $I_n$ )	0.5-1.0 x ( $I_n$ )	0.4-1.0 x ( $I_n$ )
Long Delay Time $I^2t$	12 Seconds	12 Seconds	2-24 Seconds	2-24 Seconds	2-24 Seconds	2-24 Seconds	2-24 Seconds
Long Delay Time $I^4t$	No	No	No	No	No	No	1-5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes	Yes	Yes	Yes
High Load Alarm	No	No	No	0.85 x $I_r$	0.85 x $I_r$	0.85 x $I_r$	0.5-1.0 x $I_r$
<b>Short Delay Protection (S)</b>							
Short Delay Pickup	200-800% x ( $I_n$ ) <sup>②</sup>	200-800% x ( $I_n$ ) <sup>②</sup>	200-600% S1&S2 x ( $I_r$ )	200-600% S1&S2 x ( $I_r$ )	200-600% S1&S2 x ( $I_r$ )	200-600% S1&S2 x ( $I_r$ )	150-800% x ( $I_r$ ) <sup>③</sup>
Short Delay Time $I^2t$	100 ms	No	100-500 ms	100-500 ms	100-500 ms	100-500 ms	100-500 ms
Short Delay Time Flat	No	Inst-300 ms	100-500 ms	100-500 ms	100-500 ms	100-500 ms	100-500 ms
Short Delay Time Zone Selective Interlocking	No	No	Yes	Yes	Yes	Yes	Yes
<b>Instantaneous Protection (I)</b>							
Instantaneous Pick Up	No	200-800% x ( $I_n$ )	200-600% M1&M2 x ( $I_n$ )	200-600% M1&M2 x ( $I_n$ )	200-600% M1&M2 x ( $I_n$ )	200-600% M1&M2 x ( $I_n$ )	200-800% x ( $I_n$ ) <sup>③</sup>
Discriminator	No	No	Yes <sup>④</sup>	Yes <sup>④</sup>	Yes <sup>④</sup>	Yes <sup>④</sup>	Yes
Instantaneous Override	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ground Fault Protection (G)</b>							
Ground Fault Alarm <sup>⑤</sup>	No	No	No	No	No	No	25-100% x ( $I_n$ )
Ground Fault Pick Up <sup>⑤</sup>	Varies by Frame	Varies by Frame	25-100% x ( $I_g$ )	25-100% x ( $I_g$ )	25-100% x ( $I_g$ )	25-100% x ( $I_g$ )	25-100% x ( $I_n$ )
Ground Fault Delay $I^2t$	No	No	100-500 ms	100-500 ms	100-500 ms	100-500 ms	100-500 ms
Ground Fault Delay Flat	Inst-500 ms	Inst-500 ms	100-500 ms	100-500 ms	100-500 ms	100-500 ms	100-500 ms
Ground Fault Zone Selective Interlocking	No	No	Yes	Yes	Yes	Yes	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>System Diagnostics</b>							
Status LEDs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes	Yes	Yes	Yes
Magnitude of Trip Information	No	No	No	Yes	Yes	Yes	Yes
Remote Signal Contacts	Yes <sup>⑦</sup>	Yes <sup>⑦</sup>	No	Yes	Yes	Yes	Yes
<b>System Monitoring</b>							
Digital Display	No	No	No	Yes	Yes	Yes	Yes <sup>⑥</sup>
Current	No	No	No	Yes	Yes	Yes	Yes
Voltage	No	No	No	No	No	Yes	No
Power and Energy	No	No	No	No	Yes	Yes	Yes
Power Quality-Harmonics	No	No	No	No	No	Yes	Yes
Power Factor	No	No	No	No	Yes (Over Eaton PowerNet Only)	Yes	Yes
<b>Communications</b>							
Eaton PowerNet	No	No	No	No	Yes	Yes	Yes
<b>Testing</b>							
Testing Method	Test Set		Integral	Integral	Integral	Integral	OPTIMizer, BIM, Eaton PowerNet

① Adjust by rating plug.

② Except 2500 ampere frame is 200-600%.

③ Varies by frame.

④ LS/LSG only.

⑤ Not to exceed 1200 amperes.

⑥ By OPTIMizer/BIM.

⑦ Optional. Add suffix "R" to Catalogue Number.

BIM = Breaker Interface Module

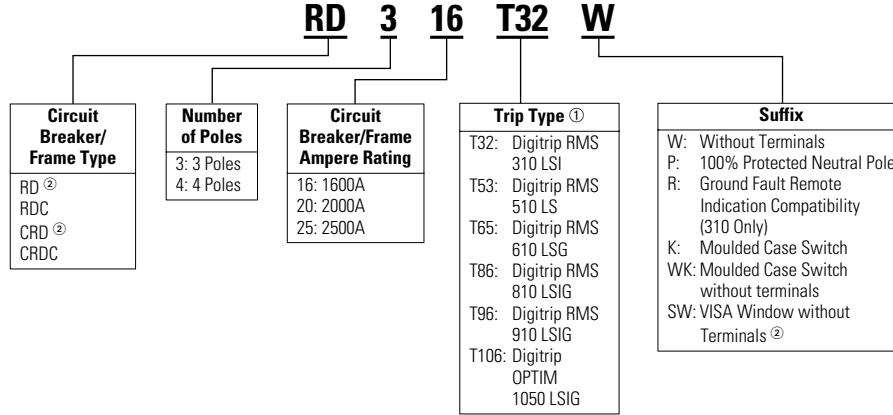
(A) = GF Alarm

 $I_g$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting x  $I_n$

### Catalogue Numbering System

This information is presented only as an aid to understanding catalogue numbers. It is not to be used to build catalogue numbers for circuit breakers or trip units.

#### Circuit Breaker/Frame Catalogue Number



### Dimensions/Weights

Number of Poles	Width	Height	Depth
3	15.5 (394)	16 (406)	9.75 (248)
4	20 (508)	16 (406)	9.75 (248)

Breaker Type	Complete Breaker	
	Number of Poles	
	3	4
<b>1600A</b>		
RD, CRD, RDC, CRDC	102 (46.266)	135 (61.235)
<b>2000A</b>		
RD, RDC	102 (46.266)	135 (61.235)
CRD, CRDC	130 (58.967)	175 (79.378)
<b>2500A</b>		
RD, RDC	135 (61.235)	182 (82.553)

<sup>①</sup> For complete list of available trip types refer to pages R-4 through R-16.

<sup>②</sup> "VISA" option is available. CSA listed only.

## Product Selection

### Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ④				Digitrip RMS 310 Rating Plug Only		
	L-Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) for LS and LSG trip unit Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) for LSI and LSIG trip unit I-Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G-Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response)				Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug
	LS	LSI	LSG ③	LSIG ③			Adjustable Ampere Ratings Catalogue Number
	Catalogue Number						
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>							
1600①	RD316T33W	RD316T32W	RD316T35W	RD316T36W	800	16RES08T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
					1000	16RES10T	
					1200	16RES12T	
					1250	16RES125T	
					1400	16RES14T	
					1500	16RES15T	
1600	16RES16T						
2000	RD320T33W	RD320T32W	RD320T35W	RD320T36W	1000	20RES10T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
					1200	20RES12T	
					1250	20RES125T	
					1400	20RES14T	
					1600	20RES16T	
					2000	20RES20T	
2500	RD325T33W	RD325T32W	RD325T35W	RD325T36W	1200	25RES12T	Adjustable Settings are: 1200, 1600, 2000, 2500 <b>A25RES25T1</b>
					1250	25RES125T	
					1600	25RES16T	
					2000	25RES20T	
					2500	25RES25T	
<b>4-Pole ② Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>							
1600 ①	RD416T33W	RD416T32W	–	–	800	16RES08T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
					1000	16RES10T	
					1200	16RES12T	
					1250	16RES125T	
					1400	16RES14T	
					1500	16RES15T	
1600	16RES16T						
2000	RD420T33W	RD420T32W	–	–	1000	20RES10T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
					1200	20RES12T	
					1250	20RES125T	
					1400	20RES14T	
					1600	20RES16T	
					2000	20RES20T	
2500	RD425T33W	RD425T32W	–	–	1200	25RES12T	Adjustable Settings are: 1200, 1600, 2000, 2500 <b>A25RES25T1</b>
					1250	25RES125T	
					1600	25RES16T	
					2000	25RES20T	
					2500	25RES25T	

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

① For SCR application use 2000 ampere frame.

② Unprotected right pole neutral. Add "P" to catalogue number for 100% protected right pole neutral, i.e., "RD416T33PW".

③ Add suffix "R" to breaker catalogue number for ground fault remote indication compatibility, i.e., RD316T35RW

④ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. i.e. RD316T33SW



### Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only				Digitrip RMS 310 Rating Plug Only		
	L – Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) for LS and LSG trip unit Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) for LSI and LSI <sup>2</sup> trip unit I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response)				Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug
	LS	LSI	LSG ③	LSIG ③			Adjustable Ampere Ratings Catalogue Number
	Catalogue Number						
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>							
1600 ①	RDC316T33W	RDC316T32W	RDC316T35W	RDC316T36W	800	16RES08T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
					1000	16RES10T	
					1200	16RES12T	
					1250	16RES125T	
					1400	16RES14T	
					1500	16RES15T	
1600	16RES16T						
2000	RDC320T33W	RDC320T32W	RDC320T35W	RDC320T36W	1000	20RES10T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
					1200	20RES12T	
					1250	20RES125T	
					1400	20RES14T	
					1600	20RES16T	
					2000	20RES20T	
2500	RDC325T33W	RDC325T32W	RDC325T35W	RDC325T36W	1200	25RES12T	Adjustable Settings are: 1200, 1600, 2000, 2500 <b>A25RES25T1</b>
					1250	25RES125T	
					1600	25RES16T	
					2000	25RES20T	
					2500	25RES25T	
<b>4-Pole ② High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>							
1600 ①	RDC416T33W	RDC416T32W	–	–	800	16RES08T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
					1000	16RES10T	
					1200	16RES12T	
					1250	16RES125T	
					1400	16RES14T	
					1500	16RES15T	
1600	16RES16T						
2000	RDC420T33W	RDC420T32W	–	–	1000	20RES10T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
					1200	20RES12T	
					1250	20RES125T	
					1400	20RES14T	
					1600	20RES16T	
					2000	20RES20T	
2500	RDC425T33W	RDC425T32W	–	–	1200	25RES12T	Adjustable Settings are: 1200, 1600, 2000, 2500 <b>A25RES25T1</b>
					1250	25RES125T	
					1600	25RES16T	
					2000	25RES20T	
					2500	25RES25T	

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

① For SCR application use 2000 ampere frame.

② Unprotected right pole neutral. Add "P" to catalogue number for 100% protected right pole neutral, i.e., "RDC416T33PW".

③ Add suffix "R" to breaker catalogue number for ground fault remote indication compatibility, i.e., RD316T35RW

**100% Rated Digitrip RMS 310 Electronic Circuit Breakers** ①

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ④				Digitrip RMS 310 Rating Plug Only		
	L-Adjustable Long Delay Pickup (By Adjustable Rating Plug) S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) for LS and LSG trip unit Independently Adjustable Short Delay Pickup and Short Delay Time (Flat Response) for LSI and LSI <sup>G</sup> trip unit I-Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous G-Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response)				Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug
	LS	LSI	LSG ③	LSIG ③			Adjustable Ampere Ratings Catalogue Number
	Catalogue Number						
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>							
1600 ②	CRD316T33W	CRD316T32W	CRD316T35W	CRD316T36W	800	16RES08T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
					1000	16RES10T	
					1200	16RES12T	
					1250	16RES125T	
					1400	16RES14T	
					1500	16RES15T	
1600	16RES16T						
2000	CRD320T33W	CRD320T32W	CRD320T35W	CRD320T36W	1000	20RES10T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
					1200	20RES12T	
					1250	20RES125T	
					1400	20RES14T	
					1600	20RES16T	
					2000	20RES20T	
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>							
1600 ①②	CRDC316T33W	CRDC316T32W	CRDC316T35W	CRDC316T36W	800	16RES08T	Adjustable Settings are: 800, 1000, 1200, 1600 <b>A16RES16T1</b>
					1000	16RES10T	
					1200	16RES12T	
					1250	16RES125T	
					1400	16RES14T	
					1500	16RES15T	
1600	16RES16T						
2000	CRDC320T33W	CRDC320T32W	CRDC320T35W	CRDC320T36W	1000	20RES10T	Adjustable Settings are: 1000, 1200, 1600, 2000 <b>A20RES20T1</b>
					1200	20RES12T	
					1250	20RES125T	
					1400	20RES14T	
					1600	20RES16T	
					2000	20RES20T	

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

① Includes B2016RDL rear connections. Refer to TD.29.02.T.E for dimensions.

② For SCR application use 2000 ampere frame.

③ Add suffix "R" to breaker catalogue number for ground fault remote indication compatibility, i.e., RD316T35RW

④ When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. i.e. CRD316T33SW

### Digitrip RMS 510 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time						Fixed Rating Plug	
	S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)							
	I – Adjustable Instantaneous Pickup							
G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)								
	LI	LS	LSI	LIG	LSG	LSIG	Rated Current ( $I_n$ )	Catalogue Number
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	RD316T51W	RD316T53W	RD316T52W	RD316T54W	RD316T55W	RD316T56W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	RD320T51W	RD320T53W	RD320T52W	RD320T54W	RD320T55W	RD320T56W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
2500	RD325T51W	RD325T53W	RD325T52W	RD325T54W	RD325T55W	RD325T56W	1600	RP6R25A160
							2000	RP6R25A200
							2500	RP6R25A250
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>								
1600	RDC316T51W	RDC316T53W	RDC316T52W	RDC316T54W	RDC316T55W	RDC316T56W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	RDC320T51W	RDC320T53W	RDC320T52W	RDC320T54W	RDC320T55W	RDC320T56W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
2500	RDC325T51W	RDC325T53W	RDC325T52W	RDC325T54W	RDC325T55W	RDC325T56W	1600	RP6R25A160
							2000	RP6R25A200
							2500	RP6R25A250

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29C885 for Digitrip 510 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. RD325T51SW

**100% Rated Digitrip RMS 510 Circuit Breakers**

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_n$ ) with Adjustable Long Delay Time						Fixed Rating Plug	
	S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I_n^2$ or Flat Response)							
	I – Adjustable Instantaneous Pickup							
	G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I_n^2$ or Flat Response)						Rated Current ( $I_n$ )	Catalogue Number
	LI	LS	LSI	LIG	LSG	LSIG		
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	CRD316T51W	CRD316T53W	CRD316T52W	CRD316T54W	CRD316T55W	CRD316T56W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRD320T51W	CRD320T53W	CRD320T52W	CRD320T54W	CRD320T55W	CRD320T56W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>								
1600	CRDC316T51W	CRDC316T53W	CRDC316T52W	CRDC316T54W	CRDC316T55W	CRDC316T56W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRDC320T51W	CRDC320T53W	CRDC320T52W	CRDC320T54W	CRDC320T55W	CRDC320T56W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29885 for Digitrip 510 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. CRD316T55SW

### Digitrip RMS 610 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_t$ ) 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 Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)						Fixed Rating Plug	
	LI	LS	LSI	LIG	LSG	LSIG	Rated Current ( $I_n$ )	Catalogue Number
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	RD316T61W	RD316T63W	RD316T62W	RD316T64W	RD316T65W	RD316T66W	800 1000 1200 1600	RP6R16A080 RP6R16A100 RP6R16A120 RP6R16A160
	RD320T61W	RD320T63W	RD320T62W	RD320T64W	RD320T65W	RD320T66W	1000 1200 1600 2000	RP6R20A100 RP6R20A120 RP6R20A160 RP6R20A200
	RD325T61W	RD325T63W	RD325T62W	RD325T64W	RD325T65W	RD325T66W	1600 2000 2500	RP6R25A160 RP6R25A200 RP6R25A250
2000	RDC316T61W	RDC316T63W	RDC316T62W	RDC316T64W	RDC316T65W	RDC316T66W	800 1000 1200 1600	RP6R16A080 RP6R16A100 RP6R16A120 RP6R16A160
	RDC320T61W	RDC320T63W	RDC320T62W	RDC320T64W	RDC320T65W	RDC320T66W	1000 1200 1600 2000	RP6R20A100 RP6R20A120 RP6R20A160 RP6R20A200
	RDC325T61W	RDC325T63W	RDC325T62W	RDC325T64W	RDC325T65W	RDC325T66W	1600 2000 2500	RP6R25A160 RP6R25A200 RP6R25A250
2500								

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29886 for Digitrip 610 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. RD320T63SW

**100% Rated Digitrip RMS 610 Circuit Breakers**

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup (I <sub>n</sub> ) with Adjustable Long Delay Time S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response) I – Adjustable Instantaneous Pickup G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response)						Fixed Rating Plug	
	LI	LS	LSI	LIG	LSG	LSIG	Rated Current (I <sub>n</sub> )	Catalogue Number
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	CRD316T61W	CRD316T63W	CRD316T62W	CRD316T64W	CRD316T65W	CRD316T66W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRD320T61W	CRD320T63W	CRD320T62W	CRD320T64W	CRD320T65W	CRD320T66W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>								
1600	CRDC316T61W	CRDC316T63W	CRDC316T62W	CRDC316T64W	CRDC316T65W	CRDC316T66W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRDC320T61W	CRDC320T63W	CRDC320T62W	CRDC320T64W	CRDC320T65W	CRDC320T66W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29886 for Digitrip 610 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. CRD316T64SW

### Digitrip RMS 810 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_p$ ) 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 Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)						Fixed Rating Plug	
	LI	LS	LSI	LIG	LSG	LSIG	Rated Current ( $I_n$ )	Catalogue Number
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	RD316T81W	RD316T83W	RD316T82W	RD316T84W	RD316T85W	RD316T86W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	RD320T81W	RD320T83W	RD320T82W	RD320T84W	RD320T85W	RD320T86W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
2500	RD325T81W	RD325T83W	RD325T82W	RD325T84W	RD325T85W	RD325T86W	1600	RP6R25A160
							2000	RP6R25A200
							2500	RP6R25A250
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>								
1600	RDC316T81W	RDC316T83W	RDC316T82W	RDC316T84W	RDC316T85W	RDC316T86W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	RDC320T81W	RDC320T83W	RDC320T82W	RDC320T84W	RDC320T85W	RDC320T86W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
2500	RDC325T81W	RDC325T83W	RDC325T82W	RDC325T84W	RDC325T85W	RDC325T86W	1600	RP6R25A160
							2000	RP6R25A200
							2500	RP6R25A250

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29888 for Digitrip 810 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. RD316T86SW

**100% Rated Digitrip RMS 810 Circuit Breakers**

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup (I <sub>n</sub> ) with Adjustable Long Delay Time						Fixed Rating Plug	
	S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)							
	I – Adjustable Instantaneous Pickup							
	G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response)						Rated Current (I <sub>n</sub> )	Catalogue Number
	LI	LS	LSI	LIG	LSG	LSIG		
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	CRD316T81W	CRD316T83W	CRD316T82W	CRD316T84W	CRD316T85W	CRD316T86W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRD320T81W	CRD320T83W	CRD320T82W	CRD320T84W	CRD320T85W	CRD320T86W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>								
1600	CRDC316T81W	CRDC316T83W	CRDC316T82W	CRDC316T84W	CRDC316T85W	CRDC316T86W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRDC320T81W	CRDC320T83W	CRDC320T82W	CRDC320T84W	CRDC320T85W	CRDC320T86W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29888 for Digitrip 810 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. CRD320T81SW



### Digitrip RMS 910 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_t$ ) 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 Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)						Fixed Rating Plug	
	LI	LS	LSI	LIG	LSG	LSIG	Rated Current ( $I_n$ )	Catalogue Number
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	RD316T91W	RD316T93W	RD316T92W	RD316T94W	RD316T95W	RD316T96W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	RD320T91W	RD320T93W	RD320T92W	RD320T94W	RD320T95W	RD320T96W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
2500	RD325T91W	RD325T93W	RD325T92W	RD325T94W	RD325T95W	RD325T96W	1600	RP6R25A160
							2000	RP6R25A200
							2500	RP6R25A250
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>								
1600	RDC316T91W	RDC316T93W	RDC316T92W	RDC316T94W	RDC316T95W	RDC316T96W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	RDC320T91W	RDC320T93W	RDC320T92W	RDC320T94W	RDC320T95W	RDC320T96W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
2500	RDC325T91W	RDC325T93W	RDC325T92W	RDC325T94W	RDC325T95W	RDC325T96W	1600	RP6R25A160
							2000	RP6R25A200
							2500	RP6R25A250

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29889 for Digitrip 910 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. RD325T92SW

**100% Rated Digitrip RMS 910 Circuit Breakers**

The CEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only ①						Digitrip Rating Plug Only	
	L – Adjustable Long Delay Pickup (I <sub>n</sub> ) with Adjustable Long Delay Time						Fixed Rating Plug	
	S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)							
	I – Adjustable Instantaneous Pickup							
	G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response)						Rated Current (I <sub>n</sub> )	Catalogue Number
	LI	LS	LSI	LIG	LSG	LSIG		
	Catalogue Number							
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>								
1600	CRD316T91W	CRD316T93W	CRD316T92W	CRD316T94W	CRD316T95W	CRD316T96W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRD320T91W	CRD320T93W	CRD320T92W	CRD320T94W	CRD320T95W	CRD320T96W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>								
1600	CRDC316T91W	CRDC316T93W	CRDC316T92W	CRDC316T94W	CRDC316T95W	CRDC316T96W	800	RP6R16A080
							1000	RP6R16A100
							1200	RP6R16A120
							1600	RP6R16A160
2000	CRDC320T91W	CRDC320T93W	CRDC320T92W	CRDC320T94W	CRDC320T95W	CRDC320T96W	1000	RP6R20A100
							1200	RP6R20A120
							1600	RP6R20A160
							2000	RP6R20A200

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29889 for Digitrip 910 Trip Unit

① When a "VISA" frame is required, add suffix "S" to circuit breaker frame catalogue number, RD and CRD only. ie. CRD316T91SW

### Digitrip OPTIM Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only		Digitrip OPTIM Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_t$ ) 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 Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)		Fixed Rating Plug	
	LSIA 1050	LSIG 1050	Ampere Rating	Catalogue Number
	Catalogue Number			
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>				
1600	RD316T107W	RD316T106W	800	ORPR16A080
			1000	ORPR16A100
			1200	ORPR16A120
			1600	ORPR16A160
2000	RD320T107W	RD320T106W	1000	ORPR20A100
			1200	ORPR20A120
			1600	ORPR20A160
			2000	ORPR20A200
2500	RD325T107W	RD325T106W	1600	ORPR25A160
			2000	ORPR25A200
			2500	ORPR25A250
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>				
1600	RDC316T107W	RDC316T106W	800	ORPR16A080
			1000	ORPR16A100
			1200	ORPR16A120
			1600	ORPR16A160
2000	RDC320T107W	RDC320T106W	1000	ORPR20A100
			1200	ORPR20A120
			1600	ORPR20A160
			2000	ORPR20A200
2500	RDC325T107W	RDC325T106W	1600	ORPR25A160
			2000	ORPR25A200
			2500	ORPR25A250

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29C891 for OPTIM Trip Unit

**100% Rated 600 Volt AC Digitrip OPTIM Circuit Breakers with Interchangeable Rating Plugs**

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

Maximum Continuous Ampere Rating @ 40°C	Circuit Breaker Frame Only		Digitrip OPTIM Rating Plug Only	
	L – Adjustable Long Delay Pickup ( $I_t$ ) 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 Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)		Fixed Rating Plug	
	LSIA 1050	LSIG 1050	Ampere Rating	Catalogue Number
<b>3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 600 Vac</b>				
1600	CRD316T107W	CRD316T106W	800	ORPR16A080
			1000	ORPR16A100
			1200	ORPR16A120
			1600	ORPR16A160
2000	CRD320T107W	CRD320T106W	1000	ORPR20A100
			1200	ORPR20A120
			1600	ORPR20A160
			2000	ORPR20A200
<b>3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 600 Vac</b>				
1600	CRDC316T107W	CRDC316T106W	800	ORPR16A080
			1000	ORPR16A100
			1200	ORPR16A120
			1600	ORPR16A160
2000	CRDC320T107W	CRDC320T106W	1000	ORPR20A100
			1200	ORPR20A120
			1600	ORPR20A160
			2000	ORPR20A200

Instruction Leaflet Number 29C107 and 29C713 for Breaker; Number 29C891 for OPTIM Trip Unit

### Moulded Case Switches

Moulded case switches are used as compact switches in applications requiring high current switching capabilities. Moulded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Moulded case switches are listed in accordance with CSA C22.2 No. 5 and Underwriters Laboratories, Inc., Standard UL 489 suitable for reverse feed use, and as 100% rated devices.

Continuous Ampere Rating @ 40°C	Complete without Terminals	
	3-Pole	4-Pole
	Catalogue Number	
1600	Type RD - High Instantaneous (K)	
	RD316WK	RD416WK
2000	Type RD - High Instantaneous (K)	
	RD320WK	RD420WK
2500	Type RD - High Instantaneous (K)	
	-	-

**Note:** Moulded case switch may trip above 17500 amperes.

Instruction Leaflet Number 29C106 for Moulded Case Switch

Moulded Case Switch Type	Number of Poles	Unfused Short Circuit Withstand Rating (Symmetrical Amperes) (kA)		
		Volts Ac (50/60 Hz)		
		240	480	600
RD	3,4	125	65	50

## Line and Load Terminals

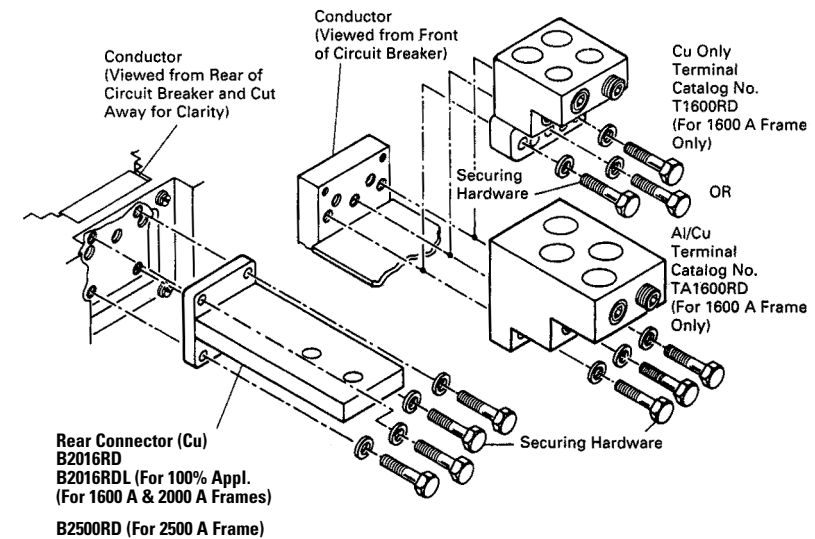
Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc. Standards UL486A and UL486B and CSA C22.2 No. 65. Unless otherwise specified, R-frame circuit breaker line load terminals are shipped separately for field installation.

## Ordering Information

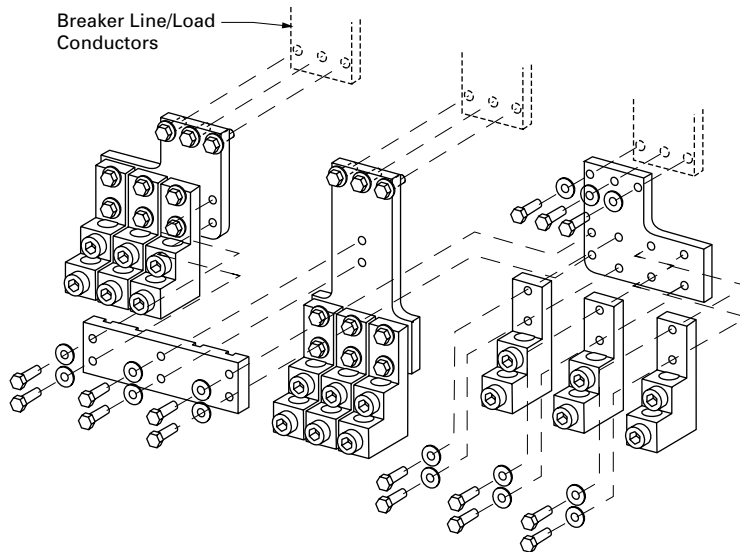
R-frame circuit breakers have Cu/Al terminals as standard and Cu only terminals as an option. Specify if factory installation is required.

## Line and Load Terminals

Maximum Breaker Amperes	Terminal Body Material	Wire Type	Hardware	AWG/kcmil Wire Range/No. Conductors	Metric Wire Range mm <sup>2</sup>	Catalogue Number
<b>Wire Terminals</b>						
1600	Aluminum	Cu/Al	English	500-1000 (4)	300-500	<b>TA1600RD</b>
1600	Copper	Cu	English	1-600 (4)	50-300	<b>T1600RD</b>
2000	Aluminum	Cu/Al	English	2-600 (6)	35-300	<b>TA2000RD</b> ①
<b>Rear Connectors</b>						
2000	Copper	—	English	—	—	<b>B2016RD</b>
2000	Copper	—	English	—	—	<b>B2016RDL</b> ②
2500	Copper	—	English	—	—	<b>B2500RD</b> ③



## TA2000RD



① Catalogue number includes bus connection, terminals, and hardware for either line side or load side of 3-pole breaker. Terminal rating: AL9CU.

② For use with 100% rated 1600A and 2000A frame. Do not order separately unless for replacement purposes. Is included in breaker carton when 100% rated device is ordered.

③ For use with 2500-amp frame. Do not order separately unless for replacement purposes. Included in breaker carton when 2500A breaker is ordered.

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

Description	Reference Page	3-Pole			4-Pole			Neu.
		Left	Centre	Right	Left	Centre	Right	
<b>Internal Accessories</b> <sup>①</sup>								
Alarm Lockout (Make/Break)	INTA-4			■			■	
Alarm Lockout (2Make/2Break)	INTA-4			■			■	
Auxiliary Switch (2A, 2B)	INTA-7			■			■	
Auxiliary Switch (4A, 4B)	INTA-7			■			■	
Shunt Trip – Standard	INTA-14			■			■	
Shunt Trip – Low Energy	INTA-15			■			■	
Undervoltage Release Mechanism	INTA-22			■			■	
Accessory Terminal Block <sup>②</sup>	INTA-23			■				■
<b>External Accessories</b>								
Base Mounting Hardware	EXTA-5							
Padlockable Handle Lock Hasp	EXTA-11		●			●		
Key Interlock Kit	EXTA-12	■	■	■	■	■	■	
Walking Beam Interlock	EXTA-13							
Electrical (Motor) Operator	EXTA-15	■	■	■	■	■	■	
Drawout Cassette	EXTA-6	●	●	●				
Handle Mechanisms	EXTA-21	■	■	■	■	■	■	
Handle Extension <sup>③</sup>	EXTA-27		■			■		
Solid-State (Electronic) Portable Test Kit (310 Only)	EXTA-28	●	●	●	●	●	●	●
<b>OPTIM System Components</b>								
Breaker Interface Module (BIM)	EXTA-29	●						
Digitrip OPTIMizer	EXTA-29	●						
Auxiliary Power Module	EXTA-29	●						
<b>Modifications (Refer to Eaton)</b>								
Special Calibration	1.2	●	●	●	●	●	●	●
Moisture Fungus Treatment	1.2	●	●	●	●	●	●	●
Freeze-Tested Circuit Breakers	1.2	●	●	●	●	●	●	●
Marine Application	1.2	●	●	●	●	●	●	●

■ Applicable in indicated pole position

● Accessory available/Modification available

<sup>①</sup> All accessories mount to the RH cavity which will accept one each shunt strip, UVR, auxiliary switch and alarm switch.

<sup>②</sup> Mounts outside breaker.

<sup>③</sup> Included with breaker.

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## Motor Circuit Protectors



### Product Description

Designated as Eaton Types GMCP, HMCP, the instantaneous-only motor circuit protector (MCP) is available in ratings from 3A to 1200A for motor starter sizes 0 through 8. The MCP is designed to comply with the applicable requirements of Underwriters Laboratories, Inc. Standard UL489, Canadian Standards Association Standard C22.2 No. 5, and International Electrotechnical Commission Recommendations IEC 157-1.

An innovative design of internal components allows higher MCP-starter combination interrupting ratings. The MCP is marked to permit proper electrical application within the assigned equipment ratings.

The MCP is a recognized component (UL File E7819) and complies with the applicable requirements of Underwriters Laboratories, Inc. Standard UL489. It is also designed to comply with the applicable requirements of Canadian Standards Association Standard C22.2 No. 5, International Electrotechnical Commission Recommendations IEC 157-1, and nameplates bear the CE marking <sup>①</sup>.

**Note:** Interrupting ratings are dependent on the starter it is used with.

<sup>①</sup> Available with MCP labelled from Eaton in U.S.A. only.



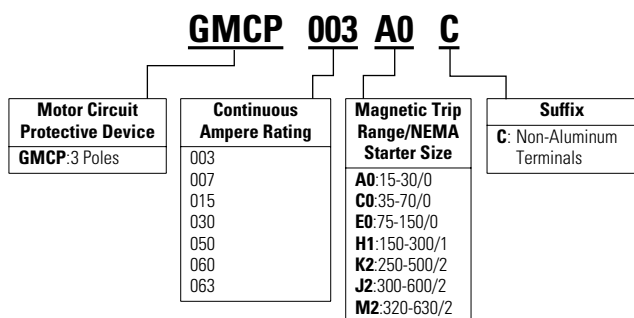
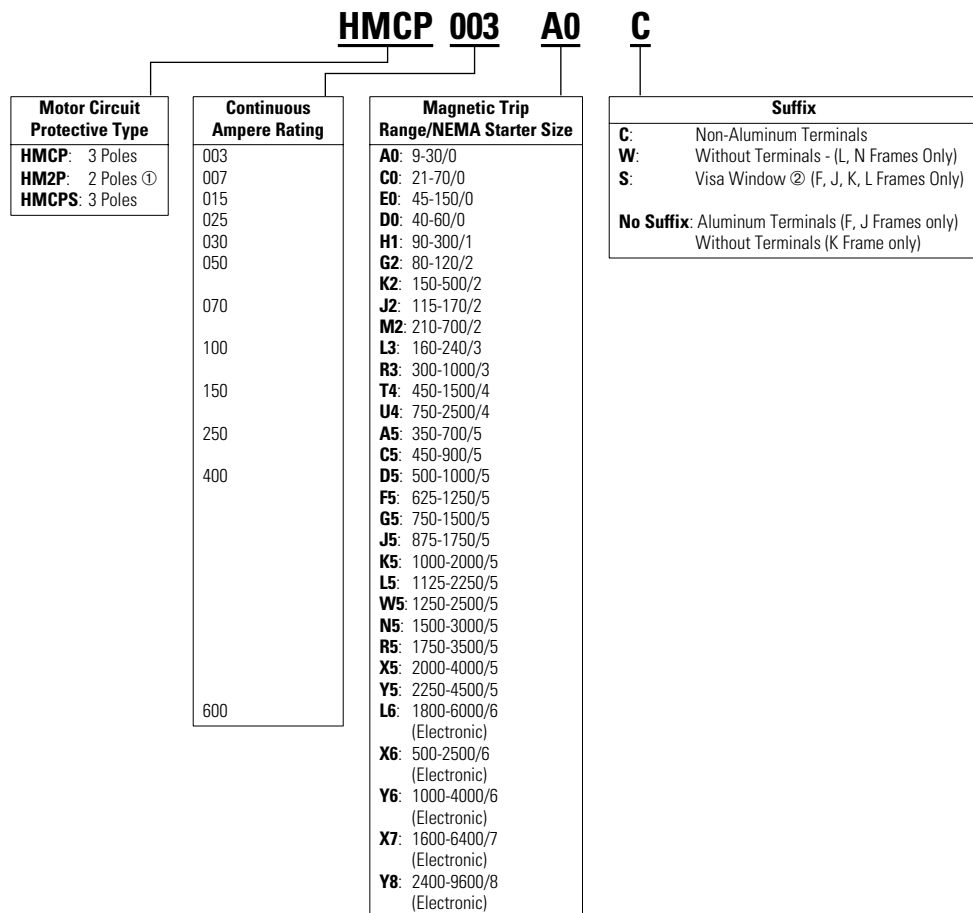
# MCP-2 Series C Moulded Case Circuit Breakers

Motor Circuit Protectors

## Catalogue Numbering System

This information is presented only as an aid to understanding Catalogue numbers. It is not to be used to build Catalogue numbers for circuit breakers or trip units.

### Motor Circuit Protector Catalogue Number



① On J and K Frame HMCP's only.

② When a "VISA" frame is required, add suffix "S" to MCP Catalogue number. ie. HMCP100R3S, HMCP250A5S, HMCP400D5S, HMCP600L6S.

# Series C Moulded Case Circuit Breakers **MCP-3**

Motor Circuit Protectors

## G-Frame

600Y/347 Vac and 480 Vac , 250 Vdc Maximum

MCP Catalogue Number	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ①	MCP Trip Setting②
<b>GMCP003A0C</b>	0	3	A	1.1 -1.2	15
			B	1.3 -1.5	18
			C	1.6 -1.7	21
			D	1.8 -1.9	24
			E	2.0 -2.2	27
			F	2.3-2.5	30
<b>GMCP007C0C</b>	0	7	A	2.6 -3.1	35
			B	3.2-3.6	42
			C	3.7-3.9	49
			D	4.3 -4.7	56
			E	4.8 -5.2	63
			F	5.3 -5.7	70
<b>GMCP015E0C</b>	0	15	A	5.7 -6.8	75
			B	6.9-7.9	90
			C	8.0-9.1	105
			D	9.2-10.3	120
			E	10.4-11.4	135
			F	11.5-12.6	150
<b>GMCP030H1C</b>	1	30	A	11.5-13.7	150
			B	13.8-16.0	180
			C	16.1-18.3	210
			D	18.4-20.6	240
			E	20.7-22.9	270
			F	23.0-25.2	300
<b>GMCP050K2C</b>	2	50	A	19.3-22.9	250
			B	23.0-26.8	300
			C	26.9-30.6	350
			D	30.7-34.5	400
			E	34.6-38.3	450
			F	38.4-42.1	500
<b>GMCP060J2C</b>	3	60	A	23.1-27.5	300
			B	27.7-32.2	360
			C	32.3-36.7	420
			D	36.9-41.4	480
			E	41.5-46.0	540
			F	46.2-50.5	600
<b>GMCP063M2C</b>	3	63	A	24.2-32.1	320
			B	29.1-34.8	380
			C	33.9-39.4	440
			D	38.8-46.4	500
			E	43.6-48.9	570
			F	48.5-53.7	630

Instruction Leaflet 15579

**Note:** All GMCP 3 - 63A come with line and load steel body terminals for Cu only wire.

## Modifications for GMCP

### Internal Accessories

These modifications must be factory installed ③

Type Accessory	Electrical Ratings			Contact Arrangement	Style Number	Factory Suffix
	Volts	Frequency	Amperes			
Shunt Trip ④	120	50/60 Hz	1.1		<b>1373D62G18</b>	<b>S5</b>
Shunt Trip ④	240	50/60 Hz	2.1		<b>1373D62G19</b>	<b>S6</b>
Auxiliary Switch ⑤	240	50/60 Hz	6.0	1a/1b	<b>1288C74G03</b>	<b>A3</b>
Auxiliary Switch ⑤	240	50/60 Hz	6.0	2a/2b	<b>1288C73G03</b>	<b>A6</b>
Alarm Switch ⑤	240	50/60 Hz	6.0	Make/Break	<b>1288C75G03</b>	<b>B3</b>
Auxiliary Switch ⑤ /Alarm Switch Combination	240	50/60 Hz	6.0	1a/1b and Make/Break	<b>1288C76G09</b>	<b>B13</b>

**Note:** No UVR available on GMCP.

Instruction Leaflet 15552 for Alarm Switch  
 Instruction Leaflet 15551 for Auxiliary Switch  
 Instruction Leaflet 15550 for Shunt Trip

### External Mounted Accessories

Description	Number Units in Package	Style Number
Lock Dog (Non-Padlockable)	1	<b>1294C01H01</b>
Mounting Hardware	1	<b>624B375G23</b>
DIN Rail Adapter ⑥	1	<b>1225C79G02</b>

Instruction Leaflet 29C191 (DIN Rail Adapter)

### Vari-Depth Handle Mechanism ⑦

Description	Catalogue Number
For Type 1 use	<b>HRGMV11L</b>
For Type 3R, 4X, 12 use	<b>HRGMV14L</b>
Close Coupled Black with Gray Handle	<b>HRGMC10</b>
Close Coupled Red with Yellow Handle	<b>HRGMC30</b>

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 Only one accessory may be installed in LH or RH of GMCP.

④ LH only.

⑤ RH only.

⑥ For use with standard 35 mm DIN rail such as, 35 x 7.5 or 15 mm per DIN EN50022.

⑦ For use with GMCP only.

# MCP-4 Series C Moulded Case Circuit Breakers

Motor Circuit Protectors

## F-Frame

600 Vac Maximum, 250 Vdc Maximum

MCP Catalogue Number	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ①	MCP Trip Setting ②
HMCP003A0C	0	3	A	.69-.91	9
			B	.92-1.0	12
			C	1.1-1.2	15
			D	1.3-1.5	18
			E	1.6-1.7	21
			F	1.8-1.9	24
			G	2.0-2.2	27
			H	2.3-2.5	30
HMCP007C0C	0	7	A	1.5-2.0	21
			B	2.1-2.5	28
			C	2.6-3.1	35
			D	3.2-3.6	42
			E	3.7-3.9	49
			F	4.3-4.7	56
			G	4.8-5.2	63
			H	5.3-5.7	70
HMCP015E0C	0	15	A	3.4-4.5	45
			B	4.6-5.6	60
			C	5.7-6.8	75
			D	6.9-7.9	90
			E	8.0-9.1	105
			F	9.2-10.3	120
			G	10.4-11.4	135
			H	11.5-12.6	150
HMCP030H1C	1	30	A	6.9-9.1	90
			B	9.2-11.4	120
			C	11.5-13.7	150
			D	13.8-16.0	180
			E	16.1-18.3	210
			F	18.4-20.6	240
			G	20.7-22.9	270
			H	23.0-25.2	300
HMCP050K2C	2	50	A	11.5-15.2	150
			B	15.3-19.1	200
			C	19.2-22.9	250
			D	23.0-26.8	300
			E	26.9-30.6	350
			F	30.7-34.5	400
			G	34.6-38.3	450
			H	38.4-42.1	500
HMCP070M2C	2	70	A	16.1-21.4	210
			B	21.5-26.8	280
			C	26.9-32.2	350
			D	32.3-37.5	420
			E	37.6-42.9	490
			F	43.0-48.3	560
			G	48.4-53.7	630
			H	53.8-59.1	700
HMCP100R3C	3	100	A	23.0-30.6	300
			B	30.7-38.3	400
			C	38.4-46.0	500
			D	46.1-53.7	600
			E	53.8-61.4	700
			F	61.5-69.1	800
			G	69.2-76.8	900
			H	76.9-84.5	1000

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 130 amperes are for special applications. C.E.C. 28-602 requires the ampere rating of the disconnecting means to be not less than 115% of the motor full load ampere rating.

## F-Frame (Continued)

600 Vac Maximum, 250 Vdc Maximum

MCP Catalogue Number	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ①	MCP Trip Setting ②
HMCP150T4C	4	150	A	34.6-46.0	450
			B	46.1-57.5	600
			C	57.6-69.1	750
			D	69.2-80.6	900
			E	80.7-92.2	1050
			F	92.3-103.7	1200
			G	103.8-115.2	1350
			H	115.3-126.7	1500
HMCP150U4C	4	150	A	57.0-75.0	750
			B	76.0-95.0	1000
			C	96.0-114.0	1250
			D	115.0-130.7	1500
			E	③	1750
			F	③	2000
			G	③	2250
			H	③	2500

Instruction Leaflet 29C401

**Note:** For HMCP 3 - 150A with suffix "C", 3 - 100A units come with line and load steel body terminals, 3T100FB. 150A unit comes with line and load stainless steel body terminals, 3T150FB.

## Special Low Magnetic Protection Application MCP

600 Vac Maximum, 250 Vdc Maximum

MCP Catalogue Number	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes	MCP Trip Setting ②
HMCP025D0C	-	25A	A	-	40
			B	-	43
			C	-	46
			D	-	49
			E	-	52
			F	-	55
			G	-	58
			H	-	60
HMCP050G2C	-	50A	A	-	80
			B	-	87
			C	-	93
			D	-	98
			E	-	103
			F	-	109
			G	-	115
			H	-	120
HMCP070J2C	-	70A	A	-	115
			B	-	122
			C	-	130
			D	-	139
			E	-	145
			F	-	153
			G	-	160
			H	-	170
HMCP100L3C	-	100A	A	-	160
			B	-	174
			C	-	185
			D	-	196
			E	-	207
			F	-	218
			G	-	229
			H	-	240

Instruction Leaflet 29C407

**Note:** HMCP 25 - 100A come with line and load steel body terminals, 3T100FB.

## MCPs for Application with Motor Starters Equipped with Electronic Overload Relays

600 Vac Maximum, 250 Vdc Maximum

MCP Catalogue Number ①	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ②	MCP Trip Setting ③
<b>HMCP5003A0C</b>	0	3	A	.69 - .91	9
			B	.92 - 1.0	12
			C	1.1-1.2	15
			D	1.3-1.5	18
			E	1.6-1.7	21
			F	1.8-1.9	24
			G	2.0-2.2	27
			H	2.3-2.5	30
<b>HMCP5007C0C</b>	0	7	A	1.5-2.0	21
			B	2.1-2.5	28
			C	2.6-3.1	35
			D	3.2-3.6	42
			E	3.7-3.9	49
			F	4.3-4.7	56
			G	4.8-5.2	63
			H	5.3-5.7	70
<b>HMCP5015E0C</b>	0	15	A	3.4-4.5	45
			B	4.6-5.6	60
			C	5.7-6.8	75
			D	6.9-7.9	90
			E	8.0-9.1	105
			F	9.2-10.3	120
			G	10.4-11.4	135
			H	11.5-12.6	150
<b>HMCP5030H1C</b>	1	30	A	6.9-9.1	90
			B	9.2-11.4	120
			C	11.5-13.7	150
			D	13.8-16.0	180
			E	16.1-18.3	210
			F	18.4-20.6	240
			G	20.7-22.9	270
			H	23.0-25.2	300
<b>HMCP5050K2C</b>	2	50	A	11.5-15.2	150
			B	15.3-19.1	200
			C	19.2-22.9	250
			D	23.0-26.8	300
			E	26.9-30.6	350
			F	30.7-34.5	400
			G	34.6-38.3	450
			H	38.4-42.1	500
<b>HMCP5100R3C</b>	3	100	A	23.0-30.6	300
			B	30.7-38.3	400
			C	38.4-46.0	500
			D	46.1-53.7	600
			E	53.8-61.4	700
			F	61.5-69.1	800
			G	69.2-76.8	900
			H	76.9-84.5	1000
<b>HMCP5150T4C</b>	4	150	A	34.6-46.0	450
			B	46.1-57.5	600
			C	57.6-69.1	750
			D	69.2-80.6	900
			E	80.7-92.2	1050
			F	92.3-103.7	1200
			G	103.8-115.2	1350
			H	115.3-126.7	1500
<b>HMCP5150U4C</b>	4	150	A	57.0-75.0	750
			B	76.0-95.0	1000
			C	96.0-114.0	1250
			D	115.0-130.7	1500
			E	④	1750
			F	④	2000
G	④	2250			
H	④	2500			

Instruction Leaflet 29C401

## Type ELC Current Limiter Attachment (Size 0-4)



The type ELC current limiter attachment for the MCP is designed to provide increased interrupting capacity. The combination may be used for the application up to 200,000A symmetrical at 600 Vac making the MCP suitable for use in network distribution systems or other applications where unusually high fault currents are available. The current limiter connects to the load end of the MCP and is provided with terminals suitable for copper or aluminum conductors. (See table).

Limiters are coordinated with the MCP so that normal fault currents are interrupted automatically by the MCP without any damage to the limiter. Only the rare very high fault is opened by the limiter. Faults that are interrupted by the limiter also magnetically trip the MCP, opening all three poles, preventing single-phase operation.

Each of the three poles of the type ELC limiter is equipped with an indicator that extends when a fault is interrupted by the limiter.

### Type ELC Current Limiter Terminal Wire Sizes ⑤

Type ELC Current Limiter Maximum Amperes	Standard Aluminum Terminals		Non-standard Terminals (Steel)	
	Wire Range AWG	Metric (mm <sup>2</sup> )	Wire Range AWG	Metric (mm <sup>2</sup> )
50	#14-2	2.5-35	#14-2 ⑥	2.5-35
100	#1-4/0	50-95	—	—
150	#1-4/0	50-95	—	—

### ELC Current Limiter Attachment

MCP Rating (Amperes)	Catalogue Number
3	<b>ELC3003R</b>
7	<b>ELC3007R</b>
15	<b>ELC3015R</b>
30	<b>ELC3030R</b>
50	<b>ELC3050R</b>
100	<b>ELC3100R</b>
150	<b>ELC3150R</b>

Instruction Leaflet 29C401

- ① HMCP5 3-100A come with line and load steel body terminals, 3T100FB. HMCP5 150A comes with line and load steel body terminals, 3T150FB.
- ② 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.
- ③ For Dc applications, actual trip levels are approximately 40% higher than values shown.
- ④ Settings above 130 amperes are for special applications. C.E.C. 28-602 requires the ampere rating of the disconnecting means to be not less than 115% of the motor full load ampere rating.
- ⑤ Terminal wire connectors are UL listed for standard stranded wire sizes as defined in UL486A or UL486B and CSA Standard C22.2 No. 65.
- ⑥ Optional on special order for copper cable only.

# MCP-6 Series C Moulded Case Circuit Breakers

Motor Circuit Protectors

## J-Frame

600 Vac Maximum, 250 Vdc Maximum

MCP Catalogue Number ①	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ②	MCP Trip Setting ③
HMCP250A5	250		A	27.0-30.7	350
			B	30.8-33.8	400
			C	33.9-36.9	440
			D	37.0-40.3	480
			E	40.4-43.8	525
			F	43.9-46.9	570
			G	47.0-50.7	610
			H	50.8-53.8	660
			I	53.9-57.2	700
HMCP250C5	250		A	34.7-38.8	450
			B	38.9-43.4	505
			C	43.5-47.6	565
			D	47.7-52.2	620
			E	52.3-56.5	680
			F	56.6-60.7	735
			G	60.8-64.9	790
			H	65.0-69.2	845
			I	69.3-73.5	900
HMCP250D5	250		A	38.5-43.4	500
			B	43.5-48.0	565
			C	48.1-53.0	625
			D	53.1-57.6	690
			E	57.7-62.3	750
			F	62.4-67.3	810
			G	67.4-71.9	875
			H	72.0-76.9	935
			I	77.0-81.6	1000
HMCP250F5	250		A	48.1-53.8	625
			B	53.9-59.9	700
			C	60.0-66.1	780
			D	66.2-72.3	860
			E	72.4-78.4	940
			F	78.5-83.8	1020
			G	83.9-89.9	1090
			H	90.0-96.1	1170
			I	96.2-102.0	1250
HMCP250G5	250		A	57.7-64.6	750
			B	64.7-71.9	840
			C	72.0-79.2	935
			D	79.3-86.5	1030
			E	86.6-93.8	1125
			F	93.9-101.1	1220
			G	101.2-108.4	1315
			H	108.5-115.3	1410
			I	115.4-122.4	1500

MCP Catalogue Number ①	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ②	MCP Trip Setting ③
HMCP250J5	250		A	67.4-75.3	875
			B	75.4-83.8	980
			C	83.9-92.3	1090
			D	92.4-100.7	1200
			E	100.8-109.2	1310
			F	109.3-117.6	1420
			G	117.7-126.1	1530
			H	126.2-134.6	1640
			I	134.7-142.8	1750
HMCP250K5	250		A	77.0-86.6	1000
			B	86.6-96.1	1125
			C	96.2-105.7	1250
			D	105.8-115.3	1375
			E	115.4-124.9	1500
			F	125.0-134.6	1625
			G	134.7-144.2	1750
			H	144.3-153.8	1875
			I	153.9-163.3	2000
HMCP250L5	250		A	86.6-97.3	1125
			B	97.4-108.4	1265
			C	108.5-118.8	1410
			D	118.9-129.9	1545
			E	130.0-140.7	1690
			F	140.8-151.5	1830
			G	151.6-162.3	1970
			H	162.4-173.0	2110
			I	173.1-183.6	2250
HMCP250W5	250		A	96.2-108.0	1250
			B	108.1-119.9	1405
			C	120.0-132.3	1560
			D	132.4-144.2	1720
			E	144.3-156.1	1875
			F	156.2-168.0	2030
			G	168.1-179.9	2185
			H	180.0-192.3	2340
			I	192.4-204.0	2500

Instruction Leaflet 29C402

① Three-pole Catalogue numbers shown. Two-pole Catalogue numbers begin with "HM2P" in place of "HMCP."

② 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.

③ For Dc applications, actual trip levels are approximately 40% higher than values shown.

## K-Frame

600 Vac Maximum, 250 Vdc Maximum

MCP Catalogue Number ①	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ②	MCP Trip Setting ③
<b>HMCP400A5C</b>	4	400	A	27.0 – 30.7	350
	4		B	30.8 – 33.8	400
	4		C	33.9 – 36.9	440
	5		D	37.0 – 40.3	480
	5		E	40.4 – 43.8	525
	5		F	43.9 – 46.9	570
	5		G	47.0 – 50.7	610
	5		H	50.8 – 53.8	660
	5		I	53.9 – 57.2	700
<b>HMCP400D5</b>	5	400	A	38.5-43.4	500
	5		B	43.5-48.0	565
	5		C	48.1-53.0	626
	5		D	53.1-57.6	690
	5		E	57.7-62.3	750
	5		F	62.4-67.3	810
	5		G	67.4-71.9	875
	5		H	72.0-76.9	935
	5		I	77.0-81.6	1000
<b>HMCP400F5</b>	5	400	A	48.1-53.8	625
	5		B	53.9-59.9	700
	5		C	60.0-66.1	780
	5		D	66.2-72.3	860
	5		E	72.4-78.4	940
	5		F	78.5-83.8	1020
	5		G	83.9-89.9	1090
	5		H	90.0-96.1	1170
	5		I	96.2-102.0	1250
<b>HMCP400G5</b>	5	400	A	57.7-64.6	750
	5		B	64.7-71.9	840
	5		C	72.0-79.2	935
	5		D	79.3-86.5	1030
	5		E	86.6-93.8	1125
	5		F	93.9-101.1	1220
	5		G	101.2-108.4	1315
	5		H	108.5-115.3	1410
	5		I	115.4-122.4	1500
<b>HMCP400J5</b>	5	400	A	67.4-75.3	875
	5		B	75.4-83.8	980
	5		C	83.9-92.3	1090
	5		D	92.4-100.7	1200
	5		E	100.8-109.2	1310
	5		F	109.3-117.6	1420
	5		G	117.7-126.1	1530
	5		H	126.2-134.6	1640
	5		I	134.7-142.8	1750
<b>HMCP400K5</b>	5	400	A	77.0-86.5	1000
	5		B	86.6-96.1	1125
	5		C	96.2-105.7	1250
	5		D	105.8-115.3	1375
	5		E	115.4-124.9	1500
	5		F	125.0-134.6	1625
	5		G	134.7-144.2	1750
	5		H	144.3-153.8	1875
	5		I	153.9-163.3	2000

MCP Catalogue Number ①	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes ②	MCP Trip Setting ③
<b>HMCP400L5</b>	5	400	A	86.6-97.3	1125
	5		B	97.4-108.4	1265
	5		C	108.5-118.8	1410
	5		D	118.9-129.9	1545
	5		E	130.0-140.7	1690
	5		F	140.8-151.5	1830
	5		G	151.6-162.3	1970
	5		H	162.4-173.0	2110
	5		I	173.1-183.6	2250
<b>HMCP400W5</b>	5	400	A	96.2-108.0	1250
	5		B	108.1-119.9	1405
	5		C	120.0-132.3	1560
	5		D	132.4-144.2	1720
	5		E	144.3-156.1	1875
	5		F	156.2-168.0	2030
	5		G	168.1-179.9	2185
	5		H	180.0-192.3	2340
	5		I	192.4-204.0	2500
<b>HMCP400N5</b>	5	400	A	115.4-129.9	1500
	5		B	130.0-144.2	1690
	5		C	144.3-158.4	1875
	5		D	158.5-173.0	2060
	5		E	173.1-187.6	2250
	5		F	187.7-201.9	2440
	5		G	202.0-216.1	2625
	5		H	216.2-230.7	2810
	5		I	230.8-244.9	3000
<b>HMCP400R5</b>	5	400	A	134.7-151.5	1750
	5		B	151.6-168.4	1970
	5		C	168.5-185.3	2190
	5		D	185.4-201.9	2410
	5		E	202.0-218.8	2625
	5		F	218.9-235.7	2845
	5		G	235.8-252.6	3065
	5		H	252.7-269.2	3285
	5		I	269.3-285.7	3500
<b>HMCP400X5</b>	5	400	A	153.9-173.0	2000
	5		B	173.1-192.3	2250
	5		C	192.4-211.5	2500
	5		D	211.6-230.7	2750
	5		E	230.8-249.9	3000
	5		F	250.0-269.2	3250
	5		G	269.3-288.4	3500
	5		H	288.5-307.6	3750
	5		I	307.7-326.9	4000
<b>HMCP400Y5</b>	5	400	A	173.1 - 194.5	2250
	5		B	194.6 - 216.1	2530
	5		C	216.2 - 237.6	2810
	5		D	237.7 - 259.5	3090
	5		E	259.6 - 281.1	3375
	5		F	281.2 - 302.6	3655
	5		G	302.7 - 324.1	3935
	5		H	324.2 - 346.1	4215
	5		I	346.2 - 368.1	4500

Instruction Leaflet 29C403

① Three-pole Catalogue numbers shown. Two-pole Catalogue numbers begin with "HM2P" in place of "HMCP."

② 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.

③ For Dc applications, actual trip levels are approximately 40% higher than values shown.

# MCP-8 Series C Moulded Case Circuit Breakers

Motor Circuit Protectors

## L-Frame ①

600 Vac Maximum

MCP Catalogue Number	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes <sup>②</sup>	MCP Trip Setting
HMCP600L6W	6	600	A	138.5 - 184.5	1800
			B	184.6 - 230.7	2400
			C	230.8 - 276.8	3000
			D	276.9 - 323.0	3600
			E	323.1 - 369.1	4200
			F	369.2 - 415.3	4800
			G	415.4 - 461.4	5400
			H	461.5 - 507.7	6000
HMCP600X6W	6	600	A	38.5 - 46.1	500
			B	46.2 - 61.4	600
			C	61.5 - 76.8	800
			D	76.9 - 96.1	1000
			E	96.2 - 115.3	1250
			F	115.4 - 153.7	1500
			G	153.8 - 192.2	2000
			H	192.3 - 230.7	2500
HMCP600Y6W	6	600	A	76.9 - 96.1	1000
			B	96.2 - 115.3	1250
			C	115.4 - 153.7	1500
			D	153.8 - 192.2	2000
			E	192.3 - 230.7	3500
			F	230.8 - 269.1	3000
			G	269.2 - 307.6	3500
			H	307.7 - 346.1	4000

Instruction Leaflet 29C404

**Note:** All HMCP 600A come without terminals. For terminals, see Page L-11 in the L-Frame MCCB section.

## N-Frame ①

600 Vac Maximum

MCP Catalogue Number	NEMA Starter Size	Continuous Amperes	Cam Setting	Motor Full Load Amperes <sup>②</sup>	MCP Trip Setting
HMCP800X7W	7	800	A	123.1 - 184.5	1600
			B	184.6 - 246.1	2400
			C	246.2 - 307.6	3200
			D	307.7 - 369.1	4000
			E	369.2 - 430.7	4800
			F	430.8 - 492.2	5600
			G	492.3 - 553.7	6400
HMCP12Y8W	8	1200	A	184.6 - 276.8	2400
			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

**Note:** All HMCP 800A and 1200A come without terminals. For terminals, see Page N-12 in the N-Frame MCCB section.

① Equipped with electronic trip device.

② 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.

## Motor Protection Circuit Breakers



## Motor Protection Circuit Breakers (MPCB)

### Product Description

Motor protection circuit breakers (MPCBs) provide CSA C22.2 No.5 and UL 489 branch circuit protection, UL 508 and CSA C22.2 No. 14 motor protection, and meet IEC 60947-2 and 50947-4 requirements. Typical branch motor loads are protected by three-component starters, consisting of breaker, contactor and overload relay, or fuse, contactor and overload relay. The MPCB application-specific protection eliminates the need for motor overload relay found in the traditional three-component starter assembly. The branch motor load protection is simplified to an MPCB and contactor, reducing both space requirements and heat generation in customer panels. Protection is provided by application-specific electronic trip units.

The electronic trip unit provides typical motor overload relay functionality and short-circuit protection against potential phase-to-phase or phase-to-ground faults.

- Disconnecting means
- Branch circuit short-circuit protection
- Overload protection
  - Class 5, 10, 15 and 20
- Phase unbalance protection
  - FDMP breaker trips when there is a 40% difference between any phase compared to the calculated three-phase average
- Phase loss protection
  - Active when the maximum phase current is greater than 50% of FLA setting
  - Breaker will trip when minimum phase current is 25% or less than the maximum phase current
  - Time delay of 1 or 2 seconds before breaker trips

- Thermal memory to prevent immediate restart after overload trip to allow motor to cool down

The MPCB is based on the Series C F-Frame. Accessories for standard Series C breakers apply to the MPCB. Unlike Motor Circuit Protectors (MCPs), MPCBs are UL 489 and CSA C22.2 No.5 listed with 18 kA and 25 kA interruption ratings @ 600 Vac.



# MPCB-2 Series C Moulded Case Circuit Breakers

Motor Protection Circuit Breakers

## Product Selection

### FDMP and HFDMP

Continuous Amperes	18 kA Without Phase Unbalance, Class 10 Motor Protection Only	18 kA With Phase Unbalance and Adjustable Motor Class Protection	25 kA Without Phase Unbalance, Class 10 Motor Protection Only	25 kA With Phase Unbalance and Adjustable Motor Class Protection
80	FDMP3080L	FDMP3080JL	HFDMP3080L	HFDMP3080JL
100	FDMP3100L	FDMP3100JL	HFDMP3100L	HFDMP3100JL
160	FDMP3160L	FDMP3160JL	HFDMP3160L	HFDMP3160JL
205	FDMP3205L	FDMP3205JL	HFDMP3205L	HFDMP3205JL

## Technical Data and Specifications

### Specifications

Feature	FDMP	HFDMP
Interruption rating at 240V	65 kA	100 kA
Interruption rating at 480V	35 kA	65 kA
Interruption rating at 600V	18 kA	25 kA
Icu/Ics at 240V	65 kA/33 kA ①	100 kA/50 kA ①
Icu/Ics at 415V	35 kA/18 kA ①	65 kA/33 kA ①
100% rated	No	No
FLA range (A)	40–205	40–205
Motor class protection	5, 10, 15, 20	5, 10, 15, 20
Phase unbalance protection (current)—active for phase current >0.5 FLA setting	≥40% delta (single-phase): (three-phase avg.) for 5 seconds	≥40% delta (single-phase): (three-phase avg.) for 5 seconds
Phase loss protection (current)—active for phase current >0.5 FLA setting	Min. phase ≤0.25 max. phase for 1 second	Min. phase ≤0.25 max. phase for 1 second
Thermal memory protection	Yes	Yes
High load indicator	—	—
Pre-detection relays	—	—
Internal accessories	Factory installed Aux. alarm, shunt trip, UVR	Factory installed Aux. alarm, shunt trip, UVR

#### Note

① IEC ratings available only on FWMP and HFWMP.

Typical Earth Leakage Circuit Breaker



### General Information

Earth Leakage Moulded Case Breakers offer superior Class 1 ground fault protection and improved ground fault coordination capability, and are listed under UL489 and 1053 as well as CSA C22.2 No. 5 and 144 standards.

Earth leakage ground fault protection differs from other types of systems in its level of sensitivity. The sensitivity of traditional devices is limited by the cumulative error of the residual current sensors and the placement of the phase and neutral conductors inside the current sensor.

Earth leakage breakers and motor protectors are zero sequence sensing devices. They are factory supplied with a single sensor and ground fault relay built-in. This technique allows for protection sensitivities down to the 30 milliampere level.

Earth leakage breakers and motor protectors are provided with a full complement of easy adjustments. The ground fault pickup setting is adjustable from 0.03 to 30 amperes in eight steps, and the ground fault time delay setting is adjustable from instantaneous to 2.0 seconds in six steps. When the pickup is set to 30 mA, the time delay setting defaults internally to instantaneous only. Increased selectivity provides for improved coordination with upstream and downstream ground fault devices as well as the flexibility to adjust for transient currents.

### Applications

#### Three-Phase, Four-Wire Loads

For three-phase applications with line-to-neutral loads, select 4-pole earth leakage breakers and wire the neutral through the fourth (right) pole.

#### Three-Phase, Three-Wire Loads

For applications with only three-phase, three-wire, line-to-line connected loads, select 3-pole earth leakage breakers.

#### Single-Phase Loads

For single-phase, 3-wire applications, use a 3-pole earth leakage breaker and connect all conductors through the breaker. For single-phase, 2-wire applications, wire to L1 - L2 or L2 - L3.

#### General

Do not reverse feed. Do not apply on 400 Hz system. Voltage range: 110 - 480 Vac.

### Standard Features

- Built-in push-to-trip button for functional testing.
- Trip window indicates red when the breaker has tripped on a ground fault.
- Form C bell alarm contact<sup>①</sup> for remote indication when the breaker has tripped under ground fault condition.
- Lockable adjustment seal helps prevent tampering with settings.
- Line and load terminals for bare cable connections.

### Accessories

#### Optional Factory Installed Internal Accessories

Earth leakage breakers use the same internal accessories as standard F-, J- and K-Frame Circuit Breakers. Internal accessories fit in the right-hand pole space and are available as factory modifications only.

#### Optional External Accessories

Earth leakage breakers use the same external accessories as the standard F-, J- and K-Frame circuit breakers.

<sup>①</sup> This Bell Alarm contact will not change state when the breaker has tripped on overload or short circuit condition.

# ELCB-2 Series C Moulded Case Circuit Breakers

Earth Leakage Circuit Breakers

## Information

### F-Frame Earth Leakage Ground Fault Breakers – Catalogue Numbers

Amperes	25 kA at 480 VAC		65 kA at 480 VAC		100 kA at 480 VAC	
	3-Pole	4-Pole	3-Pole	4-Pole	3-Pole	4-Pole
15Ⓞ	ELFD3015L	N/A	ELHFD3015L	N/A	ELFDC3015L	N/A
20Ⓞ	ELFD3020L	N/A	ELHFD3020L	N/A	ELFDC3020L	N/A
25Ⓞ	ELFD3025L	N/A	ELHFD3025L	N/A	ELFDC3025L	N/A
30Ⓞ	ELFD3030L	N/A	ELHFD3030L	N/A	ELFDC3030L	N/A
35	ELFD3035L	ELFD4035L	ELHFD3035L	ELHFD4035L	ELFDC3035L	ELFDC4035L
40	ELFD3040L	ELFD4040L	ELHFD3040L	ELHFD4040L	ELFDC3040L	ELFDC4040L
45	ELFD3045L	ELFD4045L	ELHFD3045L	ELHFD4045L	ELFDC3045L	ELFDC4045L
50	ELFD3050L	ELFD4050L	ELHFD3050L	ELHFD4050L	ELFDC3050L	ELFDC4050L
60	ELFD3060L	ELFD4060L	ELHFD3060L	ELHFD4060L	ELFDC3060L	ELFDC4060L
70	ELFD3070L	ELFD4070L	ELHFD3070L	ELHFD4070L	ELFDC3070L	ELFDC4070L
80	ELFD3080L	ELFD4080L	ELHFD3080L	ELHFD4080L	ELFDC3080L	ELFDC4080L
90	ELFD3090L	ELFD4090L	ELHFD3090L	ELHFD4090L	ELFDC3090L	ELFDC4090L
100	ELFD3100L	ELFD4100L	ELHFD3100L	ELHFD4100L	ELFDC3100L	ELFDC4100L
110	ELFD3110L	ELFD4110L	ELHFD3110L	ELHFD4110L	ELFDC3110L	ELFDC4110L
125	ELFD3125L	ELFD4125L	ELHFD3125L	ELHFD4125L	ELFDC3125L	ELFDC4125L
150	ELFD3150L	ELFD4150L	ELHFD3150L	ELHFD4150L	ELFDC3150L	ELFDC4150L

### J-Frame Earth Leakage Ground Fault Breakers – Catalogue Numbers

Amperes	35 kA at 480 VAC		65 kA at 480 VAC		100 kA at 480 VAC	
	3-Pole	4-Pole	3-Pole	4-Pole	3-Pole	4-Pole
100	ELJD3100	ELJD4100	ELHJD3100	ELHJD4100	ELJDC3100	ELJDC4100
125	ELJD3125	ELJD4125	ELHJD3125	ELHJD4125	ELJDC3125	ELJDC4125
150	ELJD3150	ELJD4150	ELHJD3150	ELHJD4150	ELJDC3150	ELJDC4150
175	ELJD3175	ELJD4175	ELHJD3175	ELHJD4175	ELJDC3175	ELJDC4175
200	ELJD3200	ELJD4200	ELHJD3200	ELHJD4200	ELJDC3200	ELJDC4200
225	ELJD3225	ELJD4225	ELHJD3225	ELHJD4225	ELJDC3225	ELJDC4225
250	ELJD3250	ELJD4250	ELHJD3250	ELHJD4250	ELJDC3250	ELJDC4250

### K-Frame Earth Leakage Ground Fault Breakers – Catalogue Numbers

Amperes	35 kA at 480 VAC		65 kA at 480 VAC		100 kA at 480 VAC	
	3-Pole	4-Pole	3-Pole	4-Pole	3-Pole	4-Pole
200	ELKD3200	ELKD4200	ELHKD3200	ELHKD4200	ELKDC3200	ELKDC4200
225	ELKD3225	ELKD4225	ELHKD3225	ELHKD4225	ELKDC3225	ELKDC4225
250	ELKD3250	ELKD4250	ELHKD3250	ELHKD4250	ELKDC3250	ELKDC4250
300	ELKD3300	ELKD4300	ELHKD3300	ELHKD4300	ELKDC3300	ELKDC4300
350	ELKD3350	ELKD4350	ELHKD3350	ELHKD4350	ELKDC3350	ELKDC4350
400	ELKD3400	ELKD4400	ELHKD3400	ELHKD4400	ELKDC3400	ELKDC4400

### Standard Line and Load Terminals – Included with Breaker

Frame	Wire Type	(Number) Range of Conductors	Terminal Material	
F-Frame	35-100A	Cu/Al	(1) #14-1/0	Steel
F-Frame	110-150A	Cu/Al	(1) #4-4/0	Stainless Steel
J-Frame	100-250A	Cu/Al	(1) #4-250 kcmil	Aluminum
K-Frame	200-350A	Cu/Al	(1) 250-500 kcmil	Aluminum
K-Frame	400A	Cu/Al	(2) 3/0-250 kcmil	Aluminum

Shaded gray areas denotes obsolete or discontinued products and services.

### F-Frame HMCP with Earth Leakage Ground Fault

Continuous Amperes	Catalogue Number 3-Pole
3Ⓞ	ELHMCP003A0C
7Ⓞ	ELHMCP007C0C
15Ⓞ	ELHMCP015E0C
25Ⓞ	ELHMCP025X0C
30Ⓞ	ELHMCP030H1C
50	ELHMCP050K2C
70	ELHMCP070M2C
100	ELHMCP100R3C
150	ELHMCP150T4C
150	ELHMCP150U4C
3	ELHMCP003A0LC
7	ELHMCP007C0LC
15	ELHMCP015E0LC
25	ELHMCP025D0C
30	ELHMCP030H1LC
50	ELHMCP050G2C
70	ELHMCP070J2C
100	ELHMCP100L3C
100	ELHMCP100K3C
<b>HMCPs for Application with Motor Starters Equipped with Electrical Overload Relays</b>	
3Ⓞ	ELHMCP003A0C
7Ⓞ	ELHMCP007C0C
15Ⓞ	ELHMCP015E0C
30Ⓞ	ELHMCP030H1C
50	ELHMCP050K2C
100	ELHMCP100R3C
150	ELHMCP150T4C
150	ELHMCP150U4C

### Selection Guide and Ordering J, K-Frame HMCP with Earth Leakage Ground Fault

Continuous Amperes	Catalogue Number 3-Pole
250	ELHMCP250A5
	ELHMCP250C5
	ELHMCP250D5
	ELHMCP250F5
	ELHMCP250G5
	ELHMCP250J5
	ELHMCP250K5
400	ELHMCP250L5
	ELHMCP250W5
	ELHMCP400D5
	ELHMCP400F5
	ELHMCP400G5
ELHMCP400J5	
ELHMCP400K5	

Ⓞ The ground fault pickup setting is adjustable from 0.03 to 10 amperes.

**Optional K-Frame Line and Load Terminals – Order Separately**

<b>Wire Type</b>	<b>(Number) Range of Conductors</b>	<b>Terminal Material</b>	<b>Catalogue Number</b>
Cu/Al	(2) 250 kcmil	Aluminum	<b>3TA401K</b> <sup>①</sup>
Cu/Al	(1) 500 kcmil	Aluminum	
Cu/Al	(2) 250 kcmil	Aluminum	<b>4TA401K</b> <sup>②</sup>
Cu/Al	(1) 500 kcmil	Aluminum	
Cu	(1) 3-350 kcmil	Copper	<b>T300K</b>
Cu	(1) 3-350 kcmil	Copper	<b>T300K</b>
Cu	(1) 250-500 kcmil	Copper	<b>T350K</b>
Cu	(1) 250-500 kcmil	Copper	<b>T350K</b>
Cu	(1) 3/0-250 kcmil	Copper	<b>3T400K</b> <sup>①</sup>
Cu	(1) 3/0-250 kcmil	Copper	<b>3T400K</b> <sup>②</sup>

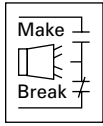
<sup>①</sup> Package of 3 terminals.

<sup>②</sup> Package of 4 terminals.

#### Contents

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## Alarm Switch



## General Information

For remote indication of automatic trip operation. Does not function with manual switching; however, it will operate when either a shunt trip or undervoltage release is operated.

A “make” contact closes and a “break” contact opens when the alarm/lockout switch operates. The switch automatically resets when the circuit breaker is reset.

## Ordering Information

### G-Frame

**Note:** G-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

### Alarm Switch ① ⑭ (RH 2-pole/ 3-pole)

Electrical Rating			Contact Arrangement	Style Number ②③④⑤⑨	Factory Suffix
Volts	Frequency	Amperes			
<b>Alarm Switch</b>					
240	50/60 Hz	6	1 Make/ 1 Break	<b>1288C75G03</b>	<b>B3</b>
<b>Alarm Switch Auxiliary Switches Combination</b>					
240	50/60 Hz	6	1 Make/ 1 Break and 1a/1b	<b>1288C76G09</b>	<b>B13</b>

Instruction Leaflet Number 15552

## F-Frame and HMCP (F)

### Electrical Rating Data ⑥

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
<b>Multi-Pole Circuit Breakers</b>			
600	50/60 Hz	6	2500
125	Dc	0.50 ⑦	
250	Dc	0.25 ⑦	
<b>Single-Pole Circuit Breakers</b>			
125/250	50/60 Hz	6 ⑦	2000
28	Dc	3 ⑦	
28	Dc	5 ⑧	

**Note:** F-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

### Alarm Switch

		Factory Mounted		(F-Frame Breaker)		(F-Frame HMCP)			
		Connection Type and Location		Alarm Switch Kit ⑨		Alarm Switch Kit ⑨			
Number of Contacts (Make and Break)	Mounting Location (Pole)	18-Inch Pigtail Leads ⑬		Terminal Block		Pigtail Leads	Terminal Block		
		Same Side	Rear ⑩	Opposite Side	Same Side				
		Suffix Number		Catalogue Number		Catalogue Number			
1	Left ⑪	<b>B01</b>	<b>B02</b>	<b>B03</b>	<b>B04</b>	<b>A1L1LPK</b>	<b>A1L1LTK</b>	<b>MA1L1LPK</b>	<b>MA1L1LTK</b>
	Right	<b>B05</b>	<b>B06</b>	<b>B07</b>	<b>B08</b>	<b>A1L1RPK</b>	<b>A1L1RTK ⑤</b>	<b>MA1L1RPK</b>	<b>MA1L1RTK</b>
2	Left ⑪	<b>B09</b>	<b>B10</b>	–	<b>B11</b>	<b>A2L1LPK</b>	<b>A2L1LTK</b>	<b>MA2L1LPK</b>	<b>MA2L1LTK</b>
	Right	<b>B12</b>	<b>B13</b>	–	<b>B14</b>	<b>A2L1RPK</b>	<b>A2L1RTK ⑤</b>	<b>MA2L1RPK</b>	<b>MA2L1RTK</b>
1 (Make Only)	Single Pole	<b>B15 ⑫</b>	–	–	–	–	–	–	–

Instruction Leaflet Number 29C180

- ① Endurance: 4000 electrical operations plus 4000 mechanical operations.  
 ② Includes 24-inch external pigtail leads, 18 AWG (16-.010).  
 ③ A maximum of two internal accessories may be mounted in a three-pole circuit breaker.  
 ④ Suitable for mounting in right pole only of 2- or 3-pole breaker.  
 ⑤ Not for use on 4-pole circuit breakers.  
 ⑥ Endurance: 4000 electrical operations plus 4000 mechanical operations.  
 ⑦ Non-inductive load.

- ⑧ Inductive (L/R = 0.026).  
 ⑨ Not listed with CSA and UL for field installation.  
 ⑩ Standard pigtail lead exit location.  
 ⑪ Standard mounting location.  
 ⑫ Factory installation only. Leads exit load end of circuit breaker.  
 ⑬ Pigtail Wire size: No. 18 AWG (0.8 mm<sup>2</sup>).  
 ⑭ Pigtail leads exit right side of circuit breaker.

### J-Frame and HMCP (J)

#### Electrical Rating Data ①②

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50③	
250	Dc	0.25③	

#### Alarm Switch

		Factory Mounted				Field Mounted	
		Connection Type and Location				Field Installation Kits ④	
Number of Contacts (Make and Break)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block	Pigtail Leads	Terminal Block
		Same Side	Rear ⑤	Opposite Side	Same Side		
		Suffix Number			Catalogue Number		
1	Left ⑥	B01	B02	B03	B04	A1L2LPK	A1L2LTK
	Right	B05	B06	B07	B08	A1L2RPK	A1L2RTK ⑦

Instruction Leaflet Number 29C181

### K-Frame and HMCP (K)

#### Electrical Rating Data ②⑧

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

#### Alarm Switch

		Factory Mounted				Field Mounted	
		Connection Type and Location				Field Installation Kits ④	
Number of Sets of Contacts (Make and Break)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block	Pigtail Leads	Terminal Block
		Same Side	Rear ⑤	Opposite Side	Same Side		
		Suffix Number			Catalogue Number		
1	Left ⑥	B01	B02	B03	B04	A1L3LPK	A1L3LTK
	Right ⑨	B05	B06	B07	B08	A1L3RPK	A1L3RTK ⑦
2	Left ⑥	B09	B10	–	B11	A2L3LPK	A2L3LTK
	Right ⑨	B12	B13	–	B14	A2L3RPK	A2L3RTK ⑦

Instruction Leaflet Number 29C182

### L-, HMCP (L) and M-Frames

#### Electrical Rating Data ②⑩

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

#### Alarm Switch

		Factory Mounted				Field Mounted	
		Connection Type and Location				Field Installation Kits ④	
Number of Sets of Contacts (Make and Break)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block	Pigtail Leads	Terminal Block
		Same Side	Rear ⑤	Opposite Side	Same Side		
		Suffix Number			Catalogue Number		
1	Left ⑥	B01	B02	B03	B04	A1L4LPK	A1L4LTK
	Right ⑩	B05	B06	B07	B08	A1L4RPK	A1L4RTK ⑦
2	Left ⑥	B09	B10	–	B11	A2L4LPK	A2L4LTK
	Right ⑩	B12	B13	–	B14	A2L4RPK	A2L4RTK ⑦

Instruction Leaflet Number 29C183

① Endurance: 6000 electrical operations plus 2000 mechanical operations.

② Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with CSA and UL for field installation.

⑤ Standard pigtail lead exit location, leads exit rear of breaker.

⑥ Standard mounting location.

⑦ Not for use on 4-pole circuit breakers.

⑧ Endurance – 5,000 electrical operations plus 1000 mechanical operations.

⑨ Breakers with K-Frame OPTIM 550 can only accept accessories in left pole.

⑩ For L-Frame breakers equipped with OPTIM 550 trip unit, installation of PowerNet or Zone Interlock Kit restricts any other accessories from being installed in the right pole.

**N-Frame and HMCP (N)****Electrical Rating Data** ①⑥

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ②	
250	Dc	0.25 ②	

**Alarm Switch**

Number of Sets of Contacts (Make and Break)	Mounting Location (Pole)	Factory Mounted				Field Mounted	
		Connection Type and Location				Field Installation Kits ③	
		18-Inch Pigtail Leads		Terminal Block		Pigtail Leads	Terminal Block
		Same Side	Rear ④	Opposite Side	Same Side		
		Suffix Number				Catalogue Number	
1	Left	<b>B01</b>	<b>B02</b>	<b>B03</b>	<b>B04</b>	<b>A1L5LPK</b>	<b>A1L5LTK</b>
	Right ④⑨	<b>B05</b>	<b>B06</b>	<b>B07</b>	<b>B08</b>	<b>A1L5RPK</b>	<b>A1L5RTK ⑧</b>
2	Left	<b>B09</b>	<b>B10</b>	–	<b>B11</b>	<b>A2L5LPK</b>	<b>A2L5LTK</b>
	Right ④⑨	<b>B12</b>	<b>B13</b>	–	<b>B14</b>	<b>A2L5RPK</b>	<b>A2L5RTK ⑧</b>

Instruction Leaflet Number 29C184

**R-Frame****Electrical Rating Data** ⑤⑥

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ②	
250	Dc	0.25 ②	

**Alarm Switch (RH only)**

Number of Contacts (Make and Break)	Factory Mounted		Field Mounted		
	Connection Type and Location		Field Installation Kits ③		
	18-Inch Pigtail Leads		Pigtail Leads		
		Suffix Number ⑦		Catalogue Number ⑦	
1		<b>B05</b>	<b>A1L6RPK</b>		
2		<b>B12</b>	<b>A2L6RPK</b>		

Instruction Leaflet Number 29C185

① Endurance – 3000 electrical operations plus 1000 mechanical operations.

② Non-inductive load.

③ Listed with CSA and UL for field installation.

④ Standard mounting location – leads exit rear of breaker.

⑤ Endurance: 500 electrical operations plus 2500 mechanical operations.

⑥ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>). Leads are red, black and blue.

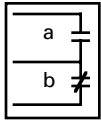
⑦ A maximum of three ASL plug-in modules may be installed in a circuit breaker.

⑧ Not for use on 4-pole circuit breakers.

⑨ For N-Frame breakers equipped with OPTIM 550 trip unit, installation of PowerNet or Zone Interlock Kit restricts any other accessories from being installed in the right pole.



## Auxiliary Switch



## General Information

The auxiliary switch provides circuit breaker contact status information by monitoring the position of the moulded cross bar which contains the moving contact arms. The auxiliary switch is used for remote indication and interlock system

verification, and consists of one or two SPDT switches housed in a plug-in module. Each SPDT switch has one "a" and one "b" contact. When the circuit breaker contacts are open, the "a" contact is open and the "b" contact is closed.

## Ordering Information

### G-Frame

**Note:** G-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

### Auxiliary Switch ⑫ (RH 2-Pole / 3-Pole)

Electrical Ratings			Contact Arrangement	Style Number ①②③④⑤	Factory Suffix
Volts	Frequency	Amperes			
240	50/60 Hz	6	1a/1b	1288C74G03	A3
240	50/60 Hz	6	2a/2b	1288C73G03	A6

Instruction Leaflet Number 15551

### F-Frame and HMCP (F)

#### Electrical Rating Data ④⑤

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
125 ⑥	50/60 Hz	1	2500
600	50/60 Hz	6	
125	Dc	0.50 ⑦	
250	Dc	0.25 ⑦	

**Note:** F-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

## Auxiliary Switch

### Factory Mounted

		Connection Type and Location			Auxiliary Switch Kits ⑧		
Number of Contacts (a and b)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		
		Same Side	Rear ⑨	Opposite Side	Same Side	Pigtail Leads	Terminal Block
		Suffix Number			Catalogue Number		
1	Left ⑩	A01	A02	A03	A04	A1X1PK	A1X1LTK
		A15 ⑪	A16 ⑪	A17 ⑪	–	E1X1PK ⑪	–
	Right or Neutral	A05	A06	A07	A08	A1X1PK	A1X1RTK ⑪
		A18 ⑪	A19 ⑪	A20 ⑪	–	E1X1PK	–
2	Left ⑩	A09	A10	–	A11	A2X1LPK	A2X1LTK
		A21 ⑪	A22 ⑪	–	–	E2X1LPK ⑪	–
	Right or Neutral	A12	A13	–	A14	A2X1RPK	A2X1RTK ⑪
		A23 ⑪	A24 ⑪	–	–	E2X1RPK ⑪	–

Instruction Leaflet Number 29C120

① Includes 24-inch external pigtail leads, #18 AWG (16-.010).

② A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

③ Suitable for mounting in right pole only of 2- or 3-pole breaker.

④ Endurance: 4000 electrical operations plus 4000 mechanical operations.

⑤ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

⑥ For use in electronic circuit of 100 micro-amperes and 15 Vdc minimum.

⑦ Non-inductive load.

⑧ Not listed with CSA and UL for field installation.

⑨ Standard mounting location – leads exit rear of breaker.

⑩ 125-volt (Max.), 50/60 Hz switch for use in electronic circuit of 100 micro-amp and 15 Vdc minimum.

⑪ Suitable for use in the Neutral pole of a 4-pole circuit breaker.

⑫ Pigtail leads exit right side of circuit breaker.

**J-Frame and HMCP (J)****Electrical Rating Data** ①②

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

**Auxiliary Switch**

		Factory Mounted			Field Mounted ④		
		Connection Type and Location			Field Installation Kits		
Number of Sets of Contacts (a and b)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		Terminal Block
		Same Side	Rear ⑤	Opposite Side	Same Side	Pigtail Leads	
		Suffix Number			Catalogue Number		
1	Left	A01	A02	A03	A04	A1X2PK	A1X2LTK
	Right ⑤	A05	A06	A07	A08	A1X2PK	A1X2RTK ⑥
2	Left	A09	A10	–	A11	A2X2PK	A2X2LTK
	Right ⑤	A12	A13	–	A14	A2X2PK	A2X2RTK ⑥

Instruction Leaflet Number 29C121

**K-Frame and HMCP (K)****Electrical Rating Data** ②⑦

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

**Auxiliary Switch**

		Factory Mounted			Field Mounted		
		Connection Type and Location			Field Installation Kits ④		
Number of Sets of Contacts (a and b)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		Terminal Block
		Same Side	Rear ⑤	Opposite Side	Same Side	Pigtail Leads	
		Suffix Number			Catalogue Number		
1	Left	A01	A02	A03	A04	A1X3PK	A1X3LTK
	Right ⑤⑧	A05	A06	A07	A08	A1X3PK	A1X3RTK ⑥
2	Left	A09	A10	–	A11	A2X3PK	A2X3LTK
	Right ⑤⑧	A12	A13	–	A14	A2X3PK	A2X3RTK ⑥
3	Left	A18	–	–	A15	A3X3LPK	A3X3LTK
	Right ⑧	A17	–	–	A16	A3X3RPK	A3X3RTK ⑥

Instruction Leaflet Number 29C122

① Endurance: 6000 electrical operations plus 2000 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with CSA and UL for field installation.

⑤ Standard mounting location – leads exit rear of breaker.

⑥ Suitable for use in the Neutral Pole of a 4-pole circuit breaker.

⑦ Endurance – 5000 electrical operations plus 1000 mechanical operations.

⑧ Breakers with K-Frame OPTIM 550 can only accept accessories in left pole.

### L-, HMCP (L) and M-Frames Electrical Rating Data ①②

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

### Auxiliary Switch

		Factory Mounted			Field Mounted		
		Connection Type and Location			Field Installation Kits ④		
Number of Sets of Contacts (a and b)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		Terminal Block
		Same Side	Rear ⑤	Opposite Side	Same Side	Pigtail Leads	
		Suffix Number			Catalogue Number		
1	Left	A01	A02	A03	A04	A1X4PK	A1X4LTK
	Right ⑤⑩	A05	A06	A07	A08	A1X4PK	A1X4RTK ⑥
2	Left	A09	A10	–	A11	A2X4PK	A2X4LTK
	Right ⑤⑩	A12	A13	–	A14	A2X4PK	A2X4RTK ⑥
3	Left	A18	–	–	A15	A3X4PK	A3X4LTK
	Right ⑤⑩	A17	–	–	A16	A3X4PK	A3X4RTK ⑥

Instruction Leaflet Number 29C123

### N-Frame and HMCP (N) Electrical Rating Data ②⑦

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

### Auxiliary Switch

		Factory Mounted			Field Mounted		
		Connection Type and Location			Field Installation Kits ④		
Number of Sets of Contacts (a and b)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		Terminal Block
		Same Side	Rear ⑤	Opposite Side	Same Side	Pigtail Leads	
		Suffix Number			Catalogue Number		
1	Left	A01	A02	A03	A04	A1X5PK	A1X5LTK
	Right ⑤⑫	A05	A06	A07	A08	A1X5PK	A1X5RTK ⑥
2	Left	A09	A10	–	A11	A2X5PK	A2X5LTK
	Right ⑤⑫	A12	A13	–	A14	A2X5PK	A2X5RTK ⑥
3	Left	A18	–	–	A15	A3X5LPK	A3X5LTK
	Right ⑤⑫	A17	–	–	A16	A3X5RPK	A3X5RTK ⑥

Instruction Leaflet Number 29C124

### R-Frame Electrical Rating Data ⑧⑨

Maximum Voltage	Frequency	Maximum Current Amperes
600	50/60 Hz	6
125	Dc	0.50 ③
250	Dc	0.25 ③

### Auxiliary Switch (RH only)

		Factory Mounted	Field Mounted
		Connection Type and Location	Field Installation Kits ④
Number of Contacts (a and b)	18-Inch Pigtail Leads		Pigtail Leads
	Suffix Number ⑩		Catalogue Number ⑩
	2	A12	
4	A19		A4X6RPK

Instruction Leaflet Number 29C125

① Endurance - 5000 electrical operations plus 1000 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with CSA and UL for field installation.

⑤ Standard mounting location – leads exit rear of breaker.

⑥ Suitable for use in the Neutral Pole of a 4-pole circuit breaker.

⑦ Endurance – 3000 electrical operations plus 1000 mechanical operations.

⑧ Endurance: 500 electrical operations plus 2500 mechanical operations.

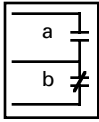
⑨ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>). Leads are red, black and blue.

⑩ A maximum of two auxiliary switches (any combination of 2a/2b or 4a/4b plug-in modules may be installed in a circuit breaker).

⑪ For L-Frame breakers equipped with OPTIM 550 trip units, installation of PowerNet or Zone Interlock Kit restricts any other accessories from being installed in the right pole.

⑫ For N-Frame breakers equipped with OPTIM 550 trip units, installation of PowerNet or Zone Interlock Kit restricts any other accessories from being installed in the right pole.

### Auxiliary Switch and Alarm Switch Combination



### General Information

Each catalogue number listed in the following table includes one auxiliary switch and one alarm switch. In an auxiliary switch ASL switch combination,

the auxiliary switch is always mounted on the side of the plug-in module next to the centre pole of the circuit breaker.

### Ordering Information

#### F-Frame and HMCP (F)

##### Electrical Rating Data ①②

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
125	50/60 Hz	1	2500
600	50/60 Hz	6	2500
125	Dc	0.50 ③	2200
250	Dc	0.25 ③	2200

**Note:** F-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

#### Auxiliary Switch and Alarm Switch Combination

Mounting Location (Pole)	Factory Mounted		(F-Frame Breaker)		(F-Frame HMCP)		
	Connection Type and Location				Auxiliary Switch & Alarm Switch Combination Kit ④		
	18-Inch Pigtail Leads		Terminal Block		Pigtail Leads	Terminal Block	
Same Side	Rear ⑤	Same Side	Leads	Block	Leads	Block	
	Suffix Number		Catalogue Number		Catalogue Number		
Left ⑤	C01	C02	C03	AAL1LPK	AAL1LTK ⑥	MAAL1LPK	MAAL1LTK ⑥
Right	C04	C05	C06	AAL1RPK	AAL1RTK ⑥	MAAL1RPK	MAAL1RTK ⑥

Instruction Leaflet Number 29C180

#### J-Frame

##### Electrical Rating Data ⑦②

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

#### Auxiliary Switch and Alarm Switch Combination

Number of Sets of Contacts (1a and 1b and 1M and 1B)	Mounting Location (Pole)	Factory Mounted			Field Mounted		
		Connection Type and Location				Field Installation Kits ⑧	
		18-Inch Pigtail Leads		Terminal Block		Pigtail Leads	Terminal Block
1	Left	Same Side	Rear ⑨	Opposite Side	Same Side	Pigtail Leads	Terminal Block
		Suffix Number		Catalogue Number		Catalogue Number	
1	Right ⑨	C01	C02	–	C03	AAL2LPK	AAL2LTK
		C04	C05	–	C06	AAL2RPK	AAL2RTK ⑥

Instruction Leaflet Number 29C181

① Endurance: 4000 electrical operations plus 4000 mechanical operations.

② Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Not listed with CSA and UL for field installation.

⑤ Standard mounting location.

⑥ Not for use on 4-pole circuit breakers.

⑦ Endurance – 6000 electrical operations plus 2000 mechanical operations.

⑧ Listed with CSA and UL for field installation.

⑨ Standard mounting location – leads exit rear of breaker.

### K-Frame and HMCP (K)

#### Electrical Rating Data ①②

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

#### Auxiliary Switch and Alarm Switch Combination

		Factory Mounted			Field Mounted			
		Connection Type and Location			Field Installation Kits ④			
Number of Sets of Contacts (1a and 1b and 1M and 1B)	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		Catalogue Number	
		Same Side	Rear ⑤	Opposite Side	Same Side	Pigtail Leads		Terminal Block
		Suffix Number						
1	Left	C01	C02	–	C03	AAL3LPK	AAL3LTK	
	Right ⑤⑧	C04	C05	–	C06	AAL3RPK	AAL3RTK ⑥	

Instruction Leaflet Number 29C182

### L-, HMCP (L) and M-Frames

#### Electrical Rating Data ①①

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

#### Auxiliary Switch and Alarm Switch Combination

		Factory Mounted			Field Mounted			
		Connection Type and Location			Field Installation Kits ④			
Number of Sets of Contacts	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		Catalogue Number	
		Same Side	Rear ⑤	Opposite Side	Same Side	Pigtail Leads		Terminal Block
		Suffix Number						
1A, 1B and 1 Make/1 Break	Left	C01	C02	–	C03	AA114LPK	AA114LTK	
	Right ⑤⑨	C04	C05	–	C06	AA114RPK	AA114RTK ⑥	
2A, 2B and 1 Make/1 Break	Left	C07	C08	–	C12	AA214LPK	AA214LTK	
	Right ⑤⑨	C10	C11	–	C13	AA214RPK	AA214RTK ⑥	
3A, 3B and 1 Make/1 Break	Left	C14	–	–	–	AA314LPK	–	
	Right ⑤⑨	C15	–	–	–	AA314RPK	–	

Instruction Leaflet Number 29C183

### N-Frame and HMCP (N)

#### Electrical Rating Data ⑦②

Maximum Voltage	Frequency	Maximum Current Amperes	Dielectric Withstand Voltage
600	50/60 Hz	6	2500
125	Dc	0.50 ③	
250	Dc	0.25 ③	

#### Auxiliary Switch and Alarm Switch Combination

		Factory Mounted			Field Mounted			
		Connection Type and Location			Field Installation Kits ④			
Number of Sets of Contacts	Mounting Location (Pole)	18-Inch Pigtail Leads			Terminal Block		Catalogue Number	
		Same Side	Rear ⑤	Opposite Side	Same Side	Pigtail Leads		Terminal Block
		Suffix Number						
1A, 1B and 1 Make/1 Break	Left	C01	C02	–	C03	AA115LPK	AA115LTK	
	Right ⑤⑩	C04	C05	–	C06	AA115RPK	AA115RTK ⑥	
2A, 2B and 1 Make/1 Break	Left	C07	C08	–	C12	AA215LPK	AA215LTK	
	Right ⑤⑩	C10	C11	–	C13	AA215RPK	AA215RTK ⑥	

Instruction Leaflet Number 29C184

① Endurance – 5000 electrical operations plus 1000 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with CSA and UL for field installation.

⑤ Standard mounting location – leads exit rear of breaker.

⑥ Not for use on 4-pole circuit breaker.

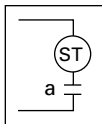
⑦ Endurance – 3000 electrical operations plus 1000 mechanical operations.

⑧ Breakers with K-Frame OPTIM 550 can only accept accessories in left pole.

⑨ For L-Frame breakers equipped with OPTIM 550 trip units, installation of PowerNet or Zone Interlock Kit restricts any other accessories from being installed in the right pole.

⑩ For N-Frame breakers equipped with OPTIM 550 trip units, installation of PowerNet or Zone Interlock Kit restricts any other accessories from being installed in the right pole.

### Shunt Trip



### General Information

The shunt trip provides remote controlled tripping of the circuit breaker. The shunt trip consists of an intermittent rated solenoid with a tripping plunger and a cutoff switch assembled to a plug-in module. When required for ground fault protection applications, certain Ac rated

shunt trips, as noted in the Electrical Rating Table, are suitable for operation at 55 percent of rated voltage.

**NOTE:** Shunt trips should not be used as circuit interlocks using maintained pilot devices.

### Ordering Information

Select shunt trip catalogue number for the voltage within the indicated voltage range. Shunt trip coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are also shown on applicable circuit breaker accessory nameplates.

### G-Frame

#### Shunt Trip ③ (LH 3-Pole only)

##### Electrical Ratings

Volts	Frequency	Amperes	Catalogue Number ①	Suffix Number
120 ②	50/60 Hz	1.1	1373D62G01	S1
240	50/60 Hz	2.1	1373D62G02	S2
12	Dc	2.8	1373D62G15	S3
24	Dc	5.7	1373D62G16	S4
24	60 Hz	—	1373D62G20	S7

Instruction Leaflet Number 15550

**Note:** G-Frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

① Not listed with CSA and UL for field installation

② Suitable for use in ground fault applications.

③ Pigtail leads exit left side of circuit breaker.

# INTA-11 Series C Moulded Case Circuit Breakers

Internal Accessories Shunt Trip

## F-Frame and HMCP (F)

### Electrical Rating Data ①②③

50/60 Hz			Dc		
Supply Voltage	Minimum Operating Voltage	VA	Supply Voltage	Minimum Operating Voltage	VA
12	6.75	75	12	9	100
24		300	24		400
48	36	92	48	36	100
60		140	60		160
110		480			
120		570			
127		640			
208	156	180	110	77	55
220		200	120		66
240		240	125		71
380		610	127		72
415	300	130	220	–	110
440		330	250	–	140
480		380	–	–	–
525		450	–	–	–
550		530	–	–	–
600		590	–	–	–
		–	–	–	–

### Shunt Trip

Voltage Rating (Ac Frequency = 50/60 Hz)	Factory Mounted					
	Connection Type and Location				Shunt Trip Kits ④	
	18-Inch Pigtail Leads ⑤		Terminal Block		Pigtail Leads	Terminal Block
Same Side	Rear ⑥	Opposite Side	Same Side			
Suffix Number	Catalogue Number					
<b>Left-Pole Mounting Ac/Dc Ratings</b>						
12-24 Vac or Vdc	S01	S02	S03	S04	SNT1LP03K	SNT1LT03K
48-127 Vac or 48-60 Vdc ⑦	S05	S06	S07	S08	SNT1LP08K	SNT1LT08K
208-380 Vac or 110-127 Vdc	S09	S10	S11	S12	SNT1LP12K	SNT1LT12K
415-600 Vac or 220-250 Vdc	S13	S14	S15	S16	SNT1LP18K	SNT1LT18K
<b>Right- or Neutral-Pole Mounting Ac/Dc Ratings ⑧</b>						
12-24 Vac or Vdc	S17	S18	S19	S20	SNT1RP03K	SNT1RT03K ⑨
48-127 Vac or 48-60 Vdc ⑦	S21	S22	S23	S24	SNT1RP08K	SNT1RT08K ⑨
208-380 Vac or 110-127 Vdc	S25	S26	S27	S28	SNT1RP12K	SNT1RT12K ⑨
415-600 Vac or 220-250 Vdc	S29	S30	S31	S32	SNT1RP18K	SNT1RT18K ⑨

Instruction Leaflet Number 29C140

**Note:** F-Frame circuit breakers are factory sealed. CSA and UL requires that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

## J-Frame and HMCP (J)

### Electrical Rating Data ①②⑩

50/60 Hz			Dc		
Supply Voltage	Minimum Operating Voltage	VA	Supply Voltage	Minimum Operating Voltage	VA
12	9	31	12	8.4	50
24		173	24		247
48	36	686	48	33.6	1094
60		1014	60		1698
110 ⑩	60.5	66	110	77	112
120 ⑩		84	120		138
127 ⑩		102	125		150
208 ⑩		354	–	–	–
220 ⑩		396	–	–	–
240 ⑩		432	–	–	–
380	285	180	110	154	40
400		200	120		58
415		240	125		–
440		610	127		–
480	360	34	–	–	–
525		42	–	–	–
550		50	–	–	–
600		60	–	–	–

### Shunt Trip

Voltage Rating (Ac Frequency = 50/60 Hz)	Factory Mounted				Field Mounted	
	Connection Type and Location				Field Installation Kits ⑫	
	18-Inch Pigtail Leads ⑤		Terminal Block		Pigtail Leads	Terminal Block
Same Side	Rear ⑬	Opposite Side	Same Side			
Suffix Number	Catalogue Number					
<b>Left-Pole Mounting Ac/Dc Ratings ⑬</b>						
12-24 Vac or Vdc	S41	S42	S43	S44	SNT2P04K	SNT2T04K
48-60 Vac or Vdc	S49	S50	S51	S52	SNT2P06K	SNT2T06K
110-240 Vac or 110-125 Vdc ⑭	S09	S10	S11	S12	SNT2P11K	SNT2T11K
380-440 Vac or 220-250 Vdc	S33	S34	S35	S36	SNT2P14K	SNT2T14K
480-600 Vac	S17	S18	S19	S20	SNT2P18K	SNT2T18K
<b>Right-Pole Mounting Ac/Dc Ratings</b>						
12-24 Vac or Vdc	S45	S46	S47	S48	SNT2P04K	SNT2T04K ⑨
48-60 Vac or Vdc	S53	S54	S55	S56	SNT2P06K	SNT2T06K ⑨
110-240 Vac or 110-125 Vdc ⑭	S29	S30	S31	S32	SNT2P11K	SNT2T11K ⑨
380-440 Vac or 220-250 Vdc	S33	S34	S35	S36	SNT2P14K	SNT2T14K ⑨
480-600 Vac	S37	S38	S39	S40	SNT2P18K	SNT2T18K ⑨

Instruction Leaflet Number 29C142

① Average unlatching time: 6 milliseconds.

② Average circuit breaker contact total opening time: 18 milliseconds.

③ Endurance: 4000 electrical operations plus 4000 mechanical operations.

④ Not listed with CSA and UL for field installation.

⑤ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

⑥ Standard pigtail lead exit location.

⑦ 120 Vac marked suitable for ground fault protection devices.

⑧ Standard mounting location.

⑨ Not for use on 4-pole circuit breakers.

⑩ Endurance – 6000 electrical operations plus 2000 mechanical operations.

⑪ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.

⑫ Listed with CSA and UL for field installation.

⑬ Standard mounting location – leads exit rear of breaker.

⑭ Suitable for use with Class 1 ground fault sensing element.

## K-Frame and HMCP (K) Electrical Rating Data ①②③

50/60 Hz			Dc		
Supply Voltage	Minimum Operating Voltage	VA	Supply Voltage	Minimum Operating Voltage	VA
12	9	45	12	8.4	35
24		200	24		170
48		830	48		710
60		1280	60		1105
110 ④	60	100	110	77	110
120 ④		120	120		130
127 ④		140	125		140
208 ④		420	—	—	—
220 ④		470	—	—	—
240 ④		550	—	—	—
380	285	95	220	154	41
400		108	250		54
415		120	—	—	—
440		136	—	—	—
480	360	40	—	—	—
525		50	—	—	—
550		50	—	—	—
600		70	—	—	—

## Shunt Trip

Factory Mounted			Field Mounted		
Connection Type and Location			Field Installation Kits ⑤		
18-Inch Pigtail Leads			Terminal Block		
Same Side	Rear ⑥	Opposite Side	Same Side	Pigtail Leads	Terminal Block
Suffix Number			Catalogue Number		
<b>Voltage Rating (Ac Frequency = 50/60 Hz)</b>					
<b>Left-Pole Mounting Ac/Dc Ratings ⑥</b>					
12-24 Vac or Vdc	<b>S41</b>	<b>S42</b>	<b>S43</b>	<b>S44</b>	<b>SNT3P04K</b>
48-60 Vac or Vdc	<b>S49</b>	<b>S50</b>	<b>S51</b>	<b>S52</b>	<b>SNT3P06K</b>
110-240 Vac or 110-125 Vdc ⑦	<b>S09</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>SNT3P11K</b>
380-440 Vac or 220-250 Vdc	<b>S13</b>	<b>S14</b>	<b>S15</b>	<b>S16</b>	<b>SNT3P14K</b>
480-600 Vac	<b>S17</b>	<b>S18</b>	<b>S19</b>	<b>S20</b>	<b>SNT3P18K</b>
<b>Right-Pole Mounting Ac/Dc Ratings ⑧⑩</b>					
12-24 Vac or Vdc	<b>S45</b>	<b>S46</b>	<b>S47</b>	<b>S48</b>	<b>SNT3P04K</b>
48-60 Vac or Vdc	<b>S53</b>	<b>S54</b>	<b>S55</b>	<b>S56</b>	<b>SNT3P06K</b>
110-240 Vac or 110-125 Vdc ⑦	<b>S29</b>	<b>S30</b>	<b>S31</b>	<b>S32</b>	<b>SNT3P11K</b>
380-440 Vac or 220-250 Vdc	<b>S33</b>	<b>S34</b>	<b>S35</b>	<b>S36</b>	<b>SNT3P14K</b>
480-600 Vac	<b>S37</b>	<b>S38</b>	<b>S39</b>	<b>S40</b>	<b>SNT3P18K</b>

Instruction Leaflet Number 29C144

## L-, HMCP (L) and M-Frames Electrical Rating Data ①②③

50/60 Hz			Dc		
Supply Voltage	Minimum Operating Voltage	VA	Supply Voltage	Minimum Operating Voltage	VA
12	9	45	12	9	35
24		200	24		170
48	34	830	48	34	710
60		1280	60		1105
110 ④	60	100	110	77	110
120 ④		120	120		130
127 ④		140	125		140
208 ④		420	—	—	—
220 ④		470	—	—	—
240 ④		550	—	—	—
380	266	95	220	154	41
400		108	250		54
415		120	—	—	—
440		136	—	—	—
480	336	40	—	—	—
525		50	—	—	—
550		50	—	—	—
600		70	—	—	—

## Shunt Trip

Factory Mounted			Field Mounted		
Connection Type and Location			Field Installation Kits ⑤		
18-Inch Pigtail Leads			Terminal Block		
Same Side	Rear ⑥	Opposite Side	Same Side	Pigtail Leads	Terminal Block
Suffix Number			Catalogue Number		
<b>Voltage Rating (Ac Frequency = 50/60 Hz)</b>					
<b>Left-Pole Mounting Ac/Dc Ratings ⑥</b>					
12-24 Vac or Vdc	<b>S01</b>	<b>S02</b>	<b>S03</b>	<b>S04</b>	<b>SNT4LP03K</b>
48-60 Vac	<b>S05</b>	<b>S06</b>	<b>S07</b>	<b>S08</b>	<b>SNT4LP05K</b>
48-60 Vdc ⑩	<b>S85</b>	<b>S86</b>	<b>S87</b>	—	<b>SNT4LP23K</b>
110-240 Vac ⑦	<b>S09</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>SNT4LP11K</b>
110-125 Vdc ⑫	<b>S41</b>	<b>S42</b>	<b>S43</b>	<b>S44</b>	<b>SNT4LP26K</b>
380-440 Vac or 220-250 Vdc	<b>S13</b>	<b>S14</b>	<b>S15</b>	<b>S16</b>	<b>SNT4LP14K</b>
480-600 Vac	<b>S17</b>	<b>S18</b>	<b>S19</b>	<b>S20</b>	<b>SNT4LP18K</b>
<b>Right-Pole Mounting Ac/Dc Ratings ⑩</b>					
12-24 Vac or Vdc	<b>S21</b>	<b>S22</b>	<b>S23</b>	<b>S24</b>	<b>SNT4RP03K</b>
48-60 Vac	<b>S25</b>	<b>S26</b>	<b>S27</b>	<b>S28</b>	<b>SNT4RP05K</b>
48-60 Vdc ⑩	<b>S88</b>	<b>S89</b>	<b>S90</b>	—	<b>SNT4RP23K</b>
110-240 Vac	<b>S29</b>	<b>S30</b>	<b>S31</b>	<b>S32</b>	<b>SNT4RP11K</b>
110-125 Vdc ⑫	<b>S45</b>	<b>S46</b>	<b>S47</b>	<b>S48</b>	<b>SNT4RP26K</b>
380-440 Vac or 220-250 Vdc	<b>S33</b>	<b>S34</b>	<b>S35</b>	<b>S36</b>	<b>SNT4RP14K</b>
480-600 Vac	<b>S37</b>	<b>S38</b>	<b>S39</b>	<b>S40</b>	<b>SNT4RP18K</b>

Instruction Leaflet Number 29C146

- ① Approximate unlatching time – 6 milliseconds.
- ② Approximate total circuit breaker contact opening time – 18 milliseconds.
- ③ Endurance – 5,000 electrical operations plus 1,000 mechanical operations.
- ④ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.
- ⑤ Listed with CSA and UL for field installation.
- ⑥ Standard mounting location – leads exit rear of breaker.
- ⑦ Suitable for use with Class 1 ground fault sensing element.
- ⑧ For use with KT (thermal-magnetic) trip units only.
- ⑨ Not for use on 4-pole circuit breaker.
- ⑩ For use with LT or MT (thermal-magnetic) 3-pole trip units only.
- ⑪ Suitable for use with the 48V and 60V rated Capacitor Trip Device (Style # 1283C62G03 and G02).
- ⑫ Suitable for use with the 120V rated Capacitor Trip Device (Style # 1283C62G01).
- ⑬ Breakers with K-Frame OPTIM 550 can only accept accessories in left pole.



# INTA-13 Series C Moulded Case Circuit Breakers

Internal Accessories Shunt Trip

## N-Frame and HMCP (N)

### Electrical Rating Data ①②③

50/60 Hz			Dc		
Supply Voltage	Minimum Operating Voltage	VA	Supply Voltage	Minimum Operating Voltage	VA
9	6	46	9	6	79
12	6	98	12	6	145
24	60	475	24	6	610
48	33.6	830	48	33.6	710
60		1280	60		1150
110 ④	60	100	110	77	110
120 ④		120	120		130
127 ④		140	125		140
208 ④		420	—	—	—
220 ④		470	—	—	—
240 ④		550	—	—	—
380	266	95	220	154	41
400		108	250	—	54
415		120	—	—	—
440		136	—	—	—
480	336	40	—	—	—
525		50	—	—	—
550		50	—	—	—
600		70	—	—	—

## Ordering Information Shunt Trip

Factory Mounted			Field Mounted		
Connection Type and Location			Field Installation Kits ⑤		
18-Inch Pigtail Leads			Terminal Block		
Same Side	Rear ⑥	Opposite Side	Same Side	Pigtail Leads	Terminal Block
Suffix Number			Catalogue Number		
<b>Voltage Rating (Ac Frequency = 50/60 Hz)</b>					
<b>Left-Pole Mounting Ac/Dc Ratings ⑥</b>					
9-24 Vac or 9-24 Vdc	<b>S01</b>	<b>S02</b>	<b>S03</b>	<b>S04</b>	<b>SNT5LP03K</b>
48-60 Vac	<b>S05</b>	<b>S06</b>	<b>S07</b>	<b>S08</b>	<b>SNT5LP05K</b>
110-240 Vac ④	<b>S09</b>	<b>S10</b>	<b>S11</b>	<b>S12</b>	<b>SNT5LP11K</b>
110-125 Vdc ⑧	<b>S41</b>	<b>S42</b>	<b>S43</b>	<b>S44</b>	<b>SNT5LP26K</b>
380-440 Vac or 220-250 Vdc	<b>S13</b>	<b>S14</b>	<b>S15</b>	<b>S16</b>	<b>SNT5LP14K</b>
480-600 Vac	<b>S17</b>	<b>S18</b>	<b>S19</b>	<b>S20</b>	<b>SNT5LP18K</b>
48-60 Vdc ⑦	<b>S21</b>	<b>S22</b>	<b>S23</b>	<b>S24</b>	<b>SNT5LP23K</b>

Instruction Leaflet Number 29C148

- ① Approximate unlatching time – 6 milliseconds.
- ② Approximate total circuit breaker contact opening time – 18 milliseconds.
- ③ Endurance – 3000 electrical operations plus 1000 mechanical operations.
- ④ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.
- ⑤ Listed with CSA and UL for field installation.
- ⑥ Standard mounting location – leads exit rear of breaker.
- ⑦ Suitable for use with the 48V and 60V rated Capacitor Trip Device (Style # 1283C62G03 and G02).
- ⑧ Suitable for use with the 120V rated Capacitor Trip Device (Style # 1283C62G01).

## R-Frame

### Electrical Rating Data

Suffix Number	Application Ratings		Electrical Operating Ratings ①②③④⑤⑥							
	Voltage (V)	Frequency (Hz)	Supply Voltage (V)	Minimum Operating Voltage (V)	I <sub>p</sub> (A)	I <sub>rms</sub> at 0.250s (A)	I <sub>rms</sub> at 0.033s (A)	VA	One Minute Dielectric Withstand Voltage (V)	
03/03K	24	50/60	24	16.8	71.1	–	50.3	1210	1050	
	24	Dc	24	16.8	–	36.1	–	870	1050	
05/05K	48-60	50/60	48	34.0	13.1	–	9.2	450	1120	
			60		17.2		12.2			740
11/11K ⑦	110-240	50/60	110	60.5	4.2	–	3.0	330	1480	
			120		4.5		3.2			390
			127		4.6		3.3			430
			208		7.9		5.6			1170
			220		8.5		6.0			1370
			240		8.7		6.1			1470
14/14K	380-440	50/60	380	266.0	4.5	–	3.2	1220	1880	
			415		5.0		3.6			1500
			440		5.3		3.7			1640
	220-250	Dc	220	154.0	–	2.4	–	530	1500	
			250		–		2.7			680
			–		–		–			–
18/18K	480-600	50/60	480	336.0	0.6	–	0.4	200	2200	
			525		0.7		0.5			270
			550		0.7		0.5			280
			600		0.8		0.6			360
23/23K	48-60	Dc	48	34.0	–	9.8	–	470	1120	
			60		–		11.6			700
26/26K	110-125	Dc	110	77.0	–	3.3	–	370	1250	
			120		–		3.6			440
			125		–		3.8			480

### Shunt Trip (RH only)

Voltage Rating (Ac Frequency = 50/60 Hz)	Factory Mounted	Field Mounted
	Connection Type and Location	Field Installation Kit s ⑧
Voltage Rating (Ac Frequency = 50/60 Hz)	18-Inch Pigtail Leads ⑨	Pigtail Leads
	Suffix Number ⑩	Catalogue Number ⑨
24 Vac or Vdc	<b>S21</b>	<b>SNT6P03K</b>
48-60 Vac	<b>S25</b>	<b>SNT6P05K</b>
110-240 Vac	<b>S29</b>	<b>SNT6P11K</b>
380-440 Vac or 220-250 Vdc	<b>S33</b>	<b>SNT6P14K</b>
480-600 Vac	<b>S37</b>	<b>SNT6P18K</b>
48-60 Vdc ⑪	<b>S88</b>	<b>SNT6P23K</b>
110-125 Vdc ⑫	<b>S45</b>	<b>SNT6P26K</b>

Instruction Leaflet Number 29C150

- ① Approximate unlatching time of 6 milliseconds.
- ② Average circuit breaker contact total opening time approximately 62 milliseconds, at rated voltage.
- ③ Endurance – 500 electrical operations and 2500 mechanical operations.
- ④ Shunt trip can be operated up to a maximum of six times per minute.
- ⑤ Maximum operating voltage – 110% of maximum voltage range rating.
- ⑥ Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>). Leads are yellow and white.
- ⑦ Suitable for use with Class 1 GFP devices; marking label supplied with accessory kit.
- ⑧ Listed with CSA and UL for field installation.
- ⑨ A maximum of two shunt trip plug-in modules may be installed in a circuit breaker.
- ⑩ Suitable for use with the 48V and 60V rated Capacitor Trip Device (Style # 1283C62G03 and G02).
- ⑪ Suitable for use with the 120V rated Capacitor Trip Device (Style # 1283C62G01).

# INTA-15 Series C Moulded Case Circuit Breakers

Internal Accessories Low Energy Shunt Trip

## Low Energy Shunt Trip

### General Information

Low energy shunt trip devices are designed to operate from low energy output signals from dedicated current sensors typically applied in ground fault protection schemes. However, with a proper control voltage source, they may be applied in place of conventional trip devices for special applications. Flux paths surrounding permanent magnets used in the shunt trip assembly hold a charged spring poised in readiness to operate the circuit breaker trip mechanism. When a 100 microfarad

capacitor charged to 28 Vdc is discharged through the shunt trip coil, the resultant flux opposes the permanent magnet flux field, which releases the stored energy in the spring to trip the circuit breaker. As the circuit breaker resets, the shunt trip reset arm is actuated by the circuit breaker handle, resetting the shunt trip. The plug-in module is mounted in retaining slots in the top of the trip unit. Coil is intermittent-rated only. Cutoff provisions required in control circuit.

**NOTE:** Shunt trips should not be used as circuit interlocks using maintained contact pilot devices.

### Ordering Information

#### F-, J-, K-, L-, M-, N-, R-Frames and HMCP (F), (J), (K), (L), (N)

**Note:** F-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

#### Low Energy Shunt Trip ①

Mounting Positions	Factory Mounted			Field Mounted		
	Connection Type and Location			Field Installation Kits ②		
	18-Inch Pigtail Leads		Terminal Block		Pigtail Leads	Terminal Block
	Same Side	Rear ③	Opposite Side	Same Side		
Suffix Numbers			Catalogue Numbers			
<b>F-Frame</b>						
Left Pole	<b>N01</b>	<b>N02</b>	<b>N03</b>	<b>N04</b>	<b>LST1LPK</b>	<b>LST1LTK</b>
Right Pole ③	<b>N05</b>	<b>N06</b>	<b>N07</b>	<b>N08</b>	<b>LST1RPK</b>	<b>LST1RTK</b>
<b>Instruction Leaflet Number 29C141</b>						
J-Frame						
Left Pole ③	<b>N01</b>	<b>N02</b>	<b>N03</b>	–	<b>LST2LPK</b>	–
Right Pole	<b>N05</b>	<b>N06</b>	<b>N07</b>	–	<b>LST2RPK</b>	–
<b>Instruction Leaflet Number 29C143</b>						
K-Frame						
Left Pole ③	<b>N01</b>	<b>N02</b>	<b>N03</b>	–	<b>LST3LPK</b>	–
Right Pole ④⑤	<b>N05</b>	<b>N06</b>	<b>N07</b>	–	<b>LST3RPK</b>	–
<b>Instruction Leaflet Number 29C145</b>						
L- and M-Frames						
Left Pole ③	<b>N01</b>	<b>N02</b>	<b>N03</b>	–	<b>LST4LPK</b>	–
Right Pole ④	<b>N05</b>	<b>N06</b>	<b>N07</b>	–	<b>LST4RPK</b>	–
<b>Instruction Leaflet Number 29C147</b>						
N-Frame						
Left Pole ③	<b>N01</b>	<b>N02</b>	<b>N03</b>	–	<b>LST5LPK</b>	–
<b>Instruction Leaflet Number 29C149</b>						
R-Frame						
Right Pole	<b>N01</b>	–	–	–	<b>LST6RPK</b>	–
<b>Instruction Leaflet Number 29C151</b>						

① Cutoff provisions required in control circuit.

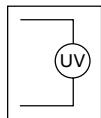
② Except F-Frame Breaker and HMCP, Field Installation kits for J-,K-,M-,N- and R-frames are listed with CSA and UL for field installation.

③ Standard mounting location – leads exit rear of breaker.

④ For use with thermal-magnetic trip units only.

⑤ Breakers with K-Frame OPTIM 550 can only accept accessories in left pole.

### Undervoltage Release Mechanism



### General Information

The undervoltage release mechanism monitors a voltage (typically a line voltage) and trips the circuit breaker when the voltage falls to between 70 and 35 percent of the solenoid coil rating.

The undervoltage release mechanism consists of a continuous rated solenoid with a plunger and tripping lever mounted in a plug-in module. The tab on the tripping lever resets the undervoltage release mechanism when normal voltage

has been restored and the circuit breaker handle is moved to the reset (or OFF) position. With less than pickup voltage applied to the undervoltage release mechanism, the circuit breaker contacts will not touch when a closing operation is attempted.

**Note:** Undervoltage release mechanism accessories are not designed for, and should not be used as, circuit interlocks.

### Ordering Information

Select handle reset undervoltage release mechanism catalogue number for the voltage within the indicated voltage range. Undervoltage release mechanism coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are shown on applicable circuit breaker accessory nameplates.

### G-Frame

**Note:** G-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory. Internal accessories are CSA and UL listed for factory installation.

### Undervoltage Release Mechanism ④ (LH 3-Pole only)

#### Electrical Ratings

Volts	Frequency	Amperes	Style Numbers ①②③	Factory Suffix
120	50/60 Hz	0.05	1373D62G03	T1
24	50/60 Hz	0.22	1373D62G04	T2
48	50/60 Hz	0.11	1373D62G05	T3
60	50/60 Hz	0.10	1373D62G06	T4
110	50 Hz	0.049	1373D62G07	T5
208	60 Hz	0.026	1373D62G08	T6
220	50 Hz	0.025	1373D62G09	T7
240	50/60 Hz	0.024	1373D62G10	T8
380	50 Hz	0.015	1373D62G11	T9
415	50 Hz	0.013	1373D62G12	T10
440	50 Hz	0.012	1373D62G13	T11
480	60 Hz	0.01	1373D62G14	T12

Instruction Leaflet Number 15553

① Includes 24 inch external pigtail leads, #18 AWG (16-.010).

② A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

③ Not listed with CSA and UL for field installation.

④ Pigtail leads exit left side of circuit breaker.

# INTA-17 Series C Moulded Case Circuit Breakers

Internal Accessories Undervoltage Release Mechanism

## F-Frame and HMCP (F)

**Note:** F-frame circuit breakers are factory sealed. CSA and UL require that internal accessories be installed at the factory.

Internal accessories are CSA and UL listed for factory installation.

## Electrical Rating Data ①

50/60 Hz					Dc				
Supply Voltage	Dropout Voltage		Pickup Voltage		Supply Voltage	Dropout Voltage		Pickup Voltage	
	Min.	Max.	Max.	VA		Min.	Max.	Max.	VA
12	4.2	6.3	7.6	1.3 2.5	12	4.2	8.4	10.2	2.8
24	8.4	16.8	20.4	1.4	24	8.4	16.8	20.4	1.6
48	21.0	33.6	40.8	1.2 1.9	48	21.0	33.6	40.8	1.3 2.0
60					60				
110	44.5	77.0	93.5	1.3	110	44.5	77.0	93.5	1.5
120				1.5	120				1.7
127				1.7	125				1.9
208	84.0	145.6	176.8	2.2	220	87.5	154.0	187.0	2.6
220				2.4	250				3.4
240				2.9	—	—	—	—	—
380	168.0	266.0	323.0	2.9	—	—	—	—	—
415				3.5	—	—	—	—	—
440				3.9	—	—	—	—	—
480				4.6	—	—	—	—	—
525	210.0	367.0	446.0	4.3	—	—	—	—	—
550				4.8	—	—	—	—	—
600				5.8	—	—	—	—	—

## Undervoltage Release Mechanism

Voltage Rating (Ac Freq = 50/60 Hz)	Factory Mounted (For F-Frame Breaker and F-Frame HMCP)				(F-Frame Breaker)		(F-Frame HMCP)	
	Connection Type and Location				Undervoltage Release Mechanism Kits ②			
	18-inch Pigtail Leads		Terminal Block		Pigtail Leads	Terminal Block	Pigtail Leads	Terminal Block
	Same Side	Rear ③	Opposite Side	Same Side				
Suffix Numbers				Catalogue Numbers				

### Left-Pole Mounting Ac Ratings

12 Vac	U01	U02	U03	U04	UVH1LP02K	UVH1LT02K	MUVH1LP02K	MUVH1LT02K
24 Vac	U05	U06	U07	U08	UVH1LP03K	UVH1LT03K	MUVH1LP03K	MUVH1LT03K
48 Vac	U37	U38	U39	U40	UVH1LP22K	UVH1LT22K	MUVH1LP22K	MUVH1LT22K
60 Vac	U97	U98	U99	U100	UVH1LP24K	UVH1LT24K	MUVH1LP24K	MUVH1LT24K
110-127 Vac	U13	U14	U15	U16	UVH1LP08K	UVH1LT08K	MUVH1LP08K	MUVH1LT08K
208-240 Vac	U17	U18	U19	U20	UVH1LP11K	UVH1LT11K	MUVH1LP11K	MUVH1LT11K
380-480 Vac	U21	U22	U23	U24	UVH1LP15K	UVH1LT15K	MUVH1LP15K	MUVH1LT15K
525-600 Vac	U25	U26	U27	U28	UVH1LP18K	UVH1LT18K	MUVH1LP18K	MUVH1LT18K

### Right-Pole Mounting Ac Ratings ④⑤

12 Vac	U49	U50	U51	U52	UVH1RP02K	UVH1RT02K	MUVH1RP02K	MUVH1RT02K
24 Vac	U53	U54	U55	U56	UVH1RP03K	UVH1RT03K	MUVH1RP03K	MUVH1RT03K
48 Vac	U85	U86	U87	U88	UVH1RP22K	UVH1RT22K	MUVH1RP22K	MUVH1RT22K
60 Vac	U101	U102	U103	U104	UVH1RP24K	UVH1RT24K	MUVH1RP24K	MUVH1RT24K
110-127 Vac	U61	U62	U63	U64	UVH1RP08K	UVH1RT08K	MUVH1RP08K	MUVH1RT08K
208-240 Vac	U65	U66	U67	U68	UVH1RP11K	UVH1RT11K	MUVH1RP11K	MUVH1RT11K
380-480 Vac	U69	U70	U71	U72	UVH1RP15K	UVH1RT15K	MUVH1RP15K	MUVH1RT15K
525-600 Vac	U73	U74	U75	U76	UVH1RP18K	UVH1RT18K	MUVH1RP18K	MUVH1RT18K

### Left-Pole Mounting Dc Ratings

12 Vdc	U29	U30	U31	U32	UVH1LP20K	UVH1LT20K	MUVH1LP20K	MUVH1LT20K
24 Vdc	U33	U34	U35	U36	UVH1LP21K	UVH1LT21K	MUVH1LP21K	MUVH1LT21K
48 Vdc	U37	U38	U39	U40	UVH1LP22K	UVH1LT22K	MUVH1LP22K	MUVH1LT22K
60 Vdc	U97	U98	U99	U100	UVH1LP24K	UVH1LT24K	MUVH1LP24K	MUVH1LT24K
110-127 Vdc	U41	U42	U43	U44	UVH1LP26K	UVH1LT26K	MUVH1LP26K	MUVH1LT26K
220-250 Vdc	U45	U46	U47	U48	UVH1LP28K	UVH1LT28K	MUVH1LP28K	MUVH1LT28K

### Right-Pole Mounting Dc Ratings ④⑤

12 Vdc	U77	U78	U79	U80	UVH1RP20K	UVH1RT20K	MUVH1RP20K	MUVH1RT20K
24 Vdc	U81	U82	U83	U84	UVH1RP21K	UVH1RT21K	MUVH1RP21K	MUVH1RT21K
48 Vdc	U85	U86	U87	U88	UVH1RP22K	UVH1RT22K	MUVH1RP22K	MUVH1RT22K
60 Vdc	U101	U102	U103	U104	UVH1RP24K	UVH1RT24K	MUVH1RP24K	MUVH1RT24K
110-127 Vdc	U89	U90	U91	U92	UVH1RP26K	UVH1RT26K	MUVH1RP26K	MUVH1RT26K
220-250 Vdc	U93	U94	U95	U96	UVH1RP28K	UVH1RT28K	MUVH1RP28K	MUVH1RT28K

Instruction Leaflet Number 29C160 (MCCB AND MCS) and 29C179 (HMCP)

① Endurance: 6000 electrical operations plus 4000 mechanical operations.

② Not listed with CSA and UL for field installation.

④ Standard mounting location.

③ Standard pigtail lead exit location.

⑤ Not for use on right pole of 4-pole circuit breaker.

# Series C Moulded Case Circuit Breakers **INTA-18**

Internal Accessories Undervoltage Release Mechanism

## J-Frame and HMCP (J)

### Electrical Rating Data ①②

50/60 Hz					Dc				
Supply Voltage	Dropout Voltage		Pickup Voltage		Supply Voltage	Dropout Voltage		Pickup Voltage	
	Min.	Max.	Max.	VA		Min.	Max.	Max.	VA
12	4.2	8.4	10.2	1.9	12	4.2	8.4	10.2	1.6
24	8.4	16.8	20.4	3.9	24	8.4	16.8	20.4	3.1
48	21.0	33.6	40.8	2.5	48	21.0	33.6	40.8	2.0
60				3.8	60				3.1
110	44.5	77.0	93.5	1.8	110				1.6
120				2.1	120	44.5	77.0	93.5	1.9
127				2.4	125				2.2
208	85.0	145.6	176.8	2.7	220	87.5	154.0	187.0	3.1
220				3.1	250				4.0
240				3.8	—	—	—	—	—
380	168.0	266.0	323.0	3.4	—	—	—	—	—
415				4.0	—	—	—	—	—
440				4.6	—	—	—	—	—
480				5.4	—	—	—	—	—

### Undervoltage Release Mechanism

Voltage Rating (Ac Freq = 50/60 Hz)	Factory Mounted				Field Mounted		
	Connection Type and Location				Field Installation Kits ③		
	18-inch Pigtail Leads		Terminal Block		Pigtail Leads	Terminal Block	Terminal Block
	Same Side	Rear ④	Opposite Side	Same Side			
	Suffix Numbers						
<b>Left-Pole Mounting Ac Ratings ⑤</b>							
12 Vac	<b>U05</b>	<b>U06</b>	<b>U07</b>	<b>U08</b>	<b>UVH2LP02K</b>	<b>UVH2LT02K</b>	
24 Vac	<b>U09</b>	<b>U10</b>	<b>U11</b>	<b>U12</b>	<b>UVH2LP03K</b>	<b>UVH2LT03K</b>	
48-60 Vac	<b>U13</b>	<b>U14</b>	<b>U15</b>	<b>U16</b>	<b>UVH2LP05K</b>	<b>UVH2LT05K</b>	
110-127 Vac	<b>U17</b>	<b>U18</b>	<b>U19</b>	<b>U20</b>	<b>UVH2LP08K</b>	<b>UVH2LT08K</b>	
208-240 Vac	<b>U21</b>	<b>U22</b>	<b>U23</b>	<b>U24</b>	<b>UVH2LP11K</b>	<b>UVH2LT11K</b>	
380-480 Vac	<b>U25</b>	<b>U26</b>	<b>U27</b>	<b>U28</b>	<b>UVH2LP15K</b>	<b>UVH2LT15K</b>	
<b>Right-Pole Mounting Ac Ratings ⑥</b>							
12 Vac	<b>U37</b>	<b>U38</b>	<b>U39</b>	<b>U40</b>	<b>UVH2RP02K</b>	<b>UVH2RT02K</b>	
24 Vac	<b>U41</b>	<b>U42</b>	<b>U43</b>	<b>U44</b>	<b>UVH2RP03K</b>	<b>UVH2RT03K</b>	
48-60 Vac	<b>U45</b>	<b>U46</b>	<b>U47</b>	<b>U48</b>	<b>UVH2RP05K</b>	<b>UVH2RT05K</b>	
110-127 Vac	<b>U49</b>	<b>U50</b>	<b>U51</b>	<b>U52</b>	<b>UVH2RP08K</b>	<b>UVH2RT08K</b>	
208-240 Vac	<b>U53</b>	<b>U54</b>	<b>U55</b>	<b>U56</b>	<b>UVH2RP11K</b>	<b>UVH2RT11K</b>	
380-480 Vac	<b>U57</b>	<b>U58</b>	<b>U59</b>	<b>U60</b>	<b>UVH2RP15K</b>	<b>UVH2RT15K</b>	
<b>Left-Pole Mounting Dc Ratings ⑤</b>							
12 Vdc	<b>T01</b>	<b>T02</b>	<b>T03</b>	<b>T04</b>	<b>UVH2LP20K</b>	<b>UVH2LT20K</b>	
24 Vdc	<b>T05</b>	<b>T06</b>	<b>T07</b>	<b>T08</b>	<b>UVH2LP21K</b>	<b>UVH2LT21K</b>	
48-60 Vdc	<b>T09</b>	<b>T10</b>	<b>T11</b>	<b>T12</b>	<b>UVH2LP23K</b>	<b>UVH2LT23K</b>	
110-127 Vdc	<b>T13</b>	<b>T14</b>	<b>T15</b>	<b>T16</b>	<b>UVH2LP26K</b>	<b>UVH2LT26K</b>	
220-250 Vdc	<b>T17</b>	<b>T18</b>	<b>T19</b>	<b>T20</b>	<b>UVH2LP28K</b>	<b>UVH2LT28K</b>	
<b>Right-Pole Mounting Dc Ratings ⑥</b>							
12 Vdc	<b>T21</b>	<b>T22</b>	<b>T23</b>	<b>T24</b>	<b>UVH2RP20K</b>	<b>UVH2RT20K</b>	
24 Vdc	<b>T25</b>	<b>T26</b>	<b>T27</b>	<b>T28</b>	<b>UVH2RP21K</b>	<b>UVH2RT21K</b>	
48-60 Vdc	<b>T29</b>	<b>T30</b>	<b>T31</b>	<b>T32</b>	<b>UVH2RP23K</b>	<b>UVH2RT23K</b>	
110-127 Vdc	<b>T33</b>	<b>T34</b>	<b>T35</b>	<b>T36</b>	<b>UVH2RP26K</b>	<b>UVH2RT26K</b>	
220-250 Vdc	<b>T37</b>	<b>T38</b>	<b>T39</b>	<b>T40</b>	<b>UVH2RP28K</b>	<b>UVH2RT28K</b>	

Instruction Leaflet Number 29C163

- ① Endurance: 6000 electrical operations plus 2000 mechanical operations.
- ② For electrical rating data for manual, automatic and electrical reset undervoltage release mechanisms, refer to Eaton's Electrical Group.
- ③ Listed with CSA and UL for field installation.
- ④ Standard pigtail lead exit location.
- ⑤ Standard mounting location.
- ⑥ Not for use on right pole of 4-pole circuit breakers.

# INTA-19 Series C Moulded Case Circuit Breakers

Internal Accessories Undervoltage Release Mechanism

## K-Frame and HMCP (K)

### Electrical Rating Data ①

50/60 Hz					Dc				
Supply Voltage	Dropout Voltage		Pickup Voltage	VA	Supply Voltage	Dropout Voltage		Pickup Voltage	VA
	Min.	Max.	Max.			Min.	Max.	Max.	
12	4.2	8.4	10.2	1.9	12	4.2	8.4	10.2	1.6
24	8.4	16.8	20.4	3.9	24	8.4	16.8	20.4	3.1
48	21.0	33.6	40.8	2.5	48	21.0	33.6	40.8	2.0
60				3.8	60				3.1
110	44.5	77.0	93.5	1.8	110				1.6
120				2.1	120	44.5	77.0	93.5	1.9
127				2.4	125				2.2
208	85.0	145.6	176.8	2.7	220	87.5	154.0	187.0	3.1
220				3.1	250				4.0
240				3.8	—	—	—	—	—
380	168.0	266.0	323.0	3.4	—	—	—	—	—
415				4.0	—	—	—	—	—
440				4.6	—	—	—	—	—
480				5.4	—	—	—	—	—

### Undervoltage Release Mechanism

Voltage Rating (Ac Freq = 50/60 Hz)	Factory Mounted			Field Mounted		
	Connection Type and Location			Field Installation Kits ②		
	18-inch Pigtail Leads		Terminal Block			
	Same Side	Rear ③	Opposite Side	Same Side	Pigtail Leads	Terminal Block
	Suffix Numbers			Catalogue Numbers		
<b>Left-Pole Mounting Ac Ratings ③</b>						
12 Vac	U05	U06	U07	U08	UVH3LP02K	UVH3LT02K
24 Vac	U09	U10	U11	U12	UVH3LP03K	UVH3LT03K
48-60 Vac	U13	U14	U15	U16	UVH3LP05K	UVH3LT05K
110-127 Vac	U17	U18	U19	U20	UVH3LP08K	UVH3LT08K
208-240 Vac	U21	U22	U23	U24	UVH3LP11K	UVH3LT11K
380-480 Vac	U25	U26	U27	U28	UVH3LP15K	UVH3LT15K
<b>Right-Pole Mounting Ac Ratings ④⑤</b>						
12 Vac	U37	U38	U39	U40	UVH3RP02K	UVH3RT02K
24 Vac	U41	U42	U43	U44	UVH3RP03K	UVH3RT03K
48-60 Vac	U45	U46	U47	U48	UVH3RP05K	UVH3RT05K
110-127 Vac	U49	U50	U51	U52	UVH3RP08K	UVH3RT08K
208-240 Vac	U53	U54	U55	U56	UVH3RP11K	UVH3RT11K
380-480 Vac	U57	U58	U59	U60	UVH3RP15K	UVH3RT15K
<b>Left-Pole Mounting Dc Ratings ③</b>						
12 Vdc	T01	T02	T03	T04	UVH3LP20K	UVH3LT20K
24 Vdc	T05	T06	T07	T08	UVH3LP21K	UVH3LT21K
48-60 Vdc	T09	T10	T11	T12	UVH3LP23K	UVH3LT23K
110-127 Vdc	T13	T14	T15	T16	UVH3LP26K	UVH3LT26K
220-250 Vdc	T17	T18	T19	T20	UVH3LP28K	UVH3LT28K
<b>Right-Pole Mounting Dc Ratings ④⑤</b>						
12 Vdc	T21	T22	T23	T24	UVH3RP20K	UVH3RT20K
24 Vdc	T25	T26	T27	T28	UVH3RP21K	UVH3RT21K
48-60 Vdc	T29	T30	T31	T32	UVH3RP23K	UVH3RT23K
110-127 Vdc	T33	T34	T35	T36	UVH3RP26K	UVH3RT26K
220-250 Vdc	T37	T38	T39	T40	UVH3RP28K	UVH3RT28K

Instruction Leaflet Number 29C166

① Endurance: 5,000 electrical operations plus 1,000 mechanical operations

② Listed with CSA and UL for field installation.

③ Standard mounting location — leads exit rear of breaker.

④ For use with KT (thermal-magnetic) trip units only.

⑤ Not for use on right pole of 4-pole circuit breaker.

# Series C Moulded Case Circuit Breakers **INTA-20**

Internal Accessories Undervoltage Release Mechanism

## L-, HMCP (L) and M-Frames

### Electrical Rating Data <sup>①</sup>

50/60 Hz					Dc				
Supply Voltage	Dropout Voltage		Pickup Voltage		Supply Voltage	Dropout Voltage		Pickup Voltage	
	Min.	Max.	Max.	VA		Min.	Max.	Max.	VA
12	4.2	8.4	10.2	1.9	12	4.2	8.4	10.2	1.6
24	8.4	16.8	20.4	3.9	24	8.4	16.8	20.4	3.1
48	21.0	33.6	40.8	2.5	48	21.0	33.6	40.8	2.0
60				3.8	60				3.1
110	44.5	77.0	93.5	1.8	110				1.6
120				2.1	120	44.5	77.0	93.5	1.9
127				2.4	125				2.2
208	85.0	145.6	176.8	2.7	220	87.5	154.0	187.0	3.1
220				3.1	250				4.0
240				3.8	—	—	—	—	—
380	168.0	266.0	323.0	3.4	—	—	—	—	—
415				4.0	—	—	—	—	—
440				4.6	—	—	—	—	—
480				5.4	—	—	—	—	—

### Undervoltage Release Mechanism

Voltage Rating (Ac Freq = 50/60 Hz)	Factory Mounted				Field Mounted		
	Connection Type and Location				Field Installation Kits <sup>②</sup>		
	18-inch Pigtail Leads			Terminal Block			
	Same Side	Rear <sup>③</sup>	Opposite Side	Same Side	Pigtail Leads	Terminal Block	
	Suffix Numbers			Catalogue Numbers			
<b>Left-Pole Mounting Ac Ratings <sup>③</sup></b>							
12 Vac	<b>U05</b>	<b>U06</b>	<b>U07</b>	<b>U08</b>	<b>UVH4LP02K</b>	<b>UVH4LT02K</b>	
24 Vac	<b>U09</b>	<b>U10</b>	<b>U11</b>	<b>U12</b>	<b>UVH4LP03K</b>	<b>UVH4LT03K</b>	
48-60 Vac	<b>U13</b>	<b>U14</b>	<b>U15</b>	<b>U16</b>	<b>UVH4LP05K</b>	<b>UVH4LT05K</b>	
110-127 Vac	<b>U17</b>	<b>U18</b>	<b>U19</b>	<b>U20</b>	<b>UVH4LP08K</b>	<b>UVH4LT08K</b>	
208-240 Vac	<b>U21</b>	<b>U22</b>	<b>U23</b>	<b>U24</b>	<b>UVH4LP11K</b>	<b>UVH4LT11K</b>	
380-480 Vac	<b>U25</b>	<b>U26</b>	<b>U27</b>	<b>U28</b>	<b>UVH4LP15K</b>	<b>UVH4LT15K</b>	
<b>Right-Pole Mounting Ac Ratings <sup>④⑤</sup></b>							
12 Vac	<b>U37</b>	<b>U38</b>	<b>U39</b>	<b>U40</b>	<b>UVH4RP02K</b>	<b>UVH4RT02K</b>	
24 Vac	<b>U41</b>	<b>U42</b>	<b>U43</b>	<b>U44</b>	<b>UVH4RP03K</b>	<b>UVH4RT03K</b>	
48-60 Vac	<b>U45</b>	<b>U46</b>	<b>U47</b>	<b>U48</b>	<b>UVH4RP05K</b>	<b>UVH4RT05K</b>	
110-127 Vac	<b>U49</b>	<b>U50</b>	<b>U51</b>	<b>U52</b>	<b>UVH4RP08K</b>	<b>UVH4RT08K</b>	
208-240 Vac	<b>U53</b>	<b>U54</b>	<b>U55</b>	<b>U56</b>	<b>UVH4RP11K</b>	<b>UVH4RT11K</b>	
380-480 Vac	<b>U57</b>	<b>U58</b>	<b>U59</b>	<b>U60</b>	<b>UVH4RP15K</b>	<b>UVH4RT15K</b>	
<b>Left-Pole Mounting Dc Ratings <sup>③</sup></b>							
12 Vdc	<b>T01</b>	<b>T02</b>	<b>T03</b>	<b>T04</b>	<b>UVH4LP20K</b>	<b>UVH4LT20K</b>	
24 Vdc	<b>T05</b>	<b>T06</b>	<b>T07</b>	<b>T08</b>	<b>UVH4LP21K</b>	<b>UVH4LT21K</b>	
48-60 Vdc	<b>T09</b>	<b>T10</b>	<b>T11</b>	<b>T12</b>	<b>UVH4LP23K</b>	<b>UVH4LT23K</b>	
110-127 Vdc	<b>T13</b>	<b>T14</b>	<b>T15</b>	<b>T16</b>	<b>UVH4LP26K</b>	<b>UVH4LT26K</b>	
220-250 Vdc	<b>T17</b>	<b>T18</b>	<b>T19</b>	<b>T20</b>	<b>UVH4LP28K</b>	<b>UVH4LT28K</b>	
<b>Right-Pole Mounting Dc Ratings <sup>④⑤</sup></b>							
12 Vdc	<b>T21</b>	<b>T22</b>	<b>T23</b>	<b>T24</b>	<b>UVH4RP20K</b>	<b>UVH4RT20K</b>	
24 Vdc	<b>T25</b>	<b>T26</b>	<b>T27</b>	<b>T28</b>	<b>UVH4RP21K</b>	<b>UVH4RT21K</b>	
48-60 Vdc	<b>T29</b>	<b>T30</b>	<b>T31</b>	<b>T32</b>	<b>UVH4RP23K</b>	<b>UVH4RT23K</b>	
110-127 Vdc	<b>T33</b>	<b>T34</b>	<b>T35</b>	<b>T36</b>	<b>UVH4RP26K</b>	<b>UVH4RT26K</b>	
220-250 Vdc	<b>T37</b>	<b>T38</b>	<b>T39</b>	<b>T40</b>	<b>UVH4RP28K</b>	<b>UVH4RT28K</b>	

Instruction Leaflet Number 29C170

- ① Endurance: 5000 electrical operations plus 1000 mechanical operations
- ② Listed with CSA and UL for field installation.
- ③ Standard mounting location — leads exit rear of breaker.
- ④ For use with LT (thermal-magnetic) trip units only.
- ⑤ Not for use on right pole of 4-pole circuit breaker.



# INTA-21 Series C Moulded Case Circuit Breakers

Internal Accessories Undervoltage Release Mechanism

## N-Frame and HMCP (N)

### Electrical Rating Data ①

50/60 Hz					Dc				
Supply Voltage	Dropout Voltage		Pickup Voltage		Supply Voltage	Dropout Voltage		Pickup Voltage	
	Min.	Max.	Max.	VA		Min.	Max.	Max.	VA
12	4.2	8.4	10.2	1.9	12	4.2	8.4	10.2	1.6
24	8.4	16.8	20.4	3.9	24	8.4	16.8	20.4	3.1
48	21.0	33.6	40.8	2.5	48	21.0	33.6	40.8	2.0
60				3.8	60				3.1
110	44.5	77.0	93.5	1.8	110	44.5	77.0	93.5	1.6
120				2.1	120				1.9
127				2.4	125				2.2
208	84.0	145.6	176.8	2.7	220	87.5	154.0	187.0	3.1
220				3.1					
240				3.8	250	–	–	–	4.0
380	175.0	266.0	323.0	3.4	–	–	–	–	–
415				4.0	–	–	–	–	–
480				4.6	–	–	–	–	–
500				5.4	–	–	–	–	–

### Undervoltage Release Mechanism

Voltage Rating (Ac Freq = 50/60 Hz)	Factory Mounted			Field Mounted		
	Connection Type and Location			Field Installation Kits ②		
	18-inch Pigtail Leads			Terminal Block		
	Same Side	Rear ③	Opposite Side	Same Side	Pigtail Leads	Terminal Block
	Suffix Numbers			Catalogue Numbers		
<b>Left-Pole Mounting Ac Ratings ③</b>						
12 Vac	<b>U05</b>	<b>U06</b>	<b>U07</b>	<b>U08</b>	<b>UVH5LP02K</b>	<b>UVH5LT02K</b>
24 Vac	<b>U09</b>	<b>U10</b>	<b>U11</b>	<b>U12</b>	<b>UVH5LP03K</b>	<b>UVH5LT03K</b>
48-60 Vac	<b>U13</b>	<b>U14</b>	<b>U153</b>	<b>U16</b>	<b>UVH5LP05K</b>	<b>UVH5LT05K</b>
110-127 Vac	<b>U17</b>	<b>U18</b>	<b>U19</b>	<b>U20</b>	<b>UVH5LP08K</b>	<b>UVH5LT08K</b>
208-240 Vac	<b>U21</b>	<b>U22</b>	<b>U23</b>	<b>U24</b>	<b>UVH5LP11K</b>	<b>UVH5LT11K</b>
380-480 Vac	<b>U25</b>	<b>U26</b>	<b>U27</b>	<b>U28</b>	<b>UVH5LP29K</b>	<b>UVH5LT29K</b>
<b>Left-Pole Mounting Dc Ratings ③</b>						
12 Vdc	<b>T01</b>	<b>T02</b>	<b>T03</b>	<b>T04</b>	<b>UVH5LP20K</b>	<b>UVH5LT20K</b>
24 Vdc	<b>T05</b>	<b>T06</b>	<b>T07</b>	<b>T08</b>	<b>UVH5LP21K</b>	<b>UVH5LT21K</b>
48-60 Vdc	<b>T09</b>	<b>T10</b>	<b>T11</b>	<b>T12</b>	<b>UVH5LP23K</b>	<b>UVH5LT23K</b>
110-127 Vdc	<b>T13</b>	<b>T14</b>	<b>T15</b>	<b>T16</b>	<b>UVH5LP26K</b>	<b>UVH5LT26K</b>
220-250 Vdc	<b>T17</b>	<b>T18</b>	<b>T19</b>	<b>T20</b>	<b>UVH5LP28K</b>	<b>UVH5LT28K</b>

Instruction Leaflet Number 29C174

① Endurance: 3000 electrical operations plus 1000 mechanical operations.

② Listed with CSA and UL for field installation.

③ Standard mounting location – leads exit rear of breaker.

### R-Frame

#### Ac Undervoltage Release Mechanism (Handle Reset) Ratings ①②

Application Ratings		Electrical Operating Ratings				Approximate Operating Time (ms)				
Catalogue Suffix	Voltage (V)	Supply Voltage (V)	Dropout Voltage (V)		Pickup Voltage (V) Max.	VA	Min. ③ UVR Response	Initiation ④ Circuit Breaker Contact Separation	Maximum Circuit Breaker Contact Opening	Dielectric ⑤ Withstand Voltage (V)
			Min.	Max.						
02/02K	12	12	4.2	8.4	10.2	2.3	5	46	77	1024
03/03K	24	24	8.4	16.8	20.4	3.1	5	46	77	1048
05/05K	48-60	48 60	21.0	33.5	40.8	3.4 6.0	5	46	77	1120
08/08K	110-127	110 120 127	44.5	77.0	93.5	3.3 3.6 3.8	5	46	77	1254
11/11K	208-240	208 220 240	84.0	145.6	176.8	4.2 6.6 7.2	5	46	77	1480
29/29K	380-500	380 415 440 480 500	168.0	266.0	323.0	3.8 8.3 8.8 9.6 10.0	5	46	77	2000

#### Dc Undervoltage Release Mechanism (Handle Reset) Ratings ①②

Application Ratings		Electrical Operating Ratings				Approximate Operating Time (ms)				
Catalogue Suffix	Voltage (V)	Supply Voltage (V)	Dropout Voltage (V)		Pickup Voltage (V) Max.	VA	Min. ③ UVR Response	Initiation ④ Circuit Breaker Contact Separation	Maximum Circuit Breaker Contact Opening	Dielectric ⑤ Withstand Voltage (V)
			Min.	Max.						
20/20K	12	12	4.2	8.4	10.2	3.4	5	46	77	1024
21/21K	24	24	8.4	16.8	20.4	4.3	5	46	77	1048
23/23K	48-60	48 60	21.0	33.5	40.8	4.8 7.2	5	46	77	1120
26/26K	110-127	110 120 125	43.8	77.0	93.5	3.3 3.6 3.8	5	46	77	1250
28/28K	220-250	220 250	87.5	154.0	187.0	6.6 7.5	5	46	77	1500

#### Undervoltage Release Mechanism (RH only)

Voltage Rating (Ac Freq = 50/60 Hz)	Factory Mounted	Field Mounted
	Connection Type and Location	Field Installation Kits ⑥
	18-inch Pigtail Leads	Pigtail Leads
	Suffix Numbers ⑦	Catalogue Numbers ⑦
12 Vac	<b>U37</b>	<b>UVH6RP02K</b>
24 Vac	<b>U41</b>	<b>UVH6RP03K</b>
48-60 Vac	<b>U45</b>	<b>UVH6RP05K</b>
110-127 Vac	<b>U49</b>	<b>UVH6RP08K</b>
208-240 Vac	<b>U53</b>	<b>UVH6RP11K</b>
380-500 Vac	<b>U57</b>	<b>UVH6RP29K</b>
12 Vdc	<b>T21</b>	<b>UVH6RP20K</b>
24 Vdc	<b>T25</b>	<b>UVH6RP21K</b>
48-60 Vdc	<b>T29</b>	<b>UVH6RP23K</b>
110-125 Vdc	<b>T33</b>	<b>UVH6RP26K</b>
220-250 Vdc	<b>T37</b>	<b>UVH6RP28K</b>

Instruction Leaflet Number 29C178

- ① Endurance – 500 electrical operations plus 2500 mechanical operations.
- ② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>). Leads are orange and brown.
- ③ UVR will override a momentary voltage dip up to the response time shown.
- ④ Unlatching occurs 1 millisecond before circuit breaker contacts begin to separate.
- ⑤ For 1 minute.
- ⑥ Listed with CSA and UL for field installation.
- ⑦ A maximum of two UVR plug-in modules may be installed in a circuit breaker.

# INTA-23 Series C Moulded Case Circuit Breakers

Internal Accessories / Accessory Terminal Block / PowerNet and Zone Interlock Kit (OPTIM 550 only)

## Accessory Terminal Block (R-Frame)

(For Fixed Mounted Configuration)



### General Information

Internal accessory wiring leads are normally supplied with pigtail leads (No. 18 AWG) that exit from the right side of the circuit breaker. Where specified, fixed mounted accessory terminal blocks are available. A maximum of one 24-point terminal block can be installed on the right side of the circuit breaker for the internal accessories.

For convenience in determining the appropriate number of terminal block points required, refer to table at right.

### Number of Control Wires For Each Internally Mounted Accessories

Type of Accessory	Number of Contacts Per Single Accessory	Required Number of Wires
Auxiliary Switch	2a/2b	6
	4a/4b	12
Alarm (Signal)/ Lockout Switch	1m/1b	6
	2m/2b	12
Shunt Trip	N/A	2
Low Energy Shunt	N/A	2
Undervoltage Release Mechanism	N/A	2

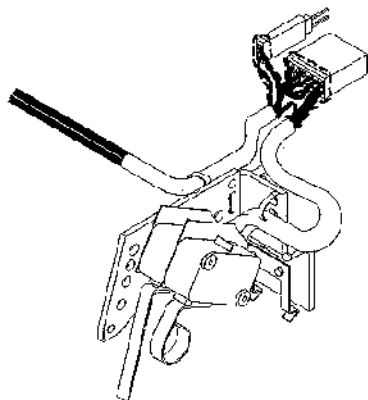
### Ordering Information ①

Factory Installed	Field Mounted
Suffix Number	Catalogue Number
<b>Q01</b>	<b>TBRDK</b>

Instruction Leaflet Number 29C312

① One 24-point accessory terminal block provided with circuit breaker when ordered factory installed or shipped from warehouse as separate item when ordered for field installation. See Digitrip RMS master connection diagram (IL 29C714).

## Eaton's PowerNet and Zone Interlock Kits (OPTIM 550 only) K-, L-, and N-Frames



### General Information

Eaton's PowerNet Communications Kit can be ordered to add PowerNet communications to an existing OPTIM 550 breaker in the field. An 18-inch wiring pigtail is routed to the rear of the breaker: two wires for PowerNet and two wires for 24V Dc (45 mA load). It is recommended that the power supply be an "isolated high quality" unit.

### Ordering Information ①

Circuit Breaker	PowerNet Kit		Zone Interlocking/ Ground Kit ②		PowerNet & Zone Interlocking/ Ground Kit ②	
	Catalogue Number	Factory Install Suffix ③	Catalogue Number	Factory Install Suffix ③	Catalogue Number	Factory Install Suffix ③
K-Frame	ICK550K	PN	ZGK550K	ZG	ZGPK550K	ZGP
L-Frame	ICK550L	PN	ZGK550L	ZG	ZGPK550L	ZGP
N-Frame	ICK550N	PN	ZGK550N	ZG	ZGPK550N	ZGP

① Installation of these kits restrict any other attachments from being installed in the RH pole.

② Includes a ground fault alarm signal which can drive the Ground Fault Alarm unit (Catalogue Number GFAU).

③ For factory installation charge of these kits, please refer to the Breaker Accessories/Modifications sections in Eaton's MCCB Price List for details.

**Note:** Instruction Leaflet Numbers (K) 29C506, (L) 29C897, (N) 29C898

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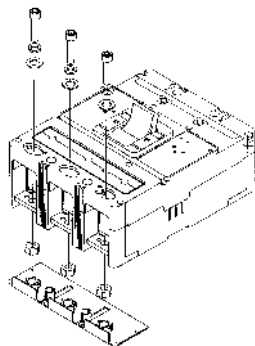
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# EXTA-2 Series C Moulded Case Circuit Breakers

External Accessories Termination Hardware

## End Cap Kit



## End Cap Kit

The End Cap Kit slides onto the line or load conductor of the circuit breaker and acts as a threaded adapter for the conductor to accept a ring terminal or other bolt-on connector. The end cap kit is available with English and metric thread sizes. (Field installation only). CSA and UL listed.

### End Cap Kit Ordering Information

Thread Type	Thread Size	Catalogue Number
<b>2-Pole F-Frame</b>		
Imperial	10-32	<b>KPEK12</b>
Metric	M-5	<b>KPEKM12</b>
<b>3-Pole F-Frame</b>		
Imperial	10-32	<b>KPEK1</b>
Metric	M-5	<b>KPEKM1</b>
<b>4-Pole F-Frame</b>		
Imperial	10-32	<b>KPEK14</b>
Metric	M-5	<b>KPEKM14</b>
<b>3-Pole J-Frame</b>		
Imperial	.312-32	<b>KPEK2</b>
Metric	M-8	<b>KPEKM2</b>
<b>4-Pole J-Frame</b>		
Imperial	.312-32	<b>KPEK24</b>
Metric	M-8	<b>KPEKM24</b>
<b>3-Pole K-Frame</b>		
Imperial	.312-32	<b>KPEK3</b>
Metric	M-8	<b>KPEKM3</b>
<b>4-Pole K-Frame</b>		
Imperial	.312-32	<b>KPEK34</b>
Metric	M-8	<b>KPEKM34</b>
<b>3-Pole L-Frame</b>		
Imperial	.312-32	<b>KPEK4</b>
Metric	M-8	<b>KPEKM4</b>
<b>4-Pole L-Frame</b>		
Imperial	.312-32	<b>KPEK44</b>
Metric	M-8	<b>KPEKM44</b>

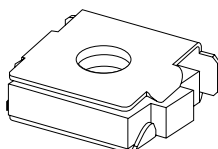
## Keeper Nut

The Keeper Nut slides onto the line or load conductor of the circuit breaker and acts as a threaded adapter for the conductor to accept a ring terminal or other bolt-on connector. The keeper nut is available with English and metric thread sizes. Screws and washers are supplied by customer. (Field installation only). CSA and UL listed.

### F-Frame Keeper Nut Ordering Information

Thread Type	Thread Size	Catalogue Number
Imperial	10-32	<b>KPR1A</b>
Metric	M-5	<b>KPR1AM</b>

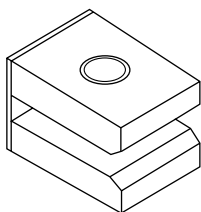
## F-Frame Keeper Nut



### K-Frame Keeper Nut Ordering Information

Thread Type	Thread Size	Line/Load End	Catalogue Number (Package of 3)
Imperial	.375-16	Line Load	<b>KPR3A</b> <b>KPR3B</b>
Metric	M-8	Line Load	<b>KPR3AM</b> <b>KPR3BM</b>

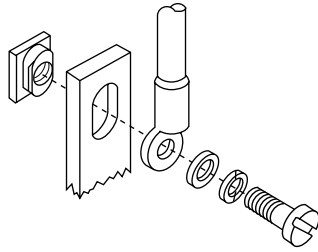
## K-Frame Keeper Nut



## L-, M-, N-Frames

Not required. Terminals are threaded.

### Plug Nut



#### J-Frame Plug Nut

The Plug Nut is used in applications where screw-connected ring-type terminals are preferred to connect cables to circuit breaker conductors. The plug nut is press-fit into the opening in the circuit breaker terminal conductor. Screws and washers are supplied by customer.

#### J-Frame Plug Nut Ordering Information

Thread Type	Thread Size	Catalogue Number Package of 6
Imperial	.250-20	<b>PLN2</b>
Metric	M-6	<b>PLN2M</b>

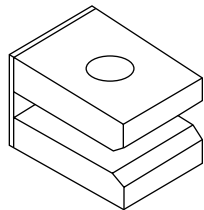
### Terminal Adapter

#### K-Frame Terminal Adapter Ordering Information <sup>①</sup>

Line/Load End	Catalogue Number Package of 3
Line & Load	<b>TAD3</b>

<sup>①</sup> K-Frame terminal adapter for use in replacing LB/DA breakers.

#### K-Frame Terminal Adapter

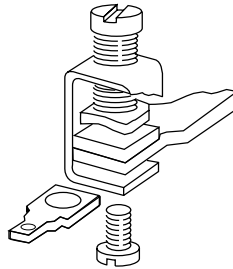


### Control Wire Terminal Kit

#### G-Frame Control Wire Terminal

Description	Style Number	Catalogue Number
Control Wire Terminal (Kit of 12)	<b>5652B38G01</b>	<b>GCWTK</b>

#### F-Frame Kit



The Control Wire Terminal Kit provides a means to tap off control power from a main disconnect, using the provided male end of a quick disconnect.

**Note:** Not for use with 3T20FB terminal.

#### F-Frame Ordering Information

Package of 12 control wire terminal tangs. Terminals must be ordered separately. Priced individually.

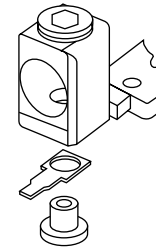
#### F-Frame Control Wire Terminal Kit

Max. Amperes	Catalogue Number
150	<b>FCWTK<sup>②</sup></b>
225	<b>FCWTK225<sup>③</sup></b>

<sup>②</sup> For use with steel terminal 3T100FB or stainless steel terminal 3T150FB.

<sup>③</sup> For use with Aluminum terminal TA225FD.

### J- and K-Frame Kit



Not for use with T250KB terminals.

#### J- and K-Frame Ordering Information

Package of 12 control wire terminal tangs. Terminals must be ordered separately. Priced individually.

#### J- and K-Frame Control Wire Terminal Kit Ordering Information

Catalogue Number
<b>KCWTK</b>

#### L-Frame Control Wire Terminal Kit Ordering Information

AWG Wire Range/Number Conductors	Metric Wire Range mm <sup>2</sup>	Catalogue Number
Al/Cu (2) 250 – 350 kcmil	120-150	<b>TA602LDCW<sup>④</sup></b>
Cu (2) 3/0 – 350 kcmil	120-150	<b>T602LDCW<sup>④</sup></b>
Al/Cu (2) 400 – 500 kcmil	185-240	<b>2TA603LDKCW<sup>⑤</sup></b> 2-Pole Kit
Al/Cu (2) 400 – 500 kcmil	185-240	<b>3TA603LDKCW<sup>⑤</sup></b> 3-Pole Kit
Al/Cu (2) 400 – 500 kcmil	185-240	<b>4TA603LDKCW<sup>⑤</sup></b> 4-Pole Kit

<sup>④</sup> Individually packed.

<sup>⑤</sup> Terminal kits contain one terminal for each pole and one terminal cover.

# EXTA-4 Series C Moulded Case Circuit Breakers

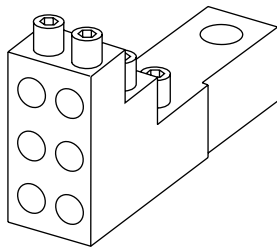
External Accessories Multiwire Connectors

## Multiwire Connectors

Field-installed Multiwire Connectors for the load side (OFF) end terminals. They are used to distribute the load from the circuit breaker to multiple devices without the use of separate distribution terminal blocks.

Multiwire lug kits include mounting hardware, insulators and tin-plated aluminum connectors to replace three mechanical load lugs. CSA and UL listed for copper only as used on the load side (OFF) end.

## Multiwire Connectors



## Multiwire Connectors Ordering Information (Package of 3)

Maximum Amperes	Wires per Terminal	Wire Size Range AWG Cu	Kit Catalogue Number
<b>G-Frame</b>			
100	3	14-2	<b>3TA100G3K</b>
100	6	14-6	<b>3TA100G6K</b>
<b>F-Frame</b>			
225	3	14-2	<b>3TA150F3K</b>
225	6	14-6	<b>3TA150F6K</b>
<b>J-Frame</b>			
225	3	14-2	<b>3TA250J3K</b>
225	6	14-6	<b>3TA250J6K</b>
<b>K-Frame</b>			
400	3	14-2/0	<b>3TA400K3K</b>
400	6	14-3	<b>3TA400K6K</b>

## Base Mounting Hardware

### Ordering Information

Hardware for surface mounting of circuit breakers is supplied only on request. Hardware consists of mounting screws and lockwashers. Order hardware for circuit breaker pole configurations as required.

### Mounting Hardware

Screw Length Inches (mm)	Catalogue Number
<b>G-Frame</b>	
.138-32 x 2.625 (66.7 mm) Std.	<b>624B375G23</b>
.138-32 x 3.000 (76.2 mm)	<b>8703C80G05</b>

## Imperial Thread Mounting Hardware

Number of Poles	Description	Type of Mounting	Catalogue Number
<b>F-Frame</b>			
1	.164-32 x 3.188-inch Pan-Head Steel Screws, Lockwashers, and Clamps	Individual Group (one set of hardware for two circuit breakers)	<b>MHDF11</b> <b>MHDF21</b>
2	.164-32 x 1.5-inch Pan-Head Steel Screws and Lockwashers	Individual	<b>MHDF2</b>
3, 4	.164-32 x 1.5-inch Pan-Head Steel Screws and Lockwashers	Individual	<b>MHDF3</b>
<b>J-Frame</b>			
2, 3, 4	.250-20 x 2.75 inch Pan-Head Steel Screws and Lockwashers	Individual	<b>BMH2</b>
<b>K-Frame</b>			
2, 3, 4	.250-20 x 1.5 inch Pan-Head Steel Screws and Lockwashers	Individual	<b>MHDK3</b>
<b>L-Frame</b>			
2, 3, 4	.250-20 x 1.5 inch Filister-Head Steel Screws and Lockwashers and Flat Washers	Individual	<b>BMH4</b>
<b>M-Frame</b>			
2, 3	.3125-18 x 1.25 inch Filister-Head Steel Screws and Lockwashers and Flat Washers	Individual	<b>BMH5</b>
<b>N-Frame</b>			
2, 3, 4	.3125-18 x 1.25 inch Pan-Head Steel Screws and Lockwashers	Individual	<b>BMH5</b>
<b>R-Frame</b>			
Supplied by customer			

## Metric Thread Mounting Hardware

Number of Poles	Description	Type of Mounting	Catalogue Number
<b>F-Frame</b>			
1	M4 – 0.7 x 80 mm Pan-Head Steel Screws, Lockwashers, and Clamps	Individual Group (one set of hardware for two circuit breakers)	<b>4218B80G09</b> <b>4218B80G10</b>
2	M4 – 0.7 x 38 mm Pan-Head Steel Screws and Lockwashers	Individual	<b>4218B80G11</b>
3, 4	M4 – 0.7 x 38 mm Pan-Head Steel Screws and Lockwashers	Individual	<b>BMH1M</b>
<b>J-Frame</b>			
2, 3, 4	M6 – 0.7 x 70mm Pan-Head Steel Screws and Lockwashers	Individual	<b>BMH2M</b>
<b>K-Frame</b>			
2, 3, 4	M6 – 0.7 x 38mm Pan-Head Steel Screws and Lockwashers	Individual	<b>BMH3M</b>
<b>L-Frame</b>			
2, 3	—	Individual	<b>BMH4M</b>
<b>M-Frame</b>			
2, 3	—	Individual	<b>BMH5M</b>
<b>N-Frame</b>			
2, 3	—	Individual	<b>BMH5M</b>
<b>R-Frame</b>			
Supplied by customer			



# EXTA-6 Series C Moulded Case Circuit Breakers

External Accessories Drawout Cassette

## Drawout Cassette



### Product Description

The Drawout Cassette is currently for use with the standard 3-pole 50 kA/600V AC, 1600A and 2000A RD and RDC circuit breakers only. It consists of two separate components: the movable mechanism which is factory mounted to the circuit breaker frame (shown in figure) 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.

Movable mechanism must be ordered with RD or RDC 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.

### RD Drawout Cassette Ordering Information

Description	Catalogue Number
<b>50 kA/600V AC Version</b>	
Movable Mechanism	<b>RD20DOM</b>
Stationary Mechanism	<b>RD20DOS</b> (without shutters) <b>RD20DOSS</b> (with shutters)
<b>65 kA/600V AC Version</b>	
Movable Mechanism	<b>RDC20DOM</b>
Stationary Mechanism	<b>RDC20DOS</b> (without shutters) <b>RDC20DOSS</b> (with shutters)

**Note:** Instruction Leaflet Number 32697

### Terminal Shields

Terminal Shields provide protection against accidental contact with live line side terminations. Terminal shields are fabricated from high dielectric insulating material and fasten over the front terminal access openings. Small openings in the shields provide limited access to the terminals for tightening connectors. (Field installation only). CSA listed.

#### G-Frame Terminal Shield

Number Units in Package	Catalogue Number
10	GTSK3

### F-Frame



#### F-Frame Terminal Shield

Number of Poles	Location	Standard (Package of 10) (Priced Individually)	Special — For use when electrical operator is mounted on circuit breaker
		Catalogue Number	Catalogue Number
1	Line	625B229G06 (TS11K)	—
2		625B229G07 (TS12K)	—
3		625B229G08 (TS13K)	4210B95G01
4		625B229G09 (TS14K)	4210B95G02

### J-Frame



#### J-Frame Terminal Shield

Number of Poles	Location	Catalogue Number (Package of 10)
2,3	Line End	1266C07G01
4		6631C01G01
2,3	Load End	6641C16G01
4		6641C16G02

### L-Frame



#### L-Frame Terminal Shield

Catalogue Number (Package of 1)
314C420G05

### K-Frame



#### K-Frame Terminal Shield

Number of Poles	Location	Catalogue Number
2, 3	Line	TS33LN (Package of 10)
4	Line	TS34LN (Package of 10)
3	Load	TS33LD (Package of 1)

### M-Frame



#### M-Frame Terminal Shield

Catalogue Number (Package of 10)
208B966G01

# EXTA-8 Series C Moulded Case Circuit Breakers

External Accessories Terminal Shields and End Covers

## Terminal End Covers

### F-Frame



### Product Description

The Terminal End Covers are designed for use in motor control centre applications where, because of confined spaces, line side conductors are normally custom fitted. The moulded end covers are made of high dielectric glass-polyester and slide over the line ends of the circuit breaker. Close fitting conductor openings are moulded into the end covers. The end cover and circuit breaker case fit together to form terminal compartments that isolate discharged ionizing gases during circuit breaker tripping. Terminal end covers are available with two conductor opening diameters, 0.25-inch (6.4 mm) and 0.41-inch (10.4 mm), and are listed with CSA and UL. (Field installation only).

### Ordering Information

The terminal end cover is available for 3-pole circuit breakers only. Two conductor opening sizes are available. Specify quantity (one per circuit breaker) when ordering.

### F-Frame Terminal End Covers

Conductor Opening Diameter in Inches (mm)	Catalogue Number
0.25 (6.35 mm)	TEC1
0.41 (10.41 mm)	TEC2

## Interphase Barriers

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



### Interphase Barriers

Frame	Catalogue Number
F	IPB1
J, K	IPB3
L	IPB4
M	IPB4
N	IPB5

## Base Mounting Plate



Suitable for mounting (6) single-pole circuit breakers.

### Base Mounting Plate G-Frame GD/GC/GHC /GCH Ordering Information

Number Units in Package	Catalogue Number
1	207B513G01

## DIN Rail Adapter



For use with standard 35 mm DIN Rail such as, 35 x 7.5 or 35 x 15 mm per DIN EN50022.

Adapter mounting screws included are for use with 2- and 3-pole circuit breakers. Adapters for 1-pole circuit breakers (pictured above) clip into the base moulding.

### DIN Rail Adapter G-Frame GD/GC/GHC/GCH Ordering Information

Poles	Number Units in Package	Catalogue Number
1-2-Pole	10	1225C79G01
3-Pole	10	1225C79G02 <sup>①</sup> (GDIN)

<sup>①</sup> For use on 3-pole breakers only.

**Note:** Instruction Leaflet Number (1-2P) 15542 and (3P) 29C091

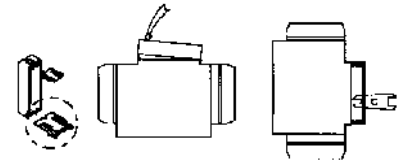
## Key Operated Attachment

### Key Operated Attachment G-Frame GD/GC/GHC/GCH Ordering Information

Number Units in Package	Catalogue Number
1	GK0A

**Note:** Instruction Leaflet Number 29C090

### Key Operated Attachment



# EXTA-10 Series C Moulded Case Circuit Breakers

External Accessories Handle Locking and Blocking Devices

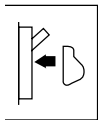
## Lock Dog (non-padlockable)



### G-Frame GD/GC/GHC/GCH/GB/GHB/GBH/GMCP Ordering Information

Number Units in Package	Catalogue Number
1	1294C01H01

## Non-padlockable Handle Block



The Non-padlockable Handle Block secures the circuit breaker handle in either the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle block holds the circuit breaker handle in the ON position.) The device is positioned over the circuit breaker handle and secured by a setscrew to deter accidental operation of the circuit breaker handle. CSA and UL listed. (Field installation only).

### Ordering Information

Frame	Catalogue Number
F	LKD1
J, K	LKD3
L, M, N	LKD4

## Snap-On Padlockable Handle Lock Hasp



### G-Frame GD/GC/GHC/GCH/GB/GHB/GBH Ordering Information

Number Units in Package	Catalogue Number <sup>①</sup>
10	1223C77G03 (GPLK)
10	1223C77G05 <sup>②</sup> (GPLKOFF)

<sup>①</sup> Accepts .285 Lock Shank

<sup>②</sup> Padlockable in the OFF position only.



The Snap-On Padlockable Handle Lock allows the handle to be locked in the OFF or ON position. (Trip-free operation allows the circuit breaker to trip when the handle lock holds the circuit breaker handle in the ON position.) This device was designed for use on the 1-pole circuit breaker, but may be used on 1-, 2-, 3- and 4-pole styles. The handle lock snaps onto the escutcheon area of the handle with an optional retaining screw for added secureness. The handle lock will accommodate one padlock with a 1/4-inch (6 mm) shackle. CSA and UL listed. (Field installation only).

### Ordering Information

Frame	Catalogue Number
F	PHL1

## Padlockable Handle Block



The device is positioned in the cover opening to prevent handle movement. Will accommodate one 5/16 padlock.

### Ordering Information

Frame	Catalogue Number
G	GPHBOFF
J, K	PHB3

## Padlockable Handle Lock Hasp



The Padlockable Handle Lock Hasp allows the handle to be locked in the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle lock holds the circuit breaker handle in the ON position.) The hasp mounts on the circuit breaker cover within the trimline. The cover is predrilled on both sides of the operating handle so that the hasp can be mounted on either side of the handle. The hasp will accommodate up to three padlocks with 1/4-inch (6 mm) shackles, one per circuit breaker. Listed per UL File E7819. (Field installation only.)

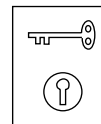
## Ordering Information

Description	Catalogue Number
<b>F-Frame</b>	
1-pole breakers	<b>PHL1</b>
2-, 3-, 4-pole breakers	<b>PLK1</b>
For Left Side Mounting	<b>PLK1LOFF</b>
For Right Side Mounting	<b>PLK1ROFF</b>
<b>J, K-Frames</b>	
2-, 3-, 4-pole breakers	<b>PLK3</b>
For Left Side Mounting	<b>PLK3LOFF</b> <sup>①</sup>
For Right Side Mounting	<b>PLK3ROFF</b> <sup>①</sup>
<b>L-Frame (Side Mounted)</b>	
Lock ON or OFF	<b>HLK4</b>
Lock OFF Only (Left-Hand Mount)	<b>HLK4LOFF</b> <sup>①</sup>
<b>L-Frame (Top Mounted)</b>	
Lock ON or OFF	<b>HLK4S</b>
Lock OFF Only	<b>HLK4SOFF</b> <sup>①</sup>
<b>M-Frame</b>	
Lock ON or OFF	<b>HLK4</b>
Lock OFF Only (Left-Hand Mount)	<b>HLK4LOFF</b> <sup>①</sup>
<b>M-Frame (Vertical Mounting)</b>	
Lock ON/OFF	<b>HLK4S</b>
Lock OFF Only	<b>HLK4SOFF</b>
<b>N-Frame</b>	
Side Mounted	<b>PLK5</b>
Top Mounted (ON/OFF)	<b>PLK5S</b>
Top Mounted (OFF Only)	<b>PLK5SOFF</b> <sup>①</sup>
<b>R-Frame</b>	
Lock ON/OFF	<b>HLK6</b>
Lock OFF Only	<b>HLK6OFF</b> <sup>①</sup>

<sup>①</sup> For padlockable handle lock hasp to padlock handle in OFF position only order either Catalogue Number.

**Note:** Instruction Leaflet Number 29C230 (F-Frame); 29C232 (J-, K-Frames); 29C234 (Side Mounted L-Frame and N-Frame, M-Frame); 29C234C (Top Mounted L-Frame and N-Frame, Vertical Mounting M-Frame); and 29C240 (R-Frame).

## Cylinder Lock



The Cylinder Lock internally blocks the trip bar in the tripped position to prevent the circuit breaker from being switched to ON. The cylinder lock is factory installed in the left pole only of the circuit breaker cover. Other internally mounted accessories cannot be installed in the same pole as the cylinder lock. (Factory installation only.)

## Ordering Information

Frame	Catalogue Number
F, J, K	Order by description

# EXTA-12 Series C Moulded Case Circuit Breakers

External Accessories Mechanical Interlocking Devices

## Key Interlock Kit (Lock Not Included)



The Key Interlock is used to externally lock the circuit breaker handle in the OFF position. When the key interlock is locked, an extended deadbolt blocks movement of the circuit breaker handle. Uniquely coded keys are removable only with the deadbolt extended. Each coded key controls a group of circuit breakers for a given specific customer installation.

The key interlock assembly is CSA and UL listed for field installation and consists of a mounting kit and a purchaser supplied deadbolt lock. The mounting kit comprises a mounting plate, which is secured to the circuit breaker cover in either the left- or right-pole position, key interlock mounting screws, and a wire seal. Specific mounting kits are required for individual key interlock types.

### Ordering Information

Key interlock mounting kits are for field installation only. Select mounting kit Catalogue Numbers to match type of lock used. Key interlocks are supplied by customer.

### Ordering Information

Lock Manufacturer	Lock Type	Bolt Projection in Withdrawn Position inches (mm)	Kit Catalogue Number
<b>F-Frame</b>			
Superior	B-4003-1	.38 (9.5)	<b>KYK1</b>
Kirk	F	.38 (9.5)	
Square D	SF	None	
Federal Pioneer	VF	.38 (9.5)	
Castell	K or QK	.38 (9.5)	<b>CTK1</b>
<b>J, K-Frames</b>			
Superior	B-4003-1	.38 (9.5)	<b>KYK3</b>
Kirk	F	.38 (9.5)	
Square D	SF	None	
Federal Pioneer	VF	.38 (9.5)	
Castell	K or QK	.38 (9.5)	<b>CTK3</b>
<b>L-, M-, N-Frame</b>			
Superior	B-4003-1	.38 (9.5)	<b>KYK4</b>
Kirk	F	.38 (9.5)	
Square D	SF	None	
Federal Pioneer	VF	.38 (9.5)	
Castell	K or QK	.38 (9.5)	<b>CTK4</b>
<b>R-Frame</b>			
Superior	B-4003-1	1.0 (25.4)	<b>KYK6</b>
Kirk	F	1.0 (25.4)	
Square D	SF	1.0 (25.4)	
Federal Pioneer	VF	1.0 (25.4)	
Castell	K or QK	1.0 (25.4)	<b>CTK6</b>

**Note:** Instruction Leaflet Number 29C231 (F-Frame); 29C233 (J-, K-Frames); 29C235 (L-, M-, N-Frames); and 29C240 (R-Frame)

### Sliding Bar Interlock



The Sliding Bar Interlock provides mechanical interlocking between two adjacent 3-pole circuit breakers. It is installed on the enclosure cover between the circuit breakers. When the sliding bar interlock handle is moved from one side to the other, a bar extends to alternately block movement of the circuit breaker handles and prevents both circuit breakers from being switched to ON at the same time. Sliding bar interlocks are not CSA and UL listed. (Field installation only.)

### Ordering Information

The sliding bar interlock is available for mounting between two adjacent 3-pole circuit breakers with circuit breakers centreline spacing as indicated in table

and enclosure front panel thickness of 1/8 or 3/16 inch (3.2 or 4.8 mm). (For field installation only.)

### Sliding Bar Interlock Ordering Information

Frame	Centreline Spacing in Inches (mm)	Catalogue Number	Instruction Leaflet Number
F	4.19 (106.4)	SBK1	29C310
J	4.38 (111.1)	SBK2	29C310
K	5.75 (146.0)	SBK3	29C310
L, M	8.50 (215.9)	SBK4	29C311
N	8.50 (215.9)	SBK5	46A8396

### Walking Beam Interlock



The Walking Beam Interlock provides mechanical interlocking between two adjacent circuit breakers of the same pole configuration. The walking beam interlock mounts on a bracket behind and between the circuit breakers. A plunger on each end of the beam is inserted through an access hole in the back plate and base of each circuit breaker. The walking beam interlock prevents both circuit breakers from being switched ON at the same time.

If a walking beam interlock is installed, the wiring troughs in the back of the circuit breaker case are blocked by the plungers and cannot be used for cross wiring. Factory modified circuit breakers are required for this application. UL File E3816.

### Ordering Information

The walking beam interlock is available for mounting between two adjacent circuit breakers spaced 1/4-inch (6.4 mm) apart and having the same pole configuration. The two circuit breakers must be factory modified to accept the walking beam interlock assembly (suitable for use with either 2-, 3- or 4-pole circuit breakers).

With properly modified circuit breakers, the walking beam interlock is suitable for field installation. Order circuit breakers specifying modification for walking beam and select walking beam interlock from table below. Circuit breakers and walking beam interlock are boxed and shipped separately.

### Walking Beam Interlock Ordering Information

Frame	Catalogue Number	Instruction Leaflet Number
F	<b>WBL1</b>	<b>29C300</b>
K	<b>WBL3</b>	<b>29C301</b>
L, M	<b>WBL4A</b>	<b>29C302</b>
N	<b>WBL5</b>	<b>29C303</b>
R ①	<b>WBL6</b>	<b>29C304</b>

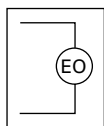
① 3-pole only.



# EXTA-14 Series C Moulded Case Circuit Breakers

External Accessories Electrical Operator

## Electrical Operator



### Product Description

The Electrical (Solenoid) Operator is a single solenoid mechanism that enables local and remote circuit breaker ON, OFF, and reset switching. The electrical operator is mounted on the circuit breaker cover within the trimline of the circuit breaker. The electrical operator uses a unique bistable latch that allows the device to operate using one solenoid. The accessory provides high-speed switching with a maximum operating time of 5 cycles (80 ms), making it suitable for generator synchronizing applications.

Means are provided for remote electrical operation and for local manual operation. A special slide includes provisions for padlocking the circuit breaker handle in the OFF position. The slide will accept three padlock shackles with a maximum diameter of 1/4-inch (6 mm) each. An interlock electrically disconnects the solenoid when the electrical operator cover is removed. The Rating Data Tables provide electrical rating data for the electrical (solenoid) operator.

The Electrical (Motor) Operator allows the circuit's breaker to be opened, closed or reset remotely. It also has a lock-off capability and provisions for manual operation.

The Electrical (Motor) Operator contains a reversible motor connected to a ball screw. The ball screw drives the circuit breaker handle. Limit switches and relays are used to control the motor.

### F-Frame Electrical (Solenoid) Operator Rating Data ①④

Operating Voltage (V) ②	Frequency	Inrush Current Amperes	Maximum Operating Time	Fuse ③ Amperes
120	50/60 Hz AC	10	5 cycles (80 ms)	3
240		5		2

- ① CSA and UL listed.
- ② Tolerance: +10%, -15% of nominal voltage.
- ③ Use current-limiting type fuse where required.
- ④ The electrical operator design is endurance tested for 10,000 electrical operations.

### F-Frame Electrical (Solenoid) Operator Ordering Information

Operating Voltage (V)	Frequency	Terminal Block	18-Inch (457.2 mm) Pigtail Lead
		Catalogue Number	Catalogue Number
120	AC	EOP1T07	EOP1P07
240		EOP1T11	EOP1P11
120	DC	EOP1T07DC	EOP1P07DC
240		EOP1T11DC	EOP1P11DC

**Note:** Instruction Leaflet Number 29C200

### F-Frame Electrical (Motor) Operator Ordering Information ⑤

Operating Voltage (V)	Frequency	Terminal Block
		Catalogue Number
120	50/60 Hz AC	MOPFD120C
24	DC	MOPFD24D
125	DC	MOPFD120C
208-250	50/60 Hz AC	MOPFD240C
220-250	DC	MOPFD240C

⑤ Motor operators MOP1P07, MOP1P03DC, MOP05DC and MOP1P07DC are replaced by MOPFD motor operators listed in table.

### J-Frame Electrical (Solenoid) Operator Rating Data ⑦⑧⑨⑩

Operating Voltage (V) ⑥	Inrush Current (A)	Fuse (A)
120	30	6
240	16	4

- ⑥ Tolerance: +10%, -15% of nominal voltage.
- ⑦ CSA and UL listed.
- ⑧ The electrical operator design has been endurance tested for 6,000 electrical operations.
- ⑨ Frequency: 50/60 Hz.
- ⑩ Maximum operating time: 5 cycles (80 ms).

### J-Frame Electrical (Solenoid) Operator Ordering Information

Operating Voltage (V)	Frequency	Terminal Block
		Catalogue Number
120	50/60 Hz AC	EOP2T07
240		EOP2T11
120	DC	EOP2T07DC
240		EOP2T11DC

**Note:** Instruction Leaflet Number 29C202

## K-Frame Electrical (Solenoid) Operator Rating Data <sup>②③④⑤</sup>

Operating Voltage (V) <sup>①</sup>	Inrush Current (A)	Fuse (A)
120	30	6
240	16	4

- ① Tolerance: +10%, -15% of nominal voltage.
- ② CSA and UL listed.
- ③ The electrical operator design has been endurance tested for 6,000 electrical operations.
- ④ Frequency: 50/60 Hz.
- ⑤ Maximum operating time: 5 cycles (80 ms).

## K-Frame Electrical (Solenoid) Operator Ordering Information

Operating Voltage (V)	Frequency	Terminal Block
		Catalogue Number
120	50/60 Hz AC	EOP3MT07
240	50/60 Hz AC	EOP3MT11
120	DC	EOP3MT07DC
240	DC	EOP3MT11DC

**Note:** Instruction Leaflet Number 29C202 (AC EOP)  
Instruction Leaflet Number 29C211 (DC EOP)

## K-Frame Electrical (Solenoid) Operator Base Mounting Kit

Frame	Catalogue Number
K	BBMK3 (For use with Busbar connected Bkr)

## L- and M-Frame Electrical (Motor) Operator Rating Data <sup>⑥⑦⑧</sup>

Operating Voltage (V)	Inrush Current Amperes
120 AC <sup>⑥</sup>	31
208	13
240	12
125 DC	21
24	50

- ⑥ CSA and UL listed.
- ⑦ The electrical operator design has been endurance tested for 6,000 electrical operations.
- ⑧ Frequency: 50/60 Hz.
- ⑨ Maximum operating time: 12 cycles max. Operator is an intermittent duty device. The safe duty cycle (OFF to ON to OFF) should not exceed one per minute.
- ⑩ Tolerance: +10%, -15% of nominal voltage.

## L- and M-Frame Electrical (Motor) Operator Ordering Information

Operating Voltage (V)	Frequency	Terminal Block
		Catalogue Number
120	50/60 Hz	EOP4MT07
208	50/60 Hz	EOP4MT11
240	50/60 Hz	EOP4MT11A
480	50/60 Hz	EOP4MT15
125	DC	EOP4MT26
24	DC	EOP4MT21

**Note:** Instruction Leaflet Number 29C203

## N-Frame Electrical (Motor) Operator Rating Data <sup>⑪</sup>

Operating Voltage (V)	Frequency	Inrush Current (A)	Fuse (A)
120	AC	31	6
208	AC	21	—
240	AC	19	4
480	AC	—	—
24	DC	50	—
48	DC	80	—
125	DC	21	—

- ⑪ CSA and UL listed.
- ⑫ Frequency: 50/60 Hz.
- ⑬ The electrical operator design has been endurance tested for 2,500 electrical operations.
- ⑭ Maximum operating time: 12 cycles max. Operator is an intermittent duty device. The safe duty cycle (OFF to ON to OFF) should not exceed one per minute.
- ⑮ Tolerance: +10%, -15% of nominal voltage.

## N-Frame Electrical (Motor) Operator Ordering Information

Operating Voltage (V)	Frequency	Pigtail Leads
		Catalogue Number
120	50/60 Hz	EOP5T07
208	50/60 Hz	EOP5T09
240	50/60 Hz	EOP5T11
480	50/60 Hz	EOP5T15
24	DC	EOP5T21
48	DC	EOP5T22
125	DC	EOP5T26

**Note:** Instruction Leaflet Number 29C204

## R-Frame Electrical (Motor) Operator Rating Data

Operating Voltage (V)	Frequency	Motor Inrush Current (A)
120	50/60 Hz	40
240	50/60 Hz	27
24	DC	58
48	DC	53

- ⑯ Operator is an intermittent duty service. The safe duty cycle (OFF to ON to OFF) should not exceed one per minute.
- ⑰ Electric Operating time at rated voltage; (a) To turn breaker ON – 1/2 second max. (b) To turn breaker OFF – 1/2 second max.
- ⑱ Motor operating temperature; Class "A" temperature limits apply.
- ⑲ A minimum 1 kVA power source is recommended for motor operation.
- ⑳ Applied voltage should be no less than 85% or no more than 110% of rated.

## R-Frame Electrical (Motor) Operator Ordering Information

Operating Voltage (V)	Frequency	Factory Installed Terminal Block
		Catalogue Number
120	50/60 Hz	EOP6T08K <sup>㉔</sup>
240	50/60 Hz	EOP6T11K
48	DC	EOP6T21K

**Note:** Instruction Leaflet Number 29C205

- ㉔ For Incom compatible version, order EOP6T08CK.

# EXTA-16 Series C Moulded Case Circuit Breakers

External Accessories Plug-in Adapters

## Plug-in Adapters



### Product Description

Plug-in Adapters simplify installation and front removal of circuit breakers. Individual line and load plug-in adapters are available for rear connection applications on 2-, 3- and 4-pole circuit breakers. Common mounting plates for line- and load-end adapters are available. One plate is required per breaker.

One Plug-in Adapter Kit is required for line-end and one for load-end.

### F-Frame Ordering Information (Flat Bar Type)

Continuous Current Rating (Amperes)	2-Pole	3-Pole	4-Pole
	Catalogue Number	Catalogue Number	Catalogue Number
100 – 225	1480D13G01 (PAD12D)	1480D13G02 (PAD13D)	1480D13G07 <sup>①</sup>
Mounting Plate	176C511H01	507C047H01	—

<sup>①</sup> 100A maximum.

**Note:** Instruction Leaflet Number 13782

### J-Frame Ordering Information (Flat Bar Type)

Continuous Current Rating (Amperes)	Terminal End	2-Pole	3-Pole	4-Pole
		Catalogue Number	Catalogue Number	Catalogue Number
250	Line	1260C86G05	1260C86G06	1231C67G01
	Load	1260C86G07	1260C86G08	1231C67G02
	1 Line and 1 Load	506C144G27	506C144G28	—
	Mounting Plate	<sup>②</sup>	PMP23	—

<sup>②</sup> Use 3-pole mounting plate for 2-pole circuit breaker.

**Note:** Instruction Leaflet Number 149321

### K-Frame Ordering Information (Flat Bar Type)

Continuous Current Rating (Amperes)	2-Pole	3-Pole	4-Pole
	Catalogue Number	Catalogue Number	Catalogue Number
400	PAD32	PAD33	—
Mounting Plate	<sup>③</sup>	PMP33	—

<sup>③</sup> Use 3-pole mounting plate for 2-pole circuit breaker.

**Note:** Instruction Leaflet Number 15378.

### L-Frame Ordering Information (Threaded Stud Type)

Continuous Current Rating (Amperes)	2-Pole	3-Pole
	Catalogue Number	Catalogue Number
600 (Threaded Stud Type)	506C059G03	506C059G04
600 (Flat Bar Type)	1288C19G01	1288C19G02
Mounting Plate	504C824H01	504C824H01

**Note:** Instruction Leaflet Number 29C314.

### M-Frame Ordering Information (Flat Bar Type)

Continuous Current Rating (Amperes)	2-Pole	3-Pole
	Catalogue Number	Catalogue Number
800	2614D53G05	2614D53G06
Mounting Plate	1290C73H01	1290C73H01

**Note:** Instruction Leaflet Number 15073.

### N-Frame Ordering Information (Flat Bar Type)

Continuous Current Rating (Amperes)	2-Pole	3-Pole
	Catalogue Number	Catalogue Number
1200	2614D53G03	2614D53G04
Mounting Plate	1290C73H01	1290C73H01

**Note:** Instruction Leaflet Number 15073.

### Plug-in Adapters (IEC rated only)

Frame	Number of Poles	Standard Certification	Catalogue Number
FD	3	IEC	PAD3F
FD	4	IEC	PAD4F
JD	3	IEC	PAD3JD
KD	3	IEC	PAD3K
LD	3	IEC	PAD3LD
LD	4	IEC	PAD4LD

### Rear Connecting Studs

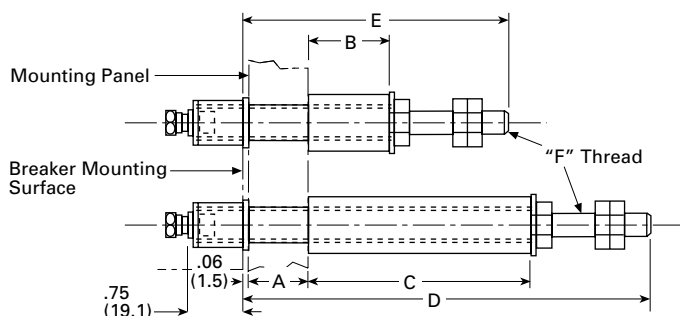


### Product Description

Rear Connecting Studs are available in several sizes to accommodate specific fixed-mounted circuit breaker applications.

Each rear connecting stud assembly consists of one stud and one tube. To maintain proper clearances between poles, select alternate long and short stud assemblies for circuit breakers with more than one pole. One assembly is required for line-end and one for load-end of each pole. Tubes must be ordered separately. Connecting studs are available only with English thread sizes.

### F-Frame Rear Connecting Stud



### F-Frame Ordering Information

Stud Ampere Rating	Stud Catalogue Number	Panel Thickness in Inches (mm)		Tube Length in Inches (mm)			Dimensions in Inches (mm)		
		A		B	C	Tube Catalogue Number	D	E	F
<b>For 15A to 100A Circuit Breakers</b>									
100A Short	<b>451D874G01</b>	1.00 (25.4)		.69 (17.5)	—	<b>32B9446H20</b>	—	3.63 (92.1)	.31
100A Short	<b>451D874G01</b>	.69 – .94 (17.5 to 23.8)		1.38 (34.9)	—	<b>32B9446H21</b>	—		(7.9) – 18
100A Short	<b>451D874G01</b>	.38 – .63 (9.5 to 15.9)		1.69 (42.9)	—	<b>32B9446H22</b>	—		
100A Short	<b>451D874G01</b>	.25 – .31 (6.4 to 7.9)		2.00 (50.8)	—	<b>32B9446H23</b>	—		
100A Long	<b>451D874G02</b>	1.00 (25.4)		—	3.44 (87.3)	<b>32B9446H24</b>	6.13 (155.6)	—	
100A Long	<b>451D874G02</b>	.69 – .94 (17.5 to 23.8)		—	3.75 (95.2)	<b>32B9446H25</b>	—	—	
100A Long	<b>451D874G02</b>	.38 – .63 (9.5 to 15.9)		—	4.06 (103.1)	<b>32B9446H26</b>	—	—	
100A Long	<b>451D874G02</b>	.25 – .31 (6.4 to 7.9)		—	4.38 (111.3)	<b>32B9446H27</b>	—	—	
<b>For 110A to 225A Circuit Breakers</b>									
225A Short	<b>374D883G01</b>	1.00 (25.4)		.69 (17.5)	—	<b>374D883H06</b>	—	4.25 (108.0)	.44
225A Short	<b>374D883G01</b>	.69 – .94 (17.5 to 23.8)		1.38 (34.9)	—	<b>374D883H07</b>	—		(11.1) – 14
225A Short	<b>374D883G01</b>	.38 – .63 (9.5 to 15.9)		1.69 (42.9)	—	<b>374D883H08</b>	—		
225A Short	<b>374D883G01</b>	.25 – .31 (6.4 to 7.9)		2.00 (50.8)	—	<b>374D883H09</b>	—		
225A Long	<b>374D883G02</b>	1.00 (25.4)		—	3.44 (87.3)	<b>374D883H10</b>	7.50 (190.5)	—	
225A Long	<b>374D883G02</b>	.69 – .94 (17.5 to 23.8)		—	3.75 (95.2)	<b>374D883H11</b>	—	—	
225A Long	<b>374D883G02</b>	.38 – .63 (9.5 to 15.9)		—	4.06 (103.1)	<b>374D883H12</b>	—	—	
225A Long	<b>374D883G02</b>	.25 – .31 (6.4 to 7.9)		—	4.38 (111.3)	<b>374D883H13</b>	—	—	

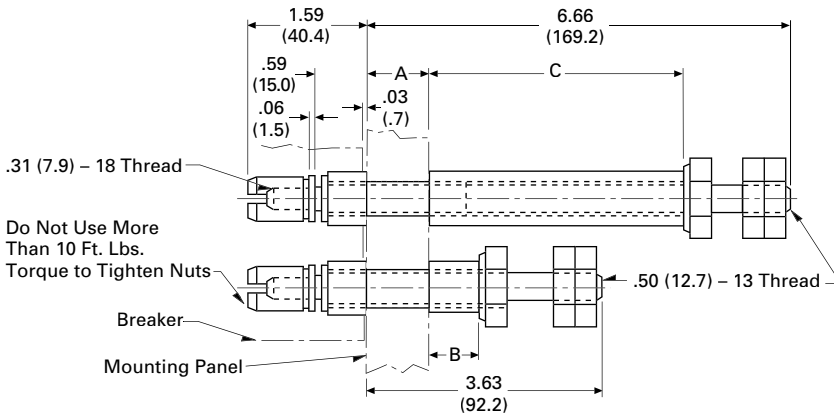
# EXTA-18 Series C Moulded Case Circuit Breakers

## External Accessories Rear Connecting Studs

### J-Frame Ordering Information

Stud Ampere Rating	Stud Catalogue Number	Panel Thickness in Inches (mm)		Tube Length in Inches (mm)			Tube Catalogue Number
		A		B	C		
250A Short	5010D23G01	.75 – 1.00 (19.1 – 24.5)		.84 (21.4)		—	456D983H05
250A Short	5010D23G01	.50 – .75 (12.7 – 19.1)		1.09 (27.7)		—	456D983H06
250A Short	5010D23G01	.25 – .50 (6.4 – 12.7)		1.03 (26.2)		—	456D983H07
250A Long	5010D23G02	.75 – 1.00 (19.1 – 24.5)		—	3.88 (98.6)		5010D23H05
250A Long	5010D23G02	.50 – .75 (12.7 – 19.1)		—	4.13 (104.9)		5010D23H06
250A Long	5010D23G02	.25 – .50 (6.4 – 12.7)		—	4.38 (111.3)		5010D23H07

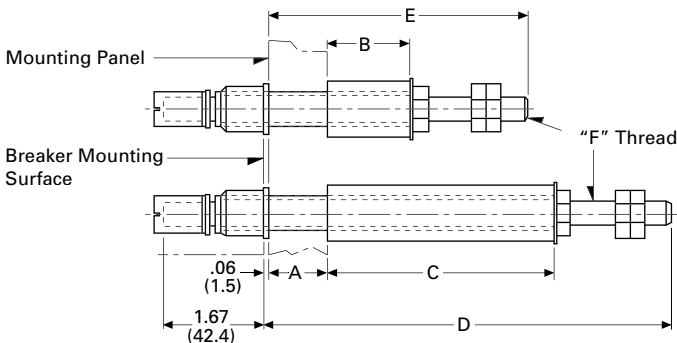
### J-Frame Rear Connecting Studs



### K-Frame Ordering Information

Stud Length	Stud Catalogue Number	Panel Thickness in Inches (mm)		Tube Length in Inches (mm)			Dimensions in Inches (mm)		
		A		B	C		D	E	F
400A Short	6642C14G02	.75 – 1 (19.1 – 24.5)		.84 (21.3)		—	—	3.66 (93.0)	.75 – 16 (19.1 – 406.4)
400A Short	6642C14G04	.5 – .75 (12.7 – 18.4)		1.09 (27.69)		—	—	—	—
400A Short	6642C14G06	.25 – .5 (6.35 – 12.7)		1.03 (26.16)		—	—	—	—
400A Long	6642C14G03	.75 – 1 (19.1 – 24.5)		—	3.78 (96.0)		—	—	—
400A Long	6642C14G05	.5 – .75 (12.7 – 18.4)		—	4.03 (102.4)		6.58 (167.1)	—	—
400A Long	6642C14G07	.25 – .5 (6.35 – 12.7)		—	4.28 (108.7)		—	—	—

### K-Frame Rear Connecting Studs



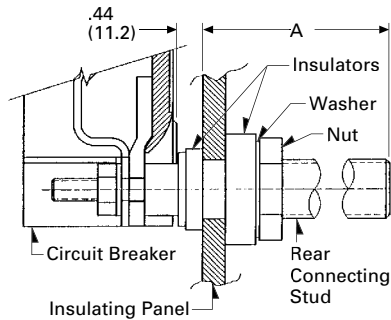
# Series C Moulded Case Circuit Breaker **EXTA-19**

External Accessories Rear Connecting Studs

## L-Frame Ordering Information

Stud Length (A) in Inches (mm)	Stud Catalogue Number
5.47 (138.9)	<b>314C960G07</b>
7.97 (202.4)	<b>314C960G08</b>
10.47 (265.9)	<b>314C960G09</b>

## L-Frame Rear Connecting Stud



## M-Frame Ordering Information <sup>①</sup>

Stud Ampere Rating	Diameter, in Inches (mm) and Thread	Extension Back of Breaker, in Inches (mm)	Stud Catalogue Numbers
225	.50 (12.7) – 13	3.66 (93.0)	<b>314C960G01</b>
400	.75 (19.1) – 16	5.91 (150.1)	<b>314C960G04</b>
400	.75 (19.1) – 16	8.41 (213.6)	<b>314C960G05</b>
400	.75 (19.1) – 16	10.91 (277.0)	<b>314C960G06</b>
600	1.00 (25.4) – 12	5.91 (150.1)	<b>314C960G07</b>
600	1.00 (25.4) – 12	8.41 (213.6)	<b>314C960G08</b>
600	1.00 (25.4) – 12	10.91 (277.0)	<b>314C960G09</b>
800	1.13 (28.7) – 12	5.91 (150.1)	<b>314C960G10</b>
800	1.13 (28.7) – 12	8.41 (213.6)	<b>314C960G11</b>
800	1.13 (28.7) – 12	10.91 (277.0)	<b>314C960G12</b>

<sup>①</sup> Not CSA and UL Listed.

## N-Frame Ordering Information <sup>②</sup>

Stud Ampere Rating	Diameter, in Inches (mm) and Thread	Extension Back of Breaker, in Inches (mm)	Stud Catalogue Numbers
800	1.13 (28.7) – 12	5.5 (139.7)	<b>623B222G01</b>
800	1.13 (28.7) – 12	8 (203.2)	<b>623B222G02</b>
800	1.13 (28.7) – 12	10.5 (266.7)	<b>623B222G03</b>
1200	1.25 (31.8) – 12	5.5 (139.7)	<b>373B375G04</b>
1200	1.25 (31.8) – 12	10.5 (266.7)	<b>373B375G03</b>

<sup>②</sup> Not CSA and UL Listed.

# EXTA-20 Series C Moulded Case Circuit Breakers

External Accessories Panelboard Connecting Straps

## Panelboard Connecting Straps



### Product Description

Panelboard Connecting Straps are used to connect the circuit breaker terminals to the panelboard bus. The panelboard connecting straps are available with various ratings for outside and centre poles. (Field installation only.)

Panelboard connecting straps are available to meet the needs of most standard panelboard applications. Style numbers for mounting brackets for CDP panelboard installations are also included.

Refer to panelboard manufacturer for compatibility.

### F-Frame Panelboard Connecting Straps

Bus Spacing in Inches (mm)	Continuous Current Rating (Amperes)	Pole Connector Type	
		Centre Catalogue Number	Outside Catalogue Number
2.75 (69.9)	50	673B142G02	673B142G09
2.75 (69.9)	100	673B142G02	673B142G10
2.75 (69.9)	150	673B142G04	673B142G03
3.5 (88.9)	50	1253C72G01	1253C72G03
3.5 (88.9)	100	1253C73G03	1253C73G06
3.5 (88.9)	150	1253C73G01	1253C73G05

### F-Frame Mounting Bracket

Number of Poles	Catalogue Number
2	624B600H02
3	624B600H01

### J-Frame Panelboard Connecting Straps

Bus Spacing in Inches (mm)	Continuous Current Rating (Amperes)	Pole Connector Type	
		Centre Catalogue Number	Outside Catalogue Number
3.5 (88.9)	250	2600D26G01	2600D26G02

### J-Frame Mounting Bracket

Number of Poles	Catalogue Number
2, 3	1576707

### K-Frame Panelboard Connecting Straps

Bus Spacing in Inches (mm)	Continuous Current Rating (Amperes)	Pole Connector Type	
		Centre Catalogue Number	Outside Catalogue Number
3.5 (88.9)	400	4212B78G02	4212B77G01

### K-Frame Mounting Bracket

Number of Poles	Catalogue Number
2, 3	208B264H01

### L-Frame Panelboard Connecting Straps

Continuous Current Rating (Amperes)	Pole Connector Type	
	Centre Catalogue Number	Outside Catalogue Number
600	624B609G01	506C052G01

### L-Frame Mounting Bracket

Number of Poles	Catalogue Number
2, 3	208B297H01

### M-Frame Panelboard Connecting Straps

Bus Spacing in Inches (mm)	Continuous Current Rating (Amperes)	Connector Type	Pole Connector Type
			Catalogue Number
3.5 (88.9)	800	Short	314C996G01
		Medium	314C996G02
		Long	314C996G03

### M-Frame Mounting Bracket

Catalogue Number
315C270H01

### N-Frame Panelboard Connecting Straps

Bus Spacing in Inches (mm)	Continuous Current Rating (Amperes)	Connector Type	Pole Connector Type
			Catalogue Number
3.5 (88.9)	1200	Short	505C606G04
		Medium	505C606G05
		Long	505C606G06

### N-Frame Mounting Bracket (Four[4] Required)

Catalogue Number
315C270H01

### Handle Mechanisms Overview

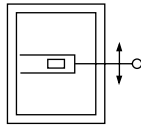
Handle Mechanisms are used to operate moulded case circuit breakers, moulded case switches and motor circuit protectors. They are available in three basic configurations — Flange Mounted, Through-the-Door and Direct (Close-Coupled) — providing safe, dependable operation and ease of installation.

- Flange Mounted
  - Flex Shaft
- Through-the-Door
  - Series C Rotary
  - Universal Rotary
- Direct (Close-Coupled)
  - Euro IEC
  - G Direct

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

#### 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, 3 feet (.9 m) through 10 feet (3 m) for use with various size enclosures.

The Flex Shaft Handle will accept up to three padlock shackles, each with a maximum diameter of 3/8-inch (9.5 mm). Can be used with NEMA 1, 3R and 12 fabricated enclosures. An optional handle is available for Flex Shaft that is suitable for use with NEMA 4 and 4X 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.

Flex Shaft is UL Listed under File E64893 and meets CSA requirements.

**Note:** Refer to Eaton’s Catalogue “Your Electrical Solutions” (3rd Edition), section 3, Pages 3 - 76 for information on type Vari-Depth, Slide Plate, MC, SM and AMT handle mechanisms.



# EXTA-22 Series C Moulded Case Circuit Breakers

External Accessories Handle Mechanisms

## Flex Shaft Ordering Information

Breaker Frame	Flexible Shaft Length in Feet (m)			
	3 (.9)	4 (1.2)	5 (1.5)	6 (1.8)
	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
G <sup>①</sup>	F0S03C	F0S04C	F0S05C	F0S06C
F	F1S03C	F1S04C	F1S05C	F1S06C
F (Dual)	F1S03CD	F1S04CD	F1S05CD	F1S06CD
J	F2S03C	F2S04C	F2S05C	F2S06C
K	F3S03C	F3S04C	F3S05C	F3S06C
L and MDL	N/A	F4S04C	F4S05C	F4S06C
N	N/A	F5S04C	F5S05C	F5S06C
R	N/A	F6S04	F6S05	F6S06

## Flex Shaft Ordering Information (Continued)

Breaker Frame	Flexible Shaft Length in Feet (m)			
	7 (2.1)	8 (2.4)	9 (2.7)	10 (3.0)
	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
G	N/A	N/A	N/A	N/A
F	F1S07C	F1S08C	F1S09C	F1S10C
F (Dual)	F1S07CD	F1S08CD	F1S09CD	F1S10CD
J	F2S07C	F2S08C	F2S09C	F2S10C
K	F3S07C	F3S08C	F3S09C	F3S10C
L and MDL	N/A	N/A	N/A	F4S10C
N	N/A	N/A	N/A	F5S10C
R	N/A	N/A	N/A	N/A

**Note:** Type 4/4X handle mechanisms are available. Add Suffix **X** to complete Catalogue Number.

Add Suffix **I** to complete Catalogue Number for IEC handle.

Original narrow handle design (No C Suffix) is available. Remove **C** from Catalogue Number.

**Note:** When selecting the length of shaft, ensure minimum bending radius of 4 inches (101.6 mm) is maintained to operate properly, for G, F, J, K Frames. (5 inches [127mm] for L, N, R Frames)

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

**Note:** Dual breakers operator available on F-Frame only.

Only the F, J & K can mount LH & RH, all others RH only.

① Suitable for GHC, GCH and GD circuit breakers and moulded case switches; not suitable for GMCP.

## Flex Shaft Accessories (F- through R-Frame)

### Type C361 NEMA 12 Safety Door Hardware

Type C361 Door Hardware Kits are designed to function with the Flex Shaft operating mechanisms.

These kits are designed to use with small enclosures up to 40 inches, intermediate 40-60 inches or larger floor cases over 60 inches to provide enclosure sealing and protection against unauthorized entry. These kits can be used on enclosure flanges with material thickness ranging from 16 gauge through 3/16 inches with flanges on the right side only. Door hardware kits are to be installed in a commercially available enclosure. Consult the enclosure manufacturer application data for proper kit selection.

### Type C361 NEMA 12 Safety Door Hardware for Flex Shaft<sup>①</sup>

Handle Length in Inches (mm)	Catalogue Number <sup>②</sup>
4 (101.6)	C361KJ4
6 (152.4)	C361KJ6
Roller Latch <sup>③</sup>	C361KR

① Customer: Consult with box manufacturer for correct door hardware and any adapters required for assembly.

② The 1/4 inch x 1/2 inch (6.35 x 12.7 mm) standard mill rectangular locking bar is not supplied with these kits.

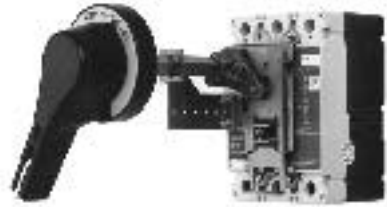
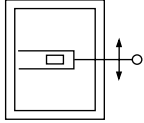
③ Third roller latch for use with 4 or 6 inch (101.6 or 152.4 mm) handle when 3 point latching is required.

## Flange Mounted Instruction Leaflets

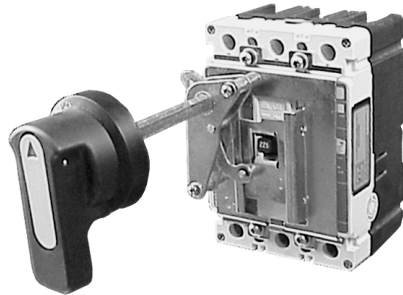
Breaker Frame	Instruction Leaflet Number
<b>Flex Shaft</b>	
G	IL01219014
F	15609
J	15605
K	15604
L and M	15606
N	15606
R	15606

### Through-the-Door Handle Mechanisms

#### Series C Rotary



#### Universal Rotary



Through-the-Door Handle Mechanisms mount on the front of an enclosure or cabinet door and externally operate the circuit breaker via a variable depth shaft or a linear operator (Type MC). Each rotary type handle mechanism includes a handle, base operating mechanism and shaft that can be cut to various lengths.

Series C Rotary handle mechanisms are for use with Moulded Case Circuit Breakers (F, J, K, L, MDL, N), Moulded Case Switches and Motor Circuit Protectors.

Series C Rotary is suitable for use with NEMA 1, 3R, 12 and 4/4X enclosure types. Type 4/4X application requires special handle, see "Ordering Information".

The Universal Rotary handle mechanisms are for use with Moulded Case Circuit Breakers (G, F, J, K, L, MDL), Moulded Case Switches and Motor Circuit Protectors.

The Universal Rotary is suitable for use with NEMA 1 and 12 enclosure types.

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).

Series C Rotary handle is metal, Universal Rotary handle is made of moulded material. Series C Rotary handle is black and Universal Rotary is available in black or yellow/red.

Series C Rotary handle was ergonomically designed with extra clearance for a "gloved hand" to operate. Handle has a 45 degree rotation. Universal Rotary has a 90 degree rotation ("pipe valve" operation) where ON is vertical and OFF is horizontal. Shafts include a support brace to ensure proper alignment. In addition, the 16-inch (406.4 mm) and 24-inch (609.6 mm) extra long shafts include an adjustable support bracket.

Series C Rotary and Universal Rotary, are UL Listed and meet CSA requirements. Universal Rotary also meets IEC947-1/2 for international compliance. Rotary UL File Number E64893.

### Features Comparison of Series C Rotary and Universal Rotary Handle Mechanism

Rotary	NEMA Enclosure Type				Handle Lock-Off <sup>②</sup>	Handle Indication: ON/OFF TRIPPED/RESET	International Markings ON (I) OFF (O)	Handle Material	Available Handle Colours	Handle Rotation <sup>③</sup>	Shaft Lengths (Inches)
	1	3R	12	4/4X <sup>①</sup>							
Series C Rotary	X	X	X	X	X	X	—	Metal	Black	45 deg.	6, 12, 16, 24
Universal Rotary	X	—	X	—	X	X	X	Moulded Plastic	Yellow/Red/Black	90 deg.	6, 12

<sup>①</sup> Type 4/4X application requires special handle. See "Ordering Information."

<sup>②</sup> All rotary handle mechanisms include a handle "Lock Off" to prevent turning the breaker ON while in the OFF position.

<sup>③</sup> Series C Rotary handle was ergonomically designed with extra clearance for a "gloved hand" to operate. Handle has a 45-degree rotation. Universal Rotary has a 90-degree rotation ("pipe valve" operation) where ON is vertical and OFF is horizontal. Shafts include a support brace to ensure proper alignment.

# EXTA-24 Series C Moulded Case Circuit Breakers

External Accessories Handle Mechanisms

## Series C Rotary Handle Mechanism Ordering Information

Shaft Length Inches (mm)	Complete Catalogue Number <sup>①</sup> (Domestic)	Separate Catalogue Number			Complete Catalogue Number (International)	
		Standard Handle <sup>②</sup> (Domestic)	Mechanism <sup>③</sup>	Shaft <sup>④</sup>	IEC IP65 <sup>⑤⑥</sup>	IEC IP66 <sup>⑤⑥</sup>
<b>F-Frame</b>						
6 (152.4)	HM1R06	6648C22G25	6648C23G11	4217B37G08	WHM1R06	WHM1R06X
12 (304.8)	HM1R12	6648C22G25	6648C23G11	4217B37G05	WHM1R12	WHM1R12X
16 (406.4)	HM1R16	6648C22G25	6648C23G11	4217B37G06	WHM1R16	WHM1R16X
24 (609.6)	HM1R24	6648C22G25	6648C23G11	4217B37G07	WHM1R24	WHM1R24X
<b>J-Frame</b>						
6 (152.4)	HM2R06	6648C22G01	6648C23G21	4217B37G08	WHM2R06	WHM2R06X
12 (304.8)	HM2R12	6648C22G01	6648C23G21	4217B37G05	WHM2R12	WHM2R12X
16 (406.4)	HM2R16	6648C22G01	6648C23G21	4217B37G06	WHM2R16	WHM2R16X
24 (609.6)	HM2R24	6648C22G01	6648C23G21	4217B37G07	WHM2R24	WHM2R24X
<b>K-Frame</b>						
6 (152.4)	HM3R06	6648C22G01	6648C23G25	4217B37G08	WHM3R06	WHM3R06X
12 (304.8)	HM3R12	6648C22G01	6648C23G25	4217B37G05	WHM3R12	WHM3R12X
16 (406.4)	HM3R16	6648C22G01	6648C23G25	4217B37G06	WHM3R16	WHM3R16X
24 (609.6)	HM3R24	6648C22G01	6648C23G25	4217B37G07	WHM3R24	WHM3R24X
<b>L- and MDL-Frame</b>						
6 (152.4)	HM4R06	6648C22G11	6648C23G19	4217B37G08	WHM4R06	WHM4R06X
12 (304.8)	HM4R12	6648C22G11	6648C23G19	4217B37G05	WHM4R12	WHM4R12X
16 (406.4)	HM4R16	6648C22G11	6648C23G19	4217B37G06	WHM4R16	WHM4R16X
24 (609.6)	HM4R24	6648C22G11	6648C23G19	4217B37G07	WHM4R24	WHM4R24X
<b>MD-Frame</b>						
6 (152.4)	HM7R06	6648C22G21	6648C23G17	4217B37G08	—	—
12 (304.8)	HM7R12	6648C22G21	6648C23G17	4217B37G05	—	—
16 (406.4)	HM7R16	6648C22G21	6648C23G17	4217B37G06	—	—
24 (609.6)	HM7R24	6648C22G21	6648C23G17	4217B37G07	—	—
<b>N-Frame</b>						
6 (152.4)	HM5R06	6648C22G21	6648C23G08	4217B37G08	WHM5R06	WHM5R06X
12 (304.8)	HM5R12	6648C22G21	6648C23G08	4217B37G05	WHM5R12	WHM5R12X
16 (406.4)	HM5R16	6648C22G21	6648C23G08	4217B37G06	WHM5R16	WHM5R16X
24 (609.6)	HM5R24	6648C22G21	6648C23G08	4217B37G07	WHM5R24	WHM5R24X

- ① Complete Catalogue Number includes the standard handle, mechanism, shaft and support brace/bracket. Type 4/4X handle mechanisms are available. Add suffix X to complete catalogue number.
- ② Standard handle is designed suitable for Types 1, 3R and 12 enclosures. For International type standard handle, contact Eaton for style numbers.
- ③ Breaker mechanism includes a shaft support bracket and its parts.
- ④ Longer shafts, 16-inch (406.4 mm) and 24-inch (609.6 mm), include an adjustable support extension.
- ⑤ IEC Handle Mechanism supplied with Metric thread mounting hardware.
- ⑥ Complete Catalogue Number includes a handle, mechanism and shaft.
- ⑦ For International type 4/4X handle, contact Eaton for style numbers.

Type 4/4X handles are similar to standard handles except they include an internal neoprene gasket. Due to gasketing effect between the handle and the housing, the handle may not indicate a tripped position.

### Type 4/4X Handles Assembly (Domestic)<sup>⑦</sup>

Frame	Style Number
F	6648C22G27
J, K	6648C22G03
L, MDL	6648C22G13
MD, N	6648C22G23

### Series C Rotary Handle Mechanism Accessories

As an option, an auxiliary switch is offered so that the control panel builder may electrically indicate the status of the breaker. This accessory would be mounted on the mechanism and comes with 24-inch (609.6 mm) pigtail leads.

### Series C Rotary Handle Mechanism Auxiliary Switch

Catalogue Number
5108A61G01

## Universal Rotary Handle Mechanism Ordering Information <sup>①</sup>

Shaft Length in Inches (mm)	Handle Colour	Complete Catalogue Number
<b>G-Frame</b>		
6 (152.4)	Black	<b>GHMVD06B</b>
12 (304.8)	Black	<b>GHMVD12B</b>
24 (609.6)	Black	<b>GHMVD24B</b>
6 (152.4)	Red	<b>GHMVD06R</b>
12 (304.8)	Red	<b>GHMVD12R</b>
24 (609.6)	Red	<b>GHMVD24R</b>
<b>F-Frame</b>		
6 (152.4)	Black	<b>FHMVD06B</b>
12 (304.8)	Black	<b>FHMVD12B</b>
24 (609.6)	Black	<b>FHMVD24B</b>
6 (152.4)	Red	<b>FHMVD06R</b>
12 (304.8)	Red	<b>FHMVD12R</b>
24 (609.6)	Red	<b>FHMVD24R</b>
<b>J-Frame</b>		
6 (152.4)	Black	<b>JHMVD06B</b>
12 (304.8)	Black	<b>JHMVD12B</b>
24 (609.6)	Black	<b>JHMVD24B</b>
6 (152.4)	Red	<b>JHMVD06R</b>
12 (304.8)	Red	<b>JHMVD12R</b>
24 (609.6)	Red	<b>JHMVD24R</b>
<b>K-Frame</b>		
6 (152.4)	Black	<b>KHMVD06B</b>
12 (304.8)	Black	<b>KHMVD12B</b>
24 (609.6)	Black	<b>KHMVD24B</b>
6 (152.4)	Red	<b>KHMVD06R</b>
12 (304.8)	Red	<b>KHMVD12R</b>
24 (609.6)	Red	<b>KHMVD24R</b>
<b>L-Frame</b>		
6 (152.4)	Black	<b>LHMVD06B</b>
12 (304.8)	Black	<b>LHMVD12B</b>
24 (609.6)	Black	<b>LHMVD24B</b>
6 (152.4)	Red	<b>LHMVD06R</b>
12 (304.8)	Red	<b>LHMVD12R</b>
24 (609.6)	Red	<b>LHMVD24R</b>
<b>MDL-Frame</b>		
6 (152.4)	Black	<b>MHMVD06B</b>
12 (304.8)	Black	<b>MHMVD12B</b>
6 (152.4)	Red	<b>MHMVD06R</b>
12 (304.8)	Red	<b>MHMVD12R</b>

<sup>①</sup> Only available as complete handle mechanism. Parts not sold separate

## Through-the-Door Handle Mechanism Instruction Leaflets Number

Breaker Frame	Series C Rotary	Universal Rotary
G	—	29C250
F	15594	29C250
J	15599	29C250
K	15600	29C250
L	15601	29C250
MDL	15601	29C250
N	15602	—

## Series C G-Frame Vari-Depth Handle Mechanism (Not Shown)

For Use With:	Breaker	Handle Color	Complete Catalogue Number
<b>Enclosure</b>		<b>Black</b>	
NEMA 1	GCH/GC/GHC/GD	Yellow	<b>HRGCV11L</b>
NEMA 1	GCH/GC/GHC/GD	Black	<b>HRGCV31L</b>
NEMA 3R/12/4X	GCH/GC/GHC/GD	Yellow	<b>HRGCV14L</b>
NEMA 3R/12/4X	GCH/GC/GHC/GD	Black	<b>HRGCV34L</b>
NEMA 1	GMCP	Yellow	<b>HRGMV11L</b>
NEMA 1	GMCP	Black	<b>HRGMV31L</b>
NEMA 3R/12/4X	GMCP	Yellow	<b>HRGMV14L</b>
NEMA 3R/12/4X	GMCP	Black	<b>HRGMV34L</b>

# EXTA-26 Series C Moulded Case Circuit Breakers

External Accessories Handle Mechanisms

## Direct (Close-Coupled) Handle Mechanisms

### Product Description

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 Euro IEC Direct handle mechanism can be used on F- through R-Frames.

The G Direct is available with a black or yellow handle, and with or without a shroud. It is suitable for use with NEMA 1 enclosures. It is for use only with the G-Frame (GD, GHC, GCH, GMCP).

An escutcheon ring and interlock clip are provided as standard. The standard design includes a lock-off feature.

The Euro IEC Direct handle mechanism is IEC-240-1. G Direct is UL listed and meets CSA requirements.

### Euro IEC Direct



### Euro IEC Direct Ordering Information

Frame	Black Handle	Red Handle
	Catalogue Number	Catalogue Number
F	HMCC1B	HMCC1R
J	HMCC2B	HMCC2R
K	HMCC3B	HMCC3R
L and M	HMCC4B	HMCC4R
N	HMVD5B	—
R	HMVD6B	—

### G Direct



### G Direct Ordering Information <sup>①</sup>

Frame	Black Handle		Yellow Handle	
	with Shroud	without Shroud	with Shroud	without Shroud
	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
GD/ GHC/GCH	HRGCC1S	HRGCC10	HRGCC3S	HRGCC30
GMCP	HRGMC1S	HRGMC10	HRGMC3S	HRGMC30

<sup>①</sup> Suitable for use on 2 or 3 Pole G-Frame.

# Series C Moulded Case Circuit Breakers **EXTA-27**

External Accessories Handle Mechanisms

## Handle Extension



Handle Extension is not included with J-, K-, L- and M-Frame breakers. It must be purchased separately.

### Handle Extension

Frame	Style Number
J, K	HEX3
L, M	HEX4

Handle Extension is included with breaker with N- and R-Frame breakers.

### Handle Extension

Frame	Style Number
N	HEX5
R	HEX6

# EXTA-28 Series C Moulded Case Circuit Breakers

External Accessories Current Limiters, Alarms, Monitors and Test Kits

## Type LFD Current Limiter ①



The LFD Current Limiter is an accessory that bolts to the load end of a standard FDB, FD, HFD or FDC thermal-magnetic circuit breaker, providing 200,000A interrupting capacity at up to 600V AC. LFD current limiters for thermal-magnetic circuit breakers are listed with CSA and UL. (UL File E47239).

① The LFD Current Limiter can also be used with the 3-pole FDE, HFDE or FDCE electronic circuit breakers.

### Ordering Information

Circuit Breaker Rating Amperes	Catalogue Number
15 – 70	LFD3070R
80 – 150	LFD3150R

**Note:** Instruction Leaflet Number 29C407

## IQ Energy Sentinel



The IQ Energy Sentinel is a highly accurate, microprocessor-based, breaker-mounted device designed to monitor power and energy readings. It represents an alternative to watt meters, watt-hour meters, and watt demand meters. Key advantages include savings in space, lower installation costs, and remote monitoring capability.

The IQ Energy Sentinel mounts on the load side of a Series C F-Frame (150 ampere) circuit breaker. It can be applied on three-phase, four-wire systems, or single-phase, three-wire systems with voltage connected through phases A and C.

**Note:** Instruction Leaflet Number 17437

For more information see Descriptive Bulletin 8178.

## Ground Fault Alarm Unit



The Ground Fault Alarm Unit is a remotely mounted device with a combination indicating light/test button that will light when the breaker trips or alarms on ground fault. The Ground Fault Alarm Unit requires a separate 120V AC power source to power the light and the internal relay which has 1NO and 1NC contacts for remote indication. The Ground Fault Alarm Unit can be panel mounted for ordering with an optional face mounting bracket.

For use on Digitrip 310 LSG and LSIK trip units K- through N-Frame and Digitrip Optim 550/1150 LSIK and LSIA trip unit c/w Zone interlocking feature (K-, L- & N-Frame).

### GF Alarm Unit Ordering Information

Description	Catalogue Number
Ground Fault Alarm Unit	GFAU
Face Mounting Bracket	1264C67G01

**Note:** Instruction Leaflet Number 29C614 Diagram

## Solid-State (Electronic) Portable Test Kit

The Solid-State (Electronic) Portable Test Kit provides verification of performance of all ratings of Digitrip 310 electronic trip units installed in circuit breakers while in service under varying load and/or phase imbalance. The test kit operates on 120-volt, 50/60 Hz power; it includes complete instructions and test times for testing long time, short time/ instantaneous operation and optional ground fault operation of the circuit breaker.

### Test Kit Ordering Information

Description	Catalogue Number
Solid-State (Electronic) Portable Test Kit	STK2

**Note:** Instruction Number 270

## Breaker Interface Module (BIM)



The Breaker Interface Module (BIM) is a panel mounted user interface device that is mounted on the front of an electrical assembly or at a remote location. The BIM is used to access, configure, test and display information for OPTIM trip units and other devices. The BIM consists of four display windows, eight function buttons, 18 LEDs, and a graphical time/current curve to provide breaker status, operational information, protection status and energy monitoring. A 24V DC power supply is required to provide power to the BIM. This is supplied by the switchboard builder to Eaton's specifications. The BIM is a member of Eaton's PowerNet family of communicating devices that connects OPTIM trip units, Digitrip RMS 810/910 trip units and energy sentinels as a subnetwork system. The BIM can also be connected to a main network via a PONI module to PowerNet software.

### Ordering Information

Catalogue  
Number

**BIMII**

**Note:** Instruction Leaflet Number 29C893

## Digitrip OPTIMizer



The Digitrip OPTIMizer is a hand-held programmer that is used to access, configure, test and display information from OPTIM trip units. The OPTIMizer plugs into the front of an OPTIM trip unit via an eight-pin telephone jack and is powered by a nine-volt battery or the auxiliary power module. One highlighted feature is the "Copy" and "Download" commands. Setting up multiple OPTIM trips can be finished in minutes and with no errors. An Auxiliary Power Module connection provides a trip test when control power is not present at the breaker. The OPTIMizer is supplied as a standard package to include the programmer, the eight-pin connection cord, battery and carrying case. The Auxiliary Power Module is optional.

### Ordering Information

Catalogue  
Number

**OPTIMizer – Standard Package**

**Note:** Instruction Leaflet Number 29C892

#### **Note: 24V DC Power Supply**

A 24V DC power supply is required for all Digitrip OPTIM trip units that are required to communicate either on the main Eaton PowerNet network or as a subnetwork to a BIM. The breaker's load is 45 mA of current. Typically one power supply is required per switchboard and can provide control power to a BIM and the OPTIM trip units. The 24V DC power supply should be an "isolated high quality" power supply with a "CE" label, and is normally provided by the switchboard manufacturer to Eaton's recommendations.

## Auxiliary Power Module



The Auxiliary Power Module is a power supply requiring 120V AC input at 50 or 60 Hz that provides a 32V DC output. The Auxiliary Power Module provides control power for testing an OPTIM trip unit when other means of control power is not available or for continuous OPTIMizer operation versus temporary with a battery. The Auxiliary Power Module connects into the top of the Digitrip OPTIMizer via a keyed receptacle. The main application for the Auxiliary Power Module would be for the testing of a stand-alone non-communicating OPTIM breaker that ordinarily would not have control power.

**Note:** The OPTIMizer can work off of 32V DC control power, although 24V DC is the standard on OPTIM breakers.

### Ordering Information

Catalogue  
Number

**PRTBAPMDV**

**Note:** Instruction Leaflet Number 29C890



## Potential Transformer Module



The Potential Transformer Module is required for Digitrip OPTIM 1050 to provide a voltage input to allow the trip unit to monitor power and energy as well as power factor. The Potential Transformer Module is a 6 VA transformer with a primary voltage input of up to 600V line to line. Three 0.1 ampere fuses are provided on the primary of the transformer and can be used for isolation purposes during dielectric testing. The device is normally panel mounted and can feed up to 16 OPTIM trip units.

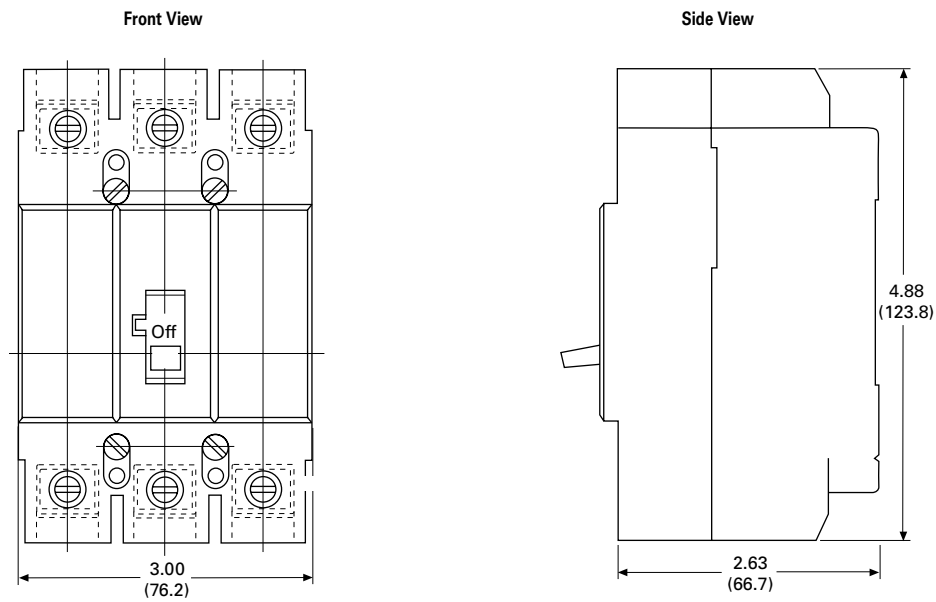
### Module Ordering Information

Description	Catalogue Number
Potential Transformer Module	DOPTMLN

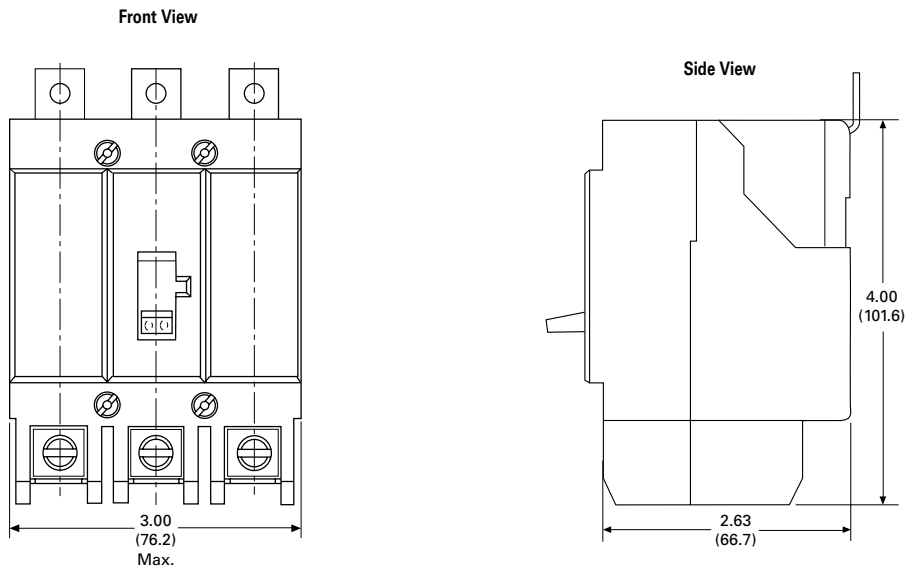
**Note:** Instruction Leaflet Number 29C894 Diagram

## Dimensions

### GD-Frame, 3-Pole — Dimensions in Inches (mm)



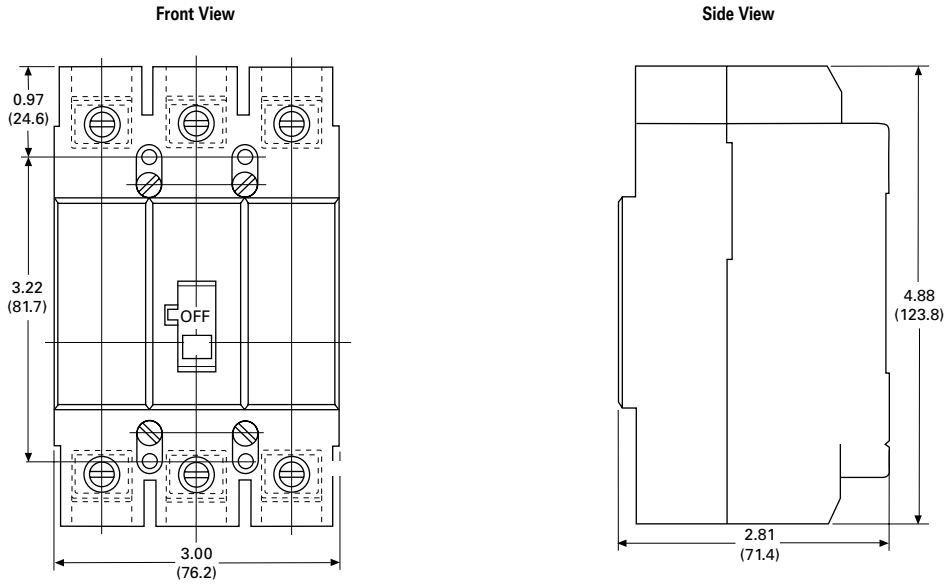
### GDB-Frame, 3-Pole — Dimensions in Inches (mm)



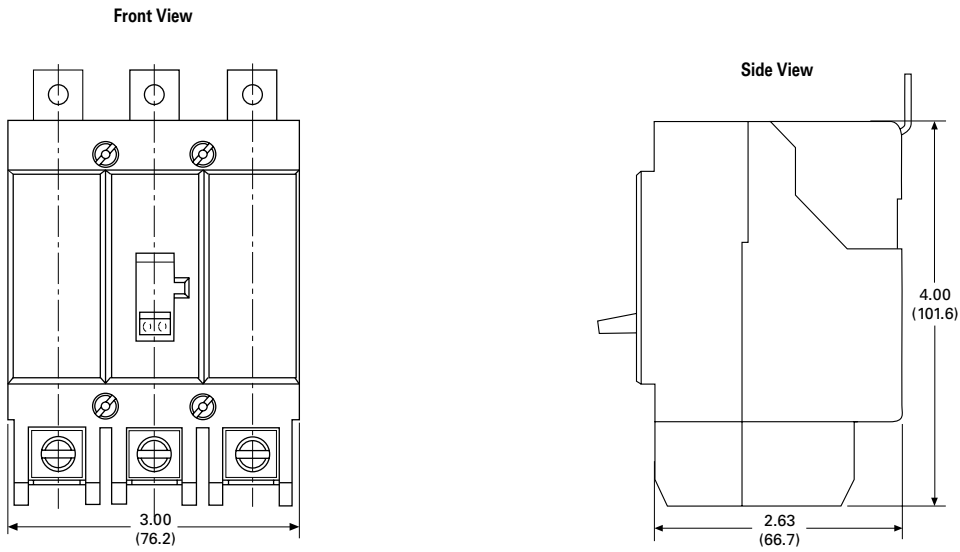
# DIM-2 Series C Moulded Case Circuit Breakers

Dimensions Frame Size GC/GHC/GCH and GB/GHB/GBH

## GC/GHC/GCH-Frame, 3-Pole — Dimensions in Inches (mm)



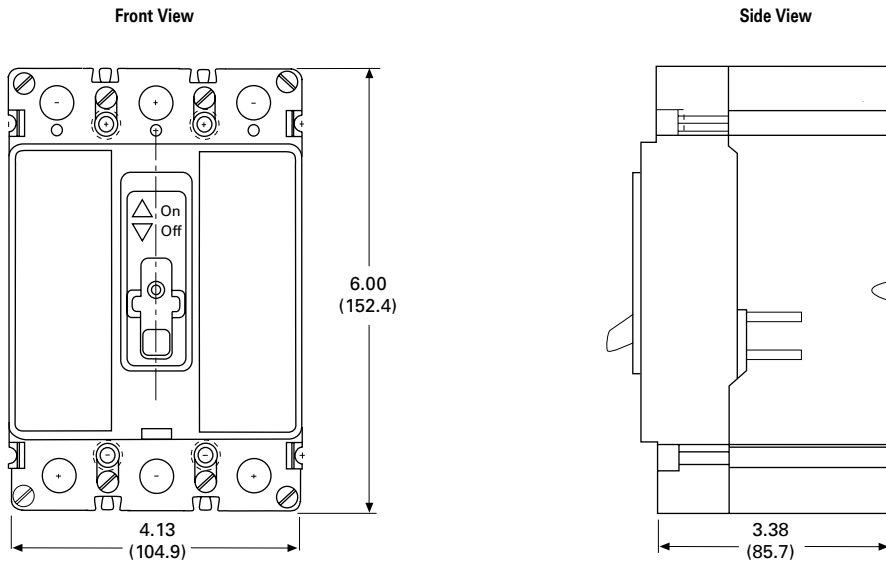
## GB/GHB/GBH-Frame, 3-Pole — Dimensions in Inches (mm)



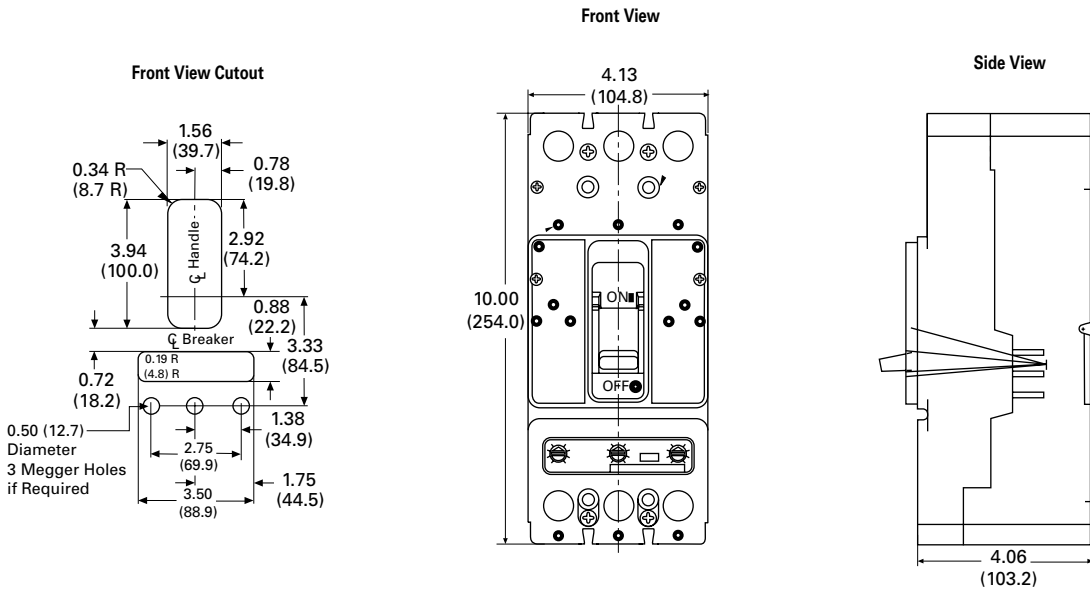
# Series C Moulded Case Circuit Breakers DIM-3

Dimensions Frame Size FD and JD

## FD-Frame, 3-Pole — Dimensions in Inches (mm)



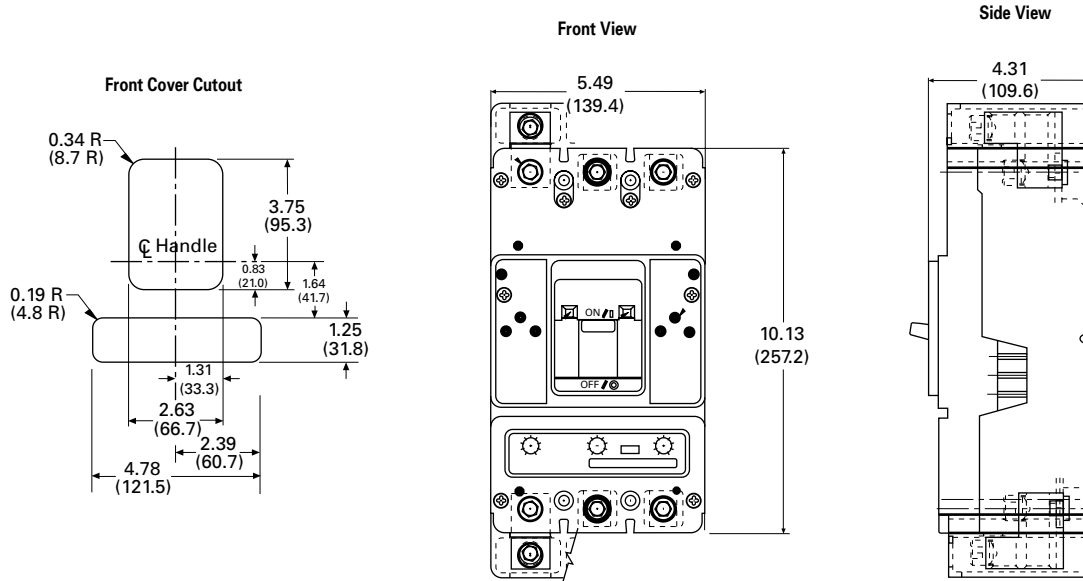
## JD-Frame, 2- and 3-Pole — Dimensions in Inches (mm)



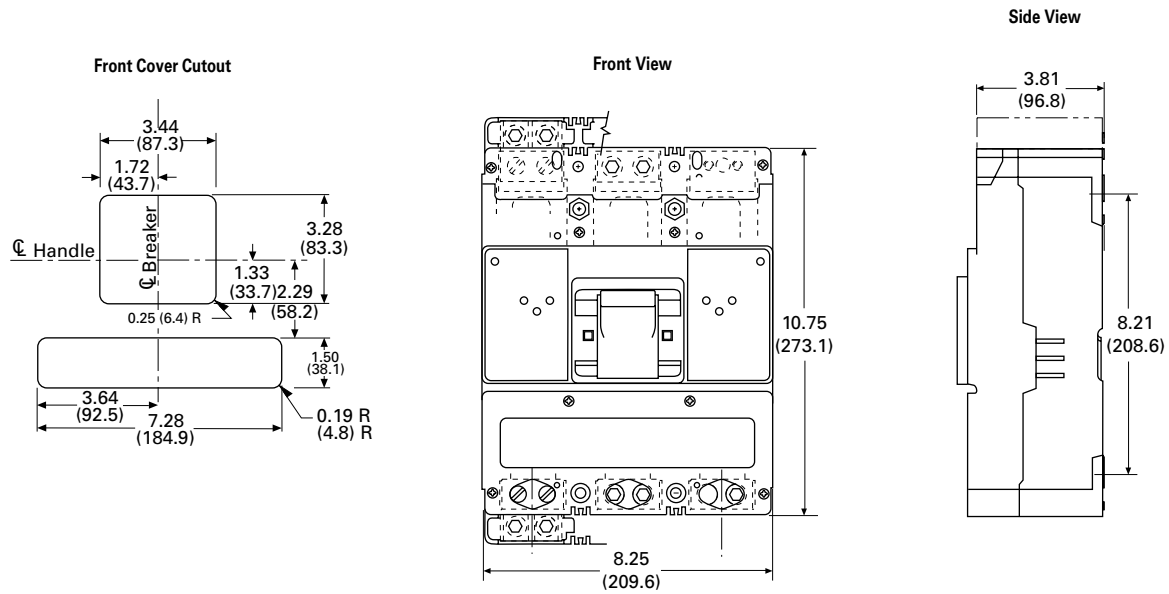
# DIM-4 Series C Moulded Case Circuit Breakers

Dimensions Frame Size KD and LD

## KD-Frame, 2- and 3-Pole — Dimensions in Inches (mm)



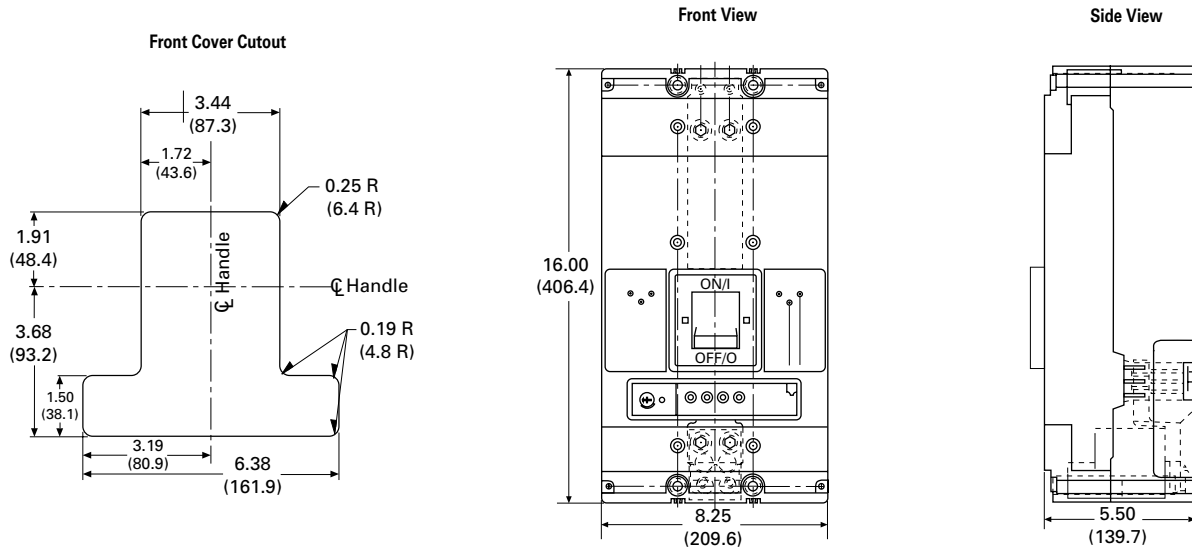
## LD-Frame, 2- and 3-Pole — Dimensions in Inches (mm)



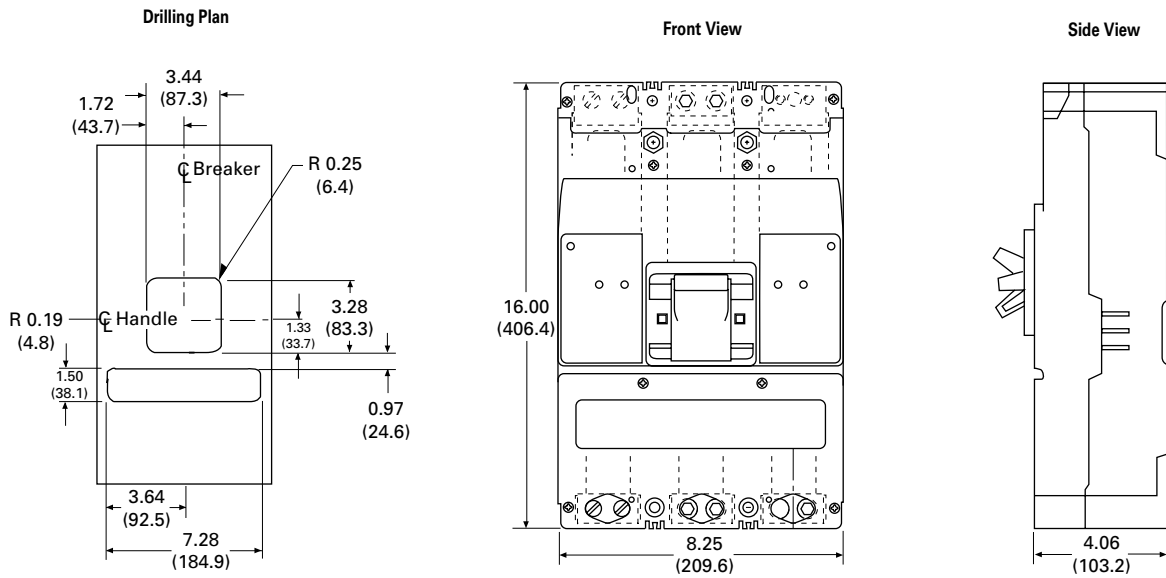
# Series C Moulded Case Circuit Breakers DIM-5

Dimensions Frame Size MDL and ND

## ND-Frame, 2- and 3-Pole — Dimensions in Inches (mm)



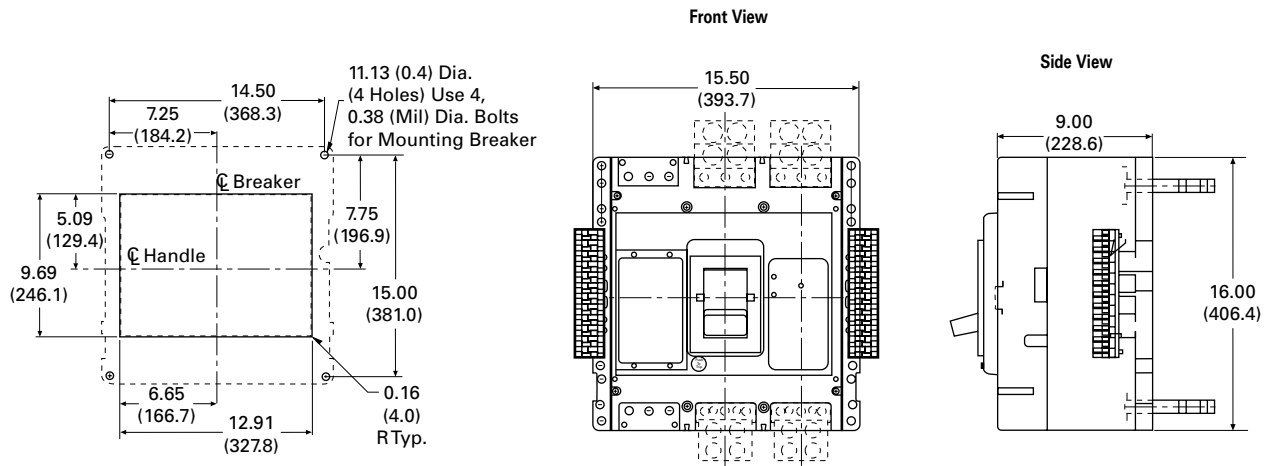
## MDL-Frame, 2- and 3-Pole — Dimensions in Inches (mm)



# DIM-6 Series C Moulded Case Circuit Breakers

Dimensions Frame Size RD

## RD-Frame, 3-Pole, 1600 and 2000 Amperes — Dimensions in Inches (mm)



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Type FCL Breaker



## Type FCL Current Limit-R Thermal-Magnetic Circuit Breakers — Non-fused

### Product Description

- 15 to 100 amperes, 480V AC
- Non-interchangeable trip, line and load terminals included

### Standards and Certifications

- Listed with Canadian Standards Association and Underwriters Laboratories except as noted

### Technical Data and Specifications

#### CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings

Circuit Breaker Type	Volts AC (50/60 Hz)	Interrupting Capacity (Symmetrical Amperes) (kA)
FCL	240	200
	480	150

On all 3-phase Delta, Grounded B phase applications, refer to Eaton.

### Line and Load Terminals

Breakers listed include line and load terminals. Terminals are CSA and UL listed for wire sizes and types listed below. When used with aluminum cable, use joint compound. To order optional aluminum terminals, add Suffix **Z** to breaker Catalogue Number listed.

#### Line and Load Terminals

Maximum Breaker Amperes	Wire Type	AWG Wire Range
<b>Standard Pressure Terminals</b>		
100	Al/Cu	14 – 1/0
<b>Optional Al/Cu Pressure Terminals</b>		
50	Al/Cu	14 – 4
100	Al/Cu	4 – 4/0

### Dimensions/Weights

#### Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2 – 3	4.13 (104.8)	8.8 (222.3)	3.4 (85.7)

#### Approximate Shipping Weight, Lbs. (Kg)

2-Pole	9 (4.1)
3-Pole	9 (4.1)

### Product Selection

#### Type FCL Circuit Breakers

Max. Cont. Amp Rating @ 40°C	2-Pole <sup>①</sup>	3-Pole
	Catalogue Number	Catalogue Number
15	FCL2015L	FCL3015L
20	FCL2020L	FCL3020L
25	FCL2025L	FCL3025L
30	FCL2030L	FCL3030L
35	FCL2035L	FCL3035L
40	FCL2040L	FCL3040L
45	FCL2045L	FCL3045L
50	FCL2050L	FCL3050L
60	FCL2060L	FCL3060L
70	FCL2070L	FCL3070L
80	FCL2080L	FCL3080L
90	FCL2090L	FCL3090L
100	FCL2100L	FCL3100L

<sup>①</sup> 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from the centre pole.



Type LCL Breaker



### Type LCL Current Limit-R Electronic Circuit Breakers — Non-fused

#### Product Description

- 125 to 400 amperes, 600V AC with solid-state trip units

#### Standards and Certifications

- Listed with Canadian Standards Association and Underwriters Laboratories except as noted.

#### Technical Data and Specifications

##### CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings

Circuit Breaker Type	Volts AC (50/60 Hz)	Interrupting Capacity (Symmetrical Amperes) (kA)
LCL	240	200
	480	200
	600	100

On all 3-phase Delta, Grounded B phase applications, refer to Eaton.

#### Dimensions/Weights

##### Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2 – 3	16 (406.40)	8.25 (209.56)	4.0625 (103.19)

##### Approximate Shipping Weight in Lbs. (Kg)

Standard	With Ground Fault
<b>2-Pole</b>	
32 (14.515)	—
<b>3-Pole</b>	
32 (14.515)	36 (16.329)

#### Product Selection

##### Standard Breakers 600V AC, 50/60 Hz

Complete breaker requires frame, rating plug and terminals.

##### Standard Breakers 600V AC, 50/60 Hz

###### Frame Only

Poles <sup>②</sup>	Standard (Long Delay, Short Time Trip and Current Limiting)	Short Time Only <sup>③</sup> and Current Limiting	Long Delay, Short Time Trip and Adjustable Short Delay Time (.08-.28 seconds) and Current Limiting
	Catalogue Number	Catalogue Number	Catalogue Number
<b>Types LCL and LCLA 250 Ampere Frame (125 – 250 Amperes)</b>			
2	LCL2250F	LCL2250FM	LCLA2250F
3	LCL3250F	LCL3250FM	LCLA3250F
<b>Type LCL and LCLA 400 Ampere Frame (200 – 400 Amperes)</b>			
2	LCL2400F	LCL2400FM	LCLA2400F
3	LCL3400F	LCL3400FM	LCLA3400F

<sup>②</sup> 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from the centre pole.

<sup>③</sup> CSA and UL listed recognized component.

**Note:** Instruction Leaflet Number 15257

#### Breakers with Built-in Ground Fault Protection

Complete breaker requires frame, rating plug and terminals — extra current transformer included for neutral.

#### Breakers with Built-in Ground Fault Protection

###### Frame Only

Poles <sup>④</sup>	Standard (Long Delay, Short Time Trip, Current Limiting and Ground Fault Trip)	Long Delay, Short Time Trip and Adjustable Short Delay Time (.06-.22 seconds), Ground Fault Trip and Current Limiting
	Catalogue Number	Catalogue Number
<b>Types LCLG and LCLGA 250 Ampere Frame (125-250 Amperes)</b>		
3	LCLG3250F	LCLGA3250F
<b>Types LCLG and LCLGA 400 Ampere Frame (200-400 Amperes)</b>		
3	LCLG3400F	LCLGA3400F

<sup>④</sup> 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from the centre pole.

**Note:** Instruction Leaflet Number 15495

## Terminals (Order Separately)

Two terminals are required per pole. Terminals are CSA and UL listed for wire type and range listed below. When used with aluminum cable, use joint compound.

**Note:** Terminals shipped separately from breaker.

### Terminals

Max. Breaker Amps	Wire Range, Type, Number of Cables	Terminal Catalogue Number
<b>Standard Copper Pressure Terminals</b>		
225	(1) 6 AWG – 350 kcmil Cu	<b>T225LA</b>
400	(1) 4 AWG – 250 kcmil Cu, plus (1) 3/0 – 600 kcmil Cu	<b>T401LA</b>
<b>Optional Al/Cu Pressure Terminals</b>		
225	(1) 6 AWG – 350 kcmil Cu, or (1) 4 AWG – 350 kcmil Al	<b>TA225LA1</b>
400	(1) 4 AWG – 250 kcmil Al/Cu, plus (1) 3/0 – 600 kcmil Al/Cu	<b>TA400LA1</b>

## Rating Plug Selection Data

Rating plugs listed below are for both standard breakers and breakers with built-in ground fault protection.

### Rating Plugs Only (For 2- or 3-Pole Frames)

Cont. Amp Rating	Magnetic Trip Setting, Amps		Fixed Rating Plugs	Adjustable Rating Plugs <sup>①</sup>
	Low	High	Catalogue Number	Catalogue Number
<b>Types LCL and LCLA 250 Ampere Frames</b>				
125	375	1125	<b>2LCL125</b>	—
150	450	1350	<b>2LCL150</b>	—
175	525	1575	<b>2LCL175</b>	<b>A2LCL175<sup>②</sup></b>
200	600	1800	<b>2LCL200</b>	<b>A2LCL200</b>
225	675	2025	<b>2LCL225</b>	<b>A2LCL225</b>
250	750	2250	<b>2LCL250</b>	<b>A2LCL250<sup>③</sup></b>
<b>Types LCL and LCLA 400 Ampere Frames</b>				
200	400	1600	<b>4LCL200</b>	—
225	450	1800	<b>4LCL225</b>	—
250	500	2000	<b>4LCL250</b>	—
275	550	2200	<b>4LCL275</b>	—
300	600	2400	<b>4LCL300</b>	<b>A4LCL300<sup>②</sup></b>
350	700	2800	<b>4LCL350</b>	<b>A4LCL350</b>
400	800	3200	<b>4LCL400</b>	<b>A4LCL400<sup>③</sup></b>

<sup>①</sup> Adjustable 70 to 100% except as noted.

<sup>②</sup> Adjustable 75 to 100%.

<sup>③</sup> Adjustable 50 to 100%.

#### Type FB Tri-Pac Breaker



### Type FB Tri-Pac Thermal-Magnetic Circuit Breakers — Fused

#### Product Description

- 15 to 100 amperes, 600V AC, 250V DC, replaceable current limiters

#### Standards and Certifications

- Listed with Canadian Standards Association and Underwriters Laboratories except as noted.

#### Technical Data and Specifications

##### CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings

- 600V AC maximum: 200,000 amperes symmetrical

##### Based on NEMA Test Procedures

- 250V DC maximum: 100,000 amperes
- On all 3-phase Delta, Ground B phase applications, refer to Eaton.

#### Line and Load Terminals

Breakers listed include line and load terminals. Terminals are CSA and UL listed for wire sizes and types listed below. When used with aluminum cable, use joint compound. To order optional aluminum terminals, add Suffix **Z** to breaker Catalogue Number listed.

#### Line and Load Terminals

Maximum Breaker Amps	Wire Type	AWG Wire Range
<b>Standard Pressure Terminals</b>		
100	Al/Cu	14 – 1/0
<b>Optional Al/Cu Pressure Terminals</b>		
50	Al/Cu	14 – 4
100	Al/Cu	4 – 4/0

#### Dimensions/Weights

##### Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2 – 3	4.125 (104.78)	8.75 (222.25)	3.5 (88.90)

##### Approximate Shipping Weight, Lbs.

Breaker	Complete Breaker	
	2-Pole	3-Pole
FB Tri-Pac	10.5	11.5

#### Product Selection

##### Type FB Tri-Pac Circuit Breakers

Maximum Continuous Ampere Rating @ 40°C	2-Pole ①	3-Pole
	Catalogue Number (Current Limiters Included)	Catalogue Number (Current Limiters Included)
15	FB2015PL	FB3015PL
20	FB2020PL	FB3020PL
30	FB2030PL	FB3030PL
40	FB2040PL	FB3040PL
50	FB2050PL	FB3050PL
60	FB2060PL	FB3060PL
70	FB2070PL	FB3070PL
90	FB2090PL	FB3090PL
100	FB2100PL	FB3100PL

① 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from the centre pole.

**Note:** Instruction Leaflet Number 14536 (for fuse replacement)

#### Replacement Current Limiters and Housing Assembly

Current Limiters: One required per pole.

##### Replacement Current Limiters

Application	Catalogue Number
Supplied as standard in Type FB Tri-Pac breakers rated 15 – 100 amperes. Replaces 200FBP03 formerly supplied on 15 – 40 ampere ratings, and 500FBP07 formerly supplied on 50 – 100 ampere ratings.	100FBP06

**Note:** Refer to CAT.71.01.T.E for complete application information.

#### Current Limiter Housing Assembly Complete with Current Limiter

Ampere Rating	Poles	Catalogue Number
15 – 100	2	176C593G09
15 – 100	3	176C593G10

Type LA Tri-Pac Breaker



### Type LA Tri-Pac Thermal-Magnetic Circuit Breakers — Fused

#### Product Description

- 70 to 400 amperes, 600V AC, 250V DC
- 2-, 3-Pole, interchangeable trip, replaceable current limiters

#### Standards and Certifications

- Listed with Canadian Standards Association and Underwriters Laboratories, except as noted.

#### Technical Data and Specifications

##### CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings

- 600V AC maximum: 200,000 amperes symmetrical

##### Based on NEMA Test Procedures

- 250V DC maximum: 100,000 amperes
- On all 3-phase Delta, Ground B phase applications, refer to Eaton.

#### Dimensions/Weights

##### Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2-3	8.25 (201.0)	16 (406.4)	4.75 (113.5)

##### Approximate Shipping Weight, Lbs.

Breaker	Complete Breaker		Frame Only		Trip Unit	
	2-Pole	3-Pole	2-Pole	3-Pole	2-Pole	3-Pole
LA Tri-Pac	29.75	34	23.5	25	2.25	3

#### Product Selection

##### Type LA Tri-Pac Circuit Breakers

Cont. Amp Rating @40°C	Magnetic Trip Setting Amps <sup>①</sup>		Complete Breaker		Shipped as Frame, Trip Units, Limiters and Terminals <sup>②</sup>		Current Limiter 1 Required per Pole
			Includes Pressure Type Copper Terminals <sup>②</sup>		Frame Only	Trip Unit Only	
			Catalogue Number	Catalogue Number			
<b>2 Poles, 600V AC, 250V DC<sup>③</sup></b>							
70	350	700	LA2070PR	LA2400PRF	LA2070PT	200LAP08	
90	450	900	LA2090PR	LA2400PRF	LA2090PT	200LAP08	
100	500	1000	LA2100PR	LA2400PRF	LA2100PT	200LAP08	
125	625	1250	LA2125PR	LA2400PRF	LA2125PT	200LAP08	
150	750	1500	LA2150PR	LA2400PRF	LA2150PT	200LAP08	
175	875	1750	LA2175PR	LA2400PRF	LA2175PT	200LAP08	
200	1000	2000	LA2200PR	LA2400PRF	LA2200PT	200LAP08	
225	1125	2250	LA2225PR	LA2400PRF	LA2225PT	400LAP10	
250	1250	2500	LA2250PR	LA2400PRF	LA2250PT	400LAP10	
300	1500	3000	LA2300PR	LA2400PRF	LA2300PT	400LAP10	
350	1750	3500	LA2350PR	LA2400PRF	LA2350PT	400LAP10	
400	2000	4000	LA2400PR	LA2400PRF	LA2400PT	400LAP10	
<b>3 Poles, 600V AC, 250V DC<sup>③</sup></b>							
70	350	700	LA3070PR	LA3400PRF	LA3070PT	200LAP08	
90	450	900	LA3090PR	LA3400PRF	LA3090PT	200LAP08	
100	500	1000	LA3100PR	LA3400PRF	LA3100PT	200LAP08	
125	625	1250	LA3125PR	LA3400PRF	LA3125PT	200LAP08	
150	750	1500	LA3150PR	LA3400PRF	LA3150PT	200LAP08	
175	875	1750	LA3175PR	LA3400PRF	LA3175PT	200LAP08	
200	1000	2000	LA3200PR	LA3400PRF	LA3200PT	200LAP08	
225	1125	2250	LA3225PR	LA3400PRF	LA3225PT	400LAP10	
250	1250	2500	LA3250PR	LA3400PRF	LA3250PT	400LAP10	
300	1500	3000	LA3300PR	LA3400PRF	LA3300PT	400LAP10	
350	1750	3500	LA3350PR	LA3400PRF	LA3350PT	400LAP10	
400	2000	4000	LA3400PR	LA3400PRF	LA3400PT	400LAP10	

① Set on high side, adjustable to lower limits.

② Terminals shipped separately from breakers.

③ 2-pole breakers or trips are supplied in 3-pole frames with current carrying parts omitted from the centre pole.

**Note:** Instruction Leaflet Number 14551 for Trip Unit and Fuse

#### Current Limiters

Included with complete breaker, one required per pole.

#### Current Limiters

Application	Catalogue Number
Supplied as standard on ratings through 200 amperes.	<b>200LAP08</b>
Supplied as standard on 225 through 400 ampere ratings, optional on lower ratings when a higher "cross-over point" is desired. (Above two limiters replace 800LAP12 formerly supplied as standard on all ratings, 600LAP09 optional on all ratings through 300 amperes, 300LAP05 optional on ratings through 150 amperes, and special rating limiter 1000LAP14.)	<b>400LAP10</b>
Special rating where a higher "cross-over point" is desired on 200 ampere and higher ratings (Replaces limiter 1500LAP20)	<b>500LAP15</b> <sup>①②</sup>

<sup>①</sup> Not listed with CSA and UL.

<sup>②</sup> Protection based on 100,000 ampere maximum fault, 480V maximum.

**Note:** New limiters suitable for replacement in existing breakers by using plug-in conductor from old limiter (instructions included with limiter). Instruction Leaflet Number 14824

#### Terminals (Order Separately)

Two terminals are required per pole. Terminals are CSA and UL listed for wire size and type listed below. When used with aluminum conductors, use joint compound. To order optional aluminum terminals, add Suffix **Z** to complete breaker Catalogue Number.

**Note:** Terminals shipped separately from breakers.

#### Terminals

Maximum Breaker Amperes	Wire Range, Type, Number of Cables	Terminal Catalogue Number
<b>Standard Copper Pressure Terminals</b>		
225	(1) 6 AWG – 350 kcmil Cu	<b>T225LA</b>
225 <sup>③</sup>	(1) 6 AWG – 250 kcmil Cu	<b>T225LBF</b>
400	(1) 4 AWG – 250 kcmil Cu, plus	<b>T401LA</b>
	(1) 3/0 – 600 kcmil Cu	
<b>Optional Al/Cu Pressure Terminals</b>		
225	(1) 6 AWG – 350 kcmil Cu, or (1) 4 AWG – 350 kcmil Cu/Al	<b>TA225LA1</b>
400	(1) 4 AWG – 250 kcmil Al/Cu, plus	<b>TA400LA1</b>
	(1) 3/0 – 600 kcmil Al/Cu	

<sup>③</sup> Optional terminal.

**Note:** Instruction Leaflet Number 13732

Type NB Tri-Pac Breaker



### Type NB Tri-Pac Thermal-Magnetic Circuit Breakers — Fused

#### Product Description

- 300 to 800 amperes, 600V AC, 250V DC
- **Note:** DC rating applies to 350 amperes maximum thermal or to magnetic only breakers.
- 2-, 3-Pole, interchangeable trip, replaceable current limiters

#### Standards and Certifications

- Listed with Canadian Standards Association and Underwriters Laboratories except as noted

#### Technical Data and Specifications

##### CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings

- 600V AC maximum: 200,000 amperes symmetrical

##### Based on NEMA Test Procedures

- 250V DC maximum: 100,000 amperes
- **Note:** DC rating applies to 350 amperes maximum thermal or to magnetic only breakers.
- On all 3-phase Delta, grounded B phase applications, refer to Eaton.

#### Dimensions/Weights

##### Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2–3	8.25 (209.56)	22 (558.80)	5.5 (139.70)

##### Approximate Shipping Weight, Lbs.

Breaker	Complete Breaker		Frame Only		Trip Unit	
	2-Pole	3-Pole	2-Pole	3-Pole	2-Pole	3-Pole
NB Tri-Pac	62	75	58	65	3.5	4

#### Product Selection

##### Type NB Tri-Pac Circuit Breakers

Cont. Amp Rating @40°C	Magnetic Trip Setting Amperes <sup>③</sup>		Complete Breaker		Shipped as Frame, Trip Units, Limiters and Terminals		Current Limiter 1 Required per Pole
			Includes Pressure Type Copper Terminals		Frame Only	Trip Unit Only	
			Catalogue Number	Catalogue Number			
<b>2 Poles, 600V AC, 250V DC<sup>①②</sup></b>							
300	1500	3000	NB2300P	NB2800PF	NB2300PT	500NBP12	
350	1750	3500	NB2350P	NB2800PF	NB2350PT	500NBP12	
400 <sup>③</sup>	2000	4000	NB2400P	NB2800PF	NB2400PT	500NBP12	
500 <sup>③</sup>	2500	5000	NB2500P	NB2800PF	NB2500PT	500NBP12	
600 <sup>③</sup>	3000	6000	NB2600P	NB2800PF	NB2600PT	800NBP20	
700 <sup>③</sup>	3000	6000	NB2700P	NB2800PF	NB2700PT	800NBP20	
800 <sup>③</sup>	3000	6000	NB2800P	NB2800PF	NB2800PT	800NBP20	
<b>3 Poles, 600V AC Only</b>							
300	1500	3000	NB3300P	NB3800PF	NB3300PT	500NBP12	
350	1750	3500	NB3350P	NB3800PF	NB3350PT	500NBP12	
400 <sup>③</sup>	2000	4000	NB3400P	NB3800PF	NB3400PT	500NBP12	
500 <sup>③</sup>	2500	5000	NB3500P	NB3800PF	NB3500PT	500NBP12	
600 <sup>③</sup>	3000	6000	NB3600P	NB3800PF	NB3600PT	800NBP20	
700 <sup>③</sup>	3000	6000	NB3700P	NB3800PF	NB3700PT	800NBP20	
800 <sup>③</sup>	3000	6000	NB3800P	NB3800PF	NB3800PT	800NBP20	

① DC rating applies to 350 amperes maximum thermal or to magnetic only breakers.

② 2-pole breakers or trips are supplied in 3-pole frames with current carrying parts omitted from the centre pole.

③ 60 Hz AC only.

**Note:** Instruction Leaflet Number 13771 for Trip Unit and Fuse

#### Current Limiters

Included with complete breaker, one required per pole.

#### Current Limiters

Application	Catalogue Number
Supplied as standard on ratings through 500 amperes.	<b>500NBP12</b>
Supplied as standard on 600 – 800 ampere ratings, optional on lower ratings when a higher “cross-over point” is desired.	<b>800NBP20</b>
Above two limiters replace 1000NBP14 formerly supplied on ratings up to 600 amperes, 1500NBP20 supplied on 700 amperes, and 2500NBP25 supplied on 800 amperes.	

#### Terminals (Order Separately)

Two terminals are required per pole. Terminals are CSA and UL listed for wire size and type listed below. When used with aluminum conductors, use joint compound. To order optional aluminum terminals, add Suffix **Z** to complete breaker Catalogue Number.

**Note:** Shipped separately from breaker.

#### Terminals

Max. Amp Rating	Wire Range, Type, Number of Cables	Terminal Catalogue Number
<b>Standard Copper Pressure Terminals</b>		
350	(1) 1 AWG – 600 kcmil Cu	<b>T350NB</b>
700	(2) 2/0 – 500 kcmil Cu	<b>T700NB1</b>
800	(3) 3/0 – 500 kcmil Cu	<b>T1000NB1</b>
<b>Optional Al/Cu Pressure Terminals</b>		
700	(2) 1 AWG – 500 kcmil Al/Cu	<b>TA700NB1</b>
800	(3) 3/0 – 400 kcmil Al/Cu	<b>TA1000NB1</b>
800	(3) 500 – 750 kcmil Al/Cu	<b>TA1201NB1</b>

Type PB Tri-Pac Breaker



## Type PB Tri-Pac Thermal-Magnetic Circuit Breakers — Fused

### Product Description

- 600 to 1600 amperes, 600V AC, 60 Hz AC, 250V DC
- Note:** Higher frequency calibration not available. Minimum of 50 Hz calibration available on special order.
- Note:** 250V DC rating applies only to magnetic only breakers.

- 2-, 3-pole interchangeable trip, replaceable current limiters

### Standards and Certifications

- Listed with Canadian Standards Association and Underwriters Laboratories except as noted

### Dimensions/Weights

#### Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2-3	12.063 (306.4)	22.13 (562.0)	9.06 (230.2)

#### Approximate Shipping Weight in Lbs. (Kg)

Breaker	Complete Breaker		Frame Only		Trip Unit	
	2-Pole	3-Pole	2-Pole	3-Pole	2-Pole	3-Pole
PB Tri-Pac	148 (67.2)	179 (81.3)	106 (48.1)	120 (54.5)	18 (8.2)	23 (10.4)

## Product Selection

### Type PB Tri-Pac Circuit Breakers

Cont. Amp Rating @40°C	AC Magnetic Trip Setting (Set on High Side, Adjustable to Lower Limits)		Complete Breaker	Shipped as Frame, Trip Unit Current Limiters and Connectors		
	Low	High	Includes Rear "T" Connectors <sup>②</sup>	Frame Only	Trip Unit Only <sup>①</sup>	Current Limiter 1 Required per Pole
			Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
<b>2 Poles, 600V AC<sup>②</sup></b>						
600	1500	5000	PB2600PR	PB21600PRF	PB2600PRT	1000PBPR20
700	1500	5000	PB2700PR	PB21600PRF	PB2700PRT	1000PBPR20
800	1500	5000	PB2800PR	PB21600PRF	PB2800PRT	1000PBPR20
900	1500	5000	PB2900PR	PB21600PRF	PB2900PRT	1000PBPR20
1000	1500	5000	PB21000PR	PB21600PRF	PB21000PRT	1000PBPR20
1200	2000	6000	PB21200PR	PB21600PRF	PB21200PRT	1600PBPR30
1400	2500	7000	PB21400PR	PB21600PRF	PB21400PRT	1600PBPR30
1600	3000	8000	PB21600PR	PB21600PRF	PB21600PRT	1600PBPR30
<b>3 Poles, 600V AC Only</b>						
600	1500	5000	PB3600PR	PB31600PRF	PB3600PRT	1000PBPR20
700	1500	5000	PB3700PR	PB31600PRF	PB3700PRT	1000PBPR20
800	1500	5000	PB3800PR	PB31600PRF	PB3800PRT	1000PBPR20
900	1500	5000	PB3900PR	PB31600PRF	PB3900PRT	1000PBPR20
1000	1500	5000	PB31000PR	PB31600PRF	PB31000PRT	1000PBPR20
1200	2000	6000	PB31200PR	PB31600PRF	PB31200PRT	1600PBPR30
1400	2500	7000	PB31400PR	PB31600PRF	PB31400PRT	1600PBPR30
1600	3000	8000	PB31600PR	PB31600PRF	PB31600PRT	1600PBPR30

<sup>①</sup> Magnetic only trip units are available. Order by description.

<sup>②</sup> 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from centre pole.

**Note:** Instruction Leaflet Number 14503



# CLCP-10 Special Application Moulded Case Circuit Breakers

Current Limiting Circuit Protectors Fused

## Current Limiters

Included with complete breaker, one required per pole.

### Current Limiters

Application	Catalogue Number
Supplied as standard on ratings through 1000 amperes. (Replaces limiter 1500PBPR30 formerly supplied on 600 and 700 ampere ratings, and 3000 PBPR27 supplied on 800-1000 ampere ratings.)	<b>1000PBPR20</b>
Supplied as standard on 1200 through 1600 ampere ratings. Optional on lower ratings where a higher "cross-over point" is desired. (Replaces limiter 4000PBR30 formerly supplied on 1200 through 1400 ampere ratings, and 5000PBPR42 supplied on 1600 ampere ratings.)	<b>1600PBPR30</b>

## Bus Bar Connectors

### "T" Connector for Cu/Al Bus

Two required per pole. For rear bus connection. Accepts up to four bus bolts. May be rotated 90°.



### Bus Bar Connectors

#### Catalogue Number

**BA2000PB**

**Note:** Not listed with CSA and UL.

## Cable Connector (Optional)

For "T" connector. Accepts four 600 kcmil copper cables.



## Cable Connector (Optional)

#### Catalogue Number

**505C706G04**

## Special Breakers

Magnetic Only Type Tri-Pacs available on request.

**Note:** Not listed with CSA and UL.

# Special Application Moulded Case Circuit Breakers CLCP-11

Current Limiting Circuit Protectors Accessories

## Options and Accessories

### Alarm Switch

For light or alarm indication when breaker trips. Does not function with manual operation. Automatically resets when breaker is re-latched. Standard leads extend 18 inches (457.2 mm) outside of breaker. Not field mountable.

### Alarm Switch

Breaker Frame	Normal Pole Meeting	Contact Operation (Specific Type Desired)
FCL	centre	Make or Break
LA Tri-Pac	Left	Make or Break
NB Tri-Pac	Left	Make or Break
PB Tri-Pac	Left	Make or Break
LCL	Left ①	Make or Break

① When alarm switch is used in conjunction with auxiliary switch, the auxiliary switch is rated 250 volts max., 5 amperes maximum.

Alarm Switch Contact Rating (Non Inductive) LA Tri-Pac: 10 amperes, 120V AC; 5A, 240V AC.

### Auxiliary Switch

For auxiliary control circuits. Miniature switches mount within breaker. Commonly used for remote indication of open or closed breaker and electrically interlocking component control circuits. "A" contacts are closed when breaker is closed. "B" contacts are open when breaker is closed. Standard leads extend 18 inches (457.2 mm) outside of breaker.

**Note:** Left-hand mounting is standard unless otherwise specified.



### Auxiliary Switch Attachment Kits for Field Mounting ②③

Breaker Type	1A-1B Catalogue Number	2A-2B Catalogue Number	Maximum AC Voltage Rating ④	Maximum Non-Inductive Amperes
<b>For Right-Hand Mounting</b>				
FCL	1369D79G03	—	240	5
NB Tri-Pac	4980D16G05	4980D16G06	480	10
PB Tri-Pac	2602D32G14	2602D32G15	480	10
LCL	—	—	480	6 (10@240)
<b>For Left-Hand Mounting</b>				
FCL	1369D79G03	—	240	5
NB Tri-Pac	4980D16G12	4980D16G13	480	10
PB Tri-Pac	2602D32G11	2602D32G12	480	10
LCL	1372D49G03	1372D49G06	480	6 (10@240)

② All switches are multiples of 1A-1B with a common electrical connection (see Figure ).

③ Field mounting voids CSA and UL listing of breaker except on LCL, NB Tri-Pac and PB Tri-Pac breakers.

④ For DC applications refer to Eaton.

**Note:** Instruction Leaflet Number 14535 NB Tri-Pac; 14534 PB Tri-Pac; 15279 LCL

### Factory Mounted Auxiliary Switches

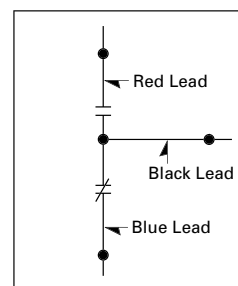
**Note:** Left-hand mounting is standard unless otherwise specified.

All of the above auxiliary switches can be specified for factory mounting at the same price as listed for the kit. These attachments have the leads out the side of the breaker and are CSA and UL listed when factory mounted unless other non-CSA/UL-listed modifications are used (except as noted).

Factory mounted switches only can be supplied for the following breakers: FB Tri-Pac, LA Tri-Pac. Order by description.

**Note:** Right-hand mounting for FB Tri-Pac only.

### Auxiliary Switches



# CLCP-12 Special Application Moulded Case Circuit Breakers

Current Limiting Circuit Protectors Accessories



## Shunt Trip

For tripping breaker from a remote point. A solenoid device mounts within breaker case. Breaker trips when coil is energized.

Shunt trips should not be used as circuit interlocks using maintained contact pilot devices.

A cutoff switch breaks the circuit to the momentary rated coil when breaker opens. Available for control voltages up to 250V DC or 600V AC. Voltage and frequency must be specified. Standard leads extend 18 inches (457.2 mm) outside of breaker.

## Shunt Trip for Field Mounting <sup>①②③</sup>

Voltage/Hz	Breaker Type		
	FCL	NB Tri-Pac	PB Tri-Pac
	Catalogue Number	Catalogue Number	Catalogue Number
<b>Right-Hand Mounting</b>			
600/50 – 60 Hz	1369D80G15	2606D58G15	2606D59G15
480/50 – 60 Hz	1369D80G16	2606D58G16	2606D59G16
240/50 – 60 Hz	1369D80G17	2606D58G17	2606D59G17
208/50 – 60 Hz	1369D80G18	2606D58G18	2606D59G18
120/50 – 60 Hz	1369D80G19	2606D58G19	2606D59G19
60/50 – 60 Hz	1369D80G20	2606D58G20	2606D59G20
48/50 – 60 Hz	1369D80G21	2606D58G21	2606D59G21
24/50 – 60 Hz	1369D80G22	2606D58G22	2606D59G22
250 DC	1369D80G23	2606D58G23	2606D59G23
125 DC	1369D80G24	2606D58G24	2606D59G24
60 DC	1369D80G25	2606D58G25	2606D59G25
48 DC	1369D80G26	2606D58G26	2606D59G26
24 DC	1369D80G27	2606D58G27	2606D59G27
12 DC	1369D80G28	2606D58G28	2606D59G28
<b>Left-Hand Mounting</b>			
600/50 – 60 Hz	1369D80G01	2606D58G01	2606D59G01
480/50 – 60 Hz	1369D80G02	2606D58G02	2606D59G02
240/50 – 60 Hz	1369D80G03	2606D58G03	2606D59G03
208/50 – 60 Hz	1369D80G04	2606D58G04	2606D59G04
120/50 – 60 Hz	1369D80G05	2606D58G05	2606D59G05
60/50 – 60 Hz	1369D80G06	2606D58G06	2606D59G06
48/50 – 60 Hz	1369D80G07	2606D58G07	2606D59G07
24/50 – 60 Hz	1369D80G08	2606D58G08	2606D59G08
250 DC	1369D80G09	2606D58G09	2606D59G09
125 DC	1369D80G10	2606D58G10	2606D59G10
60 DC	1369D80G11	2606D58G11	2606D59G11
48 DC	1369D80G12	2606D58G12	2606D59G12
24 DC	1369D80G13	2606D58G13	2606D59G13
12 DC	1369D80G14	2606D58G14	2606D59G14

① 120V AC ratings suitable for 55% pickup for ground fault applications.

② Not field mountable on non-automatic breakers (MCS).

③ Field mounting voids breakers' CSA and UL listing except on NB Tri-Pac and PB Tri-Pac.

**Note:** Instruction Leaflet Numbers 15194 (FCL); 14919 (NB Tri-Pac); 14940 (PB Tri-Pac)

Factory mounted shunt trips only can be supplied for FB Tri-Pac and LA Tri-Pac breakers. Order by description.

**Note:** Right-hand mounting for FB Tri-Pac only, not CSA and UL listed.

## Left-Hand Mounting Kits for Type LCL Current Limiting Breakers <sup>④</sup>

Description	Catalogue Number
Provision to trip flux transfer shunt trip from external 32 to 120V (DC to 60 Hz) source. <sup>⑤⑥</sup>	1372D49G22
Provision to trip flux transfer shunt trip from external 240 to 600V (50/60 Hz) source. <sup>⑥⑦</sup>	1372D49G32

④ CSA and UL listing pending. Refer to Eaton.

⑤ Rated 48V minimum for ground fault applications.

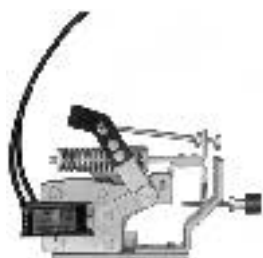
⑥ Also available factory mounted for 24V DC. Order by description.

⑦ Not for ground fault.

**Note:** Instruction Leaflet Number 15279

## Shunt Trip Coil Data for Type LCL Current Limiting Breakers

Shunt Trip Voltage Rating	Coil Inrush	
	Amperes	Volt-Amperes
120 AC	.15	18



### Standard Undervoltage Release

For undervoltage protection. A solenoid device mounts within breaker case. Coil must be energized before closing breaker. Trips breaker when voltage drops below 40 to 60% of coil rating. Picks up and seals in at 80% of coil rating. For line voltages up to 250V DC or 600V AC. Externally mounted resistors are supplied for certain ratings. Standard leads extend 18 inches (457.2 mm) outside of breaker.

**Note:** U.V.R. attachments are not designed for, and should not be used as, circuit interlocks. For further information, refer to Eaton.

### Factory Mounted Undervoltage Releases

NB Tri-Pac and PB Tri-Pac undervoltage releases can be specified for factory mounting at the same price as the kit. These attachments have the leads out the side and are UL listed when factory mounted unless other non-CSA/UL listed modifications are used.

**Note:** Right-hand mounting considered standard unless specified otherwise.

Factory mounted undervoltage releases only can be supplied for the following breakers: FB Tri-Pac, LA Tri-Pac and FCL; LCL 120V AC only. Order by description.

**Note:** Right-hand mounting for FB Tri-Pac only. UL listing pending for LCL.

### Undervoltage Release Attachment Kits for Field Mounting <sup>①</sup>

Attachment Voltage/Hz	Breaker Type			
	For Right-Hand Mounting		For Left-Hand Mounting	
	NB Tri-Pac	PB Tri-Pac	NB Tri-Pac	PB Tri-Pac
	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
24/60	—	—	—	—
48/60	—	5674D29G16	—	5674D29G08
120/60	373D632G01	5674D29G09	373D632G05	5674D29G01
208/60	373D632G19	5674D29G10	373D632G20	5674D29G02
240/60	373D632G02	5674D29G11	373D632G06	5674D29G03
480/60	373D632G03	5674D29G13	373D632G07	5674D29G05
600/60	373D632G04	5674D29G14	373D632G08	5674D29G06
12 DC	372D032G01	4976D85G01	372D032G06	4976D85G11
24 DC	372D032G02	4976D85G02	372D032G07	4976D85G12
48 DC	372D032G03	4976D85G03	372D032G08	4976D85G13
60 DC	—	4976D85G04	—	4976D85G14
125 DC	372D032G04	4976D85G07	372D032G09	4976D85G17
250 DC	372D032G05	4976D85G08	372D032G10	4976D85G18

<sup>①</sup> Field mounting voids CSA/UL listing of breaker except on NB Tri-Pac and PB Tri-Pac.

**Note:** Instruction Leaflet Number 14961 (NB Tri-Pac); 13231 (PB Tri-Pac)

### Undervoltage Release Coil Data

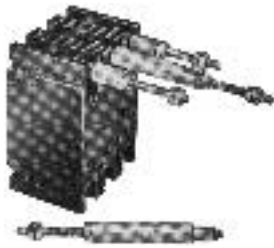
Voltage Rating	Breaker Type				
	FB Tri-Pac			LCL	
	Coil Amperes	Series Resistance (Ohms)	Total VA	Coil Amperes	Total VA
600 AC	0.020	25,000	12.0	—	—
480 AC	0.016	25,000	7.7	—	—
240 AC	0.021	6,000	5.1	—	—
208 AC	0.019	6,000	4.0	—	—
120 AC	0.023	—	2.8	.05	6
60 AC	0.203	250	12.2	—	—
48 AC	0.245	150	11.8	—	—
24 AC	0.250	50	6.0	—	—
250 AC	0.026	5,000	6.5	—	—
125 AC	0.026	—	3.3	—	—
60 AC	0.248	200	14.9	—	—
48 AC	0.260	150	12.5	—	—
24 AC	0.141	—	3.4	—	—
12 AC	0.286	—	3.5	—	—

### Undervoltage Release Coil Data

Voltage Rating	Breaker Type					
	LA Tri-Pac, PB Tri-Pac			NB Tri-Pac		
	Coil Amperes	External Series Resistance (Ohms)	Total VA	Coil Amperes	External Series Resistance (Ohms)	Total VA
600 AC	0.029	20,000	17.4	0.016	35,000	9.6
480 AC	0.014	—	6.8	0.013	30,000	6.3
240 AC	0.036	—	8.7	0.013	—	3.2
208 AC	0.036	—	7.5	0.018	—	3.8
120 AC	0.073	—	8.8	0.023	—	2.8
48 AC	0.152	—	7.3	—	—	—
250 AC	0.035	5,000	8.8	0.013	16,500	3.3
125 AC	0.039	1,500	4.9	0.013	6,500	1.7
60 AC	0.034	—	2.1	—	—	—
48 AC	0.040	—	2.0	0.012	600	0.6
24 AC	0.069	—	1.7	0.023	—	0.6
12 AC	0.136	—	1.7	0.048	—	0.6

# CLCP-14 Special Application Moulded Case Circuit Breakers

Current Limiting Circuit Protectors Accessories



## Rear Connected Studs

For complete stud assembly, order a stud and appropriate tube based on thickness of customer's mounting panel. A short stud must be assembled adjacent to a long stud to maintain clearances required by CSA and UL. Two studs are required per pole.

**Note:** Not CSA and UL listed.

**Note:** Two 400 ampere LA studs of the same length have sufficient clearance; however, customer connections may make it necessary to use a short stud adjacent to a long stud.



## Panelboard Connecting Straps

For connecting line end of breakers to panelboard bus.

**Note:** Not Underwriters Laboratories listed.

## Panelboard Connecting Straps

Ampere Rating	Connector Type	Catalogue Number
<b>Power Panelboards (Convertible) for FB Tri-Pac and FCL Breakers Bus Spacing 3.5-inch (88.9 mm)</b>		
50	Centre	1253C72G01
50	Outside	1253C72G02
100	Centre	1253C73G03
100	Outside	1253C73G04
150	Centre	1253C73G01
150	Outside	1253C73G02
<b>For LCL Breakers Bus Spacing 3.5-inch (88.9 mm)</b>		
3-Pole Mtg. Bracket		624B600H01
2-Pole Mtg. Bracket		624B600H02
<b>For LCL Breakers Bus Spacing 3.5-inch (88.9 mm)</b>		
400	Short	1275C85G01
400	Medium	1275C85G02
400	Long	1275C85G03
Mtg. Bracket Kit (1 Required)		751B044G01

## Studs for FCL and FB Tri-Pac

Mounting Panel Thickness Inches (mm)	Stud		Tube ①	
	Length	Catalogue Number	Length Inches (mm)	Catalogue Number
<b>FCL and FB Tri-Pac Breakers</b>				
1.00 (25.4)	Short	451D874G01	1.06 (26.9)	32B4446H20
	Long	451D874G02	3.44 (87.3)	32B9446H24
.68 - .94 (17.5 - 23.8)	Short	451D874G01	1.38 (35.1)	32B9446H21
	Long	451D874G02	3.75 (95.3)	32B9446H25
.38 - .63 (9.5 - 15.9)	Short	451D874G01	1.69 (42.9)	32B9446H22
	Long	451D874G02	4.06 (103.1)	32B9446H26
.25 - .31 (6.4 - 7.9)	Short	451D874G01	2.00 (50.8)	32B9446H23
	Long	451D974G02	4.38 (110.7)	32B9446H27

① Included at no charge when ordered with stud.

## Studs for LCL, LA Tri-Pac and NB Tri-Pac

Stud Ampere Rating	Diameter, Inches and Thread	Extension Back of Breaker, Inches	Stud Catalogue Number
<b>LCL, LA Tri-Pac Breakers</b>			
400 ②	.75 (19.1) - 16	5.47 (138.9)	05B7383G15
400 ②	.75 (19.1) - 16	7.97 (202.4)	05B7383G16
400 ②	.75 (19.1) - 16	10.47 (265.9)	05B7383G17
<b>NB Tri-Pac Breakers</b>			
450	1.13 (28.7) - 12	5.50 (139.7)	623B222G01
450	1.13 (28.7) - 12	8.00 (203.2)	623B222G02
450	1.13 (28.7) - 12	10.50 (266.7)	623B222G03
800	1.25 (31.7) - 12	5.50 (139.7)	373B375G04
800	1.25 (31.7) - 12	10.50 (266.7)	373B375G03

② 150, 250, 300 and 400 ampere frames only.



## Plug-In Adapter Kits

For rear connected applications such as switchboards. Facilitates ease of installation and front removal of breaker. Includes conductor for mounting on breaker, plug-in mounting blocks with matching conductor, rear studs and mounting hardware. Order two mounting block style numbers when line and load are required; order one mounting block style number when either line or load is required.

## FB Tri-Pac and FCL Breakers (Flat Bar Type) ③

Description	Catalogue Number
<b>1 Mounting Block, Line or Load</b>	
2-Pole, 100 Ampere	1480D13G06
2-Pole, 150 Ampere	
3-Pole, 100 Ampere	
3-Pole, 150 Ampere	

③ These plug-in adapter kits are CSA and UL listed as recognized components.

**Note:** Instruction Leaflet Number 13782

## LCL Breakers (Threaded Stud Type)

Description	Catalogue Number
<b>2 Mounting Blocks, Line and Load</b>	
2-Pole	313C644G25
3-Pole	313C644G26
<b>1 Mounting Block, Line and Load</b>	
2-Pole	450D010G15
3-Pole	450D010G16

**Note:** Instruction Leaflet Number 15329

## NB Tri-Pac Breakers (Flat Bar Type) ④

Description	Catalogue Number
<b>1 Mounting Block, Line or Load</b>	
NB Tri-Pac, 2 Poles	2614D53G03
NB Tri-Pac, 3 Poles	2614D53G04

④ Not CSA and UL listed.

**Note:** Instruction Leaflet Number 15073

## LA Tri-Pac Breakers (Threaded Stud Type) ⑤

Description	Catalogue Number
<b>2 Mounting Blocks, Line and Load</b>	
2-Pole	313C644G41
3-Pole	313C644G42
<b>1 Mounting Block, Line Only</b>	
2-Pole	450D010G17
3-Pole	450D010G19
<b>1 Mounting Block, Load Only</b>	
2-Pole	450D010G18
3-Pole	450D010G20

⑤ Not CSA and UL listed.

**Note:** Instruction Leaflet Number 15329

# Special Application Moulded Case Circuit Breakers CLCP-15

Current Limiting Circuit Protectors Accessories

## Mounting Block for NB Tri-Pac Breakers

### Mounting Block <sup>①</sup>

Ampere Rating	Number of Poles	Catalogue Number
<b>NB Tri-Pac</b>		
800	2	4990D16G04
800	3	4990D16G03

<sup>①</sup> Not CSA and UL listed.  
Insulated base with front removeable bolted connection.



### Extended Line Terminal Shields

For shielding line side terminal connections. One shield required per breaker. Order separately when needed. Sold only in lots of 10, including hardware.

### Extended Line Terminal Shields <sup>②</sup>

Breaker Frame	Catalogue Number
FB Tri-Pac, FCL	625B229G01
LA Tri-Pac	314C420G05
NB Tri-Pac	208B996G02

<sup>②</sup> Not CSA and UL listed.  
Insulated base with front removeable bolted connection.

### Base Mounting Hardware

Order separately when needed.

### Base Mounting Hardware

Breaker Frame	Catalogue Number
FB Tri-Pac, FCL	21C6782G18
LA Tri-Pac	21C6782G05
NB Tri-Pac	1091716
PB Tri-Pac	624B375G22

### Moisture-Fungus-Corrosion Treatment

Treatment can be provided to meet customer's specific atmospheric conditions. Moisture-fungus treating material used meets JAN-T-152; treatment meets MIL-V-173a. Requests and orders should specify government specifications or conditions to be met.

**Note:** Not CSA and UL listed.



### Handle Locks

#### Non-padlockable

For prevention of unintentional operation of breaker. Fits over breaker handle and may be removed.

#### Padlockable

For prevention of unauthorized operation of breaker. Is non-removable once installed on breaker.

**Note:** All breakers are trip free and will trip with handle locks attached. Cannot be used when handle extension is used.

### Handle Locks <sup>③</sup>

Breaker Frame	Catalogue Number
<b>Non-padlockable (No FCL, LCL)</b>	
FB Tri-Pac	29B2721H01
LA Tri-Pac	28B4596G01
NB Tri-Pac	28B4596G01
<b>Padlockable (No FCL, LCL, NB Tri-Pac)</b>	
FB Tri-Pac	765A754G01
LA Tri-Pac	373B591G02

<sup>③</sup> Not CSA and UL listed.

### Handle Extension

Breaker Frame	Catalogue Number
LA Tri-Pac	372B399G01
NB Tri-Pac	1251C65G01
PB Tri-Pac <sup>④</sup>	315C882G01

<sup>④</sup> Included with frame.

### Kirk Key Interlock

Availability: FB, LA, NB, PB Tri-Pacs.



Permits interlocking of two breakers or one breaker with other devices. Before breaker can be closed, key must be inserted and turned in breaker interlock. Breaker must be opened before key can be removed. It can then be inserted in interlock or other devices to permit their closure. Requests and orders should completely outline interlocking scheme, ultimate user and his address.

**Note:** Not available for FCL or LCL breakers.

**Note:** Not available on motor operated breakers.

### Mechanical Interlocks

For mechanically interlocking a pair of breakers so that only one may be closed at one time, but both may be open simultaneously.



### Walking Beam Type

Mounts on panel (not included) at rear of breaker. Standard breaker spacing: LA Tri-Pac, NB Tri-Pac: 8-1/2 inches centre to centre; FB Tri-Pac: 4-3/8 inches centre to centre; PB Tri-Pac: 12-1/4 inches centre to centre. Order as a set of two special factory drilled breakers and one walking beam interlock. Specify breaker type, panel thickness and centre-to-centre dimension of breakers.

**Note:** Not CSA and UL listed. Not available on drawout breakers. Not available for FCL or LCL breakers.



### Sliding Bar Type (Field Mountable)

Mounts on panel (not included) fitting over front of breakers. Standard breaker spacing: LA Tri-Pac, NB Tri-Pac: 8-1/2 inches (215.9 mm); FB Tri-Pac: 4-3/16 inches (106.4 mm) centre to centre.

**Note:** Not CSA and UL listed. Not available on drawout breakers. Not available for FCL or LCL breakers. Not available on motor operated breakers.

# CLCP-16 Special Application Moulded Case Circuit Breakers

Current Limiting Circuit Protectors Accessories

## Motor Operators

Motor operators provide complete remote control by means of a pushbutton or similar pilot device. Positive switching action is accomplished by use of an operating arm engaging the breaker handle. The unit is energized momentarily to actuate the lever arm moving it to either the ON or OFF position. The control is broken by an internal cutoff switch. Means for emergency manual operation is provided.

**Note:** The pilot device must be maintained contact type for FB Tri-Pac, FCL mechanisms; momentary contact type for all others.

Motor operators are available with motors rated 120V AC, 208V AC, and 240V AC.

**Note:** AC voltage rated operators are CSA and UL listed as recognized components.

The 480V operators utilize a 120V AC motor in conjunction with a 480/240 to 120V dual voltage transformer. (On LA and larger operators, the transformer is supplied for separate mounting by the customer.)

**Note:** The motor operator is intended only for infrequent operation in line with CSA and UL endurance standard for moulded case circuit breakers.

For FB Tri-Pac/FCL Breakers



For LA Tri-Pac Breakers



For NB Tri-Pac Breakers



For PB Tri-Pac Breakers



## Motor Operator Selection

Type Breaker	AC Voltage				DC Voltage	
	120	208	240	480	125	24
	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number	Catalogue Number
FCL	656D148G15	656D148G10	656D148G17	656D148G17	—	—
LCL	5664D54G83	5664D54G86	5664D54G84	5664D54G85	5664D54G77	5664D54G88
FB Tri-Pac	656D148G11	656D148G04	656D148G13	656D148G13	—	—
LA Tri-Pac	2607D97G22	2607D97G25	2607D97G23	2607D97G24	2607D97G44	—
NB Tri-Pac	5664D54G65	5664D54G68	5664D54G66	5664D54G67	5664D54G82	—
PB Tri-Pac	5661D52G01	5661D52G04	5661D52G02	5661D52G03	5661D52G17	—

**Note:** Instruction Leaflet Number 13148 (FCL); 15334 (LCL); 13148 (FB Tri-Pac); 15533 (LA Tri-Pac); 15534 (NB Tri-Pac); 14444 (PB Tri-Pac)

## Back Mounting Plates

Type Breaker	120, 208, 240, 480 Volts AC
	Catalogue Number
FB-P/FCL	1282C01G01

## Motor Data

Type Breaker	Motor Type	hp	Inrush Current, Ampere (Peak)			Continuous Current (RMS)			Operating Time, Open or Close
			120 Volts	208 Volts	240 Volts	120 Volts	208 Volts	240 Volts	
FB Tri-Pac	Split Phase	1/75	10	4	5	2.3	1.17	1.65	1.5 Seconds
LA Tri-Pac	Reversing	—	8	5	4	—	—	—	12 Cycles
NB Tri-Pac	Reversing	—	11	7	6	—	—	—	12 Cycles
PB Tri-Pac	Reversing	—	20	12	11	—	—	—	10 Cycles



### Drawout Frame

These drawout frames are for use with standard 3-pole Eaton moulded case circuit breakers. They consist of two separate parts; stationary mounting frame and movable carrier frame. Slide rails are drawer-type, and a screw mechanism is used to engage or withdraw the movable carrier frame.

The drawout frames have three positions: connected, test and disconnected. The frames do not include a safety tripping interlock, or secondary contacts. These are optional items and may be ordered at additional cost.

Breakers mounted in the drawout frames can be equipped with standard breaker accessories including shunt trip, undervoltage release, auxiliary switch, alarm switch and motor operator.

### Secondary Contacts

These are used to disconnect auxiliary circuits when attachments such as shunt trip or motor operator are used. Available in multiples of four contacts with a maximum of 32 contacts for the NB Tri-Pac. They must be factory mounted. Order by description as similar to stationary or moving frame and specify number of contacts required.

### Standard Installation

- Order one stationary mounting frame and one movable carrier frame.
- Order breakers without terminals or rear connectors.
- Order any attachments desired (shunt trip, undervoltage release, etc.).
- Order secondary contacts as required:
  - A shunt trip, undervoltage release or alarm switch requires two contacts
  - A 1A-1B auxiliary switch requires three contacts
  - A motor operator requires a maximum of four contacts
  - Others as required

### Racking Crank

A special crank to engage or withdraw the moving portion of the drawout. A standard 1/2 inch (12.7 mm) hex socket with extension can be used for this purpose.

### Racking Crank

#### Catalogue Number

**765A767G01**

### Cell Switches Mounted on Drawout Frames, All Ratings

Up to four switches can be provided. Order by description.

Each switch provides NO and NC contact that transfers before reaching the test position when being withdrawn, and after the test position when being racked in.

### Handle mechanisms

For selection data, see Electrical Aftermarket Products and Services Catalogue CA08105001E (pages 3 - 77).

### Selection Data

Breaker Type <sup>①</sup>	Stationary Mounting Frame	Movable Carrier Frame
	Catalogue Number	Catalogue Number
NB Tri-Pac	<b>2603D85G09</b>	<b>2608D34G12</b>

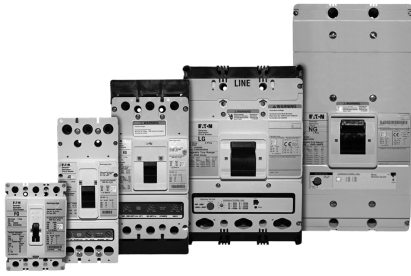
<sup>①</sup> Drawout for FB and LA Tri-Pac, FCL and LCL Circuit Breakers are not available. PB Tri-Pac movable is available factory-installed only. Order by description.



# EGCB-1 Special Application Moulded Case Circuit Breakers

Engine Generator Circuit Breakers

## Engine Generator Circuit Breakers



### Product Description

Engine generator Special Application Moulded Case Circuit Breakers are designed specifically for application on diesel engine powered standby generators where high interrupting circuit breakers are not required. The JG through NG breakers are equipped with a special trip unit, that includes standard thermal (overload) protection and special low magnetic pickup range (FG includes a fixed thermal/magnetic pickup). The standard thermal trip unit provides overload protection conductors per the National Electric Code. The low magnetic pickup range is approximately two to five times the continuous rating and provides closer low level short circuit protection when applied on generators that have very low short circuit capacity. This combination allows the user to customize the breaker to the generator output.

Engine Generator Circuit Breakers are suitable for reverse feed applications.

### Catalogue Numbering System

This information is presented only as an aid to understanding catalogue numbers. It is not to be used to build catalogue numbers for circuit breakers.

FG breakers include both line and load side terminals.

JG and KG breakers with "W" catalogue number suffix do not include any terminals.

JG, KG, LG, and NG breakers without "W" catalogue number suffix include both line and load terminals.

Contact Eaton for additional ratings and internal/external accessories.

### Technical Data and Specifications

#### CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings

Interrupting Capacity (Symmetrical Amperes)

Volts Ac (50/60 Hz)

240	18,000
480	14,000
600	10,000

#### IEC 947-2 Interrupting Capacity Ratings

Interrupting Capacity (Symmetrical Amperes)

Volts Ac (50/60 Hz)

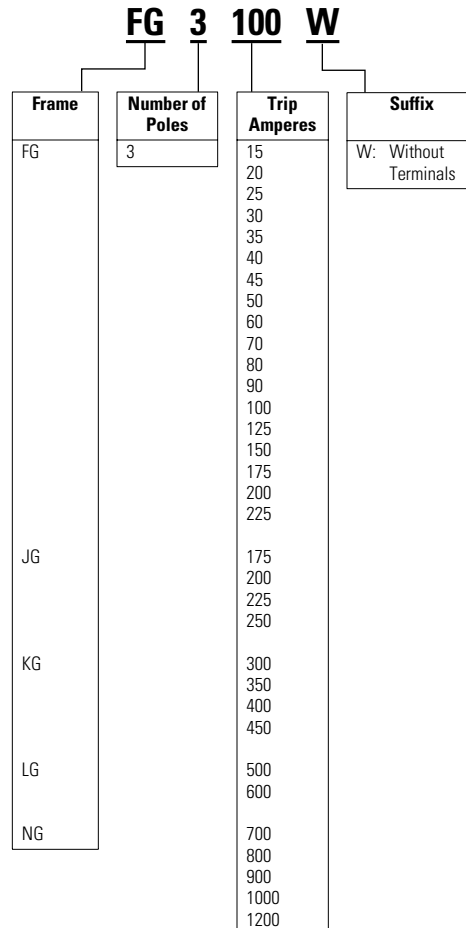
220, 240	18,000/9,000
380, 415	14,000/7,000
660, 690	10,000/5,000

### Standards and Certifications

Engine generator Special Application Moulded Case Circuit Breakers are designed to conform with the following standards:

- Underwriters Laboratories, Inc., Standard UL 489, Special Application Moulded Case Circuit Breakers and Circuit Breaker Enclosures File E7819
- Canadian Standards Association Standard C22.2 No. 5, Service Entrance and Branch Circuit Breakers
- International Electrotechnical Commission Recommendations IEC 947-2, Circuit Breakers

Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.



# Special Application Moulded Case Circuit Breakers **EGCB-2**

Engine Generator Circuit Breakers

## Product Selection

The following table lists FG through NG engine generator breakers with the maximum generator kVA and kW rating. Engine generator breakers are applied at 115% of the generator full load current rating. The maximum kW rating is based on three-phase generators at 80% power factor.

Magnetic Pickup Range	Maximum Generator Rating 60 Hz						Engine Generator Breaker Catalogue Number ④
	240 Vac		480 Vac		600 Vac		
	kVA①	kW②	kVA①	kW②	kVA①	kW②	
<b>Thermal Magnetic</b>							
Fixed	5	4	11	9	14	11	FG3015
Fixed	7	6	14	12	18	14	FG3020
Fixed	9	7	18	14	23	18	FG3025
Fixed	11	9	22	17	27	22	FG3030
Fixed	13	10	25	20	32	25	FG3035
Fixed	14	12	29	23	36	29	FG3040
Fixed	16	13	32	26	41	32	FG3045
Fixed	18	14	36	29	45	36	FG3050
Fixed	22	17	43	35	54	43	FG3060
Fixed	25	20	51	40	63	51	FG3070
Fixed	29	23	58	46	72	58	FG3080
Fixed	32	26	65	52	81	65	FG3090
Fixed	36	29	72	58	90	72	FG3100
Fixed	40	32	79	64	99	79	FG3110
Fixed	45	36	90	72	113	90	FG3125
Fixed	54	43	108	87	135	108	FG3150
Fixed	63	51	126	101	158	126	FG3175
Fixed	72	58	144	116	181	144	FG3200
Fixed	81	65	162	130	203	162	FG3225
350-700	63	51	126	101	158	126	JG3175W <sup>③</sup>
350-700	72	58	144	116	181	144	JG3175
350-700	72	58	144	116	181	144	JG3200W <sup>③</sup>
350-700	72	58	144	116	181	144	JG3200
350-700	81	65	162	130	203	162	JG3225W <sup>③</sup>
350-700	81	65	162	130	203	162	JG3225
350-700	90	72	181	144	226	181	JG3250W <sup>③</sup>
350-700	90	72	181	144	226	181	JG3250
500-1000	108	87	217	173	271	217	KG3300W <sup>③</sup>
500-1000	108	87	217	173	271	217	KG3300
500-1000	126	101	253	202	316	253	KG3350W <sup>③</sup>
500-1000	126	101	253	202	316	253	KG3350
1000-2000	144	116	289	231	361	289	KG3400W <sup>③</sup>
1000-2000	144	116	289	231	361	289	KG3400
<b>Electronic</b>							
500-2500	162	130	325	260	406	325	LG3450
500-2500	181	144	361	289	451	361	LG3500
500-2500	217	173	433	347	542	433	LG3600
500-2500	253	202	505	404	632	505	NG3700
500-2500	289	231	578	462	722	578	NG3800
1250-5000	325	260	650	520	812	650	NG3900
1250-5000	361	289	722	578	903	722	NG31000
1250-5000	433	347	867	693	1083	867	NG31200

① Breaker continuous current is based on 115% of the generator full load ampere rating.

② Based on three-phase generators at 80% power factor.

③ Without terminals.

④ FG, JG, KG include Thermal-Magnetic Trip Units, LG and NG include Electronic Trip Units.

# EGCB-3 Special Application Moulded Case Circuit Breakers

Engine Generator Circuit Breakers Enclosures

## Enclosure Description

### Type 1 General Purpose

- Surface or Flush Mounting
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

Type 1 enclosed breakers are designed for use in commercial buildings, apartment buildings and other areas where a general purpose enclosure is applicable. The breaker is front operable and is capable of being padlocked in either the On or Off position. Ratings through 1200 amperes are listed with CSA and Underwriters Laboratories, Inc. as approved for service entrance application. Both surface and flush mounted enclosures are available.

### Type 3R Rainproof Surface Mounting

- Interchangeable Hubs (Through 400 Amperes)
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

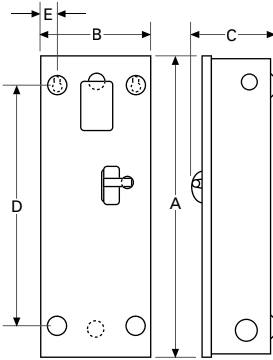
This general purpose outdoor service centre employs a circuit breaker inside a weatherproof sheet steel breaker enclosure to serve as a main disconnect and protective device for feeder circuits. Ratings through 1200 amperes are listed by CSA and Underwriters Laboratories, Inc. as suitable for service entrance application.

### Type 12 Dustproof Surface Mounting

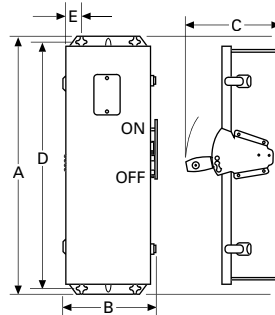
- No Knockouts or Other Openings
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

The Type 12 enclosure is designed in line with specifications for special industry application where unusually severe conditions involving oil, coolant, dust and other foreign materials exist in the operating atmosphere. The handle padlocks in the Off position and the cover is interlocked with the handle mechanism to prevent opening the cover with the circuit breaker in the On position. Ratings through 1200 amperes are listed by CSA and U.L., Inc. as suitable for service entrance application.

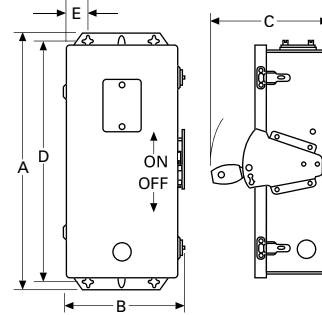
Type 1 Surface Mounted



Type 3R Rainproof



Type 12 Dustproof



## Enclosure Selection Data

Breaker Frame (Amperes)	Enclosure Type Class	Dimensions										App. Wt. Lbs.	Conduit Sizes, Inches	Catalogue Number
		A		B		C		D		E				
		Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm			
FG 15-225	Type 1	23.25	591	8.41	214	6.28	160	18.75	476	1.20	31	15	.25, .50, .75, 1, 1.25, 1.50, 2, 2.50	SFDN225
	Type 3R	25.66	652	8.84	225	9.31	237	24.28	617	1.70	43	19	.25, .50, .75, 1, 1.25, 1.50, 2, 2.50	RFDN225
	Type 12	25.66	652	8.84	226	9.31	238	24.28	618	1.70	43	18		JFDN225
JG 175-250	Type 1	34.70	881	10.92	227	7.20	183	30.00	762	1.88	48	31	.25, .50, 2, 2.50, 3	SJDN250
	Type 3R	37.50	891	11.56	294	10.22	260	35.77	909	1.94	49	40	.25, .50, 2, 2.50, 3	RJDN250
	Type 12	37.53	953	11.56	294	10.22	260	35.77	909	1.94	49	37		JJDN250
KG 300-400	Type 1	38.81	986	11.06	281	10.94	278	34.00	869	2.28	58	53	.25, .50, .75, 1.50, 2, 2.50, 3, 3.50	SKDN400
	Type 3R	41.69	997	11.75	298	14.06	357	39.90	1014	1.97	50	60	.25, .50, .75, 2.50, 3, 3.50	RKDN400
	Type 12	41.69	997	11.75	298	14.06	357	39.90	1015	1.97	50	53		JKDN400
LG 450-600	Type 1	45.88	1165	14.31	364	12.38	314	46.56	1183	1.91	48	81	.25, .50, .75, 3, 3.50, 4	SLDN600
	Type 3R	48.31	1227	14.91	379	15.50	394	46.56	1183	1.92	49	84	.25, .50, .75, 3, 3.50, 4	RLDN600
	Type 12	48.31	1227	14.91	379	15.50	394	46.56	1183	1.92	49	81		JLDN600
NG 700-1200	Type 1	61.22	1555	21.44	545	15.41	391	61.84	1571	1.97	50	178		SNDN1200
	Type 3R	63.59	1615	22.00	559	17.63	448	61.84	1571	1.97	50	175		RNDN1200
	Type 12	63.59	1615	22.00	559	17.63	448	61.84	1571	1.97	50	170		JNDN1200

# Special Application Moulded Case Circuit Breakers **EGCB-4**

Engine Generator Circuit Breakers

## Standard Template

Breaker Frame	Maximum Ampere Rating	AWG Wire Range	Metric Wire Range mm <sup>2</sup>	Catalogue Number
FG	100	#14-1/0	2.5-50	<b>3T100FB</b> ①
FG	150	#4-4/0	25-95	<b>3TA225FD</b> ①
JG	250	#4-350 kcmil	25-185	<b>TA250KB</b>
KG	350	250-500 kcmil	120-240	<b>TA350K</b>
KG	400	3/0-250 kcmil (2)	95-120	<b>3TA400K</b> ①
LG	600	250-500 kcmil (2)	120-240	<b>3TA603LDK</b> ①
NG	700	1-500 kcmil (2)	50-300	<b>TA700NB1</b>
NG	1000	3/0-400 kcmil (3)	95-185	<b>TA1000NB1</b>
NG	1200	4/0-500 kcmil (4)	120-300	<b>TA1200NB1</b>

## CSA Listed Neutral Kits, Insulated and Groundable

Maximum Enclosure Rating (A)	Main Lug Size Cu/Al	# of Lugs	Ground Lug Size Cu/Al	# of Lugs	Catalogue Number
100	(1) #14 - 1/0	2	(1) #14 - #4	2	<b>N100</b>
250	(1) #6 - 350MCM	2	(1) #14 - 1/0	2	<b>N250</b>
400	(2) 3/0 - 250MCM	2	(1) #6 - 300MCM	2	<b>N400</b>
600	(2) #1 - 500MCM	2	(1) #6 - 250MCM	2	<b>N600</b>
1200	(4) #2 - 600MCM	2	(1) #6 - 250MCM	2	<b>N1200</b>

## UL Listed Neutral Kits, Insulated and Groundable

Maximum Enclosure Rating (A)	Main Lug Size Cu/Al	Ground Lug Size Cu/Al	Catalogue Number
100	(1) #14 - 1/0	(1) #14 - 1/0	<b>INK100</b>
250	(1) #4 - 350 kcmil	(1) #4 - 300 kcmil	<b>INK250</b>
400	(1) #4 - 600 kcmil or (2) 1/0 - 250 kcmil	(1) #4 - 300 kcmil	<b>INK400</b>
600	(2) 250 - 500 kcmil	(1) #4 - 300 kcmil	<b>INK600</b>
1200	(4) 1/0 - 750 kcmil	(1) #6 - 250 kcmil	<b>INK1200</b>

## Internal Accessories

Breaker Frame	Auxiliary Switch ②		Shunt Trip ②	
	1A-1B Catalogue Number	2A-2B Catalogue Number	Rating	Catalogue Number
FG	<b>A1X1PK</b>	<b>A2X1RPK</b>	12-24 Vdc	<b>SNT1LP03K</b>
JG	<b>A1X2PK</b>	<b>A2X2PK</b>	12-24 Vdc	<b>SNT2P04K</b>
KG	<b>A1X3PK</b>	<b>A2X3PK</b>	12-24 Vdc	<b>SNT3P04K</b>
LG	<b>A1X4PK</b>	<b>A2X4PK</b>	12-24 Vdc	<b>SNT4LP03K</b>
NG	<b>A1X5RPK</b>	<b>A2X5RPK</b>	12-24 Vdc	<b>SNT5LP03K</b>

① Package of 3 terminals.

② Other accessories are available. Same as standard frame breakers.

#### Direct Current Circuit Breakers



### Direct Current Circuit Breakers

#### Product Description

DC (direct current) systems and applications are becoming commonplace as alternative energy sources have expanded and the number of DC devices and data centres using DC power has swelled.

Eaton offers moulded case circuit breakers and switches to meet circuit protection and switching requirements for a host of different DC end use requirements. Applications include UPS battery supply circuits, solar systems and electric vehicle charging, as well as commercial and industrial distribution.

Current ratings are available from 15 to 2500A, with a full scale of voltage and interrupting ratings to address needs ranging from standard to the highest performance. Optional internal accessories provide remote tripping and indication of breaker status.

The DC breaker family is CSA C22.2 No. 5 and UL 489 listed and exceeds the requirements in UL 489 Supplement SC for UPS applications. Eaton breakers may be applied in both ungrounded and select grounded applications, with poles connected in series to operate at the maximum voltages shown on **Page DCCB-2**. To use DC circuit breakers on 600V grounded systems, three poles in series must be connected on the ungrounded leg.

The HFDDC through HMDLDC DC breakers use the same internal and external accessories as their Series C or Series G AC frame equivalents. NBDC and PBDC use the same internal and external accessories as standard NB and PB breakers.

**Quick Reference Direct Current Circuit Breakers****CSA C22.2 No. 5 and UL 489 Interrupting Capacity Ratings**

Circuit Breaker Type	Maximum Amperes	Interrupting Capacity (kA)								
		Volts DC <sup>①</sup>								
		125	Poles in Series	250 <sup>②</sup>	Poles in Series	500	600	Poles in Series	750 <sup>②</sup>	Poles in Series
EGEDC	100	10	1	35	2	35	—	3	—	—
EGSDC	100	35	1	42	2	50	—	3	—	—
EGHDC	100	42	1	50	2	65	—	3	—	—
HFDDC	225	42	1	50	2	—	42	3	42	4
JGEDC	250	35	1	35	2	—	35	3	—	—
JGSDC	250	42	1	42	2	—	50	3	—	—
JGHDC	250	50	1	50	2	—	65	3	—	—
HJDDC	250	42	1	50	2	—	42	3	—	—
HKDDC	400	42	1	50	2	—	42	3	—	—
LGEDC	600	22	1	22	2	—	35	3	—	—
LGSDC	600	22	1	22	2	—	50	3	—	—
LGHDC	600	50	1	50	2	—	65	3	—	—
HLDDC	600	42	1	50	2	—	35	3	—	—
HLDDC <sup>③</sup>	1200	42	1	50	2	—	—	—	—	—
HMDLDC	800	42	1	50	2	—	35	3	—	—
NBDC	1200	42	1	50	2	—	50	3	—	—
PBDC	2500	42	1	65	2	—	65	3	—	—

**IEC 60947-2 Interrupting Capacity Ratings**

Circuit Breaker Type	Maximum Amperes	125 Volts DC		Poles in Series	250 Volts DC		Poles in Series	600 Volts DC		Poles in Series
		Icu	Ics		Icu	Ics		Icu	Ics	
EGEDC	100	10	10	1	10	10	2	—	—	—
EGSDC	100	35	35	1	35	35	2	—	—	—
EGHDC	100	42	42	1	42	42	2	—	—	—
JGEDC	250	22	22	1	22	22	2	—	—	—
JGSDC	250	22	22	1	22	22	2	—	—	—
JGHDC	250	42	42	1	42	42	2	—	—	—
HJDDC	250	—	—	—	—	—	—	20	10	3
LGEDC	600	22	22	1	22	22	2	—	—	—
LGSDC	600	22	22	1	22	22	2	—	—	—
LGHDC	600	42	42	1	42	42	2	—	—	—
HLDDC	600	—	—	—	—	—	—	20	10	3
HMDLDC	800	—	—	—	—	—	—	20	10	3

**Notes**

<sup>①</sup> DC ratings apply to substantially non-inductive circuits. Time constants per UL 489 and CSA C22.2 No. 5.

<sup>②</sup> EGEDC through HMDLDC have been tested up to 300 Vdc to allow for battery charging voltages. 750 Vdc is common in transportation applications. HFDDC, four-pole 750 Vdc is available up to 150A maximum. 300 Vdc and 750 Vdc are not UL 489 and CSA C22.2 No. 5 listed voltage ratings.

<sup>③</sup> Four-pole frame with two-poles connected in parallel.

See **Page DCCB-12** for series connection diagrams. Use NEC/CEC rated cable to connect/short poles in series as shown.

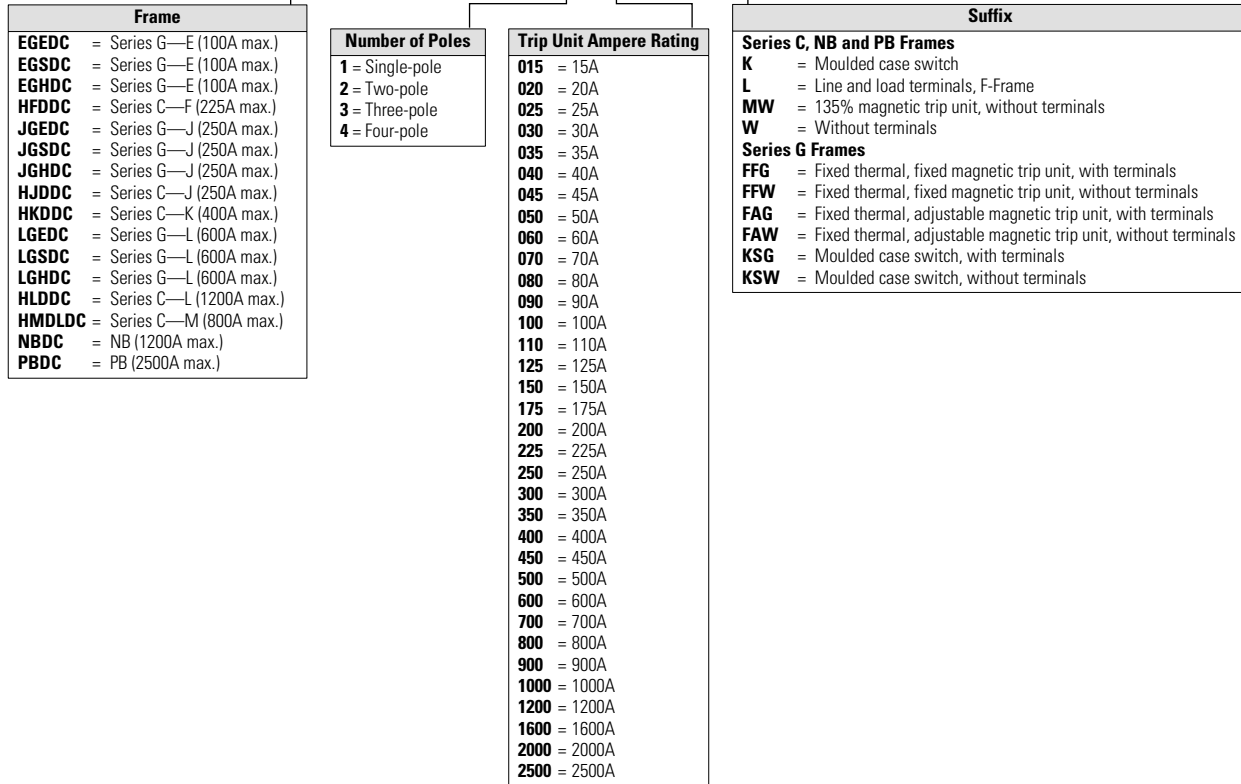
# DCCB-3 Special Application Moulded Case Circuit Breakers

Direct Current Circuit Breakers

## Catalogue Number Selection

### DC Circuit Breaker

**HFDDC 3 150 W**



## Product Selection

Type EGEDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 35 kAIC at 500 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Circuit Breaker with Terminals Catalogue Number	Complete Circuit Breaker without Terminals Catalogue Number
25	EGEDC3025FFG	EGEDC3025FFW
30	EGEDC3030FFG	EGEDC3030FFW
35	EGEDC3035FFG	EGEDC3035FFW
40	EGEDC3040FFG	EGEDC3040FFW
45	EGEDC3045FFG	EGEDC3045FFW
50	EGEDC3050FFG	EGEDC3050FFW
60	EGEDC3060FFG	EGEDC3060FFW
70	EGEDC3070FFG	EGEDC3070FFW
80	EGEDC3080FFG	EGEDC3080FFW
90	EGEDC3090FFG	EGEDC3090FFW
100	EGEDC3100FFG	EGEDC3100FFW

Type EGSDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 50 kAIC at 500 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Circuit Breaker with Terminals Catalogue Number	Complete Circuit Breaker without Terminals Catalogue Number
25	EGSDC3025FFG	EGSDC3025FFW
30	EGSDC3030FFG	EGSDC3030FFW
35	EGSDC3035FFG	EGSDC3035FFW
40	EGSDC3040FFG	EGSDC3040FFW
45	EGSDC3045FFG	EGSDC3045FFW
50	EGSDC3050FFG	EGSDC3050FFW
60	EGSDC3060FFG	EGSDC3060FFW
70	EGSDC3070FFG	EGSDC3070FFW
80	EGSDC3080FFG	EGSDC3080FFW
90	EGSDC3090FFG	EGSDC3090FFW
100	EGSDC3100FFG	EGSDC3100FFW

Type EGHDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 65 kAIC at 500 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Circuit Breaker with Terminals Catalogue Number	Complete Circuit Breaker without Terminals Catalogue Number
25	EGHDC3025FFG	EGHDC3025FFW
30	EGHDC3030FFG	EGHDC3030FFW
35	EGHDC3035FFG	EGHDC3035FFW
40	EGHDC3040FFG	EGHDC3040FFW
45	EGHDC3045FFG	EGHDC3045FFW
50	EGHDC3050FFG	EGHDC3050FFW
60	EGHDC3060FFG	EGHDC3060FFW
70	EGHDC3070FFG	EGHDC3070FFW
80	EGHDC3080FFG	EGHDC3080FFW
90	EGHDC3090FFG	EGHDC3090FFW
100	EGHDC3100FFG	EGHDC3100FFW



#### HFDDC



#### Type HFDDC DC Circuit Breakers— Three-Pole High Interrupting Capacity 42 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Circuit Breaker with Line and Load Terminals ①			
	Single-Pole Catalogue Number	Two-Pole Catalogue Number	Three-Pole Catalogue Number	Four-Pole Catalogue Number
15	HFDDC1015L	HFDDC2015L	HFDDC3015L	HFDDC4015L
20	HFDDC1020L	HFDDC2020L	HFDDC3020L	HFDDC4020L
25	HFDDC1025L	HFDDC2025L	HFDDC3025L	HFDDC4025L
30	HFDDC1030L	HFDDC2030L	HFDDC3030L	HFDDC4030L
35	HFDDC1035L	HFDDC2035L	HFDDC3035L	HFDDC4035L
40	HFDDC1040L	HFDDC2040L	HFDDC3040L	HFDDC4040L
45	HFDDC1045L	HFDDC2045L	HFDDC3045L	HFDDC4045L
50	HFDDC1050L	HFDDC2050L	HFDDC3050L	HFDDC4050L
60	HFDDC1060L	HFDDC2060L	HFDDC3060L	HFDDC4060L
70	HFDDC1070L	HFDDC2070L	HFDDC3070L	HFDDC4070L
80	HFDDC1080L	HFDDC2080L	HFDDC3080L	HFDDC4080L
90	HFDDC1090L	HFDDC2090L	HFDDC3090L	HFDDC4090L
100	HFDDC1100L	HFDDC2100L	HFDDC3100L	HFDDC4100L
110	HFDDC1110L	HFDDC2110L	HFDDC3110L	HFDDC4110L
125	HFDDC1125L	HFDDC2125L	HFDDC3125L	HFDDC4125L
150	HFDDC1150L	HFDDC2150L	HFDDC3150L	HFDDC4150L
175	—	HFDDC2175L	HFDDC3175L	—
200	—	HFDDC2200L	HFDDC3200L	—
225	—	HFDDC2225L	HFDDC3225L	—

#### Type JGEDC DC Circuit Breakers— Three-Pole High Interrupting Capacity 35 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Breaker Catalogue Number	Circuit Breaker Frame Only ② Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
70	JGEDC3070FAG	JGEDC3250NN	JT3070FA	T250FJ
90	JGEDC3090FAG	JGEDC3250NN	JT3090FA	T250FJ
100	JGEDC3100FAG	JGEDC3250NN	JT3100FA	T250FJ
125	JGEDC3125FAG	JGEDC3250NN	JT3125FA	T250FJ
150	JGEDC3150FAG	JGEDC3250NN	JT3150FA	T250FJ
175	JGEDC3175FAG	JGEDC3250NN	JT3175FA	T250FJ
200	JGEDC3200FAG	JGEDC3250NN	JT3200FA	T250FJ
225	JGEDC3225FAG	JGEDC3250NN	JT3225FA	T250FJ
250	JGEDC3250FAG	JGEDC3250NN	JT3250FA	T250FJ

#### Notes

- ① For breaker without terminals, replace "L" with "W" at end of catalogue number.
- ② For complete breaker, order individual frame, trip unit and terminals for field installation.

**Type JGSDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 50 kAIC at 600 Vdc**

Maximum Continuous Ampere Rating at 40°C	Complete Breaker Catalogue Number	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
70	JGSDC3070FAG	JGSDC3250NN	JT3070FA	T250FJ
90	JGSDC3090FAG	JGSDC3250NN	JT3090FA	T250FJ
100	JGSDC3100FAG	JGSDC3250NN	JT3100FA	T250FJ
125	JGSDC3125FAG	JGSDC3250NN	JT3125FA	T250FJ
150	JGSDC3150FAG	JGSDC3250NN	JT3150FA	T250FJ
175	JGSDC3175FAG	JGSDC3250NN	JT3175FA	T250FJ
200	JGSDC3200FAG	JGSDC3250NN	JT3200FA	T250FJ
225	JGSDC3225FAG	JGSDC3250NN	JT3225FA	T250FJ
250	JGSDC3250FAG	JGSDC3250NN	JT3250FA	T250FJ

**JGHDC3250NN**



**Type JGHDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 65 kAIC at 600 Vdc**

Maximum Continuous Ampere Rating at 40°C	Complete Breaker Catalogue Number	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
70	JGHDC3070FAG	JGHDC3250NN	JT3070FA	T250FJ
90	JGHDC3090FAG	JGHDC3250NN	JT3090FA	T250FJ
100	JGHDC3100FAG	JGHDC3250NN	JT3100FA	T250FJ
125	JGHDC3125FAG	JGHDC3250NN	JT3125FA	T250FJ
150	JGHDC3150FAG	JGHDC3250NN	JT3150FA	T250FJ
175	JGHDC3175FAG	JGHDC3250NN	JT3175FA	T250FJ
200	JGHDC3200FAG	JGHDC3250NN	JT3200FA	T250FJ
225	JGHDC3225FAG	JGHDC3250NN	JT3225FA	T250FJ
250	JGHDC3250FAG	JGHDC3250NN	JT3250FA	T250FJ

**HJDDC3250**



**Type HJDDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 42 kAIC at 600 Vdc**

Maximum Continuous Ampere Rating at 40°C	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
70	HJDDC3250F	JT3070T	TA250KB
90	HJDDC3250F	JT3090T	TA250KB
100	HJDDC3250F	JT3100T	TA250KB
125	HJDDC3250F	JT3125T	TA250KB
150	HJDDC3250F	JT3150T	TA250KB
175	HJDDC3250F	JT3175T	TA250KB
200	HJDDC3250F	JT3200T	TA250KB
225	HJDDC3250F	JT3225T	TA250KB
250	HJDDC3250F	JT3250T	TA250KB

**Note**

<sup>①</sup> For complete breaker, order individual frame, trip unit and terminals for field installation.

# DCCB-7 Special Application Moulded Case Circuit Breakers

Direct Current Circuit Breakers

## HKDCC3400



### Type HKDCC DC Circuit Breakers— Three-Pole High Interrupting Capacity 42 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
100	HKDCC3400F	KT3100T	TA300K
125	HKDCC3400F	KT3125T	TA300K
150	HKDCC3400F	KT3150T	TA300K
175	HKDCC3400F	KT3175T	TA300K
200	HKDCC3400F	KT3200T	TA300K
225	HKDCC3400F	KT3225T	TA300K
250	HKDCC3400F	KT3250T	TA350K
300	HKDCC3400F	KT3300T	TA350K
350	HKDCC3400F	KT3350T	TA350K
400	HKDCC3400F	KT3400T	3TA400K <sup>②</sup>

## LGEDC3630NN



### Type LGEDC DC Circuit Breakers— Three-Pole High Interrupting Capacity 35 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Breaker Catalogue Number	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
250	LGEDC3250FAG	LGEDC3630NN	LT3250FA	TA350LK
300	LGEDC3300FAG	LGEDC3630NN	LT3300FA	TA350LK
350	LGEDC3350FAG	LGEDC3630NN	LT3350FA	TA350LK
400	LGEDC3400FAG	LGEDC3630NN	LT3400FA	TA350LK
500	LGEDC3500FAG	LGEDC3630NN	LT4500FA	3TA632LK <sup>②</sup>
600	LGEDC3600FAG	LGEDC3630NN	LT3600FA	3TA632LK <sup>②</sup>

### Type LGSDC DC Circuit Breakers— Three-Pole High Interrupting Capacity 50 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Breaker Catalogue Number	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
250	LGSDC3250FAG	LGSDC3630NN	LT3250FA	TA350LK
300	LGSDC3300FAG	LGSDC3630NN	LT3300FA	TA350LK
350	LGSDC3350FAG	LGSDC3630NN	LT3350FA	TA350LK
400	LGSDC3400FAG	LGSDC3630NN	LT3400FA	TA350LK
500	LGSDC3500FAG	LGSDC3630NN	LT4500FA	3TA632LK <sup>②</sup>
600	LGSDC3600FAG	LGSDC3630NN	LT3600FA	3TA632LK <sup>②</sup>

#### Notes

- ① For complete breaker, order individual frame, trip unit and terminals for field installation.
- ② Three-pole kit.

**Type LGHDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 65 kAIC at 600 Vdc**

Maximum Continuous Ampere Rating at 40°C	Complete Breaker Catalogue Number	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
250	LGHDC3250FAG	LGHDC3630NN	LT3250FA	TA350LK
300	LGHDC3300FAG	LGHDC3630NN	LT3300FA	TA350LK
350	LGHDC3350FAG	LGHDC3630NN	LT3350FA	TA350LK
400	LGHDC3400FAG	LGHDC3630NN	LT3400FA	TA350LK
500	LGHDC3500FAG	LGHDC3630NN	LT4500FA	3TA632LK <sup>②</sup>
600	LGHDC3600FAG	LGHDC3630NN	LT3600FA	3TA632LK <sup>②</sup>

**HLDDC**

**Type HLDDC DC Circuit Breakers—  
Three-Pole High Interrupting Capacity 35 kAIC at 600 Vdc**

Maximum Continuous Ampere Rating at 40°C	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
300	HLDDC3600F	LT3300T	TA602LD
350	HLDDC3600F	LT3350T	TA602LD
400	HLDDC3600F	LT3400T	TA602LD
450	HLDDC3600F	LT3450T	TA602LD
500	HLDDC3600F	LT3500T	TA602LD
600	HLDDC3600F	LT3600T	3TA603LDK <sup>③</sup>

**Type HLDDC DC Circuit Breakers—  
Two-Pole High Interrupting Capacity 50 kAIC at 250 Vdc <sup>③④</sup>**

Maximum Continuous Ampere Rating at 40°C	Complete Breaker Catalogue Number
600	HLDDC20600
700	HLDDC20700
800	HLDDC20800
900	HLDDC20900
1000	HLDDC21000
1200	HLDDC21200

**Notes**

- ① For complete breaker, order individual frame, trip unit and terminals for field installation.
- ② Three-pole kit.
- ③ Includes breaker frame, trip unit and terminals.
- ④ Four-pole breaker with two poles wired in parallel.

# DCCB-9 Special Application Moulded Case Circuit Breakers

Direct Current Circuit Breakers

HMDLDC3800F



## Type HMDLDC DC Circuit Breakers— Three-Pole High Interrupting Capacity 35 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Circuit Breaker Frame Only <sup>①</sup> Catalogue Number	Thermal-Magnetic Trip Unit Catalogue Number	Standard Terminals Catalogue Number
300	HMDLDC3800F	MT3300T	TA700MA1
350	HMDLDC3800F	MT3350T	TA700MA1
400	HMDLDC3800F	MT3400T	TA700MA1
450	HMDLDC3800F	MT3450T	TA700MA1
500	HMDLDC3800F	MT3500T	TA700MA1
600	HMDLDC3800F	MT3600T	TA700MA1
700	HMDLDC3800F	MT3700T	TA700MA1
800	HMDLDC3800F	MT3800T	TA800MA2

## Type NBDC DC Circuit Breakers— Three-Pole High Interrupting Capacity 50 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Circuit Breaker Factory Assembled without Terminals <sup>②</sup> Catalogue Number	Includes Magnetic Trip Unit Calibrated at 135%	Standard Terminals Catalogue Number
700	NBDC3700MW	Included	TA1000NB1
800	NBDC3800MW	Included	TA1000NB1
900	NBDC3900MW	Included	TA1000NB1
1000	NBDC31000MW	Included	TA1000NB1
1200	NBDC31200MW	Included	TA1200NB1

## Type PBDC DC Circuit Breakers— Three-Pole High Interrupting Capacity 65 kAIC at 600 Vdc

Maximum Continuous Ampere Rating at 40°C	Complete Circuit Breaker Factory Assembled without Terminals <sup>②</sup> Catalogue Number	Includes Magnetic Trip Unit Calibrated at 135%	Standard Rear Connectors Catalogue Number
1600	PBDC31600W	Included	BA2000PB
2000	PBDC32000W	Included	BA2000PB
2500	PBDC32500W	Included	BA2500PB

**Notes**

- ① For complete breaker, order individual frame, trip unit and terminals for field installation.
- ② Includes frame and trip unit. Order terminals or connectors separately.

# Special Application Moulded Case Circuit Breakers **DCCB-10**

Direct Current Circuit Breakers

## DC Breaker Terminal Wire Ranges

Breaker Frame	Maximum Breaker Ampacity	Terminal Body Material	Wire Type	AWG Wire Range/ Number of Conductors	Metric Wire Range mm <sup>2</sup>	Number of Terminals Included	Standard Terminal Catalogue Number
EGEDC, EGSDC, EGHDC	100	Aluminum	Cu/Al	14-1/0	2.5-50	3	3TA125EF
HFDDC	20	Steel	Cu/Al	14-10 (1)	2.5-4 (1)	3	3T20FB
	100	Steel	Cu/Al	14-1/0 (1)	2.5-50 (1)	3	3T100FB
	225	Aluminum	Cu/Al	4-4/0 (1)	25-95 (1)	3	3TA225FD
JGEDC, JGSDC, JGHDC	250	Stainless steel	Cu	4-350 (1)	25-185 (1)	1	T250FJ
HJDDC	250	Aluminum	Cu/Al	4-350 kcmil (1)	25-185 (1)	1	TA250KB
HKDDC	225	Aluminum	Cu/Al	3-350 kcmil (1)	35-185 (1)	1	TA300K
	350	Aluminum	Cu/Al	250-500 kcmil (1)	120-240 (1)	1	TA350K
	400	Aluminum	Cu/Al	3/0-250 kcmil (2)	95-120 (1)	3	3TA400K
	500	Aluminum	Cu/Al	3/0-350 kcmil (2)	95-150 (2)	1	TA602LD
	600	Aluminum	Cu/Al	400-500 kcmil (2)	185-240 (2)	3	3TA603LDK
LGEDC, LGSDC, LGHDC	400	Aluminum	Cu/Al	2-500 (1)	35-240 (1)	1	TA350LK
	630	Aluminum	Cu/Al	2-500 kcmil (2)	35-240 (2)	1	TA632L
	630	Aluminum	Cu/Al	2-500 kcmil (2)	35-240 (2)	3	3TA632LK
HLDDC	500	Aluminum	Cu/Al	3/0-350 kcmil (2)	95-150 (2)	1	TA602LD
	600	Aluminum	Cu/Al	400-500 kcmil (2)	185-240 (2)	3	3TA603LDK
HMDLDC	600	Aluminum	Cu/Al	1-500 kcmil (2)	—	1	TA700MA1
	800	Aluminum	Cu/Al	3/0-400 kcmil (3)	—	1	TA800MA2
NBDC	700	Aluminum	Cu/Al	3/0-400 kcmil (3)	95-185 (3)	1	TA1000NB1
	800	Aluminum	Cu/Al	3/0-400 kcmil (3)	95-185 (3)	1	TA1000NB1
	900	Aluminum	Cu/Al	3/0-400 kcmil (3)	95-185 (3)	1	TA1000NB1
	1000	Aluminum	Cu/Al	3/0-400 kcmil (3)	95-185 (3)	1	TA1000NB1
	1200	Aluminum	Cu/Al	4/0-500 kcmil (4)	120-240 (4)	1	TA1200NB1

## Moulded Case Switches

Eaton's DC moulded case switches are used in applications requiring a compact, high-capacity disconnect. They are UL 489/CSA C22.2 No. 5 listed and have automatic high instantaneous current protection. These devices do not provide overload protection.

## Moulded Case Switches

Maximum Continuous Ampere Rating at 40°C	Unfused Short Circuit Rating (kA)	Poles in Series	With Line and Load Terminals	Without Line and Load Terminals
			Catalogue Number	Catalogue Number
<b>600 Vdc Maximum</b>				
100	42	3	HFDDC3100KL	HFDDC3100KW
150	42	3	HFDDC3150KL	HFDDC3150KW
225	42	3	HFDDC3225KL	HFDDC3225KW
250	65	3	JGKDC3250KSG	JGKDC3250KSW
250	42	3	HJDDC3250K	HJDDC3250KW
400	42	3	HKDDC3400K	HKDDC3400KW
	65	3	LGKDC3400KSG	LGKDC3400KSW
600	65	3	LGKDC3630KSG	LGKDC3630KSW
	35	3	HLDDC3600K	HLDDC3600WK
800	35	3	HMDLDC3800K	HMDLDC3800WK
<b>500 Vdc Maximum</b>				
100	65	3	EGK3100KSG	EGK3100KSW
<b>250 Vdc Maximum</b>				
100	50	2	HFDDC2100KL	HFDDC2100KW
150	50	2	HFDDC2150KL	HFDDC2150KW
225	50	2	HFDDC2225KL	HFDDC2225KW
1200	50	①	HLDDC21200K ①	HLDDC21200WK ①

### Note

① Four-pole frame with two-pole connected in parallel.

# DCCB-11 Special Application Moulded Case Circuit Breakers

Direct Current Circuit Breakers

## Accessories

### Internal Accessories

Description	Factory Installation (HFDDC)	Field Installation Kits								
		HFDDC ①	EGEDC, EGSDC, EGHDC	JGEDC, JGSDC, JGHDC	LGEDC, LGSDC, LGHDC	HJDDC	HKDDC	HLDDC	HMDLDC	NBDC
<b>Right-Pole Mounting</b>										
Auxiliary switch										
1A-1B	A06	A1X1PK	AUX1A1BPK	AUX1A1BPK	A1X2PK	A1X13PK	A1X4PK	A1X4PK	4980D16G05	2602D32G14
2A-2B	A13	A2X1RPK	AUX2A2BPK	AUX2A2BPK	A2X2PK	A2X3PK	A2X4PK	A2X4PK	4980D16G06	2602D32G15
Alarm switch										
1 make/1 break	B06	A1L1RPK	ALM1M1BEPK	ALM1M1BJPK	A1L2RPK	A1L3RPK	A1L4RPK	A1L4RPK	—	—
Auxiliary and alarm combo										
1A-1B, 1 make/1 break	C05	AAL1RPK	AUXALRMEPK	AUXALRMJPK	AAL2RPK	AAL3RPK	AA114RPK	AA114RPK	—	—
<b>Left-Pole Mounting</b>										
Shunt trip										
12 Vdc	S02	SNT1LP03K	SNT012CPK	SNT012CPK	SNT2P04K	SNT3P04K	SNT4LP03K	SNT4LP03K	2606D58G14	2606D59G28
24 Vdc	S02	SNT1LP03K	SNT060CPK	SNT060CPK	SNT2P04K	SNT3P04K	SNT4LP03K	SNT4LP03K	2606D58G13	2606D59G27
48 Vdc	S06	SNT1LP08K	SNT060CPK	SNT060CPK	SNT2P06K	SNT3P06K	SNT4LP23K	SNT4LP23K	2606D58G12	2606D59G26
60 Vdc	S06	SNT1LP08K	SNT060CPK	SNT060CPK	SNT2P06K	SNT3P06K	SNT4LP23K	SNT4LP23K	2606D58G11	2606D59G25
125 Vdc	S10	SNT1LP12K	SNT120CPK	SNT120CPK	SNT2P11K	SNT3P11K	SNT4LP26K	SNT4LP26K	2606D58G10	2606D59G24
250 Vdc	S14	SNT1LP18K	—	—	SNT2P14K	SNT3P14K	SNT4LP14K	SNT4LP14K	2606D58G09	2606D59G23
120 Vac	S06	SNT1LP12K	SNT120CPK	SNT120CPK	SNT2P11K	SNT3P11K	SNT4LP11K	SNT4LP11K	2060D58G05	2060D59G19
Undervoltage release										
12 Vdc	U30	UVH1LP20K	UVR012DPK	UVR012DPK	UVH2LP20K	UVH3LP20K	UVH4LP20K	UVH4LP20K	372D032G06	4976D85G11
24 Vdc	U34	UVH1LP21K	UVR024DPK	UVR024DPK	UVH2LP21K	UVH3LP21K	UVH4LP21K	UVH4LP21K	372D032G07	4976D85G12
48 Vdc	U38	UVH1LP22K	UVR048DPK	UVR048DPK	UVH2LP22K	UVH3LP22K	UVH4LP22K	UVH4LP22K	372D032G08	4976D85G13
125 Vdc	U42	UVH1LP26K	UVR125DPK	UVR125DPK	UVH2LP26K	UVH3LP26K	UVH4LP26K	UVH4LP26K	372D032G09	4976D85G17
250 Vdc	U46	UVH1LP28K	UVR250DPK	UVR250DPK	UVH2LP28K	UVH3LP28K	UVH4LP28K	UVH4LP28K	372D032G10	4976D85G18
120 Vac	U14	UVH1LP08K	UVR120APK	UVR120APK	UVH2LP08K	UVH3LP08K	UVH4LP08K	UVH4LP08K	373D632G05	5674D29G01

#### Note

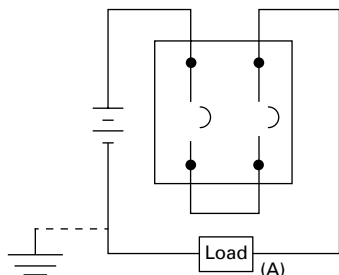
① F-Frame circuit breakers are factory sealed. Underwriters Laboratories requires that internal accessories be installed at the factory. Internal accessories are CSA/UL listed for factory installation under E7819.

One accessory can be mounted per pole, per breaker. Factory installation of accessories is available. Contact Eaton for assistance with part number configuration.

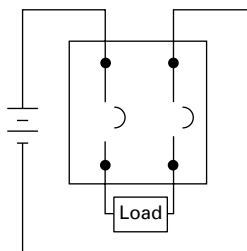
## Wiring Diagrams

### Series Connection Diagrams for DC Application ①②

#### 250 Vdc Maximum—Two Poles in Series

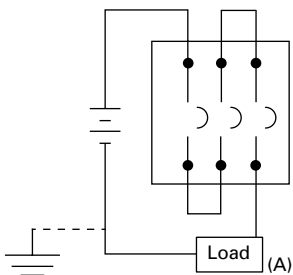


Suitable for use on ungrounded systems, or grounded systems that have one end of load (A) connected to grounded terminal, opposite poles in series connection.

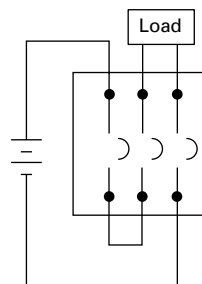


Suitable for use on ungrounded systems only.

#### 500 Vdc or 600 Vdc Maximum—Three Poles in Series

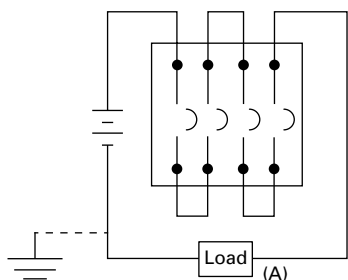


Suitable for use on ungrounded systems, or grounded systems that have one end of load (A) connected to grounded terminal, opposite poles in series connection.

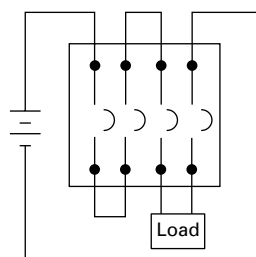


Suitable for use on ungrounded systems only.

#### 750 Vdc Maximum—Four Poles in Series



Suitable for use on ungrounded systems, or grounded systems that have one end of load (A) connected to grounded terminal, opposite poles in series connection.



Suitable for use on ungrounded systems only.

#### Notes

- ① Poles in series connection is customer supplied. Use rated cable per NEC/CEC.
- ② For grounded systems, all poles in series must be connected on non-grounded terminal, with load connected to grounded terminal.



# DCCB-13 Special Application Moulded Case Circuit Breakers

Direct Current Circuit Breakers

## Dimensions

Approximate Dimensions in Inches (mm)

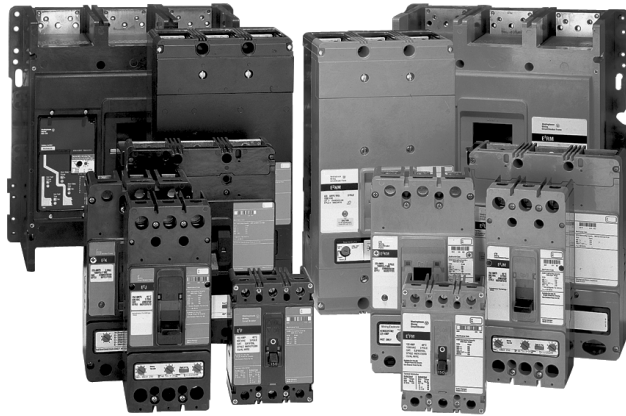
### DC Breaker Dimensions

Frame	Number of Poles	Width	Height	Depth
EGEDC, EGSDC, EGHDC	3	3.00 (76.2)	5.50 (139.7)	2.99 (75.9)
HFDDC	1	1.38 (35.1)	6.00 (152.4)	3.38 (86.0)
	2	2.75 (70.0)	6.00 (152.4)	3.38 (86.0)
	3	4.13 (105.0)	6.00 (152.4)	3.38 (86.0)
	4	5.50 (139.7)	6.00 (152.4)	3.38 (86.0)
JGEDC, JGSDC, JGHDC	3	4.13 (104.9)	7.00 (177.8)	3.57 (90.7)
HJDDC	2, 3	4.13 (105.0)	10.00 (254.0)	4.06 (103.1)
HKDDC	2, 3	5.50 (139.7)	10.13 (257.3)	4.10 (104.1)
LGEDC, LGSDC, LGHDC	3	5.48 (139.2)	10.13 (257.3)	4.09 (103.9)
600A Max. HLDDC	2, 3	8.25 (209.6)	10.75 (273.1)	4.06 (103.1)
1200A Max. HLDDC	4	11.00 (279.4)	10.75 (273.1)	4.06 (103.1)
HMDLDC	2, 3	8.25 (209.6)	16.00 (406.4)	4.06 (103.1)
NBDC	3	8.25 (209.6)	16.00 (406.4)	5.50 (139.7)
PBDC	3	12.06 (306.3)	22.06 (560.3)	9.06 (230.1)

# Special Application Moulded Case Circuit Breakers **E<sup>2</sup>MB-1**

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup> Mining Service Breakers



## E<sup>2</sup> Mining Service Breakers

### Product Overview

State-of-the-art E<sup>2</sup> mining service breakers incorporate the rigid specifications and testing procedures developed by a focus group led by engineers from several large coal companies and Eaton design engineers. Additionally, the performance of these breakers was proven and verified during hundreds of hours of field testing in harsh mine environments.

E<sup>2</sup> mining breakers are available in 600 Vac and 1000Y/577 Vac. Interchangeable trip units can be used on either 600 or 1000 Vac frames.

The E<sup>2</sup> mining breaker family is designed especially for trailing cable application per MSHA 30 CFR 75. Field interchangeable electronic rms sensing trip units are available from 150 to 2000 amperes with instantaneous pickup settings conforming to the code of Federal Regulations 30 CFR 75.601-2. Electromechanical trip units are also available with a wide range of magnetic pickup ranges.

E<sup>2</sup> electronic trip units are the first to provide the mining industry with true rms sensing, made possible by the custom ASIC microprocessor in each electronic trip unit.

E<sup>2</sup> breakers are designed to be physically and electrically interchangeable with Classic Mining Service Breakers and supersede Series C<sup>®</sup> Mining Service Breakers. The table to the right outlines direct replacements.

### 600 Vac Mining Breaker Replacement Chart

Classic	Series C	E <sup>2</sup>
FBM	FDBM	E <sup>2</sup> F
HFBM	FDM	E <sup>2</sup> F
	HFDM (mag. only)	E <sup>2</sup> F
—	JDM	E <sup>2</sup> J
KAM	KDM	E <sup>2</sup> K
KAMH	KDM	E <sup>2</sup> K
LAM	LDM	E <sup>2</sup> L
LAMH	LDM	E <sup>2</sup> L
LCM	LDM	E <sup>2</sup> L
LCMH	LDM	E <sup>2</sup> L
MAM	—	E <sup>2</sup> M
MAMH	—	E <sup>2</sup> M
MCM	—	E <sup>2</sup> M
MCMH	—	E <sup>2</sup> M
NBM	—	E <sup>2</sup> N
NBMH	—	E <sup>2</sup> N
NCM	—	E <sup>2</sup> N
NCMH	—	E <sup>2</sup> N

### 1000 Vac Mining Breaker Replacement Chart

Classic	Series C	E <sup>2</sup> M
HFM	—	E <sup>2</sup> FM
—	JDCM	E <sup>2</sup> JM
HKAM	KDCM	E <sup>2</sup> KM
HLAM	LDCM	E <sup>2</sup> LM
HLCM	LDCM	E <sup>2</sup> LM
HMAM	—	E <sup>2</sup> MM
HMCM	—	E <sup>2</sup> MM
HNBM	—	E <sup>2</sup> NM
HNBMH	—	E <sup>2</sup> NM
HNCM	—	E <sup>2</sup> NM
HLCLM	—	E <sup>2</sup> NM
HPBM	—	E <sup>2</sup> RM ①

### Additional Information on Mining Breakers

Source	Description
TD01217001E	E <sup>2</sup> Mining Circuit Breaker Dimensional Data
BR01217001E	E <sup>2</sup> Mining Circuit Breaker Brochure
TC01217001E	E <sup>2</sup> Mining Circuit Breaker Time Current Curves
<a href="http://www.eaton.com/mining">www.eaton.com/mining</a>	Mining and Metals

#### Note

① E<sup>2</sup>R/E<sup>2</sup>RM is a new frame physically different than the HPBM. See DS29-170MS.

# E2MB-2 Special Application Moulded Case Circuit Breakers

## E<sup>2</sup> Mining Service Breakers

Eaton's mining service circuit breakers provide short circuit protection as specified in the code of Federal Regulations 30 CFR 75.601-2. E<sup>2</sup> 225/400 ampere K frame and 400/600 ampere L frame electronic trip units feature specifically designed instantaneous pickup settings to conform exactly with the code of

Federal Regulations 30 CFR 75.601-2. Electromechanical trip units are also available with a wide range of magnetic pickup ranges.

The tables below list the conductor size maximum allowable circuit breaker instantaneous setting and the E<sup>2</sup> breaker that meets that setting.

### Interrupting Capacity Rating

Circuit Breaker Type	Interrupting Capacity (Symmetrical kA)				
	Vac (50/60 Hz)				
	240	480	600	1000Y/577	Vdc <sup>①</sup>
E <sup>2</sup> F	65	25	18	—	10
E <sup>2</sup> J	65	35	18	—	10
E <sup>2</sup> K	65	35	25	—	10
E <sup>2</sup> LME	100	65	35	—	42
E <sup>2</sup> L	65	35	25	—	22
E <sup>2</sup> M	65	35	25	—	22
E <sup>2</sup> N	65	50	25	—	—
E <sup>2</sup> R	125	65	50	—	—
E <sup>2</sup> FM	65	25	18	10	10
E <sup>2</sup> JM	65	35	18	10	22
E <sup>2</sup> KM	65	35	25	14	10
E <sup>2</sup> LMZ	100	65	35	10	42
E <sup>2</sup> LM	—	35	25	18	22
E <sup>2</sup> MM	—	35	25	18	22
E <sup>2</sup> NM <sup>②</sup>	—	50	25	25	—
E <sup>2</sup> RM	—	65	50	25	—

### Trailing Cable Setting Per 30 CFR 75

Conductor Size	Maximum Breaker Instantaneous Setting	Maximum Ampere 75°C Insulated Conductor	E <sup>2</sup> /E <sup>2</sup> M Instantaneous Only	Setting
14	50	15	E <sup>2</sup> K 150A	A
12	75	20	E <sup>2</sup> K 150A	B
10	150	30	E <sup>2</sup> K 150A	C
8	200	50	E <sup>2</sup> K 225A	A
6	300	65	E <sup>2</sup> K 225A	B
4	500	85	E <sup>2</sup> K 225A/E <sup>2</sup> L 400A	C/A
3	600	100	E <sup>2</sup> K 225A/E <sup>2</sup> L 400A	D/B
2	800	115	E <sup>2</sup> K 225A/E <sup>2</sup> L 400A	E/C
1	1000	130	E <sup>2</sup> K 225A/E <sup>2</sup> L 400A	F/D
1/0	1250	150	E <sup>2</sup> K 225A/E <sup>2</sup> L 400A	G/E
2/0	1500	175	E <sup>2</sup> K 225A/E <sup>2</sup> L 400A	H/F
3/0	2000	200	E <sup>2</sup> L 400A	G
4/0	2500	230	E <sup>2</sup> L 400A	H
250	2500	255	E <sup>2</sup> L 400A	H
300	2500	285	E <sup>2</sup> L 400A	H
350	2500	310	E <sup>2</sup> L 400A	H
400	2500	335	E <sup>2</sup> L 400A	H
500	2500	380	E <sup>2</sup> L 400A	H

### Auxiliary Switch Electrical Rating Data

Maximum Voltage	Frequency	Maximum Current Amperes
600	50/60 Hz	6.0
125	DC	0.5 (non-inductive load)
250	DC	0.25 (non-inductive load)

### Alarm (Signal/Lockout Switch) Electrical Rating Data

Maximum Voltage	Frequency	Maximum Current Amperes
600	50/60 Hz	6.0
125	DC	0.5 (non-inductive load)
250	DC	0.25 (non-inductive load)

#### Notes

- ① Two poles in series. DC rating applies to breakers with thermal-magnetic trip unit. Breakers with electronic trip units are not DC rated.
- ② Series rated for application with Eaton's E<sup>2</sup>KM and E<sup>2</sup>LM breakers.

## Undervoltage Release Mechanism Electrical Rating Data

Breaker Type	Supply Voltage	Dropout Voltage		Pickup Voltage	VA
		Minimum	Maximum	Maximum	
E2F/E2FM	110 Vac	44.5	77	93.5	1.3
	120 Vac				1.5
	127 Vac				1.7
	110 Vdc				1.5
	120 Vdc				1.7
	125 Vdc				1.9
E2J/E2JM	110 Vac	44.5	77	93.5	1.8
	120 Vac				2.1
	127 Vac				2.4
	110 Vdc				1.6
	120 Vdc				1.9
	125 Vdc				2.2
E2K/E2KM	110 Vac	44.5	77	93.5	1.8
	120 Vac				2.1
	127 Vac				2.4
	110 Vdc				1.6
	120 Vdc				1.9
	125 Vdc				2.2
E2LME/E2LMZ	110 Vac	44.5	77	93.5	0.96
	120 Vac				1.13
	127 Vac				1.25
	110 Vdc	43.8	77	93.5	0.94
	120 Vdc				1.12
	125 Vdc				1.21
E2L/E2LM/E2M/ E2MM	110 Vac	44.5	77	93.5	1.8
	120 Vac				2.1
	127 Vac				2.4
	110 Vdc				1.6
	120 Vdc				1.9
	125 Vdc				2.2
E2N/E2NM	110 Vac	44.5	77	93.5	1.8
	120 Vac				2.1
	127 Vac				2.4
	110 Vdc				1.6
	120 Vdc				1.9
	125 Vdc				2.2
E2R/E2RM	110 Vac	44.5	77	93.5	3.3
	120 Vac				3.6
	127 Vac				3.8
	110 Vdc	43.8	77	93.5	3.3
	120 Vdc				3.6
	125 Vdc				3.8

# E2MB-4 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## Shunt Trip Electrical Rating Data

Breaker Type	Supply Voltage	Operating Voltage		
		Minimum	VA	
E2F/E2FM	48 Vac	33.6	92	
	60 Vac		140	
	110 Vac		480	
	120 Vac		570	
	127 Vac	146	640	
	208 Vac		180	
	220 Vac		200	
	230 Vac		240	
	48 Vdc	33.6	100	
	60 Vdc		160	
	110 Vdc		77	55
	120 Vdc			66
	125 Vdc			71
E2J/E2JM	110 Vac		60.5	66
	120 Vac	84		
	127 Vac	102		
	110 Vdc	77	112	
	120 Vdc		138	
125 Vdc	150			
E2K/E2KM	110 Vac	60	100	
	120 Vac		120	
	127 Vac		140	
	110 Vdc		77	110
	120 Vdc	130		
	125 Vdc	140		
	24 Vac	41		
	48 Vac	18		139
	60 Vac			210
	E2LME/E2LMZ	110 Vac	60	83
120 Vac		92		
127 Vac		117		
24 Vdc		120		
48 Vdc		18	475	
60 Vdc			720	
110 Vdc			82	99
120 Vdc		120		
125 Vdc		121		

Breaker Type	Supply Voltage	Operating Voltage		
		Minimum	VA	
E2L/E2LM/E2M/ E2MM	48 Vac	34	830	
	60 Vac		1280	
	110 Vac		100	
	120 Vac	60	120	
	127 Vac		140	
	48 Vdc		34	710
	60 Vdc			1105
	110 Vdc	77		110
	120 Vdc		130	
	125 Vdc		140	
E2N/E2NM	110 Vac	60	100	
	120 Vac		120	
	127 Vac		140	
	110 Vdc	77	110	
	120 Vdc		130	
125 Vdc	140			
E2R/E2RM	110 Vac	60.5	330	
	120 Vac		390	
	127 Vac		430	
	110 Vdc	77	370	
	120 Vdc		440	
125 Vdc	480			

## Product Selection

### E<sup>2</sup>F/E<sup>2</sup>FM

**Thermal-Magnetic Circuit Breakers—Sealed Breakers with Non-Interchangeable Trip Unit—Include Line/Load Terminals**

#### 600 Vac Maximum, 250 Vdc, 18kA at 600 Vac, Three-Pole ①

Maximum Continuous Ampere Rating at 40°C	Catalogue Number
15	E2F3015
20	E2F3020
25	E2F3025
30	E2F3030
35	E2F3035
40	E2F3040
45	E2F3045
50	E2F305
60	E2F3060
70	E2F3070
80	E2F3080
90	E2F3090
100	E2F3100
125	E2F3125
150	E2F3150

### E<sup>2</sup>F/E<sup>2</sup>FM



#### 1000Y/577 Vac Maximum, 250 Vdc, 10 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Catalogue Number
15	—
20	E2FM3020
25	E2FM3025
30	—
35	—
40	E2FM3040
45	—
50	E2FM3050
60	E2FM3060
70	E2FM3070
80	E2FM3080
90	E2FM3090
100	E2FM3100
125	E2FM3125
150	E2FM3150

**Note**

① For two-pole application, use outer poles.

# E2MB-6 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>F/E<sup>2</sup>FM

**Magnetic Only Circuit Breakers—Sealed Breakers with Non-Interchangeable Trip Unit—Include Line/Load Terminals**

### 600 Vac Maximum, 250 Vdc, 18kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
3	9–30	E2F003AM
7	21–70	E2F007CM
15	45–150	E2F015EM
30	90–300	E2F030HM
	50–150	E2F030EM
50	150–500	E2F050KM
	66–190	E2F050YM
70	210–700	E2F070MM
100	150–500	E2F100KM
	300–1000	E2F100RM
150	450–1500	E2F150TM
	750–2500	E2F150UM

### 1000Y/577 Vac Maximum, 250 Vdc, 10 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
3	9–30	—
7	21–70	—
15	45–150	—
30	90–300	—
	50–150	—
50	150–500	E2FM050KM
	66–190	E2FM050YM
70	210–700	E2FM070MM
100	150–500	E2FM100KM
	300–1000	E2FM100RM
150	450–1500	E2FM150TM
	750–2500	E2FM150UM

# Special Application Moulded Case Circuit Breakers **E2MB-7**

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>J/E<sup>2</sup>JM

*Circuit Breakers with Interchangeable Thermal-Magnetic Trip Unit*

### 600 Vac Maximum, 250 Vdc, 18kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
70	300–650	E2J3070W	E2J3250F	E2J3070T
90	450–900	E2J3090W	E2J3250F	E2J3090T
100	500–1000	E2J3100W	E2J3250F	E2J3100T
125	625–1250	E2J3125W	E2J3250F	E2J3125T
150	750–1500	E2J3150W	E2J3250F	E2J3150T
175	875–1750	E2J3175W	E2J3250F	E2J3175T
200	1000–2000	E2J3200W	E2J3250F	E2J3200T
225	300–650	E2J3225AW	E2J3250F	E2J3225TA
	500–1000	E2J3225DW	E2J3250F	E2J3225TD
	1125–2250	E2J3225W	E2J3250F	E2J3225T
250	1250–2500	E2J3250W	E2J3250F	E2J3250T

## E<sup>2</sup>J/E<sup>2</sup>JM



### 1000Y/577 Vac Maximum, 250 Vdc, 10 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
70	300–650	E2JM3070W	E2JM3250F	E2J3070T
90	450–900	E2JM3090W	E2JM3250F	E2J3090T
100	500–1000	E2JM3100W	E2JM3250F	E2J3100T
125	625–1250	E2JM3125W	E2JM3250F	E2J3125T
150	750–1500	E2JM3150W	E2JM3250F	E2J3150T
175	875–1750	E2JM3175W	E2JM3250F	E2J3175T
200	1000–2000	E2JM3200W	E2JM3250F	E2J3200T
225	300–650	E2JM3225AW	E2JM3250F	E2J3225TA
	500–1000	E2JM3225DW	E2JM3250F	E2J3225TD
	1125–2250	E2JM3225W	E2JM3250F	E2J3225T
250	1250–2500	E2JM3250W	E2JM3250F	E2J3250T



# E2MB-8 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>J/E<sup>2</sup>JM

*Circuit Breakers with Interchangeable Magnetic Only Trip Unit*

### 600 Vac Maximum, 250 Vdc, 18kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
250	300–650	E2J3250MAW	E2J3250F	E2J3250TMA
	450–900	E2J3250MCW	E2J3250F	E2J3250TMC
	500–1000	E2J3250MDW	E2J3250F	E2J3250TMD
	625–1250	E2J3250MFW	E2J3250F	E2J3250TMF
	750–1500	E2J3250MGW	E2J3250F	E2J3250TMG
	875–1750	E2J3250MJW	E2J3250F	E2J3250TMJ
	1000–2000	E2J3250MKW	E2J3250F	E2J3250TMK
	1125–2250	E2J3250MLW	E2J3250F	E2J3250TML
	1250–2500	E2J3250MW	E2J3250F	E2J3250TM

### 1000Y/577 Vac Maximum, 250 Vdc, 10 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
250	300–650	E2JM3250MAW	E2JM3250F	E2J3250TMA
	450–900	E2JM250MCW	E2JM3250F	E2J3250TMC
	500–1000	E2JM3250MDW	E2JM3250F	E2J3250TMD
	625–1250	E2JM3250MFW	E2JM3250F	E2J3250TMF
	750–1500	E2JM3250MGW	E2JM3250F	E2J3250TMG
	875–1750	E2JM3250MJW	E2JM3250F	E2J3250TMJ
	1000–2000	E2JM3250MKW	E2JM3250F	E2J3250TMK
	1125–2250	E2JM3250MLW	E2JM3250F	E2J3250TML
	1250–2500	E2JM3250MW	E2JM3250F	E2J3250TM

# Special Application Moulded Case Circuit Breakers **E2MB-9**

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>K/E<sup>2</sup>KM

*Circuit Breakers with Interchangeable Thermal-Magnetic Trip Unit*

### 600 Vac Maximum, 250 Vdc, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
100	500–1000	E2K3100W	E2K3400F	E2K3100T
125	625–1250	E2K3125W	E2K3400F	E2K3125T
150	750–1500	E2K3150W	E2K3400F	E2K3150T
175	875–1750	E2K3175W	E2K3400F	E2K3175T
200	1000–2000	E2K3200W	E2K3400F	E2K3200T
225	300–650	E2K3225AW	E2K3400F	E2K3225TA
	500–1000	E2K3225DW	E2K3400F	E2K3225TD
	1125–2250	E2K3225W	E2K3400F	E2K3225T
250	1250–2500	E2K3250W	E2K3400F	E2K3250T
300	1500–3000	E2K3300W	E2K3400F	E2K3300T
350	1750–3500	E2K3350W	E2K3400F	E2K3350T
400	2000–4000	E2K3400W	E2K3400F	E2K3400T

## E<sup>2</sup>K/E<sup>2</sup>KM



### 1000Y/577 Vac Maximum, 250 Vdc, 14 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
100	500–1000	E2KM3100W	E2KM3400F	E2K3100T
125	625–1250	E2KM3125W	E2KM3400F	E2K3125T
150	750–1500	E2KM3150W	E2KM3400F	E2K3150T
175	875–1750	E2KM3175W	E2KM3400F	E2K3175T
200	1000–2000	E2KM3200W	E2KM3400F	E2K3200T
225	300–650	E2KM3225AW	E2KM3400F	E2K3225TA
	500–1000	E2KM3225DW	E2KM3400F	E2K3225TD
	1125–2250	E2KM3225W	E2KM3400F	E2K3225T
250	1250–2500	E2KM3250W	E2KM3400F	E2K3250T
300	1500–3000	E2KM3300W	E2KM3400F	E2K3300T
350	1750–3500	E2KM3350W	E2KM3400F	E2K3350T
400	2000–4000	E2KM3400W	E2KM3400F	E2K3400T

# E2MB-10 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>K/E<sup>2</sup>KM

*Circuit Breakers with Interchangeable Magnetic Only Trip Unit*

### 600 Vac Maximum, 250 Vdc, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
400	300–650	E2K3400MAW	E2K3400F	E2K3400TMA
	500–1000	E2K3400MDW	E2K3400F	E2K3400TMD
	625–1250	E2K3400MFW	E2K3400F	E2K3400TMF
	750–1500	E2K3400MGW	E2K3400F	E2K3400TMG
	875–1750	E2K3400MJW	E2K3400F	E2K3400TMJ
	1000–2000	E2K3400MKW	E2K3400F	E2K3400TMK
	1125–2250	E2K3400MLW	E2K3400F	E2K3400TML
	1250–2500	E2K3400MWW	E2K3400F	E2K3400TMW
	1500–3000	E2K3400MNW	E2K3400F	E2K3400TMN
	1750–3500	E2K3400MRW	E2K3400F	E2K3400TMR
	2000–4000	E2K3400MW	E2K3400F	E2K3400TM

### 1000Y/577 Vac Maximum, 250 Vdc, 14 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
400	300–650	E2KM3250MAW	E2KM3400F	E2K3400TMA
	500–1000	E2KM3400MDW	E2KM3400F	E2K3400TMD
	625–1250	E2KM3400MFW	E2KM3400F	E2K3400TMF
	750–1500	E2KM3400MGW	E2KM3400F	E2K3400TMG
	875–1750	E2KM3400MJW	E2KM3400F	E2K3400TMJ
	1000–2000	E2KM3400MKW	E2KM3400F	E2K3400TMK
	1125–2250	E2KM3400MLW	E2KM3400F	E2K3400TML
	1250–2500	E2KM3400MWW	E2KM3400F	E2K3400TMW
	1500–3000	E2KM3400MNW	E2KM3400F	E2K3400TMN
	1750–3500	E2KM3400MRW	E2KM3400F	E2K3400TMR
	2000–4000	E2KM3400MW	E2KM3400F	E2K3400TM

**E<sup>2</sup>K/E<sup>2</sup>KM***Circuit Breakers with Interchangeable Electronic Trip Unit, Long/Instantaneous***600 Vac Maximum, 25 kA at 600 Vac, Three-Pole**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
100	50–800	E2KE3100W	E2K3400F	KEM3100T
125	50–800	E2KE3125W	E2K3400F	KEM3125T
150	50–800	E2KE3150W	E2K3400F	KEM3150T
200	200–1500	E2KE3200W	E2K3400F	KEM3200T
225	200–1500	E2KE3225W	E2K3400F	KEM3225T
	500–2500	E2KE32252W	E2K3400F	KEM3225T2
400	200–1500	E2KE3400W	E2K3400F	KEM3400T
	500–2500	E2KE34002W	E2K3400F	KEM3400T2

**1000Y/577 Vac Maximum, 14 kA at 1000 Vac, Three-Pole**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
100	50–800	E2KEM3100W	E2KM3400F	KEM3100T
125	50–800	E2KEM3125W	E2KM3400F	KEM3125T
150	50–800	E2KEM3150W	E2KM3400F	KEM3150T
200	200–1500	E2KEM3200W	E2KM3400F	KEM3200T
225	200–1500	E2KEM3225	E2KM3400F	KEM3225T
	500–2500	E2KEM32252W	E2KM3400F	KEM3225T2
400	200–1500	E2KEM3400W	E2KM3400F	KEM3400T
	500–2500	E2KEM34002W	E2KM3400F	KEM3400T2

# E2MB-12 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>K/E<sup>2</sup>KM

*Circuit Breakers with Interchangeable Electronic Trip Unit, Instantaneous Only*

### 600 Vac Maximum, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
150	50–800	E2KE3150MW	E2K3400F	KEM3150TM
225	200–1500	E2KE3225MW	E2K3400F	KEM3225TM
	500–2500	E2KE3225M2W	E2K3400F	KEM3225TM2
400	200–1500	E2KE3400MW	E2K3400F	KEM3400TM
	500–2500	E2KE3400M2W	E2K3400F	KEM3400TM2

### 1000Y/577 Vac Maximum, 14 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
150	50–800	E2KEM3150MW	E2KM3400F	KEM3150TM
225	200–1500	E2KEM3225MW	E2KM3400F	KEM3225TM
	500–2500	E2KEM3225M2W	E2KM3400F	KEM3225TM2
400	200–1500	E2KEM3400MW	E2KM3400F	KEM3400TM
	500–2500	E2KEM3400M2W	E2KM3400F	KEM3400TM2

## E<sup>2</sup>LME/E<sup>2</sup>LMZ (Series G)

### *Circuit Breakers with Magnetic Only Trip Unit*

#### 600 Vac Maximum, 250 Vdc, 35 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker Catalogue Number	Frame Only Catalogue Number	Trip Unit Only Catalogue Number
400	3600–4400	E2LME3400KMW	E2LME3400NN	LT3400KM

#### 1000Y/577 Vac Maximum, 250 Vdc, 10 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker Catalogue Number	Frame Only Catalogue Number	Trip Unit Only Catalogue Number
400	3600–4400	E2LMZ3400KMW	E2LMZ3400NN	LT3400KM

### *Circuit Breakers with Interchangeable Electronic Trip Unit*

#### 600 Vac Maximum, 35 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker Catalogue Number	Frame Only Catalogue Number	Trip Unit Only Catalogue Number
160	320–1920	E2LME340031W	E2LME3400NN	LT340031M
200	400–2400	E2LME340031W	E2LME3400NN	LT340031M
225	450–2700	E2LME340031W	E2LME3400NN	LT340031M
250	500–3000	E2LME340031W	E2LME3400NN	LT340031M
300	600–3600	E2LME340031W	E2LME3400NN	LT340031M
315	630–3780	E2LME340031W	E2LME3400NN	LT340031M
350	700–4200	E2LME340031W	E2LME3400NN	LT340031M
400	800–4800	E2LME340031W	E2LME3400NN	LT340031M

#### 1000Y/577 Vac Maximum, 10 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker Catalogue Number	Frame Only Catalogue Number	Trip Unit Only Catalogue Number
160	320–1920	E2LMZ340031W	E2LMZ3400NN	LT340031M
200	400–2400	E2LMZ340031W	E2LMZ3400NN	LT340031M
225	450–2700	E2LMZ340031W	E2LMZ3400NN	LT340031M
250	500–3000	E2LMZ340031W	E2LMZ3400NN	LT340031M
300	600–3600	E2LMZ340031W	E2LMZ3400NN	LT340031M
315	630–3780	E2LMZ340031W	E2LMZ3400NN	LT340031M
350	700–4200	E2LMZ340031W	E2LMZ3400NN	LT340031M
400	800–4800	E2LMZ340031W	E2LMZ3400NN	LT340031M

# E2MB-14 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>L/E<sup>2</sup>LM

### Circuit Breakers with Interchangeable Thermal-Magnetic Trip Unit

#### 600 Vac Maximum, 250 Vdc, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
300	1500–3000	E2L3300W	E2L3600F	E2L3300T
350	1750–3500	E2L3350W	E2L3600F	E2L3350T
400	2000–4000	E2L3400W	E2L3600F	E2L3400T
450	2250–4500	E2L3450W	E2L3600F	E2L3450T
500	2500–5000	E2L3500W	E2L3600F	E2L3500T
600	3000–6000	E2L3600W	E2L3600F	E2L3600T

#### 1000Y/577 Vac Maximum, 250 Vdc, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
300	1500–3000	E2LM3300W	E2LM3600F	E2L3300T
350	1750–3500	E2LM3350W	E2LM3600F	E2L3350T
400	2000–4000	E2LM3400W	E2LM3600F	E2L3400T
450	2250–4500	E2LM3450W	E2LM3600F	E2L3450T
500	2500–5000	E2LM3500W	E2LM3600F	E2L3500T
600	3000–6000	E2LM3600W	E2LM3600F	E2L3600T
	1125–2250	—	E2LM3600F	E2L3600TL <sup>Ⓢ</sup>

#### Note

Ⓢ 600 ampere thermal 1125–2250 T.A.

# Special Application Moulded Case Circuit Breakers **E2MB-15**

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>L/E<sup>2</sup>LM

### *Circuit Breakers with Interchangeable Magnetic Only Trip Unit*

#### 600 Vac Maximum, 250 Vdc, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
600	1125–2250	E2L3600MLW	E2L3600F	E2L3600TML
	1500–3000	E2L3600MNW	E2L3600F	E2L3600TMN
	1750–3500	E2L3600MRW	E2L3600F	E2L3600TMR
	2000–4000	E2L3600MXW	E2L3600F	E2L3600TMX
	2250–4500	E2L3600MYW	E2L3600F	E2L3600TMY
	2500–5000	E2L3600MPW	E2L3600F	E2L3600TMP
	3000–6000	E2L3600MW	E2L3600F	E2L3600TM

#### 1000Y/577 Vac Maximum, 250 Vdc, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
600	1125–2250	E2LM3600MLW	E2LM3600F	E2L3600TML
	1500–3000	E2LM3600MNW	E2LM3600F	E2L3600TMN
	1750–3500	E2LM3600MRW	E2LM3600F	E2L3600TMR
	2000–4000	E2LM3600MXW	E2LM3600F	E2L3600TMX
	2250–4500	E2LM3600MYW	E2LM3600F	E2L3600TMY
	2500–5000	E2LM3600MPW	E2LM3600F	E2L3600TMP
	3000–6000	E2LM3600MW	E2LM3600F	E2L3600TM



# E2MB-16 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>L/E<sup>2</sup>LM

### Circuit Breakers with Interchangeable Electronic Trip Unit, Long/Instantaneous

#### 600 Vac Maximum, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
300	500–2500	E2LE3300W	E2L3600F	LEM3300T
350	500–2500	E2LE3350W	E2L3600F	LEM3350T
400	500–2500	E2LE3400W	E2L3600F	LEM3400T
	1000–4000	E2LE34002W	E2L3600F	LEM3400T2
600	500–2500	E2LE3600W	E2L3600F	LEM3600T
	2500–5000	E2LE36002W	E2L3600F	LEM3600T2

#### 1000Y/577 Vac Maximum, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
300	500–2500	E2LEM3300W	E2LM3600F	LEM3300T
350	500–2500	E2LEM3350W	E2LM3600F	LEM3350T
400	500–2500	E2LEM3400W	E2LM3600F	LEM3400T
	1000–4000	E2LEM34002W	E2LM3600F	LEM3400T2
600	500–2500	E2LEM3600W	E2LM3600F	LEM3600T
	2500–5000	E2LEM36002W	E2LM3600F	LEM3600T2

### Circuit Breakers with Interchangeable Electronic Trip Unit, Instantaneous Only

#### 600 Vac Maximum, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
400	500–2500	E2LE3400MW	E2L3600F	LEM3400TM
	1000–4000	E2LE3400M2W	E2L3600F	LEM3400TM2
600	500–2500	E2LE3600MW	E2L3600F	LEM3600TM
	1000–4000	E2LE3600M2W	E2L3600F	1483D53G50

#### 1000Y/577 Vac Maximum, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
400	500–2500	E2LEM3400MW	E2LM3600F	LEM3400TM
	1000–4000	E2LEM3400M2W	E2LM3600F	LEM3400TM2
600	500–2500	E2LEM3600MW	E2LM3600F	LEM3600TM
	1000–4000	E2LEM3600M2W	E2LM3600F	1483D53G50

# Special Application Moulded Case Circuit Breakers **E2MB-17**

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>M/E<sup>2</sup>MM

### Circuit Breaker with Interchangeable Thermal-Magnetic Trip Unit

#### 600 Vac Maximum, 250 Vdc, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
600	1500–3000	E2M3600W	E2M3800F	E2M3600TN
800	2000–4000	E2M3800W	E2M3800F	E2M3800TX

## E<sup>2</sup>M/E<sup>2</sup>MM



#### 1000Y/577 Vac Maximum, 250 Vdc, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
600	1500–3000	E2MM3600W	E2MM3800F	E2M3600TN
800	2000–4000	E2MM3800W	E2MM3800F	E2M3800TX

### Circuit Breaker with Interchangeable Magnetic Only Trip Unit

#### 600 Vac Maximum, 250 Vdc, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
800	1500–3000	E2M3800MNW	E2M3800F	E2M3800TMN
	2000–4000	E2M3800MXW	E2M3800F	E2M3800TMX
	2500–5000	E2M3800MPW	E2M3800F	E2M3800TMP
	3000–6000	E2M3800MWW	E2M3800F	E2M3800TMW

#### 1000Y/577 Vac Maximum, 250 Vdc, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
800	1500–3000	E2MM3800MNW	E2MM3800F	E2M3800TMN
	2000–4000	E2MM3800MXW	E2MM3800F	E2M3800TMX
	2500–5000	E2MM3800MPW	E2MM3800F	E2M3800TMP
	3000–6000	E2MM3800MWW	E2MM3800F	E2M3800TMW

# E2MB-18 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>M/E<sup>2</sup>MM

*Circuit Breaker with Interchangeable Electronic Trip Unit, Long/Instantaneous*

### 600 Vac Maximum, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
800	500–2500	E2ME3800W	E2M3800F	MEM3800T
	1000–4000	E2ME38002W	E2M3800F	MEM3800T2

### 1000Y/577 Vac Maximum, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
800	500–2500	E2MEM3800W	E2MM3800F	MEM3800T
	1000–4000	E2MEM38002W	E2MM3800F	MEM3800T2

*Circuit Breaker with Interchangeable Electronic Trip Unit, Instantaneous Only*

### 600 Vac Maximum, 25 kA at 600 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
800	500–2500	E2ME3800MW	E2M3800F	MEM3800TM
	1000–4000	E2ME3800M2W	E2M3800F	MEM3800TM2

### 1000Y/577 Vac Maximum, 18 kA at 1000 Vac, Three-Pole

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Complete Breaker	Frame Only	Trip Unit Only
		Catalogue Number	Catalogue Number	Catalogue Number
800	500–2500	E2MEM3800MW	E2MM3800F	MEM3800TM
	1000–4000	E2MEM3800M2W	E2MM3800F	MEM3800TM2

## E<sup>2</sup>N/E<sup>2</sup>NM

### *Circuit Breakers with Electronic Trip Unit, Long/Instantaneous*

#### **600 Vac Maximum, 25 kA at 600 Vac, Three-Pole Frame**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
400	500–2500	E2N3400W
500	500–2500	E2N3500W
600	500–2500	E2N3600W
700	500–2500	E2N3700W
800	500–2500	E2N3800W
900	1250–5000	E2N3900W
1000	1250–5000	E2N310W
1200	1250–5000	E2N312W

#### **1000Y/577 Vac Maximum, 25 kA at 1000 Vac, Three-Pole Frame**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
400	500–2500	E2NM3400W
500	500–2500	E2NM3500W
600	500–2500	E2NM3600W
700	500–2500	E2NM3700W
800	500–2500	E2NM3800W
900	1250–5000	E2NM3900W
1000	1250–5000	E2NM310W
1200	1250–5000	E2NM312W

### *Circuit Breakers with Electronic Trip Unit, Instantaneous Only*

#### **600 Vac Maximum, 25 kA at 600 Vac, Three-Pole Frame**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
800	500–2500	E2N3800MW
1200	1250–5000	E2N312MW

#### **1000Y/577 Vac Maximum, 25 kA at 1000 Vac, Three-Pole Frame**

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
800	500–2500	E2NM3800MW
1200	1250–5000	E2NM312MW

# E2MB-20 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## E<sup>2</sup>R/E<sup>2</sup>RM

*Circuit Breakers with Electronic Trip Unit, Long/Instantaneous (Does Not Include Rating Plugs)* <sup>①</sup>

### 600 Vac Maximum, 50 kA at 600 Vac, Three-Pole Frame

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
<b>LS</b>		
1600	2–8 x I <sub>n</sub>	E2R316T33W
2000	2–8 x I <sub>n</sub>	E2R320T33W
<b>LSI</b>		
1600	2–8 x I <sub>n</sub>	E2R316T32W
2000	2–8 x I <sub>n</sub>	E2R320T32W

### 1000Y/577 Vac Maximum, 25 kA at 1000 Vac, Three-Pole Frame

Maximum Continuous Ampere Rating at 40°C	Magnetic Trip Range	Catalogue Number
<b>LS</b>		
1600	2–8 x I <sub>n</sub>	E2RM316T33W
2000	2–8 x I <sub>n</sub>	E2RM320T33W
<b>LSI</b>		
1600	2–8 x I <sub>n</sub>	E2RM316T32W
2000	2–8 x I <sub>n</sub>	E2RM320T32W

**Note**

<sup>①</sup> Rating plugs: 1600 amperes **16RES16T**; 2000 amperes **20RES20T**.

## Accessories

### Line and Load Terminals

Breaker Type	Maximum Breaker Amperes	Wire Type	AWG Wire Range (No. Conductors)	Catalogue Number
E <sup>2</sup> F/E <sup>2</sup> FM	100	Cu/Al	#14–1/0 (1)	<b>3T100FB</b> (package of three)
	150	Cu	#4–4/0 (1)	<b>3T150FB</b> (package of three)
E <sup>2</sup> J/E <sup>2</sup> JM	250	Cu	#4–350 (1)	<b>T250KB</b>
E <sup>2</sup> K/E <sup>2</sup> KM	225	Cu	#3–350 (1)	<b>T300K</b>
	350	Cu	250–500 (1)	<b>T350K</b>
	400	Cu	2/0–250 (2)	<b>3T400K</b> (three-pole kit)
E <sup>2</sup> LME/E <sup>2</sup> LMZ	400	Cu/Al	500–750 (1)	<b>3TA631LK</b>
E <sup>2</sup> L/E <sup>2</sup> LM	400	Cu/Al	4/0–600 (1)	<b>3TA401LDK</b> (three-pole kit)
	600	Cu	250–350 (2)	<b>T602LD</b>
E <sup>2</sup> M/E <sup>2</sup> MM	600	Cu	(2) 2/0–500 kcmil	<b>T600MA1</b>
	600	Cu/Al	(2) 1–500 kcmil	<b>TA700MA1</b>
	800 std.	Cu/Al	(3) 3/0–400 kcmil	<b>TA800MA2</b>
	800	Cu/Al	(2) 500–750 kcmil	<b>TA801MA</b>
	800	Cu	(3) 3/0–300 kcmil	<b>T800MA1</b>
E <sup>2</sup> N/E <sup>2</sup> NM	700	Cu	2/0–500 (2)	<b>T700NB1</b>
	1000	Cu	3/0–500 (3)	<b>T1000NB1</b>
	1200	Cu	3/0–400 (4)	<b>T1200NB3</b>
	1600	Cu/Al	500–1000 (4)	<b>TA1600RD</b>
	2000	Cu/Al	2–600 (6)	<b>TA2000RD</b>

### End Cap Terminals—For Use with Ring Type Terminals

Breaker Type	Maximum Breaker Amperes	Catalogue Number	Metric Catalogue Number	Imperial
E <sup>2</sup> F/E <sup>2</sup> FM	150	<b>KPEK1</b>	<b>KPEMK1</b>	—
E <sup>2</sup> J/E <sup>2</sup> JM	250	<b>KPEK2</b>	<b>KPEMK2</b>	—
E <sup>2</sup> K/E <sup>2</sup> KM	400	<b>KPEK3</b>	<b>KPEMK3</b>	—
E <sup>2</sup> LME/E <sup>2</sup> LMZ	400	—	<b>L3RTWK</b>	—
E <sup>2</sup> L/E <sup>2</sup> LM	600	<b>KPEK4</b>	<b>KPEMK4</b>	—

### External Accessories

#### Padlockable Handle Lock Hasp

Breaker Type	Catalogue Number
E <sup>2</sup> F/E <sup>2</sup> FM	<b>PLK1</b>
E <sup>2</sup> J/E <sup>2</sup> JM	<b>PLK3</b>
E <sup>2</sup> K/E <sup>2</sup> KM	<b>PLK3</b>
E <sup>2</sup> LME/E <sup>2</sup> LMZ	<b>LPHL</b>
E <sup>2</sup> L/E <sup>2</sup> LM	<b>HLK4</b>
E <sup>2</sup> M/E <sup>2</sup> MM	<b>HLK4</b>
E <sup>2</sup> N/E <sup>2</sup> NM	<b>PLK5</b>
E <sup>2</sup> R/E <sup>2</sup> RM	<b>HLK6</b>

# E2MB-22 Special Application Moulded Case Circuit Breakers

E<sup>2</sup> Mining Service Breakers

## Internal Accessories

### Undervoltage Release ①

Breaker Type	UVR Type	Voltage Rating	Mounting Location	Catalogue Number	Factory Modification Code
E <sup>2</sup> F/E <sup>2</sup> FM	Handle reset	208–240 Vac	Left pole	<b>UVH1LP11K</b> (thermal/magnetic only) ②	U18
	Handle reset	110–127 Vdc	Left pole	<b>UVH1LP26K</b> (thermal/magnetic only) ②	U42
E <sup>2</sup> J/E <sup>2</sup> JM	Handle reset	110–127 Vac	Left pole	<b>UVH2LP08K</b> ②	U18
	Handle reset	208–240 Vac	Left pole	<b>UVH2LP11K</b> ②	U22
	Handle reset	110–125 Vdc	Left pole	<b>UVH2LP26K</b> ②	T14
E <sup>2</sup> K/E <sup>2</sup> KM	120 volt handle reset with LED	120 Vac	Left pole	<b>UVM3LP08K</b> ②③	U66
	120 volt handle reset with LED	120 Vac	Left pole	<b>UVM3LP08KT</b> ②④	U68
	Handle reset	110–127 Vac	Left pole	<b>UVH3LP08K</b> ②	U18
	Handle reset	208–240 Vac	Left pole	<b>UVH3LP11K</b> ②	U22
	Handle reset	110–125 Vdc	Left pole	<b>UVH3LP26K</b> ②	T14
E <sup>2</sup> LME/E <sup>2</sup> LMZ	Handle reset	110–127 Vac	Left pole	<b>UVR120APK</b>	U5
	Handle reset	110–125 Vdc	Left pole	<b>UVR125DPK</b>	U6
E <sup>2</sup> L/E <sup>2</sup> LM/E <sup>2</sup> M/E <sup>2</sup> MM	120 volt handle reset with LED	120 Vac	Left pole	<b>UVM4LP08K</b> ②③	U66
	120 volt handle reset with LED	120 Vac	Left pole	<b>UVM4LP08KT</b> ②④	U68
	Handle reset	110–127 Vac	Left pole	<b>UVH4LP08K</b> ②	U18
	Handle reset	208–240 Vac	Left pole	<b>UVH4LP11K</b> ②	U22
	Handle reset	110–125 Vdc	Left pole	<b>UVH4LP26K</b> ②	T14
E <sup>2</sup> N/E <sup>2</sup> NM	120 volt handle reset with LED	120 Vac	Left pole	<b>UVM5LP08K</b> ③	U66
	120 volt handle reset with LED	120 Vac	Left pole	<b>UVM5LT08K</b> ④	U68
	Handle reset	110–127 Vac	Left pole	<b>UVH5LP08K</b> ②	U18
	Handle reset	208–240 Vac	Left pole	<b>UVH5LP11K</b> ②	U22
	Handle reset	110–125 Vdc	Left pole	<b>UVH5LP26K</b> ②	T14
E <sup>2</sup> R/E <sup>2</sup> RM	120 volt handle reset with LED	120 Vac	Right pole	<b>UVM6RP08K</b> ③⑤	U58
	Handle reset	110–127 Vac	Right pole	<b>UVH6RP08K</b> ⑤	U49
	Handle reset	208–240 Vac	Right pole	<b>UVH6RP11K</b> ⑤	U53
	Handle reset	110–125 Vdc	Right pole	<b>UVH6RP26K</b> ⑤	T33

#### Notes

- ① Contact Eaton for internal accessory voltage ratings not listed.
- ② LH (RH also available).
- ③ Pigtail leads.
- ④ Terminal blocks.
- ⑤ RH only.

# Special Application Moulded Case Circuit Breakers **E2MB-23**

E<sup>2</sup> Mining Service Breakers

## Shunt Trip ①

Breaker Type	Voltage Rating	Mounting Location	Catalogue Number	Factory Modification Code
E <sup>2</sup> F/E <sup>2</sup> FM	48–127 Vac or 48–60 Vdc	Left pole	<b>SNT1LP08K</b> ②	S06
	208–230 Vac or 110–127 Vdc	Left pole	<b>SNT1LP12K</b> ②	S10
E <sup>2</sup> J/E <sup>2</sup> JM	110–240 Vac or 110–125 Vdc	Left pole	<b>SNT2P11K</b> ③	S10
E <sup>2</sup> K/E <sup>2</sup> KM	110–240 Vac or 110–125 Vdc	Left pole	<b>SNT3P11K</b> ③	S10
E <sup>2</sup> LME/E <sup>2</sup> LMZ	24–60 Vac/Vdc	Left pole	<b>SNT060CPK</b>	S1
	110–240 Vac/Vdc	Left pole	<b>SNT120CPK</b>	S2
E <sup>2</sup> L/E <sup>2</sup> LM/E <sup>2</sup> M/E <sup>2</sup> MM	48–60 Vac	Left pole	<b>SNT4LP05K</b> ②	S06
	48–60 Vdc	Left pole	<b>SNT4LP23K</b> ②	S86
	110–240 Vac	Left pole	<b>SNT4LP11K</b> ②	S10
	110–125 Vdc	Left pole	<b>SNT4LP26K</b> ②	S42
E <sup>2</sup> N/E <sup>2</sup> NM	110–240 Vac	Left pole	<b>SNT5LP11K</b> ②	S10
	110–125 Vdc	Left pole	<b>SNT5LP26K</b> ②	S42
E <sup>2</sup> R/E <sup>2</sup> RM	110–240 Vac	Right pole	<b>SNT6P11K</b> ④	S29
	110–125 Vdc	Right pole	<b>SNT6P26K</b> ④	S45

## Auxiliary Switch

Breaker Type	Number of Sets of Contacts (1A and 1B)	Mounting Location	Catalogue Number	Factory Modification Code
E <sup>2</sup> F/E <sup>2</sup> FM	1	Right	<b>A1X1PK</b>	A06
	2	Right	<b>A2X1RPK</b>	A13
E <sup>2</sup> J/E <sup>2</sup> JM	1	Right	<b>A1X2PK</b>	A06
	2	Right	<b>A2X2PK</b>	A13
E <sup>2</sup> K/E <sup>2</sup> KM	1	Right	<b>A1X3PK</b>	A06
	2	Right	<b>A2X3PK</b>	A13
E <sup>2</sup> LME/E <sup>2</sup> LMZ	1	Right	<b>AUX1A1BPK</b>	A1
	2	Right	<b>AUX2A2BPK</b>	A2
E <sup>2</sup> L/E <sup>2</sup> LM/E <sup>2</sup> M/E <sup>2</sup> MM	1	Right	<b>A1X4PK</b>	A06
	2	Right	<b>A2X4PK</b>	A13
E <sup>2</sup> N/E <sup>2</sup> NM	1	Right	<b>A1X5PK</b>	A06
	2	Right	<b>A2X5PK</b>	A13
E <sup>2</sup> R/E <sup>2</sup> RM	2	Right	<b>A2X6RPK</b>	A12
	4	Right	<b>A4X6RPK</b>	A19

## Alarm (Signal/Lockout Switch)

Breaker Type	Number of Sets of Contacts (Make and Break)	Mounting Location	Catalogue Number	Factory Modification Code
E <sup>2</sup> F/E <sup>2</sup> FM	1	Right	<b>A1L1LPK/A1L1RPK</b>	B06
	2	Right	<b>A2L1LPK/A2L1RPK</b>	B13
E <sup>2</sup> J/E <sup>2</sup> JM	1	Right	<b>A1L2LPK/A1L2RPK</b>	B06
E <sup>2</sup> K/E <sup>2</sup> KM	1	Right	<b>A1L3LPK/A1L3RPK</b>	B06
	2	Right	<b>A2L3LPK/A2L3RPK</b>	B13
E <sup>2</sup> LME/E <sup>2</sup> LMZ	1	Right	<b>ALM1M1BJPK</b>	B1
	2	Right	<b>ALM2M2BJPK</b>	B3
E <sup>2</sup> L/E <sup>2</sup> LM/E <sup>2</sup> M/E <sup>2</sup> MM	1	Right	<b>A1L4LPK/A1L4RPK</b>	B06
	2	Right	<b>A2L4LPK/A2L4RPK</b>	B13
E <sup>2</sup> N/E <sup>2</sup> NM	1	Right	<b>A1L5LPK/A1L5RPK</b>	B06
	2	Right	<b>A2L5LPK/A2L5RPK</b>	B13
E <sup>2</sup> R/E <sup>2</sup> RM	1	Right	<b>A1L6RPK</b>	B05
	2	Right	<b>A2L6RPK</b>	B12

### Notes

- ① Contact Eaton for internal accessory voltage ratings not listed.
- ② LH (RH also available).
- ③ LH or RH.
- ④ RH only.



#### Classic Mining Breakers

##### Product Overview

Classic mining service circuit breakers continue to be manufactured and are primarily applied to achieve an exact physical and electronic replacement of previously Eaton installed Westinghouse equipment. To upgrade to the current offering of E<sup>2</sup> mining circuit breakers, consult the cross reference information on **Page CMCB-10**.

#### AC Interrupting Capacity, Symmetrical Amperes

60 Hz AC Volts	Breaker Type				
	KAM	LAM, MAM, NBM	HKAM	HLAM <sup>②</sup>	All Other 1000 Volt Breakers <sup>②</sup>
240	25,000	42,000	—	—	—
480	22,000	30,000	—	—	—
600	22,000	22,000	—	—	—
1000 <sup>①</sup>	—	—	10,000	12,000	14,000

#### Special DC Interrupting Capacity

Breaker Type	Maximum Ampere Rating	Interrupting Capacity (Amperes) at 300–330 Vdc			
		Single-Pole		Two Poles in Series <sup>④</sup>	
		0.0–0.15 mH Inductance <sup>③</sup>	0.15–0.5 mH Inductance	0.5–0.9 mH Inductance	2.4 mH Inductance
KAM	225	15,000	10,000	15,000	5000
LAM	400/600	15,000	10,000	15,000	5000
MAM	800	15,000	10,000	15,000	5000
NBM	1200	15,000	10,000	15,000	5000

##### Notes

- ① Based on circuit power factor of 50% or greater.
- ② HLAM must be rear stud connected. If front connected, interrupting capacity rating is 10,000 amperes.
- ③ Resistive circuit.
- ④ Two poles in electrical series in ungrounded leg of circuit.

**Classic Circuit Breakers For Mining Service****Undervoltage Release Data**

Undervoltage releases are calibrated to pick up at 72 to 85% of rated voltage dropout between 35 to 70% of rated voltage.

Breaker Type	Volts	Line Amperes	Series Resistors <sup>①</sup>	Total VA
KAM, HKAM <sup>①</sup>	480/60	0.021	10,000	10.1
	240/60	0.019	—	4.6
	120/60	0.021	—	2.5
	120/60 <sup>②</sup>	0.13	—	15.6
LAM, HLAM, MAM, HMAM, NBM, HNBM <sup>①</sup>	480/60	0.033	12,000 <sup>③</sup>	15.9
	240/60	0.028	6,000	6.7
	120/60	0.029	—	3.5
	120/60 <sup>②</sup>	0.13	—	15.6

**Shunt Trip Coil Data**

Breaker Type	Volts	Amperes	VA
KAM, HKAM, LAM, HLAM, MAM, HMAM, NBM, HNBM	480/60	0.085	40.8
	240/60	1.7	408
	120/60	0.88	105.6
	48 DC	8.0	384

**Notes**

<sup>①</sup> Supplied for external customer mounting.

<sup>②</sup> New design electrical reset UVR.

<sup>③</sup> 16,000 for Type MAM and HMAM.

# CMCB-3 Special Application Moulded Case Circuit Breakers

Classic Mining Circuit Breakers

## Product Selection

For reference only. Replace these frames with E2 Series. See Cross-Reference information beginning on **Page CMCB-10**.

### Classic Mining Service Circuit Breakers

Breaker Type	Frame Style Numbers <sup>①②</sup>	Poles	Amperes	Trip Type	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>③</sup>
KAM	2609D60G64	2	180	M	None	200–400
	1291C26G07	2	180	M	UVR <sup>④</sup>	200–400
	2609D60G66	2	180	M	Standard shunt trip <sup>③</sup>	200–400
	1291C26G01	2	225	TM	UVR <sup>④</sup>	300–700
	1291C26G02	2	225	TM	UVR <sup>④</sup>	500–1000
	2609D60G67	3	180	M	None	200–400
	1291C26G08	3	180	M	UVR <sup>④</sup>	200–400
	2609D60G69	3	180	M	Standard shunt trip <sup>③</sup>	200–400
	5685D48G75	3	225	TM	None	300–700
	5685D48G74	3	225	TM	None	500–1000
	1291C26G03	3	225	TM	UVR <sup>④</sup>	300–700
	1291C26G04	3	225	TM	UVR <sup>④</sup>	500–1000
	2609D60G01	3	225	TM	Standard shunt trip <sup>③</sup>	300–700
	2609D60G02	3	225	TM	Standard shunt trip <sup>③</sup>	500–1000
	2609D60G40	3	225	M	None	300–700
	2609D60G41	3	225	M	None	500–700
	1291C26G05	3	225	M	UVR <sup>④</sup>	300–700
1291C26G06	3	225	M	UVR <sup>④</sup>	500–1000	
LAM	1291C32G01	2	400	TM	UVR <sup>④</sup>	500–1000
	2609D60G61	2	400	M	Shunt trip (48 Vdc)	750–1500
	1291C32G03	3	400	TM	UVR <sup>④</sup>	500–1000
	5685D48G73	3	400	TM	None	800–1600
	1291C32G02	3	400	TM	UVR <sup>④</sup>	800–1600
	2609D60G03	3	400	TM	Standard shunt trip <sup>③</sup>	800–1600
	2609D60G44	3	400	M	None	800–1600
	1291C32G04	3	400	M	UVR <sup>④</sup>	800–1600

#### Notes

- ① Terminals not included in style number.
- ② All breakers listed are complete with accessories indicated.
- ③ Rated 120 volts/60 Hz: undervoltage release is handle reset type.
- ④ UVR is auto-reset type, 120 Vac.

M = magnetic only; TM = thermal-magnetic.

# Special Application Moulded Case Circuit Breakers **CMCB-4**

Classic Mining Circuit Breakers

For reference only. Replace these frames with E2 Series. See Cross-Reference information beginning on **Page CMCB-10**.

## Classic Mining Service Circuit Breakers, continued

Breaker Type	Frame Style Numbers <sup>①②</sup>	Poles	Amperes	Trip Type	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>③</sup>
MAM	2609D60G17	2	600	TM	UVR <sup>④</sup>	750–1500
	2609D60G18	2	800	TM	UVR <sup>④</sup>	1000–2000
	2609D60G63	3	400	TM	UVR <sup>④</sup>	2000–4000
	5685D48G72	3	600	TM	None	1500–3000
	2609D60G19	3	600	TM	UVR <sup>④</sup>	1500–3000
	2609D60G04	3	600	TM	Standard shunt trip <sup>③</sup>	1500–3000
	2609D60G05	3	800	TM	Standard shunt trip <sup>③</sup>	2000–4000
	5685D48G71	3	800	TM	None	2000–4000
	2609D60G20	3	800	TM	UVR <sup>④</sup>	2000–4000
	2609D60G46	3	800	M	None	1500–3000
	2609D60G47	3	800	M	UVR <sup>④</sup>	1500–3000
	2609D60G48	3	800	M	None	2000–4000
	2609D60G49	3	800	M	UVR <sup>④</sup>	2000–4000
NBM	1229C37G13	2	1000	TM	UVR <sup>④</sup>	1500–3000
	1229C37G14	2	1200	TM	UVR <sup>④</sup>	2000–4000
	1227C36G10	3	1000	TM	None	2500–5000
	1229C37G15	3	1000	TM	UVR <sup>④</sup>	2500–5000
	1227C36G13	3	1000	TM	Standard shunt trip <sup>③</sup>	2500–5000
	1227C36G14	3	1200	TM	Standard shunt trip <sup>③</sup>	2500–5000
	1227C36G09	3	1200	TM	None	2500–5000
	1229C37G16	3	1200	TM	UVR <sup>④</sup>	2500–5000
	1227C36G19	3	1200	M	None	2500–5000
	1229C37G17	3	1200	M	UVR <sup>④</sup>	2500–5000

### Notes





- ① Terminals not included in style number.
- ② All breakers listed are complete with accessories indicated.
- ③ Rated 120 volts/60 Hz: undervoltage release is handle reset type.
- ④ UVR is auto-reset type, 120 Vac.

M = magnetic only; TM = thermal-magnetic.

# CMCB-5 Special Application Moulded Case Circuit Breakers

Classic Mining Circuit Breakers

## 1000 Volt Classic Mining Service Circuit Breakers

Breaker Type	Frame Style Numbers	Poles	Amperes	Trip Type	Accessories (Included in Frame)	Magnetic Trip Range, Amperes <sup>①</sup>	
<b>HKAM</b> 	HKAM	<b>2609D60G70</b>	3	180	M	None	200–400
		<b>1291C26G16</b>	3	180	M	UVR <sup>②</sup>	200–400
		<b>5685D48G87</b>	3	225	TM	None	300–700
		<b>1291C26G12</b>	3	225	TM	UVR <sup>②</sup>	300–700
		<b>5685D48G86</b>	3	225	TM	None	500–1000
		<b>1291C26G13</b>	3	225	TM	UVR <sup>②</sup>	500–1000
		<b>1291C26G14</b>	3	225	M	UVR <sup>②</sup>	300–700
		<b>1291C26G15</b>	3	225	M	UVR <sup>②</sup>	500–1000
<b>HLAM</b> 	HLAM	<b>5685D48G85</b>	3	400	TM	None	800–1600
		<b>1291C32G07</b>	3	400	TM	UVR <sup>②</sup>	800–1600
		<b>1291C32G09</b>	3	400	M	UVR <sup>②</sup>	800–1600
<b>HMAM</b> 	HMAM	<b>5685D48G84</b>	3	600	TM	None	1500–3000
		<b>2609D60G28</b>	3	600	TM	UVR <sup>③</sup>	1500–3000
		<b>5685D48G83</b>	3	800	TM	None	2000–4000
		<b>2609D60G29</b>	3	800	TM	UVR <sup>③</sup>	2000–4000
		<b>2609D60G57</b>	3	800	M	UVR <sup>③</sup>	1500–3000
		<b>2609D60G58</b>	3	800	M	UVR <sup>③</sup>	2000–4000
<b>HNAM</b> 	HNBM	<b>1227C36G12</b>	3	1000	TM	None	2500–5000
		<b>1229C37G19</b>	3	1000	TM	UVR <sup>②</sup>	2500–5000
		<b>1227C36G11</b>	3	1200	TM	None	2500–5000
		<b>1229C37G20</b>	3	1200	TM	UVR <sup>②</sup>	2500–5000
		<b>1229C37G18</b>	3	1200	M	UVR <sup>②</sup>	2500–5000

### Notes

<sup>①</sup> The magnetic trip range does not change when rating plug is changed.

<sup>②</sup> 120 volt, 60 Hz electrical reset type.

<sup>③</sup> Rated 120 volts, 60 Hz; undervoltage release is handle reset type.

M = magnetic only; TM = thermal-magnetic.

## Classic Mining Service Breaker Frames Only

Breaker Type	Frame Size, Amperes	Number of Poles	Style Numbers
KAM ①	225	2	2602D86G11
	225	3	2602D86G12
KAMH ①	225	2	2602D86G13
	225	3	2602D86G14
HKAM ①	225	3	1264C99G05
LAM ②	400	2	2602D99G05
	400	3	2602D99G06
LAMH ②	400	2	2602D99G07
	400	3	2602D99G08
HLAM ②	400	3	1264C99G02
LAM3600F	600	3	2603D48G07
LAMH3600F	600	3	2603D48G08
HLAM3600F	600	3	2603D48G09

Breaker Type	Frame Size, Amperes	Number of Poles	Style Numbers
MAM ②	800	2	2600D43G11
	800	3	2600D43G12
MAMH ②	800	2	2600D43G13
	800	3	2600D43G14
HMAM ②	800	3	1264C99G03
NBM ②	1200	2	2610D64G07
	1200	3	2610D64G08
NBMH ②	1200	2	2610D64G09
	1200	3	2610D64G10
HNBM ②	1200	3	2610D64G13

## Trip Units for Classic Mining Circuit Breakers

Breaker Type	Conductor Size	Magnetic Trip Range, Amperes	Maximum Continuous Amperes	Thermal-Magnetic Three-Pole ③ Style Numbers	Magnetic Only Three-Pole Style Numbers
HKAM	#6	150–400	180	—	2609D99G22
	#4–#3	300–700	225	5685D48G40	2611D75G01
	#4–#1	500–1000	225	5685D48G34	2611D75G02
HLAM	#4–#1	750–1500	400	5685D48G97	2609D99G21
	#2–#2/0	800–1600	400	5685D48G28	2611D75G03
HLAM600	#2–2/0	750–1500	600	2609D99G20	—
	2/0–500 kcmil	1500–3000	600	2609D99G19	—
HMAM	#2–#2/0	750–1500	600	—	—
	2/0–500 kcmil	1500–3000	600	5685D48G22	2611D75G04 ④
	#1–3/0	1000–2000	800	—	—
HNBM	3/0–500 kcmil	2000–4000	800	5685D48G16	2611D75G05
	2/0–500 kcmil	1500–3000	1000	—	—
	4/0–500 kcmil	2500–5000	1000	5685D48G10	—
HNBM	3/0–500 kcmil	2000–4000	1200	—	—
	4/0–500 kcmil	2500–5000	1200	5685D48G04	2611D75G07

**Notes**

- ① Frame modified for left-hand mounting of UVR attachment.  
 ② Frame modified for right-hand mounting of UVR attachment.  
 ③ Three-pole trip units only are suitable for replacement in 1000 volt mining service circuit breakers.  
 ④ 800 amperes.

# CMCB-7 Special Application Moulded Case Circuit Breakers

Classic Mining Circuit Breakers

## Terminals For Classic Mining Service Breakers

Terminals are UL listed for wire type and range listed below.  
When used with aluminum conductors, use joint compound.

Breaker Type	Terminal Type	Maximum Amperes	Package of 3 Line Terminals Style Number	Wire Range, Type
FBM, HFBM	Style pressure type terminals	100	<b>624B100G02</b>	#14–1/0 Al/Cu
	Optional Al/Cu pressure terminals	50	<b>624B100G10</b>	#14–#4 Al/Cu
		100	<b>624B100G17</b>	#4–4/0 Al/Cu

## Terminals For Mining Service Breakers

Breaker Type	Terminal Type	Maximum Amperes	Terminal Catalogue Number	Wire Range, Type Number of Cables
KAM, HKAM	Standard pressure terminals (copper only)	225	<b>T225LA</b>	(1) #6–350 kcmil
	Optional Al/Cu pressure terminals	225	<b>TA225LA1</b>	(1) #6–350 kcmil Cu, or (1) #4–350 kcmil Al
LAM	Standard copper pressure terminals	225	<b>T225LA</b>	(1) #6–350 kcmil Cu
		400	<b>T401LA</b>	(1) #4–250 kcmil Cu plus (1) 3/0–600 kcmil Cu
	Optional Al/Cu pressure terminals	225	<b>TA225LA1</b>	(1) #6–350 kcmil Cu, or (1) #4–350 kcmil Al
		400	<b>TA400LA1</b>	(1) #4–250 kcmil Al/Cu, plus (1) 3/0–600 kcmil Al/Cu
		400	<b>TA401LA</b>	(1) 600–750 kcmil Al
LAM-600, LAMH-600, HLAM-600	Standard copper pressure terminals	600	<b>T600LA</b>	(2) 250–500 kcmil Cu
	Optional Al/Cu pressure terminals	600	<b>TA600LA</b>	(2) 250–500 kcmil Al/Cu
MAM, HMAM, MAMH	Standard copper pressure terminals	350	<b>T350MA</b>	(1) #1–600 kcmil Cu
		600	<b>T600MA1</b>	(2) 2/0–500 kcmil Cu
		800	<b>T800MA1</b>	(3) 3/0–300 kcmil Cu
	Optional Al/Cu pressure terminals	600	<b>TA700MA1</b>	(2) #1–500 kcmil Al/Cu
		800	<b>TA800MA2</b>	(3) 3/0–400 kcmil Al/Cu
		800	<b>TA801MA</b>	(2) 500–750 kcmil Al/Cu
NBM, HNBH, NBMH	Standard copper pressure terminals	1000	<b>T1000NB1</b>	(3) 3/0–500 kcmil Cu
		1200	<b>T1200NB1</b>	(4) 3/0–400 kcmil Cu
	Optional Al/Cu pressure terminals	1000	<b>TA1000NB1</b>	(3) 3/0–400 kcmil Al/Cu
		1200	<b>TA1200NB1</b>	(4) 4/0–500 kcmil Al/Cu
		1200	<b>TA1201NB1</b>	(3) 500–750 kcmil Al/Cu

# Special Application Moulded Case Circuit Breakers **CMCB-8**

Classic Mining Circuit Breakers

## Accessories

### Classic Mining Circuit Breakers

#### Rear Connected Studs <sup>①</sup>

For complete stud assembly, order a stud and tube based on thickness of customer's mounting panel. A short stud must be assembled adjacent to a long stud to maintain

clearances required by Underwriters Laboratories.<sup>②</sup> Two studs required per pole. For List Prices, see Eaton's Price and Availability Digest.

Mounting Panel Thickness In Inches (mm)	Stud		Tube	
	Length	Style Numbers	Length In Inches (mm)	Style Numbers
<b>KAM, HKAM Breakers</b>				
0.75 (19.1)–1.00 (25.4)	Short	<b>656D565G01</b>	0.84 (21.3)	<b>456D983H05</b>
	Long	<b>656D565G02</b>	3.78 (96.0)	<b>456D983H08</b>
0.50 (12.7)–0.75 (19.1)	Short	<b>656D565G01</b>	1.09 (27.7)	<b>456D983H06</b>
	Long	<b>656D565G02</b>	4.03 (102.4)	<b>456D983H09</b>
0.25 (6.4)–0.50 (12.7)	Short	<b>656D565G01</b>	1.34 (34.0)	<b>456D983H07</b>
	Long	<b>656D565G02</b>	4.28 (108.7)	<b>456D983H10</b>

#### Rear Connected Studs For Insulated Panels Only: Two Per Pole

Stud Ampere Number	Diameter, In Inches (mm) and Thread	Extension Back of Breaker In Inches (mm)	Stud Style Numbers
<b>LAM, HLAM Breakers</b>			
225 <sup>③</sup>	0.50 (12.7)–13	3.22 (81.8)	<b>1241 345</b>
	0.50 (12.7)–13	6.28 (159.5)	<b>1241 346</b>
225 <sup>③④</sup>	0.50 (12.7)–13	4.97 (126.2)	<b>1241 392</b>
400 <sup>③</sup>	0.75 (19.1)–16	5.47 (138.9)	<b>05B7383G22</b>
	0.75 (19.1)–16	7.97 (202.4)	<b>05B7383G23</b>
	0.75 (19.1)–16	10.47 (265.9)	<b>05B7383G24</b>
600	1.00 (25.4)–12	5.91 (150.1)	<b>314C960G16</b>
	1.00 (25.4)–12	8.41 (213.6)	<b>314C960G17</b>
	1.00 (25.4)–12	10.91 (277.1)	<b>314C960G18</b>
	<b>MAM, HMAM, MAMH Breakers</b>		
225	0.50 (12.7)–13	3.66 (93.0)	<b>314C960G01</b>
400	0.75 (19.1)–16	5.91 (150.1)	<b>314C960G04</b>
	0.75 (19.1)–16	8.41 (213.6)	<b>314C960G05</b>
	0.75 (19.1)–16	10.91 (277.1)	<b>314C960G06</b>
600	1.00 (25.4)–12	5.91 (150.1)	<b>314C960G07</b>
	1.00 (25.4)–12	8.41 (213.6)	<b>314C960G08</b>
	1.00 (25.4)–12	10.91 (277.1)	<b>314C960G09</b>
800	1.13 (28.7)–12	4.91 (124.7)	<b>314C960G10</b>
	1.13 (28.7)–12	8.41 (213.6)	<b>314C960G11</b>
	1.13 (28.7)–12	10.91 (277.1)	<b>314C960G12</b>
<b>NBM, HNBM, NBMH Breakers</b>			
800	1.13 (28.7)–12	5.50 (139.7)	<b>623B222G01</b>
	1.13 (28.7)–12	8.00 (203.2)	<b>623B222G02</b>
	1.13 (28.7)–12	10.50 (266.7)	<b>623B222G03</b>
1200	1.25 (31.8)–12	5.50 (139.7)	<b>373B375G04</b>
	1.25 (31.8)–12	10.50 (266.7)	<b>373B375G03</b>

#### Line and Load Terminal Shields <sup>⑤</sup>

Breaker Type	Description	Style Numbers
KAM	Line terminals	<b>1261C93G01</b>
	Load terminals	<b>1262C46G01</b>
LAM-400	Line terminals	<b>1261C95G01</b>
	Load terminals	<b>1262C48G01</b>
MAM	Line terminals	<b>1261C97G01</b>
	Load terminals	<b>1261C97G02</b>

#### Notes

- ① Not UL listed.
- ② 400 ampere LA studs of the same length have sufficient clearance; however, customer connections may make it necessary to use a short stud adjacent to a long stud.
- ③ 150, 300 and 400 ampere frames only.
- ④ This is a special stud that includes six contact nuts for use where bus contact nuts must be used.
- ⑤ For breakers used with terminals and cable connections. Sold in packages of 10.



# CMCB-9 Special Application Moulded Case Circuit Breakers

Classic Mining Circuit Breakers

## Standard Handle Reset Undervoltage Release

For Classic breakers field mountable on special frames listed on **Page CMCB-10**, or replacement on breakers originally equipped with this type UVR.

For undervoltage protection. A solenoid device mounts within breaker case. Coil must be energized before closing breaker. Trips breaker

when voltage drops below 35 to 70% of coil rating. Picks up and seals in at 72 to 85% of coil rating. For line voltages up to 250 Vdc or 600 Vac. Externally mounted resistors are supplied for certain ratings. Standard leads extend 18.00 inches (457.2 mm) outside of breaker. Longer leads may be specified.

Breaker Type	Volts	Style Numbers
<b>Right-Hand Mounting</b>		
LAM, HLAM	120 Vac	<b>4995D12G11</b>
	120 Vac ①	<b>1228C76G03</b>
	240 Vac	<b>4995D12G13</b>
	480 Vac	<b>4995D12G14</b>
	125 Vdc	<b>4995D12G09</b>
MAM, HMAM, MAMH	120 Vac	<b>5672D69G11</b>
	120 Vac ①	—
	240 Vac	<b>5672D69G13</b>
NBM, HNBM, NBMH	480 Vac	<b>5672D69G14</b>
	120 Vac	<b>4995D11G11</b>
	120 Vac ①	<b>1229C35G03</b>
	240 Vac	<b>4995D11G13</b>
	480 Vac	<b>4995D11G14</b>
	<b>Left-Hand Mounting</b>	
KAM, HKAM	120 Vac	<b>4995D10G01</b>
	120 Vac ①	<b>1228C76G03</b>
	240 Vac	<b>4995D10G03</b>
	480 Vac	<b>4995D10G04</b>

## Shunt Trips

For tripping breaker from a remote point. A solenoid device mounts within breaker case. Breaker trips when coil is energized. A cutoff switch breaks the circuit to the momentary rated coil when breaker opens. Available for

control voltages up to 250 Vdc or 600 Vac. Voltage and frequency must be specified. Standard leads extend 18.00 inches (457.2 mm) outside of breaker. Longer leads may be specified.

Breaker Type	Volts (50–60 Hz)	Style Numbers
<b>Right-Hand Mounting</b>		
KAM, HKAM	480 Vac	<b>2605D15G16</b>
	240 Vac	<b>2605D15G17</b>
	120 Vac	<b>2605D15G19</b>
LAM, HLAM	480 Vac	<b>2606D56G16</b>
	240 Vac	<b>2606D56G17</b>
	120 Vac	<b>2606D56G19</b>
	48 Vdc	<b>2606D56G07</b>
MAM, HMAM, MAMH	480 Vac	<b>2606D57G16</b>
	240 Vac	<b>2606D57G17</b>
	120 Vac	<b>2606D57G19</b>
NBM, HNBM, NBMH	480 Vac	<b>2606D58G16</b>
	240 Vac	<b>2606D58G17</b>
	120 Vac	<b>2606D58G19</b>
<b>Left-Hand Mounting</b>		
KAM, HKAM	480 Vac	<b>2605D15G02</b>
	240 Vac	<b>2605D15G03</b>
	120 Vac	<b>2605D15G05</b>
LAM, HLAM	480 Vac	<b>2606D56G02</b>
	240 Vac	<b>2606D56G03</b>
	120 Vac	<b>2606D56G05</b>
MAM, HMAM, MAMH	480 Vac	<b>2606D57G02</b>
	240 Vac	<b>2606D57G03</b>
	120 Vac	<b>2606D57G05</b>
NBM, HNBM, NBMH	480 Vac	<b>2606D58G02</b>
	240 Vac	<b>2606D58G03</b>
	120 Vac	<b>2606D58G05</b>

### Notes

- ① Electrical reset UVR.
- ② Auto reset type.

## Reference Information

### E<sup>2</sup> Cross-Reference

Series C Mining	Superseded by E <sup>2</sup> Mining
1491D72G31	E2J3070T
1491D72G32	E2J3090T
1491D72G33	E2J3100T
1491D72G37	E2J3200T
6622C87G27	E2K3225AWU66
6622C87G28	E2K3225DWU66
6622C87G32	E2K3400GWU66
E2KM3100	E2KEM3100W
E2KM3100U66	E2KEM3100WU66
E2KM3125	E2KEM3125W
E2KM3125U66	E2KEM3125WU66
E2KM3150	E2KEM3150W
E2KM3150MU66	E2KEM3150WU66
E2KM3150TM	E2KEM3150MW
E2KM3150U66	E2KEM3150MWU66
E2KM3200	E2KEM3200W
E2KM3200U66	E2KEM3200WU66
E2KM3225	E2KEM3225W
E2KM3225F	E2KM3400F
E2KM3225FUV	E2KM3400F
E2KM3225MU66	E2KEM3225MWU66
E2KM3225TM	E2KEM3225TM
E2KM3225U66	E2KEM3225WU66
E2LM3300U66	E2LEM3300WU66
E2LM3350U66	E2LEM3350WU66
E2LM3400U66	E2LEM3400WU66
E2LM3400F	E2LM3600F
E2LM3400FUV	E2LM3600F
E2LM3400M2U66	E2LEM3400M2WU66
E2LM3400MU66	E2LEM3400MWU66
E2LM3400U66	E2LEM3400WU66
FDBM3015	E2F3015
FDBM3015WU62	E2F3015WU62
FDBM3020	E2F3020
FDBM3025	E2F3025
FDBM3025U62	E2F3025U62
FDBM3030	E2F3030
FDBM3030U62	E2F3030WU62
FDBM3030WU62	E2F3030WU62
FDBM3035	E2F3035

Series C Mining	Superseded by E <sup>2</sup> Mining
FDBM3040	E2F3040
FDBM3045	E2F3045
FDBM3050	E2F3050
FDBM3050U62	E2F3050U62
FDBM3050WU62	E2F3050WU62
FDBM3060	E2F3060
FDBM3070	E2F3070
FDBM3070WU62	E2F3070WU62
FDBM3080	E2F3080
FDBM3090	E2F3090
FDBM3100	E2F3100
FDBM3100LM04U62	E2F3100M04U62
FDBM3125	E2F3125
FDBM3150	E2F3150
FDBM3150L	E2F3150L
FDM3015	E2F3015
FDM3015L	E2F3015L
FDM3015LU62	E2F3015LU62
FDM3020	E2F3020
FDM3020LU62	E2F3020LU62
FDM3025	E2F3025
FDM3025L	E2F3025L
FDM3025LS22	E2F3025LS22
FDM3025LU62	E2F3025LU62
FDM3030	E2F3030
FDM3030LS22	E2F3030LS22
FDM3040	E2F3040
FDM3040L	E2F3040L
FDM3040LU62	E2F3040LU62
FDM3050	E2F3050
FDM3050LU62	E2F3050LU62
FDM3050U62	E2F3050U62
FDM3060	E2F3060
FDM3060LU62	E2F3060LU62
FDM3070	E2F3070
FDM3070A02U62	E2F3070A02U62
FDM3080	E2F3080
FDM3090	E2F3090
FDM3100	E2F3100
FDM3100LS22	E2F3100LS22

# CMCB-11 Special Application Moulded Case Circuit Breakers

Classic Mining Circuit Breakers

## E<sup>2</sup> Cross-Reference, continued

Series C Mining	Superseded by E <sup>2</sup> Mining
FDM3100LU62	E2FLU62
FDM3125	E2F3125
FDM3125LU62	E2F3125LU62
FDM3150	E2F3150
HFDM003AM	E2F003AM
HFDM003AMLU62	E2F003AMLU62
HFDM007CM	E2F007CM
HFDM007CMU62	E2F007CMU62
HFDM015EM	E2F015EM
HFDM015EMA02	E2F015EMA02
HFDM015EMLU62	E2F015EMLU62
HFDM015EMU62	E2F015EMU62
HFDM030HM	E2F030HM
HFDM030HMLU62	E2F030HMLU62
HFDM030HMU62	E2F030HMU62
HFDM050KM	E2F050KM
HFDM050KML	E2F050KML
HFDM050KMLU62	E2F050KMLU62
HFDM050KMU62	E2F050KMU62
HFDM070MM	E2F070MM
HFDM070MMU62	E2F070MMU62
HFDM1001M	E2F1001M
HFDM1001MS22	E2F1001MS22
HFDM100LM	E2F100LM
HFDM100LMA02	E2F100LMA02
HFDM100LMU62	E2F100LMU62
HFDM100RM	E2F100RM
HFDM100RML	E2F100RML
HFDM100RMS22	E2F100RMS22
HFDM100RMU62	E2F100RMU62
HFDM150TM	E2F150TM
HFDM150TML	E2F150TML
HFDM150TMU62	E2F150TMU62
HFDM150UM	E2F150UM
JCDA2D1S30	E2JM250MDA2D1S30
JCMA2D1S30	E2JM250MFA2D1S30
JDCM3070W	E2JM3070W
JDCM3090W	E2JM3090W
JDCM3100W	E2JM3100W
JDCM3125W	E2JM3125W

Series C Mining	Superseded by E <sup>2</sup> Mining
JDCM3150W	E2JM3150W
JDCM3175W	E2JM3175W
JDCM3200W	E2JM3200W
JDCM3225A5W	E2JM3225AW
JDCM3225D5W	E2JM3225DW
JDCM3225W	E2JM3225W
JDCM3250A5MW	E2JM3250MAW
JDCM3250A5MWU18	E2JM3250MAWU18
JDCM3250A5W	E2JM3250AW
JDCM3250C5MW	E2JM3250MCW
JDCM3250D5MW	E2JM3250MDW
JDCM3250D5MWA06	E2JM3250MDWA06
JDCM3250D5W	E2JM3250DW
JDCM3250D5WS10	E2JM3250DWS10
JDCM3250F	E2JM3250F
JDCM3250F5MD01	E2JM3250MFD01
JDCM3250F5MW	E2JM3250MFW
JDCM3250G5MW	E2JM3250MGW
JDCM3250G5WA02D01	E2JM3250MGA02D01
JDCM3250J5MW	E2JM3250MJW
JDCM3250J5MWA02	E2JM3250MJA02
JDCM3250J5WA02D01	E2JM3250MJA02D01
JDCM3250J5WD01	E2JM3250MJD01
JDCM3250K5MW	E2JM3250MKW
JDCM3250L5MW	E2JM3250MLW
JDCM3250MW	E2JM3250MW
JDCM3250W	E2JM3250W
JDCMAA2D1	E2JM3250MM02D01
JDCMDD1S30	E2JM3250MDS30D01
JDCMFD01	E2JM3250MFD01
JDCMGA02D1	E2JM3250MGA02D01
JDCMJA2D1	E2JM3250MJA02D01
JDCMJD01	E2JM3250MJD01
JDM2250F	E2JM3250F
JDM3070W	E2J3070W
JDM3090W	E2J3090W
JDM3100W	E2J3100W
JDM3125W	E2J3125W
JDM3150W	E2J3150W
JDM3150WU18	E2J3150WU18

# Special Application Moulded Case Circuit Breakers **CMCB-12**

Classic Mining Circuit Breakers

## E<sup>2</sup> Cross-Reference, continued

Series C Mining	Superseded by E <sup>2</sup> Mining
JDM3175W	E2J3175W
JDM3200W	E2J3200W
JDM3200WA06	E2J3200WA06
JDM3225A5W	E2J3225AW
JDM3225D5W	E2J3225DW
JDM3225W	E2J3225W
JDM3250A5MW	E2J3250MAW
JDM3250A5W	E2J3250AW
JDM3250C5MW	E2J3250CW
JDM3250D5MW	E2J3250MDW
JDM3250D5W	E2J3250DW
JDM3250F	E2J3250F
JDM3250F5MW	E2J3250MFW
JDM3250G5MW	E2J3250MGW
JDM3250J5MW	E2J3250MJW
JDM3250K5MW	E2J3250MKW
JDM3250L5MW	E2J3250MLW
JDM3250MW	E2J3250MW
JDM3250W	E2J3250W
JDM3250WS10	E2J3250WS10
JM2225T1125-2250	E2J3225T
JM3070T	E2J3070T
JM3090T	E2J3090T
JM3100T	E2J3100T
JM3125T	E2J3125T
JM3150T	E2J3150T
JM3175T	E2J3175T
JM3200T	E2J3200T
JM3225T	E2J3225T
JM3225TA5	E2J3225TA
JM3225TD5	E2J3225TD
JM3250T	E2J3250T
JM3250TA5	E2J3250TA
JM3250TA5M_350-700	E2J3250TMA
JM3250TC5M	E2J3250TMC
JM3250TD5_500-1000	E2J3250TMD
JM3250TF5M_625-1250	E2J3250TMF
JM3250TG5M_750-1500	E2J3250TMG
JM3250TJ5M_875-1750	E2J3250TMJ
JM3250TK5M_1000-2000	E2J3250TMK

Series C Mining	Superseded by E <sup>2</sup> Mining
JM3250TL5M_1125-2250	E2J3250TML
JM3250TM	E2J3250TM
KDCM3100W	E2KM3100W
KDCM3125W	E2KM3125W
KDCM3150W	E2KM3150W
KDCM3175W	E2KM3175W
KDCM3200W	E2KM3200W
KDCM3225A5MW	E2KM3200MAW
KDCM3225D5MW	E2KM3200MDW
KDCM3225W	E2KM3225W
KDCM3250W	E2KM3250W
KDCM3250WU18	E2KM3250WU18
KDCM3300W	E2KM3300W
KDCM3350W	E2KM3350W
KDCM3400D5MA02D09H04	E2KM3400MDA02D09H04
KDCM3400D5MW	E2KM3400MDW
KDCM3400D5MWA02D07	E2KM3400MDA02D07
KDCM3400D5W	E2KM3400DW
KDCM3400D5WD09	E2KM3400DD09
KDCM3400F	E2KM3400F
KDCM3400F5MW	E2KM3400MFW
KDCM3400FD09G04	E2KM3400MFD09G04
KDCM3400G5MW	E2KM3400MGD09G05
KDCM3400G5MWD09H04	E2KM3400MGD09H04
KDCM3400G5W	E2KM3400MGW
KDCM3400G5WD07	E2KM3400MGD07
KDCM3400J5MA02D09	E2KM3400MJA02D09
KDCM3400J5MA2D9G4S30	E2KM3400MJA2D9G4S30
KDCM3400J5MD09	E2KM3400MJD09
KDCM3400J5MD09H04S30	E2KM3400MJD09H04S30
KDCM3400J5MW	E2KM3400MJW
KDCM3400J5MWA02D07	E2KM3400MJA02D07
KDCM3400J5MWA06	E2KM3400MJWA06
KDCM3400J5MWD07S30	E2KM3400MJD07S30
KDCM3400J5WD07	E2KM3400MJD07
KDCM3400K5MW	E2KM3400MKW
KDCM3400K5MWS10	E2KM3400MKWS10
KDCM3400K5MWU18	E2KM3400MKWU18
KDCM3400L5MW	E2KM3400MLW
KDCM3400L5MWD09H04	E2KM3400MLD09H04

# CMCB-13 Special Application Moulded Case Circuit Breakers

Classic Mining Circuit Breakers

## E<sup>2</sup> Cross-Reference, continued

Series C Mining	Superseded by E <sup>2</sup> Mining
KDCM3400L5MWS10	E2KM3400MLWS10
KDCM3400L5WD07	E2KM3400MLD07
KDCM3400MW	E2KM3400MW
KDCM3400N5MW	E2KM3400MNW
KDCM3400N5MWA06	E2KM3400MNWA06
KDCM3400N5WA02D07	E2KM3400MNA02D07
KDCM3400R5MW	E2KM3400MRW
KDCM3400W	E2KM3400W
KDCM3400W5MW	E2KM3400MWW
KDCMDMD07	E2KM3400MDD07
KDCMNA2D7	E2KM3400MNA02D07
KDM2400F	E2K2400F
KDM2400G5MS50	E2K2400MGWS50
KDM2400G5MW	E2K2400MGW
KDM2400W5MW	E2K2400MWW
KDM2400W5MWA06D07S10	E2K2400MWA06D07S10
KDM2400W5MWA06D10S10	E2K2400MWA06D10S10
KDM2400W5MWD07	E2K2400MWD07
KDM2400W5MWD07S10	E2K2400MWD07S10
KDM2400W5MWD10	E2K2400MWD10
KDM2400W5MWD10S10	E2K2400MWD10S10
KDM2400W5MWS10	E2K2400MWS10
KDM3100W	E2K3100W
KDM3125W	E2K3125W
KDM3150W	E2K3150W
KDM3150WA06	E2K3150WA06
KDM3175W	E2K3175W
KDM3200W	E2K3200W
KDM3225A5W	E2K3225AW
KDM3225D5A13D09U18	E2K3225DA13D09U18
KDM3225D5MW	E2K3400MDW
KDM3225D5W	E2K3225DW
KDM3225F	E2K3400F
KDM3225W	E2K3225W
KDM3225WK37	E2KE3225W
KDM3225WK37U18	E2KE3225WU18
KDM3225WK38	E2KE3225MW
KDM3250W	E2K3250W
KDM3300W	E2K3300W
KDM3300WA06U18	E2K3300WA06U18

Series C Mining	Superseded by E <sup>2</sup> Mining
KDM3300WS10	E2K3300WS10
KDM3350W	E2K3350W
KDM3400D5MW	E2K3400MDW
KDM3400D5W	E2K3400DW
KDM3400D5WU18	E2K3400DWU18
KDM3400F	E2K3400F
KDM3400F5MW	E2K3400MFW
KDM3400FK37A06D09D18	E2KE3400A06D09D18
KDM3400G5A06D09U18	E2K3400GA06D09U18
KDM3400G5A13D09U18	E2K3400GA13D09U18
KDM3400G5MW	E2K3400MGW
KDM3400G5W	E2K3400GW
KDM3400G5WA06	E2K3400GWS10
KDM3400G5WS10	E2K3400GWS10
KDM3400G5WU18	E2K3400GWU18
KDM3400J5MW	E2K3400MJW
KDM3400K5MS54	E2K3400MKWS54
KDM3400K5MW	E2K3400MKW
KDM3400L5MW	E2K3400MLW
KDM3400MW	E2K3400MW
KDM3400MWA06U18	E2K3400MWA06U18
KDM3400N5MW	E2K3400MNW
KDM3400R5MW	E2K3400MRW
KDM3400W	E2K3400W
KDM3400W5MW	E2K3400MWW
KEM3100T	KEM3100T
KEM3125T	KEM3125T
KEM3150T	KEM3150T
KEM3150TM	KEM3150TM
KEM3200T	KEM3200T
KEM3225T	KEM3225T
KEM3225T2	KEM3225T2
KEM3225TM	KEM3225TM
KEM3225TM2	KEM3225TM2
KM2225TA5	E2K2225TA
KM2225TA5M	E2K2400TMA
KM2225TD5	E2K2225TD
KM2225TD5M	E2K2400TMD
KM2400TD5	E2K2400TD
KM2400TD5M	E2K2400TMD

## E<sup>2</sup> Cross-Reference, continued

Series C Mining	Superseded by E <sup>2</sup> Mining
KM2400TG5M	E2K2400TMG
KM2400TN5M	E2K2400TMN
KM2400TW5M	E2K2400TMW
KM3100T	E2K3100T
KM3125T	E2K3125T
KM3150T	E2K3150T
KM3175T	E2K3175T
KM3200T	E2K3200T
KM3225T	E2K3225T
KM3225TA5	E2K3225TA
KM3225TA5M	E2K3400TMA
KM3225TD5	E2K3225TD
KM3225TD5M	E2K3400TMD
KM3250T	E2K3250T
KM3300T	E2K3300T
KM3350T	E2K3350T
KM3400T	E2K3400T
KM3400TD5	E2K3400TD
KM3400TF5M	E2K3400TMF
KM3400TG5M	E2K3400TMG
KM3400TJ5M	E2K3400TMJ
KM3400TK5M	E2K3400TMK
KM3400TL5M	E2K3400TML
KM3400TM	E2K3400TM
KM3400TN5M	E2K3400TMN
KM3400TR5M	E2K3400TMR
KM3400TW5M	E2K3400TMW

Series C Mining	Superseded by E <sup>2</sup> Mining
LDCM3600EMA05W	E2LEM3600MA05W
LDCM3600F	E2LM3600F
LDM3600F	E2L3600F

Series C Mining	Superseded by E <sup>2</sup> Mining
LEM3300T	LEM3300T
LEM3350T	LEM3350T
LEM3400T	LEM3400T
LEM3400T2	LEM3400T2
LEM3400TM	LEM3400TM
LEM3400TM2	LEM3400TM2
LEM3600T	LEM3600T
LEM3600TM	LEM3600TM
LM3600TL6M	E2L3600TML
LM3600TN6M	E2L3600TMN
LM3600TP6M	E2L3600TMP
LM3600TR6M	E2L3600TMR
LM3600TS6M	E2L3600TM
LM3600TX6M	E2L3600TMX
UVE3LP08K	UVE3LP08K
UVE4LP08K	UVE4LP08K

## Additional Information on Mining Breakers

Source	Description
TD01217001E	E <sup>2</sup> Mining Circuit Breaker Dimensional Data
BR01217001E	E <sup>2</sup> Mining Circuit Breaker Brochure
TC01217001E	E <sup>2</sup> Mining Circuit Breaker Time Current Curves

# GFR-1 Special Application Moulded Case Circuit Breakers

Add-on Ground Fault Protection Type GFR

## GFR Relay



## Type GFR Ground Fault Relay

### Product Description

The GFR ground fault relays, current sensors, test panels and accessory devices are CSA and UL listed. ①

A Type GFR ground fault protection system, when properly installed on a grounded electrical system, will sense phase-to-ground fault currents. When the level of fault current is in excess of the pre-selected current pickup and time delay settings, the GFR relay will initiate a trip action of a disconnect device, which will open the faulted circuit and clear the fault.

The GFR devices are CSA and UL Class I devices designed to protect electrical equipment against extensive damage from arcing ground faults.

A basic Type GFR ground fault protection system consists of a ground fault relay②, a ground fault current sensor and a disconnect device equipped with a shunt trip device. This disconnect device can be a moulded case circuit breaker, a power circuit breaker, a bolted pressure switch or other fusible disconnect device, suitable for application with CSA or UL Class I Ground Fault Sensing and Relaying equipment.

### Options

Additional optional equipment can be added to the protection system to meet the requirements of the specifying engineer, including:

- Ground Fault Test Panel
- Ground Fault Warning Indicator Relay
- Ground Fault Indicating Ammeter

GFR relays are available with zone selective interlocking circuitry to interlock several relays within the same system. This allows the relay which detects a ground fault to instantly clear the fault by tripping the disconnect device. The relay simultaneously sends a signal to relay units "upstream" from the fault to time delay or to block their operation completely. Current sensors in various designs provide a range of "window" sizes to accommodate standard bus and cable arrangements.

Shunt trip attachments may be ordered for field mounting in Eaton moulded case circuit breakers, or may be ordered factory installed in the breaker.

## Electrical Ratings

### GFR Relay

Ground Fault Detection Ranges:  
1 to 12, 5 to 60 or 100 to 1200 Amperes

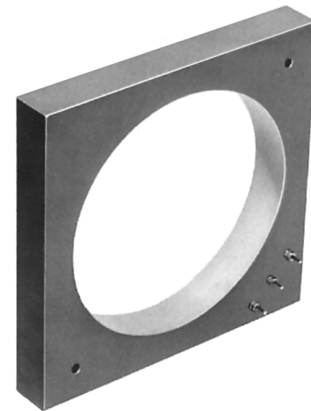
Output contacts:  
240 Volt, 50/60 Hz: 3.0Amperes  
120 Volt, 50/60 Hz: 6.0Amperes  
28 Volt Dc: 3.0Amperes  
125 Volt Dc: 0.5Amperes

Control power requirements:  
120 Volt, 50/60 Hz: 0.125 Amperes, or  
125 Volt Dc (optional)

### Sensor:

600 Volts, 50/60 Hz maximum system voltage

### Typical Current Sensor



① These devices are listed with CSA under file number 43357 and UL under file number E48381.

② Suitable for either surface or semi-flush mounting.

# Special Application Moulded Case Circuit Breakers **GFR-2**

Add-on Ground Fault Protection Type GFR

## Product Selection

Each installation requires:

1. One relay unit (select trip ampere as required)
2. One current sensor (select configuration required)
3. One circuit breaker or disconnect device with shunt trip, or a shunt trip attachment for mounting in existing breaker.
4. Test panel. (Optional)

## GFR Relay

GFR Relay Types	Catalogue Numbers ①		
	Ground Fault Pickup Amperes		
	1-12	5-60	100-1200
<b>For 120 Volt 50/60 Hz Control</b>			
Electrical Reset with Zone Interlocking	GFR12EI	GFR60EI	GFR1200EI
Electrical Reset without Zone Interlocking	GFR12E	GFR60E	GFR1200E
Mechanical Reset with Zone Interlocking	GFR12MI	GFR60MI	GFR1200MI
Mechanical Reset without Zone Interlocking	GFR12M	GFR60M	GFR1200M
<b>For 120 Volt Dc Control</b>			
Electrical Reset with Zone Interlocking	-	-	GFR1200EID
Electrical Reset without Zone Interlocking	-	-	GFR1200ED
Mechanical Reset with Zone Interlocking	-	-	GFR1200MID
Mechanical Reset without Zone Interlocking	-	-	GFR1200MD

## Current Sensor

Window Size	Style Number
<b>Used with Relays Rated 1-12 Amperes</b>	
5.50 In. I.D.	1283C45G01
<b>Used with Relays Rated 5-60 Amperes</b>	
2.50 In. I.D.	179C768G01
5.50 In. I.D.	1256C13G01
7.81 x11.00 In.Rect.②	1257C88G04
3.31 x24.94 In.Rect.②	1257C92G03
<b>Used with Relays Rated 100-1200 Amperes</b>	
2.50 In. I.D.	179C768G02
5.50 In. I.D.	1256C13G02
8.25 In. I.D.	179C767G02
7.81 x11.00 In.Rect.②	1257C88G03
9.94 x16.94 In.Rect.②	1257C90G02
9.94 x23.94 In.Rect.②	1257C91G02
15.94 x19.94 In.Rect.②	1257C89G02
3.31 x24.94 In.Rect.②	1257C92G04
6.75 x29.64 In.Rect.②	1255C39G03

Instruction Leaflet Number 15321

① Suitable for either surface or semi-flush mounting.

② One end removable for installation.

③ When a mechanically reset relay is used with a test panel, both the relay and test panel must be reset following either a simulated ground fault test or actual ground fault.

④ Not CSA and UL listed.

## Accessories

### Test Panel (120 Volts Ac) ③

Used to test the ground fault system, to give an indication the relay has tripped the breaker, and to reset the relay after tripping④. These functions may be separately mounted pilot devices.

### Optional Test Panel

Control	Test	Catalogue Number
120V 50/60 Hz	120V 50/60 Hz	GFRTP
125V Dc	120V 50/60 Hz	GFRTPD

### Ground Fault Warning Indicator

This is an accessory item for use with GFR Relays with interlocking circuitry. At approximately 30-50% of the Relay pickup setting, the indicator switches separate 120 volt Ac control power to a lamp or relay, (not included) to give an indication of a ground fault. The indicator is rated 110/120 volts Ac 50/60 Hz for a maximum indicator load of .5 amperes.

Ground Fault Warning Indicator	Style Number
Manual Reset	1234C67G01
Self-Resetting	1234C67G02

### Indicating Ammeter ④

The optional indicating ammeter. It connects to the sensor terminals, through a momentary contact pushbutton, and will indicate (in amperes) any ground fault current flowing through the sensor. Kit includes the ammeter and pushbutton.

GFR System Used with	Kit Style Number
1-12 Ampere	752B820G01
5-60 Ampere	752B820G02
100-1200 Ampere	752B820G03

### Shunt Trip Attachments

Use 120 volt Ac shunt trips.

### Face Plate

Recommended when these relays are semi-flush mounted, to close the door cutout opening.

Description	Style Number
Face Plate	752B410G01



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