

Series C® M-Frame



Typical Series C M-Frame Circuit Breaker

- All Series C 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 with non-interchangeable trip units are suitable for reverse feed use.

Interrupting Capacity Ratings

UL489/CSA Interrupting Capacity Ratings<sup>①</sup>

Circuit Breaker Type	Number of Poles	Interrupting Capacity (Symmetrical Amperes) (kA)				Page Number
		Volts Ac (50/60 Hz)			Volts Dc <sup>②③</sup>	
		240	480	600		
MDL	2, 3	65	50	25	22	69, 70
CMDL	2, 3	65	50	25	22	70
HMDL	2, 3	100	65	35	25	69, 70
CHMDL	2, 3	100	65	35	25	70



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

Circuit Breaker Type	Number of Poles	Interrupting Capacity – RMS Symmetrical Amperes (kA) $I_{CU} = I_{CS}$				Page Number
		Volts Ac (50/60 Hz)			Volts Dc <sup>②③</sup>	
		240	480	600		
MDL	2, 3	85	50	20	20	69, 70
CMDL	2, 3	85	50	20	20	70
HMDL	2, 3	100	65	25	20	69, 70
CHMDL	2, 3	100	65	25	20	70

① Utilization category A circuit breakers.  
 ② Two poles or two poles of 3-pole circuit breaker. Thermal-magnetic trip units only, MDL, HMDL breakers with electronic trip unit are not DC rated.  
 ③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds at 22 kA.

## Series C® M-Frame

### MDL-Frame Digitrip Selection Guide

Trip Unit Type	Digitrip RMS 310	
RMS Sensing	Yes	
<b>Breaker Type</b>		
Frame	MDL	
Ampere Range	400-800A	
Interrupting Rating @ 480V	50, 65 (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	Varies by Frame	Varies by Frame
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	Yes	Yes
<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>		
Cutler-Hammer PowerNet	No	No
<b>Testing</b>		
Testing Method	Test Set	

① Adjust by rating plug.

 $I_n$  = Rating Plug

## Series C® M-Frame

### Types MDL and HMDL 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		Digitrip RMS 310 Trip Unit Only <sup>②</sup>				Digitrip RMS 310 Rating Plug Only			Terminals
	Standard Interrupting Capacity 600 Vac Rated 35 kAIC @ 480 Vac	High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac	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)	Ampere Rating	Fixed Rating Plug	Adjustable Rating Plugs Ampere Rating Catalog Number	
	Catalog Number									

## 3-Pole

800	MDL3800F	HMDL3800F	MES3800LS MES3800LSI MES3800LSG MES3800LSIG	400 500 600 700 800	8MES400T 8MES500T 8MES600T 8MES700T 8MES800T	400/500/600/800 A8MES800T	See Page 72 for Standard and Optional Terminals
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Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit


### Types MDLB and HMDLB Electronic Circuit Breakers with Non-Interchangeable Trip Units

Maximum Continuous Ampere Rating @ 40°C <sup>①</sup>	Factory Assembled Circuit Breaker Consisting of Frame and Trip Unit			
	LS	LSI	LSG	LSIG
	Catalog Number			

## 3-Pole Standard Interrupting Capacity 600 Vac Rated 50 kAIC @ 480 Vac

800	MDLB3800T33W	MDLB3800T32W	MDLB3800T35W	MDLB3800T36W
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## 3-Pole High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac

800	HMDLB3800T33W	HMDLB3800T32W	 HMDLB3800T35W	HMDLB3800T36W
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Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

### 100% Rated Types CMDL and CHMDL Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC 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.

Maximum Continuous Ampere Rating @ 40°C <sup>①</sup>	Circuit Breaker Frame Only		Digitrip RMS 310 Trip Unit Only <sup>②</sup>				Digitrip RMS 310 Trip Unit Only			Terminals
	Standard Interrupting Capacity 50 kAIC @ 480 Vac	High Interrupting Capacity 50 kAIC @ 480 Vac	Standard	Options			Ampere Rating	Fixed Rating Plug	Adjustable Rating Plug Ampere Rating Catalog Number	
			Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay Ground Fault Protection	Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Ground Fault Protection				
	Catalog Number									

## 3-Pole

800	CMDL3800F	CHMDL3800F	MES3800LS	MES3800LSI	MES3800LSG	MES3800LSIG	400 500 600 700 800	8MES400T 8MES500T 8MES600T 8MES700T 8MES800T	400/500/600/800 A8MES800T	See Page 72 for Standard and Optional Terminals
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Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

① Ampere rating is established by rating plug.

② For Ac use only.

## Series C® M-Frame

### 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 catalog number. Specify if factory installation is required.

### Line and Load Terminals

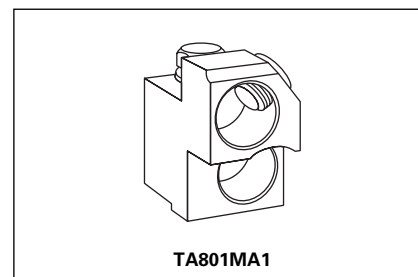
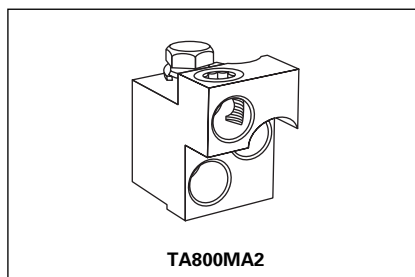
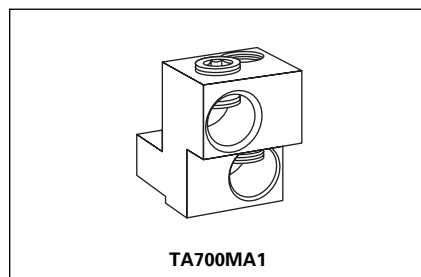
Maximum Breaker Amperes	Terminal Body Material	Wire Type	AWG Wire Range/ No. Conductors	Terminal Catalog Number	Terminals with Control Wire Termination Catalog Number
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#### Standard Cu/Al Pressure Terminals

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>	<b>TA800MA2CWT</b>
800	Aluminum	Cu/Al	(2) 500-750 kcmil	<b>TA801MA</b>	<b>TA801MACWT</b>

#### Optional Copper and Cu/Al Pressure Type Terminals

600	Copper	Cu	(2) 2/0-500 kcmil	<b>T600MA1</b>	—
800	Copper	Cu	(3) 3/0-300 kcmil	<b>T800MA1</b>	—



## Series C® M-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.

	Reference Page	2-Pole <sup>①</sup>		3-Pole			
		Left	Right	Left	Center	Right	
<b>Internal Accessories (Only One Internal Accessory Per Pole)</b>							
Alarm Lockout (Make/Break)	140	■		■		■	
Alarm Lockout (2Make/2Break)	140	■		■		■	
Auxiliary Switch (1A, 1B)	143	■		■		■	
Auxiliary Switch (2A, 2B)	143	■		■		■	
Auxiliary Switch (3A, 3B)	143	■		■		■	
Auxiliary Switch (1A, 1B) and Alarm Switch Combination	146	■		■		■	
Auxiliary Switch (2A, 2B) and Alarm Switch Combination	146	■		■		■	
Shunt Trip – Standard <sup>③</sup>	149	■		■		■	
Shunt Trip – Low Energy <sup>③</sup>	152	■		■		■	
Undervoltage Release Mechanism <sup>③</sup>	157	■		■		■	

#### External Accessories

Base Mounting Hardware	163				●		
Terminal Shields	165				●		
Interphase Barriers	166				●		
Non-Padlockable Handle Block	168				■		
Padlockable Handle Lock Hasp	169	□		□		□	
Key Interlock Kit	170	□		□		□	
Sliding Bar Interlock – Requires Two Breakers	171	●			●		
Walking Beam Interlock – Requires Two Breakers	171	●			●		
Electrical (Motor) Operator	173	●			●		
Plug-in Adapters	174	●			●		
Rear Connecting Studs	176	●			●		
Panelboard Connecting Straps	177	●			●		
Handle Mechanisms	178	●			●		
Door Hardware/Accessories	182	●			●		
Handle Extension	182				●		
Solid-State (Electronic) Portable Test Kit	184	●			●		

#### Modifications (Refer to Cutler-Hammer)

Special Calibration	186	●			●		
Moisture Fungus Treatment	186	●			●		
Freeze-Tested Circuit Breakers	186	●			●		
Marine Application	186	●			●		

■ 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 center pole.

② Refer to Cutler-Hammer for appropriate neutral pole accessory combinations.

③ Shunt trip and UVR cannot be mounted in right poles on LES trip units.