Typical M-Frame Circuit Breaker

Contents

M-Frame (300–800 Amperes)

Product Description

- All Eaton 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
- MDLB, HMDLB-Frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use

Standards and Certifications

- CE marked

CE

Catalog Number Selection

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

Circuit Breaker/Frame

MDL 3 800 F

Circuit Breaker/ Frame Type	Number of Poles	Circuit Breaker/ Frame Ampere Rating	Suffix
MDL, MDLB **HMDL, HMDLB**	**2** = 2 poles **3** = 3 poles	**300** ① **350** ① **400** **450** **500** **600** **700** **800**	**F** = Frame only **K** = High magnetic molded case switch **V** = 50°C (thermal-magnetic trip units only) **W** = Without terminals **X** = Load side terminals only **Y** = Line side terminals only

Thermal-Magnetic Trip Unit

MT 3 800 T

Trip Unit Type	Number of Poles	Trip Unit Rating/ Plug Ampere Rating	Suffix
MT **MES**	**2** = 2 poles **3** = 3 poles	**300** ① **350** ① **400** **450** **500** **600** **700** **800**	**T** = Thermal-magnetic **V** = 50°C (thermal-magnetic trip units only) **LS** = Digitrip RMS 310 **LSI** = Digitrip RMS 310 **LSG** = Digitrip RMS 310 **LSIG** = Digitrip RMS 310

Note

① Thermal-magnetic only.

Product Selection

Types MDL and HMDL Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units—Two-Pole

	Standard Interrupting Capacity 600 Vac Rated 50 kAIC at 480 Vac		High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac		Thermal-Magnetic Trip Unit Only For Use with Standard or High or Ultra High Interrupting Frames Magnetic Trip Range is 5–10 Up Through 600A; 4–8 on 700 and 800A x Continuous Ampere Rating	Standard Terminals Only [1] See Page V4-T2-227 for Optional Terminals
Maximum Continuous Ampere Rating at 40°C	Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	Frame Only Catalog Number	Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	Frame Only Catalog Number	Catalog Number	Catalog Number
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**

Types MDL and HMDL Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units—Three-Pole

	Standard Interrupting Capacity 600 Vac Rated 50 kAIC at 480 Vac		High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac		Thermal-Magnetic Trip Unit Only For Use with Standard or High or Ultra High Interrupting Frames Magnetic Trip Range is 5–10 Up Through 600A; 4–8 on 700 and 800A x Continuous Ampere Rating	Standard Terminals Only [1] See Page V4-T2-227 for Optional Terminals
Maximum Continuous Ampere Rating at 40°C	Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	Frame Only Catalog Number	Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	Frame Only Catalog Number	Catalog Number	Catalog Number
300	**MDL3300**	**MDL3800F**	**HMDL3300**	**HMDL3800F**	**MT3300T**	**TA700MA1**
350	**MDL3350**		**HMDL3350**		**MT3400T**	**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**

Note

[1] Two terminals are required per pole.

2

Types MDLB and HMDLB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units—Two-Pole ①

Maximum Continuous Ampere Rating at 40°C	Standard Interrupting Capacity 600 Vac Rated 50 kAIC at 480 Vac Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	Standard Terminals Only ② See Page V4-T2-227 for Optional Terminals Catalog Number
300	**MDLB2300**	**HMDLB2300**	**TA700MA1**
350	**MDLB2350**	**HMDLB2350**	**TA700MA1**
400	**MDLB2400**	**HMDLB2400**	**TA700MA1**
450	**MDLB2450**	**HMDLB2450**	**TA700MA1**
500	**MDLB2500**	**HMDLB2500**	**TA700MA1**
600	**MDLB2600**	**HMDLB2600**	**TA700MA1**
700	**MDLB2700**	**HMDLB2700**	**TA700MA1**
800	**MDLB2800**	**HMDLB2800**	**TA800MA2**

Types MDLB and HMDLB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units—Three Pole①

Maximum Continuous Ampere Rating at 40°C	Standard Interrupting Capacity 600 Vac Rated 50 kAIC at 480 Vac Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac Factory Assembled Circuit Consisting of Frame, Trip Unit and Terminals Catalog Number	Standard Terminals Only ② See Page V4-T2-227 for Optional Terminals Catalog Number
300	**MDLB3300**	**HMDLB3300**	**TA700MA1**
350	**MDLB3350**	**HMDLB3350**	**TA700MA1**
400	**MDLB3400**	**HMDLB3400**	**TA700MA1**
450	**MDLB3450**	**HMDLB3450**	**TA700MA1**
500	**MDLB3500**	**HMDLB3500**	**TA700MA1**
600	**MDLB3600**	**HMDLB3600**	**TA700MA1**
700	**MDLB3700**	**HMDLB3700**	**TA700MA1**
800	**MDLB3800**	**HMDLB3800**	**TA800MA2**

Notes

① Factory sealed for reverse feed application.

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.

Types MDL and HMDL Electronic Circuit Breakers with Interchangeable Trip Units—Three-Pole

Maximum Continuous Ampere Rating at 40°C ①	Circuit Breaker Frame Only: Standard Interrupting Capacity 600 Vac Rated 50 kAIC at 480 Vac — Catalog Number	Circuit Breaker Frame Only: High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac — Catalog Number	Digitrip RMS 310 Trip Unit Only ② — L – Adjustable Long Delay Pickup (by Adjustable Rating Plug); S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I^2t Response) or Adjustable Short Delay Time (Flat Response); I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous; G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response) — Catalog Number	Digitrip RMS 310 Rating Plug Only — Fixed Rating Plug — Ampere Rating	Fixed Rating Plug — Catalog Number	Adjustable Rating Plugs — Ampere Rating — Catalog Number	Terminals
800	**MDL3800F**	**HMDL3800F**	**MES3800LS**	400	**8MES400T**	400/500/600/800 **A8MES800T**	See **Page V4-T2-227** for standard and optional terminals
			MES3800LSI	500	**8MES500T**		
			MES3800LSG	600	**8MES600T**	620/640/660/680 **A8MES600T5**	
			MES3800LSIG	700	**8MES700T**		
			—	800	**8MES800T**	720/740/760/780 **A8MES700T5**	

Types MDLB and HMDLB Electronic Circuit Breakers with Non-Interchangeable Trip Units ③

Maximum Continuous Ampere Rating at 40°C ①	Factory-Assembled Circuit Breaker Consisting of Frame and Trip Unit — LS — Catalog Number	LSI — Catalog Number	LSG — Catalog Number	LSIG — Catalog Number
Three-Pole Standard Interrupting Capacity 600 Vac Rated 50 kAIC at 480 Vac				
800	**MDLB3800T33W**	**MDLB3800T32W**	**MDLB3800T35W**	**MDLB3800T36W**
Three-Pole High Interrupting Capacity 600 Vac Rated 65 kAIC at 480 Vac				
800	**HMDLB3800T33W**	**HMDLB3800T32W**	**HMDLB3800T35W**	**HMDLB3800T36W**

Notes

① Ampere rating is established by rating plug.

② For AC use only.

③ Factory sealed, suitable for reverse feed application. CMDLB and CHMDLB are also available.

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.

100% Rated Types CMDL and CHMDL Electronic Circuit Breakers with Interchangeable Trip Units—Three-Pole

	Circuit Breaker Frame Only		Digitrip RMS 310 Trip Unit Only ②				Digitrip RMS 310 Trip Unit Only			
			Standard	Options					Adjustable Rating Plug	
Maximum Continuous Ampere Rating at 40°C ①	Standard Interrupting Capacity 50 kAIC at 480 Vac	High Interrupting Capacity 65 kAIC at 480 Vac	Adjustable Short Time Pickup with I^2t Short Delay Ramp	Independently Adjustable Short Time Pickup and Delay Ground Fault Protection	Adjustable Short Time Pickup with I^2t Short Delay and Ground Fault Protection	Independently Adjustable Short Time Pickup and Ground Fault Protection	Ampere Rating	Fixed Rating Plug Catalog Number	Ampere Rating	Terminals
	Catalog Number									
800	**CMDL3800F**	**CHMDL3800F**	**MES3800LS**	**MES3800LSI**	**MES3800LSG**	**MES3800LSIG**	400	**8MES400T**	400/500/600/800 **A8MES800T**	See **Page V4-T2-227** for standard and optional terminals
							500	**8MES500T**		
							600	**8MES600T**	620/640/660/680 **A8MES600T5**	
							700	**8MES700T**		
							800	**8MES800T**	720/740/760/780 **A8MES700T5**	

Molded Case Switches

Eaton's molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories Standard UL 489.

Molded Case Switches

Maximum Continuous Ampere Rating at 40°C	600 Vac Maximum, 250 Vdc Circuit Breaker Only without Line and Load Terminals Catalog Number
Two-Pole	
800	**MDL2800WK**
	MDLB2800WK ③
	HMDL2800WK
Three-Pole	
800	**MDL3800WK**
	MDLB3800WK ③
	HMDL3800WK

Notes

① Ampere rating is established by rating plug.

② For AC use only.

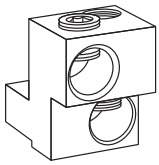
③ MDLB and HMDLB are suitable for reverse feed applications.

Molded case switch may trip above 6000 amperes.

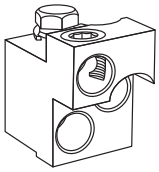
Accessories Selection Guide and Ordering Information

Line and Load Terminals

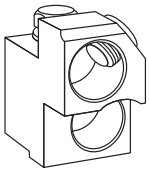
M-Frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalog number. Specify if factory installation is required.



TA700MA1



TA800MA2



TA801MA

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
Standard Cu/Al Pressure Terminals					
700	Aluminum	Cu/Al	(2) 1–500 kcmil	**TA700MA1**	**TA700MA1CWT**
800 std.	Aluminum	Cu/Al	(3) 3/0–400 kcmil	**TA800MA2**	**TA800MA2CWT**
800	Aluminum	Cu/Al	(2) 500–750 kcmil	**TA801MA**	**TA801MACWT**
Optional Copper and Cu/Al Pressure Type Terminals					
600	Copper	Cu	(2) 2/0–500 kcmil	**T600MA1**	—
800	Copper	Cu	(3) 3/0–300 kcmil	**T800MA1**	—

Accessories

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.

MD Frame Accessories

Description	Reference Page	Two-Pole ① Left	Two-Pole ① Right	Three-Pole Left	Three-Pole Center	Three-Pole Right
Internal Accessories (Only One Internal Accessory Per Pole)						
Alarm lockout (Make/Break)	**V4-T2-305**	■	■	■		■
Alarm lockout (2Make/2Break)	**V4-T2-305**	■	■	■		■
Auxiliary switch (1A, 1B)	**V4-T2-307**	■	■	■		■
Auxiliary switch (2A, 2B)	**V4-T2-307**	■	■	■		■
Auxiliary switch (3A, 3B)	**V4-T2-307**	■	■	■		■
Auxiliary switch (1A, 1B) and alarm switch combination	**V4-T2-309**	■	■	■		■
Auxiliary switch (2A, 2B) and alarm switch combination	**V4-T2-309**	■	■	■		■
Shunt trip—standard ②	**V4-T2-312**	■	■	■		■
Shunt trip—low energy ②	**V4-T2-314**	■	■	■		■
Undervoltage release mechanism ②	**V4-T2-320**	■	■	■		■
External Accessories						
Base mounting hardware	**V4-T2-340**				●	
Terminal shields	**V4-T2-342**				●	
Interphase barriers	**V4-T2-342**				●	
Non-padlockable handle block	**V4-T2-343**				■	
Padlockable handle lock hasp	**V4-T2-344**	❑		❑		❑
Key interlock kit	**V4-T2-345**	❑		❑		❑
Sliding bar interlock—requires two breakers	**V4-T2-346**	●	●	●	●	●
Walking beam interlock—requires two breakers	**V4-T2-346**	●	●	●	●	●
Electrical (motor) operator	**V4-T2-347**	●	●	●	●	●
Plug-in adapters	**V4-T2-349**	●	●	●	●	●
Rear connecting studs	**V4-T2-350**	●	●	●	●	●
Panelboard connecting straps	**V4-T2-351**	●	●	●	●	●
Handle mechanisms	**V4-T2-353**	●	●	●	●	●
Handle extension	**V4-T2-357**	●	●	●	●	●
Solid-state (electronic) portable test kit	**V4-T2-358**	●	●	●	●	●
Modifications (Refer to Eaton)						
Special calibration	—	●	●	●	●	●
Moisture fungus treatment	**V4-T2-123**	●	●	●	●	●
Freeze-tested circuit breakers	—	●	●	●	●	●
Marine/naval application	—	●	●	●	●	●

Legend

■ Applicable in indicated pole position

❑ May be mounted on left or right pole—not both

● Accessory available/modification available

Notes

① Two-pole breaker supplied in three-pole frame. Current carrying parts omitted from center pole.

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

Technical Data and Specifications

UL 489/CSA Interrupting Capacity Ratings ①

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes) Volts AC (50/60 Hz) 240	480	600	Volts DC ②③ 250
MDL, MDLB	2, 3	65	50	25	22
CMDL	2, 3	65	50	25	—
HMDL, HMDLB	2, 3	100	65	35	25
CHMDL	2, 3	100	65	35	—

IEC 947-2 Interrupting Capacity Ratings ①

Circuit Breaker Type	Number of Poles	Interrupting Capacity rms (kA Symmetrical Amperes) I_{cu} ; I_{cs} Volts AC (50/60 Hz) 240	415	690	Volts DC ②③ 250
MDL, MDLB	2, 3	65/65	50/50	20/10	20/10
CMDL	2, 3	65/65	50/50	20/10	—
HMDL, HMDLB	2, 3	100/100	70/50	25/13	20/10
CHMDL	2, 3	100/100	70/50	25/13	—

Notes

① Utilization Category A circuit breakers.

② Two-pole or two poles of three-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.

Specifications

MDL-Frame Digitrip

2

Trip Unit Type	Digitrip RMS 310	
rms sensing	Yes	Yes
Breaker Type		
Frame	MDL, MDLB, CMDL, HMDL, HMDLB, CHMDL	MDL, MDLB, CMDL, HMDL, HMDLB, CHMDL
Ampere range	400–800A	400–800A
Interrupting rating at 480 volts	50, 65 (kA)	50, 65 (kA)
Protection		
Ordering options	LS, LSG	LSI, LSIG
Fixed rated plug (I_n)	Yes	Yes
Overtemperature trip	Yes	Yes
Long Delay Protection (L)		
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
Short Delay Protection (S)		
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
Instantaneous Protection (I)		
Instantaneous pickup	No	200–800% x (I_n)
Discriminator	No	No
Instantaneous override	Yes	Yes
Ground Fault Protection (G)		
Ground fault alarm	No	No
Ground fault pickup	1–5 x I_g (160A)	1–5 x I_g (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
System Diagnostics		
Status LEDs	Yes	Yes
Cause of trip LEDs	No	No
Magnitude of trip information	No	No
Remote signal contacts—ground alarm	Yes ②	Yes ②
System Monitoring		
Digital display	No	No
Current	No	No
Power and energy	No	No
Power quality—harmonics	No	No
Power factor	No	No
Communications		
Eaton's PowerNet	No	No
Testing		
Testing method	Test set	Test set

Legend

I_n = Rating Plug

Notes

① Adjust by rating plug.

② With separate ground fault alarm unit (GFAU).

Dimensions and Weights

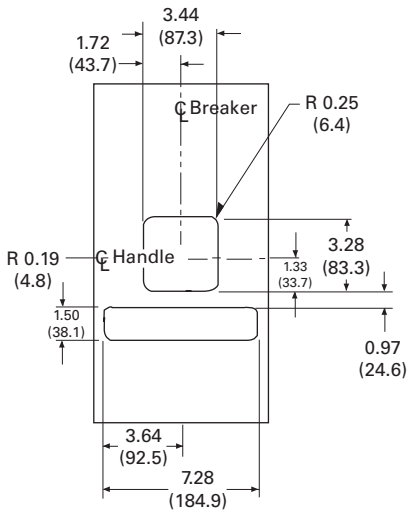
Dimensions in Inches (mm)

MD Frame

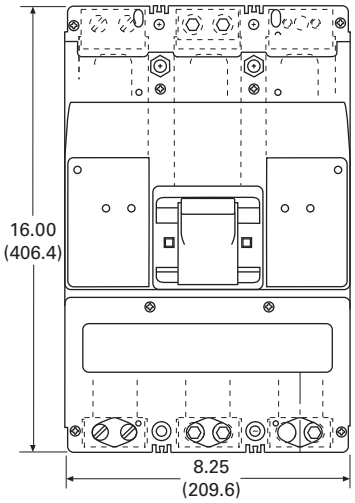
Number of Poles	Width	Height	Depth
2, 3	8.25 (209.6)	16.00 (406.4)	4.06 (103.1)

MDL-Frame, Two- and Three-Pole

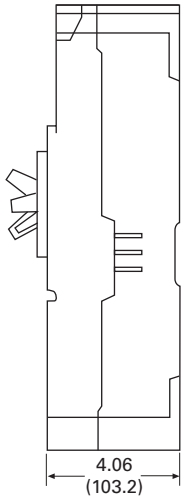
Drilling Plan



Front View



Side View



Approximate Shipping Weight, Lbs (kg)

MD Frame

	Complete Breaker		Frame Only		Trip Unit ①	
Breaker Type	Two-Pole	Three-Pole	Two-Pole	Three-Pole	Two-Pole	Three-Pole
MDL, HMDL (T/M T.U.)	26.5 (12.0)	29.0 (13.2)	24.5 (11.1)	26.0 (11.8)	2.5 (1.1)	3.0 (1.4)
MDL, HMDL (Elec. T.U.)	—	30.0 (13.6)	—	26.0 (11.8)	—	4.0 (1.8)

Note

① Thermal-magnetic only.