

Molded Case Circuit Breakers/Switches

NOARK Ex9 Series - M

Features

Molded Case Circuit Breakers (M1-M6)

NOARK Electric offers a complete range of Molded Case Circuit Breakers in six frame sizes: M1 - 150 A, M2 - 250 A, M3 - 400 A, M4 - 600 A, M5 - 800 A, and M6 - 1,200 A. Each frame size offers a range of interrupting voltage ratings from 240-690 Vac and 250-600 Vdc. The M series conforms to global standards that include UL 489, CSA C22.2 No 5 and IEC 60947-2.

- High-breaking capacity and a new patented arc extinguishing design
- New patented technology reduces the manual operating force
- High quality compact modular with energy saving and environmentally friendly design
- Installation flexibility: Bus Bar Connection, Lug Line/Load Side Connection, Plug-In, Rear Connection, Draw-Out
- Fixed and adjustable trip setting units
- Wide range of accessories: Alarm Switch and Auxiliary Contact, Shunt and Under-Voltage Trip, Interlock, NEMA and IEC Type Rotary Handle, NEMA Type Flange Handle, Motor Operator

Molded Case Motor Circuit Protectors (M1M-M6M)

NOARK Electric offers a complete range of 3 pole Molded Case Motor Circuit Protectors (MCPs, magnetic only) which are used to protect the three phase asynchronous motors in six frame sizes: M1M - 150 A, M2M - 250 A, M3M - 400 A, M4M - 600 A, M5M - 800 A, and M6M - 1,200 A. Each frame size offers a range of interrupting voltage ratings from 240-690 Vac. This series MCP conforms to global standards that include UL 489, CSA C22.2 No 5 and IEC 60947-2.

The traditional system used for this purpose is based on three different devices: a circuit breaker for protection against short-circuit, a thermal relay for protection against overload and phase loss or unbalance of phase, and a contactor for motor switching.

In particular, when selecting these devices, different factors must be taken into consideration, such as:

- The motor power
- The diagram and type of starting
- The type of motor: with cage rotor or with wound rotor
- The fault current at the point of the network where the motor is installed

Molded Case Switches (M1D-M6D)

NOARK Electric offers a complete range of Molded Case Switches in six frame sizes: M1 - 150 A, M2 - 250 A, M3 - 400 A, M4 - 600 A, M5 - 800 A, and M6 - 1,200 A. Each frame size offers a range of interrupting voltage ratings from 240-690 Vac and 250-600 Vdc. The Ex9 Series – M Molded Case Switches are only used for magnetic protection applications mainly as supply circuit protection and emergency-off disconnect switches. The Ex9 Series – M conforms to global standards that include UL 489, CSA C22.2 No 5 and IEC 60947-2.

- Instantaneous trip ability and a new patented arc extinguishing design
- New patented technology reduces the manual operating force
- High-quality compact modular with energy saving and environmentally friendly design
- Installation flexibility: Bus Bar Connection, Lug Line/Load Side Connection, Plug-In, Rear Connection, Draw-Out
- Wide range of accessories: Alarm Switch and Auxiliary Contact, Shunt and Under-Voltage Trip, Interlock, NEMA and IEC Type Rotary Handle, NEMA Type Flange Handle, Motor Operator

Molded Case Circuit Breakers/Switches

NOARK Ex9 Series - M

Accessories

- Alarm Switch
- Auxiliary Contact
- Shunt Trip
- Under-Voltage Trip
- Handle Lock
- Mechanical Interlock
- Motor Operator
- Rotary Handle
- DIN Rail Plate
- Extended Rotary Handle
- Flange Handle
- Terminal Lugs
- Plug-In Base
- Rear Connection Kit
- Draw-Out Base

Certifications



- UL 489 Listed, File No. E355392
For: Molded Case Circuit Breaker, Alarm Switch, Auxiliary Contact, Shunt Trip, Under-Voltage Trip, Handle Lock, Mechanical Interlock, Motor Operator, Rotary Handle, Extended Rotary Handle, Plug-In Base, Rear Connection Kit and Draw-Out Base



- UL 489 Listed, File No. E355396
For: Molded Case Switches



- UL 489 Listed, File No. E349009
For: Terminal Lugs
- Compliant for Canada according to CSA C22.2 No. 5-02
- IEC/EN 60947-2 Compliant
- CE Approved
- RoHS Compliant

Molded Case Circuit Breakers/Switches Product Selection Guide and Packaging

M1-M6 Product Selection Guide

M	1	S	100	T	2	L	F†	C***
NOARK Ex9 Series - M	Frame Size	Interrupting Rating	Amperage	Trip Unit	Pole	Terminal Option	Rate Code	Neutral Protection Code
	1: 150 A 2: 250 A 3: 400 A 4: 600 A 5: 800 A 6: 1200 A	S: Up to 50kA @ 240Vac (M1/M2) 65 kA @ 240Vac (M3/M4/M5/M6) 42kA @ 480Vac 22kA @ 600Vac N: 100 kA @ 240Vac Up to 65kA @ 480Vac 30kA @ 600Vac H: 150 kA @ 240Vac 100kA @ 480Vac Up to 50kA @ 600Vac	M1: 15~150 A M2: 100~250 A M3: 225~400 A M4: 400~600 A M5: 600~800A M6: 800~1200 A	T: Thermal-Magnetic E: Electronic (M6 only)	1: 1 Pole 22: 2 Poles (M1/M2 Only) 2: 2 Poles* (3 Pole Case) 3: 3 Poles 4: 4 Poles (M5-M6 Only)	Blank: Bus Bar Connection L: Lug Line/Load Side Connection (Standard configuration for M1: 1 hole, M2: 1 hole, M3: 1 hole, M4: 2 hole, M5: 600A, 700A 2 hole, M5: 800A 3 hole, M6: 800A, 1000A 3 hole, M6: 1200A 4 hole) P*: Plug-In R*: Rear Connection D*: Draw-Out	Blank: Standard MCCB (80% Rated) F: 100% Rated MCCB	Blank: Neutral Pole without protection C: Neutral Pole with 100% protection

M1M-M6M Product Selection Guide

M	1	M	S	100	T	3	L	F†
NOARK Ex9 Series - M	Frame Size	Type	Interrupting Rating	Amperage	Trip Unit	Pole	Terminal Option	Rate Code
	1: 150 A 2: 250 A 3: 400 A 4: 600 A 5: 800 A 6: 1200 A	M: Motor Protection Type	S: Up to 65 kA @ 240Vac 42kA @ 480Vac 22kA @ 600Vac N: 100 kA @ 240Vac Up to 65kA @ 480Vac 30kA @ 600Vac H: 150 kA @ 240Vac 100kA @ 480Vac Up to 50kA @ 600Vac	M1: 3~150 A M2: 250 A M3: 400 A M4: 600 A M5: 800A M6: 1200 A	T: Magnetic Only E: Electronic (M6 only)	3: 3 Poles	Blank: Bus Bar Connection L: Lug Line/Load Side Connection (Standard configuration for M1: 1 hole, M2: 1 hole, M3: 1 hole, M4 2 hole. Optional Configuration for M1: 3 hole, M3: 2 hole, need to be ordered separately.)	Blank: Standard MCCB (80% Rated) F: 100% Rated MCCB

M1D-M6D Product Selection Guide

M	1	D	H	100	2	L
NOARK Ex9 Series - M	Frame Size	Protection Type	Switch Type	Amperage	Pole	Terminal Option
	1: 150 A 2: 250 A 3: 400 A 4: 600 A 5: 800 A 6: 1200 A	D: Disconnect Switch	Blank: Normal Interrupting Capacity H: High Interrupting Capacity	M1: 150 A M2: 125~250 A M3: 250~400 A M4: 600 A M5: 600~800A M6: 800~1200 A	2*: 2 Poles 3: 3 Poles 4: 4 Poles (M5-M6 Only)	Blank: Bus Bar Connection L: Lug Line/Load Side Connection (1-Hole) L2: Lug Line/Load Side Connection (2-Holes) P*: Plug-In R*: Rear Connection D*: Draw-Out

*: Used for M1-M4
***: Used for M1-M5
***: M5 4P Only
†: M6 only

Molded Case Circuit Breakers/Switches M1-M3 Specifications

		M1							M2						M3			
Rated Current (A)		15~150							100~250						225~400			
Number of Poles		1	2		2*, 3				1	2		2*,3						
Breaker Type		N	S	N	H	S	N	H	N	S	N	S	N	H	S	N	H	
Rated Voltage 50/60 Hz	Vac	480	600		600**				480	600		600**						
	Vdc	250	500						250	500								
Interrupting Capacity (kA rms)																		
Circuit Breaker Ratings UL 489 CSA C22.2 (kA rms) Vac 50/60 Hz	240 Vac	50	50	100	150	50	100	150	50	50	100	50	100	150	65	100	150	
	480 Vac	10	35	65	100	35	65	100	10	35	65	35	65	100	42	65	100	
	600 Vac	-	14	20	25	14	20	25	-	14	20	14	20	25	18	25	30	
	250 Vdc 1 Pole	25	-						25	-								
	500 Vdc 2 Poles	-	20	35	50	20	35	50	-	20	35	20	35	50	35	50	65	
600 Vdc 3 Poles	-	-			20	35	50	-	-		20	35	50	35	50	65		
Circuit Breaker Ratings IEC 60947-2	220 / 240 Vac	50	50	100	150	50	100	150	50	50	100	50	100	150	65	100	150	
	380 / 415 Vac	-	5	8	10	5	8	10	-	6	10	6	10	12	10	15	20	
	660 / 690 Vac	-							-									
Ultimate Breaking Capacity (Icu = 100% Ics) (kA rms)	250 Vdc 1 Pole	25	-						25	-								
	500 Vdc 2 Poles	-	20	35	50	20	35	50	-	-		20	35	50	35	50	65	
	500 Vdc 3 Poles	-	-			25	35	50	-	-		25	35	50	35	50	65	
Current Rating (A) @ 104 °F (40 °C)		15~150							100~250						225~400			
Thermal-Magnetic Trip Units (Fixed)	A = Adjustable T = Thermal F = Fixed M = Magnetic	FT/ FM	15~45 FT/FM 50~150A AT/FM		15~45A FT/FM 50~100A AT/FM 125~150A AT/AM				FT/ FM	AT / AM								
Accessories																		
Alarm Switch																		
Auxiliary Contact		-		■					-		■							
Shunt Trip				■							■							
Under-Voltage Trip																		
Handle Lock		■						■	■								■	
Flange Handle								■									■	
Mechanical Interlock																		
Motor Operator																		
Handle Operators																		
Terminal Cover and Kits																		
Connection																		
Bus Bar Connection																		
Lug Line/Load Side Connection			■					■		■				■			■	
Plug-In																		
Rear Connection			■							■								
Draw-Out																		

* 2 pole in a 3 pole case

** 600 Vdc only available for 3 pole and 4 pole

Molded Case Circuit Breakers/Switches M4-M6 Specifications

		M4			M5			M6	
Rated Current (A)		400~600			600~800			800~1,200	
Number of Poles		2*,3			2*,3,4			3, 4	
Breaker Type		S	N	H	S	N	H	S	N
Rated Voltage 50/60 Hz	Vac	600**						600	
	Vdc							-	
Interrupting Capacity (kA rms)									
Circuit Breaker Ratings UL 489 CSA C22.2 (kA rms) Vac 50/60 Hz	240 Vac	65	100	150	65	100	150	65	100
	480 Vac	42	65	100	42	65	100	42	65
	600 Vac	22	30	50	22	30	50	22	42
	500 Vdc 2 Poles	35	50	65	35	50	65	-	
	600 Vdc 3 Poles	35	50	65	35	50	65	-	
Circuit Breaker Ratings IEC 60947-2	220 / 240 Vac	65	100	150	65	100	150	65 (45)	85 (45)
	380 / 415 Vac								
Ultimate Breaking Capacity (Icu = 100% Ics) (kA rms)	660 / 690 Vac	12	15	20	12	15	20	30	30
	500 Vdc 3 Poles	35	50	65	35	50	65	-	
	500 Vdc 2 Poles	35	50	65	35	50	65	-	
Current Rating (A) @ 104 °F (40 °C)		400~600			600~800			800~1,200	
Thermal-Magnetic Trip Units (Fixed)	A = Adjustable T = Thermal F = Fixed M = Magnetic	AT / AM						Electronic	
Accessories									
Alarm Switch									
Auxiliary Contact									
Shunt Trip									
Under-Voltage Trip					■				
Handle Lock		■							
Flange Handle									
Mechanical Interlock									
Motor Operator									
Handle Operators					-				
Terminal Cover and Kits									
Connection									
Bus Bar Connection		■			■				
Lug Line/Load Side Connection		-							
Plug-In		-							
Rear Connection		■			-				
Draw-Out									

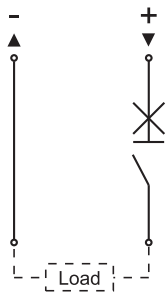
Molded Case Circuit Breakers/Switches M1-M6 Specifications

M1-M6 Specifications

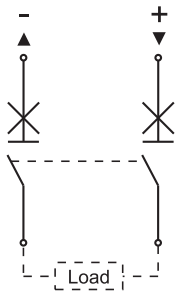
	M1	M2	M3	M4	M5	M6				
Insulation Voltage (Vi)	800 Vac									
Impulse Withstand Voltage (Vimp)	8 kVac									
Operational Voltage (Ve)	IEC	690 Vac								
	UL	600 Vac								
IEC Ics (% Icu)	100%									
Utilization Category	A									
Mechanical Operating Cycles	10,000		8,000		3,000					
Electrical Operating Cycles	6,000		5,000		500					
Dimensions LxWxD in (mm)	1 Pole	6.46x1.4x3.33 (164x35x84.5)	7.17x1.57x3.47 (182x40x88)	-						
	2 Pole	6.46x2.44x3.33 (164x62x84.5)	7.17x2.95x3.47 (182x75x88)	-						
	2 Pole*	6.46x3.54x3.33 (164x90x84.5)	7.17x4.13x3.47 (182x105x88)	11.22x5.51x4.59 (285x140x116.5)	12.32x7.68x5.43 (313x195x138)	-				
	3 Pole			-		16.18x7.68x7.58 (411x195x192.5)	22.64x9.84x15.16 (575x250x385)			
	4 Pole			-		-		16.18x10.2x7.58 (411x260x192.5)	22.64x12.6x15.16 (575x320x385)	
Weight of Unit lb (kg)	1 Pole	1.47 (0.67)	1.76 (0.8)	-						
	2 Pole	2.53 (1.15)	3.3 (1.5)	-						
	2 Poles*	3.17 (1.44)	3.75 (1.70)	8.97 (4.07)	20.94 (9.5)	27.8 (12.5)	-			
	3 Poles	3.68 (1.67)	4.41 (2.00)	13.45 (6.1)	25.35 (11.5)	33.18 (15.05)	55.56 (25.2)			
	4 Poles	-		-		43.43 (19.7)	69.67 (31.6)			
Cable Connection Wire 167 °F (75 °C) Cu Wire Only AWG (mm ²)	1-Hole	14-3/0 (2.5-95)	1-Hole 8 - 350 kcmil (10-185)	1-Hole	3/0 - 500 kcmil (95-240)	2-Holes (2x) 3/0 - 400 kcmil ((2x) 95-185)	2-Holes	250-600kcmil (120-300)	3-Holes	3/0- 750 kcmil (95-300)
	3-Holes	14-3/0 (2.5-6)		2-Holes	3 - 250 kcmil (35-120)		3-Holes	4/0 AWG-500 kcmil (100-250)	4-Holes	3/0- 500 kcmil (95-240)
Lugs in-lb (N.m)	89 (10)		230 (23)		310 (35)		398 (45)		310 (35)	

M1-M5 Interrupting Polarity for DC Application

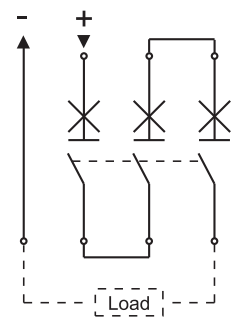
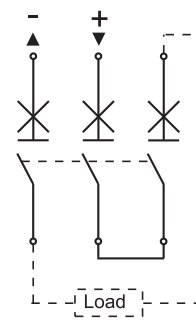
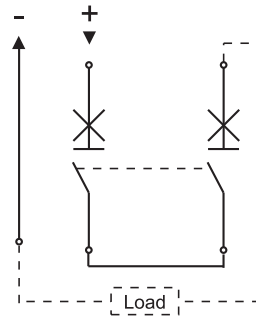
1 Pole



2 Poles



3 Poles



* 2 pole in a 3 pole case

Molded Case Circuit Breakers/Switches

M1 Trip Unit

M1 Adjustable Thermal, Fixed Magnetic

M1 1 Pole

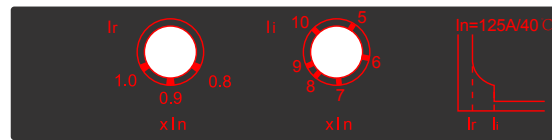
- Fixed Magnetic: 150~1,500 A tripping current
- Fixed Thermal: 15~150 A rated current

M1 2 Poles

- Fixed Thermal: 15~45 A rated current
- Adjustable Thermal: 50~150 A rated current
Adjustable: 0.8~1 x In
- Fixed Magnetic: 150~1,500 A tripping current

M1 3 Poles

- Fixed Thermal: 15-45A rated current
- Adjustable Thermal: 50-150A rated current
Adjustable: 0.8~1×In
- Fixed Magnetic: 150~1,000 A tripping current
- Adjustable Magnetic: 125~150 A rated current
Adjustable: 5~10 x In



M1 - 1 Pole

Fixed Thermal Overload Protection	I_R	15 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	60 A	70 A	80 A	90 A	100 A	125 A	150 A
	Fixed 1.0 x In		15	20	25	30	35	40	45	50	60	70	80	90	100	125
Fixed Magnetic Short Circuit Protection	I_i	15 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	60 A	70 A	80 A	90 A	100 A	125 A	150 A
	Fixed 10 x In		150	200	250	300	350	400	450	500	600	700	800	900	1000	1250

M1 - 2 Poles

Adjustable Thermal Overload Protection	I_R	15 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	60 A	70 A	80 A	90 A	100 A	125 A	150 A	
	0.8 x In									40	48	56	64	72	80	100	120
	0.9 x In									45	54	63	72	81	90	112.5	135
	1.0 x In									50	60	70	80	90	100	125	150
Fixed Magnetic Short Circuit Protection	I_i	15 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	60 A	70 A	80 A	90 A	100 A	125 A	150 A	
	Fixed 10 x In		150	200	250	300	350	400	450	500	600	700	800	900	1,000	1250	1500

M1 - 3 Poles

Adjustable Thermal Overload Protection	I_R	15 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	60 A	70 A	80 A	90 A	100 A	125 A	150 A	
	0.8 x In									40	48	56	64	72	80	100	120
	0.9 x In									45	54	63	72	81	90	112.5	135
	1.0 x In									50	60	70	80	90	100	125	150
Fixed Magnetic Short Circuit Protection	I_i	15 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	60 A	70 A	80 A	90 A	100 A	125 A	150 A	
	Fixed 10 x In		150	200	250	300	350	400	450	500	600	700	800	900	1,000	1250	1500
Adjustable Magnetic Short Circuit Protection	I_i	15 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	60 A	70 A	80 A	90 A	100 A	125 A	150 A	
	5 x In													625	750		
	6 x In													750	900		
	7 x In													875	1050		
	8 x In													1000	1200		
	10 x In													1125	1350		

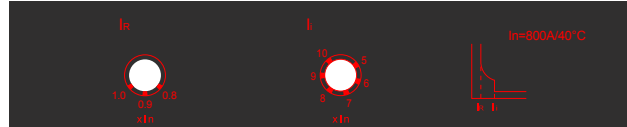
Molded Case Circuit Breakers/Switches

M2-M5 Trip Unit

M2-M5 Adjustable Thermal, Adjustable Magnetic

M2 1 Pole

- Fixed Magnetic: 1,000~2,500 A tripping current
- Fixed Thermal: 100~250 A rated current



M2 2 Poles/3 Poles - M5

- Adjustable Thermal: 100~800 A rated current
Adjustable: 0.8~1 x In
- Adjustable Magnetic: 700~8,000 A tripping current
Adjustable:
M2 - 2 Poles/3 Poles 100~150 = 7~12 x In
M2 - 2 Poles/3 Poles 175~250 = 5~10 x In
M3/M4 225~600 = 5~10 x In
M5 600~800=5~10 x In

		M2 - 1 Pole						
Fixed Thermal	I_R	100 A	125 A	150 A	175 A	200 A	225 A	250 A
Overload Protection	Fixed 1.0 x In	100	125	150	175	200	225	250
Fixed Magnetic	I_i	100A	125A	150A	175A	200A	225A	250A
Short Circuit Protection	Fixed 10 x In	1000	1250	1500	1750	2000	2250	2500

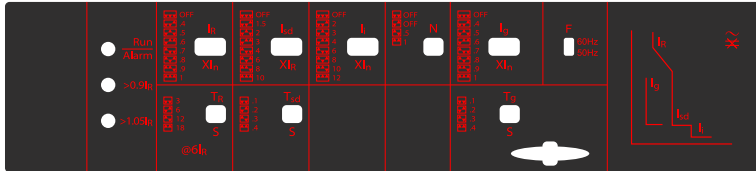
		M2 - 2 Poles/3 Pole						
Adjustable Thermal	I_R	100 A	125 A	150 A	175 A	200 A	225 A	250 A
Overload Protection	0.8 x In	80	100	120	140	160	180	200
	0.9 x In	90	112.5	135	157.5	180	202.5	225
	1.0 x In	100	125	150	175	200	225	250
Adjustable Magnetic	I_i	100 A	125 A	150 A	175 A	200 A	225 A	250 A
Short Circuit Protection	7 x In	700	875	1050				
	8 x In	800	1000	1200				
	9 x In	900	1125	1350				
	10 x In	1000	1250	1500				
	11 x In	1100	1375	1650				
	12 x In	1200	1500	1800				
Adjustable Magnetic	I_i	100A	125A	150A	175A	200A	225A	250A
Short Circuit Protection	5 x In				875	1000	1125	1250
	6 x In				1050	1200	1350	1500
	7 x In				1225	1400	1575	1750
	8 x In				1400	1600	1800	2000
	9 x In				1575	1800	2025	2250
	10 x In				1750	2000	2250	2500

		M3 - 400 A					M4 - 600 A			M5 - 800 A		
Adjustable Thermal	I_R	225 A	250 A	300 A	350 A	400 A	400 A	500 A	600 A	600 A	700 A	800 A
Overload Protection	0.8 x In	180	200	240	280	320	320	400	480	480	560	640
	0.9 x In	202.5	225	270	315	360	360	450	540	540	630	720
	1.0 x In	225	250	300	350	400	400	500	600	600	700	800
Adjustable Magnetic	I_i	225 A	250 A	300 A	350 A	400 A	400 A	500 A	600 A	600 A	700 A	800 A
Short Circuit Protection	5 x In	1,125	1,250	1,500	1,750	2,000	2,000	2,500	3,000	3,000	3,500	4,000
	6 x In	1,350	1,500	1,800	2,100	2,400	2,400	3,000	3,600	3,600	4,200	4,800
	7 x In	1,575	1,750	2,100	2,450	2,800	2,800	3,500	4,200	4,200	4,800	5,600
	8 x In	1,800	2,000	2,400	2,800	3,200	3,200	4,000	4,800	4,800	5,600	6,400
	9 x In	2,025	2,250	2,700	3,150	3,600	3,600	4,500	5,400	5,400	6,300	7,200
	10 x In	2,250	2,500	3,000	3,500	4,000	4,000	5,000	6,000	6,000	7,000	8,000

Molded Case Circuit Breakers/Switches

M6 Trip Unit

Electronic Trip Unit



These trip functions are available:

L=Long-time Delay: Long-time Delay Protection Current; Long-time Delay Protection Time

S=Short-time Delay: Short-time Delay Protection Current: Short-time Delay Protection Time

I=Instantaneous Trip

G=Ground Fault Protection Current: Short-time Delay Protection Time

Neutral Protection: Long-time Delay, Short-time Delay, Instantaneous protection

Frequency Selection available: 50 or 60 Hz

Long-time delay protection current (IR): 8 specific setting (IR): OFF, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0*In

Note:

Thermal memory function: protect load circuits against the affects of repeated overload conditions. When circuit breaker immediately closes after a long-time trip, and the continuous current exceeds the long-time setting value (Ir), thermal memory function will automatically reduce the trip time. Given repeated overload current, thermal memory function will make circuit breaker trip in gradually reduced time. When the load current resumes normally, thermal current function will start to reset. It will totally reset in about 1 hour. So next long-time trip time will correspond to the setting value. Thermal memory function will be cleared in OFF setting.

Long-time delay protection time (TR): 4 specific setting (TR) @6*IR: 3s, 6s, 12s, 18s

Working Current (I)	Long-time delay protection time (TR)
$\leq 1.05*IR$	$\geq 2h$ not trip
$\leq 1.3*IR$	$< 1h$ trip
$=6*IR$	3s/6s/12s/18s

Short-time delay protection current (I_{sd}): 8 specific setting (I_{sd}): OFF, 1.5, 2, 3, 4, 6, 8, 10*IR

Short-time delay protection time (T_{sd}): 4 specific setting (T_{sd}): 0.1s, 0.2s, 0.3s, 0.4s

Instantaneous protection Current (I_i): 8 specific setting (I_i): OFF, 2, 3, 4, 6, 8, 10, 12*In

Neutral Protecting:

Neutral long-time delay protection, 3 specific setting IR(N): OFF, 0.5, 1

Neutral Line Short-time delay protection setting, same as power line, I_{sd}(N)

Neutral Line Instantaneous protection setting, same as power line, I_i(N)

Ground Fault Protection Current Setting: 8 specific setting (I_g): OFF, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1*In

Ground Fault Protection Time Setting: 4 specific setting (T_g): 0.1s, 0.2s, 0.3s, 0.4s

Frequency Selection Setting: 2 specific setting: 50Hz, 60Hz

Molded Case Circuit Breakers/Switches M1M-M6M Specifications MCP

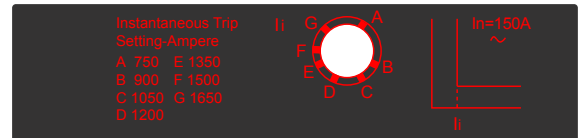
		M1M			M2M			M3M			M4M			M5M			M6M		
Current Range (A)		3~150			250			400			600			800			1200		
Number of Poles		3																	
Breaker Type		S	N	H	S	N	H	S	N	H	S	N	H	S	N	H	S	N	
Rated Voltage 50/60 Hz Vac		600																	
Interrupting Capacity (kA rms)																			
Circuit Breaker Ratings UL 489	240 Vac	50	100	150	50	100	150	65	100	150	65	100	150	65	100	150	65	100	
CSA C22.2 (kA rms)	480 Vac	35	65	100	35	65	100	42	65	100	42	65	100	42	65	100	42	65	
Vac 50/60 Hz	600 Vac	14	20	25	14	20	25	18	25	30	22	30	50	22	30	50	22	42	
Circuit Breaker Ratings IEC 60947-2	220 / 240 Vac	50	100	150	50	100	150	65	100	150	65	100	150	65	100	150	65	100	
Ultimate Breaking Capacity (Icu = 100% Ics)	380 / 415 Vac																65 (45)	85 (45)	
(kA rms)	660 / 690 Vac	5	8	10	6	10	12	10	15	20	12	15	20	12	15	20	30	30	
Magnetic Trip Units	A = Adjustable T = Thermal F = Fixed M = Magnetic	AM																	
Accessories																			
Alarm Switch																			
Auxiliary Contact																			
Shunt Trip																			
Under-Voltage Trip																			
Handle Lock																			
Flange Handle																			
Mechanical Interlock																			
Motor Operator																			
Handle Operators																			
Terminal Cover and Kits																			
Connection																			
Bus Bar Connection																			
Lug Line/Load Side Connection																			

Molded Case Circuit Protectors M1M-M3M Trip Unit

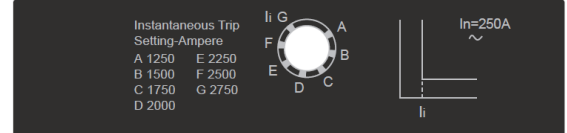
Adjustable Magnetic

- Adjustable Magnetic
- 75-14400A Tripping Current
- Continuous Amperes: M1M~M6M 3~1200A
- Frames applicable to M1M:150A, M2M: 250A, M3M: 400A, M4M: 600A, M5M: 800A, M6M: 1200A

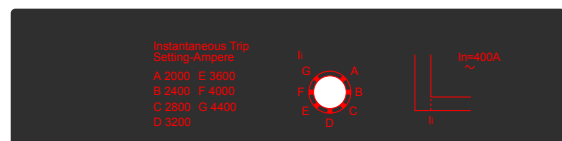
		M1M								
		I_i	3A	7A	15A	30A	50A	70A	100A	150A
Adjustable Magnetic Short Circuit Protection	A	21	35	75	150	250	350	500	750	
	B	24	42	90	180	300	420	600	900	
	C	27	49	105	210	350	490	700	1050	
	D	30	56	120	240	400	560	800	1200	
	E	33	63	135	270	450	630	900	1350	
	F		70	150	300	500	700	1000	1500	
	G				330	550	770	1100	1650	



		M2M	
		I_i	250 A
Adjustable Magnetic Short Circuit Protection	A	1250	
	B	1500	
	C	1750	
	D	2000	
	E	2250	
	F	2500	
	G	2750	



		M3M	
		I_i	400A
Adjustable Magnetic Short Circuit Protection	A	2000	
	B	2400	
	C	2800	
	D	3200	
	E	3600	
	F	4000	
	G	4400	



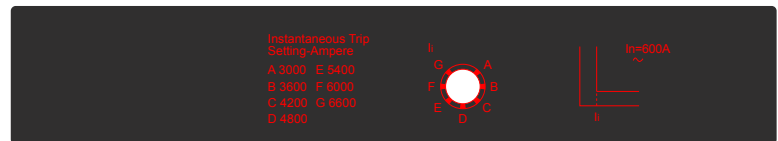
Molded Case Circuit Protectors

M4M-M6M Trip Unit

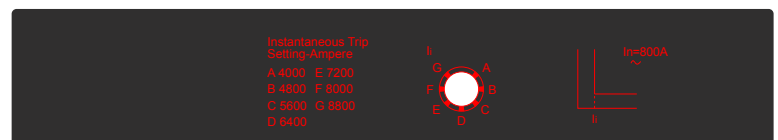
Adjustable Magnetic

- Adjustable Magnetic
- 75-14400A Tripping Current
- Continuous Amperes: M1M~M6M 3~1200A
- Frames applicable to M1M:150A, M2M: 250A, M3M: 400A, M4M: 600A, M5M: 800A, M6M: 1200A

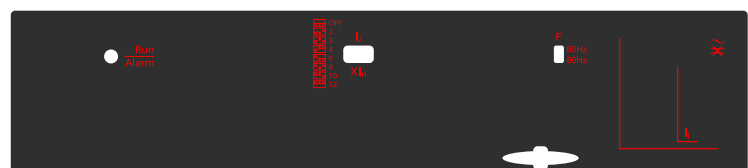
		M4M	
		I_i	600A
Adjustable Magnetic Short Circuit Protection	A	3000	
	B	3600	
	C	4200	
	D	4800	
	E	5400	
	F	6000	
	G	6600	



		M5M	
		I_i	800A
Adjustable Magnetic Short Circuit Protection	A	4000	
	B	4800	
	C	5600	
	D	6400	
	E	7200	
	F	8000	
	G	8800	

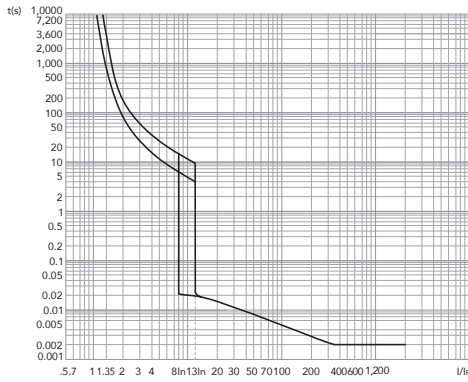


		M6M	
		I_i	1200A
Adjustable Magnetic Short Circuit Protection	2	2400	
	3	3600	
	4	4800	
	6	7200	
	8	9600	
	10	12000	
	12	14400	

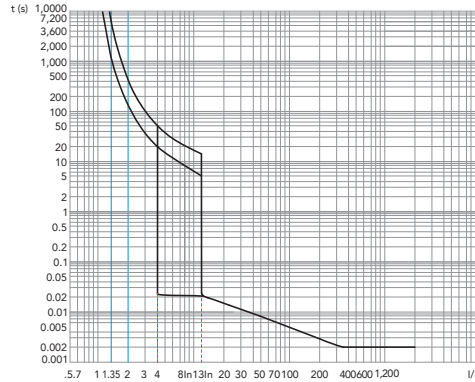


Molded Case Circuit Breakers/Switches M1-M3 Trip Curves

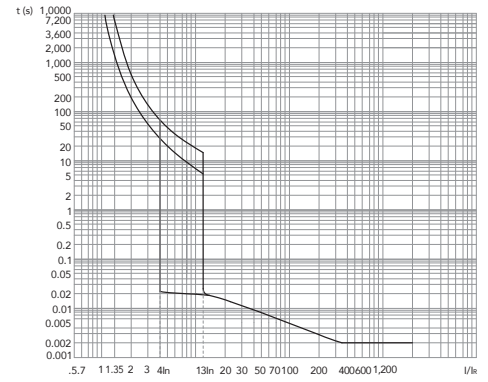
M1 (15~35 A)



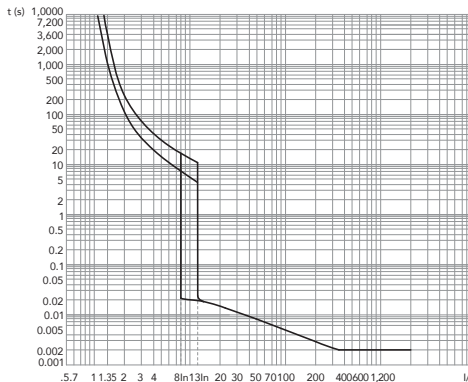
M1 (125~150 A)



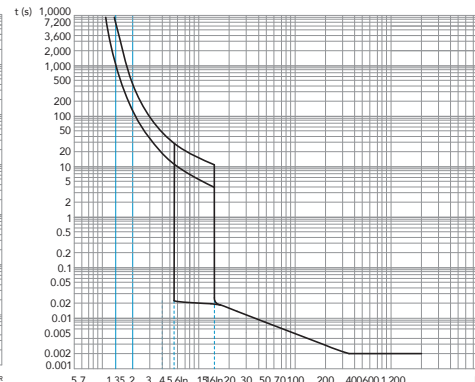
M3 (225~350 A)



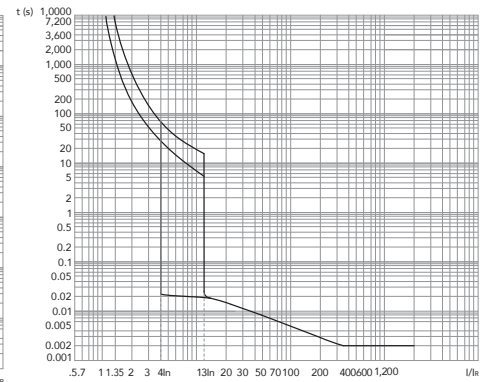
M1 (40~50 A)



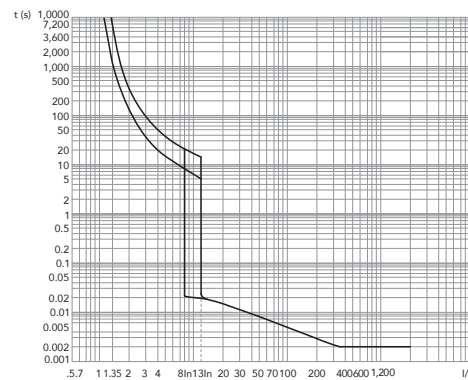
M2 (100~150 A)



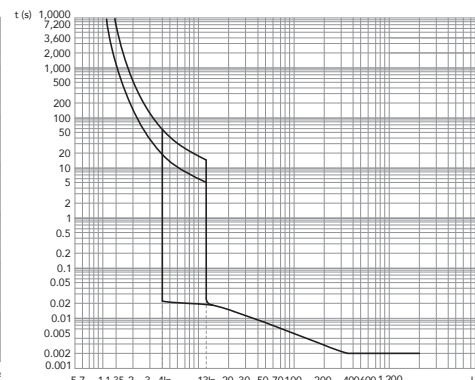
M3 (400 A)



M1 (60~100 A)

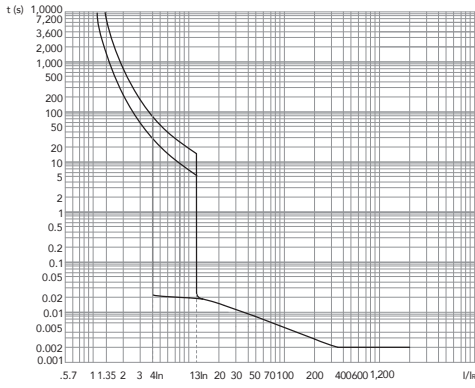


M2 (175~250 A)

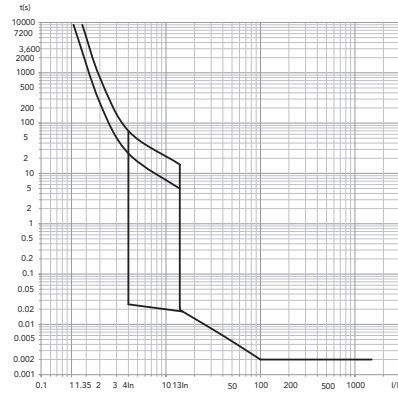


Molded Case Circuit Breakers/Switches M4-M6 Trip Curves

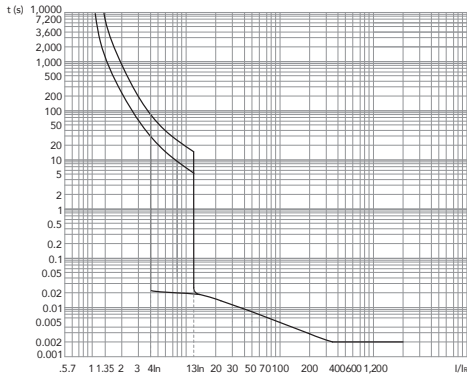
M4 (400 A)



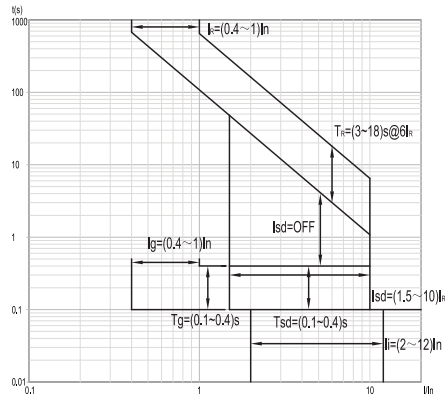
M5 (600~800 A)



M4 (500~600 A)



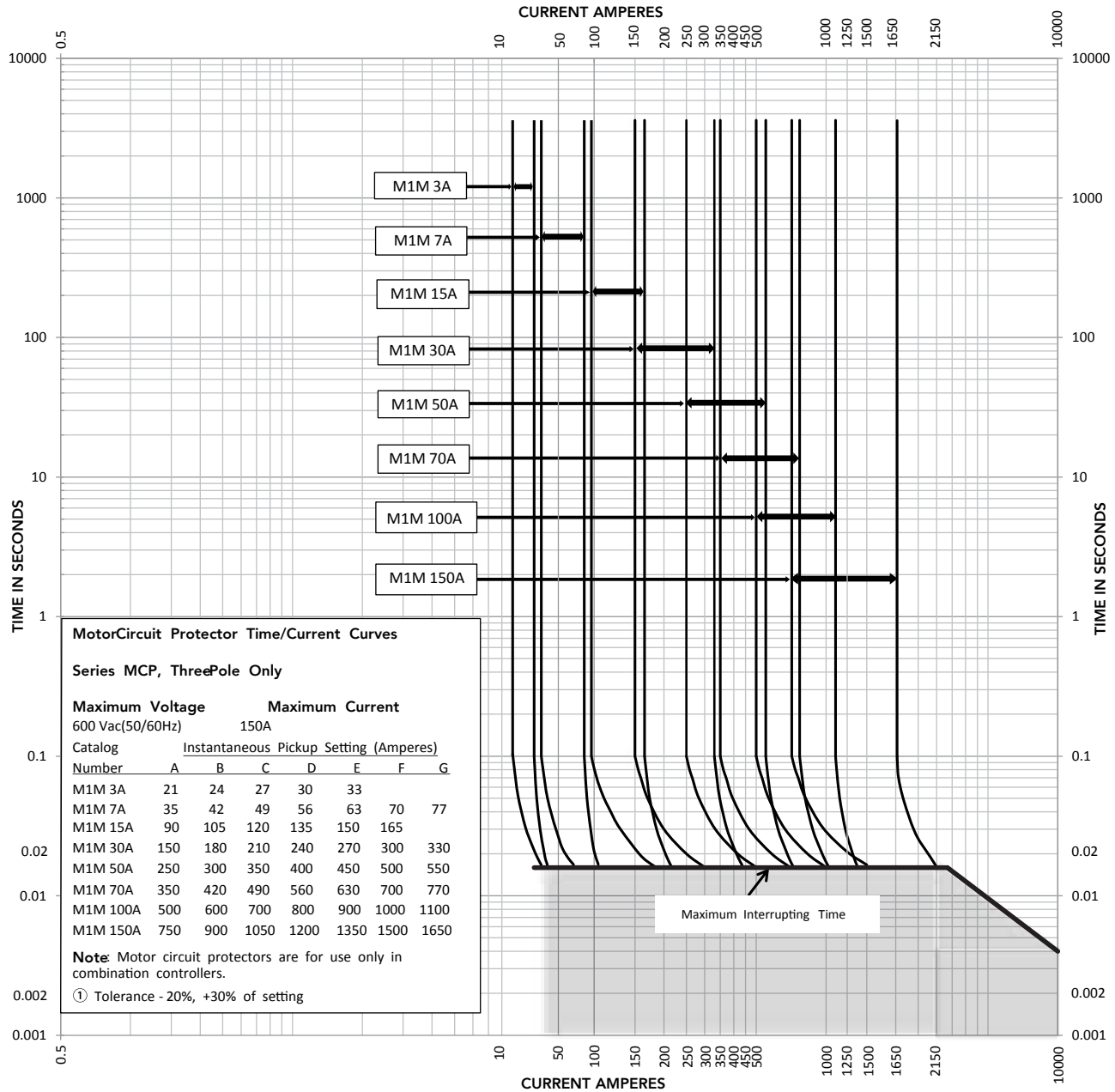
M6 (800~1200 A)



Molded Case Circuit Breakers/Switches M1M Trip Curves

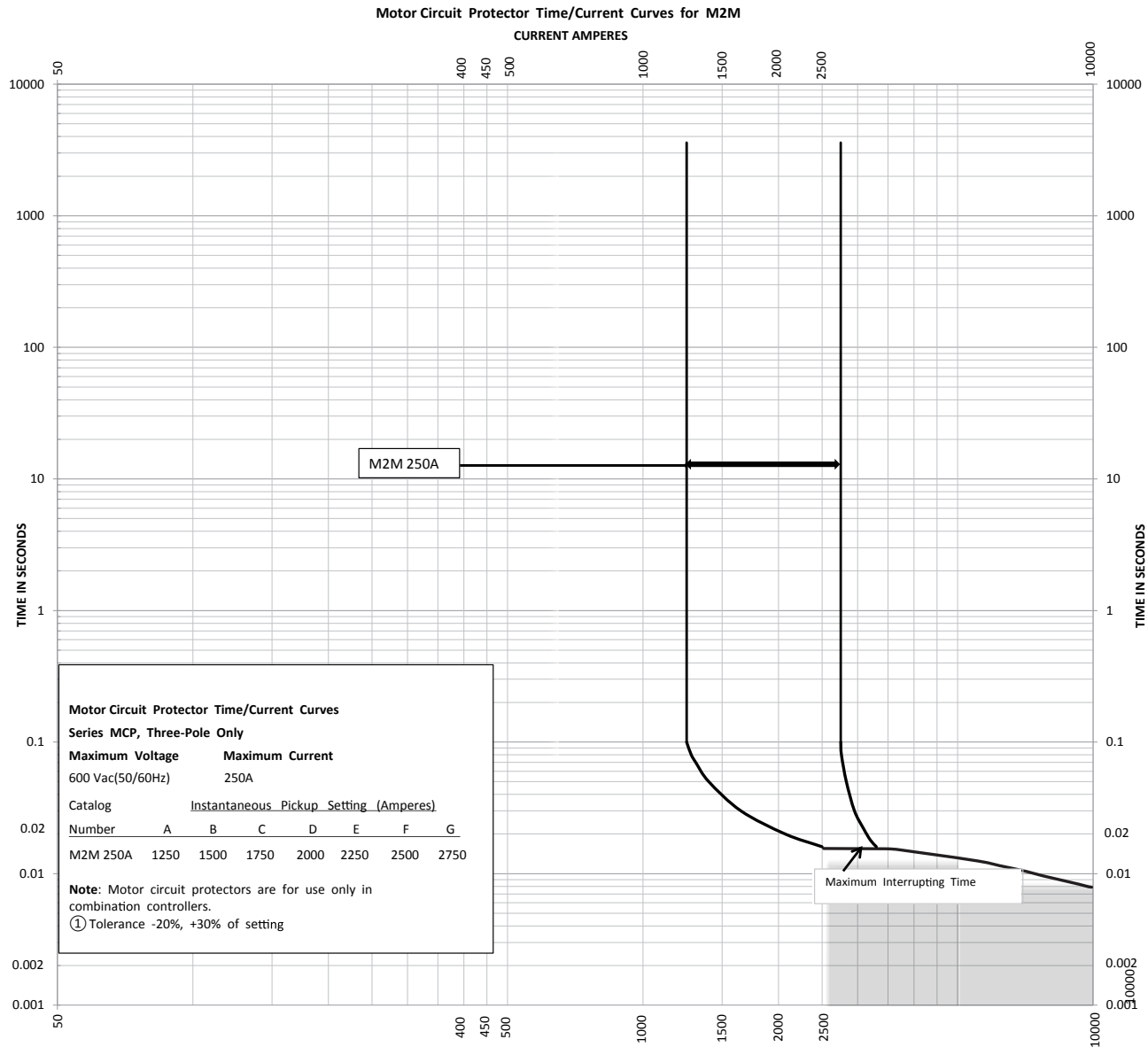
M1M

Motor Circuit Protector Time/Current Curves for M1M



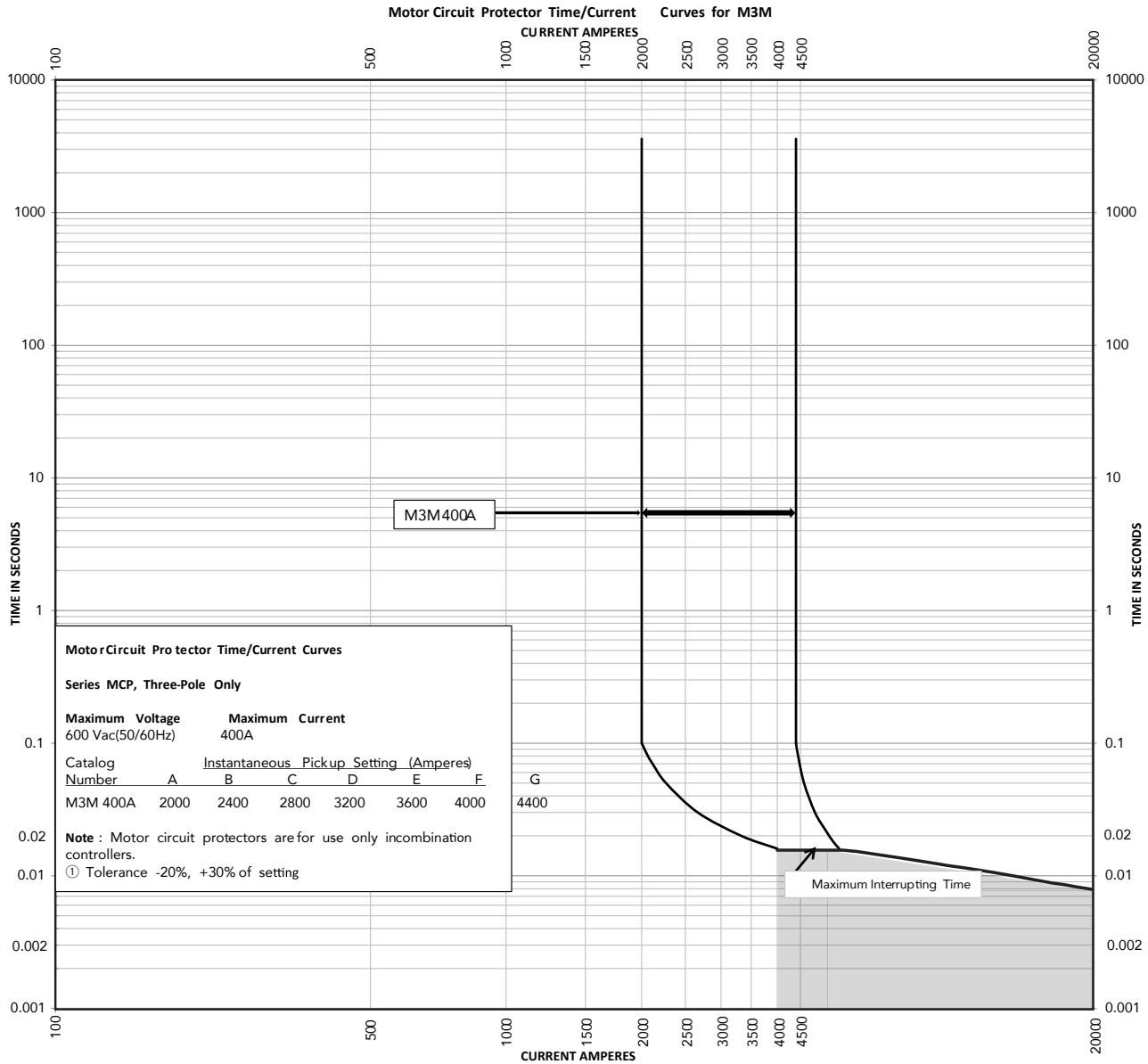
Molded Case Circuit Breakers/Switches M2M Trip Curves

M2M



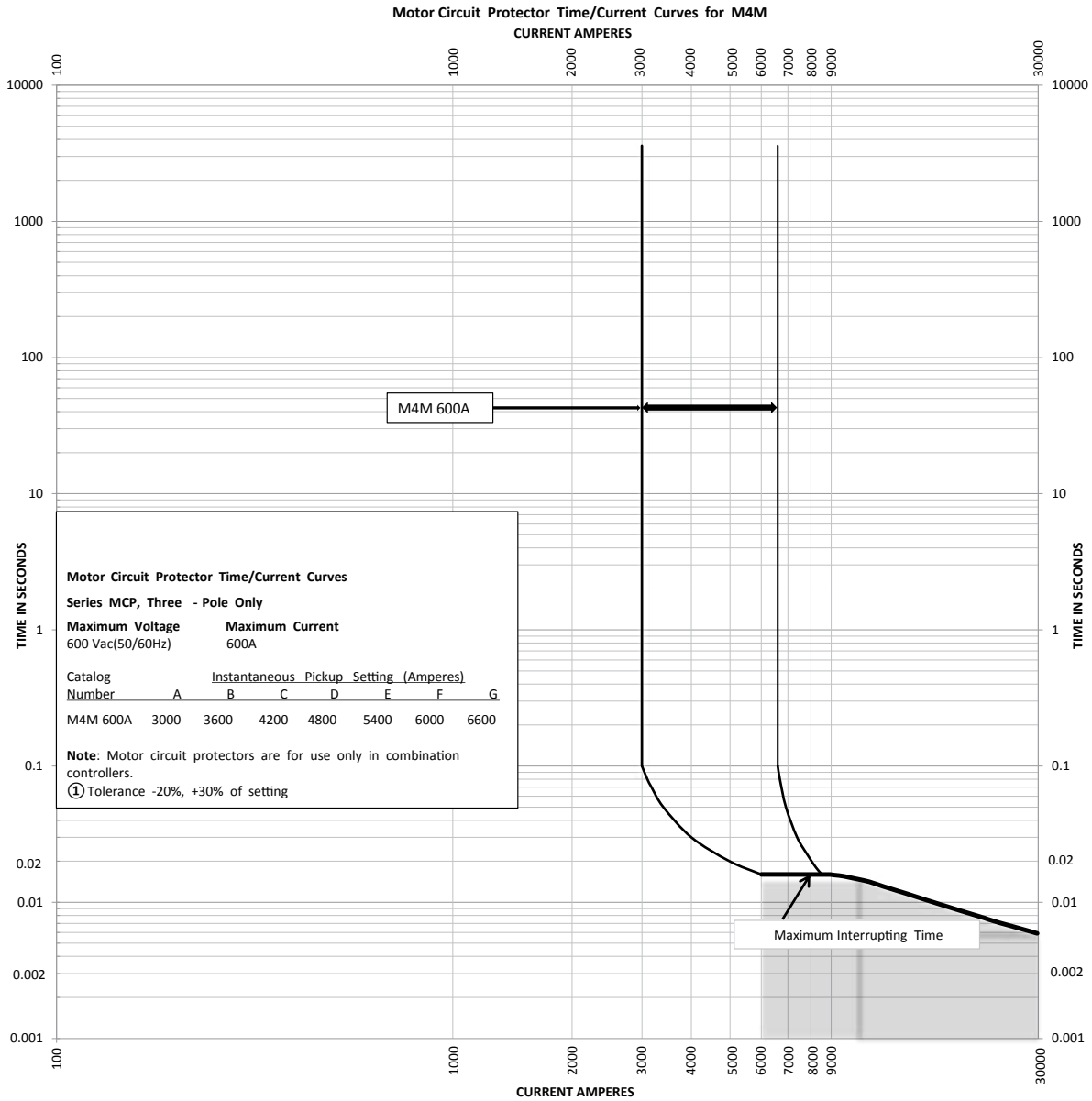
Molded Case Circuit Breakers/Switches M3M Trip Curves

M3M



Molded Case Circuit Breakers/Switches M4M Trip Curves

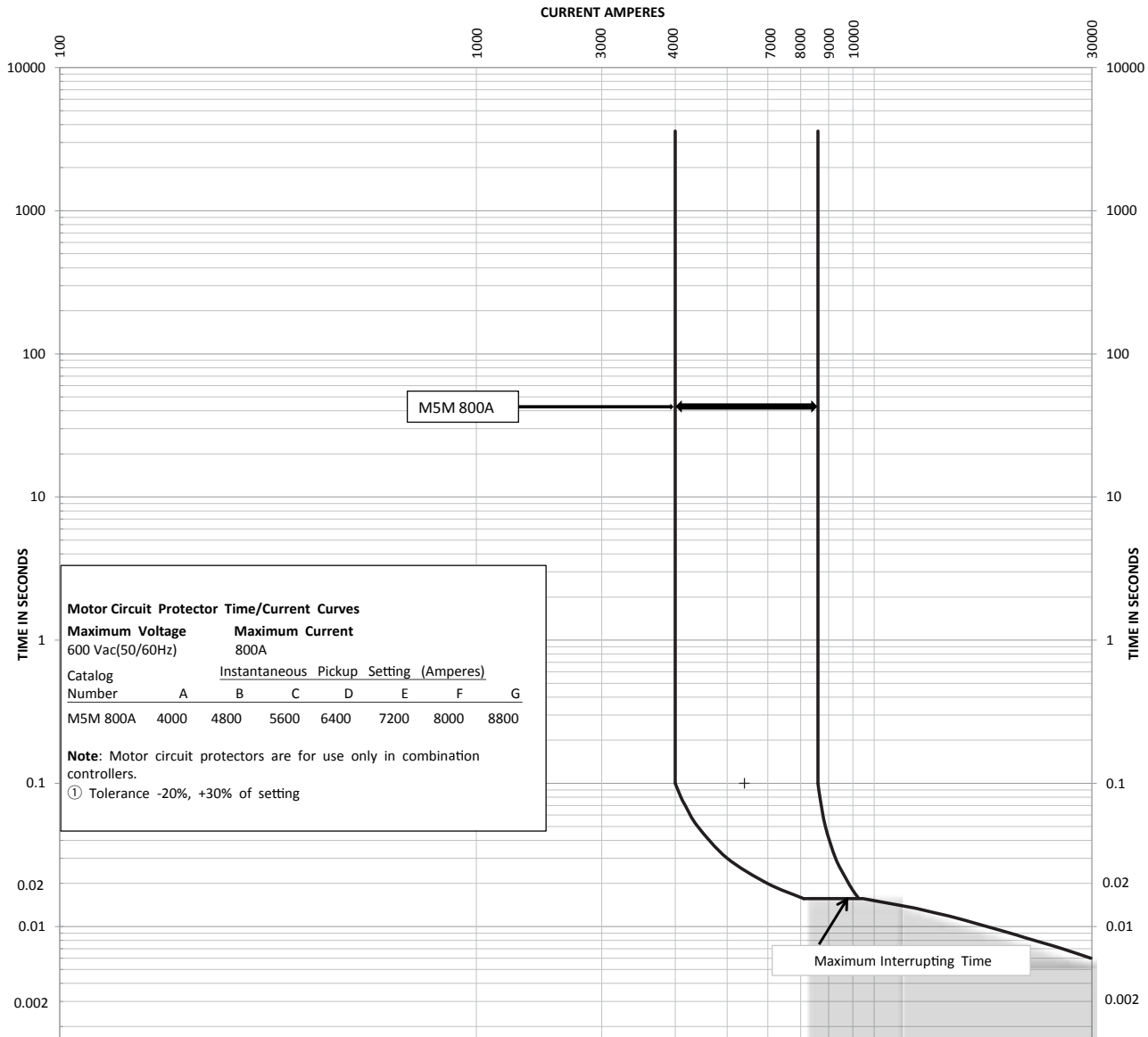
M4M



Molded Case Circuit Breakers/Switches M5M Trip Curves

M5M

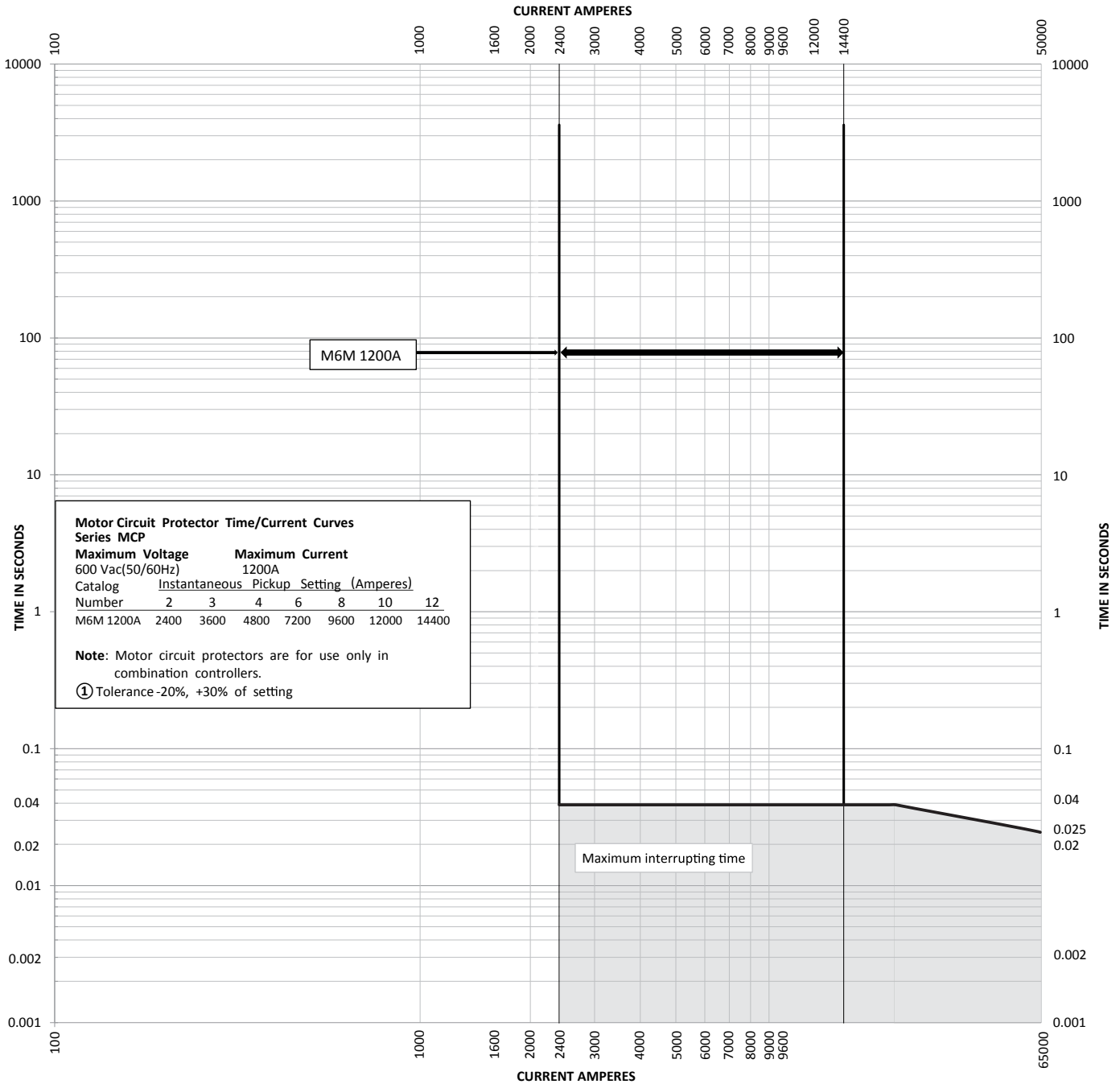
Motor Circuit Protector Time/Current Curves for M5M



Molded Case Circuit Breakers/Switches M6M Trip Curves

M6M

Motor Circuit Protector Time/Current Curves for M6M



Molded Case Circuit Breakers/Switches M1D-M6D Specifications MCS

		M1D/H		M2D/H		M3D/H		M4D/H		M5D/H		M6D
Rated Current (A)		15 ~ 150		100 ~ 250		250~400		400 ~ 600		800		800~1200
Number of Poles		2, 3								2,3,4		3,4
Switch Type		M1D	M1DH	M2D	M2DH	M3D	M3DH	M4D	M4DH	M5D	M5DH	M6D
Rated Voltage 50/60 Hz	Vac	600										
	Vdc	600										-
Withstand Rating* (kA rms)												
Circuit Breaker Ratings UL 489- -C-SA C22.2 (kA rms) Vac 50/60 Hz	240 Vac	100	150	100	150	100	150	100	150	100	150	100
	480 Vac	65	100	65	100	65	100	65	100	65	100	65
	600 Vac	20	25	20	25	25	30	30	50	30	50	42
	500 Vdc 2 Poles	35	50	35	50	50	65	50	65	50	65	-
	600 Vdc 3 Poles	35	50	35	50	50	65	50	65	50	65	-
Circuit Breaker Ratings IEC 60947-2	220 / 240 Vac	100	150	100	150	100	150	100	150	100	150	85 (60)
	380 / 415 Vac											
	660 / 690 Vac	8	10	10	12	15	20	15	20	15	20	30
Ultimate Breaking Capacity (Icu = 100% Ics) (kA rms)	500 Vdc 3 Poles	35	50	35	50	50	65	50	65	-	-	-
	500 Vdc 2 Poles	35	50	35	50	50	65	50	65	50	50	-
Trip Current (A)		15xIn		12xIn		12xIn		10xIn		10xIn		15xIn
Accessories												
Alarm Switch												
Auxiliary Contact												
Shunt Trip												
Under-Voltage Trip												
Handle Lock												
Mechanical Interlock												
Motor Operator												
Handle Operator												
Terminal Kits												
Connection												
Bus Bar Connection												
Lug Line/Load Side Connection												
Plug-In												
Rear Connection												
Draw-Out		-				■	-	■	-			-

*NOTE: The withstand rating is the fault, at rated voltage, that the molded case switch will withstand without damage when protected by a circuit breaker or fuse with an equal continuous current rating.

Molded Case Circuit Breakers/Switches M1D-M6D Specifications MCS

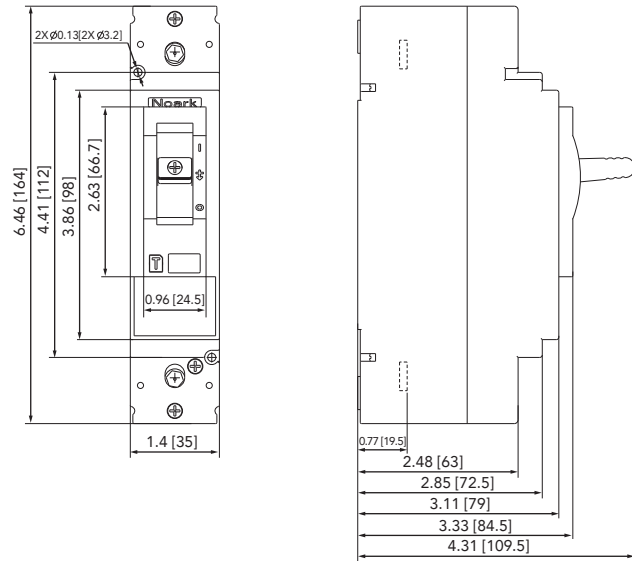
M1D-M6D Specifications

	M1D	M2D	M3D	M4D	M5D	M6D	
Insulation Voltage (Vi)	800 Vac						
Impulse Withstand Voltage (Vimp)	8 kVac						
Operational Voltage (Ve)	IEC 690 Vac						
	UL 600 Vac						
IEC Ics (% Icu)	100%						
Utilization Category	A						
Mechanical Operating Cycles	10,000		8,000		3,000		
Electrical Operating Cycles	6,000		5,000		500		
Dimensions LxWxD in (mm)	6.46x3.54x3.33 (164x90x84.5)	7.17x4.13x3.47 (182x105x88)	11.22x5.51x4.59 (285x140x116.5)	12.32x7.68x5.43 (313x195x138)	3P: 16.18x7.68x7.58 (411x195x192.5) 4P: 16.18x10.2x7.58 (411x260x192.5)	3p: 22.64x9.84x15.16 (575x250x385) 4P: 22.64x12.6x15.16 (575x320x385)	
Weight of Unit lb (kg)	2 Poles	3.17 (1.44)	3.75 (1.70)	8.97 (4.07)	20.94 (9.5)	27 (12.15)	-
	3 Poles	3.68 (1.67)	4.41 (2.00)	13.45 (6.1)	25.35 (11.5)	33.18 (15.05)	55.56 (25.2)
	4 Poles	-	-	-	-	43.43 (19.7)	69.67 (31.6)
Cable Connection Wire 167 °F (75 °C) Cu Wire Only AWG (mm ²)	1-Hole 14-3/0 (2.5-95)	1-Hole 8 - 350 kcmil (10-185)	1-Hole 3/0 - 500 kcmil (95-240)	2-Holes (2x) 3/0 - 400 kcmil ((2x) 95-185)	2-Holes 250-600kcmil (120-300)	3-Holes 3/0- 750 kcmil (95-300)	
	3-Holes 14-3/0 (2.5-6)		2-Holes 3 - 250 kcmil (35-120)		3-Holes 4/0 AWG-500 kcmil (100-250)	4-Holes 3/0- 500 kcmil (95-240)	
Lugs lb-in (N.m)	89 (10)	230 (23)	310 (35)		398 (45)	310 (35)	

Molded Case Circuit Breakers/Switches Dimensions

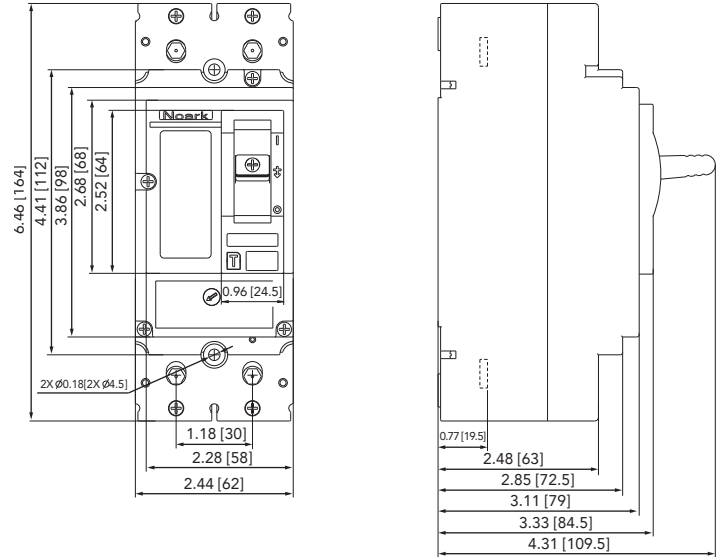
M1 1 Pole

Unit: in [mm]



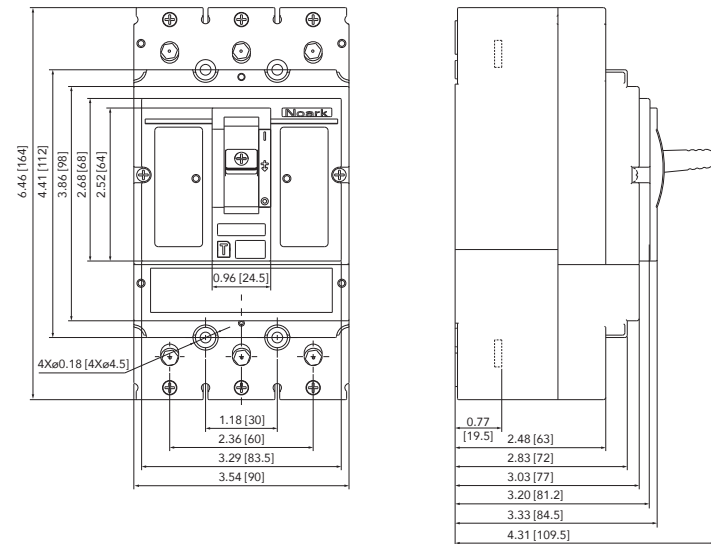
M1 2 Pole

Unit: in [mm]



M1/M1D/M1M

Unit: in [mm]

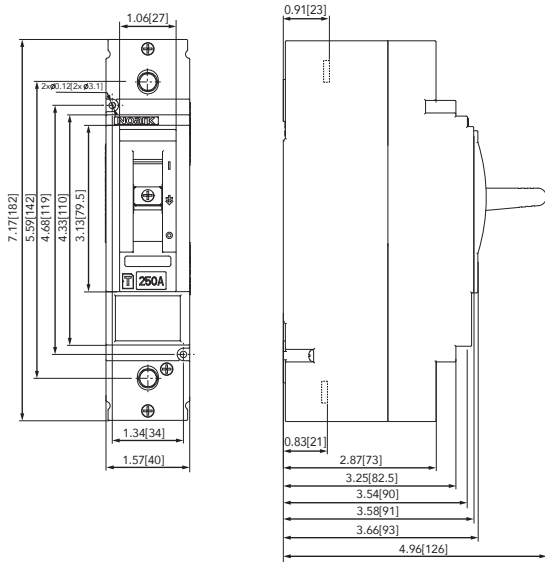


Molded Case Circuit Breakers/Switches

Dimensions

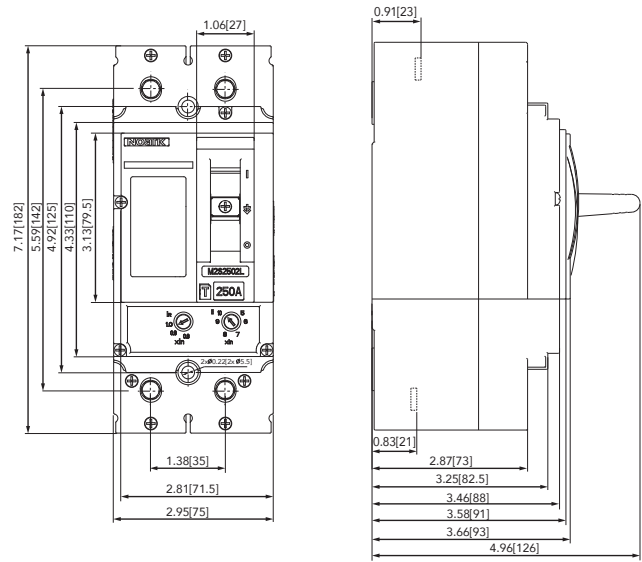
M2 1 Pole

Unit: in [mm]



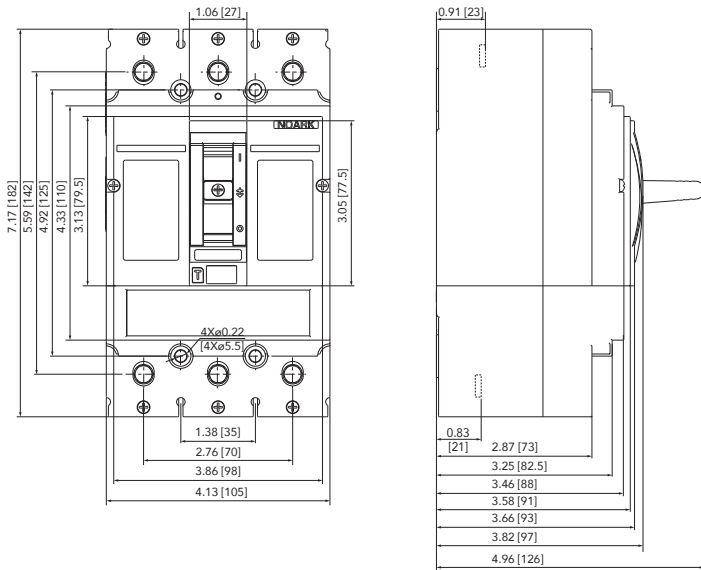
M2 2 Pole

Unit: in [mm]



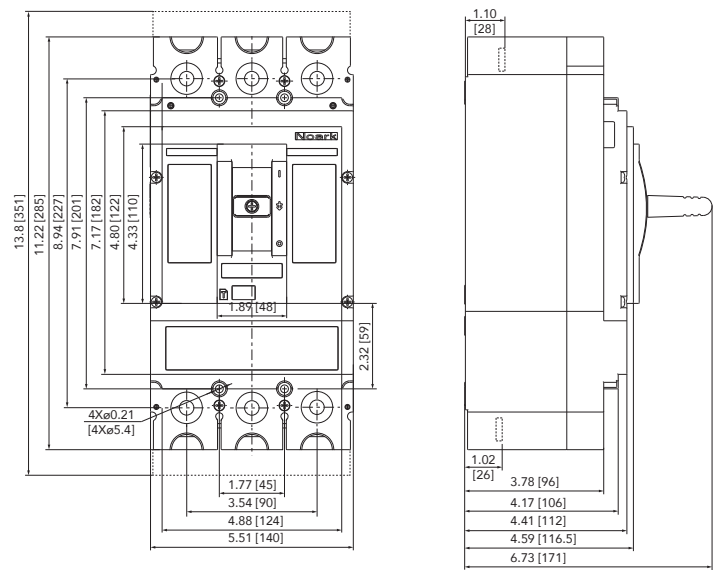
M2/M2D/M2M

Unit: in [mm]



M3/M3D/M3M

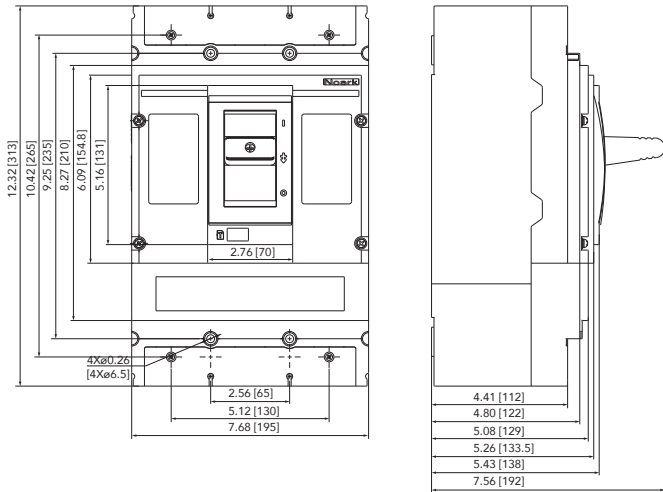
Unit: in [mm]



Molded Case Circuit Breakers/Switches Dimensions

M4/M4D/M4M

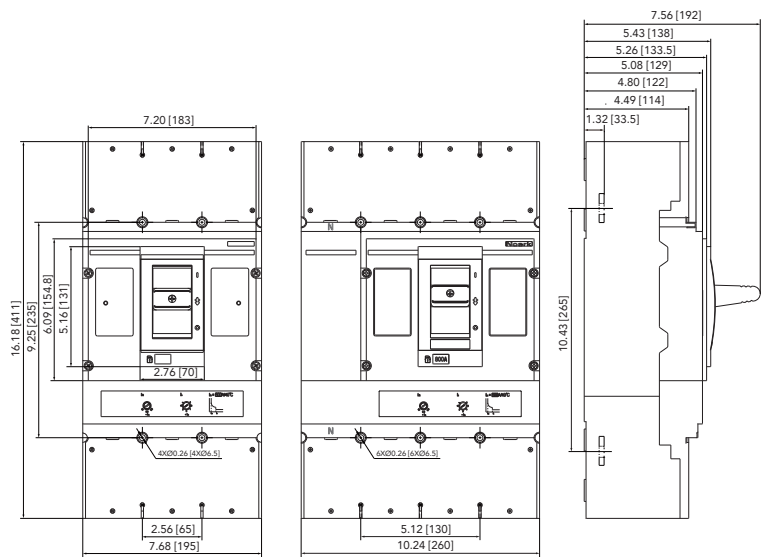
Unit: in [mm]



M5/M5D/M5M

2P, 3P, 4P

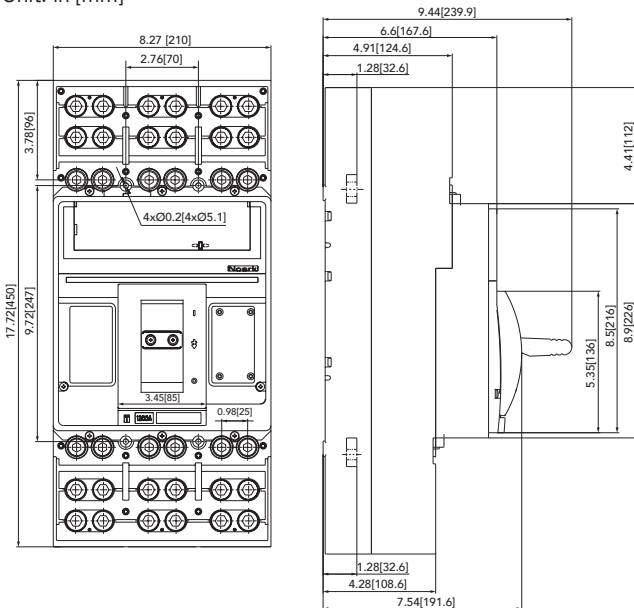
Unit: in [mm]



M6/M6D/M6M

2p, 3p

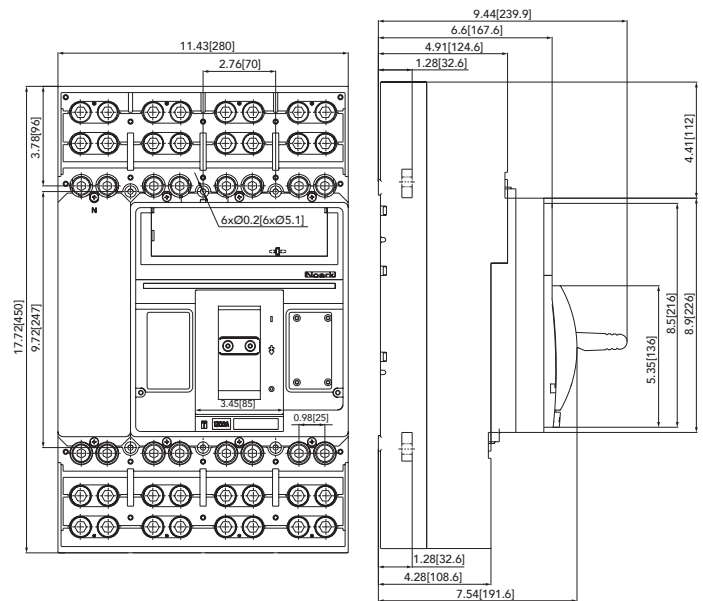
Unit: in [mm]



M6/M6D/M6M

4p

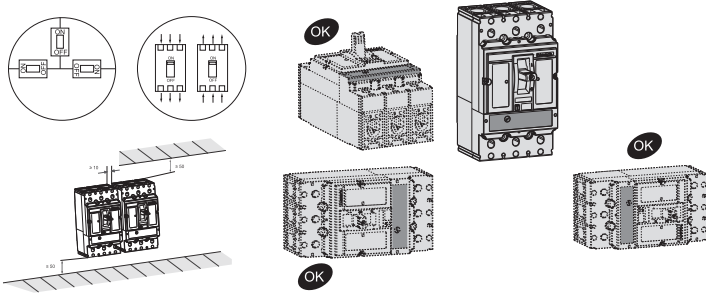
Unit: in [mm]



Molded Case Circuit Breakers/Switches Mounting Positions

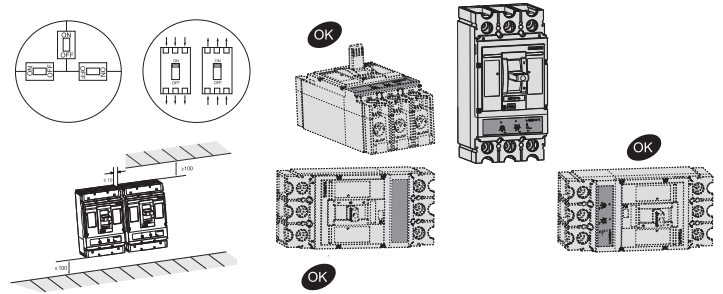
M1/M1D/M1M

Reverse Feed Allowed



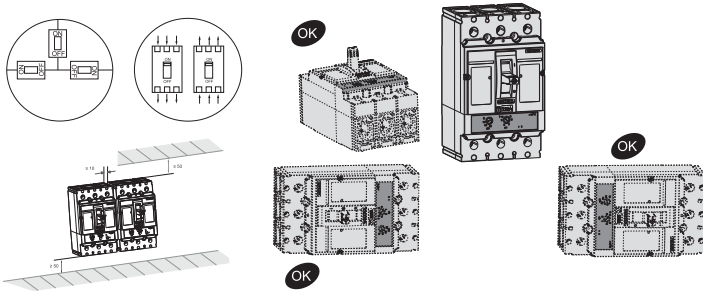
M4/M4D/M4M

Reverse Feed Allowed



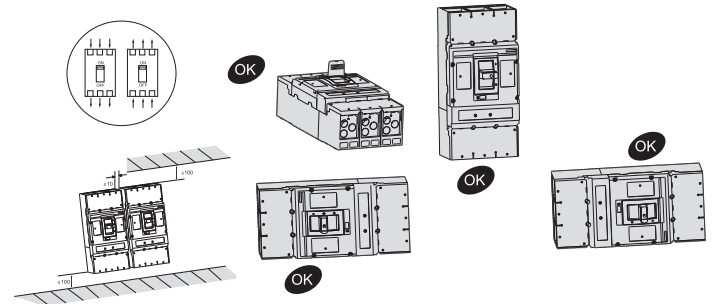
M2/M2D/M2M

Reverse Feed Allowed



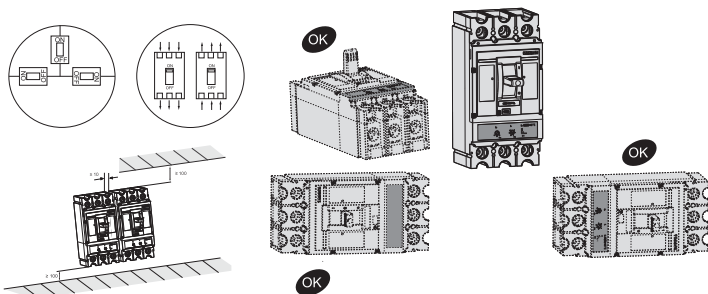
M5/M5D/M5M

Reverse Feed Allowed



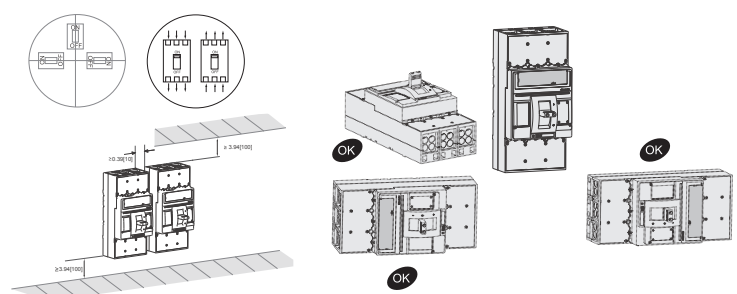
M3/M3D/M3M

Reverse Feed Allowed



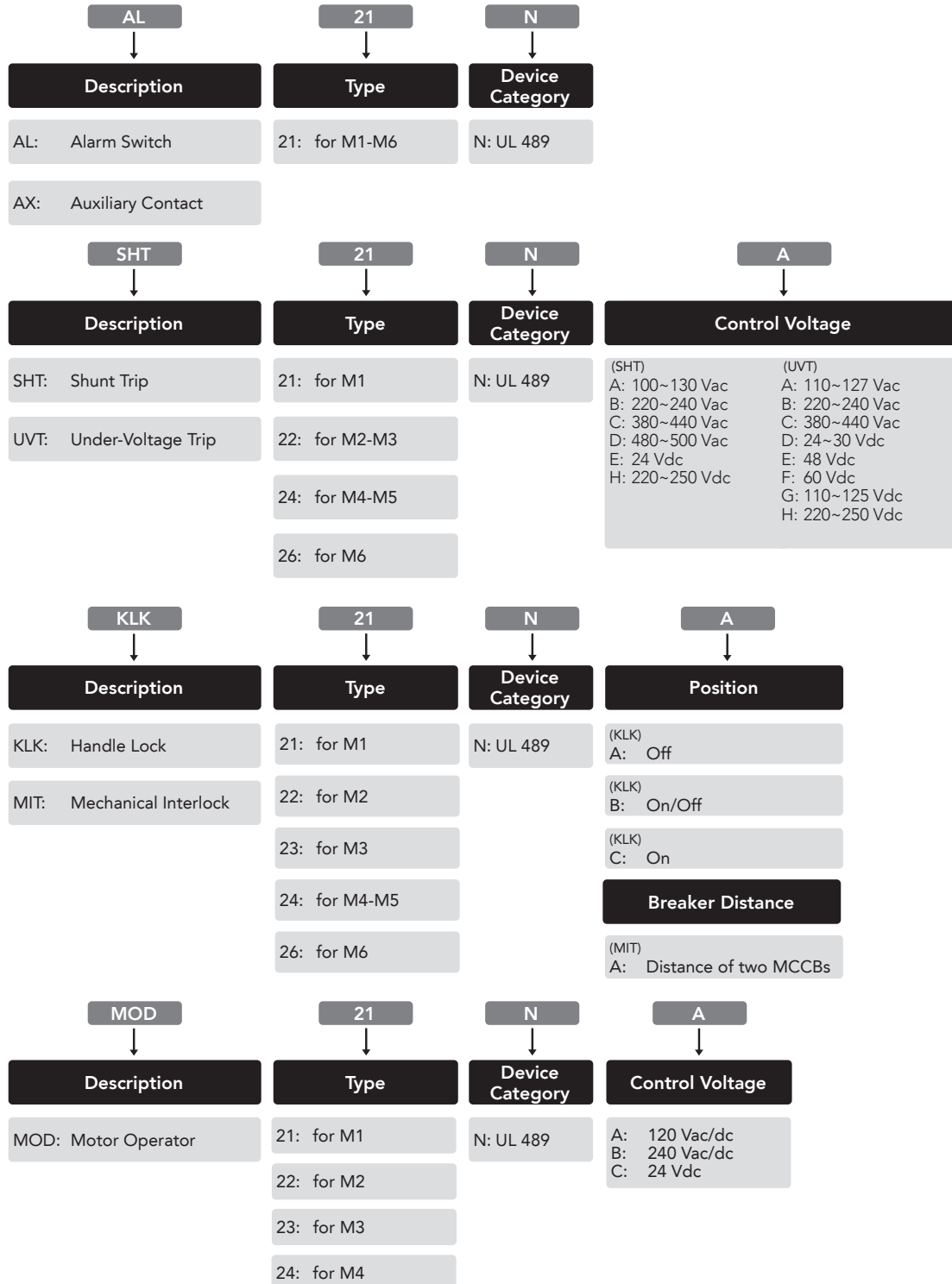
M6/M6D/M6M

Reverse Feed Allowed



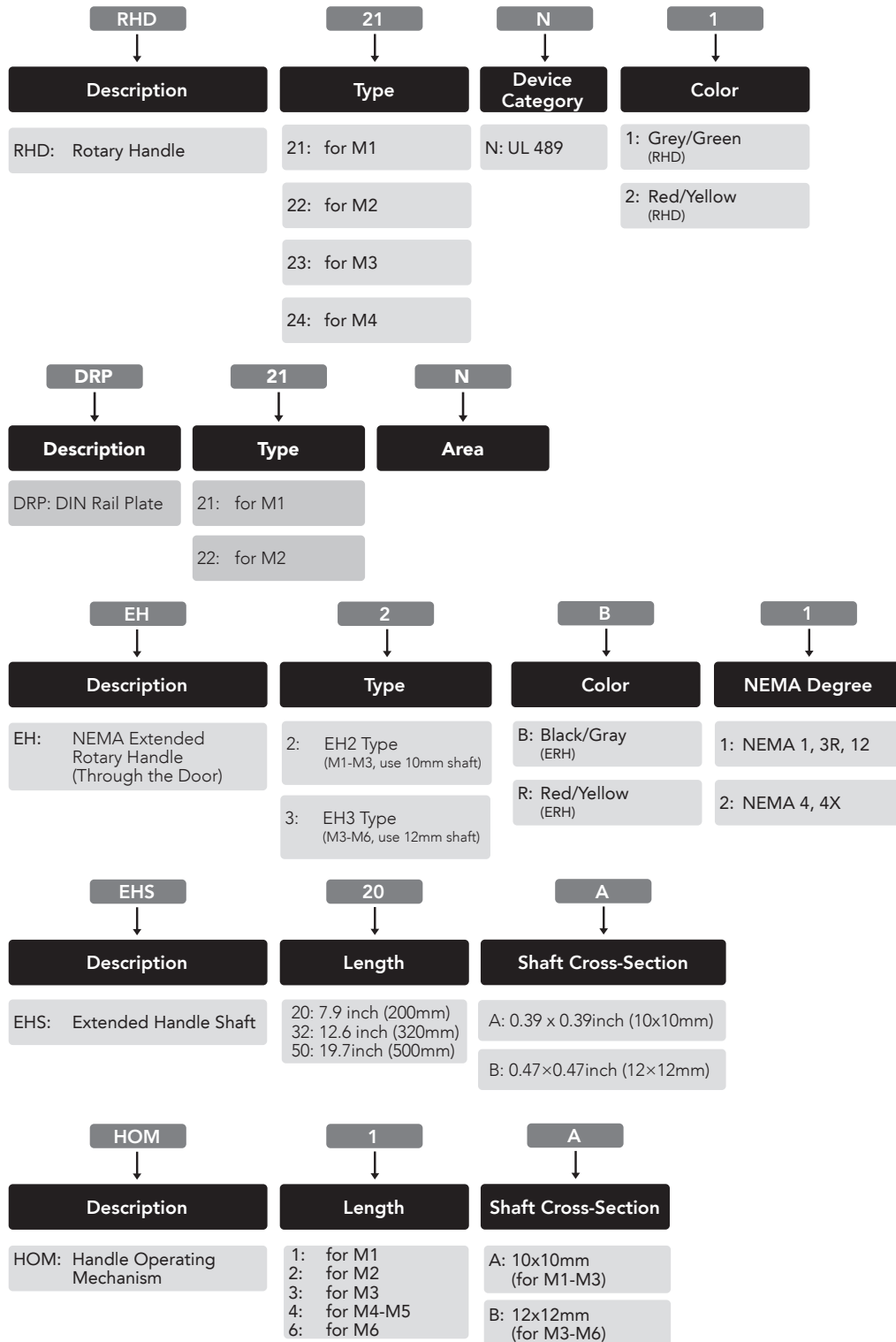
Molded Case Circuit Breakers/Switches Accessories: Product Selection Guide

Accessory Product Selection Guide



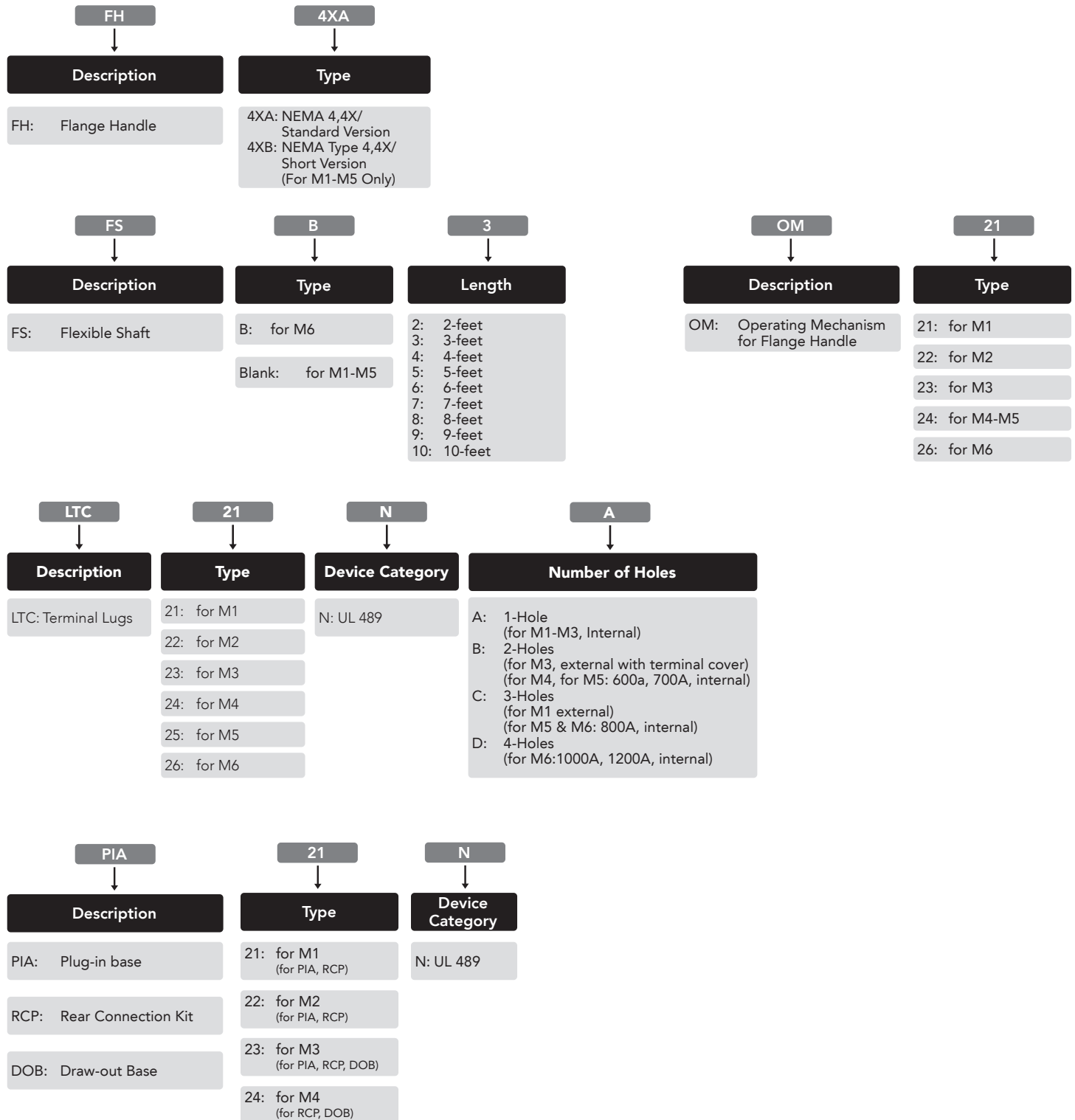
Molded Case Circuit Breakers/Switches Accessories: Product Selection Guide

Accessory Product Selection Guide

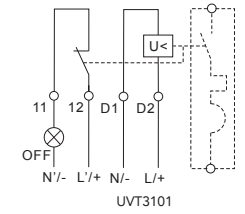
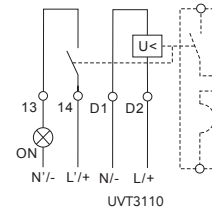
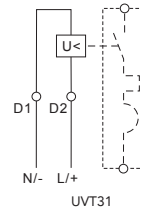
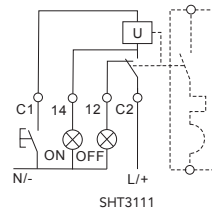
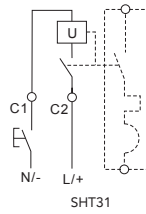
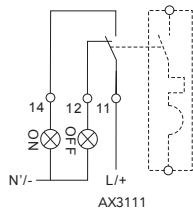
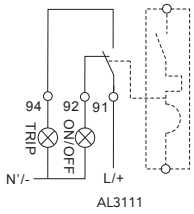


Molded Case Circuit Breakers/Switches Accessories: Product Selection Guide

Accessory Product Selection Guide



Molded Case Circuit Breakers/Switches Accessories: Wiring Diagrams

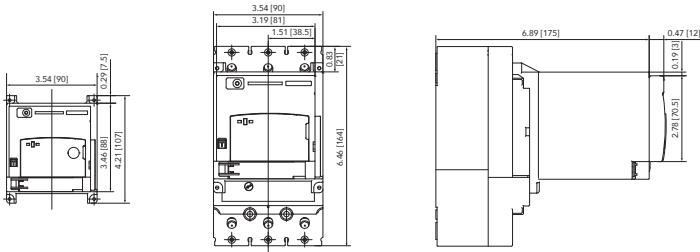


Molded Case Circuit Breakers/Switches Accessories: Dimensions

MOD21N

Motor Operator for M1

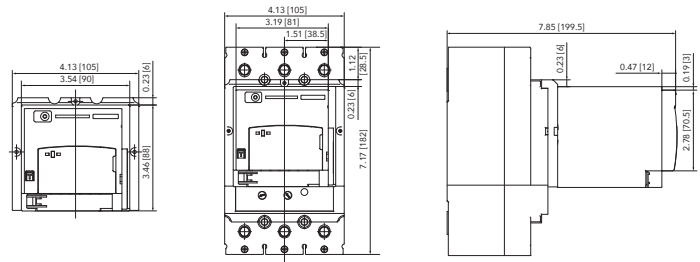
Unit: in [mm]



MOD22N

Motor Operator for M2

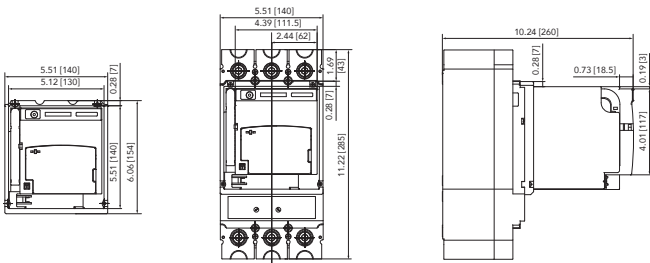
Unit: in [mm]



MOD23N

Motor Operator for M3

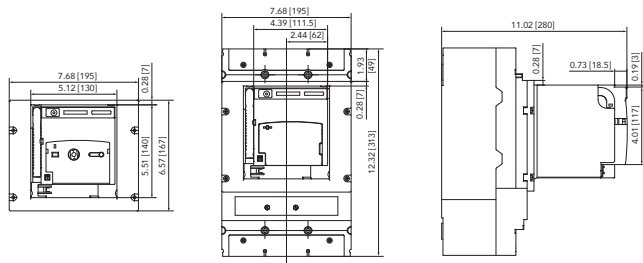
Unit: in [mm]



MOD24N

Motor Operator for M4

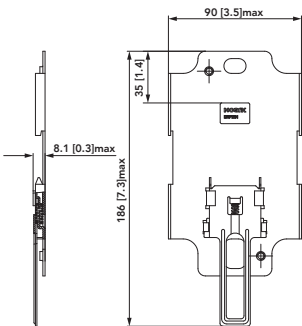
Unit: in [mm]



DRP21N

Din Rail Plate for M1

Unit: in [mm]



Molded Case Circuit Breakers/Switches Accessories: Dimensions

LTC21N

Terminal Lug Connection for M1

Unit: in [mm]



1-Hole
167 °F (75 °C)
Cu wire only
14-3/0 AWG
2.5~95 mm²
89 in-lb (10 N.m)



3-Holes
167 °F (75 °C)
Cu wire only
14-10 AWG
2.5~6 mm²
44.5 in-lb (5 N.m)

8-3 AWG
10~35 mm²
89 in-lb (10 N.m)

LTC22N

Terminal Lug Connection for M2

Unit: in [mm]



1-Hole
167 °F (75 °C)
Cu wire only
14-3/0 AWG
2.5~95 mm²
89 in-lb (10 N.m)

LTC23N

Terminal Lug Connection for M3

Unit: in [mm]



1-Hole
167 °F (75 °C)
Cu wire only
3/0 AWG - 500 kcmil
95~240 mm²
310 in-lb (35 N.m)



2-Holes
167 °F (75 °C)
Cu wire only
3 AWG - 250 kcmil
35~120 mm²
310 in-lb (35 N.m)

LTC24N

Terminal Lug Connection for M4

Unit: in [mm]

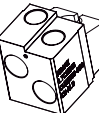


2-Holes
167 °F (75 °C)
Cu wire only
(2) 3/0 AWG - 400 kcmil
(2) 95~185 mm²
310 in-lb (35 N.m)

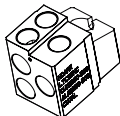
LTC25N

Terminal Lug Connection for M5

Unit: in [mm]



2-Holes
75/90°C
Al/Cu Wire Only
(2)250kcmil-600kcmil
398 lb-in/pulg/po
(2)120-300mm²
45N-m



3-Holes
75/90°C
Al/Cu Wire Only
(3)250kcmil-500kcmil
398 lb-in/pulg/po
(3)120-240mm²
45N-m

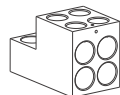
LTC26N

Terminal Lug Connection for M6

Unit: in [mm]



3-Holes
75°C/90°C
Al/Cu Wire
(3)3/0AWG-750kcmil
310 lb-in/pulg/po
(3)95-300mm²
35N-m

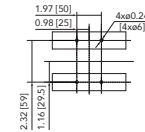
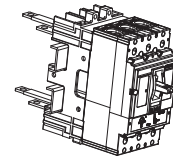
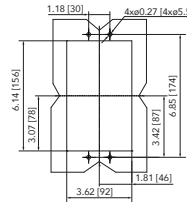
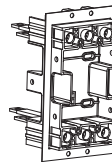
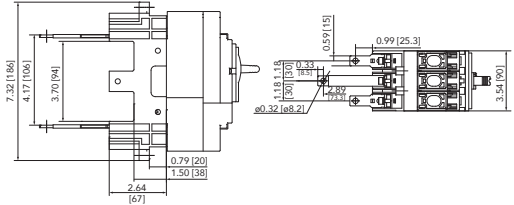
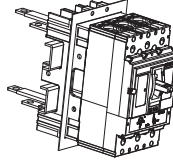


4-Holes
75°C/90°C
Al/Cu Wire
(4)3/0AWG-500kcmil
310 lb-in/pulg/po
(4)95-240mm²
35N-m

PIA21N

Plug-In Base for M1

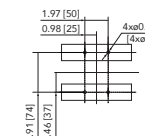
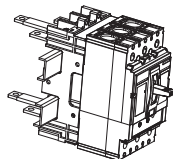
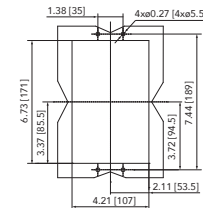
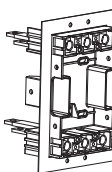
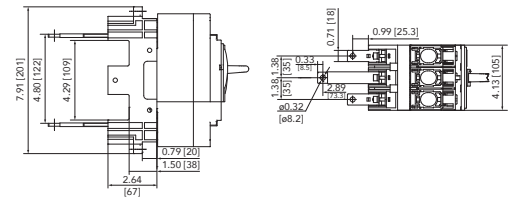
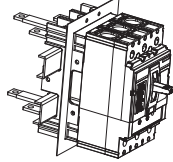
Unit: in [mm]



PIA22N

Plug-In Base for M2

Unit: in [mm]

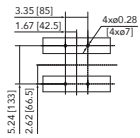
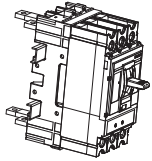
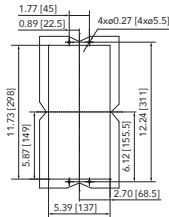
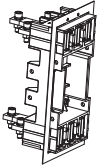
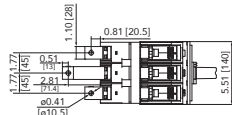
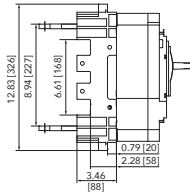
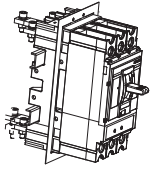


Molded Case Circuit Breakers/Switches Accessories: Dimensions

PIA23N

Plug-In Base for M3

Unit: in [mm]

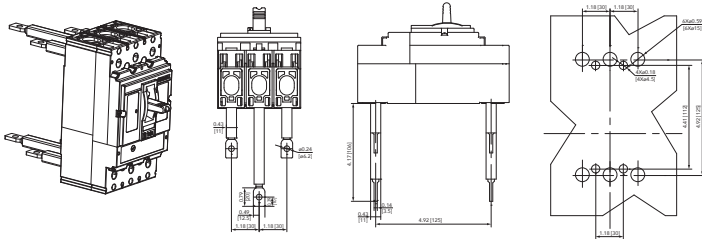


Molded Case Circuit Breakers/Switches Accessories: Dimensions

RCP21N

Rear Connection Kit for M1

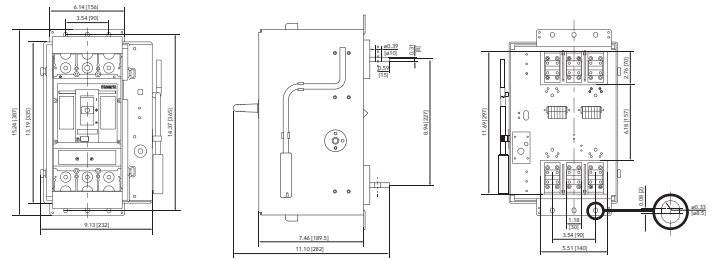
Unit: in [mm]



DOB23N

Draw-Out Base for M3

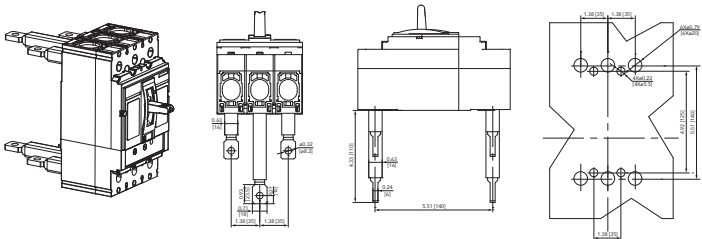
Unit: in [mm]



RCP22N

Rear Connection Kit for M2

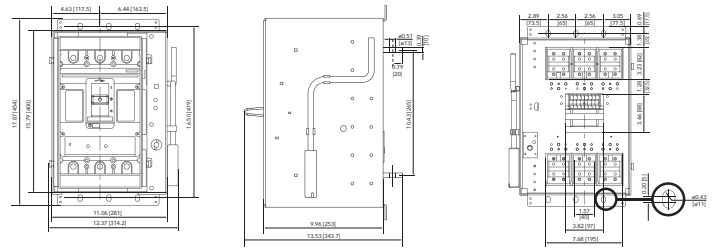
Unit: in [mm]



DOB24N

Draw-Out Base for M4

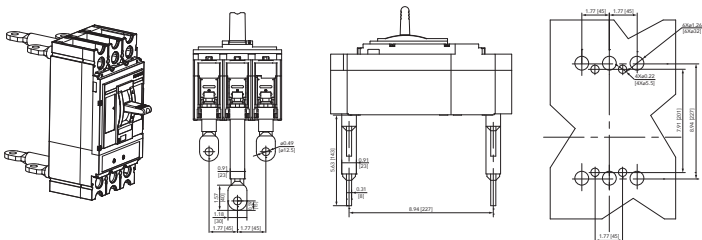
Unit: in [mm]



RCP23N

Rear Connection Kit for M3

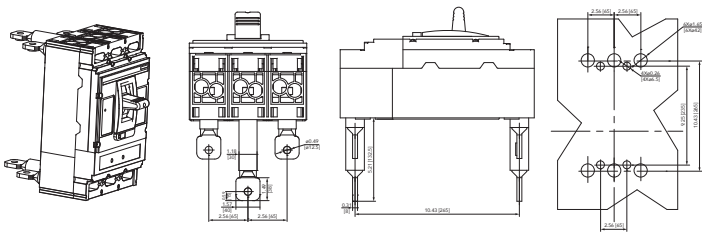
Unit: in [mm]



RCP24N

Rear Connection Kit for M4

Unit: in [mm]

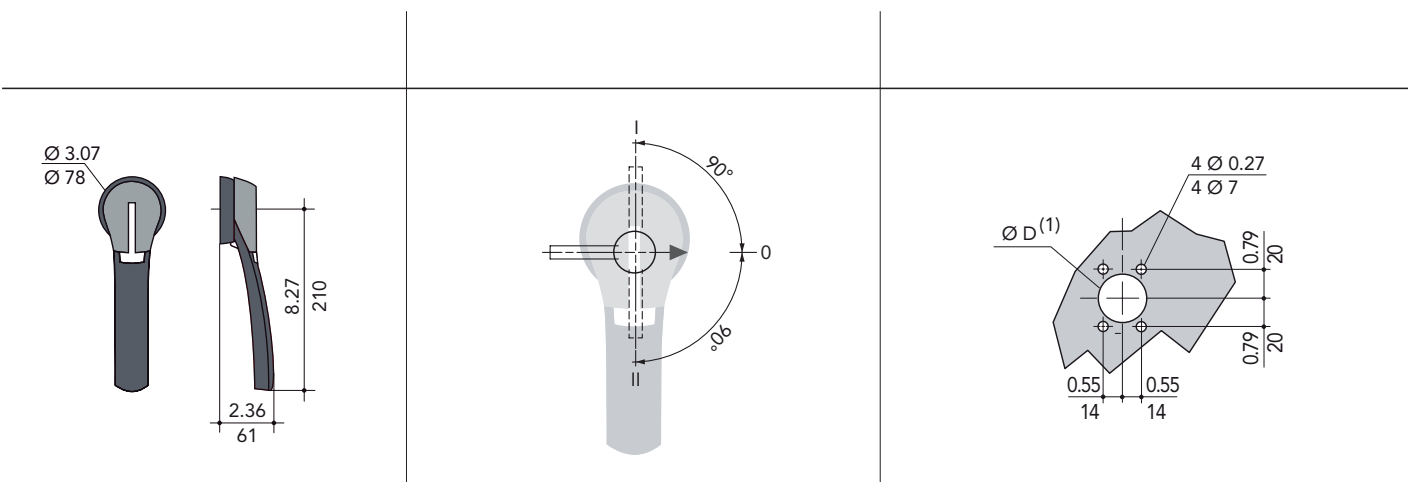
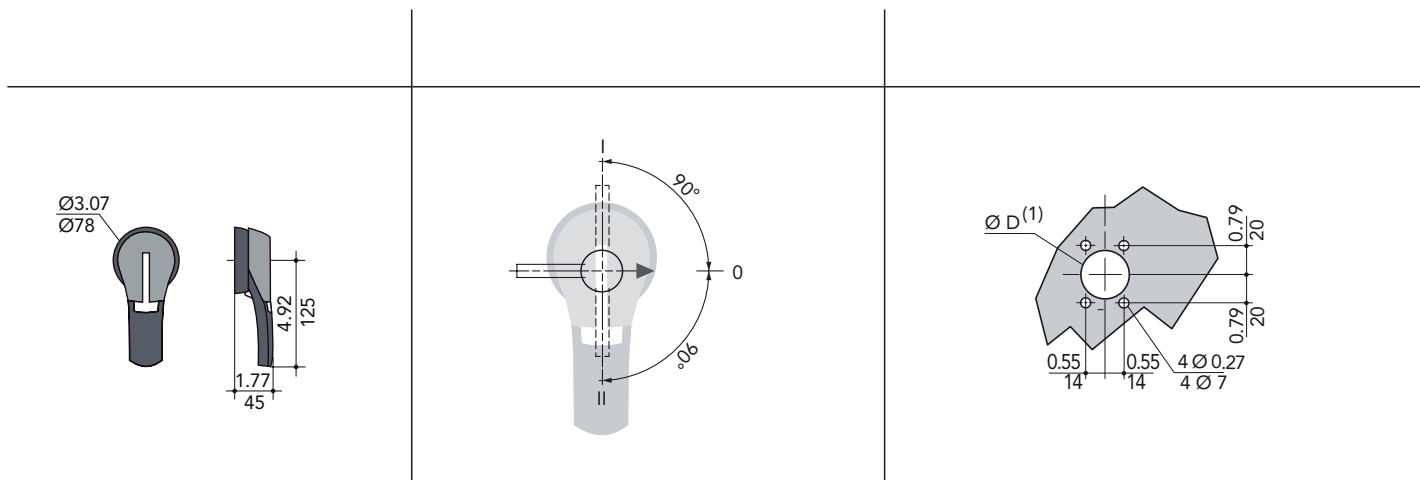


Molded Case Circuit Breakers/Switches Accessories: Dimensions

EH

External Rotary Handle for M1-M6

Unit: in [mm]



(1) Rear screw mounting: $\text{Ø}1.42$ to $\text{Ø}1.46$ ($\text{Ø}31$ to $\text{Ø}37$). Front clip mounting: $\text{Ø}1.46$ ($\text{Ø}37$).

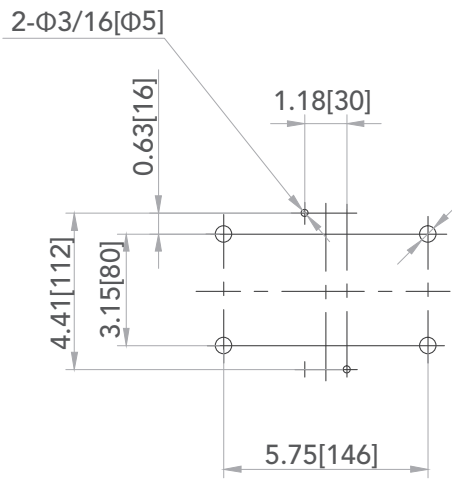
Molded Case Circuit Breakers/Switches Accessories: Dimensions

FHM

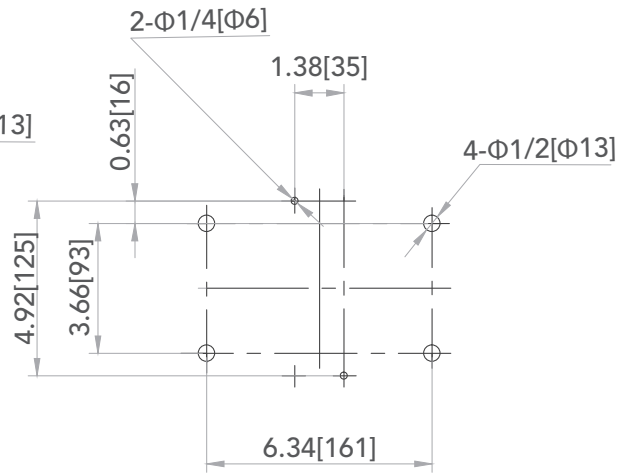
Flange Handle Mechanism for M1-M6

Unit: in [mm]

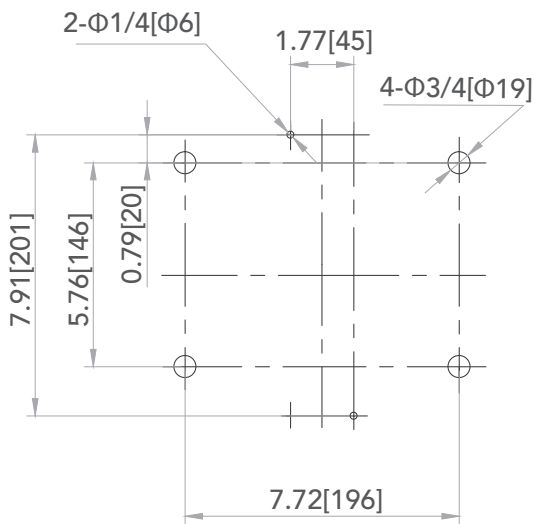
Drilling Plate for Operating Mechanism



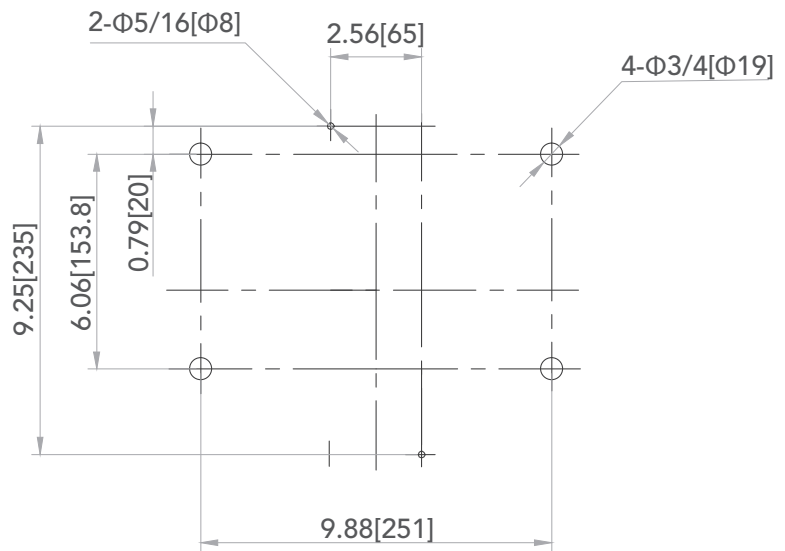
Drilling Plate for OM21



Drilling Plate for OM22



Drilling Plate for OM23



Drilling Plate for OM24


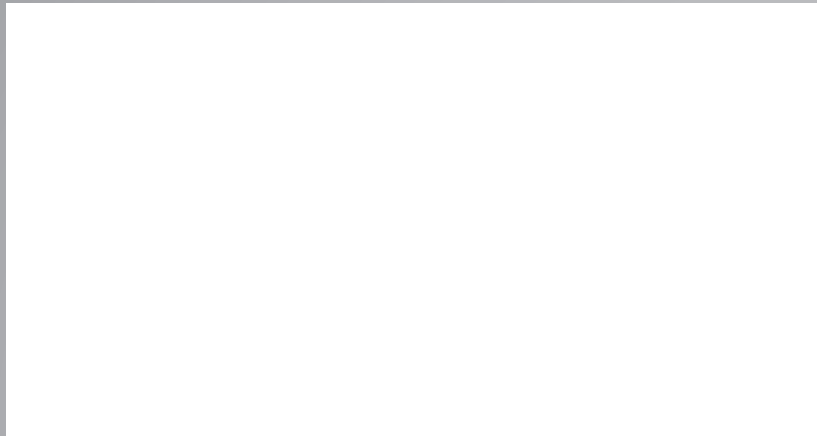
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