

Molded Case Circuit Breakers/Switches

NOARK Ex9 Series - M

Features

Molded Case Circuit Breakers (M1-M6)

NOARK Electric offers a complete range of 2, 3, and 4 pole Molded Case Circuit Breakers in six frame sizes: M1 - 100 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 5.1 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 and Draw-Out
- Fixed and adjustable trip setting units
- Wide range of accessories: Alarm Switch, Auxiliary Contact, Shunt and Under-Voltage Trip, Interlock, Rotary Handle and Motor Operator

Molded Case Switches (M1D-M6D)

NOARK Electric offers a complete range of 2, 3, and 4 pole Molded Case Switches in six frame sizes: M1 - 100 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 5.1 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 and Rear Connection
- Wide range of accessories: Alarm Switch, Auxiliary Contact, Shunt and Under-Voltage Trip, Interlock, Rotary Handle and Motor Operator

Accessories

- | | | | |
|----------------------|------------------------|--------------------------|-----------------------|
| • Alarm Switch | • Handle Lock | • Extended Rotary Handle | • Rear Connection Kit |
| • Auxiliary Contact | • Mechanical Interlock | • Flange Handle | • Draw-Out Base |
| • Shunt Trip | • Motor Operator | • Terminal Lugs | |
| • Under-Voltage Trip | • Rotary Handle | • Plug-In 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. E355394
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 [†]
NOARK Ex9 Series - M	Frame Size	Interrupting Rating	Amperage	Trip Unit	Pole	Terminal Option	Rate Code
	1: 100 A 2: 250 A 3: 400 A 4: 600 A 5: 800 A 6: 1200 A	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: 15-100 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)	2: 2 Poles* 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. Optional Configuration for M1: 3 hole, M3: 2 hole, need to be ordered separately.) P*: Plug-In R*: Rear Connection D*: Draw-Out	Blank: Standard MCCB (80% Rated) F: 100% Rated MCCB

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: 100 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: 15-100 A M2: 100-250 A M3: 225-400 A M4: 400-600 A M5: 600-800A M6: 800-1200 A	T: Magnetic Only E: Electronic (M6 only)	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. 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	100	2	L
NOARK Ex9 Series - M	Frame Size	Protection Type	Amperage	Pole	Terminal Option
	1: 100 A 2: 250 A 3: 400 A 4: 600 A 5: 800 A 6: 1200 A	D: Disconnect Switch	M1: 100 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
 †: M6 only

Molded Case Circuit Breakers/Switches

M1-M6 Specifications

M1-M6 Specifications

		M1			M2			M3			M4			M5			M6	
Rated Current (A)		15~100			100~250			225~400			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	H	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	50	100	150	50	100	150	65	100	150	65	100	150	65	100	150	65	100
	480 Vac	35	65	100	35	65	100	42	65	100	42	65	100	42	65	100	42	65
	600 Vac	14	20	25	14	20	25	18	25	30	22	30	50	22	30	50	22	42
	500 Vdc 2 Poles	20	35	50	20	35	50	35	50	65	35	50	65	35	50	65	-	
	600 Vdc 3 Poles	20	35	50	20	35	50	35	50	65	35	50	65	35	50	65	-	
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	85
	380 / 415 Vac																(45)	(45)
Ultimate Breaking Capacity (Icu = 100% Ics) (kA rms)	660 / 690 Vac	5	8	10	6	10	12	10	15	20	12	15	20	12	15	20	30	30
	500 Vdc 3 Poles	25	35	50	25	35	50	35	50	65	35	50	65	35	50	65	-	
	500 Vdc 2 Poles	20	35	50	20	35	50	35	50	65	35	50	65	35	50	65	-	
Current Rating (A) @ 104 °F (40 °C)		15~100			100~250			225~400			400~600			600~800			800~1,200	
Thermal-Magnetic Trip Units (Fixed)	A = Adjustable T = Thermal F = Fixed M = Magnetic	AT / FM			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

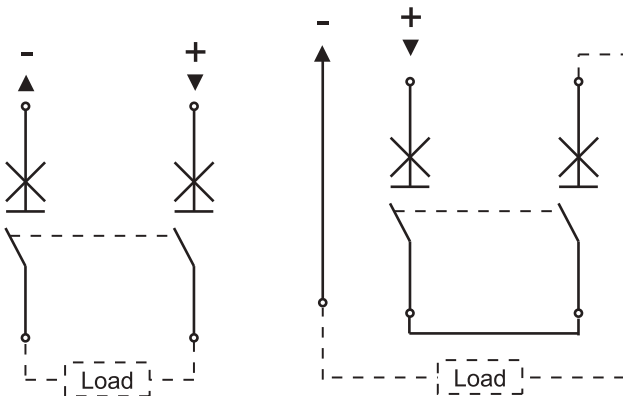
M1-M6 Specifications

M1-M6 Specifications

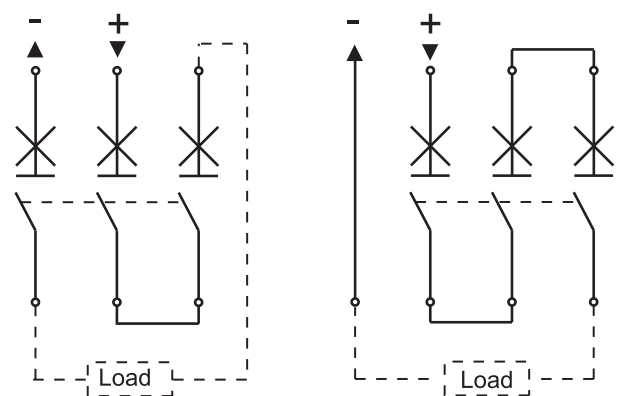
	M1	M2	M3	M4	M5	M6	
Insulation Voltage (Vi)	800 Vac						
Impulse Withstand Voltage (Vimp)	8 kVac						
Operational Voltage (Ve)	IEC 690 Vac						
	UL 600 Vac						
IEC Ics (% Icu)	100%						
Utilization Category	A						
Mechanical Operating Cycles	10,000		8,000		3,000		
Electrical Operating Cycles	6,000		5,000		500		
Dimensions LxWxD in (mm)	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)	27.8 (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 (mm²)	1-Hole 14-3/0 (2.5-95)	1-Hole 8 - 350 kcmil (10-185)	3/0 - 1-Hole 500 kcmil (95-240)	2-Holes (2x) 3/0 - 400 kcmil ((2x) 95-185)	2-Holes	250-600kcmil (120-300)	3/0- 3-Holes 750 kcmil (95-300)
	3-Holes 14-3/0 (2.5-6)		2-Holes 250 kcmil (35-120)		3-Holes		4/0 AWG-500 kcmil (100-250)
Lugs in-lb (N.m)	89 (10)		230 (23)		310 (35)		398 (45)

M1-M5 Interrupting Polarity for DC Application

2 Poles



3 Poles

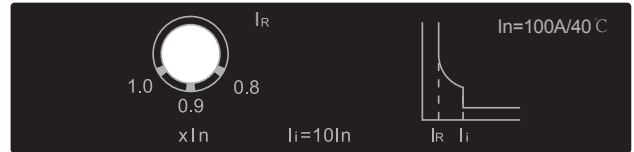


Molded Case Circuit Breakers/Switches

M1-M5 Trip Unit

M1 Adjustable Thermal, Fixed Magnetic

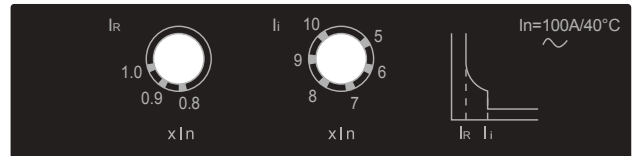
- Adjustable Thermal: 15~100 A rated current
Adjustable: 0.8~1 x I_n
- Fixed Magnetic: 150~1,000 A tripping current



		M1													
		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	
Adjustable Thermal Overload Protection	I_R														
	0.8 x I _n									40	48	56	64	72	80
	0.9 x I _n									45	54	63	72	81	90
	1.0 x I _n									50	60	70	80	90	100
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	
	Fixed 10 x I _n	150	200	250	300	350	400	450	500	600	700	800	900	1,000	

M2-M5 Adjustable Thermal, Adjustable Magnetic

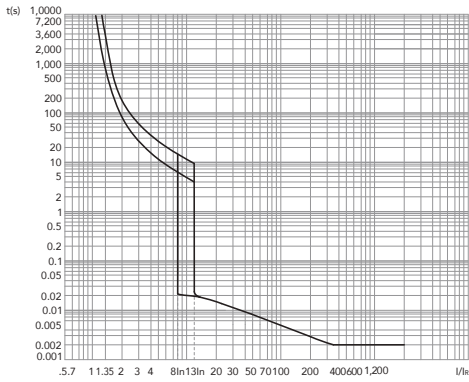
- Adjustable Thermal: 100~800 A rated current
Adjustable: 0.8~1 x I_n
 - Adjustable Magnetic: 700~8,000 A tripping current
- Adjustable:
M2 100~150 = 7~12 x I_n
M2 175~250 = 5~10 x I_n
M3/M4 225~600 = 5~10 x I_n
M5 600~800 = 5~10 x I_n



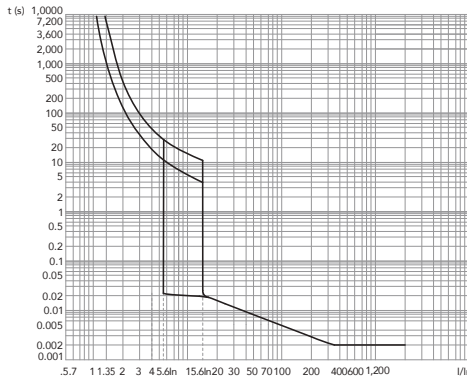
		M2 - 250 A							M3 - 400 A				
		100 A	125 A	150 A	175 A	200 A	225 A	250A	225 A	250 A	300 A	350 A	400 A
Adjustable Thermal Overload Protection	I_R												
	0.8 x I _n	80	100	120	140	160	180	200	180	200	240	280	320
	0.9 x I _n	90	112.5	135	157.5	180	202.5	225	202.5	225	270	315	360
	1.0 x I _n	100	125	150	175	200	225	250	225	250	300	350	400
Adjustable Magnetic Short Circuit Protection	I_i	100 A	125 A	150 A	175 A	200 A	225 A	250A	225 A	250 A	300 A	350 A	400 A
	5 x I _n				875	1,000	1,125	1,250	1,125	1,250	1,500	1,750	2,000
	6 x I _n				1,050	1,200	1,350	1,500	1,350	1,500	1,800	2,100	2,400
	7 x I _n	700	875	1,050	1,225	1,400	1,575	1,750	1,575	1,750	2,100	2,450	2,800
	8 x I _n	800	1,000	1,200	1,400	1,600	1,800	2,000	1,800	2,000	2,400	2,800	3,200
	9 x I _n	900	1,125	1,350	1,575	1,800	2,025	2,500	2,025	2,250	2,700	3,150	3,600
	10 x I _n	1,000	1,250	1,500	1,750	2,000	2,250	2,750	2,250	2,500	3,000	3,500	4,000
	11 x I _n	1,100	1,375	1,650									
12 x I _n	1,200	1,500	1,800										
		M4 - 600 A			M5 - 800 A								
		400 A	500 A	600 A	600 A	700 A	800 A						
Adjustable Thermal Overload Protection	I_R												
	0.8 x I _n	320	400	480	480	560	640						
	0.9 x I _n	360	450	540	540	630	720						
	1.0 x I _n	400	500	600	600	700	800						
Adjustable Magnetic Short Circuit Protection	I_i	400 A	500 A	600 A	600 A	700 A	800 A						
	5 x I _n	2,000	2,500	3,000	3,000	3,500	4,000						
	6 x I _n	2,400	3,000	3,600	3,600	4,200	4,800						
	7 x I _n	2,800	3,500	4,200	4,200	4,800	5,600						
	8 x I _n	3,200	4,000	4,800	4,800	5,600	6,400						
	9 x I _n	3,600	4,500	5,400	5,400	6,300	7,200						
10 x I _n	4,000	5,000	6,000	6,000	7,000	8,000							

Molded Case Circuit Breakers/Switches M1-M4 Trip Curves

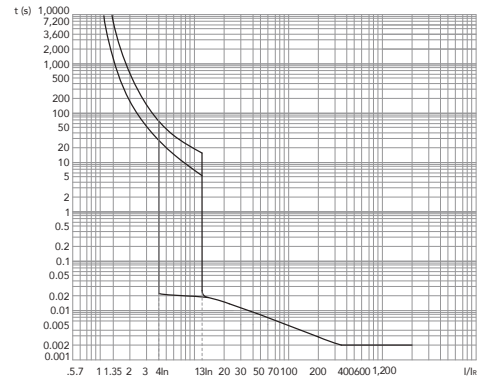
M1 (15~35 A)



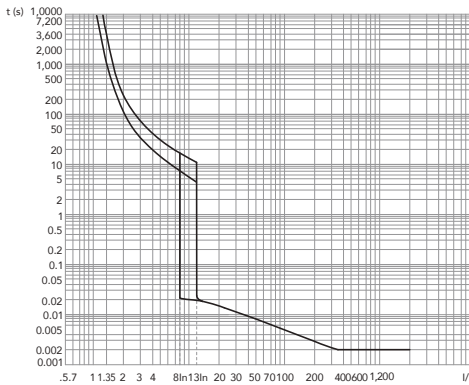
M2 (100~150 A)



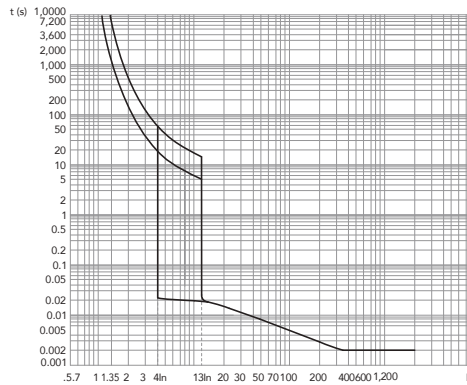
M3 (400 A)



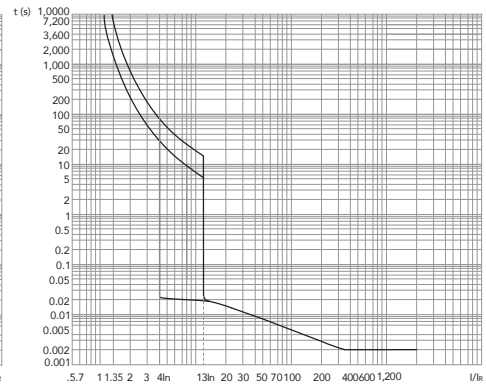
M1 (40~50 A)



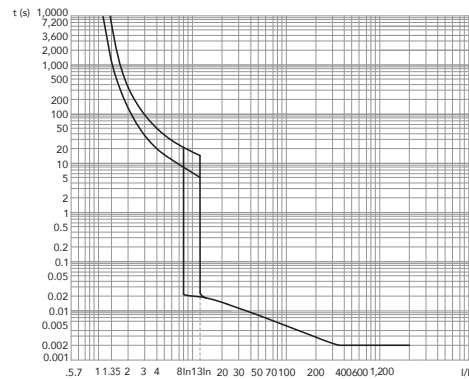
M2 (175~250 A)



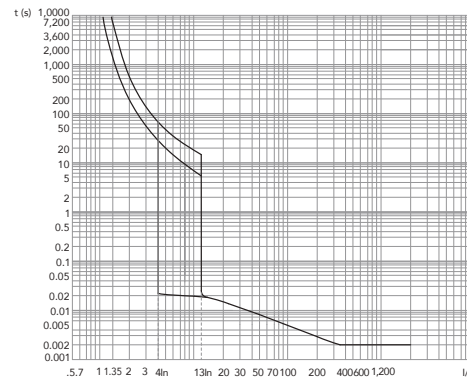
M4 (400 A)



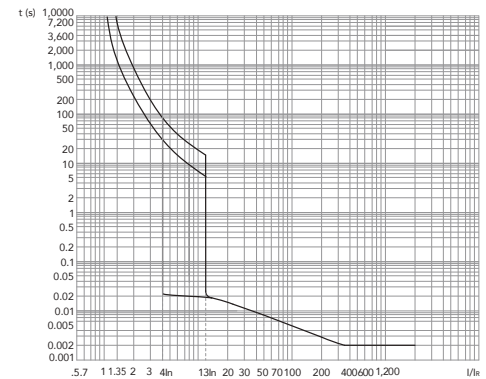
M1 (60~100 A)



M3 (225~350 A)



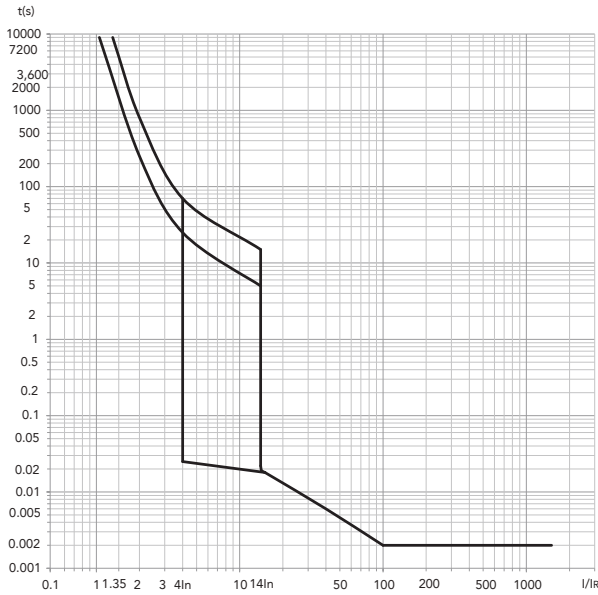
M4 (500~600 A)



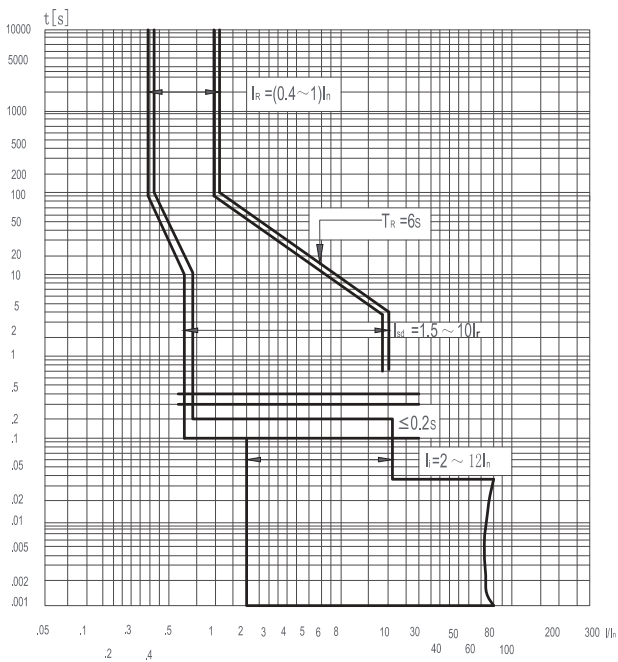
Molded Case Circuit Breakers/Switches

M5-M6 Trip Curves

M5 (600~800 A)



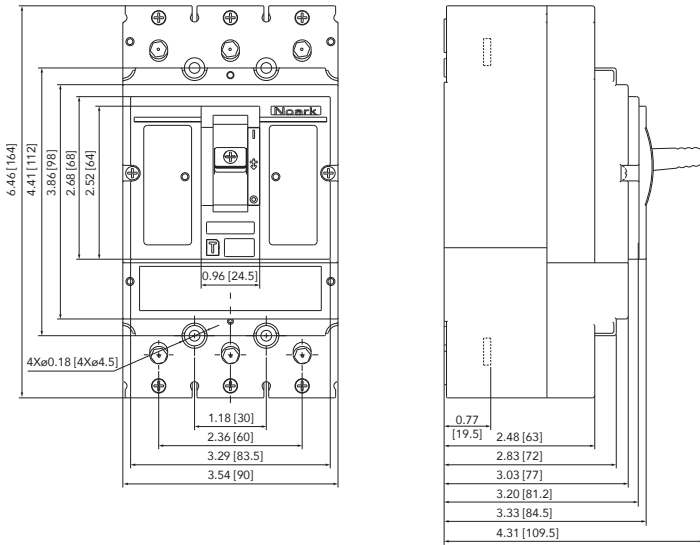
M6 (800~1200 A)



Molded Case Circuit Breakers/Switches Dimensions

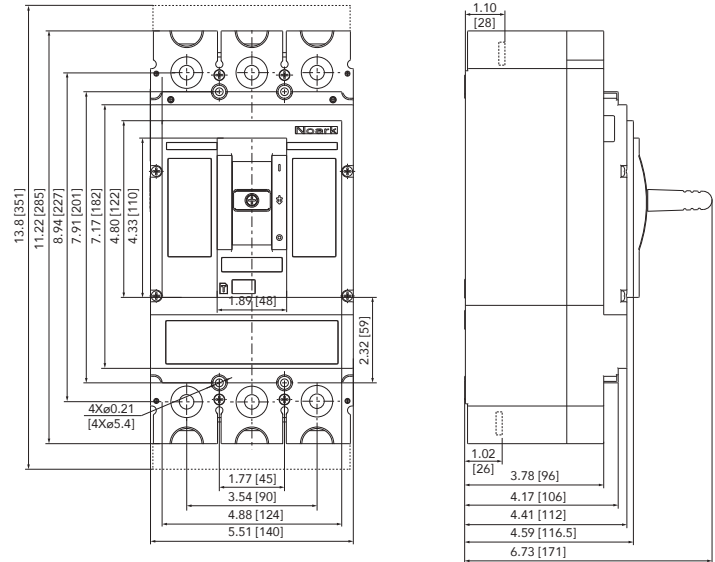
M1/M1D/M1M

Unit: in [mm]



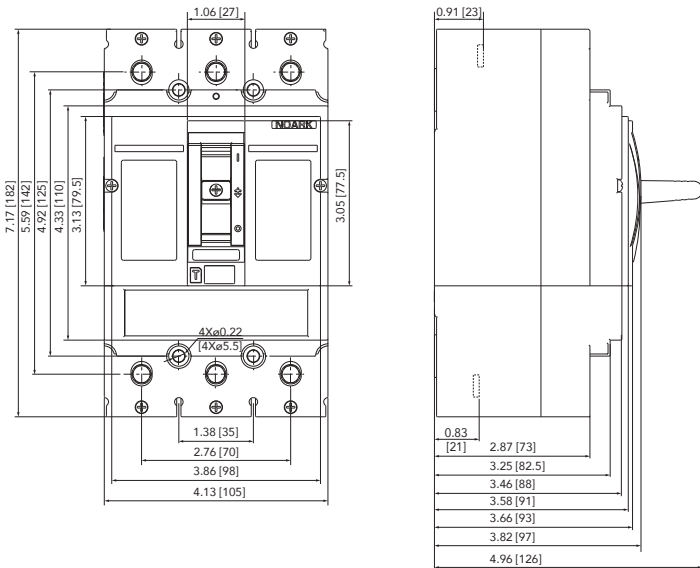
M3/M3D/M3M

Unit: in [mm]



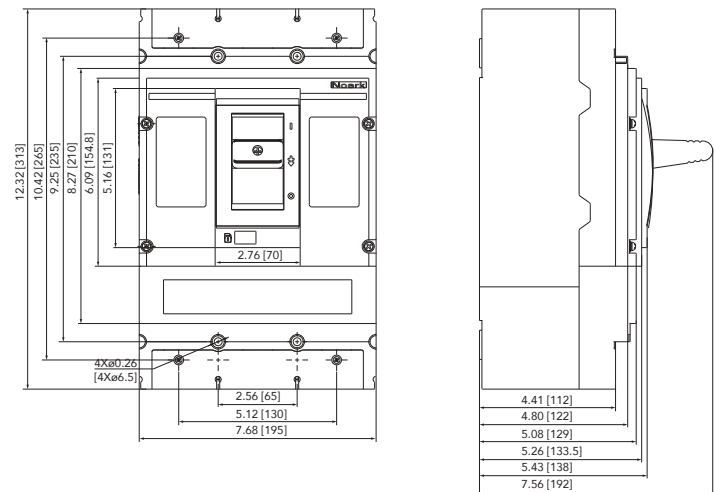
M2/M2D/M2M

Unit: in [mm]



M4/M4D/M4M

Unit: in [mm]

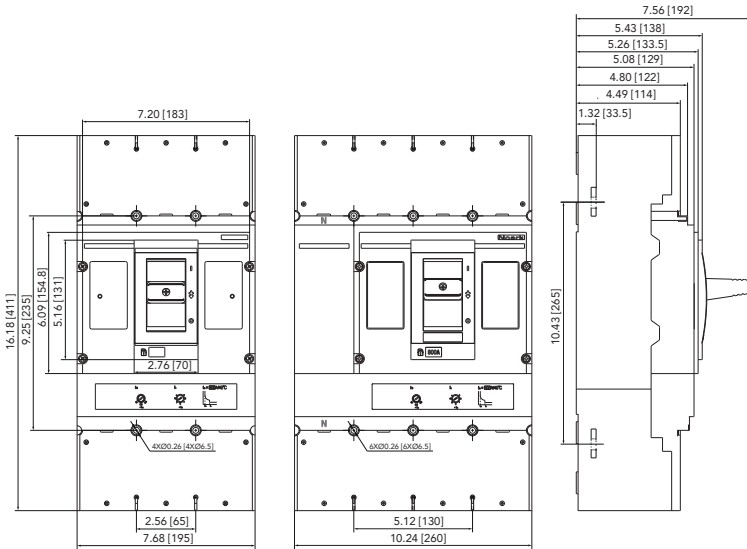


Molded Case Circuit Breakers/Switches Dimensions

M5/M5D/M5M

2P, 3P, 4P

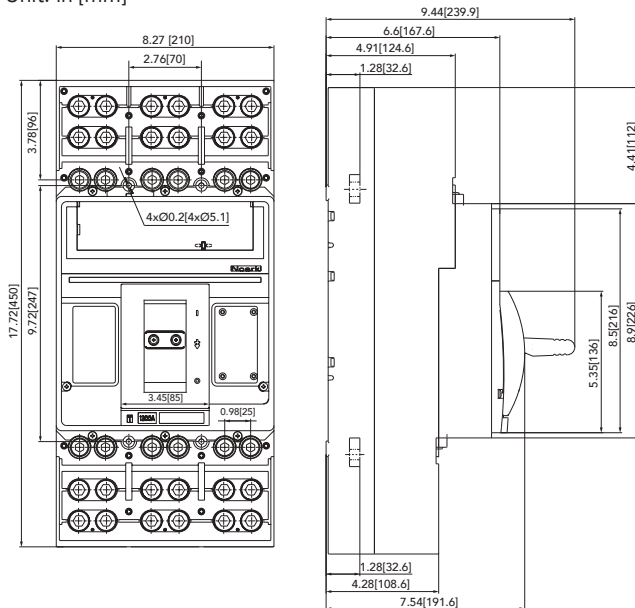
Unit: in [mm]



M6/M6D/M6M

2p, 3p

Unit: in [mm]



M6/M6D/M6M

4p

Unit: in [mm]

