Electronic Molded Case Circuit Breaker













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Application

NLM1E series electronic Moulded case circuit breaker is a new designed MCCB developed and manufactured by adopting international advanced technology. Its rated insulation voltage is 800V, is applied to the circuit of AC 50HZ, rated working voltage 400V/690, rated current up to 1250A as infrequently switch and starting of motor. MCCB has the functions of overload long delay inverse time limit, short-circuit short delay inverse time limit, short-circuit short delay definite time limit, short-circuit instantaneous and under-voltage protection, to protect the circuit and power equipment against being damage.

MCCB has the characteristics of small volume, high breaking capacity, short arcing distance, and anti-vibration.

MCCB cannot be inverted wiring, only can be 1, 3, 5 connect to the power line, 2, 4, 6 connect to the load line.

MCCB has the isolation function, its symbol is: "—/ |×—"

Model No.

NL M 1 E- □□□/□□□

- Product type and using code
- Tripping mode and accessory code
- 3 as three poles; 4 as four poles
- Operation mode
- Rated limit short-circuit breaking capacity grade
- Frame size rated current
- Electronic type tripping
- Design No.
- Moulded case circuit breaker
- Company code

StandaNLs

GB/T 14048.1 Low-voltage switchgear and controlgear — Part 1: General rules
GB/T 14048.2 Low-voltage switchgear and controlgear — Part 2: Circuit-breakers
GB/T 14048.4 Low-voltage switchgear and controlgear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters (including motor protective devices)
GB/T 14048.5 Low-voltage switchgear and controlgear — Part 5-1: Control circuit devices and switching elements — Electromechanical control circuit devices
IEC 60947-1:2020 Low-voltage switchgear and controlgear — Part 1: General rules

Normal working condition and Installation environment

Altitude of installation site: not exceeding 2000 m;
Ambient air temperature shall not exceed +50°C, and the 24-hour average temperature shall not exceed +50°C. The lower limit of ambient air temperature is -5°C;
At the maximum temperature of +50°C, the relative humidity of air shall not exceed 50%. Higher relative humidity is permitted at lower temperatures, e.g. up to 90% at 20°C. Special measures shall be taken against condensation occasionally formed on the product due to temperature variation;
Pollution degree: 3;
Installation category for the main circuit of the circuit-breaker: Category III; installation category for auxiliary and control circuits not connected to the main circuit: Category II;
Selectivity type: A or B.

Main Technical Specification

Model		NLM1E-125		NLM1E-250		NLM1E-400		NLM1E-630/800		NLM1E-1250
Frame current Inm(A)		125		250		400		630/800		1250
Breaking capacity class		M	H	M	H	M	H	M	H	M
Rated current In(A)						400		630、800		800、1000、1250
Pole		3、4	3	3、4	3	3、4	3	3、4	3	3
Rated voltage Ue(V)		AC400/690								
Rated insulated voltage Ui(V)		1000								
Rated impulse withstand voltage Uimp(V)		12000								
Rated limited short-circuit breaking capacity Icu(kA)		50	65	50	85	65	85	70	85	80
Rated working short-circuit breaking capacity Ics(kA)		35	50	35	65	50	65	50	70	50
Rated short time withstand current Icw 0.5S(kA)		--		--		5		10		15/1s
Using category		A		B		B		B		B
Arc distance(mm)		≤50		≤50		≤100		≤100		≤100
Operation performance	Power on(Times)	1500		1000		1000		500		500
	Power off(Times)	8500		7000		4000		3000		3000
Front plate wiring		○		○		○		○		○
Back plate wiring		○		○		○		○		
Plug-in wiring		○		○		○		○		
Drawer wiring						○		○		○
Under voltage release		○		○		○		○		○
Shunt release		○		○		○		○		○
Auxiliary contact		○		○		○		○		○
Alarm contact		○		○		○		○		○
Motor operation mechanism		○		○		○		○		○
Manual operation mechanism		○		○		○		○		○
Hand test device		○		○		○		○		
Intelligent control module		○		○		○		○		○
Test power module		○		○		○		○		○
LCD display module		○		○		○		○		○

Release characteristic

1.Electronic release characteristic
Breaker is installed current sensor with effective value sampling . MCCB is with the functions of overload long delay inverse time, short-circuit short delay inverse time, short-circuit short delay definite time, short-circuit instantaneous action and so on, the user can set the protection characteristic they need.
Release characteristic as picture 1
2. Overload long delay inverse time protection action characteristic as form 3
3. Short-circuit short delay protection action characteristic as form 4
4. short-circuit instantaneous protection action characteristic as form 5

Table 3

Current		Action time (S)					
Distribution Type	1.05IR	> 2h no tripping					
	1.3IR	≤1h tripping					
	2IR	Action time T_R	12	60	80	100	150
		Setting time t_R	12	60	80	100	150
Motor protection Type	1.05IR	> 2h no tripping					
	1.2IR	≤1h tripping					
	1.5IR	Action time T_R	21.3	107	142	178	267
	2 IR	Setting time t_R	12	60	80	100	150
	7.2 IR	Action time T_R	0.93	4.63	6.17	7.72	11.6
	Release class		/	10A	10	20	30

Table 4

short delay action characteristic		Current Isd	Action time(S)			
		≤0.9 Isd	No tripping			
		≥1.1 Isd	tripping			
short delay protection	inverse time protection	Isd ≤I < 1.5 Isd	$I^2T_R=(1.5\ Isd)^2\ t5d$			
	definite time protection	1.5 Isd≤I < Ii	Setting time tsd(s)	0.06	0.1	0.2	0.3
			Error(s)	±0.02	±0.03	±0.04	±0.06
			Back time(s)	/	/	0.14	0.21
Accuracy		Inverse time action time					

Table 5

	Current	Action time(S)
Action characteristic	≤0.85Ii	No tripping
	≥1.15Ii	Tripping

Table 6

Classify	Frame rated current Inm(A)	Conventional thermal current Ith(A)	Rated working current	
			AC400V	DC220V
Auxiliary contact	Inm≤ 400	3	0.3	0.15
	Inm≥ 400	3	0.4	0.15
Alarm contact	100≤ Inm≤ 800	3	0.3	0.15

Rated control power voltage (Us) and rated operating voltage (Ue) of control circuit release and the motor mechanism to see form 7

Table 7

Type		Rated voltage(V)		
		AC 50HZ		DC
Release	Shunt release	Us	220 380	110 220
	Under voltage release	Ue	220 380	- -
Motor mechanism		Us	220 380	110 220

Release unit technical parameter

1. It should reliably break the circuit breaker, when the applied voltage of shunt release is between 70% and 100% of the rated control power voltage.
2. The under-voltage release can reliably break the circuit breaker when the power voltage reduces to the 70%~35% of the under-voltage's rated operating voltage; The under-voltage release can prevent the circuit breaker close when the power voltage is lower than 35% of the under-voltage's rated operating voltage; The under-voltage release can ensure the circuit breaker can reliably close when the power voltage is higher than 85% of the under-voltage's rated operating voltage.
3. When the motor mechanism is at rated frequency, and the power voltage is between 85%~110%, the circuit breaker can be reliably closed.

The power consumption and derating coefficient

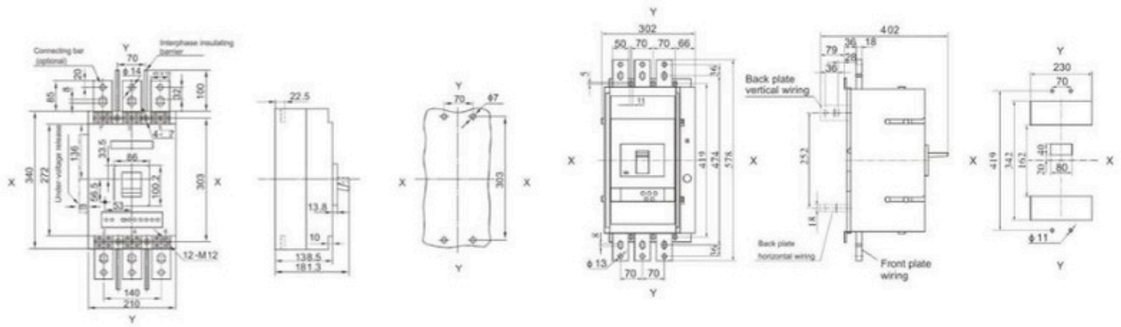
1.power consumption as form 8

Table 8

Model	Current (A)	Three phase total power consumption (VA)	
		Front/back plate wiring	Plug-in wiring
NLM1E-125	100	35	40
NLM1E-250	225	62	70
NLM1E-400	400	115	125
NLM1E-800	800	262	294

Appearance and installation dimension

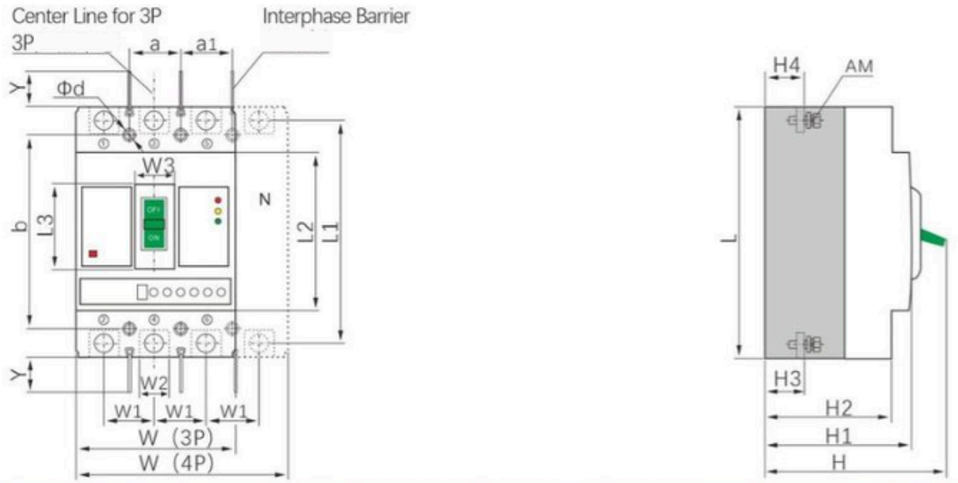
NLM1E-1250 front plate (3P)X-X, Y-Y is the center of breaker



Pictured11 NLM1E-1250 Front plate wiring and installation size

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- NLM1E-125,250,400,630,800
- Installation Dimensions for NLM1E-125, 250, 400, 630, 800, Front Panel Connection



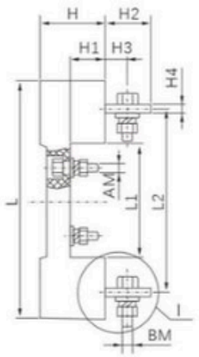
Model Specification		NLM1E-125	NLM1E-250	NLM1E-400	NLM1E-630	NLM1E-800	NLM1E-1250
Mounting Dim. (mm)	a/a1	30	35	44/50	70	70	70
	b	129	126	194	243	243	243
	Φd	Φ4.5	Φ4.5	Φ7	Φ7	Φ7	Φ7

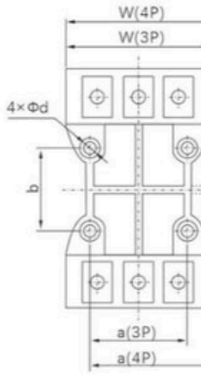
Model Specification	Poles	Overall Dimensions (mm)													
		W	W1	W2	W3	L	L1	L2	L3	H	H1	H2	H3/H4	AM	Y
NLM1E-125M/H	3P	92	30	16	28	150	132	102	54	112	82	82	28	M8	50
	4P	122													
NLM1E-250M/H	3P	107	35	22	27	165	144	102	54	112	94	85	23	M8	60
	4P	142													
NLM1E-400M/H (630 Up-ratNL 630)	3P	150	48	30	60	257	224	174	82	151	112	98	37/39	M10	110
	4P	198													
NLM1E-630M/H (630 Standard 630)	3P	182	58	40	66	270	234	185	82	158	116	105	42/39	M12	110
	4P	/													
NLM1E-800M/H (800 630 800 Frame 630)	3P	210	70	44	66	280	243	202	75	158	119	104	44/41	M12	110
	4P	280													
NLM1E-1250	3P	210	70	44	66	280	243	202	75	158	119	104	44/41	M12	110

Notes:1. Dimension W2 is the recommendNL maximum width for customer wiring.2. AM denotes the terminal screw for customer connection.3. It is recommendNL that 4-pole products be mountNL using the four holes of (a+a1).4. The busbar and overall dimensions of NLM1E-1250 may adopt the overall and mounting dimensions of NLM1-1600.

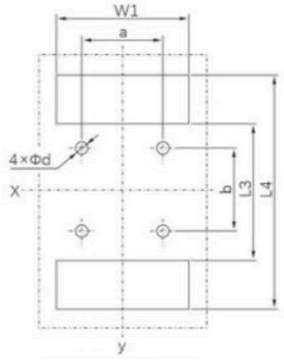
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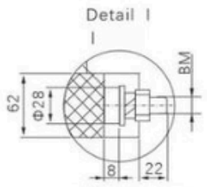
- NLM1E
- Outline, Mounting & Cutout Drawing for NLM1E Electronic MCCB, Plug-in Rear Connection





Mounting Plate Cutout Dimensions





Wiring Arrangement for 800 Frame as Shown

	Model	NLM1E-125		NLM1E-250		NLM1E-400 400&400Up-ratNL to 630A		NLM1E-630 NLM1E-630 (Standard)		NLM1E-630/800	
	Poles	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
Overall Dimensions (mm)	W	91	125	107	145	149	200	182	/	210	280
	H	50		50		60		60		87	
	H1	33		33		38		40		60	
	H2	32		37		46		50		22	
	H3	17		18		21		28		/	
	H4	4		5.5		8		11		/	
	L	168		186		280		300		305	
	L1	92		94		170		170		178	
	L2	132		145		224		234		242	
	AM	M6		M6		M8		M8		M10	
	BM	M8		M8		M12		M12		M14	
Mounting Dim.	a	60	90	70	105	60	108	100	/	90	162
	b	56		54		129		123		144	
	4×Φd	Φ7		Φ7		Φ9		Φ9		Φ12	
	W1	101	135	117	155	159	210	192	/	220	290
	L3	82		84		160		160		168	
	L4	178		196		290		310		315	