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NDM3Z系列塑料外壳式断路器 产品说明书 NDM3Z Series Moulded Case Circuit Breaker Product Manual

Nader 良信

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1. 适用范围与用途/ Application scope

NDM3Z 系列直塑壳断路器 (以下简称断路器) 按功能分为 NDM3Z 和 NDM3ZB。NDM3Z 系列简称断路器按壳架等级可分为 125 型、250 型、250V 型、250VM 型、320V 型、400 型、630 型、630V 型和 800 型 9 个等级。断路器适用于额定工作电压至 DC1500V (250V、320V、630V 型至 1500V; 250VM 型至 1100V, 额定工作电流至 800A 的直流电网电路中, 用来分配电能、保护电路和电源设备。NDM3ZB 系列简称断路器按壳架等级可分为 125 型、250 型、400 型和 800 型 4 个等级。断路器适用于额定工作电压至 DC250V, 额定工作电流至 800A 的直流电网电路中, 用来分配电能、保护电路和电源设备。断路器具有过载、短路 (NDM3ZB 还具有短路短延时保护) 和欠电压等保护功能。

The NDM3Z series of moulded case circuit breakers (Hereinafter referred to as MCCBs) is divided into NDM3Z and NDM3ZB in according to functions. The NDM3Z series MCCBs can be divided into seven **nine** according to their frame sizes, viz. Type 125, 250, 250V, 250VM, 320V, 400, 630, 630V and 800. The MCCBs are applicable for the DC grid circuit with the rated operational voltage up to DC1000V (250V, 320V, 630 up to DC1500V; 250VM up to DC1100V) and the rated operational current up to 800A for electrical energy distribution, and circuit and power equipment protection. The NDM3ZB series MCCBs can be divided into four classes according to their frame sizes, viz. Type 125, 250, 400 and 800. The MCCBs are applicable for the DC grid circuit with the rated operational voltage up to DC250V and the rated operational current up to 800A for electrical energy distribution, and circuit and power equipment protection. The MCCBs have the protecting functions in case of overload, short circuit (NDM3ZB further has short circuit delay protection), undervoltage and so on.

断路器具有隔离功能, 相应符号为/T The MCCBs have the isolating function with the relative symbol:



本产品符合标准/Standards for this kind of products:

GB/T14048.1-2012 低压开关设备和控制设备 第 1 部分 总则 / Low-voltage switchgear and controlgear—Part 1: General rules

GB/T14048.2-2008 低压开关设备和控制设备 第 2 部分 低压断路器/Low-voltage switchgear and controlgear - Part 2: Low-voltage circuit-breakers

GB/T14048.4-2010 低压开关设备和控制设备 低压机电式接触器和电动机起动器(不包含 250V 系列) / Low-voltage switchgear and controlgear - Low voltage electromechanical contactors and motor-starters(not involve 250V serial)

GB/T14048.5-2008 低压开关设备和控制设备 第 5-1 部分: 控制电路电器和开关元件机电式控制电器 / Low-voltage switchgear and controlgear—Part 5-1: Control circuit devices and switching element—Electromechanical control circuit devices

2. 型号说明/ Model and implication

ND 1	M 2	3 3	□ - 4	□ 5	□ 6	□ 7	□ / 8	□ 9	□ 10	□ 11	□ 12
序号	序号名称	NDM3Z									
1	企业代号 Enterprise	ND: “Nader”牌低压电器 Nader low-voltage apparatus									
2	产品代号 Product code	M:塑料外壳式断路器 Molder case circuit breaker									
3	设计序号 Design SN	3									
4	系列派生代号 Derived code of	Z、ZB									
5	壳架等级 Shell frame level	125、250、320、400、630、800									
6	品种派生代号	无代号: 常规产品 No code: Normal product V: 高电压分断 V: High voltage type VM: 高电压较高分断 V: High voltage type Relatively high breaking type M: 较高分断型 (NDM3ZB专用) M: Less high breaking type H: 高分断型 (NDM3ZB专用) H: High breaking type									
7	操作方式 Operation mode	无代号: 手柄直接操作 no code represents direct handle operation P: 电动操作 p: represents motor operation Z: 转动手柄 Z: represents rotary handle operation									
8	极数 Pole number	2, 3, 4									
9	脱扣器代号 Release form code	0: 无脱扣器 0: represents frame only without trip unit 1: 仅有瞬时脱扣器 1: represents magnetic only 2: 复式脱扣器 2: represents both thermal and matnetic									
10	附件代号 Accessory code	参见表 1									
11	额定电流 Setting current	参见表 2									
12	接线方式 Cabling type	2P 无代号: 常规产品 2P No code: Normal product 3P 无代号: 常规产品、J0 3P No code: Normal product, J0 4P: J0、J1、J2、J3									

表 1 附件代号
Table 1 Accessory Code

附件名称/Description of accessories	代号 /Code
分励脱扣器/Shunt release	10
双辅助触头/Double auxiliary contacts	20
单辅助触头/Single auxiliary contact	21
欠电压脱扣器/Under-voltage release	30
分励脱扣器双辅助触头/Shunt release, Double auxiliary contacts	40
分励脱扣器单辅助触头/Shunt release, Single auxiliary contact	41
分励脱扣器欠电压脱扣器/Shunt release, Under-voltage release	50
二组双辅助触头/Two groups of Double auxiliary contacts	60
二组单辅助触头/Two groups of Single auxiliary contact	61
双辅助触头单辅助触头/Double auxiliary contacts, Single auxiliary contact	62
欠电压脱扣器双辅助触头/Under-voltage release, Double auxiliary contacts	70
欠电压脱扣器单辅助触头/Under-voltage release, Single auxiliary contact	71
报警触头/Alarm contact	08
分励脱扣器报警触头/Shunt release, alarm contact	18
双辅助触头报警触头/Double auxiliary contacts, alarm contact	28
欠电压脱扣器报警触头/Under-voltage release, alarm contact	38
分励脱扣器与报警触头 Shunt release, Auxiliary and alarm contacts	48
辅助与报警触头/Auxiliary and alarm contacts	58
双辅助触头辅助与报警触头 Double auxiliary contacts /Auxiliary and alarm contacts	68
欠电压脱扣器辅助与报警触头 Under-voltage release and alarm contact	78

3. 技术参数/ Main technical parameters

表 2 NDM3Z/ZB 主要技术参数性能表/ Table 2 Main technical parameters of NDM3Z/ZB

型号 Type		NDM3Z-125	NDM3Z-250	NDM3Z-250V	NDM3Z-250VM	NDM3Z-320V
壳架等级额定电流 Inm(A) Frame size Inm(A)		125	250	250	250	320
额定电流 In(A) Rated current In(A)		16、20、25、32、 40、50、63、80、 100、125	63、80、100、 125、140、160、 180、200、225、 250	125、140、 160、180、 200、225、250	125、140、 160、180、 200、225、250	250、300、320
额定绝缘电压 Rated insulation voltage Ui(V)		1000	1500	1500	1500	1500
工频耐压 Frequency withstand voltage U(V)		3500	3500	3820	3820	3820
极数 Pole quantity		2 3 4	2 3 4	2 3	2	3
额定工作电压 Rated operational voltage Ue(DC V)		500、750、1000	500、600、 690、750、 1000、1200、 1250	1000、1500	1000、1100	1500
额定短路分断能力 Rated short circuit breaking capacity Icu/Ics(kA)	DC500V	20/20	35/35	/	/	/
	DC600V	/	8/8	/	/	/
	DC690V	/	5/5	/	/	/
	DC750V	20/20	40/25	/	/	/
	DC1000V	20/20	40/25 20/15 下进线	20/16	20/20	/
	DC1100V	/	/	/	10/10	/
	DC1200V	/	10/10	/	/	/
	DC1250V	/	15/15	/	/	/
	DC1500V	/	/	20/16	/	10/10 20/20(τ=5ms)
操作性能 Operating performance	电气寿命 Mechanical life		5000	5000	2000	2000
	免维护寿命 Maintenance free life		20000	10000	10000	12000
	机械寿命 Electrical life		40000	20000	20000	24000
可维护寿命 Maintainable life						20000

型号 Type		NDM3Z-400	NDM3Z-630	NDM3Z-630V	NDM3Z-800	NDM3Z-630 并联/ Parallel	NDM3Z-800 并联/ Parallel
壳架等级额定电流 Inm(A) Frame size Inm(A)		400	630	630	800	630	800
额定电流 In(A) Rated current		225、250、 315、350、 400	400、500、 630	400、500、 450、630	630、700、 800	1000、1250	1250、1440
额定绝缘电压 Rated insulation voltage Ui(V)		1000	1000	1600	1000	1000	1000
工频耐压 Frequency withstand voltage U (V)		3500	3500	3820	3500	3500	3500
极数 Pole quantity		2 3 4	2 3 4	2	2 3 4	4	4
额定工作电压 Rated operational voltage Ue(DC V)		500、690、 750、1000	500、690、 750、1000	1500	500、690、 750、1000	500、700	500、630
额定短路分断能力 Rated short circuit breaking capacity Icu/Ics(kA)	DC500V	35/35	35/35	/	35/35	30/30	30/30
	DC630V	/	/	/	/	/	20/20
	DC690V	8/8	8/8	/	8/8	/	/
	DC700V	/	/	/	/	20/20	/
	DC750V	40/40	40/40	/	40/40	/	/
	DC1000V	40/40	40/40	/	40/40	/	/
操作性能 Operating performance	DC1500V	/	/	20/20(τ=5ms) 15/15(τ=10ms)	/	/	/
	电气寿命 Mechanical life	1000	1000	1000	1000	1000	500
	免维护寿命 Maintenance free life	5000	5000	7000	5000	5000	5000
机械寿命 Electrical life		10000	10000	14000	10000	10000	10000
可维护寿命 Maintainable life							

型号 Type		NDM3ZB-125	NDM3ZB-250	NDM3ZB-400	NDM3ZB-800	
壳架等级额定电流 Inm(A) Frame size Inm(A)		125	250	400	800	
额定电流 In(A) Rated current		40、50、63、 80、100、125	63、80、100、 125、140、160、 180、200、225、 250	225、250、 315、350、400	400、500、 630、700、 800	
额定绝缘电压 Rated insulation voltageUi(V)		1000	1000	1000	1000	
工频耐压 Frequency withstand voltage U (V)		3500	3500	3500	3500	
极数 Pole quantity		2				
额定工作电压 Rated operational voltage Ue(DC V)		250				
额定短路分断能力 Rated short circuit breaking capacity Icc/Icu(kA)	DC250V	20/20(M) 52.5/70(H)	20/20(M) 52.5/70(H)	40/40(M) 52.5/70(H)	40/40(M) 52.5/70(H)	
额定短时耐受电流/Rated short-time withstand current Icw(kA)		2.5	5	5	10	
操作性能 Operating performance	电气寿命 Mechanical life		5000	5000	4000	3000
	机械寿命 Electrical life	免维护寿命 Maintainable free life	15000	15000	10000	10000
		可维护寿命 Maintainable life	30000	30000	20000	20000

注/Note:1. NDM3Z-125 DC500V 为 3P 产品作 2P 用,尺寸为 3P 产品尺寸。(The 2P product whose rated operational voltage is DC500V is rooted in 3P, so the dimensions are the same as 3P.)
2. NDM3Z-250/4 J3 通用接线下线线产品(While wiring needs to be connected from bottom to top)I_{cu}=20、I_{cs}=15(kA)
3.NDM3Z-250/4 DC1200V I_{cu}=I_{cs}=10(kA)
4. NDM3Z-320V DC1500V 为 3P 产品作 2P 用,尺寸为 3P 产品尺寸。(The 2P product whose rated operational voltage is DC1500V is rooted in 3P, so the dimensions are the same as 3P.)
5. NDM3ZB 系列尺寸与 3P 产品尺寸相同。Dimensions of NDM3ZB Series products are the same as 3P.)

表 3 NDM3ZB 动作特性表 Table 3 NDM3ZB Action property table

型号 Type	NDM3ZB-125	NDM3ZB-250	NDM3ZB-400	NDM3ZB-800
瞬时动作电流 Instantaneous action current I _n	16In ± 20%	16In ± 20%	16In ± 20%	16In ± 20%
短延时动作电流 Is Selective limited current I _{se}	10In ± 20%	10In ± 20%	10In ± 20%	10In ± 20%
短延时短延时动作时间整定值 Short-circuit short delay action time setpoint (ms)	OFF、10、30、 60	OFF、10、30、60	OFF、10、30、 60	OFF、10、30、 60
短延时短延时动作时间整定值允差 Short-circuit short delay action time setpoint tolerance (ms)	± 5%	± 5%	± 5%	± 5%
注:短延时动作时间不是指断路器全分断时间,为可靠实现选择性保护,仅在额定全分断时间的基础上增加的延时时间。 Notes: Short-circuit action delay time is not the full break-time of breaker, but it is only increased delay time on the basis of instant-on full break-time in order to reliably realize selective protection.				

4. 工作环境/Stand working conditions

- 海拔 ≤ 2500m ;
- 使用环境温度-35 ~ +70℃ ;
- 环境温度+40℃时相对湿度不超过 50% ,较低温度可以有较高湿度,如:20℃时相对湿度可达 90% ;
- 对于因温度变化所产生的凝露应采取相应的措施 ;
- 能耐受潮湿空气的影响 ;
- 能耐受盐雾、油雾的影响 ;
- 能耐受霉菌的影响 ;
- 断路器接至主回路的安装类别为 III 类,断路器不接至主回路的安装类别为:II 类 ;
- 污染等级:3 级 ;
- 防护等级:IP20 ;
- 无爆炸危险的介质中,且介质无足以腐蚀金属和破坏绝缘的气体与导电尘埃的地方 ;
- 在没有雨雪侵袭的地方 ;
- 当用户使用条件较上述严酷时应与制造商协商 ;
- 储存环境 见表 4 ;
- 产品降容系数表 见表 5 ;
- 高海拔降容系数 见表 6 ;
- 导体部分接线端子/安装螺钉拧紧扭矩 见表 7 ;
- Altitude ≤ 2500m ;
- Ambient temperature: -35 ~ +70℃ ;
- The relative humidity of the air does not exceed 50% at 40℃. Higher relative humidity is permitted at lower temperature, such as 90% relative humidity at 20℃ ;
- The protective actions should be taken for frost which formed by variation of temperature ;
- Resisting the effects by humid air ;
- Resisting effects by salt mist and oil mist ;
- Resisting the effects by mould ;
- Installation category for the breaker which is connected to main circuit: III , Installation category for the breaker which is not connected to main circuit: II ;
- Pollution degree:3 ;
- Protection degree: IP20 ;
- Service place without explosive media, gas and dust which are corrosive and conductive ;
- Be mounted free from rain and snow ;
- Should consult with the manufacturer when the working conditions are harsher ;
- Storage environment table4 ;
- Product derating coefficient table5 ;
- Derating coefficient in high altitude place table6 ;
- Terminal torsion value for wiring thread hole in conductor section table7 ;

表 4/ table4

项目 Item	规范 Description
周围温度 Ambient temperature	-40℃ ~ +75℃
相对湿度 Relative humidity	(Ambient temperature at 25℃) ≤ 95%

表 5/ table5

塑壳式断路器降容系数表 Molded Case Circuit Breaker Derating Coefficient Table

温度对应产品降容系数表 Derating coefficient table		温度对应产品降容系数表 Derating coefficient table						
壳架等级 额定电流(A) Frame size rated current(A)		温度对应产品降容系数表 Derating coefficient table						
		40℃	45℃	50℃	55℃	60℃	65℃	70℃
NDM3Z-125	1	1	1	1	0.96	0.91	0.85	0.78
NDM3Z-250	1	1	1	1	0.95	0.93	0.91	0.88
NDM3Z-250V	1	1	1	1	0.95	0.93	0.91	0.88
NDM3Z-250VM	1	1	1	1	0.95	0.93	0.91	0.88
NDM3Z-320V	1	1	1	1	0.95	0.93	0.91	0.88
NDM3Z-400	1	1	1	1	0.93	0.91	0.89	0.85
NDM3Z-630(V)	1	1	1	1	0.92	0.9	0.89	0.83
NDM3Z-800	1	1	1	1	0.92	0.89	0.85	0.8
NDM3ZB-125	1	0.977	0.954	0.931	0.907	0.883	0.858	
NDM3ZB-250	1	0.982	0.963	0.944	0.942	0.904	0.882	
NDM3ZB-400	1	0.981	0.962	0.942	0.922	0.901	0.879	
NDM3ZB-800	1	0.980	0.960	0.939	0.918	0.897	0.877	

表 6/ table6

塑壳断路器高海拔降容系数表

Molded Case Circuit Breaker Derating Coefficient Table in High altitude Place

海拔高度(m) Altitude(m)	系列 Series	2000	2500	3000	3500	4000	4500	5000
工作电流修正系数 Rated working current	NDM3Z	1	1	0.98	0.95	0.93	0.91	0.89
最大工作电压(V) Maximum working	NDM3ZB	1	1	0.98	0.97	0.95	0.94	0.93
工频耐压(V) Power frequency withstand voltage(V)	NDM3Z	1	1	1	1	1	1	1
绝缘电压(V) Isolation voltage(V)	NDM3ZB	-	-	-	-	-	-	-
工频耐压(V) Power frequency withstand voltage(V)	NDM3Z	1	1	1	1	1	1	1
绝缘电压(V) Isolation voltage(V)	NDM3ZB	1	1	1	1	1	1	1

表 7/ table 7

接线端子/安装螺钉拧紧扭矩 Torsion value for wiring terminal

序号 No.	壳架等级额定电流(A) Frame size rated current	螺纹直径(mm) Thread diameter	扭力矩(N·m) Torsion value
1	125、250、250V、250VM、320V	M8	12
		M4	2.4
		M10	20
2	400	M6	6
		M12	28
3	630、800	M6	6
		M10	20
4	630V	M5	4

5. 接线方式（接线图）/ Wiring Method

系统电压 System voltage	产品型号/Product type NDM3Z/ZB-125、NDM3Z/ZB-250、NDM3Z/ZB-400、NDM3Z-630、 NDM3Z/ZB-800
DC500V 及以下 DC500V or less	
DC500-750V	
DC750-1200V	(仅400/630/800壳架)
DC500V	NDM3Z 系列并联接线图 Circuit breaker in parallel wiring diagram

极数 Pole quantity	产品型号/Product type		
	NDM3Z-250V	NDM3Z-250VM/630V	NDM3Z-320V
2P			/
3P		/	

J1 型接线: Wiring mode J1 J2 型接线: Wiring mode J2 J3 型接线: Wiring mode J3

连接导线截面积与相适应的额定电流对应表/Corresponding table between wire sectional area and rated current

连接导线采用的截面积和相适应的额定电流见表 8

Table 8 of sectional area and applicable rated current adopted in wiring

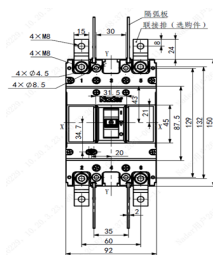
额定电流(A) Rated current(A)	16 20	25	32	40 50	63	80	100	125 140	160	180 200 225	250	315 350	400
导线截面积 Wire sectional area(mm ²)	2.5	4.0	6.0	10	16	25	35	50	70	95	120	185	240

额定电流(A) Rated current(A)	电缆线截面积		铜排尺寸	
	Cable cross-sectional area		Copper bar size	
	数量 Quantity	截面积(mm²) Cross-section area(mm²)	数量 Quantity	尺寸 (mm×mm) Cross-section area(mm×mm)
450、500	2	150	2	30x5
630	2	185	2	40x5
700、800	2	240	2	50x5

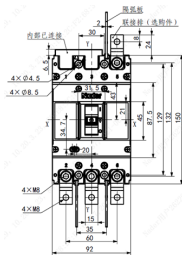
6. 产品外形及安装尺寸/ Shape dimension & Dimension

NDM3Z-125 板前接线/Front connection of NDM3Z-125

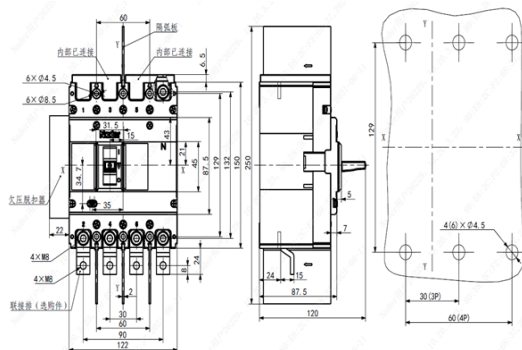
两极/Two poles



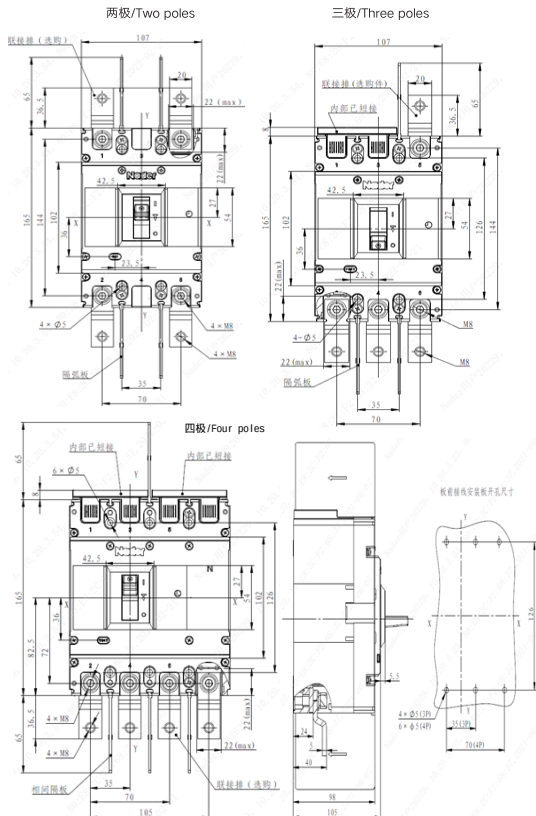
三极/Three poles



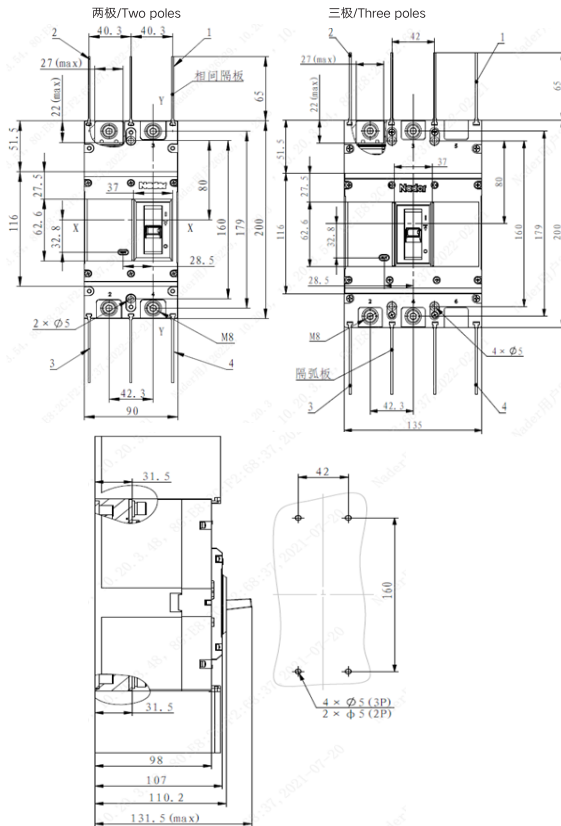
四级/Four poles



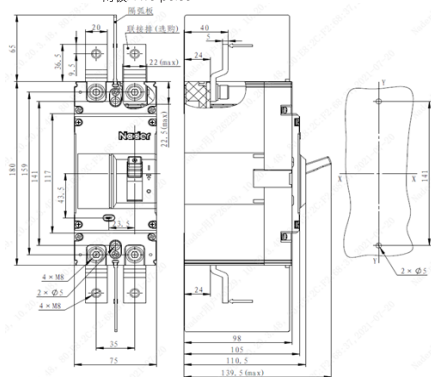
NDM3Z-250 板前接线/Front connection of NDM3Z-250



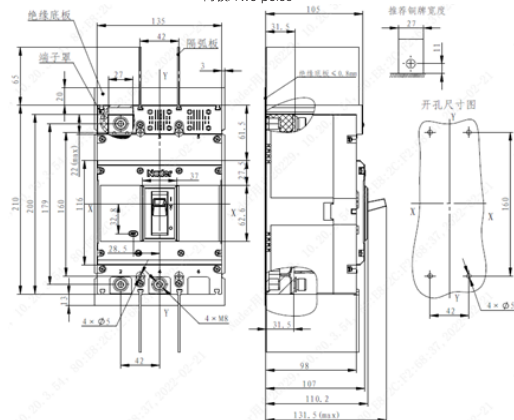
NDM3Z-250V 板前接线/Front connection of NDM3Z-250V



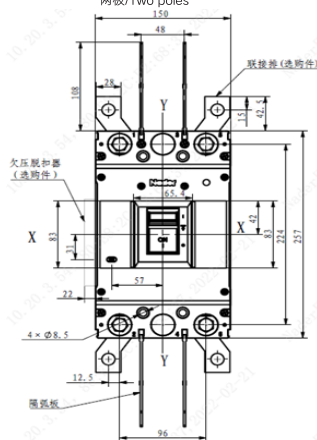
NDM3Z-250VM 板前接线/Front connection of NDM3Z-250VM
两极/Two poles



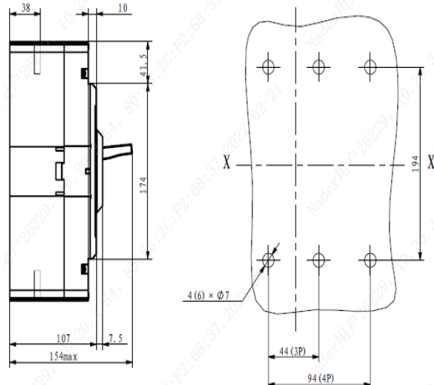
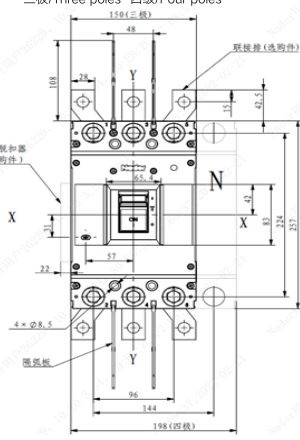
NDM3Z-320V 板前接线/Front connection of NDM3Z-320V
两极/Two poles



NDM3Z系列塑料外壳式断路器产品说明书
NDM3Z Series Moulded Case Circuit Breaker Product Manual
NDM3Z-400 板前接线 /Front connection of NDM3Z-400
两极/Two poles

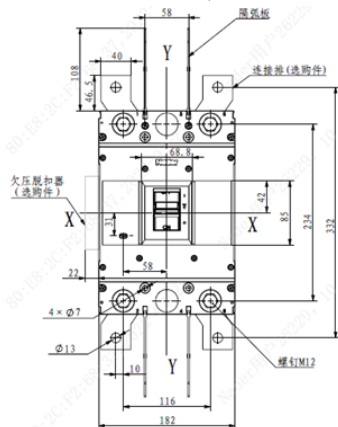


三级/Three poles 四级/Four poles

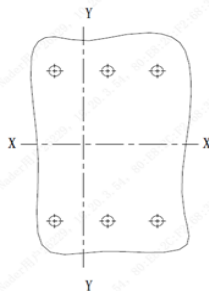
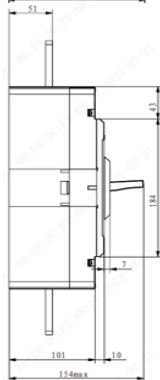
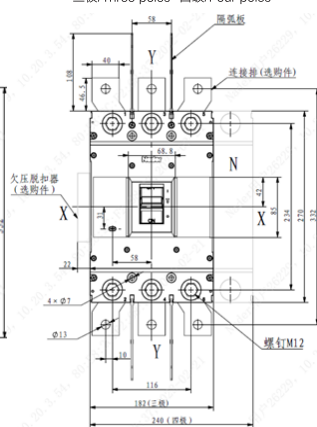


NDM3Z-630 板前接线/Front connection of NDM3Z-630

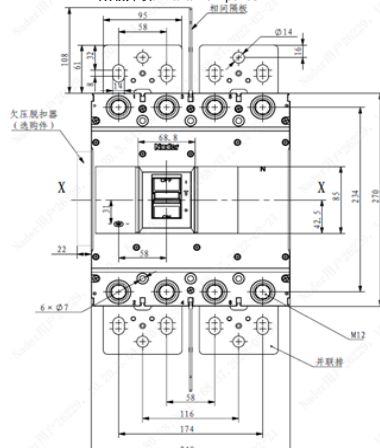
两级/Two poles



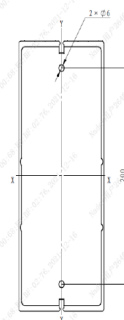
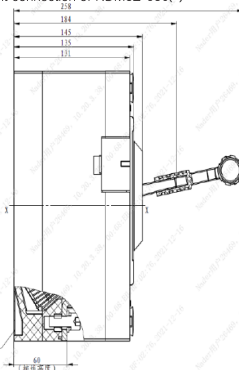
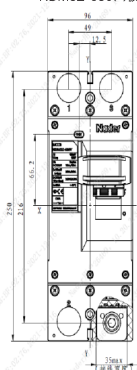
三级/Three poles 四级/Four poles



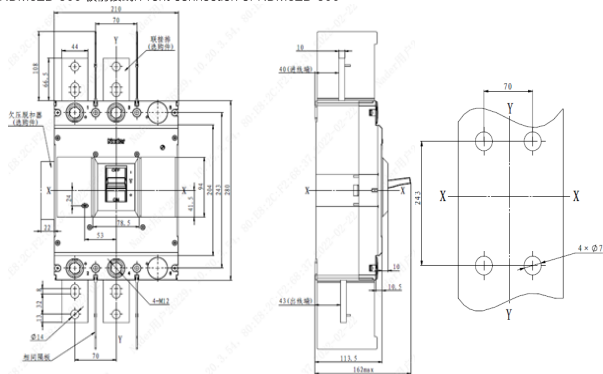
双级并联/ Parallel poles



NDM3Z-630(V)板前接线/Front connection of NDM3Z-630(V)



NDM3ZB-800 板前接线/Front connection of NDM3ZB-800



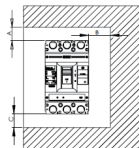
Note: The limit deviation not indicated with the tolerance dimensions is as per GB/T 1804-c.

7. 安装方式/ Mounting Method



7.1 Insulation distance mounted in the metal cabinet (unit: mm), as shown below:

安装距离 Mounting distance	A(进线端到柜面)A (inlet wire end to the cabinet face)		B (侧面到柜 体距离) B (distance from side to cabinet)	C(出线端到 柜面距离)C (outlet wire end to the cabinet face)
型号 Type	带端子罩 With a terminal cover	不带端子罩 Without a terminal cover		
125	25	65	30	30
250	25	65	30	30
250V	——	65	30	30
250VM	——	115	30	30
320V	65	——	30	30
400	25	120	35	35
630	25	120	35	35
630V	35	120	50	50
800	25	120	35	35



7.2 断路器排装之间的最小中心距离

7.2 Minimum center distance between rowed circuit breakers

型号 Type	断路器宽度 (mm) Width of circuit breaker (mm)			中心距离 (mm) Center distance (mm)		
	2P	3P	4P	2P	3P	4P
125	92	92	122	122	122	152
250	107	107	142	137	137	172
250V	90	135	—	190	190	—
250VM	75	—	—	105	—	—
320V	—	135	—	—	190	—
400	150	150	198	190	190	238
630	182	182	240	222	222	280
630V	96	—	—	126	—	—
800	210	210	280	250	250	320

注：断路器排装或叠装时，检查联接母排或电缆保证空气绝缘距离不会减少。

Note: Check the connected busbar or cable during rowing or stacking of the circuit breakers to ensure that the insulation distance won't be decreased.

7.3 断路器叠装之间最小中心距离

7.3 Minimum center distance between stacked circuit breakers

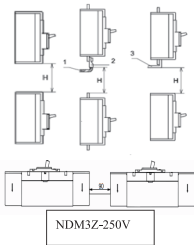
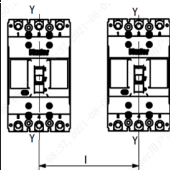
型号 Type	H(断路器上下距离) H (distance of circuit breaker from bottom)	
	带端子罩 With a terminal cover	不带端子罩 Without a terminal cover
125	90	91
250	90	93
250V	50	93
250VM	—	155
320V	95	—
400	155	155
630	155	155
630V	150	100
800	155	155

注：1. 绝缘电缆
2. 电缆端子
3. 连接-无绝缘

产品通电前检查端子罩或相间隔板装配到位。

Note: 1. Insulated cable
2. Cable terminal
3. Connection - on insulation

Check whether the arcing cover or phase partition is assembled properly before products are energized.



7.4 绝缘测试 Insulation test

本断路器出厂前已按标准规定绝缘测试。因断路器带有电子线路板，安装前如进行复测，必须按如下步骤：

Insulation test has been already carried out on the breaker according to standard before leaving factory. Due to wire circuit, the following steps should be operated if insulation test is carried out on the breaker again.

① 用 500VDC 兆欧表。500VDC megger.

② 在断路器处于断开状态，对进出连接板 1-2、3-4、5-6 之间，和 1、3、5 连接板与外壳之间（外壳用金属箱罩盖）分别进行。When breaker is broken up, insulation test is conducted separately between connecting panels 1-2, 3-4, 5-6, connecting panels 1, 3, 5 and shell.

③ 对接至主电路的欠电压脱扣器，在进线与断路器外壳间。Undervoltage tripper connected to the main circuit is arranged between intake wire and breaker shell.

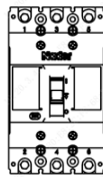
④ 绝缘电阻不小于 20MΩ。Insulation resistance is not less than 20MΩ.

注：也可分离电子线路板后进行绝缘测试。

Notes: Insulation test could be operated after wire circuit is separated.

7.5 安装 Installing

既可水平安装，亦可垂直安装。Both horizontal and vertical installations are available.



垂直安装
Vertical



水平安装
Horizontal

8. 附件说明书/ Accessory

8.1 辅助触头的额定值/Rated values of auxiliary contacts

表 9 辅助触头技术参数表/Table 9 Technical parameters of auxiliary contacts

分 类 Category	壳架电流 (A) Frame current (A)	约定发热电流Ith(A) Conventional thermal current (A)	额定工作电流 (A) Rated working current (A)
辅助触头 Auxiliary contact	125 ~ 250 400 ~ 800	3	0.3 (AC400V) 0.15(DC220V) 0.4 (AC400V) 0.15(DC220V)
报警触头 Alarm contact	125 ~ 250 400 ~ 800	3	0.3 (AC400V) 0.15(DC220V) 0.4 (AC400V) 0.15(DC220V)

8.2 辅助触头的电寿命、接通、分断能力/Electrical endurance, making and breaking capability of auxiliary contacts

表 10 辅助触头技术参数表/Table 10 Technical parameters of auxiliary contacts

使用类别 Usage category	接通 Making			分断 Breaking			电寿命次数 Electrical endurance Times	频率 Operating frequency (Time/Hour)	通电时间 Power on duration
	I/Ie	U/Ue	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1	0.3	1	1	0.3	6050	360	≥0.05s
DC-13	1	1	6Pe	1	1	6Pe			≥T0.95s

使用类别 Usage category	接通 Making			分断 Breaking			次数 Times	频率 Operating frequency (Time/Hour)	通电时间 Power on duration
	I/Ie	U/Ue	cosφ	I/Ie	U/Ue	cosφ			
AC-15	10	1.1	0.3	10	1.1	0.3	10	360	≥0.05s
DC-13	1.1	1.1	6Pe	1.1	1.1	6Pe			≥T0.95s

8.3 欠压脱扣器

断路器带有欠压脱扣器时，应使欠电脱扣器先通电，断路器才允许合闸。

根据外挂电压模块上的接线端子编号接入电源(直流电源不必区分正负极)

当电源电压下降到欠压脱扣器额定工作电压的 35% ~ 70%

范围内时，欠压脱扣器能可靠的分断断路器；当电源电压低于欠压脱扣器额定工作电压的 35% 时，欠压脱扣器能防止断路器闭合；当电源电压高于欠压脱扣器额定工作电压的 85% 时，欠压脱扣器能保证断路器可靠闭合。

8.3 Under-voltage tripper

When the breaker has an undervoltage tripper, the undervoltage tripper should be electrified, and then the breaker allows switch on.

Power supply is accessed according to wiring connector number on the external undervoltage module (anode and cathode of DC power supply are not differentiated).

When power voltage declines to 35% ~ 70% of the rated working Voltage of undervoltage tripper, the undervoltage tripper can reliably break the breaker up; when power voltage is lower than the rated working voltage of undervoltage tripper by 35%, the undervoltage tripper can prevent the breaker from closing; when power voltage is higher than the rated working voltage of undervoltage tripper by 85%, the undervoltage tripper can guarantee the reliable closure of breaker.

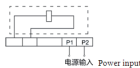
8.3 分励脱扣器

根据引出的导线编号接入电源(直流电源不必区分正

负极)。当分励脱扣器的外加电压介于额定控制电源电压的 70%~110% 之间时，能可靠分断断路器。

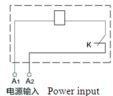
8.4 Shunt tripper

Power supply is accessed according to wiring connector number on the external undervoltage module (anode and cathode of DC power supply are not differentiated). When impressed voltage of shunt tripper is between 70% and 110% of rated control power voltage, the breaker can be reliably broken.



欠压脱扣器接线图

Wiring diagram of under-voltage release



分励脱扣器接线图

Wiring diagram of shunt tripper

9. 使用和维护 / Application & Maintenance

9.1 使用 / Usage

- 1) 断路器各种特性及附件由制造厂整定, 在使用过程中不可随意调节。/ Do not adjust the characteristic and accessories of the breaker by yourself.
- 2) 断路器手柄可以处于三个位置, 分别表示闭合、脱扣、断开三种状态, 当手柄处于脱扣位置时, 要使断路器闭合就必须先向分闸方向扳动手柄使断路器再扣, 然后合闸。/ The handle of the breaker can be placed in three position which are CLOSED, OPEN and FREE TRIP individually. When the handle is in the position of FREE TRIP. It should be turned in direction of OPEN at this moment. Then the breaker can be re-latched and closed.
- 3) 附件安装说明: 断路器必须在再扣状态才可安装所有附件, 且按照左侧辅助、右侧分励的位置安装, 安装人员务必遵循本条安装指南, 否则, 因操作不当对断路器造成的不必要损害本公司不能负责。/ Accessories installing instruction: All accessories must be installed in the open state of the breaker, and installation personnel must abide by the principle: left for Single auxiliary; right for shunt release. Nader should not be held reliable for purchase of unnecessary loss made by improper operation.
- 3) 维护检查必须有专业技术人员负责。/ Maintenance checks should be done by specialized technical personnel.
- 4) 用户如需选用内、外附件, 按所订型号由本公司提供, 以保证质量。如用户自行选购或改装, 本公司不能负责。/ User should use internal and external accessories provided by Nader so as to endure their quality; Nader should not be held reliable for purchase of accessories from other companies or authorized modifications.

9.2 维护 / Maintenance

- ◆ 维护检查必须有专业技术人员负责。
Maintenance checks should be done by specialized technical personnel.
 - ◆ 用户如需选用内、外附件, 按所订型号由本公司提供, 以保证质量。如用户自行选购或改装, 本公司不能负责。
User should use internal and external accessories provided by Nader so as to endure their quality; Nader should not be held reliable for purchase of accessories from other companies or authorized modifications.
- 在执行维护操作前, 必须先完成下列操作:
Follow following steps before conducting maintenance:
- (1) 使断路器分闸;
Open the breaker;
 - (2) 断开电源与断路器的连接 (包括主电路、辅助电路);
Disconnect power supply and breaker (including main circuit and auxiliary circuits)
 - (3) 将断路器从安装位置上卸下 (一般用于插入式, 固定式最好也如此)。
Remove the breaker from its installation position (normally for plug-in installation; it is recommended to do so for a fixing one).
- ◆ 断路器维护在正常操作条件下每年一次, 在非正常条件下每半年一次, 以下为维护内容:
Maintenance of breaker is carried out yearly under normal use and every six months under

abnormal use. The maintenance include following procedures:

- (1) 再扣断路器, 合、分断路器, 在断路器合闸时用脱扣按钮使断路器脱扣, 往复操作 5 次, 断路器应能可靠进行再扣、合、分、脱扣动作;
Re-trip the breaker, close and open the breaker, use tripping button to trip the breaker when it is closed; repeat for 5 times to check that the breaker can reliably re-trip, open, close and trip.
- (2) 清除断路器表面及连接处的灰尘 (用清洁、干燥的抹布擦拭);
Clean dust on breaker surface and connections (wipe with clean and dry cloth).
- (3) 清洁隔弧板, 如必要则需要更换隔弧板;
Clean the flash barrier; replace it if necessary.
- (4) 绝缘测试 (见 8.1)
carry out insulation test (see Section 8.1).
- (5) 检查所有连接情况, 用砂布擦除氧化物, 用可溶解剂清洁, 拧紧螺栓和螺母;
Check condition of all connections. Wipe away oxidations with abrasive cloth and clean with soluble agent. Screw bolts and nuts tight.
- (6) 如果断路器还装有其它内、外附件, 应逐一检查各个附件, 以确保其处于正常工作状态。
(按照附件说明详细内容进行测试)

If other internal or external accessories are installed in the breaker, check them one by one to ensure they are in normal working condition (carry out test according to detailed accessory descriptions).

10. 注意事项 / Notices

10.1 安装注意事项 / Precautions in installation

- 1) 断路器本体、底座 (板后接线用)、底座 (插入式接线用) 固定在安装板上。/ Breaker body, bottom plate (for wiring behind the plate) and base (for plug-in wiring) are mounted on the installation board.
- 2) 与主电路连接。/ Connection with the main circuit.
必须由具有专业资格的人员进行配线作业。/ Wiring should be done by professional qualified personnel.
确认输入电源处在完全断开的情况下, 才能进行配线作业。/ Wiring should be done after confirmation of complete disconnection of input power supply.
必须安装本体后再进行配线。/ Wiring should be done after installation of breaker body.
断路器配线必须按照接线图。/ Wiring should be in accordance with wiring diagrams.

10.2 运行注意事项 / Precautions in operation

- 1) 湿手不能操作断路器, 否则可能发生电击事故。/ Do not operate the breaker with wet hands, or electric shock would be resulted.
- 2) 断路器不能频繁操作, 否则会缩短断路器的使用寿命。/ Frequent operation will shorten service life of the breaker.
- 3) 带电动操作机构的断路器脱扣跳闸后, 电操机构必须使断路器再扣, 然后才能合闸。/ For breaker with motor-operated mechanism, after it trips, the motor-operated mechanism should re-trip the breaker before it can be closed.

10.3 保修期与售后服务 / After-sales service and warranty

本产品是在完善的质量管理体系下制造的, 当万一发生故障时, 对保修期与售后服务特作如下说明:
This product is manufactured in a sophisticated quality management system. In case of fault,

following warranty and after services clauses are applicable:

10.4 保修期 /Warranty

在用户遵守保管和使用条件下, 从本公司发货之日起, 不超过 36 个月, 断路器封印完好, 产品如因制造质量问题而发生损坏或不能正常使用时, 本公司负责无偿修理或更换。但是, 如由于下述原因引起的故障, 即使在保修期内亦作有偿修理或更换。/ On the premise of user's compliance with reservation and use specifications of the breaker, for breakers whose delivery date is within 36 months from now and whose seals are intact, Nader will repair or replace any of these breakers which are damaged or cannot work normally due to manufacture quality. However, as for faults caused by following reasons, Nader would repair or replace the breaker with a charge even it is still in warranty.

1) 由于使用错误、自行改装及不适当的维修等原因。/ Misuse, unauthorized modifications and improper repair, etc.

2) 超过标准规范的要求使用。/ Use during which standards and specifications are violated.

3) 购买后由于掉落及安装过程中发生损坏等原因。/ Damages caused by falling or improper installation, etc.

4) 地震、火灾、雷击、异常电压、其他天灾及二次灾害等原因。/ Natural disasters and secondary disasters such as earthquake, fire, thunder and abnormal voltage, etc.

10.5 售后服务/ Aftersales service

1) 出现故障时, 请与供货商或本公司售后服务部门联系。/ Contact distributor or Nader aftersales department in case of breaker fault.

2) 保修期内的修理或更换: 由于本公司制造上的问题所造成的故障, 作无偿修理, 以至更换。/ Breakers in warranty will be repaired or replaces; for faults caused by manufacture of Nader, product will be repaired for free or even replace with a new one.

3) 超过保修期后的修理或更换: 在修理后能维持功能的场合下, 作有偿修理, 否则可作有偿更换。/ Repair or replacement of breaker with expired warranty; paid repair will be done after which breaker can functions normally, or the breaker will be replaced with a charge.

11. 订货须知/ Accessory list and installation

用户务必确认对本产品技术资料已有详细了解, 并应根据断路器将来使用的场合, 按“订货规范”表订货。/ Customer should confirm that he or she is familiar with technical files of this product, and place order by the “Ordering Specifications” form according to future application of breaker.