

浙江诺科电气科技股份有限公司
ZHEJIANG NUOKE ELECTRIC TECHNOLOGY CO., LTD

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Powerlotus_cold

采用环保纸印刷

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电能表外置断路器
剩余电流保护断路器 选型手册



浙江诺科电气科技股份有限公司
ZHEJIANG NUOKE ELECTRIC TECHNOLOGY CO., LTD

诺科电气， 传承经典， 制造未来环保型工业电器

Inheriting classic,Manufacturing future environmental protection industrial electric

www.nuokedq.com

浙江诺科电气科技股份有限公司

诺科电气 (NUOKE)，专注于低压配电及工业自动化领域，为绿色能源和智能电力提供高效可靠的产品及解决方案。诺科电气系列自动转换开关电器、控制与保护开关电器、断路器产品、在电力能源、轨道交通、通信网络、数据中心、医疗、军事、冶金、消防、工业、基础设施等关键电源负荷中广泛应用。



诺科电气自成立以来，始终保持永续创新的技术研发理念，凭着优质的产品完善的服务在行业内迅速崛起，公司坚持“以人为本 开拓创新”的管理理念。在提高企业员工自身素质的同时不断增强企业的综合竞争力。公司在同行业中率先通过ISO9001

质量体系认证，中国质量认证中心的“CCC”强制性认证和“CQC”自愿性认证等。

我们以客户满意为第一原则，有效运用各种先进管理方法，以先进的生产、检测设备和制造流程，为每一台产品的高品质提供可靠保证。我们供应完美品质产品的同时，提供全方位的售后服务，您可以在任何时间、地点联系我们，所有解决方案在全国范围内均能得到诺科电气专业服务人员的全面支持。



Nuoke electric (NUOKE), focus on low voltage power distribution and industrial automation,To provide efficient and reliable products and solutions for green energy and intelligent power.Nuoke series automatic transfer switching equipment, electrical control and protection switch, Circuit breaker product, in electric power energy, rail transit, communication network, data Center, medical, military, metallurgy, fire, industry, infrastructure, etc.The wide application of key power load.

Nuoke electrical since its inception, always maintain the sustainable innovation of science and technology research and development Read, with high quality products and perfect service in the rapid rise of the industry, Companies adhere to the "people-oriented development and innovation" management philosophy. In the improvement of enterprises The quality of the employees themselves and constantly enhance the comprehensive competitiveness of enterprises. commonIn the same industry, the company took the lead through the ISO9001 quality system certification, China Quality Certification Center of the "CCC" compulsory certification and "CQC" voluntary certification, etc..

We take customer satisfaction as the first principle, the effective use of a variety of advanced management Method, with advanced production, testing equipment and manufacturing processes, for each production Product quality to provide a reliable guarantee. We supply the same quality products with perfect quality. When you can provide a full range of after-sales service, you can at any time and place Contact us, all solutions can be obtained within the scope of national electric Nuoke Full support for professional service personnel.

研发技术

NUOKE诺科电气多年的技术积累和沉淀，将尖端科技融入到任性化产品设计中，在整个产品研发生产体系中实行全价值管理，大力实施技术领先工程，始终坚持创新和低碳，创造实质性环保电器产品，为生态环境承担共同的责任

生产管理

NUOKE诺科电气的绿色生产制造体系，使贯穿于供应商→生产企业→客户的整个供应链成为“绿色供应链”；严格规范原料进化检验流程，生产过程检测流程，出厂验收流程，确保产品的卓越性能和可靠稳定。



技术创新

我们保持对高品质的追求，以“智能化、模块化、小型化”主导产品设计，多项产品技术专利有效填补了国内空白，持续投入不断优化产品开发流程、生产工艺，以基础研发推动产品设计，计算机仿真技术和现代测试手段结合，融合机构运动、结构强度、电磁场、温度等仿真分析手段，对影响低压电器产品性能与可靠性的关键系统进行全面优化设计，坚持以智慧创造更符合环保要求的工业电器产品，致力高端设备配套领域服务。

高端适配

我们积极与全球知名的院校及专业机构建立良好的合作关系，形成完善的产、学、研适配机制，帮助公司在各种新技术与解决方案及关键研究过程中取得重大突破，也极大帮助我们技术创新核心优势的形成。

安全保证

我们坚持确保为产品操作和使用人员提供最高标准的安全保证，从结构设计、外形设计及原料选用，始终以人身安全为第一要素，致力于制造安全可靠的电能管理。

环境标准

我们的环保理念始终贯彻从研发、生产、甚至产品包装及企业文化的每一个细节。设计、生产、检验检测各阶段均严格执行欧盟《RoHS指令》环保要求标准。开展与工业电器产品污染防治有关的标准研究和制定工作，根据相关法规制定材料、工艺、测试和实验方法的基础标准，杜绝使用含有毒有害物质，并积极寻找可替代品。

创新工艺

始终关注行业的产品需求趋势，引进先进的模具制造工艺，以及生产和检测设备，在关键工序上采用创新的产品工艺，用精致技术和设备提高部件精度，使人性化设计理念更有效的贯彻实施。

标准采购

在供货商的选择和评估上实行绿色标准化管理，使材料及工艺标准更加有利于人体健康及环境保护，在各关键环节精选多家材料供应商，严格按照精益求精的要求在全球范围内采购，确保材料质量的可靠稳定。

严格检测

重视产品的可靠性，配备全面的性能检测设备和环境试验设备，对低温、干燥、盐雾、湿热等不同环境下的稳定性检测，开展不同使用条件下的可靠性观察，保证产品在复杂的环境中稳定应用。

精益生产

通过对生产流程的精益化设计，提高了对生产过程的周密管理，这种生产模式可根据客户订单调节生产，减少浪费，提高效率。

NKB1

电能表外置断路器
Meter External Circuit Breaker

www.nuokedq.com
服务热线: 400 8260 831



NKB1-100ARD 电能表外置断路器
NKB1-100ARD Meter external circuit breaker



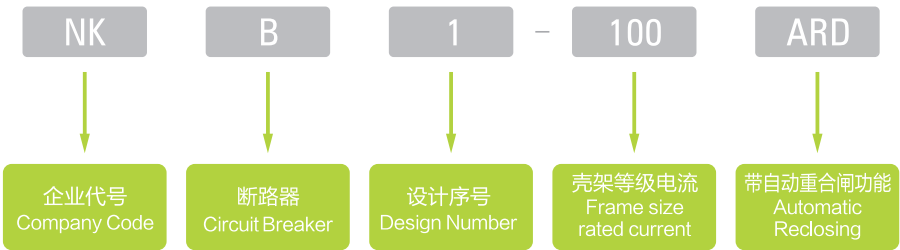
NKB1



适用范围 Application

- NKB1-100ARD电能表外置断路器(以下简称断路器), 适用于交流50Hz, 额定工作电压为至400V, 额定电流至100A的线路中, 对线路进行远距离控制分断或合闸操作, 同时对线路起过载和短路保护的作用, 也可以作为线路的不频繁操作转换之用。目前, 广泛应用于智能预付费电表配套使用来控制线路的合闸与分断。
- 符合标准: GB10963.1、IEC60898-1。
- NKB1-100ARD series meter external circuit breaker (hereinafter referred to as breaker) is suitable for AC 50Hz, rated voltage to 400V, rated current up to 100A of the line, on the line for remote control of the breaking or closing operation, at the same time on the line from overload and short circuit protection role, but also can be used as infrequent conversion of circuit operation with. At present, widely used in smart prepaid meters to control the line supporting the use of closing and breaking.
- Compliance: GB10963.1, IEC60898-1.

型号及其含义 Model and Meaning



主要技术参数 Main technical data

项目 Item	参数 Data
电气性能 Electrical Characteristics	
极数 Poles	2P、4P
功能 Function	短路保护、过载保护、隔离、远程分/合闸控制 Short circuit protection, overload protection, isolation, remote open / close control
壳架等级额定电流值 Inm Frame size rated current	100A
额定工作电压 Ue Rated operating voltage	AC230V(2P)/AC400V(4P)
额定电流 In Rated current	32A, 40A, 50A, 63A, 80A, 100A
瞬时脱扣类型 Type of Instantaneous trip	C
额定短路分断能力 Rated short-circuit breaking capacity	Ics=Icn=6000A
机械寿命 Mechanical cycle operation	10000次/times
电寿命 Electrical cycle operation	6000次/times
过电流脱扣特性 Overcurrent tripping characteristic	见表1和图1 See Table1 and Figure 1



远程控制功能 Remote control function	
合闸时间 Closing time	$t_c \leq 3s$
上电延时 Power-up	$t_d \leq 4s$
控制电平电压 Level voltage control	AC220V $\pm 30\%$
控制电平电流 Level current control	$I_c \leq 1mA$
合闸模块取电方式 Closing modules take power mode	控制线表前取电，合闸/分闸短时表后取电 Take power control line before the table, switch on / off the table after a short time to take power
分/合闸取电方式 Open / close way to take power	相线取电 Phase line to take power
相线泄漏电流 Phase leakage current	$I_L \leq 0.2mA$
控制信号指示灯 Control signal lights	有 Yes
反馈信号 Feedback signal	有 Yes
分/合闸操作方式 Open / close operation	内置轴传动 Built-in shaft drive
正常工作条件与安装条件 Installation Environment	
防护等级 Protection degree	IP20
接线能力 Connection capacity	1~35mm ²
使用环境温度 Ambient temperature	-40℃~70℃
抗湿热性 Resistance to wet heat resistance	2类
海拔 Altitude	$\leq 2000\text{ m}$
污染等级 Pollution degree	2
断路器对应铜导线截面积 Wire range	见表2 See Table2
安装环境 Installation Environment	无显著冲击和振动的地方 There was no significant impact and vibration
安装类别 Installation category	III
安装方式 Mounting	DIN标准导轨 DIN rail

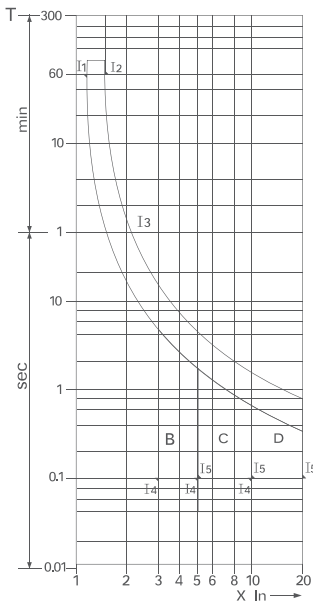
表1 Table 1

序号 No.	额定电流 Rated current	起始状态 Initial state	试验电流 Test current	规定时间 Time limit	预期结果 Expected result
1	32,40,50,63	冷态 Cold state	1.13In	$t \leq 1h$	不脱扣 No tripping
	80,100			$t \leq 2h$	
2	32,40,50,63	紧接着前项试验后进行 Right after test number 1	1.45In	$t < 1h$	脱扣 Tripping
	80,100			$t < 2h$	
3	$I_n \leq 32$	冷态 Cold state	2.55In	$1s < t < 60s$	脱扣 Tripping
	$I_n > 32$			$1s < t < 120s$	
4	全部规格 All	冷态 Cold state	5In	$t \leq 0.1s$	不脱扣 No tripping
			10In	$t < 0.1s$	脱扣 Tripping

表2 Table 2

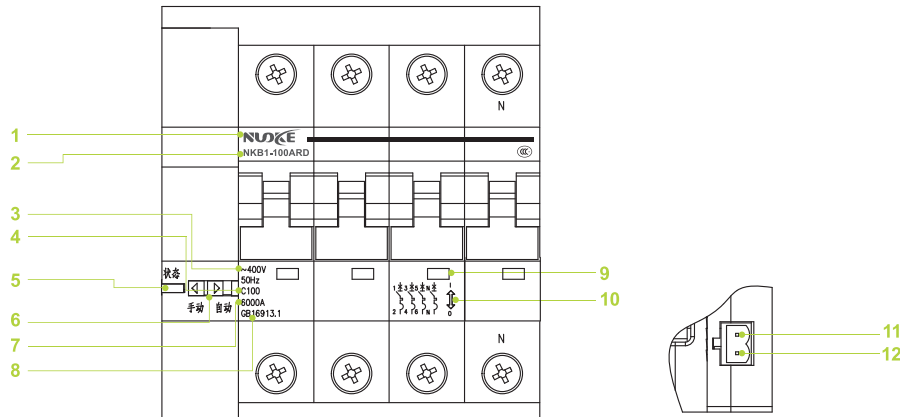
额定电流(A) Rated current	≤ 6	10	16,20	25	32	40,50	63	80	100
导线截面积(mm ²) Wire range	1	1.5	2.5	4	6	10	16	25	35

图1 Figure 1



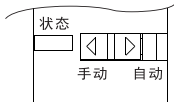
使用操作说明 Operation Instruction

- 1 品牌 Brands
- 2 型号 Model
- 3 额定电压 Rated voltage
- 4 脱扣类型+额定电流 Tripping type +Rated current
- 5 控制信号指示灯 Control signal lights
- 6 手/自动切换开关 Manual / automatic switch
- 7 额定短路能力 Rated short-circuit capacity
- 8 符合标准 Standards
- 9 指示窗 Indicator window
- 10 电气接线图 Electrical wiring diagram
- 11 控制信号线接口 Control signal line Interface
- 12 反馈信号线接口 Feedback signal wire interface



工作模式

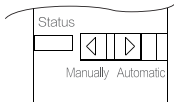
当产品工作在手动模式时，设置如下图



控制电平信号为高电平时，断路器处于允许合闸状态，此时允许用户手动合闸。
控制电平信号为低电平时，断路器延时2s后分闸，此时用户无法手动合闸。

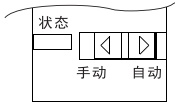
Operating mode

When the product is operating in manual mode, set the following diagram



Level control signal is high, the circuit breaker is in the closing state permit, then allows the user to manually switch on.
The control signal is low level, the circuit breaker opening delay 2s, then the user can not manual closing.

当产品工作在自动模式时，设置如下图



控制电平信号为高电平时，断路器在3s内合闸。
控制电平信号为低电平时，断路器延时2s后分闸，此时用户无法手动合闸。

● 故障跳闸

控制电平为高电平时，此时断路器如发生过载、短路故障跳闸后，断路器保持跳闸状态，需要人工排除故障后由人工合闸或通过远程给控制信号由低到高的控制信号来实现远程合闸。在故障跳闸后，如断路器进线端因检修原因临时断电再上电后，断路器故障状态保持不变。

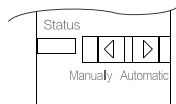
● 功耗控制

产品分、合闸模块正常工作时从信号线取电，不消耗终端用户电能。分合闸时从表后短时取电，分/合闸操作完成后断开表后取电回路。

● 其它

本产品限流特性好,燃弧时间极短、分断能力高、保护特性精确、寿命长、性能稳定可靠,同时设有明显的触头位置状态指示及控制信号指示灯。接线端子采用框式结构，接线牢固可靠。

When the product is operating in manual mode, set the following diagram



Level control signal is high, the circuit breaker in the closing within 3s.
The control signal is low level, the circuit breaker opening delay 2s, then the user can not manual closing.

● Fault trip

Control level is high, this time as the circuit breaker overload, short circuit fault trip, the breaker tripped state maintained by manual closing or to a control signal from low to high by a remote control signal after the need for manual troubleshooting remote closing. After fault tripping circuit breaker into the line side because of maintenance reasons and on again after a temporary power failure, breaker fault status remains unchanged.

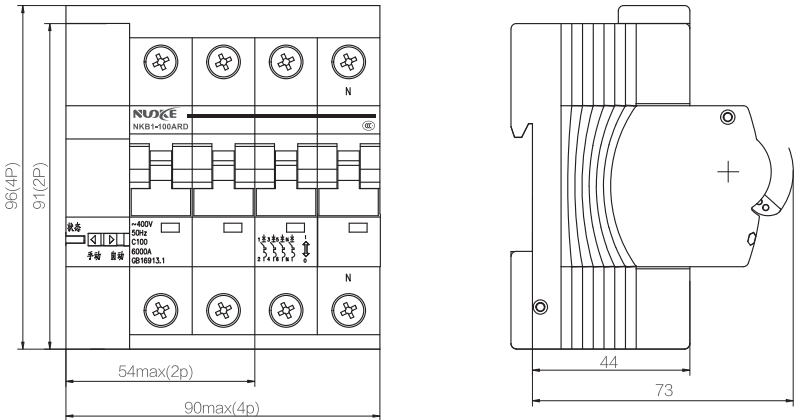
● Power control

Product points, to take power from the module to work correctly when closing the signal line, the end user does not consume energy. Open and close from the table after a short time to take power, open / close operation is complete electrical circuit after taking off the table.

● Other

This product is good limiting characteristics, arcing time is very short, high breaking capacity, accurate protection features, long life, stable and reliable performance, and has a significant position contact status indication and control signal lights. Terminals using frame structure, solid and reliable connection.

外形尺寸 Dimensions



订货说明 Ordering information

订货时请说明断路器型号、额定电流值、脱扣型式、极数、台数。

例如：

- 需订NKB1-100ARD预付电表外置断路器、额定电流为100A、脱扣型式为C型、2极、1000台。表示为: NKB1-100ARD/2P/C100 1000台。

When ordering the goods, the user shall indicate the breaker model, rated current, tripping type, Poles, Quantity.

For Example:

- NKB1-100ARD prepaid meters external circuit breakers, rated current of 100A, tripping type is type C, 2 poles, 1,000.
Example for ordering: NKB1-100ARD/2P/C100 1,000.



NKM1EL

剩余电流保护断路器(智能重合闸断路器)
NKM1EL Residual Current Operated Circuit Breaker

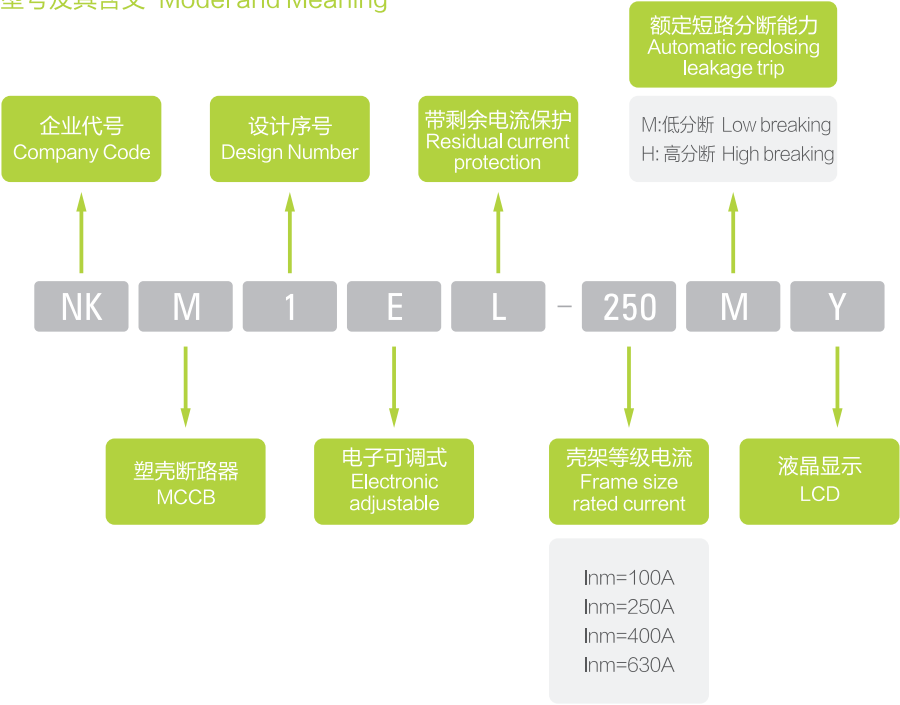
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服务热线: 400 8260 831



主要功能和特点 Main functions and features

- 采用高性能32位ARM微处理器，实时进行信号处理和智能控制；
 - 液晶中文显示，人机界面友好，操作简便；
 - 剩余电流(漏电)保护，剩余电流档位可在线整定，具有重合闸功能；
 - 实时监测跟踪线路剩余电流，自动调节档位，保证产品的投运率和可靠性；
 - 长延时、短延时和瞬时三段保护，采用电子式脱扣，与电源电压无关；
 - 具有高分断能力，保证线路短路保护的可靠性；
 - 过压保护，欠压保护，缺相保护；
 - 线路剩余电流、三相电源电压、负荷电流实时显示；
 - 保护功能及参数可在线设置修改；
 - 跳闸类型(剩余电流、闭锁、过载、欠压、过压、缺相)识别，显示，并可存储、查询、删除。
 - 网络型具有通信功能，可实现遥信、遥测、遥控、遥调。
- High-performance 32-bit ARM microprocessor, into the real signal processing and intelligent control;
 - Chinese liquid crystal display, friendly interface, easy to operate;
 - Residual current (leakage) protection, residual current gear online tuning with reclosing function;
 - Real monitoring residual current circuit tracking, automatic adjustment gear, to ensure that products put into operation and reliability;
 - Long delay, short delay and instantaneous protection, the use of electronic trip, regardless of the supply voltage;
 - Having a high breaking capacity, short circuit protection to ensure reliability;
 - Overvoltage protection, undervoltage protection, phase protection;
 - Residual current circuit, three-phase power supply voltage, load current, real-time display;
 - Protection functions and parameters can be set online modification;
 - Trip type (residual current lockout, overload, undervoltage, overvoltage, phase) to identify, display, and storage, query, delete.
 - Network type having a communication function, enabling remote, telemetry, remote control, remote adjustment.

型号及其含义 Model and Meaning





断路器分类及功能 Classification and function

功能分类 Classification	智能型 Smart type	网络型 Network type
保护功能 Protective function		
过载保护 Overload	●	●
短路保护 Short circuit protection	●	●
剩余电流保护 Residual current protection	●	●
自动重合闸 Automatic redosing	●	●
缺相保护 Phase protection	●	●
过压保护 Overvoltage Protection	●	●
欠压保护 Undervoltage protection	●	●
测量显示 Measurements display		
线路剩余电流 Residual current circuit	●	●
三相工作电压 Three-phase operating voltage	●	●
四相工作电压 Four-phase Operating current	●	●
性能设置 Performance Settings		
额定剩余动作电流 Rated residual operating current	●	●
过载长延时 Overload long delay	●	●
短路短延时 Short-circuit short delay	●	●
过压保护值 Overvoltage protection value	●	●
欠压保护值 Undervoltage protection value	●	●
时间、日期 Time, date	●	●
保护投入和退出 Protection of investment and exit	●	●
信息存储、查询、显示 Information storage, search, display		
剩余电流动作 Residual current	●	●
其他动作 Other actions	●	●
通讯功能(选配) Communication function (optional)		
RS-485/DL-T-20		●

主要技术参数 Main technical data

规格型号 Specifications	NKM1EL-100	NKM1EL-250	NKM1EL-400	NKM1EL-630
壳架等级电流(A) Frame size current (A)	100	250	400	630
极数 Poles	3P+N	3P+N	3P+N	3P+N
额定工作电压Ue(V) Rated operating voltage Ue (V)	AC400/50Hz		AC400/50Hz	
额定绝缘电压Ui(V) Rated insulation voltage Ui (V)	AC1000		AC1000	
额定冲击耐受电压Uimp(V) Rated impulse withstand voltage Uimp (V)	8000		8000	
飞弧距离(mm) Arcing distance (mm)	≥50		≥100	
极限短路分断能力Icu(KA) Limit short-circuit breaking capacity Icu (KA)	M: 50 H: 80		M: 50 H: 80	
额定运行短路分断能力Ics(KA) Rated short-circuit breaking capacity Ics (KA)	M: 35 H: 50		M: 35 H: 50	
额定剩余短路接通(分断)能力IΔm(kA) Rated residual short-circuit making (breaking) capacity I Δ m (kA)	12.5		20	
剩余电流动作特性 Residual Current Operating Characteristic	AC型		AC型	

续上表 Continued first table

规格型号 Specifications		NKM1EL-100	NKM1EL-250	NKM1EL-400	NKM1EL-630
额定剩余动作电流IΔn(mA) Rated residual operating current I Δ n (mA)		30/50/100/500/1000 MCU自动跟踪或手动任意设置 MCU automatic or manual tracking arbitrarily set		30/50/100/500/1000 MCU自动跟踪或手动任意设置 MCU automatic or manual tracking arbitrarily set	
剩余动作时间特性 Delay characteristics		0.2s/0.3s/0.5s/1s四档可调			
延时型极限不驱动时间(s) Not driving time limit (s)		0.06/0.1/0.2 可选: 2IΔn			
分断时间(s) Breaking time (s)		IΔn≤0.5; 2IΔn≤0.2; 5IΔn≤0.15			
自动重合闸时间(s) Automatic reclosing time (s)		20-60			
操作性能(次) Operational performance (times)	通电 Power ON	1500	1000	1000	1000
	不通电 Power OFF	8500	7000	4000	4000
	总次数 Total	10000	8000	5000	5000
过载、短路特性 Overload, short circuit characteristics		三段保护, 电子可调, 详见“保护特性说明” Three sections protection, electronically adjustable, (see Table 2)			
过压保护值(V) Overvoltage protection value		设置值(250V~290V)可调, 10V一档			
欠压保护值(V) Undervoltage protection value		设置值(140V~180V)可调, 10V一档			
联控延迟时间(ms) Control delay time			≤40ms		
通讯延迟时间(ms) Communication delay time			≤200ms		

保护特性说明 Protection Features Description

- 过载长延时保护 Long delay overload protection
动作值设定范围(见表1) Action value setting range (see Table 1)

表1 过载长延时参数设定 Table 1 Overload long delay parameter			
参数 Data	壳架电流 Frame size current	设定值 Setting	出厂整定值 Factory setting value
动作设定值Ir1 Action setpoint Ir1	100	40A~100A可调,10A一档	40A
	250	90A~250A可调,20A一档	90A
	400	200A~400A可调,40A一档	200A
	630	240A~630A可调,40A一档	240A
延时时间设定值tL Delay time setting tL		15s, 30s, 60s, 120s, 240s	15s

- 动作特性 Operating characteristics

表2 保护动作特性 Table 2 Operating characteristics of protection			
环境温度 Air temperature	电流名称 Current Title	整定电流倍数 Setting current multiples	约定时间 Appointed time
+40℃	约定不脱扣电流 Conventional Non-tripping current	1.05Ir1	≥2h
	约定脱扣电流 Conventional tripping current	1.30Ir1	<2h

- 延时特性
过载保护反时限特性进行:
 $T=(6Ir1/I)^2 t_L$ 延时精度: ± 10%
其中T为动作时间值, Ir1为长延时保护设定值, I为故障电流, tL为长延时时间设定值。
- Delay characteristics
Overload inverse time characteristics:
 $T=(6Ir1/I)^2 t_L$ delay accuracy: ± 10%
Where T is the time when the action value, Ir1 for the long delay protection settings, I fault current, tL for the long delay

● 短路短延时保护

短路短延时保护防止配电系统的阻抗性短路，跳闸延时是为了实现选择性保护。

● Short circuit short delay protection

The short circuit short time delay protection can prevent the impedance short circuit of distribution system, delayed tripping is to realize the selective protection.

短路短延时保护相关参数(见表3) Short circuit short delay protection parameters (Table 3)

表3:短路短延时参数设定 Table3: Short circuit short delay parameter		
参数设定 Setting	整定范围 Setting range	出厂整定值 Factory setting value
短延时动作电流设定值Ir2 Hort delay action current settings Ir2	2Ir1, 4Ir1, 6Ir1, 8Ir1, 10Ir1	2Ir1
短延时时间设定值ts Short delay time setting ts	0.1s, 0.2s, 0.3s, 0.4s	0.1s

短路短延时保护动作特性(见表4) Short circuit protection short delay operating characteristic (see Table 4)

表4：短路短延时动作特性 Table 4: Short circuit short time delay operating characteristic			
特性 Characteristic	故障电流倍数 Fault current multiples	脱扣时间 Trip time	延时误差 Delay Accuracy
不动作特性 No action	≤0.9Ir2	不动作 No action	± 40ms
动作特性 Action	> 1.1Ir2	延时动作 Delay action	± 40ms

● 瞬时保护 Transient protection

短路瞬时保护动相关参数(见表5) Instantaneous short-circuit protection covariance parameters (see Table 5)

表5:瞬时参数设定 Table 5: Instantaneous parameter settings		
参数设定 Setting	设定值 Setting range	出厂整定值 Factory setting value
瞬时动作电流设定值Ir3 Instantaneous action current setting	6Ir1,8Ir1,10Ir1,12Ir1	6Ir1

短路瞬时保护动作特性(见表6) Instantaneous short-circuit protection operation characteristics (see Table 6)

表6:瞬时动作特性 Table 6: instantaneous operating characteristics			
特性 Characteristic	电流倍数(I/Ii) Current multiple(I/Ii)	脱扣时间 Trip time	延时误差 Delay Accuracy
不动作特性 No action	≤0.85	不动作 No action	-
动作特性 Action	>1.15	瞬时动作 Momentary action	± 40ms

● 剩余电流保护特性 Residual current protection characteristics

表7：档位设置范围 Table7: Setting range		
参数 Data	设定值 Setting range	出厂整定值 Factory setting value
剩余动作电流IΔn Residual operating current IΔn	100, 200, 300, 500, 800,1000,自动	100mA

● 动作特性 Operating characteristics

表8: 动作特性 Table8: Operating characteristics				
参数 Data	特性			
额定不动作电流 Rated non-action current	0.5IΔn			
额定动作电流 Rated action current	≥0.75IΔn			
延时特性 Delay characteristics	2IΔn极限不驱动时间(Δt) 2IΔn is not driving time limit (Δt)	分断时间 Breaking time		
		IΔn	2IΔn	5IΔn
非延时 Non-delay		≤0.3s	≤0.15s	≤0.04s
0.06	≥0.10s	≤0.5s	≤0.2s	≤0.15s
0.1	≥0.20s	≤1.0s	≤0.4s	≤0.20s
0.2	≥0.30s	≤1.5s	≤0.6s	≤0.30s

● 自动档位模式 Autopilot bit mode

自动档位模式下，各档位值及浮动值：
Under automatic transmission bit mode, the value of each gear and floating values:

表9: 自动档位值及浮动值 Table9: Autopilot bit value and float value	
档位值 Gear value	浮动值(mA) Float value
30	15
50	25
100	50
500	250
1000	-

当剩余电流大于该档浮动值而未达到其动作值且稳定维持60s后，档位上浮一档，以此类推，直至最大档位，当剩余电流小于该档下一档的浮动值且稳定维持120s后，档位下浮一档，以此类推，直至最小档位。以“自动2”档位，线路初始剩余电流为100mA为例。断路器通电，档位自动整定在300mA档。当剩余电流增大至150mA以上并稳定60s后，档位变化至500mA档；当剩余电流减小至150mA以下并稳定120s后，档位变化至200mA档。

When the residual current is greater than the value of the file without float reaches its pickup and remained stable after 60s, stalls go up a file, and so on, up to the maximum position, when the residual current is less than the value of the floating stalls of the next stall and stable maintenance 120s after a fall stalls stalls, and so on until the smallest gear. In "Auto 2" position, line initial residual current is 100mA example. Breaker is energized, auto tuning stalls at 300mA file. When the residual current increases to 150mA or more stable 60s, gear shift change to 500mA; when the residual current is reduced to 150mA or less stable and 120s, gear shift change to 200mA.

● 自动重合闸

当剩余电流超过动作电流值档位动作跳闸后，经过20-60秒的时间能自动重合闸，但手动合闸不受时间限制。如故障电流消除，则合闸成功。断路器正常运行；如故障电流没有排除，断路器再次跳闸且闭锁，不可自动重合闸，必须人工操作合闸。

● Automatic reclosing

When residual current exceed the tripping value and take action to trip, it will reclose after 20-60s, but the time for manual reclosing is out of this limit. if fault current is removed, the reclosing operation will be successful, the breaker keep running normally, if fault current is still existing, the breaker will trip again and self locked, reclosing operation is limited now, it has to perform manual reclosing operation.

过压保护功能

当线路相电压高于过压保护设定值时，断路器保护跳闸。当线路电压恢复到正常电压后，断路器可自动合闸投运。过压保护的设置值范围(250V~290V)可调，10V一档，用户可自行设定或关闭保护。

欠压保护功能

当线路相电压低于欠压保护设定值时，断路器保护跳闸。当线路电压恢复到正常电压后，断路器可自动合闸投运。欠压保护的设置值范围(140V~180V)可调，10V一档，用户可自行设定或关闭保护。

缺相保护功能

当线路电源端出现缺相时，断路器保护跳闸。当线路恢复到正常电压后，可自动合闸投运。

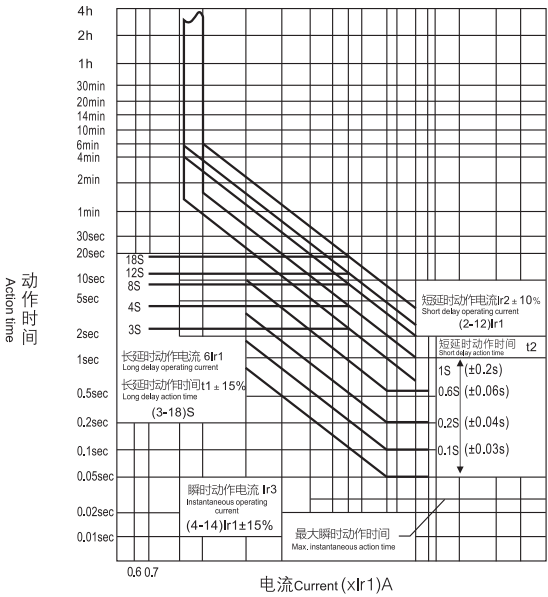
联动保护功能

通过联动接口可与其他消防设备进行联动保护具体如下：

DI输入设置 Input Settings		功能说明 Function Description	优先级 Priority	延迟时间 Delay
输入控制 Input Control	DI1与DCOM短接 DI1 with DCCOM	断路器合闸 Breaker closing	低 Low	≤40ms
	DI3与DCOM短接 DI3 with DCCOM	断路器分闸 Breaker opening	高 High	≤40ms

注意：若长时间短接会令短路一直处于分闸状态。
Note: If a long time will make the short circuit has been shorted at the opening state.

特性曲线 Characteristic curve



Overvoltage Protection

When the phase voltage exceed the over-voltage setting value, the breaker take action to trip. While servicing voltage recover, the breaker can automatically redose to put into operation, over-voltage setting range 250~290V, the user can set or close this function freely.

Undervoltage protection

When the phase voltage is lower than the under-voltage setting value, the breaker take action to trip. While servicing voltage recover, the breaker can automatically redose to put into operation, under-voltage setting range 140~180V, the user can set or close this function freely.

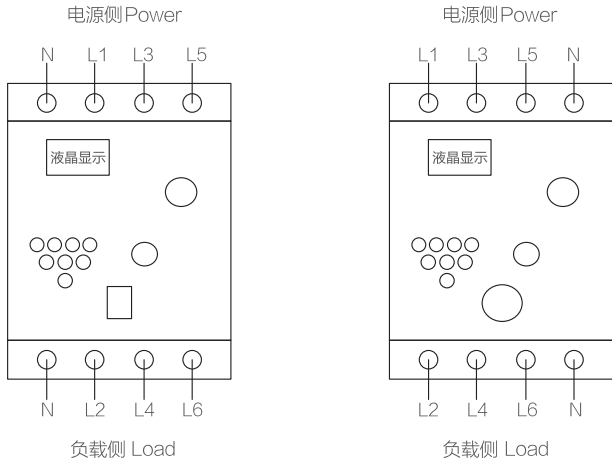
Phase Protection

When the power source side of the line happen to phase absence, the breaker take action to trip, while the line recover, it can automatically redose to put into operation.

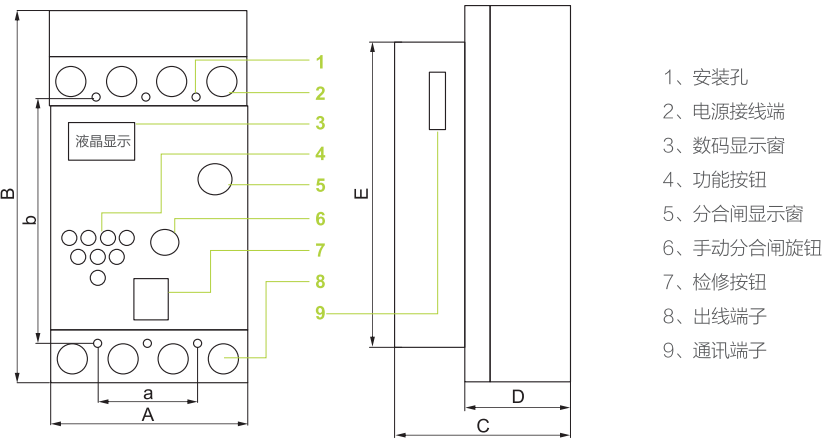
Linkage protection

Through linkage interface can be linked with other fire protection equipment, as follows:

接线图 Wiring diagram



外形及安装尺寸 Dimensions



产品型号 Model	外形尺寸(mm) Dimensions				安装尺寸(mm) Installation dimensions		
	A	B	C	D	a	b	Ød
NKM1EL-100	122	232	118	62	60	210	4-Ø4
NKM1EL-250	140	240	136	82	70	203	4-Ø4
NKM1EL-400	196	336	189	98	96	272	4-Ø6
NKM1EL-630	196	336	189	98	96	272	4-Ø6