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NDR1E-38/95系列 电子式过载继电器使用说明书 NDR1E-38/95 Series Electronic Overload Relay operation instruction

Nader 良信电器

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V1.0

Nader 良信电器

一、适用范围与用途 Application Scope and Purpose

电子式过载继电器适用于交流 50Hz/60Hz、额定电压至 690V、电流至 95A 的电路中，作三相交流电动机的过载、断相和三相电流不平衡保护之用，能够与适当的交流接触器组合成电机起动器。

Electronic overload relays apply to the overload, open-phase and three-phase current unbalance protection of three-phase AC motors in the circuit with the AC 50Hz/60Hz, the rated voltage to 690V and the current to 95A; they can be used as motor starters with the appropriate AC contactors.

二、型号说明 Model Description

ND R 1 E — □ □ □ □ / □
1 2 3 4 5 6 7 8 9

序号 SN	序号说明 SN description	NDR1E 型号 NDR1E model
1	企业代号 Enterprise code	ND: Nader 牌低压电器 ND: Nader
2	产品代号 Product code	R: 继电器 R: Relay
3	设计序号 Design SN	1
4	过载方式 Overload mode	E: 电子式 Electronic
5	产品基型代号 Product basic-type code	38、95
6	整定电流规格代号 Setting current specification code	见表 1 See Table 1
7	脱扣等级代号 Tripping level code	B:10 级 C: 20 级 B: Level 10 C: Level 20
8	辅助触头工作电压 Working voltage of the auxiliary contact	0:230V { AC-15 } 1:400V { AC-15 }
9	辅助电源电压 Auxiliary power voltage	110V、220/230V、380/400V { 50Hz/60Hz }

表 1 Table 1

过载继电器 整定电流/A Overload relay setting current/A	与熔断器一同使 用的熔断器类型 Fuse type to be used with the fuse	推荐匹配接触器的型号 (与接触器直接插接安装) Recommended matching contactor model (To be directly plugged with the contactor)	产品电流规格代 号 Product current specification code
	aM/A	gG/A	NDC1- NDR1E
0.1~0.16	0.25	2	09~38 NDR1E-3811
0.16~0.25	0.5	2	09~38 NDR1E-3812
0.25~0.4	1	2	09~38 NDR1E-3813
0.4~0.63	1	2	09~38 NDR1E-3814
0.63~1	2	4	09~38 NDR1E-3815
1~1.6	2	4	09~38 NDR1E-3816
1.6~2.5	4	6	09~38 NDR1E-3817
2.5~4	6	10	09~38 NDR1E-3818
4~6	8	16	09~38 NDR1E-3821
5.5~8	12	20	09~38 NDR1E-3822
7~10	12	20	09~38 NDR1E-3823
9~13	16	25	09~38 NDR1E-3824
12~18	20	35	12~38 NDR1E-3825
17~25	25	50	18~38 NDR1E-3826
23~32	40	63	25~38 NDR1E-3827
30~40	40	80	32~38 NDR1E-3828
23~32	40	63	40~95 NDR1E-9531
30~40	40	100	40~95 NDR1E-9532
37~50	63	100	40~95 NDR1E-9533
48~65	63	100	50~95 NDR1E-9534
55~70	80	125	65~95 NDR1E-9535
63~80	80	125	65~95 NDR1E-9536
80~95	100	160	80~95 NDR1E-9537

三、技术参数 Technical Parameters

表 2 主要性能指标

Table 2 Main Performance Indexes

产品壳架型号 Housing model			NDR1E-38	NDR1E-95
符合标准 Applicable standards			GB/T 14048.4、GB/T 14048.5	
整定电流范围 Setting current range			0.1 ~ 40A	23 ~ 95A
额定绝缘电压及频率 Rated insulation voltage and frequency			690V, 50Hz/60Hz	
脱扣等级 Tripping level			10/20	10/20
主回路接线 Main circuit wiring	无接线端子的软导线 1 根 Flexible conductor (1 piece) without terminals	最小/最大截	1.5/10 mm ²	4/35 mm ²
	有接线端子的软导线 1 根 Flexible conductor (1 piece) with terminals	面积 Minimum/maximum cross section	1/4 mm ²	4/35 mm ²
	无接线端子的硬导线 1 根 Hard conductor (1 piece) without terminals		1/6 mm ²	4/35 mm ²
主回路端子紧固扭矩 Terminal tightening torque of the main circuit			1.5N.m	9N.m
辅助电源电压 Auxiliary power voltage			110V、220/230V、380/400V (50Hz/60Hz)	
辅助触头类型 Auxiliary contact type			1NC+1NO(电气不分离) (electrical without separation) NDR1E-□□□0 1NC+1NO(电气分离) (electrical separation) NDR1E-□□□1	

额定工作电压 Rated working voltage			AC-15 230V/0.75A 400V/0.47A(根据规格可选) (optional according to model) DC-13 230V/0.1A
辅助回路接线 Auxiliary circuit wiring	无接线端子的软导线 1 根 Flexible conductor (1 piece) without terminals	最小/最大截	1/2.5 mm ²
	有接线端子的软导线 1 根 Flexible conductor (1 piece) with terminals	面积 Minimum/maximum cross section	1/2.5 mm ²
	无接线端子的硬导线 1 根 Hard conductor (1 piece) without terminals		1/2.5 mm ²
辅助端子紧固扭矩 Auxiliary terminal tightening torque			0.8N.m

表 3 动作特性
Table 3 Action features

动作特性 Action features	序号 SN	整定电流 Setting current	动作时间 Action time	起始条件 Initial conditions	周围空气温度℃Ambient air temperature ℃
各相负载平衡时 In case of load balance of each phase	1	1.05In	>2h	冷态 Cold state	-25℃~60℃
	2	1.2In	<2h	接序 1 试验后 Following the sequence 1 test	
	3	1.5In	10 级 (class 10) <4min 20 级 (class 20) <8min	接序 1 试验后 Following the sequence 1 test	
	4	7.2In	10 级 (class 10) 4s< Tps10s 20 级 (class 20) : 6s< Tps20s	冷态 Cold state	
				冷态 Cold state	

缺相保护 Default phase protection	当一相或二相电流 $I \geq 0.3I_n$ ，剩余相电流为 0 时 When the one or two-phase current satisfies $I \geq 0.3I_n$ with the other-phase current as 0	3~8s	冷态或热态 Cold state or warm state	
相不平衡 保护 Phase unbalance protection	相不平衡率 $\geq 60\%$ 时 When the phase unbalance rate is $\geq 60\%$	30~40s	冷态或热态 Cold state or warm state	
锁定功能 Locking function	10 级产品：当一相或二相电流 $I \geq 0.8I_n$ ，剩余相电流为 0，且故障时间 $\geq 8\text{min}$ 、连续三次故障后锁定自动复位功能，需手动复位 Level 10: When the one or two-phase current satisfies $I \geq 0.8I_n$ with the other-phase current as 0 and the fault time is $\geq 8\text{min}$ with the automatic reset function locked after failure for consecutive three times, it is necessary to perform the manual reset			
	10 级产品：当过载电流 $I \geq 4I_n$ 、故障时间 $\geq 8\text{min}$ 、连续三次故障后锁定自动复位功能，需手动复位 Level 10: When the overload current is $I \geq 4I_n$ and the fault time is $\geq 8\text{min}$ with the automatic reset function locked after failure for consecutive three times, it is necessary to perform the manual reset			
	20 级产品：当一相或二相电流 $I \geq 0.8I_n$ ，剩余相电流为 0，且故障时间 $\geq 14\text{min}$ 、连续三次故障后锁定自动复位功能，需手动复位 Level 20: When the one or two-phase current satisfies $I \geq 0.8I_n$ with the other-phase current as 0 and the fault time is $\geq 14\text{min}$ with the automatic reset function locked after failure for consecutive three times, it is necessary to perform the manual reset			
	20 级产品：当过载电流 $I \geq 4I_n$ ，且故障时间 $\geq 14\text{min}$ 、连续三次故障后锁定自动复位功能，需手动复位 Level 20: When the overload current is $I \geq 4I_n$ and the fault time is $\geq 14\text{min}$ with the automatic reset function locked after failure for consecutive three times, it is necessary to perform the manual reset			

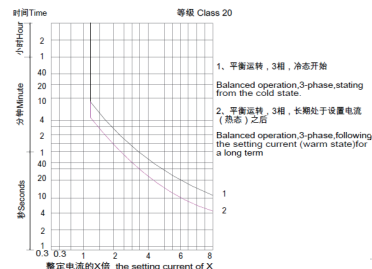
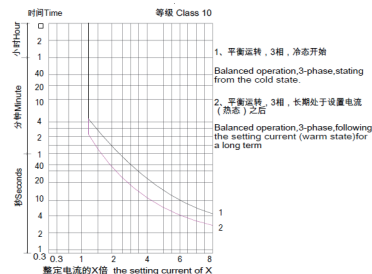
表 4 指示灯状态与工况

Table 4 Indicator status and working condition

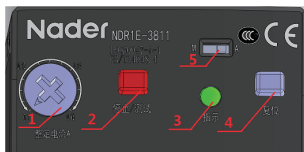
工况 Operating condition	指示灯状态 Indicator status
正常 Normal	常亮 Constantly on
过载、测试 Overload, test	均匀闪烁 Slow flashing

不平衡 Unbalance	2 快 1 慢闪烁 2-fast+1-slow flashing
缺相 Default phase	3 快 1 慢闪烁 3-fast+1-slow flashing
三次脱扣后锁定 Locked after tripped for three times	快闪 Quick flashing
脱扣 Tripped	熄灭 Off

3.1 产品脱扣特性曲线 $20 \pm 2^\circ\text{C}$ Tripping characteristic curve of the product $20 \pm 2^\circ\text{C}$



3.2 产品的特殊性能 Special performance of the product



● 整定电流刻度旋钮“1”，可进行调节。

The dial knob "1" of the setting current can be adjusted.

仅允许在箭头所示角度范围内旋转整定电流旋钮，否则会造成旋钮损坏。

Only rotate the setting current knob in the angle range indicated by the arrow; otherwise the knob will be damaged.



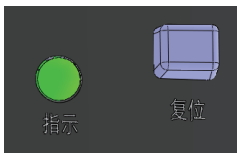
● 红色停止按钮“2” Red stop button "2"

1) 主回路及外接电源通电情况下，按下按钮，NC 触头立马断开，NO 触头接通，松开按钮，NC 触头恢复到原来的状态（停止用）。

In case the main circuit and the external power supply are connected, press the button to immediately disconnect the NC contact; in case the NO contact is connected, NC contact reverts to its original state (disabled) by releasing the button (for stop).

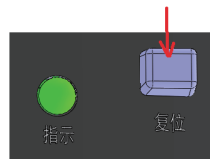
2) 仅外接电源通电情况下，按下按钮约 6-7s，NC 触头断开，NO 触头接通。(测试用)。

In case only the external power supply is connected, press the button for about 6-7s to disconnect the NC contact and connect the NO contact (for test).



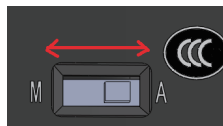
● 绿色指示 LED 灯“3”，在正常使用中可指示继电器正常工作、过载、缺相、不平衡、锁定、脱扣状态（具体见表 4）。

Green indication LED light "3", which can indicate the relay's normal operation, overload tripping status, default phase status, unbalance status, locked status, Tripped status during normal use (See table 4).



● 复位按钮“4”可实现手动复位功能。可使 NC、NO 触头切换。

Reset button "4" for the manual reset function. To switch between NC and NO contacts.



● 手动转换拨码开关“5”，在箭头方向可使产品处于手动(M)或自动(A)复位的状态。

Manual/automatic transfer dial switch "5", to make the product in the manual (M) or automatic (A) reset status in the arrow direction.

1) 处于自动复位状态时，产品在脱扣后 120s 内会自动复位，LED 会重新亮起。

In the automatic reset status, the product can reset automatically within 120s after tripping and LED will be on again.

2) 处于手动复位状态时，脱扣后，产品保持脱扣后的状态，按下按钮 4 后可使产品复位。

In the manual reset status, the product remains the tripped status after tripping and press the button 4 to reset the product.

四、工作环境 Operating Environment

4.1 环境温度：储存-40℃~+70℃；运行-25℃~+60℃，24h 的平均值不超过+35℃，环境温度低于-25℃使用时，用户应与制造厂协商。

Ambient temperature: Storage: $-40^{\circ}\text{C}\sim+70^{\circ}\text{C}$; operating: $-25^{\circ}\text{C}\sim+60^{\circ}\text{C}$, the average within 24 h shall not exceed $+35^{\circ}\text{C}$; the user shall negotiate with the factory in case the ambient temperature is lower than -25°C .

4.2 海拔：安装地点的海拔不超过 3000m。

Altitude: The altitude of the installation site doesn't exceed 3,000m.

4.3 污染等级：3

Pollution level: 3

五、电子式过载继电器配合的附件 Supporting Accessories of Electronic Overload Relay

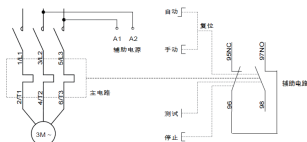
NDR1E 附件 NDR1E Accessories

序号 SN	名称 Name	型号 Model	安装方式 Installation mode
1	独立安装座 Stand-alone mounting base	A1/R1-38	插接 Plugged-in
2	独立安装座 Stand-alone mounting base	A1/R1-95	插接 Plugged-in

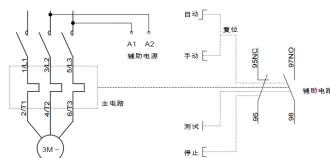
注: NDR1E 加装独立安装座后可用螺钉安装固定或 TH35 型标准导轨安装固定。Note: NDR1E can be installed and fixed with screws or the TH35-type standard guide after a stand-alone mounting base is mounted.

六、电子式过载继电器电气线路图 Electric Circuit Diagram of the Electronic Overload Relay

NDR1E-□□□0 电气线路图 NDR1E-□□□0 Electrical circuit diagram

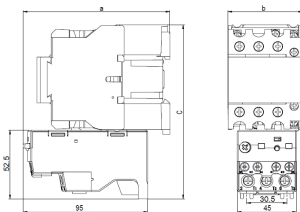


NDR1E-□□□1 电气线路图 NDR1E-□□□1 Electrical circuit diagram



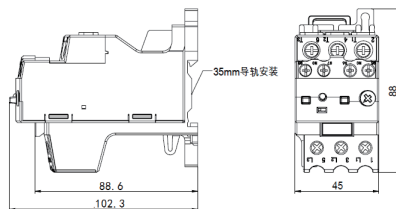
七、外形尺寸和安装尺寸 External Dimensions and Installation Dimensions

7.1 NDR1E-38 配接触器安装 NDR1E-38 installation with contactor

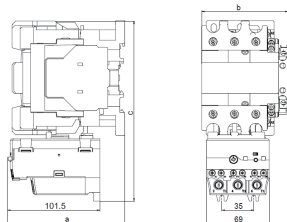


接 触 器 型 号 Contactor model	a	b	c
NDC1-09/12	103	45	127
NDC1-18	103	45.5	127
NDC1-25	115	57	136
NDC1-32	115	57	136
NDC1-38	115	57	136

7.2 NDR1E-38+A1/R1-38 导轨和螺钉安装 NDR1E-38+A1/R1-38 guide and screw installation

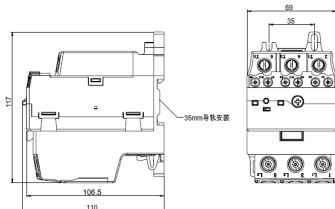


7.3 NDR1E-95 配接触器安装 NDR1E-95+A1/R1-95 with contactor

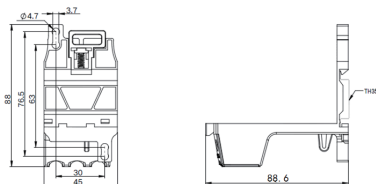


接触器型号 Contactor model	a	b	c
NDC1-40/50/65	128	74.5	195
NDC1-80/95	134	84.5	200

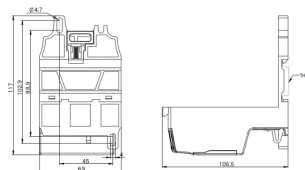
7.4 NDR1E-95+A1/R1-95 导轨和螺钉安装 NDR1E-95+A1/R1-95 guide and screw installation



7.5 独立安装座外形与安装尺寸 External and Installation Dimensions of the Stand-alone Mounting



A1/R1-38 外形与安装尺寸 A1/R1-38 Outline and Installation Dimensions



A1/R1-95 外形与安装尺寸 A1/R1-95 Outline and Installation Dimensions

注：所有安装与外形尺寸单位为 mm，未注公差按“ $\times \pm 0.5$ ， $\times \pm 1$ ”。

Note: All installation and outline dimensions are in mm with those not indicated with the tolerance as per “ $\times \pm 0.5$, $\times \pm 1$ ”.

八、注意事项 Precautions

8.1 产品应安装使用在无明显冲击和振动的地方。

The product shall be installed and used in places without obvious impact or shock.

8.2 本产品为免维护型，不得私自打开继电器进行维修，因私自拆开产品而引起的质量问题，责任自负。

This product is maintenance-free. Therefore, do not open it for maintenance without authorization. A user must be responsible for addressing a product issue that occurs because the user disassembles the product without approval.

8.3 安装接线可靠，应防止接线不良导致接线端子异常发热，引起产品受损。

Reliable installation wiring is required to prevent the abnormal heat at the terminals due to poor wiring, thus resulting in the product damage.

8.4 产品自身的正常工作需要接通 A1、A2 辅助电源（即控制电源）。

Normal operation of the product requires the A1 and A2 auxiliary power supplies (namely the control power supply).

8.5 产品出厂时整定在手动状态。

The product is set to the manual reset state when deliver.