

Contactors, Relays, Starters

Relays



NR8
Thermal
Overload Relay

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Electronic
Overload Relay

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Thermal
Overload Relay

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NR8 series Thermal Overload Relay

1. General

Nr8 series thermal overload relay (hereinafter referred to as thermal relay) is used to provide overload and phase failure protection for AC motors with a frequency of AC 50Hz/60Hz, a voltage of up to 690V and a current of 0.1A~38A that operate continuously or intermittently.

The thermal relay also has temperature compensation, operation indication, automatic and manual reset and stop functions and stable and reliable performances.

The product meets the standards GB 14048.4 and IEC 60947-4-1.

Plug-in mounting is used between the thermal relay and the contactor.

2. Usual service conditions and mounting conditions

2.1 Altitude: not higher than 2000m.

2.2 When the ambient temperature is $-5^{\circ}\text{C} \sim +40^{\circ}\text{C}$, the mean value is no greater than $+35^{\circ}\text{C}$ within 24 hours.

2.3 Atmospheric conditions: When the ambient air temperature is $+40^{\circ}\text{C}$, the relative humidity of the air shall not be higher than 50%; a higher relative humidity is allowed at a lower temperature; for example, for the wettest month, the lowest temperature averaged shall not be higher than $+25^{\circ}\text{C}$, the maximum relative humidity averaged shall be 90%, and special measures shall be taken for the condensation occasionally produced due to temperature change.

2.4 Class of pollution: 3.

2.5 The inclination between the mounting plane and the vertical plane shall not exceed 5° .

2.6 In non-explosive media that do not contain a sufficient amount of gas or conductive dust to cause metal corrosion or insulation failure.

2.7 In places with rain and snow protection equipment and not full of vapor;

2.8 In places where there is no significant shake, impact or vibration.

3. Main parameters and technical characteristics

Item			NR8-11.5	NR8-38
Current class			13	38
Nominal insulation voltage V			690	690
Phase failure protection			Have	Have
Manual and automatic reset			Have	Have
Temperature compensation			Have	Have
Tripping indication			Have	Have
Test button			Have	Have
Stop button			Have	Have
Mounting type			Plug-in type	Plug-in type
Auxiliary contact			1NO+1NC	1NO+1NC
AC-15 230V rated current A			2.61	2.61
AC-15 400V rated current A			1.5	1.5
DC-13 220V rated current A			0.2	0.2
Conductor cross-sectional area mm ²	Main circuit	Single-core or stranded conductor	1~2.5	1~10
		Terminal screw	M4	M4
	Auxiliary circuit	Single-core or stranded conductor	0.5~2.5	0.5~2.5
		Terminal screw	M3.5	M3.5

4. Others





4.1 Structural features

- 4.1.1 Three-phase bimetal type, tripping class 10A.
- 4.1.2 Phase failure protection.
- 4.1.3 Setting current continuously adjustable device.
- 4.1.4 Temperature compensation.
- 4.1.5 Operation indication.
- 4.1.6 Testing mechanism.
- 4.1.7 Stop button.
- 4.1.8 Manual and automatic reset button.
- 4.1.9 One N.O. contact and one N.C. contact, electrically separable.
- 4.1.10 Mounting type: plug-in mounting with the contactor.

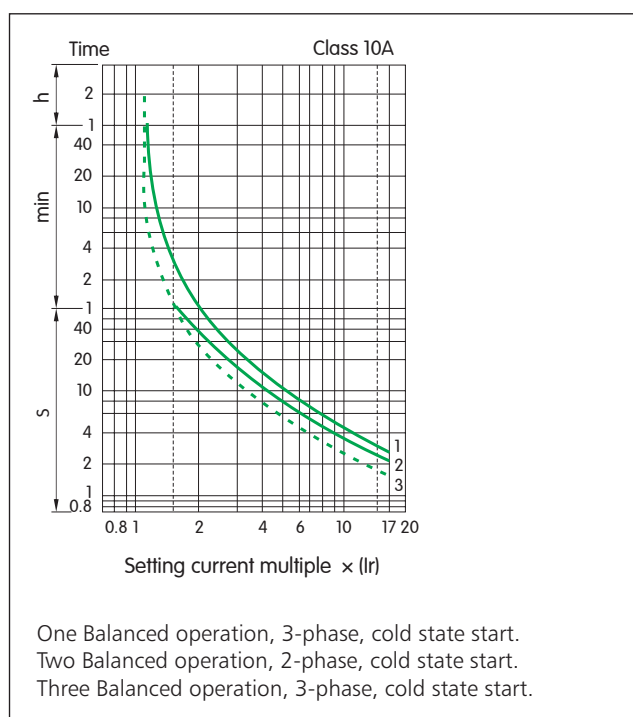
4.2 Protection characteristics

Item	No.	Setting current multiple		Operation time	Test conditions
Overload protection	1	1.05		No operation within 2h	Cold state start
	2	1.2		Operation within 2h	Hot state start (after No.1)
	3	1.5		Operation with 2min	Start when thermal equilibrium is reached after applying a 1 times setting current
	4	7.2		$2s < T_p \leq 10s$	
Phase failure protection	5	Any two phases	The other phase	No operation within 2h	Cold state start
		1.0	0.9		
	6	1.15	0	Operation within 2h	Hot state start (after No.5)

4.3 Type selection and ordering data (see the table)

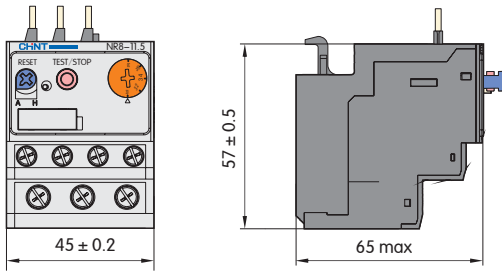
Product appearance	Rated current A	Specification of matching fuse(RT 36 is recommended) A	Model of matching contactor
		gG	
 NR8-11.5	0.1~0.16	2	 NC8-06M、NC8-06M/Z NC8-09M、NC8-09M/Z NC8-12M、NC8-12M/Z
	0.16~0.25	2	
	0.25~0.4	2	
	0.4~0.63	2	
	0.63~1	4	
	1~1.6	4	
	1.6~2.5	6	
	2.5~4	10	
	4~6	16	
	5.5~8	20	
	7~10	20	
	9~13	25	
 NR8-38	0.1~0.16	2	 NC8-09、NC8-12 NC8-18、NC8-25 NC8-32、NC8-38
	0.16~0.25	2	
	0.25~0.4	2	
	0.4~0.63	2	
	0.63~1	4	
	1~1.6	4	
	1.6~2.5	6	
	2.5~4	10	
	4~6	16	
	5.5~8	20	
	7~10	20	
	9~13	25	
12~18	35		
16~24	50		
23~32	63		
30~38	80		

4.4 Tripping characteristics

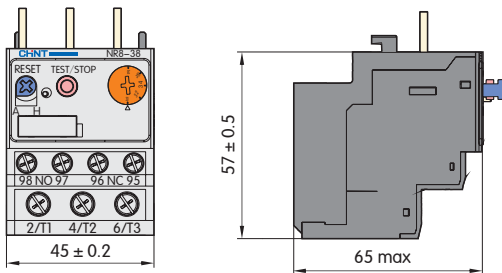


5. Overall and mounting dimensions (mm)

NR8-11.5



NR8-38



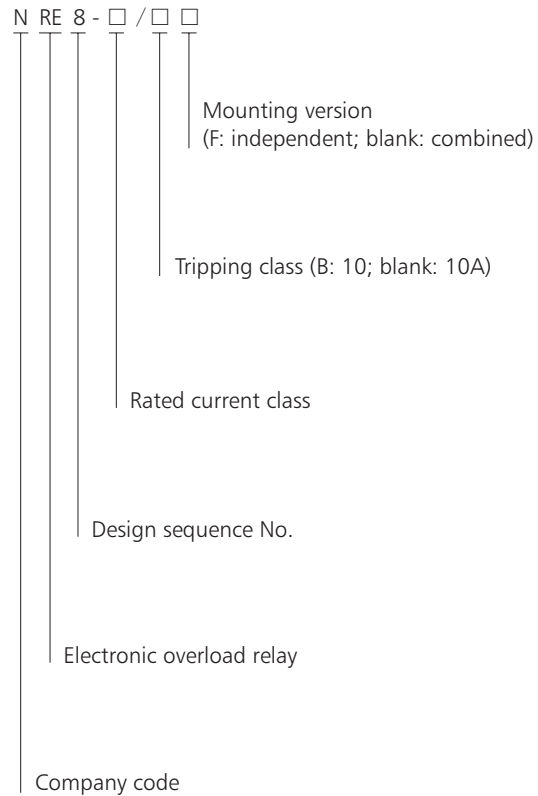


NRE8 Electronic Overload Relay

1. General

- 1.1 Certificates: CE, UKrSEPRO, UL;
- 1.2 Electrical ratings: AC50/60Hz, 690V;
- 1.3 Standards: IEC/EN 60947-4-1, UL508

2. Type designation



3. Features

- 3.1 Three-phase electronic type, tripping class 10A and 10;
- 3.2 Energy saving up to 80% compared with bimetallic type;
- 3.3 Phase-failure protection;
- 3.4 Current setting continuously adjustable;
- 3.5 Two indicator lights available for indicating normal, overload time-delay, phase-failure and phase-failure time-delay status respectively;
- 3.6 Manual test mechanism;
- 3.7 Manual reset button;
- 3.8 A pair of N/C and N/O contacts;
- 3.9 Two mounting versions: independent or combined with a contactor.

4. Technical data

- 4.1 Main Circuit: Rated insulation; Voltage: AC 690V; Rated frequency: 50/60Hz;
- 4.2 Auxiliary Circuit: Rated insulation; Voltage: AC 400V; Rated frequency: 50/60Hz; See table below for other ratings.

Utilization category	AC-15		DC-13
Rated operational voltage Ue (V)	230	400	220
Rated operational current Ie (A)	2.5	1.5	0.2
Conventional heating current (A)	5		



4.3 Wiring. Connection of main circuit is PVC insulation copper conductor or cable. See table below for details:

Current range (A)	Cross section area (mm ²)	Length (m)	Number of piece
I≤8	1.0	1	1
8<I≤12	1.5	1	1
12<I≤20	2.5	1	1
20<I≤25	4.0	1	1
25<I≤32	6.0	1	1
32<I≤50	10	1	1
50<I≤65	16	1	1
65<I≤85	25	1	1
85<I≤115	35	1	1
115<I≤150	50	2	1
150<I≤175	75	2	1
175<I≤225	95	2	1
225<I≤250	120	2	1
250<I≤275	150	2	1
275<I≤350	185	2	1
350<I≤400	240	2	1
400<I≤500	150	2	2
500<I≤630	185	2	2

4.4 Protection Characteristics

4.4.1 Operation characteristic under three-phase balanced-load status as per the table below.

Series No.	I/In	Operating time		Test condition	Ambient temperature (°C)
1	1.05	<2h non-tripping		Cold status	(20±5)°C
2	1.20	<2h tripping		Starts from hot status, right after item no.1	
3	1.50	Class 10A	≤ 2 min		
		Class 10	≤ 4 min		
4	7.20	Class 10A	2s<Tp≤10s	Cold status	
		Class 10	4s<Tp≤10s		

Under three-phase operation, if relay current reaches and maintains 1.05 times of the current setting, the green lamp flashes and red lamp does not light up, which indicates that the relay is not at over-load time-delay status, which equals to non-operation in 2 hours in serial No. 1 of the table above. A current tolerance for serial No.1 is -3%, and a current tolerance for No.2 is +3%. Cold status implies the status of the power re-energized of main circuit of relay 5 seconds after its power off.

4.4.2 Operation characteristic under phase-failure status as per the table below.

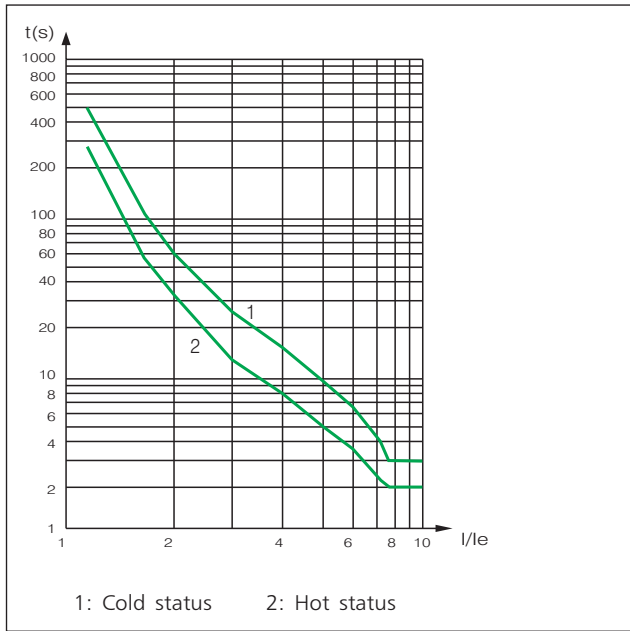
Series No.	I/In		Operating time Tp	Test condition	Ambient temperature °C
	Any two phases	The third phase			
1	1.0	0.9	<2h non-tripping	Starts from cold status	(20±5)°C
2	1.15	0	<2h tripping	Starts from hot status, right after item No.1	

Under phase failure operation, if one phase has the current = 0, the other two phases have the current ≥1.15 times of the current setting, then, the red lamp flashes, and green lamp lights up, which indicates that the relay is at time-delay release status.

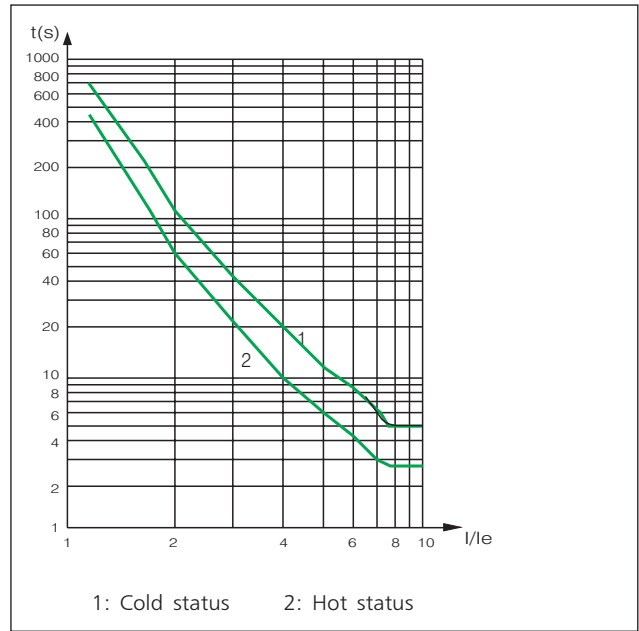
As to this table, the permissible error of the No.1 circuit is -3%, No.2 circuit +3%

4.5 Tripping Curve

Tripping class 10A



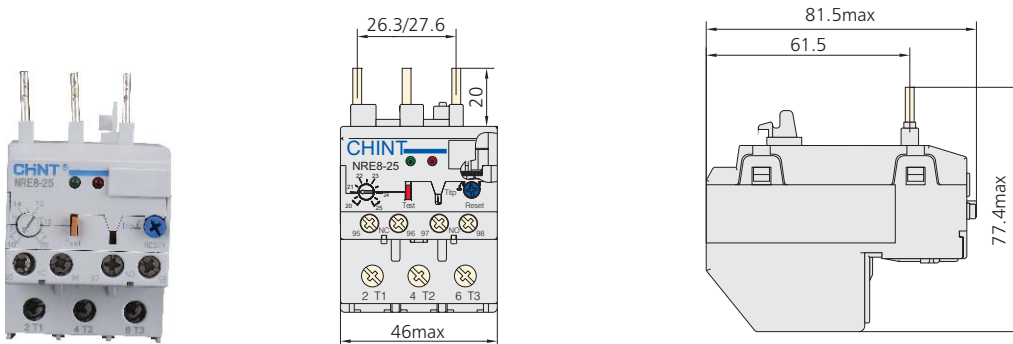
Tripping class 10A



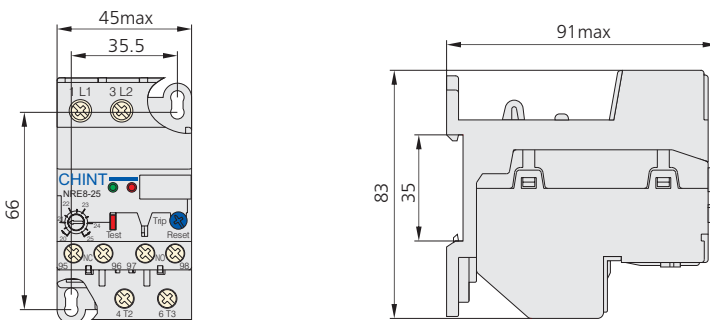
5. Overall and mounting dimensions (mm)

5.1 For Combined Mounting

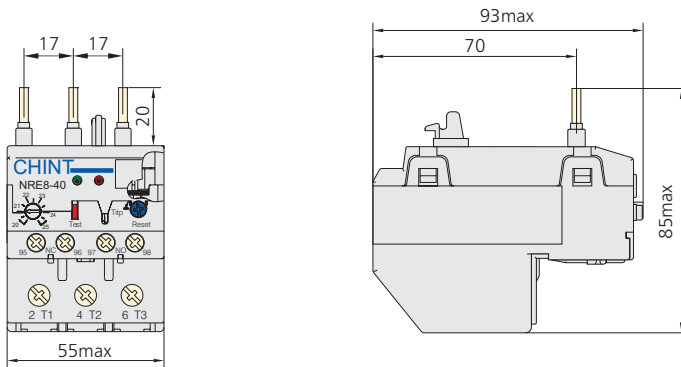
NRE8-25



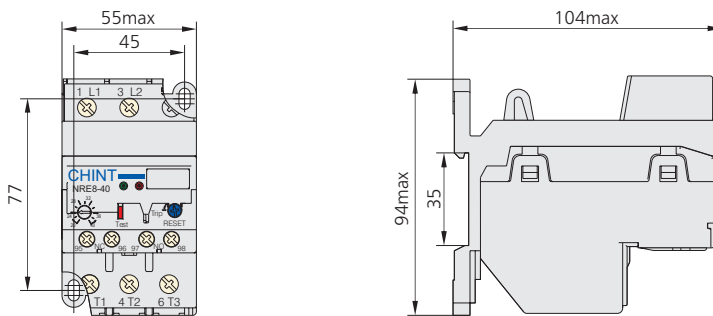
NRE8-25/F



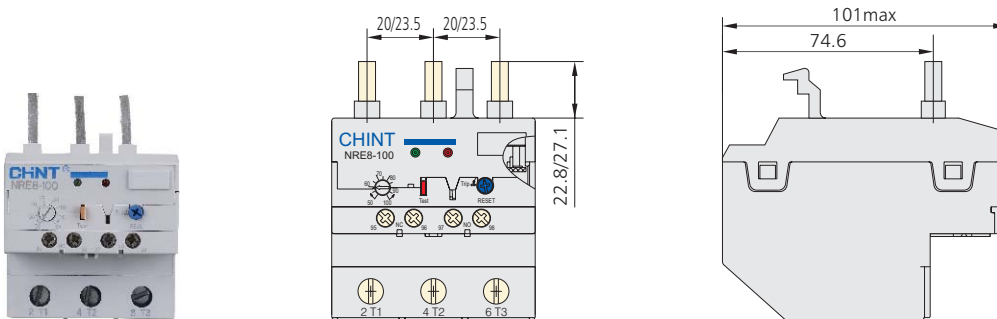
NRE8-40



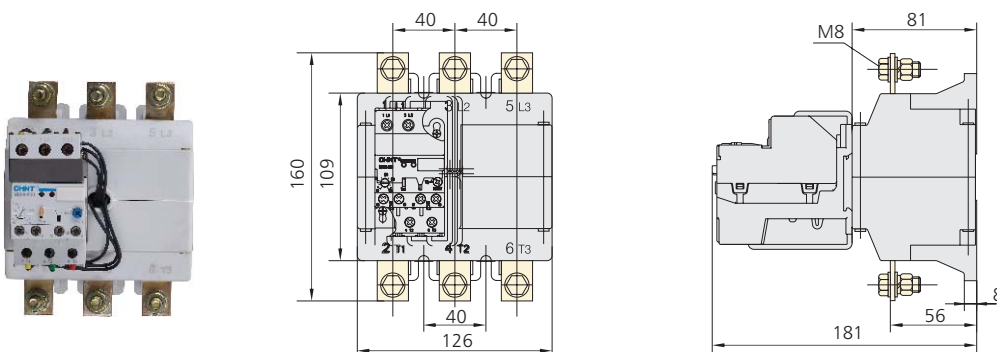
NRE8-40/F

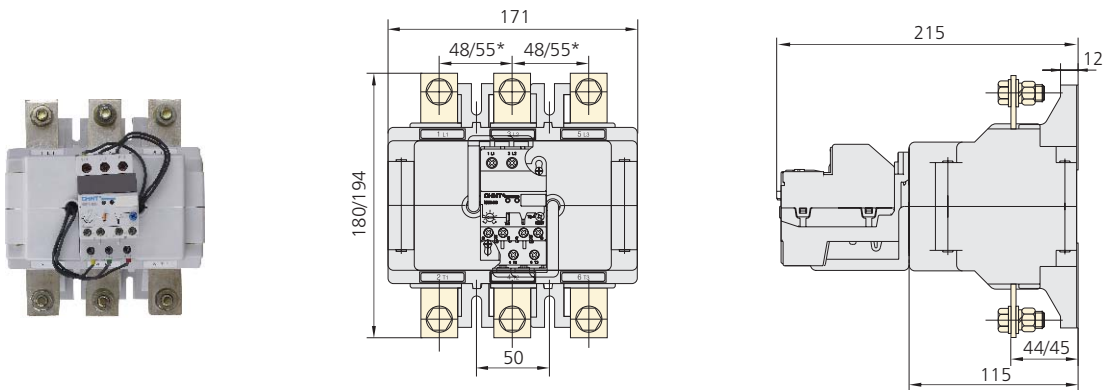


NRE8-100



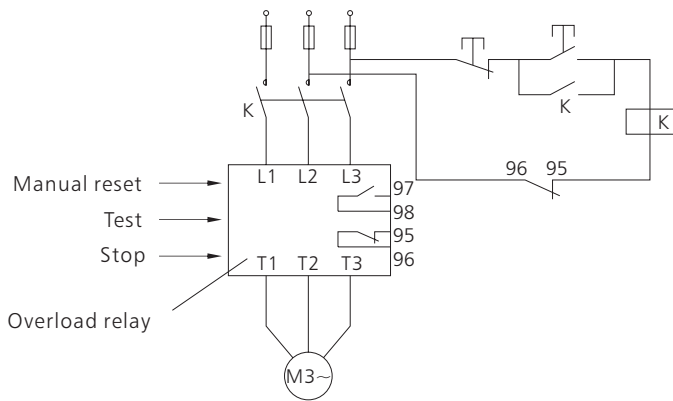
NRE8-200







Note: Dimension with "*" for the product above 400A.

6. Applications







7. Accessories

7.1 Mounting base

Mounting base	Description	Application
	NRE8-25 mounting bracket	Incorporates with NRE8-25 to form an independently mounted product
	NRE8-40 mounting bracket	Incorporates with NRE8-40 to form an independently mounted product

7.2 Assembly with contactors

Thermal overload Relay	Rated current (A)	Current setting range (A)	Model of recommended contactor	Model of recommended fuse
 NRE8-25	1.2	0.6~1.2	NC1-09	RT36-4 (NT00-4)
	2.4	1.2~2.4		RT36-6 (NT00-6)
	4	2~4		RT36-10 (NT00-10)
	8	4~8		RT36-16 (NT00-16)
	10	5~10	NC1-12	RT36-20 (NT00-20)
	12	7~12		RT36-25 (NT00-25)
	20	10~20	NC1-18, NC1-25	RT36-40 (NT00-40)
	25	20~25	NC1-25	RT36-50 (NT00-50)
32	22~32	NC1-32	RT36-80 (NT00-80)	
 NRE8-40	4	2~4	NC1-40	RT36-10 (NT00-10)
	8	4~8		RT36-16 (NT00-16)
	10	5~10		RT36-20 (NT00-20)
	20	10~20		RT36-40 (NT00-40)
	40	20~40		RT36-80 (NT00-80)
 NRE8-100	65	30~65	NC1-50, NC1-65	RT36-160 (NT00-160)
	100	50~100	NC1-80, NC1-95	RT36-200 (NT1-200)
 NRE8-200	120	85~120	NC2-115, NC2-150 NC2-185, NC2-225	RT36-250 (NT1-250)
	160	110~160		RT36-315 (NT2-315)
	200	140~200		RT36-400 (NT2-400)
 NRE8-630	250	170~250	NC2-225, NC2-265	RT36-500 (NT3-500)
	315	215~315		RT36-630 (NT3-630)
	400	275~400	NC2-330, NC2-400	RT36-800 (NT4-800)
	500	340~500	NC2-500, NC2-630	RT36-1000 (NT4-1000)
	630	430~630		RT36-1000 (NT4-1000)



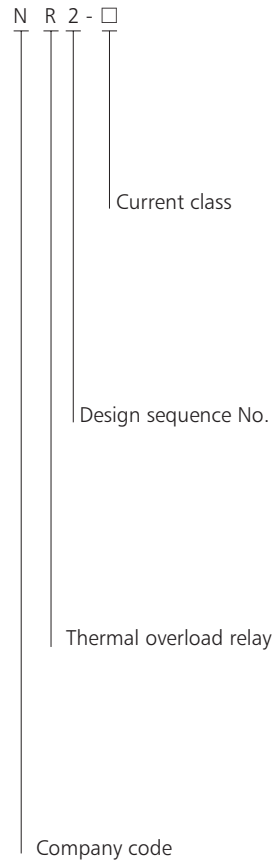


NR2 Thermal Overload Relay

1. General

- 1.1 Certificates: CE, KEMA, UkrSEPRO, GOST, RCC, UL;
- 1.2 Electric ratings: AC 50/60Hz, 690V, 0.1A~630A;
- 1.3 Tripping class: 10A;
- 1.4 Mounting version:
 - a. Plug-in: Available for NR2-11.5, 25, 36, 93, 150;
 - b. Independent: Available for NR2-200, 630;
- 1.5 Standard: IEC/EN 60947-4-1

2. Type designation



3. Features

- 3.1 3-phase bimetal
- 3.2 Continuously readjustable current settings
- 3.3 Temperature compensation
- 3.4 Tripping indicator
- 3.5 Test button
- 3.6 Stop button
- 3.7 Manual and automatic reset button
- 3.8 Electrically separated 1N/O plus 1N/C contact

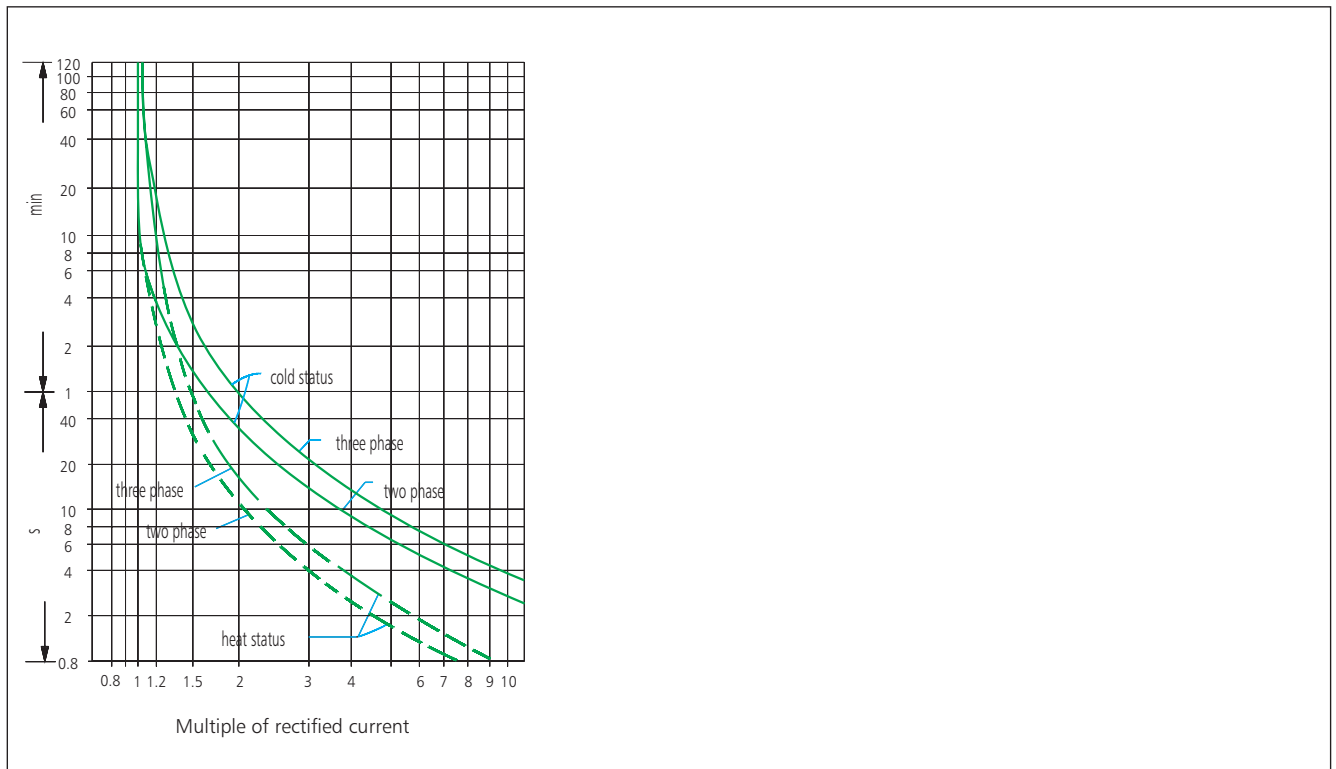


4. Technical data


4.1 Protection properties


Item	Series No.	I/In	Operating time Tp	Test condition
Overload protection	1	1.05	> 2 h	Start from cold status
	2	1.2	≤ 2 h	Start from heat status, right after item No.1
	3	1.5	≤ 2 min	Start from heat status, right after item No.1
	4	7.2	2s < Tp ≤ 10s	Start from cold status
Phase failure protection	5	Any two phases	> 2 h	Start from cold status
		Another phase		
Phase failure protection	6	1.0	≤ 2 h	Start from heat status, right after item No.5
		1.15		

Curves



4.2 Main Technical Parameters

Model		NR2-11.5						
Picture								
Current class(A)		13						
Phase failure protection function		Yes						
Automatic & manual reset		Yes						
Temperature compensation		Yes						
Tripping indicator		Yes						
Test & stop pushbutton		Yes						
Mounting mode	Plug-in	Yes						
	Independent	Yes						
Auxiliary contacts	No. of contacts	1N/O+1N/C						
	Rated current (A) (AC-15 220V)	2.73						
	Rated current (A) (AC-15 380V)	1.58						
	Rated current (A) (DC-13 220V)	0.2						
		Current setting range						
Rated operational current(A)		0.1~0.16	0.16~0.25	0.25~0.40	0.40~0.63	0.63~1	1~1.6	1.25~2
Matched fuse	aM(A)	0.25	0.5	1	1	2	2	4
	gG(A)	2	2	2	2	4	4	6

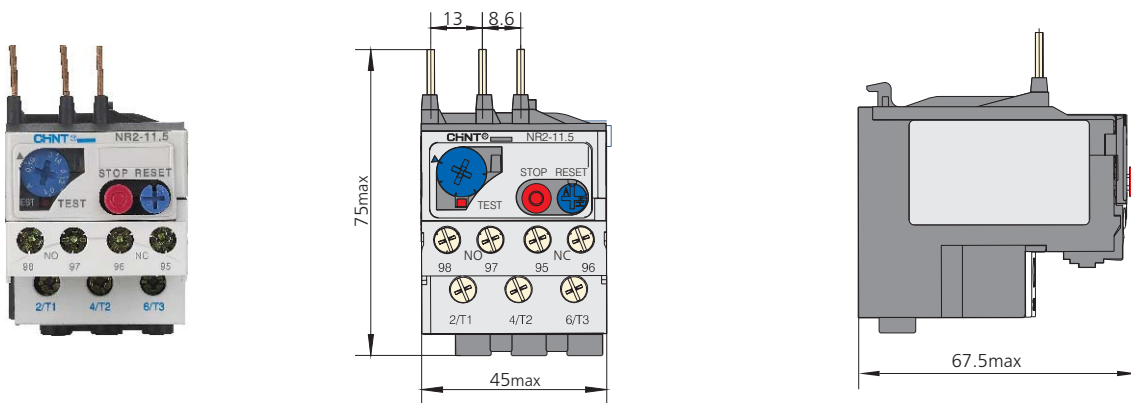
Model		NR2-93						
Picture								
Current class(A)		93						
Phase failure protection function		Yes						
Automatic & manual reset		Yes						
Temperature compensation		Yes						
Tripping indicator		Yes						
Test & stop pushbutton		Yes						
Mounting mode	Plug-in	Yes						
	Independent	Yes						
Auxiliary contacts	Configuration of contacts	1N/O+1N/C						
	Rated current (A) (AC-15 220V)	2.73						
	Rated current (A) (AC-15 380V)	1.58						
	Rated current (A) (DC-13 220V)	0.2						
		Current setting range						
Rated operational current(A)		23~32	30~40	37~50	48~65	55~70	63~80	80~93
Matched fuse	aM(A)	40	40	63	63	80	80	100
	gG(A)	63	100	100	100	125	125	160

NR2-25								NR2-36	
25								36	
Yes								Yes	
Yes								Yes	
Yes								Yes	
Yes								Yes	
Yes								Yes	
Yes								Yes	
Yes								Yes	
1N/O+1N/C								1N/O+1N/C	
2.73								2.73	
1.58								1.58	
0.2								0.2	
Current setting range								Current setting range	
1.6~2.5	2.5~4	4~6	5.5~8	7~10	9~13	12~18	17~25	23~32	28~36
4	6	8	12	12	16	20	25	40	40
6	10	16	20	20	25	35	50	63	80

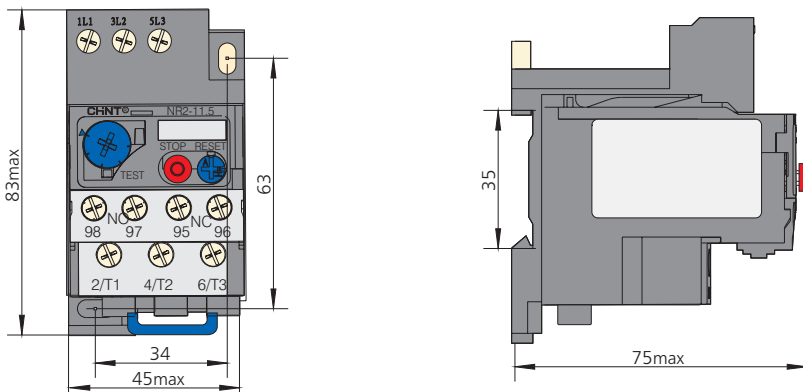
NR2-150			NR2-200			NR2-630				
150			200			630				
Yes			Yes			Yes				
Yes			Yes			Yes				
Yes			Yes			Yes				
Yes			Yes			Yes				
Yes			Yes			Yes				
Yes			No			No				
No			Yes			Yes				
1N/O+1N/C			1N/O+1N/C			1N/O+1N/C				
2.73			2.73			2.73				
1.58			1.58			1.58				
0.2			0.2			0.2				
Current setting range			Current setting range			Current setting range				
80~104	95~120	110~150	80~125	100~160	125~200	160~250	200~315	250~400	315~500	400~630
125	125	160	125	160	200	250	315	400	500	630
200	224	250	200	250	315	400	500	630	800	800

5. Overall and mounting dimensions (mm)

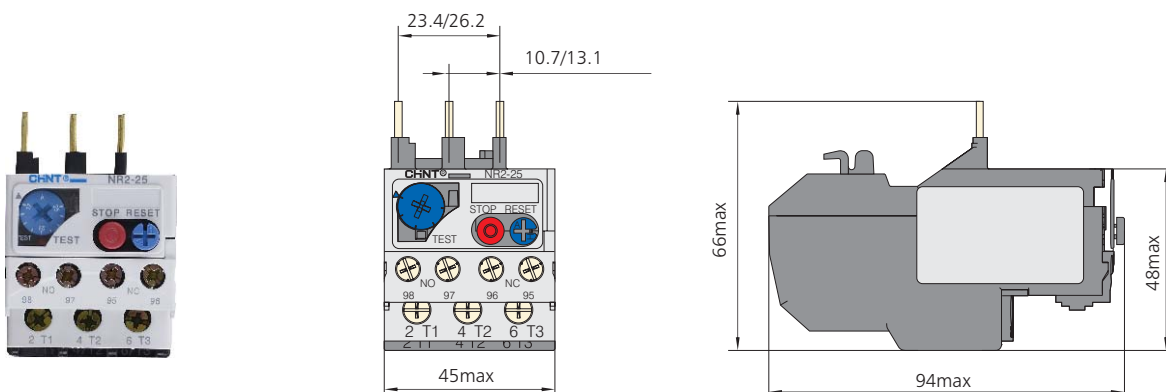
NR2-11.5



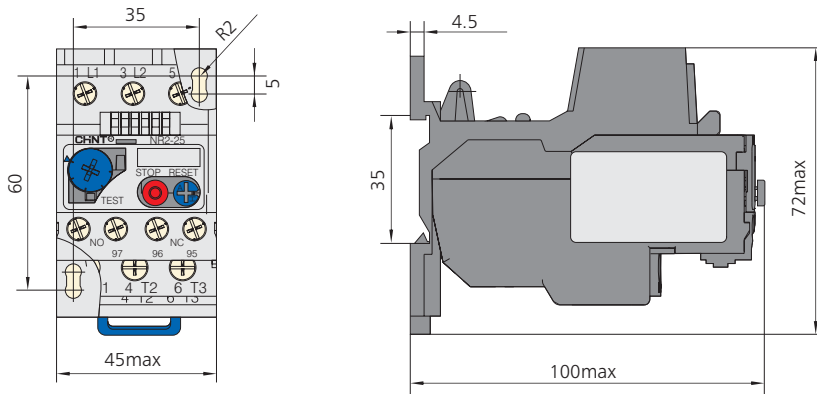
NR2-11.5 with Mounting Block



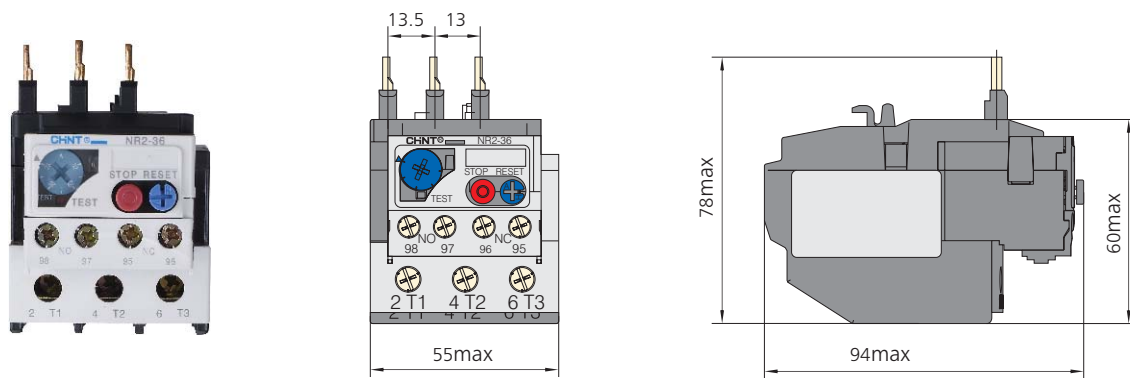
NR2-25



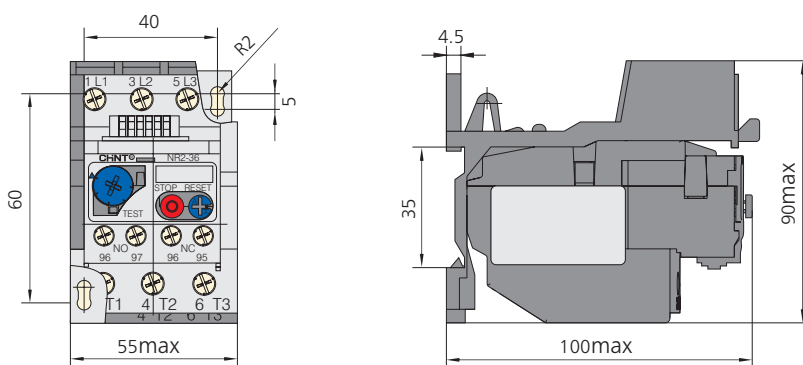
NR2-25 with Mounting Block

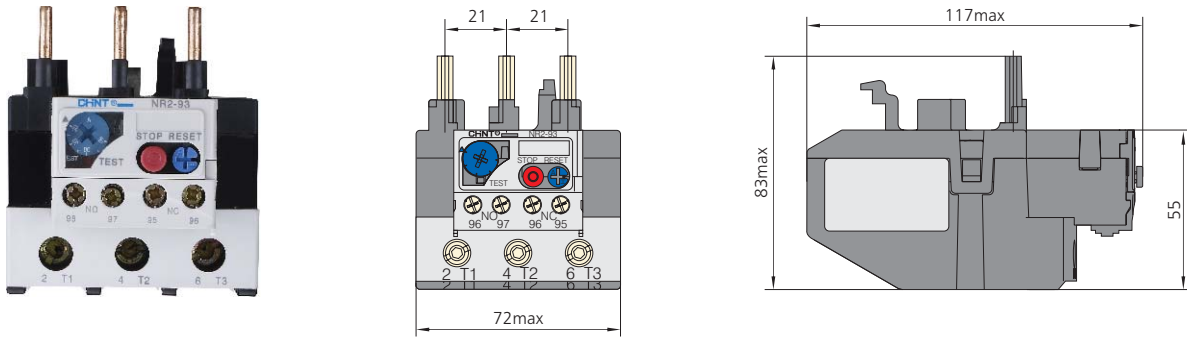


NR2-36

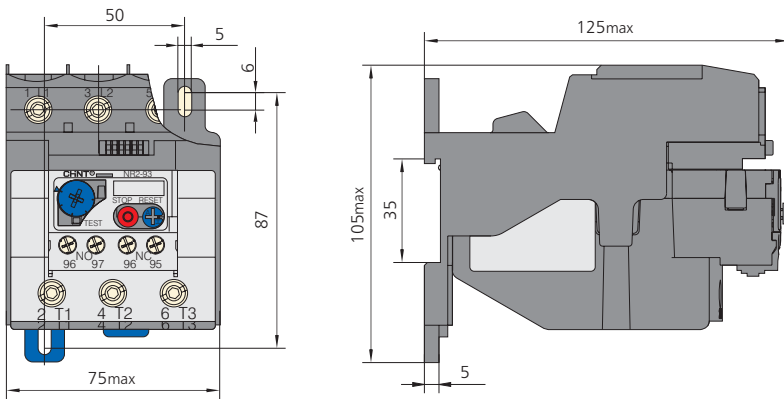


NR2-36 with Mounting Block

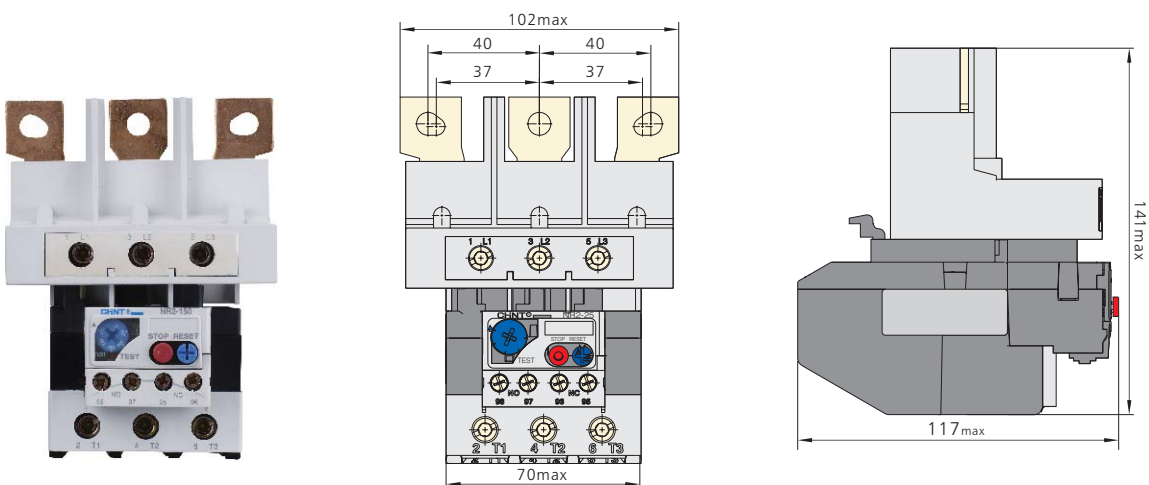


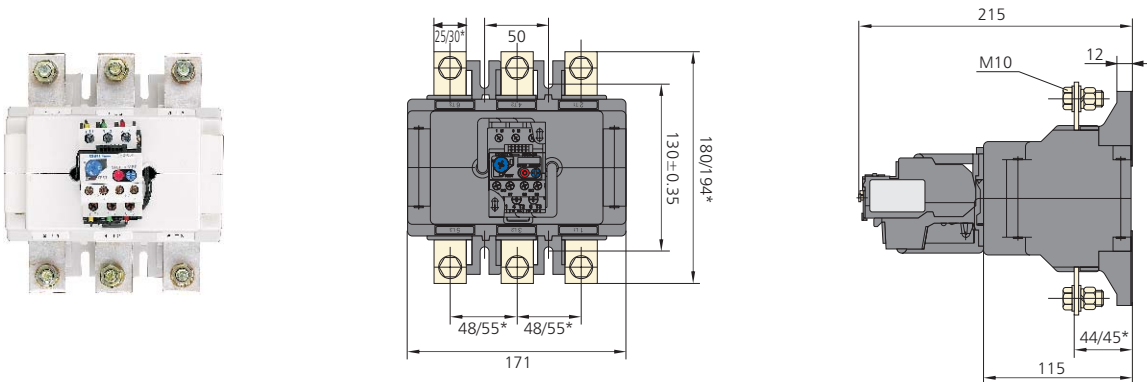
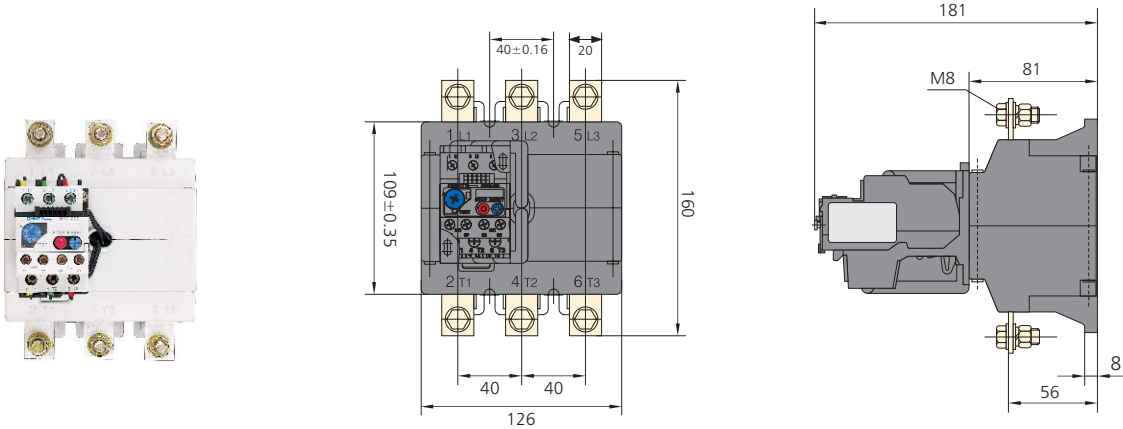


NR2-93 with Mounting Block



NR2-150





Note: Dimension with “*” for the product over 400A.



6. Wiring


Items			NR2-11.5	NR2-25	NR2-36	NR2-93	NR2-150	NR2-200	NR2-630
Cross section area of conductor mm ²	Main circuit	Single core or stranded wire	1~4	1~4	4~10	4~35	25~95	25~95	70~2×240
		Wiring screw	M3.5	M4	M4	M10	M6/M8	M8	M10
	Auxiliary circuit	Single core or stranded wire	0.5~2.5	0.5~2.5	0.5~2.5	0.5~2.5	0.5~2.5	0.5~2.5	0.5~2.5
		Wiring screw	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5

7. Accessories

No.		Description	Application
1		Mounting block for NR2-11.5	Incorporate with NR2-11.5 relay to form an independently mounted product
2		Mounting block for NR2-25	Incorporate with NR2-25 relay to form an independently mounted product
3		Mounting block for NR2-36	Incorporate with NR2-36 relay to form an independently mounted product
4		Mounting block for NR2-93	Incorporate with NR2-93 relay to form an independently mounted product

8. Assembly with contactor

Model of overload relay	Rated current (A)	Recommended fuse type (RT16 is recommended)		Model of contactor
		aM	gG	
 NR2-11.5	0.1~0.16	0.25	2	NC6-09 NC1-09~18
	0.16~0.25	0.5	2	
	0.25~0.4	1	2	
	0.4~0.63	1	2	
	0.63~1	2	4	
	1~1.6	2	4	
	1.25~2	4	6	
	1.6~2.5	4	6	
	2.5~4	6	10	
	4~6	8	16	
 NR2-25	5.5~8	12	20	NC1-09 NC1-12 NC1-18 NC1-25 NC1-32
	7~10	12	20	
	9~13	16	25	
	0.1~0.16	0.25	2	
	0.16~0.25	0.5	2	
	0.25~0.4	1	2	
	0.4~0.63	1	2	
	0.63~1	2	4	
	1~1.6	2	4	
	1.25~2	4	6	
	1.6~2.5	4	6	
	2.5~4	6	10	
	4~6	8	16	
5.5~8	12	20		
7~10	12	20		
9~13	16	25		
12~18	20	35		
17~25	25	50		

Model of overload relay	Rated current (A)	Recommended fuse type (RT16 is recommended)		Model of contactor
		aM	gG	
 NR2-36	23~32	40	63	NC1-32
	28~36	40	80	
 NR2-93	23~32	40	63	NC1-40
	30~40	40	100	NC1-50
	37~50	63	100	NC1-65
	48~65	63	100	NC1-80
	55~70	80	125	NC1-95
	63~80	80	125	
	80~93	100	160	
 NR2-150	80~104	125	200	NC2-115 NC2-150
	95~120	125	224	
	110~150	160	250	
 NR2-200	80~125	125	200	NC2-115 NC2-150 NC2-185 NC2-225
	100~160	160	250	
	125~200	200	315	
 NR2-630	160~250	250	400	NC2-185
	200~315	315	500	NC2-225
	250~400	400	630	NC2-265
	315~500	500	800	NC2-330
	400~630	630	800	NC2-400 NC2-500 NC2-630

E