



## NR8 Series Thermal Overload Relays

### 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-630A 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.

Standard: IEC 60947-4-1.

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

### 2. Operating 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  $5^{\circ}$ .
- 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. Technical data

| Item                                           |                   |                                   | NR8-16       | NR8-38       | NR8-100      | NR8-200          | NR8-630          |
|------------------------------------------------|-------------------|-----------------------------------|--------------|--------------|--------------|------------------|------------------|
| Current class                                  |                   |                                   | 16           | 38           | 100          | 200              | 630              |
| Nominal insulation voltage V                   |                   |                                   | 690          | 690          | 690          | 690              | 690              |
| Phase failure protection                       |                   |                                   | Have         | Have         | Have         | Have             | Have             |
| Manual and automatic reset                     |                   |                                   | Have         | Have         | Have         | Manual           | Manual           |
| Temperature compensation                       |                   |                                   | Have         | Have         | Have         | Have             | Have             |
| Tripping indication                            |                   |                                   | Have         | Have         | Have         | Have             | Have             |
| Test button                                    |                   |                                   | Have         | Have         | Have         | Have             | Have             |
| Stop button                                    |                   |                                   | Have         | Have         | Have         | Have             | Have             |
| Mounting type                                  |                   |                                   | Plug-in type | Plug-in type | Plug-in type | Independent type | Independent type |
| Auxiliary contact                              |                   |                                   | 1NO+1NC      | 1NO+1NC      | 1NO+1NC      | 1NO+1NC          | 1NO+1NC          |
| AC-15 230V rated current A                     |                   |                                   | /            | /            | /            | 2.5              | 2.5              |
| AC-15 380V/400V rated current A                |                   |                                   | 1.5          | 1.5          | 1.5          | 1.5              | 1.5              |
| DC-13 220V rated current A                     |                   |                                   | 0.2          | 0.2          | 0.2          | 0.2              | 0.2              |
| Conductor cross-sectional area mm <sup>2</sup> | Main circuit      | Single-core or stranded conductor | 1~2.5        | 1~10         | 6~35         | 25~98            | 50~2×185         |
|                                                |                   | Terminal screw                    | M3.5         | M4           | M4           | M8               | M10              |
|                                                | Auxiliary circuit | Single-core or stranded conductor | 1~2.5        | 1~2.5        | 1~2.5        | 1~2.5            | 1~2.5            |
|                                                |                   | Terminal screw                    | M3.5         | M3.5         | M3.5         | 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 |                 | Tripping time | Test conditions                                                                                                                       |
|--------------------------|-----|--------------------------|-----------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Overload protection      | 1   | 1.05                     |                 | >2h           | Cold state start<br>Hot state start(after No.1)<br>Start when thermal equilibrium is reached after applying a 1 times setting current |
|                          | 2   | 1.2                      |                 | ≤2h           |                                                                                                                                       |
|                          | 3   | 1.5                      |                 | ≤2min         |                                                                                                                                       |
|                          | 4   | 7.2                      |                 | 2s<Tp1≤0s     |                                                                                                                                       |
| Phase failure protection | 5   | Any two phases           | The other phase | >2h           | Cold state start                                                                                                                      |
|                          |     | 1.0                      | 0.9             |               |                                                                                                                                       |
|                          | 6   | 1.15                     | 0               | ≤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                                                     |                                                                                                                                                    |
| <br>NR8-16   | 0.1~0.14        | 2                                                      | <br>NC8-06M、NC8-06M/Z<br>NC8-09M、NC8-09M/Z<br>NC8-12M、NC8-12M/Z |
|                                                                                               | 0.14~0.2        | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.18~0.25       | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.22~0.32       | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.28~0.4        | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.35~0.5        | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.45~0.63       | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.55~0.8        | 4                                                      |                                                                                                                                                    |
|                                                                                               | 0.7~1           | 4                                                      |                                                                                                                                                    |
|                                                                                               | 0.9~1.25        | 4                                                      |                                                                                                                                                    |
|                                                                                               | 1.1~1.6         | 4                                                      |                                                                                                                                                    |
|                                                                                               | 1.4~2           | 6                                                      |                                                                                                                                                    |
|                                                                                               | 1.8~2.5         | 6                                                      |                                                                                                                                                    |
|                                                                                               | 2.2~3.2         | 10                                                     |                                                                                                                                                    |
|                                                                                               | 2.8 ~ 4         | 10                                                     |                                                                                                                                                    |
|                                                                                               | 3.5~5           | 16                                                     |                                                                                                                                                    |
|                                                                                               | 4.5~6.3         | 16                                                     |                                                                                                                                                    |
|                                                                                               | 5.5 ~ 8         | 20                                                     |                                                                                                                                                    |
|                                                                                               | 7.5~10          | 20                                                     |                                                                                                                                                    |
|                                                                                               | 9~13            | 25                                                     |                                                                                                                                                    |
|                                                                                               | 12~16           | 35                                                     |                                                                                                                                                    |
| <br>NR8-38 | 0.10-0.14       | 2                                                      | <br>NC8-09、NC8-12<br>NC8-18、NC8-25<br>NC8-32、NC8-38           |
|                                                                                               | 0.14-0.2        | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.18-0.25       | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.22-0.32       | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.28-0.4        | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.35-0.5        | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.45-0.63       | 2                                                      |                                                                                                                                                    |
|                                                                                               | 0.55-0.8        | 4                                                      |                                                                                                                                                    |
|                                                                                               | 0.7-1           | 4                                                      |                                                                                                                                                    |
|                                                                                               | 0.9-1.25        | 4                                                      |                                                                                                                                                    |
|                                                                                               | 1.1-1.6         | 4                                                      |                                                                                                                                                    |
|                                                                                               | 1.4-2           | 6                                                      |                                                                                                                                                    |
|                                                                                               | 1.8-2.5         | 6                                                      |                                                                                                                                                    |
|                                                                                               | 2.2-3.2         | 10                                                     |                                                                                                                                                    |
|                                                                                               | 2.8-4           | 10                                                     |                                                                                                                                                    |
|                                                                                               | 3.5-5           | 16                                                     |                                                                                                                                                    |
|                                                                                               | 4.5-6.3         | 16                                                     |                                                                                                                                                    |
|                                                                                               | 5.5-8           | 20                                                     |                                                                                                                                                    |
|                                                                                               | 7.5-10          | 20                                                     |                                                                                                                                                    |
|                                                                                               | 9-13            | 25                                                     |                                                                                                                                                    |
|                                                                                               | 12-16           | 35                                                     |                                                                                                                                                    |
|                                                                                               | 14-20           | 50                                                     |                                                                                                                                                    |
|                                                                                               | 18-24           | 50                                                     |                                                                                                                                                    |
|                                                                                               | 23-32           | 63                                                     |                                                                                                                                                    |
|                                                                                               | 30-38           | 80                                                     |                                                                                                                                                    |

## 5. Overall and mounting dimensions (mm)

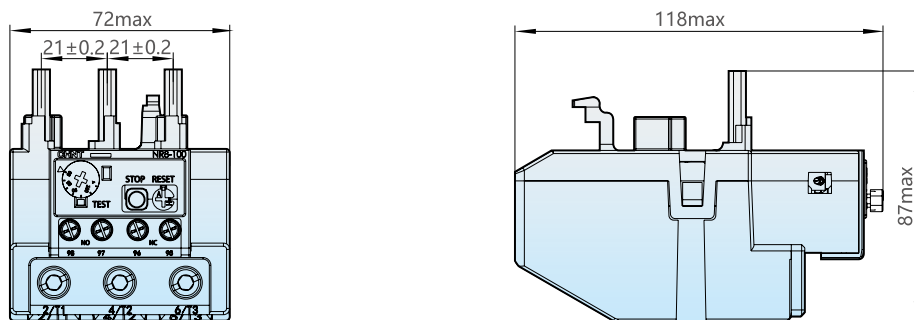
NR8-16



NR8-38



NR8-100



## NR8 Relay 16~630A

| Frame Size | Auxiliary Contacts | Setting Current | Model Description  | Code   |
|------------|--------------------|-----------------|--------------------|--------|
| 16A        | 1NO+1NC            | 0.14A-0.2A      | NR8-16 0.14A-0.2A  | 341553 |
| 16A        | 1NO+1NC            | 0.1A-0.14A      | NR8-16 0.1A-0.14A  | 341554 |
| 16A        | 1NO+1NC            | 0.18A-0.25A     | NR8-16 0.18A-0.25A | 341555 |
| 16A        | 1NO+1NC            | 0.28A-0.4A      | NR8-16 0.28A-0.4A  | 341556 |
| 16A        | 1NO+1NC            | 0.22A-0.32A     | NR8-16 0.22A-0.32A | 341557 |
| 16A        | 1NO+1NC            | 0.35A-0.5A      | NR8-16 0.35A-0.5A  | 341558 |
| 16A        | 1NO+1NC            | 0.55A-0.8A      | NR8-16 0.55A-0.8A  | 341559 |
| 16A        | 1NO+1NC            | 0.45A-0.63A     | NR8-16 0.45A-0.63A | 341560 |
| 16A        | 1NO+1NC            | 0.9A-1.25A      | NR8-16 0.9A-1.25A  | 341561 |
| 16A        | 1NO+1NC            | 0.7A-1A         | NR8-16 0.7A-1A     | 341562 |
| 16A        | 1NO+1NC            | 1.4A-2A         | NR8-16 1.4A-2A     | 341563 |
| 16A        | 1NO+1NC            | 1.8A-2.5A       | NR8-16 1.8A-2.5A   | 341564 |
| 16A        | 1NO+1NC            | 1.1A-1.6A       | NR8-16 1.1A-1.6A   | 341565 |
| 16A        | 1NO+1NC            | 2.2A-3.2A       | NR8-16 2.2A-3.2A   | 341566 |
| 16A        | 1NO+1NC            | 2.8A-4A         | NR8-16 2.8A-4A     | 341567 |
| 16A        | 1NO+1NC            | 3.5A-5A         | NR8-16 3.5A-5A     | 341568 |
| 16A        | 1NO+1NC            | 4.5A-6.3A       | NR8-16 4.5A-6.3A   | 341569 |
| 16A        | 1NO+1NC            | 5.5A-8A         | NR8-16 5.5A-8A     | 341570 |
| 16A        | 1NO+1NC            | 9A-13A          | NR8-16 9A-13A      | 341571 |
| 16A        | 1NO+1NC            | 7.5A-10A        | NR8-16 7.5A-10A    | 341572 |
| 16A        | 1NO+1NC            | 12A-16A         | NR8-16 12A-16A     | 341573 |
| 38A        | 1NO+1NC            | 0.1-0.14A       | NR8-38 0.1-0.14A   | 253671 |
| 38A        | 1NO+1NC            | 0.14-0.2A       | NR8-38 0.14-0.2A   | 253672 |
| 38A        | 1NO+1NC            | 0.18-0.25A      | NR8-38 0.18-0.25A  | 253673 |
| 38A        | 1NO+1NC            | 0.22-0.32A      | NR8-38 0.22-0.32A  | 253674 |
| 38A        | 1NO+1NC            | 0.28-0.4A       | NR8-38 0.28-0.4A   | 253675 |
| 38A        | 1NO+1NC            | 0.35-0.5A       | NR8-38 0.35-0.5A   | 253676 |
| 38A        | 1NO+1NC            | 0.45-0.63A      | NR8-38 0.45-0.63A  | 253677 |
| 38A        | 1NO+1NC            | 0.55-0.8A       | NR8-38 0.55-0.8A   | 253678 |
| 38A        | 1NO+1NC            | 0.7-1A          | NR8-38 0.7-1A      | 253679 |
| 38A        | 1NO+1NC            | 0.9-1.25A       | NR8-38 0.9-1.25A   | 253680 |
| 38A        | 1NO+1NC            | 1.1-1.6A        | NR8-38 1.1-1.6A    | 253681 |
| 38A        | 1NO+1NC            | 1.4-2A          | NR8-38 1.4-2A      | 253682 |
| 38A        | 1NO+1NC            | 1.8-2.5A        | NR8-38 1.8-2.5A    | 253683 |
| 38A        | 1NO+1NC            | 2.2-3.2A        | NR8-38 2.2-3.2A    | 253684 |
| 38A        | 1NO+1NC            | 2.8-4A          | NR8-38 2.8-4A      | 253685 |
| 38A        | 1NO+1NC            | 3.5-5A          | NR8-38 3.5-5A      | 253686 |
| 38A        | 1NO+1NC            | 4.5-6.3A        | NR8-38 4.5-6.3A    | 253687 |
| 38A        | 1NO+1NC            | 5.5-8A          | NR8-38 5.5-8A      | 253688 |
| 38A        | 1NO+1NC            | 7.5-10A         | NR8-38 7.5-10A     | 253689 |
| 38A        | 1NO+1NC            | 9-13A           | NR8-38 9-13A       | 253690 |
| 38A        | 1NO+1NC            | 12-16A          | NR8-38 12-16A      | 253691 |
| 38A        | 1NO+1NC            | 14-20A          | NR8-38 14-20A      | 253692 |
| 38A        | 1NO+1NC            | 18-24A          | NR8-38 18-24A      | 253693 |
| 38A        | 1NO+1NC            | 23-32A          | NR8-38 23-32A      | 253694 |
| 38A        | 1NO+1NC            | 30-38A          | NR8-38 30-38A      | 253695 |