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## Circuit Breakers



[www.IDEC.com/circuitbreaker](http://www.IDEC.com/circuitbreaker)



## Selection Guide

| Series                         | NC1V                                                                              | NRA                                                                                | NRBM                                                                               | NRC                                                                                                                          |
|--------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Appearance                     |  |   |  |                                           |
| Page                           | 923                                                                               | Visit <a href="http://www.IDEC.com/circuitbreaker">www.IDEC.com/circuitbreaker</a> |                                                                                    |                                                                                                                              |
| Actuator Style                 | Lever                                                                             | Lever and<br>Rocker (non-illuminated<br>and illuminated)                           | Lever                                                                              | Slide switch, lever                                                                                                          |
| Number of Poles                | 1, 2, 3                                                                           | Lever: 1, 2, 3<br>Rocker: 1                                                        | 1, 2, 3                                                                            | 1, 2                                                                                                                         |
| Protection Method              | Hydraulic magnetic                                                                | Electromagnetic trip                                                               |                                                                                    |                                                                                                                              |
| Internal Circuits              | Series current trip<br>Relay voltage trip                                         | Series current trip                                                                |                                                                                    |                                                                                                                              |
| Auxiliary Contact              | Optional 125V AC 3A (resistive load),<br>30V DC 2A (resistive load)               | Optional (250V AC, 5A; 50V DC, 1A)                                                 | Optional (250V AC, 5A; 50V DC, 1A)                                                 |                                                                                                                              |
| Alarm Contact                  | Optional 125V AC 3A (resistive load).<br>30V DC 2A (resistive load)               | Optional (250V AC, 5A; 50V DC, 1A)                                                 | Optional (250V AC, 5A; 50V DC, 1A)                                                 |                                                                                                                              |
| Inertial Delay                 | Optional (for resistance to high inrush<br>currents)                              | Optional (for resistance to high<br>inrush)                                        | Optional (for resistance to high<br>inrush)                                        | —                                                                                                                            |
| Time Delay Curves              | 3 types (AC or DC)                                                                | 2 types for DC; 3 types for AC                                                     | 2 types for DC; 3 types for AC                                                     | 2 types for DC; 2 types for AC                                                                                               |
| Rated Voltage                  | 1-pole                                                                            | 250V AC, 50/60Hz, 65V DC                                                           |                                                                                    |                                                                                                                              |
|                                | 2-pole                                                                            |                                                                                    |                                                                                    |                                                                                                                              |
|                                | 3-pole                                                                            |                                                                                    |                                                                                    |                                                                                                                              |
| Rated Tripping<br>Currents     | 0.1A, 0.3A, 0.5A, 1A, 2A, 3A, 5A, 7A,<br>10A, 15A, 20A, 25A, 30A                  | 0.3A, 0.5A, 0.75A<br>1A, 2A, 3A, 5A, 7.5A, 10A, 15A, 20A,<br>25A, 30A              | 1A, 2A, 3A, 5A, 7.5A, 10A, 15A,<br>20A, 25A, 30A, 40A, 50A                         | 0.3A, 0.5A, 0.75A, 1A, 2A, 3A, 5A,<br>7.5A, 10A, 15A, 20A, 25A, 30A                                                          |
| Rated Interruption<br>Capacity | 2,500A                                                                            | 1,000A, 250V AC (50/60Hz), 65V DC                                                  | 1,000A, 250V AC (50/60Hz), 65V DC                                                  | 2,500A, 220V AC (50/60Hz, 1-pole)<br>1,500A, 220V AC (50/60Hz, 2-pole)<br>1,500A, 65V DC (1-pole)<br>1,000A, 65V DC (2-pole) |
| Approvals                      | UL, CSA, CE, TUV, CCC                                                             | Lever: UL, CSA, VDE<br>Rocker: UL                                                  | UL, c-UL, VDE                                                                      | UL, CSA                                                                                                                      |



1. For dimensions, see end of each section.
2. UL recognized, applicable standard: UL1077, "Supplementary Protectors."
3. Not suitable for branch circuit protection.



UL Recognized  
File No. E68029



File No. LR83454  
NRC Series



File No. B07 09 13332 063

\*CE, TUV, and CCC apply to NC1V.

## NC1V Circuit Breakers

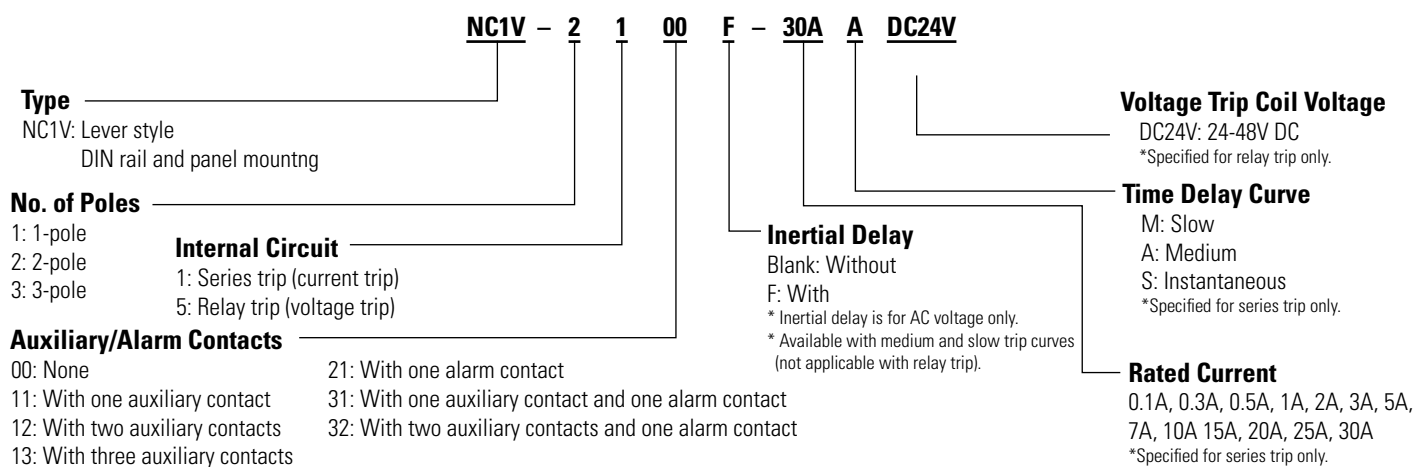
## Key features:

- Superior protection for a wide range of devices from sensitive electronic equipment to electrical control circuits. Applications include semiconductor manufacturing equipment, electronic controllers, computers, microprocessors, communications equipment, power supplies, machine tools, motors, and more.
- Excellent tripping time curve performance
- Flat retractable lever for safety operations
- Slim housing design
- Spring-up terminals allow for use of ring terminals
- Fingersafe main circuit terminals
- Color (red/green) contact position indicator
- DIN rail or direct panel mounting (through-panel mounting brackets available)
- Optional built-in auxiliary / alarm contacts



| Applicable Standards                                            | Certification Mark | File Number                                 |
|-----------------------------------------------------------------|--------------------|---------------------------------------------|
| UL1077                                                          |                    | E68029                                      |
| CSA C22.2 No. 235                                               |                    | LR83454                                     |
| EN60934                                                         |                    | B07 09 13332 063                            |
|                                                                 |                    | European Commission's Low Voltage Directive |
| GB17701-1999                                                    |                    | No. 2008010307265840                        |
| Electrical Appliance and Material Safety Law Technical Standard | Series Trip        | Jet                                         |
|                                                                 | Relay Trip         |                                             |

## Part Number Structure



Switches &amp; Pilot Lights

Signaling Lights

Relays &amp; Sockets

Timers

Contactors

Terminal Blocks

Circuit Breakers

## Specifications

|                                                                                                           |                                                    |                                                                                                                                                                                                         |                                                                                   |                  |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------|
| Operator Style                                                                                            |                                                    | Retractable lever                                                                                                                                                                                       |                                                                                   |                  |
| Internal Circuit                                                                                          |                                                    | Series trip (current trip), Relay trip (voltage trip)                                                                                                                                                   |                                                                                   |                  |
| Protection Method                                                                                         |                                                    | Hydraulic magnetic tripping system, Magnetic tripping system (voltage trip)                                                                                                                             |                                                                                   |                  |
| No. of Poles                                                                                              |                                                    | 1-pole                                                                                                                                                                                                  | 2-pole                                                                            | 3-pole           |
| Rated Voltage (AC/DC) <sup>1</sup>                                                                        |                                                    | 250V AC 50/60Hz, 65V DC                                                                                                                                                                                 | 250V AC 50/60Hz, 125V DC                                                          | 250V AC, 50/60Hz |
| Series Trip<br>(Current Trip)                                                                             | Rated Short-circuit Capacity                       | 250V AC, 2500A<br>65V DC, 2500A                                                                                                                                                                         | 250V AC, 2500A<br>125V DC, 2500A                                                  | 250V AC, 2500A   |
|                                                                                                           | Rated Current                                      | 0.1A, 0.3A, 0.5A, 1A, 2A, 3A, 5A, 7A, 10A, 15A, 20A, 25A, 30A                                                                                                                                           |                                                                                   |                  |
|                                                                                                           | Operation Characteristics <sup>2</sup>             | Time delay curve curve M (slow), curve A (medium), S (instantaneous)<br>Only curves M and A are also available with inertial delay option.                                                              |                                                                                   |                  |
| Relay Trip<br>(Voltage Trip) <sup>3</sup>                                                                 | Rated Current                                      | 30A                                                                                                                                                                                                     |                                                                                   |                  |
|                                                                                                           | Trip Voltage                                       | 24 to 48V DC (at 25°C)<br>Voltage application duration 10 sec maximum, tripping time 0.1 sec maximum (at rated voltage)                                                                                 |                                                                                   |                  |
| Auxiliary Contact/Alarm<br>Contact                                                                        | Contact Rating                                     | 125V AC 3A (resistive load), 30V DC 2A (resistive load)                                                                                                                                                 |                                                                                   |                  |
|                                                                                                           | Minimum Applicable Load                            | 24V DC 1mA (resistive load, reference value)                                                                                                                                                            |                                                                                   |                  |
| Insulation Resistance                                                                                     |                                                    | 100MΩ minimum (500V DC megger)                                                                                                                                                                          |                                                                                   |                  |
| Dielectric Strength                                                                                       |                                                    | 2,000V AC, 1 minute (between terminals when main contacts are open, between live parts of different poles, between live and dead parts)<br>600V AC (between terminals when auxiliary circuits are open) |                                                                                   |                  |
| Vibration Resistance<br>(with rated current applied)                                                      |                                                    | Damage limits:                                                                                                                                                                                          | 147 m/s <sup>2</sup> (10 to 55 Hz) (1-pole, 2-pole), 78 m/s <sup>2</sup> (3-pole) |                  |
|                                                                                                           |                                                    | Operating extremes:                                                                                                                                                                                     | 98 m/s <sup>2</sup> (1-pole, 2-pole), 78 m/s <sup>2</sup> (3-pole)                |                  |
| Shock Resistance<br>(S time delay curve: 80% rated current,<br>A, M time delay curve: 100% rated current) |                                                    | Damage limits:                                                                                                                                                                                          | 490 m/s <sup>2</sup> (1-pole, 2-pole), 297 m/s <sup>2</sup> (3-pole)              |                  |
|                                                                                                           |                                                    | Operating extremes:                                                                                                                                                                                     | 196 m/s <sup>2</sup> (S, A, M curves)                                             |                  |
| Electrical Life                                                                                           |                                                    | 10,000 cyles minimum (at rated curent), 10 operations per minute                                                                                                                                        |                                                                                   |                  |
| Reference Temperature                                                                                     |                                                    | 40°C                                                                                                                                                                                                    |                                                                                   |                  |
| Operating Temperature                                                                                     |                                                    | -10 to +60°C (no freezing)<br>Rated current is based on an ambient temperature of 40°C. When the operating temperature exceeds 40°C, derate the rated current by using the factors shown below.         |                                                                                   |                  |
| Operating Humidity                                                                                        |                                                    | 45 ~ 85% RH (no condensation)                                                                                                                                                                           |                                                                                   |                  |
| Terminal Style                                                                                            | Main Circuit Terminal                              | Spring-up, fingersafe terminal: M4 screw (up to 20A), M5 screw (25A and 30A)                                                                                                                            |                                                                                   |                  |
|                                                                                                           | Auxiliary/Alarm Contacts,<br>Voltage Coil Terminal | M3.5 screw                                                                                                                                                                                              |                                                                                   |                  |
| Weight (approx.)                                                                                          |                                                    | 1-pole: 90g, 2-pole: 170g, 3-pole: 260g                                                                                                                                                                 |                                                                                   |                  |



<sup>1</sup>3-pole model is for AC voltage only.

<sup>2</sup>For S (instantaneous) tripping curve, a humming sound may occur when used in an AC sinusoidal-wave current circuit around 80% of the rated current, however, the performance of the circuit breaker will not be affected.

To avoid unnecessary tripping, do not use in circuits where inrush currents may be present.

<sup>3</sup>Relay trip (voltage trip) type is not equipped with an overcurrent trip function.

Do not use the NC1V circuit breakers in environments where they are exposed to extreme temperature, humidity, dust, corrosive gases, vibration, shock, or in a circuit where inrush current may be present, otherwise unnecessary operation and damage may occur.

| Operating Temp. | Derating Factor |
|-----------------|-----------------|
| 50°C            | 0.9             |
| 55°C            | 0.8             |
| 60°C            | 0.7             |

## Models

Specify rated current, time delay curve, or voltage trip coil voltage in place of [6] [7] [8] when ordering.

| Internal Circuit           | No. of Poles | Inertial Delay | Auxiliary Contact Alarm Contact              | Part No            | Code                                                                                  |                                             |                               |
|----------------------------|--------------|----------------|----------------------------------------------|--------------------|---------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------|
|                            |              |                |                                              |                    | [6] Rated Current                                                                     | [7] Time Delay Curve                        | [8] Voltage Trip Coil Voltage |
| Series Trip (Current Trip) | 1-pole       | —              | —                                            | NC1V-1100-[6] [7]  | 0.1A<br>0.3A<br>0.5A<br>1A<br>2A<br>3A<br>5A<br>7A<br>10A<br>15A<br>20A<br>25A<br>30A | M (slow)<br>A (medium)<br>S (instantaneous) | —                             |
|                            |              |                | One Auxiliary Contact                        | NC1V-1111-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | One Alarm Contact                            | NC1V-1121-[6] [7]  |                                                                                       |                                             |                               |
|                            |              | With           | —                                            | NC1V-1100F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact                        | NC1V-1111F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Alarm Contact                            | NC1V-1121F-[6] [7] |                                                                                       |                                             |                               |
|                            | 2-pole       | —              | —                                            | NC1V-2100-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact                        | NC1V-2111-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | Two Auxiliary Contacts                       | NC1V-2112-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | One Alarm Contact                            | NC1V-2121-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact and One Alarm Contact  | NC1V-2131-[6] [7]  |                                                                                       |                                             |                               |
|                            |              | With           | —                                            | NC1V-2100F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact                        | NC1V-2111F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | Two Auxiliary Contacts                       | NC1V-2112F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Alarm Contact                            | NC1V-2121F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact and One Alarm Contact  | NC1V-2131F-[6] [7] |                                                                                       |                                             |                               |
|                            | 3-pole       | —              | —                                            | NC1V-3100-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact                        | NC1V-3111-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | Two Auxiliary Contacts                       | NC1V-3112-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | Three Auxiliary Contacts                     | NC1V-3113-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | One Alarm Contact                            | NC1V-3121-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact and One Alarm Contact  | NC1V-3131-[6] [7]  |                                                                                       |                                             |                               |
|                            |              | With           | Two Auxiliary Contacts and One Alarm Contact | NC1V-3132-[6] [7]  |                                                                                       |                                             |                               |
|                            |              |                | —                                            | NC1V-3100F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact                        | NC1V-3111F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | Two Auxiliary Contacts                       | NC1V-3112F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | Three Auxiliary Contacts                     | NC1V-3113F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Alarm Contact                            | NC1V-3121F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | One Auxiliary Contact and One Alarm Contact  | NC1V-3131F-[6] [7] |                                                                                       |                                             |                               |
|                            |              |                | Two Auxiliary Contacts and One Alarm Contact | NC1V-3132F-[6] [7] |                                                                                       |                                             |                               |
| Relay Trip (Voltage Trip)  | 1-pole       | —              | —                                            | NC1V-1500-[8]      | —                                                                                     | —                                           | DC24V                         |
|                            | 2-pole       |                |                                              | NC1V-2500-[8]      |                                                                                       |                                             |                               |
|                            | 3-pole       |                |                                              | NC1V-3500-[8]      |                                                                                       |                                             |                               |

Switches &amp; Pilot Lights

Signaling Lights

Relays &amp; Sockets

Timers

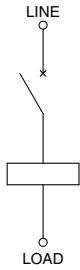
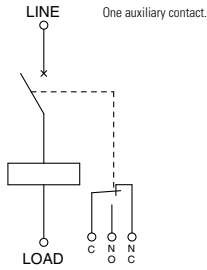
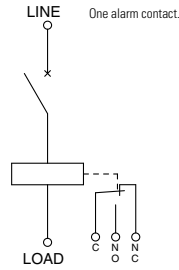
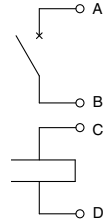
Contactors

Terminal Blocks

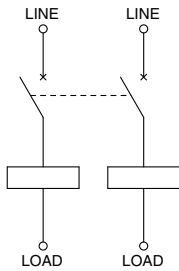
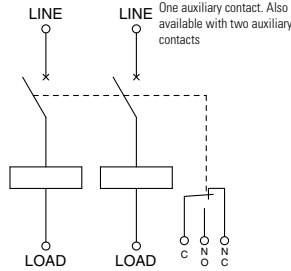
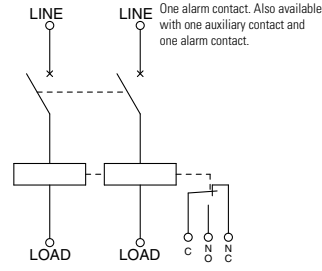
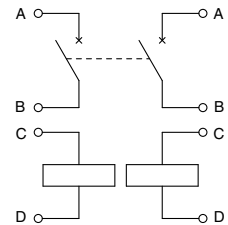
Circuit Breakers

## Internal Circuits

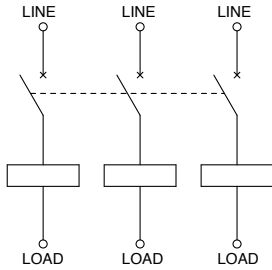
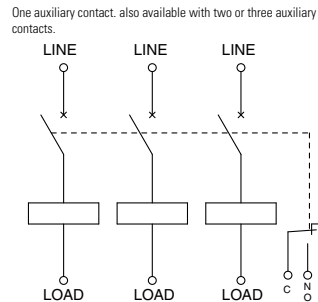
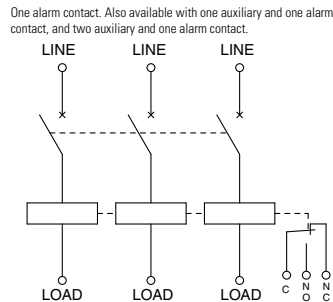
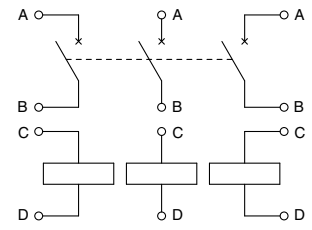
## 1-pole

NC1V-1100  
(Without auxiliary/alarm contacts)NC1V-1111  
(With auxiliary contact)NC1V-1121  
(With alarm contact)NC1V-1500  
(Relay Trip)

## 2-pole

NC1V-2100  
(Without auxiliary/alarm contacts)NC1V-2111  
(With auxiliary contact)NC1V-2121  
(With alarm contact)NC1V-2500  
(Relay Trip)

## 3-pole

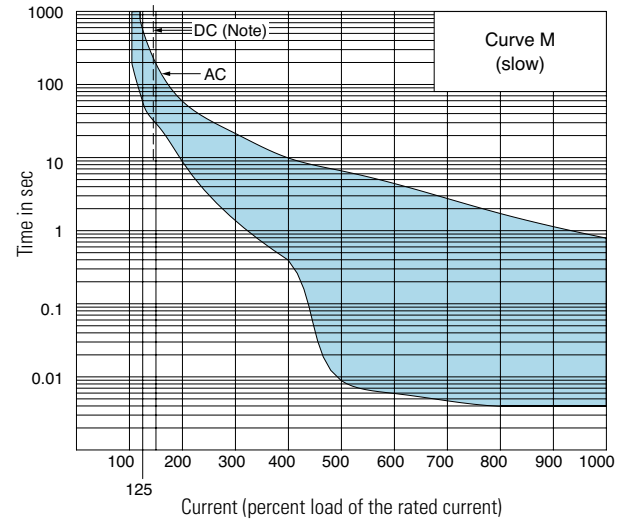
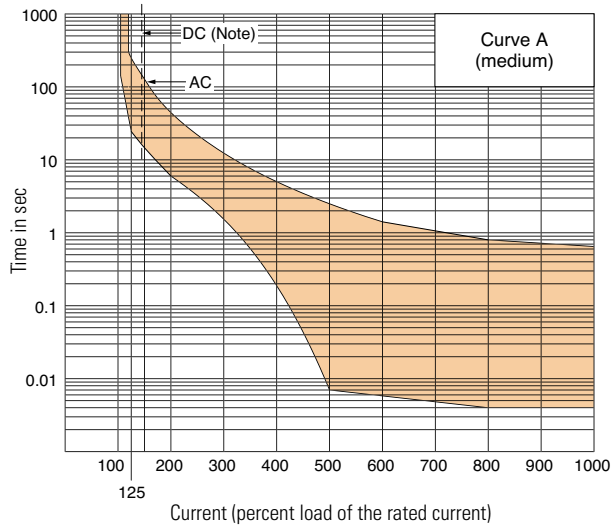
NC1V-3100  
(Without auxiliary/alarm contacts)NC1V-3111  
(With auxiliary contact)NC1V-3121  
(With alarm contact)NC1V-3500  
(Relay Trip)

## Overcurrent-Time Delay Characteristics (seconds @ 40 deg C) [vertical mounting]

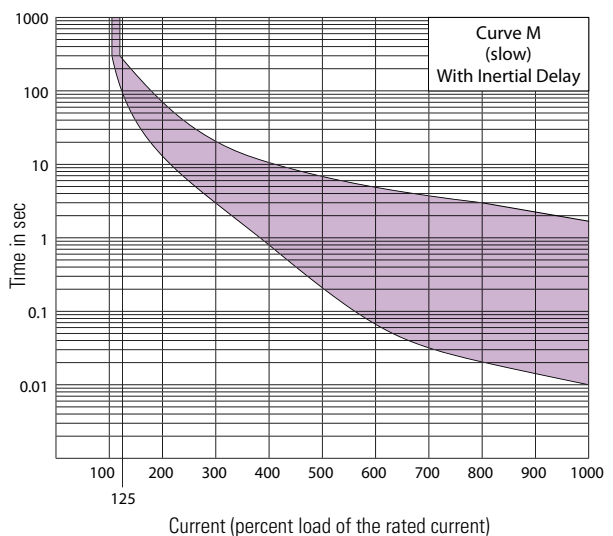
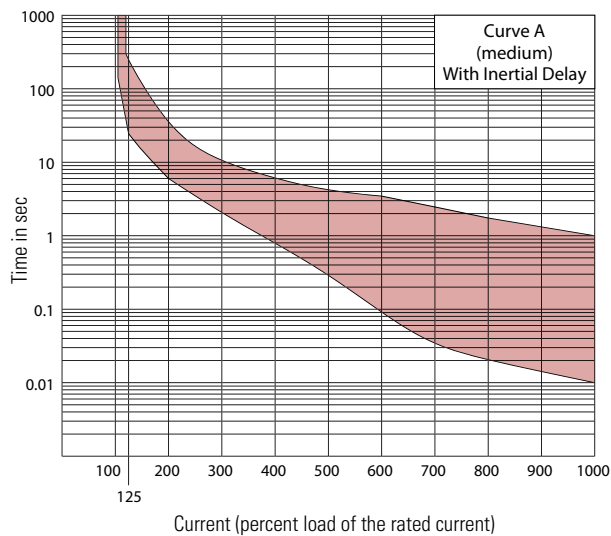
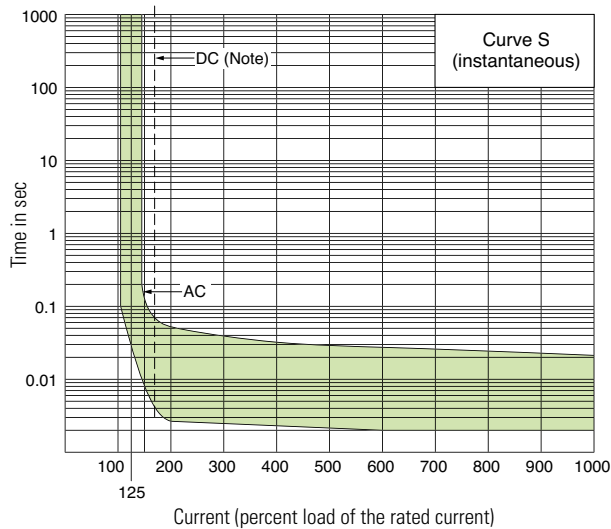
| Item            | Time Delay Curve               | Percent of Rated Current |            |               |               |                |               |                |                |                |
|-----------------|--------------------------------|--------------------------|------------|---------------|---------------|----------------|---------------|----------------|----------------|----------------|
|                 |                                | 100%                     | 125%       | 150%          | 175%          | 200%           | 400%          | 600%           | 800%           | 1000%          |
| AC (50/60Hz)/DC | S (instantaneous)              | NO TRIP                  | —          | *0.005 to 0.1 | 0.003 to 0.06 | 0.0027 to 0.05 | 0.002 to 0.03 | 0.002 to 0.028 | 0.002 to 0.025 | 0.002 to 0.022 |
|                 | A (medium)                     | NO TRIP                  | *25 to 240 | 16 to 140     | —             | 6 to 32        | 0.4 to 4      | 0.0055 to 1.5  | 0.004 to 0.8   | 0.004 to 0.65  |
|                 | M (slow)                       | NO TRIP                  | *60 to 600 | 30 to 200     | —             | 9 to 60        | 0.4 to 10     | 0.006 to 4.5   | 0.004 to 1.8   | 0.004 to 0.8   |
| AC (50/60Hz)    | With Inertial Delay A (medium) | NO TRIP                  | 25 to 240  | —             | —             | 6 to 32        | 0.8 to 6      | 0.09 to 3.5    | 0.02 to 1.8    | 0.01 to 1.0    |
|                 | With Inertial Delay M (slow)   | NO TRIP                  | 60 to 600  | —             | —             | 10 to 60       | 0.8 to 10     | 0.06 to 4.5    | 0.02 to 3      | 0.01 to 1.75   |

\*: MAY TRIP on DC

# Time Delay Curves at 40°C



Note: The entire shaded area applies to AC. For DC, the shaded area on the right of the dashed line applies.



Note: Inertial Delay option not available with S (instantaneous) curve.

Switches & Pilot Lights

Signaling Lights

Relays & Sockets

Timers

Contactors

Terminal Blocks

Circuit Breakers

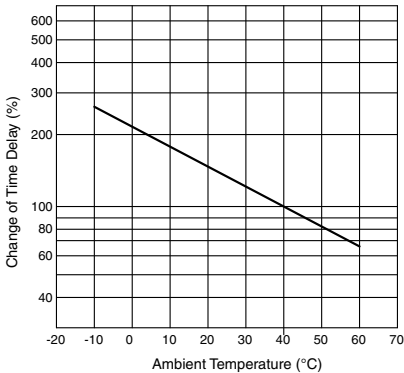
Switches & Pilot Lights  
Signaling Lights  
Relays & Sockets  
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Contactors  
Terminal Blocks  
Circuit Breakers

Time Delay Curve and Ambient Temperature

NC1V circuit breakers employ a hydraulic magnetic tripping system, where the rated current (trip current) is not affected by ambient temperatures. But the time delay may vary with the oil viscosity in the oil dash pot. Lower oil viscosity at higher temperatures results in a shorter delay, whereas at lower temperatures the delay will be longer.

Temperature Correction Curve

The time delay curves on the preceding page are measured at 40°C. With reference to the following curves, time delays can be corrected according to ambient temperature.



The time delay is based on an ambient temperature of 40°C. Time delays at other temperatures are corrected according to the temperature correction curve. The time delay of the instantaneous time delay curve (S) is not affected by ambient temperature.

When operating temperature exceeds 40°C, derate the rated current by multiplying the derating factor shown on the right.

| Operating Temp | Derating Factor |
|----------------|-----------------|
| 50°C           | 0.9             |
| 55°C           | 0.8             |
| 60°C           | 0.7             |

Impedance and Coil Resistance Series Trip (Current Trip) at 25°C

| Rated Current | For AC 50/60 Hz Impedance (Ω) |             | For DC Resistance (Ω) |             |
|---------------|-------------------------------|-------------|-----------------------|-------------|
|               | Curve S                       | Curves A, M | Curve S               | Curves A, M |
| 0.1A          | 66.0                          | 116.0       | 43.0                  | 106.0       |
| 0.3A          | 6.6                           | 11.0        | 4.1                   | 10.0        |
| 0.5A          | 1.92                          | 3.65        | 0.86                  | 3.40        |
| 1A            | 0.50                          | 0.93        | 0.25                  | 0.90        |
| 2A            | 0.16                          | 0.27        | 0.11                  | 0.25        |
| 3A            | 0.07                          | 0.12        | 0.050                 | 0.11        |
| 5A            | 0.025                         | 0.050       | 0.015                 | 0.045       |
| 7A            | 0.014                         | 0.027       | 0.011                 | 0.025       |
| 10A           | 0.007                         | 0.021       | 0.005                 | 0.020       |
| 15A           | 0.006                         | 0.010       | 0.005                 | 0.009       |
| 20A           | 0.005                         | 0.006       | 0.004                 | 0.005       |
| 25A           | 0.004                         | 0.005       | 0.004                 | 0.005       |
| 30A           | 0.003                         | 0.004       | 0.003                 | 0.004       |

Tolerance: ±25% (up to 20A), ±50% (25A and 30A)

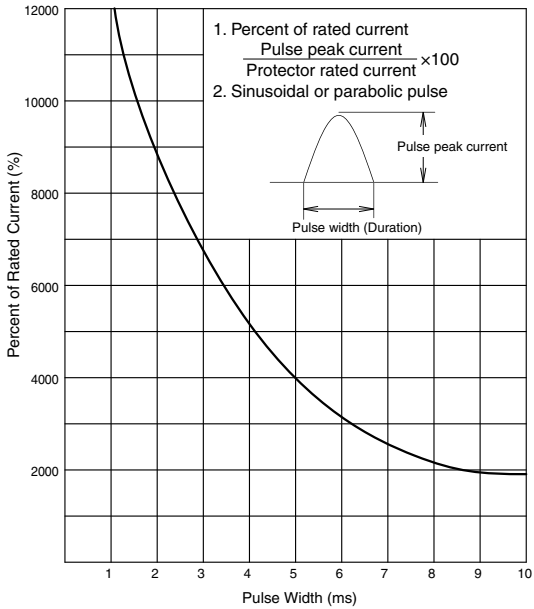
Relay Trip (Voltage Trip) at 25°C

| Tripping Voltage | For DC Resistance (Ω) |
|------------------|-----------------------|
| 24-48V           | 100.0                 |

Tolerance: ±25%

Inertial Delay

Inertial delay is designed not to trip on a non-repeating single pulse of 20 times the rated current (peak value) for a duration of 8ms. In addition, circuit breakers equipped with inertial delay do not respond to high inrush currents caused by transformer or lamp loads, but perform the specified interruption on subsequent overcurrents. Inertial delay is not available with the series trip curve S (instantaneous).



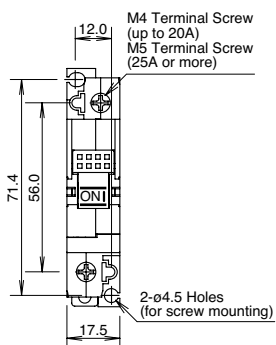
Voltage Drop Due to Coil Resistance or Impedance

The internal resistance or impedance of a circuit breaker tends to be larger for a smaller rated current. Therefore, when circuit breakers with a small rated current are used, voltage drop should be taken into consideration. Internal resistance also varies with time delay curves, which should also be considered during installation.

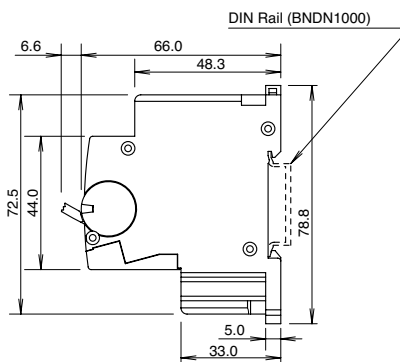


## 1-pole

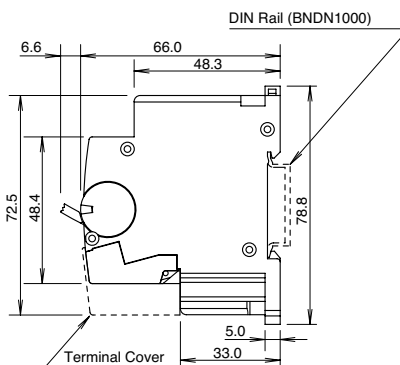
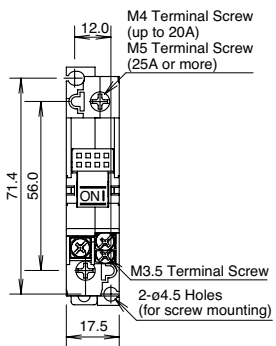
NC1V-1100



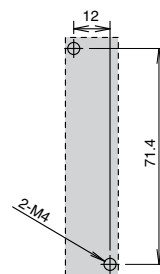
## Dimensions (mm)



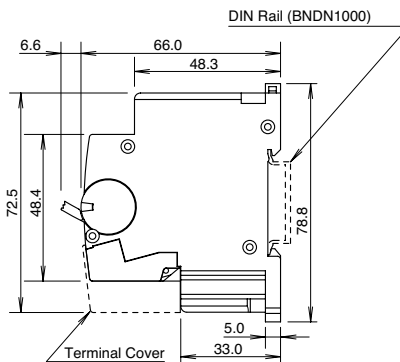
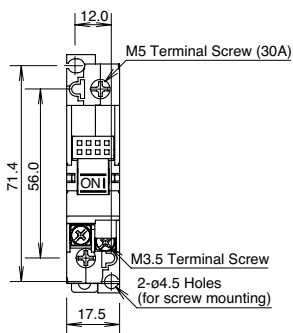
NC1V-1111  
(Auxiliary Contact)



Mounting Hole Layout  
(M4 Mounting Screws)

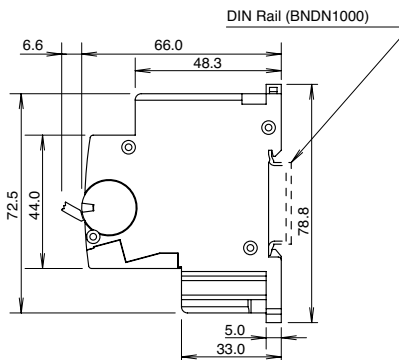
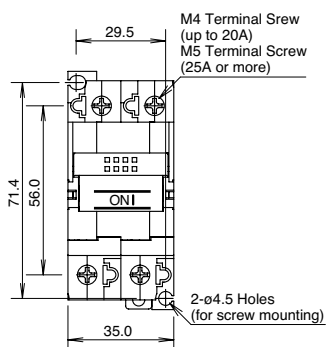


NC1V-1121  
(Alarm Contact)

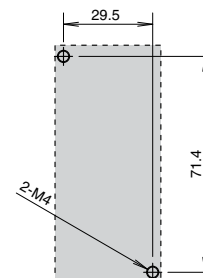


## 2-pole

NC1V-2100



Mounting Hole Layout  
(M4 Mounting Screws)



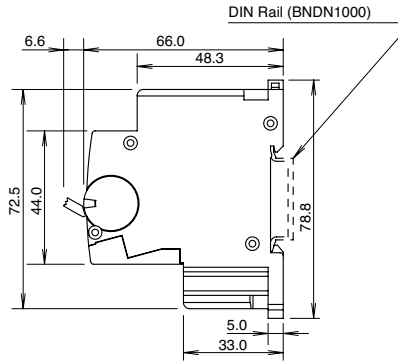
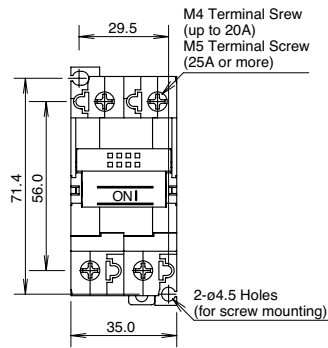
## 2-pole

NC1V-2111  
(one auxiliary contact)

NC1V-2112  
(two auxiliary contacts)

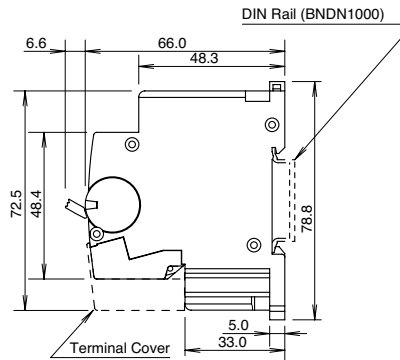
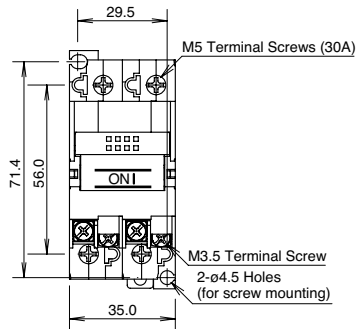
NC1V-2121  
(one alarm contact)

NC1V-2131  
(one auxiliary contact and  
one alarm contact)

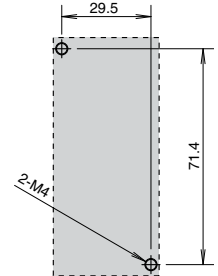


Dimensions shown are for NC1V-2111 and NC1V-2121.

NC1V-2500  
(Relay Trip)

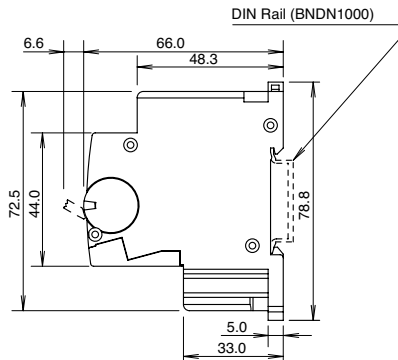
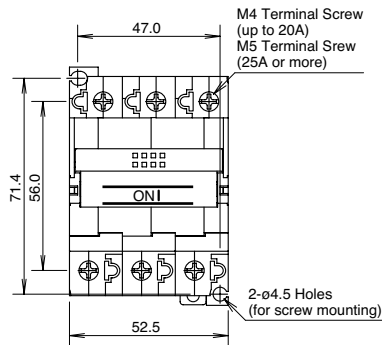


Mounting Hole Layout  
(M4 Mounting Screws)

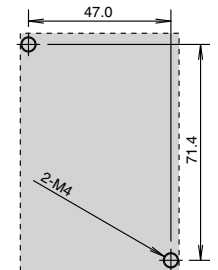


## 3-pole

NC1V-3100



Mounting Hole Layout  
(M4 Mounting Screws)



NC1V-3111  
(one auxiliary contact)

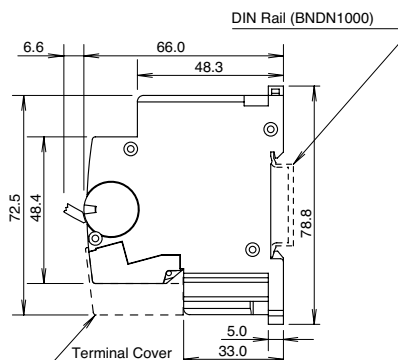
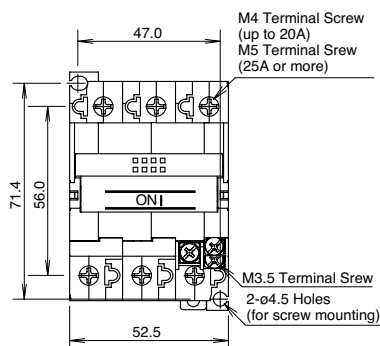
NC1V-3112  
(two auxiliary contacts)

NC1V-3113  
(three auxiliary contacts)

NC1V-3121  
(one alarm Contact)

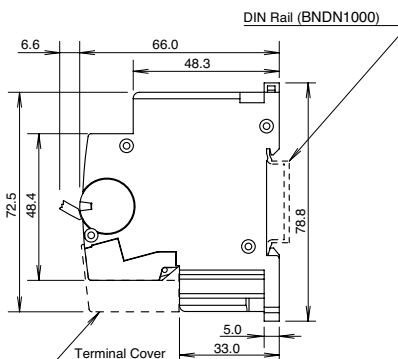
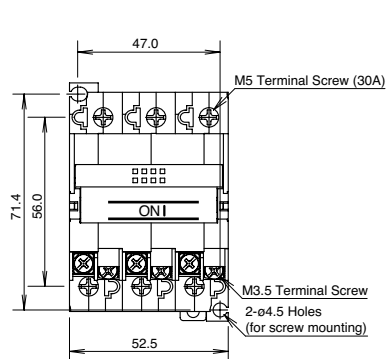
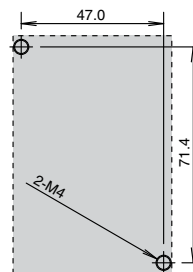
NC1V-3131  
(one auxiliary contact  
and one alarm contact)

NC1V-3132  
(two auxiliary contacts  
and one alarm contact)



Dimensions shown are for NC1V-3111 and NC1V-3121.

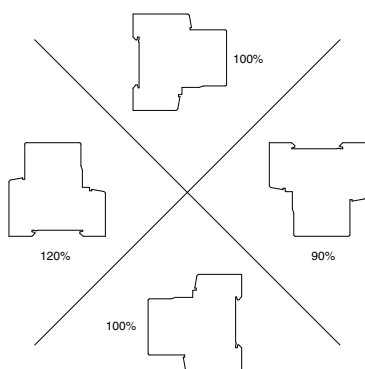
## 3-pole

NC1V-3500  
(Relay Trip)Mounting Hole Layout  
(M4 Mounting Screws)

## Instructions

## Installation Angle

Tripping method is hydraulic magnetic. Minimum operating current varies with installation angle. Operating currents are influenced by the weight of the movable iron core. With reference to the following figures, correct the rated current.



Minimum operating current is calculated from the following formula:

(Minimum operating current) =  
(Rated current) ×  
(Correction factor by installation angle) × (Reference minimum tripping current rate)

## Applicable wire and Crimp Terminals

| Terminal                                                     | Terminal Screw                                                               | Connectable Wire Size (mm <sup>2</sup> ) | Applicable Crimping Terminal | Tightening Torque (N·m) |
|--------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------|------------------------------|-------------------------|
| Main Circuit Terminals                                       | Spring-up, fingersafe, slotted Phillips screw with square washer (up to 20A) | 0.25 to 1.65                             | R1.25-4                      | 1 to 1.4                |
|                                                              |                                                                              | 1.04 to 2.63                             | R2-4                         |                         |
|                                                              |                                                                              | 2.63 to 6.64                             | R5.5-4                       |                         |
|                                                              | Spring-up fingersafe terminal (25A and 30A)                                  | 0.25 to 1.65                             | R1.25-5                      | 1.8 to 2.2              |
|                                                              |                                                                              | 1.04 to 2.63                             | R2-5                         |                         |
|                                                              |                                                                              | 2.63 to 6.64                             | R5.5-5                       |                         |
| Auxiliary Contact<br>Alarm Contact<br>Voltage Coil Terminals | Slotted Phillips screw with square washer                                    | 0.25 to 1.65                             | R1.25-3.5                    | 0.7 to 0.9              |
|                                                              |                                                                              | 1.04 to 2.63                             | R2-3.5                       |                         |

- For wiring the main circuit terminal, use applicable crimp terminals and tighten to the recommended torque.
- When using the NC1V circuit breaker as a CSA-certified product, use with CSA-certified crimp terminals.
- When using the NC1V circuit breaker as UL-recognized product, use with UL-recognized crimp terminals.

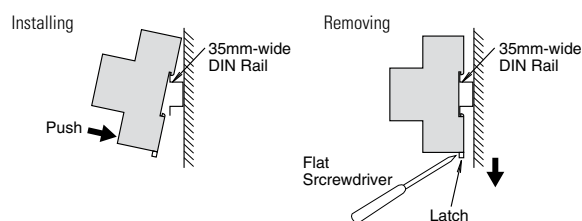
## DIN Rails

Installation on DIN Rail

- Fasten the DIN rail securely.
- With the latch facing downward, install the NC1V circuit breaker on the DIN rail as shown below.

Removal from DIN Rail

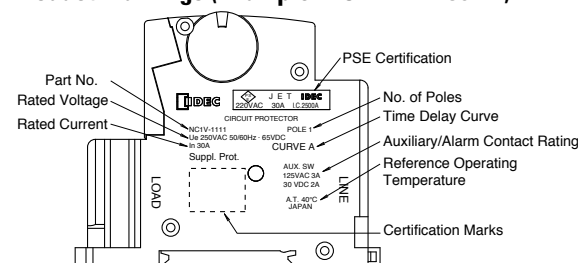
Using a flat screwdriver, pull the latch on the circuit breaker to remove from the DIN rail.



## Panel Mounting Screws (not supplied)

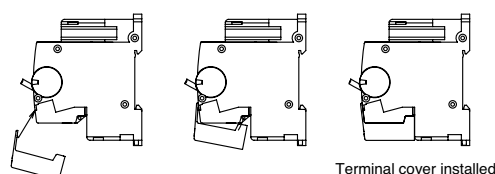
| Screw Type | Tightening Torque | Shape                         |
|------------|-------------------|-------------------------------|
| M4         | 0.8 to 1.0 N·m    | Spring Washer<br>Plain Washer |

## Product Markings (Example: NC1V-1111-30AA)

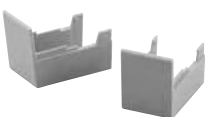


## Installation of Auxiliary/Alarm Terminal Cover

After wiring the terminals, install the terminal cover by aligning with the circuit breaker as shown below.



## Accessories

| Appearance                                                                         | Part No.  | Description                                             | Appearance                                                                         | Part No.    | Description                                               |
|------------------------------------------------------------------------------------|-----------|---------------------------------------------------------|------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------|
|   | NC9Z-MA11 | Panel Cut-Out Mounting bracket for 1-pole model         |   | NC9Z-PW1    | Marking Plate Holder*                                     |
|   | NC9Z-MA21 | Panel Cut-Out Mounting bracket for 2-pole model         |  | NC9Z-LK1    | Padlock attachment**                                      |
|   | NC9Z-MA31 | Panel Cut-Out Mounting bracket for 3-pole model         |  | NC1V-AUX-CV | Replacement Auxiliary/Alarm Terminal Cover (Nylon - PA66) |
|  | NC9Z-TA1  | Replacement Wiring Clip when using panel mount brackets | *Marking plate not supplied.<br>** Padlock not supplied.                           |             |                                                           |

Switches &amp; Pilot Lights

Signaling Lights

Relays &amp; Sockets

Timers

Contactors

Terminal Blocks

Circuit Breakers