

# General Purpose Relays

Types K, R, N, and C

Catalog  
8501CT0301R7/08  
**2008**  
Class 8501

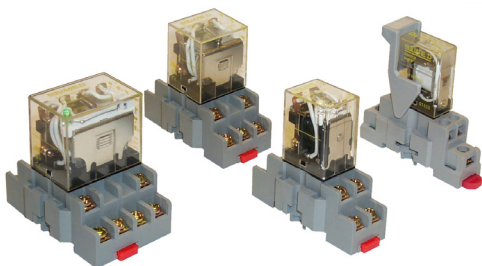


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## Type R – Miniature Plug-in Relay General and Order Information



These miniature plug-in relays have a 10 Ampere resistive rating (except for RS/RSD41), the same as the Type K plug-in relays, but are much smaller. The compact size of these relays makes them ideal for downsizing equipment.

- SPDT through 4PDT
- AC or DC Operated
- Horsepower rated
- Complete line of Sockets
- Manual Operator / Bidirectional Green LED Pilot Light Options

### UL Contact Ratings

| Type                   | Voltage | Resistive Rating | General Use Rating | Horsepower Rating |
|------------------------|---------|------------------|--------------------|-------------------|
| 8501RS41 <sup>◇</sup>  | 120 VAC | 15               | 10                 | 1/3               |
|                        | 240 VAC | 12               | 10                 | 1/2               |
| 8501RSD41 <sup>◇</sup> | 28 VDC  | 15               | 15                 | —                 |
|                        | 120 VAC | 10               | 10                 | 1/3               |
| 8501RS42               | 240 VAC | 10               | 10                 | 1/2               |
|                        | 30 VDC  | 10               | 10                 | —                 |
| 8501RSD42              | 120 VAC | 10               | 10                 | —                 |
|                        | 250 VAC | 10               | 10                 | —                 |
| 8501RS43               | 120 VAC | 10               | 10                 | —                 |
|                        | 28 VDC  | 10               | 10                 | —                 |
| 8501RSD43              | 120 VAC | 10               | 10                 | —                 |
|                        | 250 VAC | 10               | 10                 | —                 |
| 8501RS44               | 120 VAC | 10               | 10                 | —                 |
|                        | 28 VDC  | 10               | 10                 | —                 |
| 8501RSD44              | 120 VAC | 10               | 10                 | —                 |
|                        | 28 VDC  | 10               | 10                 | —                 |

<sup>◇</sup> RS41 and RSD41 relays have a B300 rating.

### Stocked Relays

| Type         | AC Voltage 50/60 Hz |     |     |     |     | Type         | DC Voltage |     |     |     |   |
|--------------|---------------------|-----|-----|-----|-----|--------------|------------|-----|-----|-----|---|
|              | 6                   | 12  | 24  | 120 | 240 |              | 6          | 12  | 24  | 110 |   |
| Voltage Code | V35                 | V36 | V14 | V20 | V24 | Voltage Code | V50        | V51 | V53 | V60 |   |
| RS41         |                     |     | S   | S   |     | RSD41        |            | S   | S   |     |   |
| RS41M1       |                     |     | S   | S   |     | RSD41M1      |            |     |     | S   |   |
| RS41P14      |                     |     | S   | S   |     | RSD41P14     |            |     |     | S   |   |
| RS41M1P14    |                     |     | S   | S   |     | RSD41M1P14   |            |     |     | S   |   |
| RS42         | S                   | S   | S   | S   | S   | RSD42        |            | S   | S   | S   | S |
| RS42M1       |                     |     |     |     |     | RSD42M1      |            |     |     |     |   |
| RS42P14      |                     |     | S   | S   | S   | RSD42P14     | S          | S   | S   | S   | S |
| RS42M1P14    |                     |     |     | S   |     | RSD42M1P14   |            |     |     | S   |   |
| RS43         |                     |     | S   | S   |     | RSD43        |            |     |     | S   |   |
| RS43M1       |                     |     |     |     |     | RSD43M1      |            |     |     |     |   |
| RS43P14      |                     |     |     | S   |     | RSD43P14     |            |     |     |     |   |
| RS43M1P14    |                     |     |     | S   |     | RSD43M1P14   |            |     |     |     |   |
| RS44         |                     |     | S   | S   | S   | RSD44        |            | S   | S   |     |   |
| RS44M1       |                     |     |     |     |     | RSD44M1      |            |     |     |     |   |
| RS44P14      |                     |     |     | S   |     | RSD44P14     |            |     |     | S   |   |
| RS44M1P14    |                     |     |     | S   |     | RSD44M1P14   |            |     |     |     |   |

S – Stocked

Factory Order items require a **minimum** order quantity of 25 and have a lead time of 12 weeks.

|                                                                                                                    | Input Voltage | Options                         | Type        |
|--------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------|-------------|
| <br>Silver Cadmium Oxide Contacts | AC 50/60 Hz   | None                            | RS41*       |
|                                                                                                                    |               | Manual Operator                 | RS41M1*     |
|                                                                                                                    |               | Pilot Light                     | RS41P14*    |
|                                                                                                                    |               | Manual Operator and Pilot Light | RS41M1P14*  |
|                                                                                                                    | DC            | None                            | RSD41*      |
|                                                                                                                    |               | Manual Operator                 | RSD41M1*    |
|                                                                                                                    |               | Pilot Light                     | RSD41P14*   |
|                                                                                                                    |               | Manual Operator and Pilot Light | RSD41M1P14* |

|                                                                                                                    | Input Voltage | Options                         | Type        |
|--------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------|-------------|
| <br>Silver Cadmium Oxide Contacts | AC 50/60 Hz   | None                            | RS42*       |
|                                                                                                                    |               | Manual Operator                 | RS42M1*     |
|                                                                                                                    |               | Pilot Light                     | RS42P14*    |
|                                                                                                                    |               | Manual Operator and Pilot Light | RS42M1P14*  |
|                                                                                                                    | DC            | None                            | RSD42*      |
|                                                                                                                    |               | Manual Operator                 | RSD42M1*    |
|                                                                                                                    |               | Pilot Light                     | RSD42P14*   |
|                                                                                                                    |               | Manual Operator and Pilot Light | RSD42M1P14* |

|                                                                                                                      | Input Voltage | Options                         | Type        |
|----------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------|-------------|
| <br>Silver Cadmium Oxide Contacts | AC 50/60 Hz   | None                            | RS43*       |
|                                                                                                                      |               | Manual Operator                 | RS43M1*     |
|                                                                                                                      |               | Pilot Light                     | RS43P14*    |
|                                                                                                                      |               | Manual Operator and Pilot Light | RS43M1P14*  |
|                                                                                                                      | DC            | None                            | RSD43*      |
|                                                                                                                      |               | Manual Operator                 | RSD43M1*    |
|                                                                                                                      |               | Pilot Light                     | RSD43P14*   |
|                                                                                                                      |               | Manual Operator and Pilot Light | RSD43M1P14* |

|                                                                                                                       | Input Voltage | Options                         | Type        |
|-----------------------------------------------------------------------------------------------------------------------|---------------|---------------------------------|-------------|
| <br>Silver Cadmium Oxide Contacts | AC 50/60 Hz   | None                            | RS44*       |
|                                                                                                                       |               | Manual Operator                 | RS44M1*     |
|                                                                                                                       |               | Pilot Light                     | RS44P14*    |
|                                                                                                                       |               | Manual Operator and Pilot Light | RS44M1P14*  |
|                                                                                                                       | DC            | None                            | RSD44*      |
|                                                                                                                       |               | Manual Operator                 | RSD44M1*    |
|                                                                                                                       |               | Pilot Light                     | RSD44P14*   |
|                                                                                                                       |               | Manual Operator and Pilot Light | RSD44M1P14* |

\* Voltage code must be specified to order this product. Refer to standard voltage codes listed in the Stocked Relay table to the left and insert as shown in How To Order.

### How to Order:

| To Order Specify:                                                                                                                                 | Catalog Number |      |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------|--------------|
| <ul style="list-style-type: none"> <li>• Class Number</li> <li>• Type Number</li> <li>• Voltage Code</li> </ul> (See Stocked Relay Table to left) | Class          | Type | Voltage Code |
|                                                                                                                                                   | 8501           | RS42 | V20          |

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Wiring Diagrams ..... page 6  
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Type R – Miniature Plug-in Relay
General and Order Information

8501 R relays are suited for use as logic elements and power switching output devices. The short stroke motion of the armature provides long mechanical life required for high speed operation of control systems. Different contact compositions allow these relays to be used in a variety of applications. Fine silver (gold flashed) and bifurcated crossbar (gold overlay silver) are suitable for high contact reliability and low level switching requirements. Silver cadmium oxide is best suited for inductive loads. Hermetically sealed relays can be used in adverse environments.

- 1, 3, or 5 Ampere Versions
- 4PDT
- Complete Socket Line
- Horsepower Rated
- AC or DC Operation
- Manual Operator/ Pilot Light Options

Table with 4 columns: 5 A, Input Voltage, Options, Type. Rows include AC 50/60 Hz and DC configurations with various options like None, Manual Operator, Pilot Light, and combinations thereof.

Table with 4 columns: 3 A, Input Voltage, Options, Type. Rows include AC 50/60 Hz and DC configurations with various options like None, Manual Operator, Pilot Light, and combinations thereof.

Table with 3 columns: 1 A, Input Voltage, Type. Rows include Best for low level switching and Bifurcated Silver Gold Plated Contacts.

Table with 3 columns: Hermetically Sealed, Input Voltage, Type. Rows include 5 Ampere Resistive and Silver Cadmium Oxide Contacts.

\* Voltage code must be specified to order this product. Refer to standard voltage codes listed in the Stocked Relays table on page 5 and insert as shown in How To Order.
^ Do not ground frame.

8501 RS4V14



Pilot Light Option

An Internal green pilot light is available in both AC and DC versions for positive indication of power to the coil. The pilot lights are bidirectional LEDs.

8501 RSD14P14V53



Manual Operation Option

To speed circuit testing, a manual operator can be provided. The relay can be manually switched to simulate normal operation.

NOTE: All Type R relays with a manual operator must be used on circuits of same polarity.

8501 RS14M1V14



Contact Ratings

Table with 4 columns: Type, Voltage, Continuous Current Rating, Horsepower Rating. Rows list various relay types (RS4, RSD4, RS14, RSD14, RS24, RSD24, RS34, RSD34) and their ratings.

^ RS4/RSD4, RS14/RSD14 have C300 pilot duty rating.
\* Horsepower rating at 120 VAC.

How to Order:

Table with 2 main sections: To Order Specify (Class Number, Type Number, Voltage Code) and Catalog Number (Class, Type, Voltage Code).

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Sockets and Holddown Clips ..... page 14

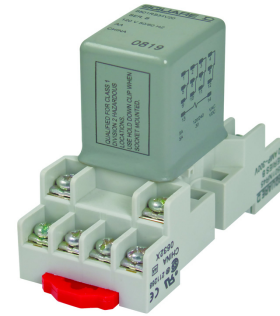
## Type R – Miniature Plug-in Relay Ordering Information and Application Data

### Stocked Relays

| Type         | AC Voltage 50/60 Hz |     |     |     |     |     | Type         | DC Voltage |     |     |     |     |  |
|--------------|---------------------|-----|-----|-----|-----|-----|--------------|------------|-----|-----|-----|-----|--|
|              | 6                   | 12  | 24  | 48  | 120 | 240 |              | 6          | 12  | 24  | 48  | 110 |  |
| Voltage Code | V35                 | V36 | V14 | V17 | V20 | V24 | Voltage Code | V50        | V51 | V53 | V56 | V60 |  |
| RS4          |                     |     | S   |     | S   |     | RSD4         |            | S   | S   |     |     |  |
| RS4M1        |                     |     |     |     | S   |     | RSD4M1       |            |     |     |     |     |  |
| RS4P14       |                     |     |     |     | S   |     | RSD4P14      |            |     | S   |     |     |  |
| RS4M1P14     |                     |     |     |     | S   |     | RSD4M1P14    |            |     | S   |     |     |  |
| RS14         |                     | S   | S   |     | S   |     | RSD14        |            | S   | S   |     | S   |  |
| RS14M1       |                     |     |     |     | S   |     | RSD14M1      |            |     | S   |     |     |  |
| RS14P14      |                     |     |     |     | S   |     | RSD14P14     |            | S   | S   |     | S   |  |
| RS14M1P14    |                     |     |     |     | S   | S   | RSD14M1P14   |            | S   | S   |     |     |  |
| RS24         |                     |     |     |     | S   |     | RSD24        |            |     | S   |     |     |  |
| RS34         |                     |     |     |     | S   |     | RSD34        |            | S   | S   |     |     |  |

S – Stocked

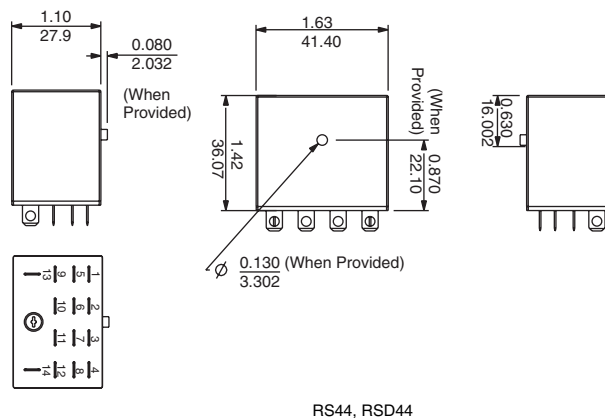
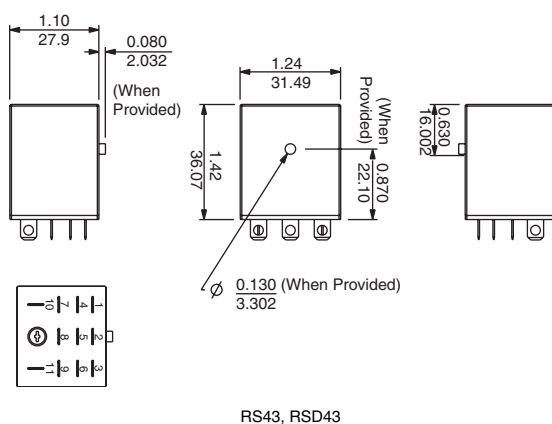
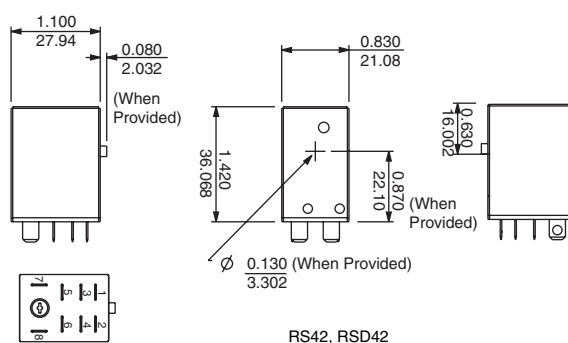
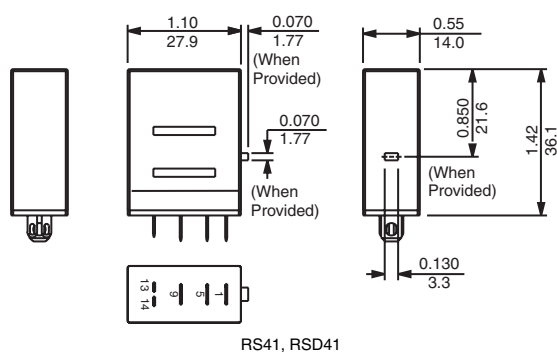
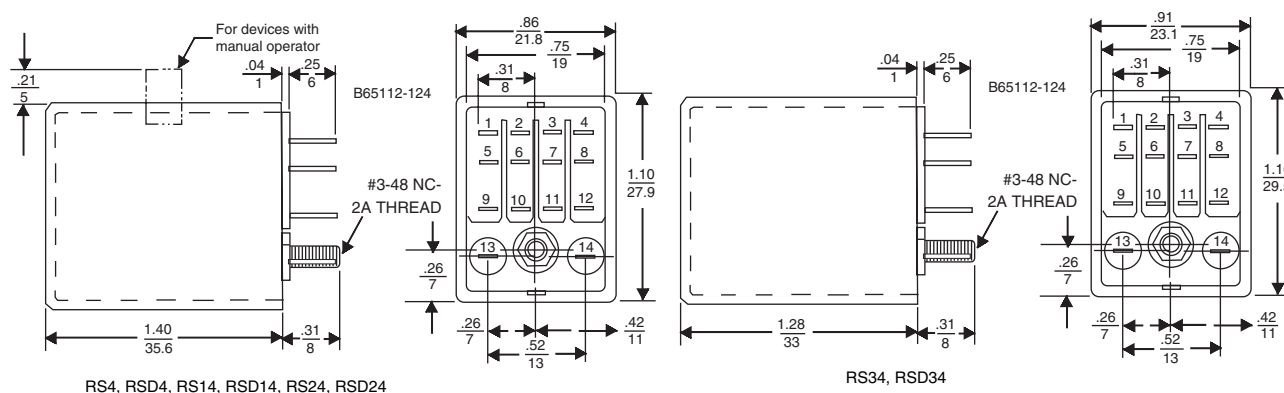
– Factory Order items require a **minimum** order quantity of 25 and have a lead time of 12 weeks.



| Class 8501 Type                                                                     |                             | RS4                                                              | RSD4     | RS14          | RSD14    | RS24          | RSD24    | RS34                                    | RSD34    | RS41                                    | RSD41    | RS42                         | RSD42    | RS43                         | RSD43    | RS44                         | RSD44    |
|-------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------|----------|---------------|----------|---------------|----------|-----------------------------------------|----------|-----------------------------------------|----------|------------------------------|----------|------------------------------|----------|------------------------------|----------|
| Operating Data                                                                      | Pick-Up Time                | 25 ms Maximum                                                    |          |               |          |               |          | 13 ms Max.                              |          | 20 ms Maximum                           |          |                              |          |                              |          |                              |          |
|                                                                                     | Drop-Out Time               | 25 ms Maximum                                                    |          |               |          |               |          | 6 ms Max.                               |          | 20 ms Maximum                           |          |                              |          |                              |          |                              |          |
|                                                                                     | Operating Temperature Range | -40° C to +70° C<br>(-40° F to +158° F)                          |          |               |          |               |          | -45° C to +70° C<br>(-49° F to +158° F) |          | -40° C to +70° C<br>(-40° F to +158° F) |          |                              |          |                              |          |                              |          |
| Coil                                                                                | Duty Cycle                  | Continuous                                                       |          |               |          |               |          |                                         |          |                                         |          |                              |          |                              |          |                              |          |
|                                                                                     | Voltage Range               | AC coils +10%, -15% of nominal<br>DC coils +10%, -20% of nominal |          |               |          |               |          |                                         |          |                                         |          |                              |          |                              |          |                              |          |
|                                                                                     | AC Coils                    | 1.2 VA sealed                                                    | —        | 1.2 VA sealed | —        | 1.2 VA sealed | —        | 1.2 VA sealed                           | —        | 1.5 VA inrush, 1.1 VA sealed            | —        | 2.2 VA inrush, 1.3 VA sealed | —        | 2.9 VA inrush, 2.0 VA sealed | —        | 3.7 VA inrush, 2.6 VA sealed | —        |
|                                                                                     | DC Coils                    | —                                                                | 0.9 watt | —             | 0.9 watt | —             | 0.9 watt | —                                       | 0.9 watt | —                                       | 0.7 watt | —                            | 0.9 watt | —                            | 1.0 watt | —                            | 1.0 watt |
|  | File CCN                    | E197072<br>NRNT2                                                 |          |               |          |               |          | N/A                                     |          | E78351<br>NLDX2                         |          | E78427<br>NRNT2              |          |                              |          |                              |          |
|  | File CCN                    | E197072<br>NRNT8<br>(Approved but not marked)                    |          |               |          |               |          | E196809<br>NQMJ2, NQMJ8                 |          | N/A                                     |          |                              |          |                              |          |                              |          |
|  | File Class                  | 211268<br>3211 07                                                |          |               |          |               |          | N/A                                     |          | 211268<br>3211 07                       |          |                              |          |                              |          |                              |          |
|  |                             | Yes                                                              |          |               |          |               |          |                                         |          |                                         |          |                              |          |                              |          |                              |          |
|  | File CCN                    | E78351 *<br>NLDX                                                 |          |               |          |               |          | E123950 *<br>NPKR, NPKR7                |          | E78351 *<br>NLDX                        |          |                              |          | N/A                          |          |                              |          |

\* When used with the appropriate 8501 NR socket.

## Wiring Diagrams



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## Type K - Plug-in Relay Dimensions and Wiring Diagram

8501 K relays are designed for multipole switching applications at 240 volts or lower. These relays have industry standard wiring and pin arrangements which allows for their use as replacements for many similar relays without wiring or hardware modifications.

- 10 or 15 Ampere Versions      • Horsepower Rated
- DPDT or 3PDT                    • DPDT Latching Relay
- Manual Operator/  
  Red Pilot Light Options        • AC or DC Operation

### Type KF – Flange Mounted – Spade Terminals

|                                                                                   | Input Voltage | Contact Arrangement | Options        | Type   |
|-----------------------------------------------------------------------------------|---------------|---------------------|----------------|--------|
|  | AC 50/60 Hz   | DPDT                | None Available | KF12*  |
|                                                                                   |               | 3PDT                |                | KF13*  |
|                                                                                   | DC            | DPDT                | None Available | KFD12* |
|                                                                                   |               | 3PDT                |                | KFD13* |

\* Socket is not required with Type KF relays.

### Type KL – Latching Relay – Spade Terminals

|                                                                                    | Input Voltage | Contact Arrangement | Options        | Type   |
|------------------------------------------------------------------------------------|---------------|---------------------|----------------|--------|
|  | AC 50/60 Hz   | DPDT                | None Available | KL12*  |
|                                                                                    | DC            | DPDT                | None Available | KLD12* |

### Stocked Relays

| Type          | AC Voltage 50/60 Hz |     |     |     |     | Type          | DC Voltage |     |     |     |     |     |  |
|---------------|---------------------|-----|-----|-----|-----|---------------|------------|-----|-----|-----|-----|-----|--|
|               | 6                   | 12  | 24  | 120 | 240 |               | 6          | 12  | 24  | 48  | 110 | 125 |  |
| Voltage Codes | V35                 | V36 | V14 | V20 | V24 | Voltage Codes | V50        | V51 | V53 | V56 | V60 | V63 |  |
| KP12          | S                   | S   | S   | S   | S   | KPD12         | S          | S   | S   | S   | S   | S   |  |
| KP12P14       |                     | S   | S   | S   | S   | KPD12P14      |            | S   | S   |     | S   | S   |  |
| KP13          |                     | S   | S   | S   | S   | KPD13         |            | S   | S   | S   | S   | S   |  |
| KP13P14       |                     |     | S   | S   | S   | KPD13P14      |            |     | S   |     |     | S   |  |
| KU12          |                     | S   | S   | S   | S   | KUD12         |            | S   | S   |     |     |     |  |
| KU12M1        |                     |     |     |     |     | KUD12M1       |            |     | S   |     |     |     |  |
| KU12P14       |                     |     | S   | S   |     | KUD12P14      |            |     |     |     |     |     |  |
| KU12M1P14     |                     |     | S   | S   | S   | KUD12M1P14    |            |     | S   |     |     |     |  |
| KU13          |                     | S   | S   | S   | S   | KUD13         |            | S   | S   |     | S   | S   |  |
| KU13M1        |                     |     |     |     |     | KUD13M1       |            |     | S   |     |     |     |  |
| KU13P14       |                     |     | S   | S   |     | KUD13P14      |            |     |     |     |     |     |  |
| KU13M1P14     |                     |     | S   | S   | S   | KUD13M1P14    |            |     | S   |     | S   | S   |  |
| KF12          |                     |     | S   | S   | S   | KFD12         |            | S   | S   |     |     |     |  |
| KF13          |                     |     | S   | S   |     | KFD13         |            |     | S   |     |     |     |  |
| KL12          |                     |     | S   | S   | S   | KLD12         |            | S   | S   |     |     |     |  |

S – Stocked

– Factory Order items require a **minimum** order quantity of 25 and have a lead time of 12 weeks.

\* Voltage code must be specified to order this product. Refer to standard voltage codes listed in the Stocked Relays table above and insert as shown in How To Order.

### How to Order:

| To Order Specify:               | Catalog Number |      |              |
|---------------------------------|----------------|------|--------------|
| • Class Number                  | Class          | Type | Voltage Code |
| • Type Number                   | 8501           | KP12 | V20          |
| • Voltage Code                  |                |      |              |
| (See Stocked Relay Table above) |                |      |              |

### Type KP – Tubular Terminals

|                                                                                   | Input Voltage | Contact Arrangement | Options     | Type      |
|-----------------------------------------------------------------------------------|---------------|---------------------|-------------|-----------|
|  | AC 50/60 Hz   | DPDT                | None        | KP12*     |
|                                                                                   |               | DPDT                | Pilot Light | KP12P14*  |
|                                                                                   |               | 3PDT                | None        | KP13*     |
|                                                                                   |               | 3PDT                | Pilot Light | KP13P14*  |
|                                                                                   | DC            | DPDT                | None        | KPD12*    |
|                                                                                   |               | DPDT                | Pilot Light | KPD12P14* |
|                                                                                   |               | 3PDT                | None        | KPD13*    |
|                                                                                   |               | 3PDT                | Pilot Light | KPD13P14* |

### Type KU – Spade Terminals

|                                                                                   | Input Voltage | Contact Arrangement | Options                         | Type        |
|-----------------------------------------------------------------------------------|---------------|---------------------|---------------------------------|-------------|
|  | AC 50/60 Hz   | DPDT                | None                            | KU12*       |
|                                                                                   |               | DPDT                | Manual Operator                 | KU12M1*     |
|                                                                                   |               | DPDT                | Pilot Light                     | KU12P14*    |
|                                                                                   |               | DPDT                | Manual Operator and Pilot Light | KU12M1P14*  |
|                                                                                   |               | 3PDT                | None                            | KU13*       |
|                                                                                   |               | 3PDT                | Manual Operator                 | KU13M1*     |
|                                                                                   |               | 3PDT                | Pilot Light                     | KU13P14*    |
|                                                                                   |               | 3PDT                | Manual Operator and Pilot Light | KU13M1P14*  |
|                                                                                   | DC            | DPDT                | None                            | KUD12*      |
|                                                                                   |               | DPDT                | Manual Operator                 | KUD12M1*    |
|                                                                                   |               | DPDT                | Pilot Light                     | KUD12P14*   |
|                                                                                   |               | DPDT                | Manual Operator and Pilot Light | KUD12M1P14* |
|                                                                                   |               | 3PDT                | None                            | KUD13*      |
|                                                                                   |               | 3PDT                | Manual Operator                 | KUD13M1*    |
|                                                                                   |               | 3PDT                | Pilot Light                     | KUD13P14*   |
|                                                                                   |               | 3PDT                | Manual Operator and Pilot Light | KUD13M1P14* |

**Pilot Light Option** – Available on Types KP and KU. Internal pilot lights are available in both ac and dc versions for positive indication of power to the coil. The pilot light will be a red bidirectional LED.

**Manual Operator Option** – Available on Type KU only. To speed circuit testing a manual operator can be provided. With this feature the relay can be manually switched to simulate normal operation.

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# Type K — Plug-in Relay

## Application Data, Dimensions, Wiring Diagrams

### Contact Ratings

| Type | AC       |                                     |     | DC       |                   |
|------|----------|-------------------------------------|-----|----------|-------------------|
|      | AC Volts | Resistive 75% PF Continuous Amperes | HP  | DC Volts | Resistive Amperes |
| KP*  | 120      | 10                                  | 1/3 | 28       | 10                |
|      | 240      | 10*                                 | 1/2 |          |                   |
| KU*  | 120      | 15*                                 | 1/3 | 28       | 10                |
|      | 240      | 10*                                 | 1/2 |          |                   |
| KL   | 120      | 10                                  | 1/3 | 28       | 10                |
|      | 240      | 10                                  | 1/2 |          |                   |

\* 8501 KP, KU, and KF relays have a B300 rating.

\* 3 pole devices have a 20 A max. total (sum of currents in all 3 poles), continuous rating.

\* 3 pole devices have a 30 A max. total (sum of currents in all 3 poles), continuous rating.

### Operating Data

|                             | Type       | Comments                                                                                                                         |
|-----------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------|
| Typical Pick-Up Time        | KP         | AC coil: approximately 12 ms<br>DC coil: approximately 18 ms                                                                     |
|                             | KF, KU     | AC coil: approximately 8 ms<br>DC coil: approximately 11 ms                                                                      |
|                             | KL         | approximately 25 ms                                                                                                              |
| Typical Drop-Out Time       | KP         | AC coil: approximately 12 ms<br>DC coil: approximately 7 ms                                                                      |
|                             | KF, KU     | AC coil: approximately 8 ms<br>DC coil: approximately 7 ms                                                                       |
|                             | KL         | approximately 25 ms                                                                                                              |
| Operating Temperature Range | KF, KP, KU | AC: 2 pole: -40°C to +55°C (-40°F to +131°F)<br>3 pole: -40°C to +45°C (-40°F to +113°F)<br>DC: -40°C to +70°C (-40°F to +158°F) |
|                             | KL         | AC/DC: -45°C to +70°C (-49°F to +158°F)                                                                                          |

### Contacts

|               |                                                         |
|---------------|---------------------------------------------------------|
| Configuration | 2PDT or 3PDT (2 or 3 Form C)                            |
| Ratings       | See contact ratings table above.                        |
| Material      | KF, KU, and KL—Silver cadmium oxide<br>KP—Silver nickel |

### Coils

|                    |                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------|
| Duty               | Continuous rated coils                                                                             |
| Available Voltages | See Stocked Relays page 7.                                                                         |
| Operate            | AC: +10, -15% of Nominal Voltage at 25°C (77°F)<br>DC: +10, -25% of Nominal Voltage at 25°C (77°F) |
| Typical Burden     | Types KP, KU, KF<br>AC: 3.6 VA inrush, 2.5 VA sealed<br>DC: 1.5 watts standard, 3 watts maximum    |
|                    | Type KL<br>AC: 2.0 VA latch, 0.8 VA unlatch<br>DC: 1.2 watts                                       |

### General

**Terminals:** Solder/plug-in

**UL/CSA:**

For 8501 KP, KU, and KF:



File CCN E197072 NRNT2



File Class 212845 3211 07



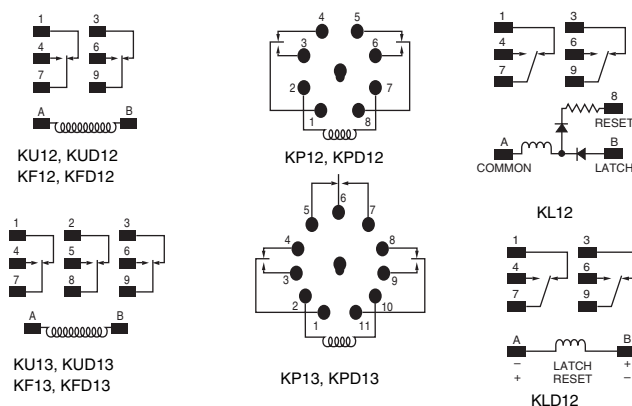
For 8501 KP, KU, and KL:



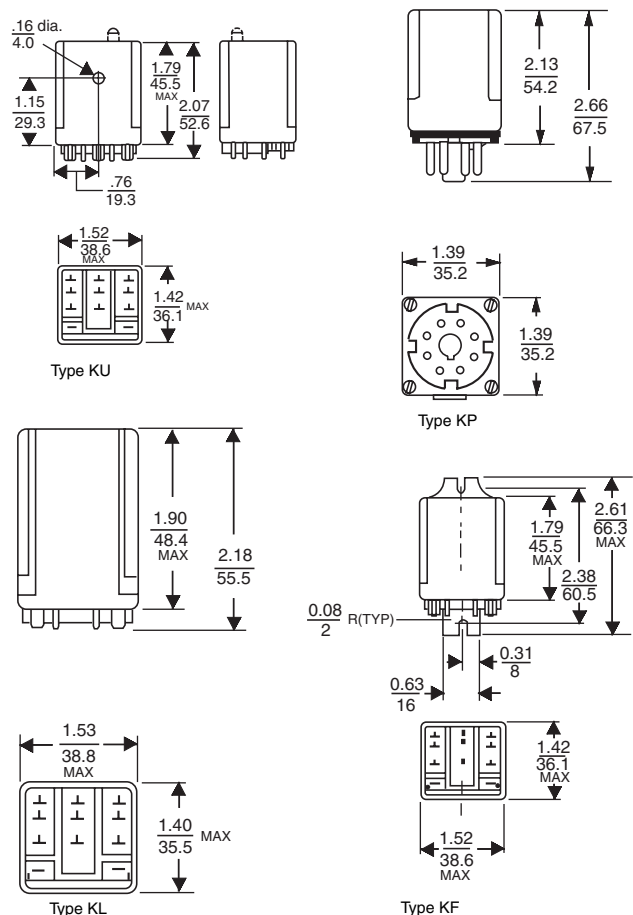
File CCN E78351 NLDX

When used with the appropriate 8501NR socket.

### Wiring Diagrams



### Approximate Dimensions



Dual Dimensions: Inches  
Millimeters

For 8501 KL:



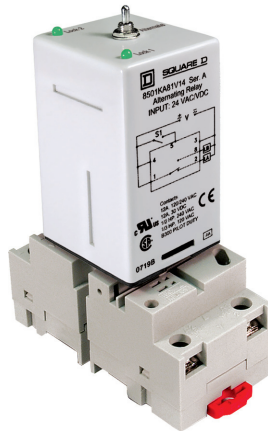
File CCN E78351 NLDX2



File Class 211269 3211 04



# Type KA – Alternating Relays General Information and Specifications



8501 KA alternating relays are designed to minimize pump and motor wear by equalizing run time between parallel components in a multi-pump system. These relays are controlled by an external control switch. This switch may be any type of contact closure; for example, the contacts of a timing relay or the closure of a float switch. The 8501 KA relays also have a toggle switch that allows the operator to lock one side of the duplex system, preventing alternation.

- 12 A Resistive Rating
- SPDT or DPDT
- Toggle switch for load control
- LED Load Indicators
- Horsepower Rated
- AC and DC Control
- UL Listed w/ SquareD Socket
- Rohs Compliant

## Type KA – Alternating Relay

|                                                                                   | Input Voltage | Contact Arrangement | Options                     | Type       |
|-----------------------------------------------------------------------------------|---------------|---------------------|-----------------------------|------------|
|  | AC & DC       | SPDT                | LED, Toggle                 | 8501KA81   |
|                                                                                   | AC & DC       | DPDT                | LED, Toggle, Duplex Pumping | 8501KA82   |
|                                                                                   | AC & DC       | DPDT (N.C.)         | LED, Toggle                 | 8501KA112  |
|                                                                                   | AC & DC       | DPDT (N.O.)         | LED, Toggle                 | 8501KA112A |

## Contact Ratings

| Type      | AC       |                   |     |            | DC       |                   |
|-----------|----------|-------------------|-----|------------|----------|-------------------|
|           | AC Volts | Resistive Amperes | HP  | Pilot Duty | DC Volts | Resistive Amperes |
| 8501KA*** | 120      | 12                | 1/3 | B300       | 30       | 12                |
|           | 240      | 12                | 1/2 | B300       |          |                   |

## Relay Availability

| Type         | AC & DC Voltage |     |     | AC Voltage |
|--------------|-----------------|-----|-----|------------|
|              | 12              | 24  | 120 | 240        |
| Voltage Code | V36             | V14 | V20 | V24        |
| 8501KA***    |                 | S   | S   |            |
| 8501KA***    |                 | S   | S   |            |
| 8501KA***    |                 | S   | S   |            |
| 8501KA***    |                 | S   | S   |            |

AC Voltage = 50/60 Hz

S – Stocked. Stocked items do not require a minimum quantity and have a lead time of 2 weeks.

All other part numbers require a minimum order quantity of 100 and have a lead time of 18 weeks.

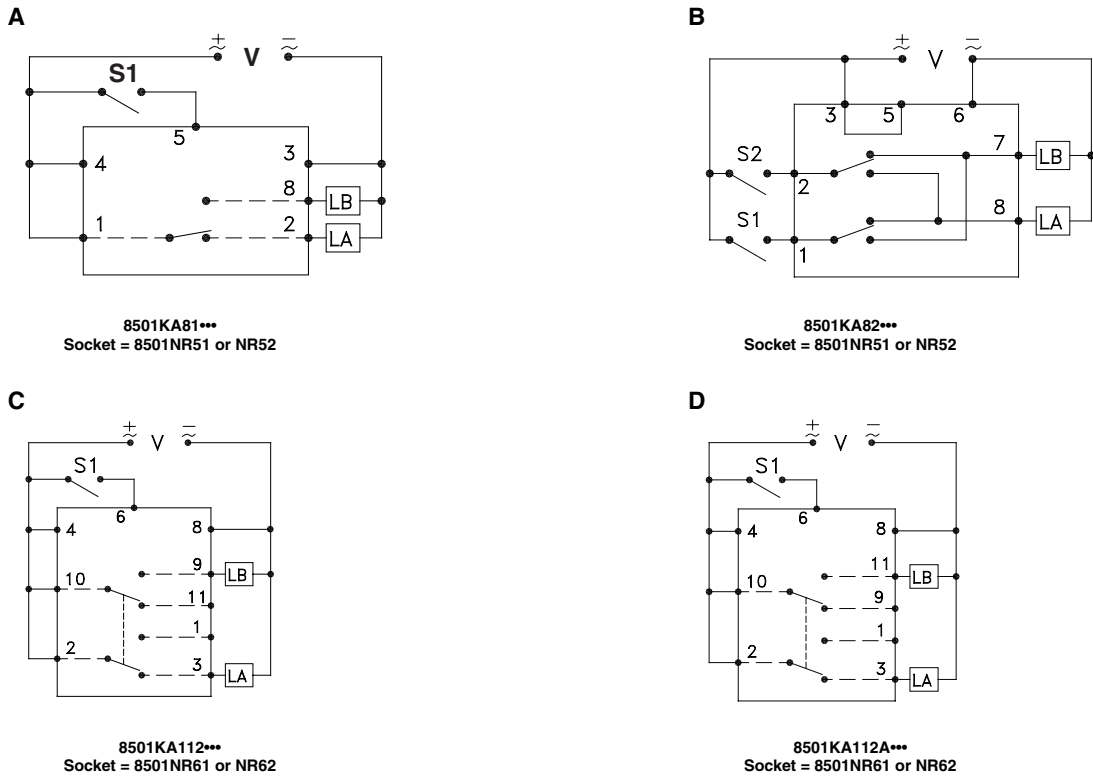
## Alternating Functions

| Diagram  | Toggle Switch Position | Detail                                                                                                                                                                                                                                                                                                                                               | S1 = Control Switch 1 | S2 = Control Switch 2 | LA = Load 1 | LB = Load 2 |
|----------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-------------|-------------|
| A, C & D | Alternate              | Closing S1 alternates the loads between LA and LB.                                                                                                                                                                                                                                                                                                   |                       |                       |             |             |
|          | Lock 1                 | LA is ON and LB is OFF. S1 is not used in this mode.                                                                                                                                                                                                                                                                                                 |                       |                       |             |             |
|          | Lock 2                 | LA is OFF and LB is ON. S1 is not used in this mode.                                                                                                                                                                                                                                                                                                 |                       |                       |             |             |
| B        | Alternate              | Closing S1 alternates the loads between LA and LB. S2 will only control LA.                                                                                                                                                                                                                                                                          |                       |                       |             |             |
|          | Lock 1                 | S1 will control LA and S2 will control LB.                                                                                                                                                                                                                                                                                                           |                       |                       |             |             |
|          | Lock 2                 | S1 will control LB and S2 will control LA.                                                                                                                                                                                                                                                                                                           |                       |                       |             |             |
|          |                        | The cross wired option allows extra system load capacity through simultaneous operation of both motors when needed (LA and LB energize simultaneously when both S1 and S2 are closed - relay contacts are not isolated).                                                                                                                             |                       |                       |             |             |
| All      |                        | Input voltage must be applied at all times for proper alternation. Use of a solid state control switch for S1 or S2 may not initiate alternation correctly. S1 or S2 voltage must be from the same supply as the unit's input voltage (see wiring diagrams). Loss of input voltage resets the unit; LA becomes the lead load for the next operation. |                       |                       |             |             |

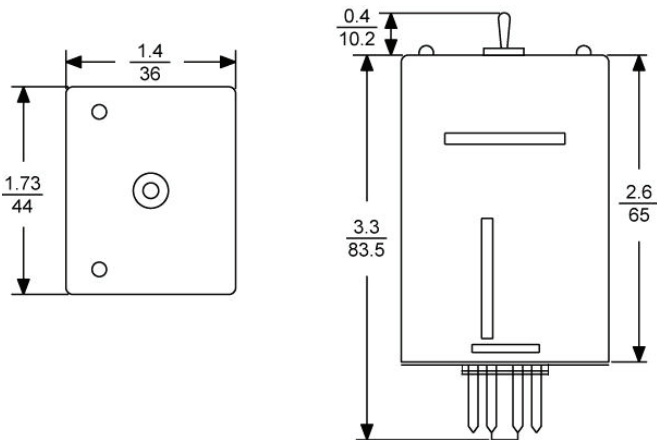
# Type KA – Alternating Relays

## Wiring Diagrams and Approximate Dimensions

### Wiring Diagrams



### Approximate Dimensions



FILE  
CLASS

E78351  
NLDX2



FILE  
CLASS

242675  
3211 07



## Type N – Sockets and Accessories General and Order Information

8501 NR sockets are designed for use with plug-in 8501 K and Type R relays, 8430 MPS phase failure relays and 9050 JCK timers. The 8501 NR45 screw terminal sockets have pressure wire clamps that accept 1 or 2 #16-22 wires. All other sockets have pressure clamps that will accept 1 or 2 #12-22 wires.

The recommended tightening torque for all terminals is 7-8 lb-in.

- All Devices Stocked in Central Warehouse
- DIN Track Mount or Direct Panel Mount
- Tubular Sockets Available in Easy-to-Wire Single Tier or Space-Saving Multi-Tier Versions

### Snapmount Sockets

| For Use With                                                   |                    |                                        | Description                               | Socket Rating                  |                 | Class 8501 Type | Std. Qty.* |
|----------------------------------------------------------------|--------------------|----------------------------------------|-------------------------------------------|--------------------------------|-----------------|-----------------|------------|
| Class 8501 Type                                                | Class 8430 Type    | Class 9050 Type                        |                                           | UL                             | CSA             |                 |            |
| KP12<br>KPD12                                                  | MPS<br>(240 volts) | JCK11 – 19<br>JCK31 – 39<br>JCK51 – 59 | 8 Pin Tubular Single Tier Screw Terminal  | 10 A<br>600 V<br>15 A<br>300 V | 10 A<br>300 V   | NR51<br>NR51B   | 1<br>10    |
|                                                                |                    | JCK60<br>JCK1 F<br>JCK3 F<br>JCK5 F    | 8 Pin Tubular Double Tier Screw Terminal  | 5 A<br>600 V<br>16 A<br>300 V  | 10 A<br>300 V   | NR52<br>NR52B   | 1<br>10    |
| KP13<br>KPD13                                                  | —                  | JCK21 – 29<br>JCK41 – 49               | 11 Pin Tubular Single Tier Screw Terminal | 5 A<br>600 V<br>15 A<br>300 V  | 10 A<br>300 V ▲ | NR61<br>NR61B   | 1<br>10    |
|                                                                |                    | JCK70<br>JCK2F<br>JCK4F                | 11 Pin Tubular Double Tier Screw Terminal | 5 A<br>600 V<br>16 A<br>300 V  | 10 A<br>300 V ▲ | NR62<br>NR62B   | 1<br>10    |
| KL<br>KU                                                       | MPS<br>(480 Volts) | —                                      | 11 Pin Spade Double Tier Screw Terminal   | 15 A<br>300 V †                | —               | NR82<br>NR82B   | 1<br>10    |
| RS41<br>RSD41                                                  | —                  | —                                      | 5 Pin Spade Double Tier Screw Terminal    | 15 A<br>300 V †                | —               | NR41<br>NR41B   | 1<br>10    |
| RS42<br>RSD42                                                  | —                  | —                                      | 8 Pin Spade Double Tier Screw Terminal    | 10 A<br>300 V                  | —               | NR42<br>NR42B   | 1<br>10    |
| RS43<br>RSD43                                                  | —                  | —                                      | 11 Pin Spade Double Tier Screw Terminal   | 10 A<br>300 V ▲                | —               | NR43<br>NR43B   | 1<br>10    |
| RS44<br>RSD44                                                  | —                  | —                                      | 14 Pin Spade Double Tier Screw Terminal   | 10 A<br>300 V ▲                | —               | NR34<br>NR34B   | 1<br>10    |
| RS4<br>RSD4<br>RS14<br>RSD14<br>RS24<br>RSD24<br>RS34<br>RSD34 | —                  | —                                      | 14 Pin Spade Double Tier Screw Terminal   | 10 A<br>300 V                  | —               | NR45<br>NR45B   | 1<br>10    |

\* Must be ordered in multiples of the quantity listed. Units provided in standard quantity of one are individually packaged; devices with B suffix have a standard quantity of 10 per bulk pack.

† Rated for use with Class 8430 Type MPS at 480 Volts.

▲ 20 A maximum total load (CSA)

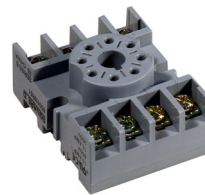
**NOTE:** For DIN 3 mounting track and end clamps refer to the NEMA type terminal block section 9080CT9601 or the IEC type terminal block section 9080CT9901R5/02.

### UL/CSA:

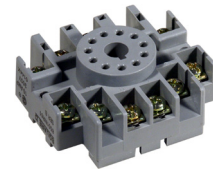
|                                                                                     |             |                 |                                                                                     |               |                    |
|-------------------------------------------------------------------------------------|-------------|-----------------|-------------------------------------------------------------------------------------|---------------|--------------------|
|  | File<br>CCN | E66924<br>SW1V2 |  | File<br>Class | LR84913<br>3211 07 |
|-------------------------------------------------------------------------------------|-------------|-----------------|-------------------------------------------------------------------------------------|---------------|--------------------|

### How to Order:

| To Order Specify: | Catalog Number |       |
|-------------------|----------------|-------|
| • Class Number    | Class          | Type  |
| • Type Number     | 8501           | NR51B |



8501 NR51



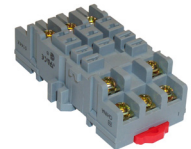
8501 NR61



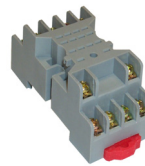
8501 NR52



8501 NR62



8501 NR82



8501 NR45



8501 NR41



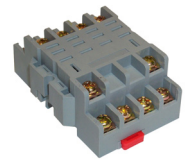
8501 NR42



8501 NH7



8501 NR43



8501 NR34

### Socket Accessories

| Socket   | For Use With                                                           | Description       | Catalog Number                   | Std. Pack* |
|----------|------------------------------------------------------------------------|-------------------|----------------------------------|------------|
| 8501NR51 | 8501KP12, KPD12                                                        | Hold Down Clip    | Not Available                    | —          |
|          | 8430MPSV24                                                             | Restraining Strap | 8501NH7                          | 1          |
|          | 9050JCK                                                                | Restraining Strap | 8501NH7                          | 1          |
| 8501NR52 | 8501KP12, KPD12                                                        | Hold Down Clip    | 8501NH52                         | 10         |
|          | 8430MPSV24                                                             | Restraining Strap | 8501NH7                          | 1          |
|          | 9050JCK                                                                | Restraining Strap | 8501NH7                          | 1          |
| 8501NR61 | 8501KP13, KPD13                                                        | Hold Down Clip    | Not Available                    | —          |
|          | 9050JCK                                                                | Restraining Strap | 8501NH7                          | 1          |
| 8501NR62 | 8501KP13, KPD13                                                        | Hold Down Clip    | 8501NH52                         | 10         |
|          | 9050JCK                                                                | Restraining Strap | 8501NH7                          | 1          |
| 8501NR82 | 8501KU and KL                                                          | Hold Down Clip    | 8501NH82                         | 10         |
|          | 8430MPSV29                                                             | Restraining Strap | 8501NH7                          | 1          |
| 8501NR41 | 8501RS41, RSD41                                                        | Hold Down Clip    | Supplied with socket as standard | —          |
| 8501NR42 | 8501RS42, RSD42                                                        | Hold Down Clip    | 8501NH42                         | 10         |
| 8501NR43 | 8501RS43, RSD43                                                        | Hold Down Clip    | 8501NH42                         | 10         |
| 8501NR34 | 8501RS44, RSD44                                                        | Hold Down Clip    | 8501NH42                         | 10         |
| 8501NR45 | 8501RS4, RSD4<br>8501RS14, RSD14<br>8501RS24, RSD24<br>8501RS34, RSD34 | Hold Down Clip    | 8501NH45                         | 10         |

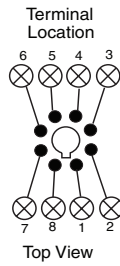
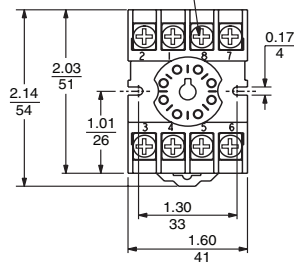
Dimensions..... page 12  
Terminal Locations..... page 12

# Type N – Sockets and Accessories

## General and Order Information

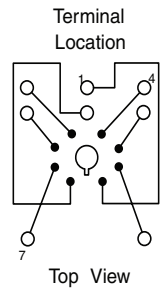
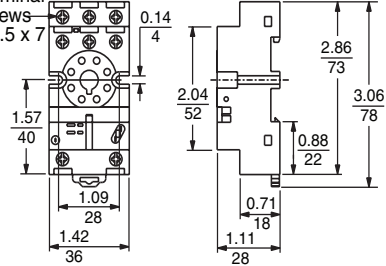
**Type NR51**

Terminal screws M3.5 x .6



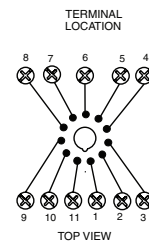
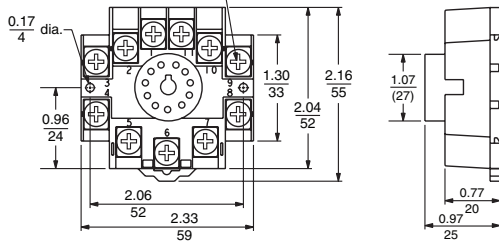
**Type NR52**

Terminal screws M3.5 x 7

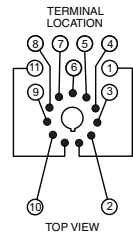
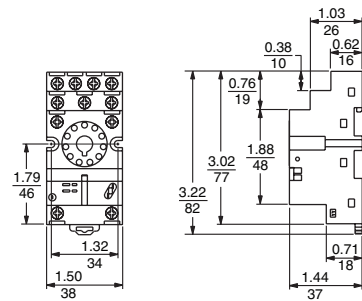


**Type NR61**

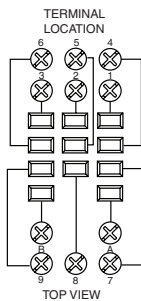
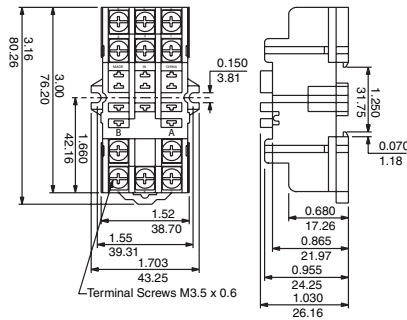
Terminal screws 6-32 x 5/16"



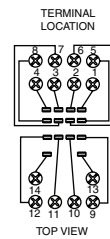
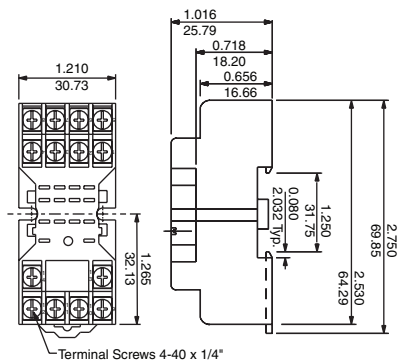
**Type NR62**



**Type NR82**

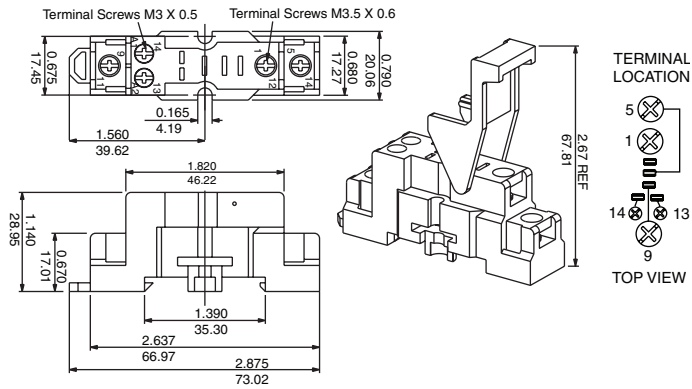


**Type NR45**

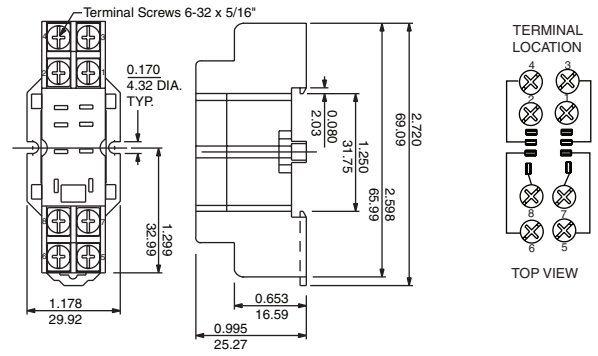


# Type N – Sockets and Accessories General and Order Information

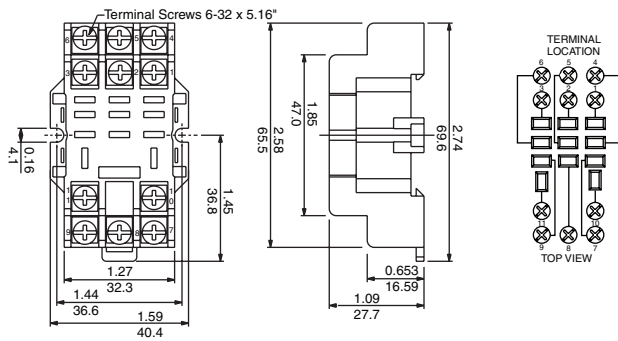
**Type NR41**



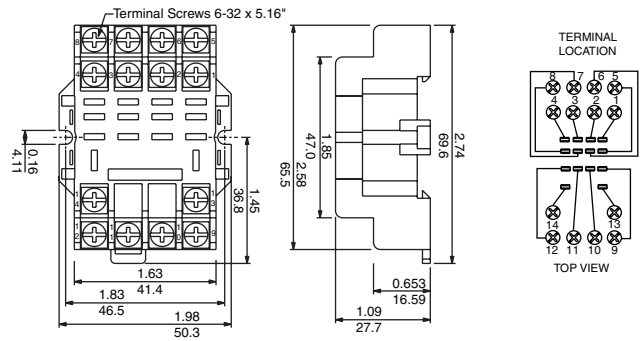
**Type NR42**



**Type NR43**



**Type NR34**



## Type C – Power Relays

### Application Data, Dimensions, Order Information

Class 8501 Type C relays are ideally suited for controlling small single phase motors and other light loads such as electric heaters, pilot lights or audible signals.

- 30 Ampere Contact Rating
- Horsepower Rated
- UL Listed
- CSA Certified
- CE Approved
- Visible Contacts
- Low Cost

8501CDO6V51



| Selection Table— AC Rated Contacts |                          |      |                            |                            | Application Data — AC Contact Ratings |                                          |      |                                 |       | Application Data — Coil Burden |                          |                              |
|------------------------------------|--------------------------|------|----------------------------|----------------------------|---------------------------------------|------------------------------------------|------|---------------------------------|-------|--------------------------------|--------------------------|------------------------------|
| Contact Arrangement                | Number of Fixed Contacts |      | AC Operated Coil Open Type | DC Operated Coil Open Type | Maximum Contact Voltage               | Resistive Ampere Rating 75% Power Factor |      | Maximum Single Phase Horsepower |       |                                | Nominal Power (VAC Coil) | Nominal DC Burden (VDC Coil) |
|                                    | N.O.                     | N.C. | Type                       | Type                       |                                       | 300V                                     | 600V | 120V                            | 230V  | 600V                           |                          |                              |
| SPST                               | 1                        | 0    | CO6*                       | CDO6*                      | 600                                   | 30                                       | 10   | 2                               | 2     | 2                              | 10VA                     | 2W                           |
| DPST                               | 2                        | 0    | CO7*                       | CDO7*                      | 600                                   | 30                                       | 5    | 1 1/2                           | 1 1/2 | 1 1/2                          | 10VA                     | 2W                           |
| SPST                               | 0                        | 1    | CO8*                       | CDO8*                      | 600                                   | 30                                       | 10   | 2                               | 2     | 2                              | 10VA                     | 2W                           |
| SPDT                               | 1                        | 1    | CO15*                      | CDO15*                     | 600                                   | 30                                       | 5    | 1 1/2                           | 1 1/2 | 1 1/2                          | 10VA                     | 2W                           |
| DPDT                               | 2                        | 2    | CO16*                      | CDO16*                     | 600                                   | 30                                       | 5    | 1 1/2                           | 1 1/2 | 1 1/2                          | 10VA                     | 2W                           |

| Selection Table — DC Rated Contacts |   |   |       |        | Application Data — DC Contact Ratings |    |      | Application Data — Coil Burden |  |  |  |  |
|-------------------------------------|---|---|-------|--------|---------------------------------------|----|------|--------------------------------|--|--|--|--|
|                                     |   |   |       |        | 110V                                  |    | 220V |                                |  |  |  |  |
| SPST                                | 1 | 0 | CO21* | CDO21* | 500                                   | 20 | 8    | N.A.                           |  |  |  |  |
| DPDT                                | 2 | 2 | CO22* | CDO22* | 325                                   | 10 | 4    |                                |  |  |  |  |

\* Voltage code must be specified to order this product. Refer to standard voltage codes listed in the Stocked Relays table below and insert as shown in How to Order.

#### Enclosure:

Separately packed NEMA Type 1 sheet steel enclosure for Types CO & CDO relays – order Class 9991 Type UE1

#### Operating Data

|                                      |                                                                                                                  |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Operating Voltages/<br>Voltage Range | AC – 6 through 480 volts, + 10/-15% of nominal at 25°C<br>DC – 6 through 110 volts, + 10/-20% of nominal at 25°C |
| Coil Inrush (VAC Coil)               | 15VA                                                                                                             |
| Coils                                | Duty: Continuous rated coils. (Non-replaceable)                                                                  |
| Operating Temp. Range                | AC: -22°F to +122°F (-30°C to +50°C)<br>DC: -22°F to +140°F (-30°C to +60°C)                                     |

#### UL/CSA:



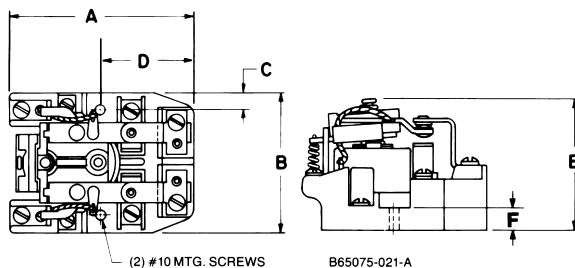
File CCN E78351  
NLDX



File Class 209683  
04 3211



#### Approximate Dimensions



#### Dimensions

| Catalog Number<br>8501****            | A    |      | B    |      | C    |     | D    |      | E    |      | F    |     |
|---------------------------------------|------|------|------|------|------|-----|------|------|------|------|------|-----|
|                                       | IN   | mm   | IN   | mm   | IN   | mm  | IN   | mm   | IN   | mm   | IN   | mm  |
| CO6, CO7, CO8,<br>CDO6, CDO7,<br>CDO8 | 2.43 | 61.7 | 2.50 | 63.5 | 0.31 | 8.0 | 0.81 | 20.6 | 2.25 | 57.2 | 0.38 | 9.5 |
| CO15, CO21,<br>CDO15, CDO21           | 2.43 | 61.7 | 2.50 | 63.5 | 0.31 | 8.0 | 0.81 | 20.6 | 2.18 | 55.4 | 0.38 | 9.5 |
| CO16, CDO16                           | 3.12 | 79.2 | 2.50 | 63.5 | 0.31 | 8.0 | 1.5  | 38.1 | 2.31 | 58.7 | 0.38 | 9.5 |
| CO22, CDO22                           | 3.12 | 79.2 | 2.50 | 63.5 | 0.31 | 8.0 | 1.5  | 38.1 | 2.53 | 64.3 | 0.38 | 9.5 |

#### Stocked Relays

| Class 8501 Type | AC Voltage – 50/60 Hz |     |     |     |     |     |     |     | Class 8501 Type | DC Voltage |     |     |     |
|-----------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----------------|------------|-----|-----|-----|
|                 | 6                     | 12  | 24  | 120 | 208 | 240 | 277 | 480 |                 | 6          | 12  | 24  | 110 |
| Voltage Code    | V35                   | V36 | V14 | V20 | V08 | V24 | V04 | V29 | Voltage Code    | V50        | V51 | V53 | V60 |
| CO6             |                       | S   | S   | S   | S   | S   | S   | S   | CDO6            |            | S   | S   |     |
| CO7             |                       | S   | S   | S   | S   | S   | S   | S   | CDO7            |            | S   | S   |     |
| CO8             |                       |     | S   | S   | S   | S   | S   | S   | CDO8            |            |     | S   |     |
| CO15            |                       | S   | S   | S   | S   | S   | S   | S   | CDO15           |            |     | S   |     |
| CO16            |                       | S   | S   | S   | S   | S   | S   | S   | CDO16           |            | S   | S   | S   |
| CO21            |                       |     |     | S   |     |     |     |     | CDO21           |            |     | S   | S   |
| CO22            |                       |     |     | S   |     |     |     |     | CDO22           |            |     | S   | S   |

S – Stocked

Factory Order items require a **minimum** order quantity of 25 and have a lead time of 12 weeks.

#### How to Order:

| To Order Specify:               | Catalog Number |      |              |
|---------------------------------|----------------|------|--------------|
| • Class Number                  | Class          | Type | Voltage Code |
| • Type Number                   | 8501           | CO6  | V20          |
| • Voltage Code                  |                |      |              |
| (See Stocked Relay Table above) |                |      |              |

## **Type C – Power Relays**

### **Application Data, Dimensions, Order Information**

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