# Bulletin 505 Three Phase Full Voltage Reversing NEMA Starters with Eutectic Alloy or Solid-State Overload Relays <br> Sizes 0 through 4 (all series), Size 5 (series L) 



## Renewal Parts

Figure 1 is an exploded view of the right-hand side starter, the left-hand side contactor is similar. Primary parts such as coils and contacts are similar in appearance for all sizes. Secondary parts such as mounting plates, overloads, etc. will vary in appearance. See page 2 for corresponding description of part and part numbers.

Figure 1


Page 4 contains the corresponding part numbers for the parts illustrated below.

Common Mounting Plate for Left and Right-Hand Contactors


## Renewal Parts for Figure 1

| Item | Description of Renewal Part | Size 0 | Size 1 | Size 2 | Size 3 | Size 4 | Size 5 (Ser. L) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Part No. | Part No. | Part No. | Part No. | Part No. | Part No. |
| 1 | Contact Block Cover | 40410-499-01 | 40410-499-02 | 40420-499-01 | 40430-457-51 | 40440-456-51 | 42450-800-01 |
| 2 | Movable Contact Support and Armature Assembly | $\begin{aligned} & 40410-498 \\ & 40410-498 \end{aligned}$ | 01 Series A 03 Series B | 40420-498-01 | 40430-452-51 | 40440-453-51 | 42450-801-01 |
| 3 | Right Hand Stationary Contact Block and Base Assembly | 40410-494-03 | 40410-494-04 | 40420-495-02 | 40430-462-52 | 40440-462-52 | 42450-307-62 |
|  | Left Hand Stationary Contact Block and Base Assembly (1) | 40410-495-03 | 40410-495-04 | 40420-496-02 | 40430-462-54 | 40440-462-54 | 42450-802-03 |
| 3A | Saddle Clamp Assembly (lug) | X-225492 |  | Does Not Apply |  |  |  |
| 3B | Lug | See Item 3A |  | 1494R-N1 8 | 40430-461-51 | 40440-461-51 | 42450-804-01 |
| 3C | Bolt | See Item 3A |  | M-6289 | M-6532 | M-6834 | Included in 3D |
| 3D | Front Terminal without Contact | (See p. 5 for exploded view of Items 3D - 3F parts for nema sizes 3 through 5) |  |  | 40430-022-02 | 40440-030-02 | 42450-302-52 |
| 3E | Rear Terminal without Contact |  |  |  | 40430-024-02 | 40440-314-51 | 40440-314-51 |
| 3 F | Front/Rear Terminal Screw | (2) |  |  | 28168-107-26 | 28168-502-26 | (3) |
| 4 | Coil Cover | 40410 | 496-01 | 40420-497-01 | 40430-454-51 | 40440-454-51 | 42450-803-01 |
| 5 | Tie Point Terminal | 599-TP02 |  |  | 599-TP34 |  |  |
| 6 | Auxiliary Contact Block | 595-A (used as a hold-in contact) |  |  |  |  |  |
| 7 | Operating Coil | See table on page 4 |  |  |  |  |  |
| 8 | Yoke (50-60 Hz) | 40410-497-01 |  | 40410-497-02 | 40430-455-51 | 40440-458-01 |  |
| 9 | Movable Contact | Order Single Pole Contact Set |  |  |  |  |  |
| 10 | Contact Spring |  |  |  |  |  |  |
| 11 | Front Stationary Contact |  |  |  |  |  |  |
| 12 | Rear Stationary Contact |  |  |  |  |  |  |
| 9-12 | Single Pole Contact Set (includes [1] each items 9-12) (7) | 40410-331-51 | 40410-331-52 | 40420-322-51 | 40430-300-51 | 40440-300-51 | 42450-805-01 |
| 13 | Eutectic Alloy Overload Relay (includes Item 13B) | 592-EUTB |  | 592-EUTC | 592-EUTD | 592-EUTE | 592-BOV16 ${ }^{(4)}$ |
| 13A | Heater Element Screw | M-1552 |  |  |  |  |  |
| 13B | Test Module | 40185-499-01 |  |  | 40430-459-51 |  | 42450-807-01 |
| 13C | Overload Relay Auxiliary Contact (included with item 13) | Not Available |  |  | 595-A34 ⑤ |  | Not Available |
| 13D | Overload Relay Mounting Plate | See Item 16 |  |  | 40430-045-02 | 40440-028-02 | 42450-028-02 |
| 13E | Jumper (size 5 only) | Does Not Apply |  |  |  |  | 42195-800-01 |
| 14 | Solid-State Overload Relay | See pages 6 or 7 |  |  |  |  |  |
| 14A | SMP / E1 Plus Reset Bar | 40794-011-01 (for SMP) / 193-ERA (for E1 Plus) |  |  |  |  |  |
| 15 | Mtg. Screw w/Washer (3 req’d) | 28169-100-26 |  | 28169-101-26 | 40430-460-51 | 40440-4 | 59-51 (4) |
| 16 | Mounting Plate for Right-Hand Contactor and Overload Relay (6) | 40410-124-02 |  | 40420-083-02 | 40430-044-02 | 40440-027-02 |  |
|  | Mounting Plate for SMP-3 (6) | 4074-031-02 |  | 40794-032-02 |  |  |  |
|  | Mounting Plate for Left Hand Contactor | 40410-031-02 |  | 40420-014-02 | 40430-044-02 | 40440-027-02 |  |
| 17 | Current Transformer | Does Not Apply |  |  |  |  | X-241563 (4) |
| 17A | Transformer Spring | Does Not Apply |  |  |  |  | 42450-806-01 (4) |

(1) Less Contacts, order Single Pole Contact Set as required.
(2) Front and rear terminal assembly not available as a renewal part. Replace the complete stationary contact block and base assembly.
(3) Front Terminal Screw Part No. is 28168-503-26 and Rear Terminal Screw Part No. is 28168-502-6.
(4) For Size 5 starter a current transformer assembly (which includes items $13,15,17$, and 17 A ) can be ordered as part number 42452-800-01.
(5) Auxiliary mounted on right-hand side provides N.O. contact function., mounting on left-hand side provides N.C. contact function.
(6) Overload relays, for sizes $0-2$, are attached directly to the mounting plate. Overload Relays, for sizes $3-5$, require a separate mounting plate. See Item 13D for sizes 3 and 4. Size 5 overload relay mounting plate is similar.
(7) Bulletin 505 reversing starters have six power poles. Order as many single pole contact kits as needed.
(8) Part number contains three lugs

Renewal Parts, Bulletin 505, Three Phase, Sizes 0 through 4 (all series), Size 5 (series L)

## Renewal Parts for Control Circuit Terminals



| NEMA Size | Mounting Terminal <br> (item 1) | Mounting Screw <br> (Item 2) | Saddle Clamp <br> Assembly (item 3) |
| :---: | :---: | :---: | :---: |
| $0-2$ | $40410-053-02$ | $28158-072-26$ | $28192-076-33$ |
| 3 | $40430-047-02$ | $\mathrm{M}-6289$ | $28192-076-33$ |
| $4-5$ | $40440-035-02$ | $28168-676-26$ | $28192-076-33$ |



Renewal Parts, Bulletin 505, Three Phase, Sizes 0 through 4 (all series), Size 5 (series L)

| Size | Power Connector <br> Kit | Mechanical <br> Interlock | Electrical Interlock <br> $(1 \mathrm{NO}-1$ NC) | Common Mounting Plate for Left <br> and Right-Hand Contactors |
| :---: | :---: | :---: | :---: | :---: |
| 0 | $599-B 01 \mathrm{R}$ | $40410-341-51$ | $595-\mathrm{AB}(2$ req’d) | $40410-090-02$ |
| 1 | $599-\mathrm{B} 01 \mathrm{R}$ | $40410-341-51$ | $595-\mathrm{AB}(2$ req’d) | $40410-090-02$ |
| 2 | $599-\mathrm{B} 2 \mathrm{R}$ | $40410-341-51$ | $595-\mathrm{AB}(2$ req’d) | $40420-058-02$ |
| 3 | $40434-300-51$ | $40410-341-51$ | $40495-462-08 \& 40495-462-09$ | $40430-078-02$ |
| 4 | $40444-300-51$ | $40410-341-52$ | $40495-462-08 \& 40495-462-09$ | $40440-078-02$ |
| 5 | $42454-300-51$ | $40410-341-52$ | $40495-462-08 \& 40495-462-09$ | $42454-039-02$ |

Operating Coils

| Catalog Number | AC |  | Coil Repair Part Number |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Suffix Code | Volts | Hz | Size 0-1 | Size 2 | Size 3 | Size 4 | Size 5 (Series L) |
| J | 24 | 60 | CB013 | CC013 | CD013 | NA | Not Available |
| K | 24 | 50 | CB407 | CC407 | CD407 | NA | AF407 |
| D | $115-120$ 60Hz, 110V 50Hz |  | CB236 | CC236 | CD236 | CE236 | AF236 |
| S | $110-115$ | 50 | CB322 | CC322 | CD322 | CE322 | AF322 |
| H | $200-208$ | 60 | CB249 | CC249 | CD249 | CE249 | AF249 |
| P | $220-230$ | 50 | CB339 | CC339 | CD339 | CE339 | AF339 |
| A | $230-240$ | 60 | CB254 | CC254 | CD254 | CE254 | AF254 |
| T | $230-240$ | 50 | CB342 | CC342 | CD342 | CE342 | AF342 |
| F | 277 | 60 | CB260 | CC260 | CD260 | CE260 | AF260 |
| N | 380 | 50 | CB354 | CC354 | CD354 | CE354 | AF354 |
| KN | $380-400$ | 50 | CB390 | CC390 | CD390 | CE390 | AF390 |
| I | 415 | 50 | CB357 | CC357 | CD357 | CE357 | AF357 |
| Q | $440-460$ | 50 | CB360 | CC360 | CD360 | CE360 | AF360 |
| M | $460-480$ | 60 | CB273 | CC273 | CD273 | CE273 | AF273 |
| C | 500 | 50 | CB364 | CC364 | CD364 | CE364 | AF364 |

Size 5 Overload Relay Assembly with Current Transformers - Repair Part Number 42452-800-01


| Components from Part Number 42452-800-01 | Part Number |
| :--- | :--- |
| Nylon Spacer Insulator | $42450-031-01$ |
| Overload Relay | $592-B O V 16$ |
| Overload Relay Mounting Plate (not labeled) | $42450-028-02$ |
| Lug | $42450-804-01$ |
| Nylon Standoff (qty 3 req'd) | $42450-029-01$ |
| Current Transformer Module | $42450-032-01$ |
| Current Transformer Module Mounting Plate (not labeled) | $42450-009-02$ |
| Current Transformer (300 to 5A ratio) qty 3 req'd | X-241563 |

Renewal Parts
Bulletin 505, Three Phase, Sizes 0 through 4 (all series), Size 5 (series L)

## Renewal Parts for Arc Hood Assembly Components - For Nema Sizes 3 and 4



| Renewal Parts for Nema Size 3 Starters |  |  |
| :---: | :---: | :---: |
| Item \# | Description | A-B Part Number (1) |
| 1 | Arc Hood | Order Stationary Contact Block \& Base Assembly (see p.2) |
|  |  |  |
|  |  |  |
| 3 | Front Terminal | 40430-022-02 |
| 5 | Rear Terminal | 40430-024-02 |
| 7 | Front Stationary Contact | Order Single Pole Contact Kit 40430-300-51 |
| 9 | Rear Stationary Contact |  |
|  |  |  |
| 11 | Screw for Front/Rear Contact | 28168-601-26 (2) |
| 12 | Screw for Front Terminal | 28168-107-26 |
| 13 | Screw for Rear Terminal | 28168-107-26 |
| Renewal Parts for Nema Size 4 Starters |  |  |
| 1 | Arc Hood | Order Stationary Contact Block \& Base Assembly (see p.2) |
|  |  |  |
|  |  |  |
| 3 | Front Terminal | 40440-030-02 |
| 5 | Rear Terminal | 40440-314-51 |
| 7 | Front Stationary Contact | Order Single Pole Contact Kit 40440-300-51 |
| 9 | Rear Stationary Contact |  |
|  |  |  |
| 11 | Screw for Front/Rear Contact | 28168-676-26 (2) |
| 12 | Screw for Front Terminal | 28168-502-26 |
| 13 | Screw for Rear Terminal | 28168-502-26 |

(1) Each part number listed below contains one piece.
(2) The screw for the front and rear stationary contacts is included in single pole contact kit part number(s) listed above.

Renewal Parts for Arc Hood Assembly Components - For Nema Size 5


## Renewal Parts

Bulletin 505, Three Phase, Sizes 0 through 4 (all series), Size 5 (series L)
(E1 Plus shown below)


## E1 Plus/SMP Solid-State Overload Relays

Order the replacement overload relay catalog number from the table below. For example, the E1 Plus Class 10 overload relay for a $505-A O D-A 1 B$ would be ordered as catalog number 592-EEBC. The replacement overload part numbers are only for existing bulletin 505 starters that were ordered with a eutectic, SMP or E1 Plus overload. The part numbers below contain one overload relay. Nema Starter sizes 4 and 5 use the SMP overload relay.

| Starter <br> Size | Full Load Current Adjustment Range (A) | $\begin{gathered} \hline \text { Class } 10 \\ \text { Cat. No. } \\ \text { Suffix Code } \end{gathered}$ | Class 10 Overload Cat. No. | $\begin{gathered} \hline \text { Class } 20 \\ \text { Cat. No. } \\ \text { Suffix Code } \end{gathered}$ | Class 20 Overload Cat. No. | $\begin{gathered} \hline \text { Class } 30 \\ \text { Cat. No. } \\ \text { Suffix Code } \\ \hline \end{gathered}$ | Class 30 Overload Cat. No. |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| E1 Plus/SMP-1 Overload Relay Manual Reset, Phase Loss Protection, Class 10, 15, 20, or 30 |  |  |  |  |  |  |  |
| 0, 1 | 0.19 to 0.6 | -A1B | 592-EEBC | -A2B | 592-EEBC | -A3B | 592-EEBC |
| 0, 1 | 0.32 to 1.0 | -A1C | 592-EEBC | -A2C | 592-EEBC | -A3C | 592-EEBC |
| 0, 1 | 1.0 to 2.9 | -A1D | 592-EECC | -A2D | 592-EECC | -A3D | 592-EECC |
| 0, 1 | 1.6 to 5.0 | -A1E | 592-EECC | -A2E | 592-EECC | -A3E | 592-EECC |
| 0, 1 | 3.7 to 12 | -A1F | 592-EEDC | -A2F | 592-EEDC | -A3F | 592-EEDC |
| 0, 1 | 5.7 to 18 | -A1G | 592-EEEC | -A2G | 592-EEEC | -A3G | 592-EEEC |
| 1 | 12 to 38 | -A1H | 592-EEEC | -A2H | 592-EEEC | -A3H | 592-EEEC |
| 2 | 5.7 to 18 | -A1G | 592-EEEC | -A2G | 592-EEEC | -A3G | 592-EEEC |
| 2 | 12 to 38 | -A1H | 592-EEFC | -A2H | 592-EEFC | -A3H | 592-EEFC |
| 2 | 14 to 45 | -A1J | 592-EEFC | -A2J | 592-EEFC | -A3J | 592-EEFC |
| 3 | 14 to 45 | -A1J | 592-EEFD | -A2J | 592-EEFD | -A3J | 592-EEFD |
| 3 | 23 to 75 | -A1K | 592-EEGD | -A2K | 592-EEGD | -A3K | 592-EEGD |
| 3 | 66 to 110 | -A1L | 592-EEGD | -A2L | 592-EEGD | -A3L | 592-EEGD |
| 4 | 23 to 75 | -A1K | 592-A1KE | -A2K | 592-A2KE | -A3K | 592-A3KE |
| 4 | 66 to 110 | -A1L | 592-A1LE | -A2L | 592-A2LE | -A3L | 592-A3LE |
| 4 | 57 to 180 | -A1M | 592-A1ME | -A2M | 592-A2ME | -A3M | 592-A3ME |
| 5 | 96 to 300 | -A1N | 592-A1NF | -A2N | 592-A2NF | -A3N | 592-A3NF |
| E1 Plus/SMP-1 Overload Relay Automatic/Manual Reset, Phase Loss Protection, Class 10, 15, 20, or 30 |  |  |  |  |  |  |  |
| 0, 1 | 0.19 to 0.6 | -A4B | 592-EEBC | -A5B | 592-EEBC | -A6B | 592-EEBC |
| 0, 1 | 0.32 to 1.0 | -A4C | 592-EEBC | -A5C | 592-EEBC | -A6C | 592-EEBC |
| 0, 1 | 1.0 to 2.9 | -A4D | 592-EECC | -A5D | 592-EECC | -A6D | 592-EECC |
| 0, 1 | 1.6 to 5.0 | -A4E | 592-EECC | -A5E | 592-EECC | -A6E | 592-EECC |
| 0, 1 | 3.7 to 12 | -A4F | 592-EEDC | -A5F | 592-EEDC | -A6F | 592-EEDC |
| 0, 1 | 5.7 to 18 | -A4G | 592-EEEC | -A5G | 592-EEEC | -A6G | 592-EEEC |
| 1 | 12 to 38 | -A4H | 592-EEEC | -A5H | 592-EEEC | -A6H | 592-EEEC |
| 2 | 5.7 to 18 | -A4G | 592-EEEC | -A5G | 592-EEEC | -A6G | 592-EEEC |
| 2 | 12 to 38 | -A4H | 592-EEFC | -A5H | 592-EEFC | -A6H | 592-EEFC |
| 2 | 14 to 45 | -A4J | 592-EEFC | -A5J | 592-EEFC | -A6J | 592-EEFC |
| 3 | 14 to 45 | -A4J | 592-EEFD | -A5J | 592-EEFD | -A6J | 592-EEFD |
| 3 | 23 to 75 | -A4K | 592-EEGD | -A5K | 592-EEGD | -A6K | 592-EEGD |
| 3 | 66 to 110 | -A4L | 592-EEGD | -A5L | 592-EEGD | -A6L | 592-EEGD |
| 4 | 23 to 75 | -A4K | 592-A4KE | -A5K | 592-A5KE | -A6K | 592-A6KE |
| 4 | 66 to 110 | -A4L | 592-A4LE | -A5L | 592-A5LE | -A6L | 592-A6LE |
| 4 | 57 to 180 | -A4M | 592-A4ME | -A5M | 592-A5ME | -A6M | 592-A6ME |
| 5 | 96 to 300 | -A4N | 592-A4NF | -A5N | 592-A5NF | -A6N | 592-A6NF |

Renewal Parts
Bulletin 505, Three Phase, Sizes 0 through 4 (all series), Size 5 (series L)
(E1 Plus shown below)


## E1 Plus/SMP Solid-State Overload Relays

Order the replacement overload relay catalog number from the table below. For example, the E1 Plus Class 10 overload relay for a 505-AOD-B1B would be ordered as catalog number 592-EEBC. The replacement overload part numbers are only for existing bulletin 505 starters that were ordered with a eutectic, SMP or E1 Plus overload. The part numbers below contain one overload relay. Nema Starter sizes 4 and 5 use the SMP overload relay. Add catalog numbers 193-EGM or 193-EJM to the E1 Plus catalog number if Ground Fault or Jam Protection is required. The E3/E3 Plus overloads include Ground Fault and Jam Protection, as standard, but must be configured via a DeviceNet network or a hand held programming terminal, with a continous power source of 24V DC from a DeviceNet network or a power supply.

| E1 Plus/SMP-2 Overload Relay Automatic/Manual Reset, Field Selectable Trip Class 10, 15, 20, or 30, Phase Loss, Jam |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Protection, and Ground Fault Protection |  |  |  |

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.
The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Rockwell Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.
Allen-Bradley publication SGI-1.1, Safety Guidelines for the Application, Installation and Maintenance of Solid-State Control (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.
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## IMPORTANT

Identifies information that is critical for successful application and understanding of the product.

Use only replacement parts and devices recommended by Rockwell Automation to maintain the integrity of the equipment. It is the user's responsibility to ensure that the renewal part number selected is properly matched to the model, series and revision level of the equipment being serviced.

## ATTENTION

Servicing energized Industrial Control Equipment can be hazardous. Severe injury or death can result from electrical shock, burn, or unintended actuation of controlled equipment. Recommended practice is to disconnect and lockout control equipment from power sources, and release stored energy, if present.

Refer to National Fire Protection Association Standard No. NFPA70E, Part 2 and (as applicable) OSHA rules for Control of Hazardous Energy Sources (Lockout/Tagout) and OSHA Electrical Safety Related Work Practices for safety related work practices, including procedural requirements for lockout/tagout, and appropriate work practices, personnel qualifications and training requirements where it is not feasible to de-energize and lockout or tagout electric circuits and equipment before working on or near exposed circuit parts.

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