# Instructions for A200 Size 00, 0, 1 or 1P Single Phase Motor Controller

I.L. 16956
Model J

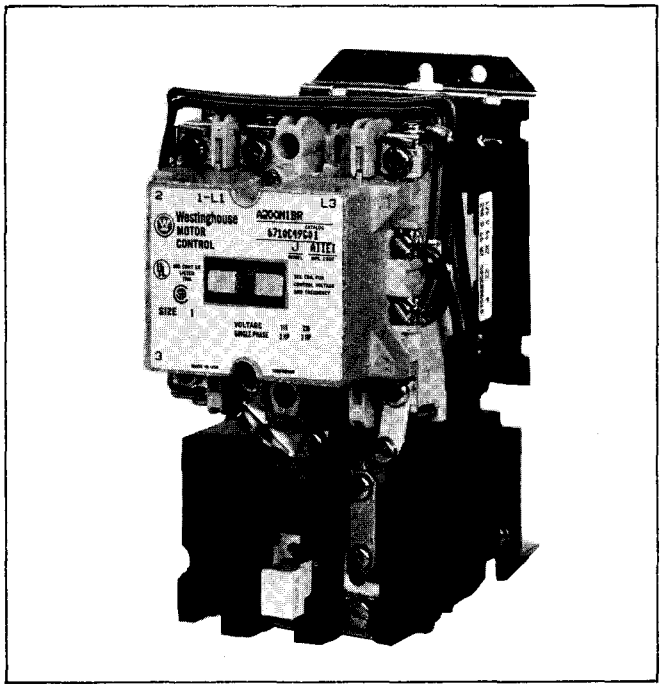


*Fig. 1 Size 1 A200 Motor Controller*

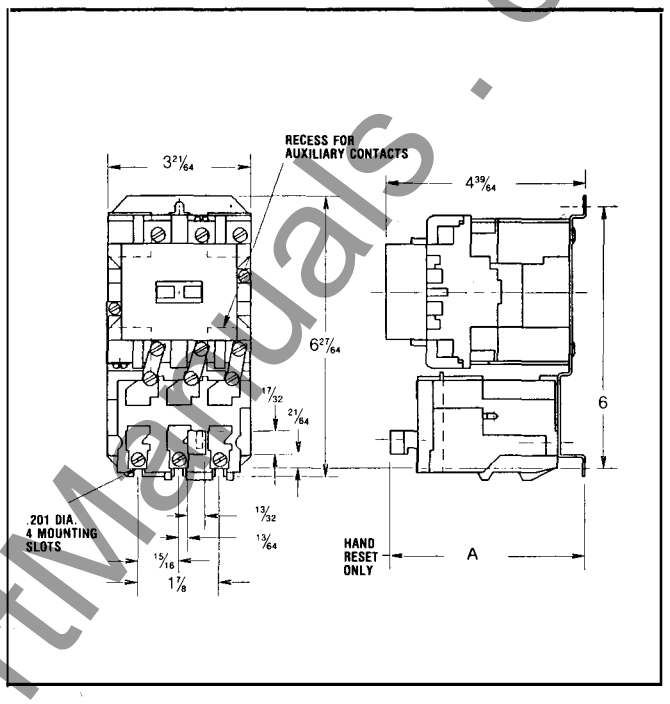


*Fig. 2 Dimension Drawing (Dim. in inches)*

| TYPE B RELAY MAX. DIM. TO RESET | A = 4 17/64 |
|---|---|

## THE CONTROLLER

The A200 motor controller, when wired as shown in Figure 4, will operate as a full voltage starter and will give protection against overload, but not against short circuit currents, when wired and provided with overload relay (OLR) heaters as listed in heater selection tables or when used with any means of inherent protection activated by motor temperature.

The controller should be protected against short circuits by providing branch circuit protection not to exceed the maximum protective device ratings listed in Table I.

**CONTROLLER RATINGS**

| NEMA SIZE | SINGLE PHASE HORSEPOWER AT 60 HERTZ 115 V | 230 V |
|---|---|---|
| 00 | ⅓ | 1 |
| 0 | 1 | 2 |
| 1 | 2 | 3 |
| 1P | 3 | 5 |

This industrial type control is designed to be installed, operated, and maintained by adequately trained workmen. These instructions do not cover all details, variations, or combinations of the equipment, its storage, delivery, installation, check out, safe operation, or maintenance. Care must be exercised to comply with local, state, and national regulations, as well as safety practices, for this class of equipment.

## AUXILIARY CONTACTS — L56 (RATED B600)

One normally open pole adjacent to the power poles is supplied as the holding circuit auxiliary contact on the size 00, 0 and 1 controller. An L56D with one normally open pole is supplied as the holding circuit auxiliary contact on the size 1P motor controller. A maximum of four L56 auxiliary units can be installed in the recesses of each contactor. These may be mounted with the terminals in line with the power poles or may be mounted with the terminals in a right angle relationship to the power poles. They mount by means of a spring clip which snaps into locations provided in the motor controller unit. To remove the L56 disengage the top spring clip, by pressing on the extended tab, and withdraw the unit.

**L56 AUXILIARY CONTACTS**

| Contact Type | Catalog No. |
|---|---|
| 1 Normally Closed | L56E |
| 1 Normally Open | L56D |
| 2 Normally Closed | L56C |
| 2 Normally Open | L56B |
| 1 Normally Open and 1 Normally Closed | L56 |

**L56 CONTACT RATINGS (B600)**

| AC Volts | Make | Break |
|---|---|---|
| 24-120 | 30A | 3A |
| 120-600 | 3600VA | 360VA |

www.ElectricalPartManuals.com

### TYPE B OVERLOAD RELAY (See Figure 3)

This A200 motor controller is usually equipped with a Type B block type ambient compensated overload relay (with gray reset rod). The controller can also be supplied with a non-ambient compensated overload relay (with red reset rod). The relay is of the bimetal actuated type equipped with a normally closed control contact. An optional isolated normally open control circuit is available for field mounting. When the overload relay trips, a yellow dot will appear flush with the molded surface below the reset rod. Resetting the relay returns this indicator to its normal concealed position.

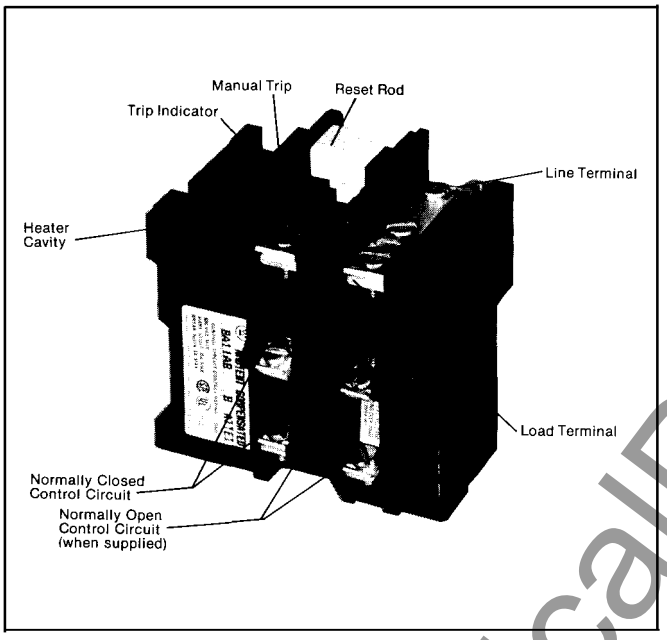


*Fig. 3 Type B Overload Relay*

### HEATERS

Heaters are not included with the motor controller and must be ordered separately per the heater selection table and the information listed below. When installing heaters be sure that connecting surfaces are clean and heaters are attached securely to the relay in the proper location with the screws provided. The trip rating of a heater in a 40°C Ambient is 125% of the minimum full load current shown in Table I. When tested at 600 percent of its trip rating, the relay will trip in 20 seconds or less.

Heaters should be selected on the basis of the actual full load current and service factor as shown on the motor nameplate or in the manufacturer's published literature. When the service factor of the motor is 1.15 to 1.25, select heaters from the heater application table. If the service factor of the motor is 1.0, or there is no service factor shown, or a maximum of 115% protection is desired, select one size smaller heater than indicated. When motor and overload relay are in different ambients and when using non-compensated overload relays, select heaters from the table using adjusted motor currents as follows: decrease rated motor current 1% for each °C motor ambient exceeds controller ambient. Increase rated motor current 1% for each °C controller ambient exceeds motor ambient.

**TABLE I — F SERIES HEATER SELECTION**

**For compensated OLR's in any size enclosure, and non-compensated OLR's in enclosures with volume not less than 5500 cu in. Wire with 75°C wire.**

| Code Marking | Full Load Current of Motor (Amperes) (40°C Ambient) | Max. Protect. Device (Amp) | Load Wire Size |
|---|---|---|---|
| FH03 | .29 — .31 | 1* | #14 |
| FH04 | .32 — .35 | 1* | #14 |
| FH05 | .36 — .39 | 1* | #14 |
| FH06 | .40 — .43 | 1* | #14 |
| FH07 | .44 — .48 | 2* | #14 |
| FH08 | .49 — .53 | 2* | #14 |
| FH09 | .54 — .58 | 2* | #14 |
| FH10 | .59 — .64 | 2* | #14 |
| FH11 | .65 — .71 | 3* | #14 |
| FH12 | .72 — .79 | 3* | #14 |
| FH13 | .80 — .87 | 3* | #14 |
| FH14 | .88 — .96 | 3* | #14 |
| FH15 | .97 — 1.06 | 3* | #14 |
| FH16 | 1.07 — 1.16 | 3* | #14 |
| FH17 | 1.17 — 1.28 | 3* | #14 |
| FH18 | 1.29 — 1.41 | 5* | #14 |
| FH19 | 1.42 — 1.55 | 5* | #14 |
| FH20 | 1.56 — 1.71 | 6* | #14 |
| FH21 | 1.72 — 1.87 | 6* | #14 |
| FH22 | 1.88 — 2.06 | 6* | #14 |
| FH23 | 2.07 — 2.26 | 6* | #14 |
| FH24 | 2.27 — 2.48 | 6* | #14 |
| FH25 | 2.49 — 2.72 | 10* | #14 |
| FH26 | 2.73 — 2.99 | 10* | #14 |
| FH27 | 3.00 — 3.28 | 15 | #14 |
| FH28 | 3.29 — 3.60 | 15 | #14 |
| FH29 | 3.61 — 3.95 | 15 | #14 |
| FH30 | 3.96 — 4.31 | 15 | #14 |
| FH31 | 4.32 — 4.71 | 15 | #14 |
| FH32 | 4.72 — 5.14 | 20 | #14 |
| FH33 | 5.15 — 5.6 | 20 | #14 |
| FH34 | 5.7 — 6.2 | 20 | #14 |
| FH35 | 6.3 — 6.8 | 25 | #14 |
| FH36 | 6.9 — 7.5 | 25 | #14 |
| FH37 | 7.6 — 8.2 | 25 | #14 |
| FH38 | 8.3 — 9.0 | 30 | #14 |
| Above Heaters for use on Size 00 | | | |
| FH39 | 9.1 — 9.9 | 30 | #14 |
| FH40 | 10.0 — 10.8 | 35 | #14 |
| FH41 | 10.9 — 11.9 | 40 | #14 |
| FH42 | 12.0 — 13.1 | 40 | #14 |
| FH43 | 13.2 — 14.3 | 45 | #14 |
| FH44 | 14.4 — 15.7 | 50 | #14 |
| FH45 | 15.8 — 17.2 | 60 | #14 |
| Above Heaters for use on Size 0 | | | |
| FH46 | 17.3 — 18.9 | 60 | #12 |
| FH47 | 19.0 — 20.8 | 70 | #10 |
| FH48 | 20.9 — 22.9 | 70 | #10 |
| FH49 | 23.0 — 25.2 | 80 | #10 |
| Above Heaters for use on Size 1 | | | |
| FH50 | 25.3 — 27.6 | 90 | #10 |
| FH51 | 27.7 — 30.3 | 100 | #8 |
| FH52 | 30.4 — 33.3 | 100 | #8 |
| FH53 | 33.4 — 36.0 | 125 | #8 |
| Above Heaters for use on Size 1P | | | |

*15 ampere protective device is permitted by NEC. Fuse size shown in table limits fault current.

www.ElectricalPartManuals.com

**WARNING:** To provide continued protection against fire and shock hazard, the complete overload relay must be replaced if burnout of a current element occurs. See Table II.

**TYPE B OVERLOAD RELAY CONTROL CONTACT RATINGS (B600)**

| | Normally Closed | | Normally Open | |
|---|---|---|---|---|
| AC Volts | Make | Break | Make | Break |
| 24-120 | 30A | 3A | 30A | 3A |
| 120-600 | 3600VA | 360VA | 3600VA | 360VA |

**TABLE II — REPLACEMENT OVERLOAD RELAY**

| OVERLOAD RELAY | CATALOG NUMBER SIZE 00, 0, 1 | SIZE 1P |
|---|---|---|
| Type B Non-ambient Compensated | BN11A | BN21A |
| Type B Ambient Compensated | BA11A | BA21A |

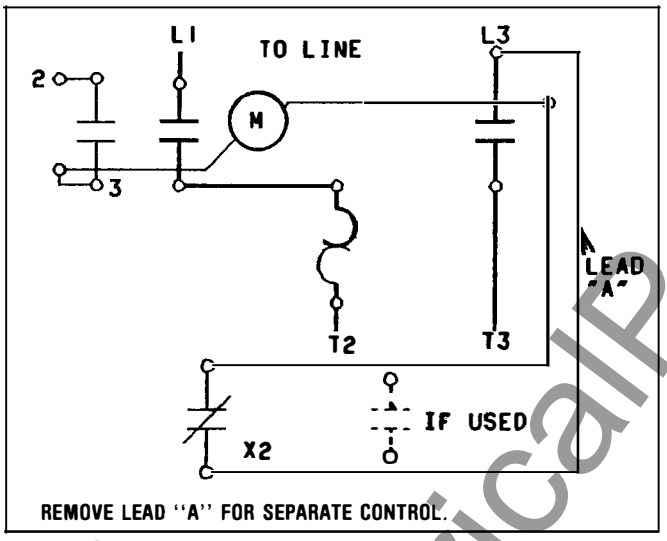


*Fig. 4 Connection Diagram*

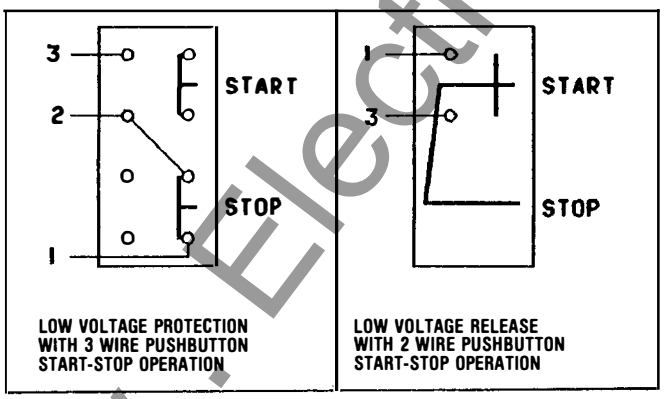


*Fig. 5 Control Station Connection Diagram*

**POWER CIRCUIT TERMINALS**

| NEMA Size | Wire Size |
|---|---|
| 00-0-1 | #14 - 6 AWG |
| 1P | #10 - 3 AWG |

Wire with copper conductors only.

**COIL**

The A200 motor controller is available with a single or dual voltage coil. When equipped with a single voltage coil, the contactor is wired as shown in Figure 4. A connection diagram for a dual voltage coil is shown in Figure 6. When supplied with a dual voltage coil, the motor controller is normally wired for the high voltage connection. The wiring may be changed to the low voltage connection by removing and reconnecting the jumpers as illustrated below.

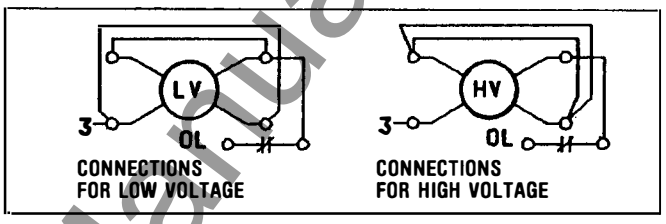


*Fig. 6 Dual Voltage Coil Connections*

**AC COIL DATA, SIZE 00, 0, 1 AND 1P (TYPICAL VALUES)**

| Inrush VA | Sealed VA | Sealed Watts | Pickup (Time in Milliseconds) | Dropout |
|---|---|---|---|---|
| 160 | 25 | 7.8 | 16—24 | 12—16 |

**REPLACEMENT COIL: ORDER BY PART NUMBER, VOLTAGE, AND FREQUENCY**

**SIZE 0 AC OPERATING COILS**

| Voltage | Freq. | Part Number |
|---|---|---|
| 24 | 60 | 505C806G16 |
| 120/110 | 60/50 | 505C806G01 |
| 208 | 60 | 505C806G02 |
| 240 | 60 | 505C806G12 |
| 277 | 60 | 505C806G18 |
| 380 | 50 | 505C806G07 |
| 480/440 | 60/50 | 505C806G13 |
| 600 | 60 | 505C806G05 |
| 120/240* | 60/60 | 505C806G10 |
| 240/480* | 60/60 | 505C806G03 |

* Dual Voltage Coils. Use only on starters originally supplied with a dual voltage coil.

**TABLE III — ACCESSORIES**

| | Cat. No. |
|---|---|
| Alarm Circuit Contact for Type B Overload Relay Rated B600 (1 normally open pole) | B3NO |

Fuse Block Kits — Meet requirements of NEC concerning common control fusing.

| Cat. No. | Qty. | Description |
|---|---|---|
| F56 | 2 | Contactor mounted Fuse Holder for 1 600 volt Bussman KTK Fuse |
| FKR | 1 | Panel mounted Fuse Holder for 2 Class CC (Bussman KTKR) Fuses* |

*Use when available fault current exceeds 10,000 Amperes.

**Order Fuses Separately By Ampere Rating.**

| Controller Size | Minimum Wire Size in Control Circuit | Suggested Fuse Size† |
|---|---|---|
| 00, 0, 1, 1P | #16 AWG | 10 AMP |

†When using a control transformer select fuse size per the National Electrical Code.

www.ElectricalPartManuals.com

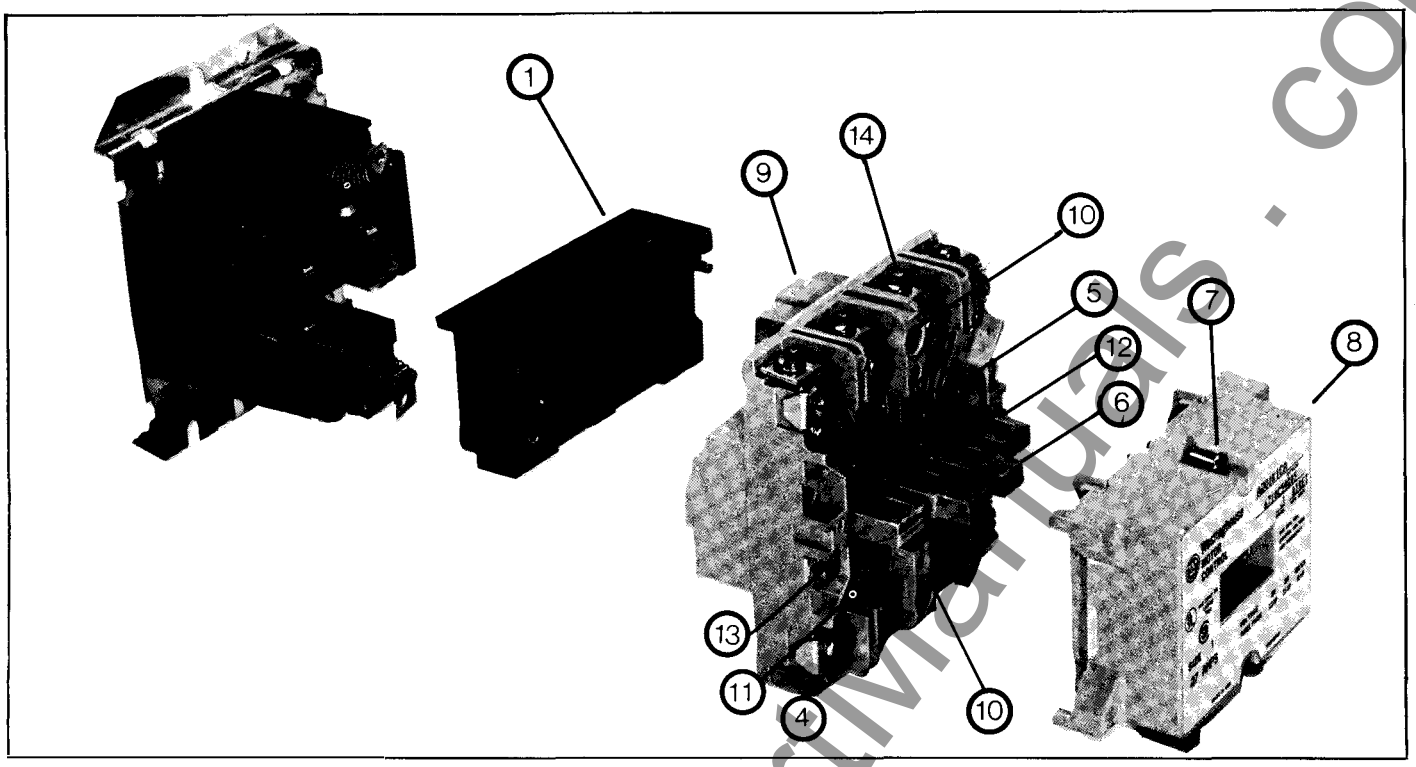


*Fig. 7 Size 1 A200 Contactor (Exploded View)*

**MAINTENANCE — First Turn Off Power —**

**To Inspect Contacts**

Refer to Figure 7. Loosen the two arc box assembly screws (7) located immediately above and below the nameplate and remove the arc box (8). Contacts (5) are visible. Retighten the screws per Table IV.

**To Replace Contacts**

After removing the arc box and with replacement contacts at hand, compress the overtravel spring (12) and remove the moving contact (5) from the crossbar (6). Disconnect any power connection. Remove the retaining screws (11) and lift out the stationary contact assembly (14).

To replace contacts, reverse the above procedure, making sure that stationary contacts are secure, (see Table IV) moving contacts are free to move, overtravel springs are seated and the crossbar moves freely when the arc box is in position.

The silver cadmium oxide contact buttons need **NO** dressing or lubricant throughout their life.

**Important —** Replace all contacts and springs as a group to avoid misalignment.

**To Replace The Coil**

Refer to Figure 7. Loosen the assembly screws (10) located to the immediate top and bottom of the arc box. Remove connector straps to the overload relay. Pull the loosened upper base structure (9) forward. Pull the coil (1) from the upper base, plug in a new coil, replace the upper base structure and check the auxiliary contacts for secureness when repositioning the upper base. Tighten the assembly screws and the connector straps screws referring to Table IV.

**Magnet — Armature Assembly**

Self alignment and permanent air gap features of the magnet armature make replacement unnecessary. Mating pole face surfaces should be kept clean.

**Arc box must be in place when the controller interrupts a circuit.**

**TABLE IV - RECOMMENDED DRIVING TORQUE**

| Location (Qty.) | Driving Torque (lb.-in.) | Fig. 7 Item |
|---|---|---|
| Cover Screw (2) | 7— 9 | 7 |
| Coil Wire Connector (2) | 7— 9 | 13 |
| Stationary Contact Screw (6) | 7— 9 | 11 |
| Main Power Connector (6) | 18—21 | 4 |
| Overload Relay Connecting Screws (3) | 16—18 | — |
| Overload Heater Fastening Screws (2) | 16—18 | — |

**TABLE V — RENEWAL PARTS**

| Pole Combination and Size | Contact Kit Part Number |
|---|---|
| 2 Pole Size 00 | 373B331G17 |
| 2 Pole Size 0 | 373B331G02 |
| 2 Pole Size 1 | 373B331G07 |
| 2 Pole Size 1P | 373B331G09 |

www.ElectricalPartManuals.com