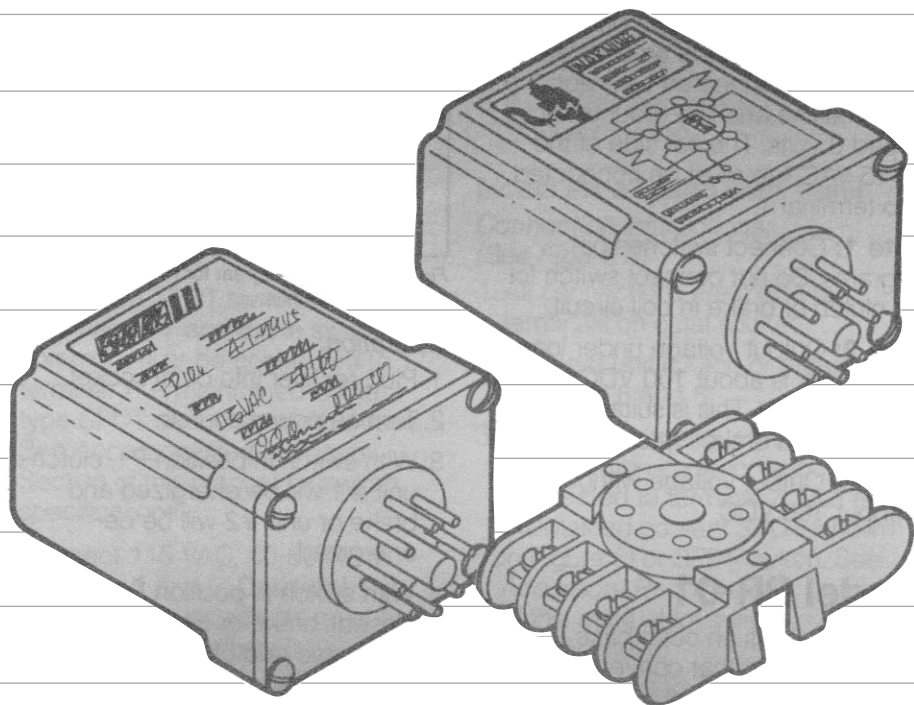


Service Manual for Rectifiers Models PR-01 and PR-33



General Information

This service manual contains installation, operating, maintenance, and replacement parts information for the following rectifier control units.

| Model | Stearns Part Number |
|-------|---------------------|
| PR-01 | 4-1-20001-00 |
| PR-33 | 4-1-20033-00 |

Installation and Operating Instructions

Caution!

The following procedures must be adhered to when installing any of the rectifiers covered by this service manual.

1. Make certain that power is locked off when wiring a rectifier installation.
2. Use adequate sized wire. We recommend no. 18 gauge for runs less than 25 feet; no. 16 gauge for runs of 25 feet or longer.
3. For both the PR-01 and PR-33, the neutral or grounded side of the 115 VAC line must be connected to terminal 5 on the octal socket. A voltmeter connected between the neutral line and line ground will read 0 volts. The *hot* side of the 115 VAC line must be connected to terminal 1.

Note 1: Connect switches per diagrams. Do not connect switch for the clutch or brake in coil circuit.

Note 2: Output voltage under load of the rectifier is about 100 VDC with 115 VAC input. This is suitable for clutches and brakes rated 90 VDC.

Note 3: Output voltage without load is about 160 VDC.

Model PR-01

Model PR-01 is an octal-base rectifier module that converts 115 VAC, 50-60 Hz to 100 VDC. It is capable of providing DC operating voltage to 1 or 2 clutches or brakes (each having less than 100 watt

power consumption). If two units are operated with this rectifier, only one unit should be energized at a time.

Model PR-01 used with 2 units

Connection instruction: (See Figure 1)

1. All connections are made to terminals on octal socket.
2. Connect clutch or unit #1 to terminals 6 and 8.
3. Connect brake or unit #2 to terminals 3 and 6.
4. Connect a single-pole, double-throw (SPDT) switch to terminals 7, 8 and 3; the switch common should be connected to terminal 7. See *Accessory Requirements* Section of this manual for switch specifications.
5. Connect 115 VAC, 50-60 Hz to terminals 1 and 5. **Caution!** The neutral or grounded side must be connected to terminal 5.

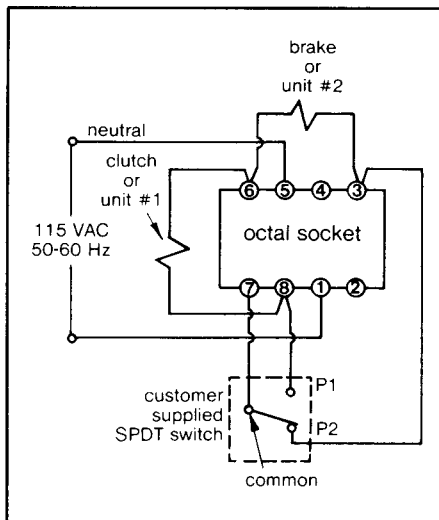


Figure 1: Wiring diagram for PR-01 rectifier with 2 units.

Operation:

1. Plug rectifier into octal socket.
2. Turn on power source.
3. With switch in position P1, clutch or unit #1 will be energized and brake or unit #2 will be de-energized.
4. With switch in position P2 (normally closed), brake or unit #2 will be energized and clutch or unit #1 will be de-energized.
5. If unit fails to operate, refer to the *Troubleshooting* Section of the manual.

Model PR-01 used with 1 unit

Connection instruction: (See Figure 2)

1. All connections are made to terminals on octal socket.
2. Connect unit to be operated (clutch or brake) to terminals 6 and 8.
3. Connect switch to terminals 7 and 8; the switch common should be connected to terminal 7. Use a maintained contact type SPDT (shown in Figure 2) or single-pole, single-throw (SPST) switch. See *Accessory Requirements* Section of this manual for switch specifications.
4. Connect 115 VAC, 50-60 Hz to terminals 1 and 5. **Caution!** The neutral or grounded side must be connected to terminal 5.

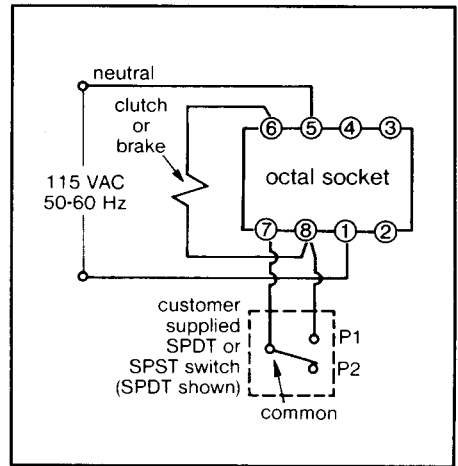


Figure 2: Wiring diagram for PR-01 rectifier with 1 unit.

Operation:

1. Plug rectifier into socket.
2. Turn on power source.
3. With switch in position P1 (or switch closed when using SPST) the clutch or brake will be energized.
4. With switch in position P2 (or switch open when using SPST) the clutch or brake will be de-energized.
5. If unit fails to operate, refer to the *Troubleshooting* Section of this manual.

Model PR-33

Model PR-33 is an octal-base rectifier module that converts 115 VAC, 50-60 Hz to a DC voltage. It provides one fixed 100 VDC output

and one adjustable (15 to 100 VDC) output.

The PR-33 is capable of providing DC operating voltage to 1 or 2 clutches or brakes (each with 50 watts or less power consumption). If two units are operated with this rectifier, only one unit should be energized at a time.

Model PR-33 used with 2 units - adjustable voltage on unit #1, fixed 100 VDC on unit #2.

Connection instructions:
(See Figure 3)

1. All connections are made to terminals on octal socket.
2. Connect unit #1 to terminals 6 and 8.
3. Connect unit #2 to terminals 3 and 6.
4. Connect side S_a of a double-pole, double-throw (DPDT) switch to terminals 3, 7 and 8; the switch common must be connected to terminal 7. See *Accessory Requirements* Section of this manual for switch specifications.
5. Connect side S_b of the switch to terminals 6 and 2; the switch common must be connected to terminal 6.
6. Connect 115 VAC, 50-60 Hz to terminals 1 and 5. **Caution!** The neutral or grounded side must be connected to terminal 5.

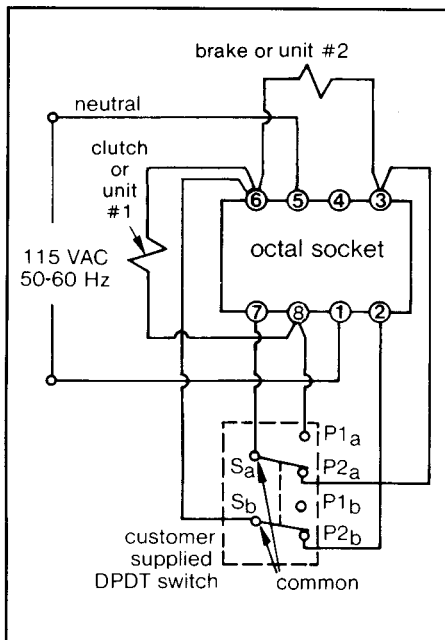


Figure 3: Wiring diagram for PR-33 rectifier with 2 units (adjustable voltage on unit #1).

Operation:

1. Plug rectifier into octal socket.
2. Turn on power source.
3. Voltage adjustments are made by removing plug button on top of rectifier case. This will expose a screwdriver slotted adjustment. Turn the adjustment clockwise to increase voltage, or counterclockwise to decrease voltage. When wired as described above, the adjusted voltage will be applied across unit #1.
4. With switch in position P1, unit #1 is energized with adjusted voltage and unit #2 is de-energized.
5. With switch in position P2 (normally closed), unit #2 is energized with 100 VDC and unit #1 is de-energized.
6. If unit fails to operate, refer to the *Troubleshooting* Section of this manual.

Note: If unit #1 is to be energized with fixed 100 VDC, and unit #2 with adjustable DC voltage, remove lead between terminal 2 of socket and P2_b of switch; add lead between terminal 2 of socket and P1_b of switch.

Model PR-33 used with 2 units - adjustable voltage on both units.

Connection instructions:
(See Figure 4)

1. All connections are made to terminals on octal socket.
2. Connect unit #1 to terminals 6 and 8.
3. Connect unit #2 to terminals 3 and 6.
4. Connect a SPDT switch to terminals 3, 7 and 8; the switch common must be connected to terminal 7. A maintained-contact type SPDT switch should be used. See *Accessory Requirements* Section of this manual for switch specifications.
5. Connect 115 VAC, 50-60 Hz to terminals 1 and 5. **Caution!** The neutral or grounded side must be connected to terminal 5.

Operation:

1. Plug rectifier into octal socket.
2. Turn on power source.

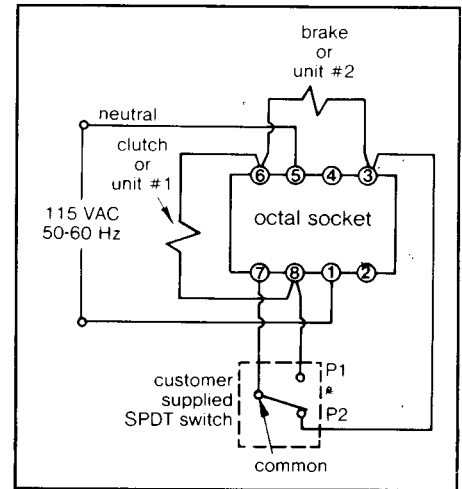


Figure 4: Wiring diagram for PR-33 rectifier with 2 units (adjustable voltage on both units).

3. Voltage adjustments are made by removing plug button on top of rectifier case. This will expose a screwdriver slotted adjustment. Turn the adjustment clockwise to increase voltage, or counterclockwise to decrease voltage. When wired as described above, this same adjusted voltage will be applied across both unit #1 and unit #2.
4. With switch in position P1, unit #1 is energized with adjusted voltage and unit #2 is de-energized.
5. With switch in position P2 (normally closed), unit #2 is energized with adjusted voltage and unit #1 is de-energized.
6. If unit fails to operate, refer to *Troubleshooting*.

Model PR-33 used with 1 unit

Connection instructions:
(See Figure 5)

1. All connections are made to terminals on octal socket.
2. Connect unit (clutch or brake) to terminals 6 and 8.
3. Connect switch to terminals 7 and 8; the switch common should be connected to terminal 7. Use a maintained contact SPDT (shown in Figure 5) or SPST switch. See *Accessory Requirements* Section of this manual for switch specifications.
4. Connect 115 VAC, 50-60 Hz to terminals 1 and 5. **Caution!** The neutral or grounded side must be connected to terminal 5.

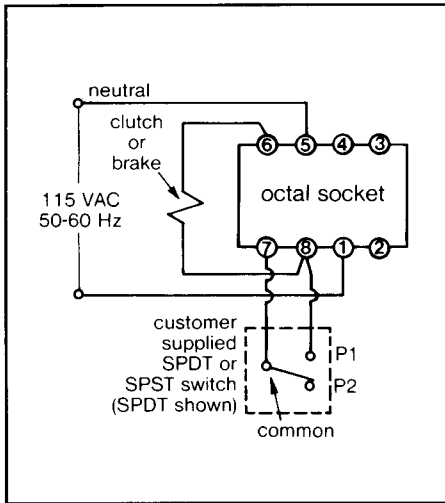


Figure 5: Wiring diagram for PR-33 rectifier with 1 unit.

Operation:

1. Plug rectifier into socket.
2. Turn on power source.
3. Voltage adjustments are made by removing plug button on top of rectifier case. This will expose a screwdriver slotted adjustment. Turn the adjustment clockwise to increase voltage, or counterclockwise to decrease voltage.
4. With switch in position P1 (or switch closed when using SPST) the clutch or brake will be energized.
5. With switch in position P2 (or switch open using SPST) the clutch or brake will be de-energized.
6. If unit fails to operate, refer to *Troubleshooting*.

Maintenance

Fuse location and access

Both PR-01 and PR-33 have internal fuses. The fuse can be checked without removing the rectifier cover. First remove rectifier module from the octal socket. An ohmmeter connected between pins 1 and 4 on the module will read near infinity if the fuse has burned out.

To replace fuse, remove four fasteners holding cover of rectifier to base plug. Carefully remove the cover. The fuse is located as shown in Figure 6. Visually check the fuse. If the fuse is burned out, remove it and replace with a new fuse of proper size and type. Carefully replace the cover and fasteners.

Troubleshooting

If the unit fails to operate or operates in an improper manner, use the following procedure to locate and correct the problem.

See applicable cautions and notes at *Installation and Operating Instructions*.

1. Check the power source (115 VAC, 50-60 Hz line voltage). Is it turned on? Using an AC voltmeter, check the voltage between terminals #1 and #5. The voltage should be between 110 and 120 VAC.
2. Check actual wiring against the wiring diagram. On model PR-33, check to see if voltage adjustment is turned up high enough to operate clutch or brake.
3. Check fuse. If the fuse is burned out, replace it with one of the same type and rating. Review entire troubleshooting procedure to identify reason for blown fuse.
4. Disconnect clutch and/or brake from rectifier. Check resistance of clutch and/or brake coils. If coil is shorted or open it should be replaced.
5. Check the connections between the rectifier and the clutch and/or brake to be operated. If the connections are loose or the wires damaged or grounded, correct the problem.
6. If the above corrective actions do not restore normal performance, the rectifier should be replaced with a new one.

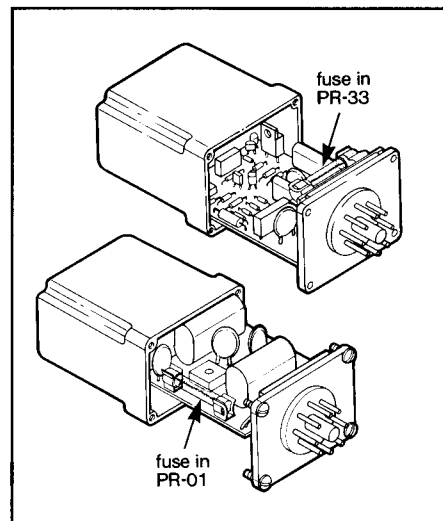


Figure 6: Fuse location.

Replacement Parts

The PR-01 and PR-33 are non-repairable units. There is only one replacement part on each of these units, the fuse. Part numbers and descriptions follow:

| Model | Fuse Type* | Fuse Part No. |
|-------|-------------------|---------------|
| PR-01 | Type 3AG, 1 amp | 9-60-1311-00 |
| PR-33 | Type 3AG, 0.6 amp | 9-60-1313-00 |

***Caution:** Do not use slow-blow type fuse.

Accessory Requirements

The following accessories are required for installation, but are not supplied with the PR-01 or PR-33 rectifiers.

1. Octal socket – Stearns part number 9-61-0153-00.
2. Switch – one switch (SPST, SPDT, or DPDT, depending upon applications). Switch should be maintained contact type. A minimum contact rating of 6A, 120 VAC inductive load is sufficient to operate all Stearns industrial clutches. However, switches with lower ratings may be used if the rating is equal to or greater than the clutch or brake coil current.
3. Hook-up wire – as required.

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