

## Magnetic Ballast Application and Troubleshooting Tips

**Safety Note:** All ballasts must be grounded to the sign and the sign must be grounded for safety. Installation of ballasts and fixtures must be accomplished in accordance with the National Electric Code and the requirements of Underwriters Laboratory. Potentially hazardous high voltage can be present and service and /or replacement should be accomplished only by qualified personnel.

Give your customers the most reliable and maintenance-free sign you can provide by carefully selecting the proper ballast from the data on the web site and on the ballast labeling. Follow the suggestions below for obtaining optimum performance.

Two of the major enemies of long maintenance-free ballast life are temperature and moisture. Minimizing the effect of these elements by proper application can aid immeasurably in assuring you of long, dependable service.

1. Mount the ballast against a flat heavy gauge metal surface in the coolest area of the sign. DO NOT double nut mount or mount on spacers or in any way raise the ballast. Heat dissipation by conduction is more effective than by radiation.
2. Heat rises; therefore, the bottom of the sign is the best location for the ballast. Keep the ballast away from other sources of heat such as other ballasts, other hot surfaces or lamps, particularly the lamp ends which generate the most heat.
3. Provide for free movement of air through the sign. Vents or louvers should be designed to allow the escape of warm air without allowing water into the sign or drafts of cold air directly on the lamps.
4. Locate the ballast away from areas where water may accumulate. Provide adequate drainage in the sign. Do not mount under louvers or doors where water may come in contact with the ballast.
5. The white lead of the ballast must be connected to the neutral side of the power supply. The ballast must be securely attached

- and grounded to the sign and the sign in turn grounded. An ungrounded sign is a potential safety hazard and may give erroneous symptoms when servicing or troubleshooting the sign.
6. Make sure the input voltage is within +/- 5% of the transformer's rating.
  7. All rapid start lamps should be provided with a starting aid for reliable starting. This aid should be a metallic strip, channel or angle 1" wide mounted within 1" of the lamp and extending the entire length of the lamp. A 1/2" strip 1/2" from the lamps is also adequate. The starting strips must be grounded.
  8. For flashing service use only ballasts designed for this purpose. Only rapid start lamps can be flashed. Use only one ballast on each flasher contact.

## Ballast Troubleshooting Tips:

The purpose of this section is to provide assistance in the diagnosis of sign lighting problems. Usually the ballast is checked first. Many ballasts returned as failures are perfectly good, and the problem lies elsewhere, potentially creating a ballast failure.

The following procedures, while not covering all possibilities, will assist in solving many common problems.

1. For safety, make sure the ballast and sign are adequately grounded. Before servicing make sure that no voltage exists between ballast case, sign frame, and earth ground.
2. Check for correct supply voltage at the sign. Also check for tripped breakers or blown fuses (suggesting a short to ground in the line, the ballast, or in the supply to the ballast). Disconnect each ballast individually to determine if the fault disappears.
3. Check ballasts for water damage.
4. Visually inspect lamps for heavy end darkening which may indicate lack of or improper filament voltage. New lamps may light but will have a short life.
5. Visually inspect all lamp sockets for evidence of arcing, breakage, misalignment, foreign materials, etc. It is not uncommon for ballast problems to occur shortly after routine re-lamping. Replace any defective sockets; clean all others.

6. With power on, check sockets for proper filament voltage. This can be done with a multimeter and should read approximately 4 volts. If there is no voltage at the socket, check the same color leads going to this socket at the ballast. Strip leads at ballast (power-off). With power on, recheck for filament voltage. If voltage is correct, check wiring for open circuit. Repair and retest. If there is no voltage, the probable cause is the ballast. Replace and retest.
7. If all sockets have proper voltage and lamps known as good will not light, turn power off. Disconnect primary supply to ballast and check all secondary leads for grounds. A short will give a low reading on the low resistance (OHMS) scale of the multimeter or the light will light on a simple continuity tester. This can be accomplished at the socket contacts or by probe puncturing the ballast leads. A short will show up on two leads of the same color. If a short exists, cut and test same color leads at the ballast. If ground is in the ballast, it should be replaced. If not, trace ground in the sign wiring and repair.
8. As outlined, thorough testing will ensure that supply voltage is correct, that there are no shorts, grounds or opens in the sign wiring, and that proper filament voltage is present.

It is important that all tests are performed to guarantee that the failed components as well as the cause for this failure are identified. Doing the job correctly the first time will ensure dependable results.