



Diode Troubleshooting & Replacement

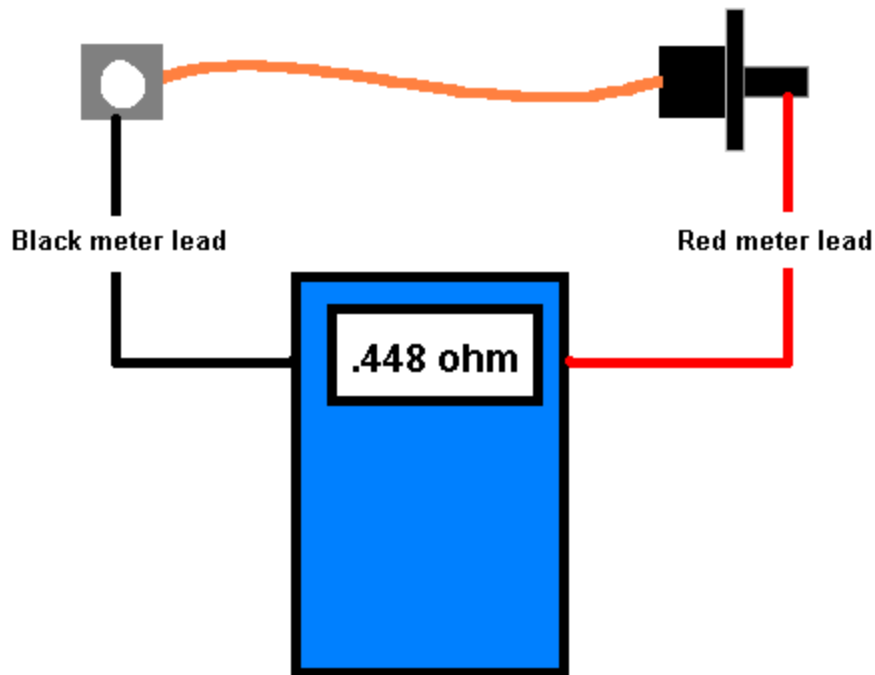
On all IREM "N" and "G" Xenon power supplies, the DC is rectified by a bank of six(6) diodes. These diodes are further divided into one pair for each of the three input phases of the input voltage. Each diode pair starts the smoothing process of changing the sinusoidal wave of AC voltage into the straight, constant level of DC voltage. After the diodes, the DC is then filtered by a capacitor and current limiter to help achieve the extremely low ripple in the output. This DC is then fed to the lamphouse section, and the ignition pulse is added with the igniter.

Typically, these power supplies should provide extremely long periods of trouble-free service with simple maintenance and proper installation and cooling. Should trouble occur, identifying the problem and fixing it is usually straightforward and simple. Following, the most common problems will be discussed, and then maintenance, mounting, and cooling.

A diode failure is easily identified by a number of methods. The most noticeable is a pronounced "flicker" of the bulb. The open circuit voltage will also be dramatically lower (measured with the power supply energized, but without the bulb lit). Hard striking, or no lighting at all are also indicators of a diode problem. **Continued use with diode damage will result in bulb and power supply damage.** Checking for a bad diode is quite simple. If a clamp-on amp meter is available, check for excessive ripple in the output current. The previously mentioned flicker is also an indicator. Check the power supply itself for damaged, burned, or missing diodes. The proper method of checking a diode is using a digital meter to test the diode.

The diode can be quickly checked in the power supply with the tail not connected, but the proper and accurate method is to remove the diode completely, and test the diode by itself. Remove the diode by first removing the flexible end, or "tail" from the heat sink, being careful to note the position of ALL hardware. This is critical when re-installing the diode later. Remove the retaining nut from the back of the heat sink that secures the body of the diode, and carefully unscrew the diode out. It is important to match the characteristics of the diode pairs, and BIG SKY recommends initially replacing all six diodes at first, and then testing for the bad diode(s) later. Good diodes can then be saved a spares, and used again later. Re-thread and tighten the new diode into the heatsink with a wrench or proper tool. Turning the diode by it's tail can damage the diode, and result in shorter diode life. **DO NOT USE ANY COMPOUNDS OR INSULATORS DURING THIS STEP.** Re-install the tail onto the mounting stud, being careful to use the hardware in the correct order. **DO NOT OVER-TIGHTEN OR CRACK THE INSULATORS ON THESE STUDS DURING THIS PROCESS.** Also be sure that the mounting tail is straight, and does not touch any part of the heat sink.

The following illustration shows a diode being checked with a DVM, and the reading that you should get. The acceptable range is .440 to .480 Ohms. Note the color of the meter leads on the diode.



Reversing the leads will result in an open, or infinite reading. This is a normal diode. If a measurement of greater than .480 ohm is read, but not much more, mark these readings on the diode, and save the diode for use as a spare. Any diode with readings of a "dead short" (.000) in either direction is no good, and must be discarded, so as not to be mistakenly used later. Also, if the diode reads open in both directions, it is also no good, and not to be re-used. When re-using spares in emergency situations, try to use pairs with similar readings.

Also be sure the leads on the contactor are secure and tight, and the coil is operating on 220VAC. Also be sure that all DC cables are tight and secure from the power supply to the bulb connections. And overheating or blackening of any of these connections will affect performance and life. Periodically check all electrical connections, to be sure that all are tight and proper.

Cooling is also quite important to diode life and power supply operation. Adequate and continuous air circulation is a must, so as to avoid any overheating. Overheated diodes will be damaged, and fail sooner.

Through proper maintenance and repair, these power supplies can last 20 years and longer! If further information is needed, please contact BIG SKY Industries or your service technician.

[\(back to tech support page\)](#)