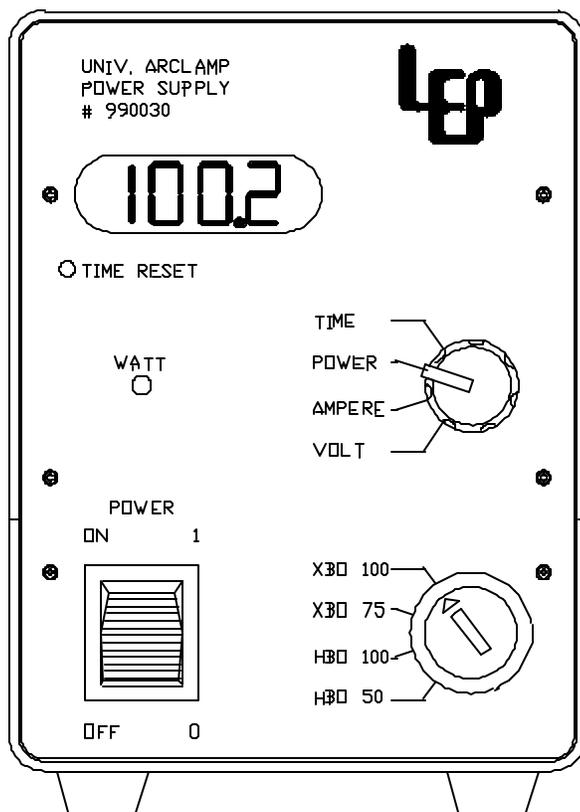


UNIVERSAL ARC LAMP POWER SUPPLY

FOR XBO100W, XBO75W, HBO100W, and HBO50W

USER'S MANUAL



LUDL ELECTRONIC PRODUCTS, LTD.

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Part no. **90M008**, Revision C

SAFETY STANDARDS

FUSE RATINGS: Fuse requirements for the selected AC line input are as follows:

115 VAC 50/60 Hz. 3 Amp time lag type (TT)

230 VAC 50/60 Hz. 1.5 Amp time lag type (TT)

Fuses, located on rear panel above AC input receptacle can be replaced by removing fuse carrier (depress cap and rotate counter-clockwise 90 degrees) and replacing with like fuse of same rating (1.5A or 3A).

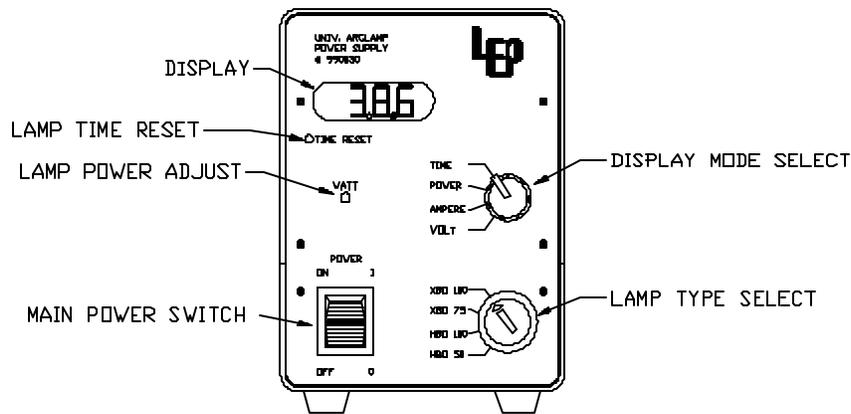
Black fuse carrier is for .25 X 1.25 inch fuses. Grey carrier is for 5 X 20 MM fuses.

LINE VOLTAGE SELECTOR SWITCH:

Line Voltage Selection of 115 or 230 volts nominal is made by a recessed slide switch located on bottom cover towards front of Power Supply.

WARNING NOTICE:

The high voltage warning symbol (a lightning bolt in a yellow triangle) on the rear panel indicates terminals have voltage exceeding 1000 Volts and should be handled appropriately. In normal operation though, the exposed terminals have a maximum of 100 volts and high voltage is inhibited unless a suitable lamp socket is installed to satisfy the interlock.



DISPLAY:

4 digit LED display. Shows the voltage, time, amps or power (watts) on the lamp. The display function is controlled by the display selector switch. The display will also show lamp ignition failure error and lamp aging status.

TIME RESET:

The recessed button switch will clear the lamp hours to zero. This is used when a new lamp is installed.

LAMP POWER ADJUST:

This recessed control adjusts the lamp power from +10% to -20% of nominal lamp power. For fine-tuning lamp performance.

DISPLAY MODE SELECT:

Controls the display function. The display can indicate time, power, amps or volts depending upon the position of this switch. The switch position can be changed at any time.

MAIN POWER SWITCH:

Turns system on or off. When switched on the power supply will display the lamp type setting for two seconds, then attempt to ignite the lamp. Switching off immediately extinguishes the lamp and shuts down power.

LAMP TYPE SELECT:

The lamp type is selected with this key switch. The small arrow points to the selected lamp type. The lamp should be selected and double-checked before powering up the system. Once the lamp is selected, the key should be removed and stored in a safe place.

VOLTAGE SELECTOR SWITCH (INTERNATIONAL VERSION ONLY)

Located on the bottom panel of the power supply frame. The slide switch is located in one of the vent slots toward the front of the unit. Using a small scwdriver, select between 115 and 220 volts. Please note that different fuses are required for the different voltages.

INSTALLATION

Verify that the voltage selector switch is set at the correct voltage (international version only) and that proper fuses are installed. The notation on the rear of the controller indicates proper fuse type.

Determine which arc lamp type is to be used. Set the keyswitch appropriately, and **remove key**.

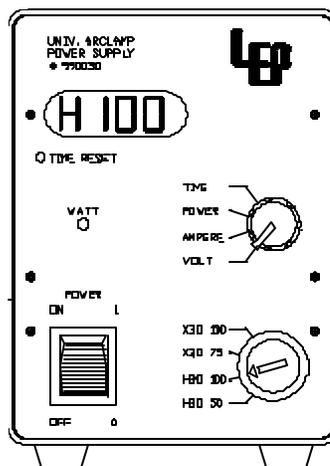
Connect cord from lamp socket to connector on rear panel.

Verify lamp type setting and connections. Connect the line cord to the receptacle on the rear panel.

Turn on main power switch.

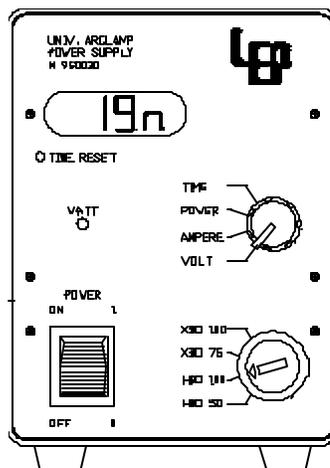
OPERATION

The selected lamp type will be displayed for 2 seconds; then the selected function switch will be displayed. The display will indicate **'H100'** or **'H50'** for the HBO 100 and the HBO 50 lamps, respectively. The XBO75 and the XBO100 lamps will be displayed simply as **'75'** and **'100'**.



FAILURE OF LAMP TO IGNITE:

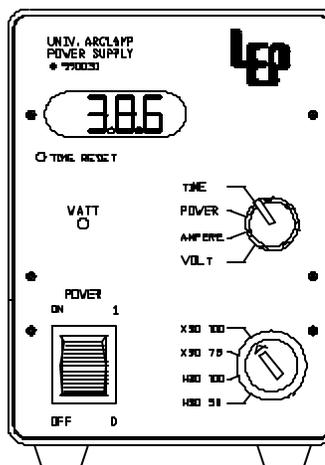
The lamp will usually turn on within 10 seconds. If the lamp does not ignite within 50 seconds, the power supply will shut down, and "Ign" will be displayed. Once the power supply shuts down, the lamp will not start. To reset this condition, turn off the main switch for 10 seconds or more. If the ignition failure continues it is usually an indication of a bad lamp, open cable or socket.



DISPLAY FUNCTIONS

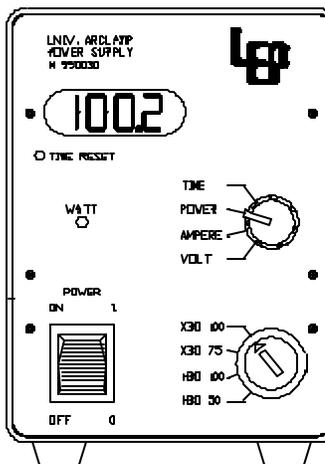
TIME:

Lamp running time is displayed in hours and tenths (HHH.T) with the decimal point flashing at a 1 second rate. When power is shut off, the elapsed time is stored. On power-up, the previous value is restored and displayed and counting continues. Lamp time is reset to zero when the TIME RESET button is pressed.



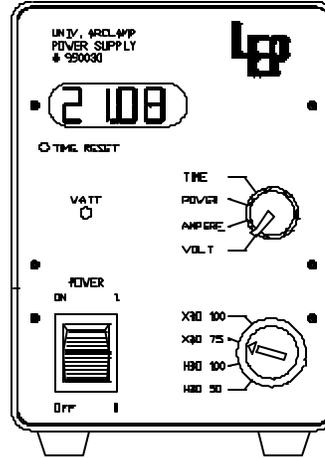
POWER:

Displays the power delivered to the lamp. The display reads to the nearest 0.1 watt. The power is calculated internally from the lamp current and voltage. The display is updated continuously. The power at any given time is equal to the product of the voltage and amperes.



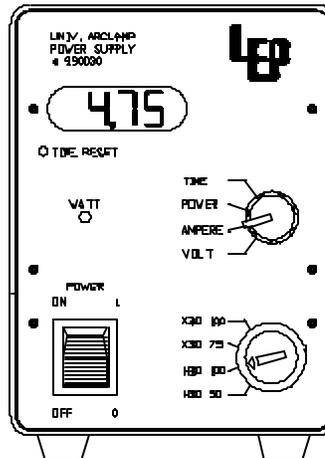
VOLT:

Displays lamp voltage from 00.00 to 50.00 volts. The voltage is shown to the nearest 0.01 volt. The display is updated continuously. When the lamp ages the voltage will increase to a predetermined limit for the selected lamp.



AMPERE:

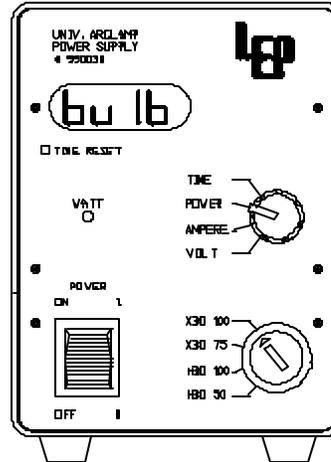
Displays lamp current from 00.00 to 10.00 amps. The resolution 0.01 amp. The display is updated continuously. The current will decrease as the lamp ages to compensate for the increase in voltage.



INDICATION OF NEED FOR LAMP REPLACEMENT:

When display starts flashing “bulb”, this indicates the lamp should be replaced soon because the power supply will not be able to control the wattage. Before this occurs, many users will change the lamp when a reduction in luminous flux occurs; however, when a reduction in light output occurs, this may be compensated for by the WATT ADJUST control.

When the lamp is replaced, reset the elapsed time indicator by pressing the recessed “TIME RESET” button.



SELECTING PROPER LAMP:

After the lamp is selected, the key should be removed from the switch. This is a safety feature to avoid tampering and guarantee safe operation. **PLEASE NOTE that changing key switch after powering on is not allowed since the switch is only active on power up.**

CAUTION: selecting the wrong lamp type can cause personal injury, explosion and damage to the lamp!

WATT ADJUST:

This recessed control adjusts the lamp power from +10% to -20% of nominal lamp power. A small 1/8" flat blade screwdriver adjusts the single-turn control. This control is best used to reduce “arc wander” in a lamp or to extend the life of a lamp by operating at lower power. To assist setting, a slight deadband ($\pm 2\%$) of nominal lamp power is included.

MONITORING LAMP LIFE:

As a normal arc lamp ages, the voltage required to maintain the rated power goes up. The power supply has the ability to sense this and make the necessary adjustments to the voltage and current. When the voltage exceeds a pre-determined threshold, the lamp is no longer useful. The power supply's multifunction display can display the time, power, volts and amperes at any given time. From time to time switch between these display settings to get an idea how much life is left on your lamp. When the voltage exceeds a pre-determined threshold, the lamp is no longer useful.

As a normal arc lamp ages and the electrodes erode, the electrical characteristics change. The voltage required to maintain the rated power goes up and the current goes down proportionately. The power supply has the ability to sense this and make the necessary adjustments to the voltage and current.

As the voltage increases, the current must decrease to maintain the proper power level.

The following table illustrates the voltage and current limits of the XBO and HBO lamps.

Lamp Voltage/Current Characteristics				
	HBO Lamps		XBO Lamps	
	50	100	75	100
'bulb' begins flashing (lamp nearing endo of life)	38 volts	38 volts	22 volts	22 volts
power supply shuts down (lamp no longer useful)	40 volts	40 volts	23 volts	23 volts
nominal current (new lamp)	2.2 amps	5.0 amps	5.4 amps	6.7 amps
current limit (replace lamp)	1.25 amps	2.50 amps	3.36 amps	4.45 amps

SPECIFICATIONS

Output power:	45-100 watts
Output voltage:	10-40 volts
Output current:	1.25 - 6.7 amps
Regulation:	$\pm 0.05\%$
Current Ripple:	$\pm 0.05\%$
Ignition (990030):	22kV pulse (XBO 75, XBO 100)
Ignition (990031):	90-110vDC
Input:	115vac, 3 amps (220vac, 1.5 amps international version)
Weight:	17lbs.
Dimensions:	5" x 7.7" x 15"

NOTES:

