

# Vari-Lux

## LIGHT SOURCE POWER SYSTEM Vari-Lux LED handpiece illumination

The **Vari-Lux** light source power system is a two circuit power pack combined with a 5-volt DC wall plug-in switching adaptor. The switching adaptor effectively reduces wall outlet AC input to a safe, 5-volt DC supply that the power pack uses to supply exact current regulated power to the **Vari-Lux** LED handpiece illumination lamps. This system is designed to be used exclusively with **Vari-Lux** LED illumination devices. However, other brand LED lamps may be effectively powered only if their operating current is 100-200 ma. See below for instructions.

### Tubing Installation

**Vari-Lux** handpiece light source tubings are available in various styles and colors to be compatible with dental unit colors and desired handpiece connections. Be certain that the style of tubing is appropriate for the particular application.

Replace the entire existing handpiece tubings with the appropriate **Vari-Lux** light source tubings. During replacement, take care not to cut or shorten the electrical wires. The supplied length of wire should be retained. After replacement is completed, install the 1/8x1/8x1/16 plastic tee and air sensing tube assemblies into the drive-air lines at an appropriate position on each tubing not more than 12" from the desired location of the **Vari-Lux** power pack.

Choose one of the tee air sensing tubes. If this particular tubing is for handpiece illumination position #1, plug the tee air tube onto the power pack barbed fitting "TUBING 1" as shown in the diagram. Another illumination tubing may be installed for "TUBING 2".

Attach the tubing wires to the power pack terminals corresponding to the tee air tube connection. The polarity of all wire connections must follow the diagram. The white (wht) wire is positive and the black (blk) wire is negative.

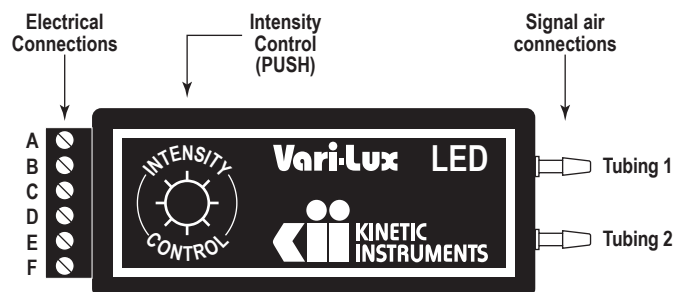
Attach the wall switching adaptor wires to the power pack terminals as shown in the diagram. Observe the polarity marking tag and insure that the positive (+) and negative (-) wires are correctly attached. Plug the wall transformer into an outlet of appropriate voltage. The wall adaptor supplied is rated at 5.0VDC @1000ma. **Do not use any wall adaptor device other than the one supplied.**

### Vari-Lux LED Power Pack Operation

After all tubing has been successfully installed as described, the handpiece illumination LED system is ready to be used. Depressing the handpiece foot control will turn ON illumination for the selected handpiece. Illumination will remain ON as long as there is air pressure to the handpiece. After removing air pressure from the handpiece, the illumination will remain ON for a period of 10 seconds and then will turn OFF automatically.

The **Vari-Lux** power pack electronic functionality is controlled using a computer chip known as a MCU (micro-controller unit). This sophisticated device utilizes computer software code to determine proper operating sequencing. Built into the program is "exclusive OR" logic which, in effect, will not permit two devices to be ON at the same time. Therefore, when switching between handpieces, the logic turns ON the most recent handpiece activated and turns OFF the other.

In addition to software driven logic control, the **Vari-Lux** power pack incorporates hardware that supplies the LED illumination device with a precise amount of DC power. This power is current regulated and maintains specific control of the LED temperature which, in turn, contributes greatly to an indefinite life expectancy. Also included are two very high current MOV (metal oxide varistor) devices that effectively absorb any transient energy bursts that could harm the LED.



A : 5 VDC positive (+)    C : Tubing 1 positive (wht +)    E : Tubing 2 positive (wht +)  
B : 5VDC negative (-)    D : Tubing 1 negative (blk -)    F : Tubing 2 negative (blk -)

### Vari-Lux LED Lamp Construction

**Vari-Lux** LED lamp construction incorporates various unique techniques in design and assembly that effectively produce a product that is intended to have a life expectancy that is indefinite. The most important factor that determines the LED life is the operating temperature of the light emitter semiconductor junction. This parameter is efficiently controlled by manufacturing a built-in thermal heat sink path connected to the service passages. Therefore, all of the air and water that is supplied to a handpiece also acts as a transfer mechanism to remove the heat generated by the LED emitter during operation.

### Adjusting the Vari-Lux LED Light Intensity

The **Vari-Lux** power pack electronics provides six discrete, precision light intensity settings: 100%, 120%, 140%, 160%, 180% and 200%. The setting percent number approximately relates to the output intensity where 200% would be two times the light output of 100%. New power packs are factory preset to the 120% setting which is roughly equivalent to 30 to 50% more light than what is available from a comparable halogen light source. Studies have shown that this intensity has been very well accepted by the general dentist population.

If desired, the intensity may be changed as follows:

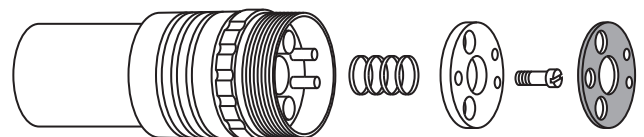
- 1) Insure that both light source circuits are OFF.
- 2) Momentarily depress the center of the "INTENSITY CONTROL" on the top of the power pack. This will cause circuit 1 LED to blink for 3 seconds and then circuit 2 LED will blink for 3 seconds.
- 3) Choose the desired circuit by momentarily depressing the control again within the 3 second blinking window. The desired LED will now go ON for 10 seconds.
- 4) Within the 10 second ON window, momentarily depress the control to advance the intensity one setting step at a time, for example from 120 to 140, etc.

Each time the control is depressed and released, the intensity will change one step higher and a new 10 second window will be initiated. Use the 10 seconds to evaluate the light intensity. When setting 200 is reached, the next step will go down to 100 and begin again. When the desired light intensity has been reached, simply do nothing and permit the 10 second window to expire and the LED will go OFF. The new setting will be retained in memory even in the event of a power failure or deliberate shut down of the wall input power source. This process can be repeated and the intensity will start from the previous memory setting.

In case it is desired to use the power pack with LED lamps other than **Vari-Lux** devices, the exact current specification must be within the range of 100-200ma. In these applications, set the power pack as close to the specification as possible.

### Kinetic-360 Vari-Lux LED Lamp Module Installation

To install the Kinetic-360 **Vari-Lux** LED lamp module, the Kinetic-360 handpiece swivel coupling must be disassembled. Remove the coupling from the tubing and disconnect it from the handpiece. Remove the coupling sealing gasket from the coupling using a pair of tweezers. Remove the single screw that secures the gasket sealing plate. Remove the gasket sealing plate being careful not to lose the spring underneath. Leave the spring in the coupling. The gasket sealing plate will not be used during re-assembly.



To install the **Vari-Lux** LED lamp module, slip the "nose" of the lamp module into the spring and align the tubes in the swivel coupling with the holes in the lamp module flange. Push the lamp module all the way down and replace the single screw removed during disassembly. Replace the sealing gasket. Do not attempt to re-use the metal gasket sealing plate as it is no longer necessary. The assembled Kinetic-360 **Vari-Lux** LED coupling requires the use of a different tubing. This is to prevent electrical incompatibility between LED and halogen lamps. Follow previous instructions regarding the installation of the **Vari-Lux** delivery tubing.

