

# Dual TripleBright II

## Warranty and Instructions

Rev. 5-26-16

### Terms Used in This Warranty and the Instructions

**Light** – This always refers to the complete light assembly, which is the housing, cover, and everything inside the housing. It is sometimes referred to just as the **Dual TripleBright II** (US Patents 6,479,947 and 6,838,837). There are at least 9 different models of **Dual TripleBright II**. Model **DFSLSS** is a **Dual TripleBright II** with filters short wave and two lamps short wave. **DFSLSM** is a **Dual TripleBright II** with filters short wave and one short wave lamp and one medium wave lamp. **DFSLS52** is a **Dual TripleBright II** with filters short wave and one short wave lamp and one LW350 lamp that peaks at about 352 nm. **DFSLS68** is a **Dual TripleBright II** with filters short wave and one short wave lamp and one LW370 lamp that peaks at about 368 nm. **DFSLM52** is a **Dual TripleBright II** with filters short wave but and one medium wave lamp and one LW350 lamp. **DFSLM68** is a **Dual TripleBright II** with filters short wave and one medium wave lamp and one LW370 lamp. **DFL5252** is a **Dual TripleBright II** with filters long wave and two LW350 lamps. **DFL5268** is a **Dual TripleBright II** with filters long wave and one LW350 lamp and one LW370 lamp. And the **DFL6868** is a **Dual TripleBright II** with filters long wave but with two LW370 lamps. Other combinations are available including some without covers or filters for irradiation applications.

**Lamp** – This always refers to the bulb, tube, or light tube. The **LS-60-254** is the short wave (SW) lamp (bulb) and has a peak output at 253.7 nm, the **LM-60-312** is the medium wave (MW) lamp and has a peak output at approximately 312 nm, the **LL-60-352** is the long wave (LW350) lamp and has peak output at approximately 352 nm, and the **LL-60-368** is the LW370 lamp and has a peak output at approximately 368 nm.

### WARRANTY

The UV SYSTEMS, Inc. **Dual TripleBright II** (US Patents 6,479,947 and 6,838,837) is guaranteed to be free of defects in materials, workmanship, and manufacture for one (1) year from date of purchase. Consumable and disposable products, including –but not limited to – lamps (light tubes), filters, and fuses are guaranteed to be free from defects in workmanship and materials for thirty (30) days from date of purchase. If equipment failure or malfunction occurs during the warranty period, UV SYSTEMS, Inc. will examine the inoperative equipment and have the option of repairing or replacing any part(s) which, in the judgment of UV SYSTEMS, Inc., was (were) originally defective or became so under conditions of normal usage and service.

No warranty shall apply to any instrument or light, or part thereof that has been subject to accident, negligence, alteration, abuse, or misuse by any user. Moreover, UV SYSTEMS, Inc. makes no warranties whatsoever with respect to parts not supplied by UV SYSTEMS, Inc. or that have been installed, used, and/or serviced other than in strict compliance with the instructions in the operation manual supplied to the end-user.

In no event shall UV SYSTEMS, Inc. be responsible to the end-user for any incidental or consequential damages, whether foreseeable or not, including, but not limited to property damage, inability to use the equipment, lost business, lost profits, or inconvenience arising out of or connected with the use of instruments or lights produced by UV SYSTEMS, Inc. Nor is

UV SYSTEMS, Inc. liable or responsible for any personal injuries occurring as a result of the use, installation and/or servicing of the light.

### **WARNING**

When the short wave or medium wave **Dual TripleBright II** is operating, huge amounts of ultraviolet (253.7 nm, UV-C for SW; and 312 nm, UV-B for MW) energy are emitted which may produce sunburn on the skin and/or conjunctivitis to the eyes upon exposure to direct or reflected radiation. Never look into a lighted SW or MW **Dual TripleBright II** light because it can quickly sunburn your eyes and skin. Always position the **Dual TripleBright II** so that the ultraviolet light shines away from you and others. The **Dual TripleBright II** may emit much more ultraviolet than you are used to. It is suggested that protective goggles (such as UV SYSTEMS, GB, or equivalent) or full face shields be used to block ultraviolet radiation from reaching your eyes, and that your skin be protected from direct exposure to the light's ultraviolet rays. **Long wave UV is not a problem.**

### **Dual TripleBright II Compared to the single lamp TripleBright II**

The SW Dual TripleBright II with two SW lamps is about 13.6% more powerful than a TripleBright II with only one SW lamp.

### **Before using the Dual TripleBright II**

**REMOVE THE RED TAPE FROM BOTH ENDS OF EACH LAMP**

The red tape is used to hold the lamps in their sockets only during shipping

### **A. OPERATION INSTRUCTIONS FOR THE Dual TripleBright II**

You are now the owner of the newest ultraviolet light specifically designed for fluorescence displays. For short wave it uses one or two custom made quartz lamps that are very resistant to bulb solarization. For medium wave it uses one or two custom made lamps with a special erythemal (also called UV-C, or soft) glass and a medium wave phosphor that peaks at approximately 312 nm. For long wave it uses one or two of the two custom made lamps with a standard soda-lime glass. For the long wave lamps one lamp has a long wave phosphor that peaks at approximately 352 nm (LW350) and the other lamp has a phosphor that peaks at approximately 368 nm (LW370). These High Output (HO) Rapid Start hot cathode lamps are the first new sources of ultraviolet for lights that are specifically designed for fluorescence displays. The **Dual TripleBright II** (US Patents 6,479,947 and 6,838,837) has a special circuit that supplies the cathode heat or filament power (yellow power cord). With this special circuit each of the **Dual TripleBright II** lamps can be turned "on" and "off" millions of times without affecting the life of the lamp. The yellow power cord supplies the filament power to both lamps. The blue cord supplies the high voltage necessary for the lamp (a) to light; with the rocker switch (a) on the **Dual TripleBright II** in series with the blue cord. The black cord supplies the high voltage necessary for the lamp (b) to light; with rocker switch (b) in series with the black cord. That means that the yellow cord **must be** plugged in and powered up at least 10 seconds before either the blue or black cords to the **Dual TripleBright II** are turned "on". The **Dual TripleBright II** has instant start operation, which means that no starters or extra switches are needed to turn the lamp "on." This means that the blue and black cords can

be plugged directly into an external electrical or electronic timer for timing applications (if the rocker switches are turned “on”). To repeat: it is important that the yellow cord must be plugged in and powered up at least 10 seconds **before** the blue or black cords are plugged in or powered up. The yellow cord can be left plugged in all the time without significant effect on the lamp in the **Dual TripleBright II**; however, you can unplug it if you will not be using the light for weeks at a time. The yellow power cord has no switch in the circuit; therefore to disconnect filament power to the lamp the cord must be unplugged. Also only the blue and black cords should be plugged into a switched wall outlet or external timer. The **Dual TripleBright II** is operated from 115V 60 Hz or 50 Hz electrical power. The “on-off” rocker switches for lamp (a) and lamp (b) are behind the baffle just above the power cords where they enter the blue **TripleBright II** housing.

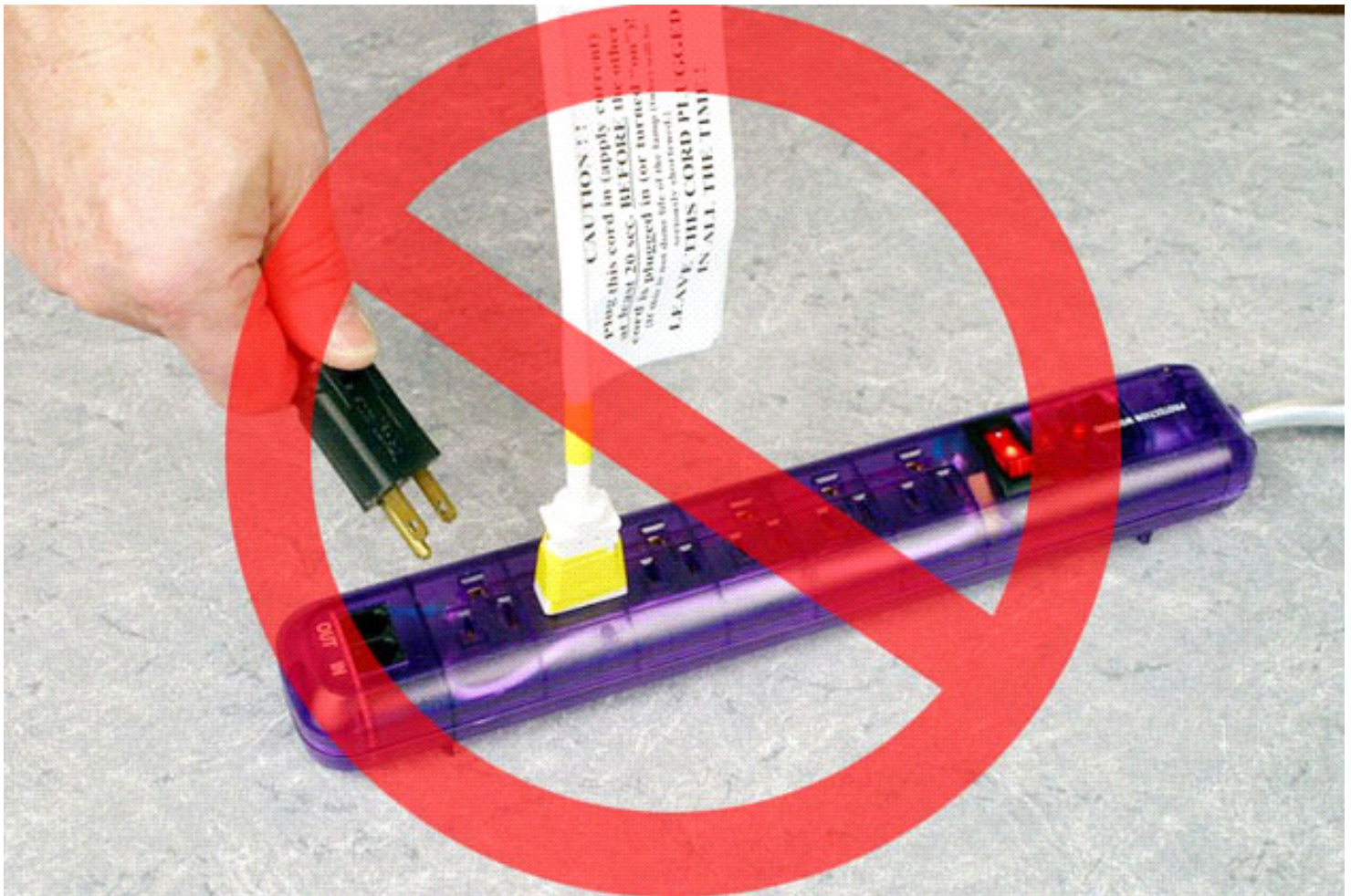
Inspect the **Dual TripleBright II** to make sure there is no shipping damage. Styrofoam “peanuts” or bubble pack might be used to protect the **Dual TripleBright II** during shipping. All that protective material (Styrofoam “peanuts” or bubble pack must be removed to clear the fan opening and air exit before the light is operated. Make sure you **remove the red tape** that holds the lamps in their sockets; the tape is only used to make sure the lamps do not come loose during shipping.

### **B. INSTALLING THE Dual TripleBright II IN YOUR DISPLAY**

The **Dual TripleBright II** comes with four built in external tabs that accept small chains or wires to hold the light to the top of your display. By adjusting the length of the chains or wires you can tilt the light to almost any direction. There also are four tapped 8-32 nuts on the back of the unit. The **Dual TripleBright II** weighs about 11 or 12 pounds depending on the lamps used. If the **Dual TripleBright II** is installed vertically the fan should be positioned at the bottom so it blows cooling air up.

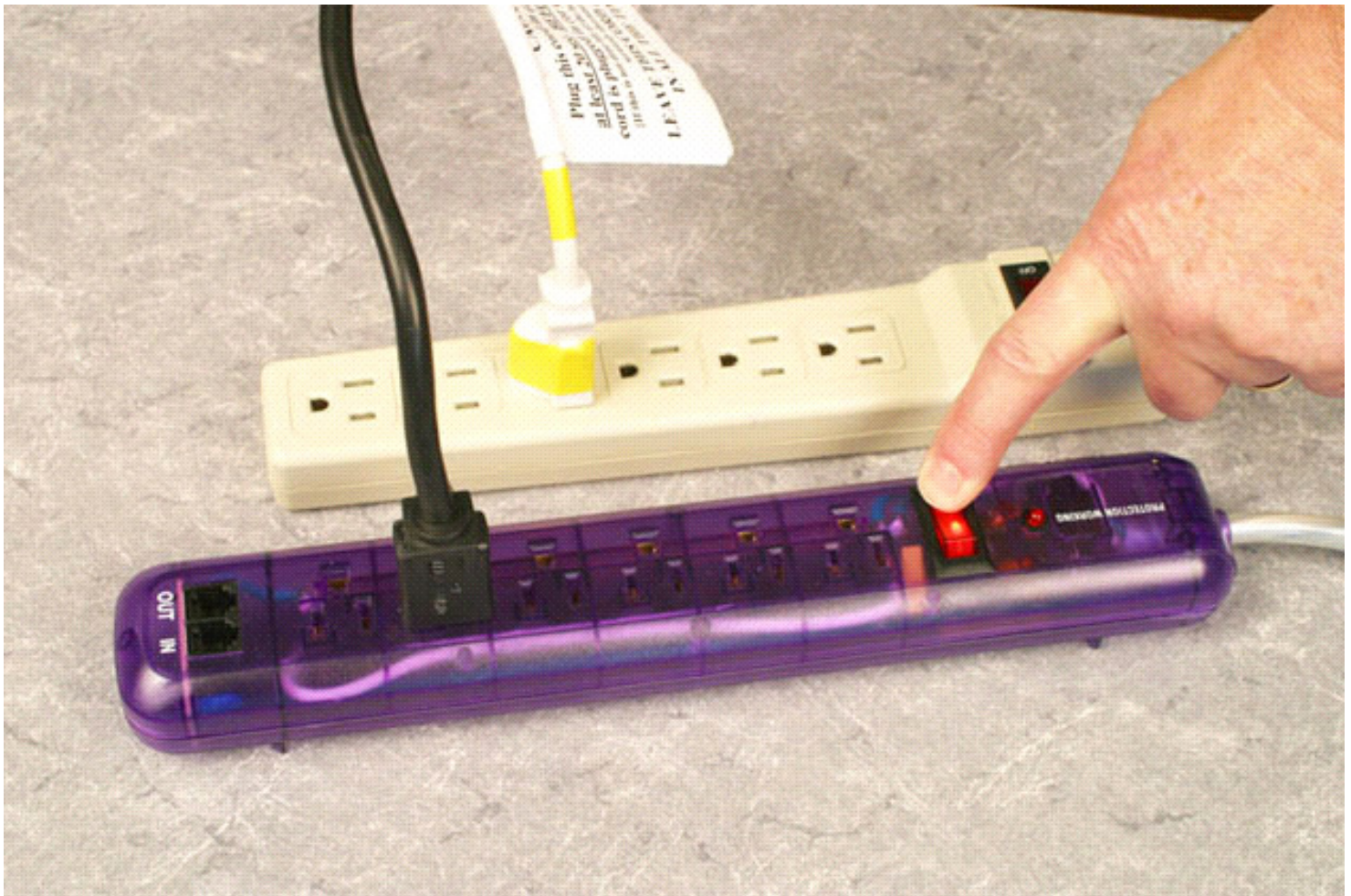
### **C. CONNECTING THE YELLOW CORD TO PERMANENT 115VAC POWER**

The cord with the yellow tape is called the yellow cord and it must be plugged in first to non-switched constant 115V 50 Hz or 60 Hz power. The yellow cord powers the filament transformer that supplies the filament voltage. The yellow cord should be plugged in **at least 10 seconds before** the **Dual TripleBright II** is turned “on”.



**NEVER PLUG ALL THREE CORDS INTO THE SAME POWER STRIP**

**Always make sure the yellow cord is powered "on" at least 20 sec. before the black cord.  
See next photo.**



**CONNECT THE YELLOW CORD TO ONE POWER STRIP AND THE BLUE AND BLACK CORDS TO A DIFFERENT POWER STRIPS OR OUTLETS**

**This allows the yellow cord to be turned “on” for 20 seconds before the blue or black power cords are turned “on”.**

**D. CONNECTION THE BLUE OR BLACK CORD TO 115 V 50 Hz or 60 Hz POWER**

The blue or black power cords can be plugged into a switched power outlet or into a timer for remotely operating the **Dual TripleBright II**. One such timer is the T-20 Timer made by UV SYSTEMS. The rocker switches on the light can be used to turn each lamp "on" or "off" rather than unplugging the blue or black power cords from the outlet. The rocker switches are behind the baffle on the end where the power cords enter the light.

**E. COOLING FAN**

The **Dual TripleBright II** has a built in cooling fan to maintain the lamps at its most efficient operating conditions by maintaining an optimum mercury vapor pressure inside the lamp. By operating at its most efficient mercury vapor pressure the UV output does not decrease as the lamp warms up. This is a common problem with many other display lights in that they heat up and the UV output decrease, but not with the **Dual TripleBright II**. The **Dual TripleBright II** should be installed in a display or enclosure that has at least two openings of about 12 square inches at each end of each light (24 inches total per light). This will allow cooler air to be drawn in at one opening near the intake and warm air to be exhausted at the other end by the other opening. Note the fan only comes “on” when lamp (b) is operating. No

harm will be done to lamp (a) “on” with the fan “off”. If the **Dual TripleBright II** is installed vertically the fan should be positioned at the bottom so it blows cooling air up.

#### **F. REPLACING THE SHORT WAVE FS-60 FILTERS and OTHER FILTERS**

Reasons you might want to replace the glass filters in your **Dual TripleBright II** are included below. If you are already familiar with this subject, skip down to the next paragraph. Long wave filters never need replacing since they do not solarize or wear out.

#### **Reasons you Might Want to Replace the SW Filters**

Because the **Dual TripleBright II** is so powerful, more short wave ultraviolet passes through the **FS-60** filters than in many other displays lights on the market. Short wave ultraviolet radiation causes a chemical reaction in the filter glass that reduces the transmission of the 253.7 nm [UV] wavelength with time. This is called solarization. The visible light that you can see transmitted through the filter does not change as the filter solarizes, and so in no way indicates the degree of solarization. This solarization effect is a function of the amount and duration of short wave ultraviolet light exposure. In addition, if the light is stored in a damp or humid environment, a dull white coating can form on the glass that also causes a reduction in 253.7 nm UV transmission. The coating is caused by a chemical action with the moisture in the air. The coating can be cleaned off, but the glass under the coating may have already been affected, which might result in reduced transmission. Fingerprints will also absorb very small amounts of UV so these could be cleaned off if desired. The filters can be checked periodically for solarization by obtaining an ultraviolet radiometer and measuring the actual 253.7 nm transmission. When the light is not being used, turn it off to reduce the filter's exposure to excessive ultraviolet. Turning the light "on" and "off" frequently has no effect on the life of the lamp, but it has a positive effect on the life of the filters (with less ultraviolet exposure). The SW filters in the **Dual TripleBright II** should last a long time depending on how humid the environment is. Recent tests indicate that the life of the **FS-60** filters is about 7,000 hours (based on a transmission of about 25% at end of life). When not in use, the light should be stored in a dry environment to protect the filters. Long wave filters do not solarize so they should never wear out.

#### **Removing Glass UV Filters**

To remove the glass **FS-60** SW filters (or FL-60 LW filters); first unplug both the yellow and blue and black power cords. Then: (1) twist the knurled knob attached to the cover that holds the cover on. (2) Let the cover swing free. (3) Side the cover (on the slip hinges) towards the cord end of the light and remove the cover. (4) Remove the filters one at a time. Note, that the points of the sheet metal screws are very sharp so be very careful. (5) Remove the three screws on one side of a filter bracket and loosen the three screws on the other side. (6) Remove one of the metal filter bracket holders and slide the filter out. (7) Do the same for the second filter. Note the filter brackets have aluminum “fingers” that hold the filters. Before installing new filters, you may wish to put some spacer or black tape between the two filters so there will be no glass-to-glass surfaces touching. The tape now between the old filters might degrade. To install a filter just reverse this procedure. Use care when installing a new filter so that the aluminum cover or metal filter bracket holders do not put undue stress on the filter, but make sure that the fingers of the brackets are over the filter (and not just on the

edge of the filter). The recommended method to attach the filter brackets is to tighten each screw a little bit, going around to all six screws several times, rather than tightening first one completely and then another screw. Tighten only enough to hold the filters gently in place.

### **G. REPLACING THE LAMPS**

To either remove or install a **LS-60-254**, **LS-60-185**, **LM-60-312**, **LL-60-352**, or a **LL-60-368** lamp, first unplug both the yellow, blue and black 115V AC plugs. Twist the knurled knob attached to the cover that holds the cover on. Let the cover swing free. Reach in and twist the lamp 90° along its axis and remove it from the lamp holders. Note, the white lamp holders are positioned exactly a set distance apart; however, every lamp has a very slight tolerance in length so some lamps may fit tightly in the lamp holders, and some might be looser. The lamp manufacturer suggested that gloves be used when installing a new SW lamp to keep fingerprints off of the lamp envelope because the oil in your fingers might block some transmission of SW ultraviolet light. Or if you do not use gloves, the manufacturer suggested that alcohol be used to wipe any finger marks off the SW lamp after the lamp is installed. However, it is estimated that any finger oil would only have a very slight absorbing effect on the SW UV, maybe only 1/2% to 3%, so gloves are not absolutely necessary. Gloves are not required for the MW, LW350, or LW370 lamps (since those wavelengths will pass through finger oil).

The **Dual TripleBright II** has two special circuits that allow the lamps to be turned “on” and “off” millions of times without affecting the normal life of the lamps. However, the lamps will fail at some time, usually by failing to come “on”. A life cycle test was conducted that operated three lamps, a **LS-60-254**, a **LM-60-312**, and a **LL-60-352** with each “on” for about 5 minutes and then “off” for about 39 seconds. The life test was stopped in Dec. 2000, without any lamp failures and they had over 94,000 “on-off” cycles and a total of over 7,588 “on” hours each. Another life test had three **LS-60-254** lamps each “on” for 8.2 seconds and “off” for only 1.8 seconds. That test was stopped in March 2005, with over 2.52 million “on-off” cycles and a total of over 10,321 “on” hours without any failures!

The UV output of the **LM-60-312**, **LL-60-352**, and **LL-60-368** lamps will be reduced as the lamp is used. One UV depreciation test indicates that the **LS-60-254** lamp will have about a 20% reduction in about 7,000 hours. Those same tests indicate that the **LL-60-352** lamp will have about a 22% reduction, and the **LM-60-312** lamp will have about a 55% reduction both in about 7,000 hours.

### **H. PERIODIC MAINTENANCE**

Because the fan draws in air from the outside of the case, it is important to clean the inside of the **Dual TripleBright II** from time to time. Every six months (depending on the environment) is suggested. The reflector, lamps, and filters should be wiped off with a clean cloth to remove any dust. Also the SW UV might affect the blue powder coat finish that is on the inside of the cover (in direct exposure to the SW UV) and turn it into dust, which just adds to the dust that needs to be removed.

### **I. ELECTRICAL SCHEMATIC**

An electrical schematic of the **Dual TripleBright II** is shown on the last page of these instructions.

## **J. MAJOR PARTS LIST FOR Dual TripleBright II**

SW Filters (2 required)	<b>FS-60</b>
LW Filters (2 required)	<b>FL-60</b>
Lamps - SW	<b>LS-60-254</b>
MW	<b>LM-60-312</b>
LW350	<b>LL-60-352</b>
LW370	<b>LL-60-368</b>
Ballast (2 required)	<b>Workhouse WH33-120-L</b>

## **K. Other UV SYSTEMS products and accessories to the Dual TripleBright II**

### Automatic Timer

### **T-20**

Electronic timer that can control up to 10 UV lights and up to four different types (such as LW350, LW370, MW, or SW) of lights and also ramp up and dim incandescent lights. Three different outputs are standard. Designed for the single **TripleBright II** and the **Dual TripleBright II**, but will also work for any Instant Start or Rapid Start fluorescent type lights that do not require starters.

### Contrast and Safety Goggles

### **GB**

These goggles will block all ultraviolet from getting in your eyes. A necessity for every collector.

### Replacement filters

### **FILTERS**

8 sizes of replacement SW or LW filters for your other ultraviolet light assemblies.

### Replacement lamps (tubes)

### **LAMPS**

17 sizes of replacement SW, MW, LW350, or LW370 lamps for your other ultraviolet light assemblies.

### Other SW UV lights

### SuperBright 3 **model 4254**

One of the most powerful hand-held SW UV light available.

### MW UV light

### SuperBright 3 **model 4312**

One of the most powerful hand-held MW UV light available.

### LW UV lights

### SuperBright 3 **model 4351** or **model 4368**

Two of the most powerful hand-held LW UV lights available.



## **L. MY "MOST IMPORTANT LIGHT"**

I want to give recognition to the most important light in my life, Jesus Christ, who said, "I am the world's light. No one who follows me stumbles around in the darkness. I provide plenty of light to live in." -John 8:12 "The Message" translation.

*Don Newsome*

## **FLUORESCENT MINERAL SOCIETY, INC.**

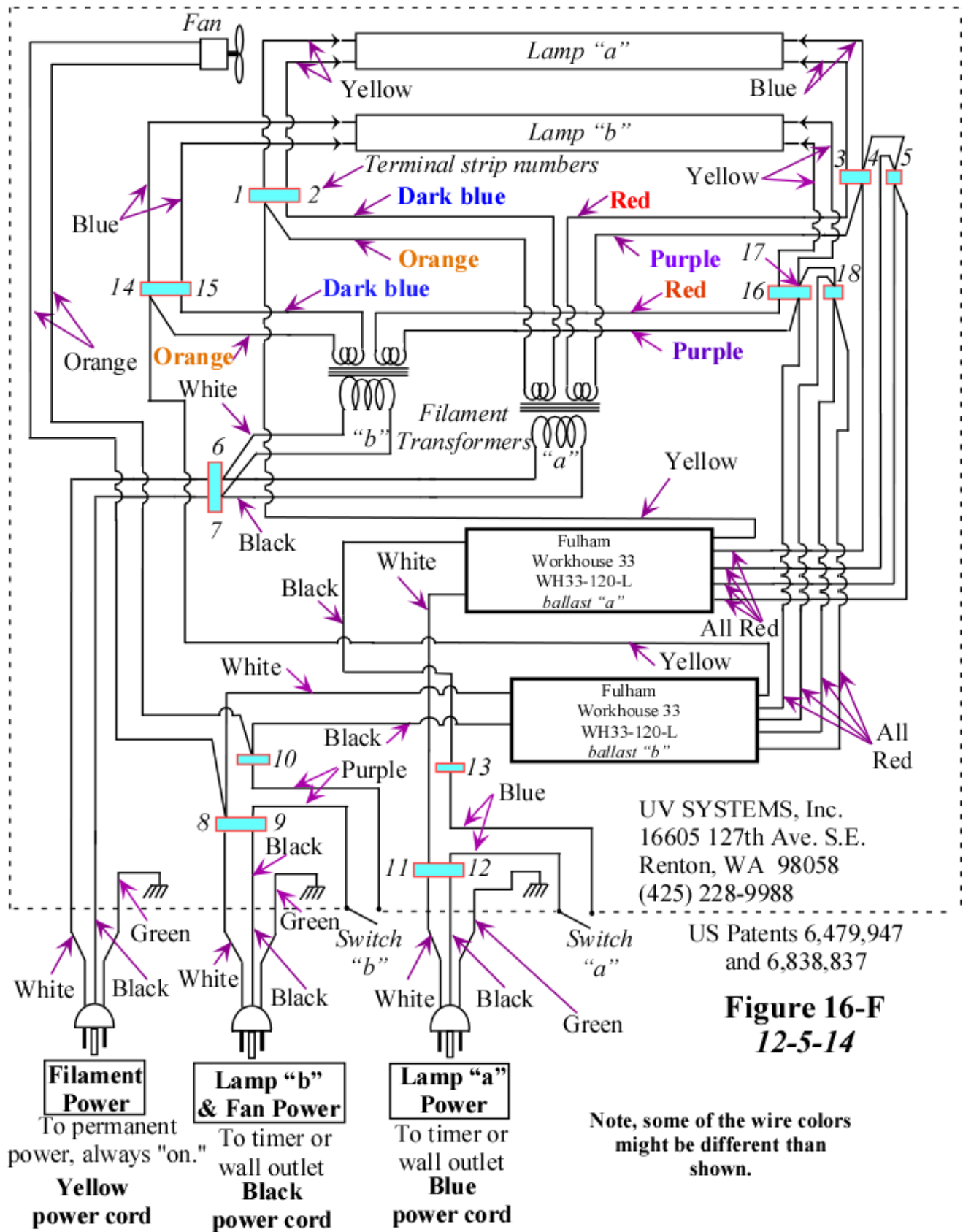
The Fluorescent Mineral Society, Inc. (FMS), it is an international organization for those interested in the fluorescence and luminescence of minerals. It is not connected in any way with UV SYSTEMS, Inc. The FMS members keep in touch through the *UV Waves*, a bimonthly newsletter with articles about fluorescent minerals and their localities, ultraviolet lamps, and related matters. The yearly or biennial *Journal of the Fluorescent Mineral Society* publishes technical articles of lasting interest. FMS members have regular regional meetings, and get together at major mineral shows like those at Denver, Tucson, and Franklin, NJ. The FMS was founded in 1971, and incorporated in 1993.

To receive a free application to the FMS contact UV SYSTEMS, Inc. or contact the FMS at: FMS, PO Box 572694, Tarzana, CA 91357 USA or on the web at: <http://www.uvminerals.org> Or communicate by email with FMS President at [president@uvminerals.org](mailto:president@uvminerals.org)

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# Dual TripleBright II With Two Lamps



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US Patents 6,479,947  
and 6,838,837

**Figure 16-F**  
**12-5-14**