

FAQ – TRISTAR® E27, GU10, MR16 and R2 LED Lamps

POWER SUPPLY NEEDED FOR LAMPS

Q. What is the power supply needed for TRISTAR-MR16 LED lamps?

A. The power supply for the TRISTAR-MR16 LED lamps is 10~17VDC. 12VDC is nominal and 16VDC is recommended because of the voltage drop when multiple lamps are used with longer distances. The capacity depends on the total number of lamps connected to the power supply. All TriStar LED lamps require 5 watts of power, so if 5 lamps are connected, 25 watts would be required, 100 watts for 20 lamps, 250 watts for 50 lamps, 500 watts for 100 lamps, etc. The formula to use in determining the power supply is Wattage = Volts x I (amperage)

12VDC to 24VDC

Q. Can the TRISTAR-MR16 lamps be used with 24VDC or higher?

A. TRISTAR-MR16 lamps can be used with power supplies from 10~24VDC, but preferably 10~17VDC/VAC. A power supply greater than 24VDC should not be used as this may damage the lamps. A power supply with 12VDC is nominal, however, you may use 16VDC is recommended if you are using long wiring, so that you can compensate for the voltage drop that results from the long wiring.

SYNCHRONIZED COLOR-CHANGING OF NON-F (FREQUENCY) LAMPS

Q. If you connect two or more TriStar E27, GU10 or MR-16 lamps (without the 'frequency' function) together, will they change in a synchronized manner using the pre-set color-changing modes of the IR Remote Controller?

A. They will change in a synchronized manner for more than nine hours. If the power is turned off for eight seconds and then on again, the lamps will operate in the memory mode in a synchronized manner for another nine-hour-plus period. The TRISTAR-RGB F-SERIES lamps, however, have a frequency that allows the lamps to auto-synchronize when multiple lamps are connected to the same AC power source using the line switch.

STAYING ON A SINGLE COLOR - BLUE

Q. How do you get the TriStar lamps to stay on blue and, if the power is turned off, shine in blue again when the power is turned on?

A. If the lamps are all on the same circuit, they should change in a synchronized manner.

For lamps connected to a wall switch, you turn the light switch on and off until the lamps are blue. If the switch is not turned off again for 20 seconds, the lamps will retain that last color (blue) no matter how many times the light switch is turned on and off. The lamp won't change to another color (or light effect) until you turn the light switch on and off within 2 seconds.

If you use the TriStar IR remote controller to change the lamps to a single color, they should again remain in the same position until changed by the remote. So if you use the remote to change the color of the lamps to blue, the lamps will turn back on with blue color until you change them with the remote.

BEAM ANGLE WITH AND WITHOUT LENS

Q. What is the beam angle of the TriStar lamps?

A. The beam angle without lens is 60°. The beam angle with lens is 30°.

E26 AND E27 BASE LAMPS

Q. Is there a difference between an E26 and an E27 type lamp base?

A. The E26 is slightly smaller than the E27. It is used in Japan.

RATIONALE FOR SPECIFYING TRISTAR LAMPS AS 5W

Q. Are TriStar LED lamps 3W lamps or 5W lamps?

A. TriStar LED lamps are considered 5W lamps for the following reason:

1. Wattage is determined by amperage x voltage: $W = I \times V$
2. A 1W LED obtains optimum current at 350mA and 4.0 volts. Each LED is 3.0-4.2V.
3. $W = I \times V$
4. $0.35A \times 3V = 1.05W/LED \times 3 LEDs = 3.15$ total watts minimum
5. $0.35A \times 4.2V = 1.47W/LED \times 3 LEDs = 4.41$ total watts maximum
6. Since some energy is consumed in the circuitry, there is a total of 5 watts of power.

SETUP AND CANCEL BUTTONS ON THE TRISTAR IR-1627 REMOTE CONTROLLER

Q. What are the functions of the Setup and Cancel buttons on the TriStar IR-1627 Remote Controller?

A. The Setup and Cancel buttons on the TriStar IR-1627 Remote Controller are used together with the PAVO-Controllers to give separate ID addresses to the TriStar SMART lamps. These buttons are not used with TRISTAR-E27-RGB, TRISTAR-GU10-RGB or TRISTAR-MR16-RGB lamps.

REDUCING HIGH VOLTAGE INPUT TO EFFICIENTLY DRIVE LEDs IN TRISTAR E27 AND GU10 RGB LAMPS

Q. How is the high voltage input of 100~240VAC into TriStar E27 and GU10 RGB lamps stepped down to power the three LEDs separately?

A. The high voltage of 100~240VAC passes through a power board that first includes a rectifier to change the current from AC to DC and then a step-down transformer to reduce the voltage from 240V to 12VDC. Then there is a control board that provides a minor step-down from 12VDC to 5VDC to power each of the Red, Green and Blue LEDs separately.

CE AND UL APPROVALS

Q. Are the TriStar lamps CE and UL approved?

A. The Tristar-GU10-RGB and TriStar-GU-10-Single Color lamps and the TriStar-E27-RGB and TriStar-E27-Single Color lamps comply with the standards of Low Voltage Directive (LVD) for Safety Test. *Passing this test is required for products to receive the CE mark.*

The Tristar-MR16, E27, GU10 including RGB and Single Color lamps, and the TriStar-MR16-Master and TriStar-MR16-Slave lamps, meet all requirements of the EMC (Electro Magnetic Compatibility) regulations.

The TriStar MR16, E27 and GU10 lamps have also passed the test for the RoHS Regulations. RoHS is a new requirement for the EU that began July 1, 2006. The regulations require that no lead, mercury or other heavy metals are included in products sold to countries in the EU.

The TriStar MR16 and R2 lamps are low voltage products, so they do not need UL approval.

The TriStar E27 and GU10 lamps have not yet been submitted for UL testing.

CONTROLLING MR16 RGB LAMPS UNDERWATER

Q. Can the IR remote controller control MR16 lamps 500mm below the surface of water?

A. Yes, it can, but if there are a group of MR16 lamps underwater, the IR remote may not be able to synchronize them. An alternative, and probably better, solution is to connect all of the MR16 lamps to an on-off switch. When you turn the switch on-off-on within two seconds, all the lamps will be synchronized. Then you can turn them off and back on within about 4 seconds and they will go to a different single color or a color changing effect - again, in a synchronized manner - each time you turn the switch off and on.

THREADS ON THE SIDE OF THE MR16

Q. What are the threads on the side of the MR16?

A. The threads on the side of the MR16 can be used for installing two extra springs for mounting purposes. After installing the springs (two stainless steel plates) you can mount the MR16 lamp directly to the ceiling without any additional fixture.

STICKERS ON THE LAMPS

Q. What is the purpose of the stickers on the lamps?

A. The stickers are warranty seals. Customers should not open the lamps. If the sticker is broken, it will invalidate the one-year warranty of the lamps.

RECOMMENDED TRANSFORMERS

Q. What are the recommended transformers for TRISTAR-MR16 lamps?

A. It is recommended that a 12VDC transformer be used with TRISTAR-MR16 lamps. It is also possible to use a 12VAC toroidal transformer or a 12VAC magnetic transformer.

Electronic transformers can work 95% of the time, but they can sometimes be unstable. (The lamps will not be harmed if electronic transformers are tried.) The user needs to use a trial and error approach.

CANNOT GET 'TRUE WHITE' COLOR FROM TRISTAR RGB LAMPS

Q: Why is the white color in the TriStar RGB lamps not a "true white" color?

A: The white in RGB lamps comes from the mixing of the RGB LED chips. The white is always cool and can be pinkish because it is difficult to get a good balance from the mixing of R, G and B. This is a natural feature of color changing lamps. If you want a true white color for an extended period, it is better to use a single-color white LED lamp than an RGB lamp.

TRISTAR MR16-RGB LAMPS STAYING IN SYNCH IN FADE AND SMOOTH MODES

Q: Will the TriStar MR16-RGB lamps stay in synch in the fade and smooth modes?

A: You may keep the TRISTAR-MR16-RGB lamps synchronized when using AC/AC transformers. If you are from the USA, you will be using a 110VAC-12VAC magnetic transformer, and connect all of the TRISTAR lamps to the secondary side (12VAC) output.

You may use a large transformer (100 Watts) to drive up to 20 TRISTAR lamps. Then you can use the On/Off switch on the secondary side, to switch to the different modes built inside the TRISTAR lamps and keep all of them synchronized, including while in the Fade/Smooth modes.

CABLE DISTANCE BETWEEN POWER SUPPLY AND TRISTAR LAMPS

Q: What is the maximum length of cable that can be run from a power supply to a 12V TriStar 5W lamp?

A: The only concern for a long power line would be the voltage drop at the end of the power line. The 12V TRISTAR LED lamps can be powered by a voltage range between 10V and 17V. If you need to wire a long distance, you can use a high voltage power source. The voltage output of some power supplies can be adjusted to its high side.

If you have a fixed 12VDC or 12VAC power supply, and you need a long wire run, then you may use bigger gauge power cables for connection.

Or if you have to wire many lamps on the same power cable, you would also need a larger gauge cable. For example, if you want to wire 10 TRISTAR lamps to a pair of 20 gauge power cables with a 12VDC power supply, and all of the lamps are tied to the very end of the cables, then you will have a maximum current output of 5 Amps, $500\text{mA} \times 10 \text{ Lamps} = 5 \text{ Amps}$.

The resistance for a 20 gauge wire is 1 ohm / 100 ft, so the maximum voltage drop would be 5 Volt / 100 ft, ($V = I * R$, $5 \text{ Volt} = 5 \text{ Amp} * 1 \text{ ohm}$) and you are allowed only to drop the voltage by 2 volt ($12 - 10 = 2$), so the maximum cable length would be 40 ft.

In any case, we would recommend that you use a higher voltage power supply, say 16 volt for a long distance run.

LUMENS AND LUMINOUS FLUX

Q: The R2 Warm White has 105 lumens. How far away do you measure this luminous flux – 1 meter or closer?

A: Lumens are a measurement of the total photonic output. It doesn't change with distance. Lux is the unit for the flux level at a certain distance. The unit is lumens/m². In other words, if the lamp is 3 meters above you, it will light up a large area in circumference and have a certain flux level. But if the lamp is above a desk, say two meters, then the circumference of the area lit is smaller and the flux level is greater. The lumens of the lamp, however, stay the same. (You can check the web for details on this.)

BRIGHTNESS OF TRISTAR-R2 COMPARED TO MR16 HALOGEN BULB

Q: Is the TRISTAR-R2 comparable in brightness to an MR16 halogen bulb?

A: Halogen lamps will generate around 18 lumens/watt, while the R2 has an actual output of 50 lumens/watt. The light pattern or beam angle of a halogen lamp is usually wider than the R2. The R2 has a beam angle of 60 degrees.

The Lux level of the R2 is equivalent to a 20-watt halogen lamp.

PHYSICAL SIZE OF R2 AND MR16 HALOGEN DOWNLIGHT

Q: Can the R2 directly replace an MR16 halogen downlight (the same physical size)?

A: The physical size of the R2 is compatible with the MR16 halogen lamp.

CAN THE TRISTAR-R2 TAKE EITHER AC OR DC VOLTAGE WITHIN THE RANGE OF 10~17 Vdc/Vac?

Q. Its voltage is 10~17 Vdc/Vac, so can the R2 take either AC or DC voltage within this range?

A. Yes. Some electronic 12VAC transformers may not be able to power up the R2. The electrical load of the R2 (3 watts) is too low and sometimes it can not be picked up (or sensed) by many electronic transformers. It is recommended that a 12VDC transformer be used. It is also possible to use a 12VAC toroidal transformer or a 12VAC magnetic transformer.

Electronic transformers can work some times, but they can sometimes be unstable – even different transformers of the same make and model can perform differently. One electronic transformer may work, but the other transformer may cause flickering. (The lamps will not be harmed if electronic transformers are tried.) The user needs to use a trial and error approach.

COLOR VARIATIONS

Q: Will the color(s) vary on an LED lamp over time?

A: Yes. An LED lamp is a semi-conductor product, so while they are more durable than incandescent or fluorescent lamps there are still many factors involved. Heat and temperature can result in some color variation over time, but this is not something we can control. Some degradation of the phosphor may take place after a period of time due to humidity and temperature variations that can affect the color consistency.

Up to now, there is no practical, economical solution to this issue.

USE OF MR16 LAMPS IN SAUNAS

Q: Can the TRISTAR-MR16 lamps be used in saunas?

A: No. The operating temperature should not be over 50° C. It is very difficult to obtain a thermal isolation in a sauna to achieve this because the ambient temperature of saunas is generally 85° ~ 100° C. The LEDs will be dead if the ambient temperature exceeds 100° C