

*Installation Manual
&
Transformer Instructions*



IMPORTANT SAFETY INSTRUCTIONS:

BEFORE INSTALLATION; Please read and thoroughly understand this installation guide to ensure safe and efficient operation of this transformer. Save these instructions for future reference. Install and maintain to comply with all applicable codes.

ClaroLux®, Inc.

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Greensboro, NC 27404

(336) 378-6800

www.ClaroLux.com

Professional Stainless Steel Transformers

Model Number	Size	Description
MT-75-SS	75 Watts	Stainless Steel 75 Watt 12-15 Volt Transformer
MT-150-SS	150 Watts	Stainless Steel 150 Watt 12-15 Volt Transformer
MT-300-SS	300 Watts	Stainless Steel 300 Watt 12-15 Volt Transformer
MT-600-SS	600 Watts	Stainless Steel 600 Watt 12-15 Volt Transformer

Photocells and Timers

Model Number	Description
PC-S	Standard Short Photocell
PC-L	Remote Photocell with Extended Wire Lead
Analog Timer	Analog Turn-Dial Timer
CS-Timer	Digital Astronomical Timer with Built-In Rechargeable Battery
SEQ-Timer	12 Volt Sequencer To Link Multiple Transformers

FEATURES & CONTROLS:

- 1) **Removable Cover:** The door may be removed to simplify installation and servicing. To remove the door, open stainless steel latch(es) and lift the top. Then slide the door up and off the pins. To reinstall, reverse this procedure.
- 2) **1 1/4" Knockout:** To accommodate 1 1/4" conduit.
- 3) **1/2" - 3/4" Knockout:** To accommodate 1/2" or 3/4" conduit.
- 4) **Magnetic Circuit Breakers:** Secondary Protection toggle switch breakers. May also be used to turn on/off circuits.
- 5) **Operating Instructions:** Located inside the door, these operating instructions provide additional wiring information.
- 6) **Terminal Block:** Large 125Amp terminal blocks can accommodate up to 8 wires per tap. Full transformer capacity can be loaded into any single voltage tap.
- 7) **Power Cord:** Heavy duty grounded 6ft. molded water-resistant plug.
- 8) **Lockable Latch:** Lockable stainless steel latch.
- 9) **Timing Receptacle:** 120 Volt timing receptacle for optional digital timer, mechanical timer, or other timing device.
- 10) **Photocell Terminal Plug:** For installation of optional 120 Volt photocell or motion detector.
- 11) **Service Door:** Access panel for easy repairs to the magnetic circuit breakers or other internal components.
- 12) **Swing down bottom tray** for easier access to the wiring compartment during installation. The tray is held in place with a hinge screw and a retaining screw on each side of the transformer enclosure. Loosen the two retaining screws in the front and pull down on the tray to open.



NOT FOR USE WITH SUBMERSIBLE FIXTURES.

WARNING: Risk of Electric Shock. Install power unit 5 feet (1.5m) or more from a pool, spa, or fountain. Where the power unit is installed (a) indoors within 10 feet (3.05m) of a pool, spa, or fountain or (b) outdoors, connect power unit to a receptacle protected by a GFCI.

WARNING: Not for use with receptacles that are weatherproof only when the receptacle cover is closed and the power unit is not inserted.

Getting Started - Halogen System

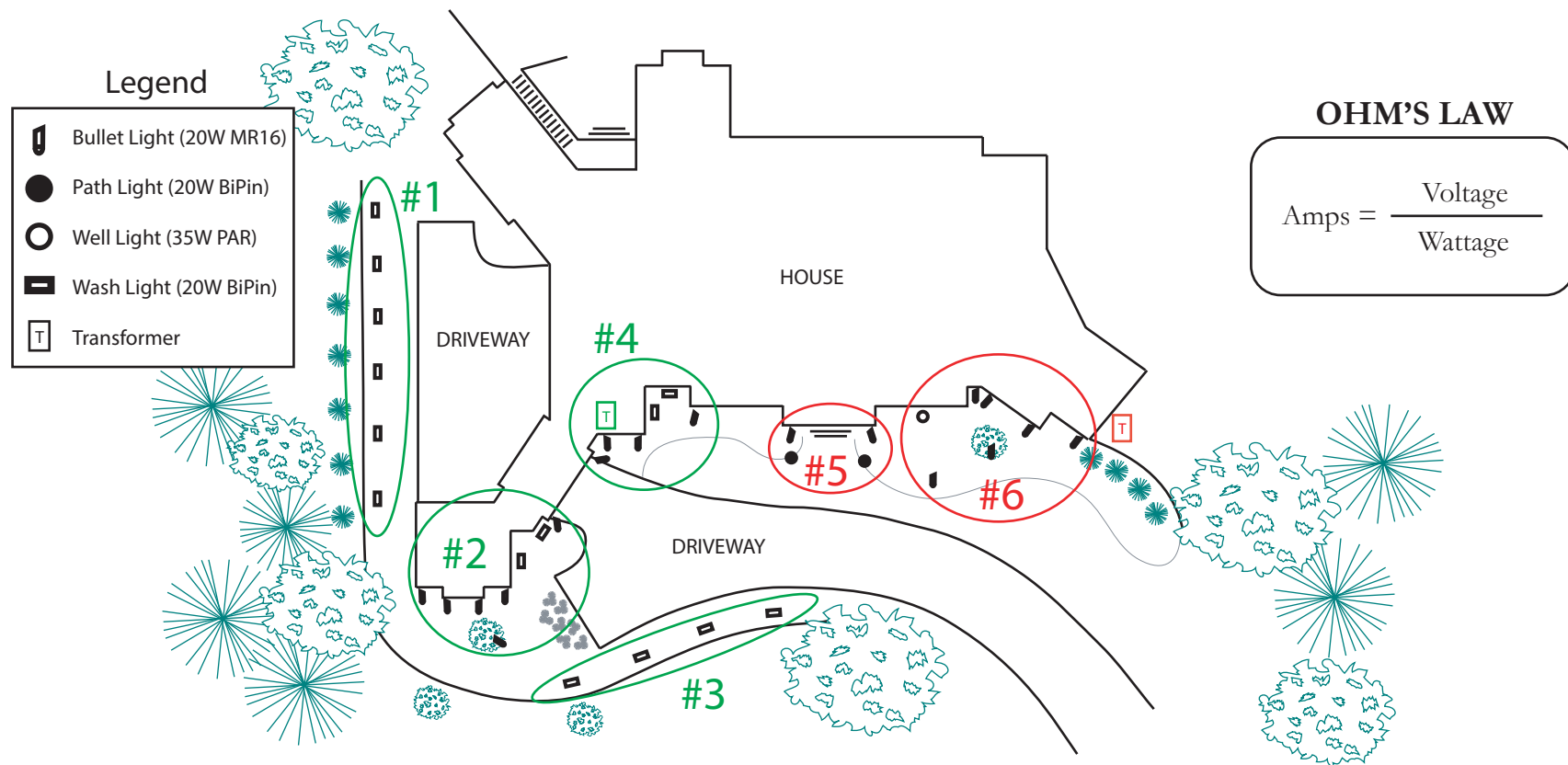
A System that lasts a Lifetime...Guaranteed!

LAYOUT SYSTEM:

- Before starting the installation process, draw a simple diagram of the system. This will help divide the system into groups of fixtures, or zones. Each zone of lighting will be powered by a "home run wire". In the diagram below, the lighting system is grouped into six zones. The home run wire is low voltage cable from the transformer to the zone of lighting.

GROUP CIRCUITS (COMMON TAPS):

- The zones of fixtures must be grouped into circuits that do not exceed 300 Watts or 25 amps. Each 300 Watt circuit is protected by a 25 amp breaker. In the example below, there are six zones totaling 715W, so a 600W transformer and a 300W transformer will be required. To have the transformers turn on at the same time using only one timer/photocell use ClaroLux's 12V Sequencer.



Common Tap #1 (600W)	Common Tap #2 (600W)	Common Tap #1 (300W)
#1 (120W) + #4 (120W) = 240W	#2 (160W) + #3 (80W) = 240W	#5 (80W) + #6 (155W) = 235W

Getting Started - LED System

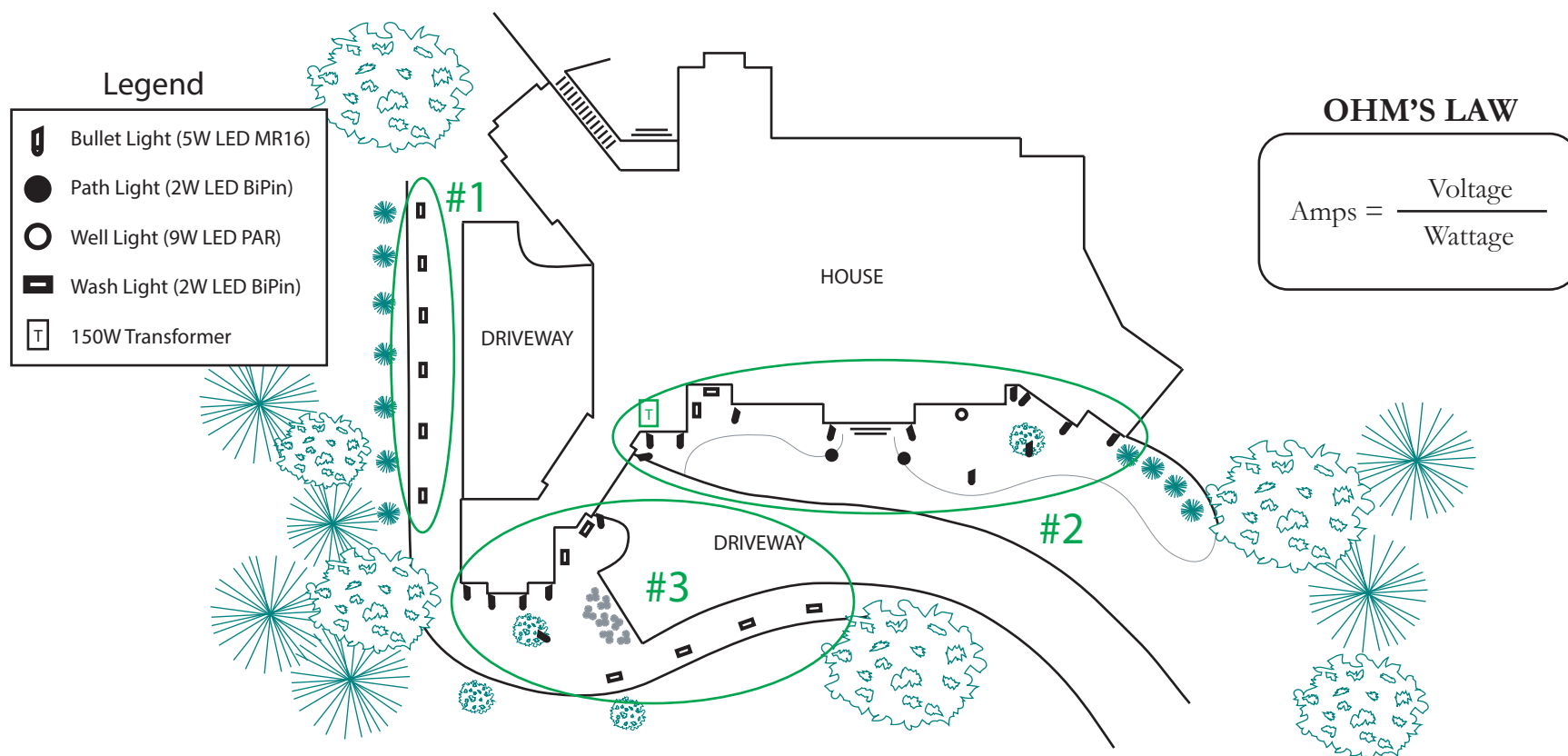
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- Before starting the installation process, draw a simple diagram of the system. This will help divide the system into groups of fixtures, or zones. Each zone of lighting will be powered by a "home run wire". In the diagram below, the lighting system is grouped into three zones. The home run wire is low voltage cable from the transformer to the zone of lighting.

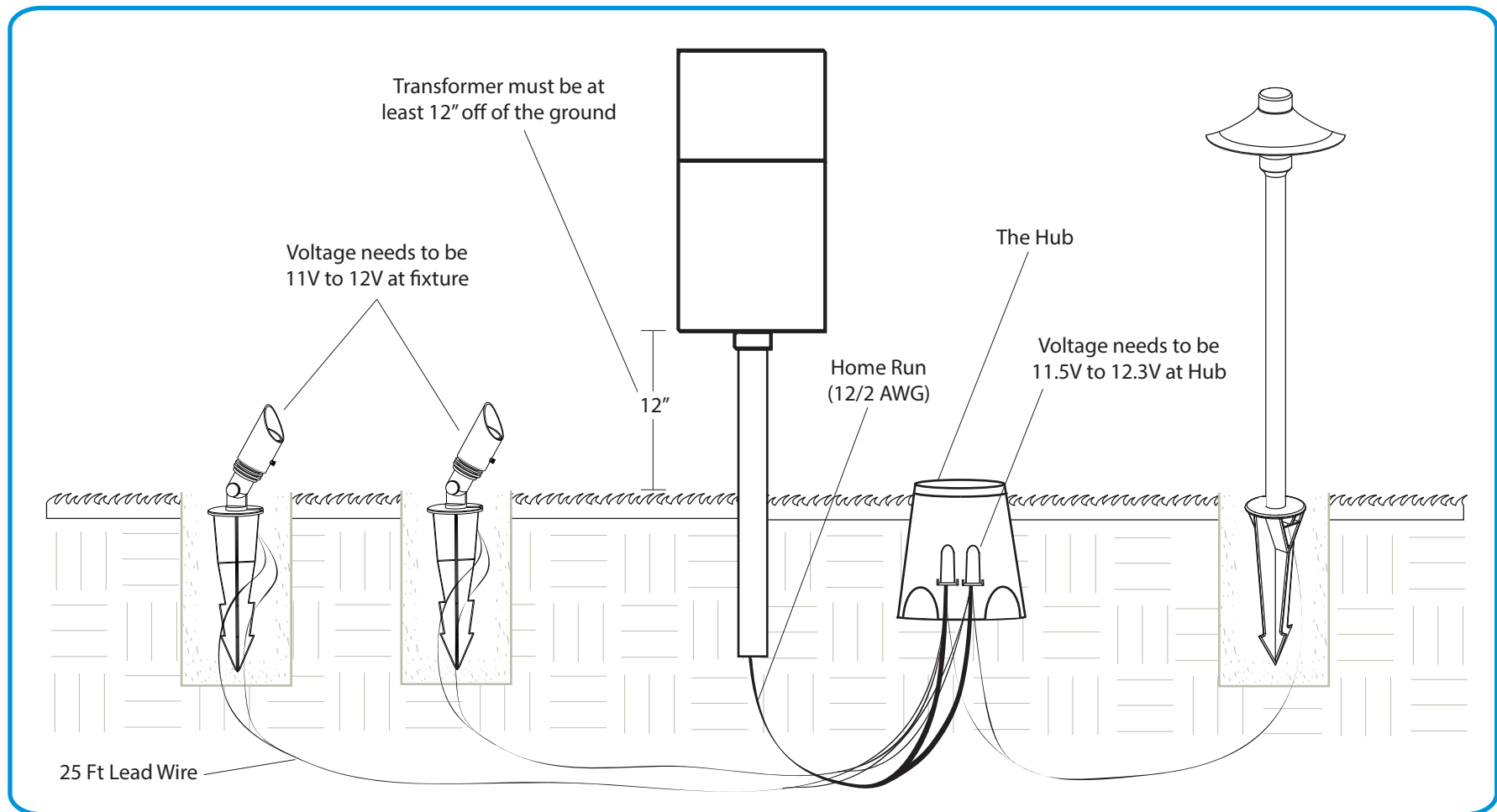
GROUP CIRCUITS (COMMON TAPS):

- If the lighting system contains more than 300W, then zones of fixtures must be grouped into circuits that do not exceed 300 Watts or 25 amps per circuit. There are two 300 Watt circuits in a 600W transformer. Each circuit is protected by a 25 amp breaker. On smaller systems like below, not requiring a large transformer (600W), grouping is not necessary.



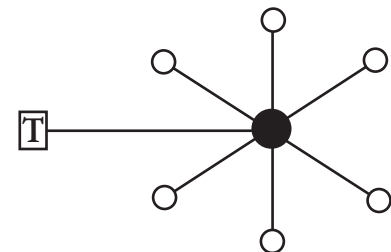
Common Tap #1 (150W)	Common Tap #1 (150W)	Common Tap #1 (150W)
#1 (12W)	#2 (77W)	#3 (42W)

The secret to professional wiring is *ClaroLux's* exclusive *Star Method*.



Benefits of the Star Method

Up to 75% Labor Savings
Equal Voltage at Every Lamp
No Connections in the Ground
Only Two Connections per Home Run
Extends the Life of the System



PLACE FIXTURES:

- Place all the fixtures in their designated locations. Once the fixtures are in place, run all 25 ft lead wires from the fixtures back to a centralized spot. This is where the Hub will be placed. By taping all of the lead wires together at the centralized location this will ensure that the wires will stay together in one place during the burying process. Please note that the secondary wires are intended for shallow burial – less than 6 inches (152mm), unless marked for direct burial. To order additional wire for the secondary wiring, please contact ClaroLux; 336-378-6800.

HOME RUN WIRES:

- Use the chart below to approximate the wire gauge of home run from the transformer to the Hub. In most cases, you can use 12AWG wire because ClaroLux's MultiTap Transformers compensate for voltage drop. The use of expensive heavy gauge wire is usually not necessary.

Key for Voltage Drop Chart: **14AWG** - **12AWG** - **10AWG**

Row	Distance to Hub	Column	1	2	3	4	5	6
		Watts	30	60	90	120	150	180
		Amps	2.5	5.0	7.5	10.0	12.5	15.0
			TAP TO BE USED AT TRANSFORMER					
A	25		12-12-12	12-12-12	13-12-12	13-12-12	13-13-12	00-13-12
B	50		12-12-12	13-13-12	14-13-12	14-13-13	15-14-13	00-14-13
C	75		13-12-12	14-13-13	15-14-13	15-14-14	00-15-14	00-15-14
D	100		13-13-12	14-14-13	15-14-13	00-15-14	00-15-14	00-00-15
E	150		14-13-12	15-14-13	00-15-14	00-00-15	00-00-15	
F	200		14-13-13	00-15-14	00-00-15	00-00-15		
G	250		15-14-13	00-15-14	00-00-15			
H	300		15-14-13	00-00-15				

Max Load Per Wire Run

Wire Gauge	Watts	Amps
10-2	240W	20A
12-2	180W	15A
14-2	150W	12.5A
16-2	100W	8.3A
18-2	65W	5.4A

VOLTAGE TESTING:

Connect all of the home run wires according to the chart. Then test the voltage at each hub. If the voltage is not reading between 11.5 and 12.3 at the hub then you will need to make adjustments at the transformer. If the home run wire is in the 14V tap and is reading 10.8V at the hub, then place the wire in the 15V tap. Retest at the hub to see if that particular zone is now reading the proper voltage. Repeat these steps, testing one home run wire at a time until you have tested the entire system. For LED systems, optimal operating range is 10V - 14V.

CONNECT HUBS:

- Separate all of the wires approximately 6", then strip off 1 1/2" of the insulation. Twist the exposed copper wires together and install the copper crimps over the exposed copper wire. Securely crimp the copper crimps onto the exposed copper wires. Cut off excess strands of copper cable. Leave the connection points open (do not install grease tubes yet). Install grease tubes covering exposed connections after testing for proper voltage.

MOUNT TRANSFORMER:

- 1) Before beginning transformer installation, check National Electric Code (NEC), and local codes. Failure to meet NEC and local codes will void the warranty, and could result in product failure and/or injury.
- 2) Remove the transformer from the box. Note: This power unit is for use with Low Voltage Landscape Lighting Systems.
- 3) Using sturdy screws and anchors (must be load bearing), attach the mounting bracket to a solid surface (the bottom of the bracket must be at least 1 foot above ground level) with the wire terminals facing downwards as shown on Page 3).

CONNECT WIRES INSIDE TRANSFORMER:

- 1) Run your "home run wires"/low voltage cables through the knockouts in the Bottom Plate.
- 2) Separate each of the cables approximately 6".
- 3) After separating the cables, strip off 5/8" of the insulation on each cable and twist the ends of the stranded cable.
- 4) Connect one leg of the cable to the designated common tap determined from the wiring diagrams on page 4 & 5. Then connect the other leg to the power tap recommended by the voltage drop chart, on Page 6.
- 5) Do not exceed the recommended amp load on the primary input (120V). See chart on Page 9.

CONNECT TRANSFORMER TO 120V GFCI OUTLET:

- 1) Turn off ALL circuit breakers in the transformer unit.
- 2) Plug in transformer; **DO NOT USE AN EXTENSION CORD.** The outdoor power unit shall be connected to a GFCI protected hooded flush type cover plate receptacle marked "Wet Location" while in use.
- 3) **WARNING: Risk of Electrical Shock.** When used outdoors, install only to a covered Class A GFCI protected receptacle that is weatherproof with the power unit connected to the receptacle. If one is not provided, contact a qualified electrician for proper installation. Ensure that the power unit and cord do not interfere with completely closing the receptacle cover.

CHECK VOLTAGE AT HUB(S):

- 1) Turn on one breaker at a time until all lighting circuits are energized. Target voltage at the Hub should be 11.5 volts - 12.3 volts (Halogen) and 10 volts - 14 volts (LED). The "home run wires"/cables supplying power to the system in the transformer may need to be adjusted (the voltage drop chart on the previous page should be used simply to APPROXIMATE the voltage tap).

Example: With fixtures connected to the 13-volt tap, and 10 volts is measured at the Hub; then the voltage in the transformer needs to be placed into the 15 volt tap. [12 volts - 10 volts = 2 volt difference; (13 volt original tap + 2 volt difference = 15 volt tap to achieve the recommended 12 volts at the Hub)]

1. PHOTOCELL ONLY: (ON AT DUSK, OFF AT DAWN)

- 1) Unplug transformer.
- 2) Remove knockout on right side of transformer.
- 3) Unplug the photocell jumper.
- 4) Thread photocell through knockout and plug it into the connection.

Note: Make sure the photocell has ample exposure to sunlight. If not, the unit will not function properly.

Note: REMEMBER TO REMOVE BLACK PHOTOCELL COVER WHEN FINISHED.

2. TIMER ONLY: (PROGRAMMED ON TIME & PROGRAMMED OFF TIME)

- 1) To program timer see manufacturer's instructions.

3. TIMER & PHOTOCELL COMBINATION: (ON AT DUSK, PROGRAMMED OFF TIME)

- 1) When using a timer and photocell combination, it is recommended to set the timer ON time for 3:00pm (or at least 2 hours prior to the earliest sunset time in your region). At 3:00PM, when the timer turns on, the photocell will energize. The lights will briefly turn on, and turn off within 1 to 2 minutes after the photocell detects light. Since the photocell is now energized, it will automatically turn the lights on when it gets dark.
- 2) After the ON time is set, now set the OFF time. To program off time, see manufacturer's instructions.
- 3) Now the system will turn ON at dusk and OFF at the programmed time.

Note: Make sure that the photocell has ample exposure to sunlight. If not, the unit will not function properly.

Note: REMEMBER TO REMOVE BLACK PHOTOCELL COVER WHEN FINISHED.

Transformer - Final System Check

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FINAL SYSTEM CHECK

SAVE THESE INSTRUCTIONS

- 1) Check Primary Amp Load by placing an Amp Probe (sample pictured below) on the primary "wire loop" or "jumper loop" where the photocell plugs into place. OR - place an Amp Probe around one side of the timer wire (shown in the diagram on page 2, point #9).

DO NOT EXCEED THE MAXIMUM INPUT CURRENT specified below.

Transformer Rating	75W	150W	300W	600W
Max. Input Current	0.625A	1.25A	2.5A	5.0A



AMP PROBE

- 2) Test secondary Amp Load.

- a) Check amp load on all home run wires going into each common tap. (i.e. If there are 3 home run wires going into common tap 1, then place the amp probe around all 3 wires). Make sure the rating does not exceed 75% of recommended amp load (specified below).

Transformer Rating	75W	150W	300W
Max. Output Current	6.25A	12.5A	25.0A

Note: This Table used 12V outputs for measurements. For higher voltage tap transformers, the Max Output Current = Transformer Rating/Output Tap Voltage.

- b) Check amp load on each individual home run wire. Place Amp Probe around the individual home run wires coming into the transformer. Ensure that the recommended amperage has not been exceeded for the wire gauge used (see the table on Page 6).

Note: Overloading the home run wires will reduce the life expectancy of the wire and is a fire hazard.

- 3) Test voltage at each Hub to ensure 11.5 volts - 12.3 volts (Halogen) and 10 volts - 14 volts (LED). Once voltage at each Hub is in the target range, install grease tubes over the copper crimps to ensure a water tight seal. Then place the covers on the Hubs.
- 4) Make sure the timer and photocell are operating properly. You have now completed the installation.

ClaroLux Transformers carry a Limited 15 year Warranty against manufacturer's defects. See below for details.

- Stainless Steel Enclosures: Lifetime warranty
- Windings (Core): 15-year warranty
- Terminal Blocks: 5-year warranty
- Electrical Components (including contactor switches, resistors, etc): 3-year warranty
- Photocells: Contact manufacturer for warranty claims
- Timers: Contact manufacturer for warranty claims

NOTE: Before ClaroLux® will accept suspect transformers, they must be bench-tested by a certified ClaroLux® Dealer to confirm malfunction. If the transformer can be fixed, the replacement parts will be sent from ClaroLux® to the ClaroLux® Dealer to repair/replace the parts. Warranty will not be honored for transformers with cut wires, bent housings, or other modifications.

Transformer warranty covers only properly installed and maintained transformers by a certified ClaroLux® Dealer. Transformers returned and inspected at the ClaroLux® Manufacturing Center in Greensboro, NC, found to have the following will not be covered by warranty:

- Transformers left operating in a horizontal position or while in contact with the ground
- Transformers left operating without cover in place as evidenced by internal weather or water damage
- Transformers with missing covers or other supplied parts
- Transformers with cut power cords, or that have been altered in any way
- Transformers damaged by loose terminal block screws
- Transformers that have been overloaded or exceeded the maximum amperage/wattage rating
- Transformers installed within one thousand feet of any salt water source must be installed in an enclosure such as by Hoffman MFG or in a building, shed, or suitable protection to avoid salt spray damage to the transformer. Damage from salt spray is not covered by this warranty. Installations in a building must adhere to specific local electrical code. Contact local electrical authority for details specific to your municipality or governing body.
- Transformers damaged by surges or lightning strikes

Return Policy - Transformers

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Transformers that are returned to ClaroLux® must have an RGA from ClaroLux® Corporate in Greensboro, NC. To replace a transformer that is suspected of having a warranted defect, the original purchaser must contact ClaroLux® and obtain a return goods authorization (RGA) and ship FOB destination to the ClaroLux® Manufacturing Center identified on the RGA.

The transformer(s) will be repaired and returned to customer either with a like model swapped out for the returned unit or the actual returned unit being repaired and returned to the customer. ClaroLux® reserves the right to issue a credit, repair, or swap-out with a rebuilt transformer any defective transformer.

If returned transformers are found to require repairs not covered under warranty, then the customer will be notified of the repair charge and given 10 days from the date of estimate to choose to either repair, return un-repaired, or to abandon ownership. **Minimum transformer repair fee for repairs not covered under warranty (please call ClaroLux for minimum repair fee).** Transformers held over 30 days (without communication from owner) will be considered abandoned and ClaroLux® will assume ownership. If owner authorizes unwarranted repairs, then the owner will be responsible for all repair, packaging, and shipping costs.

In addition to the above, all returned transformers must be tagged with the customer's name, contact person, problem encountered, cell phone number, and email address. Do not write on the transformer with a magic marker. The transformer must be packaged properly to avoid shipping damage. ClaroLux® does not cover damage caused in transit.

Warranty terms are subject to change without notice. ClaroLux® also reserves the right to modify these warranty terms in order to comply with policy or laws governing warranty issues in states or countries having specific remedies differing or additional to those described within this document.

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PO Box 4554
Greensboro, NC 27404

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ClaroLux[®]
LANDSCAPE LIGHTING

www.ClaroLux.com