

## Low Voltage & Transformers

### DESCRIPTION

Transformers reduce line voltage to 12 volts for use with Lumière low voltage fixtures.

Transformers are available in four basic types:

- Hard wire installation – Standard outdoor low voltage lighting transformer for hard wiring direct to conduit.
- Cord and plug – Plug in directly to existing outlets, for ease of installation. Also available with a built in timer.
- Inground – Low profile inground installation for reduced visual impact and increased flexibility.
- Compact solid state electronic transformers – For use in approved housings or boxes.

### Transformer Selection

The total wattage of all lamps used must not exceed the rating of the transformer selected for the installation. For example, a 150VA (VA = watts) transformer cannot power four fixtures with 50 watt lamps.

The transformer selected should match the total lamp wattage as closely as possible. It is good practice to use at least 33 to 50 percent, and no more than 85 to 90 percent, of the transformer’s rated capacity.

Make sure that the transformer selected reduces the appropriate line voltage. For example, do not use a 120 to 12 volt transformer with a 277 volt system. Lumière Atlantis series fixtures (model 1407 - 1409) must be used with model T300, which is approved for use in pool and spa type applications.

Transformers must be installed in accordance with local and national electrical codes and other rules, regulations and requirements.

### Voltage Drop

Resistance to electricity passing through electrical wiring causes the voltage at the end of a run of wire to be lower than the voltage at the transformer. This will cause fixtures at the end of a run to be noticeably dimmer than those closer to the transformer.

The factors affecting voltage drop are the total wattage of lamps on the run, the length of the run and the gauge of the wire.

There are several ways to minimize the impact of voltage drop:

- Use larger gauge cable
- Shorten cable runs
- Use lower wattage lamps
- Reduce the number of fixtures on the run
- Divide the fixtures over more runs from the transformer
- Use multiple transformers

### VOLTAGE DROP FORMULA

$$\frac{\text{Total watts on cable} \times \text{length of run}}{\text{Cable size constant}^*} = \text{Voltage Drop}$$

### CABLE SIZE CONSTANT CHART\*

Cable size	#18	#16	#14	#12	#10	#8	#6
Cable constant	1380	2200	3500	7500	11,920	18,960	30,150

Voltage drop is not always bad.

For example, dropping voltage at the lamp to 11.5 volts will give 80% of the lamp’s rated candlepower, and double the rated life of the lamp. This is acceptable in most applications, and will result in lower maintenance costs.

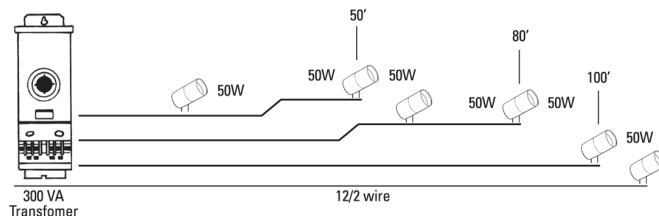
The accompanying chart demonstrates how voltage at the lamp affects rated lamp life and rated candlepower:

### VOLTAGE DROP CHART

Voltage at lamp	Life expectancy of lamp	% of rated candlepower
13.2	2/3 rated life	350
12.6	3/4 rated life	180
12.0	as rated	100
11.5	2X rated life	80
11.0	3X rated life	74
10.5	5X rated life	65
10.0	9X rated life	50

### Sample Landscape Lighting Installation

We recommend using 12/2 or larger inground stranded cable. To control voltage drop, for each 100 watts allowed, use 100 feet of wire, maximum, to stay at approximately 10 volts at the end of the run. For example, a 300 watt (300VA) transformer may have three separate runs with 100' maximum on each run. This is standard procedure for low voltage installations. Any setup within these parameters will maintain sufficient lumen output. (Provided as an example only – output requirements may vary depending on individual situations and preferences.)



### ORDERING INFORMATION

Order transformers and low voltage cable as separate line items.

### Transformers for Hard Wire Installation (120 to 12 Volt)

- Core and coil construction
- Pre-wired primary and secondary
- Secondary protection
- Potted for quiet operation and long life
- Case 3R outdoor listed

MODEL	DESCRIPTION
T50	50VA Wet listed low voltage lighting transformer for hard wire installation
T100	100VA Wet listed low voltage lighting transformer for hard wire installation
T150	150VA Wet listed low voltage lighting transformer for hard wire installation
T250	250VA Wet listed low voltage lighting transformer for hard wire installation
T300	300VA Wet listed low voltage lighting transformer for hard wire installation (Model T300 is approved for use with underwater lighting fixtures)
T750	750VA Wet listed low voltage lighting transformer for hard wire installation
T1000	1000VA Wet listed low voltage lighting transformer for hard wire installation

### Transformers for Hard Wire Installation (277 to 12 Volt)

- Core and coil construction
- Pre-wired primary and secondary
- Secondary protection
- Potted for quiet operation and long life
- Case 3R outdoor listed

MODEL	DESCRIPTION
TC300	300VA Wet listed low voltage lighting transformer for hard wire installation
TC500	500VA Wet listed low voltage lighting transformer for hard wire installation
TC750	750VA Wet listed low voltage lighting transformer for hard wire installation

### Inground Transformer (120 to 12 Volt)

- Core and coil construction
- Corrosion-proof composite material for inground installation
- Removable lid
- O-ring seals to insure fixture durability and weatherability
- Potted to protect against moisture

MODEL	DESCRIPTION
T56	300VA wet listed low voltage transformer housed in composite container for inground installation

Note: Do not bury inground transformers up to the top of the lid. Ensure that soil does not reach the bottom of the transformer's lid. Follow installation procedures for inground fixtures for proper operation.

### Solid State Transformers (120 to 12 Volt)

- Quiet operation
- Small size
- High efficiency
- Epoxy seal to protect against damp conditions
- Ideal for use in listed J-Boxes or housings

MODEL	DESCRIPTION
T60	75VA solid state transformer. Halogen and Non-LED MR16 only
T61	60VA solid state transformer with 8' cord and plug
T65	150VA solid state transformer

### Transformers with Cords, Plugs & Timers (120 to 12 Volt)

- Core and coil construction
- Epoxy impregnated for quiet, cool operation
- Thermostat protection on primary
- Circuit breaker protection on secondary
- Electrostatic grounded shield between primary and secondary
- On-off switch
- 12 volt easy wiring strip
- Equipped with 6' line cord and 3 prong plug
- hard wiring capability

MODEL	DESCRIPTION
TR150	150VA wet listed outdoor transformer with 8' cord and plug
TR150T	150VA wet listed outdoor transformer with timer and 8' cord and plug
TR300	300VA wet listed outdoor transformer with 8' cord and plug
TR300T	300VA wet listed outdoor transformer with timer and 8' cord and plug
TR600	600VA wet listed outdoor transformer with 8' cord and plug
TR600T	600VA wet listed outdoor transformer with timer and 8' cord and plug
TR900	900VA wet listed outdoor transformer with 8' cord and plug
TR900T	900VA wet listed outdoor transformer with timer and 8' cord and plug
TRPC	Photo cell for use with TR300, TR300T, TR600, TR600T, TR900, TR900T

### Transformers for Under Water Fixtures (120 to 12 Volt)

- Pool and Spa Rated

MODEL	DESCRIPTION
T300	300VA Pool and Spa Rated, Magnetic
PX100	100VA Pool and Spa Rated, Solid State

### Low Wattage Transformers for LED use

- To be installed in wet listed J-box

MODEL	DESCRIPTION
T20-PK	20VA Magnetic, 120V
T20-277 PK	20VA Magnetic, 277V
T60LED-120V	60VA Solid state, 120V
T60LED-277V	60VA Solid state, 277V