

## PRODUCT MAINTENANCE GUIDE

### Introduction:

*As with all mechanical and electrical components, maintaining the products optimum performance throughout its service life is strongly reliant on the implementation of a scheduled maintenance and cleaning program.*

*Lighting equipment is no different to this rule; hence the following guidelines serve to provide the user of Pierlite Australia lighting systems a professional service schedule for typical Metal Halide and High pressure Sodium lamp wattages of 150watt to 1000watt, E40/E39, reactor ignitor systems.*

*Although LED, CFL and linear fluorescent products use different control systems to operate the lamp, general maintenance recommendations highlighted in this guideline should be followed as good practice.*

*It is also important the application and orientation of the product installed is in accordance with the nominated product IP rating and class designation; installation environments outside these design parameters is not recommended.*

*And it goes without question, that all products should be thoroughly cleaned on a regular basis to ensure the optical performance of the product, together with the product electrical, mechanical and structural integrity as designed is maintained throughout the service life of the product.*

### HID Maintenance guidelines:

The operation of HID lamps in particular Metal Halide and High Pressure Sodium types consists of four (4) key electrical components namely; a **ballast** which acts as a current limiting device, an **ignitor** which provides a high voltage spike to the lamp upon start up, a **capacitor** providing more efficient usage of power and a **lamp** which provides the lighting source.

#### 1. the Ballast:

The ballast is the only component in the system that does not require periodic maintenance; providing the ballast has been selected and matched with the approved control gear by the component manufacturer. However, it is important to note that when system components are replaced, eg: a capacitor, the component is replaced with an equivalent rated item and at the time of the maintenance, it is recommended to check the electrical parameters of the ballast to ensure it is operating within the design limits.

#### 2. the Ignitor:

The ignitor provides the necessary (high) starting voltage to activate (ignite) the lamp. The voltage necessary for lamp activation is higher than the available mains voltage; with typical voltage pulses ranging from 1KV to 5 KV depending on the type of lamp.

Currently on the market there are two (2) key styles of ignitors namely: Impulser styles, with or without the use of a specific ignitor tap on the ballast, and Superimposed Pulse styles which do not need the use of an ignitor tap on the ballast and work independently of same. Within these two (2) styles there are various timed versions which provide the added advantage of shutting down when a lamp is either faulty or at end of life and will not restrike again."

It is important to consult with your lighting supplier to identify what ignitor system is best suited for your installation requirements eg: generally lower cost (budget) HID luminaires are not fitted with timed ignitors; hence when the lamp fails, the standard ignitor system will continue to attempt to activate the failed lamp and if maintenance programs do not provide for a prompt repair or isolation of the equipment, system damage may occur.

In layman terms, the allowance of a lamp left to continually "strike", is the same as continuing to drive your vehicle with a flat tyre, which is not recommended.

### **so when do I change an Ignitor?**

Lamp maintenance is critical to ignitor life, the quickest way to reduce the ignitor service life is to have it continuously pulse a failed lamp; this is not recommended as this condition will over heat the ignitor system and lead to premature failure of the component.

As a guide when a failed lamp is changed and the new lamp ignites immediately then the ignitor has not suffered any long term effects; however if the new lamp fails to ignite, then the ignitor will also need replacing.

Under normal operation an ignitor service life will survive four (4) to five (5) lamp changes, if a lamp displays signs of end of life as listed in the Lamp section below and is replaced immediately; ignitor life will not be adversely affected

However, as the ignitor component is a relatively low cost item (compared to accessing the product), it is advisable to consider changing the ignitor during every fourth (4th) lamp change.

### **3. the Capacitor:**

Capacitors have a typical service life expectation of 50,000 hours based upon standard operating conditions; however as with all electrical components this performance can be rapidly reduced if the product and components are subject adverse environmental conditions such as: Excessive and rapid voltage fluctuations; Excessive condensation for products not designed to accommodate water ingress; High and continued humidity levels in excess of IEC 60068-2-3; Excessive and extended thermal ambient temperatures for products not designed to accommodate such conditions; High mains harmonics.

As with the selection of ignitor components, it is important to discuss any expected adverse installation parameters with your lighting design to ensure both the correct luminaire and subcomponents are selected eg: Pierlite Australia current production guidelines use aluminium cased capacitors rated at 105degree, which are internally fused for added system safety.

### **so when do I change a capacitor?**

Additional to known failed units which should be change immediately, based upon the general lamp life expectation of 13,000 to 20,000 hours (subject to manufactures survival curves). It is recommended to check the system capacitance at each third (3rd) lamp change in accordance with the lamp manufactures guidelines and if the system is found to be out of tolerance, the component should be replaced. To reflect current technology enhancements, it is recommended to replace the component with a fused, high thermal rated, steel cased product.

### **4. the Lamp:**

In general, professional branded HID Metal Halide and High Pressure Sodium lamps have a service life of 13,000 - 20,000 hrs, based upon wattage type, minimum operating intervals and published survival curve parameters. LED, CFL and linear lamp systems vary from 6,000 to 50,000 hours rated average life.

Adoption of the manufactures operating, installation and maintenance guides are strongly recommended to ensure the optimum performance of the lamp is achieved. Frequent lamp switch cycles and short operating intervals significantly impact the longevity of a HID lamp and should be avoided. When a HID lamp has reached its designated end of life the most important task to complete to ensure the system is not unnecessarily damaged, is the prompt replacement of the lamp or isolation of the unit. Typical symptoms of "end of life" conditions are:

The colour of the lamp changes dramatically.

There is a significant loss of brightness.

The lamp no longer ignites or is delayed in striking the lamp.

The lamp starts to cycle, periodically goes out and then ignites again some time later.

### **what is lamp life?**

Professionally branded lamps are designed and tested to strict international IEC standards and with it defined calculations as to "average life". Typically there are two (2) methods of calculating lamp life namely: average rated life – whereby a defined production quantity is tested using set switching cycles and when 50% of the lamps remain the result determines the rated average life.

Eg: an installation using a quantity of 100 lamps, with a 10,000 average rated life = at 10,000 hours operation 50 lamps will have failed OR

economical life - whereby a defined production quantity is tested using set switching cycles and when the batch selected reaches a determined light output, that then determines the economical life of the lamp.

Eg: an installation using a quantity of 100 lamps, with a 10,000 average (output) life equaling a depreciation of 60% = at 10,000 hours operation the installation lighting output will be 40% of the original installed design.

It is important at the time of the lighting design to consult with your lighting professional to determine what lamp lumen depreciation factors should be included to accommodate the expected and natural deterioration of the lamp component.

For system integrity ensure you replace the lamp with a direct and approved equivalent.