KUMHO ELECTRIC USA, INC.

Advanced Lighting Technologies

Econergy™ Induction Lighting

Kumho Electric's electrode-less induction lighting leverages new technology developments to provide a high-efficiency, low-maintenance, long-term lighting solution. With a 100,000-hour rated life, Econergy induction lamps are ideal for outdoor applications where re-lamping is expensive or cumbersome, as in parking lots, street lighting, tunnels, or indoors for high bay fixtures.Versatile mounting options make them the ideal choice for a variety of pole, ceiling and wall-mounted applications.

How do Econergy Lamps Save Energy?

Typical HID lighting has steep lumen depreciation curves, losing as much as half its initial light output by the time it reaches midlife. Econergy is manufactured with technology Kumho Electric developed for the back light panel display industry, which reduces lumen depreciation to less than 30% over the 100,000-hour life of the lamp. Since HID lamps tend to be over-designed, providing higher initial lumens to compensate for fast degradation, wattage is being wasted due to expected light loss. Econergy's high lumen maintenance levels makes this over-compensation unnecessary.

In addition, Econergy provides much higher level of luminous efficacy (lumen/watt) due to scotopic factors: high color temperature (K) combined with high color rendering index (CRI). The resulting clean, crisp white light is better to read, work and sell under. Colors are truer and merchandise looks real. This better visual acuity is achieved using less energy than with other, higher-wattage lamps.

As a result, Kumho Electric's Econergy lamps are 50% more efficient than the typical HID lighting they replace. Depending on the application, one 100-watt Econergy induction lamp may replace a 150 or even a 200 watt HID lamp. Moreover, it will provide more consistent illumination over a much longer period of time.

Gradual, minimal light depreciation ensures predictable, uniform illumination over many years.

Slashing Maintenance Costs

Re-lamping outdoor or high-bay fixtures is both costly and cumbersome, involving specialized equipment and maintenance crews. Since Econergy lamps have a rated life of 100,00 or longer than 10 years(*), they can be expected to last four to five times longer than typical HID lamps. This means the frequency of replacement goes down to virtually zero. Econergy induction lighting will pay for itself with energy and labor savings on spot replacement and re-lamping costs alone.

* assuming a burn rate of 12-14 hours a day

NOTES:

- Four components make up the Econergy system: lamp, power coupler, heat sink and generator
- Approximate lumen values listed are for vertical operation of the lamp
- Mean lumens is the approximate output at 40% of rated average life

Unparalleled Warranty

The quality and durability of this product is so outstanding that Kumho Electric is offering the strongest, most comprehensive warranty program in the industry, (refer to Kumho Electric's warranty data sheet).

KUMHO ELECTRIC
Recognized around the world

The European Community

ISO 14001

USA Federal Communications Commission

ISO9001

North America Industry Standard

High Energy Efficient Equipment Label

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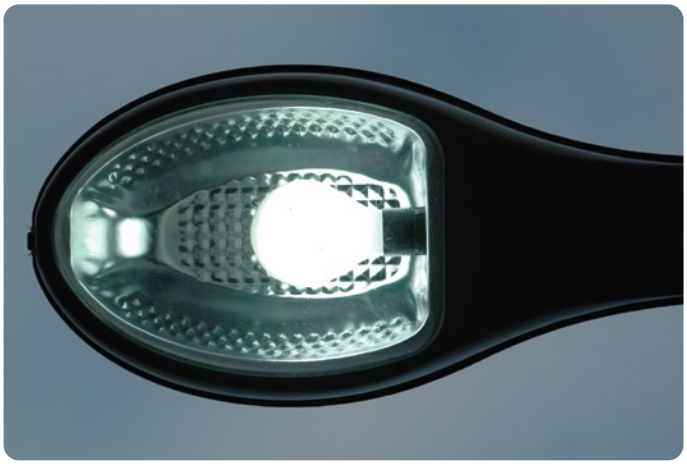
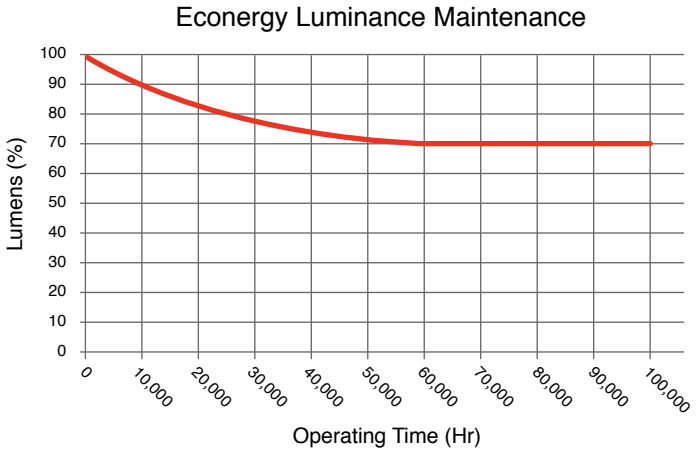
Features & Benefits

- **Very long life** – 100,000 hours rated life translates to significant savings in maintenance costs
- **High lumen output** – 2,800 initial lumens (40W lamp) to 11,250 initial lumens (150W lamp)
- **Range of input voltage** – each lamp has the ability to operate on voltages ranging from 120 to 277
- **Gradual, minimal lumen depreciation** – still at 70% luminosity at end of life means fewer replacements, more efficient lighting
- **Outstanding color rendering** – CRI of 80 provides for vivid, natural colors
- **Range of color temperatures** – choice of warm or cool light for desired effect and particular applications
- **Stable output** – relatively unaffected by fluctuations in line voltage, the Induction lamp output remains constant over wide ranges of inputs
- **Instant-ON capability** – because it does not require warm-up time to come to full luminescence, it can be controlled by occupancy sensors to provide further energy savings
- **Hot and cold operation** – performs on a wide range of environments -- from -20° to 60°
- **No flickering or noise** – a distraction-free option for indoor or outdoor applications
- **Low mercury** – uses only 6 mgs of mercury, a much more environmentally-friendly product than other alternatives





Product Comparison Chart

	Econergy	High Press Sodium	Metal Halide	Pulse Start
Power consumption (W)	**100W**	150W	175W	150W
Luminous flux (Lm)	**7,500**	14,000	14,000	14,000
Luminous efficacy (Lm/W)	**75**	93.3	80	93.3
Color temperature (K)	**3000-6500**	2,000	4000-6500	4000-6500
Color rendering index (CRI)	**80**	28	65	65
Initial/re-start time	**Instant**	8~10min	8~10min	3~4min
Set weight	**1kg**	6kg	6kg	6kg
Heated temperature	**100 C**	300~400 C	300~400 C	300~400 C
Lumen depreciation	**Slow**	Medium	Fast	Fast
Average rated life hours	**100,000**	24,000	10,000	10,000
Mercury content	**6 mg**	30 mg	30 mg	30 mg

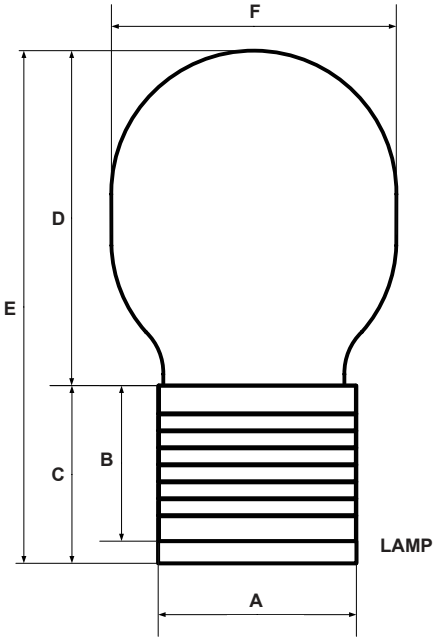
Specifications

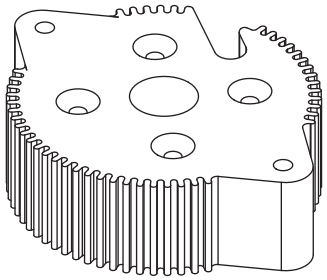
Description	Order Code	Watts (W)	Input Voltage (V)	Average Rated Life (Hrs)	Lumens (Lm)	Color Temp Kelvin (K)	CRI
Econergy 40W	101504	40	120 - 277	100,000	2,800	5000	80
Econergy 70W	101507	70	120 - 277	100,000	5,250	5000	80
Econergy 100W	101510	100	120 - 277	100,000	7,500	5000	80
Econergy 150W	101515	150	120 - 277	100,000	11,250	5000	80
Econergy 200W	101520	200	120 - 277	100,000	15,050	5000	80

Description	Luminous Flux (Lm)	Luminous Efficacy (Lm/W) (Calculated Value)	Luminous Efficacy (Lm/W) (Tested Value)	Operating Temp	MOL (in) Lamp Height [mm]	MOL (in) Heat Sink Height [mm]
Econergy 40W	2,400	<70	63~64	Less than 60°C	152	min 15
Econergy 70W	4,900	<75	70~72	Less than 60°C	180	min 15
Econergy 100W	7,500	<75	72~74	Less than 60°C	207	min 20
Econergy 150W	10,500	<75	72~74	Less than 60°C	230	min 30
Econergy 200W	14,000	<75	72~74	Less than 60°C	241	min 22

Dimensions [Unit : mm]

	40W	70W	100W	150W	200W
A	58.0	58.0	58.0	67.0	94.0
B	45.5	45.5	45.5	55.0	70.4
C	52.0	52.0	52.0	62.0	78.5
D	100.0±2.0	128±2.0	155.0±2.0	168±2.0	168±2.0
E	152.0±2.0	180.0±2.0	207.0±2.0	230±2.0	230±2.0
F	85.0	110.0	130.0	140.0	149.0
G	20	20	25	30	22
H	108	108	108	108	105
I	113	113	141	192	199
J	99	99	127	175	185
K	45	54	54	54	52.5





HEAT SINK