



CCLM LIGHTING SYSTEM

T5 Cold Cathode Light Module

The future of display illumination technology is here with our T5 Cold Cathode light module for Display, Vending Machines and Lighted Signage.

LONG LIFE: Up to 50,000 hours maintenance-free illumination.

ENERGY EFFICIENT: Super-bright white illumination with only 3.8W/lamp.

EVEN PANEL ILLUMINATION: Optics maximize the visibility of the wording.

SAVES MONEY: Operating costs are the lowest in the industry for any lamp.

FEATURES and BENEFITS

Cold Cathode offers a multitude of advantages over other types of lighting. Among its unique features are:

Energy Efficient: Uses as low as 2 watts per lamp. Most of the energy consumed is converted to light output and not to heat, versus incandescent and fluorescent lamps which convert much of the energy to heat.

Low Heat Transmission: Cold Cathode lamps operate at 200°C, generating significantly less heat than fluorescent lamps which operate at 900°C. This allows the fixture/sign to operate at a significantly lower internal temperature, as much as 25°F cooler than machines using standard fluorescent lamps. This reduction in the heat generated by the machine can significantly lower the overall air conditioning load in an installation employing many machines.

Long Life: Lamp life is extremely long, typically up to 50,000 hours, or 5-8 years of continuous maintenance-free operation, as compared to standard fluorescent life expectancy of 15,000-20,000 hours. At the end of its life cycle, cold cathode is still operating at 85% of full light output, compared to standard fluorescent lamps which are only producing 25% of initial light output.

Dimmable and Shock Resistant: Cold Cathode will not flicker due to vibration. Cold Cathode can be flashed or strobed without affecting the life of the lamp, whereas standard fluorescent lamps deteriorate, losing 3 hours of life every time they are energized.



Photo of sample machine for representational purposes only. No affiliation with the manufacturer of this machine is implied.

SPECIFICATIONS

CONSTRUCTION: The module contains a fully electronic ballast/inverter attached to a reflector. For each model, the reflector is specifically designed to meet size requirements and to enhance the lighting performance, providing shadowless illumination. This lamp module assembly is quickly installed utilizing the existing hardware within the machine.

ILLUMINATION: Each cold cathode is a fully contained light source with either one or two 3mm cold cathode lamps, each encased in a standard T-5 bi-pin fluorescent tube with corresponding T-5 lampholders.

OPERATION: The T-5 lamp module can be designed for any input voltage, and consumes 3.8 watts per lamp under normal operation. Cold cathode lamps are designed to function for up to 50,000 hours with trouble-free operation. In addition to excellent energy efficiency, maintenance costs are reduced as well, as relamping is only required every 5-8 years under continuous operation.

LABELS: UL LISTED, EC Listing pending. Engineered and manufactured to the highest level of safety.

WARRANTY: The modules are warranted to operate for three years from time of sale. The manufacturer will replace any defective part or lamp during this period.

TO ORDER: PROVIDE NUMBER OF LAMPS REQUIRED - MACHINE MANUFACTURER AND MODEL - PANEL DIMENSIONS OR CONSULT FACTORY

Alpha Enterprises Lighting, Inc.

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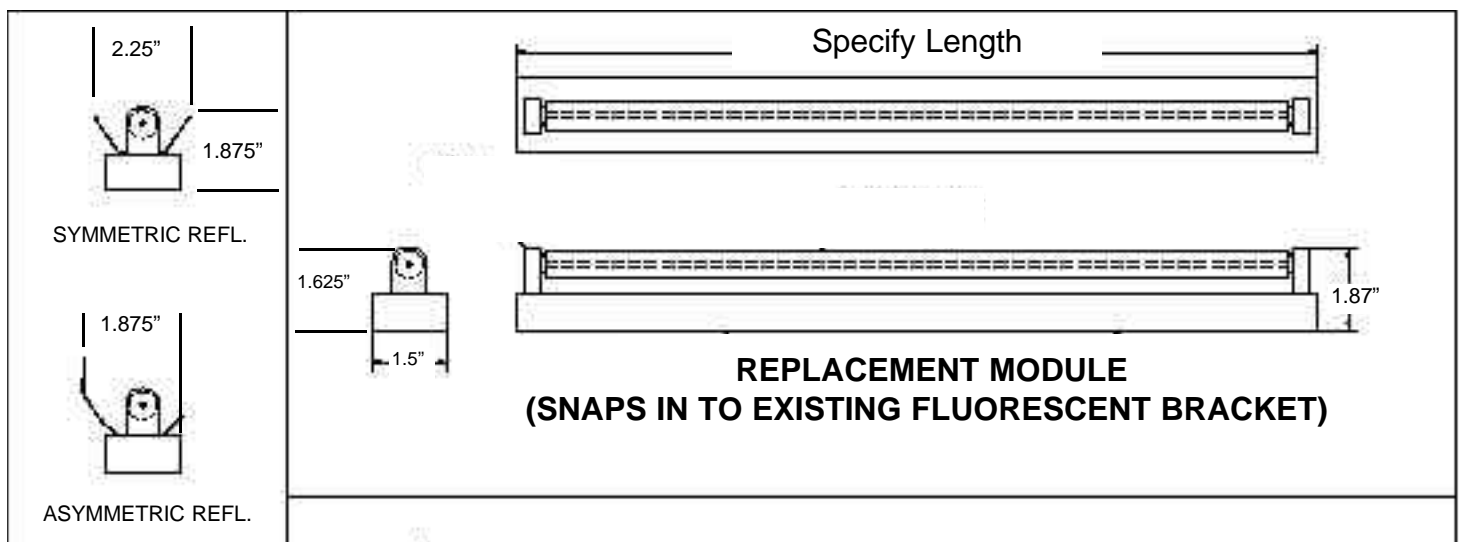
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What is cold cathode? Cold cathode lighting has been available since the '30s, and is currently used in many common applications, such as dashboard illumination, scanners, and laptop screens. Cold cathode is a form of illumination that operates by activating a phosphor coating inside a gas filled lamp, similar to the way that fluorescent and neon operate. Unlike fluorescent, however, there is no filament that must be heated to excite the phosphor, so cold cathode lamps operate at a much cooler temperature, and are designed to last 4-5 times longer than fluorescent lamps. Because there is no filament to wear out, cold cathode lamps are impervious to vibrations, repeated starting, or strobing. A bare cold cathode lamp can be very fragile; therefore we use a glass protective T5 enclosure to make it suitable for rugged applications like gaming or vending machines.

LIGHT SOURCE COMPARISON CHART

TYPE	LAMP LIFE	ENERGY EFFICIENCY (lumens per watt)	UL LISTED FOR COMMERCIAL LIGHTING	POWER SOURCE	DIMMING & STROBING
COLD CATHODE	50,000 - 70,000 HOURS	63 lumens per watt	YES	ELECTRONIC BALLAST	YES, STANDARD
NEON	25,000 HOURS	50 lumens per watt	NO	TRANSFORMER	CUSTOM FEATURE ONLY
FLUORESCENT	10,000 - 20,000 HOURS	63 lumens per watt	YES	BALLAST, USUALLY MAGNETIC	DIMMING ONLY W/EXPENSIVE DIMMING BALLAST, NO STROBING
FIBER OPTIC	2,000 - 6,000 HOURS for the illuminator bulb	9-15 lumens per watt	YES	FAN-COOLED ILLUMINATOR	YES, BUT LIMITED WITH METAL HALIDE LAMPS
WHITE LED*	30,000 HOURS	15-18 lumens per watt	YES	TRANSFORMER	YES

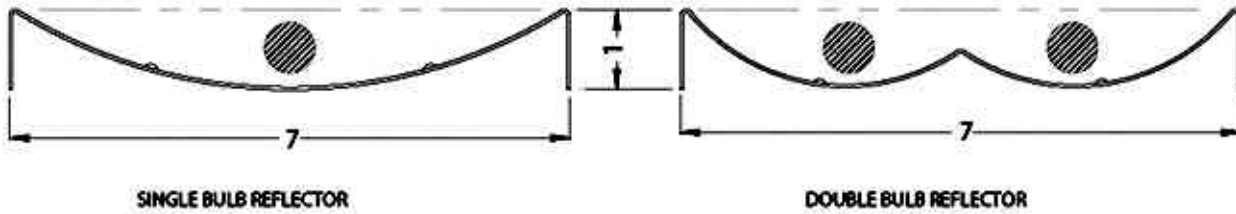
*The light output of LEDs is not yet high enough to properly back-light a display panel at a competitive cost.



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ONE-PIECE REFLECTOR DIMENSIONS



COST COMPARISON: FLUORESCENT vs. COLD CATHODE

Over a five year cycle, cold cathode offers significant savings over fluorescent in terms of operating costs, energy consumed, heat generated and maintenance. Our Cold Cathode light module operates at a fraction of the temperature, and uses 15-50% of the electricity, of a comparable fluorescent light source, significantly reducing operating costs for electricity and cooling. Cold cathode lamps operate for 5-8 years without maintenance, reducing maintenance costs to change lamps to a minimum level.

	Fluorescent F15T8 lamp, starter and ballast, (30W total lamp and ballast)	Cold Cathode 1 lamp module (3.8W lamp & electronics)
Initial cost for system	None, included in machine	\$50
Bulb replacement cost for 5 years	4 lamps per year; 5 years, \$0.80 = \$16	0
Starter cost for 5 years	4 starters per year, 5 years, \$0.40 each = \$8	0
Labor cost to change lamp & starter, \$50/hour, vs. one time cost to install cold cathode system	12 minutes x 4 per year = 48 min., or \$40.00 For 5 years = \$200	One-time installation cost: 15 minutes x \$50.00/hour = \$12.50
Electrical cost per year	263 kW hours/yr. x \$0.08/kW hour = \$21.04/yr. For 5 years = \$105.20	43 kW hours/yr. x \$0.08/kW hour = \$3.50/yr. For 5 years = \$17.50
Operating temperature of a typical 3 lamp vending machine	105 degrees F	85 degrees F Air conditioning load reduction <i>not</i> included in electrical savings
Total cost (per lamp) for 5 years	\$329.20	\$80.00
Savings over 5 years per lamp, not including cooling cost reductions		\$249.20
Savings over 5 years for a typical 3 lamp vending machine, not including cooling cost reductions		\$747.60
Payback on Initial Investment, not including cooling cost reductions		1 year + 1 day*

*Payback determined by subtracting the yearly savings (Bulbs, starters, labor, and electricity) \$62.34, less the initial cost of the module and installation--\$62.50.