

Energy Saving Products Guide



Experience the Howard Advantage

Howard has many lighting solutions to save you time, energy and money. Our LED roadway and track lighting systems are just two of the many LED solutions we offer. You will save time because the long LED life reducing maintenance needs. You will save energy because LEDs operate using almost half the energy than the system it is replacing. The benefits of saving time and money will also translate to you saving money! A reduction in maintenance costs, replacements costs, and energy costs over time will give you a payback that makes switching to LED lighting well worth the investment!

Howard also offers linear fluorescent lighting solutions that also will save you time, energy and money. Compared to HID lighting systems, linear fluorescents operate at reduced energy costs, longer life, which allows for reduced maintenance and upkeep costs. We offer several linear fluorescent options such as our Highbay Fluorescents, CEE listed High Efficiency Ballasts, and CEE listed F32T8 High Lumen linear fluorescent lamps. Additionally, our recently introduced retrofit strip kit will allow you to convert a old

magnetic fluorescent strip to a newer electronic fluorescent T8 strip without having to replace the whole fixture. You simply add the retrofit kit over the existing system! We offer our retrofit kit strips in both 4- and 8- foot options.

In addition we offer a full line of Induction lighting products. An induction lamp is an electrodeless lamp that offers greater efficiency, longer life (up to 100K hours), and lower maintenance costs compared to HID lighting. With a smaller up front cost than LED, Induction lighting provides you with a middle road to energy efficiency and lower energy and maintenance costs.

We are a manufacturer that stands by our products. In addition to the products we offer, Howard can help you with lighting layouts. Go to our home page and click on the "Lighting Layout Request" link. If you need to create and test your own photometrics, we can provide IES files for our products. Want to know how much you can potentially save, go to our home page and click on the "Cost of Ownership Calculator". Let us be the solution to your lighting needs.

HOWARDTM
LIGHTING PRODUCTS

580 Eastview Drive
Laurel, MS 39443
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www.HowardLightingProducts.com

LED Lighting

A Green Alternative



Small LED Cobrahead

Features and Specs:

- Distribution Pattern – IESNA Type II
- Life Expectancy – 50,000+ hours
- Input Wattage – 75, 90, and 120 Watts
- Efficacy – Up to 75 Lumens per Watt
- Cutoff – Full
- Glare – Low
- Housing – Die-Cast
- Lens – Flat Glass or Profile Acrylic
- Compliance – Dark Sky compliant
- Comparison – 100 , 150 & 250 Watt HPS



LED Track Lighting

Features and Specs:

- Extruded aluminum ballast housing and heat sink with stamped aluminum end plates
- Formed steel wire cover
- Powder coat paint
- Electronic constant current LED driver, 120v or 277v input
- CRI:85
- Life: 50,000 hrs
- Lumen Maintenance: >70% of initial lumens @ 50,000 hrs
- Lumen output: 1040 typical
- 0-90° tilt, 360° rotation
- Locking vertical adjustment
- Beam options: Narrow Flood 16°, Flood 30°, Wide Flood 45°, Very Wide Flood 60°
- cUL listed

LED Lighting con't

LED –A New Lighting Solution

With Howard LED products you are guaranteed to save energy, save time and save money. Our LED products will cut your energy costs drastically by up to 50%. With over 50,000 hours life expectancy, our LEDs will save you time and money in maintenance and energy costs. Let us be your choice for LED lighting solutions!

Advantages

- ♦ Long lifespan—between 50,000+ hours
- ♦ Minimal Lumen depreciation—70%
- ♦ Great color rendering
- ♦ Instant-on—light up very quickly
- ♦ Environmentally friendly—uses less energy and contains no mercury

New LED Products

Wallpacks

Mini Wall Pack-Polycarb Lens (MINIWPP)

LED / 10 watts

Small Semi-Cutoff Wallpack (SSWP)

LED / 10 watts

Medium Wallpack (MWP)

LED / 20 or 30 watts

Medium Semi-Cutoff Wallpack (MSWP2)

LED / 20 or 30 watts

Medium Cutoff Wallpack (MCWP2)

LED / 48 watts

Flood Lights

Horizontal Flood Light (HFL2)

LED / 40 watts

Small Flood Light (SFL)

LED / 20 watts

Garage Lights

Round Garage Lighter (RGL)

LED / 36 watts

Roadway Lighting

Roadway Lighter - Flat Lens (RL1F)

LED / 50 watts



RGL



MSWP2



MCWP2



RL1F



MINIWPP



SSWP



MWP



HFL2



SFL

Linear Fluorescent Lighting

Energy-Saving Lighting Systems



Highbay Linear Fluorescent

Benefits of fluorescent high-bay luminaires include:

- Energy Saving Compared to HID systems
- Exceptional Color Rendering
- High System Efficacy
- Long Lamp Life
- Instant On/Re-strike Capability
- Howard Ballast and Howard Lamp as a system is covered by Howard Industries Warranty
- Quality Lamp holders
- Computer Designed Reflectors
- System Tested, Designed, Approved, and Manufactured by Howard Industries in Mendenhall Mississippi.
- Compliant with Safety and performance standards.

Features include:

- 4 - 12 lamp options
- T8 or T5
- Instant Start or Program Rapid Start Ballasts
- High Efficiency (CEE listed)

Additional options available:

- Doors*
- Lens*
- Wireguards*
- Occupancy Sensors*
- Emergency Ballast*



Strips and Wraps

Great for area lighting, display cases, shops, sheds, task lighting, storage areas, hallways and corridors, schools and offices.

Strips are available in:

- 4 foot
- 8 foot

Wraps are available in:

- 4 foot 2 lamp
- 4 foot 4 lamp



* Not all of our fluorescent high bays can offer these options. Consult factory for available models.

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Vaporproof highbays and strips

Vaporproof Highbay (VHA1 series) is engineered for performance down to the smallest detail. It is fully gasketed to provide total protection from dust and moisture penetration. It withstands corrosion, splashing water, hose-directed water, damage from external ice formation, and temporary submersion. This rugged fixture operates four or six lamps, and as a standard feature, comes installed with a Howard ballast.



VHA1

Vaporproof Strip for Food Processing (VFP series) is the premiere fixture for the food processing industry. The time tested and proven sealed tubular design is the ideal choice for all types of meat or prepared food processing plants.

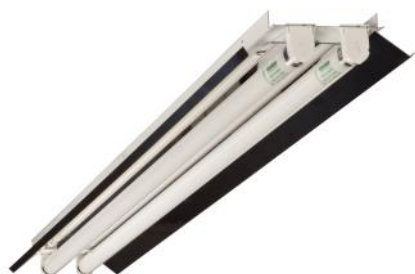


VFP

Vaporproof Strip (VSA4 or VSA8 series) fixture is gasketed to provide dust and moisture resistant illumination. This fixture operates up to three T8 or two T5HO lamps, and as a standard feature comes installed with a Howard ballast.



VSA



Fluorescent Strip Channel Retrofit Kit

Available in 4 and 8 foot options

The fluorescent strip channel retrofit kit is a simple and cost-effective solution to upgrading existing 4' strip fixtures into newer and more efficient electronic T8 or T5 strips.

Features of the fluorescent strip retrofit kit:

- Designed for trouble free installation.
- Lampholder cutouts guarantee correct lampholder spacing and that lampholder will not fall out during install.
- Optional reflectors available
- Simple one piece construction
- Code gauge steel
- High gloss, baked enamel finish
- High quality lamp holders
- NEC compliant luminaire power disconnect standard

Induction Lighting

.... offers great benefits for those looking to save energy without a large investment. Also called an electrodeless lamp, induction lighting offers a solution to customers looking for long-life, energy savings, and no high-end investment. Induction lighting offers these great benefits.

Advantages

- ♦ Long lifespan—between 65,000 and 100,000 hours
- ♦ High energy conversion efficiency between 62 and 90 Lumens per watt
- ♦ High power factor
- ♦ Minimal Lumen depreciation
- ♦ Instant-on and hot re-strike
- ♦ Environmentally friendly—uses less energy and uses less mercury compared to conventional lighting due to long lifespan
- ♦ Long term cost benefit of 35% to 55% in energy and maintenance costs compared to traditional commercial and industrial lighting.



New Induction Products

Canopy Fixtures

Small Canopy (C08)

IND / 15 or 23 watts

Medium Canopy (C12)

IND / 40 or 80 watts

Large Canopy (C19)

IND / 80, 120, or 200 watts

Flood Light

Area Light Architectural (ALA1)

IND / 80, 120 or 150 watts

Large Area Light (ALL1)

IND / 200 watts

Medium Area Light (ALM1)

IND / 80 or 120 watts

Area Lighter Shoebox-Flat Lens (ARSBF)

IND / 200 or 300 watts

Horizontal Flood Light (HFL2)

IND / 40 watts

Garage Lights

Round Garage Lighter (RGL)

IND / 40 or 80 watts

Highbays

Highbay - Acrylic 16"

Open Bottom Reflector (GHAC16)

IND / 120 or 150 watts

Highbay - Acrylic 22"

Open Bottom Reflector (GHAC22)

IND / 200, 300, or 380 watts

Roadway Lighting

Roadway Lighting Flat Lens (RL3F)

IND / 80 watts

Roadway Lighter - Flat Lens (RL1F)

IND / 100 Watts

Wallpacks

Cut-Off Wallpack (CWP)

IND / 15, 23, or 40 watts

Large Deep Wallpack (LDWP2)

IND / 80, 120, or 150 watts

Large Wallpack (LWP2)

IND / 80 watts

Medium Wallpack (MWP)

IND / 40 watts



C08

C12

C19



ARSBF



RGL



RL3F



RL1F



LDWP2



ALA1



ALL1



ALM1



HFL2



GHAC16



GHAC22



CWP



LWP2



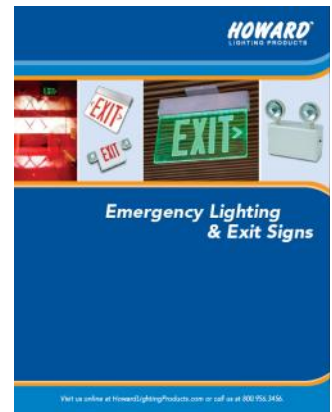
MWP

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Exit and Emergency Lighting

Howard Lighting offers a full line of Exit and Emergency lighting products, as well as, combo units, remote lamp heads, and emergency ballasts. Our LED exit and emergency products will save you energy and money. You can find all the lighting products you need in our 56-page Exit/Emergency Catalog. From our home page, go to Fixture products and click on Exit and Emergency Lighting. You will find a copy of our full catalog there!



Thermoplastic LED Exit Signs HL0201 Series

- Slim profile
- Long life, energy saving LED lamps
- Snap-fit faceplate installs without tools
- Snap-fit canopy for top or end mounting
- Dual voltage 120/277 VAC operation
- Battery Back up version available
- Self-Diagnostic and Remote Capable features also available



Edge Lite LED Exit Signs—Recessed or Surface Mount HL0203 Series

- Crystal-clear acrylic face panel
- Long life, energy saving LED lamps
- Engraved letters increase visibility
- Field-applied chevron directional indicators simplify specification and installation
- Dual voltage 120/277 VAC operation
- Battery Back up version available
- New York City approved version also available
- Self-Diagnostic feature also available



Thermoplastic LED Combo HL0214 Series

- Completely self-contained
- Long life, energy saving LED lamps
- Fully-automatic operation
- Universal mounting
- Dual voltage 120/277 VAC operation
- Push to test switch
- Includes two adjustable glare-free lighting heads
- Self-Diagnostic and remote capable features also available



Fixed Optics Emergency Light (HL0223) Adjustable Optics Emergency Light (HL0202) HL0214 Series

- Injection-molded, high impact, UV-stabilized thermoplastic construction
- Snap together construction speeds installation
- Universal mounting pattern knockouts in back for J-box mount
- Dual-voltage 120/277 VAC operation
- Maintenance-free battery

Remote lamp heads



Emergency Ballasts are available for several applications. Some Howard linear fluorescent fixtures come with emergency ballast installation option! 500 to 3000 lumens



Rebate information

With a push towards energy efficiency various utilities and government organizations offer rebates to its customers when they switch to energy efficient products. Many of our products meet these standards and would qualify for these products. Below you will find a list of websites that offer databases for each state.

Database of State Incentives for Renewables and Efficiency

DSIRE is a comprehensive source of information on state, local, utility and federal incentives and policies that promote renewable energy and energy efficiency. Established in 1995 and funded by the U.S. Department of Energy, DSIRE is an ongoing project of the N.C. Solar Center and the Interstate Renewable Energy Council.

Website: www.dsireusa.org

SpiraxSarco (Database)

State & Utility Energy Efficiency Incentive Programs & Rebates

Website: http://www.spiraxsarco.com/us/about/news-article.asp?news_id=30

Howard Lighting Products has several lines that meet standards for energy efficiency rebates when you switch from lighting systems that require more energy.

- Linear Fluorescent Highbays
- Fluorescent Strip Retrofit kits
- Linear Fluorescent Strips
- Linear Fluorescent Wraps
- LED Roadway Cobraheads
- LED Area Lighters
- LED Canopy
- Induction Lighting
- Energy Saving T8 Lamps
- Self-Ballasted Compact Fluorescent Lamps
- High Efficiency Ballasts
- And more...



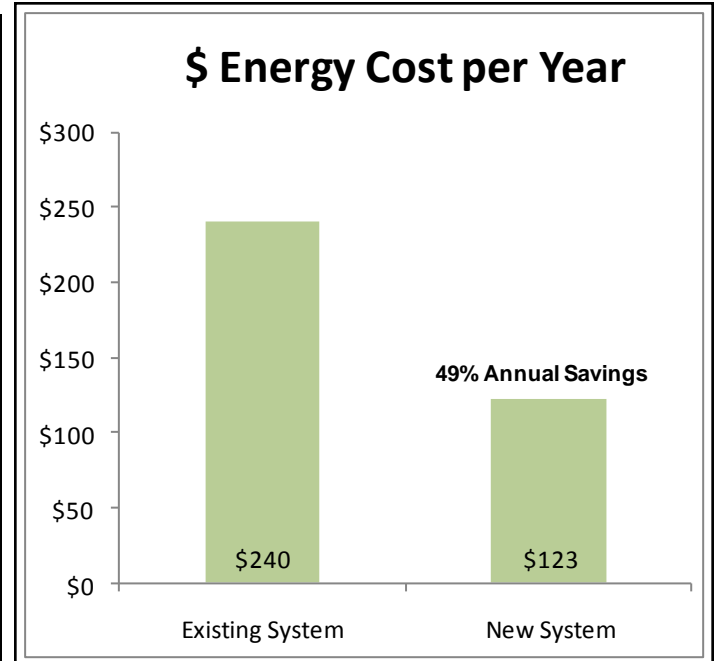
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Experience the savings!

Below is an example of the potential money saved in energy costs for 1 year by retrofitting a 400 watt metal halide fixture for a Highbay Linear Fluorescent fixture. With energy saving costs like this, the fixtures will pay for themselves! Also, if you act now, there are rebate incentives with local utilities when you purchase lamps!

Energy Cost Savings					
		Existing System		New System	
		400 Watt MH High Bay		HFB3E454APS 4 lamp T5 Program Rapid Start Fluorescent Highbay	
Hours burned per year	4368	Number of Fixtures	1	Number of Fixtures	1
Cost per kWh \$	0.12	Watts per Fixture (existing system)	458	Watts per Fixture (new system)	234
		(ballast input watts)		(ballast input watts)	
Energy Cost Estimation		Energy used per yr. (existing system)	\$240	Energy used per yr. (new system)	\$123
Potential Yearly Savings:		\$117			



Howard Industries provides this tool to examine the potential impact of lighting decisions. This tool provides an ESTIMATE only. The analysis of this tool does not warrant or guarantee the actual costs or savings that will be realized as the analysis suggested. You can find the full version of this cost saving tool at the Howard Lighting Website—www.howardlightingproducts.com.

Click "Cost of Ownership Calculator".

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Linear Fluorescent Lamps -Energy Saving and High Lumen



Howard Linear Fluorescent Lamps

Features :

- T8 Fluorescent lamps
- 32 watt High Lumen lamps
- 3000K—6500K colors
- 25, 28 and 30 watt Energy Saving
- CEE listed
- U-bent 32 watt; 25 & 28 Energy Saving
- T5 High Output Lamps



CEE Listed Lamps

Watts	Bulb	Nominal Length (in)	MOL (in)	Base	UPC#	Model #	Lumens Initial (lm)	Lumens Mean (lm)	Avg. Life (hours)	Color Temp. (K)	CRI	Pkg. Qty.	Footnotes
T8 Fluorescent Low Mercury (Energy Saving)													
25	T8	48	47.78	Med Bipin	799385-02922	F25T8/830/ES/ECO	2500	2425	24000	3000	85	25	1,2,3, E ,ECO
25	T8	48	47.78	Med Bipin	799385-02923	F25T8/835/ES/ECO	2500	2425	24000	3500	85	25	1,2,3, E ,ECO
25	T8	48	47.78	Med Bipin	799385-02924	F25T8/841/ES/ECO	2500	2425	24000	4100	85	25	1,2,3, E ,ECO
25	T8	48	47.78	Med Bipin	799385-03424	F25T8/850/ES/ECO	2500	2425	24000	5000	85	25	1,2,3, E ,ECO
25	T8	48	47.78	Med Bipin	799385-04685	F25T8/850/ES/ECO/IC	2500	2425	24000	5000	85	25	1,2,3, E ,ECO
28	T8	48	47.78	Med Bipin	799385-03910	F28T8/830/ES/ECO/IC	2725	2560	24000	3500	85	25	1,2,3, E ,ECO
28	T8	48	47.78	Med Bipin	799385-01515	F28T8/835/ES/ECO	2725	2560	24000	3500	85	25	1,2,3, E ,ECO
28	T8	48	47.78	Med Bipin	799385-01516	F28T8/841/ES/ECO	2725	2560	24000	4100	85	25	1,2,3, E ,ECO
28	T8	48	47.78	Med Bipin	799385-04023	F28T8/850/ES/ECO/IC	2725	2560	24000	3500	85	25	1,2,3, E ,ECO
T8 Fluorescent Low Mercury (High Lumens)													
32	T8	48	47.78	Med Bipin	799385-01947	F32T8/830/HL/ECO	3100	2950	24000	3000	85	25	1,2,3, E ,ECO
32	T8	48	47.22	Med Bipin	799385-03753	F32T8/830/HL/ECO/IC	3100	2950	24000	3000	83	25	1,2,3, E ,ECO
32	T8	48	47.22	Med Bipin	799385-03754	F32T8/835/HL/ECO/IC	3100	2950	24000	3500	83	25	1,2,3, E ,ECO
32	T8	48	47.22	Med Bipin	799385-03755	F32T8/841/HL/ECO/IC	3100	2950	24000	4100	83	25	1,2,3, E ,ECO
32	T8	48	47.22	Med Bipin	799385-03756	F32T8/850/HL/ECO/IC	3100	2950	24000	5000	83	25	1,2,3, E ,ECO

U-bent lamps

Watts	Bulb	Nominal Length (in)	MOL (in)	Base	UPC#	Model #	Lumens Initial (lm)	Lumens Mean (lm)	Avg. Life (hours)	Color Temp. (K)	CRI	Pkg. Qty.	Footnotes
T8 Fluorescent U-Bent, 6" Spacing, Low Mercury													
25	T8	22.5	22.6	Med Bipin	799385-02925	FB25T8/830/ES/ECO	2400	2260	24000	3000	85	20	1,2,3, E ,ECO
25	T8	22.5	22.6	Med Bipin	799385-02926	FB25T8/835/ES/ECO	2400	2260	24000	3500	85	20	1,2,3, E ,ECO
25	T8	22.5	22.6	Med Bipin	799385-02927	FB25T8/841/ES/ECO	2400	2260	24000	4100	85	20	1,2,3, E ,ECO
25	T8	22.5	22.6	Med Bipin	799385-03425	FB25T8/850/ES/ECO	2350	2210	24000	5000	85	20	1,2,3, E ,ECO
28	T8	22.5	22.6	Med Bipin	799385-01532	FB28T8/830/ES/ECO	2600	2440	24000	3000	85	20	1,2,3, E ,ECO
28	T8	22.5	22.6	Med Bipin	799385-01533	FB28T8/835/ES/ECO	2600	2440	24000	3500	85	20	1,2,3, E ,ECO
28	T8	22.5	22.6	Med Bipin	799385-01534	FB28T8/841/ES/ECO	2600	2440	24000	4100	85	20	1,2,3, E ,ECO
28	T8	22.5	22.6	Med Bipin	799385-03423	FB28T8/850/ES/ECO	2550	2400	24000	5000	85	20	1,2,3, E ,ECO
32	T8	22.5	23	Med Bipin	799385-02259	FB32T8/730/6	2750	-	24000	3000	75	20	1,2,3,ECO
32	T8	22.5	23	Med Bipin	799385-02260	FB32T8/735/6	2750	-	24000	3500	75	20	1,2,3,ECO
32	T8	22.5	23	Med Bipin	799385-02261	FB32T8/741/6	2750	-	24000	4100	75	20	1,2,3,ECO
32	T8	22.5	23	Med Bipin	799385-02262	FB32T8/830/6	3000	-	24000	3000	85	20	1,2,3,ECO
32	T8	22.5	23	Med Bipin	799385-02263	FB32T8/835/6	3000	-	24000	3500	85	20	1,2,3,ECO
32	T8	22.5	23	Med Bipin	799385-02264	FB32T8/841/6	3000	-	24000	4100	85	20	1,2,3,ECO
32	T8	22.5	23	Med Bipin	799385-02978	FB32T8/850/6	3000	-	24000	5000	85	20	1,2,3,ECO

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T5 Linear Fluorescent Lamps

Watts	Bulb	Nominal Length (in)	MOL (in)	Base	UPC#	Model #	Lumens Initial (lm)	Lumens Mean (lm)	Avg. Life (hours)	Color Temp. (K)	CRI	Pkg. Qty.	Footnotes
T5 Fluorescent													
14	T5	24	22.2	Mini Bipin (G5)	799385-01541	F14T5/830	1350	1269	20000	3000	85	25	1,2,3,4,5,6,7
14	T5	24	22.2	Mini Bipin (G5)	799385-01542	F14T5/835	1350	1269	20000	3500	85	25	1,2,3,4,5,6,7
14	T5	24	22.2	Mini Bipin (G5)	799385-01543	F14T5/841	1350	1269	20000	4100	85	25	1,2,3,4,5,6,7
14	T5	24	22.2	Mini Bipin (G5)	799385-01544	F14T5/865	1350	1269	20000	6500	85	25	1,2,3,4,5,6,7
21	T5	36	34	Mini Bipin (G5)	799385-01545	F21T5/830	2100	1974	20000	3000	85	25	1,2,3,4,5,6,7
21	T5	36	34	Mini Bipin (G5)	799385-01546	F21T5/835	2100	1974	20000	3500	85	25	1,2,3,4,5,6,7
21	T5	36	34	Mini Bipin (G5)	799385-01547	F21T5/841	2100	1974	20000	4100	85	25	1,2,3,4,5,6,7
21	T5	36	34	Mini Bipin (G5)	799385-02979	F21T5/850	2100	1974	20000	5000	85	25	1,2,3,4,5,6,7
21	T5	36	34	Mini Bipin (G5)	799385-01548	F21T5/865	2100	1974	20000	6500	85	25	1,2,3,4,5,6,7
28	T5	48	45.8	Mini Bipin (G5)	799385-01549	F28T5/830	2900	2726	20000	3000	85	25	1,2,3,4,5,6,7
28	T5	48	45.8	Mini Bipin (G5)	799385-01550	F28T5/835	2900	2726	20000	3500	85	25	1,2,3,4,5,6,7
28	T5	48	45.8	Mini Bipin (G5)	799385-01551	F28T5/841	2900	2726	20000	4100	85	25	1,2,3,4,5,6,7
28	T5	48	45.8	Mini Bipin (G5)	799385-01552	F28T5/865	2900	2726	20000	6500	85	25	1,2,3,4,5,6,7

Watts	Bulb	Nominal Length (in)	MOL (in)	Base	UPC#	Model #	Lumens Initial (lm)	Lumens Mean (lm)	Avg. Life (hours)	Color Temp. (K)	CRI	Pkg. Qty.	Footnotes
T5 HO Fluorescent													
24	T5	24	22.2	Mini Bipin (G5)	799385-01557	F24T5/830/HO	2000	1880	20000	3000	85	25	1,2,3,4,5,6,7
24	T5	24	22.2	Mini Bipin (G5)	799385-01558	F24T5/835/HO	2000	1880	20000	3500	85	25	1,2,3,4,5,6
24	T5	24	22.2	Mini Bipin (G5)	799385-01559	F24T5/841/HO	2000	1880	20000	4100	85	25	1,2,3,4,5,6
24	T5	24	22.2	Mini Bipin (G5)	799385-02980	F24T5/850/HO	2000	1880	20000	5000	85	25	1,2,3,4,5,6,7
24	T5	24	22.2	Mini Bipin (G5)	799385-01560	F24T5/865/HO	2000	1880	20000	6500	85	25	1,2,3,4,5,6,7
39	T5	36	34	Mini Bipin (G5)	799385-01561	F39T5/830/HO	3500	3290	20000	3000	85	25	1,2,3,4,5,6,7
39	T5	36	34	Mini Bipin (G5)	799385-01562	F39T5/835/HO	3500	3290	20000	3500	85	25	1,2,3,4,5,6
39	T5	36	34	Mini Bipin (G5)	799385-01563	F39T5/841/HO	3500	3290	20000	4100	85	25	1,2,3,4,5,6
39	T5	36	34	Mini Bipin (G5)	799385-02981	F39T5/850/HO	3500	3290	20000	5000	85	25	1,2,3,4,5,6,7
39	T5	36	34	Mini Bipin (G5)	799385-01564	F39T5/865/HO	3500	3290	20000	6500	85	25	1,2,3,4,5,6,7
54	T5	48	45.8	Mini Bipin (G5)	799385-01569	F54T5/830/HO	5000	4700	20000	3000	85	25	1,2,3,4,5,6
54	T5	48	45.8	Mini Bipin (G5)	799385-01570	F54T5/835/HO	5000	4700	20000	3500	85	25	1,2,3,4,5,6
54	T5	48	45.8	Mini Bipin (G5)	799385-01571	F54T5/841/HO	5000	4700	20000	4100	85	25	1,2,3,4,5,6,7
54	T5	48	45.8	Mini Bipin (G5)	799385-02784	F54T5/850/HO	5000	4700	20000	5000	85	25	1,2,3,4,5,6,7
54	T5	48	45.8	Mini Bipin (G5)	799385-01572	F54T5/865/HO	5000	4700	20000	6500	85	25	1,2,3,4,5,6,7

T5 Footnote Legend:

- 1 Average-rated life is based on 3 hours per start.
- 2 Average-rated life at 12 hours per start will increase life by approximately 25% (e.g., lamps rated at 20000 would go to 25000).
- 3 Lumen ratings, CRI and average-rated lamp life subject to change.
- 4 NEMA recommends that ballasts for this lamp have end-of-life shutdown circuitry which will safely shut the system down in the event of an abnormal end-of-life failure mode. See www.NEMA.org for details.
- 5 Minimum start temperature is a function of the ballast; consult the ballast manufacturer.
- 6 The nominal length of linear fluorescent lamps is typically measured from back of lampholder to back of lampholder. T5 and T5HO linear lamps are exceptions. The nominal length given for T5 and T5HO linear lamps is the closest familiar nominal length.
- 7 Call for availability.

Page 10 Footnote Legend:

- 1 Average-rated life is based on 3 hours per start.
 - 2 Average-rated life at 12 hours per start will increase life by approximately 25% (e.g., lamps rated at 24000 would go to 30000).
 - 3 Lumen ratings, CRI and average-rated lamp life subject to change.
- E This lamp meets Federal Minimum Efficiency standards.
- ECO Low-Mercury fluorescent lamps pass the Federal TCLP for hazardous waste. Disposal regulations may vary; check local and state regulations.

Ballasts and Lamps

High Efficient, Energy Saving and High Lumen

(next 2 pages show our ballast and lamp offering)

Ballasts



Features :

T5, T8, T12

High Efficiency Ballasts

2, 3 and 4 lamp options

Available in Standard, Low and High Ballast Factor

CEE Listed

Instant Start or Program Rapid Start

Electronic Fluorescent Ballasts not listed on CEE

Electronic Fluorescent Ballasts																
Starting	Ballast Factor	Howard Ballasts			F54HO			F98T8			F96T12			F96T12HO		
		Model #	Number of lamps	Input Voltage	Ballast Factor	Input Watts	Ballast Efficacy Factor	Ballast Factor	Input Watts	Ballast Efficacy Factor	Ballast Factor	Input Watts	Ballast Efficacy Factor	Ballast Factor	Input Watts	Ballast Efficacy Factor
Program Rapid Start	Standard	EP2/54HO/MV/90C/W	1	Multi-Volt 120	1.02	62	1.65									
				Multi-Volt 277	1.02	62	1.65									
		EP2/54HO/MV/90C/W	2	Multi-Volt 120	1.00	120	0.83									
				Multi-Volt 277	1.00	117	0.85									
Instant Start		EP2/59IS/MV/MC	1	Multi-Volt 120				1.09	68	1.60						
				Multi-Volt 277				1.09	67	1.63						
		EP2/59IS/MV/MC	2	Multi-Volt 120				0.88	108	0.81						
				Multi-Volt 277				0.88	106	0.83						
		E2/75IS-120MC	1	Multi-Volt 120				1.02	82	1.24						
				Multi-Volt 277				1.05	144	0.73						
		E2/75IS-120MC	2	Multi-Volt 120				0.88	135	0.65						
				Multi-Volt 277				0.95	79	1.20						
EP2/75IS/MV/SC		2	Multi-Volt 120	0.90				137	0.66							
			Multi-Volt 277	0.90				135	0.67							
Rapid Start		E2/110RS-120	1	Multi-Volt 120				1.03	113	0.91						
				Multi-Volt 277				1.03	113	0.91						
		E2/110RS-120	2	Multi-Volt 120				0.90	200	0.45						
				Multi-Volt 277				0.90	200	0.45						
		EP2/110RS-MV	1	Multi-Volt 120				0.92	104	0.88						
				Multi-Volt 277				0.92	104	0.88						
		EP2/110RS-MV	2	Multi-Volt 120				0.85	196	0.43						
				Multi-Volt 277				0.85	196	0.43						

Electronic Fluorescent T8 Ballasts

Starting	Ballast Factor	CEE Listed	Howard Ballasts			F32T8			F32T8/ES(30W)			F32T8/ES(28W)			F32T8/ES(25W)		
			Model #	Number of lamps	Input Voltage	Ballast Factor	Input Watts	Ballast Efficacy Factor	Ballast Factor	Input Watts	Ballast Efficacy Factor	Ballast Factor	Input Watts	Ballast Efficacy Factor	Ballast Factor	Input Watts	Ballast Efficacy Factor
Instant Start	Low	CEE	EPL2/32IS/MV/SC/HE	1	Multi-Volt 120	0.87	31	2.81	0.87	28	3.11	0.88	26	3.38	0.88	24	3.67
					Multi-Volt 277	0.87	31	2.81	0.87	28	3.11	0.88	26	3.38	0.88	24	3.67
		CEE	EPL2/32IS/MV/SC/HE	2	Multi-Volt 120	0.75	48	1.56	0.75	46	1.63	0.75	41	1.83	0.75	38	1.97
					Multi-Volt 277	0.75	48	1.56	0.75	45	1.67	0.75	41	1.83	0.75	38	1.97
		CEE	EPL3/32IS/MV/MC	2	Multi-Volt 120	0.92	58	1.59	0.92	54	1.70	0.92	49	1.88	0.95	48	1.98
					Multi-Volt 277	0.92	57	1.61	0.92	53	1.74	0.92	48	1.92	0.92	47	1.96
		CEE	EPL3/32IS/MV/MC	3	Multi-Volt 120	0.78	75	1.04	0.81	71	1.14	0.81	64	1.27	0.85	63	1.35
					Multi-Volt 277	0.78	74	1.05	0.81	70	1.16	0.81	63	1.29	0.85	61	1.39
		CEE	EPL3/32IS/MV/MC/HE	2	Multi-Volt 120	0.92	58	1.59	0.92	54	1.70	0.92	49	1.88	0.95	48	1.98
					Multi-Volt 277	0.92	57	1.61	0.92	53	1.74	0.92	48	1.92	0.92	47	1.96
		CEE	EPL3/32IS/MV/MC/HE	3	Multi-Volt 120	0.78	75	1.04	0.81	71	1.14	0.81	64	1.27	0.85	63	1.35
					Multi-Volt 277	0.78	74	1.05	0.81	70	1.16	0.81	63	1.29	0.85	61	1.39
		CEE	EPL3/32IS/MV/SC/HE	2	Multi-Volt 120	0.85	55	1.55	0.84	52	1.62	0.84	48	1.75	0.84	43	1.95
					Multi-Volt 277	0.85	54	1.57	0.84	52	1.62	0.84	47	1.79	0.84	43	1.95
		CEE	EPL3/32IS/MV/SC/HE	3	Multi-Volt 120	0.75	72	1.04	0.75	69	1.09	0.75	62	1.21	0.75	58	1.29
					Multi-Volt 277	0.75	72	1.04	0.75	68	1.10	0.75	62	1.21	0.75	57	1.32
	Standard	CEE	EPL4/32IS/MV/MC	3	Multi-Volt 120	0.82	81	1.01	0.82	75	1.09	0.82	70	1.17	0.84	68	1.24
					Multi-Volt 277	0.82	80	1.03	0.82	74	1.11	0.82	70	1.17	0.84	66	1.27
		CEE	EPL4/32IS/MV/MC	4	Multi-Volt 120	0.77	98	0.79	0.77	90	0.86	0.77	84	0.92	0.78	82	0.95
					Multi-Volt 277	0.77	96	0.80	0.77	89	0.87	0.77	84	0.92	0.78	81	0.96
		CEE	EPL4/32IS/MV/MC/HE	3	Multi-Volt 120	0.82	81	1.01	0.82	75	1.09	0.82	70	1.17	0.84	68	1.24
					Multi-Volt 277	0.82	80	1.03	0.82	74	1.11	0.82	70	1.17	0.84	66	1.27
		CEE	EPL4/32IS/MV/MC/HE	4	Multi-Volt 120	0.77	98	0.79	0.77	90	0.86	0.77	84	0.92	0.78	82	0.95
					Multi-Volt 277	0.77	96	0.80	0.77	89	0.87	0.77	84	0.92	0.78	81	0.96
		CEE	EP2/32IS/MV/MC	1	Multi-Volt 120	1.07	39	2.74	1.07	38	2.82	1.07	31	3.45	1.07	29	3.69
					Multi-Volt 277	1.07	38	2.82	1.07	37	2.89	1.07	31	3.45	1.07	28	3.82
		CEE	EP2/32IS/MV/MC	2	Multi-Volt 120	0.89	59	1.51	0.89	55	1.62	0.89	49	1.82	0.89	47	1.89
					Multi-Volt 277	0.89	57	1.56	0.89	54	1.65	0.89	48	1.85	0.89	46	1.93
		CEE	EP2/32IS/MV/MC/HE	1	Multi-Volt 120	1.08	35	3.09	1.08	31	3.48	1.08	30	3.60	1.08	29	3.72
					Multi-Volt 277	1.08	34	3.18	1.08	30	3.60	1.08	29	3.72	1.08	29	3.72
		CEE	EP2/32IS/MV/MC/HE	2	Multi-Volt 120	0.89	55	1.62	0.89	51	1.75	0.89	49	1.82	0.89	46	1.93
					Multi-Volt 277	0.89	54	1.65	0.89	51	1.75	0.89	47	1.89	0.89	45	1.98
		CEE	EP3/32IS/MV/MC/HE	2	Multi-Volt 120	0.99	63	1.57	0.99	59	1.68	0.99	54	1.83	1.00	51	1.96
					Multi-Volt 277	0.99	63	1.57	0.99	58	1.71	0.99	53	1.87	1.00	51	1.96
		CEE	EP3/32IS/MV/MC/HE	3	Multi-Volt 120	0.88	84	1.05	0.88	79	1.11	0.88	72	1.22	0.90	68	1.32
					Multi-Volt 277	0.88	83	1.06	0.88	77	1.14	0.88	70	1.26	0.90	68	1.32
		CEE	EP4/32IS/MV/MC/HE	3	Multi-Volt 120	0.96	92	1.04	0.96	84	1.14	0.96	77	1.25	0.96	74	1.30
					Multi-Volt 277	0.96	89	1.08	0.96	84	1.14	0.96	77	1.25	0.96	73	1.32
		CEE	EP4/32IS/MV/MC/HE	4	Multi-Volt 120	0.88	110	0.80	0.88	101	0.87	0.88	94	0.94	0.88	88	1.00
					Multi-Volt 277	0.88	108	0.81	0.88	100	0.88	0.88	94	0.94	0.88	88	1.00
Program Rapid Start	Standard	CEE	EPH2/32IS/MV/MC/HE	1	Multi-Volt 120	1.38	45	3.07	1.38	44	3.14	1.38	39	3.54	1.38	38	3.63
					Multi-Volt 277	1.38	45	3.07	1.38	44	3.14	1.38	39	3.54	1.38	38	3.63
		CEE	EPH2/32IS/MV/MC/HE	2	Multi-Volt 120	1.18	74	1.59	1.18	69	1.71	1.18	64	1.84	1.18	63	1.87
					Multi-Volt 277	1.18	73	1.62	1.18	69	1.71	1.18	63	1.87	1.18	62	1.90
		CEE	EPH3/32IS/MV/MC/HE	2	Multi-Volt 120	1.27	81	1.57	1.27	76	1.67	1.27	70	1.81	1.28	67	1.91
					Multi-Volt 277	1.27	80	1.59	1.27	75	1.69	1.27	69	1.84	1.28	66	1.94
		CEE	EPH3/32IS/MV/MC/HE	3	Multi-Volt 120	1.18	109	1.08	1.18	99	1.19	1.18	93	1.27	1.20	86	1.40
					Multi-Volt 277	1.18	107	1.10	1.18	99	1.19	1.18	92	1.28	1.20	85	1.41
Program Rapid Start	Standard	CEE	EP2/32PRS/MV/MC/HE	2	Multi-Volt 120	0.88	57	1.54	0.90	54	1.67	0.90	52	1.73	1.00	50	2.00
					Multi-Volt 277	0.88	56	1.57	0.90	53	1.70	0.90	51	1.76	1.00	49	2.04

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