

Walter Nichols  
Hawthorn Building  
Altoona, PA



Appendix A

# FEATURES

## OPTICAL SYSTEM

- Reflector - Self-flanged, specular clear or semi-diffuse reflector. Fluted vertical upper section works in conjunction with Bounding Ray Optical Principle to provide lamp before lamp image and smooth transition from top of reflector to bottom. Minimum flange matches reflector finish. White painted flange optional.
- Baffle/cone - Specular clear upper reflector. Microgroove baffle with white painted flange or specular black cone with flange that matches cone finish.
- Hinged lampdoor seals upper trim for optimal fixture efficiency and the reduction of stray light in the plenum.

## MECHANICAL

- 16-gauge galvanized steel mounting/plaster frame with integral yoke to retain optical system. Maximum 1-1/2" ceiling thickness.
- Mounting bars are 16-gauge galvanized steel with continuous 4" vertical adjustment, held in place with tool-less, integral cam-action locking system. Post installation adjustment possible without the use of tools from above or below the ceiling. Shipped pre-installed.
- Galvanized steel junction box with bottom-hinged access covers and spring latches. Two combination 1/2"-3/4" and three 1/2" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out) No. 12 AWG conductors, rated for 90°C.

## ELECTRICAL SYSTEM

- Horizontally-mounted, four-pin, positive-latch, thermoplastic socket.
- Class P, thermally-protected high power factor electronic ballast mounted to the junction box (CP and EL ballast mounted on ballast tray).

## LISTING

- Fixtures are UL listed for thru-branch wiring, recessed mounting and damp locations. Listed and labeled to comply with Canadian Standards (see Options).

## ENERGY

LER.DOL	Annual Energy Cost	Lamps	Lamp Lumens	Ballast Factor	Input Watts
41	\$5.83	1/26TRT	1800	0.98	27

Calculated in accordance with NEMA standard LE-5.

Type

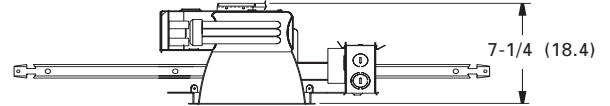
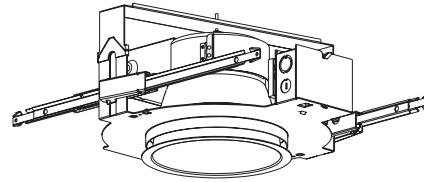
Catalog number

## Compact Fluorescent Downlights

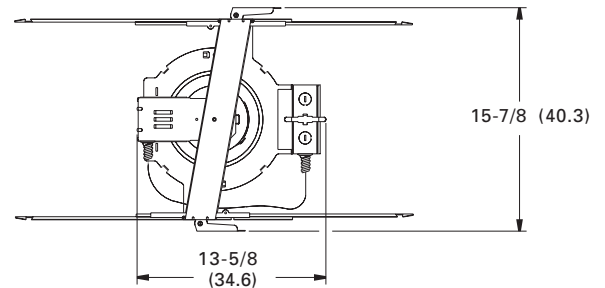
# 6" AF

## Open Reflector

Horizontal Lamp  
Triple-Tube



Aperture: 6-1/4 (15.9)  
Ceiling Opening: 7-1/8 (18.1)  
Overlap Trim: 7-1/2 (19.1)



All dimensions are inches (centimeters).

## ORDERING INFORMATION

Example: AF 1/26TRT 6AR MVOLT

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line. Order accessories as separate catalog number (shipped separately).

### AF

Series	Wattage/Lamp	Reflector/Color	Finish	Voltage	Ballast	Options
AF	1/18TRT 1/26TRT 1/32TRT 1/42TRT	6AR Clear 6PR Pewter 6UBR Umber 6WTR Wheat 6CR Champagne Gold <sup>1</sup> 6GR Gold <sup>1</sup> 6MB Black Baffle <sup>2,3</sup> 6BC Black Cone <sup>2</sup>	(blank) Specular low iridescent LD Semi-diffuse low iridescent	MVOLT <sup>4</sup> 120 277 347	(blank) GEB10 standard. Electronic ballast. DMHL <sup>5</sup> Lutron Hi-Lume electronic dimming ballast ADEZ <sup>5</sup> Advance Mark X electronic dimming ballast.	WLP With 35°K lamp (shipped separately). TRW White flange. EL <sup>6</sup> Emergency battery pack. Integral test switch provided. ELR Emergency battery pack. Remote test switch provided. GMF Single, slow-blow fuse (not available with MVOLT). RIF Radio Interference Filter. LRC Provides compatibility with Lithonia Reloc System. Reloc System can be installed less this option with connectors provided by others. Access above ceiling required. For compatible Reloc Systems, see options and accessories tab. QDS Quick Disconnect for easy ballast replacement. Not available with EL or ELR option. CP Chicago Plenum (consult factory). CSA CSA Certified.

### NOTES:

- 1 Not recommended for use with compact fluorescent lamp. Consult factory.
- 2 Not available with finishes.
- 3 White flange standard.
- 4 Multi-volt electronic ballast capable of operating on any line voltage between 120-277 volt.
- 5 Consult factory for specific availability.
- 6 Not available with black cone.

### Accessories

Order as separate catalog number.

SC6FL Sloped ceiling adaptor. Degree of slope must be specified (10D, 15D, 20D, 25D, 30D). Ex: SC6FL 10D



GOTHAM ARCHITECTURAL DOWNLIGHTING  
A DIVISION OF ACUITY LIGHTING GROUP, INC.  
1400 Lester Road Conyers Georgia 30012  
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AF 6 TRT OPEN

DCF-110

# 6" AF Open Reflector

Distribution curve    Distribution data    Output data    Coefficient of utilization    Illuminance Data at 30" Above Floor for a Single Luminaire

AF 1/18TRT 6AR, (1) CF18DT/E/IN/835, 1200 lumens per lamp, 1.3 s/mh, test no. LTL9404

Mount height	Initial fc at beam center	50% beam angle 60.9°		10% beam angle 94.1°	
		Beam diameter	fc at beam edge	Beam diameter	fc at beam edge
8'	14.0	6.5	7.0	11.8	1.4
10'	7.5	8.8	3.8	16.1	0.8
12'	4.7	11.2	2.3	20.4	0.5
14'	3.2	13.5	1.6	24.7	0.3
16'	2.3	15.9	1.2	29.0	0.2

From 0°	cp.	Lumens	Zone	Lumens	%lamp	ρf	80%	20%	50%
0°			0°-30°			pc	50%	70%	50%
5°			0°-40°			pw	30%	30%	30%
0°	423	41	0°-30°	351.8	29.3	1	63	62	61
5°	522	123	0°-40°	526.7	43.9	2	58	56	55
15°	579	187	0°-60°	693.5	57.8	3	53	50	49
25°	543	175	0°-90°	695.4	58.0	4	49	45	44
35°	328	150	90°-180°	0.0	0.0	5	45	41	41
45°	263	17	0°-180°	695.4	58.0*	6	42	38	37
55°	12	1	*Efficiency			7	38	34	34
65°	1	1				8	36	32	31
75°	1	1				9	33	29	29
85°	0	0				10	31	27	27
90°	0	0							

AF 1/26TRT 6AR, (1) CF26DT/E/IN/835, 1800 lumens per lamp, 1.2 s/mh, test no. LTL9391

Mount height	Initial fc at beam center	50% beam angle 59.9°		10% beam angle 93.8°	
		Beam diameter	fc at beam edge	Beam diameter	fc at beam edge
8'	23.6	6.3	11.8	11.8	2.4
10'	12.7	8.6	6.3	16.0	1.3
12'	7.9	11.0	4.0	20.3	0.8
14'	5.4	13.3	2.7	24.6	0.5
16'	3.9	15.6	2.0	28.8	0.4

From 0°	cp.	Lumens	Zone	Lumens	%lamp	ρf	80%	20%	50%
0°			0°-30°			pc	50%	70%	50%
5°			0°-40°			pw	30%	30%	30%
0°	713	72	0°-30°	584.2	32.5	1	69	67	65
5°	792	206	0°-40°	866.2	48.1	2	63	60	60
15°	850	307	0°-60°	1125.1	62.5	3	58	54	55
25°	765	282	0°-90°	1127.4	62.6	4	53	49	51
35°	493	232	90°-180°	0.0	0.0	5	49	45	44
45°	383	27	0°-180°	1127.4	62.6*	6	45	41	44
55°	15	2	*Efficiency			7	42	37	41
65°	1	1				8	39	34	38
75°	0	0				9	36	32	35
85°	0	0				10	34	30	33
90°	0	0							

AF 1/32TRT 6AR, (1) CF32DT/E/IN/835, 2400 lumens per lamp, 1.3 s/mh, test no. LTL9390

Mount height	Initial fc at beam center	50% beam angle 62.0°		10% beam angle 94.1°	
		Beam diameter	fc at beam edge	Beam diameter	fc at beam edge
8'	25.9	6.6	13.0	11.8	2.6
10'	13.9	9.0	7.0	16.1	1.4
12'	8.7	11.4	4.3	20.4	0.9
14'	5.9	13.8	3.0	24.7	0.6
16'	4.3	16.2	2.2	29.0	0.4

From 0°	cp.	Lumens	Zone	Lumens	%lamp	ρf	80%	20%	50%
0°			0°-30°			pc	50%	70%	50%
5°			0°-40°			pw	30%	30%	30%
0°	784	79	0°-30°	663.0	27.6	1	60	58	56
5°	868	230	0°-40°	995.2	41.5	2	55	52	54
15°	914	354	0°-60°	1299.6	54.2	3	50	47	46
25°	890	332	0°-90°	1304.8	54.4	4	46	43	45
35°	587	273	90°-180°	0.0	0.0	5	42	39	42
45°	473	31	0°-180°	1304.8	54.4*	6	39	35	39
55°	22	3	*Efficiency			7	36	32	35
65°	2	2				8	33	30	33
75°	1	1				9	31	27	30
85°	1	1				10	29	25	28
90°	0	0							

AF 1/42TRT 6AR, (1) CF42DT/E/IN/835, 3200 lumens per lamp, 1.3 s/mh, test no. LTL9521

Mount height	Initial fc at beam center	50% beam angle 62.5°		10% beam angle 94.2°	
		Beam diameter	fc at beam edge	Beam diameter	fc at beam edge
8'	35.0	6.7	17.5	11.8	3.5
10'	18.8	9.1	9.4	16.1	1.9
12'	11.7	11.5	5.9	20.4	1.2
14'	8.0	14.0	4.0	24.7	0.8
16'	5.8	16.4	2.9	29.0	0.6

From 0°	cp.	Lumens	Zone	Lumens	%lamp	ρf	80%	20%	50%
0°			0°-30°			pc	50%	70%	50%
5°			0°-40°			pw	30%	30%	30%
0°	1058	107	0°-30°	916.8	28.6	1	62	60	58
5°	1135	323	0°-40°	1390.1	43.4	2	57	54	53
15°	1136	487	0°-60°	1805.1	56.4	3	52	49	48
25°	1043	473	0°-90°	1808.4	56.5	4	48	44	44
35°	774	374	90°-180°	0.0	0.0	5	44	40	43
45°	622	41	0°-180°	1808.4	56.5*	6	41	37	40
55°	26	2	*Efficiency			7	38	34	37
65°	2	1				8	35	31	34
75°	1	1				9	32	28	31
85°	0	0				10	30	26	29
90°	0	0							

**NOTES:**

- 1 For electrical characteristics, refer to electrical data tab.
- 2 Tested to current IES and NEMA standards under stabilized laboratory conditions. Various operating factors can cause differences between laboratory data and actual field measurements. Dimensions and specifications are based on the most current available data and are subject to change without notice.
- 3 Consult factory or IES file for microgroove baffle, black cone and other photometric reports.

DCF-110

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DCF-110.p65

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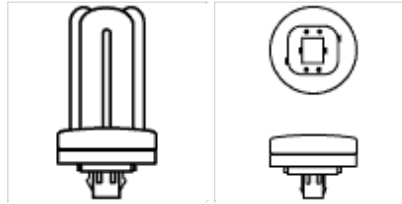
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# Lighting Specification Bulletin

## Plug-in 4-Pin Triple Biax®

**Product Code:** 34396


**Description:** TU F18TBX/SPX30/830/A/4P GX24Q-2  
GE MI

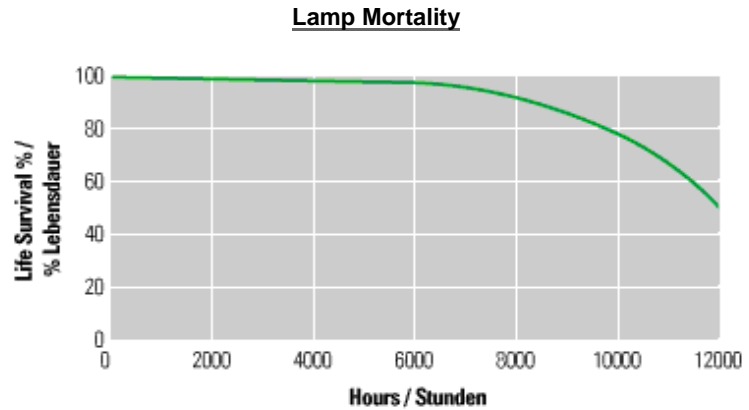


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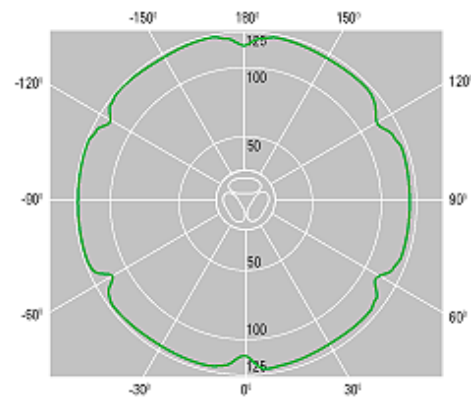
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**Job Name :**

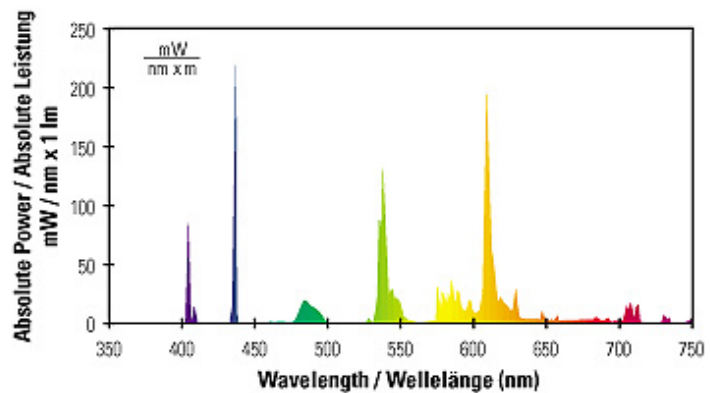
<b>General</b>	
Product Code	34396 
Description	F18TBX/SPX30/A/4
Subcategory	Plug-in 4-Pin Triple Biax®
<b>Physical</b>	
Bulb Type	BiaxT (T4)
Base Type	GX24q-2
Max Overall Length (In.)	4.8
Max Overall Length (mm)	122
Nominal Length (In.)	4.80
Nominal Length (mm)	122
Width of Lamp in inches	1.7
Depth of Lamp in inches	1.7
Base Face to Top of Lamp (In.)	4.25
<b>Photometric</b>	
Average Rated Life	12000
Lumens (Initial)	1200
Lumens (Mean)	1010
Color Temperature (K)	3000
Color Rendering Index (Ra) CRI	82
Nominal Efficacy (Lumens/Watt)	67
<b>Electrical</b>	
Watts	18
Minimum Starting Temp (deg F)	32
Nominal Lamp Operating Frequency (Hz)	60
Cold Cathode Resistance (Rc)	6.05
Max Cathode Resistance Ratio (Rh/Rc)	5.25
Min Cathode Resistance Ratio (Rh/Rc)	4.25
<b>Ballast-related information</b>	
Maximum Ballast OCV During	250



**Radial Luminous Intensity Distribution**



**Spectral Power Distribution Graphs**



Preheating (Vrms) (HF Operation)	
Minimum Ballast OCV After Preheating (Vrms) (-15 degC) (HF Operation)	550
Minimum Ballast OCV After Preheating (10 degC)	550
Minimum OCV Across Starter (Vrms) (LF Operation)	198
<b>Miscellaneous</b>	
Additional Information	NEMA Generic Designation: CFTR18W/GX24q/830, EOL protection
Footnotes	Fluorescent lamp lumens decline during life. Based on 60Hz reference circuit. 4-Pin lamp minimum starting temperature is a function of the ballast. Most ballasts are rated with a minimum starting temperature of 50° F (10° C). Ballasts are also available that provide reliable starting to 0° F (-18° C) and -20° F (-29° C). Amalgam product experience stable brightness over a wider temperature range and in various operating positions.

All values are design values or typical values when measured under laboratory conditions. Information provided is subject to change without notice. Where applicable, values are based on guidelines published in ANSI. For more information see Terms and Conditions in the link below.

➤ Reduced Wattage  LSB Data Available

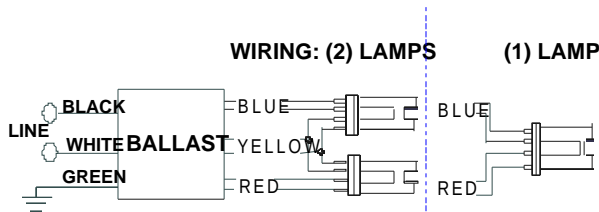


<b>ICF-2S18-H1-LD@277</b>	
Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

### Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
* CFM18W/GX24Q	1	18	0/-18	0.08	20	1.05	10	0.97	1.5	5.25
CFM18W/GX24q	2	18	0/-18	0.14	39	1.05	10	0.99	1.5	2.69
CFQ18W/G24q	1	18	0/-18	0.07	19	1.00	10	0.97	1.5	5.26
CFQ18W/G24q	2	18	0/-18	0.13	35	0.95	10	0.99	1.5	2.71
CFS16W/GR10q	2	16	0/-18	0.13	37	1.00	09	0.99	1.5	2.70
CFS21W/GR10q	1	21	0/-18	0.07	20	0.90	13	0.97	1.5	4.50
CFS21W/GR10q	2	21	0/-18	0.14	40	0.91	08	0.99	1.5	2.28

### Wiring Diagram



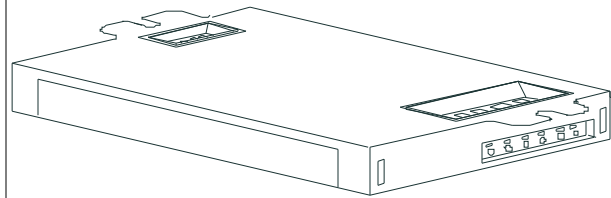
**Green Terminal must be Grounded**

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

### Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	0.0		Yellow/Blue		
White	0.0		Blue/White		
Blue	0.0		Brown		
Red	0.0		Orange		
Yellow	0		Orange/Black		
Gray			Black/White		
Violet			Red/White		

### Enclosure



### Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	2.4 "	1.0 "	4.6 "
4 49/50	2 2/5	1	4 3/5
12.6 cm	6.1 cm	2.5 cm	11.7 cm

Revised 09/02/2004



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

### ADVANCE TRANSFORMER CO.

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018

Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071

Corporate Offices: Phone: 800-322-2086



<b>ICF-2S18-H1-LD@277</b>	
Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

## **Electrical Specifications**

### **Notes:**

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.
- 1.3 Ballast shall be provided with poke-in wire trap connectors color coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start except for ballasts with -QS suffix, which shall be Rapid Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the IntelliVolt ballast. RCF models shall operate from 60 Hz input source of 120V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of -18C (0F) for primary lamp. Ballasts for PL-H lamps shall have a minimum starting temperature of -30C (-20F) for primary lamp.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit which meets NEMA recommendations.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall be Underwriters Laboratories (UL) rated for use in air-handling spaces.
- 3.4 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.5 Ballast shall comply with ANSI C82.11 where applicable.
- 3.6 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated) except for RCF models which shall be Consumer (Class B).

#### Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9001:2000 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 75C and three-years for a maximum case temperature of 85C (90C 3year warranty for ICF1H120-XX-XX, ICF2S70-XX-XX and ICF2S4290C-XX-XX modesls).
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance Transformer part # \_\_\_\_\_ or approved equal.

Revised 09/02/2004



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

**ADVANCE TRANSFORMER CO.**  
 O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD  
 ROSEMONT, ILLINOIS 60018  
 TELEPHONE: (847) 390-5000 FAX: (847) 390-5109



**Description**

Corelite's Iridium Perf Wall Mount is a semi-indirect fluorescent luminaire that features elegant styling with a sleek profile and end caps. The engineered optical system provides an asymmetric forward throw distribution. The Iridium Perf Wall may be mounted over standard 2"x4" J-Boxes for individual or continuous configurations using 4' and 8' modular sections. The Iridium Perf Wall is suited for open office perimeters, private offices, conference rooms, corridors and public spaces.

<b>Catalog #</b>		<b>Type</b>
<b>Project</b>		
<b>Comments</b>		<b>Date</b>
<b>Prepared by</b>		

**SPECIFICATION FEATURES**

**A ... Construction**

Housing is one piece die-formed cold rolled steel, forming a 7"x 2-1/2" architectural profile. Standard 4'-0" and 8'-0" fixture lengths combine for continuous runs.

**B ... End Caps**

Standard Straight and optional Beveled end caps are precision die-cast aluminum mechanically attached without exposed fasteners.

**C ... Reflectors**

Die-formed reflectors are highly specular anodized aluminum.

**D ... Electrical**

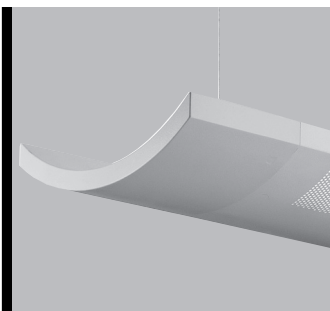
Fixtures are prewired with quick wire connectors and use UL listed Class P, T5HO program rapid start universal voltage electronic ballasts. Power factor of 97% with less than 10% THD. Fixtures and electrical components certified to UL and CUL standards.

**E ... Finish**

Fixture housings are standard white using electrostatically applied polyester powder coat paint.

**F ... Mounting**

Fixture mounts directly to existing structure over a 2" x 4" standard electrical box mounted horizontally into the wall. Refer to installation section for details.



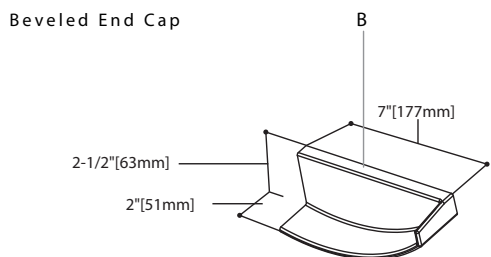
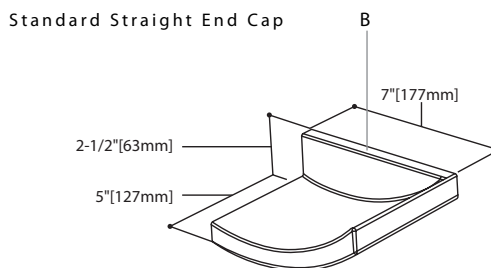
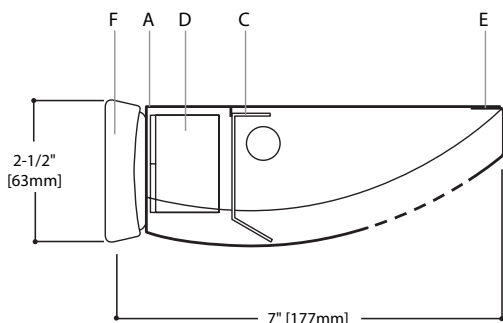
**Iridium**

**PERF WALL  
1T5HO**

**WALL MOUNT  
SEMI - INDIRECT**

Light Distribution

Indirect - 94.6%  
Direct - 5.4%



**MODULES AND DIMENSIONS\***

48" [1219mm]

96" [2438mm]

\*Dimensions do not include end caps.

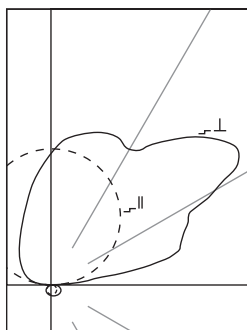
**ORDERING INFORMATION**

Sample Number: IW-SP-1T5-1D-120-SU-WA-68

<b>Series</b> IW: Iridium Perf Wall Mount	<b>Optics Up</b> S: Specular <b>Optics Down</b> P: Round Perf	<b>Number of Lamps</b> 1: 1 Lamp	<b>Lamp Type</b> T5: 54W T5 HO (4' unit) <b>Number of Circuits</b> <sup>1</sup> 1: 1 Circuit	<b>Wiring</b> <sup>1</sup> C: Standard Circuit D: Dimming E: Emergency B: Battery Pack T: Nightlight Y: Daylight	<b>Voltage</b> <sup>1</sup> 120: 120V 277: 277V 347: 347V UNV: Universal	<b>Suspension</b> SU-WA: Surface/Wall Mount <b>Run Length</b> <b>Individually Mounted</b> Luminaires may be 4' or 8' in length <b>Continuously Mounted</b> Standard row configurations over 8' consist of 4' and 8' sections	<b>Options</b> ES: Straight End Cap (Provided if none specified) EB: Beveled End Cap
--	--	-------------------------------------	---	--	--	--	--

Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications and dimensions subject to change without notice.

PHOTOMETRICS



IW-SP-1T5  
(1) FP54/841/HO  
4500 Lumens

Efficiency 73.5%

Test Report  
#LSI16233

Coefficients of Utilization

rc	Effective floor cavity reflectance																							
	80%				70%				50%				30%				10%				0%			
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	0	71	71	71	71	61	61	61	61	43	43	43	26	26	26	11	11	11	04	04	04	04	04	04
	1	64	62	59	56	56	53	51	48	37	36	35	23	22	22	10	10	09	03	03	03	03	03	03
	2	59	53	49	46	50	46	43	40	33	31	29	20	19	18	09	08	08	03	03	03	03	03	03
	3	53	47	42	38	46	41	37	33	29	26	24	18	17	15	08	07	07	02	02	02	02	02	02
	4	49	41	36	32	42	36	31	28	25	23	20	16	14	13	07	06	06	02	02	02	02	02	02
	5	45	36	31	27	38	32	27	24	23	20	17	14	12	11	06	05	05	02	02	02	02	02	02
	6	41	33	27	23	35	28	24	20	20	17	15	13	11	09	05	05	04	01	01	01	01	01	01
	7	38	29	24	20	32	25	21	18	18	15	13	11	09	08	05	04	04	01	01	01	01	01	01
	8	35	26	21	17	30	23	18	15	16	13	11	10	08	07	04	04	03	01	01	01	01	01	01
	9	32	24	19	15	27	21	16	13	15	12	10	09	07	06	04	03	03	01	01	01	01	01	01
	10	30	21	17	13	26	19	15	12	13	11	09	08	07	05	04	03	02	01	01	01	01	01	01

Candela

Angle	Along	II	45°	Across	⊥
0	59	59	59	59	59
5	58	61	63	63	63
15	55	66	72	72	72
25	51	68	77	77	77
35	42	63	80	80	80
45	35	63	76	76	76
55	23	54	68	68	68
65	12	45	58	58	58
75	5	30	46	46	46
85	0	14	26	26	26
90	0	9	18	18	18
95	35	160	82	82	82
105	188	582	815	815	815
115	347	991	920	920	920
125	487	1023	1412	1412	1412
135	606	915	1309	1309	1309
145	702	912	1073	1073	1073
155	776	968	1011	1011	1011
165	826	947	988	988	988
175	851	900	918	918	918
180	842	842	842	842	842

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	46	1.03	1.40
0-40	75	1.68	2.28
0-60	133	2.97	4.05
0-90	179	36.99	5.43
40-90	104	2.32	3.15
60-90	45	1.02	1.39
90-180	3126	69.48	94.57
0-180	3306	73.47	100.00

Luminance Data

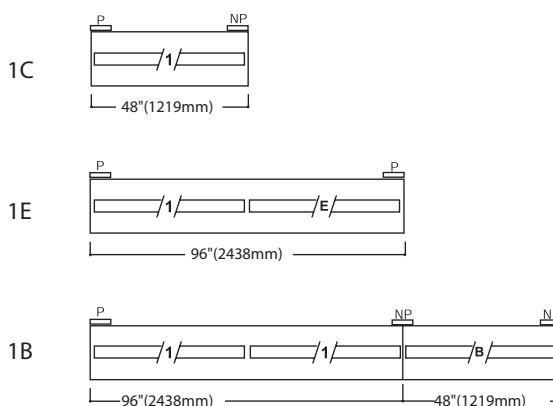
Angle in Deg	0-Deg cd/sm	45-Deg cd/sm	90-Deg cd/sm
45	871	1190	1296
55	706	1121	1285
65	500	1125	1232
75	640	913	1126
85	0	559	784

COMMON CIRCUIT CONFIGURATIONS FOR ONE LAMP WALL MOUNT FIXTURES

- 1C = Single circuit luminaire
- 1E = Single circuit luminaire with emergency circuit
- 1B = Single circuit luminaire with battery pack

- /1/ = Circuit 1
- /E/ = Emergency Circuit
- /B/ = Battery Circuit

- = Power Mount
- = Non-Power Mount



STANDARD ROW CONFIGURATIONS

FIXTURE LENGTH	4'	8'	12'	16'	20'	24'	28'	32'	36'	40'	44'	48'	52'	56'	60'	64'	68'	72'	76'	80'	84'	88'	92'	96'	100'	104'	108'	
4'	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
8'		1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	



GE Consumer & Industrial  
Lighting

Print Close

# Lighting Specification Bulletin

**T5 Starcoat High Efficiency**

**Product Code:** 46704

**Description:** F28W/T5/830/ECO

**Specification:**

**Firm Name :**

**Job Name :**

<b>General</b>	
Product Code	46704
Description	F28W/T5/830/ECO
Subcategory	T5 Starcoat High Efficiency
<b>Physical</b>	
Bulb Type	T5
Base Type	Miniature BiPin (G5)
Bulb Material	Soft Glass
Nominal Length (In.)	45.20
Nominal Length (mm)	1150
Max Overall Length (In.)	45.795
Bulb Nominal Diameter in inches	.625
Max bulb diameter	.67
Max Face to End of Opposing Pin (B)	45.42
Min Face to End of Opposing Pin (B)	45.42
<b>Photometric</b>	
Lumens (Initial)	2900
Lumens (Mean)	2726
Color Temperature (K)	3000
Nominal Efficacy (Lumens/Watt)	104
<b>Electrical</b>	
Average Rated Life	20000
Watts	28
Nominal Lamp Volts	167
Nominal Lamp Operating Frequency (Hz)	20000
Minimum Starting Temp (deg F)	5
Min. Terminal to Terminal Starting Lamp Voltage (Vrms)- Instant Start at 15°C	530
Min. Terminal to Terminal Starting Lamp Voltage (Vrms)- Rapid Start at 10°C	425
Max Cathode Resistance Ratio (Rh/Rc)	6.5
Min Cathode Resistance Ratio (Rh/Rc)	4.25
<b>Miscellaneous</b>	
TCLP Regulated	Y
Additional Information	S/P Ratio: 1.3 Lumen Ratings at 35C. At 25C, Initial Lumens are 2640.

All values are design values or typical values when measured under laboratory conditions. Information provided is subject to change without notice. Where applicable, values are based on guidelines published in ANSI. For more information see Terms and Conditions in the link below.



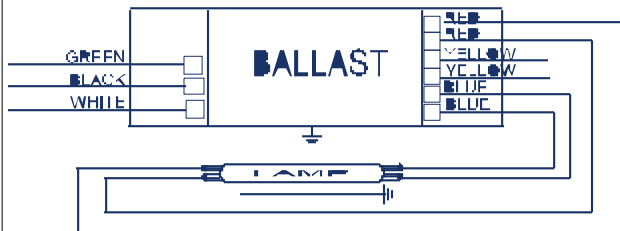
## ICN-2S28@277

Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

### Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F14T5	1	14	0/-18	0.07	19	1.07	20	0.90	1.7	5.63
F14T5	2	14	0/-18	0.13	34	1.06	10	0.98	1.7	3.12
F21T5	1	21	0/-18	0.10	26	1.03	15	0.95	1.7	3.96
F21T5	2	21	0/-18	0.17	48	1.02	10	0.98	1.7	2.13
* F28T5	1	28	0/-18	0.12	33	1.04	10	0.98	1.7	3.15
F28T5	2	28	0/-18	0.23	63	1.03	10	0.99	1.7	1.63
F35T5	1	35	0/-18	0.15	41	1.01	10	0.98	1.7	2.46
F35T5	2	35	0/-18	0.28	77	1.00	10	0.99	1.7	1.30

### Wiring Diagram



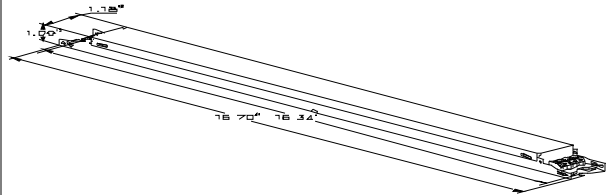
For 1 lamp operation, do not use yellow leads

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

### Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	0	0	Yellow/Blue	0	0
White	0	0	Blue/White	0	0
Blue	0	0	Brown	0	0
Red	0	0	Orange	0	0
Yellow	0	0	Orange/Black	0	0
Gray	0	0	Black/White	0	0
Violet	0	0	Red/White	0	0

### Enclosure



### Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
16.70 "	1.18 "	1.00 "	16.34 "
16 7/10	1 9/50	1	16 17/50
42.4 cm	3 cm	2.5 cm	41.5 cm

Revised 09/01/2004



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

### ADVANCE TRANSFORMER CO.

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018

Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071

Corporate Offices: Phone: 800-322-2086



<b>ICN-2S28@277</b>	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

## **Electrical Specifications**

### **Notes:**

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of \_\_\_\_\_ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of -18C (0F) or -28C (-20F) for primary lamp. Consult lamp manufacturer for temperature versus lamp characteristics.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall have a hi-low switching option when operating (4) F54T5/HO lamps to allow switching from 4-2 lamps, 3-2 lamps or 3-1 lamp.
- 2.14 Four lamp ballast shall have semi-independent lamp operation.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

#### Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9001:2000 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance Transformer part # \_\_\_\_\_ or approved equal.

Revised 09/01/2004



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

**ADVANCE TRANSFORMER CO.**  
 O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD  
 ROSEMONT, ILLINOIS 60018  
 TELEPHONE: (847) 390-5000 FAX: (847) 390-5109

Walter Nichols  
Hawthorn Building  
Altoona, PA



Appendix B



# luna<sup>®</sup> 2x2



Covered by U.S. Patent No. D395,727.

## FEATURES

2'x2' recessed indirect with perforated center basket.

Reflector and end caps form seamless one-piece housing.

High reflectance, low gloss Matte White finish controls glare and provides high efficiency.

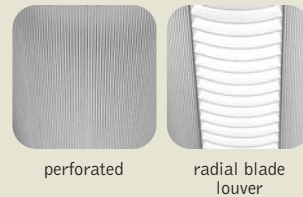
Perforated shields snap out for easy relamping.

Optional radial blade louver offers a distinct look that highlights interior architecture.

All luminaire combinations may be continuously row mounted.

Luna<sup>®</sup> provides high angle uniform distribution ideal for general illumination.

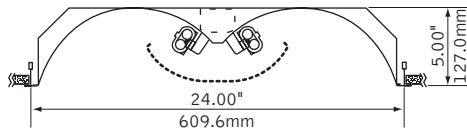
## shielding options & details



perforated

radial blade louver

## DIMENSIONAL DATA



### lamping options



BIAX LAMPS



T8 U-BEND LAMPS

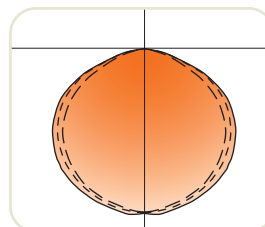


T8 LAMPS



T5/T5H0 LAMPS

## PERFORMANCE



2-Lamp 40W Bi-ax  
70% Efficiency  
1598 cd @ 5°

See **Photometric** section for additional performance data.

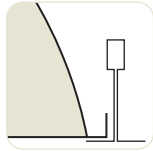
fixture type:

project name:

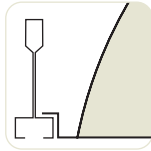
## DETAILS

### mounting

specify "G" for flat 9/16" and 15/16" tee or "ST" for 9/16" slot tee grid types.



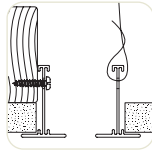
"G" flat tee  
Luminaires cannot be installed in T-bar ceiling systems over 1.5" high in T8 lamp configurations.



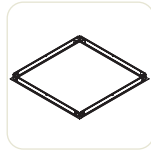
"ST" slot tee

### drywall frame kit

specify "DF" Drywall Frame Kit for drywall ceiling conditions.



Use tie-wire or screws to secure frame kit.



cut out dimensions:  
2': Min: 24.125"  
Max: 24.563"

## SPECIFICATIONS

### construction

One-piece 20 Ga. steel reflector and housing.

20 Ga. steel ends form finished housing.

Lamps are shielded by detachable 22 Ga. steel perforated lamp shield with acrylic lens insert.

Optional radial blade louver: .75"H x 1" frequency fabricated of 20 Ga. steel with acrylic lens insert.

Top access 20 Ga. steel ballast compartment.

Weight: 20 lbs

### optic

One-piece 20 Ga. steel reflectors finished in Matte Satin White powder coat.

### electrical

Electronic ballasts are thermally protected and have a Class "P" rating.

Optional DALI and other dimming ballasts available.

Consult factory for dimming specifications and availability.

UL and cUL listed.

### emergency

Emergency battery packs provide 90 minutes of illumination.

Initial lumen output for lamp types are as follows:

Biax Lamps:	Up to 650 lumens
T8 Lamps:	Up to 450 lumens
T5 Lamps:	Up to 375 lumens
T5H0 Lamps:	Up to 450 lumens
T831 Lamps:	Up to 475 lumens

Battery pack requires unswitched hot from same branch circuit as AC ballast.

### finish

Polyester powder coat applied over a 5-stage pre-treatment.

Standard luminaire housing finished in Matte Satin White.

## ORDERING

luminaire series FLU

Luna FLU

nominal size 22

2' x 2' 22

distribution B

Bi-Directional B

lamp quantity     

2 Lamps 2

3 Lamps 3

lamp type     

40 Watt Biax BX40

50 Watt Biax BX50

55 Watt Biax BX55

F31/T8U T831

(two lamp only)

T8 T8

T5 T5

T5H0 T5H0

ballast     

Electronic Instant Start <20% THD E

Electronic Program Start <10% THD S

Electronic Dimming Ballast D

(consult factory for dimming availability)

voltage     

120 Volt 120

277 Volt 277

347 Volt 347

(Consult factory for availability)

mounting     

Grid G

Slot Tee ST

shielding     

Perforated Shield PS

Radial Blade Louver RLP

factory options     

Air Return AR

Chicago Plenum CP

Dust Cover DC

Drywall Frame Kit DF

(Cut out dimensions:  
Min: 24.125"/Max: 24.563")

Emergency Battery Pack EM

Earthquake Clip EQ

HLR/GLR Fuse FU

Flex Whip FW

Include 3000K Lamp L830

Include 3500K Lamp L835

Include 4100K Lamp L841

Separate Circuit SC

finish WH

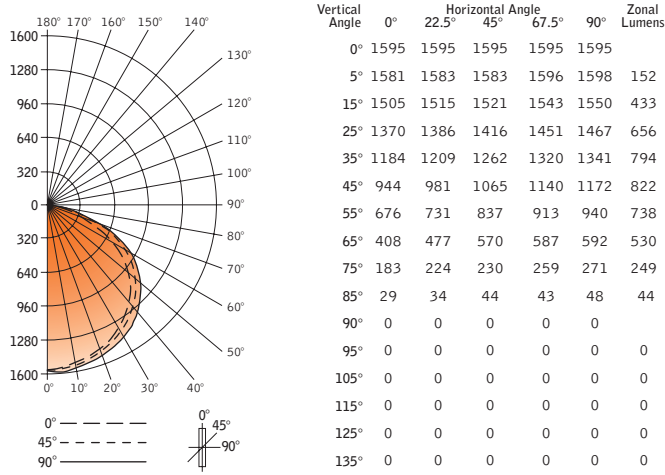
Matte Satin White WH

# luna<sup>®</sup> 2x2



Filename: FLU222BX40PS.IES  
 Catalog #: FLU-22-B-2-BX40-E-120-G-PS-WH  
 Efficiency: 70%  
 Test #: 11020.0

## CANDLEPOWER DISTRIBUTION



Spacing 1.2  
 Criterion: 1.3

Vertical Angle	0°	22.5°	45°	67.5°	90°	Zonal Lumens
0°	1595	1595	1595	1595	1595	
5°	1581	1583	1583	1596	1598	152
15°	1505	1515	1521	1543	1550	433
25°	1370	1386	1416	1451	1467	656
35°	1184	1209	1262	1320	1341	794
45°	944	981	1065	1140	1172	822
55°	676	731	837	913	940	738
65°	408	477	570	587	592	530
75°	183	224	230	259	271	249
85°	29	34	44	43	48	44
90°	0	0	0	0	0	
95°	0	0	0	0	0	0
105°	0	0	0	0	0	0
115°	0	0	0	0	0	0
125°	0	0	0	0	0	0
135°	0	0	0	0	0	0
145°	0	0	0	0	0	0
155°	0	0	0	0	0	0
165°	0	0	0	0	0	0
175°	0	0	0	0	0	0
180°	0	0	0	0	0	0

## LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixt
0°-30°	1241	19.7	28.1
0°-40°	2034	32.3	46.1
0°-60°	3594	57.0	81.4
0°-90°	4415	70.1	100.0
<b>Total Luminaire</b>	<b>0°-180° 4415</b>	<b>70</b>	<b>100.0</b>

## LUMINANCE DATA (CD/M<sup>2</sup>)

Vertical Angle	0°	45°	90°
45°	3924	4427	4872
55°	3464	4289	4817
65°	2838	3965	4118
75°	2078	2612	3078
85°	978	1484	1619

## CO-EFFICIENTS OF UTILIZATION

Floor	80				70				20					
Ceiling	50				50				50					
Wall	70	50	30	10	70	50	10	50	10	50	10	50	10	00
RCR 0	83	83	83	83	81	81	81	78	78	75	75	72	72	70
1	77	74	71	69	75	73	68	70	66	67	64	64	62	61
2	71	66	61	57	69	64	57	62	56	60	54	58	53	52
3	65	58	53	49	63	57	48	55	47	53	47	51	46	44
4	60	52	46	42	58	51	41	49	41	48	40	46	40	38
5	54	46	40	35	53	45	35	44	35	42	34	41	34	32
6	50	41	35	30	49	40	30	39	30	38	30	37	30	28
7	46	37	31	26	45	36	26	35	26	34	26	33	26	24
8	42	33	27	23	41	32	23	31	23	31	23	30	22	21
9	39	29	24	20	38	29	20	28	20	27	19	27	19	18
10	36	27	21	17	35	26	17	26	17	25	17	24	17	16

Numbers indicate percentage values of reflectivity.

Go to [www.focalpointlights.com](http://www.focalpointlights.com) for additional photometric data.

**PHILIPS**

## 21W/830 Min Bipin T5 UNP



### PRODUCT DATA

Product Number	230813
Full product name	21W/830 Min Bipin T5 UNP
Ordering Code	F21T5/830/ALTO
Pack type	Unpacked
Pieces per pack	1
Packs per case	40
Pack UPC	046677230814
EAN2US	-
Case Bar Code	50046677230819
Successor Product number	-
Wattage[W ]	21W
Color Code	830 [CCT of 3000K]
Base	Min Bipin [Miniature Bipin]
Bulb	T5 [16mm]
Special packing	ALTO
Packing Type	UNP [Unpacked]
System Description	High Efficiency
Base Information	Green[Green Base]
Packing Configuration	40
Rated Avg. Life[hr ]	24000
Dimmable	Yes
Mercury (Hg) Content[mg ]	-
Color Rendering Index[Ra8 ]	85
Color Temperature[K ]	3000
Initial Lumens[Lm ]	-
Overall Length C[mm ]	863.2
Diameter D[mm ]	17

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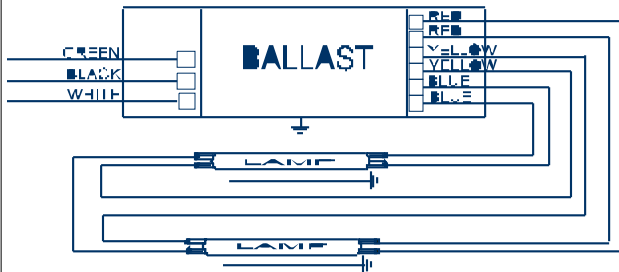
## ICN-2S28@277

Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

### Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F14T5	1	14	0/-18	0.07	19	1.07	20	0.90	1.7	5.63
F14T5	2	14	0/-18	0.13	34	1.06	10	0.98	1.7	3.12
F21T5	1	21	0/-18	0.10	26	1.03	15	0.95	1.7	3.96
* F21T5	2	21	0/-18	0.17	48	1.02	10	0.98	1.7	2.13
F28T5	1	28	0/-18	0.12	33	1.04	10	0.98	1.7	3.15
F28T5	2	28	0/-18	0.23	63	1.03	10	0.99	1.7	1.63
F35T5	1	35	0/-18	0.15	41	1.01	10	0.98	1.7	2.46
F35T5	2	35	0/-18	0.28	77	1.00	10	0.99	1.7	1.30

### Wiring Diagram

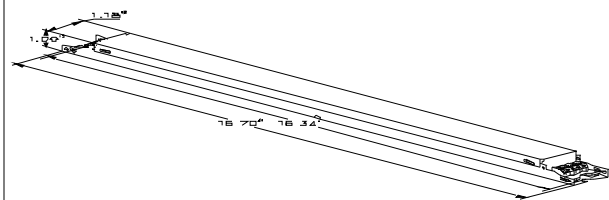


The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

### Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	0	0	Yellow/Blue	0	0
White	0	0	Blue/White	0	0
Blue	0	0	Brown	0	0
Red	0	0	Orange	0	0
Yellow	0	0	Orange/Black	0	0
Gray	0	0	Black/White	0	0
Violet	0	0	Red/White	0	0

### Enclosure



### Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
16.70 "	1.18 "	1.00 "	16.34 "
16 7/10	1 9/50	1	16 17/50
42.4 cm	3 cm	2.5 cm	41.5 cm

Revised 09/01/2004



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

### ADVANCE TRANSFORMER CO.

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018

Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071

Corporate Offices: Phone: 800-322-2086



<b>ICN-2S28@277</b>	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

## **Electrical Specifications**

### **Notes:**

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of \_\_\_\_\_ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of -18C (0F) or -28C (-20F) for primary lamp. Consult lamp manufacturer for temperature versus lamp characteristics.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall have a hi-low switching option when operating (4) F54T5/HO lamps to allow switching from 4-2 lamps, 3-2 lamps or 3-1 lamp.
- 2.14 Four lamp ballast shall have semi-independent lamp operation.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

#### Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9001:2000 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance Transformer part # \_\_\_\_\_ or approved equal.

Revised 09/01/2004



Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

**ADVANCE TRANSFORMER CO.**  
 O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD  
 ROSEMONT, ILLINOIS 60018  
 TELEPHONE: (847) 390-5000 FAX: (847) 390-5109

**Description**

308 Features a Center Luminous Glass Bowl surrounded by Four Perched Glass Bowls. Available with various glass colors and texture options.

<b>Catalog #</b>		<b>Type</b>
<b>Project</b>		
<b>Comments</b>		<b>Date</b>
<b>Prepared by</b>		

**SPECIFICATION FEATURES**

**Material/Mounting**

Brass, copper, steel or aluminum stems, trim and ball.

Quad-Pod with Decorative Rings: Four 3/8" stems with decorative ring attachment. Standard hang height of 48" (OA). Minimum overall hang height is 30" (OA). Maximum overall hang height is 8' (OA). Contact factory for lengths above 8'. Specify SCA for sloped ceilings up to 0-45°. 1/4" Architectural (light green glass) or Starfire (white glass) available in various textures and colors.

**Finish**

Standard: Unlacquered Natural Aluminum (NA) [Sustainable Design].  
Premium: Matte White (MW), Lacquered Satin Aluminum (SAL), Satin Chrome (SC), Polished Chrome (PC), Satin Brass (SB), Polished Brass (PB), Satin Copper (SCP), Polished Copper (PCP), Satin Nickel (SN), Polished Nickel (PN), Satin Zinc (SZ), Gun Metal (GNM), Oxidized Brass (OBRS), Oxidized Copper (OCP) or Custom Colors (CC).

**Glass Finish**

Standard: Glass Architectural White (GAW).  
Premium:  
Colors - Glass Architectural Celadon (GAC), Glass Architectural Parchment (GAP), Glass Architectural Coral (GAL), Glass Starfire White (GSA), Glass Starfire Celadon (GSC), Glass Starfire Parchment (GSP) or Glass Starfire Coral (GSL).  
Faux - Glass Architectural Marble White (GAMW), Glass Architectural Marble Celadon (GAMC), Glass Architectural Marble Parchment (GAMP), Glass Architectural Marble Coral (GAML), Glass Starfire Marble White (GSMW), Glass Starfire Marble Celadon (GSMC), Glass Starfire Marble Parchment (GSMP), Glass Starfire Marble Coral (GSML), Glass Architectural Sand Granite (GASG) or Glass Starfire Sand Granite (GSSG). Contact factory for additional colors and faux patterns.  
Textured: Glass Architectural Oscuro (GAO), Glass Starfire Oscuro (GSO) or Glass Architectural Opal Ice (GAI).

**Optics**

Refer to www.shaperlighting.com for complete photometrics.

**Lamp/Socket**

One (1) 50W T-5 (mini-can) 120V Xelogen lamp (5000hrs, 2900K) or 60W (G9) pinched quartz 120V halogen lamp (2000hrs, 2800K).  
Note: Six lamps total per fixture. Lamps furnished by others.

**Installation**

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" J-box or plaster ring. Integral safety cable provided.

**Options**

Center Stem with Ball (CSB), Sloped Ceiling Adaptor (SCA). Contact the factory for alternative mounting options and multi-bowls.

**Labels**

U.L. and C.U.L. listed.

**Modifications**

Shaper's skilled craftspeople with their depth of experience offer the designer the flexibility to modify standard pendant luminaires for project specific solutions. Contact the factory regarding scale options, unique finishes, mounting, additional materials/colors, or decorative detailing.



**308  
Cloud  
Interior Pendant**

Features a Center Luminous Glass Bowl surrounded by Four Perched Glass Bowls

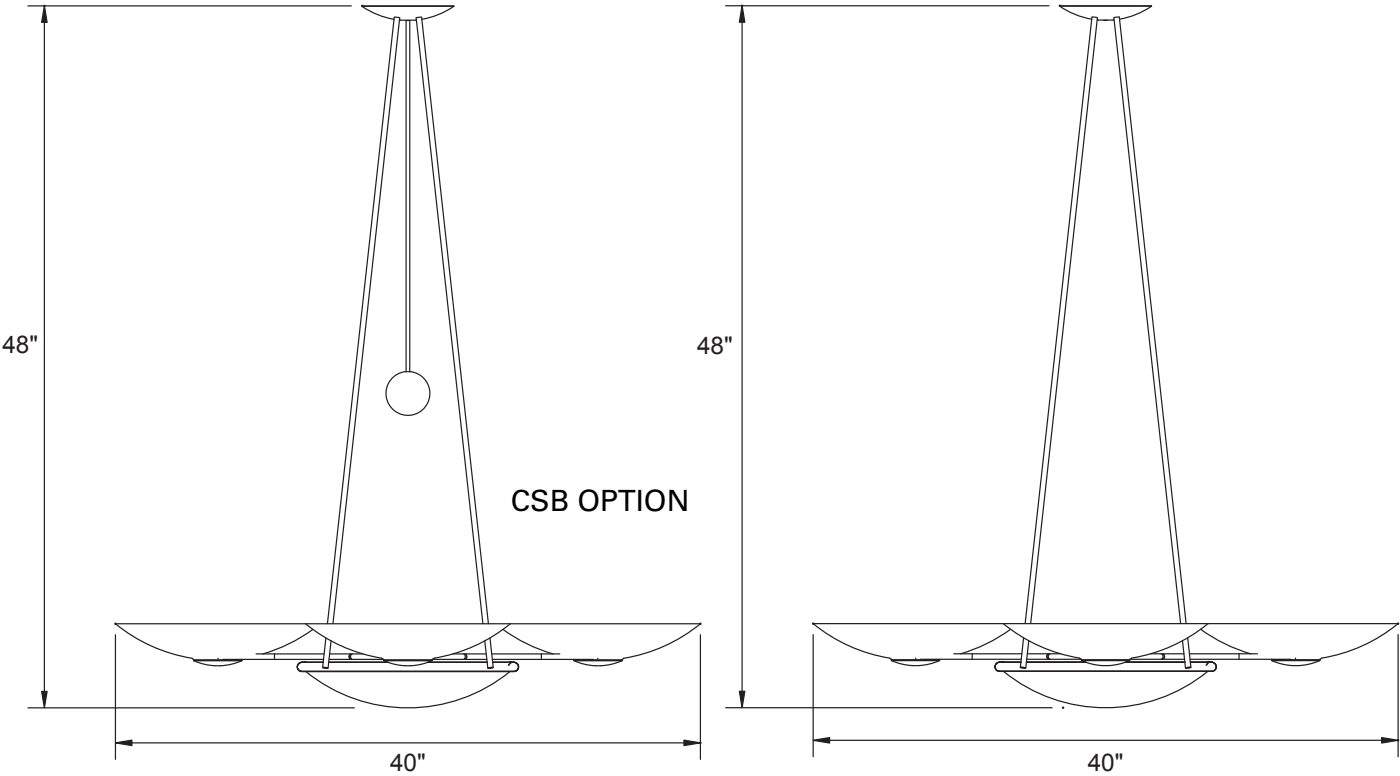


[Sustainable Design]  
Shaper's NA finish supports the goals for sustainable projects. Refer to the Icon Legend Link on shaperlighting.com.

**ORDERING EXAMPLE** 308-XEL/3/50 + XEL/8/50-120V-GOA-NZ-42

SERIES	LAMP	VOLTAGE	GLASS FINISH	TRIM FINISH	OPTIONS	OA
308	XEL/3/50 + XEL/8/50 (11 total) HAL/3/60 + HAL/8/60 (11 total)	120V (only)	GAW, GAC, GAP, GAL, GSA, GSC, GSP, GSL, GAMW, GAMC, GAMP, GAML, GSMW, GSMC, GSMP, GSML, GASG, GSSG, GAO, GSO, GAI	NA, MW, SAL, SB, PB, SC, PC, SCP, PCP, SN, PN, SZ, GNM, OBRS, OCP or CC	CSB, SCA	48" OA or Specify

DIMENSIONS







## Halogená Classic 60W Med 120V BT15 CL 1BC

Product family description  
The long life alternative to standard incandescent that offers superior light quality, less maintenance and energy savings.

### Features/Benefits

- Long life means less hassle and lower maintenance for the consumer.
- Superior Light Quality - Provides a crisp white light. Maintains a high light quality when dimmed.
- Dimmable - Greater design flexibility. Saves energy. Increases life - uses less electricity when dimmed.
- Direct Replacement - Compact size and a medium base to replace standard incandescent lamps.
- Full Line - Available in a variety of shapes, wattages and bases.

### Applications

- Ideal for table lamps, hanging pendants, ceiling fixtures, enclosed outdoor lighting, commercial downlights, or any hard-to-reach fixture.

### Notes

- Operating Instructions: Do not use lamp in close proximity to combustile materials. If used outdoors, use in an enclosed fixture only. If used indoors, no additional shield is required. Can be operated in all positions. CAUTION: Read operating instructions before use. If outer glass breaks, turn power off immediately and avoid touching any metal components. To avoid potential burn and electrical shock during lamp replacement, always turn power off and let lamp cool before replacing bulb. Lasts 2 years based on 4 hours average usage per day/7 days per week. (96)
- Rated average life is the length of operation (in hours) at which point an average of 50% of the lamps will still be operational and 50% will not. (93)

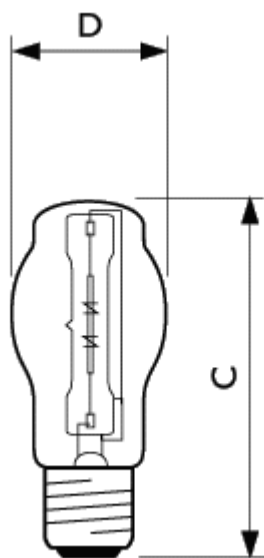
### Product data

Product Number	249243
Full product name	Halogená Classic 60W Med 120V BT15 CL 1BC
Ordering Code	BC60BT15/HAL/CL
Pack type	1 Lamp in a Blister Card
Pieces per pack	1
Packs per case	10
Pack UPC	046677249243
EAN2US	
Case Bar Code	50046677249248
Successor Product number	
Wattage[W ]	60W
Base	Med [Medium]
Voltage[V ]	120V
Bulb	BT15 [Diameter 1.875 inch]
Bulb Finish	CL [Clear]
Packing Type	1BC [1 Lamp in a Blister Card]

---

Product data	
Packing Configuration	10
Operating Position	Universal[Any or Universal (U)]
Rated Avg. Life[hr ]	
Color Rendering Index[Ra8 ]	100
Color Temperature[K ]	2900
Initial Lumens[Lm ]	920
Overall Length C[mm ]	106
Diameter D[mm ]	47.3

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Data not (yet) available

HalA E27/Medium BT15

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Walter Nichols  
Hawthorn Building  
Altoona, PA



Appendix C

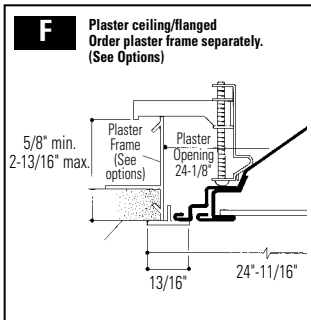
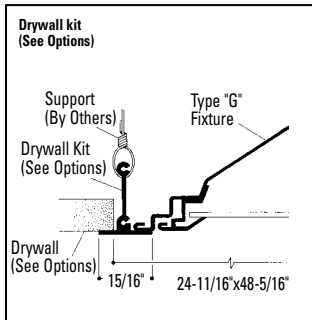
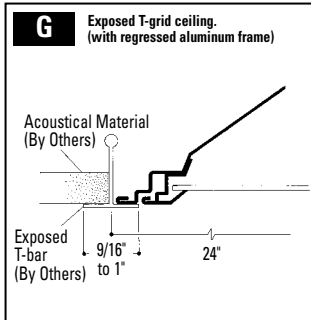
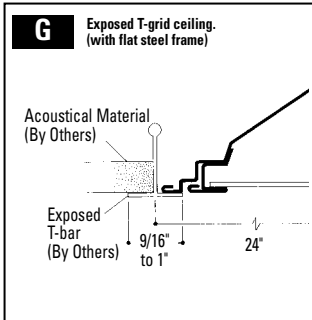
# XP/XA 2' x 4' Lens Recessed Fluorescent **XP/XA332**

## Features

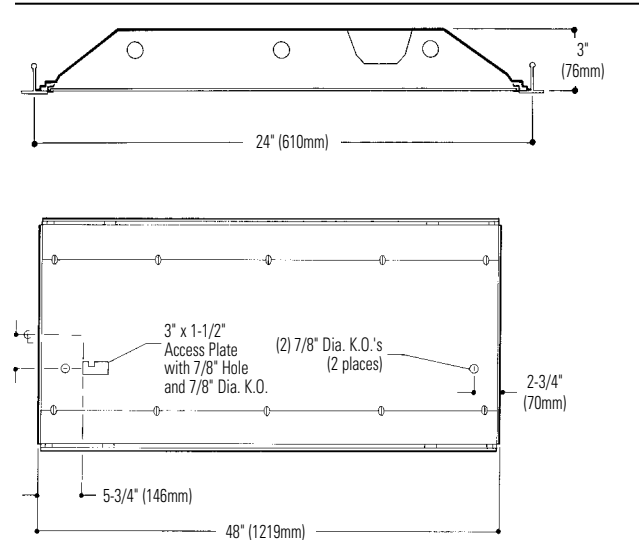
- Efficiency 85.0%.
- Shallow 3" deep housing.
- Ribbed housing for strength and stability.
- Ends of housing formed inward for safe handling.
- Built-in earthquake clips.
- Hemmed-over side rails for safe handling.
- Ends have screw dimples for installation to T-bar (no fixture or ceiling distortion).
- Flat steel or regressed aluminum lens frame with mitered corners.
- Edges of steel door frame hemmed-over for safe handling.
- No light leak.
- Internal "T" hinges – easy installation and maintenance.
- Rooster head spring latches.
- Meets code 30 requirements in New England.



## Mounting Methods



## Dimensions



**LIGHTOLIER**®


Job Information	Type:
<b>Job Name:</b>	
<b>Cat. No.:</b>	
<b>Lamp(s):</b>	
<b>Volts/Ballast:</b>	

# XP/XA 2' x 4' Lens Recessed Fluorescent **XP/XA332**

## Photometry

Model No. **XP2GVA33212003**

LER = FL - 75.2 IW - 85 BF - 0.88  
Comparative yearly lighting energy cost per 1000 lumens = \$3.19



45 Industrial Way  
Wilmington, MA 01887  
(978) 657-7600

REPORT NO.: G22921      DATE: 7/2/02  
CATALOG NO.: XP2GVA33212003  
LAMP(S): 3 F32T8, EACH RATED 2850 LUMENS.  
LUMINAIRE: 2X4 G TROFFER W/ VA LENS  
ADVANCE REL-3P32-SC

**CANDELA DISTRIBUTION**

0	0	22.5	45.0	67.5	90.0	FLUX
0	2708	2708	2708	2708	2708	
5	2709	2703	2703	2691	2694	257
15	2618	2623	2645	2666	2677	748
25	2402	2438	2518	2588	2616	1360
35	2078	2135	2269	2394	2429	1412
45	1630	1689	1818	1931	1985	1394
55	1093	1153	1263	1304	1339	1101
65	634	646	643	684	741	668
75	377	361	291	329	362	363
85	145	151	133	140	149	150
90	25	24	23	26	26	

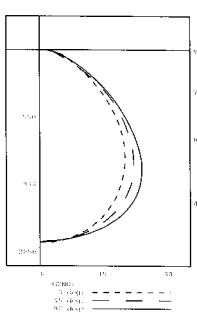
**ZONAL LUMEN SUMMARY**

ZONE	LUMENS	%LAMP	%PLAT
0 - 30	2165	25.0	30.0
0 - 40	3577	42.0	49.0
0 - 60	6072	71.0	84.0
0 - 90	7253	85.0	100.0
90-180	0	0.0	0.0
0-180	7253	85.0	100.0

TOTAL LUMINAIRE EFFICIENCY = 85.0%  
CIE TYPE - DIRECT

PLANE: 0-DEG 90-DEG  
SPACING CRITERIA: 1.2 1.4  
SHIELDING ANGLES: 90 90  
PLANE: 0-DEG 90-DEG  
LUMINOUS LENGTH: 146.000 21.000

LUMINANCE DATA IN CANDELA/deg M  
ANGLE AVERAGE AVERAGE  
IN DEG 0-DEG 45-DEG 90-DEG  
45 3697. 4124. 4503.  
55 3057. 3532. 3744.  
65 2406. 2440. 2812.  
75 2336. 1803. 2243.  
85 2669. 2448. 2742.



THIS REPORT IS BASED ON PUBLISHED INDUSTRY PROCEDURES • FIELD PERFORMANCE MAY VARY FROM LABORATORY PERFORMANCE.

### coefficients of utilization — zonal cavity method (effective floor cavity reflectance 0.20)

RW	20			20			20		
	RC	80	50	RC	80	50	RC	80	50
1	93	89	85	83	81	78	80	78	76
2	85	78	73	74	69	66	71	67	64
3	78	69	63	65	60	56	63	59	55
4	71	62	54	58	53	48	56	51	47
5	66	55	48	53	46	42	51	46	41
6	61	50	43	48	41	37	46	41	36
7	56	45	38	43	37	33	42	37	32
8	53	41	34	40	34	29	39	33	29
9	49	38	31	37	31	26	35	30	26
10	46	35	28	34	28	24	33	28	24

### visual comfort probability (rated lumens per lamp 2850)

W	L	ceiling height				ceiling height			
		8.5	10.0	13.0	16.0	8.5	10.0	13.0	16.0
20	20	60	65	73	81	59	63	69	78
20	30	52	57	63	71	53	56	60	67
20	40	48	52	58	63	50	52	56	60
20	60	44	48	52	58	46	49	52	56
30	20	62	66	72	79	61	65	69	76
30	30	53	58	62	68	54	57	60	65
30	40	48	52	56	61	50	53	55	58
30	60	44	47	50	55	46	49	50	54
30	80	42	45	46	51	44	46	48	51
40	20	64	68	72	78	63	66	70	76
40	30	55	59	63	67	56	59	61	65
40	40	49	53	56	60	51	54	56	58
40	60	45	48	50	54	46	49	51	53
40	80	42	45	46	50	44	46	48	50
40	100	41	43	44	47	43	45	46	48
60	30	56	60	64	68	57	60	62	66
60	40	50	54	57	60	52	55	56	59
60	60	45	48	50	54	47	50	51	54
60	80	42	45	46	49	44	46	47	50
60	100	41	43	43	46	43	44	45	48
100	40	54	57	59	63	54	57	59	62
100	60	48	51	52	56	49	52	53	56
100	80	45	47	47	51	46	48	49	52
100	100	43	44	44	47	44	46	46	48

## Ordering Information

Explanation of Catalog Number. Example: XP2GVA33212003GLR

XP	2	VA	3	32			
XP = Recessed Fluorescent with Flat Steel Lens Frame XA = Recessed Fluorescent with Regressed Aluminum Lens Frame	Fixture Width	Ceiling Type: G = Grid (lay-in) T-bar F = Flanged (overlap) Z spline and plaster frame	Lens Shielding Type: VA = Virgin Acrylic (standard) see options and consult factory	Lamp Quantity: (By others) 3 = 3-Lamp	Lamp Fixture Length: 32=T8, 4'= Length	Voltage: 120 or 277	Ballast: <20THD <10THD 1 & 2 Lamp Elec. (T8) SO* HI* 1-3 Lamp Elec. (T8) O3* H3* LOL Dimming (T8) PS *Instant Start Standard Other dimming options. Consult factory.

## Options/Accessories

- Special Lens:** Substitute VI for .125" nominal pattern. For other lenses, consult factory.
- Access Plates:** Top wiring access plate is shipped with fixture as standard. When access plates are required in advance for wiring convenience, specify separately. Order Catalog number: **ACPX CSP**.
- Electrical Wiring Options:** Consult factory.
- Fusing:** Internal fast-blow fusing. Suffix: **GLR**.  
Internal slow-blow fusing. Suffix: **GMF**.
- Radio Interference Filter:** 120 or 277 volt, 50 or 60 Hz. One per fixture: Suffix: **R**. One per ballast: Suffix: **B**.
- Drywall Kit:** Order Catalog Number: **FK92x4** (Request Folio OA30-10).

## Specifications

- Performance:** In an installation of 3 lamps 32 W luminaires in a room cavity of 1, with reflectance of 80% ceiling, 50% walls, 20% floor, the C.U. shall not be less than .89. To control veiling reflections, luminaire output in the 30°-90° zone shall be not less than 70%.
- Materials:** **Chassis parts** are die-formed code gauge cold rolled steel.
- Housing** is embossed for added strength and rigidity with all edges turned over for safe handling. **Lens frames**—(XP) flat full-size steel frame, (XA) regressed full-size aluminum frame.
- Finish:** **Chassis exterior**—white baked polyester enamel. **Cavity**—white baked polyester enamel minimum 86% reflectance. Phosphate undercoating.

## Specifications (continued)

- Lens:** Extruded virgin acrylic 3/16" square based female cones, running 45° to the panel edge. .095" nominal thickness (similar to pattern 12).
- Electrical:** Thermally protected class "P" ballast C.B.M. approved, non PCB. If K.O. is within 3" of ballast, use wire suitable for at least 90°.
- Labels:** I.B.E.W./UL and ULc Listed.

## Job Information Type:

**Lightolier** a Genlyte Thomas Company www.lightolier.com  
 Technical Information: (978) 657-7600 • Fax (978) 658-0595  
 631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710  
 We reserve the right to change details of design, materials and finish.  
 © 2002 Genlyte Thomas Group LLC (Lightolier Division) A0303  
**Section1A/Folio F70-11**

LIGHTOLIER®



GE Consumer & Industrial  
Lighting

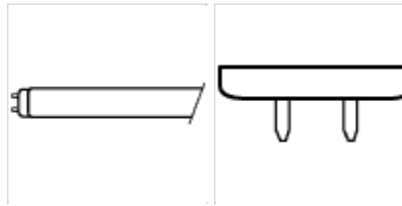
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# Lighting Specification Bulletin

**T8 ULTRA Watt-Miser (4', 8', XL) w/  
Starcoat**

**Product Code:** 48277



**Description:** F32T8SP30ISWMECO



**Specification:**

**Firm Name :**

**Job Name :**

<b>General</b>	
Product Code	48277  
Description	F32T8SP30ISWMECO
Subcategory	T8 ULTRA Watt-Miser (4', 8', XL) w/ Starcoat
<b>Physical</b>	
Bulb Type	T8
Base Type	Medium BiPin (G13)
Nominal Length (In.)	48.00
Nominal Length (mm)	1220
Max Overall Length (In.)	47.78
Bulb Nominal Diameter in inches	1
Max bulb diameter	1.1
Min bulb diameter	.94
<b>Photometric</b>	
Lumens (Initial)	2875
Lumens (Mean)	2700
Color Temperature (K)	3000
<b>Electrical</b>	
Average Rated Life	20000
Watts	30
Nominal Lamp Volts	129
Minimum Starting Temp (deg F)	59
<b>Miscellaneous</b>	
TCLP Regulated	Y
Additional Information	S/P Ratio: 1.3
Footnotes	Watt-Miser™, Watt-Miser™ Plus, F28T8/UMX and Energy Efficient (EE) lamps are intended for use where ambient temperatures are 60 F (16 C) or higher and where the lamp surface is protected from strong air drafts. Failure to protect the lamp surface may result in reduced life, poor starting or erratic operation, such as flickering

or spiraling. All T12 Watt-Miser™ lamps are intended for use on two-lamp, indoor, lead, high power factor ballasts and are not recommended for use with dimming or reduced current systems. The use of T12 Watt-Miser™ lamps on single lamp ballasts may shorten lamp life. T12 Rapid Start Watt-Miser™ lamps are intended for use only with Rapid Start Ballasts. F40 Rapid Start Watt-Miser™ lamps on high frequency electronic systems may display erratic starting before end of life. T8 Watt-Miser™ lamps are intended for use only with instant start ballasts. F28T8/UMX lamps are designed for use on UltraMax ballasts.

All values are design values or typical values when measured under laboratory conditions. Information provided is subject to change without notice. Where applicable, values are based on guidelines published in ANSI. For more information see Terms and Conditions in the link below.

➤ Reduced Wattage (E) Meets Federal Minimum Efficiency Standards





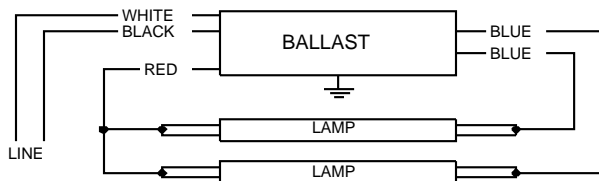
## VCN-2M32-MC

Brand Name	CENTIUM MICRO CAN
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	60 HZ
Status	Active

### Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F21T5	2	21	50/10	0.18	50	1.10	10	0.98	1.7	2.20
F25T8	2	25	0/-18	0.18	49	0.88	10	0.99	1.7	1.80
F28T5	2	28	50/10	0.22	60	0.98	10	0.99	1.7	1.63
* F32T8	2	32	0/-18	0.21	59	0.88	10	0.99	1.7	1.49
F32T8/ES (30W)	2	30	60/16	0.20	54	0.88	10	0.99	1.7	1.63

### Wiring Diagram



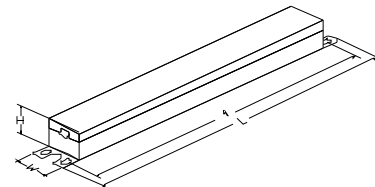
Diag. 64

The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

### Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black		0	Yellow/Blue		0
White	25L	63.5	Blue/White		0
Blue	31R	78.7	Brown		0
Red	37L	94	Orange		0
Yellow		0	Orange/Black		0
Gray		0	Black/White	25L	63.5
Violet		0	Red/White		0

### Enclosure



### Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	1.08 "	1.05 "	8.91 "
9 1/2	1 2/25	1 1/20	8 91/100
24.1 cm	2.7 cm	2.7 cm	22.6 cm

Revised 07/23/2004

Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.

### ADVANCE TRANSFORMER CO.

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018

Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071

Corporate Offices: Phone: 800-322-2086



<b>VCN-2M32-MC</b>	
Brand Name	CENTIUM MICRO CAN
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Series
Input Voltage	277
Input Frequency	60 HZ
Status	Active

## **Electrical Specifications**

### **Notes:**

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be Instant Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of 120V or 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast. IntelliVolt models shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of -18C (0F) for standard T8 lamps and 16C (60F) for energy-saving T8 lamps.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

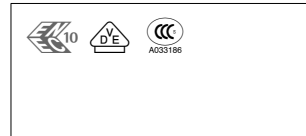
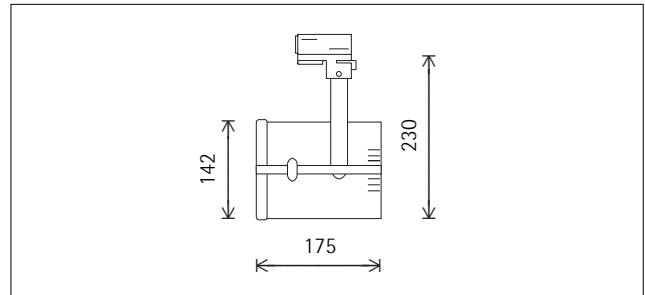
#### Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9001:2000 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance Transformer part # \_\_\_\_\_ or approved equal.
- 4.5 All products except Optanium 2.0 (IOP) models may experience lamp striations when operating 25W, 28W, or 30W energy saving T8 lamps.
- 4.6 Only the Optanium 2.0 (IOP) models are suitable for tandem-wiring applications operating 25W, 28W, or 30W energy saving T8 lamps.

**Revised 07/23/2004**

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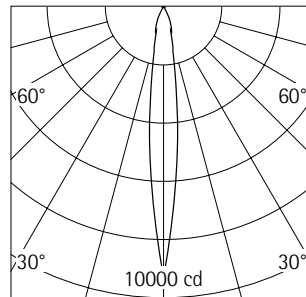
**ADVANCE TRANSFORMER CO.**  
 O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD  
 ROSEMONT, ILLINOIS 60018  
 TELEPHONE: (847) 390-5000 FAX: (847) 390-5109



**77461.000** White (RAL9002)  
 PAR38 120W 230V E27 12°  
 PAR38 120W 230V E27 30°  
 A60 100W/m 230V E27 1380lm  
 A65 150W/m 230V E27 2220lm

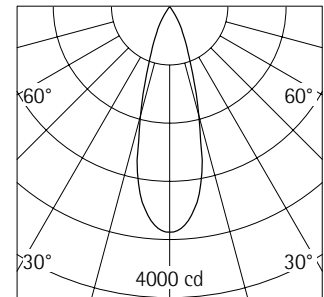
**Product description**

Housing: cast aluminium, powder-coated. 0°-90° tilt. Lateral guides for accessories. Bracket on 3-circuit adapter rotatable through 360°. ERCO 3-circuit adapter: plastic. A60 100W/m or A65 150W/m with reflector 70555.000. Weight 1.50kg



PAR38 120W 230V E27 12°

h(m)	E(lx)	D(m)
		12°
1	9300	0.21
2	2325	0.42
3	1033	0.63
4	581	0.84
5	372	1.05



PAR38 120W 230V E27 30°

h(m)	E(lx)	D(m)
		30°
1	3100	0.54
2	775	1.07
3	344	1.61
4	194	2.14
5	124	2.68



**Mounting**  
 ERCO 3-circuit track  
 Hi-trac track  
 Monopoll track  
 1-circuit singlet

# LIGHTLINE™ WALL WASH

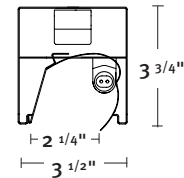
PEERLESS®

2 1/4" Aperture

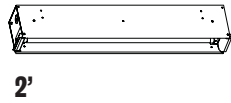
## Recessed Mount Wall Wash

# SPECIFICATIONS

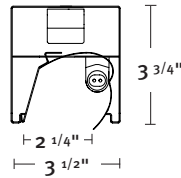
### AVAILABLE FIXTURE



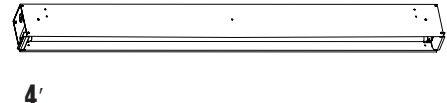
LWR9 2' T5HO/T5



2'

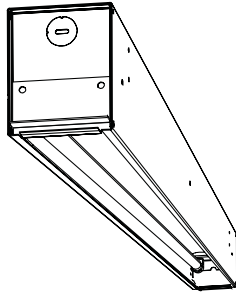


LWR9 4' T5HO/T5



4'

### SPECIFICATIONS



#### CONSTRUCTION

Housing is formed from painted cold-rolled steel. Five-stage iron-phosphate pretreatment ensures superior paint adhesion and rust resistance. Painted parts finished with high-gloss baked enamel.

#### REFLECTORS

Specular asymmetric reflector system. Black metal diffuser with round holes.

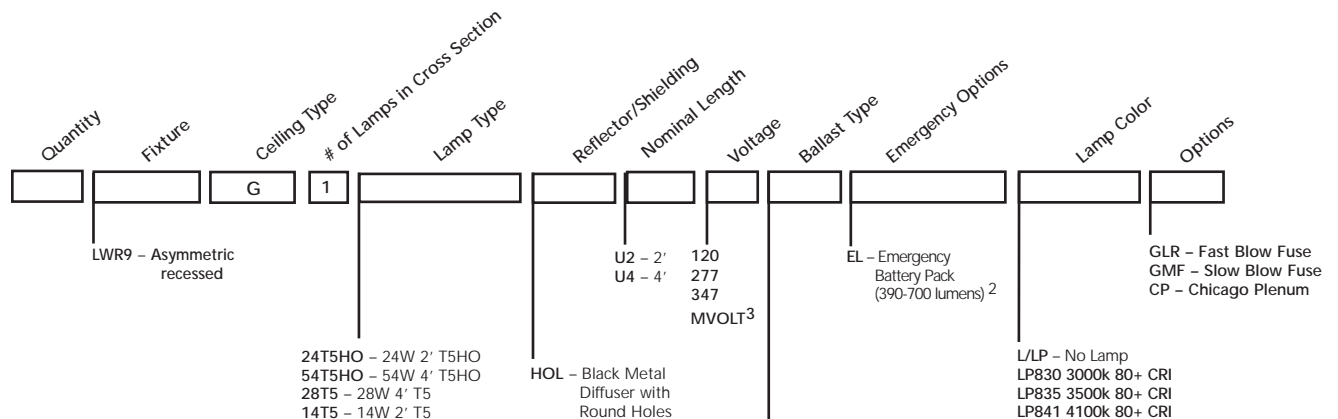
#### ELECTRICAL

Specify 120 volt, 277 volt, or 347 volt. Non EL versions damp location labeled. UL and C-UL listed and labeled. For special circuiting, consult factory.

#### FIXTURE SIZE

Nominal 2" aperture. 2' and 4' lengths available.

### ORDERING LOGIC



#### Accessories (order separately)

DHSGS2 - Gyp-board Flange Kit 2'  
DHSGS4 - Gyp-board Flange Kit 4'

- 1 Only available with 54T5HO
- 2 Only available with 28T5 & 54T5HO
- 3 Not for use when specifying battery pack

#### EXAMPLE:

Qty Fixture section

- 4 LWR9 G 1 54T5HO HOL U4 120 GEB10 L/LP  
1 LWR9 G 1 14T5 HOL U2 277 GEB10 LP835

GEB10 - 10% THD Ballast

#### Dimming Ballasts Available

- ADEZ - Advance Mark 10<sup>1</sup>  
ADZT - Advance Mark 7<sup>1</sup>  
ECO10 - Lutron ECO 10  
DMHL - Lutron Hi-Lume (FDB) - Purchased<sup>1</sup>  
OSDIM - Osram 0-10V<sup>1</sup>

PEERLESS LIGHTING Box 2556, Berkeley, CA 94702-0556 510.845-2760 Fax 510.845-2776 www.peerless-lighting.com

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LLWW-1

ITEM #:

# LIGHTLINE™ WALL WASH

PEERLESS®

2 1/4" Aperture

## Recessed Mount Wall Wash

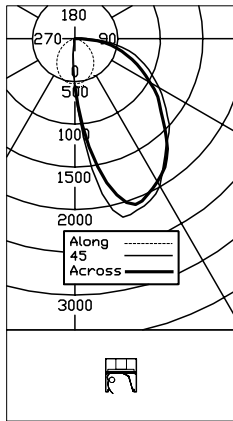
# PHOTOMETRICS

### 1-LAMP 54W T5 HIGH-OUTPUT

### 1-LAMP 28W T5 HIGH-OUTPUT

FAR-FIELD PHOTOMETRY DATE: 12-12-2005  
 REPORT NUMBER: 6893

CATALOG NUMBER: LWR9-1-54T5HO  
 LUMINAIRE: 3 1/2" W X 3 3/4" H RECESSED WALL WASH WITH ASYMMETRIC-THROW  
 SPECULAR REFLECTOR AND PERF. BLACK TRIM  
 LAMP(S): FP54/835/HO RATED @ 5000 LUMENS  
 BALLAST: QTP-1X54HO/UNV PSN  
 MOUNTING:  
 LUMEN TO CANDELA RATIO USED = 9.15  
 TOTAL INPUT WATTS = 60.9 AT 120.0 VOLTS  
 THE 0 DEGREE PLANE IS PERPENDICULAR TO THE LAMPS.



CANDELA DISTRIBUTION				FLUX	
	0.0	45.0	90.0	135.0	180.0
0	558	558	558	558	558
5	1183	1020	564	276	180
15	2163	1895	543	48	40
25	2091	2010	501	32	27
35	1809	1832	439	22	23
45	1559	1488	356	20	22
55	1274	1184	282	17	15
65	990	863	180	8	5
75	728	570	67	0	1
85	343	263	4	0	0
90	132	77	0	0	0

ZONAL LUMEN SUMMARY			
ZONE	LUMENS	%LAMP	%FIXT
0-30	748	15.0	23.8
0-40	1279	25.6	40.8
0-60	2333	46.7	74.4
0-90	3138	62.8	100.0
90-180	0	0.0	0.0
0-180	3138	62.8	100.0

TOTAL LUMINAIRE EFFICIENCY = 62.8 %  
 CIE TYPE - DIRECT

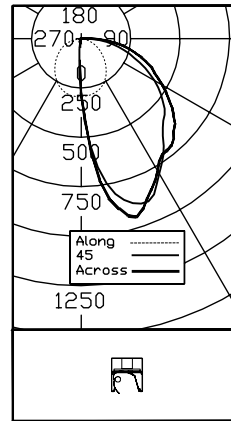
APPROVED BY:



BARE LAMP LUMEN VALUE IS RATED AT LAMP OPERATING TEMPERATURE INSIDE THE LUMINAIRE.  
 FOR DETAIL EXPLANATIONS, PLEASE SEE PEERLESS PUBLICATION # A62

FAR-FIELD PHOTOMETRY DATE: 12-12-2005  
 REPORT NUMBER: 6932

CATALOG NUMBER: LWR9-1-24T5HO  
 LUMINAIRE: 3 1/2" W X 3 3/4" H RECESSED WALL WASH WITH ASYMMETRIC-THROW  
 SPECULAR REFLECTOR AND PERF. BLACK TRIM  
 LAMP(S): FP24/835/HO RATED @ 2200 LUMENS  
 BALLAST: QTP2X39-24T5HO/UNV PSN  
 MOUNTING:  
 LUMEN TO CANDELA RATIO USED = 9.15  
 TOTAL INPUT WATTS = 26.6 AT 120.0 VOLTS  
 THE 0 DEGREE PLANE IS PERPENDICULAR TO THE LAMPS.



CANDELA DISTRIBUTION				FLUX	
	0.0	45.0	90.0	135.0	180.0
0	279	279	279	279	279
5	580	543	296	106	43
15	927	845	283	19	16
25	845	871	261	13	11
35	718	723	226	9	8
45	662	588	178	7	7
55	543	493	125	7	5
65	409	358	69	2	2
75	286	226	22	0	0
85	134	93	0	0	0
90	49	20	0	0	0

ZONAL LUMEN SUMMARY			
ZONE	LUMENS	%LAMP	%FIXT
0-30	331	15.0	25.4
0-40	550	25.0	42.2
0-60	988	44.9	75.8
0-90	1303	59.2	100.0
90-180	0	0.0	0.0
0-180	1303	59.2	100.0

TOTAL LUMINAIRE EFFICIENCY = 59.2 %  
 CIE TYPE - DIRECT

APPROVED BY:



BARE LAMP LUMEN VALUE IS RATED AT LAMP OPERATING TEMPERATURE INSIDE THE LUMINAIRE.  
 FOR DETAIL EXPLANATIONS, PLEASE SEE PEERLESS PUBLICATION # A62

LLWW-2

PEERLESS LIGHTING Box 2556, Berkeley, CA 94702-0556 510.845-2760 Fax 510.845-2776 www.peerless-lighting.com

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ITEM #:



GE Consumer & Industrial  
Lighting

# Lighting Specification Bulletin

## T5 Starcoat High Output

**Product Code:** 46760  
**Description:** F54W/T5/835/ECO

### Specification:

**Firm Name :**  
**Job Name :**

General	
Product Code	46760
Description	F54W/T5/835/ECO
Subcategory	T5 Starcoat High Output
Physical	
Bulb Type	T5
Base Type	Miniature BiPin (G5)
Bulb Material	Soft Glass
Nominal Length (In.)	45.20
Nominal Length (mm)	1150
Max Overall Length (In.)	45.795
Bulb Nominal Diameter in inches	.625
Max bulb diameter	.67
Max Face to End of Opposing Pin (B)	45.52
Min Face to End of Opposing Pin (B)	45.42
Photometric	
Lumens (Initial)	5000
Lumens (Mean)	4700
Color Temperature (K)	3500
Nominal Efficacy (Lumens/Watt)	93
Electrical	
Average Rated Life	20000
Watts	54
Nominal Lamp Volts	117
Nominal Lamp Operating Frequency (Hz)	20000
Minimum Starting Temp (deg F)	5
Min. Terminal to Terminal Starting Lamp Voltage (Vrms)- Instant Start at 15°C	620
Min. Terminal to Terminal	520

Starting Lamp Voltage (Vrms)- Rapid Start at 10° C	
Max Cathode Resistance Ratio (Rh/Rc)	6.5
Min Cathode Resistance Ratio (Rh/Rc)	4.25
<b>Miscellaneous</b>	
TCLP Regulated	Y
Additional Information	S/P Ratio: 1.5 Lumen Ratings at 35C. At 25C, Initial Lumens are 4460.

All values are design values or typical values when measured under laboratory conditions. Information provided is subject to change without notice. Where applicable, values are based on guidelines published in ANSI. For more information see Terms and Conditions in the link below.



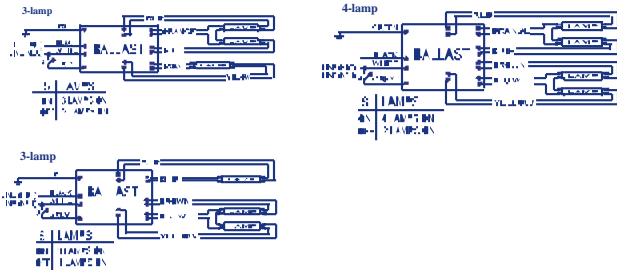
## ICN4S5490C2LS@277

Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series/Parallel
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

### Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
* F54T5/HO	1	54	0/-18	0.24	62	0.99	30	0.90	1.7	1.60
F54T5/HO	2	54	0/-18	0.43	117	0.99	10	0.98	1.7	0.85
F54T5/HO	3	54	0/-18	0.66	179	1.00	10	0.98	1.7	0.56
F54T5/HO	4	54	0/-18	0.86	234	1.00	10	0.98	1.7	0.43

### Wiring Diagram

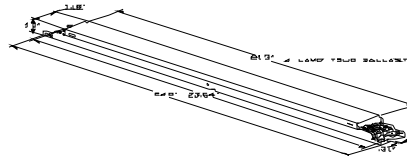


The wiring diagram that appears above is for the lamp type denoted by the asterisk (\*)

### Standard Lead Length (inches)

	in.	cm.		in.	cm.
Black	0	0	Yellow/Blue	0	0
White	0	0	Blue/White	0	0
Blue	0	0	Brown	0	0
Red	0	0	Orange	0	0
Yellow	0	0	Orange/Black	0	0
Gray	0	0	Black/White	0	0
Violet	0	0	Red/White	0	0

### Enclosure



### Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
24 "	1.18 "	1 "	23.64 "
24	1 9/50	1	23 16/25
61 cm	3 cm	2.5 cm	60 cm

Revised 10/04/2005



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### ADVANCE TRANSFORMER CO.

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018

Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071

Corporate Offices: Phone: 800-322-2086





<b>ICN4S5490C2LS@277</b>	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series/Parallel
Input Voltage	277
Input Frequency	50/60 HZ
Status	Active

## **Electrical Specifications**

### **Notes:**

#### Section I - Physical Characteristics

- 1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.
- 1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

#### Section II - Performance Requirements

- 2.1 Ballast shall be Programmed Start.
- 2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.
- 2.3 Ballast shall operate from 50/60 Hz input source of \_\_\_\_\_ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.
- 2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.
- 2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.9 Ballast shall have a Class A sound rating.
- 2.10 Ballast shall have a minimum starting temperature of -18C (0F) or -28C (-20F) for primary lamp. Consult lamp manufacturer for temperature versus lamp characteristics.
- 2.11 Ballast shall provide Lamp EOL Protection Circuit.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.
- 2.13 Ballast shall have a hi-low switching option when operating (4) F54T5/HO lamps to allow switching from 4-2 lamps, 3-2 lamps or 3-1 lamp.
- 2.14 Four lamp ballast shall have semi-independent lamp operation.

#### Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

#### Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9001:2000 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance Transformer part # \_\_\_\_\_ or approved equal.

Revised 10/04/2005



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**ADVANCE TRANSFORMER CO.**  
 O'HARE INTERNATIONAL CENTER - 10275 WEST HIGGINS ROAD  
 ROSEMONT, ILLINOIS 60018  
 TELEPHONE: (847) 390-5000 FAX: (847) 390-5109

Walter Nichols  
Hawthorn Building  
Altoona, PA



Appendix D

# LIGHTEDGE®

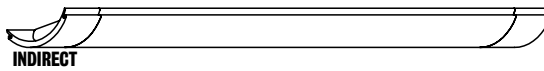
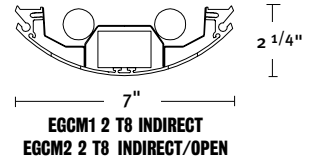
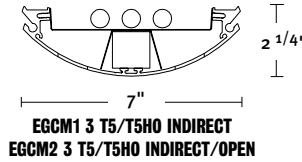
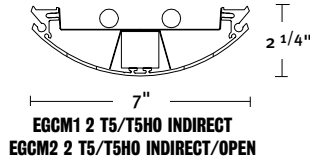
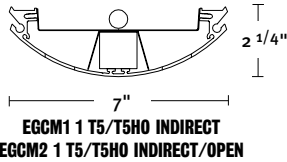
PEERLESS®

7" X 2 1/4" Deep Curved

## Pendant Mount - Modular

# SPECIFICATIONS

### AVAILABLE FIXTURES



#### CONSTRUCTION

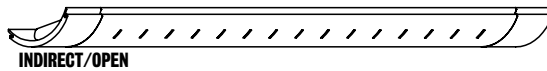
Housing and endcap AA 6063 T6 extruded aluminum forming a 7" x 2 1/4" curvilinear channel.

#### REFLECTORS

Die-formed reflectors combine with baked white enamel finish (nominal reflectance 90%). T5HO/T5 with hammertone specular aluminum.

#### FINISH

Satin anodized standard; custom colors available.



#### ELECTRICAL

Specify 120 volt, 277 volt, or 347 volt. UL and C-UL listed and labeled. For special circuiting, consult factory.

#### FIXTURE LENGTH

4', 8' and 12' lengths in a single section for exact suspension spacing of 4', 8' and 12.' For total fixture length add 4" for each end-cap. Using internal joiners, 4', 8' and 12' sections can be joined to form longer-length fixtures.

### ORDERING LOGIC

Use guide below to order complete fixture runs from four feet to three-hundred feet in increments of four feet.

Quantity	Fixture	# of Lamps in Cross Section	Lamp Type	Nominal Row Length (Must be in 4' increments)	Maximum Section Length	Voltage	Ballast Type	# of Emergency Sections (sections per run)(optional)	Emergency Type (optional)***	Switching	Lamp Color	Mounting Type	Feed/Overall Suspension	Finish	Options
	EGCM1 EGCM2	1* 2 3*	54T5HO- 54W 4' T5HO 28T5- 28W 4' T5 32- 32W 4' T8	FT	R4- 4' section R8- 8' section R12- 12' section	120 277 347	T5/T5HO GEB10- <10% THD Ballast T8 GEB- Electronic Ballast GEB10- <10% THD Ballast	EL- Emrgncy Battery Pack EC- Emergency Night Light/Circuit EN- Emergency Battery Pack w/ Night Light Circuit	SCT- Single Circuit DCT- Dual Circuit	T5/T5HO/T8 L/LP- No lamp LP830- 3000K 80 + CRI LP835- 3500K 80 + CRI LP841- 4100K 80 + CRI	F1- T-bar Ceiling F2- Hard Ceiling Horizontal J-box F4A- Grid Ceiling IDS 15/16" F4B- Grid Ceiling IDS 9/16" F4C- Grid Ceiling IDS Screw Slot	12- 12' overall 15- 15' overall 18- 18' overall 21- 21' overall 24- 24' overall XX- XX' overall	C100- Satin Anodized Finish (Standard) C099- Custom Color (consult factory)	ACG- Adjustable Cable Grippers GLR- Fast Blow Fuse GMF- Slow Blow Fuse ELH- EM Through Wire Harness ELS- EM Through Wire Harness With Single Feed CMG- White Cord Manager APF- Alternate Power Feed (F4X mounting only) AEC- Accent End Cover	

\*1 and 3 lamp not available in T8.

\*\*EL, EN and EC not available with DCT in 4' sections.

#### EXAMPLE:

Qty Fixture section

1 EGC1M3 54T5HO 12FT R12 277 GEB10 DCT L/LP F2/15 C100 ACG

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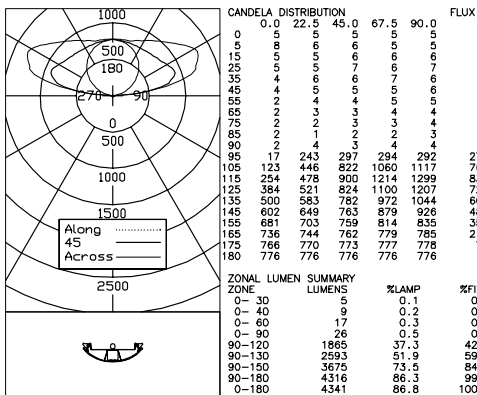
## Pendant Mount - Modular

# PHOTOMETRICS

### 1-LAMP T5 HIGH-OUTPUT

FAR-FIELD PHOTOMETRY  
REPORT NUMBER: 5495 DATE: 11-15-2001

CATALOG NUMBER: EGC2-1-54TSHO  
LUMINAIRE: 7" W X 2 1/4" H ALUMINUM INDIRECT/OPEN LIGHT WITH WHITE PAINTED AND HAMMERTONE REFLECTOR AND SLOTS  
LAMP(S): 1-FP54/835/HO RATED @ 5000 LUMENS  
BALLAST: QT 1X54/120PHO  
MOUNTING:  
LUMEN TO CANDELA RATIO USED = 9.15  
TOTAL INPUT WATTS = 60.1 AT 12.0 VOLTS  
THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.



LUMINANCE DATA IN FOOTLAMBERTS  
ANGLE AVERAGE AVERAGE AVERAGE  
IN DEG 0-DEG 45-DEG 90-DEG  
45 220 323 376  
55 178 320 355  
65 229 286 339  
75 367 367 400  
85 420 420 389

TOTAL LUMINAIRE EFFICIENCY = 86.8 %  
CIE TYPE - INDIRECT

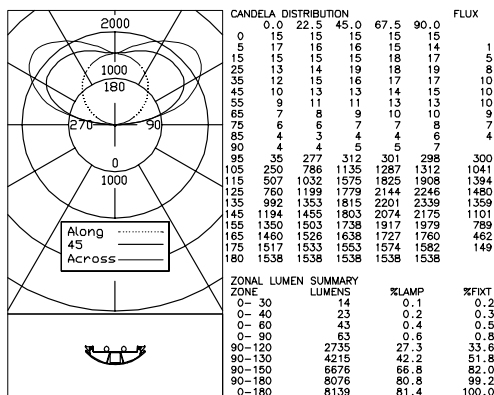
APPROVED BY:

TESTED IN ACCORDANCE WITH IES PROCEDURES, TEST DISTANCE EXCEEDS 25.0 FEET  
NEAR-FIELD PHOTOMETRY AND CU TABLE AVAILABLE UPON REQUEST

### 2-LAMP T5 HIGH-OUTPUT

FAR-FIELD PHOTOMETRY  
REPORT NUMBER: 5494 DATE: 11-15-2001

CATALOG NUMBER: EGC2-2-54TSHO  
LUMINAIRE: 7" W X 2 1/4" H ALUMINUM INDIRECT/OPEN LIGHT WITH WHITE PAINTED AND HAMMERTONE REFLECTOR AND SLOTS  
LAMP(S): 2-FP54/835/HO RATED @ 5000 LUMENS  
BALLAST: QT 2X54/120PHO  
MOUNTING:  
LUMEN TO CANDELA RATIO USED = 9.15  
TOTAL INPUT WATTS = 120.5 AT 12.0 VOLTS  
THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.



LUMINANCE DATA IN FOOTLAMBERTS  
ANGLE AVERAGE AVERAGE AVERAGE  
IN DEG 0-DEG 45-DEG 90-DEG  
45 563 796 966  
55 654 818 981  
65 657 811 910  
75 901 876 871  
85 858 858 795

TOTAL LUMINAIRE EFFICIENCY = 81.4 %  
CIE TYPE - INDIRECT

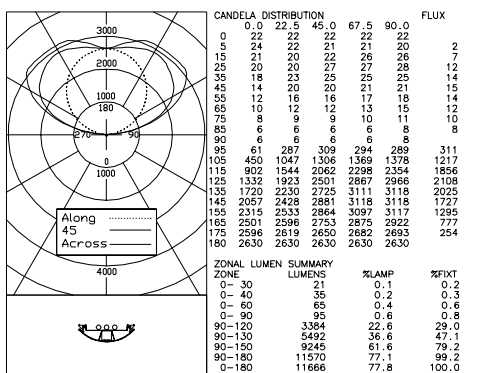
APPROVED BY:

TESTED IN ACCORDANCE WITH IES PROCEDURES, TEST DISTANCE EXCEEDS 25.0 FEET  
NEAR-FIELD PHOTOMETRY AND CU TABLE AVAILABLE UPON REQUEST

### 3-LAMP T5 HIGH-OUTPUT

FAR-FIELD PHOTOMETRY  
REPORT NUMBER: 5493 DATE: 11-15-2001

CATALOG NUMBER: EGC2-3-54TSHO  
LUMINAIRE: 7" W X 2 1/4" H ALUMINUM INDIRECT/OPEN LIGHT WITH WHITE PAINTED AND HAMMERTONE REFLECTOR AND SLOTS  
LAMP(S): 3-FP54/835/HO RATED @ 5000 LUMENS  
BALLAST: QT 1X54/120PHO & QT 2X54/120PHO  
MOUNTING:  
LUMEN TO CANDELA RATIO USED = 9.15  
TOTAL INPUT WATTS = 179.6 AT 12.0 VOLTS  
THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.



LUMINANCE DATA IN FOOTLAMBERTS  
ANGLE AVERAGE AVERAGE AVERAGE  
IN DEG 0-DEG 45-DEG 90-DEG  
45 796 1200 1380  
55 850 1204 1345  
65 915 1098 1266  
75 1244 1189 1147  
85 1254 1202 1033

TOTAL LUMINAIRE EFFICIENCY = 77.8 %  
CIE TYPE - INDIRECT

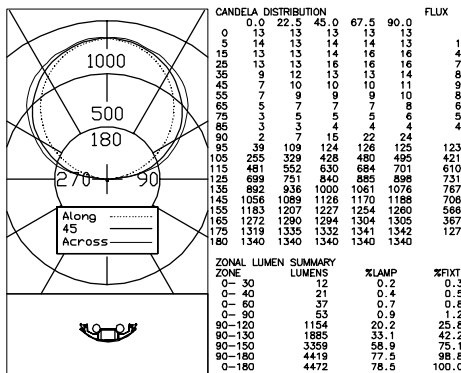
APPROVED BY:

TESTED IN ACCORDANCE WITH IES PROCEDURES, TEST DISTANCE EXCEEDS 25.0 FEET  
NEAR-FIELD PHOTOMETRY AND CU TABLE AVAILABLE UPON REQUEST

### 2-LAMP T8

FAR-FIELD PHOTOMETRY  
REPORT NUMBER: 5511 DATE: 11-15-2001

CATALOG NUMBER: EGC2-2-32  
LUMINAIRE: 7" W X 2 1/4" H ALUMINUM INDIRECT/OPEN LIGHT WITH WHITE PAINTED REFLECTOR AND SLOT  
LAMP(S): 2-F32/SP35 RATED @ 2850 LUMENS  
BALLAST: REL-2P32-SC  
MOUNTING:  
LUMEN TO CANDELA RATIO USED = 9.15  
TOTAL INPUT WATTS = 56.2 AT 12.0 VOLTS  
THE 0 DEGREE PLANE IS PARALLEL WITH THE LAMPS.



LUMINANCE DATA IN FOOTLAMBERTS  
ANGLE AVERAGE AVERAGE AVERAGE  
IN DEG 0-DEG 45-DEG 90-DEG  
45 149 205 184  
55 181 213 216  
65 186 225 222  
75 130 228 280  
85 186 242 260

TOTAL LUMINAIRE EFFICIENCY = 78.5 %  
CIE TYPE - INDIRECT

APPROVED BY:

TESTED IN ACCORDANCE WITH IES PROCEDURES, TEST DISTANCE EXCEEDS 25.0 FEET  
NEAR-FIELD PHOTOMETRY AND CU TABLE AVAILABLE UPON REQUEST

LE-18

PEERLESS LIGHTING Box 2556, Berkeley, CA 94702-0556 510.845-2760 Fax 510.845-2776 www.peerless-lighting.com

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ITEM #:



GE Consumer & Industrial  
Lighting

# Lighting Specification Bulletin

## T5 Starcoat High Output

**Product Code:** 46760

**Description:** F54W/T5/835/ECO

### Specification:

**Firm Name :**

**Job Name :**

General	
Product Code	46760
Description	F54W/T5/835/ECO
Subcategory	T5 Starcoat High Output
Physical	
Bulb Type	T5
Base Type	Miniature BiPin (G5)
Bulb Material	Soft Glass
Nominal Length (In.)	45.20
Nominal Length (mm)	1150
Max Overall Length (In.)	45.795
Bulb Nominal Diameter in inches	.625
Max bulb diameter	.67
Max Face to End of Opposing Pin (B)	45.52
Min Face to End of Opposing Pin (B)	45.42
Photometric	
Lumens (Initial)	5000
Lumens (Mean)	4700
Color Temperature (K)	3500
Nominal Efficacy (Lumens/Watt)	93
Electrical	
Average Rated Life	20000
Watts	54
Nominal Lamp Volts	117
Nominal Lamp Operating Frequency (Hz)	20000
Minimum Starting Temp (deg F)	5
Min. Terminal to Terminal Starting Lamp Voltage (Vrms)- Instant Start at 15°C	620
Min. Terminal to Terminal	520

Starting Lamp Voltage (Vrms)- Rapid Start at 10° C	
Max Cathode Resistance Ratio (Rh/Rc)	6.5
Min Cathode Resistance Ratio (Rh/Rc)	4.25
<b>Miscellaneous</b>	
TCLP Regulated	Y
Additional Information	S/P Ratio: 1.5 Lumen Ratings at 35C. At 25C, Initial Lumens are 4460.

All values are design values or typical values when measured under laboratory conditions. Information provided is subject to change without notice. Where applicable, values are based on guidelines published in ANSI. For more information see Terms and Conditions in the link below.

## Hi-lume Overview

Hi-lume architectural electronic dimming ballasts are designed to meet the most demanding lighting requirements. By providing industry-leading performance with true full-range 100% to 1% fluorescent dimming, Hi-lume ballasts enable you to provide the ideal visual environment for any application.



**Hi-lume, case type A**  
3.00”w (76mm) x 1.00”h (25mm) x 4.90”l (124mm)

### Features

- Continuous, flicker-free dimming from 100% to 1%
- Standard 3-wire line-voltage phase-control technology for consistent fixture-to-fixture dimming performance
- Models available for T4 triple-tube compact, T5-HO linear, and T8 lamps
- Programmed rapid start design preheats lamp cathodes before applying full arc voltage
- Lamps turn on to any dimmed level without flashing to full brightness
- Low harmonic distortion throughout the entire dimming range maintains power quality
- Frequency of operation ensures that ballast does not interfere with infrared devices operating between 38 and 42 kHz
- Inrush current limiting circuitry eliminates circuit breaker tripping, switch arcing, and relay failure
- End-of-lamp-life protection circuitry (for T4 and T5-HO models) ensures safe operation throughout entire lamp life cycle
- For linear lamps, ballasts maintain consistent light output for different lamp lengths, ensuring fixture uniformity
- Ultra-quiet operation
- Protected from miswires of any input power to control lead, or from lamp leads to each other and/or ground
- 100% compatible with all Lutron 3-wire fluorescent controls
- 100% performance tested at factory



**Hi-lume, case type C**  
1.18”w (30mm) x 1.00”h (25mm) x 18.00”l (457mm)



**Hi-lume, case type F**  
2.38”w (60mm) x 1.50”h (38mm) x 9.50”l (241mm)

- Designed and assembled in the USA
- 5-year limited warranty with Lutron field service commissioning (3-year standard warranty) from date of purchase

<b>Job Name:</b> <input type="text"/>	<b>Model Numbers:</b> <input type="text"/>	
<b>Job Number:</b> <input type="text"/>	<input type="text"/>	<input type="text"/>

## Specifications

### Performance

- Dimming Range: 100% to 1% measured relative light output (RLO)
- Lamp Starting: programmed rapid start
- Minimum Lamp Starting Temperature: 10°C (50°F)
- Ambient Temperature Operating Range: 10°C (50°F) to 60°C (140°F)
- Relative Humidity: maximum 90% non-condensing
- Operating Voltage: 120V or 277V at 60Hz
- Lamp Current Crest Factor: less than 1.7
- Lamp Flicker: none visible
- Light Output Variation: constant ±2% light output for line voltage variations of ±10%
- Lamp Life: average lamp life meets or exceeds rating of lamp manufacturer
- Ballast Factor: greater than .85 for T8 lamps, greater than .95 for T4 lamps, equal to 1.0 for T5-HO lamps
- Power Factor: greater than .95
- Total Harmonic Distortion (THD): less than 10%
- Maximum Inrush Current: 7 amps per ballast at 120V, 3 amps per ballast at 277V
- Sound Rating: Inaudible in a 27dBa ambient
- Maximum Ballast Case Temperature: 75°C (167°F)





### Standards

- UL Listed (evaluated to the requirements of UL935)
- CSA certified (evaluated to the requirements of C22.2 No. 74)
- Class P thermally protected
- Meets ANSI C82.11 High Frequency Ballast Standard
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- T4 and T5-HO ballasts are MIL Std. 461E compliant (meets the requirements of CE101, RE101 and RE102)
- Meets ANSI C62.41 Category A surge protection standards up to and including 6kV
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20
- Lutron Quality Systems registered to ISO 9001.2000

<b>Job Name:</b> <input type="text"/>	<b>Model Numbers:</b> <input type="text"/>	
<b>Job Number:</b> <input type="text"/>	<input type="text"/>	<input type="text"/>



### Hi-lume Ballast Models

Lamp Type				120 VOLTS		277 VOLTS	
	Lamp Watts (length)	Lamps per ballast	Case Type	Ballast Current (amps)	Hi-lume Model Number <sup>1</sup>	Ballast Current (amps)	Hi-lume Model Number <sup>1</sup>
<b>T4 triple-tube 4-pin</b>  1/2" diameter	26W	1	A	.26	HL3-T426-120-1-S	.12	HL3-T426-277-1-S
	32W	1	A	.31	HL3-T432-120-1-S	.13	HL3-T432-277-1-S
<b>T5-HO linear high output</b>  5/8" diameter	24W (21.5")	1	C	.26	FDB-T524-120-1	.13	FDB-T524-277-1
		2	C	.45	FDB-T524-120-2	.20	FDB-T524-277-2
	39W (33.4")	1	C	.38	FDB-T539-120-1	.17	FDB-T539-277-1
		2	C	.76	FDB-T539-120-2	.31	FDB-T539-277-2
	54W (45.3")	1	C	.58	FDB-T554-120-1	.25	FDB-T554-277-1
		2	C	1.1	FDB-T554-120-2	.45	FDB-T554-277-2
<b>T8 linear and U-bent</b>  1" diameter	17W (24")	1	F	.19	FDB-2427-120-1	.08	FDB-2427-277-1
		2	F	.31	FDB-2427-120-2	.15	FDB-2427-277-2
		3	F	.43	FDB-2427-120-3	.20	FDB-2427-277-3
	25W (36")	1	F	.24	FDB-3627-120-1	.12	FDB-3627-277-1
		2	F	.43	FDB-3627-120-2	.19	FDB-3627-277-2
		3	F	.62	FDB-3627-120-3	.28	FDB-3627-277-3
	32W (48")	1	F	.30	FDB-4827-120-1	.14	FDB-4827-277-1
		2	F	.57	FDB-4827-120-2	.25	FDB-4827-277-2
	3	F	.82	FDB-4827-120-3	.35	FDB-4827-277-3	
	40W (60")	1	F	.36	FDB-6027-120-1	.16	FDB-6027-277-1
		2	F	.64	FDB-6027-120-2	.30	FDB-6027-277-2
<b>T12 linear HO (800ma)</b>  1 1/2" diameter	85W (72")	1	F	.75	FDB-7280-120-1	--	--
	95W (84")	1	F	.83	FDB-8480-120-1	--	--
	110W (96")	1	F	.88	FDB-9680-120-1	--	--

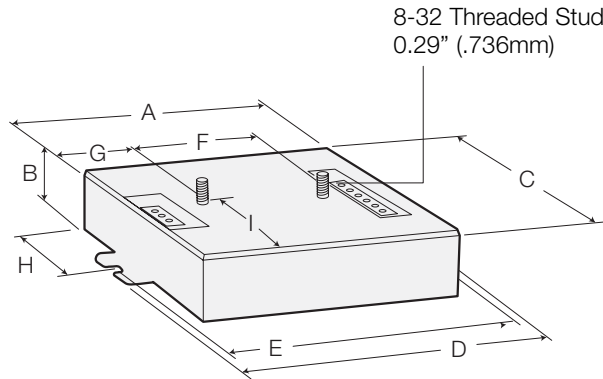
<sup>1</sup> Mounting studs standard for T4 ballasts. Delete suffix -S in the model number if mounting studs not needed.



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<b>Job Number:</b> <input type="text"/>	<input type="text"/>	<input type="text"/>

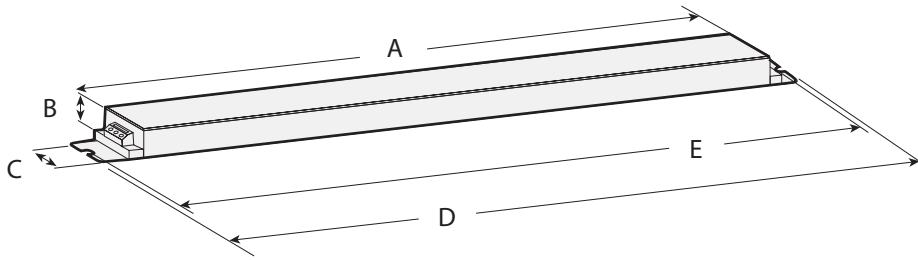
Case Dimensions

A<sup>1</sup>



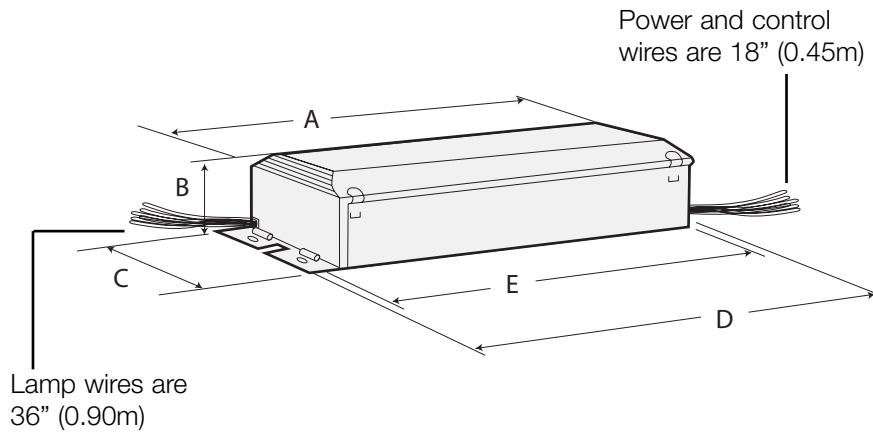
A	4.20"	(107 mm)
B	1.00"	(25 mm)
C	3.00"	(76 mm)
D	4.90"	(124 mm)
E	4.60"	(117 mm)
		(mounting centers)
F	2.00"	(51 mm)
G	1.08"	(27 mm)
H	1.60"	(41 mm)
I	1.39"	(35 mm)

C



A	16.12"	(409 mm)
B	1.00"	(25 mm)
C	1.18"	(30 mm)
D	18.00"	(457 mm)
E	17.70"	(450 mm)
		(mounting centers)

F



A	8.30"	(211 mm)
B	1.50"	(38 mm)
C	2.38"	(60 mm)
D	9.50"	(241 mm)
E	8.91"	(226 mm)
		(slot mounting centers)

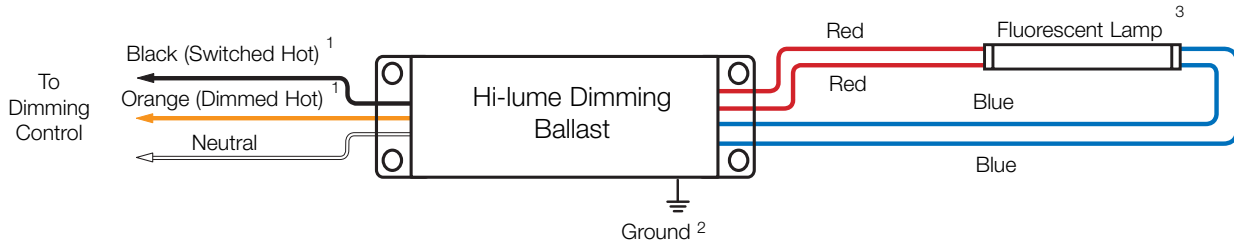
If using four hole mount, mounting centers are 9.21" (234 mm) x 1.70" (43 mm).

<sup>1</sup> Mounting studs standard. When ordering, delete suffix -S in the ballast model number if mounting studs not needed.

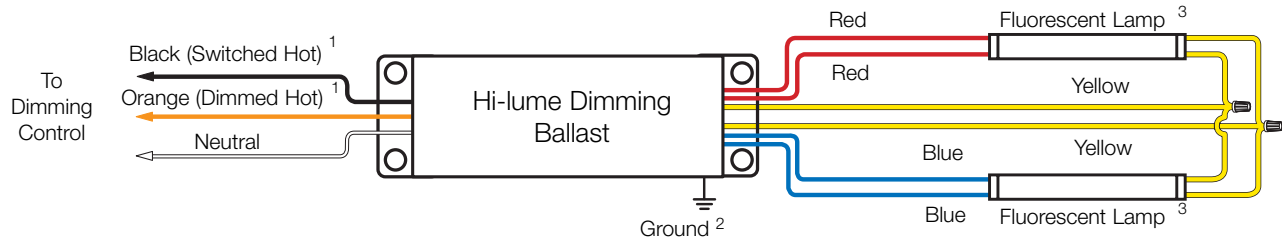
Job Name: <input type="text"/>	Model Numbers: <input type="text"/>	
Job Number: <input type="text"/>	<input type="text"/>	<input type="text"/>

# Hi-lume Wiring Diagrams

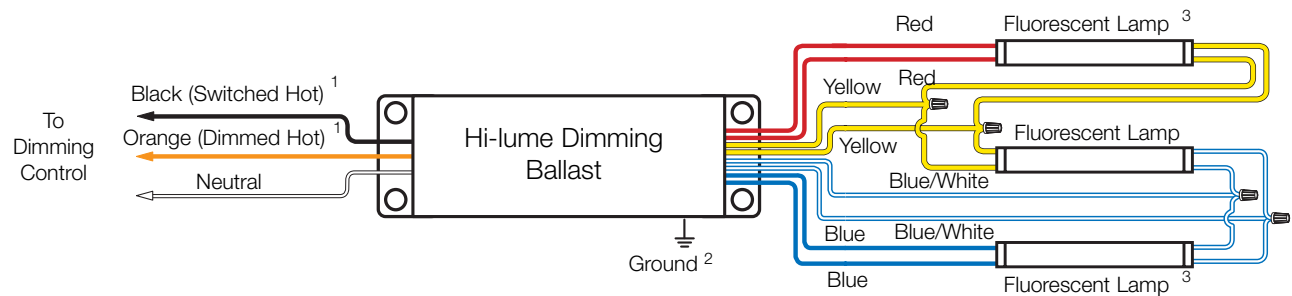
## One T5-HO or T8 lamp



## Two T5-HO or T8 lamps



## Three T8 lamps



<sup>1</sup> Dimming control wire colors do not necessarily match ballast wire colors (e.g. control 'dimmed hot' may be yellow, and ballast 'dimmed hot' may be orange. Wire colors shown are for Lutron ballasts and controls only.

<sup>2</sup> Ballast and lighting fixture must be effectively grounded.

<sup>3</sup> Includes 6" T8 U-bent lamps

Note: For T5-HO and T8 lamps, maximum lamp-to-ballast wire length is 7 feet (2m).

<b>Job Name:</b> <input type="text"/>	<b>Model Numbers:</b> <input type="text"/>	
<b>Job Number:</b> <input type="text"/>	<input type="text"/>	<input type="text"/>

Walter Nichols  
Hawthorn Building  
Altoona, PA



Appendix E

**Light Loss Factors**

<u>Space</u>	<u>Luminaire</u>	<u>Maint. Category</u>	<u>Degree of Dirt</u>	<u>Monthly Cleaning</u>	<u>LDD</u>	<u>LLD</u>	<u>BF</u>
Computer Classroom	Indirect/direct pendant	2	Clean	12	0.95	0.94	1
Corridor	Wall mount	2	Clean	12	0.95	0.94	1.04
Corridor	4" Downlight	4	Clean	12	0.88	0.84	1.05
Lecture Hall	2'x4' Troffer	4	Clean	12	0.88	0.94	0.88
Lecture Hall	Recessed wallwasher	4	Clean	12	0.88	0.94	0.99
Lecture Hall	Trackmounted spot	4	Clean	12	0.88	1	1
Music Room	2'x2' Recessed indirect	4	Clean	12	0.88	0.94	1.02
Music Room	Cloud Pendant	3	Clean	12	0.9	1	1

**Sum of Losses**

0.893

0.92872

0.77616

0.727936

0.818928

0.88

0.843744

0.9