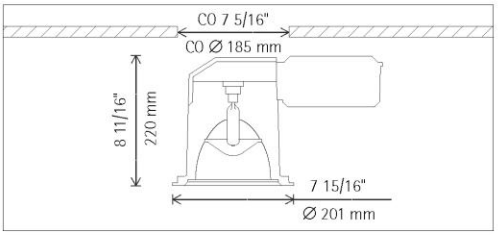
APPENDIX A: ENTRANCE LIGHTING EQUIPMENT

Fixture EF1

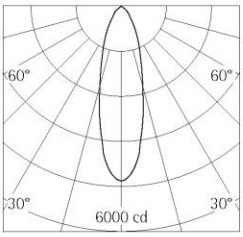
ERCO **LC Downlight**

for metal halide lamps



81022.023 Reflector silver
T6 39W G12 3400lm
ECG

Product description
Housing: cast aluminum, silver powder-coated. Mounting with 3-point support and screw-tightening. Side-mounted control gear: cast aluminum, black powder-coated.
Electronic control gear 120V/277V, 60Hz. Through-wiring possible.
Low brightness reflector: aluminum, specular anodized. Cut-off angle 30° from horizontal. Diffuser as lamp cover: glass, frosted.
Screw-fastened cover ring with safety glass: corrosion-resistant, cast aluminum, No-rinse surface treatment. Silver, double powder-coated. To be removed together with low-brightness reflector for lamp replacement.
Suitable for wet location (IP65): dust-proof and water jet-proof.
Weight 9.26lbs / 4.20kg



T6 39W G12 3400lm

h(ft)	E(fc)	D
		29°
3	518	1'7"
6	129	3'1"
9	58	4'8"
12	32	6'2"
15	21	7'9"

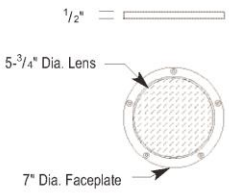
ERCO Lighting, Inc.
160 Raritan Center Parkway
Suite 10
Edison, NJ 08837
USA
Tel.: +1 732 225 8856
Fax: +1 732 225 8857
info.us@erco.com

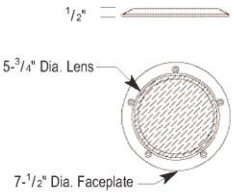
Technical Region: 120V/277V, 60Hz
Edition: 11.16.2006
Please download latest version from
www.erco.com/81022.023

Fixture EF2

T-6 Metal Halide

Integral Ballast





TR

Integral Ballast
- Patented HydroLock™ Technology
- Modular Component Construction

B-K LIGHTING

30

Catalog Number Logic

Material	Faceplate	OptiLock™	Reflector	Housing	Lamp	Finish	Accessory	Input Voltage	Option
S	CO2	T635	FL	TR	81	POL	11	120	AH

Material
Blank - Aluminum
B - Brass
S - Stainless Steel

Faceplate
HP2 - (Flush)
CO2 - (Flange)

OptiLock™
T635 - T-6 Metal Halide (35W)

Reflector
SP - Spot
MS - Medium Spot
FL - Flood

Housing
TR - Integral Ballast

Lamp
0 - By Others
81 - (35W) Metal Halide T-6 / 830

For lamp information, see page 70.

Finish

Aluminum & Brass Faceplates

Powder Coat Color	Satin	Wrinkle
Bronze	BZP	BZW
Black	BLP	BLW
White (Gloss)	WHP	WHW
Aluminum	SAP	--
Verde	--	VER

Brass Faceplates

Machined	MAC
Polished	POL
Mitique™	MIT

Stainless Faceplates

Machined	MAC
Polished	POL
Brushed	BRU

See Pages 60-61 for Additional Finish choices

Accessory *Select up to 2. Requires Accessory Holder. See page 55 for Accessory details.*
10 - Spread Lens
11 - Honeycomb Baffle
13 - Rectilinear Lens

Input Voltage
120 - 120 Volt
277 - 277 Volt

Option
AH - Accessory Holder *(Accommodates up to 2 Media)*
CPC - Concrete Pour Collar *(HP2 Only.) See page 54 for CPC details. Material and Finish to Match Faceplate. May be Field Installed prior to permanent installation of side conduit connectors. Included with ICEE Lens option.*
DG - Dome Glass Lens *(Replaces Flat Glass. Not Driveover Rated)*
GS - Glare Shield*
HD - Half Dome*
ICEE - ICEE™ Lens *(HP2 Only. Faceplate standard aluminum only. Concrete Pour Collar included.)** See pages 56-57 for details.*
RG - Rock Guard*
RO - Rock Guard with Optical Opening*
TC - Traction Control Lens *(Replaces Flat Glass.) See page 58 for details.*

** HP2 Only. Material and Finish to Match Faceplate. Dome lens included. See pages 52-54 for Option details.*

***Options DG, GS, HD, RG and RO not available with ICEE lens option*

Specifications

Fixture Housing
Corrosion-free composite, made from high strength, thermo-formed, sheet molded polyester compound. Glass reinforced, flame retardant and UV stabilized. (2) Bottom-Entry, 3/4" NPT female conduit entries with knockout plugs and (4) side flats for 1/2" or 3/4" conduit adapters.

Stability Flange (Pat. Pend)
Corrosion-free composite flange projects into installation sub-strate to reinforce housing stability. Integral REBAR saddles simplify installation onto concrete form. (4) Orthogonal bosses permit use of ½" PCV conduit or EMT to simplify vertical position and leveling of housing. Pre-set self-tapping screws anchor housing at proper elevation.

Aiming
Dual axis OptiLock™ stainless steel aiming bracket rotates 360° and provides vertical adjustment up to 14° from nadir. Positive lock action ensures optical orientation.

Socket
Specification grade ceramic body lamp holder rated for 5kV starting pulse. G12 bi-pin base, nickel-plated contacts and stainless steel, heat resistant lamp retaining clips.

Ballast Assembly
Class H Insulated, High Power Factor, Magnetic (120VAC or 277 VAC) Ballast. Integral, removable gear tray with quick disconnect and carrying handle.

Wiring / Connectors
Teflon® coated wire, 18 gauge, 600V, 250°C rated and certified to UL1659 standard. OptiLock™ and gear tray quick disconnects. Patented HydroLock™ with anti-siphon valve (ASV™) wireway. (3) Water-Tight connectors supplied for line connection. Maximum (2) #10 & (1) #18. Minimum (1) #12 & (1) #18.

Water Management
Self Evacuating Airtight Lamp Module (S.E.A.L.™). IP-68 rated, vacuum sealed enclosure. Patented Anti-Condensation Valve (ACV™) eliminates condensation from optical chamber. High temperature silicone 'O' Ring at faceplate. Patented HydroLock™ technology provides fail safe water barrier between junction box and interior components. Anti-siphon valve (ASV™) prevents "wicking" through conductor insulation.

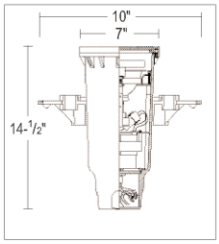
Lens
High heat, shock resistant, tempered 1/4" borosilicate flat glass lens. Suitable for walk-over and drive-over applications.

Faceplate
Solid, 1/2" machined 6061T6 aluminum with (5) black oxide, captive, stainless steel mounting screws. Faceplate options include solid, 1/2" machined brass and solid, 1/2" machined stainless steel.

Finish
StarGuard® (Pat. Pend), a 15 stage, chromate-free process cleans and conversion coats aluminum components prior to application of Class 'A' TGIC polyester powder coating. Brass components are available in powder coat or handcrafted metal finish. Stainless steel components are available in handcrafted metal finish.

Listings
ARL and CSA Listed.

®Teflon is a registered trademark of DuPont Corporation

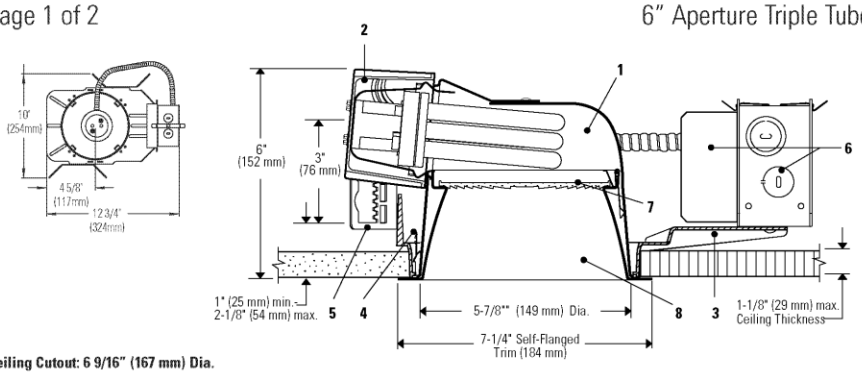


B-K LIGHTING

Fixture EF3

Calculite® Compact Fluorescent Lensed Downlight **8091**

6" Aperture Triple Tube Horizontal Lamp



Ceiling Cutout: 6 9/16" (167 mm) Dia.

Reflector Trim	Fresnel Lens	Clear Lens	Prismatic Lens
Clear Cone, White Flange	**8091FCLW**	**8091CCLW**	**8091PCLW**
Clear Cone, Polished Flange	**8091FCLP**	**8091CCLP**	**8091PCLP**
White Cone, White Flange	**8091FWHW**	**8091CWHW**	**8091PWHW**

	Opal Diffuser
Clear Cone, White Flange	**8091DCLW**
Clear Cone, Polish Flange	**8091DCLP**
White Cone, White Flange	**8091DWHW**

Frame-In Kit			Lamp
S6132BU	Electronic	120V - 277V	**26 or 32W Triple Tube**
S6132BCU3	Universal Dimming	120V - 277V	4-Pin (Amalgam)
S6132BJUM7	Advance Mark7	120V - 277V	

Remodeler Frame-In Kit			Lamp
6132BURM	Electronic	120V - 277V	**26 or 32W Triple Tube** 4-Pin (Amalgam)

Features

1. **Reflector:** 16 ga. Die-formed aluminum, Anobrite® finish.
2. **Socket Cup:** Effectively dissipates heat and positions lamp holder. Snaps onto reflector neck to assure consistently correct optical alignment without tools.
3. **Mounting Frame:** Galvanized steel for dry or plaster ceilings. Accepts other 6" Triple Tube reflectors (see S6132BU Spec Sheet).
4. **Retaining Springs:** Precision-tooled steel friction springs secure reflector to mounting frame for quick, tool-less installation.
5. **Mounting Brackets:** 16 ga. steel. Adjust from inside of fixture. Use 3/4" or 1 1/2" lathing channel, 1/2" EMT, or optional mounting bars.
6. **Ballast/J-Box:** Electronic 120V-277V. UL listed for through branch circuit wiring with max of (8) No. 12AWG, 90°c supply conductors. Outboard-mounted to reduce heat transfer and maintain lamp efficacy and life. Service from below without tools.
7. **Shielding Media:** Molded acrylic. Available in fresnel lens, clear lens, or opal diffuser. Secured to aperture cone.
8. **Cone:** 16 ga. Alzak® aluminum. Clear Iridescence Free finish or Comfort Clear™ low iridescence finish. Retained by friction springs; no loose parts.

Electrical

Note: For ballast electrical data and latest lamp/ballast compatibility refer to **"Ballast"** specification sheet for complete electrical data.
S6132BU, S6132BCU: UL listed for through branch circuit wiring with max of (8) No. 12 AWG, 90° C supply conductors.

6132BURM: UL listed for No. 12 AWG, 90° C supply conductors.

Options and Accessories

Comfort Clear™ Finishes[1]		Other Finishes	
Clear	**CCL**	White	**WH**
Diffuse	**CCD**		
Champagne Bronze	**CCZ**		
Pewter	**CPW**		

[1]Specify desired flange. **W** White, **P** Polished

Other Dimming:
S6132BJ1MX Advance MarkX, 120V
S6132BJ2MX Advance MarkX, 227V
S6132BJ1LD3 Lutron Hi-lume®, 120V
S6132BJ2LD3 Lutron Hi-lume®, 227V

Options and Accessories (continued)

Emergency	Add suffix **EM***
Chicago Plenum	Use 6132BULC
Existing/Thk. Ceiling	**FA EC6***
Emergency Ltg. Kit	**FA EM3E***
	FA EM4E*
Fuse (Slow Blow)	Add suffix **F**

*See Spec. Sheets: FAEC, FAEM

Mounting Bars & Accessories; see Specification Sheet MBA. Sloped Ceiling Adapters; see Specification Sheet SCA.

IC Frame available; see **C6CFL32** specification sheet.

Labels

All units are UL listed for wet locations; Opal Diffuser is UL listed for damp locations.

Alzak® is a registered trademark of ALCOA.
US Patent Pending.

Job Information **Type:**

Job Name:

Cat. No.:

Lamp(s):

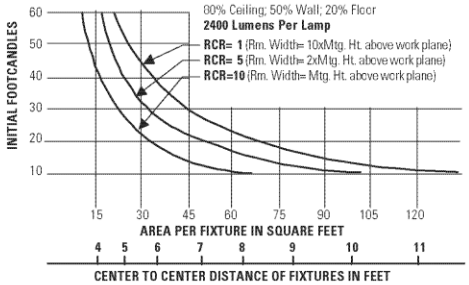
Notes:

Lightolier a Genlyte company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

32W Clear Cone (CL)

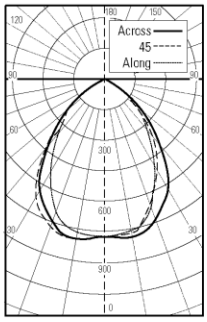
Quick Calculator



This quick calculator chart determines the number and spacing of 1 lt.- 32W PL-T units with fresnel lens and clear reflector, for any level of illumination. Conversion factors: Opal diffuser, fc x 0.8; Clear lens, fc x 1.0. 1 lt.- 26W PLT : Fresnel Lens, fc x 0.8; Opal Diffuser, fc x 0.65; Cloar lens fc x 0.8.

Spacing Ratio = 1.2

CERTIFIED TEST REPORT NO. 0075FR
COMPUTED BY LSI PROGRAM **TEST-LITE**
CALCULITE 6" DIAMETER RECESSED FLUORESCENT LENSED DOWNLIGHT
SEMI-SPECULAR REFLECTOR WITH CLEAR CONE AND FRESNEL LENS
LUMEN RATING = 2400 LMS.
1-32W PL-T LAMP,



**** EFFICIENCY = 51.2% ****

CANDLEPOWER

ANGLE	ALONG	22.5	45	67.5	ACROSS	LUMENS
0	780	780	780	780	780	
5	773	778	779	782	785	37
10	758	768	774	781	790	
15	736	732	738	753	776	104
20	680	647	664	699	739	
25	589	552	591	633	688	140
30	499	489	530	572	630	
35	413	425	446	481	536	143
40	334	358	364	386	425	
45	268	286	288	304	323	115
50	210	232	232	239	244	
55	87	105	109	116	119	55
60	32	38	42	45	47	
65	6	8	9	9	11	7
70	1	1	1	2	2	
75	1	1	1	1	1	0
80	1	1	1	1	1	
85	0	1	1	0	1	0
90	0	1	1	0	1	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	585	24.40	47.62
0-40	886	36.92	72.06
0-60	1216	50.67	98.90
0-90	1229	51.24	100.00
40-90	343	14.32	27.94
60-90	13	.57	1.10
90-180	0	.00	.00
0-180	1229	51.24	100.00

Coefficients Of Utilization

% EFFECTIVE CEILING CAVITY REFLECTANCE

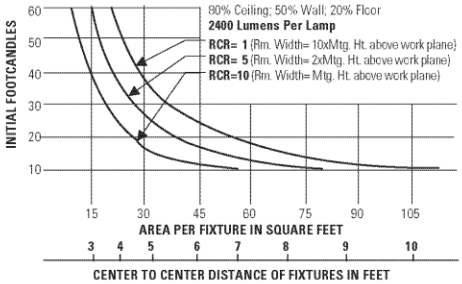
	80			70			50			30			10		0
	% WALL REFLECTANCE														
ROOM CAVITY RATIO	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
1	.56	.55	.54	.56	.54	.53	.53	.52	.51	.51	.51	.50	.50	.49	.48	.48
2	.52	.50	.48	.51	.49	.48	.50	.48	.47	.48	.47	.46	.47	.46	.45	.44
3	.48	.46	.44	.48	.45	.43	.46	.44	.43	.45	.43	.42	.44	.43	.41	.40
4	.45	.42	.40	.44	.42	.39	.43	.41	.39	.42	.40	.38	.41	.39	.38	.37
5	.42	.38	.36	.41	.38	.36	.40	.37	.35	.39	.37	.35	.38	.36	.35	.34
6	.38	.35	.33	.38	.35	.32	.37	.34	.32	.36	.34	.32	.36	.33	.32	.31
7	.35	.32	.30	.35	.32	.29	.34	.31	.29	.33	.31	.29	.33	.31	.29	.28
8	.32	.29	.27	.32	.29	.27	.32	.29	.27	.31	.28	.26	.30	.28	.26	.25
9	.30	.27	.24	.30	.26	.24	.29	.26	.24	.29	.26	.24	.28	.26	.24	.23
10	.28	.24	.22	.27	.24	.22	.27	.24	.22	.26	.24	.22	.26	.23	.22	.21

20% FLOOR CAVITY REFLECTANCE

Conversion Factors: 1 Lt-32W PLT: Opal Diffuser, CU x 0.8; Clear Lens, CU x 1.0.
1 Lt-26W PLT: Fresnel Lens, CU x 1.1; Opal Diffuser, CU x 0.9; Clear Lens, CU x 1.1.

32W White Cone (WH)

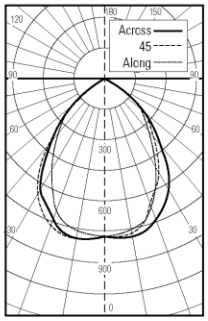
Quick Calculator



This quick calculator chart determines the number and spacing of 1 lt.- 32W PL-T units with fresnel lens and white cone, for any level of illumination. Conversion factors: Opal diffuser, fc x 0.8; Clear lens, fc x 1.0. 1 lt.- 26W PLT : Fresnel Lens, fc x 0.8; Opal Diffuser, fc x 0.65; Clear lens fc x 0.8.

Spacing Ratio = 1.1

CERTIFIED TEST REPORT NO. 0072FR
COMPUTED BY LSI PROGRAM **TEST-LITE**
CALCULITE 6" DIAMETER RECESSED FLUORESCENT LENSED DOWNLIGHT
SEMI-SPECULAR REFLECTOR WITH WHITE CONE AND FRESNEL LENS
LUMEN RATING = 2400 LMS.
1-32W PL-T LAMP,



**** EFFICIENCY = 43.9% ****

CANDLEPOWER

ANGLE	ALONG	22.5	45	67.5	ACROSS	LUMENS
0	656	656	656	656	656	
5	649	654	657	660	662	31
10	626	639	650	660	669	
15	588	605	622	639	654	87
20	525	546	567	592	617	
25	452	479	501	526	563	116
30	378	419	432	450	490	
35	312	363	361	370	405	114
40	256	303	290	297	322	
45	200	233	225	231	244	89
50	144	156	165	171	180	
55	99	115	115	117	120	53
60	66	74	76	77	79	
65	46	48	49	50	52	26
70	35	36	37	38	39	
75	26	27	27	27	29	14
80	16	17	17	19	19	
85	7	9	9	9	9	5
90	1	1	1	1	1	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	468	19.51	44.30
0-40	697	29.07	66.29
0-60	956	40.28	91.86
0-90	1052	43.86	100.00
40-90	354	14.76	33.71
60-90	85	3.57	8.14
90-180	0	.00	.00
0-180	1052	43.86	100.00

Coefficients Of Utilization

% EFFECTIVE CEILING CAVITY REFLECTANCE

	80			70			50			30			10		0
	% WALL REFLECTANCE														
ROOM CAVITY RATIO	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
1	.48	.46	.45	.47	.46	.44	.45	.44	.43	.43	.43	.42	.42	.41	.41	.40
2	.44	.42	.40	.42	.41	.39	.41	.40	.38	.40	.39	.38	.39	.38	.37	.36
3	.40	.37	.35	.39	.37	.35	.38	.38	.34	.37	.35	.34	.36	.33	.33	.33
4	.37	.34	.32	.36	.34	.32	.35	.33	.31	.34	.32	.31	.34	.32	.30	.30
5	.34	.31	.29	.33	.31	.28	.33	.30	.28	.32	.30	.28	.31	.29	.28	.27
6	.31	.28	.26	.31	.28	.26	.30	.28	.26	.29	.27	.25	.25	.27	.25	.25
7	.29	.26	.23	.28	.25	.23	.25	.25	.23	.27	.25	.23	.27	.25	.23	.22
8	.26	.23	.21	.26	.23	.21	.26	.23	.21	.25	.23	.21	.25	.23	.21	.20
9	.24	.21	.19	.24	.21	.19	.24	.21.	.19	.23	.21	.19	.23	.21	.29	.18
10	.23	.20	.18	.22	.20	.18	.22	.19	.18	.22	.19	.17	.21	.19	.19	.17

20% FLOOR CAVITY REFLECTANCE

Conversion Factors: 1 Lt-32W PLT: Opal Diffuser, CU x 0.8; Clear Lens, CU x 1.0.
1 Lt-26W PLT: Fresnel Lens, CU x 1.1; Opal Diffuser, CU x 0.9; Clear Lens, CU x 1.1.

Job Information **Type:**

Lightolier a Genlyte company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

Fixture EF4

C O L E L I G H T I N G

Illuminated Handrails

LIGHTRAIL · LR 5

LR 5W Wall Mounted
LR 5P Post Mounted

LR 5 Series Lightrail is a flexible system of wall or post mounted illuminated handrails. The unique design provides symmetrical illumination from a design which is small enough to conform to ADA requirements* for the grip surface of the handrail.

Features

Fluorescent models have a high impact acrylic lens providing a symmetrical illumination pattern using T5 lamps. Light emitting diode (LED) models have a sealed extruded polycarbonate tube with LEDs that fits flush with the rail. Linear prisms spread the illumination symmetrically. The extruded aluminum rail is welded at all intersections. Ballasts or LED drivers may be integral in the posts or railing, or may be remote. LR5 Lightrail installation may require additional electrical feeds for each run, and early cordination with the factory is suggested to clarify installation consideration.

Applications

LR 5 Lightrail is ideal as guardrails, stair and ramp railings as well as elevator railings.

Custom

We would be pleased to discuss the production of modified standard Lightrail or custom railings to suit your specific conditions. Modifications possible include custom extrusions, alternate finishes or materials, mounting adaptions, end treatments and alternate light sources.

To learn more about our custom capabilities and standard product lines call us directly or contact your local Cole representative.

* Access Board interpretation of ADA requirements considers 1¼"-1½" standard pipe sizes to be acceptable. Standard 1½" pipe is 1.90" diameter.

LR 5 Lightrail produces a symmetri-cal light distribution pattern that washes walkways with light to both sides.

Unique 1.9" diameter complies with ADA requirements.

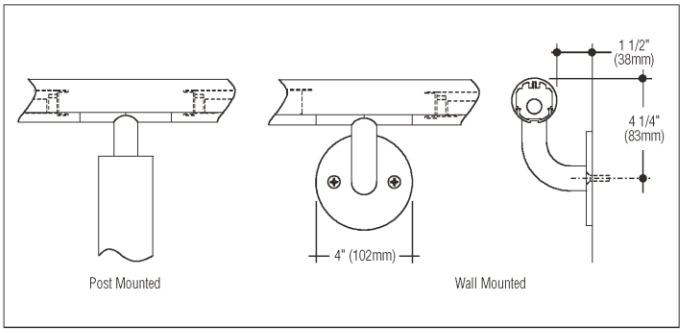
Fluorescent

LED

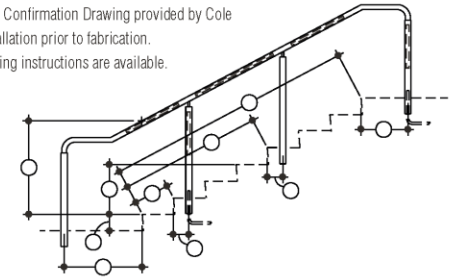
C. W. Cole & Company, Inc.
2560 N. Rosemead Boulevard
South El Monte, CA 91733-1593

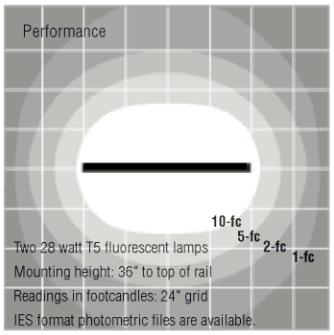
Fax (626) 443-9253
Tel. (626) 443-2473
info@colelighting.com
www.colelighting.com

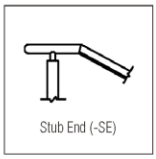
C O L E L I G H T I N G

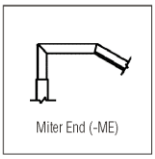


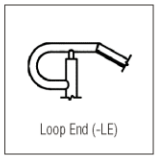
Sample Field Confirmation Drawing provided by Cole for each installation prior to fabrication.
Field measuring instructions are available.

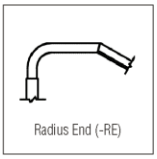












Illuminated Handrails

LIGHTRAIL · LR 5

LR 5W Wall Mounted
LR 5P Post Mounted

Specifications

Construction

• Railing is extruded 6063-T5 aluminum, bronze, or stainless steel • Posts are 2 3/8" diameter aluminum pipe or bronze • Wall brackets are fabricated aluminum or bronze • Clear, prismatic snap-in lens is extruded high-impact acrylic with prisms on the inside for better maintenance • Ends and all railing miters are welded and ground smooth • Medium bronze polyester coating is the standard finish on aluminum other finishes are available • Optional bronze has #4 satin finish.

Electrical

• Fluorescent: prewired for T5 rapid-start fluorescent lamps, available in various lengths, as required • Lamping will be determined by factory to ensure maximum even illumination • LED: prewired for LED strips and drivers • Electronic 0°F (-18°C) ballasts may be integral in railing or posts, or remote-mounted for greater continuity of illumination • Suitable for wet locations • UL/cUL listed suitable for wet locations.

Mounting

• Posts or wall brackets are provided to a maximum of 6' centers • Posts are direct buried to 6" depth and set with quick-setting grout by contractor • Baseplates are optional for post mounting • Wall bracket allows mounting over conduit stub flush with wall.

Options

Baseplate: 5" x 5" x 3/8" baseplate with four 5/8" holes. Add suffix **-BP**.
Non-illuminated: All Lightrail models are available without lighting components. Add suffix **-U**.
Ends: Add suffix. Stub **-SE**. Miter **-ME**. Loop **-LE**. Radius **-RE**.
LED Illumination: Add suffix **-LED.**
Bronze Construction: 385 architectural bronze rail with #4 satin finish. Add suffix **-BRZ.**
Stainless Steel Construction: Add suffix **-SS.**

How to Specify

Every Lightrail is custom designed and fabricated to your specific project conditions. Architectural drawings are required that clearly show the desired configurations and locations. A detailed drawing (similar to the sample above) will be provided by Cole prior to fabrication for your field verification.
1. Give catalog number, options, and voltage; LR 5W-RE-277. Lamping will be determined by the factory to maximize even illumination.
2. Select desired options and add appropriate suffixes.

QB 3M G04

C. W. Cole & Company, Inc.
2560 N. Rosemead Boulevard
South El Monte, CA 91733-1593

Fax (626) 443-9253
Tel. (626) 443-2473
info@colelighting.com
www.colelighting.com

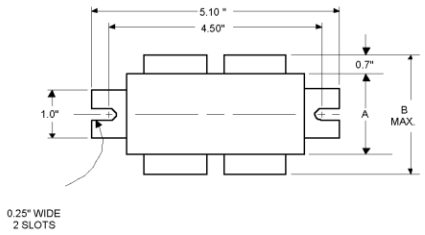
Ballast EB1

Metal Halide Lamp Ballast

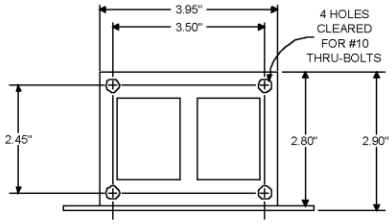
Catalog Number 71A5081
For 35/39W M130
60 Hz HX-HPF
Status: Active

DIMENSIONS AND DATA

3 X 4 CORE - 2 COIL UNIT



0.25" WIDE
2 SLOTS



INPUT VOLTS		120	277			
CIRCUIT TYPE	HX-HPF					
POWER FACTOR (min)	90%					
REGULATION						
Line Volts	±5%					
Lamp Watts	±10%					
LINE CURRENT (Amps)						
Operating		0.45	0.20			
Open Circuit		0.90	0.40			
Starting		0.50	0.22			
UL TEMPERATURE RATINGS						
Insulation Class	H(180°C)					
Coil Temperature Code	1029	B	A			
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C					
NOM. OPEN CIRCUIT VOLTAGE	230					
INPUT VOLTAGE AT LAMP DROPOUT		85	195			
INPUT WATTS	56					
RECOMMENDED FUSE (Amps)		3	1			
CORE and COIL						
Dimension (A)	0.80					
Dimension (B)	2.10					
Weight (lbs.)	3.5					
Lead Lengths	12"					
CAPACITOR REQUIREMENT						
Microfarads	5.0					
Volts (min.)	277					
Fault Current Withstand (amps)						
60 Hz TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)						
High Potential Test (Volts)						
1 minute	2000					
2 seconds	2500					
Open Circuit Voltage Test (Volts)	205-255					
Short-Circuit Current Test (Amps)						
Secondary Current		0.35	0.15	-	-	-
Input Current	0.60-0.75	0.55	0.25			

Capacitor: 7C050L33

Capacitance: 5
Dia/Oval Dim: 1.25
Height: 2.9
Temp Rating: 105°C

Wiring Diagram:

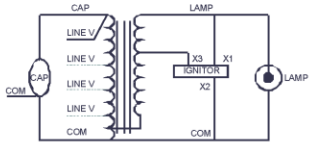


Fig. K3

UL RECOGNIZED

Ignitor: LI533-H4

Ballast to Lamp Distance
(BTL) = 15 feet
Temp Rating: 105°C

Typical Ordering Information

(please call Advance for suffix availability)

Order Suffix	Description
500D.	Ballast With Ignitor and Dry Film Capacitor
510D.	Ballast w/Welded Bracket, Ignitor, & Dry Film Capacitor
600.	Ballast and Ignitor, No Capacitor
610.	Ballast with Welded Bracket and Ignitor, No Capacitor

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Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071
Corporate Offices: Phone: 800-322-2086

05/13/99

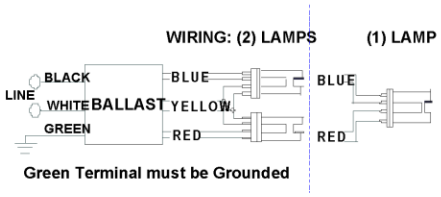
Ballast EB2

ICF2S4290CM2LD@120	
Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120
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.
* CFM32W/GX24Q	1	32	0/-18	0.27	37	1.10	15	0.98	1.5	2.97
CFM32W/GX24Q	2	32	0/-18	0.57	68	0.98	10	0.98	1.5	1.44

Wiring Diagram

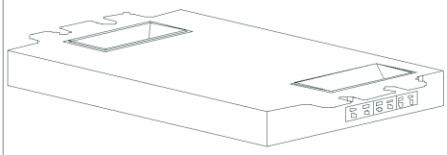


Green Terminal must be Grounded

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

Standard Lead Length (inches)

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	3.00 "	1.29 "	4.60 "
4 49/50	3	1 29/100	4 3/5
12.6 cm	7.6 cm	3.3 cm	11.7 cm

Revised 08/21/2006

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Corporate Offices: Phone: 800-322-2086

ICF2S4290CM2LD@120	
Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120
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.

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 9002 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-M4-XX, ICF2S42-90C-M2-XX and ICF2S70-M4-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 part # _____ or approved equal.

Revised 08/21/2006

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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

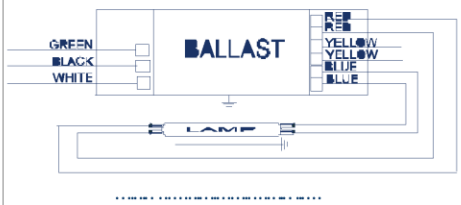
Ballast EB3

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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	0.16	19	1.07	20	0.98	1.7	5.63
F14T5	2	14	0/-18	0.29	34	1.06	10	0.98	1.7	3.12
F21T5	1	21	0/-18	0.21	26	1.03	15	0.99	1.7	3.96
F21T5	2	21	0/-18	0.40	48	1.02	10	0.98	1.7	2.13
* F28T5	1	28	0/-18	0.28	33	1.04	10	0.98	1.7	3.15
F28T5	2	28	0/-18	0.55	64	1.03	10	0.99	1.7	1.61
F35T5	1	35	0/-18	0.34	41	1.01	10	0.98	1.7	2.46
F35T5	2	35	0/-18	0.67	80	1.00	10	0.99	1.7	1.25

Wiring Diagram



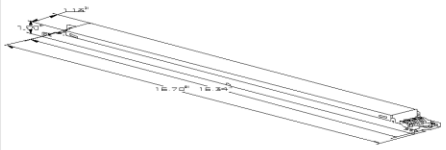
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	0	0
Blue	0	0
Red	0	0
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	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 08/21/2006

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Corporate Offices: Phone: 800-322-2086

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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 or poke-in wire trap connectors 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 light output 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).

3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 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 part # _____ or approved equal.

Revised 08/21/2006

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

Lamp EL1

16/2/2007

MasterColor CDM-T 35W/830 G12 T6 1CT

Product family description
Range of single-ended T6 high-efficiency ceramic metal halide lamps with a stable color over lifetime and a crisp, sparkling light.

Features / Benefits

- Excellent color rendering.
- Superior color stability over life within +- 200K.
- Lamp to lamp color consistency over life.
- Higher lumen maintenance than standard metal halide.
- Warm (3K) or fresh white (4K) color impression.
- High lamp efficacy (up to 93 lumens per watt) for energy saving and low heat.
- Universal operating position.
- Compact lamp dimensions for high beam intensities.
- FadeBlock for reduced fading risks.
- No shut off required in 24-hour-a-day/7-day-a-week operations (relamp fixtures at or before the end of rated life).
- Long lamp life compared to incandescent and halogen lamps.

Applications

- Accent and General lighting in retail, offices and public buildings. Decorative outdoor: floodlighting and pedestrian areas.

Notes

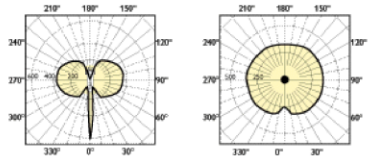
- Requires a ballast specified or approved for Philips Metal Halide lamp or one designed to the indicated ANSI Standard. A pulse ignitor is required. Sockets and wiring must withstand starting pulse. (391)
- Supply volts must be +/- 5% of rated ballast line volts for reactor type and +/- 10% for CWA or electronic ballasts. (392)
- UV filtered design (FadeBlock™). (396)
- Operate only on thermally protected ballasts (397)
- MasterColor® Metal Halide Lamps are not recommended for use on dimmers and are not warranted if used on dimmer systems. (401)
- Rated average life is the life obtained, on the average, from large representative groups of lamps in laboratory tests under controlled conditions at 10 or more operating hours per start. It is based on survival of at least 50% of the lamps and allows for individual lamps or groups of lamps to vary considerably from the average. For lamps with a rated average life of 24,000 hours, life is based on survival of 67% of the lamps. (351)
- Approximate lumen values listed are for vertical operation of the lamp. (352)
- Means Lumens is the approximate lumen output at 40% of lamp rated average life. (353)
- Heat resisting glass bulb.

Product data	
Product Number	223289
Full product name	MasterColor CDM-T 35W/830 G12 T6 1CT
Ordering Code	CDM35/T6/830
Pack type	1 Lamp in a Folding Carton
Pieces per Sku	1
Skus / Case	12
Pack UPC	046677223281

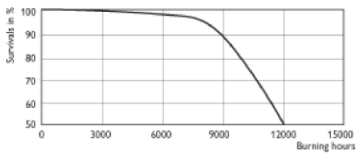
PHILIPS

1

Product data	
EAN2US	
Case Bar Code	50046677223286
Successor Product number	
Watts[W]	35W
Color Code	830 [CCT of 3000K]
Base	G12
Bulb	T6 [T 19mm]
Packing Type	1CT [1 Lamp in a Folding Carton]
Packing Configuration	12
Bulb Finish	Clear
Operating Position	Universal[Any or Universal (U)]
Rated Avg. Life[hr]	12000
ANSI Code HID	M130/E
System Power EL[W]	44
Lamp Voltage[V]	88
Dimmable	No
Mercury (Hg) Content[mg]	
Color Rendering Index[Ra8]	81
Color Designation	Warm White
Color Description	830 Warm White
Color Temperature[K]	3000
Initial Lumens[Lm]	3300
Design Mean Lumens[Lm]	2600
Overall Length C[mm]	103
Diameter D[mm]	20
Light Center Length L[in]	2.21875
Max Overall Length (MOL) – C[in]	3.9375
Diameter D[in]	0.75

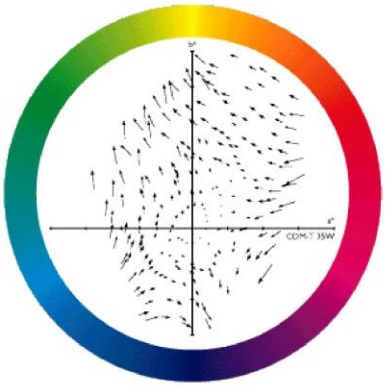


CDM-T 35W/830/930

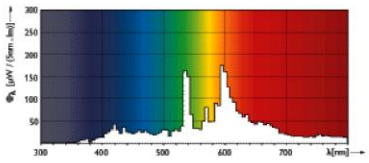


CDM-T 35W/830

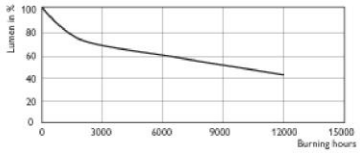
PHILIPS



CDM-T 35W/830

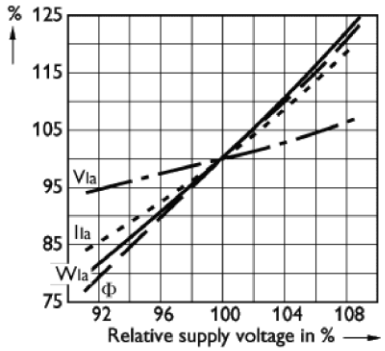


CDM-T/830

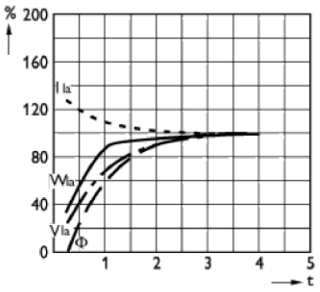


CDM-T 35W/830

PHILIPS

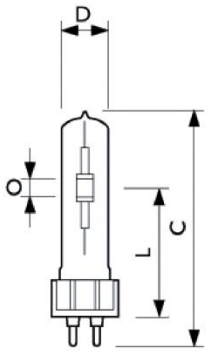


CDM-T/830



CDM-T

PHILIPS



CDM-T

	C	D		L		O
Full product name	Max	Max	Min	Nom	Max	Min
MasterColor CDM-T 35W/830 G12 T6 1CT	103	20	55	56	57	4.69

O	
Nom	Max
4.9	5.11

Lamp EL2

Product Information Bulletin

DULUX® T/E/IN/EOL ECO®

4-Pin Amalgam Compact Fluorescent Lamps

- End-of-Life (EOL) shutdown protection
- Designed to pass Federal TCLP Test*
- Improved high temperature performance
  – Maintains 90% lumens from 40° to 140°F ambient
- Operates on various ballast systems
  – Flicker free start on electronic ballasts
  – Compatible with QUICKTRONIC® System CF
- Less power consumption than incandescent of comparable light output
- High luminous efficacy
- Long 12,000 hour average rated life
  – Reduces relamping requirement and related cost
- Rare earth tri-phosphor with 82 CRI
- 2700K, 3000K, 3500K and 4100K

* Regulations may vary. Check your local and state regulations.

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.

SYLVANIA DULUX T/E/IN/EOL ECO amalgam compact fluorescent lamps are ideal for use in a wide range of applications, including high temperatures. They are designed to be operated on energy efficient electronic and dimming ballasts.

DULUX T/E/IN/EOL ECO amalgam lamps are ideal for fixtures where shorter overall length lamps with higher lumen packages are required and where lamps may operate at elevated temperatures. In addition, the delta tube configuration of these lamps provides an even light distribution.

Product Availability

Lamp	Wattage	Rated Lumens
CF18DT/E/IN	18	1200
CF26DT/E/IN	26	1800
CF32DT/E/IN	32	2400
CF42DT/E/IN	42	3200
CF57DT/E/IN	57	4300
CF70DT/E/IN*	70	5200

* Contact your SYLVANIA sales representative for product availability

System Comparison

Compact Fluorescent vs Incandescent

Lamp Type	Rated Lamp Life	System Lumens	System Wattage	System LPW	Energy[1] Savings
100W Incandescent	750 hrs.	1710	100W	17	–
DULUX T/E/IN 26W w/ QUICKTRONIC CF	12,000 hrs.	1830	28W	65	$86.00
150W Incandescent	750 hrs.	2740	150W	18.5	–
DULUX T/E/IN 42W w/ QUICKTRONIC CF	12,000 hrs.	3200	46W	70	$124.00
200W Incandescent	750 hrs.	3650	200W	19	–
DULUX T/E/IN 57W w/ QUICKTRONIC CF	12,000 hrs.	4300	62W	69	$165.00

1. Based on $.10/kWh over 12,000 hours.

Application Information

Applications
Recessed ceiling fixtures
Industrial lighting
Showcase lighting
Wall sconces
Task lighting
Exit signs
Garden and walkway lighting

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible operating systems.

Application Notes

1. 4-Pin lamps designed for dimming and electronic ballast operation.
2. Minimum starting temperature depends on ballast.
3. Rule of thumb: to estimate the appropriate compact fluorescent lamp wattage, divide the incandescent wattage by 4.
4. Equipment manufacturers are advised to consult ANSI and IEC standards for the maximum allowable dimensions and temperature to insure compatibility with similar products.
5. QUICKTRONIC System CF electronic ballasts available for all wattages: 18W, 26W, 32W, 42W, 57W & 70W.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

CF022R4

Sample Specification

Lamp(s) shall be (a) DULUX (CF18DT/IN, CF26DT/E/IN, CF32DT/E/IN, CF42DT/E/IN, CF57DT/E/IN or CF70DT/E/IN) EOL ECO lamps, with end-of-life shutdown protection and pass existing Federal TCLP limits. Lamp(s) shall have an average rated life of 12,000 hours, a correlated color temperature of (2700K, 3000K, 3500K or 4100K), and a CRI of 82. Lamps shall have a (GX24q-2, GX24q-3, GX24q-4, GX24q-5 or GX24q-6) plug-in, 4-pin base and be suitable for use on electronic and dimming ballasts. Lamps shall be operated by QUICKTRONIC ballasts. Both lamps and ballasts are covered by the QUICK 60+ system warranty.

Warranty Information

QUICK 60+ warranty for OSRAM SYLVANIA lamp and ballast combination

Limited 6 month lamp warranty and a five year ballast warranty is possible if both lamps and ballasts are provided by OSRAM SYLVANIA. See the QUICK 60+ warranty for details and restrictions.

Ordering and Specification Information

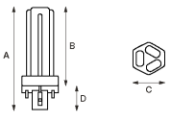
Item Number	Ordering Abbreviation	NEMA Generic Designation	Base	Watts	Volts[1]	Amps[1]	Initial Lumens	Mean Lumens[2]	Color Temp.	CRI	Av. Rated Life(hrs.)[3]
20875	CF18DT/E/IN/827	CFM18W/GX24q/27	GX24q-2	18	80	.210	1200	1032	2700K	82	12,000
20876	CF18DT/E/IN/830	CFM18W/GX24q/30	GX24q-2	18	80	.210	1200	1032	3000K	82	12,000
20877	CF18DT/E/IN/835	CFM18W/GX24q/35	GX24q-2	18	80	.210	1200	1032	3500K	82	12,000
20878	CF18DT/E/IN/841	CFM18W/GX24q/41	GX24q-2	18	80	.210	1200	1032	4100K	82	12,000
20879	CF26DT/E/IN/827	CFM26W/GX24q/27	GX24q-3	26	80	.300	1800	1548	2700K	82	12,000
20880	CF26DT/E/IN/830	CFM26W/GX24q/30	GX24q-3	26	80	.300	1800	1548	3000K	82	12,000
20881	CF26DT/E/IN/835	CFM26W/GX24q/35	GX24q-3	26	80	.300	1800	1548	3500K	82	12,000
20882	CF26DT/E/IN/841	CFM26W/GX24q/41	GX24q-3	26	80	.300	1800	1548	4100K	82	12,000
20883	CF32DT/E/IN/827	CFM32W/GX24q/27	GX24q-3	32	100	.320	2400	2064	2700K	82	12,000
20884	CF32DT/E/IN/830	CFM32W/GX24q/30	GX24q-3	32	100	.320	2400	2064	3000K	82	12,000
20885	CF32DT/E/IN/835	CFM32W/GX24q/35	GX24q-3	32	100	.320	2400	2064	3500K	82	12,000
20886	CF32DT/E/IN/841	CFM32W/GX24q/41	GX24q-3	32	100	.320	2400	2064	4100K	82	12,000
20887	CF42DT/E/IN/827	CFM42W/GX24q/27	GX24q-4	42	135	.320	3200	2752	2700K	82	12,000
20888	CF42DT/E/IN/830	CFM42W/GX24q/30	GX24q-4	42	135	.320	3200	2752	3000K	82	12,000
20871	CF42DT/E/IN/835	CFM42W/GX24q/35	GX24q-4	42	135	.320	3200	2752	3500K	82	12,000
20890	CF42DT/E/IN/841	CFM42W/GX24q/41	GX24q-4	42	135	.320	3200	2752	4100K	82	12,000
20895	CF57DT/E/IN/827[4]	CFM57W/GX24q/27	GX24q-5	57	182	.320	4300	3698	2700K	82	12,000
20896	CF57DT/E/IN/830[4]	CFM57W/GX24q/30	GX24q-5	57	182	.320	4300	3698	3000K	82	12,000
20897	CF57DT/E/IN/835[4]	CFM57W/GX24q/35	GX24q-5	57	182	.320	4300	3698	3500K	82	12,000
20899	CF57DT/E/IN/841[4]	CFM57W/GX24q/41	GX24q-5	57	182	.320	4300	3698	4100K	82	12,000
20794	CF70DT/E/IN/827[4,5,6]	CFM70W/GX24q/27	GX24q-6	70	220	.320	5200	4470	2700K	82	12,000
20795	CF70DT/E/IN/830[4,5,6]	CFM70W/GX24q/30	GX24q-6	70	220	.320	5200	4470	3000K	82	12,000
20796	CF70DT/E/IN/835[4,5,6]	CFM70W/GX24q/35	GX24q-6	70	220	.320	5200	4470	3500K	82	12,000
20797	CF70DT/E/IN/841[4,5,6]	CFM70W/GX24q/41	GX24q-6	70	220	.320	5200	4470	4100K	82	12,000

1. @ 25 KHz
2. Measured at 40% (4800 hours) of rated life.
3. Based on 3 hours per start. Number of operating hours when half have failed and half are still operating.
4. EOL protection incorporated into all 57W and 70W DULUX T/E ballasts per NEMA guidelines.
5. TCLP testing in progress; expect results by June 2005.
6. Contact your SYLVANIA sales representative for product availability

Ordering Guide

CF	26	DT	/	E	/	IN	/	835
Compact Fluorescent	Wattage 18, 26, 32, 42, 57 or 70 watts	DULUX Triple		For electronic and dimming ballasts		Amalgam		82 CRI 27 = 2700K 30 = 3000K 35 = 3500K 41 = 4100K

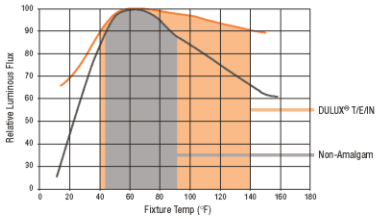
Dimensions



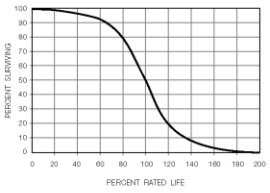
	(A) MOL [in. (mm)]	(B) Max. Base Face to Top of Lamp [in. (mm)]	(C) Max. Base Width [in. (mm)]	(D) Guide Post [in. (mm)]
CF18T/E/IN	4.77 (111)	3.74 (95)	1.90 (49)	0.62 (16)
CF26T/E/IN	4.96 (126)	4.33 (110)	1.90 (49)	0.62 (16)
CF32T/E/IN	5.60 (142)	4.96 (126)	1.90 (49)	0.62 (16)
CF42T/E/IN	6.42 (163)	5.79 (147)	1.90 (49)	0.62 (16)
CF57T/E/IN	7.76 (197)	7.13 (181)	1.90 (49)	0.62 (16)
CF70T/E/IN	9.25 (235)	8.62 (219)	1.90 (49)	0.62 (16)

Technical Information

90% Lumen Performance Range
DULUX® T/E/IN vs. Non-Amalgam Lamps



Typical Fluorescent Lamp Mortality



OSRAM SYLVANIA
National Customer
Service and Sales Center
18725 N. Union Street
Westfield, IN 46074

Industrial Commercial
Phone: 1-800-255-5042
Fax: 1-800-255-5043

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Fax: 1-800-562-4674

OEM/Specialty Markets
Phone: 1-800-762-7191
Fax: 1-800-762-7192

Photo-Optic
Phone: 1-888-677-2627
Fax: 1-800-762-7192

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Headquarters
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Mississauga, ON L5S 1S4

Industrial Commercial
Phone: 1-800-263-2852
Fax: 1-800-667-6772

Special Markets
Phone: 1-800-265-2852
Fax: 1-800-667-6772

Visit our website: www.sylvania.com

Lamp EL3

16/2/2007

28W/830 Min Bipin T5 HE ALTO UNP

Product family description
Ultra-slim design with extraordinary light output.

Features/Benefits

- Improved optical control.
- Fixtures can be 40% smaller than T8 systems.
- Design flexibility for cove and cabinet lighting.
- Better fin in 2 x 2 and 2 x 4 grid ceilings.
- Up to 104 lumens per watt.
- 95% lumen maintenance.
- 85 CRI in 3000, 3500 and 4100K.
- High system efficacy.
- Fail-safe operation at end of life.
- 20,000 hours rated average life.

Applications

- Ideal for general, decorative and architectural lighting in offices, retail stores, hotels, schools and hospitals.

Notes

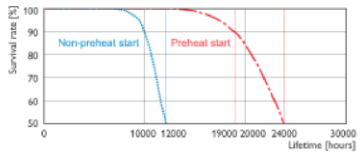
- NOT compatible with dimming ballasts.
- Silhouette™ T5 nominal lamp lengths are shorter than standard sizes. See dimension chart for details.

Product data	
Product Number	230847
Full product name	28W/830 Min Bipin T5 HE ALTO UNP
Ordering Code	F28T5/830
Pack type	Unpacked
Pieces per Sku	1
Skus / Case	40
Pack UPC	046677230845
EAN2US	
Case Bar Code	50046677230840
Successor Product number	
Watts[W]	28W
Color Code	830 [CCT of 3000K]
Base	Min Bipin [Miniature Bipin]
Bulb	T5 [16mm]
Special packing	ALTO
Packing Type	UNP [Unpacked]
Packing Configuration	40
System Description	High Efficiency
Base Information	Green[Green Base]
Rated Avg. Life[hr]	24000

PHILIPS

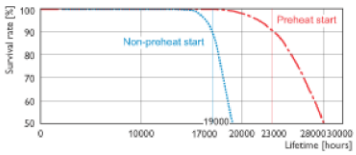
1

Product data	
Dimmable	Yes
Mercury (Hg) Content[mg]	
Color Rendering Index[Ra8]	85
Color Temperature[K]	3000
Initial Lumens[Lm]	–
Overall Length C[mm]	1163.2
Diameter D[mm]	17



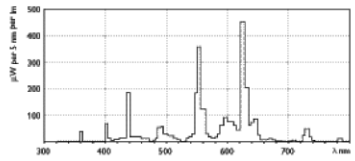
Life Expectancy 3h cycle

TL5

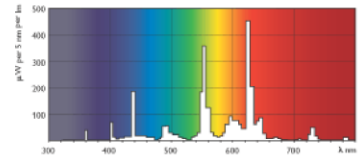


Life Expectancy 12h cycle

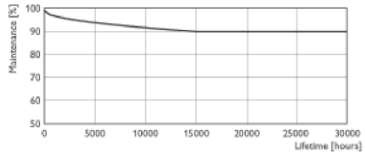
TL5



TL5/830

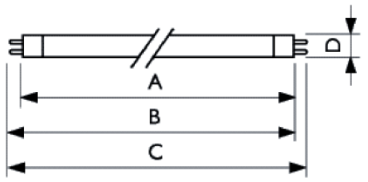


TL5/830



TL5

PHILIPS



TL5

	A		B	C	D
Full product name	Max	Min	Max	Max	Max
28W/830 Min Bipin T5 HE ALTO UNP	1149.0	1153.7	1156.1	1163.2	17

APPENDIX B: GRAND FOYER LIGHTING EQUIPMENT

Fixture GF1

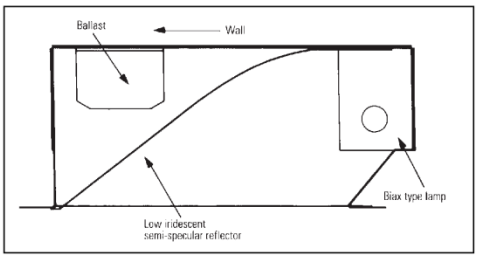
Walmaster **WMRL143120SO**

High Performance, 4', Recessed Wallwasher/Accent Light
One T8 Lamp

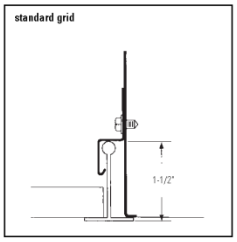
Features

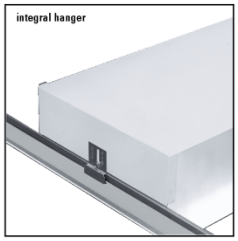
- Low iridescent semi- specular reflective system for precise controlled light output.
- Evenly lights vertical surfaces or displays (no scallops).
- Less than 3:1 maximum to minimum wall illumination when installed 6 feet on center.
- 20,000 hours lamp life
- Energy saving T8 lamp..
- No edges protrude below ceiling line.
- Can be installed only 2 feet from wall to farthest edge of fixture (3 feet maximum).
- Fits all standard and narrow grid ceiling systems.
- One-piece body and integral hanger for easy, quick installation.
- Sides of fixture can support tile or sit on T-bar.
- UL-Listed access plate.
- Meets NYC Code requirements.

Features

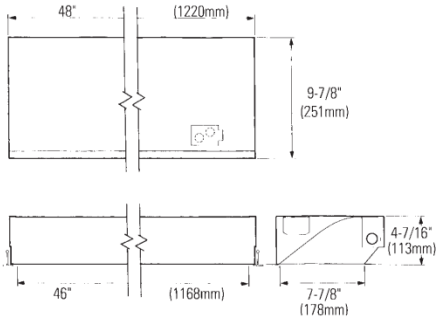


Mounting Methods





Dimensions



Job Information **Type:**

Job Name:

Cat. No.:

Lamp(s):

Volts/Ballast:

Lightolier a Genlyte 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

Section 5/Folio K10-17 Rev. A

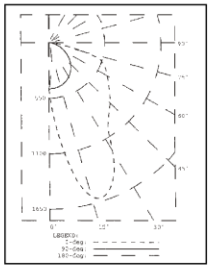
9/05

LIGHTOLIER®

Walmaster **WMRL143120S0**

High Performance, 4', Recessed Wallwasher/Accent Light
One T8 Lamp

Photometry



Model No. WMRL143120S0 LER = FP - 53.6 IW - 31.5 BF - 0.85
Comparative yearly lighting energy cost per 1000 lumens = $4.46

coefficients of utilization — zonal cavity method

	RF	20			20			20		
	RC	80			50			30		
	RW	70	50	30	50	30	10	50	30	10
room cavity ratio	1	76	73	69	68	66	64	65	63	62
	2	69	63	58	59	55	52	57	54	51
	3	63	55	49	52	47	44	50	46	43
	4	57	49	43	46	41	37	45	40	37
	5	53	44	37	41	36	32	40	35	32
	6	49	39	33	37	32	28	36	31	28
	7	45	36	29	34	29	25	33	28	25
	8	42	33	27	31	26	22	30	25	22
	9	39	30	24	29	24	20	28	23	20
	10	37	28	22	26	22	18	26	21	18

FOOTCANDLES ON WALL Fixtures 3 feet from wall to outside trim on lamp side of fixture

	INDIVIDUAL WALMASTER							MULTIPLE UNITS (6')						
Ceiling	0'	1'	2'	3'	4'	5'	6'	7'							
8'	49	38	21	12	8	5	4	3	58	46	32	28	32	46	58
7'	49	22	29	18	12	8	6	4	59	54	44	40	44	54	59
6'	36	33	25	18	12	8	6	5	48	45	41	39	41	45	48
5'	27	25	21	16	12	9	7	5	39	38	37	36	37	39	39
4'	21	20	17	14	11	8	7	5	33	32	32	31	32	32	33
3'	16	16	14	12	9	8	6	5	28	28	28	28	28	28	28
2'	13	13	12	10	9	7	6	5	25	24	24	24	24	24	25
1'	11	10	10	9	8	6	6	5	21	21	21	21	21	21	21
Floor															

	MULTIPLE UNITS (8')									CONTINUOUS ROW									
Ceiling										0'	1'	2'	3'	4'	5'	6'	7'	8'	
8'	53	41	26	18	16	18	26	41	53	50	59	68	59	51	59	68	59	50	
7'	52	46	34	26	23	26	34	46	52	67	71	76	72	69	72	76	71	67	
6'	41	38	32	26	24	26	32	38	41	60	63	65	64	63	64	65	63	52	
5'	32	30	27	25	24	25	27	30	32	52	54	55	55	55	55	55	53	52	
4'	25	25	24	22	21	22	24	25	25	46	46	47	47	48	47	46	46	46	
3'	21	21	20	20	19	20	20	21	21	38	39	40	40	41	40	40	39	38	
2'	18	18	18	17	17	17	18	18	18	33	34	35	35	35	35	35	34	33	
1'	15	15	15	15	15	15	15	15	15	28	29	30	30	30	30	30	29	28	
Floor																			

Ordering Information

Explanation of Catalog Number. Example: WMRL143120S0GLR

WM	R	L	1	4	3			
Walmaster: Low iridescent semi-specular wallwash	Recessed	**Reflector:** L = Low iridescent semi-specular aluminum	Lamp	**Length:** 4=48"	**Watts:** 3=32 Watts	**Voltage:** 120 or 277 **UNV**=120-277	**Ballast Type:**	**Options:** Add appropriate suffix to catalog no, ie: (GLR)

Ballast Type:

	<20THD	<10THD
1 Lamp Electronic (T8)	**SO***	**HI***
LOL T8 Dimming	**PS***	–

*Instant Start Standard

NOTE:
For **T8 UNV**, you must use **HI** Ballast Code.

Options/Accessories

Fusing: Internal fast-blow fusing. Suffix: **GLR**.
Internal slow-blow fusing. Suffix: **GMF**.
Radio Interference Filter: To order one RIF per fixture, Suffix: **R**.
To order one RIF per ballast, Suffix: **B**.
Electrical/Wiring Options: Consult factory.
Fluorescent Emergency Lighting System: Factory-installed emergency power battery pack with charger and inverter. Suffix: **EM**.
Drywall Frame: Catalog Number: **WL4DF/UNV**.

Specifications

Materials: Chassis parts are die-formed 20 gauge cold rolled steel with integral adjustable hanger clamp. **Reflectors**–low iridescent semi-specular aluminum are standard.
Finish: Chassis exterior–phosphate undercoating, baked white acrylic enamel. **Reflector**–low iridescent semi-specular IS standard.
Electrical: Rapid start HPF, thermally protected class "P" ballast (Biax type). If K.O. is within 3" of ballast, use wire suitable for at least 90°.
Labels: I.B.E.W./UL and ULc Listed.

optional drywall frame **WL4DF/UNV.**

Job Information **Type:**

Lightolier a Genlyte 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

Section5/Folio K10-17 Rev. A

LIGHTOLIER®

Fixture GF1A

Walmaster **WMRL143120SO**

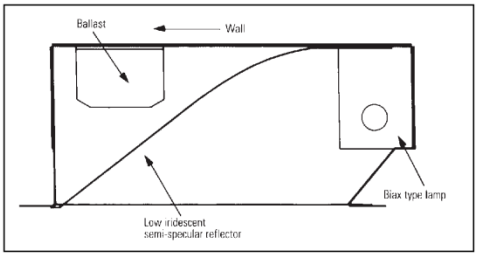
Page 1 of 2

High Performance, 4', Recessed Wallwasher/Accent Light
One T8 Lamp

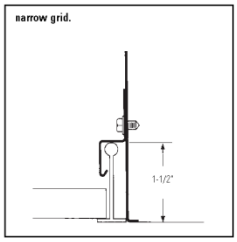
Features

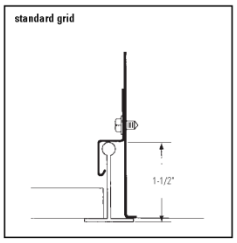
- Low iridescent semi- specular reflective system for precise controlled light output.
- Evenly lights vertical surfaces or displays (no scallops).
- Less than 3:1 maximum to minimum wall illumination when installed 6 feet on center.
- 20,000 hours lamp life
- Energy saving T8 lamp..
- No edges protrude below ceiling line.
- Can be installed only 2 feet from wall to farthest edge of fixture (3 feet maximum).
- Fits all standard and narrow grid ceiling systems.
- One-piece body and integral hanger for easy, quick installation.
- Sides of fixture can support tile or sit on T-bar.
- UL-Listed access plate.
- Meets NYC Code requirements.

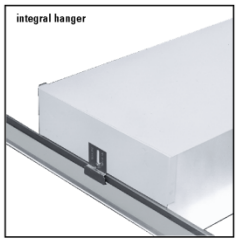
Features



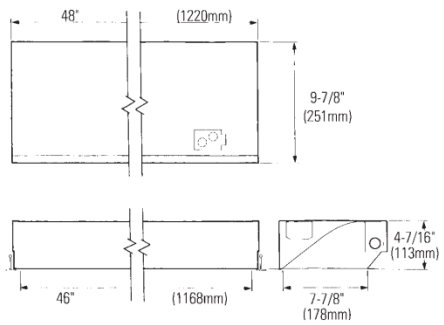
Mounting Methods







Dimensions



Job Information	**Type:**
Job Name:	
Cat. No.:	
Lamp(s):	
Volts/Ballast:	

Lightolier a Genlyte 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

Section 5/Folio K10-17 Rev. A

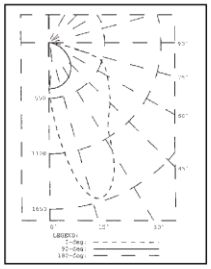
9/05

LIGHTOLIER®

Walmaster **WMRL143120S0**

High Performance, 4', Recessed Wallwasher/Accent Light
One T8 Lamp

Photometry



Model No. WMRL143120S0 LER = FP - 53.6 IW - 31.5 BF - 0.85
Comparative yearly lighting energy cost per 1000 lumens = $4.46

coefficients of utilization — zonal cavity method

RF		20			20			20		
RC		80			50			30		
RW		70	50	30	50	30	10	50	30	10
room cavity ratio	1	76	73	69	68	66	64	65	63	62
	2	69	63	58	59	55	52	57	54	51
	3	63	55	49	52	47	44	50	46	43
	4	57	49	43	46	41	37	45	40	37
	5	53	44	37	41	36	32	40	35	32
	6	49	39	33	37	32	28	36	31	28
	7	45	36	29	34	29	25	33	28	25
	8	42	33	27	31	26	22	30	25	22
	9	39	30	24	29	24	20	28	23	20
	10	37	28	22	26	22	18	26	21	18

FOOTCANDLES ON WALL Fixtures 3 feet from wall to outside trim on lamp side of fixture

	INDIVIDUAL WALMASTER							MULTIPLE UNITS (6')						
Ceiling	0'	1'	2'	3'	4'	5'	6'	7'							
8'	49	38	21	12	8	5	4	3	58	46	32	28	32	46	58
7'	49	22	29	18	12	8	6	4	59	54	44	40	44	54	59
6'	36	33	25	18	12	8	6	5	48	45	41	39	41	45	48
5'	27	25	21	16	12	9	7	5	39	38	37	36	37	39	39
4'	21	20	17	14	11	8	7	5	33	32	32	31	32	32	33
3'	16	16	14	12	9	8	6	5	28	28	28	28	28	28	28
2'	13	13	12	10	9	7	6	5	25	24	24	24	24	24	25
1'	11	10	10	9	8	6	6	5	21	21	21	21	21	21	21
Floor															

	MULTIPLE UNITS (8')									CONTINUOUS ROW									
Ceiling										0'	1'	2'	3'	4'	5'	6'	7'	8'	
8'	53	41	26	18	16	18	26	41	53	50	59	68	59	51	59	68	59	50	
7'	52	46	34	26	23	26	34	46	52	67	71	76	72	69	72	76	71	67	
6'	41	38	32	26	24	26	32	38	41	60	63	65	64	63	64	65	63	52	
5'	32	30	27	25	24	25	27	30	32	52	54	55	55	55	55	55	53	52	
4'	25	25	24	22	21	22	24	25	25	46	46	47	47	48	47	46	46	46	
3'	21	21	20	20	19	20	20	21	21	38	39	40	40	41	40	40	39	38	
2'	18	18	18	17	17	17	18	18	18	33	34	35	35	35	35	35	34	33	
1'	15	15	15	15	15	15	15	15	15	28	29	30	30	30	30	30	29	28	
Floor																			

Ordering Information

Explanation of Catalog Number. Example: WMRL143120S0GLR

WM	R	L	1	4	3			
Walmaster: Low iridescent semi-specular wallwash	**Recessed**	**Reflector:** L = Low iridescent semi-specular aluminum	**Lamp**	**Length:** 4=48"	**Watts:** 3=32 Watts	**Voltage:** 120 or 277 **UNV**=120-277	**Ballast Type:**	**Options:** Add appropriate suffix to catalog no, ie: (GLR)

Ballast Type:

	<20THD	<10THD
1 Lamp Electronic (T8)	**SO***	**HI***
LOL T8 Dimming	**PS***	–

*Instant Start Standard

NOTE:
For **T8 UNV**, you must use **HI** Ballast Code.

Options/Accessories

Fusing: Internal fast-blow fusing. Suffix: **GLR**.
Internal slow-blow fusing. Suffix: **GMF**.
Radio Interference Filter: To order one RIF per fixture, Suffix: **R**.
To order one RIF per ballast, Suffix: **B**.
Electrical/Wiring Options: Consult factory.
Fluorescent Emergency Lighting System: Factory-installed emergency power battery pack with charger and inverter. Suffix: **EM**.
Drywall Frame: Catalog Number: **WL4DF/UNV**.

Specifications

Materials: Chassis parts are die-formed 20 gauge cold rolled steel with integral adjustable hanger clamp. **Reflectors**–low iridescent semi-specular aluminum are standard.
Finish: Chassis exterior–phosphate undercoating, baked white acrylic enamel. **Reflector**–low iridescent semi-specular IS standard.
Electrical: Rapid start HPF, thermally protected class "P" ballast (Biax type). If K.O. is within 3" of ballast, use wire suitable for at least 90°.
Labels: I.B.E.W./UL and ULc Listed.

optional drywall frame WL4DF/UNV.

Job Information **Type:**

Lightolier a Genlyte Company www.lightolier.com
Technical Information: (978) 657-7600 • Fax (978) 658-0595
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Section5/Folio K10-17 Rev. A

LIGHTOLIER®

Fixture GF1B

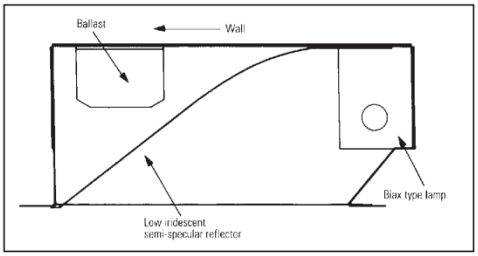
Walmaster **WMRL143120SO**

High Performance, 4', Recessed Wallwasher/Accent Light
One T8 Lamp

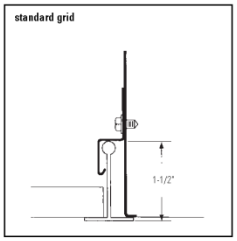
Features

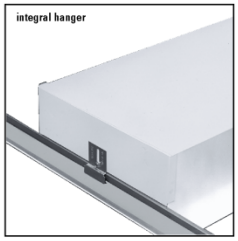
- Low iridescent semi- specular reflective system for precise controlled light output.
- Evenly lights vertical surfaces or displays (no scallops).
- Less than 3:1 maximum to minimum wall illumination when installed 6 feet on center.
- 20,000 hours lamp life
- Energy saving T8 lamp..
- No edges protrude below ceiling line.
- Can be installed only 2 feet from wall to farthest edge of fixture (3 feet maximum).
- Fits all standard and narrow grid ceiling systems.
- One-piece body and integral hanger for easy, quick installation.
- Sides of fixture can support tile or sit on T-bar.
- UL-Listed access plate.
- Meets NYC Code requirements.

Features

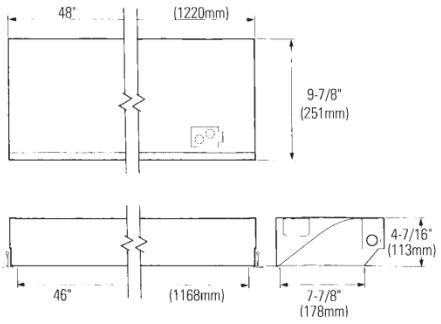


Mounting Methods





Dimensions



Job Information	**Type:**
Job Name:	
Cat. No.:	
Lamp(s):	
Volts/Ballast:	

Lightolier a Genlyte 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

Section 5/Folio K10-17 Rev. A

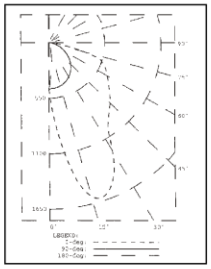
9/05

LIGHTOLIER®

Walmaster **WMRL143120S0**

High Performance, 4', Recessed Wallwasher/Accent Light
One T8 Lamp

Photometry



Model No. WMRL143120S0 LER = FP - 53.6 IW - 31.5 BF - 0.85
Comparative yearly lighting energy cost per 1000 lumens = $4.46

coefficients of utilization — zonal cavity method

RF		20			20			20		
RC		80			50			30		
RW		70	50	30	50	30	10	50	30	10
room cavity ratio	1	76	73	69	68	66	64	65	63	62
	2	69	63	58	59	55	52	57	54	51
	3	63	55	49	52	47	44	50	46	43
	4	57	49	43	46	41	37	45	40	37
	5	53	44	37	41	36	32	40	35	32
	6	49	39	33	37	32	28	36	31	28
	7	45	36	29	34	29	25	33	28	25
	8	42	33	27	31	26	22	30	25	22
	9	39	30	24	29	24	20	28	23	20
	10	37	28	22	26	22	18	26	21	18

FOOTCANDLES ON WALL Fixtures 3 feet from wall to outside trim on lamp side of fixture

	INDIVIDUAL WALMASTER							MULTIPLE UNITS (6')						
Ceiling	0'	1'	2'	3'	4'	5'	6'	7'							
8'	49	38	21	12	8	5	4	3	58	46	32	28	32	46	58
7'	49	22	29	18	12	8	6	4	59	54	44	40	44	54	59
6'	36	33	25	18	12	8	6	5	48	45	41	39	41	45	48
5'	27	25	21	16	12	9	7	5	39	38	37	36	37	39	39
4'	21	20	17	14	11	8	7	5	33	32	32	31	32	32	33
3'	16	16	14	12	9	8	6	5	28	28	28	28	28	28	28
2'	13	13	12	10	9	7	6	5	25	24	24	24	24	24	25
1'	11	10	10	9	8	6	6	5	21	21	21	21	21	21	21
Floor															

	MULTIPLE UNITS (8')									CONTINUOUS ROW									
Ceiling										0'	1'	2'	3'	4'	5'	6'	7'	8'	
8'	53	41	26	18	16	18	26	41	53	50	59	68	59	51	59	68	59	50	
7'	52	46	34	26	23	26	34	46	52	67	71	76	72	69	72	76	71	67	
6'	41	38	32	26	24	26	32	38	41	60	63	65	64	63	64	65	63	52	
5'	32	30	27	25	24	25	27	30	32	52	54	55	55	55	55	55	53	52	
4'	25	25	24	22	21	22	24	25	25	46	46	47	47	48	47	46	46	46	
3'	21	21	20	20	19	20	20	21	21	38	39	40	40	41	40	40	39	38	
2'	18	18	18	17	17	17	18	18	18	33	34	35	35	35	35	35	34	33	
1'	15	15	15	15	15	15	15	15	15	28	29	30	30	30	30	30	29	28	
Floor																			

Ordering Information

Explanation of Catalog Number. Example: WMRL143120S0GLR

WM	R	L	1	4	3			
Walmaster: Low iridescent semi-specular wallwash	**Recessed**	**Reflector:** L = Low iridescent semi-specular aluminum	**Lamp**	**Length:** 4=48"	**Watts:** 3=32 Watts	**Voltage:** 120 or 277 **UNV**=120-277	**Ballast Type:**	**Options:** Add appropriate suffix to catalog no, ie: (GLR)

Ballast Type:

	<20THD	<10THD
1 Lamp Electronic (T8)	**S0***	**HI***
LOL T8 Dimming	**PS***	–

*Instant Start Standard

NOTE:
For **T8 UNV**, you must use **HI** Ballast Code.

Options/Accessories

Fusing: Internal fast-blow fusing. Suffix: **GLR**.
Internal slow-blow fusing. Suffix: **GMF**.
Radio Interference Filter: To order one RIF per fixture, Suffix: **R**.
To order one RIF per ballast, Suffix: **B**.
Electrical/Wiring Options: Consult factory.
Fluorescent Emergency Lighting System: Factory-installed emergency power battery pack with charger and inverter. Suffix: **EM**.
Drywall Frame: Catalog Number: **WL4DF/UNV**.

Specifications

Materials: Chassis parts are die-formed 20 gauge cold rolled steel with integral adjustable hanger clamp. **Reflectors**–low iridescent semi-specular aluminum are standard.
Finish: Chassis exterior–phosphate undercoating, baked white acrylic enamel. **Reflector**–low iridescent semi-specular IS standard.
Electrical: Rapid start HPF, thermally protected class "P" ballast (Biax type). If K.O. is within 3" of ballast, use wire suitable for at least 90°.
Labels: I.B.E.W./UL and ULc Listed.

optional drywall frame WL4DF/UNV.

Job Information **Type:**

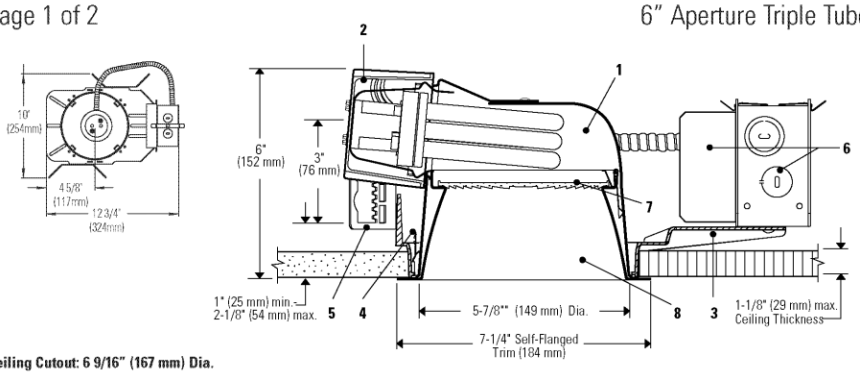
Lightolier a Genlyte Company www.lightolier.com
Technical Information: (978) 657-7600 • Fax (978) 658-0595
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710
We reserve the right to change details of design, materials and finish.
 Section5/Folio K10-17 Rev. A

LIGHTOLIER®

Fixture GF2

Calculite® Compact Fluorescent Lensed Downlight **8091**

6" Aperture Triple Tube Horizontal Lamp



Ceiling Cutout: 6 9/16" (167 mm) Dia.

Reflector Trim			
	Fresnel Lens	**Clear Lens**	**Prismatic Lens**
Clear Cone, White Flange	**8091FCLW**	**8091CCLW**	**8091PCLW**
Clear Cone, Polished Flange	**8091FCLP**	**8091CCLP**	**8091PCLP**
White Cone, White Flange	**8091FWHW**	**8091CWHW**	**8091PWHW**

	Opal Diffuser
Clear Cone, White Flange	**8091DCLW**
Clear Cone, Polish Flange	**8091DCLP**
White Cone, White Flange	**8091DWHW**

Frame-In Kit			Lamp
S6132BU	Electronic	120V - 277V	**26 or 32W Triple Tube**
S6132BCU3	Universal Dimming	120V - 277V	4-Pin (Amalgam)
S6132BJUM7	Advance Mark7	120V - 277V	

Remodeler Frame-In Kit			Lamp
6132BURM	Electronic	120V - 277V	**26 or 32W Triple Tube** 4-Pin (Amalgam)

Features

1. **Reflector:** 16 ga. Die-formed aluminum, Anobrite® finish.
2. **Socket Cup:** Effectively dissipates heat and positions lamp holder. Snaps onto reflector neck to assure consistently correct optical alignment without tools.
3. **Mounting Frame:** Galvanized steel for dry or plaster ceilings. Accepts other 6" Triple Tube reflectors (see S6132BU Spec Sheet).
4. **Retaining Springs:** Precision-tooled steel friction springs secure reflector to mounting frame for quick, tool-less installation.
5. **Mounting Brackets:** 16 ga. steel. Adjust from inside of fixture. Use 3/4" or 1 1/2" lathing channel, 1/2" EMT, or optional mounting bars.
6. **Ballast/J-Box:** Electronic 120V-277V. UL listed for through branch circuit wiring with max of (8) No. 12AWG, 90°c supply conductors. Outboard-mounted to reduce heat transfer and maintain lamp efficacy and life. Service from below without tools.
7. **Shielding Media:** Molded acrylic. Available in fresnel lens, clear lens, or opal diffuser. Secured to aperture cone.
8. **Cone:** 16 ga. Alzak® aluminum. Clear Iridescence Free finish or Comfort Clear™ low iridescence finish. Retained by friction springs; no loose parts.

Electrical

Note: For ballast electrical data and latest lamp/ballast compatibility refer to **"Ballast"** specification sheet for complete electrical data.

S6132BU, S6132BCU: UL listed for through branch circuit wiring with max of (8) No. 12 AWG, 90° C supply conductors.

6132BURM: UL listed for No. 12 AWG, 90° C supply conductors.

Options and Accessories

Comfort Clear™ Finishes[1]		**Other Finishes**	
Clear	**CCL**	White	**WH**
Diffuse	**CCD**		
Champagne Bronze	**CCZ**		
Pewter	**CPW**		

[1]Specify desired flange. **W** White, **P** Polished

Other Dimming:

S6132BJ1MX Advance MarkX, 120V
S6132BJ2MX Advance MarkX, 227V
S6132BJ1LD3 Lutron Hi-lume®, 120V
S6132BJ2LD3 Lutron Hi-lume®, 227V

Options and Accessories (continued)

Emergency	Add suffix **EM***
Chicago Plenum	Use 6132BULC
Existing/Thk. Ceiling	**FA EC6***
Emergency Ltg. Kit	**FA EM3E***
	FA EM4E*
Fuse (Slow Blow)	Add suffix **F**

*See Spec. Sheets: FAEC, FAEM

Mounting Bars & Accessories; see Specification Sheet MBA. Sloped Ceiling Adapters; see Specification Sheet SCA.

IC Frame available; see **C6CFL32** specification sheet.

Labels

All units are UL listed for wet locations; Opal Diffuser is UL listed for damp locations.

Alzak® is a registered trademark of ALCOA.
US Patent Pending.

Job Information	**Type:**
Job Name:	
Cat. No.:	
Lamp(s):	
Notes:	

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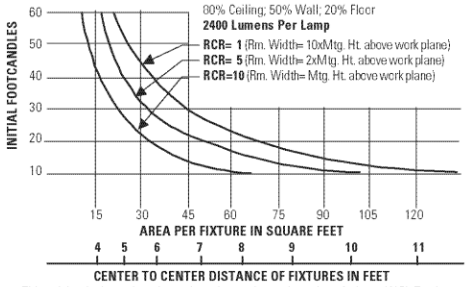
LIGHTOLIER®

Calculite® Compact Fluorescent Lensed Downlight **8091**

6" Aperture Triple Tube Horizontal Lamp

32W Clear Cone (CL)

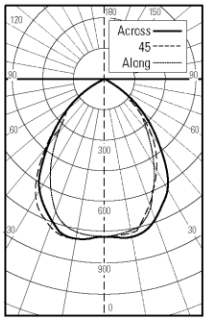
Quick Calculator



This quick calculator chart determines the number and spacing of 1 lt.- 32W PL-T units with fresnel lens and clear reflector, for any level of illumination. Conversion factors: Opal diffuser, fc x 0.8; Clear lens, fc x 1.0. 1 lt.- 26W PLT : Fresnel Lens, fc x 0.8; Opal Diffuser, fc x 0.65; Clear lens fc x 0.8.

Spacing Ratio = 1.2

CERTIFIED TEST REPORT NO. 0075FR
COMPUTED BY LSI PROGRAM **TEST-LITE**
CALCULITE 6" DIAMETER RECESSED FLUORESCENT LENSED DOWNLIGHT
SEMI-SPECULAR REFLECTOR WITH CLEAR CONE AND FRESNEL LENS
LUMEN RATING = 2400 LMS.
1-32W PL-T LAMP,



**** EFFICIENCY = 51.2% ****

CANDLEPOWER

ANGLE	ALONG	22.5	45	67.5	ACROSS	LUMENS
0	780	780	780	780	780	
5	773	778	779	782	785	37
10	758	768	774	781	790	
15	736	732	738	753	776	104
20	680	647	664	699	739	
25	589	552	591	633	688	140
30	499	489	530	572	630	
35	413	425	446	481	536	143
40	334	358	364	386	425	
45	268	286	288	304	323	115
50	210	232	232	239	244	
55	87	105	109	116	119	55
60	32	38	42	45	47	
65	6	8	9	9	11	7
70	1	1	1	2	2	
75	1	1	1	1	1	0
80	1	1	1	1	1	
85	0	1	1	0	1	0
90	0	1	1	0	1	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	585	24.40	47.62
0-40	886	36.92	72.06
0-60	1216	50.67	98.90
0-90	1229	51.24	100.00
40-90	343	14.32	27.94
60-90	13	.57	1.10
90-180	0	.00	.00
0-180	1229	51.24	100.00

Coefficients Of Utilization

% EFFECTIVE CEILING CAVITY REFLECTANCE

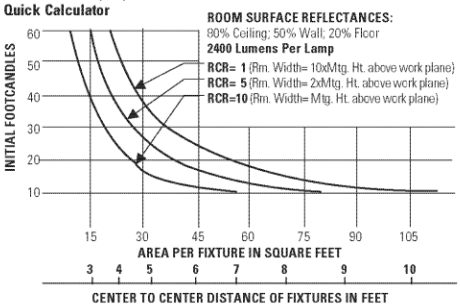
	80			70			50			30			10			0
	% WALL REFLECTANCE															
ROOM CAVITY RATIO	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
1	.56	.55	.54	.56	.54	.53	.53	.52	.51	.51	.51	.50	.50	.49	.48	.48
2	.52	.50	.48	.51	.49	.48	.50	.48	.47	.48	.47	.46	.47	.46	.45	.44
3	.48	.46	.44	.48	.45	.43	.46	.44	.43	.45	.43	.42	.44	.43	.41	.40
4	.45	.42	.40	.44	.42	.39	.43	.41	.39	.42	.40	.38	.41	.39	.38	.37
5	.42	.38	.36	.41	.38	.36	.40	.37	.35	.39	.37	.35	.38	.36	.35	.34
6	.38	.35	.33	.38	.35	.32	.37	.34	.32	.36	.34	.32	.36	.33	.32	.31
7	.35	.32	.30	.35	.32	.29	.34	.31	.29	.33	.31	.29	.33	.31	.29	.28
8	.32	.29	.27	.32	.29	.27	.32	.29	.27	.31	.28	.26	.30	.28	.26	.25
9	.30	.27	.24	.30	.26	.24	.29	.26	.24	.29	.26	.24	.28	.26	.24	.23
10	.28	.24	.22	.27	.24	.22	.27	.24	.22	.26	.24	.22	.26	.23	.22	.21

20% FLOOR CAVITY REFLECTANCE

Conversion Factors: 1 Lt-32W PLT: Opal Diffuser, CU x 0.8; Clear Lens, CU x 1.0.
1 Lt-26W PLT: Fresnel Lens, CU x 1.1; Opal Diffuser, CU x 0.9; Clear Lens, CU x 1.1.

32W White Cone (WH)

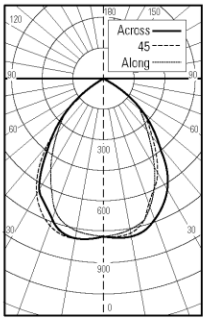
Quick Calculator



This quick calculator chart determines the number and spacing of 1 lt.- 32W PL-T units with fresnel lens and white cone, for any level of illumination. Conversion factors: Opal diffuser, fc x 0.8; Clear lens, fc x 1.0. 1 lt.- 26W PLT : Fresnel Lens, fc x 0.8; Opal Diffuser, fc x 0.65; Clear lens fc x 0.8.

Spacing Ratio = 1.1

CERTIFIED TEST REPORT NO. 0072FR
COMPUTED BY LSI PROGRAM **TEST-LITE**
CALCULITE 6" DIAMETER RECESSED FLUORESCENT LENSED DOWNLIGHT
SEMI-SPECULAR REFLECTOR WITH WHITE CONE AND FRESNEL LENS
LUMEN RATING = 2400 LMS.
1-32W PL-T LAMP,



**** EFFICIENCY = 43.9% ****

CANDLEPOWER

ANGLE	ALONG	22.5	45	67.5	ACROSS	LUMENS
0	656	656	656	656	656	
5	649	654	657	660	662	31
10	626	639	650	660	669	
15	588	605	622	639	654	87
20	525	546	567	592	617	
25	452	479	501	526	563	116
30	378	419	432	450	490	
35	312	363	361	370	405	114
40	256	303	290	297	322	
45	200	233	225	231	244	89
50	144	156	165	171	180	
55	99	115	115	117	120	53
60	66	74	76	77	79	
65	46	48	49	50	52	26
70	35	36	37	38	39	
75	26	27	27	27	29	14
80	16	17	17	19	19	
85	7	9	9	9	9	5
90	1	1	1	1	1	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	468	19.51	44.30
0-40	697	29.07	66.29
0-60	956	40.28	91.86
0-90	1052	43.86	100.00
40-90	354	14.76	33.71
60-90	85	3.57	8.14
90-180	0	.00	.00
0-180	1052	43.86	100.00

Coefficients Of Utilization

% EFFECTIVE CEILING CAVITY REFLECTANCE

	80			70			50			30			10			0
	% WALL REFLECTANCE															
ROOM CAVITY RATIO	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
1	.48	.46	.45	.47	.46	.44	.45	.44	.43	.43	.43	.42	.42	.41	.41	.40
2	.44	.42	.40	.42	.41	.39	.41	.40	.38	.40	.39	.38	.39	.38	.37	.36
3	.40	.37	.35	.39	.37	.35	.38	.38	.34	.37	.35	.34	.36	.33	.33	.33
4	.37	.34	.32	.36	.34	.32	.35	.33	.31	.34	.32	.31	.34	.32	.30	.30
5	.34	.31	.29	.33	.31	.28	.33	.30	.28	.32	.30	.28	.31	.29	.28	.27
6	.31	.28	.26	.31	.28	.26	.30	.28	.26	.29	.27	.25	.25	.27	.25	.25
7	.29	.26	.23	.28	.25	.23	.25	.25	.23	.27	.25	.23	.27	.25	.23	.22
8	.26	.23	.21	.26	.23	.21	.26	.23	.21	.25	.23	.21	.25	.23	.21	.20
9	.24	.21	.19	.24	.21	.19	.24	.21	.19	.23	.21	.19	.23	.21	.29	.18
10	.23	.20	.18	.22	.20	.18	.22	.19	.18	.22	.19	.17	.21	.19	.19	.17

20% FLOOR CAVITY REFLECTANCE

Conversion Factors: 1 Lt-32W PLT: Opal Diffuser, CU x 0.8; Clear Lens, CU x 1.0.
1 Lt-26W PLT: Fresnel Lens, CU x 1.1; Opal Diffuser, CU x 0.9; Clear Lens, CU x 1.1.

Job Information **Type:**

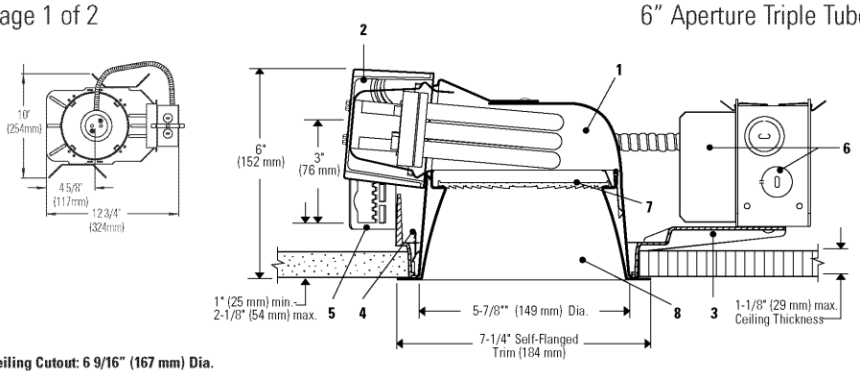
Lightolier a Genlyte company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

Fixture GF3

Calculite® Compact Fluorescent Lensed Downlight **8091**

6" Aperture Triple Tube Horizontal Lamp



Ceiling Cutout: 6 9/16" (167 mm) Dia.

Reflector Trim			
	Fresnel Lens	**Clear Lens**	**Prismatic Lens**
Clear Cone, White Flange	**8091FCLW**	**8091CCLW**	**8091PCLW**
Clear Cone, Polished Flange	**8091FCLP**	**8091CCLP**	**8091PCLP**
White Cone, White Flange	**8091FWHW**	**8091CWHW**	**8091PWHW**

	Opal Diffuser
Clear Cone, White Flange	**8091DCLW**
Clear Cone, Polish Flange	**8091DCLP**
White Cone, White Flange	**8091DWHW**

Frame-In Kit			Lamp
S6132BU	Electronic	120V - 277V	**26 or 32W Triple Tube**
S6132BCU3	Universal Dimming	120V - 277V	4-Pin (Amalgam)
S6132BJUM7	Advance Mark7	120V - 277V	

Remodeler Frame-In Kit			Lamp
6132BURM	Electronic	120V - 277V	**26 or 32W Triple Tube** 4-Pin (Amalgam)

Features

1. **Reflector:** 16 ga. Die-formed aluminum, Anobrite® finish.
2. **Socket Cup:** Effectively dissipates heat and positions lamp holder. Snaps onto reflector neck to assure consistently correct optical alignment without tools.
3. **Mounting Frame:** Galvanized steel for dry or plaster ceilings. Accepts other 6" Triple Tube reflectors (see S6132BU Spec Sheet).
4. **Retaining Springs:** Precision-tooled steel friction springs secure reflector to mounting frame for quick, tool-less installation.
5. **Mounting Brackets:** 16 ga. steel. Adjust from inside of fixture. Use 3/4" or 1 1/2" lathing channel, 1/2" EMT, or optional mounting bars.
6. **Ballast/J-Box:** Electronic 120V-277V. UL listed for through branch circuit wiring with max of (8) No. 12AWG, 90°c supply conductors. Outboard-mounted to reduce heat transfer and maintain lamp efficacy and life. Service from below without tools.
7. **Shielding Media:** Molded acrylic. Available in fresnel lens, clear lens, or opal diffuser. Secured to aperture cone.
8. **Cone:** 16 ga. Alzak® aluminum. Clear Iridescence Free finish or Comfort Clear™ low iridescence finish. Retained by friction springs; no loose parts.

Electrical

Note: For ballast electrical data and latest lamp/ballast compatibility refer to **"Ballast"** specification sheet for complete electrical data.

S6132BU, S6132BCU: UL listed for through branch circuit wiring with max of (8) No. 12 AWG, 90° C supply conductors.

6132BURM: UL listed for No. 12 AWG, 90° C supply conductors.

Options and Accessories

Comfort Clear™ Finishes[1]		**Other Finishes**	
Clear	**CCL**	White	**WH**
Diffuse	**CCD**		
Champagne Bronze	**CCZ**		
Pewter	**CPW**		

[1]Specify desired flange. **W** White, **P** Polished

Other Dimming:

S6132BJ1MX Advance MarkX, 120V
S6132BJ2MX Advance MarkX, 227V
S6132BJ1LD3 Lutron Hi-lume®, 120V
S6132BJ2LD3 Lutron Hi-lume®, 227V

Options and Accessories (continued)

Emergency	Add suffix **EM***
Chicago Plenum	Use 6132BULC
Existing/Thk. Ceiling	**FA EC6***
Emergency Ltg. Kit	**FA EM3E***
	FA EM4E*
Fuse (Slow Blow)	Add suffix **F**

*See Spec. Sheets: FAEC, FAEM

Mounting Bars & Accessories; see Specification Sheet MBA. Sloped Ceiling Adapters; see Specification Sheet SCA.

IC Frame available; see **C6CFL32** specification sheet.

Labels

All units are UL listed for wet locations; Opal Diffuser is UL listed for damp locations.

Alzak® is a registered trademark of ALCOA.
US Patent Pending.

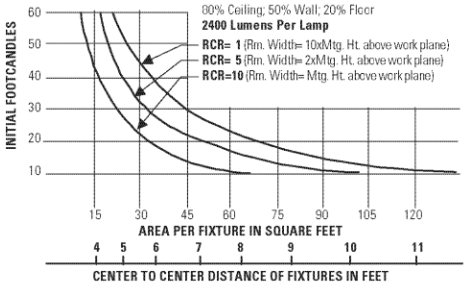
Job Information	**Type:**
Job Name:	
Cat. No.:	
Lamp(s):	
Notes:	

Lightolier a Genlyte company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

32W Clear Cone (CL)

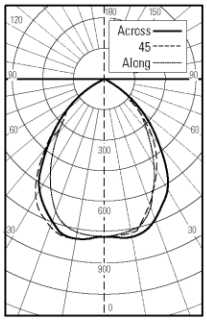
Quick Calculator



This quick calculator chart determines the number and spacing of 1 lt.- 32W PL-T units with fresnel lens and clear reflector, for any level of illumination. Conversion factors: Opal diffuser, fc x 0.8; Clear lens, fc x 1.0. 1 lt.- 26W PLT : Fresnel Lens, fc x 0.8; Opal Diffusor, fc x 0.65; Clear lens fc x 0.8.

Spacing Ratio = 1.2

CERTIFIED TEST REPORT NO. 0075FR
COMPUTED BY LSI PROGRAM **TEST-LITE**
CALCULITE 6" DIAMETER RECESSED FLUORESCENT LENSED DOWNLIGHT
SEMI-SPECULAR REFLECTOR WITH CLEAR CONE AND FRESNEL LENS
LUMEN RATING = 2400 LMS.
1-32W PL-T LAMP,



**** EFFICIENCY = 51.2% ****

CANDLEPOWER

ANGLE	ALONG	22.5	45	67.5	ACROSS	LUMENS
0	780	780	780	780	780	
5	773	778	779	782	785	37
10	758	768	774	781	790	
15	736	732	738	753	776	104
20	680	647	664	699	739	
25	589	552	591	633	688	140
30	499	489	530	572	630	
35	413	425	446	481	536	143
40	334	358	364	386	425	
45	268	286	286	304	323	115
50	210	232	232	239	244	
55	67	105	109	116	119	55
60	32	38	42	45	47	
65	6	8	9	9	11	7
70	1	1	1	2	2	
75	1	1	1	1	1	0
80	1	1	1	1	1	
85	0	1	1	0	1	0
90	0	1	1	0	1	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	585	24.40	47.62
0-40	886	36.92	72.06
0-60	1216	50.67	98.90
0-90	1229	51.24	100.00
40-90	343	14.32	27.94
60-90	13	.57	1.10
90-180	0	.00	.00
0-180	1229	51.24	100.00

Coefficients Of Utilization

	% EFFECTIVE CEILING CAVITY REFLECTANCE															
	80			70			50			30			10			0
	% WALL REFLECTANCE															
	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
1	.56	.55	.54	.56	.54	.53	.53	.52	.51	.51	.51	.50	.50	.49	.48	.48
2	.52	.50	.48	.51	.49	.48	.50	.48	.47	.48	.47	.46	.47	.46	.45	.44
3	.48	.46	.44	.48	.45	.43	.46	.44	.43	.45	.43	.42	.44	.43	.41	.40
4	.45	.42	.40	.44	.42	.39	.43	.41	.39	.42	.40	.38	.41	.39	.38	.37
5	.42	.38	.36	.41	.38	.36	.40	.37	.35	.39	.37	.35	.38	.36	.35	.34
6	.38	.35	.33	.38	.35	.32	.37	.34	.32	.36	.34	.32	.36	.33	.32	.31
7	.35	.32	.30	.35	.32	.29	.34	.31	.29	.33	.31	.29	.33	.31	.29	.28
8	.32	.29	.27	.32	.29	.27	.32	.29	.27	.31	.28	.26	.30	.28	.26	.25
9	.30	.27	.24	.30	.26	.24	.29	.26	.24	.29	.26	.24	.28	.26	.24	.23
10	.28	.24	.22	.27	.24	.22	.27	.24	.22	.26	.24	.22	.26	.23	.22	.21

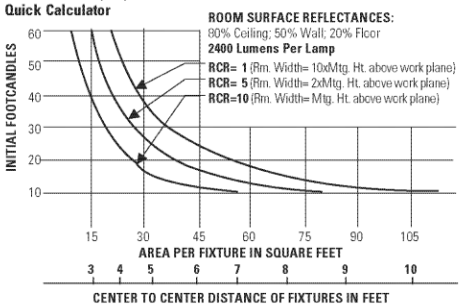
ROOM CAVITY RATIO

20% FLOOR CAVITY REFLECTANCE

Conversion Factors: 1 Lt-32W PLT: Opal Diffuser, CU x 0.8; Clear Lens, CU x 1.0.
1 Lt-26W PLT: Fresnel Lens, CU x 1.1; Opal Diffuser, CU x 0.9; Clear Lens, CU x 1.1.

32W White Cone (WH)

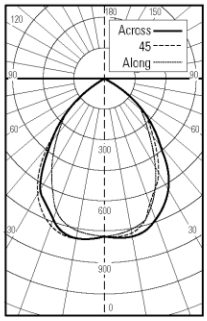
Quick Calculator



This quick calculator chart determines the number and spacing of 1 lt.- 32W PL-T units with fresnel lens and white cone, for any level of illumination. Conversion factors: Opal diffuser, fc x 0.8; Clear lens, fc x 1.0. 1 lt.- 26W PLT : Fresnel Lens, fc x 0.8; Opal Diffuser, fc x 0.65; Clear lens fc x 0.8.

Spacing Ratio = 1.1

CERTIFIED TEST REPORT NO. 0072FR
COMPUTED BY LSI PROGRAM **TEST-LITE**
CALCULITE 6" DIAMETER RECESSED FLUORESCENT LENSED DOWNLIGHT
SEMI-SPECULAR REFLECTOR WITH WHITE CONE AND FRESNEL LENS
LUMEN RATING = 2400 LMS.
1-32W PL-T LAMP,



**** EFFICIENCY = 43.9% ****

CANDLEPOWER

ANGLE	ALONG	22.5	45	67.5	ACROSS	LUMENS
0	656	656	656	656	656	
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15	588	605	622	639	654	87
20	525	546	567	592	617	
25	452	479	501	526	563	116
30	378	419	432	450	490	
35	312	363	361	370	405	114
40	256	303	290	297	322	
45	200	233	225	231	244	89
50	144	156	165	171	180	
55	99	115	115	117	120	53
60	66	74	76	77	79	
65	46	48	49	50	52	26
70	35	36	37	38	39	
75	26	27	27	27	29	14
80	16	17	17	19	19	
85	7	9	9	9	9	5
90	1	1	1	1	1	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	488	19.51	44.30
0-40	697	29.07	66.29
0-60	956	40.28	91.86
0-90	1052	43.86	100.00
40-90	354	14.76	33.71
60-90	85	3.57	8.14
90-180	0	.00	.00
0-180	1052	43.86	100.00

Coefficients Of Utilization

	% EFFECTIVE CEILING CAVITY REFLECTANCE															
	80			70			50			30			10			0
	% WALL REFLECTANCE															
	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
1	.48	.46	.45	.47	.46	.44	.45	.44	.43	.43	.43	.42	.42	.41	.41	.40
2	.44	.42	.40	.42	.41	.39	.41	.40	.38	.40	.39	.38	.39	.38	.37	.36
3	.40	.37	.35	.39	.37	.35	.38	.38	.34	.37	.35	.34	.36	.33	.33	.33
4	.37	.34	.32	.36	.34	.32	.35	.33	.31	.34	.32	.31	.34	.32	.30	.30
5	.34	.31	.29	.33	.31	.28	.33	.30	.28	.32	.30	.28	.31	.29	.28	.27
6	.31	.28	.26	.31	.28	.26	.30	.28	.26	.29	.27	.25	.25	.27	.25	.25
7	.29	.26	.23	.28	.25	.23	.25	.25	.23	.27	.25	.23	.27	.25	.23	.22
8	.26	.23	.21	.26	.23	.21	.26	.23	.21	.25	.23	.21	.25	.23	.21	.20
9	.24	.21	.19	.24	.21	.19	.24	.21	.19	.23	.21	.19	.23	.21	.29	.18
10	.23	.20	.18	.22	.20	.18	.22	.19	.18	.22	.19	.17	.21	.19	.19	.17

ROOM CAVITY RATIO

20% FLOOR CAVITY REFLECTANCE

Conversion Factors: 1 Lt-32W PLT: Opal Diffuser, CU x 0.8; Clear Lens, CU x 1.0.
1 Lt-26W PLT: Fresnel Lens, CU x 1.1; Opal Diffuser, CU x 0.9; Clear Lens, CU x 1.1.

Job Information **Type:**

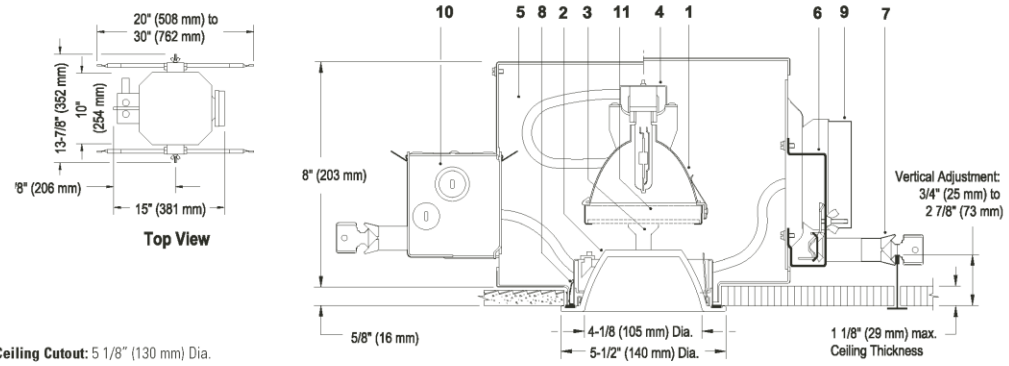
Lightolier a Genlyte company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710
We reserve the right to change details of design, materials and finish.

LIGHTOLIER®

Fixture GF4

Calculite® HID Lensed Downlight **C4T4GD-MHT4R**

4 1/2" Aperture, T4.5 Ceramic Metal Halide, Glasslite



Ceiling Cutout: 5 1/8" (130 mm) Dia.

For complete fixture order: Trim Kit (Glasslite) + Upper Reflector + Frame-In Kit. Sold Separately

Glasslite Trim Kit + Upper Reflector	Frame-In Kit		Lamp
C4T4GD + MHT4RS (Spot Upper Reflector)	**C4A20T4E1**	Electronic 120V	20W T4.5 Ceramic MH
MHT4RNF (Narrow Flood Upper Reflector)	**C4A20T4E2**	Electronic 277V	20W T4.5 Ceramic MH
MHT4RF (Flood Upper Reflector)	**C4A39T4E1**	Electronic 120V	39W T4.5 Ceramic MH
	C4A39T4E2	Electronic 277V	39W T4.5 Ceramic MH
	C4A70T4E1	Electronic 120V	70W T4.5 Ceramic MH
	C4A70T4E2	Electronic 277V	70W T4.5 Ceramic MH

Features

1. **Upper Reflector:** Specular faceted aluminum; select 12° Spot (MHT4RS) 25° Narrow Flood (MHT4RNF) or 40° Flood (MHT4RF); interchangeable.
2. **Glasslite Trim Kit:** One piece borosilicate etched glass.
3. **Lamp Holder:** Unitized construction assures proper alignment of lamp to optics for consistent optical performance.
4. **Socket Housing:** Galvanized steel, pre-wired with G8.5 pulse rated socket. Snaps onto yoke for secure attachment without tools; unitized construction assures proper alignment of lamp to optics for consistent optical performance.
5. **Frame Housing:** Steel, 0.029" (22-Ga.), matte black finish. Removable cover for top re-lamping.
6. **Frame Vertical Adjustment Mechanism:** Accommodates mounting to virtually any ceiling system using pre-installed mounting bars, or 1/2" EMT tubing (by others). Single locking feature secures all adjustments. Alignment holes and markings allow fixture to be pre-set prior to installation. Final adjustment can be made from below from inside fixture.
7. **Mounting Bars:** Galvanized steel, 0.048" (18-ga.), pre-installed telescoping bars extend to 30" long and lock securely into position. Built-in locking tabs provide positive attachment to common T-bar systems. Self-centering feature simplifies installation in 24" O.C. grid systems. Attaches to steel or wood joists without accessories.
8. **Retention Springs:** Rust resistant springs secure trim for quick, tool-less installation.
9. **Ballast / Cover Assembly:** Accessible from below and removable without tools for inspection and ballast replacement .
10. **Junction Box:** 0.059" (16-ga.) galvanized steel. UL listed for 8 No. 12 AWG, 90° C through branch circuit conductors. Allows inspection from below.
11. **Optional Accessory Holder:** Catalog # CAH4 Sold separately; die-formed steel, matte black finish, slide-in installation. Accepts up to two 3 3/4" dia. media.
12. **Thermal Protector:** (Not Shown) Meets NEC and UL requirements. Do not install insulation above nor within 3" (76mm) of any part of the luminaire.

Electrical

Electronic Ballast: 120V or 277V, 50/60 Hz., encased, high power factor, T.H.D. <15%, thermally and transient protected, RMI/RFI complies with FCC Part 18 non-consumer limits, shut-down circuit at end of lamp life, sound rating "A", -5° F minimum starting temperature, Type 1 Outdoor rating.

Ballast	ANSI Code	Voltage	Max. Amps	Input Watts
20W MH	M156	120/277	0.21/0.10	23
39W MH	M130	120/277	0.39/0.17	44
70W MH	M139	120/277	0.67/0.29	78

Options and Accessories

Chicago Plenum: Consult Factory.

Labels

UL (Suitable for Wet Locations), CSA, I.B.E.W.

Job Information **Type:**

Job Name:

Cat. No.:

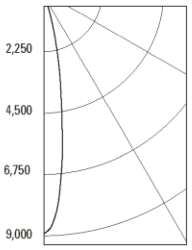
Lamp(s):

Notes:

Lightolier a Genlyte Thomas Company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

39W T4.5 CERAMIC MH, **NARROW FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 3400 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	8996	
5	7584	
10	4322	
15	2225	
20	1047	
25	452	
30	169	
35	81	
40	53	
45	39	
50	32	
55	26	
60	20	
65	12	
70	7	
75	5	
80	3	
85	0	
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	7690
55	6459
65	3966
75	2612
85	0

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	1459	42.92	91.95
0-40	1515	44.58	95.5
0-60	1569	46.16	98.88
0-90	1587	46.68	100
40-90	71	2.1	4.5
60-90	17	0.52	1.12
90-180	0	0	0
0-180	1587	46.68	100

Coefficients of Utilization

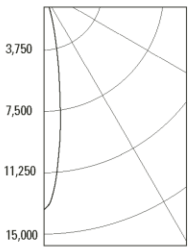
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.56	.56	.56	.56	.54	.54	.52	.52	.50	.50	.47
1	.54	.53	.52	.51	.52	.51	.50	.49	.48	.48	.46
2	.52	.51	.50	.49	.50	.48	.49	.47	.47	.46	.44
3	.51	.49	.48	.47	.48	.46	.47	.46	.46	.45	.44
4	.50	.48	.46	.45	.47	.45	.46	.44	.45	.44	.43
5	.49	.46	.45	.43	.46	.43	.45	.43	.44	.42	.42
6	.48	.45	.43	.42	.45	.42	.44	.42	.44	.42	.41
7	.46	.44	.42	.41	.44	.41	.43	.41	.43	.41	.40
8	.46	.43	.41	.40	.43	.40	.42	.40	.42	.40	.39
9	.45	.42	.41	.39	.42	.39	.42	.39	.41	.39	.39
10	.44	.41	.40	.38	.41	.38	.41	.38	.40	.38	.38

LUMINAIRE INPUT WATTS = 44

** EFFICIENCY = 46.7% **
SC = .3

CERTIFIED TEST REPORT NO. 18678FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

70W T4.5 CERAMIC MH, **NARROW FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 6200 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	13659	
5	11121	915
10	6556	
15	3509	990
20	1859	
25	942	441
30	400	
35	177	125
40	105	
45	78	62
50	65	
55	55	49
60	43	
65	29	30
70	20	
75	11	12
80	6	
85	1	2
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	15547
55	13566
65	9819
75	6013
85	2289

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	2346	37.85	89.35
0-40	2471	39.87	94.11
0-60	2582	41.65	98.32
0-90	2626	42.36	100
40-90	154	2.49	5.89
60-90	44	0.71	1.68
90-180	0	0	0
0-180	2626	42.36	100

Coefficients of Utilization

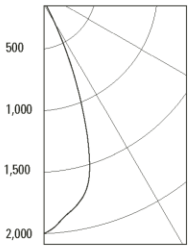
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.50	.50	.50	.50	.49	.49	.47	.47	.45	.45	.42
1	.49	.48	.47	.46	.47	.46	.45	.44	.44	.43	.41
2	.47	.46	.45	.44	.45	.43	.44	.42	.43	.41	.40
3	.46	.44	.43	.42	.44	.41	.43	.41	.42	.40	.39
4	.45	.43	.41	.40	.42	.40	.41	.39	.41	.39	.38
5	.44	.41	.40	.39	.41	.38	.40	.38	.40	.38	.37
6	.43	.40	.39	.37	.40	.37	.39	.37	.39	.37	.36
7	.41	.39	.37	.36	.39	.36	.38	.36	.38	.36	.35
8	.41	.38	.36	.35	.38	.35	.37	.35	.37	.35	.34
9	.40	.37	.36	.34	.37	.34	.37	.34	.36	.34	.34
10	.39	.36	.35	.34	.36	.34	.36	.34	.36	.33	.33

LUMINAIRE INPUT WATTS = 78

** EFFICIENCY = 42.4% **
SC = .3

CERTIFIED TEST REPORT NO.18753FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

39W T4.5 CERAMIC MH, **FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 3400 LMS. AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	1992	
5	1944	184
10	1822	
15	1660	444
20	1226	
25	706	322
30	315	
35	139	95
40	66	
45	36	31
50	30	
55	26	23
60	21	
65	16	16
70	11	
75	7	8
80	4	
85	1	2
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	7192
55	6459
65	5333
75	3973
85	2101

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	949	27.94	84.42
0-40	1045	30.74	92.9
0-60	1099	32.34	97.74
0-90	1125	33.09	100
40-90	79	2.35	7.1
60-90	25	0.75	2.26
90-180	0	0	0
0-180	1125	33.09	100

Coefficients of Utilization

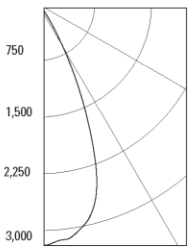
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.39	.39	.39	.39	.37	.38	.38	.38	.35	.35	.33
1	.38	.37	.37	.36	.35	.37	.37	.35	.34	.33	.32
2	.37	.35	.34	.33	.33	.36	.35	.33	.33	.32	.30
3	.35	.34	.33	.31	.32	.35	.33	.31	.32	.30	.29
4	.34	.32	.31	.30	.30	.34	.32	.30	.31	.29	.28
5	.33	.31	.30	.28	.29	.33	.31	.28	.30	.28	.27
6	.32	.30	.28	.27	.28	.32	.30	.27	.29	.27	.26
7	.31	.29	.27	.26	.27	.31	.29	.26	.28	.26	.25
8	.30	.28	.26	.25	.26	.30	.27	.25	.27	.25	.25
9	.29	.27	.25	.24	.25	.29	.27	.24	.26	.24	.24
10	.28	.26	.24	.23	.24	.28	.26	.23	.25	.23	.23

LUMINAIRE INPUT WATTS = 44

** EFFICIENCY = 33.1% **
SC = .7

CERTIFIED TEST REPORT NO.18679FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

70W T4.5 CERAMIC MH, **FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 6200 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	3172	
5	3144	303
10	3054	
15	2810	763
20	2215	
25	1361	618
30	668	
35	279	194
40	125	
45	67	57
50	55	
55	47	42
60	39	
65	29	29
70	20	
75	13	14
80	8	
85	3	3
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	13385
55	11655
65	9620
75	7313
85	4282

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	1684	27.16	83.2
0-40	1878	30.29	92.79
0-60	1977	31.9	97.71
0-90	2024	32.65	100
40-90	145	2.35	7.21
60-90	46	0.75	2.29
90-180	0	0	0
0-180	2024	32.65	100

Coefficients of Utilization

CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.39	.39	.39	.39	.38	.38	.36	.36	.35	.35	.33
1	.37	.37	.36	.35	.36	.35	.35	.34	.33	.33	.31
2	.36	.35	.34	.33	.34	.32	.33	.32	.32	.31	.30
3	.35	.33	.32	.31	.33	.31	.32	.30	.31	.30	.29
4	.34	.32	.30	.29	.31	.29	.31	.29	.30	.29	.28
5	.32	.30	.29	.28	.30	.28	.30	.28	.29	.27	.27
6	.31	.29	.28	.27	.29	.27	.29	.27	.28	.26	.26
7	.30	.28	.27	.26	.28	.25	.27	.25	.27	.25	.25
8	.29	.27	.26	.25	.27	.24	.27	.24	.26	.24	.24
9	.28	.26	.25	.24	.26	.24	.26	.23	.25	.23	.23
10	.28	.25	.24	.23	.25	.23	.25	.23	.25	.23	.22

LUMINAIRE INPUT WATTS = 78

** EFFICIENCY = 32.6% **
SC = .7

CERTIFIED TEST REPORT NO.18755FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

Job Information | **Type:**

Lightolier a Genlyte Thomas Company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

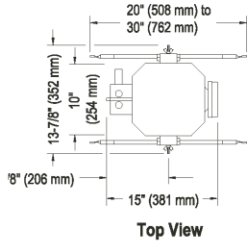
LIGHTOLIER®

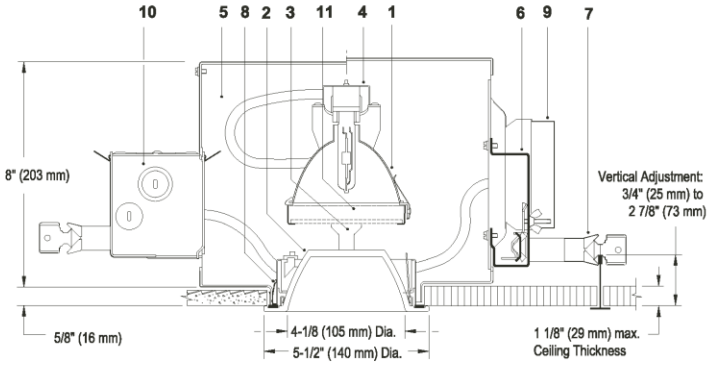
Fixture GF5

Calculite® HID Lensed Downlight **C4T4GD-MHT4R**

Page 1 of 2

4 1/2" Aperture, T4.5 Ceramic Metal Halide, Glasslite





Ceiling Cutout: 5 1/8" (130 mm) Dia.

For complete fixture order: Trim Kit (Glasslite) + Upper Reflector + Frame-In Kit. Sold Separately

Glasslite Trim Kit + Upper Reflector	Frame-In Kit		Lamp
C4T4GD + MHT4RS (Spot Upper Reflector)	**C4A20T4E1**	Electronic 120V	20W T4.5 Ceramic MH
MHT4RNF (Narrow Flood Upper Reflector)	**C4A20T4E2**	Electronic 277V	20W T4.5 Ceramic MH
MHT4RF (Flood Upper Reflector)	**C4A39T4E1**	Electronic 120V	39W T4.5 Ceramic MH
	C4A39T4E2	Electronic 277V	39W T4.5 Ceramic MH
	C4A70T4E1	Electronic 120V	70W T4.5 Ceramic MH
	C4A70T4E2	Electronic 277V	70W T4.5 Ceramic MH

Features

1. **Upper Reflector:** Specular faceted aluminum; select 12° Spot (MHT4RS) 25° Narrow Flood (MHT4RNF) or 40° Flood (MHT4RF); interchangeable.
2. **Glasslite Trim Kit:** One piece borosilicate etched glass.
3. **Lamp Holder:** Unitized construction assures proper alignment of lamp to optics for consistent optical performance.
4. **Socket Housing:** Galvanized steel, pre-wired with G8.5 pulse rated socket. Snaps onto yoke for secure attachment without tools; unitized construction assures proper alignment of lamp to optics for consistent optical performance.
5. **Frame Housing:** Steel, 0.029" (22-Ga.), matte black finish. Removable cover for top re-lamping.
6. **Frame Vertical Adjustment Mechanism:** Accommodates mounting to virtually any ceiling system using pre-installed mounting bars, or 1/2" EMT tubing (by others). Single locking feature secures all adjustments. Alignment holes and markings allow fixture to be pre-set prior to installation. Final adjustment can be made from below from inside fixture.
7. **Mounting Bars:** Galvanized steel, 0.048" (18-ga.), pre-installed telescoping bars extend to 30" long and lock securely into position. Built-in locking tabs provide positive attachment to common T-bar systems. Self-centering feature simplifies installation in 24" O.C. grid systems. Attaches to steel or wood joists without accessories.
8. **Retention Springs:** Rust resistant springs secure trim for quick, tool-less installation.
9. **Ballast / Cover Assembly:** Accessible from below and removable without tools for inspection and ballast replacement .
10. **Junction Box:** 0.059" (16-ga.) galvanized steel. UL listed for 8 No. 12 AWG, 90° C through branch circuit conductors. Allows inspection from below.
11. **Optional Accessory Holder:** Catalog # CAH4 Sold separately; die-formed steel, matte black finish, slide-in installation. Accepts up to two 3 3/4" dia. media.
12. **Thermal Protector:** (Not Shown) Meets NEC and UL requirements. Do not install insulation above nor within 3" (76mm) of any part of the luminaire.

Electrical

Electronic Ballast: 120V or 277V, 50/60 Hz., encased, high power factor, T.H.D. <15%, thermally and transient protected, RMI/RFI complies with FCC Part 18 non-consumer limits, shut-down circuit at end of lamp life, sound rating "A", -5° F minimum starting temperature, Type 1 Outdoor rating.

Ballast	ANSI Code	Voltage	Max. Amps	Input Watts
20W MH	M156	120/277	0.21/0.10	23
39W MH	M130	120/277	0.39/0.17	44
70W MH	M139	120/277	0.67/0.29	78

Options and Accessories

Chicago Plenum: Consult Factory.

Labels

UL (Suitable for Wet Locations), CSA, I.B.E.W.

Job Information **Type:**

Job Name:

Cat. No.:

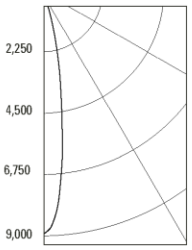
Lamp(s):

Notes:

Lightolier a Genlyte Thomas Company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

39W T4.5 CERAMIC MH, **NARROW FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 3400 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	8996	
5	7584	
10	4322	
15	2225	
20	1047	
25	452	
30	169	
35	81	
40	53	
45	39	
50	32	
55	26	
60	20	
65	12	
70	7	
75	5	
80	3	
85	0	
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	7690
55	6459
65	3966
75	2612
85	0

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	1459	42.92	91.95
0-40	1515	44.58	95.5
0-60	1569	46.16	98.88
0-90	1587	46.68	100
40-90	71	2.1	4.5
60-90	17	0.52	1.12
90-180	0	0	0
0-180	1587	46.68	100

Coefficients of Utilization

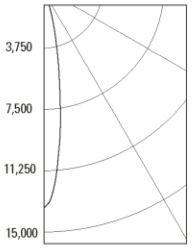
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.56	.56	.56	.56	.54	.54	.52	.52	.50	.50	.47
1	.54	.53	.52	.51	.52	.51	.50	.49	.48	.48	.46
2	.52	.51	.50	.49	.50	.48	.49	.47	.47	.46	.44
3	.51	.49	.48	.47	.48	.46	.47	.46	.46	.45	.44
4	.50	.48	.46	.45	.47	.45	.46	.44	.45	.44	.43
5	.49	.46	.45	.43	.46	.43	.45	.43	.44	.42	.42
6	.48	.45	.43	.42	.45	.42	.44	.42	.44	.42	.41
7	.46	.44	.42	.41	.44	.41	.43	.41	.43	.41	.40
8	.46	.43	.41	.40	.43	.40	.42	.40	.42	.40	.39
9	.45	.42	.41	.39	.42	.39	.42	.39	.41	.39	.39
10	.44	.41	.40	.38	.41	.38	.41	.38	.40	.38	.38

LUMINAIRE INPUT WATTS = 44

** EFFICIENCY = 46.7% **
SC = .3

CERTIFIED TEST REPORT NO. 18678FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

70W T4.5 CERAMIC MH, **NARROW FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 6200 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	13659	
5	11121	915
10	6556	
15	3509	990
20	1859	
25	942	441
30	400	
35	177	125
40	105	
45	78	62
50	65	
55	55	49
60	43	
65	29	30
70	20	
75	11	12
80	6	
85	1	2
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	15547
55	13566
65	9819
75	6013
85	2289

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	2346	37.85	89.35
0-40	2471	39.87	94.11
0-60	2582	41.65	98.32
0-90	2626	42.36	100
40-90	154	2.49	5.89
60-90	44	0.71	1.68
90-180	0	0	0
0-180	2626	42.36	100

Coefficients of Utilization

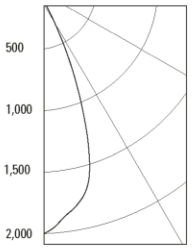
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.50	.50	.50	.50	.49	.49	.47	.47	.45	.45	.42
1	.49	.48	.47	.46	.47	.46	.45	.44	.44	.43	.41
2	.47	.46	.45	.44	.45	.43	.44	.42	.43	.41	.40
3	.46	.44	.43	.42	.44	.41	.43	.41	.42	.40	.39
4	.45	.43	.41	.40	.42	.40	.41	.39	.41	.39	.38
5	.44	.41	.40	.39	.41	.38	.40	.38	.40	.38	.37
6	.43	.40	.39	.37	.40	.37	.39	.37	.39	.37	.36
7	.41	.39	.37	.36	.39	.36	.38	.36	.38	.36	.35
8	.41	.38	.36	.35	.38	.35	.37	.35	.37	.35	.34
9	.40	.37	.36	.34	.37	.34	.37	.34	.36	.34	.34
10	.39	.36	.35	.34	.36	.34	.36	.34	.36	.33	.33

LUMINAIRE INPUT WATTS = 78

** EFFICIENCY = 42.4% **
SC = .3

CERTIFIED TEST REPORT NO.18753FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

39W T4.5 CERAMIC MH, **FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 3400 LMS. AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	1992	
5	1944	184
10	1822	
15	1660	444
20	1226	
25	706	322
30	315	
35	139	95
40	66	
45	36	31
50	30	
55	26	23
60	21	
65	16	16
70	11	
75	7	8
80	4	
85	1	2
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	7192
55	6459
65	5333
75	3973
85	2101

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	949	27.94	84.42
0-40	1045	30.74	92.9
0-60	1099	32.34	97.74
0-90	1125	33.09	100
40-90	79	2.35	7.1
60-90	25	0.75	2.26
90-180	0	0	0
0-180	1125	33.09	100

Coefficients of Utilization

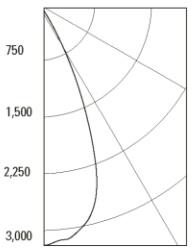
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.39	.39	.39	.39	.37	.38	.38	.38	.35	.35	.33
1	.38	.37	.37	.36	.35	.37	.37	.35	.34	.33	.32
2	.37	.35	.34	.33	.33	.36	.35	.33	.33	.32	.30
3	.35	.34	.33	.31	.32	.35	.33	.31	.32	.30	.29
4	.34	.32	.31	.30	.30	.34	.32	.30	.31	.29	.28
5	.33	.31	.30	.28	.29	.33	.31	.28	.30	.28	.27
6	.32	.30	.28	.27	.28	.32	.30	.27	.29	.27	.26
7	.31	.29	.27	.26	.27	.31	.29	.26	.28	.26	.25
8	.30	.28	.26	.25	.26	.30	.27	.25	.27	.25	.25
9	.29	.27	.25	.24	.25	.29	.27	.24	.26	.24	.24
10	.28	.26	.24	.23	.24	.28	.26	.23	.25	.23	.23

LUMINAIRE INPUT WATTS = 44

** EFFICIENCY = 33.1% **
SC = .7

CERTIFIED TEST REPORT NO.18679FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

70W T4.5 CERAMIC MH, **FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 6200 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	3172	
5	3144	303
10	3054	
15	2810	763
20	2215	
25	1361	618
30	668	
35	279	194
40	125	
45	67	57
50	55	
55	47	42
60	39	
65	29	29
70	20	
75	13	14
80	8	
85	3	3
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	13385
55	11655
65	9620
75	7313
85	4282

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	1684	27.16	83.2
0-40	1878	30.29	92.79
0-60	1977	31.9	97.71
0-90	2024	32.65	100
40-90	145	2.35	7.21
60-90	46	0.75	2.29
90-180	0	0	0
0-180	2024	32.65	100

Coefficients of Utilization

CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.39	.39	.39	.39	.38	.38	.36	.36	.35	.35	.33
1	.37	.37	.36	.35	.36	.35	.35	.34	.33	.33	.31
2	.36	.35	.34	.33	.34	.32	.33	.32	.32	.31	.30
3	.35	.33	.32	.31	.33	.31	.32	.30	.31	.30	.29
4	.34	.32	.30	.29	.31	.29	.31	.29	.30	.29	.28
5	.32	.30	.29	.28	.30	.28	.30	.28	.29	.27	.27
6	.31	.29	.28	.27	.29	.27	.29	.27	.28	.26	.26
7	.30	.28	.27	.26	.28	.25	.27	.25	.27	.25	.25
8	.29	.27	.26	.25	.27	.24	.27	.24	.26	.24	.24
9	.28	.26	.25	.24	.26	.24	.26	.23	.25	.23	.23
10	.28	.25	.24	.23	.25	.23	.25	.23	.25	.23	.22

LUMINAIRE INPUT WATTS = 78

** EFFICIENCY = 32.6% **
SC = .7

CERTIFIED TEST REPORT NO.18755FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

Job Information **Type:**

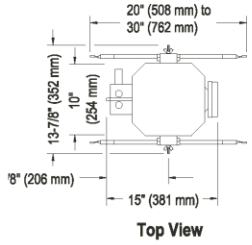
Lightolier a Genlyte Thomas Company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

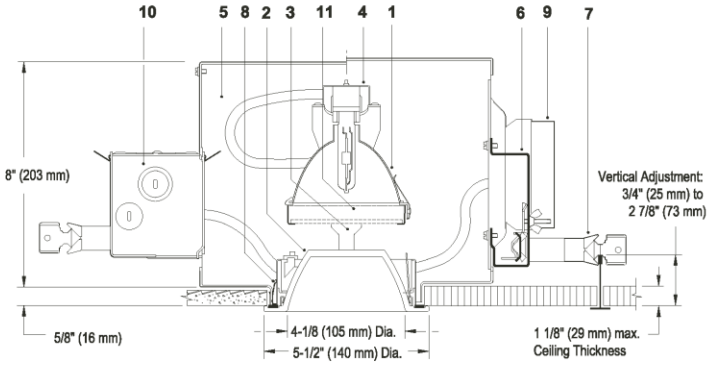
LIGHTOLIER®

Fixture GF6

Calculite® HID Lensed Downlight **C4T4GD-MHT4R**

Page 1 of 2 — 4 1/2" Aperture, T4.5 Ceramic Metal Halide, Glasslite





Ceiling Cutout: 5 1/8" (130 mm) Dia.

For complete fixture order: Trim Kit (Glasslite) + Upper Reflector + Frame-In Kit. Sold Separately

Glasslite Trim Kit + Upper Reflector	Frame-In Kit		Lamp
C4T4GD + MHT4RS (Spot Upper Reflector)	**C4A20T4E1**	Electronic 120V	20W T4.5 Ceramic MH
MHT4RNF (Narrow Flood Upper Reflector)	**C4A20T4E2**	Electronic 277V	20W T4.5 Ceramic MH
MHT4RF (Flood Upper Reflector)	**C4A39T4E1**	Electronic 120V	39W T4.5 Ceramic MH
	C4A39T4E2	Electronic 277V	39W T4.5 Ceramic MH
	C4A70T4E1	Electronic 120V	70W T4.5 Ceramic MH
	C4A70T4E2	Electronic 277V	70W T4.5 Ceramic MH

Features

1. **Upper Reflector:** Specular faceted aluminum; select 12° Spot (MHT4RS) 25° Narrow Flood (MHT4RNF) or 40° Flood (MHT4RF); interchangeable.
2. **Glasslite Trim Kit:** One piece borosilicate etched glass.
3. **Lamp Holder:** Unitized construction assures proper alignment of lamp to optics for consistent optical performance.
4. **Socket Housing:** Galvanized steel, pre-wired with G8.5 pulse rated socket. Snaps onto yoke for secure attachment without tools; unitized construction assures proper alignment of lamp to optics for consistent optical performance.
5. **Frame Housing:** Steel, 0.029" (22-Ga.), matte black finish. Removable cover for top re-lamping.
6. **Frame Vertical Adjustment Mechanism:** Accommodates mounting to virtually any ceiling system using pre-installed mounting bars, or 1/2" EMT tubing (by others). Single locking feature secures all adjustments. Alignment holes and markings allow fixture to be pre-set prior to installation. Final adjustment can be made from below from inside fixture.
7. **Mounting Bars:** Galvanized steel, 0.048" (18-ga.), pre-installed telescoping bars extend to 30" long and lock securely into position. Built-in locking tabs provide positive attachment to common T-bar systems. Self-centering feature simplifies installation in 24" O.C. grid systems. Attaches to steel or wood joists without accessories.
8. **Retention Springs:** Rust resistant springs secure trim for quick, tool-less installation.
9. **Ballast / Cover Assembly:** Accessible from below and removable without tools for inspection and ballast replacement .
10. **Junction Box:** 0.059" (16-ga.) galvanized steel. UL listed for 8 No. 12 AWG, 90° C through branch circuit conductors. Allows inspection from below.
11. **Optional Accessory Holder:** Catalog # CAH4 Sold separately; die-formed steel, matte black finish, slide-in installation. Accepts up to two 3 3/4" dia. media.
12. **Thermal Protector:** (Not Shown) Meets NEC and UL requirements. Do not install insulation above nor within 3" (76mm) of any part of the luminaire.

Electrical

Electronic Ballast: 120V or 277V, 50/60 Hz., encased, high power factor, T.H.D. <15%, thermally and transient protected, RMI/RFI complies with FCC Part 18 non-consumer limits, shut-down circuit at end of lamp life, sound rating "A", -5° F minimum starting temperature, Type 1 Outdoor rating.

Ballast	ANSI Code	Voltage	Max. Amps	Input Watts
20W MH	M156	120/277	0.21/0.10	23
39W MH	M130	120/277	0.39/0.17	44
70W MH	M139	120/277	0.67/0.29	78

Options and Accessories

Chicago Plenum: Consult Factory.

Labels

UL (Suitable for Wet Locations), CSA, I.B.E.W.

Job Information **Type:**

Job Name:

Cat. No.:

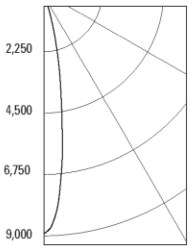
Lamp(s):

Notes:

Lightolier a Genlyte Thomas Company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

39W T4.5 CERAMIC MH, **NARROW FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 3400 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	8996	
5	7584	
10	4322	
15	2225	
20	1047	
25	452	
30	169	
35	81	
40	53	
45	39	
50	32	
55	26	
60	20	
65	12	
70	7	
75	5	
80	3	
85	0	
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	7690
55	6459
65	3966
75	2612
85	0

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	1459	42.92	91.95
0-40	1515	44.58	95.5
0-60	1569	46.16	98.88
0-90	1587	46.68	100
40-90	71	2.1	4.5
60-90	17	0.52	1.12
90-180	0	0	0
0-180	1587	46.68	100

Coefficients of Utilization

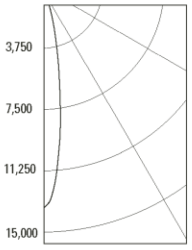
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.56	.56	.56	.56	.54	.54	.52	.52	.50	.50	.47
1	.54	.53	.52	.51	.52	.51	.50	.49	.48	.48	.46
2	.52	.51	.50	.49	.50	.48	.49	.47	.47	.46	.44
3	.51	.49	.48	.47	.48	.46	.47	.46	.46	.45	.44
4	.50	.48	.46	.45	.47	.45	.46	.44	.45	.44	.43
5	.49	.46	.45	.43	.46	.43	.45	.43	.44	.42	.42
6	.48	.45	.43	.42	.45	.42	.44	.42	.44	.42	.41
7	.46	.44	.42	.41	.44	.41	.43	.41	.43	.41	.40
8	.46	.43	.41	.40	.43	.40	.42	.40	.42	.40	.39
9	.45	.42	.41	.39	.42	.39	.42	.39	.41	.39	.39
10	.44	.41	.40	.38	.41	.38	.41	.38	.40	.38	.38

LUMINAIRE INPUT WATTS = 44

** EFFICIENCY = 46.7% **
SC = .3

CERTIFIED TEST REPORT NO. 18678FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

70W T4.5 CERAMIC MH, **NARROW FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 6200 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	13659	
5	11121	915
10	6556	
15	3509	990
20	1859	
25	942	441
30	400	
35	177	125
40	105	
45	78	62
50	65	
55	55	49
60	43	
65	29	30
70	20	
75	11	12
80	6	
85	1	2
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	15547
55	13566
65	9819
75	6013
85	2289

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	2346	37.85	89.35
0-40	2471	39.87	94.11
0-60	2582	41.65	98.32
0-90	2626	42.36	100
40-90	154	2.49	5.89
60-90	44	0.71	1.68
90-180	0	0	0
0-180	2626	42.36	100

Coefficients of Utilization

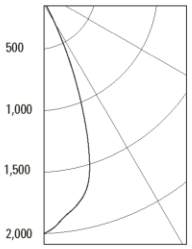
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.50	.50	.50	.50	.49	.49	.47	.47	.45	.45	.42
1	.49	.48	.47	.46	.47	.46	.45	.44	.44	.43	.41
2	.47	.46	.45	.44	.45	.43	.44	.42	.43	.41	.40
3	.46	.44	.43	.42	.44	.41	.43	.41	.42	.40	.39
4	.45	.43	.41	.40	.42	.40	.41	.39	.41	.39	.38
5	.44	.41	.40	.39	.41	.38	.40	.38	.40	.38	.37
6	.43	.40	.39	.37	.40	.37	.39	.37	.39	.37	.36
7	.41	.39	.37	.36	.39	.36	.38	.36	.38	.36	.35
8	.41	.38	.36	.35	.38	.35	.37	.35	.37	.35	.34
9	.40	.37	.36	.34	.37	.34	.37	.34	.36	.34	.34
10	.39	.36	.35	.34	.36	.34	.36	.34	.36	.33	.33

LUMINAIRE INPUT WATTS = 78

** EFFICIENCY = 42.4% **
SC = .3

CERTIFIED TEST REPORT NO.18753FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

39W T4.5 CERAMIC MH, **FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 3400 LMS. AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	1992	
5	1944	184
10	1822	
15	1660	444
20	1226	
25	706	322
30	315	
35	139	95
40	66	
45	36	31
50	30	
55	26	23
60	21	
65	16	16
70	11	
75	7	8
80	4	
85	1	2
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	7192
55	6459
65	5333
75	3973
85	2101

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	949	27.94	84.42
0-40	1045	30.74	92.9
0-60	1099	32.34	97.74
0-90	1125	33.09	100
40-90	79	2.35	7.1
60-90	25	0.75	2.26
90-180	0	0	0
0-180	1125	33.09	100

Coefficients of Utilization

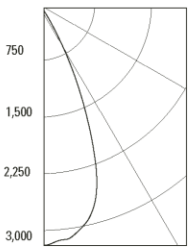
CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.39	.39	.39	.39	.37	.38	.38	.38	.35	.35	.33
1	.38	.37	.37	.36	.35	.37	.37	.35	.34	.33	.32
2	.37	.35	.34	.33	.33	.36	.35	.33	.33	.32	.30
3	.35	.34	.33	.31	.32	.35	.33	.31	.32	.30	.29
4	.34	.32	.31	.30	.30	.34	.32	.30	.31	.29	.28
5	.33	.31	.30	.28	.29	.33	.31	.28	.30	.28	.27
6	.32	.30	.28	.27	.28	.32	.30	.27	.29	.27	.26
7	.31	.29	.27	.26	.27	.31	.29	.26	.28	.26	.25
8	.30	.28	.26	.25	.26	.30	.27	.25	.27	.25	.25
9	.29	.27	.25	.24	.25	.29	.27	.24	.26	.24	.24
10	.28	.26	.24	.23	.24	.28	.26	.23	.25	.23	.23

LUMINAIRE INPUT WATTS = 44

** EFFICIENCY = 33.1% **
SC = .7

CERTIFIED TEST REPORT NO.18679FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

70W T4.5 CERAMIC MH, **FLOOD** UPPER REFLECTOR, PHILIPS, LUMEN RATING = 6200 LMS., AROMAT ELECTRONIC BALLAST



ANGLE	MEAN CP	LUMENS
0	3172	
5	3144	303
10	3054	
15	2810	763
20	2215	
25	1361	618
30	668	
35	279	194
40	125	
45	67	57
50	55	
55	47	42
60	39	
65	29	29
70	20	
75	13	14
80	8	
85	3	3
90	0	

LUMINANCE SUMMARY - CD. / SQ. M.

ANGLE	MEAN CD/SQ.M
45	13385
55	11655
65	9620
75	7313
85	4282

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	%LUMINAIRE
0-30	1684	27.16	83.2
0-40	1878	30.29	92.79
0-60	1977	31.9	97.71
0-90	2024	32.65	100
40-90	145	2.35	7.21
60-90	46	0.75	2.29
90-180	0	0	0
0-180	2024	32.65	100

Coefficients of Utilization

CEILING	80%				70%		50%		30%		
WALL	70	50	30	10	50	10	50	10	50	10	0
RCR	Zonal Cavity Method - Effective Floor Cavity Reflectance = 20%										
0	.39	.39	.39	.39	.38	.38	.36	.36	.35	.35	.33
1	.37	.37	.36	.35	.36	.35	.35	.34	.33	.33	.31
2	.36	.35	.34	.33	.34	.32	.33	.32	.32	.31	.30
3	.35	.33	.32	.31	.33	.31	.32	.30	.31	.30	.29
4	.34	.32	.30	.29	.31	.29	.31	.29	.30	.29	.28
5	.32	.30	.29	.28	.30	.28	.30	.28	.29	.27	.27
6	.31	.29	.28	.27	.29	.27	.29	.27	.28	.26	.26
7	.30	.28	.27	.26	.28	.25	.27	.25	.27	.25	.25
8	.29	.27	.26	.25	.27	.24	.27	.24	.26	.24	.24
9	.28	.26	.25	.24	.26	.24	.26	.23	.25	.23	.23
10	.28	.25	.24	.23	.25	.23	.25	.23	.25	.23	.22

LUMINAIRE INPUT WATTS = 78

** EFFICIENCY = 32.6% **
SC = .7

CERTIFIED TEST REPORT NO.18755FR, DATE: APRIL 2, 2004.
COMPUTED BY LSI PROGRAM **TEST-LITE**

Job Information | **Type:**

Lightolier a Genlyte Thomas Company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

Ballast GB1

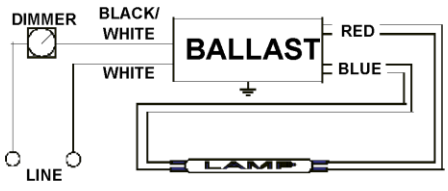
ADVANCE™

REZ-132	
Brand Name	MARK 10 POWERLINE
Ballast Type	Electronic Dimming
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
Input Frequency	50/60HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (Watts) (min/max)	Ballast Factor (min/max)	MAX THD %	Power Factor	Lamp Current Crest Factor	B.E.F.
F25T8	1	25	50/10	0.26	08/30	0.05/1.05	10	0.99	1.6	3.50
* F32T8	1	32	50/10	0.30	09/35	0.05/1.00	10	0.99	1.6	2.86

Wiring Diagram



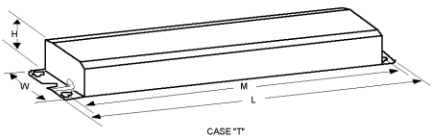
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	22	55.9
Blue	36	91.4
Red	26	66
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	22	55.9
Red/White	0	0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	2.375 "	1.5 "	8.90625 "
9 1/2	2 3/8	1 1/2	8 29/32
24.1 cm	6 cm	3.8 cm	22.6 cm

Revised 02/14/2002

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
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

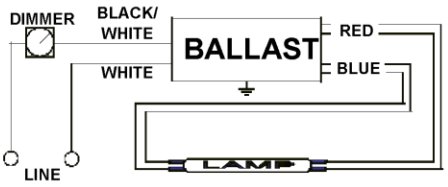
Ballast GB2

REZ-132	
Brand Name	MARK 10 POWERLINE
Ballast Type	Electronic Dimming
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
Input Frequency	50/60HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (Watts) (min/max)	Ballast Factor (min/max)	MAX THD %	Power Factor	Lamp Current Crest Factor	B.E.F.
* F25T8	1	25	50/10	0.26	08/30	0.05/1.05	10	0.99	1.6	3.50
F32T8	1	32	50/10	0.30	09/35	0.05/1.00	10	0.99	1.6	2.86

Wiring Diagram



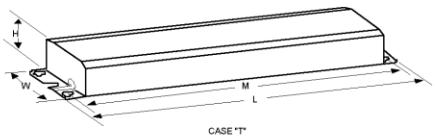
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	22	55.9
Blue	36	91.4
Red	26	66
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	22	55.9
Red/White	0	0

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
9.50 "	2.375 "	1.5 "	8.90625 "
9 1/2	2 3/8	1 1/2	8 29/32
24.1 cm	6 cm	3.8 cm	22.6 cm

Revised 02/14/2002

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.

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Corporate Offices: Phone: 800-322-2086

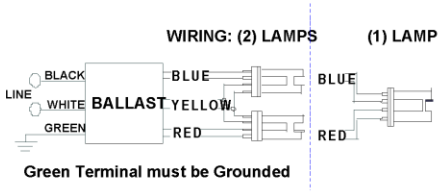
ADVANCE™

ICF-2S26-H1-LD@120	
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.
* CFM26W/GX24Q	1	26	0/-18	0.24	29	1.10	10	0.98	1.5	3.79
CFM26W/GX24q	2	26	0/-18	0.45	54	1.00	10	0.99	1.5	1.85
CFM32W/GX24q	1	32	0/-18	0.31	36	0.98	10	0.98	1.5	2.72
CFM42W/GX24q	1	42	0/-18	0.38	46	0.98	10	0.98	1.5	2.13
CFQ26W/G24q	1	26	0/-18	0.23	27	1.00	10	0.98	1.5	3.70
CFQ26W/G24q	2	26	0/-18	0.43	51	1.00	10	0.99	1.5	1.96
CFS21W/GR10q	2	21	0/-18	0.42	51	1.12	10	0.99	1.5	2.20
FT24W/2G11	2	24	0/-18	0.41	48	0.93	10	0.99	1.5	1.94

Wiring Diagram



Green Terminal must be Grounded

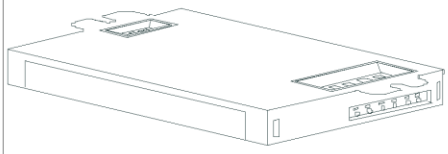
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

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

	in.	cm.
Yellow/Blue		
Blue/White		
Brown		
Orange		
Orange/Black		
Black/White		
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

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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

ICF-2S26-H1-LD@120	
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.

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 9002 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-M4-XX, ICF2S42-90C-M2-XX and ICF2S70-M4-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 part # _____ or approved equal.

Revised 09/02/2004

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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

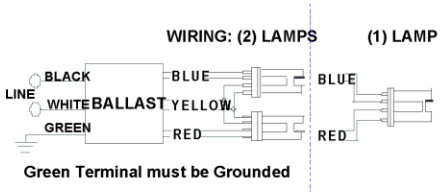
Ballast GB4

ICF2S4290CM2LD@120	
Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120
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.
* CFM32W/GX24Q	1	32	0/-18	0.27	37	1.10	15	0.98	1.5	2.97
CFM32W/GX24Q	2	32	0/-18	0.57	68	0.98	10	0.98	1.5	1.44

Wiring Diagram

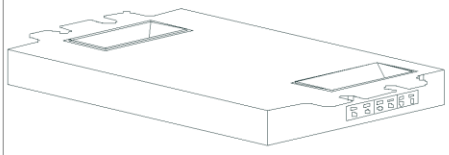


Green Terminal must be Grounded

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

Standard Lead Length (inches)

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	3.00 "	1.29 "	4.60 "
4 49/50	3	1 29/100	4 3/5
12.6 cm	7.6 cm	3.3 cm	11.7 cm

Revised 08/21/2006

ADVANCE
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

ICF2S4290CM2LD@120	
Brand Name	SMARTMATE
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Parallel
Input Voltage	120
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.

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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.

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 9002 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-M4-XX, ICF2S42-90C-M2-XX and ICF2S70-M4-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 part # _____ or approved equal.

Revised 08/21/2006

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

Ballast GB5

GE Consumer & Industrial
Lighting

20 Watt Mini Electronic HID Ballast

ULTRAMAX eHID
Superior Lumen Maintenance

GE's line of ultra cool UltraMax® eHID electronic ballasts provide up to 70% energy savings and 2-4 times the life of standard halogen. End users get the cost savings and the advantages offered in meeting strict watts per square foot requirements with these systems. UltraMax® eHID is a high energy efficiency ballast that uses less wattage to provide full light output.

The UltraMax® 20W Mini is 56% smaller than the industry standard 20W housing, but does not sacrifice energy savings or heat management to ensure a full 5 year ballast warranty.

You can count on GE to answer your lamp and ballast questions at 1-888-GEBALLAST.

Performance Features

- Saves energy: 70% less power than 75W standard halogen.
- Reduce operating costs by up to $108.00 per fixture* when replacing a 50 W Halogen HIR.
- 22.5 W system (89% efficient ballast).
- Long lamp life: 12,000 hr. design life vs. 3,000 for halogen. GE CMH® 20W lamp life extended by 3,000 hours with UltraMax eHID ballast.
- Low watts per square foot and long lamp life provide lower cost of ownership compared to halogen.
- Low frequency square wave electronic ballast maximizes ceramic metal halide performance and lamp life.
- 56% smaller than industry standard can size.
- 1" height allows ballast to run flush along standard 1.5" track.
- Normal power factor - meets IEC and ANSI power factor and THD requirements for task and recessed lighting.
- Ultra cool - 80C/5 year warranty.
- 2% output regulation over accepted ANSI lamp voltages reduces visual flicker and maintains consistent lamp color. EM lag ballasts have up to 20% change in output power over the same lamp variation range which results in an increase in power (watts) to the lamp as the voltage increases over the life of the lamp.

Applications

- Replacement of electromagnetic HID ballasts.
- Replacement of 50W HIR halogen to 70W or 90W standard halogen.
- Any track, outdoor landscape or wall pack application where watts per square foot and color quality are critical.

Benefits of Electronic Systems

System-120V Track Lamp	Ballast	Performance					Benefits Comparison		
		Initial Lumens	CBCP	Watts	LPW	Lamp Life (hrs)	% Lumens	% Savings (W)	Lamp Life (X)
90PAR/H		1310		90	15	2500			
75PAR/H		1050		75	14	2500			
80PAR/HIR		1500		80	19	3000			
70PAR/HIR		1260		70	18	3000			
CMH20T/GU6.5	UltraMax eHID 20W	1615		22.5	72	12000	23%	-75%	4.8
Q50MR16/C/NSP15			9100	50		4000			
CMH20MR16/SPL	UltraMax eHID 20W	1000	9000	22.5	44	12000		-55%	3.0

CMH20T/GU6.5 lamps with UltraMax eHID provide 23% more light, 75% energy savings and 4.8 times the life of standard 90PAR38 halogen lamps. The CMH20MR16 spot with UltraMax eHID provides 55% energy savings with 3 times the life and nearly the same center beam candle power (CBCP).

imagination at work

* @ $.10 kwh over life of ballast (approximately 4 lamp replacements). Ballasts and system specs listed on back.

Specifications: 20 Watt Mini Electronic HID Ballast

Product Code 12 Pack	Description	ANSI Designation	Line Voltage	System Watts	Nominal Current (Amps)	Power Factor	THD%	Ballast Efficiency
87490	GEMH20-MLF-120	M156	120	23	.36	> 56%	<79%	89%

Specifications

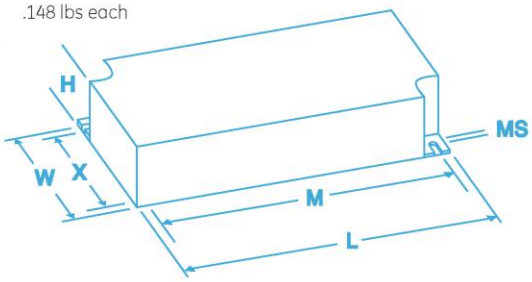
- Line Voltage 120VAC, +/- 10%, 50-60Hz
- Short Circuit Protection
- Low Frequency Square Wave
- Lamp operating frequency: 133Hz
- OCV - 350Vrms (Vpk-4.0kV)
- Lamp current crest factor <1.4
- Remote mounting distance = 8ft (18AWG)
- Meets ANSI Standard C62.41-1991
- ANSI approved pulse starting ensures high voltage reliable starting
- Side lead wires with mounting feet starting
- No ground wire required
- Meets FCC Part 18 (Class A) for EMI and RFI, Non-Consumer Limits
- UL C-UL 1029 listed
- RoHS Compliant (Reduction in Hazardous Substances)
- Housing meets UL94V0 flame retardant
- Inherent Thermal Protection
- Minimum Starting Temp: 0F, -18C
- 10" lead wires 18AWG 200C
- Max Case Temp 194F, 85C 3 yr, 176F, 80C 5 yr

Lamp Operation

20W M156 Pulse Arc or CMH Lamps

Packaging

.148 lbs each



The Power Behind the Power

UltraMax® eHID electronic ballasts are custom-manufactured to our demanding Six Sigma specifications for dependable performance with 100% burn in all ballasts at the factory to ensure every ballast is ready to go on-site.

Case Dimensions			Mounting Dimensions			
Length	Width	Height	Bracket Length	Mount Length	Mount Width	Mount Slot
(L)	(W)	(H)	(BL)	(M)	(X)	(MS)
3.74 in	1.57 in	1 in		3.36 in	1.19 in	.17 in
95 mm	40 mm	25 mm		85.4 mm	30.4 mm	4.2 mm

Transforming the ***POWER*** *of light™*

National Customer Service Center
1-888-GEBALLAST (432-2552)

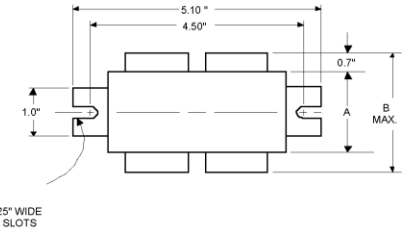
Ballast GB6

Metal Halide Lamp Ballast

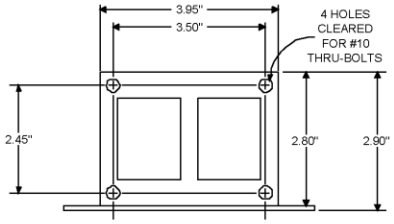
Catalog Number 71A5081
For 35/39W M130
60 Hz HX-HPF
Status: Active

DIMENSIONS AND DATA

3 X 4 CORE - 2 COIL UNIT



0.25" WIDE
2 SLOTS



INPUT VOLTS		120	277			
CIRCUIT TYPE	HX-HPF					
POWER FACTOR (min)	90%					
REGULATION						
Line Volts	±5%					
Lamp Watts	±10%					
LINE CURRENT (Amps)						
Operating		0.45	0.20			
Open Circuit		0.90	0.40			
Starting		0.50	0.22			
UL TEMPERATURE RATINGS						
Insulation Class	H(180°C)					
Coil Temperature Code	1029	B	A			
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C					
NOM. OPEN CIRCUIT VOLTAGE	230					
INPUT VOLTAGE AT LAMP DROPOUT		85	195			
INPUT WATTS	56					
RECOMMENDED FUSE (Amps)		3	1			
CORE and COIL						
Dimension (A)	0.80					
Dimension (B)	2.10					
Weight (lbs.)	3.5					
Lead Lengths	12"					
CAPACITOR REQUIREMENT						
Microfarads						
Volts (min.)	5.0					
Fault Current Withstand (amps)	277					
60 Hz TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)						
High Potential Test (Volts)						
1 minute						
2 seconds	2000					
Open Circuit Voltage Test (Volts)	2500					
Short-Circuit Current Test (Amps)	205-255					
Secondary Current						
Input Current	0.60-0.75	0.35 0.55	0.15 0.25	-	-	-

Capacitor: 7C050L33

Capacitance: 5
Dia/Oval Dim: 1.25
Height: 2.9
Temp Rating: 105°C

Wiring Diagram:

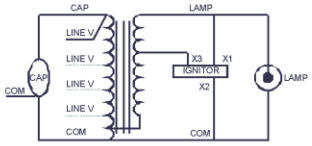


Fig. K3

U.L. RECOGNIZED

Ignitor: LI533-H4

Ballast to Lamp Distance
(BTL) = 15 feet
Temp Rating: 105°C

Typical Ordering Information

(please call Advance for suffix availability)

Order Suffix	Description
500D.	Ballast With Ignitor and Dry Film Capacitor
510D.	Ballast w/Welded Bracket, Ignitor, & Dry Film Capacitor
600.	Ballast and Ignitor, No Capacitor
610.	Ballast with Welded Bracket and Ignitor, No Capacitor

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

ADVANCE
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

05/13/99

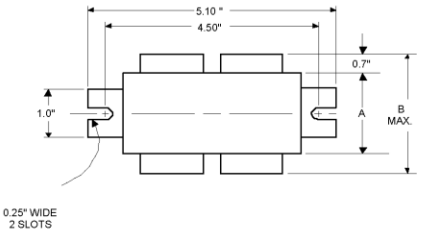
Ballast GB7

Metal Halide Lamp Ballast

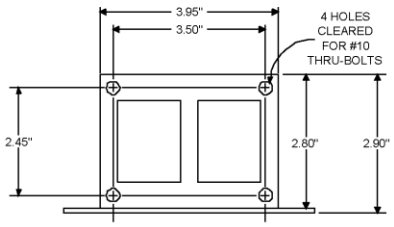
Catalog Number 71A5281
For 70W M139
60 Hz HX-HPF
Status: Active

DIMENSIONS AND DATA

3 X 4 CORE - 2 COIL UNIT



0.25" WIDE
2 SLOTS



INPUT VOLTS		120	277			
CIRCUIT TYPE	HX-HPF					
POWER FACTOR (min)	90%					
REGULATION						
Line Volts	±5%					
Lamp Watts	±7%					
LINE CURRENT (Amps)						
Operating		0.85	0.37			
Open Circuit		1.60	0.70			
Starting		0.85	0.40			
UL TEMPERATURE RATINGS						
Insulation Class	H(180°C)					
Coil Temperature Code	1029	A	A			
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C					
NOM. OPEN CIRCUIT VOLTAGE	245					
INPUT VOLTAGE AT LAMP DROPOUT		80	190			
INPUT WATTS	94					
RECOMMENDED FUSE (Amps)		4	2			
CORE and COIL						
Dimension (A)	1.50					
Dimension (B)	2.70					
Weight (lbs.)	5.5					
Lead Lengths	12"					
CAPACITOR REQUIREMENT						
Microfarads	8.0					
Volts (min.)	280					
Fault Current Withstand (amps)						
60 Hz TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)						
High Potential Test (Volts)						
1 minute	2000					
2 seconds	2500					
Open Circuit Voltage Test (Volts)	220-270					
Short-Circuit Current Test (Amps)						
Secondary Current	1.10-1.40					
Input Current		0.70 1.10	0.30 0.50	-	-	-

Capacitor: 7C080L33-R

Capacitance: 8
Dia/Oval Dim: 1.25
Height: 2.9
Temp Rating: 105°C

Ignitor: LI533-H4

Ballast to Lamp Distance
(BTL) = 10 feet
Temp Rating: 105°C

Wiring Diagram:

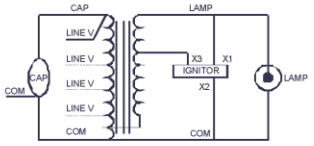


Fig. K3

U.L. RECOGNIZED

Typical Ordering Information

(please call Advance for suffix availability)

Order Suffix	Description
500D.	Ballast With Ignitor and Dry Film Capacitor
510D.	Ballast w/Welded Bracket, Ignitor, & Dry Film Capacitor
600.	Ballast and Ignitor, No Capacitor
610.	Ballast with Welded Bracket and Ignitor, No Capacitor

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

ADVANCE
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

05/13/99

Lamp GL1

6/4/2007

F32T8 TL830 ALTO

Product family description
Environmentally-responsible lamps.

Features/Benefits

- The only T8 lamps to deliver full rated average life on all T8 ballasts types (Instant Start, Rapid Start, Programmed Start, and Hybrid ballasts).
- Low mercury: TCLP® compliant.
- Energy efficient.
- Sustainable lighting solutions; Less mercury and fewer lamps in landfills, combined with energy efficiency and long life reduces the impact on the environment.
- Our Green End-Caps mean you are using environmentally-responsble lamps.
- HI-VISION® Phosphor combined with Philips exclusive cathode guard delivers: 95% lumen maintenance; reduced lamp-end blackening.
- 85 CRI for TL80 lamps; 78 CRI for TL70 lamps.

Applications

- Ideal for any lighting application requiring maximum quality of light and maintained light output.

Notes

- Rated average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Lamp life is appreciably longer if lamps are started less frequently. (202)
- Average life under engineering data with lamps turned off and restarted once every 12 operating hours.(241)
- Approximate Initial Lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life, when the output is measured during operation on a reference ballast under standard laboratory conditions. (203)
- For expected lamp lumen output, commercial ballast manufacturers can advise the appropriate Ballast Factor for each of their ballasts when they are informed of the designated lamp. The Ballast Factor is a multiplier applied to the designated lamp lumen output. (204)
- Design Lumens are the approximate lamp lumen output at 40% of the lamp's Rated Average Life. This output is based upon measurements obtained during lamp operation on a reference ballast under standard laboratory conditions. (208)

Product data	
Product Number	246678

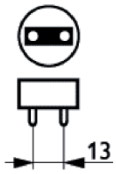
PHILIPS

1

Product data	
Full product name	F32T8 TL830 ALTO
Ordering Code	F32T8/TL830/ALTO
Pack type	1 Lamp
Pieces per Sku	1
Skus/Case	25
Pack UPC	046677246679
EAN2US	
Case Bar Code	50046677246674
Successor Product number	
Base	Medium Bi-Pin [Medium Bi-Pin Fluorescent]
Base Information	Green Base
Bulb	T8
Packing Type	1LP [1 Lamp]
Packing Configuration	25
Life with 3h/day use [years]	7an
Name Type	F32T8
Feature	ALTO®
Ordering Code	F32T8/TL830/ALTO
Pack UPC	046677246679
Case Bar Code	50046677246674
Energy Saving Product	Energy Saving
Rated Avg Life [12-Hr Prog St]	36000 hr
Rated Avg Life [12-Hr Inst St]	30000 hr
Rated Avg Life [3-Hr Prog St]	30000 hr
Rated Avg Life [3-Hr Inst St]	24000 hr
Watts	32W
Mercury (Hg) Content	3.5 mg
Color Code	TL830 [CCT of 3000K]
Color Rendering Index	85 Ra8
Color Temperature	3000 K
Initial Lumens	2950 Lm
Design Mean Lumens	2800 Lm
Nominal Length [inch]	48
Product Number	246678

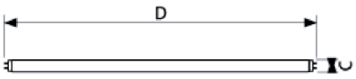
PHILIPS

F-T8-Unv Med Bipin/GB



Base Medium Bi-Pin

Energy Saving Product Energy Saving



F-T8-Unv Med Bipin

Lamp GL2

9/4/2007

F25T8 ADV830 ALTO

Product family description
High performance, long life, environmentally-responsible lamps.

Features/Benefits

- 3100 lumens is 10% more than standard T8 lamps.
- Low mercury: TCLP* compliant.
- Sustainable lighting solutions; Less mercury and fewer lamps in landfills, combined with energy efficiency and long life reduces the impact on the environment.
- HI-VISION® Phosphor combined with Philips exclusive cathode guard delivers: 95% lumen maintenance; reduced lamp-end blackening.
- Our Green End-Caps mean you are using environmentally-responsible lamps.
- 85 CRI.
- Higher lumens enables multiple system options to maximize energy saving and reduce lighting costs.
- Fully dimmable withouth burn-in.

Applications

- Ideal fot T8 applications requiring maximum light output and long life. Ideal for light harvesting.

Notes

- Rated average life under specified test conditions with lamps turned off and restarted no more frequently than once every 3 operating hours. Lamp life is appreciably longer if lamps are started less frequently. (202)
- Average life under engineering data with lamps turned off and restarted once every 12 operating hours. (241)
- Approximate Initial Lumens. The lamp lumen output is based upon lamp performance after 100 hours of operating life, when the output is measured during operation on a reference ballast under standard laboratory conditions. (203)
- For expected lamp lumen output, commercial ballast manufacturers can advise the appropriate Ballast Factor for each of their ballasts when they are informed of the designated lamp. The Ballast Factor is a multiplier applied to the designated lamp lumen output. (204)
- Design Lumens are the approximate lamp lumen output at 40% of the lamp's Rated Average Life. This output is based upon measurements obtained during lamp operation on a reference ballast under standard laboratory conditions. (208)
- Design lumens rated at 3 hours per start on Instant Start ballast. (239)
- Exclusive to Philips Lighting Company.

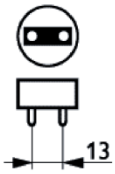
PHILIPS

1

Product data	
Product Number	204883
Full product name	F25T8 ADV830 ALTO
Ordering Code	F25T8/ADV830/ALTO
Pack type	1 Lamp
Pieces per Sku	1
Skus/Case	25
Pack UPC	046677204884
EAN2US	
Case Bar Code	50046677204889
Successor Product number	
Base	Medium Bi-Pin [Medium Bi-Pin Fluorescent]
Base Information	Green Base
Bulb	T8
Packing Type	1LP [1 Lamp]
Packing Configuration	25
Name Type	F25T8
Feature	ALTO®
Ordering Code	F25T8/ADV830/ALTO
Pack UPC	046677204884
Case Bar Code	50046677204889
Energy Saving Product	Energy Saving
Rated Avg Life [12-Hr Prog St]	36000 hr
Rated Avg Life [12-Hr Inst St]	30000 hr
Rated Avg Life [3-Hr Prog St]	30000 hr
Rated Avg Life [3-Hr Inst St]	24000 hr
Watts	25W
Mercury (Hg) Content	3.5 mg
Color Code	Advantage 830 [CCT of 3000K]
Color Rendering Index	85 Ra8
Color Temperature	3000 K
Initial Lumens	2380 Lm
Design Mean Lumens	2330 Lm
Nominal Length [inch]	36
Product Number	204883

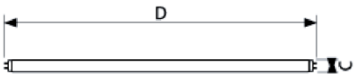
PHILIPS

F-T8-Adv Med Bipin/GB



Base Medium Bi-Pin

Energy Saving Product Energy Saving



F-T8-Adv Med Bipin

Lamp GL3

Product Information Bulletin

DULUX® T/E/IN/EOL ECO®

4-Pin Amalgam Compact Fluorescent Lamps

- End-of-Life (EOL) shutdown protection
- Designed to pass Federal TCLP Test*
- Improved high temperature performance
  – Maintains 90% lumens from 40° to 140°F ambient
- Operates on various ballast systems
  – Flicker free start on electronic ballasts
  – Compatible with QUICKTRONIC® System CF
- Less power consumption than incandescent of comparable light output
- High luminous efficacy
- Long 12,000 hour average rated life
  – Reduces relamping requirement and related cost
- Rare earth tri-phosphor with 82 CRI
- 2700K, 3000K, 3500K and 4100K

* Regulations may vary. Check your local and state regulations.

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.

SYLVANIA DULUX T/E/IN/EOL ECO amalgam compact fluorescent lamps are ideal for use in a wide range of applications, including high temperatures. They are designed to be operated on energy efficient electronic and dimming ballasts.

DULUX T/E/IN/EOL ECO amalgam lamps are ideal for fixtures where shorter overall length lamps with higher lumen packages are required and where lamps may operate at elevated temperatures. In addition, the delta tube configuration of these lamps provides an even light distribution.

Product Availability

Lamp	Wattage	Rated Lumens
CF18DT/E/IN	18	1200
CF26DT/E/IN	26	1800
CF32DT/E/IN	32	2400
CF42DT/E/IN	42	3200
CF57DT/E/IN	57	4300
CF70DT/E/IN*	70	5200

* Contact your SYLVANIA sales representative for product availability

System Comparison

Compact Fluorescent vs Incandescent

Lamp Type	Rated Lamp Life	System Lumens	System Wattage	System LPW	Energy[1] Savings
100W Incandescent	750 hrs.	1710	100W	17	–
DULUX T/E/IN 26W w/ QUICKTRONIC CF	12,000 hrs.	1830	28W	65	$86.00
150W Incandescent	750 hrs.	2740	150W	18.5	–
DULUX T/E/IN 42W w/ QUICKTRONIC CF	12,000 hrs.	3200	46W	70	$124.00
200W Incandescent	750 hrs.	3650	200W	19	–
DULUX T/E/IN 57W w/ QUICKTRONIC CF	12,000 hrs.	4300	62W	69	$165.00

1. Based on $.10/kWh over 12,000 hours.

Application Information

Applications
Recessed ceiling fixtures
Industrial lighting
Showcase lighting
Wall sconces
Task lighting
Exit signs
Garden and walkway lighting

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible operating systems.

Application Notes

1. 4-Pin lamps designed for dimming and electronic ballast operation.
2. Minimum starting temperature depends on ballast.
3. Rule of thumb: to estimate the appropriate compact fluorescent lamp wattage, divide the incandescent wattage by 4.
4. Equipment manufacturers are advised to consult ANSI and IEC standards for the maximum allowable dimensions and temperature to insure compatibility with similar products.
5. QUICKTRONIC System CF electronic ballasts available for all wattages: 18W, 26W, 32W, 42W, 57W & 70W.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

CF022R4

Sample Specification
Lamp(s) shall be (a) DULUX (CF18DT/IN, CF26DT/E/IN, CF32DT/E/IN, CF42DT/E/IN, CF57DT/E/IN or CF70DT/E/IN) EOL ECO lamps, with end-of-life shutdown protection and pass existing Federal TCLP limits. Lamp(s) shall have an average rated life of 12,000 hours, a correlated color temperature of (2700K, 3000K, 3500K or 4100K), and a CRI of 82. Lamps shall have a (GX24q-2, GX24q-3, GX24q-4, GX24q-5 or GX24q-6) plug-in, 4-pin base and be suitable for use on electronic and dimming ballasts. Lamps shall be operated by QUICKTRONIC ballasts. Both lamps and ballasts are covered by the QUICK 60+ system warranty.

Warranty Information
QUICK 60+ warranty for OSRAM SYLVANIA lamp and ballast combination
Limited 6 month lamp warranty and a five year ballast warranty is possible if both lamps and ballasts are provided by OSRAM SYLVANIA. See the QUICK 60+ warranty for details and restrictions.

Ordering and Specification Information

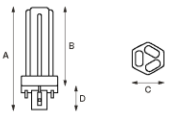
Item Number	Ordering Abbreviation	NEMA Generic Designation	Base	Watts	Volts[1]	Amps[1]	Initial Lumens	Mean Lumens[2]	Color Temp.	CRI	Av. Rated Life(hrs.)[3]
20875	CF18DT/E/IN/827	CFM18W/GX24q/27	GX24q-2	18	80	.210	1200	1032	2700K	82	12,000
20876	CF18DT/E/IN/830	CFM18W/GX24q/30	GX24q-2	18	80	.210	1200	1032	3000K	82	12,000
20877	CF18DT/E/IN/835	CFM18W/GX24q/35	GX24q-2	18	80	.210	1200	1032	3500K	82	12,000
20878	CF18DT/E/IN/841	CFM18W/GX24q/41	GX24q-2	18	80	.210	1200	1032	4100K	82	12,000
20879	CF26DT/E/IN/827	CFM26W/GX24q/27	GX24q-3	26	80	.300	1800	1548	2700K	82	12,000
20880	CF26DT/E/IN/830	CFM26W/GX24q/30	GX24q-3	26	80	.300	1800	1548	3000K	82	12,000
20881	CF26DT/E/IN/835	CFM26W/GX24q/35	GX24q-3	26	80	.300	1800	1548	3500K	82	12,000
20882	CF26DT/E/IN/841	CFM26W/GX24q/41	GX24q-3	26	80	.300	1800	1548	4100K	82	12,000
20883	CF32DT/E/IN/827	CFM32W/GX24q/27	GX24q-3	32	100	.320	2400	2064	2700K	82	12,000
20884	CF32DT/E/IN/830	CFM32W/GX24q/30	GX24q-3	32	100	.320	2400	2064	3000K	82	12,000
20885	CF32DT/E/IN/835	CFM32W/GX24q/35	GX24q-3	32	100	.320	2400	2064	3500K	82	12,000
20886	CF32DT/E/IN/841	CFM32W/GX24q/41	GX24q-3	32	100	.320	2400	2064	4100K	82	12,000
20887	CF42DT/E/IN/827	CFM42W/GX24q/27	GX24q-4	42	135	.320	3200	2752	2700K	82	12,000
20888	CF42DT/E/IN/830	CFM42W/GX24q/30	GX24q-4	42	135	.320	3200	2752	3000K	82	12,000
20871	CF42DT/E/IN/835	CFM42W/GX24q/35	GX24q-4	42	135	.320	3200	2752	3500K	82	12,000
20890	CF42DT/E/IN/841	CFM42W/GX24q/41	GX24q-4	42	135	.320	3200	2752	4100K	82	12,000
20895	CF57DT/E/IN/827[4]	CFM57W/GX24q/27	GX24q-5	57	182	.320	4300	3698	2700K	82	12,000
20896	CF57DT/E/IN/830[4]	CFM57W/GX24q/30	GX24q-5	57	182	.320	4300	3698	3000K	82	12,000
20897	CF57DT/E/IN/835[4]	CFM57W/GX24q/35	GX24q-5	57	182	.320	4300	3698	3500K	82	12,000
20899	CF57DT/E/IN/841[4]	CFM57W/GX24q/41	GX24q-5	57	182	.320	4300	3698	4100K	82	12,000
20794	CF70DT/E/IN/827[4,5,6]	CFM70W/GX24q/27	GX24q-6	70	220	.320	5200	4470	2700K	82	12,000
20795	CF70DT/E/IN/830[4,5,6]	CFM70W/GX24q/30	GX24q-6	70	220	.320	5200	4470	3000K	82	12,000
20796	CF70DT/E/IN/835[4,5,6]	CFM70W/GX24q/35	GX24q-6	70	220	.320	5200	4470	3500K	82	12,000
20797	CF70DT/E/IN/841[4,5,6]	CFM70W/GX24q/41	GX24q-6	70	220	.320	5200	4470	4100K	82	12,000

1. @ 25 KHz
2. Measured at 40% (4800 hours) of rated life.
3. Based on 3 hours per start. Number of operating hours when half have failed and half are still operating.
4. EOL protection incorporated into all 57W and 70W DULUX T/E ballasts per NEMA guidelines.
5. TCLP testing in progress; expect results by June 2005.
6. Contact your SYLVANIA sales representative for product availability

Ordering Guide

CF	26	DT	/	E	/	IN	/	835
Compact Fluorescent	Wattage 18, 26, 32, 42, 57 or 70 watts	DULUX Triple		For electronic and dimming ballasts		Amalgam		82 CRI 27 = 2700K 30 = 3000K 35 = 3500K 41 = 4100K

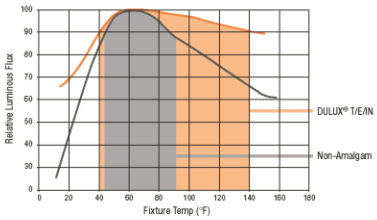
Dimensions



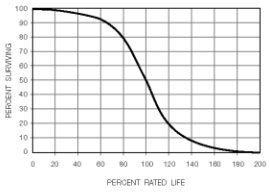
	(A) MOL [in. (mm)]	(B) Max. Base Face to Top of Lamp [in. (mm)]	(C) Max. Base Width [in. (mm)]	(D) Guide Post [in. (mm)]
CF18T/E/IN	4.77 (111)	3.74 (95)	1.90 (49)	0.62 (16)
CF26T/E/IN	4.96 (126)	4.33 (110)	1.90 (49)	0.62 (16)
CF32T/E/IN	5.60 (142)	4.96 (126)	1.90 (49)	0.62 (16)
CF42T/E/IN	6.42 (163)	5.79 (147)	1.90 (49)	0.62 (16)
CF57T/E/IN	7.76 (197)	7.13 (181)	1.90 (49)	0.62 (16)
CF70T/E/IN	9.25 (235)	8.62 (219)	1.90 (49)	0.62 (16)

Technical Information

90% Lumen Performance Range
DULUX® T/E/IN vs. Non-Amalgam Lamps



Typical Fluorescent Lamp Mortality



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Visit our website: www.sylvania.com

Product Information Bulletin

DULUX® T/E/IN/EOL ECO®

4-Pin Amalgam Compact Fluorescent Lamps

- End-of-Life (EOL) shutdown protection
- Designed to pass Federal TCLP Test*
- Improved high temperature performance
  – Maintains 90% lumens from 40° to 140°F ambient
- Operates on various ballast systems
  – Flicker free start on electronic ballasts
  – Compatible with QUICKTRONIC® System CF
- Less power consumption than incandescent of comparable light output
- High luminous efficacy
- Long 12,000 hour average rated life
  – Reduces relamping requirement and related cost
- Rare earth tri-phosphor with 82 CRI
- 2700K, 3000K, 3500K and 4100K

* Regulations may vary. Check your local and state regulations.

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.

SYLVANIA DULUX T/E/IN/EOL ECO amalgam compact fluorescent lamps are ideal for use in a wide range of applications, including high temperatures. They are designed to be operated on energy efficient electronic and dimming ballasts.

DULUX T/E/IN/EOL ECO amalgam lamps are ideal for fixtures where shorter overall length lamps with higher lumen packages are required and where lamps may operate at elevated temperatures. In addition, the delta tube configuration of these lamps provides an even light distribution.

Product Availability

Lamp	Wattage	Rated Lumens
CF18DT/E/IN	18	1200
CF26DT/E/IN	26	1800
CF32DT/E/IN	32	2400
CF42DT/E/IN	42	3200
CF57DT/E/IN	57	4300
CF70DT/E/IN*	70	5200

* Contact your SYLVANIA sales representative for product availability

System Comparison

Compact Fluorescent vs Incandescent

Lamp Type	Rated Lamp Life	System Lumens	System Wattage	System LPW	Energy[1] Savings
100W Incandescent	750 hrs.	1710	100W	17	–
DULUX T/E/IN 26W w/ QUICKTRONIC CF	12,000 hrs.	1830	28W	65	$86.00
150W Incandescent	750 hrs.	2740	150W	18.5	–
DULUX T/E/IN 42W w/ QUICKTRONIC CF	12,000 hrs.	3200	46W	70	$124.00
200W Incandescent	750 hrs.	3650	200W	19	–
DULUX T/E/IN 57W w/ QUICKTRONIC CF	12,000 hrs.	4300	62W	69	$165.00

1. Based on $.10/kWh over 12,000 hours.

Application Information

Applications
Recessed ceiling fixtures
Industrial lighting
Showcase lighting
Wall sconces
Task lighting
Exit signs
Garden and walkway lighting

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible operating systems.

Application Notes

1. 4-Pin lamps designed for dimming and electronic ballast operation.
2. Minimum starting temperature depends on ballast.
3. Rule of thumb: to estimate the appropriate compact fluorescent lamp wattage, divide the incandescent wattage by 4.
4. Equipment manufacturers are advised to consult ANSI and IEC standards for the maximum allowable dimensions and temperature to insure compatibility with similar products.
5. QUICKTRONIC System CF electronic ballasts available for all wattages: 18W, 26W, 32W, 42W, 57W & 70W.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

CF022R4

Sample Specification
Lamp(s) shall be (a) DULUX (CF18DT/IN, CF26DT/E/IN, CF32DT/E/IN, CF42DT/E/IN, CF57DT/E/IN or CF70DT/E/IN) EOL ECO lamps, with end-of-life shutdown protection and pass existing Federal TCLP limits. Lamp(s) shall have an average rated life of 12,000 hours, a correlated color temperature of (2700K, 3000K, 3500K or 4100K), and a CRI of 82. Lamps shall have a (GX24q-2, GX24q-3, GX24q-4, GX24q-5 or GX24q-6) plug-in, 4-pin base and be suitable for use on electronic and dimming ballasts. Lamps shall be operated by QUICKTRONIC ballasts. Both lamps and ballasts are covered by the QUICK 60+ system warranty.

Warranty Information
QUICK 60+ warranty for OSRAM SYLVANIA lamp and ballast combination
Limited 6 month lamp warranty and a five year ballast warranty is possible if both lamps and ballasts are provided by OSRAM SYLVANIA. See the QUICK 60+ warranty for details and restrictions.

Ordering and Specification Information

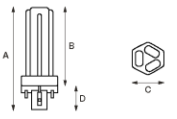
Item Number	Ordering Abbreviation	NEMA Generic Designation	Base	Watts	Volts[1]	Amps[1]	Initial Lumens	Mean Lumens[2]	Color Temp.	CRI	Av. Rated Life(hrs.)[3]
20875	CF18DT/E/IN/827	CFM18W/GX24q/27	GX24q-2	18	80	.210	1200	1032	2700K	82	12,000
20876	CF18DT/E/IN/830	CFM18W/GX24q/30	GX24q-2	18	80	.210	1200	1032	3000K	82	12,000
20877	CF18DT/E/IN/835	CFM18W/GX24q/35	GX24q-2	18	80	.210	1200	1032	3500K	82	12,000
20878	CF18DT/E/IN/841	CFM18W/GX24q/41	GX24q-2	18	80	.210	1200	1032	4100K	82	12,000
20879	CF26DT/E/IN/827	CFM26W/GX24q/27	GX24q-3	26	80	.300	1800	1548	2700K	82	12,000
20880	CF26DT/E/IN/830	CFM26W/GX24q/30	GX24q-3	26	80	.300	1800	1548	3000K	82	12,000
20881	CF26DT/E/IN/835	CFM26W/GX24q/35	GX24q-3	26	80	.300	1800	1548	3500K	82	12,000
20882	CF26DT/E/IN/841	CFM26W/GX24q/41	GX24q-3	26	80	.300	1800	1548	4100K	82	12,000
20883	CF32DT/E/IN/827	CFM32W/GX24q/27	GX24q-3	32	100	.320	2400	2064	2700K	82	12,000
20884	CF32DT/E/IN/830	CFM32W/GX24q/30	GX24q-3	32	100	.320	2400	2064	3000K	82	12,000
20885	CF32DT/E/IN/835	CFM32W/GX24q/35	GX24q-3	32	100	.320	2400	2064	3500K	82	12,000
20886	CF32DT/E/IN/841	CFM32W/GX24q/41	GX24q-3	32	100	.320	2400	2064	4100K	82	12,000
20887	CF42DT/E/IN/827	CFM42W/GX24q/27	GX24q-4	42	135	.320	3200	2752	2700K	82	12,000
20888	CF42DT/E/IN/830	CFM42W/GX24q/30	GX24q-4	42	135	.320	3200	2752	3000K	82	12,000
20871	CF42DT/E/IN/835	CFM42W/GX24q/35	GX24q-4	42	135	.320	3200	2752	3500K	82	12,000
20890	CF42DT/E/IN/841	CFM42W/GX24q/41	GX24q-4	42	135	.320	3200	2752	4100K	82	12,000
20895	CF57DT/E/IN/827[4]	CFM57W/GX24q/27	GX24q-5	57	182	.320	4300	3698	2700K	82	12,000
20896	CF57DT/E/IN/830[4]	CFM57W/GX24q/30	GX24q-5	57	182	.320	4300	3698	3000K	82	12,000
20897	CF57DT/E/IN/835[4]	CFM57W/GX24q/35	GX24q-5	57	182	.320	4300	3698	3500K	82	12,000
20899	CF57DT/E/IN/841[4]	CFM57W/GX24q/41	GX24q-5	57	182	.320	4300	3698	4100K	82	12,000
20794	CF70DT/E/IN/827[4,5,6]	CFM70W/GX24q/27	GX24q-6	70	220	.320	5200	4470	2700K	82	12,000
20795	CF70DT/E/IN/830[4,5,6]	CFM70W/GX24q/30	GX24q-6	70	220	.320	5200	4470	3000K	82	12,000
20796	CF70DT/E/IN/835[4,5,6]	CFM70W/GX24q/35	GX24q-6	70	220	.320	5200	4470	3500K	82	12,000
20797	CF70DT/E/IN/841[4,5,6]	CFM70W/GX24q/41	GX24q-6	70	220	.320	5200	4470	4100K	82	12,000

1. @ 25 KHz
2. Measured at 40% (4800 hours) of rated life.
3. Based on 3 hours per start. Number of operating hours when half have failed and half are still operating.
4. EOL protection incorporated into all 57W and 70W DULUX T/E ballasts per NEMA guidelines.
5. TCLP testing in progress; expect results by June 2005.
6. Contact your SYLVANIA sales representative for product availability

Ordering Guide

CF	26	DT	/	E	/	IN	/	835
Compact Fluorescent	Wattage 18, 26, 32, 42, 57 or 70 watts	DULUX Triple		For electronic and dimming ballasts		Amalgam		82 CRI 27 = 2700K 30 = 3000K 35 = 3500K 41 = 4100K

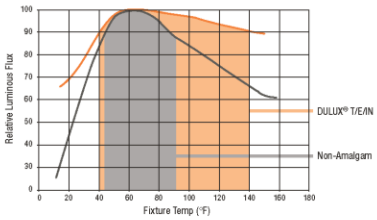
Dimensions



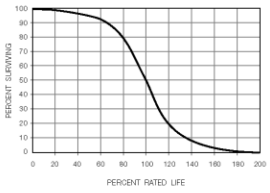
	(A) MOL [in. (mm)]	(B) Max. Base Face to Top of Lamp [in. (mm)]	(C) Max. Base Width [in. (mm)]	(D) Guide Post [in. (mm)]
CF18T/E/IN	4.77 (111)	3.74 (95)	1.90 (49)	0.62 (16)
CF26T/E/IN	4.96 (126)	4.33 (110)	1.90 (49)	0.62 (16)
CF32T/E/IN	5.60 (142)	4.96 (126)	1.90 (49)	0.62 (16)
CF42T/E/IN	6.42 (163)	5.79 (147)	1.90 (49)	0.62 (16)
CF57T/E/IN	7.76 (197)	7.13 (181)	1.90 (49)	0.62 (16)
CF70T/E/IN	9.25 (235)	8.62 (219)	1.90 (49)	0.62 (16)

Technical Information

90% Lumen Performance Range
DULUX® T/E/IN vs. Non-Amalgam Lamps



Typical Fluorescent Lamp Mortality



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Lamp GL5

Product Information Bulletin

METALARC® POWERBALL® CERAMIC T LAMPS

High CRI, Ceramic Metal Halide Tubular Single & Double-Ended Lamps

Advantages of Ceramic Arc Tube Technology

- Excellent CRI, greater than 82, yields more natural colors
- Long life and high efficacy
- Lower thermal output than tungsten halogen lamps having similar light output
- Superior color stability over the life of the lamp
- Improved lamp to lamp color consistency*
- UV-Stop technology significantly reduces UV output and minimizes discoloration and fading of materials
- Pulse start arc tube technology
- Compact light sources improve fixture optics
- Strong G8.5 bases on TC lamps allow for more robust handling

* Compared to quartz metal halide lamps of similar wattage

METALARC® POWERBALL® CERAMIC T lamps meet today's color critical needs by combining conventional metal halide pulse start characteristics such as good efficacy and long life with improved lamp to lamp color consistency and high CRI.

Compared to conventional quartz metal halide products, SYLVANIA ceramic arc tube metal halide lamps exhibit less color variation and higher efficacy. Their high mean lumens, excellent color characteristics and compact size allow them to be used in a wide variety of applications.

METALARC POWERBALL CERAMIC lamps operate on existing ANSI specified magnetic ballasts and on compatible electronic ballasts. The lamps can be used in appropriate existing fixtures designed for metal halide lamps of similar wattages and configurations.

Product Availability

Wattage	Bulb Shapes
20	TC
39	T6, TC
70	T6, TC
150	T7.5

Application Information

Applications
Retail stores, malls, lobbies, office areas, landscape lighting, accent lighting, display lighting, studio lighting, industrial/commercial

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible electronic control systems.

Application Notes
1. METALARC POWERBALL CERAMIC T6, T7.5, TC and double-ended products must be operated in enclosed fixtures capable of containing particles as hot as 1200°C.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

HID054R4 11/06

Ordering and Specification Information

Item Number	Ordering Abbreviation	Watts	Bulb	Base	ANSI Code[4]	Avg. Rated Life (hrs)	Initial Lumens	Mean Lumens	CCT	CRI
64882	MC20TC/U/G8.5/830 PB[1,3]	20	T4.5	BiPin G8.5	M156/E	12,000	1700	1275	3000K	83
64791	MC39TC/U/G8.5/830 PB[1,2]	39	T4.5	BiPin G8.5	M130/E	12,000	3400	2720	3000K	82
64363	MC39T6/U/G12/830 PB[1,2]	39	T6	G12	M130/E	12,000	3400	2720	3000K	82
64325	MC39T6/U/G12/940 PB[1,2]	39	T6	G12	M130/E	12,000	3300	2640	4200K	90
64825	MC70TC/U/G8.5/930 PB [1,2]	70	T4.5	BiPin G8.5	M139/E, M98/E	12,000	6300	5040	3000K	95
64361	MC70T6/U/G12/830 PB[1,2]	70	T6	G12	M139/E, M98/E	12,000	7000	5600	3000K	87
64200	MC70T6/U/G12/930 PB [1,2]	70	T6	G12	M139/E, M98/E	12,000	6400	5120	3000K	95
64338	MC70T6/U/G12/940 PB[1,2]	70	T6	G12	M139/E, M98/E	12,000	6700	5360	4200K	93
64359	MC150T7.5/U/G12/830 PB[1]	150	T7.5	G12	M102/E, M142/E	12,000	15,500	12,400	3000K	89
64337	MC150T7.5/U/G12/940 PB[1]	150	T7.5	G12	M102/E, M142/E	12,000	14,500	11,600	4200K	95

Item Number	Ordering Abbreviation	Watts	Bulb	Base	ANSI Code[4]	Avg. Rated Life (hrs)	Initial Lumens	Mean Lumens	CCT	CRI
64793	MC70T6/DE/830 PB[2]	70	T6	R7S RSC	M139/E, M85/E, M98/E	12,000	6900	5520	3000K	88
64794	MC150T7.5/DE/830 PB	150	T7.5	R7S RSC	M102/E, M142/E, M81/E	12,000	14,800	11,840	3000K	91

Footnotes:

1. The circuit must include overcurrent protection (i.e., Thermally Switched Ballast).
2. Minimum open circuit voltage for starting is measured with the ignitor in the circuit, minimum open circuit voltage is 209 V_{RMS}.
3. Designed for operation only on electronic ballasts.
4. The first letter of an ANSI high-intensity discharge lamp designation represents the lamp type. "M" represents quartz metal halide lamps and "C" represents ceramic metal halide lamps. Following the lamp type, there is a number representing the electrical characteristics of the ballast. "M" or "C" lamps with the same electrical numbers will operate on the same ballasts (per ANSI C78.380-2005). For example, a 150W ceramic metal halide lamp that is intended to operate on a ballast intended for M102 quartz metal halide lamps would have the designation C102.

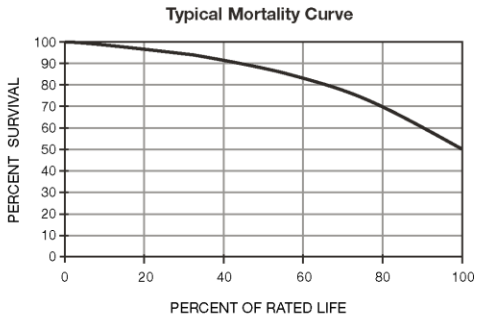
General Notes:

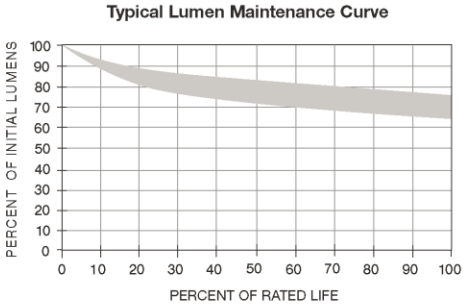
- Contact your local OSRAM SYLVANIA representative for compatible electronic ballasts.
- All ceramic lamps should be used with 4000V pulse rated socket only.
- No special handling requirements during installation (i.e., gloves not required). Always follow normal safety precautions during installation.

Ordering Guide

MC	70	T6	/	U	/	G12	/	830	PB
M=METALARC C=CERAMIC	Wattage: 70	Bulb Shape: T6		Operating position: Universal		Base: G12		80+ CRI 3000K	PB=Powerball

Technical Information

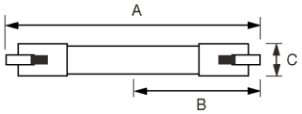




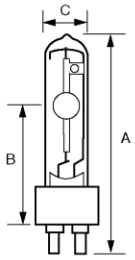
Dimensions

	(A) MOL	(B) LCL	(C) Bulb Diameter
TC	3.19"	2.05"	0.56"
T6/G12	3.94"	2.20"	0.75"
T7.5/G12	4.13"	2.20"	0.945"
T6/RSC	4.50"	2.25"	0.83"
T7.5/RSC	5.20"	2.60"	0.945"

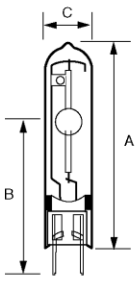
T/RSC



T6 (T7.5)/G12



TC



Lamp GL6

Product Information Bulletin

METALARC® POWERBALL® CERAMIC T LAMPS

High CRI, Ceramic Metal Halide Tubular Single & Double-Ended Lamps

Advantages of Ceramic Arc Tube Technology

- Excellent CRI, greater than 82, yields more natural colors
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- Lower thermal output than tungsten halogen lamps having similar light output
- Superior color stability over the life of the lamp
- Improved lamp to lamp color consistency*
- UV-Stop technology significantly reduces UV output and minimizes discoloration and fading of materials
- Pulse start arc tube technology
- Compact light sources improve fixture optics
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* Compared to quartz metal halide lamps of similar wattage

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Compared to conventional quartz metal halide products, SYLVANIA ceramic arc tube metal halide lamps exhibit less color variation and higher efficacy. Their high mean lumens, excellent color characteristics and compact size allow them to be used in a wide variety of applications.

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Product Availability

Wattage	Bulb Shapes
20	TC
39	T6, TC
70	T6, TC
150	T7.5

Application Information

Applications
Retail stores, malls, lobbies, office areas, landscape lighting, accent lighting, display lighting, studio lighting, industrial/commercial

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible electronic control systems.

Application Notes
1. METALARC POWERBALL CERAMIC T6, T7.5, TC and double-ended products must be operated in enclosed fixtures capable of containing particles as hot as 1200°C.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

HID054R4 11/06

Ordering and Specification Information

Item Number	Ordering Abbreviation	Watts	Bulb	Base	ANSI Code[4]	Avg. Rated Life (hrs)	Initial Lumens	Mean Lumens	CCT	CRI
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64791	MC39TC/U/G8.5/830 PB[1,2]	39	T4.5	BiPin G8.5	M130/E	12,000	3400	2720	3000K	82
64363	MC39T6/U/G12/830 PB[1,2]	39	T6	G12	M130/E	12,000	3400	2720	3000K	82
64325	MC39T6/U/G12/940 PB[1,2]	39	T6	G12	M130/E	12,000	3300	2640	4200K	90
64825	MC70TC/U/G8.5/930 PB [1,2]	70	T4.5	BiPin G8.5	M139/E, M98/E	12,000	6300	5040	3000K	95
64361	MC70T6/U/G12/830 PB[1,2]	70	T6	G12	M139/E, M98/E	12,000	7000	5600	3000K	87
64200	MC70T6/U/G12/930 PB [1,2]	70	T6	G12	M139/E, M98/E	12,000	6400	5120	3000K	95
64338	MC70T6/U/G12/940 PB[1,2]	70	T6	G12	M139/E, M98/E	12,000	6700	5360	4200K	93
64359	MC150T7.5/U/G12/830 PB[1]	150	T7.5	G12	M102/E, M142/E	12,000	15,500	12,400	3000K	89
64337	MC150T7.5/U/G12/940 PB[1]	150	T7.5	G12	M102/E, M142/E	12,000	14,500	11,600	4200K	95

Item Number	Ordering Abbreviation	Watts	Bulb	Base	ANSI Code[4]	Avg. Rated Life (hrs)	Initial Lumens	Mean Lumens	CCT	CRI
64793	MC70T6/DE/830 PB[2]	70	T6	R7S RSC	M139/E, M85/E, M98/E	12,000	6900	5520	3000K	88
64794	MC150T7.5/DE/830 PB	150	T7.5	R7S RSC	M102/E, M142/E, M81/E	12,000	14,800	11,840	3000K	91

Footnotes:

1. The circuit must include overcurrent protection (i.e., Thermally Switched Ballast).
2. Minimum open circuit voltage for starting is measured with the ignitor in the circuit, minimum open circuit voltage is 209 V_{RMS}.
3. Designed for operation only on electronic ballasts.
4. The first letter of an ANSI high-intensity discharge lamp designation represents the lamp type. "M" represents quartz metal halide lamps and "C" represents ceramic metal halide lamps. Following the lamp type, there is a number representing the electrical characteristics of the ballast. "M" or "C" lamps with the same electrical numbers will operate on the same ballasts (per ANSI C78.380-2005). For example, a 150W ceramic metal halide lamp that is intended to operate on a ballast intended for M102 quartz metal halide lamps would have the designation C102.

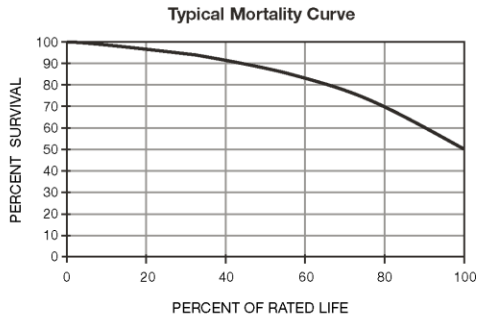
General Notes:

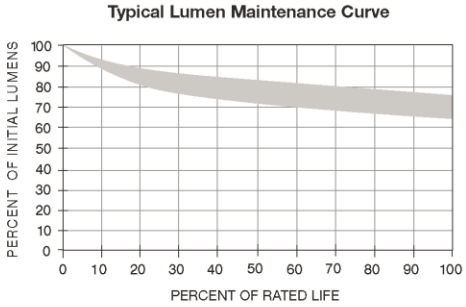
- Contact your local OSRAM SYLVANIA representative for compatible electronic ballasts.
- All ceramic lamps should be used with 4000V pulse rated socket only.
- No special handling requirements during installation (i.e., gloves not required). Always follow normal safety precautions during installation.

Ordering Guide

MC	70	T6	/	U	/	G12	/	830	PB
M=METALARC C=CERAMIC	Wattage: 70	Bulb Shape: T6		Operating position: Universal		Base: G12		80+ CRI 3000K	PB=Powerball

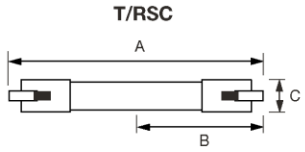
Technical Information

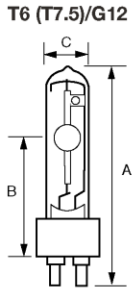


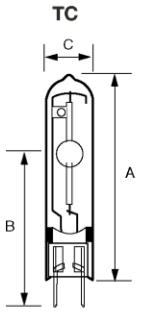


Dimensions

	(A) MOL	(B) LCL	(C) Bulb Diameter
TC	3.19"	2.05"	0.56"
T6/G12	3.94"	2.20"	0.75"
T7.5/G12	4.13"	2.20"	0.945"
T6/RSC	4.50"	2.25"	0.83"
T7.5/RSC	5.20"	2.60"	0.945"







Lamp GL7

Product Information Bulletin

METALARC® POWERBALL® CERAMIC T LAMPS

High CRI, Ceramic Metal Halide Tubular Single & Double-Ended Lamps

Advantages of Ceramic Arc Tube Technology

- Excellent CRI, greater than 82, yields more natural colors
- Long life and high efficacy
- Lower thermal output than tungsten halogen lamps having similar light output
- Superior color stability over the life of the lamp
- Improved lamp to lamp color consistency*
- UV-Stop technology significantly reduces UV output and minimizes discoloration and fading of materials
- Pulse start arc tube technology
- Compact light sources improve fixture optics
- Strong G8.5 bases on TC lamps allow for more robust handling

* Compared to quartz metal halide lamps of similar wattage

METALARC® POWERBALL® CERAMIC T lamps meet today's color critical needs by combining conventional metal halide pulse start characteristics such as good efficacy and long life with improved lamp to lamp color consistency and high CRI.

Compared to conventional quartz metal halide products, SYLVANIA ceramic arc tube metal halide lamps exhibit less color variation and higher efficacy. Their high mean lumens, excellent color characteristics and compact size allow them to be used in a wide variety of applications.

METALARC POWERBALL CERAMIC lamps operate on existing ANSI specified magnetic ballasts and on compatible electronic ballasts. The lamps can be used in appropriate existing fixtures designed for metal halide lamps of similar wattages and configurations.

Product Availability

Wattage	Bulb Shapes
20	TC
39	T6, TC
70	T6, TC
150	T7.5

Application Information

Applications
Retail stores, malls, lobbies, office areas, landscape lighting, accent lighting, display lighting, studio lighting, industrial/commercial

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible electronic control systems.

Application Notes
1. METALARC POWERBALL CERAMIC T6, T7.5, TC and double-ended products must be operated in enclosed fixtures capable of containing particles as hot as 1200°C.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

HID054R4 11/06

Ordering and Specification Information

Item Number	Ordering Abbreviation	Watts	Bulb	Base	ANSI Code[4]	Avg. Rated Life (hrs)	Initial Lumens	Mean Lumens	CCT	CRI
64882	MC20TC/U/G8.5/830 PB[1,3]	20	T4.5	BiPin G8.5	M156/E	12,000	1700	1275	3000K	83
64791	MC39TC/U/G8.5/830 PB[1,2]	39	T4.5	BiPin G8.5	M130/E	12,000	3400	2720	3000K	82
64363	MC39T6/U/G12/830 PB[1,2]	39	T6	G12	M130/E	12,000	3400	2720	3000K	82
64325	MC39T6/U/G12/940 PB[1,2]	39	T6	G12	M130/E	12,000	3300	2640	4200K	90
64825	MC70TC/U/G8.5/930 PB[1,2]	70	T4.5	BiPin G8.5	M139/E, M98/E	12,000	6300	5040	3000K	95
64361	MC70T6/U/G12/830 PB[1,2]	70	T6	G12	M139/E, M98/E	12,000	7000	5600	3000K	87
64200	MC70T6/U/G12/930 PB[1,2]	70	T6	G12	M139/E, M98/E	12,000	6400	5120	3000K	95
64338	MC70T6/U/G12/940 PB[1,2]	70	T6	G12	M139/E, M98/E	12,000	6700	5360	4200K	93
64359	MC150T7.5/U/G12/830 PB[1]	150	T7.5	G12	M102/E, M142/E	12,000	15,500	12,400	3000K	89
64337	MC150T7.5/U/G12/940 PB[1]	150	T7.5	G12	M102/E, M142/E	12,000	14,500	11,600	4200K	95

Item Number	Ordering Abbreviation	Watts	Bulb	Base	ANSI Code[4]	Avg. Rated Life (hrs)	Initial Lumens	Mean Lumens	CCT	CRI
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64794	MC150T7.5/DE/830 PB	150	T7.5	R7S RSC	M102/E, M142/E, M81/E	12,000	14,800	11,840	3000K	91

Footnotes:

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2. Minimum open circuit voltage for starting is measured with the ignitor in the circuit, minimum open circuit voltage is 209 V_{RMS}.
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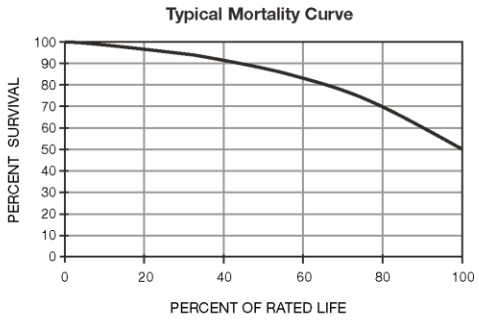
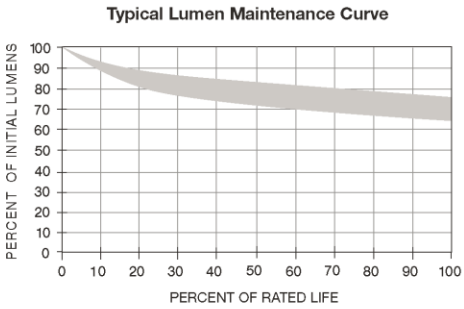
Ordering Guide

MC	70	T6	/	U	/	G12	/	830	PB
M=METALARC C=CERAMIC	Wattage: 70	Bulb Shape: T6		Operating position: Universal		Base: G12		80+ CRI 3000K	PB=Powerball

Technical Information

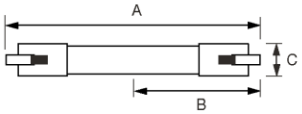




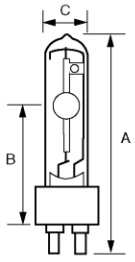
Dimensions

	(A) MOL	(B) LCL	(C) Bulb Diameter
TC	3.19"	2.05"	0.56"
T6/G12	3.94"	2.20"	0.75"
T7.5/G12	4.13"	2.20"	0.945"
T6/RSC	4.50"	2.25"	0.83"
T7.5/RSC	5.20"	2.60"	0.945"

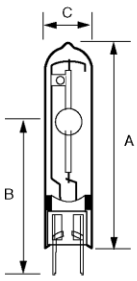
T/RSC



T6 (T7.5)/G12

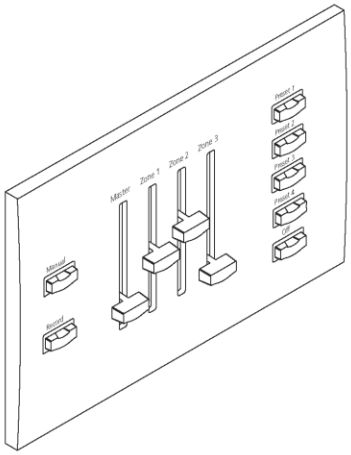


TC



ETC ARCHITECTURAL — Unison® Fader Station

Control Series



GENERAL INFORMATION

Unison fader stations provide comprehensive zone and preset control for architectural lighting applications. Fader stations are available in a wide variety of configurations and colors as well as custom options.

APPLICATIONS:
- Churches
- Hotels
- Convention Centers
- Meeting Rooms
- Schools
- Restaurants

FEATURES:
- Programmable buttons and faders
- Individual zone, and master control
- Preset record and selection
- Room Combine
- Macro activation
- Link Power control network
- Topology free wiring
- Connectorized station termination
- Designer appeal
- Custom finishes available (wood, metal)

ORDERING INFORMATION

Fader Stations

	Model #	Description	Legend
	U10100 - __1F	1 gang, 1 fader	Master
	U10101- __1F	1 gang, 1 fader, 1 button	Master, On/Off
	U10102- __1F	1 gang, 1 fader, 2 buttons	Master, On, Off
	U10105- __1F	1 gang, 1 fader, 5 buttons	Master, Preset 1-4, Off
	U30407- __1F*	3 gang, 4 fader, 7 buttons	Manual, Record, Master, Zone 1-3, Preset 1-4, Off
	U30412- __1F	3 gang, 4 fader, 12 buttons	Manual, Record, Master, Zone 1-3, Preset 1-9, Off
	U40707- __1F	4 gang, 7 fader, 7 buttons	Manual, Record, Master, Zone 1-6, Preset 1-4, Off
	U40712- __1F	4 gang, 7 fader, 12 buttons	Manual, Record, Master, Zone 1-6, Preset 1-9, Off
	U51007- __1F	5 gang, 10 fader, 7 buttons	Manual, Record, Master, Zone 1-9, Preset 1-4, Off
	U51012- __1F	5 gang, 10 fader, 12 buttons	Manual, Record, Master, Zone 1-9, Preset 1-9, Off
	U61307- __1F	6 gang, 13 fader, 7 buttons	Manual, Record, Master, Zone 1-12, Preset 1-4, Off
	U61312- __1F	6 gang, 13 fader, 12 buttons	Manual, Record, Master, Zone 1-12, Preset 1-9, Off
	U71607- __1F	7 gang, 16 fader, 7 buttons	Manual, Record, Master, Zone 1-15, Preset 1-4, Off
	U71612- __1F	7 gang, 16 fader, 12 buttons	Manual, Record, Master, Zone 1-15, Preset 1-9, Off

*Product shown above.

Notes:
Enter station color code in __ space provided. 1-white, 2-ivory, 3-gray, 4-black.
Above stations flush mount (F) in industry standard gang boxes.
Also available in surface mount (S) and portable (P) configurations.

ETC Architectural

Unison® Fader Station

Control Series

SPECIFICATIONS

MECHANICAL

Fader stations shall consist of an electronic assembly and faceplate.

Fader stations shall flush mount in industry standard gang boxes (provided by others). Surface mount back-boxes shall be available.

Station faceplates, buttons and knobs shall be constructed of injection molded, ABS plastic.

Fader station buttons and faders shall contain an integral LED status indicator.

Stations shall have no visible means of attachment.

All fader station legends shall be silk-screened in a scratch and wear resistant dark gray paint.

Stations shall be available in standard white, ivory, gray and black. Custom colors available with sample.

Fader stations shall utilize 45mm slide potentiometers with removable fader knobs and cantilever styled switch arrays with captivated buttons.

Stations shall be available with 1, 4, 7, 10, 13, or 16 faders and 1, 2, 5, 7, or 12 buttons. Custom fader stations available.

Portable fader stations shall be available.

Portable stations shall utilize wall mount station components in a light weight desk top consolette. See diagram of fader consolette.

ELECTRICAL

Fader stations shall connect to Echelon® Link Power control network.

Link Power network shall utilize low voltage Class II unshielded twisted pair, Belden type 8471 or equivalent and (1) #14 ESD drain wire (Drain wire not required when installed in grounded metal conduit).

Link Power network wiring shall not exceed 1500' (500m) without the use of a repeater. The REP, Repeater Option module shall increase network wire length in increments of 1500' (500m). Maximum (4) LCDs per power supply, total 32 stations per repeater.

Link Power network shall be topology free and polarity independent. Wiring may be bus, loop, home-run or any combination of these.

All station terminations shall be connectorized.

FUNCTIONAL

Fader stations shall be designed to operate standard default or custom system functions. Optional fader or button functions shall be programmable via Light Manager.

Optional button functions include: preset selection, manual mode activation, record mode activation, station lockout, raise, lower, macro activation, zone on/off control and wall open/close or toggle.

Optional fader functions include master, individual zone, fade rate or preset.

DIMENSIONS

Flush Backbox Dimensions

Gang	Height		Width		Depth	
	inches	cm	inches	cm	inches	cm
1 (RACO 690*)	3.75	9.53	2.0	5.08	2.5	6.35
3 (RACO 692*)	3.75	9.53	6.4	16.26	2.5	6.35
4 (RACO 693*)	3.75	9.53	8.2	20.83	2.5	6.35
5 (RACO 694*)	3.75	9.53	10.0	25.4	2.5	6.35
6 (RACO 695*)	3.75	9.53	11.8	29.97	2.5	6.35
7 (by ETC)	3.75	9.53	13.6	34.54	2.5	6.35

* or equivalent

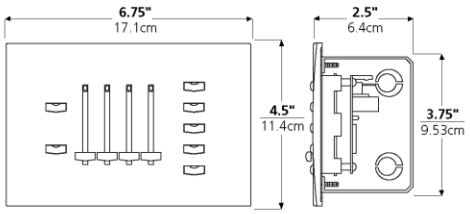
Surface Backbox Dimensions

Gang	Height		Width		Depth	
	inches	cm	inches	cm	inches	cm
1 (by ETC)	4.6	11.68	2.9	7.37	2.5	6.35
3 (by ETC)	4.6	11.68	6.9	17.53	2.5	6.35
4 (by ETC)	4.6	11.68	8.7	22.1	2.5	6.35
5 (by ETC)	4.6	11.68	10.5	26.67	2.5	6.35
6 (by ETC)	4.6	11.68	12.3	31.24	2.5	6.35
7 (by ETC)	4.6	11.68	14.1	35.81	2.5	6.35

Faceplate Dimensions

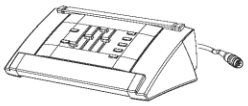
Gang	Height		Width	
	inches	cm	inches	cm
1	4.5	11.43	2.8	7.11
3	4.5	11.43	6.7	17.02
4	4.5	11.43	8.6	21.84
5	4.5	11.43	10.4	26.42
6	4.5	11.43	12.2	30.99
7	4.5	11.43	14.0	35.56

FRONT VIEW SIDE VIEW



Measurements vary with stations size.
See above table.

PORTABLE DESKTOP CONSOLETTE



Unison portable consolette option is available for all Unison stations.

For Portable Desktop Consolette dimensions add 10" to the length of the control station you are modifying. The height is a standard 6.5" and the length is 6.25". Portable stations are equipped with a 10" connector cable.

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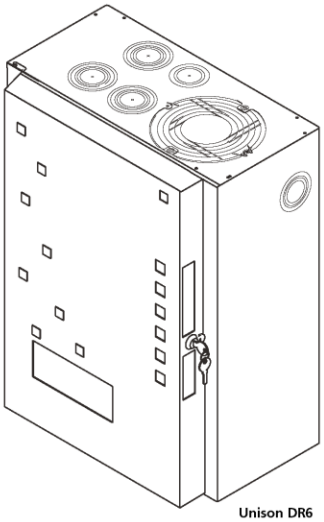
ETC ARCHITECTURAL

Unison® 120V Dimming Racks

DR Series



Unison DR6

GENERAL INFORMATION

Unison dimming, from ETC — low cost, flexible, modular dimming for architectural and theatrical lighting control applications.

APPLICATIONS
- Churches
- Hotels
- Convention Centers
- Theatres
- Schools
- Restaurants

FEATURES
- Low profile rack
- Fully pre-wired
- Easy installation, configuration and operation
- Scalable modular processing
- Backlit control electronics
- Single phase option
- Main breaker and bypass options
- Integral RS232 interface
- Dry contact interface
- Supports Dimmer Doubling™
- Controls incandescent, flourescent, low voltage, neon, and cold cathode load types

GENERAL
- Available in 100, 120, 230 and 277 Volt systems
- 6, 12 and 24 dual module configurations
  DR6-12, DR12-24, DR12-48.
- For use with ETC-Unison dual and single density dimmer modules
- Controls incandescent, low voltage, fluorescent, neon, and cold cathode load types
- Ambient Temperature
  32-104°F/0-40°C
- Ambient Humidity
  30-90° non-condensing
- UL and cUL Listed, CE Marked

ORDERING INFORMATION

120 Volt - DR Racks

Model#	Description
DR6-12-120	6 module rack - 120 Volt (12 circuits)
DR12-24-120	12 module rack - 120 Volt (24 circuits)
DR12-48-120*	(2) 12 module racks - 120 Volt (48 circuits)

*In 48 channel configurations, (2) 12 module racks are cross-bussed using AX Series main lug or main breaker enclosure.

120 Volt - AX Racks

Model#	Description
AX6-M-120-1	Auxiliary Rack with 200A Main Breaker for DR6 - 1ø, 3W
AX6-M-120-3	Auxiliary Rack with 100A Main Breaker for DR6 - 3ø, 4W
AX12-M-120-1	Auxiliary Rack with 400A Main Breaker for DR12 - 1ø, 3W
AX12-M-120-3	Auxiliary Rack with 200A Main Breaker for DR12 - 3ø, 4W*
AX12X-M-120-3	Auxiliary Rack with 400A Main Breaker for (2) DR12 - 3ø, 4W*
AX12X-ML-120-1	Auxiliary Rack with Cross-bus for (2) DR12 - 600A -1ø, 3W
AX12X-ML-120-3	Auxiliary Rack with Main Lug for (2) DR12 - 400A - 3ø, 4W*

*See Options/Accessories for reduced current trip plug options.

Control Modules

Model#	Description
CMd	Control module with dimming processor* (DMX only)
CMEd	Control module with dimming and station processor*

*A (d) dimming processor is required in every rack. One (E) station processor is required in each system using Unison stations.

Options and Accessories

Model#	Description
ARCH	Architectural Option Board (used in all stations)
FLO	Fluorescent Option Board (4-wire)
1PH6	Single phase strap kit for DR6
1PH12	Single phase strap kit for DR12
BYP	Bypass Option Board (for supplimented egress lighting)
100ATP	100 Amp trip plug for AX12 MCB Rack
200ATP	200 Amp trip plug for AX12X MCB Rack
STD	Floor mounting stand for DR rack
USI-I/O	Dry contact closure 8/in-8/out
RS232	RS232 interface (in)

Compatible Dimming Modules

Model#	Description
L10	Dual 10A Low Wattage Module 100V-120V 350µS
L10F	Dual 10A Fluorescent Low Wattage Module 100V-120V 350µS
D15	Dual 15A Universal Module 100V-120V 350µS
D15E	Dual 15A Universal Module 100V-120V 500µS
D15F	Single 15A Fluorescent Module (3 wire) 100V-120V
R15	Dual 15A Relay Module
CC15	Dual 15A Constant Circuit
D20	Dual 20A Universal Module 100V-120V 350µS
D20E	Dual 20A Universal Module 100V-120V 500µS
D20F	Single 20A Fluorescent Module (3 wire) 100V-120V
R20	Dual 20A Relay Module
CC20	Dual 20A Constant Circuit
AFM	Airflow Module

ETC Architectural

SPECIFICATIONS

MECHANICAL
- Welded 18-gauge formed steel construction
- Surface or floor mount stand
- Hinged, lockable full-height door with electrostatic air filter
- Fine textured, scratch resistant, gray epoxy paint
- Integral low-noise fan
- Modular control electronics w/ backlit 20 character LCD

ELECTRICAL
- 100, 120, 230, and 277 Volt, 3 phase systems – voltage range tolerance ± 10%
- 1 phase option kit (120 and 230 Volt only)
- 50-60Hz. Operating frequency

DR6 Rack:
- 10,000 AIC fault current protection at
  - 208/120Volt, three phase
  - 173/100Volt, three phase
- 14,000 AIC protection at 277/480Volt, three phase

DR12 Rack:
- 22,500 AIC fault current protection at
  - 208/120Volt, three phase
  - 173/100Volt, three phase
- 65,000 AIC at 208/120Volt, three phase when installed using AX Auxilliary Rack with M option - Main Breaker
- Main lugs accept maximum 400 MCM wire (205 mm2)
- Load terminals accept maximum #8 AWG wire (10 mm2)
- AX Racks equipped with breakers sized for maximum load capacity
- Lower rated trip plug options available

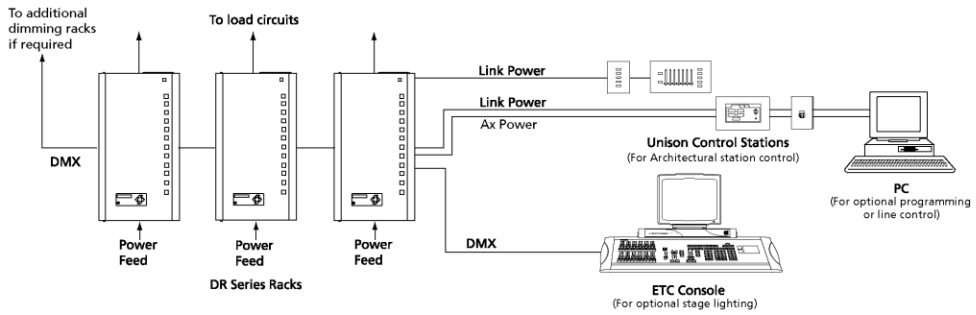
CONTROL MODULE
- Control Module (CM) houses dimming and architectural station processors.
- Contains a nine-button membrane overlay and a two-line by 20 character LCD for system configuration, testing and diagnostics

DIMMING PROCESSOR
- Utilizes industry standard DMX-512 control protocol
- Data input switches for initialization and configuration
- Configuration stored in non-volatile flash memory

ARCHITECTURAL STATION PROCESSOR
- Station processors accept Echelon Link
- Power control signals from stations and remote interfaces
- Link Power network utilizes polarity-independent, low-voltage Class II twisted pair wiring:
  - Belden type 8471 (unshielded)
  - Belden 8719 (shielded)
- 1500' (500m) wiring limit without the use of a repeater
- Repeater (REP) Option module increases wire length in increments of 1500' (500m).
- Configuration through Light Manager System software
- Station configuration and program information stored in flash memory
- 3.5" floppy disk drive for loading configurations
- Controls 512 dimmers x 512 zones with 32 stations – 4 LCDs maximum.
- Use Repeater Option module to increase station count in increments of 32.

RACK OPTIONS
- ARCH – Architectural Option Board supports termination of Unison stations, DMX, Auxiliary power and RS232 communications.
- FLO – Fluorescent Option Board provides 24 outputs for control of 4-wire (0-10vdc) fluorescent ballasts (Contact factory for approved ballast manufacturers).
- BYP – Bypass Option Board senses loss of Normal power and drives selected loads to full bright.

UNISON DIMMING AND CONTROL RISER



INTERWIRING GUIDE

	Dimmer Rack	External Rack	Sensor Rack	Station	LCD	Console
Dimmer Rack	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**DMX** (1) Belden 9729
External Rack	**DMX** (1) Belden 9729	**NA**	**DMX** (1) Belden 9729	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**DMX** (1) Belden 9729
Sensor Rack	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**NA**	**NA**	**DMX** (1) Belden 9729 **ETC Link** (1) Belden 9729 (2) #16 AWG
Station	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**NA**	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**NA**
LCD	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**NA**	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**NA**
Console	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729 **ETC Link** (1) Belden 9729 (2) #16 AWG	**NA**	**NA**	**NA**

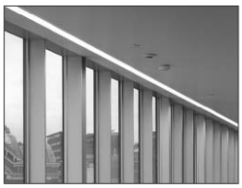
*Not required in systems with grounded metal conduit.
NA = Not Applicable

APPENDIX C: LIBRARY LIGHTING EQUIPMENT

Fixture LF1

M60 Recessed Linear Fluorescent
Flanged Extrusion - STAGGERED LAMPS

se'lux®



Project: _____ **Type:** _____ **Qty:** _____

Fixture Series	Lamp Type	Shielding	Mounting	Mounting Option	Nominal Length	Finish	Voltage

Options (refer to separate data sheets for ordering codes and details)

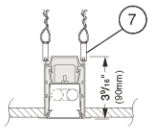
Fixture Series	Lamp Type	Shielding	Mounting	Nominal Length	Finish	Voltage	Options
M6R1S M60 Recessed Continuous Flange (Flanged Extrusion/ Flanged Endcaps) Staggered Lamps **M6R2S** M60 Recessed Flush End (Flanged Extrusion/ Flangeless Endcaps) Staggered Lamps	**1T5** F28T5 **1T5HO** F54T5HO	**OD** Extra Diffuse Lens **SD** Satine Lens	**SH** Suspension Clips **TS** 1" Studs (factory installed) **RC** Rotating Crossbars **PM** Perimeter Mount	**008** 8 foot **012** 12 foot For actual lengths see following page. For other lengths, configurations indicate nominal length rounded to the next highest foot. Factory will supply layout drawings. Individual fixtures cannot be field joined.	**WH** White **BK** Black **SV** Silver **SP** Specify RAL#	**120** **277** **347**	**TB** Lengths to Fit 2' Grid T-Bar Ceiling System (M6R1S only) **(qty)EM** Stand-by Battery Pack[1] (prefix quantity, i.e. - **5EM**) **FS** Single Fusing **DM** Dimming[1] (specify system) **DMA** Digital Addressable Dimming[1] **FW** Flex Whip (standard) **FW1** Flex Whip (dimming) **Track** Eutrac Standard[2] **DL** Suitable for Damp Locations **Downlights** (See MR11 spec sheet, pp.98)

[1]Must be low profile ballasts (1⅜" W x 1⅜" H); consult factory for details. [2]Consult factory for details.

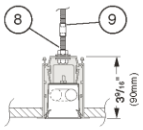
Mounting Diagrams

Scale = 1 : 8

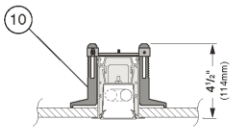
Suspension Clips (SH)



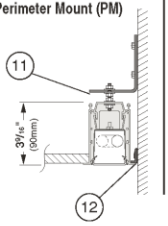
Pre-installed Rod (TS)



Rotating Crossbars (RC)

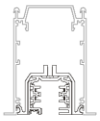


Perimeter Mount (PM)



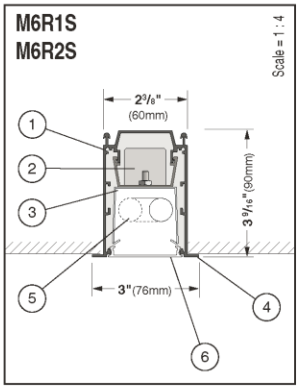
Track

Track insert including track available for all configurations, consult factory for details.



M6R1S
M6R2S

Scale = 1 : 4



1. Housing - Continuous, 6063-T5 extruded aluminum profile up to 16 feet long.

2. Ballast - Electronic, high power factor, class "P", type "A" sound rating. Specify 120v, 277v, or 347v. Ballast is factory pre-wired with leads to one end of fixture. Consult factory for ballast options.

3. Gear Tray - Die formed gear tray with integral factory preset sliding covers to fill extrusion with light, with a matt white finish for even illumination. Geartray installs as complete electrical unit and is held in place with knurled dress nuts. It is fully accessible from below ceiling.

4. Flange - 5/16" (8mm) wide flange is part of the main extruded body. Specify flush (M6R2) or flanged end plates (M6R1).

5. Lamps - As noted (by others). Other lamp lengths or wattages available, consult factory.

6. Shielding - Choose between Extra Diffuse Lens and Satine Lens. See page 8 for more details.

7. Spring steel suspension clips - Supplied two places, located nominally every 4 feet. Support wires supplied and installed by others.

8. Pre-installed 1" 1/4-20 Stud - Attached to fixture every nominal 4 feet.

9. Coupling and Threaded Rod to Structure - Supplied and installed by others.

10 Rotating Crossbar - For inaccessible ceilings, adjustable for ceiling thicknesses from **1/4"** to **2"**. Support required nominally every 4'.

11. Steel Wall Bracket and 1/4-20 Rod - Supplied nominally every 4 ft. (Fasteners to wall and wall anchors by others.)

12. Aluminum Wall Bracket - Secured to wall (fasteners and wall anchors by others) and runs entire length of fixture. Also supplied for width of M6R1 continuous flange fixtures. Allows for 1/8" gap between flange and wall to create shadow line.

Interior Luminaire Finish - Standard interior colors are White (WH), Black (BK) and Silver (SV). RAL Classic colors (SP) are available, please specify RAL#.

TEL: (845) 691-7723
FAX: (845) 691-6749
www.selux.com/usa
M6R1S-01 (v5.0)

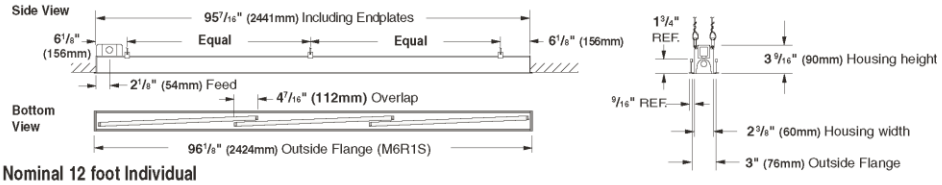
c UL us LISTED

Union Made Affiliated with **IBEW** *Local 363*

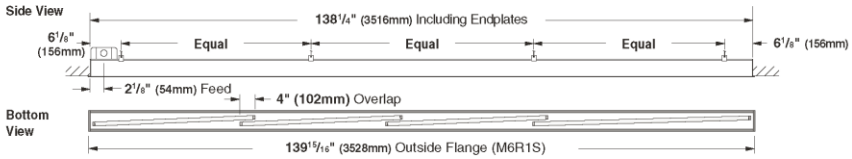
M60 Recessed Linear Fluorescent Flanged Extrusion - STAGGERED LAMPS

M6R1S/M6R2S (Single Staggered Lamps) Standard Layout Dimensions

Nominal 8 foot Individual

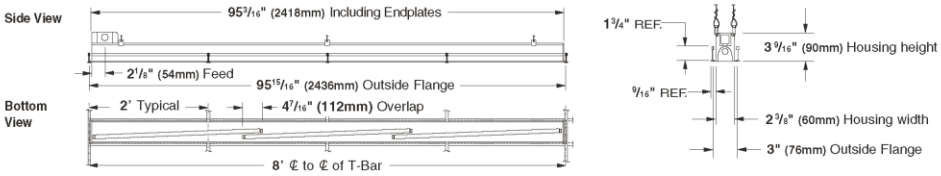


Nominal 12 foot Individual

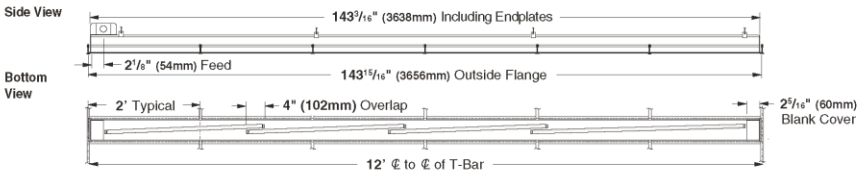


M6R1S (Single Staggered Lamps) T-Bar Layout Dimensions (option - TB)

Nominal 8 foot Individual



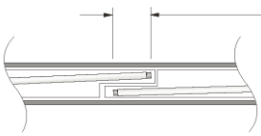
Nominal 12 foot Individual



Fixture supplied with 7/8 knockout located 2 1/8" from end in top of fixture.

For other lengths, lamping, continuous runs or configurations please specify overall length (in feet), accessories desired and sketch/drawing of configuration. SELUX will detail project drawings upon order and supply submittal drawings for approval. Individual fixtures cannot be field joined. If you have any questions please contact SELUX customer service or applications engineering for assistance (1-800-SELUX-CS).

Staggered Lamps Principle



Lamps are spaced with 4" to 6" overlap to completely illuminate luminaire and eliminate socket shadows. Factory will supply approval drawings for other lengths using combinations of 21W & 28W T5 lamps or 39W & 54W T5HO lamps.

Minimal socket shadows may be visible at certain angles. Refer to pages 6 and 8 for more information.

Fixture LF2

new in '05

louver/lens

avenue® a

FOCAL POINT®

FEATURES

Narrow aperture high performance T5/T5HO asymmetric wall wash with louver or lens shielding options.

Precision micro-optic delivers shadow free illumination from the ceiling to the floor.

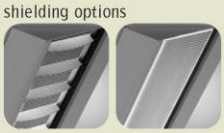
Features 2" narrow aperture for clean unobtrusive aesthetic.

Universal mounting allows compatibility for multiple grid types.

Drywall installation is available, which allows for both individual or continuous row mount capability.

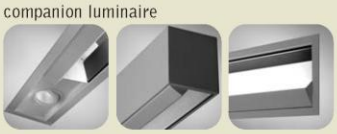
Great solution for conference rooms, highlighting artwork, corridors, white board or any application that requires high levels of vertical illumination.

shielding options



cut–off louver clear lens

companion luminaire

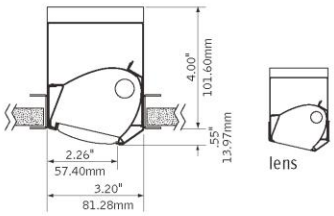


mr16 linear recessed wall mount

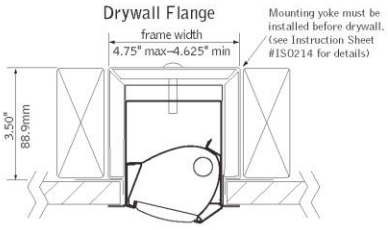
november 2005

DIMENSIONAL DATA

Grid Mount (Louver Shown)

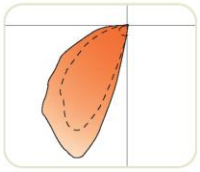


Drywall Flange



24-30" Recommended Distance from Wall

PERFORMANCE



1–Lamp T5HO
41% Efficiency
1581 cd @ 25°

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

88

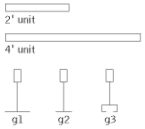
fixture type:

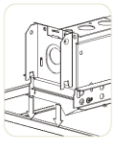
project name:

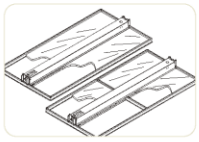
RECESSED

DETAILS

grid







Luminaires cannot be installed in T-bar ceiling systems over 1.5".

drywall

Drywall flange version provided with mounting yoke.

SPECIFICATIONS

construction

One-piece 20 Ga. steel housing

Grid fixtures include 20 Ga. steel, .5" wide universal flange rail finished in matte satin white.

Drywall flange option is provided with 20 Ga. steel, .5" wide flange kit and 20 Ga. galvanized steel mounting yoke.

2' unit weight:	5 lbs.
3' unit weight:	6 lbs.
4' unit weight:	7 lbs.

optic

.020" specular aluminum upper reflector and .020" semi-specular lower reflector.

24 Ga. perforated matte black diffuser with 24% opening.

Radial cut-off louver: .375" H x 1" frequency fabricated of 24 Ga. steel.

Clear lens: .060" thick clear acrylic.

electrical

Luminaires are individually wired for specified circuits.

Thru-wiring not available.

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:

T5 Lamp:	Up to 550 lumens
T5HO Lamps:	Up to 825 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 or Matte Black.

Perforated diffuser finished in Matte Black as standard.

Radial cut-off louver painted Matte Satin White as standard.

ORDERING

luminaire series		FAVA
Avenue A	FAVA	
shielding		_____
Clear Lens	CL	
Radial Cut-off Louver (Louver painted white)	RL	
lamping		_____
One Lamp T5	1T5	
One Lamp T5HO	1T5HO	
circuits		1C
Single Circuit	1C	
voltage		_____
120 Volt	120	
277 Volt	277	
347 Volt (Consult factory for availability)	347	
ballast		_____
Electronic Program Start <10% THD	S	
Electronic Dimming Ballast (Consult factory for dimming availability)	D	
mounting		_____
15/16" Grid	G1	
9/16" Grid	G2	
9/16" Slot Tee	G3	
Drywall Flange Cut out dimensions: 2': 3.5" x 23.6" 3': 3.5" x 35.6" 4': 3.5" x 47.6"	F	
factory options		_____
Chicago Plenum	CP	
Emergency Circuit	EC	_____
Emergency Battery Pack (3' & 4' Fixtures Only)	EM	
Seismic Brackets	EQ	_____
HLR/GLR Fuse	FU	_____
Include 3000K Lamp	L830	_____
Include 3500K Lamp	L835	
Include 4100K Lamp	L841	
finish		_____
Matte White Housing	WH	
Matte Black Housing (Perforated diffuser always painted black) (Radial cut-off louver painted Matte Satin White as standard.)	BK	
luminaire length		_____
2' Nominal Housing (Grid Mount Only)	2'	
3' Nominal Housing	3'	
4' Nominal Housing (For continuous row mount in drywall ceiling, specify luminaire run length, ie 24')	4'	

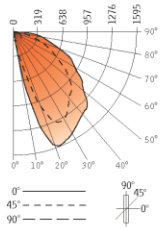
Focal Point L.L.C. 4201 South Pulaski Rd, Chicago, Illinois 60632 | T: 773.247.9494 | F: 773.247.8484 | info@focalpointlights.com | www.focalpointlights.com

louver

avenue® a

Filename: FAVARL1T5H.IES
Catalog #: FAVA-RL-1T5HO-1C-120-S-G1-WH-4'
Efficiency: 41%
Test #: 12597.0

CANDLEPOWER DISTRIBUTION



Vertical Angle	Horizontal Angle 0°	22.5°	45°	67.5°	90°	Zonal Lumens
0°	120	120	120	120	120	
5°	175	161	137	129	120	13
15°	1212	1043	556	187	121	104
25°	1581	1520	1301	404	137	248
35°	1457	1370	1228	774	144	373
45°	1354	1255	1070	835	131	443
55°	1077	952	783	582	118	383
65°	787	662	509	342	107	277
75°	441	360	244	119	66	133
85°	171	124	65	39	17	45
90°	67	51	13	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	

LUMEN SUMMARY

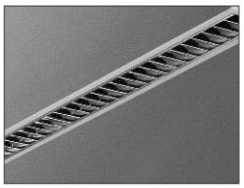
	Zone	Lumens	% Lamp	% Fixt
	0°-30°	365	7.3	17.9
	0°-40°	737	14.7	36.3
	0°-60°	1564	31.3	76.9
	0°-90°	2018	40.4	99.3
Total Luminaire	0°-180°	2032	40.6	100.0

Go to www.focalpointlights.com for additional photometric data.

Fixture LF3

M60 Linear Fluorescent Recessed

se'lux®



Project: _____ **Type:** _____ **Qty:** _____

_____ – _____ – _____ – _____ – _____ – _____ – _____ –

Fixture Series | Lamp Type | Shielding | Mounting | Linear Footage | Finish | Voltage

_____ – _____ – _____ – _____ – _____ – _____ – _____ – _____ – _____

Options (refer to separate data sheets for ordering codes and details)

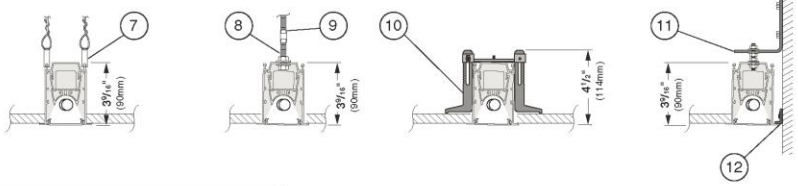
Fixture Series	Lamp Type	Shielding	Mounting	Linear Footage	Finish	Voltage	Options
M6R1 M60 Recessed Continuous Flange (Flanged Extrusion/ Flanged Endcaps) **M6R2** M60 Recessed Flush End (Flanged Extrusion/ Flangeless Endcaps)	**1T5** F28T5 **1T5HO** F54T5HO	**MA** Matte Parabolic **MP** Silky Specular Parabolic Louver **SD** Satine Lens **OD** Extra Diffuse Lens	**SH** Suspension Clips **RC** Rotating Crossbars **PM** Perimeter Mount **TS** 1" Studs (factory installed)	**004** 4 foot **008** 8 foot **012** 12 foot For actual lengths see layout dimensions. For other lengths, configurations indicate nominal length rounded to the next highest foot. Factory will supply layout drawings. Individual fixtures cannot be field joined.	**WH** White **BK** Black **SV** Silver **SP** Specify RAL#	**120** **277** **347**	**TB** Lengths to Fit 2' Grid T-Bar Ceiling System (M6R1 only) **(qty)EM** Stand-by Battery Pack[1] (prefix quantity, i.e. - **5EM**) **FS** Single Fusing **DM** Dimming[1] (specify system) **DMA** Digital Addressable Dimming[1] **SI** Satine Acrylic Inlay[2] **FW** Flex Whip (standard) **FW1** Flex Whip (dimming) **Track** Eutrac Standard[3] **DL** Suitable for Damp Locations **CCEA** Chicago Plenum **Downlights** (See MR11 spec sheet, pp.98)

[1]Must be low profile ballasts (1⅜" wide x 1 3/16" high); consult factory for details. [2]Available for MP Louver only. [3]Consult factory for details.

Mounting Diagrams

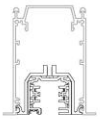
Scale = 1 : 8

Suspension Clips (SH) | **Pre-installed Rod (TS)** | **Rotating Crossbars (RC)** | **Perimeter Mount (PM)**



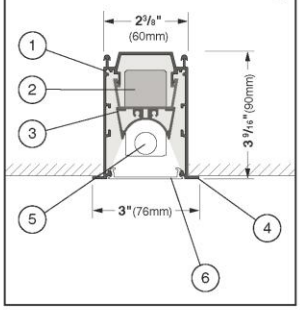
Track

Track insert including track available for all configurations, consult factory for details.



M6R1
M6R2

Scale = 1 : 4



1. Housing - Continuous, 6063-T5 extruded aluminum profile up to 16 feet long.

2. Ballast - Electronic, high power factor, class "P", type "A" sound rating. Specify 120v, 277v, or 347v. Ballast is factory pre-wired with leads to one end of fixture. Consult factory for ballast options.

3. Gear Tray - Die formed tray with specular aluminum reflector. Gear tray installs as complete electrical unit and is held in place with 1/4 turn latches. It is fully accessible from below ceiling.

4. Flange - 5/16" (8mm) wide flange is part of the main extruded body. Specify continuous flange (M6R1) or flush end (M6R2) .

5. Lamps - As noted (by others). Other lamp lengths or wattages available, consult factory.

6. Shielding - Louvers offer excellent glare control in longitudinal, lateral, and all diagonal planes. High quality aluminum louvers and acrylic shielding allow true freedom of layout for today's modern spaces.

7. Spring steel suspension clips - Supplied two places, located nominally every 4 ft. Support wires Supplied and installed by others.

8. Pre-installed 1" 1/4-20 Stud - Attached to fixture every nominal 4 feet.

9. Coupling and Threaded Rod to Structure - Supplied and installed by others.

10 Rotating Crossbar - For inaccessible ceilings, adjustable for ceiling thicknesses from **1/4"** to **2".** Support required nominally every 4'.

11. Steel Wall Bracket and 1/4-20 Rod - Supplied nominally every 4 ft. (Fasteners to wall and wall anchors by others.)

12. Aluminum Wall Bracket - Secured to wall (fasteners and wall anchors by others) and runs entire length of fixture. Also supplied for width of M6R1 continuous flange fixtures. Allows for 1/8" gap between flange and wall to create shadow line.

Interior Luminaire Finish - Standard interior colors are White (WH), Black (BK) and Silver (SV). RAL Classic colors (SP) are available, please specify RAL#.

TEL: (845) 691-7723
FAX: (845) 691-6749
www.selux.com/usa
M6R-01 (v5.0)

c UL us LISTED

Union Made Affiliated with IBEW *Local 363*

M60 Recessed Linear Fluorescent Flanged Extrusion

se'lux®

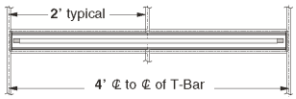
M6R1 and M6R2 Standard Layout Dimensions

Continuous Flange (M6R1)

Flush End (M6R2)

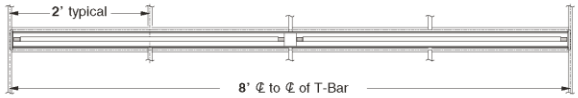
M6R1 Recessed - nominal 4 foot individual

M6R1 Recessed - T-Bar Length - nominal 4 foot individual



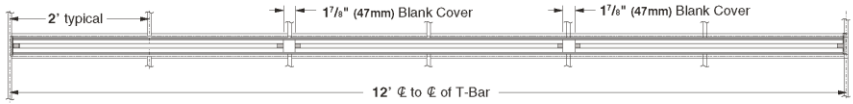
M6R1 Recessed - nominal 8 foot individual

M6R1 Recessed - T-Bar Length - nominal 8 foot individual

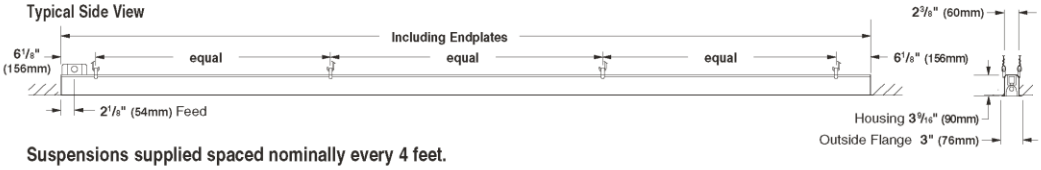


M6R1 Recessed - nominal 12 foot individual

M6R1 Recessed - T-Bar Length - nominal 12 foot individual



Typical Side View



Suspensions supplied spaced nominally every 4 feet.
Fixture supplied with 7/8 knockout located 2 1/8" from end in top of fixture.

	T5 (1 or 2 lamp)			
	M6R1/M6R2 Including Endplates	M6R1 Outside Flange	M6R1/M6R2 - TB Including Endplates	M6R1 - TB Outside Flange
4 foot individual	47.28" (1201mm)	46.63" (1184mm)	47.03" (1195mm)	47.91" (1216mm)
8 foot individual	93.72" (2380mm)	93.03" (2362mm)	95.21" (2418mm)	95.88" (2435mm)
12 foot individual	140.13" (3559mm)	139.43" (3541mm)	143.25" (3638mm)	143.22" (3638mm)

For other lengths, lamping, continuous runs or configurations please specify overall length (in feet), accessories desired and sketch/drawing of configuration. SELUX will detail project drawings upon order and supply submittal drawings for approval. Individual fixtures cannot be field joined. If you have any questions please contact SELUX customer service or applications engineering for assistance (1-800-SELUX-CS).

PO Box 1060, 5 Lumen Lane / Highland, NY 12528
TEL: (845) 691-7723 / FAX: (845) 691-6749
E-mail: seluxus@selux.com / Web Site: www.selux.com/usa
M6R1-02 (02/06)

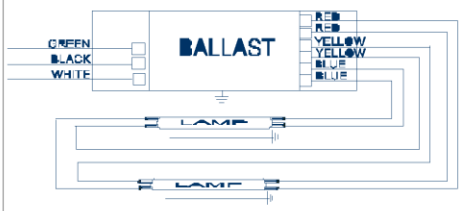
Ballast LB1

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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	0.16	19	1.07	20	0.98	1.7	5.63
F14T5	2	14	0/-18	0.29	34	1.06	10	0.98	1.7	3.12
F21T5	1	21	0/-18	0.21	26	1.03	15	0.99	1.7	3.96
F21T5	2	21	0/-18	0.40	48	1.02	10	0.98	1.7	2.13
F28T5	1	28	0/-18	0.28	33	1.04	10	0.98	1.7	3.15
* F28T5	2	28	0/-18	0.55	64	1.03	10	0.99	1.7	1.61
F35T5	1	35	0/-18	0.34	41	1.01	10	0.98	1.7	2.46
F35T5	2	35	0/-18	0.67	80	1.00	10	0.99	1.7	1.25

Wiring Diagram



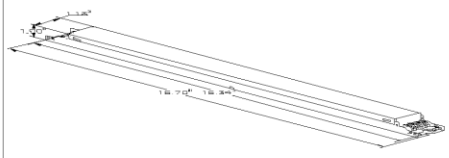
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	0	0
Blue	0	0
Red	0	0
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	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 08/21/2006

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
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

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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 or poke-in wire trap connectors 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 light output 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).

3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 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 part # _____ or approved equal.

Revised 08/21/2006

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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

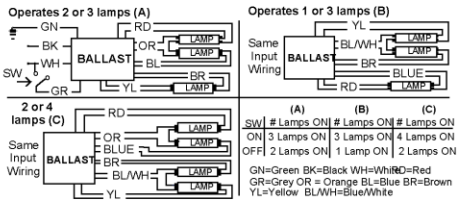
ADVANCE™

ICN4S5490C2LS@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series/Parallel
Input Voltage	120
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	-20/-29	0.52	62	0.99	15	0.98	1.7	1.60
F54T5/HO	2	54	-20/-29	0.99	118	0.99	10	0.98	1.7	0.84
* F54T5/HO	3	54	-20/-29	1.52	182	1.00	10	0.98	1.7	0.55
F54T5/HO	4	54	-20/-29	2.00	240	1.00	10	0.98	1.7	0.42

Wiring Diagram



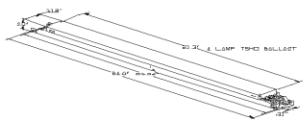
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	0	0
Blue	0	0
Red	0	0
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	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 01/31/2007

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ADVANCE
O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018
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Corporate Offices: Phone: 800-322-2086

ICN4S5490C2LS@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series/Parallel
Input Voltage	120
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 or poke-in wire trap connectors 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 light output 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).

3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 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 part # _____ or approved equal.

Revised 01/31/2007

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

Ballast

LB3

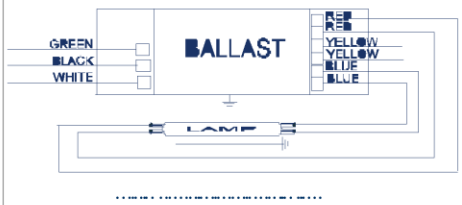
ADVANCE™

Electrical Specifications

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
Input Frequency	50/60 HZ
Status	Active

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	0.16	19	1.07	20	0.98	1.7	5.63
F14T5	2	14	0/-18	0.29	34	1.06	10	0.98	1.7	3.12
F21T5	1	21	0/-18	0.21	26	1.03	15	0.99	1.7	3.96
F21T5	2	21	0/-18	0.40	48	1.02	10	0.98	1.7	2.13
* F28T5	1	28	0/-18	0.28	33	1.04	10	0.98	1.7	3.15
F28T5	2	28	0/-18	0.55	64	1.03	10	0.99	1.7	1.61
F35T5	1	35	0/-18	0.34	41	1.01	10	0.98	1.7	2.46
F35T5	2	35	0/-18	0.67	80	1.00	10	0.99	1.7	1.25

Wiring Diagram



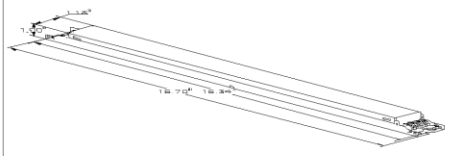
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	0	0
Blue	0	0
Red	0	0
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	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 08/21/2006

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ADVANCE
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Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071
Corporate Offices: Phone: 800-322-2086

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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 or poke-in wire trap connectors 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 light output 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).

3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 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 part # _____ or approved equal.

Revised 08/21/2006

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

Lamp LL1

16/2/2007

28W/830 Min Bipin T5 HE ALTO UNP

Product family description
Ultra-slim design with extraordinary light output.

Features/Benefits

- Improved optical control.
- Fixtures can be 40% smaller than T8 systems.
- Design flexibility for cove and cabinet lighting.
- Better fin in 2 x 2 and 2 x 4 grid ceilings.
- Up to 104 lumens per watt.
- 95% lumen maintenance.
- 85 CRI in 3000, 3500 and 4100K.
- High system efficacy.
- Fail-safe operation at end of life.
- 20,000 hours rated average life.

Applications

- Ideal for general, decorative and architectural lighting in offices, retail stores, hotels, schools and hospitals.

Notes

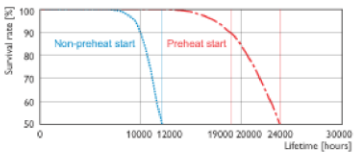
- NOT compatible with dimming ballasts.
- Silhouette™ T5 nominal lamp lengths are shorter than standard sizes. See dimension chart for details.

Product data	
Product Number	230847
Full product name	28W/830 Min Bipin T5 HE ALTO UNP
Ordering Code	F28T5/830
Pack type	Unpacked
Pieces per Sku	1
Skus / Case	40
Pack UPC	046677230845
EAN2US	
Case Bar Code	50046677230840
Successor Product number	
Watts[W]	28W
Color Code	830 [CCT of 3000K]
Base	Min Bipin [Miniature Bipin]
Bulb	T5 [16mm]
Special packing	ALTO
Packing Type	UNP [Unpacked]
Packing Configuration	40
System Description	High Efficiency
Base Information	Green[Green Base]
Rated Avg. Life[hr]	24000

PHILIPS

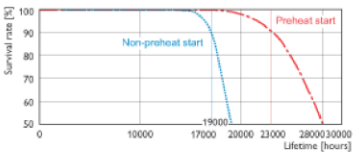
1

Product data	
Dimmable	Yes
Mercury (Hg) Content[mg]	
Color Rendering Index[Ra8]	85
Color Temperature[K]	3000
Initial Lumens[Lm]	–
Overall Length C[mm]	1163.2
Diameter D[mm]	17



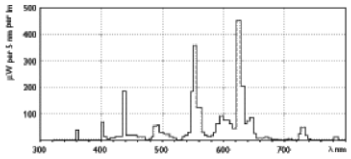
Life Expectancy 3h cycle

TL5

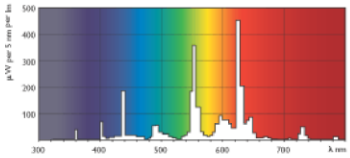


Life Expectancy 12h cycle

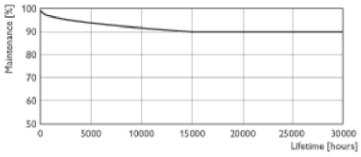
TL5



TL5/830

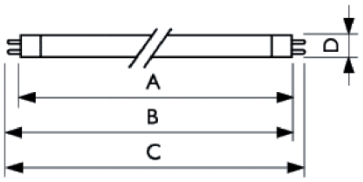


TL5/830



TL5

PHILIPS



TL5

	A		B	C	D
Full product name	Max	Min	Max	Max	Max
28W/830 Min Bipin T5 HE ALTO UNP	1149.0	1153.7	1156.1	1163.2	17

Lamp LL2

16/2/2007

– 54W/830 Min Bipin T5 HO ALTO UNP

Product family description
Powerful, environmentally-responsible ultra-slim lamps.

Features/Benefits

- Miniaturization: slim profile lamp and ballast.
- Operated on programmed start electronic ballasts.
- Low mercury: TCLP* compliant.
- Energy efficeint.
- Long life.
- Less mercury and fewer lamps in landfills, combined with energy efficiency reduces the impact on the environment.
- 85 CRI in 3000, 3500, 4100 and 5000K.
- 20,000 hours rated average life.

Applications

- Ideal for medium and high bay retail. Ideal for industrial applications.

Note

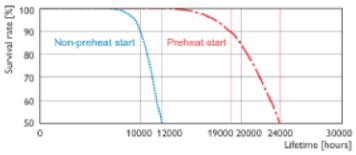
- Philips Lighting warrants T5 HO lamps when used with ballasts that are designed to meet the proposed IEC (International Electrotechnical Commission) dimming requirements and all other industry standards, ie: NEC,UL,IEC and ANSI. Please work with your Philips representative to get dimming approval before installation.
- Silhouette™ T5 nominal lamp lengths are shorter than standard sizes. See dimension chart for details.

Product data	
Product Number	290262
Full product name	– 54W/830 Min Bipin T5 HO ALTO UNP
Ordering Code	F54T5/830/HO/ALTO
Pack type	Unpacked
Pieces per Sku	1
Skus / Case	40
Pack UPC	046677290269
EAN2US	
Case Bar Code	50046677290264
Successor Product number	
Watts[W]	54W
Color Code	830 [CCT of 3000K]
Base	Min Bipin [Miniature Bipin]
Bulb	T5 [16mm]
Special packing	ALTO
Packing Type	UNP [Unpacked]
System Description	High Output
Base Information	Green[Green Base]

PHILIPS

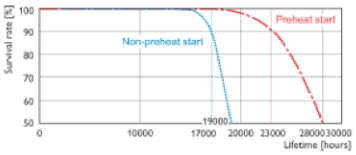
1

Product data	
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]	1163.2
Diameter D[mm]	17



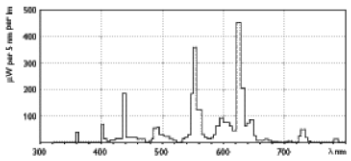
Life Expectancy 3h cycle

TL5

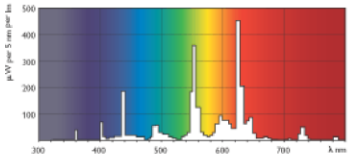


Life Expectancy 12h cycle

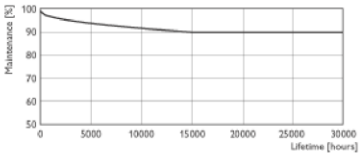
TL5



TL5/830

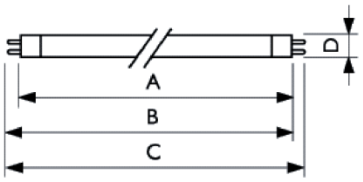


TL5/830



TL5

PHILIPS



TL5

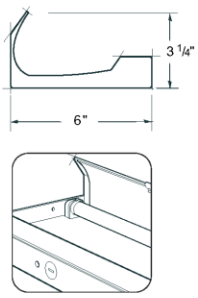
	A		B	C	D
Full product name	Max	Min	Max	Max	Max
- 54W/830 Min Bipin T5 HO ALTO UNP	1149.0	1153.7	1156.1	1163.2	17

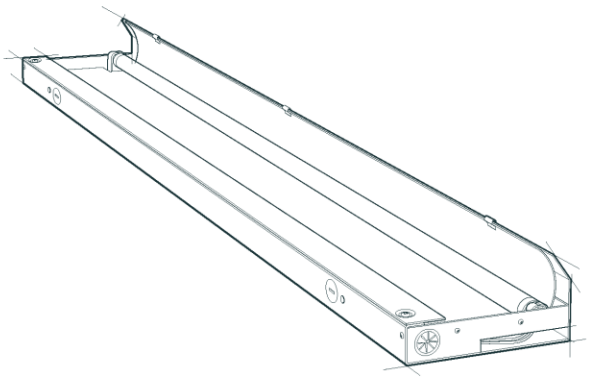
APPENDIX D: ALT. LIBRARY LIGHTING EQUIPMENT

Fixture LF1ALT

Type
Job Name
Catalog Number

Cove & Perimeter **SUPER COVE**





ordering

series	lamp rows	nominal length	voltage	options
SC				
	1T8	02'	120	PAF
	1T5	03'	277	EML*
	1T5HO	04'	347*	EMH*
		06'	*T8 & T5HO only	DM
		08'		RSE*†
		R__*		10THD†
		*row length		B__
				FH
				QC
				*consult factory for fixture lengths < 4' †T8 only

Applications Coves, retail, lobbies, small offices, conference rooms.

Features A low-profile cove lighting system designed for T5/HO or T8 lamps with a unique 3-piece optical system. Formed 95 percent reflective specular aluminum reflector throws light at low angles. Galvanized steel bottom reflector directs and diffuses light on ceiling to eliminate striations while limiting uplight. White backlight reflector fills the cove cavity with light, limiting socket shadow.

Construction The housing, available in 2-, 3-, 4-, 6- or 8-foot standard lengths, and end plates are made of die-formed, 20-gauge steel. The three part reflector system is die-formed from 95 percent reflective specular aluminum, 20-gauge steel and galvanized steel.

Finish The standard exterior body color is white enamel.

Electrical T8 fixtures have instant-start electronic ballasts with less than 20% THD. T5/HO fixtures have programmed-start electronic ballasts with less than 10% THD. Fixtures are U.L. Damp labeled (non-emergency) and I.B.E.W. manufactured. Maximum ballasts size available: 1 5/8" width x 1 1/4" height.

Mounting Fixture is to be surface-mounted within concealed coves.

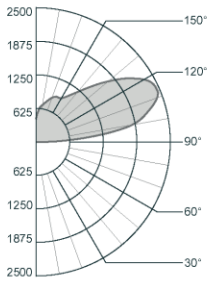
Options **PAF**: painted after fabrication; **EML**: emergency battery (T5/HO=700 lumens; T8=600 lumens); **EMH**: emergency battery (T5/HO=1200 lumens; T8=1200 lumens); **DM**: dimming (consult factory); **RSE**: rapid-start electronic (T8 only); **10THD**: ballast with < 10% total harmonic distortion; (T8 only); **B_**: specific ballast, specify manufacturer and catalog number (consult factory); **FH**: fixture fusing (slow blow); **QC**: quick-connect circuit assemblies.

Prudential Lighting phone 213.746.0360 fax 213.741.8590 **www.prulite.com**

photometric data

SC-1T5HO-04

Report # LSI16391 D=0.0% I=100.0%
Lamp Lumens: 4500 Input Watts: 58



Candlepower Summary

Vertical Angle	Horizontal Angle 0°	22.5°	45°	67.5°	90°	Output Lumens
90	0	48	35	79	39	
95	10	584	840	1069	911	385
100	37	821	1350	1858	1802	
105	74	753	1615	2064	2149	723
110	111	633	1686	2253	2400	
115	147	567	1557	2225	2455	694
120	183	543	1356	2027	2335	
125	222	564	1154	1759	2076	519
130	256	616	1001	1492	1764	
135	290	646	892	1257	1473	359
140	323	660	835	1082	1230	
145	349	652	838	938	1056	249
150	374	652	848	916	946	
155	395	644	810	905	933	174
160	413	646	761	838	881	
165	427	616	707	756	788	96
170	439	564	671	690	701	
175	446	499	564	575	603	28
180	429	429	429	429	429	

Zonal Lumen Summary

Zone	% Lamp	% Luminaire
0-90	0.00	0.00
0-180	75.74	100.00

Efficiency = 75.7%

Peak Candela = 2458 @ 112.5°
Peak : Zenith Ratio = 5.7 : 1

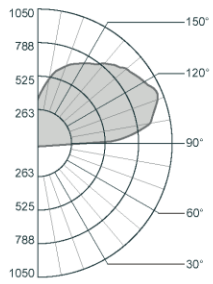
Coefficients of Utilization (%)

Floor	effective floor cavity reflectance - .20											
Ceiling	80				70				50			
Wall	70	50	30	10	70	50	30	10	50	30	10	
RCR 0	72	72	72	72	62	62	62	62	42	42	42	
1	66	63	60	57	56	53	51	49	37	35	34	
2	60	54	50	47	51	47	43	40	32	30	28	
3	54	48	43	39	46	41	37	34	28	26	24	
4	50	42	37	33	42	36	32	28	25	22	20	
5	45	37	32	28	39	32	27	24	22	19	17	
6	42	33	28	24	35	28	24	21	20	17	15	
7	38	30	24	20	32	25	21	18	18	15	12	
8	35	27	21	18	30	23	18	15	16	13	11	
9	32	24	19	15	28	21	16	13	14	12	09	

photometric data

SC-1T8-04

Report # LSI16088 D=0.0% I=100.0%
Lamp Lumens: 2950 Input Watts: 31



Candlepower Summary

Vertical Angle	Horizontal Angle 0°	22.5°	45°	67.5°	90°	Output Lumens
90	2	138	316	518	556	
95	17	258	493	704	757	248
100	44	360	605	855	917	
105	81	373	695	903	974	328
110	118	382	717	959	1042	
115	156	399	699	934	1044	325
120	192	422	685	887	986	
125	227	451	672	852	937	287
130	260	481	669	820	897	
135	292	509	653	798	857	245
140	319	530	660	756	827	
145	349	547	663	739	778	197
150	373	545	664	725	759	
155	393	536	652	709	734	142
160	410	520	637	679	703	
165	424	502	592	635	660	90
170	434	483	538	560	584	
175	440	460	485	486	500	24
180	430	430	430	430	430	

Zonal Lumen Summary

Zone	% Lamp	% Luminaire
0-90	0.00	0.00
0-180	71.58	100.00

Efficiency = 71.6%

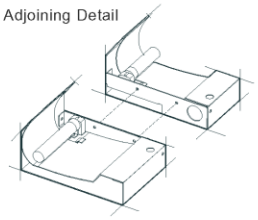
Peak Candela = 1053 @ 112.5°
Peak : Zenith Ratio = 2.4 : 1

Coefficients of Utilization (%)

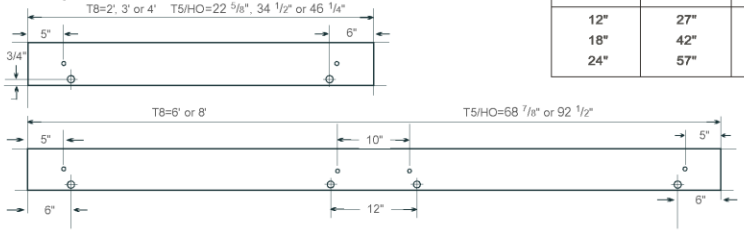
Floor	effective floor cavity reflectance - .20											
Ceiling	80				70				50			
Wall	70	50	30	10	70	50	30	10	50	30	10	
RCR 0	68	68	68	68	58	58	58	58	40	40	40	
1	62	59	57	54	53	51	49	46	35	33	32	
2	56	51	47	44	48	44	41	38	30	28	26	
3	51	45	41	37	44	39	35	32	27	24	22	
4	47	40	35	31	41	34	30	27	23	21	19	
5	43	35	30	26	36	30	26	23	21	18	16	
6	39	31	26	22	33	27	23	19	19	16	14	
7	36	28	23	19	31	24	20	17	17	14	12	
8	33	25	20	17	28	22	17	14	15	12	10	
9	31	23	18	14	26	20	15	13	14	11	09	

installation

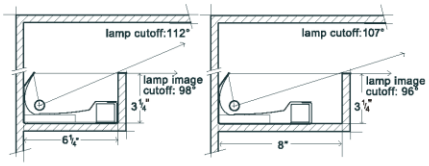
Adjoining Detail



Mounting Locations



Mounting Details



Distance from wall along ceiling

cove to ceiling	Peak Candela @ 112.5°	6¼" cove		8" cove	
		lamp	lamp image	lamp	lamp image
12"	27"	27"	70"	37"	91"
18"	42"	42"	112"	57"	148"
24"	57"	57"	155"	77"	205"

In an effort to continually provide the highest quality products, Prudential reserves the right to change design specifications and/or materials, without notice.

Fixture LF2ALT

S632PLTWW

6" Open Reflector Wall Washers

SPEX SX1-4

REV. 06/04

CAT. NO:

TYPE: **PROJECT:**

6

PRODUCT INFORMATION

Applications

Small aperture open reflector wall wash for use with long-life energy efficient compact fluorescent lamps. Provides uniform light distribution with excellent color rendition. Ideal for low ceilings and areas requiring long hours of continuous operation such as lobbies, corridors, reception areas and offices.

Specifications

1. **Ballast** - One (1) Type 1 Class P, high power factor universal voltage electronic compact fluorescent ballast. Offers 1 lamp operation for 120 through 277 volt input voltage.

	18W 120V	18W 277V	26W 120V	26W 277V	32W 120V	32W 277V	42W 120V	42W 277V
Line current amps	.19	.08	.25	.11	.32	.14	.42	.18
Input watts including ballast loss	22	22	28	28	36	36	48	48
Ballast factor	1.00	1.00	1.02	1.02	1.00	1.00	.98+	.98+
Minimum starting temperature	0°F	0°F	0°F	0°F	0°F	0°F	0°F	0°F

2. **Mounting pan** - Precision die-stamped 20 gauge galvanized steel mounting pan and yoke assembly. Accommodates ceiling materials up to 3/4" thick.

3. **Installation** - Mounting pan has pre-installed universal mounting brackets with vertical adjustment. Junction box and mounting brackets are accessible from below ceiling. For 30" C -channel hanger bars, specify Q1030 accessory, ordered separately. For 27" flat bar hangers, specify Q1031 accessory, ordered seperately.

4. **Reflector** - Precision spun .050 aluminum one piece reflector, self flanged with clear specular low iridescent finish. Reflector is screw mounted for positive attachment to socket assembly. Standard flat flange is painted white. Optional polished flange matching reflector finish available, add FF to catalog number.

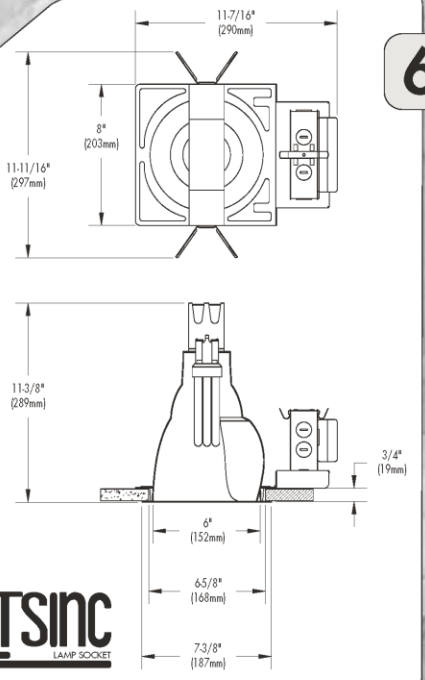
5. **Socket** - CFM42W/GX24q, CFM32W/GX24q, CFM26W/GX24q, CFM18W/GX24q, CFQ26W/G24q, CFQ18W/G24q, CFQ13W/G24q.

6. **Junction box** - Large 32-cubic inch 16 gauge galvanized steel with snap-on covers. Approved for through wiring with up to 8 #12 AWG conductors.

7. **Optional emergency system** - Emergency system includes battery, electronic circuitry, charger and test/monitor plate with test switch and charging indicator light. Test/monitor plate may be installed in the ceiling near fixture or other remote location. Operates appropriate lamp wattage for a minimum of 90 minutes following power failure. Emergency system complies with NFPA life safety code, OSHA and NEC. Suitable for dry locations.

8. **U.L. Listed** - For use in damp locations and approved for Through Branch Circuit Wiring. I.B.E.W. union made.

Canadian Specifications may vary from these shown, consult Canadian Division.



HeatSinc LAMP SOCKET

CATALOG SYSTEM AND OPTIONS

EXAMPLE OF COMPLETE CATALOG NUMBER: **S632PLTU-T6WWCS**

Spex Aperture	Lamp (by others)***	Frame Options**	Supply Voltage		Reflector Series/Size	Reflector Type	Reflector Finishes*	Reflector Options **
S6	32PLT [1]	F1 Fuse120volt	U	-	T6	WW-Wall Wash	CS - Clear Specular (low IR)	IE- Integral Emergency
	18PLT	F2 Fuse277volt	Universal Voltage 120 through 277 50 & 60 Hz			DWW-Double Wall Wash	CSS - Clear Semi Specular	
	26QPL	F3 Fuse347volt				CWW-Corner Wall Wash	HZ - Haze	
	18QPL	EM Emergency					PW- Pewter	
	13QPL	IE Integral Emergency					WT - Wheat	
		D1 [2] Dimming 120volt					FF-Finish Flange (add as suffix to color)	
		D2 [2] Dimming 277volt						

made with pride in the United States of America

*Consult Factory for other reflector finishes
**IE must be specified on both frame and reflector for Integral Emergency.
***Consult factory for 13 watt dimming.
[1] Utilizes 26, 32 and 42 watt triple tube lamp.
[2] Specify lamp wattage for 26, 32 or 42 watt for dimming option.

CAPRI|OMEGA:
776 South Green St., Tupelo, MS 38804
Phone 662.842.7212 FAX 662.841.5501
www.omegalighting.com

CANADIAN DIVISION:
189 Bullock Drive, Markham, Ontario, Canada L3P 1W4
Phone 905.294.9570 FAX 800.268.0003

omega LIGHTING

SPEX

S632PLTWW-CS Photometric Data

Wall Washer with Clear Reflector

Source: Compact Fluorescent
Lamp: (1) CFM32W
Reflectances: 80% ceiling, 50% walls, 20% floor
Maintanance Factor: 1.0
IES File: F20232.IES

Distance from ceiling (ft)	2'-6" from wall, 2'-6" on center		2'-6" from wall, 3' on center		3' from wall, 3' on center		3' from wall, 4' on center	
	Below Fixtures	Between Fixtures	Below Fixtures	Between Fixtures	Below Fixtures	Between Fixtures	Below Fixtures	Between Fixtures
1	16.1	15.1	14.0	12.1	10.4	9.5	8.8	6.9
2	23.0	21.6	20.3	18.0	15.3	14.3	12.5	10.3
3	27.6	27.7	24.4	22.6	19.2	17.6	15.6	12.8
4	26.7	26.5	22.4	22.5	19.9	20.2	16.1	15.0
5	23.0	22.9	19.9	19.6	19.2	18.9	14.7	14.7
6	19.0	18.9	16.7	16.4	16.9	16.9	13.3	13.3
7	13.8	13.7	14.6	14.6	3.2	3.1	11.7	11.6
8	13.4	13.4	11.9	11.9	12.9	12.8	10.5	10.3
9	11.5	11.6	10.6	10.5	11.4	11.3	9.3	9.1

6

S626QPLWW-CS Photometric Data

Wall Washer with Clear Reflector

Source: Compact Fluorescent
Lamp: CFQ26W
Reflectances: 80% ceiling, 50% walls, 20% floor
Maintanance Factor: 1.0
IES File: F20813.IES

Distance from ceiling (ft)	2'-6" from wall, 2'-6" on center		2'-6" from wall, 3' on center		3' from wall, 3' on center		3' from wall, 4' on center	
	Below Fixtures	Between Fixtures	Below Fixtures	Between Fixtures	Below Fixtures	Between Fixtures	Below Fixtures	Between Fixtures
1	11.97	11.06	10.04	7.62	5.08	4.60	4.60	3.77
2	19.78	18.60	15.83	13.42	9.81	9.32	8.54	7.41
3	21.26	20.13	16.86	14.85	12.02	11.37	10.21	9.19
4	19.07	18.59	15.14	13.81	12.47	11.85	10.53	9.64
5	16.66	15.96	12.94	12.34	11.78	11.78	9.96	9.25
6	13.80	13.54	10.88	10.47	10.77	10.49	9.03	8.62
7	11.73	11.61	9.28	9.06	9.64	9.43	8.09	7.86
8	10.43	10.20	8.19	8.16	8.62	8.58	7.31	7.11
9	9.20	8.95	7.22	7.27	7.67	7.69	6.53	6.42

Additional photometric test files are available @ omegalighting.com

omega LIGHTING

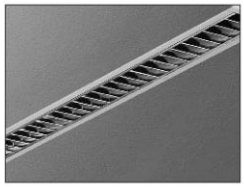
OMEGA LIGHTING:
776 South Green St., Tupelo, MS 38804
Phone 662.842.7212 FAX 662.841.5501

CANADIAN DIVISION:
189 Bullock Drive, Markham, Ontario, Canada L3P 1W4
Phone 905.294.9570 FAX 800.268.0003

Fixture LF3ALT

M60 Linear Fluorescent Recessed

se'lux®



Project: _____ **Type:** _____ **Qty:** _____

Fixture Series	Lamp Type	Shielding	Mounting	Linear Footage	Finish	Voltage
_____	_____	_____	_____	_____	_____	_____

Options (refer to separate data sheets for ordering codes and details)

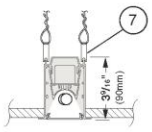
Fixture Series	Lamp Type	Shielding	Mounting	Linear Footage	Finish	Voltage	Options
M6R1 M60 Recessed Continuous Flange (Flanged Extrusion/ Flanged Endcaps) **M6R2** M60 Recessed Flush End (Flanged Extrusion/ Flangeless Endcaps)	**1T5** F28T5 **1T5HO** F54T5HO	**MA** Matte Parabolic **MP** Silky Specular Parabolic Louver **SD** Satine Lens **OD** Extra Diffuse Lens	**SH** Suspension Clips **RC** Rotating Crossbars **PM** Perimeter Mount **TS** 1" Studs (factory installed)	**004** 4 foot **008** 8 foot **012** 12 foot For actual lengths see layout dimensions. For other lengths, configurations indicate nominal length rounded to the next highest foot. Factory will supply layout drawings. Individual fixtures cannot be field joined.	**WH** White **BK** Black **SV** Silver **SP** Specify RAL#	120 277 347	**TB** Lengths to Fit 2' Grid T-Bar Ceiling System (M6R1 only) **(qty.)EM** Stand-by Battery Pack[1] (prefix quantity, i.e. - **5EM**) **FS** Single Fusing **DM** Dimming[1] (specify system) **DMA** Digital Addressable Dimming[1] **SI** Satine Acrylic Inlay[2] **FW** Flex Whip (standard) **FW1** Flex Whip (dimming) **Track** Eutrac Standard[3] **DL** Suitable for Damp Locations **CCEA** Chicago Plenum **Downlights** (See MR11 spec sheet, pp.98)

[1]Must be low profile ballasts (1⅞" wide x 1⅞" high); consult factory for details. [2]Available for MP Louver only. [3]Consult factory for details.

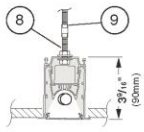
Mounting Diagrams

Scale = 1 : 8

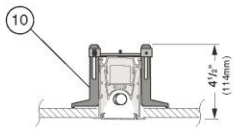
Suspension Clips (SH)



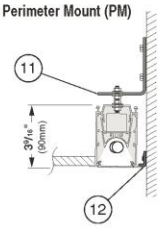
Pre-installed Rod (TS)



Rotating Crossbars (RC)

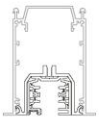


Perimeter Mount (PM)



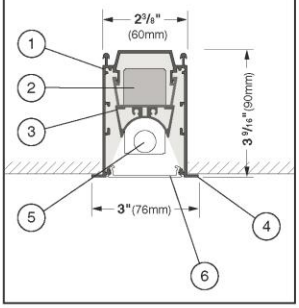
Track

Track insert including track available for all configurations, consult factory for details.



M6R1
M6R2

Scale = 1 : 4



1. Housing - Continuous, 6063-T5 extruded aluminum profile up to 16 feet long.

2. Ballast - Electronic, high power factor, class "P", type "A" sound rating. Specify 120v, 277v, or 347v. Ballast is factory pre-wired with leads to one end of fixture. Consult factory for ballast options.

3. Gear Tray - Die formed tray with specular aluminum reflector. Gear tray installs as complete electrical unit and is held in place with 1/4 turn latches. It is fully accessible from below ceiling.

4. Flange - 5/16" (8mm) wide flange is part of the main extruded body. Specify continuous flange (M6R1) or flush end (M6R2) .

5. Lamps - As noted (by others). Other lamp lengths or wattages available, consult factory.

6. Shielding - Louvers offer excellent glare control in longitudinal, lateral, and all diagonal planes. High quality aluminum louvers and acrylic shielding allow true freedom of layout for today's modern spaces.

7. Spring steel suspension clips - Supplied two places, located nominally every 4 ft. Support wires Supplied and installed by others.

8. Pre-installed 1" 1/4-20 Stud - Attached to fixture every nominal 4 feet.

9. Coupling and Threaded Rod to Structure - Supplied and installed by others.

10 Rotating Crossbar - For inaccessible ceilings, adjustable for ceiling thicknesses from **1/4"** to **2".** Support required nominally every 4'.

11. Steel Wall Bracket and 1/4-20 Rod - Supplied nominally every 4 ft. (Fasteners to wall and wall anchors by others.)

12. Aluminum Wall Bracket - Secured to wall (fasteners and wall anchors by others) and runs entire length of fixture. Also supplied for width of M6R1 continuous flange fixtures. Allows for 1/8" gap between flange and wall to create shadow line.

Interior Luminaire Finish - Standard interior colors are White (WH), Black (BK) and Silver (SV). RAL Classic colors (SP) are available, please specify RAL#.

TEL: (845) 691-7723
FAX: (845) 691-6749
www.selux.com/usa
M6R-01 (v5.0)

c UL us LISTED
Union Made Affiliated with **IBEW** *Local 363*

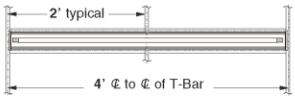
M60 Recessed Linear Fluorescent Flanged Extrusion

se'lux®

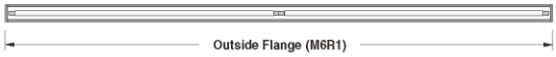
M6R1 and M6R2 Standard Layout Dimensions

M6R1 Recessed - nominal 4 foot individual

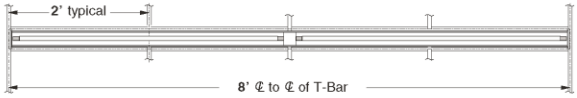
M6R1 Recessed - T-Bar Length - nominal 4 foot individual



M6R1 Recessed - nominal 8 foot individual

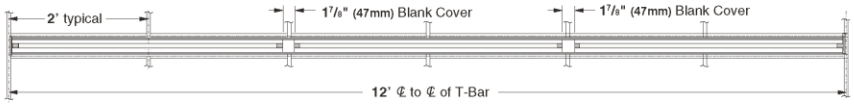


M6R1 Recessed - T-Bar Length - nominal 8 foot individual

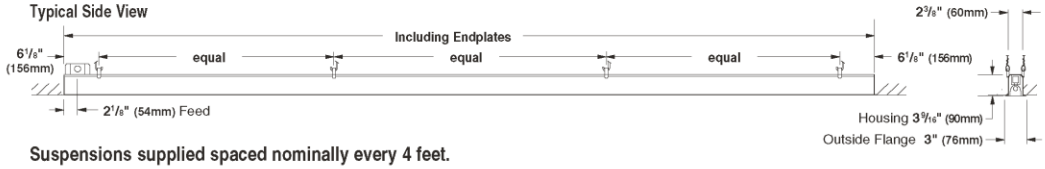


M6R1 Recessed - nominal 12 foot individual

M6R1 Recessed - T-Bar Length - nominal 12 foot individual

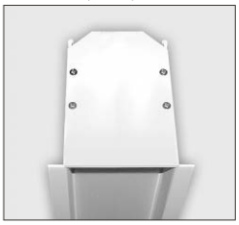


Typical Side View



Continuous Flange (M6R1)

Flush End (M6R2)



Suspensions supplied spaced nominally every 4 feet.
Fixture supplied with 7/8 knockout located 2 1/8" from end in top of fixture.

	T5 (1 or 2 lamp)			
	M6R1/M6R2 Including Endplates	M6R1 Outside Flange	M6R1/M6R2 - TB Including Endplates	M6R1 - TB Outside Flange
4 foot individual	47.28" (1201mm)	46.63" (1184mm)	47.03" (1195mm)	47.91" (1216mm)
8 foot individual	93.72" (2380mm)	93.03" (2362mm)	95.21" (2418mm)	95.88" (2435mm)
12 foot individual	140.13" (3559mm)	139.43" (3541mm)	143.25" (3638mm)	143.22" (3638mm)

For other lengths, lamping, continuous runs or configurations please specify overall length (in feet), accessories desired and sketch/drawing of configuration. SELUX will detail project drawings upon order and supply submittal drawings for approval. Individual fixtures cannot be field joined. If you have any questions please contact SELUX customer service or applications engineering for assistance (1-800-SELUX-CS).

PO Box 1060, 5 Lumen Lane / Highland, NY 12528
TEL: (845) 691-7723 / FAX: (845) 691-6749
E-mail: seluxus@selux.com / Web Site: www.selux.com/usa
M6R1-02 (02/06)

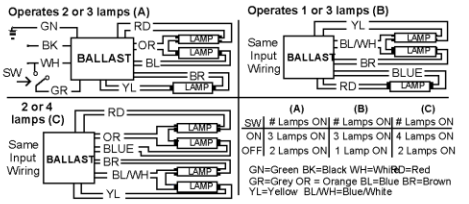
Ballast LB1ALT

ICN4S5490C2LS@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series/Parallel
Input Voltage	120
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	-20/-29	0.52	62	0.99	15	0.98	1.7	1.60
* F54T5/HO	2	54	-20/-29	0.99	118	0.99	10	0.98	1.7	0.84
F54T5/HO	3	54	-20/-29	1.52	182	1.00	10	0.98	1.7	0.55
F54T5/HO	4	54	-20/-29	2.00	240	1.00	10	0.98	1.7	0.42

Wiring Diagram



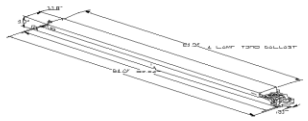
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	0	0
Blue	0	0
Red	0	0
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	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 01/31/2007

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
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

ICN4S5490C2LS@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series/Parallel
Input Voltage	120
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 or poke-in wire trap connectors 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 light output 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).

3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 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 part # _____ or approved equal

Revised 01/31/2007

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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

Ballast LB2ALT

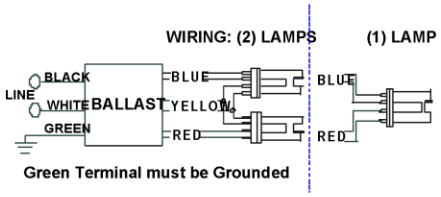
ADVANCE™

ICF-2S42-M2-BS@120	
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.
* CFM32W/GX24q	2	32	0/-18	0.57	68	0.98	10	0.98	1.5	1.44

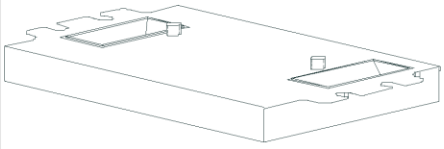
Wiring Diagram



Green Terminal must be Grounded

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

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	3.00 "	1.29 "	2.00 "
4 49/50	3	1 29/100	2
12.6 cm	7.6 cm	3.3 cm	5.1 cm

Standard Lead Length (inches)

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

	in.	cm.
Yellow/Blue		
Blue/White		
Brown		
Orange		
Orange/Black		
Black/White		
Red/White		

Revised 09/02/2004

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ADVANCE
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

ICF-2S42-M2-BS@120	
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.

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 9002 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-M4-XX, ICF2S42-90C-M2-XX and ICF2S70-M4-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 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

Ballast LB3ALT

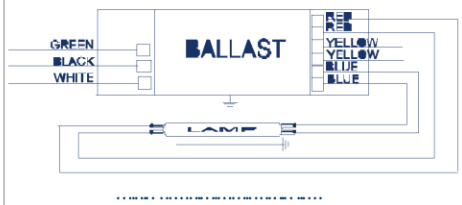
ADVANCE™

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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	0.16	19	1.07	20	0.98	1.7	5.63
F14T5	2	14	0/-18	0.29	34	1.06	10	0.98	1.7	3.12
F21T5	1	21	0/-18	0.21	26	1.03	15	0.99	1.7	3.96
F21T5	2	21	0/-18	0.40	48	1.02	10	0.98	1.7	2.13
* F28T5	1	28	0/-18	0.28	33	1.04	10	0.98	1.7	3.15
F28T5	2	28	0/-18	0.55	64	1.03	10	0.99	1.7	1.61
F35T5	1	35	0/-18	0.34	41	1.01	10	0.98	1.7	2.46
F35T5	2	35	0/-18	0.67	80	1.00	10	0.99	1.7	1.25

Wiring Diagram



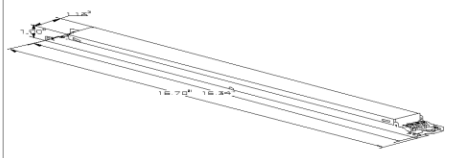
The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

	in.	cm.
Black	0	0
White	0	0
Blue	0	0
Red	0	0
Yellow	0	0
Gray	0	0
Violet	0	0

	in.	cm.
Yellow/Blue	0	0
Blue/White	0	0
Brown	0	0
Orange	0	0
Orange/Black	0	0
Black/White	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 08/21/2006

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
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

ICN-2S28@120	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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 or poke-in wire trap connectors 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 light output 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).

3.6 Ballast shall comply with UL Type CC rating.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 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 part # _____ or approved equal.

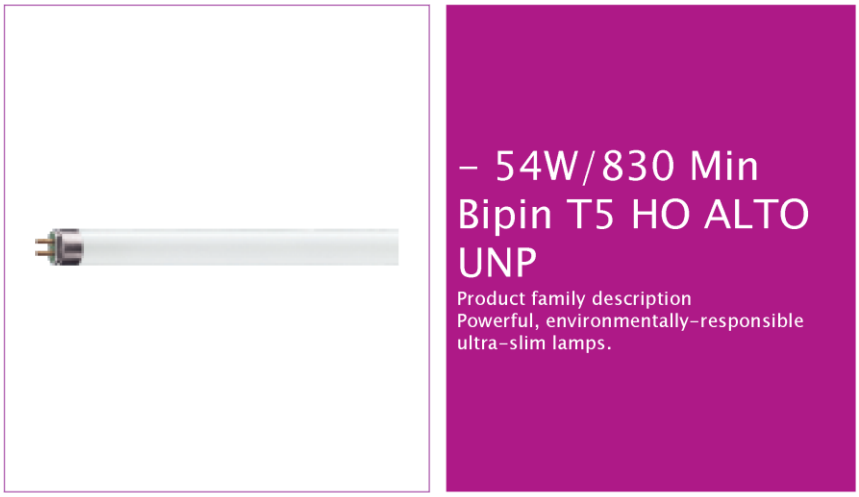
Revised 08/21/2006

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

Lamp LL1ALT

16/2/2007



– 54W/830 Min Bipin T5 HO ALTO UNP

Product family description
Powerful, environmentally-responsible ultra-slim lamps.

Features/Benefits

- Miniaturization: slim profile lamp and ballast.
- Operated on programmed start electronic ballasts.
- Low mercury: TCLP* compliant.
- Energy efficeint.
- Long life.
- Less mercury and fewer lamps in landfills, combined with energy efficiency reduces the impact on the environment.
- 85 CRI in 3000, 3500, 4100 and 5000K.
- 20,000 hours rated average life.

Applications

- Ideal for medium and high bay retail. Ideal for industrial applications.

Note

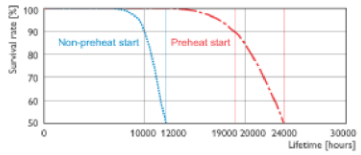
- Philips Lighting warrants T5 HO lamps when used with ballasts that are designed to meet the proposed IEC (International Electrotechnical Commission) dimming requirements and all other industry standards, ie: NEC,UL,IEC and ANSI. Please work with your Philips representative to get dimming approval before installation.
- Silhouette™ T5 nominal lamp lengths are shorter than standard sizes. See dimension chart for details.

Product data	
Product Number	290262
Full product name	– 54W/830 Min Bipin T5 HO ALTO UNP
Ordering Code	F54T5/830/HO/ALTO
Pack type	Unpacked
Pieces per Sku	1
Skus / Case	40
Pack UPC	046677290269
EAN2US	
Case Bar Code	50046677290264
Successor Product number	
Watts[W]	54W
Color Code	830 [CCT of 3000K]
Base	Min Bipin [Miniature Bipin]
Bulb	T5 [16mm]
Special packing	ALTO
Packing Type	UNP [Unpacked]
System Description	High Output
Base Information	Green[Green Base]

PHILIPS

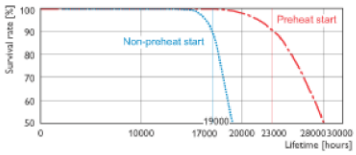
1

Product data	
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]	1163.2
Diameter D[mm]	17



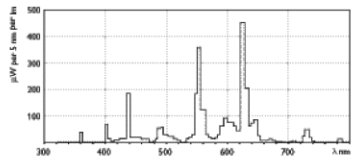
Life Expectancy 3h cycle

TL5

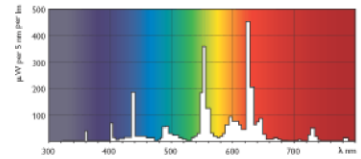


Life Expectancy 12h cycle

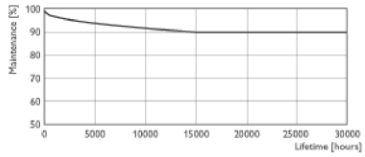
TL5



TL5/830

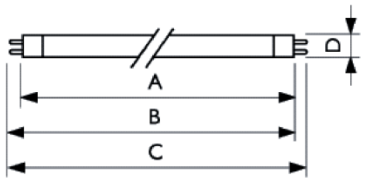


TL5/830



TL5

PHILIPS



TL5

	A		B	C	D
Full product name	Max	Min	Max	Max	Max
- 54W/830 Min Bipin T5 HO ALTO UNP	1149.0	1153.7	1156.1	1163.2	17

Lamp LL2ALT

Product Information Bulletin

DULUX® T/E/IN/EOL ECO®

4-Pin Amalgam Compact Fluorescent Lamps

- End-of-Life (EOL) shutdown protection
- Designed to pass Federal TCLP Test*
- Improved high temperature performance
  – Maintains 90% lumens from 40° to 140°F ambient
- Operates on various ballast systems
  – Flicker free start on electronic ballasts
  – Compatible with QUICKTRONIC® System CF
- Less power consumption than incandescent of comparable light output
- High luminous efficacy
- Long 12,000 hour average rated life
  – Reduces relamping requirement and related cost
- Rare earth tri-phosphor with 82 CRI
- 2700K, 3000K, 3500K and 4100K

* Regulations may vary. Check your local and state regulations.

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.

SYLVANIA DULUX T/E/IN/EOL ECO amalgam compact fluorescent lamps are ideal for use in a wide range of applications, including high temperatures. They are designed to be operated on energy efficient electronic and dimming ballasts.

DULUX T/E/IN/EOL ECO amalgam lamps are ideal for fixtures where shorter overall length lamps with higher lumen packages are required and where lamps may operate at elevated temperatures. In addition, the delta tube configuration of these lamps provides an even light distribution.

Product Availability

Lamp	Wattage	Rated Lumens
CF18DT/E/IN	18	1200
CF26DT/E/IN	26	1800
CF32DT/E/IN	32	2400
CF42DT/E/IN	42	3200
CF57DT/E/IN	57	4300
CF70DT/E/IN*	70	5200

* Contact your SYLVANIA sales representative for product availability

System Comparison

Compact Fluorescent vs Incandescent

Lamp Type	Rated Lamp Life	System Lumens	System Wattage	System LPW	Energy[1] Savings
100W Incandescent	750 hrs.	1710	100W	17	–
DULUX T/E/IN 26W w/ QUICKTRONIC CF	12,000 hrs.	1830	28W	65	$86.00
150W Incandescent	750 hrs.	2740	150W	18.5	–
DULUX T/E/IN 42W w/ QUICKTRONIC CF	12,000 hrs.	3200	46W	70	$124.00
200W Incandescent	750 hrs.	3650	200W	19	–
DULUX T/E/IN 57W w/ QUICKTRONIC CF	12,000 hrs.	4300	62W	69	$165.00

1. Based on $.10/kWh over 12,000 hours.

Application Information

Applications
Recessed ceiling fixtures
Industrial lighting
Showcase lighting
Wall sconces
Task lighting
Exit signs
Garden and walkway lighting

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible operating systems.

Application Notes

1. 4-Pin lamps designed for dimming and electronic ballast operation.
2. Minimum starting temperature depends on ballast.
3. Rule of thumb: to estimate the appropriate compact fluorescent lamp wattage, divide the incandescent wattage by 4.
4. Equipment manufacturers are advised to consult ANSI and IEC standards for the maximum allowable dimensions and temperature to insure compatibility with similar products.
5. QUICKTRONIC System CF electronic ballasts available for all wattages: 18W, 26W, 32W, 42W, 57W & 70W.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

CF022R4

Sample Specification
Lamp(s) shall be (a) DULUX (CF18DT/IN, CF26DT/E/IN, CF32DT/E/IN, CF42DT/E/IN, CF57DT/E/IN or CF70DT/E/IN) EOL ECO lamps, with end-of-life shutdown protection and pass existing Federal TCLP limits. Lamp(s) shall have an average rated life of 12,000 hours, a correlated color temperature of (2700K, 3000K, 3500K or 4100K), and a CRI of 82. Lamps shall have a (GX24q-2, GX24q-3, GX24q-4, GX24q-5 or GX24q-6) plug-in, 4-pin base and be suitable for use on electronic and dimming ballasts. Lamps shall be operated by QUICKTRONIC ballasts. Both lamps and ballasts are covered by the QUICK 60+ system warranty.

Warranty Information
QUICK 60+ warranty for OSRAM SYLVANIA lamp and ballast combination
Limited 6 month lamp warranty and a five year ballast warranty is possible if both lamps and ballasts are provided by OSRAM SYLVANIA. See the QUICK 60+ warranty for details and restrictions.

Ordering and Specification Information

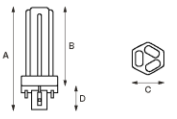
Item Number	Ordering Abbreviation	NEMA Generic Designation	Base	Watts	Volts[1]	Amps[1]	Initial Lumens	Mean Lumens[2]	Color Temp.	CRI	Av. Rated Life(hrs.)[3]
20875	CF18DT/E/IN/827	CFM18W/GX24q/27	GX24q-2	18	80	.210	1200	1032	2700K	82	12,000
20876	CF18DT/E/IN/830	CFM18W/GX24q/30	GX24q-2	18	80	.210	1200	1032	3000K	82	12,000
20877	CF18DT/E/IN/835	CFM18W/GX24q/35	GX24q-2	18	80	.210	1200	1032	3500K	82	12,000
20878	CF18DT/E/IN/841	CFM18W/GX24q/41	GX24q-2	18	80	.210	1200	1032	4100K	82	12,000
20879	CF26DT/E/IN/827	CFM26W/GX24q/27	GX24q-3	26	80	.300	1800	1548	2700K	82	12,000
20880	CF26DT/E/IN/830	CFM26W/GX24q/30	GX24q-3	26	80	.300	1800	1548	3000K	82	12,000
20881	CF26DT/E/IN/835	CFM26W/GX24q/35	GX24q-3	26	80	.300	1800	1548	3500K	82	12,000
20882	CF26DT/E/IN/841	CFM26W/GX24q/41	GX24q-3	26	80	.300	1800	1548	4100K	82	12,000
20883	CF32DT/E/IN/827	CFM32W/GX24q/27	GX24q-3	32	100	.320	2400	2064	2700K	82	12,000
20884	CF32DT/E/IN/830	CFM32W/GX24q/30	GX24q-3	32	100	.320	2400	2064	3000K	82	12,000
20885	CF32DT/E/IN/835	CFM32W/GX24q/35	GX24q-3	32	100	.320	2400	2064	3500K	82	12,000
20886	CF32DT/E/IN/841	CFM32W/GX24q/41	GX24q-3	32	100	.320	2400	2064	4100K	82	12,000
20887	CF42DT/E/IN/827	CFM42W/GX24q/27	GX24q-4	42	135	.320	3200	2752	2700K	82	12,000
20888	CF42DT/E/IN/830	CFM42W/GX24q/30	GX24q-4	42	135	.320	3200	2752	3000K	82	12,000
20871	CF42DT/E/IN/835	CFM42W/GX24q/35	GX24q-4	42	135	.320	3200	2752	3500K	82	12,000
20890	CF42DT/E/IN/841	CFM42W/GX24q/41	GX24q-4	42	135	.320	3200	2752	4100K	82	12,000
20895	CF57DT/E/IN/827[4]	CFM57W/GX24q/27	GX24q-5	57	182	.320	4300	3698	2700K	82	12,000
20896	CF57DT/E/IN/830[4]	CFM57W/GX24q/30	GX24q-5	57	182	.320	4300	3698	3000K	82	12,000
20897	CF57DT/E/IN/835[4]	CFM57W/GX24q/35	GX24q-5	57	182	.320	4300	3698	3500K	82	12,000
20899	CF57DT/E/IN/841[4]	CFM57W/GX24q/41	GX24q-5	57	182	.320	4300	3698	4100K	82	12,000
20794	CF70DT/E/IN/827[4,5,6]	CFM70W/GX24q/27	GX24q-6	70	220	.320	5200	4470	2700K	82	12,000
20795	CF70DT/E/IN/830[4,5,6]	CFM70W/GX24q/30	GX24q-6	70	220	.320	5200	4470	3000K	82	12,000
20796	CF70DT/E/IN/835[4,5,6]	CFM70W/GX24q/35	GX24q-6	70	220	.320	5200	4470	3500K	82	12,000
20797	CF70DT/E/IN/841[4,5,6]	CFM70W/GX24q/41	GX24q-6	70	220	.320	5200	4470	4100K	82	12,000

1. @ 25 KHz
2. Measured at 40% (4800 hours) of rated life.
3. Based on 3 hours per start. Number of operating hours when half have failed and half are still operating.
4. EOL protection incorporated into all 57W and 70W DULUX T/E ballasts per NEMA guidelines.
5. TCLP testing in progress; expect results by June 2005.
6. Contact your SYLVANIA sales representative for product availability

Ordering Guide

CF	26	DT	/	E	/	IN	/	835
Compact Fluorescent	Wattage 18, 26, 32, 42, 57 or 70 watts	DULUX Triple		For electronic and dimming ballasts		Amalgam		82 CRI 27 = 2700K 30 = 3000K 35 = 3500K 41 = 4100K

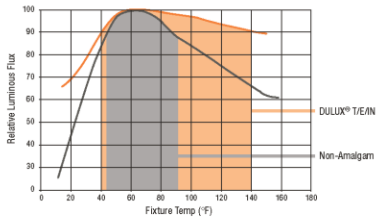
Dimensions



	(A) MOL [in. (mm)]	(B) Max. Base Face to Top of Lamp [in. (mm)]	(C) Max. Base Width [in. (mm)]	(D) Guide Post [in. (mm)]
CF18T/E/IN	4.77 (111)	3.74 (95)	1.90 (49)	0.62 (16)
CF26T/E/IN	4.96 (126)	4.33 (110)	1.90 (49)	0.62 (16)
CF32T/E/IN	5.60 (142)	4.96 (126)	1.90 (49)	0.62 (16)
CF42T/E/IN	6.42 (163)	5.79 (147)	1.90 (49)	0.62 (16)
CF57T/E/IN	7.76 (197)	7.13 (181)	1.90 (49)	0.62 (16)
CF70T/E/IN	9.25 (235)	8.62 (219)	1.90 (49)	0.62 (16)

Technical Information

90% Lumen Performance Range
DULUX® T/E/IN vs. Non-Amalgam Lamps



Typical Fluorescent Lamp Mortality

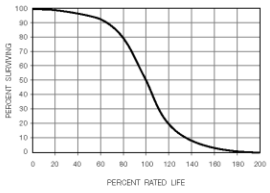


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Photo-Optic
Phone: 1-888-677-2627
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Fax: 1-800-667-6772

Visit our website: www.sylvania.com

Lamp LL3ALT

16/2/2007

28W/830 Min Bipin T5 HE ALTO UNP

Product family description
Ultra-slim design with extraordinary light output.

Features/Benefits

- Improved optical control.
- Fixtures can be 40% smaller than T8 systems.
- Design flexibility for cove and cabinet lighting.
- Better fin in 2 x 2 and 2 x 4 grid ceilings.
- Up to 104 lumens per watt.
- 95% lumen maintenance.
- 85 CRI in 3000, 3500 and 4100K.
- High system efficacy.
- Fail-safe operation at end of life.
- 20,000 hours rated average life.

Applications

- Ideal for general, decorative and architectural lighting in offices, retail stores, hotels, schools and hospitals.

Notes

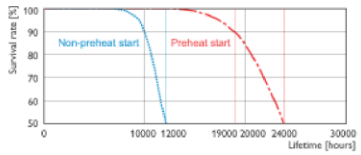
- NOT compatible with dimming ballasts.
- Silhouette™ T5 nominal lamp lengths are shorter than standard sizes. See dimension chart for details.

Product data	
Product Number	230847
Full product name	28W/830 Min Bipin T5 HE ALTO UNP
Ordering Code	F28T5/830
Pack type	Unpacked
Pieces per Sku	1
Skus / Case	40
Pack UPC	046677230845
EAN2US	
Case Bar Code	50046677230840
Successor Product number	
Watts[W]	28W
Color Code	830 [CCT of 3000K]
Base	Min Bipin [Miniature Bipin]
Bulb	T5 [16mm]
Special packing	ALTO
Packing Type	UNP [Unpacked]
Packing Configuration	40
System Description	High Efficiency
Base Information	Green[Green Base]
Rated Avg. Life[hr]	24000

PHILIPS

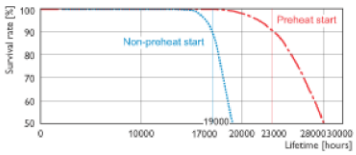
1

Product data	
Dimmable	Yes
Mercury (Hg) Content[mg]	
Color Rendering Index[Ra8]	85
Color Temperature[K]	3000
Initial Lumens[Lm]	–
Overall Length C[mm]	1163.2
Diameter D[mm]	17



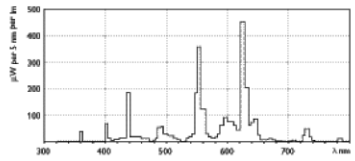
Life Expectancy 3h cycle

TL5

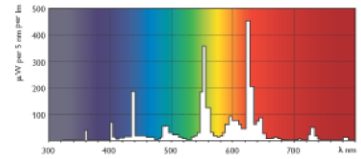


Life Expectancy 12h cycle

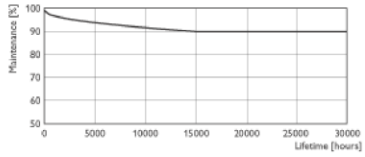
TL5



TL5/830

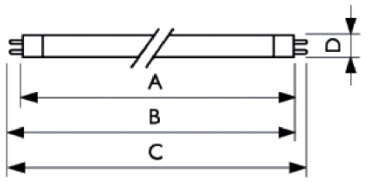


TL5/830



TL5

PHILIPS



TL5

	A		B	C	D
Full product name	Max	Min	Max	Max	Max
28W/830 Min Bipin T5 HE ALTO UNP	1149.0	1153.7	1156.1	1163.2	17

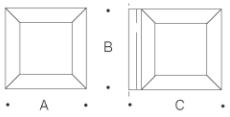
APPENDIX E: ROOF TERRACE LIGHTING EQUIPMENT

Fixture TF1

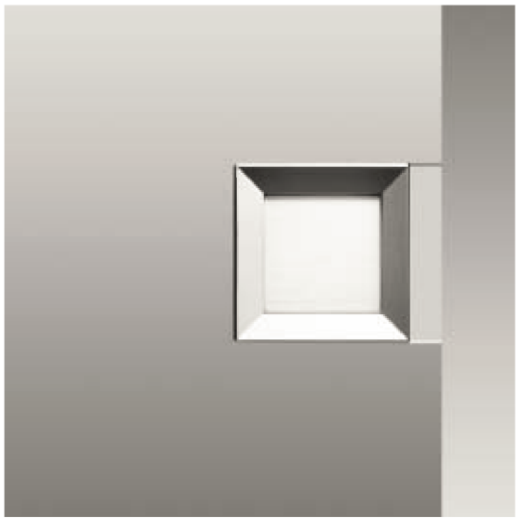
Wall and ceiling luminaires

Type:
BEGA Product #:
Project:
Voltage:
Color:
Options:
Modified:

Housing: One piece die cast aluminum supplied with universal mounting bracket for direct attachment to 3½" or 4" octagonal wiring box.
Enclosure: Molded clear glass refractor, ¼" thick with internal optical texture and white ceramic coating provides a very uniform light distribution. Fully gasketed with a molded silicone rubber gasket for water tight operation. One piece die cast aluminum guard, secured by captive, socket head screws threaded into stainless steel inserts. Interior of the lamp compartment is painted white.
Electrical: Lampholders: (26W, 32W, 42W multi-watt socket) G24q-3, Gx24q-4 rotary lock lampholder rated 75W, 600V. Multi-watt electronic ballast 26W-32W-42W and universal voltage (120 through 277V).
Finish: These luminaires are available in five standard BEGA colors: Black (BLK); White (WHT); Bronze (BRZ); Silver (SLV); Eurocoat™ (URO). To specify, add appropriate suffix to catalog number. For complete description of BEGA finishing process, refer to technical information section at end of catalog. Custom colors supplied on special order.
U.L. listed, suitable for wet locations. Protection class: IP 65.



Wall or ceiling mounted luminaires with die cast aluminum frame/guard. Heavy pressed ¼" thick crystal glass with internal structure and white translucent ceramic coating. U.L. listed, suitable for wet locations. IP 65. Color: Standard BEGA finishes.



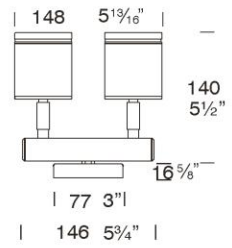
	Lamp	Lumen	A	B	C
2639P	1 26/32/42W CF triple-4p	1800/2400/3200	8¾	8¾	10⅝

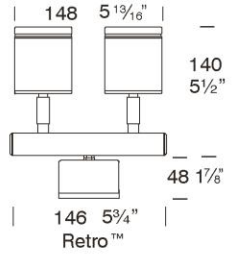
BEGA/US 1000 BEGA Way, Carpinteria, CA 93013 [P] 805·684·0533 [F] 805·684·6682

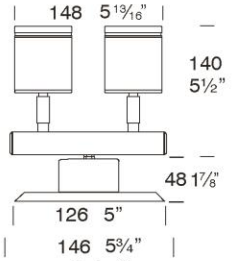
Fixture TF2

Twin Wall Spot

Cat. No. TWS
Cat. No. TWS/R







HUNZA

The two individual spotlights can be aimed in entirely different directions allowing 360 degree rotation and 0 - 90° elevation and are water-resistant.

The Retro™ is a 110/240 ac mains option suited to an installation where mounting a transformer is a problem, e.g. a brick wall where there is only the cable protruding out of the wall and it is not an option to recess the transformer or when replacing an existing light fitting. The base size increases in size to accomodate the encapsulated IP66 dimmable transformer.

Ordering Information

Luminaire Type	Material/Finish	Accessories
TWS - Twin Wall Spot	BK - Black BZ - Bronze GN - Green MS - Metallic Silver WH - White COP - Copper SS - 316 Stainless Steel	CJK150 - Cable Joint Kit DFL - Frosted Lens GG - Glare Guard HCL - Hex Cell Louvre Adaptor /R - Retro™ Transformer 110/240 volt WBAP - Wall Box Adaptor Plate

Ordering Example
TWS GN - Twin Wall Spot in Green
TWS/R BZ - Twin Wall Spot Retro™ in Bronze
DFL - Frosted Lens
(Accessories ordered separately)

Patent Pending

HUNZA
FACTORY: Ph: 64-9-528 9471 Fax: 64-9-528 9361.
USA: Ph. 310 560 7310 Fax. 1 877 692 4589.
hunza@hunza.co.nz www.hunza.co.nz
Specifications may change without notice.
130 Felton Matthew Ave, Glen Innes, Auckland, New Zealand.
3237 Long Island St, W. Sacramento, California 95691, USA.
Manufactured in New Zealand.

5.6

Luminaire Construction

CNC machined from one of the following metals:

Body: High corrosion resistant low copper 63.5mm (2½") x 10mm (25/64") aluminium. End cap - solid aluminium 63.5mm (2½") rod,.

Base & Mounting Plate (Retro™): Cast from virgin high corrosion resistant CC401 low copper aluminium alloy chromate substrate and high UV resistant polyester powder coat - Black, Bronze, Green, Metallic Silver, White.

Body: Copper 63.5mm (2½") x 10mm (25/64). End cap - solid copper 63.5mm (2½") rod.

Base: Copper Hand spun 2mm (5/64")

Mounting Plate: Forged brass (Retro™).

Body: Stainless steel 316 63.5mm (2½") x 10mm (25/64) rod. End cap - 316 stainless steel 63.5mm (2½") rod.

Base: Investment cast and CNC machined.

Mounting Plate: Investment cast and CNC machined. (Retro™)

Mounting

12 volt: the luminaire is mounted to the wall using two 316 stainless screws through a shallow base 16mm (5/8") in depth. A Wall Box Adaptor Plate (Cat. WBAP) is available as an accessory to fit 3.0 and 4.0 junction boxes for USA /Canada.

Retro™ luminaire (110/240 volt) : a mounting plate is fixed to the wall using two screws and then the luminaire is fitted to the mounting plate.

Features

Lenses:

3mm (1/8") thick clear tempered shatter resistant glass.
Life Time Warranty.

Gaskets:

Silicone, iron impregnated 220°c (428°f).

Lamp Holders:

GU5.3 - 350°c (662°f) ceramic multi contact lamp holder with 250°c (480°f) teflon cables.

Accessories:

CJK150 Cable Joint Kit (Cat.CJK150) Not approved for USA /Canada.

Frosted Lens (Cat. DFL).

Glare Guard (Cat. GG.)

Hex Cell Louver Adaptor (Cat. HCL)

Retro™ transformer 110/240 volt (Cat. /R)

Wall Box Adaptor Plate (Cat. WBAP 12 volt luminaire USA / Canada)

Swivel:

Aluminium and Copper luminaires - 360° rotation and 0 - 90° elevation, solid brass with anti rust spring.

Stainless Steel luminaires - 360° rotation and 0 - 90° elevation, full stainless steel construction.

Standards

IP66 AS/NZS61046 UL1838

Luminaire Weight

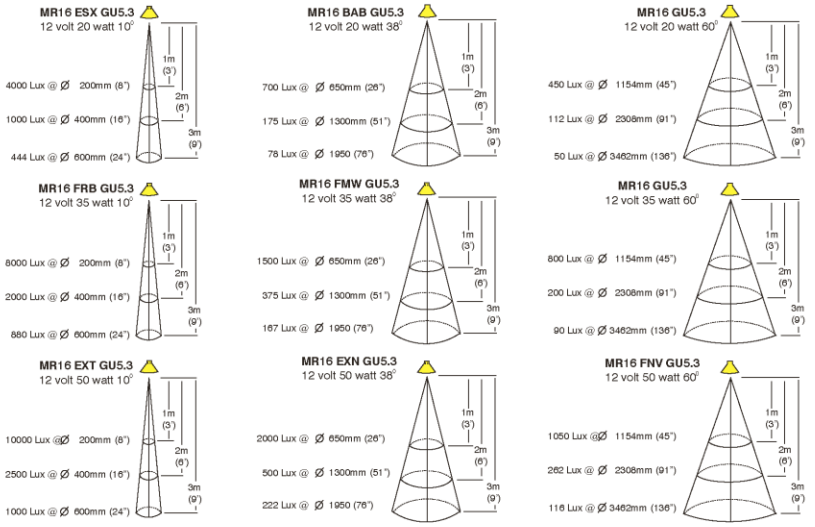
12 volt
Alum .775kg (1lb 11oz)
Cop 2.230kg (4lb 14oz)
SS 1.750kg (3lb 13oz)
Retro™
Alum 1.100kg (21lb 6oz)
Cop 2.650kg (5lb 13oz)
SS 2.200kg (4lb 13oz)

Power Supply

12 volt
HUNZA® Inground or HUNZA® Wall Mount Transformer: not included.
USA/ Canada
HUNZA® Wall Mount Transformer: not included
RETRO™
HUNZA® 110/240 volt ac silicone encapsulated electronic transformer built into the Retro™ base. Dimmable with a suitable leading edge dimmer.

Luminaire: supplied with

MR16 GU5.3 2 x 20, 35 or 50 watt lamps max.
Retro™
MR16 GU5.3 2 x 20 watt lamps max.
USA and Canada
MR16 GU5.3 2 x 20 or 35 watt lamp max.
Retro™
MR16 GU5.3 2 x 20watt lamps max.



HUNZA

FACTORY: Ph: 64-9-528 9471 Fax: 64-9-528 9361.
130 Felton Matthew Ave, Glen Innes, Auckland, New Zealand.
USA: Ph. 310 560 7310 Fax. 1 877 692 4589.
3237 Long Island St, W. Sacramento, California 95691, USA.
hunza@hunza.co.nz www.hunza.co.nz
Manufactured in New Zealand.

Ballast TB1

ADVANCE

REZ-1T42-M2-BS	
Brand Name	MARK 10 POWERLINE
Ballast Type	Electronic Dimming
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120
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 (Watts) (min/max)	Ballast Factor (min/max)	MAX THD %	Power Factor	Lamp Current Crest Factor	B.E.F.
CFQ26W/G24Q	1	26	50/10	0.26	08/31	0.05/1.00	10	0.98	1.6	3.23
CFTR26W/GX24Q	1	26	50/10	0.26	08/31	0.05/1.00	10	0.98	1.6	3.23
CFTR32W/GX24Q	1	32	50/10	0.32	09/38	0.05/1.00	10	0.98	1.6	2.63
* CFTR42W/GX24Q	1	42	50/10	0.41	10/49	0.05/1.00	10	0.99	1.6	2.04

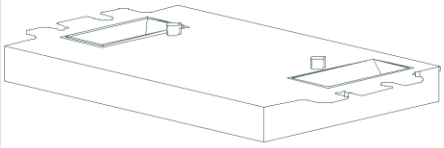
Wiring Diagram

Diag. 134

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

Standard Lead Length (inches)

Enclosure



Enclosure Dimensions

OverAll (L)	Width (W)	Height (H)	Mounting (M)
4.98 "	3.00 "	1.29 "	2.00 "
4 49/50	3	1 29/100	2
12.6 cm	7.6 cm	3.3 cm	5.1 cm

Revised 08/17/2006

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
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

Transformer TX1

Transformers

Magnetic Low Voltage Transformer

- Stainless steel enclosure
- Separate high and low voltage wiring compartment
- Primary voltage 120V
- Secondary voltage 12V, 13V, 14V
- Fully encapsulated core and coil
- UL approved, wet location
- (2) Side entry double KO's 1/2" or 3/4" in each compartment
- Internal automatic reset primary overload protection
- Fully dimmable

Note: TR Series transformers have 12, 13, and 14 volt secondary taps. CAUTION.....DO NOT use 13 or 14 volt taps without consulting the factory engineering department through your local B-K LIGHTING REPRESENTATIVE.

		Weight	Height	Depth	C	D	E	F
TR-100	100 VA	9 lbs.	7-3/4"	4-5/16"	6-3/8"	5-1/2"	3"	1"
TR-300	300 VA	12 lbs.	8-1/4"	4-5/16"	6-3/8"	5-1/2"	3"	1-1/8"
TR-500	500 VA	18 lbs.	10"	4-1/2"	6-5/8"	5-3/4"	3"	1-1/8"

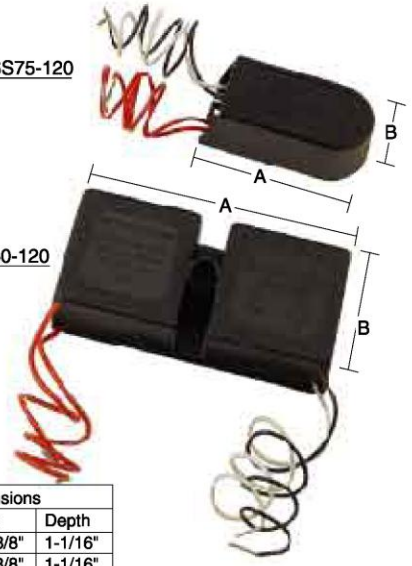
Electronic Low Voltage Transformer

- Fully dimmable 120VAC input
- Thermal plastic housing, fully encapsulated
- Primary voltage 120VAC or 230VAC, 50/60 Hz
- Secondary voltage 11.6V
- RFI filtration
- Primary overload protection
- UL and cULus listed for use in weather proof enclosure
- Soft start circuitry

Note:
Maximum operating ambient temperature 90°C.
Minimum operating ambient temperature -15°C.
Transformer must be housed in weatherproof enclosure. Other primary and secondary voltage available, consult factory.

TRSS75-120

TRSS150-120



	Maximum Wattage	Minimum Wattage	Input Voltage	Dimensions A	B	Depth
TRSS75-120	75 VA	10 VA	120V	2-3/4"	1-3/8"	1-1/16"
TRSS75-230	75 VA	10 VA	230V	2-3/4"	1-3/8"	1-1/16"
TRSS150-120	150 VA	20 VA	120V	4-3/8"	2-1/16"	1-3/16"

Lamp TL1

Product Information Bulletin

DULUX® T/E/IN/EOL ECO®

4-Pin Amalgam Compact Fluorescent Lamps

- End-of-Life (EOL) shutdown protection
- Designed to pass Federal TCLP Test*
- Improved high temperature performance
  – Maintains 90% lumens from 40° to 140°F ambient
- Operates on various ballast systems
  – Flicker free start on electronic ballasts
  – Compatible with QUICKTRONIC® System CF
- Less power consumption than incandescent of comparable light output
- High luminous efficacy
- Long 12,000 hour average rated life
  – Reduces relamping requirement and related cost
- Rare earth tri-phosphor with 82 CRI
- 2700K, 3000K, 3500K and 4100K

* Regulations may vary. Check your local and state regulations.

ECOLOGIC® is a comprehensive program of OSRAM SYLVANIA focused on addressing environmental issues at all stages of lamp life.

SYLVANIA DULUX T/E/IN/EOL ECO amalgam compact fluorescent lamps are ideal for use in a wide range of applications, including high temperatures. They are designed to be operated on energy efficient electronic and dimming ballasts.

DULUX T/E/IN/EOL ECO amalgam lamps are ideal for fixtures where shorter overall length lamps with higher lumen packages are required and where lamps may operate at elevated temperatures. In addition, the delta tube configuration of these lamps provides an even light distribution.

Product Availability

Lamp	Wattage	Rated Lumens
CF18DT/E/IN	18	1200
CF26DT/E/IN	26	1800
CF32DT/E/IN	32	2400
CF42DT/E/IN	42	3200
CF57DT/E/IN	57	4300
CF70DT/E/IN*	70	5200

* Contact your SYLVANIA sales representative for product availability

System Comparison

Compact Fluorescent vs Incandescent

Lamp Type	Rated Lamp Life	System Lumens	System Wattage	System LPW	Energy[1] Savings
100W Incandescent	750 hrs.	1710	100W	17	–
DULUX T/E/IN 26W w/ QUICKTRONIC CF	12,000 hrs.	1830	28W	65	$86.00
150W Incandescent	750 hrs.	2740	150W	18.5	–
DULUX T/E/IN 42W w/ QUICKTRONIC CF	12,000 hrs.	3200	46W	70	$124.00
200W Incandescent	750 hrs.	3650	200W	19	–
DULUX T/E/IN 57W w/ QUICKTRONIC CF	12,000 hrs.	4300	62W	69	$165.00

1. Based on $.10/kWh over 12,000 hours.

Application Information

Applications
Recessed ceiling fixtures
Industrial lighting
Showcase lighting
Wall sconces
Task lighting
Exit signs
Garden and walkway lighting

Fixtures
Contact your local fixture agent for available fixtures.

Ballast Information
Contact your OSRAM SYLVANIA representative for a list of compatible operating systems.

Application Notes

1. 4-Pin lamps designed for dimming and electronic ballast operation.
2. Minimum starting temperature depends on ballast.
3. Rule of thumb: to estimate the appropriate compact fluorescent lamp wattage, divide the incandescent wattage by 4.
4. Equipment manufacturers are advised to consult ANSI and IEC standards for the maximum allowable dimensions and temperature to insure compatibility with similar products.
5. QUICKTRONIC System CF electronic ballasts available for all wattages: 18W, 26W, 32W, 42W, 57W & 70W.

SEE THE WORLD IN A NEW LIGHT SYLVANIA

CF022R4

Sample Specification

Lamp(s) shall be (a) DULUX (CF18DT/IN, CF26DT/E/IN, CF32DT/E/IN, CF42DT/E/IN, CF57DT/E/IN or CF70DT/E/IN) EOL ECO lamps, with end-of-life shutdown protection and pass existing Federal TCLP limits. Lamp(s) shall have an average rated life of 12,000 hours, a correlated color temperature of (2700K, 3000K, 3500K or 4100K), and a CRI of 82. Lamps shall have a (GX24q-2, GX24q-3, GX24q-4, GX24q-5 or GX24q-6) plug-in, 4-pin base and be suitable for use on electronic and dimming ballasts. Lamps shall be operated by QUICKTRONIC ballasts. Both lamps and ballasts are covered by the QUICK 60+ system warranty.

Warranty Information

QUICK 60+ warranty for OSRAM SYLVANIA lamp and ballast combination

Limited 6 month lamp warranty and a five year ballast warranty is possible if both lamps and ballasts are provided by OSRAM SYLVANIA. See the QUICK 60+ warranty for details and restrictions.

Ordering and Specification Information

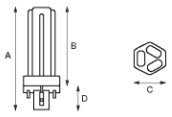
Item Number	Ordering Abbreviation	NEMA Generic Designation	Base	Watts	Volts[1]	Amps[1]	Initial Lumens	Mean Lumens[2]	Color Temp.	CRI	Av. Rated Life(hrs.)[3]
20875	CF18DT/E/IN/827	CFM18W/GX24q/27	GX24q-2	18	80	.210	1200	1032	2700K	82	12,000
20876	CF18DT/E/IN/830	CFM18W/GX24q/30	GX24q-2	18	80	.210	1200	1032	3000K	82	12,000
20877	CF18DT/E/IN/835	CFM18W/GX24q/35	GX24q-2	18	80	.210	1200	1032	3500K	82	12,000
20878	CF18DT/E/IN/841	CFM18W/GX24q/41	GX24q-2	18	80	.210	1200	1032	4100K	82	12,000
20879	CF26DT/E/IN/827	CFM26W/GX24q/27	GX24q-3	26	80	.300	1800	1548	2700K	82	12,000
20880	CF26DT/E/IN/830	CFM26W/GX24q/30	GX24q-3	26	80	.300	1800	1548	3000K	82	12,000
20881	CF26DT/E/IN/835	CFM26W/GX24q/35	GX24q-3	26	80	.300	1800	1548	3500K	82	12,000
20882	CF26DT/E/IN/841	CFM26W/GX24q/41	GX24q-3	26	80	.300	1800	1548	4100K	82	12,000
20883	CF32DT/E/IN/827	CFM32W/GX24q/27	GX24q-3	32	100	.320	2400	2064	2700K	82	12,000
20884	CF32DT/E/IN/830	CFM32W/GX24q/30	GX24q-3	32	100	.320	2400	2064	3000K	82	12,000
20885	CF32DT/E/IN/835	CFM32W/GX24q/35	GX24q-3	32	100	.320	2400	2064	3500K	82	12,000
20886	CF32DT/E/IN/841	CFM32W/GX24q/41	GX24q-3	32	100	.320	2400	2064	4100K	82	12,000
20887	CF42DT/E/IN/827	CFM42W/GX24q/27	GX24q-4	42	135	.320	3200	2752	2700K	82	12,000
20888	CF42DT/E/IN/830	CFM42W/GX24q/30	GX24q-4	42	135	.320	3200	2752	3000K	82	12,000
20871	CF42DT/E/IN/835	CFM42W/GX24q/35	GX24q-4	42	135	.320	3200	2752	3500K	82	12,000
20890	CF42DT/E/IN/841	CFM42W/GX24q/41	GX24q-4	42	135	.320	3200	2752	4100K	82	12,000
20895	CF57DT/E/IN/827[4]	CFM57W/GX24q/27	GX24q-5	57	182	.320	4300	3698	2700K	82	12,000
20896	CF57DT/E/IN/830[4]	CFM57W/GX24q/30	GX24q-5	57	182	.320	4300	3698	3000K	82	12,000
20897	CF57DT/E/IN/835[4]	CFM57W/GX24q/35	GX24q-5	57	182	.320	4300	3698	3500K	82	12,000
20899	CF57DT/E/IN/841[4]	CFM57W/GX24q/41	GX24q-5	57	182	.320	4300	3698	4100K	82	12,000
20794	CF70DT/E/IN/827[4,5,6]	CFM70W/GX24q/27	GX24q-6	70	220	.320	5200	4470	2700K	82	12,000
20795	CF70DT/E/IN/830[4,5,6]	CFM70W/GX24q/30	GX24q-6	70	220	.320	5200	4470	3000K	82	12,000
20796	CF70DT/E/IN/835[4,5,6]	CFM70W/GX24q/35	GX24q-6	70	220	.320	5200	4470	3500K	82	12,000
20797	CF70DT/E/IN/841[4,5,6]	CFM70W/GX24q/41	GX24q-6	70	220	.320	5200	4470	4100K	82	12,000

1. @ 25 KHz
2. Measured at 40% (4800 hours) of rated life.
3. Based on 3 hours per start. Number of operating hours when half have failed and half are still operating.
4. EOL protection incorporated into all 57W and 70W DULUX T/E ballasts per NEMA guidelines.
5. TCLP testing in progress; expect results by June 2005.
6. Contact your SYLVANIA sales representative for product availability

Ordering Guide

CF	26	DT	/	E	/	IN	/	835
Compact Fluorescent	Wattage 18, 26, 32, 42, 57 or 70 watts	DULUX Triple		For electronic and dimming ballasts		Amalgam		82 CRI 27 = 2700K 30 = 3000K 35 = 3500K 41 = 4100K

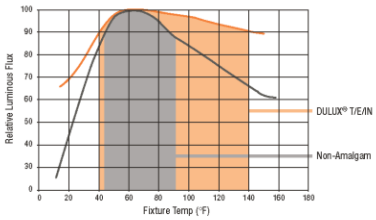
Dimensions



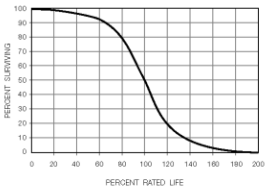
	(A) MOL [in. (mm)]	(B) Max. Base Face to Top of Lamp [in. (mm)]	(C) Max. Base Width [in. (mm)]	(D) Guide Post [in. (mm)]
CF18T/E/IN	4.77 (111)	3.74 (95)	1.90 (49)	0.62 (16)
CF26T/E/IN	4.96 (126)	4.33 (110)	1.90 (49)	0.62 (16)
CF32T/E/IN	5.60 (142)	4.96 (126)	1.90 (49)	0.62 (16)
CF42T/E/IN	6.42 (163)	5.79 (147)	1.90 (49)	0.62 (16)
CF57T/E/IN	7.76 (197)	7.13 (181)	1.90 (49)	0.62 (16)
CF70T/E/IN	9.25 (235)	8.62 (219)	1.90 (49)	0.62 (16)

Technical Information

90% Lumen Performance Range
DULUX® T/E/IN vs. Non-Amalgam Lamps



Typical Fluorescent Lamp Mortality



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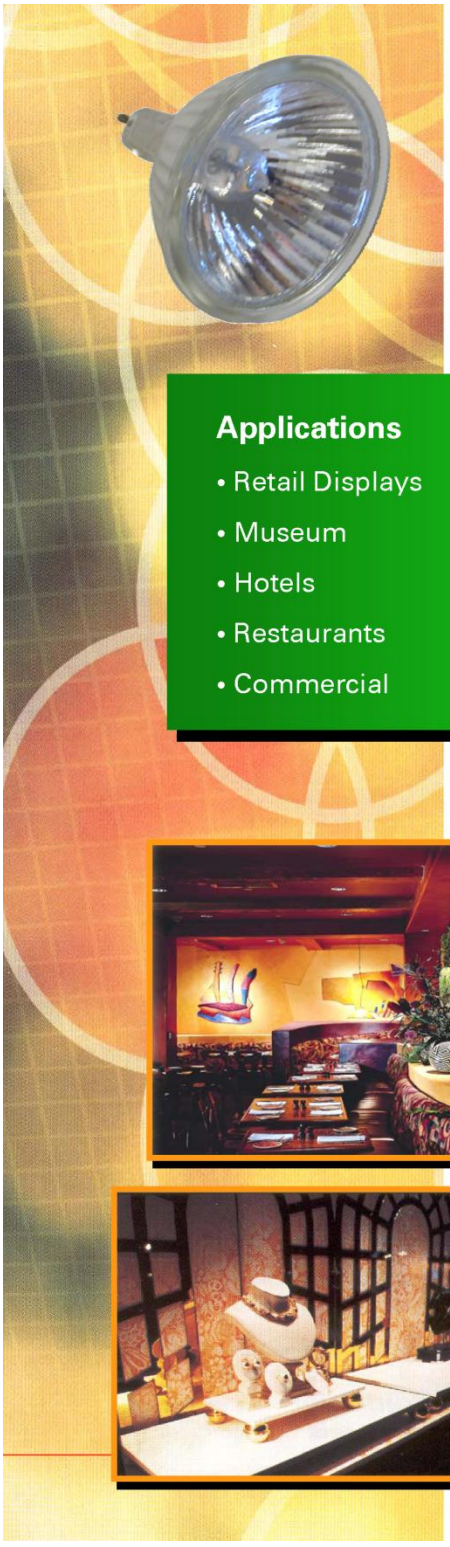
Lamp TL2



Precise™ IR

Energy Saving MR16

Energy Savings...

Use a 37 watt Precise IR to replace a standard 50 watt MR16 and reduce energy consumption by 26%.

Halogen IR Technology...

Most of the wattage used by standard lamps generates invisible infrared light energy. The Precise IR halogen capsule has a special infrared coating which redirects this wasted electricity back onto the lamp filament. Using this recycled heat allows the lamp to consume less energy.

Crisp, white light...

The hard coated dichroic reflector with an axial filament produces a very smooth beam pattern.

4000 hour rated lamp life.

UV-Control...

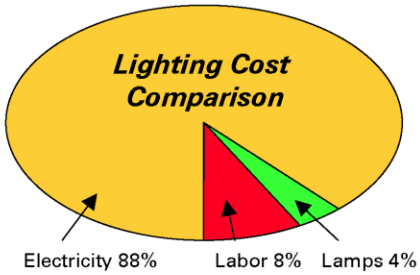
The IR coated capsule and the cover glass combine to virtually eliminate UV-B and UV-C radiation. Precise IR is ideal for heat sensitive applications and also reduces fading and discoloration.

Applications

- Retail Displays
- Museum
- Hotels
- Restaurants
- Commercial

GE Lighting

Precise™ IR Energy Saving MR16



Cost Of Light:

The purchase price of the lamps represents only a small fraction of the overall cost of light. Energy consumption is the largest expense and upgrading your lighting with high technology GE lamps can save thousands of dollars each year.

GE Lamps:
Delivering Value to Your Customer's Bottom Line!

Product Information	GE IR MR16	50 Watt Standard MR16's		
Product	GE Precise IR	GE Constant Color Precise Lamps	Competitive 5000 Hour Lamps	Competitive 4000 Hour Lamps
Description	Q37MR16/HIR	Q50MR16/C	50MR16	50MR16
Watts	37	50	50	50
Life	4000	6000	5000	4000
Beam Angle - CBCP	25-4400	25-3200	24-3200	25-3200
Annual Lamp Changes	1.10	0.73	0.88	1.10
Annual Operating Costs				
Labor (Lamp Changes x Labor Cost)	$2.20	$1.47	$1.76	$2.20
Energy ($/kwh x Watts x Hours / 1000)	$16.28	$22.00	$22.00	$22.00
Total	$18.48	$23.47	$23.76	$24.20
Annual Savings/Socket*		$4.99	$5.28	$5.72
% Savings		27%	29%	31%

*Assumes: Energy Rate - 10¢ kWh, replacement labor cost - $2.00 per lamp, Annual Hours of Operation - 4,400 hours

Precise™ IR - Ordering and Specification Information

Order Code	Description	Volts	Case Quantity	Watts	Filament Type	MOL (in)	Diameter (in)	Rated Average Life	Color Temp.	CBCP	Beam Angle	Base Type	Replaces Standard MR16
16715	Q37MR16/HIR/CG10	12	20	37	C-8	1.77	2	4000	3000	12,500	10	2-Pin GU5.3	50 Watt
16716	Q37MR16/HIR/CG25	12	20	37	C-8	1.77	2	4000	3000	4,400	25	2-Pin GU5.3	50 Watt
16717	Q37MR16/HIR/CG40	12	20	37	C-8	1.77	2	4000	3000	2,050	40	2-Pin GU5.3	50 Watt
16718	Q50MR16/HIR/CG10	12	20	50	C-8	1.77	2	4000	3000	15,000	10	2-Pin GU5.3	65-75 Watt
16719	Q50MR16/HIR/CG25	12	20	50	C-8	1.77	2	4000	3000	5,700	25	2-Pin GU5.3	65-75 Watt
16720	Q50MR16/HIR/CG40	12	20	50	C-8	1.77	2	4000	3000	2,600	40	2-Pin GU5.3	65-75 Watt

Cover glass allows for use in open fixtures.

GE Lighting

For completed product information, visit the GE Lighting Web Site at www.GELighting.com

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APPENDIX F: DAYLIGHTING STUDY

For this Daylighting Study, I analyzed the contributions of daylight to the most major space in the building, the Grand Foyer. However, I found through this study that the contributions of the daylight to this space did not generate very usable light due to the environment and the architecture of the building. Also, I found upon further inquiry that because the building management system used throughout the building to control the theatrical lighting and other systems came from the theater industry, customized integration with daylight would prove to be very costly.

For this daylight study, I analyzed three views of the building: a bird's-eye-view of just the ground floor of the building ("Ground Floor View", the Grand Foyer is the portion with the blue carpeting), a view from the south facing north ("North View"), and a view from the southeast facing northeast ("Exterior Angle View"). Each view was analyzed on four days – June 21, August 21, October 21, and December 21. Because the August 21 analysis is identical to an analysis of April 21, and the October 21 analysis is identical to an analysis of February 21, this analysis covers the 21st of every other month throughout an entire year.

Ground Floor View

	June 21	August 21	October 21	December 21 (no DST)
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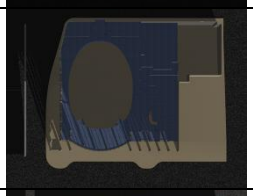
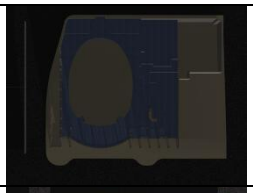
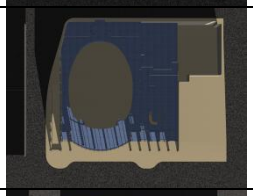
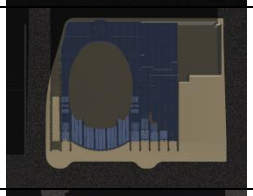
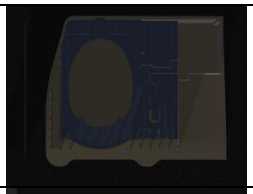
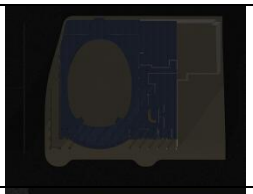
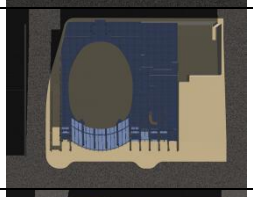
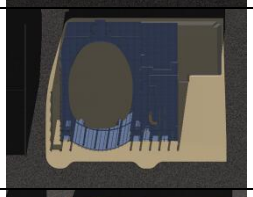
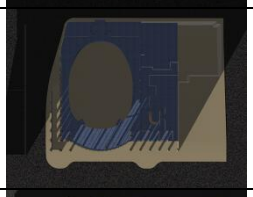
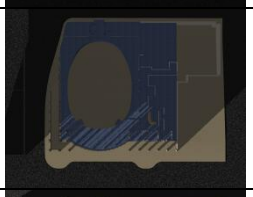
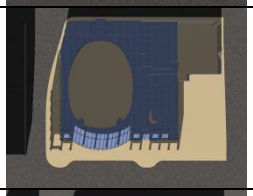
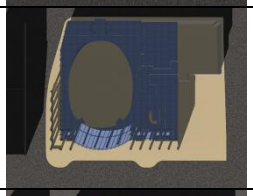
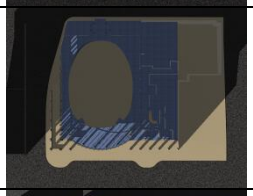
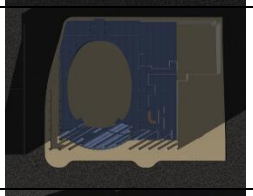
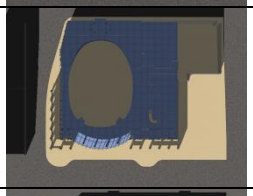
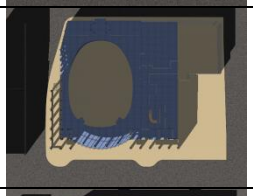
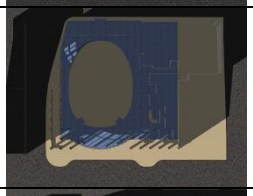
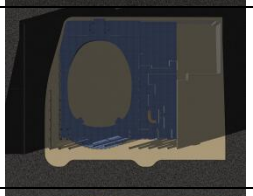
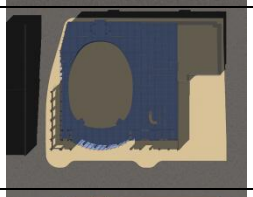
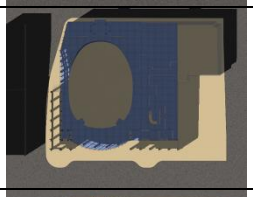
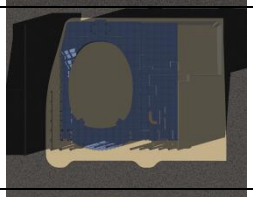
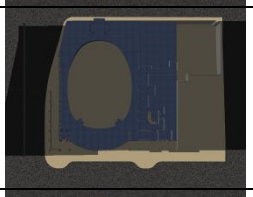
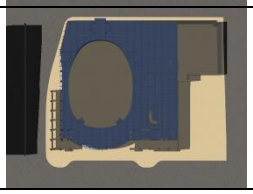
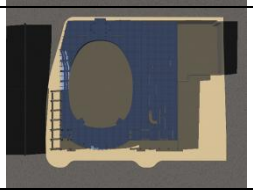
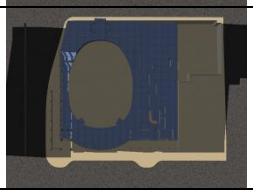
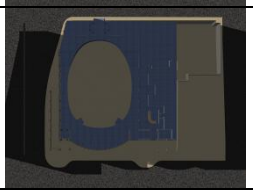
7 am				
8 am				
9 am				
10 am				
11 am				
12 pm				
1 pm				

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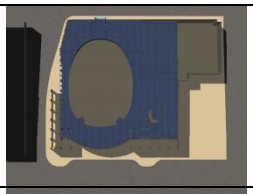
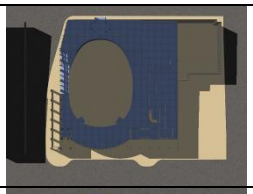
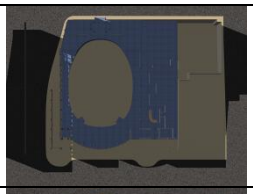
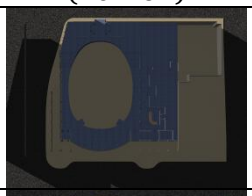
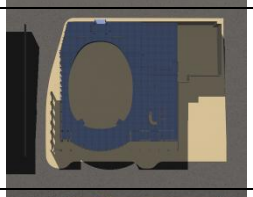
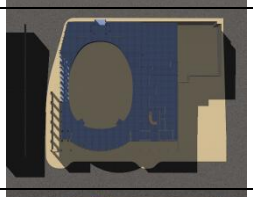
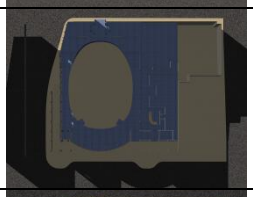
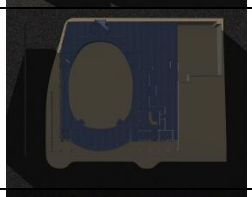
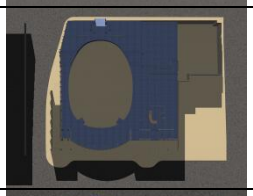
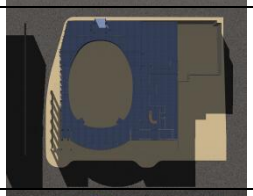
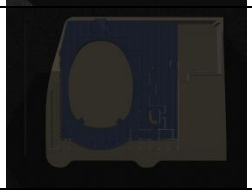
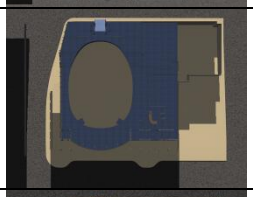
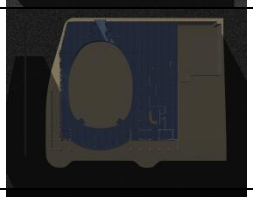
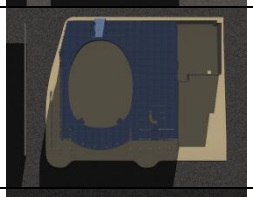
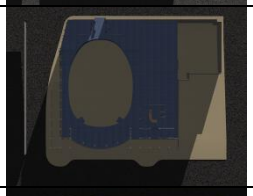
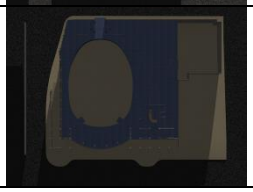
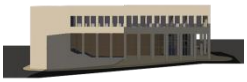
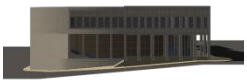
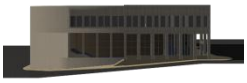
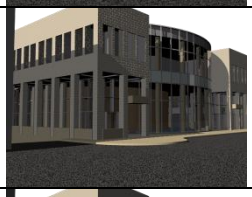
2 pm				
3 pm				
4 pm				
5 pm				
6 pm				
7 pm				
8 pm				

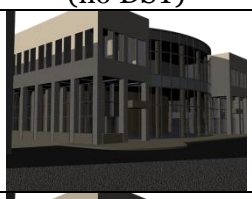
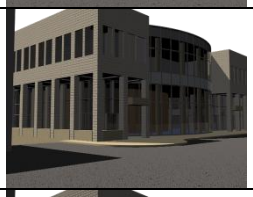
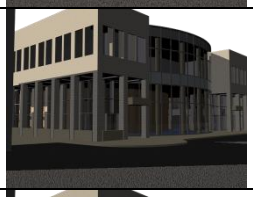
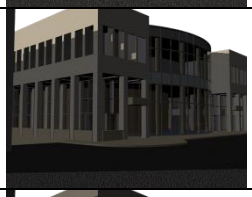
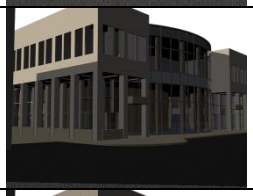
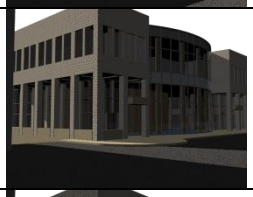
North View

	June 21	August 21	October 21	December 21 (no DST)
6 am				
7 am				
8 am				
9 am				
10 am				
11 am				
12 pm				
1 pm				

	June 21	August 21	October 21	December 21 (no DST)
2 pm				
3 pm				
4 pm				
5 pm				
6 pm				
7 pm				
8 pm				

Exterior Angle View

	June 21	August 21	October 21	December 21 (no DST)
6 am				
7 am				
8 am				
9 am				
10 am				
11 am				
12 pm				
1 pm				

	June 21	August 21	October 21	December 21 (no DST)
2 pm				
3 pm				
4 pm				
5 pm				
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APPENDIX G: ELECTRICAL EQUIPMENT

Product Description

- 600V AC maximum (250V DC).
- 3-phase 4-wire, 3-phase 3-wire, 1-phase 3-wire, 1-phase 2-wire.
- 800 ampere maximum main lugs.
- 600 ampere maximum main breaker.
- 225 ampere maximum branch breakers.
- Bolt-on branch breakers.
- Factory assembled.
- Refer to **Page 14-3** for additional information.

Type PRL3a

Application Description

- Lighting and appliance branch panelboard or power distribution panelboard.
- Fully rated or series rated.
- Interrupting ratings up to 200 kA symmetrical.
- Suitable for use as Service Entrance Equipment, when specified on the order.
- See **Pages 14-3** through **14-16** for additional information.

Standards and Certification

- UL 67, UL 50.
- Federal Specification W-P-115c.
- Refer to **Page 14-3** for additional information.

Options and Accessories

- Refer to **Page 14-42**.

Layout and Sizing

- Refer to **Page 14-23**.

Product Selection

Formula Pricing: Base Price + Branch Circuits + Modifications = Total Price U.S. $

Table 14-24. Base Prices — PRL3a

Ampere Rating	Interrupting Rating (kA Symmetrical)				Breaker Type	Price U.S. $		
	240V AC	480V AC	600V AC	250V DC		3Ph 4W	1Ph 3W, 1Ph 2W	3Ph 3W
Main Lug Only								
100	—	—	—	—	—	726.	601.	617.
250	—	—	—	—	—	791.	662.	673.
400	—	—	—	—	—	1,261.	966.	1,095.
600	—	—	—	—	—	1,659.	1,213.	1,463.
800 ①	—	—	—	—	—	2,613.	2,244.	2,429.
Main Breaker								
100	18	14	—	10	EHD	1,344.	1,096.	1,255.
100	18	14	14	10	FDB	1,465.	1,277.	1,373.
100	65	—	—	—	ED	1,784.	1,507.	1,630.
100	100	—	—	—	EDH	2,178.	1,858.	1,925.
100	65	35	18	10	FD	2,030.	1,753.	1,876.
100	100	65	25	22	HFD	2,652.	2,149.	2,496.
100	200	100	35	22	FDC	3,561.	2,967.	3,488.
100	200	150	—	—	FCL	4,191.	3,490.	4,105.
100	200	200	200	100 ②	FB-P ③	4,191.	3,490.	4,105.
225	65	—	—	—	ED	2,366.	1,983.	2,267.
225	100	—	—	—	EDH	2,757.	2,331.	2,561.
225	200	—	—	—	EDC	3,719.	3,251.	3,583.
225	65	35	18	10	FD	2,927.	2,403.	2,818.
225	100	65	25	22	HFD	5,201.	4,421.	5,064.
225	200	100	35	22	FDC	7,978.	6,809.	7,832.
250	65	35	18	10	JD	3,073.	2,523.	2,959.
250	100	65	25	22	HJD	5,460.	4,641.	5,318.
250	200	100	35	22	JDC	8,377.	7,149.	8,223.
400	65	—	—	10	DK	4,208.	3,645.	4,122.
400	65	35	25	10	KD	4,732.	3,896.	4,301.
400	100	65	35	22	HKD	6,902.	6,264.	6,756.
400	200	100	50	22	KDC	9,346.	7,457.	9,104.
400	200	200	—	—	LCL ④	10,203.	8,141.	9,922.
400	200	200	200	100 ②	LA-P ③④	10,266.	8,202.	9,998.
600	65	35	25	22	LD	7,098.	5,660.	6,715.
600	100	65	35	25	HLD	11,615.	9,976.	11,261.
600	200	100	50	25	LDC	12,982.	11,149.	12,583.
600	65	35	25	22	CLD ⑤	8,872.	7,074.	8,394.
600	100	65	35	25	CHLD ⑤	14,519.	12,470.	14,077.
600	200	100	50	25	CLDC ⑤	16,228.	13,936.	15,730.

① 800 ampere MLO requires 28-inch (711.2 mm) wide box.
② 100,000 based on NEMA test procedure.
③ Top feed only.
④ Requires 6-1/2-inch (165.1 mm) deep box. Not available in Type 3R, 12, 4 and 4X enclosures.
⑤ 100% rated circuit breaker. Requires copper bus. Not available in Type 12, 4 and 4X enclosures.

14

Discount Symbol **CE9**

Table 14-25. Branch Circuit Breakers — PRL3a

Ampere Rating	Interrupting Rating (kA Symmetrical)				Breaker Type	Price U.S. $								
						Breaker			Space Only			Provision Only		
	240V AC	480V AC	600V AC	250V DC		1-Pole	2-Pole	3-Pole	1-Pole	2-Pole	3-Pole	1-Pole	2-Pole	3-Pole
15 – 60	10 ①②	—	—	—	BAB	46.	95.	—	—	—	—	18.	35.	—
15 – 60	10	—	—	—	BAB-H	—	191.	245.	—	—	—	—	35.	52.
70	10 ①②	—	—	—	BAB	85.	163.	—	—	—	—	18.	35.	—
70	10	—	—	—	BAB-H	—	269.	312.	—	—	—	—	35.	52.
80 – 100	10 ①②	—	—	—	BAB	—	189.	—	—	—	—	—	35.	52.
80 – 100	10	—	—	—	BAB-H	—	282.	331.	—	—	—	—	35.	52.
15 – 50 ③	10 ①②	—	—	—	QBGF	313.	495.	—	—	—	—	18.	35.	—
15 – 50 ③	10	—	—	—	QBGFEP	500.	791.	—	—	—	—	18.	35.	—
15 – 20	10 ①②	—	—	—	QBAF ④	313.	495.	—	—	—	—	18.	35.	—
15 – 20	10 ①②	—	—	—	QBAG ⑤	344.	537.	—	—	—	—	18.	35.	—
15 – 60	10 ①②	—	—	—	BAB-D ⑥	57.	119.	—	—	—	—	18.	35.	—
15 – 30	10 ①②	—	—	—	BAB-C ⑦	168.	217.	—	—	—	—	—	—	—
15 – 30	10 ①	—	—	—	BABR ⑧	283.	519.	—	—	—	—	18.	35.	—
15 – 30	10 ①	—	—	—	BABRS ⑥	305.	560.	—	—	—	—	18.	35.	—
15 – 60	22 ①②	—	—	—	QBHW	95.	149.	—	—	—	—	18.	35.	52.
15 – 60	22	—	—	—	QBHW-H	—	269.	362.	—	—	—	18.	35.	52.
70	22 ①②	—	—	—	QBHW	125.	191.	—	—	—	—	18.	35.	52.
70	22	—	—	—	QBHW-H	—	333.	451.	—	—	—	18.	35.	52.
80 – 100	22 ①②	—	—	—	QBHW	—	254.	—	—	—	—	18.	35.	52.
80 – 100	22	—	—	—	QBHW-H	—	413.	538.	—	—	—	18.	35.	52.
15 – 30	22	—	—	—	QBHGF	623.	988.	—	—	—	—	18.	35.	52.
15 – 30	22	—	—	—	QBHGFEP	999.	1,582.	—	—	—	—	18.	35.	—
15 – 20	65	14 ⑨⑩	—	—	GHQ	136.	—	—	—	—	—	18.	—	—
15 – 60	65	14 ⑨⑩	—	14	GHB	156.	492.	625.	—	—	—	18.	35.	52.
70 – 100	65	14 ⑨⑩	—	14	GHB	246.	603.	732.	—	—	—	18.	35.	52.
15 – 30	65	25 ⑨⑩	—	—	HGHB	229.	—	—	—	—	—	18.	—	—
15 – 30	65	14 ⑨⑩	—	14	GHBS ⑧	456.	836.	—	—	—	—	18.	35.	52.
15 – 60	—	14 ⑨⑩	—	—	GHBGFEP	1,809.	—	—	—	—	—	18.	—	—
15 – 20	—	14 ⑨⑩	—	—	GHBHID ⑥	163.	—	—	—	—	—	18.	—	—
15 – 60	18 ⑪	14 ⑨	—	10	EHD	179.	537.	638.	25.	50.	74.	48.	96.	144.
70 – 100	18 ⑪	14 ⑨	—	10	EHD	272.	622.	756.	25.	50.	74.	48.	96.	144.
15 – 60	18	14	14	10	FDB	—	572.	734.	—	50.	74.	—	96.	144.
70 – 100	18	14	14	10	FDB	—	697.	866.	—	50.	74.	—	96.	144.
110 – 150	18	14	14	10	FDB	—	1,524.	1,898.	—	50.	74.	—	96.	144.
15 – 60	65 ⑪	35 ⑨	18	10	FD	367.	871.	1,029.	25.	50.	74.	48.	96.	144.
70 – 100	65 ⑪	35 ⑨	18	10	FD	408.	992.	1,167.	25.	50.	74.	48.	96.	144.
110 – 225	65 ⑪	25	18	10	FD ⑫	—	2,226.	2,559.	—	50.	74.	—	96.	144.
15 – 60	100 ⑪	65 ⑨	25	22	HFD	497.	1,104.	1,433.	25.	50.	74.	48.	96.	144.
70 – 100	100 ⑪	65 ⑨	25	22	HFD	560.	1,420.	1,752.	25.	50.	74.	48.	96.	144.
110 – 225	100 ⑪	65	25	22	HFD ⑫	—	3,169.	3,939.	—	50.	74.	—	96.	144.
15 – 60	200	100	35	22	FDC	—	1,657.	2,153.	—	50.	74.	—	96.	144.
70 – 100	200	100	35	22	FDC	—	2,130.	2,635.	—	50.	74.	—	96.	144.
110 – 225	200	100	35	22	FDC ⑫	—	4,522.	5,297.	—	50.	74.	—	96.	144.
100 – 225	65	—	—	—	ED ⑫	—	841.	1,127.	—	50.	74.	—	96.	144.
100 – 225	100	—	—	—	EDH ⑫	—	1,095.	1,502.	—	50.	74.	—	96.	144.
100 – 225	200	—	—	—	EDC ⑫	—	1,499.	1,997.	—	50.	74.	—	96.	144.

① 1-pole breaker rated 120V AC.
② 2-pole breaker rated 120/240V AC.
③ 50 ampere devices are available as 2-pole only.
④ Arc fault circuit breaker.
⑤ Arc fault circuit breaker with GFCI.
⑥ HID (High Intensity Discharge) rated breaker.
⑦ Switching Neutral Breaker. 1-pole device requires 2-pole space, 2-pole device requires 3-pole space.
⑧ Solenoid operated breaker.
⑨ 1-pole breaker rated 277V AC.
⑩ For use on 480Y/277V systems only.
⑪ AIC rating for 2- and 3-pole breakers only.
⑫ Maximum of six breakers per panel, 175 – 225 amperes.

Discount Symbol..... **CE9**

Panel Layout Instructions

1. Select:
   a. Required mains (lugs or breaker).
   b. Neutral where required.
   c. Branch circuits as required.
2. Layout panel as shown in **Figure 14-4**, using appropriate "X" dimensions.
3. Using total X units (panel height) find box height in inches (mm) and box catalog number from **Table 14-26**. (When total X units come out to an uneven number, use next highest number; i.e., if total X comes out 25X, use 31X.)

Layout Example

1. Description of Panel
   Type PRL3a 3-phase, 4-wire, 120/208V AC flush mounting. Panel to have short circuit rating of 22,000 symmetrical amperes. Main breaker 400 amperes, 3-pole, bottom mounting. Branch circuits bolt-on as follows:

   12 – 20 ampere 1-pole QBHW
   1 – 200 ampere 3-pole ED
   1 – 225 ampere 3-pole ED
2. Layout Information from **Figure 14-4**:
   a. 400 ampere Neutral . . . . = 8X
   b. 12-poles of QBHW. . . . . = 5X
   c. Two 3-pole ED breakers . . . = 6X
   d. Main breaker, 400 amperes, 3-pole DK. . . . . = 15X
      Total Height . . . . . = 34X
3. From **Table 14-26**:
   a. 34X Height (use 40X box)
   b. Box Height. . . . . 72 inches (1828.8 mm)
   c. Box Catalog Number **YS2072**

		Poles 6 - 3X 12 - 5X 18 - 8X 24 - 10X 30 - 13X 36 - 15X 42 - 18X	BAB, QBHW, BABR, BABRS GHQ, GHB, HGHB ①
1-Pole 2-Pole 1-Pole 2-Pole	1-Pole 2-Pole 3-Pole	1X 2X 3X	ED, EDH, EDC, EHD, FDB, FD, HFD, FDC 150A Max. Per Branch Breaker (300A Max. Per Connector)
2- or 3-Pole		2X 2-Pole 3X 3-Pole	ED, EDH, EDC FD, HFD, FDC ②③
Neutral Section		5X 8X 11X	100-250A 400-800A 800A with Thru-feed Lug
Main Lug Section		2X 5X 8X 14X	100A 250A 400-600A 800A
Main Breaker Section	Horizontal Mounting	2X 2-Pole 3X 3-Pole	EHD, FDB, FD, HFD, FDC ED, EDH, EDC ③④
	Vertical Mounting	7X 9X 14X 15X 17X 21X	EHD, FDB, FD, HFD, FDC, ED, EDH, EDC ⑤ FCL, FB-P ⑥ JD HJD, JDC DK, KD HKD, KDC LD, HLD, LDC CLD, CHLD, CLDC LCL, LA-P ⑥⑦

Figure 14-4. PRL3a Layout

① GHB, HGHB and GHQ breakers cannot be mixed on same connector as BAB, QBHW, BABR and BABRS.
② Maximum of six breakers per panel.
③ If optional terminal kit 3TA225FDK is required, must use 28-inch (711.2 mm) box.
④ Horizontal mounted 15 – 150 ampere main breakers EHD, FDB, FD, HFD and FDC, will be furnished as branch breaker construction. Branch breakers 1-, 2- or 3-pole as required, may be located opposite these main breakers.
⑤ If optional terminal kit 3TA225FDK is required, use 10X.
⑥ FB-P and LA-P top mounting only.
⑦ LCL or LA-P main breaker requires 6-1/2-inch (165.1 mm) deep box.

Table 14-26. Box Tabulation — PRL3a

"X" Units	Box Height Inches	Box Height mm	Box Catalog Number	Trim Catalog Number ⑧
100 – 400 Amperes				
14X	36	914.4	**YS2036**	**LT2036S or F**
23X	48	1219.2	**YS2048**	**LT2048S or F**
31X	60	1524.0	**YS2060**	**LT2060S or F**
40X	72	1828.8	**YS2072**	**LT2072S or F**
53X	90	2286.0	**YS2090**	**LT2090S or F**
600 – 800 Amperes				
23X	48	1219.2	**YS2848**	**LTV2848S or F**
31X	60	1524.0	**YS2860**	**LTV2860S or F**
40X	72	1828.8	**YS2872**	**LTV2872S or F**
53X	90	2286.0	**YS2890**	**LTV2890S or F**

⑧ 600 ampere panels are optionally available with 20-inch (508 mm) wide box. If selected, change 20-inch (508 mm) wide trim catalog number to LTV_S or F.

Cabinets

Fronts are code-gauge steel, ANSI-61 light gray painted finish.

Boxes are code-gauge galvanized steel without knockouts. Standard depth is 5-3/4 inches (146.1 mm).

Standard widths are:

20-inch (508.0 mm) 100 – 400 amperes.
28-inch (711.2 mm) 600 – 800 amperes.

Note: 600 ampere panels are optionally available with 20-inch (508 mm) wide box. If selected, change 20-inch (508 mm) wide trim catalog number to LTV_S or F.

Standard Depth

5-3/4 inches (146.1 mm).

Top and Bottom Gutters

5-1/2 inches (139.7 mm) minimum.

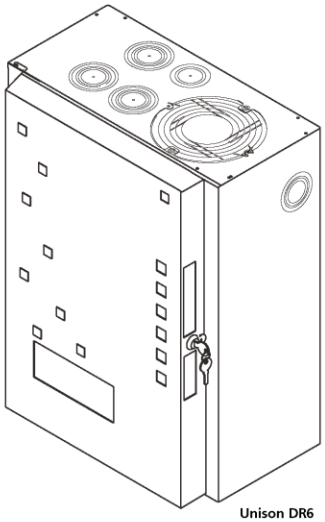
Side Gutters

4 inches (101.6 mm) minimum.

ETC ARCHITECTURAL

Unison® 120V Dimming Racks

DR Series



Unison DR6

GENERAL INFORMATION

Unison dimming, from ETC — low cost, flexible, modular dimming for architectural and theatrical lighting control applications.

APPLICATIONS
- Churches
- Hotels
- Convention Centers
- Theatres
- Schools
- Restaurants

FEATURES
- Low profile rack
- Fully pre-wired
- Easy installation, configuration and operation
- Scalable modular processing
- Backlit control electronics
- Single phase option
- Main breaker and bypass options
- Integral RS232 interface
- Dry contact interface
- Supports Dimmer Doubling™
- Controls incandescent, flourescent, low voltage, neon, and cold cathode load types

GENERAL
- Available in 100, 120, 230 and 277 Volt systems
- 6, 12 and 24 dual module configurations
  DR6-12, DR12-24, DR12-48.
- For use with ETC-Unison dual and single density dimmer modules
- Controls incandescent, low voltage, fluorescent, neon, and cold cathode load types
- Ambient Temperature
  32-104°F/0-40°C
- Ambient Humidity
  30-90° non-condensing
- UL and cUL Listed, CE Marked

ORDERING INFORMATION

120 Volt - DR Racks

Model#	Description
DR6-12-120	6 module rack - 120 Volt (12 circuits)
DR12-24-120	12 module rack - 120 Volt (24 circuits)
DR12-48-120*	(2) 12 module racks - 120 Volt (48 circuits)

*In 48 channel configurations, (2) 12 module racks are cross-bussed using AX Series main lug or main breaker enclosure.

120 Volt - AX Racks

Model#	Description
AX6-M-120-1	Auxiliary Rack with 200A Main Breaker for DR6 - 1ø, 3W
AX6-M-120-3	Auxiliary Rack with 100A Main Breaker for DR6 - 3ø, 4W
AX12-M-120-1	Auxiliary Rack with 400A Main Breaker for DR12 - 1ø, 3W
AX12-M-120-3	Auxiliary Rack with 200A Main Breaker for DR12 - 3ø, 4W*
AX12X-M-120-3	Auxiliary Rack with 400A Main Breaker for (2) DR12 - 3ø, 4W*
AX12X-ML-120-1	Auxiliary Rack with Cross-bus for (2) DR12 - 600A -1ø, 3W
AX12X-ML-120-3	Auxiliary Rack with Main Lug for (2) DR12 - 400A - 3ø, 4W*

*See Options/Accessories for reduced current trip plug options.

Control Modules

Model#	Description
CMd	Control module with dimming processor* (DMX only)
CMEd	Control module with dimming and station processor*

*A (d) dimming processor is required in every rack. One (E) station processor is required in each system using Unison stations.

Options and Accessories

Model#	Description
ARCH	Architectural Option Board (used in all stations)
FLO	Fluorescent Option Board (4-wire)
1PH6	Single phase strap kit for DR6
1PH12	Single phase strap kit for DR12
BYP	Bypass Option Board (for supplimented egress lighting)
100ATP	100 Amp trip plug for AX12 MCB Rack
200ATP	200 Amp trip plug for AX12X MCB Rack
STD	Floor mounting stand for DR rack
USI-I/O	Dry contact closure 8/in-8/out
RS232	RS232 interface (in)

Compatible Dimming Modules

Model#	Description
L10	Dual 10A Low Wattage Module 100V-120V 350µS
L10F	Dual 10A Fluorescent Low Wattage Module 100V-120V 350µS
D15	Dual 15A Universal Module 100V-120V 350µS
D15E	Dual 15A Universal Module 100V-120V 500µS
D15F	Single 15A Fluorescent Module (3 wire) 100V-120V
R15	Dual 15A Relay Module
CC15	Dual 15A Constant Circuit
D20	Dual 20A Universal Module 100V-120V 350µS
D20E	Dual 20A Universal Module 100V-120V 500µS
D20F	Single 20A Fluorescent Module (3 wire) 100V-120V
R20	Dual 20A Relay Module
CC20	Dual 20A Constant Circuit
AFM	Airflow Module

ETC Architectural

SPECIFICATIONS

MECHANICAL
- Welded 18-gauge formed steel construction
- Surface or floor mount stand
- Hinged, lockable full-height door with electrostatic air filter
- Fine textured, scratch resistant, gray epoxy paint
- Integral low-noise fan
- Modular control electronics w/ backlit 20 character LCD

ELECTRICAL
- 100, 120, 230, and 277 Volt, 3 phase systems – voltage range tolerance ± 10%
- 1 phase option kit (120 and 230 Volt only)
- 50-60Hz. Operating frequency

DR6 Rack:
- 10,000 AIC fault current protection at
  - 208/120Volt, three phase
  - 173/100Volt, three phase
- 14,000 AIC protection at 277/480Volt, three phase

DR12 Rack:
- 22,500 AIC fault current protection at
  - 208/120Volt, three phase
  - 173/100Volt, three phase
- 65,000 AIC at 208/120Volt, three phase when installed using AX Auxilliary Rack with M option - Main Breaker
- Main lugs accept maximum 400 MCM wire (205 mm2)
- Load terminals accept maximum #8 AWG wire (10 mm2)
- AX Racks equipped with breakers sized for maximum load capacity
- Lower rated trip plug options available

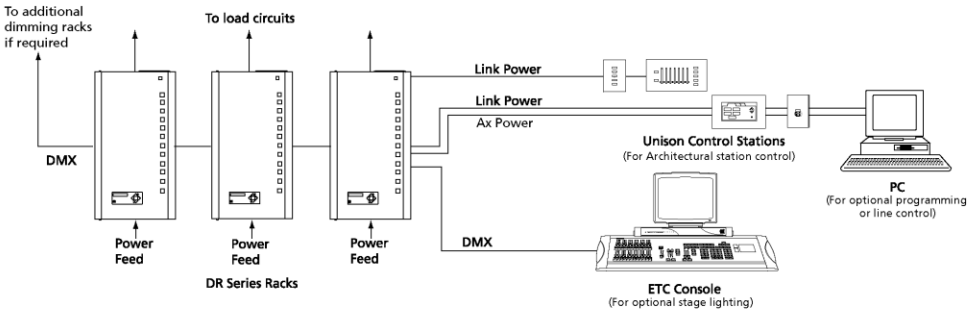
CONTROL MODULE
- Control Module (CM) houses dimming and architectural station processors.
- Contains a nine-button membrane overlay and a two-line by 20 character LCD for system configuration, testing and diagnostics

DIMMING PROCESSOR
- Utilizes industry standard DMX-512 control protocol
- Data input switches for initialization and configuration
- Configuration stored in non-volatile flash memory

ARCHITECTURAL STATION PROCESSOR
- Station processors accept Echelon Link
- Power control signals from stations and remote interfaces
- Link Power network utilizes polarity-independent, low-voltage Class II twisted pair wiring:
  - Belden type 8471 (unshielded)
  - Belden 8719 (shielded)
- 1500' (500m) wiring limit without the use of a repeater
- Repeater (REP) Option module increases wire length in increments of 1500' (500m).
- Configuration through Light Manager System software
- Station configuration and program information stored in flash memory
- 3.5" floppy disk drive for loading configurations
- Controls 512 dimmers x 512 zones with 32 stations – 4 LCDs maximum.
- Use Repeater Option module to increase station count in increments of 32.

RACK OPTIONS
- ARCH – Architectural Option Board supports termination of Unison stations, DMX, Auxiliary power and RS232 communications.
- FLO – Fluorescent Option Board provides 24 outputs for control of 4-wire (0-10vdc) fluorescent ballasts (Contact factory for approved ballast manufacturers).
- BYP – Bypass Option Board senses loss of Normal power and drives selected loads to full bright.

UNISON DIMMING AND CONTROL RISER



INTERWIRING GUIDE

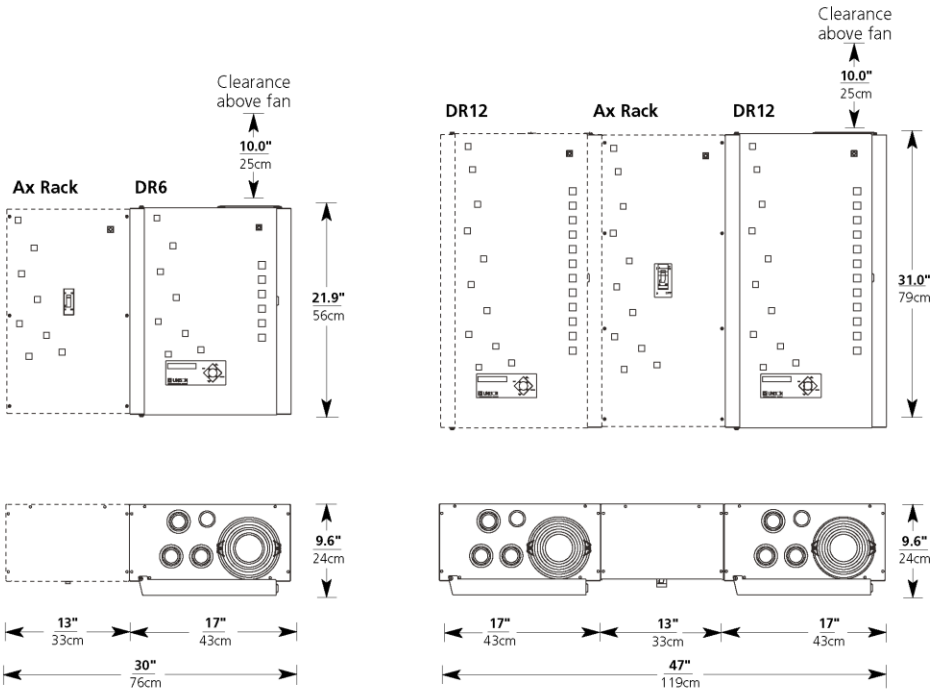
	Dimmer Rack	External Rack	Sensor Rack	Station	LCD	Console
Dimmer Rack	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**DMX** (1) Belden 9729
External Rack	**DMX** (1) Belden 9729	**NA**	**DMX** (1) Belden 9729	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**DMX** (1) Belden 9729
Sensor Rack	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**NA**	**NA**	**DMX** (1) Belden 9729 **ETC Link** (1) Belden 9729 (2) #16 AWG
Station	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**NA**	**LINK Power** (1) Belden 8471 (1) #14 AWG*	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**NA**
LCD	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**NA**	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**LINK Power** (1) Belden 8471 (1) #14 AWG* **Ax Power** (2) #16 AWG	**NA**
Console	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729	**DMX** (1) Belden 9729 **ETC Link** (1) Belden 9729 (2) #16 AWG	**NA**	**NA**	**NA**

*Not required in systems with grounded metal conduit.
NA = Not Applicable

Unison® 120V Dimming Racks

DR Series

RACK DIMENSIONS



PHYSICAL

Rack Dimensions

Model	Height		Width		Depth	
	inches	cm	inches	cm	inches	cm
DR6	21.9	55.6	17.0	43.1	9.6	24.4
DR12	31.0	78.7	17.0	43.1	9.6	24.4
AX6	21.9	55.6	13.0	33.0	9.6	24.4
AX12	31.0	78.7	13.0	33.0	9.6	24.4
AX12X	31.0	78.7	13.0	33.0	9.6	24.4

Rack Weights* no modules

Model	Weight		Shipping Weight	
	lbs	kgs	lbs	kgs
DR6	31.0	14.1	37.0	16.8
DR12	42.0	19.1	49.0	22.2
AX6	33.0	15.0	38.0	17.2
AX12	66.0	29.9	72.0	32.7
AX12X	54.0	24.5	60.0	27.2

* Weights and Dimensions typical

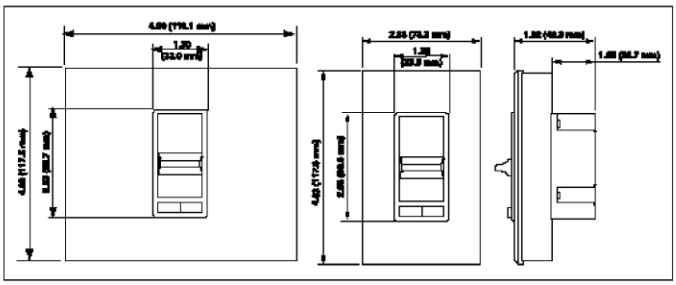
ETC Architectural

Americas ■ 3030 Laura Lane, P.O. Box 620979, Middleton, WI 53562-0979 USA ■ Tel: +1 608 831 4116 ■ Fax: +1 608 836 1736 ■ Toll free: 866 382 2724 ■ Toll free fax: 800 555 8912
Europe ■ Unit 5, Victoria Industrial Estate, Victoria Road, London W3 6UU, UK ■ Tel: +44 (0)20 8896 1000 ■ Fax: +44 (0)20 8896 2000
Asia ■ Room 605-606, Tower III Enterprise Square, 9 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong ■ Tel: +852 2799 1220 ■ Fax: +852 2799 9325
Web: www.etcconnect.com ■ **Email:** (US) mail@etcconnect.com ■ (UK) mail@etceurope.com ■ (Asia) mail@etcasia.com

Product Specifications

Renoir

Renoir™ Architectural Specification Multi-Location Lighting Controls



Renoir Wide Fin Renior Narrow Fin

Renoir

APPLICATION

Leviton Renoir™ rugged, full-range Architectural Specification Grade dimmers are designed for high-power loads (800W, 1000W, 1500W and 2000W) in a wide variety of commercial applications. Renoir is a preset Decora-style slide dimmer. These devices feature classic architectural fin design with screwless snap-on covers and they are available for incandescent, magnetic low-voltage and fluorescent lighting control.

FEATURES

- UL Listed (File # E-31373)
- CSA Certified (File # LR-3413)
- Rugged ON/OFF rocker switch turns lights ON at last selected brightness level.
- Smooth-action, linear slide control for easy, precise operation.
- Available in single-pole (one location) and 3-way (multi-location) versions. 3-way dimmer is used with standard 3-way ON/OFF switch.
- Decora-styling coordinates with Leviton's extensive line of Decora devices.
- Decora-style screwless snap-on wallplate presents an attractive appearance in any application.
- Slim, compact housing easily fits in standard wall boxes.
- Fins are easily removed for multi-gang applications.
- Large radio/TV interference filter.
- Illuminated versions available.
- Rated for incandescent, magnetic low-voltage, magnetic fluorescent and electronic fluorescent lighting, plus fan speed control.

LEVITON SPECIFICATIONSUBMITTAL

JOB NAME:	CATALOG NUMBERS:	
JOB NUMBER:		

Leviton Mfg. Co., Inc.
59-25 Little Neck Pkwy • Little Neck, NY 11362-2591 • Tech Line: 1-800-824-3005 • Fax: 1-800-832-9538
Visit our Website at: www.leviton.com

LEVITON LIGHTING CONTROL DIVISION
Building a Connected World

Product Specifications

Renoir

STANDARDS SPECIFICATIONS

Architectural Specification Grade Dimmer shall be UL Listed Leviton Architectural Specification Grade Multi-Location Preset Slide Dimmer with Limited Two-Year Warranty, smooth action, linear slide control, rugged ON/OFF rocker preset switch, and fins that are easily removed for multi-gang installations. Available in illuminated or non-illuminate versions in ratings and colors as scheduled on plan.

Performance Specifications		
Electrical	• Input 120 VAC @ 60Hz, 277 VAC @ 60Hz. • RFI noise suppression.	• Line voltage regulation. • Maximum load incandescent 2000 watts stand alone.
Mechanical	• Dimmer control – slide bar • 3-way versions work with a 3-way switch. • The LED will be lighted when the device switches the load off.	• On/off rocker switch. • Two wire device; three wire on 3-way • On/off switch provides air-gap switch for servicing.
Environmental	• Operating 0 degrees celsius to 55 degrees celsius. • Relative humidity, non-condensing 20% to 90%.	• Non-operating –10 degrees celsius to 85 degrees celsius.

ORDERING INFORMATION

Cat. No.	Rating	Description
80800	800W 120V AC Incandescent	Single-Pole (narrow fin)
80800-3	800W 120V AC Incandescent	3-Way (narrow fin)
81000	1000W 120V AC Incandescent	Single-Pole (narrow fin)
81000-L	1000W 120V AC Incandescent	Illuminated, Single-Pole (narrow fin)
81000-3	1000W 120V AC Incandescent	3-Way (narrow fin)
81000-L3	1000W 120V AC Incandescent	Illuminated, 3-Way (narrow fin)
81500	1500W 120V AC Incandescent	Single-Pole (wide fin)
81500-3	1500W 120V AC Incandescent	3-Way (wide fin)
82000	2000W 120V AC Incandescent	Single-Pole (wide fin)
82000-L	2000W 120V AC Incandescent	Illuminated, Single-Pole (wide fin)
82000-3	2000W 120V AC Incandescent	3-Way (wide fin)
82000-L3	2000W 120V AC Incandescent	Illuminated, 3-Way (wide fin)
71111	1000VA (750W) 120V AC Magnetic Low-Voltage	Single-Pole (narrow fin)
71113	1000VA (750W) 120V AC Magnetic Low-Voltage	3-Way (narrow fin)
71511	1500VA (1125W) 120V AC Magnetic Low-Voltage	Single-Pole (wide fin)
71513	1500VA (1125W) 120V AC Magnetic Low-Voltage	3-Way (wide fin)
26666-31	1200VA (900W) 120V AC Advance Mark X fluorescent dimming ballast	Single-Pole and 3-Way (wide fin)
26666-37	1200VA (900W) 277V AC Advance Mark X fluorescent dimming ballast	Single-Pole and 3-Way (wide fin)
80827	7.5 Amps 120V AC	Single-Pole Fan Speed Control (narrow fin)
81127	10 Amps 120V AC	Single-Pole Fan Speed Control (wide fin)
81527	15 Amps 120V AC	Single-Pole Fan Speed Control (wide fin)

Available in White (-W) and Ivory (-I). Incandescent non-illuminated versions also available in Gray (-GY).

CAUTION ON RETROFITS: When retrofitting Mark X dimming ballasts into fixtures that originally had Instant Start ballasts, the sockets MUST be replaced with Rapid Start sockets in order to allow proper dimmer operation and prevent damage to the dimming ballast. Refer to the instructions provided with the ballast and the Leviton Mark X dimmer.

NOTE: Mark X™ is a trademark of the Advance Transformer Company.

LEVITON SPECIFICATION SUBMITTAL

JOB NAME:	CATALOG NUMBERS:	
JOB NUMBER:		

Leviton Mfg. Co., Inc.
59-25 Little Neck Pkwy • Little Neck, NY 11362-2591 • Tech Line: 1-800-824-3005 • Fax: 1-800-832-9538

Visit our Website at: www.leviton.com

G-6444B/J2-tp

LEVITON LIGHTING CONTROL DIVISION Building a Connected World

GEPV-185

GE
Energy

GEPVp-185-M

185 WATT PHOTOVOLTAIC MODULE

FEATURES

- 54 poly-crystalline cells connected in series
- Peak power of 185 watts at 25.6 volts
- Designed for optimum use in residential and commercial grid-tied applications
- 25-year limited warranty on power output, 5-year limited warranty on materials and workmanship*
- Pre-wired junction box with MC Connectors

BENEFITS

- Output power tolerance of +/- 5%
- Robust, clear anodized aluminum frame with pre-drilled holes for quick installation

CERTIFICATIONS

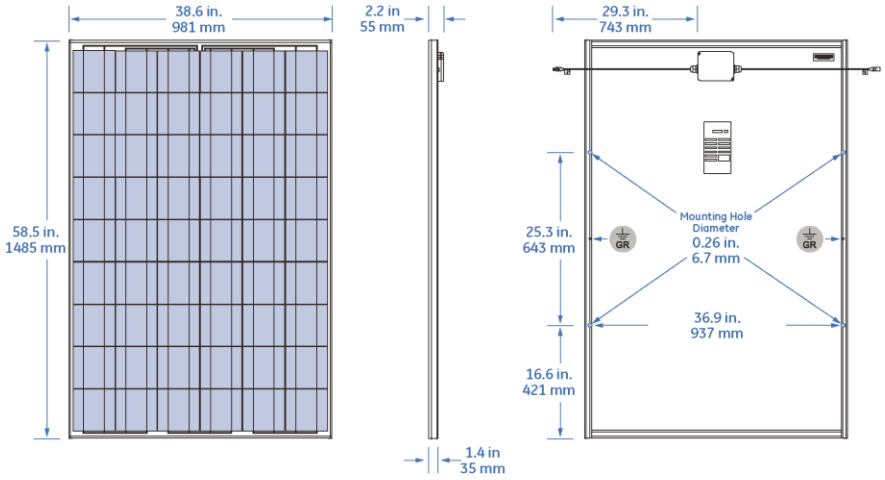
The GEPVp-185 Module meets the following requirements:

UL-1703 IEC 61215

*Refer to GE Energy Product Warranty for specific details

imagination at work

PHYSICAL CHARACTERISTICS

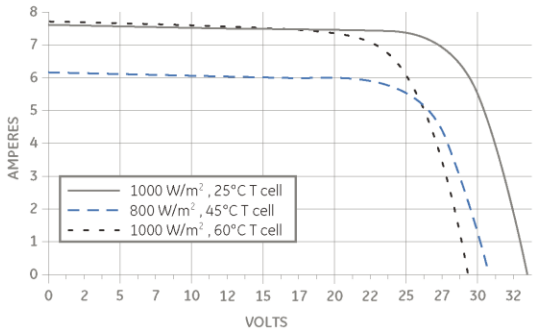


Physical Design Properties

Weight	39.0 lb [17.7 kg]
Weight (Wind) Bearing Potential	50 lbs/ft^2 [125 mph equivalent]
Hailstone Impact Resistance	1" @ 50 mph [25 mm @ 80 kph]

ELECTRICAL PERFORMANCE

Typical IV Curve for GEPVp-185-M Module



Typical Performance Characteristics

Peak Power (Wp)	Watts	185
Max. Power Voltage (Vmp)	Volts	25.6
Max. Power Current (Imp)	Amps	7.2
Open Circuit Voltage (Voc)	Volts	32.3
Short Circuit Current (Isc)	Amps	7.8
Short Circuit Temp. Coefficient	mA/°C	5.6
Open Circuit Voltage Coefficient	V/°C	-0.12
Max. Power Temp. Coefficient	%/°C	-0.5
Max. Series Fuse	Amps	15
Normal Operating Cell Temperature (NOCT)	deg. C	45

IV parameters are rated at Standard Test Conditions (Irradiance of 1000 W/m^2, AM 1.5G, cell temperature 25°C). As with all single crystal PV Modules, during the stabilization process that occurs during the first few days in service, module power may decrease approximately 3% from typical maximum power due to a phenomenon known as Light Induced Degradation (LID). All measurements are guaranteed at the laminate leads. NOCT is measured at 800 W/m^2, 20 deg. C ambient, and 1 m/s windspeed.

GE Energy
231 Lake Drive
Newark, DE 19702
866-750-3150
gepower.com/solar

GEA-14223A (02/06) Photo: PSP30590-02
30R/15PC

EATON | Cutler-Hammer

Molded Case Circuit Breakers
10 – 225 Amperes

January 2003
Vol. 1, Ref. No. [0531]

F-Frame

Contents

F-Frame

Typical F-Frame Breaker

Product Description

- All Cutler-Hammer F-Frame Circuit Breakers by Eaton Corporation are HACR rated.
- All circuit breakers 10 through 50 amperes are suitable for HID (high intensity discharge) use.
- All F-Frame circuit breakers are suitable for reverse feed use.

Technical Data and Specifications

Table 12-25. UL 489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)					
		Volts AC (50/60 Hz)				Volts DC ①	
		240	277	480	600	125	250 ②③
ED	2, 3	65	—	—	—	10	—
EDH	2, 3	100	—	—	—	10	—
EDC	2, 3	200	—	—	—	10	—
EHD	1	—	14	—	—	10	—
	2, 3	18	—	14	—	—	10
FDB	2, 3, 4	18	—	14	14	—	10
FD	1	—	25	—	—	10	—
	2, 3, 4	65	—	35	18	—	10
HFD	1	—	65	—	—	10	—
	2, 3, 4	100	—	65	25	—	22
FDC	2, 3, 4	200	—	100	35	—	22

① DC ratings apply to substantially non-inductive circuits.
② 2-pole circuit breaker, or two poles of 3-pole circuit breaker.
③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

Table 12-26. IEC 157-1 (P1) Interrupting Capacity Ratings (P1)

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)					
		Volts AC (50/60 Hz)				Volts DC ④	
		220, 240	380, 415	440	500	125	250 ⑤⑥
ED	2, 3	65	—	—	—	10	—
EDH	2, 3	100	—	—	—	10	—
EDC	2, 3	200	—	—	—	10	—
FDB	2, 3, 4	18	14	14	14	—	10
FD	1	25	—	—	—	10	—
	2, 3, 4	65	35	35	18	—	10
HFD	1	65	—	—	—	10	—
	2, 3, 4	100	65	65	25	—	22
FDC	2, 3, 4	200	100	100	35	—	22

④ DC ratings apply to substantially non-inductive circuits.
⑤ 2-pole circuit breaker, or two poles of 3-pole circuit breaker.
⑥ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

Dimensions/Weights

Table 12-27. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
1	1.38 (35.1)	6.00 (152.4)	3.38 (86.0)
2	2.75 (70.0)	6.00 (152.4)	3.38 (86.0)
3	4.13 (105.0)	6.00 (152.4)	3.38 (86.0)
4	5.50 (139.7)	6.00 (152.4)	3.38 (86.0)

Table 12-28. Approximate Shipping Weight, Lbs. (kg)

Breaker Type	Number of Poles			
	1	2	3	4
ED, EDH, EDC	—	3 (1.4)	4.5 (2.0)	—
EHD, FDB, FD, HFD, FDC	2 (.9)	3 (1.4)	4.5 (2.0)	6 (2.7)

Product Selection

This information is presented only as an aid to understanding Catalog Numbers. It is not to be used to build Catalog Numbers for circuit breakers or trip units.

Table 12-29. Circuit Breaker Catalog Numbering System

FDC 3 100 L

Circuit Breaker Type	Number of Poles	Trip Amperes	Suffix
EHD FDB FD HFD FDC	1 = 1 Pole 2 = 2 Poles 3 = 3 Poles 4 = 4 Poles	010 015 020 025 030 035 040 045 050 060 070 080 090 100 110 125 150 175 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) 200 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) 225 (FD, HFD, FDC, 2-, 3-, 4-Pole Only)	E = 100% Protected (4-Pole only) Neutral Pole EH = 50% Protected (4-Pole only) K = High Magnetic Molded Case Switch L = Line and Load Terminals S = Stainless Steel Terminals V = 50°C Calibration W = Without Terminals Y = Line Terminals Only Z = Aluminum Terminals (≤ 100 Amperes)

EDC 3 200 L

Circuit Breaker Type	Number of Poles	Trip Amperes	Suffix
ED EDH EDC	2 = 2-Pole 3 = 3-Pole	100 125 150 175 200 225	L = Line and Load Terminals W = Without Terminals Y = Line Terminals Only Z = Aluminum Terminals (100 Amperes)

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EATON | Cutler-Hammer

January 2003
Vol. 1, Ref. No. [0549]

Contents

K-Frame

Typical K-Frame Circuit Breaker

Product Description

- All Cutler-Hammer K-Frame Circuit Breakers by Eaton Corporation are HACR rated.
- K-Frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- K-Frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

Technical Data and Specifications

Table 12-59. NEMA/UL 489/CSA Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)				
		Volts AC (50/60 Hz)				Volts DC
		240	277	480	600	250 ①②
DK	2, 3	65	—	—	—	10
KDB	2, 3, 4	65	—	35	25	10
KD	2, 3, 4	65	—	35	25	10
HKD	2, 3, 4	100	—	65	35	22
KDC	2, 3, 4	200	—	100	50	22
CK	3	65	—	35	25	10
CHKD	3	100	—	65	35	22

① 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
② Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

Table 12-60. IEC 157-1 (P1) Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)						
		Volts AC (50/60 Hz)						Volts DC
		240	380	415	440	500	600	250 ③④
DK	2, 3	65	—	—	—	—	—	10
KDB	2, 3, 4	65	40	40	—	—	—	10
KD	2, 3, 4	65	40	40	—	—	—	10
HKD	2, 3, 4	100	65	65	—	—	—	22
KDC	2, 3, 4	200	100	100	—	—	—	22

③ 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
④ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

K-Frame Digitrip Specifications

Table 12-61. Specifications

Trip Unit Type	Digitrip RMS 310		Digitrip OPTIM 550	Digitrip OPTIM 1050
rms Sensing	Yes		Yes	Yes
Breaker Type				
Frame	K		K	K
Ampere Range	125 – 400A		125 – 400A	125 – 400A
Interrupting Rating @ 480V	35, 65, 100 (kA)		35, 65, 100 (kA)	35, 65, 100 (kA)
Protection				
Ordering Options	LS, LSG	LSI, LSIG	LSI, LSI(A), LSIG	LSI(A), LSIG
Fixed Rated Plug (I_n)	Yes	Yes	Yes	Yes
Overtemperature Trip	Yes	Yes	Yes	Yes
Long Delay Protection (L)				
Adjustable Rating Plug (I_n)	Yes	Yes	No	No
Long Delay Pickup	0.5 – 1.0 (I_n) ①	0.5 – 1.0 (I_n) ①	0.4 – 1.0 x (I_n)	0.4 – 1.0 x (I_n)
Long Delay Time I^2t	12 Seconds	12 Seconds	2 – 24 Seconds	2 – 24 Seconds
Long Delay Time I^4t	No	No	1 – 5 Seconds	1 – 5 Seconds
Long Delay Thermal Memory	Yes	Yes	Yes	Yes
High Load Alarm	No	No	0.5 – 1.0 x I_r	0.5 – 1.0 x I_r
Short Delay Protection (S)				
Short Delay Pickup	200 – 800% x (I_n)	200 – 800% x (I_n)	150 – 800% x (I_r)	150 – 800% x (I_r)
Short Delay Time I^2t	100 ms	No	100 – 500 ms	100 – 500 ms
Short Delay Time Flat	No	Inst – 300 ms	100 – 500 ms	100 – 500 ms
Short Delay Time Zone Selective Interlocking	No	No	Yes ②	Yes
Instantaneous Protection (I)				
Instantaneous Pickup	No	200 – 800% x (I_n)	200 – 800% x (I_n)	200 – 800% x (I_n)
Discriminator	No	No	Yes	Yes
Instantaneous Override	Yes	Yes	Yes	Yes
Ground Fault Protection (G)				
Ground Fault Alarm	No	No	20 – 100% x (I_s)	20 – 100% x (I_s)
Ground Fault Pickup	Varies by Frame	Varies by Frame	20 – 100% x (I_s)	20 – 100% x (I_s)
Ground Fault Delay I^2t	No	No	100 – 500 ms	100 – 500 ms
Ground Fault Delay Flat	Inst – 500 ms	Inst – 500 ms	100 – 500 ms	100 – 500 ms
Ground Fault Zone Selective Interlocking	No	No	Yes ②	Yes
Ground Fault Thermal Memory	Yes	Yes	Yes	Yes
System Diagnostics				
Status LEDs	Yes	Yes	Yes	Yes
Cause of Trip LEDs	No	No	Yes	Yes
Magnitude of Trip Information	No	No	Yes	Yes
Remote Signal Contact — Ground Alarm	Yes ③	Yes ③	Yes ②	Yes
Local Auxiliary and Bell Alarm Contact	Optional	Optional	Optional	Included
System Monitoring				
Digital Display	No	No	Yes ④	Yes ④
Current	No	No	Yes	Yes
Power and Energy	No	No	No	Yes
Power Quality — Harmonics	No	No	No	Yes
Power Factor	No	No	No	Yes
Communications				
Eaton's Cutler-Hammer PowerNet	No	No	Yes ⑤	Yes
Testing				
Testing Method	Test Set		OPTIMizer, BIM, Eaton's Cutler-Hammer PowerNet	

① Adjust by rating plug.
② Zone interlock kit.
③ With Separate ground fault alarm unit.
④ By OPTIMizer/BIM.
⑤ Eaton's Cutler-Hammer PowerNet kit.

Legend: BIM = Breaker Interface Module
(A) = GF Alarm
I_s = Sensor Rating
I_n = Rating Plug
I_r = Long Delay Pickup Setting

Contents

J-Frame

Typical J-Frame Circuit Breaker

Product Description

- All Cutler-Hammer J-Frame Circuit Breakers by Eaton Corporation are HACR rated.
- J-Frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- J-Frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

Technical Data and Specifications

Table 12-47. UL 489 Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)					
		Volts AC (50/60 Hz)				Volts DC	
		240	480	600	125	250 ①②	500 ③
JDB	2, 3	65	35	8	—	10	—
JD	2, 3, 4	65	35	18	—	10	—
HJD	2, 3, 4	100	65	25	—	22	—
JDC	2, 3, 4	200	100	35	—	22	—

① 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
② Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.
③ 8 milliseconds time constant.

Table 12-48. IEC 157-1 (P1) Interrupting Capacity Ratings

Circuit Breaker Type	Number of Poles	Interrupting Capacity (kA Symmetrical Amperes)					
		Volts AC (50/60 Hz)					Volts DC
		240	380	415	600	125	250 ④⑤
JD	2, 3, 4	65	35	35	—	—	10
HJD	2, 3, 4	100	65	65	—	—	22
JDC	2, 3, 4	200	100	100	—	—	22

④ 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
⑤ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

Dimensions/Weights

Table 12-49. Dimensions in Inches (mm)

Number of Poles	Width	Height	Depth
2, 3 4	4.13 (105.0) 5.50 (139.7)	10.00 (254.0) 10.00 (254.0)	4.06 (104.1) 4.06 (104.1)

Table 12-50. Approximate Shipping Weight in Lbs. (kg)

Breaker Type	Complete Breaker			Frame Only			Trip Unit		
	Number of Poles								
	2	3	4	2	3	4	2	3	4
JDB JD	11.25 (5.1) 11.25 (5.1)	12.50 (5.7) 12.50 (5.7)	— 13.25 (6.0)	— 9.00 (4.1)	— 10.00 (4.5)	— 10.50 (4.8)	— 2.00 (.9)	— 2.00 (.9)	— 2.25 (1.0)
HJD JDC	11.25 (5.1) 12.25 (5.6)	12.50 (5.7) 13.50 (6.1)	13.25 (6.0) 14.25 (6.5)	9.00 (4.1) 10.00 (4.5)	10.00 (4.5) 11.00 (5.0)	10.50 (4.8) 11.50 (5.2)	2.00 (.9) 2.00 (.9)	2.00 (.9) 2.00 (.9)	2.25 (1.0) 2.25 (1.0)

Product Selection

This information is presented only as an aid to understanding Catalog Numbers. It is not to be used to build Catalog Numbers for circuit breakers or trip units.

Table 12-51. Circuit Breaker/Frame Catalog Numbering System

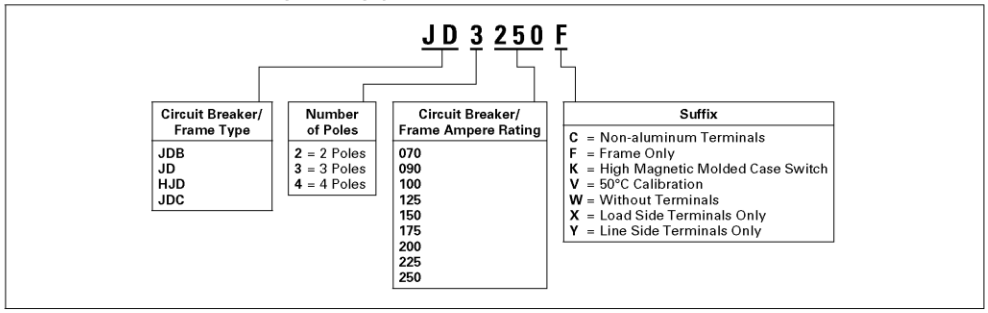
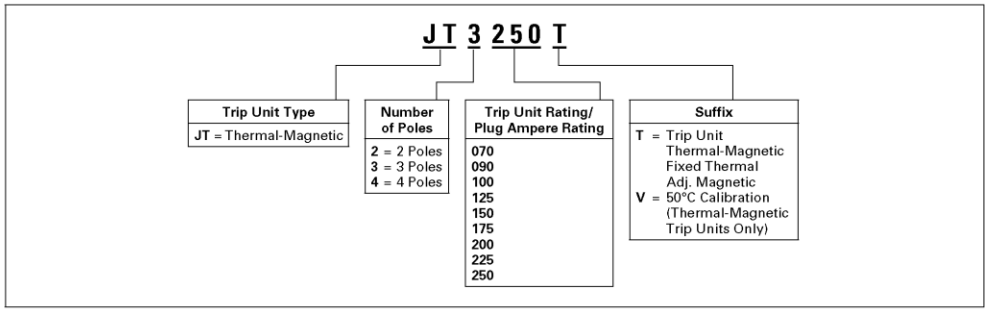


Table 12-52. Trip Unit Catalog Numbering System



G Breaker Timecurve

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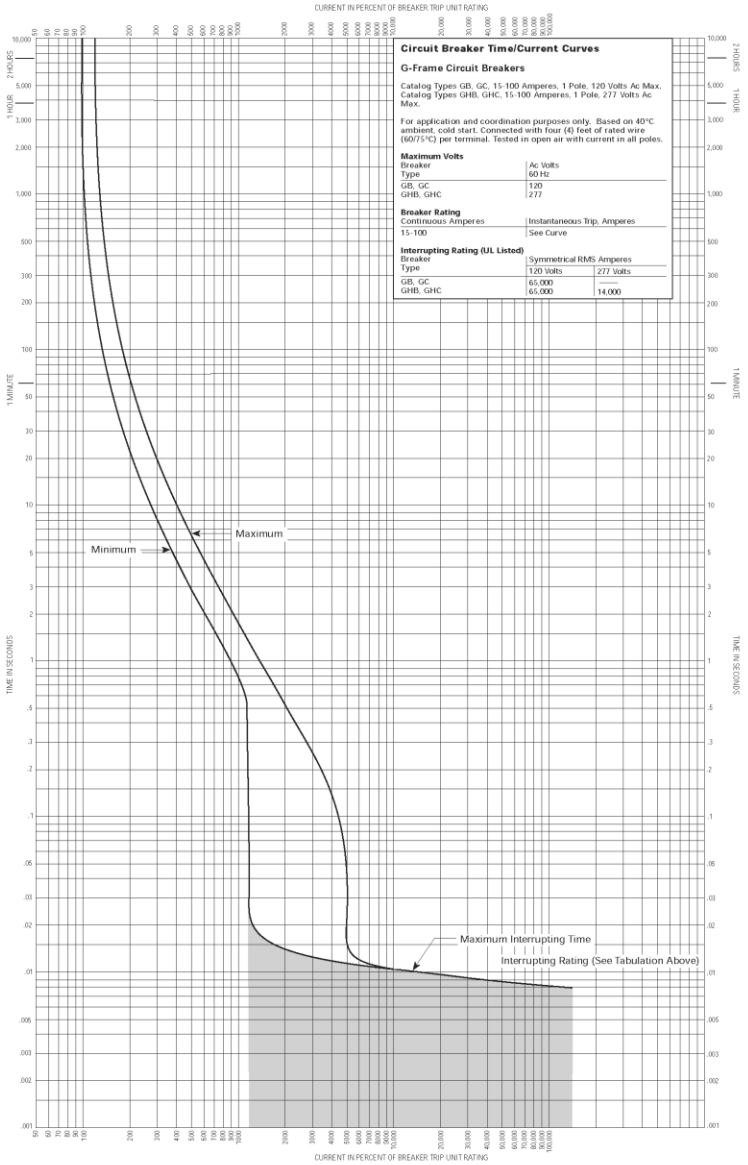
Application Data
29-167G

Page 2

AB DE-ION Circuit Breakers

Types GB, GHB, GC, GHC 15-100 Amperes, 1 Pole



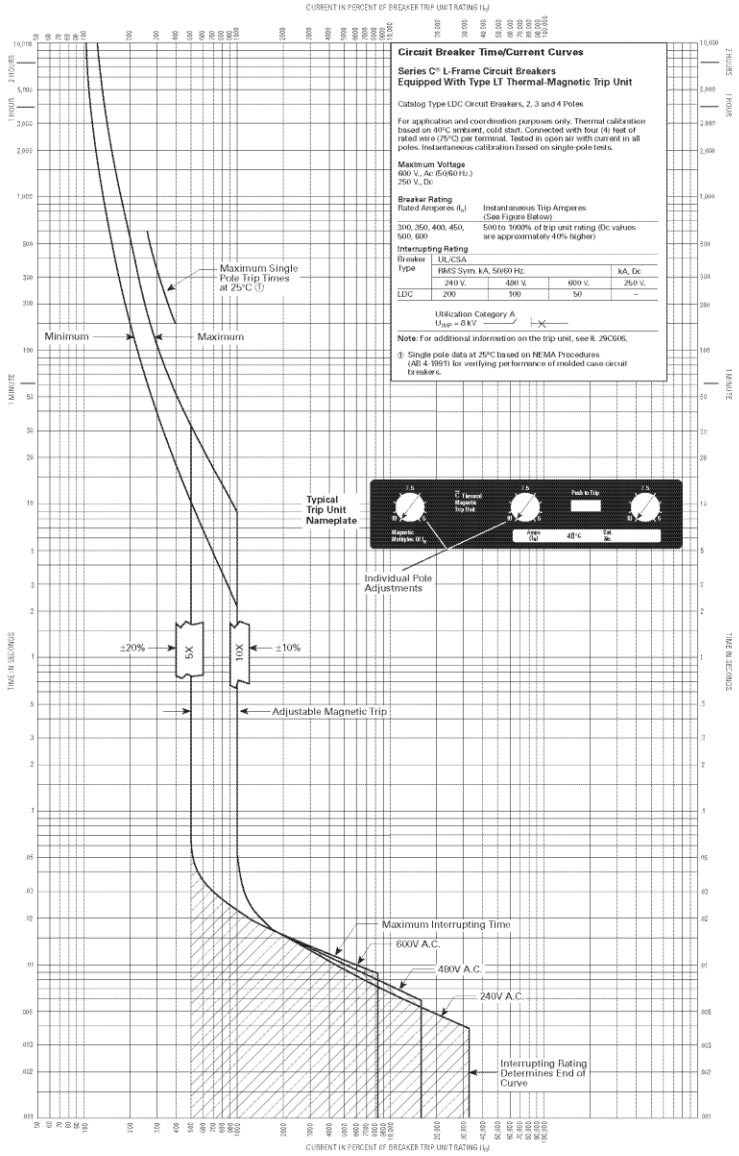
Curve No. SC-3500-83B

October 1997

L Breaker Timecurve

AB DE-ION Circuit Breakers

Type LDC Equipped With Type LT Thermal-Magnetic Trip Unit



October 1997

Curve No. SC-5760-94

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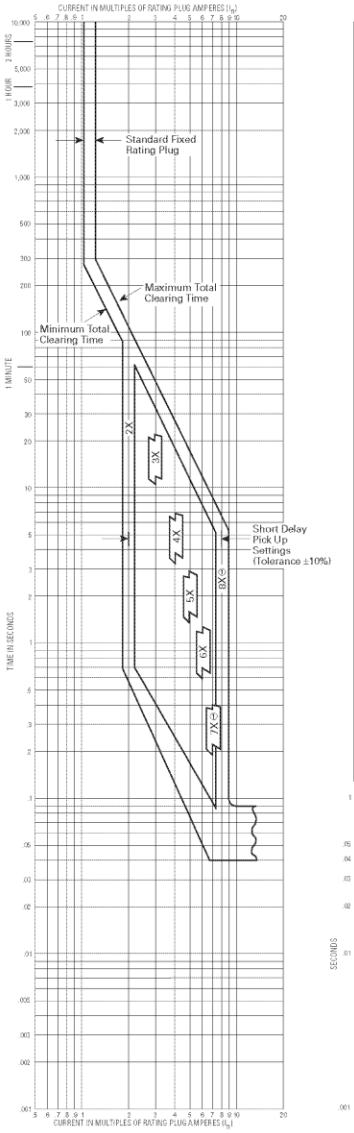
Application Data
29-167R

Page 2

AB DE-ION Circuit Breakers

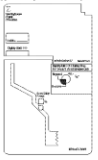
Types RD, CRD, RDC, CRDC Equipped With Digitrip RMS 310 Trip Units. Typical Instantaneous Time-Phase Current Characteristic Curve Based on I_n



Circuit Breaker Time/Current Curves (Phase Current) ⑥

Series C⑪ R-Frame Circuit Breakers
Equipped With Type Digitrip RMS 310 Trip Units

Typical Trip Unit Nameplate



For use with Trip Unit Catalog Numbers

1600A Max.	2000A Max.	2500A Max.
RES 1600LS	RES2000LS	RES2500LS
RES 1600LSG	RES2000LSG	RES2500LSG
RES 1600LS	RES2000LS	RES2500LS

Frame Rating Amperes (Max.)	Available Rating Plugs Ampere Rating (I_{in})	Type	Catalog Number	Short Delay Pickup Range Amperes
1600	1600	Fixed	16RES16T	3200-12800
	1400	Fixed	16RES14T	2800-11200
	1250	Fixed	16RES125T⑤	2500-10000
	1200	Fixed	16RES12T	2400-9600
	1000	Fixed	16RES10T	2000-8000
	800	Fixed	16RES08T	1600-6400
	800, 1000, 1200, 1600	Adj.	A16RES16T1	1600-12800
	800, 1000, 1250, 1600	Adj.	A16RES16T2⑤	1600-12800
2000	2000	Fixed	20RES20T	4000-16000
	1600	Fixed	20RES16T	3200-12800
	1400	Fixed	20RES14T	2800-11200
	1250	Fixed	20RES125T⑤	2500-10000
	1200	Fixed	20RES12T	2400-9600
	1000	Fixed	20RES10T	2000-8000
	1000, 1200, 1600, 2000	Adj.	A20RES20T1	2000-16000
	1000, 1250, 1600, 2000	Adj.	A20RES20T2⑤	2000-16000
2500	2500	Fixed	25RES25T	5000-15000
	2000	Fixed	25RES20T	4000-12000
	1600	Fixed	25RES16T	3200-9600
	1250	Fixed	25RES125T⑤	2500-7500
	1200	Fixed	25RES12T	2400-7200
	1200, 1600, 2000, 2500	Adj.	A25RES25T1	24000-15000
	1250, 1600, 2000, 2500	Adj.	A25RES25T2⑤	2500-15000

Interrupting Ratings – 50/60 Hz
RMS Sym. Amperes (kA)

Breaker Type	UL/CSA			IEC 947-2		Q_{CO}
	240V	480V	600V	220-240V	380-415V	500V
RD, CRD	125	65	50	125	65	42
RDC, CRDC	200	100	65	200	100	65

Utilization Category A
$I_{cs} = 0.25\ I_{cu}$
$U_{imp} = 8$ kV

Notes
Curve accuracy applies from –20°C to +55°C ambient. For possible ampere derating for ambient above 40°C, refer to Cutler-Hammer.

Digitrip RMS 310 trip units are suitable for functional field testing with test kit Cat. No. STK2. For field testing using primary injection methods, follow NEMA publication AB-4-1991.

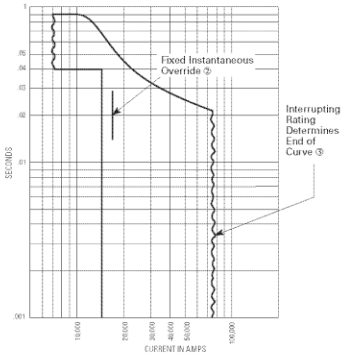
① For 2500A styles, maximum short delay pickup setting = 6X.

② For high fault current levels a fixed instantaneous override is provided at 17,500A (Tolerance ±15%).

③ The end of the curve is determined by the interrupting rating of the circuit breaker. See above tabulation.

④ For ground fault time-current curves see SC-5631-93.

⑤ Not UL/CSA Listed.



Curve No. SC-5629-93

October 1997