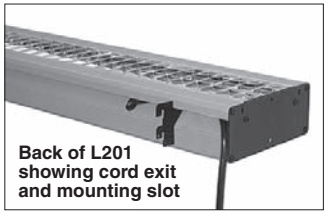
APPENDIX A



Features

- *Task and ambient lighting from a single T5 lamp*
- *Typical energy consumption is 0.6 W/sf or less*
- *Integrates with embedded wireless controls (consult factory)*
- *Low profile; integrates with open plan office furniture systems*
- *Portable; may be reconfigured along with the furniture*
- *Reduces glare, eyestrain and visual distraction*

TA 1.0

Specifications

Finish:

Painted housing, fillers, decorative end plates, and mounting accessories (panel hooks, end mount rails, stanchions).

Painted surfaces – environmentally friendly 6-stage pretreatment and electrostatically applied thermoset powder coat provides a long lasting, scratch resistant finish. Choice of standard colors. RAL and computer matched colors available on request.

Reflector – extruded aluminum, chemically brightened and clear anodized.

Louver tiles – specular vacuum metalized polycarbonate with clear polymer topcoat for easy cleaning.

Mounting:

L201 has a continuous mounting slot along the rear of the unit, and can be mounted to a wall, furniture panel, or desk clamp stanchion. L201 cords are routed along the mounting slot and can be specified for right- or left-hand exit.

L202 has a smooth back surface for mounting with end mount rails (for 24" wide end panels) or with desk clamp stanchions. L202 cord exits are specified left or right, rear or bottom of unit, depending on mounting method. Stanchions feature a cord management slot.

Electrical:

Integral electronic ballast is HPF thermally protected class P, 120 volt. BF > 0.98. Programmed start maximizes lamp life and minimizes energy use.

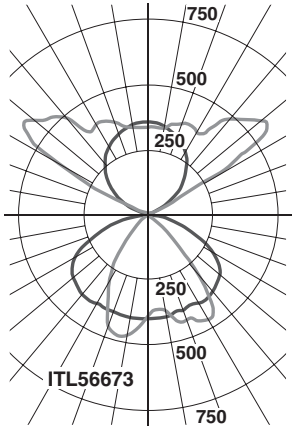
Cord – 9' 18-3 SJT, molded NEMA 5-15 grounded plug, factory installed. Chicago Code cord with integral circuit breaker available. Low profile grounded plug with 45° rotation is standard. Black is standard; gray and beige cords are available at additional cost.

Standard output T5 lamps are included. Choose from 3000K, 3500K and 4100K lamps.

Standard:

UL listed or CSA certified.

Performance



Lighter curve at left shows 180° to 0°. Darker curve shows 90° to 270°.

High lamp height position, see website for alternate positions. Illuminance based on a minimum of ten workstations. Light levels will be 5-10% greater in large rooms with more workstations. Ballast factor 0.98, input watts 52, maximum candlepower at 140° is 629 cd.

*For complete photometrics, see **thelightingquotient.com**.*

tambient
Green in any color™

Project: _____ Type: _____

Sample number: L201-71S6-M-EL15-1-1R-0S-35

L	2	0		–		–		–		–		–		–		–	
Style				Length/Lamp(s) Code		Optic		Finish		Electrical	Cord	Cord Exit		Options		Lamp Color	

Style

L201 Task ambient luminaire with integral hang-on mounting channel

L202 Task ambient luminaire with smooth back panel

Length/Lamps

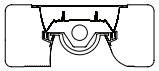
Code	*Length (mm)*	*Lamp(s)*	*Input*
24S2	24" (610)	1xF14T5	14W
36S3	35-3/4" (910)	1xF21T5	27W
48S4	47-1/2" (1205)	1xF28T5	33W
60S5	59" (1500)	1xF35T5	41W
71S6	70-3/4" (1800)	2xF21T5	49W
83S7	82-1/2" (2095)	1xF21T5 + 1xF28T5	60W
95S8	94-1/4" (2395)	2xF28T5	66W

Other lengths and lamping are available; consult factory.

TA 1.1

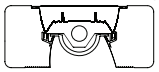
Optic

L Low-mount (L202 shown)



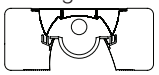
For low-mount IES information, consult factory.

M Mid-mount (L202 shown)



Download IES file.

H High-mount (L202 shown)



Download IES file.

Mounting Height	*Worksurface Depth*	
	24"	*30"*
48" – 50"	Low	Low
51" – 52"	Mid	Low
53" – 57"	Mid	Mid
58" – 61"	High	Mid
62" – 63"	High/(1)	High
64" – 66"	(1)	High

(1) Consult factory. Notation for height 62" – 63" is for L202.

To avoid glare, do not install below 48" or above 66".

Finish

EL02 Eggshell white
EL06 Dark bronze
EL07 Silver
EL08 Semi-gloss black
EL12 British racing green
EL15 Warm metallic
TASL Semi-gloss slate
XXXX Custom color (specify or submit sample)
or 4-digit RAL color code (color chart available)

Electrical

120 V only

1 Electronic ballast

T Dimming ballast for personal dimming control option (L201 only, specify with option **0D**). For other dimming applications, consult factory.

Cord

90° SW rotation plug, 9 feet:

1 Black
3 Gray
5 Beige
7 Chicago cord, integral circuit breaker, black

Straight plug, 9 feet (L202 only):

2 Black
4 Gray
6 Beige
8 Chicago cord, integral circuit breaker, black

Cord Exit

R Right rear (L201, L202)
L Left rear (L201, L202)
E Right bottom (L202 only)
W Left bottom (L202 only)

For L202, **R** and **L** are on dual stanchion only. **E** and **W** exits (L202) are 1-1/2" from end of luminaire.

Options

00 None
0S On/off switch
0D Dimming switch (L201, for use with dimming ballast only)
X0 Dual stanchion pre-drill (L202)
XS Dual stanchion pre-drill and integral on/off switch (L202)
XX Custom modification (specify)

Lamp Color

30 3000K, 85 CRI
35 3500K, 85 CRI
41 4100K, 85 CRI

Mounting Accessories

*For compatible furniture systems, see website.

TPH Panel Hooks, pair (L201)
TPR End Mount Rail Kit (L202)

T	P			–	
			System*		Finish (at left)

TPH Panel Hooks mount to slotted panel frame. Stamped and formed CRS, pair. **TPR End Mount Rails** (for 24" wide end panels) mount to slotted panel frames. Several models are available to interface with a variety of panel systems. Pair of rails, includes pair of black interface plates.

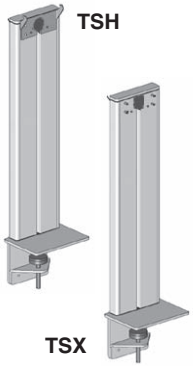
TPE End Mount Brackets, pair (P202)

Support the ends of the luminaire, black, pair.

TMHDW Wall Brackets, pair (L201)

T	M	H	D	W	–	E	L	0	0

TMHDW Wall Brackets mount to stud framed walls, millwork, and other solid surfaces. Stamped and formed CRS, black, pair.



TSH Desk Clamp Stanchion (L201)
TSX Desk Clamp Stanchion (L202)

T	S			–	
			Height		Finish (at left)

Desk Clamp Stanchions mount to edge of worksurface – 1/2" to 3-1/4" thick. Extruded aluminum post. Resilient pads resist slippage, protect surfaces. Integral cord management. **TSH19-/TSX19-** places top of luminaire 19-1/2" above worksurface. Sold individually; some luminaires require two stanchions.

L202 with TSX stanchion, back view

tambient *from* **The Lighting Quotient**
114 Boston Post Road, West Haven, Connecticut 06516, USA
Voice 203.931.4455 • Fax 203.931.4464 • **thelightingquotient.com**

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Green in any color™

PureFX®

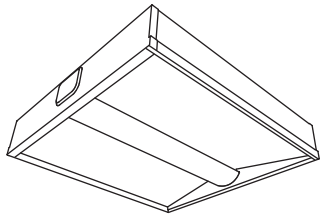
LEDALITE

Recessed

2’x2’

1 TT5 (40W)

mesoOptics® airwave™ RESPONSE®



Project Name

Spec Type

Notes

Order Guide

Some combinations of product options may not be available. Consult factory for assistance with your specification.

9422			B140	–		–		–		–	

Product Series & Size

PureFX 2’x2’

Version

D1 Standard T-Grid
D2 Slot T-Grid
A1 Air Return on Standard T-Grid
A2 Air Return on Slot T-Grid

See details on next page

Configuration

ST Standalone
CR Continuous Row
SMS Standalone Master/Satellite
CMS Continuous Row Master/Satellite

Lamping

1 TT5 (40W)

Housing

S Standard (22ga.)
N New York (20ga.)
C Chicago Plenum
T Standard w/ Frame Restraint

Wiring

1 1 cct
5 1 cct w/ Battery Pack
7 1 cct Dimming

Consult website for complete list of standard wiring options

Voltage

1 120V
2 277V
3 347V

Ballast

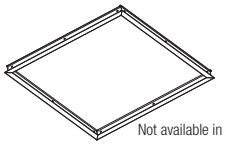
E Standard Ballast

Consult website for ballast manufacturer information

Upgrades & Accessories

Please indicate with check mark.

- ☐ Lamps Included
- ☐ Lamps Included & Installed
- ☐ Job Pack
- ☐ Flex Whip
- ☐ Drywall Kit



Not available in continuous row

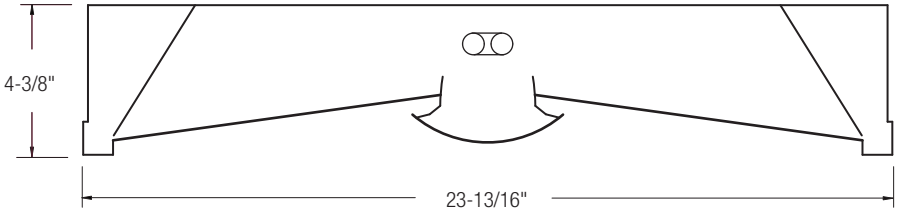
Can be mounted to wood frame or with hanger wire

Wood Frame

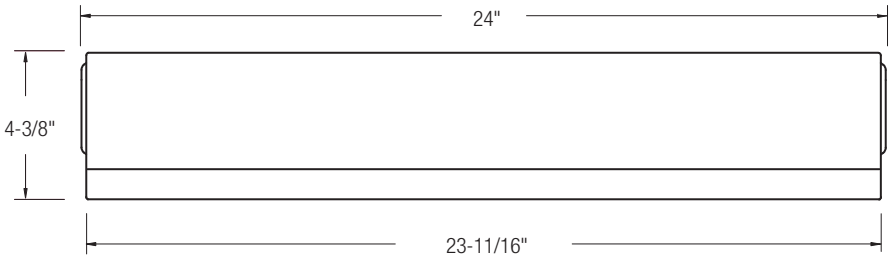
Hanger Wire

- ☐ Response Daylight
  For details visit www.ledalite.com/response

Cross Section



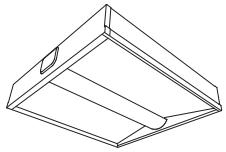
Side View



Phone: 604.888.6811 Fax: 800.665.5332 Web: www.ledalite.com

PureFX®

Recessed
2'x2'
1 TT5 (40W)



Photometry

Report Summary

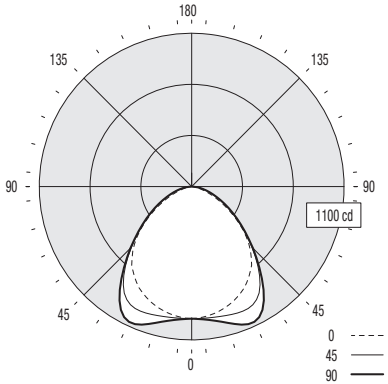
Report # 9900426
Filename 9422D1B140.ies
Efficiency 79%

Spacing Criteria 1.3 @ 0˚ along
1.4 @ 90˚ across

Meets RP-1-04 recommendations for VDT-Normal spaces

Candela Distribution

Vertical Angle	Horizontal Angle 0	22.5	45	67.5	90	Zonal Lumens
0	948	948	948	948	948	
5	940	945	949	955	956	92
15	904	920	958	996	1013	272
25	840	879	965	1044	1071	441
35	739	791	860	902	905	524
45	584	600	614	626	626	472
55	376	377	390	402	398	349
65	187	199	223	234	229	216
75	64	77	105	113	111	102
85	8	12	20	22	21	23
90	0	0	0	0	0	



Coefficients of Utilization (%)

Ceiling:	80				70			50			0
Wall:	70	50	30	10	70	50	30	50	30	10	0
0 RCR	94	94	94	94	92	92	92	87	87	87	79
1	87	83	80	78	85	82	79	78	76	74	68
2	80	74	69	65	78	72	68	70	66	63	58
3	73	65	60	55	71	64	59	62	57	53	50
4	67	58	52	47	66	57	51	55	50	46	43
5	62	53	46	41	60	52	45	50	45	40	38
6	57	47	41	36	56	47	40	45	40	36	33
7	53	43	37	32	52	43	36	41	36	32	30
8	50	39	33	29	48	39	33	38	32	28	27
9	46	36	30	26	45	36	30	35	29	26	24
10	44	33	27	23	43	33	27	32	27	23	22

Based on a floor reflectance of 0.2

Avg. Luminance (cd/m²)

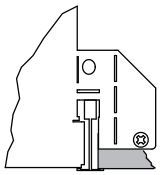
Vertical Angle	Horizontal Angle 0	45	90
55	1913	1985	2025
65	1292	1540	1582
75	722	1184	1252
85	268	670	703

IES files for this and other photometric options can be downloaded online at www.ledalite.com

Additional Information

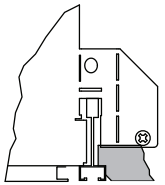
Mounting

Integrates with most common T-bar ceiling types.



Option D1 works with 9/16" and 15/16" flat T-grid ceilings. It can also be used with slot T-grid ceilings, but it will not sit flush with the bottom of the T-bar.

D1 Standard T-Grid

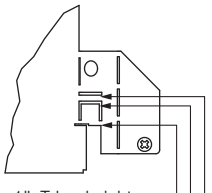


Option D2 is designed to sit flush with slot T-grid ceilings and some tegular tile ceiling types.

D2 Slot T-Grid

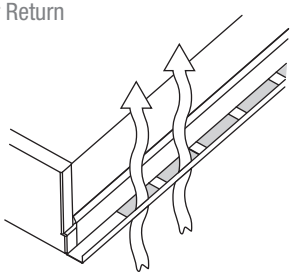
Ceiling Types

Integrated mounting tabs can be field-adjusted to various T-bar ceiling heights for fastening directly to the T-bar grid and/or tied-off to the building structure.



1" T-bar height
1-1/2" T-bar height
1-11/16" T-bar height

Air Return



The air return version features slotted vents along the sides of the fixture. As a result, the installation method of the air return version is different to the standard version, and the fixture cannot be installed in continuous rows.

Specifications

Due to continuing product improvements, Ledalite reserves the right to change specifications without notice.

Housing
Die-formed, post-painted, 22 gauge cold-rolled steel (New York City version is 20 gauge). Wire entrances are positioned on the side of the housing to allow easy wiring access for the installer. Multiple wire entrances are available on top or side to allow continuous row mounting of fixtures. Optional frame restraint is available to provide additional support to the optical frame.

Weight
Maximum 23 lbs.

Optical System
Optical assembly consists of flat acrylic panels and extruded curved acrylic lens. A protected MesoOptics® film layer creates optimal light distribution and high efficiency. The optical frame ends are constructed from die-formed cold-rolled steel assembled together with extruded aluminum profiles in a sturdy frame. The frame is hinged to allow easy access to the inside of the fixture. Maintenance can be performed from below the ceiling without tools. No hardware is visible.

Mounting
Fixture is compatible with most ceiling types. Integrated bend-out tabs are provided for different T-grid heights. Optional drywall kit is available for non-accessible ceilings. Use screws or hanger wire (supplied by others) to secure fixture.

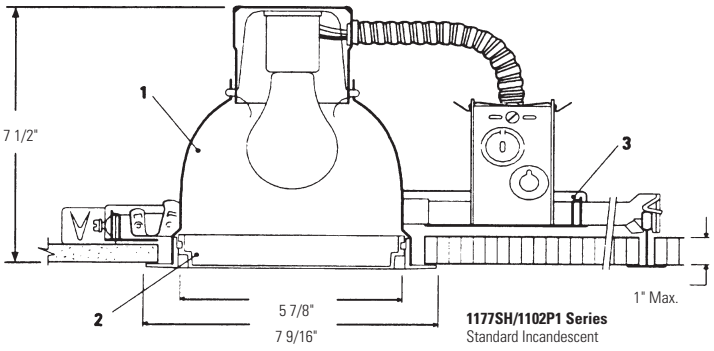
Ballast
Electronic. Supplied with pre-installed ballast disconnects as per national electric codes.

Wiring
Optional flex whips are supplied in 6' lengths for 1x4, 2x2 and 2x4 fixtures. Flex connectors are supplied in 9' lengths for standard master/satellite configurations.

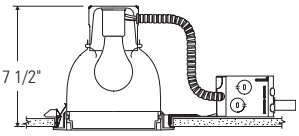
Air Return
Air return option available in 2'x2' and 2'x4' sizes only. Side rails are finished in black.

Approvals
Certified to UL & CSA Standards.
City of Chicago Approved CCEA (housing option C).
Designed to comply with NYC code requirements (Housing Option N).

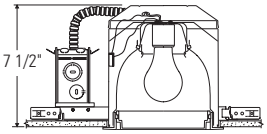
Finish
Housing and Frame: Post-painted, high quality powder coat. Available in white only.



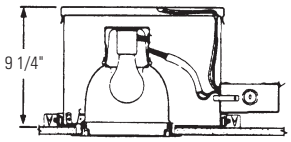
1177SH/1102P1 Series
Standard Incandescent



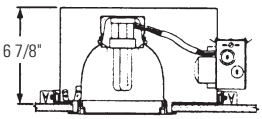
1177SH/1103R
Lytening™ Non-IC
Remodeler Ring



1177SH/1104IC
Lytening™
Convertible Non-IC Only



1177SH/1100 DEEP IC Series
Incandescent Insulated Ceiling



1177SH/1100AICMFT
Fluorescent Insulated Ceiling

Complete Fixture consists of Reflector Trim & Frame-In Kit. Select each separately.

Reflector Trim	Frame-In Kit — See Individual Frame-In Kit Specification Sheets							
	Incandescent				Fluorescent			
	Frame-In Kit	Installation Type	Lamping	Height	Frame-In Kit	Installation Type	Lamping	Height
1177SH Lexan®	**1102P1** **1103R**	Non-IC Non-IC Remodeler	60W A19	7 1/2" 7 1/2"	**1101F18U Series**	UniFrame™ Non-IC	(1) Quad/Triple 18W (GX24q-2)	6 5/8"
	1100IC **1100AICM** **1100DICM** **1100DAICM**	IC AirSeal® IC Deep IC Deep AirSeal® IC	40W A19	7 5/16" 7 5/16" 9 1/4" 9 1/4"	**1101F2642U Series**	UniFrame™ Non-IC	(1) Triple 26/32W (GX24q-3)	6 5/8"
	1104IC/N **1104ICR**	Non-IC Non-IC Remodeler	40W A19	7 1/2" 7 1/2"	**1104F13 Series**	IC	(1) Quad/Triple 13W (GX24q-1)	7 1/2"
					1104F18 Series	IC	(1) Quad/Triple 18W (GX24q-2)	7 1/2"
					1104F26 Series	IC	(1) Quad/Triple 26W (GX24q-3)	7 1/2"
					1100FTU Series	Non-IC	(1) Triple 26/32W (GX24q-3)	7 5/8"
					1100AICMFT	AirSeal®-IC	(1) Triple 26/32W (GX24q-3)	6 7/8"
					1910XFH1	Conversion Kit	(1) Quad 13W (GX23-2)	7 5/8"
					1101F18ICU/N	Performance IC	(1) Quad/Triple 18W (GX24q-2)	7 1/4"
					1101F2642ICU **1101F26421UN**	Performance IC	(1) Triple 26/32W (GX24q-3)	7 1/4"
					1101FDICMX1/N	Performance IC Advance Mark10 Dimming 120v	(1) Triple 26/32W (GX24q-3)	7 1/4"
					1101FDICMX2/N	Performance IC Advance Mark10 Dimming 277v	(1) Triple 26/32W (GX24q-3)	7 1/4"
					1910XDH1	Conversion Kit	(2) Quad 13W (GX23-2)	7 5/8"

Features

1. **Reflector:** Hydroformed aluminum, .040" minimum thickness (18 ga.); Anobrite® (anodic-processed) semi-specular finish for permanent reflectivity; plastic white trim flange.
2. **Flush Diffuser:** Translucent white, break resistant polycarbonate Lexan® Installs and removes with twist-lock actions; no tools required.
3. **Frame-In Kit:** (1102P1 standard frame shown). Other frames listed above and shown on the right. See Frame-In Kit specification sheets for more details.

Labels

UL (Suitable for Wet Locations - Covered Ceiling), I.B.E.W.
Meets NEC® requirements for Spas and Hot Tubs.

NEC® is a registered trademark of the National Fire Protection Agency.
US Patent Numbers: 5,045,985
Other US & Foreign Patents Pending.

Job Information **Type:**

Job Name:

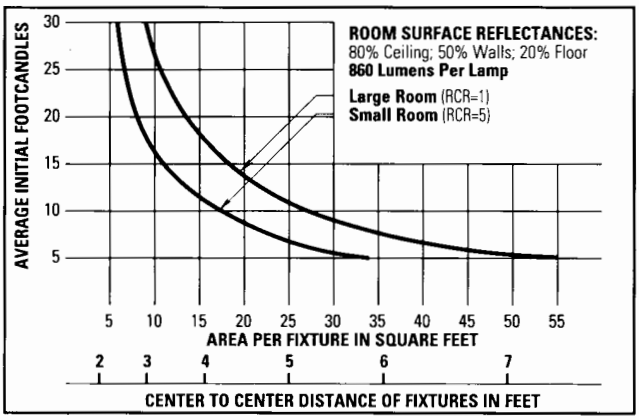
Cat. No.:

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®

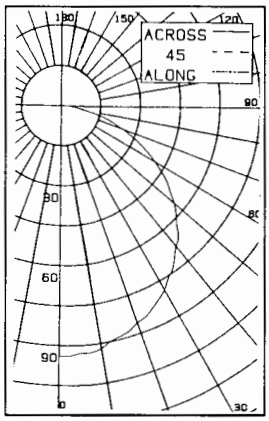


Use quick calculator chart to determine the spacing of 2 Lt. Watt Quad Tube units for a desired level of illumination. Conversion Factors: 1 Lt. 13W Quad Tube, F.C. x 0.5. 60W A19, F.C. x 1.0.

SPACING RATIO = 1.2

CERTIFIED TEST REPORT NO. 2145
COMPUTED BY LSI PROGRAM **TEST-LITE**

RECESSED LYTECASTER DOWNLIGHT
5 7/8" DIA., FLUSH OPLAX TRANSLUCENT LEXAN
TWO 13W DTT QUAD TUBE FLUORESCENT LAMPS. LUMEN RATING = 860 LMS.



DATE: JULY 18, 1990
PREPARED FOR:
LIGHTOLIER, SECAUCUS N.J.

CANDLEPOWER SUMMARY

ANGLE	MEAN CP	LUMENS
0	94	
5	93	9
10	92	
15	89	25
20	86	
25	83	38
30	79	
35	74	46
40	68	
45	62	48
50	56	
55	49	44
60	41	
65	33	33
70	25	
75	18	19
80	10	
85	4	5
90	1	

ZONAL LUMENS AND PERCENTAGES

ZONE	LUMENS	% LAMP	% LUMINAIRE
0—30	72	4.21	27.01
0—40	118	6.91	44.30
0—60	210	12.25	78.59
0—90	268	15.59	100.00
40—90	149	8.68	55.70
60—90	57	3.34	21.41
90—180	0	.00	.00
0—180	268	15.59	100.00

** EFFICIENCY = 15.6% **

TESTED ACCORDING TO IES PROCEDURES. TEST DISTANCE EXCEEDS FIVE TIMES THE GREATEST LUMINOUS OPENING OF LUMINAIRE.

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	.16	.16	.15	.16	.16	.15	.15	.15	.15	.15	.15	.14	.14	.14	.14	.13
2	.15	.14	.13	.14	.13	.13	.14	.3	.12.	13	.13	.12	.13	.12	.12	.11
3	.13	.12	.11	.13	.12	.11	.12	.11	.10	.12	.11	.10	.11	.11	.10	.10
4	.12	.10	.09	.11	.10	.09	.11	.10	.09	.11	.10	.09	.10	.09	.09	.09
5	.10	.09	.08	.10	.09	.08	.10	.09	.08	.09	.09	.08	.09	.08	.08	.07
6	.09	.08	.07	.09	.08	.07	.09	.08	.07	.09	.08	.07	.08	.07	.07	.06
7	.08	.07	.06	.08	.07	.06	.08	.07	.06	.08	.07	.06	.07	.07	.06	.06
8	.07	.06	.05	.07	.06	.05	.07	.06	.05	.07	.06	.05	.07	.06	.05	.05
9	.07	.06	.05	.07	.05	.05	.07	.05	.05	.06	.05	.05	.06	.05	.05	.04
10	.06	.05	.04	.06	.05	.04	.06	.05	.04	.06	.05	.04	.06	.05	.04	.04

20% FLOOR CAVITY REFLECTANCE

Conversion Factors: 1 Lt. 13W Quad Tube, C.U. x 1.0. 60W A19, C.U. x 2.0.

To convert lighting data for a lower wattage incandescent lamp of the **same type**, multiply the footcandle (or candlepower) values by the ratio of the lumens of the two lamps.
The coefficients of utilization remain the same.

Job Information **Type:**

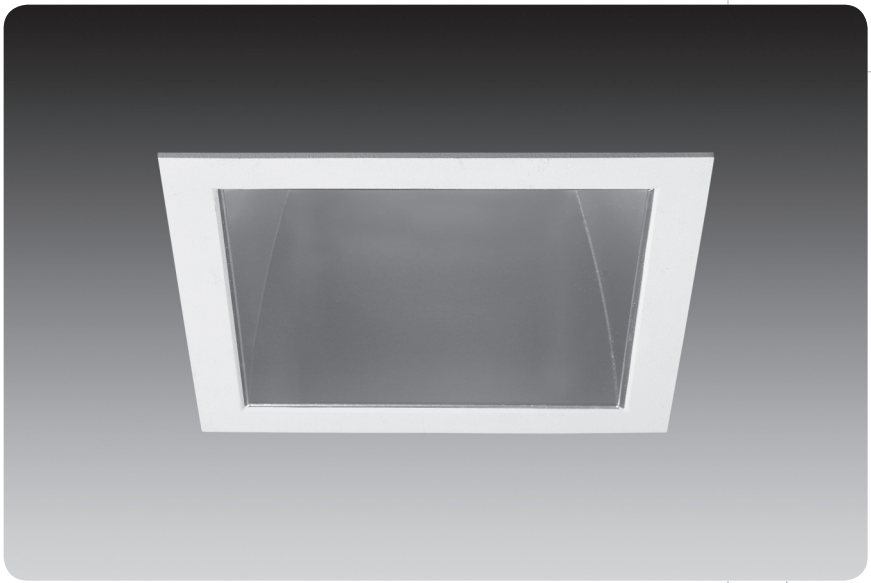
Lightolier a Genlyte company www.lightolier.com
631 Airport Road, Fall River, MA 02720 • (508) 679-8131 • Fax (508) 674-4710

LIGHTOLIER®

4.5" x 4.5" – downlight

id®

CFL



Patent Pending

features

Overlap trim features:

- One piece die-cast construction creates seamless integration with reflector eliminating mitered corners.
- Die-cast flange maintains tight fit of reflector corners.
- **SmartLock™** clip allows for quick removal and re–assembly of trim components for field painting.

Flush trim features:

- Minimal .225" thick self flanged trim integrates seamlessly into drywall ceilings.
- Flush flange requires no field painting.

Centered optics achieved with **CenterLock™** die-cast socket cup which locates and locks 18, 26 or 32 watt lamp in center of aperture.

LampAlign™ allows installation of upper reflector in any direction regardless of housing direction. Lamps are aligned for consistent appearance and light distribution.

Reflector design eliminates tabs in corners for a seamless, no light leaks look.

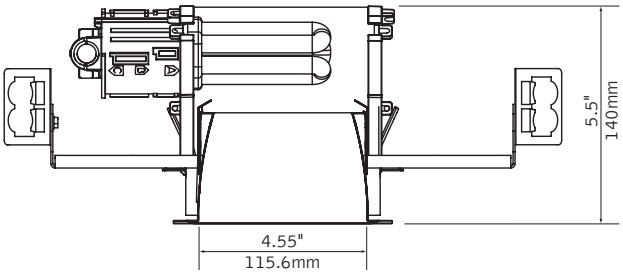
1" tall housing collar rotates up to 90˚.

55-degree cut-off to lamp and its image.

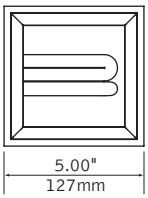
lens option

MicroGlow

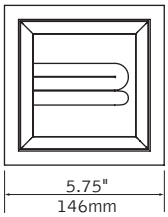
dimensional data

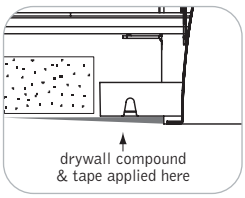


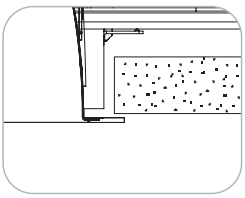
flush trim



overlap trim

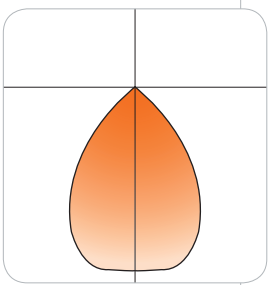






performance

1–Lamp 32W Triple Tube
Downlight Optic, Clear Diffuse
45% Efficiency
761 cd @ 10°



Visit focalpointlights.com for complete photometric data.

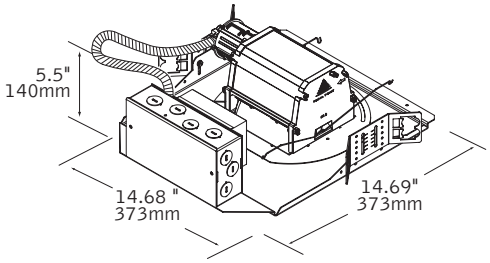
octeber 2010 C

fixture:

project:

details

t–rated housing non–ic



specifications

housing

Frame features up to 90-degree locking adjustment of aperture after installation for parallel alignment to walls or adjacent fixtures.
Frame may be installed into ceiling thicknesses up to 1". For thicker ceiling consult factory.
Flex conduit with screw tight fittings mechanically fasten to CenterLock™ socket cup. CenterLock™ provides proper venting for lamps.
Butterfly brackets allow mounting to ½ emt. Order bar hangers as an accessory.
Galvanized steel frame includes large Junction box 7" x 3.5" with (10) ½" pry outs.
UL listed for through branch wiring, four #12 90°C conductors.

upper reflector

Multi-faceted steel upper reflector mounts to die cast end caps and is finished in High Reflectance White powder coat. Adjustable socket cup allows 18, 26 and 32W lamps to be centered in the optic to maintain optimal performance.

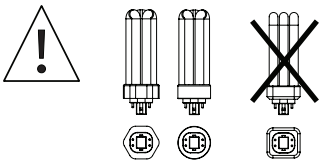
trim

Lower reflector provides 55-degree cut off to lamp and lamp image.
Parabolic aluminum fastens to die-cast flange on overlap trim. Flush trim option for drywall installations features a minimal reflector flange.
Trim attaches to upper reflector via torsion springs.
Consult factory for custom reflector finishes.
Upper reflector and lower reflector ship separately from housing frame to avoid construction abuse.
Optional .125" thick MicroGlow™ micro prism lens provides lamp obscuration.

electrical

Luminaires are pre-wired for single circuit with thermally protected Class "P" program start <10% THD electronic ballast.
Consult factory for dimming specifications and availability.
UL Listed.
Integral emergency battery test switch and indicator light in optic.
Rotary lock socket allows for easy lamp removal and reduces lamp breakage.
One lamp triple tube compact fluorescent, 4-pin, 18W-(GX24q-2), 26W/32W-(Gx24q-3/4). OSI and GE lamps only.

finish



Trim flange, end caps and upper reflector finished in polyester powder coat over a 5-stage pre-treatment.

housing ordering

		FC44
housing series		
ID CFL Square Housing	FC44	
lamp (OSI & GE lamps only)		_____
18W Triple Tube, GX24q-2	18TT	
26W Triple Tube, GX24q-3 (Includes wattage restriction label)	26TT	
32W Triple Tube, GX24q-3	32TT	
ballast		_____
Electronic Program Start <10% THD	S	
Electronic Dimming Ballast*	D	
voltage		_____
120V	120	
277V	277	
347V	347	
faceplate type		_____
Square Flush	SF	
Square Overlap	SO	
housing type		T
Thermally Protected, Non-IC	T	
factory options		
Chicago Plenum	CP	_____
Emergency Battery Pack*	EM	_____
HLR/GLR Fuse	FU	_____
Include 3000K Lamp	L830	_____
Include 3500K Lamp	L835	
Include 4100K Lamp	L841	

trim ordering

		D44
trim aperture		
4.5" Square Aperture	D44	
faceplate type		_____
Square Flush	SF	
Square Overlap	SO	
optic		_____
Downlight	DN	
Regress MicroGlow Lens	RLMG	
color		_____
Clear Specular	CS	
Clear Diffuse	CD	
Warm Diffuse	WD	
Silver Talc Diffuse	TD	
flange finish (for SO option only)		_____
White	WH	
Black	BK	
Titanium Silver	TS	
Aluminum Raw	AL	

a complete unit consists of
two line items, housing and trim
example: FC44-32TT-S-120-SO-T
D44-SO-DN-CD-WH

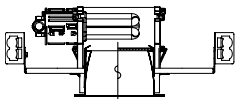
* for more information see Reference section.

Focal Point LLC | 4141 S. Pulaski Rd, Chicago, IL 60632 | T: 773.247.9494 | F: 773.247.8484 | info@focalpointlights.com | www.focalpointlights.com.

4.5"x4.5" – downlight

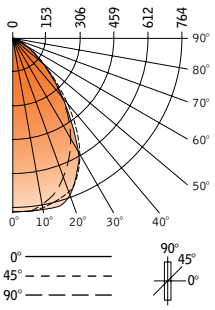
id®

CFL



Filename: D44DNCS32TT.IES
Catalog #: FC44-32TT-U-SO-T, D44-SO-DN-CS-WH
Efficiency: 45%
Photometric Report #: 13971.0

CANDLEPOWER DISTRIBUTION



Vertical Angle	0°	22.5°	45°	67.5°	90°	Zonal Lumens
	Horizontal Angle					
0°	760	760	760	760	760	
5°	761	760	763	764	763	73
15°	699	711	735	759	761	208
25°	569	604	660	647	646	291
35°	403	456	463	422	410	274
45°	224	233	217	236	231	177
55°	52	69	62	58	49	54
65°	9	8	9	9	9	9
75°	3	2	3	2	3	3
85°	0	0	0	0	0	0
90°	0	0	0	0	0	

Spacing Criteria
End: 1.0
Cross: 1.1

LUMEN SUMMARY

	Zone	Lumens	% Lamp	% Fixt
	0°-30°	572	23.8	52.6
	0°40°	847	35.3	77.8
	0°-60°	1077	44.9	99
	0°-90°	1089	45.4	100
Total Luminaire	0°-180°	1089	45.4	100

LUMINANCE DATA (CD/M²)

Vertical Angle	0°	45°	90°
45°	24062	23310	24814
55°	6886	8210	6489
65°	1618	1618	1618
75°	880	880	880
85°	0	0	0

CO–EFFICIENTS OF UTILIZATION

Floor		80				70			50		30		10		00
Ceiling		70	50	30	10	70	50	10	50	10	50	10	50	10	00
Wall	RCR														
	0	54	54	54	54	53	53	53	50	50	48	48	46	46	45
	1	51	50	49	48	50	49	47	47	45	45	44	44	43	42
	2	49	46	44	43	48	45	42	44	41	43	40	41	39	39
	3	46	43	40	38	45	42	38	41	37	40	37	39	36	35
	4	43	39	37	34	42	39	34	38	34	37	33	36	33	32
	5	40	36	33	31	40	36	31	35	31	34	30	33	30	29
	6	38	34	31	28	37	33	28	32	28	32	28	31	28	27
	7	36	31	28	26	35	31	26	30	26	29	25	29	25	25
	8	33	28	25	23	33	28	23	28	23	27	28	27	23	22
	9	31	26	23	21	30	26	21	25	21	25	21	24	20	20
	10	29	24	21	19	28	24	19	23	19	23	19	22	19	18

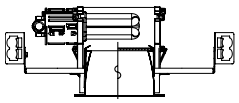
Numbers indicate percentage values of reflectivity.

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

4.5"x4.5" – downlight

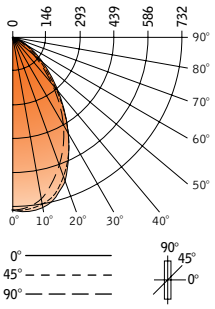
id®

CFL



Filename: D44DNCD32TT.IES
Catalog #: FC44-32TT-S-SO-T, D44-SO-DN-CD-WH
Efficiency: 42%
Photometric Report #: 14182.0

CANDLEPOWER DISTRIBUTION



Vertical Angle	0°	22.5°	45°	67.5°	90°	Zonal Lumens
	Horizontal Angle					
0°	727	727	727	727	727	
5°	717	722	726	729	732	69
15°	633	656	679	390	693	191
25°	497	523	549	552	544	248
35°	344	363	353	357	365	224
45°	203	192	181	207	221	153
55°	97	78	75	90	107	77
65°	44	33	28	38	48	36
75°	15	12	10	14	20	14
85°	4	3	2	3	5	3
90°	0	0	0	0	0	

Spacing Criteria
End: 0.9
Cross: 1.0

LUMEN SUMMARY

	Zone	Lumens	% Lamp	% Fixt
	0°-30°	508	21.2	50
	0°40°	732	30.5	72
	0°-60°	936	40.1	94.7
	0°-90°	1016	42.3	100
Total Luminaire	0°-180°	1016	42.3	100

LUMINANCE DATA (CD/M²)

Vertical Angle	0°	45°	90°
45°	21806	19443	23740
55°	12845	9932	14170
65°	7908	5032	8627
75°	4402	2935	5869
85°	3486	1743	4357

CO–EFFICIENTS OF UTILIZATION

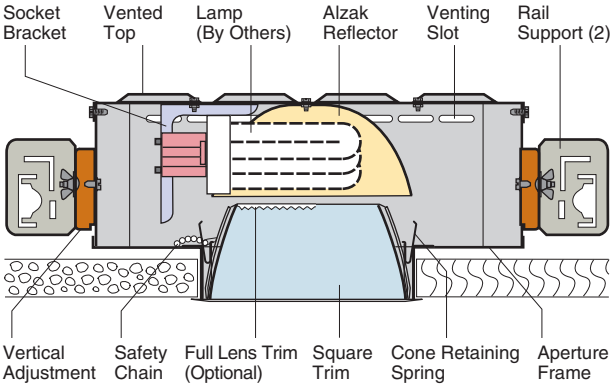
Floor		80				70			50		30		10		00
Ceiling		70	50	30	10	70	50	10	50	10	50	10	50	10	00
Wall	RCR														
	0	50	50	50	50	49	49	49	47	47	45	45	43	43	42
	1	48	46	45	44	47	45	46	44	42	42	41	41	39	39
	2	45	42	40	39	44	42	38	40	37	39	37	38	36	35
	3	43	39	36	35	47	38	34	37	34	36	33	35	33	32
	4	39	36	33	31	39	35	31	34	30	33	30	33	30	29
	5	37	33	30	28	36	32	28	31	27	31	27	30	27	26
	6	35	30	27	25	34	30	25	29	25	29	25	28	25	24
	7	32	28	25	23	32	28	23	27	23	26	22	26	22	22
	8	30	25	26	21	30	25	20	25	20	24	20	24	20	19
	9	28	23	20	18	28	23	18	23	18	22	18	22	18	17
	10	26	21	19	17	26	21	17	21	17	21	17	20	16	16

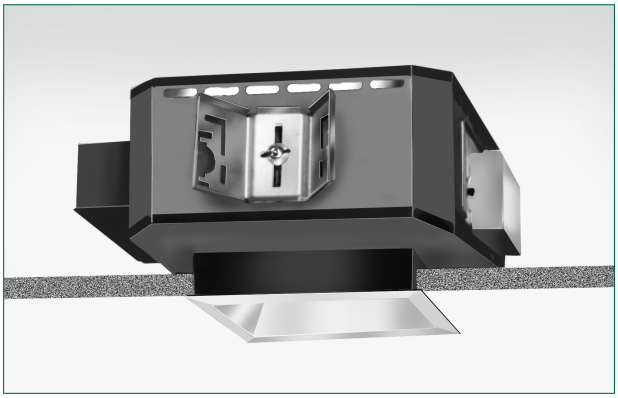
Numbers indicate percentage values of reflectivity.

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

H8443 H22a

Shallow Depth Downlight
One 26 or 32W Triple Tube Compact Fluorescent Lamp
4 1/2" Square Parabolic Trim





Optics and Applications
The socket is mounted horizontally in an ellipsoidal primary reflector. Recess depth is reduced for shallow plenums. Use in low to medium height ceilings for corridors, entries and for general and area lighting.

Design Features
A steel housing protects and aligns reflectors and lamps. The socket and ballast will accept 26 or 32W triple tube wattages interchangeably. The square trim is stabilized by a proprietary steel web to prevent racking and is held to the ceiling by constant pressure springs. Maximum ceiling thickness 7/8". Ballast and lamp service from below.

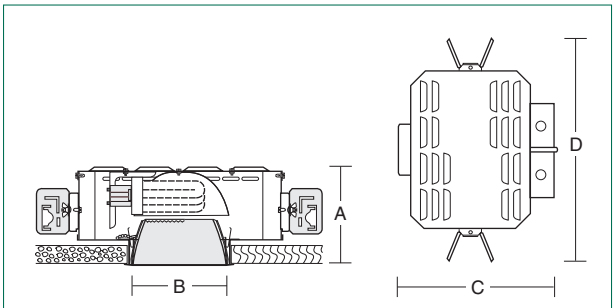
Finish
Housings and structural parts are painted matte black to suppress stray light leaks. Standard trims are anodized Softglow® clear. Special finishes, textures and colors are available, see below under Accessories.

Trim Textures
Textured trims create a subtle new aperture appearance. Select among different embossed patterns to match the ambiance of the space being illuminated. Refer to Squares brochure for descriptive photos.

Ballasts
Fully electronic, microprocessor controlled with programmed start to assure rated lamp life. Input voltage ranges from 120V through 277V. Operates 26 or 32W lamps interchangeably. Power factor .98, starting temperature 0°F (-18°C), THD<10%. Pre-heat start < 1.0 second. End of lamp life protection. Rated for > 50,000 starts.

General
Fixtures are pre-wired, UL and C-UL listed for eight wire 75°C branch circuit wiring. Union made IBEW. Suitable for damp locations.

Dimensions and Lamps



Number	A Depth	B Aperture	C Width	D Length	Lamps
H8443	5 1/2" 140mm	4 1/2" sq. 114mm	13 1/2" 343mm	19" 483mm	26-32W TripleTube compact fluorescent

Accessories

R2	26" support rails.	WT	White trim flange.
R5	52" support rails.	WHT	White complete trim.
SB	Softglow black.	BP	Ball Peen texture.
SG	Softglow gold.	CG	Corrugated texture.
SH	Softglow mocha.	DS	Distressed texture.
SP	Softglow graphite.	WV	Woven texture.
ST	Softglow titanium.	LL	Linear spread lens.
SW	Softglow wheat.	LP	Large prism lens.
SY	Softglow pewter.	MP	Microprism lens.
SZ	Softglow bronze.	V347	347 volt ballast.
BR	Bright trim finish.	FC	Four cell cross baffle.
FR	Frosting on lens.	DM	Dimming ballast.
F	Fuse.		Specify watts and volts.

FLT4 Full lens trim, specify lens type, e.g. H8443-FLT4LL.
WRL Wattage restriction label, specify wattage.
EM Emergency power includes integral charger light and test switch visible through aperture. Battery operation for 90 minutes.

kurt versen
Kurt Versen Company
Point Source Lighting
Westwood, New Jersey 07675

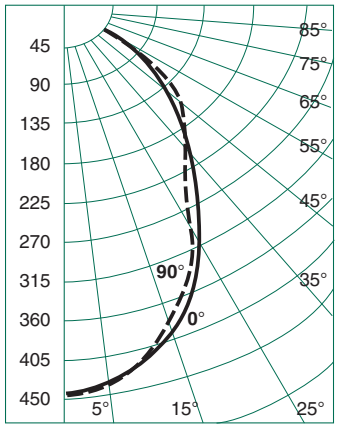
H22a H8443

Performance Datachart

Single Unit Initial Footcandles, 30" Work Plane							Ceiling to Floor	Multiple Units Initial Footcandles, 30" Work Plane			
H8443 26W Philips Triple Tube Read Top Data H8443 32W Philips Triple Tube Read Bottom Data								Ceiling 80% Walls 50% Floor 20%			
Nadir	10°		20°		30°			Spacing is Maximum Over Work Plane			
FC	FC	Diam	FC	Diam	FC	Diam		Spacing	RCR 1	RCR 3	RCR 8
15 18	13 16	2' 2'	10 12	4' 4'	5 7	6' 6'	8'	5' 6'	26 29	22 25	14 16
11 13	9 11	2' 2'	7 9	5' 5'	4 5	8' 8'	9'	6' 7'	19 21	16 18	10 11
8 9	7 9	3' 3'	5 7	5' 5'	3 4	9' 9'	10'	7' 8'	14 16	12 13	8 9
6 7	6 7	3' 3'	4 5	6' 6'	2 3	10' 10'	11'	8' 9'	11 12	9 10	6 7
5 6	4 5	3' 3'	3 4	7' 7'	2 2	11' 11'	12'	9' 10'	9 10	7 8	5 5

See notes 2, 3 and 4.

Candlepower Distribution

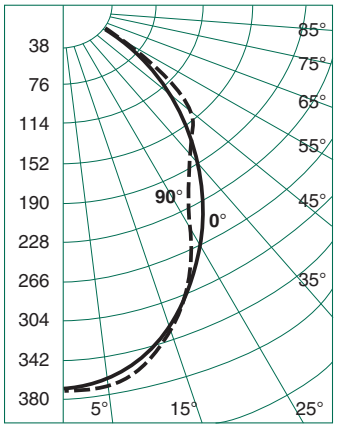


H8443 One 26W Triple Tube Philips
Eff. 35% S/M 0° .94 S/M 90° .91

Candelas

°	0° 1800*	90° 1800*
0	445	445
5	440	441
10	422	417
15	393	386
20	355	346
25	307	293
30	254	231
35	211	208
40	173	190
45	143	156
50	104	120
55	57	80
60	20	35
65	9	10
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

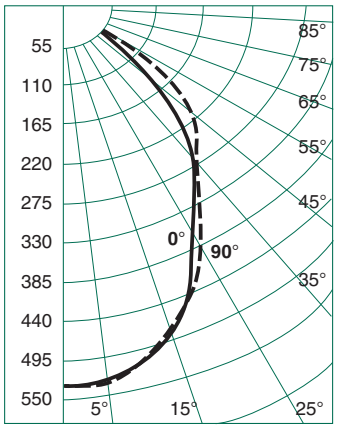
° Vertical Angles
* Initial Lamp Lumens



H8443 One 26W Triple Tube Osram
Eff. 30% S/M 0° .98 S/M 90° .92

°	0° 1800*	90° 1800*
0	375	375
5	368	375
10	354	361
15	336	329
20	308	289
25	268	251
30	225	201
35	188	176
40	157	164
45	123	149
50	89	120
55	45	76
60	14	30
65	8	9
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

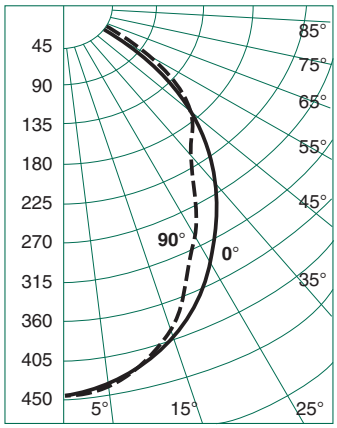
° Vertical Angles
* Initial Lamp Lumens



H8443 One 32W Triple Tube Philips
Eff. 34% S/M 0° 1.04 S/M 90° .96

°	0° 2400*	90° 2400*
0	531	531
5	528	532
10	510	506
15	484	475
20	449	436
25	404	378
30	359	310
35	310	272
40	257	247
45	200	201
50	139	155
55	78	105
60	28	50
65	12	13
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

° Vertical Angles
* Initial Lamp Lumens



H8443 One 32W Triple Tube Osram
Eff. 28% S/M 0° 1.03 S/M 90° .93

°	0° 2400*	90° 2400*
0	449	449
5	445	443
10	428	426
15	405	391
20	373	349
25	338	303
30	299	244
35	259	209
40	219	190
45	168	174
50	115	141
55	60	89
60	18	34
65	10	10
70	0	0
75	0	0
80	0	0
85	0	0
90	0	0

° Vertical Angles
* Initial Lamp Lumens

Notes

1 Softglow® cone multipliers: Gold x .89, Wheat x .87, Pewter x .73, Mocha x .75, Graphite x .70, Titanium x .70, Bronze x .68.

2 Single unit Datachart pattern diameters are determined by the number of degrees from each side of nadir. Therefore a 20° diameter represents a total 40° pattern width at the work plane 30" above the floor. Footcandle values are at the edge of that diameter.

3 Datachart spacing is rounded off to the nearest foot.

4 Data by IES methods. Compact fluorescent data vary due to lamp lumen differences, power input, burning position, ambient temperature and ballast characteristics. A modification factor should be applied.

FLEXIBLE CATHODE LIGHT STRIP
(MODEL FCLS)

Crystal Plaza - Alexandria,VA • Lighting design: C.M. Kling & Associates Photo: Eric Long

The Flexible Cathode Light Strip (FCLS) effectively brings cold cathode lighting into the 21st century. All the best features of shadowless long-life, cold-cathode fluorescent lighting have been engineered into a simple, self-contained, discreet, flexible luminaire. FCLS combines low electricity consumption and high lumens, and long lamp life, effectively eliminating the need for the bulky inefficient magnetic transformers, ballasts, and fixture dimensions associated with traditional component-based cold-cathode lighting systems.

Each beautifully-designed luminaire can conform to almost any shape or size (straight, curved or bent) of our custom or standardized lamps, in an almost infinite variety of deeply-saturated colors and high color-rendering whites. The Flexible Cathode Light Strip (FCLS) is completely modular, low profile (only 2 3/4" tall, including the lamp), installs in minutes, and offers the convenience of "plug-and-play" connections between fixtures. Lamps simply snap in and out, and all luminaires are provided as standard with integral, inaudible 1% electronic dimming ballasts.

"FLEXIBLE CATHODE LIGHT STRIP...BECAUSE THE WORLD IS ROUND"

c UL us LISTED

Patent 7,293,895
Patent 6,454,431

CLS CATHODE LIGHTING SYSTEMS
INNOVATIVE LIGHTING TECHNOLOGY®

8020 Queenair Drive, Gaithersburg, MD 20879 USA • ph: 301 921 4120 • fax: 301 963 3050
email: info@CathodeLightingSystems.com • website: www.CathodeLightingSystems.com

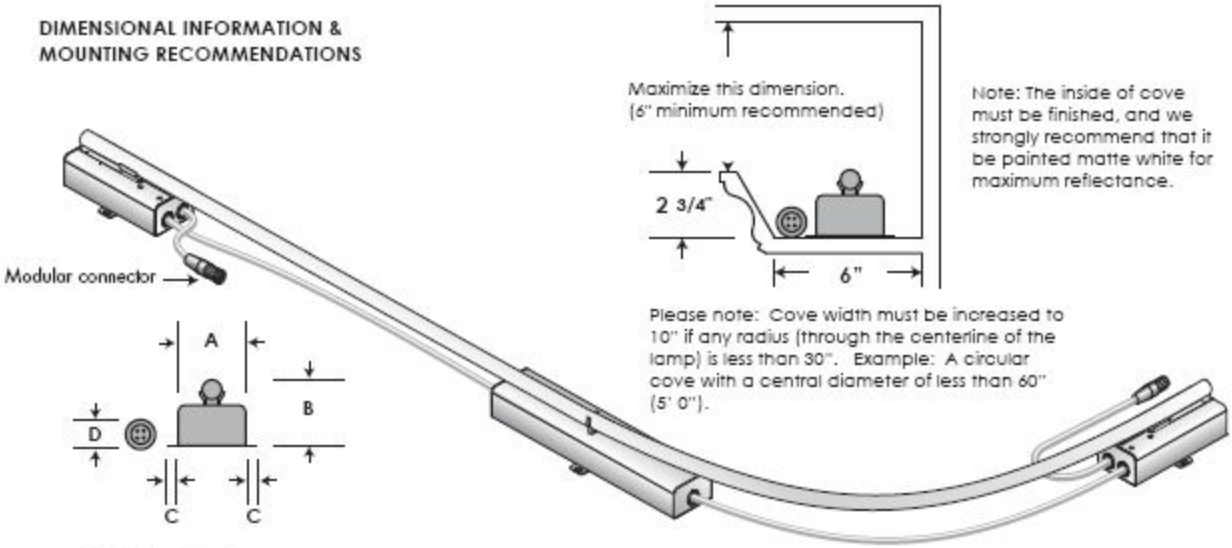
PRODUCT DATA SHEET

FLEXIBLE CATHODE LIGHT STRIP (FCLS)

FEATURES & BENEFITS

- Illumination is seamless from end to end, with no dark spots or socket shadow
- Each luminaire can flex or conform to almost any shape or size of lamp (straight, curved or bent) up to 7' 6" long
- Reliable, long-life high-output T6 cold cathode lamps (up to 50,000 hours of life) are available in standard or custom straight lengths, and can be custom-curved or bent to confor m to almost any architectural requirement
- Up to 322 feet of fixtures on one 20-amp circuit @ 277 volts, or 135 feet of fixtures @120 volts
- Lamps snap in and out of luminaires via innovative zero-clearance lamp bases and lampholders
- New electronic ballast technology offers inaudible operation and a power factor >.95
- Extremely low profile - only 2 3/4" tall with lamp installed
- External "plug and play" modular connectors allow rapid installation and eliminate all manual wiring between luminaires
- Luminaires are completely self contained. Absolutely no disassembly of the luminaire is required to install. Simply install the luminaire on its mounting surface, snap lamp in, and plug into the next luminaire.
- All luminaires come equipped with 1% dimming ballasts, and are compatible with 3-wire fluorescent dimmers
- All luminaires dim at the same rate, regardless of variations in lamp length or shape.
- Wide color selection, and up to 10 different white hues from to choose from
- UL-Listed c UL us LISTED

DIMENSIONAL INFORMATION & MOUNTING RECOMMENDATIONS



A. Width: 2 3/4"
B. Height (with lamp): 2 3/4"
C. Mounting tab width: 5/8"
D. Modular connector diameter: 1 5/16"

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FLEXIBLE CATHODE LIGHT STRIP (FCLS) — LAMP COLORS & ORDERING INFORMATION

LAMP COLORS

WHITE LAMPS: All whites are triphosphor with a CRI of 92

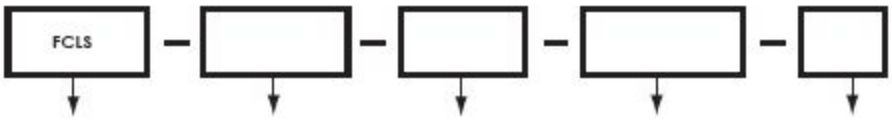
Cat. No.	Shade of White	Lumens per foot	Efficacy
28TC	Incandescent white - 2800°K	772	77.2 lumens/watt
30TC	Warm white - 3000°K	759	76.2 lumens/watt
35TC	Soft white - 3500°K	780	78.2 lumens/watt
42TC	Cool white - 4200°K	750	75.3 lumens/watt
50TC	Ice white - 5000°K	738	73.2 lumens/watt
65TC	Daylight - 6500°K	751	75.4 lumens/watt

Photometric information: All photometric values provided by LTL (Luminaire Testing Laboratories, Allentown, PA) .

COLORED LAMPS:

Pink White (PW)
Hot Pink (HP)
Red (RD)
Lavender (LV)
Purple (PR)
Sky Blue (SB)
Deep Blue (DB)
Turquoise (TQ)
Aquamarine (AQ)
Standard Green (GR)
Bright Green (BG)
Gold (GD)
Canary Yellow (CY)
Orange (OR)
Amber (AM)

ORDERING INFORMATION



Fixture Type:
CLS (Flexible Cathode Light Strip)

Lamp footage:
Round up to the nearest foot.

Lamp type:
S - Straight
C - Curved

Lamp color:
See color chart above for correct catalog numbers.

If color has not been chosen at time of specification, please write: TBD

Voltage:
120 - 120 volts
277 - 277 volts

Example: One circular light cove, 157' in circumference. Lamp color is 2800°K incandescent white. Fixtures will operate at 120 volts.

FCLS - 157 - C - 28TC - 120

Model FCLS
Length: 157 feet
Curved lamps
120 volts
2800°K incandescent-white lamps

CATHODE LIGHTING SYSTEMS
INNOVATIVE LIGHTING TECHNOLOGY®

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email: info@CathodeLightingSystems.com • website: www.CathodeLightingSystems.com

FLEXIBLE CATHODE LIGHT STRIP (FCLS) — ELECTRICAL INFORMATION & SPECIFICATIONS

ELECTRICAL INFORMATION

Ballast type	Primary voltage	Primary amps / VA	Watts per foot*	Dimming protocol	Maximum luminaires per 20-amp circuit*	Maximum lamp footage per 20-amp circuit*
Electronic	120 volts 50/60 Hz	.85 amps / 102 VA	13.6	3-wire fluorescent	18 @ 120 volts	135 feet
Electronic	277 volts 50/60 Hz	.37 amps / 102 VA	13.6	3-wire fluorescent	43 @ 277 volts	322 feet

*Values are based on maximizing all lamp lengths at 7'6". Actual values may vary depending upon the selection of luminaire lengths.

Dimming: Three-wire fluorescent (switched hot, dimmed hot, and neutral). Lutron is recommended.

Primary Wiring: Branch circuit wiring must contain three (3) conductors + ground in order to utilize dimming feature.

Branch circuit requirements: H-FCLS must be powered by a dedicated circuit only. Maximum breaker size is 20 amps.

SPECIFICATIONS

Luminaire: Shall be Cathode Lighting Systems model FCLS (Flexible Cathode Light Strip), and shall be field-adjustable to accommodate straight, curved or bent lamps up to 7'6" in length. Luminaires shall provide a continuous, uninterrupted line of light when installed as instructed. Luminaires shall be provided with integral male and female power connectors at each end to electrically connect each luminaire to the next. Luminaires shall be satin-anodized .050" aluminum and stainless steel and shall be permanently connected with matching flexible cable. No disassembly or entry into the internal parts of the luminaire shall be required during installation, either for wiring or for mounting.

Lamps: Shall be 50,000-hour T6 cold-cathode fluorescent, color as specified, in curvatures, shapes and sizes dictated by the architectural requirements. Lamps shall be provided with single-pin bases for zero-clearance snap-in installation and removal from lampholders. (Lamps that are hard-wired to the power supply in parallel or series are not acceptable alternatives). Lamps shall be manufactured with butt-sealed ends to provide complete illumination at each lamp end and shall have provisions to be locked into place, utilizing the luminaire's lamp-locking clips. Lamps shall produce 759 lumens per foot (35TC) and manufacturer shall provide independent test lab reports to substantiate.

Integral Ballasts: Shall be noiseless, electronic 990-volt, high-output, instant-start cold cathode, class P thermally protected, and shall automatically de-energize upon removal of lamps from the luminaire. Ballast power factor shall be >.95

Approvals: Luminaire shall be UL and cUL-listed under UL category: IEUZ Fluorescent surface-mounted luminaires.

Manufacturer: Shall be Cathode Lighting Systems Inc., Gaithersburg, MD - USA (800) 551-5012.
Website: www.CathodeLightingSystems.com

CATHODE LIGHTING SYSTEMS
INNOVATIVE LIGHTING TECHNOLOGY®

8020 Queenair Drive, Gaithersburg, MD 20879 USA • ph: 301 921 4120 • fax: 301 963 3050
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Catalog Number
PAR38

Fixture Type:

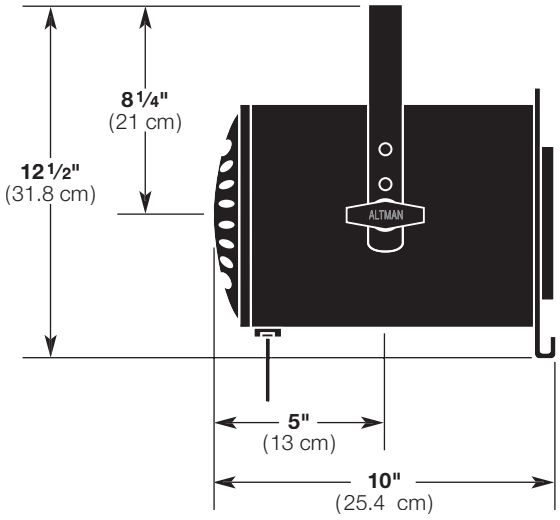
The PAR38 fixture is a low cost, versatile luminaire designed for diverse applications. Intensities and beam spreads are functions of the lamp selected for use in the fixture. One luminaire can serve multiple purposes simply by changing the lamp type. The small size of the PAR38 and a wide range of lamps to choose from make it an ideal luminaire for many lighting applications. Typical installations are found in night-clubs, concerts, theatres and architectural situations where maximum flexibility is desired from a small compact package.

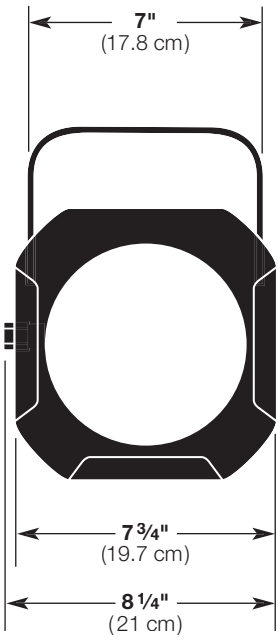
Specifications subject to change without notice

300 WATT
PAR38
spotlight/floodlight

Features

- Rugged sheet steel construction
- Medium screw base socket
- 3 position yoke adjustment
- Color frame and safety cable with spring clip included
- Three 36" Teflon lead wires
- Up to 25 Feet Hi-Temp rubber cable optional
- U.L. and c.U.L. listed for 300 watts
- Made in the USA





ALTMAN Lighting, Inc.
BRINGING IMAGINATION TO LIGHT

Specifications

Housing: Sheet steel construction.

Materials: Construction employs all corrosion-resistant materials and hardware.

Yoke: Rigid flat steel.

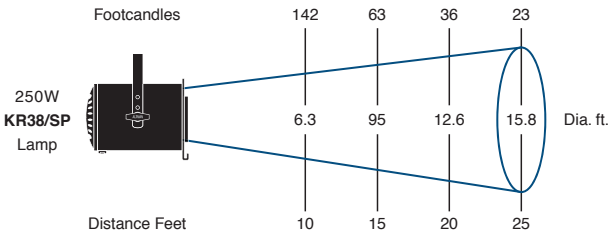
Socket: Medium screw base. Tool free relamping.

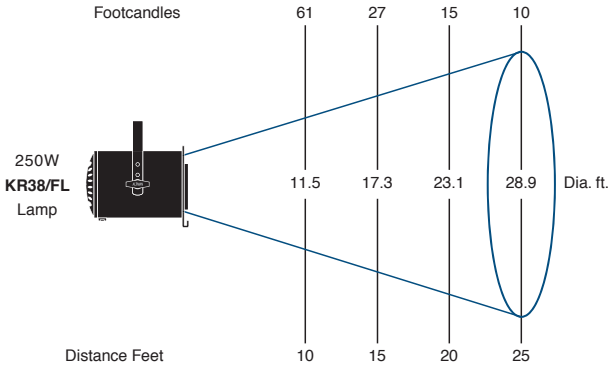
Rating: 120/240 volts AC/DC operation. 2.5/1.3 amps, 300 watts maximum.

Cable: 36" Teflon leads encased in black sleeving. Hi-Temp rubber cable optional, up to 25'.

Finish: Black epoxy sandtex, electrostatic application.

Weight: Approx; 4 lbs. (1.8 kg).





ACCESSORIES Supplied with Luminaire	
6-CF	Color Frame
SC-36-BK	Safety Cable with Spring Clip

ADDITIONAL ACCESSORIES	
510	Malleable Iron Pipe Clamp
6-BD-4	4-Way Barn Doors
6-SN	Snoot
404-6	Motorized Color Wheel

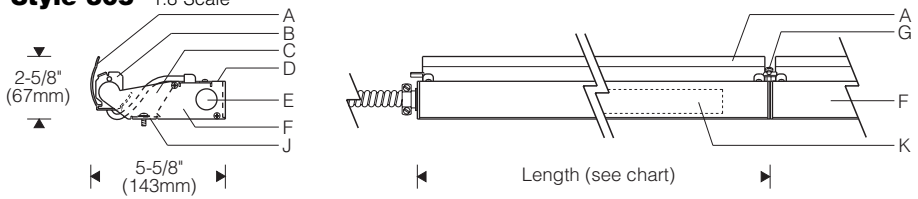
LAMP DATA

Manufacturers Lamp Code	Watts	Candlepower (Candela)	Color Temp (°K)	Rated Life (Hours)	Field Angle (Degrees°)
100R/FL	100	900	2700	2,000	60°
100R/SP	100	5,000	2775	2,000	36°
120BR40/FL	120	—	2900	2,000	60°
120BR40/SP	120	—	2900	2,000	20°
120PAR/CAP/FL30°	120	4,600	2950	3,000	30°
120PAR/CAP/SP9°	120	22,500	2950	3,000	9°
250KR38/FL	250	6,100	2850	4,000	60°
250KR38/SP	250	14,200	2850	4,000	35°
Q250PAR38/FL	250	6,500	2900	6,000	60°
Q250PAR38/SP	250	28,000	2900	6,000	24°
300R/FL	300	2,900	2775	2,000	60°
300R/SP	300	14,000	2775	2,000	24°

ALTMAN Lighting, Inc.
BRINGING IMAGINATION TO LIGHT

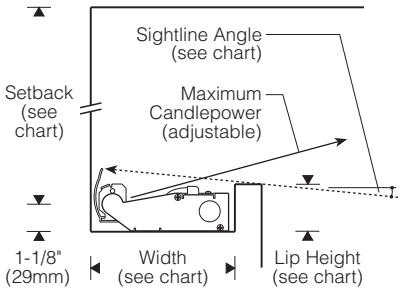
57 Alexander Street, Yonkers, NY 10701 Tel: 914.476.7987, 212.569.7777, Fax: 914.963.7304, Toll free: 800.4.ALTMAN or
Visit our website at http://www.altmanltg.com

Style 305 1:8 Scale



Lamp Length	*Luminaire Length*
1 x 2'	23-1/16" (586mm)
1 x 3'	34-7/8" (886mm)
1 x 4'	46-11/16" (1186mm)
1 x 5'	58-1/2" (1486mm)
2 x 3'	69-1/2" (1765mm)
2 x 4'	93-1/8" (2365mm)
2 x 5'	116-5/8" (2963mm)

Cove



Cove Dimensions

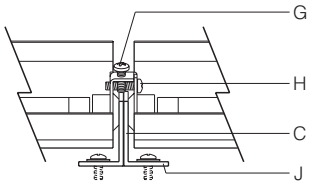
(max. candlepower aimed 15° above horiz.)

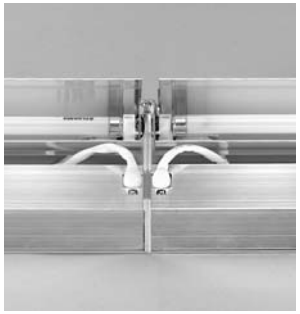
Sightline	0° (horiz. cutoff)	5°	10°
Width *(inside)*	6-1/2" (165mm)	5-7/8" (150mm)	5-7/8" (150mm)
Lip *(inside)*	2-5/8" (67mm)	2-1/8" (54mm)	1-5/8" (41mm)
Setback *(varies)*	Recommended minimum: 12" T5, 18" T5HO		

Note: Finish interior of cove matte white for best results.

Joint 1:4 Scale

(ballast compartment not shown for clarity)





Specifications

- **A** Specular extruded aluminum reflector
- **B** Stainless steel lamp-holder/support brackets
- **C** Aluminum sidearm with mounting tab
- **D** Extruded aluminum ballast/wireway channel cover
- **E** Conduit entry (one each end, conduit and connector by others)
- **F** Extruded aluminum ballast/wireway compartment
- **G** Rotation locking screw
- **H** Joiner/alignment screw
- **J** Mounting tab (fastener by others)
- **K** Integral electronic ballast

Finish:

Reflector – extruded high purity aluminum with clear anodized specular finish. Sidearms and ballast/wireway compartment – mill finish aluminum. All luminaire hardware – stainless steel.

Mounting:

Lay-in installation requires only one fastener per joint (by others). Sidearms with mounting tabs can be base or wall mounted. Luminaires can be mounted individually or joined together to form a continuous row.

Reflector aiming is adjustable and is fixed in position by rotation locking screws at each sidearm. When mounted in a continuous row, joiner screws lock reflectors together allowing all in the row to be aimed together.

Standard:

UL listed or CSA certified for damp locations (Style 124 painted model with lens recommended for damp locations).

Electrical:

Use 90°C wire for supply connections.

Integral electronic HPF thermally protected class P ballast with end-of-life protection. Ballast/wireway compartment includes one conduit entry at each end. Channel cover removes for access to ballast and wiring. Luminaires may be butted end-to-end (connectors by others) for through wiring. Optional #12 AWG prewired modular through wiring with quick connectors.

Master/satellite combination is available (Configuration **3**, see Ordering Information). Master supplied with 2-lamp ballast (wiring, conduit and connectors between master and satellite units by others).

Optional electronic dimming ballast; compatible dimmer switch required (by others). Consult sales representative for compatibility and specifications.

Optional integral emergency battery operates one lamp. Separate unswitched supply is required.

For complete ballast specifications, see Accessories Section.

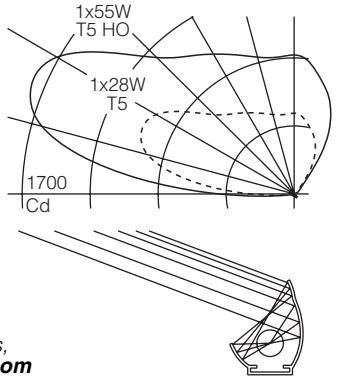
Features

- *T5 fluorescent – precise optical control for unequaled projection of light from perimeter coves*
- *Adjustable – all reflectors in a row join and aim together; rotation locking screws secure position**
- *Only 2-5/8" high – fits in low profile coves*
- *Integral electronic ballast, thru wiring for easy installation*

C 19.0

Performance

Two parabolic reflector sections drive light across the ceiling from one edge. An elliptical section shields the lamp from normal viewing angles and redirects its light to a parabola. Glare is minimized and asymmetry of the beam is maximized resulting in high beam efficiency and superior surface uniformity.



For complete photometrics, visit ***thelightingquotient.com***

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***U.S. Patents 5,550,725 and D432,696; EPO 0710796.**

To form a Catalog Number

F 3 0 5 - T [ ] - S - 0 0 - [ ] - [ ] [ ]

1 2 3 4 5 6 7 8

1 Source

F = Linear fluorescent

2 Style

305 = Xtra small concealed, **integral** ballast

3 Lamp

Note: To order by overall row length, enter **ROW CODE** in place of Lamp Code below (see Row Charts on page C-19.2). Row Code specifies a row complete with all necessary reflectors and ballasts.

T [ ] [ ] = **Lamp Code** (to specify individual units)

Lamp Wattage (see chart below)

Reflector Configuration, specify **1**, **2** or **3** (see chart below)

Example: **T228** = two 28W T5 lamps in nominal 8' reflector; one 2-lamp ballast

Reflector Configuration

1	1 - Lamp Ballast 1-Lamp Reflector
2	2 - Lamp Ballast 2-Lamp Reflector
3	2 - Lamp Ballast 1-Lamp Reflector (Master) 1-Lamp Reflector (Satellite)

Lamp Wattage	*Lamp Length*	*Lamp Number*
T5 Fluorescent		
14	2'	F14T5
21	3'	F21T5
28	4'	F28T5
35	5'	F35T5
T5 HO Fluorescent*		
24	2'	F24T5/HO
39	3'	F39T5/HO
55	4'	F54T5/HO
80	5'	F80T5/HO

For complete lamp and ballast information, see Accessories Section. Standard T5 and T5HO lamp color is 3000K/80+ CRI.

C 19.1

Project:

4 Mounting

S = Sidearms with mounting tabs

5 Finish

00 = Bright anodized reflector with mill finish ballast compartment

6 Voltage/Ballast

Electronic

1 = 120V
2 = 277V
3 = 347V (Canada)

*Dimming**

T = 120V
V = 277V

* Consult sales representative for dimming 5' lamps (lamp codes **Tx35**, **Tx80**) and for Reflector Configuration **3**. Availability for wattages and voltages varies with ballast manufacturer and control type – see **thelightingquotient.com** for additional dimming specifications and limitations.

7 Option (see Accessories Section for specifications)

00 = No options
0E = Integral emergency battery pack with indicator lamp and test button. Operates one lamp. Available in nominal 4', 6' and 8' units only (lamp codes **T128**, **T221**, **T228**, **T328**, **T155**, **T239**, **T255** and **T355**).
0K = Prewired modular #12 AWG through wiring with quick connectors
EK = Combination of emergency battery pack and prewired modular through wiring as described above
XX = For modification not listed, include detailed description. Consult factory prior to specification.

8 Destination Requirement

0 = UL listed or CSA certified for U.S.
J = UL listed or CSA certified for Canada

Example

F305 - T221 - S - 00 - 1 - 000

Xtra small concealed fluorescent unit consisting of one nominal 6' reflector with two 21W T5 lamps. Integral 120V electronic 2-lamp ballast. Sidearms with mounting tabs. UL listed or CSA certified for U.S.

Type:

Accessories

Order separately. See Accessories Section for specifications.

AFK000X [ ] = Ballast **fuse** kit

0 = U.S.
J = Canada

elliptipar There is no equal™

elliptipar *from* **The Lighting Quotient**
114 Boston Post Road, West Haven, Connecticut 06516, USA
Voice 203.931.4455 • Fax 203.931.4464 • **thelightingquotient.com**

To order by Row Code – T5 lamps

When the Style 305 xtra small concealed T5 fluorescent is run continuously in **straight** coves, **elliptipar** offers the option of specifying and ordering the entire row as one catalog number. Ordering by row eliminates the need to calculate length, type and quantity of reflectors.

Steps to specify Row Code:

1. Determine clear inside length of cove.
2. Round up to nearest foot and find the nominal row length in chart.
3. Determine what lengths/wattages of lamps will be used and select the corresponding lamp combination codes.
   Example: If only 3' and 4' lamps are to be used on the project, specify row codes ending with **A**, **B** and/or **D** only.
4. If for a given nominal row length a preferred lamp combination is not listed, select the next shorter row that is available in the desired lamp combination.
5. Once the nominal row length and lamp combination has been found in the chart, note the actual overall row length (last column).
6. Consider the unlighted length at each end of the row (subtract the overall row length from the clear inside length, and divide the remainder by two). It is generally recommended that the unlighted length at each end be between 6" and 12".
7. Enter the four character Row Code in place of the Lamp Code described on page C-19.1. The remainder of the catalog number is formed as shown on page C-19.1.

Features

- *Time saving – simplifies specification and ordering*
- *One catalog number – includes all necessary reflectors to install row*
- *Assured fit – all you need is the clear inside length of the cove*

3 Row Code

Note: Enter row code in place of Lamp Code described on page C-19.1.

= **Row Code**

Lamp Combination*
A = All nominal 3' lamps
B = All nominal 4' lamps
C = All nominal 5' lamps
D = Nominal 3' and 4' lamps
F = Nominal 3' and 5' lamps
G = Nominal 4' and 5' lamps

Nominal Row Length in feet, between 3' and 50' **

S = T5 fluorescent
V = T5/HO fluorescent

* Not all lamp combinations are available for each nominal row length (see chart).

** Nominal row lengths over 50' can be formed by combining shorter row lengths (Example: a nominal 60' row can be ordered as two nominal 30' rows).

Example

F305 - S15A - S - 00 - 2 - 000

Nominal 15' long row of Style 305 xtra small concealed T5 fluorescent using only nominal 3' (21W) lamps. Row includes two nominal 6' luminaires for use with two 3' lamps each, one nominal 3' luminaire for use with one 3' lamp and integral 277V electronic ballasts. Overall row length is 14' 5-7/8".

Nominal Row Length (feet)	*Lamp Combination*	*Nominal 3' Luminaire (1 x nominal 3' lamp)*	*Nominal 4' Luminaire (1 x nominal 4' lamp)*	*Nominal 5' Luminaire (1 x nominal 5' lamp)*	*Nominal 6' Luminaire (2 x nominal 3' lamps)*	*Nominal 8' Luminaire (2 x nominal 4' lamps)*	*Nominal 10' Luminaire (2 x nominal 5' lamps)*	*Overall Row Length*
03	**A**	1						2' 10-7/8"
04	**B**		1					3' 10-11/16"
05	**C**			1				4' 10-1/2"
06	**A**				1			5' 9-1/2"
07	**D**	1	1					6' 9-9/16"
08	**B**					1		7' 9-1/8"
08	**F**	1		1				7' 9-3/8"
09	**A**	1			1			8' 8-3/8"
09	**G**		1	1				8' 9-3/16"
10	**C**						1	9' 8-5/8"
10	**D**		1		1			9' 8-3/16"
11	**D**	1				1		10' 8"
11	**F**			1	1			10' 8"
12	**A**				2			11' 7"
12	**B**		1			1		11' 7-13/16"
13	**D**	1	1		1			12' 7-1/16"
13	**F**	1					1	12' 7-1/2"
13	**G**			1		1		12' 7-5/8"
14	**D**				1	1		13' 6-5/8"
14	**F**	1		1	1			13' 6-7/8"
14	**G**		1				1	13' 7-5/16"
15	**A**	1			2			14' 5-7/8"
15	**C**			1			1	14' 7-1/8"
15	**D**	1	1			1		14' 6-11/16"
16	**B**					2		15' 6-1/4"
16	**F**				1		1	15' 6-1/8"
17	**D**	1			1	1		16' 5-1/2"
17	**F**			1	2			16' 5-1/2"
17	**G**		1	1		1		16' 6-5/16"
18	**A**				3			17' 4-1/2"
18	**D**		1		1	1		17' 5-5/16"
18	**F**	1		1			1	17' 6"
18	**G**					1	1	17' 5-3/4"
19	**D**	1				2		18' 5-1/8"
19	**F**	1			1		1	18' 5"
19	**G**		1	1			1	18' 5-13/16"

To order by Row Code – T5 Lamps

Project:

Type:

Nominal Row Length (feet)	Lamp Combination	Nominal 3' Luminaire (1 x nominal 3' lamp)	Nominal 4' Luminaire (1 x nominal 4' lamp)	Nominal 5' Luminaire (1 x nominal 5' lamp)	Nominal 6' Luminaire (2 x nominal 3' lamps)	Nominal 8' Luminaire (2 x nominal 4' lamps)	Nominal 10' Luminaire (2 x nominal 5' lamps)	Overall Row Length
20	**B**		1			2		19' 4-15/16"
20	**C**						2	19' 5-1/4"
21	**A**	1			3			20' 3-3/8"
21	**D**	1	1		1	1		20' 4-3/16"
21	**F**			1	1		1	20' 4-5/8"
21	**G**			1		2		20' 4-3/4"
22	**D**		1		3			21' 3-3/16"
22	**F**				2		1	21' 3-5/8"
22	**G**		1			1	1	21' 4-7/16"
23	**D**	1	1			2		22' 3-13/16"
23	**F**	1					2	22' 4-1/8"
23	**G**			1		1	1	22' 4-1/4"
24	**A**				4			23' 2"
24	**B**					3		23' 3-3/8"
24	**F**	1		1	1		1	23' 3-1/2"
24	**G**		1				2	23' 3-15/16"
25	**C**			1			2	24' 3-3/4"
25	**D**	1			1	2		24' 2-5/8"
26	**D**		1		1	2		25' 2-7/16"
26	**F**				1		2	25' 2-3/4"
26	**G**					2	1	25' 2-7/8"
27	**A**	1			4			26' 0-7/8"
27	**D**	1				3		26' 2-1/4"
27	**F**			1	2		1	26' 2-1/8"
27	**G**		1	1		1	1	26' 2-15/16"
28	**B**		1			3		27' 2-1/16"
28	**F**	1		1			2	27' 2-5/8"
28	**G**					1	2	27' 2-3/8"
29	**D**	1	1		1	2		28' 1-5/16"
29	**F**	1			1		2	28' 1-5/8"
29	**G**		1	1			2	28' 2-7/16"
30	**A**				5			28' 11-1/2"
30	**C**						3	29' 1-7/8"
30	**D**				1	3		29' 0-7/8"
31	**D**	1	1			3		30' 0-15/16"
31	**F**			1	1		2	30' 1-1/4"
31	**G**			1		2	1	30' 1-3/8"

Nominal Row Length (feet)	Lamp Combination	Nominal 3' Luminaire (1 x nominal 3' lamp)	Nominal 4' Luminaire (1 x nominal 4' lamp)	Nominal 5' Luminaire (1 x nominal 5' lamp)	Nominal 6' Luminaire (2 x nominal 3' lamps)	Nominal 8' Luminaire (2 x nominal 4' lamps)	Nominal 10' Luminaire (2 x nominal 5' lamps)	Overall Row Length
32	**A**	1			5			31' 10-3/8"
32	**B**					4		31' 0-1/2"
32	**D**	1			1	3		31' 11-3/4"
32	**F**				2		2	31' 0-1/4"
32	**G**		1			1	2	31' 1-1/16"
33	**D**		1		1	3		32' 11-9/16"
33	**F**	1					3	32' 0-3/4"
33	**G**			1		1	2	32' 0-7/8"
34	**D**	1				4		33' 11-3/8"
34	**F**	1		1	1		2	33' 0-1/8"
34	**G**					3	1	33' 0"
35	**A**				6			34' 9"
35	**B**		1			4		34' 11-3/16"
35	**C**			1			3	34' 0-3/8"
36	**D**	1	1		1	3		35' 10-7/16"
36	**G**			1		4		35' 11"
37	**D**				1	4		36' 10"
37	**F**				3		2	36' 9-3/4"
37	**G**					1	3	36' 11"
38	**A**	1			6			37' 7-7/8"
38	**D**	1	1			4		37' 10-1/16"
38	**G**		1	1			3	37' 11-1/16"
39	**B**					5		38' 9-5/8"
39	**C**						4	38' 10-1/2"
40	**D**	1			1	4		39' 8-7/8"
40	**F**			1	1		3	39' 9-7/8"
40	**G**			1		2	2	39' 10"
41	**A**				7			40' 6-1/2"
41	**D**		1		1	4		40' 8-11/16"
41	**F**				2		3	40' 8-7/8"
41	**G**		1			1	3	40' 9-11/16"
42	**D**	1				5		41' 8-1/2"
42	**F**	1					4	41' 9-3/8"
42	**G**		1	1		3	1	41' 9-3/16"
43	**B**		1			5		42' 8-5/16"
43	**F**				4		2	42' 7-1/4"
43	**G**		1				4	42' 9-3/16"

Nominal Row Length (feet)	Lamp Combination	Nominal 3' Luminaire (1 x nominal 3' lamp)	Nominal 4' Luminaire (1 x nominal 4' lamp)	Nominal 5' Luminaire (1 x nominal 5' lamp)	Nominal 6' Luminaire (2 x nominal 3' lamps)	Nominal 8' Luminaire (2 x nominal 4' lamps)	Nominal 10' Luminaire (2 x nominal 5' lamps)	Overall Row Length
44	**A**	1			7			43' 5-3/8"
44	**C**			1			4	43' 9"
44	**D**	1	1		1	4		43' 7-9/16"
45	**D**				1	5		44' 7-1/8"
45	**F**				1		4	44' 8"
45	**G**					2	3	44' 8-1/8"
46	**D**	1	1			5		45' 7-3/16"
46	**F**			1	2		3	45' 7-3/8"
46	**G**		1	1		1	3	45' 8-3/16"
47	**A**				8			46' 4"
47	**B**					6		46' 6-3/4"
47	**F**	1		1			4	46' 7-7/8"
47	**G**					1	4	46' 7-5/8"
48	**D**	1			1	5		47' 6"
48	**F**	1			1		4	47' 6-7/8"
48	**G**		1	1			4	47' 7-11/16"
49	**C**						5	48' 7-1/8"
49	**D**				3	4		48' 5"
50	**A**	1			8			49' 2-7/8"
50	**D**	1				6		49' 5-5/8"
50	**F**			1	1		4	49' 6-1/2"
50	**G**			1		2	3	49' 6-5/8"

C 19.3

elliptipar There is no equal™

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114 Boston Post Road, West Haven, Connecticut 06516, USA
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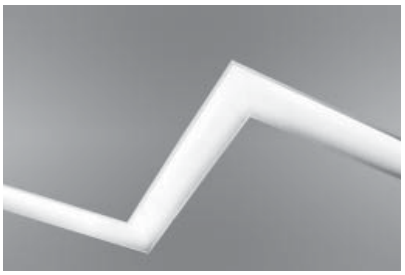
MARK®
ARCHITECTURAL
LIGHTING



The **Perimeter Plus** Series

With up to 40 feet of seamless reflector, Perimeter Plus is perfect for corridors and other long spaces. The white or semi-diffuse silver reflector can be field trimmed at job sites to accommodate any run length.

Standard 9-inch staggering of T5, T5HO or T8 lamps eliminates socket shadows and provides perimeter lighting for less than 8 watts per linear foot. Molded 90-degree inside and outside corners allow easy installation, and telescoping housing and lamp trays are standard.

Type:

Project:

Catalog Number:
DO NOT TYPE HERE. Autopopulated field.

Specification Features

Housing
Die-formed, 20-gauge, cold-rolled steel.

Ceiling and Wall Trim
Precision-extruded aluminum.

Finish
Matte white.

Reflector
Opaque white or silver metallic reflector in standard lengths up to 40 feet. Reflector can be field-trimmed with scissors or utility knife at job site to accommodate any run length.

Shielding
Unshielded. Open parabolic, silver or white reflector options available.

Lamps
Standard 9" stagger, (1) or (2) T5, T5HO or T8. Lamps provided by others.

Ballast
Thermally protected Class P energy-saving electronic ballast.

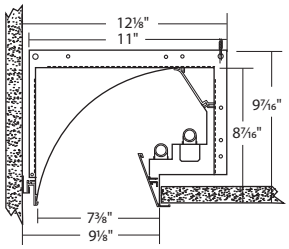
Mounting
Recessed perimeter wall wash in 8', 6', 4', 3' and 2' sections. Telescoping housing and lamp sections provided in all runs and patterns.

Corners
90-degree inside or outside molded corners.

Certification
cULus Listed, IBEW (Local 3) Union-made in the USA.

Technical Drawings

2T5



Ordering

Example: PPL 16FT WH 2T5S EBPR 120

Series	Length[1]	Color	Corner configurations	No. of lamps/Lamp type[2]	Ballast	Voltage	Options
PPL Perimeter Plus	**_ ft.** Provide wall-to-wall dimensions	**SL** Silver **WH** White	**90IC** 90° inside molded corner **90OC** 90° outside molded corner	Number of lamps: **1**, **2** Lamp type[2]: **T5S**, **T5HOS**, **T8S**	**EBPR** Program rapid start (standard) **EBIS** Instant start **EDB** Dimming (specify) **EDHL** Lutron Hi-Lume® dimming **EDE10** Lutron Eco-10® dimming **EDES** Lutron Eco System®	**120** **277** **347**[3]	**EMPK** Emergency battery pack **CP** Chicago plenum

Notes
1 Provide field dimensions when placing order. For patterns, clearly indicate inside or outside corners. Upon request, factory will prepare installation drawings for approval.
2 Consult factory for other lamps.
3 Consult factory for lamp and ballast compatibility.

marklighting.com 3 Kilmer Rd, Edison NJ 08817 T (732) 985 2600 F (732) 985 8441

DESCRIPTION

Coronado 740 is a compact accent/flood fixture for use with PAR38 ceramic metal halide lamps. It is fully adjustable from all mounting positions and features a patented locking clutch mechanism to ensure positive fixture aiming (U.S. patents 5,713,662 and D373,437). Various lenses, louvers and color or dichroic filters can be combined - up to three at once - to create multiple lighting effects. Lumière's exclusive Siphon Protection System (S.P.S.) prevents water from siphoning into the fixture through its own lead wires.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

A ... Material
Hood is precision-machined from corrosion-resistant 6061-T6 aluminum billet. Housing and stem assembly are die-cast aluminum.

B ... Finish
Fixtures are double protected by a chromate conversion undercoating and polyester powdercoat paint finish, surpassing the rigorous demands of the outdoor environment. A variety of standard colors are available.

C ... Hood
Hood is removable for easy relamping and accepts up to three internal accessories at once (lenses, louvers, filters) to achieve multiple lighting effects. The flush lens design sheds water and minimizes debris collection.

D ... Gasket
Housing and hood are sealed with a high temperature silicone o-ring gasket to prevent water intrusion.

E ... Lens
Tempered glass lens, factory sealed with high temperature adhesive to prevent water intrusion and breakage due to thermal shock.

F ... Mounting Stem
Mounting stem is fully adjustable from all mounting positions and features a patented locking clutch mechanism to ensure positive fixture aiming (U.S. patents 5,713,662 and D373,437). Equipped with standard 1/2" NPS threaded male fitting. Lumière's exclusive Siphon Protection System (S.P.S.) prevents water from siphoning into the fixture through its own lead wires.

G ... Hardware
Stainless steel hardware is standard to provide maximum corrosion-resistance.

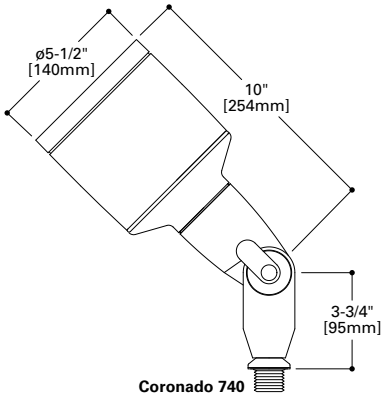
H ... Socket
Ceramic socket with 250° C Teflon® coated lead wires and medium base.

I ... Ballast
Remote core & coil ballast is standard (120/208/240/277/347V). Maximum remote mounting distance for a core & coil ballast is 50'. Remote electronic ballast (120/277V) is available as an option by adding the prefix "EL" to the ballast/mounting code. Maximum remote mounting distance for an electronic ballast depends upon the ballast manufacturer and may require the use of special low capacitance wire, separate conduit runs for lead wires, or other special installation requirements. See ballast manufacturer's installation instructions or contact the factory for remote mounting distance and installation requirements.

J ... Lamp
Not included. Available from Lumière as an accessory - see reverse side of this page.

K ... Labels & Approvals
UL and cUL listed, standard wet label. IP65 rated. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made.

L ... Warranty
Lumière warrants its fixtures against defects in materials & workmanship for three (3) years. Auxiliary equipment such as transformers, ballasts and lamps carry the original manufacturer's warranty.



Coronado 740

CORONADO

740

100W (max.) PAR38
Metal Halide

Accent/Flood

IP65

Specifications and Dimensions subject to change without notice.
Consult your representative for additional options and finishes.

Lamp	ANSI Code	Watts	Beam Spread	CBCP	°K	Life (hrs.)	Base	Volts
CDM100PAR38/SP	M90	100	15°	40,000	3000	7500	medium	120-347
CDM100PAR38/FL	M90	100	30°	20,000	3000	7500	medium	120-347
CDM70PAR38/SP	M98	70	10°	28,000	3000	7500	medium	120-347
CDM70PAR38/FL	M98	70	30°	16,000	3000	7500	medium	120-347

NOTE: Inferior quality lamps may adversely affect the performance of this product. Use only name brand lamps from reputable lamp manufacturers.

NOTES AND FORMULAS

- Beam diameter is to 50% of maximum footcandles, rounded to the nearest half-foot.
- Footcandle values are initial. Apply appropriate light loss factors where necessary.
- Bare lamp data shown. Consult lamp manufacturers to obtain detailed specifications for their lamps.

ORDERING INFORMATION

Series
740=PAR38 Coronado w/Locking Clutch Aiming

Source
Metal Halide
MH70PAR38=70W Metal Halide PAR38, Medium Base
MH100PAR38=100W Metal Halide PAR38, Medium Base

Voltage
120=120V
277=277V
208=208V
240=240V
347=347V

Ballast
__=Standard Core and Coil Ballast
EL=Electronic Ballast
ELM=Electronic Ballast, Mini Housing[1]

Mounting
MB=Fixture mounts to inground ballast container
MBR=Fixture mounts to flat surface, remote inground ballast container
SM=Fixture mounts to wall mounted ballast housing, bottom conduit entry
WM=Fixture mounts to wall mounted ballast housing, over J-box
WR=Fixture mounts to flat surface, remote ballast housing
TS=Fixture mounts to ballast housing strapped to tree, bottom conduit entry
TSR=Fixture strapped to tree, remote inground ballast container
TSR2=Fixture strapped to tree, remote ballast housing strapped to tree

Finish
Painted
BK=Black
BZ=Bronze
CS=City Silver
VE=Verde
WT=White

Accessories
Glare Shield
FH38=Angled Glare Shield, (Specify finish: BK, BZ, CS, VE, WT)
Glare Shield Finish
BK=Black
BZ=Bronze
CS=City Silver
VE=Verde
WT=White
Filters
F71-38=Peach Dichroic Filter, 4.95" Dia
F72-38=Amber Dichroic Filter, 4.95" Dia
F73-38=Green Dichroic Filter, 4.95" Dia
F74-38=Medium Blue Dichroic Filter, 4.95" Dia
F75-38=Yellow Dichroic Filter, 4.95" Dia
F76-38=Red Dichroic Filter, 4.95" Dia
F77-38=Dark Blue Dichroic Filter, 4.95" Dia
F78-38=Light Blue Dichroic Filter, 4.95" Dia
F79-38=Neutral Density Dichroic Filter, 4.95" Dia
F80-38=Magenta Dichroic Filter, 4.95" Dia
F22-38=Red Color Filter, 4.95" Dia
F33-38=Blue Color Filter, 4.95" Dia
F44-38=Green Color Filter, 4.95" Dia
F55-38=Yellow Color Filter, 4.95" Dia
F66-38=Mercury Vapor Color Filter, 4.95" Dia
Optical Lenses
LSL-38: Linear Spread Lens (elongate standard beam spread), 4.95" Dia
OSL-38: Overall Spread Lens (increase beam spread), 4.95" Dia
DIF-38: Diffused Lens (provide even illumination), 4.95" Dia
Optical Louver
LVR-38: Hex Cell Louver (reduce glare), 4.95" Dia
Lamps
MHP38100-SP: 100W PAR38 Metal Halide Spot
MHP38100-FL: 100W PAR38 Metal Halide Flood
MHP38100-WFL: 100W PAR38 Metal Halide Wide Flood

Notes: **1** ELM Ballast available with WM, SM & TS Mounting only.
* Lamp not included.
* Consult your Cooper Lighting representative for additional options and finishes.

PHOTOMETRIC DATA

Coronado 740
Lamp=
CDM100PAR38/SP
(M90)
CBCP=40,000

Cone of Light

Distance to Illuminated Plane	Initial Nadir Footcandles	Beam Diameter
25'0"	65	6'6"
20'0"	102	5'0"
15'0"	181	4'0"
12'0"	283	3'0"
10'0"	408	2'6"
8'0"	637	2'0"

Lamp Wattage Multiplier
70W x 0.70

Coronado 740
Lamp=
CDM100PAR38/FL
(M90)
CBCP=20,000

Cone of Light

Distance to Illuminated Plane	Initial Nadir Footcandles	Beam Diameter
25'0"	33	12'6"
20'0"	51	10'0"
15'0"	91	7'6"
12'0"	142	6'0"
10'0"	204	5'0"
8'0"	320	4'0"

Lamp Wattage Multiplier
70W x 0.76

luxrail™

For Amber only.

Application

ANSI and ADA compliant, **luxrail** is an indoor/outdoor LED-based handrail that delivers functional illumination. Two intensities may be specified: standard output and high output. The standard light output version delivers illuminance levels appropriate for exterior applications (2 footcandles at grade) as well as for dark interior environments with low ambient illumination levels (e.g., themed environments, theatres and residential areas). The high output version delivers illuminance levels applicable to interior environments – providing in excess of 10 footcandles along the path of egress (ANSI required for stair treads). Independent photometric test reports and IES Format data are available at **www.iolighting.com**.

luxrail's standard handrail gripping surfaces are circular in cross section and meet 2004 ADAAG (Americans with Disability Act Accessibility Guidelines). Patented optical assemblies deliver 10˚, 45˚ and 65˚ beam spreads. The 45˚ and 65˚ beam patterns are most suitable for illuminating pathways, while the 10˚ beam spread offers accent lighting for optional glass or stainless steel cable railing infills. Reference page 44 of this catalog for information regarding infill options. **io** ensures that each LED is provided thermal and electrical management properties in accordance with the LED manufacturers recommendations. Projected average rated life is 50,000 hours at 70% of lamp lumen output. Contact factory for IES LM-80 compliance. To ensure proper performance, architectural details should allow for ventilation and air flow around the fixture. Ambient temperature surrounding the fixture shall not exceed 120˚F *(48.9˚C).*

Light Output

Two luminous intensities are available for white light. All values below are initial lumens per foot. IES LM-79 format files may be obtained from the factory or downloaded from **www.iolighting.com.**

	Standard Output	High Output
2700K White:	48 lms/ft	180 lms/ft
3000K White:	48 lms/ft	180 lms/ft
5000K White:	63 lms/ft	240 lms/ft

Construction

luxrail may be post mounted or wall mounted. Mounting hardware (post or wall) is typically required up to 5' O.C., depending on the handrail alloy. Final post and wall bracket spacing must be determined by a licensed architect or structural engineer. **io** can provide engineering upon request. **luxrail** is available in stainless steel and aluminum. **grab bars** are available in aluminum only. The lighting fixture component of the **luxrail** is a stand alone unit and is available in incremental nominal lengths that range from 6" to 60". Vandal resistant access chamber allows units to be removed for maintenance purposes.

All handrail component parts are engineered for quick installation. Field welding or cutting is typically not required. All parts are prefabricated to field dimensions and are assembled in the field with mechanical connection or epoxy. Contact **io** Lighting for recommended handrail installers.

The light fixture's housing is made of a light weight, yet durable aluminum, providing the recommended heat sink requirements for the LEDs. Housing, patented optical assembly and stainless steel end caps are bonded to prevent water infiltration.

Electrical

luxrail houses a low voltage LED-based light fixture that is integrated into the underside of the handrail. 24 volt 96 watt power supplies are provided as a standard. For detailed information regarding daisy chain limitations, remote distance limitations, power supply options, and dimming options consult the **io** website, the **io** catalog (pages 98-100) or an **io** representative.

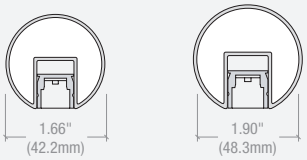
Dimming modules must be specified separately. For detailed information, see page 98 of this brochure or download the power supply specification sheet from **www.iolighting.com**.

Power Consumption

Standard Output: 1.44 w/ft **High Output: 7.62 w/ft**

Power consumption does not include power supply losses.

Dimensions



io luxrail 65°, 3KHO

lighting factsCM
A Program of the U.S. DOE

Light Output (Lumens)	244
Watts	20.9
Lumens per Watt (Efficacy)	11
Color Accuracy Color Rendering Index (CRI)	72
Light Color Correlated Color Temperature (CCT)	3027 (Bright White)

Warm White | Bright White | Daylight
2700K 3000K 4500K 6500K

All results are according to IESNA LM-79-2008: *Approved Method for the Electrical and Photometric Testing of Solid-State Lighting.* The U.S. Department of Energy (DOE) verifies product test data and results.

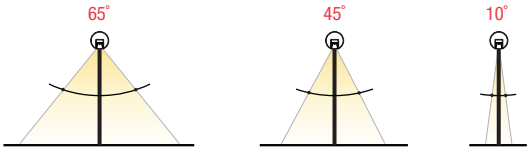
Visit www.lightingfacts.com for the *Label Reference Guide.*

Registration Number: 6PRA-7ZBT8B
Model Number: 0.03.I.3KHO.65.1.05.2
Type: Outdoor path lights

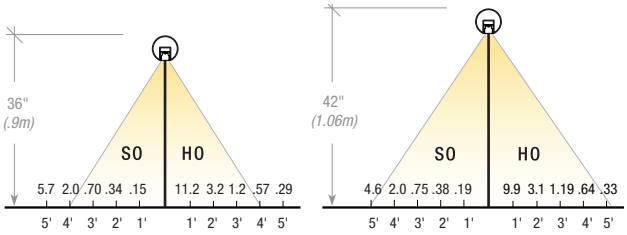
Label references 30" **luxrail** fixture with a 65˚ beam spread in High Output 3000K. Lighting Facts for additional beam spreads and light output levels may be obtained from **io** Lighting.

Light Output / Distributions

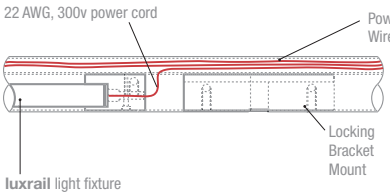
BEAM SPREAD OPTIONS

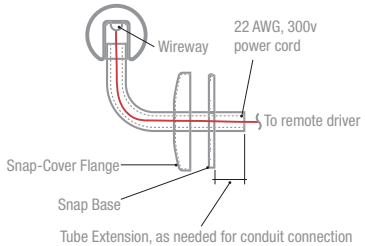


LIGHT OUTPUT - 65 DEGREE WARM WHITE



WALL MOUNT DETAILS*

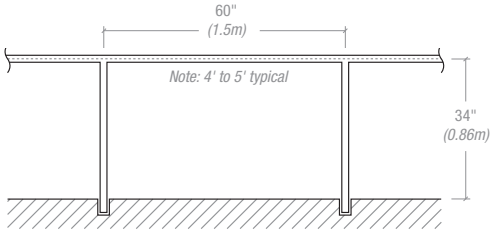




* Wall mounted **luxrail** may be mounted to new or existing guardrail (by others).

Post and wall bracket spacing must be determined by a licensed architect or structural engineer.

POST MOUNT APPLICATION



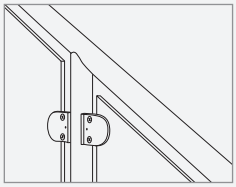
Wildlife Friendly Fixtures

IDA's Fixture Seal of Approval

Mounting / Infill Options

PM (post mounted)

WM (wall mount intermediate)



Glass infill
(glass provided by others)

Stainless steel cable infill
(only available on flat surfaces)

Order Code

0	.	06	.		.		.		.		.		.		.		.		.	
io		1		2		3		4		5		6		7		8		9		10

1. PRODUCT FAMILY
06 luxrail

2. ALLOY / FINISH
SSS Stainless steel satin
SSP Stainless steel polished
CAA Clear anodized aluminum [7]

3. SIZE
1 1.66" O.D. (1¼" pipe size) [7] (available for SS & CAA)
2 1.90" O.D. (1½" pipe size) (available for SS & CAA)

4. MOUNTING
PM Post mounted [7]
WM Wall or guard rail mounted

5. INFILL
AC Stainless steel cable [5]
GL Glass (provided by others)
C Custom
NR Not required

6. LIGHT DISTRIBUTION
10 10 Degree
45 45 Degree
65 65 Degree
NI Handrail only (not illuminated)

7. LIGHT COLOR
27K Warm White
3K Warm White [3]
5K Cool White [3]
27KHO Warm White
3KHO Warm White [3]
5KHO Cool White [3]
R Red [4]
G Green [4]
B Blue [4]
A Amber [4]

8. LENGTH
GB2 2' nominal [8]
GB3 3' nominal [8]
GB4 4' nominal [8]
GB5 5' nominal [8]
HR In Feet / Inches (provide overall length of each handrail section) [2][6]

9. VOLTAGE / DIMMING
1 120v
2 277v
3 120v w/dim
4 277v w/dim
5 Other

10. SPECIFY DRIVER / DIMMING [1]
Note: If not specified otherwise, ***io*** *will supply 96 watt drivers. Download Power Supply specification sheet from* ***www.iolighting.com****.*

SSL Chromaticity Standard: ANSI C78.337		
Color	**Nominal CCT**	**Target CCT & Tolerance (K)**
White	2700K	2725 ±145
White	3000K	3045 ± 175
White	5000K	5028 ± 283

For Metric Conversion		
1"	**1"**	**1'**
25.4mm	2.54cm	0.3m

Footnotes

1. ***Power Supply Specification Sheet*** *may be downloaded from* ***www.iolighting.com****.*
2. *Each handrail application will be custom to accommodate varying field conditions and design requirements. Shop drawings will be required to manage specifics of each handrail section.*
3. *White light variance between LEDs within a single fixture will not exceed ANSI Binning Standards.*
4. *Only available in 7.6 w/ft.*
5. *Stainless Steel cable available for flat surfaces only.*
6. *Detailed elevation drawings of handrail section are required for quote.*
7. ***grab bars*** *available in aluminum only.*

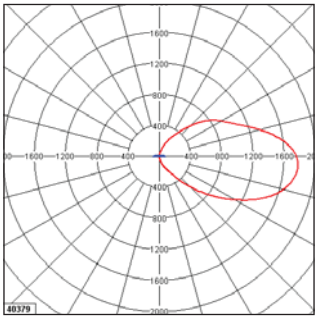
LUMINAIRE SPECIFICATION

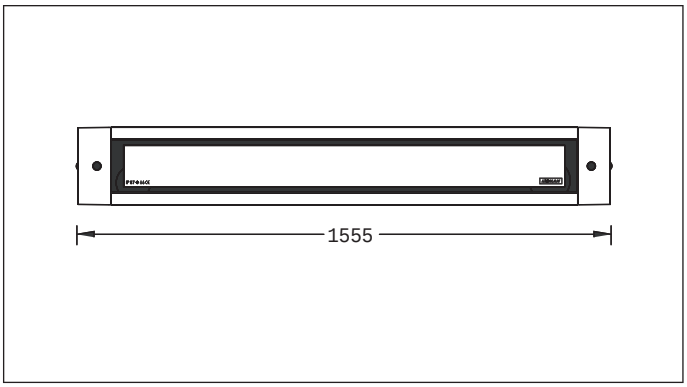
LIGMAN
The quality of life...

PROJECT : _____ DATE : _____

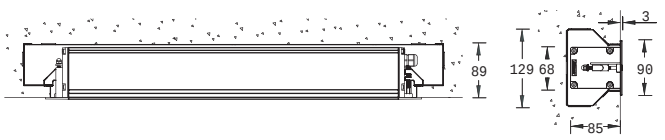
LOCATION : _____

QUANTITY : _____ NOTE : _____





Mounting Detail



40379

Light linear recessed wall light luminaire

IP67 /EN 60598/CLASS I / / IK07

Product Type

Recessed Wall light luminaire.

Product Information

Light linear luminaires are designed to offer functional, a wide range of lighting solutions and dramatic highlighting of the architectural facades of different buildings through the linear design with superior finishing. They are suitable for many other applications incluing commercial and ancient or modern architectural interiors/exteriors. The luminaires are fetures such as long life, limited maintenance and constant lifetime performance, suitable for high efficiency long-life lampsavailable with different colour temperatures and easy to hot-restrike and reduced dimensions. The FH T5 lamps work at –20º to +50º C while FQ T5 lamps work at 0º to +50º C ambient temperatures but it has to be considered that lamp output is sensibly lower at low temperatures .

Material Characteristics

Die-cast aluminium and extrudsion aluminium with high corrosion resistance.Aluminium end caps by one cap provided one cable gland PG 11 entry for wiring is standard.And two cable glands PG 11 is available upon requested. Stainless steel screws. Durable silicone rubber gasket and clear toughened glass. Anodized high purity aluminium reflector with asymmetrical reflectors. Supplied with T5 fluorescent lamps, operating from integral electronic control gear. Choice of wattages and colour temperature 3000 or 6000 K. Luminaire is possibility of uplighting as well as downlighting and available in 4 lengths. Powder paint with high corrosion resistance with chemical chromatised protection.

Physical Data

Length: 1555 mm.
Weight: 7.3 Kg.

Colour

- ☐ Black - RAL 9011
- ☐ White - RAL 9003
- ☐ Matt Silver - RAL 9006
- ☐ Dark Grey - RAL 7043
- ☐ Custom - RAL _____

Reflector

Asymmetrical reflector.

Lamp

T5(T16) FQ 80w.220-240v. G5 6150 lm.

Note

- Integral control gear.

LIGMAN

Branch : Business contact address / Showroom
2912 Ladprao Rd., Klongjun, Bangkapi,
Bangkok 10240 Thailand
Email : info@ligmanlighting.com

Tel : +66 (0) 2 7339140 (9 lines)
Fax : +66 (0) 2 7339153 (Administration)
+66 (0) 2 7339154 (Overseas Sales)
+66 (0) 2 7339150 (Domestic Sales)

Head office : Chachoengsao factory office
17/2 Moo 4, Monthong, Bangnampreaw,
Chachoengsao 24150 Thailand

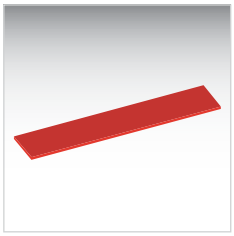
Tel : +66 (0) 38 581676-81
Fax : +66 (0) 38 581415
Email : factory@ligmanlighting.com
Website : www.ligmanlighting.com

LUMINAIRE SPECIFICATION

LIGMAN
The quality of life...

40379
Light linear recessed wall light luminaire

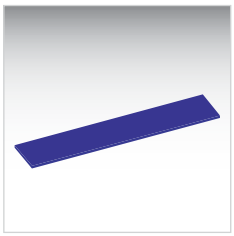
ACCESSORIES



☐ A60716

Red Coloured filter 1470 mm.

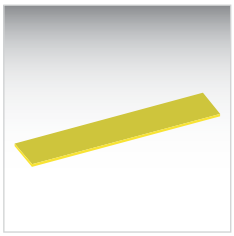
Supplied with holder.



☐ A60717

Blue Coloured filter 1470 mm.

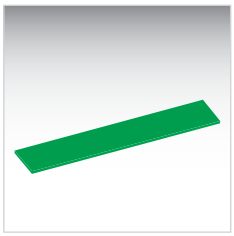
Supplied with holder.



☐ A60718

Yellow Coloured filter 1470 mm.

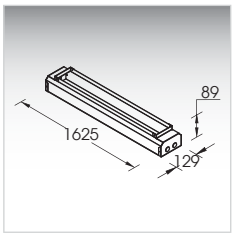
Supplied with holder.



☐ A60719

Green Coloured filter 1470 mm.

Supplied with holder.



☐ A41051

Recessing box in aluminium

(for recessed wall in concrete)

LIGMAN

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Bangkok 10240 Thailand
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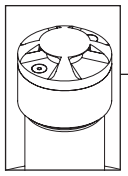


MINI-MICRO™ DRIVESTAR™

PROJECT:	
TYPE:	
CATALOG NUMBER:	
NOTES:	

CATALOG NUMBER LOGIC

			MD	LED								
Example	**B**	-	**MD**	-	**LED**	-	**e28**	-	**F**	-	**MIT**	-	**1**	-	**B**

Material

Blank - Aluminum
B - Brass
S - Stainless Steel

Series

MD - Mini-Micro™ DriveStar™

Source

LED - **'e'** technology with Integral Driver

LED Type *LED's within each group are interchangeable*

GROUP 1
e34 - 3W LED/3K/Side

GROUP 2
e28 - 1W LED/3K/Side
e29 - 1W LED/4K/Side
e31 - 1WLED/Blue/Side
e32 - 1WLED/Green/Side

GROUP 3
e30 - 1W LED/Red/Side
e33 - 1W LED/Amber/Side

Installation

F - Flush mount
S - Surface mount

Finish

Aluminum & Brass Finish

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

Brass Finish

Machined	MAC
Polished	POL
Mitique™	MIT

Stainless Finish

Machined	MAC
Polished	POL
Brushed *Interior Use Only*	BRU

Also available in Premium Finishes
See submittal SUB-1439-00

Optical Openings

1 - Single **2** - 2 at 180° **4** - 4 at 90°

Faceplate Style

A - Solid **B** - Round Accent

LM79 DATA

Group	BK No.	CCT(Typ.)	Input Watts	CRI (Typ.)
1	e34	3000K White	2.8	72
2	e28	3000K White	1.1	72
2	e29	4000K White	1.1	66
2	e31	Blue (460nm)	1.1	~
2	e32	Green (525nm)	1.1	~
3	e30	Red (625nm)	1.1	~
3	e33	Amber (592nm)	1.1	~

L70 DATA

Minimum Rated Life (hrs.)
70% of initial lumens (L_{70})

35,000
35,000
35,000
50,000
50,000
50,000
50,000

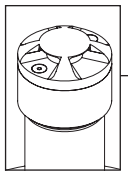
*OPTICAL DATA

Beam Type	Angle
Radial	360°h x 270°v
Radial	360°h x 270°v
Radial	360°h x 270°v
Radial	360°h x 270°v
Radial	360°h x 270°v
Radial	360°h x 270°v
Radial	360°h x 270°v

B-K LIGHTING
40429 Brickyard Drive • Madera, CA 93636 • USA
559.438.5800 • FAX 559.438.5900
www.bklighting.com • info@bklighting.com

SUBMITTAL DATE 3-18-11

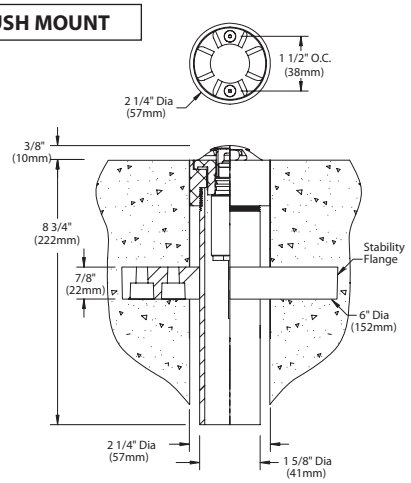
DRAWING NUMBER SUB001068



MINI-MICRO™ DRIVESTAR™

PROJECT:	
TYPE:	

FLUSH MOUNT

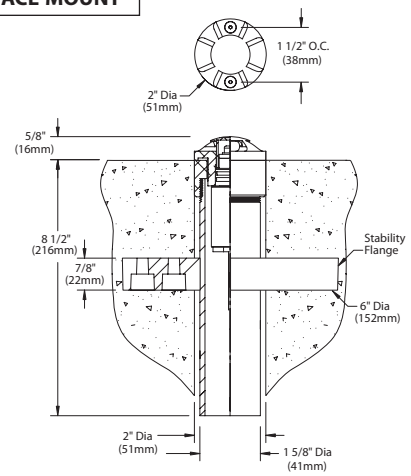


FACEPLATE DETAIL

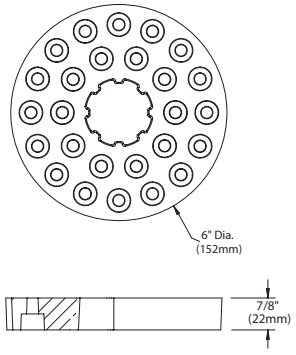
STYLE 'A'

STYLE 'B'

SURFACE MOUNT



STABILITY FLANGE



SPECIFICATIONS

GreenSource Initiative™
Metal and packaging components are made from recycled materials. Manufactured using renewable solar energy, produced onsite. Returnable to manufacturer at end of life to ensure cradle-to-cradle handling. Packaging contains no chlorofluorocarbons (CFC's). Use of this product may qualify for GreenSource efficacy and recycling rebate(s). Consult www.bklighting.com/greensource for program requirements.

Materials
Furnished in Copper-Free Aluminum (Type 6061-T6), Brass (Type 360) or Stainless Steel (Type 304).

Body
Fully machined from solid billet. Unibody design provides enclosed, water-proof wireway and integral heat sink for maximum component life. High temperature, silicone 'O' Ring provides water-tight seal. Provided with hard-coat (Type III) black anodize finish for maximum corrosion resistance. Weather-tight cable connector with 14" 18Ga., 2 wire low voltage cable.

Housing
Fixture provided with 1-5/8" dia., Schedule 80 PVC housing for direct burial into soil or concrete. 6" dia., molded stability flange projects into substrate to simplify installation and reinforce housing stability.

Faceplate
Machined from solid, copper-free aluminum, brass or stainless steel. Available with one, two, or four optical openings. Specify solid faceplate (A) or center aperture (B). Countersunk holes provide for flush hardware mounting.

Lens
Shock resistant, tempered, translucent glass lens is factory adhered to faceplate and provides hermetically sealed optical compartment.

BKSSL™
Screw-based, side-emitting, multi-directional, integrated solid state system with 'e' technology is scalable for field upgrade. Modular design with electrical quick disconnects permit field maintenance. Refer to LED Type to determine component interchangeability.

Integral non-dimming driver. Up to 50,000 hour rated life at 70% of initial lumens (L70). BKSSL technology provides long life, significant energy reduction and exceptional thermal management.

Installation
Flush Mount features integral concrete pour collar. Top edge of collar to be installed flush with finished grade. Collar material and finish to match faceplate. (2) Threaded holes for faceplate installation. Faceplate style 'A' is suitable for walk-over and drive-over applications to 35,000 lbs. GVW.

Surface Mount features fully machined copper-free aluminum installation collar. Provided with hard-coat (Type III) black anodize finish for maximum corrosion resistance. (2) Threaded holes for faceplate installation.

Transformer
For use with 12VAC BKSSL remote transformer.

Wiring
Teflon® coated, 18AWG, 600V, 250° C rated and certified to UL 1659 standard.

Hardware
Tamper-resistant, stainless steel hardware. Faceplate screws are additionally black oxide treated for additional corrosion resistance.

Finish
StarGuard® (Pat. Pend.), a RoHs compliant, 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. (Brushed finish for interior use only).

Warranty
5 year limited warranty.

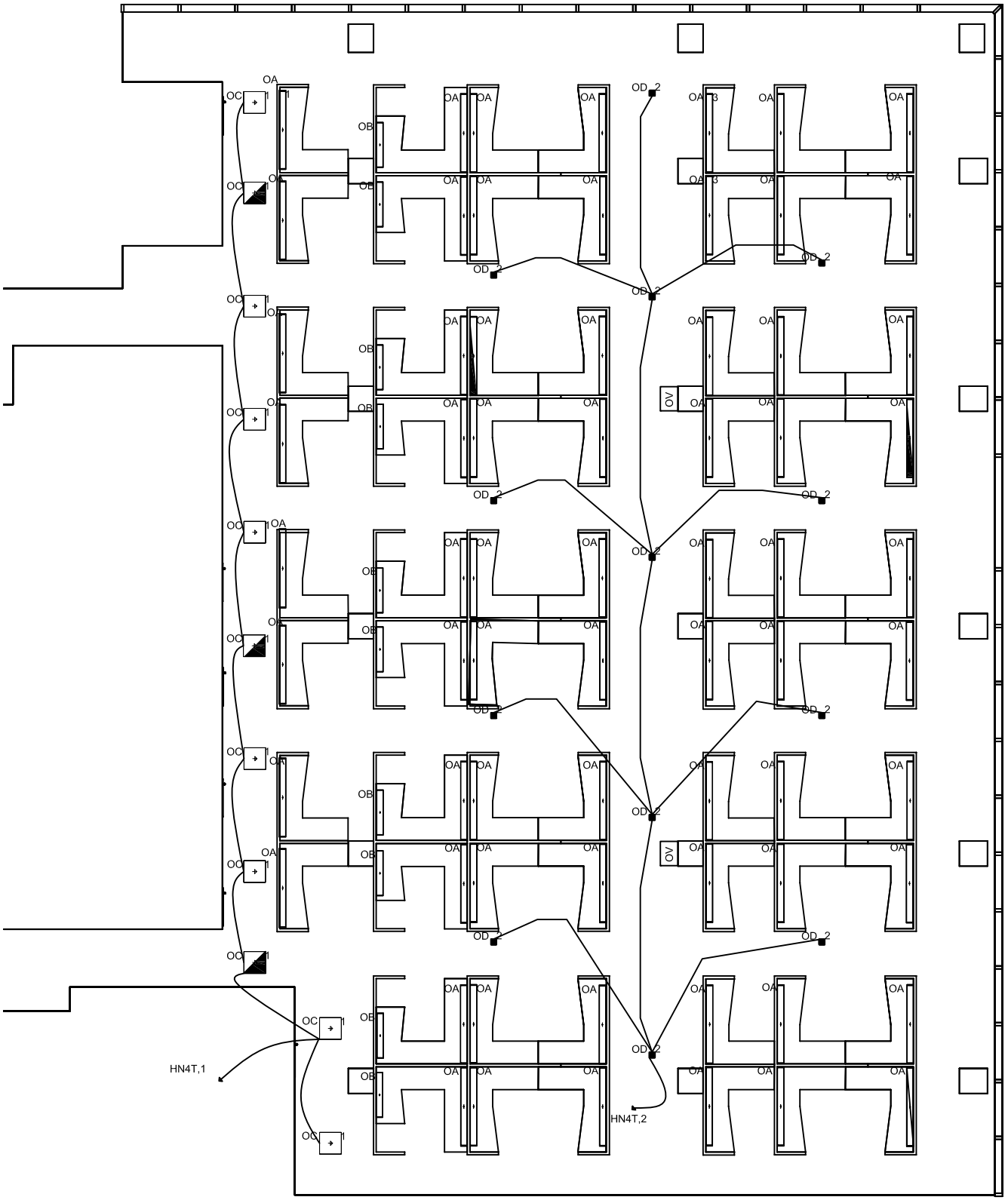
Certification and Listing
ITL tested to IESNA LM-79. Lighting Facts Registration per USDOE (www.lightingfacts.com). ETL Listed to ANSI/UL Standard 1838 and UL Subject 8750 and Certified to CAN/CSA Standard C22.2 No. 9. RoHs compliant. Suitable for use in wet locations. Suitable for ground-mounted recessed. Made in USA.

®Teflon is a registered trademark of DuPont Corporation.
®Energy Star is a registered trademark of the United States Environmental Protection Agency.

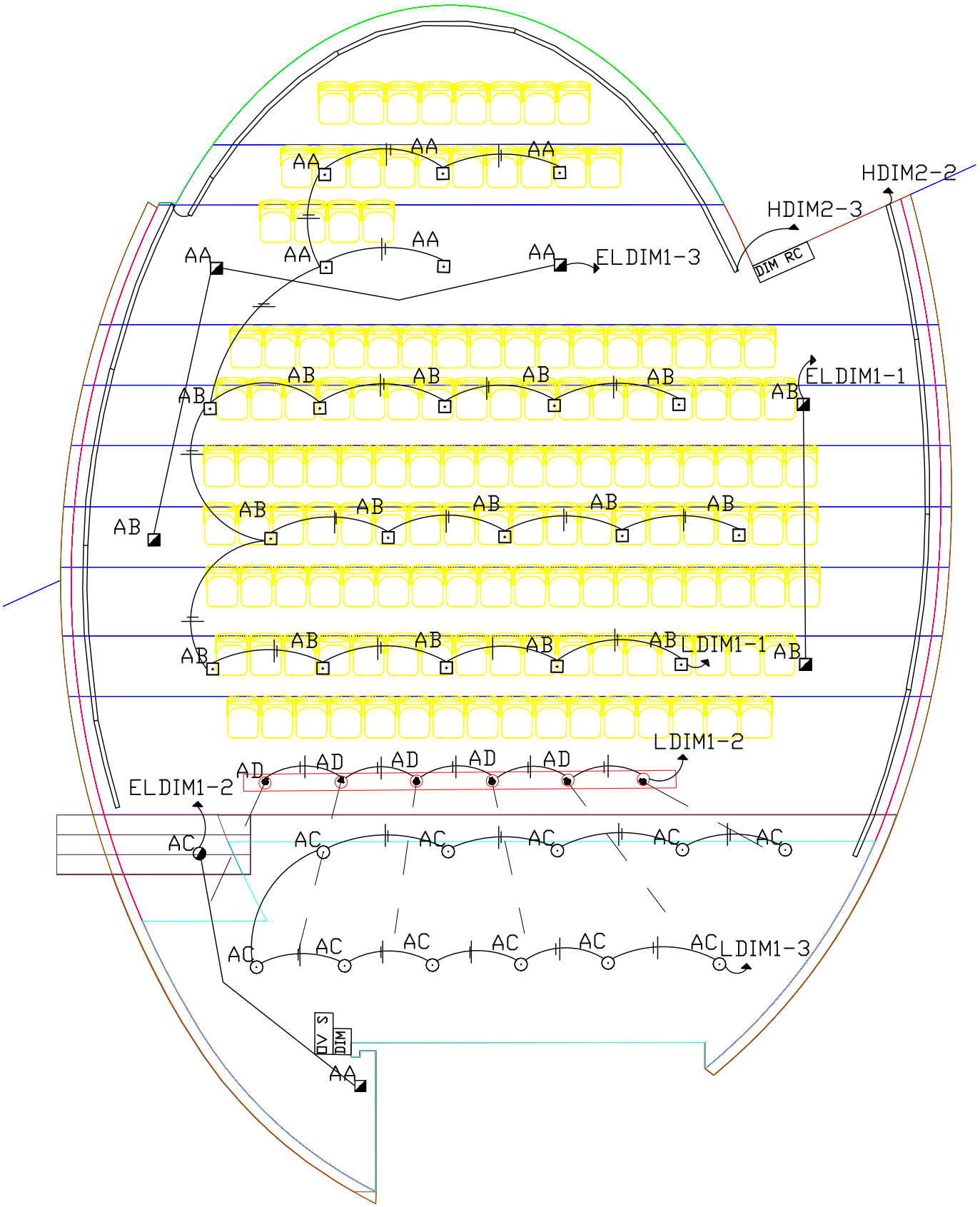
B-K LIGHTING
40429 Brickyard Drive • Madera, CA 93636 • USA
559.438.5800 • FAX 559.438.5900
www.bklighting.com • info@bklighting.com

SUBMITTAL DATE	DRAWING NUMBER
3-18-11	SUB001068

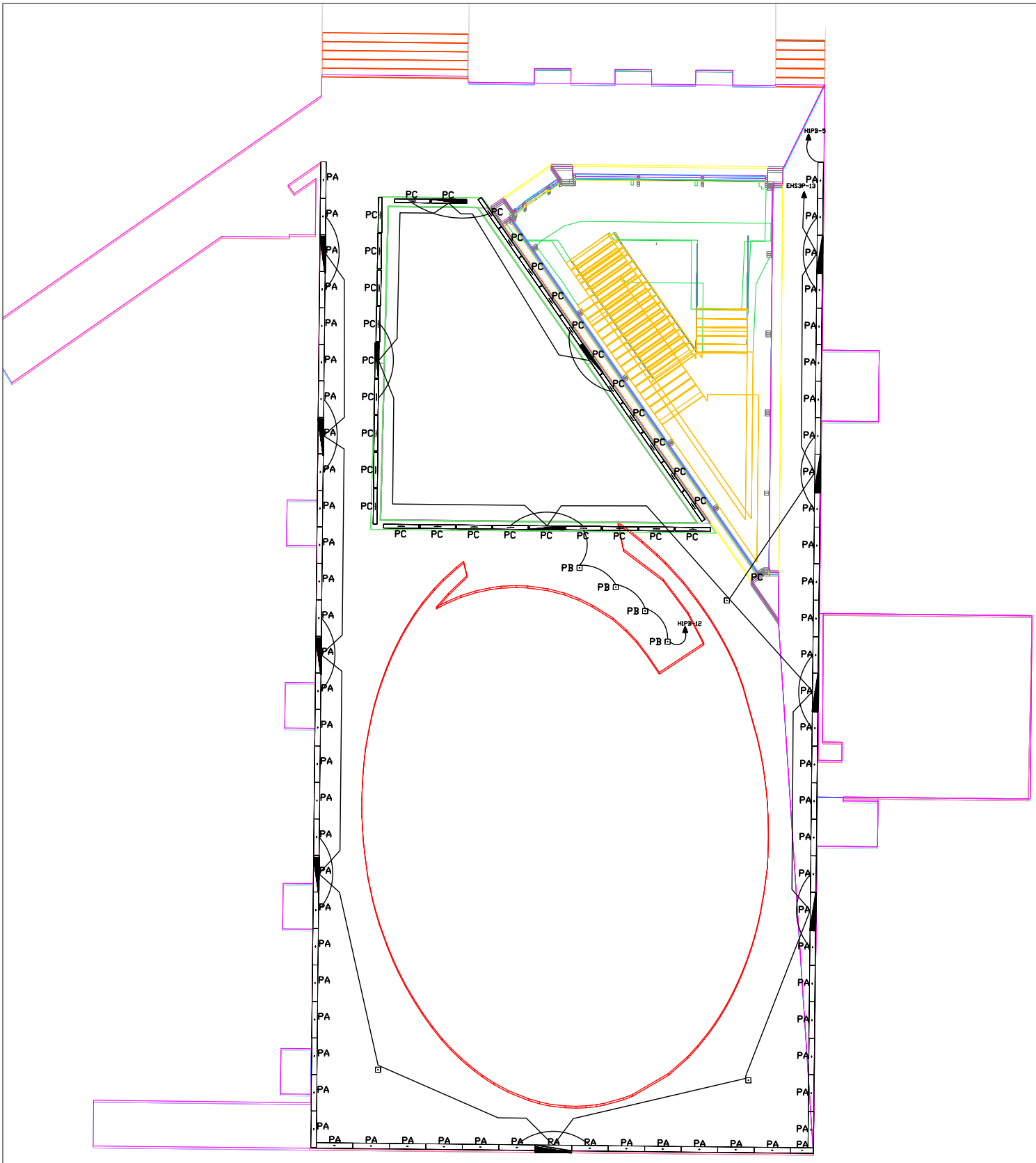
APPENDIX B



	IAN HERRON
	OPEN OFFICE
	LIGHTING PLAN



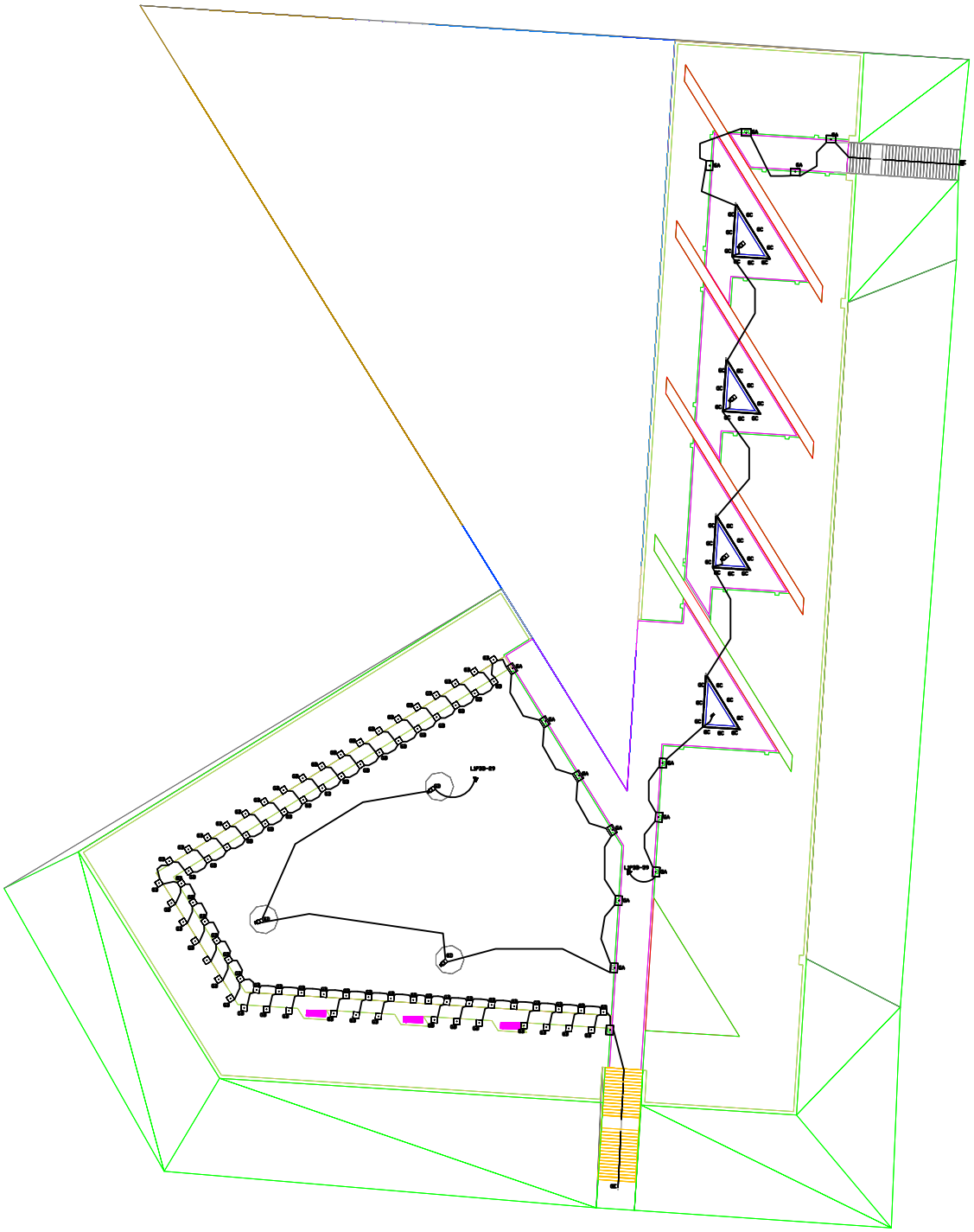
	IAN HERRON
	AUDITORIUM
	LIGHTING PLAN



IAN HERRON

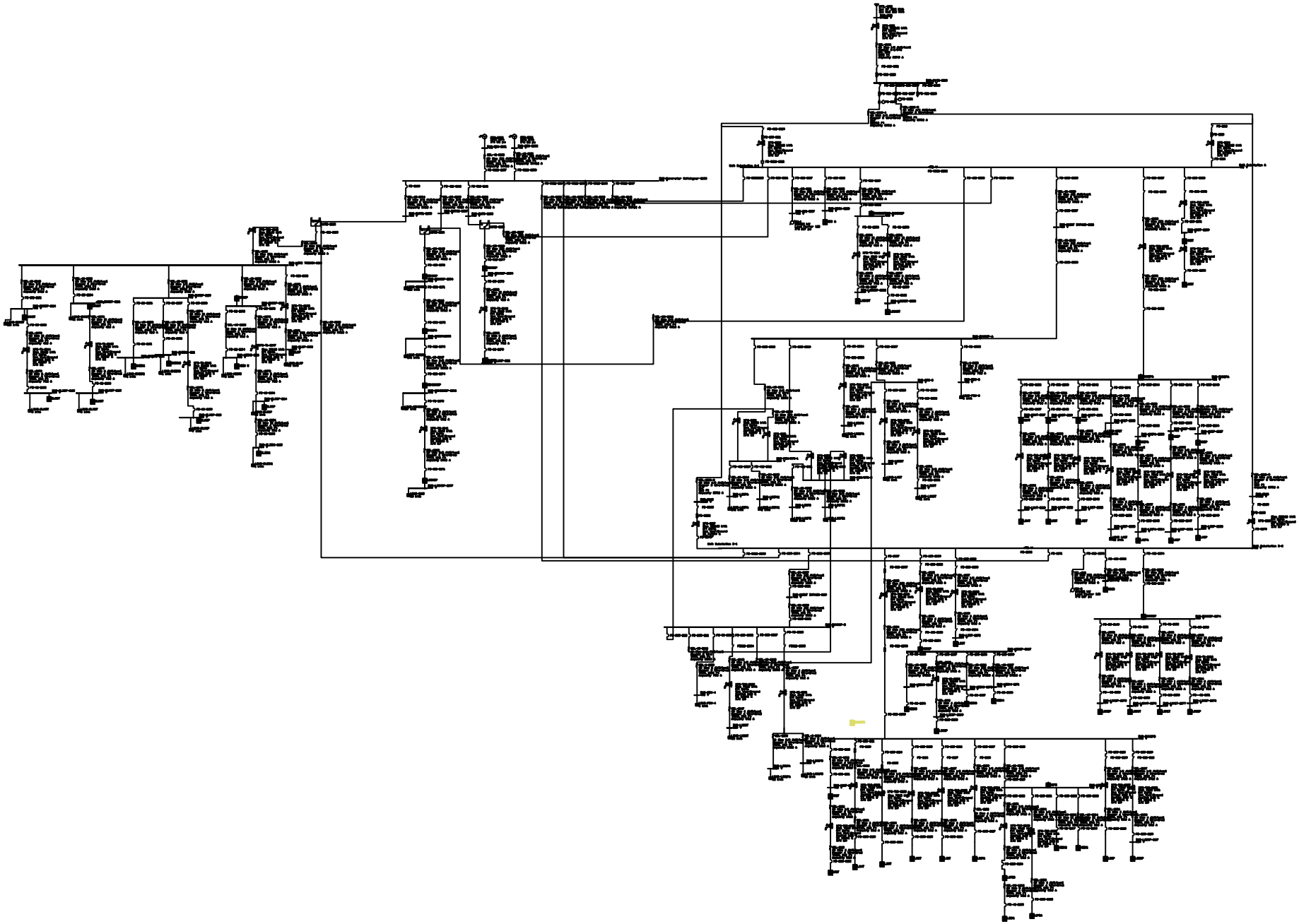
PREFUNCTION

LIGHTING PLAN



	IAN HERRON
	PLAZA
	LIGHTING PLAN

APPENDIX C



Project: Senior Thesis

Scenario: Base Project

Bus

Isc 3P (A)mps	Isc LL (A)mps	@ (deg)	Isc LLG (A)mps	@ (deg)	Isc SLG (A)mps	@ (deg)	Asym3P 1/2 Cycle (A)mps
1818	0	0.0	0	0.0	487	-76.4	2513
2015	0	0.0	0	0.0	1826	-84.2	2671
2015	0	0.0	0	0.0	1826	-84.2	2671
0	0	0.0	0	0.0	0	0.0	0
0	0	0.0	0	0.0	0	0.0	0
2014	0	0.0	0	0.0	1824	-84.2	2669
2014	0	0.0	0	0.0	1824	-84.2	2669
27438	0	0.0	0	0.0	25078	-81.2	27697
32741	0	0.0	0	0.0	31165	-90.5	33997
24787	0	0.0	0	0.0	21714	-84.0	25116
24787	0	0.0	0	0.0	21714	-84.0	25116
24770	0	0.0	0	0.0	21705	-84.0	25097
31325	0	0.0	0	0.0	29395	-87.2	32114
5260	0	0.0	0	0.0	177	-61.4	5265
18040	0	0.0	0	0.0	15381	-74.3	18068
4970	0	0.0	0	0.0	177	-61.4	4974
31325	0	0.0	0	0.0	29395	-87.2	32114
15572	0	0.0	0	0.0	13222	-67.6	15576
2960	0	0.0	0	0.0	106	-61.3	2961
5260	0	0.0	0	0.0	177	-61.4	5265
25560	0	0.0	0	0.0	23105	-72.6	25616
3063	0	0.0	0	0.0	106	-61.3	3064
2282	0	0.0	0	0.0	150	-62.9	2291
3196	0	0.0	0	0.0	353	-94.3	3232
2190	0	0.0	0	0.0	149	-63.0	2196
3120	0	0.0	0	0.0	352	-94.3	3150
1988	0	0.0	0	0.0	148	-63.2	1991

2944	0	0.0	0	0.0	350	-94.4	2963
2900	0	0.0	0	0.0	350	-94.4	2917
1940	0	0.0	0	0.0	148	-63.3	1943
2864	0	0.0	0	0.0	153	-62.7	2945
3621	0	0.0	0	0.0	357	-94.2	3752
7347	0	0.0	0	0.0	5912	-68.8	7348
2704	0	0.0	0	0.0	106	-61.4	2705
10642	0	0.0	0	0.0	9031	-50.1	10642
2152	0	0.0	0	0.0	62	-61.2	2153
12157	0	0.0	0	0.0	10401	-46.4	12157
1250	0	0.0	0	0.0	35	-61.2	1251
12157	0	0.0	0	0.0	10401	-46.4	12157
1250	0	0.0	0	0.0	35	-61.2	1251
48881	0	0.0	0	0.0	57136	-106.4	60458
8593	0	0.0	0	0.0	9142	-138.5	10698
6009	0	0.0	0	0.0	5565	-120.8	6212
4118	0	0.0	0	0.0	181	-91.8	4130
4144	0	0.0	0	0.0	181	-91.7	4156
6121	0	0.0	0	0.0	5699	-121.4	6347
6036	0	0.0	0	0.0	5598	-120.9	6245
4124	0	0.0	0	0.0	181	-91.7	4137
3831	0	0.0	0	0.0	180	-91.8	3837
4977	0	0.0	0	0.0	4475	-107.3	4998
4833	0	0.0	0	0.0	4324	-106.4	4850
3791	0	0.0	0	0.0	180	-91.8	3796
3752	0	0.0	0	0.0	180	-91.8	3756
4696	0	0.0	0	0.0	4183	-105.6	4710
4566	0	0.0	0	0.0	4049	-104.9	4577
3713	0	0.0	0	0.0	180	-91.8	3717
20917	0	0.0	0	0.0	17284	-83.8	21156
41027	0	0.0	0	0.0	43212	-88.8	42803
19274	0	0.0	0	0.0	1191	-63.3	22716

41027	0	0.0	0	0.0	43212	-88.8	42803
8352	0	0.0	0	0.0	516	-63.3	9844
48881	0	0.0	0	0.0	57136	-106.4	60457
8593	0	0.0	0	0.0	517	-63.3	10698
7476	0	0.0	0	0.0	508	-63.5	7874
10090	0	0.0	0	0.0	1198	-95.3	11133
5601	0	0.0	0	0.0	491	-64.4	5651
3994	0	0.0	0	0.0	180	-91.7	4001
4605	0	0.0	0	0.0	479	-64.9	4617
3725	0	0.0	0	0.0	180	-91.8	3729
4954	0	0.0	0	0.0	484	-64.7	4974
3825	0	0.0	0	0.0	180	-91.8	3830
5152	0	0.0	0	0.0	486	-64.6	5178
3879	0	0.0	0	0.0	180	-91.8	3885
3944	0	0.0	0	0.0	180	-91.7	3950
5401	0	0.0	0	0.0	489	-64.5	5439
4045	0	0.0	0	0.0	181	-91.7	4052
5812	0	0.0	0	0.0	493	-64.3	5879
5981	0	0.0	0	0.0	499	-64.6	6179
4112	0	0.0	0	0.0	181	-91.8	4124
5981	0	0.0	0	0.0	499	-64.6	6179
4112	0	0.0	0	0.0	181	-91.8	4124
6959	0	0.0	0	0.0	504	-63.9	7248
4248	0	0.0	0	0.0	176	-91.7	4259
6604	0	0.0	0	0.0	501	-64.0	6790
4223	0	0.0	0	0.0	181	-91.7	4234
1247	0	0.0	0	0.0	35	-61.2	1248
11486	0	0.0	0	0.0	9801	-47.0	11486
15207	0	0.0	0	0.0	13146	-51.5	15207
1620	0	0.0	0	0.0	70	-61.3	1620
1620	0	0.0	0	0.0	70	-61.3	1620
15207	0	0.0	0	0.0	13146	-51.5	15207

11486	0	0.0	0	0.0	9801	-47.0	11486
1247	0	0.0	0	0.0	35	-61.2	1248
20674	0	0.0	0	0.0	17833	-79.5	20774
19110	0	0.0	0	0.0	16289	-79.0	19186
2952	0	0.0	0	0.0	153	-62.6	3056
2058	0	0.0	0	0.0	1918	-87.5	2805
27438	0	0.0	0	0.0	25078	-81.2	27697
32741	0	0.0	0	0.0	31165	-90.5	33997
20674	0	0.0	0	0.0	17833	-79.5	20774
47983	0	0.0	0	0.0	53924	-101.6	56210
40704	0	0.0	0	0.0	41754	-92.4	43302
46859	0	0.0	0	0.0	51896	-97.2	52320
26626	0	0.0	0	0.0	23262	-86.8	27194
8521	0	0.0	0	0.0	9025	-138.0	10517
8521	0	0.0	0	0.0	517	-63.3	10517
37985	0	0.0	0	0.0	38056	-99.4	42318
37985	0	0.0	0	0.0	38056	-99.4	42318
44522	0	0.0	0	0.0	48691	-101.0	51027
38880	0	0.0	0	0.0	39698	-91.6	40940
280	0	0.0	0	0.0	95	-63.3	280
524	0	0.0	0	0.0	117	-63.3	524
2213	0	0.0	0	0.0	150	-63.2	2225
2449	0	0.0	0	0.0	151	-63.0	2473
2557	0	0.0	0	0.0	152	-62.9	2590
2157	0	0.0	0	0.0	149	-63.2	2166
863	0	0.0	0	0.0	254	-94.3	863
2558	0	0.0	0	0.0	340	-94.5	2562
2701	0	0.0	0	0.0	342	-94.4	2706
2763	0	0.0	0	0.0	343	-94.4	2770
1755	0	0.0	0	0.0	61	-61.2	1756
3518	0	0.0	0	0.0	356	-94.4	3633
2522	0	0.0	0	0.0	340	-94.5	2526

54879	0	0.0	0	0.0	67157	-110.4	75490
54879	0	0.0	0	0.0	67157	-110.4	75490
55959	0	0.0	0	0.0	70745	-112.2	78002
6193	0	0.0	0	0.0	501	-64.5	6460
2131	0	0.0	0	0.0	411	-64.4	2131
2131	0	0.0	0	0.0	411	-64.4	2131
7655	0	0.0	0	0.0	510	-63.5	8202
7655	0	0.0	0	0.0	510	-63.5	8202
7374	0	0.0	0	0.0	509	-63.7	7868
1305	0	0.0	0	0.0	140	-63.3	1305
6251	0	0.0	0	0.0	5849	-122.9	6533
5152	0	0.0	0	0.0	4661	-108.3	5178
5812	0	0.0	0	0.0	493	-64.3	5879
6340	0	0.0	0	0.0	5958	-123.4	6646
5000	0	0.0	0	0.0	4499	-107.4	5021
6222	0	0.0	0	0.0	5813	-122.8	6496
4855	0	0.0	0	0.0	4347	-106.5	4872
4717	0	0.0	0	0.0	4204	-105.7	4731
2363	0	0.0	0	0.0	77	-61.4	2366
7787	0	0.0	0	0.0	510	-63.4	8361
3602	0	0.0	0	0.0	179	-91.8	3605
3602	0	0.0	0	0.0	179	-91.8	3605
9154	0	0.0	0	0.0	684	-64.0	9277
9123	0	0.0	0	0.0	688	-63.8	9190
9122	0	0.0	0	0.0	668	-63.9	9254
9094	0	0.0	0	0.0	672	-63.7	9166
2136	0	0.0	0	0.0	171	-92.0	2136
3612	0	0.0	0	0.0	179	-91.8	3615
3371	0	0.0	0	0.0	179	-91.9	3372
3501	0	0.0	0	0.0	179	-91.8	3502
3627	0	0.0	0	0.0	179	-91.8	3631
3339	0	0.0	0	0.0	179	-91.9	3340

3607	0	0.0	0	0.0	179	-91.8	3610
3307	0	0.0	0	0.0	178	-91.9	3308
3276	0	0.0	0	0.0	178	-91.9	3277
1320	0	0.0	0	0.0	1436	-121.2	1320
4396	0	0.0	0	0.0	175	-61.5	4397
4396	0	0.0	0	0.0	175	-61.5	4397
4187	0	0.0	0	0.0	175	-61.5	4188
1164	0	0.0	0	0.0	35	-61.2	1164
1563	0	0.0	0	0.0	70	-61.3	1563
1161	0	0.0	0	0.0	35	-61.2	1162
1563	0	0.0	0	0.0	70	-61.3	1563
3541	0	0.0	0	0.0	179	-91.8	3543
3461	0	0.0	0	0.0	179	-91.8	3462
3691	0	0.0	0	0.0	175	-91.8	3694
3409	0	0.0	0	0.0	179	-91.8	3410
3233	0	0.0	0	0.0	178	-91.9	3234
3285	0	0.0	0	0.0	178	-91.9	3287
12541	0	0.0	0	0.0	1122	-63.8	12568
2932	0	0.0	0	0.0	106	-61.3	2933
2077	0	0.0	0	0.0	104	-61.6	2077
2838	0	0.0	0	0.0	106	-61.4	2838
2602	0	0.0	0	0.0	105	-61.4	2602
1164	0	0.0	0	0.0	35	-61.2	1164
8008	0	0.0	0	0.0	1130	-95.7	8083
3683	0	0.0	0	0.0	179	-91.8	3686
1161	0	0.0	0	0.0	35	-61.2	1162
41726	0	0.0	0	0.0	43938	-102.0	48116
41726	0	0.0	0	0.0	43938	-102.0	48117
22482	0	0.0	0	0.0	19729	-77.6	22571
24274	0	0.0	0	0.0	21587	-78.9	24406
2059	0	0.0	0	0.0	1917	-87.3	2805
4546	0	0.0	0	0.0	3805	-42.9	4546

4546	0	0.0	0	0.0	3805	-42.9	4546
13332	0	0.0	0	0.0	709	-62.7	13962
13389	0	0.0	0	0.0	693	-62.7	14101
22434	0	0.0	0	0.0	19712	-77.6	22523
30313	0	0.0	0	0.0	28167	-88.8	31181
8390	0	0.0	0	0.0	6714	-72.9	8394
10328	0	0.0	0	0.0	8323	-74.9	10337
20739	0	0.0	0	0.0	17933	-78.0	20817
2922	0	0.0	0	0.0	153	-62.7	3020
51361	0	0.0	0	0.0	62322	-109.9	67293
51575	0	0.0	0	0.0	62424	-110.1	67819
51361	0	0.0	0	0.0	62322	-109.9	67291
51573	0	0.0	0	0.0	62421	-110.1	67802

Cable

Bus1	Isc 3P to Bus1 (A)mps	@(deg)	Isc 3P to Bus2 (A)mps	@ (deg)	IscSLG Bus1 (A)mps	@ (deg)	IscSLG Bus2 (A)mps
BUS-MVS1-0003	487	122.6	1551	-94.7	274	90.6	1526
BUS-MVS1-0003	487	122.6	1551	-94.7	274	90.6	1526
	0	0.0	0	0.0	0	0.0	0
	0	0.0	0	0.0	0	0.0	0
BUS-0035	259	116.9	1780	-90.3	150	89.1	1675
BUS-0036	262	116.2	1776	-90.3	152	88.9	1673
	0	0.0	0	0.0	0	0.0	0
BUS-0229	0	0.0	19110	-78.8	0	0.0	16289
BUS-WIRE TROUGH-0118	0	0.0	2864	-120.7	0	0.0	153
BUS-0167	0	0.0	3518	-151.7	0	0.0	356
BUS-EHS3P-0113	0	0.0	1940	-103.6	0	0.0	148
BUS-0164	0	0.0	2522	-133.9	0	0.0	340
BUS-EHN2P-0109	0	0.0	1988	-104.3	0	0.0	148
BUS-0163	0	0.0	2558	-134.3	0	0.0	340
BUS-EHN2T-0106	0	0.0	2190	-107.1	0	0.0	149
BUS-0161	0	0.0	2701	-135.8	0	0.0	342

BUS-EHN5T-0104	0	0.0	2282	-108.4	0	0.0	150
BUS-0159	0	0.0	2763	-136.5	0	0.0	343
BUS-SDHNMP-0099	0	0.0	10642	-51.2	0	0.0	9031
BUS-SDHSCM3P-0096	0	0.0	7347	-65.4	0	0.0	5912
BUS-0169	0	0.0	2602	-95.4	0	0.0	105
BUS-0171	0	0.0	1755	-93.2	0	0.0	61
BUS-DHNCM2P	0	0.0	12157	-48.9	0	0.0	10401
BUS-0173	0	0.0	1164	-97.5	0	0.0	35
BUS-DHNCM2P	0	0.0	12157	-48.9	0	0.0	10401
BUS-0175	0	0.0	1164	-97.5	0	0.0	35
BUS-DHNM2P-0074	0	0.0	11486	-49.1	0	0.0	9801
Unit Substation A	0	0.0	48881	-108.2	0	0.0	57136
BUS-0177	0	0.0	8521	-138.1	0	0.0	9025
BUS-HN4T-0017	0	0.0	4566	-106.3	0	0.0	4049
BUS-0191	0	0.0	3276	-128.6	0	0.0	178
BUS-HN3T-0019	0	0.0	4696	-107.2	0	0.0	4183
BUS-0188	0	0.0	3307	-128.8	0	0.0	178
BUS-HN2T-0021	0	0.0	4833	-108.1	0	0.0	4324
BUS-0187	0	0.0	3339	-129.0	0	0.0	179
BUS-0183	0	0.0	3612	-132.0	0	0.0	179
BUS-HN1PA-0023	0	0.0	6036	-122.1	0	0.0	5598
BUS-HN2P-0025	0	0.0	6121	-122.5	0	0.0	5699
BUS-0180	0	0.0	3627	-132.0	0	0.0	179
BUS-0179	0	0.0	3607	-131.9	0	0.0	179
BUS-HN3P-0027	0	0.0	6009	-121.9	0	0.0	5565
Unit Substation B-1	0	0.0	48881	-108.2	0	0.0	57136
BUS-0198	0	0.0	8521	-138.1	0	0.0	517
Unit Substation B-1	0	0.0	41027	-93.7	0	0.0	43212
BUS-0196	0	0.0	7787	-127.9	0	0.0	510
Unit Substation B-1	0	0.0	41027	-93.7	0	0.0	43212
BUS-0194	0	0.0	12541	-105.9	0	0.0	1122
BUS-HSC3P-0067	0	0.0	7476	-125.3	0	0.0	508

BUS-0200	0	0.0	8008	-143.5	0	0.0	1130
Unit Substation B-2	1649	68.1	19444	-82.2	1330	69.0	16469
BUS-0221	0	0.0	1161	-97.4	0	0.0	35
BUS-DHNM2P-0074	0	0.0	11486	-49.1	0	0.0	9801
BUS-0228	0	0.0	1161	-97.4	0	0.0	35
BUS-0202	0	0.0	3501	-130.0	0	0.0	179
BUS-DHNM2P-0074	0	0.0	15207	-54.4	0	0.0	13146
BUS-0224	0	0.0	1563	-88.0	0	0.0	70
BUS-DHNM2P-0074	0	0.0	15207	-54.4	0	0.0	13146
BUS-0225	0	0.0	1563	-88.0	0	0.0	70
BUS-HN1T-0052	0	0.0	5601	-113.3	0	0.0	491
BUS-0204	0	0.0	3285	-128.7	0	0.0	178
BUS-DHN2PB	0	0.0	4605	-106.6	0	0.0	479
BUS-DHN2PB	0	0.0	4954	-108.9	0	0.0	484
BUS-0206	0	0.0	3233	-127.9	0	0.0	178
BUS-DHN2PB	0	0.0	5152	-110.2	0	0.0	486
BUS-0208	0	0.0	3409	-129.4	0	0.0	179
BUS-DHN2PB	0	0.0	5401	-111.9	0	0.0	489
BUS-0209	0	0.0	3461	-129.8	0	0.0	179
BUS-DHN2PB	0	0.0	5812	-114.8	0	0.0	493
BUS-0211	0	0.0	3541	-130.3	0	0.0	179
BUS-H1PB	0	0.0	5981	-121.8	0	0.0	499
BUS-0214	0	0.0	3602	-131.9	0	0.0	179
BUS-0216	0	0.0	3602	-131.9	0	0.0	179
BUS-H1PB	0	0.0	5981	-121.8	0	0.0	499
BUS-DHN2PB	0	0.0	6959	-123.4	0	0.0	504
BUS-0218	0	0.0	3691	-131.3	0	0.0	175
BUS-DHN2PB	0	0.0	6604	-120.6	0	0.0	501
BUS-0220	0	0.0	3683	-131.2	0	0.0	179
BUS-HN1T-0022	0	0.0	4977	-109.0	0	0.0	4475
BUS-0184	0	0.0	3371	-129.2	0	0.0	179
BUS-DHNC2P-A	0	0.0	31325	-89.9	0	0.0	29395

BUS-0140	0	0.0	4396	-96.5	0	0.0	175
BUS-0144	0	0.0	4187	-96.0	0	0.0	175
BUS-STS-3	0	0.0	18040	-74.4	0	0.0	15381
BUS-0148	0	0.0	4396	-96.5	0	0.0	175
BUS-DHNC2P-B	0	0.0	31325	-89.9	0	0.0	29395
BUS-STS-3	0	0.0	15572	-67.7	0	0.0	13222
BUS-0147	0	0.0	2838	-95.5	0	0.0	106
BUS-DHNC2P-B	0	0.0	25560	-75.9	0	0.0	23105
BUS-0150	0	0.0	2932	-95.9	0	0.0	106
BUS-0231	0	0.0	2922	-121.9	0	0.0	153
BUS-0232	973	122.7	1324	-110.7	548	90.5	1369
BUS-DHNC2P-A	0	0.0	4546	-42.5	0	0.0	3805
BUS-DHNC2P-B	0	0.0	4546	-42.5	0	0.0	3805
BUS-DHN2PA	0	0.0	4717	-107.3	0	0.0	4204
BUS-DHN2PA	0	0.0	4855	-108.2	0	0.0	4347
BUS-DHN2PA	0	0.0	5000	-109.2	0	0.0	4499
BUS-DHN2PA	0	0.0	5152	-110.2	0	0.0	4661
BUS-DHN2PB	0	0.0	5812	-114.8	0	0.0	493
BUS-WIRE TROUGH-0118	0	0.0	2557	-115.5	0	0.0	152
BUS-WIRE TROUGH-0118	0	0.0	2449	-113.8	0	0.0	151
BUS-WIRE TROUGH-0118	0	0.0	2213	-110.0	0	0.0	150
BUS-WIRE TROUGH-0118	0	0.0	2157	-109.1	0	0.0	149
BUS-SHS1PA0095	0	0.0	8390	-69.5	0	0.0	6714
BUS-DHNC2P-B	2804	97.9	10369	-78.5	3007	99.6	8967
BUS-DHNC2P-A	2804	97.9	10369	-78.5	3007	99.6	8967
	0	0.0	0	0.0	0	0.0	0
BUS-Generator Switchgear-0083	0	0.0	40704	-96.3	0	0.0	41754
BUS-Auto1 to Sub B0090	20674	100.1	0	0.0	17833	100.5	0
BUS-DHNC2P-B	577	63.9	23829	-84.5	385	66.0	21154
BUS-DHNC2P-B	564	62.8	23842	-84.4	377	65.0	21162
BUS-DHNC2P-A	577	63.9	23829	-84.5	385	66.0	21154
BUS-DHN2PA	0	0.0	6251	-124.0	0	0.0	5849

BUS-DHN2PA	0	0.0	6340	-124.5	0	0.0	5958
BUS-DHN2PA	0	0.0	6222	-123.9	0	0.0	5813
BUS-DHN2PB	0	0.0	6193	-123.7	0	0.0	501
BUS-PDU/STS-1	0	0.0	9154	-115.8	0	0.0	684
BUS-PDU/STS-2	0	0.0	9122	-116.2	0	0.0	668
BUS-SDHNMP-0094	0	0.0	10328	-72.0	0	0.0	8323
Unit Substation A-1	0	0.0	22482	-78.8	0	0.0	19729
Unit Substation B-2	0	0.0	24274	-80.5	0	0.0	21587
Unit Substation B-2	0	0.0	38880	-95.3	0	0.0	39698
BUS-Generator Switchgear-0083	0	0.0	46859	-101.3	0	0.0	51896
BUS-Auto 2 to Sub A-0089	27438	96.4	0	0.0	25078	98.8	0
BUS-0093	0	0.0	22434	-78.8	0	0.0	19712
BUS-PDU/STS-1	0	0.0	9123	-112.2	0	0.0	688
BUS-PDU/STS-2	0	0.0	9094	-112.5	0	0.0	672
Unit Substation A-1	1672	67.2	25090	-87.0	1349	68.1	22365
Unit Substation A-1	0	0.0	44522	-103.7	0	0.0	48691
BUS-Generator Switchgear-0083	0	0.0	47983	-104.7	0	0.0	53924
BUS-Auto 3 to Sub A-0091	32741	87.2	0	0.0	31165	89.5	0
BUS-0098	0	0.0	30313	-90.7	0	0.0	28167
Unit Substation B-1	1066	84.0	38786	-104.9	1233	87.7	40991
BUS-MAINT BYPASS-0119	2991	86.0	34246	-102.6	3028	90.8	34485
Unit Substation A	1066	84.0	38786	-104.9	1233	87.7	40991
BUS-MAINT BYPASS-0120	2991	86.1	34246	-102.6	3028	90.8	34485
BUS-GEN-0081	41740	59.2	14871	-86.8	53743	71.1	13314
BUS-GEN-0082	41740	59.2	14871	-86.8	53743	71.1	13314
BUS-Generator Switchgear-0083	8663	45.5	41323	-104.5	11684	70.4	46622
BUS-Generator Switchgear-0083	7342	40.4	41688	-104.8	10420	70.3	46712
BUS-Generator Switchgear-0083	7345	40.3	41687	-104.8	10422	70.2	46710
BUS-Generator Switchgear-0083	8695	45.4	41304	-104.5	11704	70.3	46605
BUS-H1PB	0	0.0	2131	-80.3	0	0.0	411
BUS-H1PB	0	0.0	2131	-80.3	0	0.0	411

BUS-HSC3P-0067	0	0.0	7374	-127.1	0	0.0	509
BUS-HSC3P-0067	0	0.0	7655	-127.6	0	0.0	510
BUS-HSC3P-0067	0	0.0	7655	-127.6	0	0.0	510
BUS-EHN2P-0109	0	0.0	524	-72.9	0	0.0	117
BUS-EHN2P-0109	0	0.0	280	-68.2	0	0.0	95
BUS-ELS3P-0114	0	0.0	863	-105.8	0	0.0	254
BUS-EHS3P-0113	0	0.0	1305	-88.8	0	0.0	140
BUS-L1PBB-0060	0	0.0	2136	-115.6	0	0.0	171
BUS-0150	0	0.0	2077	-88.7	0	0.0	104

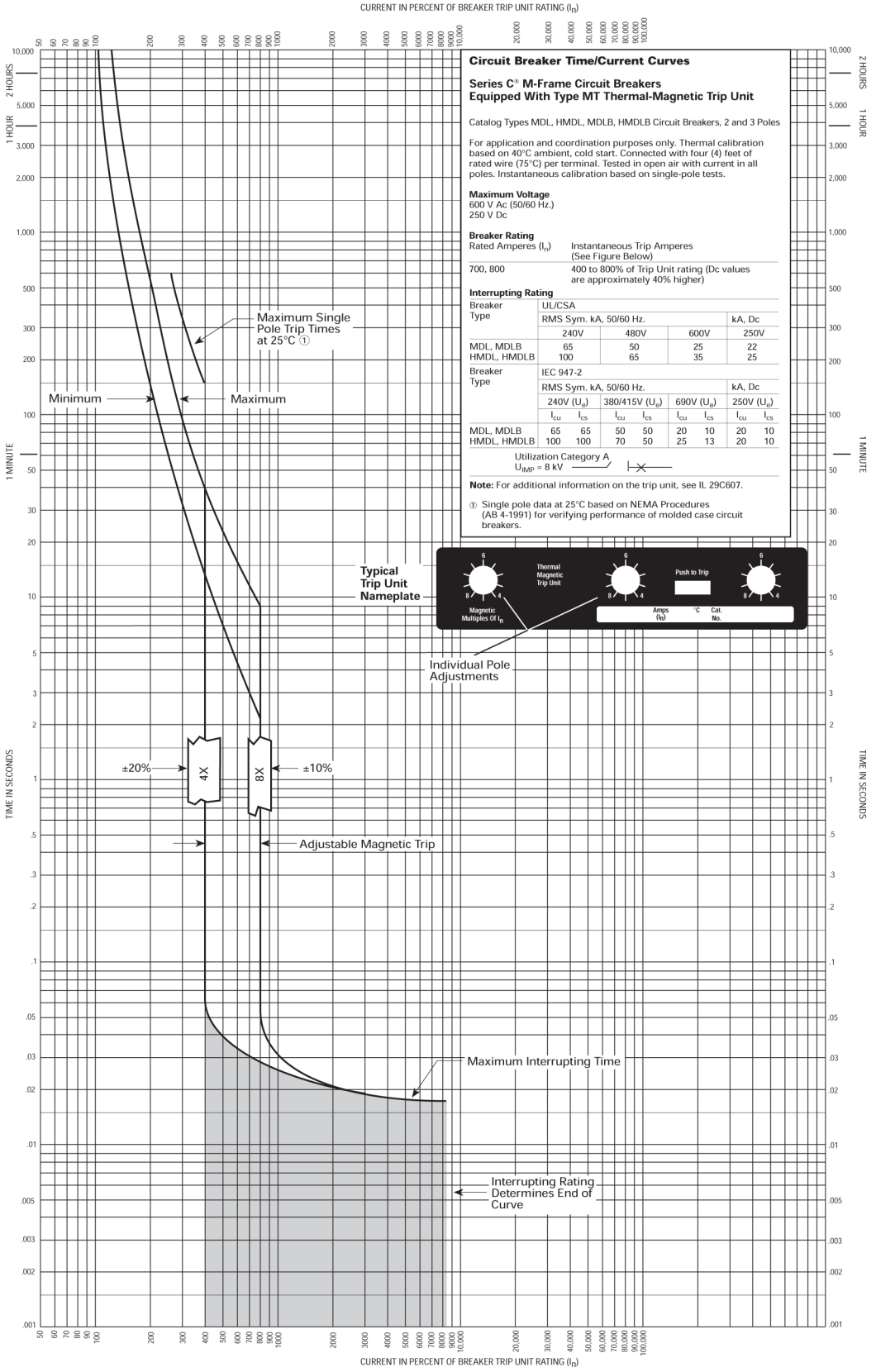
2-Winding Transformer

Bus	Isc 3P to Bus1 (A)mps	@ (deg)	Isc 3P to Bus2 (A)mps	@ (deg)	IscSLG to Bus1 (A)mps	@ (deg)	IscSLG to Bus2 (A)mps
BUS-0001	245	154.2	1326	-110.9	42	103.7	1371
BUS-0035	262	-63.8	10001	41.4	152	-91.2	14542
BUS-0036	259	-63.1	10036	41.3	150	-90.9	14506
BUS-0045	260	116.8	10032	-138.6	150	89.1	14503
BUS-0046	263	116.1	9999	-138.6	152	88.8	14540
BUS-0124	1083	-112.7	6666	55.6	632	-111.1	355
BUS-0125	1083	-112.7	6666	55.6	632	-111.1	355
BUS-DHNC2P-A	564	62.8	6852	-126.2	377	65.0	352
BUS-0136	1058	-113.8	6539	55.6	618	-112.2	341
BUS-0146	0	0.0	2960	-96.1	0	13.3	106
BUS-0149	0	0.0	3063	-96.5	0	16.4	106
BUS-0195	0	0.0	8352	-135.5	0	50.9	516
BUS-0199	0	0.0	10090	-160.7	0	77.7	1198
BUS-0193	0	0.0	19274	-135.5	0	50.9	1191
BUS-0172	0	0.0	1250	-100.1	0	-113.5	35
BUS-0174	0	0.0	1250	-100.1	0	-113.5	35
BUS-0222	0	0.0	1247	80.0	0	66.0	35
BUS-0227	0	0.0	1247	-100.0	0	-114.0	35
BUS-0170	0	0.0	2152	-100.0	0	-115.0	62
BUS-0158	0	0.0	3196	-144.6	0	-121.2	353

BUS-0160	0	0.0	3120	-143.6	0	-122.6	352
BUS-0162	0	0.0	2944	-141.4	0	-125.5	350
BUS-0165	0	0.0	2900	39.1	0	53.8	350
BUS-HN5T-0029	0	0.0	1320	-122.2	0	0.0	1436
BUS-0190	0	0.0	3713	-133.0	0	145.7	180
BUS-0189	0	0.0	3752	46.8	0	-34.2	180
BUS-0186	0	0.0	3791	-133.5	0	145.9	180
BUS-0182	0	0.0	4124	-137.3	0	145.4	181
BUS-0181	0	0.0	4144	42.6	0	-34.5	181
BUS-0178	0	0.0	4118	-137.3	0	145.4	181
BUS-0185	0	0.0	3831	46.2	0	-34.0	180
BUS-0139	0	0.0	5260	-102.5	0	177.0	177
BUS-0201	0	0.0	3994	-134.9	0	-166.8	180
BUS-0203	0	0.0	3725	-133.1	0	-174.0	180
BUS-0205	0	0.0	3825	-133.7	0	-171.5	180
BUS-0207	0	0.0	3879	-134.1	0	-170.1	180
BUS-0210	0	0.0	3944	45.4	0	11.7	180
BUS-0212	0	0.0	4045	44.7	0	14.8	181
BUS-0217	0	0.0	4248	-136.9	0	-156.1	176
BUS-0213	0	0.0	4112	-137.3	0	-158.6	181
BUS-0215	0	0.0	4112	-137.3	0	-158.6	181
BUS-0219	0	0.0	4223	-136.5	0	-159.1	181
BUS-0143	0	0.0	4970	-101.5	0	174.4	177
BUS-0145	0	0.0	5260	-102.5	0	177.0	177
Unit Substation A	0	0.0	2363	-102.8	0	-176.0	77
BUS-0223	0	0.0	1620	-88.5	0	-69.7	70
BUS-0226	0	0.0	1620	91.5	0	110.3	70
BUS-0230	0	0.0	2952	-122.2	0	-136.7	153
BUS-0176	0	0.0	8593	-138.5	0	148.3	9142
BUS-0197	0	0.0	8593	-138.5	0	157.8	517
BUS-0168	0	0.0	2704	-95.9	0	9.8	106
BUS-0166	0	0.0	3621	-152.4	0	-108.6	357

APPENDIX D

Types MDL, HMDL, MDLB, and HMDLB Equipped with Type MT Thermal-Magnetic Trip Unit, 700 and 800 Amperes



Circuit Breaker Time/Current Curves

Series C® M-Frame Circuit Breakers Equipped With Type MT Thermal-Magnetic Trip Unit

Catalog Types MDL, HMDL, MDLB, HMDLB Circuit Breakers, 2 and 3 Poles

For application and coordination purposes only. Thermal calibration based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (75°C) per terminal. Tested in open air with current in all poles. Instantaneous calibration based on single-pole tests.

Maximum Voltage
600 V Ac (50/60 Hz.)
250 V Dc

Breaker Rating

Rated Amperes (I_n)	Instantaneous Trip Amperes (See Figure Below)
700, 800	400 to 800% of Trip Unit rating (Dc values are approximately 40% higher)

Interrupting Rating

Breaker Type	UL/CSA							
	RMS Sym. kA, 50/60 Hz.						kA, Dc	
	240V		480V		600V		250V	
MDL, MDLB	65		50		25		22	
HMDL, HMDLB	100		65		35		25	
Breaker Type	IEC 947-2							
	RMS Sym. kA, 50/60 Hz.						kA, Dc	
	240V (U_e)		380/415V (U_e)		690V (U_e)		250V (U_e)	
	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}	I_{cu}	I_{cs}
MDL, MDLB	65	65	50	50	20	10	20	10
HMDL, HMDLB	100	100	70	50	25	13	20	10

Utilization Category A
U_{IMP} = 8 kV

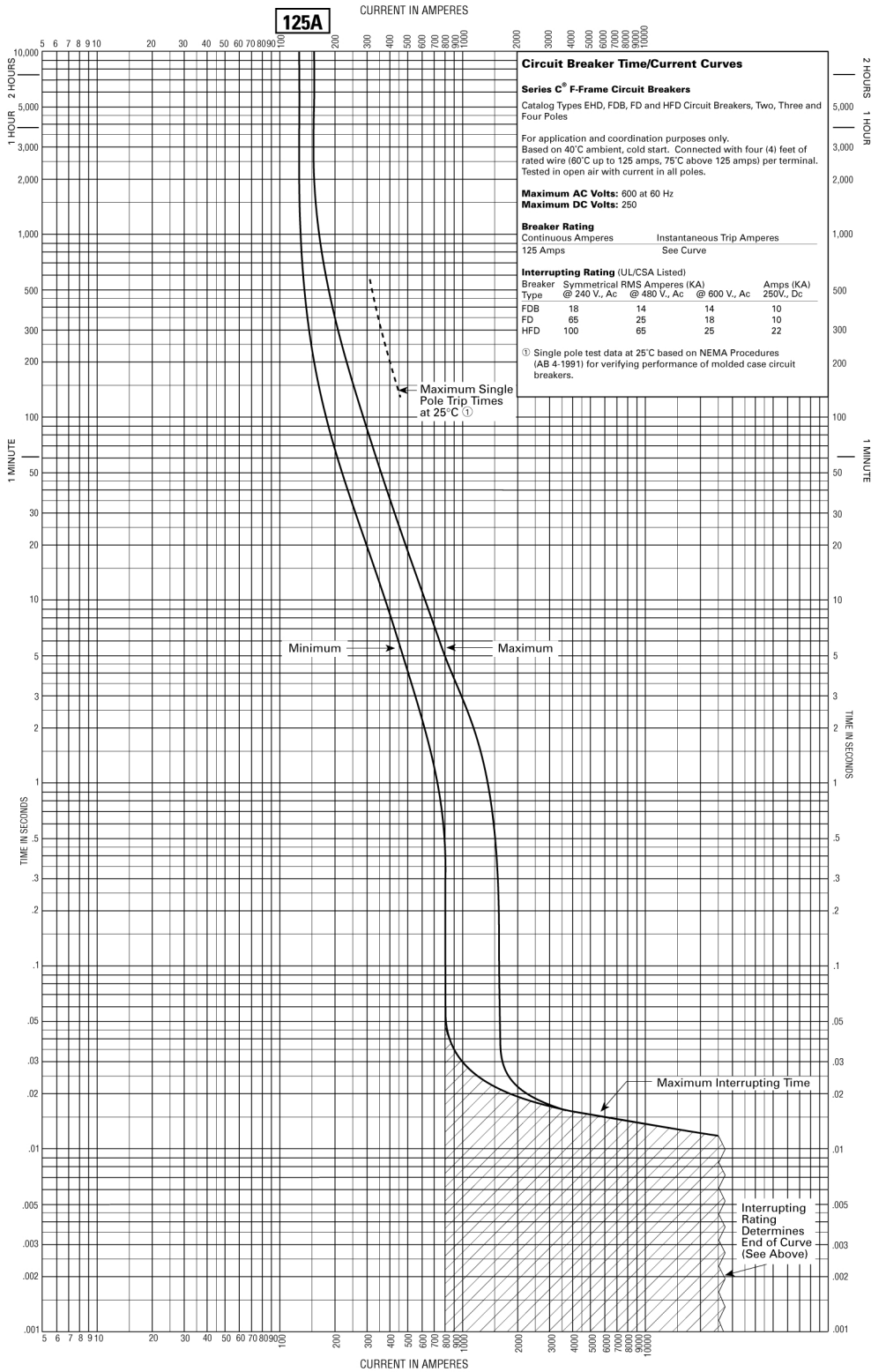
Note: For additional information on the trip unit, see IL 29C607.

① Single pole data at 25°C based on NEMA Procedures (AB 4-1991) for verifying performance of molded case circuit breakers.

Curve No. SC-6912-98

AB DE-ION Circuit Breakers

Types FDB, FD and HFD 125 Amperes



Curve No. SC-4148-87B

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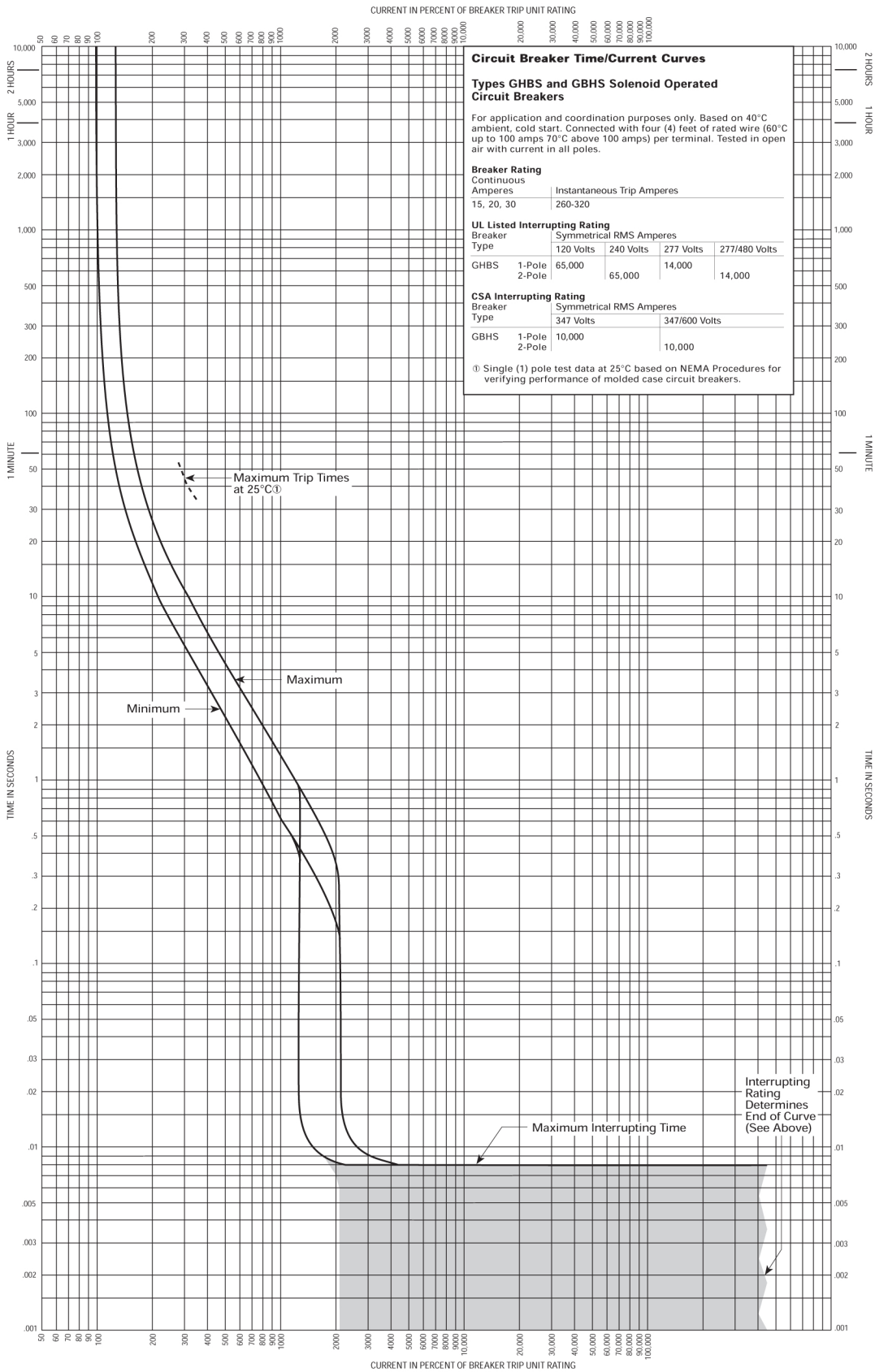
Type GHBS 15-30 Amperes, 1, 2 Poles



Circuit Breaker Time/Current Curves

Types GHBS and GBHS Solenoid Operated Circuit Breakers

For application and coordination purposes only. Based on 40°C ambient, cold start. Connected with four (4) feet of rated wire (60°C up to 100 amps 70°C above 100 amps) per terminal. Tested in open air with current in all poles.

Breaker Rating

Continuous Amperes	Instantaneous Trip Amperes
15, 20, 30	260-320

UL Listed Interrupting Rating

Breaker Type		Symmetrical RMS Amperes			
		120 Volts	240 Volts	277 Volts	277/480 Volts
GHBS	1-Pole	65,000		14,000	
	2-Pole		65,000		14,000

CSA Interrupting Rating

Breaker Type		Symmetrical RMS Amperes	
		347 Volts	347/600 Volts
GBHS	1-Pole	10,000	
	2-Pole		10,000

① Single (1) pole test data at 25°C based on NEMA Procedures for verifying performance of molded case circuit breakers.

Curve No. SC 5695-93B