

Spring Semester Progress Report
Library and Building Entrance Lighting Depth Work



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EXECUTIVE SUMMARY

In this spring semester progress report, I relied on the knowledge I gained from researching the lighting and electrical systems in Technical Assignment 1 and 2 to apply the concepts I came up with in Technical Assignment 3 to two of the spaces in The Pennsylvania Academy of Music. I chose luminaires and layouts to apply light to the rooms according to the conceptual designs from Technical Assignment 3 and based on the criteria set forth in Technical Assignment 1. I then used the research from Technical Assignment 2 to generate power plans and panelboard redesigns for the spaces.

This progress report only touched on two of the spaces in the building, the library and the building entrance. This report did not go very far into the electrical depth or either of my breadth areas. Once these other factors are taken into consideration, the designs for these spaces and their associated electrical configurations may be altered slightly to fit more closely the analysis and designs of the rest of the project. Additional changes will likely be made when discrepancies between the electrical plans and some of the electrical documentation can be worked out.

The files associated with this report are located in my T:\ drive under the folder “Spring Progress”.

LIBRARY

Design Intent

The Library is a space that will hold music and books for use by the students of the Academy. The bookshelves are all along the north wall and have inspection counters in them. Reading tables and an administration desk fill the rest of the space.

This space will be used for group and individual education as well as informal gatherings and meetings. It is unlikely that this space would ever be used as a performance space due to its acoustical characteristics. With this in mind, it is my intent to bring a reminder of the music though silently.

I am proposing to use the recessed ceiling cavity in the space as a sculptural element that integrates the lighting design. I have placed a series of luminaires to represent the five lines of the musical staff in this volume. I will further explore this sculptural element in my architectural breadth. Ample vertical illumination should be placed on the shelves and reading tables. More light will be placed on the horizontal planes of the inspection tables so that they may be used to assess information quickly before returning to the reading tables.

The windows in this space look out to a balcony of the Grand Foyer. Once daylight studies of this space are done as part of the rest of my depth work, revisions may be made to the lighting design to incorporate daylight contributions as well as “borrowed” light from this space.

Design Criteria

Since the task of reading music involves more active thought and visual complexity than reading words, higher than recommended illumination levels will not be viewed as detractive. The IESNA-recommended goal of 30 horizontal footcandles is desirable for the reading tables. A higher target illumination level of 50 horizontal footcandles will be established for the inspection tables. Because of the incorporation of the inspection tables, the IESNA-recommended goal of 30 vertical footcandles at 30 inches off of the floor might be higher than necessary.

A summary of the assumed reflectances for this space are given in Table 1: Library Surface Reflectances.

Surface	Assumed Reflectance
Doors	0.33
Glass	0.10
Wood	0.50
Ceiling	0.85
Walls	0.50
Floor	0.20

Table 1: Library Surface Reflectances

Equipment

The lighting equipment specifications can be cross-referenced through Table 2: Library Lighting Specification Cross-Reference in Table 3: Library Luminaire Specifications, Table 4: Library Ballast Specifications, and Table 5: Library Lamp Specifications. The catalog pages for these products are included in Appendix A: Library Lighting Equipment.

Fixture Label	Type	Lamp	Lamp Quantity	Ballast	Fixture Quantity
LF1	Downlight	LT5	1	LB1	40
LF2	Wallwasher	LT5HO	1	LB2	8
LF3	Downlight	LT5	1	LB3	5

Table 2: Library Lighting Specification Cross-Reference

Fixture Label	Manufacturer	Catalog Number
LF1	se'lux	M6R1S-1T5-OD-RC-008
LF2	Focal Point	FAVA-RL-1T5HO-1C
LF3	se'lux	M6R1-1T5-SD-RC-004-WH

Table 3: Library Luminaire Specifications

Ballast Label	Manufacturer	Catalog Number	Lamps	Input Watts	Ballast Factor
LB1	Advance	ICN-2M32-MC	2	68	1.05
LB2	Advance	ICN-2S54-90C	2	117	1.00
LB3	Advance	ICN-132-MC	1	34	1.05

Table 4: Library Ballast Specifications

Lamp Type	Manufacturer	Catalog Number	Nominal Wattage	Initial Lumen Output
LT5	Philips	F28T5/830/ALTO	28	2900
LT5HO	Philips	F54T6/830/HO/ALTO	54	5000

Table 5: Library Lamp Specifications

Light Loss Factors

When calculating light loss factors for this space, I am assuming that it is a very clean environment with a twelve-month cleaning cycle. I am also assuming a cavity height of 8'-6" and a perimeter of 136' to get a room cavity ratio of 1.85. These calculations are in table Table 6: Library Light Loss Factors.

Fixture Label	Ballast Factor	LLD	Luminaire Maintenance Category	LDD	RSDD	Total LLF
LF1	1.05	0.95	V	0.93	0.98	0.909
LF2	1.00	0.95	IV	0.94	0.98	0.875
LF3	1.05	0.95	V	0.93	0.98	0.909

Table 6: Library Light Loss Factors

Power Density

The power density according to ASHRAE 90.1-2004 vary according to the spaces in a library. The total number of watts available to be used is calculated in Table 7: Library Allowable Power Density. The power used in my design is calculated in Table 8: Library Designed Power Density.

Area	Square Footage (ft²)	Allowed Power Density (w/ft²)	Allowed Wattage
Stacks	600	1.7	1020
Reading Area	960	1.2	1152
TOTAL			2172

Table 7: Library Allowable Power Density

Ballast Label	Lamps	Input Watts	Ballast Quantity	Watts per Ballast Type
LB1	2	68	20	1360
LB2	2	117	4	456
LB3	1	34	5	170
TOTAL				1986

Table 8: Library Designed Power Density

Luminaire Locations

The luminaire locations are given in Figure 1: Library Luminaire Locations. The section mounting detail of fixture type LF3 above the inspection tables, and within the millwork, is given in Figure 2: LF3 Mounting Location. Controls for the system would be located at both doors to the library.

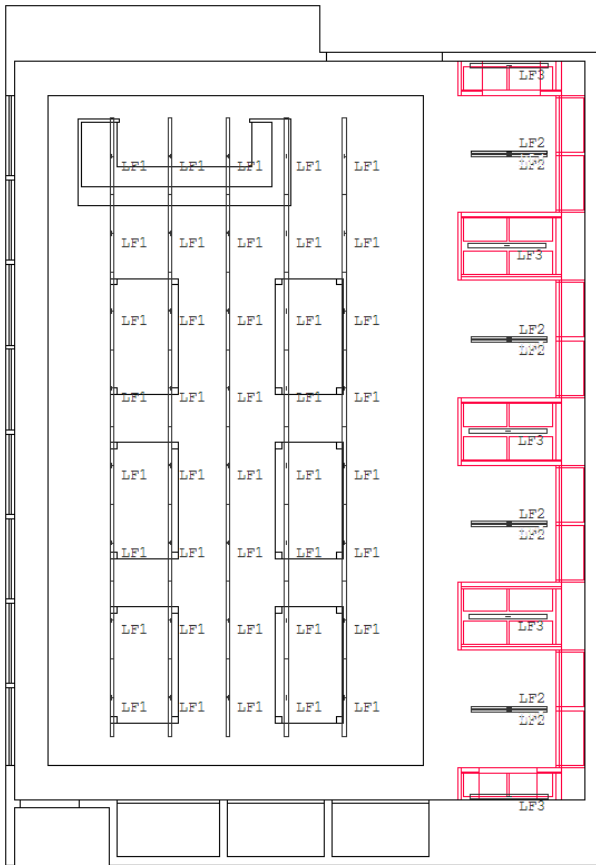


Figure 1: Library Luminaire Locations

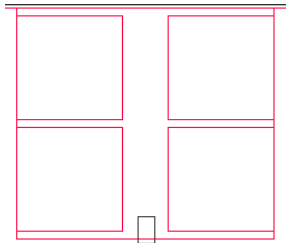


Figure 2: LF3 Mounting Location

System Performance

The library lighting system performance is shown in Figure 3: Library Pseudocolor Rendering, View 1 and Figure 4: Library Pseudocolor Rendering, View 2.

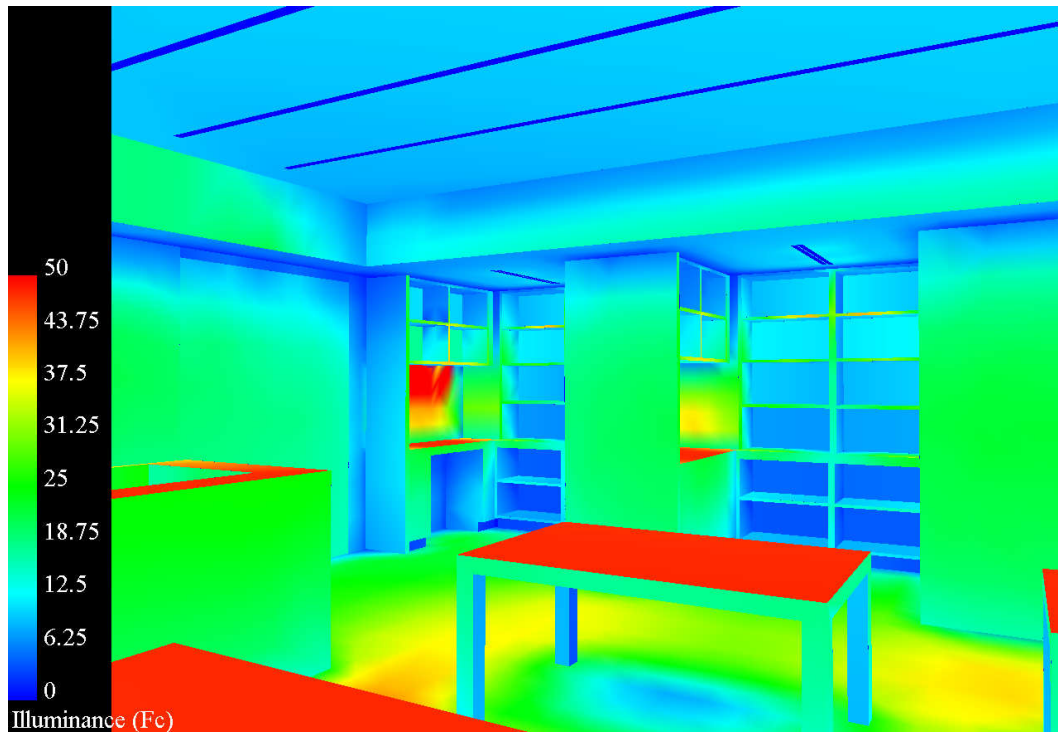


Figure 3: Library Pseudocolor Rendering, View 1

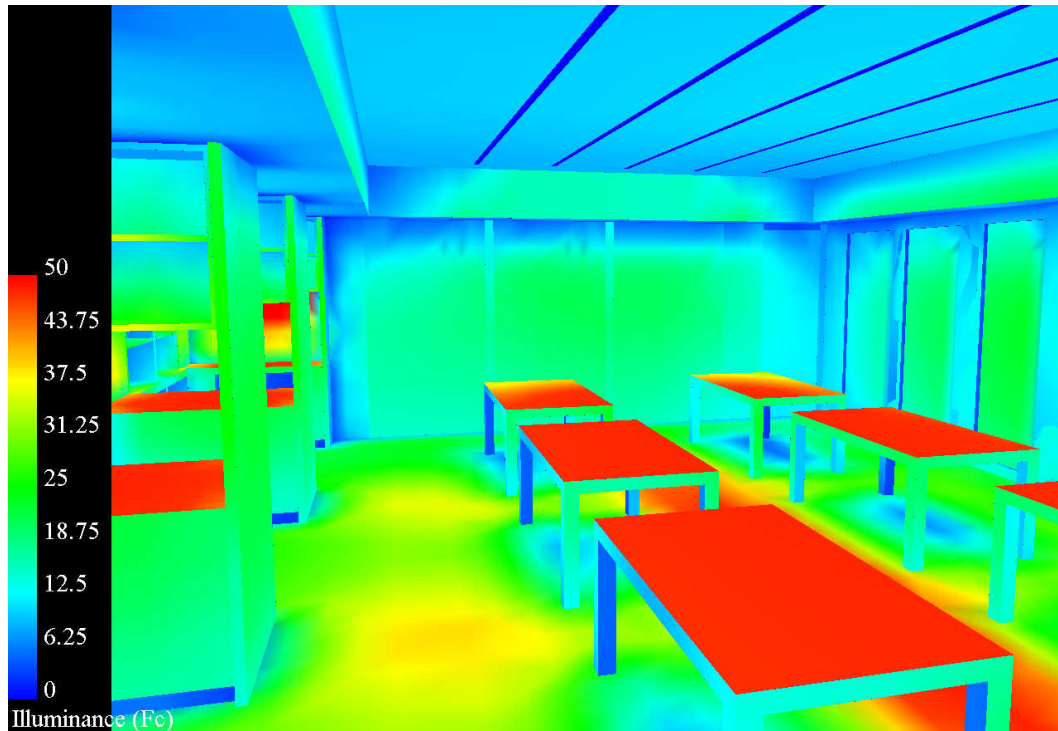


Figure 4: Library Pseudocolor Rendering, View 2

Renderings

Color renderings of the library can be seen in Figure 5: Library Color Rendering, View 1 and Figure 6: Library Color Rendering, View 2.



Figure 5: Library Color Rendering, View 1



Figure 6: Library Color Rendering, View 2

Lighting Power Plan

The library lighting power plan can be seen in Figure 7: Library Lighting Power Plan.

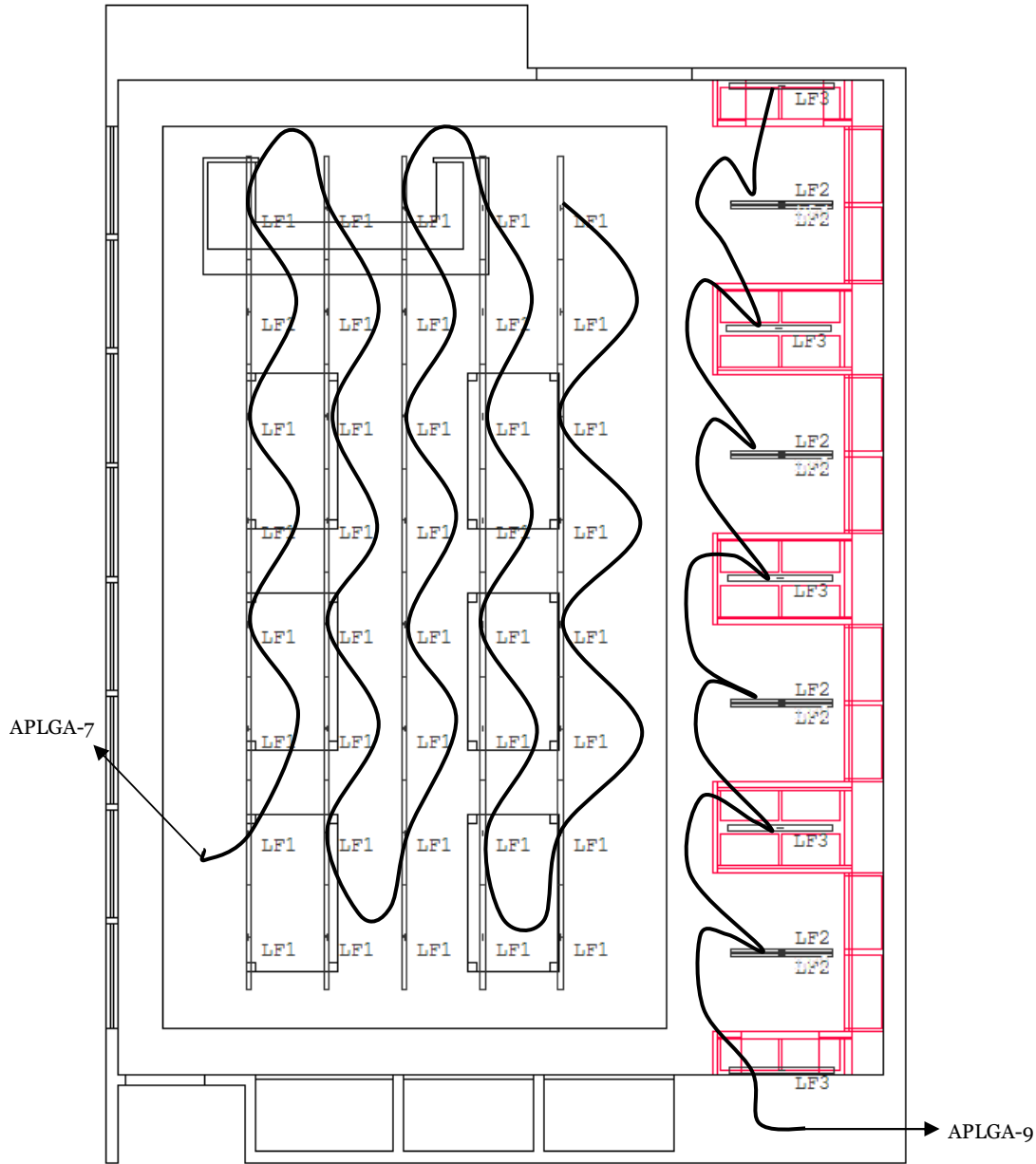


Figure 7: Library Lighting Power Plan

Panelboards

Due to discrepancies between the plans and the panelboard schedules for my building, I must make the assumptions that the plans supersede the separate panelboard schedules

at this point. This will be further investigated later. The original design of the panelboard containing the library lighting can be seen in Figure 8: ALPGA Panelboard Schedule (by Electrical Engineer). The updated panelboard schedule can be seen in Figure 9: Revised ALPGA Panelboard Schedule. At this point, the changes to the panelboard were too insignificant to warrant a redesign.

PANEL: APLGA		SECT.: 1		MTG.: SURFACE								
VOLTS: 120/208		PHASE: 3		WIRES: 4								
GND.: GROUND BUS												
MAIN C.B.: 225A		MINIMUM INTERRUPTING RATING:		10,000A								
CKT. No.	TRIP (Amps)	Category	DESCRIPTION OF LOAD	Category	Load (Va)	Per Phase (Va)	Load (Va)	Category	Description Of Load	Trips (Amps)	Ckt. No.	
1	20		LIGHTING	L	600	1400	800	R	RECEPTACLES	20	2	
3	20		LIGHTING	L	1500	2700	1200	R	CLEANING OUTLETS	20	4	
5	20		2ND FLR. LIGHTING	L	1700	2500	800	R	RECEPTACLES	20	6	
7	20		SPARE		400		400	R	RECEPTACLES	20	8	
9	20		2ND FLR. LIGHTING	L	800	1600	800	R	COAT RACK	20	10	
11	20		CLEANING OUTLET 'AA'	R	600		1200	R	RECEPTACLES	20	12	
13	20		2ND FLR. RECEPTACLES	R	800	1700	900	L	2ND FL. LIGHTING	20	14	
15	20		FAN POWERED BOX	O	1080	2280	1200	R	2ND FL. RECEPTACLES	20	16	
17	20		FAN POWERED BOX	O	1080		1080	O	CH-4	20	18	
19	20		FAN POWERED BOX	O	1080				SPARE	20	20	
21	20		SPARE			0			SPARE	20	22	
23	20		SPARE			0	0		SPARE	20	24	
25	20		SPARE		0				SPARE	20	26	
27	20		SPARE			0			SPARE	20	28	
29	20		SPARE				0		SPARE	20	30	
TOTAL CONNECTED LOAD (VA) PER PHASE:						4580	6580	4780				
TOTAL CONNECTED LIGHTING LOAD (KVA):				4600	5500 6400 3240 13320 37		900 5000 0					
TOTAL CONNECTED RECEPTACLE LOAD (KVA):				1400								
TOTAL CONNECTED OTHER LOAD (KVA):				3240								
TOTAL DEMAND LOAD (KVA):												
TOTAL DEMAND LOAD (AMPS):												
SUPPLIED FROM		DEMAND LOAD										
PANEL:		L= Continuous Lighting @ 125%*Connected										
FEEDER:		R= Convenience Receptacles @ 100% Of 1st 10kw+50% of remainder										
		O=Other Loads @ 100%*Connected										

Figure 8: ALPGA Panelboard Schedule (by Electrical Engineer)

PANELBOARD SCHEDULE												
VOLTAGE: 208 SIZE/TYPE BUS: 225A COPPER SIZE/TYPE MAIN: MLO			PANEL TAG: APLGA PANEL LOCATION: Dimmer Room PANEL MOUNTING: SURFACE					MIN. C/B AIC: 10K OPTIONS:				
DESCRIPTION	LOCATION	LOAD (WATTS)	C/B SIZE	POS. NO.	A	B	C	POS. NO.	C/B SIZE	LOAD (WATTS)	LOCATION	DESCRIPTION
Lighting	0	600	20A/1P	1	*			2	20A/1P	800	2nd Floor	Receptacles
Lighting	0	1500	20A/1P	3		*		4	20A/1P	1200	Cleaning Outlet	Receptacles
Lighting	2nd Floor	1700	20A/1P	5			*	6	20A/1P	800	2nd Floor	Receptacles
Lighting	Library	1780	20A/1P	7	*			8	20A/1P	400	Grand Foyer	Receptacles
Lighting	Library	814	20A/1P	9		*		10	20A/1P	800	Grand Foyer	Coat Rack
Receptacles	Cleaning Outlet	600	20A/1P	11			*	12	20A/1P	600	Grand Foyer	Receptacles
Receptacles	2nd Floor	800	20A/1P	13	*			14	20A/1P	900	2nd Floor	Lighting
Mechanical	0	1080	20A/1P	15		*		16	20A/1P	1200	2nd Floor	Receptacles
Mechanical	0	1080	20A/1P	17			*	18	20A/1P	0	CH-4	Mechanical
Mechanical	0	1080	20A/1P	19	*			20	20A/1P	0	0	Spare
Spare	0	0	20A/1P	21		*		22	20A/1P	0	0	Spare
Spare	0	0	20A/1P	23			*	24	20A/1P	0	0	Spare
Spare	0	0	20A/1P	25	*			26	20A/1P	0	0	Spare
Spare	0	0	20A/1P	27		*		28	20A/1P	0	0	Spare
Spare	0	0	20A/1P	29			*	30	20A/1P	0	0	Spare
		0	20A/1P	31	*			32	20A/1P	0		
		0	20A/1P	33		*		34	20A/1P	0		
		0	20A/1P	35			*	36	20A/1P	0		
		0	20A/1P	37	*			38	20A/1P	0		
		0	20A/1P	39		*		40	20A/1P	0		
		0	20A/1P	41			*	42	20A/1P	0		
CONNECTED LOAD (KW) - A		6.36							TOTAL DESIGN LOAD (KW)		17.40	
CONNECTED LOAD (KW) - B		6.59							POWER FACTOR		1.00	
CONNECTED LOAD (KW) - C		4.78							TOTAL DESIGN LOAD (AMPS)		48	

Figure 9: Revised ALPGA Panelboard Schedule

BUILDING ENTRANCE

Design Intent

The main entrance to the building is the part of the façade that will be seen by most people who travel past the building. It consists of a three-story, curved glass structure looking in at the two-story lobby and a performance space on the third floor. This is nestled between an extension of the third floor supported by square columns that go to the street level. At night, the glass atrium will be given the chance to glow from the lighting in the lobby. The exterior spaces should get equal treatment.

I am proposing to pair the glowing surfaces behind the glass by making the volumes enclosed by the canopies and columns glow as well. This should be guided by the need to provide accurate facial rendering and the need to have ample horizontal illumination so that the steps scattered throughout the path are visible. Another design guideline is minimizing light trespass coming from the exterior lighting. Outside of this area under the canopy of the building, the lighting is taken care of by the city.

Design Criteria

The design criteria is to get 5 footcandles of horizontal illumination on the ground and 5 footcandles of vertical illumination at about head height. The reflectances I assumed for this space are given in Table 9: Building Entrance Reflectances.

Surface	Assumed Reflectance
Limestone	0.50
Glass	0.10
Concrete	0.40

Table 9: Building Entrance Reflectances

Equipment

The lighting equipment specifications can be cross referenced through Table 10: Building Entrance Specification Cross Reference in Table 11: Building Entrance Luminaire Specifications, Table 12: Building Entrance Ballast Specifications, and Table 13: Building Entrance Lamp Specifications. The catalog pages for these products are given in Appendix B: Entrance Lighting Equipment.

Fixture Label	Type	Lamp	Lamp Quantity	Ballast	Fixture Quantity
FF1	Downlight	FMH70	1	FB1	10
FF2	Uplight	FMH39	1	FB2	12

Table 10: Building Entrance Specification Cross Reference

Fixture Label	Manufacturer	Catalog Number
FF1	Erco	81030.023
FF2	B-K Lighting	S-HP2-T635-MS-TR-o-SAP-ICEE

Table 11: Building Entrance Luminaire Specifications

Ballast Label	Manufacturer	Catalog Number	Lamps	Input Watts	ANSI Code
FB1	Advance	71A5281	1	94	M139/E
FB2	Advance	71A5081	1	56	M130/E

Table 12: Building Entrance Ballast Specifications

Lamp Type	Manufacturer	Catalog Number	Nominal Wattage	ANSI Code	Initial Lumen Output
FMH70	Philips	CDM70/T6/830	70	M139/E	6600
FMH39	Philips	CDM35/T6/830	39	M130/E	3300

Table 13: Building Entrance Lamp Specifications

Light Loss Factors

Since this is an outdoor space, I have assumed that the space is a medium cleanliness rating with a 12 month cleaning cycle. I have assumed an RSDD of 0.9 as a safety factor.

The calculations for the light loss factors are given in Table 14: Building Entrance Light Loss Factors.

Fixture Label	Ballast Factor	LLD	Luminaire Maintenance Category	LDD	RSDD	Total LLF
FF1	1	0.75	V	0.83	0.9	0.560
FF2	1	0.78	V	0.83	0.9	0.583

Table 14: Building Entrance Light Loss Factors

Power Density

The exterior lighting power density according to ASHRAE 90.1-2004 varies according to what objects are being lit. The total number of watts available to be used is calculated in Table 15: Building Entrance Allowable Power Density. The power used in my design is calculated in Table 16: Building Entrance Designed Power Density.

Item Description	Measurement	Allowable Power Density	Allowed Wattage (w)
Stair	81 ft ²	1.0 W/ft ²	81
Main Entrances	42 ft	30 W/ft	1260
Secondary Entrance	3.5 ft	20 W/ft	70
Canopy (3 rd Floor)	1520 ft ²	1.25 W/ft ²	1900
Canopy (Signage)	183 ft ²	1.25 W/ft ²	229
Subtotal			3540
Multiplier			x 1.05
TOTAL			3717

Table 15: Building Entrance Allowable Power Density

Ballast Label	Lamps	Input Watts	Ballast Quantity	Watts per Ballast Type
FB1	1	94	10	940
FB2	1	56	12	672
TOTAL				1612

Table 16: Building Entrance Designed Power Density

Luminaire Locations

The luminaire locations are given in Figure 10: Building Entrance Luminaire Locations.

Controls for these luminaires would be integral with the building management system.

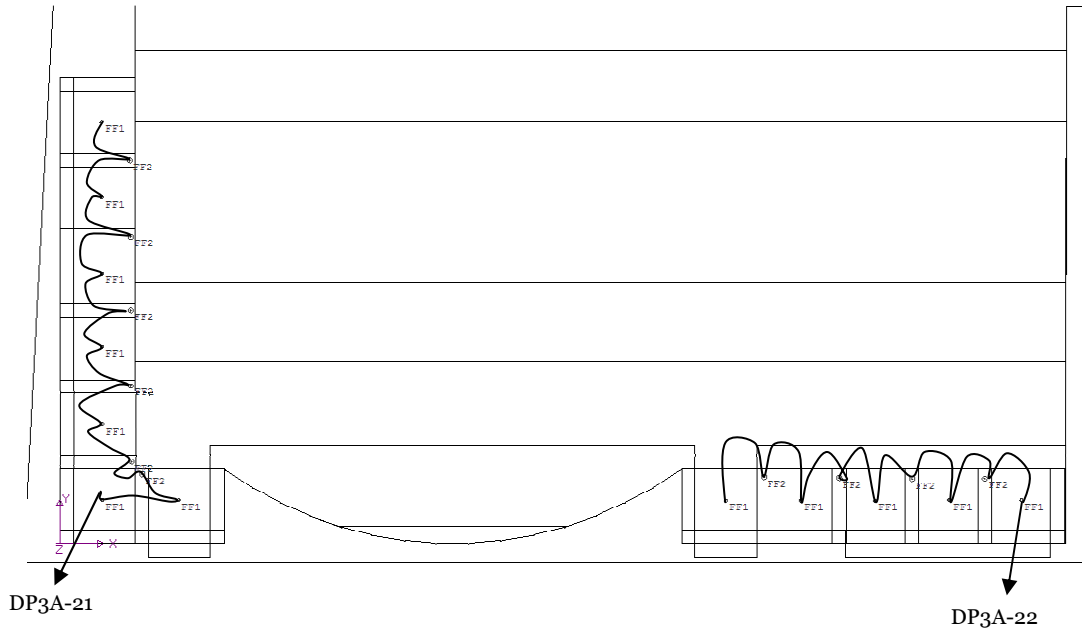


Figure 10: Building Entrance Luminaire Locations

System Performance

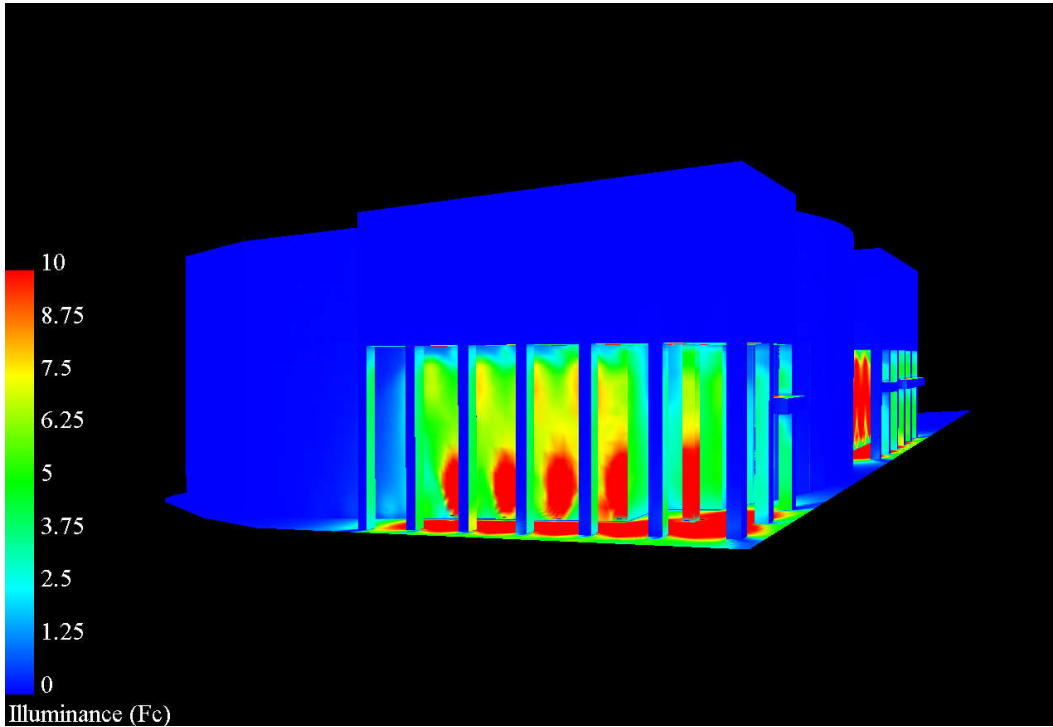


Figure 11: Building Entrance Pseudocolor, View 1

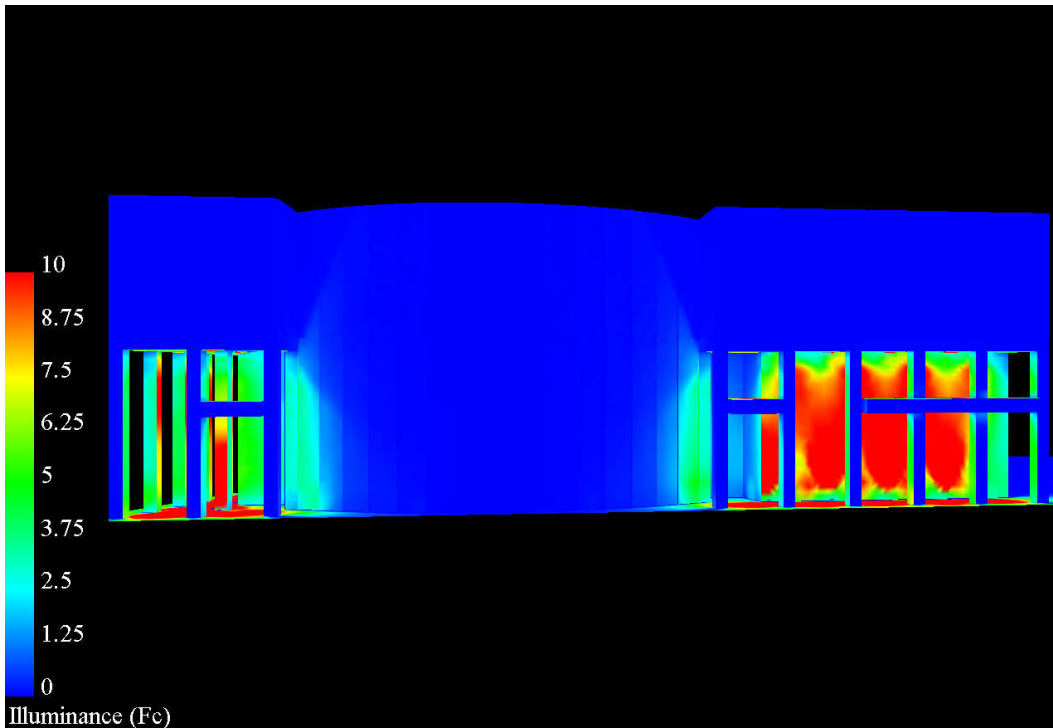


Figure 12: Building Entrance Pseudocolor, View 2

Panelboards

The minor changes to the loading on the original design of the panelboard, Figure 13: DP3A Panelboard Schedule (By Electrical Engineer), did not warrant redesign at this point – see Figure 14: Revised DP3A Panelboard Schedule. However, looking ahead, this panelboard will definitely be revised as I get farther along in my electrical and lighting depths.

PANEL:	DP3A	SECT.:	1	MTG.:	SURFACE
VOLTS:	120/208	PHASE:	3	WIRES:	4
MAIN C.B.:				GND.:	GROUND BUS
MAIN BUS:	225A	MINIMUM INTERRUPTING RATING:	10,000A		

CKT. No.	TRIP (Amps)	Category	DESCRIPTION OF LOAD	Category	Load (Va)	Per Phase (Va)			Load (Va)	Category	Description Of Load	Trip (Amps)	Ckt. No.
						A	B	C					
1	20		GRAND FOYER	L	1500	2500			1000	L	GRAND FOYER	20	2
3	20		GRAND FOYER	L	1750		2500		750	L	GRAND FOYER	20	4
5	20		GRAND FOYER	L	750			1750	1000	L	GRAND FOYER	20	6
7	20		GRAND FOYER	L	1000	2000			1000	L	GRAND FOYER	20	8
9	20		GRAND FOYER	L	1000		2000		1000	L	GRAND FOYER	20	10
11	20		GRAND FOYER	L	1000			2000	1000	L	GRAND FOYER	20	12
13	20		GRAND FOYER	L	1000	2000			1000	L	GRAND FOYER	20	14
15	20		GRAND FOYER	L	1000		2000		1000	L	GRAND FOYER	20	16
17	20		GRAND FOYER	L	1000			2000	1000	L	GRAND FOYER	20	18
19	20		GRAND FOYER	L	1000	2000			1000	L	GRAND FOYER	20	20
21	20		LOUNGE	L	1000		2000		1000	L	LOUNGE	20	22
23	20		LOUNGE	L	600			800	200	L	INSTITUTE	20	24
25	20		INSTITUTE	L	500	1200			700	L	INSTITUTE	20	26
27	20		INSTITUTE	L	200		1160		960	L	EXTERIOR ENTRY	20	28
29	20		EXTERIOR LOGGIA	L	660			1980	1320	L	EXTERIOR LOGGIA	20	30
31	20		EXTERIOR LOGGIA	L	1200				180	L	EXTERIOR STEP LITS	20	32
33	20											20	34
35	20											20	36
37	20											20	38
39	20											20	40
41	20											20	42
TOTAL CONNECTED LOAD (VA) PER PHASE:						9700	9660	8530					

TOTAL CONNECTED LIGHTING LOAD (KVA):	15160	29270	14110
TOTAL CONNECTED RECEPTACLE LOAD (KVA):	0	0	0
TOTAL CONNECTED OTHER LOAD (KVA):	0	0	0
TOTAL DEMAND LOAD (KVA):		36593	
TOTAL DEMAND LOAD (AMPS):		102	

SUPPLIED FROM	DEMAND LOAD
PANEL:	L= Continuous Lighting @ 125%*Connected
FEEDER:	R= Convenience Receptacles @ 100% Of 1st 10kw+50% of remainder
	O=Other Loads @ 100%*Connected

Figure 13: DP3A Panelboard Schedule (By Electrical Engineer)

PANELBOARD SCHEDULE												
VOLTAGE: 208 SIZE/TYPE BUS: 225A COPPER SIZE/TYPE MAIN: MLO			PANEL TAG: DP3A PANEL LOCATION: Dimmer Room PANEL MOUNTING: SURFACE					MIN. C/B AIC: 12K OPTIONS:				
DESCRIPTION	LOCATION	LOAD (WATTS)	C/B SIZE	POS. NO.	A	B	C	POS. NO.	C/B SIZE	LOAD (WATTS)	LOCATION	DESCRIPTION
Lighting	Grand Foyer	1500	20A/1P	1	*			2	20A/1P	1000	Grand Foyer	Lighting
Lighting	Grand Foyer	1750	20A/1P	3		*		4	20A/1P	750	Grand Foyer	Lighting
Lighting	Grand Foyer	750	20A/1P	5			*	6	20A/1P	1750	Grand Foyer	Lighting
Lighting	Grand Foyer	1000	20A/1P	7	*			8	20A/1P	1000	Grand Foyer	Lighting
Lighting	Grand Foyer	1000	20A/1P	9		*		10	20A/1P	1000	Grand Foyer	Lighting
Lighting	Grand Foyer	1000	20A/1P	11			*	12	20A/1P	1000	Grand Foyer	Lighting
Lighting	Grand Foyer	1000	20A/1P	13	*			14	20A/1P	1000	Grand Foyer	Lighting
Lighting	Grand Foyer	1000	20A/1P	15		*		16	20A/1P	1000	Grand Foyer	Lighting
Lighting	Grand Foyer	1000	20A/1P	17			*	18	20A/1P	1000	Grand Foyer	Lighting
Lighting	Grand Foyer	1000	20A/1P	19	*			20	20A/1P	1000	Grand Foyer	Lighting
Lighting	Lounge	1000	20A/1P	21		*		22	20A/1P	1000	Lounge	Lighting
Lighting	Lounge	600	20A/1P	23			*	24	20A/1P	500	Institute	Lighting
Lighting	Institute	700	20A/1P	25	*			26	20A/1P	200	Institute	Lighting
Lighting	Exterior	1366	20A/1P	27		*		28	20A/1P	956	Exterior	Lighting
		0	20A/1P	29			*	30	20A/1P	0		
		0	20A/1P	31	*			32	20A/1P	0		
		0	20A/1P	33		*		34	20A/1P	0		
		0	20A/1P	35			*	36	20A/1P	0		
		0	20A/1P	37	*			38	20A/1P	0		
		0	20A/1P	39		*		40	20A/1P	0		
		0	20A/1P	41			*	42	20A/1P	0		
CONNECTED LOAD (KW) - A		9.40						TOTAL DESIGN LOAD (KW)			30.60	
CONNECTED LOAD (KW) - B		10.82						POWER FACTOR			1.00	
CONNECTED LOAD (KW) - C		7.60						TOTAL DESIGN LOAD (AMPS)			85	

Figure 14: Revised DP3A Panelboard Schedule

APPENDIX A: LIBRARY LIGHTING EQUIPMENT

Fixture LF1

M60 Recessed Linear Fluorescent Flanged Extrusion - STAGGERED LAMPS



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

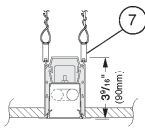
Fixture Series	Lamp Type	Shielding	Mounting	Mounting Option	Nominal Length	Finish	Voltage

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

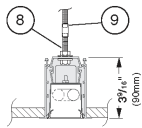
Fixture Series	Lamp Type	Shielding	Mounting	Nominal Length	Finish	Voltage	Options
M6R1S M60 Recessed Continuous Flange (Flanged Extrusion/ Flanged Endcaps) Staggered Lamps M6R2S M60 Recessed Flush End (Flanged Extrusion/ Flangeless Endcaps) Staggered Lamps	1T5 F28T5 1T5HO F44T5HO	OD Extra Diffuse Lens SD Satine Lens	SH Suspension Clips TS 1" Studs (factory installed) RC Rotating Crossbars PM Perimeter Mount	008 8 foot 012 12 foot For actual lengths see following page. For other lengths, configurations indicate nominal length rounded to the next highest foot. Factory will supply layout drawings. Individual fixtures cannot be field joined.	WH White BK Black SV Silver SP Specify RAL#	120 277 347	TB Lengths to Fit 2' Grid T-Bar Ceiling System (M6R1S only) (qty)EM Stand-by Battery Pack ¹ (prefix quantity, i.e. -SEM) FS Single Fusing DM Dimming ¹ (specify system) DMA Digital Addressable Dimming ¹ FW Flex Whip (standard) FW1 Flex Whip (dimming) Track Eutrac Standard ² DL Suitable for Damp Locations Downlights (See MR11 spec sheet, pp.98)
	¹ Must be low profile ballasts (1 1/4" W x 1 1/2" H); consult factory for details. ² Consult factory for details.						

Mounting Diagrams

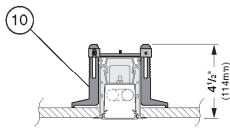
Suspension Clips (SH)



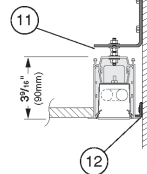
Pre-installed Rod (TS)



Rotating Crossbars (RC)



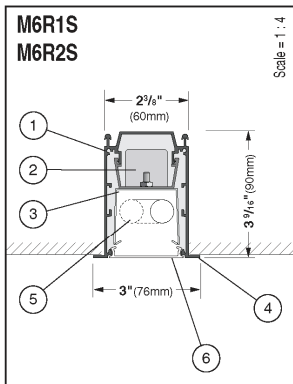
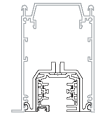
Perimeter Mount (PM)



Scale = 1 : 8

Track

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



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 www.selux.com/usa
 M6R1S-01 (v5.0)



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

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

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

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

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

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

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

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

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

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

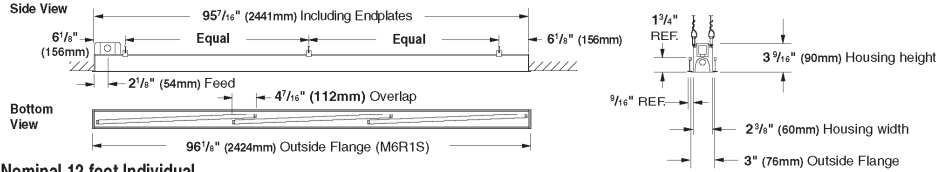
11. Steel Wall Bracket and 1/4-20 Rod - Supplied nominally every 4 ft. (Fasteners to wall and wall anchors by others.)

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

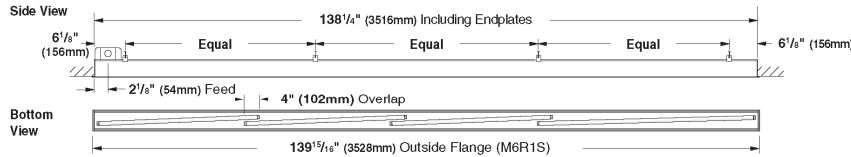
Interior Luminaire Finish - Standard interior colors are White (WH), Black (BK) and Silver (SV). RAL Classic colors (SP) are available, please specify RAL#.

M6R1S/M6R2S (Single Staggered Lamps) Standard Layout Dimensions

Nominal 8 foot Individual

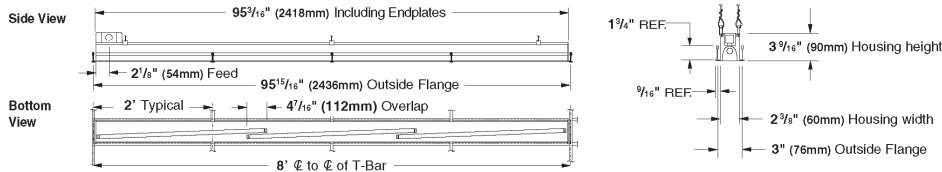


Nominal 12 foot Individual

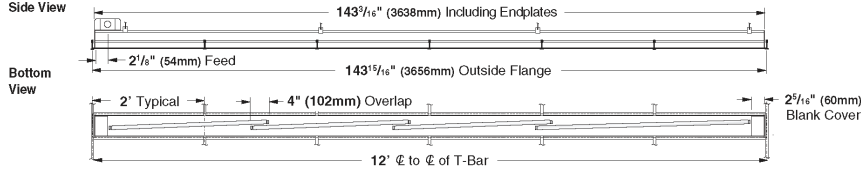


M6R1S (Single Staggered Lamps) T-Bar Layout Dimensions (option - TB)

Nominal 8 foot Individual



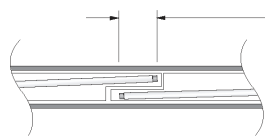
Nominal 12 foot Individual



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

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

Staggered Lamps Principle



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

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

Fixture LF2

new in '05

louver/lens
avenue® a



FEATURES

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

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

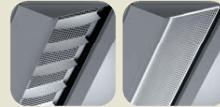
Features 2" narrow aperture for clean unobtrusive aesthetic.

Universal mounting allows compatibility for multiple grid types.

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

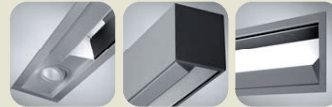
Great solution for conference rooms, highlighting artwork, corridors, white board or any application that requires high levels of vertical illumination.

shielding options



cut-off louver clear lens

companion luminaire

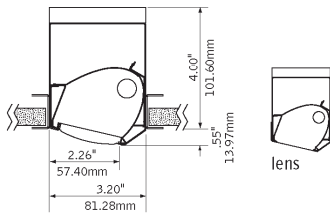


mr16 linear recessed wall mount

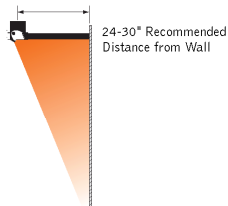
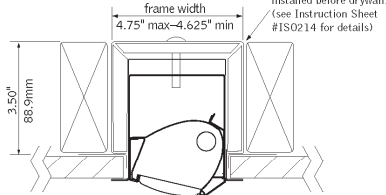
november 2005

DIMENSIONAL DATA

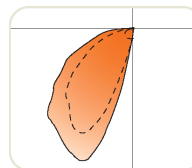
Grid Mount (Louver Shown)



Drywall Flange



PERFORMANCE



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

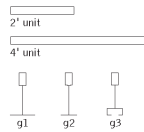
See **Photometric** section for additional performance data.

88

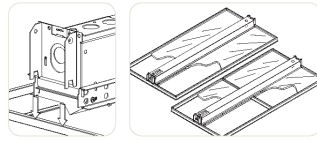
fixture type:
project name:

DETAILS

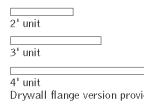
grid



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



drywall



Drywall flange version provided with mounting yoke.

SPECIFICATIONS

construction

One-piece 20 Ga. steel housing
Grid fixtures include 20 Ga. steel, .5" wide universal flange rail finished in matte satin white.
Drywall flange option is provided with 20 Ga. steel, .5" wide flange kit and 20 Ga. galvanized steel mounting yoke.

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

optic

.020" specular aluminum upper reflector and .020" semi-specular lower reflector.
24 Ga. perforated matte black diffuser with 24% opening.
Radial cut-off louver: .375" H x 1" frequency fabricated of 24 Ga. steel.
Clear lens: .060" thick clear acrylic.

electrical

Luminaires are individually wired for specified circuits.
Thru-wiring not available.
Electronic ballasts are thermally protected and have a Class "P" rating.
Optional DALI and other dimming ballasts available.
Consult factory for dimming specifications and availability.
UL and cUL listed.

emergency

Emergency battery packs provide 90 minutes of illumination.
Initial lumen output for lamp types are as follows:

T5 Lamp: Up to 550 lumens
T5HO lamps: Up to 825 lumens

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

finish

Polyester powder coat applied over a 5-stage pre-treatment.
Standard luminaire housing finished in Matte Satin White or Matte Black.
Perforated diffuser finished in Matte Black as standard.
Radial cut-off louver painted Matte Satin White as standard.

ORDERING

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

RECESSED

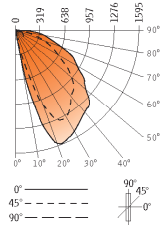
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Focal Point L.L.C. reserves the right to change specifications for product improvement without notification.

louver
avenue® a



Filename: FAVARL1T5HJES
 Catalog #: FAVA-RL-1T5H0-1C-120-S-G1-WH-4'
 Efficiency: 41%
 Test #: 12597.0

CANDLEPOWER DISTRIBUTION



Vertical Angle	0°	22.5°	45°	67.5°	90°	Zonal Lumens
0°	120	120	120	120	120	
5°	175	161	137	129	120	13
15°	1212	1043	556	187	121	104
25°	1581	1520	1301	404	137	248
35°	1457	1370	1228	774	144	373
45°	1354	1255	1070	835	131	443
55°	1077	952	783	582	118	383
65°	787	662	509	342	107	277
75°	441	360	244	119	66	133
85°	171	124	65	39	17	45
90°	6.7	5.1	1.3	0	0	
95°	0	0	0	0	0	0
105°	0	0	0	0	0	0
115°	0	0	0	0	0	0
125°	0	0	0	0	0	0
135°	0	0	0	0	0	0
145°	0	0	0	0	0	0
155°	0	0	0	0	0	0
165°	0	0	0	0	0	0
175°	0	0	0	0	0	0
180°	0	0	0	0	0	0

LUMEN SUMMARY

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

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

Fixture LF3

M60 Linear Fluorescent Recessed



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

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

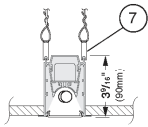
Options (refer to separate data sheets for ordering codes and details)

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

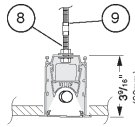
¹Must be low profile ballasts (1 1/2" wide x 1 1/2" high); consult factory for details. ²Available for MP Louver only. ³Consult factory for details.

Mounting Diagrams

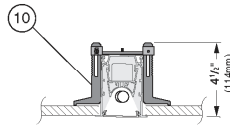
Suspension Clips (SH)



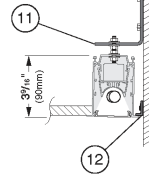
Pre-installed Rod (TS)



Rotating Crossbars (RC)



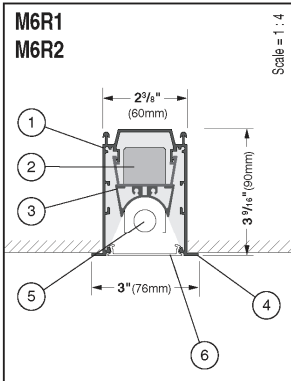
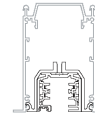
Perimeter Mount (PM)



Scale = 1 : 8

Track

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



Scale = 1 : 4

- Housing** - Continuous, 6063-T5 extruded aluminum profile up to 16 feet long.
- Ballast** - Electronic, high power factor, class "P", type "A" sound rating. Specify 120v, 277v, or 347v. Ballast is factory pre-wired with leads to one end of fixture. Consult factory for ballast options.
- Gear Tray** - Die formed tray with specular aluminum reflector. Gear tray installs as complete electrical unit and is held in place with 1/4 turn latches. It is fully accessible from below ceiling.
- Flange** - 5/16" (8mm) wide flange is part of the main extruded body. Specify continuous flange (M6R1) or flush end (M6R2).
- Lamps** - As noted (by others). Other lamp lengths or wattages available, consult factory.

- Shielding** - Louvers offer excellent glare control in longitudinal, lateral, and all diagonal planes. High quality aluminum louvers and acrylic shielding allow true freedom of layout for today's modern spaces.
- Spring steel suspension clips** - Supplied two places, located nominally every 4 ft. Support wires Supplied and installed by others.
- Pre-installed 1" 1/4-20 Stud** - Attached to fixture every nominal 4 feet.
- Coupling and Threaded Rod to Structure** - Supplied and installed by others.
- Rotating Crossbar** - For inaccessible ceilings, adjustable for ceiling thicknesses from 1/4" to 2". Support required nominally every 4'.

- Steel Wall Bracket and 1/4-20 Rod** - Supplied nominally every 4 ft. (Fasteners to wall and wall anchors by others.)
 - Aluminum Wall Bracket** - Secured to wall (fasteners and wall anchors by others) and runs entire length of fixture. Also supplied for width of M6R1 continuous flange fixtures. Allows for 1/8" gap between flange and wall to create shadow line.
- Interior Luminaire Finish** - Standard interior colors are White (WH), Black (BK) and Silver (SV). RAL Classic colors (SP) are available, please specify RAL#.

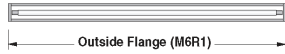
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M6R-01 (v5.0)



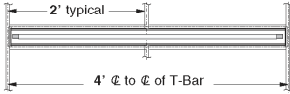
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M6R1 and M6R2 Standard Layout Dimensions

M6R1 Recessed - nominal 4 foot individual



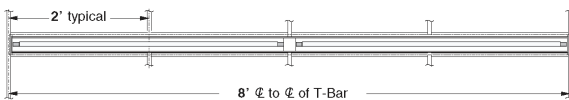
M6R1 Recessed - T-Bar Length - nominal 4 foot individual



M6R1 Recessed - nominal 8 foot individual



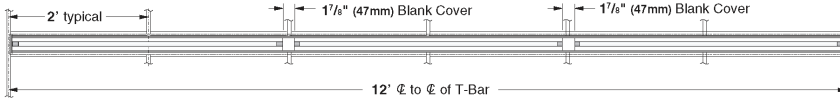
M6R1 Recessed - T-Bar Length - nominal 8 foot individual



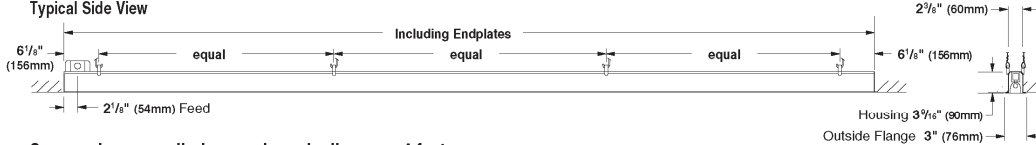
M6R1 Recessed - nominal 12 foot individual



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



Typical Side View



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

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

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

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 M6R1-02 (02/06)

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Continuous Flange (M6R1)



Flush End (M6R2)



Ballast LB1



ICN-2M32-MC@277V	
Brand Name	CENTIUM
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F14T5	2	14	32/00	0.13	36	1.05	10	0.98	1.7	2.92
F17T8	2	17	0/-18	0.11	31	0.88	10	0.98	1.7	2.84
F21T5	2	21	32/00	0.18	50	1.05	10	0.98	1.7	2.10
F25T8	2	25	0/-18	0.16	44	0.88	15	0.98	1.7	2.00
* F28T5	2	28	32/00	0.25	68	1.05	10	0.98	1.7	1.54
F32T8	2	32	0/-18	0.21	59	0.88	10	0.98	1.7	1.49
F32T8/ES (30W)	2	30	0/-18	0.20	54	0.88	10	0.98	1.7	1.63

Wiring Diagram

Diag. 64

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

Standard Lead Length (inches)

Enclosure

Enclosure Dimensions

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

Revised 02/22/2005



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 Corporate Offices: Phone: 800-322-2086



ICN-2M32-MC@277V	
Brand Name	CENTIUM
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

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

Section II - Performance Requirements

- 2.1 Ballast shall be _____ (Instant or Rapid) Start.
- 2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.
- 2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power (except T8/HO ballast).
- 2.4 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast. IntelliVolt models shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.
- 2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz ("GCN" models between 20kHz and 30kHz) to avoid interference with infrared devices and eliminate visible flicker.
- 2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.
- 2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.
- 2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.
- 2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.
- 2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.
- 2.11 Ballast shall have a minimum starting temperature of _____ [-18C (0F) for standard T8 and Long Twin Tube lamps, 10C (50F) for standard T12 lamps, 0C (32F) for Slimline T8 lamps and "GCN" models, -29C (-20F) for T8/HO lamps,] for primary lamp application. Ballast shall have a minimum starting temperature of 60F (16C) for energy-saving T8 and T12 lamps.
- 2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

Section III - Regulatory Requirements

- 3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).
- 3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable. Models with -HAZ suffix meet UL 935 Type HL (hazardous location) requirements.
- 3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.
- 3.4 Ballast shall comply with ANSI C82.11 where applicable.
- 3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance part # _____ or approved equal.

NOTE: The use of Optanium 2.0 (IOP) models is recommended to reduce striation in energy-saving T8 lamps (25W, 28W or 30W). Remote or tandem wiring of energy-saving T8 lamps (25W, 28W or 30W) is only recommended for Optanium 2.0 (IOP) models.

Revised 02/22/2005



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Ballast LB2

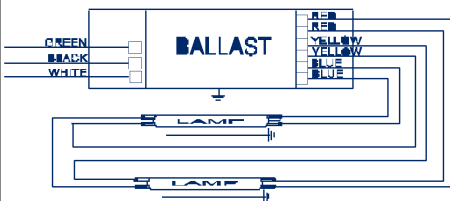


ICN-2S54-90C@277	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F54T5/HO	1	54	-20/-29	0.23	62	1.02	10	0.96	1.7	1.65
* F54T5/HO	2	54	-20/-29	0.43	117	1.00	10	0.98	1.7	0.85

Wiring Diagram

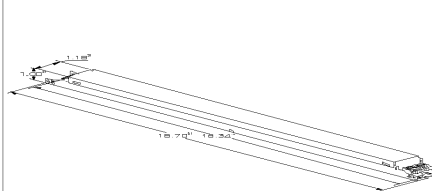


The wiring diagram that appears above is for the lamp type denoted by the asterisk (*)

Standard Lead Length (inches)

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

Enclosure



Enclosure Dimensions

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

Revised 01/31/2007



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ICN-2S54-90C@277	
Brand Name	CENTIUM T5
Ballast Type	Electronic
Starting Method	Programmed Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

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

Section II - Performance Requirements

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

Section III - Regulatory Requirements

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

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C. Ballasts with a "90C" designation in their catalog number shall also carry a three-year warranty at a maximum case temperature of 90C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance part # _____ or approved equal.

Revised 01/31/2007



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Ballast LB3

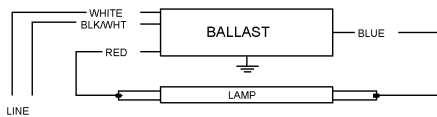


Electrical Specifications

ICN-132-MC@277V	
Brand Name	CENTIUM MICRO CAN
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Lamp Type	Num. of Lamps	Rated Lamp Watts	Min. Start Temp (°F/C)	Input Current (Amps)	Input Power (ANSI Watts)	Ballast Factor	MAX THD %	Power Factor	MAX Lamp Current Crest Factor	B.E.F.
F14T5	1	14	32/00	0.07	19	1.05	20	0.98	1.7	5.53
F17T8	1	17	0/-18	0.06	17	0.88	20	0.98	1.7	5.18
F21T5	1	21	32/00	0.09	26	1.05	15	0.98	1.7	4.04
F25T8	1	25	0/-18	0.09	23	0.88	15	0.98	1.7	3.83
* F28T5	1	28	32/00	0.12	34	1.05	10	0.98	1.7	3.09
F32T8	1	32	0/-18	0.11	30	0.88	10	0.98	1.7	2.93
F32T8/ES (30W)	1	30	60/16	0.10	27	0.88	10	0.98	1.7	3.26

Wiring Diagram

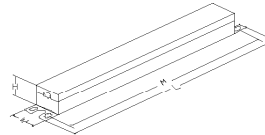


Diag. 63

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

Standard Lead Length (inches)

Enclosure



Enclosure Dimensions

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

Revised 01/06/2005



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ICN-132-MC@277V	
Brand Name	CENTIUM MICRO CAN
Ballast Type	Electronic
Starting Method	Instant Start
Lamp Connection	Series
Input Voltage	120-277
Input Frequency	50/60 HZ
Status	Active

Electrical Specifications

Notes:

Section I - Physical Characteristics

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

Section II - Performance Requirements

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

Section III - Regulatory Requirements

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

Section IV - Other

- 4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
- 4.2 Ballast shall carry a five-year warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 70C.
- 4.3 Manufacturer shall have a fifteen-year history of producing electronic ballasts for the North American market.
- 4.4 Ballast shall be Advance part # _____ or approved equal.

NOTE: The use of Optanium 2.0 (IOP) models is recommended to reduce striations in energy-saving T8 lamps (25W, 28W or 30W). Remote or tandem wiring of energy-saving T8 lamps (25W, 28W or 30W) is only recommended for Optanium 2.0 (IOP) models.

Consult lamp manufacturer for operation of T5 lamps on instant start ballasts.

Revised 01/06/2005

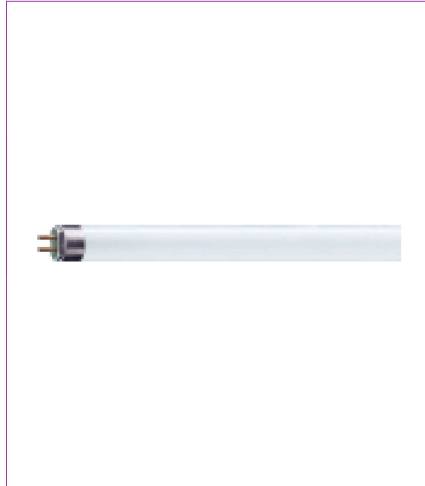


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Lamp LT5

16/2/2007



28W/830 Min Bipin T5 HE ALTO UNP

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

Features/Benefits

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

Applications

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

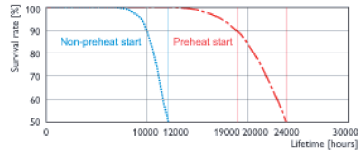
Notes

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

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

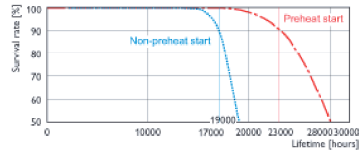
1

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



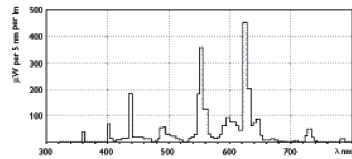
Life Expectancy 3h cycle

TL5

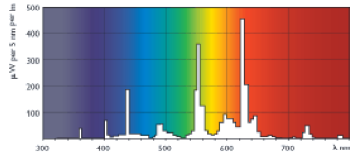


Life Expectancy 12h cycle

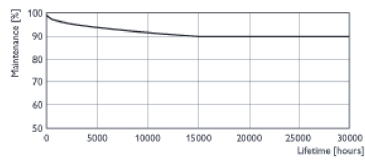
TL5



TL5/830

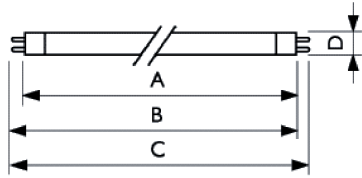


TL5/830



TL5





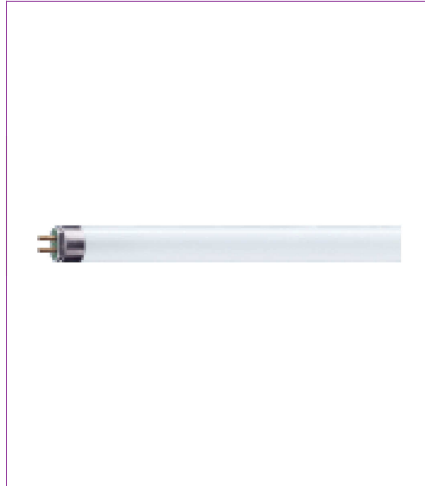
TL5

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



Lamp LT5HO

16/2/2007



– 54W/830 Min Bipin T5 HO ALTO UNP

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

Features/Benefits

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

Applications

- Ideal for medium and high bay retail. Ideal for

industrial applications.

Note

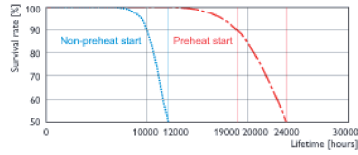
- Philips Lighting warrants T5 HO lamps when used with ballasts that are designed to meet the proposed IEC (International Electrotechnical Commission) dimming requirements and all other industry standards, ie: NEC,UL,IEC and ANSI. Please work with your Philips representative to get dimming approval before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

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

PHILIPS

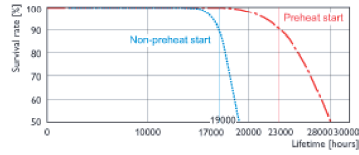
1

Product data	
Packing Configuration	40
Rated Avg. Life[hr]	24000
Dimmable	Yes
Mercury (Hg) Content[mg]	
Color Rendering Index[Ra8]	85
Color Temperature[K]	3000
Initial Lumens[Lm]	-
Overall Length C[mm]	1163.2
Diameter D[mm]	17



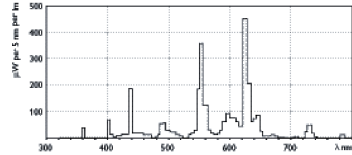
Life Expectancy 3h cycle

TL5

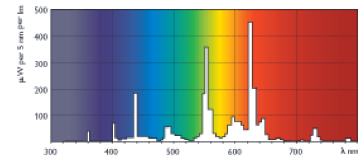


Life Expectancy 12h cycle

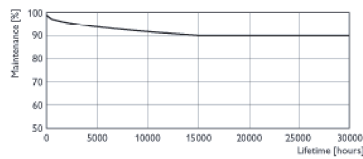
TL5



TL5/830

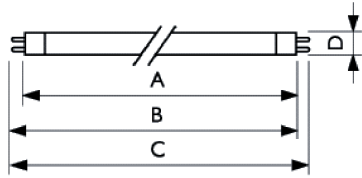


TL5/830



TL5





TL5

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



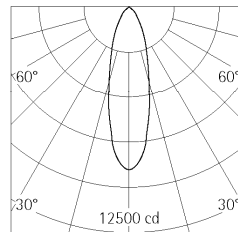
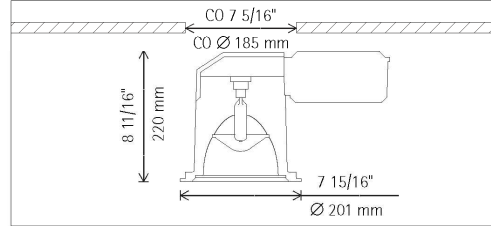
APPENDIX B: ENTRANCE LIGHTING EQUIPMENT

Fixture FF1

ERCO

LC Downlight

for metal halide lamps



T6 70W G12 6600lm

h(ft)	E(fc)	D
3	1005	29"
6	251	1'7"
9	112	4'8"
12	63	6'2"
15	40	7'9"

81030.023 Reflector silver
T6 70W G12 6600lm
ECG

Product description

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

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

Technical Region: 120V/277V, 60Hz
Edition: 11.16.2006
Please download latest version from
www.erco.com/81030.023

1/1

Fixture FF2

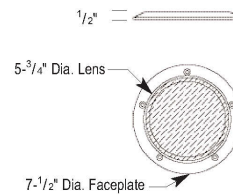
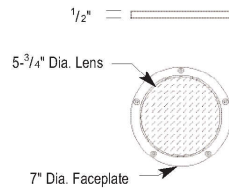
T-6 Metal Halide



Integral Ballast



HP2 & CO2 faceplates are machined from 1/2" thick solid material.













TR



Integral Ballast

- Patented HydroLock™ Technology
- Modular Component Construction

Catalog Number Logic

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

Material
Blank - Aluminum
B - Brass
S - Stainless Steel

Faceplate
HP2 - (Flush)
CO2 - (Flange)

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

Reflector
SP - Spot
MS - Medium Spot
FL - Flood

Housing
TR - Integral Ballast

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

For lamp information, see page 70.

Finish

Aluminum & Brass Faceplates			Brass Faceplates	
Powder Coat Color	Satin	Wrinkle	Machined	MAC
Bronze	BZP	BZW	Polished	POL
Black	BLP	BLW	Mitique™	MIT
White (Gloss)	WHP	WHW	Stainless Faceplates	
Aluminum	SAP	--	Machined	MAC
Verde	--	VER	Polished	POL
			Brushed	BRU

See Pages 60-61 for Additional Finish choices

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

Input Voltage
120 - 120 Volt
277 - 277 Volt

Option
AH - Accessory Holder (Accommodates up to 2 Media)
CPC - Concrete Pour Collar (HP2 Only.) See page 54 for CPC details. Material and Finish to Match Faceplate. May be Field Installed prior to permanent installation of side conduit connectors. Included with ICEE Lens option.
DG - Dome Glass Lens (Replaces Flat Glass. Not Driveover Rated)
GS - Glare Shield*
HD - Half Dome*
ICEE - ICEE™ Lens (HP2 Only. Faceplate standard aluminum only. Concrete Pour Collar included.)** See pages 56-57 for details.
RG - Rock Guard*
RO - Rock Guard with Optical Opening*
TC - Traction Control Lens (Replaces Flat Glass.) See page 58 for details.
 *HP2 Only. Material and Finish to Match Faceplate. Dome lens included. See pages 52-54 for Option details.
 **Options DG, GS, HD, RG and RO not available with ICEE lens option

Specifications

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

Stability Flange (Pat. Pend)
 Corrosion-free composite flange projects into installation sub-strate to reinforce housing stability. Integral REBAR saddles simplify installation onto concrete form. (4) Orthogonal bosses permit use of 1/2" PCV conduit or EMT to simplify vertical position and leveling of housing. Pre-set self-tapping screws anchor housing at proper elevation.

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

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

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

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

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

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

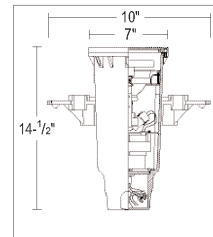
Faceplate
 Solid, 1/2" machined 6061T6 aluminum with (5) black oxide, captive, stainless steel mounting screws. Faceplate options include solid, 1/2" machined brass and solid, 1/2" machined stainless steel.

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


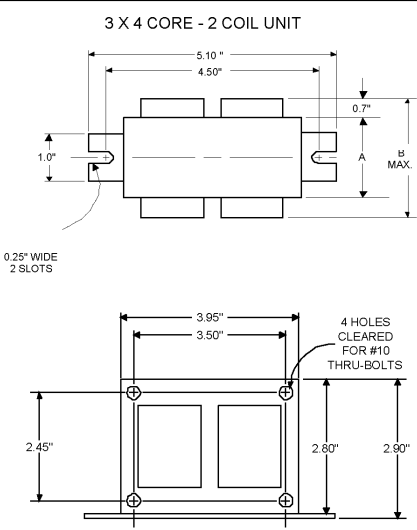
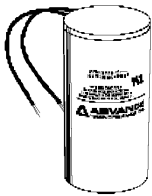
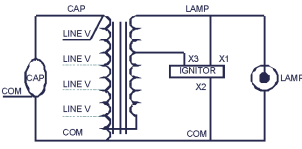

Listings
 ARL and CSA Listed.



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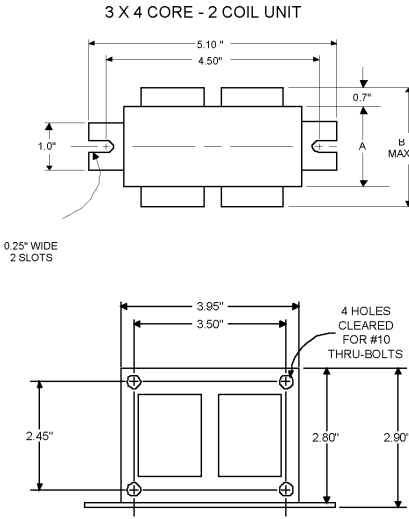

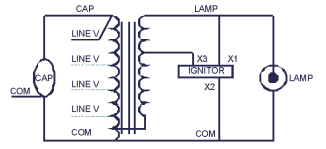



Ballast FB1

	Metal Halide Lamp Ballast	Catalog Number 71A5281 For 70W M139 60 Hz HX-HPF Status: Active																																																																																																																																																																																																																		
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ADVANCE
 O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018 05/13/99
 Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071
 Corporate Offices: Phone: 800-322-2086

Ballast FB2

	Metal Halide Lamp Ballast	Catalog Number 71A5081 For 35/39W M130 60 Hz HX-HPF Status: Active																																																																																																																																																																																																																								
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<p style="text-align: center;">3 X 4 CORE - 2 COIL UNIT</p> 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>INPUT VOLTS</td> <td style="text-align: center;">120</td> <td style="text-align: center;">277</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CIRCUIT TYPE</td> <td colspan="5" style="text-align: center;">HX-HPF</td> </tr> <tr> <td>POWER FACTOR (min)</td> <td colspan="5" style="text-align: center;">90%</td> </tr> <tr> <td>REGULATION</td> <td colspan="5"></td> </tr> <tr> <td> Line Volts</td> <td colspan="5" style="text-align: center;">±5%</td> </tr> <tr> <td> Lamp Watts</td> <td colspan="5" style="text-align: center;">±10%</td> </tr> <tr> <td>LINE CURRENT (Amps)</td> <td colspan="5"></td> </tr> <tr> <td> Operating</td> <td style="text-align: center;">0.45</td> <td style="text-align: center;">0.20</td> <td></td> <td></td> <td></td> </tr> <tr> <td> Open Circuit</td> <td style="text-align: center;">0.90</td> <td style="text-align: center;">0.40</td> <td></td> <td></td> <td></td> </tr> <tr> <td> Starting</td> <td style="text-align: center;">0.50</td> <td style="text-align: center;">0.22</td> <td></td> <td></td> <td></td> </tr> <tr> <td>UL TEMPERATURE RATINGS</td> <td colspan="5"></td> </tr> <tr> <td> Insulation Class</td> <td colspan="5" style="text-align: center;">H(180°C)</td> </tr> <tr> <td> Coil Temperature Code</td> <td colspan="5" style="text-align: center;">1029</td> </tr> <tr> <td>MIN. AMBIENT STARTING TEMP.</td> <td colspan="5" style="text-align: center;">-20°F or -30°C</td> </tr> <tr> <td>NOM. OPEN CIRCUIT VOLTAGE</td> <td colspan="5" style="text-align: center;">230</td> </tr> <tr> <td>INPUT VOLTAGE AT LAMP DROPOUT</td> <td style="text-align: center;">85</td> <td style="text-align: center;">195</td> <td></td> <td></td> <td></td> </tr> <tr> <td>INPUT WATTS</td> <td colspan="5"></td> </tr> <tr> <td>RECOMMENDED FUSE (Amps)</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CORE and COIL</td> <td colspan="5"></td> </tr> <tr> <td> Dimension (A)</td> <td colspan="5" style="text-align: center;">0.80</td> </tr> <tr> <td> Dimension (B)</td> <td colspan="5" style="text-align: center;">2.10</td> </tr> <tr> <td> Weight (lbs.)</td> <td colspan="5" style="text-align: center;">3.5</td> </tr> <tr> <td> Lead Lengths</td> <td colspan="5" style="text-align: center;">12"</td> </tr> <tr> <td>CAPACITOR REQUIREMENT</td> <td colspan="5"></td> </tr> <tr> <td> Microfarads</td> <td colspan="5" style="text-align: center;">5.0</td> </tr> <tr> <td> Volts (min.)</td> <td colspan="5" style="text-align: center;">277</td> </tr> <tr> <td> Fault Current Withstand (amps)</td> <td colspan="5" style="text-align: center;">277</td> </tr> <tr> <td>60 HZ TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)</td> <td colspan="5"></td> </tr> <tr> <td> High Potential Test (Volts)</td> <td colspan="5"></td> </tr> <tr> <td> 1 minute</td> <td colspan="5" style="text-align: center;">2000</td> </tr> <tr> <td> 2 seconds</td> <td colspan="5" style="text-align: center;">2500</td> </tr> <tr> <td> Open Circuit Voltage Test (Volts)</td> <td colspan="5" style="text-align: center;">205-255</td> </tr> <tr> <td> Short-Circuit Current Test (Amps)</td> <td colspan="5"></td> </tr> <tr> <td> Secondary Current</td> <td colspan="5"></td> </tr> <tr> <td> Input Current</td> <td style="text-align: center;">0.60-0.75</td> <td style="text-align: center;">0.35</td> <td style="text-align: center;">0.15</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> </tr> <tr> <td></td> <td style="text-align: center;">0.55</td> <td style="text-align: center;">0.25</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> </tr> </table>		INPUT VOLTS	120	277				CIRCUIT TYPE	HX-HPF					POWER FACTOR (min)	90%					REGULATION						Line Volts	±5%					Lamp Watts	±10%					LINE CURRENT (Amps)						Operating	0.45	0.20				Open Circuit	0.90	0.40				Starting	0.50	0.22				UL TEMPERATURE RATINGS						Insulation Class	H(180°C)					Coil Temperature Code	1029					MIN. AMBIENT STARTING TEMP.	-20°F or -30°C					NOM. OPEN CIRCUIT VOLTAGE	230					INPUT VOLTAGE AT LAMP DROPOUT	85	195				INPUT WATTS						RECOMMENDED FUSE (Amps)	3	1				CORE and COIL						Dimension (A)	0.80					Dimension (B)	2.10					Weight (lbs.)	3.5					Lead Lengths	12"					CAPACITOR REQUIREMENT						Microfarads	5.0					Volts (min.)	277					Fault Current Withstand (amps)	277					60 HZ TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)						High Potential Test (Volts)						1 minute	2000					2 seconds	2500					Open Circuit Voltage Test (Volts)	205-255					Short-Circuit Current Test (Amps)						Secondary Current						Input Current	0.60-0.75	0.35	0.15	-	-		0.55	0.25	-	-	-
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ADVANCE

O'HARE INTERNATIONAL CENTER · 10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018 05/13/99
 Customer Support/Technical Service: Phone: 800-372-3331 · Fax: 630-307-3071
 Corporate Offices: Phone: 800-322-2086

Lamp FMH70

16/2/2007



MasterColor CDM-T 70W/830 G12 T6 1CT

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

Features / Benefits

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

Applications

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

Notes

- Requires a ballast specified or approved for Philips Metal Halide lamp or one designed to the indicated ANSI Standard. A pulse ignitor is required.

Sockets and wiring must withstand starting pulse. (391)

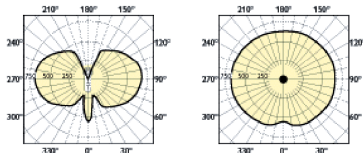
- Supply volts must be \pm 5% of rated ballast line volts for reactor type and \pm 10% for CWA or electronic ballasts. (392)
- UV filtered design (FadeBlock™). (396)
- Operate only on thermally protected ballasts (397)
- MasterColor® Metal Halide Lamps are not recommended for use on dimmers and are not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

Product data

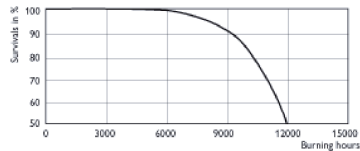
Product Number	223370
Full product name	MasterColor CDM-T 70W/830 G12 T6 1CT
Ordering Code	CDM70/T6/830
Pack type	1 Lamp in a Folding Carton
Pieces per Sku	1
Skus / Case	12
Pack UPC	046677223373

1

Product data	
EAN2US	
Case Bar Code	50046677223378
Successor Product number	
Watts[W]	70W
Color Code	830 [CCT of 3000K]
Base	G12
Bulb	T6 [T 19mm]
Packing Type	1CT [1 Lamp in a Folding Carton]
Packing Configuration	12
Bulb Finish	Clear
Operating Position	Universal[Any or Universal (U)]
Rated Avg. Life[hr]	12000
ANSI Code HID	M139/E
System Power EL[W]	83
Lamp Voltage[V]	88
Dimmable	No
Mercury (Hg) Content[mg]	
Color Rendering Index[Ra8]	84
Color Designation	Warm White
Color Description	830 Warm White
Color Temperature[K]	3000
Initial Lumens[Lm]	6600
Design Mean Lumens[Lm]	4950
Overall Length C[mm]	103
Diameter D[mm]	20
Light Center Length L[in]	2.21875
Max Overall Length (MOL) - C[in]	3.9375
Diameter D[in]	0.75

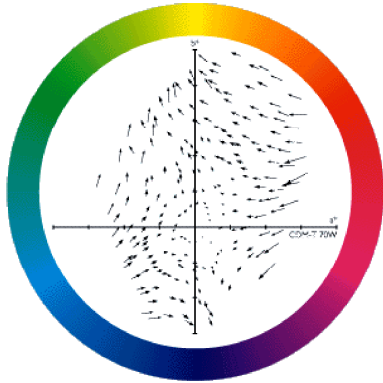


CDM-T 70W/830/942

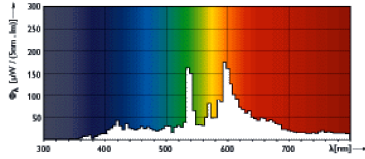


CDM-T 70W/150W/830/942

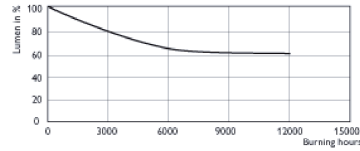
PHILIPS



CDM-T 70W/830

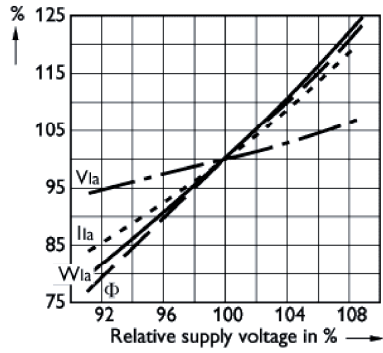


CDM-T/830

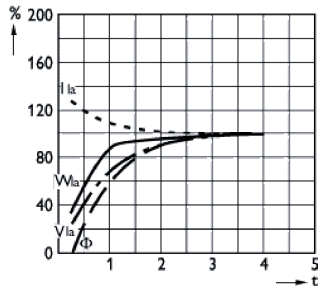


CDM-T 70W/150W/830/942

PHILIPS

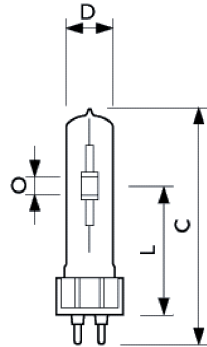


CDM-T/830



CDM-T

PHILIPS



CDM-T

	C		D		L		O	
Full product name	Max	Max	Min	Nom	Max	Min	Max	Min
Master Color CDM-T 70W/830 G12 T6 ICT	103	20	55	56	57	6.67		
			O					
	Nom		Max					
	7		7.33					





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

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

Features / Benefits

- Excellent color rendering.
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Notes

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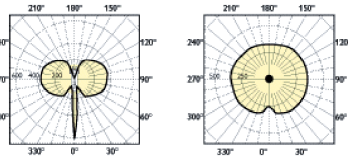
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Product data

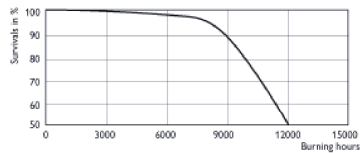
Product Number	223289
Full product name	MasterColor CDM-T 35W/830 G12 T6 1CT
Ordering Code	CDM35/T6/830
Pack type	1 Lamp in a Folding Carton
Pieces per Sku	1
Skus / Case	12
Pack UPC	04667723281

PHILIPS

Product data	
EAN2US	
Case Bar Code	50046677223286
Successor Product number	
Watts[W]	35W
Color Code	830 [CCT of 3000K]
Base	G12
Bulb	T6 [T 19mm]
Packing Type	1CT [1 Lamp in a Folding Carton]
Packing Configuration	12
Bulb Finish	Clear
Operating Position	Universal[Any or Universal (U)]
Rated Avg. Life[hr]	12000
ANSI Code HID	M130/E
System Power EL[W]	44
Lamp Voltage[V]	88
Dimmable	No
Mercury (Hg) Content[mg]	
Color Rendering Index[Ra8]	81
Color Designation	Warm White
Color Description	830 Warm White
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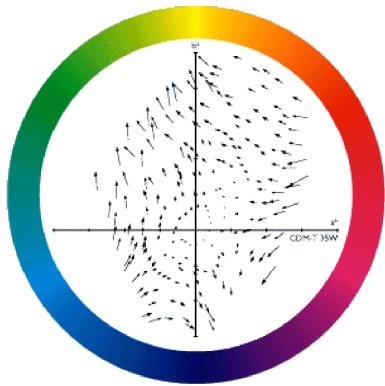


CDM-T 35W/830/930

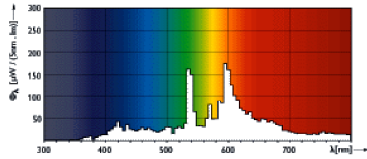


CDM-T 35W/830

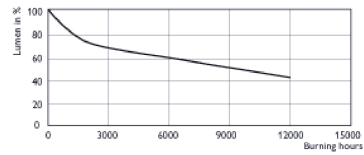




CDM-T 35W/830

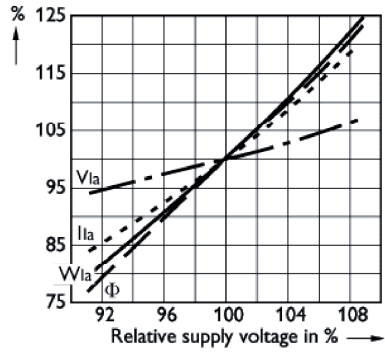


CDM-T/830

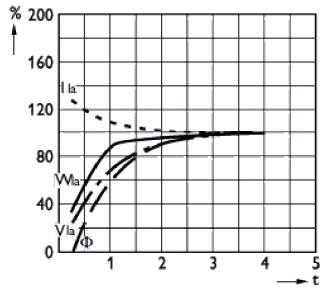


CDM-T 35W/830



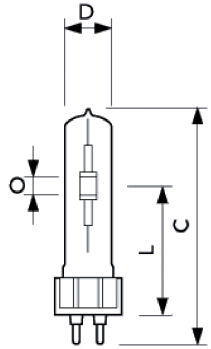


CDM-T/830



CDM-T

PHILIPS



CDM-T

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Full product name	Max	Max	Min	Nom	Max	Min	Max	Min
MasterColor CDM-T 35W/ 830 G12 T6 ICT	103	20	55	56	57	4.69		
			O					
	Nom		Max					
	4.9		5.11					

