APPENDIX H

Lighting Basis of Design Details

Last Updated 10/12/2018

LPASC 2'x2'
LED Low Profile Recessed Troffer

The LPASC's low profile design makes it ideal for shallow plenum applications. Best in class configurable lumen packages and efficiencies that target DLC Standard/ Premium. This fixture delivers even illumination with excellent, low angle brightness control throughout the space. Available in 1x4, 2x2, and 2x4.

Features & Specifications

Optical System

- High transmission impact resistant diffuse acrylic radius lens eliminates bright spots from individual LED's and provides high vertical illumination and visual comfort.
- Use of closely spaced medium-power, high brightness chips minimizes pixelation and provides uniform lens luminance.
- Available in 5000K, 4000K, 3500K and 3000K color temperatures.
- Minimum CRI of 80. Optional 90 CRI available, consult factory for lead times.
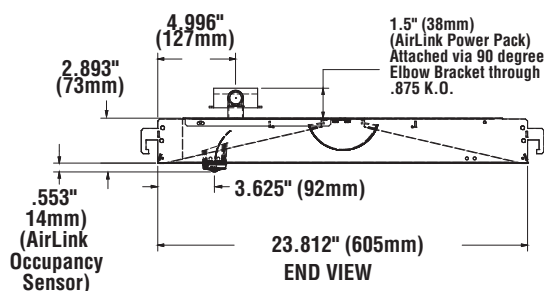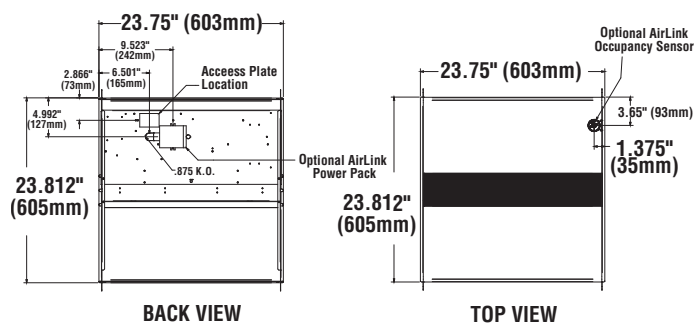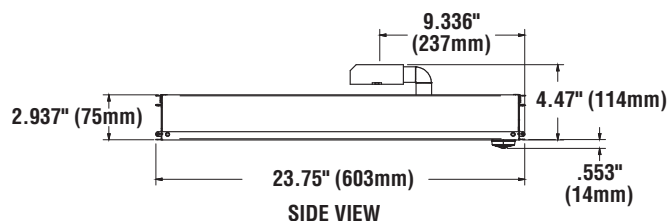
Electrical

- High-performance driver features over-voltage, under voltage, short-circuit and over temperature protection.
- 0-10 volt dimming (1% - 100%) standard.
- Standard Universal voltage (120-277 Vac) Input 50/60 Hz or optional High voltage (347Vac).
- L70 Calculated Life: >100k Hours (See Lumen Maintenance on Page 2)
- Total harmonic distortion: <20%
- Power factor: >.95
- Input power stays constant over life.
- Optional 120v-277v integral emergency battery pack is available to meet critical life-safety lighting requirements. The 90-minute batteries provide constant power to the LED system, ensuring code compliance. A test switch/indicator button is installed in the housing for ease of maintenance.

Controls

- LSI AirLink™ controls featuring Lutron Clear Connect makes each luminaire controllable, creating a wireless communication with other AirLink™ control devices such as dimmers, switches, occupancy sensors and photocontrols. The integrated sensor is both a passive infrared motion detector and photocell. See Page 2 for the coverage diagram.
- Step-level dimming option allows system to be switched to 50% power for compliance with common energy codes while maintaining fixture appearance.
- Sensor Ready Drivers available; consult factory for limitations.

Dimensions

SIDE VIEW
9.336" (237mm)
2.937" (75mm)
4.47" (114mm)
23.75" (603mm)
.553" (14mm)

BACK VIEW
23.75" (603mm)
9.523" (242mm)
2.866" (73mm)
6.501" (165mm)
Access Plate Location
4.992" (127mm)
.875 K.O.
23.812" (605mm)
Optional AirLink Power Pack

TOP VIEW
Optional AirLink Occupancy Sensor
23.75" (603mm)
3.65" (93mm)
1.375" (35mm)
23.812" (605mm)

END VIEW
4.996" (127mm)
2.893" (73mm)
1.5" (38mm) (AirLink Power Pack) Attached via 90 degree Elbow Bracket through .875 K.O.
.553" 14mm) (AirLink Occupancy Sensor)
3.625" (92mm)
23.812" (605mm)

Features & Specifications (Cont.)

Construction

- Rigid housing is die-formed 20-gauge cold rolled steel for consistency and strength.
- End plates come equipped with integral NEC compliant earthquake clips.
- Ultra-slim < 3" luminaire height and lightweight design effectively target a broad range of plenum/wall spaces and allow for easy installations.
- Below plenum room side access to optical chamber and driver compartment via pressure removable radius lens and side panel.
- Luminaire is proudly manufactured in the U.S.
- Luminaire is painted after fabrication following treatment with phosphate rust inhibitor. Finish coating of housing reflecting surfaces is with high-reflectance white (minimum 92%) polyester powder.

Installation

- Luminaire installs by lifting it through grid ceiling and resting it on the T-bars.
- Luminaire installs onto standard 15/16" and narrow 9/16" T-grid ceiling systems.
- An accessory flange kit is available for installing into drywall or plaster.

Warranty

- LSI LED Fixtures carry a 5-year warranty.
- 1 Year warranty on optional Battery Back Up. Test regularly in accordance with local codes.

Listings

- Listed to UL 1598 and UL 8750 for 25°C Ambient applications.
- IC Rated.
- RoHS Compliant.
- American Recovery and Reinvestment Act Funding Compliant.
- Lighting Facts Approved.
- Suitable For Damp Locations.

Performance

DELIVERED LUMENS*

Lumens	3000K		3500K		4000K		5000K		
	Delivered Lumens	Efficacy	Delivered Lumens	Efficacy	Delivered Lumens	Efficacy	Delivered Lumens	Efficacy	Wattage
20L	2017	110.8	2134	117.3	2092	114.9	2231	122.6	18.2
25L	2460	110.8	2603	117.3	2552	115.0	2722	122.6	22.2
32L	3115	110.5	3296	116.9	3231	114.6	3446	122.2	28.2

*LED Chips are frequently updated therefore values are nominal.

ELECTRICAL DATA*

Lumens	Watts	120V	208V	240V	277V	347V
20L	18.2	0.152	0.088	0.076	0.066	0.052
25L	22.2	0.185	0.107	0.093	0.080	0.064
32L	28.2	0.235	0.136	0.118	0.102	0.081

*Electrical data at 25C (77F). Actual wattage may differ by +/-10%.

RECOMMENDED LUMEN MAINTENANCE[1]

Ambient Temp C	0 hrs.[2]	25K hrs.[2]	50K hrs.[3]	75K hrs.[3]	100K hrs.[3]
25	100.00%	95.02%	92.33%	89.71%	87.17%

1 - Lumen maintenance values at 25°C are calculated per TM-21 based on LM-80 data and in-situ luminaire testing.
2 - In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times (6X)the IESNA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip).
3 - In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times NA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip).

APPLICATION REFERENCE*

Lumens	Spacing	Lumens	LPW	W/FT²	Avg Fc	# of Luminaires
32L	10' x 8'	3231	115	0.353	37	20
32L	8' x 8'	3231	115	0.441	47	25
32L	8'x 6'	3231	115	0.529	56	30

*Based on a 9' Mtg.Ht., 4K color Temp, 80/50/20 reflectances, 2.5' work plane, LLF:1.0, 40' x 40' Room

Luminaire Ordering Guide

TYPICAL ORDER EXAMPLE:	**LPASC22 LED 32L UNV DIM1 40 ALC EM U**

Family/Size	LED Gen	Lumen Package*	Voltage	Driver	Color Temperature	Controls	Options	Packaging
LPASC22 - (2x2)	LED	20L = 2000 25L = 2500 32L = 3200 *Consult factory for programmable wattages and lumen packages.	UNV - 120-277V HV - 347V[1]	DIM1 - Dims to 1% (0-10 volt dimming) LDE1 - Hi-Lume 1% (With Soft On Fade To Black)[4] L3D -Lutron Hi-Lume 1%[4] LDE5 - Lutron 5-Series[4] SR - Sensor Ready[4] SD50 – Step Dimming Driver to 50%	30 - 3000K[3,4] 35 - 3500K 40 - 4000K 50 - 5000K	BLANK = (No Controls) ALC - AirLink Controller ALOS - AirLink Controller w/ Occupancy Sensor ALVS - AirLink Controller w/ Vacancy Sensor	EM10- 10 watt Emergency Battery Backup FC1 - 6' 3/8" (3) #18 Leads (For Use In Non-Dimming Applications) FC15D - 6' 3/8" (5) #18 Leads (For Use In Dimming Applications 90C - 90 CRI[3,4]	U - Single Pack JP - Job Pack

Accessory Ordering Information (Accessories are field installed)

Description	Order Number
Flange Kit 2x2	FK22

AirLink™ Control Accessories

Order as separate catalog number. Visit http://www.lsi-airlink.com for complete listing of AirLink™ controls.

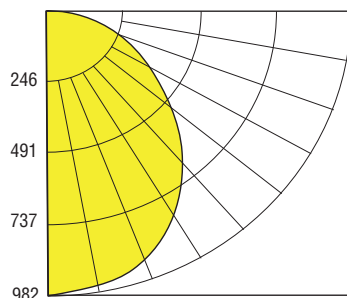| Wireless switches	Catalog number	Part Number	Wireless Occupancy Sensors	Part Number
On/Off & Raise Lower	ALWS 3B-(color)-KIT[2]	6241032	Wireless 360° 400 ft², Ceiling Mount	624094
			Wireless 180° 3000 ft², Wall Mount	632617
Wireless Photocell controls	**Catalog number**	**Part Number**	Wireless 90° 2500 ft², Corner Mount	624096
On/Off & Dimming	ALCM-W-PC	624090	Wireless, Hallway 150 ft Length	632620
Commission Laser Kit (See Laser warnings)		634574		

Footnotes:

1 - Not available with AirLink
2 - Available colors are White, Ivory and Light Almond (WH, IV, LA)
3 - Consult Factory for lead times
4 - Consult with factory

Photometry

LPASC22 LED 32L 40

Luminaire photometry has been conducted by a NVLAP accredited testing laboratory in accordance with IESNA LM-79-08. As specified by IESNA LM-79-08 the entire luminaire is tested as the source resulting in a luminaire efficiency of 100%.

See http://www.lsi-industries.com/products/led-lighting-solutions.aspx for detailed photometric data.

ZONAL LUMEN SUMMARY		
ZONE	LUMENS	% OF LUMINAIRE
0-20	358.9	11.1%
0-30	774.0	24.0%
0-40	1,285.3	39.8%
0-60	2,350.5	72.8%
0-80	3,125.5	96.7%
0-90	3,230.6	100.0%
10-90	3,139.0	97.2%
20-40	926.4	28.7%
20-50	1,471.0	45.5%
40-70	1,512.1	46.8%
60-80	775.0	24.0%
70-80	328.2	10.2%
80-90	105.1	3.3%
90-180	0	0
0-180	3,230.6	100

Controls

AirLink™
enabled by Lutron®

AirLink is LSI's wireless indoor lighting control system. This fixture is compatible with the AirLink system & contains a factory-installed fixture controller (ALC) & sensor (ALOS/ALVS). For further information on these components, you can view their specsheets at www.lsi-airlink.com/airlink

Applications

• Small offices, conference rooms, lounges, classrooms

Features

• Minimum Light Level Setting (optional). Certain applications, such as hallways, may require that the lights never turn off. For these areas, select the minimum light level option and the load will lower to programed low-end level

• Daylighting dims lights down to OFF. Occupancy sensor must go unoccupied (vacant) in order for the fixture sensor to turn the lights off

• Occupancy sensor timeout (fixture sensor): 15 minutes

• Power failure memory: If power is interrupted, connected loads will return to the previous level

• Low-end trim adjustment (default is 1V or ballasts/drivers minimum for Lutron EcoSystem ballasts/drivers). High-end trim adjustment (default is 10V or 100% for Lutron EcoSystem ballasts/drivers)

• Includes integrated power measurement circuit that provides data to the wireless hub with +/_ 2% accuracy or 0.5W whichever is higher

• Passive infrared motion detection with exclusive Lutron XCT Technology for major and minor motion detection

• Up to 300 ft² (27.9 m²) major motion coverage and 150 ft² (13.9 m²) minor motion coverage & 360˚ field-of-view

• Daylight sensor has simple, automatic calibration straight out-of-the-box

• Designed to give a linear response to changes in perceived light level. Detects ambient light level changes from 0 to 150 fc (0 to 1600 lx)

Range

Wireless Sensors & Controls must be located within 60ft (18m) line of sight or 30ft (9m) through walls of the associated control module

Major motion: Movement of a person entering or passing through an area

Minor motion: Movement of a person occupying an area and engaging in small activities (e.g., reaching for a telephone, turning the pages of a book, etc.)