

THINKING AHEAD FOR DOMESTIC SSL MANUFACTURING

For LED & OLED Luminaires

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VP Engineering, Indoor

DOE SSL R&D Workshop

Long Beach, CA January 31st 2017

- Who We Are
- Why There
- Why Here
- How Here
- Summary

Who We Are

Acuity who?

Who We Are

NET SALES

(\$Billions, FY)



- 98% North America
- ~ 50% New Construction / 50% Renovation
- ~ 85% Non-Residential / 15% Residential

OPERATIONS

- 20 Manufacturing Facilities
- 12,000 Associates

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AcuityControls

Aculux

AEL American Electric Lighting

ANTIQUE STREET LAMPS

CARANDINI

DISTECH CONTROLS

gotham

HEALTHCARE LIGHTING

HOLOPHANE

HYDREL

indy

Juno

LITHONIA LIGHTING

MARK ARCHITECTURAL LIGHTING

nLIGHT

Peerless

ROAM

sensorswitch

SUNOPTICS

WINONA

AcuityBrands

Why there?

Why There

It works if

- Limited SKUs
- Material vs Labor Costs
- Shipping Costs
 - > Water vs Air
 - > Sizes getting smaller



But there are risks

- Success
- Long lead-time
(Design + Manufacturing + Shipping)
- Market shift (Cost and/or Performance)



Why here?

Why Here

Needed if you have

- Massive SKU count



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Needed if you have

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FEATURES & SPECIFICATIONS

INTENDED USE — The VT Series Volumetric LED Troffer (VTL) combines the aesthetics and high performance with intelligent LED engines for applications: offices, schools, retail locations and hospitals. High efficacy light engine delivers long life and excellent color, ensuring superior quality lighting installation that is highly efficient and sustainable. Multiple lumen packages and driver options provide solutions for all your lighting applications. Prismatic light controls provide design flexibility and ease of installation and optimize energy savings.

CONSTRUCTION — Rugged, one-piece solid-cast die-cast polycarbonate, painted after fabrication with embedded facets. Impact modified, single clear acrylic diffuser provides excellent tracking and wide distribution. Flat plates include integral 1/4 inch clips. Fixtures may be recessed and wired in continuous rows. Total fixture height is only 4-1/2".

OPTICS — Volumetric illumination is achieved by creating an optimal mix of light levels, patterns, vertical and horizontal work surfaces. The interior space, objects and occupants is more balanced, complementary luminaire placement is required for the effect. reflector cavity softens and distributes light into the space while providing contrast between the fixture and ceiling. Slanted-mold plates provide a smooth, low-glare surface. The fixture provides LED concealment, even illumination across the fixture and improved beam spread.

Listing Number:
Name:
Type:



VT Series Volumetric LED Troffer

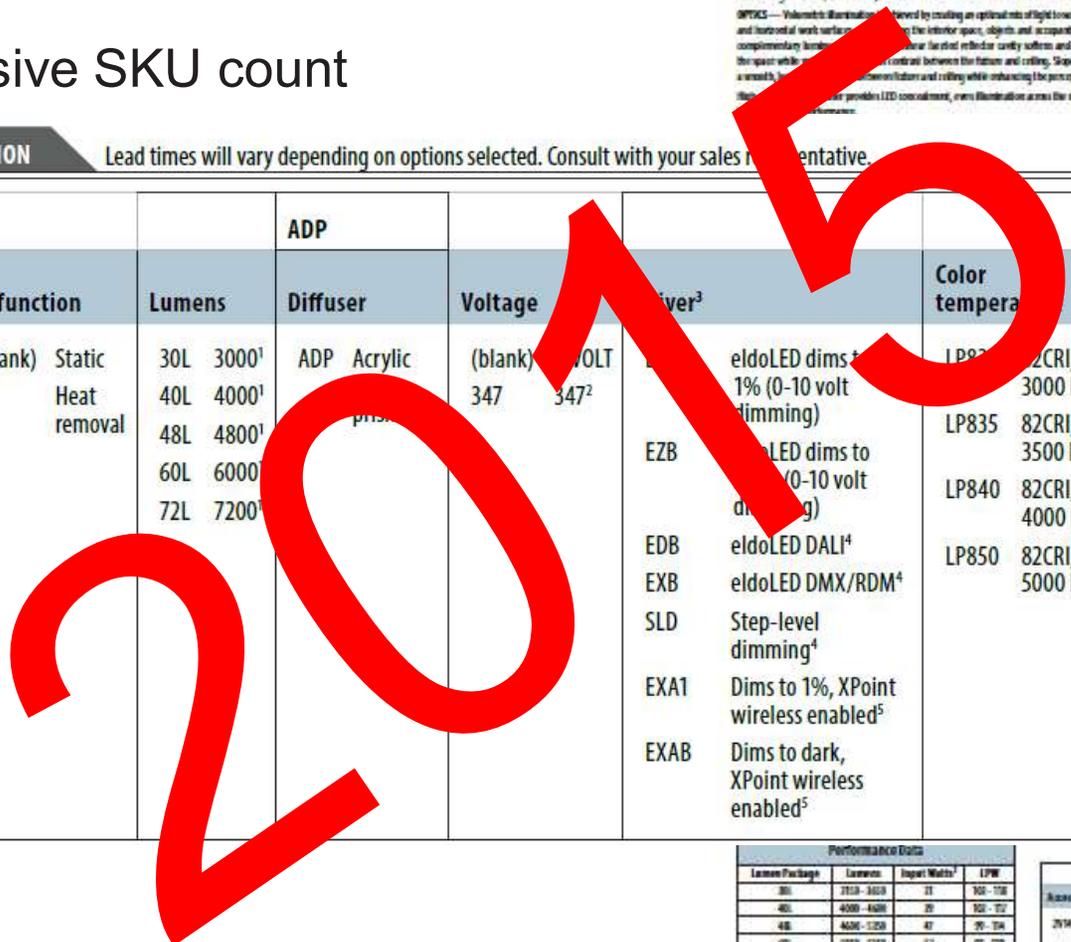
2VTL

Example: 2VTL4 48L ADP EZ1 LP835 N80

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Series	Air function	Lumens	Diffuser	Voltage	Driver ³	Color temperature	Controls ⁶	Options
2VTL4 2X4 VTL	(blank) Static H Heat removal	30L 3000 ¹ 40L 4000 ¹ 48L 4800 ¹ 60L 6000 ¹ 72L 7200 ¹	ADP Acrylic	(blank) 120VLT 347 347 ²	EZB eldoLED dims to 1% (0-10 volt dimming) EZB eldoLED dims to 1% (0-10 volt dimming) EDB eldoLED DALI ⁴ EXB eldoLED DMX/RDM ⁴ SLD Step-level dimming ⁴ EXA1 Dims to 1%, XPoint wireless enabled ⁵ EXAB Dims to dark, XPoint wireless enabled ⁵	LP835 82CRI, 3000 K LP835 82CRI, 3500 K LP840 82CRI, 4000 K LP850 82CRI, 5000 K	(blank) No controls N80 nlight® with 80% lumen management N80EMG nlight® with 80% lumen management For use with generator supply EM power N100 nlight® without lumen management N100EMG nlight® without lumen management For use with generator supply EM power	EL7L 700 lumen battery pack EL14L 1400 lumen battery pack CP Chicago plenum



Lumen Package	Lumens	Input Watts ⁷	LPW
30L	2910 - 3010	21	130 - 138
40L	4000 - 4080	29	132 - 137
48L	4630 - 4720	47	99 - 104
60L	5910 - 6030	52	112 - 119
72L	6710 - 7000	66	102 - 111

2VTL P/N:	Order in adjacent fixture mounting (flush with 9/16" T-bar) for 2x4 fixture
DGASH:	Drywall ceiling adaptor, used installation ⁷

1. Approximate lumen output.
2. Consult factory for availability. Not available with 0/1/10 or 1/10 flashing points.
3. Actual wattage may differ by +/- 10% when operating between 120-277V +/- 10%.
4. Not Available with N80, N80EMG, N100, or N100EMG.
5. Cableway not included. Dependent on site construction. Visit www.lightingcontrols.com/Ordering for more information.
6. EMC limits on 100 or 120.
7. When DGASH is used, order 2VTL P/N is necessary.

$$2 \times 5 \times 1 \times 2 \times 7 \times 4 \times 4 \times 3$$

= 6720 Options

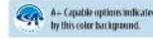
Why Here

Needed if you have

- Massive SKU count



2BLT Volumetric Recessed Lighting 2'x4'



ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: 2BLT4 40L ADP EZ1 LP840

2BLT4		Lumens ¹		Diffuser		Voltage		Driver		Color temperature	
Series	2x4 BLT	(blank) Static A Air supply/return ²	Standard efficiency (>100 LPW)		High efficiency ^{3,4} (>130 LPW)		ADP Curved, linear prisms ADSM Curved, smooth SDP Square, linear prisms SDSM Square, smooth Includes trim rings to match sensor⁵ version ADPT Curved, linear prisms AD5MT Curved, smooth SDPT Square, linear prisms SD5MT Square, smooth	(blank) MVOLT 120 120V 277 277V 347 347V ⁶	EZ1 eidoLED dims to 1% (0-10 volt dimming) SLD Step-level dimming ⁷ LE3 Lutron Ecosystem driver dims to 1% ^{8,9}	LP830 82CRI, 3000 K LP835 82CRI, 3500 K LP840 82CRI, 4000 K LP850 82CRI, 5000 K LP930 90CRI, 3000K LP935 90CRI, 3500K LP946 90CRI, 4000K LP950 90CRI, 5000K	
			30L 3000	40L 4000	40L HE 4000	48L HE 4800					
			40L 4000	48L 4800	60L HE 6000	72L HE 7200					
			48L 4800	60L 6000	72L HE 7200	85L HE 8500					
			60L 6000	72L 7200							
			72L 7200								

Controls		Occupancy control ¹⁴		Individual Control		Options	
(blank)	No nLight ¹⁵	(blank)	No sensor control	MSD/AD5X	PIR integral occupancy sensor with automatic dimming control photocell ¹²	EL7L	700 lumen battery pack ¹⁶
N80	nLight ¹⁵ with 80% lumen management	nLight Wired Networking		MSD/POT/AD5X		EL14L	1400 lumen battery pack ¹⁶
N80EMG	nLight ¹⁵ with 80% lumen management for use with generator supply EM power ⁴	NES7	nLight ¹⁵ nES 7 PIR integral occupancy sensor ¹¹	MSD/POT/AD5X		EL14L SD	1400 lumen battery pack with self-diagnostic testing feature ^{14,16}
N100	nLight ¹⁵ without lumen management	NESPOT7	nLight ¹⁵ nES PDT 7 dual technology integral occupancy control ¹¹	MSD/POT/AD5X		CP	Chicago plenum ¹⁷
N100EMG	nLight ¹⁵ without lumen management for use with generator supply EM power ⁴	NES/AD5X	nLight ¹⁵ nES 7 AD5X PIR integral occupancy sensor with automatic dimming photocell ¹¹	MSD/POT/AD5X		BGTD	Bodine Generator Transfer Device ¹⁸
NLTAIR	nLight AIR enabled ⁹	NES/POT/AD5X	nLight ¹⁵ nES PDT 7 dual technology integral occupancy sensor with automatic dimming photocell ¹¹	MSD/POT/AD5X		PWS1836	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit
		nLight Wireless Networking		nLight Wireless Zone		PWS1846	6' pre-wire, 3/8" diameter, 18 gauge, 2 circuit
		RES7N	nLight AIR PIR integral occupancy sensor with automatic dimming photocell for Networking Capabilities	RESZ		PWS1846 PWSLV	Two cables: one 6' pre-wire, 3/8" diameter, 18 gauge, 2 circuits; one 6' pre-wire, 3/8" diameter, 18 gauge, purple and gray ¹⁷
						PWS1856V	6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit w/low voltage purple and grey wires ¹⁷
						GLR	Fast-blowing fuse ¹⁹
						GMP	Slow-blowing fuse ¹⁹
						NPLT	Narrow pallet
						RBL	RELOC ²⁰ -ready luminaire ¹⁴
						LATC	Earthquake clip
						DWAM	Anti-Microbial paint
						JP16	Job packaging
						IP5X	Gasketed diffuser compartment to meet IP5X rating ¹⁹

Accessories next page

Notes

- Air supply/return option only available with ADP, ADSM, SDPT, and SDSMT diffuser options.
- Approximate lumen output.
- All versions may not achieve 130+ LPW index to photometry on www.acuitybrands.com.
- Air supply/return option, 90 CRI, and versions with integral sensor trim rings may not achieve 130 LPW.
- Not available with SLD (E1), or (E1)4L options.
- Not available with N80, N80EMG, N100, N100EMG, NLTAIR, or occupancy control.
- Not available with controls, occupancy controls, or PWS options. Consult factory for 18 Lumen dimming.
- nLight EMG option requires a connection to existing light network. Power is provided from a separate N80 or N100 enabled fixture.
- Must order with RES7N or RES7Z sensor. Only available with E21 driver. Not available with 72L, 72LHE, or 85LHE options.
- Must specify diffuser with trim rings. See sensor options on page 6.
- Requires N80, N80EMG, N100, or N100EMG.
- Only available with E21 driver option. 0-10v dimming wires not accessible via access plate.
- When using pre-wire option, use PWS1846 or PWS1846 PWSLV.
- For more information, please see the [PSS02 specification sheet](#).
- Not available with N80, N80EMG, N100, or N100EMG.
- Must specify voltage. Requires ISE labeling, voltage specific. Consult factory for options.
- Not available with nLight wired/wireless network or individual controls.
- Must specify voltage, 120 or 277, with GLR and GMP listing.
- For ordering logs, consult [IBS_2013](#).
- Not available with air supply/return or Wired Networking (NES,) and Individual Control (POT,) sensors.



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2BLT-234

> 200,000 Options

Why Here

Needed if you have

- Massive SKU count
- To reduce shipping costs
 - > Size
 - > Weight
- Shorter Lead-times



Why Here

Needed if you have

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 - > Weight
- Shorter Lead-times
- Complex designs



Why Here

Needed if you have

- Massive SKU count
- To reduce shipping costs
 - > Size
 - > Weight
- Shorter Lead-times
- Complex designs
- Innovation

VLC

BLE

TLA

IPS

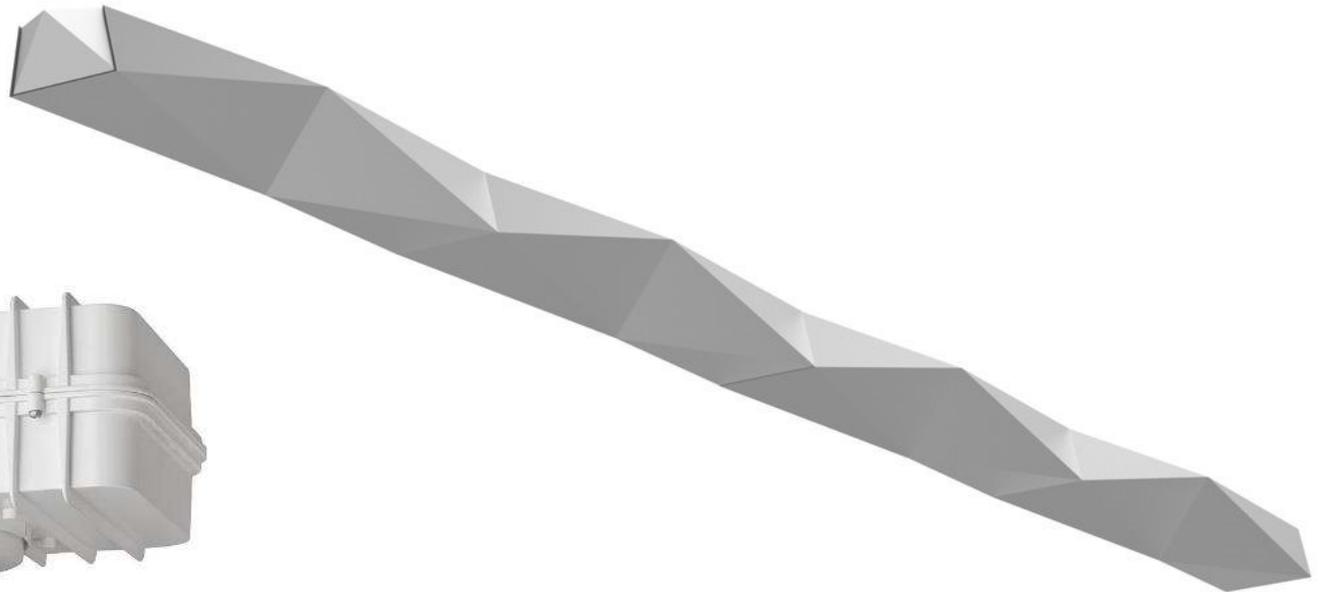
IOT

How here?

How here

Possible if you have

- Reduced Labor Costs



How Here

LEAN Manufacturing is Key to reducing Labor Costs

- Visual Management
- Process Mapping
- 5S (Simplify, Straighten, Scrub, Stabilize, Sustain)
- Six Sigma
- Kaizen
- Identify and eliminate wastes

How Here

Competition Feeds on our Waste

Our Goal

The
relentless
pursuit and
elimination
of WASTE



How Here

BEFORE



28 people
producing
280 units/hr. in
5000 sq. ft.

16 people
producing
300 units/hr.
in 2200 sq. ft.
with 2 cells



AFTER

How Here



How Here



How Here



How Here



How Here



Investment

Summary

Summary

- For the future we expect
 - > More North American Vertical Integration
 - > More Controls
 - > More Complexity
 - > More Investment
 - > More Innovation

Thank You