

ITEM OPPORTUNITY SYNOPSIS

Scouting Number:	2024-211
Name of the item to be scouted:	Exit Signs and Emergency Battery Units (EBUs)
State item to be used in:	Vermont
Describe the Item:	
Please describe the item application/the end use of the item.	Emergency lighting to illuminate path of egress and shown direction of egress travel
Supplier Information:	
Type of Supplier Being Sought (select from the list below):	
Manufacturer	x
Contract Manufacturer	
Distributor	
Other (Please Specify)	
Reason for Scouting Submission (select from the list below)	
2nd Supplier	
Price	
Re-Shore	
Past supplier no longer available	
New Product Startup	
BABA	x
Other (Please Specify)	
Summary of Technical Specifications and Performance Requirements:	
Describe the manufacturing processes (elaborate to provide as much detail as possible)	Factory formed and built. Extruded aluminum/plastic housings, electronic assembly.
Provide dimensions / size / tolerances / performance specifications of the item	EBUs shall provide a minimum of 1 foot-candle (fc) along the path of egress. Exit signs shall be illuminated by AC or battery power. Battery provided exit signs shall have test switch. Exit signs shall not exceed 4W of operating power.
List required materials needed to make the product, including materials of product components, if applicable	plastic, glass, steel copper, aluminum, LEDs, Batteries
Are there applicable certification requirements?	
Yes	x
No	
Please explain:	UL
Are there any applicable regulations that apply to the production of this item?	
Yes	x
No	
Please explain:	Compliant with VT ADA guidelines
Are there any other standards / requirements?	
Yes	x
No	
Please explain:	Exit signs and EBUs shall conform to latest NEC and NFPA 101
NAICS CODES:	
NAICS 1	335122 Commercial, industrial, and institutional electric lighting fixture manufacturing
NAICS 2	
Additional Comments:	
Additional technical comments:	
Volume and Pricing:	
Estimated Potential Business Volume (i.e. #units per day, month, year):	Exit Signs/EBUs – · X1 Edge-Lit Exits = Quantity 6 (Currently BAA) \$400 · X1W Edge-Lit Exits (wall mount) = Quantity 3 (Currently BAA) \$400 · X2W Weatherproof – Quantity 1 (Currently BAA) \$300 · X3W ADA edge-lit exit signs wall mount = Quantity 2 (nothing found) \$300 · EBU Emergency battery unit BOH – Quantity 1 (Currently BAA) \$200
Estimated Target Price/Unit Cost Information:	Estimated unit costs are below: X1 Edge-Lit Exits = \$400 X1W Edge-Lit Exits (wall mount) = \$400 X2W Weatherproof –\$300 X3W ADA edge-lit exit signs wall mount = \$300 EBU Emergency battery unit BOH –\$200

Delivery Requirements:	
When is it needed by? (Immediate, 30 days, 6 months, etc.)	Construction is scheduled to start in February of 2025
Describe packaging requirements (i.e. individually/group packaging, etc.)	Individually wrapped
Where will this item be shipped?	Norwich University, Northfield, VT
Additional Comments:	
Is there other information you would like to include?	Contact information for questions including BABA/Buy American compliance: Jones Architecture Alya Staber alya@jonesarch.com Please copy scouting@nist.gov on all correspondence.



FEATURES & SPECIFICATIONS

INTENDED USE — Provides a minimum of 90 minutes illumination for the rated wattage upon loss of AC power to meet and exceed code required emergency lighting. Ideal for applications requiring attractive LED unit equipment with quick installation and unparalleled performance for mounting heights from 7.5' to 30'. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.**
[Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.](#)

CONSTRUCTION — The housing is a standard white (black optional) thermoplastic with a compact and low-profile contemporary design. It is 5VA flame rated, impact-resistant, scratch-resistant and corrosion proof. The UV-stable resin resists discoloration from natural and man-made light sources. There is a low-profile, integrated and back-lit test switch with an easily visible multi-color LED status indicator. The back-plate contains a universal j-box mounting pattern to facilitate ease of installation on a wide variety of j-boxes and the front housing allows tool-less access for ease of maintenance.

The lamp heads have a unique track-and-swivel arrangement permitting full range of direction of optical aiming.

OPTICS — The ELM4L features two high-performance LEDs rated at 3.3 watts per lamp head and delivers a total of 640 lumens in a spot pattern (SP640L).

The ELM6L features three high-performance LEDs rated at 5.3 watts per lamp head and delivers a total of 1,100 lumens in a spot pattern (SP1100L).

The typical life of an LED is 10 years. The LED light sources typically never need to be replaced under normal conditions for normal off applications.

CCT: 5000K

ELECTRICAL — Orderable in multiple voltages (see ordering tree for specific voltages.)

Current-limiting charger maximizes battery life and minimizes energy consumption to provide low operating costs. Small battery chargers Certified in the CA Title 20 Appliance Efficiency Database.

Short-circuit protection — current-limiting charger circuitry protects printed circuit board from shorts.

Regulated charge voltage maintains a stable charge voltage over a wide range of line voltages.

Prevents over/undercharging that shortens battery life and reduces capacity. Filtered charger input minimizes charge voltage ripple and extends battery life.

BATTERY: Sealed, maintenance-free nickel-cadmium (ELM4L only) or Lithium Iron Phosphate battery. Optional High-Output (HO option) and Extra High Output (EHO option), LTP battery type only, provides a wide variety of remote capacities and/or extended run-times.

Automatic 24-hour recharge after a 90-minute discharge.

Advanced electrical design provides constant light output throughout the entire discharge period.

Brownout protection is automatically switched to emergency mode when supply voltage drops below approximately 80 percent nominal of 120, 220, 277 or 347. Other input voltages may vary.

AC/LVD reset allows battery connection before AC power is applied and prevents battery damage from deep discharge.

Self-Diagnostics: Continuously monitors AC functionality. Test switch and remote tester (RTKIT accessory) provide manual activation of 30-second diagnostic testing for on-demand visual inspection. Standard derangement monitoring will indicate disconnected battery, charger failure and displays green flashing indicator light while in emergency mode. Single multi-chromatic LED indicator to display two-state charging, test activation and three-state self-diagnostics.

SELF-DIAGNOSTICS and REMOTE TEST (SDRT and AELR option):

Self-diagnostic testing: Five minutes every 30 days and 90 minutes annually. Diagnostic evaluation of lamps, AC to DC transfer, battery charging and condition of microprocessor. Automatic test is easily postponed for eight hours by activating manual test switch or use of remote tester (RTKIT accessory).

AELR option: STAR (Self-testing Automated Reporting) radio transmits monthly and annual test results and diagnostics information for automated reporting requirements.

For more information visit AcuityBrands.com/STAR

INSTALLATION — Wall and ceiling mount standard. Blind-mate connector ensures easy installation and safe maintenance. 7/8" entrance provision at top of unit for standard 1/2" conduit entry. Tool-less removal of front cover from back-plate for ease of installation and maintenance.

LISTINGS — UL damp location listed standard and wet location listed when used with the WPVS accessory, all at 50-104°F (10-40°C). Meets or exceeds all applicable requirements for UL 924, NFPA 101 (current Life Safety code), NFPA 70 (NEC), NOM (Norma Oficial Mexicana), California Energy Commission Title 20 section 1605.3 (W)(4), FCC Title 47, Part 15, Subpart B and OSHA. List and labeled to comply with Canadian Standards C22.2 No. 141-10.

BUY AMERICAN ACT — Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT regulations. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY — 5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

NOTE: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

† Small Battery Chargers Certified in the CA Title 20 Appliance Efficiency Database.

Catalog Number
Notes
Type



Contemporary Commercial LED Emergency Light



ELM4L
640 Lumens

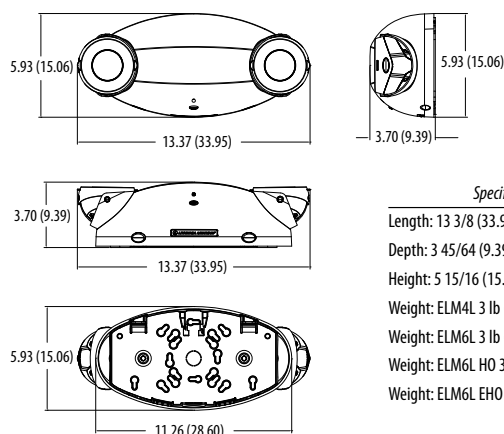
ELM6L
1100 Lumens

LITHIUM IRON PHOSPHATE
NICKEL CADMIUM



MOUNTING

All dimensions are inches (centimeters) unless otherwise indicated.



Specifications

Length: 13 3/8 (33.95)
 Depth: 3 45/64 (9.39)
 Height: 5 15/16 (15.06)
 Weight: ELM4L 3 lb (1.4kg)
 Weight: ELM6L 3 lb (1.4kg)
 Weight: ELM6L HO 3.5 lbs (1.59 kg)
 Weight: ELM6L EHO 3.75 lbs (1.7 kg)



Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect.
 *See ordering tree for details



ELM4L-ELM6L Quantum® LED Contemporary Commercial Emergency Light


 Design Select options indicated by this color background.


 Looking for Contractor Select readily available configurations? Click here to visit Contractor Select™ spec sheet or go to www.contractorselect.com

NICKEL CADMIUM BATTERY MODELS

ORDERING INFORMATION For shortest lead times, configure product using **bolded options**. **Example:** ELM4L

Series	Lamp Type	Housing Color	Voltage	Battery Type	Automatic Testing	Options
ELM4L ¹ 640 lumens, adjustable optics	(blank) SP640L 640 lumen, 6.6 watt, Spot Pattern, two lamp	(blank) White B Black	(blank) 120-277 VAC, 50/60Hz UVOLT 120 - 347 VAC, 50/60Hz	(blank) Nicad	(blank) None	(blank) none WPVS Wet protective vandal shield ² BAA Buy America(n) Act Compliant PM Pendant Mount ³


 Design Select options indicated by this color background.

LITHIUM IRON PHOSPHATE BATTERY MODELS

ORDERING INFORMATION For shortest lead times, configure product using **bolded options**. **Example:** ELM6L UVOLT LTP SDRT

Series ¹	Lamp Type	Housing Color	Voltage	Battery Type	Automatic Testing	Options
ELM4L 640 lumens, adjustable optics	(blank) SP640L 640 lumen, 6.6 watt, Spot Pattern, two lamp	(blank) White B Black	UVOLT 120 - 347 VAC, 50/60Hz	LTP Lithium Iron Phosphate	(blank) none ² SDRT Self-diagnostics, remote test AELR Automated Emergency Lighting Reporting ³	LLH Less lamp heads ⁴ HO High-output battery EHO Extra High-output battery WPVS Wet protective vandal shield ⁵ BAA Buy America(n) Act Compliant PM Pendant mount ⁶
ELM6L 1100 lumens, adjustable optics	(blank) SP1100L 1100 lumen, 10.6 watt, Spot Pattern, two lamp					

Other Accessories: Order as separate catalog number.	
WPVS LRG W	Wet protective vandal shield, white (must be used for wet location applications)
WPVS LRG B	Wet protective vandal shield, black (must be used for wet location applications)
ELA WG1	Wireguard, 13 3/4"H x 15 1/4"W x 6"D (see spec sheet ELA-WG).
RTKIT	Remote test kit, up to 40' away (includes goggles, laser and battery)



ELM4L-ELM6L mounted inside the WPVS

- Notes**
- Extended run-time or remote capacity is standard. New ELMRE and ELMRW style remotes are compatible with both SDRT and non-SDRT versions (see page 4).
 - Only available with ELM4L.
 - SDRT option required. AELR radio transmits monthly and annual test results and diagnostics information for automated reporting requirements. Only available with LTP battery type. Not available with BAA option.
 - ELM4L with LLH (less lamp heads) not available with SDRT. ELM6L with LLH only available with SDRT.
 - Must be ordered when using for wet location applications. WPVS breaks out and ships separately and color will match (ex: WPVS LRG B). Decreases delivered lumens up to 20%. See spec sheet [WPVS](#) for more information.
 - Pendant mount option will include a 12" long 3/8-16 UNC threaded rod and hardware. Not available with any other lengths.

ELM4L-ELM6L Quantum® LED Contemporary Commercial Emergency Light

Enabled with STAR

Emergency Lighting with Self-Testing Automated Reporting (STAR), enables self-testing and automated reporting to aid in life safety code compliance. Build your solution and choose your preferred deployment from Mobile STAR, where test data is logged in each individual unit and broadcast to the CLAIRity™+ app, or Connected STAR, where test data is logged in the STAR Gateway by IOTA® and emailed directly. **Leave the ladders, disruptions and written records behind with emergency lighting solutions with STAR!**

Life Safety Code NFPA 101 testing and reporting requirements for emergency lighting include:

- Testing for 30 seconds every 30 days
- Testing for 90 minutes once a year
- Record keeping and to report to the authority having local jurisdiction

MOBILE STAR

For small scale applications

CONNECTED STAR

For large scale applications

ELM4L-ELM6L Quantum® LED Contemporary Commercial Emergency Light

REMOTES

BATTERY CAPACITY AND LOADING					
Battery Option (LTP Only)	Battery Voltage	Total Capacity 90 Minutes	LP220L (1.2 Watts each) Maximum # Remote Lamps ¹	SP640L (3.3 Watts each) Maximum # Remote Lamps ¹	SP1100L (5.3 Watts each) Maximum # Remote Lamps ^{1,2}
ELM4L LLH LTP	9.6V	11 watts	9	3	2
ELM4L LLH HO	9.6V	22 watts	18	6	4
ELM4L LLH EHO	12.8V	32 watts	26	9	6
ELM4L LTP	9.6V	11 watts	3	1	0
ELM4L LTP HO	9.6V	22 watts	12	4	2
ELM4L LTP EHO	12.8V	32 watts	21	7	6
ELM6L LTP	9.6V	11 watts	0	0	0
ELM6L LTP HO	9.6V	22 watts	9	3	2
ELM6L LTP EHO	12.8V	32 watts	17	6	4
ELM6L LLH LTP	9.6V	11 watts	9	3	2
ELM6L LLH LTP HO	9.6V	22 watts	18	6	4
ELM6L LLH LTP EHO	12.8V	32 watts	26	9	6

- Notes
- These are in addition to the lamp heads on the product.
 - ELMRW not available with SP1100L lamp type. For SP1100L wet location applications, order ELMRE with WPVS.

ELMRE Compatible Remotes^{1,2}

LTP Compatible Remote Accessories: Order as separate catalog number.	
ELMRE LP220L SGL ^{1,2}	Single LED Indoor remote head, white.
ELMRE LP220L T ^{1,2}	Twin LED Indoor remote heads, white.
ELMRE SP640L SGL ^{1,2}	Single LED Indoor remote head, white.
ELMRE SP640L T ^{1,2}	Twin LED Indoor remote heads, white.
ELMRE SP1100L SGL ^{1,2}	Single LED Indoor remote head, white.
ELMRE SP1100L T ^{1,2}	Twin LED Indoor remote heads, white.
ELMRW LP220L DDBTXD SGL ^{1,3}	Single LED Wet Location remote head, dark bronze, 110 lumens
ELMRW LP220L DDBTXD T ^{1,3}	Twin LED Wet Location remote heads, dark bronze, 220 lumens
ELMRW SP640L DDBTXD SGL ^{1,3}	Single LED Wet Location remote head, dark bronze, 320 lumens
ELMRW SP640L DDBTXD T ^{1,3}	Twin LED Wet Location remote heads, dark bronze, 640 lumens

- Notes
- Compatible with SDRT and non-SDRT versions.
 - Order the WPVS accessory for wet location listing and vandal protection.
 - See ELMRW Spec sheet for color options. Available in aluminum glossy, white glossy, black glossy, and dark bronze textured.



ELMRE LP220L SGL



ELMRE LP220L T



ELMRE SP640L SGL



ELMRE SP640L T



ELMRE SP1100L SGL



ELMRE SP1100L T



ELMRW LP220L DDBTXD SGL



ELMRW LP220L DDBTXD T



ELMRW SP640L DDBTXD SGL



ELMRW SP640L DDBTXD T

ELM4L-ELM6L Quantum® LED Contemporary Commercial Emergency Light

SPECIFICATIONS

ELECTRICAL			
Primary Circuit			
Type	Volts	Input amps	Watts
Nicad	120	0.032	3.15
	347	0.036	3.15
Lithium Iron Phosphate (SDRT)	120	0.028	2.78
	347	0.033	2.78
Lithium Iron Phosphate (HO option)	120	0.046	4.77
	347	0.046	4.77
Lithium Iron Phosphate (EHO option)	120	0.052	5.95
	347	0.045	5.95

BATTERY CAPACITY FOR EXTENDED RUN-TIMES				
Battery Option	Total Capacity 2 hours	Remote Capacity 2 hours*	Total Capacity 4 hours	Remote Capacity 4 hours*
ELM4L - LTP	8.25 watts	NA	NA	NA
ELM4L - HO	16.5 watts	9.9 watts	8.25 watts	NA
ELM4L EHO	24 watts	17.4 watts	12 watts	5.4 watts
ELM6L - LTP	8.25 watts**	8.25 watts**	NA	NA
ELM6L HO	16.5 watts	5.9 watts	8.25 watts**	8.25 watts**
ELM6L EHO	24 watts	13.4 watts	12 watts	12 watts**

* Remote capacity left after using standard lamps shipped mounted on luminaire. ELM4L standard high performance LED lamp heads are rated at 3.3 watts each, delivering a total of 640 lumens. ELM6L standard high performance LED lamp heads are rated at 5.3 watts each, delivering a total of 1,100 lumens. These lamps are different in both wattage and performance from the LT24 compatible remotes.

** LLH option only

BATTERY			
Nicad (6V)			
Typical Shelf life¹	Typical life¹	Maintenance²	Temperature range³,⁴
3 years	6-8 years	none	50-104°F (10-40°C)
Lithium Iron Phosphate (standard and HO option) (9.6V)			
Typical Shelf life¹	Typical life¹	Maintenance²	Temperature range³,⁴
1 year	6-8 years	none	50-104°F (10-40°C)
Lithium Iron Phosphate (EHO option) (12.8V)			
Typical Shelf life¹	Typical life¹	Maintenance²	Temperature range³,⁴
1 year	6-8 years	none	50-104°F (10-40°C)

Notes

- At 77°F ambient temperature, charge/discharge cycles and prolonged full discharge may reduce useful life.
- All life safety equipment, including emergency lighting for path of egress must be tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required testing could jeopardize the safety of occupants and will void all warranties.
- Temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity.
- Battery life is negatively impacted by many variables including temperature, charging rates, number of cycles and deep discharges due to long periods of time without AC power.

SPACING GUIDELINES

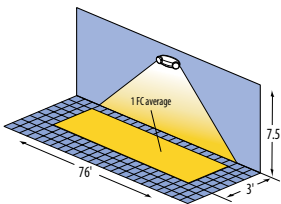
*Note: To see complete photometric report or download the .ies file for this product, visit Lithonia Lighting ELM4L and ELM6L home page.

Maximum Spacing Guidelines — ELM4L¹						
Mounting Height	Illumination Level	Single Luminaire		Multiple Luminaire		Application Notes
		3' Path of Egress	6' Path of Egress	3' Path of Egress	6' Path of Egress	
7.5'	1FC Avg¹	62'	58'	67'	60'	100' Corridor, 8' wide, and 12' high with 80/50/20 reflectances
10'	1FC Avg¹	62'	58'	67'	60'	
7.5'	1FC Avg¹	52'	40'	66'	58'	Retail open area: 200' X 15' X 30' with 80/50/20 reflectances
10'	1FC Avg¹	52'	48'	64'	60'	
12'	1FC Avg¹	52'	48'	62'	59'	
16'	1FC Avg¹	52'	44'	61'	58'	
20'	1FC Avg¹	44'	42'	60'	58'	
24'	1FC Avg¹	34'	34'	42'	58'	

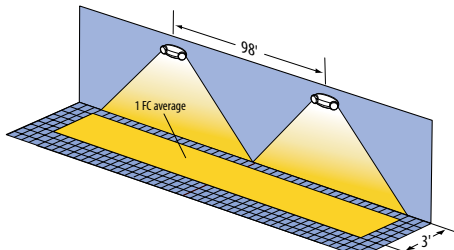
Maximum Spacing Guidelines — ELM6L¹						
Mounting Height	Illumination Level	Single Luminaire		Multiple Luminaire		Application Notes
		3' Path of Egress	6' Path of Egress	3' Path of Egress	6' Path of Egress	
7.5'	1FC Avg¹	76'	74'	98'	90'	100' Corridor, 8' wide, and 12' high with 80/50/20 reflectances
10'	1FC Avg¹	76'	74'	98'	88'	
7.5'	1FC Avg¹	60'	48'	77'	68'	Retail open area: 200' X 15' X 30' with 80/50/20 reflectances
10'	1FC Avg¹	78'	56'	85'	82'	
12'	1FC Avg¹	68'	66'	77'	74'	
16'	1FC Avg¹	72'	68'	72'	74'	
20'	1FC Avg¹	66'	64'	70'	68'	
24'	1FC Avg¹	66'	56'	65'	62'	

Notes:

- Also meets the additional illumination requirements of NFPA 101: 1FC minimum and max/min ration of 40:1.



Example of single ELM6L illuminating a 3' path of egress



Example of multiple ELM6L units illuminating a 3' path of egress



FEATURES & SPECIFICATIONS

INTENDED USE — Suitable for applications requiring attractive edge-lit exit signage, universal installation and low energy consumption.

CONSTRUCTION — Extruded brushed aluminum finish.

Clear acrylic panels- letters measure 6" high with 3/4" stroke, with 100 ft viewing distance rating, based upon UL 924 standard.

For single-face clear panels, EXIT is seen as a reversed image from the back.

OPTICS — LEDs mounted on printed circuit board. The typical life of the exit LED lamp is 5 years, based on 24/7 operation.

The LED operating frequency is 120Hz.

ELECTRICAL — Dual voltage input capacity (120/277V).

Battery: (EL Option) — Sealed, maintenance free nickel-cadmium battery delivers 90 minutes capacity to emergency lamps. Test switch provides manual activation of 30-second diagnostic testing for on-demand visual inspection.

Self-diagnostic testing (EL Option Only) for 30 seconds every 30 days and 90 minutes annually. Diagnostic evaluation of LED light source, AC to DC transfer, charging and battery condition.

INSTALLATION — EDG — Universal mounting canopy for top or end mount. Back mount standard for single face only. Canopy provided.

EDGR — Recessed mounting. Bar hanger and brackets provided for both new or restricted ceiling access installation applications. Available for use in drop ceiling applications. Back wall mount (WM) option.

Universal directional indicators. Field selected and attached.

LISTINGS — UL damp location listed 32°-122°F (0°-50°C) standard. Meets UL924, NFPA 101 (current Life Safety Code), NEC and OSHA illumination standards. Meets all applicable FCC Title 47, Part 15, Subpart B requirements.

Government Procurement:

BUY AMERICAN ACT — Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT regulations.

Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY — 5-year limited warranty (Battery is prorated). This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

NOTE: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

† Exit Signs Certified in the CA Title 20 Appliance Efficiency Database.

Catalog Number
Notes
Type



QUANTUM
LED Edge-Lit Exits

EDG
EDGR



Specifications

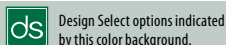
EDG (End Mount)	EDG (Top Mount)
Length: 13 (33.0)	Length: 13-5/8 (34.6)
Depth: 5-1/2 (14.0)	Depth: 4-5/16 (11.0)
Height: 11-1/8 (28.3)	Height: 11-3/4 (29.8)
Shipping Weight: 4 lbs (1.8 kgs)	Shipping Weight: 4 lbs (1.8 kgs)
EDG (Back Mount)	EDGR
Length: 13 (33.0)	Length: 13 (33.0)
Depth: 3 (7.6)	Depth: 1-3/4 (4.4)
Height: 11-1/8 (28.3)	Height: 8 (20.3)
Shipping Weight: 4 lbs (1.8 kgs)	Shipping Weight: 6.8 lbs (3.1 kgs)
	Shipping Weight (WM option): 8.1 lbs (3.7 kgs)

All dimensions are inches (centimeters) unless otherwise noted.



Items marked by a shaded background qualify for the Design Select program and ship in 15 days or less. To learn more about Design Select, visit www.acuitybrands.com/designselect.

*See ordering tree for details



ORDERING INFORMATION

For shortest lead times, configure products using **bolded options**.

Example: EDG 1 R EL

Family	Housing color	Number of faces	Letter color	Operations	Options
EDG Surface mount LED edge-lit exit	(blank) Brushed aluminum	1 Single face	R Red on clear (single face only) ¹	(blank) AC only	(blank) None
EDGR Recessed LED edge-lit exit	W White	2 Double face	G Green on clear (single face only) ¹	EL Nickel-cadmium battery	WM Recessed wall mount ²
			RMR Red on mirror ²		BAA Buy America(n) Act Compliant
			GMR Green on mirror ²		
			RW Red on white ³	X2 Lamp wired on two separate AC circuits (specify 120V or 277V) ^{4,5}	
			GW Green on white ³	SD Self-diagnostics ⁶	
					BABA REQUIRED

Accessories: Order as separate item.

ELA US12	12" stem kit with brushed aluminum canopy ⁸
ELA W US12	12" stem kit with white canopy ⁸
ELA WG1	Wireguard (13 3/4"H x 15 1/4"W x 6" D, back mount only)

Notes

- For single-face clear panels, EXIT is seen as a reversed image from the back.
- Available with single and double face.
- White panel standard for double and single face.
- Both circuits can be energized at the same time.
- Not available with EL and SD options.
- Available with EL option only.
- Available on EDGR single face only
- See spec sheet [ELA-StemKits](#). Only available for EDG.

EDG-EDGR LED, Quantum® Surface and Recessed Mount Edge-Lit Exits

SPECIFICATIONS

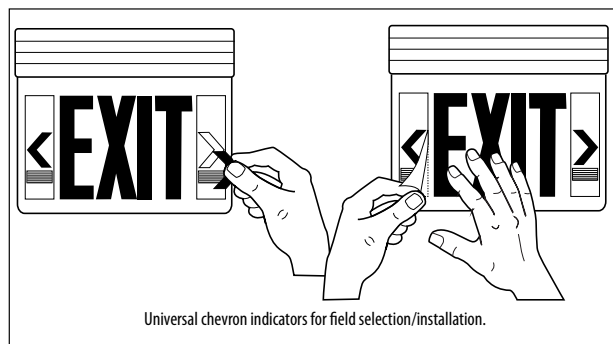
ELECTRICAL						
Primary Circuit						
Type	Typical LED life ¹	Supply voltage	EDG		EDGR	
			Input Watts	Max amps.	Input Watts	Max amps.
Red LED AC only	>5 years	120	2.5	0.020	3.8	0.030
		277	2.8	0.010	4.5	0.014
Green LED AC only	>5 years	120	2.2	0.020	3.8	0.030
		277	2.2	0.010	4.5	0.020
Red LED emergency	>5 years	120	3.0	0.030	3.8	0.031
		277	3.1	0.010	4.5	0.015
Green LED emergency	>5 years	120	2.6	0.020	3.8	0.031
		277	2.8	0.010	4.5	0.020

BATTERY (EL option)			
Sealed Nickel-Cadmium			
Shelf life ²	Typical life ²	Maintenance ³	Temperature range ⁴
3 years	6-8 years	none	32-122°F (0-50°C)

Notes

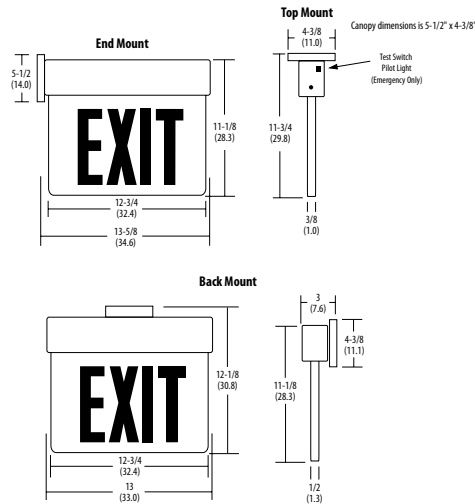
- Based on 24/7 operation. The typical life of the exit LED lamp is 5 years.
- At 77°F (25°C).
- All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties.
- Temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity.

KEY FEATURES



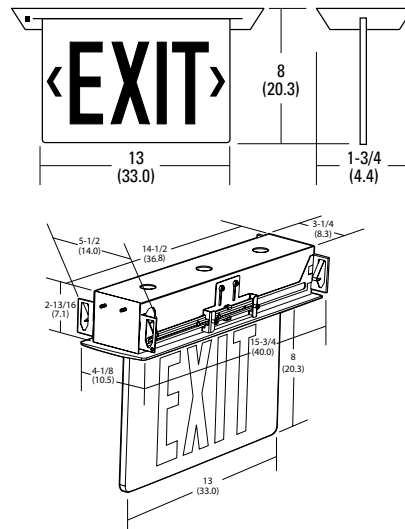
MOUNTING

EDG

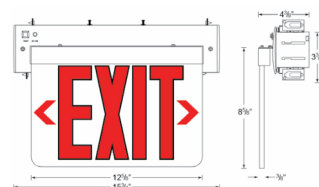


EDGR

Note: For drop ceiling applications refer to the standard installation section of the instruction sheet. Not applicable for "bracket mount" installation.



EDGR WM option





FEATURES & SPECIFICATIONS

INTENDED USE — Suitable for wet location (4X option), security/prisons and high-abuse applications. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.** [Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.](#)

CONSTRUCTION — The housing is .25" to .525" thick rugged, low-profile cast aluminum.

Clear, UV-stable polycarbonate cover is .130" thick to prevent cracking or breaking. Cover is secured with four stainless steel, Torx T20 tamper-resistant screws with center pin. Cover is secured with four stainless steel, phillips, head screws with the FPA option.

.1" thick polycarbonate faceplate incorporates universal directional chevron knockouts that are concealed and easily removed and replaced.

Universal mount (UM) option available — top, back, end mounting or conduit entry (canopy provided).

Letters 6" high with 3/4" stroke, with 100 ft viewing distance rating, based upon UL924 standards.

U.S. Patent No. 5,611,163 and D383,501.

OPTICS — Lamp is constructed using new LED technology. Provides perfectly uniform illumination.

The typical life of the exit LED lamp is 5 years, based on 24/7 operation. Single-face exit uses one LED lamp; double-face exit uses two LED lamps.

Low energy consumption — red lamp consumes 2.3W (120V); green lamp consumes 1.7W (120V).

ELECTRICAL — Dual voltage input capability (120/277V).

INSTALLATION — Back mount standard for single face (no canopy), unless universal mount (UM) specified.

Conduit entry (1/2" - 14 UNC) included with universal mounting.

Cast-aluminum canopy attaches to 10-gauge steel mounting plate for top or end mounting (not required for back mounting).

Canopy mounting bracket provides 160 lbs. of mounting strength when mounted to suitable structure. Bracket will only fit a 2-gang junction box.

LISTINGS — UL Listed. 4X option is UL 924 wet location listed and UL listed to NEMA 4X ratings. NSF certified (FPA option). Meets UL 924, NFPA 101 (current Life Safety Code), NEC and OSHA illumination standards, and State of Minnesota energy-efficient legislation requiring less than 20W consumption. Suitable for ambient temperatures 10°C (50°F) to 40°C (104°F). Meets all applicable FCC Title 47, Part 15, Subpart B requirements.

BUY AMERICAN ACT — Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT regulations. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY — 5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties.

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

Catalog Number
Notes
Type

Indura®

All-Conditions Exits

LV

LED LAMPS

NEMA 4X Rating Available



White on white
w/red letter color



Black on black
w/green letter color

ORDERING INFORMATION For shortest lead times, configure products using **bolded options**.

Example: LV S W 1 R 120/277

LV	S						
Series	Face type	Faceplate/housing color	Number of faces	Letter color	Input voltage	Mounting	Options
LV	S Stencil	(blank) Black faceplate on black housing	1 Single face	R Red	120/277 Dual voltage	(blank) Back mount ²	(Blank) None
		W White on white	2 Double face ¹	G Green		UM Universal mount	X2 Primary and secondary AC inputs provided ^{3,4}
		WB White on black					DL UL Listed for damp locations (10°C - 40°C)
		BW Black on white					4X UL Listed for NEMA 4X
		AB Aluminum on black					FPA Food protection area (National Sanitation Foundation Certified - splash zone) ⁵
		AW Aluminum on white					BAA Buy America(n) Act Compliant

Accessories: Order as separate catalog number.

ELA TPS T20	Torx tamper-resistant bit for T20 center-pin screw
ELA VSA	Stem/Conduit mounting kit (see spec sheet ELA-VSA)

Notes

- Available with universal mount only.
- Back mount standard with single face unless UM is specified. Not available on double face.
- UL Listed as emergency lighting equipment.
- Must specify input voltage (120 or 277V). Not available dual voltage.
- Torx tamper-resistant screws not included with FPA.

LV LED, Indura®

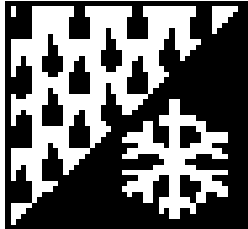
SPECIFICATIONS

ELECTRICAL					
Primary Circuit					
Type	Typical LED life ¹	Supply voltage	Number of lamps ²	Input watts	Max. amps
Red	>5 years	120	1	2.3	.15
			2	4.6	.30
Red	>5 years	277	1	2.2	.13
			2	4.4	.26
Red	>5 years	347	1	1.12	.29
			2	3.16	.29
Green	>5 years	120	1	1.7	.087
			2	2.8	.081
Green	>5 years	277	1	1.9	.089
			2	3.3	.086

Notes

- Based on 24/7 operation. The typical life of the exit LED lamp is 5 years.
- Two-lamp version available with double-face only.

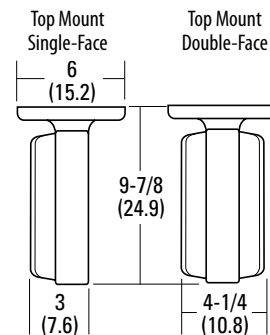
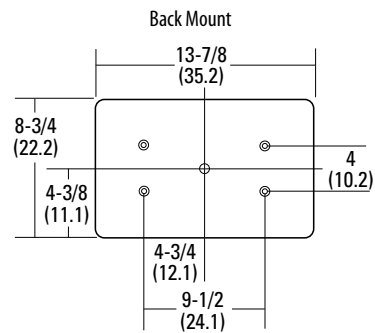
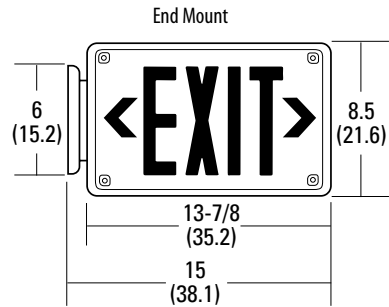
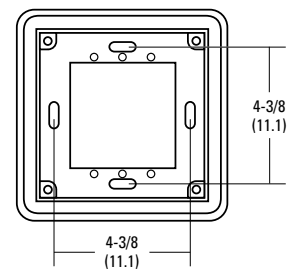
KEY FEATURES



UL approved for damp or NEMA4X wet locations (see options). Cold weather — down to -40°C (LV EL N emergency only).

MOUNTING

All dimensions are in inches (centimeters).
Shipping weight: 11 lbs. (5 kgs.)

NEMA 4X
Mounting Plate

Housing or canopy mounting bracket should be attached to mounting surface using suitable fastener for type of wall material. All four mounting hole positions should be used, and anchors or screws should have a minimum pullout rating of 160 lbs. Bracket will only fit a 2-gang junction box.



Project

Type

Catalog Number

SPECIFICATIONS

STATE SPECIFIC

HOUSING

- Durable 20 gauge steel
- Field adjustable chevrons standard
- White housing standard
- Brushed aluminum also available
- Universal mounting pattern and key hole slots are stamped into housing

ELECTRICAL

- Dual voltage 120/277VAC
- Rated for use indoor locations
- Solid state charger and transfer
- Brownout protection

ILLUMINATION

- Acrylic face plate in clear, white, or mirrored
- 2W power consumption

BATTERY

- Maintenance free, NiCad battery provides a minimum of 90 minutes in emergency mode
- 120 minute battery optional
- Recharging time is 24 hours
- Maximum battery temperature is 45°C

CODE COMPLIANCE

- cCSAus Listed for Indoor Locations
- Meets UL Requirements

WARRANTY

- 5 year warranty

ORDERING INFORMATION

MODEL#	Face/Letter/Panel	Housing	Mounting
SWXEH-EDGU	1RC (Single Face, Red on Clear)	W (White)	RC (Recessed Ceiling)
	2RS (Double Face, Red on Silver)		RW (Recessed Wall)
	2RW (Double Face, Red on White)		SC (Surface Ceiling)
	3RS (Single Face, Red on Silver)		SW (Surface Wall)
	3RW (Single Face, Red on White)		SE (Surface End)
	1GC (Single Face, Green on Clear)		
	2GS (Double Face, Green on Silver)		
	2GW (Double Face, Green on White)		
	3GS (Single Face, Green on Silver)		
	3GW (Single Face, Green on White)		

LETTER COLOR ON SILVER OR MIRROR

OPTIONS (Factory Installed)

BA	- Brushed Aluminum Housing (replaces W in part number)
EM	- NiCad Battery (90 minute)
EM120	- NiCad Battery (120 minute)
INV	- Inverted Face

ACCESSORIES (Order Separately, Ships on Side)

SK12-* - 12" Stem Kit (other lengths available)

*Specify **W-White**; **B-Black**; **BA-Brushed Aluminum**

SWXEH-EDGU

Massachusetts

Approved Edgelit

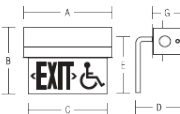
Recessed Ceiling



Surface Ceiling/End



Recessed Wall



Surface Wall



Model	A	B	C	D	E	F	G
RC	19.50"	11.25"	17.50"	5.00"	7.25"	4.00"	4.00"
WR	21.50"	10.00"	17.50"	5.50"	8.00"	4.00"	4.00"
SC	19.50"	11.00"	17.50"	4.25"	7.25"	4.00"	4.00"
WS	19.50"	10.00"	17.50"	5.50"	8.00"	4.00"	4.00"
ES	19.50"	11.25"	17.50"	4.25"	7.25"	4.00"	4.00"

SECTION 265100

LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary General Conditions and other Division 01 specification sections, apply to this Section and to all Contractors, Subcontractors, or other persons supplying materials and/or labor, entering into the Project site and/or premises, directly, or indirectly.
- B. The Specifications and Drawings are intended to be complementary. A particular section, paragraph, or heading in a Division may not describe each and every detail concerning work to be done and materials to be furnished. The Drawings are diagrammatic and may not show all of the work required or all construction details. Dimensions are shown for critical areas only; all dimensions and actual placements are to be verified in the field. It is to be understood that the best trade practices of the Division will prevail. It remains the responsibility of the Contractor or Subcontractor to provide all items, equipment, construction, and services required to the proper execution and completion of the Work.
- C. Reference listings are provided as a convenience to the Contractor or Subcontractor providing the Work of this Section and may not contain all the requirements affecting this Section. It remains the responsibility of the Contractor or Subcontractor to locate and comply with all requirements of the Contract Documents.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fixtures
 - 2. Solid State Lighting/Light Emitting Diode (LED)
- B. General Requirements:
 - 1. Provide all lighting fixtures as shown completely wired, controlled, and securely attached to supports.
 - 2. Fixture details shown may be modified by the manufacturer provided all of the following conditions have been met:
 - 3. Fixture performance is equal or improved.
 - a. Structural, mechanical, electrical, safety, and maintenance characteristics are equal or improved.
 - b. Cost to the Owner is reduced or equal.
 - c. Modifications have been reviewed by the Architect and have been approved by the Architect in writing.
- C. Regulatory References:
 - 1. All specified items or systems shall be designed, manufactured, tested, and installed in compliance with applicable provisions of all governing codes, rules, laws, and ordinances in accordance with Section 260100.

- a. If there is a conflict between applicable documents, then the more stringent requirement shall apply. All documents listed are believed to be the most current releases of the documents. The Contractor has the responsibility to determine and adhere to all applicable documents and to the most recent release when developing the proposal for installation.
 - b. This document does not replace any code, either partially or wholly. The Contractor must be aware of local codes that may impact this project.
2. Materials and installation shall be in accordance with the latest revision of the National Electrical Code, and with any applicable Federal, State, and local codes and regulations.
3. The standards and regulating committees referred in this specification and to which compliance with is required are:
 - a. ANSI C78.379 – Electric Lamps – Incandescent and High-Intensity Discharge Reflector Lamps – Classification of Beam Patterns.
 - b. ANSI C82.1 – Ballasts for Fluorescent Lamps – Specifications.
 - c. ANSI C82.4 – Ballasts for High-Intensity Discharge and Low-Pressure Sodium Lamps (Multiple Supply Type).
 - d. ANSI/NFPA 70 – National Electrical Code.
 - e. ANSI/NFPA 101 – Life Safety Code.
 - f. NEMA WD 6 – Wiring Device – Dimensional Requirements.
 - g. ASHRAE/IESNA Standard 90.1 – Energy Standard for Buildings (current version or most recent approved version by the local authority).
 - h. IECC – International Energy Conservation Code (current version or most recent approved version by the local authority).
 - i. IESNA Standards LM-79 and LM-80 – Electric and Photometric Measurements of Solid State Lighting Products, and Measuring Lumen Maintenance of LED Light Sources, respectively.
 - j. UL Underwriters Laboratories.
 - k. NRTL Nationally Recognized Testing Laboratory.
4. All fixtures and assembled components shall be new, of good quality, and be approved by and bear the label of UL for the applicable location and conditions (wet, damp, dry, etc.) or other approved testing agencies, i.e. ETL, unless otherwise specified in writing.
 - a. Label shall not interfere with fixture performance, maintenance, or the seating of any fixture element, and shall not be visible during normal fixture operation.

1.3 DEFINITIONS

- A. BF: Ballast factor.
- B. CCT: Correlated color temperature.
- C. CRI: Color-rendering index.
- D. HID: High-intensity discharge.
- E. LER: Luminaire efficacy rating.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting fixture, including driver housing if provided.
- H. TCLP: Toxicity Characteristic Leaching Procedure.

1.4 SUBMITTALS

- A. Submit shop drawings and product data including photometric and pertinent physical characteristics of luminaire data in accordance with Section 26 01 00. All submittals shall have project name and fixture type clearly shown.
1. For standard catalog items with no modifications, submit catalog cut sheets prepared by the manufacturer which clearly show all elements to be supplied and all corresponding product data (including driver manufacturer and model number; voltage; accessories or options and any miscellaneous items detailed in the written description of the specification.) If cut sheet shows more than one (1) fixture type, all non-applicable information shall be crossed out.
 2. For custom fixtures, modified fixtures or linear fixtures mounted in continuous rows, submit a drawing prepared by the manufacturer showing all details of construction, lengths of runs, pendant locations, power locations, finishes and list of materials. Drawings must be to scale. Contractor shall provide manufacturer with field dimensions where required. If scallop shields, wallwash reflectors, or baffles are required, drawings shall indicate relative position to wall or adjacent vertical surface.
 3. The review of shop drawings and/or product data does not relieve the Contractor and lighting control manufacturer of the responsibility of providing a complete, coordinated, and functioning installation. Incompatibilities among equipment and components including, but not limited to, mismatched voltages, differing signal protocol, etc., shall be resolved at the sole responsibility and expense of the Contractor.
- B. Substitutions:
1. Substitutions: No substitutions will be considered unless necessary due to strikes, lockouts, bankruptcy, or discontinuance of manufacturer, etc. In such cases, the Contractor shall apply to the Lighting Consultant/Engineer, in writing, within ten (10) days of realizing his inability to furnish the article specified, describing completely the substitution he desires to make.
 2. The fixture manufacturer and model number listed first for each fixture type in the lighting fixture schedules establishes the performance specification for that fixture type. Manufacturers that are subsequently listed for a specific fixture type, but without model numbers, are believed to be able to produce an acceptable alternate to the specified fixture. These manufacturers must provide equipment identical in appearance, materials, and performance to the fixture listed by model number in the fixture schedule. The lighting fixture manufacturer may be required to submit samples, photometric data, and point-by-point calculations of the areas where the lighting fixtures will be located. The Architect, Engineer, and Lighting designer shall be the sole judges in determining whether a manufacturer's fixture complies with the specifications, and shall reserve the right to disqualify any manufacturer.
 3. Where noted on the lighting fixture schedule or in Division 1, the Contractor shall provide individual unit prices for alternates listed for a particular fixture type.
- C. Certifications: Provide manufacturer's certification that all applicable products were manufactured in United States and meet the requirements of the Build America, Buy America Act (BABA) (part of Infrastructure Investment and Jobs Act).

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals per 260100.

1.6 EXTRA STOCK

- A. Furnish to the owner and store at the site where directed, the following items:
 - 1. Two (2) drivers for each light fixture type.
- B. Extra stock shall be packaged in manufacturer's unopened cartons and identified as to contents by fixture type.

1.7 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910, complying with the IESNA Lighting Measurements Testing & Calculation Guides.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NFPA 70.
- E. Mockups: Provide interior lighting fixtures for room or module mockups complete with power and control connections.
 - 1. Obtain Architect's approval of fixtures for mockups before starting installations.
 - 2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 3. Approved fixtures in mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- F. Build America, Buy America Act (BABA) Requirements: All applicable products shall be manufactured in United States and shall meet the requirements of the Build America, Buy America Act (BABA) (part of Infrastructure Investment and Jobs Act).

1.8 COORDINATION

- A. Confirm compatibility and interface of other materials with fixture and area. Report discrepancies to the Engineer, and defer ordering until clarified.
- B. Supply frames, trim rings, and backboxes to other trades, as may be required.
- C. Coordinate with other trades to avoid conflicts between fixtures, supports, fittings, mechanical equipment, and other utilities.
- D. Subsequent to review of shop drawings and prior to ordering fixtures verify voltage at each fixture also consult with all others to determine the type of ceiling and ceiling suspension system in each and every room and order fixtures to suit and fit the particular ceiling and ceiling suspension system. Any extra costs because of failure on the part of this Contractor to verify

voltage or ceiling requirements shall be paid for by this Contractor. It is not the intent of fixture catalog numbers shown to classify the voltage, ceiling or ceiling suspension.

- E. Fixtures shall be described herein and on the Drawings and be appropriate for the intended location. Where indicated on the Drawings, fixtures shall have emergency driver suitable for emergency use.

1.9 WARRANTIES

- A. All fixtures and workmanship shall be guaranteed free of defects and fully operational for a minimum of one year after the acceptance of the project by the Owner. Any fixtures or workmanship found to be defective during the warranty period will be either fixed or replaced by the Contractor at no cost to the Owner.
- B. LED Fixtures shall carry a full warranty for a minimum of five (5) years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide light fixtures as indicated on the Drawings. See Lighting Fixture Schedule.

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS

- A. Ferrous mounting hardware and accessories shall be finished using either a galvanic or phosphate primer/baked paint process to prevent corrosion and discoloration of adjacent materials.
- B. For weatherproof and vaportight installation, painted finishes of fixtures and accessories shall be weatherproof enamel using proper primers or hot dipped galvanized and bonderized epoxy, in accordance with manufacturer's requirements. Unless otherwise specified all painted surfaces shall have a life expectancy of not less than twenty years.
- C. Where dissimilar metal parts come in contact with each other, apply to both surfaces a coating material to prevent corrosion.
- D. Fasteners shall be manufactured of non-magnetic stainless steel or anodized aluminum, except in indoor applications where galvanized steel shall be acceptable.
- E. Fixtures shall be free of light leaks and shall be designed to provide sufficient ventilation of LED engine and driver including vent holes where required.
- F. All recessed LED lighting fixtures shall be provided with an integral, automatic resetting, thermal cut-out.
- G. Outdoor fixtures shall have wire mesh corrosion resistant screens in the vent holes properly sized to prevent incursion of insects, small animals, and/or other small rodents.
- H. All sheet metal work shall be free from tool marks and dents and shall have accurate angles bent as sharp as compatible with the gauges of the required metal. All intersections and joints shall be formed true and of adequate strength and structural rigidity to prevent any distortion after assembly. All sheet metal shall be free of light leaks. All edges shall be finished so there are no sharp edges exposed. All miters shall be in accurate alignment with abutting

intersecting members. Piecing of plates in individual runs in single planes and the use of spliced pieces or filler material to cover defective workmanship shall not be acceptable. Sheet metal work shall be properly fabricated so that planes will not deform (i.e. become concave or convex, due to normal expected ambient and operating conditions).

- I. In adjustable fixtures, aiming and positive locking devices shall be provided.
- J. Plastic for lenses and diffusers shall be formed of colorless 100% virgin acrylic. The quality of the raw material must meet American Society of Testing Materials (ASTM) standards, as tested by an independent testing laboratory. Acrylic plastic lenses and diffusers shall be properly cast, molded, or extruded, as specified, and shall remain free of any dimensional instability, discoloration, embrittlement, or loss of light transmittance for at least 15 years. Glass used for lenses, refractors, and diffusers in incandescent lighting fixtures shall be tempered for high impact and heat resistance; the glass shall be crystal clear in quality with a transmittance of no less than 88%. Exterior fixtures shall use tempered Borosilicate glass, Corning #7740, or equal. For fixtures directly exposed to the elements and aimed above the horizontal, use Corning Vycor glass or equal. Where optical lenses are used, they shall be free from spherical and chromatic aberrations and other imperfections that may hinder their functional performance.
- K. All lenses, louvers, and other light-diffusing elements shall be removable, but positively held so that hinging or other normal motion will not cause them to drop out.
- L. All light fixtures with integral daylight or occupancy sensors shall have said sensors installed by the fixture manufacturer, in accordance with the sensor manufacturer's requirements, and at the location as shown or described in the specifications or plans. Proper wiring, either to an integral device in the fixture or to an external system, shall be provided in the factory.
- M. All aircraft cable suspended pendants or linear light fixtures shall be provided with a minimum slack of 24" of cable in addition to the specified suspension length (or mounting height as the case may be) and adjustable, locking cable grippers so that the mounting height may be adjusted in the field. The Contractor shall not cut the spare cable length before the Architect has approved the final mounting height.
- N. Any fixture or part thereof that has been specified with an incompatible, part, or accessory, as determined by the Contractor and/or fixture manufacturer shall not be ordered and or installed and shall instead be immediately brought to the attention of the Architect, Lighting Designer, and Engineer. Failure of the Contractor to address any known issues, which results in the delay of procuring the proper equipment, shall be the responsibility of the Contractor.

2.3 SOLID STATE LIGHTING/LIGHT EMITTING DIODE (LED) LAMPS AND LUMINAIRES

A. General:

- 1. The electrical contractor, in cooperation with lighting control manufacturer and light fixture manufacturers, is responsible for ensuring compatibility between all LED Drivers and the lighting control system components. All proposed LED fixtures shall be tested by the lighting control manufacturer at the factory to verify compatibility prior to installation in the field. If any LED fixture is determined to be not compatible with the proposed lighting control system, it is the electrical contractor's responsibility to work with the light fixture manufacturer to provide a driver that is compatible with the lighting control system.
- 2. All 0-10VDC LED dimming drivers shall meet the requirements of IEC 60929 for current sinking control and shall have an isolate 0-10VDC control circuit.

3. Luminaire manufacturer shall have a minimum of five (5) years' experience in the manufacture and design of LED products and systems and no less than one hundred (100) North American installations.
4. Unless otherwise specified, all LED luminaires and power/data supplies shall be provided by a single manufacturer to ensure compatibility.
5. All components, peripheral devices, and control software are to be provided by and shall be the responsibility of a single entity. All components shall perform successfully as a complete system.
6. Include all components necessary for a complete installation. Provide all power supplies, synchronizers, data cables, and data terminators for a complete working system.
7. LEDs shall comply with IESNA LM-80 – Standards for Lumen Maintenance of LED Lighting Products.
8. White LEDs shall have a rated source life of 50,000 hours under normal operating conditions. RGB LEDs shall have a rated source life of 100,000 hours. LED "rated source life" is defined as the time when a minimum of 70% of initial lumen output remains.
9. Manufacturer shall provide Luminaire Efficacy (lm/W), total luminous flux (lumens), luminous intensity (candelas) chromaticity coordinates, CCT and CRI. Optical performance, polar diagrams, and relevant luminance and illuminance photometric data. Provide data in IES file format in accordance with IES LM-79-2008, based on test results from an independent Nationally Recognized Testing Laboratory.
10. All LED sources used in the LED luminaire shall be of proven quality from established and reputable LED manufacturers and shall have been fabricated after 2007. Acceptable LED lamp manufacturers unless otherwise noted are:
 - a. Cree, Inc.
 - b. Philips Lighting
 - c. Nichia Corporation
 - d. Norlux
 - e. Opto Technology, Inc.
 - f. Osram Optron Semiconductor

B. Replacement and Spares:

1. Manufacturer shall provide written guarantee of the following:
 - a. Manufacturer will keep record of original bin for each LED module and have replacement modules from the same bin available for three (3) years after date of installation.
 - b. Manufacturer will keep an inventory of replacement parts (source assembly, power, and control components).
 - c. Manufacturer's LED system will not become obsolete for ten (10) years: Manufacturer will provide exact replacement parts, or provide upgraded parts that are designed to fit into the original luminaire and provide equivalent distribution and lumen output to the original, without any negative consequences.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lighting Fixtures:

1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.

2. Install specified lamps in each luminaire.
 3. Install accessories furnished with each luminaire.
- B. Install all lighting fixtures in accordance with manufacturer's instructions.
- C. The care and protection of all fixtures shall be the responsibility of this contractor until the work under this contract is accepted by the owner.
- D. Shipping and Storage:
1. All fixtures received at the site shall be stored in clean and dry space until fixtures are installed.
 2. Manufacturer shall clearly mark each box with fixture designation prior to shipping.
 3. Reflector cones, baffles, louvers, aperture plates, gimbal rings, and decorative elements shall be packed by the manufacturer separate from the housing body (body, stem, etc.) of the fixture.
- E. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly and reinstall.
- F. Remote Mounting of Driver: Distance between the driver and fixture shall not exceed that recommended by driver manufacturer. Verify, with driver manufacturer, maximum distance between driver and luminaire.
- G. All fixture wiring shall be in accordance with NEC Article 410 whenever high temperature insulation is required instead of normal branch circuit wiring.
- H. Install fixtures to dissipate driver and LED engine heat.
- I. Exit signs and emergency lighting units shall be wired ahead of all switching.
- J. Verify lighting switching with Engineer, if necessary for intended operation.
- K. Install exterior fixtures so as to prevent the entrance of water or other substances.
- L. Fixtures recessed in ceilings which have a fire resistive rating of one hour or more shall be enclosed in a box/structure which has a fire resistive rating equal to or greater than that of the ceiling.
- M. Luminaires containing driver shall be supported directly to the building structure by wire, chain, or threaded rod of sufficient strength to carry the luminaire.
- N. In no case shall fixtures be supported from ductwork, piping, or other equipment.
- O. Fixtures and/or fixture outlet boxes shall be provided with hangers that adequately support the full weight of the fixture. Design of hangers and method of fastening other than herein specified shall be submitted to the Architect for approval. Fixtures mounted on outlet boxes shall be rigidly secured to fixture studs in outlet box. Hickies or extension pieces shall be installed where required to facilitate proper installation. Fixtures weighing more than 50lbs shall be supported independently of the outlet box.

- P. Fixtures shall be installed in accordance with any applicable seismic codes.
- Q. For fixtures with variable position lamp holder assemblies, contractor shall confirm prior to installation proper lamp holder (socket) position in field, and shall adjust, if necessary, after coordination with manufacturer.
- R. Contractor shall be responsible for adjusting aperture rings on all ceiling recessed fixtures to accommodate various ceiling material thickness. Contractor shall be responsible for coordinating the cut-out size in ceiling to ensure aperture covers cut-out entirely. The bottom of aperture rings shall be flush with finished ceiling or not more than 1/16" above. Under no circumstances will the aperture ring extend below the finished ceiling surface.
- S. Fixtures shall be installed so that no labels will be visible under normal operating conditions of the fixture.
- T. Do not install lenses, trims, reflectors, cones, baffles, louvers, or decorative elements until completion of ceiling installation, plastering, painting, and clean-up. All non-removable lenses, trims, reflectors, cones, baffles, louvers, and decorative elements shall be protected from damage during construction. Replace painted, scratched, dented, or otherwise damaged fixture components at no cost to the owner.
- U. Locations of fixtures are shown diagrammatically. Verify exact location and spacing with Reflected Ceiling Plans and other reference data before ordering of fixtures and during installation.
- V. Fixture locations in mechanical and electrical rooms, unless otherwise noted, are approximate. Coordinate mounting height and location of lighting fixtures to clear mechanical, electrical, plumbing, and fire protection equipment and to adequately illuminate meters, gauges, and equipment. Pendant mounted fixtures shall be secured appropriately in areas of high air movement.

3.2 IDENTIFICATION

- A. Install labels with panel and circuit numbers on concealed junction and outlet boxes.

3.3 FIELD QUALITY CONTROL

- B. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery/generator and retransfer to normal.
- C. Verify that self-luminous exit signs are installed according to their listing and the requirements in NFPA 101.
- D. Prepare a written report of test, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to the lighting system, retest to demonstrate compliance with standards.

3.4 STARTUP SERVICE

- A. Fixtures shall be thoroughly cleaned of all dust, dirt, debris, and fingerprints, following manufacturer's instructions. If the fixtures are deemed dirty by the Architect at the completion of the project, the contractor shall clean them at no additional cost to the owner.

- B. Orient all adjustable wall washer reflectors to aim flat against nearest adjacent walls.
- C. All adjustable lighting units shall be aimed, focused, locked, etc. by the contractor, under the supervision of the Lighting Designer. All aiming and adjusting shall be carried out after the entire installation is complete. All ladders, scaffolds, etc. required shall be furnished by the contractor. As aiming and adjusting is completed, locking setscrews and bolts and nuts shall be tightened securely. Where possible, units shall be focused during the normal working day. However, where daylight interferes with accurate assessment of fixture focus, aiming shall be accomplished at night.
- D. Replace any failed lamps concurrent with owner's final acceptance of project.

3.5 ADJUSTING

- A. Occupancy Adjustments: Within two (2) months of date of substantial completion, provide on-site assistance in adjusting amiable luminaires to suit actual occupied conditions. Provide one (1) 8-hour visit to project during other-than-normal occupancy hours for this purpose. Some of this work may be required after dark.

END OF SECTION