

LED Multi-Level Options

For use with Cree Edge™ Series, LEDway® Series, 228 Series™, 304 Series™, XSP Series, CPY Series, OSQ series and VG Series Luminaires

Product Description

The Cree® Multi-Level options include a factory-installed sensor integrated into the luminaire which allows the luminaire to produce different lumen outputs in High Mode and Low Mode. The multi-level option is designed to operate all LEDs at the same output for maximum and uniform life.

The occupancy sensor uses passive infrared technology that reacts to changes in infrared energy (moving heat) within the coverage area of the sensor. When motion is detected the luminaire is switched to High Mode. After motion is no longer detected and the time delay cycle has been completed, the luminaire is returned to its Low Mode setting. The sensor itself includes eight possible field adjustable settings for each of the following categories: Ambient Light, Time Delay, High Dimming and Low Dimming.

Ambient Light feature (A) is factory set at "OSO" which eliminates any daylight harvesting management and allows the fixture to operate only on occupancy. The Ambient Light feature includes eight possible field settings:

Factory Setting

Occupancy Sensing Only (OSO):

Occupancy detection (PIR) enabled only. Ambient Light sensing is disabled. The sensor will switch the luminaire to High Mode during occupancy detection regardless of environment light levels. After motion is no longer detected and the time delay cycle has been completed, the luminaire returned to its Low Mode setting.

Field Settings (must be changed in field)

Occupancy Sensing and Time Off (OSTO):

Occupancy detection (PIR) enabled only with Time Off operation. Ambient Light sensing is disabled. The sensor will switch the luminaire to High Mode during occupancy detection regardless of environment light levels. After motion is no longer detected and the time delay cycle has been completed, the luminaire returned to its Low Mode setting. Sensor will switch the luminaire to Off after 30 minutes of no occupancy detection (Low Mode).

Occupancy Sensing and Low Ambient (OSLA):

Occupancy detection (PIR) and Ambient Light sensing enabled. When in Low Mode and environment light levels exceed 130 Lux (12 FC), luminaire will turn Off and remain Off regardless of occupancy. If environment light levels are below 80 Lux (7 FC), luminaire will remain in Low Mode during no occupancy and switch to High Mode after occupancy is detected.

Occupancy Sensing and High Ambient (OSHA):

Occupancy detection (PIR) and Ambient Light sensing enabled. When in Low Mode and environment light levels exceed 600 Lux (55 FC), luminaire will turn Off and remain Off regardless of occupancy. If environment light levels are below 500 Lux (46 FC), luminaire will remain in Low Mode during no occupancy and switch to High Mode after occupancy is detected.

Occupancy Sensing, Low Ambient and Time Off (OSLATO):

Occupancy detection (PIR), Ambient Light sensing and Time Off enabled. When in Low Mode and environment light levels exceed 130 Lux (12 FC), luminaire will turn Off and remain Off regardless of occupancy. If environment light levels are below 80 Lux (7 FC) and occupancy is detected, luminaire will switch to High Mode. After motion is no longer detected and the time delay cycle has been completed, the luminaire returned to its Low Mode setting. Sensor will switch the luminaire Off after 2 minutes of no occupancy detection (Low Mode).

Occupancy Sensing, High Ambient and Time Off (OSHATO):

Occupancy detection (PIR), Ambient Light sensing and Time Off enabled. When in Low Mode and environment light levels exceed 600 Lux (55 FC), luminaire will turn Off and remain Off regardless of occupancy. If environment light levels are below 500 Lux (46 FC) and occupancy is detected, luminaire will switch to High Mode. After motion is no longer detected and the time delay cycle has been completed, the luminaire returns to its Low Mode setting. Sensor will switch the luminaire Off after 2 minutes of no occupancy detection (Low Mode).

The following features are used to bypass sensor:

Lock Low Mode (LL):

Sensor locks in Low Dimming level indefinitely. The occupancy detection (PIR) and Ambient Light operation are disabled during the Lock Low Mode. Typically used for Test Mode.

Lock High Mode (LH):

Sensor turns the fixture on at the Low Dimming setting. Sensor will cycle every 5 seconds between specified Low and High Dimming settings for 4 complete cycles (Low, High, Low, High) and then locks in High Mode indefinitely. The occupancy detection (PIR) and Ambient Light operation are disabled during the Lock High Mode. Typically used for Test Mode.

Time Delay feature (D) can be adjusted from 0.5 min to 30 min. and is factory set at 4 min. Once motion is detected, the lighting load will remain in the High Mode until motion is no longer detected and the Time Delay cycle has been completed.

Low Dimming refer to product specific table for Low Dimming (L) ranges and factory settings.

High Dimming refer to product specific table for High Dimming (H) ranges and factory settings. Please note some luminaires may have maximum output limitations.

Limited Warranty*

5 year on Multi-Level Option

* See www.cree.com/lighting/products/warranty for warranty terms

Figure 1 – LEDway® Streetlights, Cree Edge™, Cree Edge™ High Output and OSQ Series Area and Flood Luminaires, and XSP Street and Area Luminaires

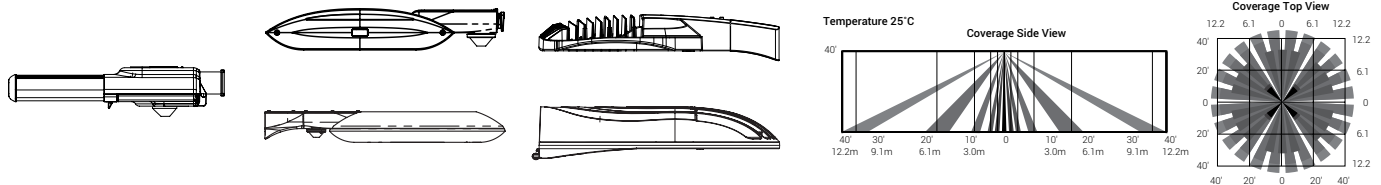


Figure 2 – Cree Edge™ and CPY250™ Canopy/Soffit Luminaires, 304 Series™ and 228 Series™ Recessed Canopy/Soffit Luminaires, 304 Series™ Interior Recessed and Flood Luminaires



Figure 3 – Cree Edge™ and XSPW™ Wall Mount Luminaires, Cree Edge™ and 304 Series™ Parking Structure Luminaires, and VG Series Vehicle Garage Luminaires



Sensor Details	
Luminaire	Coverage Area
LEDway® Streetlights, Cree Edge™, Cree Edge™ High Output and OSQ Series Area and Flood Luminaires, and XSP Street and Area Luminaires	<p>Lens coverage: 30' (9.1m) optimal mounting height and 60' (18.3m) diameter coverage with a 360° circular pattern. The minimum and maximum mounting heights are 20' (6.1m) and 40' (12.2m) respectively. Lens mounting height to coverage radius is 1:1.</p> <p>See Figure 1.</p> <p>Note: When mounting heights are above 30' (9.1m), the sensor only detects large objects such as fork lift trucks or cars.</p>
Cree Edge™ and CPY250™ Canopy/Soffit Luminaires, 304 Series™ and 228 Series™ Recessed Canopy/Soffit Luminaires, and 304 Series™ Interior Recessed and Flood Luminaires	<p>Lens coverage: 20' (6.1m) optimal mounting height and 40' (12.2m) diameter coverage area with a 360° circular pattern. The minimum and maximum mounting heights are 10' (3m) and 30' (9.1m) respectively. Lens mounting height to coverage radius ratio is 1:1.</p> <p>See Figure 2.</p>
Cree Edge™ and XSPW™ Wall Mount Luminaires, Cree Edge™ and 304 Series™ Parking Structure Luminaires, and VG Series Vehicle Garage Luminaires	<p>Lens coverage: 10' (3m) optimal mounting height and 50' (15.2m) diameter coverage area with a 360° circular pattern. The maximum mounting height is 15' (4.6m). Lens mounting height to coverage radius is 1:2.5.</p> <p>See Figure 3.</p>



LED Multi-Level Options

Product Availability

Cree Edge™ Series Luminaires												
Drive Current (mA)	Voltage	Area & Flood			Area & Flood Round		Canopy	Interior Round	Parking	Pathway ¹	Security	High Output Area & Flood
		Direct & Adjustable Arm Mounts	Post Top Mounts	SA Mounts	Direct & Adjustable Arm Mounts	Post Top Mounts ¹	All Mounts	All Mounts	All Mounts	All Mounts	Wall Mount	All Mounts
350	120-277	20-160 LEDs ^{FPR}	40-160 LEDs ^{FP}	N/A	40-120 LEDs ^F	N/A	40-160 LEDs ^{FP}	N/A	40-100 LEDs ^F	N/A	20-80 LEDs ^F	N/A
	347-480	20-160 LEDs	40-80 LEDs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
525	120-277	20-160 LEDs ^{FPR}	40-160 LEDs ^{FP}	N/A	40-120 LEDs ^F	N/A	40-160 LEDs ^{FP}	N/A	40-100 LEDs ^F	N/A	20-80 LEDs ^F	N/A
	347-480	20-160 LEDs	40-80 LEDs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
700	120-277	20-60 LEDs ^{FPR}	40-60 LEDs ^{FP}	N/A	40-60 LEDs ^F	N/A	40-60 LEDs ^{FP}	N/A	40-60 LEDs ^F	N/A	20-80 LEDs ^F	120, 240 LEDs ^{FR}
	347-480	20-60 LEDs	40-60 LEDs	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1000	120-277	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	120 LEDs ^{FR}
	347-480	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

¹ Consult TL spec sheet for availability

^F Multi-Level option available with Fusing option

^{FP} Multi-Level option available with Photocell option

^{FR} Multi-Level option available with NEMA[®] Photocell Receptacle option

LEDway® Series Luminaires			
Drive Current (mA)	Voltage	LEDway® Streetlight	
		Horizontal Tenon Mount	IP66 Rated Mounts
350	120-277	N/A	20-120 LEDs ^{FR}
	347-480	N/A	N/A
525	120-277	N/A	20-120 LEDs ^{FR}
	347-480	N/A	N/A
700	120-277	N/A	20-120 LEDs ^{FR}
	347-480	N/A	N/A
1000	120-277	N/A	N/A
	347-480	N/A	N/A

^F Multi-Level option available with Fusing option

^{FR} Multi-Level option available with NEMA[®] Photocell Receptacle option

304 Series™ Luminaires										
Drive Current (mA)	Voltage	Canopy			Parking Structure	Floodlight	Interior		Soffit	
		Recessed Mount for Single Skin Canopies	Recessed Mount for Double Skin Canopies	Recessed Upgrade Kit Mounts	All Mounts	Yoke Mounts	Recessed Mount	IC Rated Recessed Mount	Recessed Mount	IC Rated Recessed Mount
350	120-277	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	40 LEDs ^F	40-60 LEDs ^F	40 LEDs ^F
	347-480	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
525	120-277	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	40-60 LEDs ^F	N/A	40-60 LEDs ^F	N/A
	347-480	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
700	120-277	40-60 LEDs ^F	40-60 LEDs ^F	N/A	40-60 LEDs ^F	40-60 LEDs ^F	N/A	N/A	N/A	N/A
	347-480	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

^F Multi-Level option available with Fusing option

228 Series™ Luminaires						
Drive Current (mA)	Voltage	Canopy			Soffit	
		Recessed Mount	Recessed Upgrade Kit Mounts	Recessed Mount	IC Rated Recessed Mount	
350	120-277	90 LEDs	N/A	30, 60 LEDs	N/A	
	347-480	N/A	N/A	N/A	N/A	
525	120-277	30, 60, 90 LEDs	30, 60 LEDs	30, 60 LEDs	N/A	
	347-480	N/A	N/A	N/A	N/A	
700	120-277	30, 60, 90 LEDs	30, 60 LEDs	N/A	N/A	
	347-480	N/A	N/A	N/A	N/A	
900	120-277	60 LEDs ¹	N/A	N/A	N/A	
	347-480	N/A	N/A	N/A	N/A	
1000	120-277	30 LEDs ¹	N/A	N/A	N/A	
	347-480	N/A	N/A	N/A	N/A	

¹ Requires marked spacing 48" (1,219mm) x 24" (610mm) x 6" (152mm); 48" (1,219mm) luminaire to luminaire, 24" (610mm) luminaire to side wall, 6" (152mm) above luminaire.



LED Multi-Level Options

350mA Drive Current

Note: For use with products when 350mA drive current is specified. Specified drive current represents the maximum drive current that will be available with dimming option. Specifying the maximum allowed drive current for your product will provide the greatest range of dimming. Multipliers are for estimating purposes only. Check actual spec sheet data where available.

Position	Low Dimming Settings					
	120-277V			347-480V		
	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
0	0	0.00	0.00	0	0.00	0.00
1	75	0.15	0.15	38	0.10	0.11
2	125	0.26	0.27	63	0.17	0.18
3	150	0.31	0.31	75	0.20	0.22
4	175	0.36	0.37	88	0.23	0.29
5	225	0.45	0.45	113	0.31	0.35
6	275	0.55	0.53	138	0.38	0.41
7	325	0.64	0.62	163	0.45	0.48

Factory Dimming Settings		
Multi-Level Option	Low Dimming Setting	High Dimming Setting
ML4 (HL)	75mA	350mA
ML5 (HK)	175mA	350mA

Position	High Dimming Settings					
	120-277V			347-480V		
	Drive Current	System Watts Multiplier	Lumen Multiplier	Drive Current	System Watts Multiplier	Lumen Multiplier
0	350	0.67	0.70	175	0.49	0.52
1	425	0.83	0.80	213	0.59	0.60
2	475	0.92	0.89	238	0.66	0.66
3	525	1.00	1.00	263	0.74	0.73
4	525	1.00	1.00	275	0.77	0.76
5	525	1.00	1.00	288	0.81	0.79
6	525	1.00	1.00	313	0.88	0.85
7	525	1.00	1.00	350	1.00	1.00

525mA Drive Current

Note: For use with products when 525mA drive current is specified. Specified drive current represents the maximum drive current that will be available with dimming option. Specifying the maximum allowed drive current for your product will provide the greatest range of dimming. Multipliers are for estimating purposes only. Check actual spec sheet data where available.

Position	Low Dimming Settings					
	120-277V			347-480V		
	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
0	0	0.00	0.00	0	0.00	0.00
1	75	0.15	0.15	75	0.15	0.15
2	125	0.26	0.27	125	0.26	0.27
3	150	0.31	0.31	150	0.31	0.31
4	175	0.36	0.37	175	0.45	0.45
5	225	0.45	0.45	225	0.45	0.45
6	275	0.55	0.53	275	0.55	0.53
7	325	0.64	0.62	325	0.64	0.62

Factory Dimming Settings		
Multi-Level Option	Low Dimming Setting	High Dimming Setting
ML (CL)	75mA	525mA
ML1 (CK)	175mA	525mA



LED Multi-Level Options

525mA Drive Current Continued

Note: For use with products when 525mA drive current is specified. Specified drive current represents the maximum drive current that will be available with dimming option. Specifying the maximum allowed drive current for your product will provide the greatest range of dimming. Multipliers are for estimating purposes only. Check actual spec sheet data where available.

Position	High Dimming Settings					
	120-277V			347-480V		
	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
0	350	0.67	0.70	350	0.67	0.70
1	425	0.83	0.80	425	0.83	0.80
2	475	0.92	0.89	475	0.82	0.89
3	525	1.00	1.00	525	1.00	1.00
4	525	1.00	1.00	525	1.00	1.00
5	525	1.00	1.00	525	1.00	1.00
6	525	1.00	1.00	525	1.00	1.00
7	525	1.00	1.00	525	1.00	1.00

700mA Drive Current

Note: For use with products when 700mA drive current is specified. Specified drive current represents the maximum drive current that will be available with dimming option. Specifying the maximum allowed drive current for your product will provide the greatest range of dimming. Multipliers are for estimating purposes only. Check actual spec sheet data where available.

Position	Low Dimming Settings					
	120-277V			347-480V		
	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
0	0	0.00	0.00	0	0.0	0.0
1	75	0.11	0.12	75	0.14	0.12
2	125	0.19	0.21	125	0.19	0.21
3	150	0.23	0.25	150	0.23	0.25
4	175	0.26	0.29	175	0.26	0.29
5	225	0.32	0.35	225	0.33	0.35
6	275	0.40	0.42	275	0.40	0.42
7	325	0.78	0.49	325	0.47	0.49

Factory Dimming Settings		
Multi-Level Option	Low Dimming Setting	High Dimming Setting
ML2 (DL)	75mA	700mA
ML3 (DK)	175mA	700mA

Position	High Dimming Settings					
	120-277V			347-480V		
	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
0	350	0.50	0.56	350	0.49	0.56
1	425	0.62	0.63	425	0.60	0.63
2	475	0.68	0.70	475	0.67	0.70
3	525	0.76	0.79	525	0.73	0.79
4	550	0.80	0.80	550	0.78	0.80
5	575	0.83	0.84	575	0.81	0.80
6	625	0.90	0.91	625	0.88	0.91
7	700	1.00	1.00	700	1.00	1.00

LED Multi-Level Options

1000mA Drive Current

Note: For use with products when 1000mA drive current is specified. Specified drive current represents the maximum drive current that will be available with dimming option. Specifying the maximum allowed drive current for your product will provide the greatest range of dimming. Multipliers are for estimating purposes only. Check actual spec sheet data where available.

Position	Low Dimming Settings			High Dimming Settings		
	120-277V			120-277V		
	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier	Drive Current (mA)	System Watts Multiplier	Lumen Multiplier
0	0	0.00	0.00	525	0.44	0.53
1	110	0.08	0.16	650	0.56	0.63
2	175	0.13	0.25	750	0.65	0.71
3	225	0.19	0.25	825	0.73	0.77
4	270	0.22	0.30	850	0.75	0.79
5	350	0.29	0.39	900	0.78	0.83
6	425	0.36	0.43	1000	0.87	0.91
7	500	0.42	0.51	1050	1.00	1.00

Factory Dimming Settings		
Multi-Level Option	Low Dimming Setting	High Dimming Setting
ML6 (XL)	110mA	1000mA
ML7 (XK)	175mA	1000mA

VG Series

Note: For use with VG Series luminaires

VG Series Luminaires		
Input Power Designator	Voltage	Availability
A	120-277	Available
	347, 480	Available

Position	Low Dimming Settings		High Dimming Settings	
	120-277V, 347V, 480V		120-277V, 347V, 480V	
	System Watts Multiplier	Lumen Multiplier	System Watts Multiplier	Lumen Multiplier
0	0.00	0.00	0.44	0.53
1	0.08	0.16	0.56	0.63
2	0.13	0.25	0.65	0.71
3	0.19	0.25	0.73	0.77
4	0.22	0.30	0.75	0.79
5	0.29	0.39	0.78	0.83
6	0.36	0.43	0.87	0.91
7	0.42	0.51	1.00	1.00

Factory Dimming Settings		
Multi-Level Option	Low Dimming Setting	High Dimming Setting
ML	5	7
ML1	5	4
ML2	1	7
ML3	1	4
ML4	1	0
ML5	5	0

LED Multi-Level Options

CPY Series

Note: For use with CPY250™ luminaires

CPY Series Luminaires		
Input Power Designator	Voltage	Availability
A	120-277	N/A
	347-480	N/A
B	120-277	Available
	347-480	N/A
C	120-277	N/A
	347-480	N/A
D	120-277	Available
	347-480	N/A

Factory Dimming Settings			
Input Power Designator	Multi-Level Option	Low Dimming Setting	High Dimming Setting
B	ML	4	5
D	ML	4	7

CPY Series – Input Power Designator B				
Position	Low Dimming Settings		High Dimming Settings	
	120-277V		120-277V	
	System Watts Multiplier	Lumen Multiplier	System Watts Multiplier	Lumen Multiplier
0	0.20	0.12	0.72	0.75
1	0.27	0.28	0.81	0.83
2	0.32	0.33	0.90	0.91
3	0.36	0.38	1.00	1.00
4	0.45	0.48	1.00	1.00
5	0.54	0.57	1.00	1.00
6	0.63	0.67	1.00	1.00
7	0.68	0.71	1.00	1.00

CPY Series – Input Power Designator D				
Position	Low Dimming Settings		High Dimming Settings	
	120-277V		120-277V	
	System Watts Multiplier	Lumen Multiplier	System Watts Multiplier	Lumen Multiplier
0	0.00	0.00	0.54	0.55
1	0.14	0.14	0.65	0.67
2	0.20	0.17	0.72	0.75
3	0.24	0.22	0.80	0.83
4	0.27	0.26	0.84	0.86
5	0.35	0.35	0.88	0.90
6	0.43	0.44	0.96	0.97
7	0.50	0.51	1.00	1.00

OSQ Series

Note: For use with OSQ™ luminaires

OSQ Series Luminaires		
Input Power Designator	Voltage	Availability
A	120-277	Available ^{F,R}
	347-480	N/A
J	120-277	Available ^{F,R}
	347-480	N/A
S	120-277	Available ^{F,R}
	347-480	N/A

^F Multi-Level option available with Fusing option

^R Multi-Level option available with NEMA® Photocell Receptacle option

Position	Low Dimming Settings		High Dimming Settings	
	120-277V		120-277V	
	System Watts Multiplier	Lumen Multiplier	System Watts Multiplier	Lumen Multiplier
0	0.00	0.00	0.50	0.60
1	0.12	0.14	0.62	0.72
2	0.17	0.23	0.71	0.80
3	0.22	0.29	0.78	0.85
4	0.26	0.34	0.81	0.87
5	0.34	0.43	0.85	0.90
6	0.41	0.51	0.95	0.97
7	0.48	0.58	1.00	1.00

Factory Dimming Settings		
Multi-Level Option	Low Dimming Setting	High Dimming Setting
ML	5	7



LED Multi-Level Options

XSP Series

Note: For use with XSP1™, XSP2™, XSP2L™ and XSPW™ Luminaires

XSP Series Luminaires		
Input Power Designator	Voltage	Availability
XSP1, XSP2 Versions A&B A-I	120-277	Available ^{FR}
	347-480	Available ^R
XSP2L Version A L-P	120-277	Available ^{FR}
XSPW C	120-277	Available ^{FR}
	347	N/A
XSPW G	120-277	N/A
	347	N/A

^F Multi-Level option available with Fusing option

^R Multi-Level option available with NEMA[®] Photocell Receptacle option

XSP1, XSP2, & XSPW Luminaires				
Position	Low Dimming Settings		High Dimming Settings	
	120-480V		120-480V	
	System Watts Multiplier	Lumen Multiplier	System Watts Multiplier	Lumen Multiplier
0	0.00	0.00	0.47	0.51
1	0.16	0.12	0.55	0.60
2	0.18	0.16	0.63	0.68
3	0.22	0.21	0.71	0.75
4	0.26	0.26	0.82	0.85
5	0.31	0.33	0.88	0.90
6	0.35	0.38	1.00	1.00
7	0.41	0.44	1.00	1.00

Factory Dimming Settings			
Luminaire	Multi-Level Option	Low Dimming Setting	High Dimming Setting
XSP1, XSP2 and XSP2L	ML (K)	4	7
XSPW	ML (K)	5	7

XSP2L Luminaires				
Position	Low Dimming Settings		High Dimming Settings	
	120-277V		120-277V	
	System Watts Multiplier	Lumen Multiplier	System Watts Multiplier	Lumen Multiplier
0	0.00	0.00	0.61	0.69
1	0.18	0.18	0.71	0.78
2	0.25	0.28	0.81	0.86
3	0.30	0.34	0.91	0.94
4	0.34	0.40	1.00	1.00
5	0.41	0.41	1.00	1.00
6	0.45	0.53	1.00	1.00
7	0.53	0.62	1.00	1.00