

■ TECHNICAL

The Technical section provides details about lamps, ballasts, ambient temperature limits and 2-level control. This section also includes brief explanations of IESNA and NEMA Classifications, as well as Beta Lighting Warranties.

■ SECTION CONTENTS

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PULSE START METAL HALIDE

	HPF, 60 Hz			NPF, 60 Hz		
	System Wattage	Starting Amperes	Operating Amperes	System Wattage	Starting Amperes	Operating Amperes
50W PSMH						
120V	68	1.20†	0.60	70	2.40	1.50
208V	68	0.65†	0.35	70	1.25	0.85
240V	68	0.60†	0.30	70	1.00	0.75
277V	68	0.50†	0.25	70	0.80	0.65
347V	72	0.40†	0.25	72	0.80	0.55
70W PSMH						
120V	90	1.70†	0.80	90	2.60	2.10
208V	90	0.95†	0.45	90	1.50	1.20
240V	90	0.85†	0.40	90	1.25	1.00
277V	90	0.70†	0.35	90	1.10	0.85
347V	90	0.60†	0.30	90	1.05	0.70
100W PSMH						
120V	127	2.60†	1.10	127	4.00	3.00
208V	127	1.50†	0.65	127	2.30	1.50
240V	127	1.30†	0.55	127	2.00	1.35
277V	127	1.20†	0.50	127	1.75	1.30
347V	130	1.00†	0.40	130	1.40	1.00

	HPF, 60 Hz			
	Ballast Type	System Wattage	Starting Amperes	Operating Amperes
125W PSMH				
120V	CWA	150	0.90	1.30
277V	CWA	150	0.40	0.55
150W PSMH				
277V	Reactor	170	1.50†	0.65
120V	CWA	190	1.40	1.70
208V	CWA	190	0.80	1.00
240V	CWA	190	0.70	0.85
277V	CWA	190	0.60	0.75
347V	CWA	190	0.40	0.55
480V	CWA	190	0.25	0.40
200W PSMH				
277V	Reactor	219	1.25†	0.80
120V	CWA	232	1.40	2.00
208V	CWA	232	0.75	1.15
240V	CWA	232	0.70	1.00
277V	CWA	232	0.60	0.85
347V	CWA	232	0.35	0.70
480V	CWA	232	0.35	0.50
250W PSMH				
277V	Reactor	275	1.35†	1.10
120V	CWA	288	1.40	2.50
208V	CWA	288	0.80	1.45
240V	CWA	288	0.70	1.25
277V	CWA	288	0.60	1.10
347V	CWA	288	0.50	0.90
480V	CWA	288	0.35	0.60
300W PSMH				
277V	Reactor	324	1.55	1.25
120V	CWA	342	1.30	2.80
208V	CWA	342	0.80	1.65
240V	CWA	342	0.65	1.40
277V	CWA	342	0.55	1.25
320W PSMH				
277V	Reactor	349	1.70	1.40
120V	CWA	368	2.60	3.20
208V	CWA	368	1.50	1.80
240V	CWA	368	1.30	1.60
277V	CWA	368	1.15	1.40
347V	CWA	368	0.85	1.15
480V	CWA	368	0.60	0.80

Notes: Per NEC, non-continuous load (starting current) can be sized to 100% of circuit rating. Continuous loads (operating current) are limited to 80% of circuit current rating.

† Denotes open circuit amperes when value exceeds starting current amperes.

PULSE START METAL HALIDE (CONT.)

	Ballast Type	HPF, 60 Hz		
		System Wattage	Starting Amperes	Operating Amperes
350W PSMH				
277V	Reactor	380	1.90	1.50
120V	CWA	400	3.30	3.60
208V	CWA	400	1.90	2.10
240V	CWA	400	1.65	1.80
277V	CWA	400	1.40	1.55
347V	CWA	400	1.10	1.20
480V	CWA	400	0.75	0.90
400W PSMH				
277V	Reactor	435	2.10	1.70
120V	CWA	450	3.50	4.00
208V	CWA	450	2.00	2.30
240V	CWA	450	1.75	2.00
277V	CWA	450	1.50	1.75
347V	CWA	452	1.20	1.40
480V	CWA	455	0.90	1.00
450W PSMH				
277V	Reactor	485	2.30	1.90
120V	CWA	503	4.20	4.50
208V	CWA	503	2.40	2.60
240V	CWA	503	2.10	2.25
277V	CWA	503	1.80	2.00
347V	CWA	508	1.40	1.50
480V	CWA	505	1.00	1.10
750W PSMH				
120V	CWA	815	4.80	6.80
208V	CWA	815	2.80	4.00
240V	CWA	815	2.40	3.40
277V	CWA	815	2.10	3.00
347V	CWA	820	1.70	2.40
480V	CWA	820	1.10	1.70
875W PSMH				
480V	Reactor	922	2.00	2.45
120V	CWA	940	5.50	8.00
208V	CWA	940	3.20	4.50
240V	CWA	940	2.75	4.00
277V	CWA	940	2.40	3.45
480V	CWA	940	1.30	2.00
1000W PSMH				
120V	CWA	1080	6.00	9.00
208V	CWA	1080	3.50	5.20
240V	CWA	1080	3.00	4.50
277V	CWA	1080	2.60	3.90
347V	CWA	1080	2.10	3.15
480V	CWA	1080	1.50	2.30

Notes: Per NEC, non-continuous load (starting current) can be sized to 100% of circuit rating. Continuous loads (operating current) are limited to 80% of circuit current rating.

METAL HALIDE

	System Wattage	HPF, 60 Hz	
		Starting Amperes	Operating Amperes
175W MH			
120V	210	1.60	1.80
208V	210	0.90	1.10
240V	210	0.80	0.90
277V	210	0.70	0.80
347V	210	0.50	0.65
480V	211	0.30	0.45
250W MH			
120V	289	1.80	2.50
208V	289	1.10	1.45
240V	289	0.90	1.25
277V	289	0.80	1.10
347V	289	0.60	0.90
480V	295	0.50	0.65

METAL HALIDE (CONT.)

	HPF, 60 Hz		
	System Wattage	Starting Amperes	Operating Amperes
400W MH			
120V	455	2.80	4.00
208V	455	1.60	2.30
240V	455	1.40	2.00
277V	455	1.20	1.75
347V	455	1.10	1.40
480V	457	0.70	1.00
1000W MH			
120V	1080	6.00	9.00
208V	1080	3.50	5.20
240V	1080	3.00	4.50
277V	1080	2.60	3.90
347V	1080	2.10	3.15
480V	1080	1.60	2.25

METAL HALIDE - PAR

	HPF, 60 Hz		
	System Wattage	Starting Amperes	Operating Amperes
35W PAR20			
120V	56	0.90†	0.45
277V	56	0.40†	0.20
35W PAR30			
120V	56	0.90†	0.45
277V	56	0.40†	0.20
70W PAR30			
120V	90	1.70†	0.80
277V	90	0.80†	0.40
70W PAR38			
120V	90	1.70†	0.80
277V	90	0.80†	0.40
100W PAR38			
120V	129	2.60†	1.10
277V	129	1.20†	0.05

† Denotes open circuit amperes when value exceeds starting current amperes.

COMPACT FLUORESCENT

	HPF, 60 Hz		
	System Wattage	Operating Amperes	Ballast Type
13W quad tube/2-pin			
120V	17	0.14	Magnetic
277V	21	0.09	
13W quad tube/4-pin			
120V	17	0.13	Electronic
277V	17	0.06	
26W quad tube/4-pin			
120V	27	0.23	Electronic
277V	27	0.09	
26W triple tube/4-pin			
120V	26	0.22	Electronic
277V	26	0.09	
32W triple tube/4-pin			
120V	36	0.30	Electronic
277V	36	0.13	
42W triple tube/4-pin			
120V	47	0.39	Electronic
277V	47	0.17	
57W quad tube/4-pin			
120V	59	0.50	Electronic
277V	59	0.21	

HIGH PRESSURE SODIUM

	HPF, 60 Hz			NPF, 60 Hz		
	System Wattage	Starting Amperes	Operating Amperes	System Wattage	Starting Amperes	Operating Amperes
35W HPS						
120V	46	0.80†	0.40*	46	1.40	0.85
208V	56	0.60*†	0.35*	54	0.95	0.70
240V	56	0.50*†	0.30*	54	0.85	0.60
277V	56	0.45*†	0.25*	54	0.70	0.55
50W HPS						
120V	62	1.00†	0.60*	62	1.80	1.20
208V	79	0.85*†	0.45*	78	1.35	0.90
240V	79	0.70*†	0.40*	78	1.15	0.80
277V	79	0.60*†	0.40*	78	1.00	0.70
70W HPS						
120V	86	1.30†	0.80	86	2.10	1.75
208V	96	0.90†	0.55	99	1.50	1.10
240V	105	0.80†	0.50	99	1.30	0.95
277V	105	0.70†	0.45	99	1.10	0.90
347V	93	0.60†	0.35	93	0.85	0.60
480V	94	0.40†	0.25	94	0.55	0.50
100W HPS						
120V	115	1.80†	1.10	115	3.10	2.15
208V	130	1.30†	0.70	130	1.80	1.30
240V	130	1.10†	0.60	130	1.60	1.15
277V	130	1.00*†	0.60*	130	1.85	1.60
347V	130	0.70†	0.40	130	1.05	0.80
480V	130	0.60†	0.35	130	0.80	0.65
150W HPS						
120V	170	2.40†	1.55	170	4.50	3.30
208V	188	1.60†	1.00	188	2.90	1.85
240V	188	1.40†	0.85	188	2.50	1.65
277V	188	1.30†	0.80	188	2.55	2.00
347V	188	0.90†	0.60	188	1.55	1.10
480V	188	0.70†	0.45	188	1.20	1.00
250W HPS						
120V	300	1.75	2.50			
208V	300	1.00	1.50			
240V	300	0.85	1.30			
277V	300	0.75	1.10			
347V	300	0.75	0.90			
480V	300	0.45	0.70			
400W HPS						
120V	460	3.30	3.80			
208V	460	1.90	2.20			
240V	460	1.65	1.90			
277V	460	1.40	1.70			
347V	460	1.15	1.30			
480V	460	0.80	1.00			
1000W HPS						
120V	1100	5.00	9.50			
208V	1100	3.00	5.50			
240V	1100	2.60	4.80			
277V	1100	2.20	4.20			
347V	1100	1.70	3.30			
480V	1100	1.30	2.40			

* Not truly High Power Factor; but rather Power Factor Corrected P.F. between 80 and 90%.

† Denotes open circuit amperes when value exceeds starting current amperes.

2D FLUORESCENT

	HPF, 60 Hz		
	System Wattage	Operating Amperes	Ballast Type
21W 2D® Plug-In/4-pin			
120V	22	0.17	Electronic
277V	21	0.08	
28W 2D® Plug-In/4-pin			
120V	30	0.21	Electronic
277V	28	0.10	
38W 2D® Plug-In/4-pin			
120V	42	0.31	Electronic
277V	38	0.14	
28W 2D® Plug-In/4-pin (Universal Voltage Ballast)			
120-277V	28	0.11/0.24	Electronic
38W 2D® Plug-In/4-pin (Universal Voltage Ballast)			
120-277V	38	0.33/0.14	Electronic

2D is a registered trademark of GE Lighting.

LOW VOLTAGE (12V) – INCANDESCENT

Lamp Description	Average Rated Life	Visual Beam Spread (~50% max CBCP)	Nadir Candlepower (Candelas)	COLUMN A 0° Aiming Angle Beam Spread per Ft.	COLUMN B 60° Aiming Angle Beam Spread per Ft. from Wall
MR11 bi-pin base–Halogen					
20W					
Q20MR11/NFL30°-FTC	3500	30°	600	0.54	1.07W x 2.73H
35W					
Q35MR11/SP20°-FTF	3500	20°	3000	0.35	0.71W x 1.56H
Q35MR11/NFL30°-FTH	3500	30°	1300	0.54	1.07W x 2.73H
MR16 bi-pin base–Halogen					
20W					
Q20MR16/C/FL40°-BAB	5000	40°	525	0.73	1.46W x 4.83H
Q20MR16/C/NSP15°-ESX	5000	15°	3750	0.26	0.53W x 1.11H
Q20MR16/C/VNSP7°-EZX	3000	7°	7400	0.12	0.24W x 0.49H
42W					
Q42MR16/C/VNSP9°-EZY	3500	9°	12300	0.16	0.31W x 0.64H
50W					
Q50MR16/C/FL40°-EXN	6000	40°	1700	0.73	1.46W x 4.83H
Q50MR16/C/NFL25°-EXZ	6000	25°	3200	0.44	0.89W x 2.08H
Q50MR16/C/NSP15°-EXT	6000	15°	9100	0.26	0.53W x 1.11H
71W					
Q71MR16/C/FL40°-EYC	4000	40°	2200	0.73	1.46W x 4.83H
Q71MR16/C/NFL25°-EYJ	4000	25°	5500	0.44	0.89W x 2.08H
Q71MR16/C/NSP15°-EYF	4000	15°	11500	0.26	0.53W x 1.11H
PAR 36 screw terminal–Halogen					
36W					
36PAR36/CAP/NSP 13°	4000	13°	3500	0.23	0.46W x 0.95H
36PAR36/CAP/VNSP 5°	4000	5°	17000	0.09	0.17W x 0.35H
36PAR36/CAP/WFL 32°	4000	32°	1000	0.57	1.15W x 3.05H
50W					
50PAR36/H/SP8°	4000	8°	30000	0.14	0.28W x 0.57H
50PAR36/H/SP5°	4000	5°	35000	0.09	0.17W x 0.35H
50PAR36/H/FL30°	4000	30°	1300	0.54	1.07W x 2.73H

LINE VOLTAGE – INCANDESCENT

Lamp Description	Average Rated Life	Visual Beam Spread (~50% max CBCP)	Nadir Candlepower (Candelas)	COLUMN A 0° Aiming Angle Beam Spread per Ft.	COLUMN B 60° Aiming Angle Beam Spread per Ft. from Wall
PAR Lamp–Halogen					
50W					
50PAR20H/FL25°	2500	25°	1500	0.44	0.89W x 2.08H
50PAR20H/NFL30°	2500	30°	1200	0.54	1.07W x 2.73H
50PAR20H/NSP10°	2500	10°	6000	0.17	0.35W x 0.72H
50PAR30H/FL40°	2500	40°	1300	0.73	1.46W x 4.83H
50PAR30/CAP/SPL/NSP9°	2500	9°	8800	0.16	0.31W x 0.64H
50PAR30L/H/FL40°	3000	40°	1000	0.73	1.46W x 4.83H
50PAR30L/H/SP10°	3000	10°	7000	0.17	0.35W x 0.72H
75W					
75PAR30/CAP/SPL/FL40°	2500	40°	2100	0.73	1.46W x 4.83H
75PAR30/CAP/SPL/NSP9°	2500	9°	15400	0.16	0.31W x 0.64H
75PAR30H/SP10°	3000	10°	13000	0.17	0.35W x 0.72H
75PAR30L/H/FL25°	3000	25°	3100	0.44	0.89W x 2.08H
75PAR30L/H/SP10°	3000	10°	9000	0.17	0.35W x 0.72H
90W					
90PAR/H/FL25°	2500	25°	4100	0.44	0.89W x 2.08H
90PAR/H/SP10°	2500	10°	16000	0.17	0.35W x 0.72H
150W					
150PAR/FL 130V	750	30°	4500	0.54	1.07W x 2.73H
Quartz Halogen T4					
100W					
Q100CL/DC (1200 lumens)	2000	—	—	—	—

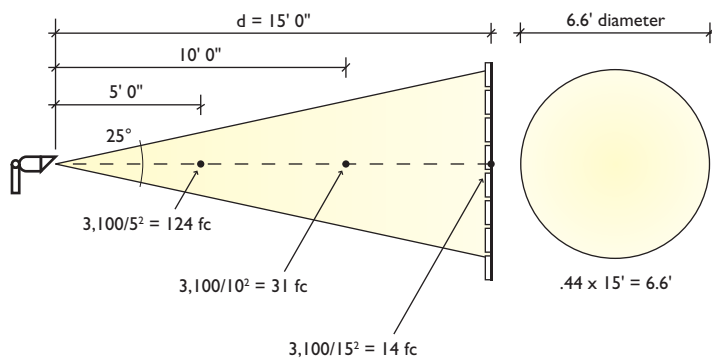
METAL HALIDE – PAR

Lamp Description	Initial Lamp Lumens	Average Rated Life	Visual Beam Spread (~50% max CBCP)	Nadir Candlepower (Candelas)	COLUMN A 0° Aiming Angle Beam Spread per Ft.	COLUMN B 60° Aiming Angle Beam Spread per Ft. from Wall	CCT K	CRI
35W PAR20								
CDM35/PAR20/M/FL	2000	9000	30°	5000	0.54	1.07W x 2.73H	3000	>80
CDM35/PAR20/M/SP	2000	9000	10°	23000	0.17	0.35W x 0.72H	3000	>80
35W PAR30								
CDM35/PAR30L/M/FL	2200	9000	30°	8900	0.54	1.07W x 2.73H	3000	>80
CDM35/PAR30L/M/SP	2200	9000	10°	44000	0.17	0.35W x 0.72H	3000	>80
70W PAR30								
CDM70/PAR30/L/M/FL	4850	9000	40°	10000	0.73	1.46W x 4.83H	3000	>80
CDM70/PAR30/L/M/SP	4850	9000	10°	68000	0.17	0.35W x 0.72H	3000	>80
70W PAR38								
MP70PAR38/U/FL	3400	8500	35°	10000	0.63	1.26W x 3.59H	3000	70
MP70PAR38/U/SP	3400	8500	20°	18000	0.35	0.71W x 1.56H	3000	70
MP70PAR38/U/VWFL	3400	8500	65°	3000	1.27	2.55W x +100H	3000	70
100W PAR38								
MPI00PAR38/U/FL	5800	8500	35°	12000	0.63	1.26W x 3.59H	3000	70
MPI00PAR38/U/SP	5800	8500	20°	26000	0.35	0.71W x 1.56H	3000	70
MPI00PAR38/U/VWFL	5800	8500	65°	4500	1.27	2.55W x +100H	3000	70

BEAM SPREAD CALCULATIONS

The distance from the luminaire to the object being illuminated has a great impact on the resultant beam spread and light level. As the distance from the luminaire increases, the width of the beam increases. As a result, the available light will cover a larger area while producing a lower overall light level within the beam area. The Inverse Square Law or the Cosine Law provides a mathematical calculation to determine the light levels at the center of the beam spread (see below). The footcandle level at the center will be 2x as bright as the footcandle level found at the perimeter of the calculated circle of light (see formulas below to determine the approximate circle of light at 50% of maximum CBCP).

Lamp used in examples: 75 PAR30L Flood Incandescent on page 418.

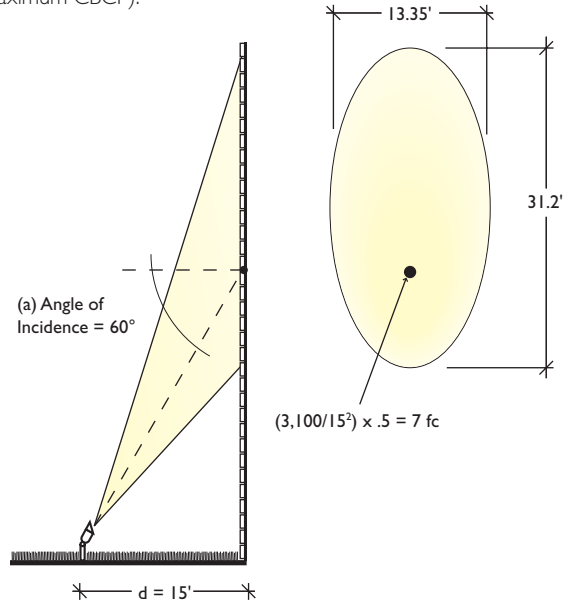


The Inverse Square Law may be used to determine nadir footcandles when the lamp is perpendicular to the surface to be illuminated:

Inverse Square Law: $fc = \text{nadir candela} / d^2$
 ie: $(3100/15^2) \times .5 = 14 \text{ fc}$

To determine the beam spread for a lamp that is perpendicular to the surface to be illuminated, multiply the distance (d) to the surface by the value indicated in Column A on page 418 and above.

ie: $.44 \times 15' = 6.6' \text{ diameter}$



When the surface to be illuminated is not perpendicular to the light source, use the Cosine Law to determine nadir footcandles:

Cosine Law: $fc = (\text{nadir candela} / d^2) \times \cos a$
 ie: $(3100/15^2) \times .5 = 7 \text{ fc}$

To determine the beam spread for a lamp that is at a 60° angle to the surface to be illuminated, multiply the distance (d) to the surface by the values indicated in Column B on page 418 and above.

ie: $.89 \times 15' = 13.35' \text{ diameter}$
 $2.08 \times 15' = 31.2' \text{ diameter}$

PULSE START METAL HALIDE LAMPS

Lamp Description	Bulb Type	Burning Position	Initial Lumens ¹ V/H	Mean Lumens	Average Rated Life ² V/H	CCT K	CRI
50W (ANSI-M110)							
MH 50W/U/PS	ED17	U	3400/3100	2200	10000/7500	4000	65
MH 50W/C/U/PS	ED17	U	3200/2900	2100	10000/7500	3700	70
MP 50W/C/U/UVS/PS/3K	EDX17	U	3000/2700	2000	10000/7500	3200	70
70W (ANSI-M98)							
MH 70W/U/PS	ED17	U	5600/5000	3600	15000/11250	4000	65
MH 70W/C/U/PS	ED17	U	5300/4800	3400	15000/11250	3700	70
MP 70W/C/U/UVS/PS/3K	EDX17	U	5000/4500	3300	15000/11250	3200	70
100W (ANSI-M90)							
MH 100W/U/PS	ED17	U	9000/8100	5900	15000/11250	4000	65
MH 100W/C/U/PS	ED17	U	8500/7700	5500	15000/11250	3700	70
MP 100W/C/U/UVS/PS/3K	EDX17	U	8100/7300	5300	15000/11250	3200	70
125W (ANSI-M150)							
MH 125W/U/PS	ED17	U	12000/10800	8400	15000/11250	4000	65
MH 125W/C/U/PS	ED17	U	11400/10300	8000	15000/11250	3700	70
150W (ANSI-M102)							
MH 150W/U/PS	ED17	U	14000/12600	10500	15000/11250	4000	65
MH 150W/C/U/PS	ED17	U	13300/12000	10000	15000/11250	3700	70
MP 150W/U/PS	EDX17	U	13300/12000	10000	15000/11250	4000	65
175W (ANSI-M152)							
MS 175W/BU/MED/PS	ED17	BU ±15°	17500/-	14000	15000/-	4000	65
MS 175W/BU/PS	ED28	BU ±15°	17500/-	14000	15000/-	4000	65
MS 175W/C/BU/PS	ED28	BU ±15°	16600/-	13300	15000/-	3700	70
200W (ANSI-M136)							
MS 200W/C/V/MED/PS	ED17	V ±15°	20000/-	16000	12000/-	3700	70
MS 200W/V/MED/PS	ED17	BU ±15°	21000/-	16800	12000/-	4000	65
MH 200W/U/PS	ED28	U	21000/18900	16800	15000/11250	4000	65
MH 200W/C/U/PS	ED28	U	20000/18000	16000	15000/11250	3700	70
MP 200W/V/PS	ED28	V ±15°	20000/-	16000	15000/-	4000	65
MP 200W/C/V/PS	ED28	V ±15°	19000/-	15200	15000/-	3700	70
250W (ANSI-M153)							
MH 250W/HBD/PS	ED28	BD ±90°	25000/22500	20000	15000/11250	4000	65
MH 250W/HBU/PS	ED28	BU ±90°	25000/22500	20000	15000/11250	4000	65
MH 250W/C/HBU/PS	ED28	BU ±90°	23800/21400	19000	15000/11250	3700	70
MP 250W/BU/UVS/PS	ED28	BU ±15°	23800/-	19000	15000/-	4000	65
MP 250W/C/BU/UVS/PS	ED28	BU ±15°	22600/-	18100	15000/-	3700	70
300W (ANSI-M151)							
MH 300W/U/ED28/PS	ED28	U	30500/27500	24400	20000+/15000	4000	65
MH 300W/C/HBU/ED28/PS	ED28	BU ±90°	29000/26000	23200	20000+/15000	3700	70
MP 300W/BU/ED28/UVS/PS	ED28	BU ±15°	29000	23200	20000+	4000	65
MP 300W/C/BU/ED28/UVS/PS	ED28	BU ±15°	27500	22000	20000+	3700	70
320W (ANSI-M154)							
⚡ MS 320W/ED28/PS	ED28	V ±15°	33000	26400	20000+	4000	65
⚡ MS 320W/C/V/ED28/PS	ED28	V ±15°	31000	24800	20000+	3700	70
⚡ MS 320W/BU/ED28/PS	ED28	BU ±15°	34000	27200	20000+	4000	65
⚡ MS 320W/C/BU/ED28/PS	ED28	BU ±15°	32300	25800	20000+	3700	70
MS 320W/V/ED37/PS	ED37	V ±15°	33000	26400	20000+	4000	65
MS 320W/C/V/ED37/PS	ED37	V ±15°	31000	24800	20000+	3700	70
⚡ MP 320W/BU/ED28/UVS/PS	ED28	BU ±15°	32300/-	25800	20000+/-	4000	65
⚡ MP 320W/BU/ED37/UVS/PS	ED37	BU ±15°	32300/-	25800	20000+/-	4000	65
⚡ MP 320W/C/BU/ED37/UVS/PS	ED37	BU ±15°	30600/-	24500	20000+/-	3700	70
⚡ MH 320W/H75/ED28/PS	ED28	H ±75°	29700	23800	15000	4000	65
⚡ MH 320W/H75/ED37/PS	ED37	H ±75°	29700	23800	15000	4000	65
350W (ANSI-M131)							
⚡ MH 350W/U/ED28/PS	ED28	U	37000/33300	29600	20000+/15000	4000	65
⚡ MH 350W/C/U/ED28/PS	ED28	U	35200/31700	28200	20000+/15000	3700	70
MH 350W/U/PS	ED37	U	37000/33300	29600	20000+/15000	4000	65
MH 350W/C/U/PS	ED37	U	35200/31700	28200	20000+/15000	3700	70
MP 350W/BU/UVS/PS	ED37	BU ±15°	35200	28200	20000+	4000	65
MP 350W/C/BU/UVS/PS	ED37	BU ±15°	33400	26700	20000+	3700	70
⚡ MP 350W/BU/ED28/UVS/PS	ED28	BU ±15°	35200	28200	20000+	4000	65
⚡ MP 350W/C/BU/ED28/PS	ED28	BU ±15°	33400	26700	20000+	3700	70
MP 350W/BD/UVS/PS	ED37	BD ±15°	35200	28200	20000+	4000	65
MP 350W/C/BD/UVS/PS	ED37	BD ±15°	33400	26700	20000+	3700	70

¹ Initial lumens at 100 hours
² Average rated life at 10 hours operation/start
 ⚡ Reduced envelope lamp

PULSE START METAL HALIDE LAMPS (CONT.)

Lamp Description	Bulb Type	Burning Position	Initial Lumens ¹ V/H	Mean Lumens	Average Rated Life ² V/H	CCT K	CRI
400W (ANSI-M155)							
⚡ MS 400W/V/ED28/PS	ED28	V ±15°	44000	35200	20000+	4000	65
MS 400W/V/PS	ED37	V ±15°	44000	35200	20000+	4000	65
MS 400W/C/V/PS	ED37	V ±15°	42000	33600	20000+	3700	70
⚡ MP 400W/BU/ED28/UVS/PS	ED28	BU ±15°	42000/-	33600	20000+/-	4000	65
⚡ MP 400W/C/BU/ED28/UVS/PS	ED28	BU ±15°	40000/-	32000	20000+/-	3700	70
MP 400W/BU/UVS/PS	ED37	BU ±15°	42000/-	33600	20000+/-	4000	65
MP 400W/C/BU/UVS/PS	ED37	BU ±15°	42000	33600	20000+/-	4000	65
MH 400W/H75/PS	ED37	H ±75°	40000	32000	15000	4000	65
⚡ MH 400W/H75/ED28/PS	ED28	H ±75°	40000	32000	15000	4000	65
450W (ANSI-M144)							
MS 450W/BU/PS	ED37	BU ±15°	50000/-	40000	20000+/-	4000	65
MS 450W/C/BU/PS	ED37	BU ±15°	47500/-	38000	20000+/-	3700	70
MP 450W/BU/PS	ED37	BU ±15°	47500/-	38000	20000+/-	4000	65
MP 450W/C/BU/PS	ED37	BU ±15°	45200/-	36200	20000+/-	3700	70
750W (ANSI-M149)							
MVR750/CV/BU/PA	BT37	VBU	72000	54000	16000	3700	70
MS750/PS/BU-HOR/BT37	BT37	BU ±90°	80000/72000	60000/54000	16000/12000	4000	65
MVR750/VBU/PA	BT37	VBU	82000	60000	16000	4000	65
875W (ANSI-M166/E)							
⚡ MS 875W/BU/BT37/PS	BT37	BU ±15°	100000	80000	20000+	4000	65
⚡ MS 875W/HOR/BT37/PS	BT37	H ±45°	95000	76000	12000	4000	65
1000W (ANSI-M141)							
⚡ MS 1000/U/PS/BT37	BT37	U	110000/107800	96000/86300	15000/9000	3800	65
MS 1000W/HOR/T25/PS	T25	H ±45°	110000	77000	10000	3400	65

METAL HALIDE LAMPS

Lamp Description	Bulb Type	Burning Position	Initial Lumens ¹ V/H	Mean Lumens	Average Rated Life ² V/H	CCT K	CRI
175W (ANSI-M57)							
MH 175W/U/MED	ED17	U	14000/12600	9100	10000/7500	4000	65
MH 175W/C/U/MED	ED17	U	13300/12000	8600	10000/7500	3700	70
MH MVR175W/U	ED28	U	13600/11700	8800/7400	6000/10000	4000	65
MH MVR175W/C/U	ED28	U	12900/11900	8400/7900	6000/10000	3900	70
250W (ANSI-M58)							
MH MVR250W/U	ED28	U	20800/19100	13500/12400	6000/10000	4200	65
MH MVR250W/C/U	ED28	U	19800/18200	13000/11600	6000/10000	3900	70
400W (ANSI-M59)							
⚡ MH 400W/U/ED28	ED28	U	36000/32400	23400	20000/15000	4000	65
MH MVR400W/U	ED37	U	36000/33100	23500/22100	20000/15000	4000	65
MH MVR400W/C/U	ED37	U	35000/32200	23000/19300	20000/15000	3700	70
MS 400W/HOR	ED37	H ±45°	-/40000	26000	-/20000	4000	65
1000W (ANSI-M47)							
⚡ MH 1000W/U/BT37	BT37	U	105000/94500	68300	12000/9000	4000	65
MVR 1000W/U	BT56	U	108000/100280	86000/79000	15000/11000	4000	65
MVR 1000W/C/U	BT56	U	105000/96600	80000/73000	15000/11000	3700	65

¹ Initial lumens at 100 hours
² Average rated life at 10 hours operation/start
 ⚡ Reduced envelope lamp

LAMP DESCRIPTION KEY

55	Mogul Base 150W HPS	ED28	Elliptical Dimpled 3-1/2" Diameter	SPORT 60	High Output	PA	Pulse Arc
3K	3200 Kelvin			LU	High Pressure Sodium	PS	Pulse Start Metal Halide
BD	Base Down	ED37	Elliptical Dimpled 4-5/8" Diameter	MED	Medium Base	SBY	Standby
BT37	Blown Tubular 4-5/8" Diameter			MH	Metal Halide	T25	Tubular 3-1/8" Diameter
BU	Base Up	HBD	Horizontal to BD	MP	Protected MH—Open Rated	U	Universal
C	Coated	HBU	Horizontal to BU	MS	Super MH	UVS	UV Shield
D	Diffuse	HOR	Horizontal	MVR	Multi-Vapor	V	Vertical (BU and BD)

HIGH PRESSURE SODIUM LAMPS

Lamp Description	Bulb Type	Burning Position	Initial Lumens ¹ V/H	Mean Lumens	Average Rated Life ² V/H	CCT K	CRI
50W (ANSI-S68) LU50/MED	B17	U	4000	3600	24000	1900	22
70W (ANSI-S62) LU70/MED LU70	B17 ED23-1/2	U U	6400 6400	5450 5450	24000 24000	1900 1900	22 22
100W (ANSI-S54) LU100/MED LU100	B17 ED23-1/2	U U	9500 9500	8550 8550	24000 24000	2000 2000	22 22
150W (ANSI-S55) LU150/MED LU150/55	B17 ED23-1/2	U U	16000 16000	14400 14400	24000 24000	2000 2000	22 22
250W (ANSI-S50) LU250	ED18	U	28000	27000	24000	2100	22
400W (ANSI-S51) LU400	ED18	U	51000	45000	24000	2100	22
1000W (ANSI-S52) LU1000	E25	U	140000	126000	24000	2100	22

LINEAR FLUORESCENT

Lamp Description	Bulb Type	Initial Lumens ¹	Mean Lumens	Rated Life ³	CCT K	CRI
F54W/T5/835	T5HO	5000	4700	20000	3500	85
F54W/T5/841	T5HO	5000	4700	20000	4100	85
F32T8/SP41/ECO	T8	2800	2660	20000	4100	78
F32T8/SPX35/ECO	T8	2950	2800	20000	3500	86
F32T8/SPX41/ECO	T8	2950	2800	20000	4100	86

COMPACT FLUORESCENT

Lamp Description	Initial Lumens ¹	Mean Lumens	Average Rated Life ³	CCT K	CRI
13W Quad Tube					
F13DBX2T4/SPX35	810	685	10000	3500	82
F13DBX/SPX35/4P	900	765	12000	3500	82
F13BX/SPX35/835	825	710	10000	3500	82
26W Quad Tube					
F26DBX2T4/SPX35	1710	1460	10000	3500	82
F26DBX2T4/SPX35/4P	1710	1460	12000	3500	82
26W Triple Tube					
F26TBX/SPX35/A/4P	1710	1440	12000	3500	82
32W Triple Tube					
F32TBX/SPX35A/4P	2200	1870	10000	3500	82
42W Triple Tube					
CF42DT/E/IN/835	2752	—	10000	3500	82
57W Quad Tube					
F57QBX835A4P	4300	3700	12000	3500	82

¹ Initial lumens at 100 hours
² Average rated life at 10 hours operation per start
³ Average rated life at 3 hours operation per start

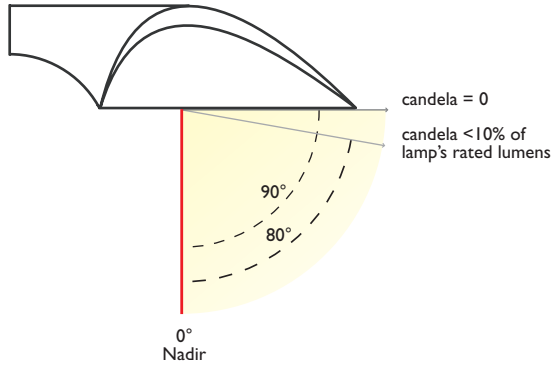
2D FLUORESCENT

Lamp Description	Initial Lumens ¹	Mean Lumens	Average Rated Life ³	CCT K	CRI
21W					
F212D/835/4P	1350	1135	10000	3500	82
28W					
F282D/835/4P	2050	1720	10000	3500	82
38W					
F382D/835/4P	2850	2395	10000	3500	82

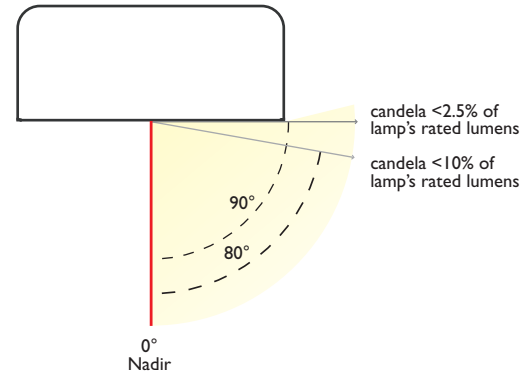
LAMP DESCRIPTION KEY

55	Mogul Base 150W HPS	ED28	Elliptical Dimpled 3-1/2" Diameter	SPORT 60	High Output	PA	Pulse Arc
3K	3200 Kelvin			LU	High Pressure Sodium	PS	Pulse Start Metal Halide
BD	Base Down	ED37	Elliptical Dimpled 4-5/8" Diameter	MED	Medium Base	SBY	Standby
BT37	Blown Tubular 4-5/8" Diameter			MH	Metal Halide	T25	Tubular 3-1/8" Diameter
BU	Base Up	HBD	Horizontal to BD	MP	Protected MH—Open Rated	U	Universal
C	Coated	HBU	Horizontal to BU	MS	Super MH	UVS	UV Shield
D	Diffuse	HOR	Horizontal	MVR	Multi-Vapor	V	Vertical (BU and BD)

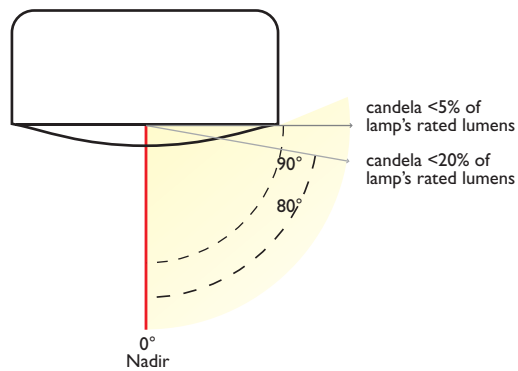
Full Cutoff Classification



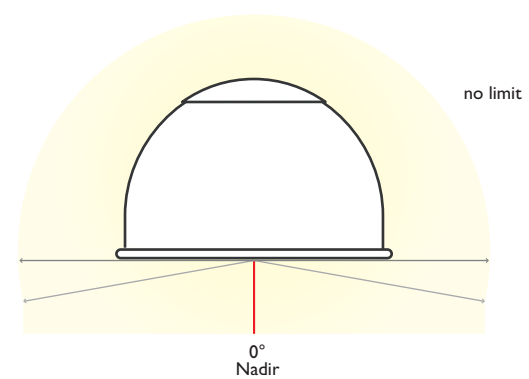
Cutoff Classification



Semi Cutoff Classification



Noncutoff Classification



Complying with local and federal lighting ordinances for light pollution is an increasingly important consideration when selecting outdoor lighting fixtures. Excessive light spill is inefficient and causes glare and discomfort to pedestrian and vehicular traffic, and creates a nuisance to surrounding property owners and users.



A "Cutoff Optic" icon is provided on the bottom of Beta outdoor product pages to indicate that the luminaire meets IESNA Full Cutoff, Cutoff or Semi Cutoff Classification.

The IESNA Cutoff Classifications define (how well the luminaire controls light at angles above 80° from nadir; and) what proportion of a luminaire's output is being distributed at 80° and 90° above nadir.

Full Cutoff: A luminaire is classified as Full Cutoff when the candela (per 1000 lamp lumens) at 90° above nadir is zero, and the candela is less than 10% of the lamp's rated lumens at 80° above nadir.

Cutoff: A luminaire is classified as Cutoff when the candela (per 1000 lamp lumens) at 90° above nadir is less than 2.5% of the lamp's rated lumens, and the candela is less than 10% of rated lumens at 80° above nadir.

Semi Cutoff: A luminaire is classified as Semi Cutoff when the candela (per 1000 lamp lumens) at 90° above nadir is less than 5% of the lamp's rated lumens, and the candela is less than 20% of the rated lumens at 80° above nadir.

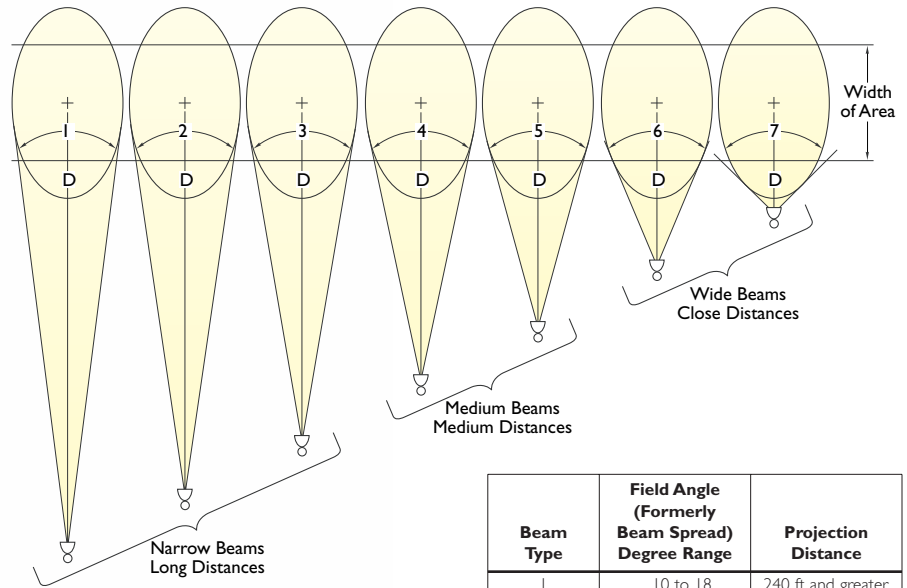
Noncutoff: A luminaire classified as Noncutoff has no luminous limitations.

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The National Electrical Manufacturers Association (NEMA) field angle classification is widely used by the lighting industry to classify the overall candlepower distribution pattern of a floodlight.

When the beam pattern of the floodlight is asymmetrical, its NEMA type is designated using both of the horizontal and vertical field angles. The horizontal type is listed first, and the vertical type is listed second. Therefore, a floodlight with a horizontal field angle of 75° (Type 5) and a vertical field angle of 35° (Type 3) is designated as a Type 5x3 floodlight.

This classification is useful to the designer for preliminary design selections. However, the coefficient of utilization (CU) of each design application should be based on the total luminous flux (in lumens) of the luminaire rather than the NEMA field angle.



Beam Type	Field Angle (Formerly Beam Spread) Degree Range	Projection Distance
1	10 to 18	240 ft and greater
2	18 to 29	200 to 240 ft
3	29 to 46	175 to 200 ft
4	46 to 70	145 to 175 ft
5	70 to 100	105 to 145 ft
6	110 to 130	80 to 105 ft
7	130 and up	under 80 ft

NEMA Field Angle (Formerly Beam Spread) Classifications and Their Effective Projection Distances

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Beta Lighting Area Lights produce lighting footprints that can be identified by their distribution forward of and to each side of a single fixture location. Distribution Types describe the spread of the luminaire's footprint in front of the fixture (Types I, II, III or IV), while Distribution Ranges define the spread to either side (Short, Medium or Long Distribution Range). The Distribution Type alone is often used by manufacturers to describe the general pattern of the luminaire's footprint (figure 1). However, evaluating the actual photometric data of a luminaire will provide the best comparison tool for specification.

Labeling the luminaire's Distribution Type is based on placing the luminaire's footprint on a grid representing distances in units of mounting heights (figure 2). The footprint is defined by tracing an area representing the luminaire's distribution at 50% of maximum candela. The Distribution Type is determined by identifying where the furthest edge of this footprint falls on the grid.

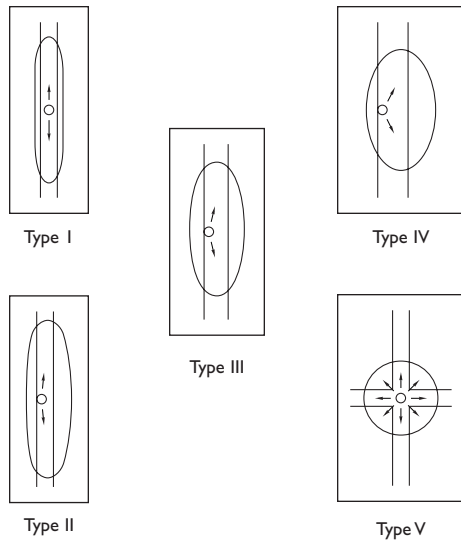


Figure 1. IESNA Distribution Types

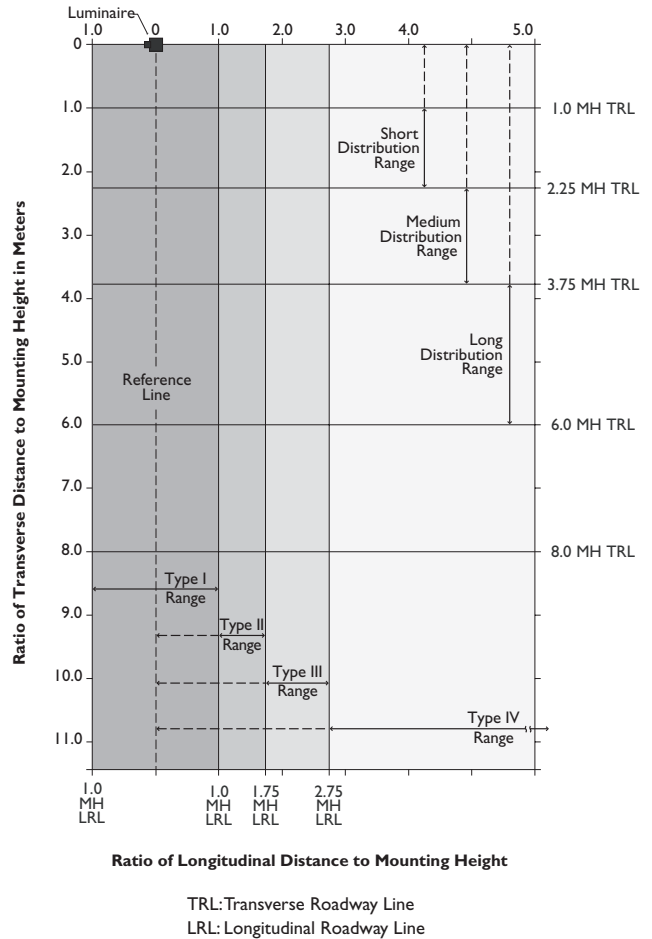


Figure 2. Plan View of Roadway Coverage for Different Types of Luminaires

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BLF (Beta Linear Fluorescents)

2 LAMP 13" WIDE - DAMP

Lamp	Ambient Temperature	
	Open	Enclosed
T5HO	45°C	N/A
T8	40°C	N/A

2 LAMP 6" WIDE - WET

Lamp	Ambient Temperature	
	Open	Enclosed
T5HO	N/A	35°C
T8	N/A	35°C

4 LAMP 21" WIDE - DAMP

Lamp	Ambient Temperature	
	Open	Enclosed
T5HO	45°C	40°C
T8	35°C	30°C

6 LAMP 30" WIDE - DAMP

Lamp	Ambient Temperature	
	Open	Enclosed
T5HO	45°C	40°C
T8	35°C	30°C

6 LAMP 24" WIDE - DAMP

Lamp	Ambient Temperature	
	Open	Enclosed
T5HO	45°C	N/A
T8	35°C	N/A

BHB (Beta High Bays) - HID

GLASS PRISMATIC HIGH BAY

Lamp	Ambient Temperature	
	Open	Enclosed
PULSE START METAL HALIDE		
250W PSMH	40°C	40°C
400W PSMH	40°C	40°C
METAL HALIDE		
175W MH	N/A	50°C
250W MH	N/A	50°C
400W MH	50°C	50°C
HIGH PRESSURE SODIUM		
150W HPS	50°C	50°C
250W HPS	50°C	50°C
400W HPS	50°C	50°C

AISLE LIGHT HIGH BAY

Lamp	Ambient Temperature	
	Open	Enclosed
PULSE START METAL HALIDE		
250W PSMH	55°C	55°C
400W PSMH (w/o fusing)	55°C	55°C
400W PSMH (w/fusing)	50°C	55°C
450W PSMH	40°C	40°C
METAL HALIDE		
250W MH	N/A	65°C
400W PSMH (w/o fusing)	55°C	55°C
400W PSMH (w/fusing)	50°C	55°C
HIGH PRESSURE SODIUM		
120W HPS	65°C	65°C
250W HPS	65°C	65°C
400W HPS	55°C	55°C

16" PRISMATIC HIGH BAY

Lamp	Ambient Temperature	
	Open	Enclosed
PULSE START METAL HALIDE		
250W PSMH	40°C	40°C
400W PSMH	40°C	N/A
METAL HALIDE		
175W MH	N/A	40°C
250W MH	N/A	40°C
400W MH	40°C	N/A
HIGH PRESSURE SODIUM		
150W HPS	40°C	40°C
250W HPS	40°C	40°C
400W HPS	40°C	N/A

22" PRISMATIC & TRANSLUCENT

Lamp	Ambient Temperature	
	Open	Enclosed
PULSE START METAL HALIDE		
250W PSMH	55°C	40°C
320W PSMH	55°C	40°C
350W PSMH	55°C	N/A
400W PSMH	55°C	N/A
450W PSMH	55°C	N/A
METAL HALIDE		
250W MH	N/A	40°C
400W MH	40°C	N/A
HIGH PRESSURE SODIUM		
250W HPS	55°C	40°C
400W HPS	55°C	40°C

16" & 22" ALUMINUM HIGH BAY

Lamp	Ambient Temperature	
	Open	Enclosed
PULSE START METAL HALIDE		
250W PSMH	55°C	55°C
400W PSMH (w/o fusing)	55°C	55°C
400W PSMH (w/fusing)	50°C	55°C
450W PSMH	40°C	40°C
METAL HALIDE		
250W MH	N/A	65°C
400W MH (w/o fusing)	55°C	55°C
400W MH (w/fusing)	50°C	55°C
HIGH PRESSURE SODIUM		
150W HPS	65°C	65°C
250W HPS	65°C	65°C
400W HPS	60°C	55°C

BHB (Beta High Bays) – FLUORESCENT

22" CFL PRISMATIC

Lamp	Ambient Temperature	
	Open	Enclosed
4 x 26 CFL	50°C (35°C*)	50°C (40°C*)
4 x 32 CFL	50°C (30°C*)	50°C (35°C*)
4 x 42 CFL	50°C	50°C
4 x 57 CFL	50°C	40°C
6 x 26 CFL	50°C	50°C
6 x 32 CFL	50°C	50°C
6 x 42 CFL	50°C	50°C
8 x 26 CFL	50°C	45°C
8 x 32 CFL	45°C	40°C
8 x 42 CFL	40°C	35°C

* with "DM" option

22" CFL ALUMINUM

Lamp	Ambient Temperature	
	Open	Enclosed
4 x 26 CFL	50°C (35°C*)	50°C (40°C*)
4 x 32 CFL	50°C (30°C*)	50°C (35°C*)
4 x 42 CFL	50°C	50°C
4 x 57 CFL	50°C	40°C
6 x 26 CFL	50°C	50°C
6 x 32 CFL	50°C	50°C
6 x 42 CFL	40°C	35°C
8 x 26 CFL	50°C	45°C
8 x 32 CFL	40°C	35°C
8 x 42 CFL	40°C	35°C

* with "DM" option

BLB (Beta Low Bay)

16" ALUMINUM LOW BAY – DAMP

Lamp	Ambient Temperature*
PULSE START METAL HALIDE	
250W PSMH	55°C
400W PSMH	40°C
450W PSMH	40°C
METAL HALIDE	
175W MH	55°C
250W MH	55°C
400W MH	40°C
HIGH PRESSURE SODIUM	
150W HPS	55°C
250W HPS	55°C
400W HPS	40°C

22" ALUMINUM LOW BAY – DAMP

Lamp	Ambient Temperature*
PULSE START METAL HALIDE	
250W PSMH	55°C
400W PSMH	40°C
450W PSMH	40°C
METAL HALIDE	
175W MH	55°C
250W MH	55°C
400W MH	40°C
HIGH PRESSURE SODIUM	
150W HPS	55°C
250W HPS	55°C
400W HPS	40°C

28" ALUMINUM LOW BAY – DAMP

Lamp	Ambient Temperature*
PULSE START METAL HALIDE	
250W PSMH	55°C
400W PSMH	40°C
450W PSMH	40°C
METAL HALIDE	
175W MH	55°C
250W MH	55°C
400W MH	40°C
HIGH PRESSURE SODIUM	
150W HPS	55°C
250W HPS	55°C
400W HPS	40°C

* Wet Location: 40°C Maximum Ambient Temperature regardless of wattage for wet location versions of above products.

16" ALUMINUM MINI LOW BAY

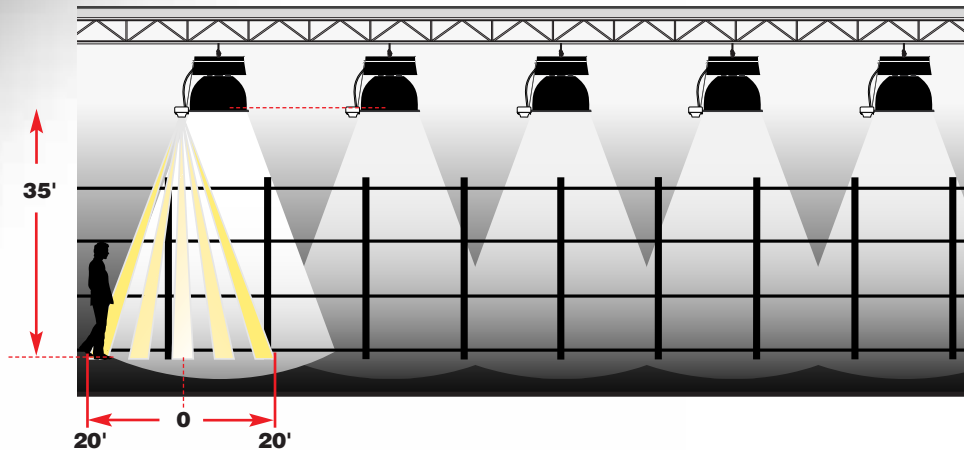
Lamp	Ambient Temperature
METAL HALIDE	
175W MH	25°C

12" MINI PRISMATIC LOW BAY

Lamp	Ambient Temperature
METAL HALIDE	
175W MH	25°C

CONVERSION TABLE

Centigrade	Fahrenheit
25°C	77°F
30°C	86°F
35°C	95°F
40°C	104°F
45°C	113°F
50°C	122°F
55°C	131°F
60°C	140°F
65°C	149°F



INDIVIDUAL FIXTURE CONTROL OFFERS MAXIMUM FLEXIBILITY AND ENERGY SAVINGS

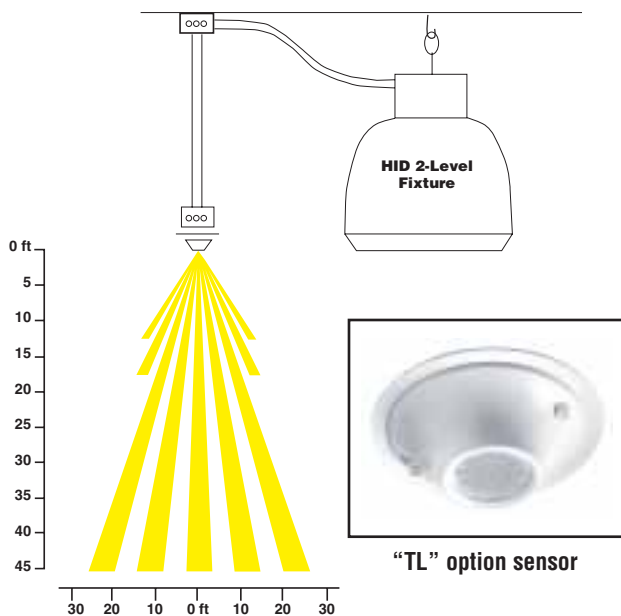
The "TL" option is completely integrated at the factory into most High or Low Bay fixtures. Its passive infrared technology (PIR) can detect temperature changes as an occupant moves within the sensor's 360-degree field of view. Once an occupant approaches from 15 to 20 feet underneath each light fixture, the 2-level sensor activates the fixture, instantaneously from low to high mode, and keeps it on for a designated time-delay period. The time-delay is adjustable from 0.5 to 20 minutes and can be adjusted manually with a tool provided with each unit.

Any High or Low Bay fixture with the integrated "TL" option is the ultimate in individual control and is the easiest to install because no additional wiring is necessary.

SENSOR COVERAGE PATTERNS

Sensor coverage patterns are created from a high-quality fresnel lens and are symmetrical in pattern.

Coverages shown are maximum and represent coverage for walking motion. For building spaces with lower levels of activity, with obstacles and barriers or fixtures installed at extreme mounting heights, coverage size may be decreased.



LIMITED FINISH WARRANTY

We will warrant to the original purchaser, with proof of purchase, its Colorfast DeltaGuard™ finish for a period of seven years from date of shipment. We will repair, or at our option, replace the defective finish if it exhibits cracking, peeling, excessive fading or corrosion defects during the warranty period. This warranty applies only to the Colorfast DeltaGuard finish and only when the product bearing the Colorfast DeltaGuard finish is properly handled, maintained, installed and exposed to normal environmental conditions. This warranty excludes defects resulting from improper handling, storage, installation, acts of God, fire, vandalism or civil disturbances. Purchaser must notify us in writing within 60 days of noticing the defect. This warranty excludes field labor or service charges related to the repair or replacement of the Colorfast DeltaGuard finish. We reserve the right to change the warranty period without prior notice and without incurring obligation and expressly disclaim all warranties not stated in this limited warranty.

LIMITED PRODUCT WARRANTY

We warrant to the original purchaser, with proof of purchase, its delivered products shall be free from defects in material and workmanship:

One Year

- Directional Accent In-Ground Mount
- Sealed Well Light
- Round Tapered Poles (including the finish)

Three Years

- All luminaires except Directional Accent In-Ground Mount and Sealed Well Light

We will repair, or at our option, replace the defective product during the stated warranty period. This warranty applies only to the repair or replacement of the product and only when the product is properly handled, installed and maintained according to our instructions. This warranty excludes defects resulting from improper handling, storage, installation, acts of God, fire, vandalism or civil disturbances. Purchaser must notify us in writing within 60 days of noticing the defect. This warranty excludes field labor or service charges related to the repair or replacement of the product. We reserve the right to change the warranty period without prior notice and without incurring obligation and expressly disclaim all warranties not stated in this limited warranty.

LIMITED LAMP WARRANTY

We warrant to the original purchaser, with proof of purchase, its supplied lamps for the following periods from date of shipment.

Three Months

- Incandescent lamps, including halogen and quartz
- Compact fluorescent lamps used in products that are connected to control gear or occupancy sensor that cause lamps to frequently switch "on" or "off".
- Special order compact fluorescent lamp, regardless of manufacturer's published lamp life data.

Six Months

- HID lamps with rated life less than 10,000 hours, as published in the Technical section of this catalog.
- Fluorescent lamps with rated life less than 10,000 hours, as published in the Technical section of this catalog.
- Linear fluorescent lamps used in products that are connected to control gear or occupancy sensor that cause lamps to frequently switch "on" or "off".
- Special order HID lamps, regardless of manufacturer's published lamp life data.

One Year

- HID lamps with rated life equal or greater than 10,000 hours as published in the Technical section of this catalog.
- Fluorescent lamps with rated life equal to or greater than 10,000 hours, as published in the Technical section of this catalog.

We will replace the defective lamp during the stated warranty period. This warranty applies only to the replacement of the lamp and only when the lamp is properly handled, installed and maintained according to our instructions. This warranty excludes defects resulting from improper handling, storage, installation, acts of God, fire, vandalism or civil disturbances. This warranty excludes field labor or service charges related to the repair or replacement of the lamp. We reserve the right to change the warranty period without prior notice and without incurring obligation and expressly disclaim all warranties not stated in this limited warranty.