Product Information and Specification Guide

Metal Halide Lamps

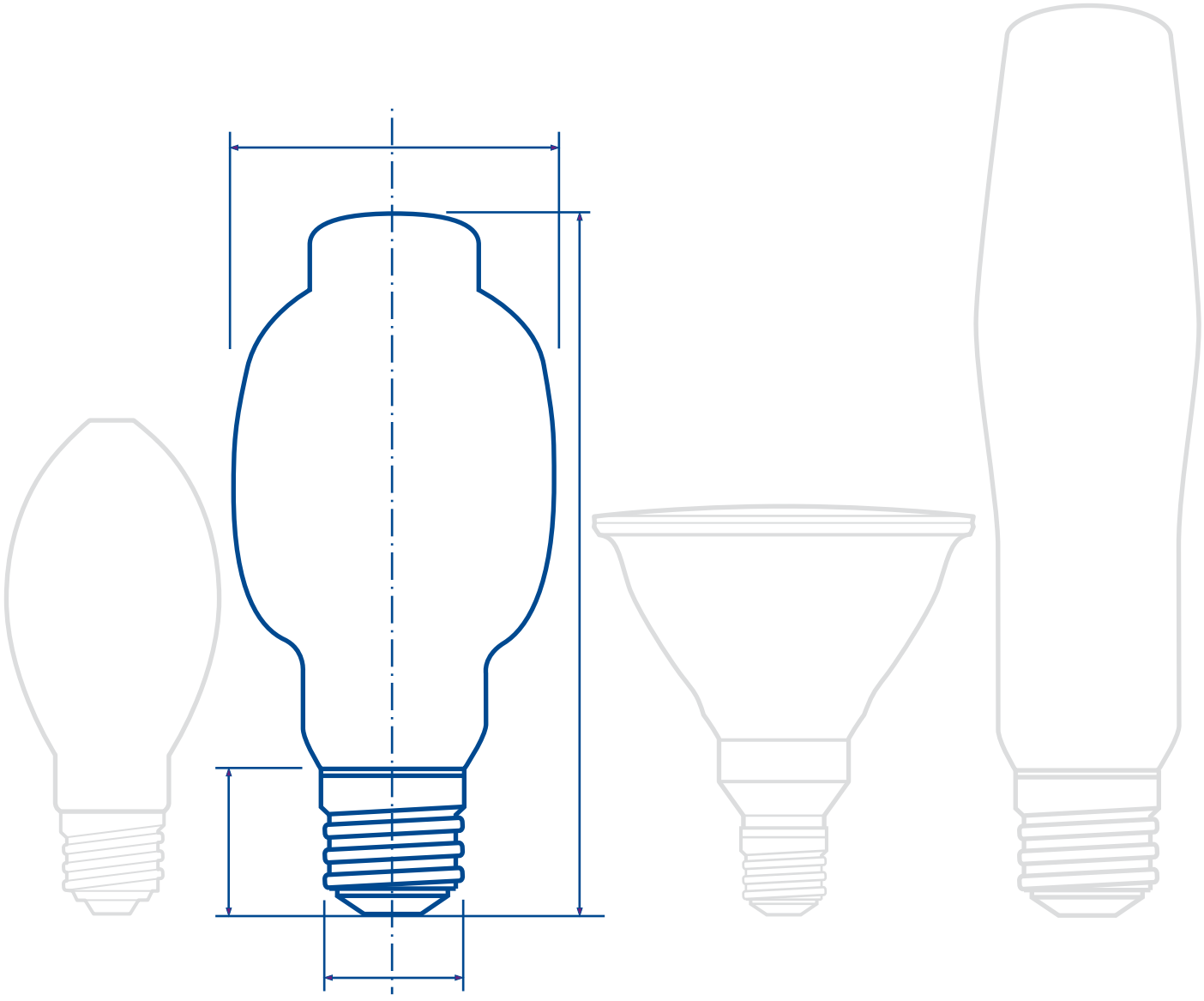


Table of Contents

SYLVANIA Metal Halide Lamps

Specification Guide
This guide contains a complete listing of SYLVANIA metal halide products available at its time of printing. The guide contains technical data (photometric, electrical, and physical characteristics) and is a supplement to the product information bulletins. Consult the online catalog at **www.mySYLVANIA.com/register** for the most up-to-date information as ratings are subject to change without notice.

OSRAM SYLVANIA offers additional literature describing each product family, which is updated as new products become available.

Consult product catalog, online catalog, or printed packaging for warning label for Metal Halide lamps.

Lumen Rating
SYLVANIA Metal Halide lamps, with the exception of HQI® lamps, are specified at rated wattage. What does this mean? The light output values contained in this specification guide are based on actual lamp operation on an ANSI circuit (high power factor linear reactor) while operated at rated wattage. Mean Lumens are measured on ANSI reference circuits at rated wattage at 40% of average rated life. Commercially available magnetic CWA and Lag ballasts may operate lamps below rated wattage depending on power factor of the system. This reduction in wattage may decrease luminous output.

HQI lamps are specified at rated input to the reference circuit. Photometric and electrical results will vary on commercial ballasts.

Ratings are based on burning cycles of at least 10 hours per start (excluding M1500 and BRITELINE lamps) on ballasts which meet ANSI standards. Initial lumens are based on 100 hours of operation. Any reduction in the rated operational hours per start will adversely affect light output and lamp life.

Life Rating
The average life of a lamp is based on vertical operation (unless otherwise noted) of representative lamps operated under controlled conditions of at least 10 hours per start (except for M1500 and BRITELINE lamps, which are based on 5 hours per start). Average life is defined as the total operating hours at which 50% (Median) of a group of lamps of significant size is still operating.

Operating cycles shorter than 10 hours per start will reduce lamp life as follows:

5 hours/start – Approximately 75% of Rating

2.5 hours/start – Approximately 55% of Rating

1.25 hours/start – Approximately 40% of Rating

Typical survival curves have been provided for most lamps contained herein. The curves illustrate the definition of average rated life and the percentage of expected lamp failures.

Maximum Base Temperature
A welded mogul screw base allows higher maximum operating base temperature than designated by ANSI (except for EX39 bases). For specific temperature requirements, see product section.

Light Center Length
The light center length of HID lamps is usually measured from the center of the arc tube to the bottom of the lamp base.

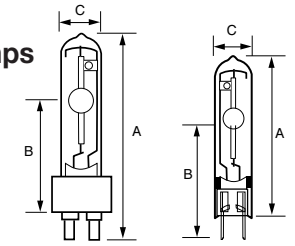
Light Center Length measurements for ceramic T6/G12 & TC are slightly different as shown in the pictures below.

Maximum Overall Length
The maximum overall length of single-ended lamps is the maximum distance from the top of the bulb to the bottom of the base. For double-ended lamps, it is the maximum distance from end-to-end excluding any leadwires.

Arc Length
Arc length is the dimension of the arc discharge measured from one electrode tip to the other. (METALARC® POWERBALL® Ceramic lamps are designed with a semi-opaque arc tube, thus arc length should be used as a reference only).

T6/T7.5 (G12) and TC Lamps

A = Maximum Overall Length
B = Light Center Length
C = Diameter



T6/T7.5 (G12) **TC**

Key to Date of Manufacture
The existing date code system is comprised of 4 characters. The second character represents the year, i.e. 6 = 2006 and the third character represents the month, i.e. 1 = January 9 = September, a = October.

Date Code Reference Table

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	/b418	/b428	/b438	/b448	/b458	/b468	/b478	/b488	/b498	/b4a8	/b4b8	/b4c8
2005	/b518	/b528	/b538	/b548	/b558	/b568	/b578	/b588	/b598	/b5a8	/b5b8	/b5c8
2006	/b618	/b628	/b638	/b648	/b658	/b668	/b678	/b688	/b698	/b6a8	/b6b8	/b6c8
2007	/b718	/b728	/b738	/b748	/b758	/b768	/b778	/b788	/b798	/b7a8	/b7b8	/b7c8
2008	/b818	/b828	/b838	/b848	/b858	/b868	/b878	/b888	/b898	/b8a8	/b8b8	/b8c8
2009	/b918	/b928	/b938	/b948	/b958	/b968	/b978	/b988	/b998	/b9a8	/b9b8	/b9c8
2010	/b018	/b028	/b038	/b048	/b058	/b068	/b078	/b088	/b098	/b0a8	/b0b8	/b0c8
2011	/b118	/b128	/b138	/b148	/b158	/b168	/b178	/b188	/b198	/b1a8	/b1b8	/b1c8
2012	/b218	/b228	/b238	/b248	/b258	/b268	/b278	/b288	/b298	/b2a8	/b2b8	/b2c8
2013	/b318	/b328	/b338	/b348	/b358	/b368	/b378	/b388	/b398	/b3a8	/b3b8	/b3c8
2014	/b418	/b428	/b438	/b448	/b458	/b468	/b478	/b488	/b498	/b4a8	/b4b8	/b4c8

METALARC® Performance Means Best Performance
SYLVANIA Metal Halide lamps are the ideal choice for today's energy-conscious lighting world. High output, high efficacy, and a wide range of wattages and colors allow designers increased flexibility to optimize their lighting solution while holding costs down. METALARC lamps have significantly higher efficacy than mercury vapor or incandescent products and have considerably better CRI than mercury vapor and high pressure sodium lamps.

OSRAM SYLVANIA offers a complete line of Metal Halide lamps in a variety of families. Each family of products offers a variety of open or enclosed fixture rated lamps, as defined by new ANSI nomenclature for fixture ratings: O/E/S/F.

O = Lamps classified as O-type, comply with ANSI Standard C78.389 for containment testing and may be used in open luminaires.

E = Lamps classified as E-type are to be used ONLY in suitably rated enclosed luminaires.

S = When operated within 15 degrees of vertical, this lamp may be operated in an open luminaire provided the installation is not near people or flammable or combustible material, otherwise it must be operated in a suitably enclosed luminaire.

F = F-rated lamps require an enclosed fixture with a UV filter and lens interlock.

METALARC PRO-TECH® (MP)
For lamps that will operate safely in either open or enclosed fixtures just look for the "MP" designation – METALARC PRO-TECH. These are specially designed lamps that incorporate a protective shroud to contain an arc tube rupture. METALARC PRO-TECH lamps can be used in open or enclosed fixtures. Dedicated bases are supplied on both low and high wattage lamp types while the PRO-TECH lamps are designed specifically for use with exclusionary sockets in open fixtures, they are also compatible with standard sockets. Lamps are available from 50W to 1000W in both the clear and coated versions.

Standard Probe Start Metal Halide Lamps

Standard METALARC Lamps (M)
A wide range of general lighting lamps includes wattages from 175W to 1500W. They offer exceptional white light in either a clear or coated outer bulb. Standard METALARC lamps allow for design flexibility with multiple light source solutions to choose from.

SUPER METALARC Lamps (MS)
SUPER METALARC lamps are position dedicated, which means that they are specially designed to run in specific operating positions. This feature allows these lamps to exhibit improved performance over standard (universal operating) metal halide lamps of similar wattage. Product features include longer life, higher maintained lumens and increased efficacy. For applications where higher light output or specific operating positions are required, Super METALARC lamps are available in 175, 250, 400, and 1000 watt.

METALARC SUPERSAVER® (M/SS)
Constructed with an enhanced arc tube for peak performance, METALARC SUPERSAVER lamps are designed as energy saving replacements for standard lamps. The 950 watt SUPERSAVER lamp is a direct retrofit
for existing 1000 watt products. The 360 watt SUPERSAVER replaces 400 watt products and the 150 watt SUPERSAVER replaces 175 watt lamps—no ballast change is required.

METALARC PULSE START (M/PS)
METALARC PULSE START lamps utilize metal halide performance with proven ignitor technology for longer life, improved lumen maintenance and reduced color shift over lamp life compared to standard metal halide products. Lamp configurations include low and high wattage types, both clear and coated. METALARC PRO-TECH lamps less than 150 watts and POWERBALL Ceramic lamps also utilize PULSE START technology.

All PULSE START lamps require the use of a 4000V pulse rated socket.

METALARC POWERBALL® Ceramic (MC or MCP)
METALARC POWERBALL Ceramic lamps meet today's color critical needs by combining conventional metal halide pulse start characteristics, such as high efficacy and long life, with improved lamp-to-lamp color consistency and high CRI (>85). Their compact size allows for use in a wide variety of applications.

METALARC POWERBALL lamps use a patented rounded arc tube shape, which allows for a more uniform temperature and improved color consistency. A wide configuration of clear and coated lamps are available, from 20W-150W in TC, T6, T7.5, PAR20, PAR30LN, PAR38, and E17 bulb shapes (available in PRO-TECH). In addition, higher wattage lamps such as the 250W and 320W POWERBALL Ceramic are available.

Specialty Metal Halide Lamps

METALARC SAFELINE® (MT)
The SAFELINE is available in 400 watts. This lamp is specially designed to self-extinguish within 15 minutes when the outer bulb is broken. This lamp is recommended for use in sports facilities and other places of public assembly where the lamps may be subject to breakage by external objects.

METALARC BRITELINE
OSRAM SYLVANIA offers the BRITELINE family of double ended lamps in 1500 and 2000 watts. These lamps allow for optimized fixture designs, which provide excellent optical control and high efficiency. The lamps are particularly well suited for sports lighting and outdoor floodlighting applications. All lamps are rated for type F luminaires and must be operated in enclosed fixtures with an interlocked ultraviolet (UV) filter glass lens to prevent serious skin burns and eye inflammation resulting from shortwave ultraviolet radiation.

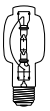
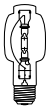
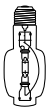
HQI®
HQI lamps are recommended for installations where higher CRI values are critical, such as interior and display lighting. These lamps are offered in a wide variety of wattages including 70 and 150. They are available in both the double-ended and single-ended configuration, in a variety of color temperatures and have CRI values up to 93.

All HQI lamps must be operated in enclosed fixtures.

NOTES
For lamp wattages of 360W and greater, it is recommended that lampholders with nickel-plated copper alloy center contacts (with spring) should be used rather than electrical contacts made of stainless steel.

Standard (Probe Start)

Standard METALARC®

	175 Watt					
						
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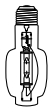
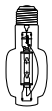
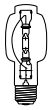
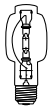
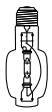
Item No.	64479	64480	64733	64471	64472	64473
Ordering Abbreviation	M175/U/MED	M175/C/U/MED	MP175/BU-ONLY/MED	M175/U	M175/C/U	M175/3K/BU-ONLY
ANSI Spec No.	M57/E	M57/E	M57/O	M57/E	M57/E	M57/E
Physical Characteristics						
Operating Position	Universal		Base-Up ONLY	Universal		Base-Up ONLY
Bulb Designation	ED17			BT28		
Nominal Bulb Diameter mm (")	54 (2.13)			89 (3.5)		
Base Type	E26 Medium			E39 Mogul		
Nom. Light Center Length mm (")	86 (3.39)			127 (5.0)		
Max. Overall Length mm (")	138 (5.43)			211 (8.31)		
Nominal Arc Length mm (")	26 (1.02)	N/A	18 (0.71)	26 (1.02)	N/A	
Max. Bulb Temperature °C (°F)	400 (752)					
Max. Base Temperature °C (°F)	210 (410)			250 (482)		
Electrical Characteristics						
Nominal Lamp Watts	175					
Nominal Lamp Volts (RMS)	132					
Nominal Lamp Current (RMS)	1.5					
Minimum Start Volt-LAG	382 RMS, 540 Peak					
Minimum Start Volt-Lead Peak	280 RMS, 560 Peak					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	10000V, 7500H		10000	10000V, 7500H		10000
Initial Lumens	14400V, 12800H	13000V, 11080H	14400	14400V, 12800H	14000V, 12000H	11800
Mean Lumens	9300	8400	10800	9300	8400	7600
Correlated Color Temperature °K	4000	3600	3600	4200	3800	3200
Color Rending Index (CRI)	65	70	65		70	
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	7-12					
Nominal CIE X	0.383	0.4	0.399	0.374	0.39	0.427
Chromaticity Coordinates Y	0.387	0.39	0.387	0.385	0.385	0.41

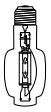
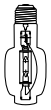
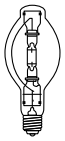
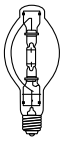
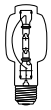
Standard (Probe Start)

Standard METALARC®

	175 Watt		250 Watt			
						
	Clear	Coated	Clear	Coated	Clear	Coated
Item No.	64773	64774	64457	64458	64474	64475
Ordering Abbreviation	MP175/ BU-ONLY	MP175/C/ BU-ONLY	M250/U	M250/C/U	M250/U/ ET18	M250/3K/ BU-ONLY
ANSI Spec No.	M57/O	M57/O	M58/E	M58/E	M58/E	M58/E
Physical Characteristics						
Operating Position	Base-Up ONLY		Universal			Base-Up ONLY
Bulb Designation	BT28				ET18	BT28
Nominal Bulb Diameter mm (")	89 (3.5)				57 (2.25)	89 (3.5)
Base Type	EX39 Excl. Mogul		E39 Mogul			
Nom. Light Center Length mm (")	127 (5.0)				147 (5.75)	127 (5.0)
Max. Overall Length mm (")	211 (8.31)				248 (9.75)	211 (8.31)
Nominal Arc Length mm (")	28.5 (1.12)	N/A	35 (1.38)	N/A	35 (1.38)	N/A
Max. Bulb Temperature °C (°F)	400 (752)				430 (806)	400 (752)
Max. Base Temperature °C (°F)	210 (410)		250 (482)			
Electrical Characteristics						
Nominal Lamp Watts	175		250			
Nominal Lamp Volts (RMS)	132		133			
Nominal Lamp Current (RMS)	1.5		2.1			
Minimum Start Volt-LAG	382 RMS, 540 Peak					
Minimum Start Volt-Lead Peak	280 RMS, 560 Peak		300 RMS, 540 Peak			
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	10000					
Initial Lumens	14400	12800	22000V, 20000H	21500V, 19500H	22000V, 20000H	17500
Mean Lumens	10200	7800	17000V, 14100H	17000V, 14000H	17500V, 13500H	13000
Correlated Color Temperature °K	4000	3800	4200	3800	4000	3200
Color Rending Index (CRI)	65	70	65	70	65	70
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	7-12					
Nominal CIE X Chromaticity Coordinates Y	0.385 0.393	0.402 0.395	0.375 0.385	0.39 0.388	0.383 0.385	0.427 0.41

Standard (Probe Start)

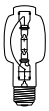
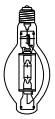
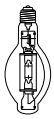
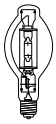
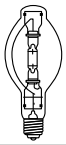
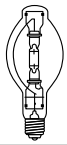
Standard METALARC®

	250 Watt		400 Watt			
						
	Clear	Coated	Clear	Coated	Clear	Clear
Item No.	64404	64405	64490	64492	64575	64488
Ordering Abbreviation	MP250/ BU-ONLY	MP250/C/ BU-ONLY	M400/U	M400/C/U	M400/U/ET18	M400/U/BT28
ANSI Spec No.	M58/O	M58/O	M59/S	M59/S	M59/E	M59/E
Physical Characteristics						
Operating Position	Base up-ONLY		Universal			
Bulb Designation	BT28		BT37		ET18	BT28
Nominal Bulb Diameter mm (")	89 (3.5)		117 (4.6)		57 (2.25)	89 (3.5)
Base Type	EX39 Excl. Mogul		E39 Mogul			
Nom. Light Center Length mm (")	127 (5.0)		178 (7.0)		156 (6.14)	127 (5.0)
Max. Overall Length mm (")	211 (8.31)		292 (11.5)		248 (9.75)	211 (8.31)
Arc Length mm (")	35 (1.38)	N/A	45 (1.77)	N/A	45 (1.77)	
Max. Bulb Temperature °C (°F)	400 (752)				430 (806)[1]	400 (752)
Max. Base Temperature °C (°F)	210 (410)		250 (482)			
Electrical Characteristics						
Nominal Lamp Watts	250		400			
Nominal Lamp Volts (RMS)	133		135			
Nominal Lamp Current (RMS)	2.1		3.25			
Minimum Start Volt-LAG	382 RMS, 540 Peak					
Minimum Start Volt-Lead Peak	300 RMS, 540 Peak		295 RMS, 531 Peak			
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	10000		20000V, 15000H			
Initial Lumens	23000	20000	36000V, 32000H		36000V, 33000H	36000V, 32000H
Mean Lumens	17000	14350	23500V, 20500H	22500V, 20500H	23400V, 21500H	23500V, 20500H
Correlated Color Temperature °K	4000	3800	4000	3700	4000	
Color Rending Index (CRI)	65	70	65	70	65	65
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	7-12					
Nominal CIE X	0.383	0.404	0.382	0.39	0.389	0.382
Chromaticity Coordinates Y	0.385	0.401	0.38	0.37	0.403	0.38

(1) Max. bulb temperature in the horizontal position is 500°C

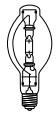
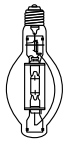
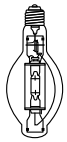
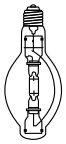
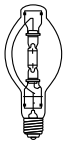
Standard (Probe Start)

Standard METALARC®

	400 Watt				1000 Watt	
						
	Coated	Clear	Coated	Clear	Clear	Coated
Item No.	64489	64705	64706	64717	64468	64470
Ordering Abbreviation	M400/C/U/ BT28	MP400/ BU-ONLY	MP400/C/ BU-ONLY	MP400/ BD-ONLY	M1000/U	M1000/C/U
ANSI Spec No.	M59/E	M59/O	M59/O	M59/O	M47/S	M47/S
Physical Characteristics						
Operating Position	Universal	Base-Up ONLY		Base-Down ONLY	Universal	
Bulb Designation	BT28	BT37			BT56	
Nominal Bulb Diameter mm (")	89 (3.5)	117 (4.6)			178 (7.0)	
Base Type	E39 Mogul	EX39 Excl. Mogul			E39 Mogul	
Nom. Light Center Length mm (")	127 (5.0)	178 (7.0)			241 (9.5)	
Max. Overall Length mm (")	211 (8.31)	292 (11.5)			391 (15.4)	
Nominal Arc Length mm (")	N/A	45 (1.77)	N/A	45 (1.77)	91 (3.58)	N/A
Max. Bulb Temperature °C (°F)	400 (752)				430 (806)	
Max. Base Temperature °C (°F)	250 (482)	210 (410)			250 (482)	
Electrical Characteristics						
Nominal Lamp Watts	400				1000	
Nominal Lamp Volts (RMS)	135				263	
Nominal Lamp Current (RMS)	3.25				4.1	
Minimum Start Volt-LAG	382 RMS, 540 Peak				530 RMS, 750 Peak	
Minimum Start Volt-Lead Peak	295 RMS, 531 Peak				380 RMS, 760 Peak	
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	20000V, 15000H	20000			18000V, 12000H	
Initial Lumens	36000V, 32000H	40000	38500	40000	110000V, 107800H	107000V, 101600H
Mean Lumens	22500V, 20500H	26000	25000	26000	86000V, 86000H	80000V, 80000H
Correlated Color Temperature °K	3600		3400	3600	4000	3400
Color Rending Index (CRI)	70	65	70	65		70
Warm Up Time (minutes)	2-4			4	2-4	
Hot Restrike Time (minutes)	7-12					
Nominal CIE X Chromaticity Coordinates Y	0.395 0.372	0.402 0.397	0.41 0.39	0.402 0.397	0.383 0.388	0.406 0.385

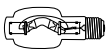
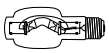
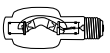
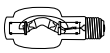
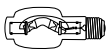
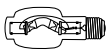
Standard (Probe Start)

Standard METALARC®

	1000 Watt			1500 Watt	
					
	Clear	Clear	Coated	Clear	Clear
Item No.	64469	64714	64716	64431	64432
Ordering Abbreviation	M1000/U/BT37	MP1000/ BU-ONLY	MP1000/C/ BU-ONLY	M1500/BU-HOR	M1500/BD
ANSI Spec No.	M47/E	M47/O	M47/O	M48/E	M48/E
Physical Characteristics					
Operating Position	Universal	Base-Up ONLY		Base-Up to HOR	Base-Down
Bulb Designation	BT37	BT56			
Nominal Bulb Diameter mm (")	117 (4.6)	178 (7.0)			
Base Type	E39 Mogul	EX39 Excl. Mogul		E39 Mogul	
Nom. Light Center Length mm (")	178 (7.0)	241 (9.5)			
Max. Overall Length mm (")	292 (11.5)	391 (15.4)			
Nominal Arc Length mm (")	91 (3.58)		N/A	91 (3.58)	
Max. Bulb Temperature °C (°F)	430 (806)	400 (752)		430 (806)	
Max. Base Temperature °C (°F)	250 (482)	210 (410)		250 (482)	
Electrical Characteristics					
Nominal Lamp Watts	1000			1500	
Nominal Lamp Volts (RMS)	263			268	
Nominal Lamp Current (RMS)	4.1			6.2	
Minimum Start Volt-LAG	530 RMS, 750 Peak				
Minimum Start Volt-Lead Peak	380 RMS, 760 Peak			410 RMS, 820 Peak	
Maximum Current Crest Factor	1.8				
Photometric Characteristics					
Average Rated Life (Hours)	15000V, 9000H	15000		3000	
Initial Lumens	110000V, 100500H	109000	102000	170000V, 153000H	167000V
Mean Lumens	93500V, 86000H	87500	82000	140000V, 127400H	140000V
Correlated Color Temperature °K	3800	3500	3200	4000	
Color Rending Index (CRI)	65		70		
Warm Up Time (minutes)	2-4			4-6	
Hot Restrike Time (minutes)	7-12	10		12-17	
Nominal CIE Chromaticity Coordinates X Y	0.389 0.388	0.403 0.389	0.426 0.389	0.38 0.376	

Standard (Probe Start)

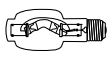
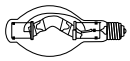
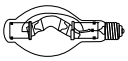
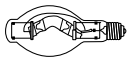
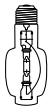
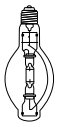
SUPER METALARC®

	175 Watt		250 Watt			400 Watt
						
	Clear	Coated	Clear	Coated	Coated	Clear
Item No.	64439	64440	64448	64449	64496	64443
Ordering Abbreviation	MS175/HOR	MS175/ C/HOR	MS250/HOR	MS250/ C/HOR	MS250/ 3K/HOR	MS400/ HOR/BT28
ANSI Spec No.	M57/E	M57/E	M58/E	M58/E	M58/E	M59/E
Physical Characteristics						
Operating Position	Horizontal					
Bulb Designation	BT28					
Nominal Bulb Diameter mm (")	89 (3.5)					
Base Type	E39 POM Mogul					
Nom. Light Center Length mm (")	127 (5.0)					
Max. Overall Length mm (")	211 (8.31)					
Nominal Arc Length mm (")	26 (1.0)	N/A	33 (1.3)	N/A		39 (1.54)
Max. Bulb Temperature °C (°F)	400 (752)					
Max. Base Temperature °C (°F)	250 (482)					
Electrical Characteristics						
Nominal Lamp Watts	175		250			400
Nominal Lamp Volts (RMS)	132		133			
Nominal Lamp Current (RMS)	1.5		2.1			3.25
Minimum Start Volt-LAG	382 RMS, 540 Peak					
Minimum Start Volt-Lead Peak	280 RMS, 560 Peak		300 RMS, 540 Peak			295 RMS, 531 Peak
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	10000		10000			20000
Initial Lumens	15000	14500	23000	22000	17200	39000
Mean Lumens	8000		15000	14000	12500	26000
Correlated Color Temperature °K	4200	4000	4200	3800	3200	4200
Color Rending Index (CRI)	65	70	65	70		65
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	7-12					
Nominal CIE X Chromaticity Coordinates Y	0.375 0.388	0.383 0.388	0.375 0.385	0.392 0.388	0.427 0.41	0.38 0.385

POM = Position-Oriented Mogul

Standard (Probe Start)

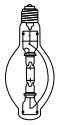
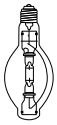
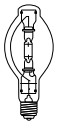
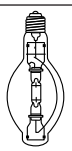
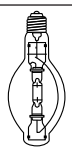
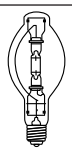
SUPER METALARC®

	400 Watt					
						
	Coated	Clear	Coated	Coated	Clear	Clear
Item No.	64444	64445	64446	64498	64441	64450
Ordering Abbreviation	MS400/C/ HOR/BT28	MS400/HOR	MS400/ C/HOR	MS400/ 3K/HOR	MS400/ BU-ONLY/BT28	MS400/ BU-ONLY
ANSI Spec No.	M59/E	M59/E	M59/E	M59/E	M59/E	M59/S
Physical Characteristics						
Operating Position	Horizontal				Base-Up ONLY	
Bulb Designation	BT28	BT37			BT28	BT37
Nominal Bulb Diameter mm (")	89 (3.5)	117 (4.6)			89 (3.5)	117 (4.6)
Base Type	E39 POM Mogul				E39 Mogul	
Nom. Light Center Length mm (")	127 (5.0)	178 (7.0)			127 (5.0)	178 (7.0)
Max. Overall Length mm (")	211 (8.31)	292 (11.5)			211 (8.31)	292 (11.5)
Nominal Arc Length mm (")	N/A	39 (1.54)	N/A	N/A	38 (1.5)	
Max. Bulb Temperature °C (°F)	400 (752)					
Max. Base Temperature °C (°F)	250 (482)					
Electrical Characteristics						
Nominal Lamp Watts	400					
Nominal Lamp Volts (RMS)	133				135	
Nominal Lamp Current (RMS)	3.25					
Minimum Start Volt-LAG	382 RMS, 540 Peak					
Minimum Start Volt-Lead Peak	295 RMS, 531 Peak					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	20000					
Initial Lumens	36500	39000	38000	33500	40000	42000
Mean Lumens	24000	25000	24000	23300	26000	
Correlated Color Temperature °K	3800	4200	3800	3200	3800	4000
Color Rending Index (CRI)	70	65	70		65	
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	7-12					
Nominal CIE X Chromaticity Coordinates Y	0.392 0.39	0.375 0.385	0.39 0.385	0.427 0.41	0.392 0.39	0.383 0.388

POM = Position-Oriented Mogul

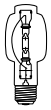
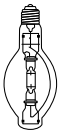
Standard (Probe Start)

SUPER METALARC®

	400 Watt			1000 Watt		
						
	Coated	Coated	Clear	Clear	Coated	Clear
Item No.	64452	64454	64451	64435	64460	64436
Ordering Abbreviation	MS400/C/ BU-ONLY	MS400/3K/ BU-ONLY	MS400/ BD-ONLY	MS1000/ BU-ONLY	MS1000/C/ BU-ONLY	MS1000/ BD-ONLY
ANSI Spec No.	M59/S	M59/S	M59/S	M47/S	M47/S	M47/S
Physical Characteristics						
Operating Position	Base-Up ONLY		Base-Down	Base-Up ONLY		Base-Down
Bulb Designation	BT37			BT56		
Nominal Bulb Diameter mm (")	117 (4.6)			178 (7.0)		
Base Type	E39 Mogul					
Nom. Light Center Length mm (")	178 (7.0)			241 (9.5)		
Max. Overall Length mm (")	292 (11.5)			391 (15.375)		
Nominal Arc Length mm (")	N/A	N/A	38 (1.5)	90 (3.54)	N/A	90 (3.54)
Max. Bulb Temperature °C (°F)	400 (752)					
Max. Base Temperature °C (°F)	250 (482)					
Electrical Characteristics						
Nominal Lamp Watts	400			1000		
Nominal Lamp Volts (RMS)	135	133	135	263		
Nominal Lamp Current (RMS)	3.25			4.1		
Minimum Start Volt-LAG	382 RMS, 540 Peak			530 RMS, 750 Peak		
Minimum Start Volt-Lead Peak	295 RMS, 531 Peak			380 RMS, 760 Peak		
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	20000			18000		
Initial Lumens	42000	35000	42000	115000	110000	115000
Mean Lumens	24700	22000	26000	92000	88000	92000
Correlated Color Temperature °K	3600	3200	4000		3400	4000
Color Rending Index (CRI)	70		65		70	65
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	7-12					
Nominal CIE X Chromaticity Coordinates Y	0.398 0.385	0.426 0.405	0.383 0.388		0.413 0.395	0.383 0.388

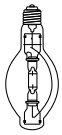
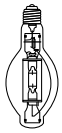
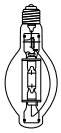
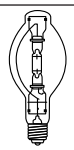
Standard (Probe Start)

METALARC SUPERSAVER®

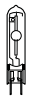
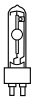
	150 Watt	360 Watt		
				
	Clear	Clear	Coated	Clear
Item No.	64719	64828	64829	64655
Ordering Abbreviation	M150/SS/ U/BT28	MS360/SS/ BU-Only/ED28	MS360/C/SS/ BU-Only/ED28	MS360/SS/ BU-HOR
ANSI Spec No.	M107/E, M57/E	M59/E, M165/E	M59/E, M165/E	M59/S, M165/S
Physical Characteristics				
Operating Position	Universal	Base-Up ONLY		Base-Up to HOR
Bulb Designation	BT28	ED28		BT37
Nominal Bulb Diameter mm (")	89 (3.5)			117 (4.6)
Base Type	E39 Mogul			
Nom. Light Center Length mm (")	127 (5.0)			178 (7.0)
Max. Overall Length mm (")	211 (8.31)			292 (11.5)
Nominal Arc Length mm (")	15 (0.6)	31.2 (1.2)	N/A	38 (1.5)
Max. Bulb Temperature °C (°F)	400 (752)			
Max. Base Temperature °C (°F)	250 (482)	230 (446)	210 (410)	250 (482)
Electrical Characteristics				
Nominal Lamp Watts	150	360		
Nominal Lamp Volts (RMS)	110	120		
Nominal Lamp Current (RMS)	1.5	3.2		3.25
Minimum Start Volt-LAG	382 RMS, 540 Peak			
Minimum Start Volt-Lead Peak	280 RMS	295 RMS		
Voltage Crest Factor (VCF)	2.0 Minimum	1.8 Minimum		
Maximum Current Crest Factor	1.8			
Photometric Characteristics				
Average Rated Life (Hours)	10000V, 7500H	20000		20000V, 15000H
Initial Lumens	13000V, 12000H	36000	34200	36000V, 30000H
Mean Lumens	7500V, 8500H	23400	22000	23500V, 19000H
Correlated Color Temperature °K	4000		3700	4000
Color Rending Index (CRI)	65		70	65
Warm Up Time (minutes)	2-4	3-5		2-4
Hot Restrike Time (minutes)	7-12	8-12	10-15	7-12
Nominal CIE X Chromaticity Coordinates Y	0.38 0.39	0.385 0.39	0.395 0.390	0.382 0.393

Standard (Probe Start)

METALARC SUPERSAVER®

	360 Watt			950W
				
	Coated	Clear	Coated	Clear
Item No.	64656	64737	64738	64850
Ordering Abbreviation	MS360/C/SS/ BU-HOR	MSP360/SS/ BU-ONLY	MSP360/C/SS/ BU-ONLY	M950/SS/ U/BT56
ANSI Spec No.	M59/S, M165/S	M59/O, M165/O	M59/O, M165/O	M47/E
Physical Characteristics				
Operating Position	Base-Up to HOR	Base-Up ONLY		Universal
Bulb Designation	BT37			BT56
Nominal Bulb Diameter mm (")	117 (4.6)			178 (7)
Base Type	E39 Mogul	EX39 Excl. Mogul		E39 Mogul
Nom. Light Center Length mm (")	178 (7.0)			241 (9.5)
Max. Overall Length mm (")	292 (11.5)			391 (15.4)
Nominal Arc Length mm (")	N/A	38 (1.5)	N/A	81 (3.19)
Max. Bulb Temperature °C (°F)	400 (752)			430 (806)
Max. Base Temperature °C (°F)	250 (482)	210 (410)		250 (482)
Electrical Characteristics				
Nominal Lamp Watts	360			950
Nominal Lamp Volts (RMS)	120			235
Nominal Lamp Current (RMS)	3.25			4.1
Minimum Start Volt-LAG	382 RMS, 540 Peak			530 RMS, 750 Peak
Minimum Start Volt-Lead Peak	295 RMS			380 RMS, 760 Peak
Voltage Crest Factor (VCF)	1.8 Minimum			2
Maximum Current Crest Factor	1.8			
Photometric Characteristics				
Average Rated Life (Hours)	20000V, 15000H	20000	20000	18000V, 12000H
Initial Lumens	36000V, 30000H	35000	34000	103000V 90000H
Mean Lumens	22500V, 19000H	23500	22500	80000V 64000H
Correlated Color Temperature °K	3600	4000	3600	4000
Color Rending Index (CRI)	70	65	70	65
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	7-12			
Nominal CIE X Chromaticity Coordinates Y	0.402 0.393	0.389 0.402	0.405 0.394	0.383 0.388

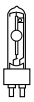
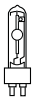
METALARC® PULSE START POWERBALL® Ceramic

	20 Watt	39 Watt			50 Watt	
						
	Clear	Clear	Clear	Clear	Clear	Coated
Item No.	64882	64791	64363	64325	64840	64849
Ordering Abbreviation	MC20TC/U/ 830 PB	MC39TC/U/ G8.5/830 PB	MC39T6/U/ G12/830 PB	MC39T6/U/ G12/940 PB	MCP50/U/ MED/830 PB	MCP50/C/U/ MED/830 PB
ANSI Spec No.	M156/E	M130/E [1]	M130/E [1]	M130/E [1]	M110/O, M148/O, M148	M110/O, M148/O
Physical Characteristics						
Operating Position	Universal					
Bulb Designation	T4.5		T6		E17	
Nominal Bulb Diameter mm (")	15 (0.6)		19 (0.75)		54 (2.13)	
Base Type	BiPin G8.5		G12		E26 Medium	
Nom. Light Center Length mm (")	52 (2.0)		56 (2.2)		86 (3.39)	
Max. Overall Length mm (")	81 (3.19)		100 (3.94)		138 (5.43)	
Nominal Arc Length mm (")	4.8 (0.19)				6.3 (0.25)	
Max. Bulb Temperature °C (°F)	450 (842)				400 (752)	
Max. Base Temperature °C (°F)	300 (572)		280 (536)		210 (410)	
Electrical Characteristics						
Nominal Lamp Watts	20	39			50	
Nominal Lamp Volts (RMS)	100	90			90	
Nominal Lamp Current (RMS)	0.23	0.53			0.68	
Minimum Start Volt-LAG	230 RMS, 296 Peak [2]				235 RMS, 332 Peak	
Minimum Start Volt-Lead Peak	N/A					
Voltage Crest Factor (VCF)	N/A					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	12000					
Initial Lumens	1700	3300	3400	3300	4100	3800
Mean Lumens	1275	2720	2720	2640	2850	2640
Correlated Color Temperature °K	3000			4200	3000	2900
Color Rending Index (CRI)	83	82		90	88	
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	2-15				4-6	
Nominal CIE X Chromaticity Coordinates Y	0.435 0.395	0.432 0.396	0.435 0.4	0.435 0.395	0.4375 0.400	0.44 0.404

(1) The circuit must include overcurrent protection (i.e. Thermally Switched ballast).

(2) Lamp requires a nominal open circuit voltage of 230V or higher. Without ignitor in the circuit, minimum OCV is 209Vrms.

METALARC® PULSE START POWERBALL® Ceramic

	70 Watt					
						
	Clear	Clear	Clear	Clear	Clear	Clear
Item No.	64792	64825	64361	64200	64338	64793
Ordering Abbreviation	MC70TC/U/ G8.5/830	MC70TC/U/ G8.5/930 PB	MC70T6/U/ G12/830 PB	MC70T6/U/ G12/930 PB	MC70T6/U/ G12/940 PB	MC70T6/ DE/830 PB
ANSI Spec No.	M139/E, M98/E [1]	M98E, M139/E, M98	M139/E, M98/E [1]	M139/E, M98/E	M139/E, M98/E [1]	M139/E, M85/E, M98/E
Physical Characteristics						
Operating Position	Universal					HOR ± 45°
Bulb Designation	T4.5		T6			
Nominal Bulb Diameter mm (")	15 (0.6)		19 (0.75)			21 (0.83)
Base Type	BiPin G8.5		G12			R7S RSC
Nom. Light Center Length mm (")	52 (2.0)		56 (2.2)			55.88 (2.2)
Max. Overall Length mm (")	81 (3.19)		100 (3.94)			114.2 (4.5)
Nominal Arc Length mm (")	7.4 (0.29)					9.2 (0.36)
Max. Bulb Temperature °C (°F)	450 (842)	550 (1022)	500 (932)			
Max. Base Temperature °C (°F)	300 (572)		280 (536)			250 (482)
Electrical Characteristics						
Nominal Lamp Watts	70					
Nominal Lamp Volts (RMS)	90					
Nominal Lamp Current (RMS)	0.98					
Minimum Start Volt-LAG	230 RMS, 296 Peak [2]					
Minimum Start Volt-Lead Peak	N/A					
Voltage Crest Factor (VCF)	N/A					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	9000	12000				
Initial Lumens	6600	6300	7000	6400	6700	6900
Mean Lumens	5280	5040	5600	5120	5360	5520
Correlated Color Temperature °K	3000				4200	3000
Color Rending Index (CRI)	83	95	87	95	93	88
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	2-15					
Nominal CIE X	0.438	0.444	0.434	0.444	0.372	0.435
Chromaticity Coordinates Y	0.399	0.405	0.401	0.405	0.378	0.399

(1) The circuit must include overcurrent protection (i.e. Thermally Switched ballast).

(2) Lamp requires a nominal open circuit voltage of 230V or higher. Without ignitor in the circuit, minimum OCV is 209Vrms.

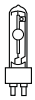
METALARC® PULSE START

POWERBALL® Ceramic

	70 Watt			
				
	Clear	Coated	Clear	Coated
Item No.	64739	64740	64193	64194
Ordering Abbreviation	MCP70/U/ MED/830 PB	MCP70/C/U/ MED/830 PB	MCP70/U/ MED/940 PB	MCP70/C/U/ MED/940 PB
ANSI Spec No.	M139/O, M98/O	M139/O, M98/O	M139/O, M98/O	M139/O, M98/O
Physical Characteristics				
Operating Position	Universal			
Bulb Designation	E17			
Nominal Bulb Diameter mm (")	54 (2.125)			
Base Type	E26 Medium			
Nom. Light Center Length mm (")	86 (3.39)			
Max. Overall Length mm (")	138 (5.43)			
Nominal Arc Length mm (")	6.7 (0.26)	N/A	6.7 (0.26)	N/A
Max. Bulb Temperature °C (°F)	400 (752)			
Max. Base Temperature °C (°F)	210 (410)			
Electrical Characteristics				
Nominal Lamp Watts	70			
Nominal Lamp Volts (RMS)	90			
Nominal Lamp Current (RMS)	0.98			
Minimum Start Volt-LAG	230 RMS, 325 Peak		230 RMS, 296 Peak	
Minimum Start Volt-Lead Peak	N/A			
Voltage Crest Factor (VCF)	N/A			
Maximum Current Crest Factor	1.8			
Photometric Characteristics				
Average Rated Life (Hours)	16000		12000	
Initial Lumens	5900	5500	6000	5600
Mean Lumens	4365	3900	4800	4480
Correlated Color Temperature °K	3000		4000	3800
Color Rending Index (CRI)	88		93	
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	4-6			
Nominal CIE X Chromaticity Coordinates Y	0.43 0.395		0.383 0.386	0.39 0.386

METALARC® PULSE START

POWERBALL® Ceramic

	100 Watt			150 Watt	
					
	Clear	Coated	Clear	Clear	Clear
Item No.	64743	64744	64322	64359	64337
Ordering Abbreviation	MCP100/U/ MED/830 PB	MCP100/C/U/ MED/830 PB	MCP100/U/ MED/940 PB	MC150/T7.5/U/ G12/830 PB	MC150/T7.5/U/ G12/940 PB
ANSI Spec No.	M90/O, M140/O	M90/O, M140/O	M90/O, M140/O	M102/E, M142/E [1]	M102/E, M142/E [1]
Physical Characteristics					
Operating Position	Universal				
Bulb Designation	E17			T7.5	
Nominal Bulb Diameter mm (")	54 (2.125)			24 (0.945)	
Base Type	E26 Medium			G12	
Nom. Light Center Length mm (")	86 (3.39)			56 (2.2)	
Max. Overall Length mm (")	138 (5.43)			105 (4.125)	
Nominal Arc Length mm (")	7.9 (0.311)	N/A	7.9 (0.311)	9.2 (0.36)	
Max. Bulb Temperature °C (°F)	400 (752)			650 (1202)	
Max. Base Temperature °C (°F)	210 (410)			280 (536)	
Electrical Characteristics					
Nominal Lamp Watts	100			150	
Nominal Lamp Volts (RMS)	100			95	
Nominal Lamp Current (RMS)	1.1			1.8	
Minimum Start Volt-LAG	235 RMS, 333 Peak				
Minimum Start Volt-Lead Peak	N/A				
Voltage Crest Factor (VCF)	N/A				
Maximum Current Crest Factor	1.8				
Photometric Characteristics					
Average Rated Life (Hours)	16000		20000	12000	
Initial Lumens	9000	8100	8200	15500	14500
Mean Lumens	6660	5994	6150	12400	11600
Correlated Color Temperature °K	3000		4000	3000	4200
Color Rending Index (CRI)	88		93	89	95
Warm Up Time (minutes)	2-4				
Hot Restrike Time (minutes)	4-6			2-15	
Nominal CIE X Chromaticity Coordinates Y	0.43 0.395		0.375 0.367	0.435 0.4	0.371 0.366

(1) The circuit must include overcurrent protection (i.e. Thermally Switched ballast).

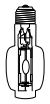
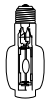
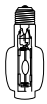
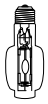
METALARC® PULSE START

POWERBALL® Ceramic

	150 Watt		
			
	Clear	Clear	Coated
Item No.	64794	64741	64742
Ordering Abbreviation	MC150/T7.5/ DE/830 PB	MCP150/U/ MED/830 PB	MCP150/C/U/ MED/830 PB
ANSI Spec No.	M102/E, M142/E, M81/E	M102/O, M142/O	M102/O, M142/O
Physical Characteristics			
Operating Position	HOR ± 45°	Universal	
Bulb Designation	T7.5	E17	
Nominal Bulb Diameter mm.(")	24 (0.945)	54 (2.125)	
Base Type	R7S RSC	E26 Medium	
Nom. Light Center Length mm. (")	66 (2.6)	86 (3.39)	
Max. Overall Length mm. (")	132 (5.2)	138 (5.43)	
Nominal Arc Length mm. (")	9.2 (0.36)	9.2 (0.36)	N/A
Max. Bulb Temperature °C (°F)	650 (1202)	400 (752)	
Max. Base Temperature °C (°F)	280 (536)	210 (410)	
Electrical Characteristics			
Nominal Lamp Watts	150		
Nominal Lamp Volts (RMS)	95		
Nominal Lamp Current (RMS)	1.8		
Minimum Start Volt-LAG	235 RMS, 333Peak		
Minimum Start Volt-Lead Peak	N/A		
Voltage Crest Factor (VCF)	N/A		
Maximum Current Crest Factor	1.8		
Photometric Characteristics			
Average Rated Life (Hours)	12000		
Initial Lumens	14800	13000	12000
Mean Lumens	11840	11000	10000
Correlated Color Temperature °K	3000		
Color Rending Index (CRI)	91	88	
Warm Up Time (minutes)	2-4		
Hot Restrike Time (minutes)	2-15	4-6	
Nominal CIE Chromaticity Coordinates X Y	0.43 0.39	0.435 0.4	0.435 0.4

METALARC® PULSE START

POWERBALL® Ceramic

	250 Watt		320 Watt	
				
	Clear	Coated	Clear	Coated
Item No.	64786	64821	64834	64851
Ordering Abbreviation	MCP250/PS/BU-ONLY/940PB	MCP250/C/PS/BU-ONLY/940PB	MCP320/PS/BU-ONLY/840/BT37PB	MCP320/C/PS/BU-ONLY/840/BT37PB
ANSI Spec No.	M153/O	M153/O	M154/O	M154/O
Physical Characteristics				
Operating Position	Base-Up ONLY			
Bulb Designation	BT28		BT37	
Nominal Bulb Diameter mm.(")	89 (3.5)		117 (4.6)	
Base Type	EX39 Exclusionary Mogul			
Nom. Light Center Length mm. (")	127 (5.0)		178 (7)	
Max. Overall Length mm. (")	211 (8.31)		292 (11.5)	
Nominal Arc Length mm. (")	16.6 (0.65)	N/A	20.2 (0.795)	
Max. Bulb Temperature °C (°F)	400 (752)			
Max. Base Temperature °C (°F)	210 (410)			
Electrical Characteristics				
Nominal Lamp Watts	250 [1]		320	
Nominal Lamp Volts (RMS)	133		135	
Nominal Lamp Current (RMS)	2.3		2.6	
Minimum Start Volt-LAG	254 RMS, 345 Peak [2]			
Minimum Start Volt-Lead Peak	254 RMS, 483 Peak			
Voltage Crest Factor (VCF)	1.9			
Maximum Current Crest Factor	1.8			
Sustaining Minimum Voltage			270V	
Minimum Pulse Width at 2700V			1.3µs	
Photometric Characteristics				
Average Rated Life (Hours)	15000		20000	
Initial Lumens	24000	22500	37500	36000
Mean Lumens	19200	18000	28125	27000
Correlated Color Temperature °K	4200	4000	4000	3900
Color Rending Index (CRI)	94		88	
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	5-7			
Nominal CIE Chromaticity Coordinates X	0.368	0.382	0.383	0.386
Y	0.355	0.367	0.379	0.381

(1) Wattage will be slightly lower on Magnetic Ballasts, see information in Lumen rating section.

(2) 345V peak allows for mag-reg ballast use, 359V peak for standard lag ballasts.

METALARC® PULSE START POWERBALL® Ceramic PARs

	20 Watt		39 Watt			
						
	SP	FL	SP	FL	SP	FL
Item No.	64879	64878	64824	64826	64880	64881
Ordering Abbreviation	MCP20PAR30LN/ U/830/SP/ECO PB	MCP20PAR30LN/ U/830/FL/ECO PB	MCP39PAR20/ U/830/SP PB	MCP39PAR20/ U/830/FL PB	MCP39PAR30LN/ U/830/SP/ECO PB	MCP39PAR30LN/ U/830/FL/ECO PB
ANSI Spec No.	M156/O	M156/O	M130/O [1]	M130/O [1]	M130/O [1]	M130/O [1]
Physical Characteristics						
Operating Position	Universal					
Bulb Designation	PAR30LN		PAR20		PAR30LN	
Nominal Bulb Diameter mm (")	95.25 (3.75)		63.5 (2.5)		95.25 (3.75)	
Base Type	E26 Medium					
Maximum Overall Length mm (")	121 (4.76)		92.7 (3.65)		121 (4.76)	
Max. Bulb Temperature °C (°F)	300 (572)					
Max. Base Temperature °C (°F)	210 (410)					
Electrical Characteristics						
Nominal Lamp Watts	20		39			
Nominal Lamp Volts (RMS)	95		90			
Nominal Lamp Amps (RMS)	0.23		0.53			
Minimum Start Volt - LAG	230 RMS, 296 Peak [2]					
Minimum Start Volt - Lead Peak	N/A					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	12000					
Initial Lumens	1200		2000		2300	
Initial Center Beam Candle Power	24000	4000	20000	5000	39600	8000
Beam Angle (Degree)	8	24	10	30	10	30
Correlated Color Temperature °K	3100		3000			
Color Rending Index (CRI)	82		87		85	
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	4-6					
Nominal CIE Chromaticity Coordinates X	0.435				0.431	
Nominal CIE Chromaticity Coordinates Y	0.395				0.393	

(1) The circuit must include overcurrent protection (i.e. Thermally Switched ballast).

(2) Lamp requires a nominal open circuit voltage of 230V or higher. Without ignitor in the circuit, minimum OCV is 209Vrms.

METALARC® PULSE START

POWERBALL® Ceramic PARs

	70 Watt			
				
	SP	FL	SP	FL
Item No.	64745	64746	64201	64202
Ordering Abbreviation	MCP70PAR30LN/ U/830/SP	MCP70PAR30LN/ U/830/FL	MCP70PAR30LN/ U/930/SP/ECOPB	MCP70PAR30LN/ U/930/FL/ECOPB
ANSI Spec No.	M139/O M98/O	M139/O M98/O	M139/O M98/O	M139/O M98/O
Physical Characteristics				
Operating Position	Universal			
Bulb Designation	PAR30LN			
Nominal Bulb Diameter mm (")	95.25 (3.75)			
Base Type	E26 Medium			
Maximum Overall Length mm (")	121 (4.76)			
Max. Bulb Temperature °C (°F)	300 (572)			
Max. Base Temperature °C (°F)	210 (410)			
Electrical Characteristics				
Nominal Lamp Watts	70			
Nominal Lamp Volts (RMS)	90			
Nominal Lamp Amps (RMS)	0.98			
Minimum Start Volt - LAG	230 RMS, 296 Peak[1]			
Minimum Start Volt - Lead Peak	N/A			
Maximum Current Crest Factor	1.8			
Photometric Characteristics				
Average Rated Life (Hours)	12000			
Initial Lumens	3700		3600	
Initial Center Beam Candle Power	46000	16000	42000	12000
Beam Angle (Degree)	12	30	12	30
Correlated Color Temperature °K	2900		3000	
Color Rending Index (CRI)	85		95	
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	4-6			
Nominal CIE Chromaticity Coordinates X Y	0.444 0.405		0.433 0.397	

(1) Lamp requires a nominal open circuit voltage of 230V or higher. Without ignitor in the circuit, minimum OCV is 209Vrms.

METALARC® PULSE START POWERBALL® Ceramic PARs

	70 Watt			100 Watt		
						
	SP	FL	VWFL	SP	FL	VWFL
Item No.	64749	64750	64751	64752	64753	64754
Ordering Abbreviation	MCP70PAR38/U/830/SP/ECOPB	MCP70PAR38/U/830/FL/ECOPB	MCP70PAR38/U/830/VWFL/ECOPB	MCP100PAR38/U/830/SP/ECOPB	MCP100PAR38/U/830/FL/ECOPB	MCP100PAR38/U/VWFL/ECOPB
ANSI Spec No.	M139/O, M98/O	M139/O, M98/O	M139/O, M98/O	M90/O, M140/O	M90/O, M140/O	M90/O, M140/O
Physical Characteristics						
Operating Position	Universal					
Bulb Designation	PAR38					
Nominal Bulb Diameter mm (")	121 (4.76)					
Base Type	E26 Medium Skirt [1]					
Maximum Overall Length mm (")	135 (5.32)					
Max. Bulb Temperature °C (°F)	350 (662)					
Max. Base Temperature °C (°F)	190 (374)					
Electrical Characteristics						
Nominal Lamp Watts	70			100		
Nominal Lamp Volts (RMS)	88			100		
Nominal Lamp Amps (RMS)	0.9			1.1		
Minimum Start Volt - LAG	230 RMS, 325 Peak			235 RMS, 333 Peak		
Minimum Start Volt - Lead Peak	N/A					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	12000					
Initial Lumens	4300			6500		
Initial Cntr Beam Candle Power	40000	16000	3500	58000	25000	6000
Beam Angle (Degree)	15	25	65	15	25	60
Correlated Color Temperature °K	3000					
Color Rending Index (CRI)	88					
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	4-6					
Nominal CIE Chromaticity Coordinates X Y	0.43 0.4					

(1) Lamps with medium skirt base are not compatible with exclusionary medium sockets.

METALARC®
PULSE START

POWERBALL® Ceramic PARs

	150 Watt		
			
	SP	FL	FL
Item No.	64841	64842	64843
Ordering Abbreviation	MCP150/PAR38/U/830/SP/ECOPB	MCP150/PAR38/U/830/FL/ECOPB	MCP150/PAR38/U/830/VWFL/ECOPB
ANSI Spec No.	M102/O	M102/O	M102/O
Physical Characteristics			
Operating Position	Universal		
Bulb Designation	PAR38		
Nominal Bulb Diameter mm (")	121 (4.76)		
Base Type	E26 Medium Skirted		
Max. Overall Length mm (")	135 (5.32)		
Max. Bulb Temperature °C (°F)	350 (662)		
Max. Base Temperature °C (°F)	190 (374)		
Electrical Characteristics			
Nominal Lamp Watts	150		
Nominal Lamp Volts (RMS)	95		
Nominal Lamp Amps (RMS)	1.8		
Minimum Start Volt-LAG	235 RMS, 332 Peak		
Minimum Start Volt-Lead Peak	N/A		
Maximum Current Crest Factor	1.8		
Photometric Characteristics			
Average Rated Life (Hours)	12000		
Initial Lumens	9100		
Initial Center Beam Candle Power	50000	28000	6500
Beam Angle (Degree)	15	25	65
Correlated Color Temperature °K	3000		
Color Rending Index (CRI)	88		
Warm Up Time (minutes)	2-4		
Hot Restrike Time (minutes)	4-6		
Nominal CIE Chromaticity Coordinates X Y	0.43 0.400		

METALARC® PULSE START Medium Base

	50 Watt		70 Watt			
						
	Clear	Coated	Clear	Coated	Clear	Coated
Item No.	64587	64588	64547	64546	64625	64621
Ordering Abbreviation	MP50/U/MED	MP50/C/U/MED	MP70/U/MED	MP70/C/U/MED	MPD70/U/ MED/840	MPD70/C/U/ MED/840
ANSI Spec No.	M110/O	M110/O	M98/O	M98/O	M98/O	M98/O
Physical Characteristics						
Operating Position	Universal					
Bulb Designation	E17					
Nominal Bulb Diameter mm (")	54 (2.125)					
Base Type	E26 Medium					
Nom. Light Center Length mm (")	86 (3.39)					
Max. Overall Length mm (")	138 (5.43)					
Nominal Arc Length mm (")	8 (0.31)	N/A	9.5 (0.37)	N/A	7.5 (0.3)	N/A
Max. Bulb Temperature °C (°F)	400 (752)					
Max. Base Temperature °C (°F)	210 (410)					
Electrical Characteristics						
Nominal Lamp Watts	50		70			
Nominal Lamp Volts (RMS)	85					
Nominal Lamp Current (RMS)	0.68		0.9			
Minimum Start Volt-LAG	235 RMS, 332 Peak					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	20000V, 10000H	15000V, 10000H			7500V, 6000H	
Initial Lumens	3450	3200	5200	4700	5500	5100
Mean Lumens	1900	1750	3400	3100	4000	3800
Correlated Color Temperature °K	3000	2900	3000	2900	4200	4000
Color Rending Index (CRI)	70		75		80	82
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	5-7					
Nominal CIE X Chromaticity Coordinates Y	0.426 0.382	0.432 0.383	0.426 0.382	0.432 0.383	0.371 0.378	0.374 0.379

METALARC® PULSE START

Medium Base

	100 Watt			
				
	Clear	Coated	Clear	Coated
Item No.	64417	64418	64426	64433
Ordering Abbreviation	MP100/U/MED	MP100C/U/MED	MPD100/U/ MED/840	MPD100/C/U/ MED/840
ANSI Spec No.	M90/O	M90/O	M90/O	M90/O
Physical Characteristics				
Operating Position	Universal			
Bulb Designation	E17			
Nominal Bulb Diameter mm (")	54 (2.125)			
Base Type	E26 Medium			
Nom. Light Center Length mm (")	86 (3.39)			
Max. Overall Length mm (")	138 (5.43)			
Nominal Arc Length mm (")	14 (0.55)	N/A	11.5 (0.45)	N/A
Max. Bulb Temperature °C (°F)	400 (752)			
Max. Base Temperature °C (°F)	210 (410)			
Electrical Characteristics				
Nominal Lamp Watts	100			
Nominal Lamp Volts (RMS)	100		95	
Nominal Lamp Current (RMS)	1.1			
Minimum Start Volt-LAG	235 RMS, 332 Peak			
Maximum Current Crest Factor	1.8			
Photometric Characteristics				
Average Rated Life (Hours)	15000V, 10000H		7500V, 6000H	
Initial Lumens	8500	7900	8400	7700
Mean Lumens	5525	5800		5500
Correlated Color Temperature °K	3000	2900	4200	4000
Color Rending Index (CRI)	75		82	
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	5-7			
Nominal CIE Chromaticity Coordinates X Y	0.426 0.382	0.432 0.383	0.374 0.376	0.379 0.378

METALARC® PULSE START Medium Base

	150 Watt				175 Watt	
						
	Clear	Coated	Clear	Coated	Clear	Coated
Item No.	64402	64406	64403	64425	64171	64170
Ordering Abbreviation	MP150/U/MED	MP150/C/ U/MED	MPD150/U/ MED/840	MPD150/C/U/ MED/840	MS175/PS/ BU-ONLY/MED	MS175/C/PS/ BU-ONLY/MED
ANSI Spec No.	M102/O	M102/O	M102/O	M102/O	M152/E, M137/E [1]	M152/E, M137/E [1]
Physical Characteristics						
Operating Position	Universal				Base-Up ONLY	
Bulb Designation	E17				ED17	
Nominal Bulb Diameter mm (")	54 (2.125)					
Base Type	E26 Medium					
Nom. Light Center Length mm (")	86 (3.39)				86.87 (3.42)	
Max. Overall Length mm (")	138 (5.43)				137.9 (5.43)	
Nominal Arc Length mm (")	16.5 (0.65)	N/A	15.7 (0.62)	N/A	20.6 (0.811)	N/A
Max. Bulb Temperature °C (°F)	400 (752)					
Max. Base Temperature °C (°F)	210 (410)					
Electrical Characteristics						
Nominal Lamp Watts	150				175	
Nominal Lamp Volts (RMS)	95		90		132	
Nominal Lamp Current (RMS)	1.8				1.5	
Minimum Start Volt-LAG	235 RMS, 332 Peak				254 RMS, 359 Peak	
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	15000V, 10000H		7500V, 6000H		15000	
Initial Lumens	12900	11600	12500	11500	17500	16600
Mean Lumens	8000	7500	11000	9500	12800	12500
Correlated Color Temperature °K	3000	2900	4200	4000	4000	3700
Color Rending Index (CRI)	75		88		65	70
Warm Up Time (minutes)	2-4				1-2	
Hot Restrike Time (minutes)	5-7				2-4	
Nominal CIE X Chromaticity Coordinates Y	0.426 0.382	0.432 0.383	0.373 0.376	0.3838 0.3852	0.385 0.39	0.395 0.39

(1) If lamps are operated on ballasts with sustaining voltage < 270V, lamp life will be significantly reduced. Some old ANSI ballasts may not meet this 270V criteria.

METALARC® PULSE START Medium Base PARs

	70 Watt			100 Watt		
						
	SP	FL	VWFL	SP	FL	VWFL
Item No.	64590	64592	64594	64580	64582	64584
Ordering Abbreviation	MP70PAR38/ U/SP20/ECO	MP70PAR38/ U/FL35/ECO	MP70PAR38/ U/VWFL65/ECO	MP100PAR38/ U/SP20/ECO	MP100PAR38/ U/FL35/ECO	MP100PAR38/ U/VWFL65/ECO
ANSI Spec No.	M98/O	M98/O	M98/O	M90/O	M90/O	M90/O
Physical Characteristics						
Operating Position	Universal					
Bulb Designation	PAR38					
Nominal Bulb Diameter mm (")	121 (4.75)					
Base Type	E26 Medium Skirt [1]					
Max. Overall Length mm (")	135 (5.32)					
Max. Bulb Temperature °C (°F)	350 (662)					
Max. Base Temperature °C (°F)	190 (374)					
Electrical Characteristics						
Nominal Lamp Watts	70			100		
Nominal Lamp Volts (RMS)	85			100		
Nominal Lamp Amps (RMS)	0.9			1.1		
Minimum Start Volt - LAG	235 RMS, 332 Peak					
Minimum Start Volt - Lead Peak	N/A					
Maximum Current Crest Factor	1.8					
Photometric Characteristics						
Average Rated Life (Hours)	8500					
Initial Lumens	3400			5800		
Initial Center Beam Candle Power	18000	10000	3000	26000	12000	4500
Beam Angle (Degree)	20	35	65	20	35	65
Correlated Color Temperature °K	3200			3000		
Color Rending Index (CRI)	75					
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	5-7					
Nominal CIE Chromaticity Coordinates X Y	0.42 0.39					

(1) Lamps with medium skirt base are not compatible with exclusionary medium sockets.

METALARC® PULSE START

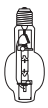
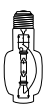
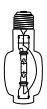
Medium Base PARs

	150 Watt		
			
	SP	FL	VWFL
Item No.	64593	64597	64599
Ordering Abbreviation	MP150PAR38/ U/SP20/ECO	MP150PAR38/ U/FL35/ECO	MP150PAR38/ U/VWFL65/ECO
ANSI Spec No.	M102/O	M102/O	M102/O
Physical Characteristics			
Operating Position	Universal		
Bulb Designation	PAR38		
Nominal Bulb Diameter mm. (")	121 (4.75)		
Base Type	E26 Medium Skirt [1]		
Max. Overall Length mm. (")	135 (5.32)		
Max. Bulb Temperature °C (°F)	350 (662)		
Max. Base Temperature °C (°F)	190 (374)		
Electrical Characteristics			
Nominal Lamp Watts	150		
Nominal Lamp Volts (RMS)	95		
Nominal Lamp Amps (RMS)	1.8		
Minimum Start Volt - LAG	235 RMS, 332 Peak		
Minimum Start Volt - Lead Peak	N/A		
Maximum Current Crest Factor	1.8		
Photometric Characteristics			
Average Rated Life (Hours)	8500		
Initial Lumens	8800		
Initial Center Beam Candle Power	34000	17000	7500
Beam Angle (Degree)	20	35	65
Correlated Color Temperature °K	3200		
Color Rending Index (CRI)	75		
Warm Up Time (minutes)	2-4		
Hot Restrike Time (minutes)	5-7		
Nominal CIE Chromaticity Coordinates X Y	0.42 0.39		

(1) Lamps with medium skirt base are not compatible with exclusionary medium sockets.

METALARC® PULSE START

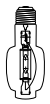
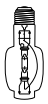
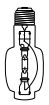
Mogul Base

	175 Watt		200 Watt		
					
	Clear	Coated	Clear	Clear	Coated
Item No.	64815	64816	64837	64838	64839
Ordering Abbreviation	MS175/PS/ BU-Only	MS175/C/PS/ BU-Only	MS200/PS/ BU-Only/ET23.5	MS200/PS/ BU-Only/BT28	MS200/C/PS/ BU-Only/BT28
ANSI Spec No.	M152/E	M152/E	M136/E	M136/E	M136/E
Old ANSI Spec No. [1]	M137/E [1]	M137/E [1]			
Physical Characteristics					
Operating Position	Base-Up ONLY				
Bulb Designation	ED28		ET23.5	BT28	
Nominal Bulb Diameter mm (")	89 (3.5)		75 (2.9)	89 (3.5)	
Base Type	E39 Mogul				
Nom. Light Center Length mm (")	127 (5.0)		114 (4.49)	127 (5.0)	
Max.Overall Length mm (")	211 (8.31)		177 (6.97)	211 (8.31)	
Nominal Arc Length mm (")	20.6 (0.811)	N/A	28 (1.10)	135 (1.38)	N/A
Max. Bulb Temperature °C (°F)	400 (752)				
Max. Base Temperature °C (°F)	210 (410)		250 (482)		
Electrical Characteristics					
Nominal Lamp Watts	175		200		
Nominal Lamp Volts (RMS)	132		132		
Nominal Lamp Current (RMS)	1.5		3.25		
Minimum Start Volt-LAG	254 RMS 359 Peak		254 RMS, 345 Peak		
Minimum Start Volt-Lead Peak	254 RMS, 483 Peak		254 RMS, 483 Peak		
Maximum Current Crest Factor	1.8				
Sustaining Voltage Minimum	270 V				
Minimum Pulse Width at 2700V	1.3 µs				
Photometric Characteristics					
Average Rated Life (Hours)	15000				
Initial Lumens	17500	16600	19000		18000
Mean Lumens	12800	12500	13300	13500	12800
Correlated Color Temperature °K	4200	3700	4200	4000	3800
Color Rending Index (CRI)	65	70	65		70
Warm Up Time (minutes)	2-4	1-2	2-4		
Hot Restrike Time (minutes)	2-4		4-7	5-7	
Nominal CIE X Chromaticity Coordinates Y	0.385 0.39	0.395 0.39	0.374 0.385	0.374 0.385	0.39 0.39

(1) If lamps are operated on ballasts with sustaining voltage < 270V, lamp life will be significantly reduced. Some old ANSI ballasts may not meet this 270V criteria.

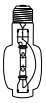
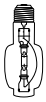
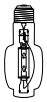
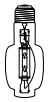
METALARC® PULSE START

Mogul Base

	250 Watt			
				
	Clear	Coated	Clear	Coated
Item No.	64789	64790	64578	64617
Ordering Abbreviation	MP250/PS/ BU-ONLY	MP250/C/PS/ BU-ONLY	MS250/PS/ BU-ONLY	MS250/C/PS/ BU-ONLY
ANSI Spec No.	M153/O		M153/E	
Old ANSI Spec No.[1]	M138/O [1]		M138/E [1]	
Physical Characteristics				
Operating Position	Base-Up ONLY			
Bulb Designation	BT28			
Nominal Bulb Diameter mm (")	89 (3.5)			
Base Type	EX39 Excl. Mogul		E39 Mogul	
Nom. Light Center Length mm (")	127 (5.0)			
Max.Overall Length mm (")	211 (8.31)			
Nominal Arc Length mm (")	35 (1.38)	N/A	35 (1.38)	N/A
Max. Bulb Temperature °C (°F)	400 (752)			
Max. Base Temperature °C (°F)	210 (410)		250 (482)	
Electrical Characteristics				
Nominal Lamp Watts	250			
Nominal Lamp Volts (RMS)	133			
Nominal Lamp Current (RMS)	2.1			
Minimum Start Volt-LAG	254 RMS, 345 Peak			
Minimum Start Volt-Lead Peak	254 RMS, 483 Peak			
Maximum Current Crest Factor	1.8			
Sustaining Voltage Minimum	270 V			
Minimum Pulse Width at 2700V	1.3 µs			
Photometric Characteristics				
Average Rated Life (Hours)	15000		20000	
Initial Lumens	22500	21000	23000	21500
Mean Lumens	17000	16000	17000	15500
Correlated Color Temperature °K	4000		4200	3600
Color Rending Index (CRI)	65	70	65	70
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	5-7			
Nominal CIE X Chromaticity Coordinates Y	0.385 0.4		0.375 0.39	0.402 0.394

(1) If lamps are operated on ballasts with sustaining voltage < 270V, lamp life will be significantly reduced. Some old ANSI ballasts may not meet this 270V criteria.

METALARC® PULSE START Mogul Base

	320 Watt					
						
	Clear	Coated	Clear		Coated	
Item No.	64507	64646	64391		64349	
Ordering Abbreviation	MS320/PS/ BU-HOR	MS320/C/PS/ BU-HOR	MP320/350/PS/BU-ONLY/BT28		MP320/350/C/PS/BU-ONLY/BT28	
ANSI Spec No.	M154/E	M154/E	M154/O (320 Watt)	"Under Consideration" (350 Watt)	M154/O (320 Watt)	"Under Consideration" (350 Watt)
Old ANSI Spec No. [1]	M132/E [1]	M132/E [1]	M132/O [1]	M131/O [1]	M132/O [1]	M131/O [1]
Physical Characteristics						
Operating Position	Base-Up to Horizontal		Base-Up ONLY			
Bulb Designation	BT28					
Nominal Bulb Diameter mm (")	89 (3.5)					
Base Type	E39 Mogul		EX39 Excl. Mogul			
Nom. Light Center Length mm (")	127 (5.0)					
Max. Overall Length mm (")	211 (8.31)					
Nominal Arc Length mm (")	35 (1.38)	N/A	35 (1.38)		N/A	
Max. Bulb Temperature °C (°F)	400 (752)					
Max. Base Temperature °C (°F)	250 (482)		210 (410)			
Electrical Characteristics						
Nominal Lamp Watts	320			350	320	350
Nominal Lamp Volts (RMS) (2)	135					
Nominal Lamp Current (RMS)	2.63	2.63	2.6	2.9	2.6	2.9
Minimum Start Volt-LAG	254 RMS, 345 Peak					
Minimum Start Volt-Lead Peak	254 RMS, 483 Peak					
Maximum Current Crest Factor	1.8					
Sustaining Voltage Minimum	270 V					
Minimum Pulse Width at 2700V	1.3 µs					
Photometric Characteristics						
Average Rated Life (Hours)	20000V, 15000H		20000			
Initial Lumens	32000V, 30000H	30000V, 28000H	28600	33500	27700	32000
Mean Lumens	21000V, 19700H	19700V, 18400H	21000	24000	19000	22000
Correlated Color Temperature °K	4300	3900	3800	3600	3600	
Color Rending Index (CRI)	65	70	65		70	
Warm Up Time (minutes)	2-4					
Hot Restrike Time (minutes)	5-7					
Nominal CIE X Chromaticity Coordinates Y	0.372 0.388	0.387 0.387	0.39 0.39		0.386 0.39	0.386 0.391

(1) If lamps are operated on ballasts with sustaining voltage < 270V, lamp life will be significantly reduced. Some old ANSI ballasts may not meet this 270V criteria.

METALARC® PULSE START

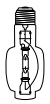
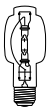
Mogul Base

	350 Watt			
				
	Clear		Coated	
Item No.	64769		64770	
Ordering Abbreviation	MP350/400/PS/BU-ONLY		MP350/400/C/PS/BU-ONLY	
ANSI Spec No.	"Under Consideration" (350 Watt)	M155/O (400 Watt)	"Under Consideration" (350 Watt)	M155/O (400 Watt)
Old ANSI Spec No.[1]	M131/O [1]	M135/O [1]	M131/O [1]	M135/O [1]
Physical Characteristics				
Operating Position	Base-Up ONLY			
Bulb Designation	BT37			
Nominal Bulb Diameter mm (")	117 (4.6)			
Base Type	EX39 Excl. Mogul			
Nom. Light Center Length mm (")	178 (7.0)			
Max. Overall Length mm (")	292 (11.5)			
Nominal Arc Length mm (")	38 (1.50)		N/A	
Max. Bulb Temperature °C (°F)	400 (752)			
Max. Base Temperature °C (°F)	210 (410)			
Electrical Characteristics				
Nominal Lamp Watts	350	400	350	400
Nominal Lamp Volts (RMS) (2)	135			
Nominal Lamp Current (RMS)	2.9	3.25	2.9	3.25
Minimum Start Volt-LAG	254 RMS, 345 Peak			
Minimum Start Volt-Lead Peak	254 RMS, 483 Peak			
Maximum Current Crest Factor	1.8			
Sustaining Voltage Minimum	270 V			
Minimum Pulse Width at 2700V	1.3 µs			
Photometric Characteristics				
Average Rated Life (Hours)	20000			
Initial Lumens	33000	40000	32000	39000
Mean Lumens	24500	29500	23000	28000
Correlated Color Temperature °K	3700	3500	3500	3300
Color Rending Index (CRI)	65		70	
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	5-7			
Nominal CIE X Chromaticity Coordinates Y	0.4 0.398	0.417 0.4	0.412 0.396	0.42 0.397

(1) If lamps are operated on ballasts with sustaining voltage < 270V, lamp life will be significantly reduced. Some old ANSI ballasts may not meet this 270V criteria.

METALARC® PULSE START

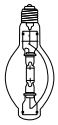
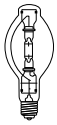
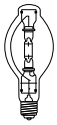
Mogul Base

	400 Watt			
				
	Clear	Clear	Clear	Coated
Item No.	64189	64191	64525	64527
Ordering Abbreviation	MS400/PS/ BU-ONLY/BT28	MS400/PS/ BD-ONLY/BT28	MS400/PS/ BU-ONLY	MS400/C/PS/ BU-ONLY
ANSI Spec No.	M155/E	M155/E	M155/S	M155/S
Old ANSI Spec No.[1]			M135/S[1]	M135/S[1]
Physical Characteristics				
Operating Position	Base-Up ONLY	Base Down ONLY	Base-Up ONLY	
Bulb Designation	BT28		BT37	
Nominal Bulb Diameter mm (")	89 (3.5)		117 (4.6)	
Base Type	E39 Mogul			
Nom. Light Center Length mm (")	127 (5)		178 (7.0)	
Max. Overall Length mm (")	211 (8.31)		292 (11.5)	
Nominal Arc Length mm (")	38 (1.5)			N/A
Max. Bulb Temperature °C (°F)	400 (752)			
Max. Base Temperature °C (°F)	250 (482)			
Electrical Characteristics				
Nominal Lamp Watts	400			
Nominal Lamp Volts (RMS) (2)	135			
Nominal Lamp Current (RMS)	3.25			
Minimum Start Volt-LAG	254 RMS, 345 Peak			
Minimum Start Volt-Lead Peak	254 RMS, 483 Peak			
Maximum Current Crest Factor	1.8			
Sustaining Voltage Minimum	270 V			
Minimum Pulse Width at 2700V	1.3 µs			
Photometric Characteristics				
Average Rated Life (Hours)	20000			
Initial Lumens	40000		42000	
Mean Lumens	32500		31000	29000
Correlated Color Temperature °K	4100		4000	3600
Color Rending Index (CRI)	65			70
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	5-7			
Nominal CIE X Chromaticity Coordinates Y	0.393 0.4		0.383 0.388	0.396 0.379

(1) If lamps are operated on ballasts with sustaining voltage < 270V, lamp life will be significantly reduced. Some old ANSI ballasts may not meet this 270V criteria.

METALARC® PULSE START

Mogul Base

	750 Watt			1000 Watt
				
	Clear	Coated	Clear	Clear
Item No.	64787	64822	65424	64351
Ordering Abbreviation	MS750/PS/BU-HOR/BT37	MS750/PS/C/BU-HOR/BT37	MS750/PS/BD-ONLY/BT37	M1000/PS/U/BT37
ANSI Spec No.	M149/E [1]	M149/E [1]	M149/E	M141/E
Old ANSI Spec No.	N/A	N/A	N/A	N/A
Physical Characteristics				
Operating Position	Base-Up to Horizontal		Base-Down ONLY	Universal
Bulb Designation	BT37			
Nominal Bulb Diameter mm (")	117 (4.6)			
Base Type	E39 Mogul			
Nom. Light Center Length mm (")	178 (7)			
Max. Overall Length mm (")	292 (11.5)			
Nominal Arc Length mm (")	73 (2.87)	N/A	73 (2.87)	94 (3.7)
Max. Bulb Temperature °C (°F)	430 (806)			
Max. Base Temperature °C (°F)	250 (482)			
Electrical Characteristics				
Nominal Lamp Watts	750			1000
Nominal Lamp Volts (RMS)	200			263
Nominal Lamp Current (RMS)	4			4.1
Minimum Start Volt-LAG	330 RMS, 467 Peak			N/A
Minimum Start Volt-Lead Peak	330 RMS, 594 Peak			350 RMS, 650 Peak
Maximum Current Crest Factor	1.8			
Sustaining Voltage Minimum	270 V			
Minimum Pulse Width at 2700V	1.3 µs			
Photometric Characteristics				
Average Rated Life (Hours)	16000V, 12000H		16000	15000V, 9000H
Initial Lumens	78000V, 68000H	75000V, 65000H	78000	110000V, 107800H
Mean Lumens	67000V, 56000H	63000V, 53500H	67000	96000V, 86300H
Correlated Color Temperature °K	4000	3700	4000	3800
Color Rending Index (CRI)	65	70	65	65
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	6-9			
Nominal CIE Chromaticity Coordinates X Y	0.39 0.39	0.4 0.39	0.39 0.39	0.389 0.388

(1) When operated on ballasts having a sustaining voltage less than 310V, lamp life may be significantly reduced.

Specialty

SAFELINE®

	400 Watt	
		
	Clear	Coated
Item No.	64707	64709
Ordering Abbreviation	MT400/ BU-ONLY	MT400/C/ BU-ONLY
ANSI Spec No.	M59/S	M59/S
Physical Characteristics		
Operating Position	Base-Up ONLY	
Bulb Designation	BT37	
Nominal Bulb Diameter mm (")	117 (4.6)	
Base Type	E39 Mogul	
Nom. Light Center Length mm (")	178 (7.0)	
Max. Overall Length mm (")	292 (11.5)	
Nominal Arc Length mm (")	45 (1.77)	N/A
Max. Bulb Temperature °C (°F)	400 (752)	
Max. Base Temperature °C (°F)	250 (482)	
Electrical Characteristics		
Nominal Lamp Watts	400	
Nominal Lamp Volts (RMS)	135	
Nominal Lamp Current (RMS)	3.2	
Minimum Start Volt-LAG	382 RMS, 540 Peak	
Minimum Start Volt-Lead Peak	295 RMS	
Voltage Crest Factor (VCF)	1.8 Minimum	
Maximum Current Crest Factor	1.8	
Photometric Characteristics		
Average Rated Life (Hours)	20000	
Initial Lumens	36000	35000
Mean Lumens	22000	20600
Correlated Color Temperature °K	4500	4100
Color Rending Index (CRI)	60	65
Warm Up Time (minutes)	2-4	
Hot Restrike Time (minutes)	7-12	
Nominal CIE Chromaticity Coordinates X Y	0.385 0.395	0.394 0.387

Specialty

HQI®

	150 Watt	70 Watt	
			
	Clear	Clear	Clear
Item No.	64342	64360	64362
Ordering Abbreviation	HQI-SE150/NDX	HQI-DE70/WDX	HQI-DE70/NDX
ANSI Spec No.	M81/E	M85/E	M85/E
Physical Characteristics			
Operating Position	Universal	HOR ± 45°	
Bulb Designation	T7.5	T6	
Nominal Bulb Diameter mm (")	25 (0.94)	19 (0.75)	
Base Type	G12	R7S RSC	
Nom. Light Cntr Length mm (")	56 (2.2)	57 (2.25)	
Nominal Arc Length mm (")	7 (0.28)	7 (0.28)	
Max Overall Length mm (")	84 (3.31)	114 (4.5)	
Max. Bulb Temperature °C (°F)	550 (1022)	500 (932)	
Max. Base Temperature °C (°F)	350 (662)	250 (482)	
Electrical Characteristics			
Nominal Lamp Watts	150	70	
Nominal Lamp Volts (RMS)	95	97	85
Nominal Lamp Current (RMS)	1.8	1	
Minimum Start Volt-LAG	235 RMS, 332 Peak	230RMS, 325 Peak	
Minimum Start Volt-Lead Peak	N/A		
Voltage Crest Factor (VCF)	N/A		
Maximum Current Crest Factor	1.8		
Photometric Characteristics			
Average Rated Life (Hours)		9000	
Initial Lumens	13000	5000	5500
Mean Lumens	9200	4400	3800
Correlated Color Temperature °K	4200	3000	4000
Color Rending Index (CRI)	85	76	83
Warm Up Time (minutes)	2-4		
Hot Restrike Time (minutes)		2-15	
Nominal CIE Chromaticity X	0.37	0.433	0.384
Coordinates Y	0.365	0.398	0.37

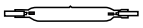
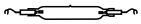
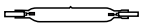
Specialty

HQI®

	150 Watt		150 Watt
			
	Clear	Clear	Clear
Item No.	64366	64368	64339
Ordering Abbreviation	HQI-DE150/WDX	HQI-DE150/NDX	HQI-R150/ NDX/FO
ANSI Spec No.	M81/E	M81/E	M81/E
Physical Characteristics			
Operating Position	HOR ± 45°		Horizontal
Bulb Designation	T7		R30
Nominal Bulb Diameter mm (")	22 (0.87)		95.25 (3.75)
Base Type	R7S RSC		2 Pin Connector
Nom. Light Center Length mm (")	66 (2.6)		N/A
Nominal Arc Length mm (")	16.5 (0.65)		N/A
Max Overall Length mm (")	132 (5.2)		92 (3.6)
Max. Bulb Temperature °C (°F)	650 (1202)		N/A
Max. Base Temperature °C (°F)	250 (482)		N/A
Electrical Characteristics			
Nominal Lamp Watts	150		150
Nominal Lamp Volts (RMS)	95		95
Nominal Lamp Current (RMS)	1.8		1.8
Minimum Start Volt-LAG	230 RMS, 325 Peak		
Minimum Start Volt-Lead Peak	N/A		
Voltage Crest Factor (VCF)	N/A		
Maximum Current Crest Factor	1.8		
Photometric Characteristics			
Average Rated Life (Hours)	12000		9000
Initial Lumens	11000	11250	11000
Mean Lumens	9000	9500	N/A
Correlated Color Temperature °K	3000	4200	4200
Color Rending Index (CRI)	76	85	85
Warm Up Time (minutes)	2-4		N/A
Hot Restrike Time (minutes)	2-15		
Nominal CIE Chromaticity Coordinates X Y	0.433 0.398	0.37 0.365	0.37 0.371

Specialty

BRITELINE

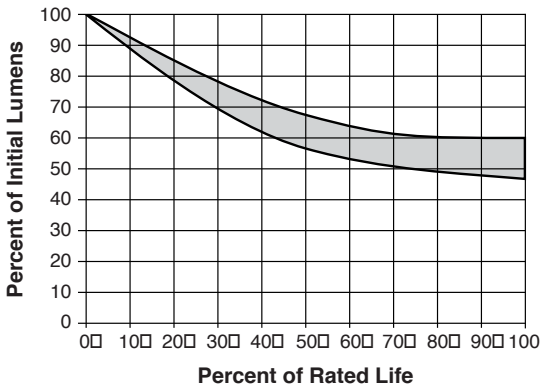
	1500 Watt		2000 Watt	
				
	Clear	Clear	Clear	Clear
Item No.	66619	66632	66627	66631
Ordering Abbreviation	M1500T7/DE	M1500T8/DE	M2000T8/DE	M2000T9/DE
ANSI Spec No.	M__F	M133/F	M__F	M134/F
Physical Characteristics				
Operating Position	HOR ± 4°			
Bulb Designation	T7	T8		T9
Nominal Bulb Diameter mm (")	22 (0.87)	25 (1.0)		29 (1.14)
Base Type	RX7S RRSC	Cer #8-10 Spade	RX7S RRSC	Cer #8-10 Spade
Nom. Light Center Length mm (")	127 (5.0)			
Max Overall Length mm (")	256 (10.08)	254 (10.0)		
Nominal Arc Length mm (")	170.5 (6.71)	110 (4.3)	180 (7.09)	108 (4.25)
Max. Bulb Temperature °C (°F)	800 (1472)	950 (1742)		
Max. Base Temperature °C (°F)	400 (752)			450 (842)
Electrical Characteristics				
Nominal Lamp Watts	1500		2000	
Nominal Lamp Volts (RMS)	500	265	250	
Nominal Lamp Current (RMS)	3.2	6.3	8.5	
Minimum Start Volt-LAG	800	N/A	456	N/A
Minimum Start Volt-Lead Peak	800 RMS, 1550 Peak	400 RMS, 820 Peak	380 RMS, 760 Peak	375 RMS, 750 Peak
Voltage Crest Factor (VCF)	1.8 Minimum			
Maximum Current Crest Factor	1.8			
Photometric Characteristics				
Average Rated Life (Hours)	3000	6000	3000	
Initial Lumens	150000		200000	180000
Mean Lumens	127500	120000	170000	153000
Correlated Color Temperature °K	4200		4000	4200
Color Rending Index (CRI)	65			
Warm Up Time (minutes)	2-4			
Hot Restrike Time (minutes)	5-10			
Nominal CIE Chromaticity Coordinates X Y	0.375 0.37	0.375 0.38	0.375 0.37	0.375 0.38

Lumen Maintenance Curves

The light output of METALARC® lamps gradually declines throughout lamp life. This phenomenon is also found in other electrical light sources, such as fluorescent & incandescent. Approximate lumen maintenance curves found below are typical ranges based upon the tolerances of luminaires, ballasts, and input voltage.

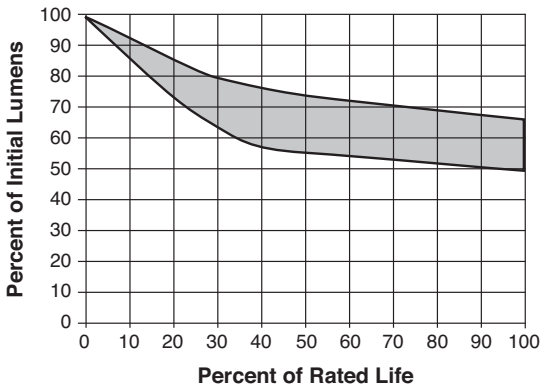
A wide variation of expected lumen maintenance is found throughout the product line due to chemistry differences, starting method differences, arc tube variations, and lamp life ratings. Actual lamp performance may vary.

Typical Lumen Maintenance Curve



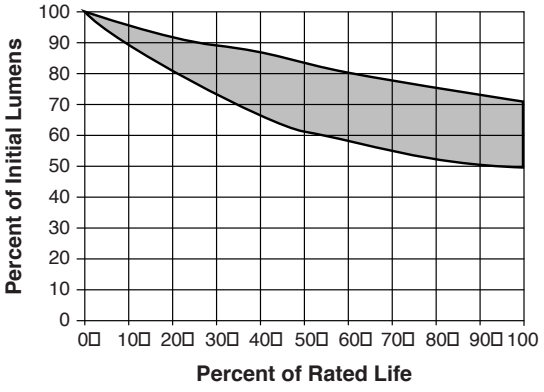
Standard METALARC (except 1000W and 1500W)
SUPER METALARC
METALARC SUPERSAVER®
METALARC SAFELINE®
METALARC PRO-TECH®

Typical Lumen Maintenance Curve



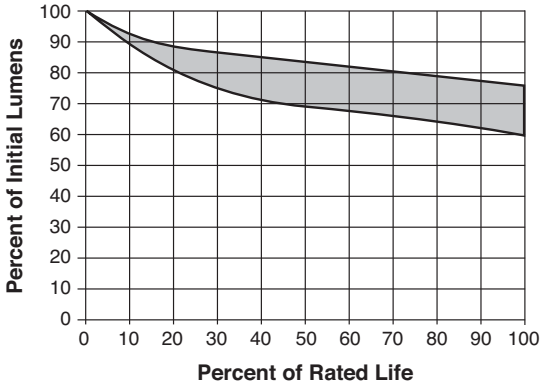
METALARC POWERBALL® PAR Lamps

Typical Lumen Maintenance Curve



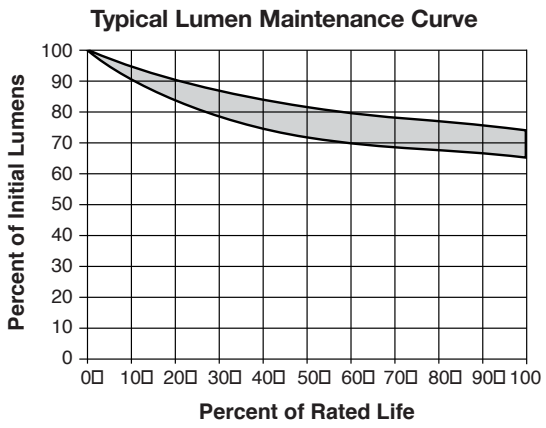
METALARC PULSE START
METALARC BRITELINE
HQI®

Typical Lumen Maintenance Curve

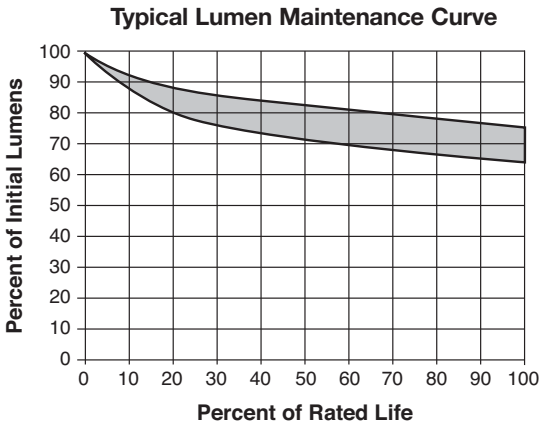


METALARC POWERBALL E17
and High Wattage Lamps

Lumen Maintenance Curves (continued)



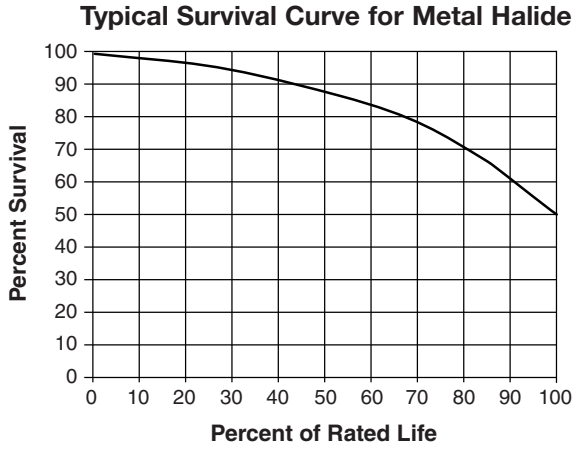
Standard METALARC® 1000W and 1500W



METALARC POWERBALL® T Lamps

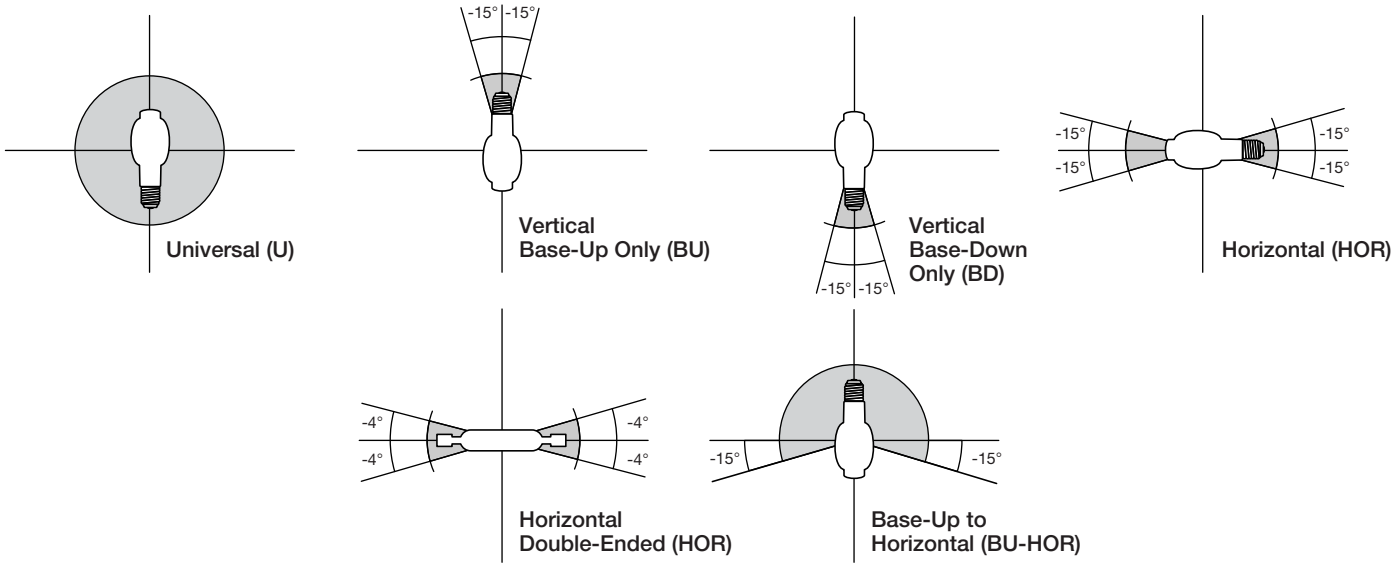
Typical Survival Curves

Typical survival curves are based on 10 hours per start with the exceptions of the M1500, and BRITELINE (which are based on 5 hours per start). The curve is nominal approximation; actual lamp performance may vary.



Operating Positions

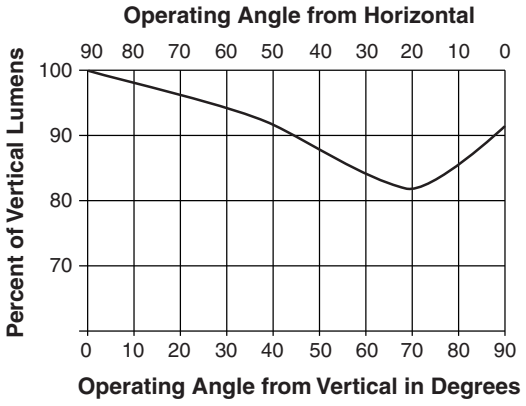
METALARC® and SUPER METALARC® lamps have various operating position requirements. Each lamp type has these requirements as part of the lamp ordering information etched on the outer jacket of the lamp; for example, MP400/BU—base-up only.



Effect of Operating Position

The published ratings of universal METALARC lamps are established with the lamps operated in the vertical (base-up) position. In operating positions other than vertical, the arc tends to bend upward thereby producing non-uniform heating of the arc tube wall, resulting in less efficient operation. This may cause the lamp wattage and lumen output to decrease slightly, and may reduce the Lumen Maintenance. The operating positions which produce the lowest lumen output (and should therefore be avoided) are approximately 20–30° from horizontal (60–70° from vertical). The graph shows the effects of light output versus lamp operating position for METALARC lamps. These effects are more prevalent among higher wattage lamps (250W–1500W) and performance may vary by lamp type. This curve should be used as a guideline, and not a standard (see specific ratings for details).

METALARC Lamps—
Typical Lumen Output Characteristics



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WARNING: This lamp can cause serious skin burn and eye inflammation from shortwave Ultraviolet radiation if the outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available.

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