



2013

Philips Entertainment Lamps catalogue

PHILIPS

sense and simplicity



General Introduction

Energizing lives with the power of light

Today's entertainment industry calls for lighting solutions that captivate audiences and turn each performance into something magical. Addressing these needs, Philips Special Lighting focuses on creating lamp systems that bring experiences to life, immersing the audience in the emotion and drama.

Partners in innovation

We develop our cutting-edge lamp technologies in close partnership with luminaire manufacturers around the world, enabling lighting designers to create spectacular experiences in a wide range of entertainment applications.

Just have a look at some of our major innovations that have set the pace in the industry:

- Platinum
- Gold™ FastFit
- Gold™ MiniFastFit
- StagePainter

You will find more information on these specific technologies in the corresponding chapters of this catalogue.

Lighting up a whole world of entertainment

Our products are designed-in and applied world-wide. For more information, please have a look at our web site www.philips.com/lighting/entertainment

World-wide support and service

With years of experience in the entertainment and cinema industry, we understand the importance of customer service. We have a dedicated group of well trained employees that are committed to delivering the best service and support in the industry. With offices around the world, we always have a branch near you. This, in combination with a global presence in production and warehousing facilities, enables us to respond swiftly to your requests.

This catalogue contains the international product range of entertainment lamps. It is possible that some of the products are not available in your country. For more information, please contact your local sales representative. The contact details can be found on page 100 - 102.

Please also visit our website: www.philips.com/lighting/entertainment

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The power to light your creativity

Most lighting designers have a true passion for creating spectacular shows. To help bring out the best in their talents, we have developed the Platinum lamp system. Philips Platinum lamps are extremely compact and intense, allowing OEMs to design really small and flexible fixtures that rotate fast and highlight every angle on stage. The fixtures with Platinum inside bring the artists' performances to life, creating an experience that the audience will never forget!

Many OEMs have already integrated Platinum lamps into their entertainment fixtures and our lamps have had the honor of lighting up many famous artist worldwide. For more information, please visit our web site www.philips.com/lighting/entertainment

A lamp that's faster fitting for more free time

Another successful innovation that in the meantime has been well established in the market is the Philips FastFit concept, developed for single ended MSR Gold™ and Halogen Hi-Brite lamps. The rear load lamp base system, co-developed with Bender & Wirth, enables easy lamp replacement and adjustments in a matter of seconds. The FastFit lamps are also available with a smaller lamp base, called MiniFastFit. These MiniFastFit lamps with a PGJX28 base allow OEMs to make smaller and lighter fixtures compared to the regular FastFit concept, with the PGJX50 lamp base.



FastFit lamp replacement



MSR Gold™ FastFit



MSR Gold™ MiniFastFit



MSR Platinum 35

MSR Platinum 35 – enhanced stage lighting

Today’s stage designs call for lighting solutions which deliver high brightness and high-contrast beams to avoid shadow creation, as well as more compact luminaire and fixture designs to improve creative choice and design flexibility. Addressing this need, we have developed an incredibly powerful, brilliant and lightweight, compact system for the most amazing light experience – MSR Platinum 35.

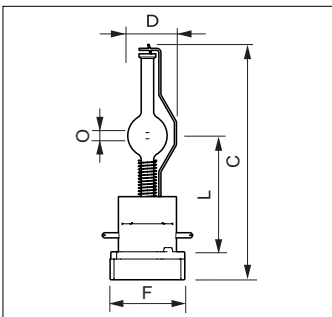
This lamp system provides a powerful and innovative tool to create intense lighting and delivers the same good light quality as other MSR lamps. The exceptionally short arc generates sparkling, bright light and this ultra-compact design makes the lamp suitable for smaller stage lighting fixtures, MSR Platinum 35 gives lighting designers far greater freedom in positioning luminaires.

Product Features

- Very short arc
- Compact system
- High Correlated color temperature
- Philips FastFit technology
- Philips Platinum technology

Product Benefits

- High beam intensity, high brightness
- Freedom to create smaller and lighter fixtures
- High perceived brightness
- Easy and fast lamp replacement
- A long and reliable lifetime



MRS Platinum 35

Type	C Max	D Max	L Nom	L Max	O Nom
MSR Platinum 35	116	235	56	57	3.0

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR Platinum 35	800	PGJX36	54500	70	7750	73	1000	any

Type	Lamp current (A)	Ordering number
Philips MSR Platinum 35	12.3	9281 909 05114



MSR Gold™ 700, 700/2, 1200 FastFit

MSR Gold™ 1500, 2000, 2000/2,
2500/2 FastFit

MSR Gold™ FastFit – easy lamp replacement in seconds

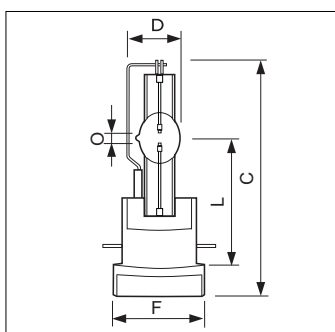
All lamps burn out eventually, but when this happens with single ended MSR Gold™ FastFit, it is replaced in seconds – thanks to the specially designed lamp base and lamp holder. This lamp provides a high beam intensity of pure, white light for a truly illuminating performance, while the gold-plated caps provide superior heat protection and prevent premature failure. P3 technology allows use in any position and at higher temperatures, further extending lamp life and consistency of high-quality light output.

Product Features

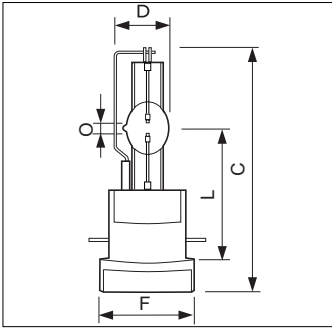
- Philips FastFit
- Very short arc
- Compact design
- Flexible power range
- Philips pinch protection
- Innovative gold plated pins
- MSR filling

Product Benefits

- Lamp replacement in just seconds
- High beam intensity
- Easy handling, smaller and lighter fixtures possible
- Boostable light levels
- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time
- Reduces early lamp or lamp holder failures. Excellent current transfer
- Pure, white light; color point close to black body line

MSR Gold™ 1500, 2000(/2),
2500/2 FastFit

Type	C Max	D Max	F Nom	L Nom	L Max	O Nom
MSR Gold™ 1500 FastFit	128	28	41	65	66	5.5
MSR Gold™ 2000 FastFit	134	34	41	67	68	8.0
MSR Gold™ 2000/2 FastFit	134	34	41	67	68	8.0
MSR Gold™ 2500/2 FastFit	153	35.5	41	74.9	75.9	9.5



MSR Gold™ 700(/2), 1200 FastFit

Type	C Max	D Max	F Nom	L Nom	L Max	O Nom
MSR Gold™ 700 FastFit	112	23.2	41	65	66	3.8
MSR Gold™ 700/2 FastFit	112	23.2	41	65	66	3.8
MSR Gold™ 1200 FastFit	128	26.1	41	65	66	5.5

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning Position
Philips MSR Gold™ 700 FastFit	700	PGJX50	50000	71	6000	80	750	any
Philips MSR Gold™ 700/2 FastFit	700	PGJX50	50000	71	7500	75	750	any
Philips MSR Gold™ 1200 FastFit	1200	PGJX50	95000	80	6000	80	750	any
Philips MSR Gold™ 1500 FastFit	1500	PGJX50	120000	80	6000	80	750	any
Philips MSR Gold™ 2000 FastFit	2000	PGJX50	162000	81	6050	91	750	any
Philips MSR Gold™ 2000/2 FastFit	2000	PGJX50	160000	80	7500	88	750	any
Philips MSR Gold™ 2500/2 FastFit	2500	PGJX50	193000	77	7200	85	750	any

Type	Lamp current (A)	Ordering number
Philips MSR Gold™ 700 FastFit	10.2	9281 060 05114
Philips MSR Gold™ 700/2 FastFit	10.2	9281 062 05114
Philips MSR Gold™ 1200 FastFit	15	9281 750 05114
Philips MSR Gold™ 1500 FastFit	15.3	9281 073 05114
Philips MSR Gold™ 2000 FastFit	15.2	9281 769 05114
Philips MSR Gold™ 2000/2 FastFit	15.4	9281 061 05114
Philips MSR Gold™ 2500/2 FastFit	19.53	9281 064 05114



MSR Gold™ MiniFastFit

MSR Gold™ MiniFastFit – lamp replacement in seconds

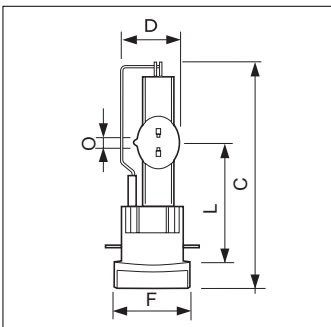
Thanks to the specially designed lamp base, the MSR Gold™ MiniFastFit takes just seconds to replace, to help ensure non-stop clubbing entertainment. In addition, the innovative gold plated pins ensure excellent current transfer to prolong lamp and lamp holder lifetimes and thereby reduce lamp replacement costs. Easy handling and small compact fixture designs are allowed by the lamps compact size, while the very short arc provides a high perceived brightness and high beam intensity. Moreover, the latest addition to the range: Philips MSR Gold™ 700/1 FastFit offers a pure, white light (5600K). Especially designed to be used in theaters, television studios, studio and stages.

Product Features

- Philips MiniFastFit
- Compact design
- Innovative gold plated pins
- High color temperature
- Very short arc

Product Benefits

- Lamp replacement in just seconds
- Easy handling, smaller and lighter fixtures
- Reduces early lamp or lamp holder failures.
 - Excellent current transfer
- High perceived brightness
- High beam intensity



MSR Gold™ MiniFastFit

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSR Gold™ 400 MiniFastFit	111	23.2	35.3	36	36.5	56	57	3.0
MSR Gold™ 575/2 MiniFastFit	112	23.2	35.3	36	36.5	56	57	3.5
MSR Gold™ 700 MiniFastFit	116	23	35.3	36	36.5	56	57	3.5
MSR Gold™ 700/1 MiniFastFit	112	23.2	35.3	36	36.5	56	57	3.8
MSR Gold™ 700/2 MiniFastFit	112	23.2	35.3	36	36.5	56	57	3.8

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR Gold™ 400 MiniFastFit	400	PGJX28	26000	65	6700	60	750	any
Philips MSR Gold™ 575/2 MiniFastFit	575	PGJX28	38600	63	7500	70	750	any
Philips MSR Gold™ 700 MiniFastFit	700	PGJX28	50000	68	6000	73	750	any
Philips MSR Gold™ 700/1 MiniFastFit	700	PGJX28	53400	76.3	5700	73	750	any
Philips MSR Gold™ 700/2 MiniFastFit	700	PGJX28	47000	69	7200	75	750	any

MSR Gold™ MiniFastFit

Type	Lamp current (A)	Ordering number
Philips MSR Gold™ 400 MiniFastFit	7.2	9281 940 05114
Philips MSR Gold™ 575/2 MiniFastFit	10.2	9281 840 05114
Philips MSR Gold™ 700 MiniFastFit	10.9	9281 941 05114
Philips MSR Gold™ 700/1 MiniFastFit	10.2	9281 974 05112
Philips MSR Gold™ 700/2 MiniFastFit	10.2	9281 999 05114



MSR Gold™ SA(1/2) DE

MSR Gold™ SA Double Ended – for extended performance

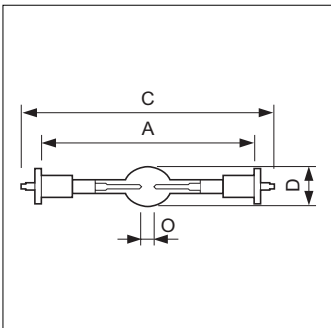
To optimize the total lifetime of the double ended MSR Gold™ SA Double Ended lamps, the caps are plated with gold. This provides superior heat protection and thereby minimizes premature failure of the lamp and lamp holder, as well as ensuring extended consistent performance. In addition, the highly innovative P3 technology, developed by Philips, allows the lamp to be used at higher temperatures, which further extends service life and consistency of high-quality light output.

Product Features

- Philips Pinch Protection
- MSR filling
- Gold plated lamp caps

Product Benefits

- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time
- Pure, white light; color point close to black body line. Consistent color impression over MSR Range
- Reduces early lamp or lamp holder failures



MSR Gold™ SA/DE

Type	A Min	A Nom	A Max	C Max	D Max	O Nom
MSR Gold™ 575 SA/2 DE	69.6	70	70.4	92	18.5	5.0
MSR Gold™ 700 SA/2 DE	114.4	114.8	115.2	136	19	4.0
MSR Gold™ 1200 SA/DE	114.4	114.8	115.2	136	22	7.0
MSR Gold™ 1200 SA/2 DE	114.4	114.8	115.2	136	22	7.0
MSR Gold™ 1510 SA/DE	114.4	114.8	115.2	136	23	7.0

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR Gold™ 575 SA/2 DE	575	SFC-11	42000	73	7500	75	750	any
Philips MSR Gold™ 700 SA/2 DE	700	SFC10-4	56000	80	7500	75	750	any
Philips MSR Gold™ 1200 SA/DE	1200	SFC10-4	106000	91	6000	85	750	any
Philips MSR Gold™ 1200 SA/2 DE	1200	SFC10-4	103000	86	7500	85	750	any
Philips MSR Gold™ 1510 SA/DE	1500	SFC10-4	140000	93	6000	85	750	any

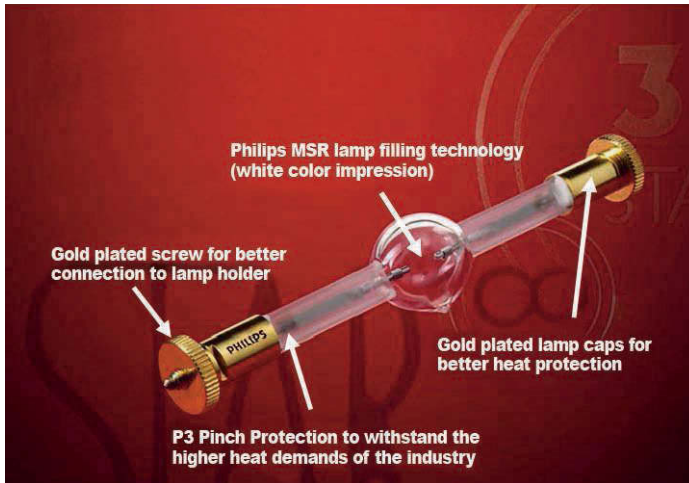


Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

MSR Gold™ SA Double Ended

Type	Lamp current (A)	Ordering number
Philips MSR Gold™ 575 SA/2 DE	7	9281 751 05114
Philips MSR Gold™ 700 SA/2 DE	11.5	9281 747 05114
Philips MSR Gold™ 1200 SA/DE	13.6	9280 996 05114
Philips MSR Gold™ 1200 SA/2 DE	13.6	9281 753 05114
Philips MSR Gold™ 1510 SA/DE	13.5	9281 766 05114



MSR Gold™



MSR 700 (/2), MSR 1200 (/2)



MSR 400, MSR 575/2

MSR – bright vivid colors, always

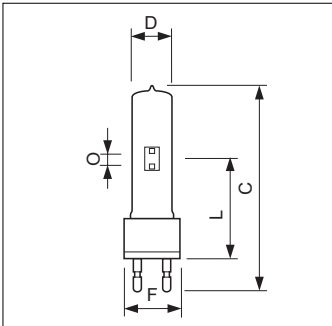
The high color rendering index of the single ended MSR series ensures that everyone in the audience can enjoy the true colors of the scenery, the stage props, the players and their costumes – in fact everything that is on stage can be made bright and vivid in daylight quality light. Also, thanks to the single ended lamp concept, the luminaire has optimal light collection and direction possibilities to help ensure brightness on stage exactly where and when it is needed. In addition, the MSR can be used in any burning position for easy set-up and convenience.

Product Features

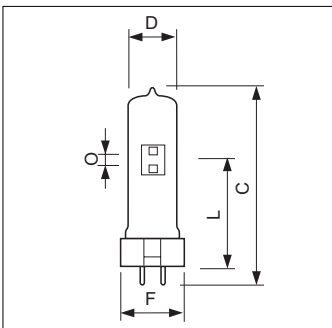
- Single ended lamp concept
- High CRI
- Daylight Color Temperatures

Product Benefits

- Optimal light collection
- Excellent color characteristics
- Brightness on stage



G22



GX9.5

Type	C Max	D Max	F Nom	L Nom	L Max	O Nom
MSR 700	152	30	42	75	76	8.0
MSR 700/2	152	30	42	75	76	8.0
MSR 1200	175	40	53	85	86	10.0
MSR 1200/2	175	40	53	85	86	10.0

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSR 400	112	23	34	35	36	62	63	6.0
MSR 575/2 10H	125	30	34	35	36	65	66	7.0

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR 400	400	GX9.5	32000	80	5900	95	1000	any
Philips MSR 575/2 10H	575	GX9.5	49000	85	7200	70	1000	any
Philips MSR 700	700	G22	55000	80	5900	75	1000	any
Philips MSR 700/2	700	G22	55000	78	7200	80	1000	any
Philips MSR 1200	1200	G22	110000	91	5900	80	800	any
Philips MSR 1200/2	1200	G22	110000	91	7200	85	800	any

Type	Lamp current (A)	Ordering number
Philips MSR 400	6.9	9280 779 05114
Philips MSR 575/2 10H	6.95	9281 716 05114
Philips MSR 700	12	9280 780 05114
Philips MSR 700/2	11	9281 715 05114
Philips MSR 1200	13.8	9280 781 05114
Philips MSR 1200/2	13.8	9281 718 05114



MSR 1200 SA, MSR 2000 SA



MSR 400 SA, MSR 700 SA



MSR Gold™ 1200 SA/SE

MSR Short Arc – for longer life

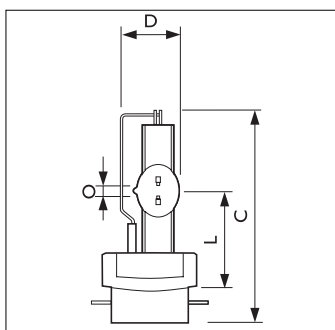
The lamp's short arc and compact design helps enable a compact luminaire that provides high beam intensity, while the excellent color rendition characteristics help ensure optimal colors on stage. The highly innovative P3 technology, developed by Philips, allows MSR Short Arc lamps to be used at higher temperatures in any burning position. The result? Longer lifetime, fewer early failures and a highly consistent performance throughout the lamp's lifetime.

Product Features

- Philips Pinch Protection
- Short arc
- Compact lamp design
- MSR filling

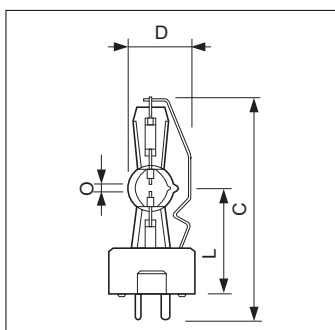
Product Benefits

- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time
- High beam intensity
- Compact design luminaires
- Excellent color characteristics, optimal colors on stage



MSR Gold SA/SE

Type	C Max	D Max	L Nom	L Max	O Nom
MSR Gold™ 1200 SA/SE	109	26.1	45	46	5.5



GY9.5

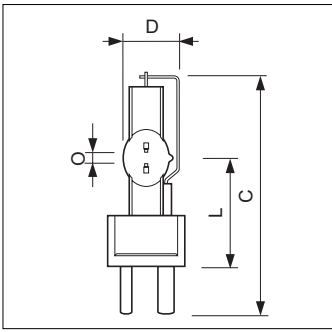
Type	C Max	D Max	L Nom	L Max	O Nom
MSR 400 SA	80	23.5	36.5	37	3.0
MSR 700 SA	83	25	39	39.5	4.0



Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

MSR Short Arc



GY22

Type	C Max	D Max	L Nom	L Max	O Nom
MSR 1200 SA	135	34	59	60	7.0
MSR 2000 SA	135	34	59	60	7.0

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR 400 SA	400	GY9.5	30000	75	5600	75	750	any
Philips MSR 700 SA	700	GY9.5	55000	80	5600	80	750	any
Philips MSR 1200 SA	1200	GY22	96000	80	6000	80	750	any
Philips MSR 2000 SA	1800	GY22	174000	88	6000	89	750	any
Philips MSR Gold™ 1200 SA/SE	1200	PGJ41	93000	78	6000	80	750	any

Type	Lamp current (A)	Ordering number
Philips MSR 400 SA	8.4	9281 702 05114
Philips MSR 700 SA	11	9281 703 05114
Philips MSR 1200 SA	13.8	9281 709 05114
Philips MSR 2000 SA	21.5	9281 732 05114
Philips MSR Gold™ 1200 SA/SE	15	9281 746 05114



MSI

MSI – the true color performer

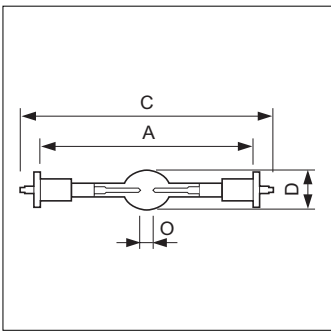
The excellent color rendition characteristics of the light produced by the MSI lamp helps ensure that audiences are always enthralled by the true natural colors and textures on the stage. What’s more, the high luminous efficacy ensures that these lamps produce consistently high levels of lighting for a relatively small amount of energy consumption, making them the smart on-stage solution in more ways than one.

Product Features

- Excellent Colors Characteristics
- High Luminous efficacy

Product Benefits

- Matching colors on the set
- High Light levels



MSI

Type	A Max	C Max	D Max	O Nom
MSI 575 HR/2	116	138	20	7
MSI 575 HR	116	138	20	7
MSI 1200 HR	181	220	28	10

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSI 575 HR/2	575	SFC10-4	47000	82	7800	80	750	p10
Philips MSI 575 HR	575	SFC10-4	49000	85	6000	80	750	p10
Philips MSI 1200 HR	1200	SFC15.5-6	100000	83	6000	80	750	p10

Type	Lamp current (A)	Ordering number
Philips MSI 575 HR/2	7.0	9249 117 00040
Philips MSI 575 HR	7.0	9248 410 00040
Philips MSI 1200 HR	13.0	9248 406 00040



XE 3000 BA



XE 3002 DP

Xenon Entertainment (Large Venue) – optimized projector performance

The Xenon Entertainment (Large Venue) lamps are custom made per projector model to ensure optimized projector performance: there is a different, perfect-fitting lamp for each projector model. In addition, the innovative, advanced electrode design helps ensure projectors always reach their full light output potential. Add to that the long lamp life and reduced envelope darkening and the result is that these lamps are the stars of the large venue projector world

Product Features

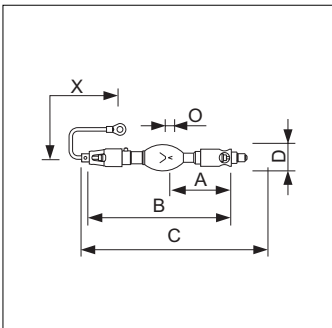
- Customized by projector model
- High initial light output
- Advanced electrode design

Product Benefits

- Optimum projector performance
- Achieve rated projector light output on screen
- Long lamp life, less envelope darkening

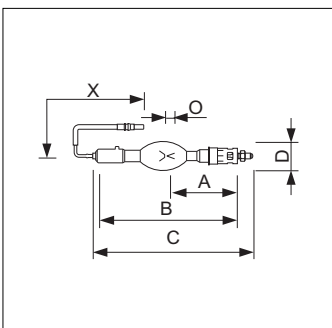


XE 3003 BA



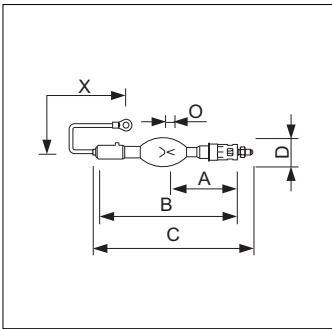
XE 3000 BA

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips XE 3000 BA	110	248	287	46	5.2	125



XE 3002 DP

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips XE 3002 DP	123	245	270	51	4.2	241



XE 3003 BA

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips XE 3003 BA	123	245	270	51	4.2	125

Type	Lamp Wattage (W)	Lamp Voltage	Lamp current (A)	Min/Max (A)	Ignition voltage (V)	Cooling (min.air flow ft.s)	Burning position
Philips XE 3000 BA	3000	30	100	80/110	36000	7	p30
Philips XE 3002 DP	3002	30	100	60/110	36000	7	p30
Philips XE 3003 BA	3003	30	100	60/110	36000	7	p30

Type	Average life expectancy	Ordering number
Philips XE 3000 BA	750	9284 127 06201
Philips XE 3002 DP	750	9284 130 06201
Philips XE 3003 BA	500	9284 132 06201



The power to light your creativity

In clubs it is vital to create the right mood with impactful and fast moving lighting effects. The Philips Platinum lamps do just that. Their very short arc produces a sparkling, bright light that eliminates shadows and perfectly reproduces brilliant and vivid colors. Moreover, the system is so compact that smaller, lightweight fixtures can be developed, to be used anywhere and rotate fast around the room. More design possibilities, more impact and less energy consumption.

A range of lamps for every event

The Philips Club range also features PAR 56 and PAR 64 lamps. An efficient lighting package with high quality Philips components, all optically aligned and sealed into a robust lamp. In line with the renowned Philips Entertainment Lighting standards, Philips PAR lamps offer the very best quality, reliability and lowest cost of ownership available today.



MSD Platinum 2 R



MSD Platinum 5 R



MSD Platinum 15 R

MSD Platinum – The power to light your creativity

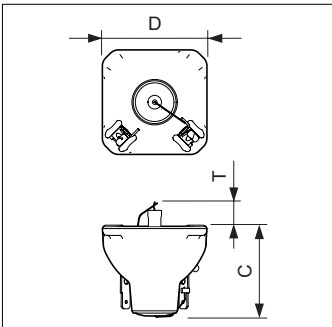
The new MSD Platinum lamps open up new levels of creative freedom in entertainment lighting, with powerful, compact and brilliantly intense light. Their compact, lightweight design provides the freedom to create smaller, lighter luminaires – for use at any location on stage. And their short arc, high color temperature and innovative reflector produce a sparkling, high beam intensity for outstanding color reproduction. They also offer long and reliable lifetime, high efficacy and fast replacement times. It all adds up to an intensely exciting creative experience.

Product Features

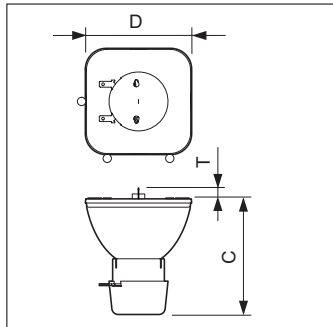
- Philips MSD features
- Very short arc
- Smaller, compact design
- Reflector lamp
- High correlated color temperature

Product Benefits

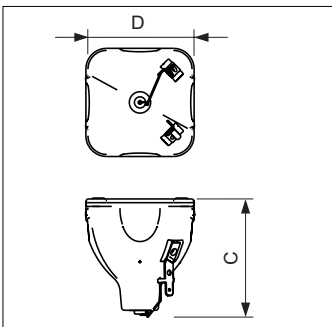
- A long and reliable lifetime
- High beam intensity
- Freedom to create smaller and lighter fixtures
- Perfect alignment and placing with lamp replacements in seconds.
Renewed optical system with maximum light output
- High perceived brightness



MSD Platinum 2 R



MSD Platinum 5 R



MSD Platinum 15 R

Type	C Max	D Max	T Max
MSD Platinum 2 R	43.5	46.5	13.5
MSD Platinum 5 R	57.1	51.4	6.8

Type	C Max	D Max
MSD Platinum 15 R	66.4	58.5

Type	Lamp Wattage (W)	Lumen output (lm)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSD Platinum 2 R	132	5150	8000	75	6000	any
Philips MSD Platinum 5 R	160	7950	8000	75	2000	any
Philips MSD Platinum 15 R	300	13500	8000	75	2000	any

Type	Arc size (mm)	Pinch temperature (°C)	Ordering number
Philips MSD Platinum 2 R	0,9	350	9281 976 05300
Philips MSD Platinum 5 R	1	350	9281 908 05314
Philips MSD Platinum 15 R	1.3	350	9281 916 05314



MSR Gold™ MiniFastFit

MSR Gold™ MiniFastFit – lamp replacement in seconds

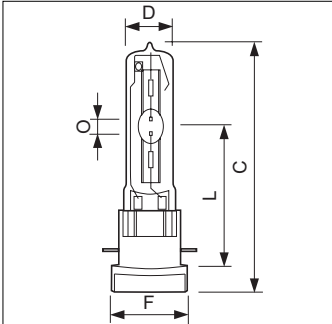
Thanks to the specially designed lamp base and lamp holder, the MSR Gold™ MiniFastFit takes just seconds to replace, to help ensure non-stop clubbing entertainment. In addition, the innovative gold plated pins ensure excellent current transfer to prolong lamp and lamp holder lifetimes and thereby reduce lamp replacement costs. Easy handling and small compact fixture designs are allowed by the lamps compact size, while the very short arc provides a high perceived brightness and high beam intensity.

Product Features

- Philips MiniFastFit
- Compact design
- Innovative gold plated pins
- Color temperature >8000K
- Very short arc

Product Benefits

- Lamp replacement in just seconds
- Easy handling, smaller and lighter fixtures
- Reduces early lamp or lamp holder failures. Excellent current transfer
- High perceived brightness
- High beam intensity



MSR Gold™ 300/2 MiniFastFit

Type	C Max	D Max	L Nom	L Max	O Nom
MSR Gold™ 300/2 MiniFastFit	126	23	66.8	67.8	5.0

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR Gold™ 300/2 MiniFastFit	300	PGJX28	23000	77	8300	80	750	any

Type	Lamp current (A)	Ordering number
Philips MSR Gold™ 300/2 MiniFastFit	3.8	9281 771 05114



MSD Gold™ MiniFastFit

MSD Gold™ MiniFastFit – replacement in seconds + longer life

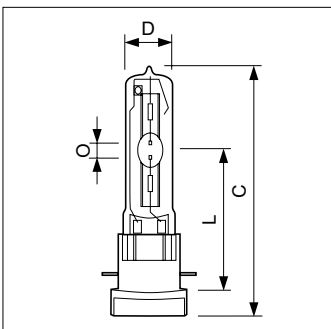
The specially designed lamp base of the MSD Gold™ MiniFastFit means that this lamp can be replaced in just seconds, helping to ensure non-stop entertainment. In addition, the innovative gold plated pins ensure excellent current transfer to prolong lamp and lamp holder lifetimes and thereby reduce lamp replacement costs. The lamp's compact size allows for easy handling and compact fixture designs, while the very short arc provides a high perceived brightness and high beam intensity. What's more, the MSD Gold™ MiniFastFit has an extended lifetime, which further reduces lamp replacement costs.

Product Features

- Philips MiniFastFit
- Compact design
- Innovative gold plated pins
- Color temperature >8000K
- Very short arc
- Long lifetime (2000hrs)

Product Benefits

- Lamp replacement in just seconds
- Easy handling, smaller and lighter fixtures
- Reduces early lamp or lamp holder failures. Excellent current transfer
- High perceived brightness
- High beam intensity
- Less lamp replacement



MSD Gold™ MiniFastFit

Type	C Max	D Max	L Nom	L Max	O Nom
MSD Gold™ 300/2 MiniFastFit	126	23	66.8	67.8	5

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSD Gold™ 300/2 MiniFastFit	300	PGJX28	21000	70	8600	70	2000	any

Type	Lamp current (A)	Ordering number
Philips MSD Gold™ 300/2 MiniFastFit	3.8	9281 998 05114



MSD 150/2



MSD 200(/2), MSD 250(/2)

MSD – right light, stage bright

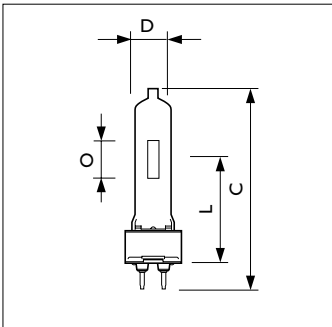
These single ended, compact lamps enable optimal light collection and accurate beam control, while they also provide true daylight color temperatures – all to create great stage brightness and vivid entertainment. And since they offer long lifetime usage they help minimize the cost of ownership via fewer lamp replacements and fewer maintenance man hour costs.

Product Features

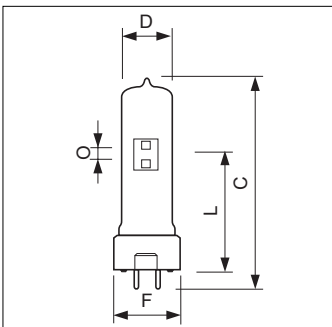
- Single ended lamp concept
- Long life
- Daylight Color Temperatures

Product Benefits

- Optimal light collection
- Low cost of ownership
- Brightness on stage



MSD 150/2



MSD 200(/2), MSD 250(/2)

Type	C Max	D Max	L Nom	L Max	O Nom
MSD 150/2	110	20	56	57	5

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSD 200	108	23	27	28	29	55	56	5
MSD 200/2	108	23	27	28	29	55	56	5
MSD 250	108	23	27	28	29	55	56	5
MSD 250/2 30H	108	23	27	28	29	55	56	5

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSD 150/2	150	G12	10500	70	8500	62	3000	any
Philips MSD 200/2	200	GY9.5	13500	67	6700	70	3000	any
Philips MSD 200	200	GY9.5	13500	67	6000	80	2000	any
Philips MSD 250	250	GY9.5	18000	72	6700	75	3000	any
Philips MSD 250/2 30H	250	GY9.5	18000	72	8500	70	3000	any

Type	Lamp current (A)	Ordering number
Philips MSD 150/2	1.85	9281 728 05114
Philips MSD 200/2	3.4	9280 976 05114
Philips MSD 200	3.4	9280 972 05114
Philips MSD 250	3	9280 987 05114
Philips MSD 250/2 30H	3	9280 990 05114



PAR64



PAR56

PAR56 and PAR 64 – picking out the smallest of details

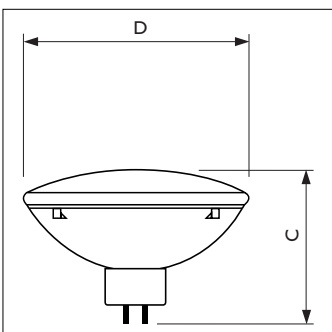
These self-contained spotlights are ideal for intensifying the visual experience in all kinds of clubs, that is because their accurate beam control picks out even the smallest of details even over long distances. This beam control makes the PAR 56 and PAR 64 excellent for long-range light projections. In addition, the universal burning feature provides complete flexibility of luminaire angle and position, while the front glass of the PAR56 provides thermal and physical protection. The result? Complete creative freedom to achieve the desired effect. Immediate re-strike also ensures instant resumption of entertainment after any power interruption.

Product Features

- Self-contained spotlight
- Front glass
- Universal burning
- Hot restrike

Product Benefits

- Allows details to be picked out over long distances with good beam control
- Excellent for long-range light projections
- Provides thermal and physical protection
- Allows fullest flexibility of luminaire angle and position to obtain the desired effect
- Immediate re-strike after any power interruption



PAR56 and PAR64

Type	C Max	D Max
PAR56 300W 230V NSP	127	178
PAR56 300W 240V NSP	127	178
PAR56 300W 230V MFL	127	178
PAR56 300W 240V MFL	127	178
PAR56 300W 230V WFL	127	178
PAR56 300W 240V WFL	127	178
PAR64 250W 28V VNSP	150	204
PAR64 1000W 120V NSP	150	204
PAR64 1000W 230V NSP	150	204
PAR64 1000W 240V NSP	150	204
PAR64 1000W 120V VNSP	150	204
PAR64 1000W 230V VNSP	150	204
PAR64 1000W 240V VNSP	150	204
PAR64 1000W 120V MFL	150	204
PAR64 1000W 230V MFL	150	204
PAR64 1000W 240V MFL	150	204

Type	Lamp Wattage (W)	Cap/base	ANSI Code	LIF Code	Color temperature (K)	Average lamp life (h)	Burning position	Ordering number
Philips PAR56 300W 230V NSP	300	GX16d	-	-	3000	2000	any	9247 835 44204
Philips PAR56 300W 240V NSP	300	GX16d	-	-	3000	2000	any	9247 835 45504
Philips PAR56 300W 230V MFL	300	GX16d	-	-	3000	2000	any	9247 836 44204
Philips PAR56 300W 240V MFL	300	GX16d	-	-	3000	2000	any	9247 836 45504
Philips PAR56 300W 230V WFL	300	GX16d	-	-	3000	2000	any	9247 837 44204
Philips PAR56 300W 240V WFL	300	GX16d	-	-	2000	2000	any	9247 837 45504
Philips PAR64 250W 28V VNSP	250	Multipurpose	-	-	3200	50	any	9247 832 21704
Philips PAR64 1000W 120V NSP	1000	GX16d	-	-	3200	800	any	9284 004 05304
Philips PAR64 1000W 230V NSP	1000	GX16d	EXD	CP61	3200	300	any	9247 833 44204
Philips PAR64 1000W 240V NSP	1000	GX16d	EXD	CP61	3200	300	any	9247 833 45504
Philips PAR64 1000W 120V VNSP	1000	GX16d	-	-	3200	800	any	9284 005 05304
Philips PAR64 1000W 230V VNSP	1000	GX16d	EXC	CP60	3200	300	any	9247 832 44204
Philips PAR64 1000W 240V VNSP	1000	GX16d	EXC	CP60	3200	300	any	9247 832 45504
Philips PAR64 1000W 120V MFL	1000	GX16d	-	-	3200	800	any	9284 006 05304
Philips PAR64 1000W 230V MFL	1000	GX16d	EXE	CP62	3200	300	any	9247 834 44204
Philips PAR64 1000W 240V MFL	1000	GX16d	EXE	CP62	3200	300	any	9247 834 45504



GX5.3 smooth



GZ6.35

Halogen Low Voltage – long life, low costs

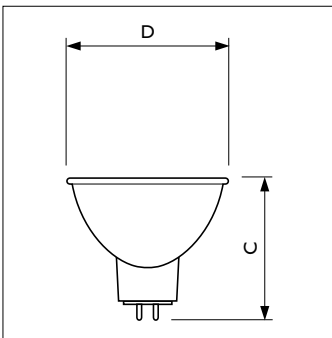
The long lifetime of most of the Halogen Low Voltage lamps is further extended by the unique P3 technology developed by Philips. This allows the lamp to be used at higher temperatures, thereby extending the lamp's lifetime, reducing early failures, and resulting in fewer maintenance man hour costs. P3 also ensures consistency of high-quality light output, and allows the lamp to be used in any burning position, which enables more compact fixture designs. In addition, the compact filament produces a clean white light and high beam intensity for true natural colors on stage and without any hotspots.

Product Features

- Lifetime up to 1000 hours due to Philips Pinch Protection
- Compact filament
- White light
- Even light distribution

Product Benefits

- Lower lamp replacement costs
- High beam intensity
- Pure colors on stage
- Allows creative use without hotspots or shadows



GX5.3, GZ6.35

Type	C Max	D Max
6834/5H 100W GZ6.35 12V	42	50
ELC/10H 250W GX5.3 24V	44.5	50
6423/5H 150W GZ6.35 15V	42	50
ELC/5H 250W 24V	44.5	50

Type	Lamp Wattage (W)	Cap/base	ANSI Code	LIF Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)	Burning position
Philips 6834/5H 100W GZ6.35 12V	100	GZ6.35	EFP/5H	A1/231-5H	580	3400	500	any
Philips 6423/5H 150W GZ6.35 15V	150	GZ6.35	EFR/5H	A1/223-5H	720	3400	500	any
Philips ELC/10H 250W GX5.3 24V	250	GX5.3	ELC/10H	A1/259-10H	-	3400	1000	any
Philips ELC/5H 250W GX5.3 24V	250	GX5.3	ELC/5H	-	-	3400	500	any

Type	Pinch temperature (°C)	Ordering number
Philips 6834/5H 100W GZ6.35 12V	350	9240 565 17104
Philips 6423/5H 150W GZ6.35 15V	350	9240 592 18504
Philips ELC/10H 250W GX5.3 24V	400	9249 132 20540
Philips ELC/5H 250W GX5.3 24V	400	9248 627 20540



Paint exactly the scene you imagined with brilliant LED light – time after time after time

Especially in theaters, lighting can help to tell a story and to turn a performance into something magical. To achieve this, it is crucial that fixtures offer maximum freedom in creating scenes and allow for a perfect recreation of these scenes. Now this is possible with the flexible and controllable Philips StagePainter D60 2000.

The StagePainter D60 2000 system puts creative freedom and lighting control at your fingertips to create breathtaking moods and dynamic effects. It offers an endless palette of fast, tunable, white or colored LED light and an easy to use interface. Lighting designers can paint exactly the scene they imagined by playing with color, intensity, hue and saturation. Moreover, the scenes can be recreated flawlessly, fixture after fixture, night after night, thanks to the high color consistency of the LED modules.

To get inspired by the possibilities of the StagePainter D60 2000 have a look at our website: www.philips.com/lighting/entertainment



StagePainter

Exactly the lighting experience you intended

The StagePainter family of products produces perfectly controllable light due to the integrated color mixing to create unique and dynamic environments with flexible scene-setting capabilities. StagePainter products consistently deliver high-quality tunable white and color illumination that creates new value for the lighting designer and OEM fixture manufacturers, such as:

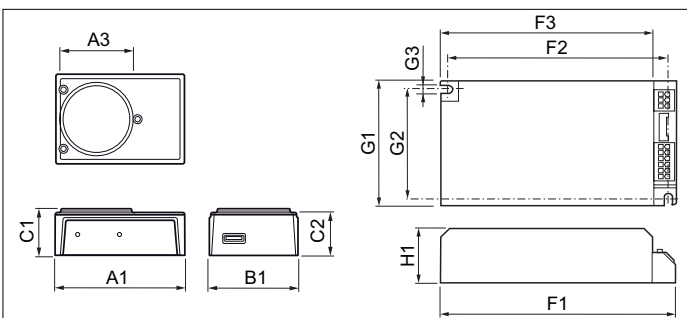
- Creating dramatic effects through electronically fast-switchable light of any color, intensity, hue and saturation
- Enabling scene and mood-setting flexibility

Product Features

- Smart System (LED module + driver + DMX interface)
- Internal color feedback mechanism
- Integrated color mixing
- High color purity
- Smooth dimming
- Adjustable Tc: 2700-6500K

Product Benefits

- OEMs: Easy design in. Lighting Designers: Easy, intuitive interface
- High color consistency over time and between modules
- High quality of light: Perfect color homogeneity on output window; therefore no color shadows
- Nice saturated colors can be displayed
- Dimming to 0 without visible steps
- Allows perfect control of color temperature and light output level, ideal for TV studio



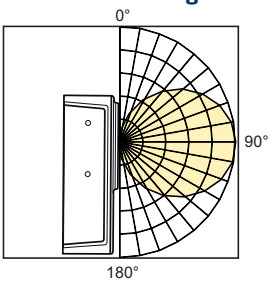
StagePainter

Type	A1 Nom	A3 Nom	B1 Nom	C1 Nom	C2 Nom	F1 Nom	F2 Nom	F3 Nom	G1 Nom	G2 Nom	G3 Nom	H1 Nom
StagePainter: D60 2000 1SYS	121.6	66.8	82.8	43.9	40.4	138	128.5	124.5	74	63.6	4.5	32

Type	Lumen output (lm)	Dimming (%)	Correlated Color Temperature (K)	Color rendering index (Ra)	RGB Gamut	Color Consistency 0 hour	Color Consistency 10 000 hour	Luminous Efficacy System (Lm/W)
Philips StagePainter D60 2000 1SYS	2000	100-0	6500	90	R: x=0.670, y=0.320; G: x=0.210, y=0.670; B: x=0.150, y=0.080	5	6	50

Type	Lumen maintenance @ 50000 hrs (%)	Power (W)	Input voltage (V)	Line Frequency (Hz)	Control Interface for Module	T-case Maximum Gear (°C)	T-case Maximum LED module (°C)	Burning position	Ordering number
Philips StagePainter D60 2000 1SYS	70	20-40	120-277	50-60	DMX/RDM	65	65	any	9144 999 99101

Photometric diagram



StagePainter



Halogen FastFit

Halogen FastFit - lamp replacement in seconds

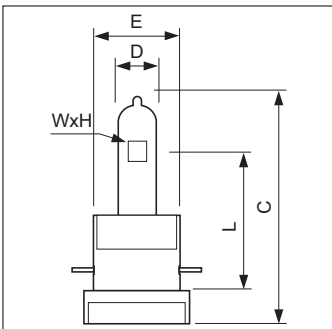
Halogen FastFit lamps are replaced in seconds - thanks to the specially designed base. The compact filament ensures high beam intensity, while the shock-resistant design allows easy handling and reliable use in moving head systems. In addition, the highly innovative P3 technology allows use at higher temperatures, which further extends lifetime and consistency of light output. P3 technology also allows the lamp to be used in any burning position and enables more compact designs of fixtures.

Product Features

- Philips FastFit
- Compact Filament
- Philips P3 pinch protection technology
- Compact, shock resistant design

Product Benefits

- Lamp replacement in just seconds, exchangeable with HID lamp
- High beam intensity
- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time
- Ease handling, ideal for moving head systems



Halogen FastFit

Type	C Max	D Max	E Max	H Nom	L Nom	W Nom
7017G Hi-Brite 750W FastFit	125	19	41	9.5	26	8.5
7016G Hi-Brite 1200W FastFit	140	25	41	10.5	82	11.7
7019G 750W PGJX50 115V FastFit	140	19	41	9	79	9.5
7018G 800W PGJX50 230V FastFit	140	19	41	12.5	79	9
7021G/LL 575W 115V FastFit	140	19	41	9.5	79	9
7024G 600W 230V LL FastFit	140	19	41	15.3	79	8.5

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)	Burning position
Philips 7017G Hi-Brite 750W FastFit	750	80	PGJX50	-	22500	3250	300	any
Philips 7016G Hi-Brite 1200W FastFit	1200	80	PGJX50	-	36000	3250	200	any
Philips 7019G 750W PGJX50 115V FastFit	750	115	PGJX50	GRS	20500	3200	300	any
Philips 7018G 800W PGJX50 230V FastFit	800	230	PGJX50	GRT	20000	3200	200	any
Philips 7021G/LL 575W 115V FastFit	575	115	PGJX50	NPA	12400	3000	1500	any
Philips 7024G 600W 230V LL FastFit	600	230	PGJX50	-	12000	2900	1500	any



Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

Type	Pinch temperature (°C)	Ordering number
Philips 7017G Hi-Brite 750W FastFit	500	9245 768 28928
Philips 7016G Hi-Brite 1200W FastFit	500	9245 752 28928
Philips 7019G 750W PGJX50 115V FastFit	500	9245 824 34428
Philips 7018G 800W PGJX50 230V FastFit	500	9245 823 44228
Philips 7021G/LL 575W 115V FastFit	480	9245 828 34428
Philips 7024G 600W 230V LL FastFit	480	9245 831 44228



FastFit lamp replacement



6980Z, 7009Z



7015TXO

Hi-Brite – ease of handling and cost reduction

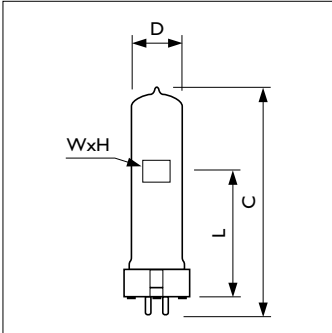
The compact, shock-resistant design of the Hi-Brite lamp series makes it easy to handle and ideal for moving head systems. Also, the compact filament ensures a high beam intensity, which can be used to reduce energy consumption: for example, 1200W can now be used instead of 2500W. In addition, the highly innovative P3 technology, developed by Philips, allows the lamp to be used at higher temperatures in any burning position, which further extends lamp lifetime, reduces lamp replacement costs and ensures consistency of high-quality light output.

Product Features

- Philips Pinch Protection
- Compact, shock resistant design
- Compact filament

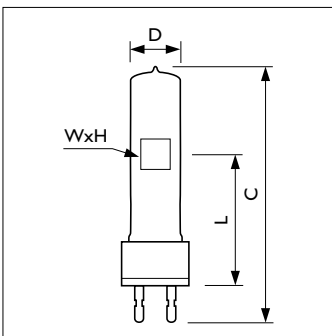
Product Benefits

- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time
- Easy handling, ideal for moving head systems
- High beam intensity resulting in reduced energy consumption (1200W instead of 2500W)



7015TXO

Type	C Max	D Max	H Nom	L Nom	W Nom
7015TXO 750W GX9.5 100V	104	19	8.5	55	9.5



6980Z, 7009Z

Type	C Max	D Max	H Nom	L Nom	W Nom
6980Z 1200W G22 80V	140	25	10.2	63.5	11.7
7009Z 1200W G22 80V	140	25	10.2	72.5	11.7



Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

Type	Lamp Wattage (W)	Voltage	Cap/base	Lumen output (lm)	Color temperature (K)	Average lamp life (h)	Burning position
Philips 6980Z 1200W G22 80V	1200	80	G22	36000	3250	200	any
Philips 7009Z 1200W G22 80V	1200	80	G22	36000	3250	200	any
Philips 7015TXO 750W GX9.5 100V	750	100	GX9.5	20250	3200	300	any

Type	Pinch temperature (°C)	Ordering number
Philips 6980Z 1200W G22 80V	500	9245 465 28928
Philips 7009Z 1200W G22 80V	500	9245 690 28928
Philips 7015TXO 750W GX9.5 100V	500	9245 745 30928



Compact Source

Compact Source – for higher performance luminaires

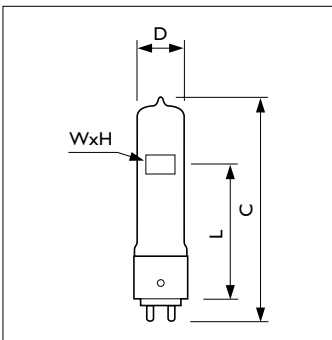
The very compact filament in the Compact Source series helps create a proportionately high beam intensity and the Compact Source range is therefore ideal for the latest generation of high-performance luminaires. Also, thanks to their low energy consumption, each dimmer can serve significantly more fixtures, thereby reducing overall dimmer costs. What's more, the Compact Source lamps incorporate the innovative P3 technology, developed by Philips, which enables the lamps to be used at higher temperatures in any burning position. This results in longer lamp lifetimes, reduced lamp replacement costs, and a more consistent lighting performance over the whole lifetime of the lamp.

Product Features

- Philips P3 pinch protection
- Very compact filament

Product Benefits

- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time.
- High beam intensity. Due to low energy consumption, more fixtures from each dimmer can be offered.



Compact Source

Type	C Max	D Max	H Nom	L Nom	W Nom
6989P 575W G9.5 115V	101	19	7.5	60.5	9
6992P 575W G9.5 115V	101	19	9.5	60.5	9
6986P 600W G9.5 230V	101	19	12	60.5	8
6986P 600W G9.5 240V	101	19	12	60.5	8
6991P 600W G9.5 230V	101	19	15.5	60.5	8.5
6991P 600W G9.5 240V	101	19	15.5	60.5	8.5
6982P 800W G9.5 230V	101	20	12.5	60.5	9
6982P 800W G9.5 240V	101	19	12.5	60.5	9

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)	Burning position
Philips 6989P 575W G9.5 115V	575	115	G9.5	GLC	15500	3200	400	any
Philips 6992P 575W G9.5 115V	575	115	G9.5	GLA	13500	3100	1500	any
Philips 6986P 600W G9.5 230V	600	230	G9.5	GKV	14700	3200	300	any
Philips 6986P 600W G9.5 240V	600	240	G9.5	GKV	15000	3200	300	any
Philips 6991P 600W G9.5 230V	600	230	G9.5	GLB	13000	3100	1500	any
Philips 6991P 600W G9.5 240V	600	240	G9.5	GLB	13000	3100	1500	any



Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)	Burning position
Philips 6982P 800W G9.5 230V	800	230	G9.5	-	20000	3200	200	any
Philips 6982P 800W G9.5 240V	800	240	G9.5	-	20000	3200	200	any

Type	Pinch temperature (°C)	Ordering number
Philips 6989P 575W G9.5 115V	500	9245 342 34428
Philips 6992P 575W G9.5 115V	500	9245 385 34428
Philips 6986P 600W G9.5 230V	500	9245 344 44228
Philips 6986P 600W G9.5 240V	500	9245 344 45528
Philips 6991P 600W G9.5 230V	500	9245 386 44228
Philips 6991P 600W G9.5 240V	500	9245 386 45528
Philips 6982P 800W G9.5 230V	500	9245 456 44228
Philips 6982P 800W G9.5 240V	500	9245 456 45528



HPL

HPL – approved for Source Four™

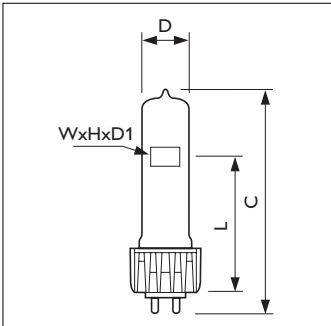
HPL lamps include a barrel-shaped filament that is approved by ETC for use in its Source Four™ fixtures. Bright, high quality light and high beam intensity is assured by the optimal filament design, while the unique P3 technology, developed by Philips, allows the lamp to be used at higher temperatures, which extends lifetime and consistency of high-quality light output, resulting in fewer early failures and fewer maintenance man hour costs.

Product Features

- Philips Pinch Protection
- Optimal filament
- Designed for Source Four™ fixtures

Product Benefits

- Enables use at higher temperature in any burning position. Longer lifetime, fewer early failures, consistent performance over time.
- High beam intensity
- High beam intensity and high quality bright light



HPL

Type	C Max	D Max	D1 Nom	H Nom	L Nom	W Nom
7007 575W Heat Sink 115V	104	19	6	9	60.3	6
7007 575W Heat Sink 230V	104	19	7.5	9.5	60.3	8.6
7007 575W Heat Sink 240V	104	19	7.5	10	60.3	8.6
7007/LL 575W Heat Sink 115V	104	19	6	11	60.3	6
7007/LL 575W Heat Sink 230V	104	19	7.5	11.5	60.3	8.6
7007/LL 575W Heat Sink 240V	104	19	8	11.5	60.3	9.2
7008 750W Heat Sink 115V	104	19	6.3	10.5	60.3	6.3
7008 750W/Heat Sink 230V	104	19	7.5	11.5	60.3	8.6
7008 750W Heat Sink 240V	104	19	7.5	11.5	60.3	8.6

Type	Lamp Wattage (W)	Voltage	Cap/base	Lumen output (lm)	Color temperature (K)	Average lamp life (h)	Burning position	Pinch temperature (°C)
Philips 7007 575W Heat Sink 115V	575	115	Heat Sink	16520	3250	300	any	500
Philips 7007 575W Heat Sink 230V	575	230	Heat Sink	14900	3200	400	any	500
Philips 7007 575W Heat Sink 240V	575	240	Heat Sink	14900	3200	400	any	500
Philips 7007/LL 575W Heat Sink 115V	575	115	Heat Sink	12360	3050	2000	any	480
Philips 7007/LL 575W Heat Sink 230V	575	230	Heat Sink	11760	3050	1500	any	480
Philips 7007/LL 575W Heat Sink 240V	575	240	Heat Sink	11760	3050	1500	any	480
Philips 7008 750W Heat Sink 115V	750	115	Heat Sink	21900	3250	300	any	500
Philips 7008 750W/Heat Sink 230V	750	230	Heat Sink	19750	3200	300	any	500
Philips 7008 750W Heat Sink 240V	750	240	Heat Sink	19750	3200	300	any	500



Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

Type	Ordering number
Philips 7007 575W Heat Sink 115V	9245 549 34428
Philips 7007 575W Heat Sink 230V	9245 549 44228
Philips 7007 575W Heat Sink 240V	9245 549 45528
Philips 7007/LL 575W Heat Sink 115V	9245 550 34428
Philips 7007/LL 575W Heat Sink 230V	9245 550 44228
Philips 7007/LL 575W Heat Sink 240V	9245 550 45528
Philips 7008 750W Heat Sink 115V	9245 551 34428
Philips 7008 750W/Heat Sink 230V	9245 551 44228
Philips 7008 750W Heat Sink 240V	9245 551 45528



Blue pinch

Blue Pinch – high power, low weight

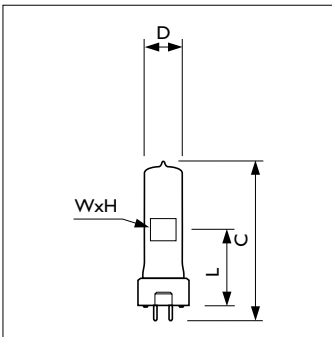
The small lamp size of the Blue Pinch series combined with the high performance pinch protection technology enables fixture manufacturers to create light and compact luminaires with a very high lumen output.

Product Features

- Enables a significant reduction of light centre length (LCL), or an increase in lamp power by up to 300 per cent with same LCL, compared with unprotected lamps
- Unique pinch protection

Product Benefits

- Meet the needs of fixture manufacturers who wish to create compact and lightweight luminaires without sacrificing lumen output or lamp life
- Lamp pinch can be operated at up to 500°C



Blue pinch

Type	C Max	D Max	H Nom	L Nom	W Nom
6995I/BP 1000W GY9.5 230V	95	22	14.5	46.5	11
6995I/BP 1000W GY9.5 240V	95	22	14.5	46.5	11

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)	Burning position
Philips 6995I/BP 1000W GY9.5 230V	1000	230	GY9.5	GAB	25000	3200	250	s90
Philips 6995I/BP 1000W GY9.5 240V	1000	240	GY9.5	GAD	25000	3200	250	s90

Type	Pinch temperature (°C)	Ordering number
Philips 6995I/BP 1000W GY9.5 230V	500	9245 267 44228
Philips 6995I/BP 1000W GY9.5 240V	500	9245 267 45528



GX9.5



GY9.5



P28s

Halogen High Voltage SE – super extended lamp life

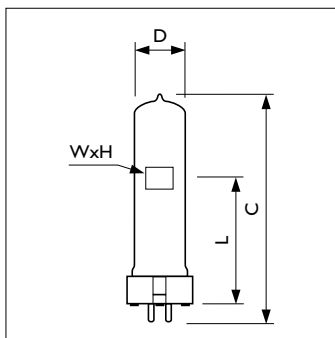
Two distinctive features make this lamp ideal for use in theater luminaires where long life is essential. Firstly, the filament is especially designed for extended lifetime. Secondly the highly innovative P3 technology, developed by Philips, allows the pinch to better withstand extreme heat conditions which extends the average lamp lifetime, ensures consistent high-quality light output over time, and results in fewer early failures and fewer maintenance man hour costs.

Product Features

- Philips Pinch Protection
- Special filament design for use in luminaires where longer life is of great importance

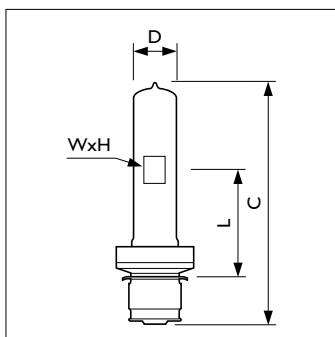
Product Benefits

- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time.
- Ideal for theater lighting applications



GX9.5

Type	C Max	D Max	H Nom	L Nom	W Nom
6998P 650W GX9.5 230V	110	22	12.5	55	10
6998P 650W GX9.5 240V	110	22	12.5	55	10
6996P 1000W GX9.5 230V	110	23	17	55	11
6996P 1000W GX9.5 240V	110	23	17	55	11
6897P 1200W GX9.5 230V	120	25	14.5	67	15
6897P 1200W GX9.5 240V	120	25	14.5	67	15



P28s

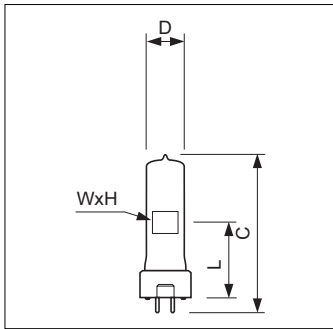
Type	C Max	D Max	H Nom	L Nom	W Nom
6800C 500W P28s 120V	130	20	10	55.6	8.5
6800C 500W P28s 240V	130	22	13	55.6	9.5
6996C 1000W P28s 230V	125	23	16	55.6	10
6996C 1000W P28s 240V	125	23	16	55.6	10



Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

Halogen High Voltage SE



GY9.5

Type	C Max	D Max	H Nom	L Nom	W Nom
6874P 300W GY9.5 230V	80	18	14	46.5	8
6874P 300W GY9.5 240V	80	18	14	46.5	8
6820P 500W GY9.5 230V	90	22	11	46.5	11
6820P 500W GY9.5 240V	90	22	11	46.5	11
6877P 500W GY9.5 230V	85	18	21	46.5	8
6877P 500W GY9.5 240V	85	18	21	46.5	8
6823P 650W GY9.5 230V	90	22	13.5	46.5	11
6823P 650W GY9.5 240V	90	22	13.5	46.5	11

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	LIF Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)
Philips 6874P 300W GY9.5 230V	300	230	GY9.5	-	M/38	5100	2950	2000
Philips 6874P 300W GY9.5 240V	300	240	GY9.5	-	M/38	5100	2950	2000
Philips 6800C 500W P28s 120V	500	120	P28s	BTL	-	11000	2950	750
Philips 6800C 500W P28s 240V	500	240	P28s	-	T/24 (T/17)	9500	2950	900
Philips 6820P 500W GY9.5 230V	500	230	GY9.5	GCV/GVH	T/25 (T/18)	11000	3000	360
Philips 6820P 500W GY9.5 240V	500	240	GY9.5	GCW/GCJ	T/25 (T/18)	11000	3000	360
Philips 6877P 500W GY9.5 230V	500	230	GY9.5	-	M/40	10000	2950	2000
Philips 6877P 500W GY9.5 240V	500	240	GY9.5	-	M/40	10000	2950	2000
Philips 6823P 650W GY9.5 230V	650	230	GY9.5	GCK/GCT	T/27 (T/26)	14500	3050	600
Philips 6823P 650W GY9.5 240V	650	240	GY9.5	GCL/GCS	T/27 (T/26)	14500	3050	600
Philips 6998P 650W GX9.5 230V	650	230	GX9.5	-	T/21 (T/12)	13000	3000	900
Philips 6998P 650W GX9.5 240V	650	240	GX9.5	-	T/21 (T/12)	12600	3000	900
Philips 6996C 1000W P28s 230V	1000	230	P28s	FKD	T/20 (T/14)	21000	3050	900
Philips 6996C 1000W P28s 240V	1000	240	P28s	FKD	T/20 (T/14)	21000	3050	900
Philips 6996P 1000W GX9.5 230V	1000	230	GX9.5	FWP	T/19 (T/11)	21000	3050	900
Philips 6996P 1000W GX9.5 240V	1000	240	GX9.5	FWR	T/19 (T/11)	21000	3050	900
Philips 6897P 1200W GX9.5 230V	1200	230	GX9.5	FWS	T/29	27600	3000	480
Philips 6897P 1200W GX9.5 240V	1200	240	GX9.5	FWT	T/29	27600	3000	480

Type	Burning position	Pinch temperature (°C)	Ordering number
Philips 6874P 300W GY9.5 230V	any	400	9239 497 43228
Philips 6874P 300W GY9.5 240V	any	400	9239 497 45728
Philips 6800C 500W P28s 120V	any	350	9245 166 36328
Philips 6800C 500W P28s 240V	any	500	9238 547 45528
Philips 6820P 500W GY9.5 230V	any	500	9238 940 43228
Philips 6820P 500W GY9.5 240V	any	500	9238 940 45528
Philips 6877P 500W GY9.5 230V	any	400	9239 498 43228
Philips 6877P 500W GY9.5 240V	any	400	9239 498 45728
Philips 6823P 650W GY9.5 230V	any	500	9238 654 43228
Philips 6823P 650W GY9.5 240V	any	500	9238 654 45528
Philips 6998P 650W GX9.5 230V	any	500	9238 650 43228
Philips 6998P 650W GX9.5 240V	any	500	9238 650 45528
Philips 6996C 1000W P28s 230V	any	500	9238 652 43228
Philips 6996C 1000W P28s 240V	any	500	9238 652 45528

Type	Burning position	Pinch temperature (°C)	Ordering number
Philips 6996P 1000W GX9.5 230V	any	500	9238 651 43228
Philips 6996P 1000W GX9.5 240V	any	500	9238 651 45528
Philips 6897P 1200W GX9.5 230V	any	500	9238 537 42928
Philips 6897P 1200W GX9.5 240V	any	500	9238 537 45528



MSR DE

MSR DE – compact power

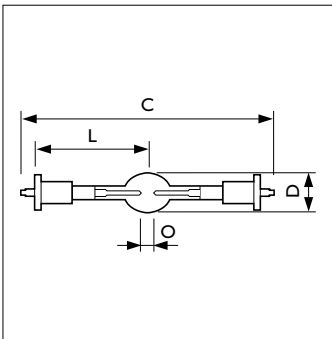
The MSR DE offers 1800 watts of power but has the same dimensions as an MSI 1200W lamp, enabling fixtures to combine power with compact design. Or, to put it another way: it gives more light for more punch. The MSR filling provides a pure, white light and high consistency color impression over MSR range, it also ensures a stable color temperature over its entire lifetime.

Product Features

- MSR filling
- Same dimensions as MSI 1200W

Product Benefits

- Pure, white light. Color point close to black body line
- Consistent color impression over MSR range
- Stable color temperature over lifetime
- More light in same size, for more punch
- Allows compact fixture design



MSR 1800 DE

Type	C Max	D Max	L Nom	L Max	O Nom
MSR 1800 DE	220	28.5	67	68	10.0

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR 1800 DE	1800	SFC15.5-6	145000	80	6000	85	750	any

Type	Lamp current (A)	Ordering number
Philips MSR 1800 DE	20	9281 067 05120



Philips LTIX 2000W H



Philips LTIX 1000W HTP, Philips LTIX 2000W HTP



Philips LTIX 2500W HS

Xenon Entertainment (Follow Spots) – sunlight, always

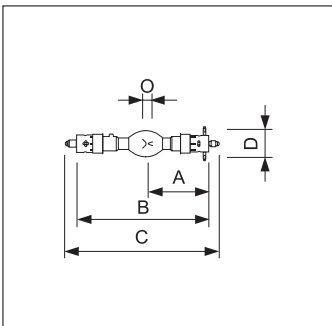
The pure xenon gas filling of the Xenon Entertainment (Follow Spots) helps ensure pure, white light that matches the spectral distribution of the sun. Besides this, it generates these color properties consistently throughout its entire lifetime, ensuring sunlight-quality colors, always. In addition, its hot restrike ability maximizes availability, while the capability of operating at lower than rated wattages means that dimming strategies are possible.

Product Features

- Pure Xenon fill gas
- Approx. 6000K color temperature
- Hot restrike
- Dimmable

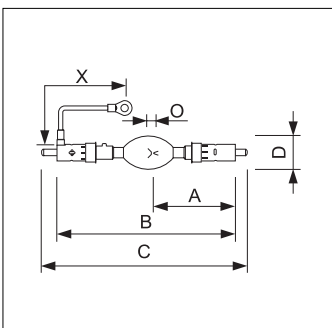
Product Benefits

- Constant color properties during lamp life
- Pure, white light matching the spectral distribution of the sun
- Hot re-ignition is possible ensuring constant light availability
- Capable of operating at lower than rated wattages



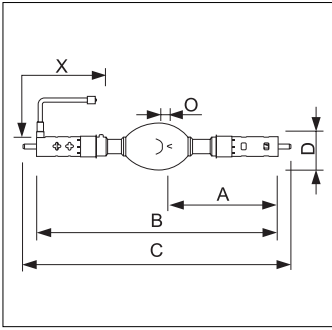
LTIX 700W, 1000W, 1600W HS

Type	A Nom	B Max	C Max	D Nom	O Nom
Philips LTIX 700W HS	95	205	235	40	3.2
Philips LTIX 1000W HS	95	205	235	40	3.5
Philips LTIX 1600W HS	95	205	235	46	4.0



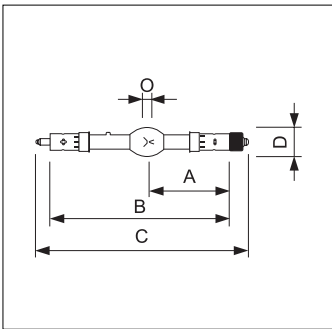
LTIX 3000W HEHS

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips LTIX 3000W HEHS	145	302	337	52	6.0	280



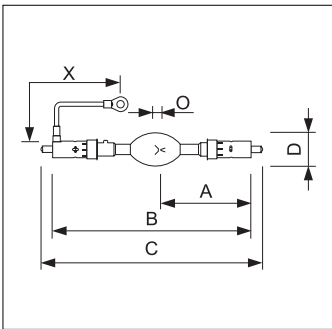
LTIX 4500W, 5000W, 6002W, 7000W HS

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips LTIX 4500W HS	171	370	410	70	7.0	305
Philips LTIX 6002W HS	170.5	393	433	78	9.0	370
Philips LTIX 7000W HS	170.5	393	433	78	11.0	305



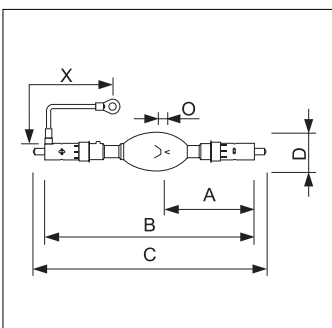
LTIX 1000W, 2000W, 3000W, 4000W HTP

Type	A Nom	B Max	C Max	D Nom	O Nom
Philips LTIX 2000W HTP	142	322	375	52	6.0
Philips LTIX 4000W HTP	167.5	382	428	70	7.0



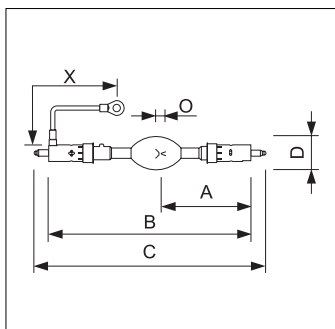
LTIX 2000W, 2500W, 3000W HS

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips LTIX 2000W HS	145	302	342	60	5.0	280
Philips LTIX 2000W XB	114	229	274	60	5.0	255
Philips LTIX 2000W XS	121	302	342	52	5.8	305
Philips LTIX 2500W HS	145	302	342	60	5.5	280
Philips LTIX 3000W HS	145	302	342	60	6.0	280
Philips LTIX 4000W XS	173	393	418	70	7.0	355
Philips LTIX 7000W XS	173	393	418	78	11.0	-



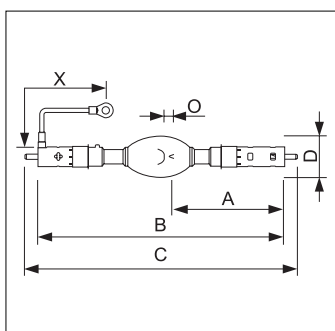
LTIX 2000W HEHS

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips LTIX 2000W HEHS	145	302	337	46	5.0	280



LTIX 2000W, 2500W, 3000W H

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips LTIX 2000W H	142.5	322	370	52	5.8	280
Philips LTIX 3000W H	167.5	382	427	60	7.0	280



LTIX 4202W, 8000W HEHS

Type	A Nom	B Max	C Max	D Nom	O Nom	X Nom
Philips LTIX 4202W HEHS	171	370	410	62	7.0	305
Philips LTIX 8000W HEHS	170.5	395	437	70	12.0	305

Type	Lamp Wattage (W)	Lamp Voltage	Lamp current (A)	Lumen output (lm)	Lamp current Span	Ignition Peak Voltage	Cooling (min.air flow ft.s)	Burning position
Philips LTIX 700W HS	700	18	37	20000	30/45	33000	20	hor/ver20
Philips LTIX 1000W HS	1000	19	50	32000	30/55	33000	20	hor/ver20
Philips LTIX 1600W HS	1600	23	65	60000	50/70	33000	20	hor/ver20
Philips LTIX 2000W H	2000	27	70	80000	50/85	36000	20	hor/ver30
Philips LTIX 2000W HEHS	2000	24	80	80000	50/85	36000	20	hor/ver30
Philips LTIX 2000W HS	2000	24	80	80000	50/85	36000	20	hor/ver30
Philips LTIX 2000W HTP	2000	27	70	80000	50/85	36000	20	hor/ver30
Philips LTIX 2000W XB	2000	27	70	80000	50/85	36000	20	hor/ver20
Philips LTIX 2000W XS	2000	24	80	80000	75/85	36000	20	hor/ver20
Philips LTIX 2500W HS	2500	28	90	100000	70/100	36000	20	hor/ver30
Philips LTIX 3000W H	3000	29	100	130000	60/100	36000	20	hor/ver30
Philips LTIX 3000W HEHS	3000	29	100	130000	60/110	36000	20	hor/ver30
Philips LTIX 3000W HS	3000	29	100	130000	60/110	36000	20	hor/ver30
Philips LTIX 4000W HTP	4000	30	130	155000	100/140	36000	20	hor/ver20
Philips LTIX 4000W XS	4000	30	130	155000	85/100	36000	20	hor/ver20
Philips LTIX 4202W HEHS	4202	29	140	190000	80/160	36000	20	hor/ver20
Philips LTIX 4500W HS	4500	29	135	155000	80/150	36000	20	hor/ver30
Philips LTIX 6002W HS	6002	37	160	350000	110/165	44000	20	hor/ver15
Philips LTIX 7000W HS	7000	41	160	350000	110/165	44000	20	hor/ver15
Philips LTIX 7000W XS	7000	41	160	350000	110/165	44000	20	hor/ver15
Philips LTIX 8000W HEHS	8000	45	175	350000	135/80	45000	20	hor/ver15

Xenon Entertainment (Follow Spots)

Type	Magnet	Average Lifetime	Ordering number
Philips LTIX 700W HS	-	1500	9284 103 06301
Philips LTIX 1000W HS	-	1500	9284 107 06301
Philips LTIX 1600W HS	-	1500	9284 122 06301
Philips LTIX 2000W H	Horizontal required	2400	9284 135 06301
Philips LTIX 2000W HEHS	-	1800	9284 138 06301
Philips LTIX 2000W HS	-	2400	9284 141 06301
Philips LTIX 2000W HTP	Horizontal required	2400	9284 142 06301
Philips LTIX 2000W XB	-	1500	9284 145 06301
Philips LTIX 2000W XS	-	1500	9284 147 06301
Philips LTIX 2500W HS	-	1500	9284 114 06201
Philips LTIX 3000W H	required	1500	9284 119 06201
Philips LTIX 3000W HEHS	-	1200	9284 122 06201
Philips LTIX 3000W HS	required	1500	9284 125 06201
Philips LTIX 4000W HTP	-	1200	9284 141 06201
Philips LTIX 4000W XS	-	1000	9284 142 06201
Philips LTIX 4202W HEHS	required	700	9284 152 06201
Philips LTIX 4500W HS	Horizontal required	1000	9284 155 06201
Philips LTIX 6002W HS	required	500	9284 173 06201
Philips LTIX 7000W HS	Horizontal required	600	9284 183 06201
Philips LTIX 7000W XS	-	500	9284 184 06201
Philips LTIX 8000W HEHS	-	-	9284 138 06301

Explanation abbreviations:

H: Horizontal

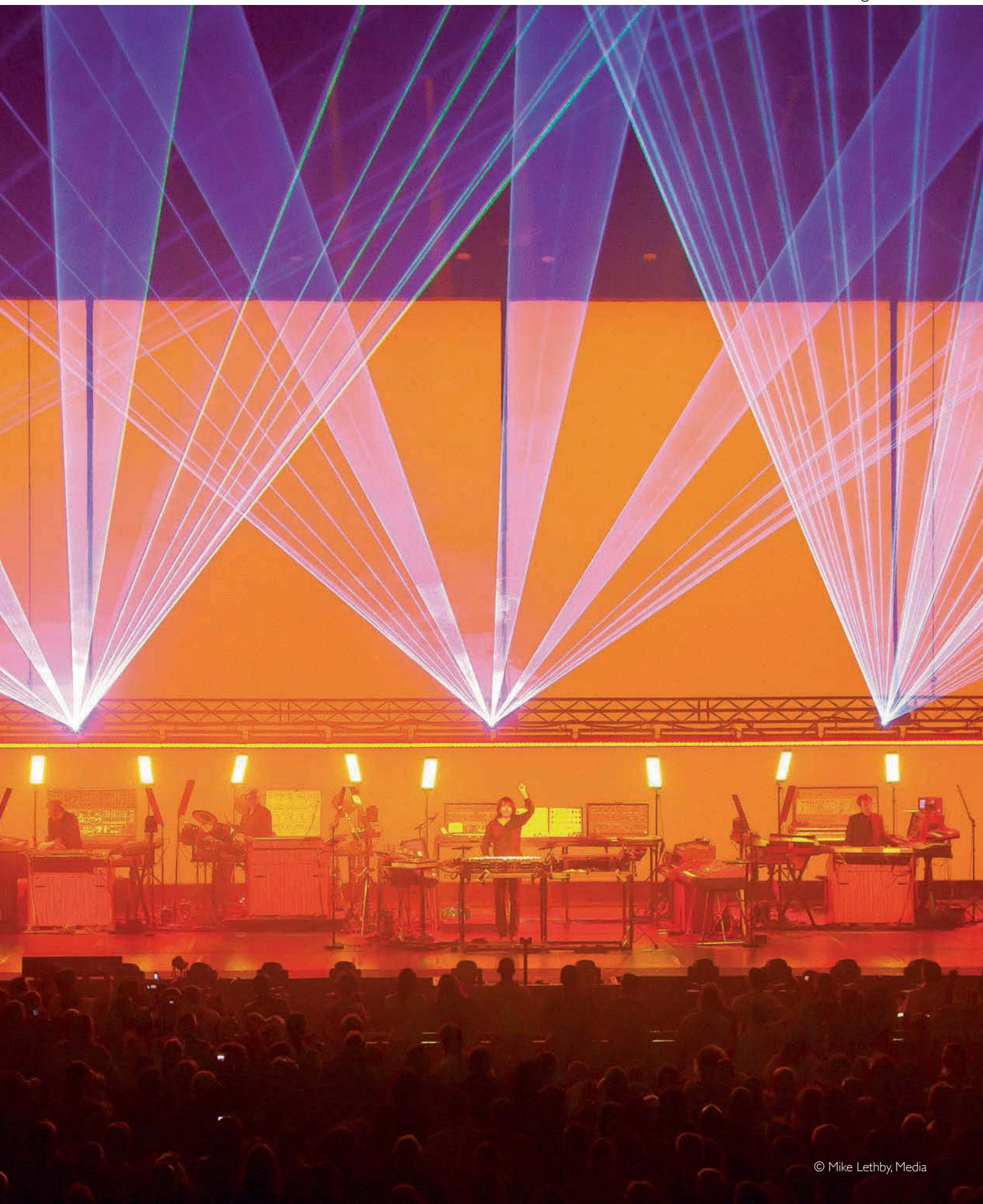
HS: Short lamp

HEHS: Short Helios®

HTP: Lamp with threaded pin

XB: Brightlight fixture

XS: Sky-tracker fixture





“In fact it’s early evening... I make it high noon.”

The star products of the Philips Film Lighting range are the MSR Hot Restrike lamps. The lamps create the perfect daylight in any condition. They give excellent quality and the right amount of light, constantly on call.

Furthermore they are stable and reliable to ensure perfect performance conditions and their compact Single Ended Lamp technology enables hot re-ignition while maintaining superb color characteristics.



MSR 6000 HR, MSR 12000 HR, MSR 18000 HR



MSR 575 HR



MSR 125 HR , MSR 200 HR , MSR 250 HR , MSR 400 HR



MSR 1200 HR



MSR 2500 HR, MSR 4000 HR

MSR Hot Restrike –instant daylight at any time

Thanks to an optimized color temperature and a high color rendering index, the MSR Hot Restrike creates perfect 'daylight' in any condition. Also, the single ended lamp design enables hot re-ignition, which ensures daylight lighting and superb color rendition is always instantly available. They also incorporate the innovative P3 technology, developed by Philips, which allows use at higher temperatures and therefore extends lifetime and consistency of high-quality light output.

Product Features

- Philips Pinch Protection
- MSR filling
- Optimal discharge tubes geometry
- High efficacy
- Single ended lamp concept
- Hot Restrike capability

Product Benefits

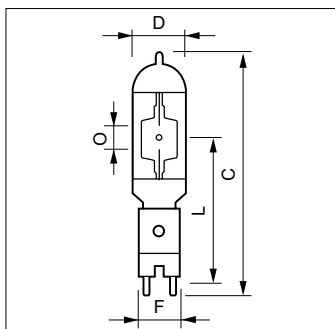
- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time
- Perfect daylight color due to 6000K temperature with excellent color characteristics required for the set
- No arc movement
- High lumen output
- High beam intensity
- Hot re-ignition is possible ensuring the availability of the light at any time



Philips Pinch Protection technology

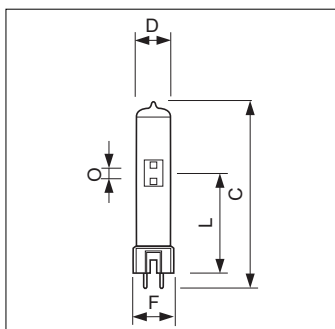
- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.

For 2500W and higher



MSR 6000 HR, MSR 12000 HR, MSR 18000 HR

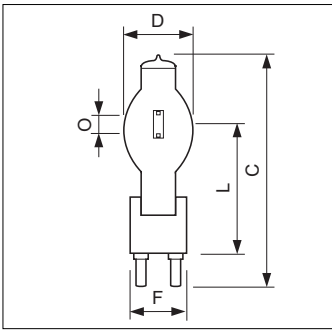
Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSR 6000 HR	375	74	61	62	63	210	212	23
MSR 12000 HR	460	103	70	71	72	255	257	30
MSR 18000 HR	490	103	76.5	78	79.5	260	263	44



MSR 125 HR, 200 HR, 250 HR, 400 HR

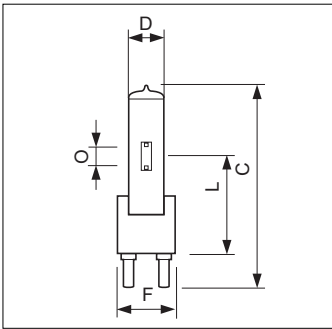
Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSR 125 HR	77	17	23	23.5	24	39	40	4.0
MSR 200 HR	80	20	23	23.5	24	39	40	5.0
MSR 250 HR	110	23	23	23.5	24	59	60	5.0
MSR 400 HR	110	23	23	23.5	24	60	61	6.0

MSR Hot Restrike



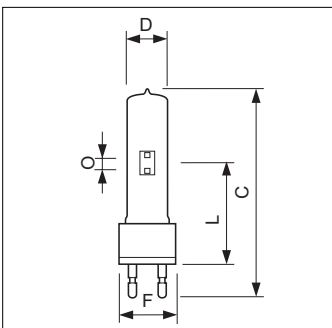
MSR 2500 HR, MSR 4000 HR

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSR 2500 HR	240	60	63	65	67	127	128	14.0
MSR 2500 HR/J	240	60	63	65	67	127	128	14.0
MSR 4000 HR	255	77	63	65	67	142	143	20.0
MSR 4000 HR/J	255	77	63	65	67	142	143	20.0



MSR 1200 HR

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSR 1200 HR	200	40	63	65	67	107	108	10.0



G22

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSR 575 HR	145	30	41	42	43	70	71	7.0

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSR 125 HR	125	GZX9.5	9400	75	6000	92	200	any
Philips MSR 200 HR	200	GZY9.5	15000	75	6000	92	200	any
Philips MSR 250 HR	250	GZY9.5	20000	80	6000	90	750	any
Philips MSR 400 HR	400	GZZ9.5	32000	80	6000	92	1000	any
Philips MSR 575 HR	575	G22	49000	85	6000	90	1000	any
Philips MSR 1200 HR	1200	G38	110000	91	6000	95	1000	any
Philips MSR 2500 HR	2500	G38	240000	96	6000	95	500	any
Philips MSR 2500 HR/J	2500	G38	228000	91	6000	90	500	any
Philips MSR 4000 HR	4000	G38	380000	95	6000	91	500	any
Philips MSR 4000 HR/J	4000	G38	370000	93	6000	91	500	any
Philips MSR 6000 HR	6000	GY38	570000	95	6000	95	300	any
Philips MSR 12000 HR	12000	GY38	1120000	93	6000	95	300	any
Philips MSR 18000 HR	18000	GX51	1650000	92	6000	90	300	any

Type	Lamp current (A)	Ordering number
Philips MSR 125 HR	1.9	9280 602 05114
Philips MSR 200 HR	3.3	9280 979 05114
Philips MSR 250 HR	2.6	9281 756 05114
Philips MSR 400 HR	6.9	9280 502 05114
Philips MSR 575 HR	6.95	9280 977 05114
Philips MSR 1200 HR	13.8	9281 050 05114
Philips MSR 2500 HR	25.6	9281 049 05114
Philips MSR 2500 HR/J	25.6	9281 742 05114
Philips MSR 4000 HR	27.5	9280 504 05114
Philips MSR 4000 HR/J	25	9281 738 05114
Philips MSR 6000 HR	55	9281 727 05120
Philips MSR 12000 HR	84	9281 733 05120
Philips MSR 18000 HR	77.6	9281 055 05120



G9.5



G38



GY9.5



P28s



GX9.5



GY16



G22



GX6.35

Halogen High Voltage SE – stars on film and video

The high, constant output and consistent color temperature of these single ended halogen lamps ensure attractive, accurately exposed pictures for both film and video. Furthermore, these lamps incorporate the highly innovative P3 technology, developed by Philips. This allows the lamps to be used at higher temperatures, which extends overall lifetime and consistency of their high-quality light output. P3 technology also allows the lamp to be used in any burning position and enables more compact designs of fixtures. In addition, the very wide choice of dimensions and power ratings opens new levels of creative freedom for the luminaire designer.

Product Features

Studio/film:

- All lamps have a correlated color temperature of 3200K

Video:

- High constant light output and color temperature

Product Benefits

Studio/film:

- High lumen output
- Enables use at higher temperatures in any burning position. Longer lifetime, fewer early failures, consistent performance over time.

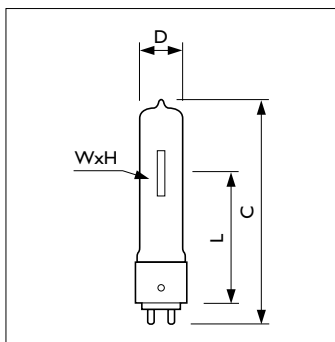
Video:

- Makes attractive, accurately exposed pictures possible



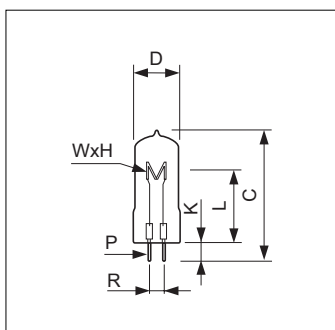
Philips Pinch Protection technology

- **Reliability**, through longer lifetime and fewer early failures.
- **Quality**, through excellent storage characteristics and consistent performance over time.
- **Compactness**, allowing more compact design of fixtures and burning positions.



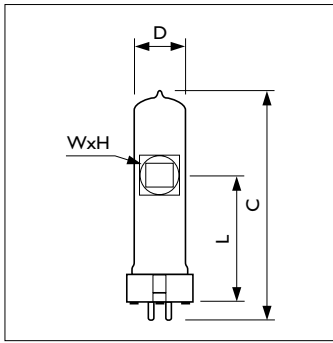
G9.5

Type	C Max	D Max	H Nom	L Nom	W Nom
6983P 1000W G9.5 120V	105	20	23	60.5	6
6983P 1000W G9.5 230V	105	20	23	60.5	6
6983P 1000W G9.5 240V	105	20	23	60.5	6



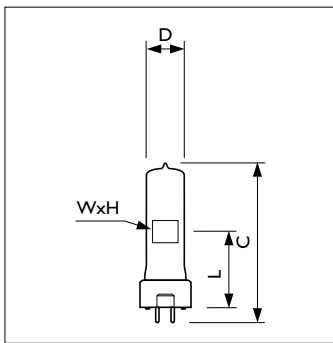
GX6.35

Type	C Max	D Max	H Nom	K Min	K Nom	K Max	L Nom	P Min	P Nom	P Max	R Min	R Nom	R Max	W Nom
7003 150W GX6.35 230V	54	18	6	6.5	7	7.5	30	0.95	1	1.05	-	6.35	-	6
VL300 300W GX6.35 120V	56	18	9	6.5	7	7.5	31.5	0.95	1	1.05	6.1	6.35	6.6	6
VL300 300W GX6.35 230V	56	18	9	6.5	7	7.5	31.5	0.95	1	1.05	6.1	6.35	6.6	6



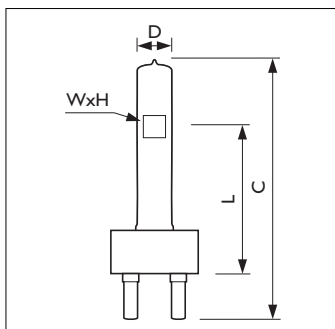
GX9.5 with reflector

Type	C Max	D Max	H Nom	L Nom	W Nom
6984P 1000W GX9.5 230V	110	23	13	55	15.5



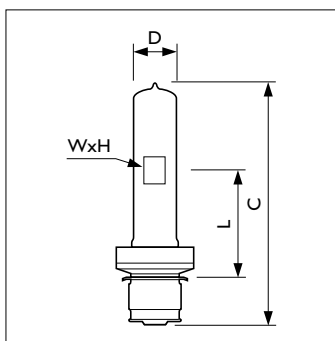
GY9.5

Type	C Max	D Max	H Nom	L Nom	W Nom
6872P 300W GY9.5 230V	90	18	13	46.5	8
6872P 300W GY9.5 240V	90	18	13	46.5	8
6873P 500W GY9.5 230V	90	18	18	46.5	8
6873P 500W GY9.5 240V	90	18	18	46.5	8
7389 500W GY9.5 230V	75	22	9	36.5	10.5
7389 500W GY9.5 240V	75	22	9	36.5	10.5
6638P 650W GY9.5 120V	90	22	12	46.5	11
6638P 650W GY9.5 230V	90	22	12	46.5	11
6638P 650W GY9.5 240V	90	22	12	46.5	11



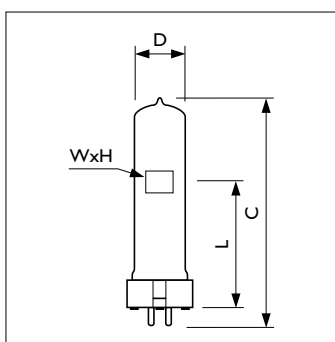
G38

Type	C Max	D Max	H Nom	L Nom	W Nom
6994Z 2000W G38 120V	210	40	15.5	127	17
6994Z 2000W G38 230V	210	40	18.5	127	17
6994Z 2000W G38 240V	210	40	18.5	127	17
6963Z 5000W G38 230V	280	62	28.5	165	26
6963Z 5000W G38 240V	280	62	28.5	165	26



P28s

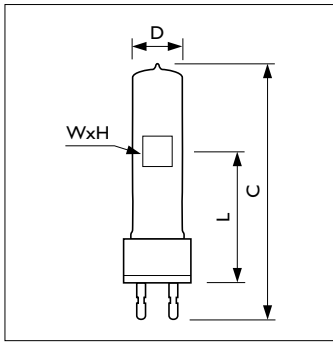
Type	C Max	D Max	H Nom	L Nom	W Nom
7001C 750W P28s 120V	127	22	11	55.6	10



GX9,5

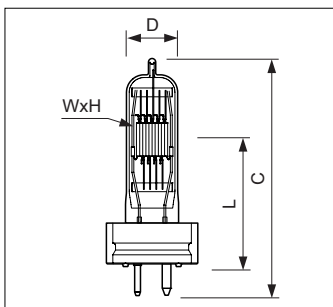
Type	C Max	D Max	H Nom	L Nom	W Nom
6993P 650W GX9.5 230V	110	22	10	55	10
6995P 1000W GX9.5 230V	110	23	14.5	55	11
1000W GX9.5 230V	110	30.5	14.5	55	11
6995P 1000W GX9.5 240V	110	23	14.5	55	11
1200W GX9.5 120V	110	30.5	14.5	55	11
6895P 1200W GX9.5 230V	120	28	15.5	67	17

Halogen High Voltage SE



G22

Type	C Max	D Max	H Nom	L Nom	W Nom
6993Z 650W G22 230V	140	25	13	72.5	12
6995Z 1000W G22 120V	140	28	10.5	63.5	10
6995Z 1000W G22 230V	140	22	14	72.5	10.5
6995Z 1000W G22 240V	140	22	14	72.5	10.5
7002Y 1000W G22 115V	140	22	14	72.5	10.5
7002Y 1000W G22 230V	140	22	13.5	72.5	11.5
7002Y 1000W G22 240V	175	40	21	90	20
6975Z 2000W G22 230V	140	22	10.5	72.5	11.5
6975Z 2000W G22 240V	140	22	10.5	72.5	11.5
6994Y 2000W G22 230V	160	40	18.5	75	17



GY16

Type	C Max	D Max	H Nom	L Nom	W Nom
6994P 2000W GY16 230V	145	29	18.5	70	17
6994P 2000W GY16 240V	145	29	18.5	70	17

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	LIF Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)
Philips 7003 150W GX6.35 230V	150	230	GX6.35	-	-	3000	3000	150
Philips 6872P 300W GY9.5 230V	300	230	GY9.5	FSL	CP/81	7050	3200	150
Philips 6872P 300W GY9.5 240V	300	240	GY9.5	FSK	CP/81	7050	3200	150
Philips 6873P 500W GY9.5 230V	500	230	GY9.5	FRH	CP/82	13500	3200	150
Philips 6873P 500W GY9.5 240V	500	240	GY9.5	FRJ	CP/82	13500	3200	150
Philips 7389 500W GY9.5 230V	500	230	GY9.5	-	A1/244	14000	3200	50
Philips 7389 500W GY9.5 240V	500	240	GY9.5	-	A1/244	14000	3200	50

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	LIF Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)
Philips 6638P 650W GY9.5 120V	650	120	GY9.5		-	16900	3200	200
Philips 6638P 650W GY9.5 230V	650	230	GY9.5	FRL	CP/89	16500	3200	180
Philips 6638P 650W GY9.5 240V	650	240	GY9.5	FRM	CP/89	16500	3200	180
Philips 6993P 650W GX9.5 230V	650	230	GX9.5	FVC	CP/67 (CP/23)	16500	3200	120
Philips 6993Z 650W G22 230V	650	230	G22	FKH	CP/68 (CP/39)	16500	3200	120
Philips 7001C 750W P28s 120V	750	120	P28s	BTN	-	17500	3200	500
Philips 1000W GX9.5 230V	1000	230	GX9.5	-	-	25000	3200	200
Philips 6983P 1000W G9.5 120V	1000	120	G9.5	FEL	CP/77	27000	3200	300
Philips 6983P 1000W G9.5 230V	1000	230	G9.5	FEP	CP/77	26000	3200	180
Philips 6983P 1000W G9.5 240V	1000	240	G9.5	FEP	CP/77	26000	3200	180
Philips 6984P 1000W GX9.5 230V	1000	230	GX9.5	-	CP/63	22500	3200	180
Philips 6995P 1000W GX9.5 230V	1000	230	GX9.5	FVA	CP/70 (CP/24)	25000	3200	240
Philips 6995P 1000W GX9.5 240V	1000	240	GX9.5	FVB	CP/70 (CP/24)	25000	3200	240
Philips 6995Z 1000W G22 120V	1000	120	G22	EGT	-	27000	3200	240
Philips 6995Z 1000W G22 230V	1000	230	G22	FKJ	CP/71 (CP/40)	25000	3200	240
Philips 6995Z 1000W G22 240V	1000	240	G22	FKJ	CP/71 (CP/40)	25000	3200	240
Philips 7002Y 1000W G22 115V	1000	115	G22	-	-	29000	3200	250
Philips 7002Y 1000W G22 230V	1000	230	G22	-	-	29000	3200	250
Philips 7002Y 1000W G22 240V	1000	240	G22	-	-	29000	3200	250
Philips 1200W GX9.5 120V	1200	120	GX9.5	-	-	34200	3200	150
Philips 6895P 1200W GX9.5 230V	1200	230	GX9.5	-	CP/90	30000	3200	240
Philips 6975Z 2000W G22 230V	2000	230	G22	-	CP/92	50000	3200	400
Philips 6975Z 2000W G22 240V	2000	240	G22	-	CP/92	50000	3200	400
Philips 6994P 2000W GY16 230V	2000	230	GY16	FTM	CP/72 (CP/43)	50000	3200	450
Philips 6994P 2000W GY16 240V	2000	240	GY16	FTL	CP/72 (CP/43)	50000	3200	450
Philips 6994Y 2000W G22 230V	2000	230	G22	-	CP/75 (CP/55)	50000	3200	480
Philips 6994Z 2000W G38 120V	2000	120	G38	CYX	-	54000	3200	420
Philips 6994Z 2000W G38 230V	2000	230	G38	FKK/FKP	CP/73 (CP/41)	50000	3200	480
Philips 6994Z 2000W G38 240V	2000	240	G38	FKK/FKP	CP/73 (CP/41)	50000	3200	480
Philips 6963Z 5000W G38 230V	5000	230	G38	-	CP/85 (CP/29)	132500	3200	400
Philips 6963Z 5000W G38 240V	5000	240	G38	-	CP/85 (CP/29)	132500	3200	420
Philips VL300 300W GX6.35 120V	300	120	GX6.35	-	-	8700	3200	20
Philips VL300 300W GX6.35 230V	300	230	GX6.35	-	-	8550	3200	20

Halogen High Voltage SE

Type	Burning position	Pinch temperature (°C)	Ordering number
Philips 7003 150W GX6.35 230V	any	400	9245 537 44258
Philips 6872P 300W GY9.5 230V	any	350	9239 495 42928
Philips 6872P 300W GY9.5 240V	any	350	9239 495 45728
Philips 6873P 500W GY9.5 230V	any	350	9239 496 42928
Philips 6873P 500W GY9.5 240V	any	350	9239 496 45528
Philips 7389 500W GY9.5 230V	s90	400	9238 716 43228
Philips 7389 500W GY9.5 240V	s90	400	9238 716 45728
Philips 6638P 650W GY9.5 120V	any	500	9245 013 36348
Philips 6638P 650W GY9.5 230V	any	500	9245 013 42928
Philips 6638P 650W GY9.5 240V	any	500	9245 013 45528
Philips 6993P 650W GX9.5 230V	s90	400	9238 903 42928
Philips 6993Z 650W G22 230V	any	500	9238 904 42928
Philips 7001C 750W P28s 120V	any	500	9245 097 36328
Philips 1000W GX9.5 230V	any	450	9245 051 44234
Philips 6983P 1000W G9.5 120V	any	500	9244 006 36335
Philips 6983P 1000W G9.5 230V	any	500	9244 000 42928
Philips 6983P 1000W G9.5 240V	any	500	9244 000 45528
Philips 6984P 1000W GX9.5 230V	any	500	9238 913 42928
Philips 6995P 1000W GX9.5 230V	any	500	9238 846 42928
Philips 6995P 1000W GX9.5 240V	any	500	9238 846 45528
Philips 6995Z 1000W G22 120V	any	500	9238 801 36328
Philips 6995Z 1000W G22 230V	any	500	9238 847 42928
Philips 6995Z 1000W G22 240V	any	500	9238 847 45528
Philips 7002Y 1000W G22 115V	any	500	9245 536 34428
Philips 7002Y 1000W G22 230V	any	500	9245 536 44228
Philips 7002Y 1000W G22 240V	any	500	9245 536 45528
Philips 1200W GX9.5 120V	any	500	9245 215 36328
Philips 6895P 1200W GX9.5 230V	s90	400	9239 314 42928
Philips 6975Z 2000W G22 230V	s90	400	9245 154 44248
Philips 6975Z 2000W G22 240V	s90	400	9245 154 45548
Philips 6994P 2000W GY16 230V	s90	400	9238 910 42948
Philips 6994P 2000W GY16 240V	s90	400	9238 910 45548
Philips 6994Y 2000W G22 230V	s90	400	9238 947 42948
Philips 6994Z 2000W G38 120V	s90	400	9245 026 36349
Philips 6994Z 2000W G38 230V	s90	400	9238 911 42948
Philips 6994Z 2000W G38 240V	s90	400	9238 911 45548
Philips 6963Z 5000W G38 230V	any	500	9238 659 42924
Philips 6963Z 5000W G38 240V	any	500	9238 659 45524
Philips VL300 300W GX6.35 120V	any	400	9239 494 36358
Philips VL300 300W GX6.35 230V	any	400	9239 494 43258



RX7s



R7s

Halogen High Voltage DE – great color for film and video

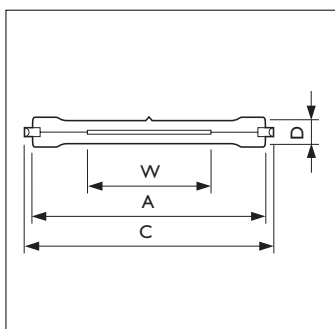
The high, constant light output and consistent color temperature of these double ended high voltage halogen lamps ensure attractive, accurately exposed pictures for both film and video. In addition, the wide choice of dimensions and power ratings opens new levels of creative freedom for the luminaire designer.

Product Features

- Studio/film: Color temperature of 3200K
- Video: High constant light output and color temperature

Product Benefits

- Studio/film: Good color rendering
- Video: Makes attractive, accurately exposed pictures possible



R7s, RX7s

Type	A Nom	C Max	D Max	W Nom
7775R/16 625W R7s 230V	185.7	189.1	11	120
13162R 800W R7s 230V	74.9	78.3	15.8	25
13162R 800W R7s 240V	74.9	78.3	15.8	25
13477R 800W R7s 230V	114.2	117.5	11	60
13477R 800W R7s 240V	114.2	117.5	11	60
7786R 1000W R7s 230V	114.2	117.5	11	60
7786R 1000W R7s 240V	114.2	117.5	11	60
13203R 1000W R7s 120V	138.1	141.5	29	35
13704R 1000W R7s 230V	114.2	-	-	-
13989R 1000W R7s 230V	185.7	189.1	11	120
13989R 1000W R7s 240V	185.7	189.1	11	120
PF801R 1000W R7s 115-120V	121.7	125.1	9	68
PF801R 1000W R7s 230V	121.7	125.1	9	72
6358R 1250W R7s 230V	185.7	189.1	11	120
6358R 1250W R7s 240V	185.7	189.1	11	120
7012R 2000W RX7s 230V	138	141.5	18	30
7012R 2000W RX7s 240V	138	141.5	18	30

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	LIF Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)
Philips 7775R/16 625W R7s 230V	625	230	R7s	-	P2/10	16250	3200	150
Philips 13162R 800W R7s 230V	800	230	R7s	DXX	P2/13	20000	3200	30
Philips 13162R 800W R7s 240V	800	240	R7s	DXX	P2/13	21600	3200	75
Philips 13477R 800W R7s 230V	800	230	R7s	EME	P2/11	23600	3200	150
Philips 13477R 800W R7s 240V	800	240	R7s	EME	P2/11	24400	3200	150
Philips 7786R 1000W R7s 230V	1000	230	R7s	-	P2/20	30000	3200	300
Philips 7786R 1000W R7s 240V	1000	240	R7s	-	P2/20	30000	3200	300
Philips 13203R 1000W R7s 120V	1000	120	R7s	DWT	-	21500	3200	2000
Philips 13704R 1000W R7s 230V	1000	230	R7s	-	P2/35	26600	3200	150
Philips 13989R 1000W R7s 230V	1000	230	R7s	EKM	P2/7	26000	3200	200

Halogen High Voltage DE

Type	Lamp Wattage (W)	Voltage	Cap/base	ANSI Code	LIF Code	Lumen output (lm)	Color temperature (K)	Average lamp life (h)
Philips 13989R 1000W R7s 240V	1000	240	R7s	EKM	P2/7	26000	3200	200
Philips PF801R 1000W R7s 115-120V	1000	115-120	R7s	-	-	34000	3400	15
Philips PF801R 1000W R7s 230V	1000	230	R7s	FDG	P1/12	34000	3400	15
Philips 6358R 1250W R7s 230V	1250	230	R7s	-	P2/12	33750	3200	200
Philips 6358R 1250W R7s 240V	1250	240	R7s	-	P2/12	33750	3200	200
Philips 7012R 2000W RX7s 230V	2000	230	RX7s		P2/27	50000	3200	300
Philips 7012R 2000W RX7s 240V	2000	240	RX7s		P2/27	50000	3200	300

Type	Operating Position	Pinch temperature (°C)	Ordering number
Philips 7775R/16 625W R7s 230V	p15	400	9238 790 43201
Philips 13162R 800W R7s 230V	p15	400	9238 921 43260
Philips 13162R 800W R7s 240V	p15	400	9238 921 45760
Philips 13477R 800W R7s 230V	p15	400	9238 925 43201
Philips 13477R 800W R7s 240V	p15	400	9238 925 45701
Philips 7786R 1000W R7s 230V	p15	400	9238 849 43201
Philips 7786R 1000W R7s 240V	p15	400	9238 849 45701
Philips 13203R 1000W R7s 120V	any	350	9245 156 36330
Philips 13704R 1000W R7s 230V	any	400	9239 361 42960
Philips 13989R 1000W R7s 230V	any	400	9238 780 43201
Philips 13989R 1000W R7s 240V	any	400	9238 780 45701
Philips PF801R 1000W R7s 115-120V	any	450	9238 627 34501
Philips PF801R 1000W R7s 230V	any	450	9238 627 43201
Philips 6358R 1250W R7s 230V	p15	400	9238 784 43201
Philips 6358R 1250W R7s 240V	p15	400	9238 784 45701
Philips 7012R 2000W RX7s 230V	p15	350	9245 694 44260
Philips 7012R 2000W RX7s 240V	p15	350	9245 694 45560



Ceramic ST 250 HR

Ceramic ST – extreme cost-efficiency

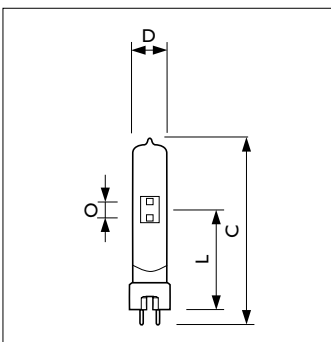
The same amount of light as a halogen, but at a mere fraction of the energy consumption costs. That is the promise of the Ceramic ST series: the world's first discharge lamp that matches halogen color characteristics. Cost of ownership is further driven down by the extreme long-life of this 'breakthrough' ceramic technology: typically, it lasts at least 10 times that of an equivalent halogen lamp. And, since the power consumption is minimized, so too is the heat discharge, providing for cooler, more comfortable studios. It all adds up to perfect color quality, fewer lamp replacements, and dramatically lower operating costs.

Product Features

- Ceramic Discharge Technology
- Hot Restrikeable

Product Benefits

- Due to 4 times less power consumption for same light level as halogen, smaller fixtures can be used and less cooling is needed
- Attractive cost of ownership, less replacement costs. Lifespan is 16 times longer compared to halogen. Payback time is < 2 years.
- Discharge lamp of 3200K color temperature with excellent color characteristics and homogeneous beam quality



Ceramic ST 250 HR

Type	C Max	D Max	L Max	O Nom
Ceramic ST 250W HR	110	23	61	8

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position	Lamp current (A)
Philips Ceramic ST 250W HR	250	GZY9.5	23000	92	3200	90	4000	any	2.6

Type	Ordering number
Philips Ceramic ST 250W HR	9281 735 05114



Philips Architainment lamps, unlimited flexibility

Philips Architainment lamps offer excellent colors, a strong beam and long life for amazing creativity and flexibility in architectural lighting. The high color temperature makes them especially suitable for architainment applications. Philips Architainment lamps can bring any object into the limelight and give it the charisma it deserves.



MSA 2500 DE

Architectural MSA – double ended night colors

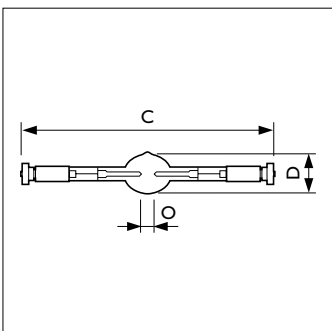
The high luminous efficacy and optimal lamp filling of the double ended Architectural MSA lamps create high beam intensity and excellent color rendering. While the compact arc of the lamp allows efficient beam control and high intensity. Ideal to illuminate architecture of all types at night.

Product Features

- High luminous efficacy
- Compact arc
- Optimal lamp filling

Product Benefits

- High lumen output
- High beam intensity
- Excellent colors



MSA 2500 DE

Type	C Max	D Max	O Nom
MSA 2500 DE	364	41	25

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSA 2500 DE	2500	(P)SFC	250000	100	5600	90	2500	p15

Type	Lamp current (A)	Ordering number
Philips MSA 2500 DE	22.5	9280 994 05103



MSD 575 HR, MSD 700, MSD 1200



MSD 575

Architectural MSD – single ended night colors

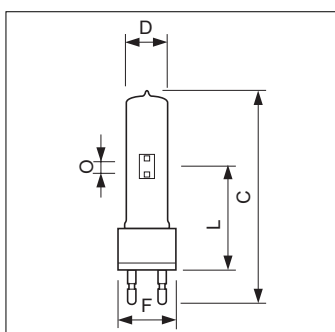
The high luminous efficacy and optimal lamp filling of the single ended Architectural MSD lamps create high beam intensity and excellent color rendering. While the compact arc of the lamp allows efficient beam control and high intensity. Ideal to illuminate architecture of all types at night.

Product Features

- High luminous efficacy
- Long life
- Optimal lamp filling

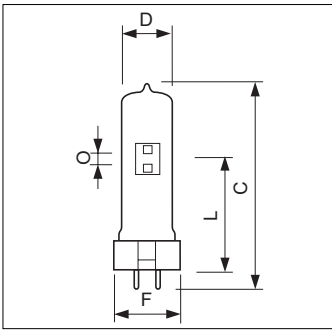
Product Benefits

- High lumen output
- Low cost of ownership
- Excellent colors



G22

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSD 575 HR	145	30	41	42	43	70	71	8
MSD 700	175	40	52	53	54	85	86	10
MSD 1200	183	41	52	53	54	85	86	14



GX9.5

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
MSD 575	125	30	34	35	36	65	66	8

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips MSD 575	575	GX9.5	43000	75	6000	75	3000	any
Philips MSD 575 HR	575	G22	46000	80	6000	75	2000	any
Philips MSD 700	700	G22	50500	72	6000	75	3000	any
Philips MSD 1200	1200	G22	92000	77	6000	80	3000	any

Type	Lamp current (A)	Ordering number
Philips MSD 575	6.95	9280 988 05114
Philips MSD 575 HR	6.95	9280 989 05114
Philips MSD 700	11	9281 704 05114
Philips MSD 1200	13.8	9281 720 05114



CDM-SA/T 150W

CDM-SA/T – the greener way to light up the night

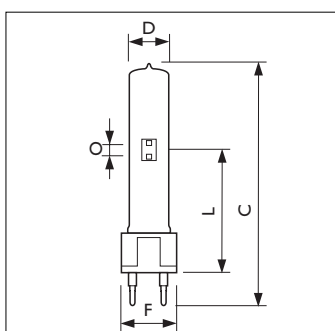
With a high luminous efficacy producing more lumens per watt than standard Architainment lamps, the CDM-SA/T is the greener alternative to light up the night. In addition, the optimal lamp filling and short arc of the lamp create a high beam intensity and excellent color rendering.

Product Features

- High luminous efficacy
- Compact arc
- Optimal lamp filling

Product Benefits

- High lumen output
- High beam intensity
- Excellent colors



CDM-SA/T G12

Type	C Max	D Max	F Min	F Nom	F Max	L Nom	L Max	O Nom
CDM-SA/T 150W/942	110	20	29	30	31	56	57	6

Type	Lamp Wattage (W)	Cap/base	Lumen output (lm)	Efficacy source (lm/W)	Color temperature (K)	Color rendering index (Ra)	Average lamp life (h)	Burning position
Philips CDM-SA/T 150W/942	150	G12	14000	88	4200	95	9000	any

Type	Lamp current (A)	Ordering number
Philips CDM-SA/T 150W/942	1.8	9280 866 05103



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Cross reference list Filament lamps

LIF code	Philips type	ANSI code	Philips type	ANSI code	Philips type
A1/223-5H	6423/5H	BTL	6800C 120V	GCV/GVH	6820P 230V
A1/231-5H	6834/5H	BTN	7001C	GCW/GCJ	6820P 240V
A1/231-8H	6834/8H	CYV	6995Y	GKV	6986P
A1/244	7389	CYX	6994Z 120V	GLA	6992P
A1/259-10H	ELC/10H	DWT	13203R	GLB	6991P
CP/63	6984P	DXX	13162R	GLC	6989P
CP/67 (CP/23)	6993P	EPF/5H	6834/5H	GRS	7019G
CP/68 (CP/39)	6993Z	EPF/8H	6834/8H	GRT	7018G
CP/70 (CP/24)	6995P	EFR/5H	6423/5H		
CP/71 (CP/40)	6995Z	EGT	6995Z 120V		
CP/72 (CP/43)	6994P	EKM	13989R		
CP/73 (CP/41)	6994Z	ELC/5H	ELC/5H		
CP/75 (CP/55)	6994Y	ELC/10H	ELC/10H		
CP/77	6983P	EME	13477R		
CP/81	6872P	EXC	PAR64 VNSP		
CP/82	6873P	EXD	PAR64 NSP		
CP/85 (CP/29)	6963Z	EXE	PAR64 MFL		
CP/89	6638P	FDG	PF801 R		
CP/90	6895P	FEL	6983P 120V		
CP/91	6894Y	FEP	6983P 230V, 240V		
CP/92	6975Z	FKD	6996C		
CP60	PAR64 VNSP	FKH	6993Z		
CP61	PAR64 NSP	FKJ	6995Z		
CP62	PAR64 MFL	FKK/FKP	6994Z		
M/38	6874P	FRH	6873P 230V		
M/40	6877P	FRJ	6873P 240V		
P1/12	PF801 R	FRL	6638P 230V		
P2/10	7775R/16	FRM	6638P 240V		
P2/11	13477R	FSK	6872P 240V		
P2/12	6358R	FSL	6872P 230V		
P2/13	13162R	FTL	6994P 240V		
P2/20	7786R	FTM	6994P 230V		
P2/27	7012R	FVA	6995P 230V		
P2/35	13704R	FVB	6995P 240V		
P2/7	13989R	FVC	6993P		
T/19 (T/11)	6996P	FWP	6996P 230V		
T/20 (T/14)	6996C	FWR	6996P 240V		
T/21 (T/12)	6998P	FWS	6897P 230V		
T/24 (T/17)	6800C	FWT	6897P 240V		
T/25 (T/18)	6820P	GAB	6995I/BP 230V		
T/27 (T/26)	6823P	GAD	6995I/BP 240V		
T/29	6897P	GCK/GCT	6823P 230V		
		GCL/GCS	6823P 240V		

Osram code	Philips type	Osram code	Philips type
54532	7786R/16	64777	6975 Z
54574	6365 R	64781	7012R
54585	5968	64787	6994 Y
54613	6994 Z	64788	6994 P
54631	6638P	64789	6994 Z
54662	6827 Z	64789	6994 Z
54685	6800C	64796	6894Y
54687	7001C	64805	6963 Z
54689	6995C	93723	6980Z
54706	6995 Y	93728	7007
64501	VL 150	93728LL	7007LL
64502	VL 150	93729	7008
64512	VL 300	93734	6983 P
64515	VL 300		
64516	VL300		
64571	13162		
64571	13162 R		
64579	PF 801 R		
64580	PF 801 R		
64582	7786 R		
64583	7786 R		
64662	6874 P		
64670	6820P		
64672	6877 P		
64673	6872P		
64674	6873P		
64678	6928P		
64680	7389		
64716	6986 P		
64717	6638 P		
64718	6823 P		
64719	6998P		
64720	6993 P		
64721	6993 Z		
64722	6998 C		
64730	7764		
64732	7804		
64733	7804		
64741	13989 R		
64742	6995 Z		
64743	6983P		
64744	6996 P		
64745	6995 P		
64746	6996 C		
64747	6995 Z		
64748 BXS	6995I/BP		
64751	6358R		
64752	6897 P		
64754	6895 P		

Cross reference list Discharge lamps

Special HID lamps (Non Hot-Restrike lamps)

Philips	Osram	SLI	Koto	GE	Ushio	Xenbow/Jenbo
Single-ended Metal Halide lamps with outer bulb						
MSR 400	HSR 400/60	BA 400 SE NHR		CSR 400/CS		NSD 400
	HSR 575/60	BA 575 SE NHR			USR 575	
MSR 575/2	HSR 575/72	BA 575 SE NHR 7.2	DIS-7	CSR 575/2/SE CSR 575/2/T/SE (8000 K)	USD 5.75/2 NHR	NSK 575/2
MSR 700	HSR 700/60	BA 700 SE NHR	DIS-7		USR 700 NHR	NSK 700
MSR 700/2				CSR 700/2/SE		NSK 700/2
MSR 1200	HSR 1200/60	BA 1200 SE NHR	DIS-12		USR 1200 SE	NSK 1200
MSR 1200/2	HSR 1200/72			CSR 1200/2/SE		NSK 1200/2
MSD 150/2	HSD 150W/70	BA 150 SE NHR				
MSD 200	HSD 200/60	BA 200 SE D			USD-200 NHR	NSD 200
MSD 200/2						
MSD 250	HSD 250/60	BA 250 SE D			USD-250 NHR	NSD 250
MSD 250/2	HSD 250/80	BA 250/2 SE D8.5		CSD250/2 SE	USD-250/2 NHR	NSD 250/2
MSD 575	HSD 575/60	BA 575 SE D			USD-575 NHR	NSD 575
	HSD 575					
MSD 700						
MSD 1200	HSD 1200/60					NSD 1200

Philips	Osram	SLI	GE	Xenbow/Jenbo
Single-ended Metal Halide lamps without outer bulb				
MSR Gold™ 300/2 MiniFastFit			CSR 300/2/TAL	NSK G 300/2 mini
MSD Gold™ 300/2 MiniFastFit	HSD 300W/80/P28 HTI 400W/60/P28		CSR 300/2/TAL	
MSR Gold™ 400 MiniFastFit	HTI 400W/60/P28			
MSR Gold™ 700/2 MiniFastFit	HTI 700W/75/P28		CSR 700/TAL/60/PGJX28	NSK G 700/2 mini
MSR Gold™ 700 FastFit			CSR 700/TAL/60/PGJX50	NSK G 700
MSR Gold™ 700/2 FastFit	HTI 700W/75/P50		CSR 700/TAL	NSK G 700/2
MSR Gold™ 1200 FastFit				NSK G 1200
MSR Gold™ 1500 FastFit	HTI 1500W/60/P50		CSR 1500/TAL/60	
MSR Gold™ 2000 FastFit				
MSR Gold™ 2000/2 FastFit				
MSR Gold™ 2500/2 FastFit				
MSR 400 SA	HTI 405 W/SE XS HTI 600 W/SE			NSK 400SA
MSR 700 SA	HTI 705 W/SE	BA 700 SE SA5.6	CSR 700 SA CSR 700 SA/72	NSK 700SA
MSR 1200 SA	HTI 1200 W/SE XS HTI 1800 W/SE		CSR 1200 SA CSR 1500 SA	NSK 1200 SA
MSR 2000 SA			CSR 2000 SA	
	HTI 2500 W/SE			

Note: All Philips lamps have pinch protection up to 500degr Celsius

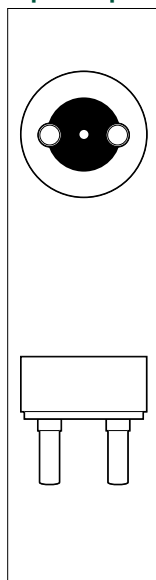
Special HID lamps (Hot-Restrike lamps)

Philips	Osram	SLI	Koto	ILC	GE	Wolfram	Ushio	Xenbow/Jenbo
Double ended Metal Halide Lamps								
MSR Gold™ 575 SA/2 DE	SharXS HTI 575 W/D4/75				CSR 575/S/DE			MHK 575/2
MSR Gold™ 700 SA/2 DE	SharXS HTI 700 W/D4/75				CSR 700/S/DE			MHK 700/2
MSR Gold™ 1200 SA/DE	SharXS HTI 1200 W/D7/60 HMI 1200 W/S	BA 1200 DE S 6.0	DI-12/S		CSR 1200/S/DE/60		UMI 1200 GS	MHK 1200 DX
MSR Gold™ 1200 SA/2 DE	SharXS HTI 1200 W/D7/75	BA 1200 DE S 7.2			CSR 1200/S/DE/72		1200 HB	MHK 1200/2 DX
MSR Gold™ 1510 SA/DE	SharXS HTI 1500W/D7/60 HMI 200 HMD 300	BA 200	DI – 2	DMI 200	CSR 200/DE		UMI 200	MHK 1500 DX
MSI 575	HMI 575 W/GS	BA 575 DE	DI – 6	DMI 575	CSR 575/DE	575	UMI 575 GS	MHK 575
MSI 575/2	HMI 575 W/GS LL HTI 700 W/DE HMI 575/WGS XS							MHK 575/2
MSI 1200	HMI 1200 W/GS	BA 1200 DE	DI – 12 DI – 12/S	DMI 1200	CSR 1200/DE CSR 1200S/DE	1200	UMI 1200 UMI 1200 GS	MHK 1200
MSI 2500	HMI 2500 W/DEL HMI 2500 W/S HMD 2500	BA 2500	DI – 25 DI – 25/S DI – 25/HV	DMI 2500	CSR 2500/DE	2500	UMI 2500 GS	MHK 2500 MHK 2500/S
MSI 4000	HMI 4000 W DE	BA 4000 DE	DI – 40 DI – 40/HV	DMI 4000	CSR 4000/DE	4000	UMI 4000	
MSI 6000	HMI 6000 W XS	BA 6000 DE	DI – 60 DI – 80	DMI 6000	CSR 6000/DE	6000	UMI 6000	
MSI 12000	HMI 12000 W/XS HMI 18000 W	BA 12000 DE	DI – 120 DI – 120/HV DI – 180 DI – 180/S	DMI 12000 DMI 18000	CSR 12000/DE CSR 18000/DE CSR 18000/S/DE	12000 18000	UMI 12000 UMI 18000	
Single-ended Metal Halide lamps with outer bulb								
MSR 125 HR	HMI 123				CSR 125/SE/HR			
MSR 200 HR	HMI 200 W/SE	BA 200 SE HR			CSR 200/SE/HR			NSK 200HR
MSR 250 HR	HMI 250 W/SE							
MSR 400 HR	HMI 400 W/SE	BA 400 SE HR			CSR 400/SE/HR CSR 400/SE/HR/75			NSK 400HR
MSR 575 HR	HMI 575 W/SEL	BA 575 SE HR BA 800 SE HR	DIS – 6 H DIC – 6 H		CSR 575/SE/HR CSR 800/SE/HR	575	USR 575 BE SE	NSK 575HR
MSR 1200 HR	HMI 1200 W/SE	BA 1200 SE NHR	DIS – 12 H		CSR 1200/SE/HR	1200	USR 1200 SE	NSK 1200HR
MSR 2500 HR	HMI 2500 W/SE	BA 2500 SE HR	DIS – 25 H	DSE 2500	CSR 2500/SE/HR	2500	USR 2500	NSK 2500HR
MSR 4000 HR	HMI 4000 W/SE	BA 4000 SE HR	DIS – 40 H	DSE 4000	CSR 4000/SE/HR	4000	USR 4000	
MSR 6000 HR	HMI 6000 W/SE		DIS – 60 H		CSR 6000/SE/HR	6000		
MSR 12000 HR	HMI 12000 W/SE		DIS – 120 H		CSR 12000/SE/HR	12000		
MSR 18000 HR	HMI 18000 W/SE		DIS – 180H		CSR 18000/SE/HR	18000		

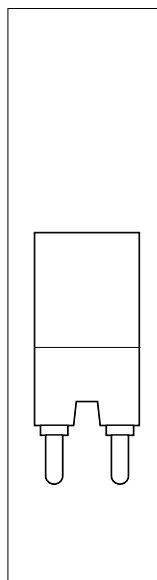
Cross reference list for Search lights and Follow spots

Company	Model type	Wattage	Philips type
E/T/C Audiovisuel	pigi Xenon Projector 5/7K	6000	Philips LTIX-6002W-HS
	pigi Xenon Projector 5/7K	7000	Philips LTIX-7000W-HS
L.P.Associates	2KW Sky Dancer	2000	Philips LTIX-2000W-HS
	2KW XELAMP Architectural Spotlight	2000	Philips LTIX-2000W-HS
	4KW Sky Dancer	4000	Philips LTIX-4500W-HS
	4KW XELAMP Architectural Spotlight	4000	Philips LTIX-4500W-HS
	7KW Sky Dancer	7000	Philips LTIX-7000W-HS
	7KW XELAMP Architectural Spotlight	7000	Philips LTIX-7000W-HS
Lycian Stage Lighting	Lycian 1290 XLT	2000	Philips LTIX-2000W-HS
	Lycian 1293 X3K	3000	Philips LTIX-3000W-HS
	Lycian 1294 SuperArc 4K	4000	Philips LTIX-4500W-HS
	Lycian 1293 X3K	3000	Philips LTIX-3000W-HEHS
Phoebus Manufacturing	Silverbeam PSL-9 1K Xenon	1000	Philips LTIX-1000W-HS
	Silverbeam 360 2KW	2000	Philips LTIX-2000W-HS
	Silverbeam PSL-9 1K Xenon	1000	Philips LTIX-1000W-HS
	Silverbeam 360 4KW	4000	Philips LTIX-4500W-HS
	Silverbeam PSL-14 2K Xenon	2000	Philips LTIX-2000W-HTP
	Silverbeam PSL-20 4K Xenon	4000	Philips LTIX-4000W-HTP
Space Cannon Illumination	2.5KW	2500	Philips LTIX-2500W-HS
	3KW	3000	Philips LTIX-3000W-HS
	4KW	4000	Philips LTIX-4500W-HS
	7KW	7000	Philips LTIX-7000W-HS
Strong International	TROUPER	700	Philips LTIX-700W-HS
	SUPERTROUPER	1000	Philips LTIX-1000W-HS
	SUPERTROUPER	1600	Philips LTIX-1600W-HS
	SUPERTROUPER II Short Version	2000	Philips LTIX 2000W-HS
	GLADIATOR II	2500	Philips LTIX-2500W-HS
	TROUPER	700	Philips LTIX-700W-HS
	SUPERTROUPER	1000	Philips LTIX-1000W-HS
	Silverbeam PSL-20 7K Xenon	7000	Philips LTIX-7000W-HS
	Silverbeam 360 7KW	7000	Philips LTIX-7000W-HS
	XENON SUPERTROUPER	2000	Philips LTIX-2000W-H
	XENON GLADIATOR III	3000	Philips LTIX-3000W-H
	XENON BRITELIGHT 2K	2000	Philips LTIX-2000W-XB
	XENON SKYTRACKER (old)	2000	Philips LTIX-2000W-XS
	XENON BRITELIGHT& SKYTRACKER (old)	4000	Philips LTIX-4000W-XS
XENON BRITELIGHT& SKYTRACKER (old)	7000	Philips LTIX-7000W-XS	
Syncrolite	XL-10	10000	Philips LTIX-10001W-HS
	XL 10	8000	Philips LTIX-8000W-HEHS

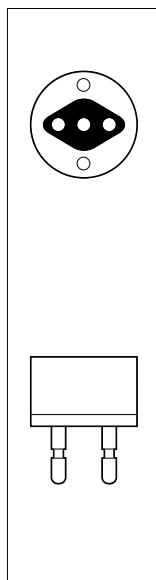
Bipost/Bipin



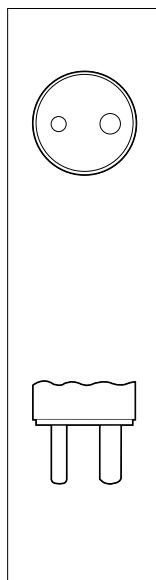
G38
IEC: 7004-76
ANSI: Mogul
bipost



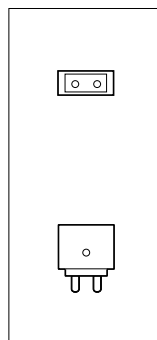
GY38



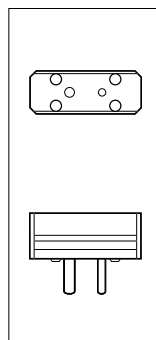
G22
IEC: 7004-70-1
ANSI: Medium
bipost



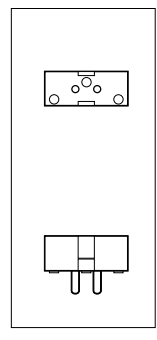
GY22



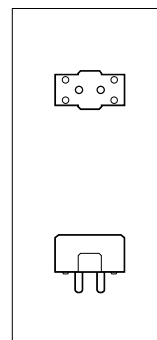
G9.5
IEC: 7004-70-1
ANSI: Medium
2-pin



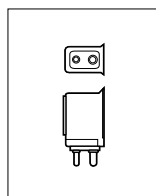
GY16
IEC: 7004-74



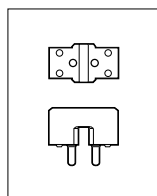
GX9.5
DIN: 49638
IEC: 7004-70A



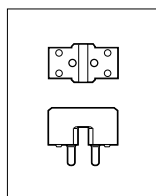
GY9.5/GZ9.5
IEC: 7004-70B-2
ANSI: Two-pin
ceramic



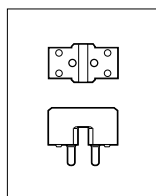
GX7.9



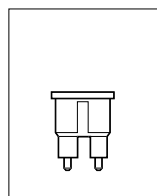
GZX9.5
IEC: 7004-70B
ANSI: Two-pin
ceramic



GZY9.5
IEC: 7004-70B
ANSI: Two-pin
ceramic

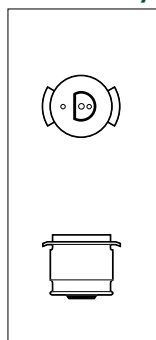


GZZ9.5
IEC: 7004-70B
ANSI: Two-pin
ceramic

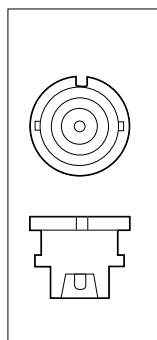


Not standardised

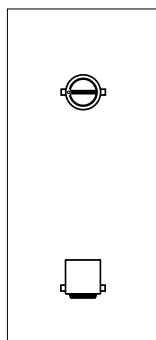
Prefocus/Bayonet



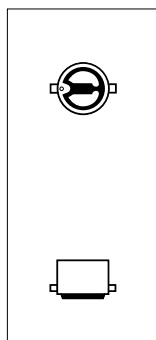
P28s
DIN: 49728
IEC: 7004-42
ANSI: Medium
prefocus base
C 81-30-1976
sheet 1-5-1



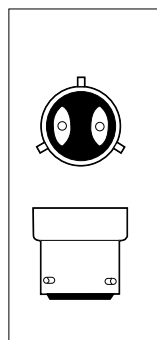
P32d



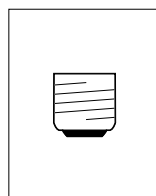
BA15d
DIN: 49720
IEC: 7004-11A
ANSI: Candelabra
bayonet base
double contact
C 81-30-1976
sheet 1-3-1



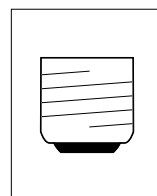
B22d/22
IEC: 7004-10



B22d3

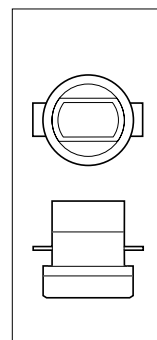


E27
DIN: 49620
IEC: 7004-21
Edison screw



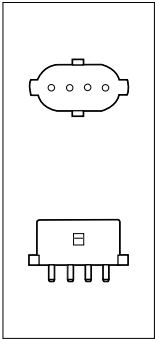
E40
DIN: 49625
IEC: 7004-24
ANSI: Mogul
screw base
C 81-10-1976
sheet 1-17-1

FastFit

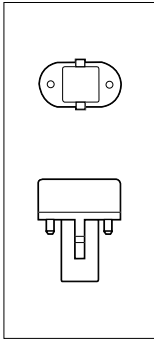


PGJX50

For fluorescent lamps

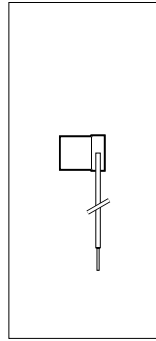


G27

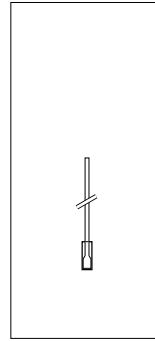


G23

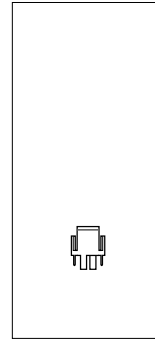
Cable/Connector



Cap 15.8/14.7 cable

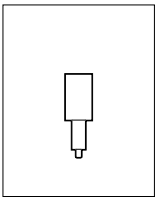


Cable

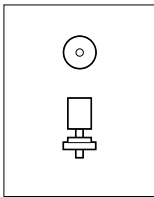


AMP connector

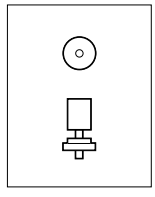
For double-ended lamps



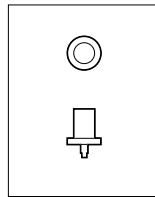
SFa21-12
DIN: 49759



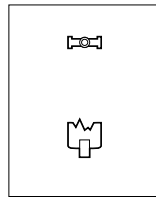
SFc10-4
DIN: 49759



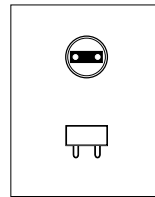
SFc11
DIN: 49759



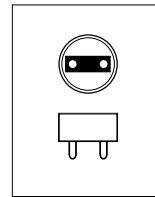
SFc15.6-6
DIN: 49759



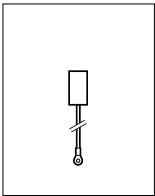
R7s, DIN:49750
IEC: 7004-92
ANSI: Recessed
single contact base



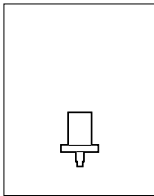
G5



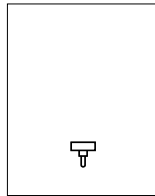
G13



SFa7-5-2
S30x70

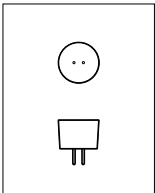


SFc18-5-6
(P) SFc

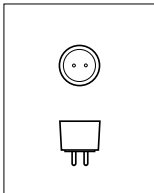


Fa4
IEC: 7004-58-1

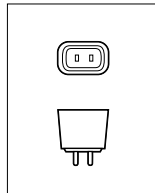
For low-voltage lamps



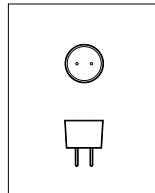
GZ4



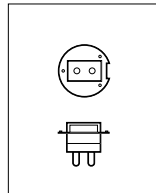
GX5.3
(Round pin)



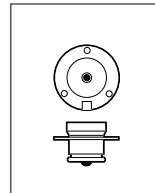
GY5.3



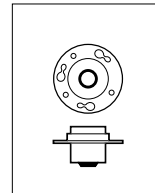
GZ6.35
DIN:49754
IEC: 7004-59A



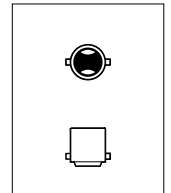
PG22-6.35
DIN: 49751
IEC: 7004-48



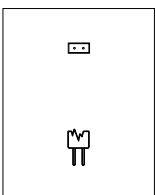
PX28s



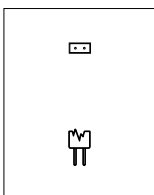
P30s
IEC: 7004-44



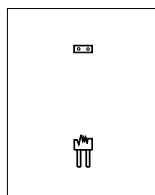
BA15s, DIN:49720
IEC: 7004-11A
ANSI: Single contact
candelabra bayonet
base, C81-30-1976,
sheet 1-3-1



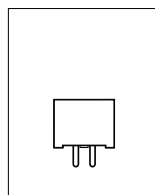
G3.9



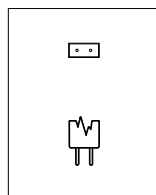
G4
IEC: 7004-72



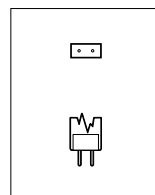
GU4
IEC: 7004-72



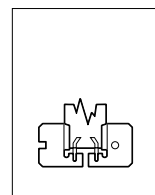
G5.3
IEC: 7004-73-2
ANSI: Miniature
2-pin



G6.35, GY6.35
GX6.35,
IEC: 7004-59
ANSI: C 8140-1972



B15d
DIN:49721
IEC: 7004-11a

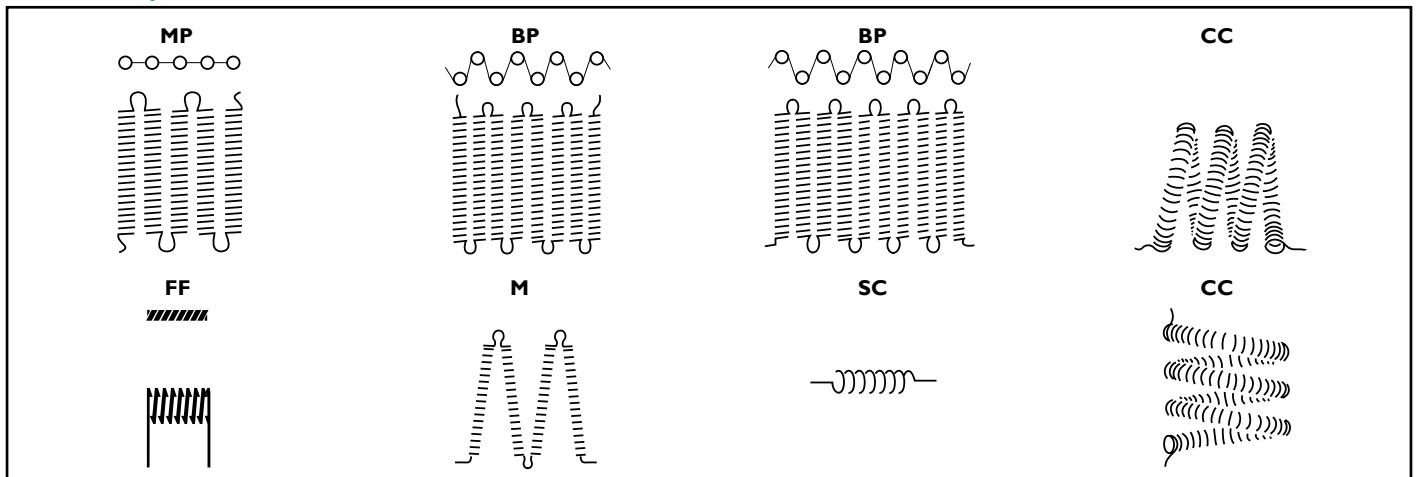


A26/14

Lamp bases and their names

Bi-pin cap	G38	Prefocus cap	P28s	SFc15.6-6	Prefocus cap	PX28s
	GY38	Bayonet/Prefocus cap	GY38	Recessed single contact cap and end of lamp	Prefocus cap	P30s
Bi-pin cap and base	G22	Bayonet cap	P23d	R7s	Bayonet cap	BA15s
Bi-pin cap	GY22	Bayonet cap	BA15d	Bi-pin cap	G5	G3.9
Bi-pin cap	G9.5	Bayonet cap	B22d3	Bi-pin cap	G13	Bi-pin lamp base
Bi-pin cap	GY16	Screw cap	E27	SFA1-5-6	Bi-pin lamp base	GU4
Bi-pin cap	GX9.5	Screw cap	E40	SFc18-5-6	Bi-pin cap	G5.3
Bi-pin cap on finished lamp	GY9.5	Cap	2G7	Single-pin cap and end of tubular lamp	Fa4	Bi-pin lamp base for use
Bi-pin cap on finished lamp	GZ9.6	Bi-pin cap	G23	Bi-pin lamp base	GZ4	Bayonet cap
	GX7.9	Cap 15.8/14.7 cable	Cable	Bi-pin base	GX5.3	B15d
	GZX9.5	Cable	AMP connector	Bi-pin base	GY5.3	A26/14
	GZY9.5	SFa21-12	SFa21-12	Bi-pin lamp base	GZ6.35	GZY
	GZZ9.5	SFc10-4	SFc10-4	Prefocus cap	PG22	PGJX50
	Special					

Filament shapes



- | | |
|--------------------|------------------|
| FF = Flat filament | MP = Mono Plane |
| CC = Coiled coil | BP = Bi plane |
| M = M shape | SC = Single coil |

Fusing

All mains voltage filament lamps (halogen and non-halogen) must be fused to reduce the risk of shattering at end-of-life.

The table gives the appropriate value

Wattage W	Voltage V	Fuse A	Wattage W	Voltage V	Fuse A
500	55	16	1200	100-130	16
300	100-130	4	1200	220-250	10
300	220-250	2	2000	100-130	25
500	100-130	6.3	2000	220-250	10
500	220-250	4	2500	100	35
650	100	10	2500	115-130	25
650	115-130	6.3	2500	220-250	16
650	220-250	4	3250	220-230	16
750/800	115-130	10	3250	240-250	16
750/800	220-230	6.3	5000	115-130	50
900	220-230	6.3	5000	220-250	25
1000	100	16			
1000	115-130	10			
1000	220-250	6.3			

Lamp Life

Indication of lamp life can be a confusing matter. The lamps in this catalogue (unless indicated differently) have a lamp life indicated by "Average life" or "Life 50%". This means at least 50% of the population is still working at the indicated number of hours.

In other words:

- Average lamp life 1000 hours
- Batch size 100 pieces

then:

- At reaching 1000 hours;
- at least 50 pieces are still working.

Realise that certain types in special applications have degraded so much that although they still burn they are unfit to fulfill their given task!



The halogen lamp

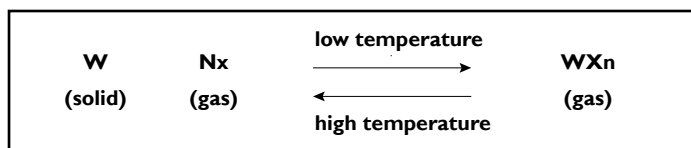
The difference between a halogen lamp and a conventional lamp is the adding of a halogen to the inert-gas filling of the lamp.

The halogens are I(Iodine), Br(Bromine), F(Fluorine) and Cl(Chlorine).

Non-halogen lamps have large bulbs to spread the evaporated tungsten over a large area. With the halogen cycle the lamp no longer blackens during its life-cycle, therefore the bulb can be made much smaller.

An additional advantage of these small bulbs is that they can withstand high filling pressures. A high filling pressure will reduce the dissipation of tungsten from the filament and can be used to increase the life of the lamp or the output (lm/W).

In the lamp a complex chemical process takes place where the basic reaction can be described as follows:



in which W = Tungsten

X = Halogen

See also fig. 1

In the vicinity of the filament the temperature is so high that only atoms of tungsten and halogens are present. Near the bulb wall will be found a compound of WXn. The transition between these two situations depends on the kind of halogen which is used in the lamp. Generally this will be at 500 to 1600 °C for the gas phase and at 1200 to 1600 °C for the solid (dissociated) phase. In the lamp one finds several areas in which these processes are taking place. See fig. 2.

So what happens in the lamp?

The evaporated tungsten of the filament associates near the bulb wall (area A) with the free halogens. Due to partial pressure this gas is transported back to area B where it dissociates and the tungsten is deposited back on the filament. The halogen can then be used for the next identical process.

Unfortunately the tungsten particles are not deposited on exactly the same spot from which they evaporated so that, in due time, certain parts of the filament get thinner; this causes so-called "hot-spots".

At a hot spot the evaporation rate is higher than average due to the higher temperature. This phenomenon results in the failure of the lamp

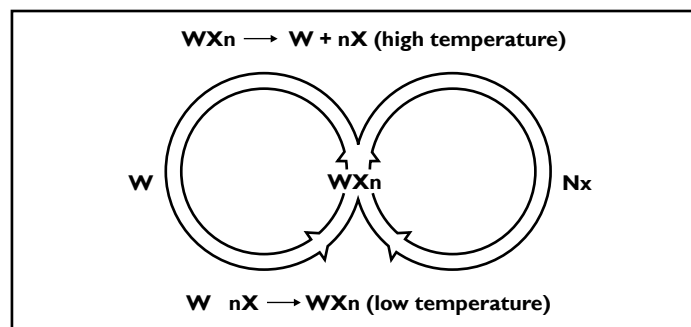


Fig. 1 The tungsten regenerative cycle

Halogen lamps on different supply voltages

Since the chemical processes which take place only function within certain temperature limits, a halogen lamp cannot be used on any desired voltage. Over- and under-rating can only be carried out within the limitations discussed below.

a. Under-voltage

Under-voltage of a lamp will decrease the filament temperature and therefore the rate of evaporation. For example, 5% under-voltage will result in 200% life expectancy. However, reduced evaporation of tungsten means more free halogens in the lamp. These free halogens will attack cold parts in the lamp; the coldest parts are the lead-in wires. Now, dissipation of tungsten takes place from the lead-in wires to the hot filament. The lead-in wires get thinner and thinner and after some time the filament collapses. To prevent this, a minimum bulb temperature of 250 °C must be maintained.

b. Over-voltage

Over-voltage will increase the filament temperature, causing a higher rate of evaporation. For example, 5% over-voltage results in 50% life expectancy. Moreover, zone "B" will be further away from the filament. At a certain moment zone "B" will be partly inside the bulb and partly outside. This means that evaporated particles of tungsten will blacken the inner side of the bulb wall. A black body absorbs more infrared, this infrared heats the glass, causing more blackening, etc., etc. At a particular instant the glass melts, the bulb will start to bulge and, some time later, the lamp will leak. Oxygen will enter and the filament will burn itself out soon after. To prevent the start of this disastrous sequence, a maximum bulb temperature of 900 °C is recommended.

c. Short switching

The percentage of added halides in a lamp is determined by the application of that lamp. Three main groups of lamps can be stated:

- a) Continuous use - studio lamps - car lamps, etc.
- b) Continuous or switching - slide projector lamps
- c) Very short switching - lamps for copying machines

Lamps cannot be used for an application other than that for which they are made without serious effects on the life of the lamp occurring.

Summary

It is not possible to quote minimum or maximum voltages on which halogen lamps can be used: the processes are governed by temperature. If a lamp is cooled very well, it can be satisfactorily operated on over-voltage, but it should not be under-run. When a lamp is under-run, the cooling must be cut down in order to maintain the 250 °C bulb temperature.

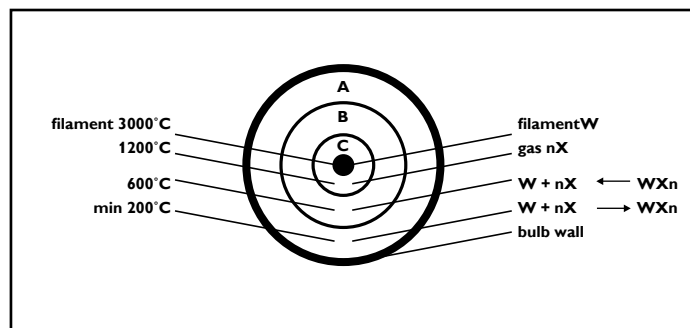


Fig. 2. Cross-section through a halogen lamp

Temperature limits of halogen lamps

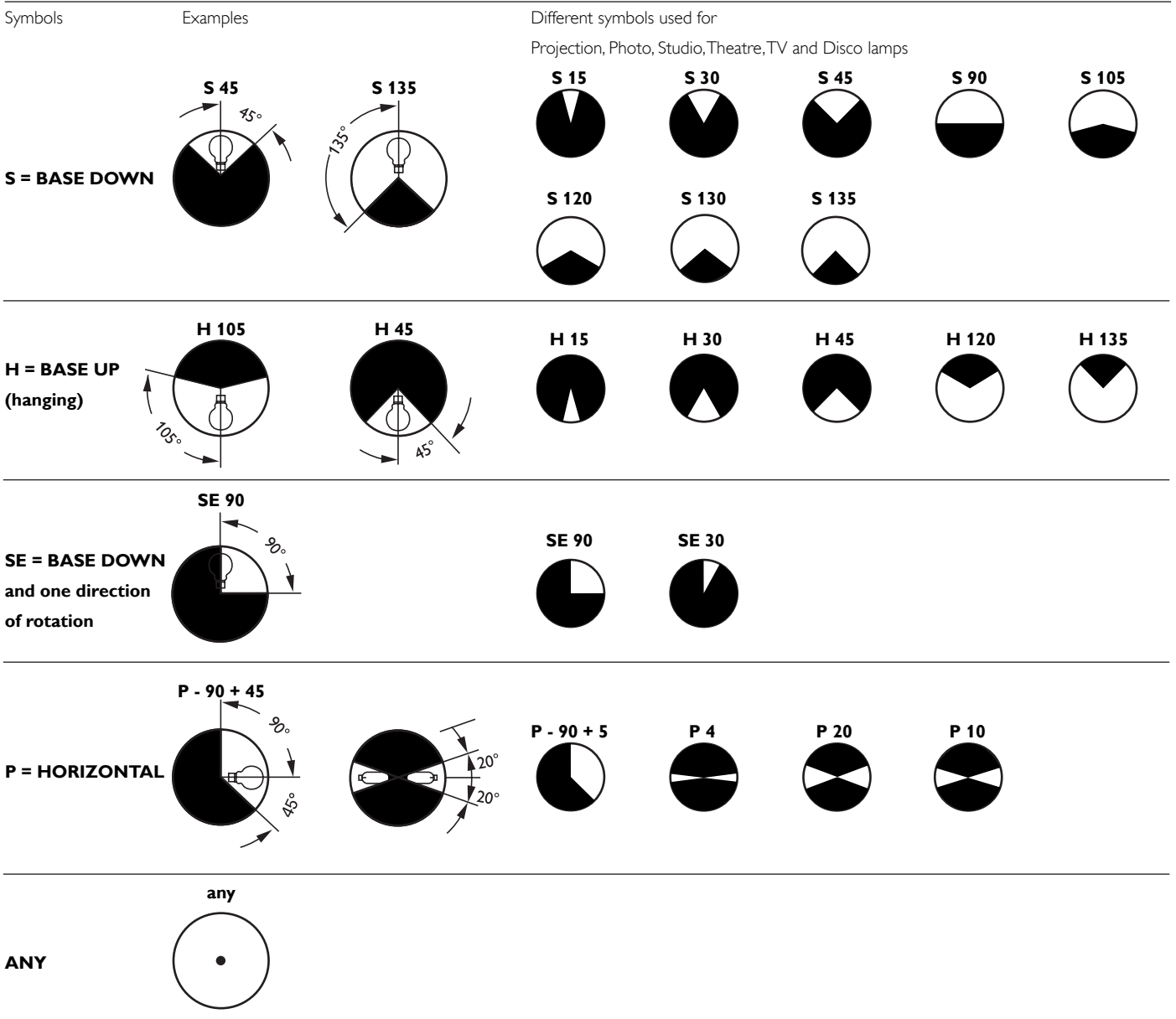
Although halogen lamps, with their quartz-glass envelopes, can withstand very high temperatures, there are certain limits within which the lamps should be held.

	Average life			
	< 15h	15 - 300 h	300 - 800 h	> 800 h
Pinch temperature (lamps without P3) in °C	max 450	max 400	max 350	max 350
Pinch temperature (lamps with P3) in °C	max 500	max 500	max 500	max 480
Bulb temperature in °C	250 - 900	250 - 900	250 - 900	250 - 900

Outside these limits the halogen will not function properly, leading to blackening and short life.

Burning positions

The lamps are illustrated in the position in which they are to be used. The deviations allowed are indicated by white sectors in a black circle.



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Fundamentals of Light and color

Radiation

Radiation is emission or transfer of energy in the form of electromagnetic waves.

These electromagnetic waves travel through a vacuum with a velocity close to 300 000 km/s. Interactions between matter and radiation are explained with the quantum theory of radiation.

It states that energy is emitted and absorbed in discrete quanta (photons). Examples of these interactions are photoelectric, chemical, and biological effects of radiation.

Optical Radiation (UV Light IR)

Light may be defined as any radiation capable of causing a visual sensation directly.

Light waves occupy only a very small part of the spectrum of electromagnetic waves. The limits of visible radiation are not well defined and vary according to the individual – the lower limit is generally taken as being 380 nm and the upper limit 780 nm (1 nanometre (nm) = 10^{-9} m).

The visible spectrum can be divided into a number of approximate wavelength ranges, each of which makes a certain color impression on the human eye:

380	-	435	nm	violet
435	-	500	nm	blue
500	-	566	nm	green
565	-	600	nm	yellow
600	-	630	nm	orange
630	-	780	nm	red

Ultraviolet and Infrared Radiation

Electromagnetic radiation with wavelengths just beyond the violet and red ends of the visible spectrum are known as ultraviolet and infrared radiation respectively.

Ultraviolet radiation

A study of the effects obtained with ultraviolet radiation of different wavelengths has led to the following classification by the CIE into three wavebands:

UV-A	(long-wave)	315-400 nm
UV-B	(medium-wave)	280-315 nm
UV-C	(short-wave)	100-280 nm

This classification is based upon a small number of well-investigated processes - principally the effects on the human skin - and by no means implies that all practical applications of UV are confined to a distinct waveband. Some processes respond to a wide ultraviolet spectrum and others overlap into the visible spectrum as well.

Infrared radiation

As with ultraviolet radiation, infrared radiation occupies three wavebands:

IR-A	(short-wave)	800 - 1400 nm
IR-B	(medium-wave)	1400 - 3000 nm
IR-C	(long-wave)	3000 - 10000 nm

Vision

The eye has a lens, which focuses an image on a light-sensitive surface, the retina.

The retina consists of a delicate layer of nerve tissue in which there are two types of nerve fibre endings in the form of light-sensitive cells, called cones and rods. The concentration of cones and rods varies over the retinal area. On the optical axis the centre of the retina (the fovea) only contains cones. Outside the fovea area, the rods and cones are mixed, the proportion of cones decreasing towards the periphery of the retina.

Central vision

The cones in the fovea produce a very sharp image showing the greatest detail of which the eye is capable.

Peripheral vision

The periphery of the retina, which is composed chiefly of rods, does not produce sharp vision, and objects seen by this area appear as fuzzy silhouettes. The periphery is, however, highly sensitive to movement and flicker.

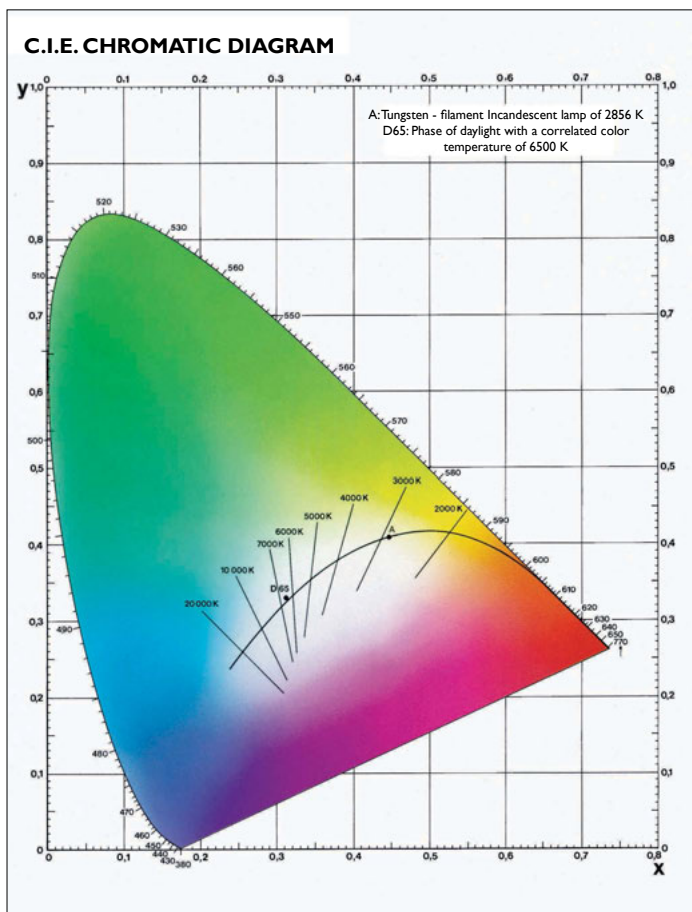
Adaptation

Adaptation, the process whereby the eye is able to function over a wide range of illuminance levels, involves (amongst other things) a change in the pupillary opening along with photochemical changes in the retina.

Color Vision

The cones enable us to distinguish color. This is possible because there are in fact three types of cones, with pigments sensitive to the red, green and blue parts of the spectrum, respectively.

The brain interprets the relative stimulation of the three color receptors as the color impression. Persons who miss one type of cone are partially color blind.



Spectral Sensitivity of the Eye

Within the visible range of the electromagnetic spectrum the eye sensitivity varies strongly with different wavelengths of the same energy content.

For example, under conditions of photopic vision the eye is about twenty times more sensitive to light with a wavelength of 555 nm (yellow-green) than it is to wavelengths of 700 nm (deep red) or 450 nm (violet-blue). The peak sensitivity for scotopic vision lies about 50 nm nearer to the blue end of the spectrum than the maximum sensitivity for photopic vision.

As early as 1924, the Commission Internationale de LEclairage (CIE) laid down a standard spectral eye sensitivity curve for photopic vision. The curves give the relative photopic eye sensitivity (V) as a function of the wavelength (l), and are therefore generally called V(l) curve having its maximum at 555 nm.

Black body radiator

The black body, or full radiator, is a body that absorbs all radiation falling upon it, transmitting none and reflecting none. The radiation characteristics of such bodies are accurately known and can be very precisely calculated at all wavelengths and temperatures.

The spectral energy distribution of a black body is, according to Planck's law, a function of wavelength and absolute temperature. Not only does the radiant energy increase rapidly with operating temperature, but the wavelength at which the maximum occurs becomes shorter. Radiation of this form is called thermal radiation, or black-body radiation. And because all wavelengths are present in the spectrum of a thermal radiator, such a spectrum is called a continuous spectrum. The black-body radiator is often used as a primary reference standard when describing the light from practical light sources.

Systems of color Specification

CIE System

The chromaticity diagram

The chromaticity diagram, or color triangle, adopted by the CIE in 1931 permits the mathematically exact specification of any color of light in terms of two chromaticity co-ordinates, x and y. These co-ordinates are calculated from a knowledge of the lamp's spectral energy distribution and the response of a CIE standard colorimetric observer related to the three types of light sensitive cones in the human eye. The most saturated light color are found along the sides of the triangle, these gradually diluting into 'white light' toward the centre.

In this diagram the boundaries are formed by the spectral locus which is composed of the color points of monochromatic radiation ranging from blue in the left corner towards green in the top and finally red in the bottom right corner.

Color Temperature

Color temperature is a term used to describe the color of a light source by comparing it with the color of a black body radiator, or full radiator. The temperature of the black body, in Kelvin, at which a color match is obtained, is said to be the color temperature of the source. The curve formed on the CIE chromaticity diagram by plotting the chromaticities of a black body radiator at various temperatures, is known as the Planckian locus. Any source that has a chromaticity on this locus may be specified by a color temperature. A source not on the Planckian focus can be described by means of its correlated color temperature, that is, the temperature of the black body at which its color resembles most closely that of the source; provided, that is, that it is not too far from the Planckian focus.

Color Rendering

The CIE General Color Rendering Index R_a

In order to be able to compare the color characteristics of various types of light source, the concept of a color rendering index, based on the appearance of a number of test color under different illuminants, was introduced by the CIE.

The average of the chromaticity shifts occurring when the test color are alternately illuminated, first by the lamp under test and then by a reference source of the same color temperature, provides a good measure of the color rendering properties of the test source.

The reference light source used for sources with a correlated color temperature of 5000 K and below is a full (or black-body) radiator of the nearest color temperature. Above 5000 K, the reference source used provides simulated or 'reconstituted' daylight of the appropriate color temperature.

In the CIE test color method recommended for international use in 1965, eight Munsell test color of medium saturation were used for measuring and specifying these color rendering properties. Nowadays, fourteen test color are often employed, saturated red, yellow, green and blue, and color approximating the human skin and green foliage having been added.

The general color rendering index, or R_a , of a source has a maximum value of 100, which occurs when the spectral distributions of the test source and the reference source are identical.

Incandescent lamps have a spectral energy distribution almost identical to that of the standard source, and therefore give excellent color rendering.

The efficacy of these lamps, however, is rather low.

In discharge lamps which have a much higher efficacy a large variety in spectral composition hence color rendition is found, ranging from light sources like Fluorescent super 80 and 90 lamps and CDM metal Halide lamps with good or excellent color rendition while still having a high efficacy on one hand and ultra high efficacy lamps like SOX with a very moderate color rendition.

Limitations of the R_a System

Two serious limitations of the R_a system should be mentioned.

In the first place, it should be remembered that the R_a of a lamp is an average value based on the examination of only eight test color. Secondly, a low value for a particular color can mean either that the color will be poorly (weakly) - rendered, or that it will be exaggerated, perhaps even with a flattering effect as will be explained in the new CRV system. Thus, a source may be found to have a seemingly acceptable R_a value, despite the fact that it is incapable of faithfully reproducing a particular test color.

The New CRV system: precise definition of color quality

The right light

Color rendering is an important aspect of artificial lighting. In some situations color should be represented as naturally as possible under daylight conditions yet in other cases lighting should highlight individual color or create a specific atmosphere. However, there are various lighting situations where it is not so much a precise natural color rendering that matters most but where light level and efficiency are of greater importance.

Whether your requirement is for medium quality color rendering, natural color rendering or highlighting of special color, there is the right kind of lamp for each and every application.

In the past, finding the right quality color rendering and tailoring it to your precise requirement was a complex task. It called for special skills acquired through long – and often costly – experience.

Now, however, the new CRV diagram (color Rendering Vector) means you can get the results you need – without first going through a costly learning curve!

The color Rendering Vectors (CRV) system provides a completely new and more sophisticated way of defining color quality, making it a valuable tool for lighting professionals involved in the specification of light sources and the design of lighting installations.

Up to 215 measuring points

Instead of being limited to just the eight color of the color rendering index (CRI) method, CRV uses a much larger number of color as fixed measured points. In fact, 215 color have been selected from a multitude of practical situations, and include color which are widely used in textiles, paints and many other products, as well as those which are most commonly found in nature. The color rendering ability of the light source under investigation is tested at each point of these 215 color points, and compared with that of a reference light source.

Separate analysis of deviations

Another important improvement is that the color deviations are analysed separately for each of the 215 color. There is no averaging, so the rendering of each individual color is assessed and registered separately.

The CRV diagram

These deviations are represented by a CRV diagram – a circle showing all the color of the spectrum around its circumference, and containing two axes serving as references to show the deviation in the rendering of each color.

The deviations are indicated by a vector pointing from the natural color (viewed, under a reference or full-spectrum light source) to the perceived color (viewed under the test light).

Three aspects of color quality

Each one of the up to 215 vectors is an arrow which shows three aspects of color quality:

- The direction of the vector shows the direction of the color deviation. A shift towards the circumference of the circle indicates an increase in color saturation (more intense), while a shift towards the centre means a decrease in saturation (less intense).
- The start and end points of
- the vector show the true color (under the reference light source) and the perceived color (under the test light source), respectively.
- The length of the vector shows the magnitude of the color deviation.

Two main parameters

Thanks to its accurate representation of color quality for up to 215 measuring points the CRV method gives a very precise impression of the color rendering characteristics of a light source. In describing color quality, two parameters are particularly important:

Hue: the direction and magnitude of the shift in color.

Chroma: the direction and magnitude of the shift in saturation.

A third parameter, the color value or 'lightness', refers to the amount of light reflected from a coloured surface, and can vary for color of the same hue

and chroma. In practise, color shifts are almost always a combination of shifts in hue and chroma, and the lightness will not be considered further here.

Selection of lighting on color quality

Key factors in the selection of lighting for specific application include the type of activity carried out in the area, the general environment, the desired ambience and the products being sold. Three basic levels color quality can be defined: high, good and average.

High color quality

An incandescent lamp, with its low efficacy of 12 lumen per watt, possesses a well balanced color spectrum. Application of the CRV method therefore shows no deviation at all.

The discharge lamps with the best color rendering properties are the fluorescent 'TL' lamps of the /90 series.

The diagram for these lamps (see next column) indicates hardly any deviation, thereby demonstrating the excellent color rendering characteristics of this light source. In the home, up-market shops and showrooms and museums, high color quality is essential to ensure that people, products and displayed objects have a natural color appearance.

Good color quality

Fluorescent 'TL' lamps of the /80 series have good color rendering characteristics. The diagram shows only a limited color shift. These fluorescent lamps are therefore very widely used in many applications where good color rendering is important.

In offices, department stores and light industrial premises, good color quality is a major consideration. In these cases it is not acceptable for color to deviate substantially from their natural appearance.

Average color quality

Fluorescent lamps of color /33 cause appreciable deviations in color rendering, as the CRV diagram shows. As a result, lamps of this color quality are suitable only for use in situations where color rendering is of little importance. In railway stations and car parks, efficiency takes priority over color rendering. Here, the light source will not be selected primarily for its color quality. However, when people are working in these areas, at least average color quality is recommended.

Philips, recycling and the environment

We are not just concerned about great product innovation. A great deal of effort has gone into making our products environmentally friendly. The company is committed to the Environmental Management System (ISO 14001) in its European factories – this is annually audited – and has implemented eco-design programmes to make sure that, in the product creation process, environmental issues are dealt with correctly.

For customers, the Philips standard of quality is a clear indication that the products meet or surpass the declared specifications. What is more, the products are delivered as agreed upon and the service meets the customer's expectations.

During the past few years we have successfully reduced environmentally unfriendly substances in our lamps. For example Philips took the lead in the reduction of mercury in our TL-D Super 80 Fluorescent lamps and elimination of mercury in SON-PIA lamps. However, Philips has also started to investigate how we can intelligently recycle our products. The first generation of recycling (also called downward recycling) focused on reusing lamp components in whatever application possible (e.g. through reuse in building materials).

Most manufacturers doing so reached 100 % recycling, which although it seemed promising at first, was still based upon the use of highly valuable natural resources (e.g. fluorescent powders) in less valuable applications (e.g. road construction materials).

The second generation of recycling focused upon the re-use of those resources in the same applications as where they were initially used. This 'upward recycling' ensures we (re) use our natural resources to their fullest potential.

However, the most valuable resource consumed by light sources, is however the energy in the form of electricity it consumes.

Therefore, the most energy efficient light sources are also the most environmental friendly. Philips has therefore focused its second generation recycling efforts on its Master products. Combining the most efficient use of energy and the highest possible percentage of reuse, we call this SMART ECOLOGIES. To help our customers, to identify these products easily, we have given these special ranges of Master products an easily recognisable Green Cap. A symbol of the highest quality, combined with the best environmental friendly alternative.

Philips Quality Standards

In striving for optimum quality levels, the internationally recognised ISO 9001 system for quality assurance, and the newer QS 9000 standard, have been implemented and rigidly enforced in Philips factories. Almost all phases of development and production are involved in a process of continual improvement within the framework of Total Quality Management (TQM) and achieving so-called 'world class' levels of quality.

But quality is not just a piece of paper or a set of good intentions. It is about making products with zero defects and good lifetime reliability for ease of mind. It is about supplying our customers with their goods at the right time, and it is about developing the best lighting products in the world and communicating the benefits in the most effective way. It is about handling questions and queries in the most helpful and speedy manner. In short it is about making us easy and rewarding to do business with. And with our company wide quality improvement program BEST (Business Excellence through Speed and Teamwork) we are confident we will also in this new millennium be capable of continuously 'Making things better'.

International standards and approvals for control gear

In this publication the specification of Philips control gear satisfies the standards for safety, performance and reliability quoted in the numerous IEC publications for ballasts (electronic and electromagnetic), ignition devices, etc. As for Electro-Magnetic Interference, Philips products conform to the relevant European and/or IEC regulations.

On many occasions, formal approval will amount to supervised manufacturing test procedures or testing at the manufacturer's premises (SMT), meaning that these tests are then performed by Philips own engineers, under official supervision. As soon as approval is given, these may be shown on the product labelling (e.g. ENEC).

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Document order number: 3222 635 66812

02/2013

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