

www.GELighting.com



GE Consumer Products
Lighting

 and General Electric are both registered trade marks of the General Electric Company, USA © General Electric Company (USA) 2003

ENT.CAT. 02/2003

SHOWBIZ™ FOR STAGE, STUDIO, DISCO AND PHOTOGRAPHIC LIGHTING



GE Lighting

SHOWBIZ™

SHOWBIZ™ FOR STAGE, STUDIO, DISCO AND PHOTOGRAPHIC LIGHTING

Introduction

Welcome to this new updated catalogue.

Under the SHOWBIZ™ brand GE Lighting will continue to be a leading supplier to the various sectors which make up the entertainment lighting industry.

GE Lighting have an ongoing strategy of product innovation and improvement to meet the demands and applications of O.E.M.s and end users.

This updated catalogue shows those lamps, from the extensive range of entertainment lighting products, which are currently in popular use. Please note the many new products including a more comprehensive range of discharge range.

Certain other USA manufactured lamp types may be available to special order. Please contact your local GE Lighting Sales Office for details.

Notes

- A Hemispherical shield in front of filament masking all direct light
- B Operate at or near horizontal
- C Protect from moisture. Safety screening techniques recommended
- D Replace broken lamp immediately. Inner bulb pressurised and could shatter unexpectedly
- E Use safety screen external to lamp
- F Operate BDTH
- G Operate BD ±30°
- H 100V rating available to order
- J 120V rating available to order
- K Specially designed for searchlight applications
- L Twin filament lamp. Lumen figures relate to single and twin filament options
- M Tungsten Halogen minimum bulb wall temp 250°C
- N 3 or 4 amp HBC fuse necessary
- P 5 or 6 amp HBC fuse necessary
- Q 6 or 7 amp HBC fuse necessary
- R 10 amp HBC fuse necessary
- S Due to internal integral reflector nominal lumens not shown
- T Obscured top
- V Due to integral dichroic reflector nominal lumens not shown
- W Axial coiled coil single ended lamps will generally give better reliability against premature arcing if orientations in which the main support spine is under the filament are avoided

Contents

Symbols	2 - 3
PAR Lamps	4 - 17
Single Ended Halogen Lamps	18 - 35
Linear Halogen Lamps	36 - 43
Specialist Projector Lamps	44 - 61
Discharge Lamps	62 - 81
Technical Information	82 - 117
Index	118 - 141
GE Lighting World Addresses	142 - 148

Symbols

English	Français	Italiano	Español	Deutsch		English	Français	Italiano	Español	Deutsch	
W	Watts	Watt	Watt	Vatios	Nennleistung in Watt	A	Length 1	Longueur 1	Lunghezza 1	Longitud 1	Länge l
V	Volts	Volt	Volt	Voltios	Spannung in Volt	C	Length 2	Longueur 2	Lunghezza 2	Longitud 2	Länge 2
amp	AMP	Courant (amp)	Corrente	Intensidad (A)	Strom (A)	B	Diameter	Diamètre	Diametro	Diámetro	Durchmesser
OC	Order Code	Code de Commande	Codice ordinazione	Código de pedido	Auftragscode	mm	Gap (mm)	Distance (mm)	Distanza fra gli elettrodi (mm)	Distancia (mm)	Lichtbogenlänge
D	Description	Description	Descrizione	Descripción	Beschreibung	mm	Filament Form	Forme du Filament	Forma filamento	Forma del filamento	Wendelausführung
	Product Code	Code Produit	Codice prodotto	Código de producto	Produktcode	H	Rated Life	Durée de Vie Moyenne	Durata nominale	Vida media	Lebensdauer
ANSI	ANSI	ANSI	Codice ANSI	ANSI	ANSI-Code	H	Life, burning position horizontal (hours)	Durée de vie, fonctionnement horizontal	Vita, posizione di funzionamento orizzontale	Vida, posición de funcionamiento horizontal	Mittlere Lebensdauer, Brennlage
LIF	LIF	LIF	Codice LIF	LIF	LIF - Code	V	Life, burning position vertical (hours)	Durée de vie, fonctionnement vertical	Vita, posizione di funzionamento verticale	Vida, posición de funcionamiento vertical	Mittlere Lebensdauer, Vertikal
A	Primary Application	Application Principale	Applicazione principale	Aplicación básica	Erstanwendung	Cd	Peak Intensity	Pic d'Intensité	Intensita' di picco	Intensidad máxima	Lichtstärke in cd
	Cap	Culot	Attacco	Casquillo	Socket	10%	Beam 10%	Faisceau 10%	Apertura del fascio al 10% del picco massimo	Haz 10%	Austrahlwinkel 10%
	Bulb/Lamp	Ampoule	Forma /lampada	Lámpara/bulbo	Lampe	50%	Beam 50%	Faisceau 50%	Apertura del fascio al 50% del picco massimo	Haz 50%	Austrahlwinkel 50%
F	Finish	Finition	Finitura	Acabado	Finish	1/2	Angle 1/2	Ouverture 50% de l'intensité max	Apertura al 50% dell'intensità massima	Angulo mitad de pico (grados)	Halbwerts-winkel
	Working Distance /Focal Distance	Distance de Montage	Distanza Focale /Distancia focal	Distancia de trabajo /Distance Focale	Betriebsabstand	1/10	Angle 1/10	Ouverture 10% de l'intensité max	Apertura al 10% dell'intensità massima	Angulo décima parte de pico (grados)	Zehntwerts-winkel

English	Français	Italiano	Español	Deutsch		English	Français	Italiano	Español	Deutsch	
	HxW	HxW	Apertura in Gradi (orizzontale x verticale)	HxW	HxW		Run up time (mins)	Temps de mise en régime (min)	Tempo di andata a regime (min)	Tiempo de arranque (min)	Anlaufzeit (min)
	Initial Lumens	Lumens initiaux	Lumen iniziali	Lúmenes iniciales	Anfangslichtstrom in Lumen		Restrike time (mins)	Temps de Réamorçage (min)	Tempo di riaccensione (min)	Tiempo de reencendido (min)	Wiederzündzeit (min)
	Lumens 100hrs	Lumens 100Hres	Lumen 100 ore	Lúmenes 100	Anfangslicht- strom (lm)		Pulse	Fréquence	Impulso di accensione	Frecuencia	Impuls
	Lumen Maintenance	Maintenance de flux	Lumen	Mantenimiento de flujo	Licht- stromerhalt		Run up Current	Courant d'Amorçage	Corrente di avviamento	Corriente de arranque	Einschaltstrom
	Chromaticity	Chromaticité	Coordinate cromatiche	Cromaticidad	Farbart		Ballast Choke	Ballast	Ballast	Balasto magnético	Drosselspule
	Colour	Couleur	Colore	Color	Farbe		Ignitor	Amorceur	Accenditore	Ignitor	Anzünden
	Colour Temperature	Température de Couleur	Temperatura colore	Temperatura de color	Farbtemperatur		Capacitor	Capaciteur	Condensatore	Capacitador	Kondensator
	Ra	IRC	Índice di resa cromatica	Indice de resolución cromática	CRI		Pack Quantity	Quantité par Emballage	Imballo pezzi	Unidad de embalaje	Verpackungseinheit
	Burn Position	Position de Fonctionnement	Posizione di funzionamento	Posición de funcionamiento	Brennlage		Figure Number	Numéro de schéma	Figura n.	Figura número	Fig. nummer
	Starting Time (sec)	Temps d'Amorçage (sec)	Tempo di accensione (sec)	Tiempo de encendido (sec)	Startzeit (sec)		Notes	Notes	Note	Notas	Bemerkung

PAR Lamps

PAR 36	6 - 8
PAR 46	9 -10
PAR 56	11 - 12
PAR 64	13 - 17
New Super PAR 64	

PAR lamps provide a robust and flexible design solution for a wide range of theatre, studio and nightclub applications.



Twister, Wilhelmshafen, Germany By Fischer Art of Light & Sound GmbH, Bremen

PAR 36



PAR 56



PAR 64



Lampes Par

Les lampes PAR sont une ressource flexible et robuste pour une large gamme d'applications dans les théâtres, les discothèques et les studios.

Lampade PAR

Le lampade PAR forniscono la possibilità di progettare soluzioni efficaci e flessibili per applicazioni in teatro, studio e locali notturni.

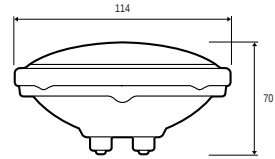
Lámparas PAR

Las lamparas PAR son una solución robusta y a la vez flexible cuando se realizan diseños de iluminación en todo tipo de teatros, escenarios, discotecas.

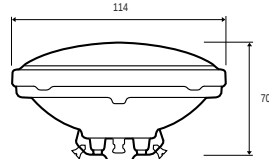
PAR Lampen

Par Lampen bieten eine robuste und flexible Designlösung für eine umfangreiche Anwendung an Theater-, Studio- und Nachtclub-Anwendungen.

PAR Lamps



PAR 36 Ferrule cap



PAR 36 Screw Terminal cap

PAR 36 Ferrule cap

W	V	OC	Cd	K	10%	50%	H	BC	BC	
650	120	FCW	-	3200	-	60x55	100	12	BC	41672
650	120	FCX	24000	3200	-	40x30	100	12	BC	41673

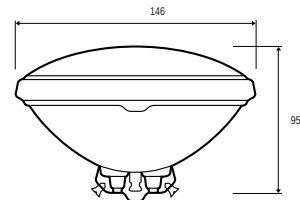
PAR 36 Screw Terminal cap

W	V	OC	Cd	K	10%	50%	H	BC	BC	
0.5Amp	4.7	4546	6300	-	3x3	-	1000	12	-	24780
12.5Amp	4.75	4547	20000	-	3x3	-	100	12	-	24788
25	5.5	25PAR36	30000	3000	5.5x4.5	-	1000	12	A	14553
25	12	25PAR36/NSP	4500	-	19x17	10x8	2000	12	A	14554
25	12	25PAR36/WFL	500	-	49x41	37x26	2000	12	A	14555
25	12	25PAR36/VWFL	250	-	82x80	40x33	2000	12	A	14556
30	12.8	4405	50000	-	6x5	-	100	12	AD	24425
30	6.2	4511	2300	-	TRAPEZOID	-	300	12	-	24663
30	6.4	H4515	67000	-	5.5x4	-	100	12	AD	15133
30	6.4	4515	55000	-	5x5	-	100	12	A	24673
30	6.4	H7604	100000	-	7x5	-	100	12	-	43576
30	6.2	4516	45000	-	9x4	-	300	12	-	24678
37.5	12.8	H7616	70000	-	7x4	-	300	12	A	42838
50	12	50PAR36/VNSP	25000	-	11x9	-	2000	12	A	12892
50	12	50PAR36/NSP	9200	-	20x17	11x9	2000	12	A	16540
50	12	50PAR36/WFL	1300	-	48x41	36x28	2000	12	A	16541
50	12	50PAR36/WFL/H	-	3050	-	-	4000	12	-	19880
50	12	50PAR36/VWFL	600	-	80x80	40x37	2000	12	A	16542
50	28	4502	10000	-	40x7	-	400	12	-	24627
50	28	4505	45000	-	11x5	-	400	12	-	24640
100	13	4509	110000	-	12x6	-	25	12	-	24650
100	13	4509X	110000	-	12x6	-	25	12	-	41503
100	13	4595	60000	-	14x16	-	300	12	-	24892
100	28	4591	90000	-	12x6	-	25	12	-	24882

PAR Lamps continued

PAR 36 Screw Terminal cap continued

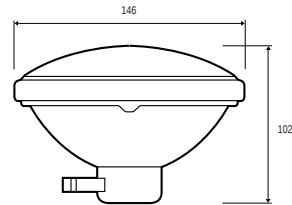
W	V	OC	Cd	K						
50	28	4593	1500	—	80x30	—	400	12	—	24887
100	28	4594	70000	—	13x7	—	300	12	BC	24891
150	28	4626	25000	—	40x9	—	300	12	—	24964
150	28	4627	3000	—	80x30	—	300	12	—	24966
250	28	4587	4000	—	40x13	—	25	12	—	24867
250	28	4596	150000	3000	11x12	—	25	12	—	24898
650	120	DWE	24000	3200	—	40x30	100	12	BC	41667
650	120	FBE	35000	5000	—	25x15	35	12	BC	41669
650	120	FBO	75000	3400	—	25x15	30	12	BC	41671



PAR 46 Screw Terminal cap

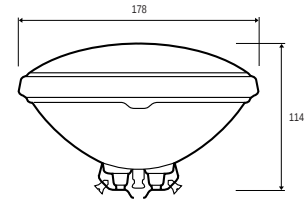
W	V	OC	Cd	K						
30	6.4	4535	95000	—	5.5x4	—	100	12	A	24735
30	12.8	4435	75000	—	5x5	—	300	12	A	24577
40	12.5	4531	30000	—	20x5	—	400	12	—	24726
50	12.8	H7635	160000	—	6.5x4	—	100	12	D	43591
100	13	4537-2	200000	—	11x16	—	25	12	—	40822
100	13	4537	200000	—	11x6	—	25	12	—	24742
150	28	4570	32000	—	50x9	—	300	12	—	24828
150	28	4571	7000	—	80x25	—	300	12	—	24830
150	28	4572	4500	—	55x55	—	300	12	—	24833
250	28	4551	75000	—	50x10	—	25	12	—	24795
250	28	4553	300000	—	11x12	—	25	12	E	24799
450	28	4580	400000	—	13x14	—	10	12	—	24859
450	28	4581	400000	—	13x14	—	10	12	—	24862
450	16.5	4635	325000	—	14x15	—	25	12	—	33284
450	28	Q4554	65000	—	50x11	—	25	12	—	37706
450	28	Q4597	16000	—	60x35	—	1000	12	—	37372
450	28	Q4681	310000	—	15x9	—	50	12	—	36271

PAR Lamps continued



PAR 46 Medium Side Prong cap

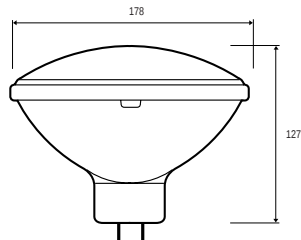
W	V	OC	Cd	K	10%	50%	H	12	E	C
150	125	150PAR46/3MFL	8000	2750	39x25	26x13	2000	12	E	41968
200	120	200PAR46/3MFL	11500	2750	40x24	27x13	2000	12	E	20138



PAR 56 Screw Terminal cap

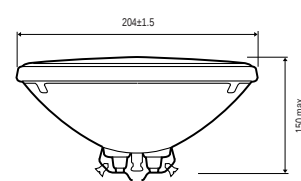
W	V	OC	Cd	K	10%	50%	H	12	E	C
100	12	4545	225000	—	9x5	—	100	12	A	24768
120	12	120PAR56/VNSP	60000	—	15x10	8x6	2000	12	—	19023
120	12	120PAR56/MFL	19000	—	29x15	18x9	2000	12	—	19024
120	12	120PAR56/WFL	5625	—	50x25	35x18	2000	12	—	19025
200	30	200PAR	270000	—	9x9	—	500	12	—	20122
240	12	240PAR56/VNSP	140000	—	7x10	9x6	2000	12	C	20575
240	12	240PAR56/MFL	46000	—	28x15	18x9	2000	12	C	20576
240	12	240PAR56/WFL	13000	—	50x27	35x18	2000	12	C	20577
300	12	300PAR56/WFL	—	—	—	—	1000	12	—	23427

PAR Lamps continued

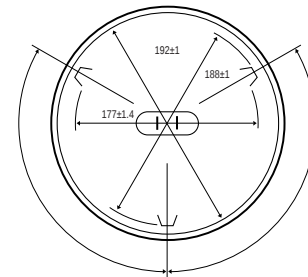


PAR 56 GX16d cap

W	V	OC	Cd	K	10%	50%	H	CD	CD	C
300	120	300PAR56/NSP	68000	2750	20x14	10x8	2000	12	C	20803
300	120	300PAR56/MFL	24000	2750	34x19	23x11	2000	12	C	20836
300	120	300PAR56/WFL	11000	2750	57x27	37x18	2000	12	C	20849
300	230	300PAR56/NSP	40000	—	—	—	2000	12	C	20853
300	230	300PAR56/MFL	30000	—	—	—	2000	12	C	20852
300	230	300PAR56/WFL	10000	—	—	—	2000	12	C	20854
300	240	300PAR56/NSP	40000	—	—	—	2000	12	C	18676
300	240	300PAR56/MFL	30000	—	—	—	2000	12	C	18677
300	240	300PAR56/WFL	10000	—	—	—	2000	12	C	18678
500	120	Q500PAR56/NSP	96000	2950	32x15	13x8	4000	6	CD	43494
500	120	Q500PAR56/MFL	43000	2950	42x20	26x10	4000	6	CD	43495
500	120	Q500PAR56/WFL	19000	2950	66x34	44x20	4000	6	CD	43496

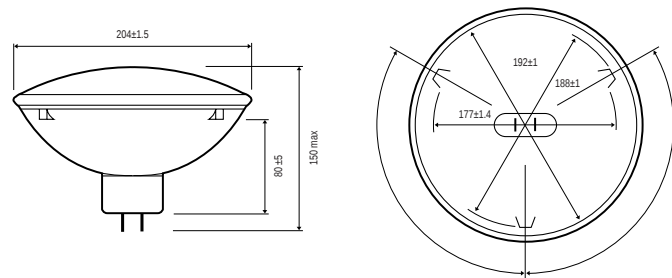


PAR 64 Screw Terminal cap



W	V	OC	Cd	K	10%	50%	H	CD	CD	C
250	28	4552	500000	—	8x7	—	25	12	—	40576
600	28	4559	600000	—	11x12	—	25	12	C	40578
600	28	Q4559	600000	—	12x8	—	100	12	CD	40579
600	28	Q4559X	765000	—	11x7.5	—	100	12	CD	42552

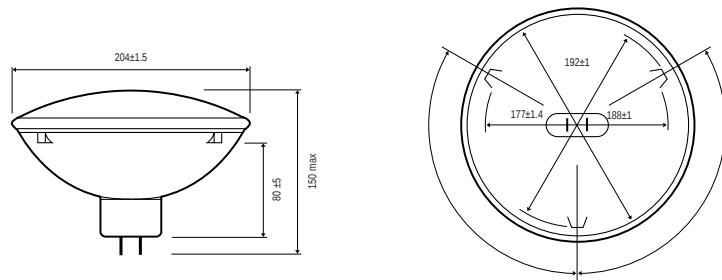
PAR Lamps continued



PAR 64 GX16d base (EMEP)

W	V	LIF	OC	Cd	K	△10%	△50%	Light Bulb Icon	Beam Spread Icon	Document Icon	Light Bulb Icon
500	230	CP86	Q500PAR64/VNSP	240000	3200	16x13	10x7	300	6	CD	30280
500	240	CP86	Q500PAR64/VNSP	240000	3200	16x13	10x7	300	6	CD	30282
500	230	CP87	Q500PAR64/NSP	140000	3200	19x16	11x9	300	6	CD	30283
500	240	CP87	Q500PAR64/NSP	140000	3200	19x16	11x9	300	6	CD	30286
500	230	CP88	Q500PAR64/MFL	65000	3200	32x19	21x10	300	6	CD	30287
500	240	CP88	Q500PAR64/MFL	65000	3200	32x19	21x10	300	6	CD	30288
500	230	—	500/PAR64/MFL	—	2700	32x19	21x10	2000	12	CD	39411
500	230	—	500/PAR64/WFL	—	2700	—	—	2000	12	CD	39414
New 1000	230	CP60	EXC SUPER	352000	3200	12x9	20x17	300	6	CD	93409
1000	240	CP60	EXC SUPER	352000	3200	12x9	20x17	300	6	CD	10925
1000	230	CP61	EXD SUPER	297000	3200	14x10	22x20	300	6	CD	10928
1000	240	CP61	EXD SUPER	297000	3200	14x10	22x20	300	6	CD	10929
1000	230	CP62	EXE SUPER	138000	3200	24x11	38x20	300	6	CD	10930
1000	240	CP62	EXE SUPER	138000	3200	24x11	38x20	300	6	CD	10931
1000	230	CP95	—	15000	3200	125x95	70x70	300	6	CD	30277
1000	240	CP95	—	15000	3200	125x95	70x70	300	6	CD	30278
1000	230	—	EXG/PAR64/WFL	38000	3200	73x36	57x21	300	6	CD	35482
1000	240	—	EXG/PAR64/WFL	38000	3200	73x36	57x21	300	6	CD	35483

PAR Lamps continued



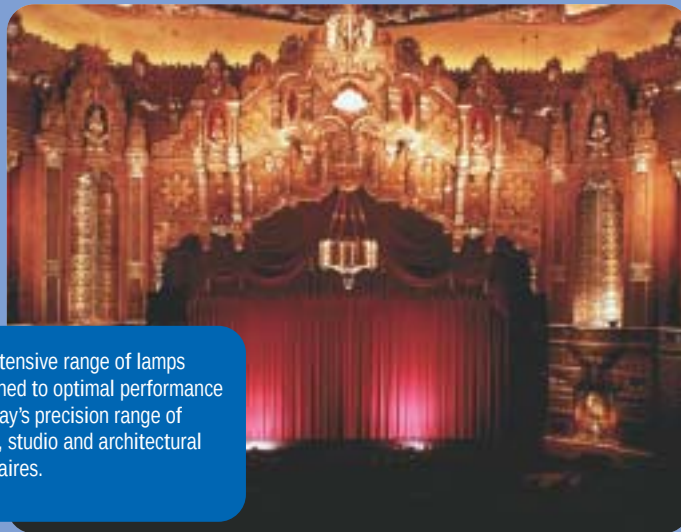
PAR 64 GX16d cap (EMEP)

W	V	OC	Cd	K						
500	120	500PAR64/NSP	110000	2800	19x14	12x7	2000	12	CD	39406
500	120	500PAR64/MFL	37000	2800	35x19	23x11	2000	12	CD	39409
1000	120	FFN	400000	3200	24x10	12x6	800	6	CD	13233
1000	120	FFP	330000	3200	26x14	14x7	800	6	CD	13229
1000	120	FFR	125000	3200	44x11	28x12	800	6	CD	13228
1000	120	FFS	40000	3200	71x45	48x24	800	6	CD	13227
1000	120	FGN	70000	5200	43x20	27x11	200	6	CD	13225
1000	120	Q1000PAR64/NSP	200000	3000	31x14	15x8	4000	6	CD	43497
1000	120	Q1000PAR64/MFL	80000	3000	45x22	28x12	4000	6	CD	43498
1000	120	Q1000PAR64/VNSP	33000	3000	72x45	48x24	4000	6	CD	43499

Single Ended Halogen Lamps

HPL	20
New HPL additions	
G9.5 base	21
GY9.5 base	22 - 23
GX9.5 base	24 - 25
GY16 base	26
G22 base	27
New G22 80V	
P28s base	28 - 29
G38 base	30 - 31
New GX38 high wattages	
GX38q base	33
E40 base	34
P40s base	35

An extensive range of lamps designed to optimal performance in today's precision range of stage, studio and architectural luminaires.



HPL



OC 1200



12K GX38



Lampes Halogenes Mono Culot

Une large gamme de lampes conçues pour optimiser les performances des luminaires destinés à l'éclairage architectural et studio.

Lampade Alogene ad Attacco Singolo

Una vasta gamma di lampade concepite per ottimizzare le prestazioni di sofisticati apparecchi di illuminazione per palcoscenico, studio e impiego architetture.

Lámparas Halogenas Bipin

Un amplio rango de lámparas diseñadas para un óptimo rendimiento dentro de los aparatos de iluminación de precisión utilizados actualmente en la iluminación espectacular.

Einseitig-gesockelte Halogenlampen

Eine umfassende Auswahl an Lampen wurde entworfen, um eine optimale Leistung in der heutigen Präzisionsauswahl an Bühnen-, Studio- und architektonischer Beleuchtung zu bieten.

Single Ended Halogen

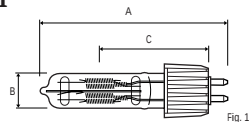


Fig. 1

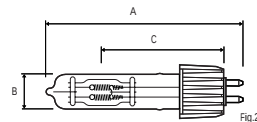


Fig. 2

High Performance Lamps

W	V	OC	LM	K		HxW							FIG N°
575	230	HPL 575	14900	3200	SCH	10 x 9.5	106	18	60.3	300	12	37128	1
575	240	HPL 575	14900	3200	SCH	10 x 9.5	106	18	60.3	300	12	37131	1
575	120	HPL 575-C	16520	3250	SCS	9 x 6	106	18	60.3	300	12	92433	2
575	115	HPL 575-C	16520	3250	SCS	9 x 6	106	18	60.3	300	12	92431	2
575	230	HPL 575-X LL	11780	3050	SCH	12 x 9.5	106	18	60.3	1500	12	37817	1
575	240	HPL 575-X LL	11780	3050	SCH	12 x 9.5	106	18	60.3	1500	12	37818	1
575	120	HPL 575-X LL-C	12360	3050	SCS	11 x 6	106	18	60.3	2000	12	92435	2
575	115	HPL 575-X LL-C	12360	3050	SCS	11 x 6	106	18	60.3	2000	12	92434	2
750	230	HPL 750	19750	3200	SCH	11.5 x 9.5	106	18	60.3	300	12	37824	1
750	240	HPL 750	19750	3200	SCH	11.5 x 9.5	106	18	60.3	300	12	37826	1
750	115	HPL 750-C	22000	3250	SCS	10.5 x 6.3	106	18	60.3	300	12	92432	2
750	115	HPL 750-XLL-C	16400	3050	SCS	13 x 6.3	106	18	60.3	2000	12	92770*	2
750	230	HPL 750-XLL-C	15600	3050	SCH	13 x 8	106	18	60.3	1500	12	92768*	1
750	240	HPL 750-C-XLL-C	15600	3050	SCH	13 x 8	106	18	60.3	1500	12	92769*	1

*Available mid 2003

The HPL 750w version has a pinned base to ensure correct application

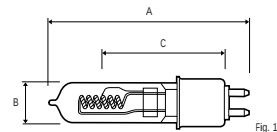


Fig. 1

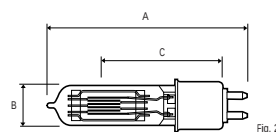


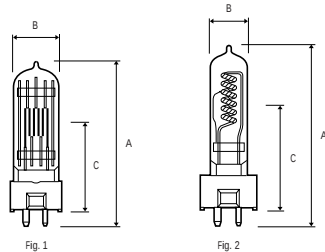
Fig. 2

G9.5 base

W	V	OC	ANSI	LM	K		HxW								FIG N°
500	120	—	EHD	10000	2900	CC-8	18x5	105	20	60.5	2000	24	W	39768	1
575	115	HX600	FLK	16500	3200	CC-8	12.7x6	105	18	60.5	300	24	W	11450	1
575	115	—	FLK/LL	12800	3100	CC-8	13.7x6	105	18	60.5	1500	50	W	39730	1
600	230	HX600	GKV	14000	3200	C13-D	13.5x7.5	105	18	60.5	250	24	—	39739	2
600	240	HX600	GKV	14000	3200	C13-D	13.5x7.5	105	18	60.5	250	24	—	39750	2
600	230	—	GKV/LL	11000	3000	C13-D	16x8	105	18	60.5	1500	24	—	39751	2
600	240	—	GKV/LL	11000	3000	C13-D	16x8	105	18	60.5	1500	24	—	39752	2
650	230	—	FKR	15000	3100	CC-8	24x5	105	20	60.5	300	24	W	39734	1
650	240	—	FKR	15000	3100	CC-8	24x5	105	20	60.5	300	24	W	39735	1
750	120	—	EHF	20000	3200	CC-8	19x7	105	20	60.5	300	24	W	39771	1
750	120	—	EHG	15000	3000	CC-8	19x7	105	20	60.5	2000	24	W	39770	1
800	230	HX800	—	20000	3200	C13-D	15.8x8.4	105	18	60.5	250	24	—	39753	2
800	240	HX800	—	20000	3200	C13-D	15.8x8.4	105	18	60.5	250	24	—	39754	2
1000	120	CP77	FEL	27500	3200	CC-8	19x7	105	20	60.5	300	24	W	39769	1
1000	230	CP77	FEP	25000	3200	CC-8	24x7	105	20	60.5	300	24	W	39738	1
1000	240	CP77	FEP	25000	3200	CC-8	24x7	105	20	60.5	300	24	W	39736	1

GKV/LL IS EQUIVALENT TO GLB

Single Ended Halogen Continued



GY9.5 base - Grid-form Filament

W	V	LIF	OC	LM	K		HxW	A	B	C					FIG N°
300	120	CP81	FKW	6900	3200	S	15x10	90	25	46	50	24	—	39781	1
300	230	CP81	FSL	6900	3200	S	11x10	90	25	46	150	24	—	39780	1
300	240	CP81	FSK	6900	3200	S	11x10	90	25	46	150	24	—	39779	1
500	120	CP82	FRG	13000	3200	MP	12.5x11.5	90	25	46	150	24	—	39623	1
500	230	CP82	FRH	12500	3200	MP	13x13	90	25	46	150	24	—	39624	1
500	240	CP82	FRJ	12500	3200	MP	13x13	90	25	46	150	24	—	39628	1

GY9.5 base - Grid-form filament

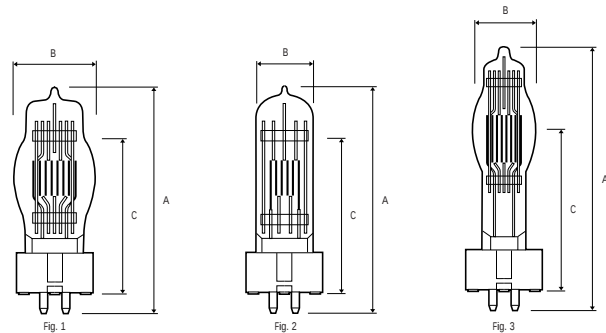
W	V	LIF	OC	LM	K		HxW	A	B	C					FIG N°
500	230	T18	GCV	11000	3050	MP	13.5x13	90	23	46	400	24	—	39717	1
500	240	T18	GCW	11000	3050	MP	13.5x13	90	23	46	400	24	—	39629	1
500	230	T25	GCV	11000	3000	BP	11X11	90	23	46.5	360	24	—	39455	1
500	240	T25	GCW	11000	3000	BP	11X11	90	23	46.5	360	24	—	39262	1
650	230	T27	GCT	14500	3050	BP	13X11	90	23	46.5	400	24	—	39456	1
650	240	T27	GCS	14500	3050	BP	13X11	90	23	46.5	400	24	—	39457	1
650	120	T26	FRE	15500	3100	MP	13.5x13.5	90	23	46	500	24	—	39630	1
650	230	T26	GCT	15500	3100	MP	15.5x13.5	90	23	46	400	24	—	39635	1
650	240	T26	GCS	15500	3100	MP	15.5x13.5	90	23	46	400	24	—	39636	1
650	120	CP89	FRK	16900	3200	MP	12.5x11.5	90	25	46	200	24	—	39637	1
650	230	CP89	FRL	16250	3200	MP	13x13	90	25	46	150	24	—	39640	1
650	240	CP89	FRM	16250	3200	MP	13x13	90	25	46	150	24	—	39642	1

S = Staggered Filament Burning position VBD ±90

GY9.5 base - Coiled Coil Filament

600	120		FMR	12600	3050	CC-8	16x6	85	16	51	2000	24	W	30475	2
-----	-----	--	-----	-------	------	------	------	----	----	----	------	----	---	-------	---

Single Ended Halogen Continued

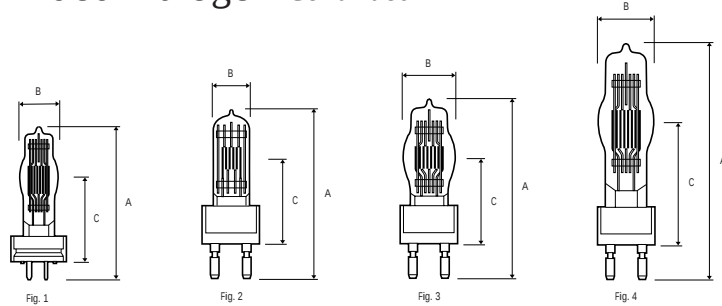


GX9.5 base

W	V	LIF	OC	LM	K		HxW	A	B	C	H				FIG N°
650	230	T12	—	13500	3000	MP	15.5x14.5	110	25	55	750	12	—	39661	2
650	240	T12	—	13500	3000	MP	15.5x14.5	110	25	55	750	12	—	39663	2
650	230	CP23	—	16900	3200	MP	12x14.5	110	25	55	100	12	—	39654	2
650	240	CP23	—	16900	3200	MP	12x14.5	110	25	55	100	12	—	39660	2
1000	230	CP24	—	26000	3200	MP	18.5x17.5	110	35	55	200	12	—	39651	1
1000	240	CP24	—	26000	3200	MP	18.5x17.5	110	35	55	200	12	—	39653	1
1000	115/120	T11	Q1000T8/CL	23500	3050	MP	16x14	110	35	55	750	24	—	29331	1
1000	230	T11	—	23000	3050	MP	17.5x17.5	110	35	55	750	12	—	39656	1
1000	240	T11	—	23000	3050	MP	17.5x17.5	110	35	55	750	12	—	39659	1
1000	230	T19	FWP	21000	3050	BP	15x12	110	35	55	750	12	HJ	39657	2
1000	240	T19	FWR	21000	3050	BP	15x12	110	35	55	750	12	HJ	39658	2
1000	230	CP70	FVA	25000	3200	BP	15x12	110	35	55	200	12	HJ	39241	2
1000	240	CP70	FVB	25000	3200	BP	15x12	110	35	55	200	12	HJ	39242	2
1200	120	T29	—	30500	3050	BP	15x13	125	35	67	400	12	—	39647	3
1200	230	T29	FWS	29000	3050	BP	16x13	125	35	67	400	12	—	39723	3
1200	240	T29	FWT	29000	3050	BP	16x13	125	35	67	400	12	—	39667	3
1200	230	CP90	—	33000	3200	BP	16x12	125	35	67	200	12	J	39724	3
1200	240	CP90	—	33000	3200	BP	16x12	125	35	67	200	12	—	39725	3

Burning position VBD ±90

Single Ended Halogen Continued



GY16 base

W	V	LIF	OC	LM	K		HxW	A	B	C					FIG N°
2000	230	CP43	FTM	54000	3200	MP	22x22.5	145	40	70	400	12	—	20309	1
2000	240	CP43	FTL	54000	3200	MP	22x22.5	145	40	70	400	12	—	20310	1
2000	120	CP79	—	56000	3200	BP	17.5x16	145	40	70	400	12	—	13053864	1
2000	230	CP79	—	54000	3200	BP	18.5x17	145	40	70	350	12	H	30497	1
2000	240	CP79	—	54000	3200	BP	18.5x17	145	40	70	350	12	—	30498	1

Burning position VBD ±90

New

G22 Low Voltage

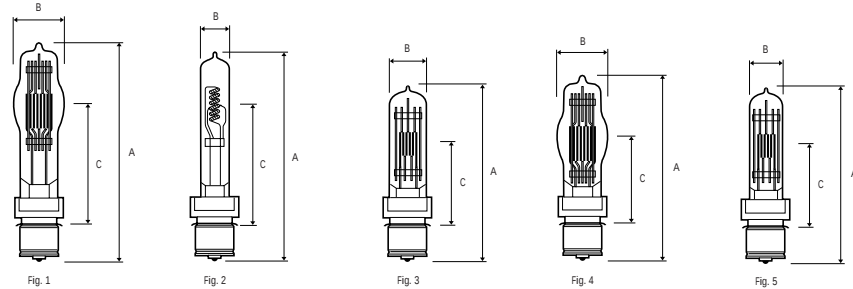
W	V	OC	LM	K		HxW	A	B	C					FIG N°
1200	80	OC1200	37500	3300	BP	10.5x12.5	140	26	63.5	300	12	—	91580	2

G22 base

W	V	LIF	ANSI	LM	K		HxW	A	B	C					FIG N°
500	120	—	EGN	13000	3200	MP	12x11.5	140	21	63.5	150	12	—	30373	2
650	230	CP39	FKH	16900	3200	MP	12x14.5	140	25	63.5	100	12	—	20320	2
650	240	CP39	FKH	16900	3200	MP	12x14.5	140	25	63.5	100	12	—	20321	2
1000	120	—	EGT	28500	3200	MP	14.5x14	140	22	63.5	250	12	—	39191	2
1000	230	CP40	FKJ	26000	3200	MP	18.5x17.5	140	26	63.5	200	12	—	39655	2
1000	240	CP40	FKJ	26000	3200	MP	18.5x17.5	140	26	63.5	200	12	—	20286	2
1200	240	CP93	—	33000	3200	BP	16x12	140	35	63.5	200	12	—	30384	3
2000	120	CP92	—	55000	3200	BP	18x17	175	40	90	400	12	—	30391	4
2000	230	CP92	—	52000	3200	BP	18.5x17	175	40	90	400	12	—	30394	4
2000	240	CP92	—	52000	3200	BP	18.5x17	175	40	90	400	12	—	30397	4
2500	230	CP91	—	67500	3200	BP	24x18	175	40	90	400	12	—	30415	4
2500	240	CP91	—	67500	3200	BP	24x18	175	40	90	400	12	—	30423	4

Burning position VBD ±90

Single Ended Halogen Continued



P28s base (medium prefocus)

															
500	120	—	EGE	10450	2950	CC-8	18x5	152	13	88.9	2000	12	—	39135	2
500	120	—	BTM	13000	3200	MP	12x11.5	130	21	55.5	150	12	—	16465	5
500	230	T17	FKF	9500	2950	MP	13.5x14.5	130	21	55.5	750	12	—	30535	5
500	240	T17	—	9500	2950	MP	13.5x14.5	130	21	55.5	750	12	—	30536	5
500	230	T28	—	11000	3000	MP	15x12	130	12	55.5	300	12	—	39731	5

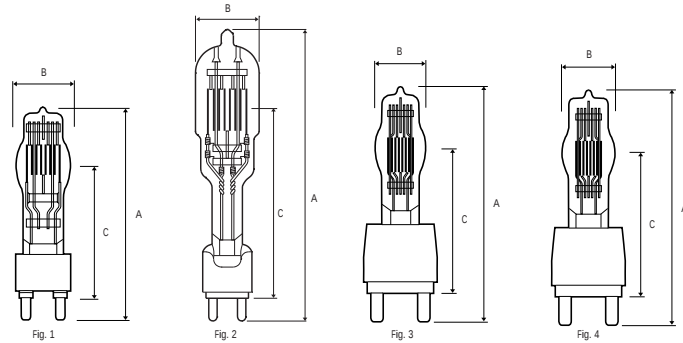
Burning position VBU ±90

P28s base (medium prefocus)

															
500	240	T28	—	11000	3000	MP	15x12	130	21	55.5	300	12	—	39733	5
650	230	T13	FKB	13500	3000	MP	15.5x14.5	130	25	55.5	750	12	—	30541	3
650	240	T13	—	13500	3000	MP	15.5x14.5	130	25	55.5	750	12	—	30542	3
650	230	CP51	FKM	16900	3200	MP	12x14.5	130	25	55.5	200	12	—	20323	3
650	240	CP51	—	16900	3200	MP	12x14.5	130	25	55.5	200	12	—	20324	3
1000	120	—	EGJ	27500	3200	CC-8	19x7	152	20	88.9	500	12	W	38853	2
1000	230	—	EWE	26500	3200	CC-8	24x6	152	20	88.9	250	12	W	30533	2
1000	230	T14	FKD	23000	3050	MP	17.5x17.5	130	35	55.5	750	12	—	20385	4
1000	240	—	EWE	26500	3200	CC-8	24x6	152	20	88.9	250	12	W	30534	2
1000	240	T14	—	23000	3050	MP	17.5x17.5	130	35	55.5	750	12	—	20388	4
1000	240	T15	FKE	23000	3050	MP	17.5x17.5	160	35	88.9	750	12	—	30532	1
1000	240	CP52	FKN	26000	3200	MP	18.5x17.5	130	35	55.5	200	12	—	30546	4

Burning position VBD ±90

Single Ended Halogen Continued



G38 base (mogul prefocus)

W	V	LIF	ANSI	LM	K		HxW								FIG Nº
1000	230	HX270	—	25000	3200	BP	15x12	216	35	127	200	12	—	35234	3
1000	240	HX270	—	25000	3200	BP	15x12	216	35	127	200	12	—	35233	3
2000	120	HX270	CYX	59000	3200	MP	21.5x20.5	216	32	127	400	6	—	36636	3
2000	230	CP41	FKK	54000	3200	MP	22x22.5	216	32	127	400	12	—	31844	3
2000	240	CP41	FKK	54000	3200	MP	22x22.5	216	32	127	400	12	—	31849	3
2500	230	CP94	—	67500	3200	BP	24x18	210	40	127	400	12	—	30499	3
2500	240	CP94	—	67500	3200	BP	24x18	210	40	127	400	12	—	30500	3
3000	230	HX48	—	82000	3200	MP	24x26	210	47	127	400	12	K	30503	4
3000	240	HX48	—	82000	3200	MP	24x26	210	47	127	400	12	K	30504	4
5000	120	CP29	DPY	143000	3200	MP	31x36	280	65	165	500	6	—	41736	1
5000	230	CP29	—	135000	3200	MP	36x33	280	65	165	500	12	—	30505	1
5000	240	CP29	—	135000	3200	MP	36x33	280	65	165	500	12	—	30506	1
10000	220/230	CP83	—	280000	3200	MP	38x56	405	85	254	250	1	—	12036	2
10000	240	CP83	—	280000	3200	MP	39x56	405	85	254	250	1	—	12037	2

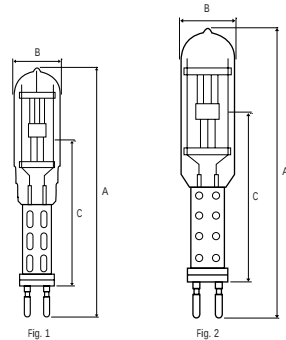
Burning position VBD ±90 except HX48 VBD ±45

Single Ended Halogen Continued

New

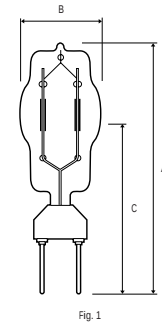
GX38 base - Single-ended High Wattage Halogen Lamps

W	V	LM	K		HxW	A	B	C					FIG N°
12000	120	420000	3400	MP	31x56	410	254	85	150	1	—	48770	1
12000	230	420000	3400	MP	37x56	410	254	85	130	1	—	48771	1
12000	240	420000	3400	MP	36x56	410	254	85	130	1	—	48779	1
20000	230	580000	3200	MP	50x92	560	354	103	400	1	—	48773	2
20000	240	580000	3200	MP	52x92	560	354	103	400	1	—	48774	2
24000	230	800000	3400	MP	46x92	560	354	103	150	1	—	48776	2
24000	240	800000	3400	MP	52x92	560	354	103	150	1	—	48777	2



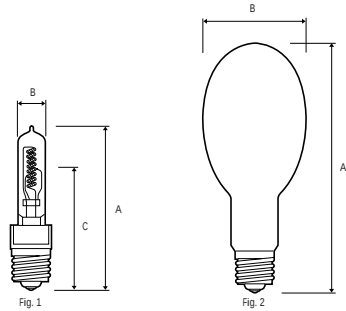
GX38q base - Twin filament

W	V	LIF	LM	K		HxW	A	B	C					FIG N°
1250/650	230	CP105	27000/13000	3050	TF	24x18.5	220	55	143	250	12	L	34056	1
1250/650	240	CP105	27000/13000	3050	TF	24x18.5	220	55	143	250	12	L	34024	1
1250/1250	230	CP30	27000/56000	3200	TF	24x18.5(x2)	220	55	143	300	12	L	30513	1
1250/1250	240	CP30	27000/56000	3200	TP	24x18.5(x2)	220	55	143	300	12	L	30514	1
1250/2250	230	CP58	27000/59000/91000	3200	TF	27.5x25/24x22	220	70	143	300	12	L	30515	1
1250/2500	240	CP58	27000/59000/91000	3200	TF	27.5x25/24x22	220	70	143	300	12	L	30517	1
2500/2500	230	CP32	59000/127000	3200	TF	27.5x25(x2)	220	70	143	300	12	L	30518	1
2500/2500	240	CP32	59000/127000	3200	TF	27.5x25(x2)	220	70	143	300	12	L	30519	1



Burning position VBD ±45

Single Ended Halogen Continued



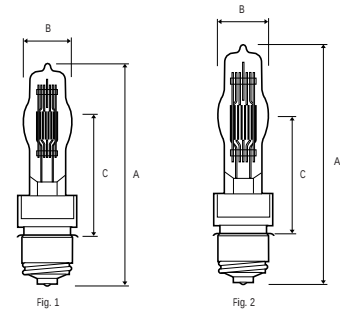
E40 base - Clear, Coil Filament

W	V	LIF	ANSI	LM	K		HxW	A	B	C					FIG N°
2000	220/230	CP59	—	50000	3200	CC-8	40x7	190	30	133	300	12	W	29424	1
2000	240	CP59	—	50000	3200	CC-8	40x7	190	30	133	300	12	W	29426	1

E40 base - Frosted, Coil Filament

1000	120	—	DKZ/DSE	28000	3200	CC-8	—	330	165	—	750	10	—	34377	2
1500	120	—	DKX/DSF	41000	3200	CC-8	—	330	165	—	1000	12	—	40357	2

DKX/DSF Burning position – any



P40s base (mogul prefocus)

W	V	LIF	ANSI	LM	K		HxW	A	B	C					FIG N°
1000	240	T16	—	23000	3050	MP	17.5x17.5	180	35	87	750	12	—	30521	1
1500	120	T16	DTA	41000	3200	MP	19x17	200	40	87	300	6	—	30522	2
2000	230	CP53	—	54000	3200	MP	22x22.5	200	40	87	400	12	—	20311	2
2000	240	CP53	—	54000	3200	MP	22x22.5	200	40	87	400	12	—	20312	2

Burning position VBD ±90

Linear Halogen Lamps

Double-Ended Quartzline®

Length 79.4 mm 38

Length 95.3 mm 39

Length 119.1 mm 40

Length 142.9 mm 41

Length 189.1 mm 42

This precision range of quartzline lamps are widely used in television broadcast studios around the world.



CNBC Europe's Studio.
CNBC, the 24-hour global business television news channel

P2/27



Lampes Halogenes Lineaires

Cette gamme spécifique de lampes quartz est très largement utilisée par les studios de télévision à travers le Monde.

Lampade Alogene Lineari

Questa gamma di lampade alogene è usata negli studi di produzione televisiva di tutto il mondo.

Lámparas Halógenas Lineales

Este rango de lámparas de cuarzo de alta precisión es ampliamente utilizado en los estudios de televisión de todo el mundo.

Stabförmige Halogenlampen

Die Genauigkeit der Quarzlampen sind weltweit in den Fernsehstudios verbreitet.

Linear Halogen

Double-Ended Quartzline® Lamps with R7s Caps

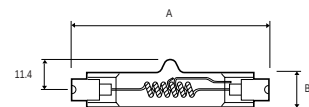


Fig. 1

Length 79.4mm

W	V	LIF	OC	LM	K		A	B	H				FIG N°
650	120	P2/6	FAD	16500	3200	CC-8	79.4	13.5	100	24	C	30325	1
800	230	P2/13	DXX	21400	3200	CC-8	79.4	13.5	75	24	C	36952	1
800	240	P2/13	DXX	21400	3200	CC-8	79.4	13.5	75	24	C	36953	1

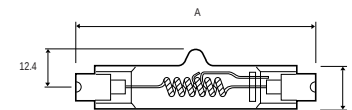
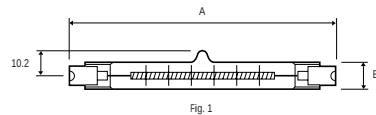


Fig. 2

Length 95.3mm

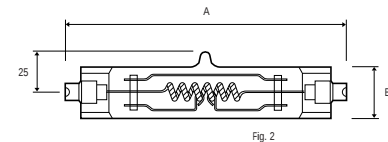
W	V	OC	LM	K		A	B	H				FIG N°
1000	120	DXW	28000	3200	CC-8	95.3	16	150	24	–	30157	2
1000	120	FBY	26000	3200	CC-8	95.3	16	150	24	Frost	30374	2

Linear Halogen Continued



Length 119.1mm - Burn Horizontal $\pm 4^\circ$

W	V	LIF	OC	LM	K		A	B	H				FIG N°
300	120	—	EHM	6200	2950	C-8	119.1	11	2000	6	—	43703	1
500	120	—	FCL	11100	3000	C-8	119.1	11	2000	12	—	23731	1
750	120	—	EJG	20600	3200	C-8	119.1	11	400	12	—	23756	1
800	240	P2/11	EME/Clear	22000	3200	C-8	119.1	11	150	12	—	23760	1
800	240	P2/11	EMF/Frosted	21400	3200	C-8	119.1	11	150	12	—	23761	1
1000	120	P2/28	FCM	28000	3200	C-8	119.1	11	400	12	—	23797	1

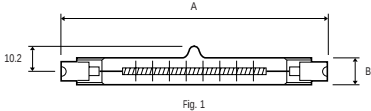


Length 142.9mm - Burn Horizontal $\pm 4^\circ$ — RX7s Caps

W	V	LIF	OC	LM	K		A	B	H				FIG N°
2000	230	P2/27	FEX	50000	3200	CC-8	142.9	30	300	12	—	35338	2
2000	240	P2/27	FEX	50000	3200	CC-8	142.9	30	300	12	—	35339	2
2000	120	P2/27	FEY	57000	3200	CC-8	142.9	30	400	12	—	39790	2

Linear Halogen Continued

Notes



Length 189.1mm - Burn Horizontal ±4°

W	V	LIF	OC	LM	K								FIG N°
625	230	P2/10	—	16900	3200	C-8	189.1	12	300	12	—	19697	1
625	240	P2/10	—	16900	3200	C-8	189.1	12	300	12	—	19698	1
1000	230	P2/7	EKM	28000	3200	C-8	189.1	12	300	12	—	20249	1
1000	240	P2/7	EKM	28000	3200	C-8	189.1	12	300	12	—	20253	1
1250	230	P2/12	—	35000	3200	C-8	189.1	12	300	12	—	19695	1
1250	240	P2/12	—	35000	3200	C-8	189.1	12	300	12	—	19696	1

Specialist Projector Lamps

Single-ended Quartzline®	46 - 47
A1 class projector	48
G17q	49
Low volt single ended	50
Mains volt single ended	51
Linear projector	52
MR16 projector	53 -57
New ELC 500	
MR11 projector	58
MR13 projector	59
MR14 projector	60
High intensity arc	61



A full range of specialist projection lamps designed to deliver excellent optical performance and reliability.

Overhead Projector, ACCO UK

Projector



Lampes Photo-Projection

Une gamme complète de lampes projection spécialement conçues afin de délivrer une excellente performance optique et d'une grande fiabilité.

Single Ended Capsules



Lampade da Proiezione

Una gamma completa di lampade da proiezione di grande affidabilità progettate per fornire eccellenti prestazioni ottiche

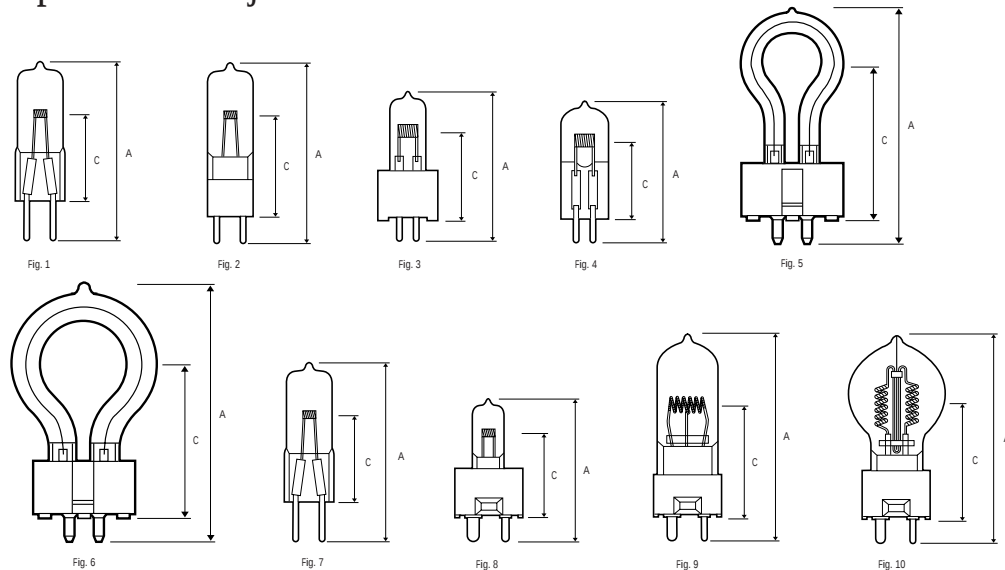
Specialist Projector



Projektionslampen

Eine komplette Auswahl an speziellen Projektionslampen, entworfen um eine ausgezeichneten optischen Performance und Verlässlichkeit zu bieten.

Specialist Projector



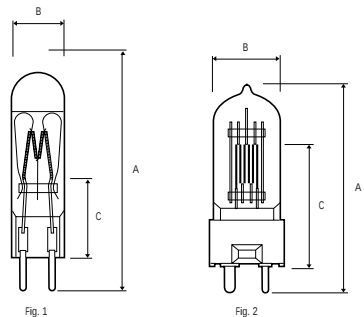
Single-ended Quartzline® - Projector Lamps



30	6.6	EXL	—	375	—	C-8	3.3x1.3	2900	44.5	25	1000	GZ9.5	24	M	11478	—
30	10.8	DZA	—	800	BDTH	C-6	3.8x1.3	3100	51	27	400	G5.3	24	M	37346	4
50	12	BRL	A1/220	1400	BDTH	C-6	3.3x1.6	3400	44	30	50	G6.35	100	M	18234	1
100	12	FCR	A1/215	3500	BDTH	C-6	5.1x3.8	3300	44	30	50	GY6.35	100	M	14876	1
100	12	FDT	A1/261	2900	BDTH	C-6 Oval	5.8x3.8	3300	54	27	50	GZ9.5	24	M	35321	8
120	6.6	EVV	—	3150	—	C-6 Oval	6.4x3	3200	64	39	500	GZ9.5	24	M	10099	—
150	6.6	EWR	—	4100	—	C-6 Oval	6.4x.4.1	3200	64	39	500	GZ9.5	24	M	11427	—
150	15	BRJ/EVB	A1/234	5000	BDTH	C-6 Oval	4.8x3.0	3400	44	30	50	G6.35	100	M	18235	1
150	24	DZE/FDS	A1/262	5000	BDTH	C-6 Oval	6.4x3.8	3250	68	33	100	GZ9.5	24	M	37695	8
150	24	FCS	A1/216	4500	BDTH	C-6 Oval	6.4x3.8	3300	51	30	50	G6.35	100	M	13598	1
175	24	EML	—	5000	BDTH	C-6	5.3x4.8	3200	54	27	125	G5.3	24	M	42612	3
250	24	EHJ	A1/223	9000	BDTH	C-6 Oval	7.6x3.8	3400	57	33	50	G6.35	100	M	14874	1
275	24	FNT	—	10000	BDTH	C-6 Oval	3.5x7.1	3400	57	33	50	G6.35	100	M	18241	1
300	24	FLW	—	10200	BDTH	C-6 Oval	8.6x5.8	3500	55	33	50	GY6.35*	20	M	19886	2
400	36	EVD	A1/239	16000	BDTH	C-6 Oval	9.4x4.7	3200	60	36	50	GY6.35	25	M	41164	1
400	36	—	A1/270	14500	BDTH	CC	9x4.6	—	57	36	150	GY6.35	100	M	30888	7
500	230	—	HX501	11500	BDTH	—	—	3050	60	46	300	GX9.5	24	M	35484	5
600	120	DYS	A1/264	17000	BDTH	CC-6	12.7x6.4	3200	64	37	75	GZ9.5	24	CM	32955	9
600	120	FFJ	—	17000	—	CC-8	—	3250	—	—	85	R7S	24	—	29592	—
650	230	DYR	A1/233	16500	Any	2CC-8	11.4x11.4	3200	64	37	50	GZ9.5	24	CMN	33248	10
650	240	DYR	A1/233	16500	Any	2CC-8	11.4x11.4	3200	64	37	50	GZ9.5	24	CM	33250	10
800	120	—	HX185	19000	BDTH	—	—	3050	100	53	300	GX9.5	24	M	32714	6
800	230	—	HX185	19000	BDTH	—	—	3050	100	53	300	GX9.5	24	M	30949	6
800	240	—	HX185	19000	BDTH	—	—	3050	100	53	300	GX9.5	24	M	35232	6
1000	120	BRH	—	30000	—	CC-8	—	3350	—	—	60	R7S	24	—	29604	—

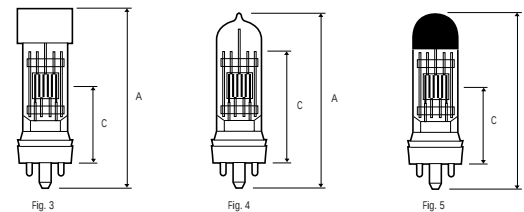
* Ceramic

Specialist Projector continued



A1 Class Projector Bulbs

W	V	LIF	LM	BP		A	B	C	H					FIG N°
150	220/230	A1/248	3000	BDTH	MP	62	16.3	40	50	G6.35	50	MT	30584	1
150	240	A1/248	3000	BDTH	MP	62	16.3	40	50	G6.35	50	MT	30585	1
300	220/230	A1/249	7200	BDTH	MP	62	16.3	40	50	G6.35	50	MNT	30587	1
300	240	A1/249	7200	BDTH	MP	62	16.3	40	50	G6.35	50	MNT	30588	1
500	220/230	A1/244	13000	BDTH	MP	75	28.5	36.5	75	GY9.5	24	MN	39643	2
500	240	A1/244	13000	BDTH	MP	75	28.5	36.5	75	GY9.5	24	MN	39644	2
650	240	A1/247	17750	BDTH	MP	75	28.5	36.5	75	GY9.5	24	MP	39650	2
800	220/230	A1/245	21500	BDTH	MP	87	28.5	44.5	75	GY9.5	24	MP	39648	2
800	240	A1/245	21500	BDTH	MP	87	28.5	44.5	75	GY9.5	24	MP	39649	2



G17q cap

W	V	ANSI	LIF	LM	BP		K	A	C	H				FIG N°
500	240	—	A1/241	—	BDTH	BP	3200	83	40	50	24	MNSTQ	39727	5
500	120	CBA	—	—	BDTH	BP	3200	92	44	50	24	MNT	36117	3
500	220	EPS	A1/268	—	BDTH	MP	3250	94	40	50	24	MNS	39728	4
500	240	EPS	A1/268	—	BDTH	MP	3250	94	40	50	24	MNS	39729	4

Specialist Projector continued

Single-ended Tungsten Halogen Lamps

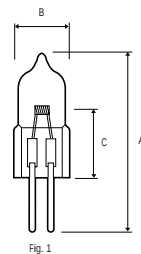


Fig. 1

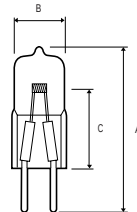


Fig. 2

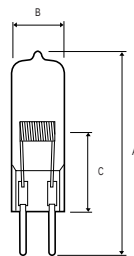


Fig. 3

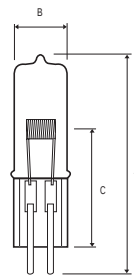


Fig. 4

Low Voltage single-ended capsule

W	V	LIF				LM	K						FIG N°
10	6	M29/ESA	30	10	19.5	200	3200	G4	Trans	100	20	34720	1
20	6	M30/ESB	30	10	19.5	450	3200	G4	Trans	100	20	34718	1
50	12	M32	44	12	30	930	3000	GY6.35	Trans	4000	20	34702	2
100	12	M28/EVA	44	12	30	2400	3000	GY6.35	C-6 Oval	2000	20	34676	3
250	24	M33	55	13.5	33	8600	3000	G6.35	C-6 Oval	300	100	34768	3
250	24	M36	58	15	30	5750	3000	G6.35	C-6 Oval	2000	100	29231	4

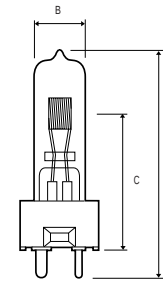


Fig. 4

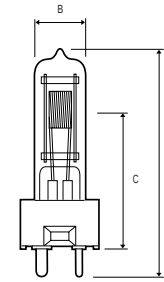


Fig. 5

Mains Voltage single-ended capsule

													
300	120	M38	80	28.5	45.5	5500	2900	GY9.5	CC	2000	24	39786	4
300	220/230	M38	80	28.5	45.5	5000	2900	GY9.5	CC	2000	24	39785	4
300	240/250	M38	80	28.5	45.5	5000	2900	GY9.5	CC	2000	24	39784	4
500	220/230	M40	85	30	45.5	8500	2900	GY9.5	SC	2000	24	39621	5
500	240/250	M40	85	30	45.5	8500	2900	GY9.5	SC	2000	24	39622	5

Specialist Projector continued

Double-ended lamps with R7s caps

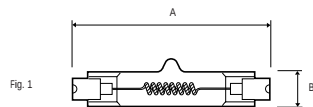


Fig. 1

Linear Projector Lamps

W	V	ANSI	LIF	A										
200	20	DDN	—	Microfilm	—	CC-8	60.1	13.5	3150	24	M	34570	1	
375	30	DWZ	A1/226	Overhead projector	1000	CC-8	80.9	10	3000	24	M	29578	1	
420	120	FAL	A1/227	Overhead projector	75	CC-8	66.5	13.5	3200	24	M	29581	1	

Multi-Mirror® Quartzline® Projection lamps

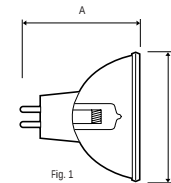


Fig. 1

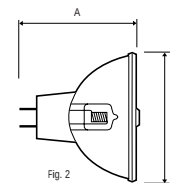


Fig. 2

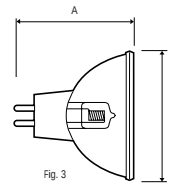


Fig. 3

MR-16 Faceted Dichroic Reflector

W	V	ANSI	LIF	A															
30	10.8	EKZ	—	16mm projection	200	40	C-6	44.45	50.67	3100	GX5.3	20	MV	36902	1				
50	13.8	DJT	—	Microfilm	1000	155	CC-6	44.45	50.67	3150	GX5.3	20	MV	44854	1				
50	8	EFM	A1/229	8mm projection	50	32	C-6	44.45	50.67	3300	GZ6.35	20	MV	41251	2				
75	12	EFN	A1/230	8mm projection	50	32	CC-6	44.45	50.67	3350	GZ6.35	20	MV	41252	2				
80	19	DDM	—	Slide projection	50	155	CC-6	44.45	50.67	3350	GX5.3	20	MV	43206	1				
80	21	DDS	—	Microfilm	1000	165	CC-6	44.45	50.67	3125	GX5.3	20	MV	43988	1				

Specialist Projector continued

MR-16 Faceted Dichroic Reflector continued

W	V	ANSI	LIF	A	H	H	H	A	B	K	H	H	H	H	FIG N°
85	13.8	DED	—	Microfilm	1000	165	CC-6	44.45	50.67	3150	GX5.3	20	MV	43950	1
100	12	EFP	A1/231	8mm projection	50	32	CC-6	44.45	50.67	3350	GZ6.35	20	MV	41253	2
150	15	EFR	A1/232	8mm projection	50	32	CC-6	44.45	50.67	3350	GZ6.35	20	MV	41254	2
150	20	DDL	—	Microfilm	500	200	CC-6	44.45	50.67	3150	GX5.3	20	MV	43537	1
150	21	ELD/EJN	—	Microfilm	40	165	CC-6	44.45	50.67	3350	GX5.3	20	MV	38306	1
150	21	EJM	—	8mm projection	40	40	CC-6	44.45	50.67	3350	GX5.3	10	MV	29151	1
150	21	EKE	—	8mm projection	200	45	CC-6	44.45	50.67	3250	GX5.3	20	MV	35200	1
200	24	EKX	—	Microfilm	25	145	CC-6	44.45	50.67	3400	GX5.3	20	MV	36899	1
200	24	EJL	A1/252	16mm, Colour printer	50	32	CC-6	44.45	50.67	3400	GX5.3	20	MV	29150	1
250	24	ELC	A1/259	16mm, Colour printer	50	30	CC-6	44.45	50.67	3400	GX5.3	20	MV	37462	1
New 250	24	ELC500	—	Disco	500	30	CC-6	44.45	50.67	3250	GY5.3	20	MV	15377	1
250	120	ENH	—	Slide projection	175	155	CC-8	44.45	50.67	3250	GY5.3	20	MV	38686	3
300	120	ELH	—	Slide projection	35	155	CC-8	44.45	50.67	3350	GY5.3	10	MV	38476	1
300	120	ENG	—	Slide projection	15	155	CC-8	44.45	50.67	3450	GY5.3	10	MV	38685	3

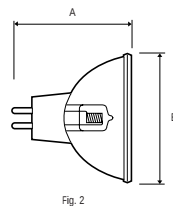
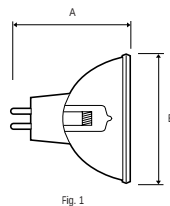
MR-16 Dichroic Reflector

W	V	ANSI	LIF	A	H	H	H	A	B	K	H	H	H	H	FIG N°
80	19	EJY	—	Fibre optics	25	40	CC-6	44.45	50.67	3400	GX5.3	20	MV	32886	1
80	30	ELB	—	8mm projection	18	32	CC-6	44.45	50.67	3400	GX5.3	20	MV	37412	1
150	21	EJA	—	Fibre optics	40	28	CC-6	44.45	50.67	3350	GX5.3	20	MV	32882	1
150	21	EJV	—	8mm, printer	40	45	CC-6	44.45	50.67	3350	GX5.3	20	MV	32831	1

MR-16 Dichroic Reflector

W	V	ANSI	LIF	A	H	H	BP	H	A	B	K	H	H	H	FIG N°
150	21	DNF	A1/266	8mm projection	25	70	Horiz	CC-6	45	50	3400	GX7.9	24	39742	1

Specialist Projector continued



MR-16 Faceted Dichroic Reflector

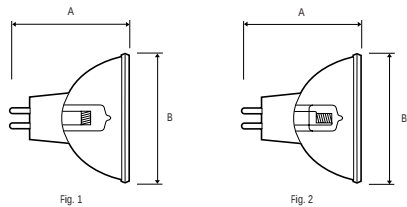


W	V	ANSI	A	H	Light bulb	Spring	A	B	K	Fan	Box	Document	Light bulb	FIG N°
25	13.8	FHX	Microfilm	250	110	CC-6	44.45	50.67	3200	GX5.3	20	MV	47914	1
42	10.8	EPT	Fibre optics	8000	40	C-6	44.45	50.67	2900	GX5.3	20	MV	41729	1
50	12	ENL	Fibre optics*	4000	40	C-6	44.45	50.67	3050	GX5.3	20	MV	25475	1
50	13.8	EPZ	Microfilm	1000	110	CC-6	44.45	50.67	3150	GX5.3	20	MV	43948	1
50	13.8	FML	Microfilm	1000	215	CC-6	44.45	50.67	3150	GX5.3	20	MV	14887	1
80	19	ENW/ENC	8mm projection	200	45	CC-6	44.45	50.67	3200	GX5.3	10	MV	40248	1
90	14.5	EPV	Microfilm	500	155	CC-6	44.45	50.67	3150	GX5.3	20	MV	41882	1
90	14.5	EPX	Microfilm	500	165	CC-6	44.45	50.67	3150	GX5.3	20	MV	42614	1
150	120	ESD	Enlarger, projection	12	45	CC-8	44.45	50.67	3350	GY5.3	20	MV	43756	2
150	120	EZK	Camera light	200	—	CC-8	44.45	50.67	3200	GY5.3	20	MV	15477	2
200	24	EWf	Overhead projection	50	300	CC-8	44.45	50.67	3300	GX5.3	20	MV	11132	2
200	82	EYA	Enlarger	50	—	CC-8	44.45	50.67	3300	GY5.3	20	MV	13152	2
250	82	EVW	Overhead projection	50	300	CC-8	44.45	50.67	3300	GY5.3	20	MV	11110	2
250	120	EXX	Camera light	25	—	CC-8	44.45	50.67	3300	GY5.3	20	MV	11750	2
340	36	ERV	Overhead projection	75	300	CC-8	44.45	50.67	3300	GX5.3	20	MV	41874	2
360	100	EPW	Overhead projection	75	300	CC-6	44.45	50.67	3250	GY5.3	20	MV	41702	2
360	82	ENX	Overhead projection	75	300	CC-8	44.45	50.67	3300	GY5.3	20	MV	41705	2
410	82	FXL	Overhead projection	38	300	CC-8	44.45	50.67	3300	GY5.3	20	MV	21613	2

* Display lighting

Specialist Projector continued

Multi-Mirror® Quartzline® Projection lamps



MR-11 Faceted Dichroic Reflector

W	V	ANSI	A	H	H	H	A	B	K	H	H	H	H	H
28	12	FLS	Microfilm	1000	216	CC-6	40	35.3	3000	GZ4	10	MV	30894	1
28	13.8	FLT	Microfilm	500	76 or 175	CC-6	40	35.3	3050	GZ4	10	MV	31964	1

MR-13 Faceted Dichroic Reflector

W	V	ANSI	A	H	H	H	A	B	K	H	H	H	H	H
250	82	EXY	Slide projection	200	150	CC-8	44.4	42.4	3200	GX5.3	10	MV	12097	2
225	68	EZF/EZJ	Colour printer	500	—	CC-8	44.4	42.4		GX5.3	10	MV	15832	2
300	82	EXR	Slide projection	35	150	CC-8	44.4	42.4	3350	GX5.3	10	MV	12092	2
300	82	EXW	Slide projection	15	150	CC-8	44.4	42.4	3450	GX5.3	10	MV	12095	2
300	82	FHS	Slide projection	70	150	CC-8	44.4	42.4	3300	GX5.3	10	MV	47614	2

Specialist Projector continued

G7.9 Vented Cap Reflector Quartzline®

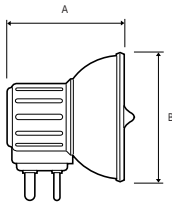


Fig. 1

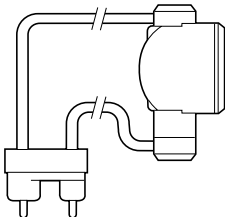


Fig. 2

MR-14 Dichroic Reflector

W	V	ANSI	LIF	A													
50	16	ELS/ELR	—	Microfilm	650	120	BDTH	CC-6	36	44.4	3100	GX7.9	24	41885	1		
250	24	EMM/EKS	A1/258	16mm projection	50	67	BDTH	CC-6	42.2	44.4	3400	GX7.9	24	40017	1		

High Intensity Arc

W	V	ANSI	D														
300	35	EZG	Gemini 300 (EZG)	Quartz Arc Tube in 50mm dichroic reflector	Special 2-pin polarized plug	37	75	6000	4	11134	2						
350	45	EZT	Marc-350/16T (EZT)	Quartz Arc Tube in 76mm dichroic reflector	Special 2-pin polarized plug	52	50	5000	4	39936	2						

Gemini and Marc lamps should be operated with the plane of the reflector vertical. These lamps should not be operated for periods of less than three minutes since short operating cycles reduce life and degrade performance.

Discharge Lamps

New	CSR & CSD	64-65
	CMH (Ceramic Metal Halide)	66-68
	CSS compact	69
	CSI/CID	70-75
	Circuit diagrams	76-78
New	Cinema Lamps-High Lumen Biax™	79
New	Cinema Lamps-Fluorescent	79-81
	Linear ultra violet	81

New CSR & CSD lamps have been introduced to increase the range of discharge products for use in Stage & Studio applications.



MGM Grand, Las Vegas,
Discharge lighting being used in one of the top Entertainment resorts.

CSD 250/2



CSR 575/2



Lampes à Décharge

Les nouvelles lampes CSR & CSD ont été lancées afin d'élargir l'offre destinée aux applications scéniques et studios

Lampade a Scarica

Le nuove lampade CSR & CSD sono state introdotte per implementare la gamma delle lampade scarica utilizzabili in teatri e studi

Lámparas de Descarga

Nuevas lámparas CSR y CSD han sido lanzadas al mercado para incrementar el rango de productos de descarga para uso en aplicaciones de Estudio y Teatro

Hochdruckentladungslampen

Die neuen CSR & CSD Lampen wurden eingeführt, als Sortimentserweiterung im Entladungslampenbereich für die Bühnen und Studiobeleuchtung.

Discharge lamps

New



Fig. 1



Fig. 2



Fig. 3



Fig. 4

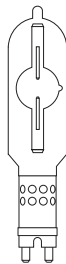


Fig. 5



Fig. 6



Fig. 7

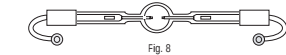


Fig. 8

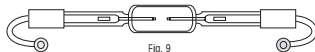


Fig. 9

Single Ended Hot Restrike

W	CCT	V		F	BP	H	LM	D			FIG N°
125	5600	80	GZY9.5	CLEAR	UNIVERSAL	200	9400	CSR125/SE/HR	10	48461	1
200	5600	80	GZY9.5	CLEAR	UNIVERSAL	200	15000	CSR200/SE/HR	10	48462	1
400	5900	70	GX9.5	CLEAR	UNIVERSAL	1000	32000	CSR400/SE/HR	TBA	TBA*	-
575	6000	95	G22	CLEAR	UNIVERSAL	750	48000	CSR575/SE/HR	10	48463	2
1200	6000	100	G38	CLEAR	UNIVERSAL	750	110000	CSR1200/SE/HR	6	48464	3
2500	6000	115	G38	CLEAR	UNIVERSAL	500	220000	CSR2500/SE/HR	6	48465	4
4000	6000	200	G38	CLEAR	UNIVERSAL	500	380000	CSR4000/SE/HR	6	48466	4
6000	6000	123	G38	CLEAR	UNIVERSAL	300	540000	CSR6000/SE/HR	6	48467	5
12000	6000	160	G38	CLEAR	UNIVERSAL	250	1100000	CSR12000/SE/HR	4	48468	5

* Available late 2003

New

Single Ended Cold Start

W	CCT	V		F	BP	H	LM	D			FIG N°
250	8500	90	GY9.5	CLEAR	UNIVERSAL	2000	18000	CSD250/2/SE	10	10744	-
575	7200	95	GX9.5	CLEAR	UNIVERSAL	1000	49000	CSR575/2/T/SE	10	49492	-
575	7200	95	GX9.5	CLEAR	UNIVERSAL	1000	49000	CSR575/2/SE	10	15378	-
700	7200	72	G22	CLEAR	UNIVERSAL	1000	55000	CSR700/2/SE	10	49491	-
1200	7200	100	G22/30x53	CLEAR	UNIVERSAL	1000	110000	CSR1200/2/T/SE	6	15379	-
1200	7200	100	G22/30x53	CLEAR	UNIVERSAL	1000	110000	CSR1200/2/SE	6	49490	-

Double Ended Hot Restrike

200	6000	-	X515	CLEAR	HORIZONTAL±15°	300	16000	CSR200/DE	10	48450	6
575	6000	-	SFc 10-4 Sleeve/Thd.Pin M4	CLEAR	HORIZONTAL±15°	750	49000	CSR575/DE	10	48451	7
1200	6000	-	SFc 10-4 Sleeve/Thd.Pin M6	CLEAR	HORIZONTAL±15°	500	110000	CSR1200S/DE	10	48452	7
1200	6000	-	SFc 10-5-6 Sleeve/Thd.Pin M6	CLEAR	HORIZONTAL±15°	750	110000	CSR1200/DE	10	48453	7
2500	6000	-	Sta 21-12	CLEAR	HORIZONTAL±15°	500	240000	CSR2500/DE	6	48454	8
4000	6000	-	Sta 21-12	CLEAR	HORIZONTAL±15°	500	410000	CSR4000/DE	6	48455	8
6000	6000	-	25x51 cylinder LEAD 165mm	CLEAR	HORIZONTAL±15°	300	570000	CSR6000/DE	10	48456	8
12000	6000	-	30x70 cylinder LEAD 165mm	CLEAR	HORIZONTAL±15°	300	1100000	CSR12000/DE	10	48457	9
18000	6000	-	30x70 cylinder LEAD 165mm	CLEAR	HORIZONTAL±15°	300	1650000	CSR18000/DE	6	48459	9
18000	6000	-	30x70 cylinder LEAD 165mm	CLEAR	HORIZONTAL±15°	300	1650000	CSR18000S/DE	6	48460	9

Short Arc

700	5600	70	GY9.5	CLEAR	UNIVERSAL/LEAD DOWN	750	55000	CSR700SA	TBA	15380*	-
1200	5600	100	GY22	CLEAR	UNIVERSAL/LEAD DOWN	1000	96000	CSR1200SA	TBA	TBA*	-

* Available late 2003

Discharge lamps continued



Fig 1

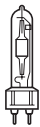


Fig 2



Fig 3

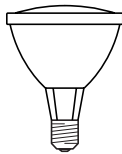


Fig 4



Fig 5



Fig 6

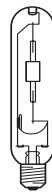


Fig 7

Ceramic Metal Halide (CMH)



Single Ended 'Minis'

20	3000	80+	T4.5	G8.5	CLEAR	UNIVERSAL	9000	7500	1700	CMH20/TC/UVC/U/830/G8.5	92079	1
35	3000	80+	T4.5	G8.5	CLEAR	UNIVERSAL	10000	10000	3400	CMH35/TC/UVC/U/830/G8.5	38697	1
70	3000	80+	T4.5	G8.5	CLEAR	UNIVERSAL	9000	9000	6200	CMH70/TC/UVC/U/830/G8.5	38700	1

Single Ended

35	3000	80+	T6	G12	CLEAR	UNIVERSAL	10000	10000	3400	CMH35/T/UVC/U/830/G12	38696	2
70	3000	80+	T6	G12	CLEAR	UNIVERSAL	15000	15000	6000	CMH70/T/UVC/U/830/G12	38844	2
70	4200	90+	T6	G12	CLEAR	UNIVERSAL	15000	15000	6000	CMH70/T/UVC/U/942/G12	38701	2
150	3000	80+	T6	G12	CLEAR	UNIVERSAL	12000	12000	14000	CMH150/T/UVC/U/830/G12	38863	2
150	4200	90+	T6	G12	CLEAR	UNIVERSAL	12000	12000	13000	CMH150/T/UVC/U/942/G12	38694	2

Ceramic Metal Halide (CMH)



Double Ended

70	3000	80+	T6	Rx7s	CLEAR	HORIZONTAL ± 45°	15000	—	7000	CMH70/TD/UVC/830/Rx7s	36910	3
70	4200	90+	T6	Rx7s	CLEAR	HORIZONTAL ± 45°	15000	—	6200	CMH70/TD/UVC/942/Rx7s	38698	3
150	3000	80+	T7	Rx7s-24	CLEAR	HORIZONTAL ± 45°	15000	—	14500	CMH150/TD/UVC/830/Rx7s-24	36912	3
150	4200	90+	T7	Rx7s-24	CLEAR	HORIZONTAL ± 45°	15000	—	12500	CMH150/TD/UVC/942/Rx7s-24	38692	3

PAR 20

35	3000	80+	PAR20	E27	CLEAR	UNIVERSAL	10000	10000	2100	CMH35/PAR20/830/E27/SP	41883	4
35	3000	80+	PAR20	E27	CLEAR	UNIVERSAL	10000	10000	2100	CMH35/PAR20/830/E27/FL	41884	4

PAR 30

35	3000	80+	PAR30	E27	CLEAR	UNIVERSAL	10000	10000	2400	CMH35/PAR30/830/E27/SP	41886	4
35	3000	80+	PAR30	E27	CLEAR	UNIVERSAL	10000	10000	2400	CMH35/PAR30/830/E27/FL	41887	4
70	3000	80+	PAR30	E27	CLEAR	UNIVERSAL	10000	10000	4700	CMH70/PAR30/830/E27/SP	41621	4
70	3000	80+	PAR30	E27	CLEAR	UNIVERSAL	10000	10000	4700	CMH70/PAR30/830/E27/FL	41620	4

Architainment PAR64

150	TBA	TBA	PAR64	GX16d	TBA	TBA	TBA	TBA	TBA	CMH PAR64 150W GX16d NSP	TBA*	-
150	TBA	TBA	PAR64	GX16d	TBA	TBA	TBA	TBA	TBA	CMH PAR64 150W GX16d MF	TBA*	-
150	TBA	TBA	PAR64	GX16d	TBA	TBA	TBA	TBA	TBA	CMH PAR64 150W GX16d WFL	TBA*	-

* Available late 2003

Stage & Studio

150	4200	96		G12	CLEAR	UNIVERSAL	6000	6000	12900	CMH150 SA G12	TBA*	-
-----	------	----	--	-----	-------	-----------	------	------	-------	---------------	------	---

* Available late 2003

Discharge lamps continued

Ceramic Metal Halide (CMH) continued

W	K	CRI			F	BP	H	V	LM		D		FIG N°
---	---	-----	--	--	---	----	---	---	----	--	---	--	--------

Elliptical Clear

70	3000	80+	ED17	E27	CLEAR	UNIVERSAL	15000	15000	6300	CMH70/E/U/830/E27/C	46189	5
100	3000	80+	ED17	E27	CLEAR	UNIVERSAL	15000	10000	9200	CMH100/E/U/830/E27/C	46191	5

Elliptical Diffuse

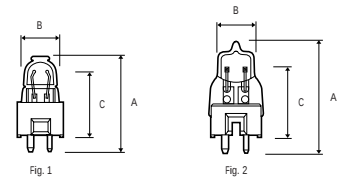
70	3000	80+	ED17	E27	DIFFUSE	UNIVERSAL	15000	15000	6000	CMH70/E/U/830/E27/D	46187	6
100	3000	80+	ED17	E27	DIFFUSE	UNIVERSAL	15000	10000	8700	CMH100/E/U/830/E27/D	46194	6
250	3000	80+	ED28	E40	DIFFUSE	UNIVERSAL	15000	15000	23500	CMH250/E/VBU/830/E40/D	10591*	6
400	3000	80+	ED18	E40	DIFFUSE	VBU	—	15000	40000	CMH400/E/VBU/830/E40/D	92952	6
400	3000	80+	ED37	E40	DIFFUSE	HORIZONTAL	15000	—	40000	CMH400/E/HOR/830/E40/D	13087*	6

Tubular Clear

70	3000	80+	T12	E27	CLEAR	UNIVERSAL	15000	15000	6600	CMH70/T/830/E27	38752	7
100	3000	80+	T15	E40	CLEAR	UNIVERSAL	12000	12000	9200	CMH100/T/830/E40	92478**	7
150	3000	80+	T15	E40	CLEAR	UNIVERSAL	12000	12000	14000	CMH150/T/830/E40	38749	7
250	3000	80+	T15	E40	CLEAR	UNIVERSAL	15000	15000	25000	CMH250/T/U/830/E40	10589*	7
400	3000	80+	ED18	E40	CLEAR	VBU	—	15000	42000	CMH400/T/VBU/830/E40	92951	7
400	3000	80+	ED37	E40	CLEAR	HORIZONTAL	15000	—	42000	CMH400/T/HOR/830/E40	13067*	7

*available in the second quarter 2003

**available in the fourth quarter 2003



CSS

W	V	OC	LM	K	A	B	C			
---	---	----	----	---	---	---	---	--	--	--

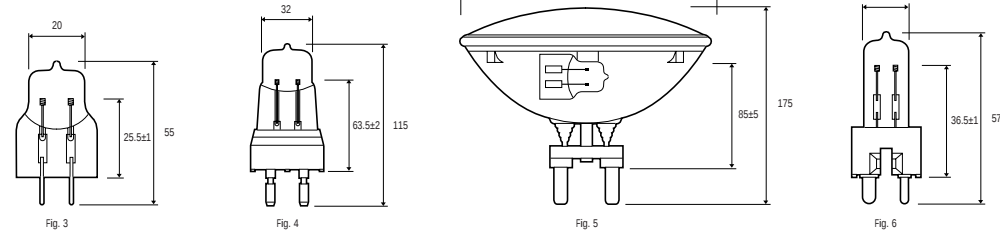
140	85	CSS150/850/GY9.5	10000	5000	48	22	30	1000	10	GY9.5
575	95	CSS575/855/GY9.5	40250	5500	94	22	52	500	10	GY9.5

XY	CRI	BP	mm	RC	R	S				FIG N°
----	-----	----	----	----	---	---	--	--	--	--------

x0.346	y0.358	80	BDH	6	1.87	120	3	3.5 - 5	34813	1
x0.322	y0.341	85	BDH	9	7	60	5	9	34822	2

Discharge lamps continued

CSI/CID Lamps (Compact Source Iodide/Compact Iodide Daylight)



Special bipin base (2 pin 9mm)

W	V	OC	LM 100	%	H	K	XY	CRI	BP	mm	
400	100	99-0201 CSI	32000	85% at 500 hrs	500	4000±400	x0.385 y0.395	80	VBD±90	9±1	±0.5 spacing 0.76 dia
amp	RC	SO	RO	I						FIG N°	
5	30	9 Peak	5	G53444 or Bag Turgi SE15/7U	G53371.T	7xGC2331 40µF 250V	30555	3			

G22 base (medium bipost)

W	V	OC	LM 100	%	H	K	XY	CRI	BP	mm	
1000	77	99-0221 CSI	90000	85% at 500 hrs	500	4000±400	x0.385 y0.395	80	VBD±90	14±1	-
amp	RC	SO	RO	I						FIG N°	
15	60	9 Peak	5	G53444 or Bag Turgi SE15/7U	G53307.T	7xGC2346 175µF 250V	30558	4			

G38 base (mogul bipost)

W	V	OC	Cd	1/2	1/10	H	K	XY	CRI	BP	
1000	77	99-1222 CSI	1350000	6	18	3500	3800±500	x0.393 y0.395	80	HOR±90	15±1.5
1000	77	99-1422 CSI	1350000	6	18	3500	3800±500	x0.393 y0.395	80	HOR±90	15±1.5
amp	RC	SO	RO	I						FIG N°	
15	60	12 Peak	10	G53444 or Bag Turgi SE15/7U	G53307.T	7xGC2346 175µF 250V	29333	5			
15	60	25*	Instant (hot restrike)	G53352.T or IREM AD1540	G53307.T	7xGC2346 175µF 250V	29336	5			

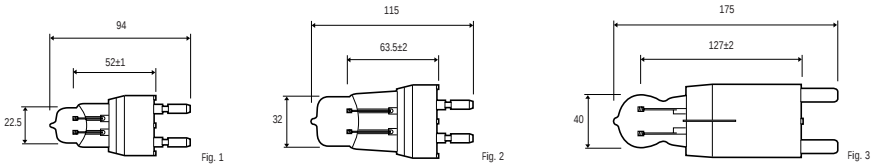
*Measured between sphere gap of 7.5mm in air
Circuit diagrams for CSI/CID lamps can be found on pages 76-78 this includes other essential components

Discharge lamps continued

Special Bipin base

W	V	OC	LM100			K	XY	CRI		
200	70	99-0211 CID	14000	90% at 150 hrs	150	5500±400	x0.332 y0.341	85	VBD±90	5.5±1.5
amp	RC			I				FIG N°		
3.3	60	12 Peak	Instant (hot restrike)	IREM AD312R	G53398.T	GC2382 35µF 250V	30560	6		

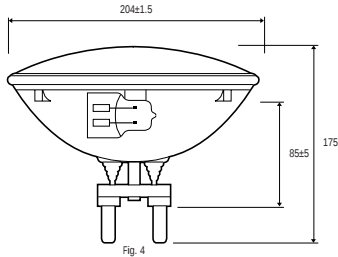
Circuit diagrams for CSI/CID lamps can be found on pages 76-78 this includes other essential components



G22 base (medium bipost)

W	V	OC	LM100			K	XY	CRI		
575	95	99-0415 CID	40250	90% at 500 hrs	500	5500±400	x0.322 y0.341	85	VBD±90	9±1
1000	77	99-0222 CID	70000	90% at 500 hrs	500	5500±400	x0.332 y0.341	85	VBD±90	15±1.5
amp	RC			I				FIG N°		
7	60	9 Peak	5	G53444 or Bag Turgi SE15/7U	IREM ZA57	4xGC2331 80µF 250V	30563	1		
15	60	9 Peak	5	G53444 or Bag Turgi SE15/7U	G53307.T	7xGC2346 175µF 250V	30561	2		

Discharge lamps continued



G38 base (mogul bipost)

W	V	OC	Cd			K	XY	CRI		
2500	100	99-0431 CID	200000	90% at 350 hrs	350	5500±400	x0.332 y0.341	85	VBD±90	18±1

amp	RC			I				FIG N°
28	60	50*	Instant (hot restrike)	IREM AD30/50	2x G53307.T	11xGC2346 275µF 250V	30567	3

* Measured between sphere gap of 17mm in air

G38 base (mogul bipost)

W	V	OC	Cd				K	XY	CRI		
1000	77	99-1225 CID	850000	8	20	1500	5500±400	x0.333 y0.341	85	HOR±90	15±1.5
1000	77	99-1425 CID	850000	8	20	1000	5500±400	x0.333 y0.341	85	HOR±90	15±1.5
1200	100	99-1435 CID	820000	9	18	1000	5500±400	x0.332 y0.341	85	HOR±90	18±1

amp	RC			I				FIG N°
15	60	12 Peak	10	G53444 or Bag Turgi SE15/7U	G53307.T	7xGC2346 175µF 250V	30360	4
15	60	25*	Instant (hot restrike)	G53352.T or IREM AD1540	G53307.T	7xGC2346 175µF 250V	30371	4
14	80	50**	Instant (hot restrike)	IREM AD1550	G53307.T	6xGC2346 150µF 250V	30372	4

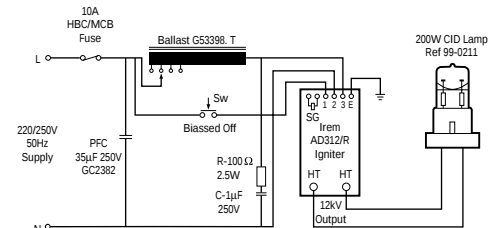
* Measured between sphere gap of 7.5mm in air

** Measured between sphere gap of 17mm in air

Circuit diagrams for CSI/CID lamps can be found on pages 76-78 this includes other essential components

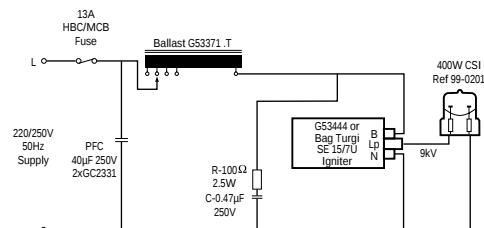
Discharge lamps continued

200 Watt CID Hot-Restart Lamp Circuit Diagram



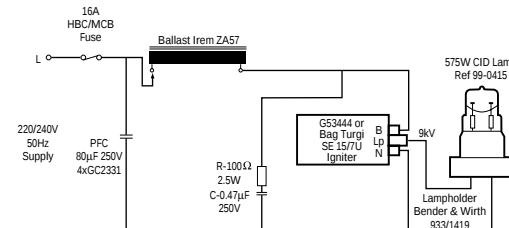
Sw - Normally open contacts - Manual switch or 2 second ON timer
Maximum cable capacitance between igniter and lamp - 30pF (200mm length)

400 Watt CSI Lamp Circuit Diagram



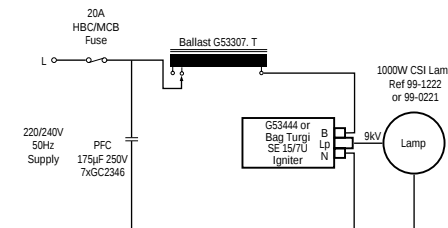
Maximum cable capacitance between igniter and lamp - 50pF (300mm length)

575 Watt CID Lamp Circuit Diagram



Maximum cable capacitance between igniter and lamp - 50pF (300mm length)

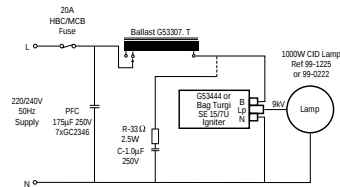
1000 Watt CSI Lamp Circuit Diagram



Lampholder for 99-1222 - Bender & Wirth 938/223 and for 99-0221 - Bender & Wirth 933/1419
Maximum cable capacitance between igniter and lamp - 50pF (300mm length)
Replace G53445 (or Bag Turgi SE600/D) igniter sparkgap element when replacing a failed lamp

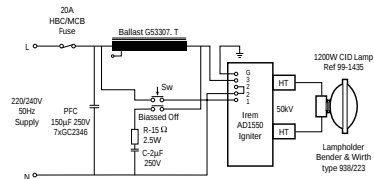
Discharge lamps continued

1000 Watt CID Lamp Circuit Diagram



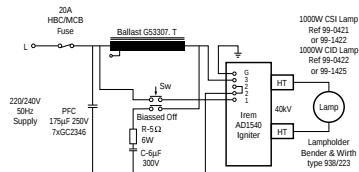
Lampholder for 99-1222 - Bender & Wirth 938/223 and for 99-0222 - Bender & Wirth 933/1419
R/C components necessary ONLY when used on a 220V rate supply
Maximum cable capacitance between igniter and lamp - 50pF (300mm length)
Replace G53445 (or Bag Turgi SE600/D) igniter sparkgap element when replacing a failed lamp

1200 Watt CID Hot-Restart Lamp Circuit Diagram



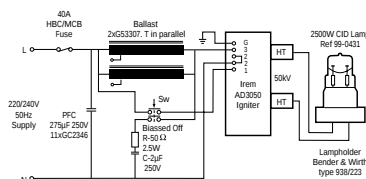
Sw - Normally open contacts - Manual switch or 2 second ON timer
Maximum cable capacitance between igniter and lamp - 30pF (200mm length)

1000 Watt CSI/CID Hot-Restart Lamp Circuit Diagram



Sw - Normally open contacts - Manual switch or 2 second ON timer
Maximum cable capacitance between igniter and lamp - 30pF (200mm length)

2500 Watt CID Hot-Restart Lamp Circuit Diagram



Sw - Normally open contacts - Manual switch or 2 second ON timer
Maximum cable capacitance between igniter and lamp - 30pF (200mm length)

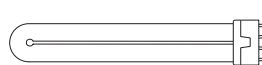


Fig. 1



Fig. 2

Cinema Lamps



Cinema High Lumen Biax™

36	F36BX/CINEMA32	Indoor	10000	10	15816	1
36	F36BX/CINEMA56	Daylight	10000	10	15819	1
55	F55BX/CINEMA32	Indoor	10000	10	15811	1
55	F55BX/CINEMA56	Daylight	10000	10	15814	1

Cinema Lamps 32 & 55

T8

15	F15T8/CINEMA32	Indoor	7500	24	15722	2
15	F15T8/CINEMA55	Daylight	7500	24	15723	2
15	F15T8/CINEMA32/CVG	Indoor	7500	24	15800	2
15	F15T8/CINEMA55/CVG	Daylight	7500	24	15801	2
17	F17T8/CINEMA32	Indoor	15000	24	15724	2
17	F17T8/CINEMA55	Daylight	15000	24	15725	2
17	F17T8/CINEMA32/CVG	Indoor	15000	24	15806	2
17	F17T8/CINEMA55/CVG	Daylight	15000	24	15810	2
32	F32T8/CIN55	Daylight	20000	36	47869	2
32	F32T8/CIN32	Indoor	20000	36	47868	2
32	F32T8/CIN55/CVG	Daylight	20000	36	47882	2
32	F32T8/CIN32/CVG	Indoor	20000	36	47881	2

CVG = These lamps feature GE's exclusive CovRguard coating

Cinema Lamps 32 & 55 continued

T12

W		D				FIG N°
20	F20T12/CINEMA32	Indoor	9000	24	15558	2
20	F20T12/CINEMA55	Daylight	9000	24	15710	2
20	F20T12/CINEMA32/CVG	Indoor	9000	24	15766	2
20	F20T12/CINEMA/55CVG	Daylight	9000	24	15774	2
30	F30T12/CINEMA32	Indoor	15000	24	15714	2
30	F30T12/CINEMA55	Daylight	15000	24	15715	2
30	F30T12/CINEMA32/CVG	Indoor	15000	24	15779	2
30	F30T12/CINEMA/55/CVG	Daylight	15000	24	15780	2
35	F20T12/CINEMA32/HO	Indoor	7000	24	15712	2
35	F20T12/CINEMA55/HO	Daylight	7000	24	15713	2
35	F20T12/CINEMA32/HO/CVG	Indoor	7000	24	15775	2
35	F20T12/CINEMA55/HO/CVG	Daylight	7000	24	15776	2
40	F40T12/CIN55	Daylight	20000	30	47864	2
40	F40T12/CIN32	Indoor	20000	30	47857	2
40	F40T12/CIN55/CVG	Daylight	20000	30	47877	2
40	F40T12/CIN32/CVG	Indoor	20000	30	47876	2
75	F40T12/CINEMA32/HO	Indoor	12000	30	15716	2
75	F40T12/CINEMA55/HO	Daylight	12000	30	15717	2
75	F40T12/CINEMA32/HO/CVG	Indoor	12000	30	15782	2
75	F40T12/CINEMA55/HO/CVG	Daylight	12000	30	15783	2

CVG = These lamps feature GE's exclusive CovRguard coating

Cinema Lamps 32 & 55 continued

T12

W		D				FIG N°
85	F72T12/CINEMA32/HO	Indoor	12000	15	15718	2
85	F72T12/CINEMA55/HO	Daylight	12000	15	15719	2
85	F72T12/CINEMA32/HO/CVG	Indoor	12000	15	15785	2
85	F72T12/CINEMA55/HO/CVG	Daylight	12000	15	15786	2
110	F96T12/CINEMA32/HO	Indoor	12000	15	15720	2
110	F96T12/CINEMA55/HO	Daylight	12000	15	15721	2
110	F96T12/CINEMA32/HO/CVG	Indoor	12000	15	15794	2
110	F96T12/CINEMA55/HO/CVG	Daylight	12000	15	15798	2

Fluorescent Cinema Lamps - life on rapid start ballast

CVG = These lamps feature GE's exclusive CovRguard coating

Blacklight Blue (produce long wave ultra-violet light)

T12

W			D				FIG N°
20	600	F20T12/BLB	Blacklight Blue	9000	6	34747	2
40	1200	F40BLB	Blacklight Blue	20000	6	25618	2

Technical information

Explanation of codes	83 - 86
Glossary	87 - 90
Operating notes	91 - 92
Health and safety guide	93 - 96
Filament & cap designations	97 - 98
Lamp comparison / construction	99 - 105
Lamp performance	106 - 109
Surge current	110 - 111
Discharge lamps	112 - 117

Explanation of codes

Lamps listed in this catalogue are those designed for use as follows:

A1 Prefix - L.I.F. (Lighting Industries Federation) reference indicates lamps which were primarily designed for use with slide, film and overhead projectors.

ANSI Codes - These are 3-letter codes assigned by the American National Standards Institute. They provide a system for assuring mechanical and electrical interchangeability among similarly coded lamps from various manufacturers.

CP Prefix - Lamps designed for use in conjunction with film balanced for 3200K. These are single ended types intended for use in Fresnel/ellipsoidal luminaires etc.

P2 Prefix - Again for use with 3200K film stock for open faced luminaires and video sun guns.

P1 Prefix - For use with 3400K film stock.

T Prefix - Lamps intended for theatre luminaire applications. These are of lower colour temperature (2900 - 3050K) and longer life than the often similar CP types above.

C.S.I. - Discharge lamps with a colour temperature of around 4000K for outside broadcast and follow spot use.

C.I.D. - Discharge lamps with a colour temperature of 5500-6000K for location filming and applications such as disco lighting where a very bright compact source is required.

Incandescent tungsten halogen lamps

Special and Experimental Lamps

In addition to these standard ranges, a number of similar types are available to special order and in most cases, a minimum order quantity will apply. These include non-standard voltage ranges of some types e.g. 100V, 100/115V, 120V and also a number of types which have the GE “HX” or “THE” prefix.

Lamp Bases

The listings use the IEC International designations for lamp bases. Where appropriate, alternative local descriptions are appended.

Filament Format

The listings use the following codings for filament shape:

S.C. - Axial Single Coil - equivalent to ANSI C8

C.C. - Axial Coiled Coil - equivalent to ANSI CC8

M.P. - Monoplane Grid - equivalent to ANSI C13

B.P. - Biplane Grid - equivalent to ANSI C13D

T.F. - Twin Monoplane Grid - equivalent to ANSI 2C13

S.C.H - Single Coil Hexagonal - equivalent to ANSI 6-C8

S.C.S - Single Coil Square - equivalent to ANSI 4-C8

CP Range of Lamps for Fresnel and Spotlight Fittings

As the result of extensive and sustained development work, much of it original, GE are able to offer a comprehensive range of lamps of quartz construction, operating on the tungsten halogen principle for all Television Studio, 'motion picture', and Theatre lighting purposes.

GE has been strongly supported by the television and film industries in its decision to discontinue glass lamps for studio lighting purposes. This is because the industry has appreciated the financial advantages of quartz halogen lamps, their reliability and virtually constant colour temperature.

The increase in the use of the lamps we now manufacture is due to the GE policy of exploiting the important advantages of compact size offered by quartz halogen construction.

As a result GE are able to supply quartz halogen lamps for use in Fresnel and spotlight fittings from 300 watts to 24,000 watts. These lamps employ a wide range of commonly accepted bases. This gives fittings manufacturers a comprehensive range of compact lamps and permits the construction of smaller, lighter and more efficient luminaires.

Glossary of basic product information

Rated Average Life

Average life ratings of Projection Lamps are based on closely controlled laboratory tests of lamps, at their rated voltage, over a long period of production time. Rated Average Life is not necessarily the same as service life; mechanical shock and vibration, voltage fluctuation, temperature and other environmental factors may result in shorter service life. As with any average value, some individual lamps may operate longer, and some may operate shorter, than their Rated Average Life. (Supply voltage variation can significantly affect lamp life; see comments under Lamp Life Ratings, page 107).

'T' Class Lamps for Theatre Spotlight Fittings

With this group of lamps GE are continuing their policy of developing quartz halogen lamps. These lamps operate at a lower colour temperature than the CP range. An average life of a remarkable 750 hours is achieved for most of the GE range. Similar cost savings to those offered by quartz halogen CP lamps are now presented by the quartz halogen 'T' range.

Typical Working Distance

For Multi-Mirror® and other reflector lamps and MARC™ lamps, the Working Distance shown is the distance from the front surface of the reflector rim to the film plane, in the optical system for which the lamp was first designed. In most cases, it provides a uniform plane of light for the intended aperture.

Light Centre Length (LCL)

This dimension defines the location of the filament in relation to the lamp base. It is measured from the geometric centre of the filament to a specified point on, or plane through, the base. Light Centre Length is subject to manufacturing tolerances.

Maximum Overall Length (MOL)

This dimension includes the lamp bulb and all rigid parts of the base. Since the listed lengths include maximum tolerances, actual lamps are generally slightly shorter.

Approximate Initial Lumens

The value shown is based on spherical photometry, at rated voltage, of lamps that have been seasoned for approximately 15% (or a minimum of 2 hours) or more of their rated average life.

Approximate Colour Temperature

The radiation within the visible spectrum from tungsten filament lamps is similar in spectral distribution to that from a “blackbody” at specific colour temperatures. The Colour Temperatures shown are approximate initial values in Kelvin (K) for lamps operated at rated voltage. As the spectral distribution of MARC lamps does not conform to that of a “blackbody”, the values shown are ‘correlated’ colour temperatures expressed in Kelvin.

Important Notice

This catalogue contains accumulated data to February 2003. Additional information is constantly being uncovered through research and testing, which may modify the data given herein. This is particularly true of newer lamps. For the latest lamp design data and information, contact your General Electric Lamp Representative.

The data and suggested applications contained in this catalogue, as well as any additional information our representative may be able to furnish, are for general information only and are not intended and should not be taken as representations or warranties as to the suitability of a lamp for any particular attention or use in any particular equipment, nor are our representatives authorised to make any such representations or give any such warranties. Applications and conditions of use are many and varied, and beyond our control. We cannot possibly have the same degree of knowledge that the purchaser has with respect to the design of their equipment and the conditions of its use. Therefore, it is up to the purchaser to make their own determination as to the suitability of a lamp for his intended application or use and to assume the responsibility for that determination.

General Electric desires to supply the best possible products at all times. For this reason, General Electric reserves the right to make changes in its products when it believes such changes will improve its products.

Operating Notes

Caution notices are included with all lamps. Users are urged to read and comply with these.

Operating precautions

All lamps in this catalogue must be operated with a series fuse in the circuit, as directed in the Technical Digest.

Lamps of quartz construction use a gas filling at a pressure higher than atmospheric and as the lamp can in rare instances shatter in use, suitable shielding techniques should be employed where appropriate. Also protect the lamp from mishandling, scratches and abrasions, and do not operate at above correct rated voltage.

Operating position

For good performance lamps must be used within specified limitations on operating position. The following abbreviations are used in the lamp tables to indicate these limits:

BD - Base Down. Operate only vertical, base down.

BU - Base Up. Operate only vertical, base up.

BDTH - Base Down To Horizontal. Do not operate with base above horizontal.

Horiz. - Horizontal. Operate only in horizontal position.

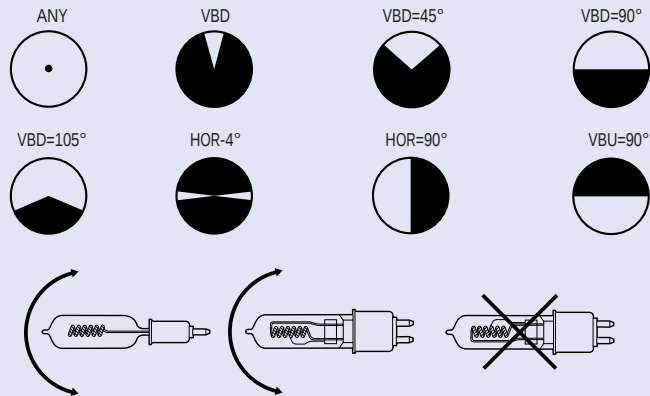


Fig. 1

Axial coiled coil single ended lamps will generally give better reliability against premature arcing if orientations in which the main support spine is under the filament are avoided.

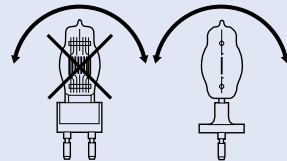


Fig. 2

The lamp must not be rotated in the filament plane (or electrode plane).

Health and safety guide

Instructions for PAR64, PAR56, Closed Stage & Studio lamps Stage & Studio and Unshielded lamps

- 1 Disconnect from power supply before removing and/or replacing lamp or fuse
- 2 Install by holding the lamp cap and if necessary wear eye protection.
- 3 If the lamp is handled, clean before operation with lint free cloth moistened with alcohol or Methylated Spirits.
- 4 Avoid improper operation of the lamp e.g. at over voltage or at burning angles not designated for the lamp type or rating. Operate in series with a quick acting high breaking capacity fuse of suitable rating. Non observation of these points may damage the lamp or equipment.
- 5 In operation:
 - (a) lamps develop a high internal pressure and could shatter
 - (b) lamps develop a high surface temperature
 - (c) direct exposure may cause UV irritation to skin and eyes

The use of glass or other UV filters is advised if the lamp is used in close proximity for a prolonged period.

Avoid operation in proximity to combustibles

Allow to cool before attempting replacement
- 6 Life expired lamps should be broken in a suitable robust container or wrapping to retain flying fragments. There is a toxic content in the fill gas and larger quantities should only be broken in a well ventilated area
- 7 Always check that replacement lamps are the correct type for the application and that rating, cap and control gear are correct
- 8 Lamps having outer bulbs must not be operated if the outer glass is broken

ANSI notice for PAR64, Super PAR64, PAR56, Closed Stage & Studio lamps

Warning

- Risk of electric shock
Turn power off before inspection, installation or removal.
- Risk of fire
Keep combustible materials away from lamp.
Use in fixture rated for this product.
- A damaged lamp emits UV radiation which may cause eye / skin injury
Turn power off if glass bulb is broken. Remove and dispose of lamp.
- Pressurized lamp – unexpected rupture may cause injury, fire, or property damage
Do not exceed 110% of rated voltage.
Avoid direct water / liquid contact.
Use in enclosed fixture rated for this product.
Do not use lamp if outer glass is scratched or broken.

Caution

- Risk of burn
Allow lamp to cool before handling.
Turn power off before installing lamp.
- Lamp may shatter and cause injury if broken
Do not use lamp if outer glass is scratched or broken
Dispose of lamp in a closed container

ANSI notice for Stage & Studio unshielded lamps

Warning

- Risk of electric shock
Turn power off before inspection, installation or removal
- Risk of fire
Keep combustible materials away from lamp
Use in fixture rated for this product.
- Pressurized lamp – unexpected rupture may cause injury, fire, or property damage
Do not exceed 110% of rated voltage.
Do not touch glass with bare hands
Use in enclosed fixture rated for this product.
Do not use lamp if outer glass is scratched or broken.
Operate lamp only in specified position.

Caution

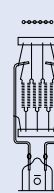
- Risk of burn
Allow lamp to cool before handling.
Turn power off before installing lamp.
- Lamp emits UV radiation which may cause eye / skin irritation. RG-2
Limit unshielded exposure to less than 15 minutes per day.
- Lamp may shatter and cause injury if broken
Wear safety glasses and gloves when handling lamp.
Do not use lamp if outer glass is scratched or broken.
Dispose of lamp in a closed container.

Additional Special Precautions for the Operation of Metal Halide Discharge Lamps

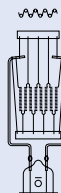
- 1 Check that replacement lamp is correct type for the application, that rating, cap and control gear are correct.
- 2 Lamps having outer bulbs must not be operated if the outer glass is broken.
- 3 Instructions given with metal halide lamps must be carefully followed in all respects. Protection against the explosion of lamp must be maintained, do not remove any covering or shields until the lamp is located in an approved enclosed housing.
- 4 Certain lamps generate ozone in use and should be operated only in well ventilated locations.
- 5 Metal halide lamps with quartz envelopes without glass outer bulbs may emit short wave ultra violet radiation which is harmful to eyes and skin. Operators must be shielded from direct or indirect short wave ultra violet radiation.

Filament designation

The configuration of the filaments in all tungsten filament lamps is identified by a prefix letter or letters, followed by a number. The letter indicates whether the wire is a single coil (C) or coiled coil (CC); the number indicates the form or arrangement of the coil on its support structure. Note that the illustrations are not to scale.



Planar (MP) C13
Monoplane



Biplanar (BP) C13d
Biplane



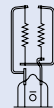
C2V



C7A



C9



2C8 2CC8



C6 Oval



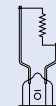
CC6 (Reflector)



CC8 (Reflector)



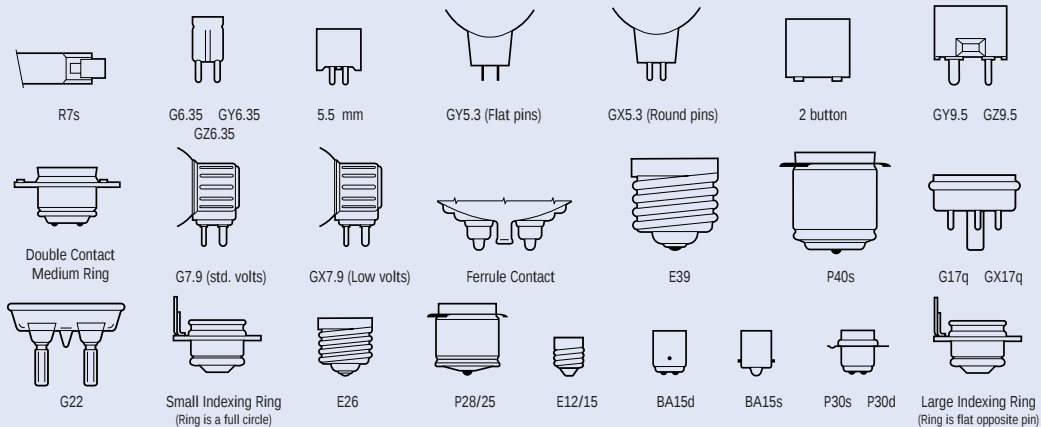
C6 CC6



C8 CC8

Lamp caps

Typical caps used on the Photographic lamps listed in this catalogue are shown below along with their IEC codes and normal names or common abbreviations. The IEC codes are used in the majority of table entries. Note that the illustrations are not to scale.



Lamp Comparison and Construction

Lamps for Ellipsoidal Spotlights

A problem is encountered with some ellipsoidal spotlight luminaires due to the fact that a portion of the reflected beam of light is directed onto the cap of the lamp designed for Fresnel fittings. This leads to overheating of the cap and seal which may result in premature lamp failure.

GE have therefore designed lamps intended for use in ellipsoidal spotlights where the size of the cap has been reduced and the neck length correspondingly increased, thus removing the critical seal area from the reflected radiation and ensuring that optimum lamp life is obtained.

Linear and 'U' Lamps - for Studio Lighting 3200K

Whilst a comprehensive selection of lamps for spotlight fittings is important to the lighting director, of almost equal importance is a range suitable for the many different fittings now on the market which use tungsten halogen lamps of tubular construction. GE believe their range gives a wide choice and is unmatched in performance and reliability.

Hard glass Halogen compared with Quartz Halogen

The tungsten halogen principle is now so well known and documented elsewhere that it is considered unnecessary to describe it here. However should you require details of this principle then please contact GE Lighting Ltd or your nearest Subsidiary Company. It is important to distinguish between hard glass lamps that merely have a halogen compound added to the filling gas and lamps such as those enumerated, which are of quartz construction. The former are from the point of view of life and performance identical to conventional glass lamps of the same rating, the halogen only serving to prolong the usefulness of the lamp by preventing internal blackening due to evaporated tungsten. However, once a lamp is constructed from quartz with its higher melting point, instead of glass, the designer can make use of the much greater strength of the small envelope. It is then possible to increase the filling pressure which by reducing tungsten evaporation from the filament prolongs the life of the lamp to at least twice that of a glass lamp of equivalent efficacy.

Biplane or Monoplane?

The filament format of a lamp will have an effect on the beam performance of a luminaire.

In Fresnel optics a biplane filament will, due to its smaller area, produce a narrower spot of slightly increased peak intensity, compared to an equivalent monoplane filament. However, in intermediate and flood positions better light collection is obtained from a monoplane source, as the additional light collected by the rear mirror is largely obscured with a biplane source. A wider angle beam for a given intensity is thus provided by a monoplane filament.

Ellipsoidal optics are designed around a specific filament area. Larger areas will allow some of the light to fall outside the gate and be lost. A smaller filament area will concentrate the light on the centre of the gate producing a hot spot. The choice between a monoplane and a smaller equivalent biplane is, therefore, dependent on luminaire design and customer preference.

GE pursue a policy of allowing the customers to make this choice by offering both monoplane and biplane versions of relevant lamp types.

Arc Prevention in Tungsten Halogen Studio Lamp Applications

Almost all production personnel in the film and television industry have at some time encountered sudden failure of incandescent studio lamps. When this occurs at a crucial moment and forces a re-shoot the cost can be considerable.

The significant features of these failures were that they almost always occurred during the first 20 hours of use and the incidence of failure increased with operating temperatures. Failure invariably resulted from an arc across the filament plugs which destroyed the tails of the filament.

Tungsten halogen lamps are gas filled. The introduction of hydrogen is predicted to react with the halogen to 'slow down' the tungsten halogen cycle. In addition it is known that hydrogen will slowly diffuse through the hot quartz bulb so that the hydrogen concentration would gradually diminish.

The rate of loss of hydrogen during lamp operation is less than previously predicted and based upon spectroradiometer measurements and calculations, maximum protection is only required during the initial 50 hours of life. Hence the use of hydrogen additions is the most advantageous method of ensuring reliable operation of lamps during early life, particularly in demanding operating conditions.

GE Lighting offer lamps with proprietary hydrogen addition*. This offers adequate arcing protection without significantly interfering with the halogen cycle.

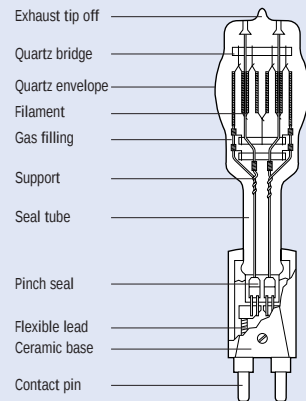
*owned by GE under US PAT #4743802

Lamp performance as a function of operating voltage

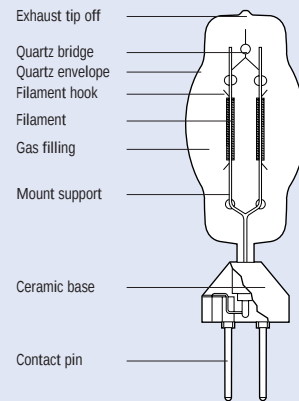
Tungsten halogen lamp performance (light output, power consumption, life, colour, temperature) is a strong function of operating voltage. The rated performances claimed in this catalogue have been achieved at nominal rated volts. Operating the lamps at other than the rated voltage will significantly affect performance, as shown graphically on pages 106 and 107. All lamps are designed for use with proprietary dimming equipment as required.

Lamp comparison and construction

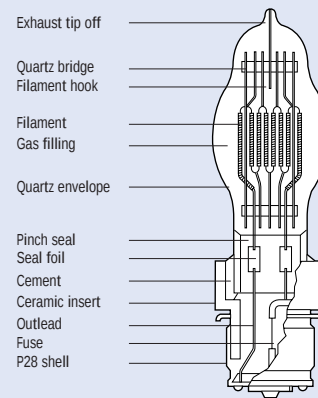
A typical high wattage studio lamp



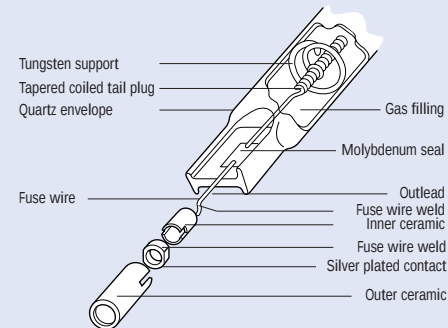
A typical 4 pin twin filament studio lamp



A typical low wattage theatre class tungsten halogen lamp

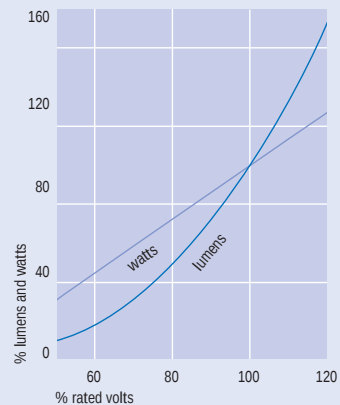


End section of a typical quartz linear tungsten halogen lamp

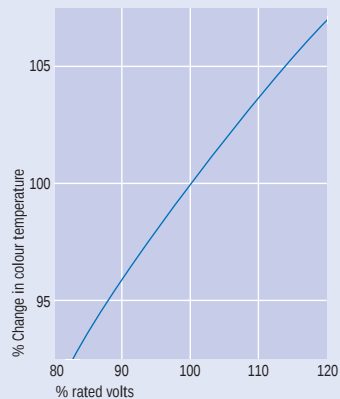


Lamp performance

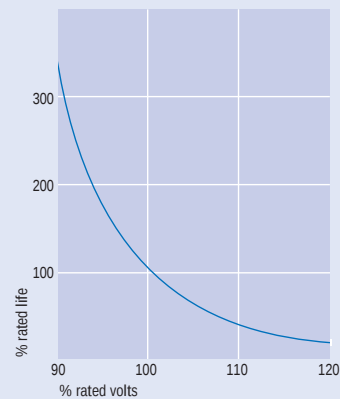
Variation of light output and wattage with applied voltage for a typical studio lamp



Colour temperature variation with voltage for typical studio lamp

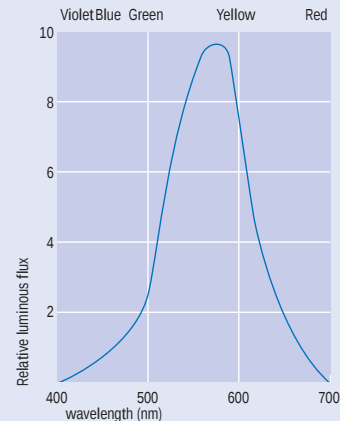


Typical life variation against operation voltage

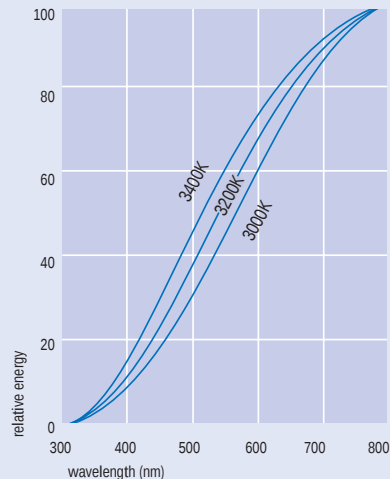


Spectral distribution of luminous flux (lumens) for typical theatre and studio lamp

Calculations of lamp life achievement taken from this graph should be considered strictly theoretical as the life factor is considerably influenced by frequency of switching, environment, vibration, handling, cleaning etc. This graph is based on the average achievement of numerous lamp tests, and thus should only be used as an approximate guide to performance.



Total spectral energy distribution of typical studio lamp



Spectral energy distribution can be shown in absolute terms whereas radiation in terms of visible light is related to the response of the human eye. (Spectral distribution chart on previous page)

Operating Temperature of Tungsten Halogen Studio Lamps

The following maximum and minimum temperatures are suggested for optimum life. Operation outside these figures will not necessarily cause immediate failure but will affect life adversely to an increasing extent.

Seal - 450°C maximum

Above this figure the sealing foil oxidises at a rate increasing with temperature and is frequently the cause of short life due to seal failure.

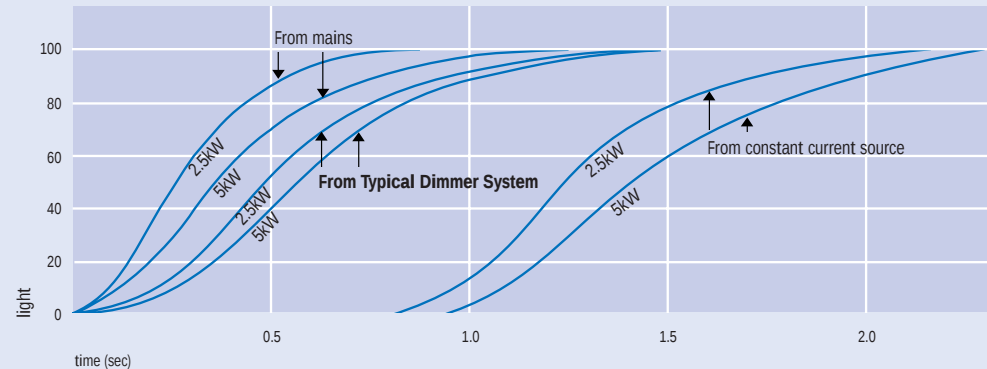
Bulb - 250° - 800°C

Outside this range the halogen cycle becomes less efficient and blackening may occur. Temperatures above 1200°C will cause the bulb to soften.

Pins - 350°C maximum

Above this figure the plating on the pins may lose adhesion and the contact will deteriorate. Such deterioration may form local hot spots which rapidly worsen and may result in arcing and irreparable damage to both lamp and holder. Should signs of this be evident on removal of a failed lamp, it is important that a good contact is restored by replacing the lampholder before the next lamp is fitted. Otherwise the new lamp will rapidly fail in a similar manner.

Turn on time of studio lamps



Surge Current

The cold resistance of a halogen studio lamp is approx. 1/17 of its value in normal operation. On switch on, theoretically a surge current of $17\sqrt{2}$ x the normal current would flow and depending on the thermal mass of the filament* this will fall to the lamp normal current in approx. 1 sec. In practice this maximum theoretical current does not appear due to (a) switch on does not always occur at the peak of the AC voltage, (b) the supply has some impedance which is comparable with the cold resistance of high wattage lamps, i.e. maximum possible surge current where V is the applied voltage and Z is the sum of the lamp cold resistance and the supply impedance.

Typically supply impedance is the order of 0.3 ohm and lamp life is based on testing with such a supply. In the rare cases where the line impedance is lower than this figure, an adverse effect on life may be encountered particularly with high wattage types, due to the then extremely high surge current on switching.

lamp	type	cold resistance (ohms)	max. surge current (amps)				normal operating current
			line impedance = 0 ohms	0.1 ohms	0.3 ohms	0.5 ohms	
240V	10kW	0.34	1000	774	530	405	41.5
240V	5kW	0.7	486	424	340	283	20.8
115V	5kW	0.15	1085	650	360	250	43.5
240V	2kW	1.7	200	189	170	154	8.35
117V	2kW	0.41	404	324	233	182	17.1
240V	1kW	3.4	100	97	92	87	4.15

Fusing of Tungsten Halogen Studio and Theatre Lamps

A lamp normally fails at end of life by fusing of the filament. Often an arc then forms and as there is little resistance to limit the current this rises to a very high value which if maintained can result in a serious overload on the envelope and seals. This might result in the lamp shattering. A quick acting high breaking capacity fuse must be connected in the supply line in all applications. Suitable types are given in BS88 (IEC 60269), IEC 60127 or IEC 60241.

lamp power (watts)	fuse (rated current) (amps)		
		100-115V	115-130V
500	6	6	4
650	10	6	4
1000	16 (15 UK)	10	6
1500	20	16 (15 UK)	10
2000	25 (30 UK)	25 (20 UK)	10
2500	35 (30 UK)	25 (30 UK)	16 (15 UK)
5000	63 (60 UK)	50	25 (30 UK)
10000	125	100	50

Discharge lamps

Even with all the advances which have been made in tungsten halogen technology in recent years there are still occasions, particularly whilst working on location, when handling the number of fittings required to give an acceptable illumination level can be a logistical headache.

One GE metal halide discharge lamp can provide more light than three tungsten halogen lamps of the same rating. That means one third the power consumption and one third the number of fittings to transport and aim. The potential for major cost savings is clear.

GE Lighting has led the way in adapting discharge lamps for use in the performing arts. The company was the first and for many years the only manufacturer to offer metal halide lamps in the compact, single ended capsule format. The minimal dimensions of these lamps can be incorporated into fittings which are much smaller than corresponding luminaires using double ended lamps of the same power. With a near point light source excellent optical control is possible.

Compact iodide lamps are also available in a sealed beam format. With the light source carefully positioned in the reflector, optimum optical performance is guaranteed.

The nitrogen filling gas in the outer bulb prevents oxygen attacking the seal of the inner capsule and so increases the life of the lamp dramatically.

All CID discharge studio and stage lamps are dimmable to 50% of peak lumens and the great majority are available in hot re-strike versions for applications where frequent changes in lighting levels are required. All lamps will re-strike within ten minutes of switch off.

Compact Iodide Daylight (CID) Discharge Lamps

With a colour temperature of 5500K these lamps provide an excellent simulation of daylight. For location filming, colour matching with natural light presents no problem.

In the studio, interior scenes can be given a realistic appearance. As relatively small numbers of lamps are required the amount of heat generated is substantially less than under tungsten halogen lamps giving the same illumination. For all personnel the working environment is much more comfortable. Of course, the running costs are correspondingly lower too.

In the theatre CID discharge lamps are particularly useful in follow spotlights. The very high light output from a point source creates a very intense, sharp beam.

Compact Source Iodide (CSI) Discharge Lamps

CSI lamps offer all the advantages of the CID range, but operate at the warmer colour temperature of 4000K. This allows the lamps to be readily blended with tungsten halogen lighting.

Compact Source Special (CSS) Discharge Lamps

These lamps are specially developed for disco and fibre optics applications. Life may be extended if fan or forced cooling is used.

CSR

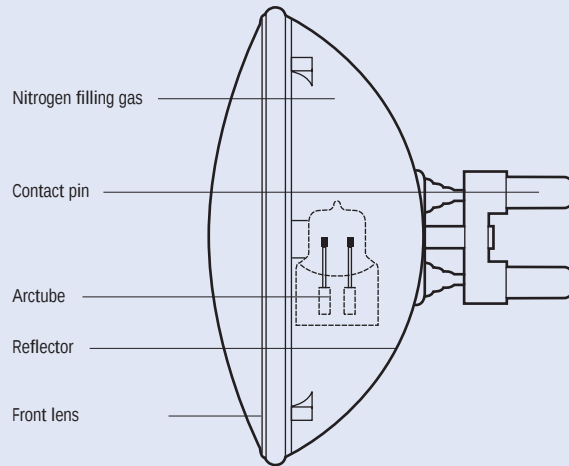
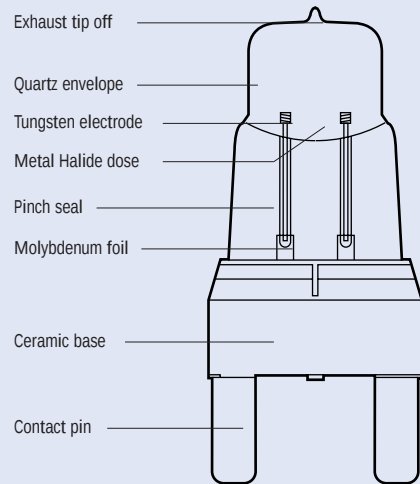
High efficiency compact arc cold start metal halide lamps.

CSR HR

High efficiency compact arc hot start metal halide lamps.

CSD

Long life compact arc metal halide lamps with high colour temperature.



Operating Temperature of Discharge Studio Lamps

The following maximum and minimum temperatures are suggested for optimum life. Operation outside of these figures will not necessarily cause immediate failure but will effect life adversely to an increasing extent.

Cap/bulb interface capsule lamps - 450° maximum

Above this figure the sealing foil oxidises at a rate increasing with temperature and is frequently the cause of short life due to seal failure.

Bulb

capsule lamps 700° - 1000°C

sealed beam lamps 150° - 400°C

Above 1000°C, quartz may devitrify, which will cause the arc tube to leak, loss of dose will cause the arc tube to operate below the minimum temperature, the metal halides will not vaporise as required, and lamp performance will be impaired.

Pins - 350°C maximum

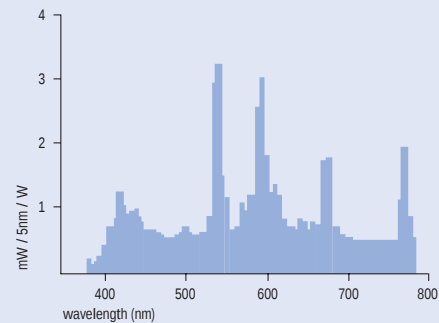
Above this figure the plating on the pins may lose adhesion and the contact will deteriorate. Such deterioration may form local hot spots which rapidly worsen and may result in arcing and irreparable damage to both lamp and holder. Should signs of this be evident on removal of a failed lamp, it is important that a good contact is restored by replacing the lampholder before the next lamp is fitted, otherwise the new lamp will rapidly fail in a similar manner.

N.B. For sealed beam lamps - to ensure that the above conditions are met, it is important that the lamp does not operate above 400°C even in an enclosed fitting.

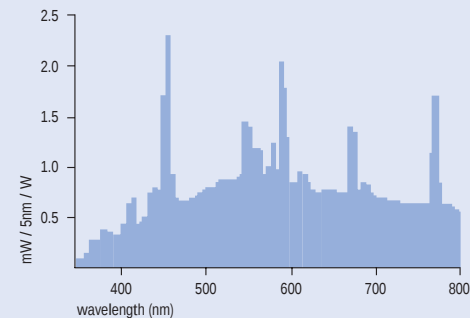
Fusing of Discharge Studio and Theatre Lamps

A quick acting high breaking capacity fuse must be connected in the supply line in all applications. Suitable types are given in BS88 (IEC 60269), IEC 60127 or IEC 60241. See page 111 for suitable fuse ratings.

Spectral distribution of luminous flux (lumens) for CSI discharge lamps



Spectral distribution of luminous flux (lumens) for CID discharge lamps



Index

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
PAR lamps by order code								
25PAR36	7				•			
25PAR36/NSP	7				•			
25PAR36/WFL	7				•			
25PAR36/VWFL	7				•			
50PAR36/VNSP	7				•			
50PAR36/NSP	7				•			
50PAR36/WFL	7				•			
50PAR36/VWFL	7				•			
50PAR36/WFL/H	7				•			
150PAR46/3MFL	10				•			
200PAR46/3MFL	10				•			
120PAR56/VNSP	11				•			
120PAR56/MFL	11				•			
120PAR56/WFL	11				•			
200PAR	11				•			
240PAR56/VNSP	11				•			
240PAR56/MFL	11				•			
240PAR56/WFL	11				•			

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
300PAR56/NSP	12				•			
300PAR56/MFL	12				•			
300PAR56/WFL	12				•			
500PAR64/NSP	17				•			
500PAR64/MFL	17				•			
Q500PAR56/NSP	12					•		
Q500PAR56/MFL	12					•		
Q500PAR56/WFL	12					•		
Q500PAR64/VNSP	15					•		
Q500PAR64/NSP	15					•		
Q500PAR64/MFL	15					•		
500PAR64/WFL	15					•		
500PAR64/MFL	15					•		
Q1000PAR64/NSP	17						•	
Q1000PAR64/MFL	17						•	
Q1000PAR64/VNSP	17						•	
DWE	8						•	
EXC	15					•		
EXD	15					•		

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
EXE	15					•		
EXG	15					•		
FBE	8				•	•		
FBO	8		•			•		
FCX	6				•	•		
FCW	9				•	•		
FFN	17		•	•	•	•		
FFP	17		•	•	•	•		
FFR	17		•	•	•	•		
FFS	17		•	•	•	•		
FGN	17		•			•		
4405	7				•			
4435	9				•			
4502	7				•			
4505	7				•			
4509	7				•			
4509X	7				•			
4511	7				•			
4515	7				•			

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
H4515	7				•			
4516	7				•			
4531	9				•			
4535	9				•			
4537	7				•			
4537-2	9				•			
4545	11				•			
4546	7				•			
4547	7				•			
4551	9				•			
4552	13				•			
4553	9				•			
Q4554	9				•			
4559	13				•			
Q4559	13				•			
Q4559X	13				•			
4570	9				•			
4571	9				•			
4572	9				•			

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
4580	9				•			
4581	9				•			
4587	8				•			
4591	7				•			
4593	8				•			
4594	8				•			
4595	7				•			
4596	8				•			
4626	8				•			
4627	8				•			
4635	9				•			
Q4597	9				•			
Q4681	9				•			
H7604	7				•			
H7616	7				•			
H7635	9				•			

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
Theatre lamps by LIF code								
T11	25			•				
T12	25			•				
T13	29			•				
T14	29			•				
T15	29			•				
T16	35			•				
T17	28			•				
T18	23			•				
T19	25			•				
T25	23			•				
T26	23			•				
T27	23			•				
T28	28			•				
T29	25			•				
OC1200	27			•				

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
TV Film & Studio lamps by LIF code								
CP23	25					•		
CP24	25					•		
CP29	31					•		
CP30	33					•		
CP32	33					•		
CP39	27			•		•		
CP40	27			•		•		
CP41	31			•		•		
CP43	26					•		
CP51	29					•		
CP52	29					•		
CP53	35					•		
CP58	33					•		
CP59	34					•		
CP60	15			•	•	•		
CP61	15			•	•	•		
CP62	15			•	•	•		
CP70	25					•		

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
CP77	21			•				
CP79	26					•		
CP81	22		•			•		
CP82	22		•			•		
CP83	31					•		
CP86	15			•	•	•		
CP87	15			•	•	•		
CP88	15			•	•	•		
CP89	23					•		
CP90	25					•		
CP91	27					•		
CP92	27					•		
CP93	27					•		
CP94	31					•		
CP95	15			•	•	•		
CP105	33					•		
HX48	31					•		
HX270	31					•		
HX800	21			•				

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
GX38 12K	32					•	•	
GX38 20K	32					•	•	
GX38 24K	32					•	•	
High Performance Lamps								
HPL575	20			•				
HPL575-C	20			•				
HPL575-XLL	20			•				
HPL575-XLL-C	20			•				
HPL750	20			•				
HPL750-C	20			•				
HPL750-XLL	20			•				
Theatre TV Film & Studio lamps by ANSI code								
BTM	28					•	•	
CYX	31			•		•		
DKX/DSF	33					•		
DKZ/DSE	33					•		
DPY	31					•		

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
DTA	34			•				
DWE	8		•		•			
EGE	28			•				
EGJ	29			•				
EGN	27					•		
EGT	27					•		
EHD	21					•		
EHF	21					•		
EHG	21			•				
EWE	29					•		
FBE	8	•				•		
FBO	8		•			•		
FCX	6		•		•	•		
FCW	9		•		•	•		
FEL	21		•	•		•		
FEP	21		•	•		•		
FFN	17		•	•	•	•		
FFP	17		•	•	•	•		
FFR	17		•	•	•	•		

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
FFS	17		•	•	•	•		
FGN	17			•		•		
FKB	29			•				
FKD	29			•				
FKE	29			•				
FKF	28			•				
FKH	27					•		
FKJ	27					•		
FKK	31					•		
FKM	29					•		
FKN	29					•		
FKR	21			•				
FKW	22					•		
FLK	21			•				
FLK/LL	21			•				
FMR	23			•				
FRE	23			•				
FRG	22					•		
FRH	22					•		

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
FRJ	22					•		
FRK	23					•		
FRL	23					•		
FRM	23					•		
FSK	22					•		
FSL	22					•		
FTL	26			•		•		
FTM	26			•		•		
FVA	25					•		
FVB	25					•		
FWP	25			•				
FWR	25			•				
FWS	25			•				
FWT	25			•				
GCS	23			•				
GCT	23			•				
GCV	23			•				
GCW	23			•				
GKV	21			•				

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
GKV/LL	21			•				
Linear TV & Studio lamps by LIF code								
P2/6	38		•			•		
P2/7	42		•			•		
P2/10	42		•			•		
P2/11	40		•			•		
P2/12	42		•			•		
P2/13	38		•			•		
P2/27	41		•			•		
P2/28	40		•			•		
Linear TV Film & Studio lamps by ANSI code								
DXW	39					•		
DXX	38					•		
EHM	40					•		
EKM	42					•		
EJG	40					•		
EME	40					•		

Lamp type

page

EMF	40
FAD	38
FBY	39
FCL	40
FCM	40
FEX	41
FEY	41

Single Ended Hot restrike

CSR 12S/SE/HR	64
CSR 200/SE/HR	64
CSR 575/SE/HR	64
CSR 1200/SE/HR	64
CSR 2500/SE/HR	64
CSR 4000/SE/HR	64
CSR 6000/SE/HR	64
CSR 12000/SE/HR	64

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
Single Ended Cold Start								
CSD 250/2 SE	65				•	•		
CSR 575/2	65				•	•		
CSR 700/2	65				•	•		
CSR 1200/2	65				•	•		
Double Ended Hot restrike								
CSR 200/DE	65					•		
CSR 575/DE	65					•		
CSR 1200S/DE	65					•		
CSR 1200/DE	65					•		
CSR 2500/DE	65					•		
CSR 4000/DE	65					•		
CSR 6000/DE	65					•		
CSR 12000/DE	65					•		
CSR 18000/DE	65					•		
CSR 18000S/DE	65					•		

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
CMH								
SINGLE ENDED MINIS	66				•		•	
SINGLE ENDED	66				•		•	
PAR	67				•		•	
DOUBLE ENDED	67				•		•	
ELLIPTICAL CLEAR	68				•		•	
ELLIPTICAL DIFFUSE	68				•		•	
TUBULAR CLEAR	68				•		•	
Discharge lamps								
CSI								
99-0201	70						•	
99-0221	71						•	
99-1222	71						•	
99-1422	71						•	
CID								
99-0211	72						•	
99-0222	73						•	

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
99-0415	73				•		•	
99-0431	74						•	
99-1225	75						•	
99-1425	75						•	
99-1435	75						•	
CSS								
150/850	69				•			
575/855	69				•			
Blacklight blue								
F20 T12/BLB	81				•			
F40 BLB	81				•			
Cinema Lamps								
BIAX-COMPACT FLUORESCENT	79					•	•	
LINEAR FLUORESCENT	79-81					•	•	

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
Specialist Projector lamps by LIF code								
A1/215	47	•	•		•			
A1/216	47	•	•	•	•			
A1/220	47	•						
A1/223	47	•	•	•				
A1/226	52	•						
A1/227	52	•						
A1/229	53	•						
A1/230	53	•						
A1/231	54	•						
A1/232	54	•						
A1/233	47	•					•	
A1/234	47	•	•					
A1/239	47	•			•			
A1/241	49	•						
A1/244	48	•	•		•	•		
A1/245	48	•						
A1/247	48	•						
A1/248	48	•			•			

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
EJV	55			•				
EJY	55			•				
EKE	54			•				
EKX	54		•					
EKZ	53		•					
ELB	55			•				
ELC	54	•		•	•			
ELC 500	54				•			
ELD/EJN	54			•				
ELH	54			•	•			
ELS/ELR	60		•	•				
EML	47	•						
EMM/EKS	60	•		•				
ENG	54	•		•				
ENH	54			•	•			
ENL	57			•				
ENW/ENC	57	•		•				
ENX	57	•	•					
EPS	49	•						

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
EPT	57			•				
EPV	57		•					
EPW	57		•					
EPX	57		•					
EPZ	57		•					
ERV	57		•					
ESA	50			•				
ESB	50			•				
ESD	57	•						
EVA	50	•						
EVD	47	•			•			
EVV	47			•				
EVW	57			•				
EWf	57		•					
EWR	47			•				
EXL	47			•				
EXR	59	•	•	•				
EXW	59	•	•	•				
EXX	57	•		•				

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
EXY	59	•	•	•				
EYA	57			•				
EZF/EZJ	59			•				
EZK	57			•				
EZM	61			•				
EZT	61			•				
FAL	52	•						
FCR	47	•						
FCS	47	•						
FDT	47	•	•					
FFJ	47			•				
FHS	59	•	•	•				
FHX	57			•				
FLS	58		•					
FLT	58		•					
FLW	47					•		
FML	57	•						
FNT	47		•					
FXL	57	•						

Lamp type	page	Audio visual	Micrographic	Photographic	Theatre / Stage	Disco	TV / Film / Studio	Outside Broadcast
M28	50	•		•				
M29	50	•		•				
M30	50	•		•				
M32	50	•		•				
M33	50	•		•				
M36	50	•		•				
M38	51				•			
M40	51				•			