

# LAMPS INCANDESCENT

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CI/SIB	(63.9)
UDC	696.6:628.94

## GLS

### General lighting service Incandescent lamps

A range of tungsten filament lamps having the advantages of instant light, low installation cost and warmth of colour tone.

#### RANGE

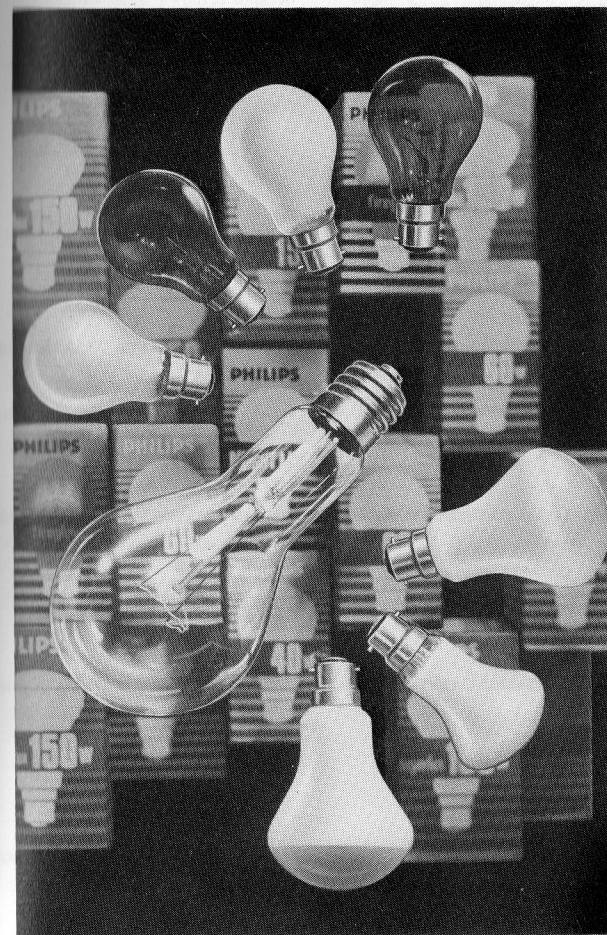
This Data Sheet covers pear-shaped lamps in clear, pearl, coiled-coil, single-coil and low-voltage versions, K-Mushroom, Superlux, Fireglow and Nightlight lamps.

#### APPLICATIONS

- Clear bulbs: Used to create sparkle in glass fittings, etc.
- Pearl bulbs: Lightly diffused to reduce filament glare and to soften shadows.
- Argenta bulbs: White internal coating to give a high degree of diffusion and reduced glare. Gives a soothing, restful light.

#### FEATURES

- **Quality:** Stringent quality control procedures and meticulous attention to cleanliness result in a high degree of uniformity to specification.
- **Safety:** Test and inspection procedures are geared to the safety of lamps in service. All GLS lamps of 25 Watts or greater, rated for supply voltages of 100V or more, are internally fused.



Handbook Ref.

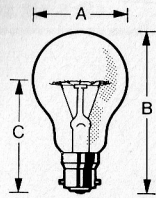
**5.1.1**

To reorder this data sheet quote

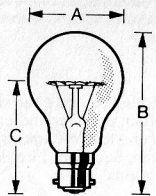
PL1789

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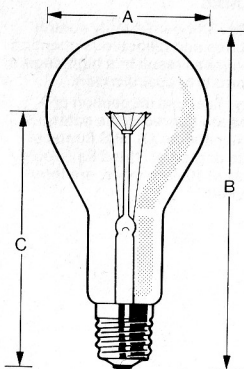
New



GLS Coiled Coil



GLS Single Coil



GES Single Coil

### GLS Coiled-coil

Rating	Dimensions (mm)		
	A	B	C
25W-100W	60	103	70
150W	68	125	90

### GLS Coiled-coil - high efficiency

For general use, with more light output than single-coil and long life equivalents.

### GLS Single-coil

Rating	Dimensions (mm)		
	A	B	C
15W-100W	60	103	70
150W, 200W	80	160	120
300W, 500W	110	233	178
1000W	130	290	225

### GLS Single-coil - normal efficiency

A range of high and low wattage and low voltage types, for use where the benefits of coiled-coil filaments are not applicable.

### K-Mushroom

Rating	Dimensions (mm)	
	A	B
40W-100W	60	100
150W	75	120

**K-Mushroom** - Modern, attractive, compact shape with internal white 'Argenta' finish for maximum diffusion. Gives a softer light and looks neater and more modern when not in use. Coiled-coil filaments. Smaller box sizes.

### Superlux

Rating	Dimensions (mm)	
	A	B
60W-100W	60	100
150W	75	120

**Superlux** - Directional mushroom lamp giving a diffused wide (2 x 35%) downward beam while retaining some upward light. A useful working light and possible economical alternative to wide beam reflector lamps.

### Fireglow

Rating	Dimensions (mm)	
	A	B
60W	60	103

**Fireglow** - A durable red lacquer creates a warm, glowing flame effect for use in fuel effect fires.

### Night light

Rating	Dimensions (mm)	
	A	B
8W	60	103

**Night light** - Gives a sense of security to children and elderly people when used in bedrooms, nurseries, stairways and hospitals. Has a low power consumption for economy.

Wattage	Voltage	Cap	Finish	Packing quantity
25W	240V, 250V	BC	Pearl	25
40W	240V	BC/ES†	Pearl, clear	25, 10 x 10*
40W	250V	BC	Pearl, clear	25, 10 x 10*
40W	220/230V	BC	Pearl	25
60W	240V	BC/ES	Pearl, clear	25, 10 x 10*
60W	250V	BC/ES†	Pearl/clear	25
60W	220/230V	BC	Pearl	25
75W	240V	BC/ES	Pearl	25
75W	250V	BC	Pearl	25
100W	240V	BC/ES	Pearl, clear	25, 10 x 10*
100W	250V	BC/ES†	Pearl, clear	25, 10 x 10*
150W	240V, 250V	BC/ES	Pearl, clear	25, 10 x 10*
150W	250V	BC†/ES	Pearl, clear	25

† Pearl only \* Pearl with BC only

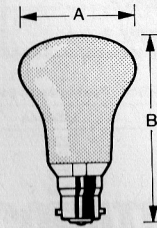
Wattage	Voltage	Cap	Finish	Packing quantity
15W	240V, 250V	BC	Pearl	25
300W	240V, 250V	BC/ES	Pearl, clear	25
300W	240V, 250V	GES	Clear	10
800W	240V, 250V	GES	Clear	10
1000W	240V, 250V	GES	Clear	10
<b>110V lamps</b>				
40W	110V	BC	Pearl	25
60W	110V	BC/ES	Pearl	25
100W	110V	BC/ES	Pearl	25
150W	110V	BC/ES	Pearl	25
300W	110V	BC/ES	Pearl	25
300W	110V	GES	Clear	10
800W	110V	GES	Clear	10
1000W	110V	GES	Clear	10
<b>25V and 50V lamps for emergency lighting</b>				
25W	25V, 50V	BC/ES	Pearl	25
40W	25V, 50V	BC/ES	Pearl	25
60W	25V, 50V	BC/ES	Pearl	25
100W	25V, 50V	BC	Pearl	25
100W	25V	ES	Pearl	25

Wattage	Voltage	Cap	Finish	Packing quantity
40W	240/250V	BC	Argenta	25, 10 x 10
60W	240/250V	BC	Argenta	25, 10 x 10
100W	240/250V	BC	Argenta	25, 10 x 10
150W	240/250V	BC	Argenta	25, 10 x 10

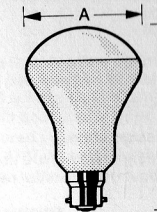
Wattage	Voltage	Cap	Finish	Packing quantity
60W	240/250V	BC	Argenta	25
100W	240/250V	BC	Argenta	25
150W	240/250V	BC	Argenta	25

Wattage	Voltage	Cap	Finish	Packing quantity
60W	240/250V	BC, 3-pin BC	Amber	10 x 10

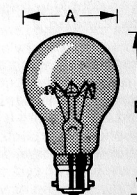
Wattage	Voltage	Cap	Finish	Packing quantity
8W	240/250V	BC	Pearl	10 x 10



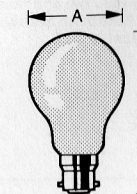
K. Mushroom



Superlux



Fireglow



Night Light

Dimensions are nominal and for BC caps. For ES caps add 1.5mm to dimension B.

**PERFORMANCE DATA**

For General Lighting Service tungsten filament lamps.

**Lumen output**

Initial rated lumens to BS 161

**High efficiency. Pear-shaped 240V**

Watts	Lumens
25	225
40	420
60	710
75	940
100	1360
150	2180

**Normal efficiency. Pear-shaped**

240V		110V	
Watts	Lumens	Watts	Lumens
15	115	25	225
200	2900	40	445
300	4650	60	770
500	8300	100	1420
1000	18400	150	2360
		200	3300
		300	5200
		500	9400
		1000	20200

**Lighting design notes**

Lighting design lumens are usually taken at about 94% of initial rated lumens.

End of life lumens are typically 90% of initial rated lumens.

**Effect of supply voltage on performance**

The life expectancy and light output of tungsten filament lamps are highly dependent on supply voltage, as shown in fig. 1 and fig. 2.

These curves may be used as a guide to average performance, but factors such as frequency of switching, vibration and temperature exert a greater influence on expected results as voltage deviates further from normal.

GLS lamps may be operated in any position, but life expectancy may be reduced in positions other than cap-up.

**SPECIFICATION**

GLS lamps are designed to conform with BS 161 (IEC 64) and related British and European Standards where applicable.

Figure 1

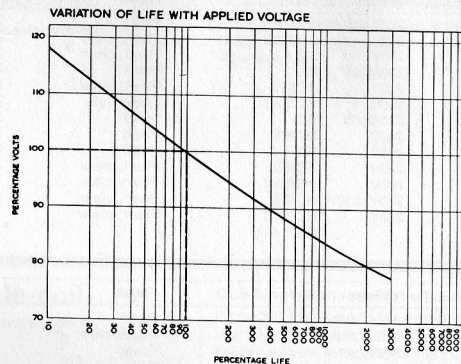
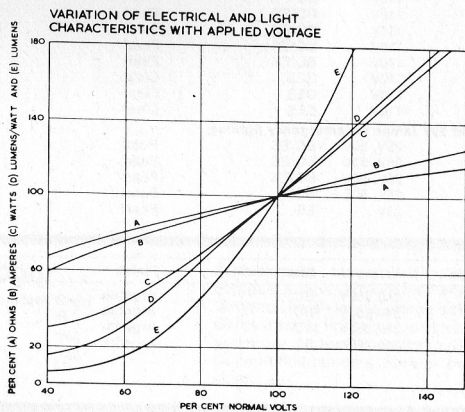


Figure 2



Made in Great Britain.

CI/SIB	(63.9)
UDC	696.6:628.94

**DECORATIVE incandescent lamps**

A range of tungsten filament lamps for use on normal mains supplies, for effect or decorative lighting.

**RANGE**

This Data Sheet covers internally-coloured pear-shaped GLS lamps, plain and twisted candle lamps, round bulb and tubular types.

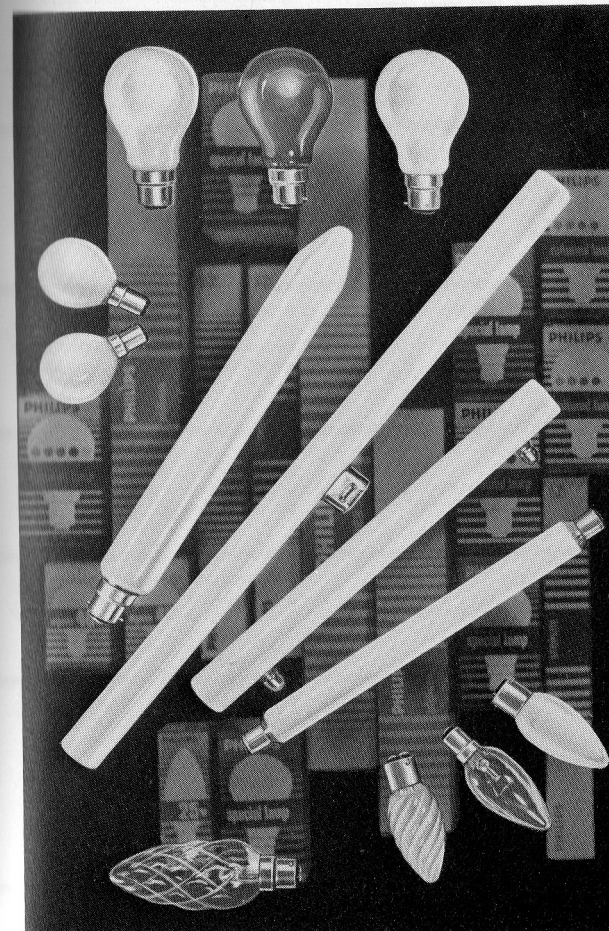
For Coloured pygmy lamps see data sheet PL 1787, Special Service Lamps.

**APPLICATIONS**

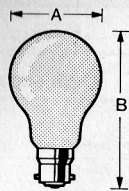
- Clear bulbs: Used to create sparkle in glass fittings, chandeliers, etc.
- Pearl bulbs: Lightly diffused to reduce glare and filament images, and to soften shadows.
- Argenta bulbs: White internal coating to give a high degree of diffusion and reduced glare, having an attractive appearance when switched off.
- Argenta rose: Pink tone for restful warmth.

**FEATURES**

- **Quality:** Stringent quality control procedures and meticulous attention to cleanliness result in a high degree of uniformity to specification.
- **Safety:** Test and inspection procedures are geared to the safety of lamps in service.



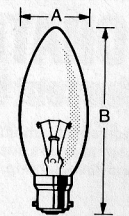
Handbook Ref.	<b>5.12</b>
To reorder this data sheet quote	1.78 PL 1788
Replaces	PL 6123/2



**Coloured GLS - Argenta Rose**

Rating	Dimensions (mm)	
	A	B
15W-100W	60	103

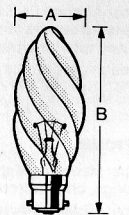
**Coloured GLS** - Lamps for mood lighting and parties available in six standard colours: Red, Blue, Green, Yellow, Amber, and Pink. White is available in 15W and 25W ratings only. 15W and 25W ratings can be used outdoors with weatherproof lampholders.



**Plain Candle**

Rating	Dimensions (mm)			
	A	B	B	B
25W, 40W	35	89	95.5	97
	(BC) (SBC) (SES)			
60W	45	125	127	—

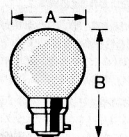
**Plain Candle** - Attractive, slim olive shape in clear, pearl and White Argenta. Clear candles are frequently used in glass chandeliers to create sparkle. All types have coiled-coil filaments for improved light output.



**Twisted Candle**

Rating	Dimensions (mm)		
	A	B	B
25W	35	97	100
	(BC) (SBC)		
40W, 60W	47	125	127

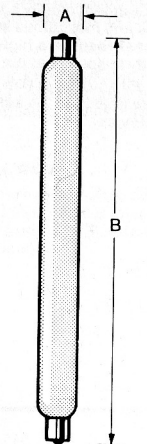
**Twisted Candle** - Decorative, slim twisted shape in clear or pearl; an alternative to the plain candle lamp.



**Argenta Lustre**

Rating	Dimensions (mm)			
	A	B	B	B
25W, 40W	45	68.5	73.5	70
	(BC) (SBC) (ES) (SES)			

**Argenta Lustre** - A small, round bulb with an internal white Argenta coating, frequently used where the bulb itself forms part of the design of the fitting.



**Striplite**

Rating	Dimensions (mm)	
	A	B
30W, 60W	25	221 or 284

**Striplite** - Double cap, clear or opal, in two lengths. Useful for concealed lighting or for low glare (opal), over mirrors, bedheads, aquaria, etc.

Rating	Dimensions (mm)	
	A	B
60W	38	303

**Colorenta** - Single cap, inside white, giving a uniform soft, diffuse light over the whole lamp.

Rating	Dimensions (mm)	
	A	B
35W	30	305 (12")
53W	30	457 (18")
60W	30	500 (20")
75W	30	610 (24")
110W	30	915 (36")
150W	30	1220 (48")

**Philinea 1** - Architectural Straight lamp with concealed peg fixings, in several lengths, with similar surface brightness. Opal White finish.

Rating	Dimensions (mm)	
	A	B
60W	30	500 (20")

**Philinea 2** - Architectural Straight lamp with single central concealed peg cap. Opal finish.

Dimensions are nominal

Wattage	Voltage	Cap	Finish	Packing quantity
<b>Coloured GLS</b>				
15W	240/250V	BC	Internally coloured	10 x 10
25W	240/250V	BC	Internally coloured	10 x 10
40W*	240/250V	BC	Internally coloured	10 x 10
60W*	240/250V	BC	Internally coloured	10 x 10
100W*	240/250V	BC	Internally coloured	10 x 10

Wattage	Voltage	Cap	Finish	Packing quantity
<b>Argenta rose</b>				
60W	240/250V	BC	Argenta	25
100W	240/250V	BC	Argenta	25

\*Not suitable for outdoor use unless protected against rain.

Wattage	Voltage	Cap	Finish	Packing quantity
<b>Plain candle</b>				
25W	240/250V	BC, SBC	Clear, pearl	50 (5 x 10)
40W	240/250V	BC, SBC	Clear, pearl	50 (5 x 10)
60W	240/250V	BC, SBC	Clear, pearl	50 (5 x 10)
<b>Argenta candle</b>				
25W	240/250V	BC, SBC, SES	Argenta	50 (5 x 10)
40W	240/250V	BC, SBC, SES	Argenta	50 (5 x 10)
60W	240/250V	BC, SBC	Argenta	50 (5 x 10)

Wattage	Voltage	Cap	Finish	Packing quantity
25W	240/250V	BC, SBC	Clear, pearl	50 (5 x 10)
40W	240/250V	BC, SBC	Clear, pearl	50 (5 x 10)
60W	240/250V	BC, SBC	Clear, pearl	50 (5 x 10)

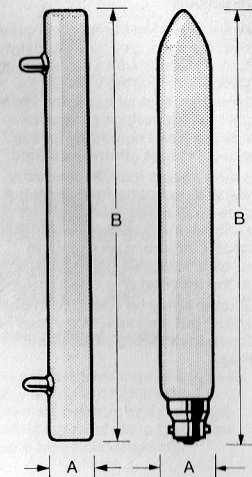
Wattage	Voltage	Cap	Finish	Packing quantity
25W	240/250V	BC, SBC, ES, SES	Argenta	50 (5 x 10)
40W	240/250V	BC, SBC, ES, SES	Argenta	50 (5 x 10)

Wattage	Voltage	Cap	Finish	Packing quantity
30W	240/250V	S15s	Clear, opal	25
60W	240/250V	S15s	Clear, opal	25

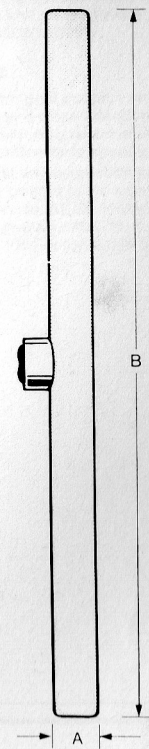
Wattage	Voltage	Cap	Finish	Packing quantity
60W	240/250V	BC	Argenta	25

Wattage	Voltage	Cap	Finish	Packing quantity
35W	240/250V	Peg	Opal	25
53W	240/250V	Peg	Opal	18
60W	240/250V	Peg	Opal	25
75W	240/250V	Peg	Opal	18
110W	240/250V	Peg	Opal	6
150W	240/250V	Peg	Opal	6

Wattage	Voltage	Cap	Finish	Packing quantity
60W	240/250V	Central Peg S14d	Opal	25



**Philinea 1 Colorenta**



**Philinea 2**

**Effect of supply voltage on performance**

In common with all tungsten filament lamps, the life expectancy and light output of decorative lamps are highly dependent on supply voltage. To reduce the effect on expected life of higher supply voltages, decorative lamps are rated nominally for 245V supplies, unless otherwise stated.

The data shown may be used as a guide to average performance, but factors such as frequency of switching, vibration and temperature exert a greater influence on expected results as voltage deviates further from the nominal.

GLS lamps may be operated in any position, but life expectancy may be reduced in positions other than cap-up.

**PERFORMANCE DATA for Tungsten Filament Decorative Lamps**

Figure 1

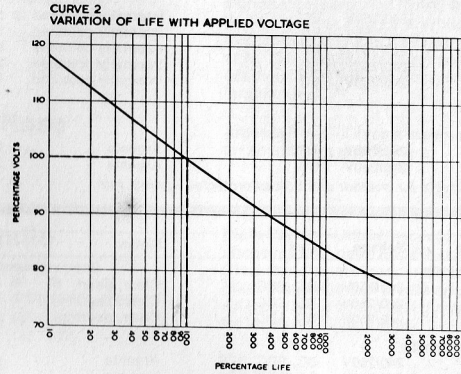
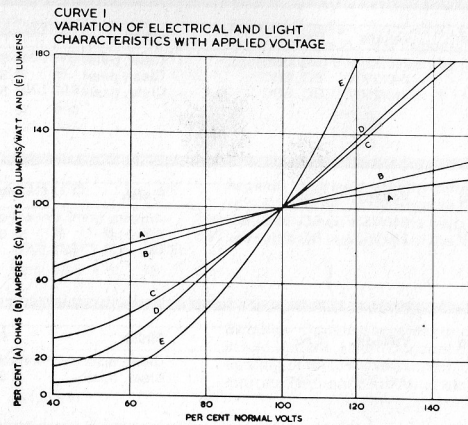
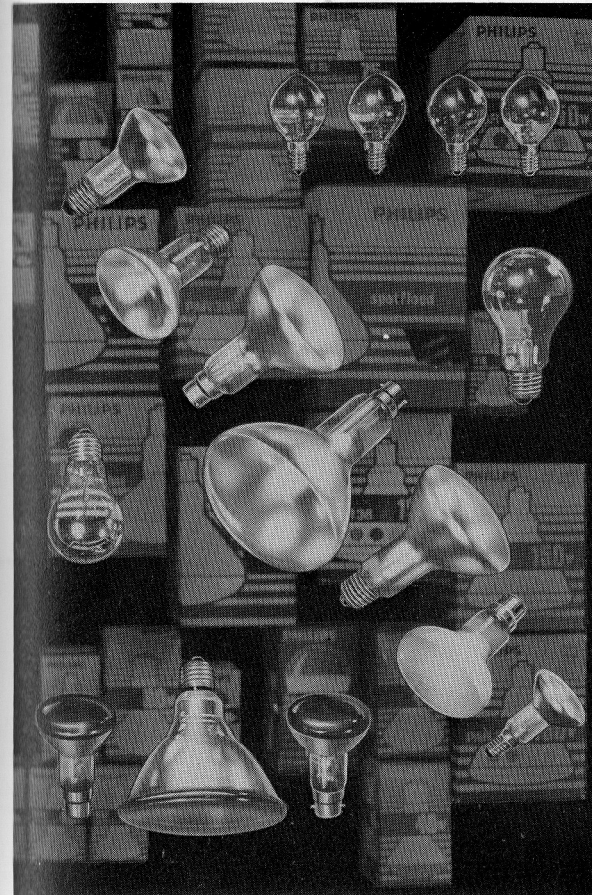


Figure 2



Lamps: Made in UK unless otherwise stated on packaging.



CI/SIB	(63.2)
UDC	696.6:628.976

# DISPLAY LAMPS

## Incandescent lamps

A comprehensive range of lamps for display and effect lighting in commerce, industry and the home, including pressed glass types also suitable for exterior lighting.

### RANGE

This Data Sheet covers internally silvered reflector lamps rated from 40W to 300W in various beam widths and colours and crown silvered lamps from 40W to 100W.

### FEATURES

- **Quality:** Stringent quality control procedures and close attention to filament positioning result in a high degree of uniformity to specification.
- **Safety:** Test and inspection procedures are geared to the safety of lamps in service. All GLS lamps of 25 Watts or greater, rated for supply voltages of 100V or more, are internally fused.

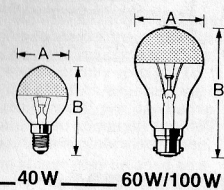
Handbook Ref.

**5.1.4**

To reorder this data sheet quote 6.78 PL1790

Replaces NEW

### Crown Silvered



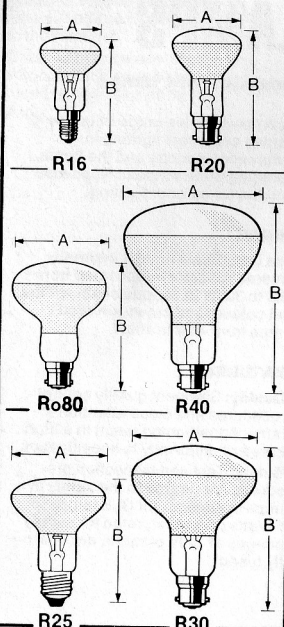
Rating	Dimensions (mm)			
	A	B	B (BC)	B (SES)
40W	45	—	—	77.5
60W	60	103	104.5	—
100W	68	120	121.5	—

### Crown Silvered - bowl reflector

Principal use is in conjunction with reflector dishes to give a glare-free narrow beam of high intensity for accent display work.

New 40W shape:- The distinctive 'pointed' reflectorised crown gives a brighter and more homogenous beam from parabolic dishes by directing more light onto the dish. Cap temperature rise is also reduced.

### Internally Silvered



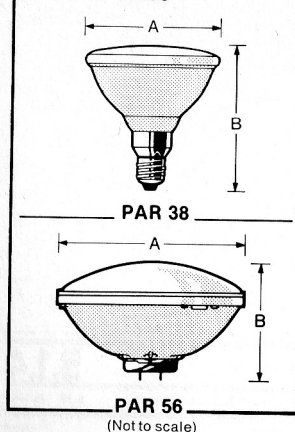
Rating	Dimensions (mm)			
	A	B (BC)	B (ES)	B (SES)
R16 (40W)	50	—	—	84
R20 (40, 60W)	63.5	99	100.5	—
Ro80 (60W)	80	110	111.5	—
R25 (75, 100W)	80	—	111.5	—
R30 (75, 100W)	95	137	138.5	—
R40 (150W)	125	176.5	178	—

### Internally Silvered-blown bulb reflector

A comprehensive range from narrow spot to wide flood in various voltages to suit every application. Recent introductions are the small R16, and the R25 narrow spot alternative to the Ro80. R30 colours include amber and pink in addition to the standard colour range.

For applications such as display, exhibition, task and reading lighting, and indoor spotlighting. Especially effective in Philips display lighting fittings.

### Pressed Glass



Rating	Dimensions (mm)	
	A	B
PAR 38 (100, 150W)	122 max	136 max
PAR 56 (300W)	177.2 max	128 max

### Pressed Glass

Precision-made, efficient internally reflectorised lamps of robust construction to give high beam intensity with 2000 hours' nominal average life.

#### PAR38

Full range includes Colour and Cool Spot versions. 150W coloured lamps have stained glass for permanence of colour. All PAR 38 lamps except Cool Spot and 150W coloured lamps are suitable for unprotected outdoor applications in suitable fittings.

#### PAR56

Available in three beam widths with elliptical pattern of high intensity. Frequently used in high-mounted long-throw applications and in purpose-built fittings where it is located by means of the front rim. Protect from water splashes.

Description	Wattage	Voltage	Cap	Finish	Beam angle†	Beam centre intensity Candelas	Packing quantity
Bowl reflector	40W	240/250V	SES	Clear	—	—	20
Bowl reflector	60W	240/250V	BC, ES	Clear	—	—	25
Bowl reflector	100W	240/250V	BC, ES, 3-pin BC	Clear	—	—	25

Description	Wattage	Voltage	Cap	Finish	Beam angle†	Beam centre intensity Candelas	Packing quantity
R16 flood	40W	240V	SES	Diffused	40°	325cd	25
R20 flood	60W	240/250V	BC, ES	Diffused	32°	700cd	25
Ro80 wide flood	60W	240/250V	BC, ES	Diffused	70°	270cd	25
R25 spot	75W	240/250V	BC, ES	Diffused	22°	1350cd	25
R25 spot	100W	240/250V	BC, ES	Diffused	22°	2000cd	25
R30 flood	75W	240/250V	BC, ES	Diffused	35°	700cd	10
R30 flood	100W	240/250V	BC, ES	Diffused	35°	1000cd	10
R40 flood	150W	240/250V	BC, ES	Diffused	35°	2300cd	10
R40 narrow spot	150W	24V	ES	Diffused	10°	23000cd	9
R20 coloured flood	40W	240/250V	BC, ES	Red, blue green, yellow	—	—	12
R30 coloured flood	75W	240/250V	BC, ES	Red, blue green, yellow	—	—	10
R40 coloured flood	100W	240/250V	BC, ES	Red, blue, green, yellow, amber, pink	—	—	10

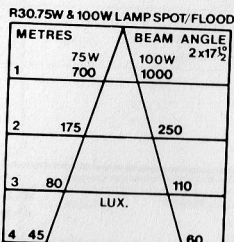
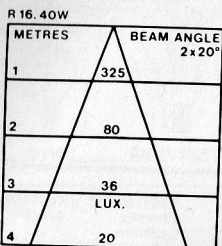
Description	Wattage	Voltage	Cap	Finish	Beam angle†	Beam centre intensity Candelas	Packing quantity
PAR38 spot	100W	240V	ES	Clear	16°	4000	15
PAR38 flood	100W	240V	ES	Clear	38°	1700	15
PAR38 narrow spot	150W	24V	ES	Clear	10°	25000	15
	150W	110V	ES	Clear	18°	9500	15
	150W	240V	ES	Clear	18°	7000	15
PAR38 flood	150W	110V	ES	Clear	38°	3400	15
	150W	240V	ES	Clear	38°	2750	15
PAR38 cool spot*	150W	240V	ES	Clear	18°	7000	15
PAR38 coloured flood	100W	240V	ES	Red, blue, yellow, green	36°	1700	15
PAR38 coloured spot	150W	240V	ES	Red, blue, yellow, green	18°	7000	15
PAR56 narrow spot	300W	240V	GLX16d	Clear	15° x 9°	40000	6
PAR56 medium flood	300W	240V	GLX16d	Clear	25° x 11°	22000	6
PAR56 wide flood	300W	240V	GLX16d	Clear	40° x 16°	9000	6

\* Dichroic reflector focusses visible light while permitting heat content to pass through. Heat content of beam is reduced by up to 75%. This lamp may only be used in special heat-resisting fittings.

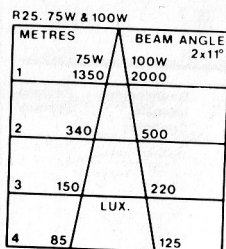
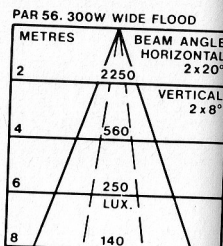
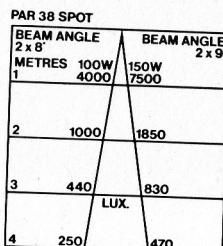
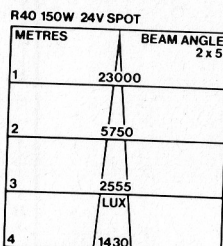
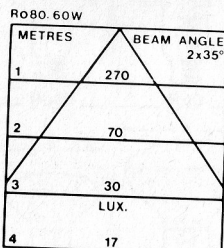
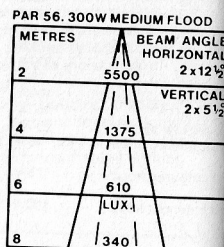
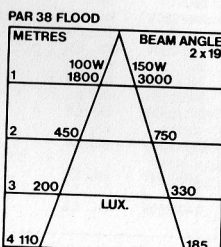
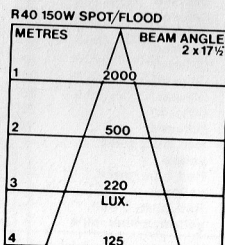
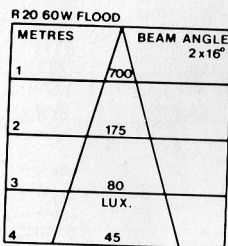
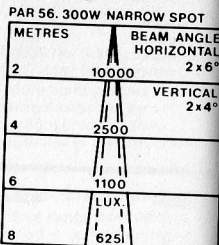
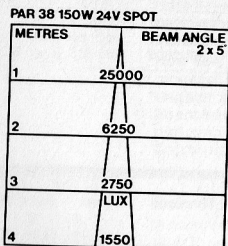
† Beam angle between 50% intensity values. Diagrams overlaid.

# BEAM ANGLE DATA

## Internally Silvered



## Pressed Glass



### Using the Guide

The beam cones are drawn at the angles where the light intensity is 50% of the centre intensity. PAR 56 lamps give an elliptical beam.

The 'Lux' is a measure of the illuminance on a surface (lumens per sq. metre), and the values given are at beam centre for the distances shown.

Lux is calculated by dividing intensity (candelas) by the distance squared (m<sup>2</sup>), for surfaces at 90° to the beam. Candela values are shown in the table. The I.E.S. interior Lighting Code recommends:

Shop display 500 Lux  
Desk Lighting 500 Lux  
Casual Reading 150 Lux

Made in UK unless otherwise stated on packaging

CI/SIB	(63.9)
UDC	696.6:628.94

# DISPLAY LAMPS

## Tungsten halogen

A range of single-ended and linear tungsten halogen lamps used in display lighting.

### RANGE

Single-ended lamps:

M28 - 12V 100W

M32 - 12V 50W

M44 - 6V 35W

Linear lamps:

K9 - 240/250V 300W

K1 - 240/250V 500W

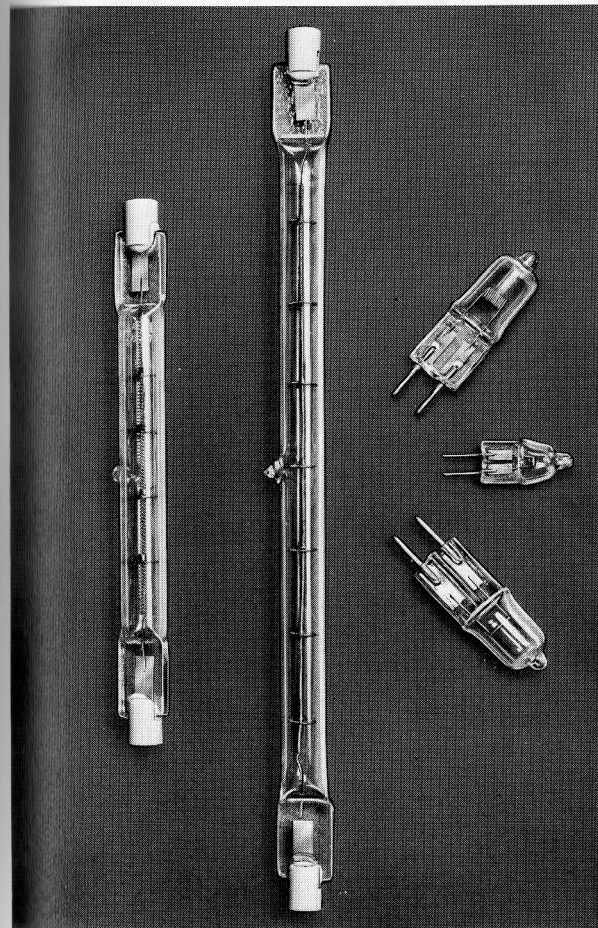
### APPLICATIONS

For use wherever a lamp of small size and well-maintained output is appropriate, such as in narrow-spot reflector fittings and in lightweight floodlights.

For details of other tungsten halogen lamps, see Data Sheets PL 1769, 1770 and 1811.

### FEATURES

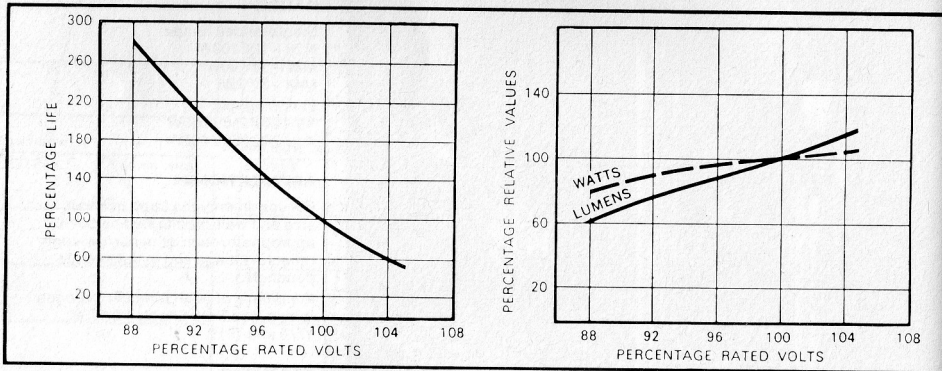
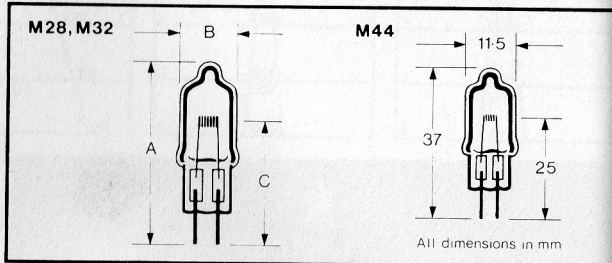
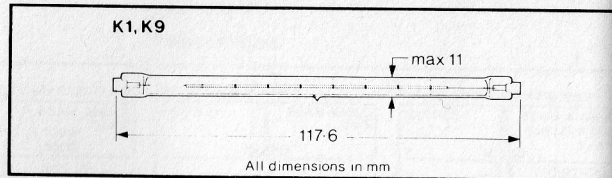
- Excellent colour rendering preserves the natural colours of the environment in which the lamps are used
- Small size permits use in modern, slim-line fittings
- Tungsten halogen regenerative cycle maintains constant light output throughout longer-than-average life
- Care in manufacture ensures accurate filament positioning for good optical control
- The pins of types M28 and M32 are specially finished for reliable electrical contact in long service life
- Instantaneous light after switch-on





### TUNGSTEN HALOGEN LAMP CHARACTERISTICS

The theoretical extended life obtained from the curves below is not always realised in practice, as many factors influence life considerably (vibration, handling, cleaning, frequency of switching, etc.). These curves are based on averages obtained from many lamps, and can only be used as an approximate guide to performance.



### DIMENSIONS & ELECTRICAL DATA

Catalogue No.	Wattage	Voltage	Cap	Dimensions (mm)		Light centre length C	Average Life (hours)	Light Output (lumens)	Burning position	Packing quantity
				Bulb diameter (max) A	Overall length (max) B					
M28 (Cat. No. 7724)	100W	12V	GY6.35	13.5	45	30 ± 0.25	2000	2250	Any	100
M32 (Cat. No. 13512)	50W	12V	GY6.35	12	44	30 ± 0.25	2000	900	Any	100
M44 (Cat. No. 6609)	35W	6V	G4	11.5	37	25 ± 0.25	2000	600	Any	200
K9 (Cat. No. 12113R)	300W	240/250V	R7s-15	11	117.6	—	2000	5100	Horiz. ± 4	12, 72
K1 (Cat. No. 7785R)	500W	240/250V	R7s-15	11	117.6	—	2000	8500	Horiz. ± 4	12, 72

#### Important Notes:

**HANDLING:** If the quartz bulb has been handled, it should be cleaned with a solvent such as methylated spirit to remove all traces of grease before lighting.

**SEAL TEMPERATURE:** Precautions must be taken to ensure that the temperature of the quartz-metal seal does not exceed 350°C, though the bulb temperature must be greater than 250°C and less than 900°C.

### ORDERING DATA

Please order lamps in the form given in the following example, in multiples of the packing quantity:-  
200 Philips tungsten halogen lamps 12V 50W Cat. No. 13512.

Made in Holland.

CI/SIB	(63.9)
UDC	626.6:628.94

## HEAT LAMPS

### Blown bulb internal reflector types

Tungsten filament heat lamps for directional short-wave infra-red heating purposes.

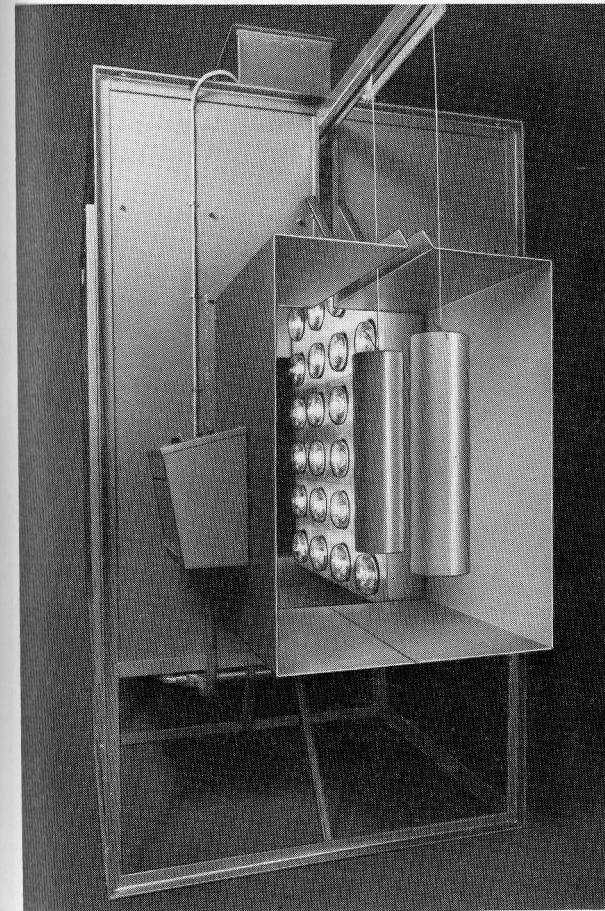
#### RANGE

IR250WS – 250W rating, normal glass, frosted finish (Industrial use only).  
IR300WCH, IR300WRH – 300W rating, hard glass, clear or red finish.  
IR375WCH – 375W rating, hard glass, clear finish.

Available to special order only:-  
IR150WS – 150W rating, normal glass, frosted finish (Industrial use only).  
IR150WRS – 150W rating, normal glass, red finish (Industrial use only).

#### APPLICATIONS

- Livestock rearing
- Personnel comfort
- Entrance canopies, to provide light and warmth
- Low-intensity process heating
- Paint drying and curing
- Pre-heating



Handbook Ref.

5.1.6

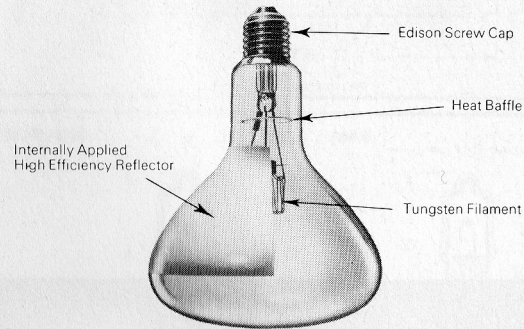
To reorder this Data Sheet quote PL 1805

Replaces PL 8988

## FEATURES

- Highly efficient conversion of electrical energy into radiant heat.
- Instant response – no warm-up or cool-down delay.
- High-efficiency parabolic reflector internally applied to bulb maintains installation efficiency.
- 5000 hours' average life expectancy.
- Hard glass versions resist thermal shock due to splashing and are therefore suitable for all applications.
- Frosted lamp gives diffused light and heat output; particularly suitable for livestock rearing.
- Red lamp reduces visible light without affecting heat output; is suitable for livestock rearing and open-sided process heating ovens.

## Construction of Philips Heat Lamp



## PROCESS HEATING APPLICATION NOTES

### General

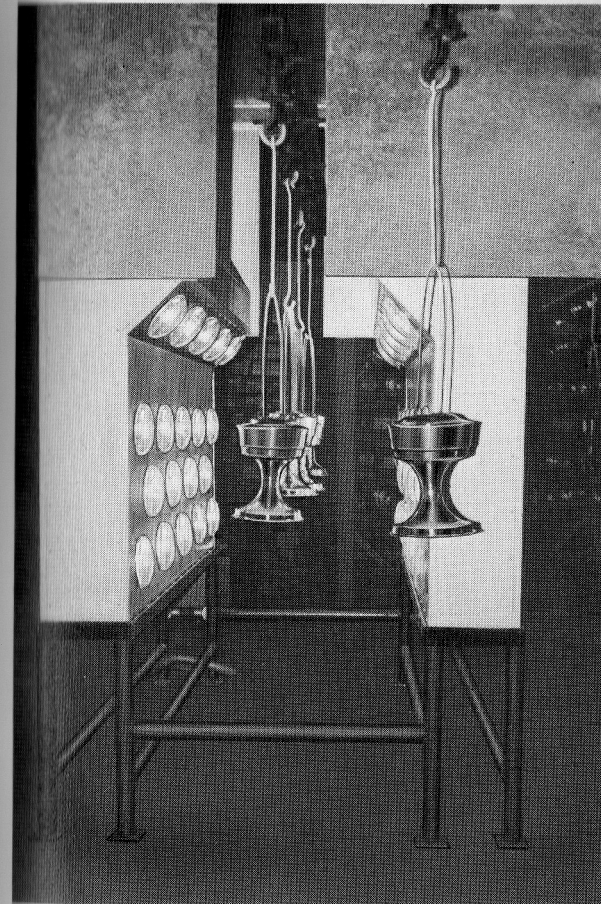
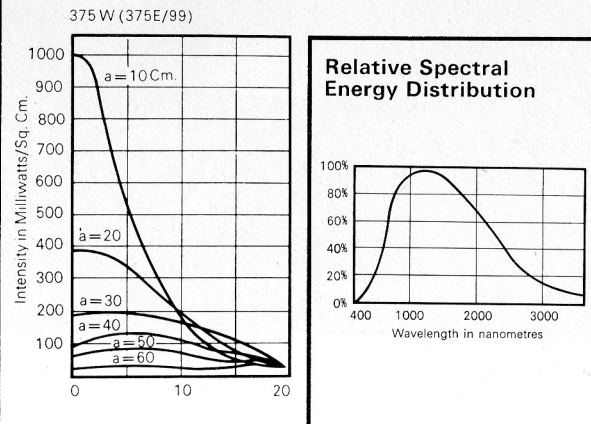
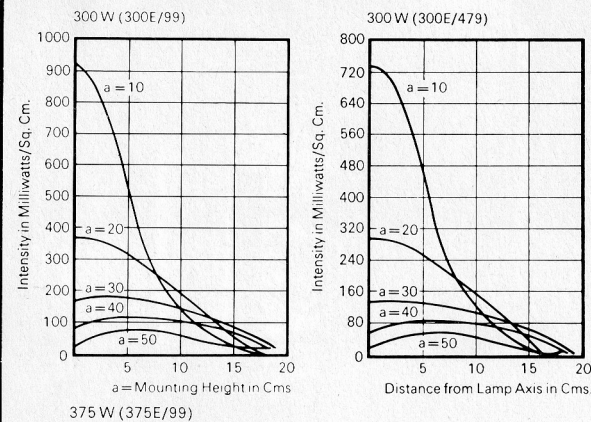
1. Shortwave infra-red penetrates translucent materials, unlike long-wave infra-red from dull or 'black' emitters, which is absorbed at most surfaces.
2. The virtually instant response to switching or dimming has important safety and energy-saving connotations, with flammable products and in batch control applications for example.
3. Infra-red output is unaffected by draughts, and if used on reduced voltage the life expectancy is increased while the output remains shortwave.
4. These lamps are for applications requiring intensities up to 10kW/m<sup>2</sup> installed. For higher intensities, use Philips Type IRK linear heat lamps.

### Equipment design

The simplicity of the lamps permits great versatility in the design of installations.

1. Heat lamp spacing and height is predetermined from a small-scale feasibility test, and may be made adjustable in practice.
2. Lamps must not be enclosed in insulated ovens. They heat by direct radiation, and must be given adequate ventilation around lampholders and wiring.
3. For enhanced efficiency on reflective or openwork products, highly reflective aluminium tunnel sides should be used with recessed heat lamps. Philips recessed fitting W4001 is suitable.
4. Heat control is possible by selective switching, series/parallel switching or dimming.

## Radiation Intensity in planes perpendicular to lamp axis



Drying of protective finish on lamps.

## GLASS BULBS AND FINISHES

Bulbs are obtainable blown from normal 'soft' glass or from heat-resistant 'hard' glass. Soft glass lamps are marked 'For industrial use only', and must not be used where there is any chance of splashing, as the resultant thermal shock is likely to fracture the bulb.

Hard glass lamps have a much greater resistance to thermal shock, and are suitable for all applications.

## ORDERING DATA

Please order lamps in the form given in the following example, quoting voltage, wattage and packing quantity:-

36 Philips heat lamps 240/250V, 300W, Type IR300WRH.

Made in Holland.

## LAMP DATA

Catalogue No.	Type No.	Wattage	Voltage	Cap	Finish	Glass	Overall Length max. (mm)	Bulb Diameter max. (mm)	Packing Quantity
IR150WS	13346/E44	150	240/250	ES	Frosted	Normal	185	126	Special order only
IR150WRS	13346/E479	150	240/250	ES	Red	Normal	185	126	Special order only
IR250WS	13352/E44	250	110/120	ES	Frosted	Normal	185	126	9
			240/250						15
IR300WCH	13374/EO6	300	240/250	ES	Clear	Hard	185	126	9
IR300WRH	13374/E479	300	240/250	ES	Red	Hard	185	126	9
IR375WCH	13344/EO6	375	110/120	ES	Clear	Hard	185	126	9
			240/250						

### Notes:

Colour temperature of filament approximately 2400K.

Average life is 5000 hours at rated voltage, but this may be affected by actual working conditions (vibration, switching frequency, etc.). These lamps may be operated in any position.

### Catalogue suffixes

- B = Soft glass.
- H = Hard glass.
- C = Clear finish.
- R = Red finish.

628.94
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# IRK LINEAR QUARTZ HEAT LAMPS

**Tungsten filament heat-lamps for short-wave infra-red radiation in high-intensity applications**

## RANGE

Standard types rated from 500W to 3kW  
High power halogen types 12kW and 20kW  
Print drying types 1kW and 2kW

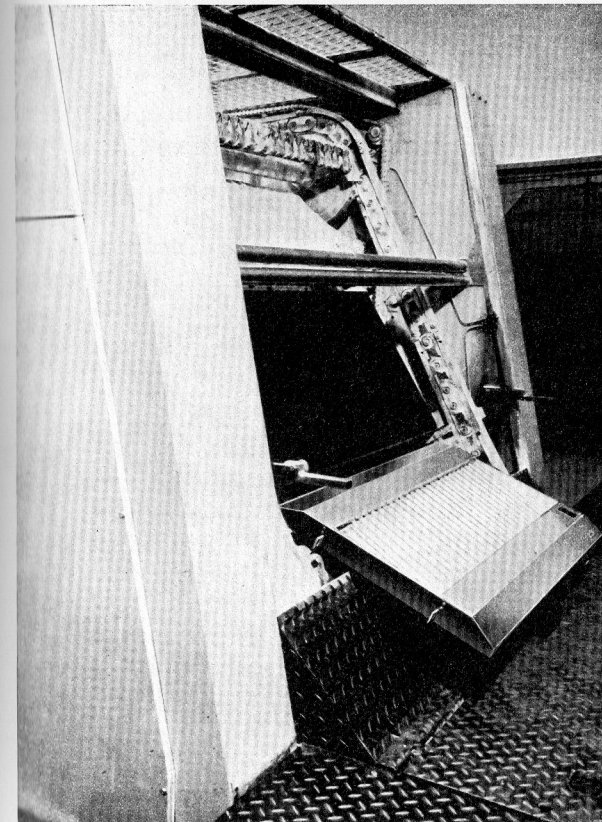
## APPLICATIONS

Used with suitable reflector units, IRK heat-lamps can give very high rates of heat transfer, reducing processing times and space requirements, in situations such as:-

- Preheating and mass heating
- Drying
- Paint drying and baking of powder paints
- Curing applications
- Food preparation
- Stress relieving, expanding, fusing, etc.
- Printing ink drying

## FEATURES

- Fast response; full heat output is achieved within 1 second, and the lamps may be dimmed for fast process control.
- Lamp output is reduced by 80% within 1 second of switching off, greatly enhancing safety.
- Provides a highly-efficient, energy-effective source of conversion to infra-red radiation.
- Produces product temperatures up to 1350°C.
- Easily focussed for extra intensity.
- Reflectorised versions are available.
- Permit clean, lightweight, simple installations.



*Dryer fitted to Roland 800, shown in lamp inspection position*

Handbook Ref.	<b>5.16/1</b>
To reorder this data sheet quote	2.78 PL 1814
Replaces	PL 8321/1

## NOTES FOR USERS

Short-wave infra-red radiation behaves in a manner similar to red light, and penetrates translucent materials, unlike long-wave infra-red from 'dull' or 'black' emitters which is substantially absorbed at many surfaces. It is advisable to conduct small-scale feasibility tests before designing a new installation.

IRK lamps should be mounted flexibly to accommodate differential expansion, and ventilation and/or heat sinks should be provided for the end seals as necessary.

Maximum permissible quartz/metal end seal temperature is 300°C.

Maximum permissible quartz tube temperature is 900°C.

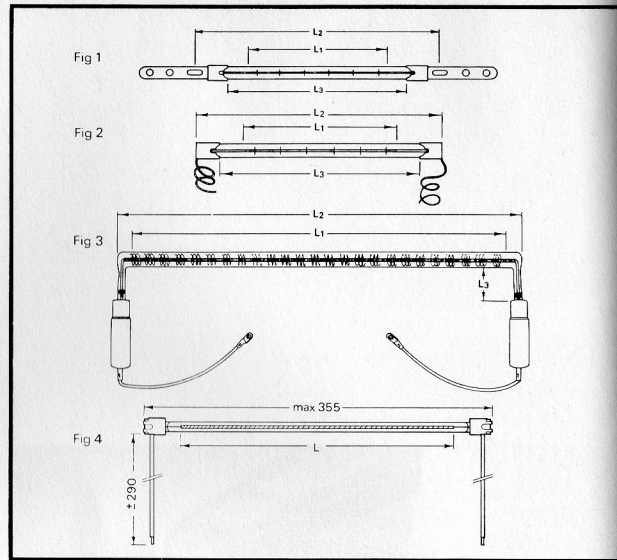
The danger of exceeding these temperatures occurs in high-intensity ovens where considerable re-radiation is taking place (e.g. heating metal sheet or billets to temperatures above 1,000°C) and in these circumstances, forced cooling of the envelopes may be required.

Aluminium reflectors will normally require forced-air or water cooling for continuous operation.

Recently-introduced lamp types 13713Z/98 and 13168Z/98 have metal endcaps which may be clipped to an earthed frame, and are equipped with insulated flying leads. **These lamps are for printing ink drying applications only.**

A special lampholder, Type Z9570, is available for use with strip terminated types.

The lamps should not be subjected to vibration or mechanical shock.



### General characteristics

All types except 12kW and 20kW:  
Filament colour temperature: about 2400K

Average life: 5,000 hours at midpoint of voltage range

Peak wavelength: about 1.2 micron  
Types 13478K (12kW) and 13785K (20kW):

Filament colour temperature: about 3000K

Tungsten halogen  
Peak wavelength: about 1.0 micron

### SPECIFICATION

Standard types are designed to conform with the International Standard IEC 240.

### ORDERING DATA

Please order in the form given in the following example, quoting Catalogue No., voltage and wattage, and in multiples of the packing quantity:-  
12 Philips IRK heat lamps 13195Y 1kW

## DIMENSIONS & LAMP DATA

Catalogue No.	Volts	Kilowatts	End connection	Tube dia. maximum (mm)	L1 (heated length) (mm)	L2 (fixing centres) (mm)	L3* minimum (mm)	Figure	Notes	Packing quantity
13169X	110/130	0.5	Strip	12	140 ± 2	241 ± 5	171	1	B	10
13169X/98	110/130	0.5	Strip	12	140 ± 2	241 ± 5	171	1	B, C	10
13169Y	110/130	0.5	Wire	12	140 ± 2	241 ± 5	171	2	B	10
13195Y	220/250	1	Wire	12	272 ± 2	348 ± 5	298	2	B	10
13195X/98	220/250	1	Strip	12	272 ± 2	348 ± 5	298	1	B, C	10
13713X	220/250	1	Strip	12	272 ± 2	348 ± 5	298	1	B	10
13168X	220/250	2	Strip	12	280 ± 2	368 ± 5	298	1	A, E	10
13765X	380/420	2	Strip	12	410 ± 2	508 ± 5	438	1	B	10
13245X/98	380/420	2	Strip	12	410 ± 2	508 ± 5	438	1	B, C	10
13230X	380/420	3	Strip	12	700 ± 2	798 ± 5	728	1	B	10
13230X/98	380/420	3	Strip	12	700 ± 2	798 ± 5	728	1	B, C	10
13478K	220/250	12	Cable	28	375 ± 5	400 ± 7	55 ± 5	3	A, D, E	—
13785K	380/420	20	Cable	28	665 ± 5	690 ± 7	55 ± 5	3	A, D, E	—
13713Z/98	220/250	1	Special	12	272 ± 2	355	290	4	B, C, E, F	—
13168Z/98	220/250	2	Special	12	280 ± 2	355	290	4	B, C, E, F	—

### Notes

A - for horizontal operation only

B - for any operating position

C - with white reflectorised strip on bulb

D - Tungsten halogen lamp

E - To be operated under special conditions

F - Only for use in printing ink drying applications

\* The dimension L3 is given for safety reasons, and represents the minimum distance between the current-carrying metal end connections.

CI/SIB (63.9)  
UDC 696.6:628.94

# FLOODLIGHTING LAMPS

## Tungsten halogen

A range of linear lamps for horizontal burning ( $\pm 4^\circ$ ), suitable for use in small, lightweight luminaires for a wide variety of floodlighting applications.

### APPLICATIONS

#### Outdoor applications

- Building sites
- Sports grounds
- Parks
- Large gardens
- Fountains
- Car parks
- Airport aprons

#### Indoor applications

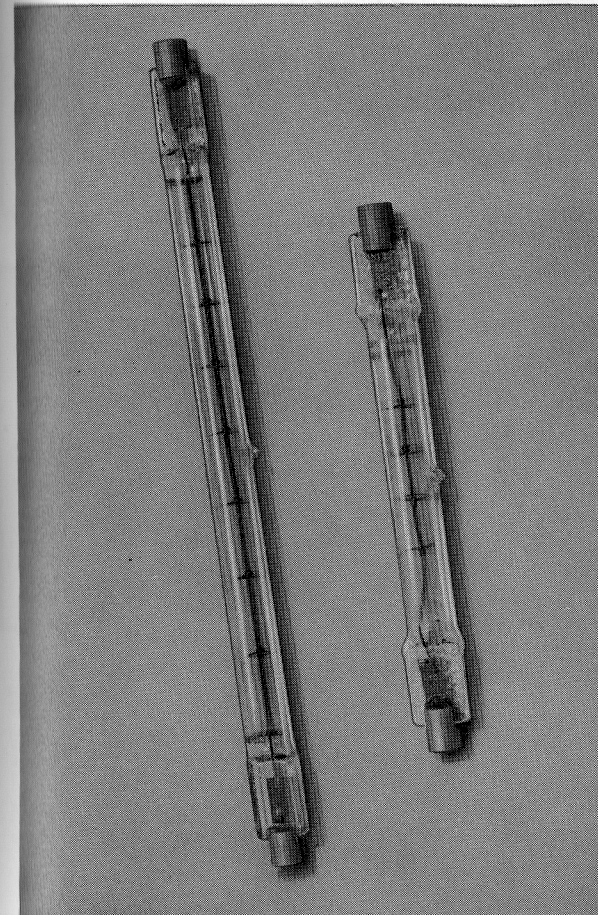
- Shops
- Halls
- Factories

### RANGE

Linear lamps for operation from 240/250V supplies:-

- K9 - 300W
- K1 - 500W\*
- K4 - 1000W\*
- K5 - 1500W
- K6 - 2000W

\* Also available for operation from 120V supplies.



Handbook Ref.

5.1.7

To reorder this data sheet quote 11.77 PL1770/3

Replaces PL1770/2

## FEATURES

- Excellent colour rendering of tungsten halogen lamps preserves the natural colours of the environment in which the lamps are used.
- Luminous flux output is maintained throughout the life of the lamps due to the halogen regenerative cycle.
- Up to 20% more efficient than a GLS lamp of corresponding rating.
- Compact, easily controllable light source, suitable for use in small, lightweight luminaires.
- Easy to install and maintain.
- Instantaneous light after switch on.

## TUNGSTEN HALOGEN LAMP CHARACTERISTICS

The theoretical extended life calculated from the curves below is not always realised in practice as many other causes influence this factor considerably, e.g. Vibration, Handling, Cleaning, Frequency of Switching, etc.

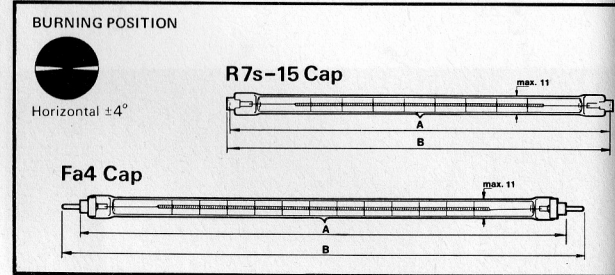
These curves are based on averages of many lamps and can only be used as an approximate guide to performance.

## The tungsten halogen cycle

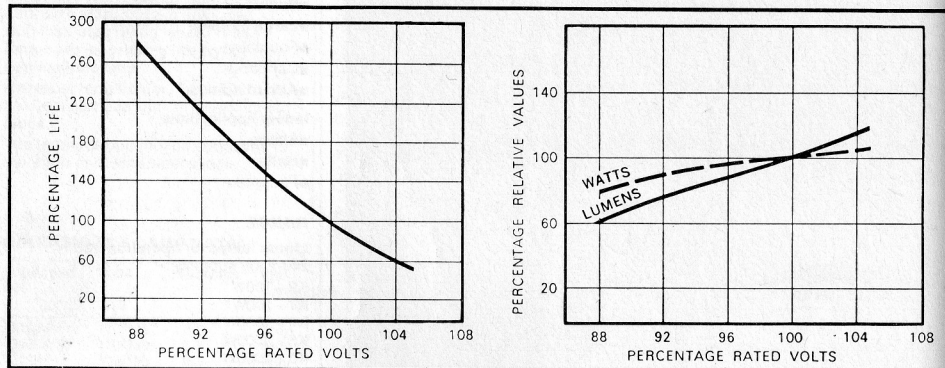
The slow evaporation of a tungsten filament in operation causes particles of tungsten to condense on the relatively cool walls of a conventional lamp, blackening the inside surface. The halogen added to the gas filling of a tungsten halogen lamp combines with the tungsten to form tungsten halide. By constructing the lamp in such a way that the wall temperature is kept above 250°C, the tungsten halide is prevented from condensing and is carried back into the vicinity of the filament.

The high temperature of the filament breaks down the tungsten halide into tungsten and halogen; the metallic tungsten is deposited on the filament and the halogen is released to repeat the cycle.

The result is that tungsten halogen lamps do not blacken, but emit their full light output throughout their working life.



Note: Dimension A (above) relates to electrical contact centres; Dimension B relates to overall length.



## DIMENSIONS, ELECTRICAL & ORDERING DATA

Type	Catalogue Number	Lamp Watts W	Lamp Voltage V	Cap	Nominal Luminous Flux	Width (max.)	Dimensions (mm)		Packing quantity
							A	B max.	
K9	12113R	300	240/250	R7s-15	5,100	11	114.2 ± 1.6	117.6	12 or 72
K1	7785R	500	120	R7s-15	10,000	11	114.2 ± 1.6	117.6	12 or 72
K1	7785R	500	240/250	R7s-15	8,500	11	114.2 ± 1.6	117.6	12 or 72
K4	12013R	1000	120	R7s-15	22,000	11	185.7 ± 1.6	189.1	12 or 72
K4	12013R	1000	240/250	R7s-15	22,000	11	185.7 ± 1.6	189.1	12 or 72
K5	13021R	1500	240/250	R7s-15	33,000	11	250.7 ± 1.6	254.1	12 or 72
K6	12110R	2000	240/250	Fa4	44,000	11	322.0 ± 2.1	334.4	12 or 72

Please order in the form given in the following example, in multiples of the packing quantity:-

72 Philips tungsten halogen lamps 240V 500W Type

Made in Holland.

CI/SIB	(63.9)
UDC	696.6:628.94

# TRAFFIC SIGNAL LAMPS

## Tungsten halogen

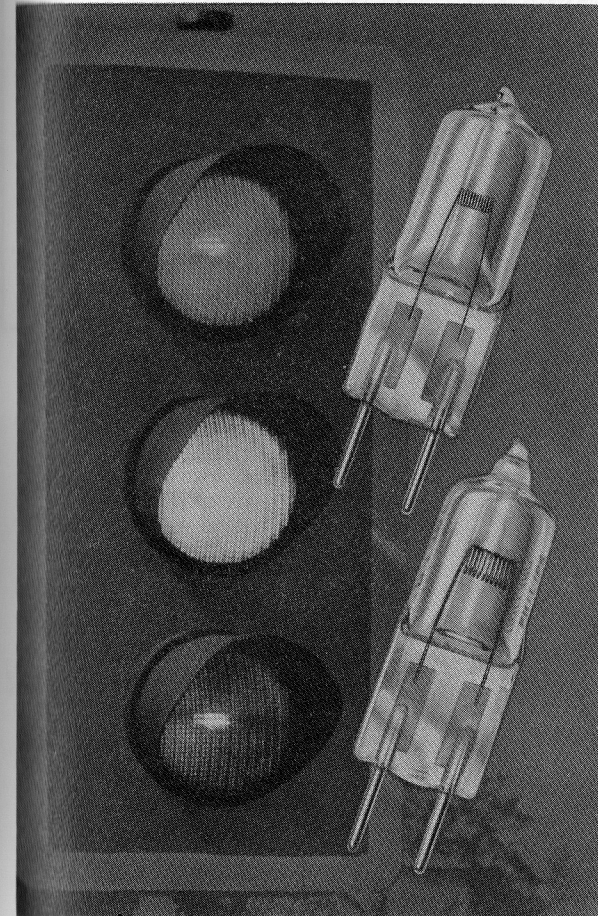
A range of two tungsten halogen projector lamps which meet the requirements of BS 505: 1971 "Road traffic signals". The lamps are suitable for burning in the VBD (vertical base down) position ±90° (M28) and universal operation (M32).

## RANGE

M/32 and M/28, rated at 50W and 100W respectively, for operation from 12V supplies.

## APPLICATIONS

Suitable for use in road traffic signals, and for many other miscellaneous applications where reliable, long-life bi-pin lamps are required.



## FEATURES

### The tungsten halogen cycle

The slow evaporation of a tungsten filament in operation causes particles of tungsten to condense on the relatively cool walls of a conventional lamp, blackening the inside surface. The halogen added to the gas filling of a tungsten halogen lamp combines with the tungsten to form tungsten halide. By constructing the lamp in such a way that the wall temperature is kept above 250°C, the tungsten halide is prevented from condensing and is carried back into the vicinity of the filament.

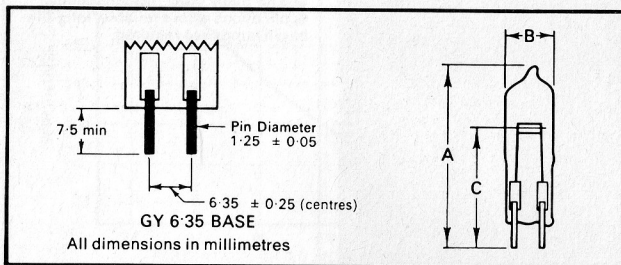
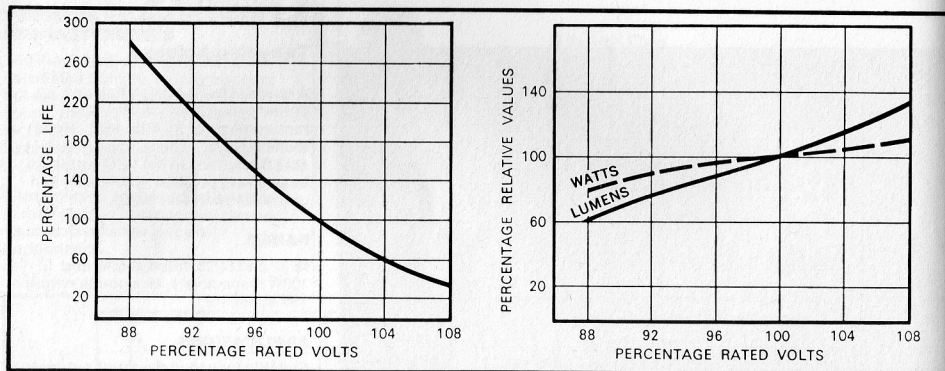
The high temperature of the filament breaks down the tungsten halide into tungsten and halogen; the metallic tungsten is deposited on the filament and the halogen is released to repeat the cycle.

The result is that tungsten halogen lamps do not blacken, but emit their full light output throughout their working life.

## TUNGSTEN HALOGEN LAMP CHARACTERISTICS

The theoretical extended life calculated from the curves below is not always realised in practice as many other causes influence this factor considerably, e.g. Vibration, Handling, Cleaning, Frequency of Switching, etc.

These curves are based on averages of many lamps and can only be used as an approximate guide to performance.



## DIMENSIONS, ELECTRICAL & ORDERING DATA

Type	Catalogue Number	Lamp Watts W	Lamp Volts V	Average Life (hours)	Light output (lumens)	Cap	Bulb Diameter max. (B)	Overall Length max. (A)	Light centre length (C)	Filament dimensions	Packing quantity
M/32	13512	50	12	2000	900	GY6.35	12	44	30 ± 0.25	5.0 × 1.5	100
M/28	7724	100	12	2000	2250	GY6.35	13.5	44	30 ± 0.25	4.8 × 3.0	100

- Important Notes:**
- Life is quoted as that obtained on continuous burning on open racks at a controlled voltage of 12V.
  - HANDLING:** If the quartz bulb has been handled, it should be cleaned with a solvent such as methylated spirit to remove all traces of grease before lighting.
  - SEAL TEMPERATURE:** Precautions must be taken to ensure that the temperature of the quartz-metal seal does not exceed 350°C, though the bulb temperature must be greater than 250°C.

Please order in the form given in the following example, in multiples of the packing quantity:—  
200 Philips traffic signal lamps 12V 50W  
Type 13512

Made in Holland.

CI/SIB	(63.9)
UDC	696.6:628.94

# SPECIAL SERVICE TYPES incandescent lamps

A range of tungsten filament lamps manufactured for specific applications, or for special conditions of service.

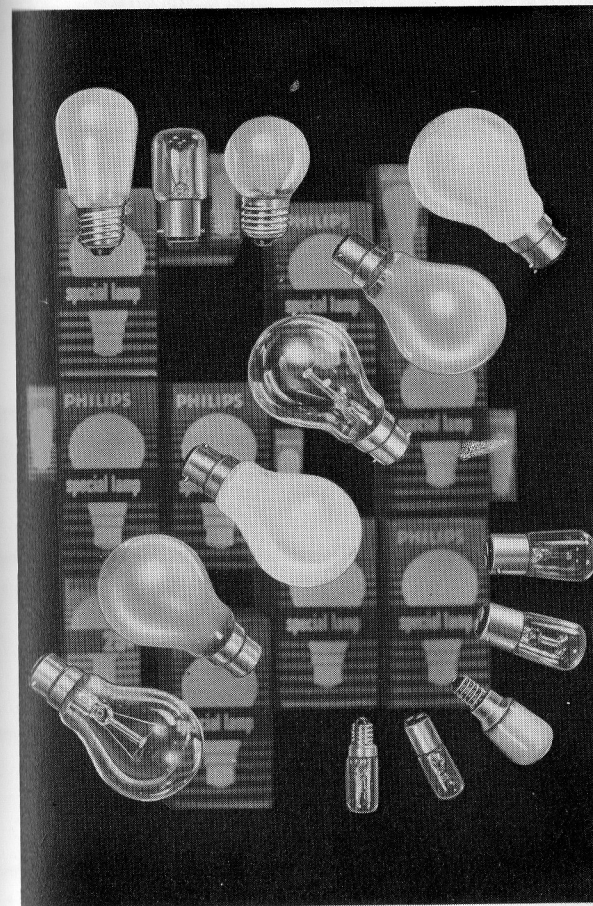
## RANGE

This Data Sheet covers lamps for rough service conditions; sign and coloured sign, pilot and indicator lamps, single-ended tubular; appliance; baker's oven and tungsten ballast lamps.

Details of traffic signal and infra-red heat lamps are given on Data Sheets PL 1769 & PL 1805.

## FEATURES

- Quality:** Stringent quality control procedures and meticulous attention to cleanliness result in a high degree of uniformity to specification.
- Safety:** Test and inspection procedures are geared to the safety of lamps in service.



Handbook Ref

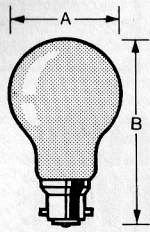
**5.110**

To reorder this data sheet quote

1.78 PL 1787

Replaces

New



Rough Service

### Rough Service

Rating	Dimensions (mm)		
	A	B	B
40W, 60W	60	103	104.5
100W	68	125	—

**Rough Service**—Reinforced internal construction gives increased resistance to filament breakage due to jolts and vibration. Suitable for use in hand inspection lamps, for industrial machine lighting and similar applications.

### Sign

Rating	Dimensions (mm)				
	A	B	B	B	B
15W	28	57	63	60.5	64.5

**Sign**—A range of pygmy sign lamps with many applications.

### Internally Coloured Sign

Rating	Dimensions (mm)	
	A	B
15W	28	57

**Internally Coloured Sign**—Red, blue, white, green, yellow, pink and amber. The lamps may be used externally in suitable holders.

### Pilot

Rating	Dimensions (mm)			
	A	B	B	B
6/10W	20 (max)	40	46	46

**Pilot**—Small indicator lamps for many applications.

### Switchboard Indicator

Rating	Dimensions (mm)	
	A	B
10W	28	57

**Switchboard Indicator**—Special-purpose lamp, for telephone switchboard indication.

### Single Ended Tubular

Rating	Dimensions (mm)		
	A	B	B
25W	25	86	92

**Single-ended Tubular**—A lamp with a slim profile and an extra-long light centre length.

### Appliance

Rating	Dimensions (mm)		
	A	B	B
25W tubular	28.5	61 (max)	—
25W round	45	—	71
40W pear	45	—	90.5

**Appliance**—Special-purpose lamps, for use in cookers, and other appliances.

### Baker's Oven

Rating	Dimensions (mm)	
	A	B
60W	60	103

**Baker's Oven**—Special design to withstand temperatures up to 450°F (232°C).

### Tungsten Ballast

Rating	Dimensions (mm)	
	A	B
75W, 80W	60	103

**Tungsten Ballast**—Special-purpose lamps for series ballast in certain fluorescent fittings for 4ft 40W lamps. Replacement type only.

Dimensions are nominal

Wattage	Voltage	Cap	Finish	Packing quantity
40W	240/250V	BC, ES	Pearl	25
60W	240/250V	BC, ES	Pearl	25
100W	200/250V	BC, ES	Pearl	25
40W	110/120V	BC	Pearl	25
60W	110/120V	BC	Pearl	25
100W	110/120V	BC	Pearl	25

Wattage	Voltage	Cap	Finish	Packing quantity
15W	25V	BC	Clear	100
15W	50V	BC	Clear	100
15W	110V	BC, SBC, ES, SES	Clear	100
15W	120/130V	BC	Clear	100
15W	200/250V	BC, SBC, ES, SES	Clear	100

Wattage	Voltage	Cap	Finish	Packing quantity
15W	200/250V	BC	Internally coloured	100

Wattage	Voltage	Cap	Finish	Packing quantity
15W	100/130V	SBC, SES, E12	Clear	100
10W	200/250V	SBC, SES, E12	Clear	100

Wattage	Voltage	Cap	Finish	Packing quantity
10W	200/250V	BC	Clear	100

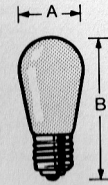
Wattage	Voltage	Cap	Finish	Packing quantity
15W	240/250V	BC, SBC	Clear	50

Wattage	Voltage	Cap	Finish	Packing quantity
15W tubular	240/250V	BC	Clear	100
15W round	240/250V	ES	Pearl	50
40W pear	240/250V	ES	Pearl	100

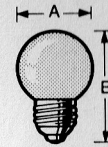
Wattage	Voltage	Cap	Finish	Packing quantity
60W	240V	BC	Clear	25

Wattage	Voltage	Cap	Finish	Packing quantity
15W	150V	3-pin BC	Argenta	25
10W	160V	3-pin BC	Argenta	25

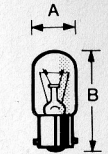
### Appliance



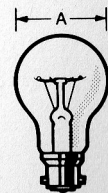
Pear



Round



Tubular



Bakers Oven



Tungsten Ballast

**Effect of supply voltage on performance**

In common with all tungsten filament lamps, the life expectancy and light output of special service lamps are highly dependent on supply voltage.

The data shown may be used as a guide to average performance, but factors such as frequency of switching, vibration and temperature exert a greater influence on expected results as voltage deviates further from the nominal.

GLS lamps may be operated in any position, but life expectancy may be reduced in positions other than cap-up.

**PERFORMANCE DATA for tungsten filament special service lamps**

Figure 1

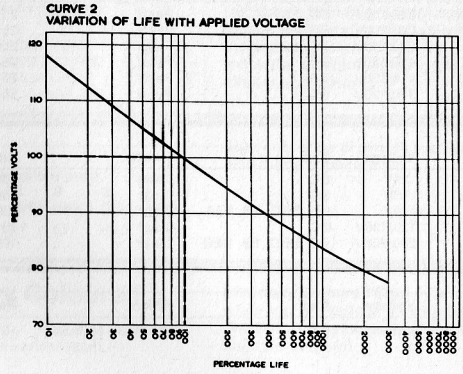
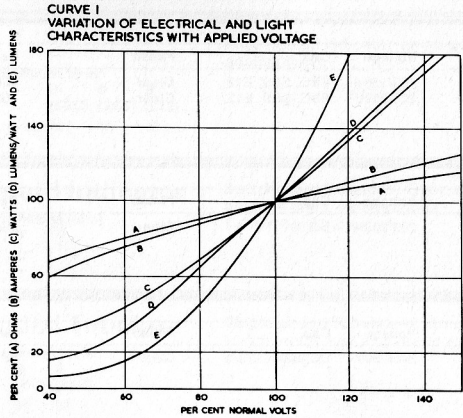


Figure 2



**Lamps:** Made in UK unless otherwise stated on packaging.