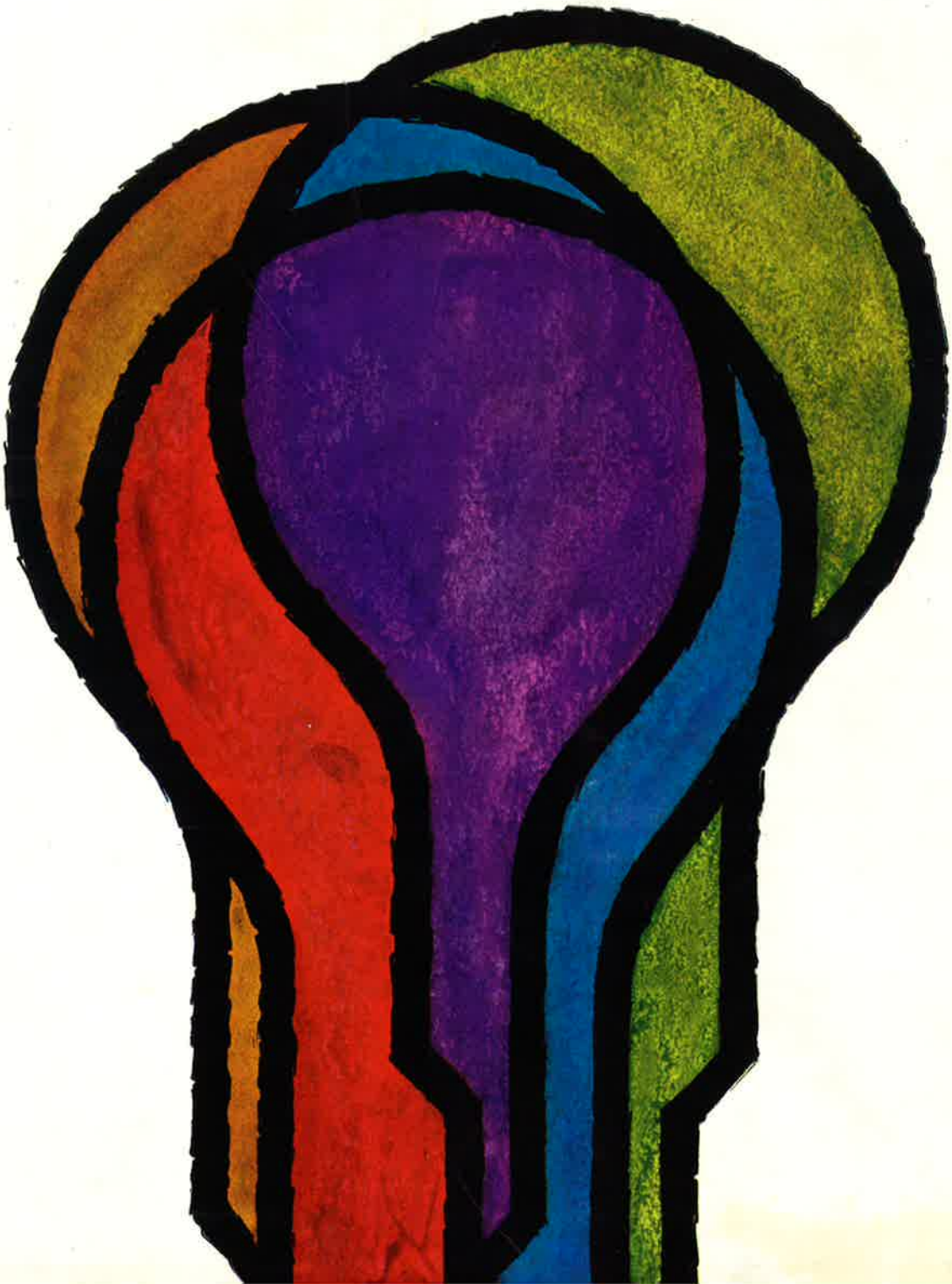
PHILIPS

PHILIPS / *lamp catalogue*

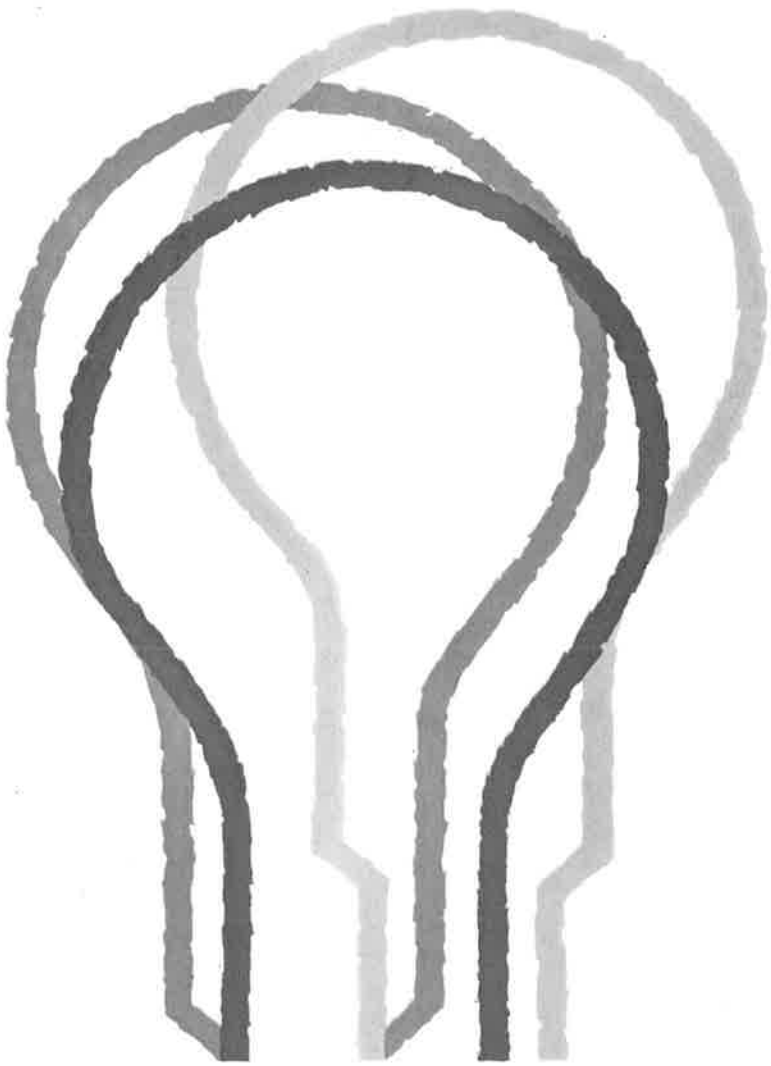


PHILIPS / *lamp catalogue*

Preface

Light is limitless, its uses are infinite, its history is fascinating.
Although the first uncertain flickers of gas began to dispel the gloom from the cities, millions were still without light when Gerard and Anton Philips were born.
They lived to see an age which they had helped to create . . . an age in which electric light has become as convenient as the switch which operates it.
The first Philips incandescent lamp was produced in 1891 and since that date, the Company have blazed a pioneer's trail in the lighting industry, creating . . .
Light which illuminates, heats and controls . . .
White light, black light, infra-red, ultra-violet . . .
Light for medicine and science, light for entertainment or drama, light for security in factories, for analysis and convenience.
Light which has brought within man's reach:
Comfort in his home, safety on the highways, and in the air - the thrill of discovery!
Today, in 59 countries, Philips produce over 40,000 types of lamps and fittings which are marketed by 70 sales organizations throughout the world.
In addition, Philips have built up an international network of Lighting Service Bureaus to help local engineers, architects, public authorities, industrial enterprises and others to solve problems in any field of application. Backed by a fund of knowledge accumulated during three quarters of a century, the Philips organizations all over the world give expert advice wherever high-quality lighting is needed.

PHILIPS LEAD THE WORLD IN LIGHTING!

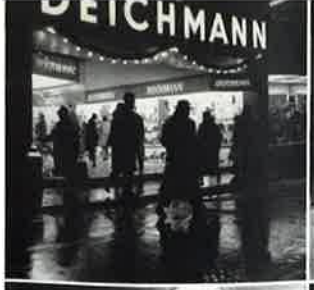


CONTENTS

ALL DATA CONTAINED IN THIS CATALOGUE ARE SUBJECT TO CHANGE WITHOUT NOTICE

The Philips fitting range is not incorporated in this catalogue. However, a survey of fittings for indoor and outdoor lighting is given on the pages 123 and 124.
Concerning airport lighting a brief survey is inserted on the pages 126—127.
Detailed information on both subjects will be readily given on request.

FOR A VARIETY OF PURPOSES- A VARIETY OF LAMPS



PHILIPS

Right up to the twentieth century there was hardly any differentiation in the use of light sources. Wax lights and candles were used in churches, in palaces, in homes, in castles. People who wanted more light, and who could afford it, took more wax lights, more candles or more torches. One and the same light source was used for all occupations: candles for the troubadours, for the banqueting guests, the poet, the priest, the innkeeper, the cobbler, the wine merchant, the captain of the guard. Even the development of new light sources in the 19th century did not alter much. Gas lamps were installed in theatres, in the streets, in factories, in ordinary dwellings, in places of worship. And when, towards the end of the century, electric lamps proved to be preferable to gas lamps and oil lamps, there was still no differentiation. One might say that lamps had the task of combating the negative aspects of living: of repelling darkness, of overcoming the impossibility of living normally after sunset, of warding off danger. It is less than forty years ago that light was given a more positive task and that this task became more and more specifically adapted to the circumstances of the application. This would have been impossible, of course, without the rapid development of numerous types of light sources. But it is also true that the very awareness of the positive function of artificial light promoted that development. Light was no longer a tool; light was the substance that went into thousands of different tools. Now it can be said that there is a special lamp-type for every application. Philips alone produce over forty thousand different lamp-types. They differ not only in shape and size, in luminous efficiency and mechanical strength, but also in the "essence" of their light. The difference between a candle and an incandescent lamp is as big as that between an incandescent lamp and a fluorescent lamp. There is now a tremendous choice of lighting principles, and the final choice is always determined by the application itself or by special circumstances.

What happened with lamps in the last fifty years, happened in the last ten years with fittings. Originally, they had the sole task of protecting the lamp. There is, however, a growing awareness now that fittings can play as positive a role as the lamps themselves. Here too Philips play a leading part, in the investigation of that positive function, in the development of better fittings, in the propagation of modern ideas throughout the world.

This catalogue thus contains information on a wide variety of lamps and of fittings. However much they vary, they have one characteristic in common - true Philips quality.

INCANDESCENT LAMPS

TABLE OF CONTENTS

QUALITY

Lamps for various applications no longer look alike, but various makes of lamps for the same application may now look very much alike. The following important question remains: are they the same as far as quality is concerned? No, they cannot possibly be the same. It is relatively easy to imitate shapes and designs and it is not too difficult to work on the same principles. But it is impossible to have uniformity in raw materials, in rules for testing material and quality, just as it is impossible to apply the same accuracy in the manufacturing process, or to exert the same care in the despatch of the lamps.

However, it is true that the quality of a lamp can rarely be "seen" the moment a lamp is bought. Quality is not painted on, it is built in. And yet, a lamp may easily reveal "indirect evidence" of quality.

When a lamp carries the familiar Philips emblem and name, the user can be absolutely sure that every possible step was taken to ensure the highest possible quality for that particular application. There are, in fact, three different guarantees.

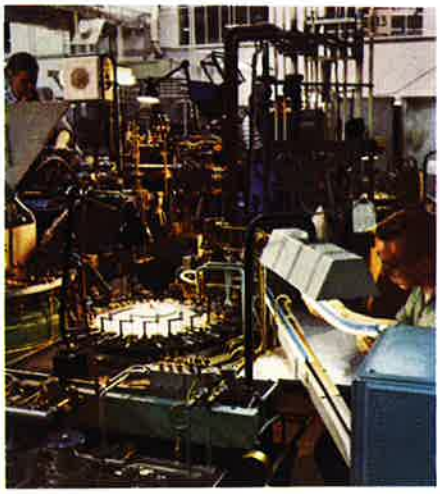
The first one is the Philips research behind every type of lamp. Philips are leading lamp-manufacturers in their own right. Their research laboratories are constantly engaged not only in the study of lighting as a phenomenon, but also in the development of new types of lamps, new principles, new machines to improve production, new materials for better quality, new appliances to test the characteristics of lamps, new standards to be applied.

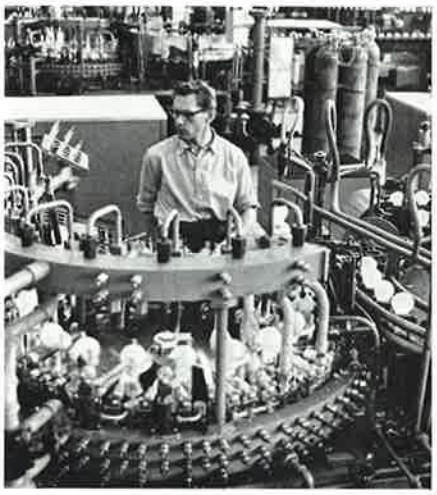
The second guarantee is the experience of Philips in this field.

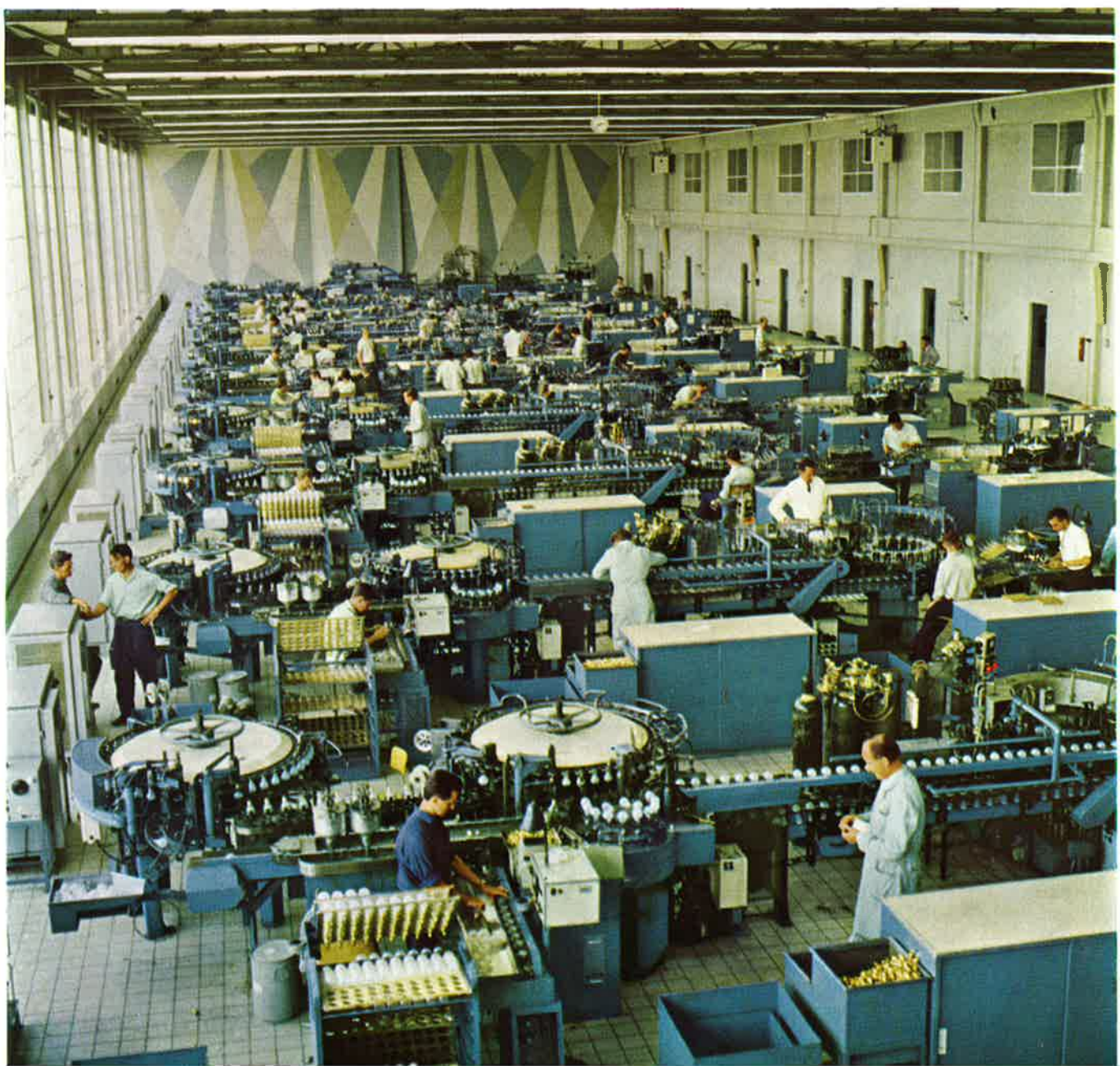
In 1891 the Company was founded for the production of electric lamps. In the course of time, many other products were added to the manufacturing programme, but light has remained one of the pillars of the Company, receiving continuous attention from the laboratories.

The third guarantee, and in some respects the most important of the three, is the determination of Philips to keep the international lead in this particular field, because it is this determination that stimulates the scientists in the laboratories and that enables Philips to make the most of the vast, world-wide experience that has been built up over three quarters of a century.

There are several centres throughout the world where Philips lamps are manufactured, but there is a constant flow of information from one centre to the other; they all benefit by the research work carried out in centralized research laboratories and in decentralized development laboratories. And wherever Philips lamps are made, the same high standards are applied, in the interest of Philips, but no less in the interest of the consumer who can trust any lamp that carries the Philips emblem and the Philips name.







CONSTRUCTION OF LAMPS

1. **Gas**

   In order to prevent rapid evaporation of the filament and to permit higher filament temperatures, most lamps from 40 W upwards are gas-filled. This results in higher efficiency. The gas normally used is a mixture of nitrogen and argon. Some special-purpose lamps, however, are filled with krypton or a halogen.

2. **Support wires**

   The filament of an incandescent lamp is kept in place by molybdenum wires. In order to reduce heat losses, the number is restricted to the minimum.

3. **Lead-in wires**

   The current is led through the filament by the lead-in wires. These wires consist of three parts:
   from filament to glass pinch: nickel,
   in the glass pinch: a special alloy to form an airtight seal,
   from glass pinch to base: copper.

4. **Button**

   The support wires are inserted into a glass button on top of a rod.

5. **Stem tube**

   This tube conducts the lead-in wires into the bulb. When the glass is melted, the top end is pinched, to that an air-tight seal is formed.

6. **Fuse**

   The part of the lead-in wires in the stem tube serves as a fuse which opens the circuit when the filament arcs.

7. **Exhaust tube**

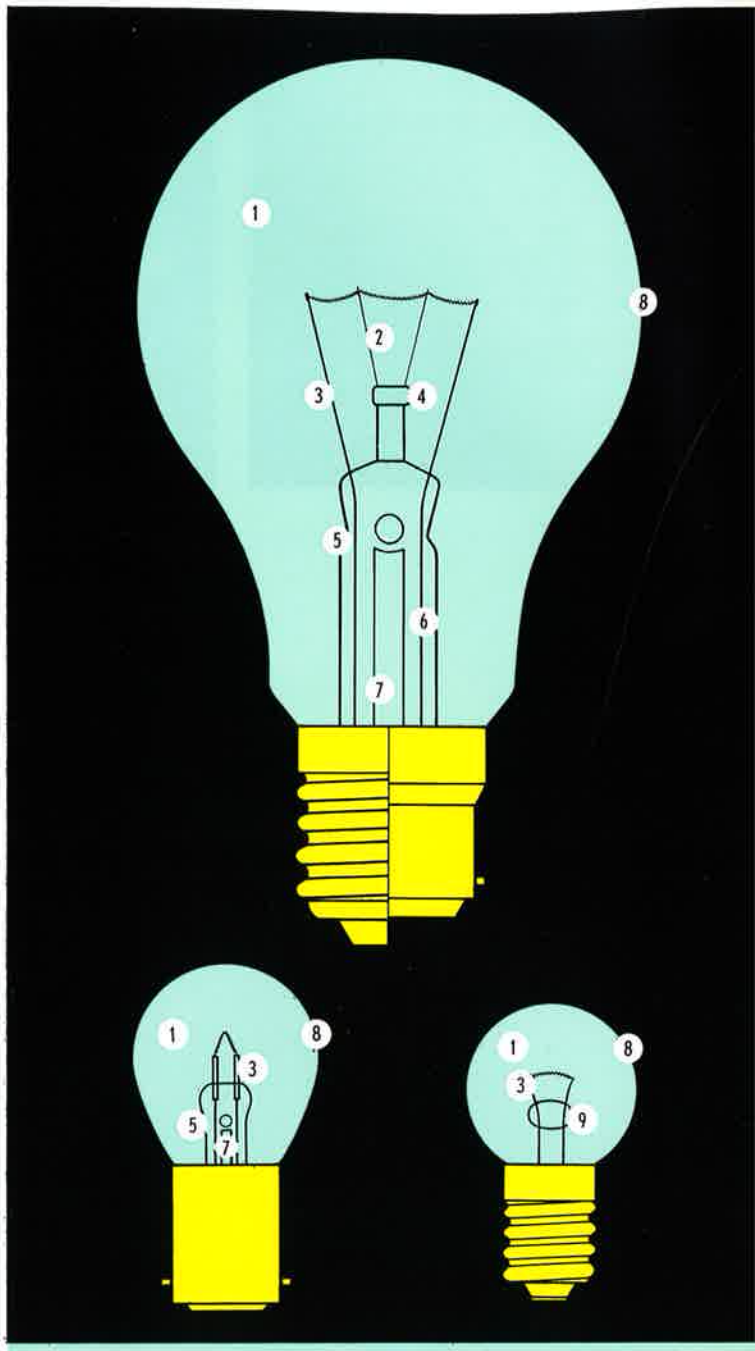
   Through this tube the air is exhausted and the bulb is filled with gas. After this has been done, the tube is sealed and the base can be fitted.

8. **Bulb**

   This is the glass envelope, supplied in different shapes and finishes (see page 11).

9. **Glass bead**

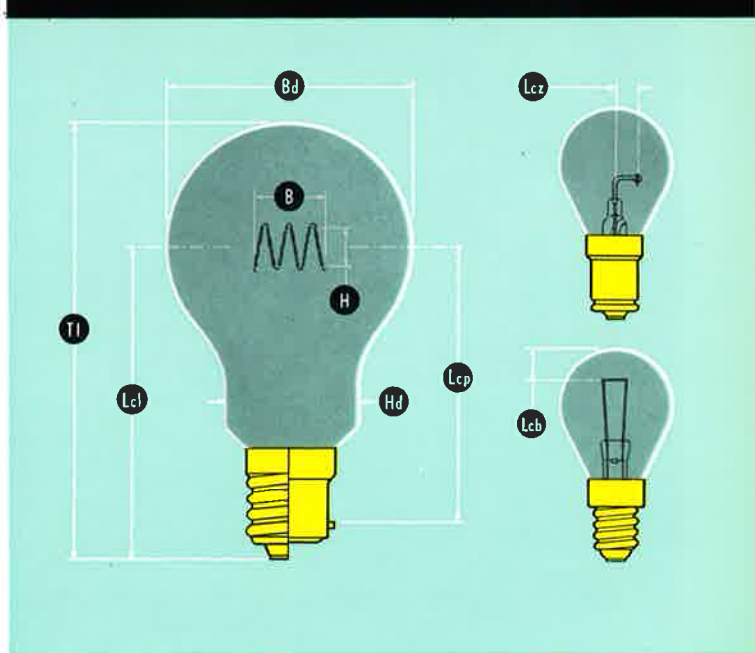
   Sometimes, instead of the stem tube, a glass bead is fused around the wires, e.g. with most miniature lamps.

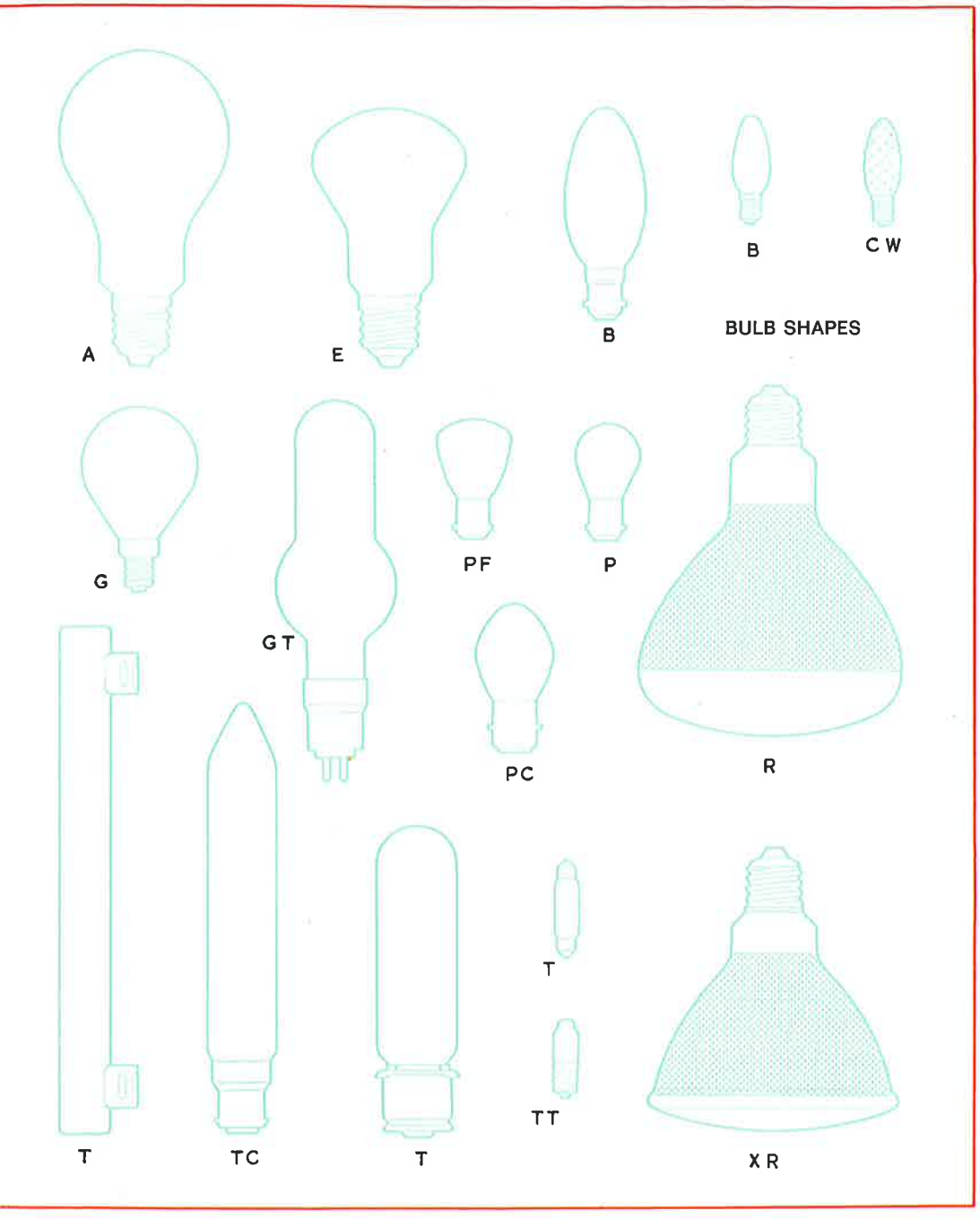


DIMENSIONS

For detailed information about dimensions, the following letters should be used:

Bd	Bulb diameter
Tl	Total length (Overall length)
Lcl	Light centre length
Hd	Neck diameter
Lcp	Light centre length from the tops of the base pins or wings
B	Width of filament
H	Height of filament
Lcz	Distance light centre - lamp axis
Lcb	Distance light centre - bulb top.



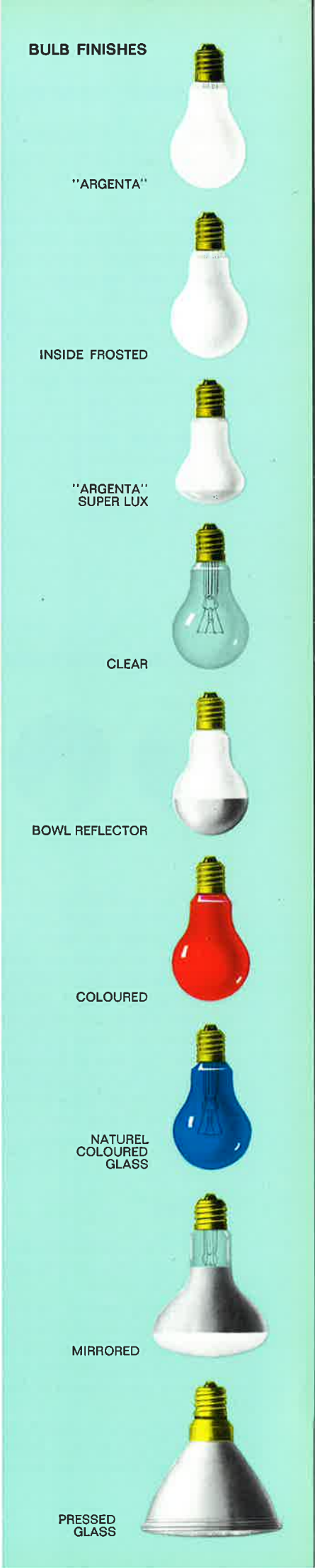


BULB SHAPES

A survey is given above of the current shapes of lamp bulbs of the incandescent lamp group. All models shown in this catalogue have been derived from this series. The shapes are indicated by the letters shown. A special model is XR which is composed of pressed glass parts.

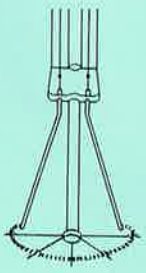
BULB FINISHES

Lamp bulbs are available with different finishes. They are applied according to the requirements stipulated for obtaining a desired control of light, for influencing the quality of light or for producing a certain colour of light. The most important finishes are: "Argenta" - inside frosted - clear - bowl reflector - coloured - natural coloured - mirrored and pressed glass. The front of the pressed glass bulbs has special patterns for spot or for flood-lighting purposes.

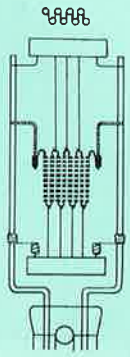


FILAMENT SHAPES

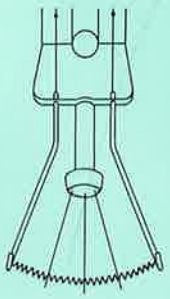
A great variety of filaments is required for the many lamp types belonging to the Philips range.
These pages give a survey of the principal shapes manufactured nowadays.
All these filament constructions fulfil the most stringent demands and new developments keep taking place in the Philips laboratories where much research is carried out to improve further the electrical and mechanical properties of this vital part of the incandescent lamp.
Tungsten is generally used as filament material and the quality of the wire, which is often very thin, mainly determines the quality of the lamp.
In the Philips factories great care is taken to produce the best possible filament wire, and a diamond die factory was erected to facilitate production and improve the quality of the filament.
Basically, three filament types are distinguished: straight, single coil and coiled coil.



A



E



F

BURNING POSITIONS OF THE LAMPS

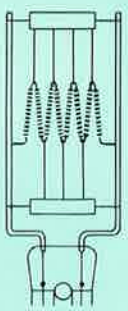
Fig. 1

Fig. 2

Fig. 3

Fig. 4

In this catalogue all lamps are shown in their normal burning position. Other positions, however, are often permissible or the lamps may even be used in any position. In the latter case, of course, no restrictions are made. If the lamps are constructed in such a way that they must be used in a fixed position or that their deviation is limited, then the positions allowed are indicated by black circles with white sectors. The white sector can be considered as a solid angle within which the axis of the lamp must fall. The lamp base is assumed to be at the centre of the circle. Generally, the line representing the normal position will be the bisector of the angle formed by the two outer lines (fig. 1, 2 and 3). If the burning position may only deviate on one side, then the normal position coincides with one outer side of the white sector (fig. 4).



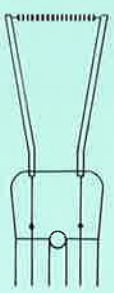
M

N

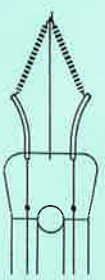
LETTERS

In place of or together with the figures shown above, the burning position can also be indicated by a letter and the angle of deviation, as follows:
S for standing position (e.g. S45 for fig. 1)
H for hanging position (e.g. H45 for fig. 2)
P for horizontal position (e.g. P30 for fig. 3).
The letter E is placed after the letters S, H or P if the burning position is only allowed to deviate on one side (e.g. SE30 for fig. 4).
It must be borne in mind that in the burning position of lamps having a D, E, L, M or P filament, no sideways deviations in the plane of the filament are permitted.

RO4



R 1



VO1

V11

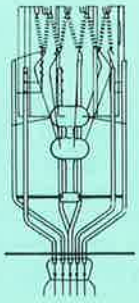
AG

B

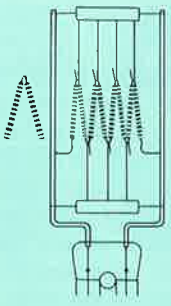
B

BO6

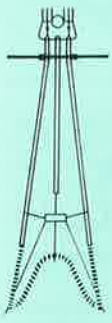
C



CO3

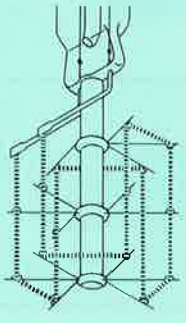


D

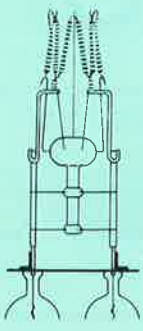


FG

J



JJ



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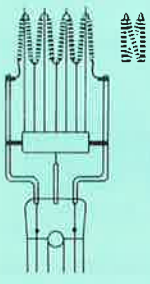
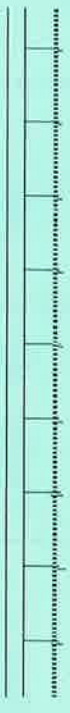


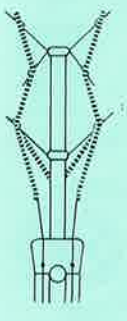
L



R

RG

RRG



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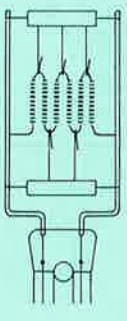
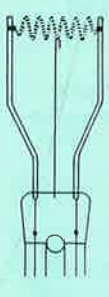


P

Q1

R

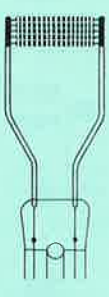
RO2



R11

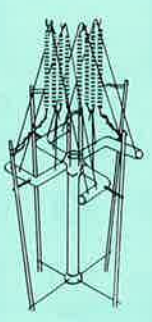
R12

R2



RP

S1



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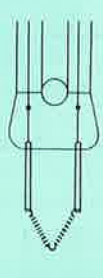

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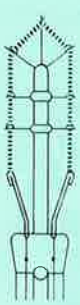
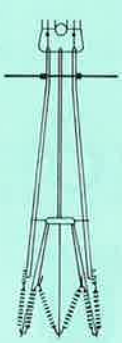


BY



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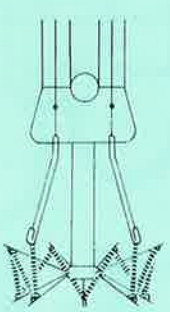

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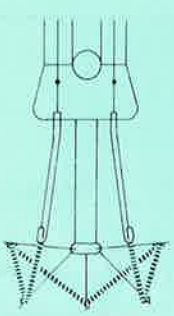

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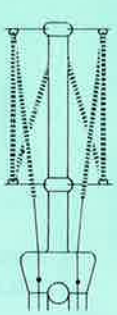


WY

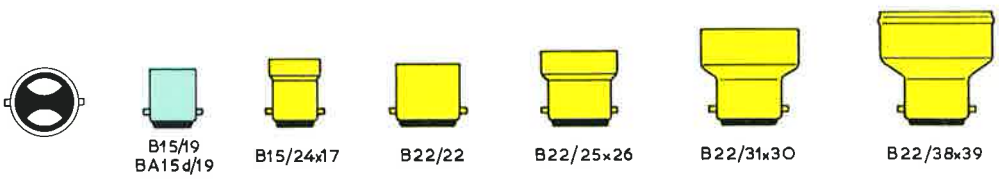
Z11

BASES

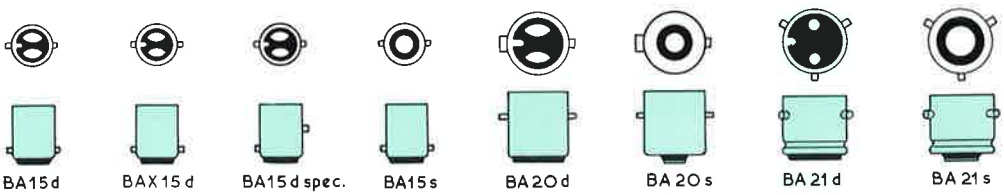
A great variety of lamp bases is, of course, necessary to cope with the many different applications for the wide range of Philips lamps. On these two pages a summary is given of the complete programme of lamp bases, as featured in the tables in this catalogue. The bases are denoted with the standard designation, so that it will be quite easy to find out with which base a certain lamp is equipped. Philips lamp bases comply with the international requirements and all materials used are of superior quality, great care also being bestowed on the finish.
The bases are shown here on a scale of 1 : 2.5.

SCREW BASES

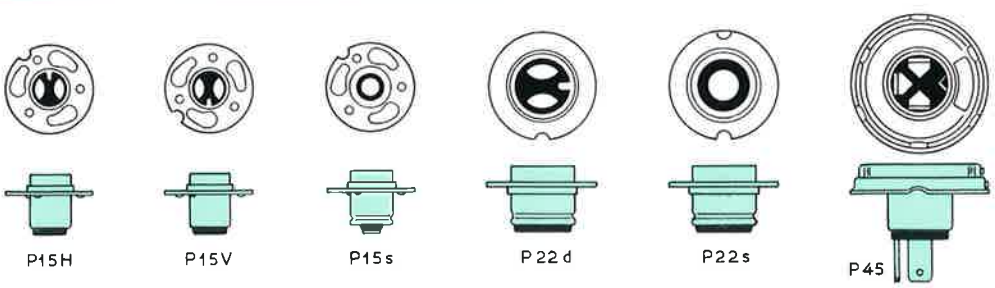
BAYONET BASES



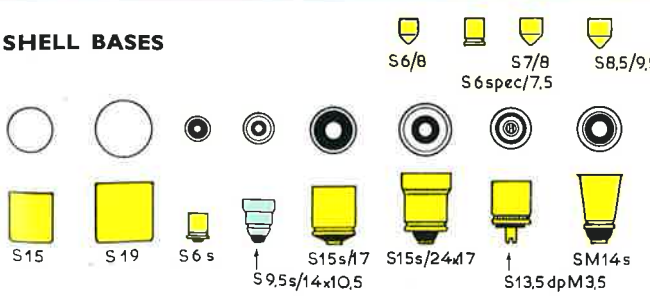
BAYONET BASES FOR MOTORCAR LAMPS



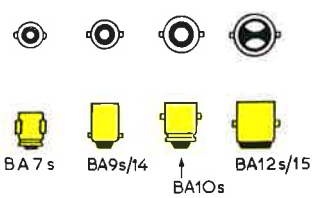
PREFOCUS BASES



SHELL BASES



BAYONET BASES FOR MINIATURE LAMPS



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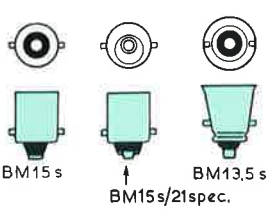
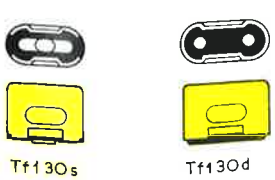
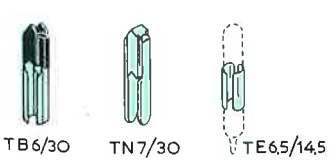


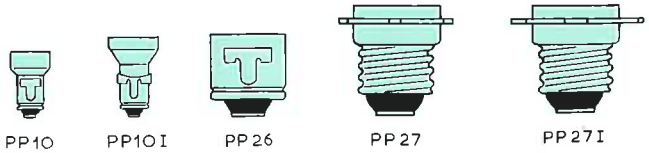
SIDE CONTACT BASES

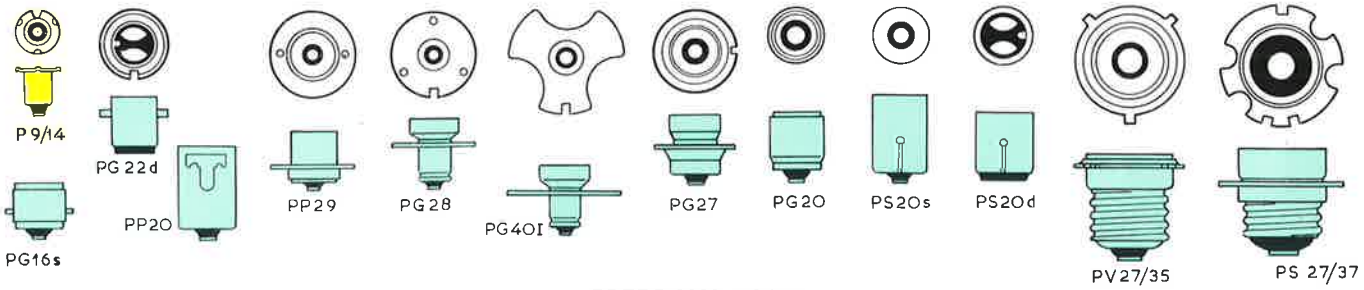




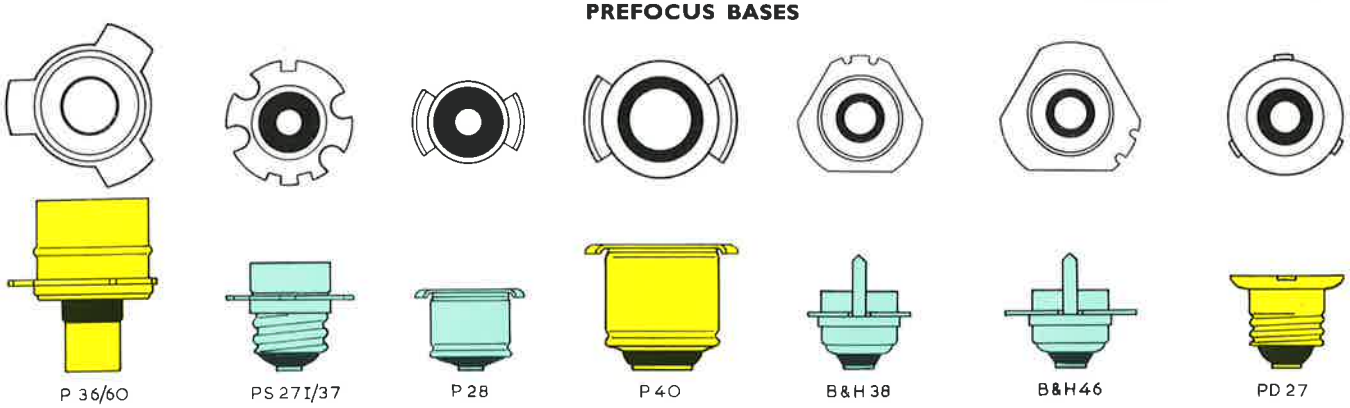
BASES FOR TELEPHONE LAMPS

PREFOCUS BASES

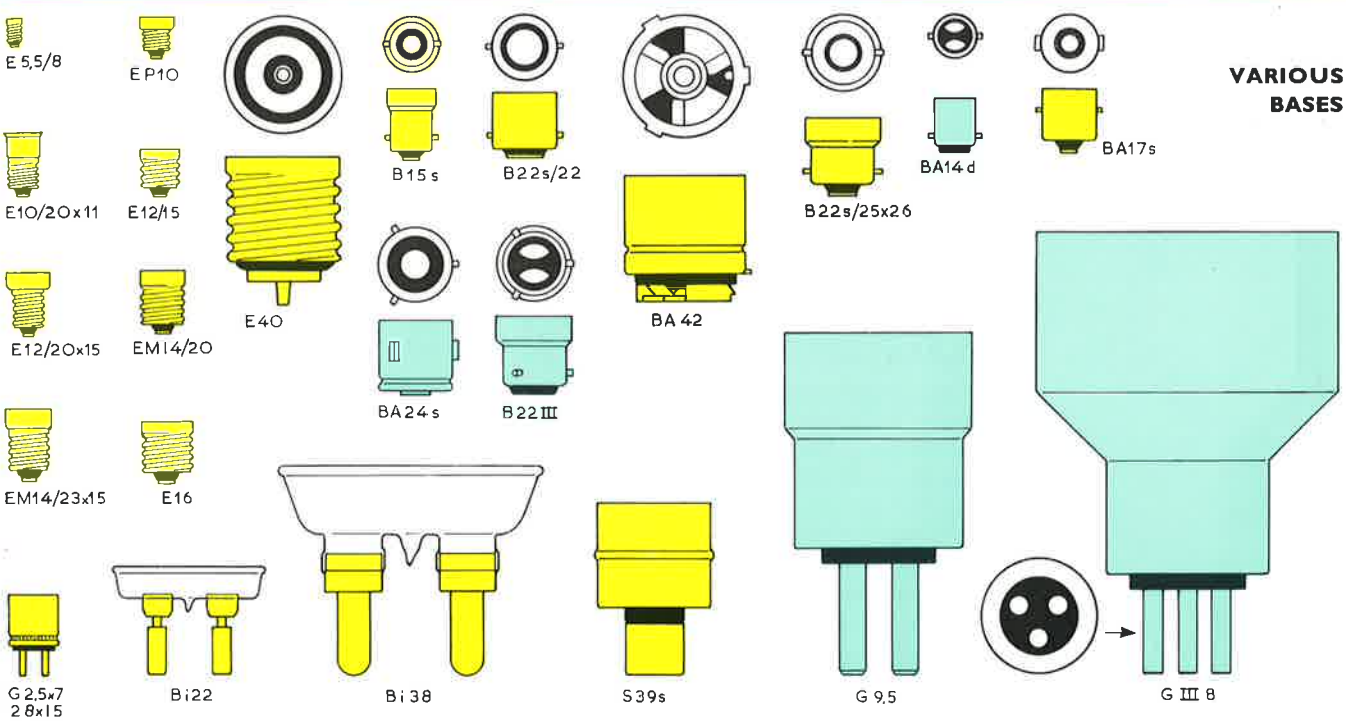




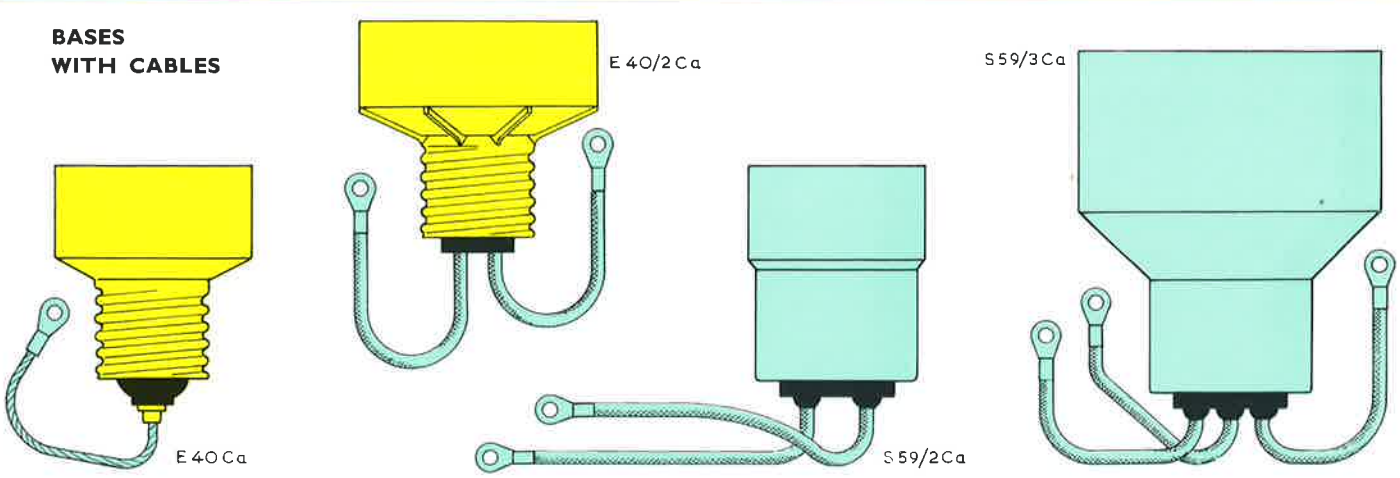
PREFOCUS BASES

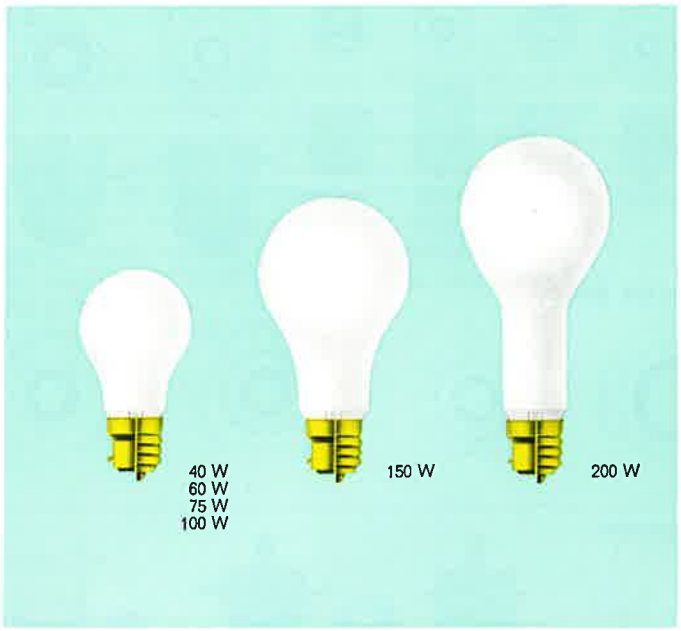


VARIOUS BASES



BASES WITH CABLES





"ARGENTA" LAMPS

Philips "Argenta" lamps excel because of several special light characteristics, among which we may mention: pleasant, warm light, soft shadow effect, perfect diffusion of light and complete absence of glare. They are, therefore, particularly suitable for home, office and shop lighting.

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22
40	110			60	109	107.5
60	115			60	109	107.5
75	120			60	109	107.5
100	125/130	Gas-filled	Coiled coil	60	109	107.5
150	220/230			80	148.5	144
200	240			80	178	173.5 [1]
	250					

[1] On special request only.

Luminous flux in lumens

Wattage W	110 V	115 V	120 V	125/130 V	220/230 V	240 V	250 V
40	465	465	460	455	400	390	385
60	780	780	770	760	670	660	650
75	1020	1010	1000	990	890	870	860
100	1460	1460	1440	1440	1280	1260	1240
150	2220	2200	2180	2160	1940	1900	1880
200	3050	3050	3050	3000	2750	2650	2600

Lumen values for other voltages available on request.

GENERAL LIGHTING SERVICE LAMPS

INSIDE FROSTED AND CLEAR LAMPS

The clear version which was originally in general use, has, in the course of time, been almost entirely superseded by the inside-frosted type, which owing to its freedom from glare is suitable for a wide variety of purposes. Nevertheless, the clear lamp is still fairly widely applied in the field of indirect lighting, in closed fittings and in those cases where brilliance and sparkle are more important than the avoidance of glare.

Finish	Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22	Max. length with base E 40
	15		Vacuum	Single coil	60	109	107.5	—
	25				60	109	107.5	—
	25				60	109	107.5	—
	40				60	109	107.5	—
Inside frosted or clear	60	110	Gas-filled	Coiled coil	60	109	107.5	—
	75	115			60	109	107.5	—
	100	120			60	109	107.5	—
	150	125/130			80	148.5	144	—
	200	220/230			80	178	173.5 [1]	—
	300	240			90	183	—	188
	300	250			90	183	—	188
	500		Gas-filled	Single coil	110	248 [2]	—	239
Clear	1000				150	—	—	308
	1500				170	—	—	343
	2000				200	—	—	358

[1] On special request only. [2] Non-standard.

Luminous flux in lumens

Wattage W	110 V	115 V	120 V	125/130 V	220/230 V	240 V	250 V
15	135	135	135	135	120	115	115
25 [1]	—	—	—	—	230	225	225
25 [2]	265	265	265	260	—	—	—
40	500	500	495	490	430	420	415
60	840	840	830	820	730	710	700
75	1100	1090	1080	1070	960	940	930
100	1580	1580	1560	1560	1380	1360	1340
150	2400	2380	2360	2340	2100	2060	2040
200	3300	3300	3300	3250	2950	2900	2880
300 [2]	—	—	—	—	4750	4650	4600
300 [1]	5200	5150	5150	5100	—	—	—
500	9400	9400	9300	9300	8400	8300	8200
1000	20200	20200	20000	20000	18800	18400	18400
1500	31500	31500	31500	31000	30000	29500	29500
2000	43500	43000	43000	43000	40000	39500	39000

[1] Single coil. [2] Coiled coil.

Lumen values for other voltages available on request.

INSIDE FROSTED

15 W
25 W
40 W
60 W
75 W
100 W

150 W

200 W

300 W

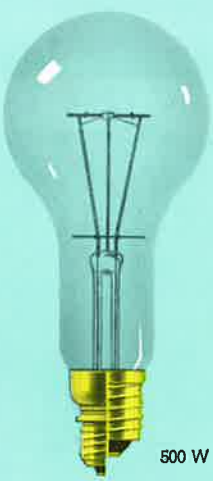
CLEAR

15 W
25 W
40 W
60 W
75 W
100 W

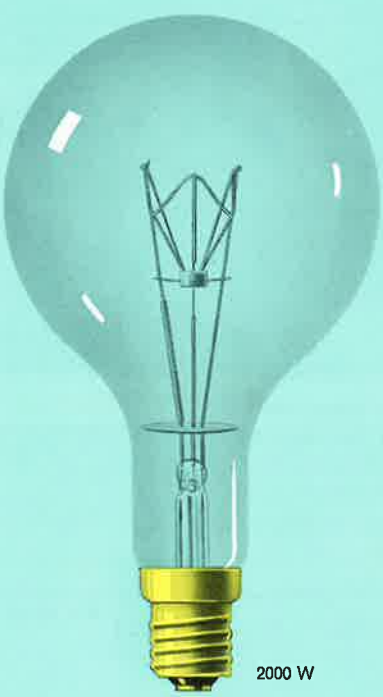
150 W

200 W

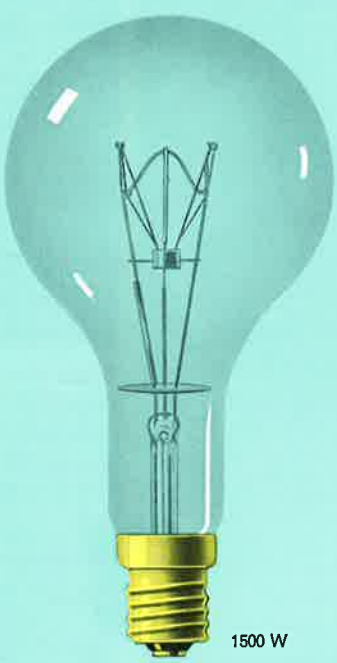
300 W



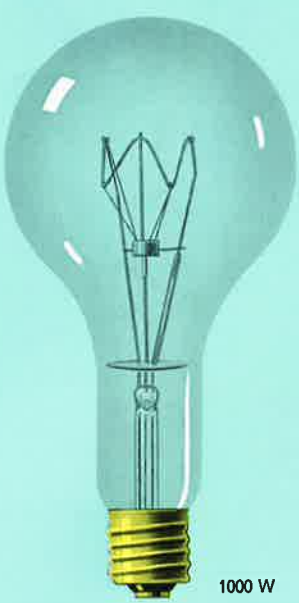
500 W



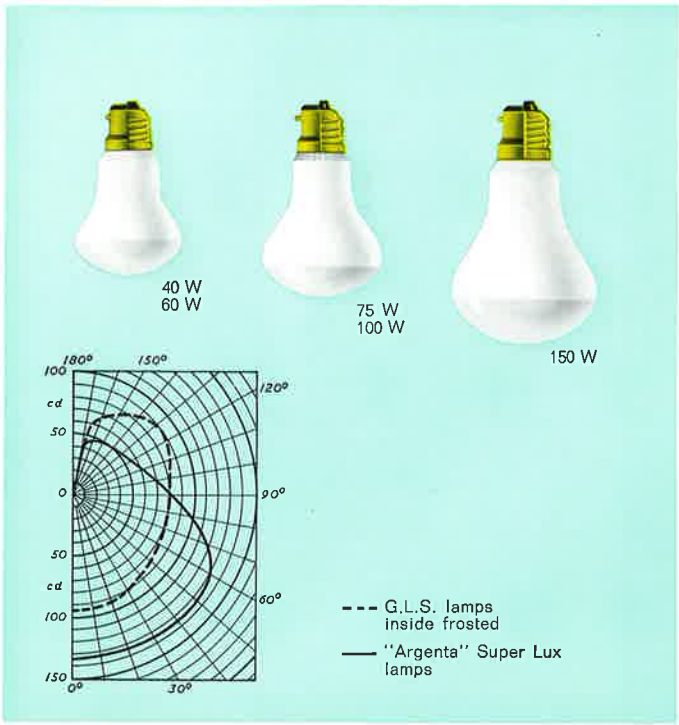
2000 W



1500 W



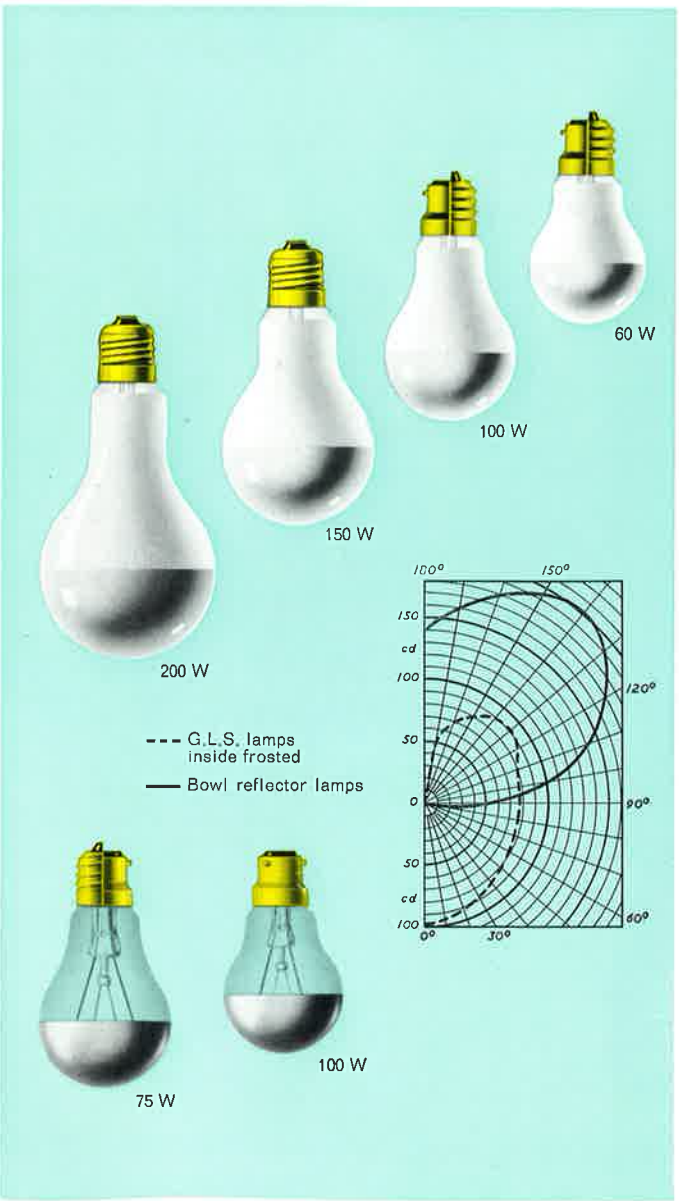
1000 W



"ARGENTA" SUPER LUX LAMPS

With these lamps, the favourable combination of a partially "Argenta" and partially satin-frosted bulb has resulted in a higher luminous intensity (up to 30 %) in the direction of the working plane, while the other favourable characteristics of the "Argenta" lamps, such as soft shadows and a perfect diffusion of light in the other directions, are retained. This construction makes the Super Lux lamp specially suitable for all applications where higher local illumination levels are required.

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base	
					E 27	B 22
	110					
40	115			50	91.5	90
60	120			50	91.5	90
75	125/130	Gas-filled	Coiled coil	60	104.5	103
100	220/230			60	104.5	103
150	240			75	128.5	124
	250					



BOWL REFLECTOR LAMPS

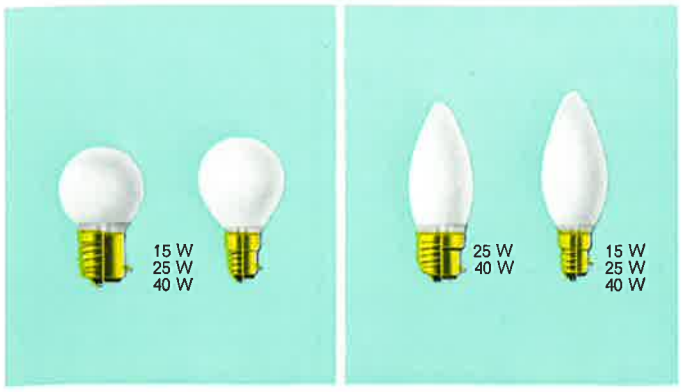
Fundamentally these are normal, inside-frosted incandescent lamps, the bulb being provided with a silvered bowl, the glaring filament thus being completely shielded from view. This characteristic makes the lamp extremely popular for efficient indirect lighting in homes, shops, offices etc.

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base	
					E 27	B22
60	110/115	Gas-filled	Coiled coil	60	109	107.5
100	125/130			70	128.5	124
	220/230					
150	240/250		Single coil	80	148.5	—
200				90	178	—

BOWL REFLECTOR LAMPS FOR SPOTLIGHT FITTINGS

These bowl reflector lamps are especially designed for spotlighting in combination with our fittings NB 73 - NB 116 - NB 117 - NB 118; they have a clear glass bulb.

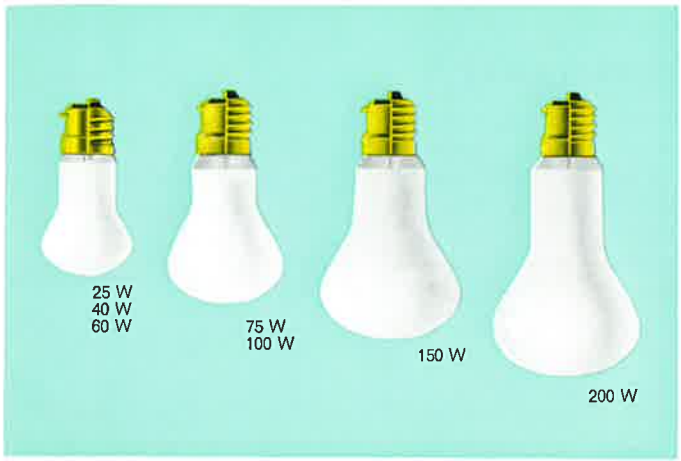
Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base	
					E27	B22 III
75	24			60	—	107.5
100				70	—	124
100	110/115 125/130 220/230 240/250	Gas-filled	Coiled coil	70	128.5	—



LUSTRE AND CANDLE LAMPS

Intended for use in all kinds of ornamental fittings, to create a cosy atmosphere in the home.

Finish	Wattage W	Voltage V	Diam.	Max. length with base			
				E14	B15	E27	B22
Inside frosted	15	110	45	78.5	—	74	—
"Argenta" or inside frosted	25	115	45	78.5	77	74	72.5
	40	120	45	78.5	77	74	72.5
Inside frosted	15	125/130 220/230 240	35	98.5	97	—	—
"Argenta" or inside frosted	25	250	35	98.5	97	95.5	94
	40		35	98.5	97	95.5	94

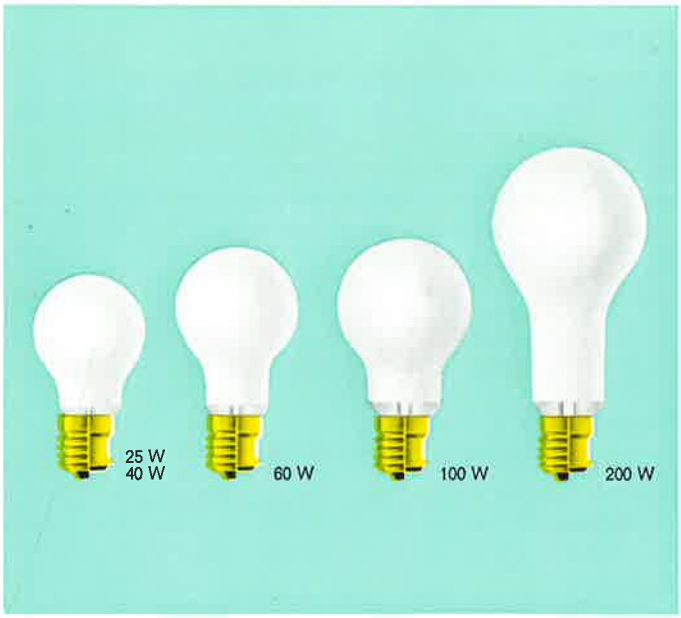


K-LAMPS

Owing to their special bulb shape of smaller dimensions, these lamps can be used in places and fittings where the available room would not allow the application of an ordinary lamp. Supplied with "Argenta" finish.

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base	
					E 27	B 22
25	110			50	91.5	90
40	115			50	91.5	90
60	120			50	91.5	90
75	125/130	Gas-filled	Coiled coil	60	104.5	103
100	220/230			60	104.5	103
150	240			75	128.5	124
200	250			80	151.5	147 1)

1) On special request only.

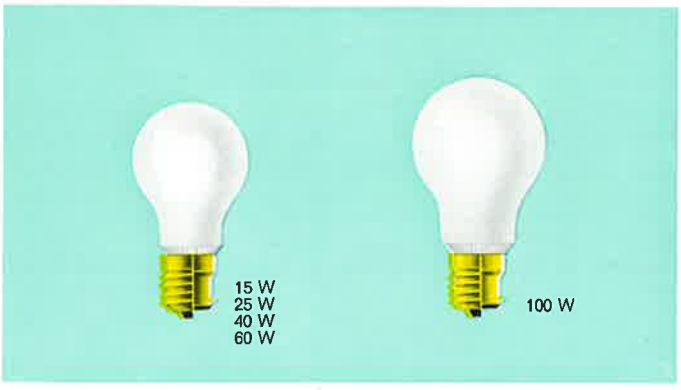


REINFORCED-CONSTRUCTION LAMPS

The particularly strong filament of these lamps, for which a special filament wire is used, makes them extremely suitable for use in places where shocks, bumps and vibrations frequently occur. They are available with an inside-frosted finish.

Wattage W	Voltage V	Diam.	Max. length with base	
			E 27	B 22
	110			
25	115	60	109	107.5
40	120	60	109	107.5
60	125/130	65	120.5	116
100	220/230	70	128.5	124
200	240	80	178	173.5 1)
	250			

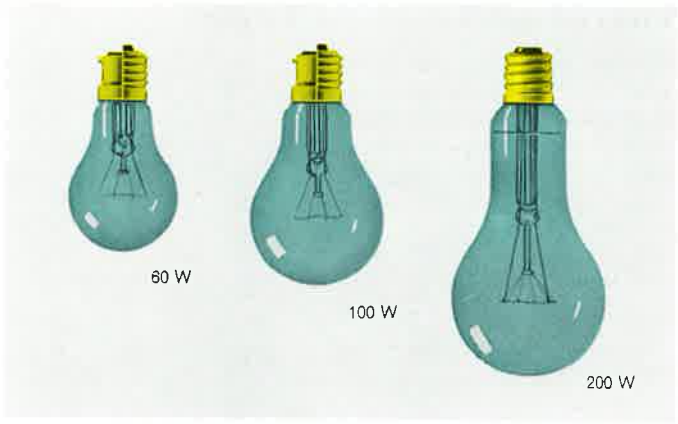
1) On special request only.



LOW-VOLTAGE LAMPS

In places where power must be supplied by accumulators or other private house-lighting plants, such as in rural areas or in isolated districts, special low-voltage lamps are required. Philips manufacture these lamps in a range from 6-42 V, with an inside-frosted finish.

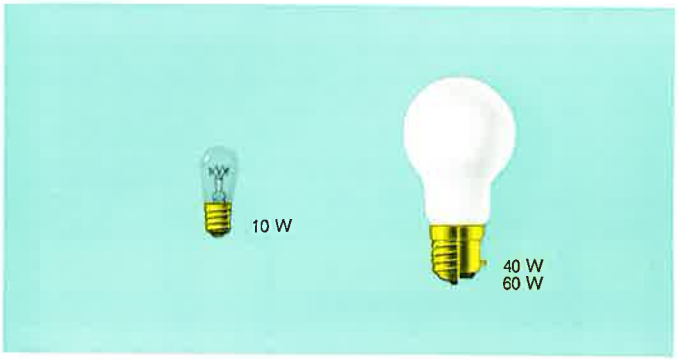
Wattage W	Voltage V	Diam.	Max. length with base	
			E 27	B 22
15	6, 12, 24, 32	60	109	107.5
25	6, 12, 24, 32, 42	60	109	107.5
40	12, 24, 32, 42	60	109	107.5
60	12, 24, 32, 42	60	109	107.5
100	24, 32, 42	70	123.5	124



DAYLIGHT-BLUE LAMPS

The natural-coloured glass bulb filters the excess of red light, peculiar to conventional incandescent lamps. The light colour of these lamps thus approaches that of daylight, as a result of which they are extremely helpful for colour discrimination.

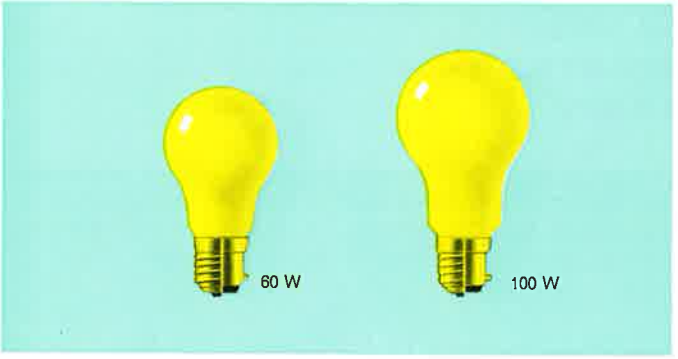
Finish	Wattage W	Voltage V	Diam.	Max. length with base	
				E 27	B 22
Natural blue glass	60	110/115	60	109	107.5
	100	125/130	70	128.5	124
	200	220/230 240/250	80	178	—



OVEN LAMPS

These lamps are primarily designed for use in places where the ambient temperature is high, such as in ovens, rotisseries etc. Manufactured with special heat-resistant solder and lamp-base cement, they ensure satisfactory operation in lampholders at temperatures up to 280 °C.

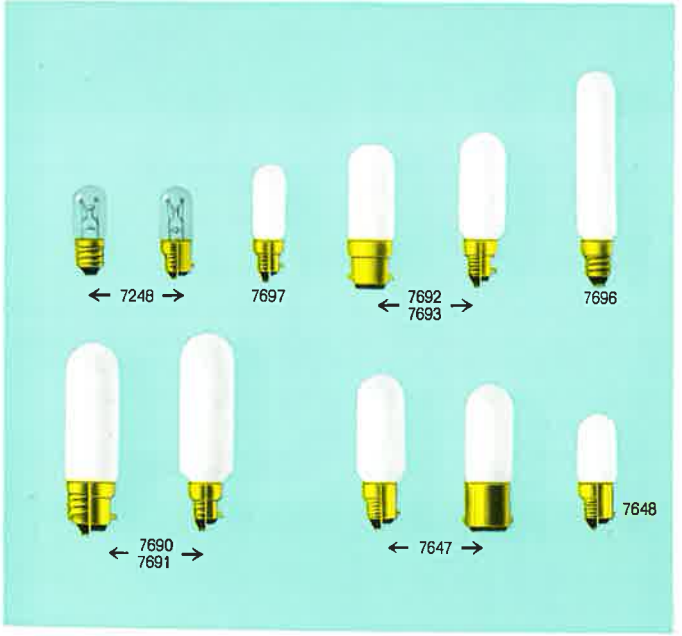
Finish	Wattage W	Voltage V	Diam.	Max. length with base		
				E 14	E 27	B 22
Clear	10	110/115 125/130	19	49	—	—
Inside frosted	40	220/230	60	—	109	104.5
	60	240/250	60	—	109	104.5



"ANTI-INSECT" LAMPS

Philips have developed a lamp whose yellow light has less attraction for most insects than light of other colours. These lamps are thus the ideal light sources for garden parties, camps, road stands, service stations etc.

Finish	Wattage W	Voltage V	Diam.	Max. length with base	
				E 27	B 22
Inside yellow	60	110/115 125/130 220/230 240/250	60	109	107.5
	100		70	128.5	124

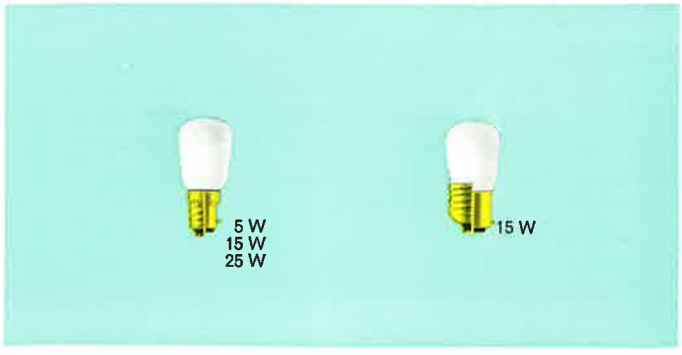


TUBULAR LAMPS

Tubular lamps find wide application in homes and industry, e.g. in refrigerators, vacuum cleaners, sewing machines and other domestic apparatus, for piano and cupboard lighting, for signalling purposes in switch boards, telephone exchanges etc.

Catalogue number	Wattage W	Voltage V	Finish	Diam.	Max. length with base				
					E 12	E 14	B 15	E 27	B 22
7248	6	110/115 120 125/130	Clear	18	47	48	47	—	—
7248	10	220/230 240/250		18	47	48	47	—	—
7697	15	110/115 125/130 220/230 240/250	Inside frosted	18	—	61	60	—	—
7692	15			25	—	81.5	80	—	76
7693	25			25	—	81.5	80	—	76
7696	25			20.5	—	117.5	—	—	—
7691	25			28	—	105.5	104	102.5	101
7690	40			28	—	105.5	104	102.5	101
7647 1)	25	110/115 125/130 220/230		25	—	86.5	80	—	76
7648 1)	25			22	—	63.5	57	—	—

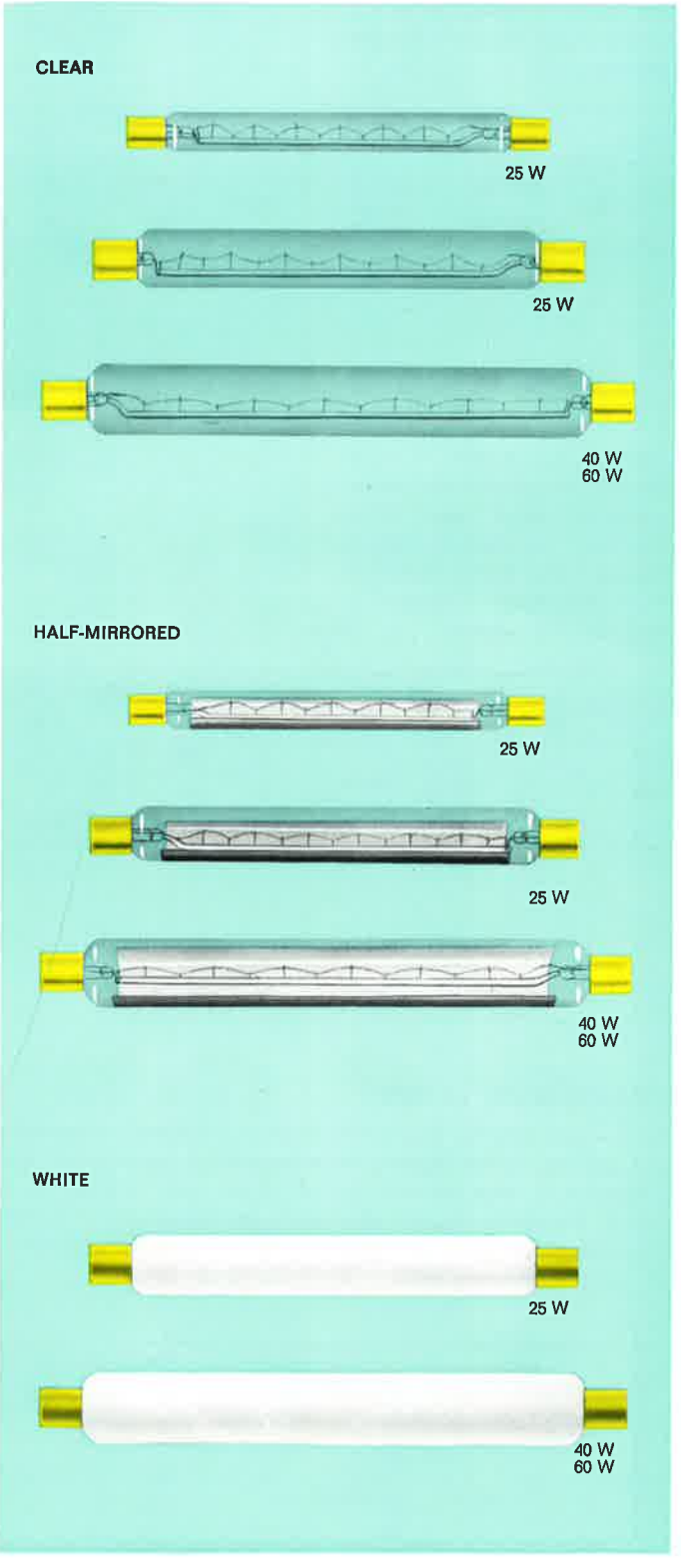
1) Reinforced construction.



PILOT LAMPS

These lamps are extensively used in places where space is restricted and little light is wanted; they find application in signs, running light advertisements, illuminated scoreboards, switchboards, refrigerators, cupboards etc.

Finish	Wattage W	Voltage V	Diam.	Max. length with base			
				E 14	B 15	E 27	B 22
Inside frosted	5	12, 24	28	65.5	64	—	—
	15	12, 24, 48, 65, 110/115, 125/130, 220/230, 240/250	28	65.5	64	59	61
	25	110/115, 125/130, 220/230, 240/250	28	65.5	64	—	—

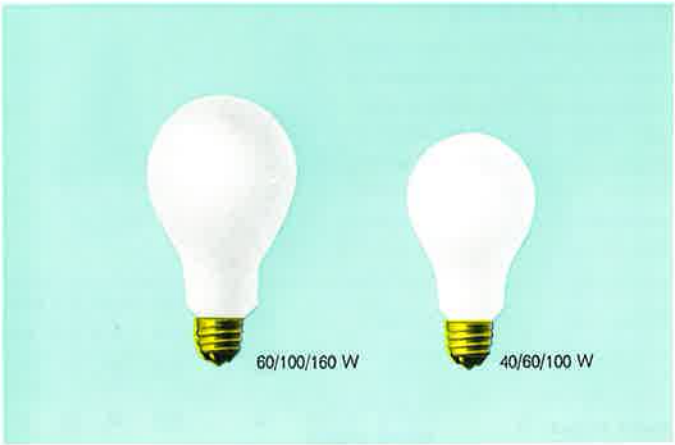


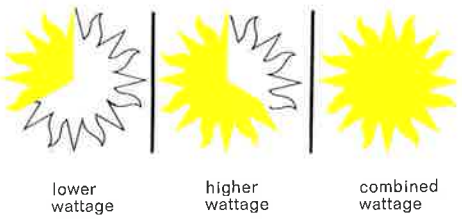
SHOW-WINDOW LAMPS

Their slender shape, small diameter and high luminous intensity make these lamps very well suited for the illumination of show-windows, showcases, aquaria, pictures and mirrors. The filament, extending over the entire length of the lamp, gives a uniform, long strip of light. The lamps should be mounted in such a way that their light is evenly distributed in the required direction, the bulbs themselves remaining screened from view.

Finish	Wattage W	Voltage V	Base	Diam.	Overall length
Clear	25		S 15	22	222
	25		S 19	30	261
	40		S 19	38	311
	60		S 19	38	311
Half-mirrored	25	110/115	S 15	22	222
	25	125/130	S 19	30	261
	40	220/230	S 19	38	311
	60	240/250	S 19	38	311
White	25		S 19	30	261
	40		S 19	38	311
	60		S 19	38	311

PHILIPS

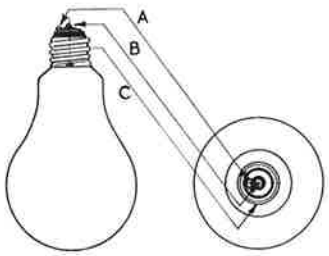




THREE-LIGHT LAMPS

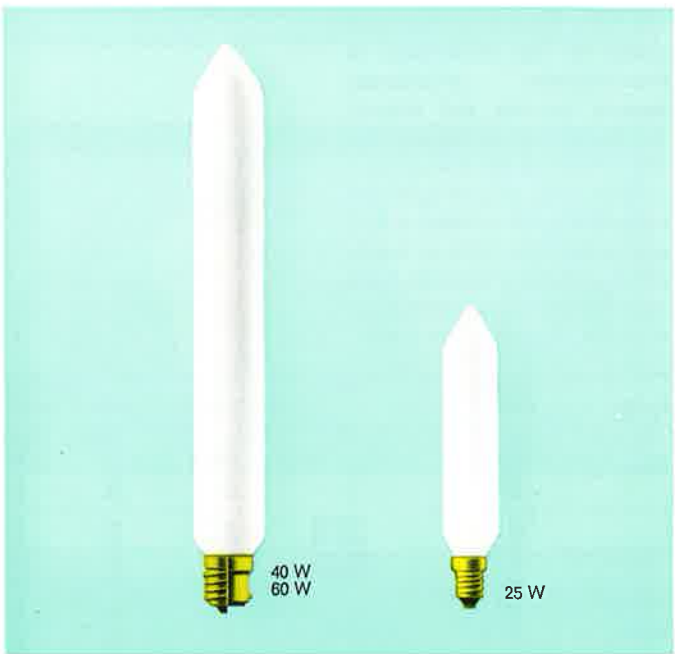
Three-light lamps contain two filaments, making it possible to obtain three different illumination levels. In fact, each filament is of a different wattage and can be lighted individually or in combination with the other, thus giving these lamps numerous application possibilities. The medium wattage should be regarded as normal, the lower is for decoration or casual effects, the combined wattage is for use where visual requirements are important.

A = contact lower wattage
B = contact higher wattage
C = combined contact



top view

Finish	Wattage W	Voltage V	Base	Diam.	Overall length
"Argenta"	40/60/100	110/115 125/130 220/230 240/250	3cE26	70	124
	60/100/160			80	142



"COLORENTA" LAMPS

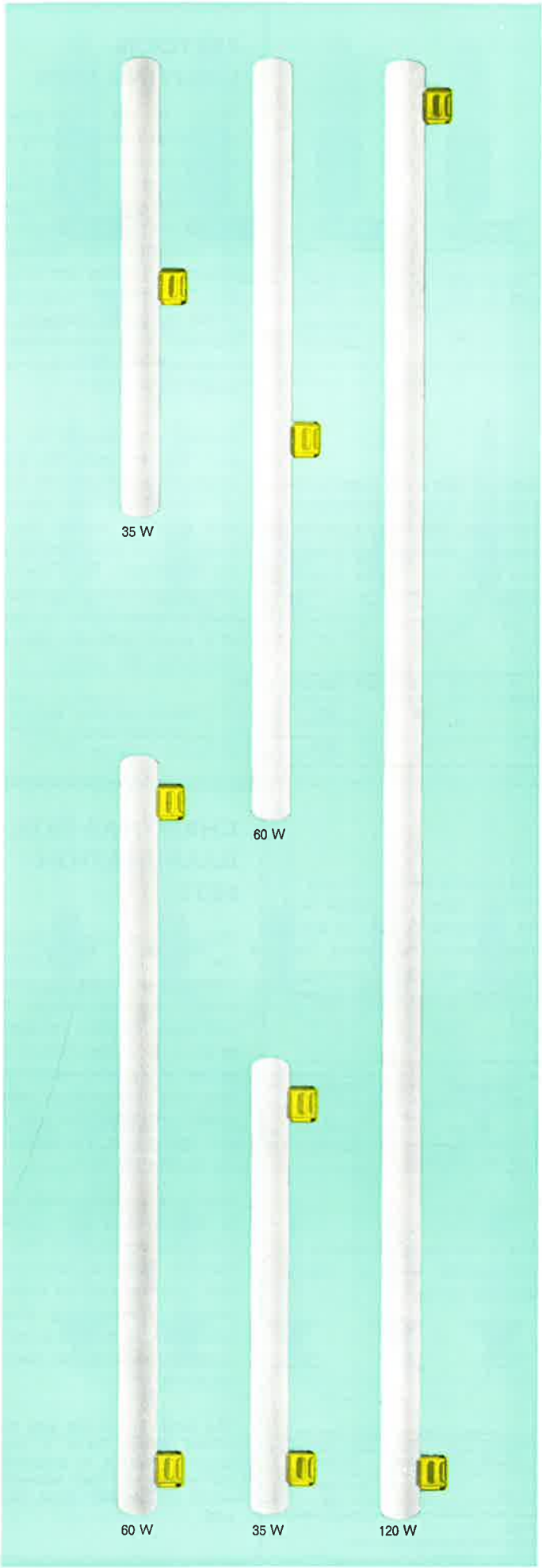
The graceful design of these lamps combined with their white, enamelled finish result in a charming candle-light effect, making these lamps outstandingly decorative elements in contemporary interiors.

Catalogue number	Wattage W	Voltage V	Finish	Diam.	Max. length with base E 14	Max. length with base E 27	Max. length with base B 22
6353	25	110/115 125/130 220/230 240/250	White enamelled	30	164	—	—
6350	40			38	—	315.5	311
6351	60			38	—	315.5	311

"FANTASIE" LAMP

A new-style lamp for decorative and general interior lighting of living rooms, halls, restaurants, shops, recreation rooms, canteens etc. They can be mounted in simple lampholders, thus forming the ideal, modern-style substitute for the common type of white, globe fittings, or in elaborate fittings with or without additional glass outer globes.

Finish	Wattage W	Voltage V	Diam.	Max. length with base E 27	Max. length with base B 22
"Argenta"	40	110 115 120 125/130 220/230 240 250	70	142	137.5



"PHILINEA" LAMPS

A combination of slimness of line, white finish and concealed bases has made these lamps appealing to the eye. Moreover, filaments of adapted wattage ensure incandescent light of a strength sufficient for various types of utility lighting systems. An additional feature is that the lamp bases are not mounted at the lamp ends, so that "Philinea" lamps can be arranged to form continuous strips of light. All these features ensure that the lamps find wide application in banks, theatres, hotels, shops and homes.

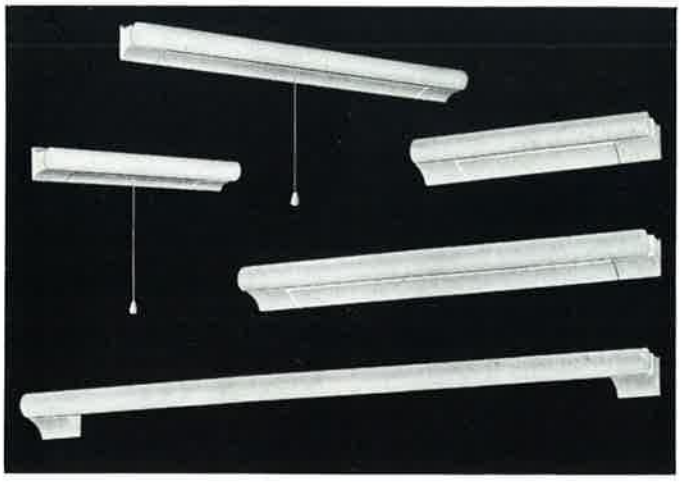
Catalogue number	Wattage W	Voltage V	Finish	Base	Diam.	Overall length
6275 X	35	110 115 120 125/130 220/230 235 240 250	Inside white	S14s	30	300
6276 X	60				30	500
6277 X	120				30	1000
6275 Z	35			S14d	30	300
6276 Z	60				30	500

LAMPHOLDERS

As "Philinea" lamps require special lampholders, Philips have holders in an ivory-coloured finish available for the lamps with S14s bases. In addition, mounting channels for the 300 and 500 mm lamps can be supplied, so as to simplify mounting. The channels can be had with or without pull switch. The design of the lampholders as well as of the channels is in line with to-day's architectural demands.

Description	Catalogue number	For lamps	Finish	Dimensions l x b x h
Lampholder	7644 [1]	35 W 60 W 120 W	Ivory sprayed "Philite"	50 x 46 x 39
Mounting channel	7622/10 [2]	35 W		301 x 46 x 39
	7609/10 [2]	60 W		501 x 46 x 39

[1] Two lampholders are needed per lamp.
[2] Can also be supplied with pull-switch; cat. no. . . ./20.



PHILIPS

NIGHT LAMP (INCANDESCENT)

For use in those places where subdued lighting is desirable or necessary, Philips have developed a range of lamps, the "filament" type of which is shown opposite. Their low power-consumption, long service life and subdued light make these lamps eminently suitable for children's bedrooms, hospitals, nurseries, passages, staircases etc. - Available with an inside frosted finish.

Voltage V	Luminous intensity cd	Diam.	Max. length with base	
			E27	B22
110/130 220/250	approx. 5	45	74	72.5

NIGHT LAMP (GLOW)

Another night lamp, belonging, however, to the large family of discharge lamps. These "glow" lamps do not have a filament, the rare gas filling (in this case neon) acting here as the current-carrying medium. Having no filament, neon night lamps have the additional feature of being vibration and shock proof. They are supplied with a fluorescent bulb, giving a greenish light.

Catalogue number	Voltage V 1)	Wattage W	Base	Diam.	Overall length
13511E/48 13511B/48	110 - 250	max. 0.8	E27 B22	45 45	79 74.5

1) When ordering, please indicate exact voltage required.

PLUG-IN LAMPS

Fundamentally the same lamp as the neon glow lamp mentioned above. The only difference is that it can be plugged directly into a wall-socket. Available for wall-sockets with or without earthing provision.

Catalogue number	Voltage V 3)	Wattage W	Diam.	Overall length
13511A/48 1) 13511Y/48 2)	100 - 250	max. 0.8	45 45	88 88

1) Pin diam. 4 mm; for European wall-sockets.
2) Pin diam. 4.8 mm; for European wall-sockets with earthing provision.
3) When ordering, please indicate exact voltage required.

FESTOON LIGHTING SETS

There is an ever-growing demand for festoon lighting sets suitable for outdoor use, e.g. for the illumination of large trees in parks and gardens, near petrol service stations, in playgrounds, on balconies, for decorative lighting of façades and streets, etc. The "Philite" lampholders of the set shown opposite, are provided with rubber sealing rings and interconnected with heavy rubber cord.

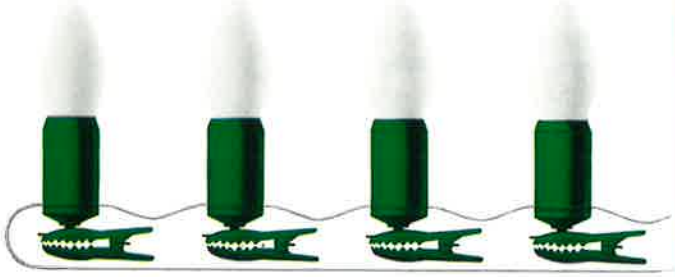
Another set designed for outdoor use as well. The green lampholders with saucers made of "Philite" are also provided with a rubber sealing ring, to prevent water from entering into the lampholder. Both the sets described here, are attached to trees or other objects by means of a strong crocodile clip with ball-and-socket joint.

CHRISTMAS-TREE ILLUMINATION SETS

Philips christmas-tree illumination sets have the following characteristic features: quality, safety, attractive design. The unit shown opposite consists of 16 short, green lampholders with saucer made of pressed thermosetting plastic fitted with a strong crocodile clip with ball and socket joint. The lamps are candle-shaped.

Another set which greatly adds to the pleasant and convivial Christmas atmosphere. This set contains 16 white lampholders with green saucer, all made of pressed thermosetting plastic. Attachment to the tree is carried out in the same way as described above.

The lamps for all the sets mentioned above have a short-circuiting device, to ensure that the circuit is not interrupted when one of the lamps burns out.



Set	Lamp [1] [2]	Voltage V	Catalogue number	Diam. holder	Max. length incl. of lamp
16 green holders	candle; inside frosted	200 - 250	7575/7688	29	140
	candle; clear		7575/7687		

[1] Also available with lamps in various colours, on request.

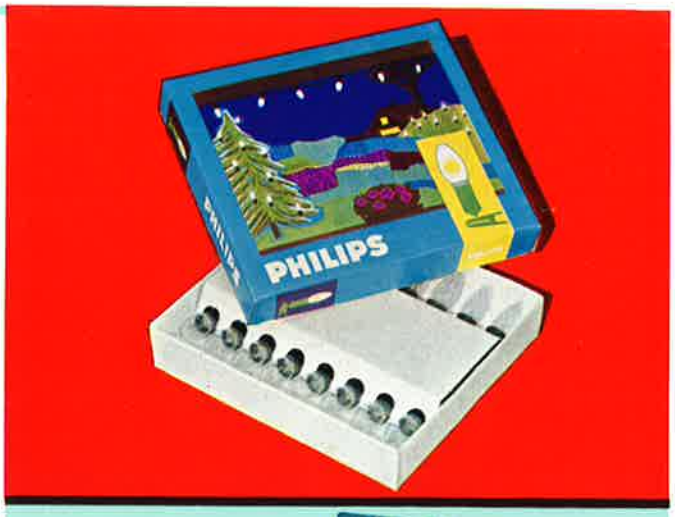
Set	Lamp [2]	Voltage V	Catalogue number	Diam. saucer	Max. length incl. of lamp
16 green holders	white long candle; clear ribbed top	110 - 130 200 - 250	7509/7552	40	128

[2] For data and dimensions of the lamps see page 26.

Set	Lamp [1]	Voltage V	Catalogue number	Diam. saucer	Max. length incl. of lamp
16 green holders	coloured long candle; clear ribbed top	110 - 130	7557/7535	40	128
	white long candle; clear ribbed top	200 - 250	7557/7552	40	128

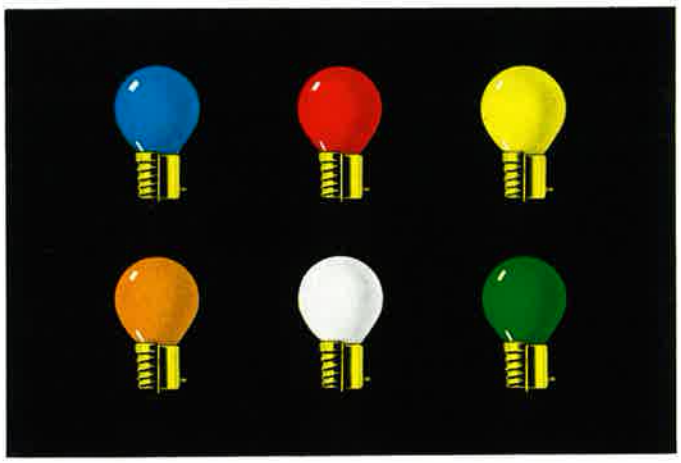
Set	Lamp [1]	Voltage V	Catalogue number	Diam. saucer	Max. length incl. of lamp
16 white candles with green saucer	dwarf-candle; ribbed; clear	100 - 130 200 - 250	7540/7515	40	117

[1] For data and dimensions of the lamps see page 26.

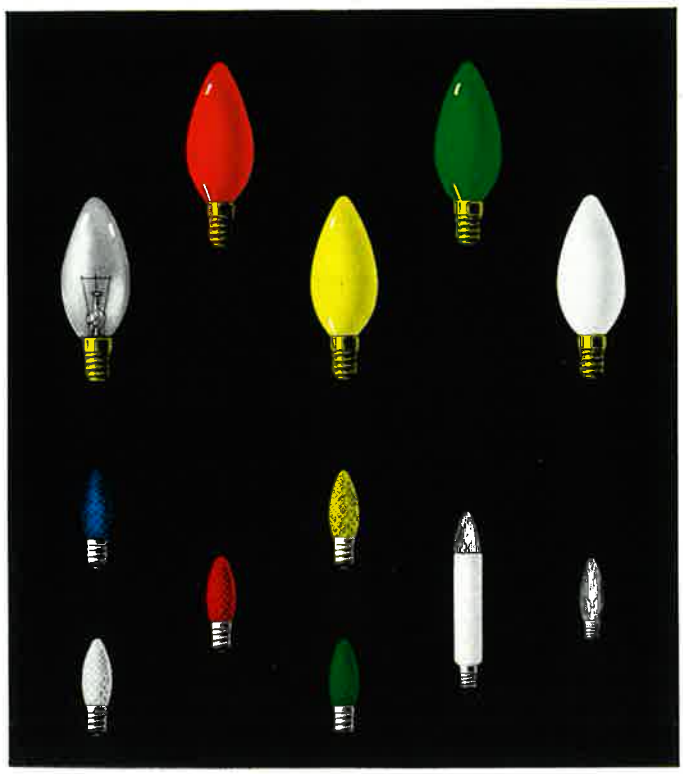


COLOURED LAMPS

The colour coatings of these lamps being flushed inside, they cannot chip, scratch or fade, nor can they be affected by weathering. This feature makes the lamps ideal for outside decorative use in illumination signs, Christmas and other decorations, for garden parties, carnivals, fairs etc. Of course, there are also numerous applications for special effects in homes, theatres, public buildings, restaurants etc. Philips coloured lamps are supplied in two shapes: the "normal" and the drop shape, and are destined for parallel mounting.



Finish	Wattage W	Voltage V	Diam.	Max. length with base		
				E14	E27	B22
Red Green White Blue	15 25 40	110/115 125/130 220/230 240/250	60	—	109	107.5
Yellow Orange	15 25		45	78.5	74	72.5



FESTIVE ILLUMINATION LAMPS

In addition to the coloured lamps for parallel burning described above, Philips manufacture various kinds of lamps for festive illumination and ornamental lighting for series burning as well. These small lamps are available in a wide assortment of colours and have a low power consumption. They are designed for a wide field of application such as decorative designs, special effects in homes, theatres and restaurants etc.

All series burning lamps are provided with a short-circuiting device, to ensure that the current is not interrupted when one of the lamps burns out.

Shape	Finish	Voltage V	Wattage W	Diam.	Max. length with base	
					E10	E14
Candle	clear, inside frosted or coloured [1]	14	4	35	—	98.5
Pine-apple	clear or coloured [2]	7 and 14	1.5 and 3	18	53	—
Long candle	ivory white [3] shaft; clear ribbed top;	7 and 14	3	14.5	95	—
Dwarf-candle	clear [3]; ribbed bulb	7 and 14	1.5 and 3	13.5	47	—

[1] Red, green, yellow.
[2] Transparent: red, green, blue, yellow.
[3] Also available in various colours, on request.

"COMPTALUX"

150 W
300 W

75 W
100 W

"COMPTALUX"-FLOOD

100 W
150 W

"COMPTALUX" LAMPS

Philips "Comptalux" lamps are provided with a high-quality internal mirror which cannot be affected by external conditions such as dirt and dust. The lamps produce a wide beam of light and can be supplied in two versions: the pressed-glass and the blown-bulb version. Lamps of the former group, the so-called "Comptalux"-Flood lamps, have the widest field of application as they are made from pressed hard glass, which makes them ideal for outdoor use, e.g. for floodlighting, without further protection. Another feature of the pressed-glass version is that the lamps have a higher light intensity and a longer life than blown-bulb reflector lamps (2000 hours versus 1000 hours). The blown-bulb "Comptalux" lamps are suitable for indoor lighting only, in places where the requirements imposed on the illumination level are not so stringent.

Catalogue number	Voltage V	Wattage W	Base	Diam.	Max. length
"Comptalux"					
13927 E/44	110, 115, 120, 125/130, 220/230, 240, 250	75	E 27	95	130
13927 B/44			B 22	95	125.5
13412 E/44		100	E 27	95	130
13412 B/44			B 22	95	125.5
13211 E/44		150	E 27	125	165
13211 B/44			B 22	125	160.5
13320 E/44		300	E 27	125	165
"Comptalux"-Flood					
13985 E/99	110, 115, 120, 125/130, 220/230, 240, 250	100	E 27	122	133
13012 E/99		150	E 27	122	133

Voltage V	Wattage W	Total initial luminous flux lm	Luminous intensity centre beam cd	Half value beam spread [1] degrees	Illumination in centre of beam lux 1.5 m [3]	2.5 m [3]	3.5 m [3]	4.5 m [3]	Half value beam width [2] cm 1.5 m [3]	2.5 m [3]	3.5 m [3]	4.5 m [3]
"Comptalux"												
	75	750	550	2 x 25°	245	90	45	27	2 x 70	2 x 117	2 x 163	2 x 210
110, 115, 120,	100	1025	770	2 x 25°	340	125	65	38	2 x 70	2 x 117	2 x 163	2 x 210
125/130	150	1600	1100	2 x 25°	490	175	90	55	2 x 70	2 x 117	2 x 163	2 x 210
	300	3750	2400	2 x 25°	1065	385	195	120	2 x 70	2 x 117	2 x 163	2 x 210
	75	650	500	2 x 25°	220	80	40	25	2 x 70	2 x 117	2 x 163	2 x 210
220/230,	100	925	700	2 x 25°	310	110	55	35	2 x 70	2 x 117	2 x 163	2 x 210
240, 250	150	1350	1000	2 x 25°	445	160	80	50	2 x 70	2 x 117	2 x 163	2 x 210
	300	3600	2200	2 x 25°	980	350	180	110	2 x 70	2 x 117	2 x 163	2 x 210
"Comptalux"-Flood												
110, 115, 120,	100	960	2150	2 x 18°	955	345	175	105	2 x 48	2 x 81	2 x 113	2 x 146
125/130	150	1500	3400	2 x 18°	1510	545	275	170	2 x 48	2 x 81	2 x 113	2 x 146
220/230,	100	820	1800	2 x 18°	800	290	145	90	2 x 48	2 x 81	2 x 113	2 x 146
240, 250	150	3000	3000	2 x 18°	1335	480	245	150	2 x 48	2 x 81	2 x 113	2 x 146

"COMPTALUX"-FLOOD COLOR

[1] Twice the angle measured from the beam axis at which the luminous intensity is half of that in the beam centre.

[2] Twice the distance measured from the beam axis at which the luminous intensity is half of that in the beam centre; at the limits of this beam width the illumination is approximately 35 % (for "Comptalux"-Flood lamps: 43 %) of that in the beam centre.

[3] Suspension height of the lamp.

"COMPTALUX"- FLOOD COLOR LAMPS

Pressed-glass reflector lamps are supplied with red, green, yellow or blue front as well, thus enabling a variety of coloured lighting effects to be easily obtained. The colours are heat and weather resistant and are therefore suitable for both indoor and outdoor use. Philips "Comptalux"-Flood Color lamps are ideal for all kinds of illumination purposes.

Catalogue number	Colour	Voltage V	Wattage W	Base	Diam.	Max. length
13985 E/476	red	110 115 120 125/130 220/230 240 250	100	E 27	122	133
13985 E/470	blue					
13985 E/472	yellow					
13985 E/473	green					

"ATTRALUX"

150 W
300 W

75 W
100 W

"ATTRALUX"-SPOT

100 W
150 W

"ATTRALUX" LAMPS

Apart from the narrow beam of light "Attralux" lamps produce, they have, for the rest, the same excellent qualities and are supplied in the same versions as "Comptalux" lamps, the pressed-glass version being sold under the trade name "Attralux"-Spot. "Attralux" lamps are applied for the illumination of smaller surfaces or for objects placed at greater distances. The 150 W type is also available for 24 V. This lamp has a still narrower beam and a candela value three times as great as that of the corresponding 220/230 V type, and is particularly suitable for all applications where, for reasons of safety, low voltage is preferred. The 24 V "Spot" version can furthermore be considered as a reinforced construction type, in view of its reinforced filament.

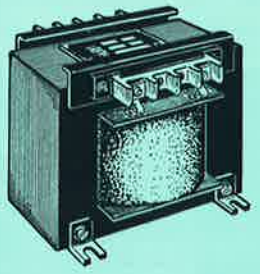
Catalogue number		Voltage V	Wattage W	Base	Diam.	Max. length
"Attralux"						
13926	E/44		75	E 27	95	130
	B/44			B 22	95	125.5
13411	E/44	110, 115, 120,	100	E 27	95	130
	B/44	125/130, 220/230,		B 22	95	125.5
13378	E/44	240, 250	150	E 27	125	165
	B/44			B 22	125	160.5
13321	E/44		300	E 27	125	165
13378	E/44	24	150	E 27	125	165
	B/44			B 22	125	160.5
"Attralux"-Spot						
13987	E/99	110, 115, 120,	100	E 27	122	133
13011	E/99	125/130, 220/230, 240, 250	150	E 27	122	133
13011	E/99	24	150	E 27	122	133

Voltage V	Wattage W	Total initial luminous flux lm	Luminous intensity centre beam cd	Half value beam spread [1] degrees	Illumination in centre of beam lux 1.5 m [3]	2.5 m [3]	3.5 m [3]	4.5 m [3]	Half value beam width [2] cm 1.5 m [3]	2.5 m [3]	3.5 m [3]	4.5 m [3]
"Attralux"												
110	75	750	1750	2 x 9°	780	280	145	85	2 x 23	2 x 40	2 x 55	2 x 71
115	100	1050	2700	2 x 9°	1200	430	220	135	2 x 23	2 x 40	2 x 55	2 x 71
120	150	1700	5400	2 x 9°	2400	860	440	265	2 x 23	2 x 40	2 x 55	2 x 71
125/130	300	3750	6600	2 x 15°	2935	1055	540	325	2 x 40	2 x 67	2 x 94	2 x 120
220/230	75	650	1600	2 x 9°	710	225	130	80	2 x 23	2 x 40	2 x 55	2 x 71
240	100	950	2500	2 x 9°	1110	400	205	125	2 x 23	2 x 40	2 x 55	2 x 71
250	150	1475	5000	2 x 9°	2220	800	410	245	2 x 23	2 x 40	2 x 55	2 x 71
	300	3600	6000	2 x 15°	2665	960	490	295	2 x 40	2 x 67	2 x 94	2 x 120
24	150	2350	25000	2 x 5°	11110	4000	2040	1235	2 x 13	2 x 22	2 x 31	2 x 39
"Attralux"-Spot												
110												
115	100	960	5600	2 x 8°	2490	895	455	275	2 x 21	2 x 35	2 x 49	2 x 63
120	150	1500	10000	2 x 8°	4445	1600	815	495	2 x 21	2 x 35	2 x 49	2 x 63
125/130												
220/230	100	820	4000	2 x 8°	1775	640	325	195	2 x 21	2 x 35	2 x 49	2 x 63
240	150	1400	7500	2 x 8°	3335	1200	610	370	2 x 21	2 x 35	2 x 49	2 x 63
250												
24	150	2000	25000	2 x 5°	11110	4000	2040	1235	2 x 13	2 x 22	2 x 31	2 x 39

1) Twice the angle measured from the beam axis at which the luminous intensity is half of that in the beam centre.

2) Twice the distance measured from the beam axis at which the luminous intensity is half of that in the beam centre; at the limits of this beam width the illumination is approximately 47 % (for "Attralux"-Spot lamps: 50 %) of that in the beam centre.

3) Suspension height of the lamp.



STEP-DOWN TRANSFORMER

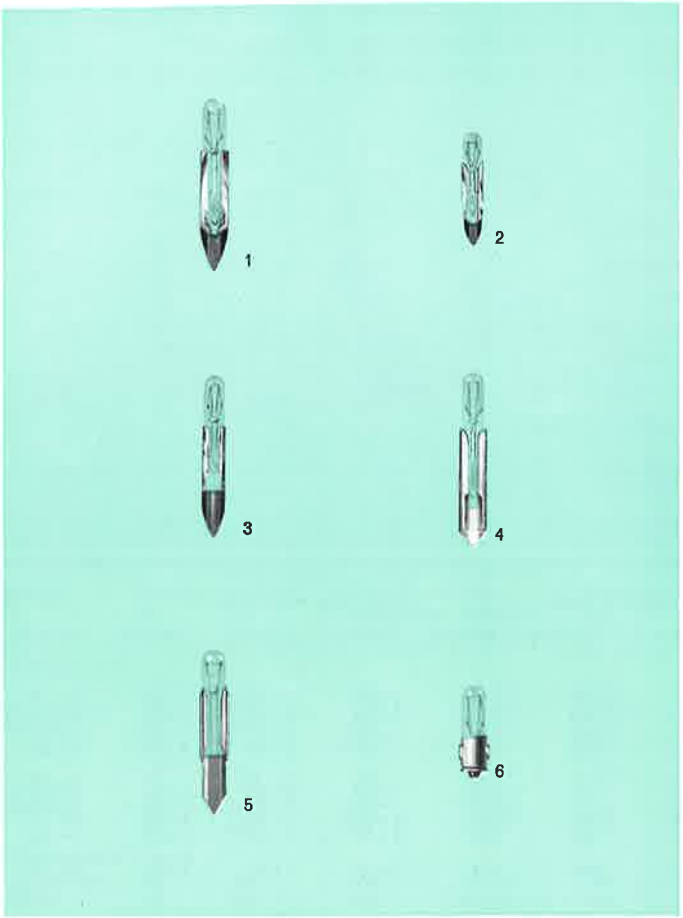
When "Attralux" 24 V lamps are applied, an additional step-down transformer is required.

Catalogue number	Primary voltage V	Secondary voltage V	Mains current A	Losses W	Dimensions l x b x h
59500 CH/00	225	24	0.75	19	108 x 92 x 105
59500 BT/00	110/125	24	1.55 [1] 1.35 [2]	20 [1] 19 [2]	

1) For 110 V primary voltage
2) For 125 V primary voltage

TELEPHONE LAMPS

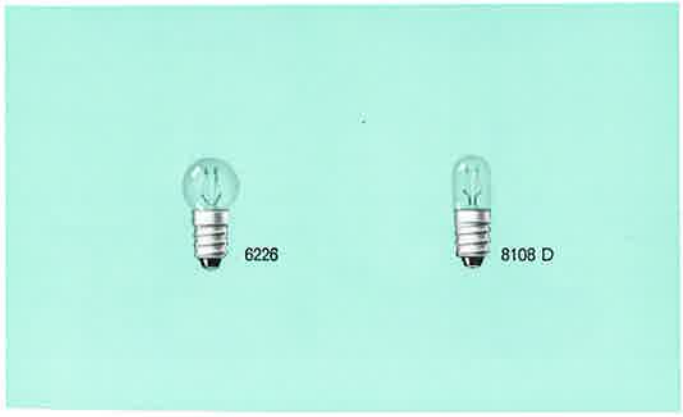
These lamps find wide application in telephone exchanges where they act as indicators to enable visual control of the number of lines in operation and the connections made. Moreover, the miniature lamp type with B7s cap is, owing to its compactness, ideal for mounting in push-buttons, apparatus for intercom facilities etc. — Telephone lamps can also be applied as resistors. When mounted in series with the circuit, they serve to keep a check on the proper functioning of the respective telephone lines.



Type	Voltage V	Current mA	Base	Diam.	Overall length	Fig.
BELL	6	40	T 6.8	6	45	1
	12	30				
	12	40				
	12	100				
	24	40				
	24	50				
	24	100				
	36	45				
	48	40				
	50	60				
	60	40				
	60	55				
BELL LILLIPUT	6	20	T 5.7	4.8	31	2
	6	40				
	12	20				
	12	50				
	24	20				
	24	50				
	36	20				
	48	20				
	48	30				
	60	20				
ERICSSON	6	40	T 5.8	5.3	43	3
	6	75				
	12	20				
	12	50				
	24	40				
	24	60				
	36	35				
	36	50				
	48	30				
	60	40				
NAWI	7	40	T 6.6	6	46	4
	15	40				
	20	40				
	24	40				
	30	40				
	30	100				
	45	100				
	60	40				
	45	40				
BSI	4	250	T 7	6.6	45	5
	6	41				
	17	45				
	24	100				
—	6	40	B 7 s	6.6	23.7	6
	6	100				
	12	20				
	12	50				
	24	20				
	24	50				
	36	20				
	36	50				
	48	20				
	48	50				
	60	20				
	60	50				

NEWSREEL LAMPS

Newsreel lamps have been designed to display advertising texts, announcements, company names and other messages in bright and easy-to-read letters. The tracing effect, resulting from the lamps lighting up one after the other, is striking and has a high visual impact. The lighting system is composed of electronic light relays, consisting of a cadmium-sulphide cell and an incandescent lamp.



Catalogue number	Voltage V	Wattage W	Current A	Av. life h	Base	Diam.	Overall length
6226	40	2.5	—	1000	E 10	15	29
8108D	24	—	0.05	1000	E 10	10.5	30

MINERS' LAMPS

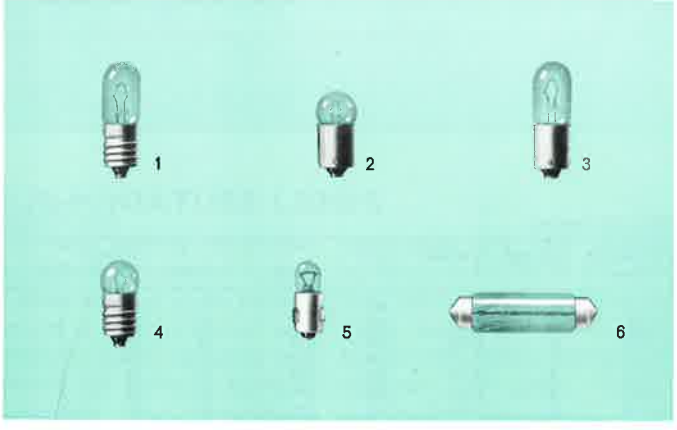
It is of vital importance that the miner can rely on the proper functioning of the lamps he must use when performing his task. For this reason the greatest care is bestowed on the production of these lamps.

Cat.no. or Group no.	Voltage V	Current A	Filling	Av. life h	Base	Diam.	Overall length	Fig.
D 010-01	2.4	1		500	E 10	17.3	31	1
D 010-14	2.5	0.6		500	BA 15d	25	45	2
D 010-14	2.5	0.6		500	BMX 15s	25	47	2
D 010-01	3.6	1		500	E 10	17.3	31	1
D 010-31 [1]	3.75	0.9/0.9	Krypton	500	BA 15d	25	50.5	3
D 010-28	3.8	1.5		300	BA 15s	25	50.5	4
D 010-28	3.8	1.75		350	BA 15s	25	50.5	4
5951	3.95	0.8		750	E 10	15	29	5
5952	3.95	0.9		750	E 10	15	29	5
5964	4	0.46	Argon	200	E 10	11	24	6
5965	4	0.67		400	E 10	15	29	5
5953	4	0.67		400	E 10	15	29	5
5966	4	0.7		750	E 10	15	29	5
5954	4	0.8		400	E 10	15	29	5
5955	4	0.8		200	E 10	17.3	31	1
5956	4	1	Krypton	400	E 10	15	29	5
5967	4	1		200	E 10	15	29	5
D 010-99	4	1		350	BA 15s	25	50.5	4
5960	4	1		250	E 14	19	47.5	7
5961 [1]	4	1/1		350	BA 15d	19	42	8
5962 [1]	4	1.4/0.8		200	BA 15d	19	42	8
5963	4	1.5		300	BA 15s	25	50.5	4

[1] Double-filament lamp.

DIAL LAMPS

These lamps are used extensively throughout the radio industry for panel lighting and indication on radios, tape recorders etc. Great care is given to precision mounting of the filament so as to avoid interference noise. They are also widely applied in elevators, signal panels, clocks, amplifiers, etc.



Catalogue number	Voltage V	Current A	Base	Diam.	Overall length	Fig.
7995 D	1.5	0.5	E 10	10.5	30	1
41	2.5	0.5	E 10	10.5	30	1
8041 D	4	0.1	E 10	10.5	30	1
8023 N	6	0.18	BA 9s	11	24	2
8073 N	6.3	0.1	BA 9s	10.5	30	3
8008 D [1]	6.3	0.15	E 10	10.5	30	1
8008 N [2]	6.3	0.15	BA 9s	10.5	30	3
8009 D [3]	6.3	0.25	E 10	10.5	30	1
8009 N [4]	6.3	0.25	BA 9s	10.5	30	3
8024 D	6.3	0.3	E 10	10.5	30	1
8045 D	6.3	0.32	E 10	10.5	30	1
7037 D	6.5	0.3	E 10	11	24	4
7997 N	7	0.1	BA 7s	6.7	20	5
7996 D	7	0.3	E 10	10.5	30	1
7994 N	7.2	0.1	BA 9s	11	24	2
8034 D	10	0.2	E 10	10.5	30	1
8010 T	10	0.2	S 8.5s	10.5	39	6
8089 D	12	0.1	E 10	11	24	4
8089 N	12	0.1	BA 9s	11	24	2
7998 N	14	0.1	BA 7s	6.7	20	5
8004 D	15	0.2	E 10	10.5	30	1
8011 T	15	0.2	S 8.5s	10.5	39	6
8005 D	18	0.1	E 10	10.5	30	1
8012 T	18	0.1	S 8.5s	10.5	39	6
8097 D	19	0.1	E 10	10.5	30	1

[1] American equivalent type 40
[2] American equivalent type 47
[3] American equivalent type 46
[4] American equivalent type 44

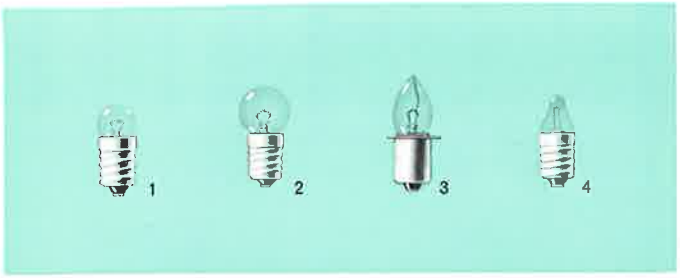
FLASHER LAMPS

Philips flasher lamps have a built-in bi-metal strip which automatically closes and opens the current circuit, resulting in intermittent lighting and extinguishing of the lamp. An ideal self-contained flashing unit for a great variety of applications, e.g. as marker light in the event of a motorcar break-down, as warning light in case of road accidents or road repairs, as identification light on police belts, as flashing unit in festive illuminations, advertising media etc.

Catalogue number	Voltage V	Current A	Base	Diam.	Overall length	Fig.
401	1.25	0.22	E 10	15	29	1
7406	2.6	0.3	E 10	15	29	1
7407	4.9	0.3	E 10	15	29	1
7408	4.9	0.3	BA 9s	15	28	2
25	6	0.19	E 10	18.5	47	3
7405	6.5	0.5	E 10	15	29	1
455	6.5	0.5	BA 9s	15	28	2
257	14	0.27	BA 9s	15	28	2

FLASHLIGHT LAMPS - PREFOCUS FLASHLIGHT LAMPS - LENS-END LAMPS

Flashlight lamps with round bulb are suitable for torches from which an even spread of light is required, or which have a focusing arrangement. - By using prefocus lamps in conjunction with a parabolic reflector, a beam of high intensity may be obtained. - Lens-end lamps are commonly used for pencil-type torches. They produce a concentrated spot of light.

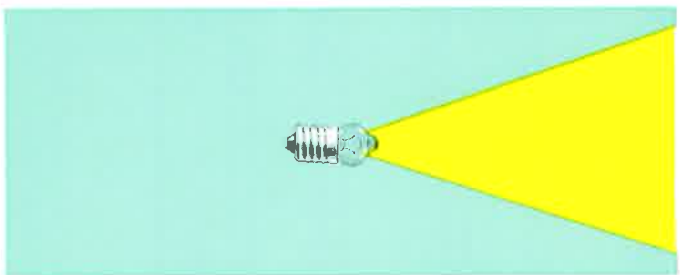


Flashlight lamps

Catalogue number	Voltage V	Current A	Base	Diam.	Overall length	Fig.
7100D	1.5	0.15	E10	11	24	1
14	2.47	0.3	E10	11	24	1
7111D	2.5	0.1	E10	11	24	1
6890D	2.5	0.2	E10	11	24	1
7135D	2.5	0.3	E10	11	24	1
6891D	3.5	0.2	E10	11	24	1
13	3.7	0.3	E10	11	24	1
7138D	3.8	0.3	E10	11	24	1
31	6.15	0.3	E10	14	27.5	2
7145D	6.2	0.3	E10	14	27.5	2
Prefocus flashlight lamps						
PR8	1.9	0.6	P13.5	11	30.5	3
PR4	2.3	0.27	P13.5	11	30.5	3
PR2	2.4	0.5	P13.5	11	30.5	3
PR6	2.5	0.3	P13.5	11	30.5	3
PR9	2.7	0.15	P13.5	11	30.5	3
PR3	3.6	0.5	P13.5	11	30.5	3
PR7	3.8	0.3	P13.5	11	30.5	3
PR12	6.0	0.5	P13.5	11	30.5	3
Lens-end lamps						
112	1.2	0.22	E10	9.1	23.5	4
7067D	2.2	0.18	E10	9.1	23.5	4
222	2.2	0.25	E10	9.1	23.5	4

LENSLITE LAMPS

Lenslite lamps produce a sharply concentrated uniformly distributed beam of light of a high luminous intensity. This is achieved by means of the front of the bulb which consists of a lens focusing the light beam. The difference from the lens-end lamps described above lies in the fact that Lenslite lamps give a wider beam of light.



Catalogue number	Voltage V	Current A	Base	Diam.	Overall length
6890D/34	2.5	0.2	E10	11	24
7135D/34	2.5	0.3	E10	11	24
6891D/34	3.5	0.2	E10	11	24
7138D/34	3.8	0.3	E10	11	24

BICYCLE LAMPS - LAMPS FOR BICYCLES WITH AUXILIARY MOTOR

Philips can offer a wide range of bicycle and motorcycle lamps of high dependability, essential to ensure safety for the users of these vehicles during the hours of darkness.

Bicycle lamps — Head lamps

Catalogue number	Voltage V	Current A	Life h	Base	Diam.	Overall length	Fig.
7126D	4	0.3	100	E10	15	29	1
7120D	6	0.15	100	E10	15	29	1
7133D	6	0.25	100	E10	15	29	1
7140D	6	0.30	100	E10	15	29	1
7141D	6	0.35	100	E10	15	29	1
7152C	6	0.40	100	EP10	15	29	2
7152D	6	0.40	100	E10	15	29	1
7142D	6	0.45	100	E10	15	29	1
7143D	6	0.50	100	E10	15	29	1
7185D	8	0.45	100	E10	15	29	1
7192D	10	0.4	100	E10	15	29	1
7193D	10	0.45	100	E10	15	29	1
Tail lamps							
7121D	6	0.05	1000	E10	11	24	3
7121N	6	0.05	1000	BA9s	11	24	4
7098D	6	0.1	1000	E10	11	24	3
7181D	8 - 10	0.05	1000	E10	11	24	3
7181N	8 - 10	0.05	1000	BA9s	11	24	4

Lamps for bicycles with auxiliary motor — Head lamps

Catalogue number	Voltage V	Wattage W	Life h	Base	Diam.	Overall length	Fig.
7012D	6	4.0	100	E10	15	29	5
7014D	6	4.8	100	E10	15	29	5
7017D	6	6.2	100	E10	15	29	5
7018D	6	6.8	100	E10	15	29	5
7019D	6	7.5	100	E10	15	29	5
7030 [1]	6	15/15	100	BAX15d	28	54	6
7008	6	15.0	100	P26s	25.5	43	7

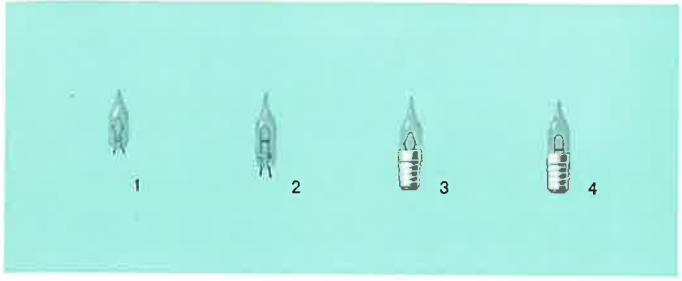
[1]) Duplo lamp.

Tail lamps

Catalogue number	Voltage V	Wattage W	Life h	Base	Diam.	Overall length	Fig.
7000D	6	1.5	1000	E10	11	24	8
7000N	6	1.5	1000	BA9s	11	24	9
7009D	6	2.0	1000	E10	11	24	8
7009N	6	2.0	1000	BA9s	11	24	9
7087D	6	3.0	1000	E10	11	24	8

PISELLO LAMPS

These colourful, gay and decorative midget lamps are especially designed for use by makers of sets of various kinds and by craftsmen for incorporation in their products in the fields of illumination, toys and religious articles. Moreover, they can be applied in publicity signs, moving displays, eye-catchers, clocks, and wherever a small lamp is wanted.

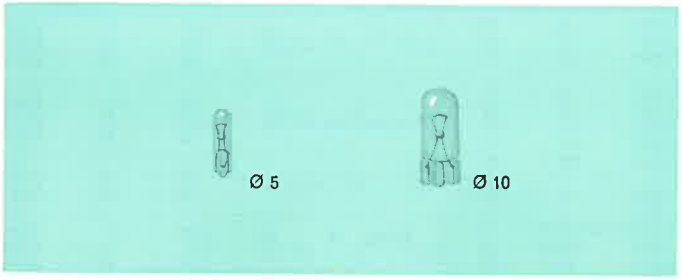


Catalogue number 1)	Voltage V	Current A	Diam.	Overall length	Fig.	Finish
13883	3.5	0.2	5	14	1	without base; without short-circuiting device
13884	6	0.15	5.5	16		
13885	12	0.1	5.5	16		
13886	24	0.05	5.5	19		
13887	3.5	0.2	5.5	19	2	without base; with short-circuiting device
13888	6	0.15	5.5	19		
13896	12	0.1	5.5	19		
13903	24	0.05	5.5	21		
13889	3.5	0.2	5.5	24.5	3	with E5 base; without short-circuiting device
13890	6	0.15	5.5	24.5		
13891	12	0.1	5.5	24.5		
13892	24	0.05	5.5	26.5		
13893	3.5	0.2	5.5	24.5	4	with E5 base; with short-circuiting device
13894	6	0.15	5.5	24.5		
13895	12	0.1	5.5	24.5		
13957	24	0.05	5.5	26.5		

1) Available with clear, red, cyclamen, green, yellow and blue bulb.

WEDGE-BASE LAMPS

Fundamentally normal type miniature lamps; it is just the flat glass wedge at the bottom of the lamp instead of a metal base, which gives the wedge-base lamps so many advantages over the usual types. These lamps can be applied in signal panels, measuring equipment, amplifiers, as indicator lamps, for the lighting of dials, dashboards etc.



Catalogue number	Voltage V	Wattage W	Current A	Candle power	Diam.	Overall length	Application
6960	6	2	—	—	10	26.7	Motorcar lamps
12960	12	2	—	—			
13960	24	2	—	—			
6256	6	3	—	—			
12256	12	3	—	—			
13256	24	3	—	—			
6961	6	4	—	—			
12961	12	4	—	—			
13961	24	5	—	—			
500	6	5	—	—			
501	12	6	—	—			
502	24	3	—	—			
158	12	—	—	2			
161	12	—	—	2			
6516	6	1.2	—	—	5	20	
12516	12	1.2	—	—			
13516	24	1.2	—	—			
159	6.3	—	0.15	—	10	26.7	Dial lamps
259	6.3	—	0.25	—			
6223	7	1	—	—	5	20	
6515	7	—	0.035	—			
6501	1.5	—	0.1	—	5	20	Signal lamps
6502	4	1	—	—			
6521	6	1	—	—			
12521	12	1	—	—			
13521	24	1	—	—			
6522	6	—	0.030	—			
12522	12	—	0.030	—			
13522	24	—	0.030	—			
6504	16/20	1	—	—	5	20	Toy lamp

SUB-MINIATURE LAMPS

The trend towards miniaturization in many sections of modern industry has led to the production of a wide variety of sub-miniature lamps, designed specifically for particular types of equipment and instruments where the need has arisen for very small, yet high quality, light sources. Some of the principal application possibilities of these lamps are as follows: for aircraft, telecommunication equipment, computers, optical and medical instruments, radio panel lighting, toys etc.

Type	Voltage V	Current mA	Bulb shape	Base	Diam.	Overall length	Fig.
D150.90	1	40	T3	no	3	7.5	1
	2.5	200		S3	3	10	2
	6	40					
	8	50					
	10	50					
	14	30					
	5	60		no	3	7.5	1
D150.16	1	40	T4	no	4	12	3
	2.5	200		S5	4	13	4
	6	40		S5	4	14	5
	8	50					
	10	50					
	14	30					
	3	190		no	4	12	3
	6	60					
	28	40		no	4	12	3
				S5	4	13	4
	16	30		S5	4	14	5
D150.26	3	190	T4	special	4	14.2	6
D150.20	1.35	60	T5	no	6.35	13	7
	18	40		S6	6.35	15	8
	28	40					
	1	40		S6	6.35	15	8
	2.5	200					
	6	200					
D150.91	2.2	150	T5.7	no	5.7	11	9
				E5	5.7	14.5	10
D114.14	6	40	T6.5	no	6.8	18	11
	6	200		BA7s	6.8	20	12
	12	150					
	24	30					
	24	100					
	36	30					
	36	50					
	48	40					
	60	20					
	60	40					

MOTORCAR LAMPS

As the number of motorcars is constantly growing and speeds are increasing, efficient and reliable vehicle lighting is one of the major criteria in present-day road safety. Philips have always been in the van of progress as far as lamps and lighting, including lighting equipment for motor vehicles, are concerned and have available a full range of efficient and reliable motorcar lamps. We would draw attention to the latest developments in this field: the halogen lamps and the wedge-base lamps. The main advantages of motorcar lamps with halogen-filling are inter alia: smaller dimensions, a higher luminous intensity, no light depreciation during effective life as there is no bulb blackening. — To mention some features of the wedge-base lamps: they can be recessed into an adaptor, thus less space is required; greatly improved contact; better resistance to high temperature and humidity; easier insertion of the lamp. (The wedge-base lamps are illustrated on page 33).
These two pages give a survey of the motorcar lamps Philips can offer for cars of Continental make, whereas the next 2 pages show the ranges for American and British motorcars.

European type-number range

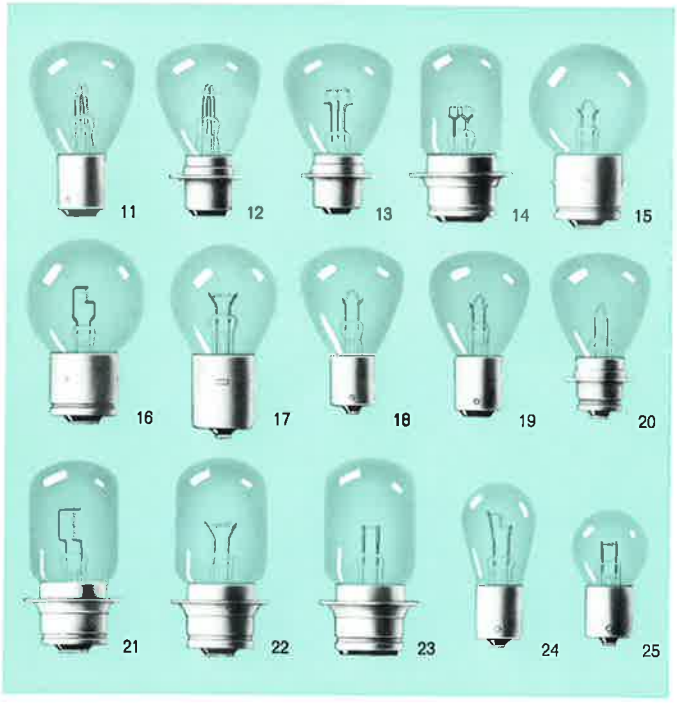
Headlight lamps

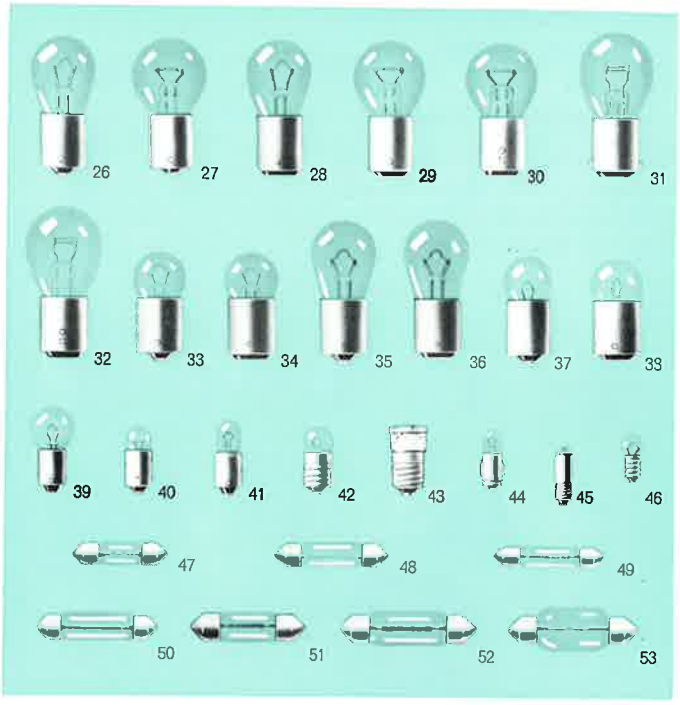
Catalogue number	Voltage V	Wattage W	Base	Diam.	Overall length	Fig.	Remarks
6258	6	55					
12258	12	55	P14.5s	—	66.5	1	Halogen lamp
13258	24	70					
6620	6	45/40					
12620	12	45/40	P45t	40	82	2	"DUPLO"-d lamp
13620	24	55/50					
6725	6	35/35					
6745	6	45/40					
12725	12	35/35	BA21d	40	61	3	
12745	12	45/40					
13745	24	45/40					
6708	6	15/15					
6718	6	25/25					
6728	6	35/35					
6748	6	45/40	BA20d	35	70	4	
12728	12	35/35					
12748	12	45/40					
13748	24	45/40					
13333	24	50/50					
6791	6	25/25					
6792	6	35/35	BA15d	35	58	5	
12792	12	35/35					
13792	24	35/35					
6722	6	35/35					
6742	6	45/40					
12722	12	35/35	BA15d	35	58	6	
12742	12	45/40					
13742	24	45/40					
6721	6	35/35					
6741	6	45/40					
12721	12	35/35	P22d	28	62	7	
12741	12	45/40					
13741	24	45/40					
6951	6	35/35	P15d	35	58	8	
12951	12	35/35					
6953	6	35/35	PX15d	35	58	9	
6704	6	45/40	PY42d	35	67	10	
12704	12	45/40					
6612	6	25/25					
6622	6	35/35	BA15d	35	56	11	
12622	12	35/35					
6902	6	35/35	P15d	35	56	12	
12902	12	35/35					
6905	6	35/35	PX15d	35	56	13	
12905	12	35/35					
12958	12	42/36	P22d	28	62	14	
12959	12	42/36					
6224	6	35					
6244	6	45					
12224	12	35	BA21s	40	61	15	
12244	12	45					
13244	24	50					

Catalogue number	Voltage V	Wattage W	Base	Diam.	Overall length	Fig.	Remarks
6253	6	45					
12253	12	45	BA21s	40	61	16	
13253	24	50					
6227	6	35					
6247	6	45					
12227	12	35	BA20s	35	66	17	
12247	12	45					
13247	24	50					
6211	6	25					
6221	6	35					
6241	6	45	BA15s	35	56	18	
12221	12	35					
12241	12	45					
13241	24	45					
6212	6	25					
6222	6	35					
6242	6	45	BA15d	35	56	19	
12222	12	35					
12242	12	45					
13242	24	45					
6299	6	35					Single-filament lamps
12299	12	35	P15s	35	56	20	
13299	24	35					
6318	6	35					
6343	6	45	P22s	28	62	21	
12343	12	45					
13343	24	50					
6323	6	35					
6228	6	45					
12323	12	35	P22s	28	62	22	
12228	12	45					
13322	24	50					
12292	12	35	P22d	28	62	23	
13293	24	50					
6325	6	25					
12325	12	25	BA15s	25	52	24	
13324	24	25					
6418	6	25	BA15s	25	45	25	
12418	12	25					

Auxiliary lighting

6401	6	15					
12401	12	15	BA15s	22	45	26	
13401	24	15					
6445	6	18					
6421	6	20					
6498	6	21					Stop/flasher-lamps
12445	12	18					
12421	12	20	BA15s	25	45	27	
12498	12	21					
13445	24	20					
13421	24	20					
13498	24	21					



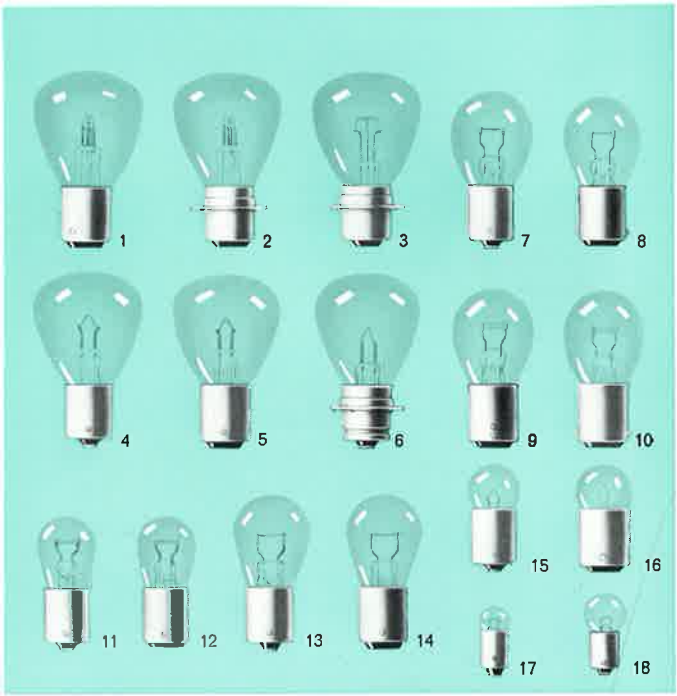


Catalogue number	Voltage V	Wattage W	Base	Diam.	Overall length	Fig.	Service
6402	6	15					
12402	12	15	BA15d	22	45	28	
13402	24	15					
6422	6	20					
12422	12	20	BA15d	25	45	29	
13422	24	20					
12416	12	15	BAY15d	25	45	30	
12419	12	20					
6503	6	20/5					Stop/flasher-lamps
12503	12	20/5	BA15d	25	50.5	31	
13406	24	20/5					
6517	6	18/5					
6500	6	20/5					
6499	6	21/5					
12517	12	18/5					
12500	12	20/5	BAY15d	25	50.5	32	
12499	12	21/5					
13500	24	20/5					
13517	24	20/7					
13499	24	21/5					
6814	6	10					
6413	6	15					
12814	12	10	BA15s	18	35	33	
12413	12	15					
13814	24	10					
13413	24	15					
6400	6	10					Signal lamps
6417	6	15					
12400	12	10	BA15d	18	35	34	
12417	12	15					
13400	24	10					
13417	24	15					
6403	6	15					
12403	12	15	BA15s	22	45	35	
13403	24	15					Bus interior lamps
6404	6	15					
12404	12	15	BA15d	22	45	36	
13404	24	15					
6811	6	3					
6821	6	5					
12811	12	3	BA15s	18	35	37	
12821	12	5					
13821	24	5					
6812	6	3					
6822	6	5					Side, tail and parking lamps
12812	12	3	BA15d	18	35	38	
12822	12	5					
13822	24	5					
6819	6	5					
12819	12	6	BA9s	15	29	39	
13819	24	6					

Catalogue number	Voltage V	Wattage W	Base	Diam.	Overall length	Fig.	Service
6913	6	2					
6910	6	3					
12913	12	2	BA9s	8.8	23	40	
12910	12	3					
13913	24	2					
13910	24	3					
6929	6	4					
12929	12	4	BA9s	8.8	26	41	
13929	24	4					
6875	6	2					
12875	12	3	E10	11	24	42	
13875	24	3					Dashboard, indicator and parking lamps
6876	6	2					
12876	12	3	E10/19	12	22	43	
13376	24	3					
6828	6	0.6					
6829	6	1.2	BA7s	6.7	20	44	
12829	12	2					
13829	24	3					
6925	6	1.2					
12925	12	1.2	E5.5	6	20	45	
13925	24	2					
12326	12	1.5	E5.5	7.5	16.5	46	
6842	6	3					
12842	12	3	S7	7.5	31	47	
13842	24	3					
6843	6	3					
12843	12	3	S7	7.5	36	48	
13843	24	3					
6849	6	3					
12849	12	3	S6	6	36	49	
13849	24	3					
6914	6	3					
12914	12	3	S7	7.5	39	50	Indicator, interior, parking and trafficator lamps
13914	24	3					
6844	6	5					
6854	6	10					
12844	12	5	S8.5	10.5	39	51	
12854	12	10					
13844	24	5					
13854	24	10					
6864	6	5					
6866	6	10					
12864	12	5	S8.5	10.5	44	52	
12866	12	10					
13864	24	5					
13866	24	10					
6850	6	15					
6807	6	18					
12850	12	15	S8.5	15	44	53	Flasher lamps
12807	12	18					
13850	24	15					
13807	24	20					

MOTORCAR LAMPS
AMERICAN AND BRITISH TYPE-NUMBER RANGES

These pages show the extensive range of motorcar lamps Philips have available for cars of American and British makes.



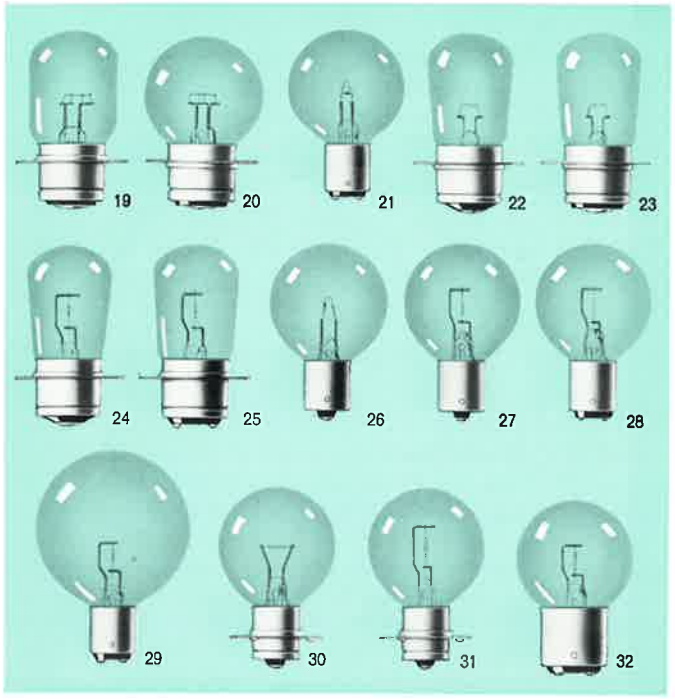
"TROUBLELITE"

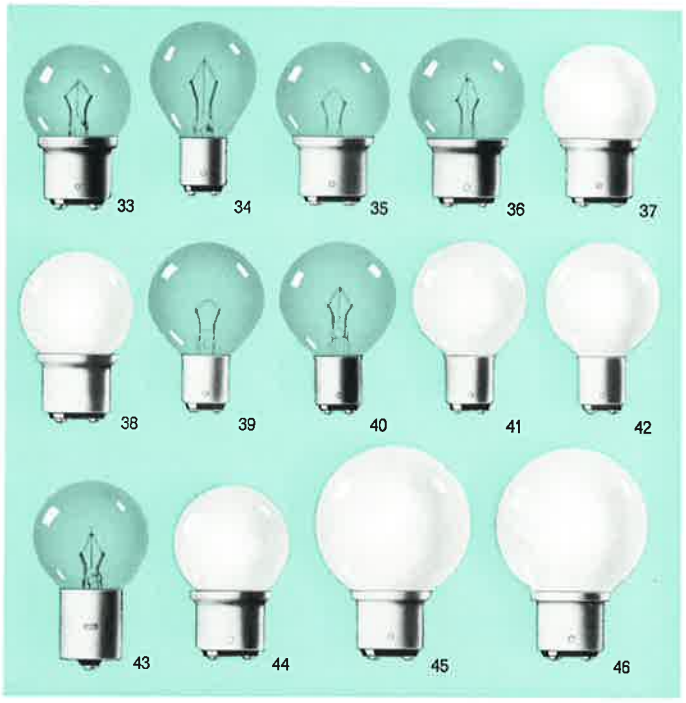
A handy little lamp, equipped with an exceptionally powerful permanent magnet, so that it firmly adheres to almost all metal parts of the car. One side casts a strong beam of white light, the other side simultaneously gives a red light that is visible from a great distance. These features, combined with the fact that it can be adjusted in five positions, make this lamp ideally suitable for carrying out repairs, as a warning light, as a spare tail-light, for map reading, for illuminating the luggage compartment etc. It is provided with a 6-metre flex fitted with two battery clips and packed in an attractive, sturdy box with reel. A Philips blinker lamp can also be supplied with the "Troublelite", so that it automatically switches on and off. In this way it can also be used as a flashing warning light.

Catalogue number "Troublelite"	Voltage V	Catalogue number lamp	Wattage W
7916/06	6	6826	5
7916/12	12	12826	5

American type-number range

Catalogue number	Voltage V	Candle power	Base	Diam.	Overall length	Fig.	Particulars
1000	6-8	32/32	BA15d	35	56	1	
1124	12-16	32/32					
2330	6-8	32/32	P15d	35	56	2	Double-filament headlight lamps
2336	12-16	32/32					
2331	6-8	32/32	PX15d	35	56	3	
1133	6-8	32	BA15s	35	56	4	
1183	6-8	50					
1143	12-16	32					
1195	12-16	50					
1134	6-8	32	BA15d	35	56	5	Single-filament headlight lamps
1184	6-8	50					
1144	12-16	32					
1197	12-16	50					
1007	6-8	32	P15s	35	56	6	
1323	6-8	32					
1503	6-8	50					
1327	12-16	32					
1507	12-16	50					
1129	6-8	21	BA15s	25	50.5	7	Single-filament stop lamps
1141	12-16	21					
1073	12-16	32					
1130	6-8	21	BA15d	25	50.5	8	
1142	12-16	21					
1154	6-8	21/3	BAY15d	25	50.5	9	Double-filament stop/tail lamps
1016	12-16	21/6					
1034	12-16	32/4					
1158	6-8	21/3	BA15d	25	50.5	10	
1176	12-16	21/6					
209	6-8	15	BA15s	19	43	11	Interior lamps
1003	12-16	15					
210	6-8	15	BA15d	19	43	12	
1004	12-16	15					
87	6-8	15	BA15s	25	50.5	13	
93	12-16	15					
1203	24	21					
88	6-8	15	BA15d	25	50.5	14	
94	12-16	15					
1204	24	21					
63	6-8	3	BA15s	18	36	15	Side and tail lamps
81	6-8	6					
67	12-16	4					
89	12-16	6					
64	6-8	3	BA15d	18	36	16	
82	6-8	6					
68	12-16	4					
90	12-16	6					





Catalogue number	Voltage V	Candle power	Base	Diam.	Overall length	Fig.	Particulars
51	6-8	1	BA9s	11	23.5	17	Dashboard/ indicator lamps
53	12-16	1					
55	6-8	2	BA9s	14	27	18	
57	12-16	2					

British type-number range

Headlight lamps

Catalogue number	Voltage V	Wattage W	Base	Diam.	Overall length	Fig.	Particulars
166	6	24/24	P22d	28	61.5	19	Double-filament lamps
312	6	30/24					
373	6	30/24					
306	6	36/36					
356	6.4	45/35					
603 1)	12	42/36					
414	12	50/40					
354	12	42/36					
355	12	42/36					
604 1)	12	42/36					
302	12	48/48					
359	24	44/38					
404	12	60/36	P22d	38	61	20	
168	6	24/24	BA15d	38	60	21	
170	6	36/36					
171	12	36/36					
194	24	36/36					
173	6	36	P22s	28	61.5	22	Single-filament lamps
323	12	48					
600 1)	12	48					
606	24	44					
326	12	38	P22d	28	61.5	23	
330	24	44					
160	6	24	P22s	28	61.5	24	
172	6	36					
162	12	36					
185	12	48					
685 1)	12	48					
177	12	36	P22d	28	61.5	25	
331	24	44					
57	12	36	BA15s	38	60	26	
106	6	24	BA15s	38	60	27	
108	6	36					
610	6	48					
2	12	36					
23	12	48					

Catalogue number	Voltage V	Wattage W	Base	Diam.	Overall length	Fig.	Particulars
109	6	24	BA15d	38	60	28	Single-filament lamps
111	6	36					
4	12	24					
5	12	36					
27	12	48					
122	24	24					
123	24	36					
140	24	48					
128	24	60	BA15d	50	72	29	
667	6	36	P15s	38	62	30	
668	12	36					
669	6	36	P15s	38	62	31	
670	12	36					
. . .	12	36	B22d	38	60	32	
622	24	36					

1) Cadmium yellow finish.

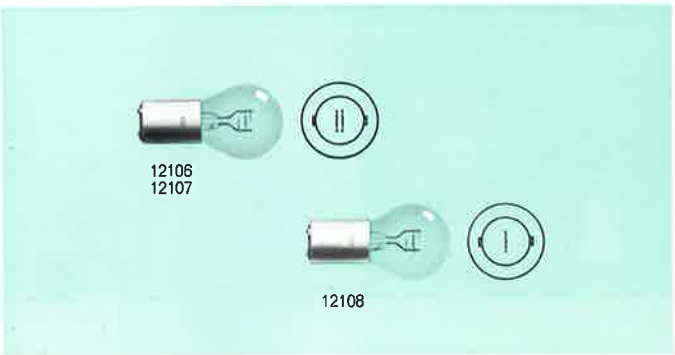
Auxiliary lighting

Voltage V	Wattage W	Finish	Base	Diam.	Overall length	Fig.	Particulars
24	12	daylight blue	B22d	35	57	33	Bus interior lamps
24	15	daylight blue					
24	12	daylight blue	BA15d	35	60	34	
12	12	clear	B22d	38	55	35	
12	24	clear	B22d	38	57	36	
24	12	clear					
24	20	clear					
12	12	inside frosted	B22d	38	55	37	
12	24	inside frosted	B22d	38	57	38	
24	12	inside frosted					
24	20	inside frosted					
12	12	clear	BA15d	38	60	39	
12	24	clear	BA15d	38	60	40	
24	12	clear					
12	12	inside frosted	BA15d	38	60	41	
12	24	inside frosted	BA15d	38	60	42	
24	12	inside frosted					
24	20	inside frosted					
24	12	clear	BA20s	38	65	43	
24	12	inside flushed	B22d	38	57	44	
12	12	inside frosted	B22d	50	72	45	
24	12	inside frosted	B22d	50	72	46	

TRAIN LAMPS

To withstand the intense vibrations and shocks encountered on railway trains, lamps of a robust construction are required. The range of lamps Philips have available for this special purpose, is shown opposite.

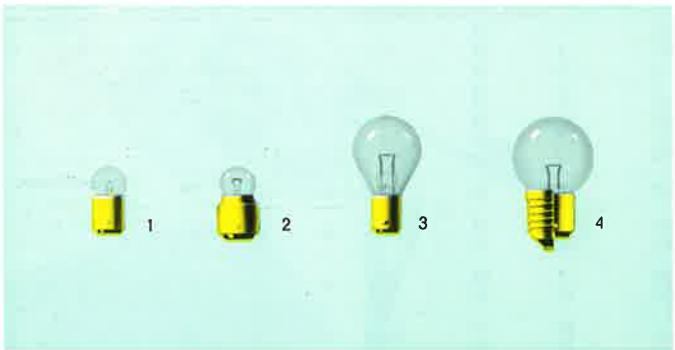
Finish	Voltage V	Wattage W	Base	Diam.	Overall length
"Argenta" or inside frosted	24 or 32	15 25	B22	45	72



LAMPS FOR OPTICAL SIGNALING

Increasing speed and frequency in railway traffic require the perfecting of the signaling systems generally used hitherto. Optical signals are, therefore, gradually replacing manual or flag signs, which means a really important step forward in ensuring the safety of both passengers and railway material, as the human element is eliminated here as far as possible. Philips manufacture a range of high-precision lamps for this field of application as well.

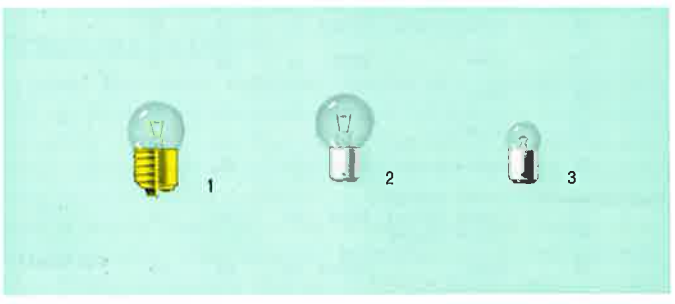
Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
12108	12	6	55					
12106	12	30/30	350	600	BA20d	35.5	67	29.6
12107	30	15/15	165					



BOAT LAMPS

These lamps are made in a variety of sizes and shapes for different applications on board steamers, motorboats, yachts etc.

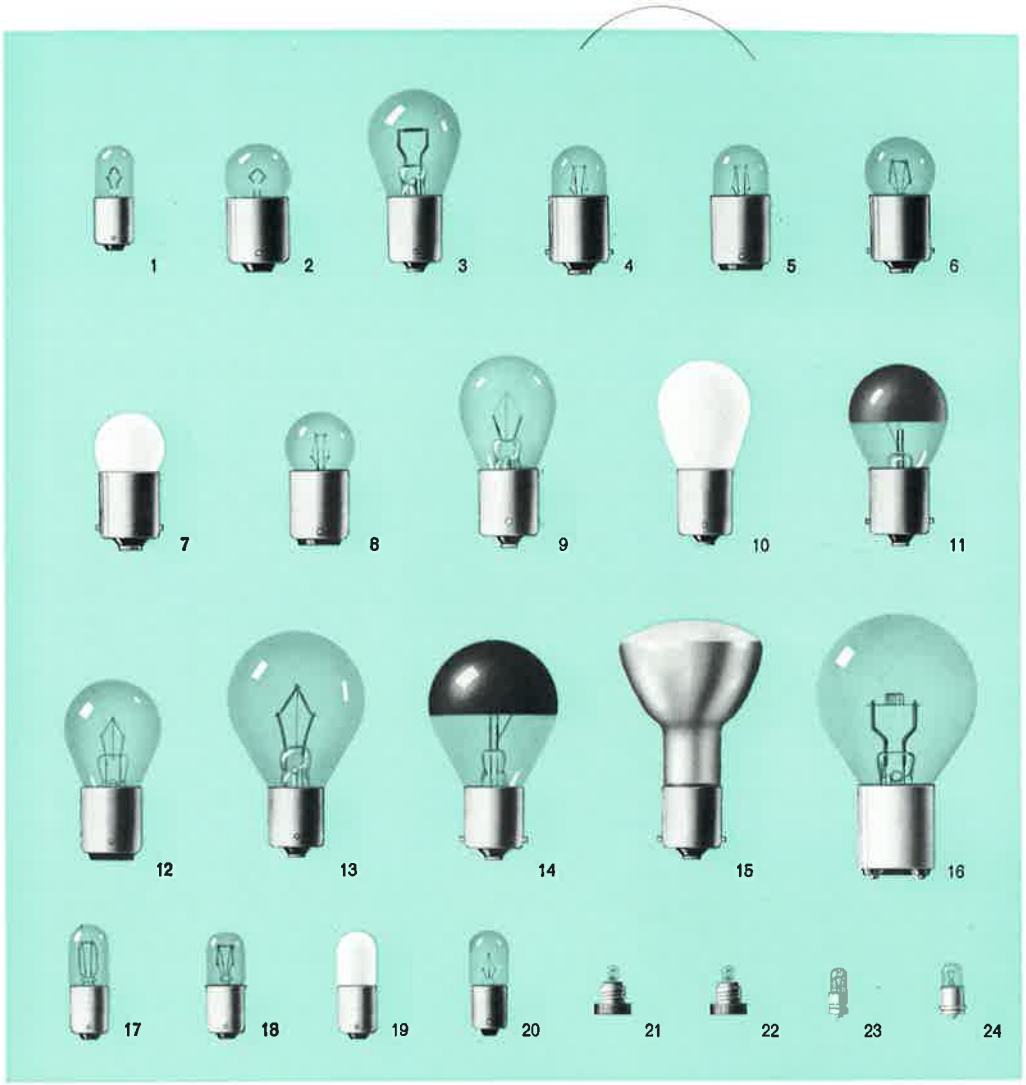
Catalogue number			Wattage W	Diam.	Max. length with base			Fig.
6 V	12 V	24 V			E27	B22	BA15d	
13425	13423	13424	5	18	—	38	35	1, 2
13426	13430	13434	10					
13427	13431	13435	15					
13428	13432	13436	25	35	—	—	60	3
13429	13433	13437	35					
13456	13460	13464	10					
13457	13461	13465	15					
13458	13462	13466	25	40	69	61	—	4
13459	13463	13467	35					



CURRENT-INDICATOR LAMPS

Current indicators find wide application in various kinds of apparatus to indicate their proper functioning or, when applied on switchboards, to show whether the current is on or off.

Current A	Diam.	Max. length with base			Fig.
		E27	B22	B15d	
0.09 - 0.15 0.13 - 0.22 0.18 - 0.31 0.28 - 0.45 0.40 - 0.65 0.58 - 0.95 0.85 - 1.40 1.25 - 2.00 1.80 - 3.00 2.70 - 4.50 4.00 - 6.50 5.80 - 10.00	30	51.5	49	49	1 2
0.09 - 0.15	18	—	—	35	3



AIRCRAFT LAMPS

Aviation has undergone an enormous development in recent years, which has created a great demand for a wide variety of aircraft lamps of many types. To meet these demands Philips have available an extensive range of lamps for general illumination of passenger cabins, galley and luggage compartments, as well as controlled-beam lamps for passengers' individual reading and for stewardess' and navigator's worktables.

Philips catalogue number	U.S.A. catalogue number	Design voltage V	Watts, Amps, or Candle Power	Average life h	Base	Max. diam.	Lcl.	Max. overall length	Fig.	Service [2]
44	44	6.3	0.25 A	3000	BA9s	10.9	20	30	1	1
47	47	6.3	0.15 A	3000	BA9s	10.9	20	30	1	1
63	63	7.0	3 CP	1000	BA15s	18.5	19	36	2	1 - 2
81	81	6.5	6 CP	500	BA15s	18.5	19	36	2	1 - 2
89	89	13	6 CP	750	BA15s	18.5	19	36	2	1 - 2
87	87	6.75	15 CP	300	BA15s	25.5	28.6	50	3	2 - 3
12000 N	301	28	3 CP	500	BA15s	16.5	17.5	35	4	1 - 2
12000 W	302	28	3 CP	500	BA15d	16.5	17.5	35	5	1 - 2
12001 N	303	28	6 CP	500	BA15s	18.5	19	36	6	1 - 2
12001 N/07 [1]	303 OF	28	6 CP	500	BA15s	18.5	19	36	7	1 - 2
12001 W	304	28	6 CP	500	BA15d	18.5	19	36	8	1 - 2
12100 N	305	28	15 CP	300	BA15s	25.5	28.6	50.5	9	2
12100 N/21 [1]	305 IF	28	15 CP	300	BA15s	25.5	28.6	50.5	10	2
12101 N	307	28	21 CP	300	BA15s	25.5	28.6	50.5	9	2 - 3
12101 N/21 [1]	307 IF	28	21 CP	300	BA15s	25.5	28.6	50.5	10	2
12101 N/02 [1]	307 SB	28	21 CP	300	BA15s	25.5	28.6	50.5	11	2
12101 W	308	28	21 CP	300	BA15d	25.5	28.6	50.5	12	2
12102 N	309	28	32 CP	300	BA15s	36	31.8	60	13	2 - 3
12102 N/02 [1]	309 SB	28	32 CP	300	BA15s	36	31.8	60	14	2
12103 N	311	28	50 CP	300	BA15s	36	31.8	60	13	2 - 3
12105 N/13 [1]	1385	28	20 W	300	BA15s	39	—	67	15	2
12109	—	28	100 W	100	BA20d	43	30	73	16	2
12003 N	1820	28	0.10 A	1000	BA9s	10.9	16	30	17	1
12005 N	1819	28	0.035 A	1000	BA9s	10.9	16	30	17	1
12006 N	313	28	0.17 A	500	BA9s	10.9	16	30	17	1
12006 N/276 [1]	313 R	28	0.17 A	500	BA9s	10.9	16	30	18	1
12006 N/07 [1]	313 OF	28	0.17 A	500	BA9s	10.9	16	30	19	1
12010 N	1816	13	0.33 A	1000	BA9s	10.9	16	30	20	1
323 R/476 [1]	323 R	3	0.19 A	350	special	4.25	4.3	14.2	21	1
323	323	3	0.19 A	350	special	4.25	4.3	14.2	22	1
325	325	3	0.19 A	350	special	4.25	11.1	13.5	23	1
327	327	28	0.04 A	1000	special	6	12.75	15.8	24	1
328	328	6	0.2 A	500	special	6	12.75	15.8	23	1

[1] ...../02 silvered bowl
...../07 outside frosted
...../13 outside-frosted front
...../21 inside frosted
...../276 red
...../476 red

[2] 1 = indicator or instrument
2 = interior
3 = position

LAMPS FOR MEDICAL PURPOSES

Lamps for medical, ophthalmological and dental applications have to fulfil special requirements. For this reason Philips bestow the utmost care on the manufacturing of these lamps so as to ensure optimum reliability. The lamps used in operating theatres are, for example, equipped with a double filament. The main filament is connected to the mains, the auxiliary filament to an accumulator battery. In the event of a breakdown in the electric mains during an operation, the auxiliary filament is switched on.

Application	Catalogue number	Voltage V		Wattage W		Lumens		Base	Diam.	Lcl.	Overall length
		Fil. 1	Fil. 2	Fil.1	Fil. 2	Fil. 1	Fil. 2				
Lamps for operating theatres (two-filament lamps)	13276 G [1]	100 - 145 150 - 250	12/24 12/24	150 150	100 100	1900 1850	1700 1500	EFc40d	90	—	180
	13279 G [2]	100 - 145 150 - 250	12/24 12/24	150 150	100 100	1900 1850	1600 1400	EFc40d	120	—	221
	13280 G [3]	100 - 145 100 - 145 150 - 250	100 - 145 150 - 250 150 - 250	150 150 150	150 150 150	1900 1900 1850	1600 1600 1400	EFc40d	120	—	221
Surgical lamps (single filament lamps)	13975 E [1]	100 - 165 170 - 250	— —	75 75	— —	740 590	— —	E27	75	104.5	145
	13975 B [1]	100 - 165 170 - 250	— —	75 75	— —	740 590	— —	B22	75	100	140.5
	13976 E [1]	100 - 165 170 - 250	— —	150 150	— —	1700 1500	— —	E27	80	104.5	148.5
	13976 B [1]	100 - 165 170 - 250	— —	150 150	— —	1700 1500	— —	B22	80	100	144

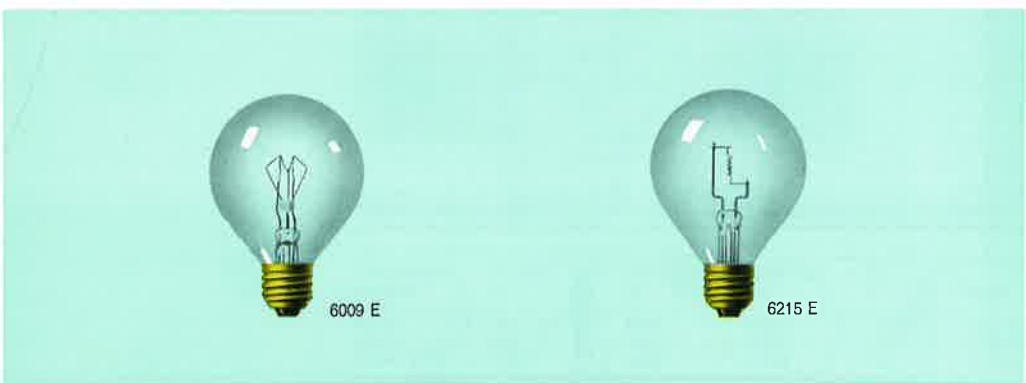
[1]) Clear, cat.no. . . . . /00; inside frosted, cat.no. . . . . /21
[2]) Opal glass, cat.no. . . . . /88; inside frosted, cat.no. . . . . /21
[3]) Opal glass, cat.no. . . . . /88

Burning positions
13276
13280
13975
13976

P 360

13279

H 30



LOCOMOTIVE HEADLIGHT LAMPS

For this purpose, Philips have developed a range of lamps which produce a strong beam of light and which effectively withstand the intense vibrations and shocks encountered on the railway trains.

Catalogue number	Voltage V	Wattage W	Filament b x h	Filament shape	Lum. flux. lm	Av. life h	Base	Diam.	Overall length	Lcl.
6009 E	24 32	150	7 x 7 7 x 7	cylindrical	2500 2400	500	E27	80	120	76
6215 E	24 32	250	4.5 x 9 4 x 12	straight coiled coil	5200 5200	500	E27	80	120	76

Burning position

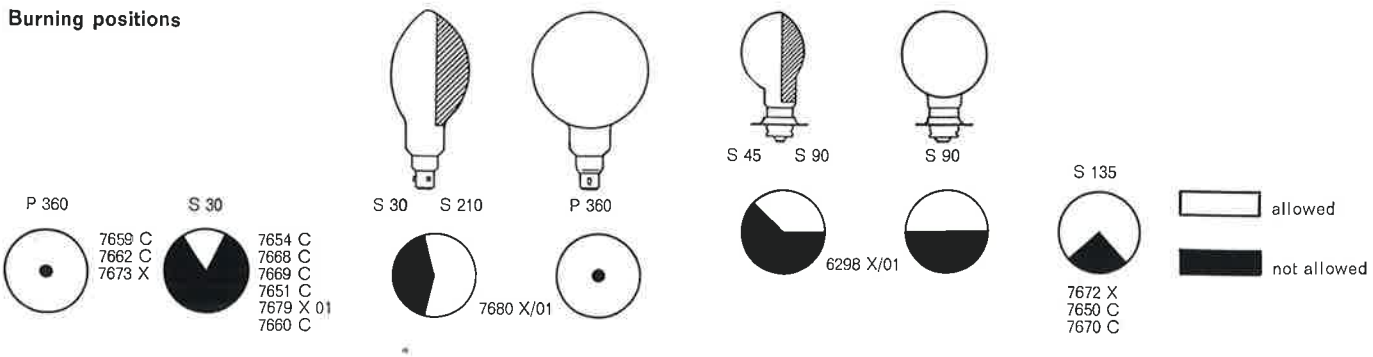
S 135

AERODROME LAMPS

Good airfield lighting contributes highly to the safety of air traffic. With this thought in mind, a full range of lamps has been designed to fulfil the special requirements for the lighting of aerodromes; for instance, lamps for beacons to help pilots to identify individual airports, for approach lights to guide them safely to the runways during bad weather, for runway and taxiway lights for safe travel, for obstruction lights to mark possible obstacles etc. To keep pace with aircraft development, continuous research is being carried out in the Philips Laboratories, to make constant improvements in these lamps.

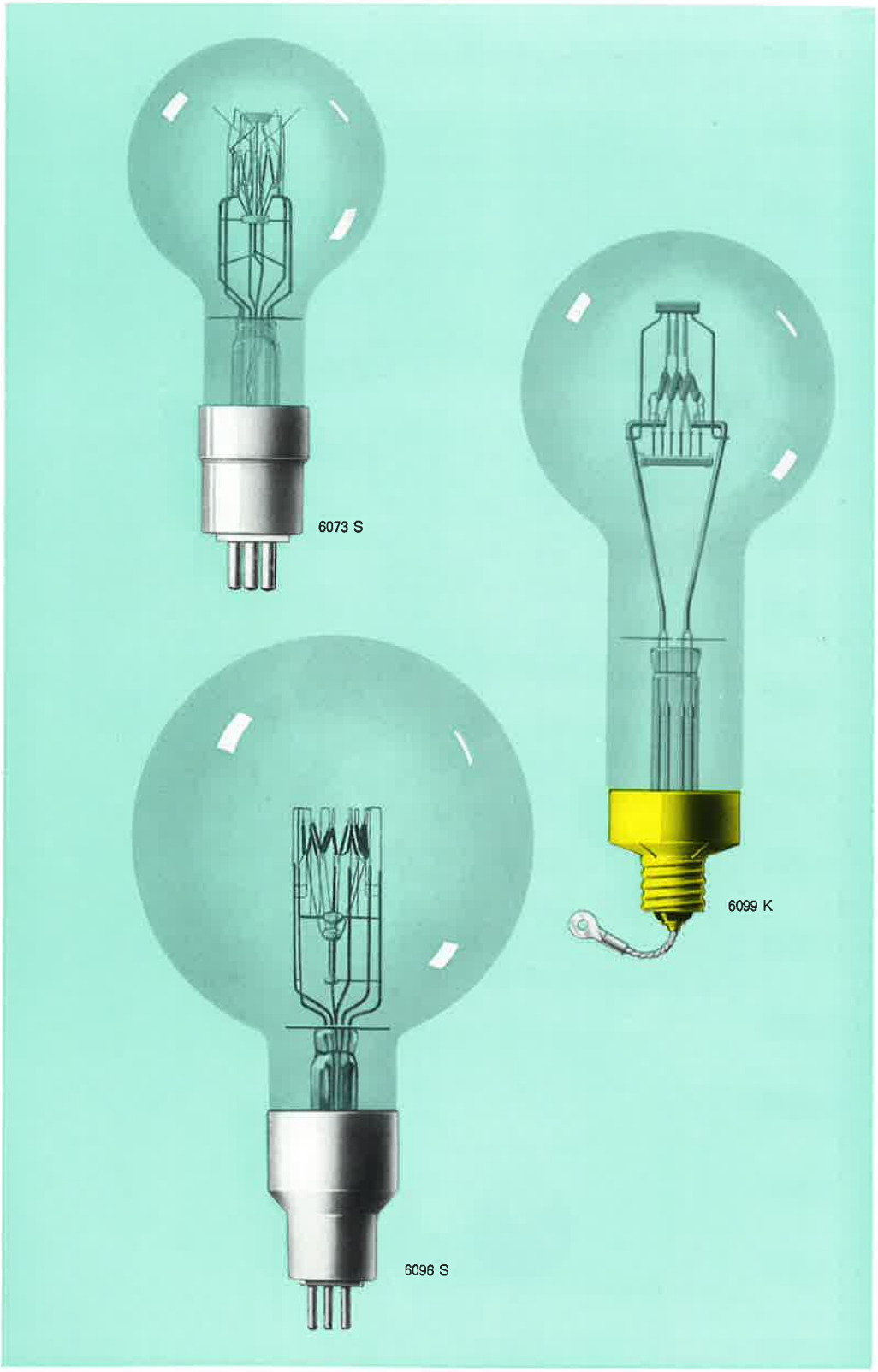
Catalogue number	Wattage W	Current A	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
7659 C	—	6.6	325	2000	P28s	65	132	70
7662 C	—	6.6	1020	2000	P28s	65	132	70
7669 C	30	6.6	330	1000	P28s	32	98	38
7673 X	35	6.6	480	500	B24s	35	58	—
6298 X/01	35	5.83	—	300	P15s	44/35.4	70	37
7654 C	45	6.6	560	1000	P28s	32	98	38
7651 C	65	6.6	1000	1000	P28s	32	100	38
7679 X/01	65	6.6	—	100	B24s	55/45.5	89	45
7668 C	100	6.6	1550	1000	P28s	32	98	38
7672 X	100	6.6	1940	200	BA24s	55	83	37
7680 X/01	100	6.6	—	200	B24s	140/97	212	130
7650 C	200	6.6	4450	200	P28s	70	108	44.5
7660 C	200	6.6	4450	75	P28s	45	134	55.6
7670 C	200	6.6	4450	200	P28s	70	108	44.5

Burning positions



LIGHTHOUSE AND BEACON LAMPS

Lighthouse and beacon lamps have to be high quality light sources as they must fulfil a task of major importance, i.e. to be a safe guide for the seafarer. As it is necessary that lighthouses and beacons be visible over long distances, Philips make a range of lamps for this application, which have a very high luminous efficiency and which excel in reliability. Besides the special types described on this page, there are other lamps suitable for this purpose as well; these are to be found on page 46.



Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
6073S	100 - 135	1500	25000	800	G25t-59	150	341	220
6096S	100	3000	50000	800	G25t-59	240	428	270
6099K	70	4200	81500	1000	EK40s	200	445	292

Burning positions


6073S

SH30


6096S
6099K

S30

PROJECTION LAMPS FOR PHOTOGRAPHERS', FILM AND TELEVISION STUDIOS

Lamps which have to serve this purpose, are manufactured with highly concentrated filaments, in order to obtain maximum luminous intensity of the controlled beam. Great care is given to the exact centering of the filament with respect to the pins of lamps with bi-post base, so that the replacement can be made without any further adjustment. The lamps are suitable for both black-and-white and where a colour temperature of 3200 °K is required.

Catalogue number	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Base	Diam.	Overall length	Lcl.
13176 P [1] [2]	100 - 160 200 - 250	500	14 x 11 17 x 12	11500 10500	Bi22	95	140	63.5
13191 P [3]	100 - 160 200 - 250	500	14 x 11 17 x 12	13000 11500	Bi22	63	165	63.5
13173 P [3]	100 - 160 200 - 250	750	14 x 13 18 x 14	19000 18000	Bi22	76	165	63.5
13174 P [2]	100 - 160 200 - 250	750	14 x 13 18 x 14	19000 18000	Bi22	76	165	63.5
6023 G [4]	100 - 160 200 - 250	1000	17 x 14 22 x 14	26000 23000	E40	130	205	133
6046 G	100 - 160 200 - 250	2000	24 x 19 30 x 23	55000 50000	E40	150	220	133
13177 P	100 - 160 200 - 250	2000	24 x 19 30 x 23	55000 50000	Bi38	150	240	127
6039 G [1]	100 - 160 200 - 250	3000	28 x 20 36 x 24	85000 78000	E40	170	247	150
6038 P	100 - 160 200 - 250	5000	34 x 25 46 x 28	145000 135000	Bi38	200	305	165
6040 K	100 - 160 200 - 250	5000	34 x 25 46 x 28	145000 135000	K59d	200	340	228
13185 P	100 - 160 200 - 250	5000	34 x 25 46 x 28	145000 135000	Bi38	200	340	165
6225 K	100 - 160 200 - 250	10000	50 x 35 56 x 40	300000 280000	K100d	270	477	305
13111 P	100 - 160 200 - 250	10000	50 x 35 56 x 40	300000 280000	Bi38	270	440	254
13013 K	100 - 160 200 - 250	20000	64 x 30 70 x 40	600000 600000	K100t K100d	380	625	420

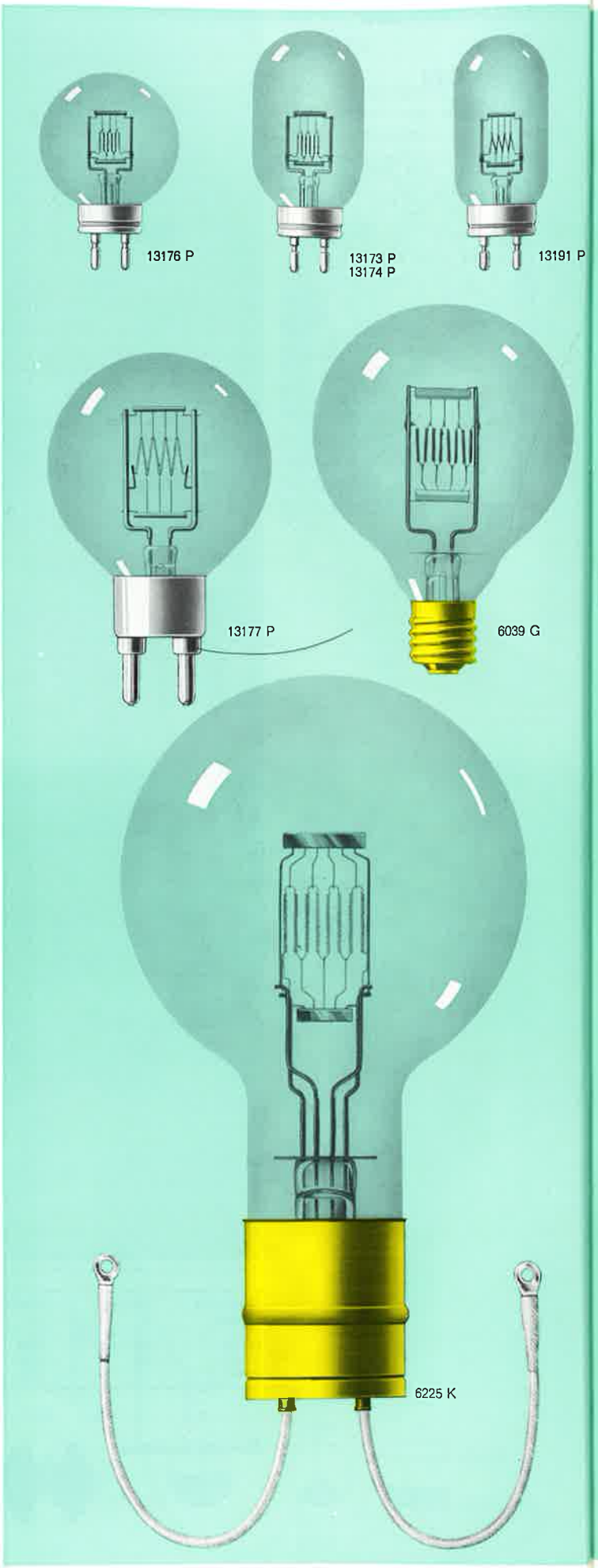
[1] Non-standard
[2] For black and white only
[3] Specially made for colour film, approx. 3200 °K
[4] Can also be supplied with P40s base, cat.no. 6023 C; light centre length 100 mm. Overall length 210 mm

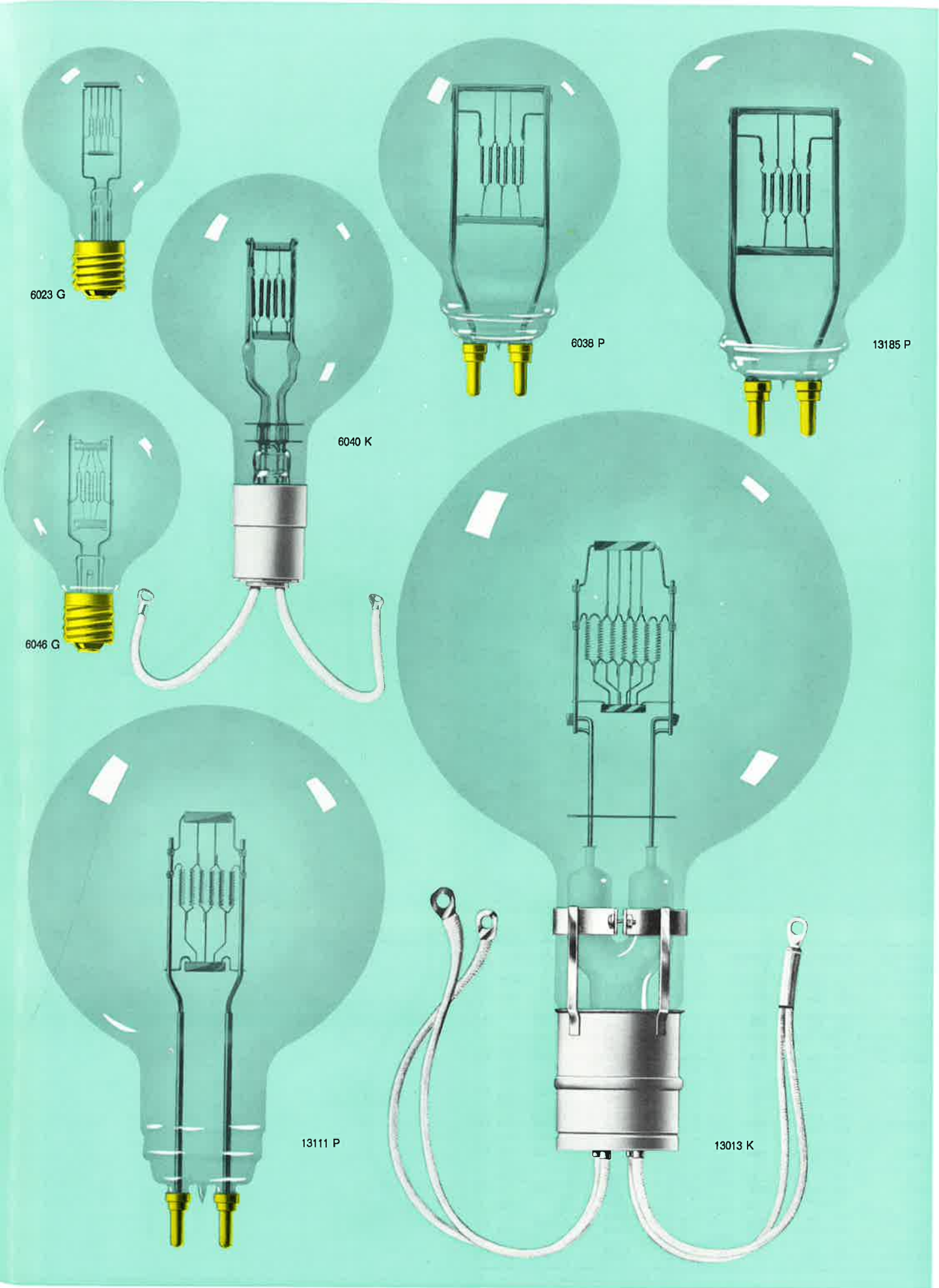
Burning positions

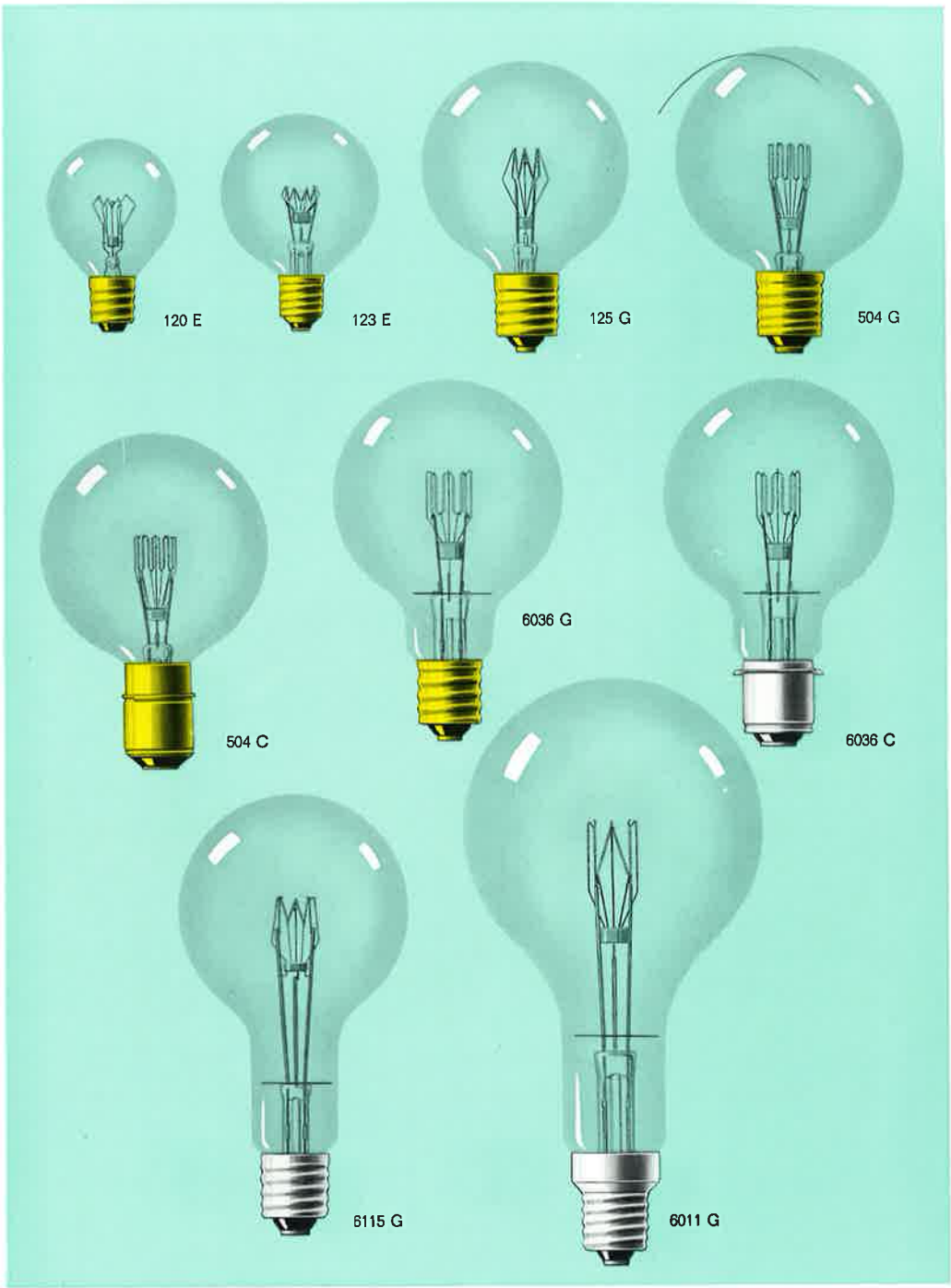
S 45

for 13176 P only

S 90




6023 G
6040 K
6038 P
13185 P
6046 G
13111 P
13013 K



FLOODLIGHTING LAMPS

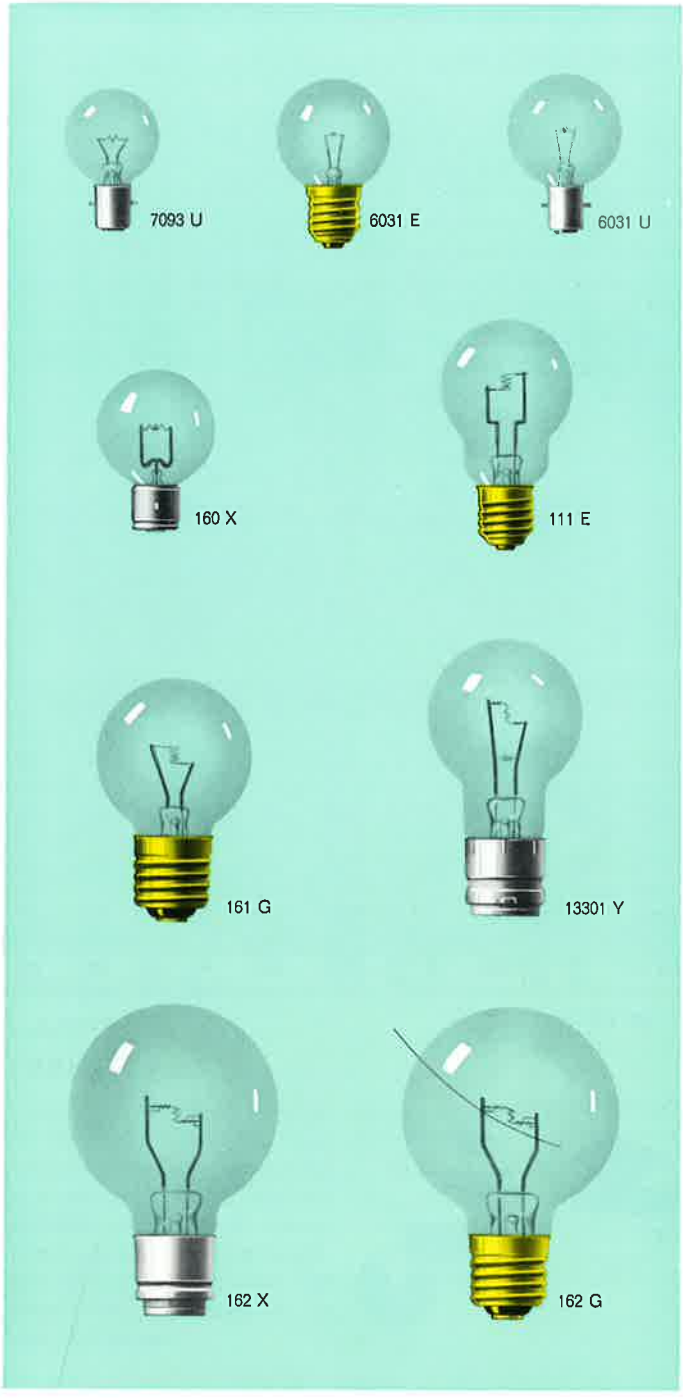
These lamps are intended for floodlighting buildings, sports stadia, parks, statues, etc. They have concentrated, cylindrical filaments as a result of which a strong, accurately controlled beam of light is produced. They fit any of the commonly used projectors.

Burning position

S 135

Catalogue number	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
120 E	100 - 160 200 - 250	100	12 x 6 14 x 9	1100 900	500	E27	80	120	76
123 E	100 - 160 200 - 250	250	14 x 8,5 16 x 11	3500 3200	500	E27	90	125	76
125 G	24 100 - 160 200 - 250	500	7 x 11 13 x 12 16 x 14	11500 8800 7500	500	E40	120	175	108
504 G [1]	100 - 160 200 - 250	1000	15 x 14 17 x 18	19000 18000	500	E40	130	181	108
504 C [1]	100 - 160 200 - 250	1000	15 x 14 17 x 18	19000 18000	500	P40s	130	195	80
6036 G	100 - 160 200 - 250	1000	15 x 14 17 x 18	19000 18000	500	E40	130	211	140
6036 C	24 100 - 160 200 - 250	1000	15 x 11 15 x 14 17 x 18	22000 19000 18000	500	P40s	130	215	100
6115 G [1]	100 - 160 200 - 250	1000	15 x 14 17 x 18	19000 18000	500	E40	130	252	180
6011 G [1]	100 - 160 200 - 250	1500	22 x 15 24 x 22	31000 29000	500	E40	170	343	235

[1] Non-standard



LOW VOLTAGE SPOT- AND FLOODLIGHTING LAMPS FOR THEATRES

For reasons of safety, low voltage is often applied on stages in theatres. Philips supply a range of lamps for this application, which have the additional advantage of highly concentrated filaments, so that light beams of a high luminous intensity can be obtained.

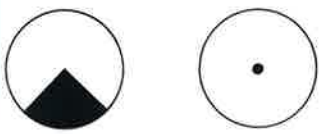
Catalogue number	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
7093 U	24	100	5.5 x 3.5	2000	100	BA20d	48	75	30
6031 E [1]	24	100	5.5 x 3.5	2000	100	E27	55	91	58
6031 U	24	100	5.5 x 3.5	2200	100	BA20d	55	82	35.5
160 X [1]	24	200	6.5 x 4.5	4600	100	B24s-3	60	85	37
111 E [1]	24	250	4.5 x 6.5	6400	100	E27	70	121	82
161 G	24	250	4.5 x 6.5	6400	100	E40	80	130	85
162 X	24	500	8 x 9	12000	100	B42t	110	168	95
162 G	24	500	8 x 9	12000	100	E40	110	168	108

Special 12 V lamps for spot- and floodlighting

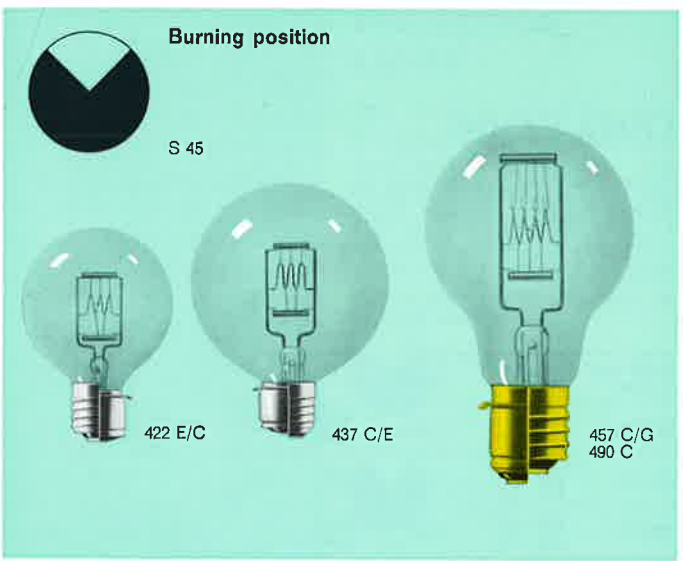
7093 U	12	100	3 x 3.5	2500	100	BA20d	48	75	30
6031 E [1]	12	100	3.5 x 3.5	2500	100	E27	55	91	58
6031 U	12	100	3.5 x 3.5	2500	100	BA20d	55	82	35.5
13301 Y [1]	12	250	5 x 5	6500	100	B42t	80	150	95

All these lamps can also be supplied with inside mirror.
[1] Non-standard

Burning positions



S 135 S 360

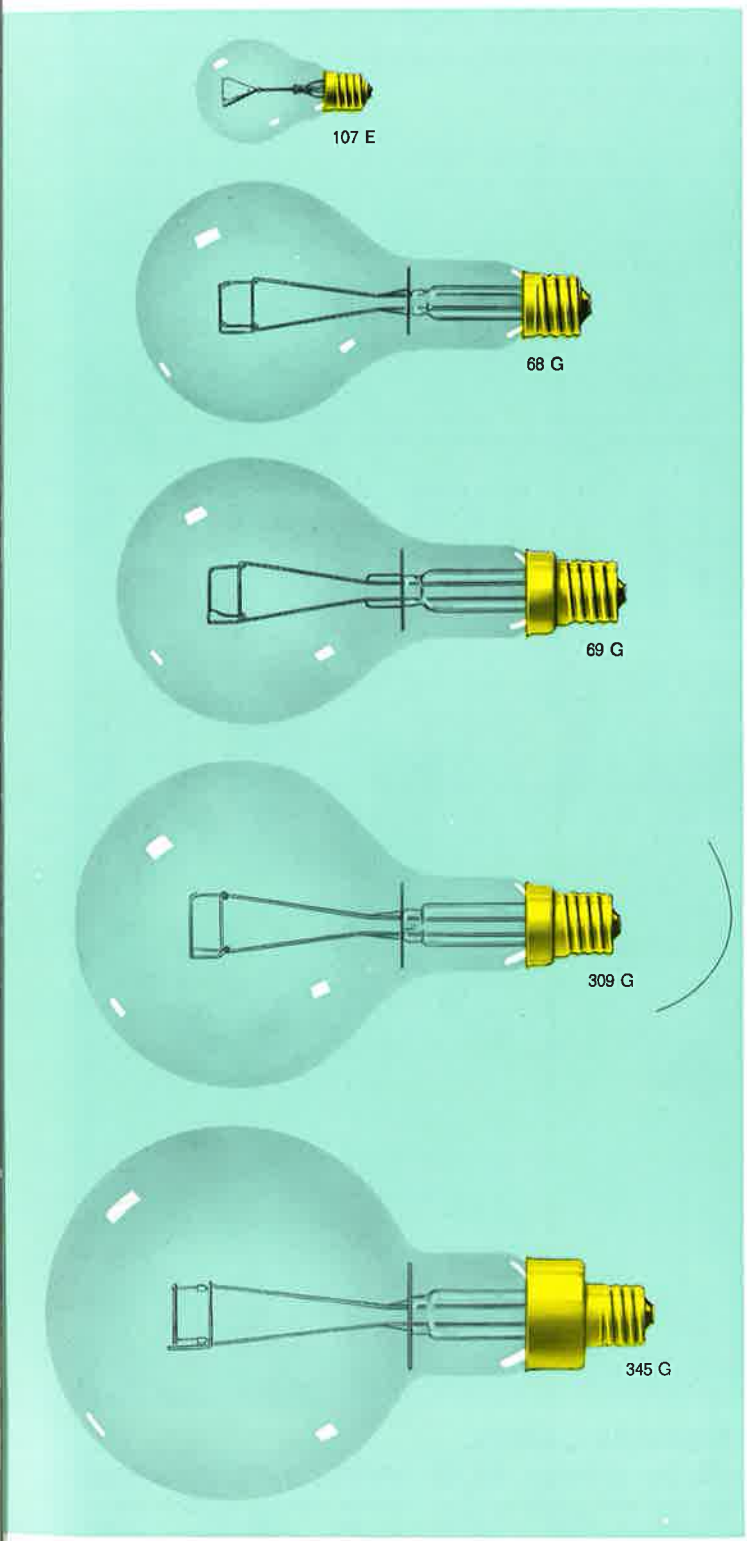


EPISCOPE LAMPS

Lamps for episcopes and for stage and studio lighting. They can be supplied with or without mirror. - The lumen and life values stated in the table below, refer to lamps without mirror.

Catalogue number [1]	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
422 E	100 - 160 200 - 250	250	12 x 8 16 x 10	5000 4500	100	E27	80	115	70
422 C	100 - 160 200 - 250	250	12 x 8 16 x 10	5000 4500	100	P28s	80	115	44.5
437 C	100 - 160 200 - 250	500	14 x 11 17 x 12	11500 10500	100	P28s	100	135	55.6
437 E [2]	100 - 160 200 - 250	500	14 x 11 17 x 12	11500 10500	100	E27	100	140	85
457 C	100 - 160 200 - 250	1000	17 x 14 22 x 14	26000 23000	100	P40s	110	185	84
457 G	100 - 160 200 - 250	1000	17 x 14 22 x 14	26000 23000	100	E40	110	180	120
490 C	100 - 160 200 - 250	1000	17 x 14 22 x 14	26000 23000	100	P40s	110	190	87

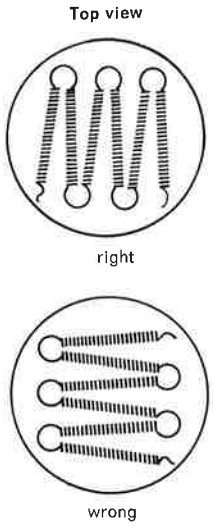
[1] When ordering lamps with mirror, please add /01 to the catalogue number.
[2] On special request: for "Janus" apparatus with E27/46x38, overall length 150, lcl. 94; catalogue number: 437 X



PROJECTION LAMPS (HORIZONTAL)

Their sharp, concentrated beam makes these lamps eminently suitable for stage lighting. They are specially developed for burning in a horizontal position. Care should be taken, that the part of the bulb marked "top" is uppermost. The projectors in which these lamps are used, must be properly ventilated.

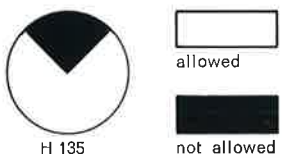
Position of filament



Catalogue number	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
107 E	100 - 160 200 - 250	100	11 x 9 12 x 9	1200 1050	300	E27	70	120	95
68 G	100 - 160 200 - 250	1000	21 x 18 25 x 21	21000 19000	300	E40	150	300	235
69 G	100 - 160 200 - 250	1500	25 x 21 28 x 26	33000 31000	300	E40	170	330	260
309 G	100 - 160 200 - 250	2000	27 x 23 30 x 28	46000 42000	300	E40	200	360	275
345 G 1)	100 - 160 200 - 250	3000	30 x 25 35 x 25	70000 65000	300	E40	240	400	310

1) Non-standard

Burning positions

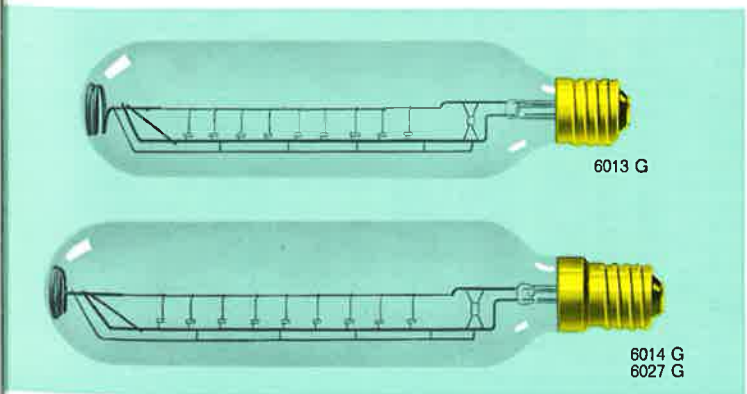


H 135

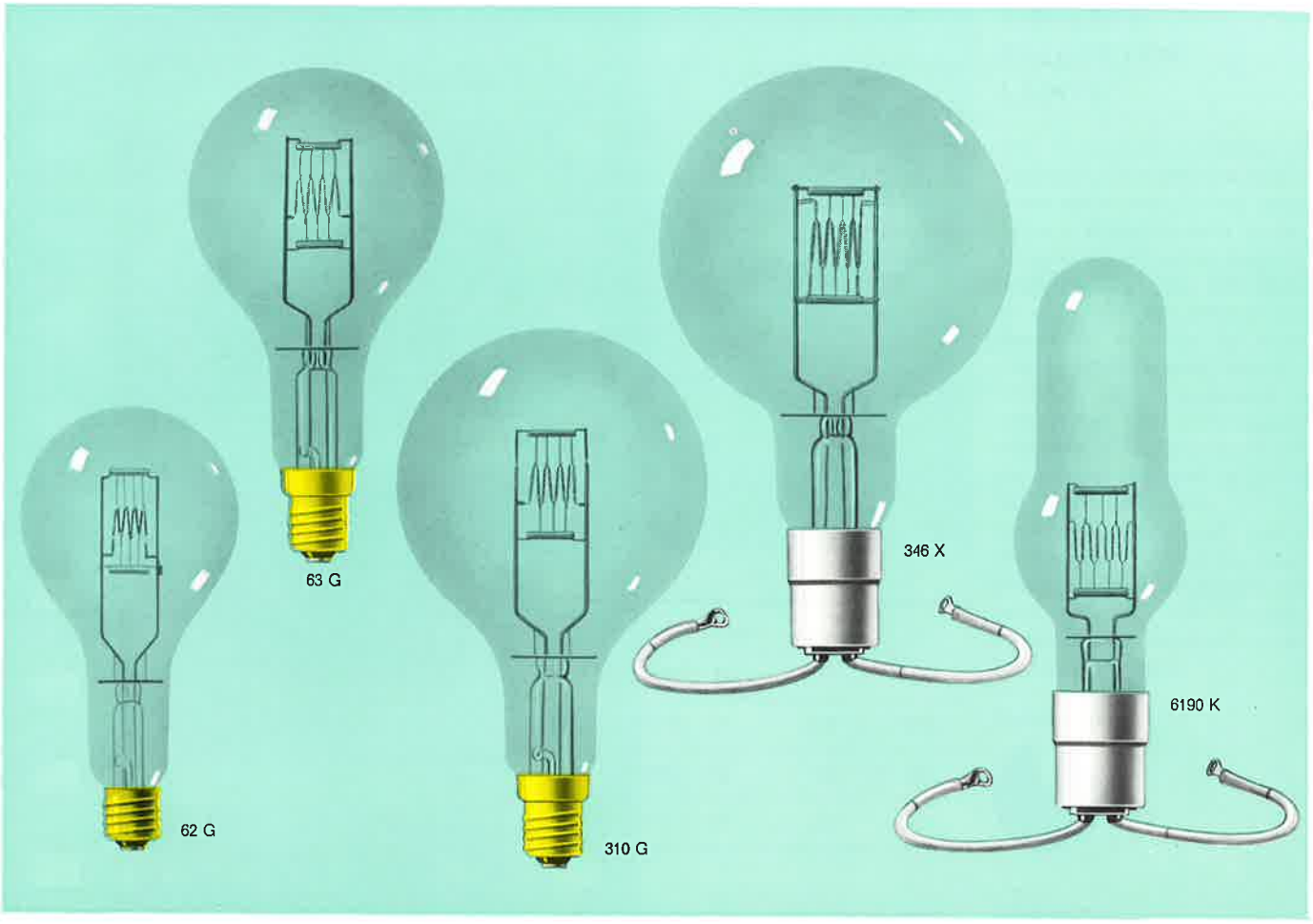
S 135

LINEA LAMPS

Tubular shaped lamps, also intended for stage lighting, especially as footlights. When the lamps are burnt in a horizontal or inclined position, care should be taken that the glass stem is underneath the filament; moreover, it is advisable to support the top part of the lamp.



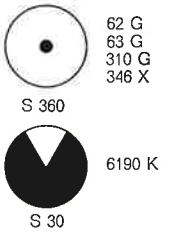
Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Diam.	Overall length
6013 G	100 - 160 200 - 250	500	9500 9000	500	E40	90	360
6014 G	100 - 160 200 - 250	1000	21000 20000	500	E40	100	405
6027 G	100 - 160 200 - 250	1500	32000 30000	500	E40	100	405



PROJECTION LAMPS (VERTICAL)

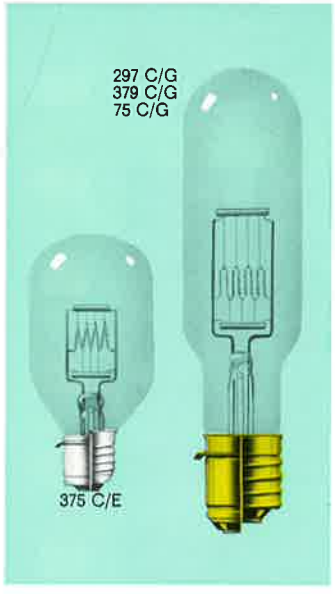
These lamps have been developed for stage lighting as well, especially however, for burning in a vertical position. They are available without or with mirror. When applying mirrored lamps, care should be taken that the mirror does not come to lie over the filament.

Burning positions



Catalogue number [1]	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
62 G	100 - 160 200 - 250	1000	21 x 18 25 x 21	22000 20000	300	E40	150	300	215
63 G	100 - 160 200 - 250	1500	25 x 21 28 x 26	34000 32000	300	E40	170	330	235
310 G	100 - 160 200 - 250	2000	27 x 23 30 x 28	48000 44000	300	E40	200	360	250
346 X	100 - 160 200 - 250	3000	30 x 25 35 x 25	72000 66000	300	K59d	240	395	265
6190 K	32 65 100 - 160 200 - 250	3000	26 x 14 22 x 22 28 x 20 36 x 24	85000 85000 85000 78000	100	K59d	120	380	178

[1] When lamps with mirror are desired, the figures /01 should be added to the catalogue number.



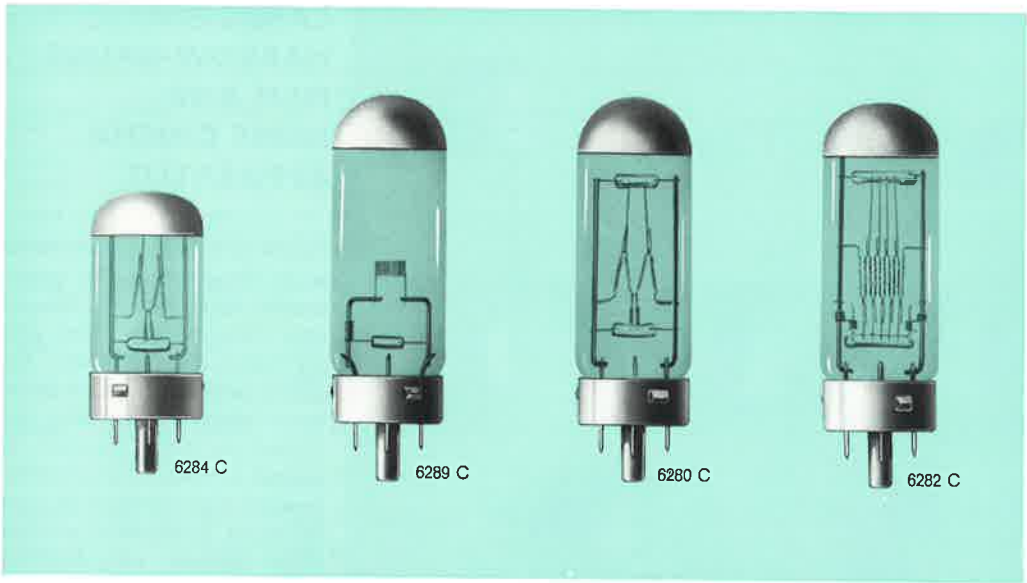
TUBULAR PROJECTION LAMPS

This range of lamps has been developed for use in dia-projectors and epidiascopes. The lamps of higher wattage are also suitable for projectors used in smaller cinemas and theatres.

Burning positions

Catalogue number	Voltage V	Wattage or Current	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
375 C	100 - 160 200 - 250	500 W	14 x 11 17 x 12	11500 10500	100	P28s	65	135	55.6
375 E	100 - 160 200 - 250	500 W	14 x 11 17 x 12	11500 10500	100	E27	65	135	76
297 C	100 - 160 200 - 250	1000 W	17 x 14 22 x 14	26000 23000	100	P40s	65	245	87
297 G	100 - 160 200 - 250	1000 W	17 x 14 22 x 14	26000 23000	100	E40	65	240	120
379 C [1]	30	30 A	11.5 x 8	24000	100	P40s	65	245	87
379 G [1]	30	30 A	11.5 x 8	24000	100	E40	65	240	120
75 C [1]	30	30 A	12 x 11	24000	100	P40s	65	245	87
75 G [1]	30	30 A	12 x 11	24000	100	E40	65	240	120

[1] Non-standard

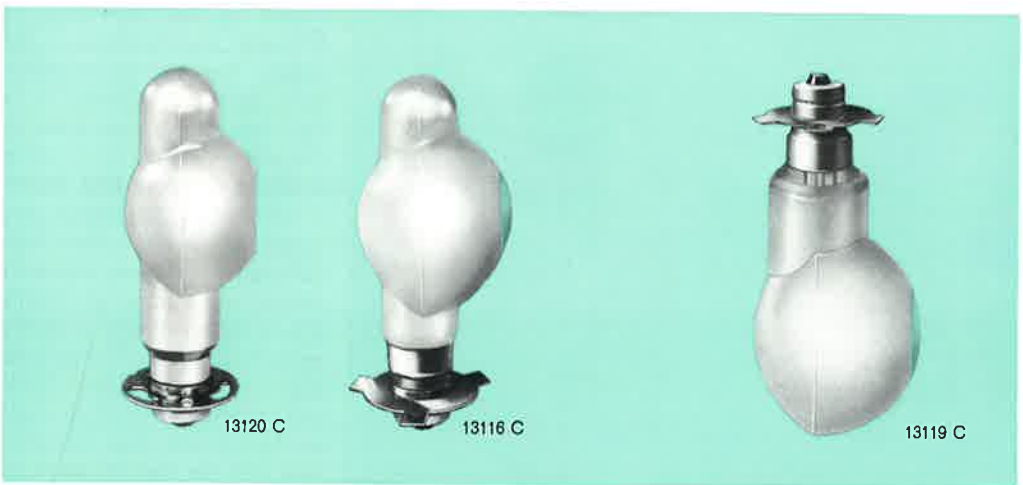


PIN-BASE PROJECTOR LAMPS

The tremendous advances in projector performance in recent years have caused a real revolution in projection-lamp design. To meet the wishes of projector designers to make still more compact projectors, Philips have developed a range of short lamps, which enable manufacturers to design projectors in accordance with contemporary conceptions. These lamps satisfy the highest standards of precision and craftmanship. — The keyed guide-pin and heavy duty contact pins of the base assure precise alignment and positioning of the filament, resulting in an excellent performance of the lamp.

Catalogue number	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
6284 C	100 - 130 200 - 250	150	5.5 x 6.4 8 x 8	3200 3000	25	G17q	29	76	33.4
6289 C	24	150	5.8 x 2.9	4250	25	GY17q	32	103	39.7
6280 C	100 - 130 200 - 250	300	7.5 x 8 10 x 8	7400 6900	25	G17q	32	103	39.7
6282 C	100 - 130 200 - 250	500	8.5 x 7.5 10 x 9.5	12500 11400	25	G17q	32	103	39.7

Burning position



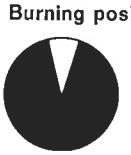
MIRROR CONDENSER LAMPS

For narrow-gauge film projectors Philips can supply light sources with an internal ellipsoidal mirror, rendering a separate condenser lens, applied in conventional projection systems, superfluous.
Though these lamps have only a low power consumption, they achieve a screen brilliance equal to that of most other conventional lamps of far higher wattages. In addition, the small size of these lamps enables the designer to meet in every respect the demands for modern projectors.

Catalogue number	Voltage V	Wattage W	Filament b x h	Filament shape 1)	Av. life h	Base	Diam.	Overall length	Lcl.
13120 C 2)	8	50	2.9 x 1.8	k	25	P15s	32.5	96	nom. 47
13116 C 3)	12	100	3.6 x 2.5	k	25	P35s	40	95	nom. 44
13119 C 3)	12	150	4.8 x 3.1	k	25	P35s	45	98	nom. 55

1) See page 52 2) For 8 mm projectors 3) For 16 mm projectors

Burning positions


13120 C
S 15

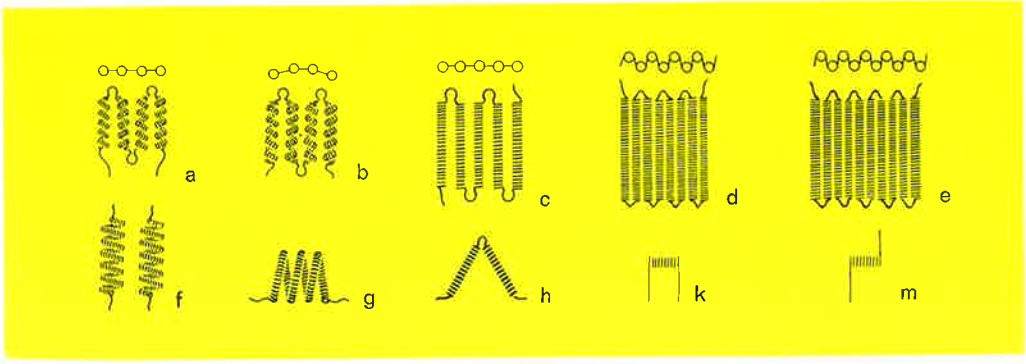

13116 C
SH 15


13119 C
H 15

STANDARD RANGE

LAMPS FOR NARROW-GAUGE FILM AND HOME CINEMA APPARATUS

As the lamp may be considered to be the heart of the optical system of a projector, the utmost care must be taken with the manufacture of lamps for picture projection. The range of lamps which Philips have designed for this purpose is second to none as regards, for instance, their luminous efficiency, small dimensions, concentrated filament with optimum luminous intensity and minimum manufacturing tolerances. The know-how and experience of generations of skillful lamp-makers, and continuous research in the Philips laboratories are a guarantee of a product of uniformly high efficiency and reliability and of the instant application of the latest scientific discoveries in this field. The excellent quality of Philips projector lamps is, moreover, confirmed by the preference of projector manufacturers. - To ensure that the lamps reach their nominal efficiency, it is very important to use them on the right voltage, as a slight drop in voltage already causes a considerable decrease in light output. In view of their high burning temperature and their special construction the lamps should be effectively protected against vibrations. In projectors with auxiliary mirror, care should be taken that the image of the filament does not coincide with the filament itself, so as to avoid undue shortening of the life of the lamps.



Burning positions

STANDARD RANGE

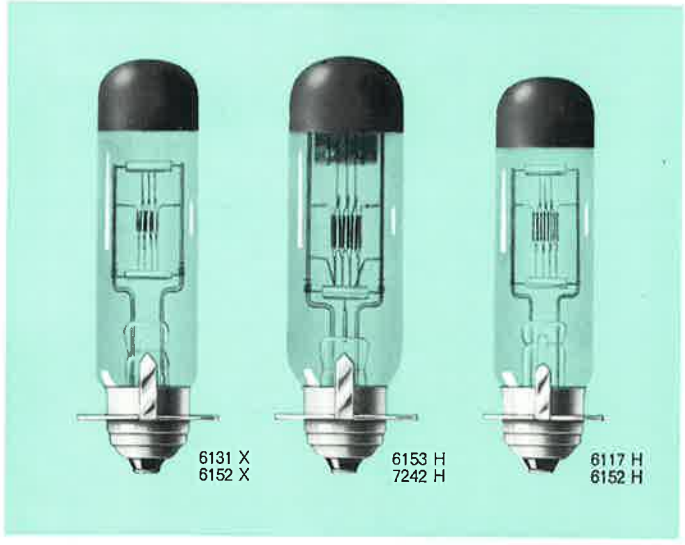
Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.	Fig.
13149N	115 - 125	30	400	25	B15s	22	67	35	1
6156N	100 - 130	50	700	50	B15s	25	78	35	2
7232N [1]	100 - 130 [2]	50	700	50	B15s	25	78	35	2
6157N	100 - 130 200 - 250	75	1200 1000	50	B15s	25	78	35	2
7238N	12	100	2800	25	B15s	25	78	35	2
7909J	12	100	2800	25	B21s-4	25	79	29.5	3
6158N	100 - 130 200 - 250	100	1700 1500	50	B15s	25	78	35	2
6067C	100 - 130 200 - 250	100	1700 1500	50	P28s	25	135	55.6	6
13141N	100 - 130 200 - 250	150	2900 2700	50	B15s	25	90	35	4
13140C	100 - 130 200 - 250	150	2900 2700	50	P28s	25	135	55.6	6
6166N	100 - 130 200 - 250	200	4400 4000	25	B15s	25	90	35	4
7224C [3]	—	200 [4]	4400	50	P28s	32	135	55.6	7
6070C	100 - 130 200 - 250	250	5300 5000	50	P28s	32	135	55.6	7
7217C	—	250 [5]	5750	50	P28s	32	135	55.6	7
7229C [3]	—	250 [5]	6200	25	P28s	32	135	55.6	7
7212N	100 - 130 200 - 250	300	7400 6900	25	B15s	27	105	35	5
6131C	100 - 130 200 - 250	300	7400 6900	25	P28s	32	135	55.6	7
7066N	100 - 130 200 - 250	300	7400 6900	25	B15s	32	81	35	8
7219C	—	375	9000	50	P28s	32	135	55.6	7
6152C	100 - 130 200 - 250	500	12500 11400	25	P28s	32	135	55.6	7
6153C	100 - 130 200 - 250	750 [5]	19500 18000	25	P28s	38	140	55.6	9
7242C	100 - 130 200 - 250	1000	27000 25000	25	P28s	38	140	55.6	9
6185C	100 - 130 200 - 250	1000	27000 25000	25	P28s	65	140	55.6	10

[1] Filament 3 mm ecc. [2] 110 V - 0.45 A [3] Filament 5 mm ecc.
[4] Current: 4 A [5] Current: 5 A

FOR BELL AND HOWELL PROJECTORS

Burning position

S15



FOR BELL AND HOWELL PROJECTORS

(Non-standard types)

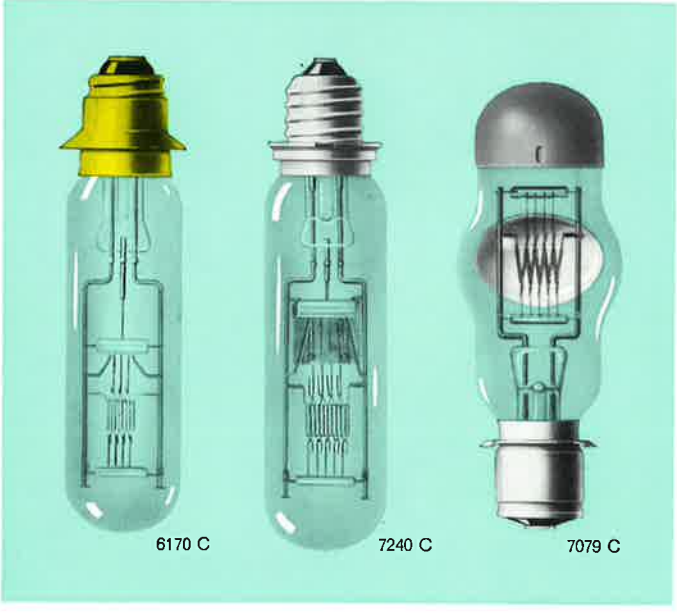
Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
6131X	100 - 130	300	7400	25	P46s	32	130	59
6117H	100 - 130	400	9400	25	P38s	32	130	59
6152H	100 - 130	500	12500	25	P38s	32	130	59
6152X	100 - 130	500	12500	25	P46s	32	130	59
6153H	100 - 130	750	19500	25	P46s	38	135	59
7242H [1]	100 - 130	1000	27000	25	P46s	38	135	59

[1] Can also be supplied in 200 - 250 V.

Burning positions

HE15 S15

FOR DEBRIE AND PHILIPS PROJECTORS

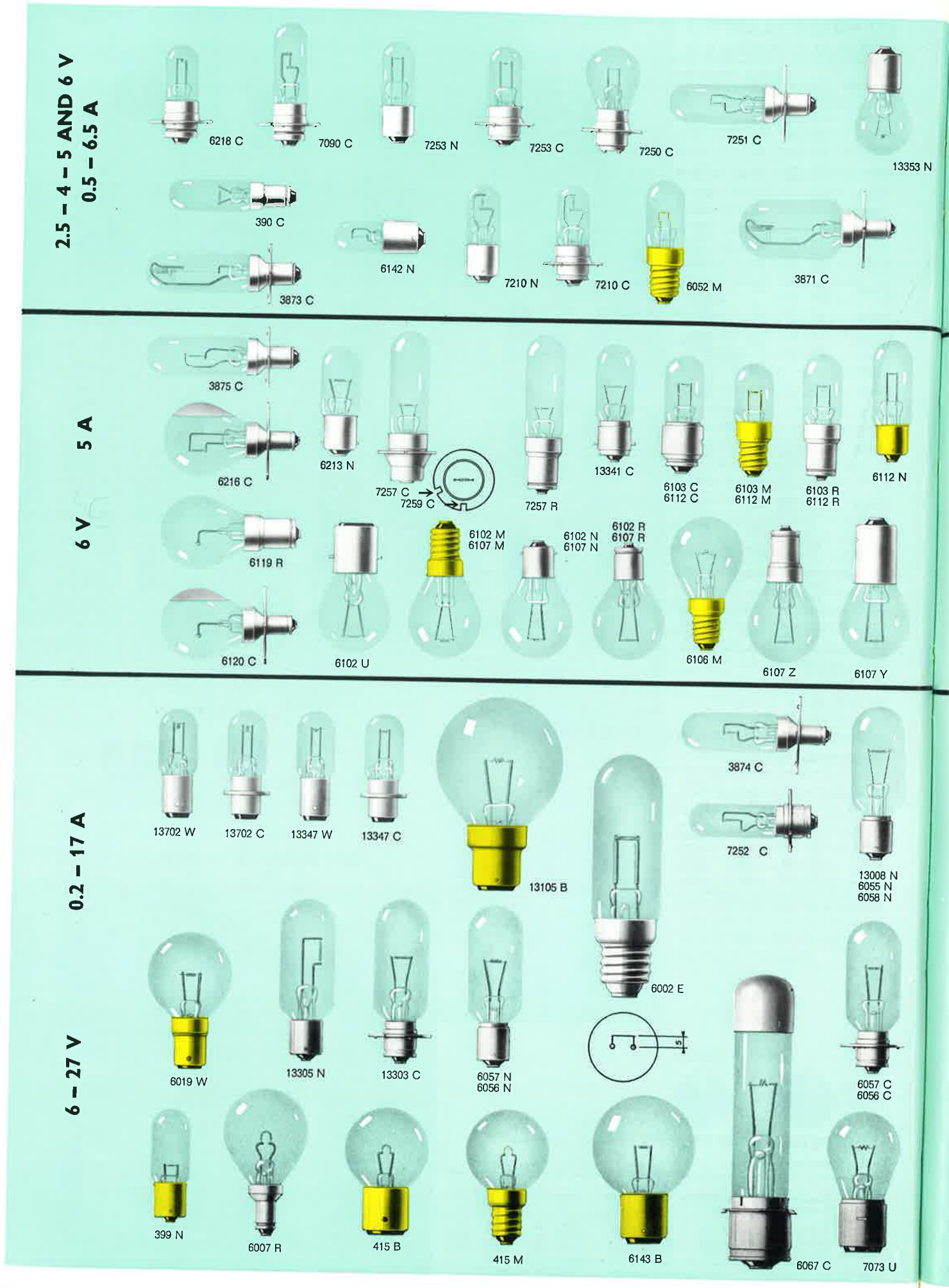


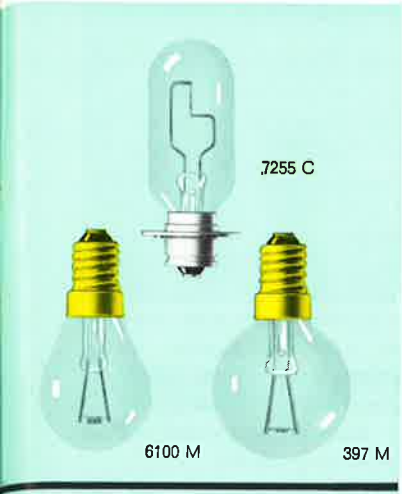
FOR DEBRIE AND PHILIPS PROJECTORS

(Non-standard types)

Make	Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.
Debrie	6170 C [1]	100 - 130	750	19500	25	P39s	36	153.5	81
Philips	7079 C	110	750	[3]	25	P28s	50	140	55.6
Philips	7240 C [2]	110	1000	27000	25	P36s	38	155	81

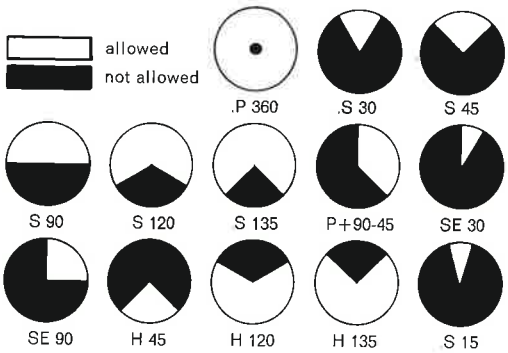
[1] Filament 4 mm ecc. [2] Filament 6 mm ecc. [3] With mirror


2.5 – 4 – 5 AND 6 V
0.5 – 6.5 A
6218 C
7090 C
7253 N
7253 C
7250 C
7251 C
13353 N
390 C
3873 C
6142 N
7210 N
7210 C
6052 M
3871 C
6 V
5 A
3875 C
6216 C
6213 N
7257 C
7259 C
7257 R
13341 C
6103 C
6112 C
6103 M
6112 M
6103 R
6112 R
6112 N
6119 R
6120 C
6102 U
6102 M
6107 M
6102 N
6107 N
6102 R
6107 R
6106 M
6107 Z
6107 Y
0.2 – 17 A
6 – 27 V
13702 W
13702 C
13347 W
13347 C
13105 B
3874 C
7252 C
13008 N
6055 N
6058 N
6019 W
13305 N
13303 C
6057 N
6056 N
6002 E
6057 C
6056 C
399 N
6007 R
415 B
415 M
6143 B
6067 C
7073 U



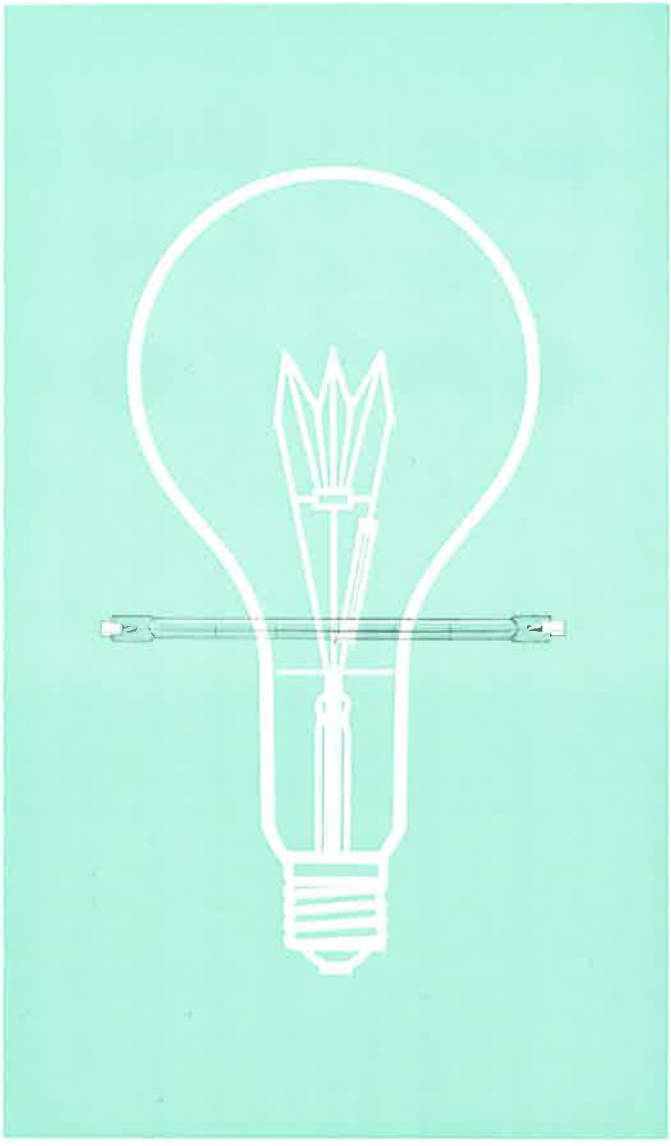
SOUND-FILM EXCITER, HOME-CINEMA AND MICROPROJECTION LAMPS

The quality of this category of lamps is determined by the filament. Philips bestow, therefore, the utmost care on the manufacture of perfect filaments with small tolerances in their dimensions.



Catalogue number	Voltage V	Wattage W	Current A	Fil. dim. mm	Lum. flux lm	Av. life h	Base	Diam.	Overall length	Lcl.	Burning position
6218C	2.5	—	3	1 x 1	50	100	P15s	16	50	28.6	P360
7090C	4	—	0.75	0.2 x 2	30	50	P15s	16	59	28.6	P360
7253N	4	—	0.75	2 x 0.2	30	50	B15s	16	49	31.8	P360
7253C	4	—	0.75	2 x 0.2	30	50	P15s	16	49	28.6	P360
7250C	4	—	0.75	2 x 0.2	30	50	P15d	25	51	28.6	H120
7251C	5	—	4	0.6 x 6.5	245	1000	PX28s	18	70	31.5	P+90-45
13353N	5	—	4	1.1 x 1.1	310	100	B15s	25	49	31.8	H45
7255C	5	—	6.5	1 x 5	700	100	P15s	25	78	41.2	S135
390C	6	—	0.5	1.2 x 0.2	42	50	P10s	15	63	25	S15
3873C	6	—	0.8	0.046 x 16	25	100	PX28s	18	71	31.5	P360
6142N	6	—	1	0.25 x 4	80	100	B15s	16	42	22	P360
7210N	6	—	1	0.25 x 4	80	100	B15s	16	49	29.5	S45
7210C	6	—	1	0.25 x 4	80	100	P15s	16	49	28.6	S45
6052M	6	—	1.45	1 x 1 [2]	95	100	E14	18.5	60	43.5	SE90
3871C	6	—	1.45	0.073 x 20	80	100	PX40s	28	74	31.5	F360
6100M	6	—	4.35	4.5 x 0.8	440	100	E14	35	65	8 [3]	H120
397M	6	—	4.5	3 x 1	475	100	E14	40	67	8 [3]	H120
3875C	6	—	5	1 x 5	525	100	PX28s	18	70	31.5	P+90-45
6216C	6	—	5	1 x 5 [4]	525	100	PY40s	32	62	29	P+90-45
6213N	6	—	5	5 x 1	525	100	B15s	18.5	54	28	S30
7257C	6	—	5	2.5 x 1.5	510	100	P27s	18	72	22	S30
7259C	6	—	5	2.5 x 1.5	510	100	P27s	18	72	22	S30
7257R	6	—	5	2.5 x 1.5	510	100	SX15s	18	72	38	S30
13341C	6	—	5	5 x 1	525	100	P16s	18.5	55	28	S30
6103C	6	—	5	2.5 x 1.5	510	100	PY20s	18.5	58	25.5	S30
6112C	6	—	5	5 x 1	525	100	PY20s	18.5	58	25.5	S30
6103M	6	—	5	2.5 x 1.5	510	100	E14	18.5	60	40.5	S30
6112M	6	—	5	5 x 1	525	100	E14	18.5	60	40.5	S30
6103R	6	—	5	2.5 x 1.5	510	100	SX15s	18.5	58	41	S30
6112R	6	—	5	5 x 1	525	100	SX15s	18.5	58	41	S30
6112N	6	—	5	5 x 1	525	100	B15s	18.5	58	34	S30
6112X	6	—	5	5 x 1	525	100	B15s	18.5	54	28	S30
7254R	6	—	5	2.5 x 1.5	510	100	SX15s	18	72	41	S30
6119R	6	—	5	2.5 x 1.5 [5]	510	100	SX15s	32	64	43.5	P+90-45
6120C	6	—	5	2.5 x 1.5 [4]	510	100	PX40s	32	62	29	P+90-45
6102U	6	—	5	2.5 x 1.5	510	100	BA20d	35	63	8 [3]	H120
6102M	6	—	5	2.5 x 1.5	510	100	E14	35	65	8 [3]	H120
6107M	6	—	5	4 x 1	525	100	E14	35	65	8 [3]	H120
6102N	6	—	5	2.5 x 1.5	510	100	B15s	35	60	8 [3]	H120
6107N	6	—	5	4 x 1	525	100	B15s	35	60	8 [3]	H120
6102R	6	—	5	2.5 x 1.5	510	100	SX15s	35	60	8 [3]	H120
6107R	6	—	5	4 x 1	525	100	SX15s	35	60	8 [3]	H120
6106M	6	—	5	2 x 2	510	100	E14	35	65	45	S135
6107Z	6	—	5	4 x 1	525	100	SX15s	35	64	8 [3]	H120
6107Y	6	—	5	4 x 1	525	100	P20s	35	67	45.5	H120
6107X	6	—	5	4 x 1	525	100	B15s	35	64	8 [3]	H120
6164M	6	—	5	2 x 2	510	100	E14	40	67	45	P360
13702W	6	15	—	1.9 x 1.7	205	100	BA15d	18.5	53	6.5 [3]	H135
13702C	6	15	—	1.9 x 1.7	205	100	PX22d	18.5	53	6.5 [3]	H135
13347W	6	15	—	1.9 x 1.7	205	100	BA15d	18.5	53	6.5 [3]	H135
13347C	6	15	—	1.9 x 1.7	205	100	PX22d	18.5	53	6.5 [3]	H135
13105B	6	100	—	3 x 3	2000	100	B22d	60	92	53.5	S135
6002E	6	—	16 - 17	8.5 x 2.1	1400	100	E27	32	118	76	S30
3874C	6.5	—	1.48	0.5 x 3	110	500	PX28s	18	70	31.5	P+90-45
7252C	7	—	0.2	0.15 x 3.5	10	50	P15s	16	60	28.6	P360
13008N	8	—	2	6 x 0.6	300	1000	B15s	25	78	44.5	S135
6055N	8	—	4	7.5 x 0.5	625	100	B15s	25	78	44.5	S135
6114N	8	—	4	7.5 x 0.5	625	100	B15s	25	78	49.5	S135
6019M	8	—	6	2.5 x 2	900	100	E14	40	67	45	P360
6019W	8	—	6	2.5 x 2	900	100	B15d	40	67	39	P360
6058N	8.5	—	4	8 x 0.5	680	100	B15s	25	78	44.5	S135
6136N	8.5	—	4	8 x 0.5	680	100	B15s	25	78	49.5	S135
13305N	8.5	—	4	0.5 x 8 [6]	680	100	B15s	25	78	44.5	SE30
13303C	9	—	4	5 x 1.25	575	500	P15s	25	78	37.3	S135
6057N	10	—	5	4.5 x 1.5	1050	100	B15s	25	78	40.5	S135
6057C	10	—	5	4.5 x 1.5	1050	100	P15s	25	78	37.3	S135
6057V	10	—	5	4.5 x 1.5	1050	100	B17s	25	78	31.5	S135
6138N	10	—	5	4.5 x 1.5	1050	100	B15s	25	78	43	S30
6056N	10	—	7.5	4.5 x 2	1650	100	B15s	25	78	40.5	S30
6056C	10	—	7.5	4.5 x 2	1650	100	P15s	25	78	37.3	S30
6056V	10	—	7.5	4.5 x 2	1650	100	B17s	25	78	31.5	S30
399N	12	—	0.5	2 x 0.9	120	100	B15s	18.5	54	20	S30
6007R [1]	12	—	2	3.5 x 2	550	25	S9.5s	40	66	43.5	S90
415B	12	—	3.5	4.5 x 2	880	100	B22d	40	62	37	S90
415M	12	—	3.5	4.5 x 2	880	100	E14	40	67	45	S90
6143B	12	50	—	2.5 x 2.5	1125	100	B22d	48	71	38.5	S135
6067C	12	100	—	2.6 x 3.3	2550	100	P28s	25.5	135	55.6	S15
7073U	15	60	—	2.6 x 2.4	1560	20	BA20d	35	66	30	S120
392N	25	—	1	3.5 x 1.2	450	100	B15s	18.5	54	20	S30
6139N	27	—	1	3.5 x 1	445	100	B15s	25	78	40.5	S135

1) Can also be supplied with outside mirror.
2) Exc. 4.8 mm.
3) Distance from filament to bottom of bulb.
4) Exc. 6 mm.
5) Exc. 8 mm.
6) Exc. 5 mm.



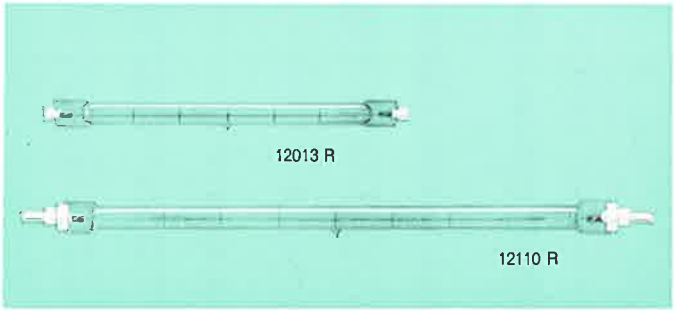
HALOGEN PROJECTION LAMPS

The halogen lamp, one of the latest members of the family of incandescent lamps, has some great advantages over the usual incandescent lamps.

It may be assumed to be a well-known fact that, owing to the evaporation of the tungsten filament, the life of an incandescent lamp is limited, and that the luminous flux decreases steadily owing to blackening of the bulb wall. The temperature of the filament could be increased with the object of obtaining a higher luminous flux. This would mean, however, a faster evaporation of the coil, thus a further decrease in life and a more rapid blackening of the bulb. Moreover, this blackening is related to the dimensions of the bulb for, the smaller the bulb, the smaller the surface over which the blackening is then spread, so that a greater loss of light results.

With the addition of a small amount of halogen to the filling gas, it has been possible to restore part of the evaporated tungsten to the filament, by means of a chemical reaction, which effects a so-called "regenerative cycle". As a result of this, the following main advantages could be obtained: no blackening of the bulb, therefore no light depreciation during effective life; smaller bulbs; the possibility of increasing the temperature of the filament without decreasing the life.

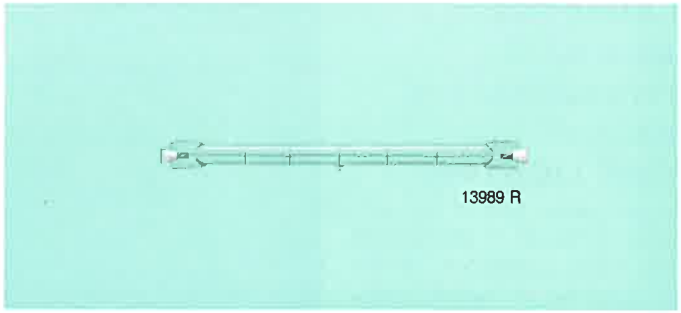
These developments have enabled Philips to manufacture a range of lamps of small dimensions and a high luminous intensity, eminently suitable for floodlighting, for the lighting of film studios, for 8 mm cine photography, for narrow-gauge film projection, and for use in motorcar headlights. - (The motorcar headlight lamps are to be found on page 34).



FLOODLIGHT LAMPS

In the field of floodlighting, Philips have available two types of tubular quartz halogen lamps. The light of these lamps allows good colour rendition. Owing to their small dimensions, these lamps have opened the way to the construction of small, handy and efficient fittings. - These lamps find wide application outdoors for the illumination of buildings, sports grounds and playing fields, parks, large gardens, fountains, car parks, "Son et Lumière" installations, the lighting of airport runways etc., and indoors for the lighting of public halls, factories, sports-halls etc.

Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Max. diam.	Max. insertion length	Burning position
12013R	115/120 125/130 220/230 240/250	1000	22000	2000	Fa7 - 4.3	12	190	horizontal
12110R	220/230 240/250	2000	44000	2000	Fa4	12	324.1	horizontal

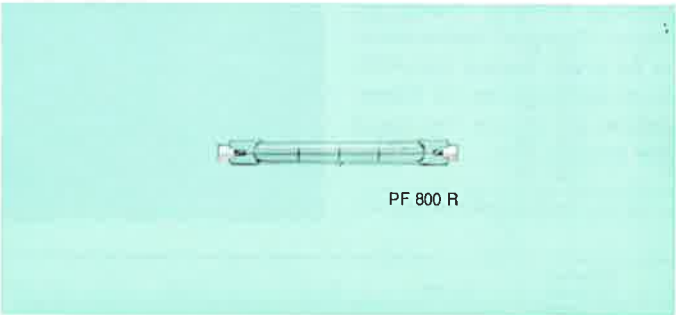


13989 R

FILM AND TV STUDIO LAMP

For use in colour film and colour TV studios where a definite colour temperature is required, a halogen lamp has been developed having a colour temperature of about 3200 °K which is eminently suitable for this purpose. As with halogen lamps no blackening at all of the bulb wall arises, this colour temperature remains constant throughout the lamp life, which is a highly important factor for the lighting of colour studios.

Catalogue number	Voltage V	Wattage W	Lum. flux lm	Colour temperature °K	Base	Max. diam.	Max. insertion length	Burning position
13989R	220/230 240/250	1000	26000	approx. 3200	Fa7 - 4.3	12	190	any

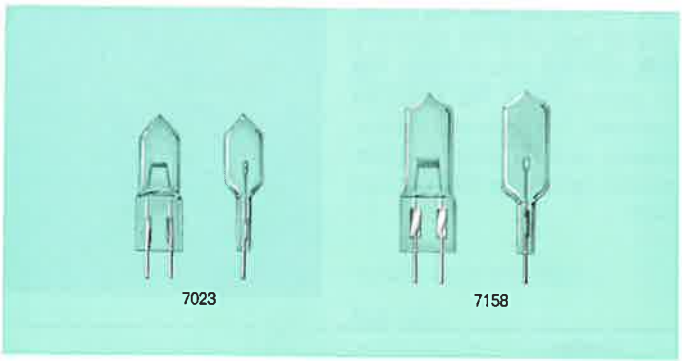


PF 800 R

HALOGEN LAMP FOR CINE AND STILL PHOTOGRAPHY

This lamp has mainly been designed for amateur use, to serve the ever-growing demand for suitable lighting for 8 mm cine photography. It can, moreover, advantageously be used for general indoor photography. Because of the tungsten-halogen regenerative process, its particularly favourable colour temperature for both black-and-white and colour film is maintained throughout the full 15 hours lamp life. The small dimensions of the lamp allow the construction of small-sized fittings. This halogen lamp, combined with an appropriate reflector, secures a high luminous intensity and an even distribution of light. - A low-voltage and a high-voltage version is available.

Catalogue number	Voltage V	Wattage W	Lum. flux lm	Colour temperature °K	Av. life h	Base	Max. diam.	Max. insertion length	Burning position
PF800R	115/120 125/130	650	21000	approx. 3400	15	Fa7 - 4.3	12	125.1	any
	220/230 240/250	1000	33000						



7023 7158

NARROW-GAUGE FILM AND SLIDE-PROJECTOR LAMPS

Two types of quartz halogen lamps for use in narrow-gauge film and in slide-projectors can be supplied. Just as with the other halogen lamps, they have a high luminous intensity, which is maintained during the entire service life. - Their small dimensions allow the construction of more efficient projectors, as the filament can be placed at a shorter distance from the condensor lens, so that a greater part of the emitted light passes the film or the slide. In addition, colour rendition of these halogen lamps is excellent.

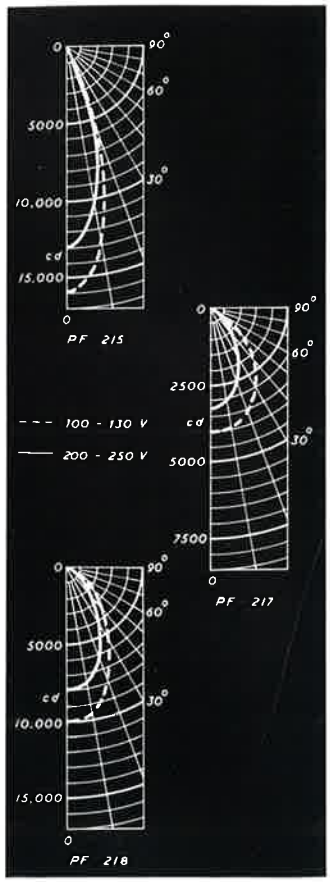
Catalogue number	Voltage V	Wattage W	Fil. dim. b x h	Lum. flux lm	Av. life h	Base	Max. diam.	Overall length	Lcl.	Burning position
7023	12	100	4.2 x 2.3	2800	50	G6.35—1.25	11	44	30	base down
7158	24	150	5.8 x 2.9	4700	50	G6.35—1.0	13.5	50	32	base down

LAMPS FOR GENERAL PHOTOGRAPHIC AND CINE LIGHTING

A substantial part of the progress in the art of photography has been contributed by the development of special lamps for this application. The experience of generations of lamp manufacturers is a guarantee for the lamps Philips have developed in this field, for the use of both amateurs and professionals.

"PHOTOLITA"

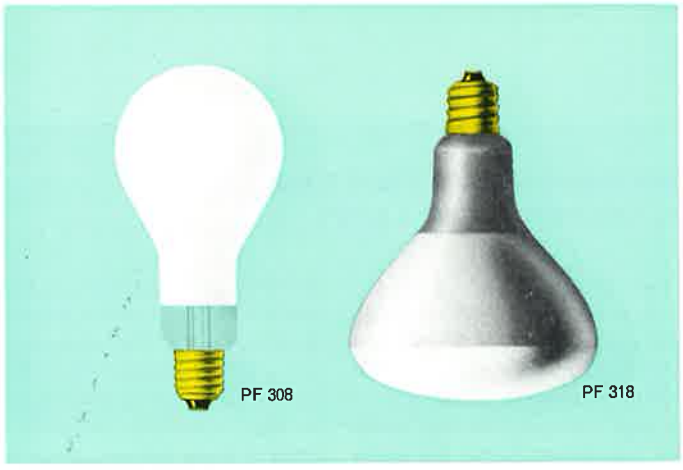
These lamps are available in the inside-frosted finish and with internal reflector. Both kinds of lamp have an extremely high luminous intensity. Though the life of "Photolita" lamps seems to be short, a great many pictures can be made, as the exposure per picture requires a few seconds only.



Light distribution diagrams

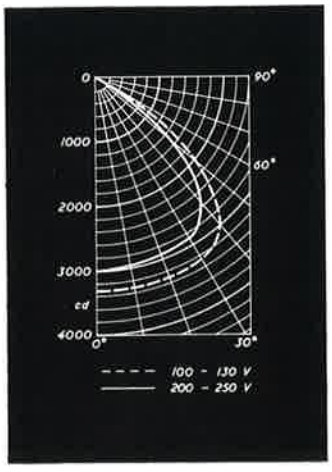
Type	Catalogue number	Voltage V	Wattage W	Lum. flux lm	Candles in centre of beam	Av. life h	Base	Diam.	Overall length
"Photolita" S	PF207	100 - 130 200 - 250	250	8500 7500	—	3	E27 1)	60	110
"Photolita" N	PF208	100 - 130 200 - 250	500	17000 14500	—	6	E27 1)	90	183
"Photolita" T	PF209	100 - 130 200 - 250	1000	34000 29000	—	10	E40	110	240
"Photolita" KM	PF215	100 - 130 200 - 250	375	—	16000 13000	4	E27	95	132
"Photolita" SM	PF217	100 - 130 200 - 250	250	—	4000 3300	3	E27 1)	80	129
"Photolita" NM	PF218	100 - 130 200 - 250	500	—	10000 8000	6	E27 1)	111	160

1) Can also be supplied with B22 base.



"ARGAPHOTO"

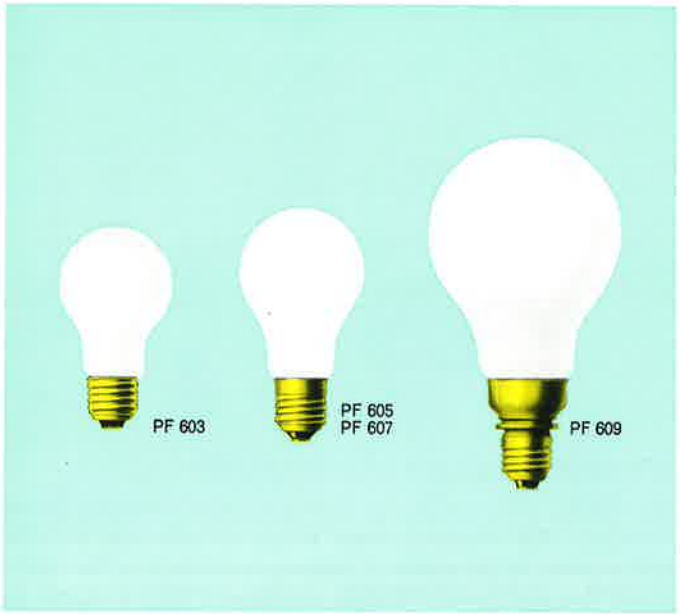
"Argaphoto" lamps give a more diffused lighting and have a longer life than the "Photolita" series. They are available in two versions as well; the inside-frosted type is to be used in a reflector, the other version has an internal mirror. The lamps are intended for infra-red photography, and for general photographic lighting for still and cine work.



Light distribution diagram

Type	Catalogue number	Voltage V	Wattage W	Lum. flux lm	Candles in centre of beam	Av. life h	Base	Diam.	Overall length
"Argaphoto" B	PF308	100 - 130 200 - 250	500	12500 11000	—	100	E27 1)	90	183
"Argaphoto" BM	PF318	100 - 130 200 - 250	500	—	3300 3000	100	E27 1)	125	178

1) Can also be supplied with B22 base.



"PHOTOCRESCENTA"

Enlarger lamps with a white diffusing bulb. These light sources have a high luminous intensity and give an even distribution of the light, as is required for enlarging apparatus. Philips "Photocrescenta" lamps are, therefore, a valuable asset to the professional as well as to the amateur photographer.

Catalogue number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Diam.	Overall length
PF603	100 - 130 200 - 250	75	1300 1150	100	E27 1)	60	109
PF605	100 - 130 200 - 250	150	3000 2700	100	E27 1)	65	121
PF607	100 - 130 200 - 250	250	8000 7200	3	E27 1)	65	121
PF609	100 - 130 200 - 250	300	6000 5400	100	E27 1)	100	179

1) Can also be supplied with B22 base.

DARKROOM LAMPS

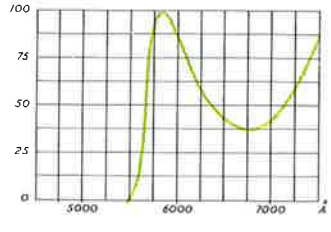
In the processing of cine and photographic materials, the different characteristics of negative and positive materials impose special requirements which are fully taken into account with the Philips range of darkroom lamps.

Catalogue number	Colour	Voltage V	Base	Diam.	Overall length
PF710 PF711 PF712 PF713	yellow-green green red yellow	110/115 125/130 150/160 220/230 240/250	E27 1)	60	113

1) Can also be supplied with B22 base.

RELATIVE SPECTRAL ENERGY EMISSION

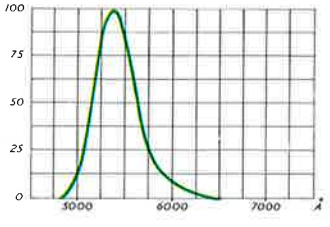
PF 710



Yellow-green lamp

Eminently suitable for enlarging and printing on bromide and chlorobromide papers.

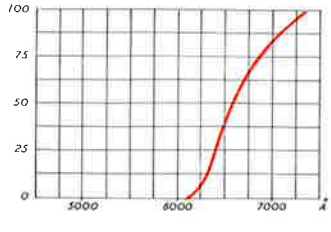
PF 711



Green lamp

For processing panchromatic negative material.

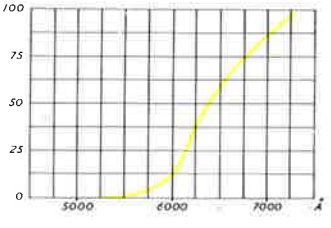
PF 712



Red lamp

Suitable for developing orthochromatic negative material.

PF 713



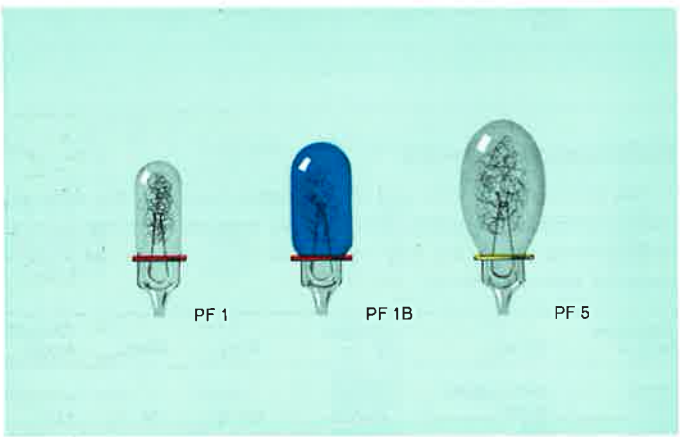
Yellow lamp

For use when developing normal contact papers and less sensitive chlorobromide papers.

PHILIPS

"PHOTOFLUX" FLASHBULBS

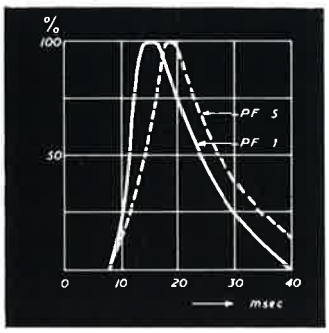
The modern camera-owner is making an ever-increasing use of flashbulbs. The "Photoflux" bulbs Philips can offer him, are ideal light sources for exposures of fast-moving subjects or for candid shots. They are indispensable for photographs indoors as well as outdoors when daylight is insufficient or absent, or, in case of bright weather, to decrease the sharp contrast between sun-lit areas and dark shadows. "Photoflux" bulbs make every camera-user independent of time, place and weather. With this never failing aid he can be sure of a successful snap every time.



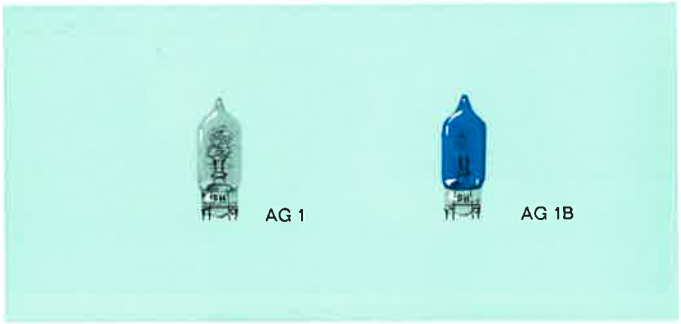
BASELESS TYPES

Technical developments have led to the manufacture of a series of small-size baseless flashbulbs of a high luminous intensity, which are shown opposite. The blue "Photoflux" flashbulbs are intended for use with daylight colour materials. - For reliable ignition, the use of a battery-capacitor system is recommended.

Relative light emission curve

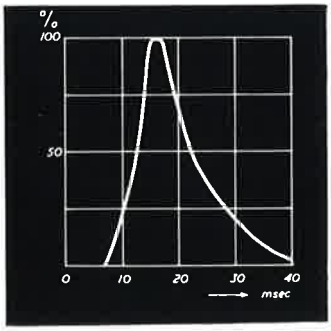


Catalogue number	Voltage range V	Light output lmsec	Time to full peak msec	Flash duration at half peak msec	Approx. colour temperature °K	Colour	Diam.	Overall length
PF1	3 - 30	7500	15	10 - 12	4000	clear	12	41
PF1B	3 - 30	7500	15	10 - 12	5500	blue	16	46
PF5	3 - 30	18000	18	14	4000	clear	22	51

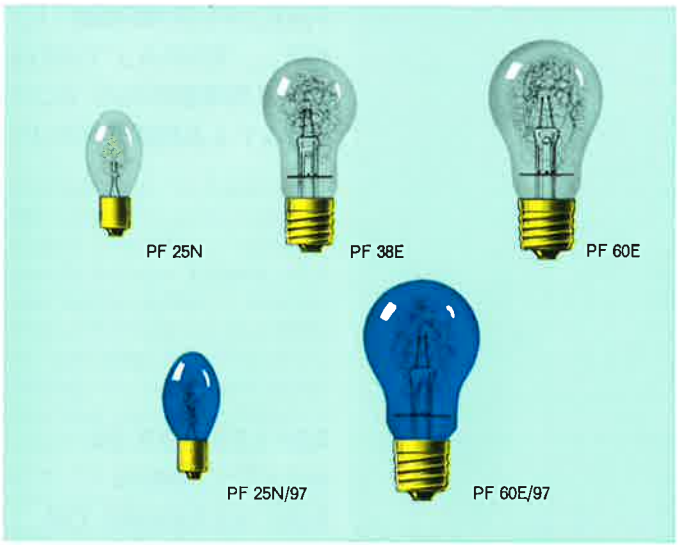


Another type of a small baseless flashbulb, adapted to the latest development of cameras. This type is also available with a blue coating carefully matched to the colour characteristics of daylight-type colour films. For the rest, these flashbulbs feature the same excellent qualities as the bulbs described above.

Relative light emission curve



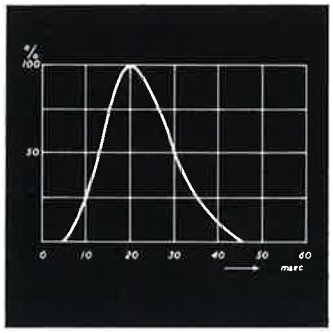
Catalogue number	Voltage range V	Light output lmsec	Time to full peak msec	Flash duration at half peak msec	Approx. colour temperature °K	Colour	Diam.	Overall length
AG1	3 - 30	7500	15	12 - 14	4000	clear	12	33.5
AG1B	3 - 30	5500	15	12 - 14	5500	blue	12	33.5



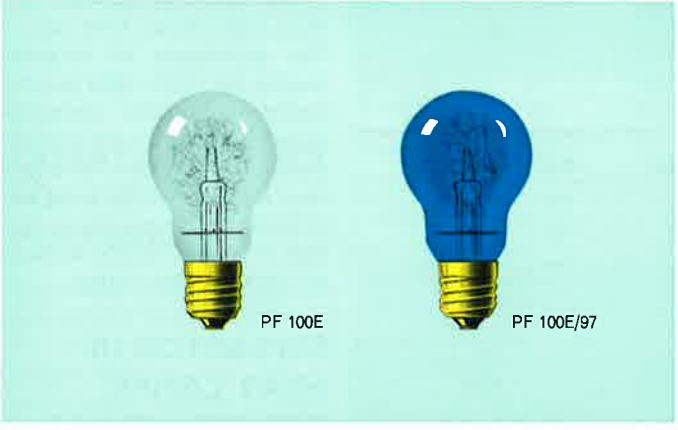
"PHOTOFLUX" FLASHBULBS CLASS M

Class M flashbulbs have been designed for cameras having between-the-lens shutters, and are excellent for all-round photography. They can be used with the "open-flash" method as well as with cameras having built-in synchronisation. With the exception of type PF 38E they are also available with a blue filter lacquer for colour photography.

Relative light emission curve



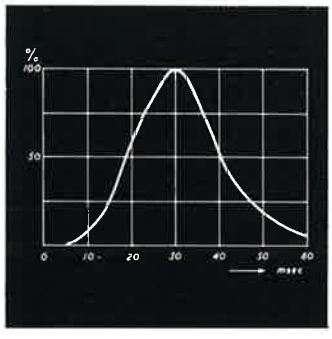
Catalogue number	Voltage range V	Light output lmsec	Max. luminous flux Mlm	Time to full peak msec	Flash duration at half peak msec	Time to half peak msec	Approx. colour temperature °K	Colour	Base	Diam.	Overall length
PF25N	3 - 30	18000	1.4	20	12	15	4000	clear	B15s	31	65
PF25N/97	3 - 30	12600	1.0	20	12	15	5500	blue	B15s	31	65
PF38E	3 - 30	33000	1.8	20	13	13	4000	clear	E27	50	101
PF60E	3 - 30	62000	2.8	20	14	15	4000	clear	E27	60	115
PF60E/97	3 - 30	31000	1.8	20	14	15	5500	blue	E27	60	115



"PHOTOFLUX" FLASHBULBS CLASS S

Destined for use with cameras equipped with between-the-lens shutters as well, the PF 100E and PF 100E/97 flashbulbs have a greater luminous intensity than other "Photoflux" bulbs and are therefore specially suitable for large area coverage. They are to be used for photographing with the "open-flash" method.

Relative light emission curve

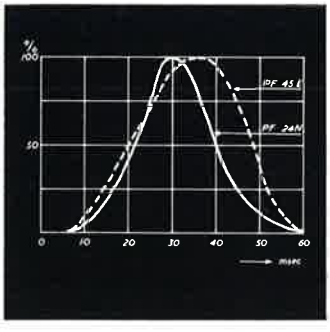


Catalogue number	Voltage range V	Light output lmsec	Max. luminous flux Mlm	Time to full peak msec	Flash duration at half peak msec	Time to half peak msec	Approx. colour temperature °K	Colour	Base	Diam.	Overall length
PF100E	3 - 30	95000	3.8	30	17	19	4000	clear	E27	70	125
PF100E/97	3 - 30	47500	2.4	30	17	19	5500	blue	E27	70	125

"PHOTOFLUX" FLASHBULBS CLASS FP

As appears from their relatively long flash duration at half peak, these types are specifically destined to be used with cameras with focal-plane shutters.

Relative light emission curve



Catalogue number	Voltage range V	Light output lmsec	Max. luminous flux Mlm	Flash duration at half peak msec	Time to half peak msec	Approx. colour temperature °K	Colour	Base	Diam.	Overall length
PF24N	3 - 30	17000	0.6	30	15	4000	clear	B15s	31	74
PF24N/97	3 - 30	11900	0.4	30	15	5500	blue	B15s	31	74
PF45E	3 - 30	45000	1.1	30	16	4000	clear	E27	60	115
PF45E/97	3 - 30	22500	0.7	30	16	5500	blue	E27	60	115

PHILIPS RANGE OF INFRA-RED HEAT LAMPS

Catalogue number	Wattage W	Voltage V	Finish bulb front	Av. life h	Base	Diam.	Overall length
13346E/479	150	110/120 125/130	rubinized	> 5000	E27	111	160
13352E/479	250	220/230 230/240	rubinized			125	185
13352E/44	250	240/250	inside frosted			125	185

REFLECTOR IR HEAT LAMPS FOR REARING OF ANIMALS

Efficient heating is an absolute necessity for a poultry farm and livestock enterprise run on modern lines.

Philips Reflector Infra-Red Heat Lamps make a considerable contribution to the healthy rearing of chicks, ducklings, goslings, turkeys, pigs, calves, foals, etc.

The advantages of infra-red heating are: more rapid growth, decreased mortality, increased power of resistance and hygienic premises. - Philips Infra-Red Heat Lamps offer the extra advantages of: long service life, high efficiency, simple installation and complete safety.

Catalogue number	Wattage W	Voltage V	Finish bulb front	Av. life h	Base	Diam.	Overall length
13372E/06	250	110/120 125/130 220/230 230/240 240/250	clear	> 5000	E27	125	185
13372E/44			inside satin-frosted				
13344E/06	375		clear				
13344E/44			inside satin-frosted				

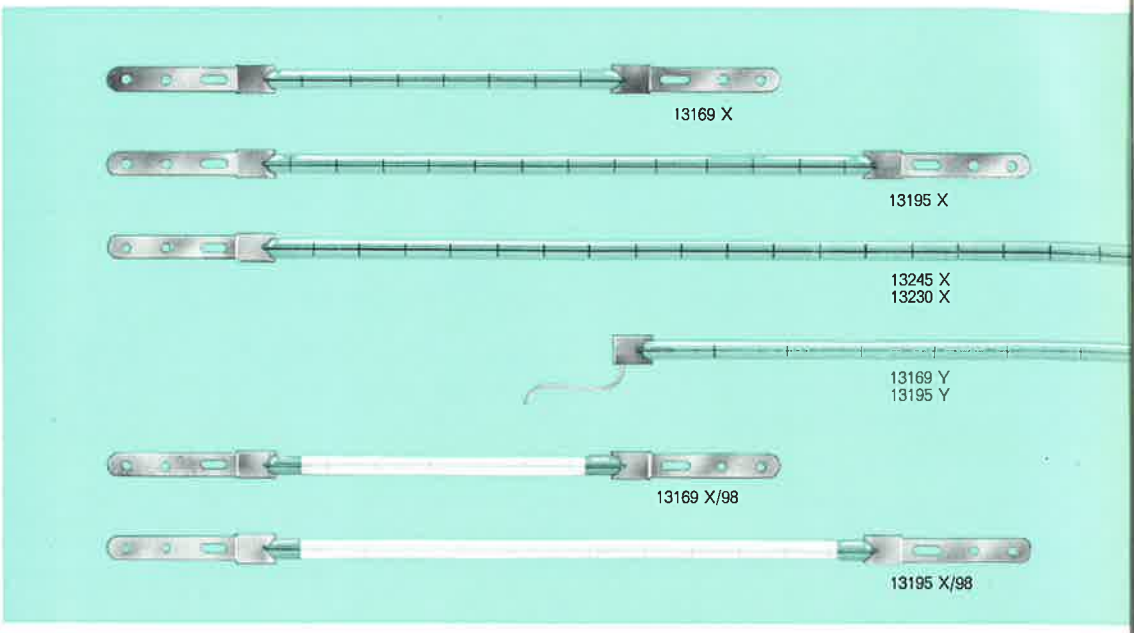
REFLECTOR IR HEAT LAMPS FOR INDUSTRIAL PURPOSES

Philips Reflector Infra-Red Heat Lamps have proved to be for most industries the proper solution to their drying problems, as these lamps possess some very characteristic properties, making them extremely suitable for industrial drying processes. These lamps also make it possible to construct, at low initial cost, efficient ovens of simple construction, of light weight, easily transportable and of great adaptability to varying conditions.

Some outstanding features of Philips Reflector Infra-Red Heat Lamps are as follows: high power with small dimensions, high efficiency and long service life, any burning position permissible and easily interchangeable.

QUARTZ IR HEAT LAMPS FOR INDUSTRIAL PURPOSES

The application of higher-power IRK lamps in heaters used in industrial processes is increasing rapidly because a higher infra-red energy output is provided than is the case with the reflector-bulb lamps. Moreover, quartz heaters are much more sturdy. The most outstanding feature of quartz infra-red lamps is, however, the possibility of building very compact heating systems, simple and light in weight. Moreover, the lamps reach the optimum working temperature immediately and cool down very rapidly. Finally, temperature control is possible within very narrow limits, which is an essential factor in treating all kinds of modern material.

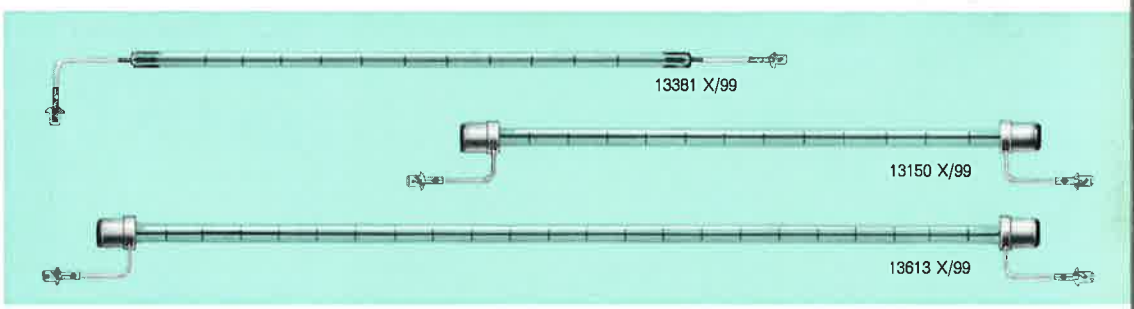


Catalogue number	Wattage W	Voltage V	Bulb and finish	Base	Diam.	Heated length	Fixing centres
13169X	500	110/130	clear quartz	clips X502	10	160	241
13195X	1000	220/250			10	270	368
13245X	2000	380/415			10	425	508
13230X	3000	380/415			10	720	798
13169Y	500	110/130	clear quartz	clips with supply leads	10	abt. 152	216 1)
13195Y	1000	220/250			10	abt. 271	346 1)
13169X/98	500	110/130	clear quartz with reflector strip	clips X502	10	abt. 152	241
13195X/98	1000	220/250			10	abt. 271	368

1) Max. overall length.

QUARTZ IR LAMPS FOR COPYING PURPOSES

The Philips tubular, quartz infra-red copying lamps are efficient, compact size, high-intensity radiant heat sources for dry reproduction systems. - These are high colour-temperature lamps with exact filament and dimensional tolerances, offering accurate focussing in properly designed reflectors.



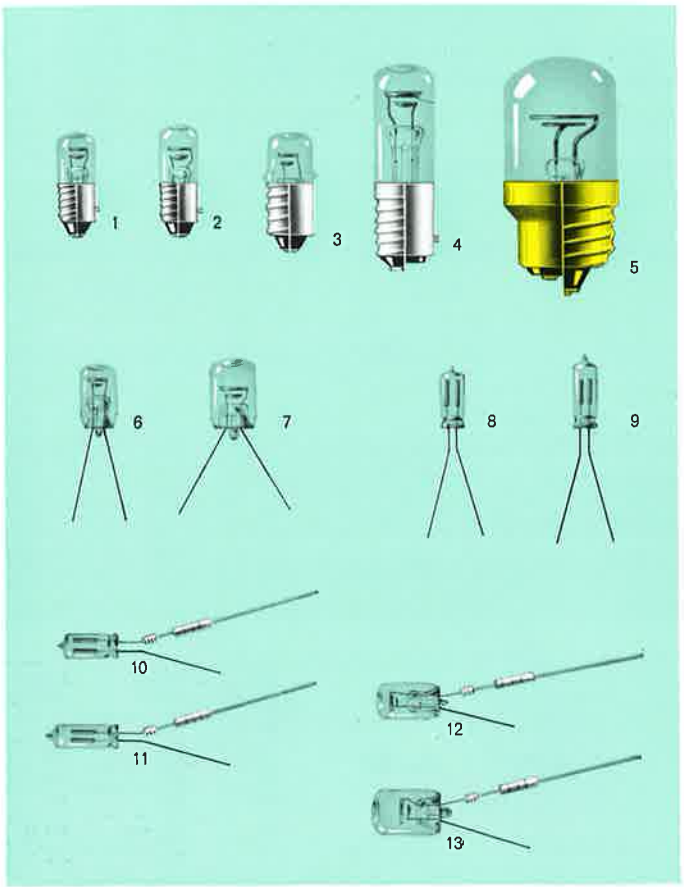
Catalogue number	Voltage V	Wattage W	Bulb shape	Material	Base	Diam.	Heated length	Max. overall length
13381X/99 1)	115 220	1350	T2½	clear quartz	baseless	8	254	294
13150X/99 2)	220 280	1350	T3	clear quartz	ceramic	10	254	305 3)
13613X/99	490	2360	T3	clear quartz	ceramic	10	441	495 3)

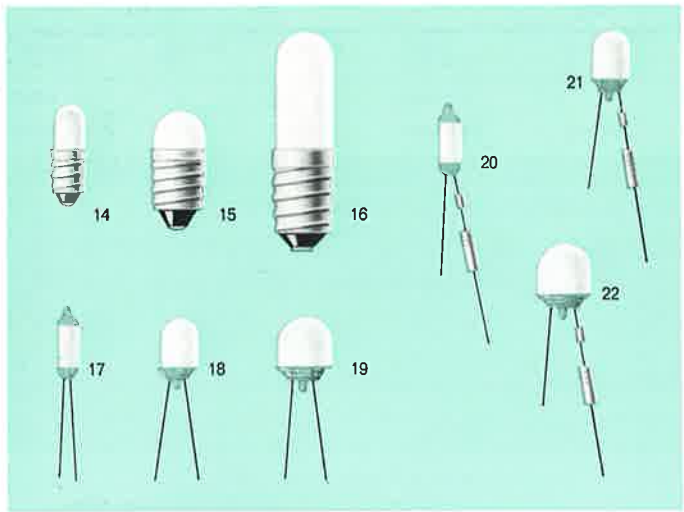
1) Also available in a 1500 W version, for 220, 240 and 280 V, cat. no. 13380X/99.
2) Also available in a 1500 W version, for 220 and 240 V, cat. no. 13259X/99.
3) Inclusive of bases.

QUARTZ HEATERS FOR COMFORT HEATING

The quartz heater IRQ has been designed for application in the space-heating field. Quartz heaters possess various characteristics which make them eminently suitable for this purpose: they radiate heat immediately, reach high radiating temperatures, have a good optical effect, can resist sudden temperature changes and are resistant to acids.

Catalogue number	Voltage V	Wattage W	Material	Coil temperature °K	Burning position	Diam.	Heated length	Max. overall length
13219	225	1000	satin-quartz	approx. 1200	horizontal	8	560	721





NEON GLOW LAMPS

The extensive range of Philips Neon Glow Lamps provides a large selection for inclusion in most types of signal units and fittings. They can be ordered in a great variety of dimensions and voltages, with or without base, with or without series resistor.

Glow lamps with built-in or attached resistor can be connected directly to the mains. Glow lamps supplied without resistor must have a resistor connected in series.

Continuous development has made high-brightness types available throughout the entire range; they can be supplied in green as well.

Applications

All kinds of electric appliances such as irons, grills, domestic heaters, boilers, frying pans, electric ovens, washing machines, dish washers, hair dryers, coffee percolators, freezers, refrigerators, blankets, etc.

Features

- small dimensions
- suitable for mains tension
- high brightness
- hardly affected by mains fluctuations
- shock and vibration-proof to a large extent
- minimum heat development
- negligible current consumption
- long service life

Glow lamps with built-in resistor

Catalogue number	Mains voltage V	Approx. current mA	Base	Max. diam.	Overall length	Fig.
GL40D [1]	110/130 a.c. and d.c.	1	EX10	10	26	1
GL40N [1]	220/250 a.c.	1.5	BA9s			
	380 a.c.	0.6				
GL50D [1] [2]	110/130 a.c. and d.c.	1	EX10	10	28	2
GL50N [1] [2]	220/250 a.c.	1.5	BA9s			
	380 a.c.	0.6				
GL41M [1] [2]	110/130 a.c. and d.c.	2	E14	14	30	3
GL41W [1] [2]	220/250 a.c.	2.5	B15d			
	380 a.c.	1				
GL42M [1] [2]	110/130 a.c. and d.c.	2	E14	15.5	54	4
GL42W [1] [2]	220/250 a.c.	3.5	B15d		52	
	380 a.c.	2				
GL45E	110/130 a.c. and d.c.	4	E27	28.5	62	5
GL45B	220/250 a.c.	7	B22		58	
Glow lamps without resistor in the base [3]						
GL14D	110/130 a.c. and d.c.	1	EX10	10	26	1
GL14N			BA9s			
GL1M [2]		2	E14	14	30	3
GL1W [2]			B15d			
GL12D [1]	220/250 a.c.	1.5	EX10	10	26	1
GL12N [1]			BA9s			
GL4M [1] [2]		2.5	E14	14	30	3
GL4W [1] [2]			B15d			
Baseless glow lamps without resistor [4]						
GL14 [2]	110/130 a.c. and d.c.	1	—	9	18.5	6
GL1 [2]		2	—	11.5	24	7
GL6		0.5	—	6	16	8
GL8		0.5	—	6	19	9
GL 9 [1]	110/130 a.c. 220/250 a.c.	2	—	6	19	9
GL12 [1] [2]	220/250 a.c.	1.5	—	9	18.5	6
GL4 [1] [2]		2.5	—	11.5	24	7
GL5 [1]		1	—	6	12.5	8
GL7 [1]		1.5	—	6	16	8
Baseless glow lamps with attached resistor						
GR14	110/130 a.c.	1	—	9	18.5	12
GR1		2	—	11.5	21	13
GR6		0.5	—	6	16	10
GR8		0.5	—	6	19	11
GR9 [1]	110/130 a.c. 220/250 a.c.	2	—	6	19	11
GR12 [1]	220/250 a.c.	1.5	—	9	18.5	12
GR4 [1]		2.5	—	11.5	21	13
GR5 [1]		1	—	6	12.5	10
GR7 [1]		1.5	—	6	16	10
Green fluorescent glow lamps with built-in resistor						
GR60D [1]	220 a.c. 240 a.c.	1.5	EX10	10	26	14
GR66M [1]		2	E14	14	30	15
GR72M [1]		4	E14	16	54	16
Baseless green fluorescent glow lamps without resistor [5]						
GL52 [1]	220 a.c. 240 a.c.	1.5	—	6	19	17
GL60 [1]		1.5	—	10	18.5	18
GL66 [1]		2	—	14	19	19
Baseless green fluorescent glow lamps with attached resistor						
GR52 [1]	220 a.c. 240 a.c.	1.5	—	6	19	20
GR60 [1]		1.5	—	10	18.5	21
GR66 [1]		2	—	14	19	22

POCKET TYPE VOLTAGE INDICATOR

As a useful help for everyone who has to deal with electricity, Philips can offer a small, handy voltage indicator, which can, moreover, be used as a screwdriver. If the tested point is "live", the built-in neon indicator will give a red glow. Suitable for voltages of 90 - 380 V a.c. and d.c. Catalogue number 7800/15. Dimensions: diameter 14.5 mm, overall length 120 mm.

[1] High brightness types; as for the lamps GL 40, 50, 41 and 42 this applies only to the high-voltage versions.
[2] Lamps with lens-end bulb.
[3] Recommended series resistor 56, 27, 82 and 47 kΩ ¼ W resp.
[4] Recommended series resistor 56, 27, 120, 120, 27, 68, 82, 47, 150 and 100 kΩ ¼ W resp.
[5] Recommended series resistor 68, 82 and 47 kΩ ¼ W resp. for 220 V; 82, 100 and 56 kΩ ¼ W resp. for 240 V.

FLUORESCENT LAMPS

TABLE OF CONTENTS

FLUORESCENT LAMPS

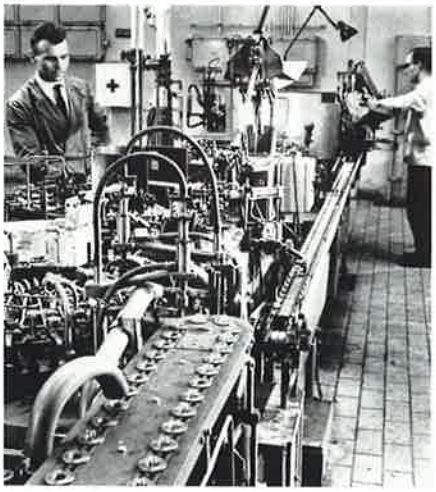
The development of fluorescent lamps started only a few years later than that of the gas-discharge lamps, but was as important and sensational. Fluorescent lamps had an even greater impact on the public mind, because they differed so considerably in shape from all previous lamps, and also because they soon found their way to shops, factories, offices and homes on account of their much higher efficiency.

Philips introduced their first fluorescent lamps in 1939, but further development in Europe came to a temporary standstill as a result of the Second World War. It was resumed in 1945 in new factories and new laboratories. Research led to a large variety of types, now including instant-start, rapid-start, reflector, circular, slimline lamps, all in an abundance of colours and ratings.

The outstanding reputation of Philips in the field of fluorescent lamps is based on more than quality alone. Many years ago Philips decided that they should not sell "lamps", but "light". Philips were certainly amongst the first to recognize an often-overlooked difference between incandescent lamps and fluorescent lamps. Incandescent light comes from electricity plus a lamp. Fluorescent light comes from electricity plus a lamp plus a number of accessories. However high the quality of the lamp itself, it cannot be expected to give optimum service unless all the accessories are of the same high quality as the lamp. There is considerable interaction of an economic nature. Poor accessories waste current; they reduce not only the efficiency of a lamp, but also its service life. That is the reason why Philips insisted on the highest quality of accessories. The reputation of the Philips fluorescent lamp is at stake.

Philips further contributed to the popularity of the new light source by developing a large number of colour-shades (most of them shades of white) with the specific purpose of getting excellent colour rendering.

The story of fluorescent lighting shows once again that the invention of a new type of light source, however important in itself, is only the first step on a very long road leading towards perfection, a road paved with research.

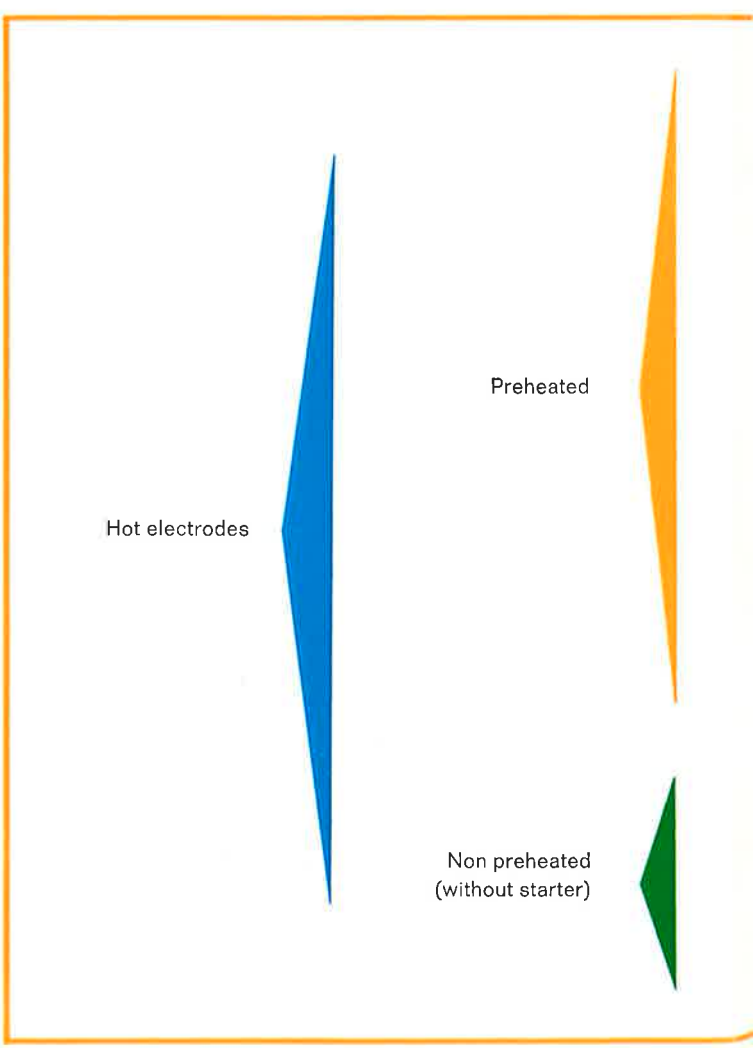


FLUORESCENT-LAMP PROGRAMME

In the Philips fluorescent lamp programme there is a type available for almost every application in the general lighting field. In the survey below the fluorescent lamps are grouped according to the methods of starting and operation. Each method requires a particular combination of lamp and auxiliary equipment.

The complete range of Philips fluorescent lamps is composed of the following types:

- The fluorescent lamps of the "TL" standard range operate with starter switches and ballasts. In this group are also incorporated "TL" miniature, "TL"D small diameter, "TL"E circular, "TL"W and "TL" coloured fluorescent lamps.
- The reflector-type lamp "TL"F has an internal reflecting powder layer. It is also normally starter-operated.
- The rapid-start fluorescent lamps "TL"M/RS operate without starters on special ballasts. Rapid-start fluorescent lamps are also supplied in a circular version, type "TL"EM/RS and with internal reflector, type "TL"MF/RS.
- The "TL"/RS rapid-start lamps operate without starter on special ballasts. They can also be operated with starter on normal ballasts.
- "TL"/RS and "TL"M/RS "Double-Flux" lamps operate without starter on special ballasts. These lamps too, can be supplied with internal reflector.
- For Great Britain, Philips manufacture a series of universal "TL"A fluorescent lamps, suitable for either switch or instant start ballasts. Again, these lamps are also made with internal reflector, type "TL"AF.



COLOURS

Maximum efficiency	col. temp.	Maximum colour rendition	col. temp.
Warm white /29	3000 °K	Warm white deluxe /32	3000 °K
White /33	4200 °K	White deluxe /34	3800 °K
Cool daylight /54	6500 °K	Daylight /55 (or colour matching)	6500 °K
		Daylight /57	7400 °K

- The fluorescent lamps "TL"C have been designed for d.c. operation in trains, trams, buses, aircraft and ships. They operate on stabilizing tubes.
- The "TL"R lamps are for d.c. operation. They need auxiliary equipment, such as stabilizing lamps and magnetic relays.
- Fluorescent-lamp type "TL"S with inside ignition strip can be operated with stabilizing lamps as well as with a ballast. No starter is required.
- For housing in flameproof fittings the "TL"X type is available, which operates without starter on the same ballasts as for "TL"S lamps.
- Finally, the Slimline lamps are instant-start, hot-cathode fluorescent lamps. They operate without starter and have a single-pin base.

It is not only the right choice of lamp types and the correct use of fittings on which good lighting is based, the colour of the light also has a part to play. In addition to types with high luminous efficiency, there are also available those developed for maximum colour rendition. As can be seen from the above table, colours 32, 34, 55 and 57 ensure perfect rendition of all colours, thanks to their well-balanced spectrum. The colours 29, 33 and 54 give maximum efficiency.

With starter
"TL" Standard-type lamps
"TL"F Reflector-type lamps
"TL"D Slender-type lamps
"TL"E Circular lamps
"TL"W lamp
"TL" Coloured lamps
"TL" Miniature lamps
"TL"C Lamps for d.c. operation

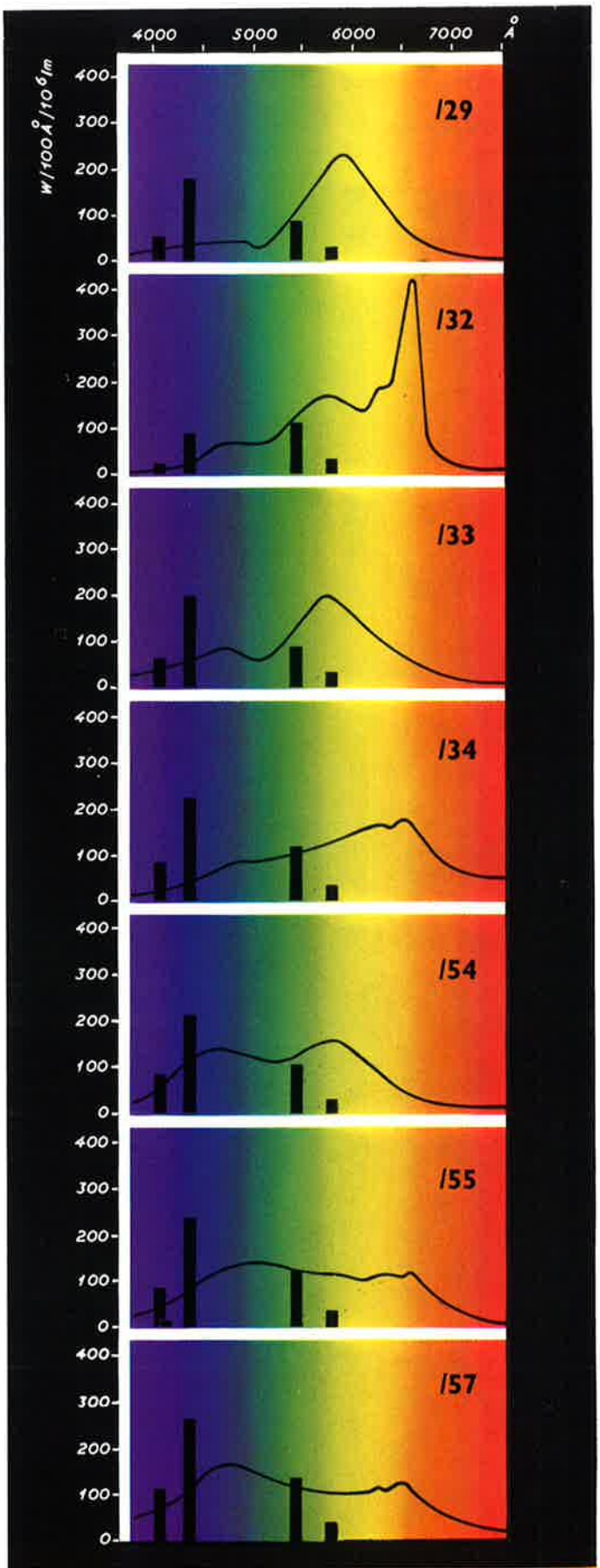
With or without starter (high-resistance electrodes)
"TL"A(F) Universal lamps

With or without starter (low-resistance electrodes)
"TL"/RS Rapid-start lamps
"TL"M(F)/RS "Double-Flux" lamps

Without starter (rapid-start) (low-resistance electrodes)
"TL"M(F)/RS Rapid-start lamps
"TL"(F)/RS "Double-Flux" lamps
"TL"EM/RS Circular rapid-start lamps

With inside ignition strip (instant-start)
"TL"R Instant-start lamps for d.c. operation
"TL"S Instant-start lamps for a.c. operation
"TL"X Instant-start lamps for a.c. operation (lamps for flameproof fittings)

Without ignition strip (instant-start)
Slimline lamps

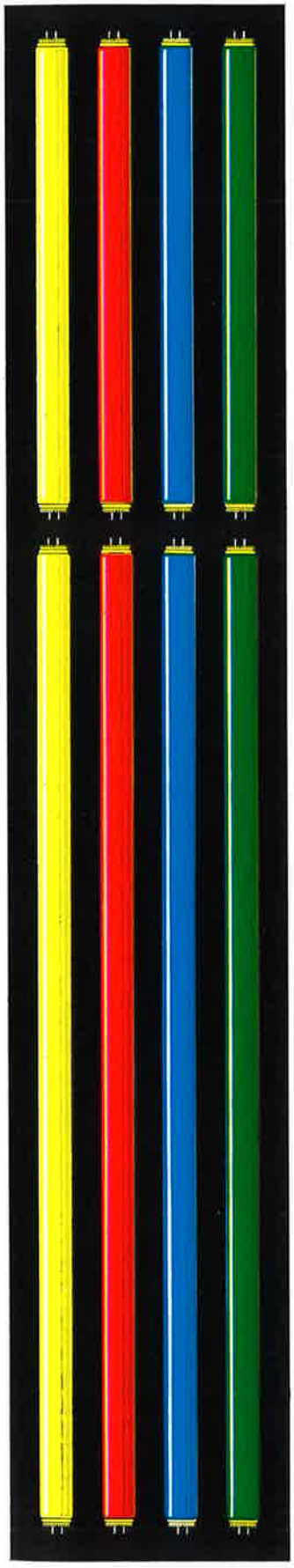


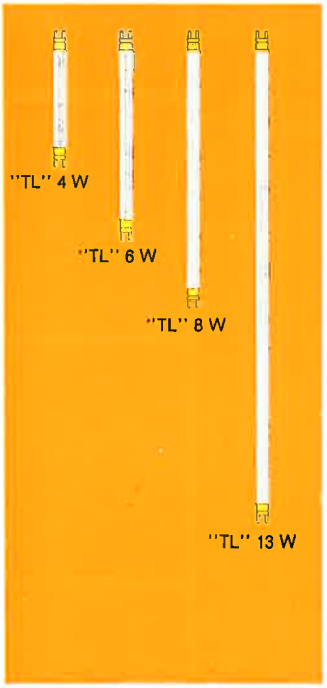
Spectral light distributions (in percentages)

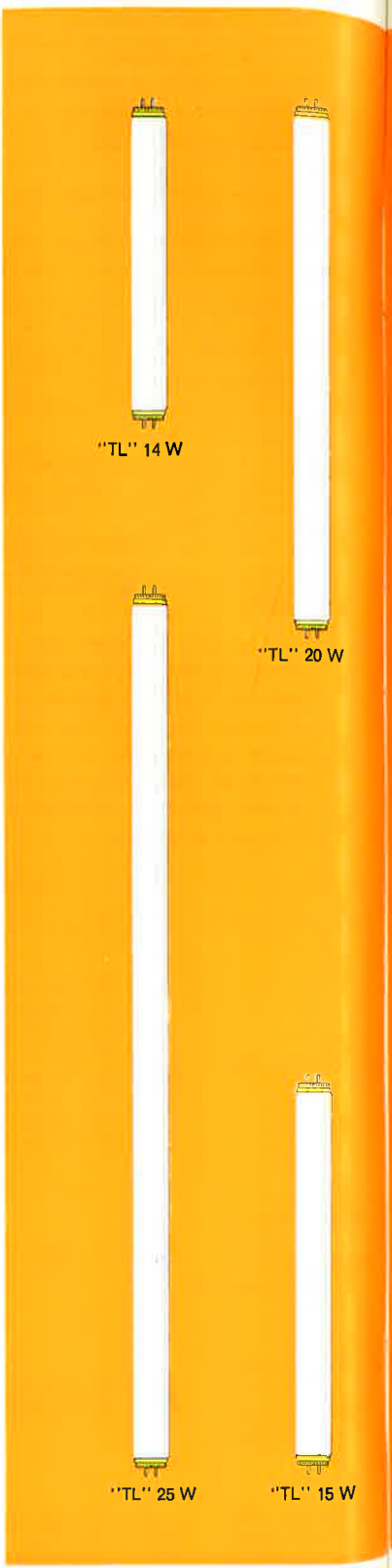
Lamp \ Colour	Far violet 3800-4200	Violet 4200-4400	Blue 4400-4600	Blue-green 4600-5100	Green 5100-5600	Yellow 5600-6100	Light-red 6100-6600	Dark-red 6600-7600
"TL"/29	0.006	0.25	0.14	2.23	27.3	59.2	10.7	0.21
"TL"/32	0.003	0.15	0.22	4.48	33.9	44.1	16.2	0.93
"TL"/33	0.010	0.28	0.33	4.97	38.4	49.9	7.94	0.17
"TL"/34	0.009	0.37	0.30	6.01	39.0	40.0	13.5	0.77
"TL"/54	0.018	0.44	0.65	8.66	41.6	41.7	6.58	0.16
"TL"/86	0.014	0.41	0.57	9.60	45.4	33.8	9.60	0.54
"TL"/57	0.020	0.48	0.73	10.51	45.4	32.9	9.41	0.53

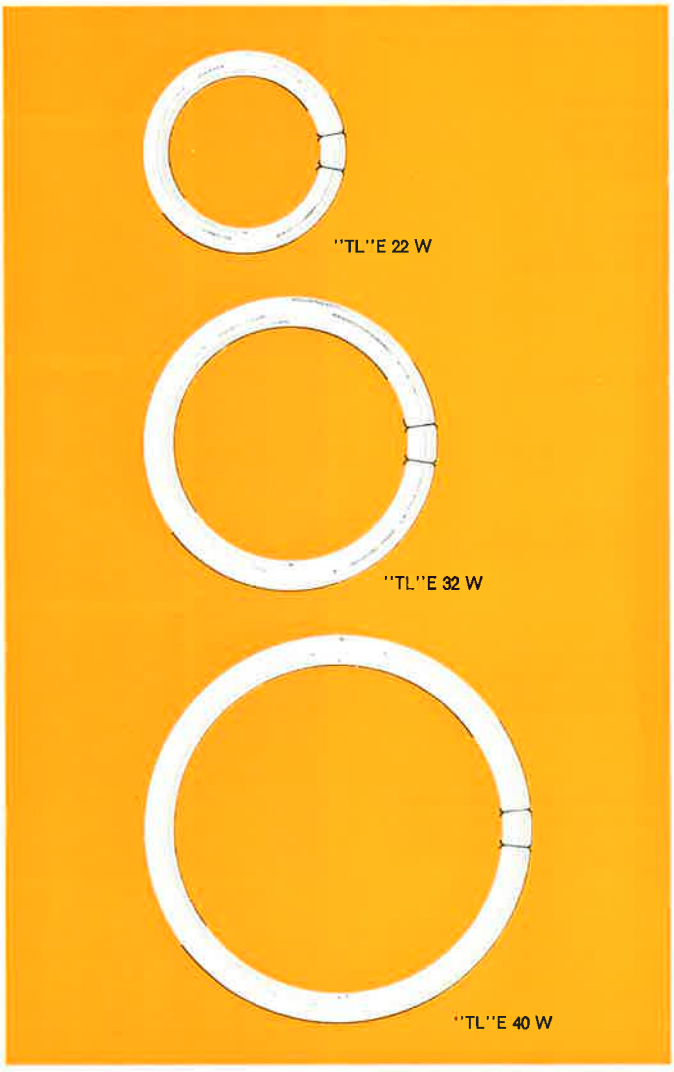
"TL" STANDARD RANGE

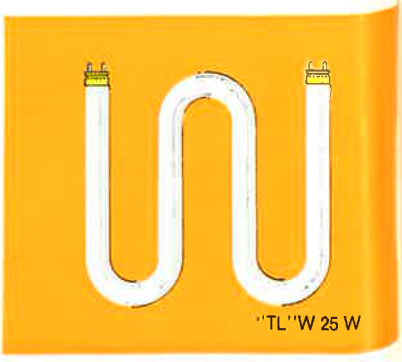
The lamps of the "TL" standard range are to be used on a.c. mains with ballasts, and starters which ensure preheating of the electrodes. The range comprises "TL" standard, "TL" miniature, "TL"D, "TL" coloured, "TL"E and "TL"W lamps.





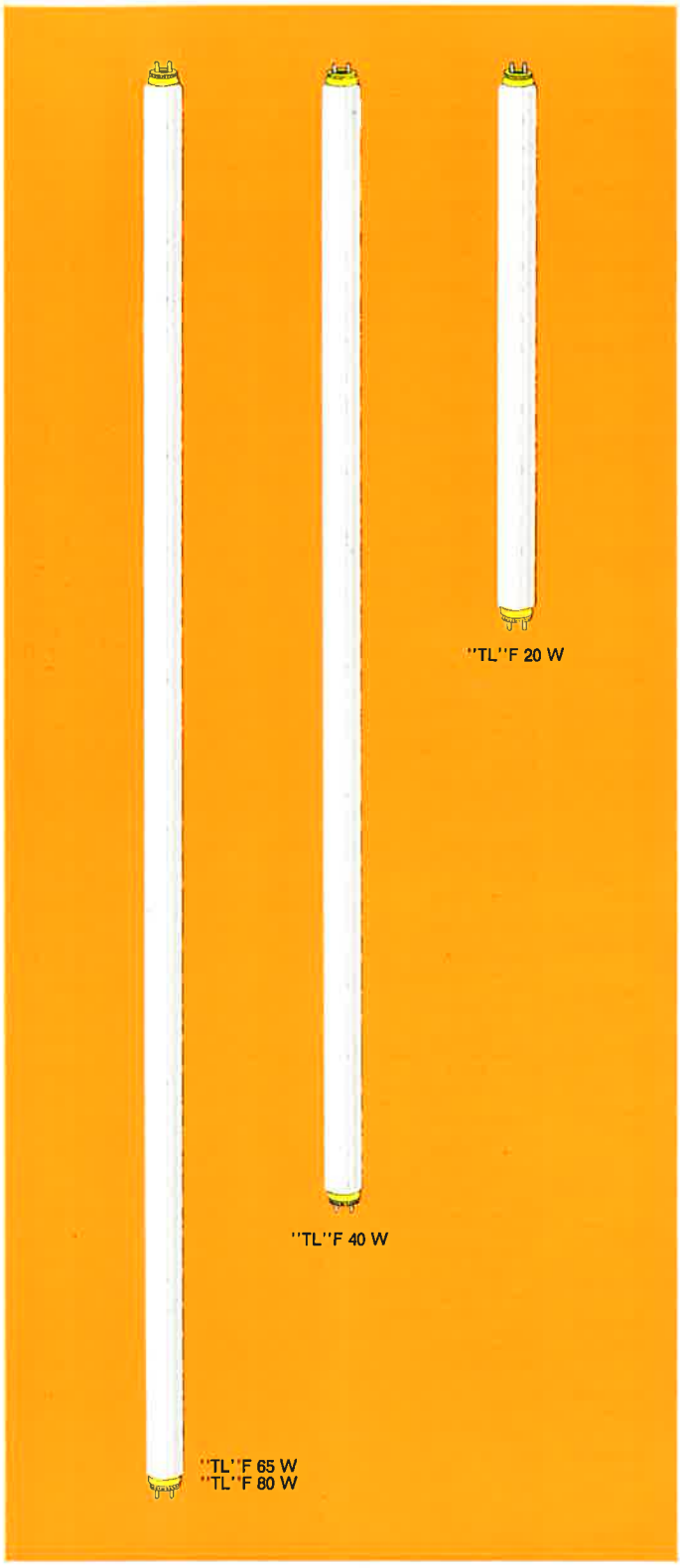






Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
"TL" 4 W	15 (6)	16 (5/8)	Miniature bipin	Warm white	110	0.6	"TL" 4 W/29
				White	100	0.55	"TL" 4 W/33
				White deluxe	70	0.4	"TL" 4 W/34
"TL" 6 W	23 (9)	16 (5/8)	Miniature bipin	Warm white	240	0.8	"TL" 6 W/29
				White	240	0.8	"TL" 6 W/33
				White deluxe	170	0.6	"TL" 6 W/34
				Daylight [3]	170	0.6	"TL" 6 W/55
"TL" 8 W	30 (12)	16 (5/8)	Miniature bipin	Warm white	400	1.0	"TL" 8 W/29
				White	390	1.0	"TL" 8 W/33
				White deluxe	270	0.7	"TL" 8 W/34
				Daylight [3]	270	0.7	"TL" 8 W/55
"TL" 13 W	53 (21)	16 (5/8)	Miniature bipin	Warm white	760	1.0	"TL" 13 W/29
				White	760	1.0	"TL" 13 W/33
				White deluxe	540	0.7	"TL" 13 W/34
				Daylight [3]	540	0.7	"TL" 13 W/55
"TL"D 15 W	46 (18)	26 (1)	Standard bipin	Warm white	880	0.85	"TL"D 15 W/29
				Warm white deluxe	570	0.55	"TL"D 15 W/32
				White	860	0.85	"TL"D 15 W/33
				White deluxe	580	0.55	"TL"D 15 W/34
				Daylight [3]	580	0.55	"TL"D 15 W/55
				Cool daylight	700	0.7	"TL"D 15 W/54
"TL"D 30 W	92 (36)	26 (1)	Standard bipin	Warm white	2080	1.0	"TL"D 30 W/29
				Warm white deluxe	1350	0.6	"TL"D 30 W/32
				White	2050	1.0	"TL"D 30 W/33
				White deluxe	1400	0.6	"TL"D 30 W/34
				Daylight [3]	1400	0.6	"TL"D 30 W/55
				Cool daylight	1700	0.8	"TL"D 30 W/54
"TL" 14 W	38 (15)	38 (1½)	Standard bipin	Warm white	610	0.5	"TL" 14 W/29
				White	610	0.5	"TL" 14 W/33
				White deluxe	410	0.3	"TL" 14 W/34
				Daylight [3]	410	0.3	"TL" 14 W/55
				Cool daylight	500	0.4	"TL" 14 W/54
"TL" 15 W	46 (18)	38 (1½)	Standard bipin	Warm white	800	0.5	"TL" 15 W/29
				Warm white deluxe	530	0.35	"TL" 15 W/32
				White	800	0.5	"TL" 15 W/33
				White deluxe	550	0.35	"TL" 15 W/34
				Daylight [3]	550	0.35	"TL" 15 W/55
				Cool daylight	660	0.4	"TL" 15 W/54
"TL" 20 W	61 (24)	38 (1½)	Standard bipin	Warm white	1150	0.65	"TL" 20 W/29
				Warm white deluxe	750	0.4	"TL" 20 W/32
				White	1100	0.65	"TL" 20 W/33
				White deluxe	750	0.4	"TL" 20 W/34
				Daylight [3]	750	0.4	"TL" 20 W/55
				Cool daylight	900	0.5	"TL" 20 W/54
"TL" 25 W	100 (39)	38 (1½)	Standard bipin	Warm white	1700	0.5	"TL" 25 W/29
				Warm white deluxe	1130	0.35	"TL" 25 W/32
				White	1700	0.5	"TL" 25 W/33
				White deluxe	1150	0.35	"TL" 25 W/34
				Daylight [3]	1150	0.35	"TL" 25 W/55
				Cool daylight	1400	0.4	"TL" 25 W/54
"TL" 40 W [4]	122 (48)	38 (1½)	Standard bipin	Warm white	3000	0.7	"TL" 40 W/29
				Warm white deluxe	1950	0.45	"TL" 40 W/32
				White	3000	0.7	"TL" 40 W/33
				White deluxe	2000	0.45	"TL" 40 W/34
				Daylight [3]	2000	0.45	"TL" 40 W/55
				Cool daylight	2400	0.55	"TL" 40 W/54
				Daylight 7400 °K	1700	0.4	"TL" 40 W/57
"TL" 65 W	152 (60)	38 (1½)	Standard bipin	Warm white	4900	0.9	"TL" 65 W/29
				Warm white deluxe	3200	0.6	"TL" 65 W/32
				White	4850	0.9	"TL" 65 W/33
				White deluxe	3300	0.6	"TL" 65 W/34
				Daylight [3]	3300	0.6	"TL" 65 W/55
"TL" 80 W	152 (60)	38 (1½)	Standard bipin	Warm white	5300	0.95	"TL" 80 W/29
				Warm white deluxe	3450	0.65	"TL" 80 W/32
				White	5200	0.95	"TL" 80 W/33
				White deluxe	3500	0.65	"TL" 80 W/34
				Daylight [3]	3500	0.65	"TL" 80 W/55
"TL"D 15 W coloured	46 (18)	26 (1)	Standard bipin	Green	1000	—	"TL"D 15 W/14
"TL" 20 W coloured	61 (24)	38 (1½)	Standard bipin	Red	60	—	"TL" 20 W/15
				Yellow	800	—	"TL" 20 W/16
				Green	1300	—	"TL" 20 W/17
				Blue	250	—	"TL" 20 W/18
"TL" 40 W coloured	122 (48)	38 (1½)	Standard bipin	Red	160	—	"TL" 40 W/15
				Yellow	2000	—	"TL" 40 W/16
				Green	3300	—	"TL" 40 W/17
				Blue	650	—	"TL" 40 W/18
"TL"E 22 W	21.5 [5] (8)	28 (1⅛)	Four-pin	Warm white	1100	0.7	"TL"E 22 W/29
				White	1100	0.7	"TL"E 22 W/33
				White deluxe	750	0.45	"TL"E 22 W/34
				Daylight [3]	750	0.45	"TL"E 22 W/55
				Cool daylight	900	0.6	"TL"E 22 W/54
"TL"E 32 W	31 [5] (12)	32 (1¼)	Four-pin	Warm white	1850	0.75	"TL"E 32 W/29
				Warm white deluxe	1250	0.5	"TL"E 32 W/32
				White	1850	0.75	"TL"E 32 W/33
				White deluxe	1300	0.55	"TL"E 32 W/34
				Daylight [3]	1300	0.55	"TL"E 32 W/55
				Cool daylight	1530	0.6	"TL"E 32 W/54
"TL"E 40 W	41 [5] (16)	32 (1¼)	Four-pin	Warm white	2640	0.75	"TL"E 40 W/29
				Warm white deluxe	1800	0.5	"TL"E 40 W/32
				White	2640	0.75	"TL"E 40 W/33
				White deluxe	1850	0.5	"TL"E 40 W/34
				Daylight [3]	1850	0.5	"TL"E 40 W/55
				Cool daylight	2170	0.6	"TL"E 40 W/54
"TL"W 25 W	—	27 (1 1/16)	Standard bipin	White deluxe	1150	0.4	"TL"W 25 W/34

1) Inclusive of lampholders.
2) After 100 burning hours.
3) Colour matching.
4) For low ambient temperature ignition (—20 °C): cat. no. "TL"B 40 W/. .; this lamp also reaches its rated light output at +27 °C ambient temperature. Therefore at low ambient temperatures these lamps have to be employed in enclosed fittings.
5) Outer diameter of circle.

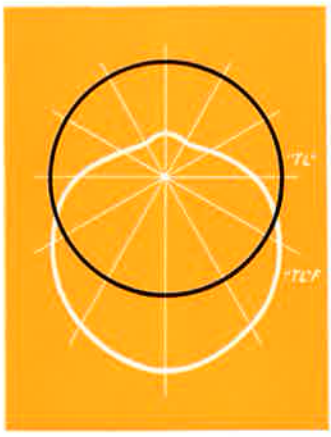


"TL"F REFLECTOR FLUORESCENT LAMPS

One of the main causes of light depreciation with "TL" fluorescent lamps is the deposit of dust on top of the lamp in course of time, even when they are protected by reflectors. However, the presence of dust on a fluorescent lamp, the light rays of which are mainly directed downwards, causes practically no trouble. Philips have such a lamp in their programme, denominated "TL"F lamp.

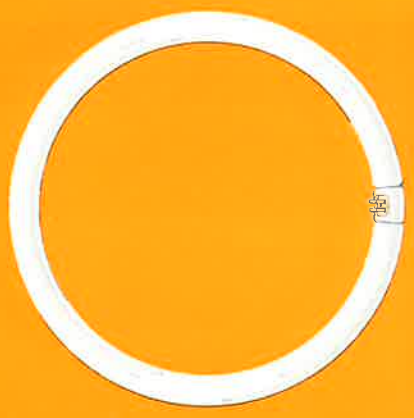
The "TL"F fluorescent lamp is provided with a reflecting powder coating. This coating covers about 2/3 of the circumference and is found between the layer of fluorescent powder and the glass wall. The reflecting layer reflects light that would normally be emitted upwards. In this way the majority of the luminous flux passes through the single-coated portion of the lamp. Consequently, in the direction of this part the luminous intensity is considerably higher than that of a normal "TL" lamp, whereas in the direction of the coating the intensity is considerably reduced. The luminous intensity in the downward direction is approximately 70 % greater than that of non-reflector lamps. Thus, the presence of dust on a reflector fluorescent lamp so mounted that the light rays are mainly directed downwards, causes practically no trouble. For practical use this means that the illumination level obtained with "TL"F lamps will remain considerably higher than that obtained with normal "TL" lamps. The "TL"F lamp is the ideal light source for dusty rooms, such as workshops, and it has advantages in offices also.

Light distribution of a "TL"F lamp in comparison with a normal "TL" lamp.



Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm² [3]	Catalogue number
"TL"F 20 W	61 (24)	38 (1½)	Standard bipin	Warm white	980	1.1 /02	"TL"F 20 W/29
				White	980	1.1 /02	"TL"F 20 W/33
				White deluxe	640	0.75/0.15	"TL"F 20 W/34
				Daylight [4]	640	0.75/0.15	"TL"F 20 W/55
"TL"F 40 W	122 (48)	38 (1½)	Standard bipin	Warm white	2520	1.4/0.37	"TL"F 40 W/29
				White	2520	1.4/0.37	"TL"F 40 W/33
				White deluxe	1700	1.0/0.2	"TL"F 40 W/34
				Daylight [4]	1700	1.0/0.2	"TL"F 40 W/55
"TL"F 65 W	152 (60)	38 (1½)	Standard bipin	Warm white	4200	2.0/0.4	"TL"F 65 W/29
				White	4200	2.0/0.4	"TL"F 65 W/33
				White deluxe	2850	1.3/0.25	"TL"F 65 W/34
				Daylight [4]	2850	1.3/0.25	"TL"F 65 W/55
"TL"F 80 W	152 (60)	38 (1½)	Standard bipin	Warm whIte	4550	2.1/0.4	"TL"F 80 W/29
				White	4550	2.1/0.4	"TL"F 80 W/33
				Daylight [4]	3100	1.4/0.3	"TL"F 80 W/55

[1] Inclusive of lampholders. [2] After 100 burning hours. [3] Appr. luminance values of the window and reflecting side of the lamp. [4] Colour matching.



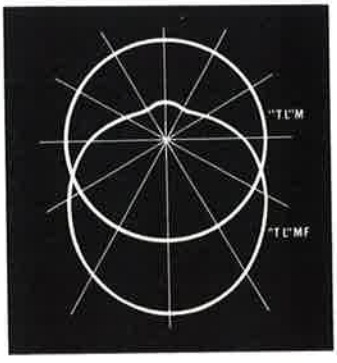
"TL"EM 40 W RS

"TL"M 20 W RS "TL"M 65 W RS
"TL"M 40 W RS

"TL"M/RS RAPID-START FLUORESCENT LAMPS

"TL"M/RS rapid-start fluorescent lamps are provided with an external ignition strip, connected to one of the electrodes via a high-omic resistor, which enables starterless operation. To ensure prompt ignition also in damp surroundings, the lamp is provided with a silicon coating. - When used with the corresponding ballast, the "TL"M/RS lamp offers the following important advantages: almost instant starting, no limiting installation requirements, and finally: ignition independent of atmospheric conditions.

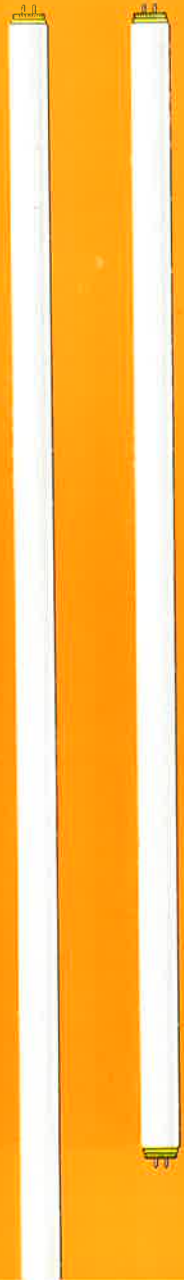
Light distribution of the "TL"MF lamp in comparison with the normal "TL"M lamp.



"TL"MF/RS RAPID-START REFLECTOR FLUORESCENT LAMPS

The "TL"MF/RS reflector fluorescent lamps combine the electrical properties of the "TL"M/RS lamp with the lighting properties of the "TL"F lamp. This means that "TL"MF/RS lamps ignite rapidly, without the use of a starter, and that they have a very favourable light distribution, thanks to the internal reflecting powder coating. Consequently, this lamp constitutes a useful light source for dusty rooms.

"TL"MF 65 W RS "TL"MF 40 W RS



Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
"TL"M 20 W RS	61 (24)	38 (1½)	Standard bipin	Warm white	1050	0.5	"TL"M 20 W/29 RS
				Warm white deluxe	700	0.35	"TL"M 20 W/32 RS
				White	1050	0.5	"TL"M 20 W/33 RS
				White deluxe	720	0.35	"TL"M 20 W/34 RS
				Daylight [3]	720	0.35	"TL"M 20 W/55 RS
"TL"M 40 W RS	122 (48)	38 (1½)	Standard bipin	Warm white	2800	0.65	"TL"M 40 W/29 RS
				Warm white deluxe	1860	0.4	"TL"M 40 W/32 RS
				White	2800	0.65	"TL"M 40 W/33 RS
				White deluxe	1900	0.4	"TL"M 40 W/34 RS
				Daylight [3]	1900	0.4	"TL"M 40 W/55 RS
				Cool daylight	2250	0.5	"TL"M 40 W/54 RS
"TL"M 65 W RS	152 (60)	38 (1½)	Standard bipin	Warm white	4600	0.85	"TL"M 65 W/29 RS
				Warm white deluxe	3000	0.55	"TL"M 65 W/32 RS
				White	4550	0.85	"TL"M 65 W/33 RS
				White deluxe	3100	0.55	"TL"M 65 W/34 RS
				Daylight [3]	3100	0.55	"TL"M 65 W/55 RS
"TL"EM 40 W RS	41 [5] (16)	32 (1¼)	Four-pin	Warm white	2520	0.75	"TL"EM 40 W/29 RS
				Warm white deluxe	1700	0.5	"TL"EM 40 W/32 RS
				White	2520	0.75	"TL"EM 40 W/33 RS
				White deluxe	1750	0.5	"TL"EM 40 W/34 RS
				Daylight [3]	1750	0.5	"TL"EM 40 W/55 RS
"TL"MF 40 W RS	122 (48)	38 (1½)	Standard bipin	Warm white	2400	1.5/0.3 [4]	"TL"MF 40 W/29 RS
				White	2400	1.5/0.3 [4]	"TL"MF 40 W/33 RS
				Daylight [3]	1700	1.0/0.2 [4]	"TL"MF 40 W/55 RS
"TL"MF 65 W RS	152 (60)	38 (1½)	Standard bipin	Warm white	4100	1.8/0.35 [4]	"TL"MF 65 W/29 RS
				White	4100	1.8/0.35 [4]	"TL"MF 65 W/33 RS

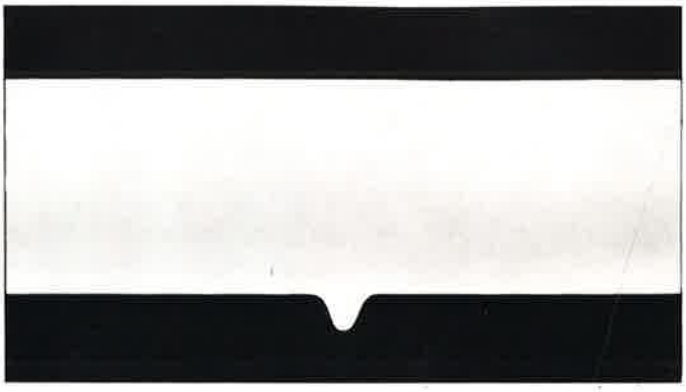
1) Inclusive of lampholders.
2) After 100 burning hours.
3) Colour matching.
4) Approx. luminance values of the window and reflecting side of the lamp.
5) Outer diameter of circle.

"TL"M 120 W RS

"TL" 180 W RS

"TL"(M)/RS "DOUBLE-FLUX" FLUORESCENT LAMPS

Normally the luminous flux of fluorescent lamps can only be raised by increasing the wattage, which can only be done if the lamp is made longer accordingly. A normal 4 ft "TL" 40 W/33 lamp, for instance, produces 3000 lm, i.e. 750 lm/ft. Now, based on the length of the next type of lamp, viz. the 5 ft 65 W, Philips developed a lamp of much higher wattage, viz. 120 W, which has a luminous flux of 7300 lm in colour /33, or 1460 lm/ft. This means that the luminous flux per unit of length is twice as much as was previously possible, hence the name "Double-Flux". Besides this 5 ft 120 W type, an 8 ft 180 W lamp is available.



Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
"TL"M 120 W RS	152 (60)	35 (1⅜)	Standard bipin	White	7300	1.3	"TL"M 120 W/33 RS
				Daylight [3]	5500	1.0	"TL"M 120 W/55 RS
"TL" 180 W RS	244 (96)	35 (1⅜)	Recessed double-contact	White	12600	1.4	"TL" 180 W/33 RS

[1]) Inclusive of lampholders. [2]) After 100 burning hours. [3]) Colour matching.

The pressure-control dome is responsible for the optimum conversion of energy into light. Burning position: horizontal, with dome downwards; further information on request.

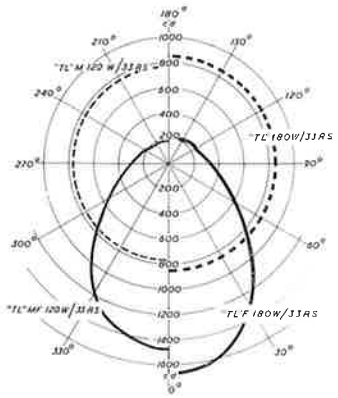
"TL"MF 120 W RS

"TL"F 180 W RS

"TL"(M)F/RS "DOUBLE-FLUX" FLUORESCENT LAMPS

The "TL"(M)/RS "Double-Flux" lamps are also available with a reflecting powder layer, as described with the "TL"F lamps (page 74). These lamps, designated "TL"(M)F/RS, combine the advantages of the "Double-Flux" lamps (a high luminous flux per unit of length) with those of the "TL"F lamps (the luminous flux in the downward direction is approximately 70 % greater than that of non-reflector lamps). "TL"(M)F/RS "Double-Flux" lamps are, therefore, the ideal solution for dusty rooms, and their application has advantages in offices also.

LIGHT DISTRIBUTION OF "TL"(M)F RS/33 LAMPS IN COMPARISON WITH "TL"(M) RS/33 LAMPS.



Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm² [3]	Catalogue number
"TL"MF 120 W RS	152 (60)	35 (1⅜)	Standard bipin	White	6500	2.7/0.5	"TL"MF 120 W/33 RS
"TL"F 180 W RS	244 (96)	35 (1⅜)	Recessed double-contact	White	11000	3.0/0.55	"TL"F 180 W/33 RS

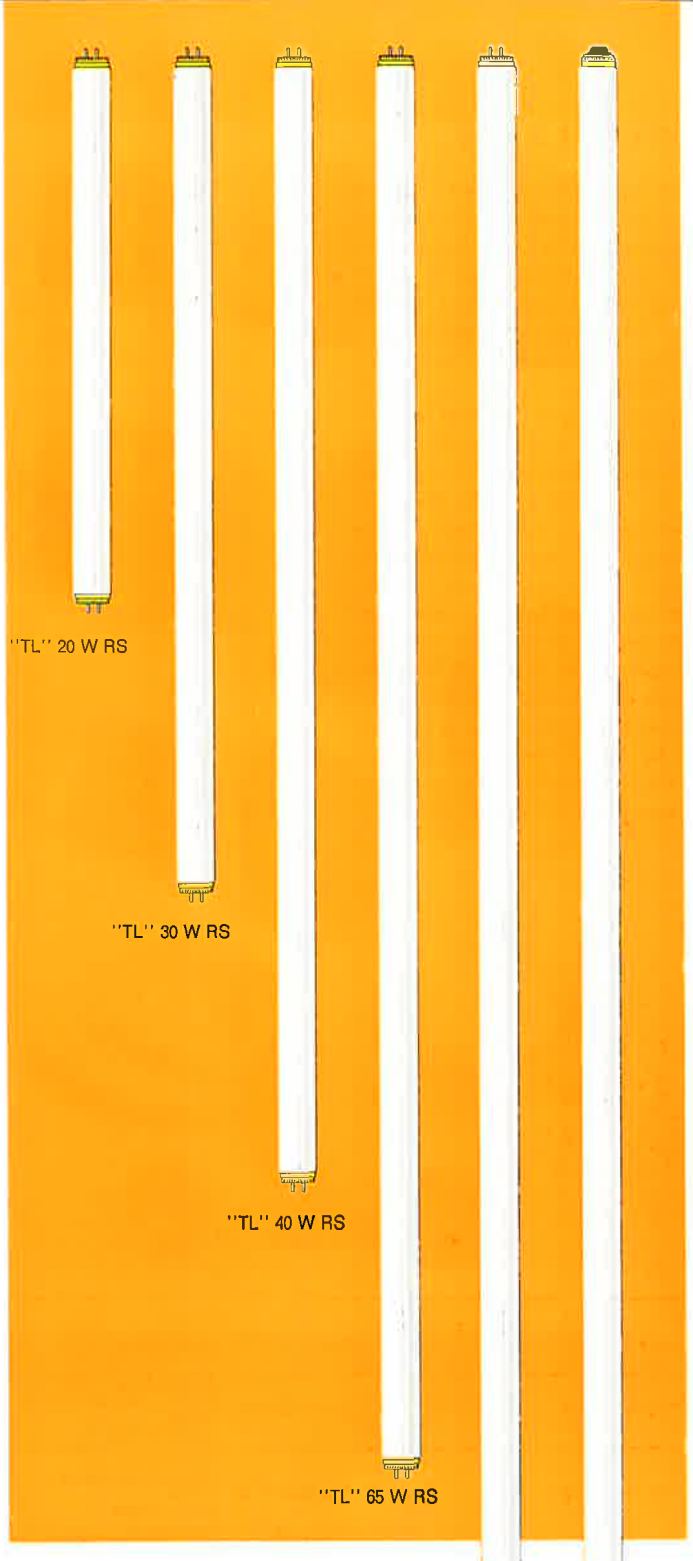
[1]) Inclusive of lampholders. [2]) After 100 burning hours.
[3]) Approx. luminance values of the window and reflecting side of the lamp.

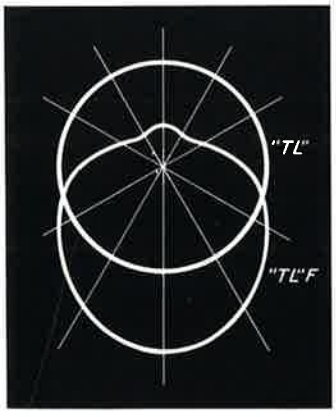

SOLA


PHILIPS

"TL"(F)/RS RAPID-START LAMPS

The fluorescent lamps of the "TL"/RS type are operated on rapid-start ballasts of various design. The lamps up to 65 W (shorter types) can also be used on circuits with starter switch.
When the lamps are operated on rapid-start gear, it is essential to mount them within a distance of 2 cm from an earthed metal reflector, channel or metal strip. The latter should be at least 4 cm wide and be mounted parallel to the lamp over its full length.
The tubes are silicon-coated in order to eliminate any adverse influence of humidity on the striking voltage of the lamps.
The 105 W type of the "TL"/RS lamps is also available with internal reflecting layer. As said before, this lamp "TL"F/RS can best be applied in dusty surroundings.





Light distribution of a "TL"F/RS lamp in comparison with a "TL"/RS lamp.

Type		Tube length 1) cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux 2) lm	Luminance cd/cm²	Catalogue number
"TL"	20 W RS	61 (24)	38 (1½)	Standard bipin	White	1100	0.65	"TL" 20 W/33 RS
"TL"	30 W RS	92 (36)	38 (1½)	Standard bipin	White	2000	0.65	"TL" 30 W/33 RS
					Daylight 3)	1300	0.45	"TL" 30 W/55 RS
					Cool daylight	1600	0.55	"TL" 30 W/54 RS
"TL"	40 W RS	122 (48)	38 (1½)	Standard bipin	Warm white	2850	0.65	"TL" 40 W/29 RS
					White	2850	0.65	"TL" 40 W/33 RS
					Daylight 3)	2000	0.45	"TL" 40 W/55 RS
					Cool daylight	2300	0.55	"TL" 40 W/54 RS
"TL"	65 W RS	152 (60)	38 (1½)	Standard bipin	Warm white	4900	0.9	"TL" 65 W/29 RS
					Warm white deluxe	3200	0.6	"TL" 65 W/32 RS
					White	4850	0.9	"TL" 65 W/33 RS
					White deluxe	3300	0.6	"TL" 65 W/34 RS
					Daylight 3)	3300	0.6	"TL" 65 W/55 RS
"TL"	85 W RS	244 (96)	38 (1½)	Standard bipin	White	7000	0.8	"TL" 85 W/33 RS
"TL"	105 W RS	244 (96)	38 (1½)	Recessed double-contact	Warm white	8100	0.85	"TL" 105 W/29 RS
					White	7900	0.85	"TL" 105 W/33 RS
					White deluxe	5400	0.55	"TL" 105 W/34 RS
"TL"F	105 W RS	244 (96)	38 (1½)	Recessed double-contact	Warm white	7100	1.9/0.4 4)	"TL"F 105 W/29 RS
					White	7000	1.9/0.4 4)	"TL"F 105 W/33 RS

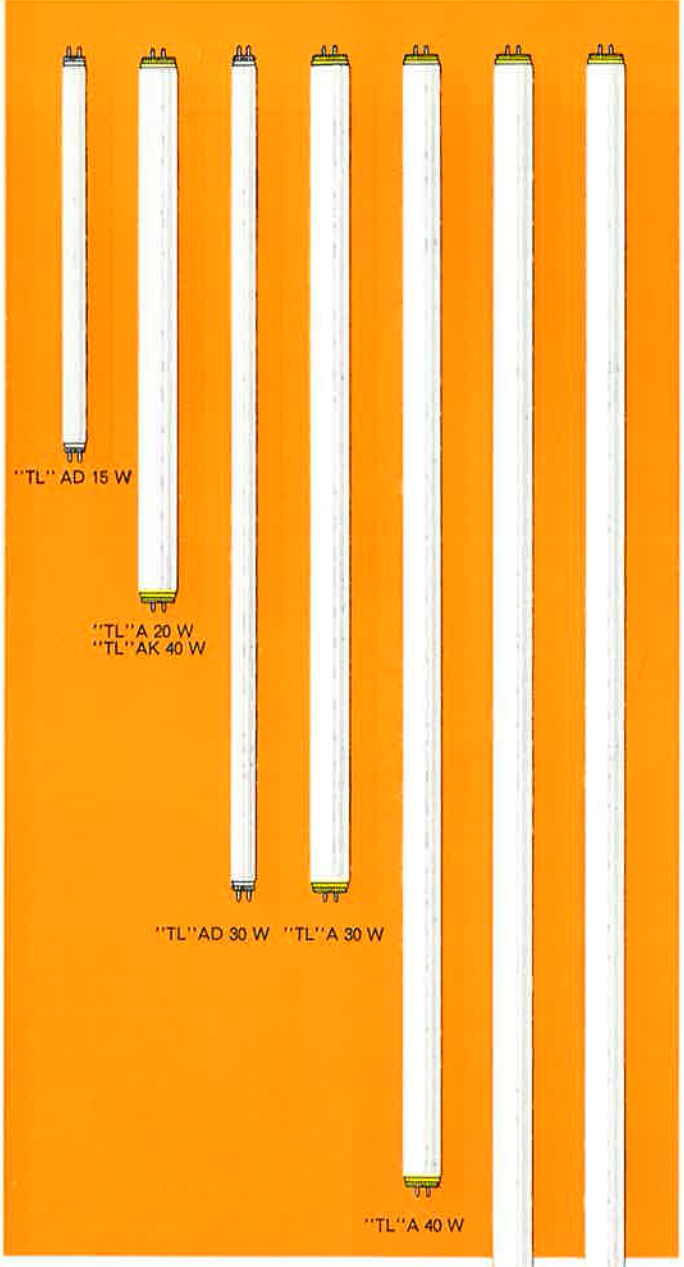
1) Inclusive of lampholders. 2) After 100 burning hours. 3) Colour matching.
4) Approx. luminance values of the window and reflecting side of the lamp.

"TL" 85 W RS

"TL"(F) 105 W RS

"TL"A LAMPS

Philips have designed a series of fluorescent lamps meant for application in Great Britain and a few other countries in which the British instant-start system is sufficiently widespread.
These so-called "universal" lamps are suitable for either switch-start or instant-start ballasts as made according to British specifications for instant-start preheat ballasts. They are designated "TL"A lamps. "TL"A lamps are not interchangeable with rapid-start lamps of the same rating because their electrodes are of the high-resistance type. The 15 W and 30 W lamps are only available in the small diameter version and are called "TL"AD. - The 40 W-type can also be supplied in a short version, the 2 ft "TL"AK 40 W.

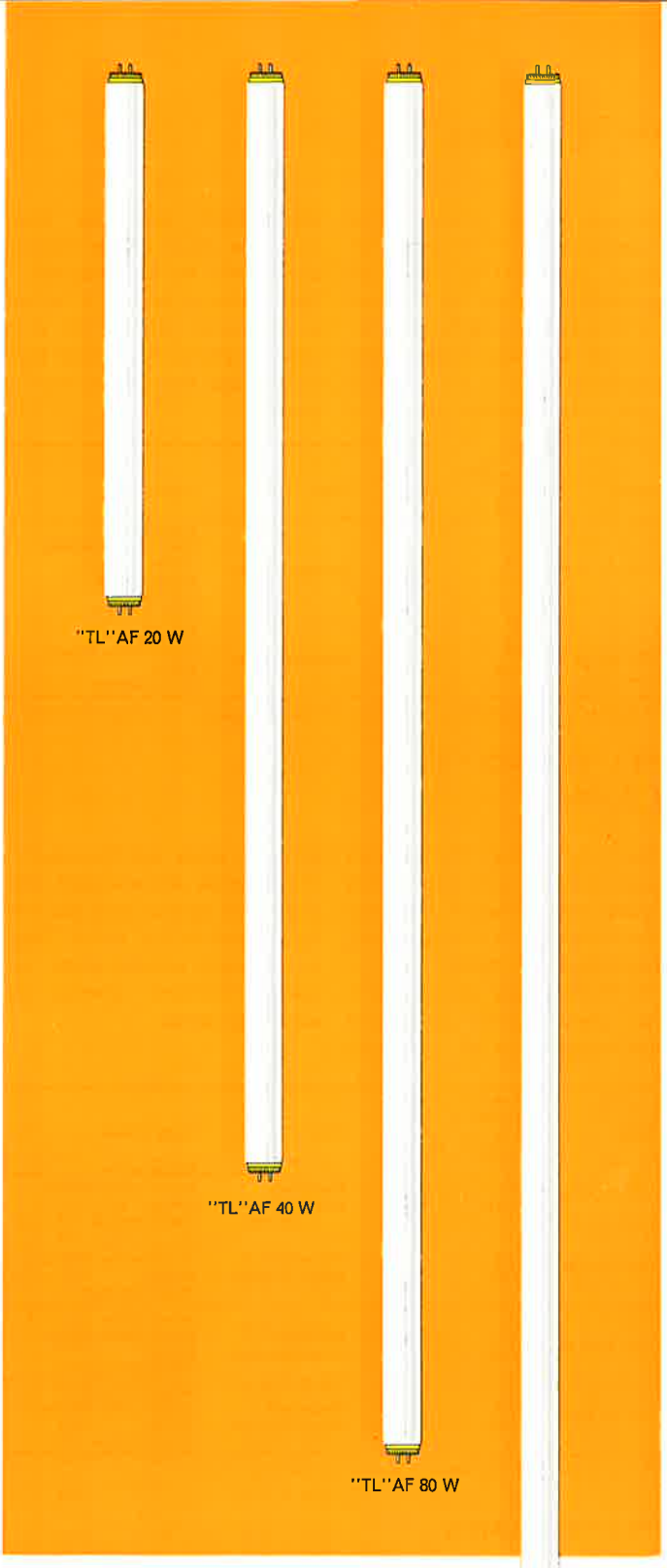


Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
"TL"AD 15 W	46 (18)	26 (1)	Standard bipin	Warm white	800	0.85	"TL"AD 15 W/29
				Warm white deluxe	530	0.55	"TL"AD 15 W/32
				White	800	0.85	"TL"AD 15 W/33
				White deluxe	540	0.55	"TL"AD 15 W/34
"TL"A 20 W [4]	61 (24)	38 (1½)	Standard bipin	Warm white	1040	0.65	"TL"A 20 W/29
				Warm white deluxe	690	0.4	"TL"A 20 W/32
				White	1040	0.65	"TL"A 20 W/33
				White deluxe	710	0.4	"TL"A 20 W/34
				Daylight [3]	710	0.4	"TL"A 20 W/55
"TL"AD 30 W	92 (36)	26 (1)	Standard bipin	Warm white	1960	1.0	"TL"AD 30 W/29
				Warm white deluxe	1300	0.6	"TL"AD 30 W/32
				White	1960	1.0	"TL"AD 30 W/33
				White deluxe	1340	0.6	"TL"AD 30 W/34
"TL"A 30 W	92 (36)	38 (1½)	Standard bipin	Warm white	1900	0.7	"TL"A 30 W/29
				Warm white deluxe	1260	0.4	"TL"A 30 W/32
				White	1900	0.7	"TL"A 30 W/33
				White deluxe	1300	0.4	"TL"A 30 W/34
"TL"A 40 W	122 (48)	38 (1½)	Standard bipin	Warm white	2700	0.65	"TL"A 40 W/29
				Warm white deluxe	1790	0.45	"TL"A 40 W/32
				White	2700	0.65	"TL"A 40 W/33
				White deluxe	1870	0.4	"TL"A 40 W/34
				Daylight [3]	1870	0.4	"TL"A 40 W/55
"TL"AK 40 W	61 (24)	38 (1½)	Standard bipin	Warm white	1580	0.95	"TL"AK 40 W/29
				Warm white deluxe	1050	0.65	"TL"AK 40 W/32
				White	1580	0.95	"TL"AK 40 W/33
				White deluxe	1100	0.70	"TL"AK 40 W/34
"TL"A 80 W [5]	152 (60)	38 (1½)	Standard bipin	Warm white	4900	0.95	"TL"A 80 W/29
				Warm white deluxe	3210	0.65	"TL"A 80 W/32
				White	4850	0.95	"TL"A 80 W/33
				White deluxe	3300	0.65	"TL"A 80 W/34
				Daylight [3]	3300	0.65	"TL"A 80 W/55
"TL"A 125 W	244 (96)	38 (1½)	Standard bipin	Warm white	8800	0.95	"TL"A 125 W/29
				Warm white deluxe	5780	0.65	"TL"A 125 W/32
				White	8720	0.95	"TL"A 125 W/33

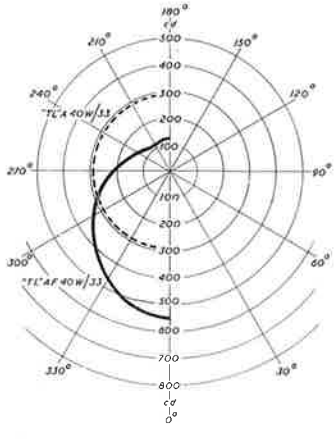
[1] Inclusive of lampholders. [2] After 100 burning hours. [3] Colour matching.
[4] The 20 W lamp is also available without stripe (silicon coated); cat. no. e.g.: "TL" 20 W/33 T. Luminous flux, etc. as for "TL" 20 W standard type (see page 73).
[5] The 80 W lamp is also available without stripe (silicon coated); cat. no. "TL" 80 W/. . For luminous flux, etc. see page 73.

"TL"AF LAMPS

The 20 W, 40 W, 80 W and 125 W versions of the "TL"A series are also supplied with internal reflecting layer, as described in connection with the "TL"F lamps (page 74). These lamps have, of course, the same electrical characteristics as the corresponding "TL"A lamps. The reflecting layer makes them pre-eminently suitable for surroundings where dust collection on the lamps is a problem.



LIGHT DISTRIBUTION OF "TL"AF 40 W/33 LAMPS IN COMPARISON WITH "TL"A 40 W/33 LAMPS



For other types multiply the values of the "TL"AF 40 W/33 lamp by the following factors:

Type	Factor	Max. candle power cd
"TL"AF 20 W	0.39	215
"TL"AF 80 W	1.72	946
"TL"AF 125 W	2.74	1507

For the other colours the max. candle power is proportional to the respective luminous flux.

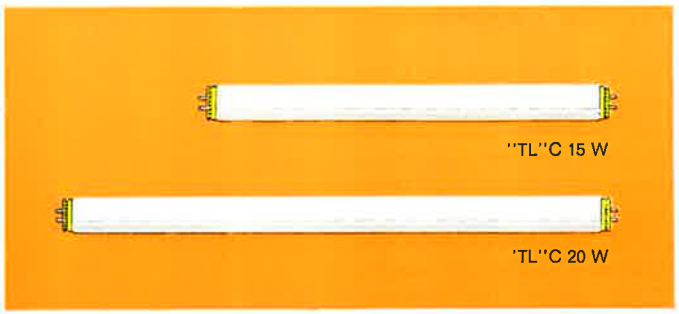
Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm² [3]	Catalogue number
"TL"AF 20 W [4]	61 (24)	38 (1½)	Standard bipin	Warm white	930	1.2/0.2	"TL"AF 20 W/29
				White	930	1.2/0.2	"TL"AF 20 W/33
"TL"AF 40 W	122 (48)	38 (1½)	Standard bipin	Warm white	2450	1.4/0.3	"TL"AF 40 W/29
				White	2450	1.4/0.3	"TL"AF 40 W/33
				Daylight [6]	1680	1.0/0.2	"TL"AF 40 W/55
"TL"AF 80 W [5]	152 (60)	38 (1½)	Standard bipin	Warm white	4400	2.1/0.4	"TL"AF 80 W/29
				White	4350	2.1/0.4	"TL"AF 80 W/33
				Daylight [6]	2950	1.4/0.3	"TL"AF 80 W/55
"TL"AF 125 W	244 (96)	38 (1½)	Standard bipin	Warm white	7700	2.1/0.4	"TL"AF 125 W/29
				White	7600	2.1/0.4	"TL"AF 125 W/33

1) Inclusive of lampholders.
2) After 100 burning hours.
3) Approx. luminance values of the window and reflecting side of the lamp.
4) The 20 W lamp is also available without stripe (silicon coated); cat. no. e.g.: "TL"F 20 W/33 T. Luminous flux, etc. as for "TL"F 20 W standard type (see page 74).
5) The 80 W lamp is also available without stripe (silicon coated); cat. no.: "TL"F 80 W/. . For luminous flux, etc. see page 74.
6) Colour matching.

"TL"AF 125 W

"TL"C LAMPS

For use on d.c. mains, Philips manufacture a 15 W and 20 W lamp, type "TL"C. Although primarily designed for d.c., the 15 W lamp can also be used on a.c. on the usual ballasts and starter circuits for the standard type. When operated on d.c., a twin-filament stabilizing tube takes the place of the ballast, and starters are not required. The stability of the "TL"C lamps is of special interest for d.c. vehicle lighting, where large battery-voltage fluctuations mostly occur.



Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
"TL"C 15 W	46 (18)	38 (1½)	Standard bipin	Warm white	800	0.5	"TL"C 15 W/29
				Warm white deluxe	530	0.35	"TL"C 15 W/32
				White	800	0.5	"TL"C 15 W/33
				White deluxe	550	0.35	"TL"C 15 W/34
				Daylight [3]	550	0.35	"TL"C 15 W 55
				Cool daylight	660	0.4	"TL"C 15 W/54
"TL"C 20 W	61 (24)	38 (1½)	Standard bipin	Warm white	1020	0.5	"TL"C 20 W/29
				Warm white deluxe	680	0.35	"TL"C 20 W/32
				White	1020	0.5	"TL"C 20 W/33
				White deluxe	680	0.35	"TL"C 20 W/34

[1] Inclusive of lampholders. [2] After 100 burning hours. [3] Colour matching.

"TL"R AND "TL"S LAMPS

The "TL"R and "TL"S fluorescent lamps are instant-start types, which means that they start immediately after switching on, without any flicker.
"TL"R lamps are provided with two inside ignition-strips and are designed for d.c. operation in trains, ships and tramcars.
"TL"S lamps are equipped with one inside ignition-strip and are to be used on a.c. mains. They are operated without starter on special ballasts, chokes or stabilizing lamps.

Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
"TL"R 20 W	61 (24)	38 (1½)	Recessed single-contact	Warm white	900	0.4	"TL"R 20 W/29
				Warm white deluxe	600	0.3	"TL"R 20 W/32
				White	900	0.4	"TL"R 20 W/33
				White deluxe	620	0.3	"TL"R 20 W/34
"TL"R 40 W	122 (48)	38 (1½)	Recessed single-contact	Warm white	2300	0.5	"TL"R 40 W/29
				Warm white deluxe	1550	0.35	"TL"R 40 W/32
				White	2300	0.5	"TL"R 40 W/33
				White deluxe	1700	0.4	"TL"R 40 W/34
"TL"S 20 W	61 (24)	38 (1½)	Recessed single-contact	Warm white	950	0.5	"TL"S 20 W/29
				Warm white deluxe	650	0.35	"TL"S 20 W/32
				White	950	0.5	"TL"S 20 W/33
				White deluxe	650	0.35	"TL"S 20 W/34
"TL"S 40 W	122 (48)	38 (1½)	Recessed single-contact	Warm white	2450	0.55	"TL"S 40 W/29
				Warm white deluxe	1600	0.4	"TL"S 40 W/32
				White	2450	0.55	"TL"S 40 W/33
				White deluxe	1650	0.4	"TL"S 40 W/34

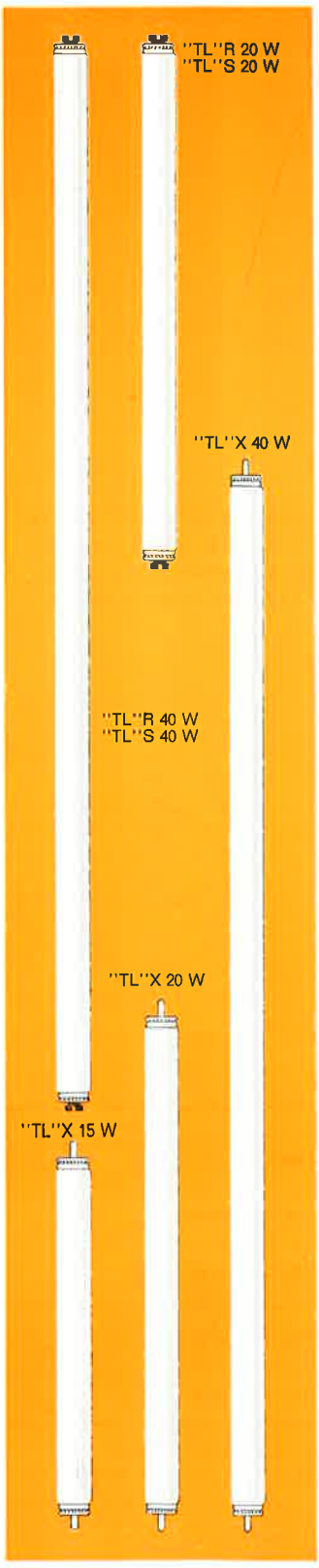
[1] Inclusive of lampholders. [2] After 100 burning hours.

"TL"X LAMPS

"TL"X lamps are identical with "TL"S lamps, but for the caps which have a nickeled single pin. This instant-start lamp type is to be applied in "flameproof" and "increased safety" fittings as designed in accordance with the German V.D.E. 170/171 and similar specifications. The flameproof lampholders are made by the specialised fitting-makers.
"TL"X lamps are operated from a ballast which provides the required starting voltage.

Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
"TL"X 15 W	46 (18)	38 (1½)	Single-pin	White	620	0.45	"TL"X 15 W/33
"TL"X 20 W	61 (24)	38 (1½)	Single-pin	Warm white	950	0.5	"TL"X 20 W/29
				Warm white deluxe	650	0.35	"TL"X 20 W/32
				White	950	0.5	"TL"X 20 W/33
"TL"X 40 W	122 (48)	38 (1½)	Single-pin	Warm white	2450	0.55	"TL"X 40 W/29
				White	2450	0.55	"TL"X 40 W/33
				Daylight [3]	1650	0.4	"TL"X 40 W/55

[1] Max. length inclusive of pins; length of pins 18.5 mm (¾ in) each. [2] After 100 burning hours. [3] Colour matching.

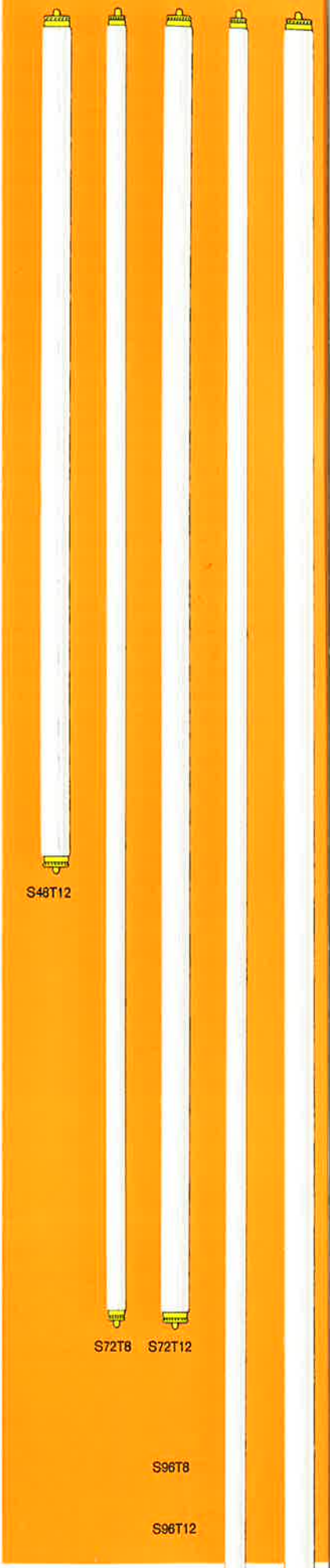


SLIMLINE LAMPS

Philips slimline fluorescent lamps are instant-start lamps with non-preheated cathodes. When used in combination with the right ballast, the lamp ignites immediately after switching on, without flicker. Slimline lamps have single-pin caps and are available in a wide choice of sizes, wattages and colours.
The most important characteristics are: coating with high-efficiency fluorescent powder for top luminous performance, reliable ignition down to 0 °F (—18 °C), long life and dependable service, invisible water-repellent coating for reliable operation under humid conditions.

Type	Tube length [1] cm (in)	Tube diam. mm (in)	Cap	Lamp Voltage V	Power absorbed W	Light colour	Nominal luminous flux [2] lm	Luminance cd/cm²	Catalogue number
S 48 T 12	122 (48)	38 (1½)	Single-pin	97	38	White	2550	0.65	S 48 T 12/33
						Daylight [3]	1800	0.5	S 48 T 12/55
						Cool daylight	2150	0.55	S 48 T 12/54
S 72 T 8	183 (72)	26 (1)	Single-pin	240	25	Warm white	1800	0.4	S 72 T 8/29
				210	36.5		2700	0.6	
				190	48		3500	0.8	
				240	25	White	1800	0.4	S 72 T 8/33
				210	36.5		2700	0.6	
				190	48		3450	0.8	
				240	25	White deluxe	1250	0.3	S 72 T 8/34
				210	36.5		1850	0.4	
				190	48		2350	0.5	
				240	25	Daylight [3]	1250	0.3	S 72 T 8/55
				210	36.5		1850	0.4	
				190	48		2350	0.5	
S 72 T 12	183 (72)	38 (1½)	Single-pin	145	55	Warm white	4200	0.65	S 72 T 12/29
						Warm white deluxe	2650	0.4	S 72 T 12/32
						White	4100	0.65	S 72 T 12/33
						White deluxe	2750	0.4	S 72 T 12/34
						Daylight [3]	2750	0.4	S 72 T 12/55
						Cool daylight	3350	0.5	S 72 T 12/54
S 96 T 8	244 (96)	26 (1)	Single-pin	320	33	Warm white	2800	0.45	S 96 T 8/29
				285	49		4200	0.7	
				255	64		5400	0.9	
				320	33	White	2800	0.45	S 96 T 8/33
				285	49		4150	0.7	
				255	64		5350	0.9	
				320	33	White deluxe	1900	0.3	S 96 T 8/34
				285	49		2800	0.45	
				255	64		3600	0.6	
				320	33	Daylight [3]	1900	0.3	S 96 T 8/55
				285	49		2800	0.45	
				255	64		3600	0.6	
				320	33	Cool daylight	2300	0.4	S 96 T 8/54
				285	49		3400	0.6	
				255	64		4400	0.75	
S 96 T 12	244 (96)	38 (1½)	Single-pin	190	74	Warm white	5750	0.7	S 96 T 12/29
						Warm white deluxe	3650	0.45	S 96 T 12/32
						White	5600	0.65	S 96 T 12/33
						White deluxe	3800	0.45	S 96 T 12/34
						Daylight [3]	3800	0.45	S 96 T 12/55
						Cool daylight	4600	0.55	S 96 T 12/54

[1] Inclusive of lampholders. [2] After 100 burning hours. [3] Colour matching.



BALLASTS FOR FLUORESCENT LAMPS

In each fluorescent lighting installation the ballasts form an invisible but essential part, being a decisive factor in the correct operation of the lamps.
The three most important functions a fluorescent lamp ballast must fulfil, are:

1. Preheating the lamp electrodes so as to start electron emission.
2. Providing a sufficiently high voltage to start the arc between the electrodes.
3. Stabilizing the lamp current and power to the values set for each type of lamp.

Apart from these fundamental requirements, a quality ballast should also comply with a number of demands which ensure smooth operation. Firstly the design of the ballast must be such as to keep its power loss as low as possible, resulting in a long operating-life. Furthermore, the dimensions and weight should be confined to the minimum, so as to promote economic fitting design. It is by no means easy to comply with these requirements, the more so as they interfere with each other. The Philips range of totally enclosed ballasts entirely fulfil the above conditions. The ballasts are filled with a specially compounded and processed polyester, which is a thermosetting material, i.e. it remains hard and thus cannot flow out. This material guarantees so high a dissipation of heat, that the dimensions of the ballast could be considerably reduced, whereas the temperature rise is kept well within the limits of the I.E.C./C.E.E. specifications. As the coil is now practically hermetically sealed, it is no longer exposed to atmospheric influences and ballast hum is virtually absent. Thus, Philips polyester ballasts not only amply meet the requirements, the materials and technique of manufacture endow, for practical purposes, unlimited life.

FEATURES

- Small dimensions
- Correct power supplied to the lamp, hence full lumen output
- Correct preheating conditions during starting, together with minimum distortion of lamp-current wave-form during operation, thus ensuring long lamp life
- Low working temperature due to cooling of polyester resin between coil and sheet-steel cannister
- Freedom from leakage: polyester cannot melt
- High reliability, combined with very long life; no maintenance
- Easy to mount: terminals, no loose wire ends
- Noiseless
- Reduced weight
- Compliance with all supply authority requirements; made in accordance with international specifications
- Wiring diagram clearly marked

BALLASTS FOR PREHEATED, SWITCHSTART OPERATED FLUORESCENT LAMPS

1. Low Power-Factor ballasts (LPF)

a. **Inductive ballast**
Single-lamp ballast consisting of choke or leakage autotransformer .....Example: Fig. A

b. **Capacitive ballast**
Single-lamp ballast consisting of choke and series capacitor. To be used alternately with inductive ballast to provide a high power-factor, anti-stroboscopic circuit (duo circuit) .....Example: Fig. B

2. High Power-Factor ballasts (HPF)

a. **Duo ballast (anti-stroboscopic)**
Twin-lamp ballast consisting of inductive and capacitive branches .....Example: Fig. C

b. **Single-lamp ballast**
This ballast consists of a choke coil (or leakage autotransformer) and a capacitor connected across the mains .....Example: Fig. D

3. Tandem circuit

4, 6, 8, 14, 15 and 20 W lamps can also be paired in series on one 220 V ballast of appropriate rating (or four on the corresponding duo ballasts) .....Example: Fig. E

BALLASTS FOR PREHEATED, STARTERLESS OPERATED FLUORESCENT LAMPS

1. Low Power-Factor ballasts (LPF)

a. **Inductive ballast (40 W)**
Single-lamp ballast consisting of leakage autotransformer with windings for parallel preheating of the electrodes .....Example: Fig. F

b. **Inductive ballast (20 W)**
Single-lamp ballast consisting of choke and preheating transformer .....Example: Fig. G

c. **Inductive ballast (2 x 20 W)**
Twin-lamp ballast consisting of choke and preheating transformer .....Example: Fig. H

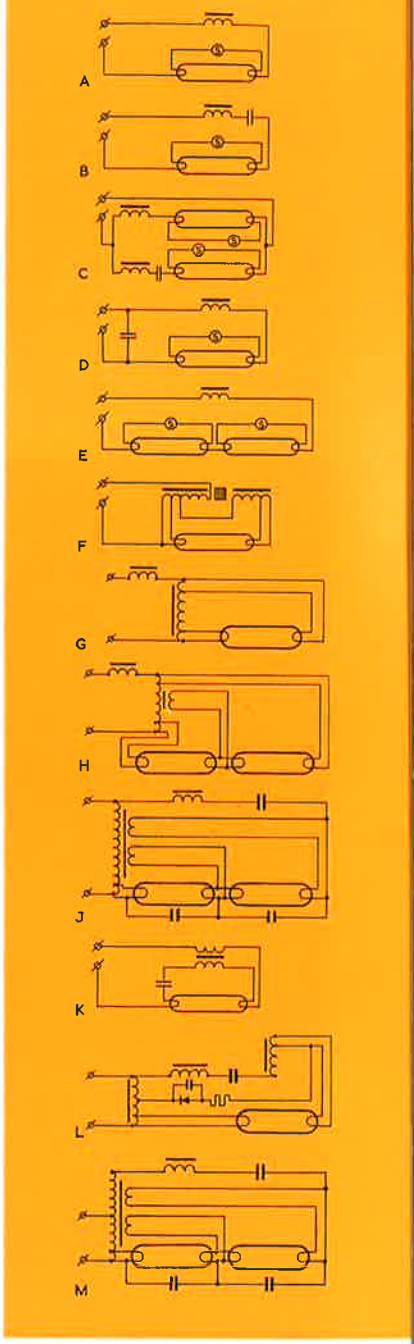
d. **Capacitive ballast (2 x 20 W)**
Twin-lamp ballast consisting of preheating transformer, a choke and series capacitor and two capacitors parallel to the lamps, for the ignition .....Example: Fig. J

2. High Power-Factor ballasts (HPF)

a. **Single-lamp ballast**
Semi-resonant ballast consisting of two partly-coupled choke coils and capacitor, with series preheating of the electrodes .....Example: Fig. K

b. **Single-lamp ballast (180 W)**
This ballast consists of a step-up transformer with preheating windings for the electrodes, a choke and series capacitor, and an ignition circuit .....Example: Fig. L

c. **Twin-lamp ballast (sequence start)**
This ballast consists of a step-up transformer with preheating windings for the electrodes, a choke and series capacitor and two capacitors parallel to the lamps, for the ignition .....Example: Fig. M



BALLAST SELECTION

HPF not stipulated: Inductive ballasts

HPF stipulated:

In single-lamp fittings:
a. Inductive and capacitive ballasts *) alternately
b. HPF single-lamp ballast
c. Inductive ballast with separate, parallel capacitor
Solution a. is cheapest and eliminates stroboscopic effects.

In twin-lamp fittings:
a. Duo ballast
b. Combination of inductive and capacitive ballast *)

In three-lamp fittings:
a. Duo + inductive ballast and duo + capacitive ballast *) alternately
b. Duo + HPF single-lamp ballast
c. 1 inductive + 2 capacitive ballasts *) and 1 capacitive *) + 2 inductive ballasts alternately

In four-lamp fittings:
a. 2 duo ballasts
b. 2 inductive and 2 capacitive ballasts *)

In fittings for 4, 6, 8, 14, 15 and 20 W lamps the number of ballasts required can be reduced by using the tandem circuit (see fig. E above).

*) Capacitive ballast or inductive ballast with separate series capacitor.

TECHNICAL AND ORDERING DATA OF 50 C/S BALLASTS*

Preheated, switchstart operation

LOW POWER-FACTOR (INDUCTIVE)

Type and number of lamps		Nom. voltage V [1]	Catalogue number	Mains current A		Power factor	Losses W	Wiring diagram fig.	Dimensions		Starter type [2]
				During ignition	During operation				Case type	Length A mm	
"TL" 4 W	1	110/125	58456 BT/04	0.17	0.16	0.35	3	1	P	88	S 2
	1	220	58451 AH/04	0.17	0.16	0.30	6	2	P	88	S 2
	2	220	58451 AH/04	0.17	0.16	0.30	6	3	P	88	2 x S 2
"TL" 6 W	1	110/125	58456 BT/04	0.17	0.16	0.40	3	1	P	88	S 2
	1	220	58451 AH/04	0.17	0.16	0.30	6	2	P	88	S 2
	2	220	58452 AH/04	0.21	0.17	0.50	5.5	3	P	88	2 x S 2
"TL" 8 W	1	110/125	58457 BT/04	0.22	0.17	0.55	3	1	P	88	S 2
	1	220	58451 AH/04	0.17	0.16	0.30	6	2	P	88	S 2
	2	220	58452 AH/04	0.21	0.17	0.50	4.5	3	P	88	2 x S 2
"TL" 13 W	1	220	58452 AH/04	0.21	0.17	0.50	5	2	P	88	S 10
"TL" 14 W	1	110/125	58494 BT/04	0.45/0.40	0.39	0.45/0.40	7/7	1	P	88	S 2
	2	220	58483 AH/04	0.50	0.42	0.45	11	3	P	128	2 x S 2
"TL" 15 W	1	110/125	58494 BT/04	0.45/0.40	0.36	0.45/0.40	6.5/6.5	1	P	88	S 2
	1	220	58494 AH/04	0.33	0.32	0.35	9	2	P	88	S 2
	2	220	58483 AH/04	0.50	0.40	0.50	10	3	P	128	2 x S 2
"TL"D 15 W	1	110/125	58494 BT/04	0.42/0.39	0.32	0.55/0.50	5.5/6	1	P	88	S 2
	1	220	58494 AH/04	0.33	0.32	0.35	9	2	P	128	S 2
	2	220	58483 AH/04	0.48	0.36	0.50	9.5	3	P	128	2 x S 2
"TL" 20 W "TL"F 20 W "TL"E 22 W	1	110/125	58434 BT/04	0.51/0.48	0.37	0.60	6	1	P	88	S 2
	1	220	58434 AH/04	0.43	0.39	0.35	11	2	P	128	S 2
	2	220	58429 AH/04	0.63	0.42	0.50	10	3	P	128	2 x S 2
"TL" 25 W "TL"W 25 W	1	220	58413 AH/02	0.38	0.29	0.50	7.5	2	P	128	S 10
"TL"D 30 W	1	110	59484 BF/00	1.20	0.85	0.45	13	8	Q	150	S 10
	1	125	59484 BG/00	1.05	0.75	0.45	12	8	Q	150	S 10
	1	220	58483 AH/04	0.48	0.37	0.50	9.5	2	P	128	S 10
"TL"E 32 W	1	110	59474 BF/00	1.15	0.83	0.50	12	9	Q	150	S 7
	1	125	59474 BG/00	1.00	0.74	0.50	12	9	Q	150	S 7
	1	220	58476 AH/00	0.55	0.45	0.40	9.5	10	Q	105	S 10
"TL" 40 W "TL"B 40 W "TL"F 40 W "TL"E 40 W	1	110	59427 BF/02	1.35	0.95	0.50	13	8	Q	150	S 10
	1	125	59427 BG/02	1.15	0.85	0.50	12	8	Q	150	S 10
	1	110	59429 BF/02	1.25	0.90	0.50	13.5	8	P	178	S 10
	1	125	59429 BG/02	1.20	0.84	0.50	12.5	8	P	178	S 10
	1	220	58429 AH/04	0.63	0.44	0.50	10	2	P	128	S 10
"TL" 65 W "TL"F 65 W	1	220	58464 AH/00	1.05	0.67	0.50	10	2	Q	150	S 10
	1	220	58463 AH/04	0.95	0.67	0.50	14	2	P	178	S 10
"TL"M 120 W/RS	1	220	58472 AH/00	2.10	1.50	0.40	18	2		[5]	S 12

HIGH POWER-FACTOR

"TL" 20 W "TL"F 20 W "TL"E 22 W	2	220	58458 AH/02	0.40	0.26	0.90	11	6	P	253	2 x S 2
	4	220	58704 AH/02 [3]	0.25	0.47	0.95	14.5	5	Q	240	4 x S 2
"TL" 40 W "TL"B 40 W "TL"F 40 W "TL"E 40 W	1	110/125	59428 BT/01	0.78/0.68	0.55/0.48	0.90	16	4	Q	285	S 10
	1	220	58458 AH/02	0.40	0.26	0.90	11	8	P	253	S 10
	2	220	58704 AH/02 [3]	0.25	0.44	0.95	14.5	7	Q	240	2 x S 10

COMBINATIONS FOR DUO CIRCUIT

Preheated, switchstart operation

HIGH POWER-FACTOR AND ANTI-STROBOSCOPIC

Type and number of lamps		Nom. voltage V [1]	Catalogue number	Mains current A		Power factor	Losses W	Wiring diagram fig.	Dimensions		Starter type [2]
				During ignition	During operation				Case type	Length A mm	
"TL" 15 W	4	220	58483 AH/04 I [4] 58584 AH/04 C	0.31	0.37	0.95	18.5	3	P P	128 253	4 x S 2
"TL"D 15 W	4	220	58483 AH/04 I 58584 AH/04 C	0.31	0.38	0.95	18	3	P P	128 253	4 x S 2
"TL" 20 W "TL"F 20 W "TL"E 22 W	2	220	58434 AH/04 I 58524 AH/04 C	0.18	0.28	0.95	18.5	2	P P	128 253	2 x S 2
	4	220	58429 AH/04 I 58556 AH/02 C	0.40	0.45	0.95	20	3	P P	128 253	4 x S 2
"TL" 25 W "TL"W 25 W	2	220	58413 AH/02 I 58503 AH/04 C	0.22	0.30	0.95	14	2	P P	128 253	2 x S 10
"TL"D 30 W	2	220	58483 AH/04 I 58584 AH/04 C	0.27	0.37	0.95	18	2	P P	128 253	2 x S 10
"TL"E 32 W	2	220	58476 AH/00 I 58556 AH/02 C	0.23	0.47	0.95	19.5	10	Q P	105 253	2 x S 10
"TL" 40 W "TL"F 40 W "TL"E 40 W	2	220	58429 AH/04 I 58556 AH/02 C	0.33	0.47	0.95	20	2	P P	128 253	2 x S 10
"TL" 65 W "TL"F 65 W	2	220	58463 AH/04 I 58563 AH/02 C	0.48	0.74	0.95	30	2	P P	178 353	2 x S 10
"TL"M 120 W/RS	2	220	58472 AH/00 I 58570 AH/00 C	0.90	1.40	0.90	38	2		[5] [6]	2 x S 12

WIRING DIAGRAMS

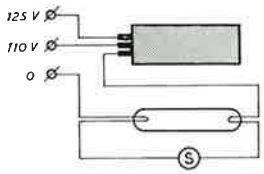


Fig. 1

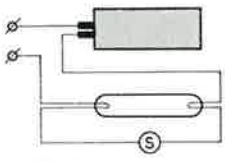


Fig. 2

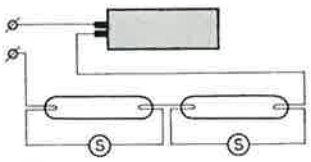


Fig. 3

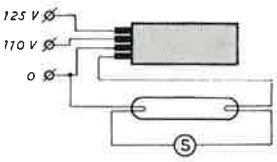


Fig. 4

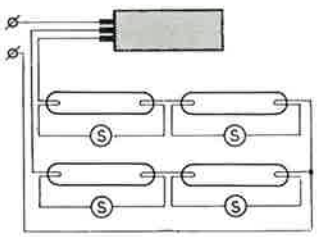


Fig. 5

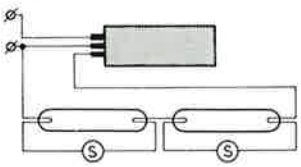


Fig. 6

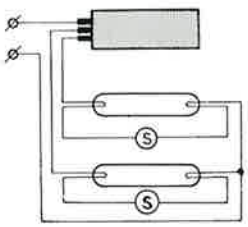


Fig. 7

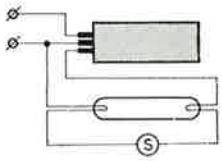


Fig. 8

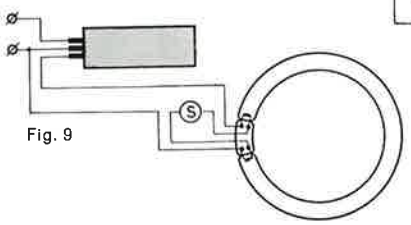


Fig. 9

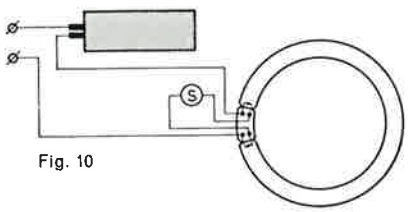


Fig. 10

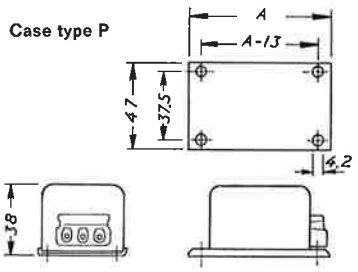
[1] Consumers voltage:
110 V = 105 - 115 V;
125 V = 120 - 130 V;
220 V = 210 - 230 V.
[2] For further data see page 94.
[3] Anti-stroboscopic
[4] I = Inductive; C = Capacitive
[5] Dimensions: 140 x 79 x 67 mm
[6] Dimensions: 256 x 79 x 67 mm

*

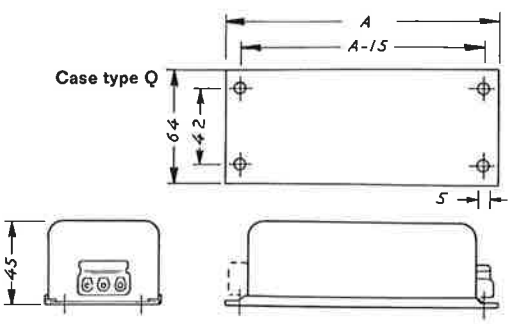
Our normal range of ballasts has been designed for use on 110, 125 or 220 V 50 c/s mains. Data on ballasts for 60 c/s mains are readily supplied on request.

DIMENSIONS

Case type P



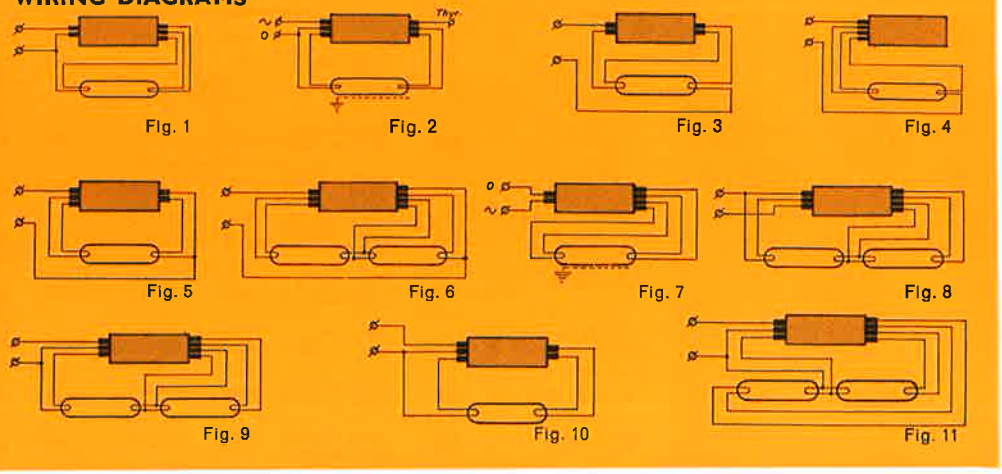
Case type Q



BALLASTS FOR "TL"M(F)/RS LAMPS

"TL"M(F)/RS lamps are employed in starterless circuits. For this purpose special ballasts are needed. In conjunction with the lamp and its starting aids, reliable and rapid ignition is ensured, even at lower temperatures and under less favourable voltage conditions, independent of the humidity of the surrounding atmosphere.

WIRING DIAGRAMS



Preheated starterless operation

Type and number of lamps		Nom. voltage 1) V	Catalogue number	Mains current A		Power factor	Losses W	Wiring diagram fig.	Dimensions	
				During ignition	During operation				Case type	Length A mm
Low Power-Factor (Inductive)										
"TL"M 20 W RS	1	220	58459 AH/02	0.02	0.38	0.35	10.5	5	P	178
	2	220	59440 AH/02	0.05	0.42	0.55	12.5	6	P	253
"TL"M 40 W RS "TL"MF 40 W RS "TL"EM 40 W RS	1	220	59453 AH/00	0.85	0.58	0.45	16	1	Q	195
Low Power-Factor (Capacitive)										
"TL"M 20 W RS	2	220	59442 AH/02	0.05	0.40	0.60	20	9	P	353
High Power-Factor										
"TL"M 40 W RS	1	220	60402 AH/00	0.45	0.25	0.95	12	3	Q	240
"TL"MF 40 W RS	1	220	60406 AH/02	0.45	0.27	0.90	17.5	4	P	278
"TL"EM 40 W RS	2	220	59701 AH/00	0.23	0.52	0.90	24	8	Q	285
"TL"M 65 W RS "TL"MF 65 W RS	1	220	60405 AH/00	0.68	0.42	0.90	16	3	Q	285
"TL" 85 W RS	1	220	60415 AH/00	0.72	0.50	0.95	23	10	Q	330
	2	220	59713 AH/00	0.12	1.00	0.95	42	11	Q 2)	420
"TL"M 120 W RS "TL"MF 120 W RS	1	220	60403 AH/00	1.55	0.75	0.90	27	4		3)
"TL" 180 W RS "TL"F 180 W RS	1	220	60413 AH/00	1.13	1.15	0.85	45	7		4)
High Power-Factor (for dimming installations only)										
"TL"M 20 W RS	1	220	58446 AH/02	0.30	0.17	0.90	15.5	2	P	278
"TL"M 40 W RS "TL"MF 40 W RS	1	220	58447 AH/02	0.28	0.28	0.90	16	2	P	278
			58448 AH/00	0.36	0.27	0.90	16	2	Q	285
"TL"M 65 W RS "TL"MF 65 W RS	1	220	58449 AH/00	0.59	0.45	0.90	24	2	Q	375

1) Consumers voltage:
220 V = 210 - 230 V
2) Height 53 mm
3) Dimensions: 285 x 79 x 67 mm
4) Dimensions: 420 x 79 x 67 mm

STEP-UP TRANSFORMER

If 110/125 V ballasts are not available or the use of a separate step-up transformer is advantageous, this 100 VA step-up transformer should be used in conjunction with 220 V ballasts. It can operate two "TL" 40 W lamps in duo-circuit or 2 "TL"M 40 W/RS lamps on HPF single-lamp ballasts. The transformer is cooled by means of a polyester filling of the box.

FIG. 21

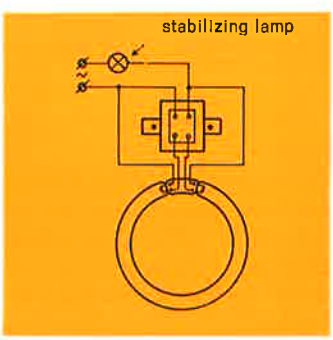
Catalogue number	Primary voltage V	Secondary voltage V	Power VA	Frequency c/s	Losses on full load W		Dimensions 1)	
					110 V	125 V	Case type	Length A mm
59492 BT/01	110/125	220	100	50 - 60	12.5	11.5	Q	150
59493 BT/02	110/125	220	100	50 - 60	15	12	P	178

1) See page 87

CIRCUIT FOR ONE "TL"EM/RS LAMP

One "TL"EM/RS lamp can be used on mains of 220 - 250 V, 50 - 60 c/s, ballasted by a stabilizing lamp. For various supply voltages, as mentioned in the table, the appropriate stabilizing lamp must be used. For preheating of the electrodes a preheat transformer is required.

Mains voltage V	Catalogue number stabilizing lamp		Wattage W	Total wattage W	Mains current A	Cat. no. transformer	Losses transformer W
	type STA	type STB					
220 - 230	6552	6562	67.5	109	0.5	59465 CC/08	1.5
230	6555	6565	70	111.5			
240	6556	6566	75	116.5			
250	6557	6567	80	121.5			




ZUG

ELECTRONIC APPARATUS FOR REGULATING THE LUMINOUS FLUX OF "TL"M/RS LAMPS

Fig. 1

Fig. 2

Fig. 3

In the case of every lamp there is a certain relationship between the luminous flux and the lamp current. The regulation of the luminous flux of all modern light sources is based on the principle of varying the lamp current.

With incandescent lamps, the lamp current can be regulated by varying the voltage applied to the lamp. This simple method cannot, however, be used with gas-discharge lamps, as the lamp must be ignited anew in each half-cycle. A certain ignition voltage is necessary for this. As ignition can no longer take place if this voltage is reduced, the lamp cannot remain burning either.

Several systems are known for the regulating — dimming as it is called — of "TL"M/RS fluorescent lamps, for instance with the aid of thyratrons. With these systems the voltage is kept fairly constant, but the moment of ignition and thus the current through the "TL"M/RS fluorescent lamps is controlled.

Owing to recent developments in the field of semiconductors, silicon-controlled rectifiers have become available which, in principle, have the same function as the thyratrons used hitherto. Two silicon-controlled rectifiers are connected anti-parallel and this combination is included in series with the "TL"M/RS fluorescent lamps in one circuit.

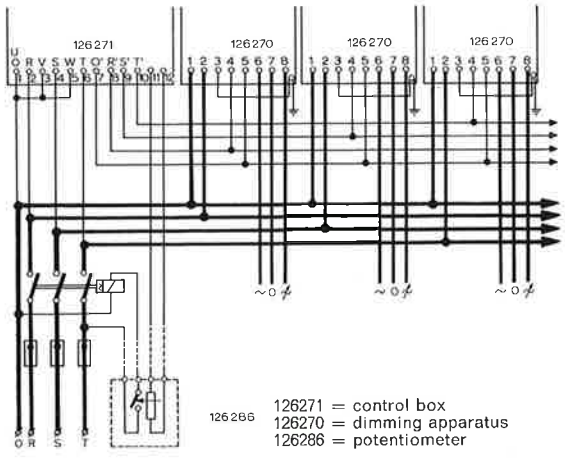
To avoid interference with radio reception, a filter is connected in series with the silicon-controlled rectifiers. In order to ensure good preheating of the electrodes of the "TL"M/RS fluorescent lamps, specially developed ballasts are applied.

The ballast contains a preheat transformer for which two secondary windings and one series impedance are provided in the ballast. The lamp is connected, in series with the series impedance, to the dimming apparatus.

During each half-cycle the controlled rectifiers will, in turn, allow the current to pass provided that a suitable signal ensures that they become conductive. A phase-changing network postpones the moment at which the signal is given so that the average current is regulated. A circuit which ensures that the luminous flux is constant in each set position, independent of mains voltage fluctuations, is included in the apparatus.

The dimming ballasts for the "TL"M/RS fluorescent lamps are housed in mounting channels or fittings.

In the dimming apparatus (fig. 1), if necessary together with a control box (fig. 2), all other components are accommodated to enable the luminous flux of the "TL"M/RS fluorescent lamps to be regulated. In addition, a potentiometer (fig. 3) is necessary for operating the dimming apparatus, either direct or via the control box.



CONNECTION DIAGRAM

The diagram shown alongside relates to a case in which more than 50 lamps 40 W or 20 W or more than 32 lamps 65 W are to be regulated. The dimming apparatus are connected to one control box, it being possible to connect a maximum of 150 dimming apparatus, distributed over three phases, to the control box. This means that 7500 "TL"M 40 W/RS or "TL"M 20 W/RS or 4800 "TL"M 65 W/RS lamps at the maximum can be regulated with this equipment.

TRANSISTOR BALLASTS

Fluorescent lamps are being employed more and more in vehicle lighting, as for this application also they have various significant advantages over incandescent lamps: very long life, high luminous output, yet low consumption, resistance to vibration, uniform illumination, no glare, slim shape, cool operation, low sensitivity to voltage fluctuations.
To convert the vehicle low voltage d.c. supply to the a.c. current required by fluorescent lamps, special ballasts are required. Philips transistor ballasts serve this purpose, without moving-parts and without the need for servicing. They are already widely applied in railway carriages and in road transport vehicles. Most conventional fluorescent lighting can be adapted to take transistor ballasts, or alternatively, lamps and ballasts may be installed separately at convenient points.

Philips transistor ballasts have a number of features which make them second to none, especially for this application.

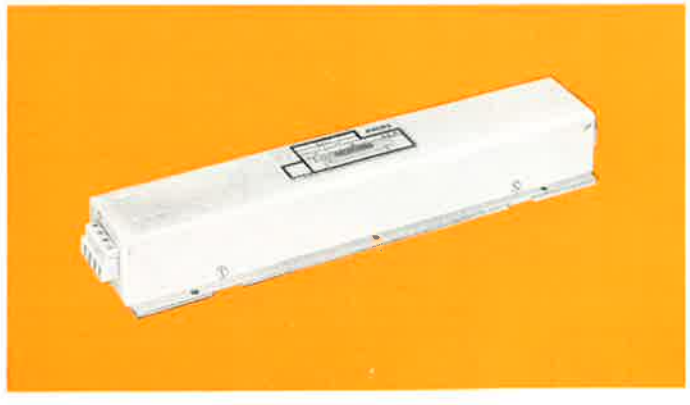
- **Transistor ballasts make possible the operation of fluorescent lamps on low-voltage battery supplies.**
- **No moving-parts and no servicing required; ballast life indefinitely long.**
- **Small, light in weight, easy to fix and wire.**
- **All supply wiring is at low voltage.**
- **Overall efficiency over 80 %.**
- **Design ensures ignition at low temperatures (—15 °C), reliable and stable operation in spite of considerable voltage fluctuations, e.g. ranging from 10 to 15 and 20 to 30 V.**

APPLICATIONS

Philips transistor ballasts have widened the range of applications of fluorescent lamps in a large measure. Nowadays, fluorescent lighting installations can be found in:

- motor buses, both for interior lighting and for advertising signs
- railway carriages
- aircraft
- loading space of lorries and vans
- caravans and tents
- fishing boats and other small vessels
- houses and farms in which low voltage d.c. supplies are available
- emergency lighting
- mobile workshops
- travelling shops

The Philips transistor ballasts are a combination of an inverter and a ballast unit, enabling fluorescent lamps to be used with 6, 12 and 24 V batteries.
The inverter converts the d.c. voltage into 220 - 350 V a.c. voltage of a very high frequency (± 8000 c/s). Thus it has been possible to keep the dimensions of the ballast very small. Inverter and ballast are housed in an aluminium casing of reduced dimensions.



TRANSISTOR BALLASTS

Type and number of lamps		Nominal d.c. voltage V	Catalogue number	Mains current during operation A	Secondary frequency c/s	Efficiency %	Wiring diagram fig	Dimensions fig.
"TL" 6 W	1	6	59813 TE/00	2.0	8000	50	A	3
"TL" 8 W	1			2.3		55		
"TL" 6 W	1	13	59808 TA/00	0.95	9000	57	C	4
"TL" 8 W	1			1.15		55		
"TL" 6 W	1	26	59808 TB/01	0.43	16000	61	C	4
"TL" 8 W	1			0.52		65		
"TL" 6 W	6	26	103877 + 6 x 59816 ZZ/90	1.7	8000	81	E	2 and 1 resp.
"TL" 8 W	4	26	103963 + 4 x 59817 ZZ/90	1.6	8000	77	F	2 and 1 resp.
	1	13	59800 TA/00	2.2	7000	75	D	3
"TL"M 20 W RS	1	26	59800 TB/00	1.1	8500	82	D	3
	2	26	59802 TB/03	2.3	7500	82	B	3
"TL"M 40 W RS	1	26				69	D	3
	1	13	59801 TA/00	2.2	8000	82	D	3
"TL"A 20 W	1	26	59801 TB/00	1.1	8500	82	D	3
	2	26	59803 TB/03	2.2	8000	84	B	3
"TL"A 40 W	1	26				77	D	
	1	13	59806 TA/00	2.2	8000	75	G	3
"TL"S 20 W	1	26	59806 TB/00	1.1	8000	80	G	3
	2	26	59807 TB/00	2.1	8000	84	H	3
"TL"S 40 W	1	26				79	G	
"TL"S 20 W	2	32 1)	59807 TC/00	1.8	8000	80	H	3
"TL"S 40 W	1	32 1)				75	G	

1) Maximum d.c. supply voltage permissible 32 V. This voltage should not be exceeded under any circumstances.

DIMENSIONS

Fig. 1

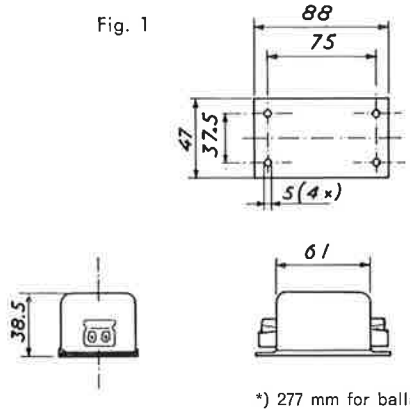
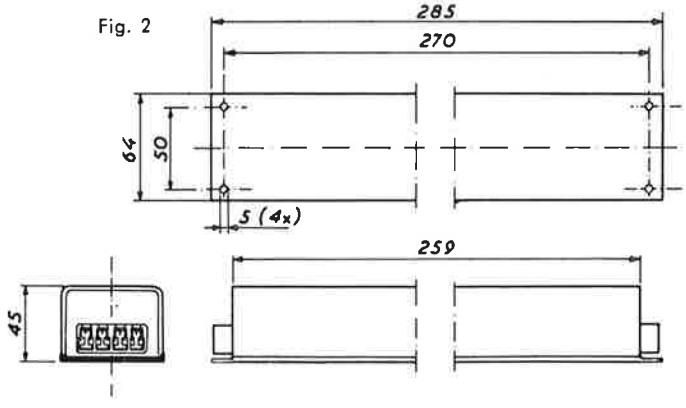


Fig. 2



*) 277 mm for ballasts for "TL"S lamps.

Fig. 3

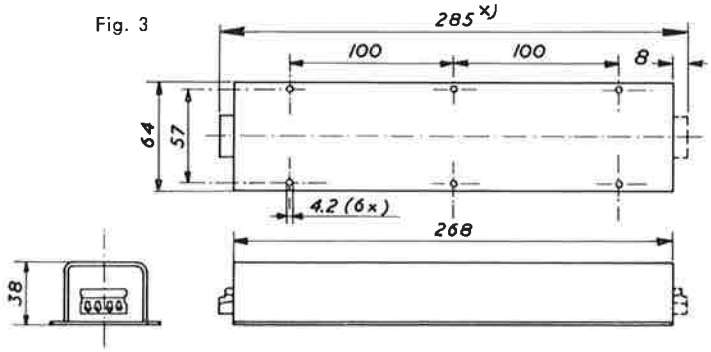
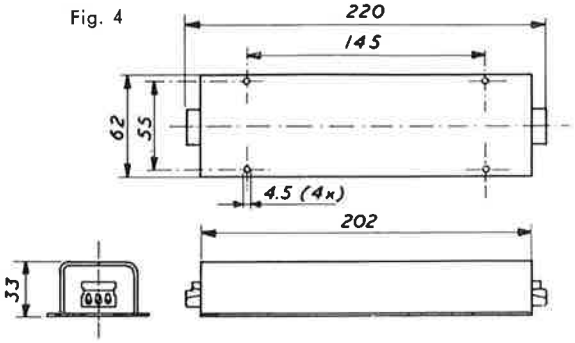
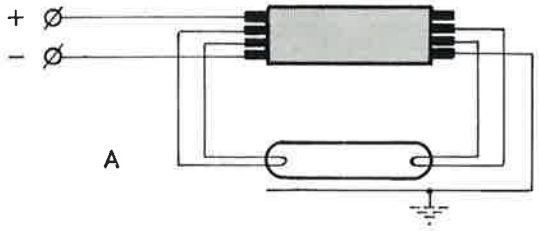
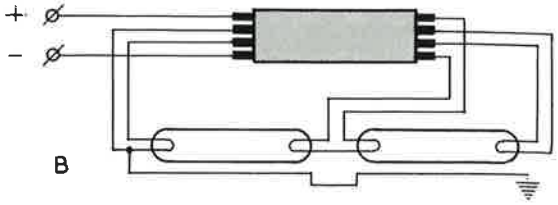


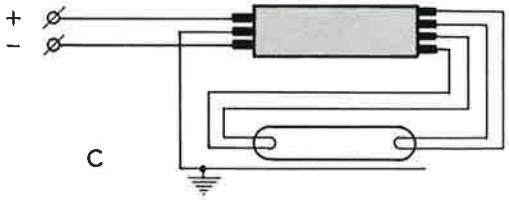
Fig. 4

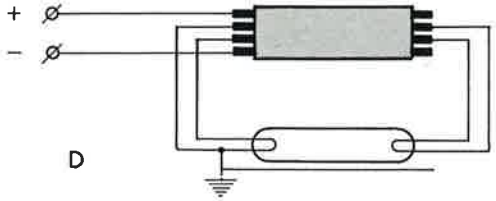


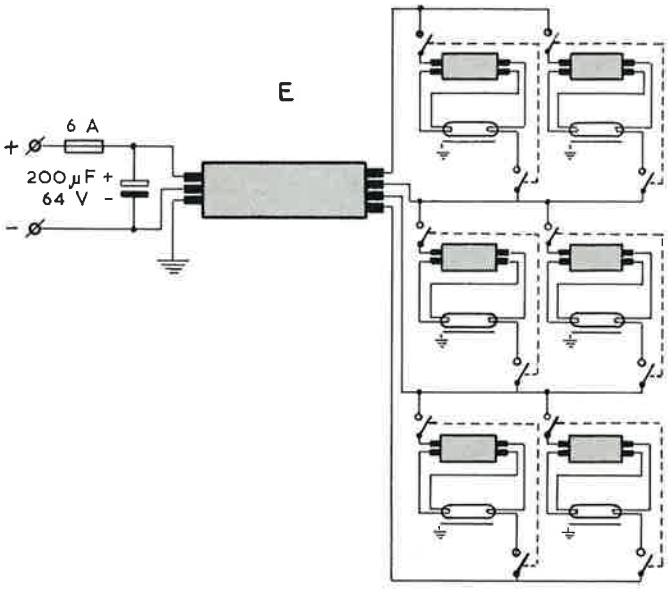
WIRING DIAGRAMS

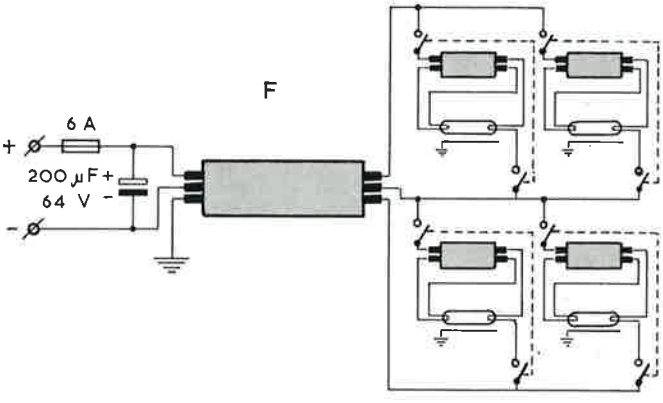


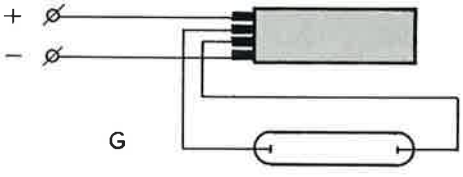


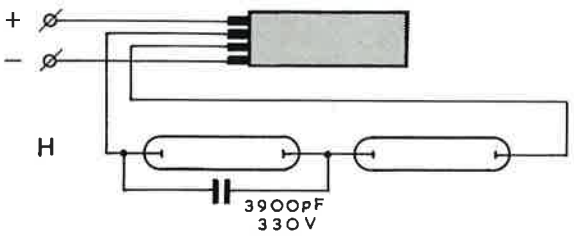










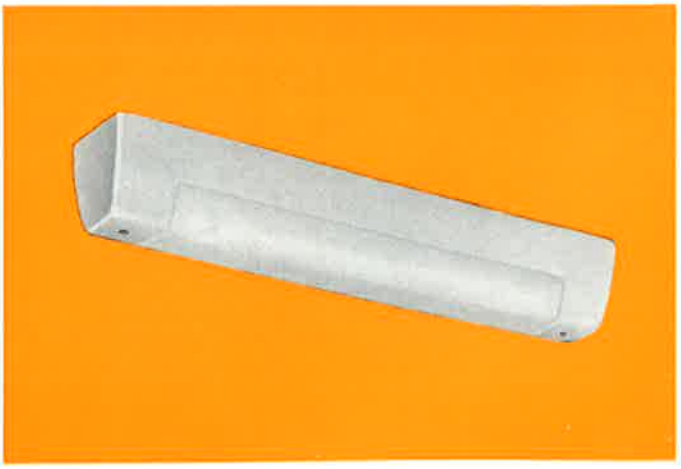


FITTING FOR CARAVAN LIGHTING

Philips have developed a small fitting for caravan lighting with built-in transistor ballast. It is suitable for a "TL" miniature lamp 8 W and can be used on 6 or 12 V d.c. supply.

The ballast operates on a very high frequency of 16000 c/s, so that it is absolutely noiseless.

The fitting consists of a mounting unit, containing the electrical equipment, and a plastic cover.



LAMPHOLDERS AND STARTERHOLDERS

The importance of good lampholders and starterholders as wiring accessories in fluorescent lighting systems can hardly be overestimated. Although the lampholders are destined primarily to support the lamp, they must also have well-sprung contacts engaging effectively with the pins of the lamp. Moreover they must prevent the lamp from being extinguished due to bad contact, the latter in its turn being caused by vibration, for example. Finally, the lampholders must be constructed in such a way that the lamp be easily removable either for cleaning or replacement purposes.

The shape of the lampholders should be such that they do not interrupt the line of light when fluorescent lamps are mounted in a continuous row; their dimensions must therefore be reduced to the minimum, without interfering with the requirement that they should be strong enough to resist the forces to which they are subjected when the lamp is inserted or removed.

Philips lampholders fully comply with all these demands and, in addition, they are shockproof. Neither during insertion or removal of the lamp, nor after the lamp has been taken out, are any live parts of the lampholder exposed.

Description	Catalogue number	Material	Fig.
Springloaded rotor-type lampholder for side mounting	61478/02	white "Philite"	1
Springloaded rotor-type lampholder for mounting on a plane parallel to the lamp	61469/02 [1]	white "Philite"	2
Lampholder for standard bipin caps	61499/02	white "Philite"	3
Adjustable lampholder for "TL"F lamps	61502/02	white "Philite"	3
Watertight lampholder for standard bipin caps	61497/.0 [2] 61497/.1 [2]	black "Philite" white "Philite"	4
Lampholders for recessed single-contact caps	61476/12 [3] 61477/02 [4]	white "Philite"	5
Lampholder for miniature bipin caps	61495/02	white "Philite"	6
Transparent lampholder for "TL"W lamp	61506/05	poly-carbonate	7
Lampholders for recessed double-contact caps	61501/02 [5] 61500/02 [6]	white "Philite"	8
For circular lamps with four-pin cap: lampholder	61487/02	white "Philite"	9
For circular lamps with four-pin cap: support	61486/02	white "Philite"	10
For circular lamps with four-pin cap: base	61488/02	white "Philite"	11
Starterholder with screw terminals	61505/02	white "Philite"	12
Starterholder with soldering lugs	61505/00	white "Philite"	13

1) With earth-contact spring: cat. no. 61469/03
2) /00 and /01 for "TL", "TL"B, "TL"C, "TL"F, "TL"M/RS and "TL"MF/RS lamps; /10 and /11 for "TL"D and TUV lamps
3) For voltages up to 250 V
4) For voltages up to 500 V
5) With rotatable contacts
6) With telescope contacts

STARTERS

The function of the starter in the fluorescent lamp circuit is to start the lamp automatically. Philips starters are carefully constructed for long and reliable operation, and are designed to ensure starting characteristics that will promote full lamp life. Hence, they help to cut down maintenance cost and are a really important link in the economic operation of fluorescent lamps.

Type	Catalogue number	For use with fluorescent lamps type	Diam.	Overall length
S 2	61411/41	4-6-8-14-15-20-22 W [1]	21	38
S 7	61496/00	32 W		
S 10	61454/01	32 W on 210 - 250 V 13-25-30-40-65-80 W		
S 12	61442/00	"TL"M 120 W/RS		
G 1	61407/00	25 - 40 W on 220 V d.c. [2]		

1) At ambient temperatures lower than 5 °C, use starter-type S10 for "TL" 8 W, when connected to 210 - 250 V
2) On 220 V d.c. the use of "TL"M 40 W/RS lamps is recommended

GAS-DISCHARGE LAMPS

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GAS-DISCHARGE LAMPS

However great its importance in the history of illuminating engineering, the incandescent lamp did not alter the philosophy of light which was based on the assumption that all light was the same in principle, and that the light sources differed only as regards quantity of light produced, economy and ease of handling. That philosophy did change when gas-discharge lamps arrived on the scene. Paraffin oil had replaced candles, gas replaced paraffin oil, electric lamps of the incandescent type replaced gas lamps, but gas-discharge lamps did not make incandescent lamps out-moded, they merely replaced them in some specific applications such as the lighting of public roads.

Philips played a considerable part in the development of gas-discharge lamps and have extensive experience in this field, gained over a long period. As early as 1932, Philips installed their first gas-discharge lamps for the lighting of a highway. The high luminous efficiency and the long useful life of these lamps drew the attention of authorities and lighting engineers everywhere. The development of these lamps proved what research workers in laboratories had already predicted: light could be made to fit the application, just like a glove can fit the hand. Ideas now generally accepted were revolutionary barely thirty-five years ago. But these ideas were adopted all the sooner because the term "gas-discharge lamp" was found to have a very wide range. The group of gas-discharge lamps now contains numerous different types, linked by a common principle, rather than by any common applications. Now there are sodium lamps, high-pressure mercury lamps, colour-corrected mercury lamps, blended-light lamps, xenon lamps. Their fields of application vary no less than those of incandescent lamps.

The difference in technical principle between the incandescent lamp and the gas-discharge lamp is obviously taken into account also as far as manufacture is concerned.

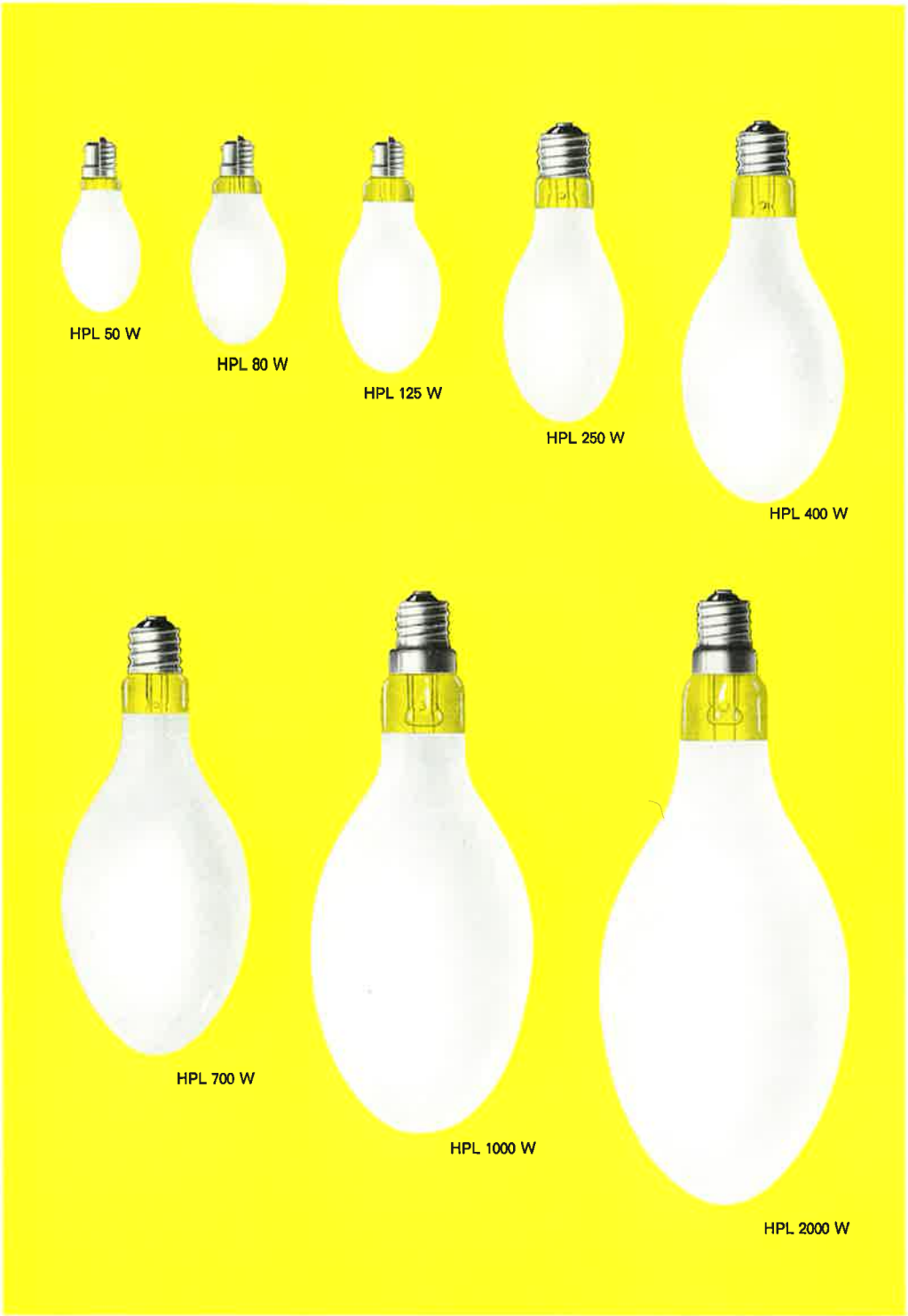
There was a time when gas-discharge lamps were made in a special shop of an incandescent-lamp factory.

Now Philips have established a number of factories where only gas-discharge lamps are made and where specialized quality research can be carried out.

HPL MERCURY FLUORESCENT LAMPS

Philips colour-corrected high-pressure mercury-vapour lamps have a wide variety of applications. The comprehensive range of these efficient light sources ensures the most economical solution for the lighting problems in numerous industrial and public-lighting installations. The range comprises lamps with a wattage of 50 W to 2000 W and with a luminous flux of 1700 lm to 125000 lm!

The high-efficiency discharge, in balanced combination with the fluorescent coating, provides a crisp white light with excellent colour properties. Philips HPL lamps thus combine fine colour quality with high luminous output and long service life.

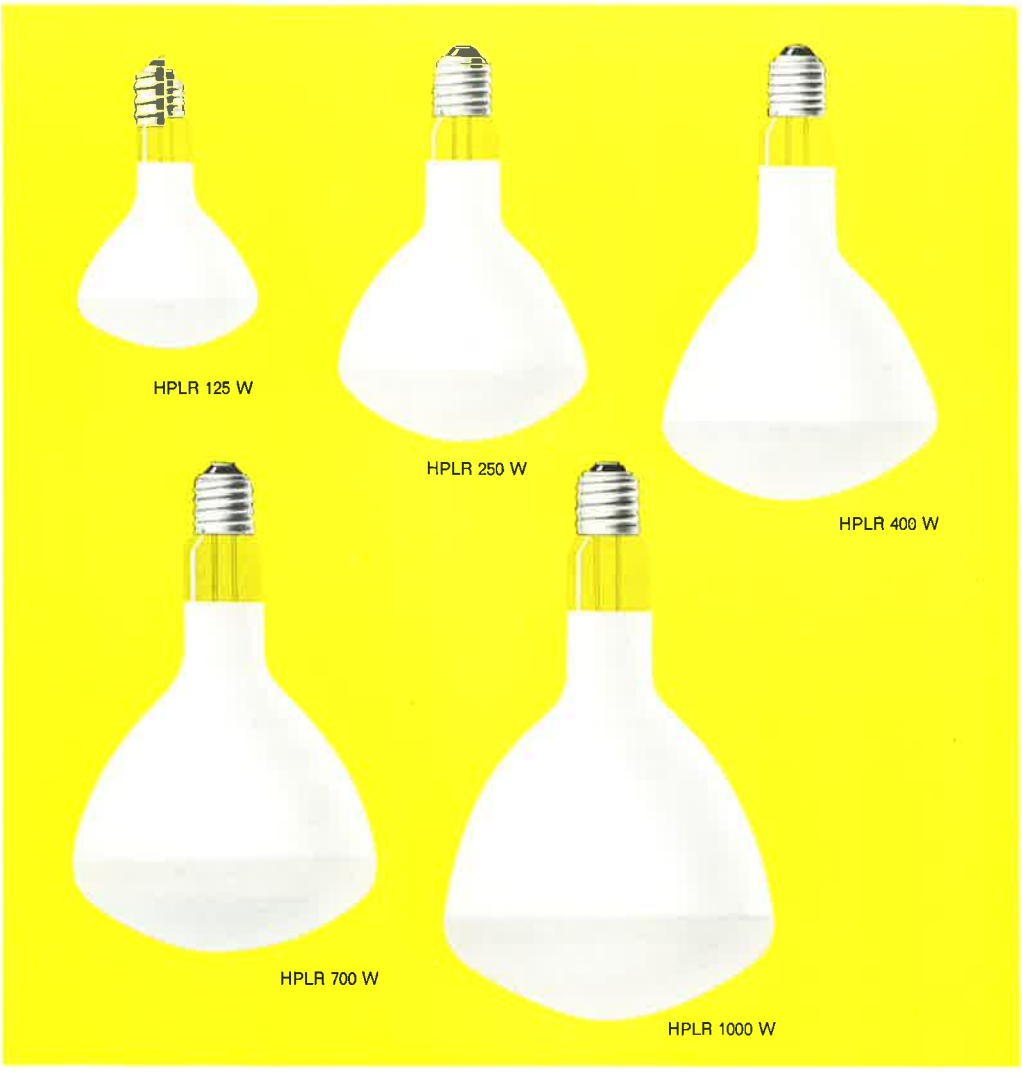


Lamp type [1]	Catalogue number			Lamp voltage V	Lamp current A	Lum. flux lm [2]	Diam.	Max. length with base		
	E27-base	B22-base	E40-base					E27	B22	E40
HPL 50 W	57224 E/25	57224 B/25	—	95	0.6	1700	55	129	125	—
HPL 80 W	57235 E/25	57235 B/25	—	115	0.8	3100	70	156	152	—
HPL 125 W	57236 E/97	57236 B/97	57236 G/97	125	1.15	5400	75	177	172	186
HPL 250 W	—	—	57220 G/97	135	2.1	11500	90	—	—	227
HPL 400 W	—	—	57221 G/97	140	3.2	20500	120	—	—	290
HPL 700 W	—	—	57226 G/97	140	5.4	37000	140	—	—	330
HPL 1000 W	—	—	57222 G/97	145	7.5	52000	165	—	—	410
HPL 2000 W	—	—	57229 G/97	270	8.0	125000	185	—	—	445

[1] For ballasts, see page 106.
[2] After 100 burning hours.

HPLR MERCURY FLUORESCENT REFLECTOR LAMPS

The new-shape Philips internal-reflector mercury fluorescent lamps are ideally suited for high-bay mounting, where maintenance is a problem.
This highly economical lamp, HPLR, gives good colour rendering and is available in a wide range of wattages.
The most important innovations are the optimum bulb shape and the titanium dioxide reflector surface inside the lamp, making it impervious to atmospheric pollution in dirty surroundings, so that the high efficiency is maintained throughout its long, reliable life. HPLR lamps may be used indoors as well as outdoors in permanent or temporary fittings, there being no need for expensive optical control fittings.
The application possibilities are legion, just a few examples being: factory lighting, quarries, paper mills, iron foundries and advertisement floodlighting.



Lamp type [1]	Catalogue number E27-base	Catalogue number E40-base	Lamp voltage V	Lamp current A	Lum. flux lm [2]	Diam.	Max. length with base E27	Max. length with base E40
HPLR 125 W	57238 E/93	57238 G/93	125	1.15	4900	125	190	199
HPLR 250 W	—	57239 G/93	135	2.00	10800	165	—	264
HPLR 400 W	—	57240 G/93	140	3.20	19000	180	—	304
HPLR 700 W	—	57231 G/93	140	5.25	33500	200	—	328
HPLR 1000 W	—	57241 G/93	145	7.50	50000	220	—	380
HPLRH 250 W	—	57244 G/99	135	2.00	6700	165	—	264
HPLRH 400 W	—	57243 G/99	140	3.20	12600	180	—	304
HPLRH 700 W	—	57245 G/99	140	5.25	22500	200	—	328

[1] For ballasts, see page 106. [2] After 100 burning hours.

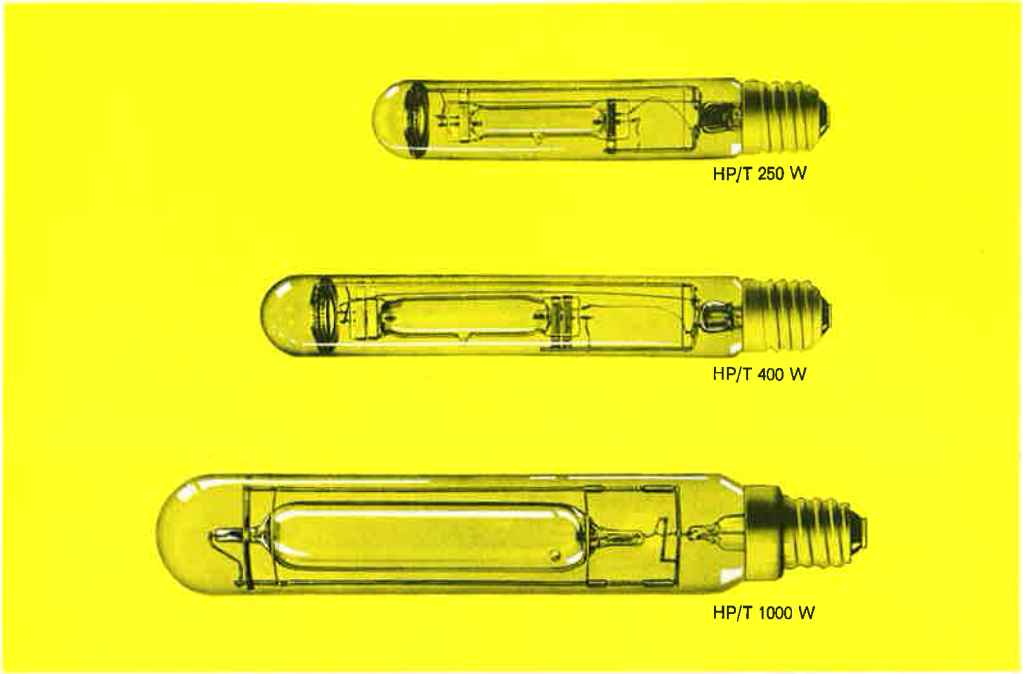
HPLRH MERCURY REFLECTOR LAMPS

The appearance of the HPLRH mercury reflector lamps for use in horticulture, has resulted in reliable lighting installations in this field. Mercury reflector lamps meet all demands made: high output per unit, built-in reflector, excellent spectral quality, easy to install, long life.
HPLRH lamps are equipped with an aluminium reflector to reduce the brightness of the bulb (in view of the mounting at eye level) and with a fluorescent coating at the bottom of the bulb, to be sure that no harmful UV-radiation is emitted.

HP/T MERCURY LAMPS

HP/T lamps are non-colour-corrected high-pressure mercury-vapour lamps, consisting of a quartz discharge-tube, contained in a tubular glass outer-bulb. These lamps have a high luminous flux and ensure excellent visual acuity and are thus suitable for installations where colour rendition is of minor importance.

Special applications of these lamps are: photography, photochemical processes, egg testing, microscopic examinations, etc.



Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Lum. flux lm 1)	Base	Diam.	Overall length
HP/T 250 W	57130 G/00	135	2.05	11500	E40	46	257
HP/T 400 W	57131 G/00	140	3.15	20500	E40	46	313
HP/T 1000 W	57213 G/00	145	7.50	52000	E40	65	382

1) After 100 burning hours.

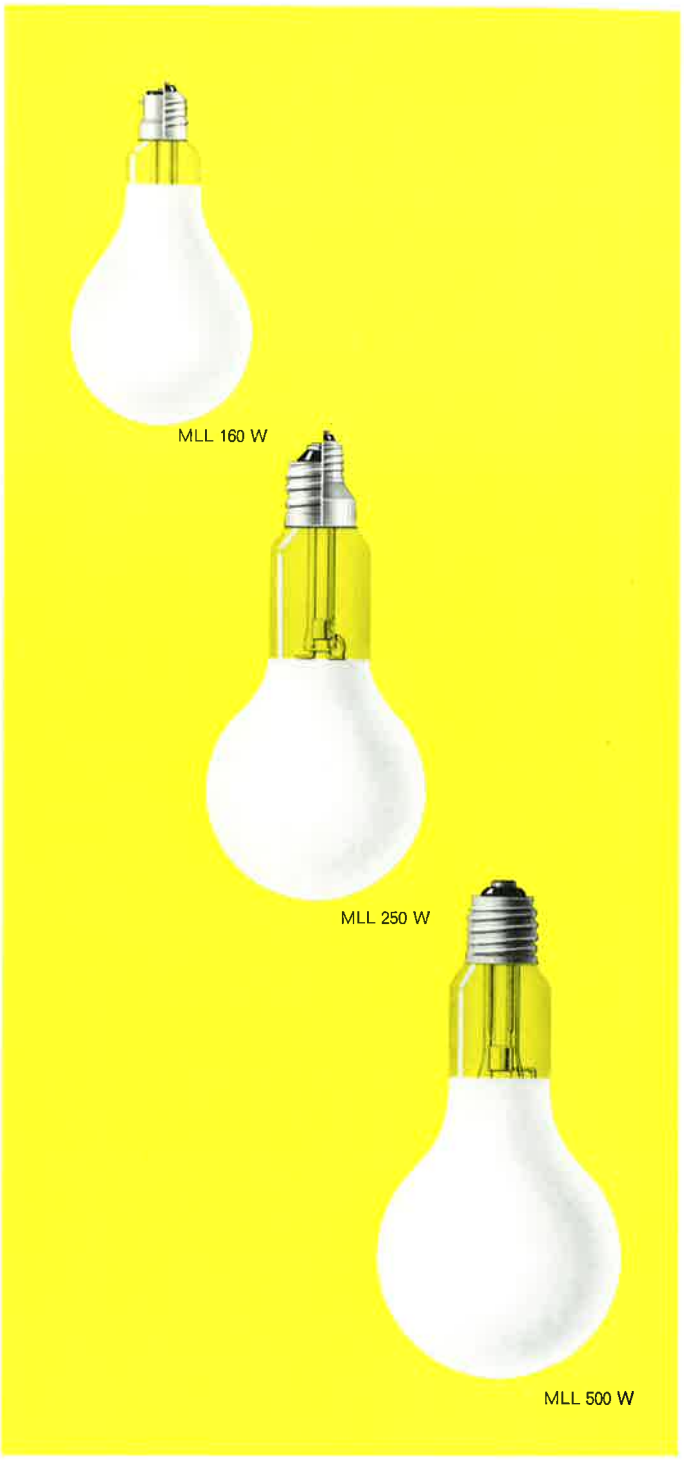
PHILIPS

MLL BLENDED-LIGHT LAMPS

MLL lamps consist of a quartz mercury discharge-tube connected in series with a tungsten filament. This filament functions as an incandescent light source and at the same time it operates as a ballast for the mercury discharge-tube, by limiting the lamp current. Hence, MLL lamps can be connected direct to the mains (200 - 250 V, 40 - 60 c/s), without the use of ballasts.

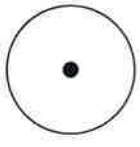
The outer bulb of MLL lamps is internally coated with a corrective layer, to improve the colour rendition. This coating ensures a proper blending of the light of both sources, resulting in diffused and clear white light, with the attendant feature of reduced glare. A few minutes after an MLL lamp is switched on, the performance of the two light sources reaches its optimum efficiency. Philips MLL lamps meet the present demands for longer life, better luminous efficiency and economical light depreciation.

They are an excellent means to improve the lighting of streets, factories, stores, garages and in many other fields of application. Existing lighting installations with incandescent lamps can easily be modernized without any extra cost for control gear, wiring or new fittings.

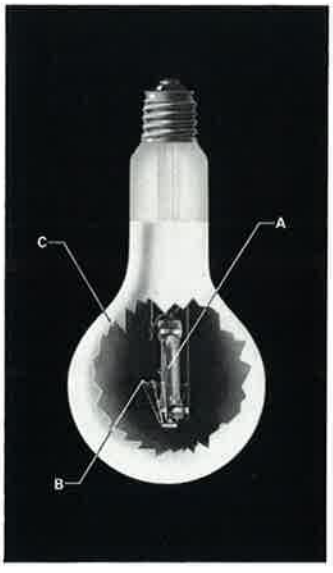


Burning positions

MLL 160 W



MLL 250 W
MLL 500 W



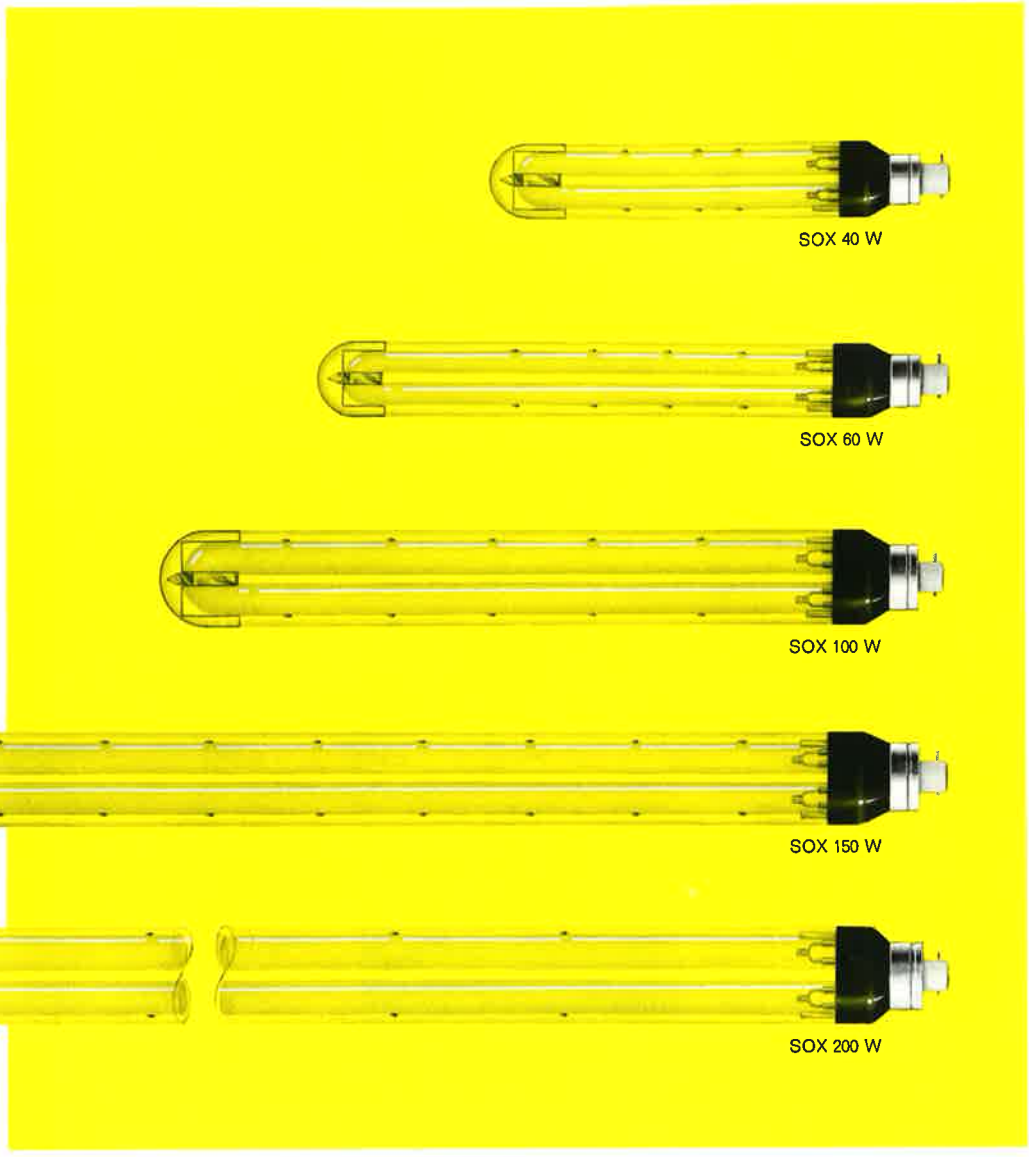
Exploded view of MLL lamp, showing the combination of the light sources.
A = Gas-discharge tube
B = Coiled filament
C = Bulb coating

Lamp type	Catalogue number [1]	Nominal voltage V	Minimum mains voltage [2] V	Lamp current A	Nominal luminous flux [3] lm	Diam.	Max. length with base E27	B22	E40
MLL 160 W [4]	57503 E/B/56	200 - 210	180	0.83	2900	88	183	178.5	—
	57504 E/B/56	210 - 220	180	0.79					
	57500 E/B/56	220 - 230	180	0.75					
	57501 E/B/56	230 - 240	190	0.72					
	57502 E/B/56	240 - 250	200	0.69					
MLL 250 W	57508 E/G/25	200 - 210	190	1.32	5200	110	245	—	239
	57509 E/G/25	210 - 220	190	1.26					
	57505 E/G/25	220 - 230	190	1.20					
	57506 E/G/25	230 - 240	195	1.15					
	57507 E/G/25	240 - 250	205	1.10					
MLL 500 W	57513 G/97	200 - 210	180	2.60	12500	130	—	—	274
	57514 G/97	210 - 220	180	2.50					
	57510 G/97	220 - 230	180	2.40					
	57511 G/97	230 - 240	190	2.30					
	57512 G/97	240 - 250	200	2.20					

1) E stands for E27-base, B for B22-base, G for E40-base
2) For vertical burning position; for other burning positions, values are slightly higher.
3) After 100 burning hours.
4) On special request the MLL 160 W lamp can also be supplied with hard glass outer bulb. In this case the catalogue number reads . . . . /96.

TIN-OXIDE SODIUM LAMPS SOX

Philips have recently succeeded in developing a new range of sodium lamps, type SOX, characterized by a tin-oxide layer. The outstanding features of these SOX lamps are as follows: super-high efficiency (up to 150 lm/W), optimum lumen maintenance throughout life (95 %), long and reliable life, interchangeability with existing types, as they are identical as regards mechanical and electrical characteristics. In view of the rapidly increasing traffic density, the range of new sodium SOX lamps is definitely the most efficient and economic solution for public lighting.



Burning positions

SOX 40 W
SOX 60 W

SOX 100 W
SOX 150 W
SOX 200 W

Lamp type	Catalogue number	Voltage V	Current A	Lum. flux lm 1)	Diam.	Overall length
SOX 40 W	57021B/00	75	0.60	4400	51	310
SOX 60 W	57022B/00	115	0.60	7400	51	424
SOX 100 W	57023B/00	120	0.90	12500	64.5	525
SOX 150 W	57024B/00	180	0.90	20500	64.5	775
SOX 200 W	57025B/00	265	0.90	30000	64.5	1120

1) After 100 burning hours.

LAMPHOLDER

The striking voltage of SOX lamps is above 250 V. It is, therefore, advisable not to use the normal bayonet lampholder for 220 V, but exclusively that of our own make, specially designed for sodium lamps. Moreover, it provides protection from rain and snow.
Catalogue number: 61085/00.
Dimensions: 53 x 42 x 33 mm.

BALLASTS FOR MERCURY AND SODIUM LAMPS

Mercury and sodium lamps, like all other gas-discharge lamps, need control gear to limit the current flowing through the circuit, and the ballast characteristics must conform to the lamp requirements. Over 45 years of specialized engineering makes the Philips ballasts first in economy, durability and consistently high performance. They incorporate in their dripproof, canned polyester-filled units the newest electrical designs ensuring very low operating temperatures and low wattage losses combined with the most rugged mechanical and electrical constructions.

Ballasts for mercury lamps

Inductive ballasts

For lamps	Catalogue number	Nom. voltage V	Mains current A	Power factor	Losses W	With capacitor µF	Mains current A	Power factor	Dimensions l x b x h
HPL 50 W	58211 AH/01	220	0.62	0.42	9	8	0.32	0.90	140 x 65 x 70
HPL 80 W	58225 AH/00	220	0.80	0.50	8.5	8	0.45	0.90	130 x 70 x 77
	59202 BT/01	110/125	1.70/1.55	0.50	15	10	0.95/0.85	0.90	144 x 87 x 90
HPL(R) 125 W	58226 AH/00	220	1.15	0.55	13	10	0.70	0.90	140 x 70 x 77
HPR, HPW 125 W	59203 BT/01	110/125	2.50/2.20	0.55/0.50	20/18	10	1.60/1.40	0.85	144 x 87 x 105
HPL(R)(RH) 250 W	58107 AH/00	220	2.05	0.55	17	20	1.30	0.95	168 x 88 x 101
HPT 250 W	59115 BT/01	110/125	4.20/3.70	0.60	22/19	20	2.60/2.30	0.95	175 x 104 x 120
HPL(R)(RH) 400 W	58108 AH/00	220	3.15	0.60	21	25	2.10	0.90	150 x 95 x 117
HPT 400 W	59106 BT/01	110/125	6.70/5.90	0.55	28/25	25	4.40/3.80	0.90	215 x 138 x 125
HPL(R)(RH) 700 W	58109 AH/00	220	5.25	0.65	32	40	3.60	0.90	210 x 115 x 134
HPL(R) 1000 W	58214 AH/00	220	7.50	0.65	43	58	5.30	0.90	210 x 115 x 134
HPT 1000 W	59204 BT/00	110/125	16.00/14.00	0.60	55/53	50	10.20/9.20	0.90	320 x 192 x 142
HPL 2000 W	58219 CX/00	380	8.00	0.65	68	40	5.75	0.95	255 x 165 x 172
Combined ballasts									
HPL 80 W	58217 AH/00	220	0.80	0.50	9	8	0.45	0.90	155 x 68 x 92
HPL(R), HPR, HPW 125 W			1.15	0.55	14	10	0.70		
HPL(R)(RH), HPT 250 W	58218 AH/00	220	2.05	0.55	14	20	1.30	0.95	170 x 95 x 117
HPL(R)(RH), HPT 400 W			3.15	0.65	22	25	2.10	0.90	
Combinations for duo-circuit (H.P.F.)									
2 x HPL 80 W	58225 AH/00 I [1] 58215 AH/00 C [1]	220	0.85	0.95	17				130 x 70 x 77 210 x 68 x 92
2 x HPL(R), HPR, HPW 125 W	58226 AH/00 I 58216 AH/00 C	220	1.30	0.95	25				140 x 70 x 77 250 x 68 x 92
2 x HPL(R)(RH), HPT 250 W	58107 AH/00 I 58220 AH/00 C	220	2.45	0.95	37				168 x 88 x 101 270 x 88 x 101
2 x HPL(R)(RH), HPT 400 W	58108 AH/00 I 58221 AH/00 C	220	3.90	0.95	48				150 x 95 x 117 290 x 95 x 117

Ballasts for sodium lamps

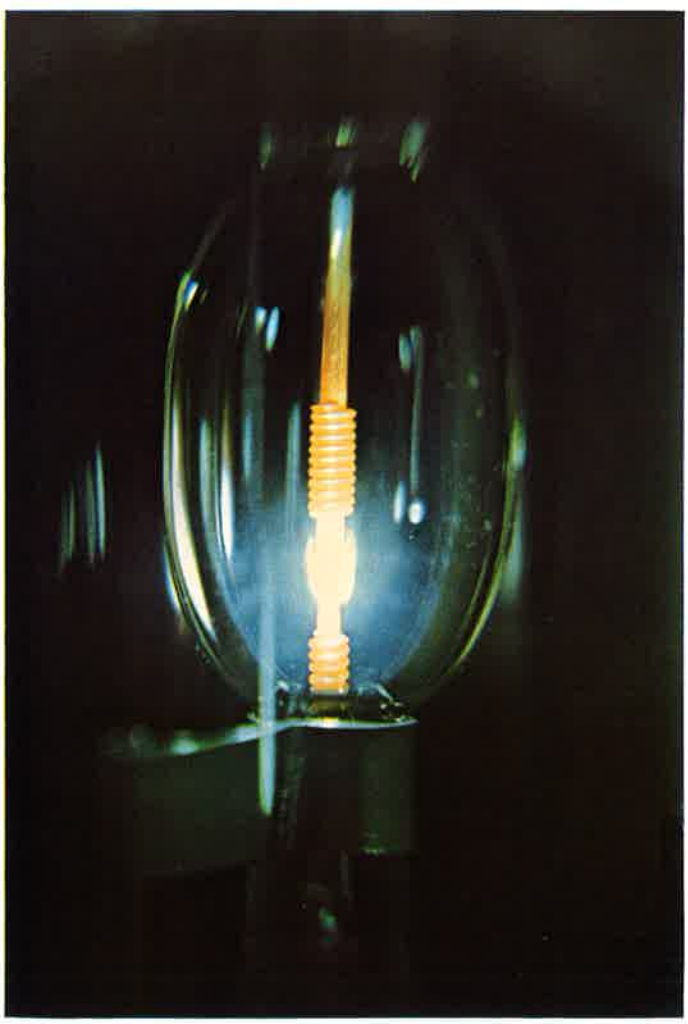
1) I = Inductive C = Capacitive

Inductive ballasts

SOX 40 W	59010 AH/00	220	1.45	0.18	18	20	0.29	0.85	180 x 87 x 100
SOX 60 W	59010 AH/00	220	1.40	0.25	19	20	0.37	0.95	180 x 87 x 100
SOX 100 W	59011 AH/00	220	2.20	0.25	21	30	0.61	0.90	205 x 110 x 116
H.P.F. ballasts (with built-in capacitor)									
SOX 40 W	59008 AH/02	220	0.31	0.85	18				235 x 87 x 100
SOX 60 W	59008 AH/02	220	0.40	0.90	18				235 x 87 x 100
SOX 100 W	59009 AH/02	220	0.65	0.85	21				275 x 110 x 116
SOX 150 W	59004 AH/02	220	0.98	0.85	30				275 x 110 x 116
SOX 200 W	59004 AH/02	220	1.10	0.95	30				275 x 110 x 116

Data on low-voltage apparatus on request.


VEAN
AKER



GAS-DISCHARGE LAMPS FOR SPECIAL PURPOSES

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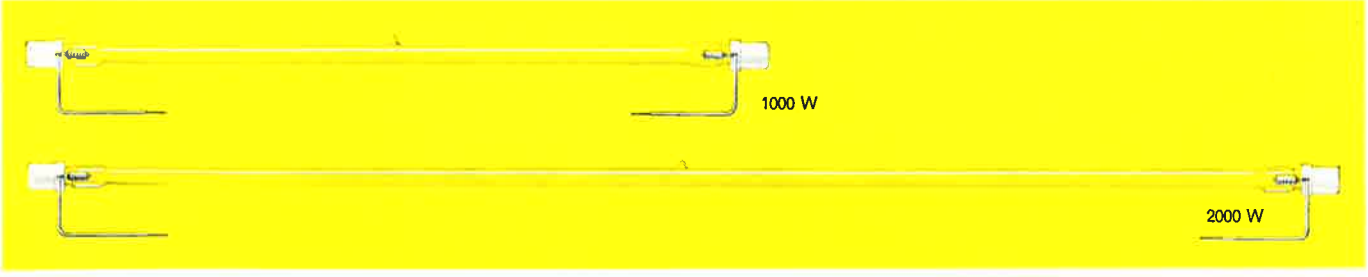


XOP LAMPS

The Philips XOP lamps are low-pressure xenon-filled discharge lamps specially developed for reproduction and copying in the printing industry. One of the most important features of these lamps is that their spectrum largely approximates average daylight, making them the answer to the problems of copy-board lighting, particularly in regard to colour exposures.

The following additional features make these lamps even more useful for copy-board lighting: Instant start and restart (no warming up), maximum efficiency immediately after starting, colour temperature and light output remain constant during the entire, long service life, clean in operation, ideal for reflector design due to the very small diameter, uniform burning during exposure, and high efficiency.

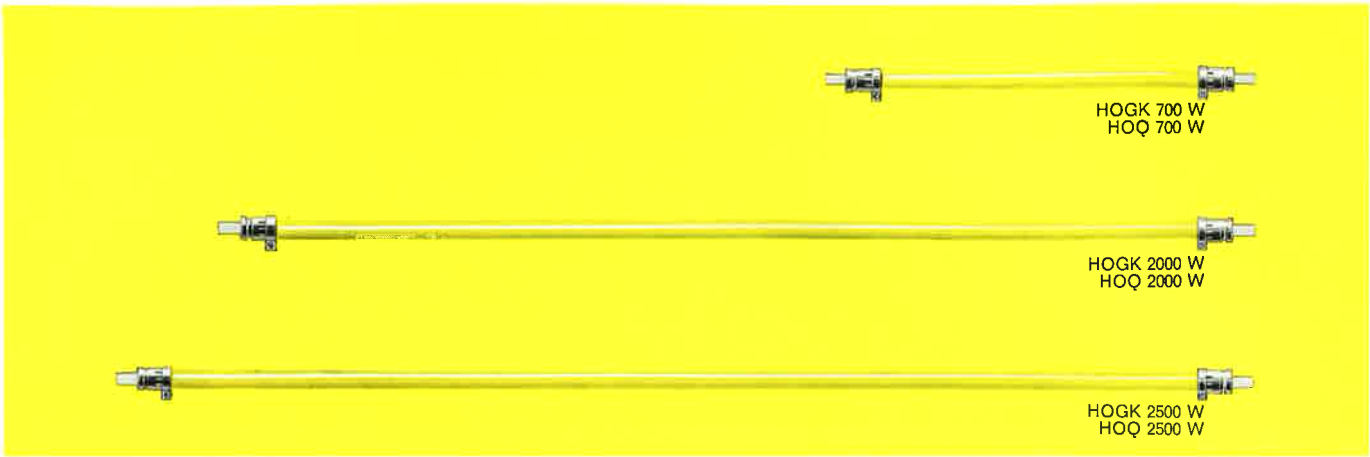
APPLICATIONS

Copy-board lighting. Small size horizontal copy-boards, as well as large vertical ones can be lit very evenly with two or four lamps respectively. Due to its spectral-energy distribution, the XOP lamp is excellent for colour reproduction, whereas for black-white reproduction these lamps are superior to almost any other light source.

Stop-and-repeat copying machines. Here, too, XOP lamps are preferred because of the possibility of instant start (as distinct from mercury high-pressure lamps) and thus complicated mechanical shutters are not necessary.

Light source in photo and film studios. Xenon lamps have also proved their use as stand-by lights in film studios. Once more because their spectrum approximates average daylight.

Catalogue number	Wattage W	Voltage V	Peak current A	Effective current A	Lum. flux lm	Colour temperature °K	Diam.	Overall length
126231	1000	90 - 110	approx. 220	approx. 15	28000	approx. 5400	10	395
126297	2000	180 - 220	approx. 220	approx. 15	56000	approx. 5400	10	698



HOGK AND HOQ LIGHT-PRINTING LAMPS

The use of light copying equipment has increased tremendously in the last decennia. This has brought about a steep rise in the demand for tubular mercury-vapour lamps, specially designed for this purpose and which so successfully replace the carbon arc lamps mainly employed in earlier days. Without belittling the great strides made in the development of suitable printing papers and in the construction of increasingly compact and reliable printing machines, one may say in all modesty that it is the mercury-vapour lamp which should be given credit for setting the ball rolling.
HOGK and HOQ lamps are geometrically and electrically identical; they only differ in the kind of quartz used for their envelopes.
For HOQ lamps a special quartz is used, which does not give rise to ozone formation and their application does not call for measures to prevent ozone formation or to have it exhausted.
Moreover, the output of HOQ lamps in the long-wave ultra-violet and adjacent visible region (to which most phototype papers are sensitive) is slightly better than that of HOGK lamps. This difference is even larger when HOGK lamps are operated in a jacket to keep the ozone within bounds, because this jacket will absorb some radiation.

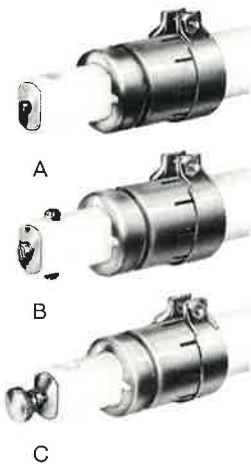
LAMP BASES

All HOGK and HOQ lamps are fitted with universal lamp bases, comprising:

A: end contacts

B: side contacts

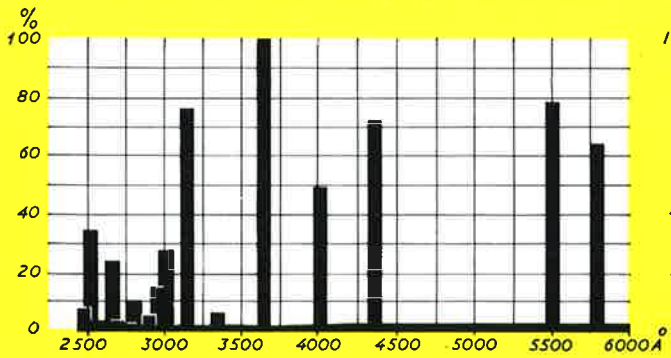
C: a milled screw to connect the leads direct to the lamp, in case lampholders are not used.



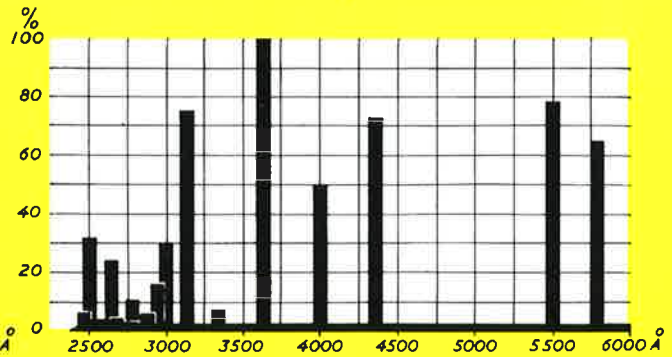
Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Max. diam.	Min. luminous length	Overall length
HOGK 700 W	57123 AH/51	190	4.2	24	413	567
HOGK 2000 W	57118 AH/51	550	4.2	24	1213	1367
HOGK 2500 W	57124 AH/51	550	5.5	24	1350	1504
HOQ 700 W	57123 AH/60	190	4.2	24	413	567
HOQ 2000 W	57118 AH/60	550	4.2	24	1213	1367
HOQ 2500 W	57124 AH/60	550	5.5	24	1350	1504

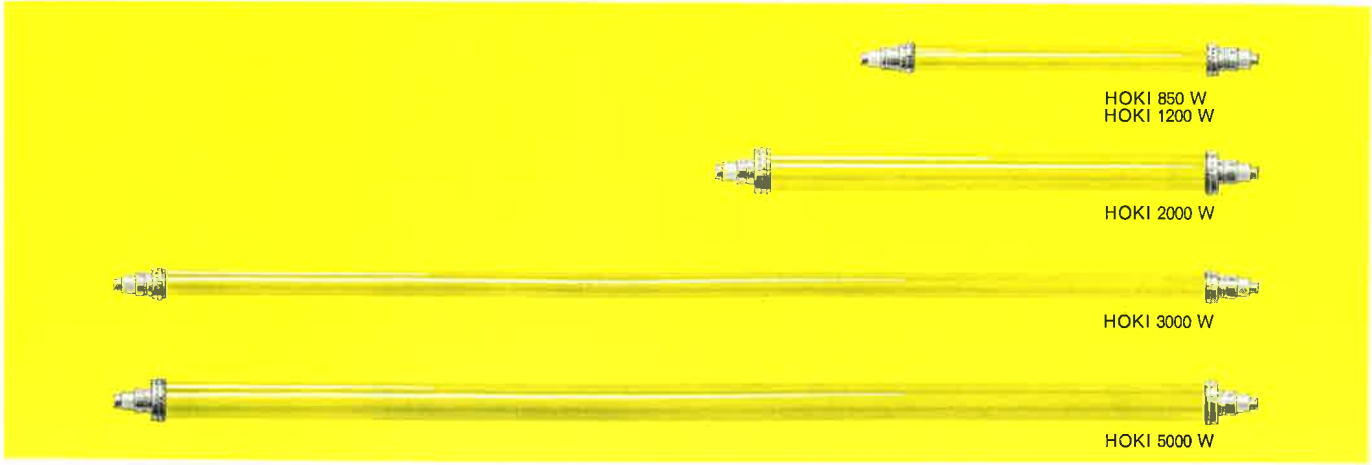
Quartz lamps, either HOGK, HOQ or HOKI types, are powerful ultra-violet radiators and therefore, measures have to be taken to protect eyes and skin.

RELATIVE SPECTRAL ENERGY DISTRIBUTION HOGK LAMPS



RELATIVE SPECTRAL ENERGY DISTRIBUTION HOQ LAMPS



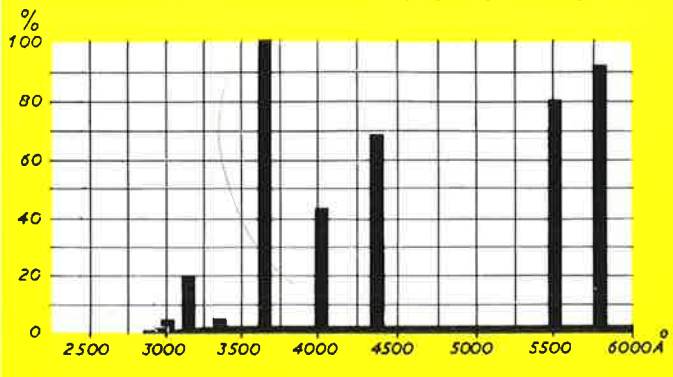


HOKI
LIGHT-PRINTING LAMPS

HOKI lamps consist of a quartz burner and an integral jacket made of a glass having a high transparency for long-wave ultra-violet radiation. This jacket prevents ozone formation outside the lamp and protects the burner from the airstream flowing between the lamp and the printing cylinder.
HOKI lamps have a higher wattage per unit length and their surface temperature is accordingly higher than that of HOGK or HOQ lamps. Electrically they are identical with their predecessors, the HOK lamps (without jacket). The latter used to be mounted in separate jackets, made available by the equipment maker. Geometrically and also with regard to the bases there are some differences, which may require some mounting modifications.

Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Max. diam.	Min. luminous length	Overall length
HOKI 850 W	126112	740	1.3	39	413	539
HOKI 1200 W	57129 AP/65	550	2.5	35	398	524
HOKI 2000 W	57128 AP/65	550	4.2	50	588	715
HOKI 3000 W	57125 AP/65	1250	2.9	35	1368	1495
HOKI 5000 W	57153 AP/65	1800	3.2	50	1368	1495

RELATIVE SPECTRAL ENERGY DISTRIBUTION HOKI LAMPS



BALLASTS

Most HOGK, HOQ and HOKI lamps are operated from a.c. mains in conjunction with the ballasts mentioned in the table below. These ballasts are of the constant-wattage type (with high power-factor) and the capacitors mentioned are essential in the circuitry. A constant-wattage ballast consists of a leak-transformer and a suitable capacitor, which is connected to the secondary side in series with the lamp. Mains fluctuations of ± 10 % cause less than 2 % variation in lamp wattage. When ordering constant-wattage ballasts, the leak-transformers and the capacitors should be specified in accordance with the table below.
The lamp guarantee only holds good if the lamps are operated on Philips ballasts or ballasts approved by Philips.

For lamp	Catalogue number	Nom. voltage V	Losses W	Dimensions l x b x h
HOGK 700 W HOQ 700 W	Data are given on request			
HOKI 850 W	126126	230	125	255 x 120 x 157
HOKI 1200 W	Data are given on request			
HOGK 2000 W HOQ 2000 W HOKI 2000 W	126232	230	170	350 x 215 x 205
HOGK 2500 W HOQ 2500 W	Data are given on request			
HOKI 3000 W	126194	220	340	350 x 215 x 265
HOKI 5000 W	126218	230	550	350 x 215 x 265

Power-factor correction

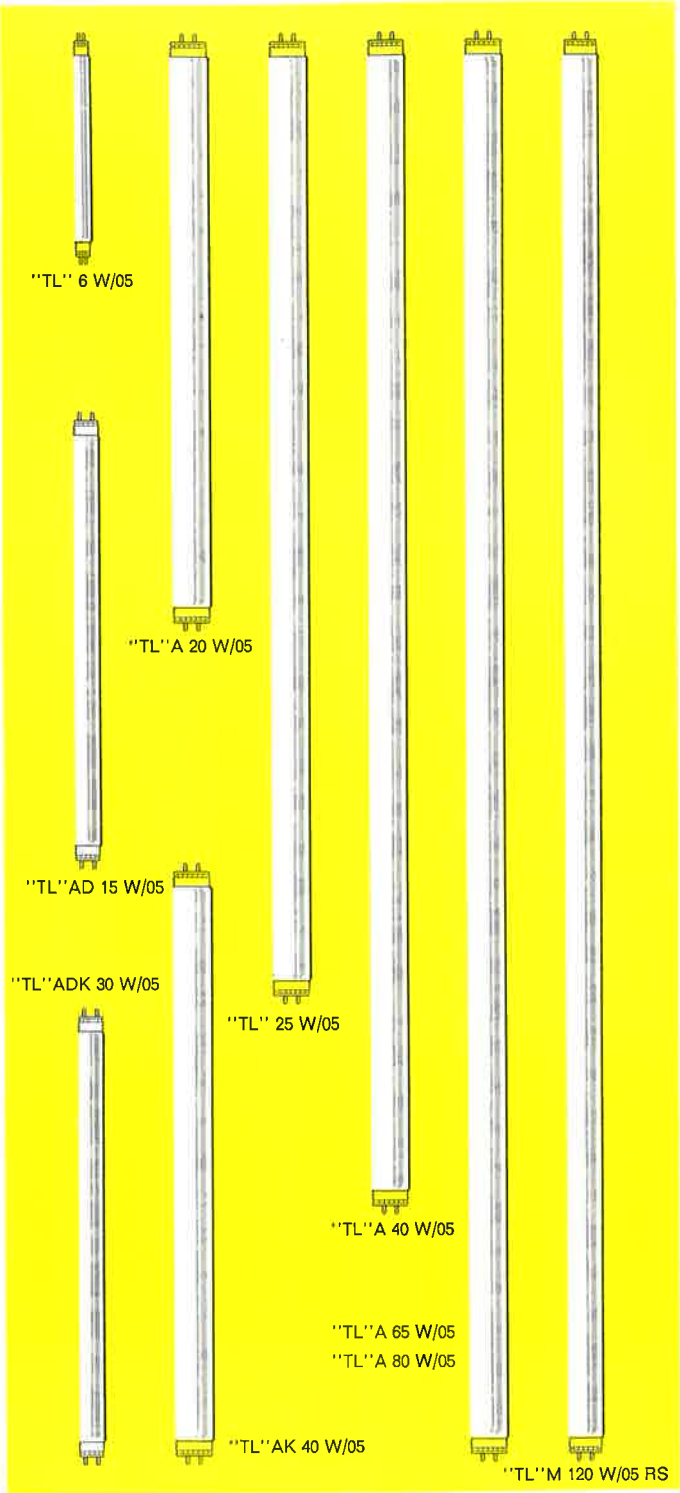
For ballast	Capacitors 1) Number	Capacitors 1) Value µF	Voltage over capacitors V	Mains current A	Power factor
126126	2	7	660 each	4.4	0.95
126232	4	15.8	440 each	9.7	0.95
126194	6	6.5	660 each	15	0.95
126218	12	10.2	500 each	25	0.95

1) Ambient temperature may not exceed 70 °C.

SUPER ACTINIC "TL" LAMPS

Super actinic "TL" lamps are second to none as regards efficiency of long-wave U.V. radiation, needed for various photochemical processes, such as light (diazo) printing, copying and reproduction. They are tubular, low-pressure mercury lamps, coated on the inside with a fluorescent layer that transforms the short-wave ultra-violet radiation of the arc into useful actinic radiation with a peak at approximately 3700 Å.

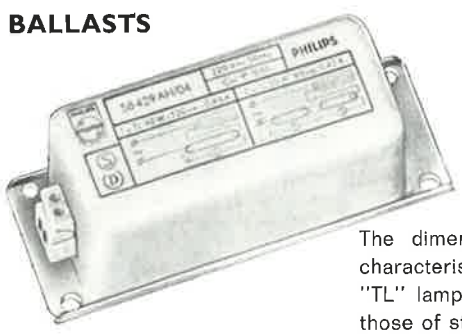
Super actinic "TL" lamps are operated from a.c. mains. As lamp powers are low, several lamps are often used together per machine when a larger light-printing speed is required. Heat production is relatively small and therefore the lamps may be placed quite near to the printing materials and no complicated cooling systems are required. In order to achieve maximum results, it is recommended to place and space the lamps in such a way that they intercept each other's radiation as little as possible and that the bulb-wall temperature does not exceed 40 - 50 °C.



Catalogue number	Lamp voltage V	Lamp current A	Cap	Diam.	Overall length 1)
"TL" 6 W/05	44	0.16	Miniature bipin	16	226
"TL"AD 15 W/05	54	0.32	Standard bipin	26	451
"TL"A 20 W/05	57	0.39	Standard bipin	38	604
"TL" 25 W/05	94	0.29	Standard bipin	38	984
"TL"ADK 30 W/05	44	0.84	Standard bipin	26	451
"TL"A 40 W/05	106	0.44	Standard bipin	38	1213
"TL"AK 40 W/05	46	0.88	Standard bipin	38	604
"TL"A 65 W/05	110	0.67	Standard bipin	38	1514
"TL"A 80 W/05	99	0.87	Standard bipin	38	1514
"TL"M 120 W/05 RS	100	1.50	Standard bipin	35	1514

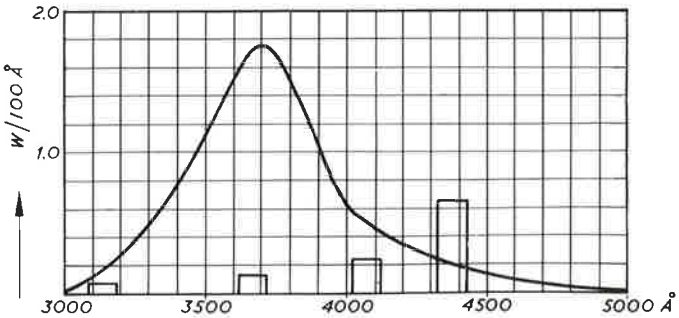
1) Inclusive of pins.

BALLASTS



The dimensions and electrical characteristics of super actinic "TL" lamps being identical with those of standard "TL" lamps of the same rating, the ballasts and other accessories of the latter can be used. For data see pages 86 - 87.

ABSOLUTE SPECTRAL ENERGY DISTRIBUTION FOR "TL"A 40 W/05

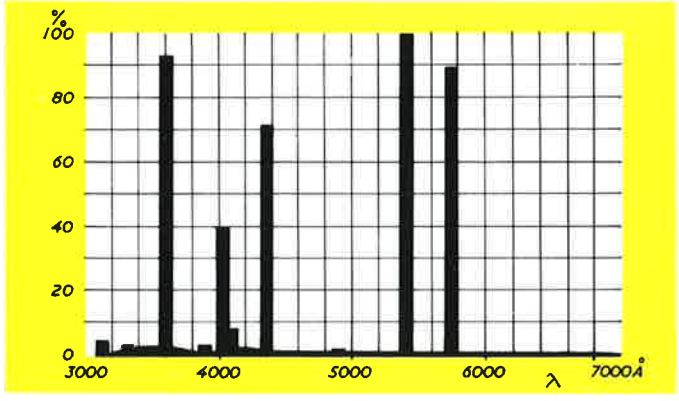


HPR LAMP

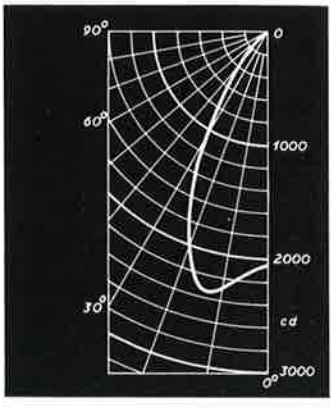
Owing to the bluish-white light with strong actinic radiation, the HPR 125 W mercury-vapour lamp with internal reflector is particularly suitable for black-and-white reproduction and copying processes. It is also widely used as a floodlight lamp and - when a separate Wood's glass filter is applied - as a "black light" lamp, the reflector ensuring a homogeneous beam of radiation.

Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Base	Diam.	Overall length
HPR 125 W	57205 E/99	125	1.15	E27	110	222

RELATIVE SPECTRAL ENERGY DISTRIBUTION



LIGHT DISTRIBUTION DIAGRAM

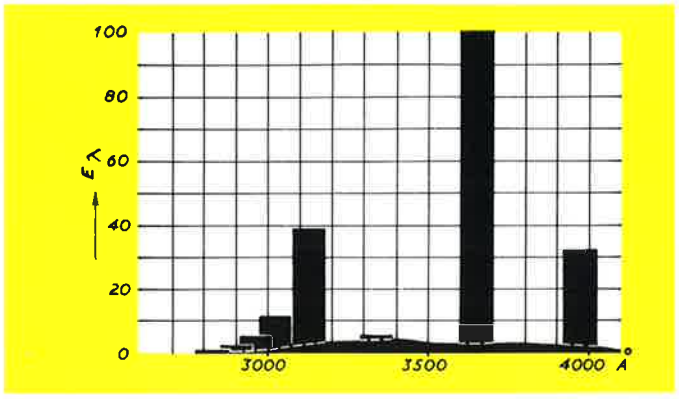


SUNLAMP MLU

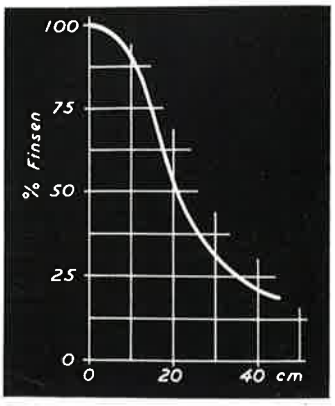
The sunlamp MLU 300 W is a tungsten mercury lamp, built on the principle of the blended-light lamps MLL. The built-in filament acts as a current-limiting device and consequently this lamp can be operated direct from the mains without the aid of a ballast.
Besides visible light, strong ultra-violet radiation is also emitted as well as infra-red radiation. The bulb is made of hard glass which filters out radiation below 2800 Å. The internal reflector ensures a homogeneous beam of radiant energy. - These characteristics make the lamp eminently suitable as a sunlamp for home use.
Besides, the MLU 300 W lamp also finds application in the preheating and drying processes of plastics.

Lamp type	Catalogue number	Mains voltage V	Lamp current A	Finsen output F	Power factor	Base	Diam.	Overall length
MLU 300 W	57265 F/28	220	1.4	21	0.97	B22 III	125	177

RELATIVE SPECTRAL ENERGY DISTRIBUTION



ERYTHEMAL ENERGY INTENSITY CURVE

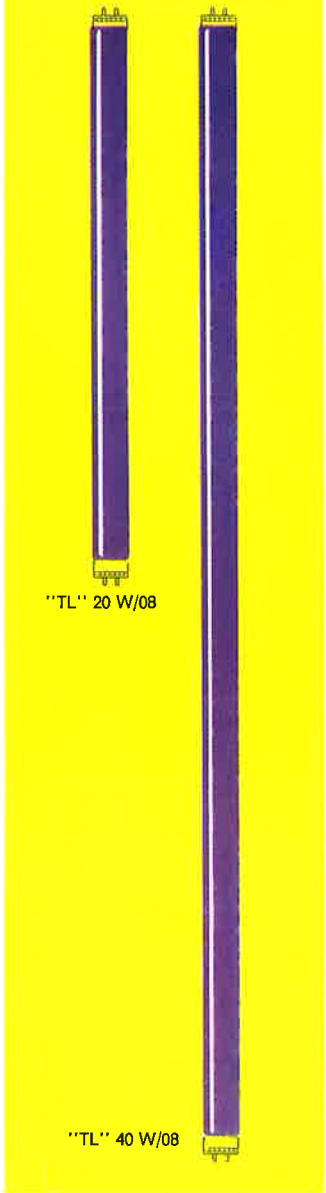


BLACK LIGHT BLUE LAMPS

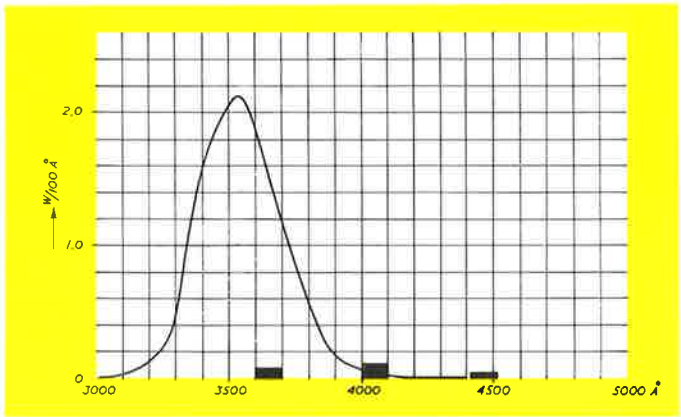
Black light blue fluorescent lamps are tubular low-pressure mercury-vapour lamps. The bulb consists of dark blue glass, transparent for ultra-violet and opaque for visible radiation. The ultra-violet radiation is emitted by a fluorescent powder layer on the inside of the tube, which converts the arc's energy into long-wave ultra-violet with a maximum emission at 3500 Å.
Black light blue lamps are applied for the excitation of the "luminescence" phenomenon; for applications, see HPW lamp mentioned below.
A minimum of visible light is produced by the lamp as this would interfere with the luminescent colour.
The lamps are operated from a.c. mains, in series with a ballast and with a suitable starter in circuit. These accessories are identical with those used for standard fluorescent lamps of the same rating.

FEATURES

- Radiation in the long-wave ultra-violet part of the spectrum gives maximum efficiency.
- The tube being made of a deep-blue glass, no separate filter is necessary.
- The tubular shape is excellently suited to applications where uniform radiation at a short distance is needed over a large surface.



ABSOLUTE SPECTRAL ENERGY DISTRIBUTION OF "TL" 40 W/08



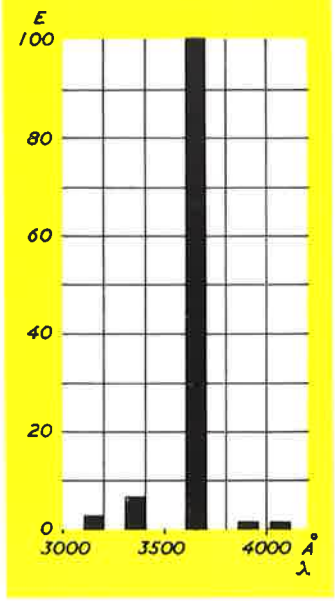
Catalogue number	Lamp voltage V	Lamp current A	Cap	Diam.	Overall length 1)
"TL" 20 W/08	57	0.39	Standard bipin	38	604
"TL" 40 W/08	106	0.44		38	1213

1) Inclusive of pins.

HPW 125 W LAMP

The HPW 125 W black light lamp is a super-high-pressure mercury-vapour lamp, consisting of a quartz discharge tube in an outer envelope of black Wood's glass. It constitutes a source of invisible radiation for the excitation of the phenomenon "luminescence". Because of easy mounting and simplicity of operation, this lamp is used for the most varied purposes, e.g. for analysis and detection in chemical, sugar and textile industries, in food production, philately, mineralogy, banking, criminology and medicine.

RELATIVE SPECTRAL ENERGY DISTRIBUTION



Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Base	Diam.	Overall length
HPW 125 W	57236 E/70	125	1.15	E27	75	177

TUV 6 W LAMP

The TUV 6 W germicidal lamp works on the principle of a glow discharge. It operates on 220/230 V mains tension without the use of a ballast. The absence of ballasts is an additional advantage, facilitating the application of this lamp in spaces of reduced dimensions.
Owing to its small size, the TUV 6 W germicidal lamp constitutes an inexpensive and handy source of ultra-violet radiation, used in analysis by means of the phenomenon "luminescence", in refrigerators and in vending machines for liquids.

TUV 6 W

Lamp type	Catalogue number	Nom. voltage V	Lamp current A	Energy output UV 2537 Å mW	Base	Diam.	Overall length
TUV 6 W	57416 E/40	220	0.027	85	E27	26	150

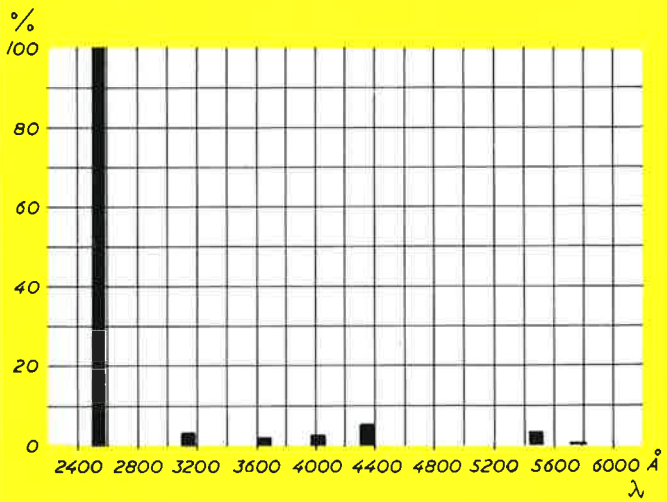
TUV GERMICIDAL LAMPS

Essentially, TUV germicidal lamps are low-pressure mercury-vapour lamps, just as fluorescent lamps, however without a phosphor coating and using a glass which transmits efficiently the short-wave ultra-violet. TUV lamps radiate most of their energy at the 2537 Å-line, which is very near the wavelength most effective in destroying bacteria and moulds. They are widely used in hospitals, cold-storage rooms, cheese warehouses, pharmaceutical industries, dairies, breweries, bacteriological research institutes, etc.
TUV lamps must be used with caution. Affected skin (erythema) and eyes (conjunctivitis) may be the result of long exposures.

TUV 15 W

TUV 30 W

RELATIVE SPECTRAL ENERGY DISTRIBUTION



BALLASTS

TUV lamps 15 W and 30 W have been designed along the same electrical lines as the normal fluorescent lamps of the same rating and they therefore need exactly the same type of ballasts and other accessories. For data on ballasts and accessories, see pages 86 and 94.

Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Energy output UV 2537 Å W	Cap	Diam.	Overall length 1)
TUV 15 W	57415 P/40	53	0.33	3.5	Standard bipin	26	451
TUV 30 W	57413 P/40	100	0.37	8.0		26	908

1) Inclusive of pins.

OZONE LAMP 4 W

The Philips ozone lamp has a special glass bulb which transmits the 1850 Å wavelength. This ultra-violet radiation converts oxygen into ozone. Moreover, a small amount of germicidal radiation is emitted at 2537 Å.

The OZ 4 W lamp eliminates or minimizes odours in spaces up to approx. 30 m³. The lamp is used for air deodorization, in small cabinets for sterilization, and in drying-apparatus to give dried clothes a fresh smell.

Ozone lamps are operated either on a.c. or d.c. and on any circuit voltage above 20 V. Several lamps may be operated in series from a single ballast.

OZ 4 W

Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Energy output 1849 Å 1) mW	Base	Diam.	Overall length
OZ 4 W	57901 M/30	10 - 12	0.35	1	E14	34	59

1) Ozone formation.

COMPACT SOURCE LAMPS CS

CS lamps are super-high-pressure mercury lamps. They are characterized by a very high energy concentration in the smallest possible dimensions. This results in a high brightness hitherto unknown for such an uncomplicated light source. Moreover, CS lamps give very high energy radiation in the middle and long wave ultra-violet.
Compact source mercury lamps are operated on a.c. or d.c. and have natural cooling. They consist of an elliptical quartz discharge tube with two diametrically placed electrodes. The 150 W size has a tubular outer bulb of hard glass, which transmits the visible and long wave ultra-violet.
Philips compact source lamps are the result of extensive research in the laboratories, combined with close contact with the market. They have some distinct advantages over many other types of lamps: they have a small concentrated point source, a high intrinsic brightness, a radiation of high actinic value and low heat content.

APPLICATIONS

Compact source lamps provide the solution when light sources are needed with a higher luminance — in the visible region — or radiation sources with a high intensity in the ultra-violet region. Examples of applications are as follows: microfilm enlargers, recording and measuring instruments, searchlights, microscopy, zone melting, photochemistry.

Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Lum. flux lm	Luminance cd/cm²	Burning position [1]	Av. life [4] h	Diam.	Overall length
CS 100 W	57178 AR/51	20 d.c.	5	2000	170000	vertical ± 90°	200	9.5	87.5
CS 150 W	57141 C/92	66 d.c.	2.3	7000	25000	vertical	200	35	140
	57177 C/92	66 a.c.	2.7	7000	25000	vertical	200	35	140
CS 200 W	57179 AR/51	57 d.c.	3.5	10000	45000	vertical ± 20°	400	17	124
CS 500 W	57142 AR/51	77 d.c.	6.5	29000	30000	vertical ± 20°	400	28	170
		[2] a.c.	[3]	29000	30000	vertical ± 20°	200	28	170
CS 1000 W	57176 AR/51	80 d.c.	12.5	50000	35000	vertical ± 15°	400	46	288
		80 a.c.	14.5	50000	35000	vertical ± 15°	200	46	288

1) Anode down.
2) 81 or 73.5 V, } dependent on the connections to the
3) 7.1 or 7.8 A, } tappings of the power supply unit.
4) Based on an average of 3 burning hours per switching.

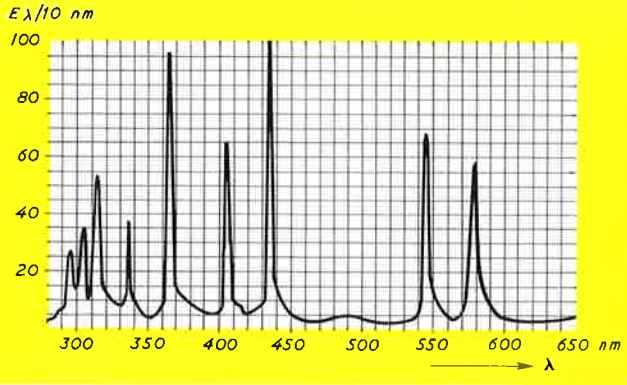
BALLASTS

Compact source lamps being gas-discharge lamps, they need some form of current-limiting device or ballast.
For the CS 150 W lamp complete gear is normally available, either for 220 V 50 c/s or for 110 V 60 c/s. Gear for the other lamps is usually made according to the specific requirements of the equipment maker.
Technical information on the requirements to be met when designing rectifiers, ignition devices and induction coils is obtainable on application.

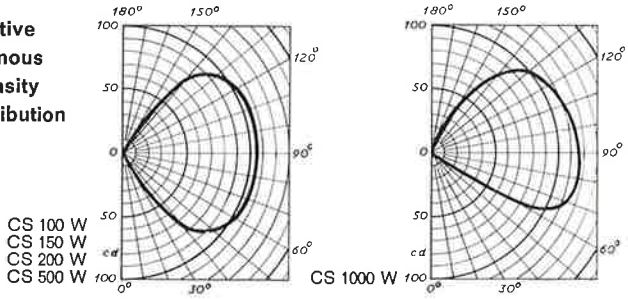
Power supply unit for CS 150 W

Catalogue number	Nom. voltage V	Mains current A	Power factor	Losses W	Dimensions
103783	220	2.0	0.40	30	260 x 170 x 130

SPECTRAL ENERGY DISTRIBUTION

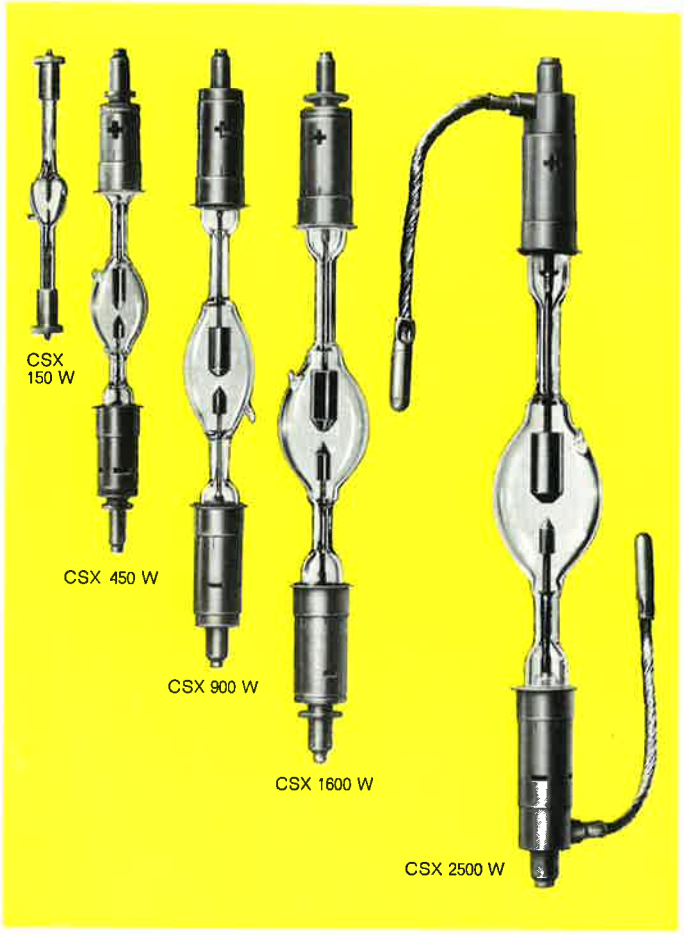


Relative luminous intensity distribution



COMPACT SOURCE XENON LAMPS CSX

CSX lamps are super-high-pressure xenon lamps. They combine the very high brightness and maximum arc stability of the standard CS lamps with a colour rendition which closely resembles daylight. Moreover, the light colour of compact source xenon lamps is independent of variations in the supply voltage and it remains unchanged even when the luminous flux is being regulated.
Another advantage of these lamps is that the optical adjustment remains constant when once set and that they are perfectly clean in operation. CSX lamps are only developed for d.c. supply. They have the same elliptical quartz discharge tube as the CS lamps. All CSX lamps should burn vertically, cathode (smaller electrode) down. The positive of the supply voltage is to be connected to the upper electrode.
Information on the design of lamp housings for CSX lamps can be obtained on request.



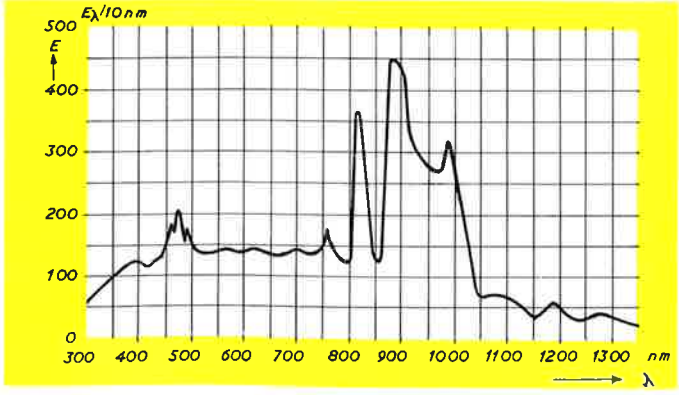
APPLICATIONS

Compact source xenon lamps can be used in a wide range of applications, especially where previously other, less convenient light sources had to be utilized or where no sources were available at all. Application examples are as follows: cinema projection, colour matching, scientific purposes (microscopy), small spotlights, spotlights in film studios, background projectors, beacons, zone melting.

Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Lum. flux lm	Luminance cd/cm²	Colour temperature °K	Burning position [1]	Av. life [2] h	Diam.	Overall length
CSX 150 W	57146 AR/51	20	7.5	2300	9000	6060	vertical ± 15°	1200	20	150
CSX 450 W	57143 AR/51	18	25	12000	40000	6300	vertical ± 30°	2000	29	262
CSX 900 W	57144 AR/51	21	43	30500	55000	6300	vertical ± 30°	2000	38	325
CSX 1600 W	57145 AR/51	25	64	60000	70000	6300	vertical ± 30°	2000	47	370
CSX 2500 W	57180 AR/51	30	83	100000	72000	6300	vertical ± 30°	1500	57	428

1) Cathode down.
2) Based on an average of 20 burning minutes per switching.

SPECTRAL ENERGY DISTRIBUTION



RECTIFIERS

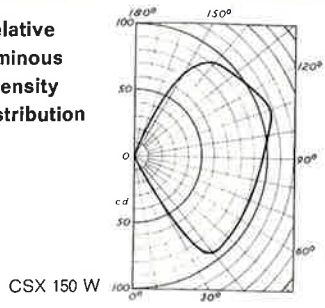
As said before, CSX lamps are operated on d.c. supply. In case no d.c. supply is available, a suitable rectifier of sufficient power is necessary. All information on the design and testing of rectifiers which fulfil the Philips requirements for obtaining optimum life, can be provided on application.

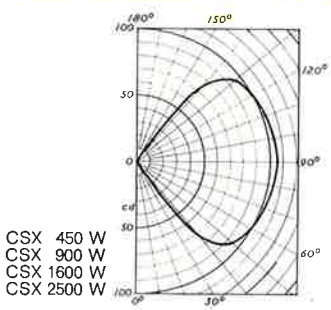
IGNITION DEVICES

Every CSX lamp needs an ignition device to ensure reliable starting. The output of these devices being about 30 - 40 kV, the connection wire between the high-voltage terminal and the lamp base should be as short as possible. Best results will be obtained with copper wire of 6 mm² with a maximum length of 30 cm, insulated by porcelain beads. The minimum distance between this wire and metallic parts should be 5 cm.

For lamps	Catalogue number	Ignition voltage kV	Dimensions
CSX 150 W	103940	28	162 x 90 x 100
CSX 450 W	103944	40	190 x 130 x 118
CSX 900 W	103942	40	230 x 160 x 199
CSX 1600 W	103943	50	230 x 160 x 199
CSX 2500 W	126149	50	230 x 160 x 199

Relative luminous intensity distribution





SPECTRAL LAMPS

Philips have developed a range of spectral lamps, which consist of a small discharge tube enclosed in a cylindrical outer bulb. The discharge tube is filled with a gas, a metallic vapour or a mixture of both and the electrodes permit a very high current density. In this way, a light source is obtained capable of emitting considerable energy in one single spectral line or in a few lines. These strongly monochromatic light sources are an important aid for physical and chemical experiments and for tests where visible or ultra-violet radiation plays a part. For most experiments it is necessary that the different sources be interchangeable both as regards electrical and geometrical characteristics. Hence, all Philips spectral lamps have identical outer dimensions as well as an identical light centre length, ensuring complete interchangeability.

Hg (low pressure) Hg (high pressure) Na Rb He

APPLICATIONS

Spectral lamps can be applied in all kinds of biological, chemical and physical experiments, such as interferometry, polarimetry, refractometry and spectroscopy.

FILTERS

In some cases it may be desired to separate a part of the spectrum or even to arrange that only light of one wavelength is emitted. A special filter has then to be used or, if under certain conditions it is not possible to achieve this with filters, a monochromator will have to be placed in front of the lamps. Should it be necessary to eliminate the infra-red radiation, then extra filters have to be added.
None of the filters in question are supplied by Philips; names of suppliers are available on request.

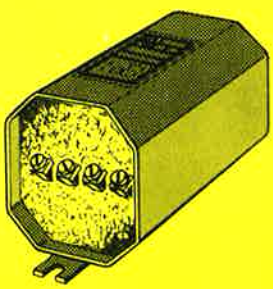
	Gas or vapour	Catalogue number 1)	Wattage W	Lamp current A	Outer bulb	Arc length mm
For visible spectra	Hg (low pressure)	93123	15	approx. 0.9	glass	40
	Hg (high pressure)	93136	90		glass	30
	Cd	93162	25		glass	30
	Zn	103137	25		glass	30
	Hg, Cd, Zn	93145	90		glass	30
	He	93098	45		glass	32
	Ne	93099	25		glass	40
	A	93100	15		glass	40
	Kr	93101	15		glass	40
	Xe	93102	10		glass	40
	Na	93122	15		glass	40
	Rb	93104	15		glass	40
	Cs	93105	10		glass	40
	K	93103	10		glass	40
	In	103778	25		quartz	25
	Tl	126121	20		quartz	30
	Ga	126162	20		quartz	30
For ultra-violet spectra	Hg (low pressure)	93109	15	approx. 0.9	quartz	40
	Hg (high pressure)	93110	90		quartz	30
	Cd	93107	25		quartz	30
	Zn	93106	25		quartz	30
	Hg, Cd, Zn	93146	90		quartz	30
	In	103778	25		quartz	25
	Tl	126121	20		quartz	30
	Ga	126162	20		quartz	30

1) Base: E27; diam.: 30; overall length: 174; lcl.: 110.

PHOTOGRAMS OF THE SPECTRA

AUTO-LEAK TRANSFORMERS

For the sake of easy ignition it is better to use a higher voltage than the mains tension. For that purpose an auto-leak transformer with an open circuit voltage of 470 V and with a primary voltage of 110/125 or 220 V can be supplied.



Catalogue number	Mains voltage V	No-load voltage V	Primary current A	Operating current A	Dimensions l x b x h
59011 AH/00	220	490	2.10	0.9	205 x 110 x 116
59003 BT/02	110/125	470	4.10/3.80	0.9	175 x 104 x 130

DEUTERIUM AND MERCURY SPECTRAL LAMPS

The deuterium lamp produces a continuous spectrum with, above 4000 Å, the Balmer-lines and the strongest lines of the multi-line-spectrum of deuterium. The mercury lamp dissipates its energy in the well-known lines only.

Lamp type	Catalogue number	Lamp voltage V	Lamp current A	Bulb	Av. life 1) h	Diam.	Overall length
Deuterium lamp	126138	60 - 90 d.c.	0.3 d.c.	quartz	200	30	71
Mercury lamp	103687	15 - 20 d.c.	0.3 d.c.	quartz	200	30	71

1) Life after which energy output is 65% of the 0-hour value.

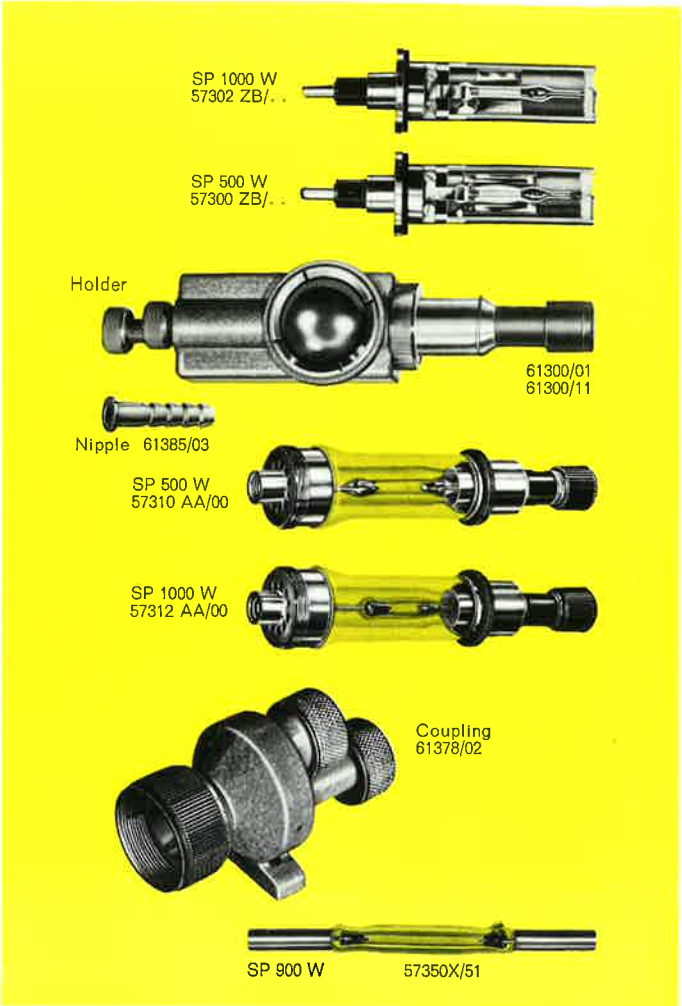
FORCED-COOLED SUPER-HIGH-PRESSURE MERCURY LAMPS SP

Philips manufacture a series of super-high-pressure mercury lamps with forced cooling, the SP lamps. Light from SP lamps is whiter than that produced by ordinary mercury lamps due to the internal pressure, which is very high. They constitute small light sources having a high level of brightness and a high efficiency. Additional features are, furthermore, that maximum luminous efficiency is reached at once and that the lamps re-ignite immediately.

In many instances Philips SP lamps have proved to be an invaluable aid in obtaining a high degree of accuracy and in realizing large economies of labour and materials. They are used in the ship-building industry, in factories making railway carriages, large boilers and containers, and heavy machinery generally. Philips SP lamps are also being applied in ceilometers, photography, photochemical processes, film and micro-projection, and in equipment which measures or checks by means of an optical system, e.g. for profile scanning in grinding and milling machines. Their use is also general for checking ball bearings, typewriter components, watch parts and in other precision industries.

The 500 W and 900 W lamps are used on a.c., the 1000 W lamps on d.c. The 500 W and 1000 W lamps are made in two versions: either to radiate freely in all directions or to emit a directed radiation. The 900 W size is a quartz discharge tube only, without a housing.

SP 500 W and 1000 W lamps have water-cooling, the SP 900 W is air-cooled. The discharge produces a considerable quantity of UV-radiation. With the exception of the SP 900 W lamp, this radiation is for the greater part absorbed by glass parts in the lamp jacket. With the lamps designed for directed radiation these glass parts may be replaced by corresponding parts of quartz which transmits the ultra-violet radiation.



Lamp type		Catalogue number	Lamp voltage V	Lamp current A	Lum. flux [1] lm	Luminance [1] cd/cm²	Luminous length	Overall length
SP 500 W	for directed radiation	57300 ZB/. . [2]	450 a.c.	1.4	15000	25000	12.5	93
SP 1000 W		57302 ZB/. . [2]	500 d.c.	1.9	30000	45000	12.5	93
SP 500 W	for free radiation	57310 AA/00	550 a.c.	1.4	30000	25000	12.5	appr. 110
SP 1000 W		57312 AA/00	700 d.c.	1.9	60000	45000	12.5	appr. 110
SP 900 W		57350 X/51	800 a.c.	1.5	50000	22000	25	81

[1]) With reflector and cover.
[2]) With clear or frosted glass cover: /00 or /07 resp.
With clear or frosted quartz cover: /51 or /52 resp.

BALLASTS

Philips SP lamps are operated with a leak-transformer for a.c. operation (500 W and 900 W lamps) or with a rectifier for d.c. operation (1000 W lamps). The 500 W lamps can be connected to mains voltages between 105 and 380 V, 50 c/s, the 900 W lamp to voltages of 205, 215, 225 V, 50 c/s.

The 500 W leak-transformer is shown opposite.

Detailed information on ballasts and rectifiers for various voltages and frequencies will be supplied on request.

SUPER-HIGH-PRESSURE PULSED MERCURY LAMPS SPP

The SPP 800 W and 1000 W lamps are super-high-pressure mercury lamps, primarily developed for cinema projectors and for operation from a pulsator producing a pulse frequency of 60 - 120 pulses per second. For the 1000 W version, a correction filter can be applied if desired, in order to obtain a better colour balance.


Aluminium reflector

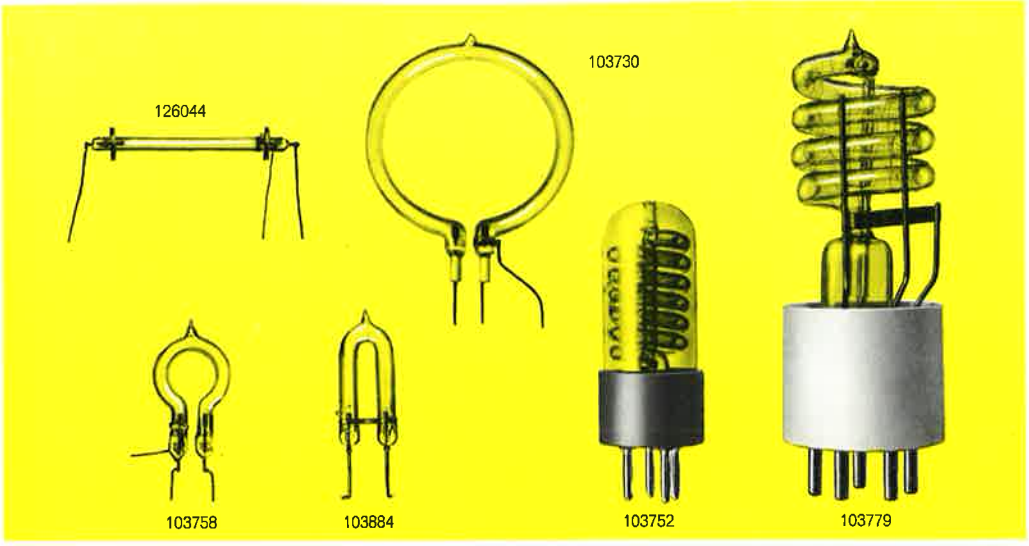
Lamp type	Catalogue number	No-load voltage V	Effective arc current A	Pulse frequency /sec	Pulse duration msec	Efficiency lm/W	Luminous length	Overall length
SPP 800 W	57356X/51 [1]	1100	2	60 - 120	appr. 2.5	50	16	80
SPP 1000 W	57358/51 [1]	1200	2.1	60 - 120	appr. 2.5	60	16	80

[1]) Inclusive of two reflectors.

DISCHARGE FLASHLAMPS

Philips xenon flashlamps are hard glass or quartz discharge lamps of different shapes, with xenon filling. An electrical discharge is passed through the tube to create an intensive light flash with a daylight spectrum (colour-temperature approx. 5000 - 6000 °K) of very short duration. These light sources, therefore, are eminently suitable for making sharply defined photographic negatives or for signaling installations. They are characterized by: high efficiency, optimum flash duration, reliable ignition, low tolerance in luminous flux, easy maintenance.

The flashlamps dealt with in this catalogue have been designed in accordance with the requirements of makers of flash equipment.

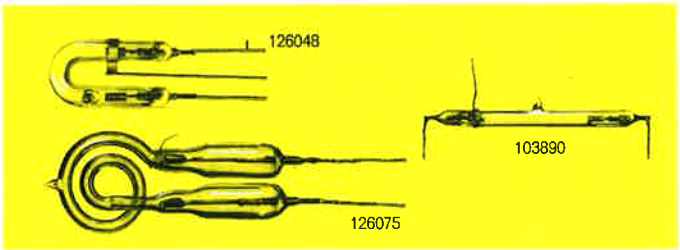


Lamp type [1]	Energy per flash Wsec. Nom.	Energy per flash Wsec. Max.	Anode Voltage V Min.	Anode Voltage V Max.	Max. flash frequency flashes/min.	Life (number of flashes)	Material of discharge lamp	Main capacitor µF	Overall length
103730	1000	1500	2400	3000	0.5	1000	Quartz	220	100
103752	800	1100	2400	3400	1	1000	Quartz	240	100
126044	60	80	400	500	3	3000	Glass	500	70
103758	60	70	380	510	9	10000	Glass	500	40
103779	45	52	1700	1950	120	3.5×10^6	Glass	32	153
103884	40	42	450	550	9	10000	Glass	280	41

[1]) These lamps are a choice from many flashlamps manufactured in the course of time. Other types are regularly being developed. Up-to-date documentation is available on request.

XENON STROBOSCOPIC FLASHLAMPS

Xenon stroboscopic flashlamps are xenon-filled lamps, which give very short and intensive flashes with a high flash-frequency. With these lamps high-speed rotating, vibrating or reciprocating mechanisms can be observed clearly. They are applied in the nautical and aeronautical, in the electrical and electronic fields, in the textile and printing industries, in medicine and in photography.



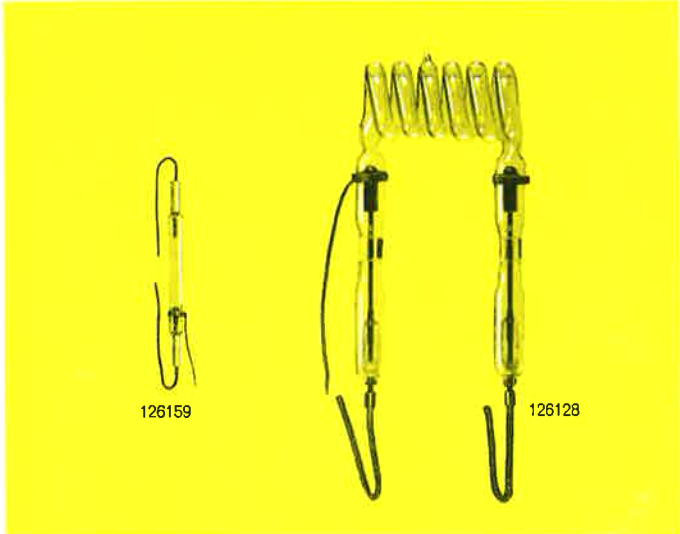
Lamp type	Nom. energy Ws	Anode voltage V Min.	Anode voltage V Max.	Flash frequency fl./sec.	Flash duration µsec.	Ignition voltage V	Life at nom. energy and 50 c/s	Overall length
103890	4	300	500	0 - 300	<10	10000	>100	70
126048	6	300	500	0 - 300	<7	10000	>100	42
126075	40	1200	1700	0 - 500	<10	10000	>100	74

LASER PUMPING FLASHLAMPS

For solid-state lasers Philips have developed two special xenon flashlamps with which the rubies can be pumped above their threshold level.

The most efficient way in which the straight flashlamp, type 126159, can be used is to mount the lamp in one focus of an elliptical reflector and the laser rod (ruby) in the second focus of the same reflector. All the energy dissipated by the lamp is consequently concentrated in the ruby.

The helix flashlamp, type 126128, is a very high-power flashlamp which operates on a high voltage. By means of this flashlamp a very simple laser can be built, as the laser rod can be set up along the axis of the helix of the flashlamp. Hence, without the aid of adequate reflectors, the laser rod can be brought above its threshold level.



Lamp type	Energy per flash Wsec Nom.	Energy per flash Wsec Max.	Anode voltage V Min.	Anode voltage V Max.	Max. flash freq. fl./min.	Main capacitor at Nom. load µF	Main capacitor at Max. load µF	Inductance to connect in series µH	Life (number of fl. with inductance)	Flash duration µsec.	Overall length
126159	250	500	750	3000	2	125	250	40	1000	200	120
126128	1500	10000	1500	5000	1	250	1600	0.5	1000	<2000	210

PHILIPS FITTINGS FOR INDOOR LIGHTING

When switching on the light, most people do not realize that they are witnessing the result of a made-to-measure lighting scheme, scientifically combining the correct light sources with specially developed fittings and thus providing the necessary quality and quantity of light.

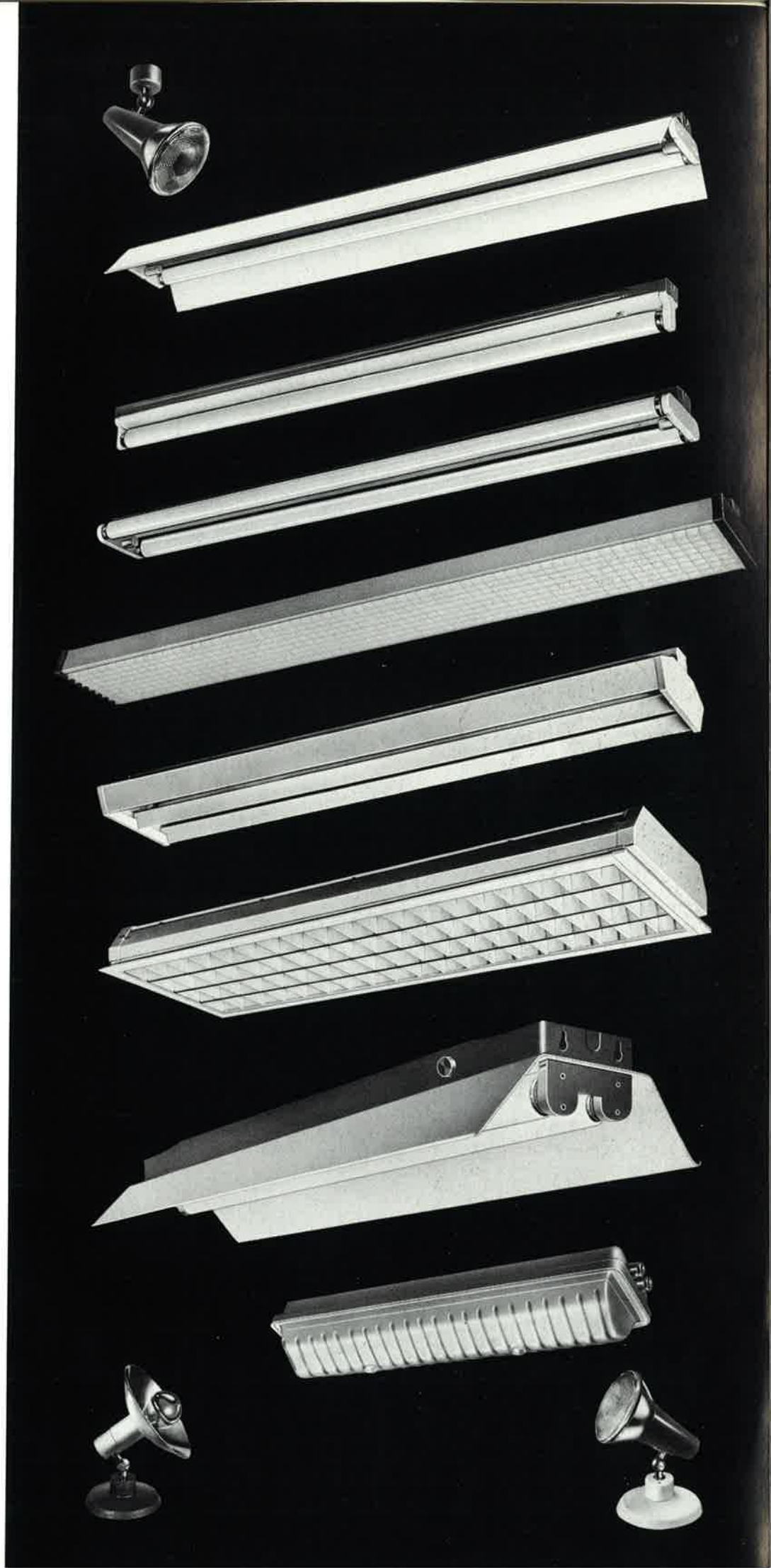
Philips lead the world in lighting because Philips can supply all elements to create the perfect lighting scheme for every application. In this scheme the fitting is of major importance.

It is by no means a simple matter to make a fitting elegant and, at the same time, conform to lighting-engineering, temperature and installation requirements. Designing a new lamp is frequently much easier than designing a new fitting.

In any case, specialists are needed in all fields — lighting engineers, electrical and design experts — perfectionists who are not satisfied with a compromise.

This page can give no more than a limited survey of the wide variety of fittings for indoor lighting, designed and produced by Philips. There are special publications devoted to this subject.

The important point is to realize that Philips feel responsible for the right application of their lamps, through the use of efficient fittings. This applies not only to fittings for special lamps, but to the entire range of fittings, including those which are used in the home.



PHILIPS FITTINGS FOR OUTDOOR LIGHTING

When driving on a road, most people do not realize that they are witnessing the result of a made-to-measure lighting scheme, scientifically combining the correct light sources with specially developed fittings and thus providing the necessary quality and quantity of light.

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The important point is to realize that Philips feel responsible for the right application of their lamps, through the use of efficient fittings. This applies not only to fittings for special lamps, but to the entire range of fittings, including those which are used in the home.

The Philips Company have for many years considered research in the street-lighting sector and the full use of their many facilities for development in this field, as a special duty.
The open-air laboratory shown here is an excellent means to contribute effectively to finding up-to-date solutions for the problems involved.

PHILIPS AIRPORT-LIGHTING EQUIPMENT

A full range of Airport-Lighting equipment has been developed which has been approved by several institutions in this particular field. The range includes:

- **Approach lights**
- **Runway lights**
- **Threshold lights**
- **Taxiway lights**
- **Obstruction lights**
- **Airport lamps**
- **Lamp transformers**
- **Constant-current regulators**
- **Control panels**
- **Apron floodlights**

In view of the complexity of special demands involved in the installation of any airport-lighting system, it is advisable to apply to your nearest Philips Office, which will gladly supply the information required.

For approach lighting, unidirectional as well as omnidirectional fittings are supplied. For the approach lighting systems of instrument-approach runways and precision-approach runways the Philips unidirectional approach lights PS24 or PS28 are used, whereas for approach lighting systems of non-instrument runways the omnidirectional approach light PS22 is applied. This latter fitting is also used in combination with unidirectional approach lights to provide circling guidance.

Both elevated-type and flush-type fittings are supplied for runway and threshold lighting. The Philips elevated types are the high-intensity bidirectional runway and threshold light PS16 and the medium-intensity bidirectional or low-intensity omnidirectional fitting PS22. The high-intensity runway light PS25 and the low-intensity runway light PS26 are flush-type fittings for recessed mounting in the concrete along the runway or threshold. For the lighting of taxiways either elevated taxiway lights PS22 or flush-type taxiway lights PS26 may be used. The elevated fitting PS22 can be supplied with a daylight marker cone.

For the lighting of obstructions the PS14 obstruction light is used. A double-light version can also be supplied. The fitting is manufactured for multiple or for series circuits.

Control panels are built to order in conformity with the requirements of our customers. They can be provided with the on/off switches, selector switches, indicator lamps, mimic diagram and all other controls required for the remote control of all the airport lighting circuits.

The Philips constant-current regulators are of the static type, provided with contacts for positive back-indication and lightning arresters. If required, they can be provided with brightness control and circuit selectors.

Series isolating transformers can be supplied either completely enclosed in synthetic rubber or in a compound-filled cast-iron housing.

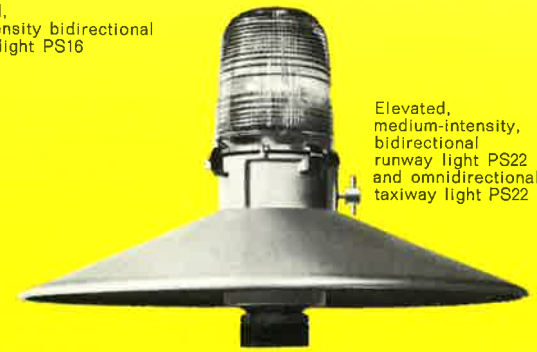
Omnidirectional approach light PS22

Unidirectional approach light PS24

Unidirectional approach light PS28

Omnidirectional approach light PS22 with daylight marker cone

Elevated, high-intensity bidirectional runway light PS16



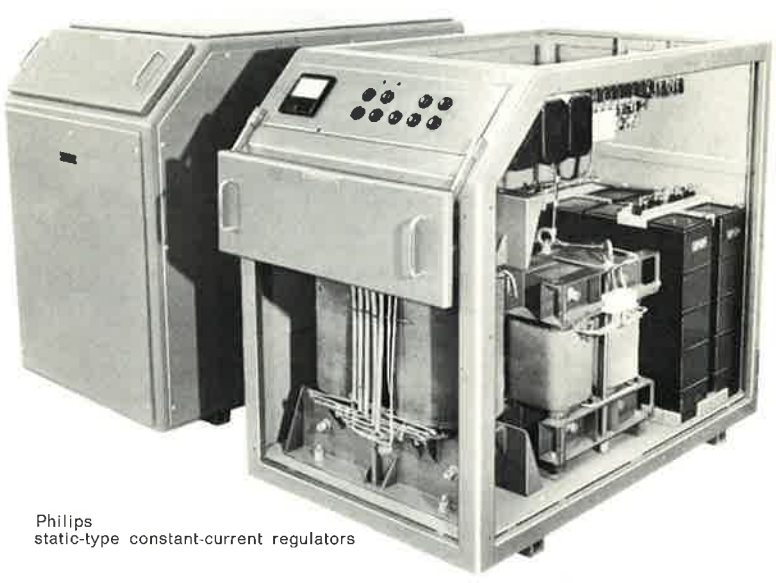
Elevated, medium-intensity, bidirectional runway light PS22 and omnidirectional taxiway light PS22

Obstruction light PS14

Flush-type, low-intensity runway and taxiway light PS26

Flush-type, high-intensity runway light PS25

Airport-lighting control console with mimic diagram

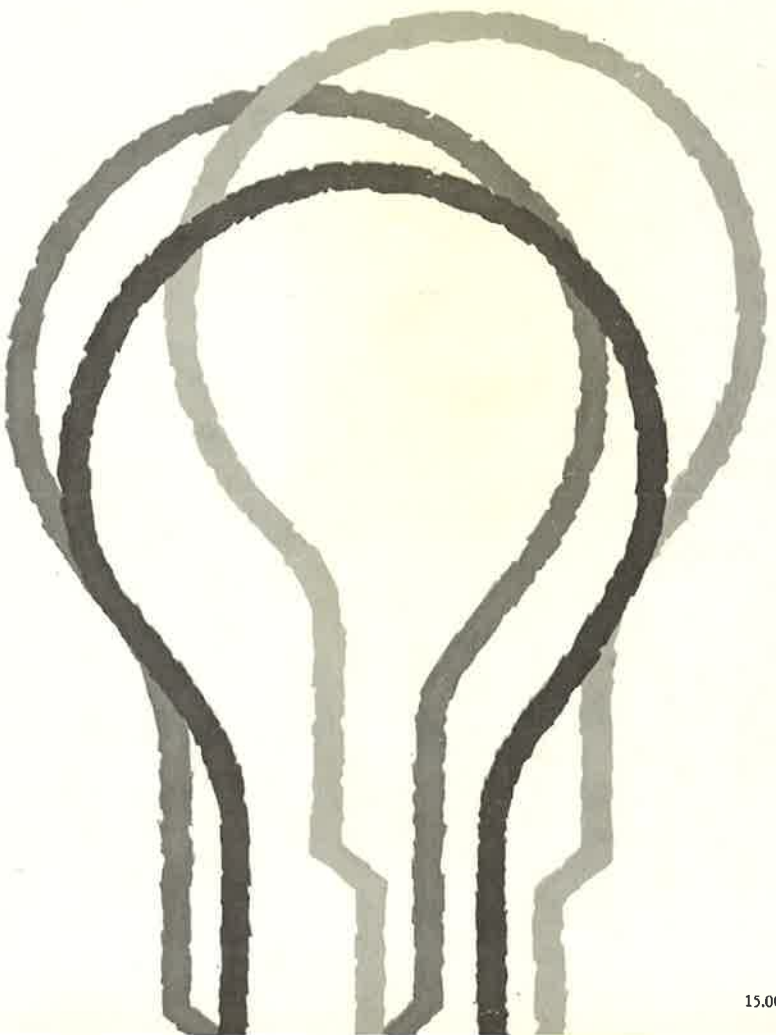


Philips static-type constant-current regulators

Synthetic-rubber-encased series isolating transformers

Series isolating transformer in cast-iron housing

INDEX OF LAMP TYPES



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