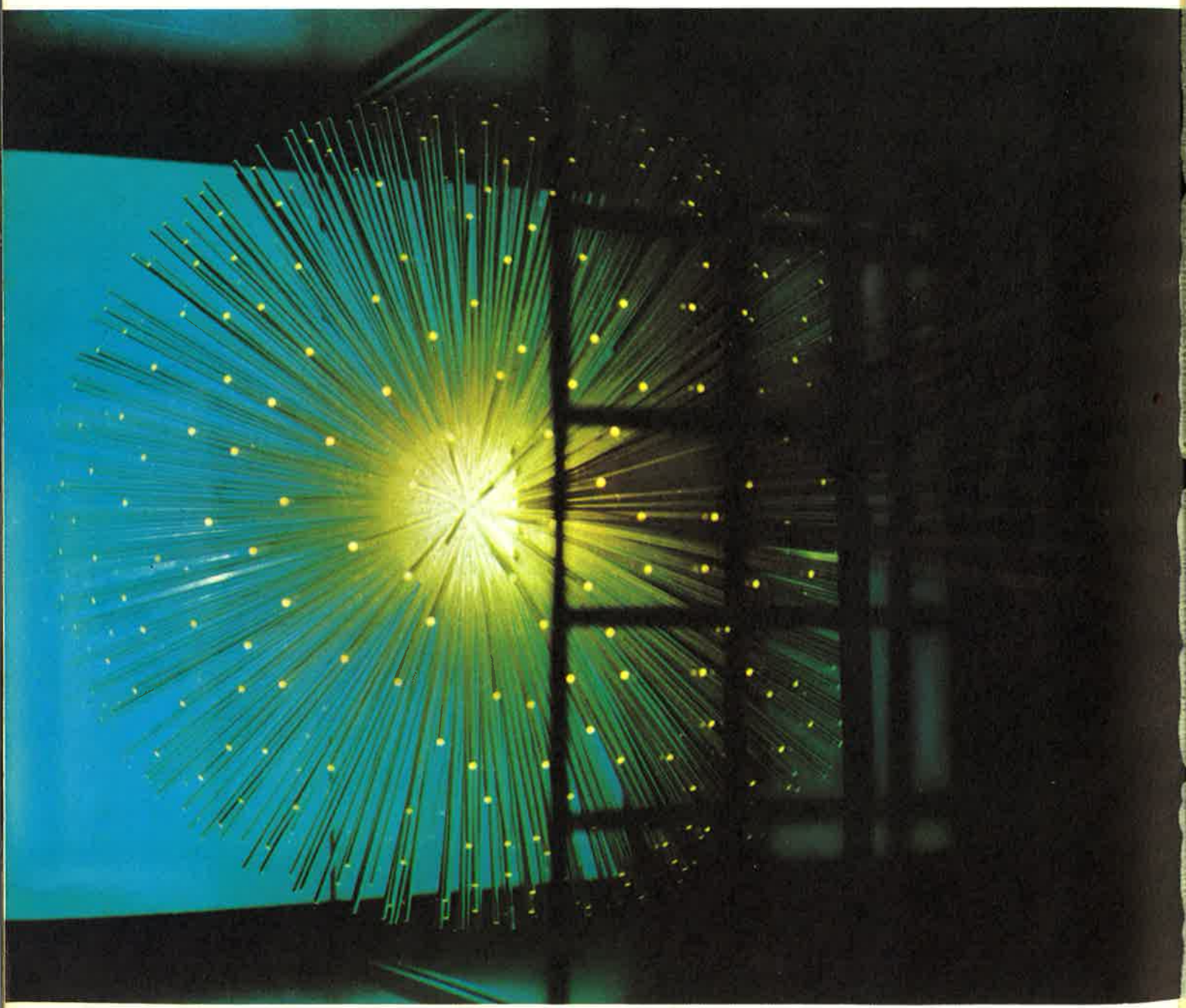
PHILIPS

PHILIPS

lamp catalogue



PHILIPS

lampcatalogue

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 detection 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, Philips produce lamps and fittings of over 40,000 different types which are marketed by sales organizations in nearly every country of 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 each and every field of application. Backed by a fund of knowledge accumulated during three quarters of a century, the Philips organizations give expert advice wherever high-quality lighting is needed.

PHILIPS LEAD THE WORLD IN LIGHTING!

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PAGES B 1 - B 27

Standard range "TL" lamps - Reflector lamps "TL"F - Rapid-start lamps "TL"(M) RS - "Double-flux" rapid-start lamps "TL"(M) RS - Universal lamps "TL"A - Lamps for D.C. operation type "TL"C - Instant-start lamps, types "TL"R, "TL"S and "TL"X - Slimline lamps - Ballasts - Apparatus for dimming installations - Transistor ballasts - Lampholders - Starterholders - Starters

GAS-DISCHARGE LAMPS
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Mercury fluorescent lamps - Mercury reflector fluorescent lamps - Mercury lamps - Blended-light lamps - Mercury halide lamps - High-pressure sodium lamps - Low-pressure sodium lamps - Ballasts - Ignitors

PHOTO AND PROJECTION LAMPS
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"Photoflux" lamps - Lamps for general photographic lighting - Discharge flashlamps - Narrow-gauge projection lamps - Sound-film exciter lamps - Microprojection lamps - Episcope lamps - Epidiascope lamps - Theatre lamps - Studio lamps - Projection lamps (horizontal and vertical) - Linea lamps - Tubular projection lamps - Floodlighting lamps - Operating-theatre lamps - Locomotive headlight lamps - Lighthouse and beacon lamps - Airport lamps

MINIATURE LAMPS
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Telephone lamps - Newscaster lamps - Miners' lamps - Dial lamps - Midget and sub-miniature lamps - Flasher lamps - Flashlight lamps - Lenslite lamps - Lens-end lamps - Bicycle lamps - Wedge-base lamps - Motorcar lamps - Train lamps - Boat lamps - Lamps for optical signaling - Current-indicator lamps - Aircraft lamps - Neon glow lamps

LAMPS FOR SPECIAL PURPOSES
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Infra-red lamps for agricultural purposes - Infra-red lamps for industrial purposes - Infra-red lamps for copying purposes - Pulsed xenon lamps - Light-printing lamps - Compact-source lamps - Actinic "TL" lamps - Repro lamp - Lamp for photochemical processes - Lamp for plant irradiation - Sunlamp - Forced-cooled mercury lamps - Spectral lamps - Laser pumping flashlamps - Germicidal lamps - Ozone lamp - Blacklight lamps

FOR A VARIETY OF PURPOSES- A VARIETY OF LAMPS

Right up to the twentieth century there was hardly any distinction in the use of light sources. Candles and oil lamps were used in churches, in palaces, in homes, in castles. People who wanted more light, and who could afford it simply took more candles, more oil lamps or more torches.

This very limited range of light sources was used for all needs: 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 make much difference in this respect.

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 distinction. 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 source. 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. The immense range of types 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 half-century, happened in the last fifteen years with fittings. Originally, they had the sole task of protecting the lamp. There is, however, a growing awareness now that fittings can fulfil as positive a function as the lamps themselves. Here too Philips play a leading role, in the investigation of that positive function, in the development of better fittings, in the propagation of modern ideas throughout the world.

A wide variety of lamps is shown in this catalogue. However much they vary, they have one characteristic in common - true Philips quality.

QUALITY

Lamps for various applications no longer look alike, however various "makes" of lamp for the same application may look very much alike. This gives rise to the following vital question: 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 degree of 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" at 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 certain that every possible step was taken to ensure the highest possible quality for the particular application. There are, in fact, three different guarantees.

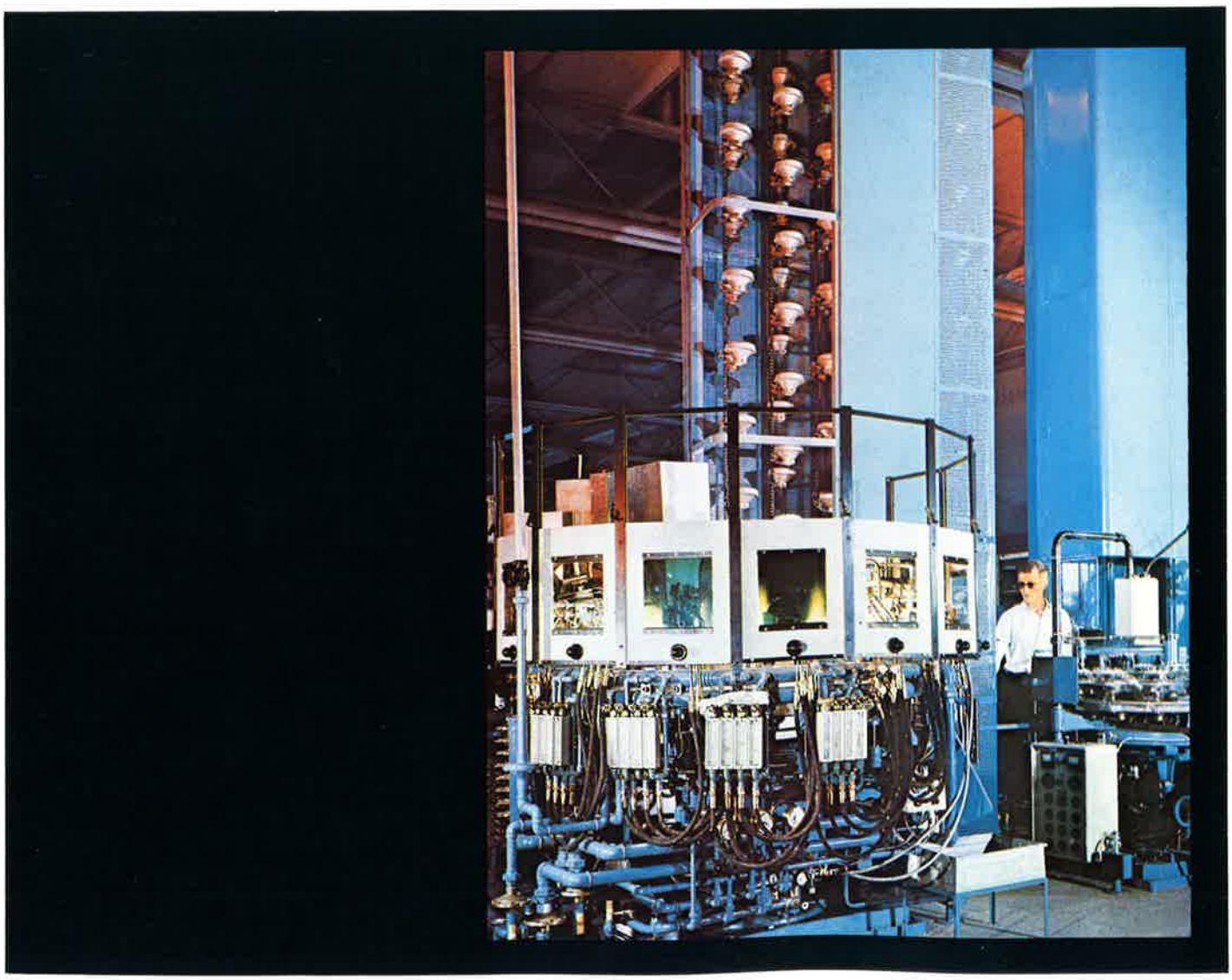
The first one is the Philips research behind every type of lamp. Philips are leading lamp-manufacturers in their own right. Their research laboratories are continuously engaged not only in the study of lighting as a phenomenon, but also in the development of new types of lamp, new principles, new machines 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 constant attention from the laboratories.

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

Philips lamps are manufactured in a multitude of centres throughout the world. There is an incessant flow of information from one centre to the other, all of them benefiting 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.



INCANDESCENT LAMPS

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PHILIPS

SUPER LUX LAMPS

The favourable combination of a partially "Argenta" and partially satin-frosted bulb has resulted in a higher luminous intensity (up to 35 %) 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. Super Lux lamps are specially suitable for all applications where higher local illumination levels are required.


40 W
60 W


75 W
100 W


150 W
200 W

Luminous flux in lumens

Wattage W	110-130 V	220-250 V
40	465	405
60	780	690
75	1010	910
100	1480	1300
150	2220	2000
200	3150	2850

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
40	110			50	91.5	90	9202 262	9202 252 .....
60	115			50	91.5	90	9202 362	9202 352 .....
75	120			60	104.5	103	9202 412	9202 402 .....
100	125-130	Gas-filled	Coiled coil	60	104.5	103	9202 462	9202 452 .....
150	220-230			75	128.5	124	9202 512	9202 502 .....
200	240			75	128.5	124	9202 575	9202 570 .....
	250							

"ARGENTA" LAMPS

Philips "Argenta" lamps with their special light characteristics such as perfect diffusion of pleasant, warm light, soft shadow effect and complete absence of glare are particularly suitable for home, office and shop lighting.


40 W
60 W
75 W
100 W


150 W


200 W

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
40	110			60	107.5	106	9200 114	9200 104 .....
60	115			60	107.5	106	9200 214	9200 204 .....
75	120			60	107.5	106	9200 314	9200 304 .....
100	125-130	Gas-filled	Coiled coil	60	107.5	106	9200 414	9200 404 .....
150	220-230			70	128.5	124	9200 620	9200 617 .....
200	240			80	169.5	165 [1]	9200 727	9200 722 .....
	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

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

150 W

200 W

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.

Inside-frosted lamps

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
15		Vacuum	Single coil	60	107.5	106	9201 056	9201 051 .....
25 [1]	110			60	107.5	106	9200 011	9200 001 .....
25 [2]	115			60	107.5	106	9200 011	9200 001 .....
40	120			60	107.5	106	9200 111	9200 101 .....
60	125-130			60	107.5	106	9200 211	9200 201 .....
75	220-230	Gas-filled	Coiled coil	60	107.5	106	9200 311	9200 301 .....
100	240			60	107.5	106	9200 411	9200 401 .....
150	250			70	128.5	124	9200 619	9200 616 .....
200				80	169.5	165 [3]	9200 726	9200 721 .....[3]

Clear lamps

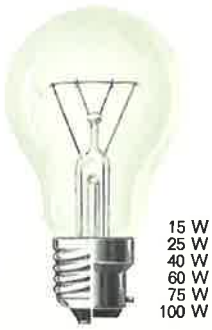
Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22	Max. length with base E 40	Ordering number with base E 27	Ordering number with base B 22	Ordering number with base E 40
15		Vacuum	Single coil	60	107.5	106	—	9201 055	9201 050	—
25 [1]				60	107.5	106	—	9200 010	9200 000	—
25 [2]				60	107.5	106	—	9200 010	9200 000	—
40	110			60	107.5	106	—	9200 110	9200 100	—
60	115			60	107.5	106	—	9200 210	9200 200	—
75	120		Coiled coil	60	107.5	106	—	9200 310	9200 300	—
100	125-130			60	107.5	106	—	9200 410	9200 400	—
150	220-230			70	128.5	124	—	9200 618	9200 615	—
200	240	Gas-filled		80	169.5	165 [3]	—	9200 725	9200 720 .....[3]	—
300 [2]	250			90	183	—	189	9201 405	—	9201 410 .....
300 [1]				90	183	—	189	9201 405	—	9201 410 .....
500			Single coil	110	—	—	239	—	—	9201 505 .....
1000				130	—	—	274	—	—	9201 705 .....
2000				200	—	—	358	—	—	9201 900 .....

[1] 220-230 V, 240 V and 250 V
[2] 110 V, 115 V, 120 V and 125-130 V
[3] On special request only.

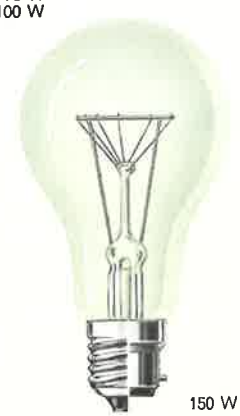
Luminous flux in lumens

Wattage W	110 V	115 V	120 V	125-130 V	220-230 V	240 V	250 V
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	2480	2460	2460	2440	2220	2180	2160
200	3450	3450	3450	3400	3150	3050	3050
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
2000	43500	43000	43000	43000	40000	39500	39000

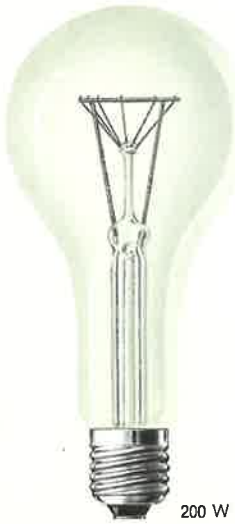
[1] Single coil.
[2] Coiled coil.



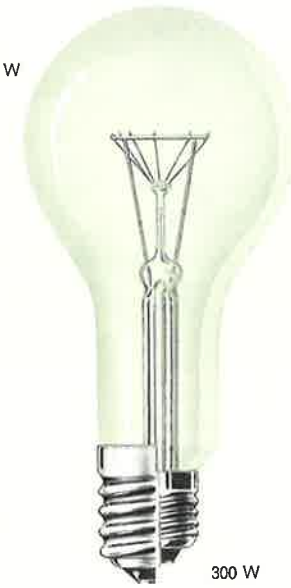
15 W
25 W
40 W
60 W
75 W
100 W



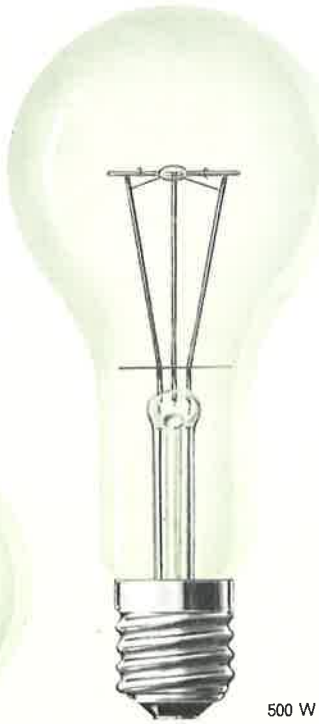
150 W



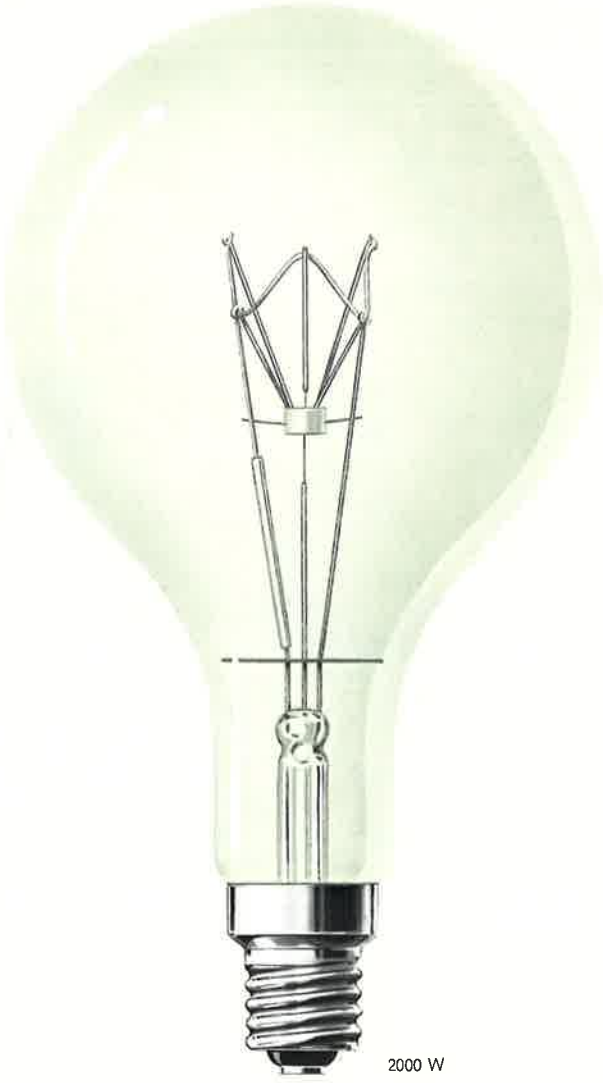
200 W



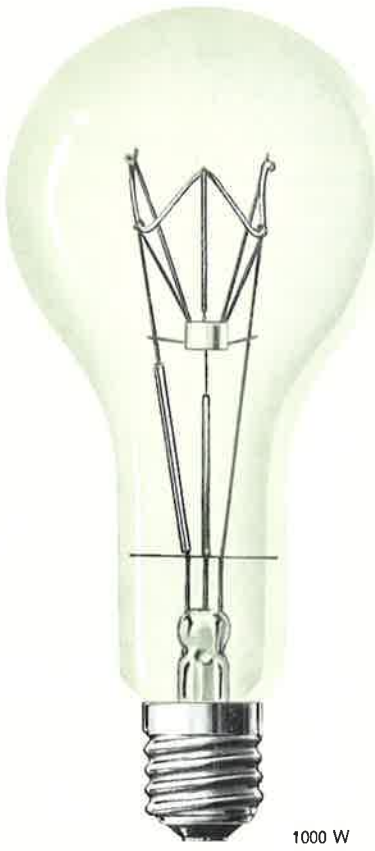
300 W



500 W



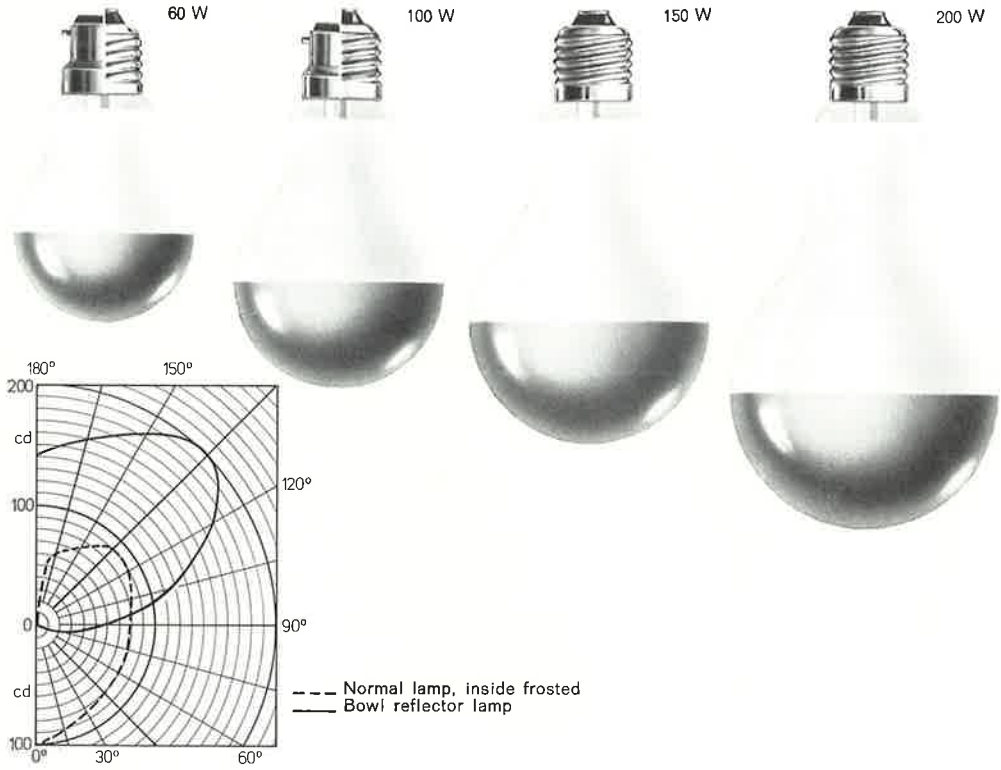
2000 W



1000 W

BOWL REFLECTOR LAMPS

Fundamentally these are normal, inside - frosted incandescent lamps. The bulb is provided with a silvered bowl, the glaring filament thus being completely shielded from view. This characteristic accounts for the lamp's great popularity as a light source for efficient indirect lighting in homes, shops, offices, etc.



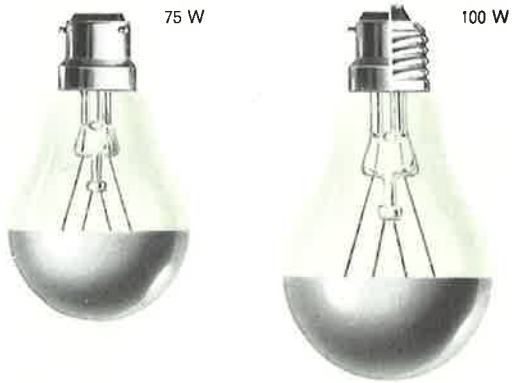
Luminous flux in lumens

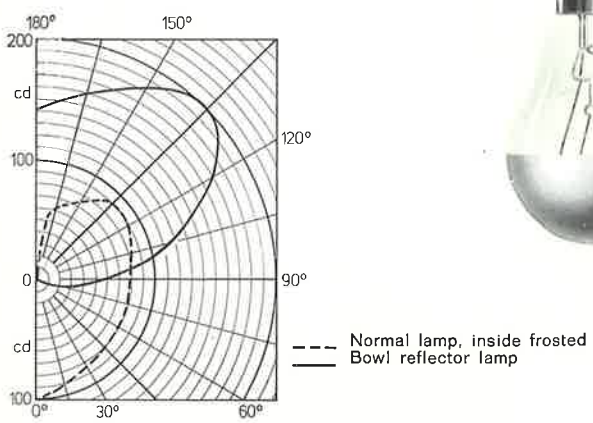
Wattage W	110...130 V	220...250 V
60	630	520
100	1170	1010
150	1940	1720
200	2750	2450

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
60	110-115	Gas-filled	Coiled coil	60	107.5	106	9204 315	9204 305 .....
100	125-130			70	128.5	124	9204 335	9204 330 .....
150	220-230		Single coil	80	148	—	9204 345	—
200	240-250			88	175	—	9204 350	—

BOWL REFLECTOR LAMPS FOR SPOTLIGHT FITTINGS

These clear-glass bowl reflector lamps are specially designed for use in combination with spotlight fittings. They are excellent for high-impact shop-window displays with strong customer-appeal.





Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	Max. length with base B 22 III	Ordering number with base E 27	Ordering number with base B 22 III
75	24	Gas-filled	Coiled coil	60	—	106	—	9204 323 205 ..
100				70	—	124	—	9204 333 205 ..
100	110-115 125-130 220-230 240-250			70	128.5	—	9204 338	—

LUSTRE AND CANDLE LAMPS

These decorative lamps provide properly diffused light in chandeliers, sconces and ornamental wall brackets of all kinds, enhancing the elegance of homes, hotels, restaurants, foyers, etc.

15 W
25 W
40 W

15 W
25 W
40 W
60 W

Finish	Wattage W	Voltage V	Diam.	Max. length with base E 14	B 15	E 27	B 22	Ordering number with base E 14	B 15	E 27	B 22
"Argenta"	25	110 115 120 125-130 220-230 240 250	45	77.5	76	72.5	71	9214 112	9214 102	9214 117	9214 107 .....
	40		45	77.5	76	72.5	71	9214 212	9214 202	9214 217	9214 207 .....
	25		35	98.5	97	95.5 [1]	94 [1]	9214 868	9214 852	9214 872 ..... [1]	9214 857 ..... [1]
	40		35	99.5	98	96 [1]	94.5 [1]	9214 917	9214 902	9214 922 ..... [1]	9214 907 ..... [1]
Inside frosted	15		45	77.5	—	72.5	—	9214 011	—	9214 016	—
	25		45	77.5	76	72.5	71	9214 111	9214 101	9214 116	9214 106 .....
	40		45	77.5	76	72.5	71	9214 211	9214 201	9214 216	9214 206 .....
	15		35	98.5	97	95.5 [1]	94 [1]	9214 811	9214 801	9214 815 ..... [1]	9214 817 ..... [1]
	25		35	98.5	97	95.5 [1]	94 [1]	9214 866	9214 851	9214 871 ..... [1]	9214 856 ..... [1]
	40		35	99.5	98	96 [1]	94.5 [1]	9214 916	9214 901	9214 921 ..... [1]	9214 906 ..... [1]
	60		35	99.5	98	96 [1]	94.5 [1]	9215 011	9215 001	9215 016 ..... [1]	9215 006 ..... [1]
Clear [1]	15		45	77.5	—	72.5	—	9214 010 ..... [1]	—	9214 015 ..... [1]	—
	25		45	77.5	76	72.5	71	9214 110 ..... [1]	9214 100 ..... [1]	9214 115 ..... [1]	9214 105 ..... [1]
	40		45	77.5	76	72.5	71	9214 210 ..... [1]	9214 200 ..... [1]	9214 215 ..... [1]	9214 205 ..... [1]

[1] On special request only.

TWISTED CANDLE LAMPS

With their ingeniously designed "twist", these crystal-clear candle lamps lend brilliance and sparkle to the fragile beauty of exquisite Venetian chandeliers, crystal sconces and other decorative fittings. Lamps that add lustre to life!

15 W
25 W
40 W
60 W

Finish	Wattage W	Voltage V	Base	Diam.	Max. length	Ordering number
Clear	15 25 40 60	110 115 120 125-130 220-230 240 250	E 14	35	102.5	9214 825 ..... 9214 891 ..... 9214 941 ..... 9215 020 .....

"ARGENTA" K-LAMPS

Lamps of small dimensions with a special shape of bulb in an "Argenta" finish. They are designed for use in places where the available space would not permit the application of a conventional lamp.

25 W
40 W
60 W

75 W
100 W

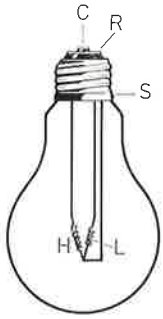
150 W

200 W

Wattage W	Voltage V	Filling	Filament	Diam.	Max. length with base E 27	B 22	Ordering number with base E 27	B 22
25	110	Gas-filled	Coiled coil	50	91.5	90	9202 211	9202 201 .....
40	115			50	91.5	90	9202 261	9202 251 .....
60	120			50	91.5	90	9202 361	9202 351 .....
75	125-130			60	104.5	103	9202 411	9202 401 .....
100	220-230			60	104.5	103	9202 461	9202 451 .....
150	240			75	128.5	124	9202 511	9202 501 .....
200	250			80	151.5	—	9202 561	—

THREE-LIGHT LAMPS

Three-light lamps contain two filaments, thus providing three different illumination levels. As each filament is of a different wattage and can be lighted individually or in combination with the other filament, there are numerous application possibilities for these lamps. The medium wattage should be regarded as normal, the lower is for decorative or casual effects, and the combined wattage is for use when the emphasis lies on visual requirements.
These lamps are specially suitable for homes, the bulb's "Argenta" finish providing a pleasant, softly diffused light.



C = Central contact
R = Ring contact
S = Side contact
H = High-wattage filament
L = Low-wattage filament


60/100/160 W


40/60/100 W

Finish	Wattage W	Voltage V	Base	Diam.	Max. length	Ordering number
"Argenta"	40/60/100	110-115 125-130 220-230 240-250	E 26 d	70	124	9205 580 .....
	60/100/160			80	142	9205 583 .....

"COLORENTA" LAMPS

Lamps of graceful design and white enamelled finish which create a charming candle-light effect. Used as decorative elements, their streamlined elegance harmonizes perfectly with contemporary interior décors.

Finish	Type number	Wattage W	Voltage V	Diam.	Max. length with base			Ordering number with base		
					E 14	E 27	B 22	E 14	E 27	B 22
Outside white coated	6353	25	110-115 125-130 220-230 240-250	30	164	161	—	9210 405	9210 410	—
Inside white coated	6350	40		38	—	315.5	311	—	9210 421	9210 420 .....
	6351	60		38	—	315.5	311	—	9210 431	9210 430 .....

"FANTASIE" LAMPS

An unusual lamp-style for decorative and general interior lighting of living rooms, halls, restaurants, shops, recreation rooms, canteens, etc. These lamps can be mounted in simple holders to form the ideal up-to-date substitute for normal lamps installed in conventional white globe fittings. Furthermore, they may be applied in elaborate fittings with or without additional glass outer globes.


40 W


40 W
60 W

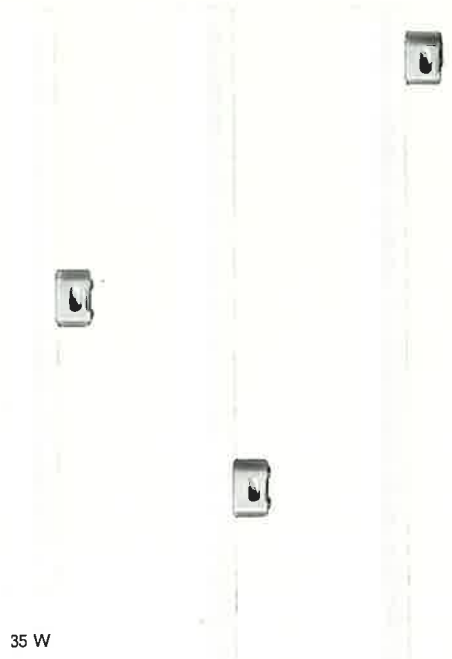

25 W

Finish	Wattage W	Voltage V	Diam.	Max. length with base		Ordering number with base	
				E 27	B 22	E 27	B 22
"Argenta"	40	110-115 125-130 220-230 240-250	70	142	137.5	9232 721	9232 720 .....

"PHILINEA" LAMPS

Slimness of line, white finish and concealed bases give these lamps strong eye-appeal. Moreover, filaments of adapted wattage ensure incandescent light of sufficient power for various types of utility lighting systems.
An additional interesting feature is the position of the lamp bases, which are not mounted at the lamp-ends. This arrangement permits of the lamps being installed to form continuous strips of light.
All these features combined ensure a wide field of application for "Philinea" lamps in banks, theatres, hotels, shops, homes, etc.

Finish	Type number	Wattage W	Voltage V	Base	Diam.	Max. length	Ordering number
Inside white	6275 X	35	110 115 120 125-130 220-230 240 250	2 x S 14 s	30	300	9210 207 .....
	6276 X	60			30	500	9210 217 .....
	6277 X	120			30	1000	9210 230 .....
	6275 Z	35		1 x S 14 d	30	300	9210 206 .....
	6276 Z	60			30	500	9210 216 .....



35 W

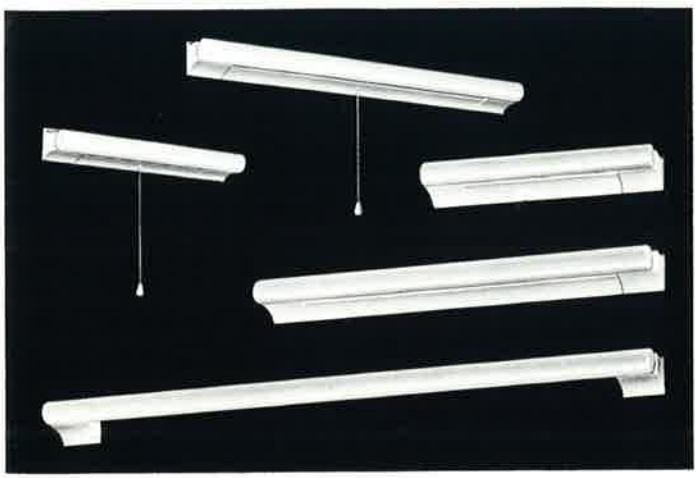
60 W

MOUNTING CHANNELS AND LAMPHOLDERS

Philips supply the special lampholders required for "Philinea" lamps; holders for the lamps with S14s bases are available in an ivory-coloured finish.
To simplify mounting, channels — with or without pull switch — can also be provided, although only for the 35 W and 60 W types, however.
The lampholders and mounting channels are designed in perfect harmony with today's architectural demands.

Finish	Denomination	Type number	For lamps	Dimensions l x b x h	Ordering number
Ivory sprayed "Philite"	Lampholder	7644/10 [1]	35 W 60 W 120 W	50 x 46 x 39	9145 000 660 .. [1]
	Mounting channel	7622/10 7622/20 [2]	35 W	301 x 46 x 39	9140 000 012 .. 9140 000 013 .. [2]
		7609/10 7609/20 [2]	60 W	501 x 46 x 39	9140 000 010 .. 9140 000 011 .. [2]

[1]) Two lampholders are needed per lamp
[2]) With pull-switch



60 W 35 W 120 W

REINFORCED-CONSTRUCTION LAMPS

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

25 W
40 W
60 W

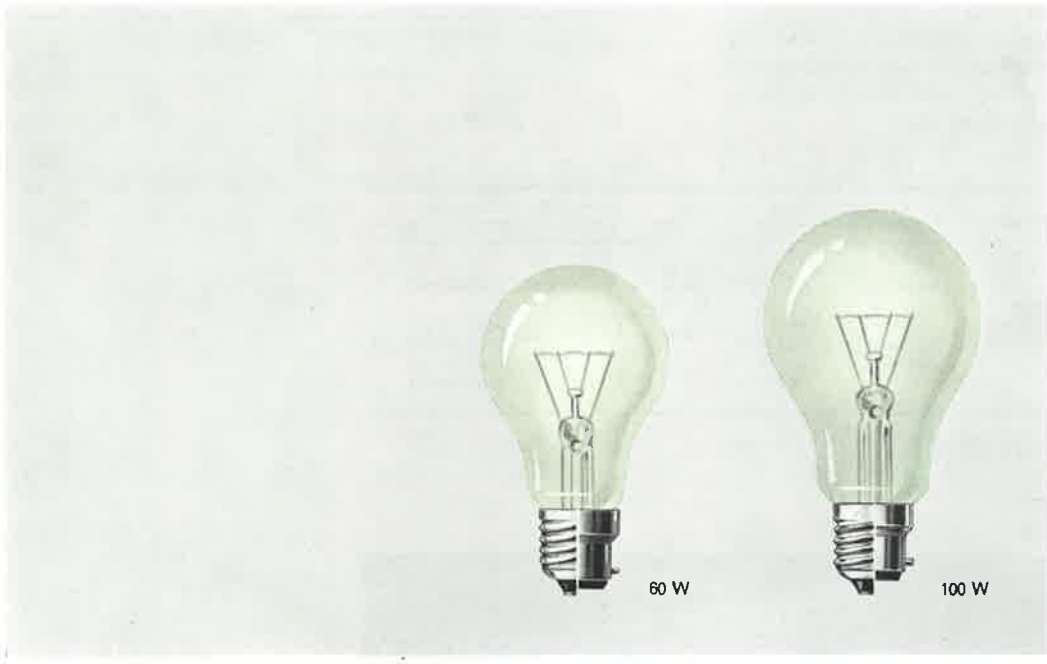
100 W

200 W

Finish	Wattage W	Voltage V	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
		110					
	25	115	60	107.5	106	9204 436	9204 431 .....
	40	120	60	107.5	106	9204 456	9204 451 .....
Inside frosted	60	125-130	60	107.5	106	9204 508	9204 503 .....
	100	220-230	70	128.5	124	9204 606	9204 601 .....
	200	240	80	169.5	165	9204 728	9204 726 .....
		250					

DAYLIGHT-BLUE LAMPS

The natural-coloured glass bulb filters the excess of red light, characteristic of conventional incandescent lamps. Hence, the light colour of these lamps approaches that of daylight; this makes them extremely useful for colour matching.



60 W

100 W

Finish	Wattage W	Voltage V	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
		110-115					
Natural	60	125-130	60	107.5	106	9202 801	9202 800 .....
blue glass	100	220-230	70	128.5	124	9202 811	9202 810 .....
		240-250					

"ANTI-INSECT" LAMPS

Philips have developed a lamp whose yellow light exerts 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.

Note. Meanwhile the 100 W lamp is manufactured in the 60 mm bulb as well.

Finish	Wattage W	Voltage V	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
Inside yellow	60	110-115 125-130	60	107.5	106	9203 716	9203 706 .....
	100	220-230 240-250	70	128.5	124	9203 911	9203 901 .....

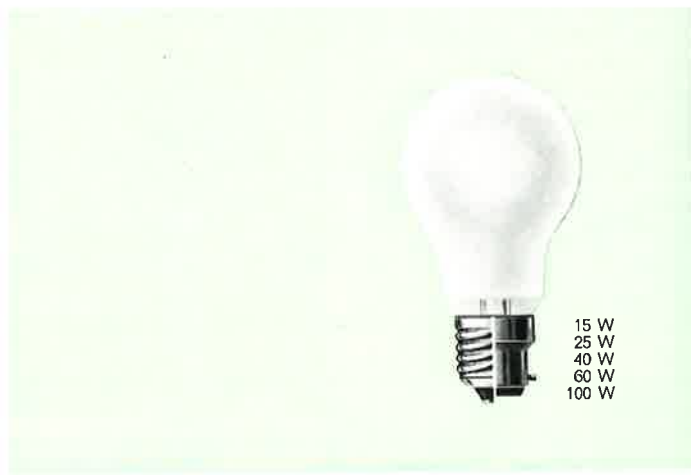
OVEN LAMPS

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

Finish	Wattage W	Voltage V	Diam.	Max. length with base E 14	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 14	Ordering number with base E 27	Ordering number with base B 22
Clear	15	110-115 125 130 220-230 240-250	22	48	—	—	9228 713	—	—
Inside frosted	40		60	—	107.5	106	—	9205 505	9205 500 .....
	60		60	—	107.5	106	—	9205 515	9205 510 .....

LOW-VOLTAGE LAMPS

Special low-voltage lamps are required, for instance, in rural or isolated areas where power must be supplied by accumulators or other indoor-lighting plants. Philips manufacture these lamps, with an inside-frosted finish, in a 6-42 V range.



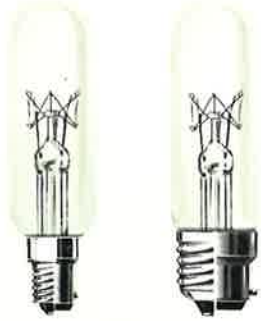
Finish	Wattage W	Voltage V	Diam.	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 27	Ordering number with base B 22
Inside frosted	15	6, 12, 24, 32	60	107.5	106	9201 056	9201 051 .....
	25	6, 12, 24, 32, 42				9200 011	9200 001 .....
	40	12, 24, 32, 42				9200 111	9200 101 .....
	60	12, 24, 32, 42				9200 211	9200 201 .....
	100	24, 32, 42				9200 411	9200 401 .....

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 signaling purposes in switch-boards, telephone exchanges, etc.

7965-7966

7692-7693



7691

7696

7647

7648

7690

Finish	Type number	Wattage W	Voltage V	Diam.	Max. length with base E 12	E 14	B 15	E 27	B 22	Ordering number with base E 12	E 14	B 15	E 27	B 22
Clear	7965	10/6	140/110 250/220	17	47	49	48	—	—	9210 571 361 .. 9210 571 459 ..	9210 572 361 .. 9210 572 459 ..	9210 570 361 .. 9210 570 459 ..	— —	— —
	7966	15/10	250/220	17	47	49	48	—	—	9210 581 464 ..	9210 582 464 ..	9210 580 464 ..	—	—
	7692	15	110-115	25	—	81.5	80	—	76	—	9210 729	9210 721	—	9210 725 .....
	7693	25	125-130	25	—	81.5	80	—	76	—	9210 836	9210 835	—	9210 838 .....
	7696	25	220-230	20.5	—	116.5	—	—	—	—	9210 806	—	—	—
	7691	25	240-250	28	—	105.5	104	102	100.5	—	9210 849	9210 854	9210 847	9210 848 .....
	7690	40	110-115 125-130 220-230 240-250	28	—	105.5	104	102	100.5	—	9210 905	9210 907	9210 904	9210 906 .....
Inside frosted	7647 [1])	25	110-115 125-130 220-230	25	—	81.5	75	—	76	—	9210 832	9210 830	—	9210 831 .....
	7648 [1])	25		22	—	63.5	57	—	—	—	9210 813	9210 810	—	—

[1]) Reinforced construction

PILOT LAMPS

These lamps are used extensively wherever space is restricted and little light is wanted; they are applied in signs, running text advertisements, illuminated scoreboards, switchboards, refrigerators, cupboards, etc.

5 W
15 W
25 W

15 W

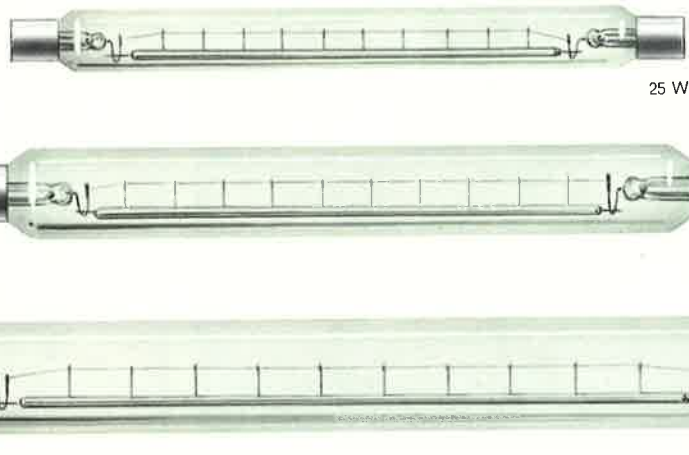
15 W

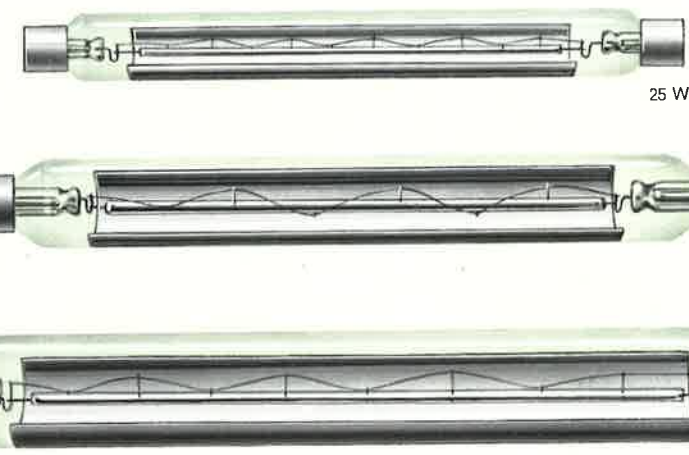
Finish	Wattage W	Voltage V	Diam.	Max. length with base E 14	B 15	E 27	B 22	Ordering number with base E 14	B 15	E 27	B 22
Clear	5	12, 24	28	65.5	64	—	—	9215 210	9215 200	—	—
	15	12, 24, 48, 65, 110-115, 125-130, 220-230, 240-250	28	65.5	64	60	62	9215 260	9215 250	9215 265	9215 255 .....
			26 [1])	57.5	56	—	—	9215 275 ..... [1])	9215 270 ..... [1])	—	—
	25	110-115, 125-130, 220-230, 240-250	28	65.5	64	—	—	9215 310	9215 300	—	—

[1]) On special request only

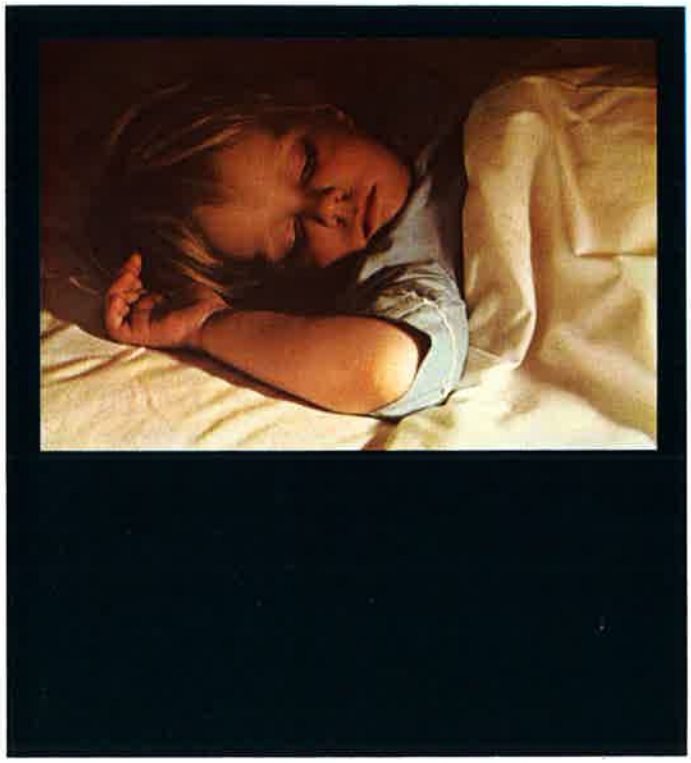
SHOW-WINDOW LAMPS

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





Finish	Wattage W	Voltage V	Base	Diam.	Max. length	Ordering number
Clear	25	110-115 125-130 220-230 240-250	2 x S 15	22	222	9210 280 .....
	25		2 x S 19	30	261	9210 275 .....
	40		2 x S 19	38	311	9210 330 .....
	60		2 x S 19	38	311	9210 350 .....
Half-mirrored	25		2 x S 15	22	222	9210 281 .....
	25		2 x S 19	30	261	9210 276 .....
	40		2 x S 19	38	311	9210 331 .....
	60		2 x S 19	38	311	9210 351 .....
White	25		2 x S 19	30	261	9210 278 .....
	40		2 x S 19	38	311	9210 333 .....
	60		2 x S 19	38	311	9210 353 .....



FESTOON LIGHTING SETS

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

Another set designed chiefly for outdoor use but which can also be used indoors. The green lampholders complete with "Philite" saucers are also provided with a rubber sealing ring, to prevent water from entering the lampholders. Both the sets described here, are attached to trees or other objects by means of a strong crocodile clip with ball-and-socket joint.

NIGHT LIGHTS (INCANDESCENT)

Lamps for use in those places where subdued lighting is desirable or necessary. Their low current consumption, long service life and restful, subdued light make these lamps eminently suitable for applications where a continuously-burning light source is necessary, for instance as night lights and orientation lights.

Finish	Voltage V	Luminous intensity cd	Diam.	Max. length with base		Ordering number with base	
				E 27	B 22	E 27	B 22
Inside frosted	110-130 220-250	approx. 5	45	72.5	71	9214 251	9214 250 .....

NIGHT LIGHTS (NEON)

Thanks to their negligible current consumption, neon night lights can be used continuously and can, therefore, be added to existing installations without any major electrical changes being necessary. They emit a soft glow and are ideal as night lights in nurseries, hospitals, corridors, etc. Two versions are available: pink and green.

Light colour	Type number	Voltage V	Wattage W	Base	Diam.	Max. length	Ordering number
Pink	GH 3/01 GH 3/02	110-130 220-250	< 0.5	GY 19	43	58.5	9283 545 099 .. 9283 546 099 ..
Green	GH 3/03 GH 3/04	220 240					9283 547 099 .. 9283 548 099 ..
Pink	GH 4/01 GH 4/02	110-130 220-250	< 0.5	[1]	43	38.5	9283 541 099 .. 9283 542 099 ..

[1]) For American wall-sockets

CHRISTMAS-TREE ILLUMINATION SETS

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

An elegantly designed set consisting of 16 (plus 1 spare) "pine-apple" lamps. The bulbs are transparent and lacquered in 5 different colours, with flower-shaped, coloured "Philite" lampholders, sliding bead and special divisible plug to break the contact - a very practical device when mounting the lamps to the branches of a tree.
The lamps for all the sets mentioned here have a short-circuiting device, to ensure that the circuit is not interrupted when one of the lamps burns out.

Set	Lamp [1])	Voltage V	Type number	Diam. holder/saucer	Max. length incl. of lamp	Ordering number
16 green holders	candle; inside frosted candle; clear	210-240	7575/7688 7577/7720	29	140	9140 000 171 .. 9140 000 181 ..
16 green holders	white long candle; clear ribbed top	210-240	7509/7552	40	128	9140 000 087 ..
16 white candles with green saucer	dwarf candle; ribbed; clear	210-240	7540/7515	40	128	9140 000 093 ..
16 coloured holders	pine-apple; various colours	210-240	7506/7516	43	67	9140 000 084 ..

[1]) For data and dimensions of the lamps see page A 17

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 lamp ideal for outdoor decorative use in light 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 for parallel mounting are supplied in two shapes: the conventional and the drop shape.

Finish	Colour	Wattage W	Voltage V	Diam.	Max. length with base E 14	Max. length with base E 27	Max. length with base B 22	Ordering number with base E 14	Ordering number with base E 27	Ordering number with base B 22
Inside coloured	white	25	110-115 125-130 220-230 240-250	60	—	107.5	106	—	9203 516	9203 505 .....
	orange							—	9203 513	9203 503 .....
	yellow							—	9203 511	9203 501 .....
	red							—	9203 514	9203 504 .....
	green	40						—	9203 612	9203 602 .....
	blue							—	9203 610	9203 600 .....
	white	15		45	77.5	72.5	71	9215 616	9215 626	9215 606 .....
	orange							9215 613	9215 623	9215 603 .....
	yellow							9215 611	9215 621	9215 601 .....
	red							9215 614	9215 624	9215 604 .....
	green	25						9215 712	9215 722	9215 702 .....
	blue							9215 710	9215 720	9215 700 .....

FESTIVE ILLUMINATION LAMPS

In addition to the coloured lamps for parallel burning described on the opposite page, Philips manufacture lamps of various kinds 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 an extensive 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 and colour	Voltage V	Wattage or Current	Base	Diam.	Max. length	Ordering number
long candle	ribbed top; ivory sprayed shaft	14	3 W	E 10	14.5	93	9235 914 183 ..
		23	3 W				9235 914 203 ..
		34	0.1 A				9235 904 229 ..
	ribbed top; red sprayed shaft	14	3 W				9235 913 183 ..
		23	3 W				9235 913 203 ..
		34	0.1 A				9235 903 229 ..
mini-candle	ribbed top; ivory sprayed shaft	14	3 W	E 10	11	55.5	9235 926 183 ..
		34	0.1 A				9235 905 229 ..
	ribbed top; red sprayed shaft	14	3 W				9235 925 183 ..
		34	0.1 A				9235 906 229 ..
dwarf-candle	ribbed bulb; clear	14	3 W	E 10	13.6	47	9236 010 183 ..
	ribbed bulb; blue						9236 011 183 ..
	ribbed bulb; yellow						9236 012 183 ..
	ribbed bulb; green						9236 013 183 ..
	ribbed bulb; red						9236 014 183 ..
	ribbed bulb; clear	23	3 W				9236 010 203 ..
	ribbed bulb; blue						9236 011 203 ..
	ribbed bulb; yellow						9236 012 203 ..
	ribbed bulb; green						9236 013 203 ..
	ribbed bulb; red						9236 014 203 ..
	ribbed bulb; clear	34	0.1 A				9235 950 229 ..
	ribbed bulb; blue						9235 951 229 ..
	ribbed bulb; yellow						9235 952 229 ..
	ribbed bulb; green						9235 953 229 ..
	ribbed bulb; red						9235 954 229 ..
candle [1]	clear	14	4 W	E 14	35	98.5	9215 050 183 ..
	inside frosted						9215 051 183 ..
	blue						9216 260 183 ..
	yellow						9216 261 183 ..
	green						9216 262 183 ..
	red						9216 263 183 ..
pine-apple	clear	14	3 W	E 10	18	53	9236 020 183 ..
	blue						9236 021 183 ..
	yellow						9236 022 183 ..
	green						9236 023 183 ..
	red						9236 024 183 ..

[1]) For outdoor illumination sets

100 W
150 W

100 W
150 W

300 W

REFLECTOR LAMPS

Philips Reflector Lamps are provided with a high-quality internal mirror which cannot be affected by corrosion or soiling in any form. As the filament is adjusted mechanically in relation to the reflector, the correct light distribution is guaranteed. With their superb technical quality, excellent colour-rendering and accurate light distribution they are the ideal light sources for a truly unparalleled variety of applications. Reflector lamps can be supplied in two versions: the pressed-glass and blown-bulb versions. The former has the widest field of application as it is made from pressed hard-glass making it ideal for outdoor use without further protection. Blown-bulb lamps are suitable for indoor lighting only. Another feature of the pressed glass version is that the lamps have a higher luminous intensity and a longer life than blown-bulb reflector lamps (2000 hours versus 1000 hours).

"COMPTALUX"-FLOOD pressed-glass lamps

Philips "Comptalux" pressed-glass lamps with a front glass made of prismatic elements produce wide homogeneous "floodlight" beams of high intensity.

PAR 38 "Comptalux"-Flood. Suitable for modelling effects, and for attaining higher illumination levels in large areas, e.g. in shops, showrooms and shopwindows. In outdoor applications for flood-lighting advertising signs, buildings, statues, sportsgrounds, parks, gardens etc.

"Comptalux" Wide Flood. Designed for the lighting of larger surfaces at shorter distances.

PAR 56 "Comptalux" Medium and **Wide Flood,** designed for use where still higher illumination levels are needed, especially for applications with great mounting heights, both indoors and outdoors.

Note: PAR 38 can be used outdoors without any protection, provided the lamps are applied in a watertight lampholder.

Although PAR 56 are made of heat-resistant glass, when used outdoors they should be protected from water splashes by a glass-covered, well-gasketed housing.

Denomination	Bulb shape	Type number	Voltage V	Wattage W	Base	Diam.	Max. length	Ordering number
flood	PAR 38	13985 E/99	115 125-130 220-230 240	100	E 27	121	136	9238 021 .....
		13012 E/99		150				9238 031 .....
wide flood		13718 E/99		100	E 27	121	136	9238 028 .....
		13783 E/99		150				9238 037 .....
medium flood	PAR 56	13028 X/99		300	GX 16 d [1]	177.2	127.5	9238 041 .....
wide flood		13029 X/99						9238 042 .....

[1] Mogul end-prong

Denomination	Bulb shape	Wattage W	Luminous flux lm		Luminous intensity in beam centre cd		Half-value beam spread [1]	Illumination in centre of beam lux						Half-value beam width [3] cm		
								1.5 m [2]		2.5 m [2]		3.5 m [2]				
			LV	HV	LV	HV		LV	HV	LV	HV	LV	HV	1.5 m [2]	2.5 m [2]	3.5 m [2]
flood	PAR 38	100	960	820	2150	1700	2 x 18°	955	800	345	290	175	145	2 x 48	2 x 80	2 x 113
		150	1500	1400	3400	2750	2 x 18°	1510	1335	545	480	275	245	2 x 48	2 x 80	2 x 113
wide flood		100	960	820	1250	1000	2 x 24°	555	445	200	160	100	80	2 x 70	2 x 114	2 x 160
		150	1500	1400	2100	1700	2 x 24°	930	750	340	270	175	140	2 x 70	2 x 114	2 x 160
medium flood	PAR 56	300	3400	3000	24000	22000	hor. 2 x 12.5° vert. 2 x 5.5°	9650	8250	3550	3000	1900	1550	hor. 66 vert. 31	hor. 110 vert. 52	hor. 155 vert. 74
wide flood		300	3400	3000	10000	9000	hor. 2 x 20° vert. 2 x 8°	4800	3100	1800	1800	900	750	hor. 104 vert. 42	hor. 173 vert. 50	hor. 242 vert. 118

[1] Twice the angle measured from the beam axis at which the luminous intensity is half of that in the beam centre.
[2] Suspension height of the lamp.
[3] 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 43 % of that in the beam centre.

100 W
150 W

35 W

300 W

"ATTRALUX"-SPOT pressed-glass lamps

Philips "Attralux" pressed-glass lamps with stippled front refractor produce narrow beams of very high luminous intensity.

PAR 38 "Attralux"-Spot. Used mainly for the illumination of smaller surfaces or for objects placed at greater distances and for dramatic modelling effects. Also available in a 24 V/150 W version which may be considered suitable for rough service; it has higher lumen and candela values and a rough service filament. This lamp is extremely suitable for applications where safety is of importance (low voltage).

The **Rough Service** type with a special filament construction makes this lamp more resistant to shocks and vibrations. Typical applications are building sites, sites where repair work is carried out on bridges and road surfaces, etc.

PAR 56 "Attralux" Narrow Spot lamps, designed for strong local lighting, and high levels of floodlighting if used in batteries. These lamps are usually focused on more distant objects, e.g. displays, towers and monuments. They are also applied in churches and with high ceilings.

PAR 36 "Attralux" Compact Spot with a built-in 6 V 35 W halogen lamp of high efficiency and almost 100 % lumen maintenance. An extremely narrow beam of high intensity is produced.

Denomination	Bulb shape	Type number	Voltage V	Wattage W	Base	Diam.	Max. length	Ordering number
compact spot	PAR 36	13825 X/99	6	35	G 40	113	72	8222 203 512 ..
spot	PAR 38	13011 E/99	24	150	E 27	121	136	9238 030 205 ..
		13011 F/99			B 22 III		125	9238 070 205 ..
		13987 E/99	115	100	E 27	121	136	9238 020 .....
		13011 E/99	125-130	150	E 27	121	136	9238 030 .....
rough service		13708 E/99 [1]	220-230	150	E 27	121	136	9238 036 .....
narrow spot	PAR 56	13027 X/99	240	300	GX 16 d [2]	177.2	127.5	9238 040 .....

[1] Burning position: H 90
[2] Mogul end-prong

Denomination	Bulb shape	Wattage W	Luminous flux lm		Luminous intensity in beam centre cd		Half-value beam spread [1]	Illumination in centre of beam lux						Half-value beam width [3] cm		
								1.5 m [2]		2.5 m [2]		3.5 m [2]				
			LV	HV	LV	HV		LV	HV	LV	HV	LV	HV	1.5 m [3]	2.5 m [3]	3.5 m [3]
compact spot	PAR 36	35	—	—	30000	—	2 x 1.7°	13300	—	4800	—	2440	—	—	—	—
spot	PAR 38	150 [4]	2000	—	25000	—	2 x 5 °	11110	—	4000	—	2040	—	2 x 13	2 x 22	2 x 31
		100	960	820	5600	4000	2 x 8 °	2490	1775	895	640	455	325	2 x 21	2 x 35	2 x 49
		150	1500	1400	10000	7500	2 x 8 °	4445	3335	1600	1200	815	610	2 x 21	2 x 35	2 x 49
rough service		150	—	—	4800	3500	2 x 10 °	—	1460	—	525	—	270	2 x 26	2 x 43	2 x 60
narrow spot	PAR 56	300	3400	3000	50000	40000	hor. 2 x 7.5° vert. 2 x 4.5°	17700	15600	7350	6000	4000	3100	hor. 37 vert. 26	hor. 64 vert. 44	hor. 86 vert. 61

[1] Twice the angle measured from the beam axis at which the luminous intensity is half of that in the beam centre.
[2] Suspension height of the lamp.
[3] 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 50 % of that in the beam centre.
[4] 24 V version.

"COMPTALUX" Cool-Flood "ATTRALUX" Cool-Spot

The increase in illumination levels has led to an increase in lamp power, hence to greater and, in certain applications, inconvenient heat generation. These lamps have, therefore, been developed to solve this heat problem. Thanks to a special reflector consisting of a large number of alternate layers of different materials, approximately 75 % of the heat radiated in the beam of the conventional PAR 38 lamps is transmitted through the back of these "cool beam" lamps. In practice, their advantages are: minimum discoloration and drying out of displayed articles; greater environmental comfort.

Their applications include: shops dealing in perishable foods, flower and cosmetic displays, museums, congress halls, etc.

"COMPTALUX" Cool-Flood

"ATTRALUX" Cool-Spot

Denomination	Bulb shape	Type number	Voltage V	Wattage W	Base	Diam.	Max. length	Ordering number
"Comptalux" cool-flood "Attralux" cool-spot	PAR 38	13953 E/99 13951 E/99	115 125-130 220-230 240	150	E 27	121	136	9238 039 ..... 9238 038 .....

Denomination	Luminous flux lm		Luminous intensity in beam centre cd		Half-value beam spread [1]	Illumination in centre of beam lux						Half-value beam width [3] cm		
						1.5 m [2]		2.5 m [2]		3.5 m [2]				
	LV	HV	LV	HV		LV	HV	LV	HV	LV	HV	1.5 m [2]	2.5 m [2]	3.5 m [2]
"Comptalux" cool-flood	1500	1400	3400	2750	2 x 18°	1510	1335	545	480	275	245	2 x 48	2 x 80	2 x 113
"Attralux" cool-spot	1500	1400	10000	7500	2 x 8°	4445	3335	1600	1200	815	610	2 x 21	2 x 35	2 x 49

[1]) Twice the angle measured from the beam axis at which the luminous intensity is half of that in the beam centre.
[2]) Suspension height of the lamp.
[3]) 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 43 % ("Comptalux" lamps) or 50 % ("Attralux" lamps) of that in the beam centre.

"COMPTALUX"-FLOOD COLOR PRESSED-GLASS LAMPS

A range of pressed-glass lamps with a weatherproof, coloured silicone lacquer coating — in red, blue, yellow or green — on the refractor face. These lamps provide excellent opportunities in the field of decorative lighting for both indoor aud outdoor applications and, enclosed in a watertight fitting, for underwater lighting. For all other outdoor applications a watertight lampholder is sufficient. Charming effects can be obtained in parks, public and private gardens for sound and light performances and festive illuminations. They add glamour to the atmosphere in restaurants, bars and dance halls and provide striking background lighting for show-window displays.

Bulb shape	Colour	Type number	Voltage V	Wattage W	Base	Diam.	Max. length	Ordering number
PAR 38	blue	13985 E/470	115	100	E 27	121	136	9238 022 .....
	yellow	13985 E/472	125-130					9238 023 .....
	green	13985 E/473	220-230					9238 024 .....
	red	13985 E/476	240					9238 025 .....

"COMPTALUX" blown-bulb lamps

R 30 and R 40

Lamps with frosted bulb-front, producing "flood" beams; suitable for indoor applications where very high illumination levels are not required and longer lifetime it not so necessary. See also "Reflector Lamps" pages A 18 - A 19.

"K"-Bulb

The "Comptalux"-K is an all-purpose baby-type reflector lamp. The light beam has been chosen wide to serve all manner of general lighting purposes.

"ATTRALUX" blown-bulb lamp

R 40

This 24 V/150 W lamp is a spot-lamp with a concentrated beam suitable for all indoor spotlight applications. The luminous intensity is much higher than that of the "Comptalux" lamps.

60 W
100 W

75 W
100 W

150 W
300 W

Denomination	Bulb shape	Type number	Voltage V	Wattage W	Base	Diam.	Max. length	Ordering number
"Comptalux"	R 30	13733 E/44	115 125-130 220-230 240	75	E 27	95	135	9232 054 .....
		13733 B/44			B 22		130.5	9232 053 .....
		13734 E/44		100	E 27	95	135	9232 065 .....
		13734 B/44			B 22		130.5	9232 064 .....
	R 40	12318 E/44		150	E 27	125	165	9232 076 .....
		12318 B/44			B 22		160.5	9232 075 .....
		13736 E/44		300	E 27	125	175	9232 081 .....
	"K"	13622 E/44		60	E 27	75	128.5	9204 369 .....
		13622 B/44			B 22		124	9204 368 .....
		13015 E/44		100	E 27	75	128.5	9204 376 .....
		13015 B/44			B 27		124	9204 375 .....
"Attralux"	R 40	13378 E/44	24	150	E 27	125	165	9232 023 205 ..

Denomination	Bulb shape	Wattage W	Luminous flux lm LV	Luminous flux lm HV	Luminous intensity in beam centre cd LV	Luminous intensity in beam centre cd HV	Half-value beam spread [1]	Illumination in centre of beam lux 1.5 m [2] LV	1.5 m [2] HV	2.5 m [2] LV	2.5 m [2] HV	3.5 m [2] LV	3.5 m [2] HV	Half-value beam width [3] cm 1.5 m [2]	2.5 m [2]	3.5 m [2]
"Comptalux"	R 30	75	750	650	800	700	2 x 17.5°	340	310	125	110	65	55	2 x 48	2 x 80	2 x 110
		100	1025	925	1200	1000		490	445	175	160	90	80			
	R 40	150	1600	1350	2500	2300	2 x 17.5°	980	890	350	320	180	160	2 x 48	2 x 80	2 x 110
		300	3750	3600	4600	4200	2 x 18°	1960	1780	700	640	350	320			
	"K"	60	540	500	225	200	2 x 50°	—	—	—	—	—	—	—	—	—
		100	1070	1000	440	400		—	—	—	—	—	—			
"Attralux"	R 40	150	2350	—	25000	—	2 x 5°	11110	—	4000	—	2040	—	2 x 13	2 x 22	2 x 31

[1] Twice the angle measured from the beam axis at which the luminous intensity is half of that in the beam centre.
[2] Suspension height of the lamp.
[3] 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 % of that in the beam centre in the case of "Comptalux" lamps and 47 % in the case of "Attralux" lamps.

FLUORESCENT LAMPS

Philips' outstanding reputation in the field of fluorescent lamps is based on more than quality alone. Many years ago Philips decided that they would not sell "lamps", but "light". They 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 insist on the highest quality also for accessories. The reputation of the Philips fluorescent lamp is at stake.
Philips further contributed to the popularity of this light source by developing a large number of colour-shades (most of them shades of white) for the specific purpose of providing excellent colour rendering.

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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 alongside 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 lamps, "TL"D small diameter, "TL"E circular, "TL"U, "TL"W as well as "TL" coloured fluorescent lamps.

— The reflector type lamp bearing the letter F in its designation, e.g. "TL"F, has an internal reflecting powder layer. The reflector version is available in most of our current types and wattages.

— The rapid-start fluorescent lamps "TL"M RS operate without starters on special ballasts. These lamps have an external strip facilitating ignition and dimming. Rapid-start fluorescent lamps are also supplied in a circular version, type "TL"EM RS.

— The "TL" RS rapid-start lamps operate without starter on special ballasts.

— "TL" RS and "TL"M RS "Double-Flux" lamps operate without starter on special ballasts.

— For Great-Britain, Philips manufacure a series of universal "TL"A fluorescent lamps, suitable for either switch or instant start ballasts.

— The fluorescent lamps "TL"C and "TL"R are specialized lamps designed for D.C. operation. The "TL"C operates on stabilizing tubes; the "TL"R needs auxiliary equipment, such as stabilizing lamps and magnetic relays.

— Fluorescent-lamp type "TL"S with internal ignition strip is usually operated with a stabilizing lamp but can also function on a normal ballast. No starter is required.

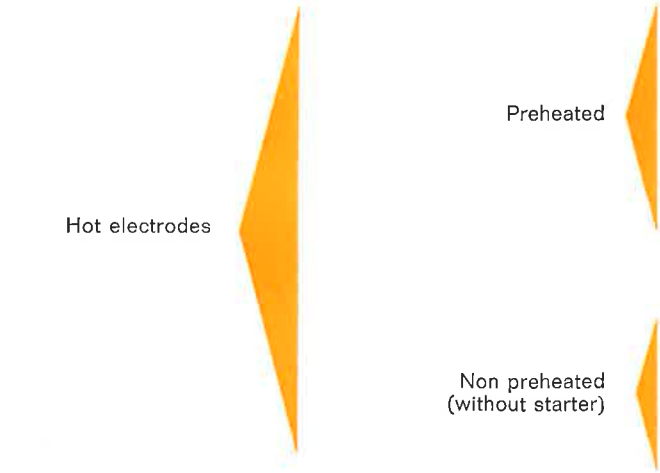
— The "TL"X type is available for housing in flameproof fittings; it operates without starter on the same ballasts as for "TL"S lamps.

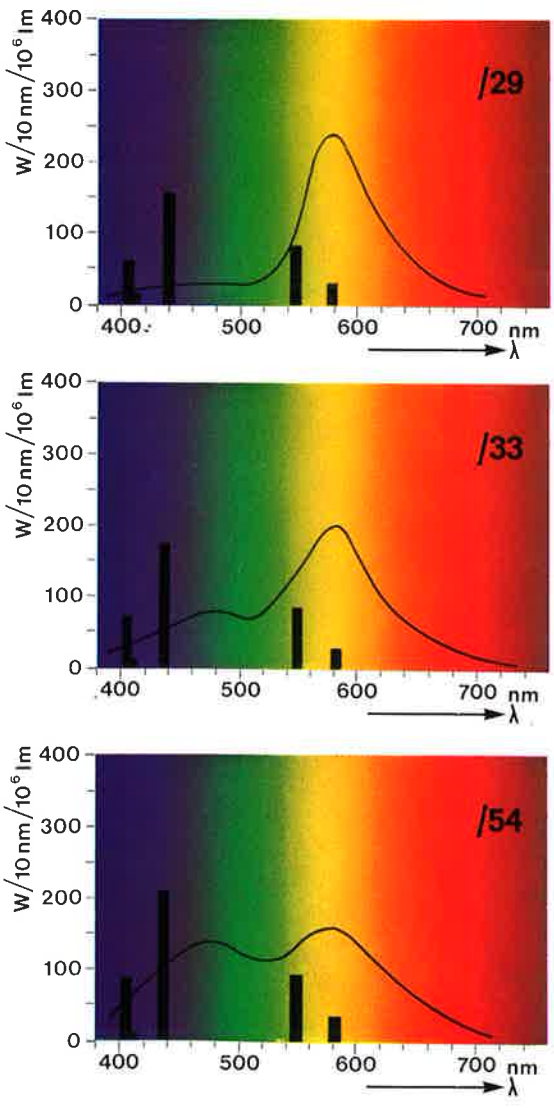
— Finally, the Slimline lamps are instant-start, hot-cathode fluorescent lamps. They operate without starter.

For technical reasons it is not feasible to combine, in one single lamp, the highest possible light output and the best possible colour rendition. One feature will always be present at the expense of the other. We therefore have three variations for each colour temperature range: Highest efficiency, good efficiency/good colour rendering and best colour rendering.

COLOUR-SHADE VARIETIES

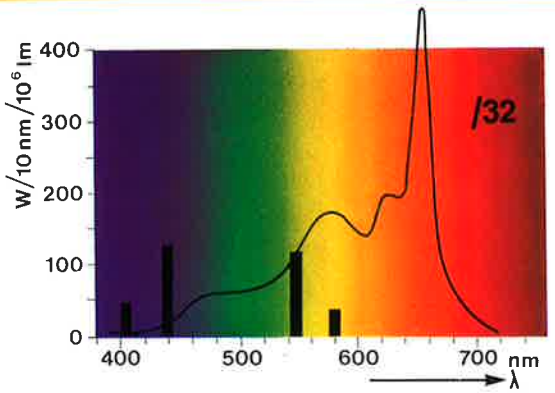
Ranges	Best efficiency	Good efficiency/ good colour rendering	Best colour rendering
Warm white	Warm white /29 3000 °K	Warm white deluxe /32 3000 °K	Warm white special deluxe /27 2700 °K
White	White /33 4200 °K	White deluxe /34 3800 °K	White special deluxe /37 4200 °K
Daylight	Cool daylight /54 6500 °K	Daylight /55 6500 °K	Daylight /57 7400 °K
			White /47 (specialty for graphic art) 5000 °K

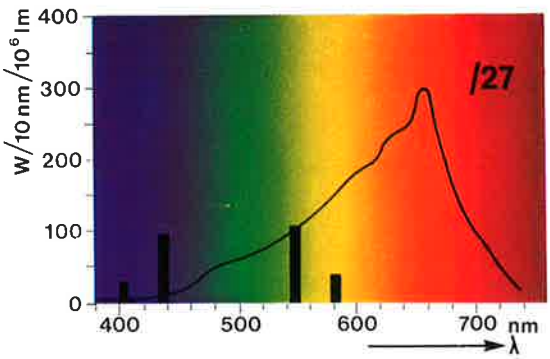


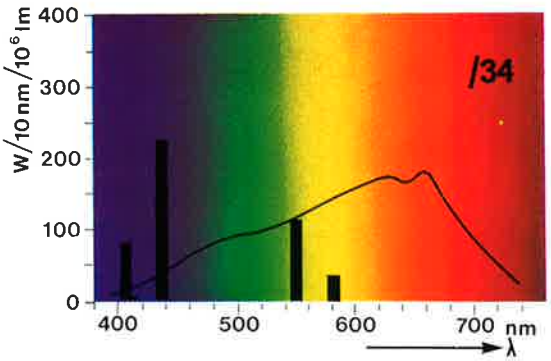


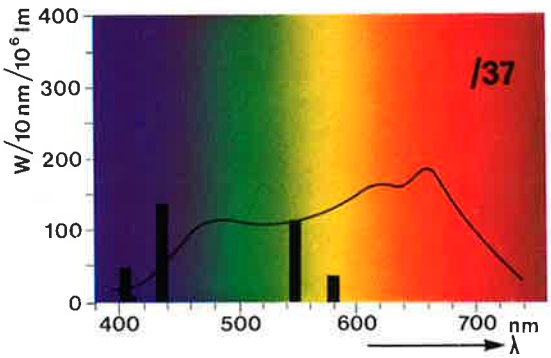
/29	Warm white	3000 °K
/33	White	4200 °K
/54	Cool daylight	6500 °K
/32	Warm white deluxe	3000 °K
/34	White deluxe	3800 °K

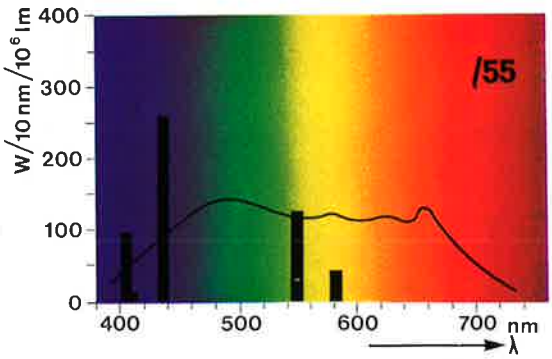
With starter	"TL" Standard-type lamps, "TL"F Reflector-type lamps, "TL"D Slender-type lamps, "TL"E Circular lamps, "TL"U lamps, "TL"W lamp, "TL" Coloured lamps, "TL" Miniature lamps, "TL"C lamps for D.C. operation
With or without starter (high-resistance electrodes)	"TL"A(F) Universal lamps
With or without 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

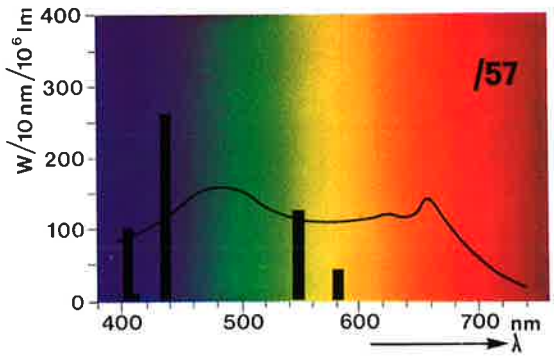


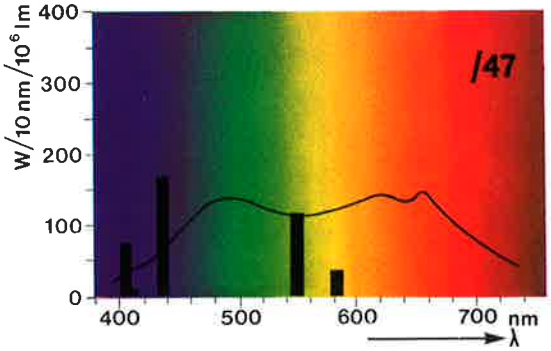




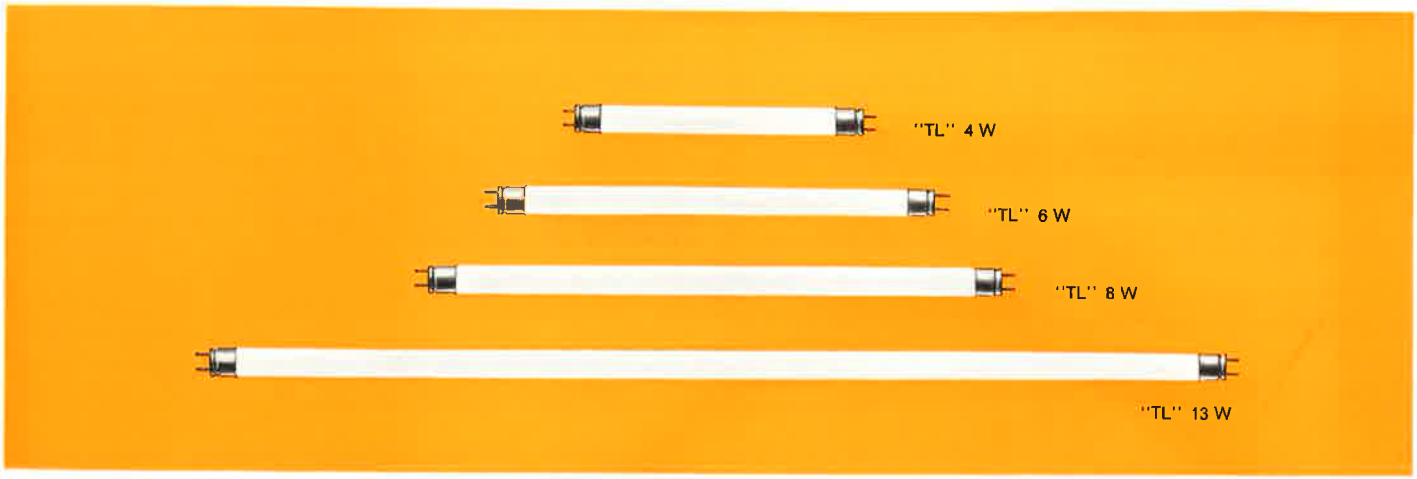




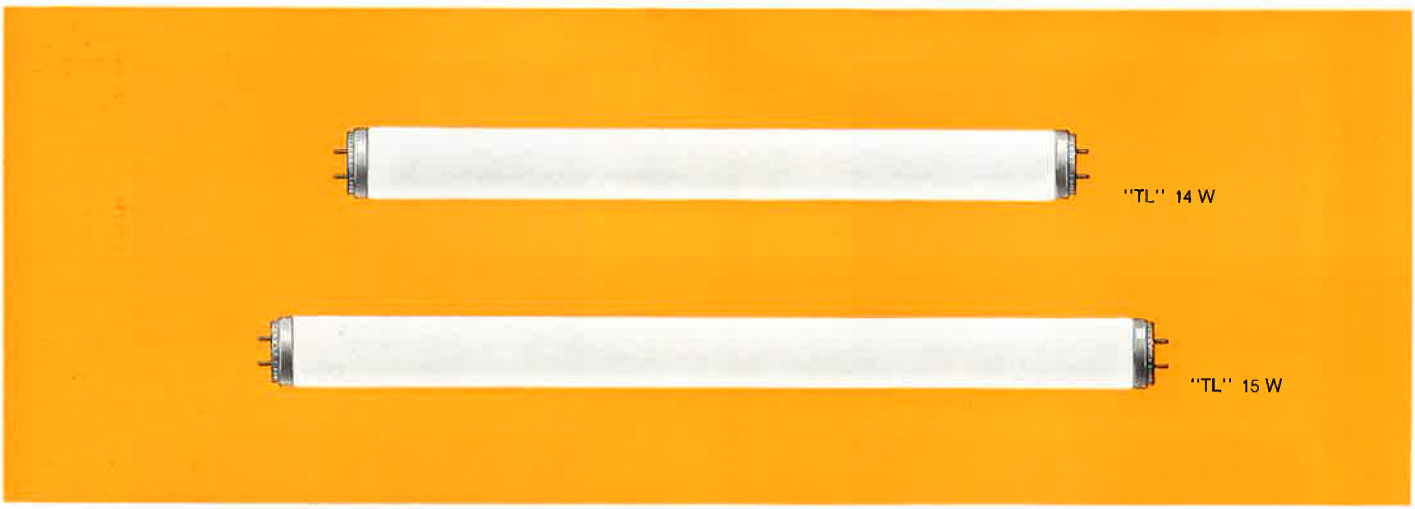


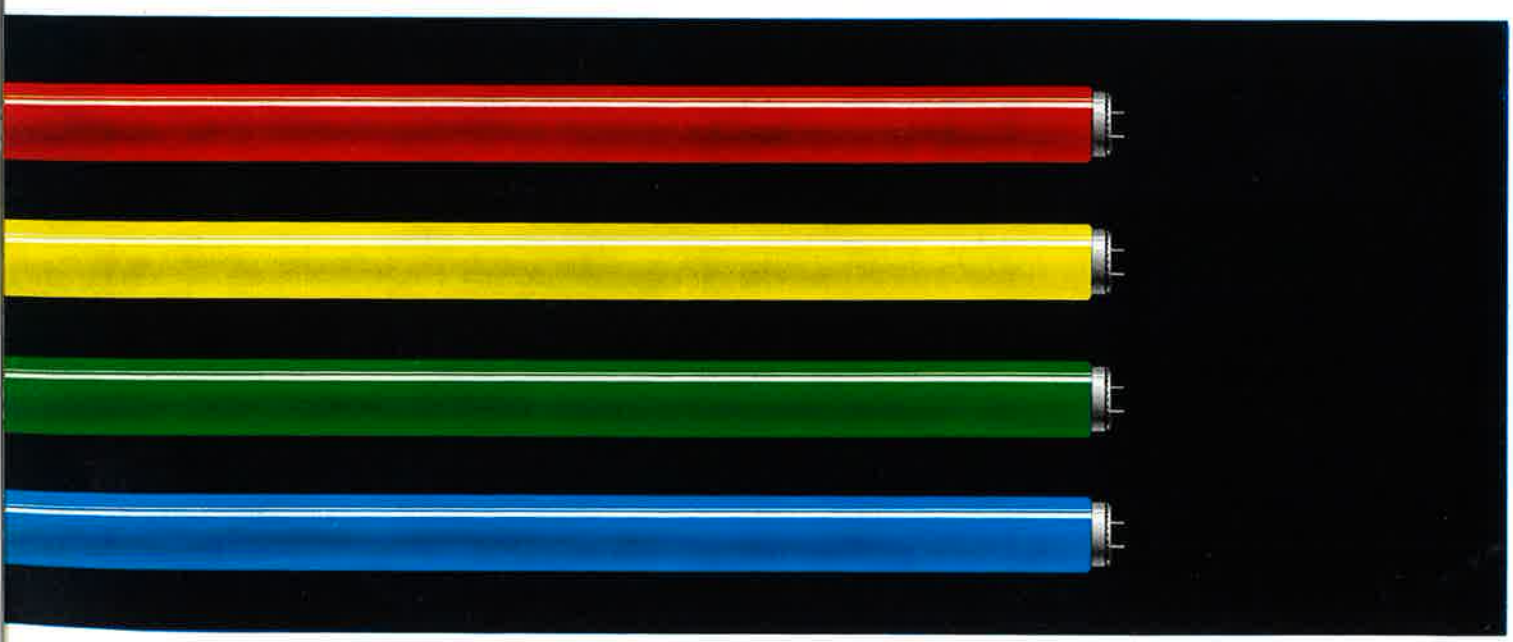


/55	Daylight	6500 °K
/27	Warm white special deluxe	2700 °K
/37	White special deluxe	4200 °K
/57	Daylight	7400 °K
/47	White	5000 °K


"TL" 4 W
"TL" 6 W
"TL" 8 W
"TL" 13 W


"TL"D 15 W
"TL"D 30 W


"TL" 14 W
"TL" 15 W



"TL" STANDARD-TYPE FLUORESCENT LAMPS

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 lamps; "TL" miniature lamps, the 6 W and 8 W types being widely applied in yachts, caravans, vans, for camping purposes etc.; "TL"D; "TL" coloured; "TL"E; "TL"U and "TL"W lamps. (See also pages B 6 - B 7.)

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance cd/cm²	Catalogue number	Ordering number
Miniature types								
"TL" 4 W	15	16	G 5	Warm white	130	0.7	"TL" 4 W/29	9280 000 029 ..
				White	150	0.8	"TL" 4 W/33	9280 000 033 ..
"TL" 6 W	23	16	G 5	Warm white special deluxe	160	0.55	"TL" 6 W/27	9280 005 027 ..
				Warm white	280	0.9	"TL" 6 W/29	9280 005 029 ..
				White	300	1.0	"TL" 6 W/33	9280 005 033 ..
				White deluxe	200	0.65	"TL" 6 W/34	9280 005 034 ..
				Daylight	200	0.65	"TL" 6 W/55	9280 005 055 ..
"TL" 8 W	30	16	G 5	Warm white special deluxe	240	0.6	"TL" 8 W/27	9280 010 027 ..
				Warm white	445	1.0	"TL" 8 W/29	9280 010 029 ..
				White	475	1.0	"TL" 8 W/33	9280 010 033 ..
				White deluxe	310	0.7	"TL" 8 W/34	9280 010 034 ..
				Daylight	310	0.7	"TL" 8 W/55	9280 010 055 ..
				Whilte 5000 °K	240	0.6	"TL" 8 W/47	9280 010 047 ..
"TL" 13 W	53	16	G 5	Warm white special deluxe	500	0.6	"TL" 13 W/27	9280 015 027 ..
				Warm white	890	1.0	"TL" 13 W/29	9280 015 029 ..
				White	950	1.1	"TL" 13 W/33	9280 015 033 ..
				White deluxe	630	0.75	"TL" 13 W/34	9280 015 034 ..
Slender types								
"TL"D 15 W	46	26	G 13	Warm white special deluxe	500	0.5	"TL"D 15 W/27	9280 245 027 ..
				Warm white	880	0.85	"TL"D 15 W/29	9280 245 029 ..
				Warm white deluxe	570	0.55	"TL"D 15 W/32	9280 245 032 ..
				White	900	0.85	"TL"D 15 W/33	9280 245 033 ..
				White deluxe	590	0.55	"TL"D 15 W/34	9280 245 034 ..
				White 5000 °K	495	0.45	"TL"D 15 W/47	9280 245 047 ..
				Cool daylight	760	0.65	"TL"D 15 W/54	9280 245 054 ..
				Daylight	590	0.55	"TL"D 15 W/55	9280 245 055 ..
"TL"D 30 W	92	26	G 13	Warm white special deluxe	1220	0.55	"TL"D 30 W/27	9280 250 027 ..
				Warm white	2120	1.0	"TL"D 30 W/29	9280 250 029 ..
				Warm white deluxe	1350	0.6	"TL"D 30 W/32	9280 250 032 ..
				White	2225	1.0	"TL"D 30 W/33	9280 250 033 ..
				White deluxe	1485	0.6	"TL"D 30 W/34	9280 250 034 ..
				Cool daylight	1850	0.9	"TL"D 30 W/54	9280 250 054 ..
				Daylight	1485	0.6	"TL"D 30 W/55	9280 250 055 ..
Short types								
"TL" 14 W	38	38	G 13	Warm white	650	0.5	"TL" 14 W/29	9280 020 029 ..
				White	710	0.55	"TL" 14 W/33	9280 020 033 ..
				White deluxe	445	0.3	"TL" 14 W/34	9280 020 034 ..
				Cool daylight	580	0.45	"TL" 14 W/54	9280 020 054 ..
				Daylight	445	0.3	"TL" 14 W/55	9280 020 055 ..
"TL" 15 W	46	38	G 13	Warm white	810	0.5	"TL" 15 W/29	9280 025 029 ..
				Warm white deluxe	530	0.35	"TL" 15 W/32	9280 025 032 ..
				White	830	0.5	"TL" 15 W/33	9280 025 033 ..
				White deluxe	550	0.35	"TL" 15 W/34	9280 025 034 ..
				Cool daylight	690	0.4	"TL" 15 W/54	9280 025 054 ..
				Daylight	550	0.35	"TL" 15 W/55	9280 025 055 ..
Coloured types								
"TL" 20 W coloured	61	38	G 13	Red	60	—	"TL" 20 W/15	9280 035 015 ..
				Yellow	800	—	"TL" 20 W/16	9280 035 016 ..
				Green	1300	—	"TL" 20 W/17	9280 035 017 ..
				Blue	250	—	"TL" 20 W/18	9280 035 018 ..
"TL" 40 W coloured	122	38	G 13	Red	160	—	"TL" 40 W/15	9280 060 015 ..
				Yellow	2000	—	"TL" 40 W/16	9280 060 016 ..
				Green	3300	—	"TL" 40 W/17	9280 060 017 ..
				Blue	650	—	"TL" 40 W/18	9280 060 018 ..

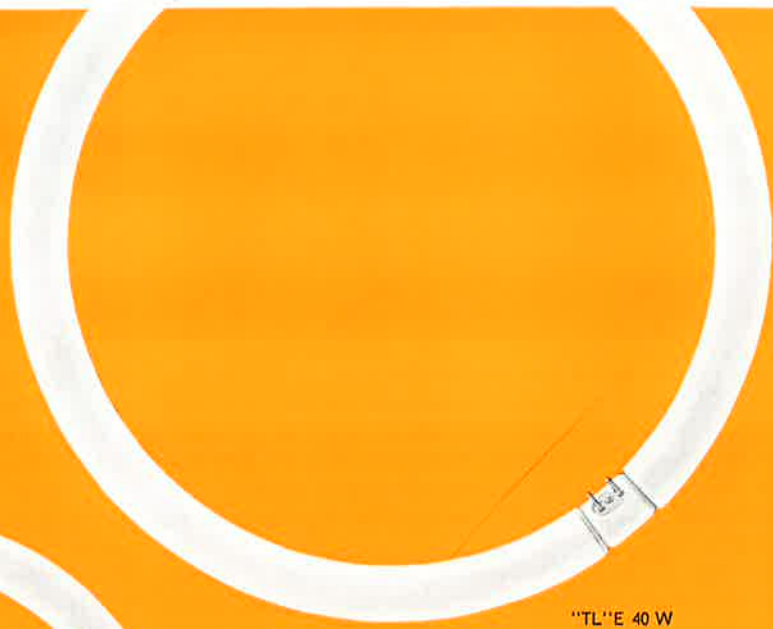
[1]) After 100 burning hours

"TL" STANDARD-TYPE FLUORESCENT LAMPS (Continued)

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance cd/cm²	Catalogue number	Ordering number
"TL" 20 W	61	38	G 13	Warm white special deluxe	650	0.35	"TL" 20 W/27	9280 035 027 ..
				Warm white	1150	0.65	"TL" 20 W/29	9280 035 029 ..
				Warm white deluxe	750	0.4	"TL" 20 W/32	9280 035 032 ..
				White	1220	0.65	"TL" 20 W/33	9280 035 033 ..
				White deluxe	760	0.4	"TL" 20 W/34	9280 035 034 ..
				White special deluxe	650	0.35	"TL" 20 W/37	9280 035 037 ..
				White 5000 °K	650	0.35	"TL" 20 W/47	9280 035 047 ..
				Cool daylight	1030	0.5	"TL" 20 W/54	9280 035 054 ..
				Daylight	760	0.4	"TL" 20 W/55	9280 035 055 ..
"TL" 25 W	100	38	G 13	Warm white	1770	0.5	"TL" 25 W/29	9280 050 029 ..
				Warm white deluxe	1110	0.35	"TL" 25 W/32	9280 050 032 ..
				White	1800	0.5	"TL" 25 W/33	9280 050 033 ..
				White deluxe	1160	0.35	"TL" 25 W/34	9280 050 034 ..
				Daylight	1160	0.35	"TL" 25 W/55	9280 050 055 ..
"TL" 40 W [2]	122	38	G 13	Warm white special deluxe	1750	0.4	"TL" 40 W/27	9280 060 027 ..
				Warm white	3070	0.7	"TL" 40 W/29	9280 060 029 ..
				Warm white deluxe	1950	0.45	"TL" 40 W/32	9280 060 032 ..
				White	3200	0.75	"TL" 40 W/33	9280 060 033 ..
				White deluxe	2020	0.45	"TL" 40 W/34	9280 060 034 ..
				White special deluxe	1730	0.4	"TL" 40 W/37	9280 060 037 ..
				White 5000 °K	1750	0.4	"TL" 40 W/47	9280 060 047 ..
				Cool daylight	2600	0.55	"TL" 40 W/54	9280 060 054 ..
				Daylight	2020	0.45	"TL" 40 W/55	9280 060 055 ..
				Daylight 7400 °K	1760	0.4	"TL" 40 W/57	9280 060 057 ..
"TL" 40 W-1	100	38	G 13	Warm white special deluxe	1620	0.4	"TL" 40 W-1/27	9280 075 027 ..
				Warm white	2870	0.75	"TL" 40 W-1/29	9280 075 029 ..
				Warm white deluxe	1830	0.55	"TL" 40 W-1/32	9280 075 032 ..
				White	2870	0.75	"TL" 40 W-1/33	9280 075 033 ..
				White deluxe	1930	0.55	"TL" 40 W-1/34	9280 075 034 ..
				White special deluxe	1620	0.4	"TL" 40 W-1/37	9280 075 037 ..
"TL" 65 W	152	38	G 13	Warm white special deluxe	2820	0.5	"TL" 65 W/27	9280 085 027 ..
				Warm white	4950	0.9	"TL" 65 W/29	9280 085 029 ..
				Warm white deluxe	3200	0.6	"TL" 65 W/32	9280 085 032 ..
				White	5100	0.9	"TL" 65 W/33	9280 085 033 ..
				White deluxe	3320	0.6	"TL" 65 W/34	9280 085 034 ..
				Cool daylight	4010	0.75	"TL" 65 W/54	9280 085 054 ..
				Daylight	3320	0.6	"TL" 65 W/55	9280 085 055 ..
"TL"E 22 W	21.5 [3]	28 [4]	G 10q	Warm white	1110	0.7	"TL"E 22 W/29	9280 260 029 ..
				White	1110	0.7	"TL"E 22 W/33	9280 260 033 ..
				White deluxe	750	0.45	"TL"E 22 W/34	9280 260 034 ..
				Cool daylight	900	0.6	"TL"E 22 W/54	9280 260 054 ..
				Daylight	750	0.45	"TL"E 22 W/55	9280 260 055 ..
"TL"E 32 W	31 [3]	32 [4]	G 10q	Warm white special deluxe	1210	0.45	"TL"E 32 W/27	9280 265 027 ..
				Warm white	2080	0.75	"TL"E 32 W/29	9280 265 029 ..
				Warm white deluxe	1515	0.6	"TL"E 32 W/32	9280 265 032 ..
				White	2080	0.75	"TL"E 32 W/33	9280 265 033 ..
				White deluxe	1400	0.55	"TL"E 32 W/34	9280 265 034 ..
				Cool daylight	1730	0.65	"TL"E 32 W/54	9280 265 054 ..
				Daylight	1400	0.55	"TL"E 32 W/55	9280 265 055 ..
"TL"E 40 W	41 [3]	32 [4]	G 10q	Warm white special deluxe	1830	0.45	"TL"E 40 W/27	9280 270 027 ..
				Warm white	2930	0.75	"TL"E 40 W/29	9280 270 029 ..
				Warm white deluxe	2130	0.55	"TL"E 40 W/32	9280 270 032 ..
				White	2930	0.75	"TL"E 40 W/33	9280 270 033 ..
				White deluxe	1990	0.5	"TL"E 40 W/34	9280 270 034 ..
				Cool daylight	2425	0.65	"TL"E 40 W/54	9280 270 054 ..
				Daylight	1990	0.5	"TL"E 40 W/55	9280 270 055 ..
"TL"U 20 W	31 [5]	38 [4]	G 13	Warm white	1100	0.45	"TL"U 20 W/29	9280 387 029 ..
				White	1100	0.45	"TL"U 20 W/33	9280 387 033 ..
"TL"U 40 W	60.7 [5]	38 [4]	G 13	Warm white special deluxe	1700	0.4	"TL"U 40 W/27	9280 388 027 ..
				Warm white	2850	0.6	"TL"U 40 W/29	9280 388 029 ..
				Warm white deluxe	2000	0.45	"TL"U 40 W/32	9280 388 032 ..
				White	2850	0.6	"TL"U 40 W/33	9280 388 033 ..
"TL"U 65 W	76.5 [5]	38 [4]	G 13	Warm white	4850	0.75	"TL"U 65 W/29	9280 389 029 ..
				White	4850	0.75	"TL"U 65 W/33	9280 389 033 ..
"TL"W 25 W	—	27	G 13	Warm white deluxe	1250	0.45	"TL"W 25 W/32	9280 360 032 ..
				White deluxe	1250	0.45	"TL"W 25 W/34	9280 360 034 ..

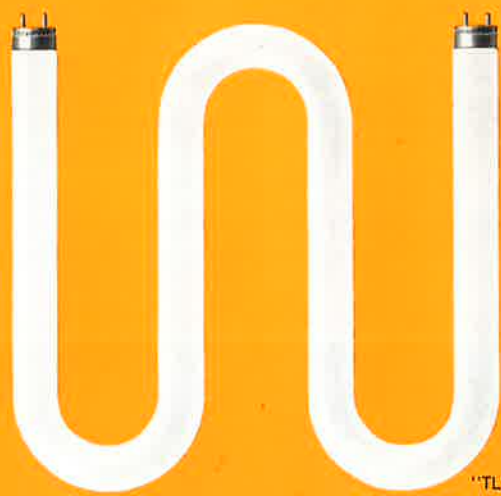
[1]) After 100 burning hours
[2]) For low ambient temperature ignition (up to —20 °C): cat. no. "TL"B 40 W/ . . At low ambient temperatures these lamps have to be applied in enclosed fittings, as they reach their rated light output at +27 °C ambient temperature. Only available in the colours /29 and /33; ordering numbers 9280 215 029 .. and 9280 215 033 .. resp.
[3]) Outer diameter of lamp circle
[4]) Tube diameter
[5]) Max. **folded** length

"TL"E 22 W



"TL"E 40 W

"TL"E 32 W

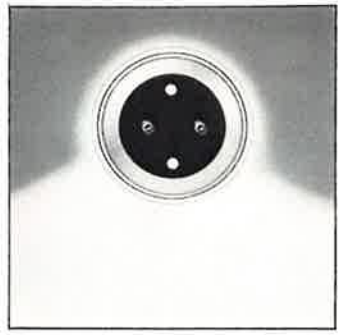


"TL"W 25 W

"TL"U 20 W

"TL"U 40 W

"TL"U 65 W



"TL"F REFLECTOR FLUORESCENT LAMPS

One of the main causes of light depreciation with "TL" fluorescent lamps is the deposit of dust which accumulates on top of the lamp in the 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 a lamp of this type in their programme, designated "TL"F.

The "TL"F fluorescent lamp is provided with a reflecting powder coating. This coating covers about 2/3 of the circumference and is applied between the layer of fluorescent powder and the glass wall. The reflecting layer reflects light downwards that would normally be emitted upwards. In the direction of this downward part the luminous intensity is, therefore, considerably higher than that of a "TL" lamp without reflector, whereas in the upward direction the intensity is considerably reduced.

The luminous intensity in the downward direction is approximately 70 % greater than that of non-reflector lamps. Apart from dust there is the more general problem that with a normal "TL" lamp most of the upward light emission goes to waste.

The illumination level obtained with "TL"F lamps, however, is and will remain considerably higher than that obtained with "TL" lamps. The "TL"F lamp is the ideal light source for upgrading lux levels provided by old installations, for dusty rooms and dark ceilings, and for high lux level applications in general.

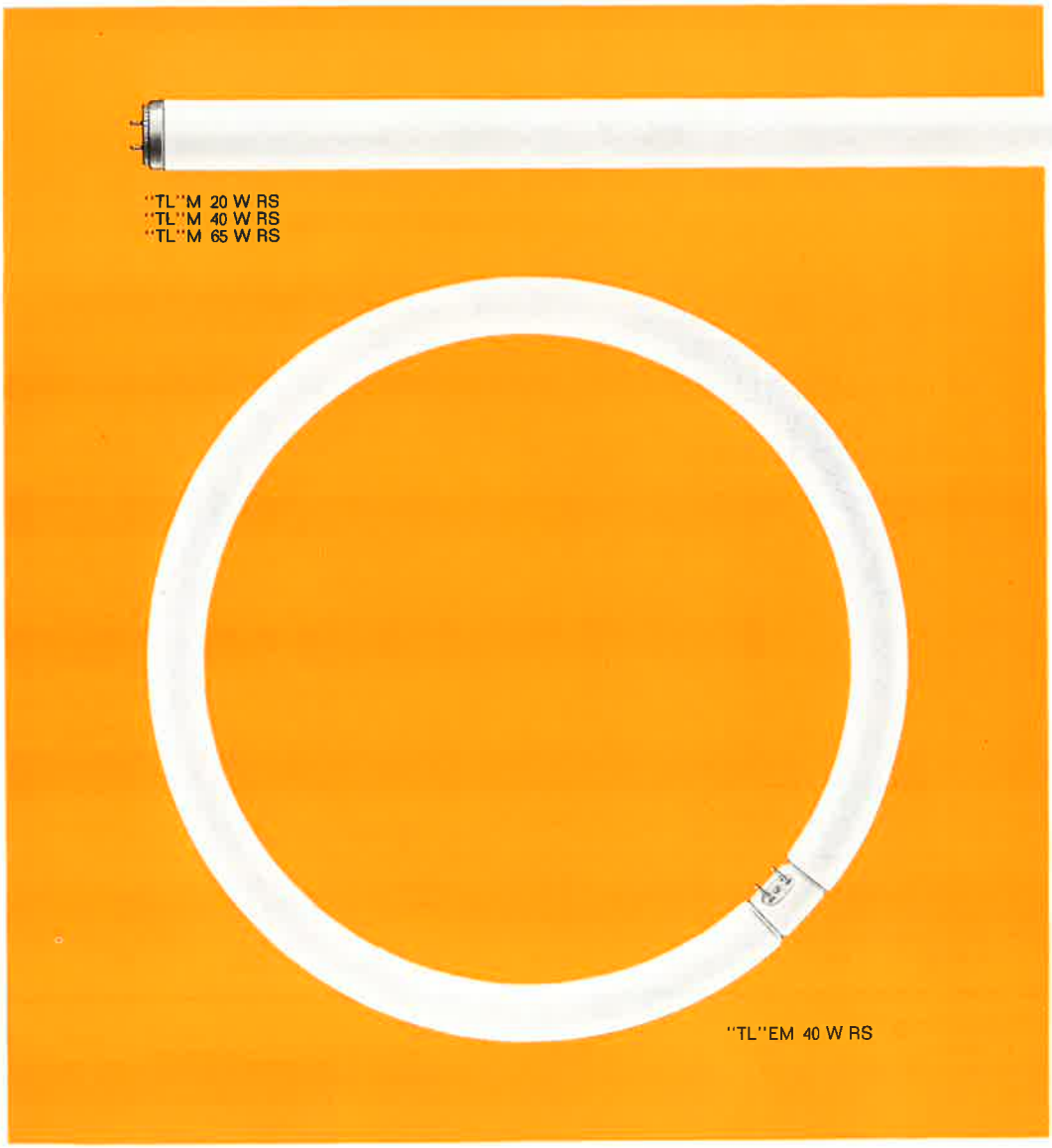
Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance [2] cd/cm²	Catalogue number	Ordering number
"TL"F 20 W	61	38	G 13	Warm white	990	1.1/0.2	"TL"F 20 W/29	9280 036 029 ..
				White	1000	1.1/0.2	"TL"F 20 W/33	9280 036 033 ..
				White deluxe	690	0.75/0.15	"TL"F 20 W/34	9280 036 034 ..
				Daylight	690	0.75/0.15	"TL"F 20 W/55	9280 036 055 ..
"TL"F 40 W	122	38	G 13	Warm white	2600	1.4/0.35	"TL"F 40 W/29	9280 062 029 ..
				White	2700	1.4/0.35	"TL"F 40 W/33	9280 062 033 ..
				White deluxe	1800	1.0/0.2	"TL"F 40 W/34	9280 062 034 ..
				Daylight	1800	1.0/0.2	"TL"F 40 W/55	9280 062 055 ..
"TL"F 40 W-1	100	38	G 13	White	2520	1.3/0.25	"TL"F 40 W-1/33	9280 078 033 ..
"TL"F 65 W	152	38	G 13	Warm white	4350	2.0/0.4	"TL"F 65 W/29	9280 086 029 ..
				White	4400	2.0/0.4	"TL"F 65 W/33	9280 086 033 ..
				White deluxe	2920	1.3/0.25	"TL"F 65 W/34	9280 086 034 ..
				Daylight	2920	1.3/0.25	"TL"F 65 W/55	9280 086 055 ..

[1]) After 100 burning hours
[2]) Approximate luminance values of the window and of the reflecting side of the lamp

"TL"M RS AND "TL"MF RS RAPID-START FLUORESCENT LAMPS

"TL"M RS rapid-start fluorescent lamps are provided wih an external ignition strip, connected to one of the electrodes via a high-chmic resistor, which permits starterless operation. To ensure prompt ignition even in damp surroundings, the lamp is provided with a silicon coating. When used with he appropriate ballast, the "TL"M RS lamp offers the following important advantages: instant starting and ignition independent of atmospheric conditions. This is the only fluorescent lamp that can be **dimmed,** that is to say when connected to a dimming apparatus its output can be varied between zero and normal lumen output.

A reflector (F) version, the principle of which is described on the opposite page, is available for a number of "TL"M lamps as well.



Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance cd/cm²	Catalogue number	Ordering number
"TL"M 20 W RS	61	38	G 13	Warm white special deluxe	650	0.35	"TL"M 20 W/27 RS	9280 300 027 ..
				Warm white	1110	0.5	"TL"M 20 W/29 RS	9280 300 029 ..
				Warm white deluxe	720	0.35	"TL"M 20 W/32 RS	9280 300 032 ..
				White	1110	0.5	"TL"M 20 W/33 RS	9280 300 033 ..
				White deluxe	730	0.35	"TL"M 20 W/34 RS	9280 300 034 ..
				White special deluxe	650	0.35	"TL"M 20 W/37 RS	9280 300 037 ..
				Daylight	730	0.35	"TL"M 20 W/55 RS	9280 300 055 ..
"TL"M 40 W RS	122	38	G 13	Warm white special deluxe	1650	0.35	"TL"M 40 W/27 RS	9280 305 027 ..
				Warm white	2820	0.65	"TL"M 40 W/29 RS	9280 305 029 ..
				Warm white deluxe	1860	0.4	"TL"M 40 W/32 RS	9280 305 032 ..
				White	2900	0.65	"TL"M 40 W/33 RS	9280 305 033 ..
				White deluxe	1900	0.4	"TL"M 40 W/34 RS	9280 305 034 ..
				White special deluxe	1650	0.35	"TL"M 40 W/37 RS	9280 305 037 ..
				Cool daylight	2325	0.5	"TL"M 40 W/54 RS	9280 305 054 ..
				Daylight	1900	0.4	"TL"M 40 W/55 RS	9280 305 055 ..
"TL"M 65 W RS	152	38	G 13	Warm white special deluxe	2750	0.5	"TL"M 65 W/27 RS	9280 310 027 ..
				Warm white	4650	0.85	"TL"M 65 W/29 RS	9280 310 029 ..
				Warm white deluxe	3050	0.55	"TL"M 65 W/32 RS	9280 310 032 ..
				White	4800	0.85	"TL"M 65 W/33 RS	9280 310 033 ..
				White deluxe	3200	0.55	"TL"M 65 W/34 RS	9280 310 034 ..
				White special deluxe	2850	0.5	"TL"M 65 W/37 RS	9280 310 037 ..
				Daylight	3200	0.55	"TL"M 65 W/55 RS	9280 310 055 ..
"TL"EM 40 W RS	41 [2]	32	G 10q	Warm white	2850	0.75	"TL"EM 40 W/29 RS	9280 275 029 ..
				Warm white deluxe	2070	0.5	"TL"EM 40 W/32 RS	9280 275 032 ..
				White	2850	0.75	"TL"EM 40 W/33 RS	9280 275 033 ..
				White deluxe	1930	0.5	"TL"EM 40 W/34 RS	9280 275 034 ..
Reflector types								
"TL"MF 40 W RS	122	38	G 13	White	2550	1.2/0.2 [3]	"TL"MF 40 W/33 RS	9280 306 033 ..
				White deluxe	1730	0.7/0.15 [3]	"TL"MF 40 W/34 RS	9280 306 034 ..
"TL"MF 65 W RS	152	38	G 13	White	4250	1.5/0.30 [3]	"TL"MF 65 W/33 RS	9280 311 033 ..
				White deluxe	2770	1.0/0.2 [3]	"TL"MF 65 W/34 RS	9280 311 034 ..

[1]) After 100 burning hours
[2]) Outer diameter of lamp circle
[3]) Approximate luminance values of the window and of the reflecting side of the lamp

"TL"M RS AND "TL" RS "DOUBLE-FLUX" FLUORESCENT LAMPS

The problem of obtaining more lumens from the same lamp length means that the mercury-vapour pressure must be kept at the low level required for optimum light production, notwithstanding the increasing tube-wall temperature. This problem can be solved by creating a cool spot in the lamp.
In the "TL"(M) RS "Double-Flux" — so-called because the luminous flux per unit of length is twice as much as previously possible — this cool spot is located behind the electrodes, where a space of 6 cm is left free. A screen behind the electrodes prevents heat from radiating in the direction of the cool spot.
The lamps should be applied in well-ventilated fittings and can be operated without starter on rapid-start ballasts. The electrodes are of the triple-coil low-voltage type.

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance cd/cm²	Catalogue number	Ordering number
"TL"M 115 W RS	122	38	G 13	White	7100	1.7	"TL"M 115 W/33 RS	9280 315 033 ..
"TL"M 140 W RS	152	38	G 13	White	9000	1.7	"TL"M 140 W/33 RS	9280 320 033 ..
"TL" 215 W RS	244	38	R 17d	White White deluxe	15500 10500	1.7 1.1	"TL" 215 W/33 RS "TL" 215 W/34 RS	9280 135 033 .. 9280 135 034 ..

[1]) After 100 burning hours

"TL"MF RS AND "TL"F RS "DOUBLE-FLUX" REFLECTOR FLUORESCENT LAMPS

The "TL"(M) RS "Double-Flux" lamps are also available with a reflecting powder layer, as described for the "TL"F lamps (page B 8). 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 ideal for upgrading the lux level provided by old installations, for dusty rooms, ceilings and for high lux level applications.

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance [2] cd/cm²	Catalogue number	Ordering number
"TL"MF 115 W RS	122	38	G 13	White	6200	3.1/0.6	"TL"MF 115 W/33 RS	9280 316 033 ..
"TL"MF 140 W RS	152	38	G 13	White	7800	3.1/0.6	"TL"MF 140 W/33 RS	9280 321 033 ..
"TL"F 215 W RS	244	38	R 17d	White	13000	3.1/0.6	"TL"F 215 W/33 RS	9280 136 033 ..

[1]) After 100 burning hours
[2]) Approximate luminance values of the window and of the reflecting side of the lamp

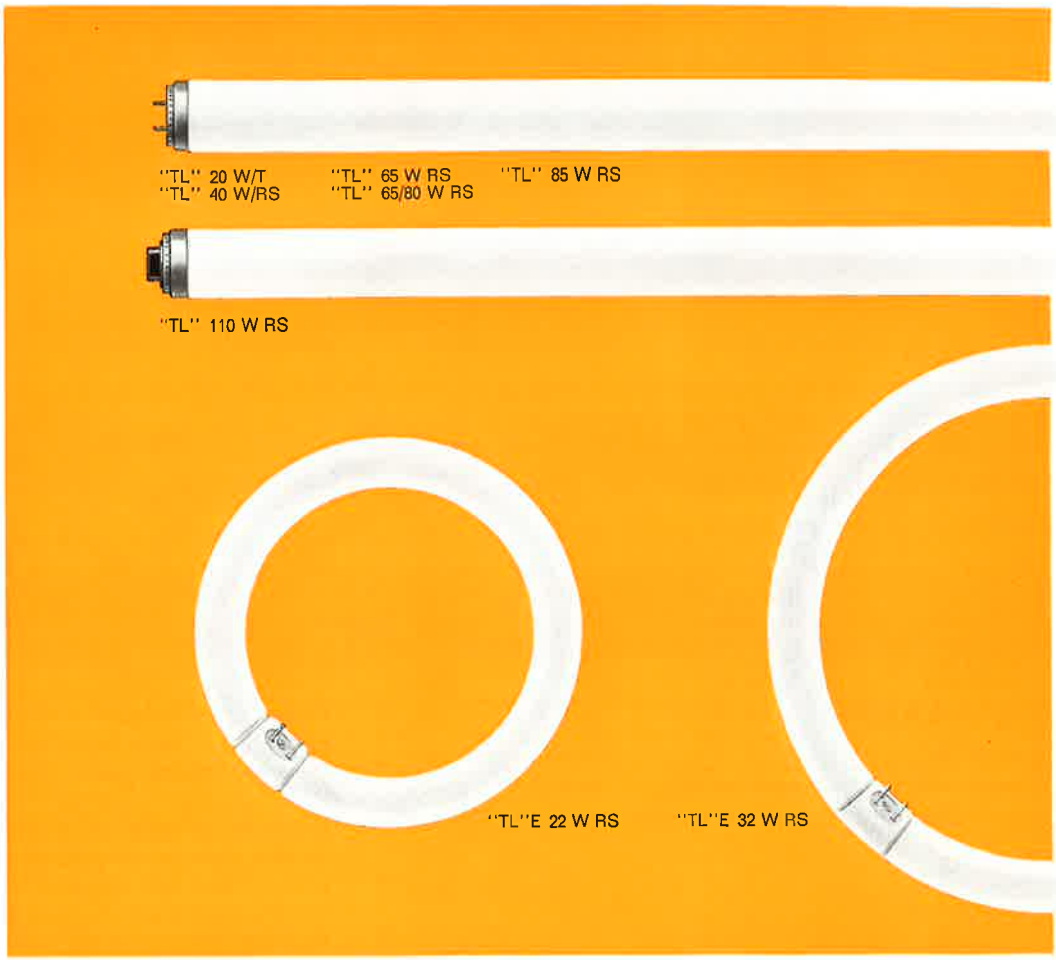
"TL" RS AND "TL"F RS RAPID-START FLUORESCENT LAMPS

The fluorescent lamps of the "TL" RS type are operated on rapid-start ballasts of various design. The shorter lamps, up to the 65/80 W type, 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 2 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 various types of "TL" RS lamp are also available with internal reflecting layer, as described for the "TL"F lamps (page B 8).



Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance [2] cd/cm²	Catalogue number	Ordering number
"TL" 20 W/T [3]	61	38	G 13	Warm white	1180	0.6	"TL" 20 W/29 T	9280 148 029 ..
				Warm white deluxe	760	0.35	"TL" 20 W/32 T	9280 148 032 ..
				White	1180	0.6	"TL" 20 W/33 T	9280 148 033 ..
				White deluxe	780	0.35	"TL" 20 W/34 T	9280 148 034 ..
				Daylight	780	0.35	"TL" 20 W/55 T	9280 148 055 ..
"TL"E 22 W RS	21.5 [6]	28	G 10q	White	1110	0.7	"TL"E 22 W/33 RS	9280 280 033 ..
				Cool daylight	900	0.6	"TL"E 22 W/54 RS	9280 280 054 ..
"TL"E 32 W RS	31 [6]	32	G 10q	White	2080	0.75	"TL"E 32 W/33 RS	9280 285 033 ..
				Cool daylight	1730	0.65	"TL"E 32 W/54 RS	9280 285 054 ..
"TL" 40 W RS	122	38	G 13	Warm white special deluxe	1750	0.4	"TL" 40 W/27 RS	9280 110 027 ..
				White	3200	0.7	"TL" 40 W/33 RS	9280 110 033 ..
				White deluxe	2020	0.45	"TL" 40 W/34 RS	9280 110 034 ..
				Cool daylight	2600	0.55	"TL" 40 W/54 RS	9280 110 054 ..
				Daylight	2020	0.45	"TL" 40 W/55 RS	9280 110 055 ..
"TL" 65 W RS	152	38	G 13	Warm white special deluxe	2820	0.5	"TL" 65 W/27 RS	9280 115 027 ..
				White special deluxe	2820	0.5	"TL" 65 W/37 RS	9280 115 037 ..
				White 5000 °K	2900	0.55	"TL" 65 W/47 RS	9280 115 047 ..
				Daylight 7400 °K	2700	0.5	"TL" 65 W/57 RS	9280 115 057 ..
"TL" 65/80 W RS	152	38	G 13	Warm white	4950 [4]/5450 [5]	0.9 [4]/0.95 [5]	"TL" 65/80 W/29 RS	9280 115 029 ..
				Warm white deluxe	3200 [4]/3500 [5]	0.6 [4]/0.65 [5]	"TL" 65/80 W/32 RS	9280 115 032 ..
				White	5100 [4]/5450 [5]	0.95 [4]/0.95 [5]	"TL" 65/80 W/33 RS	9280 115 033 ..
				White deluxe	3320 [4]/3660 [5]	0.6 [4]/0.65 [5]	"TL" 65/80 W/34 RS	9280 115 034 ..
"TL" 85 W RS	244	38	G 13	Warm white	7030	0.75	"TL" 85 W/29 RS	9280 120 029 ..
				Warm white deluxe	4850	0.5	"TL" 85 W/32 RS	9280 120 032 ..
				White	7100	0.8	"TL" 85 W/33 RS	9280 120 033 ..
"TL" 110 W RS	244	38	R 17d	Warm white deluxe	5940	0.65	"TL" 110 W/32 RS	9280 125 032 ..
				White	8900	1.0	"TL" 110 W/33 RS	9280 125 033 ..
				White deluxe	5900	0.65	"TL" 110 W/34 RS	9280 125 034 ..
"TL"F 20 W/T [3]	61	38	G 13	White	1030	1.0/0.2	"TL"F 20 W/33 T	9280 145 033 ..
"TL"F 65/80 W RS	152	38	G 13	Warm white	4350 [4]/4750 [5]	1.6/0.3 [4] 1.7/0.35 [5]	"TL"F 65/80 W/29 RS	9280 116 029 ..
				White	4400 [4]/4800 [5]	1.6/0.3 [4] 1.7/0.35 [5]	"TL"F 65/80 W/33 RS	9280 116 033 ..
				White deluxe	2930 [4]/3220 [5]	1.1/0.25 [4] 1.15/0.3 [5]	"TL"F 65/80 W/34 RS	9280 116 034 ..
"TL"F 85 W RS	244	38	G 13	Warm white	6430	1.4/0.3	"TL"F 85 W/29 RS	9280 121 029 ..
				White	6430	1.5/0.3	"TL"F 85 W/33 RS	9280 121 033 ..
				White deluxe	4100	1.0/0.2	"TL"F 85 W/34 RS	9280 121 034 ..
"TL"F 110 W RS	244	38	R 17d	White	7950	1.8/0.35	"TL"F 110 W/33 RS	9280 126 033 ..

[1]) After 100 burning hours
[2]) Approximate luminance values of the window and of the reflecting side of the lamp
[3]) Also available with stripe, cat. no. e.g.: "TL"A(F) 20 W/. .; see page B 12 (B 13)
[4]) When operated on 65 W gear
[5]) When operated on 80 W gear
[6]) Outer diameter lamp circle

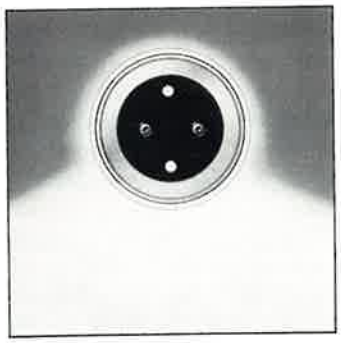
"TL"A LAMPS

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" "TL"A lamps are suitable for either switch-start or instant-start ballasts made in accordance with British specifications for instant-start preheat ballasts. "TL"A lamps are silicon-coated and provided with an ignition strip. They 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 and are designated "TL"AD. The 40 W-type can also be supplied in a short version, the 2 ft "TL"AK 40 W.

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance cd/cm²	Catalogue number	Ordering number
"TL"AD 15 W	46	26	G 13	Warm white	850	0.8	"TL"AD 15 W/29	9280 185 029 ..
				White	870	0.8	"TL"AD 15 W/33	9280 185 033 ..
				White deluxe	580	0.55	"TL"AD 15 W/34	9280 185 034 ..
				Daylight	580	0.55	"TL"AD 15 W/55	9280 185 055 ..
'TL"AD 30 W	92	26	G 13	Warm white	2050	0.9	"TL"AD 30 W/29	9280 190 029 ..
				Warm white deluxe	1350	0.6	"TL"AD 30 W/32	9280 190 032 ..
				White	2150	1.0	"TL"AD 30 W/33	9280 190 033 ..
				White deluxe	1400	0.6	"TL"AD 30 W/34	9280 190 034 ..
				Daylight	1400	0.6	"TL"AD 30 W/55	9280 190 055 ..
"TL"A 20 W [2]	61	38	G 13	Warm white	1140	0.5	"TL"A 20 W/29	9280 155 029 ..
				Warm white deluxe	750	0.35	"TL"A 20 W/32	9280 155 032 ..
				White	1140	0.5	"TL"A 20 W/33	9280 155 033 ..
				White deluxe	760	0.35	"TL"A 20 W/34	9280 155 034 ..
				Daylight	760	0.35	"TL"A 20 W/55	9280 155 055 ..
"TL"A 30 W	92	38	G 13	Warm white	2030	0.6	"TL"A 30 W/29	9280 160 029 ..
				Warm white deluxe	1300	0.4	"TL"A 30 W/32	9280 160 032 ..
				White	2030	0.6	"TL"A 30 W/33	9280 160 033 ..
				White deluxe	1350	0.4	"TL"A 30 W/34	9280 160 034 ..
				Daylight	1350	0.4	"TL"A 30 W/55	9280 160 055 ..
'TL"A 40 W	122	38	G 13	Warm white	2850	0.65	"TL"A 40 W/29	9280 165 029 ..
				Warm white deluxe	1850	0.45	"TL"A 40 W/32	9280 165 032 ..
				White	2900	0.65	"TL"A 40 W/33	9280 165 033 ..
				White deluxe	1900	0.45	"TL"A 40 W/34	9280 165 034 ..
				Daylight	1900	0.45	"TL"A 40 W/55	9280 165 055 ..
"TL"AK 40 W	61	38	G 13	Warm white	2000	0.95	"TL"AK 40 W/29	9280 200 029 ..
				Warm white deluxe	1330	0.65	"TL"AK 40 W/32	9280 200 032 ..
				White	2000	0.95	"TL"AK 40 W/33	9280 200 033 ..
				White deluxe	1380	0.70	"TL"AK 40 W/34	9280 200 034 ..
				Daylight	1380	0.70	"TL"AK 40 W/55	9280 200 055 ..
"TL" 80 W/T [3]	152	38	G 13	White	5350	0.95	"TL" 80 W/33 T	9280 090 033 ..
				Daylight	3600	0.65	"TL" 80 W/55 T	9280 090 055 ..
"TL"A 125 W	244	38	G 13	Warm white	9300	1.00	"TL"A 125 W/29	9280 180 029 ..
				Warm white deluxe	5800	0.65	"TL"A 125 W/32	9280 180 032 ..
				White	9500	1.05	"TL"A 125 W/33	9280 180 033 ..

[1]) After 100 burning hours
[2]) Also available without stripe (silicon coated) cat. no. e.g.: "TL" 20 W/33 T; see page B 11
[3]) Without stripe (silicon-coated)

"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 under "TL"F lamps (page B 8). These lamps have, of course, the same electrical characteristics as the corresponding "TL"A lamps.

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance [2] cd/cm²	Catalogue number	Ordering number
"TL"AF 20 W [3]	61	38	G 13	Warm white White	990 990	0.9/0.2 0.9/0.2	"TL"AF 20 W/29 "TL"AF 20 W/33	9280 156 029 .. 9280 156 033 ..
"TL"AF 40 W	122	38	G 13	White	2525	1.1/0.3	"TL"AF 40 W/33	9280 167 033 ..
"TL"F 80 W/T [4]	152	38	G 13	White	4600	1.8/0.35	"TL"F 80 W/33 T	9280 092 033 ..
"TL"AF 125 W	244	38	G 13	White	8400	1.9/0.4	"TL"AF 125 W/33	9280 181 033 ..

[1]) After 100 burning hours
[2]) Approximate luminance values of the window and of the reflecting side of the lamp
[3]) Also available without stripe (silicon coated): cat. no.: "TL"F 20 W/33 T; see page B 11
[4]) Without stripe (silicon coated)

"TL"C LAMPS

For use on D.C. mains, Philips manufacture a 15 W and 20 W lamp, type "TL"C. They are extensively applied on ships, aircraft and trains. 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 ballasts, and starters are not required. "TL"C 20 W lamps are fitted internally with two conducting strips, each being approximately half the lengh of the lamp. The stability of the "TL"C lamps is of special interest for D.C. vehicle lighting, where considerable battery-voltage fluctuations usually occur.

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] [2] lm	Luminance [2] cd/cm²	Catalogue number	Ordering number
"TL"C 15 W	46	38	G 13	Warm white	820	0.5	"TL"C 15 W/29	9280 230 029 ..
				Warm white deluxe	530	0.35	"TL"C 15 W/32	9280 230 032 ..
				White deluxe	550	0.35	"TL"C 15 W/34	9280 230 034 ..
"TL"C 20 W	61	38	G 13	Warm white	1100	0.5	"TL"C 20 W/29	9280 235 029 ..
				Warm white deluxe	690	0.35	"TL"C 20 W/32	9280 235 032 ..
				White deluxe	710	0.35	"TL"C 20 W/34	9280 235 034 ..

[1]) After 100 burning hours
[2]) Bearing on D.C.

"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 the occurrence of any flicker.
"TL"R lamps are provided with two inside ignition-strips and are designed for D.C. operation.
"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	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance cd/cm²	Catalogue number	Ordering number
"TL"R 20 W	61	38	R 18s	Warm white	990	0.4	"TL"R 20 W/29	9280 340 029 ..
				Warm white deluxe	600	0.3	"TL"R 20 W/32	9280 340 032 ..
				White	990	0.4	"TL"R 20 W/33	9280 340 033 ..
				White deluxe	630	0.3	"TL"R 20 W/34	9280 340 034 ..
"TL"R 40 W	122	38	R 18s	Warm white deluxe	1550	0.35	"TL"R 40 W/32	9280 345 032 ..
				White	2300	0.5	"TL"R 40 W/33	9280 345 033 ..
				White deluxe	1600	0.4	"TL"R 40 W/34	9280 345 034 ..
"TL"S 20 W	61	38	R 18s	Warm white special deluxe	590	0.3	"TL"S 20 W/27	9280 350 027 ..
				Warm white	1000	0.5	"TL"S 20 W/29	9280 350 029 ..
				Warm white deluxe	680	0.35	"TL"S 20 W/32	9280 350 032 ..
				White	1000	0.5	"TL"S 20 W/33	9280 350 033 ..
				White deluxe	690	0.35	"TL"S 20 W/34	9280 350 034 ..
				Daylight	690	0.35	"TL"S 20 W/55	9280 350 055 ..
"TL"S 40 W	122	38	R 18s	Warm white special deluxe	1430 [2]	0.35	"TL"S 40 W/27	9280 355 027 ..
				Warm white	2525 [2]	0.55	"TL"S 40 W/29	9280 355 029 ..
				Warm white deluxe	1600 [2]	0.4	"TL"S 40 W/32	9280 355 032 ..
				White	2525 [2]	0.55	"TL"S 40 W/33	9280 355 033 ..
				White deluxe	1700 [2]	0.4	"TL"S 40 W/34	9280 355 034 ..
				Daylight	1700 [2]	0.4	"TL"S 40 W/55	9280 355 055 ..

[1]) After 100 burning hours
[2]) With inductive ballast. With incandescent ballast lamp the luminous flux is about 4 % lower.

"TL"X LAMPS

"TL"X lamps are identical with "TL"S lamps except for the bases which have a nickeled single pin. "TL"X lamps are operated from a ballast which provides the required starting voltage without the use of a starter. This instant-start lamp type is to be applied in "flame-proof" and "increased safety" fittings designed in accordance with the German V.D.E. 170/171 and similar specifications. However, under no circumstances should "TL"X lamps be installed in rooms where there is danger of explosion owing to the presence of hydrogen, acetylene or town gas with over 70 % volume hydrogen.

Type	Nom. length cm	Nom. diameter mm	Caps	Colour designation	Luminous flux [1] lm	Luminance cd/cm²	Catalogue number	Ordering number
"TL"X 15 W	45	38	Fa 6	White	660	0.45	"TL"X 15 W/33	9280 370 033 ..
"TL"X 20 W	60	38	Fa 6	Warm white	1000	0.5	"TL"X 20 W/29	9280 375 029 ..
				White	1000	0.5	"TL"X 20 W/33	9280 375 033 ..
"TL"X 40 W	120	38	Fa 6	Warm white	2525	0.55	"TL"X 40 W/29	9280 380 029 ..
				White	2525	0.55	"TL"X 40 W/33	9280 380 033 ..

[1]) After 100 burning hours

SLIMLINE LAMPS

Philips slimline fluorescent lamps are instant-start lamps with non-preheated cathodes. The latter feature calls for ballasts that provide a high ignition voltage but the lamp ignites immediately after switching on, without any sign of flicker. Slimline lamps have single-pin bases and are available in a wide choice of sizes, wattages and colours.

These lamps possess the following salient characteristics: a coating of high-efficiency fluorescent powder for top light output; reliable ignition down to 0 °F (—18 °C); long, dependable service life and invisible water-repellent coating for reliable operation under humid conditions.

Type	Nom. length cm	Nom. diameter mm	Lamp voltage V	Lamp current A	Power absorbed W	Starting voltage [1] Vo	Caps	Colour designation	Luminous flux [2] lm	Luminance cd/cm²	Catalogue number	Ordering number
S 48 T 12	122	38	97	0.42	38	385	Fa 8	White	2900	0.65	S 48 T 12/33	9280 410 033 ..
S 72 T 8	183	26	240 210 190	0.12 0.20 0.30	25 36 49	540	Fa 8	White	1960 2920 3730	0.4 0.6 0.8	S 72 T 8/33	9280 415 033 ..
			240 210 190	0.12 0.20 0.30	25 36 49			White deluxe	1310 1900 2410	0.3 0.4 0.5	S 72 T 8/34	9280 415 034 ..
			240 210 190	0.12 0.20 0.30	25 36 49			Daylight	1310 1900 2410	0.3 0.4 0.5	S 72 T 8/55	9280 415 055 ..
S 72 T 12	183	38	145	0.42	56	475	Fa 8	White	4400	0.65	S 72 T 12/33	9280 420 033 ..
								White deluxe	2970	0.4	S 72 T 12/34	9280 420 034 ..
								Cool daylight	3650	0.55	S 72 T 12/54	9280 420 054 ..
								Daylight	2970	0.4	S 72 T 12/55	9280 420 055 ..
S 96 T 8	244	26	320 285 255	0.12 0.20 0.30	33 49 64	675	Fa 8	Warm white	2680 4040 5200	0.45 0.7 0.9	S 96 T 8/29	9280 425 029 ..
			320 285 255	0.12 0.20 0.30	33 49 64			White	2680 4040 5200	0.45 0.7 0.9	S 96 T 8/33	9280 425 033 ..
			320 285 255	0.12 0.20 0.30	33 49 64			White deluxe	1950 2900 3700	0.3 0.45 0.6	S 96 T 8/34	9280 425 034 ..
			320 285 255	0.12 0.20 0.30	33 49 64			Daylight	1950 2900 3700	0.3 0.45 0.6	S 96 T 8/55	9280 425 055 ..
S 96 T 12	244	38	190	0.42	73	565	Fa 8	Warm white	5940	0.7	S 96 T 12/29	9280 430 029 ..
								White	6200	0.75	S 96 T 12/33	9280 430 033 ..
								White deluxe	3850	0.45	S 96 T 12/34	9280 430 034 ..
								Cool daylight	5400	0.65	S 96 T 12/54	9280 430 054 ..
								Daylight	3850	0.45	S 96 T 12/55	9280 430 055 ..
SF 96 T 12	244	38	190	0.42	73	565	Fa 8	White	5400	1.25/0.3 [3]	SF 96 T 12/33	9280 431 033 ..

[1] V_0 = Intended to provide reliable starting at an ambient temperature of 10 °C (50 °F) min. at 90 % of rated voltage
[2] After 100 burning hours
[3] Approximate luminance values of the window and of the reflecting side of the lamp

BALLASTS FOR FLUORESCENT LAMPS

Features of the Philips ballasts

- 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
- Leakproof: polyester cannot melt
- High reliability, combined with very long life; no maintenance
- Easy mounting by means of:
  1. connection block, or
  2. connection pins for use with AMP connectors or wiring connectors
  3. connection pins with push-on adapter
- Noiseless
- Reduced weight
- Compliance with all supply authority requirements; made in accordance with international specifications
- Wiring diagram clearly marked

In each fluorescent lighting installation the ballasts form an invisible but essential part; they play a decisive role 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 strike 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 economical fitting design. It is by no means easy to comply with these requirements, the more so as they conflict with each other. Nevertheless the Philips range of totally enclosed ballasts fulfil the above conditions completely. 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, but the materials and technique used in their manufacture endow them, for practical purposes, with unlimited life.

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.

*) Capacitive ballast or inductive ballast with separate series capacitor

Our normal range of ballasts has been designed for use on 110, 125 or 220 V 50 c/s mains. Data on ballasts for other voltages and frequencies can be supplied on demand.

BALLASTS FOR PREHEATED, SWITCH-START 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 ballast) . . Example: Fig. E

BALLASTS FOR PREHEATED, STARTERLESS OPERATED FLUORESCENT LAMPS

1. LOW POWER-FACTOR BALLASTS (LPF)

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

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

c) **Capacitive ballast (2 x 20 W)**
Twin-lamp ballast consisting of preheating transformer, choke, series capacitor and capacitor for the ignition in parallel to one lamp . . . . Example: Fig. H
(The combination of b) and c) gives an HPF-duo circuit for 4 x 20 W)

d) **Inductive single-lamp circuit for 20 W**
consisting of separate choke and preheating transformer . . . . . Example: Fig. J

e) **Ditto for 40 W** . . . . . Example: Fig. K

f) **Capacitive single-lamp circuit for 20 W and 40 W**
consisting of choke, series capacitor and preheating transformer . . . Example: Fig. L
(The combination of d) and f) gives an HPF-duo circuit for 2 x 20 W)
(The combination of e) and f) gives an HPF-duo circuit for 2 x 40 W)

2. HIGH POWER-FACTOR BALLASTS (HPF)

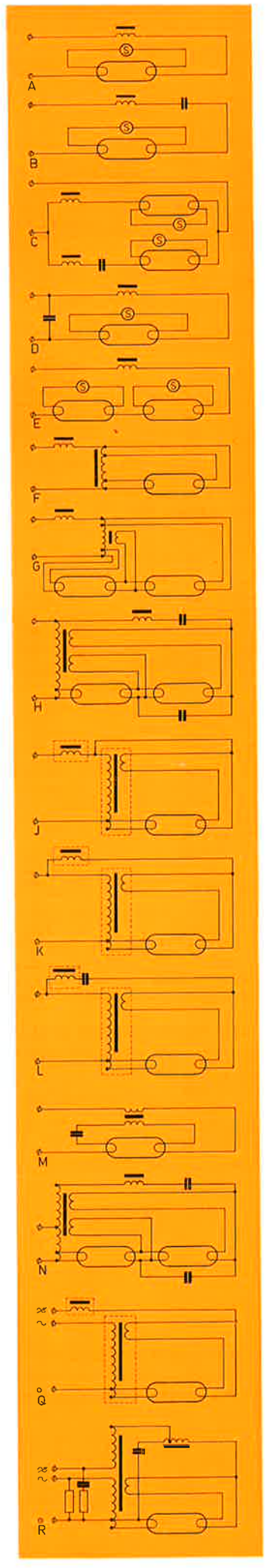
a) **Single-lamp ballast**
Semi-resonant ballast consisting of two partly-coupled choke coils and capacitor, with series preheating of the electrodes . . . . . Example: Fig. M

b) **Twin-lamp ballast (sequence start; 2 x 40 W)**
This ballast consists of a step-up transformer with preheating windings for the electrodes, a choke and series capacitor and a capacitor for the ignition parallel to one lamp . . . . . Example: Fig. N

3. LOW POWER-FACTOR CIRCUIT/BALLAST FOR LIGHT-REGULATING INSTALLATIONS

a) **Single-lamp circuit (for 20 or 40 W)**
consisting of a choke and a separate preheating transformer . . . . Example: Fig. Q

b) **Single-lamp ballast (for 65 W)**
consisting of a preheating transformer, a tapped choke and capacitors, forming a circuit to produce reliable (re)ignition voltages . . . . . Example: Fig. R



LOW POWER-FACTOR (INDUCTIVE) BALLASTS

Switchstart operation

For lamps type	number	Nominal voltage [1] V	Type number [2]	Power factor	Mains current A during ignition	Mains current A during operation	Losses (warm) W	Starter type [3]	Wiring diagram fig.	Dimensions case type	Dimensions length A	Ordering number
"TL" 4 W	1	110 125	58456 BT/04	0.35	0.17	0.16	3	S 2	1	P	88	9130 010 001 ..
	1	220	58451 AH/04	0.30	0.17	0.17	6.5	S 2	2	P	88	9130 020 003 ..
	2	220	58451 AH/04	0.30	0.17	0.16	6	2 x S 2	3	P	88	9130 020 003 ..
"TL" 6 W	1	110 125	58456 BT/04	0.40	0.17	0.16	3	S 2	1	P	88	9130 010 001 ..
	1	220	58451 AH/04	0.30	0.17	0.16	6	S 2	2	P	88	9130 020 003 ..
	2	220	58452 AH/04	0.50	0.21	0.17	5.5	2 x S 2	3	P	88	9130 090 003 ..
"TL" 8 W	1	110 125	58457 BT/04	0.55	0.22	0.17	3	S 2	1	P	88	9130 060 001 ..
	1	220	58451 AH/04	0.30	0.17	0.15	5.5	S 2	2	P	88	9130 020 003 ..
	2	220	58452 AH/04	0.50	0.21	0.17	4.5	2 x S 2	3	P	88	9130 090 003 ..
"TL" 13 W	1	220	58452 AH/04	0.50	0.21	0.17	5	S 10	2	P	88	9130 090 003 ..
"TL" 14 W	1	110 125	58494 BT/04	0.45 0.40	0.45 0.40	0.39	7	S 2	1	P	88	9130 120 001 ..
	2	220	58483 AH/04	0.45	0.50	0.42	11	2 x S 2	3	P	128	9130 240 003 ..
"TL" 15 W	1	110 125	58494 BT/04	0.45 0.40	0.45 0.40	0.36	6.5	S 2	1	P	88	9130 120 001 ..
	1	220	58494 AH/04	0.35	0.33	0.32	9.5	S 2	2	P	128	9130 120 003 ..
	2	220	58483 AH/04	0.50	0.50	0.40	10.5	2 x S 2	3	P	128	9130 240 003 ..
"TL"D 15 W	1	110 125	58494 BT/04	0.55 0.50	0.42 0.39	0.32	5.5 6	S 2	1	P	88	9130 120 001 ..
	1	220	58494 AH/04	0.35	0.33	0.32	9.5	S 2	2	P	128	9130 120 003 ..
	2	220	58483 AH/04	0.50	0.48	0.36	9.5	2 x S 2	3	P	128	9130 240 003 ..
"TL" 20 W "TL"E 22 W "TL"U 20 W	1	110 125	58434 BT/04	0.60	0.51 0.48	0.37	6	S 2	1	P	88	9130 150 001 ..
	1	220	58434 AH/34 [4] 58434 AH/44 [5]	0.35	0.43	0.37	11	S 2	2	P	128	9130 150 503 .. [4] 9130 150 603 .. [5]
	2	220	BTP 40L 01 [4] BTP 40L 02 [5]	0.50	0.62	0.41	11	2 x S 2	3	P	108	9130 334 203 .. [4] 9130 334 303 .. [5]
"TL" 25 W "TL"W 25 W	1	220	58413 AH/02 58413 AH/24 [4]	0.50	0.38	0.29	7.5	S 10	2	P	128	9130 210 003 .. 9130 210 103 .. [4]
"TL"D 30 W	1	110 125	59484 BF/00 59484 BG/00	0.45	1.20 1.05	0.85 0.75	13 12	S 10	4	Q	150	9132 246 000 .. 9132 246 002 ..
	1	220	58483 AH/04	0.50	0.48	0.37	10	S 10	2	P	128	9130 240 003 ..
"TL"E 32 W	1	110 125	59474 BT/00	0.50	1.13 1.00	0.83 0.74	12	S 7	5	Q	150	9132 300 301 ..
	1	220	58476 AH/00	0.40	0.55	0.45	9	S 10	6	Q	105	9132 300 003 ..
"TL" 40 W "TL"E 40 W "TL"U 40 W	1	110 125	59429 BF/22 [4] 59429 BG/22 [4]	0.50	1.25 1.20	0.90 0.84	13.5 12.5	S 10	4	P	178	9130 331 200 .. [4] 9130 331 202 .. [4]
	1	220	BTP 40L 01 [4] BTP 40L 02 [5]	0.50	0.62	0.43	11	S 10	2	P	108	9130 334 203 .. [4] 9130 334 303 .. [5]
"TL" 40 W-1	1	220	BTP 41L 01 [4] BTP 41L 02 [5]	0.45	0.67	0.56	15	S 10	2	P	153	9130 332 103 .. 9130 332 203 ..
"TL" 65 W	1	220	58464 AH/00	0.50	1.05	0.67	11	S 10	2	Q	150	9132 390 003 ..
"TL"U 65 W	1	220	BTP 65L 01 [4] BTP 65L 02 [5]	0.50	0.98	0.67	14	S 10	2	P	153	9130 391 603 .. [4] 9130 391 703 .. [5]
"TL"M 140 W RS	1	220	BTQ 140L 01 [4] [6]	0.50	2.10	1.50	26.5	S 12	7	Q	150	9132 610 003 .. [4][6]

HIGH POWER-FACTOR BALLASTS

"TL" 20 W "TL"E 22 W "TL"U 20 W	2	220	58458 AH/02	0.90	0.40	0.26	10	2 x S 2	8	P	253	9130 336 003 ..
	4	220	58704 AH/02 [8]	0.95	0.25	0.47	14.5	4 x S 2	9	Q	240	9132 728 003 ..
"TL" 40 W "TL"E 40 W "TL"U 40 W	1	110 125	59428 BT/01	0.90	0.78 0.68	0.55 0.48	16	S 10	10	Q	285	9132 336 201 ..
	1	220	58458 AH/02	0.90	0.40	0.26	10.5	S 10	12	P	253	9130 336 003 ..
	2	220	58704 AH/02 [8]	0.95	0.25	0.44	15	2 x S 10	11	Q	240	9132 728 003 ..

CONNECTION POSSIBILITIES

Fig. A: with connection block **Fig. B: with connection pins** **Fig. C: with connection pins and adapter**

The connection pins fit AMP connectors type 160208-6 for 0.75 mm² solid wire, or standard connection block.

NOTE

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.

HIGH POWER-FACTOR CIRCUITS
(Combinations for duo circuit, anti-stroboscopic)

Switchstart operation

For lamps type	number	Nominal voltage [1] V	Type number [2]		Power factor	Mains current A during ignition	Mains current A during operation	Losses (warm) W	Starter type [3]	Wiring diagram fig.	Dimensions case type	Dimensions length A	Ordering number
"TL" 15 W	4	220	58483 AH/04	I [9]	0.95	0.31	0.37	18.5	4 x S 2	14	P	128	9130 240 003 ..
			58584 AH/04	C [9]						14	P	253	9130 243 003 ..
"TL"D 15 W	4	220	58483 AH/04	I	0.95	0.31	0.38	18	4 x S 2	14	P	128	9130 240 003 ..
			58584 AH/04	C						14	P	253	9130 243 003 ..
"TL" 20 W "TL"E 22 W "TL"U 20 W	2	220	or 58434 AH/34 [4] 58434 AH/44 [5]	I	0.95	0.18	0.28	18.5	2 x S 2	13	P	128	or 9130 150 503 .. [4] 9130 150 603 .. [5]
			58524 AH/04	C						13	P	253	9130 153 003 ..
	4	220	or BTP 40L 01 [4] BTP 40L 02 [5]	I	0.95	0.40	0.45	21	4 x S 2	14	P	108	or 9130 334 203 .. [4] 9130 334 303 .. [5]
			58556 AH/02	C						14	P	253	9130 333 003 ..
"TL" 25 W	2	220	or 58413 AH/02 58413 AH/24 [4]	I	0.95	0.22	0.30	14	2 x S 10	13	P	128	or 9130 210 003 .. 9130 210 103 .. [4]
			or 58413 AH/02 58413 AH/24 [4] + cap. 2.4 µF 380 V [7]	C						15	P	128	or 9130 210 003 .. 9130 210 103 .. [4] + cap. 2.4 µF 380 V [7]
"TL"D 30 W	2	220	58483 AH/04	I	0.95	0.27	0.37	18	2 x S 10	13	P	128	9130 240 003 ..
			58584 AH/04	C						13	P	253	9130 243 003 ..
"TL"E 32 W	2	220	58476 AH/00	I	0.95	0.23	0.47	19.5	2 x S 10	16	Q	105	9132 300 003 ..
			58556 AH/02	C						16	P	253	9130 333 003 ..
"TL" 40 W "TL"E 40 W "TL"U 40 W	2	220	or BTP 40L 01 [4] BTP 40L 02 [5]	I	0.95	0.33	0.47	21	2 x S 10	13	P	108	or 9130 334 203 .. [4] 9130 334 303 .. [5]
			58556 AH/02	C						13	P	253	9130 333 003 ..
"TL" 40 W-1	2	220	or BTP 41L 01 [4] BTP 41L 02 [5]	I	0.95	0.12	0.49	30	2 x S 10	13	P	153	or 9130 332 103 .. [4] 9130 332 203 .. [5]
			or BTP 41L 01 [4] BTP 41L 02 [5] + cap. 4.5 µF 440 V [7]	C						15	P	153	or 9130 332 103 .. [4] 9130 332 203 .. [5] + Cap. 4.5 µF 440 V [7]
"TL" 65 W "TL"U 65 W	2	220	or BTP 65L 01 [4] BTP 65L 02 [5]	I	0.95	0.48	0.74	30	2 x S 10	13	P	153	or 9130 391 003 .. [4] 9130 391 103 .. [5]
			or BTP 65L 01 [4] BTP 65L 02 [5] + cap. 5.7 µF 380 V [7]	C						15	P	153	or 9130 391 003 .. [4] 9130 391 103 .. [5] + cap. 5.7 µF 380 V [7]
"TL"M 140 W RS	2	220	BTQ 140L 01 [4] [6]	I	0.90	0.90	1.40	48	2 x S 12	17	Q	150	9132 610 003 .. [4] [6]
			+ BTQ 140L 01 [4] [6] cap. 12.9 µF 440 V [7]	C						18	Q	150	+ 9132 610 003 .. [4] [6] cap. 12.9 µF 440 V [7]

[1]) Consumers' voltage: 110 V = 105-115 V; 125 V = 120-130 V; 220 V = 210-230 V (50 c/s)
[2]) If not indicated otherwise, the ballasts are provided with connection block (fig. A, page B 18)
[3]) For technical data on starters see page B 27
[4]) With pins (fig. B, page B 18)
[5]) With pins and adapter (fig. C, page B 18)
[6]) Two ballasts in series
[7]) To be connected in series with the ballast. Capacitance tolerance ± 10 %. Capacitors to be ordered from C.D. Elcoma.
[8]) Anti-stroboscopic
[9]) I = Inductive; C = Capacitive

WIRING DIAGRAMS

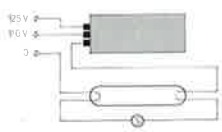


Fig. 1

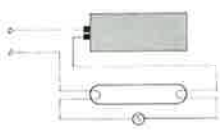


Fig. 2

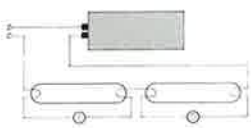


Fig. 3

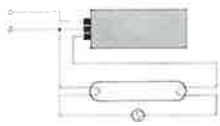


Fig. 4

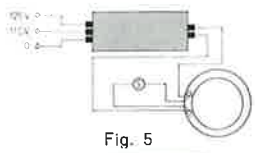


Fig. 5

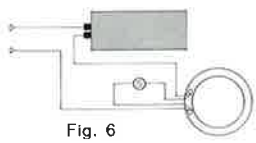
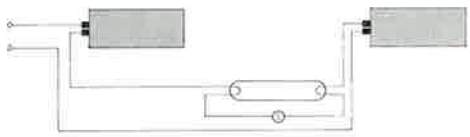


Fig. 6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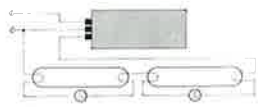
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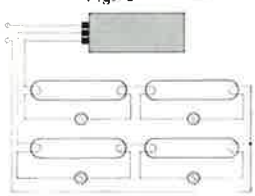


Fig. 9

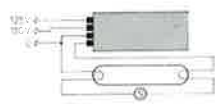


Fig. 10


Fig. 11

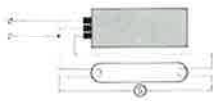


Fig. 12

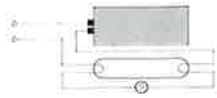


Fig. 13

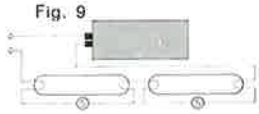


Fig. 14

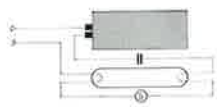


Fig. 15


Fig. 17

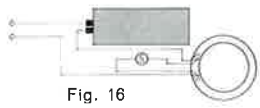


Fig. 16

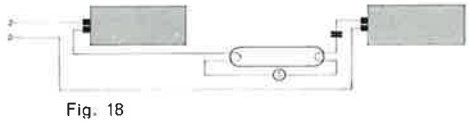


Fig. 18

BALLASTS FOR "TL"M RS LAMPS

"TL"M RS lamps are employed in starterless and light-regulating 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.

LOW POWER-FACTOR (INDUCTIVE) BALLASTS/CIRCUITS

For lamps type	number	Nominal voltage [1] V	Type number [2]	Power factor	Mains current A during ignition	Mains current A during operation	Losses (warm) W	Wiring diagram fig.	Dimensions case type	Dimensions length A	Ordering number
	1	220	58459 AH/02	0.35	0.02	0.38	10.5	25	P	178	9131 150 003 ..
"TL"M 20 W RS	1	220	58434 AH/34 [3] or 58434 AH/44 [4] + 59466 AH/22 [3] [5] + cap. 18000 pF [4]	0.35	0.05	0.40	12	26	P P	128 88	9130 150 503 .. [3] or 9130 150 603 .. [4] + 9131 990 091 .. [3] [5] + cap. 18000 pF [4]
	2	220	59440 AH/02	0.55	0.05	0.42	12.5	20	P	253	9131 707 003 ..
"TL"M 40 W RS	1	220	BTP 40L 01 [3] or BTP 40L 02 [4] + 59466 AH/22 [3] [5] + cap. 18000 pF [4]	0.50	0.05	0.50	16	27	P P	128 88	9130 334 203 .. [3] or 9130 334 303 .. [4] + 9131 990 091 .. [3] [5] + cap. 18000 pF [4]
"TL"EM 40 W RS	operate on "TL"M 40 W RS ballasts										

For light-regulating installations only

"TL"M 20 W RS	1	220	58434 AH/34 [3] or 58434 AH/44 [4] + 59466 AH/22 [3] [5]	0.35	0.05	0.48	17	29	P P	128 88	9130 150 503 .. [3] or 9130 150 603 .. [4] + 9131 990 091 .. [3] [5]
"TL"M 40 W RS	1	220	BTP 40L 01 [3] or BTP 40L 02 [4] + 59466 AH/22 [3] [5]	0.50	0.05	0.50	16	29	P P	128 88	9130 334 203 .. [3] or 9130 334 303 .. [4] + 9131 990 091 .. [3] [5]
"TL"M 65 W RS	1	220	BMQ 65L 50	0.45	0.06	0.88	23	19	Q	285	9133 390 103 ..

WIRING DIAGRAMS


Fig. 19


Fig. 20


Fig. 21


Fig. 22

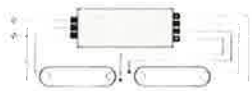


Fig. 23


Fig. 24


Fig. 25

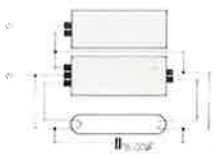


Fig. 26

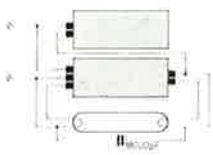


Fig. 27

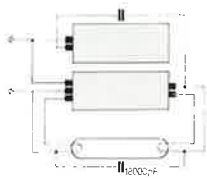
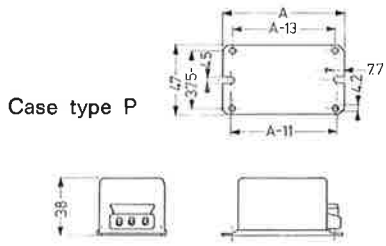


Fig. 28

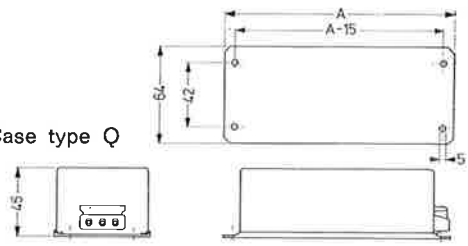

Fig. 29

DIMENSIONS

Case type P



Case type Q



HIGH POWER-FACTOR BALLASTS

For lamps type	number	Nominal voltage [1] V	Type number [2]	Power factor	Mains current A during ignition	Mains current A during operation	Losses (warm) W	Wiring diagram fig.	Dimensions case type	Dimensions length A	Ordering number
"TL"M 40 W RS	1	220	BMQ 40H 01 [3] BMQ 40H 02 [4]	0.95	0.44	0.25	11.5	21	Q	240	9133 336 503 .. [3] 9133 336 603 .. [4]
	2	220	59701 AH/00	0.90	0.23	0.49	24	22	Q	285	9133 727 003 ..
"TL"EM 40 W RS	operate on "TL"M 40 W RS ballasts										
"TL"M 65 W RS	1	220	BMQ 65H 01 [3] BMQ 65H 02 [4]	0.90	0.70	0.42	17.5	21	Q	240	9133 396 503 .. [3] 9133 396 603 .. [4]
"TL" 85 W RS	1	220	60415 AH/00	0.95	0.72	0.50	23	24	Q	330	9133 456 003 ..
"TL" 110 W RS	1	220	60414 AH/00	0.95	1.12	0.60	30	24	Q	375	9133 516 003 ..
"TL" 215 W RS	1	220	data on request								

HIGH POWER-FACTOR CIRCUITS (Combinations for duo circuit, anti-stroboscopic)

"TL"M 20 W RS	2	220	or 58434 AH/34 [3] 58434 AH/44 [4] + 59466 AH/22 [3] [5] + cap. 18000 pF [6]	I [10]	0.95	0.10	0.32	29	26	P 128 P 88	or 9130 150 503 .. [3] 9130 150 603 .. [4] + 9131 990 091 .. [3] [5] + cap. 18000 pF [6]
			or BTP 40L 01 [3] BTP 40L 02 [4] + cap. 3.4 µF 380 V [11] + 59466 AH/22 [3] [5] + cap. 18000 pF [6]	C [10]					28	P 128 P 88	or 9130 334 203 .. [3] 9130 334 303 .. [4] + cap. 3.4 µF 380 V [11] + 9131 990 091 .. [3] [5] + cap. 18000 pF [6]
	4	220	59440 AH/02	I	0.95	0.10	0.53	32.5	20	P 253	9131 707 003 ..
			59442 AH/02	C					23	P 353	9131 707 103 ..
"TL"M 40 W RS	2	220	or BTP 40L 01 [3] BTP 40L 02 [4] + 59466 AH/22 [3] [5] + cap. 18000 pF [6]	I	0.95	0.10	0.54	33	27	P 128 P 88	or 9130 334 203 .. [3] 9130 334 303 .. [4] + 9131 990 091 .. [3] [5] + cap. 18000 pF [6]
			or BTP 40L 01 [3] BTP 40L 02 [4] + cap. 3.7 µF 380 V [11] + 59466 AH/22 [3] [5] + cap. 18000 pF [6]	C					28	P 128 P 88	or 9130 334 203 .. [3] 9130 334 303 .. [4] + cap. 3.7 µF 380 V [11] + 9131 990 091 .. [3] [5] + cap. 18000 pF [6]

[1] Consumers' voltage: 110 V = 105-115 V; 125 V = 120-130 V; 220 V = 210-230 V (50 c/s)
[2] If not indicated otherwise, the ballasts are provided with connection block (fig. A, page B 18)
[3] With pins (fig. B, page B 18)
[4] With pins and adapter (fig. C, page B 18)
[5] Preheat transformer; for technical data see below
[6] Anti radio-interference capacitor; to be ordered from C.D. Elcoma
[10] I = Inductive; C = Capacitive
[11] To be connected in series with the ballast; capacitance tolerance ± 5 %
Capacitors to be ordered from C.D. Elcoma

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, one "TL" 65 W lamp in HPF circuit or one "TL"M 65 W RS lamp on an HPF ballast. The transformer is cooled by the polyester filling of the box.

Type number	Primary voltage V	Secondary voltage V	Power VA	Max. secondary current A	Frequency c/s	Losses on full load W 110 V	Losses on full load W 125 V	Dimensions [1] case type	Dimensions [1] length A	Ordering number
59493 BT/02	110 125	220	100	0.46	50-60	15	12	P	178	9131 990 190 ..

[1] With pins (fig. B, page B 18)

WIRING DIAGRAM

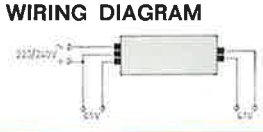
PREHEAT TRANSFORMER

Preheat transformers are used for preheating the cathodes of a "TL"M 20 W RS or a "TL"M 40 W RS lamp in starterless circuits or in light-regulating circuits.

Type number	Primary voltage V	Secondary voltage V	Max. secondary current A	Frequency c/s	Losses W	Dimensions [2] case type	Dimensions [2] length A	Ordering number
59466 AH/22 [1]	220	2 x 4.1	0.45	50-60	6	P	88	9131 990 091 ..

[1] With pins (fig. B, page B 18)
[2] For dimensional sketch see page B 20

WIRING DIAGRAM



ELECTRONIC LIGHT REGULATION FOR "TL"M RS LAMPS

Applications

In planning many modern lighting installations it is becoming increasingly evident that there is a need to provide facilities for regulating the illumination level uniformly between zero and maximum. This permits the area concerned to be used as efficiently as possible, either independently of the daylight situation or adapted to it.

The following are typical examples of areas where light regulation is either a necessity or an invaluable asset:

- lecture rooms
- classrooms
- congress halls and conference rooms
- theatres and cinemas
- dance halls
- hospitals
- shops and department stores
- control rooms
- traffic tunnels

In certain buildings such as theatres and congress halls, light regulation is provided as a matter of course, in view of the adaptation difficulties of the eye during transitions from light to dark surroundings and vice versa. But a light regulating installation can also be applied successfully in hospital corridors and operating theatres. This permits the illumination level in the corridors to be lowered at night so that patients in the darkened wards are not disturbed by bright lights. The pattern and uniformity of the lighting are maintained. Moreover, the corridors inside the building can be adapted to the daylight level prevailing in the neighbouring wards and workrooms.

Lighting installations with a high illumination level are designed for modern lecture rooms shut off from daylight. When slides are being projected the lighting can be regulated in such a way that note-taking is still possible. Light regulating equipment can also be used in shops and department stores to adapt the illumination level to varying situations and to create the desired atmosphere.

During busy spells, a high level can be chosen and at quiet times a lower level still permits the normal lighting pattern to be maintained.

Light regulator

Control unit

Potentiometer

Principle

With 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. Special ballasts and a regulator fitted with thyristors are used for controlling the lamp current of "TL"M RS lamps.

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 thyristors. 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.

Two thyristors, i.e. 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 electrodes of the "TL"M 20 and 40 W RS lamps are constantly preheated via neutral and phase by means of a preheat transformer. The lamp current flows through the circuit via the regulated phase, choke and lamp to the neutral lead of the mains. For "TL"M 65 W RS lamps a special ballast with higher open voltage is required which is, in principle, a combination of a preheat transformer and a choke.

During each half-cycle the thyristors 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 phase of the control signals is shifted when an externally connected potentiometer is varied from zero to maximum.

LIGHT REGULATION OF SMALL INSTALLATIONS

Regulator Type	Regulator Ordering number	For lamps Type	For lamps Number	Mains voltage [1] V	Max. mains current A	Dimensions l x b x h	Type number ballast	Circuit	Type number preheat transformer
LR 252	9134 700 003 ..	"TL"M 20 W RS	1 to 50	220	22	348 x 210 x 80	58434 AH/44	inductive	59466 AH/22
LR 164	9134 990 586 ..	"TL"M 40 W RS	1 to 24	220	11	348 x 210 x 80	58429 AH/44 [2]	inductive	59466 AH/22 [2]
LR 254	9134 910 086 ..	"TL"M 40 W RS	1 to 50	220	22	348 x 210 x 80	58429 AH/44 [2]	inductive	59466 AH/22 [2]
LR 257	9134 920 186 ..	"TL"M 65 W RS	1 to 32	220	22	348 x 210 x 80	BMQ 65L 50 [3]	inductive	—

[1] 50 c/s
[2] Instead of ballast and preheat transformer a special ballast with higher open voltage (270 V) can be ordered; type: BMQ 40L 50
[3] Special ballast with higher open voltage (270 V)

LIGHT REGULATION OF LARGE INSTALLATIONS

Control unit Type	Control unit Ordering number	For lamps	Mains voltage [1] V	Maximum mains current per phase A	Maximum control current for 50 regulators per phase A	Control voltage V	Maximum number of light regulators type LR 250	Dimensions l x b x h
126379	9136 800 201 ..	"TL"M 20 W RS	3 x 220	0.1	0.1	20	3 x 50 [2]	360 x 350 x 76
126271	9136 800 200 ..	"TL"M 40 W RS	3 x 220	0.1	0.1	20	3 x 50 [2]	360 x 350 x 76
LRC 16	8222 209 112 ..	"TL"M 65 W RS	3 x 220	0.1	0.1	20	3 x 50 [2]	360 x 350 x 76

[1] 50 c/s
[2] max. 50 regulators LR 250 per phase

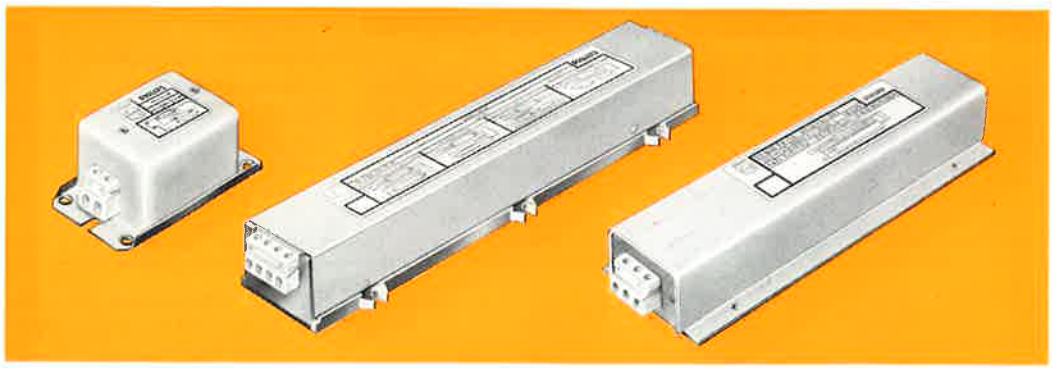
In this installation, only the LR 250 regulator is used as follows:

Regulator Type	Regulator Ordering number	For lamps Type	For lamps Number	Type number control unit	Mains voltage [1] V	Dimensions l x b x h	Type number ballast	Circuit	Type number preheat transformer
LR 250	9134 990 086 ..	"TL"M 20 W RS	1 to 50	126379	220	348 x 210 x 80	58434 AH/44	inductive	59466 AH/22
		"TL"M 40 W RS	1 to 50	126271	220		58429 AH/44 [2]	inductive	59466 AH/22 [2]
		"TL"M 65 W RS	1 to 32	LRC 16	220		BMQ 65L 50 [3]	inductive	—

[1] 50 c/s
[2] Instead of ballast and preheat transformer a special ballast with higher open voltage (270 V) can be ordered; type: BMQ 40L 50
[3] Special ballast with higher open voltage (270 V)

TRANSISTOR BALLASTS

Fluorescent lamps are widely employed in vehicle lighting as they have various significant advantages over incandescent lamps for this application as well: very long life, high light output — yet low consumption, resistance to vibration, uniform light distribution, no glare, slim shape, cool operation, low sensitivity to voltage fluctuations.
In all cases where the lighting installation is fed from a D.C. supply, such as batteries, the power available is limited; hence it is imperative that the installation be highly efficient and fluorescent lamps are the ideal sources for such applications.
To convert the vehicle low-voltage D.C. supply to the A.C. current required by fluorescent lamps, special ballasts are needed. Philips transistor ballasts serve this purpose without the need for maintenance or servicing; they are used, to a considerable extent, in railway carriages and road transport vehicles. Most conventional fluorescent fittings can be adapted to take transistor ballasts or alternatively lamps and ballasts may be installed separately at convenient points.



Philips transistor ballasts are a combination of an inverter and a ballast unit, enabling fluorescent lamps to be used with 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 small dimensions.

Features

Philips transistor ballasts possess a number of features which make them second to none, especially for vehicle lighting installations:

- — Transistor ballasts make it possible to operate fluorescent lamps on low-voltage battery supplies.
- — No maintenance or servicing required; ballast life indefinitely long.
- — Small, light in weight, easy to fix and wire.
- — All supply wiring is low voltage.
- — Overall efficiency over 80 %.
- — Protected against polarity reversal.
- — Built-in filter for radio-interference suppression.
- — The design ensures immediate ignition at low temperatures (—15 °C); reliable and stable operation in spite of considerable voltage fluctuations, for instance ranging from 10 to 15 and 20 to 30 V.

DIMENSIONS

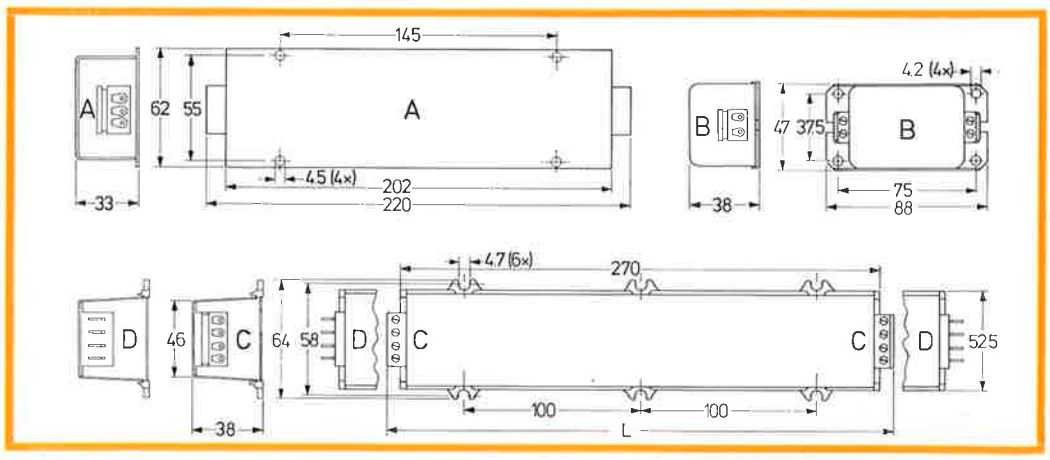


Fig. C: L = 285 mm
Fig. D: L = 290 mm

Applications

- Philips transistor ballasts have considerably widened the range of applications of fluorescent lamps which are applied to great advantage 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 installations
  - — mobile workshops
  - — travelling shops

Ballasts for 13 V D.C. (10-15 V)

For lamps type	number	Type number	Mains current at nominal voltage A	Secondary frequency kc/s	Wiring diagram fig.	Dimensions fig.	Ordering number
"TL" 6 W "TL" 8 W	1 1	59808 TA/00	0.90 1.10	9	1	A	9134 040 021 ..
"TL"A 20 W "TL"M 20 W RS "TL"S 20 W	1 1 1	59826 TA/03	2.30	8	2 2 3	C	9134 150 821 ..

Ballasts for 26 V D.C. (20-30 V)

"TL" 6 W "TL" 8 W "TL" 13 W	1 1 1	59808 TB/04	0.40 0.46 0.68	16	1	A	9134 040 322 ..
"TL" 6 W	1-6	59811 TB/03 + 6 x 59816 ZZ/90	1.60	8	4	C B	9134 860 122 .. 9134 030 024 ..
"TL" 8 W	1-4	59809 TB/03 [1] + 4 x 59817 ZZ/90	1.50	8	5	C B	9134 870 322 .. 9134 060 025 ..
"TL" 13 W	1-2	59809 TB/03 [1] + 2 x 59817 ZZ/90	1.50	8	6	C B	9134 870 322 .. 9134 060 025 ..
"TL"(A)D 15 W "TL"(A)D 30 W	2 1	59827 TB/03	1.70	8	7 8	C	9134 690 022 ..
"TL"A 20 W "TL"M 20 W RS "TL"S 20 W	1 1 1	59826 TB/03	1.20	8	2 2 3	C	9134 150 722 ..
"TL"A 20 W "TL"M 20 W RS "TL"S 20 W "TL"A 40 W "TL"M 40 W RS "TL"S 40 W	2 2 2 1 1 1	59825 TB/03 [1]	2.10	8	7 7 9 8 8 10	C	9134 330 522 ..
"TL"S 20 W "TL"S 40 W	2 1	59831 TB/07 [1] [2]	2.00	8	11 12	D	9134 331 022 ..

[1] Ballasts 59809 TB/03, 59825 TB/03 and 59831 TB/07 may be operated from a mains supply of 32 V D.C. max., provided their ambient temperature does not surpass 30 °C and the temperature of the bottom-plate where the transistor compartment is located does not exceed 65 °C.

[2] This ballast is provided with tabs for connection to AMP Faston "250" series receptacles. See dimensions fig. D

WIRING DIAGRAMS

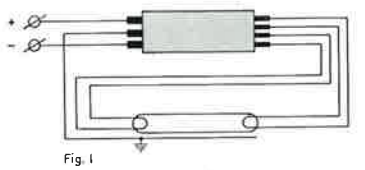


Fig. 1

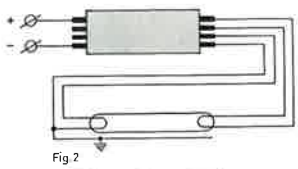


Fig. 2

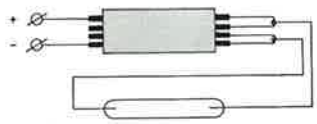


Fig. 3

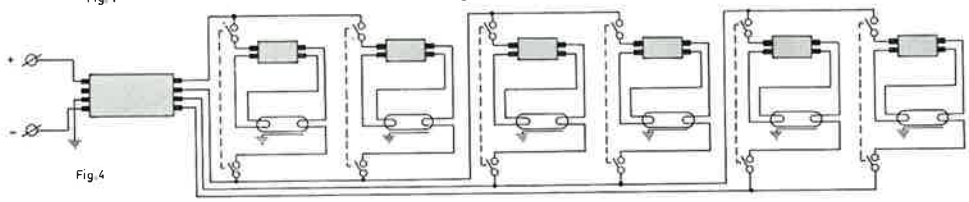


Fig. 4

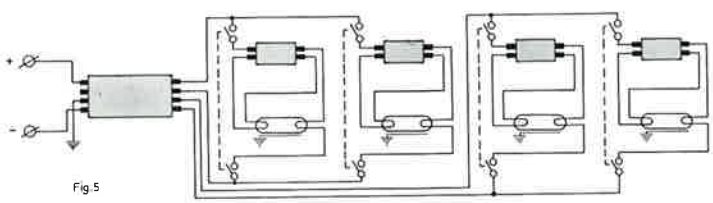


Fig. 5

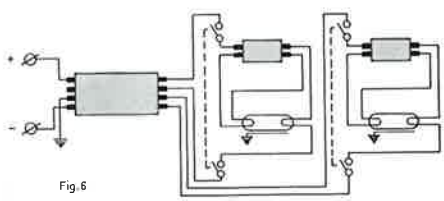


Fig. 6

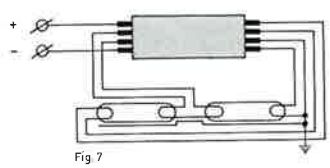


Fig. 7

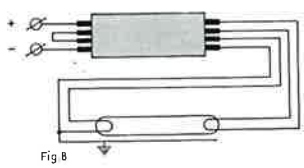


Fig. 8

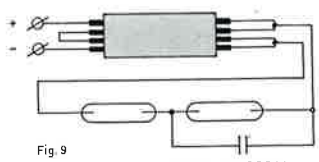


Fig. 9

3900 pF 330 V

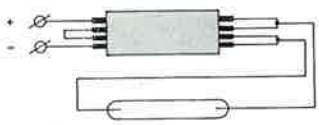


Fig. 10

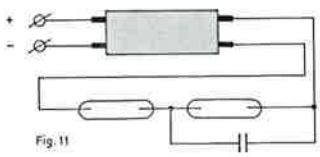


Fig. 11

3900 pF 330 V

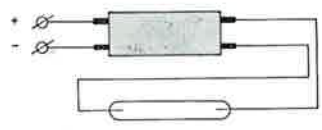


Fig. 12

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 extinguishing due to bad contact, the latter in its turn being caused, for example, by vibration. Finally, the lampholders must be constructed in such a way that the lamp is 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, while still fulfilling 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 touchproof. Neither during insertion nor removal of the lamp, nor after the lamp has been extracted, are any live parts of the lampholders exposed.

Description	Fig.	Type number	Material	Ordering number
Lampholder with spring-loaded rotor and insert contacts; for side mounting	1	H 03	white "Philite"	9145 000 036 ..
Idem; for surface mounting	2	H 04	white "Philite"	9145 000 058 ..
Lampholder with spring-loaded rotor and screw contacts; for side mounting	3	61478/02	white "Philite"	9145 000 008 ..
Idem; for operation under unfavourable temperature conditions (max. 165 °C)	4	61478/00	black asbestos "Philite"	9145 000 007 ..
Lampholder with spring-loaded rotor and screw contacts; for surface mounting	5	61469/02	white "Philite"	9145 000 000 ..
Idem; with earth contact spring	6	61469/03	white "Philite"	9145 000 001 ..
Rotor-type lampholder with screw contacts; for surface or through-mounting	7	61499/02	white "Philite"	9145 000 019 ..
Idem; with adjustable rotor (for reflector fluorescent lamps)	8	61502/02	white "Philite"	9145 000 021 ..
Self-fixing rotor-type lampholder with insert contacts; for surface or through-mounting	9	H 01	white "Philite"	9145 000 042 ..
Watertight lampholder for "TL"(F), "TL"A(F), "TL"B, "TL"C and "TL"M(F) lamps	10	61497/00	black "Philite"	9145 000 015 ..
Idem; for "TL"D and TUV lamps	11	61497/10	black "Philite"	9145 000 017 ..
For circular lamps with four-pin cap: lampholder	12	61487/02	white "Philite"	9145 000 011 ..
For circular lamps with four-pin cap: support	13	61486/02	white "Philite"	9145 000 505 ..
For circular lamps with four-pin cap: base	14	61488/02	white "Philite"	9145 000 506 ..
Transparent lampholder for "TL"W lamps	15	61506/05	poly-carbonate	9145 000 024 ..
Lampholder for lamps with miniature bi-pin caps	16	61495/02	white "Philite"	9145 000 014 ..
Lampholder for lamps with recessed single-contact caps; for side mounting	17	61509/02	white "Philite"	9145 000 025 ..
Idem; for surface or through-mounting; for voltages up to 250 V	18	61476/12	white "Philite"	9145 000 003 ..
Idem; for surface or through-mounting; for voltages up to 500 V	18	61477/02	white "Philite"	9145 000 005 ..
Base for heightened mounting	19	61474/02	white "Philite"	9145 000 500 ..
Lampholder for lamps with recessed double-contact caps; with fixed contacts	20	61515/02	white "Philite"	9145 000 056 ..
Idem; with telescope contacts	21	61516/02	white "Philite"	
Starterholder with insert contacts	22	H 06	white "Philite"	9145 000 210 ..
Holder for four-contact stabilizing tubes and relays	23	61479/00	black "Philite"	9145 000 300 ..
Holder for stabilizing lamps and tubes with three-pin bayonet base (B 22 III)	24	61485/00	black "Philite"	9145 000 301 ..

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 costs and are a truly vital link in the economic operation of fluorescent lamps.

Type	For use with fluorescent lamps	Diam.	Max. length	Ordering number
S 2	4, 6, 8, 14, 15, 20 and 22 W [1]			9283 907 000 ..
S 10	13, 25, 30, 40, 65 and 80 W; 32 W on 210 ... 250 V	21.5	39	9283 922 000 ..
S 7	32 W			9283 926 000 ..
S 12	"TL"M 140 W RS			9283 916 000 ..

[1] At ambient temperatures lower than 5 °C, use starter type S 10 for "TL" 8 W, when connected to 210 ... 250 V


A. BOVENKAMP

GAS-DISCHARGE LAMPS

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HPL-N MERCURY-VAPOUR FLUORESCENT LAMPS

Philips HPL-N high-pressure mercury-vapour lamps form the latest range of mercury lamps to be introduced. Two important features distinguish these lamps from the mercury lamps hitherto available. Firstly, the light output is approximately 10 % higher than that of existing HPL lamps. In addition, an exclusive rare earth phosphor coating is applied, resulting in an 85 % increase in red.
The range comprises lamps with ratings of 50 W to 2000 W and luminous flux values of 1900 lm to 120000 lm!
Philips HPL-N lamps thus combine excellent colour quality with very high luminous output and long service life.

The Philips HPL-N lamps are particularly suitable for street lighting and industrial applications, where they will result in schemes with higher illumination levels and better colour rendition with no additional running costs.
Existing HPL equipment requires no alteration to take HPL-N lamps.

Type [1]	Type number	Base	Lamp voltage V	Lamp current A	Luminous flux [2] lm	Percentage of red [3] %	Diam.	Max. length	Ordering number
HPL-N 50 W	57224 E/73	E 27	95	0.60	1900	14	55	129	9280 505 073 ··
	57224 B/73	B 22						124.5	9280 506 073 ··
HPL-N 80 W	57235 E/73	E 27	115	0.80	3500	14	70	156	9280 510 073 ··
	57235 B/73	B 22						151.5	9280 511 073 ··
HPL-N 125 W	57236 E/74	E 27	125	1.15	6250	13.5	75	177	9280 520 074 ··
	57236 B/74	B 22						172.5	9280 521 074 ··
	57236 G/74	E 40						186	9280 523 074 ··
HPL-N 175 W	57248 G/74	E 40	130	1.50	8600	12.5	90	226	9280 525 074 ··
HPL-N 250 W	57220 G/74	E 40	135	2.10	13500	12.5	90	226	9280 530 074 ··
HPL-N 400 W	57221 G/74	E 40	140	3.20	23000	11.5	120	290	9280 535 074 ··
HPL-N 700 W	57226 G/74	E 40	140	5.40	42500	10.5	140	329	9280 540 074 ··
HPL-N 1000 W	57222 G/74	E 40	140	7.50	57000	10.5	165	400	9280 545 074 ··
HPL-N 2000 W	57229 G/74	E 40	270	8.00	120000	10.5	185	445	9280 555 074 ··

[1]) For ballasts see page C 6 [2]) After 100 burning hours [3]) At 0 hours

HPLR MERCURY-VAPOUR FLUORESCENT REFLECTOR LAMPS

The Philips mercury fluorescent lamps with internal reflector provide good colour rendering and are available in a wide range of wattages.
The most important feature is the bulb with the built-in titanium dioxide reflector which directs the light precisely where it is needed and makes the lamp impervious to soiling in dirty surroundings so that high efficiency is maintained throughout the lamp's 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, to name just a few: factory lighting, quarries, paper mills, iron foundries and floodlighting for advertising purposes.

Type [1]	Type number	Base	Lamp voltage V	Lamp current A	Luminous flux [2] lm	Diam.	Max. length	Ordering number
HPLR 125 W	57238 E/93 57238 G/93	E 27 E 40	125	1.15	5000	125	190 199	9280 620 093 .. 9280 622 093 ..
HPLR 250 W	57239 G/93	E 40	135	2.10	11000	165	260	9280 625 093 ..
HPLR 400 W	57240 G/93	E 40	140	3.20	19000	180	300	9280 630 093 ..
HPLR 700 W	57231 G/93	E 40	145	5.25	35000	200	328	9280 635 093 ..
HPLR 1000 W	57241 G/93	E 40	145	7.50	51000	220	380	9280 640 093 ..

[1]) For ballasts see page C 6 [2]) After 100 burning hours

HP MERCURY-VAPOUR LAMPS

When colour rendering is not essential, this super-high-pressure mercury-vapour lamp, with its bluish-white light, is extremely suitable for public lighting, floodlighting and outdoor and indoor application in industry. These HP lamps are, moreover, very useful in photochemical processes, egg testing, microscopic examinations, etc.
The discharge tube is made of quartz. The bulb is of clear or inside-frosted soft glass for the 80 W type; of clear hard glass for the 175, 250 and 400 W types; the 125 W version is available in clear or inside-frosted soft glass and in clear hard glass.
The burning position is universal.

Ballasts

For ballasts see page C 6.

HP 80 W

HP 125 W

HP 175 W
HP 250 W

HP 400 W

Type [1]	Type number	Base	Lamp voltage V	Lamp current A	Luminous flux [2] lm	Diam.	Max. length	Ordering number
HP 80 W	57235 E/00	E 27	115	0.80	3100	70	156	9280 510 000 ..
	57235 E/21 [3]	E 27					156	9280 510 021 .. [3]
	57235 B/00	B 22 II					151.5	9280 511 000 ..
	57235 B/21 [3]	B 22 II					151.5	9280 511 021 .. [3]
	57235 F/00	B 22 III					151.5	9280 512 000 ..
	57235 F/21 [3]	B 22 III					151.5	9280 512 021 .. [3]
HP 125 W	57236 E/00	E 27	125	1.15	5600	75	177	9280 520 000 ..
	57236 E/21 [3]	E 27					177	9280 520 021 .. [3]
	57236 E/92 [4]	E 27					177	9280 520 092 .. [4]
	57236 B/00	B 22 II					172.5	9280 521 000 ..
	57236 B/21 [3]	B 22 II					172.5	9280 521 021 .. [3]
	57236 B/92 [4]	B 22 II					172.5	9280 521 092 .. [4]
	57236 F/00	B 22 III					172.5	9280 522 000 ..
	57236 F/21 [3]	B 22 III					172.5	9280 522 021 .. [3]
	57236 F/92 [4]	B 22 III					172.5	9280 522 092 .. [4]
HP 175 W	57248 G/92 [4]	E 40	130	1.50	8000	90	226	9280 525 092 .. [4]
HP 250 W	57220 G/92 [4]	E 40	135	2.10	11500	90	226	9280 530 092 .. [4]
HP 400 W	57221 G/92 [4]	E 40	140	3.20	21000	120	290	9280 535 092 .. [4]

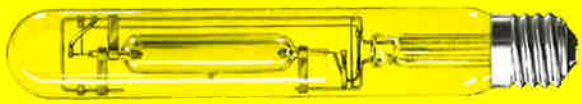
[1] For ballasts see page C 6
[2] After 100 burning hours
[3] Inside frosted; soft glass
[4] Clear; hard glass

HP/T MERCURY-VAPOUR LAMPS

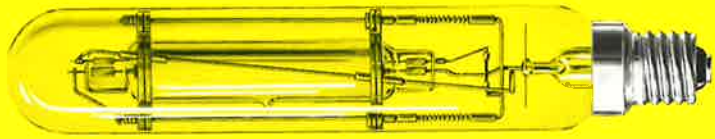
HP/T lamps are non-colour-corrected high-pressure mercury-vapour lamps, consisting of a quartz discharge-tube, contained in a tubular hard glass outer envelope. These lamps have a high luminous flux and ensure excellent visual acuity. They are suitable for installations where colour rendition is of minor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

Special applications for these lamps include photography, photo-chemical processes, egg testing, microscopic examination, etc.

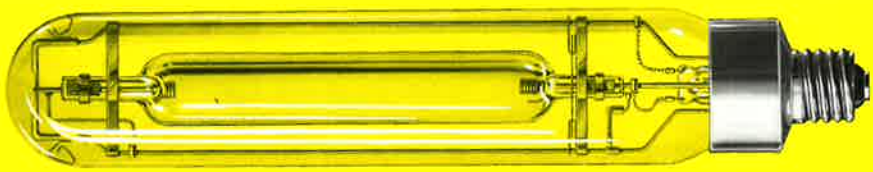
HP/T 250 W



HP/T 400 W



HP/T 1000 W



HP/T 2000 W

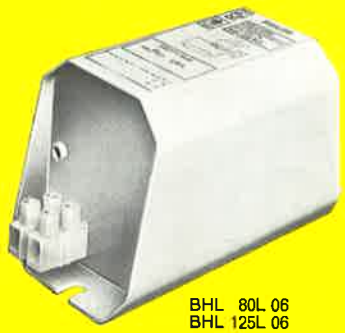
Type [1]	Type number	Base	Lamp voltage V	Lamp current A	Luminous flux [2] lm	Diam.	Max. length	Ordering number
HP/T 250 W	57130 G/92	E 40	135	2.10	11500	46	257	9280 585 092 ..
HP/T 400 W	57131 G/92	E 40	140	3.15	21000	46	313	9280 595 092 ..
HP/T 1000 W	57213 G/92	E 40	145	7.50	52000	65	382	9280 605 092 ..
HP/T 2000 W	57214 G/92	E 40	150	14.00	118000	82	472	9280 610 092 ..

[1]) For ballasts see page C 6
[2]) After 100 burning hours

PHILIPS

BALLASTS FOR MERCURY-VAPOUR AND MERCURY-HALIDE LAMPS

Mercury 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 half a century 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 construction.



BHL 80L 06
BHL 125L 06

58109 AH/00

Low power-factor (inductive) ballasts

For lamps	Type number	Nominal voltage V	Mains current A	Power factor	Losses W	Power-factor correction [1] Capacitor µF	Capacitor V	Mains current A	Dimensions l x b x h	Ordering number
50 W	58211 AH/01	220	0.62	0.43	8.5	8	250	0.32	140 x 65 x 70	9136 000 003 ..
80 W [4]	BHL 80L 06	220	0.80	0.50	11.5	8	250	0.45	130 x 71 x 76	9136 010 703 ..
125 W [4]	BHL 125L 06	220	1.15	0.55	12.5	10	250	0.70	130 x 71 x 76	9136 020 803 ..
175 W	58247 AH/00	220	1.50	0.60	17.5	15	250	0.95	150 x 67 x 91	9136 080 003 ..
250 W	58237 AH/00	220	2.15	0.55	18.5	20	250	1.30	150 x 85 x 91	9136 030 303 ..
400 W	58238 AH/00	220	3.25	0.60	26	25	250	2.10	150 x 87 x 100	9136 040 303 ..
700 W	58109 AH/00	220	5.25	0.65	32	40	250	3.60	210 x 114 x 133	9136 050 003 ..
1000 W [5]	58214 AH/01	220	7.50	0.65	43	58	250	5.30	210 x 114 x 133	9136 060 103 ..
2000 W	58219 CX/00	380	8.00	0.65	68	—	—	—	255 x 165 x 172	9136 070 089 ..

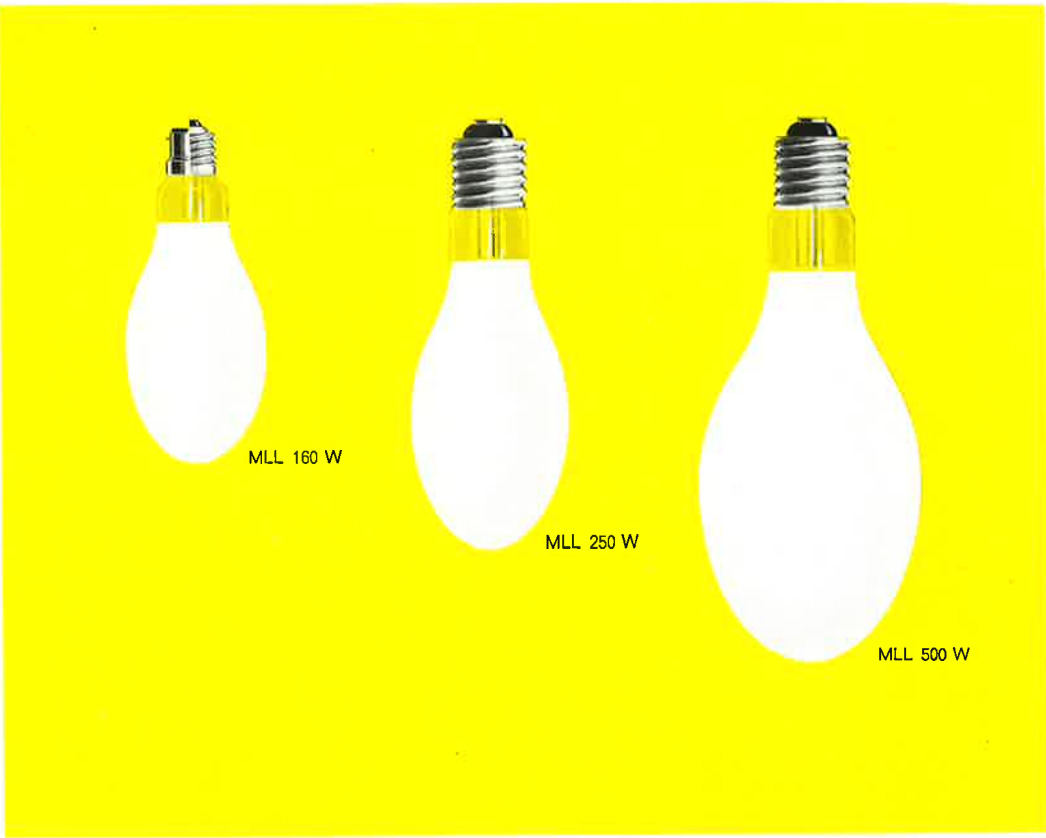
Low power-factor (inductive) ballasts for multiple ratings

80 W 125 W	BHL 125L 08	220	0.80 1.15	0.50 0.55	9 14	8 10	250 250	0.45 0.70	130 x 71 x 76	9136 120 103 ..
250 W 400 W	58218 AH/00	220	2.05 3.15	0.55 0.65	14 22	20 25	250 250	1.30 2.10	170 x 94 x 116	9136 130 003 ..

High power-factor circuits (combinations for duo-circuit) (for mercury-vapour lamps only)

2 x 50 W	58211 AH/01	I [3]	220	0.55	0.98	19	—	—	140 x 65 x 70	9136 000 003 ..
	58211 AH/01 + cap. 5 µF 380 V [2]	C [3]							140 x 65 x 70	9136 000 003 .. + cap. 5 µF 380 V [2]
2 x 80 W	BHL 80L 06	I	220	0.85	0.95	20	—	—	130 x 71 x 76	9136 010 703 ..
	58215 AH/00	C							210 x 67 x 91	9136 013 003 ..
2 x 125 W	BHL 125L 06	I	220	1.30	0.95	28	—	—	130 x 71 x 76	9136 020 803 ..
	58216 AH/00	C							250 x 67 x 91	9136 023 003 ..
2 x 175 W	58247 AH/00	I	220	1.85	0.95	37	—	—	150 x 67 x 91	9136 080 003 ..
	58247 AH/00 + cap. 13.6 µF 380 V [2]	C							150 x 67 x 91	9136 080 003 .. + cap. 13.6 µF 380 V [2]
2 x 250 W	58237 AH/00	I	220	2.45	0.95	39	—	—	150 x 85 x 91	9136 030 303 ..
	58220 AH/00	C							270 x 87 x 100	9136 033 003 ..
2 x 400 W	58238 AH/00	I	220	3.90	0.95	52	—	—	150 x 87 x 100	9136 040 303 ..
	58221 AH/00	C							290 x 94 x 116	9136 043 003 ..
2 x 700 W	58109 AH/00	I	220	6.90	0.97	70	—	—	210 x 114 x 133	9136 050 003 ..
	58109 AH/00 + cap. 50 µF 380 V [2]	C							210 x 114 x 133	9136 050 003 .. + cap. 50 µF 380 V [2]
2 x 1000 W	58214 AH/01	I	220	9.75	0.98	100	—	—	210 x 114 x 133	9136 060 103 ..
	58214 AH/01 + cap. 70 µF 380 V [2]	C							210 x 114 x 133	9136 060 103 .. + cap. 70 µF 380 V [2]

[1]) To obtain HPF circuit (cos. $\varphi \geqslant 0.85$) by means of a parallel capacitor across the mains. Capacitance tolerance ± 10 %. Capacitors to be ordered from C.D. Elcoma.
[2]) Capacitor to be connected in series with the ballast. Capacitance tolerance ± 5 %.
[3]) I = Inductive; C = Capacitive.
[4]) A ballast for indoor use only is available as well. Data on request.
[5]) For HPI/T 2000 W 220 V two ballasts in parallel.



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, 50 - 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 fully the present demands for longer life, better luminous efficiency and economical light depreciation. All ratings are ovoid in design, just as the HPL-N lamps.

They are an excellent means to improve the lighting in many fields of application including streets, factories, stores, garages, etc.

Existing lighting installations with incandescent lamps can easily be modernized without any extra cost for control gear, wiring or new fittings.

Type	Type number	Base	Nominal voltage V	Min. mains voltage [1] V	Lamp current A	Luminous flux [2] lm	Diam.	Max. length	Ordering number
MLL 160 W	57503 E/25	E 27	200-210	180	0.83	2950	75	177	9280 950 515 ..
	57503 B/25	B 22						172.5	9280 951 515 ..
	57504 E/25	E 27	210-220	180	0.79			177	9280 950 516 ..
	57504 B/25	B 22						172.5	9280 951 516 ..
	57500 E/25	E 27	220-230	180	0.75			177	9280 950 517 ..
	57500 B/25	B 22						172.5	9280 951 517 ..
	57501 E/25	E 27	230-240	190	0.72			177	9280 950 518 ..
	57501 B/25	B 22						172.5	9280 951 518 ..
	57502 E/25	E 27	240-250	200	0.69			177	9280 950 519 ..
	57502 B/25	B 22						172.5	9280 951 519 ..
MLL 250 W	57508 E/25	E 27	200-210	190	1.32	5500	90	216	9280 960 515 ..
	57508 G/25	E 40						227	9280 962 515 ..
	57509 E/25	E 27	210-220	190	1.26			216	9280 960 516 ..
	57509 G/25	E 40						227	9280 962 516 ..
	57505 E/25	E 27	220-230	190	1.20			216	9280 960 517 ..
	57505 G/25	E 40						227	9280 962 517 ..
	57506 E/25	E 27	230-240	195	1.15			216	9280 960 518 ..
	57506 G/25	E 40						227	9280 962 518 ..
	57507 E/25	E 27	240-250	205	1.10			216	9280 960 519 ..
	57507 G/25	E 40						227	9280 962 519 ..
MLL 500 W	57513 G/97	E 40	200-210	180	2.60	12500	120	290	9280 970 530 ..
	57514 G/97	E 40	210-220	180	2.50				9280 970 531 ..
	57510 G/97	E 40	220-230	180	2.40				9280 970 532 ..
	57511 G/97	E 40	230-240	190	2.30				9280 970 533 ..
	51512 G/97	E 40	240-250	200	2.20				9280 970 534 ..

[1]) Data valid for vertical burning position. For other burning positions values are slightly higher.
[2]) After 100 burning hours.

Burning positions

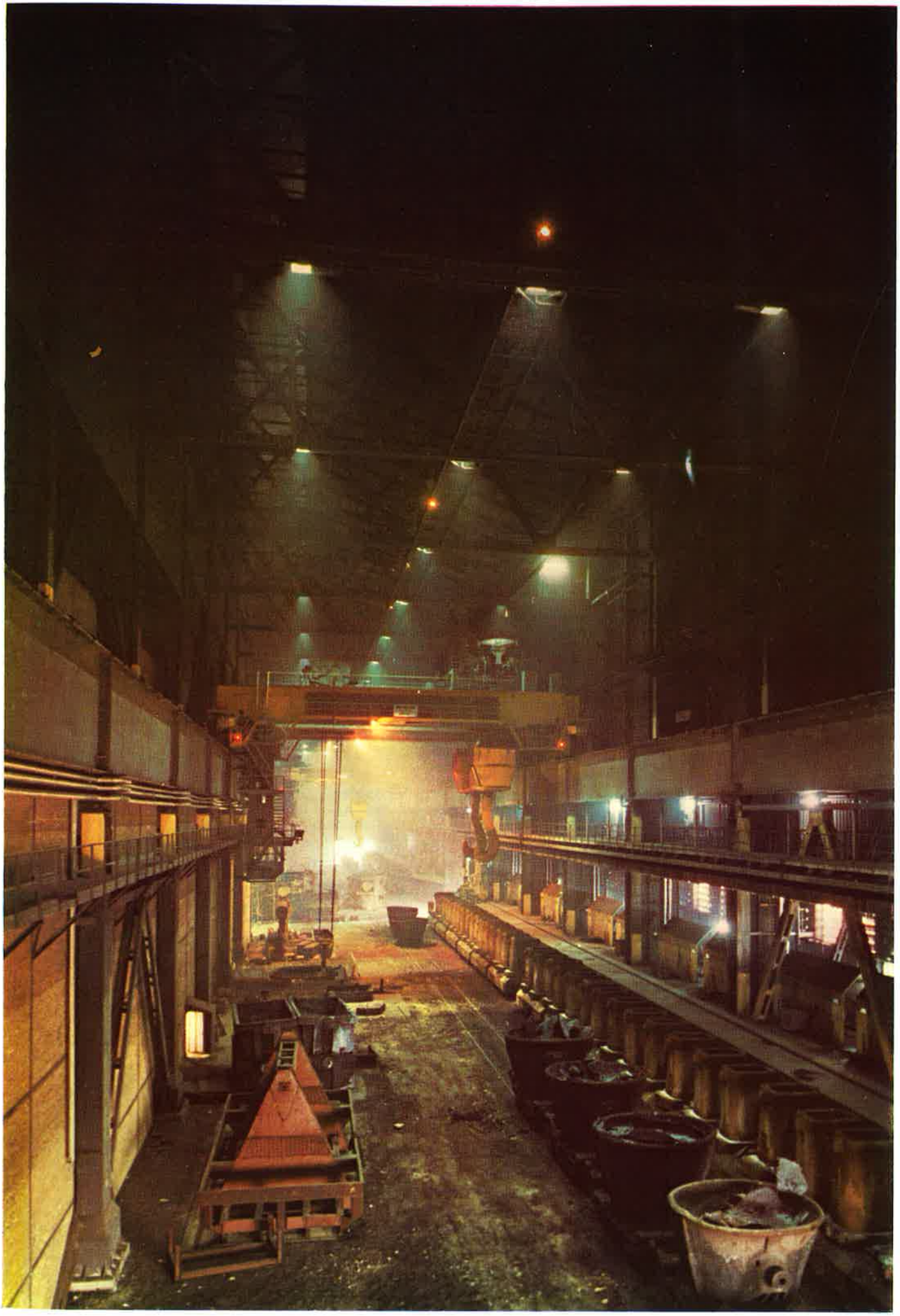
SH 30

160 W

SH 45

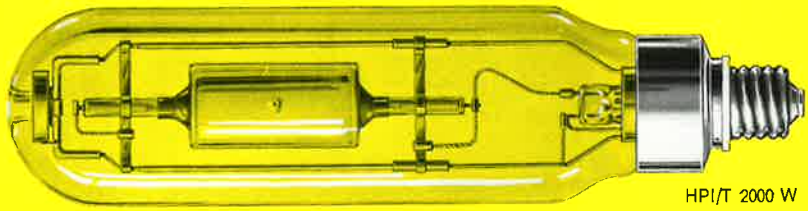
250 W
500 W

MLL 160 W: vertical ± 30°, cap up or down.
MLL 250 W and 500 W: although a universal burning position is possible, a vertical position ± 45° cap up or down is recommended, especially when undertension is expected.

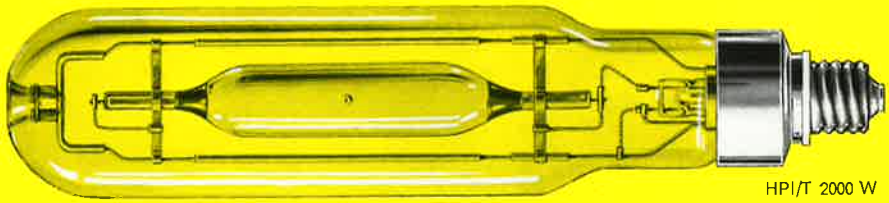


HPI 400 W

HPI/T 400 W



HPI/T 2000 W



HPI/T 2000 W

HPI - HPI/T HIGH-PRESSURE MERCURY HALIDE LAMPS

The special mixture of well chosen metal halide additives in the discharge of these lamps creates a light source with outstanding colour characteristics combined with a very high luminous efficiency. These characteristics make these lamps specially suitable for applications where the combination of good colour rendering and a high illumination level is a necessity.

Type	Type number	Base	Lamp voltage V	Lamp current A	Luminous flux lm	Diam.	Max. length	Ordering number
HPI 400 W	126647	E 40	125	3.4	28000	120	290	9280 731 .....
HPI/T 400 W	126633	E 40	125	3.4	30000	46	283	9280 734 092 ..
HPI/T 1000 W [1]	126672	E 40	130	8.3	88000	65	382	9280 740 092 ..
HPI/T 2000 W	126656	E 40	135	16.5	180000	100	430	9280 736 092 ..
HPI/T 2000 W	126399	E 40	240	9.0	190000	100	465	9280 735 092 ..

[1]) Provisional data

Applications

Sports grounds with colour television broadcasting facilities,
floodlighting,
high-bay lighting,
shipyards, etc.

S 51

BALLASTS AND IGNITORS

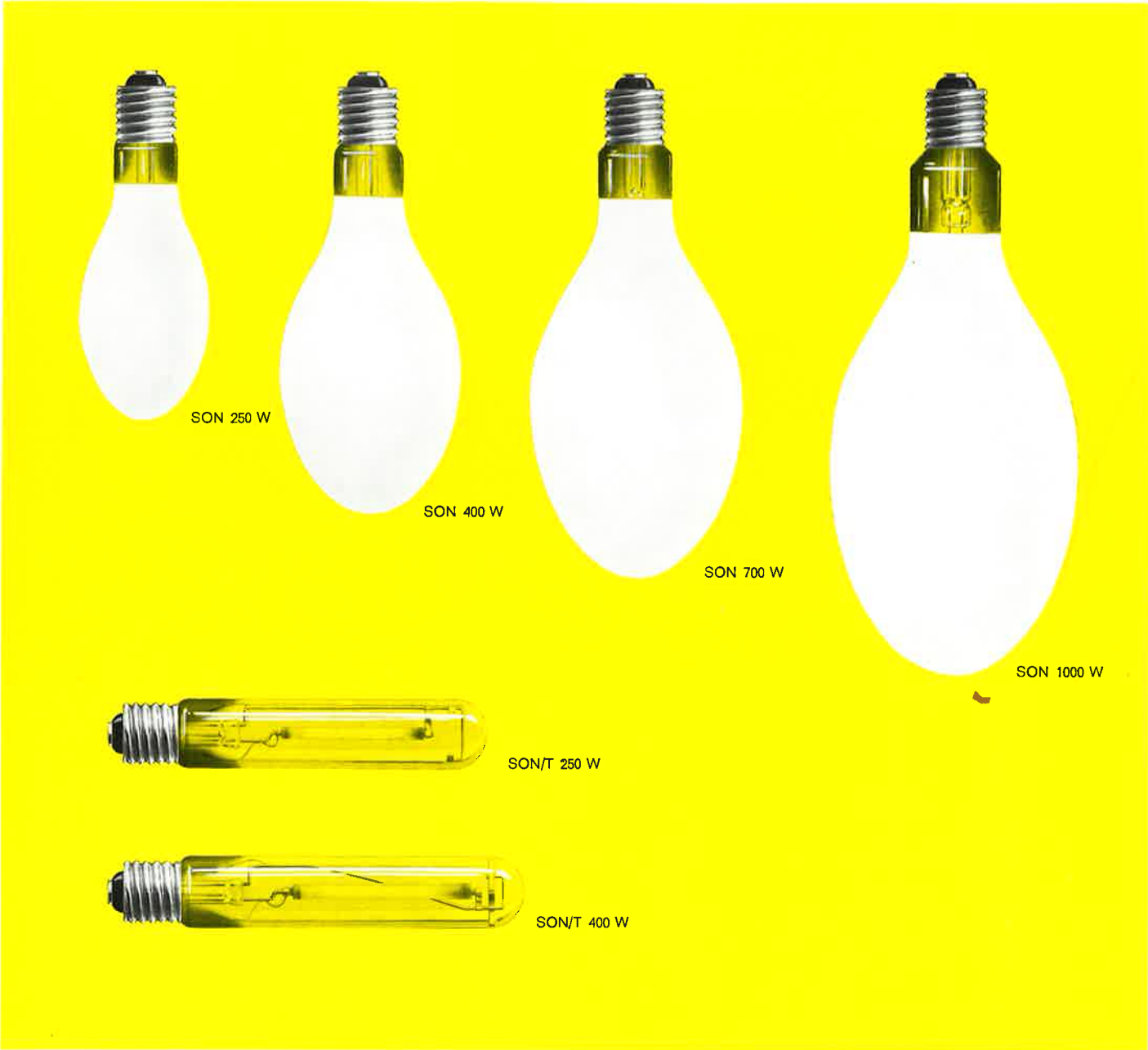
For ballasts see page C 6.

The ignition voltage of high-pressure mercury halide lamps is higher than the applied mains voltage. It is, therefore, not only necessary to use — as with all gas-discharge lamps — a ballast to control the current flowing through the circuit, but an ignitor must also be employed to give a sufficiently high voltage pulse to ignite the lamp.

Philips electronic thyristor ignitors, specially designed for this purpose, combine a very sturdy mechanical construction with a reliable electronic system to ensure efficient functioning of the ballast-ignitor-lamp circuit throughout a very long service life. The ignitor can be used in combination with an ordinary inductive high-pressure mercury ballast.

For lamps	Type number	Mains voltage V	Frequency c/s	Diam.	Max. length	Ordering number
HPI 400 W HPI/T 400 W	S 51	220 ... 240	50-60	40	137	9136 190 599 ..
HPI/T 1000 W HPI/T 2000 W	S 52	220 ... 240	50-60	40	137	9136 190 699 ..
HPI/T 2000 W	126689	380 ... 415	50-60	150 x 64 x 45 [1]		8222 209 839 ..

[1]) l x b x h



SON - SON/T
HIGH-PRESSURE SODIUM LAMPS

The development of high-pressure sodium-vapour discharge lamps has been greeted by light users as a major breakthrough in technology and is regarded as the most important and spectacular single step forward for thirty years.
By utilizing materials new to lamp technology such as sintered aluminium oxide and advanced techniques in manufacture, Philips have produced a range of sodium lamps with pleasant colour appearance, improved colour rendering, high luminous efficiency, excellent lumen maintenance, long reliable life and rugged construction.
Hardly ever have all these features been available in one type of lamp to meet so many applications. Both indoors and outdoors these lamps have gained wide acceptance.

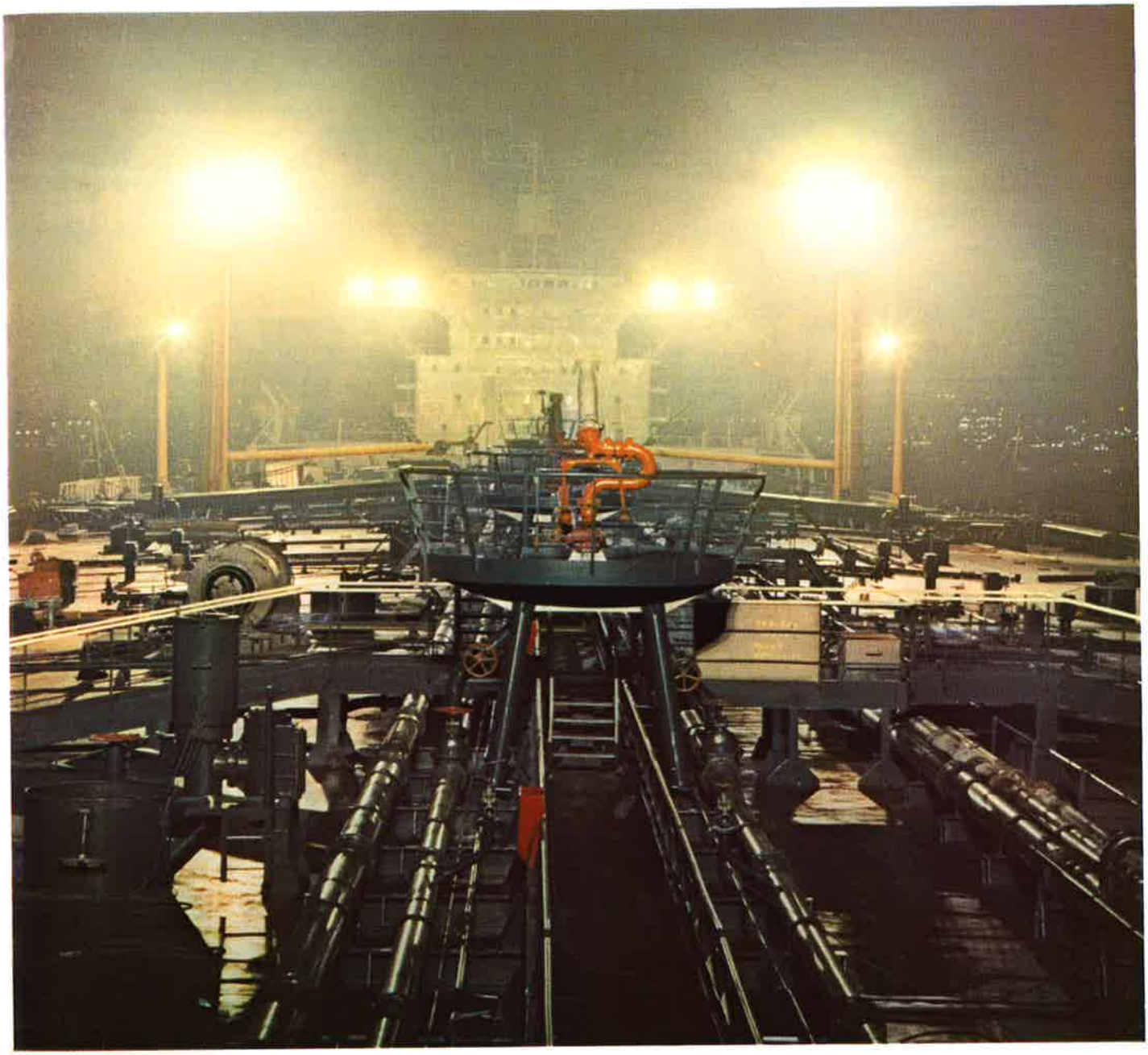
Applications

- Lighting of city centres
- Street lighting
- Dock lighting
- Floodlighting
- Airport lighting
- High-bay lighting
- Lighting of container depots

Philips high-pressure sodium lamps, their ballasts and ignitors are the result of perfect integration in design. Hence, their use ensures trouble-free service with subsequent saving in maintenance costs.

Type	Type number	Base	Lamp voltage V	Lamp current A	Luminous flux lm	Diam.	Max. length	Lcl.	Ordering number
SON 250 W	126645	E 40	100	3.000	19000	90	226	—	9281 510 098 ..
SON 400 W	126631	E 40	105	4.400	38000	120	290	—	9281 520 098 ..
SON 700 W [1])	126719	E 40	110	7.400	63000	140	329	—	9281 530 085 ..
SON 1000 W [1])	126720	E 40	115	9.800	90000	165	400	—	9281 540 085 ..
SON/T 250 W	126632	E 40	100	3.000	20000	46	257	158 ± 4	9281 515 092 ..
SON/T 400 W	57030 G/92	E 40	105	4.400	40000	46	283	175 ± 5	9281 445 092 ..
SON/T 700 W [1])	126675	E 40	110	7.400	70000	50	330	205 ± 5	9281 535 092 ..
SON/T 1000 W [1])	126676	E 40	115	9.800	100000	65	382	240 ± 5	9281 545 092 ..

[1]) Provisional data



CONTROL GEAR

High-pressure sodium lamps require control gear to limit the current flowing through the circuit. Due to the fact that the ignition voltage of these lamps is in excess of mains supply voltages, a small solid-state thyristor ignitor, delivering a peak voltage of sufficient magnitude to ensure reliable ignition (and hot re-ignition), is required in the lamp circuit.

BSN 250L 02

S 50

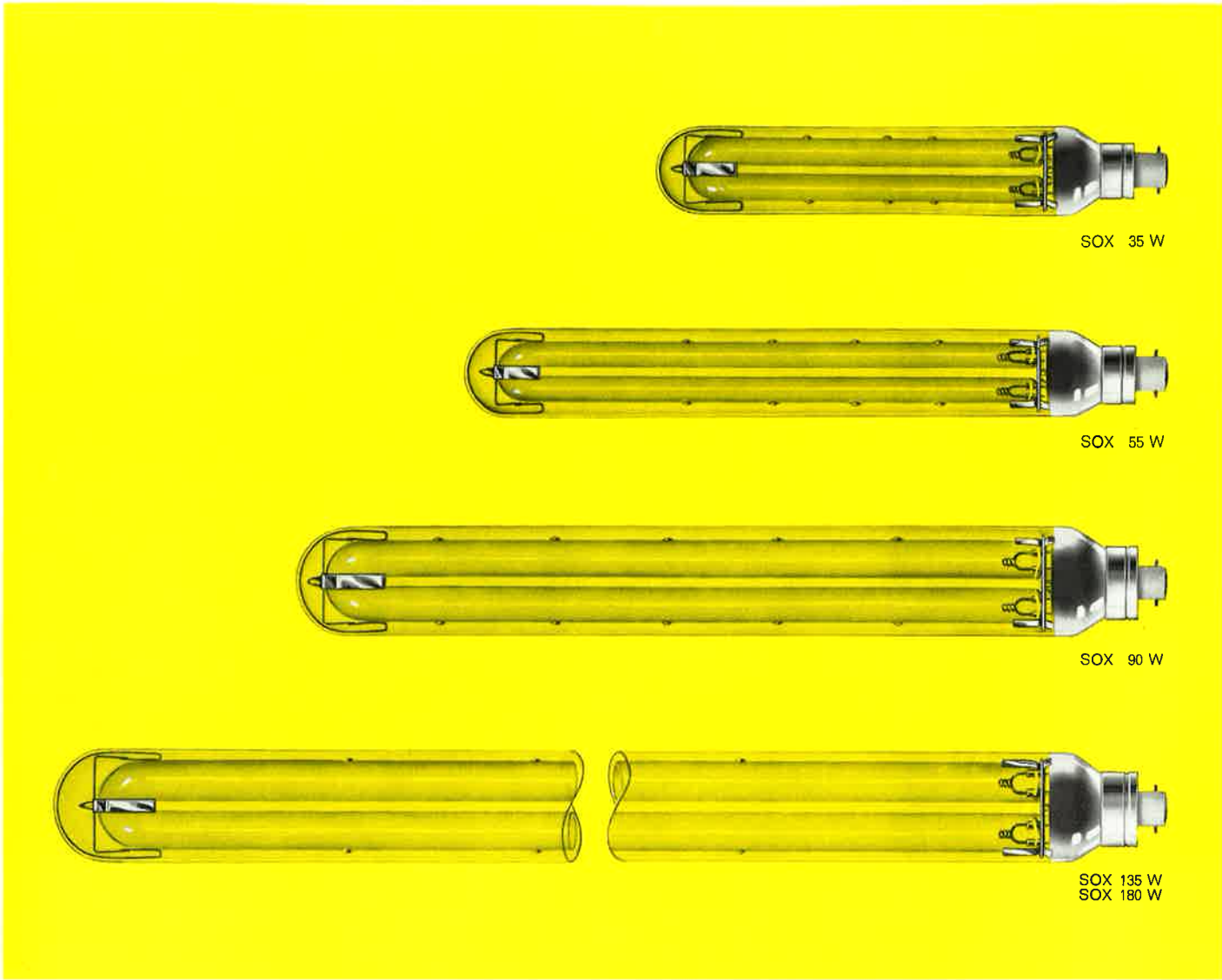
Ignition devices

For lamps	Type number	Mains voltage V	Frequency c/s	Diam.	Max. length	Ordering number
SON(/T) 250 W SON(/T) 400 W	S 50	220 ... 240	50-60	40	137	9136 250 103 ..
SON(/T) 700 W SON(/T) 1000 W	S 53					9136 280 103 ..

Ballasts

For lamps	Type number	Nominal voltage V	Mains current A	Power factor	Losses W	Power-factor correction [1] Capacitor µF	Capacitor V	Mains current A	Power factor	Dimensions l x b x h	Ordering number
SON(/T) 250 W	BSN 250L 02	220	3.000	0.45	33	40	300	1.450	0.9	150 x 87 x 100	9136 250 203 ..
SON(/T) 400 W	BSN 400L 02		4.300	0.45	39	45	300	2.200	0.9	165 x 94 x 116	9136 230 203 ..
SON(/T) 700 W	BSN 700L 02		7.400	0.45	55	90	300	3.800	0.9	235 x 114 x 133	9136 280 003 ..
SON(/T) 1000 W	BSN 1000L 02		—	—	—	125	300	—	0.9	235 x 114 x 133	9136 290 003 ..

[1]) To obtain HPF circuit by means of a parallel capacitor across the mains.
Capacitance tolerance ± 10 %. Capacitors to be ordered from C.D. Elcoma.



SOX INDIUM-OXIDE SODIUM LAMPS

The range of low-pressure sodium SOX lamps is definitely the most efficient and economical solution for public lighting. The outstanding features of these SOX lamps are as follows: exclusive, optimum heat-reflecting coating of indium-oxide providing new standards of super-high efficiency - up to 175 lm/W; optimum lumen maintenance throughout life (95 %); long, reliable life; interchangeable with the previous SOI and tin-oxide-coated SOX low-pressure sodium lamps as they are identical in regard to mechanical and electrical characteristics.

Type	Type number	Lamp voltage V	Lamp current A	Luminous flux [1] lm	Diam.	Max. length	Ordering number
SOX 35 W	57031 B/00	70	0.60	4650	51	310	9281 455 000 ..
SOX 55 W	57032 B/00	105	0.59	7700	51	425	9281 460 000 ..
SOX 90 W	57033 B/00	115	0.94	12500	66	528	9281 465 000 ..
SOX 135 W	57034 B/00	160	0.95	21500	66	775	9281 470 000 ..
SOX 180 W	57035 B/00	245	0.91	32000	66	1120	9281 475 000 ..

[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. The lampholder is suitable for a voltage up to 750 V - 4 Amps.

Type number: 61085/00; ordering number: 9145 000 600 ..
Dimensions: 53 x 42 x 33 mm.

BALLASTS FOR SOX LAMPS

As with all gas-discharge lamps, low-pressure sodium lamps SOX require control gear to limit the current flowing through the circuit. However, the ignition voltage of these lamps and in most cases the lamp voltage are higher than the applied mains voltage; this necessitates the use of special control gear. As leading manufacturers of low-pressure sodium lamps Philips have developed a range of auto-leak-transformers with outstanding characteristics for optimal operation of these low-pressure sodium lamps.

BSX 85H 02

Low power-factor (inductive) ballasts

For lamps	Type number	Nominal voltage V	Mains current A	Power factor	Losses W	Power-factor correction [1] Capacitor µF	Capacitor V	Mains current A	Power factor	Dimensions l x b x h	Ordering number
SOX 35 W SOX 55 W	BSX 85L 02	220	1.400	0.20	21	20	250	0.285 0.360	0.88 0.97	165 x 85 x 91	9136 200 303 ..
SOX 90 W	59011 AH/00	220	2.200	0.30	23	30	250	0.580	0.94	205 x 110 x 116	9136 210 003 ..

High power-factor ballasts (with built-in capacitor)

SOX 35 W SOX 55 W	BSX 85H 02	220	0.290 0.370	0.90	22	—	—	—	—	280 x 85 x 91	9136 206 303 ..
SOX 90 W	BSX 90H 02	220	0.600	0.95	35	—	—	—	—	285 x 114 x 94	9136 500 105 ..
SOX 135 W SOX 180 W	59004 AH/00	220	0.910 1.040	0.81 0.95	29.5	4 —	250 —	0.800 —	0.93 —	275 x 110 x 116	9136 226 403 ..

[1]) To obtain HPF circuit (cos. $\varphi \geq 0.85$) by means of a parallel capacitor across the mains. Capacitance tolerance ± 10 %. Capacitors to be ordered from C.D. Elcoma.

PHOTO AND PROJECTION LAMPS

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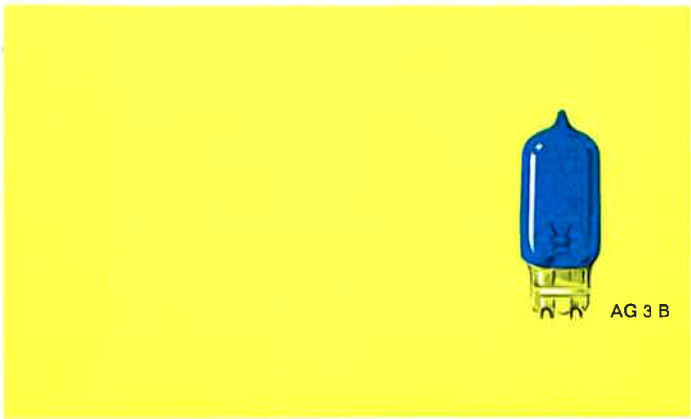
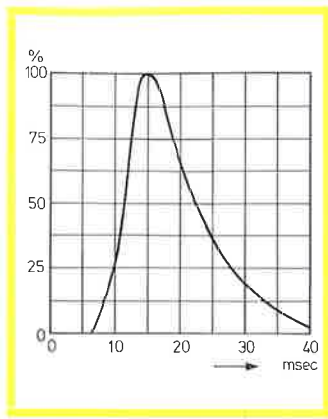
"PHOTOFLUX" FLASHBULBS

The modern camera-owner is making ever-increasing use of flashbulbs.
Philips "Photoflux" bulbs are the ideal light sources for exposures of fast-moving subjects or candid shots. They are indispensable for both indoor and outdoor photography — when there is little or no daylight or, in bright weather, to diminish the sharp contrast between sun-lit areas and dark shadows. "Photoflux" bulbs make every camera-owner independent of time, place and weather. With this never-failing aid he can be sure that every shot turns out a winner.

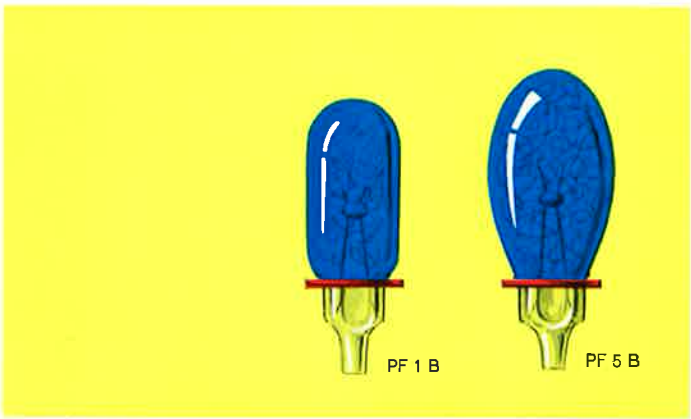


BASELESS TYPES

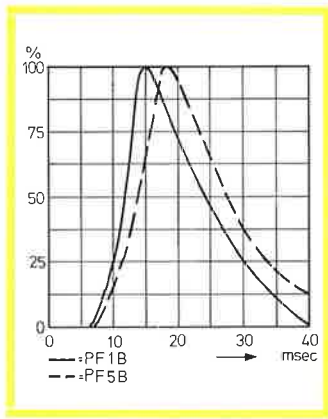
Technical developments have led to the manufacture of a series of small baseless flashbulbs of a high luminous intensity.
Type AG3B is available with a blue coating carefully matched to the colour characteristics of daylight-type colour films but it can be used equally well for black-and-white photography.
In case they are required for particular reasons, AG1 and AG1B are still available.



Type number	Voltage range V	Light output lmsec	Time to full peak msec	Flash duration at half peak msec	Colour	Max. diam.	Max. length	Ordering number
AG 3 B		7500			blue			9239 507 043 ..
AG 1	3-30	7500	15	13	clear	12.7	33.5	9239 504 043 ..
AG 1 B		5500			blue			9239 505 043 ..



Other types of small baseless flashbulbs, the PF1B and PF5B, are specially designed for PF-type flashguns.
These blue "Photoflux" flashbulbs which possess the same excellent qualities as the bulb described above, are intended for use with both daylight colour and black-and-white materials.

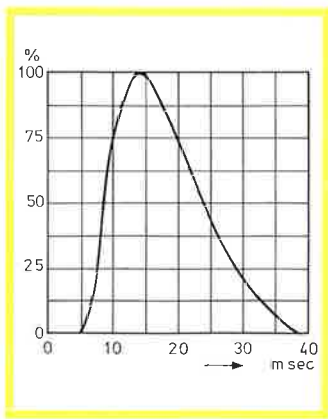


Type number [1]	Voltage range V	Light output lmsec	Time to full peak msec	Flash duration at half peak msec	Colour	Max. diam.	Max. length	Ordering number
PF 1 B	3-30	7500	15	12	blue	16.8	46	9239 501 043 ..
PF 5 B		18000	18	14		22.5	51	9239 511 043 ..

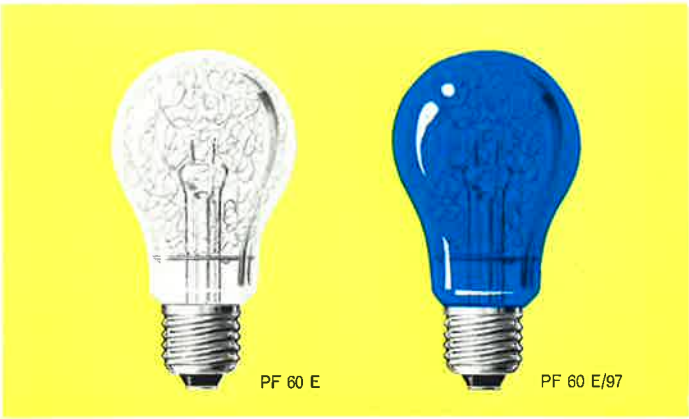
[1]) See also type PF 6 B on page D3.

FLASHCUBE

This flash unit contains 4 blue flashbulbs, each with its own individual reflector. The unit permits the photographer to take 4 flash pictures in very rapid succession.
Cameras adapted to this unit are available on the market as well as various types of adapter to enable the flash unit to be used on older-type cameras.

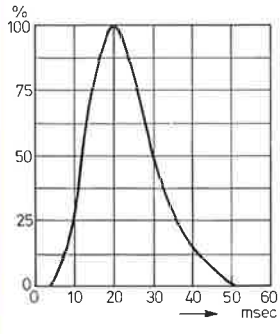


Type number	Voltage range V	Total centre beam intensity cdsec	Time to full peak msec	Flash duration at half peak msec	Max. diam.	Max. length	Ordering number
PFC 4	3-30	approx. 2000	15	13	29.2	35.7	9239 520 043 ..

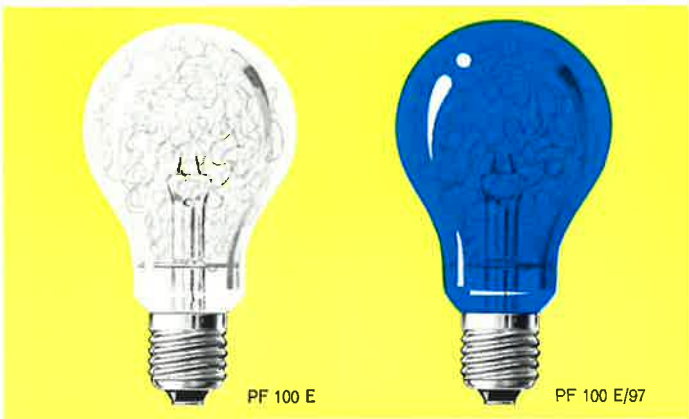


"PHOTOFLUX" FLASHBULBS CLASS M

Class M flashbulbs have been specially designed for cameras having between-the-lens shutters. They can be used with the "open-flash" method as well as with cameras having built-in synchronisation. They are also available with a blue filter lacquer for colour photography.

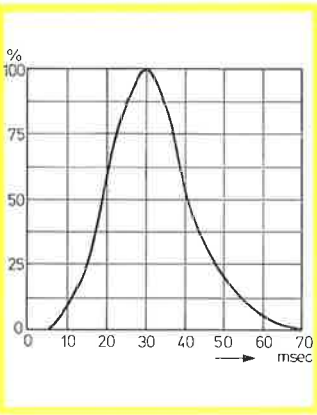


Type number	Voltage range V	Light output lmsec	Time to full peak msec	Flash duration at half peak msec	Base	Colour	Max. diam.	Max. length	Ordering number
PF 60 E	3-30	62000	20	14	E 27	clear	61	115	9239 543 043 ..
PF 60 E/97		31000				blue			9239 544 043 ..

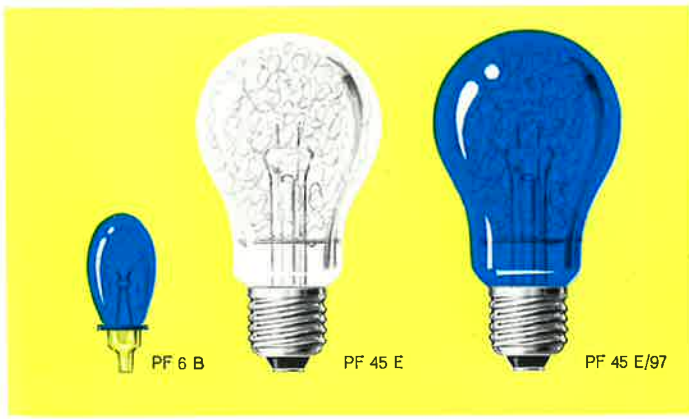


"PHOTOFLUX" FLASHBULBS CLASS S

Destined also for use with cameras equipped with between-the-lens shutters, 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 intended for the "open-flash" method of photography.

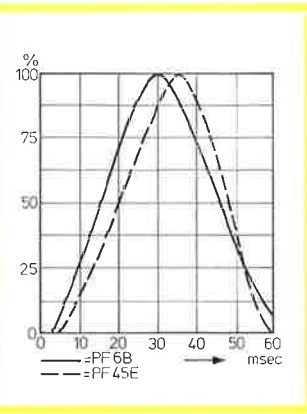


Type number	Voltage range V	Light output lmsec	Time to full peak msec	Flash duration at half peak msec	Base	Colour	Max. diam.	Max. length	Ordering number
PF 100 E	3-30	95000	30	17	E 27	clear	71	125	9239 545 043 ..
PF 100 E/97		47500				blue			9239 546 043 ..



"PHOTOFLUX" FLASHBULBS CLASS FP

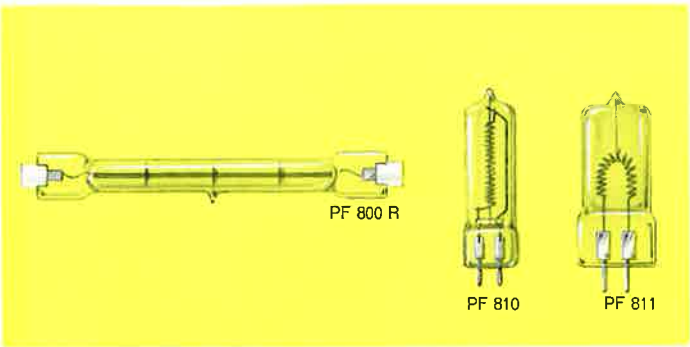
Due to their relatively long flash duration at half peak, these types are specifically destined to be used with cameras with focal-plane shutters.



Type number	Voltage range V	Light output lmsec	Flash duration at half peak msec	Time to half peak msec	Base	Colour	Max. diam.	Max. length	Ordering number
PF 6 B		15000		15	—	blue	22.5	51	9239 513 043 ..
PF 45 E	3-30	45000	30	16	E 27	clear	61	115	9239 541 043 ..
PF 45 E/97		22500		16	E 27	blue	61	115	9239 542 043 ..

LAMPS FOR GENERAL PHOTOGRAPHIC AND CINE LIGHTING

The development of special lamps for photography has played a considerable part in the rapid progress of this creative art. The experience of generations as lamp manufacturers has gone into the design of the lamps which Philips produce in this specialized field for the use of both amateurs and professionals.
The Philips name and their unrivalled research facilities are the guarantee of quality.



HALOGEN LAMPS

These lamps have been designed mainly for amateur use, to serve the evergrowing demand for suitable lighting for 8 mm ciné photography.
Owing to the tungsten-halogen regenerative process, their particularly favourable colour temperature for both black-and-white and colour film is maintained throughout the full lamp life.
Moreover, the small dimensions of the lamps permit the construction of small fittings. Combined with an appropriate reflector these halogen lamps ensure a high luminous intensity and uniform distribution of light.

Type number	Voltage V	Wattage W	Luminous flux lm	Colour temperature ° K	Average life h	Base	Burning position	Max. diam.	Max. length	Ordering number
PF 800 R	115-120 125-130 220-230 240-250	1000	33000	approx. 3400	15	R 7s-15	any	12	125.1 [1]	9238 755 345 .. 9238 755 356 .. 9238 755 432 .. 9238 755 457 ..
PF 810	115-120 125-130 220-230 240-250	650	20000	approx. 3400	15	G 6.35-18	any	17	60 65	9238 751 345 .. 9238 751 356 .. 9238 751 432 .. 9238 751 457 ..
PF 811	115-120 125-130 220-230 240-250	1000	33000	approx. 3400	15	G 6.35-24	any	24	67.5	9238 756 345 .. 9238 756 356 .. 9238 756 432 .. 9238 756 457 ..

[1]) Max. insertion length

"PHOTOLITA" (Inside-frosted)

"Photolita" lamps are available in two versions. The inside-frosted type illustrated opposite is to be used with a separate reflector. It has an extremely high luminous intensity.
As the exposure time per picture is a few seconds only, a great many pictures can be taken during the lifetime of these "Photolita" lamps.

Type	Type number	Voltage V	Wattage W	Luminous flux lm	Average life h	Base	Diam.	Max. length	Ordering number
"Photolita" S	PF 207	100 ... 130 200 ... 250	250	8500 7500	3	E 27 B 22	60 60	107.5 106	9205 253 ..... 9205 250 .....
"Photolita" N	PF 208	100 ... 130 200 ... 250	500	17000 14500	6	E 27 B 22	88 88	180 175.5	9205 263 ..... 9205 260 .....
"Photolita" T	PF 209	100 ... 130 200 ... 250	1000	34000 29000	10	E 40	110	239	9205 270 .....

"PHOTOLITA" (Internal reflector)

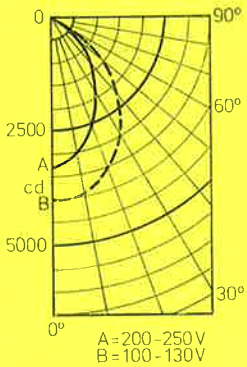
Unlike the version described on the foregoing page, the use of a separate reflector is superfluous with this type of "Photolita" lamp, as it is designed with an internal reflector.

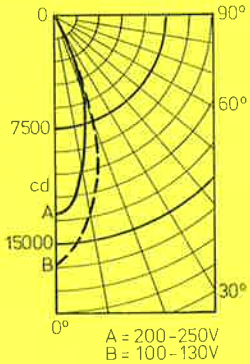
As regards luminous intensity and exposure time, the same applies as for the inside-frosted version.

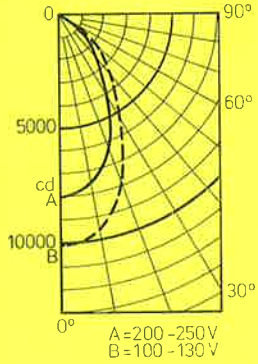
PF 217

PF 215

PF 218







Type	Type number	Voltage V	Wattage W	Luminous intensity in centre of beam cd	Average life h	Base	Diam.	Max. length	Ordering number
"Photolita" SM	PF 217	100 ... 130 200 ... 250	250	4000 3300	3	E 27 B 22	95 95	135 130.5	9232 155 ..... 9232 150 .....
"Photolita" KM	PF 215	100 ... 130 200 ... 250	375	16000 13000	4	E 27	95	132	9232 170 .....
"Photolita" NM	PF 218	100 ... 130 200 ... 250	500	10000 8000	6	E 27 B 22	125 125	175 173	9232 185 ..... 9232 180 .....

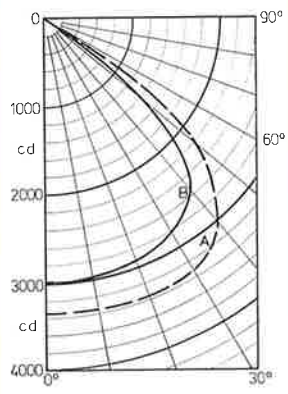
"ARGAPHOTO"

"Argaphoto" lamps give a more diffused form of lighting and have a longer life than the "Photolita" series.

They are available in two versions as well; the inside-frosted type is for use in a reflector, the other version has an internal mirror. The lamps are intended for general photographic lighting for still and cine work.

PF 308

PF 318



A = 100 ... 130 V
B = 200 ... 250 V

Type	Type number	Voltage V	Wattage W	Luminous flux lm	Luminous intensity in centre of beam cd	Average life h	Base	Diam.	Max. length	Ordering number
"Argaphoto" B	PF 308	100 ... 130 200 ... 250	500	12500 11000	— —	100	E 27 B 22	88	180 175.5	9205 201 ..... 9205 200 .....
"Argaphoto" BM	PF 318	100 ... 130 200 ... 250	500	— —	3300 3000	100	E 27	125	177	9232 190 .....

LAMPS FOR GENERAL PHOTOGRAPHIC AND CINE LIGHTING (continued)

"PHOTO-CRESCENTA"

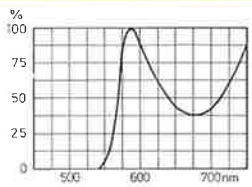
Enlarger lamps with a white diffusing bulb. These light sources have a high luminous intensity and provide the even distribution of light required for enlarging processes. Philips "Photocrescenta" lamps are, therefore, an invaluable asset to the professional as well as to the amateur photographer.

Type number	Voltage V	Wattage W	Luminous flux lm	Average life h	Base	Diam.	Max. length	Ordering number
PF 603	100 ... 130 200 ... 250	75	1300 1150	100	E 27 B 22	60 60	107.5 106	9205 311 ..... 9205 310 .....
PF 605	100 ... 130 200 ... 250	150	3000 2700	100	E 27 B 22	65 65	120.5 116	9205 321 ..... 9205 320 .....
PF 607	100 ... 130 200 ... 250	250	8000 7200	3	E 27 B 22	65 65	120.5 116	9205 326 ..... 9205 325 .....
PF 609	100 ... 130 200 ... 250	300	6000 5400	100	E 27 B 22	88 88	180 175.5	9205 331 ..... 9205 330 .....

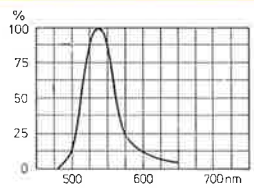
DARKROOM LAMPS

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

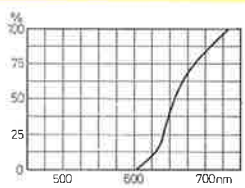
Type number	Colour	Voltage V	Base	Diam.	Max. length	Ordering number
PF 710	yellow-green	110-115 125-130 150-160 220-230 240-250	E 27 B 22	60 60	107.5 106	9205 355 ..... 9205 350 .....
PF 711	green		E 27 B 22	60 60	107.5 106	9205 356 ..... 9205 351 .....
PF 712	red		E 27 B 22	60 60	107.5 106	9205 357 ..... 9205 352 .....
PF 713	yellow		E 27 B 22	60 60	107.5 106	9205 358 ..... 9205 353 .....



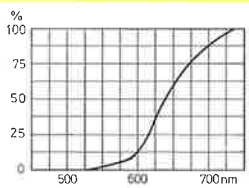
Yellow-green lamp
Eminently suitable for enlarging and printing on bromide and chlorobromide papers.



Green lamp
For processing panchromatic negative material.



Red lamp
Suitable for developing orthochromatic negative material.

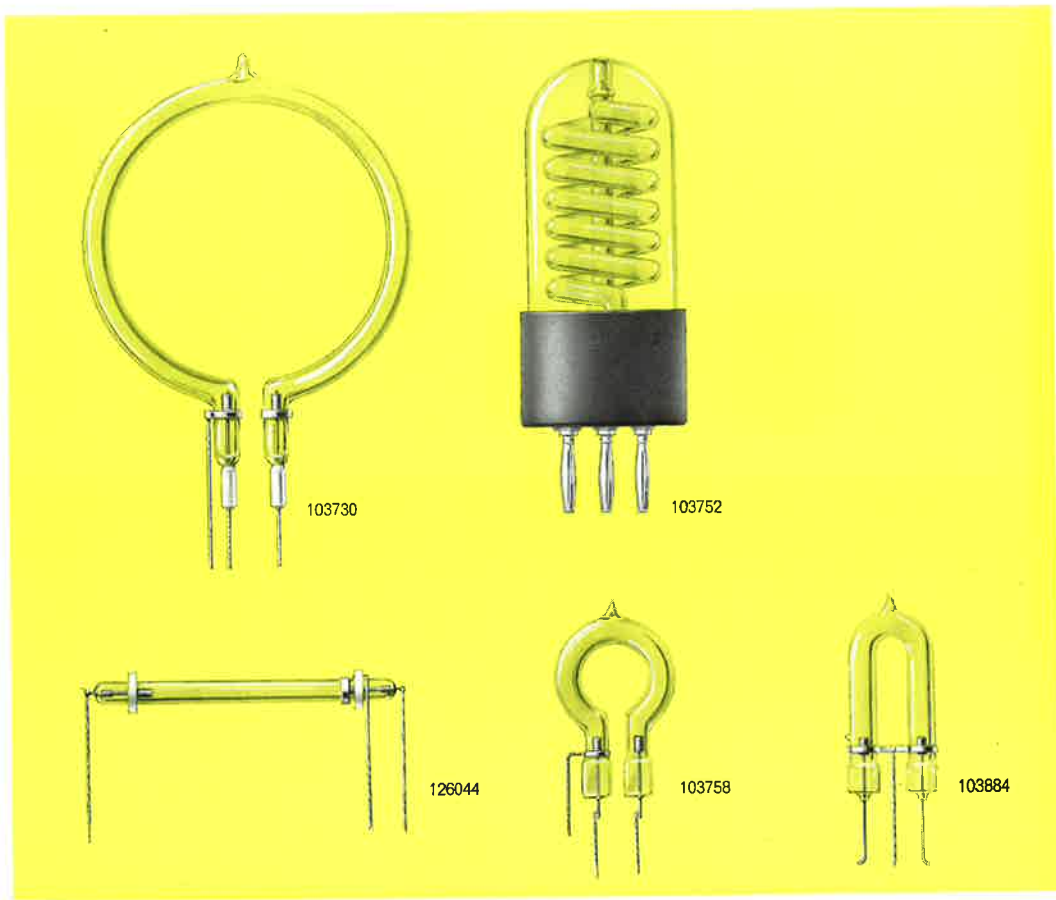


Yellow lamp
For use when developing normal contact papers and less sensitive chlorobromide papers.

DISCHARGE FLASHLAMPS

Philips xenon flashlamps are hard glass or quartz discharge lamps of various shapes, with xenon filling. An electrical discharge is passed through the tube to create an intensive light flash with a daylight spectrum (colour-temperature approximately 5000-6000 °K) of very short duration. These light sources are, therefore, eminently suitable for making sharply defined photographic negatives or for use in signaling installations. Their characteristics are 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 flash-equipment makers.

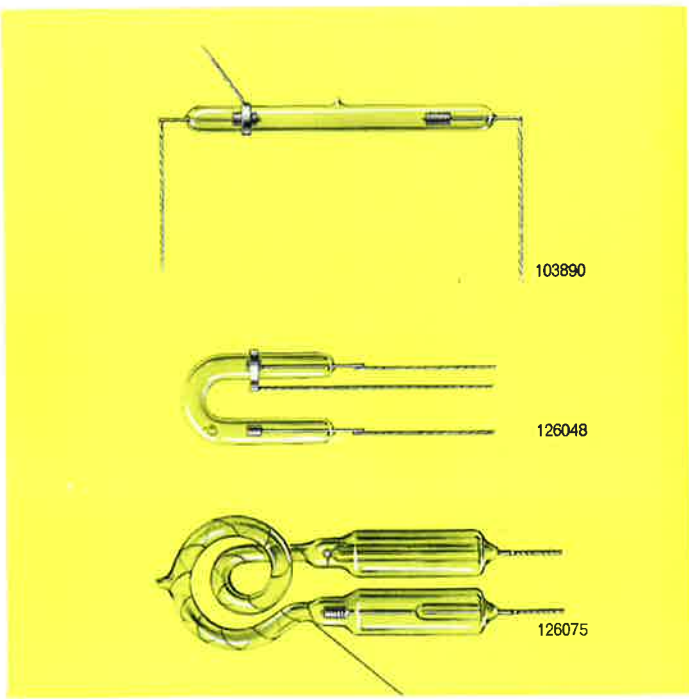


Type number [1]	Max. energy per flash Wsec	Anode voltage V min.	Anode voltage V max.	Max. flash frequency flashes/min	Life (number of flashes)	Bulb material	Main capacitor µF	Max. length	Ordering number
103 730	1000	2400	3000	0.5	1000	quartz	220	95	9283 801 000 ..
103 752	800	2400	3400	1	1000	quartz	140	100	9283 802 000 ..
126 044	80	400	500	3	3000	glass	500	70	9283 809 000 ..
103 758	70	380	510	9	10000	glass	400	40	9283 803 000 ..
103 884	60	400	550	6	10000	glass	280	41	9283 831 000 ..

[1]) These lamps are a choice from many flashlamps manufactured in the course of time. Other types are regularly being developed. Data available on request.

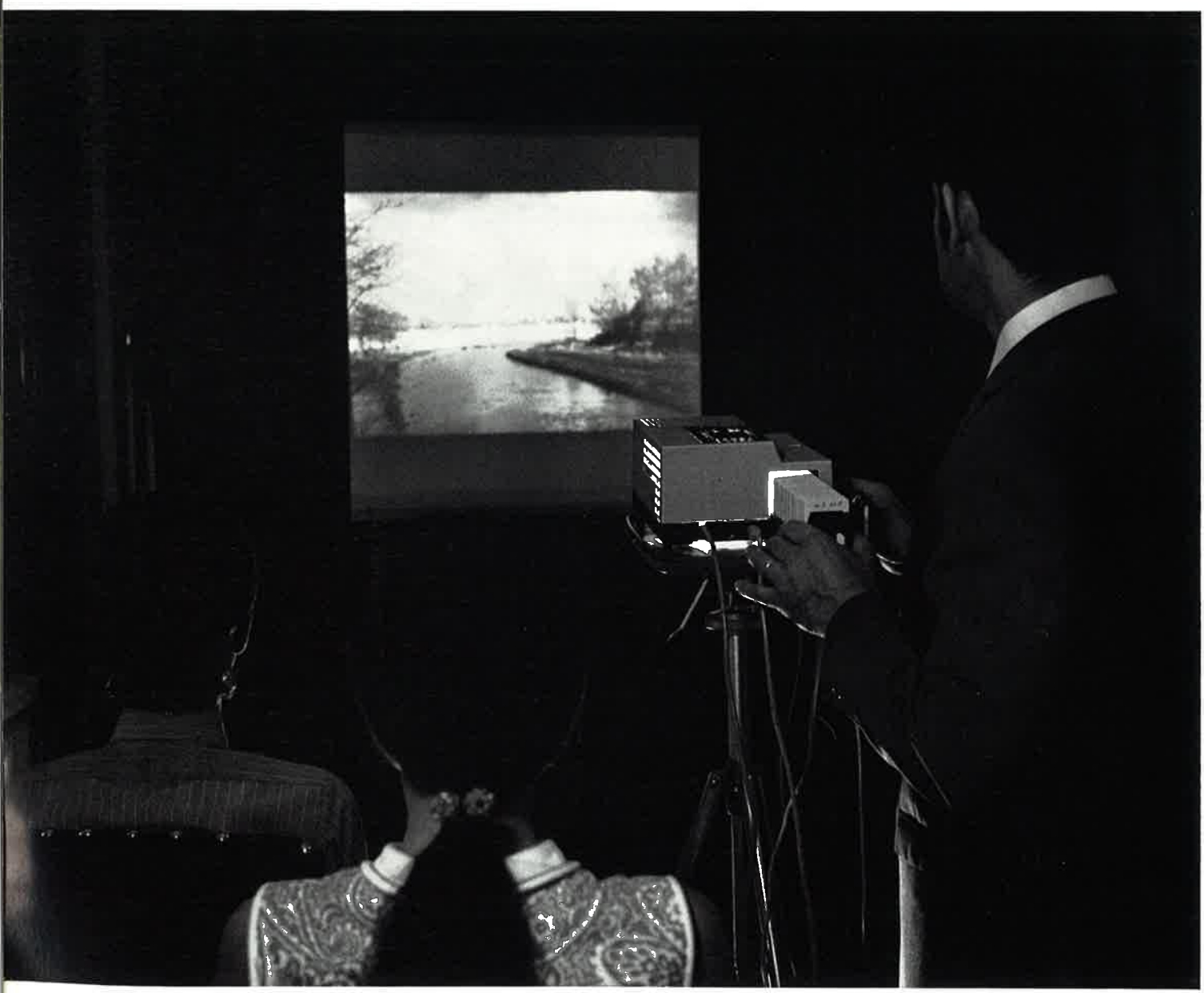
XENON STROBOSCOPIC FLASHLAMPS

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.



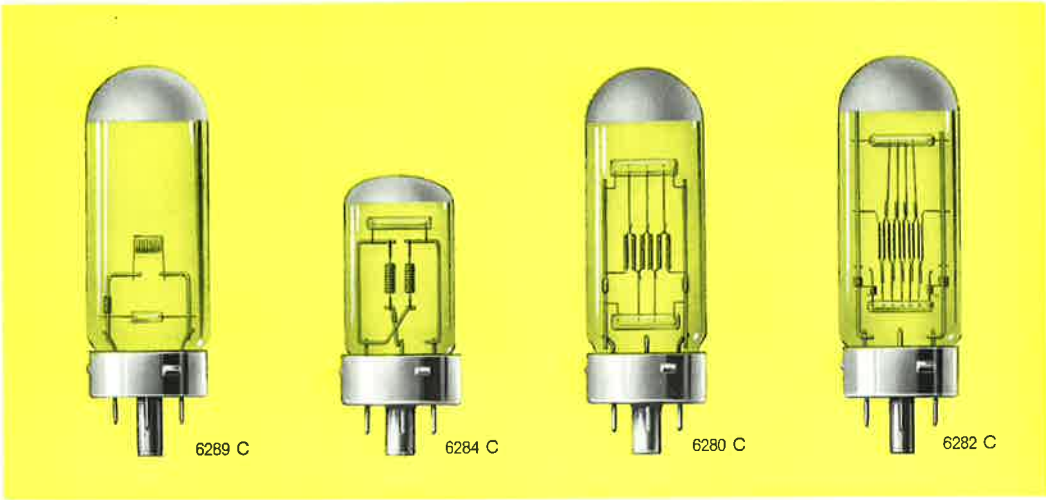
Type number	Nominal energy W	Anode voltage V min.	Anode voltage V max.	Flash frequency flashes/sec	Flash duration µsec	Max. ignition voltage V	Life [1] h	Max. length	Ordering number
103 890	4	350	500	0-300	< 7	10000	> 100	70	9283 808 000 ..
126 048	6	300	600	0-300	< 7	10000	> 100	42	9283 810 000 ..
126 075	40	1200	1870	0-500	< 10	10000	> 100	74	9283 842 000 ..

[1]) At nominal energy and at 50 c/s.



PIN-BASE PROJECTOR LAMPS

To meet the wishes of projector designers to make still more compact projectors, Philips have developed a range of short lamps, which satisfy the highest standards of precision and craftmanship. — The keyed guide-pin and heavy-duty contact pins of the base ensure precise alignment and positioning of the filament, resulting in an excellent performance of the lamp.



Burning position

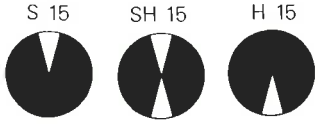
Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
6289 C	24	150	6.4 x 3.2	k	4300	25	G17q	32	103	39.7	9222 107 205 ..
6284 C	100 ... 130 200 ... 250	150	5.5 x 6.4 8.0 x 8.0	f b	3200 2700	25	G17q	29	76	33.4	9222 105 .....
6280 C	100 ... 130 200 ... 250	300	9.0 x 10.0 10.5 x 8.0	c b	7400 6900	25	G17q	32	102.5	39.7	9222 162 .....
6282 C	100 ... 130 200 ... 250	500	8.5 x 7.5 10.5 x 9.5	d e	12500 11400	25	G17q	32	102.5	39.7	9222 212 .....

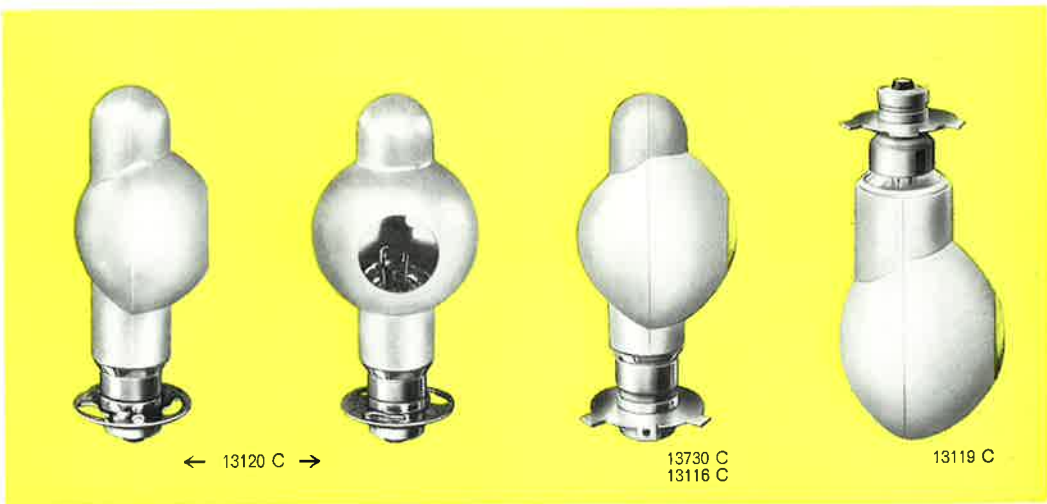
MIRROR CONDENSER LAMPS

For narrow-gauge film projectors Philips can supply light sources with an internal ellipsoidal mirror, which renders 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, their small size enables the designer to meet, in every respect, the demands imposed by modern projectors.

Burning positions





Type number	Voltage V	Wattage W	Av. life h	Base	Diam.	Max. length	Lcl.	Burning position	Ordering number
13120 C [1]	8	50	25	P30s	32/43	96	47 [4]	S 15	9222 014 145 .. [1]
13730 C [1] [3]	12	75	15	P35s	40/49	95	44 [4]	SH 15	9222 045 171 .. [1] [3]
13116 C [1] [3]	12	100	25	P35s	40/49	95	44 [4]	SH 15	9222 070 171 .. [1] [3]
13119 C [2] [3]	12	150	25	P35s	45/55	98	55 [4]	H 15	9222 106 171 .. [2] [3]

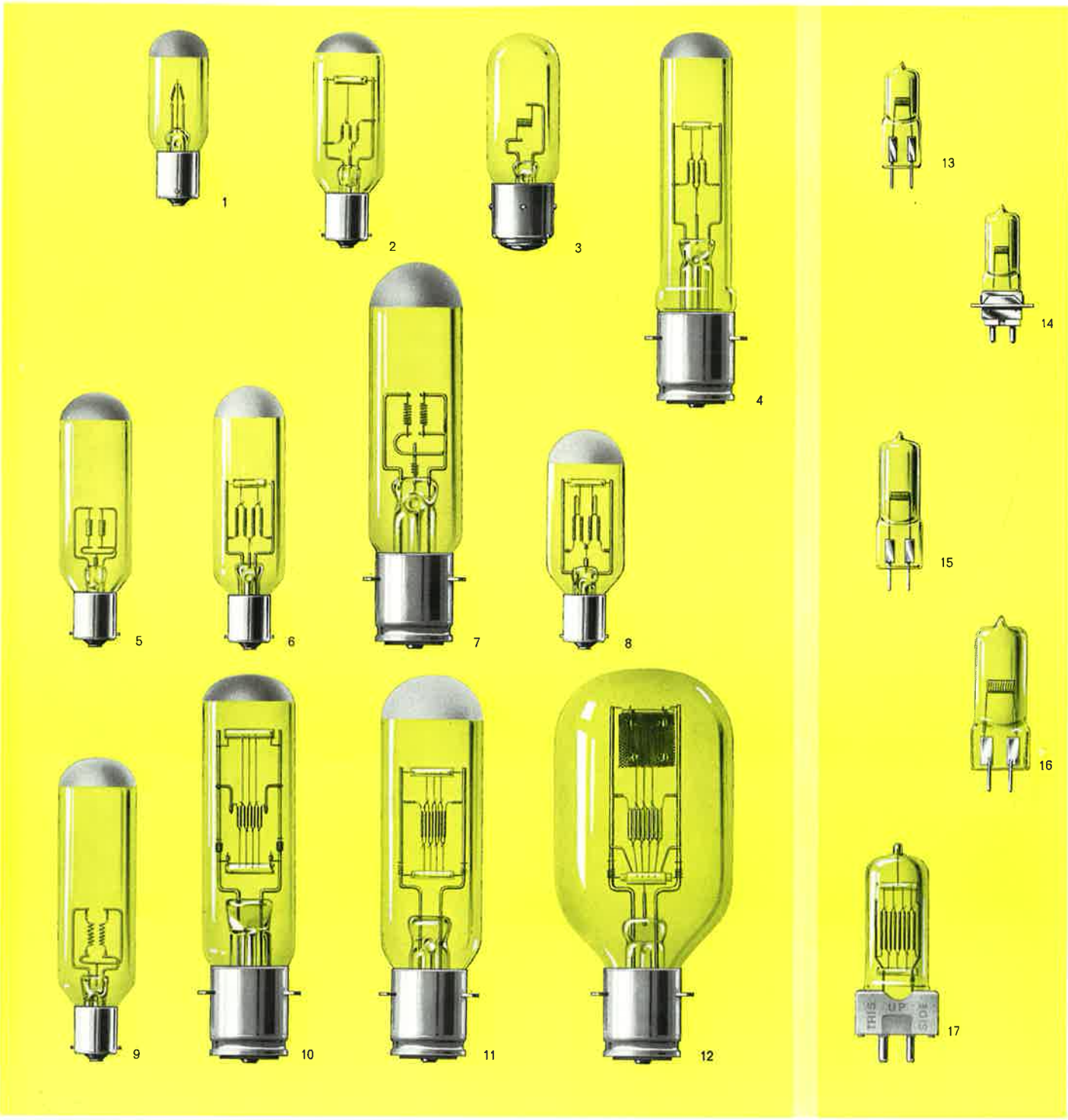
[1] For 8 mm projectors [2] For 16 mm projectors [3] Non-standard type [4] Nominal dimension for construction of projector

HALOGEN ELLIPSOIDAL REFLECTOR LAMPS

These lamps are designed for the projection of Super 8 films. They combine the efficient mirror condenser system with the halogen lamp technique and, from 75 W on, the principle of the dichroic cool-light mirror. This means that practically all the light but, nevertheless, only 40 % of the generated heat are reflected. The remaining heat is transmitted to the rear by the dichroic layers. Excellent screen illumination is obtained, even after lamp replacement, as the lamps are accurately prefocused.

Burning position

Type number	Voltage V	Wattage W	Mirror	Av. life h	Base	Diam. reflector	Max. length	Ordering number
6847	8	50	aluminium	50	GZ 6.35-25	49.7	42	9238 720 145 ..
6853	12	75	dichroic					9238 721 171 ..
6834	12	100	dichroic					9238 722 171 ..
6423	15	150	dichroic					9238 723 185 ..



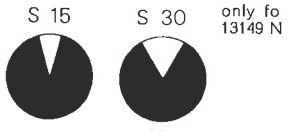
LAMPS FOR NARROW-GAUGE FILM AND HOME CINEMA APPARATUS

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 skilful lampmakers, and continuous research in the Philips laboratories guarantee a product of uniformly high efficiency and reliability and 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.

HALOGEN TYPES

Various types of quartz halogen lamp for use in narrow-gauge film (8 and 16 mm) and in slide projectors can be supplied.
Just as the other halogen lamps, these types have a high luminous intensity which is maintained throughout the entire lamp life, excellent colour rendition and small dimensions which allow the construction of more compact and efficient projectors.

Burning positions



Burning position

Conventional types

Type number	Voltage V	Wattage or Current	Filament b x h	shape	Lum. flux lm	Base	Diam.	Max. length	Lcl.	Ordering number	Fig.
13149 N [1]	115—125	30 W	4.5 x 5.5	h	400	B15s	22	67	35	9224 225 346 .. [1]	1
7238 N	12	100 W	4.6 x 2.6	k	2800	B15s	25	78	35	9222 051 171 ..	2
7909 J [1]	12	100 W	4.6 x 2.6	k	2800	B21s-4	25	79	29.5	9222 069 171 .. [1]	3
6158 N	100 ... 130 200 ... 250	100 W	6 x 5 7 x 6.5	p b	1850 1650	B15s	25	78	35	9222 051	2
6067 C [1]	100 ... 130 200 ... 250	100 W	6 x 5 7 x 6.5	p b	1850 1650	P28s	25	135	55.6	9222 057 ..... [1]	4
13141 N	100 ... 130 200 ... 250	150 W	6 x 5.5 8 x 8	f b	3200 3000	B15s	25	90	35	9222 101	5
13140 C [1]	100 ... 130 200 ... 250	150 W	6.5 x 7 8 x 8	f b	3200 2850	P28s	25	135	55.6	9222 104 ..... [1]	4
6166 N [1]	100 ... 130 200 ... 250	200 W	6.5 x 6.5 10 x 8	f b	4400 4000	B15s	27	90	35	9222 121 ..... [1]	6
7217 C [1]	50	5 A	7 x 7	c	6200	P28s	32	135	55.6	9222 511 253 .. [1]	7
6070 C [1]	100 ... 130 200 ... 250	250 W	7 x 7 10 x 8	f b	5300 5000	P28s	32	135	55.6	9222 146 ..... [1]	7
7066 N	100 ... 130 200 ... 250	300 W	9 x 9 10 x 8	c b	7400 6900	B15s	27	81	35	9222 160	8
7212 N [1]	100 ... 130 200 ... 250	300 W	9 x 9 10 x 8	c b	7400 6900	B15s	27	105	35	9222 152 ..... [1]	9
6131 C [1]	100 ... 130 200 ... 250	300 W	9 x 9 10 x 8	c b	7400 6900	P28s	32	135	55.6	9222 153 ..... [1]	7
7219 C [1]	75	5 A	9 x 9	c	9700	P28s	32	135	55.6	9222 511 281 .. [1]	7
6152 C	100 ... 130 200 ... 250	500 W	8.5 x 7.5 10 x 9.5	d e	12500 11400	P28s	32	135	55.6	9222 201	10
6153 C	100 ... 130 200 ... 250	750 W	10 x 10 13 x 10.5	d e	19500 18000	P28s	38	140	55.6	9222 231	11
7242 C	100 ... 130 200 ... 250	1000 W	11 x 11 14 x 11	d e	27000 25000	P28s	38	140	55.6	9222 270	11
6185 C [1]	100 ... 130 200 ... 250	1000 W	11 x 11 14 x 11	d e	27000 25000	P28s	65	140	55.6	9222 274 ..... [1]	12

Note. Average life of type 6070 C: 50 h; of all other types: 25 h

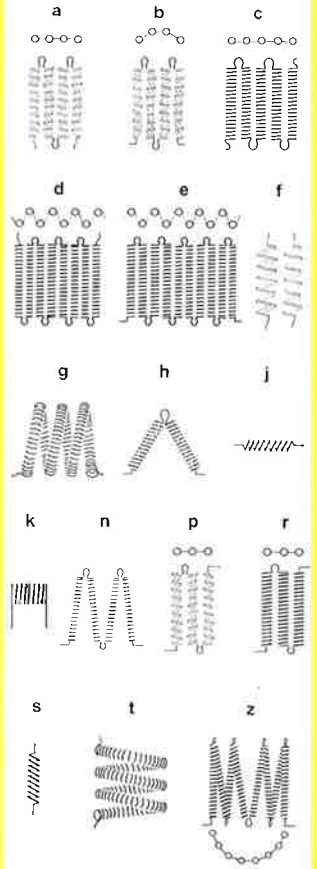
Halogen types

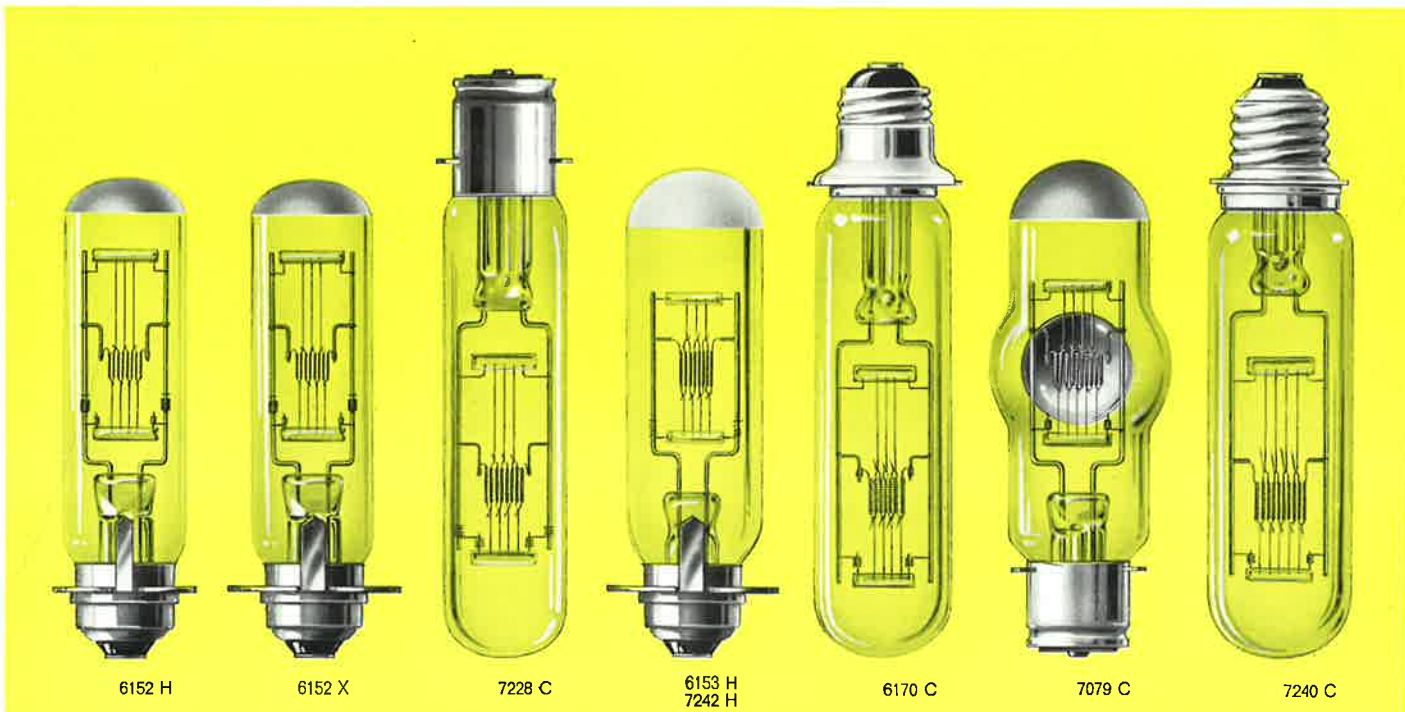
7027	12	50 W	3.3 x 1.6	k	1400	G6.35-13	11.5 max.	44	30	9238 702 171 ..	13
7023	12	100 W	4.2 x 2.3	k	3000	GY6.35-13	11 max.	44	30	9238 700 171 ..	13
6839 C [1]	12	100 W	4.2 x 2.3	k	3000	PG22d	11.5 max.	48	18	9238 701 171 .. [1]	14
6550 [1]	15	150 W	4.8 x 3.0	k	5000	G6.35-13	11.5 max.	44	30	9238 706 185 .. [1]	13
7158	24	150 W	5.8 x 2.9	k	5000	G6.35-15	13.5 max.	50	32	9238 705 205 ..	15
7748	24	250 W	7.0 x 3.5	k	8500	G6.35-15	13.5 max.	55	33	9238 708 205 ..	15
7787	36	400 W	9.4 x 4.7	k	14500	G6.35-20	18 max.	60	36	9238 714 233 ..	16
7389	220—230 240—250	500 W	11.5 x 11	d	14500	GY9.5	22 max.	75	36.5	9238 716 432 .. 9238 716 457 ..	17

[1] Non-standard type

Note. Average life of all types: 50 h

Filament shapes

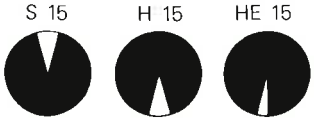




FOR VARIOUS MAKES OF PROJECTORS [1]

Burning positions

6152 H/X 6153 H 7079 C 7242 H	7228 C	6170 C 7240 C
S 15	H 15	HE 15

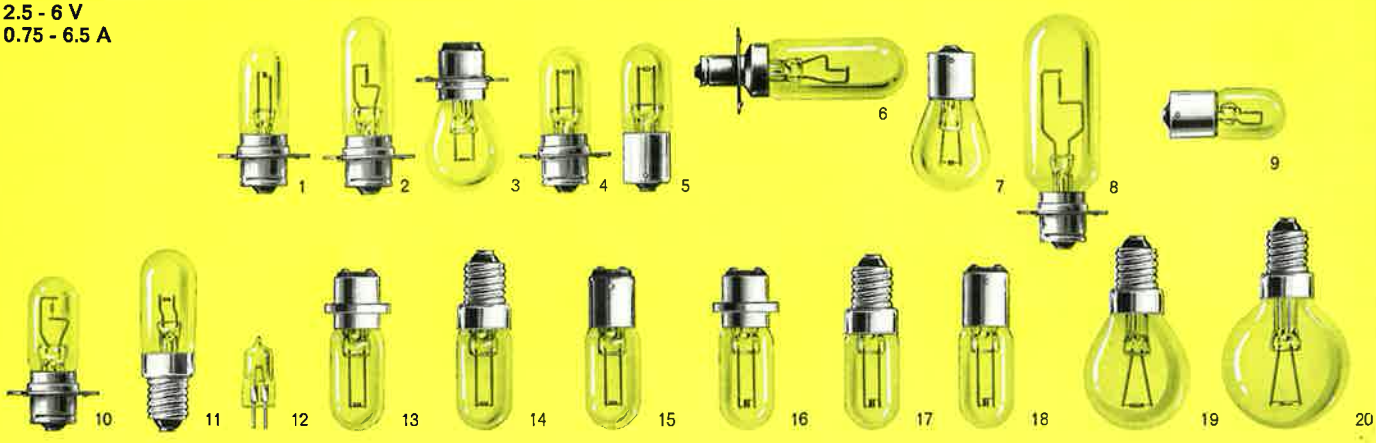


Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Base	Diam.	Max. length	Lcl.	For make	Ordering number
6152 H 6152 X	100 ... 130	500	8.5 x 7.5	d	12500	P38s P46s	32	130	59	Bell and Howell	9222 202 ..... 9222 203 .....
7228 C	100 ... 130	500	8.5 x 7.5	d	12500	P28s	32	150	81	Ericsson	9222 205 .....
6153 H	100 ... 130	750	10 x 10	d	19500	P46s	38	135	59	Bell and Howell	9222 232 .....
6170 C	100 ... 135	750	10 x 10 [4]	d	19500	P39s	36	153.5	81	Debrie	9222 235 .....
7079 C [2]	110	750	12.5 x 8.5	d	—	P28s	50/38	140	55.6	Philips	9222 239 319 ..
7242 H	100 ... 130 200 ... 250	1000	11 x 11 14 x 11	d	27000 25000	P46s	38	135	59	Bell and Howell	9222 271 .....
7240 C	110	1000	11 x 11 [3]	d	27000	P36s	38	155	81	Philips	9222 278 319 ..

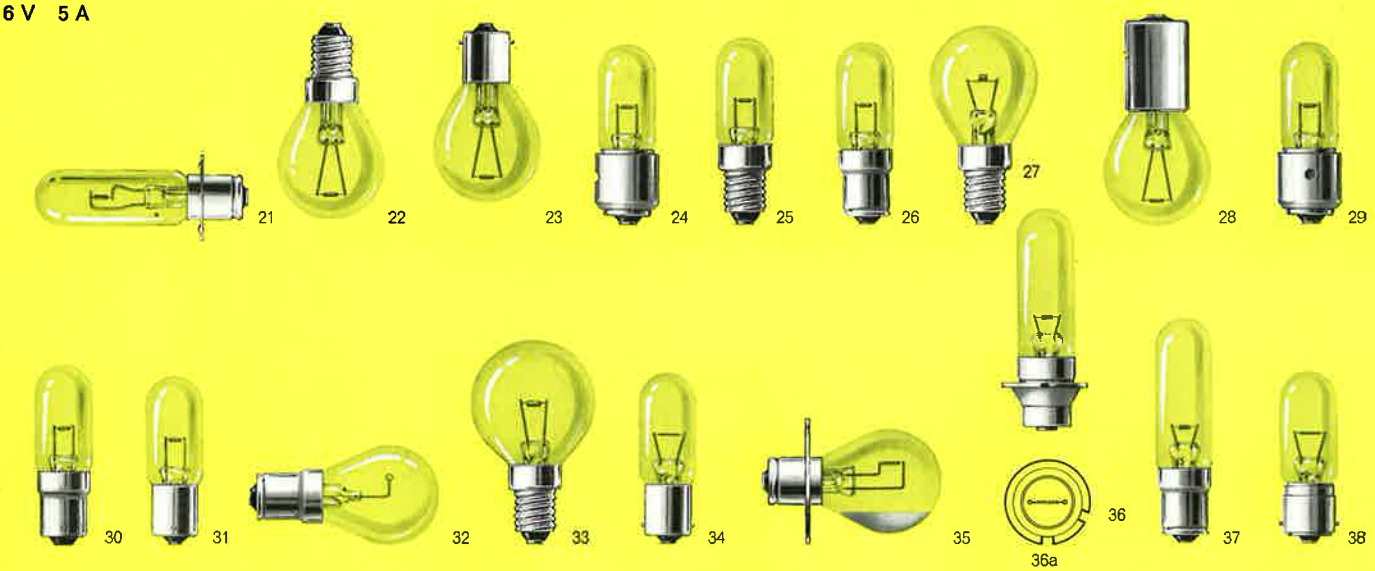
[1] All lamps are non-standard types [2] With mirror [3] Filament 6 mm eccentric [4] Filament 4 mm eccentric

Note. Average life of all types: 25 h

2.5 - 6 V
0.75 - 6.5 A



6 V 5 A

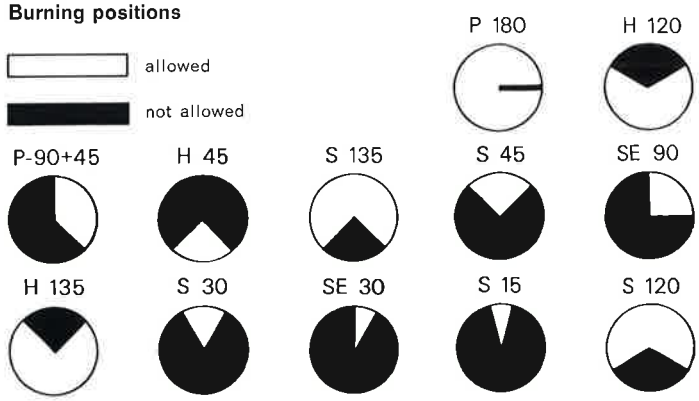


6 - 27 V
0.2 - 17 A

SOUND-FILM EXCITER, HOME-CINEMA AND MICROPROJECTION LAMPS

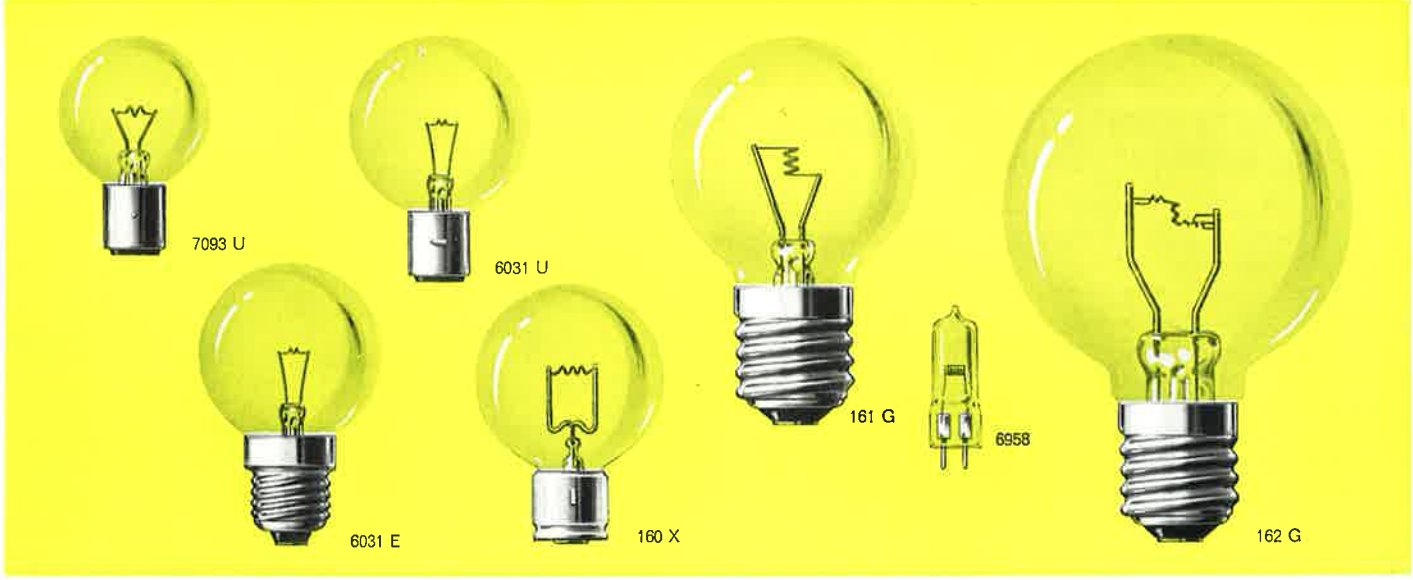
For the quality of every sound-film exciter, home-cinema or micro-projection lamp to be really superior, the filament should meet specific requirements of the utmost stringency.
Only slight tolerances in their dimensions and uniform luminous intensity are salient characteristics of these lamps.
The Philips range of sound-film exciter, home-cinema and micro-projection lamps is such that for almost all current kinds and makes of projector, precisely the right type of lamp can be supplied. Each and every lamp is the result of an advanced manufacturing technique which ensures perfect, reliable operation.

Burning positions



Type number	Voltage V	Current or Wattage	Filament b x h	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Burning position	Ordering number	Fig.
6218 C	2.5	3 A	1.0 x 1.0	50	100	P30s	16	50	28.6	P180	9224 460 032 ..	1
7090 C	4	0.75 A	0.2 x 2.0	30	50	P30s	16	59	28.6	P180	9224 411 063 ..	2
7250 C	4	0.75 A	2.0 x 0.2	30	50	P30d	25	51	28.6	H120	9224 406 063 ..	3
7253 C	4	0.75 A	2.0 x 0.2	30	50	P30s	16	49	28.6	P180	9224 410 063 ..	4
7253 N						B15s	16	49	31.8		9224 408 063 ..	5
7251 C	5	4 A	0.6 x 6.5	245	1000	PX28s	18	70	31.5	P—90+45	9224 470 082 ..	6
13353 N	5	4 A	1.1 x 1.1	310	100	B15s	25	48	31.8	H45	9224 567 082 ..	7
7255 C	5	6.5 A	1.0 x 5.0	700	50	P30s	25	78	41.2	S135	9224 554 082 ..	8
6142 N	6	1 A	0.25 x 4.0	80	100	B15s	16	42	22	P180	9224 422 101 ..	9
7210 C	6	1 A	0.25 x 4.0	80	100	P30s	16	50	28.6	S45	9224 424 101 ..	10
6052 M	6	1.45 A	1.0 x 1.0	95	100	E14	18.5	60	43.5	SE90	9224 432 101 ..	11
7387 [3]	6	10 W	1.6 x 0.6	200	100	G4-0.7	9 max.	30	19.5	any	9238 745 101 .. [3]	12
13347 C	6	15 W	1.9 x 1.7	205	100	PX22d	18.5	53	6.5 [1]	H135	9224 573 101 ..	13
13347 M						E14	18.5	58	48.5		9224 572 101 ..	14
13347 W						B15d	18.5	53	6.5 [1]		9224 570 101 ..	15
13702 C	6	15 W	1.9 x 1.7	205	100	PX22d	18.5	53	6.5 [1]	H135	9224 577 101 ..	16
13702 M						E14	18.5	58	48.5		9224 576 101 ..	17
13702 W						B15d	18.5	53	6.5 [1]		9224 575 101 ..	18
6100 M	6	4.35 A	4.5 x 0.8	440	100	E14	35	65	8 [1]	H120	9224 476 101 ..	19
397 M	6	4.5 A	3.0 x 1.0	475	100	E14	40	67	8 [1]	H120	9224 333 101 ..	20
3875 C	6	5 A	1.0 x 5.0	525	100	PX28s	18	70	31.5	P—90+45	9224 503 101 ..	21
6102 M	6	5 A	2.5 x 1.5	510	100	E14	35	65	8 [1]	H120	9224 483 101 ..	22
6102 N						B15s	35	60	8 [1]		9224 481 101 ..	23
6103 C	6	5 A	2.5 x 1.5	510	100	PY20s	18.5	58	25.5	S30	9224 506 101 ..	24
6103 M						E14	18.5	60	40.5		9224 505 101 ..	25
6103 R						SX15s	18.5	58	41		9224 507 101 ..	26
6106 M	6	5 A	2.0 x 2.0	510	100	E14	35	70	45	S135	9224 497 101 ..	27
6107 M	6	5 A	4.0 x 1.0	525	100	E14	35	65	8 [1]	H120	9224 490 101 ..	22
6107 Y						P20s	35	67	45.5		9224 491 101 ..	28
6112 C	6	5 A	4.2 x 1.0	525	100	PY20s	18.5	58	25.5	S30	9224 514 101 ..	29
6112 M						E14	18.5	60	40.5		9224 512 101 ..	25
6112 N						B15s	18.5	58	34		9224 510 101 ..	30
6112 R						SX15s	18.5	58	41		9224 516 101 ..	26
6112 X						B15s	18.5	54	28		9224 511 101 ..	31
6119 R	6	5 A	2.5 x 1.5	510	100	SX15s	32	64	43.5	P—90+45	9224 501 101 ..	32
6164 M	6	5 A	2.0 x 2.0	510	100	E14	40	67	45	P180	9224 344 101 ..	33
6213 N	6	5 A	5.0 x 1.0	525	100	B15s	18.5	54	28	S30	9224 527 101 ..	34
6216 C	6	5 A	1.0 x 5.0	525	100	PY40s	32	62	29	P—90+45	9224 502 101 ..	35
7257 C	6	5 A	2.5 x 1.5	510	100	P27s	18	72	22	S30	9224 519 101 ..	36
7257 R						SX15s	18	72	38		9224 518 101 ..	37
7259 C	6	5 A	2.5 x 1.5	510	100	P27s	18	72	22	S30	9224 520 101 ..	36a
13341 C	6	5 A	5.0 x 1.0	525	100	P16s	18.5	55	28	S30	9224 517 101 ..	38
13105 B	6	100 W	3.0 x 3.0	2000	100	B22d	60	93	54	S135	9222 060 101 ..	39
6002 E	6	16-17 A	8.5 x 2.1	1400	100	E27	32	118	76	S30	9224 665 101 ..	40
3874 C	6.5	1.48 A	0.5 x 3.0	110	500	PX28s	18	70	31.5	P—90+45	9224 440 116 ..	41
7252 C	7	0.2 A	0.15 x 3.5	10	50	P30s	16	60	28.6	P180	9224 400 126 ..	42
6055 N	8	4 A	7.5 x 0.5	625	100	B15s	25	78	44.5	S135	9224 465 145 ..	43
6019 M	8	6 A	2.5 x 2.0	900	100	E14	40	67	45	P180	9224 371 145 ..	44
6019 W						B15d	40	67	39		9224 370 145 ..	45
6058 N	8.5	4 A	8.0 x 0.5	680	100	B15s	25	78	44.5	S135	9224 465 151 ..	43
13305 N	8.5	4 A	0.5 x 8.0	680	100	B15s	25	78	44.5	SE30	9224 469 151 ..	46
13303 C	9	4 A	5.0 x 1.25	575	500	P30s	25	78	37.3	S135	9224 467 155 ..	47
6057 C	10	5 A	4.5 x 1.5	1050	100	P30s	25	78	37.3	S135	9224 526 158 ..	47
6057 N						B15s	25	78	40.5		9224 523 158 ..	43
6056 C	10	7.5 A	4.5 x 2.0	1650	100	P30s	25	78	37.3	S30	9224 557 158 ..	47
6056 N						B15s	25	78	40.5		9224 555 158 ..	48
390 C	12	0.5 A	1.2 x 0.2	42	50	P10s	15	63	25	S15	9224 252 171 ..	49
6007 M/01 [2]	12	2 A	3.5 x 2.0	—	25	E14	40	66	44	S30	9224 286 171 .. [2]	50
415 N/01 [2]	12	3.5 A	4.5 x 2.5	—	100	B15s	40	65.5	37	S135	9224 321 171 .. [2]	51
6143 E	12	50 W	2.5 x 2.5	1125	100	E27	48	75	49	S135	9222 009 171 ..	52
6143 B						B22d	48	71	38		9222 006 171 ..	53
6067 C	12	100 W	2.6 x 3.3	2400	100	P28s	25.5	135	55.6	S15	9222 057 171 ..	54
7073 U	15	60 W	2.6 x 2.4	1560	20	BA20d	35	66	30	S120	9222 031 185 ..	55
392 N	25	1 A	3.5 x 1.2	450	100	B15s	18.5	54	20	S30	9224 271 209 ..	56
6139 N	27	1 A	3.5 x 1.0	445	100	B15s	25	78	40.5	S135	9224 420 214 ..	43

[1]) Distance light centre - bulb top [2]) With mirror [3]) Halogen type



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 providing light beams of a high luminous intensity.

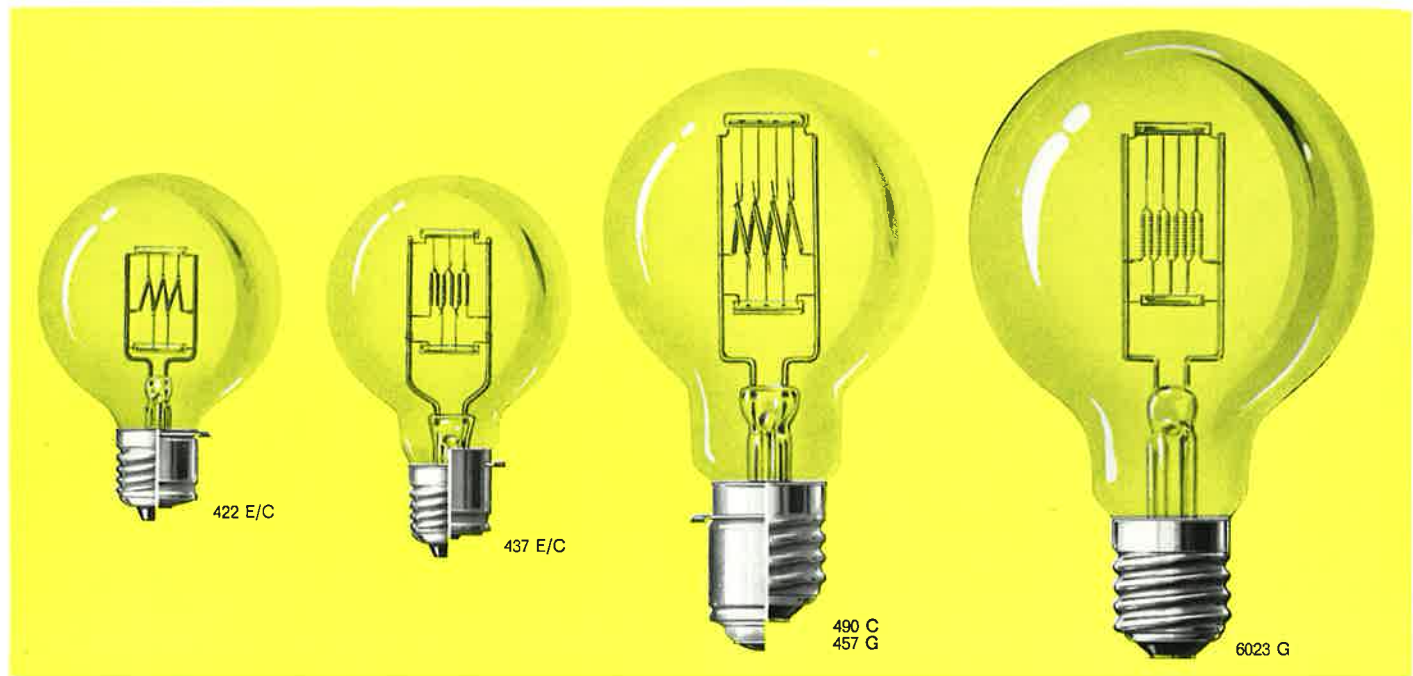
Burning positions

type 6958 only: any

S 135

Type number	Voltage V	Wattage W	Filament b x h	Filament shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
7093 U 7093 U/02 [1]	12	100	3.0 x 3.5	g	2400	100	BA20d	48	75	30	9223 750 171 .. 9223 752 171 .. [1]
6031 E [2] 6031 E/02 [1] [3]	12	100	3.5 x 3.5	g	2400	100	E27	55	91	58	9223 735 171 .. [2] 9223 737 171 .. [1] [3]
6031 U [2] 6031 U/02 [1] [2]							BA20d	55	82	35	9223 719 171 .. [2] 9223 721 171 .. [1] [3]
7093 U 7093 U/02 [1]	24	100	5.5 x 3.5	g	2100	100	BA20d	48	75	30	9223 750 205 .. 9223 752 205 .. [1]
6031 E [2] 6031 E/02 [1] [2]	24	100	5.5 x 3.5	g	2100	100	E27	55	91	58	9223 735 205 .. [2] 9223 737 205 .. [1] [2]
6031 U [2] 6031 U/02 [1] [2]							BA20d	55	82	35	9223 719 205 .. [2] 9223 721 205 .. [1] [3]
160 X [2] 160 X/02 [1] [2]	24	200	6.5 x 4.5	g	4600	100	B24s-3	60	85	37	9223 810 205 .. [2] 9223 812 205 .. [1] [2]
6958 [3]	24	250	7.0 x 3.5	k	7500	300	G6.35-1	14.5	55	33	9238 820 205 .. [3]
161 G [2] 161 G/02 [1] [2]	24	250	4.5 x 7.0	t	6400	100	E40	80	130	85	9223 415 205 .. [2] 9223 417 205 .. [1] [2]
162 G 162 G/02 [1]	24	500	8.0 x 8.0	t	12000	100	E40	110	168	108	9223 467 205 .. 9223 469 205 .. [1]

[1]) With bowl mirror [2]) Non-standard type [3]) Halogen type



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 opposite table, refer to lamps without mirror.

Burning position

S 45

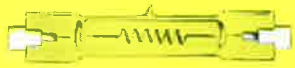
Type number	Voltage V	Wattage W	Filament b x h	Filament shape	Lum. flux lm	Av. life [1] h	Base	Diam.	Max. length	Lcl.	Ordering number
422 C 422 C/01 [2]	100 ... 160 200 ... 250	250	12 x 8 16 x 10	n n	5000 4500	100	P28s	80	115	44.5	9222 802 ..... 9222 803 ..... [2]
422 E 422 E/01 [2]							E27	80	115	70	9222 800 ..... 9222 801 ..... [2]
437 C 437 C/01 [2]	100 ... 160 200 ... 250	500	14 x 11 17 x 12	c n	11500 10500	100	P28s	80	135	55.6	9222 814 ..... 9222 815 ..... [2]
437 E 437 E/01 [2]							E27	80	135	85	9222 812 ..... 9222 813 ..... [2]
457 G 457 G/01 [2]	100 ... 160 200 ... 250	1000	17 x 14 22 x 14	c c	26000 23000	100	E40	110	180	120	9222 840 ..... 9222 841 ..... [2]
490 C [3]	100 ... 160 200 ... 250	1000	17 x 14 22 x 14	c c	23000 21500	200	P40s	110	190	87	9222 845 ..... [3]
6023 G 6023 G/01 [2]	100 ... 160 200 ... 250	1000	17 x 14 22 x 14	c c	26000 23000	100	E40	130	205	133	9223 121 ..... 9223 122 ..... [2]

[1]) Under laboratory conditions [2]) With mirror [3]) Replacement type for 457 C; only available without mirror

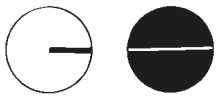
HALOGEN EPIDIASCOPE LAMPS

These types have been specially designed for overhead projectors used mainly for educational purposes.


12216 R


12260 R

Burning positions



12216 R 12260 R

Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Av. life h	Base	Max. diam.	Max. insertion length	Ordering number
12216 R	120	420	14.0 x 3.0	j	11000	75	R7s-15	13	63.7	9238 715 363 ..
12260 R	120	600	16.5 x 4.0	g	17000	75	R7s-15	13	91.8	9238 718 363 ..
	220 - 230		19.0 x 3.7	g						9238 718 432 ..
	240 - 250		19.0 x 3.7	g						9238 718 457 ..


13339 W

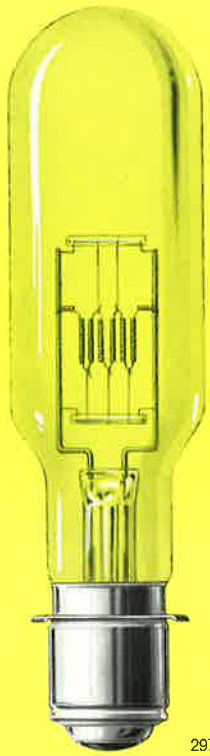

558 C

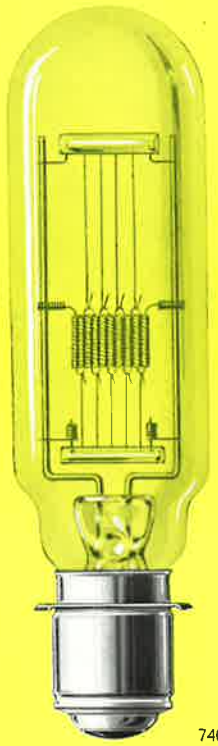

559 C


490 C


6291 C

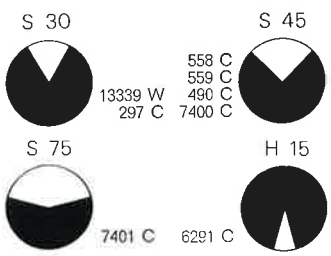

7401 C


297 C


7400 C

THEATRE LAMPS

Theatre lamps have highly concentrated filaments with high brightness. Great care is bestowed on the positioning of the filament, to ensure optimum performance in theatre fittings.



Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
13339 W	100 ... 160	100	6.5 x 6.5	b	1500	200	B15d	48	69	35	9224 585 .....
	200 ... 250		8.0 x 8.5	b	1250						
558 C	100 ... 160	250	12 x 8	n	4500	200	P28s	70	121	55.6	9223 421 .....
	200 ... 250		16 x 8	n	4000						
559 C	100 ... 160	500	14 x 11	c	10500	200	P28s	80	125	55.6	9223 471 .....
	200 ... 250		17 x 12	n	9700						
490 C [1]	100 ... 160	1000	17 x 14	c	23000	200	P40s	110	190	87	9222 845 ..... [1]
	200 ... 250		22 x 14	c	21500						
6291 C	100 ... 160	1000	11 x 14	d	23000	200	P28s	38	150	89	9222 727 .....
	200 ... 250		14 x 14	e	22000						
7401 C	100 ... 160	1000	11 x 14	d	23000	200	P28s	100	135	55.6	9223 506 .....
	200 ... 250		14 x 14	e	21500						
297 C [2]	100 ... 160	1000	17 x 14	c	26000	100	P40s	65	245	87	9222 721 ..... [2]
	200 ... 250		22 x 14	c	23000						
7400 C	200 ... 250	2000	24 x 21	e	48000	100	P40s	65	245	87	9222 749 .....

[1] Replacement type for 457 C [2] Non-standard type

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 for cases where a colour temperature of 3200 °K is required.

Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
13191 P	100 ... 160 200 ... 250	500	14 x 11 17 x 12	c n	13500 12000	approx. 35 approx. 25	G22	63	165	63.5	9223 102 .....
13176 P [1] [2]	100 ... 160 200 ... 250	500	14 x 11 17 x 12	c n	11500 10500	100	G22	95	140	63.5	9223 100 ..... [1] [2]
13173 P	100 ... 160 200 ... 250	750	14 x 13 18 x 14	c n	19000 18000	approx. 50 approx. 35	G22	76	165	63.5	9223 111 .....
13174 P [2]	100 ... 160 200 ... 250	750	14 x 13 18 x 14	c n	18000 16500	100	G22	76	165	63.5	9223 110 ..... [2]
6023 C	100 ... 160 200 ... 250	1000	17 x 14 22 x 14	c c	26000 23000	approx. 100	P40s	130	211	100	9223 123 .....
6023 G	100 ... 160 200 ... 250	1000	17 x 14 22 x 14	c c	26000 23000	approx. 100	E40	130	205	133	9223 121 .....
6045 P [1]	100 ... 160 200 ... 250	1000	17 x 14 22 x 14	c c	26000 23000	100	G38	150	237	127	9223 120 ..... [1]
6046 G	100 ... 160 200 ... 250	2000	24 x 19 30 x 23	c n	55000 50000	approx. 100	E40	150	219	133	9223 140 .....

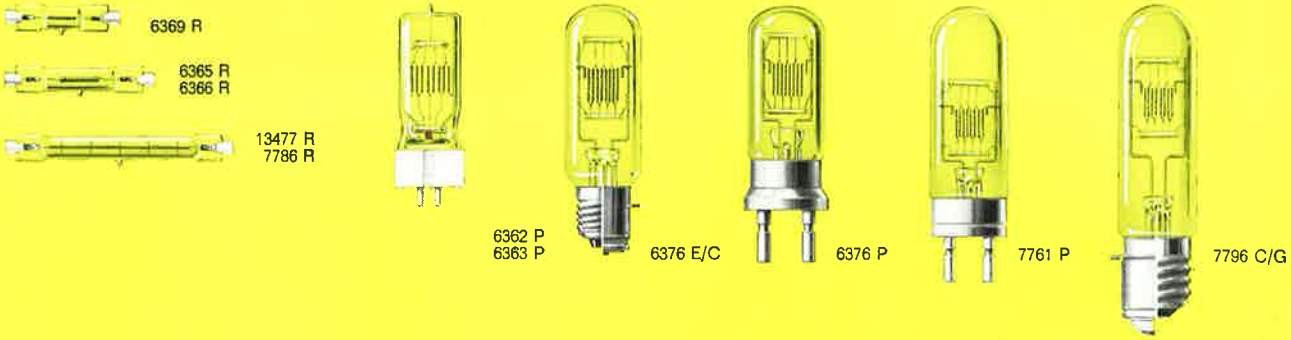
[1]) Non-standard type [2]) For black-and-white only

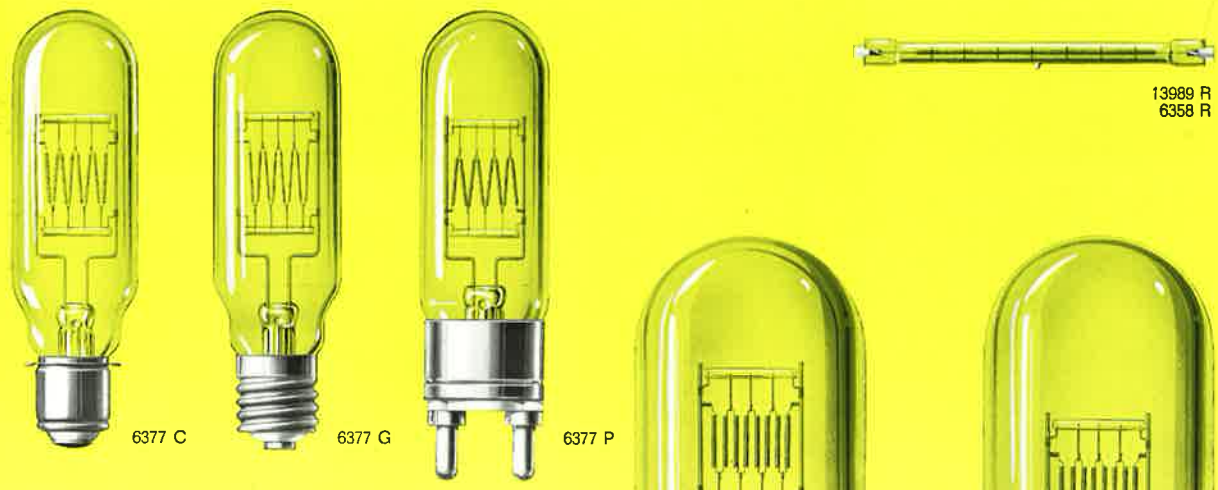
Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Av. life h	Base	Diam.	length Max.	Lcl.	Ordering number
13177 P	100 ... 160 200 ... 250	2000	24 x 19 30 x 23	c n	55000 50000	approx. 100	G38	150	240	127	9223 150 .....
6039 G [1]	100 ... 160 200 ... 250	3000	28 x 20 36 x 24	c c	85000 78000	approx. 100	E40	170	247	150	9223 162 ..... [1]
6038 P [1]	100 ... 160 200 ... 250	5000	34 x 25 46 x 28	c c	145000 135000	approx. 150	G38	200	305	165	9223 171 ..... [1]
6040 K	100 ... 160 200 ... 250	5000	34 x 25 46 x 28	c c	145000 135000	approx. 150	K59d	200	340	228	9223 170 .....
13185 P	100 ... 160 200 ... 250	5000	34 x 25 46 x 28	c c	145000 135000	approx. 150	G38	200	340	165	9223 175 .....
13111 P	100 ... 160 200 ... 250	10000	50 x 35 56 x 40	c c	300000 280000	approx. 200	G38	270	440	254	9223 180 .....
6225 K	100 ... 160 200 ... 250	10000	50 x 35 56 x 40	c c	300000 280000	approx. 200	K100d	270	477	305	9223 181 .....
13013 K	100 ... 160 200 ... 250	20000	64 x 30 70 x 40	c c	600000 600000	approx. 200	K100t K100d	380	625	420	9223 190 ..... 9223 191 .....

Burning position

S 45

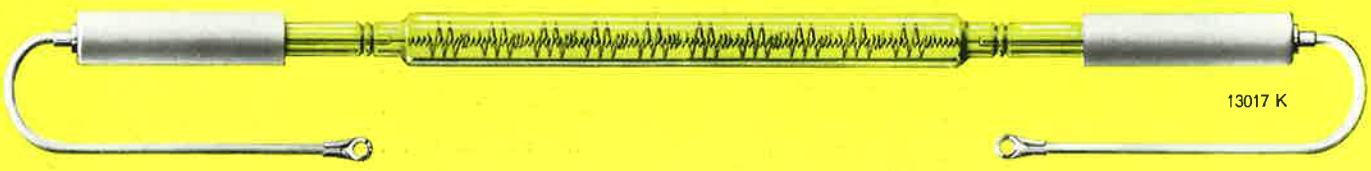
[1] Non-standard type


6369 R
6365 R
6366 R
13477 R
7786 R
6362 P
6363 P
6376 E/C
6376 P
7761 P
7796 C/G


6377 C
6377 G
6377 P

13989 R
6358 R


6378 K
6378 P


13017 K

HALOGEN STUDIO LAMPS

For use in colour film and colour TV studios where a specific colour temperature is required, halogen lamps with a colour temperature of about 3200 °K have been developed, which are eminently suitable for this purpose. As with all other halogen lamps, no blackening of the bulb wall occurs, a highly important factor for this application.

Halogen lamps with glass bulbs of larger dimensions are intended for use in existing studio spotlight fittings. Their advantages over conventional studio lamps are constant colour temperature and no depreciation in light output.

The halogen lamps for spotlights are supplied in two versions: with quartz envelopes and two-pin bases and with hard-glass envelopes and conventional bases.

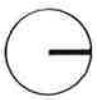
Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Approx. life h	Base	Max. diam.	Max. length	Lcl.	Ordering number
6369 R	30	250	13 [1]	g	6500	150	R7s-15	12	57.1 [2]	—	9238 781 221 ..
6362 P	220 240	650	15 x 15	c	16800	100	GX9.5	32	110	55	9238 786 429 .. 9238 786 455 ..
6365 R	115 - 120 125 - 130	650	20 [1]	g	18200	75	R7s-15	12	78.3 [2]	—	9238 782 345 .. 9238 782 356 ..
6376 C 6376 E 6376 P	115 125 220 240	650	14 x 11 14 x 11 17 x 13 17 x 13	c	16800	50	P28s E27 G22	39	125 125 131	55.6 76 63.5	9223 105 ..... 9223 106 ..... 9223 107 .....
6366 R	220 - 230 240 - 250	800	21 [1]	g	21000	75	R7s-15	12	78.3 [2]	—	9238 783 432 .. 9238 783 457 ..
13477 R	220 - 230 240 - 250	800	75 [1]	j	21600	150	R7s-15	12	117.6 [2]	—	9238 770 432 .. 9238 770 457 ..
6363 P	220 240	1000	16 x 20	c	26000	150	GX9.5	32	110	55	9238 787 429 .. 9238 787 455 ..
7761 P	220 240	1000	16 x 17	c	26000	70	G22	45	161	63.5	9238 772 429 .. 9238 772 455 ..
7796 C 7796 G	220 240	1000	16 x 17	c	26000	70	P40s E40	45	188 180	87 120	9238 773 ..... 9238 774 .....
7786 R	115 - 120 220 - 230 240 - 250	1000	75 [1]	j	26000 25000 25000	200	R7s-15	12	117.6 [2]	—	9238 771 345 .. 9238 771 432 .. 9238 771 457 ..
13989 R	115 - 120 125 - 130 220 - 230 240 - 250	1000	120 [1]	j	26000 26000 25000 25000	200	R7s-15	12	189.1 [2]	—	9238 780 345 .. 9328 780 356 .. 9238 780 432 .. 9238 780 457 ..
6358 R	220 - 230 240 - 250	1250	120 [1]	j	33500	200	R7s-15	12	189.1 [2]	—	9238 784 432 .. 9238 784 457 ..
6377 C 6377 G 6377 P	115 125 220 240	2000	24 x 19 24 x 19 30 x 23 30 x 23	c c c c	52000	100	P40s E40 G38	66	222 222 242	87 133 127	9223 156 ..... 9223 155 ..... 9223 157 .....
6378 K 6378 P	115 125 220 240	5000	34 x 25 34 x 25 46 x 28 46 x 28	c c c c	130000	150	K59d G38	121.5	328	228 165	9223 178 ..... 9223 179 .....
13017 K	220 - 230	10000	290 [1]	j	255000	2000	K28s	28.5	655	—	9238 815 432 ..

[1]) **Length** of filament

[2]) **Insertion** length

Burning positions

P 180



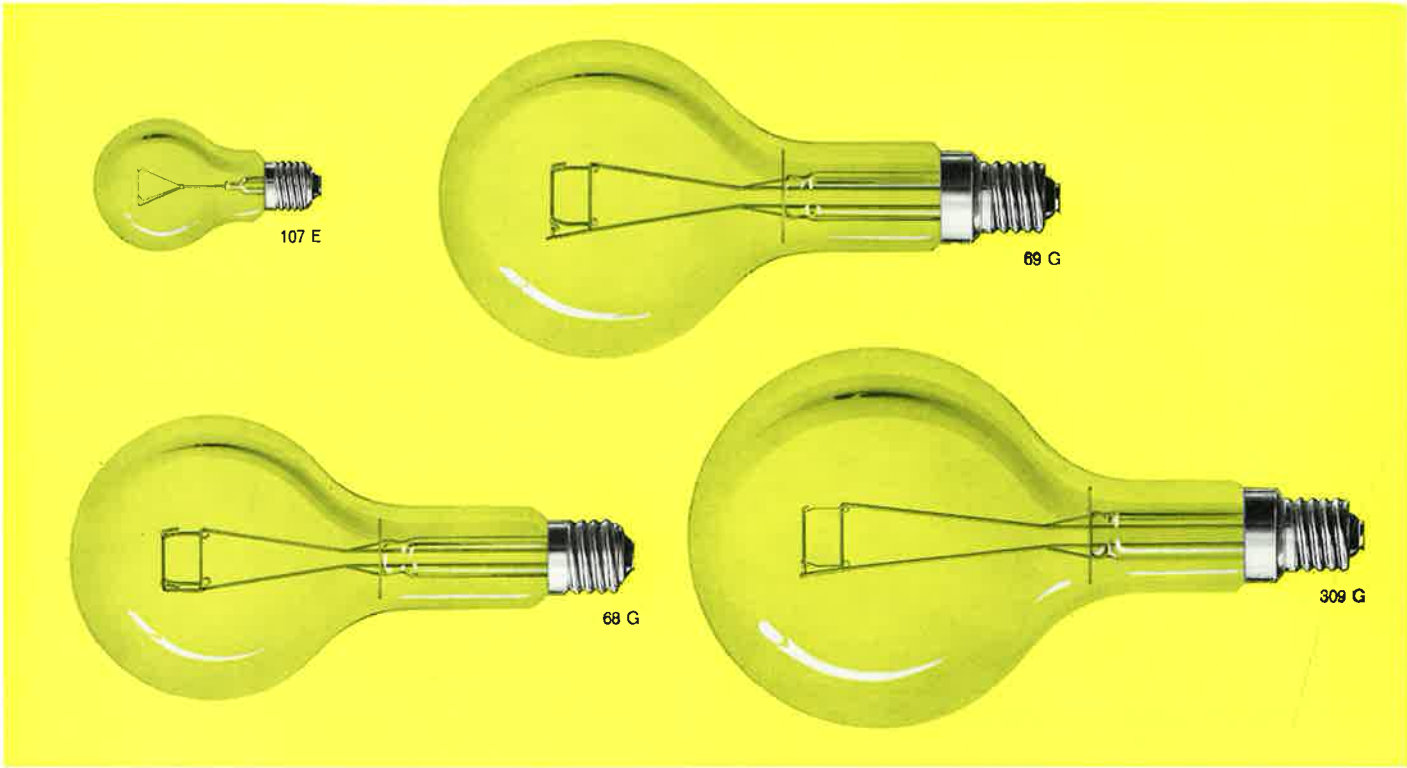
6369 R
6365 R
6366 R
13989 R

S 45

6362 P
6376 C/E/P
6363 P
7761 P
7796 C/G
6377 C/G/P
6378 K/P

P 4

13477 R
7786 R
6358 R
13017 K



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.

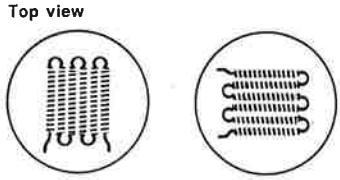
Type number	Voltage V	Wattage W	Filament b x h	Lum. flux lm	Av. life [1] h	Base	Diam.	Max. length	Lcl.	Ordering number
107 E [2]	100 ... 160 200 ... 250	100	11 x 9 12 x 9	1200 1050	300	E 27	70	120	95	9222 901 ..... [2]
68 G [2]	100 ... 160 200 ... 250	1000	21 x 18 25 x 21	21000 19000	300	E 40	150	300	235	9222 915 ..... [2]
69 G [2]	100 ... 160 200 ... 250	1500	25 x 21 28 x 26	33000 31000	300	E 40	170	330	260	9222 920 ..... [2]
309 G [2]	100 ... 160 200 ... 250	2000	27 x 23 30 x 28	46000 42000	300	E 40	200	360	275	9222 925 ..... [2]

[1]) Under laboratory conditions

[2]) Non-standard type

Position of filament

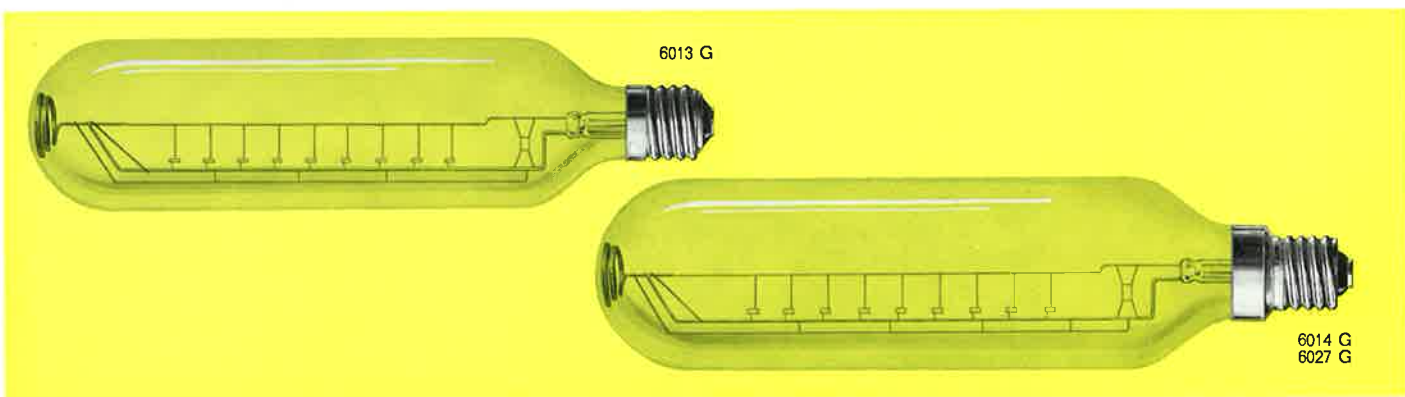
Top view



Right Wrong

Burning position

H 135



LINEA LAMPS

Tubular shaped lamps, also intended for stage lighting, especially as footlights.

Burning position

S 135

Type number	Voltage V	Wattage W	Filament length	Filament shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Ordering number
6013 G	100 ... 160 200 ... 250	500	170 170	⌋ ⌋	9500 9000	500	E 40	90	360	9224 605 .....
6014 G	100 ... 160 200 ... 250	1000	210 210	⌋ ⌋	21000 20000	500	E 40	100	400	9224 607 .....
6027 G [1]	100 ... 160 200 ... 250	1500	210 210	⌋ ⌋	32000 30000	500	E 40	100	400	9224 609 ..... [1]

[1]) Non-standard type

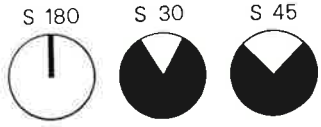
PROJECTION LAMPS (VERTICAL)

Their sharp, concentrated beam makes these lamps eminently suitable for stage lighting. They are specially designed for burning in a vertical position.

Type number	Voltage V	Wattage W	Filament b x h	Filament shape	Lum. flux lm	Av.life[1] h	Base	Diam.	Max. length	Lcl.	Ordering number
62 G [2]	100 ... 160	1000	21 x 18	n	22000	300	E 40	150	300	215	9223 025 ..... [2]
62 G/01 [2] [3]	200 ... 250		25 x 21	n	20000						9223 026 ..... [2] [3]
63 G [2]	100 ... 160	1500	25 x 21	n	34000	300	E 40	170	330	235	9223 030 ..... [2]
	200 ... 250		28 x 26	n	32000						
310 G [2]	100 ... 160	2000	27 x 23	n	48000	300	E 40	200	360	250	9223 040 ..... [2]
310 G/01 [2] [3]	200 ... 250		30 x 28	n	44000						9223 041 ..... [2] [3]
6190 K [2]	100 ... 160	3000	28 x 20	c	85000	100	K 59 d	90/120	380	178	9223 053 ..... [2]
	200 ... 250		36 x 24	c	78000						

[1]) Under laboratory conditions [2]) Non-standard type [3]) With mirror

Burning positions



62 G, 63 G, 310 G — 6190 K, 297 C/G, 379 C/G, 75 C/G — 375 C/E

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.

Type number	Voltage V	Wattage or Current	Filament b x h	Filament shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
375 C	100 ... 130	500 W	14 x 11	c	11500	100	P 28 s	65	135	55.6	9222 708 .....
375 E [1])	200 ... 250		17 x 12	n	10500		E 27	65	135	76	9222 706 ..... [1])
297 C [1])	100 ... 130	1000 W	17 x 14	c	26000	100	P 40 s	65	245	87	9222 721 ..... [1])
297 G [1])	200 ... 250		22 x 14	c	23000		E 40	65	240	120	9222 720 ..... [1])
379 C [1])	30	30 A	11.5 x 8	d	24000	100	P 40 s	65	245	87	9222 756 221 .. [1])
379 G [1])							E 40	65	240	120	9222 755 221 .. [1])
75 C [1])			12 x 11	c			P 40 s	65	245	87	9222 751 221 .. [1])
75 G [1])							E 40	65	240	120	9222 750 221 .. [1])

[1]) Non-standard type

FLOODLIGHT 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

Type number	Voltage V	Wattage W	Filament b x h	shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
120 E	100 ... 160 200 ... 250	100	12 x 6 14 x 9	z z	1100 900	500	E27	80	120	76	9223 331 .....
123 E	100 ... 160 200 ... 250	250	14 x 8.5 16 x 11	z z	3800 3200	500	E27	80	120	76	9223 403 .....
125 G	100 ... 160 200 ... 250	500	13 x 12 16 x 14	z z	8800 8000	500	E40	120	175	108	9223 453 .....
504 G [1]	100 ... 160 200 ... 250	1000	15 x 14 19 x 18	z z	19000 18000	500	E40	130	178	108	9223 500 ..... [1]
6115 G [1]	100 ... 160 200 ... 250	1000	15 x 14 19 x 18	z z	19000 18000	500	E40	130	252	180	9223 495 ..... [1]
6036 G	100 ... 160 200 ... 250	1000	15 x 14 19 x 18	z z	19000 18000	500	E40	130	211	140	9223 491 .....
6235 G	100 ... 160 200 ... 250	1500	22 x 15 24 x 22	z z	30000 28800	500	E40	150	219	133	9223 532 .....
6011 G [1]	100 ... 160 200 ... 250	1500	22 x 15 24 x 22	z z	31000 29000	500	E40	170	343	235	9223 530 ..... [1]
13100 G	100 ... 160 200 ... 250	2000	23 x 25 26 x 26	z z	48500 43000	300	E40	200	370	230	9223 540 .....

[1]) Non-standard type

Type number	Voltage V	Wattage W	Filament length	Filament shape	Lum. flux lm	Approx. life h	Base	Max. diam.	Max. length	Ordering number
7785 R	120	500	61	j	10500	2000	R7s-15	12	117.6 [2]	9238 803 363 ..
12013 R	115 - 120 125 - 130 220 - 230 240 - 250	1000	120	j	22000	2000	R7s-15	12	189.1 [2]	9238 800 345 .. 9238 800 356 .. 9238 800 432 .. 9238 800 457 ..
13989 R	115 - 120 125 - 130 220 - 230 240 - 250	1000	120	j	26000 26000 25000 25000	200	R7s15	12	189.1 [2]	9238 780 345 .. 9238 780 356 .. 9238 780 432 .. 9238 780 457 ..
13021 R [1]	220 - 230 240 - 250	1500	170	j	33000	2000	R7s-15	12	254.1 [2]	9238 805 432 .. [1] 9238 805 457 .. [1]
12110 R	220 - 230 240 - 250	2000	215	j	44000	2000	Fa4	12	334.4	9238 810 432 .. 9238 810 457 ..
12259 R	220 - 230 240 - 250	2000	175	j	58000	200	Fa4	12	334.4	9238 811 432 .. 9238 811 457 ..
13017 K	220 - 230	10000	290	j	255000	2000	K28s	28.5	655	9238 815 432 ..

[1]) Non-standard type

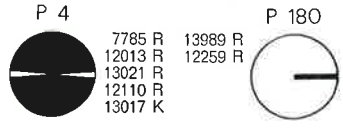
[2]) **Insertion** length

HALOGEN TYPES

Halogen floodlight lamps provide excellent colour rendering. Moreover, no blackening of the bulb occurs, the luminous flux remaining constant throughout the lamplife.

Applications outdoors: lighting of buildings, sportsgrounds, parks, fountains, airport runways, etc. Indoors halogen floodlight lamps give outstanding performance in public halls, factories, etc.

Burning positions



OPERATING-THEATRE LAMPS

Lamps for medical applications have to fulfil very special requirements. For this reason Philips bestow the utmost care on the manufacture of these lamps, so as to ensure optimum reliability. The lamps used in operating theatres, for example, are 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 immediately switched on.

Burning positions

P 180

13276 G
13280 G/51

H 30

13279 G/51

Type number	Voltage V	Wattage W	Luminous flux lm	Average life h	Base	Diam.	Max. length	Ordering number
13276 G	100 ... 145 [1]	150	1700	1000	EFc40d	90	180	9239 701 ..... [3]
	12 [2]	100		300				
	150 ... 250 [1]	150	1500	1000				
	12 [2]	100		300				
	100 ... 145 [1]	150	1700	1000				9239 703 ..... [4]
	24 [2]	100		300				
	150 ... 250 [1]	150	1500	1000				
	24 [2]	100		300				
13279 G/51	100 ... 145 [1]	150	1600	1000	EFc40d	120	221	9239 707 ..... [5]
	12 [2]	100		300				
	150 ... 250 [1]	150	1400	1000				
	12 [2]	100		300				
	100 ... 145 [1]	150	1600	1000				9239 710 ..... [6]
	24 [2]	100		300				
	150 ... 250 [1]	150	1400	1000				
	24 [2]	100		300				
13280 G/51	100 ... 145 [1]	150	1600	1000	EFc40d	120	221	9239 700 .....
	100 ... 145 [2]							
	150 ... 250 [1]		1400					
	150 ... 250 [2]							

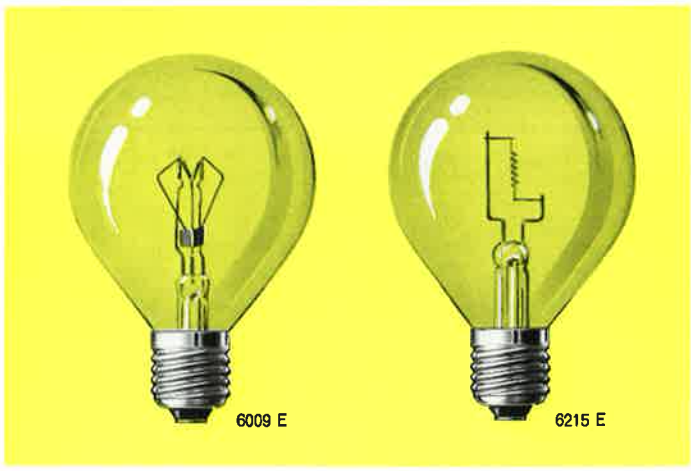
[1]) Main-filament voltage [2]) Emergency-filament voltage
[3]) Clear; with inside-frosted bulb: 9239 702 ..... [4]) Clear; with inside-frosted bulb: 9239 704 .....
[5]) Inside white; with inside-frosted bulb: 9239 706 ..... [6]) Inside white; with inside-frosted bulb: 9239 709 .....

LOCOMOTIVE HEADLIGHT LAMPS

Philips have developed a range of locomotive headlight lamps which effectively withstand the intense vibrations and shocks occurring on railway trains.

Burning position

S 135



Type number	Voltage V	Wattage W	Filament b x h	Filament shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
6009 E	24	150	7 x 7	cylindrical	2500	500	E27	80	121	76	9223 640 205 ..
	32		7 x 7	cylindrical	2400						9223 640 224 ..
6215 E	24	250	4.5 x 9	straight	5200						9223 653 205 ..
	32		4 x 12	coiled coil	5200						9223 653 224 ..

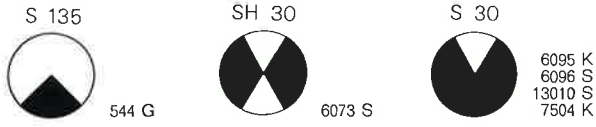
LIGHTHOUSE AND BEACON LAMPS

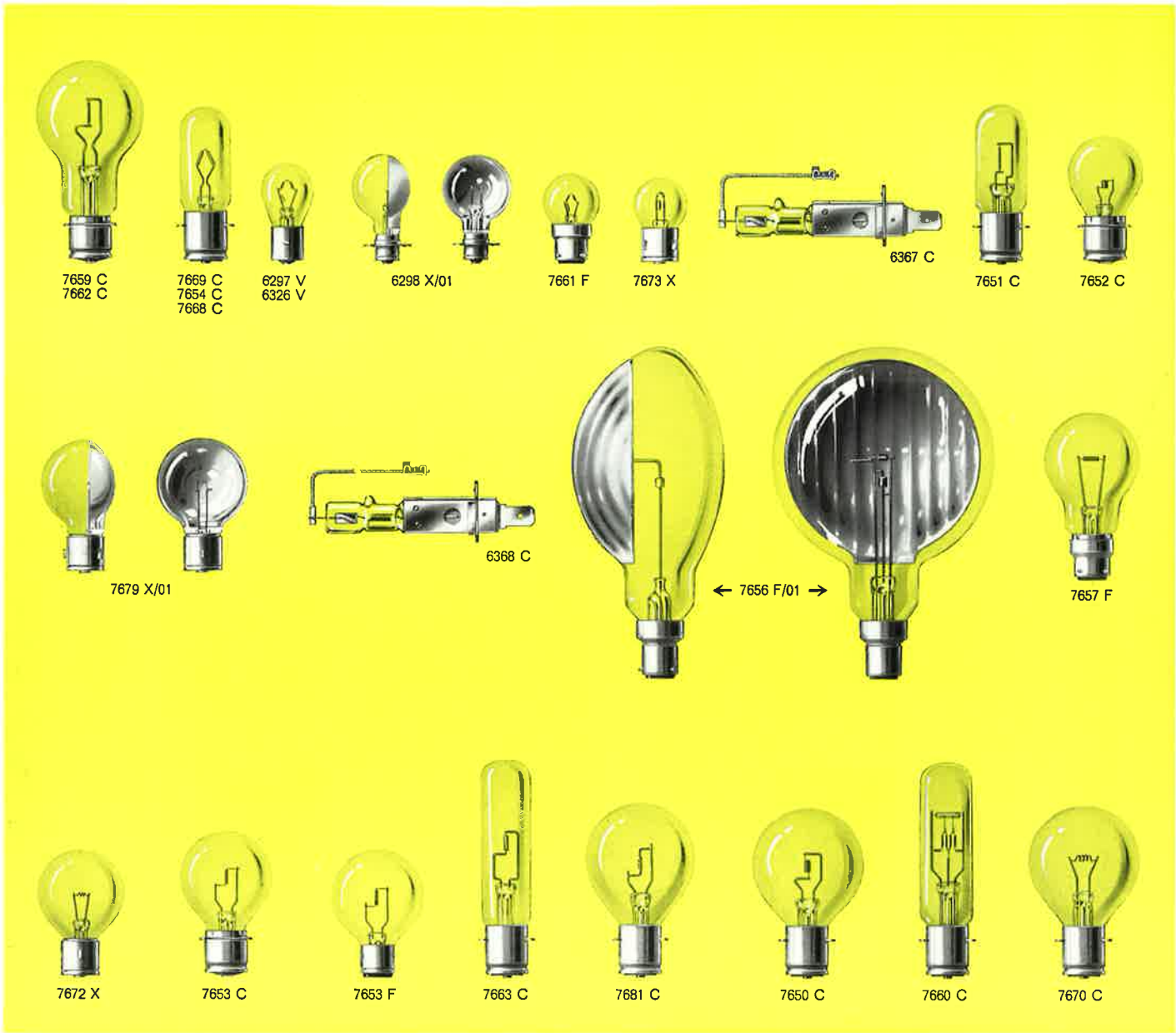
Lighthouse and beacon lamps must be superior quality light sources as they fulfil a task of major importance, namely that of guiding the seafarer safely. As lighthouses and beacons should be visible over long distances, Philips supply a range of high-reliability lamps with a very high luminous intensity, for this specific application.

Type number [1]	Voltage V	Wattage W	Filament b x h	Filament shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number [1]
544 G	200 ... 250	1000	19 x 18	cylindrical	18000	500	E40	150	308	225	9223 496 .....
6073 S	100 ... 135	1500	28 x 16	cylindrical [2]	25500	800	G25t-59	150	341	220	9224 132 .....
6095 K	60	3000	26 x 16	coiled coil	66000	500	EK40s	200	490	292	9224 159 264 ..
6096 S	100	3000	37 x 17	cylindrical [2]	50000	800	G25t-59	240	428	270	9224 157 309 ..
13010 S	115	3000	37 x 17	cylindrical [2]	50000	800	G25t-59	200	408	270	9224 158 344 ..
7504 K	70	4200	30 x 20	coiled coil	90000	1000	EK40s	200	490	292	9224 197 275 ..

[1]) All lamps are non-standard types. Besides the special types shown on this page there are other lamps also suitable for this purpose (see pages D 22 - D 23).
[2]) Consisting of three parts to be connected to a three-phase supply.

Burning positions

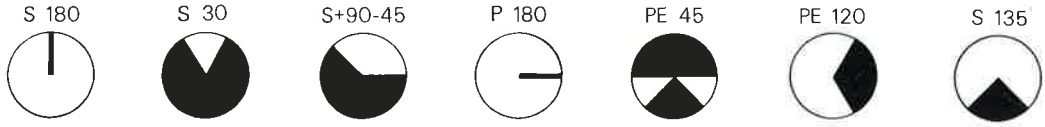




AIRPORT LIGHTING

Efficient airport lighting makes a vital contribution to the safety of air traffic.
With full focus on the prospects of the future — fast handling of the ever-growing number of aircraft operations, passengers and quantities of freight and the age of jumbo-jets — Philips have developed an extensive range of super lighting systems for the special requirements of airports.
Philips' aids to aviation include precision prefocused halogen lamps for centre line and touch-down zone lighting, lamps for beacons to help pilots identify individual airports, approach lights to guide them safely to the runways during bad weather, runway and taxiway lights for safe travel, obstruction lights to mark possible obstructions, etc. — and in he Philips laboratories continuous research in close cooperation with airport authorities, is devoted to the constant improvement of these lamps.

Burning positions



S 180	S 30	S+90-45	P 180	PE 45	PE 120	S 135
7659 C 7662 C 6297 V 6326 V 7661 F 7673 X 7672 X	7669 C 7654 C 7651 C 7679 X/01 7657 F 7668 C 7660 C	6298 X/01	6367 C 6368 C	7652 C	7656 F/01	7653 C 7653 F 7663 C 7681 C 7650 C 7670 C

Type number	Wattage W	Current A	Filament b x h	shape	Lum. flux lm	Av. life h	Base	Diam.	Max. length	Lcl.	Ordering number
7659 C	—	6.6	1 x 6.6	s	325	2000	P28s	65	132	70	9224 180 859 ..
7662 C	—	6.6	1 x 11.4	s	1020	2000	P28s	65	132	70	9224 181 859 ..
7669 C	30	6.6	3.5 x 2.5	h	330	1000	P28s	32	98	38	9224 000 859 ..
6297 V [1]	35	5.83	4.8 x 2.4	h	430	500	BA20s	35	66	12 [3]	9224 010 855 .. [1]
6298 X/01 [1]	35	5.83	1.4 x 4.1	—	540	300	P15s	44/35.4	70	37	9224 009 855 .. [1]
6326 V [1]	35	5.83	4.8 x 2.4	h	430	500	BA20s	35	66	31	9224 011 855 .. [1]
7661 F [1]	35	5.83	4.8 x 2.4	h	430	500	B22d-3	35	57	12 [3]	9224 005 855 .. [1]
7673 X	35	6.6	6.4 x 2.2	h	400	500	B24s	35	58	12 [3]	9224 006 859 ..
6367 C [2]	45	6.6	6 [4]	j	675	1000	P18s	—	70	—	9238 703 859 .. [2]
7654 C	45	6.6	7.2 x 3.3	h	610	1000	P28s	32	98	38	9224 020 859 ..
7651 C	65	6.6	1 x 10	s	1000	1000	P28s	32	100	38	9224 031 859 ..
7652 C [1]	65	6.6	3 x 3.7	t	1170	200	P28s	48	82	25.4	9224 032 859 .. [1]
7679 X/01 [1]	65	6.6	1 x 8	—	1160	100	B24s	55/45.5	89	45	9224 030 859 .. [1]
6368 C [2]	100	6.6	7 [4]	j	2350	1000	P18s	—	74	—	9238 704 859 .. [2]
7656 F/01 [1]	100	4.17	6 x 2.6	—	1990	200	B22d-3	140/97	212	130	9224 040 842 .. [1]
7657 F [1]	100	4.17	6 x 2.6	g	1990	200	B22d-3	60	108	68	9224 042 842 .. [1]
7668 C	100	6.6	9.2 x 9	h	1550	1000	P28s	32	98	38	9224 049 859 ..
7672 X	100	6.6	3.2 x 3.5	g	1940	200	BA24s	55	83	37	9224 045 859 ..
7653 C [1]	150	6.6	3.4 x 6.3	t	3135	200	P28s	60	96	38	9224 051 859 .. [1]
7653 F [1]	150	6.6	3.4 x 6.3	t	3135	200	BA21d-3	60	85	40	9224 050 859 .. [1]
7663 C	150	6.6	3 x 5.4	t	3550	75	P28s	32	135	55.6	9224 052 859 ..
7681 C	150	6.6	3.1 x 5.4	t	3990	100	P28s	70	108	44.5	9224 053 859 ..
7650 C	200	6.6	4.2 x 6.9	t	4460	200	P28s	70	108	44.5	9224 061 859 ..
7660 C	200	6.6	7 x 7	c	4450	75	P28s	32	135	55.6	9224 060 859 ..
7670 C	200	6.6	6.9 x 4.2	g	4460	200	P28s	70	108	44.5	9224 062 859 ..

[1]) Non-standard type [2]) Halogen lamp [3]) Distance light centre - bulb top [4]) **Max. length** of filament

MINIATURE LAMPS

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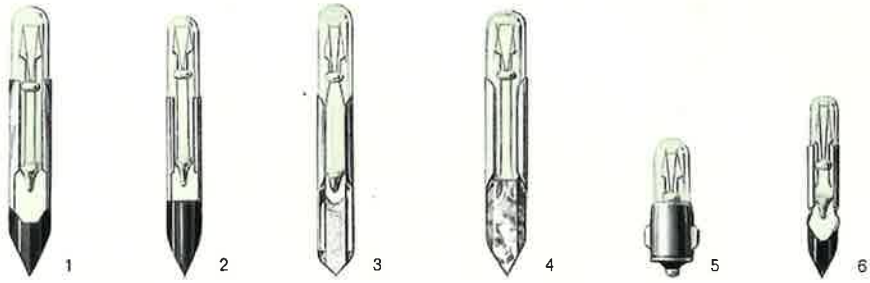
TELEPHONE LAMPS

These lamps are applied extensively in telephone exchanges where they act as indicators, permitting visual control of the number of lines in operation and the connections made. Moreover, due to their compactness, the miniature lamp-type fitted with the BA7s and the Bell Lilliput type are ideal for mounting in push-buttons, intercom apparatus, etc.
Telephone lamps can also be applied as resistors. When mounted in series with the circuit, they serve the very useful purpose of keeping a check on the proper functioning of the telephone lines.



Type	Voltage V	Current mA	Base	Diam.	Max. length	Fig.	Ordering number
Bell	6	20	T6.8	6	45	1	9236 110 101 ..
	6	40					9236 140 101 ..
	12	30					9236 120 171 ..
	12	40					9236 140 171 ..
	12	52					9236 180 171 ..
	12	100					9236 200 171 ..
	24	40					9236 140 205 ..
	24	50					9236 170 205 ..
	24	60					9236 190 205 ..
	24	100					9236 200 205 ..
	30	40					9236 140 221 ..
	36	45					9236 165 233 ..
	48	40					9236 140 251 ..
	60	20					9236 110 264 ..
	60	35					9236 130 264 ..
	60	40					9236 140 264 ..
	60	55					9236 181 264 ..
Ericsson	6	40	T5.8	5	43	2	9236 145 101 ..
	6	75					9236 199 101 ..
	12	20					9236 112 171 ..
	12	50					9236 172 171 ..
	24	20					9236 112 205 ..
	24	40					9236 145 205 ..
	24	60					9236 191 205 ..
	36	20					9236 112 233 ..
	36	35					9236 131 233 ..
	36	50					9236 172 233 ..
	48	20					9236 112 251 ..
	48	30					9236 122 251 ..
	60	20					9236 112 264 ..
	60	40					9236 145 264 ..
NAWI	7	40	T6.6	6	46	3	9236 141 126 ..
	15	40					9236 141 185 ..
	20	40					9236 141 197 ..
	30	40					9236 141 221 ..
	30	100					9236 201 221 ..
	45	40					9236 141 248 ..
	60	40					9236 141 264 ..
BSI or GPO no. 2	4	250	T7	6.6	44.4	4	9236 225 063 ..
	6	41					9236 161 101 ..
	12	20					9236 106 171 ..
	12	50					9236 174 171 ..
	12	100					9236 208 171 ..
	17	45					9236 166 191 ..
	24	100					9236 208 205 ..
	45	37					9236 235 248 ..
	50	45					9236 166 253 ..
BA7s	6	100	BA7s	6.6 max.	23.7	5	9235 165 101 ..
	12	50					9235 078 171 ..
	24	25					9235 042 205 ..
	24	50					9235 078 205 ..
	60	20					9235 160 264 ..
Bell lilliput	6	20	T5.5	4.8	31	6	9236 107 101 ..
	6	40					9236 151 101 ..
	12	20					9236 109 171 ..
	12	50					9236 175 171 ..
	24	20					9236 109 205 ..
	24	50					9236 175 205 ..
	30	20					9236 109 221 ..
	30	40					9236 151 221 ..
	48	20					9236 109 251 ..
	60	20					9236 109 264 ..
	60	30					9236 123 264 ..

NEWSCASTER LAMPS

Newscaster lamps have been designed for application in newscasters, running text advertisements, animated and other light signs, announcements, company names, etc., giving their message in bright, easy-to-read letters for eye-catching communication. The tracing effect, as the lamps light up one after the other, makes a striking visual impact.

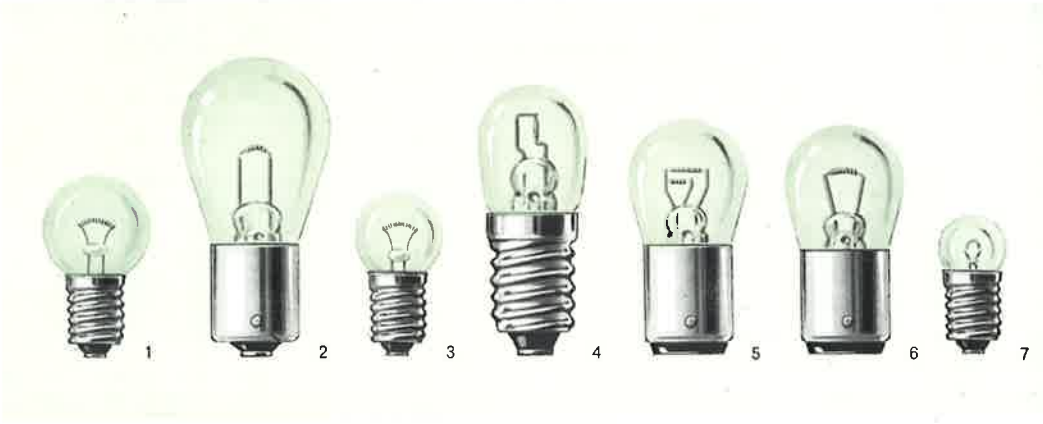

6226 D


8108 D

Type number	Voltage V	Wattage W	Current A	Av. life h	Base	Diam.	Max. length	Ordering number
6226 D	40	2.5	—	1000	E 10	15	29	9236 545 239 ..
8108 D	24	—	0.05	1000	E 10	10	30	9235 073 205 ..

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.



Type number	Voltage V	Current A	Av. life h	Base	Filling	Diam.	Max. length	Lcl.	Fig.	Ordering number
—	2.4	1.0	500	E 10		17.3	31	23 ± 1.5	1	9235 760 029 ..
5951	3.95	0.8	750	E 10		15	29	23.5 ± 0.5	3	9235 742 062 ..
5953	4	0.67	400	E 10		15	29	12.5 ± 0.5 [1]	3	9235 725 063 ..
5966	4	0.7	750	E 10		17.3	31	23.5 ± 0.5	1	9235 730 063 ..
5954	4	0.8	400	E 10		15	29	12.5 ± 0.5 [1]	3	9235 741 063 ..
5955	4	0.8	200	E 10	krypton	17.3	31	23 ± 1.5	1	9235 740 063 ..
5956	4	1.0	400	E 10		15	29	12.5 ± 0.5 [1]	3	9235 761 063 ..
5967	4	1.0	200	E 10		15	29	23.5 ± 0.5	3	9235 762 063 ..
5960	4	1.0	250	E 14		19	45.5	38 ± 2	4	9228 011 063 ..
5961 [2]	4/4	1.0/1.0	350/350	BA 15 d		19	42	26 ± 1	5	9228 143 063 ..
5963	4	1.5	300	BA 15 s		25	50	28.5 ± 1.5	2	9228 085 063 ..
5957	4	2.0	400	BA 15 d		19	42	25 ± 1	6	9228 130 063 ..
5964	4	0.46	200	E 10	argon	11	24	—	7	9235 709 063 ..

[1]) Distance between end of screw thread and filament centre. [2]) Double-filament lamp.

DIAL LAMPS

These lamps are used extensively throughout the radio and record-playing-equipment industries for panel lighting and indication on radios, tape recorders, etc. Great care is given to precision mounting of the filament so as to avoid noise interfering with reception or sound quality. They are also widely applied in elevators, signal panels, clocks, amplifiers, etc.

Type number	Voltage V	Current or Wattage	Av. life h	Base	Diam.	Max. length	Fig.	Ordering number
7995 D	1.5	0.5 A	100	E 10	10	30	1	9235 574 013 ..
8096 D	2.5	0.5 A	indefinite [1])	E 10	10	30	1	9235 571 032 ..
8041 D	4	0.1 A	indefinite [1])	E 10	10	30	1	9235 421 063 ..
8041 D/71 [2])	4	0.1 A	indefinite [1])	E 10	10	30	1	9235 423 063 ..
8023 D	6	0.18 A	indefinite [1])	E 10	11	24	2	9235 474 101 ..
8023 N	6	0.18 A	indefinite [1])	BA 9 s	11	24	3	9235 473 101 ..
7999 D	6.3	0.1 A	indefinite [1])	E 10	11	24	2	9235 431 112 ..
7999 D/71 [2])	6.3	0.1 A	indefinite [1])	E 10	11	24	2	9235 432 112 ..
8073 D	6.3	0.1 A	indefinite [1])	E 10	10	30	1	9235 421 112 ..
8073 D/71 [2])	6.3	0.1 A	indefinite [1])	E 10	10	30	1	9235 423 112 ..
8008 D [3])	6.3	0.15 A	indefinite [1])	E 10	10	30	1	9235 454 112 ..
8008 D/71 [2])	6.3	0.15 A	indefinite [1])	E 10	10	30	1	9235 455 112 ..
8008 N [4])	6.3	0.15 A	indefinite [1])	BA 9 s	10	30	4	9235 452 112 ..
8009 D [5])	6.3	0.25 A	indefinite [1])	E 10	10	30	1	9235 497 112 ..
8009 D/71 [2])	6.3	0.25 A	indefinite [1])	E 10	10	30	1	9235 498 112 ..
8009 N [6])	6.3	0.25 A	indefinite [1])	BA 9 s	10	30	4	9235 495 112 ..
8024 D	6.3	0.3 A	indefinite [1])	E 10	10	30	1	9235 512 112 ..
8024 D/71 [2])	6.3	0.3 A	indefinite [1])	E 10	10	30	1	9235 513 112 ..
8024 N	6.3	0.3 A	indefinite [1])	BA 9 s	10	30	4	9235 510 112 ..
8024 N/71 [2])	6.3	0.3 A	indefinite [1])	BA 9 s	10	30	4	9235 511 112 ..
8045 D	6.3	0.32 A	indefinite [1])	E 10	10	30	1	9235 534 112 ..
8045 D/71 [2])	6.3	0.32 A	indefinite [1])	E 10	10	30	1	9235 535 112 ..
8091 D	6.3	0.64 A	indefinite [1])	E 10	10	30	1	9235 591 112 ..
7997 N	7	0.1 A	indefinite [1])	BA 7 s	6.7	20	5	9235 435 126 ..
7996 D	7	0.3 A	indefinite [1])	E 10	10	30	1	9235 516 126 ..
7996 D/71 [2])	7	0.3 A	indefinite [1])	E 10	10	30	1	9235 517 126 ..
7994 N	7.2	0.1 A	indefinite [1])	BA 9 s	11	24	3	9235 433 131 ..
8034 D	10	0.2 A	indefinite [1])	E 10	10	30	1	9235 481 158 ..
8010 T	10	0.2 A	indefinite [1])	S 8.5 s	10.5	36	6	9236 410 158 ..
8003 D	12	0.1 A	indefinite [1])	E 10	10	30	1	9235 421 171 ..
8089 D	12	0.1 A	indefinite [1])	E 10	11	24	2	9235 431 171 ..
8089 D/71 [2])	12	0.1 A	indefinite [1])	E 10	11	24	2	9235 432 171 ..
8089 N	12	0.1 A	indefinite [1])	BA 9 s	11	24	3	9235 429 171 ..
7998 N	14	0.1 A	indefinite [1])	BA 7 s	6.7	20	5	9235 435 183 ..
8004 D	15	0.2 A	indefinite [1])	E 10	10	30	1	9235 477 185 ..
8004 D/71 [2])	15	0.2 A	indefinite [1])	E 10	10	30	1	9235 478 185 ..
8011 T	15	0.2 A	indefinite [1])	S 8.5 s	10.5	36	6	9236 410 185 ..
8005 D	18	0.1 A	indefinite [1])	E 10	10	30	1	9235 421 193 ..
8005 D/71 [2])	18	0.1 A	indefinite [1])	E 10	10	30	1	9235 423 193 ..
8012 T	18	0.1 A	indefinite [1])	S 8.5 s	10.5	36	6	9236 400 193 ..
8097 D	19	0.1 A	indefinite [1])	E 10	10	30	1	9235 416 195 ..
8097 D/71 [2])	19	0.1 A	indefinite [1])	E 10	10	30	1	9235 418 195 ..
6992	24	3 W	250	S 6 s	6.1	33.5	7	9236 327 205 ..

[1]) Indefinite = over 2000 hours
[2]) Ribbed bulb
[3]) American equivalent type 40
[4]) American equivalent type 47
[5]) American equivalent type 46
[6]) American equivalent type 44

SUB-MINIATURE AND MIDGET-MINIATURE LAMPS

The trend towards miniaturization in many sectors of modern industry has led to the production of a wide variety of sub-miniature and midget-miniature lamps specially designed for specific types of equipment and instruments where the need has arisen for very small, high-quality light sources. The main applications for these lamps are in aircraft, telecommunication equipment, computers, optical and medical instruments, radio panels, toys, etc.

2 mm

1

T 1

2

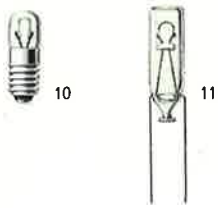
3

T 1¼

4 5 6

T 1¾

7 8 9



10 11

Type	Type number	Voltage V	Current mA	Lum. flux lm	Av. life h	Base or Terminal	Diam.	Max. length	Fig.	Ordering number
2 mm	—	1.5	70	0.25	1 000	wire terminal [1]	2.1	7.5	1	9236 677 013 ..
	—	1.5	25	0.05	1 500	wire terminal	3.0	6.5	2	9236 690 013 ..
T 1 [3]	680	5	60	0.4	100 000	wire terminal	3.0	6.5	2	9236 651 082 ..
	683	5	60	0.6	100 000	wire terminal	3.0	6.5	2	9236 614 082 ..
	685	5	60	0.6	100 000	sub-midget flanged	3.0	9.5	3	9236 630 082 ..
	713	5	75	1	40 000	wire terminal	3.0	6.5	2	9236 693 082 ..
	714	5	75	1	40 000	sub-midget flanged	3.0	9.5	3	9236 694 082 ..
	715	5	115	1.5	40 000	wire terminal	3.0	6.5	2	9236 696 082 ..
	718	5	115	1.5	40 000	sub-midget flanged	3.0	9.5	3	9236 697 082 ..
	—	2.5	400	6.5	30	wire terminal	4.44 max.	11.68	4	—
	—	2.5	400	6.5	30	special midget flanged	4.2	13.5	5	—
	2139 D	3	190	3	350	wire terminal	4.44 max.	11.68	4	—
	—	3	190	3	350	special midget flanged	4.2	13.5	5	—
	323	3	190	3	350	special	4.0	14.2	6	—
	2114 D	6	60	1.5	3 000	wire termnal	4.44 max.	11.68	4	—
T 1¼	—	6	60	1.5	3 000	special midget flanged	4.2	13.5	5	—
	—	12	100	3.5	1 000	wire terminal	4.44 max.	11.68	4	—
	—	12	100	3.5	1 000	special midget flanged	4.2	13.5	5	—
	—	14	80	3.5	50 000	wire terminal	4.44 max.	11.68	4	—
	—	14	80	3.5	50 000	special midget flanged	4.2	13.5	5	—
	—	28	40	3.5	25 000	wire terminal	4.44 max.	11.68	4	—
	—	28	40	3.5	25 000	special midget flanged	4.2	13.5	5	—
	331	1.35	60	0.125	500	midget flanged	5.7	15.8	7	9236 654 009 ..
	698	1.35	60	0.125	500	midget grooved	5.84 max.	15.7	8	9236 656 009 ..
	1728 D	1.35	60	0.125	500	wire terminal	5.7	13.2	9	9236 655 009 ..
	368	2.5	200	2.5	1 000	midget flanged	5.7	15.8	7	8222 203 181 ..
	1783 D	2.5	200	2.5	1 000	wire terminal	5.7	13.2	9	8222 203 051 ..
	1767	2.5	200	2.5	1 000	midget screw	5.7	17.0	10	8222 203 184 ..
	268	2.5	350	1.75	50 000	midget flanged	5.7	15.8	7	8222 203 164 ..
	2169 D	2.5	350	1.75	50 000	wire terminal	5.7	13.2	9	8222 203 165 ..
	338	2.7	60	0.5	500	midget flanged	5.7	15.8	7	8222 203 179 ..
	1738 D	2.7	60	0.5	500	wire terminal	5.7	13.2	9	8222 203 180 ..
	2171 D	4.5	120	0.5	25 000	wire terminal	5.7	13.2	9	9236 664 072 ..
	—	4.5	140	0.75	25 000	wire terminal	6.22	20.35	11	9236 679 101 ..
	345	6	40	0.5	1 000	midget flanged	5.7	15.8	7	9236 648 101 ..
	1730 D	6	40	0.5	1 000	wire terminal	5.7	13.2	9	9236 671 101 ..
	342	6	40	0.5	1 000	midget screw	5.7	17.0	10	8222 203 166 ..
	—	6	45	1.2	2 000	wire terminal	5.7	13.2	9	9236 634 101 ..
	328	6	200	4 [3]	1 000	midget flanged	5.7	15.8	7	9236 602 101 ..
	337	6	200	4 [3]	1 000	midget grooved	5.84 max.	15.7	8	9236 686 101 ..
	1784 D	6	200	4 [3]	1 000	wire terminal	5.7	13.2	9	9236 685 101 ..
	1768	6	200	4 [3]	1 000	midget screw	5.7	17.0	10	8222 203 186 ..
	380	6.3	40	0.35	50 000	midget flanged	5.7	15.8	7	9236 700 112 ..
	2180 D	6.3	40	0.35	50 000	wire terminal	5.7	13.2	9	9236 701 112 ..
	377	6.3	75	3	500	midget flanged	5.7	15.8	7	9236 725 112 ..
	1739 D	6.3	75	3	500	wire terminal	5.7	13.2	9	9236 726 112 ..
	381	6.3	200	5	50 000	midget flanged	5.7	15.8	7	8222 203 086 ..
	379	6.3	200	5	50 000	midget grooved	5.84 max.	15.7	8	8222 203 158 ..
	2181 D	6.3	200	5	50 000	wire terminal	5.7	13.2	9	8222 203 157 ..
	378	6.3	200	5	50 000	midget screw	5.7	17.0	10	8222 203 170 ..
	349	6.3	200	7	3 000	midget flanged	5.7	15.8	7	8222 203 143 ..
	398	6.3	200	7	3 000	midget grooved	5.84 max.	15.7	8	8222 203 144 ..
	2112 D	6.3	200	7	3 000	wire terminal	5.7	13.2	9	8222 203 073 ..
T 1¾	344	10	14	0.075	5 000	midget flanged	5.7	15.8	7	9236 658 158 ..
	709	10	14	0.075	5 000	midget grooved	5.84 max.	15.7	8	9236 675 158 ..
	1869 D	10	14	0.075	5 000	wire terminal	5.7	13.2	9	9236 659 158 ..
	367 X	10	40	1	3 000	midget flanged	5.7	15.8	7	8222 203 150 ..
	397	10	40	1	3 000	midget grooved	5.84 max.	15.7	8	8222 203 151 ..
	2107 D	10	40	1	3 000	wire terminal	5.7	13.2	9	8222 203 102 ..
	394	12	40	1.5	10 000	midget flanged	5.7	15.8	7	9236 703 171 ..
	2174 D	12	40	1.5	10 000	wire terminal	5.7	13.2	9	9236 702 171 ..
	—	12	100	4	1 000	midget flanged	5.7	15.8	7	8222 203 062 ..
	—	12	100	4	1 000	wire terminal	5.7	13.2	9	8222 203 185 ..
	382	14	80	3.5	50 000	midget flanged	5.7	15.8	7	9236 668 183 ..
	386	14	80	3.5	50 000	midget grooved	5.84 max.	15.7	8	9236 669 183 ..
	2182 D	14	80	3.5	50 000	wire terminal	5.7	13.2	9	9236 665 183 ..
	330	14	80	6	750	midget flanged	5.7	15.8	7	9234 635 183 ..
	336	14	80	6	750	midget grooved	5.84 max.	15.7	8	8222 203 129 ..
	1705 D	14	80	6	750	wire terminal	5.7	13.2	9	9236 667 183 ..
	373	14	80	6	750	midget screw	5.7	17.0	10	8222 203 182 ..
	370	18	40	2.7	1 000	midget flanged	5.7	15.8	7	8222 203 068 ..
	346	18	40	2.7	1 000	midget grooved	5.84 max.	15.7	8	8222 203 142 ..
	2102 D	18	40	2.7	1 000	wire terminal	5.7	13.2	9	8222 203 106 ..
	457	22	40	3.5	2 000	midget grooved	5.84 max.	15.7	8	8222 203 091 ..
	385	28	40	1.85	50 000	midget flanged	5.7	15.8	7	8222 203 173 ..
	387	28	40	3.5	25 000	midget flanged	5.7	15.8	7	9234 627 217 ..
	388	28	40	3.5	25 000	midget grooved	5.84 max.	15.7	8	9236 673 217 ..
	2187 D	28	40	3.5	25 000	wire terminal	5.7	13.2	9	9236 670 217 ..
	327	28	40	4.25	1 000	midget flanged	5.7	15.8	7	9234 625 217 ..
	334	28	40	4.25	1 000	midget grooved	5.84 max.	15.7	8	9234 628 217 ..
	1762 D [4]	28	40	4.25	1 000	wire terminal	5.7	13.2	9	9234 624 217 ..
	335	28	40	4.25	1 000	midget screw	5.7	17.0	10	8222 203 178 ..
	357	28	60	7.5	1 000	midget flanged	5.7	15.8	7	9236 657 217 ..
	—	28	80	12	1 000	midget flanged	5.7	15.8	7	8222 203 065 ..

[1]) Can also be supplied with slide base
[2]) Can also be supplied in various colours
[3]) At 5 Volts
[4]) Can also be supplied in green and red colour

PISELLO LAMPS

These tiny, colourful, gay, decorative lamps are specially designed for the use of setmakers and craftsmen for incorporation in their products such as decorative illumination sets, toys, religious articles, etc. Moreover, they are very effective in publicity signs, running light displays, clocks, etc.
A bi-metal flasher type is also included in the Pisello range.

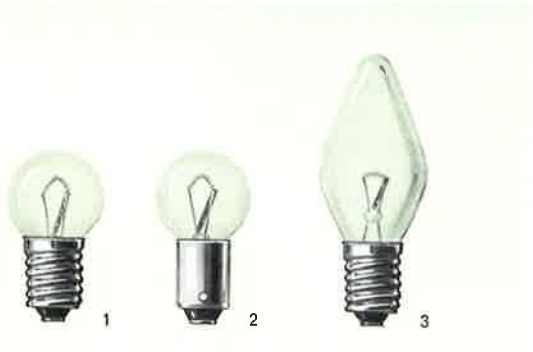
BASELESS TYPES						TYPES WITH BASE E 5								
Type number	Finish [1]	Max. diam.	Max. length	Fig.	Ordering number	Type number	Finish [1]	Max. diam.	Max. length	Fig.	Ordering number	Colour	Voltage V	Current A
13797/00 13797/970 13797/972 13797/973 13797/976 13797/978	A	5	13.5	1	9237 150 013 .. 9237 151 013 .. 9237 152 013 .. 9237 153 013 .. 9237 154 013 .. 9237 155 013 ..							clear blue yellow green red cyclamen	1.5	0.2
13798/00 13798/970 13798/972 13798/973 13798/976 13798/978	A	5	13.5	1	9237 150 032 .. 9237 151 032 .. 9237 152 032 .. 9237 153 032 .. 9237 154 032 .. 9237 155 032 ..							clear blue yellow green red cyclamen		
13800/00 13800/970 13800/972 13800/973 13800/976 13800/978	B	5.25	19	2	9237 162 032 .. 9237 163 032 .. 9237 164 032 .. 9237 165 032 .. 9237 166 032 .. 9237 167 032 ..							clear blue yellow green red cyclamen	2.5	0.2
13793/00 [2]	A	5.6	21.5	5	9237 180 032 ..							clear		
13883/00 13883/970 13883/972 13883/973 13883/976 13883/978	A	5	13.5	1	9237 150 052 .. 9237 151 052 .. 9237 152 052 .. 9237 153 052 .. 9237 154 052 .. 9237 155 052 ..	13889/00	C	5.5	24.5	3	9237 168 052 ..	clear blue yellow green red cyclamen		
13887/00 13887/970 13887/972 13887/973 13887/976 13887/978	B	5.25	19	2	9237 162 052 .. 9237 163 052 .. 9237 164 052 .. 9237 165 052 .. 9237 166 052 .. 9237 167 052 ..	13893/00	D	5.5	24.5	4	9237 174 052 ..	clear blue yellow green red cyclamen	3.5	0.2
13794/00 [2]	A	5.6	24.5	5	9237 180 052 ..							clear		
13884/00 13884/970 13884/972 13884/973 13884/976 13884/978	A	5.25	16	1	9237 100 101 .. 9237 101 101 .. 9237 102 101 .. 9237 103 101 .. 9237 104 101 .. 9237 105 101 ..	13890/00	C	5.5	24.5	3	9237 112 101 ..	clear blue yellow green red cyclamen		
13888/00 13888/970 13888/972 13888/973 13888/976 13888/978	B	5.25	19	2	9237 106 101 .. 9237 107 101 .. 9237 108 101 .. 9237 109 101 .. 9237 110 101 .. 9237 111 101 ..	13894/00	D	5.5	24.5	4	9237 118 101 ..	clear blue yellow green red cyclamen	6	0.15
13795/00 [2]	A	5.6	24.5	5	9237 125 101 ..							clear		
13885/00 13885/970 13885/972 13885/973 13885/976 13885/978	A	5.5	16	1	9237 050 171 .. 9237 051 171 .. 9237 052 171 .. 9237 053 171 .. 9237 054 171 .. 9237 055 171 ..	13891/00 13891/970 13891/972 13891/973 13891/976 13891/978	C	5.5	24.5	3	9237 074 171 .. 9237 075 171 .. 9237 076 171 .. 9237 077 171 .. 9237 078 171 .. 9237 079 171 ..	clear blue yellow green red cyclamen		
13896/00 13896/970 13896/972 13896/973 13896/976 13896/978	B	5.5	19	2	9237 062 171 .. 9237 063 171 .. 9237 064 171 .. 9237 065 171 .. 9237 066 171 .. 9237 067 171 ..	13895/00 13895/970 13895/972 13895/973 13895/976 13895/978	D	5.5	24.5	4	9237 080 171 .. 9237 081 171 .. 9237 082 171 .. 9237 083 171 .. 9237 084 171 .. 9237 085 171 ..	clear blue yellow green red cyclamen	12	0.1
13796/00 [2]	A	5.6	24.5	5	9237 090 171 ..							clear		
13886/00 13886/970 13886/972 13886/973 13886/976 13886/978	A	5.5	19	1	9237 005 205 .. 9237 006 205 .. 9237 007 205 .. 9237 008 205 .. 9237 009 205 .. 9237 010 205 ..	13892/00 13892/970 13892/972 13892/973 13892/976 13892/978	C	5.5	26.5	3	9237 017 205 .. 9237 018 205 .. 9237 019 205 .. 9237 020 250 .. 9237 021 205 .. 9237 022 205 ..	clear blue yellow green red cyclamen		
13903/00 13903/970 13903/972 13903/973 13903/976 13903/978	B	5.5	20.5	2	9237 011 205 .. 9237 012 205 .. 9237 013 205 .. 9237 014 205 .. 9237 015 205 .. 9237 016 205 ..	13957/00 13957/970 13957/972 13957/973 13957/976 13957/978	D	5.5	26.5	4	9237 023 205 .. 9237 024 205 .. 9237 025 205 .. 9237 026 205 .. 9237 027 205 .. 9237 028 205 ..	clear blue yellow green red cyclamen	24	0.05
13962/00 [2]	A	5.6	24.5	5	9237 040 205 ..							clear		

[1] A = without short circuiting device; length of leads 30 mm
B = with short circuiting device; length of leads 30 mm
C = without short circuiting device
D = with short circuiting device

[2] Flasher type

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. A flasher lamp is also included in the Pisello lamp range (vide Pisello lamps, page E 4).



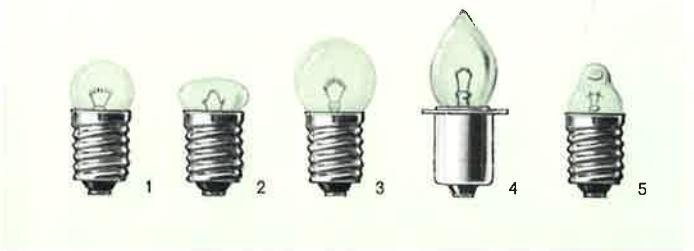
Type	Voltage V	Current A	Flash frequency per min.	Av. life h	Base	Diam.	Max. length	Fig.	Ordering number
406	2.6	0.3		50	E 10	15	29	1	9236 501 034 ..
407	4.9	0.3		50	E 10	15	29	1	9236 502 081 ..
408	4.9	0.3		50	BA 9 s	15	28	2	9236 527 081 ..
405	6.5	0.5	60-150	500	E 10	15	29	1	9236 503 116 ..
455	6.5	0.5		500	BA 9 s	15	28	2	9236 510 116 ..
25	6.5	0.5		500	E 10	18.3	47	3	9236 515 116 ..
258	12	0.27		500	E 10	15	29	1	9236 512 171 ..
257	12	0.27		500	BA 9 s	15	28	2	9236 511 171 ..

FLASHLIGHT LAMPS
PREFOCUS FLASHLIGHT LAMPS
LENS-END LAMPS

Flashlight lamps with the round bulb are suitable for torches from which a uniform light distribution is required or which have a focusing device.

By using prefocus lamps in conjunction with a parabolic reflector a beam of high-intensity can be obtained.

Lens-end types are specially destined for those applications where a concentrated spot of light is required and no space is available for a lamp and reflector assembly, for example pencil-type torches, toys, etc.



Flashlight lamps

Type number	Voltage V	Current A	Av. life h	Base	Diam.	Max. length	Fig.	Ordering number
7100 D	1.5	0.15	15	E 10	11	24	1	9234 500 013 ..
6890 D	2.5	0.20	15	E 10	11	24	1	9234 510 032 ..
7135 D	2.5	0.30	10	E 10	11	24	1	9234 530 032 ..
7103 D	3.5	0.20	15	E 10	12	22	2	9234 513 052 ..
6891 D	3.5	0.20	15	E 10	11	24	1	9234 510 052 ..
6882 D	3.8	0.07	15	E 10	11	24	1	9234 580 058 ..
7138 D	3.8	0.30	15	E 10	11	24	1	9234 530 058 ..
7139 D	4.5	0.30	15	E 10	11	24	1	9234 530 072 ..
7145 D	6.2	0.30	15	E 10	14	27.5	3	9234 535 109 ..

Prefocus flashlight lamps

PR 4	2.3	0.27	10	P 13.5 s	11	30.5	4	9234 529 028 ..
PR 2	2.4	0.50	5	P 13.5 s	11	30.5	4	9234 540 029 ..
PR 6	2.5	0.30	10	P 13.5 s	11	30.5	4	9234 531 032 ..
PR 9	2.7	0.15	45	P 13.5 s	11	30.5	4	9234 501 036 ..
PR 3	3.6	0.50	10	P 13.5 s	11	30.5	4	9234 540 054 ..
PR 7	3.7	0.30	15	P 13.5 s	11	30.5	4	9234 531 056 ..
PR 11	4.5	0.35	50	P 13.5 s	11	30.5	4	9234 564 072 ..
PR 15	4.5	0.50	30	P 13.5 s	11	30.5	4	9234 540 072 ..
PR 13	4.75	0.50	15	P 13.5 s	11	30.5	4	9234 540 077 ..
PR 12	6.0	0.50	15	P 13.5 s	11	30.5	4	9234 540 101 ..
PR 18	7.2	0.55	15	P 13.5 s	11	30.5	4	9234 545 131 ..

Lens-end lamps

112	1.2	0.22	3.5	E 10	9.1	23.5	5	9234 518 007 ..
7067 D	2.2	0.18	15	E 10	9.1	23.5	5	9234 509 026 ..
222	2.2	0.25	4	E 10	9.1	23.5	5	9234 520 026 ..
7068 D	2.5	0.20	15	E 10	9.1	23.5	5	9234 514 032 ..
7071 D	2.5	0.30	10	E 10	9.1	23.5	5	9234 533 032 ..
7069 D	3.5	0.20	15	E 10	9.1	23.5	5	9234 514 052 ..
7072 D	3.7	0.30	15	E 10	9.1	23.5	5	9234 533 056 ..

LENSLITE LAMPS

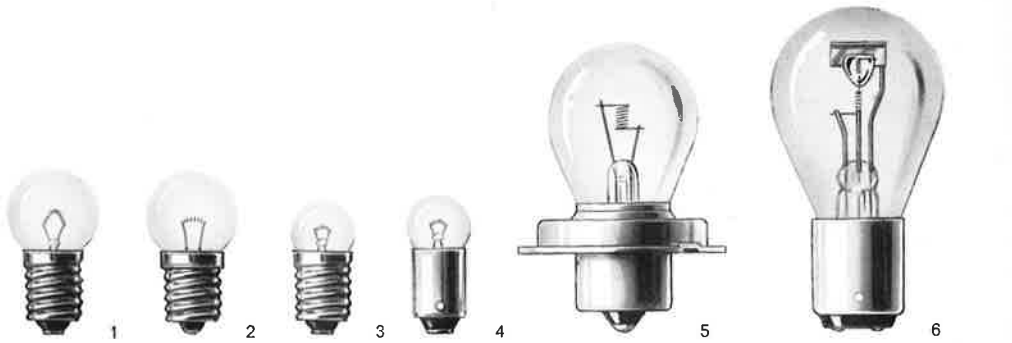
Lenslite lamps produce a sharply concentrated, uniformly distributed beam of light of a high luminous intensity. This is provided by means of the front of the bulb which consists of a lens focusing the light beam. The difference between the Lenslite lamps and the Lens-end lamps described above lies in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

Type number	Voltage V	Current A	Av. life h	Base	Diam.	Max. length	Ordering number
6890 D/34	2.5	0.20	15	E 10	11	24	9234 512 032 ..
7135 D/34	2.5	0.30	10	E 10	11	24	9234 532 032 ..
6891 D/34	3.5	0.20	15	E 10	11	24	9234 512 052 ..
7138 D/34	3.8	0.30	15	E 10	11	24	9234 532 058 ..

BICYCLE LAMPS

LAMPS FOR BICYCLES WITH AUXILIARY MOTOR

Philips' extensive range of highly dependable bicycle and motorcycle lamps makes a significant contribution towards ensuring the safety of cyclists after dark.



Bicycle lamps — Head lamps

Type number	Voltage V	Current A	Av. life h	Base	Diam.	Max. length	Fig.	Ordering number
7126 D	4	0.3	100	E 10	15	29	1	9234 425 063 ..
7133 D	6	0.25	100	E 10	15	29	1	9234 420 101 ..
7133 D/71 [1])	6	0.25	100	E 10	15	29	1	9234 421 101 ..
7140 D	6	0.30	100	E 10	15	29	1	9234 425 101 ..
7140 D/71 [1])	6	0.30	100	E 10	15	29	1	9234 426 101 ..
7141 D	6	0.35	100	E 10	15	29	1	9234 430 101 ..
7141 D/71 [1])	6	0.35	100	E 10	15	29	1	9234 431 101 ..
7152 D	6	0.40	100	E 10	15	29	1	9234 435 101 ..
7152 C	6	0.40	100	EP 10	15	29	2	9234 438 101 ..
7142 D	6	0.45	100	E 10	15	29	1	9234 440 101 ..
7142 D/71 [1])	6	0.45	100	E 10	15	29	1	9234 441 101 ..
7143 D	6	0.50	100	E 10	15	29	1	9234 445 101 ..
7143 D/71 [1])	6	0.50	100	E 10	15	29	1	9234 446 101 ..
7185 D	8	0.45	100	E 10	15	29	1	9234 440 145 ..
7185 D/71 [1])	8	0.45	100	E 10	15	29	1	9234 441 145 ..
7192 D	10	0.40	100	E 10	15	29	1	9234 435 158 ..
7192 D/71 [1])	10	0.40	100	E 10	15	29	1	9234 436 158 ..
7193 D	10	0.45	100	E 10	15	29	1	9234 440 158 ..
								Tail lamps
7121 D	6	0.05	1000	E 10	11	24	3	9234 406 101 ..
7121 N	6	0.05	1000	BA 9 s	11	24	4	9234 405 101 ..
7098 D	6	0.10	1000	E 10	11	24	3	9234 411 101 ..
7181 D	8-10	0.05	1000	E 10	11	24	3	9234 406 146 ..
7181 N	8-10	0.05	1000	BA 9 s	11	24	4	9234 405 146 ..

Lamps for bicycles with auxiliary motor — Head lamps

Type number	Voltage V	Wattage W	Av. life h	Base	Diam.	Max. length	Fig.	Ordering number
7012 D	6	4	250	E 10	15	29	1	9234 472 101 ..
7014 D	6	4.8	250	E 10	15	29	1	9234 474 101 ..
7017 D	6	6.2	250	E 10	15	29	1	9234 477 101 ..
7018 D	6	6.8	250	E 10	15	29	1	9234 478 101 ..
7019 D	6	7.5	250	E 10	15	29	1	9234 479 101 ..
7008	6	15	100	P 26 s	25	48	5	9226 597 101 ..
7030 [2])	6	15/15	100	BAX 15 d	28	54	6	9226 005 101 ..
								Tail lamps
7000 N	6	1.5	250	BA 9 s	11	24	4	9234 466 101 ..
7009 D	6	2	250	E 10	11	24	3	9234 467 101 ..
7009 N	6	2	250	BA 9 s	11	24	4	9234 468 101 ..
7087 D	6	3	250	E 10	11	24	3	9234 451 101 ..
7087 N	6	3	250	BA 9 s	11	24	4	9234 450 101 ..
7007 D	6	4.8	1000	E 10	15	29	1	9234 460 101 ..

[1]) Ribbed bulb

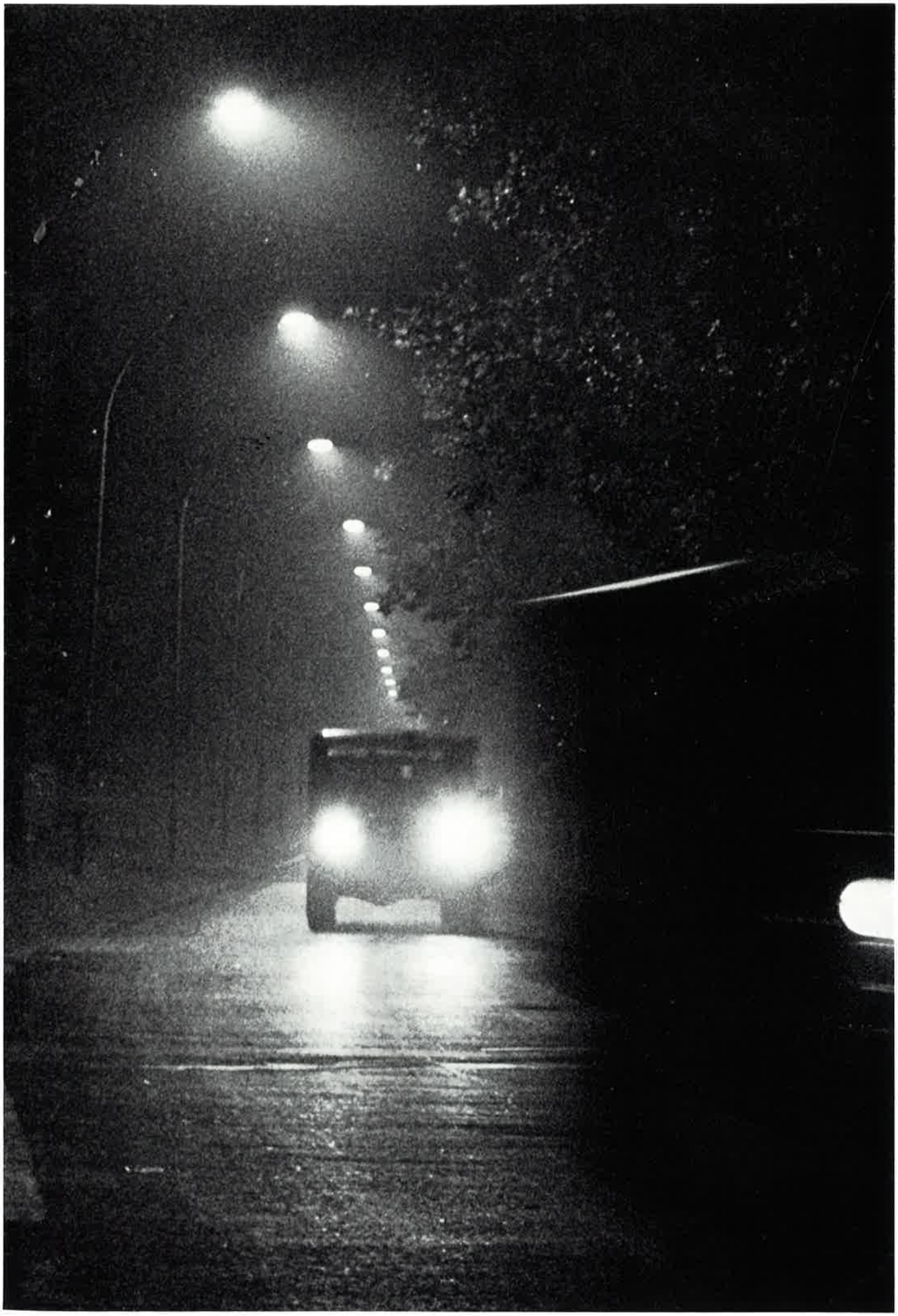
[2]) "Duplo" lamp

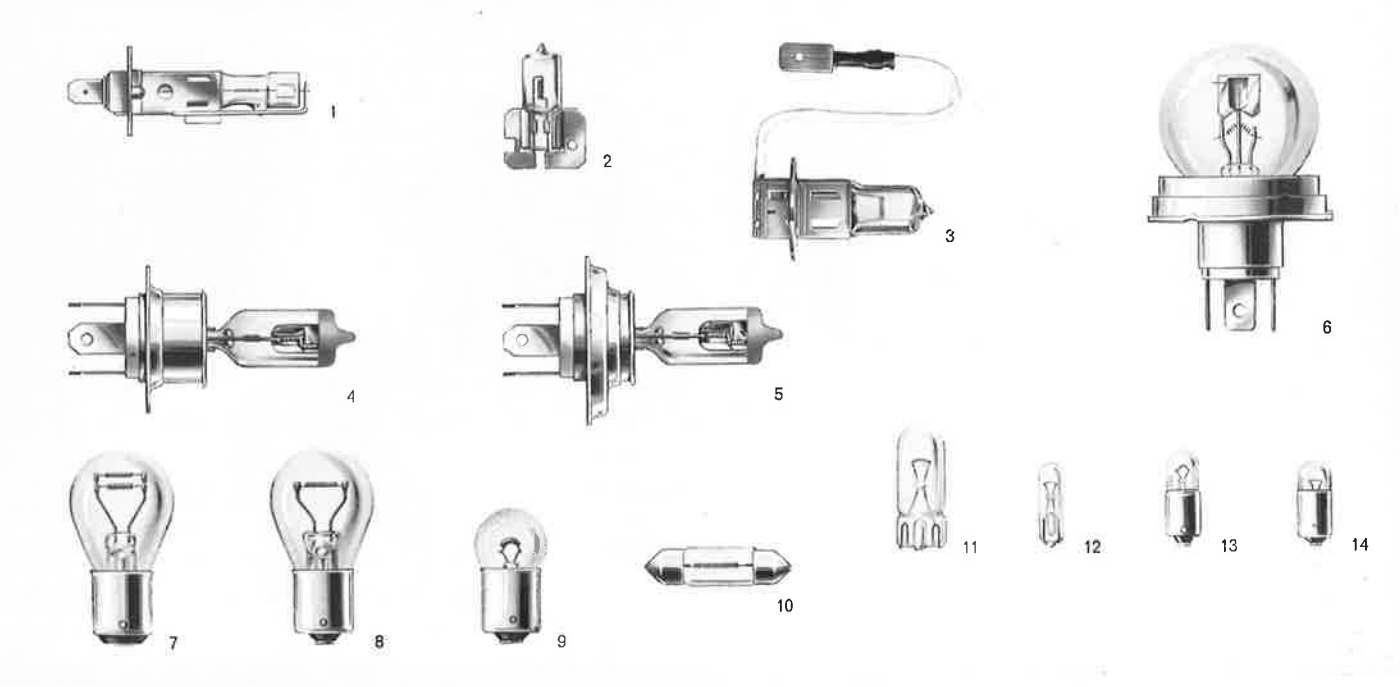
WEDGE-BASE LAMPS

Fundamentally normal miniature lamps. The only difference being the flat glass wedge at the bottom of the lamp instead of a metal base; this gives the wedge-base lamps the following advantages over the normal types: they can be recessed in an adapter, thus requiring less space; greatly improved contact; better resistance to high temperatures and humidity; easier insertion of the lamp.

These lamps can be applied in signal panels, measuring equipment, amplifiers, and can be used as indicator lamps, for the lighting of dials, dashboards, etc.

Type number	Voltage V	Wattage W	Current or candle power	Max. diam.	Max. length	Ordering number	Application
6516	6	1.2	—	5	20	9237 200 101 ..	motorcar lamps
12516	12	1.2	—			9237 200 171 ..	
6960	6	2	—	10.3	26.7	9237 205 101 ..	
12960	12	2	—			9237 205 171 ..	
6256	6	3	—			9237 212 101 ..	
12256	12	3	—	10.3	26.7	9237 212 171 ..	
13256	24	3	—			9237 212 205 ..	
6961	6	5	—			9237 220 101 ..	
12961	12	5	—	10.3	26.7	9237 220 171 ..	
13961	24	5	—			9237 220 205 ..	
500	6	3	—			9237 211 101 ..	
501	12	5	—	10.3	26.7	9237 220 171 ..	
502	24	5	—			9237 225 205 ..	
158	12	—	2 cp	10.3	26.7	9237 230 171 ..	
194	12	—	2 cp	10.3	26.7	9237 231 171 ..	
159	6.3	—	0.15 A	10.3	26.7	9237 250 112 ..	dial lamps
259	6.3	—	0.25 A	10.3	26.7	9237 255 112 ..	
6223	7	1	—	5	20	9237 235 126 ..	
6515	7	—	0.035 A	5	20	9237 244 126 ..	
6502	4	1	—	5	20	9237 236 063 ..	signal lamps
6521	6	1	—			9237 237 101 ..	
12521	12	1	—	5	20	9237 237 171 ..	
13521	24	1	—			9237 237 205 ..	
6522	6	—	0.030 A			9237 260 101 ..	
12522	12	—	0.030 A	5	20	9237 260 171 ..	
13522	24	—	0.030 A			9237 260 205 ..	





MOTORCAR LAMPS

With rapidly increasing traffic density and ever higher speeds, efficient and reliable vehicle lighting is one of the major criteria for present-day road safety. Philips have always been in the vanguard of progress in lighting equipment and this applies equally to the lighting of motorized vehicles for which they can supply a full range of highly efficient, dependable lamps. Interesting developments in this field are the halogen lamps and the wedge-base lamps.

The main advantages of motorcar lamps with halogen filling are smaller dimensions, higher luminous intensity and no light depreciation during effective life, as blackening does not occur.

Specially noteworthy are the H4 twin-filament "Duplo" type of halogen lamps (type numbers 12453 and 12342) with an exceptionally high luminous intensity and a light distribution which fully satisfies all official traffic regulations.

The wedge-base lamps possess the following features: economy of space as they can be recessed in an adapter; considerably improved contact; greater resistance to high temperatures and humidity; simpler insertion of the lamp.

The following pages give a survey of the motorcar lamps which Philips can offer.

European standardized types

Headlight lamps

Type number	Voltage V	Wattage W	Base	Max. diam.	Max. length	Fig.	Ordering number	Remarks	
6258 12258 13258	6 12 24	55 55 70	P 14.5 s	—	67.5	1	9238 855 101 .. 9238 855 171 .. 9238 860 205 ..	axial filament types	halogen lamps
12311	12	55	K 511	9/20.5	31	2	9238 854 171 ..		
6336 12336 13336	6 12 24	55 55 70	PK 22 s	11.5	42	3	9238 857 101 .. 9238 857 171 .. 9238 861 205 ..	transversal filament types	
12453	12	60/55	P 36 t	17	92	4	9238 865 171 ..	asymmetric types	
12342	12	60/55	P 43 t - 38	17	92	5	9238 866 171 ..		
6620 12620 13620	6 12 24	45/40 45/40 55/50	P 45 t	41	77	6	9226 190 101 .. 9226 190 171 .. 9226 192 205 ..	"Duplo"-d lamp	

Auxiliary lamps (to be used for approved lights)

6499 12499 13499	6 12 24	21/5 21/5 21/5	BAY 15 d	25.5	50.5	7	9226 777 101 .. 9226 777 171 .. 9226 777 205 ..	double filament stop/flasher lamp
6498 12498 13498	6 12 24	21 21 21	BA 15 s	25.5	50.5	8	9226 737 101 .. 9226 737 171 .. 9226 737 205 ..	single filament stop/flasher lamp
6821 6814 12821 12814 13821 13814	6 6 12 12 24 24	5 10 5 10 5 10	BA 15 s	18.5	35	9	9234 020 101 .. 9234 041 101 .. 9234 020 171 .. 9234 041 171 .. 9234 020 205 .. 9234 041 205 ..	
6844 12844 13844	6 12 24	5 5 5	S 8.5	11	36	10	9236 341 101 .. 9236 341 171 .. 9236 341 205 ..	
6961 12961 13961	6 12 24	5 5 5	—	10.29	26.7	11	9237 220 101 .. 9237 220 171 .. 9237 220 205 ..	side, tail and parking lamps
500 501 502	6 12 24	3 5 5	—	10.29	26.7	11	9237 211 101 .. 9237 220 171 .. 9237 225 205 ..	
158	12	— (2 cp)	—	10.29	26.7	11	9237 230 171 ..	
194	12	— (2 cp)	—	10.29	26.7	11	9237 231 171 ..	
6516 12516	6 12	1.2 1.2	—	5	20	12	9237 200 101 .. 9237 200 171 ..	
6929 12929 13929	6 12 24	4 4 4	BA 9 s	8.6	27.4	13	9234 350 101 .. 9234 350 171 .. 9234 350 205 ..	

Auxiliary lamps (for non-approved lights)

6960 6256 12960 12256 13256	6 6 12 12 24	2 3 2 3 3	—	10.29	26.7	11	9237 205 101 .. 9237 212 101 .. 9237 205 171 .. 9237 212 171 .. 9237 212 205 ..	interior/dashboard lamps
6913 12913 13913	6 12 24	2 2 2	BA 9 s	8.6	23.9	14	9234 315 101 .. 9234 315 171 .. 9234 315 205 ..	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MOTORCAR LAMPS

Standard types

Headlight lamps

Type number	Voltage V	Wattage W	Base	Max. diam.	Max. length	Fig.	Ordering number	Remarks
6725	6	35/35	BA 21 d	41	61	1	9226 110 101 ..	"Duplo" lamps
6725/86 [1])	6	35/35					9226 111 101 .. [1])	
6745	6	45/40					9226 115 101 ..	
6745/86 [1])	6	45/40					9226 116 101 .. [1])	
12725	12	35/35					9226 110 171 ..	
12725/86 [1])	12	35/35					9226 111 171 .. [1])	
12745	12	45/40					9226 115 171 ..	
12745/86 [1])	12	45/40					9226 116 171 .. [1])	
13745	24	45/40					9226 115 205 ..	
13745/86 [1])	24	45/40					9226 116 205 .. [1])	
13333	28	50/50	BA 20 d	39.8	67.5	2	9226 085 217 ..	
6718	6	25/25	BA 20d	36	70	3	9226 065 101 ..	
6728	6	35/35					9226 070 101 ..	
6728/86 [1])	6	35/35					9226 071 101 .. [1])	
6748	6	45/40					9226 075 101 ..	
6748/86 [1])	6	45/40					9226 076 101 .. [1])	
12728	12	35/35					9226 070 171 ..	
12728/86 [1])	12	35/35					9226 071 171 .. [1])	
12748	12	45/40					9226 075 171 ..	
12748/86 [1])	12	45/40					9226 076 171 .. [1])	
13748	24	45/40					9226 075 205 ..	
13748/86 [1])	24	45/40					9226 076 205 .. [1])	
6722	6	35/35	BA 15 d	36	58	4	9226 020 101 ..	
6742	6	45/40					9226 030 101 ..	
12722	12	35/35					9226 020 171 ..	
12742	12	45/40					9226 030 171 ..	
13742	24	45/40					9226 030 205 ..	
6721	6	35/35	P 22 d	29	62	5	9226 175 101 ..	
6721/86 [1])	6	35/35					9226 176 101 .. [1])	
6741	6	45/40					9226 180 101 ..	
6741/86 [1])	6	45/40					9226 181 101 .. [1])	
12721	12	35/35					9226 175 171 ..	
12721/86 [1])	12	35/35					9226 176 171 .. [1])	
12741	12	45/40					9226 180 171 ..	
12741/86 [1])	12	45/40					9226 181 171 .. [1])	
13741	24	45/40					9226 180 205 ..	
13741/86 [1])	24	45/40					9226 181 205 .. [1])	
12958	12	42/36	P 22 d	29	62	6	9226 345 171 ..	double-filament lamps
12959	12	42/36					9226 347 171 ..	
6224	6	35	BA 21 s	41	61	7	9226 520 101 ..	single-filament lamps
6224/86 [1])	6	35					9226 521 101 .. [1])	
6244	6	50					9226 540 101 ..	
6244/86 [1])	6	50					9226 541 101 .. [1])	
12224	12	35					9226 520 171 ..	
12224/86 [1])	12	35					9226 521 171 .. [1])	
12244	12	50					9226 540 171 ..	
12244/86 [1])	12	50					9226 541 171 .. [1])	
13244	24	50					9226 540 205 ..	
13244/86 [1])	24	50					9226 541 205 .. [1])	

[1]) Selective yellow


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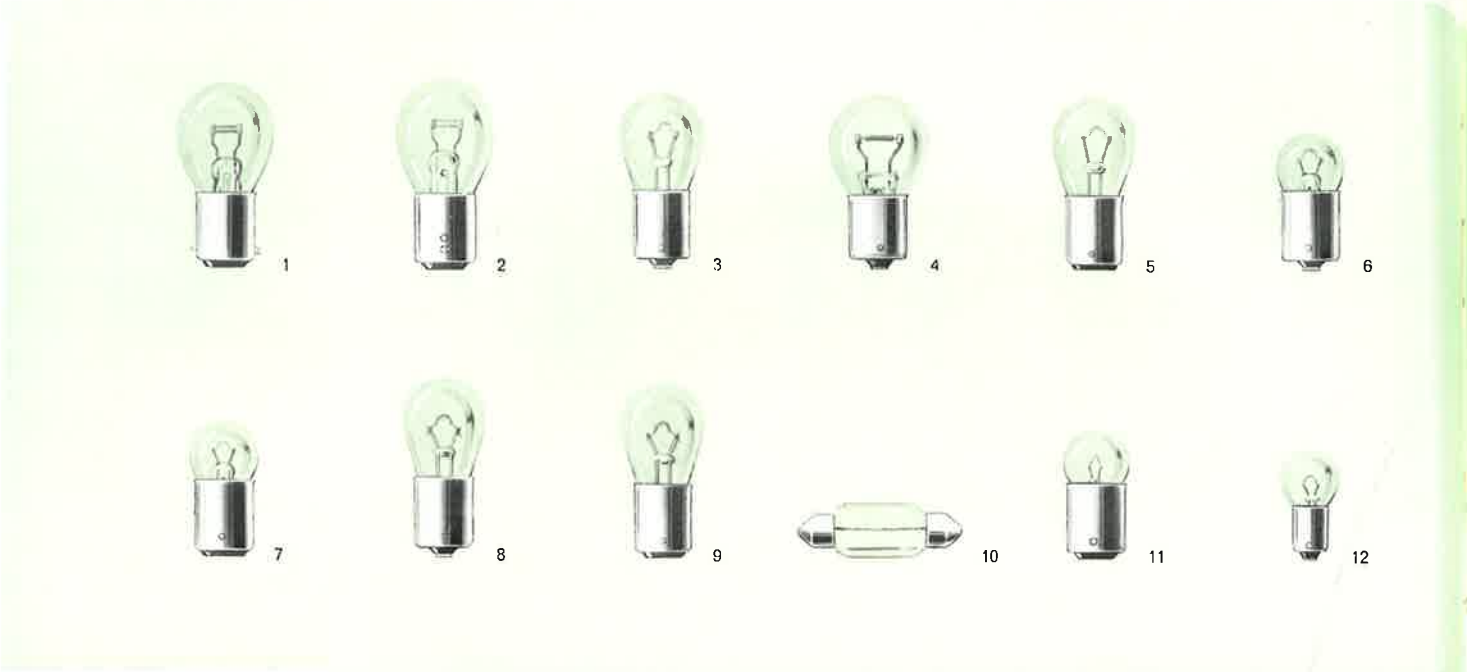
Standard types (continued)

Headlight lamps (continued)

Type number	Voltage V	Wattage W	Base	Max. diam.	Max. length	Fig.	Ordering number	Remarks
6253	6	45	BA 21 s	41	61	8	9226 535 101 ..	
6253/86 [1]	6	45					9226 536 101 .. [1]	
12253	12	45					9226 535 171 ..	
12253/86 [1]	12	45					9226 536 171 .. [1]	
13253	24	50					9226 542 205 ..	
13253/86 [1]	24	50					9226 543 205 .. [1]	
6227	6	35	BA 20 s	36	66	9	9226 481 101 ..	
6227/86 [1]	6	35					9226 482 101 .. [1]	
6247	6	45					9226 490 101 ..	
6247/86 [1]	6	45					9226 491 101 .. [1]	
12227	12	35					9226 481 171 ..	
12227/86 [1]	12	35					9226 482 171 .. [1]	
12247	12	45					9226 490 171 ..	
12247/86 [1]	12	45					9226 491 171 .. [1]	
13227	24	35					9226 481 205 ..	
13227/86 [1]	24	35					9226 482 205 .. [1]	
13247	24	50					9226 502 205 ..	
13247/86 [1]	24	50					9226 503 205 .. [1]	
6211	6	25	BA 15 s	36	56	10	9226 406 101 ..	
6221	6	35					9226 419 101 ..	
6241	6	45					9226 439 101 ..	
12221	12	35					9226 419 171 ..	
12241	12	45					9226 439 171 ..	
13241	24	45					9226 439 205 ..	
6222	6	35	BA 15 d	36	56	11	9226 418 101 ..	single-filament lamps
6242	6	45					9226 438 101 ..	
12222	12	35					9226 418 171 ..	
12242	12	45					9226 438 171 ..	
13242	24	45					9226 438 205 ..	
6343	6	45	P 22 s	29	62	12	9226 567 101 ..	
6343/86 [1]	6	45					9226 568 101 .. [1]	
12343	12	45					9226 567 171 ..	
12343/86 [1]	12	45					9226 568 171 .. [1]	
13343	24	50					9226 573 205 ..	
13343/86 [1]	24	50					9226 574 205 .. [1]	
6228	6	45	P 22 s	29	62	13	9226 565 101 ..	
6228/86 [1]	6	45					9226 566 101 .. [1]	
12228	12	50					9226 570 171 ..	
12228/86 [1]	12	50					9226 571 171 .. [1]	
13322	24	50					9226 570 205 ..	
6325	6	25	BA 15 s	25.5	52	14	9226 411 101 ..	
12325	12	25					9226 411 171 ..	
13324	24	25					9226 411 205 ..	
6418	6	25	BA 15 s	25.5	45	15	9226 731 101 ..	
12418	12	25					9226 731 171 ..	
13418	24	25					9226 731 205 ..	

[1]) Selective yellow



MOTORCAR LAMPS

Standard types (continued)

Auxiliary lamps (to be used for approved lights)

Type number	Voltage V	Wattage W	Base	Max. diam.	Max. length	Fig.	Ordering number	Remarks
6503	6	20/5	BA 15 d	25.5	50.5	1	9226 771 101 ..	
12503	12	20/5					9226 771 171 ..	
13406	24	20/5					9226 771 205 ..	
6517	6	18/5	BAY 15 d	25.5	50.5	2	9226 770 101 ..	double-filament stop/flasher lamps
6500	6	20/5					9226 772 101 ..	
12517	12	18/5					9226 770 171 ..	
12500	12	20/5					9226 772 171 ..	
13517	24	18/5					9226 770 205 ..	
13500	24	20/5					9226 772 205 ..	
6401	6	15	BA 15 s	22.5	45	3	9234 200 101 ..	single-filament stop/flasher lamps
6445	6	18					9234 230 101 ..	
12401	12	15					9234 200 171 ..	
12445	12	18					9234 230 171 ..	
13401	24	15					9234 200 205 ..	
13445	24	18					9234 230 205 ..	
6421	6	20	BA 15 s	25.5	45	4	9226 721 101 ..	
12421	12	20					9226 721 171 ..	
13421	24	20					9226 721 205 ..	
6402	6	15	BA 15 d	22.5	45	5	9234 201 101 ..	
12402	12	15					9234 201 171 ..	
13402	24	15					9234 201 205 ..	
6413	6	15	BA 15 s	18.5	35	6	9234 210 101 ..	
12413	12	15					9234 210 171 ..	
13413	24	15					9234 210 205 ..	
6400	6	10	BA 15 d	18.5	35	7	9234 040 101 ..	
12400	12	10					9234 040 171 ..	
13400	24	10					9234 040 205 ..	
6403	6	15	BA 15 s	22.5	45	8	9234 220 101 ..	
12403	12	15					9234 220 171 ..	
13403	24	15					9234 220 205 ..	
6404	6	15	BA 15 d	22.5	45	9	9234 221 101 ..	
12404	12	15					9234 221 171 ..	
13404	24	15					9234 221 205 ..	
6850	6	15	S 8.5	15.5	41	10	9236 390 101 ..	
6807	6	18					9236 395 101 ..	
12850	12	15					9236 390 171 ..	
12807	12	18					9236 395 171 ..	
13850	24	15					9236 390 205 ..	
13807	24	18					9236 395 205 ..	
6822	6	5	BA 15 d	18.5	35	11	9234 021 101 ..	side, tail and parking lamps
12822	12	5					9234 021 171 ..	
13822	24	5					9234 021 205 ..	
6819	6	5	BA 9 s	15.5	29	12	9234 360 101 ..	
12819	12	6					9234 371 171 ..	
13819	24	5					9234 360 205 ..	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Standard types (continued)

Auxiliary lamps (for non-approved lights)

Type number	Voltage V	Wattage W	Base	Max. diam.	Max. length	Fig.	Ordering number	Remarks
6910	6	3					9234 340 101 ..	
12910	12	3	BA 9 s	8.6	23	13	9234 340 171 ..	
13910	24	3					9234 340 205 ..	
6875	6	2					9234 318 101 ..	
12875	12	3	E 10	11.5	24	14	9234 343 171 ..	
13875	24	3					9234 343 205 ..	
6876	6	2					9234 317 101 ..	
12876	12	3	E 10/19	12.5	22	15	9234 342 171 ..	
13876	24	3					9234 342 205 ..	
6828	6	0.6					9234 300 101 ..	
6829	6	1.2	BA 7 s	6.8	20.7	16	9234 305 101 ..	
12829	12	2					9234 316 171 ..	
13829	24	3					9234 341 205 ..	
6842	6	3					9236 320 101 ..	
12842	12	3	S 7	8	28	17	9236 320 171 ..	
13842	24	3					9236 320 205 ..	
6843	6	3					9236 321 101 ..	dashboard, interior and parking lamps
12843	12	3	S 7	8	33	18	9236 321 171 ..	
13843	24	3					9236 321 205 ..	
6849	6	3					9236 324 101 ..	
12849	12	3	S 6	6.6	33	19	9236 324 171 ..	
13849	24	3					9236 324 205 ..	
6914	6	3					9236 323 101 ..	
12914	12	3	S 7	8	36	20	9236 323 171 ..	
13914	24	3					9236 323 205 ..	
6854	6	10					9236 382 101 ..	
12854	12	10	S 8.5	11	36	21	9236 382 171 ..	
13854	24	10					9236 382 205 ..	
6864	6	5					9236 342 101 ..	
6866	6	10					9236 380 101 ..	
12864	12	5	S 8.5	11	41	22	9236 342 171 ..	
12866	12	10					9236 380 171 ..	
13864	24	5					9236 342 205 ..	
13866	24	10					9236 380 205 ..	

MOTORCAR LAMPS

Non-standard types

Headlight lamps

Type number	Voltage V	Wattage W	Base	Max. diam.	Max. length	Fig.	Ordering number	Remarks
6791 6792 12792 13792	6 6 12 24	25/25 35/35 35/35 35/35	BA 15 d	36	60	1	9226 017 101 .. 9226 022 101 .. 9226 022 171 .. 9226 022 205 ..	
6951 12951	6 12	35/35 35/35	P 15 d	36	58	2	9226 155 101 .. 9226 155 171 ..	"Duplo" lamps
6953 12953	6 12	35/35 35/35	PX 15 d	36	58	3	9226 157 101 .. 9226 157 171 ..	
6704 12704	6 12	45/40 45/40	PY 42 d	36	64.5	4	9226 195 101 .. 9226 195 171 ..	
6612 6622 12622	6 6 12	25/25 35/35 35/35	BA 15 d	36	56	5	9226 300 101 .. 9226 305 101 .. 9226 305 171 ..	
6902 12902	6 12	35/35 35/35	P 15 d	36	56	6	9226 325 101 .. 9226 325 171 ..	double-filament lamps
6905 12905	6 12	35/35 35/35	PX 15 d	36	56	7	9226 326 101 .. 9226 326 171 ..	
6299 12299 13299	6 12 24	35 35 35	P 15 s	36	56	8	9226 550 101 .. 9226 550 171 .. 9226 550 205 ..	
6323 12323	6 12	35 35	P 22 s	29	62	9	9226 560 101 .. 9226 560 171 ..	single-filament lamps
12292 13293	12 24	35 50	P 22 d	29	62	10	9226 562 171 .. 9226 572 205 ..	

Auxiliary lamps (to be used for approved lights)

6422 12422 13422	6 12 24	20 20 20	BA 15 d	25.5	45	11	9226 720 101 .. 9226 720 171 .. 9226 720 205 ..	
12416 12419	12 12	15 20	BAY 15 d	25.5	45	12	9226 702 171 .. 9226 722 171 ..	single-filament stop/flasher lamps
6417 12417 13417	6 12 24	15 15 15	BA 15 d	18.5	35	13	9234 211 101 .. 9234 211 171 .. 9234 211 205 ..	
6811 12811	6 12	3 3	BA 15 s	18.5	35	14	9234 000 101 .. 9234 000 171 ..	side, tail and parking lamps
6812 12812	6 12	3 3	BA 15 d	18.5	35	15	9234 001 101 .. 9234 001 171 ..	

Auxiliary lamps (for non-approved lights)

12926	12	1.5	E 5	7.5	16.5	16	9234 309 171 ..	dashboard, interior and parking lamp


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American type-number range

Headlight lamps

Type number	Voltage V	Candle power cp	Base	Max. diam.	Max. length	Fig.	Ordering number	Remarks
1000 1124	6- 8 12-16	32/32 32/32	BA 15 d	36	56	1	9226 310 102 .. 9226 310 172 ..	
2330 2336	6- 8 12-16	32/32 32/32	P 15 d	36	56	2	9226 330 102 .. 9226 330 172 ..	double-filament lamps
2331	6- 8	32/32	PX 15 d	36	56	3	9226 331 102 ..	
1133 1183 1143 1195	6- 8 6- 8 12-16 12-16	32 50 32 50	BA 15 s	36	56	4	9226 461 102 .. 9226 466 102 .. 9226 461 172 .. 9226 466 172 ..	
1134 1184 1144	6- 8 6- 8 12-16	32 50 32	BA 15 d	36	56	5	9226 460 102 .. 9226 465 102 .. 9226 460 172 ..	single-filament lamps
1007 1323 1327	6- 8 6- 8 12-16	32 32 32	P 15 s	36	56	6	9226 556 102 .. 9226 555 102 .. 9226 555 172 ..	

Auxiliary lamps (to be used for approved lights)

1154 1016 1034	6- 8 12-16 12-16	21/3 21/6 32/4	BAY 15 d	25.5	50.5	7	9226 781 102 .. 9226 784 172 .. 9226 786 172 ..	double-filament stop/tail lamps
1158 1176	6- 8 12-16	21/3 21/6	BA 15 d	25.5	50.5	8	9226 780 102 .. 9226 783 172 ..	
1129 1141 1073	6- 8 12-16 12-16	21 21 32	BA 15 s	25.5	50.5	9	9226 745 102 .. 9226 745 172 .. 9226 746 172 ..	
1130 1142	6- 8 12-16	21 21	BA 15 d	25.5	50.5	10	9226 744 102 .. 9226 744 172 ..	
63 81 67 89	6- 8 6- 8 12-16 12-16	3 6 4 6	BA 15 s	18.5	36	11	9234 050 102 .. 9234 060 102 .. 9234 055 172 .. 9234 060 172 ..	single-filament stop, side and tail lamps
64 82 68 90	6- 8 6- 8 12-16 12-16	3 6 4 6	BA 15 d	18.5	36	12	9234 051 102 .. 9234 061 102 .. 9234 056 172 .. 9234 061 172 ..	

Auxiliary lamps (for non-approved lights)

209 1003	6- 8 12-16	15 15	BA 15 s	19.3	43	13	9226 741 102 .. 9226 741 172 ..	
210 1004	6- 8 12-16	15 15	BA 15 d	19.3	43	14	9226 740 102 .. 9226 740 172 ..	
87 93	6- 8 12-16	15 15	BA 15 s	25.5	50.5	15	9226 743 102 .. 9226 743 172 ..	interior, dashboard and indicator lamps
88 94	6- 8 12-16	15 15	BA 15 d	25.5	50.5	16	9226 742 102 .. 9226 742 172 ..	
51 53	6- 8 12-16	1 1	BA 9 s	11.5	24	17	9234 380 102 .. 9234 380 172 ..	
55 57	6- 8 12-16	2 2	BA 9 s	14.5	27	18	9234 390 102 .. 9234 390 172 ..	

TRAIN LAMPS

To withstand the intense vibrations and shocks occurring on railway trains, lamps of a robust construction are required.
The lamps shown opposite have been specially designed by Philips for this purpose.

Finish	Voltage V	Wattage W	Base	Diam.	Max. length	Ordering number
Inside frosted	24	15 25 40	B 22	45	72.5	9218 111 205 .. 9218 135 205 .. 9218 145 205 ..

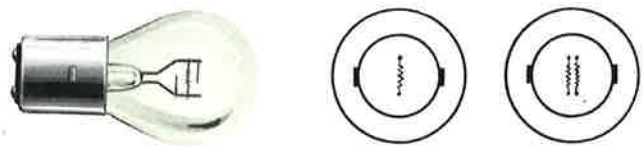
BOAT LAMPS

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

Type number and voltage 6 V	12 V	24 V	Wattage W	Base	Diam.	Max. length	Ordering number 6 V	12 V	24 V	Fig.
13 425 B 13 425 W	13 423 B 13 423 W	13 424 B 13 424 W	5	B 22 BA 15 d	18 18	38 35	9234 612 101 .. 9234 611 101 ..	9234 612 171 .. 9234 611 171 ..	9234 612 205 .. 9234 611 205 ..	1 2
13 456 E 13 456 B 13 426 W	13 460 E 13 460 B 13 430 W	13 464 E 13 464 B 13 434 W	10	E 27 B 22 BA 15 d	40 40 35	69 61 60	9228 504 101 .. 9228 503 101 .. 9228 500 101 ..	9228 504 171 .. 9228 503 171 .. 9228 500 171 ..	9228 504 205 .. 9228 503 205 .. 9228 500 205 ..	3 3 4
13 457 E 13 457 B 13 427 W	13 461 E 13 461 B 13 431 W	13 465 E 13 465 B 13 435 W	15	E 27 B 22 BA 15 d	40 40 35	69 61 60	9228 524 101 .. 9228 523 101 .. 9228 520 101 ..	9228 524 171 .. 9228 523 171 .. 9228 520 171 ..	9228 524 205 .. 9228 523 205 .. 9228 520 205 ..	3 3 4
13 458 E 13 458 B 13 428 W	13 462 E 13 462 B 13 432 W	13 466 E 13 466 B 13 436 W	25	E 27 B 22 BA 15 d	40 40 35	69 61 60	9228 544 101 .. 9228 543 101 .. 9228 540 101 ..	9228 544 171 .. 9228 543 171 .. 9228 540 171 ..	9228 544 205 .. 9228 543 205 .. 9228 540 205 ..	3 3 4
13 459 E 13 459 B 13 429 W	13 463 E 13 463 B 13 433 W	13 467 E 13 467 B 13 437 W	35	E 27 B 22 BA 15 d	40 40 35	69 61 60	9228 568 101 .. 9228 567 101 .. 9228 560 101 ..	9228 568 171 .. 9228 567 171 .. 9228 560 171 ..	9228 568 205 .. 9228 567 205 .. 9228 560 205 ..	3 3 4

LAMPS FOR OPTICAL SIGNALING

Increasing railway traffic and higher speeds require the perfecting of the signaling systems generally applied hitherto. Optical signals are, therefore, gradually replacing manual or flag signs, hence eliminating the human element as far as possible. Philips make a significant contribution towards safety in this sector with their range of high-precision lamps manufactured to meet the specific needs of optical signaling.



Type number	Voltage V	Wattage W	Lum. flux lm	Av. life h	Base	Max. diam.	Max. length	Lcl.	Ordering number
12108 12106 12107	12 12 30	6 30/30 15/15	55 350 165	600	BA 20 d	35.5	67	29.6	9227 237 171 .. 9227 339 171 .. 9227 279 221 ..

CURRENT-INDICATOR LAMPS

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

Current range	Base	Diam.	Max. length	Fig.	Ordering number
0.090- 0.150 A	BA 15 d B 22 d	30	49	1 2	9227 705 001 .. 9227 704 001 ..
0.130- 0.220 A	B 22 d	30	49	2	9227 708 001 ..
0.180- 0.310 A	E 27 B 22 d	30	51.5 49	2	9227 715 001 .. 9227 712 001 ..
0.280- 0.450 A	E 27 B 22 d	30	51.5 49	2	9227 719 001 .. 9227 716 001 ..
0.400- 0.650 A	B 22 d	30	49	2	9227 720 001 ..
0.580- 0.950 A	E 27 B 22 d	30	51.5 49	2	9227 727 001 .. 9227 724 001 ..

Current range	Base	Diam.	Max. length	Fig.	Ordering number
0.850- 1.400 A	E 27 B 22 d	30	51.5 49	2	9227 731 001 .. 9227 728 001 ..
1.250- 2.000 A	E 27 B 22 d	30	51.5 49	2	9227 735 001 .. 9227 732 001 ..
1.800- 3.000 A	E 27 B 22 d	30	51.5 49	2	9227 743 001 .. 9227 740 001 ..
2.700- 4.500 A	E 27	30	51.5	2	9227 751 001 ..
4.000- 6.500 A	E 27 B 22 d	30	51.5 49	2	9227 759 001 .. 9227 756 001 ..
5.800-10.000 A	E 27	30	51.5	2	9227 767 001 ..

AIRCRAFT LAMPS

The immense development of aviation in recent years has created an urgent demand for a wide variety of aircraft lamps. To meet this demand Philips have available an extensive range of lamps for the general lighting of passenger cabins as well as reading lamps, lamps for stewardesses' and navigators' work tables, for galleys, luggage compartments, etc.

Type number	Design voltage V	Current, Wattage or Candle power	Average life h	Base	Diam.	Max. length	Lcl.	Fig.	Ordering number	Application [1]
323 323 R/476 [3]	3	0.190 A	350	special	4	14.2	4.5	1 2	9236 600 042 .. 9236 601 042 ..	1
328	6	0.200 A	500	S 6 s	5.7	15.8	9.5	3	9236 602 101 ..	1
47	6.3	0.150 A	3000	BA 9 s	10	29	19.5	4	9234 660 112 ..	1
44	6.3	0.250 A	3000	BA 9 s	10	30	20	4	9235 500 112 ..	1, 4
1129	6.4	21 cp	200	BA 15 s	25	50.5	31.8	5	9226 745 114 ..	2, 3, 4
81	6.5	6 cp	500	BA 15 s	18	36	19	6	9234 060 116 ..	1, 2, 4
87	6.75	15 cp	300	BA 15 s	25	50.5	28.6	5	9226 743 121 ..	2, 3
63 64	7	3 cp	1000	BA 15 s BA 15 d	18	36	19	6	9234 050 126 .. 9234 051 126 ..	1, 2, 4
1143	12.5	32 cp	400	BA 15 s	35	56	31.8	7	9226 461 178 ..	3
1141 1142	12.8	21 cp	500	BA 15 s BA 15 d	25	50.5	31.8	5	9226 745 179 .. 9226 744 179 ..	2, 3, 4
1816	13	0.330 A	1000	BA 9 s	10	29	16	8	9234 690 181 ..	1
1047	26	2.700 A	25	BA 15 s	35	56	31.8	7	9228 590 212 ..	3, 5
1819	28	0.040 A	1000	BA 9 s	10	29	16	9	9234 620 217 ..	1
327	28	0.040 A	1000	SX 6 s	5.7	15.8	9.6	3	9234 625 217 ..	1
1820	28	0.100 A	1000	BA 9 s	10	29	16	9	9234 640 217 ..	1
313 313 OF/07 [3] 313 R/276 [4]	28	0.170 A	500	BA 9 s	10	29	16	9 10 11	9234 671 217 .. 9234 674 217 .. 9234 672 217 ..	1
301 302	28	3 cp	500	BA 15 s BA 15 d	16.2	34	17.5	12	9234 730 217 .. 9234 732 217 ..	1, 2
303 303 OF/07 [3] 304	28	6 cp	500	BA 15 s BA 15 s BA 15 d	18	35	19	13 14 13	9234 740 217 .. 9234 741 217 .. 9234 743 217 ..	1, 2
305 305 IF/21 [5] 306	28	15 cp	300	BA 15 s BA 15 s BA 15 d	25	50.5	28.6	15 16 15	9228 602 217 .. 9228 603 217 .. 9228 600 217 ..	2
307 307 IF/21 [5] 307 SB/02 [6] 308	28	21 cp	300	BA 15 s BA 15 s BA 15 s BA 15 d	25	50.5	31.8	15 16 17 15	9228 612 217 .. 9228 613 217 .. 9228 616 217 .. 9228 610 217 ..	2, 3
309 309 SB/02 [6] 310	28	32 cp	300	BA 15 s BA 15 s BA 15 d	36	60	31.8	18 19 18	9228 622 217 .. 9228 625 217 .. 9228 620 217 ..	2, 3
311 312	28	50 cp	300	BA 15 s BA 15 d	36	60	31.8	18	9228 632 217 .. 9228 630 217 ..	2, 3
1385/13 [7]	28	20 W	300	BA 15 s	38	66.5	—	20	9228 537 217 ..	6
13018	28	85 W	250	special	8	63	—	21	9238 740 217 ..	7
12109	28	100 W	100	BA 20 d	42	71	30	22	9232 606 217 ..	2
13032	28	260 W	300	R 7 s-15	12	63.4	—	23	8222 204 680 ..	8

[1] 1 = indicator or instrument lamp
2 = interior lamp
3 = position lamp
4 = lamp for groundservice vehicles
5 = flashing or signal lamp
6 = reading lamp
7 = (halogen) anti-collision lamp
8 = landing lamp

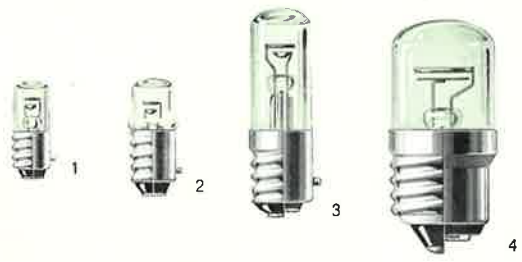
[2] red stoved
[3] outside frosted
[4] red sprayed
[5] inside frosted
[6] silvered bowl
[7] outside-frosted front

NEON GLOW LAMPS

The extensive range of Philips Neon Glow Lamps provides a large selection for inclusion in most types of signal unit and fitting. 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 also be supplied in green. An interesting development in the high-brightness range is a rectangular lamp with square contact plates. An important feature is the position of the electrodes adjoining each other, to function as a kind of reflector, thus producing a more directed beam of light.



Applications

Electric appliances of all kinds 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; virtually shock and vibration-proof; minimum heat development; negligible current consumption; long service life.

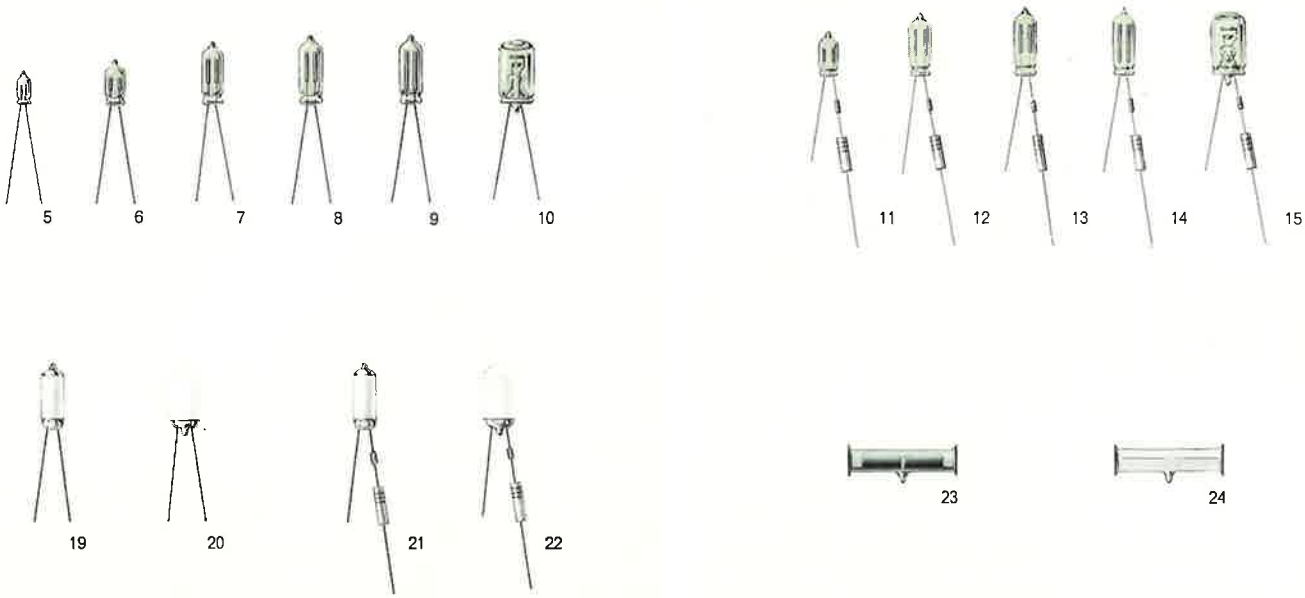
Types with built-in series resistor

Type number	Mains Voltage V	Approx. current mA	Base	Max. diam.	Max. length	Fig.	Ordering number
GL 40 D	110 ... 130 A.C. and D.C. 220 ... 250 A.C. 380 A.C.	1 1.5 0.6	EX 10	10	26	1	9282 720 000 .. [1] 9282 721 000 .. [1] [2] 9282 722 000 .. [1] [2]
GL 40 N	110 ... 130 A.C. and D.C. 220 ... 250 A.C. 380 A.C.	1 1.5 0.6	BA 9 s	10	26	1	9282 725 000 .. [1] 9282 726 000 .. [1] [2] 9282 727 000 .. [1] [2]
GL 41 M	110 ... 130 A.C. and D.C. 220 ... 250 A.C. 380 A.C.	2 2.5 1	E 14	14	30	2	9282 815 000 .. [1] 9282 816 000 .. [1] [2] 9282 817 000 .. [1] [2]
GL 41 W	110 ... 130 A.C. and D.C. 220 ... 250 A.C. 380 A.C.	2 2.5 1	B 15 d	14	30	2	9282 820 000 .. [1] 9282 821 000 .. [1] [2] 9282 822 000 .. [1] [2]
GL 42 M	110 ... 130 A.C. and D.C. 220 ... 250 A.C. 380 A.C.	2 3.5 2	E 14	15.5	54	3	9282 950 000 .. [1] 9282 951 000 .. [1] [2] 9282 952 000 .. [1] [2]
GL 42 W	110 ... 130 A.C. and D.C. 220 ... 250 A.C. 380 A.C.	2 3.5 2	B 15 d	15.5	51.5	3	9282 955 000 .. [1] 9282 956 000 .. [1] [2] 9282 957 000 .. [1] [2]
GL 45 E	110 ... 130 A.C. 110 ... 130 D.C. 220 ... 250 A.C.	4 4 7	E 27	28.5	62	4	9283 005 000 .. 9283 007 000 .. 9283 006 000 ..
GL 45 B	110 ... 130 A.C. 110 ... 130 D.C. 220-230 A.C. 230-250 A.C.	4 4 7 7	B 22	28.5	58	4	9283 000 000 .. 9283 003 000 .. 9283 001 000 .. 9283 002 000 ..

Types to be used with separate resistor

Type number	Mains voltage V	Ignition voltage V	Approx. current mA	Base	Max. diam.	Max. length	Fig.	Ordering number	Recommended series resistor kΩ	W
GL 14 D GL 14 N	110 ... 130 A.C. and D.C.	< 75 A.C. < 105 D.C.	1	EX 10 BA 9 s	10	26	1	9282 256 000 .. [1] 9282 257 000 .. [1]	56	0.25
GL 1 M GL 1 W	110 ... 130 A.C. and D.C.	< 75 A.C. < 105 D.C.	2	E 14 B 15 d	14	30	2	9282 301 000 .. [1] 9282 302 000 .. [1]	27	0.25
GL 12 D GL 12 N	220 ... 250 A.C.	< 200	1.5	EX 10 BA 9 s	10	26	1	9282 251 000 .. [1] [2] 9282 252 000 .. [1] [2]	82	0.25
GL 4 M GL 4 W	220 ... 250 A.C.	< 200	2.5	E 14 B 15 d	14	30	2	9282 306 000 .. [1] [2] 9282 307 000 .. [1] [2]	47	0.25

[1]) Lens-end type
[2]) High-brightness type



Baseless types without resistor

Type number	Mains voltage V	Ignition voltage V		Approx. current mA	Base	Max. diam.	Max. length	Fig.	Ordering number	Recommended series resistor kΩ	W
GL 2	110 ... 130 A.C. and D.C. 220 ... 250 A.C. and D.C. 380 A.C.	< 65 A.C.	< 90 D.C.	0.5	—	4.7	11	5	9282 207 000 ..	120 270 680	0.1 0.1 0.1
GL 6	110 ... 130 A.C. and D.C. 220 ... 250 A.C. and D.C.	< 65 A.C.	< 90 D.C.	0.5	—	6	16	7	9282 201 000 ..	120 330	0.25 0.25
GL 8	110 ... 130 A.C. and D.C. 220 ... 250 A.C. and D.C.	< 65 A.C.	< 90 D.C.	0.5	—	6	19	8	9282 203 000 ..	120 330	0.25 0.25
GL 14	110 ... 130 A.C. and D.C.	< 75 A.C.	< 105 D.C.	1	—	8.9	18.5	10	9282 255 000 .. [1]	56	0.25
GL 5	110 ... 130 A.C. 220 ... 250 A.C.	< 100		1	—	6	12.5	6	9282 200 000 .. [2]	47 150	0.25 0.25
GL 7	110 ... 130 A.C. 220 ... 250 A.C.	< 100		1.5	—	6	16	7	9282 202 000 .. [2]	47 100	0.25 0.25
GL 12	220 ... 250 A.C.	< 187		1.5	—	8.9	18.5	10	9282 250 000 .. [1] [3]	82	0.25
GL 9	110 ... 130 A.C. 220 ... 250 A.C.	< 100		2	—	6	19	9	9282 204 000 .. [2] [3]	27 68	0.25 0.5

Baseless types with attached series resistor

GR 6	110 ... 130 A.C.	—		0.5	—	6	16	12	9282 600 000 ..	—	—
GR 8	110 ... 130 A.C.	—		0.5	—	6	19	13	9282 610 000 ..	—	—
GR 5	110 ... 130 A.C. 220 ... 250 A.C.	—		1	—	6	12.5	11	9282 649 000 .. [2] 9282 650 000 .. [2]	—	—
GR 14	110 ... 130 A.C.	—		1	—	8.9	18.5	15	9282 710 000 .. [1]	—	—
GR 7	110 ... 130 A.C. 220 ... 250 A.C.	—		1.5	—	6	16	12	9282 606 000 .. [2] 9282 605 000 .. [2]	—	—
GR 12	220 ... 250 A.C.	—		1.5	—	8.9	18.5	15	9282 711 000 .. [1] [3]	—	—
GR 9	110 ... 130 A.C. 220 ... 250 A.C.	—		2	—	6	19	14	9282 615 000 .. [2] [3] 9282 616 000 .. [2] [3]	—	—

Green-fluorescent types with built-in series resistor

GR 60 D	220 A.C. 240 A.C.	—		70	EX 10	10	26	16	9282 770 117 .. [2] 9282 771 117 .. [2]	—	—
GR 66 M	220 A.C. 240 A.C.	—		70	E 14	14	30	17	9282 905 117 .. [2] 9282 906 117 .. [2]	—	—
GR 72 M	220 A.C. 240 A.C.	—		70	E 14	16	54	18	9282 980 117 .. [2] 9282 981 117 .. [2]	—	—

Baseless green-fluorescent types without resistor

GL 69 [4]	220 A.C. 240 A.C.	< 187		1.2	—	6	17.5	19	9282 206 117 .. [2]	82 100	0.25 0.25
GL 60 [4]	220 A.C. 240 A.C.	< 187		1.5	—	10	17.5	20	9282 260 117 .. [2]	82 100	0.25 0.25

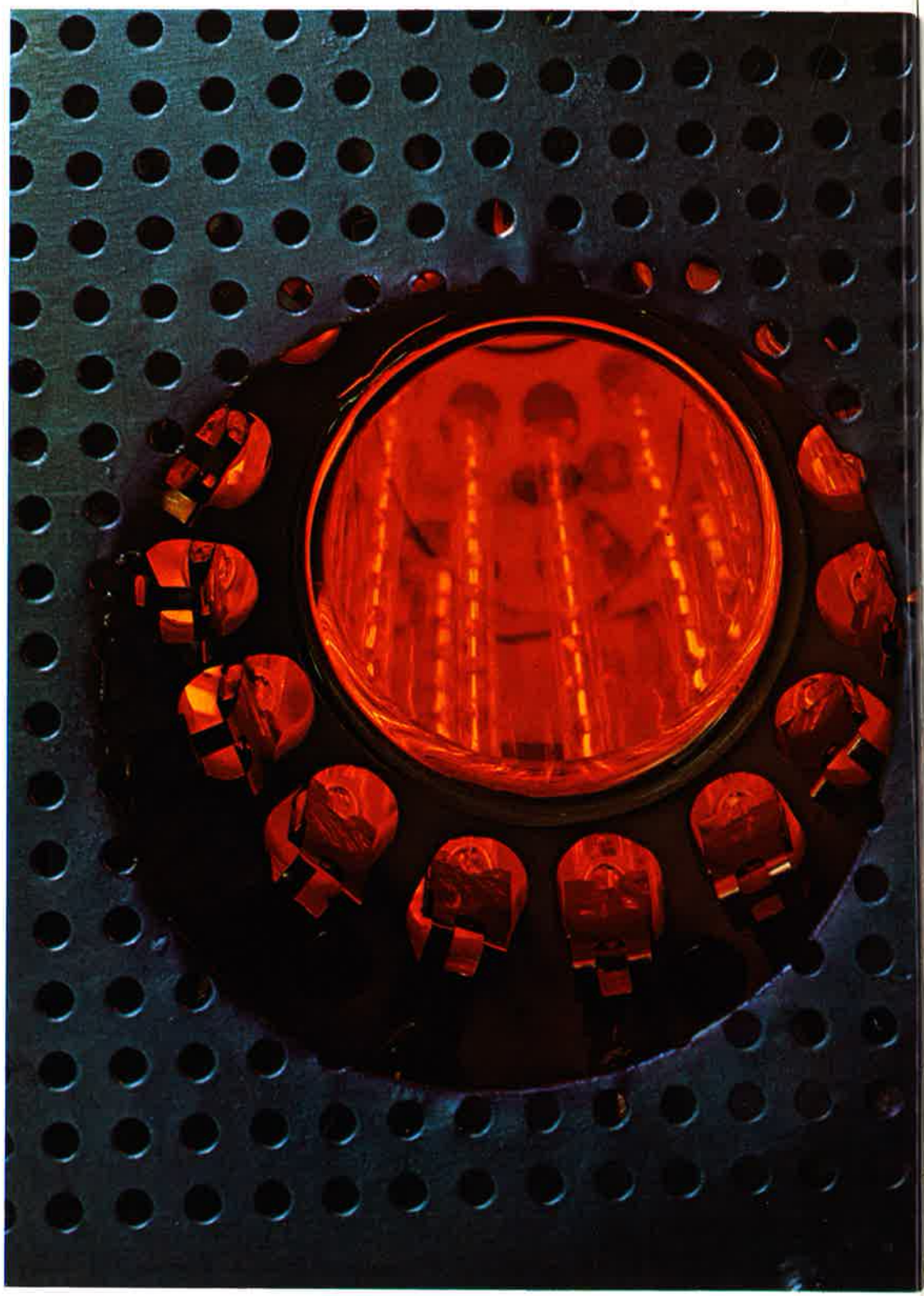
Baseless green-fluorescent types with attached series resistor

GR 69 [4]	220 A.C. 240 A.C.	—		1.2	—	6	17.5	21	9282 651 117 .. [2] 9282 652 117 .. [2]	—	—
GR 60 [4]	220 A.C. 240 A.C.	—		1.5	—	10	17.5	22	9282 765 117 .. [2] 9282 766 117 .. [2]	—	—

Neon-red and green-fluorescent types with end-contacts; without resistor

GL 90 [5] [6]	220 A.C. 240 A.C.	< 187		4	—	6	28.5	23	9282 254 000 .. [2]	27 30	0.5 0.5
GL 91 [4] [7]	220 A.C. 240 A.C.	< 187		4	—	6	28.5	24	9282 259 117 .. [2]	27 30	0.5 0.5

[1]) Lens-end type
[2]) High-brightness type
[3]) With extra-long electrodes
[4]) Max. ambient temperature 70 °C
[5]) Max. ambient temperature 100 °C
[6]) Signal colour: red
[7]) Signal colour: green



LAMPS FOR SPECIAL PURPOSES

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INFRA-RED REFLECTOR HEAT LAMPS FOR AGRICULTURAL PURPOSES

Efficient heating is of paramount importance for a poultry farm and livestock enterprise run on modern lines.

Philips infra-red reflector heat lamps make an invaluable contribution towards the breeding of healthy chicks, ducklings, goslings, turkeys, pigs, calves, foals, etc.

The outstanding advantages of infra-red heating can be summarized as follows: more rapid growth, less mortality, increased power of resistance of the livestock and more hygienic premises.

These favourable conditions can be achieved to perfection with Philips infra-red reflector heat lamps, which combine high efficiency, long service life, simple installation and complete safety.

13346 E/44
13352 E/44
13372 E/44

13346 E/479
13352 E/479
13372 E/479

Type number	Wattage W	Voltage V	Finish bulb front	Av. life h	Base	Diam.	Max. length	Ordering number
13346 E/44	150	220-230 230-250	inside satin-frosted	5000	E 27	125	183	9232 208 .....
13346 E/479		110-120 125-130 220-230 230-250	red					9232 206 .....
13352 E/44	250		inside satin-frosted					9232 216 .....
13352 E/479			red					9232 222 .....
13372 E/44 [1] [2]			inside satin-frosted					9232 220 .....
13372 E/479 [1]		110-120 220-230	red					9232 224 .....

[1]) Hard-glass bulb

[2]) Specially recommended for pig breeding

INFRA-RED REFLECTOR HEAT LAMPS FOR "INFRAPHIL" APPARATUS

The "Infraphil" lamp emits a skin-penetrating warmth in the short-wave infra-red region, the inside of the bulb being coated with a reflective layer. The lamps are red fronted; the pressed-glass version is, moreover, provided with prismatic rings producing a lens effect that provides a very beneficial concentration of radiant heat.

Philips "Infraphil" is applied to promote healing and soothe away pain in case of ailments such as rheumatism, lumbago, aching muscles, colds, neuralgia, etc.

13373 F/479

13379 F/479

Type number	Wattage W	Voltage V	Bulb and finish	Av. life h	Base	Diam.	Max. length	Ordering number
13373 F/479	150	115-120 125-130 220-230 240	blown bulb; red front	300	B 22 III	125	173	9232 240 .....
13379 F/479			pressed glass; red front			121	125	9238 032 .....

INFRA-RED REFLECTOR HEAT LAMPS FOR INDUSTRIAL PURPOSES

The characteristic features of Philips infra-red reflector heat lamps have proved their worth in the industrial sector as well, where they have been used with striking success by many industries to solve the problems encountered during industrial drying processes. These lamps also permit the construction, at low initial cost, of efficient, lightweight, easily transportable ovens of simple construction, which are readily adaptable to varying conditions.

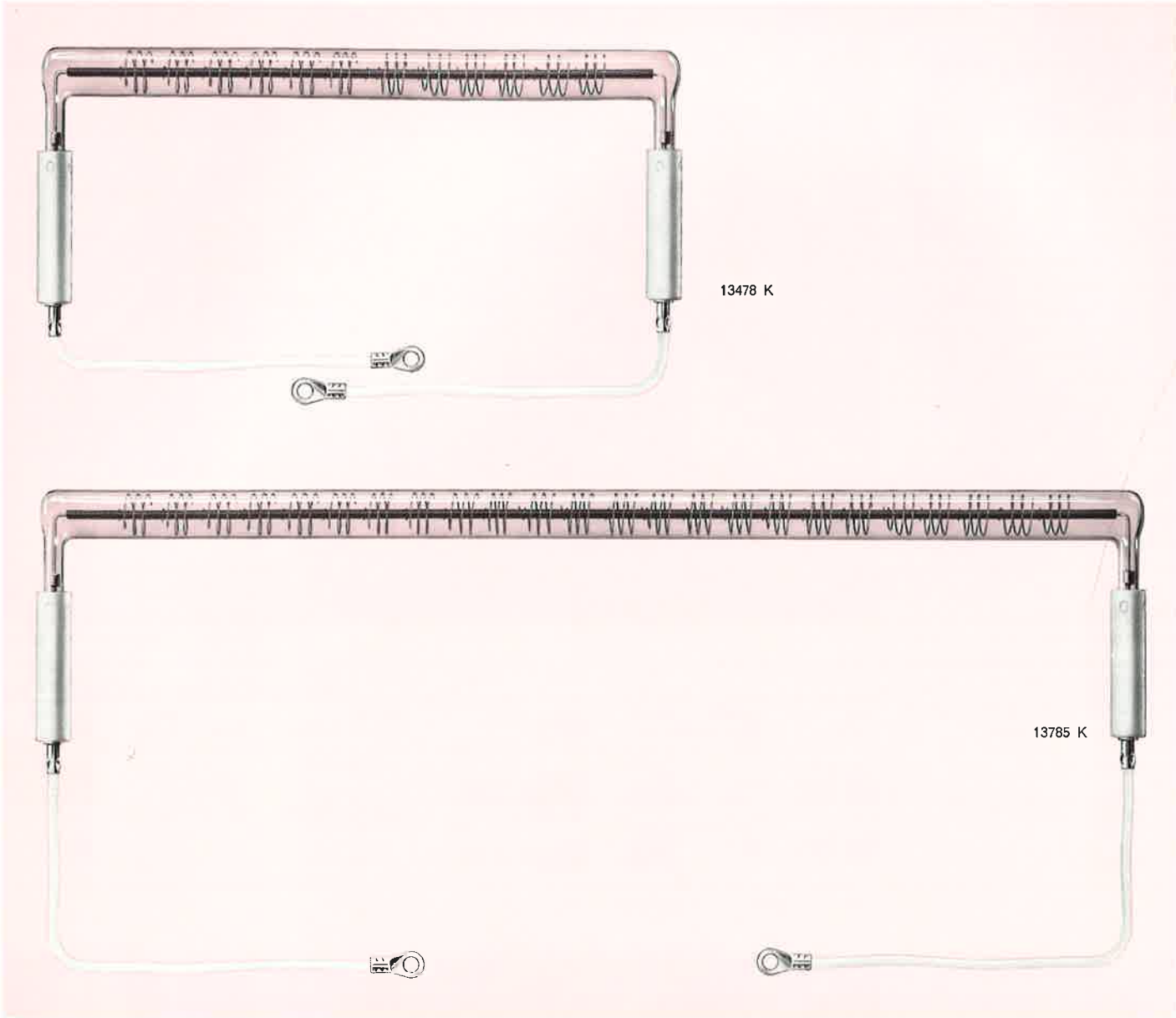
Philips reflector infra-red heat lamps are considered outstanding for the following reasons: They combine high power with small dimensions, excellent efficiency with long service life to which are added the very useful characteristics of easy interchangeability and ability to burn in any desired position.

13372 E/06
13344 E/06

13372 E/44
13352 E/44
13344 E/44

Type number	Wattage W	Voltage V	Finish bulb front	Av. life h	Base	Diam.	Max. length	Ordering number
13372 E/06 [1])	250	110-120 125-130 220-230 230-250	clear	5000	E 27	125	183	9232 219 .....
13372 E/44 [1])			inside satin-frosted					9232 220 .....
13352 E/44			inside satin-frosted					9232 216 .....
13344 E/06 [1])	375	110-120 220-230 230-250	clear					9232 235 .....
13344 E/44 [1])			inside satin-frosted					9232 236 .....

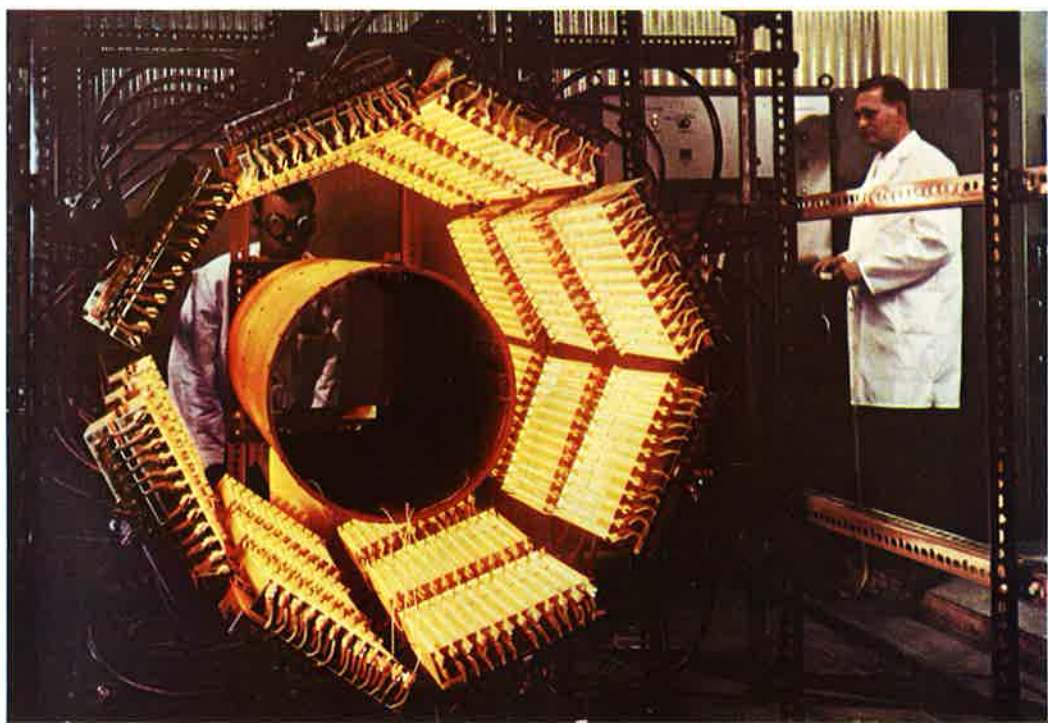
[1]) Hard-glass bulb

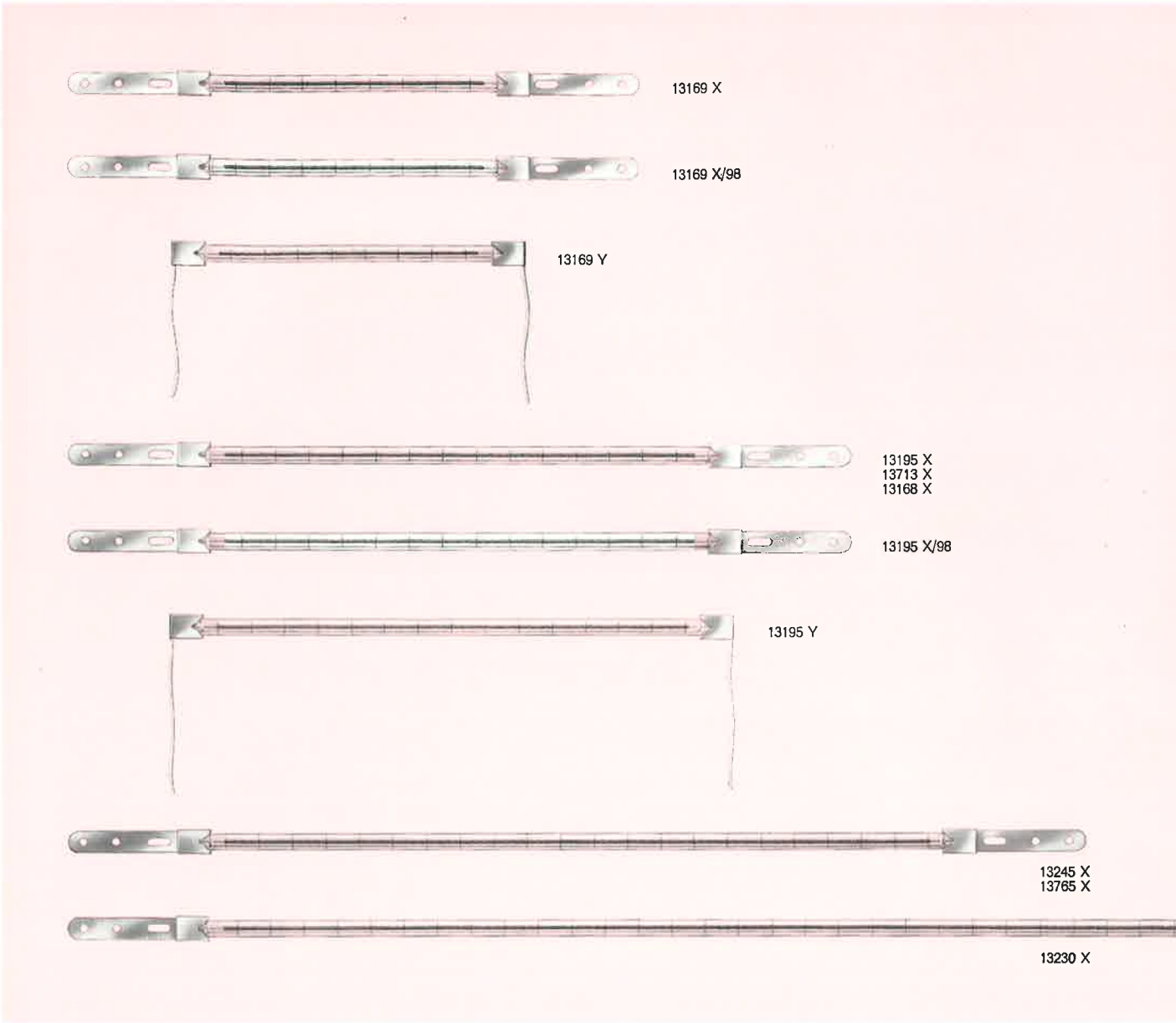


HALOGEN INFRA-RED HEAT LAMPS FOR INDUSTRIAL PURPOSES

These 12 and 20 kW infra-red lamps are the most powerful infra-red lamps produced to date. They are used in special water-cooled reflectors for those applications where product temperatures of well over 1000 °C must be attained with a high efficiency, or where an extremely quick object temperature rise is a must.

Type number	Wattage W	Voltage V	Burning position	Caps	Cables	Diam.	Heated length	Max. length	Ordering number
13478 K	12000	220-250	horizontal	K25s/115	insulated with silicon rubber	31	375	405	8222 204 546 ..
13785 K	20000	380-420					665	697	9238 731 579 ..





QUARTZ INFRA-RED HEAT LAMPS FOR INDUSTRIAL PURPOSES

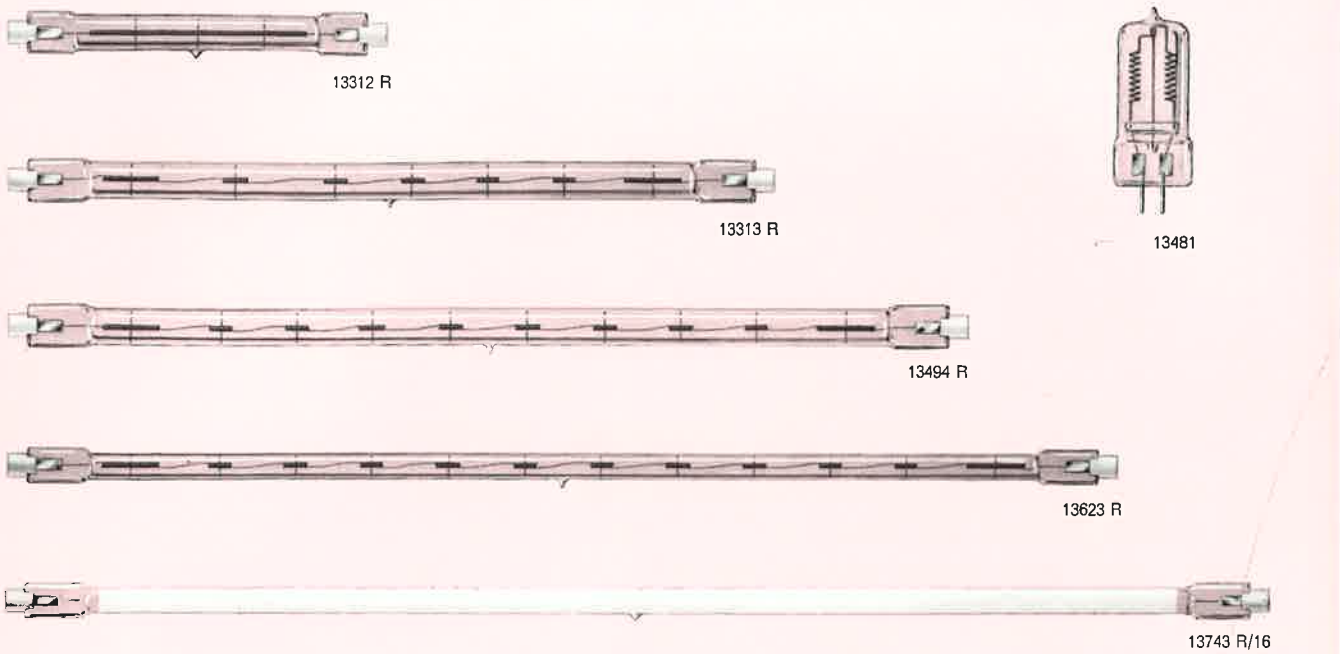
The application of higher-wattage lamps in heaters used for industrial processes is rapidly increasing as their infra-red energy output is higher than that of reflector-bulb lamps. Moreover, quartz heaters are much sturdier. The most outstanding feature of quartz infra-red lamps, however, is the possibility which they provide of building very compact, simple, light-weight heating systems. An added advantage is the fact that the lamps reach their optimum working temperature immediately and cool down very rapidly. Finally, temperature control is possible within very narrow limits, this being an essential factor in treating modern material of all kinds.

Type number	Wattage W	Voltage V	Av. life h	Burning position	Caps	Diam.	Heated length	Fixing centres	Ordering number
13169 X	500	110-130		any	X 502	12	140	241	9238 500 323 ..
13169 X/98 [1]					X 502			241	9238 502 323 ..
13169 Y					clips with supply leads			226 [2]	9238 501 323 ..
13195 X	1000	220-250	> 5000	horizontal	X 502	12	272	368	9238 510 439 ..
13195 X/98 [1]					X 502			368	9238 514 439 ..
13195 Y					clips with supply leads			353 [2]	9238 511 439 ..
13713 X				any	X 502	12	272	368	9238 515 439 ..
13168 X				horizontal	X 502	12	280	368	9238 525 439 ..
13245 X	2000	380-420		horizontal	X 502	12	410	508	9238 530 579 ..
13765 X				any	X 502	12	410	508	9238 531 579 ..
13230 X	3000			horizontal	X 502	12	700	798	9238 540 579 ..

[1]) With reflector stripe [2]) Max. length

LAMPHOLDER

A special lampholder has been developed for these lamps.



HALOGEN LIGHT COPYING LAMPS

These lamps are excellent for use in electrostatic copying machines. A further suitable application is for copy-board lighting.

Type number	Wattage W	Voltage V	Average luminous flux lm	Average colour temperature °K	Practical life switchings [1]	Burning position	Base	Diam.	Lighting length	Max. insertion length	Ordering number
13312 R	500	120	13000	3200	> 50000	horizontal	R 7s-15	12	60	117.6	9238 614 363 ..
13313 R	1000	220	22000				R 7s	12	210	254.1	9238 613 429 ..
13494 R	1000	220	21000				R 7s	12	272	317.9	8222 204 653 ..
13623 R	1500	230	33000				R 7s	8.6	320	368.1	9238 623 442 ..
13743 R/16 [2]	1800	280	40000				R 7s	8.6	368	418.2	9238 625 468 ..
13481	1000	220-230 240-250	26000			vertical; base down	G 6.35	24	56 [3]	70 [4]	9238 612 432 .. 9238 612 457 ..

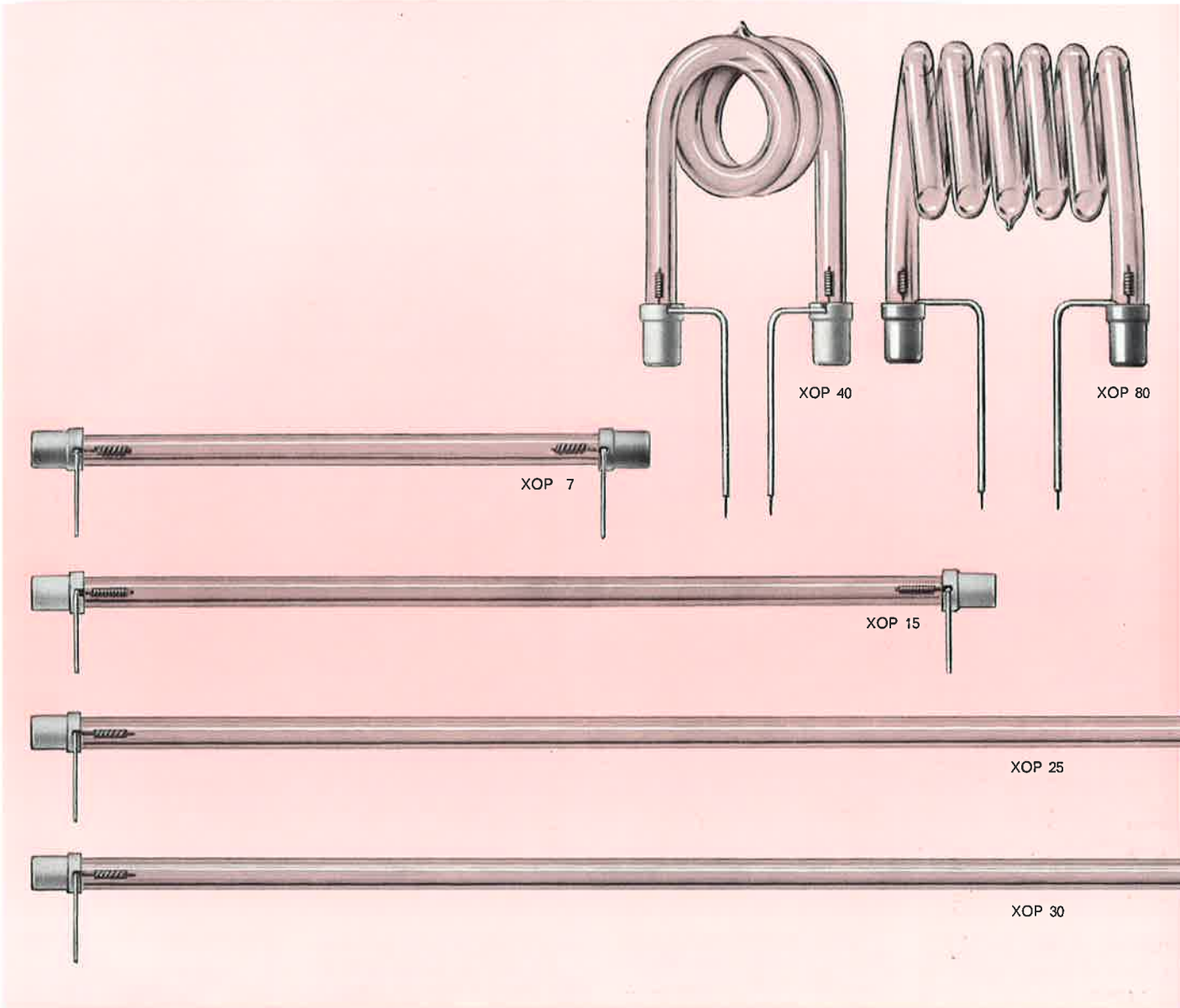
[1]) Switchings lasting 6-8 sec each [2]) Outside frosted [3]) Light centre length [4]) Max. overall length

QUARTZ INFRA-RED HEAT LAMPS FOR COPYING PURPOSES

The Philips tubular, quartz infra-red copying lamps are efficient, compact, high-intensity radiant heat sources for dry reproduction systems. They are high-colour-temperature lamps with exact filament and dimensional tolerances, providing accurate focusing in suitably designed reflectors.

Type number	Wattage W	Voltage V	Practical life switchings [1]	Burning position	Caps	Max. diam.	Heated length	Max. length	Ordering number
13381/99	1350	115 220 240	25000	horizontal	ceramic, with flexible leads	8.6	254	322	9238 608 344 .. 9238 608 429 .. 9238 608 455 ..

[1]) 4 seconds on - 4 seconds off



XOP LAMPS

The Philips XOP lamps are low-pressure pulsed xenon discharge lamps specially developed for the graphic art industry. One of their most important features is that the spectrum largely approximates that of average daylight, hence the lamp is the perfect answer to the problems of copy-board lighting.

XOP lamps possess the following additional advantages which make them particularly useful for this application: Instant start and restart (no warming-up); full light output immediately after starting; colour temperature and light output remain constant during their entire life; very clean in operation; ideal for reflector design due to their very small diameter; uniform light output during exposure; long life, hence low operating costs; high efficiency.

Applications

Copy-board lighting

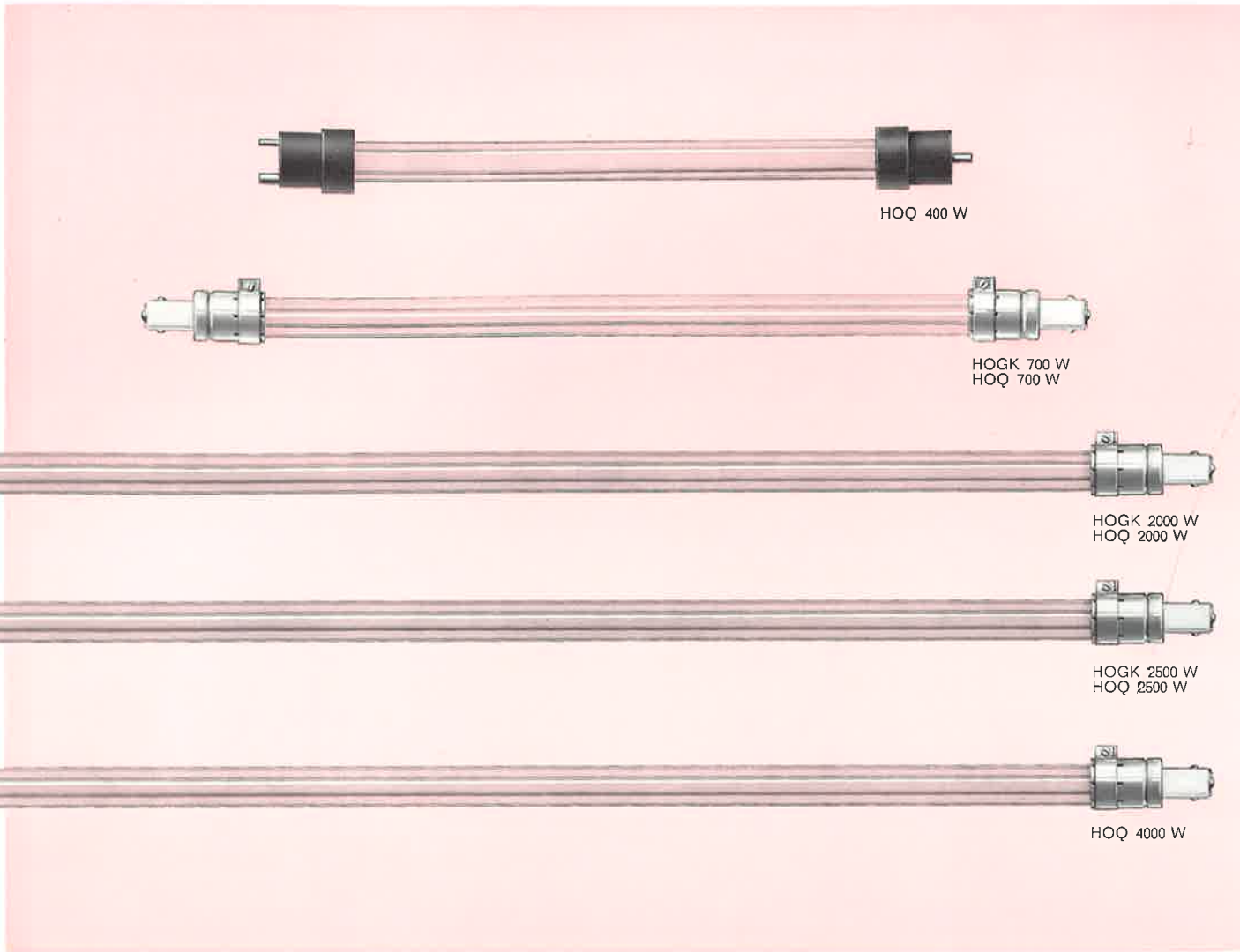
Small, horizontal copy-boards as well as large vertical ones can be lit very evenly with two or four linear lamps respectively. Owing to their spectral energy distribution, XOP lamps are eminently suitable for colour reproduction, while for black-and-white reproduction these lamps are superior to almost every other light source.

Stop-and-repeat copying machines

Here too, XOP lamps are extremely useful because of the fact that there is no run-up time.

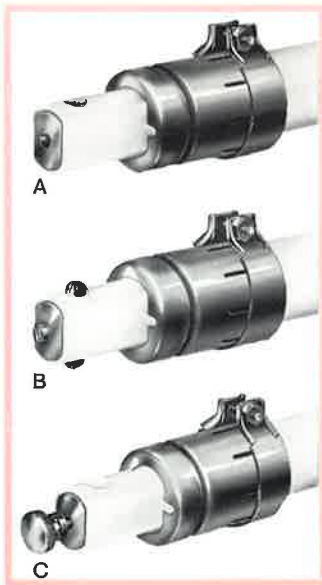
Type	Lamp voltage V	Lamp current A	Nom. lamp wattage W	Luminous efficiency lm/W	Colour temperature °K	Pulse frequency c/s	Average life h	Burning position	Diam.	Max. length	Ordering number
XOP 7	52 ± 3	18.0	750						12 max.	241	9283 768 051 ..
XOP 15	105 ± 5	18.0	1500						12 max.	395	9283 769 051 ..
XOP 25	115 ± 5	18.0	2000	20-25	5600	100-120	300	any	12 max.	540	9283 775 051 ..
XOP 30	210 ± 10	18.0	3000						12 max.	698	9283 772 051 ..
XOP 40	210 ± 10	19.0	4000						[1]	[1]	9283 774 051 ..
XOP 80	420 ± 15	19.0	8000						[2]	[2]	9283 777 051 ..

[1] l x b x h = 64.15 x 60 x 118 (max.)
[2] l x b x h = 109.15 x 60 x 118 (max.)



HOGK AND HOQ LIGHT-PRINTING LAMPS

HOGK and HOQ light-printing lamps are geometrically and electrically identical; they differ only in the kind of quartz used for their envelopes. In the case of HOQ lamps a special quartz is utilized which does not give rise to ozone formation.
Moreover the output of HOQ lamps in the long-wave ultra-violet and adjacent visible region is even slightly better than that of HOGK lamps.



Lamp bases

All HOGK and HOQ lamps have universal lamp bases with

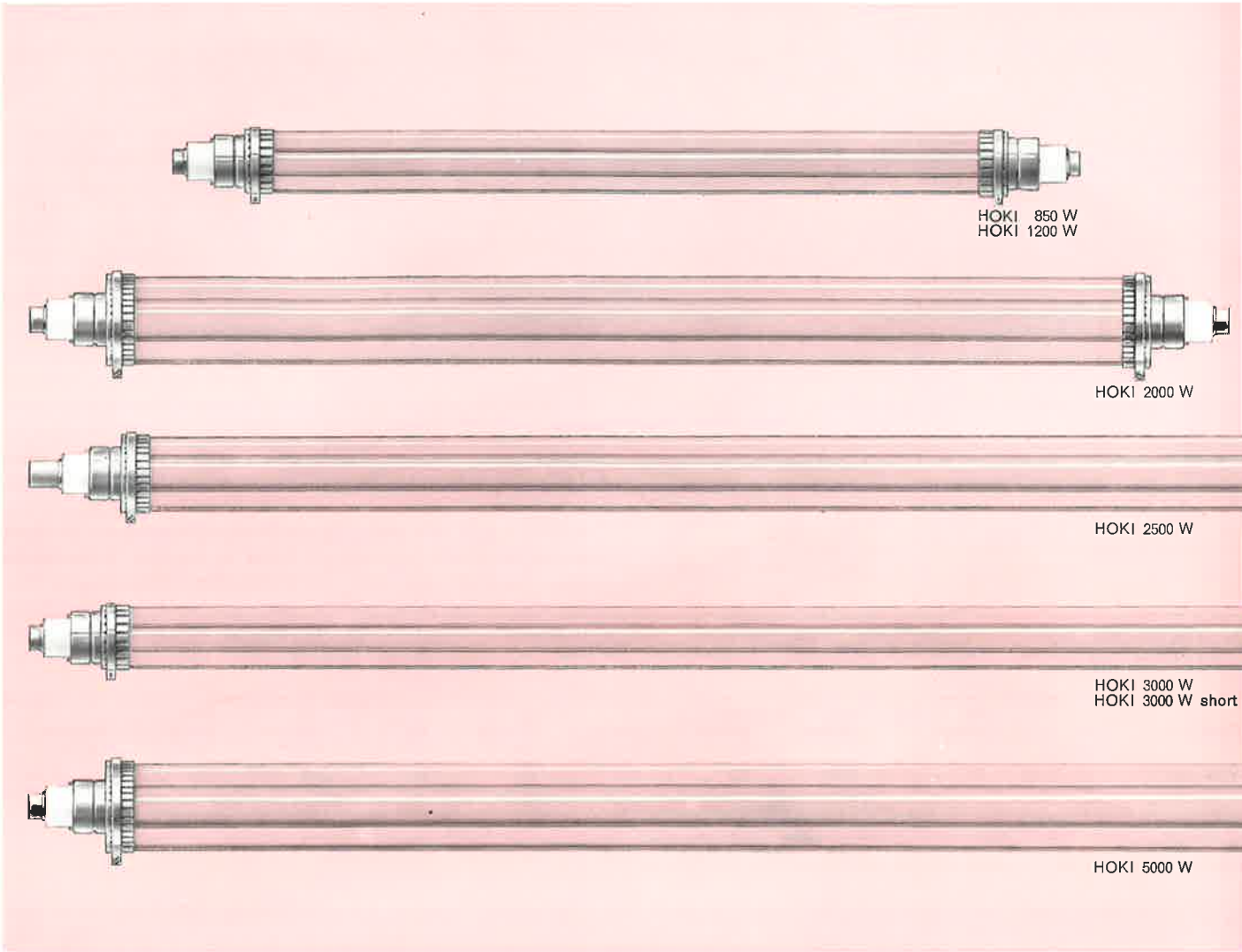
A: end contacts

B: side contacts

C: insulated contact screw (for connection direct to the leads).

Type	Type number	Min. starting voltage V	Lamp voltage V	Lamp current A	Life [1] h	Burning position	Max. diam.	Min. luminous length	Max. overall length	Ordering number
HOGK 700 W	57123 AH/51	340	190	4.2			24	413	567	9281 806 051 ..
HOGK 2000 W	57118 AH/51	680	550	4.2	1000	any	24	1213	1367	9281 816 051 ..
HOGK 2500 W	57124 AH/51	680	550	5.5			24	1350	1504	9281 820 051 ..
HOQ 400 W	57117 X/60	200	125	3.5			24	300	422	9281 800 060 ..
HOQ 700 W	57123 AH/60	340	190	4.2			24	413	567	9281 806 060 ..
HOQ 2000 W	57118 AH/60	680	550	4.2	1000	any	24	1213	1367	9281 816 060 ..
HOQ 2500 W	57124 AH/60	680	550	5.5			24	1350	1504	9281 820 060 ..
HOQ 4000 W	126508	2400	1800	2.5			24	1683	1840	9281 825 060 ..

[1]) At an average of 4 burning hours per switching



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.

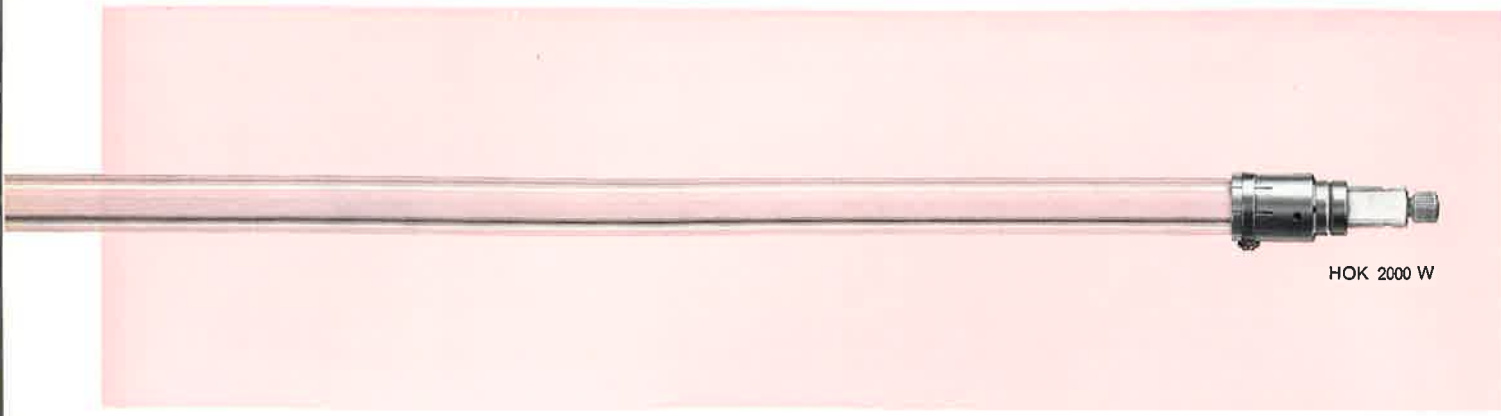
This jacket prevents ozone formation outside the lamp and protects the burner from the airstream flowing between the lamp and the printing cylinder.

HOKI lamps have a higher wattage per unit of length and their surface temperature is correspondingly higher than that of HOGK or HOQ lamps.

Electrically they are identical with their predecessors, the HOK lamps (without jacket). Geometrically and also with regard to the bases there are some differences which may require certain mounting modifications.

Type	Type number	Min. starting voltage V	Lamp voltage V	Lamp current A	Life [1] h	Burning position	Max. diam.	Min. luminous length	Max. overall length	Ordering number
HOKI 850 W	57199 AP/65	750	740	1.3			37	413	539	9281 835 065 ..
HOKI 1200 W	57129 AP/65	600	550	2.5			37	398	524	9281 840 065 ..
HOKI 2000 W	57128 AP/65	680	550	4.2			51	588	715	9281 845 065 ..
HOKI 2500 W	57151 AP/65	680	550	5.5	1000	any	43	1335	1481	9281 850 065 ..
HOKI 3000 W	57125 AP/65	1300	1250	2.7			37	1368	1495	9281 855 065 ..
HOKI 3000 W short	126464	1500	1250	2.7			37	795	925	9281 856 065 ..
HOKI 5000 W	57153 AP/65	2000	1800	3.2			51	1368	1495	9281 860 065 ..

[1]) At an average of 4 burning hours per switching



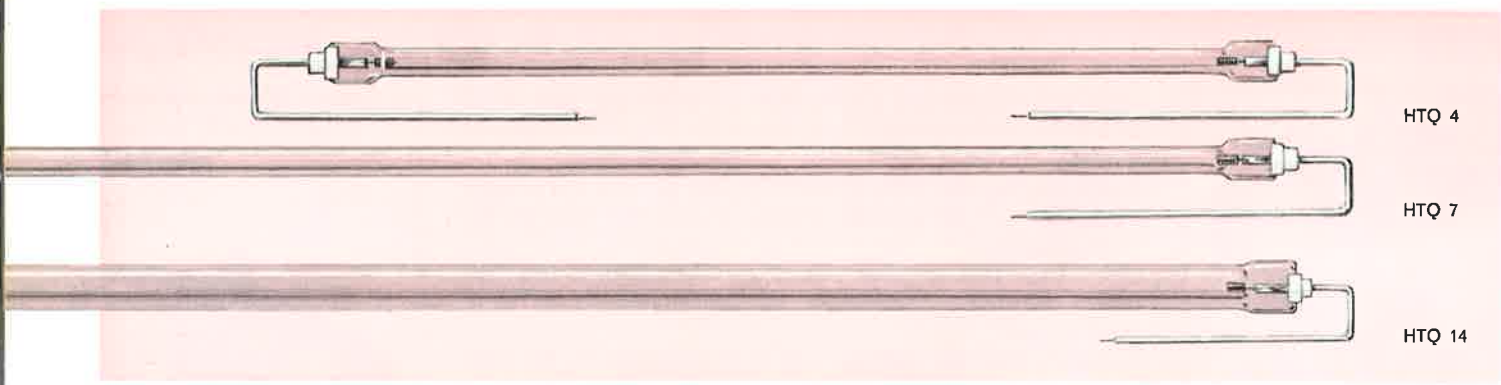
HOK 2000 W

HOK LIGHT-PRINTING LAMP

The transparency of the quartz tube of the HOK lamp to ultra-violet radiation combined with an admissibly high wattage per unit of length makes this lamp highly efficient. The HOK lamp is an extremely economical proposition where very high printing speeds are necessary.
The lamp is also very useful for sterilization purposes and for those applications where formation of ozone is required. It should be noted, however, that this ozone formation may be harmful, depending on the concentration.
The lamp may be used in all positions.

Type	Type number	Min. starting voltage V	Lamp voltage V	Lamp current A	Life [1] h	Burning position	Max. diam.	Min. luminous length	Max. overall length	Ordering number
HOK 2000 W	57122 AH/51	680	550	4.2	1000	any	30	561	732	9281 885 051 ..

[1]) At an average of 4 burning hours per switching



HTQ 4

HTQ 7

HTQ 14

HTQ LIGHT-PRINTING LAMPS

Although originally developed for light-printing purposes, these high-pressure mercury-vapour lamps are mainly used for the irradiation of polyester lacquers containing photosensitive additives. This irradiation causes polymerisation to occur and results in complete hardening of the lacquer coating within a considerably shorter time than when using conventional drying methods.

Type	Lamp voltage V	Nominal wattage W	Operating current A	Burning position	Diam.	Max. radiation length	Max. overall length	Ordering number
HTQ 4	700 ± 25	1000	1.7	horizontal	12.5	442	505.5	9281 870 060 ..
HTQ 7	1400 ± 50	2000	1.7	horizontal	12.5	702	765.5	9281 875 060 ..
HTQ 14	1400 ± 50	4000	3.35	horizontal	24 max.	1402	1470.5	9281 880 060 ..

BALLASTS

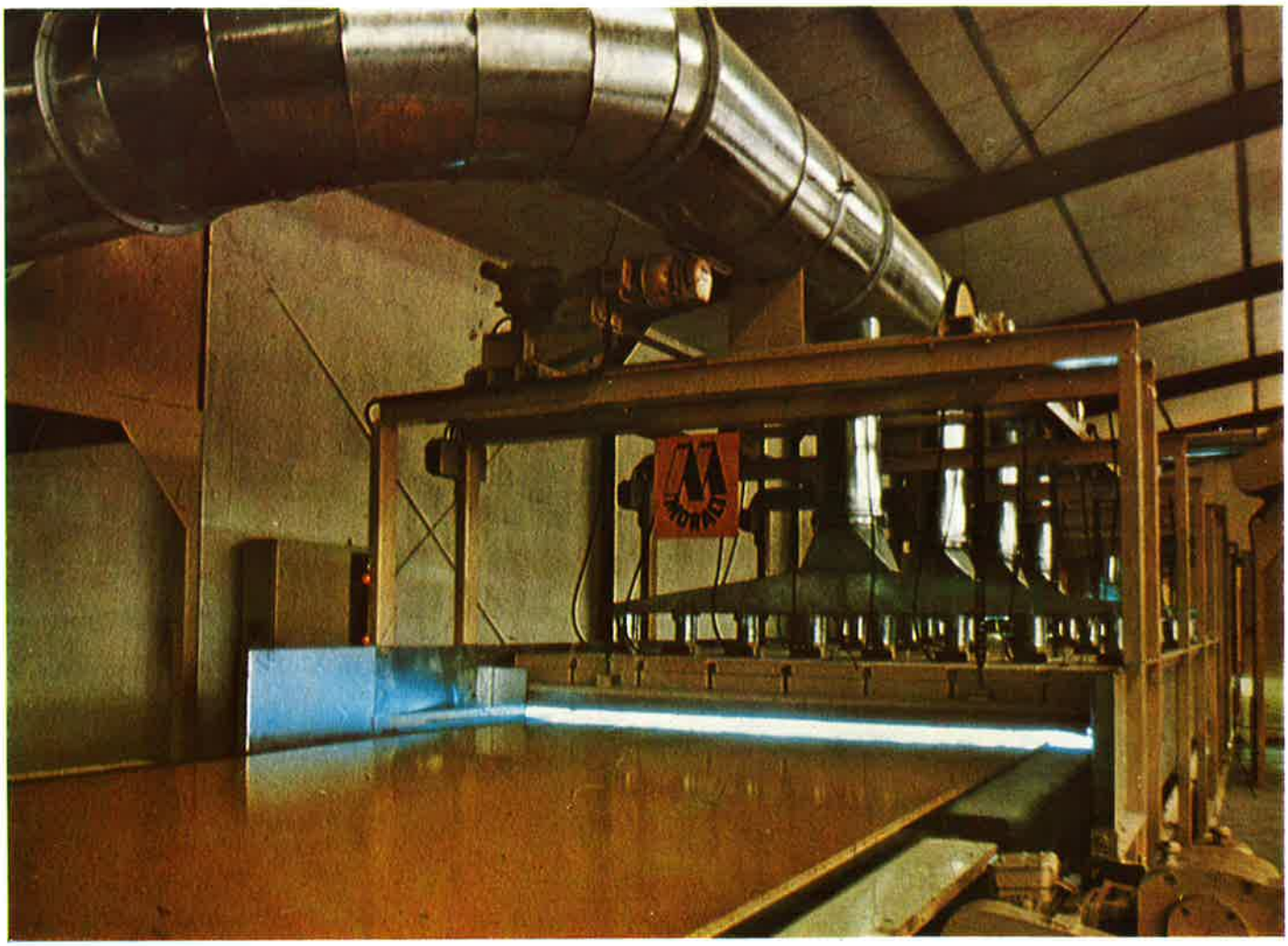
Most HOGK, HOQ and HOKI lamps are operated from A.C. mains in conjunction with the ballasts mentioned in the opposite table. These ballasts are of the constant-wattage type (with high power-factor) and the capacitors mentioned are essential in the circuitry. A constant-wattage ballast consists of a leak-transformer 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 opposite table.

The lamp guarantee only holds good if the lamps are operated on Philips ballasts or ballasts approved by Philips.

126533

126546

For lamps	Type number	Nom. voltage V	Mains current A	Series capacitor µF	Power factor	Losses W	Number of ballasts required	Dimensions l x b x h	Ordering number
HOKI 850 W	126533	230	4.60	3.5	0.95	160	1	220 x 115 x 134	9136 400 186 ..
HOKI 1200 W		230	6.27	9.0	0.99	213	2		
HOGK 2000 W HOQ 2000 W HOK 2000 W HOKI 2000 W		230	10.80	15.4	0.98	380	3		
HOGK 2500 W HOQ 2500 W HOKI 2500 W		230	13.10	19.7	0.98	475	4		
HOKI 3000 W		230	15.40	4.3	0.98	535	4		
HTQ 4	126546	220-240	5.20	4.67	0.95	145	1	255 x 135 x 162	9136 060 386 ..
HTQ 7		230	10.60	2.33	0.97	285	2		
HTQ 14		230	20.50	4.67	0.96	550	4		



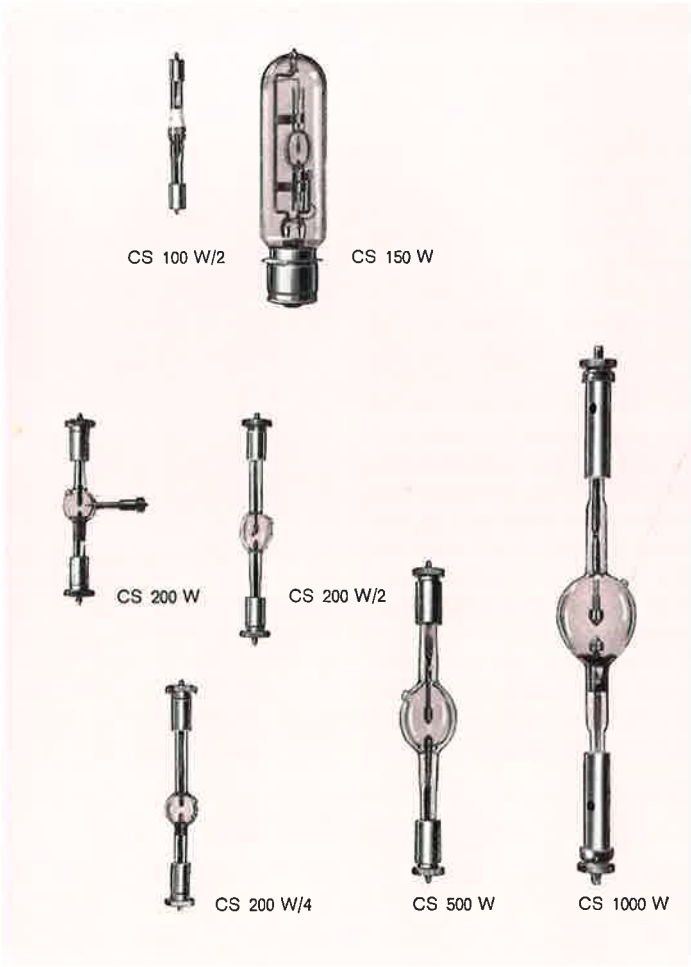
COMPACT SOURCE LAMPS CS

Compact Source Lamps are super-high-pressure mercury lamps. They are characterized by a very high energy concentration within the smallest dimensions. This results in a high brightness, hitherto unknown for such an uncomplicated light source. Moreover, CS lamps emit very high energy radiation in the middle and long-wave ultra-violet region.

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.

Compact source lamps provide the solution when mercury light sources with a higher luminance in the visible region are needed or radiation sources with a high intensity in the ultra-violet region.

They are applied, for example, in microfilm enlargers, recording and measuring instruments, in the fields of microscopy and photochemistry.



Type	Lamp voltage V	Lamp current A	Luminous flux lm	Luminance cd/cm²	Arc length	Burning position	Average life [1] h	Diam.	Max. length	Ordering number
CS 50 W/3	22 D.C.	2.3	1150	120000	0.35	vertical ± 15° [2]	200	9	51	9281 725 051 ..
CS 100 W/2	20 D.C.	5.0	2000	170000	0.20	vertical ± 90° [2]	200	10	87.5	9281 700 051 ..
CS 150 W/2	66 D.C.	2.3	7500	30000	2.00	base down	200	35	140	9281 705 092 ..
CS 150 W/4	66 A.C.	2.7								9281 706 092 ..
CS 200 W	[3] A.C.	[4]	9500	33000	2.20	vertical ± 20° [9]	200	17.5	108	9281 712 051 ..
CS 200 W/2	57 D.C.	3.5	10000	45000	2.20	vertical ± 20° [2]	400	17	124	9281 711 051 ..
CS 200 W/4	[3] A.C.	[4]	9500	33000	2.20	vertical ± 20° [9]	200	17.5	124	9281 713 051 ..
CS 500 W/2	77 D.C.	6.5	29000	30000	4.30	vertical ± 20° [2]	400	28	167	9281 716 051 ..
CS 500 W/4	[5] A.C.	[6]				vertical ± 20° [9]	200			9281 715 051 ..
CS 1000 W/2	80 D.C.	12.5	50000	35000	4.20	vertical ± 15° [2]	400	43	288	9281 722 051 ..
CS 1000 W/4	[7] A.C.	[8]				vertical ± 15° [9]	200			9281 720 051 ..

[1] Based on an average of 3 burning hours per switching
[2] Anode down
[3] 57 - 65 V or 50 - 57 V
[4] 3.4 - 3.9 A or 3.9 - 4.4 A
[5] 77 - 85 V or 70 - 77 V
[6] 6.7 - 7.5 A or 7.5 - 8.3 A
[7] 80 - 85 V or 75 - 80 V
[8] 13.3 - 14.2 A or 14.2 - 15.1 A
dependent on the connection to the tappings of the power supply unit
[9] Stamped base down

BALLASTS

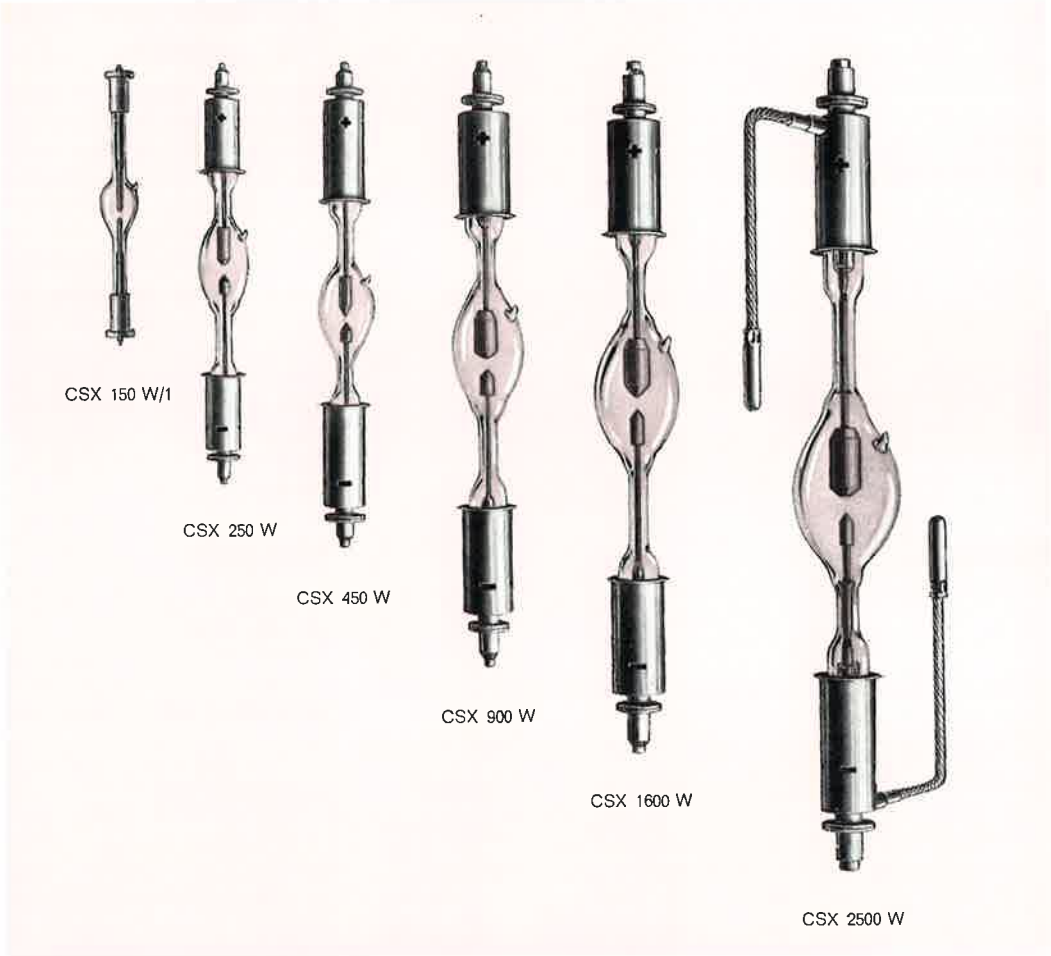
Compact source lamps being gas-discharge lamps, they need some form of current-limiting device or ballast.

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 request.

Power supply unit for CS 150 W

Nom. voltage V	Mains current A	Power factor	Losses W	Dimensions	Ordering number
220	2.0	0.40	30	260 x 170 x 130	9136 300 001 ..



COMPACT SOURCE XENON LAMPS CSX

These super-high-pressure xenon lamps combine very high brightness and maximum arc stability with a colour rendition which closely resembles that of daylight. Moreover, the light colour of compact source xenon lamps is unaffected by 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 developed for D.C. supply.
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. They are applied for cinema projection, colour matching, zone melting, scientific purposes (microscopy); in small spotlights, spotlights in film studios, background projectors, beacons, searchlights, etc.

Type	Lamp voltage V	Lamp current A	Luminous flux lm	Luminance cd/cm²	Colour temperature °K	Arc length	Burning position	Average life [1] h	Diam.	Max. length	Ordering number
CSX 75 W/2	14	5.4	850	40000	6100	0.5	vertical or horizontal ± 10°	400	10	90	9281 780 051 ..
CSX 150 W/1	20	7.5	3000	13000	6100	2.2	vertical ± 15°	1200	20	150	9281 752 051 ..
CSX 250 W	14	18.0	4800	26000	6100	1.7	vertical ± 15°	1200	24	226	9281 753 051 ..
CSX 450 W	18	25.0	12000	35000	6300	2.4	vertical ± 30°	2000	29	260	9281 755 051 ..
CSX 900 W	21	43.0	30000	55000	6300	3.3	vertical ± 30°	2000	38	325	9281 760 051 ..
CSX 1600 W	25	64.0	60000	70000	6300	4.2	vertical ± 30°	2000	47	370	9281 765 051 ..
CSX 2500 W	30	83.0	100000	72000	6300	6.0	vertical ± 30°	2000	57	428	9281 770 051 ..
CSX 4000 W	33	120.0	180000	70000	6300	7.5	vertical ± 15°	1500	54	432	9281 775 051 ..
CSX 6500 W	40	165.0	325000	95000	6300	9.0	vertical ± 10° [2]	500	60	480	9281 790 051 ..

[1] Based on an average of 20 burning minutes per switching
[2] Cathode down

RECTIFIERS AND IGNITION DEVICES

As mentioned above, CSX lamps are operated on D.C. supply. In the event that no D.C. is available, a suitable rectifier of sufficient power is necessary.
These lamps require an ignition device to ensure reliable starting.
Information on gear and installation can be provided on request.


CSI 250 W

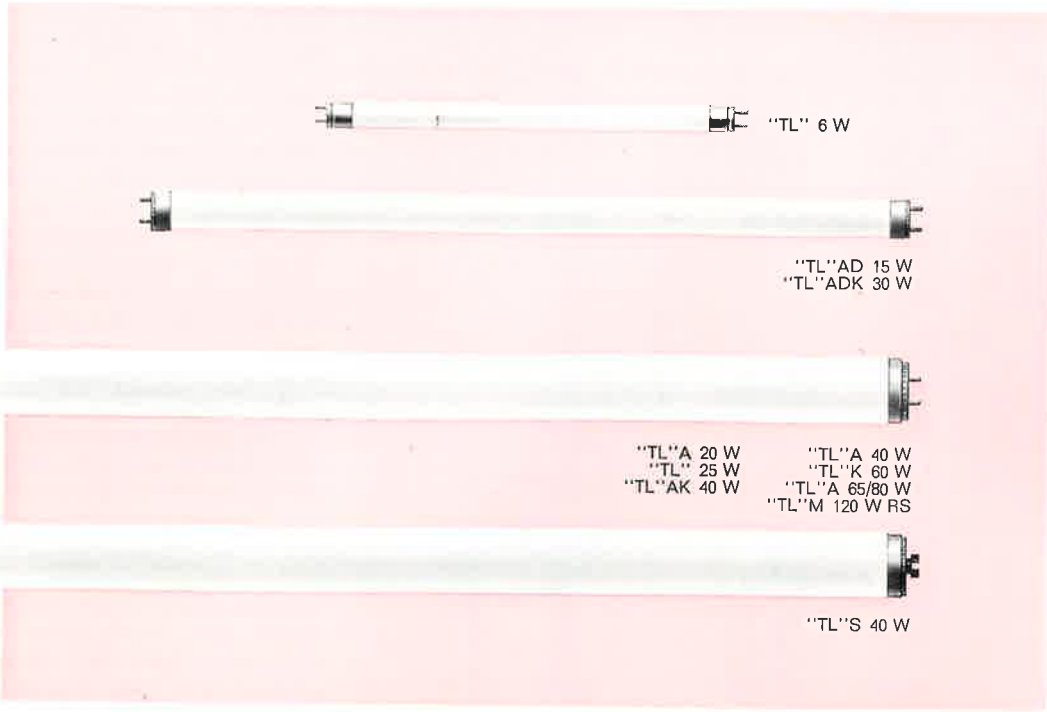
COMPACT SOURCE IODIDE LAMPS CSI

After years of research, Philips have succeeded in developing compact source mercury lamps with metal additives which provide perfect colour rendering.
The lamps have been developed for A.C. mains supply and as such are ideal for professional colour-slide projectors and microscope lighting.
These compact source lamps possess the following additional features:

- Improved image sharpness because of the small dimensions of their light source.
- Low light depreciation.
- Rigid construction and great mechanical strength.
- High efficiency of 60 lumen per watt.
- Useful life of 400 hours.
- Very uniform screen illumination.
- Simple control gear.

Type	Lamp voltage V	Lamp current A	Luminous flux lm	Arc length	Burning position	Average life [1] h	Diam.	Max. length	Ordering number
CSI 250 W	80	3.7	15000	5.0	vertical ± 15° [3]	400	32	147	9281 730 092 ..
CSI 250 W/1 [3]	60	4.8		3.0	vertical ± 15° [4]	250	12.5	124	9281 731 051 .. [2]
CSI 450 W	77	6.7	28000	6.0	vertical ± 15° [3]	400	35	147	9281 735 000 ..
CSI 450 W/1 [2]			30000	6.0	vertical ± 15° [4]	200	17	106	9281 736 051 .. [2]

[1] Based on an average of 30 burning minutes per switching
[2] Without outer bulb
[3] Base down
[4] Stamped base down



ACTINIC "TL" LAMPS

Actinic "TL" lamps are highly efficient as regards the emission of long-wave ultra-violet radiation needed for various photochemical and lacquer prehardening processes.
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 370 nm for the /05 types and at 420 nm for the /03 types.

BALLASTS

The dimensions and electrical characteristics of 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 B 16 - B 27.

Type	Lamp voltage V	Lamp current A	Caps	Nom. diameter mm	Nom. length cm	Catalogue number	Ordering number
"TL" 6 W	44	0.160	G 5	16	23	"TL" 6 W/05	9280 005 005 ..
"TL"AD 15 W	56	0.310	G 13	26	46	"TL"AD 15 W/05	9280 185 005 ..
"TL"A 20 W	57	0.370	G 13	38	61	"TL"A 20 W/05	9280 155 005 ..
"TL" 25 W	94	0.290	G 13	38	100	"TL" 25 W/05	9280 050 005 ..
"TL"ADK 30 W	44	0.840	G 13	26	46	"TL"ADK 30 W/03 "TL"ADK 30 W/05	9280 195 003 .. 9280 195 005 ..
"TL"AK 40 W	47	0.880	G 13	38	61	"TL"AK 40 W/03 "TL"AK 40 W/05	9280 200 003 .. 9280 200 005 ..
"TL"A 40 W	103	0.430	G 13	38	122	"TL"A 40 W/05	9280 165 005 ..
"TL"S 40 W	109	0.420	R 18 s	38	122	"TL"S 40 W/05	9280 355 005 ..
"TL"K 60 W	93	0.730	G 13	38	122	"TL"K 60 W/05	8222 205 298 ..
"TL"A 65/80 W	110/99	0.670/0.870	G 13	38	152	"TL"A 65/80 W/05	9280 170 005 ..
"TL"M 120 W RS	100	1.500	G 13	36	152	"TL"M 120 W/03 RS "TL"M 120 W/05 RS	9280 319 003 .. 9280 319 005 ..

HPR MERCURY-VAPOUR LAMP

Owing to its 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.

Type	Type number	Lamp voltage V	Lamp current A	Luminous flux lm	Base	Diam.	Max. length	Ordering number
HPR 125 W	57205 E/99	125	1.150	2800	E27	110	223	9280 645 099 ..

HPK MERCURY-VAPOUR LAMP

The HPK 125 W high-pressure mercury-vapour lamp comprises a small quartz tube in which the discharge takes place and a bipolar connection to the electrodes. The lamp emits a high degree of ultra-violet radiation and is mainly applied for photochemical processes.

Type [1]	Type number	Lamp voltage V	Lamp current A	Luminous flux [2] lm	Base	Diam.	Max. length	Ordering number
HPK 125 W	57203 B/00	125	1.150	4750	B 15 d	—	101	9280 701 051 ..

[1]) For ballasts see page C 6
[2]) After 100 burning hours

MLU SUNLAMP

The MLU 300 W sunlamp is a tungsten mercury lamp, built on the principle of the MLL blended-light lamps. 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 as well as infra-red radiation is emitted. The bulb is made of hard glass which filters out radiation below 280 nm. The internal reflector ensures a homogeneous beam of radiant energy. These characteristics make the lamp eminently suitable as a sunlamp for home use.
In addition, the MLU 300 W lamp can be used in the ageing process of plastics.

Type	Type number	Mains voltage V	Lamp current A	Base	Diam.	Max. length	Ordering number
MLU 300 W	57268 F/28 57265 F/28	110-130 220-240	2.500 [1] 1.400 [2]	B 22 III	125	179	9281 001 535 .. 9281 001 537 ..

[1]) At 120 V [2]) At 220 V

HLRG REFLECTOR LAMPS

The advent of the HLRG mercury reflector lamps for use in horticulture has made it possible to provide highly reliable lighting installations for this application. These lamps fulfil perfectly all the requirements such as high output per unit, excellent spectral qualities, ease of installation, long life.
HLRG lamps are equipped with an internal aluminium reflector to concentrate the light on the plants; the fluorescent coating on the bowl of the bulb increases the radiation in the red portion of the spectrum thus improving plant growth.

Type [1])	Type number	Lamp voltage V	Lamp current A	Luminous flux [2]) lm	Base	Diam.	Max. length	Ordering number
HLRG 400 W	57246 G/93	145	3.200	14000	E 40	140	329	9280 631 093 ..

[1]) For ballasts see page C 6
[2]) After 100 burning hours

FORCED-COOLED SUPER-HIGH-PRESSURE MERCURY LAMPS SP

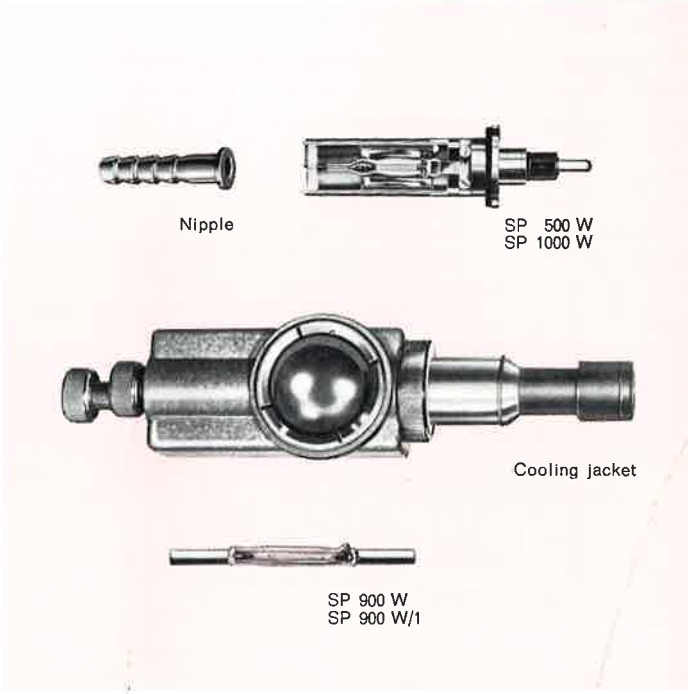
Philips manufacture a series of super-high-pressure mercury lamps with forced cooling, the SP lamps. Light from SP lamps is whiter than that produced by ordinary mercury lamps due to the internal pressure, which is very high. They are small light sources having a high level of luminance and a high efficiency. 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 production of colour television tubes, in the shipbuilding 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. They are also in general use 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 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 500 and 1000 W lamps, the glass parts in the lamp jacket which absorb this radiation may be replaced by corresponding parts of quartz which transmits the ultra-violet radiation.



BALLASTS

Details regarding ballasts for SP lamps will be supplied on request. No rectifier is available for the SP 1000 W.

Type	Type number	Lamp voltage V	Lamp current A	Luminous flux lm	Luminance cd/cm²	Arc length	Max. length	Ordering number
SP 500 W SP 1000 W	57300 ZB/00 [1] 57302 ZB/00 [2]	450 A.C. 500 D.C.	1.4 2.0	15000 [3] 30000 [3]	25000 [3] 45000 [3]	12.5	93	9283 700 000 .. [1] 9283 710 000 .. [2]
SP 900 W SP 900 W/1	57350 X/51 57359 X/51	750 A.C. 810 A.C.	1.3	50000	22000 30000	25 17	81	9283 705 051 .. 9283 706 051 ..

[1]) With glass cover; with quartz cover: 57300 ZB/51 and 9283 700 051 .. resp.
[2]) With glass cover; with quartz cover: 57302 ZB/51 and 9283 710 051 .. resp.
[3]) With reflector and cover

PULSED SUPER-HIGH-PRESSURE MERCURY LAMPS SPP

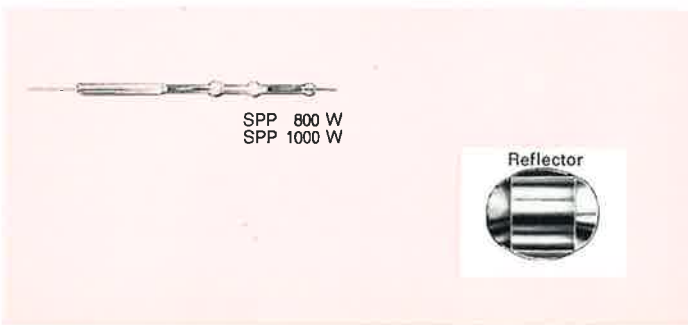
The Philips SPP lamps are super-high-pressure mercury-vapour lamps specially developed for cinema projection.

The very small dimensions and high luminance make these lamps most suitable for use in optical equipment. The lamps are operated by a pulsating direct current variable over the range of 60-120 pulses per second.

Light is produced only during the pulses. As the lamp is dark during the intervals, a shutter is unnecessary when the lamp is used in a film projector.

Other features which make SPP lamps eminently suitable for cinema projection are:

- Great economy.
- Flicker-free projection, even at very high screen brilliance.
- Constant light output, irrespective of the number of operating hours.
- Perfectly uniform brightness on the screen.



REFLECTOR

Two reflectors are supplied together with each individual lamp. The reflector shape is optimal for the above application. The reflector can be easily fitted into the cooling unit.

Type	Type number	Ignition voltage V	Lamp current A	Pulse frequency /second	Pulse duration msec	Efficiency lm/W	Arc length	Max. length	Ordering number
SPP 800 W SPP 1000 W	57356/51 [1] 57358/51 [1]	1100 1200	2.0 2.1	60-120	1.5-2.5	55	17 16	80	9283 721 051 .. [1] 9283 726 051 .. [1]

[1]) Inclusive of two reflectors

SPECTRAL LAMPS

Strong monochromatic sources, or sources which emit a number of monochromatic lines of known wavelength, are an important aid in physical and chemical research where visible or ultra-violet radiation plays a part.

For most experiments, the different sources used must be interchangeable as regards electrical and geometrical characteristics. To meet these demands, Philips have developed spectral lamps, which consist of a small discharge tube surrounded by a cylindrical outer bulb. The discharge tube contains a gas, a metallic vapour or a mixture of both in a very pure state, 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. All lamps have identical outer dimensions and light centre lengths, ensuring complete interchangeability. For those applications where ultra-violet radiation plays a part, lamps are available consisting of a quartz discharge tube mounted in a quartz outer bulb, which emits UV radiation extending to the short UV.

Mercury lamps are made for low as well as for high pressure. In the latter case the amount of mercury is such that the metal is entirely vaporized at the operating temperature. In addition to the lines, the spectrum of a high-pressure mercury lamp shows a relatively weak continuum covering the UV and visible regions of the spectrum. The low-pressure mercury lamp shows no addition of a continuum.

If it is desired to separate a part of the spectrum, filters can be used. In favourable cases these can be so arranged that only light of one wavelength is emitted. If conditions are such that this cannot be achieved with filters, a monochromator will have to be placed in front of the lamps.

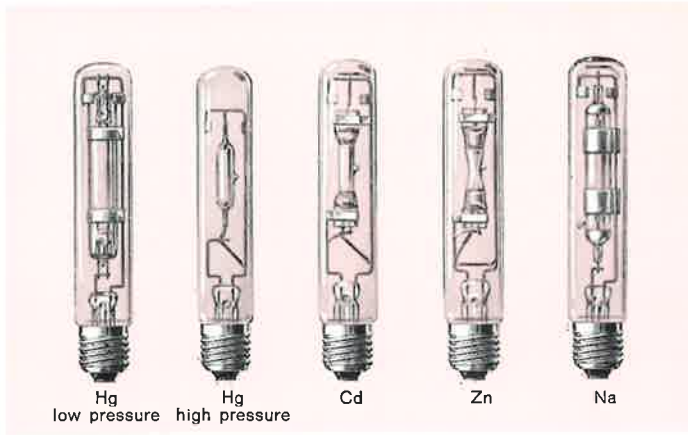
Applications

All kinds of biological, chemical and physical experiments, such as interferometry, polarimetry, refractometry and spectroscopy.

AUTO-LEAK TRANSFORMER

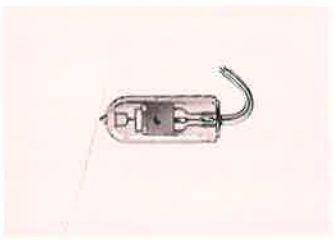
Although some of the lamps may be connected to a 220 V A.C. supply – employing, of course, a suitable current-limiting device – it is better to use a higher voltage for the sake of easy ignition.

An auto-leak transformer with a primary voltage of 110/125 or 220 V can be supplied together with the lamp.



	Gas or vapour	Wattage W	Lamp current A	Material of bulb	Arc length	Catalogue number [1]
For visible spectra	Hg (low pressure)	12	0.9	glass	38	9281 950 000 ..
	Hg (high pressure)	90	0.9	glass	25	9281 951 092 ..
	Cd	16	0.9	glass	24	9281 960 092 ..
	Zn	16	0.9	glass	24	9281 940 092 ..
	Hg, Cd, Zn	75	0.9	glass	24	9281 975 092 ..
	He	60	0.9	glass	32	9281 900 000 ..
	Ne	20	0.9	glass	27	9281 905 000 ..
	A	15	0.9	glass	27	9281 910 000 ..
	Kr	15	0.9	glass	27	9281 915 000 ..
	Xe	10	0.9	glass	27	9281 920 000 ..
	Na	14	0.9	glass	19	9281 945 000 ..
	Rb	15	0.9	glass	33	9281 930 000 ..
	Cs	10	0.9	glass	33	9281 935 000 ..
	K	10	0.9	glass	33	9281 925 000 ..
For ultra-violet spectra	Hg (low pressure)	12	0.9	quartz	40	9281 952 051 ..
	Hg (high pressure)	90	0.9	quartz	25	9281 953 051 ..
	Cd	16	0.9	quartz	24	9281 961 051 ..
	Zn	16	0.9	quartz	24	9281 941 051 ..
	Hg, Cd, Zn	75	0.9	quartz	24	9281 976 051 ..
For visible and ultra-violet spectra	In	25	0.9	quartz	25	9281 965 051 ..
	Tl	20	0.9	quartz	30	9281 970 051 ..
	Ga	20	0.9	quartz	30	9281 985 051 ..

[1]) Dimensions of the lamps: diam. 30; max. length 177; lcl. 110. Base E 27



DEUTERIUM SPECTRAL LAMP

The deuterium lamp produces a continuous spectrum, with the Balmer-lines and the strongest lines of the multiline-spectrum of deuterium above 400 nm.

Type number	Lamp voltage V	Lamp current A	Bulb material	Average life [1] h	Diam.	Max. length	Ordering number
126138	60-90 D.C.	0.3	quartz	200	30	71	9281 980 051 ..

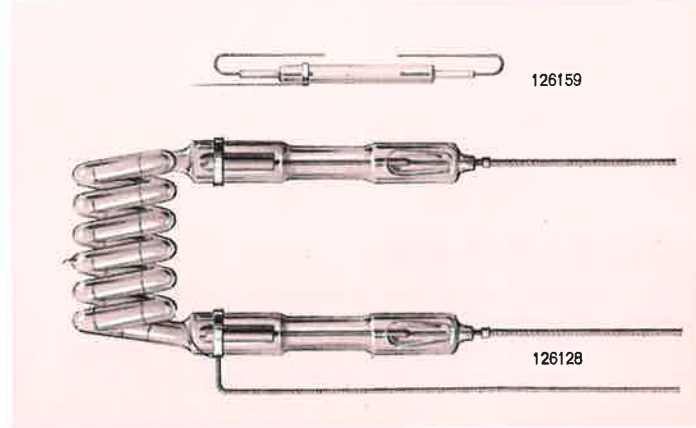
[1]) Life after which the energy output is 65 % of the 0-hour value

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.

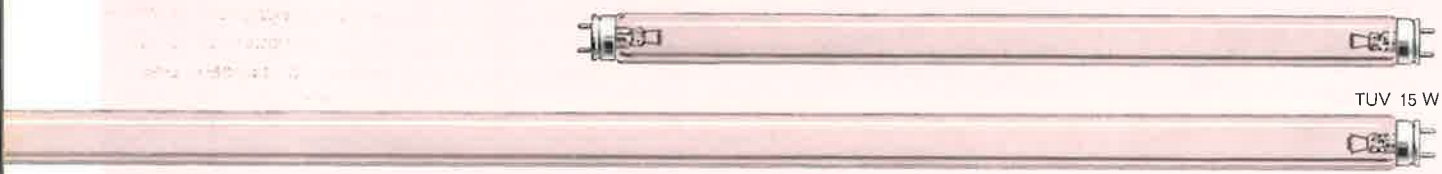
The helix flashlamp, type 126128, is a very high-power flashlamp which operates on a high voltage. By means of this flashlamp a very simple laser can be built, as the laser rod can be set up along the axis of the helix of the flashlamp. Hence, without the aid of adequate reflectors, the laser rod can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



Type number	Energy per flash Ws		Anode voltage V		Max. flash frequency flashes/min	Main capacitor µF		Inductance to be connected in series µH	Life (number of flashes with inductance)	Flash duration µsec	Max. length	Ordering number
	nom.	max.	min.	max.		at nom. load	at max. load					
126159	250	500	750	3000	2	125	250	40	1000	200	120	9283 815 000 ..
126128	1500	10000	1500	5000	1	250	1600	0.5	1000	< 2000	210	9283 812 000 ..

TUV GERMICIDAL LAMPS

Basically TUV germicidal lamps are low-pressure mercury-vapour lamps, just as fluorescent lamps, with the difference, however, that these TUV lamps do not have a phosphor coating and the glass which is utilized transmits efficiently the short-wave ultra-violet. TUV lamps radiate most of their energy at the 253.7 nm line, which is very close to 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 15 W

TUV 30 W

BALLASTS

TUV lamps of 15 W and 30 W need the same type of ballasts and other accessories as normal fluorescent lamps of the same rating. For data see pages B 18 and B 26.

Type number	Lamp voltage V	Lamp current A	Energy output UV 253.7 nm W	Caps	Nom. diameter mm	Nom. length cm	Ordering number
TUV 15 W	56	0.310	3.5	G 13	26	46	9280 390 040 ..
TUV 30 W	96	0.360	9.0	G 13	26	92	9280 395 040 ..

TUV 6 W GERMICIDAL LAMP

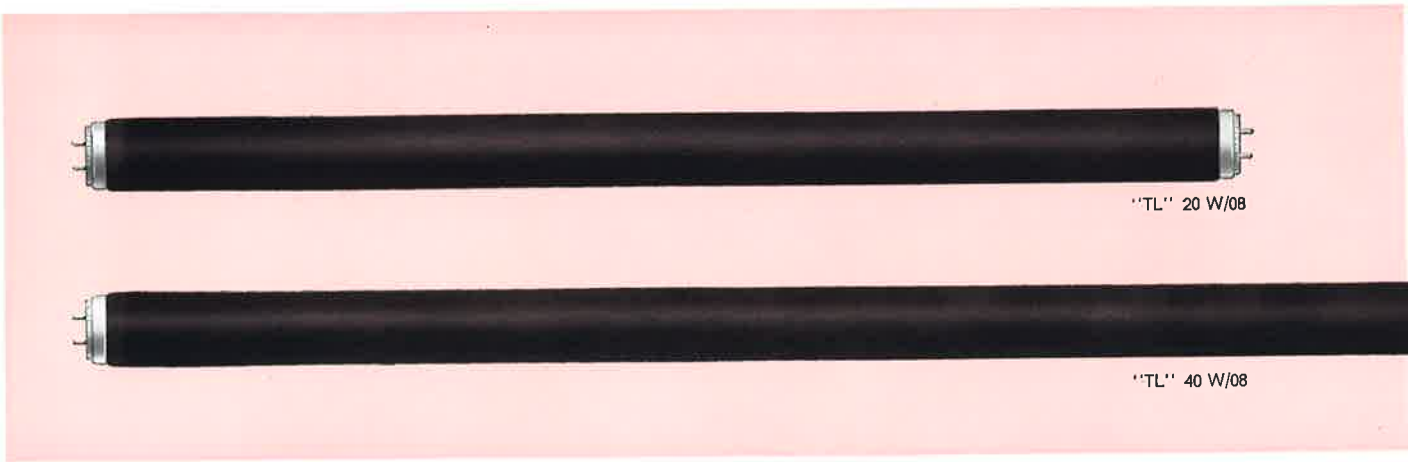
The TUV 6 W germicidal lamp works on the principle of a glow discharge. It operates on 220 V mains tension without the use of a ballast. Owing to its small size, this lamp is an inexpensive and handy source of short-wave ultra-violet radiation for sterilization purposes.
The absence of a ballast is an additional advantage, facilitating the application of this lamp in spaces of small dimensions.

Type	Type number	Nom. voltage V	Lamp current A	Energy output UV 253.7 nm mW	Base	Diam.	Max. length	Ordering number
TUV 6 W	57416 E/40	220	0.027	85	E 27	27	157.5	9283 781 040 ..

OZONE LAMP 4 W

This lamp has a glass bulb which transmits the 185 nm wavelength. This ultra-violet radiation converts oxygen into ozone. Moreover, a small amount of germicidal radiation is emitted at 253.7 nm.
The OZ 4 W lamp eliminates or minimizes odours in spaces up to approximately 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. – It operates on both A.C. and D.C. supply and on any circuit voltage above 20 V. Due to the mercury-vapour discharge it will be necessary to use a current-limiting device which may be either a capacitor or a resistor.

Type	Type number	Lamp voltage V	Lamp current A	Energy output at 184.9 nm mW	Base	Diam.	Max. length	Ordering number
OZ 4 W	57901 M/30	10-12	0.350	1	E 14	34	59	9283 765 030 ..



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 350 nm.
Black light blue lamps are applied for the excitation of the luminescence phenomenon.
A minimum of visible light is produced by the lamp as this would interfere with the luminescence phenomenon.
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.
Black light blue lamps are used in a wide variety of applications such as analysis and detection in the chemical and textile industries; in food production, philately, mineralogy, banking, criminology and medicine. They are also applied for decorative lighting in the entertainment field.

Features

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

Type	Lamp voltage V	Lamp current A	Caps	Nom. diameter mm	Nom. length cm	Catalogue number	Ordering number
"TL" 20 W	57	0.370	G 13	38	61	"TL" 20 W/08	9280 035 008 ..
"TL" 40 W	103	0.430	G 13	38	122	"TL" 40 W/08	9280 060 008 ..

HPW 125 W LAMP

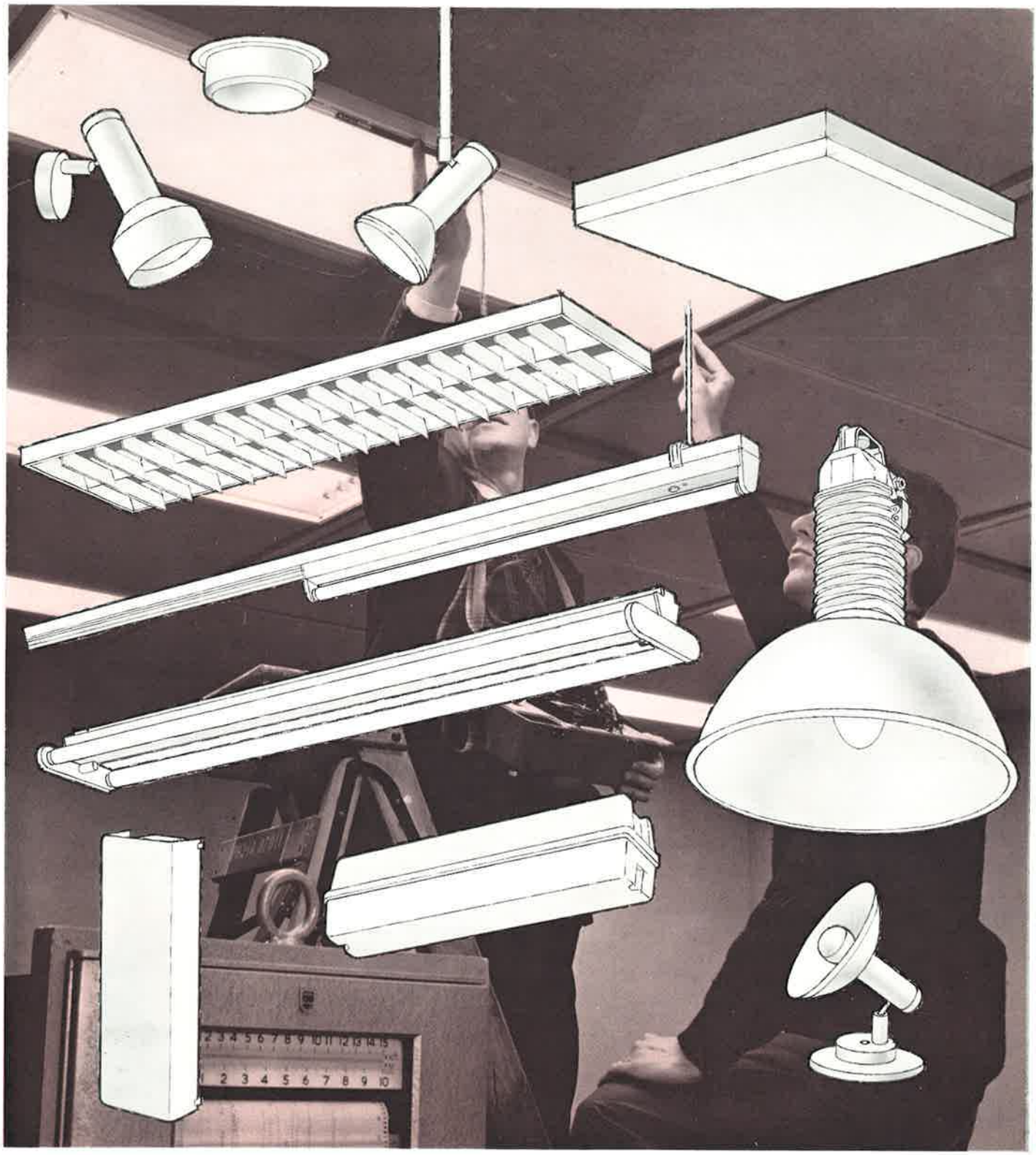
The HPW 125 W black light lamp is a high-pressure mercury-vapour lamp, consisting of a quartz discharge tube in an outer envelope of deep blue Wood's glass. It is a source of invisible radiation for the excitation of the luminescence phenomenon.
Easy mounting and simple operation are characteristics of this lamp which is used for the most varied purposes such as mentioned for the black light blue lamps described above.

Type	Type number	Lamp voltage V	Lamp current A	Base	Diam.	Max. length	Ordering number
HPW 125 W	57236 E/70	125	1.150	E 27	75	177	9280 520 070 ..

TW 6 W BLACK LIGHT LAMP

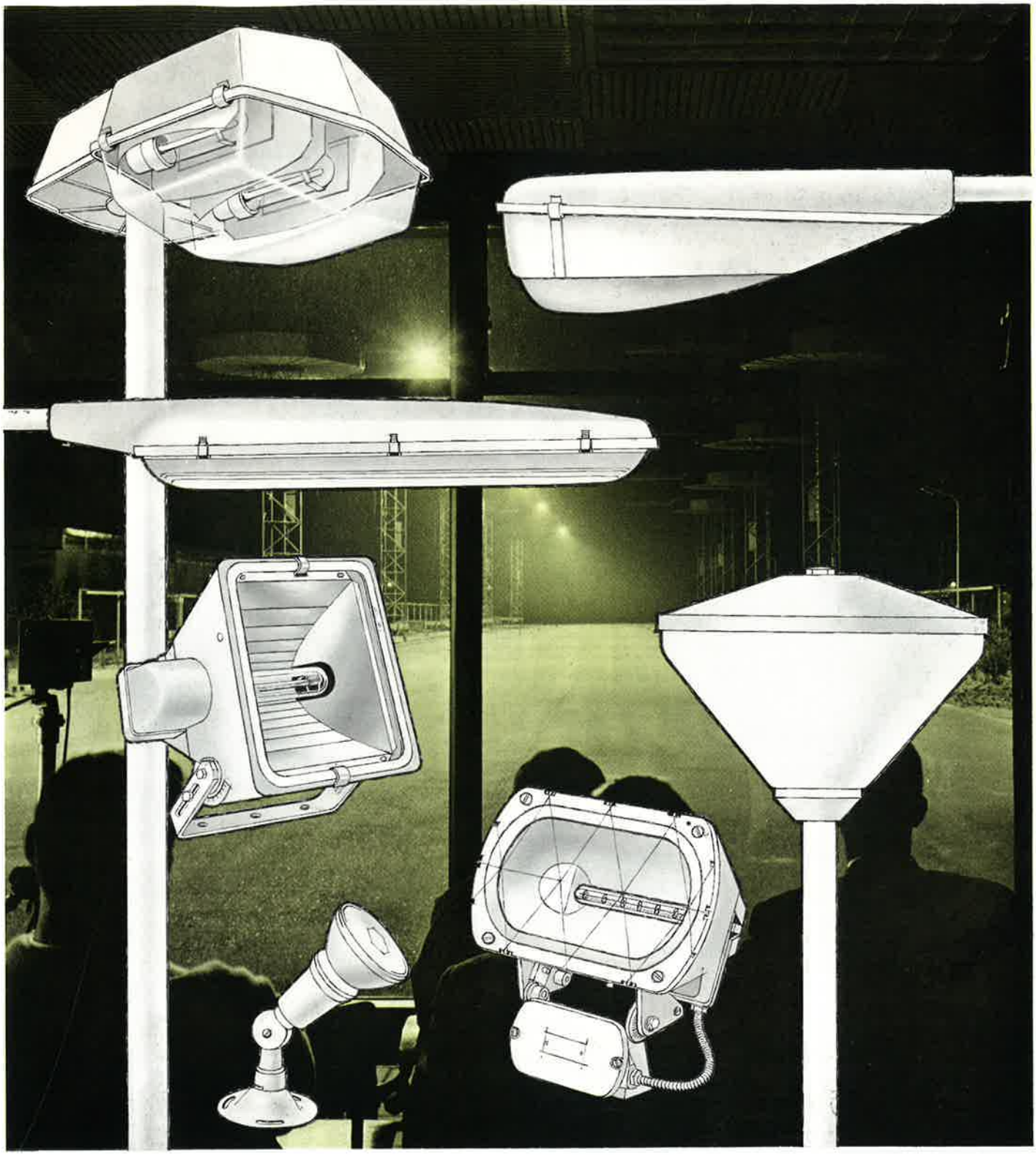
This black light lamp works on the principle of a glow discharge.
It operates on 220 V mains tension without the use of a ballast and is an inexpensive, handy source of long-wave ultra-violet radiation for the excitation of the fluorescence phenomenon mainly applied in philately. As no ballast is required, the lamp can be applied in spaces of limited dimensions.

Type	Type number	Mains voltage V	Lamp current A	Energy output UV 350 nm mW	Base	Diam.	Max. length	Ordering number
TW 6 W	57416 E/70	220	0.027	50	E 27	27	157.5	9283 779 008 ..



PHILIPS FITTINGS

When switching-on the light indoors or driving on a well-lit 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.
Philips lead the world in lighting because they can supply all the 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 which is elegant while, at the same time, conforming to lighting-engineering, temperature and installation requirements.
Specialists are needed in many fields — lighting engineering, electrical and design experts — perfectionists who are not satisfied with a compromise.



These two pages can give no more than a limited survey of the wide variety of fittings 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 to the entire range of fittings, including those which are used in the home.
In the street-lighting sector where the perfect combination of lamp and fitting is of vital importance for traffic safety, the Philips Company have, for many years, considered research and the full use of their many facilities for development in this field, as a special duty.
The Philips open-air laboratory is an excellent means to contribute effectively towards finding up-to-date solutions for the problems involved.

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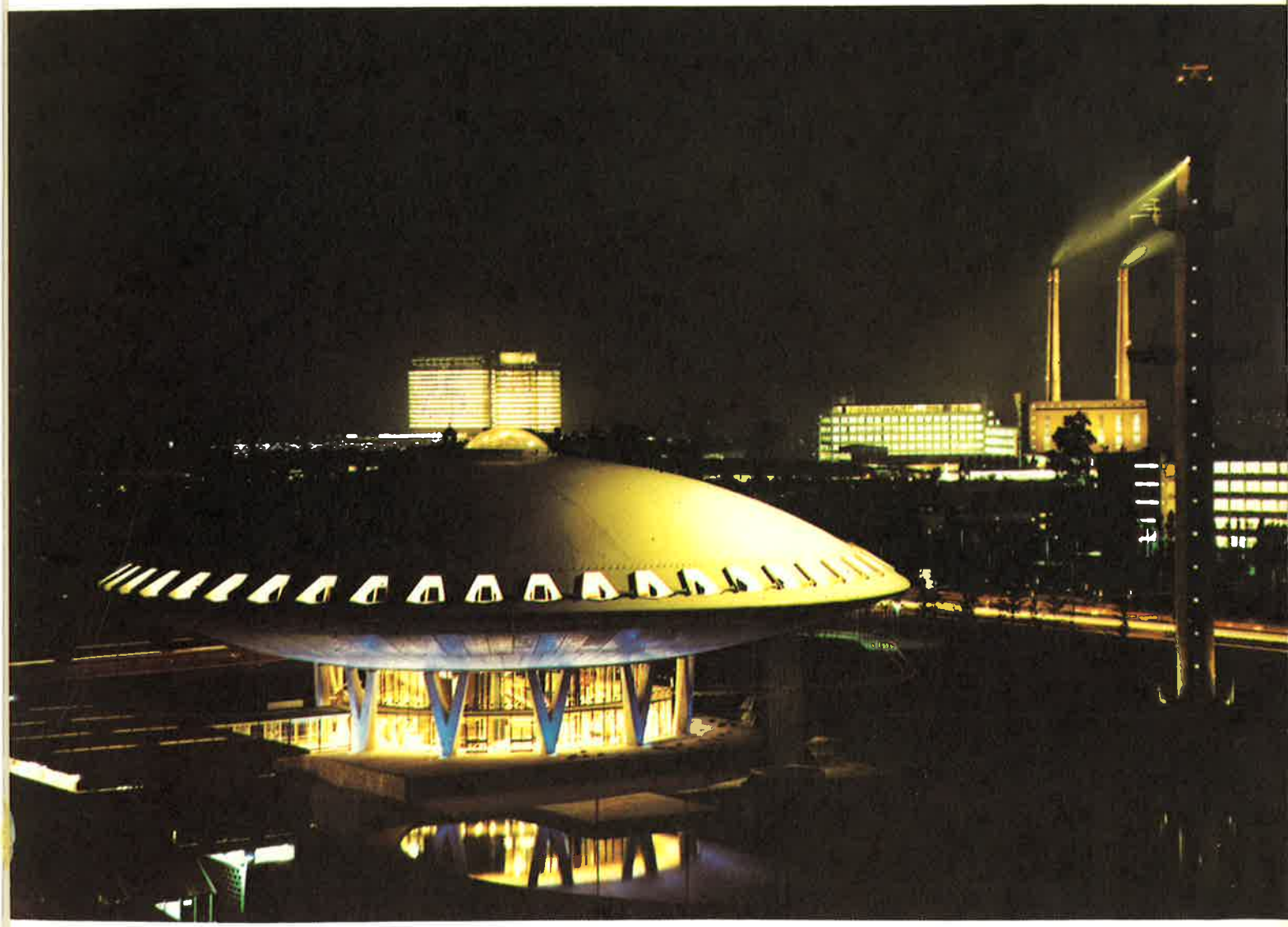

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