

TUNGSRAM

LIGHTING
PRODUCTS

TUNGSRAM

MAKES LIGHT WORK

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THIS IS TUNGSRAM

Tungsrám is a leading manufacturer of lighting products to major companies throughout the world.

Established in 1896, Tungsrám now has offices world wide. The company prides itself on the range of lighting and superior service it provides to all its customers, large and small.

History

Tungsrám has a long and distinguished history.

Over the years, Tungsrám's scientists and engineers have made a valuable contribution to the world of lighting. At the turn of the century they developed the world's first tungsten filament light. Then, over 50 years ago, Tungsrám was responsible for the development of the first large crystal tungsten filament light, and the first krypton lamps.

More recently Tungsrám has introduced its range of energy saving lamps.

Prompt and courteous service

Tungsrám has sophisticated engineering plants with up-to-date production lines throughout the world. The company offers customers objective and expert advice on which lamps to buy for specific purposes, together with a prompt after-sales service.

And, of course, Tungsrám lamps are manufactured to the highest possible standards.

Tungsrám – Makes Light Work

Tungsrám Lighting Ltd offers a wide range of lamps to suit all possible purposes. If this catalogue does not cover your requirements, please contact our office where our staff will be pleased to help you.

Tungsrám Lighting Ltd reserves the right to amend technical details at any time. The data and figures in this catalogue are for information and do not indicate actual delivery conditions.

GENERAL LIGHTING SERVICE LAMPS

Standard range of GLS lamps

Extra and extra-es lamps

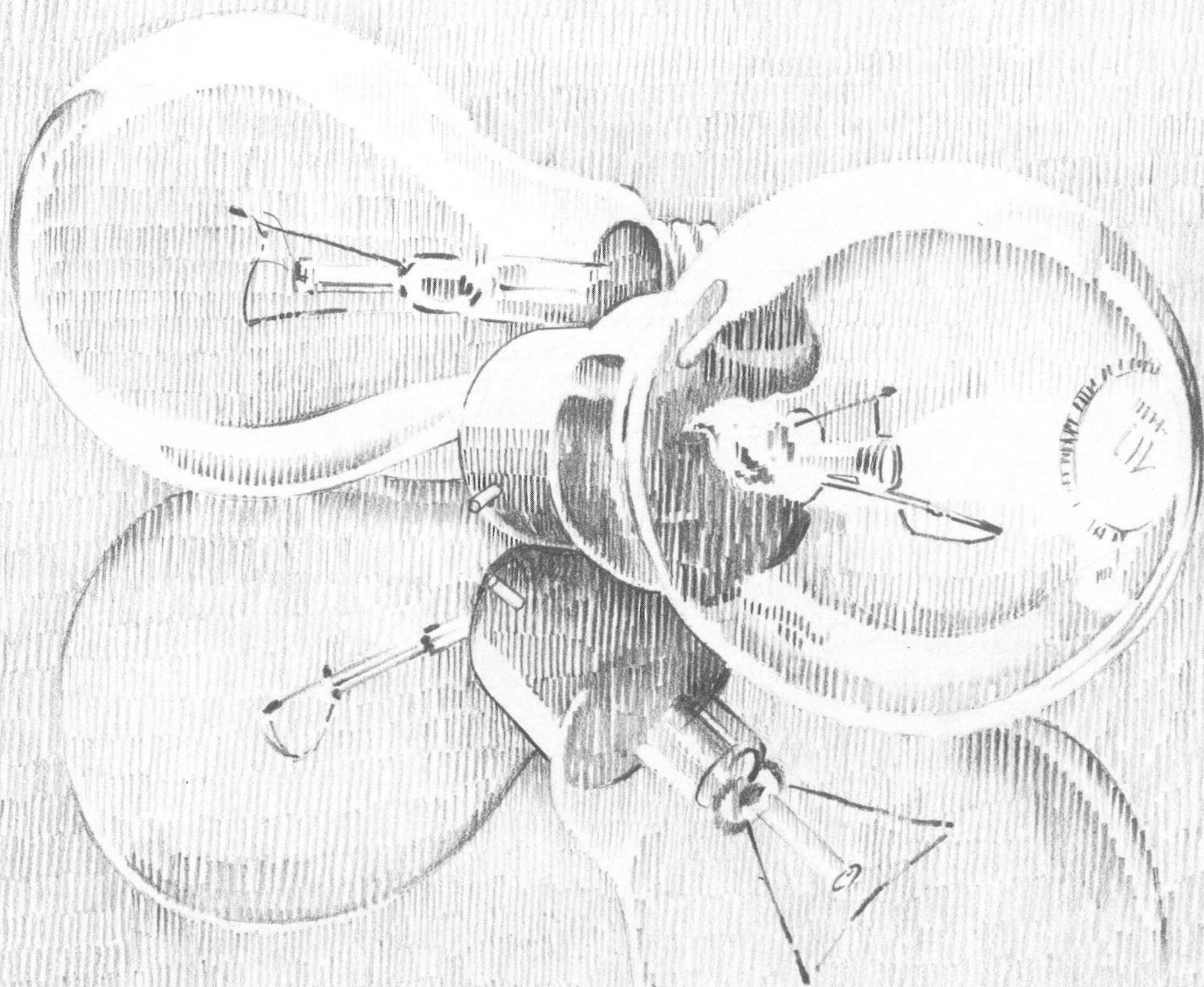
Naturlux lamps

Decorative lamps

Tungsraflex lamps

Tungsrapar 38 lamps

Halogen floodlighting lamps

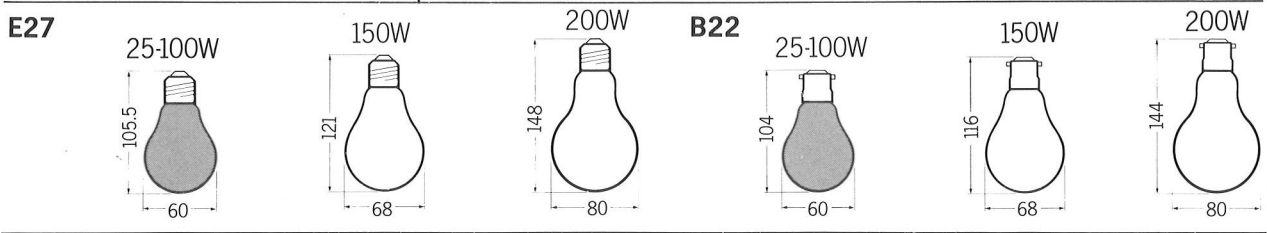


Incandescent lamps continue to be the most popular source of artificial light.

They are easy to install and to replace, no gear is needed in the circuit and small size fixtures are possible.

Unless otherwise specified, the average rated life of Tungstram lamps is 1,000 hours.

Type	Watts	Volts*	Luminous Flux (lm)	Filling	Incandescent Body
in clear or inside frosted bulb cap: E27 or B22	25	240	215	vacuum	coiled coil filament
	40	240	420	gas	
	60	240	710		
	75	240	940		
	100	240	1,360		
	150	240	2,180		
*Other voltages available on request.	200	240	3,050		



KRYPTON LAMPS

STANDARD KRYPTON LAMPS

These small, attractive lamps emit silver white light with greater efficiency than argon gas filled lamps. They are available either in clear glass, or with an inside frosted bulb.

KRYPTON SUPERBA AND SUPERBA-ES LAMPS

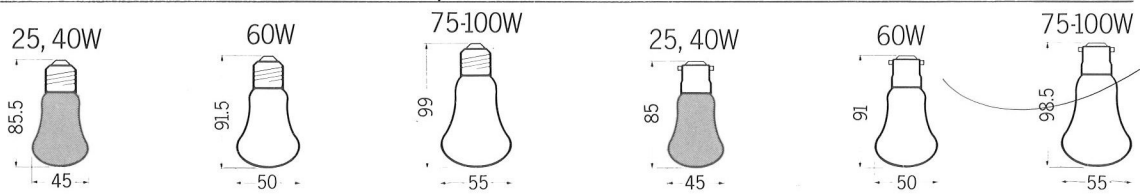
Superba lamps, with opal bulbs and krypton gas fillings offer visual comfort and glare-free illumination without screening systems or refracting glasses.

Superba-ES lamps increase radiation by 8-10% over Superba lamps by absorbing less light.

KRYPTON SUPERBALUX LAMPS

Opal Superbalux lamps, used mainly in spotlights, yield up to 40% more light than Superba lamps. This is made possible by providing the Superbalux lamps with an inside frosted bulb top.

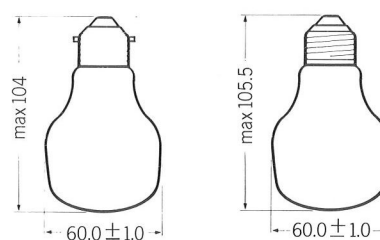
Type	Watts	Volts*	Filling	Incandescent Body
in clear and inside frosted bulb SUPERBA, SUPERBA-ES, SUPERBALUX cap: E27 or B22	25	240	Krypton	coiled coil filament
	40	240		
	60	240		
	75	240		
	100	240		
*Other voltages available on request.				



Tungsram's Softlamp provides contemporary soft lighting with no harsh shadows or glare. This is achieved by diffusing the light through a special inside coating and the contemporary bulb shape allows it to be spread evenly.

Watts	Volts*	Cap	Length	Diameter	Life
28	240	E27 B22	105.5mm	60.0mm	1000 hours
40	240				
60	240				
75	240				
100	240				

*Other voltages available on request.

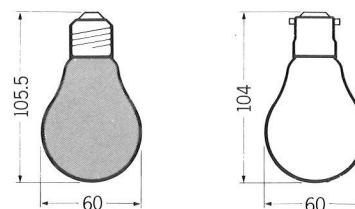


EXTRA AND EXTRA-ES LAMPS

These decorative lamps in opalised bulbs ensure perfect glare-free light. They can be used in fittings with no diffuser or refractor bowl.

Extra-es lamps give out 8-10% more light than Extra lamps of the same power, because they absorb less light and contain an improved inside coating which diffuses the light more effectively.

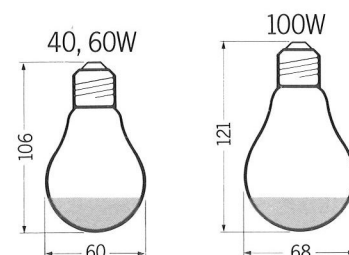
Type	Watts	Volts	Filling	Incandescent Body
EXTRA, EXTRA-ES cap: E27 or B22	40	240	gas	coiled coil filament
	60	240		
	75	240		
	100	240		



TUNGSRASILVER AND TUNGSRAGOLD LAMPS

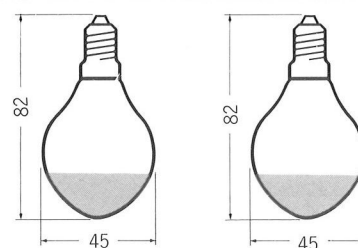
Tungsrasilver lamps provide simple indirect lighting whilst the gold crown mirror in Tungsragegold lamps creates a subdued light and intimate atmosphere.

Type	Watts	Volts	Filling	Incandescent Body
TUNGSRASILVER in clear or inside frosted bulb	40	240	gas	coiled coil filament
TUNGSRAGOLD in clear bulb	60	240		
cap: E27	100	240		



PEAK TOP LAMPS

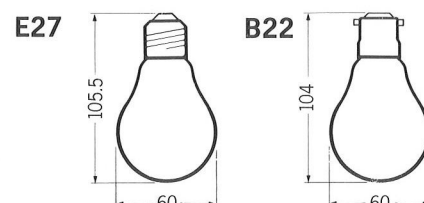
Watts	Volts	Cap	Finish	Ø mm	Length mm	Standard Pack
25	240	E14, B15d	Silver, Clear	45	82	10/100
40	240					
25	240	E14, B15d	Gold, Clear	45	82	10/100
40	240					



NATURLUX LAMPS

These are glare-free local lights, available in a range of colours, for use in greenhouses to grow forced fruit and vegetables.

Type	Watts	Volts	Filling	Incandescent Body
special blue-coloured cap: E27 or B22	40	240	gas	coiled coil filament
	60	240		
	100	240		



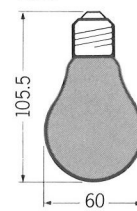
ROUGH SERVICE LAMPS

These lamps have a filament specially designed to withstand adverse conditions such as mechanical shocks and vibrations.

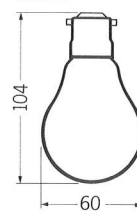
Variants for 220-250V, in ratings from 40-100W, and with an extra-long life of up to 2,500 hours are available.

Type	Watts	Volts	Filling	Incandescent Body
in clear or inside frosted bulb cap: E27 or B22	40	24	vacuum	coiled filament
	60	110-115		
	100	240		

E27



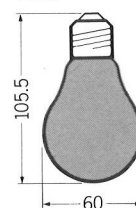
B22



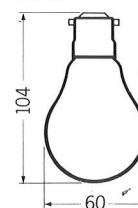
LOW VOLTAGE GLS LAMPS

Type	Watts	Volts	Filling	Incandescent Body
in clear or inside frosted bulb cap: E27 or B22	15	24, 36, 42	gas	coiled filament
	25	24, 36, 42, 50, 65		
	40	24, 36, 42, 50, 65		
	60	24, 36, 42, 50, 65		
	75	24, 36, 42, 50, 65		
	100	24, 36, 42, 50, 65		

E27

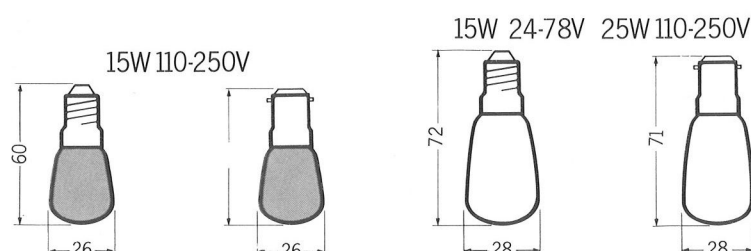


B22



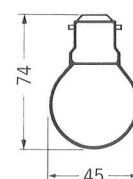
Pygmy lamps are mainly for industrial applications and for lighting confined spaces (eg. in refrigerators or behind television sets, where their use reduces contrast against the background).

Type	Watts	Volts	Filling	Incandescent Body
in clear bulb	15	24, 42 50, 78	gas	coiled filament
in clear or inside frosted bulb cap: E14 or B15d	15 25	240 240	vacuum	coiled filament



TRAIN LAMPS

Type	Watts	Volts	Filling	Incandescent Body
in clear or inside frosted bulb cap: B22	15 25 40	24, 36, 50, 55 24, 36, 50, 55, 78 24, 36, 50, 55, 78	gas	coiled filament

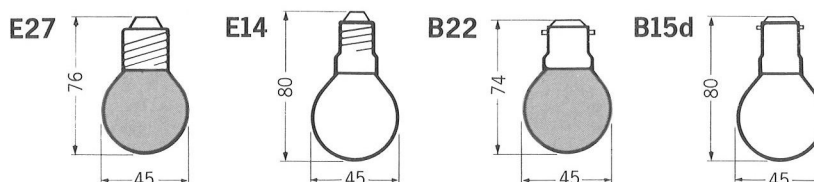


DECORATIVE LAMPS

ROUND LAMPS

A night-light of approximately 5W is manufactured in both clear glass, or with an inside frosted bulb.

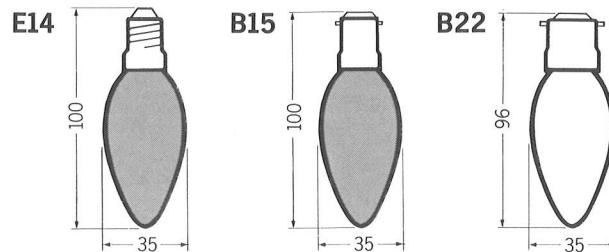
Type	Watts	Volts	Filling	Incandescent Body
in clear, inside frosted or opal bulb cap: E27, B22, E14 or B15d	15 25 40	240 240 240	vacuum gas	coiled filament coiled coil filament



CANDLE LAMPS

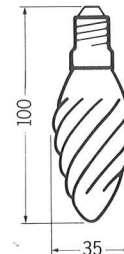
Type	Watts	Volts	Filling	Incandescent Body
in clear, inside frosted or opal bulb cap: E14, B15d or B22	15	240	vacuum	coiled filament
	25	240	gas	coiled
	40	240		coil filament
	60*	240		

*This type is available only in clear glass or with an inside frosted bulb.
Recommended burning position: cap down.



TWISTED CANDLE LAMPS

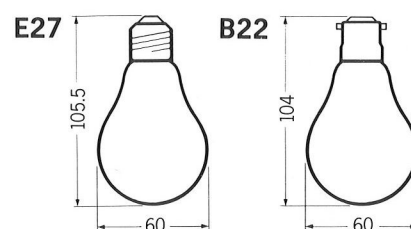
Type	Watts	Volts	Filling	Incandescent Body
In clear bulb cap: E14	25	240	gas	coiled
	40	240		coil filament



COLOURED DECORATIVE LAMPS

COLOURED GLS LAMPS

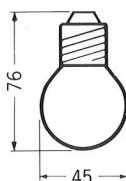
Type	Watts	Volts	Filling	Incandescent Body
red, orange, yellow, green, blue cap: E27 or B22	15	240	vacuum	coiled filament
	25	240		
	40	240		



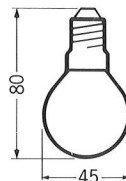
COLOURED ROUND LAMPS

Type	Watts	Volts	Filling	Incandescent Body
red, orange, yellow, green, blue cap: E27, E14, B22 or B15d	15	240	vacuum	coiled filament
	25	240		

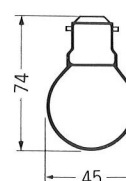
E27



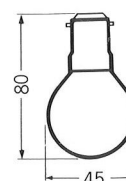
E14



B22



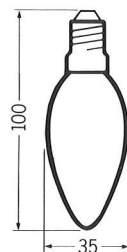
B15d



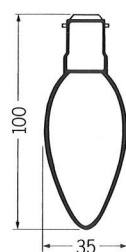
COLOURED CANDLE LAMPS

Type	Watts	Volts	Filling	Incandescent Body
red, orange, yellow, green, blue cap: E14, B15d or B22	15	240	vacuum	coiled filament
	25	240		

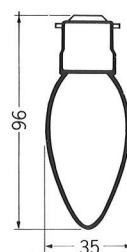
E14



B15d



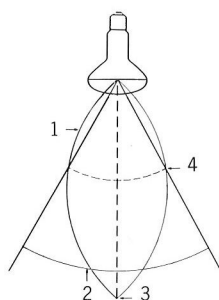
B22



TUNGSRFLEX LAMPS

The beam angle of Tungsrflex lamps varies with the bulb shape. The inside bulbs are mirrored to deflect the light and no separate reflector is needed.

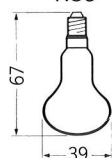
Tungsrflex lamps can be used for spotlights and for target lighting – for example, in shopwindows.



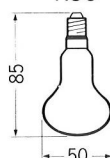
Interpretation of radiation angle:

- 1 – light distribution curve
- 2 – radiation angle
- 3 – maximum luminous intensity
- 4 – half luminous intensity

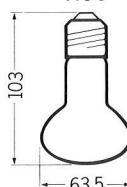
R39



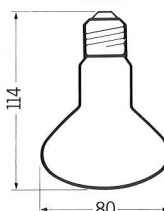
R50



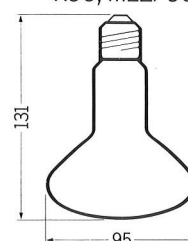
R63



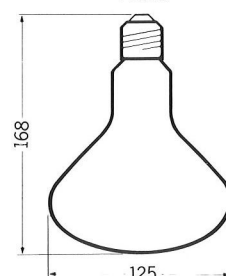
R80



R95, ML2/95



R125

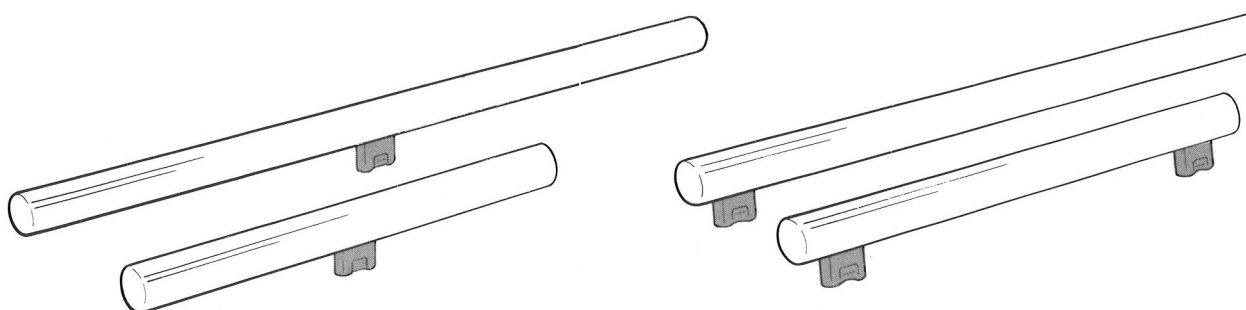


Type	Watts	Volts	Radiation Angle (Grade)	Maximum Luminous Intensity (cd)
TUNGSRFLEX-R39 cap: E14, B15d	15 30	240 240	30	—
TUNGSRFLEX-R50* cap: E14	25 40	240 240	30	200 425
TUNGSRFLEX-R63* cap: E27	40 60	240 240	30	450 800
TUNGSRFLEX-R80* cap: E27	40 60	240 240	80	—
TUNGSRFLEX-R95* cap: E27	75 100	240 240	35	1,100 1,500
TUNGSRFLEX-R125* cap: E27	150	240 240	35	2,300
TUNGSRFLEX-ML2/95 cap: E27	150	240 240	35	2,300

*These lamps are available in transparent colours for use in discos etc. Colours available: red, orange, yellow, green, blue, violet.

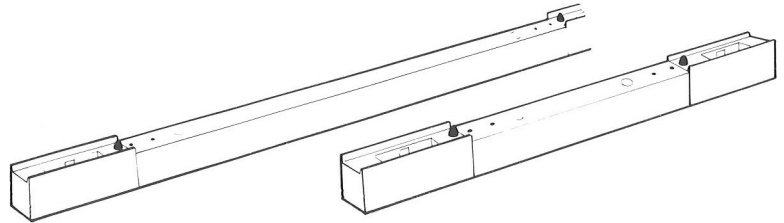
TUNGSRALIN ARCHITECTURAL STRIPLIGHTS

Watts	Cap	Finish	Ø mm	Length mm	Standard pack	
35	2 x S14s	Opalized	30	300	25	
	1 x S14d					
60	2 x S14s			500		
	1 x S14d			300		
				500		
100	2 x S14s					16
120				1000		
35	2 x S14s	Clear, Frosted	30	300	25	
	1 x S14d					
60	2 x S14s			500		
	1 x S14d			300		
				500		
100	2 x S14s					



LIN FITTINGS FOR TUNGSRALIN LAMPS

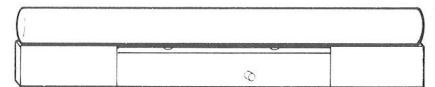
Type No.	Execution	Length mm	Admissible Wattage
300	Without switch	300	60W
300 D	With push switch	300	60W
300 Z	With pull switch	300	60W
500	Without switch	500	100W
500 D	With push switch	500	100W
500 Z	With pull switch	500	100W



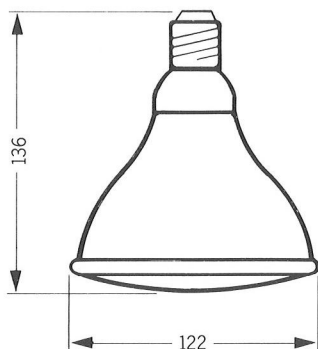
TUNGSRALIN SETS

These sets contain both lamps and fittings.

Type No.	Execution	Length mm	Admissible Wattage
T300	Without switch	300	60W
T300 D	With push switch	300	60W
T300 Z	With pull switch	300	60W
T500	Without switch	500	100W
T500 D	With push switch	500	100W
T500 Z	With pull switch	500	100W



TUNGSRAPAR 38 LAMPS



These pressed glass reflector lamps (PAR 38) are available with either spotlights (SPOT-lamps) or with a wide beam for floodlights (FLOOD-lamps). Both types are available with clear or coloured front lens (red, yellow, green, blue).

Cool beam lamps – all with a clear front lens – are provided with a dichroic mirror. This consists of alternate layers of an optical system, transmitting the heat generated in the beam backwards. Only visible light is reflected.

Dichroic lamps are used where illuminated objects need protection from the radiated heat which is present in traditionally controlled incandescent lighting.

Tungsrapar 38 lamps are very resistant to shocks and heat and have a life of approximately 2,000 hours. They are suitable for both indoor and outdoor use.

TUNGSRAPAR 38 LAMPS WITH CLEAR FRONT LENS

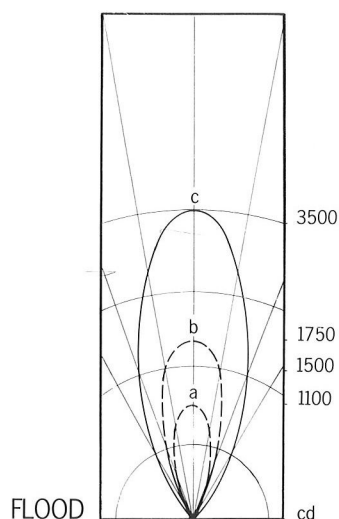
Type	Watts	Volts	Radiation Angle (Grade)	Maximum Luminous Intensity (cd)	Filling	Incandescent Body
SPOT cap: E27	100	24	10	14,000	gas	coiled filament
	150	24	10	25,000		
	75	240	15	2,600		coiled coil filament
	100	240	15	4,000		
	150	240	15	7,000		
FLOOD cap: E27	75	240	30	1,100		
	100	240	30	1,750		
	150	240	30	3,000		

TUNGSRAPAR 38 LAMPS WITH DICHROIC MIRROR AND CLEAR FRONT LENS

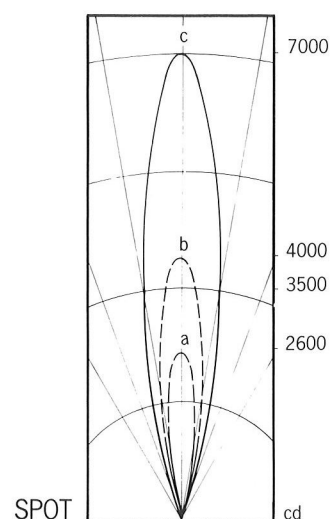
Type	Watts	Volts	Radiation Angle (Grade)	Maximum Luminous Intensity (cd)	Filling	Incandescent Body
SPOT cap: E27	100	240	15	4,000	gas	coiled coil filament
	150	240	15	7,000		
FLOOD cap: E27	100	240	30	1,750		
	150	240	30	3,000		

TUNGSRAPAR 38 LAMPS WITH COLOURED FRONT LENS

Type	Colour	Watts	Volts	Radiation Angle (Grade)	Filling	Incandescent Body
SPOT cap: E27	Red	150	240	15	gas	coiled coil filament
	yellow	150	240	15		
	green	150	240	15		
	blue	150	240	15		
FLOOD cap: E27	red	100	240	30		
	yellow	100	240	30		
	green	100	240	30		
	blue	100	240	30		



a 75W
b 100W
c 150W



Tungsrapar 38-ES lamps offer equal light to the Tungsrapar 38 lamps for less power, and are therefore less expensive to run. By using a 80 or 120W Tungsrapar 38-ES instead of a 100 or 120W Tungsrapar 38 you can save up to 20% more power.

Tungsrapar 38-ES lamps are resistant to shocks and splashing water, and can be used for a variety of indoor and outdoor applications such as shop-windows, restaurants, fountains and swimming pools.

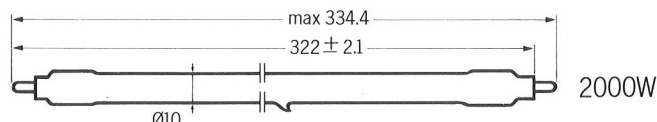
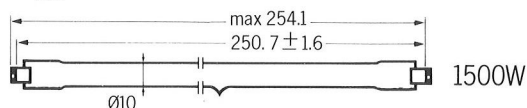
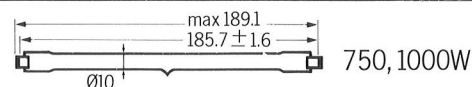
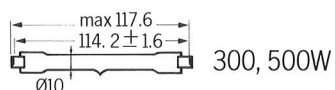
Type	Watts	Volts	Radiation Angle (Grade)	Maximum Luminous Intensity (cd)	Filling	Incandescent body
SPOT cap: E27	80	240	12	4,000	gas	coiled coil filament
	120	240	12	7,000		
FLOOD cap: E27	80	240	30	1,750		
	120	240	30	3,000		

HALOGEN FLOODLIGHTING LAMPS

These lamps feature constant high luminous flux and good colour rendition. Applications include workshops, ramps, outdoor accent lights and decorative lighting.

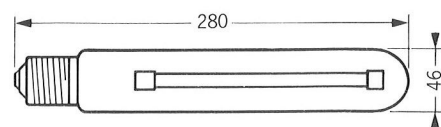
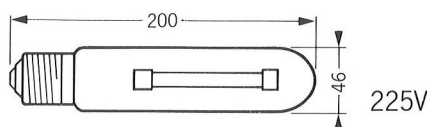
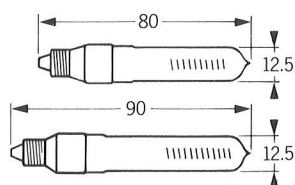
LINEAR

Type	Cap	Watts	Volts	Luminous Flux (klm)	Life (hours)
51020	R7s-15	300	240	5.0	1,000
50000	R7s-15	500	240	9.5	
50050	R7s-15	750	240	15.0	
50020	R7s-15	1,000	240	22.0	2,000
50030	R7s-15	1,500	240	33.0	
50040	Fa4	2,000	240	44.0	



WITH EDISON-CAP

Type	Cap	Watts	Volts	Luminous Flux (klm)	Life (Hours)
57020	E11	150	120, 130	2.8	2,000
57040	E11	250	120, 130	4.85	2,000
57070	E11	500	120, 130	8.25	2,000
51010	E40	500	225	9.5	1,000
51030	E40	1,000	225	22.0	2,000



FLUORESCENT LAMPS

Energy saving fluorescent
lamps

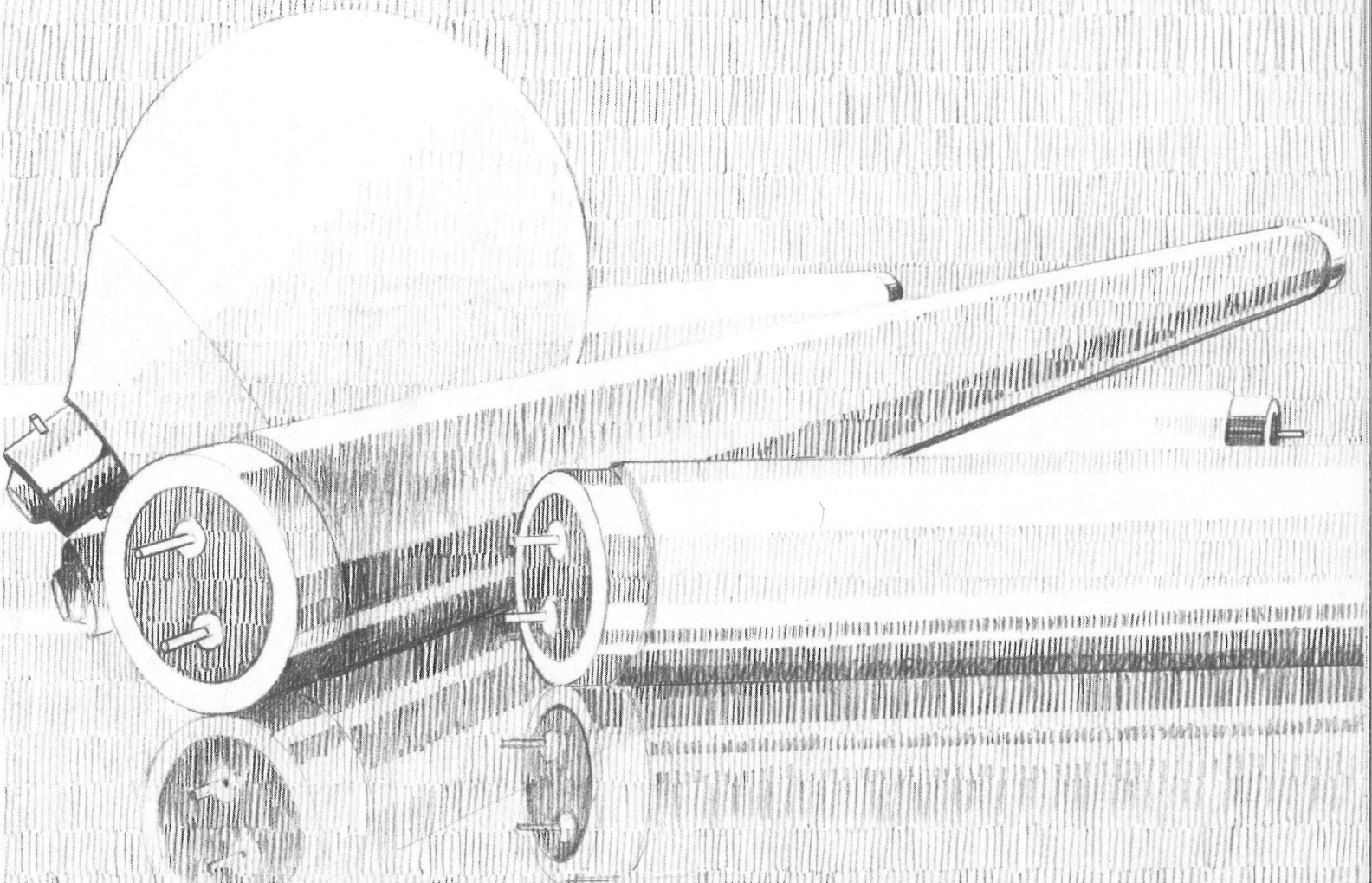
Fluorescent lamps Ø38mm

Globolux lamps

Compact fluorescent lamps

Caps

Circuit diagrams



Fluorescent lamps are the best choice for many indoor lighting applications. Low luminance over a large surface gives uniform glare-free lighting of large areas even without the use of louvres.

These lamps are low pressure discharge light sources which can not be connected to the mains directly without limiting the current. This is done by using a ballast specified for both the mains voltage and the lamp power.

Fluorescent lamps are available in a variety of colours, and, if used properly, are an efficient source of light for a long period of time.

In order to achieve the best use of your fluorescent lamp:

- the period between switching on and switching off should not be less than 3 hours;
- the lamp should not be continually turned on and off;
- fluctuations in the supply voltage should not exceed $\pm 10\%$;
- the ballasts should meet the lamp's specifications.

PROPER CHOICE OF FLUORESCENT LIGHTING

Fluorescent lights are available in a variety of tones which provide warm or cool lighting. The table below will help you decide on the right tone for any particular application, in a temperate climate. In mediterranean and tropical climates these values will shift to the right – to cool tones – and in colder climates, warmer tones will be more suitable.

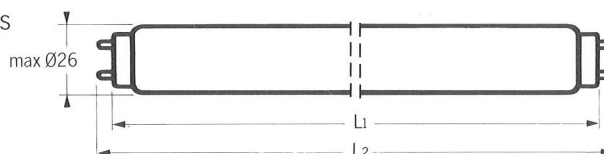
Application	Tone									
	F271	F29	F3	F301	F62	F33	F25	F34	F7	F72
Home	●		●					●		
Bathroom	●		●							
Kitchen	●									
School, auditorium	●	●								
Hospital ward	●		●			●		●		
Theatre			●					●		
Cinema			●			●	●	●		
Restaurant	●		●	●			●			
Grocery			●				●	●		
Butcher's shop			●		●			●		
Furniture shop	●		●	●			●	●		
Glass and china shop			●				●	●		
Book shop			●	●		●	●	●		
Parfumery, hairdresser's salon	●		●	●				●		
Clothes shop			●			●	●	●		●
Flower shop	●		●				●	●		
Jewellery	●		●			●	●	●		
Foundry		●				●	●		●	
Dye House		●	●			●	●	●		●
Printing house			●			●	●	●		
Workshop		●				●	●			
Studio			●			●	●	●		
Warehouse		●				●				
Laboratory			●			●	●	●		●
Conference room			●				●	●		
Office			●			●	●	●		
Exhibition hall							●	●		
Street lighting		●				●				
Gallery			●					●		
Lighting of statues								●		

FLUORESCENT LAMPS Ø38mm

STANDARD AND DE LUXE FLUORESCENT LAMPS

Type	15	20	25	30	40	40-1 ¹	65	80
Rated power (W)	15	20	25	30	40	40	65	80
Rated current (A)	0.33	0.37	0.29	0.41	0.43	0.56	0.67	0.87
Initial luminous flux (lm)								
F271 (intima de luxe, colour temperature 2700 K)	500	700	975	1,230	1,750	1,600	2,900	3,140
F29 (warm white, colour temperature 2900 K)	780	1,150	1,740	2,180	3,000	2,700	4,800	5,400
F3 (white, colour temperature 3500 K)	600	800	1,200	1,400	2,000	1,800	3,300	3,520
F301 (special de luxe, colour temperature 3000 K)	740	1,000	1,450	1,840	2,600	2,400	4,100	4,600
F62 (natural white de luxe, colour temperature 4000 K)	500	700	975	1,230	1,750	1,600	2,900	3,140
F33 (white, colour temperature 4300 K)	780	1,150	1,740	2,180	3,000	2,700	4,800	5,400
F25 (universal white, colour temperature 4300 K)	660	1,050	1,500	1,760	2,500	2,300	4,000	4,400
F34 (white de luxe, colour temperature 4300 K)	550	850	1,200	1,450	2,050	1,900	3,300	3,600
F7 (daylight, colour temperature 6000 K)	640	1,000	1,350	1,600	2,300	2,000	3,650	4,050
F72 (cold daylight, colour temperature 6500 K)	620	850	1,270	1,500	2,150	1,950	3,350	3,800
Power consumption with ballast (W)	20.5	27	33	38	49	51	76	92
L ₁ , max (mm)	437	590	970	895	1,200	970	1,500	1,500
L ₂ , max (mm)	451	604	984	909	1,214	984	1,514	1,514
Standard packing (pcs)	25							

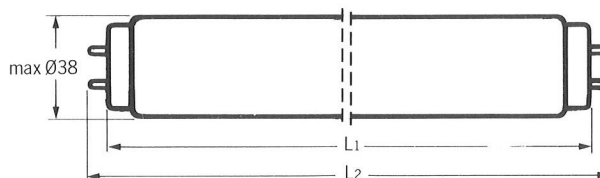
¹special ballast required not recommended for new installations



ENERGY SAVING FLUORESCENT LAMPS

A 10% energy saving can be achieved by using 26mm diameter Tungsram fluorescent lamps instead of 38mm diameter lamps. Fittings for both 26mm and 38mm diameter lamps remain the same.

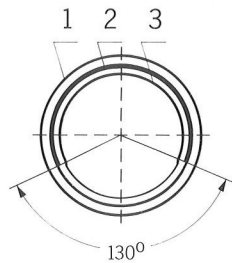
Type	18	36	58
Rated power (W)	18	36	58
Rated current (A)	0.37	0.43	0.67
Initial luminous flux (lm)			
F29 (warm white)	1,150	3,000	4,800
F33 (white)	1,150	3,000	4,800
F25 (universal white)	1,050	2,500	4,000
F7 (daylight)	1,000	2,300	3,650
F72 (cold daylight)	850	2,150	3,350
Power consumption with ballast (W)	25	45	69
L ₁ , max. (mm)	590	1,200	1,500
L ₂ , max. (mm)	604	1,214	1,514
Standard packing (pcs)	50		



COLOURED FLUORESCENT LAMPS

Coloured fluorescent lamps are available in green, red, blue, yellow, pink and orange, and in 20 and 40W versions.

Electrical characteristics and dimensions correspond to those of standard fluorescent lamps.



- 1 bulb
- 2 reflecting layer
- 3 Phosphor coating

FLUORESCENT LAMPS F-R, WITH INCORPORATED REFLECTOR

The entire length of the bulb is coated with a white reflector layer which extends over two-thirds of the circumference. The luminous flux is directed downwards at a 130° angle, and is approximately 66% higher than that of standard fluorescent lamps. The effectiveness is not affected by dust, so these lamps are particularly suitable for areas where they can not be cleaned regularly.

Dimensions and electrical characteristics are the same as those of standard fluorescent lamps.

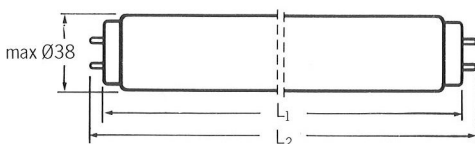
FLUORESCENT LAMPS FRS-M RAPIDSTART

These lamps can be operated without a starter. The cathodes are pre-heated by the ballast and therefore the lamps light up almost immediately.

Fluorescent lamps FRS-M are designed for use in conference rooms and other locations where constant switching on and off is likely (eg. during video or slide presentations).

These lamps can easily be identified by the metal strip on the outside of the bulb.

Type	FRS-M 20	FRS-M 40
Rated power (W)	20	40
Rated current (A)	0.37	0.43
Initial luminous flux (lm)		
F29 (warm white)	1,150	3,000
F32 (warm white de luxe)	800	1,900
F3 (white)	1,150	3,000
F25 (universal white)	1,050	2,500
F34 (white de luxe)	800	1,900
F7 (daylight)	1,000	2,300
F72 (cold daylight)	850	2,150
Power consumption with ballast (W)	30	53
L ₁ , max. (mm)	590	1,200
L ₂ , max. (mm)	604	1,214
Standard packing (pcs)	25	



FLUORESCENT LAMPS F-X

These single-pin cap fluorescent lamps are designed to be fitted in locations where there is a risk of explosion. The use of starters is made unnecessary by the internal ignition strip which prevents any explosion occurring if gas permeates through cracks in the lamps when it is switched on.

These lamps are available in 15 and 20W versions, with ballasts designed for the same standard ratings. A lamp with a 40W rating requires a ballast featuring an open-circuit voltage higher than the ignition voltage of the lamp.

Type	F-X 15	F-X 20	F-X 40
Rated power (W)	15	20	40
Rated current (A)	0.33	0.39	0.43
Luminous flux in tone F3 (lm)	630	1,000	2,500
L ₁ , max. (mm)	421.0	574.0	1,183.5
L ₂ , max. (mm)	458.0	611.0	1,220.5
Standard packing (pcs)	25		

COMPACT FLUORESCENT LAMPS

These new lamps provide an energy saving alternative source to incandescent lamps and traditional fluorescent lamps.

The advantages include good colour rendering, long life and their compact form, as well as energy saving features such as low heat and high luminous efficacy.

GLOBOLUX 125 ENERGY SAVING FLUORESCENT LAMPS

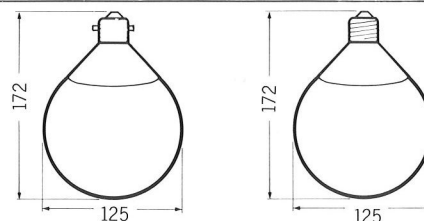
These attractive globe-shaped fluorescent lamps are exchangeable with incandescent lamps with an E27 or B22 cap.

Globolux 125 is available in 9, 13 and 18W versions which are equal to globe lamps of 40, 60 and 100W.

As well as giving off a pleasant light, the Globolux 125 has a life of approximately 8,000 hours and its energy saving effect mounts up to approximately 80%. The starter and ballast are incorporated in the Globolux 125.

Applications include in and outdoor lighting, at home, in offices, restaurants and hotels.

Watts	Cap	Finish	Ø mm	Length mm	Standard Pack
9	E27, B22	Opal	125	172	1/6
13					
18					



COMPACT FLUORESCENT LAMPS – SERIES FD 7 – FD 11

Type	FD 7	FD 9	FD 11
Power consumption (W)	7	9	11
Luminous flux (lm)	400	600	900
Luminous efficacy (lm/W)	57	66	82
Colour temperature (K)	2700		
Life (hours)	5000		
Overall length (mm)	135	167	235
Cap	G23		

COMPACT FLUORESCENT LAMPS – SERIES FD-L 18 – FD-L 36

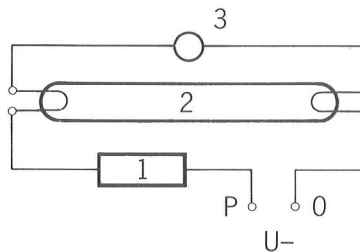
Type	FD-L 18	FD-L 24	FD-L 36
Power consumption (W)	18	24	36
Luminous flux (lm)	1250	1800	2900
Luminous efficacy (lm/W)	69	75	80
Colour temperature (K)	2700/F 82 3000/F 83 4000/F 84		
Life (hours)	5000		
Overall length (mm)	245	340	435
Cap	G32 g-1		

Type	FD-D 10	FD-D 13	FD-D 18	FD-D 26
Power consumption (W)	10	13	18	26
Luminous flux (lm)	600	900	1230	1800
Luminous efficacy (lm/W)	60	70	70	70
Colour temperature (K)	2700			
Life (hours)	5000			
Overall length (mm)	116	150	173	192
Cap	G24 d-1	G24 d-1	G24 d-2	G24 d-2

CIRCUIT DIAGRAMS

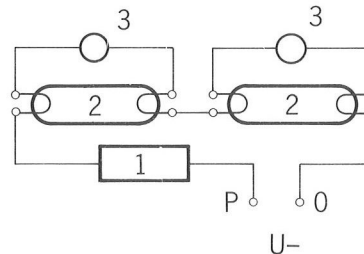
The following circuit diagrams may help with the choice of control gear for fluorescent lamps.

Inductive ballast without power-factor correction.



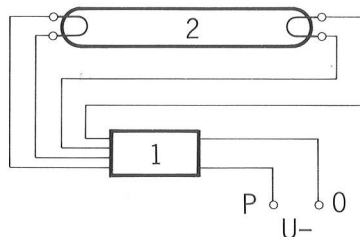
- 1 = choke coil
- 2 = fluorescent lamp
- 3 = starter
- 0 = neutral wire
- P = phase wire
- U- = mains

Two lamps series circuit with uncorrected power factor for Fluorescent Lamps 4 W, 6 W, 8 W, 15 W, 20 W. If the starting time is protracted, remove one of the Starters and put it back into its socket with an angular displacement of 180°.



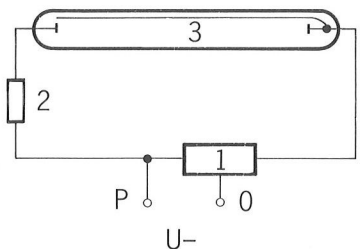
- 1 = choke coil
- 2 = fluorescent lamp
- 3 = starter
- 0 = neutral wire
- P = phase wire
- U- = mains

Circuit for Fluorescent Lamps FRS-M



- 1 = RS-ballast
- 2 = fluorescent lamp FRS-M 20 W or 40 W
- 0 = neutral wire
- P = phase wire
- U- = mains

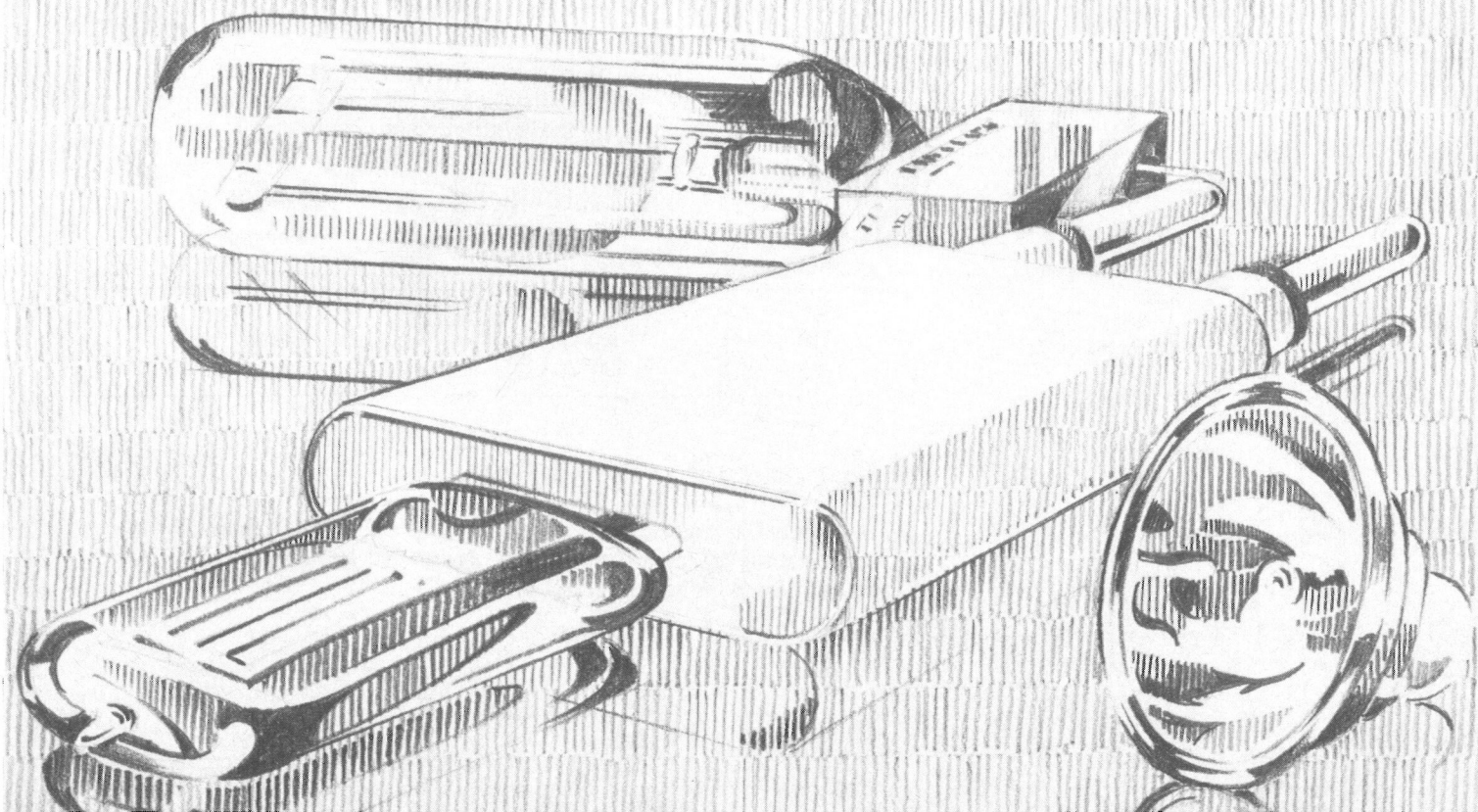
Circuit for Fluorescent Lamps F-X 40 W



- 1 = booster transformer
- 2 = choke coil
- 3 = fluorescent lamp F-X 40 W
- 0 = neutral wire
- P = phase wire
- U- = mains

PHOTO, PROJECTION AND FLOODLIGHT LAMPS

Photo lamps
Projection lamps
Floodlight lamps
Caps



The advantages of photo, projection and floodlight lamps are many. They are small, efficient, with both a high luminance and a constant luminous flux. Strict tolerances in manufacturing mean that these specialist lamps are constant in temperature and the direction of the beam is accurate.

Halogen photo lamps are designed for use in artificial light. They are suitable for photographic and film studios, for both black and white and colour photography.

Projection lamps can be fitted in cinema, narrow film, slide, episcope and epislide projectors.

High power halogen floodlight lamps are valuable light sources in film and TV studios for use in artificial light. They are also suitable for stage lighting.

Low power floodlight lamps are used as supplementary light sources in floodlighting.

IMPORTANT

Because of their high operating temperature and compact light source, projection lamps should be protected from vibration and shock. Without adequate cooling, the glass bulb can soften and the cap become loose. Overheating may reduce the life of these lamps.

To avoid marks becoming burnt onto halogen bulbs, wipe fingerprints and dust off with alcohol before turning on.

The temperature of quartz glass bulbs should not exceed 300°C.

Lamp burning positions specified here should be adhered to as deviations may result in premature lamp failure or decrease the life of the lamp. If the temperature of a halogen lamp falls below 250°C – the temperature at which the halogen cycle is maintained – the tungsten filament might fail.

In projection lamps with a multi-coil monoplane filament, the image of coil should fill the space. In slide projector lamps with a flat incandescent body, the image should lie directly above the filament. This will ensure optimum screen illumination.

Apparatus equipped with projection lamps with a multicoil light source may be tilted, providing the filament coils do not come in contact.

LAMP LIFE

Under the above conditions, a lamp should last 1,000 hours. Significant deviations from the standard operating voltage will have adverse effects on both the luminous flux and the life of the lamp.

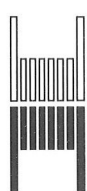
For example:

Per cent of rated volts	Per cent of rated lumens	Per cent of rated life
100	100	100
105	approx. 120	approx. 50
95	approx. 80	approx. 200

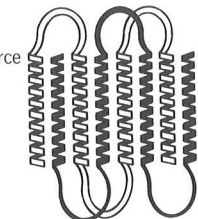
LIGHT CENTRE AND CAP AXIS

In narrow film projection lamps with monoplane or biplane light source, the deviation of the light centre from the cap axis should not exceed + or – 1mm perpendicular to the light source plane.

flat light source and its image



light source
image

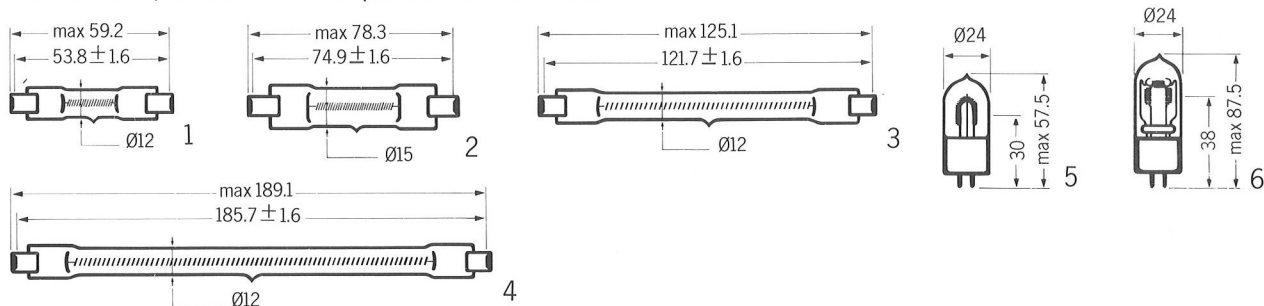


multi coil monoplane
light source and its image

HALOGEN PHOTO LAMPS

Type	Watts	Volts	Luminous flux (klm)	Life (hours)	Colour tempera- ture (K)	cap	Figure	Burning position
50160	250	30	6.5	150	3200	R7s-15	1	any
50100	650	115-120	20.0	15	3400	R7s-18	2	horizontal ^l
55040		240				GX6, 35-25	5	any
55050		220-230						
50110	800	225	22.0	15	3400	R7s-18	2	horizontal ^l
50120	1000	125, 225	33.0	50		R7s-15	3	any
50210		225	25.0	200			4	
55060		240	33.0	15	3400	GX6, 35-25	6	
55070		220-230	27.5	75	3200			

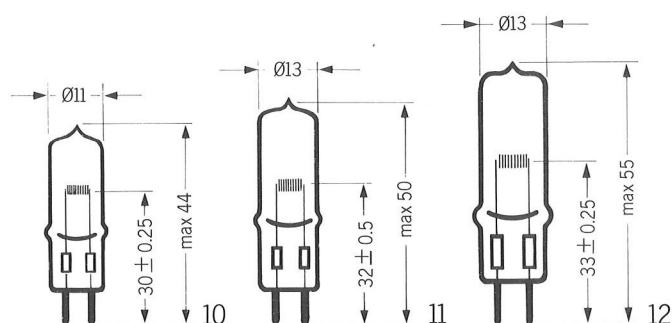
*can also be operated in a vertical position for a short time.



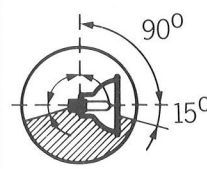
PROJECTION LAMPS

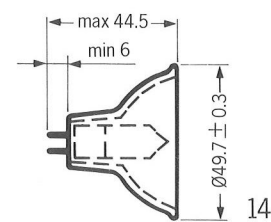
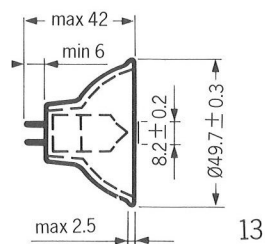
HALOGEN PROJECTION LAMPS

Type	Watts	Volts	Dimensions of Incandescent Body b x h (mm)	Luminous flux (lm)	Life (hours)	Cap	Figure	Burning Position
50550	50	12	3,3 x 1,6	1400	50	G6, 35-15	10	vertical, cap down ± 90°
50510	100		4,2 x 2,3	3000		GY6, 35-15		
50530	150	15	4,8 x 3,0	5000		G6, 35-15	11	
50520		24	5,8 x 2,9					
50550	250		7,0 x 3,5	8500			12	



DICHROIC MIRROR HALOGEN PROJECTION LAMPS

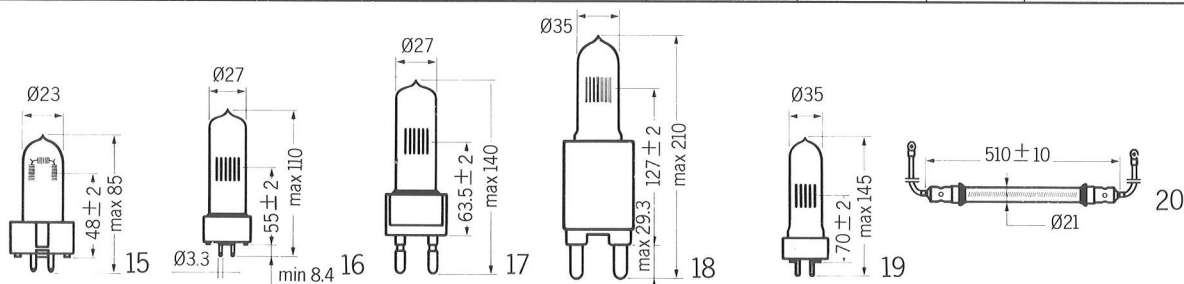
Type	Watts	Volts	Life (hours)	Cap	Figure	Burning Position
52200	50	8	50	GZ6, 35-18	13	
52210	75	12				
52220	100	12				
52230	150	15	25	G5,3	14	
52240	200	24				
52250	250	24				



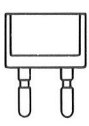





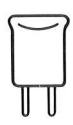

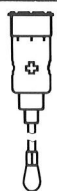


FLOODLIGHT LAMPS

HALOGEN FLOODLIGHT LAMPS

Type	Watts	Volts	Luminous Flux (klm)	Dimensions of Incandescent body b x h (mm)	Life (hours)	Cap	Figure	Burning position
54030	1000	220-230	27.5	14 x 14	75	GX9,5	15	Vertical, cap down ± 45°
54040		220	26.0	16 x 17	200		16	
54050			23.0	17.5 x 17.5	750	G22	17	
54060			26.0	16 x 17	200		18	
54080	2000		52.0	22 x 22	400	G38	18	
54090		GY16				19		
50060	5000	225	123.0	—	2000	K25s/250	20	horizontal ± 4°



CAPS

					
G22	G38	G6,35-15	G5,3 GZ6,35-18	GX6,35-25	GX9,5
					
	GY6,35-15	GY16	K25s/250	R7s-15	R7s-18

SPECIAL LAMPS

Halogen shop-window lamps

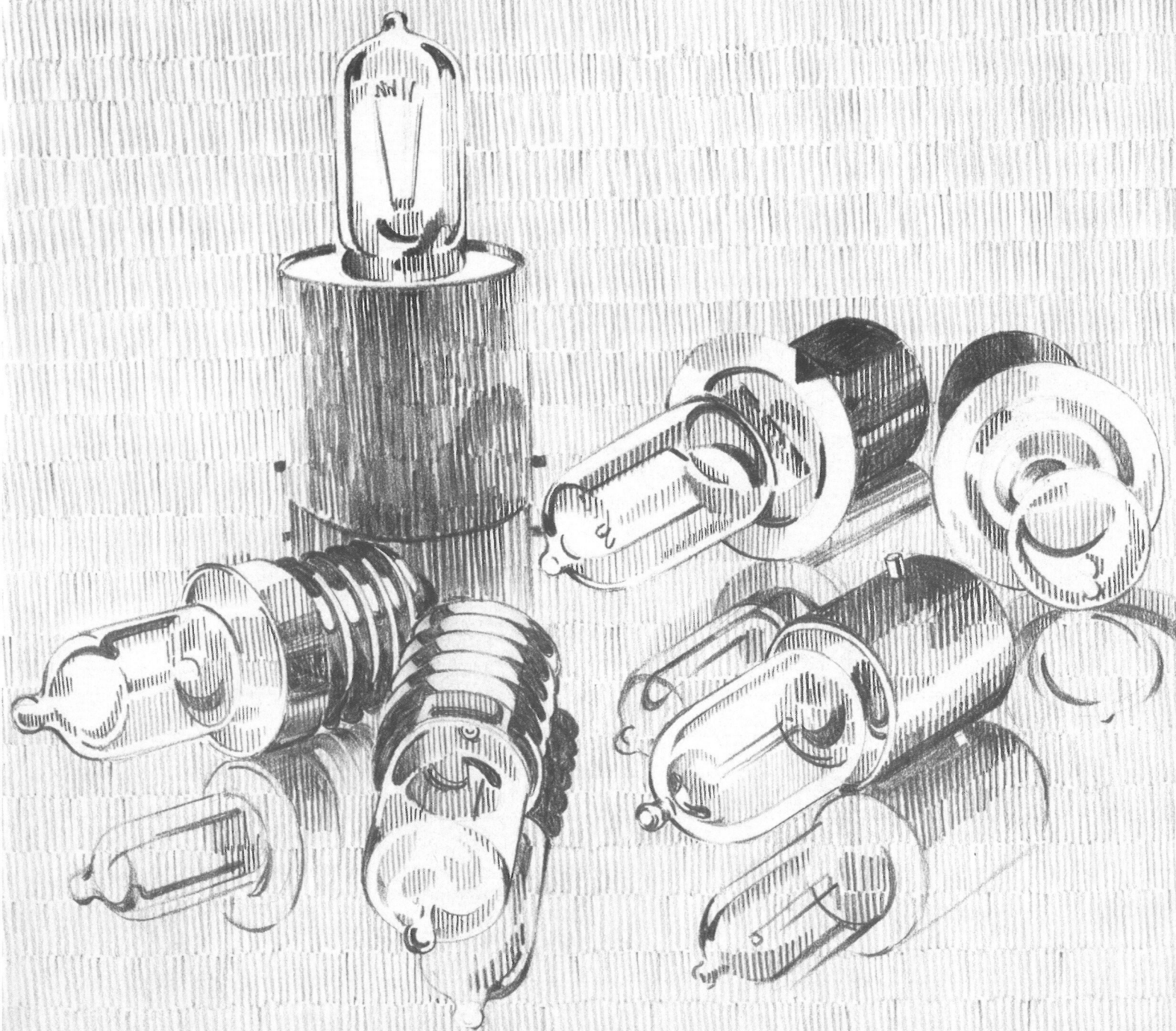
Halogen miniature lamps

Traditional miniature lamps

Baby blue fluorescent lamps

Blacklight lamps

Infrared lamps



DICHROIC MIRROR HALOGEN SHOP-WINDOW LAMPS

These lamps, fitted with dichroic mirrors, are specially designed for accent lighting and are particularly suitable for shop windows.

WHITE LIGHT EMITTING LAMPS

The advantages of these lamps include long life combined with a directed beam, uniform light distribution and a comfortable hue. Their design ensures that illuminated objects will not be damaged by heat from the lamps. Halogen shop window lamps will also save energy with their constant luminous flux.

Type	ANSI Code	W	V	Luminous Intensity (cd)	Colour temperature (K)	Radiation angle (deg.) ²	Life (hours)	Cap	l (mm)	Ø (mm)
52260 NSP	EZX	20	12	10000	2950	5	2000	GX5,3	44.5	50.5
52380 SP ¹	ESX			3300		10				
52270 NFL	—			2000		20				
52330 WFL ¹	BAB			460		40				
52390 SP ¹ ,	—	35		6000	3050	10	3000			
52400 WFL ¹ ,				1000		40				
52280 SP ¹	EXT	50		9150		10				
52290 NFL ¹	EXZ			3000		20				
52350 FL	ENL			2200		30				
52360 WFL ¹	EXN			1500		40				
52410 SP ¹ ,	—	65		10500		10				
52430 WFL ¹ ,				1700		40				
52300 SP ¹	EYF	75		11500		10	3500			
52310 NFL	EYJ			4000		20				
52370 WFL ¹	EYC			2000		40				

¹ These types are equivalent to the types designated with the suitable ANSI code only as applications are concerned.

² Nominal value.

COLOURED LIGHT EMITTING LAMPS

The selective reflection dichroic mirrors, based on thin film techniques, ensure excellent colour stability throughout the lamp's life.

The lamps are available in a wide range of colours.

	Type	Watts	Volts	Life (hours)	Cap	l (mm)	Ø (mm)
Spot	52460	50	12	3000	GX5,3	44.5	50.5
	52480	75					
Flood	52470	50					
	52490	75					

MINIATURE HALOGEN LAMPS

The advantages of using miniature halogen lamps are the high luminous flux and efficiency, with no loss of flux over a long life time.

FLASHLIGHT LAMPS

Type	Volts	Amps	Luminous Flux (lm)	Life (hours)	Cap	Battery voltage (V)	Fig.
58720	2.8	0.85	35	10	P13,5s	3.0	1
58740	4.0	0.85	60	25		4.5	
58750	5.2	0.50	48	15		6	
58760		0.85	85	25			
58770	6.5	0.70	90			50	
58710	7.2	0.80	125				
58830	2.8	0.85	36	10	E10	3.0	2
58850	4.0	0.85	62	25		4.5	
58860	5.2	0.50	50	15		6	
58870		0.85	90	25			

MINERS LAMPS

Type	Watts	Volts	Luminous Flux (lm)	Life (hours)	Cap	Fig.
58800	3.0	4.0	43	150	P13,5s	1
58790	4.0		50	400		

BICYCLE HEADLIGHT LAMPS

Type	Watts	Volts	Luminous flux (lm)	Luminous efficacy (lm/W)	Life (hours)	Cap	Fig.
58170	2.4	6	36	15	100	EP10	3
58230						BA9s	4
58290						P13,5s	1
58180	3.0		46	15.3		EP10	3
58240						BA9s	4
58300						P13,5s	1

OTHER MINIATURE HALOGEN LAMPS

These lamps can be used for a variety of specialist applications such as slide projectors, microfilm readers and scientific instruments.

Type	Volts	Watts	Luminous flux (lm)	Life (hours)	Cap	Fig.
56050	6	6	95	100	G4	5
56140			86		BA9s	6
56070		8	140		G4	5
56160			120		BA9s	6
56010		10	200		G4	5
56130			180		BA9s	6
56020		20	440		G4	5
56120			420		BA9s	6
56030			550		G4	5
56110			500		BA9s	6
56040	12	20	390	2000	G4	5
56500*		50	900		GY6,35	7
56510*		100	2350			
56600*	24	150	4300	300	G6,35	8

*Burning position: vertical, cap down $\pm 90^\circ$

LONG LIFE HALOGEN LAMP WITH ALUMINIUM REFLECTOR.

This 12V/20W lamp can be used for reading lamps, shopwindows and other local lights.

Type	Volts	Watts	Luminous Intensity, max. (cd)	Radiation Angle (grade)	Life (hours)	Length (mm)	Ø (mm)	Cap
56370	12	20	3000	10	2000	31	48	G4

FLASHLIGHT LAMPS

Type	Volts	Amps	Luminous flux (lm)	Life (hours)	Battery voltage (V)	Cap	Fig.
2779	2.5	0.1	1.7	15	3	E10	9
2780		0.2	3.7				
2781		0.3	5.8				
2782	3.5	0.2	6.3		4.5		10
2784	3.8	0.3	10.6				
2792	2.2	0.18	2.4				
2797	3.0	0.125	2.8		4.5		
2752/PR4	2.33	0.27	0.4*	10	3	P13,5s	11
2753/PR5	2.35	0.35	0.45*	35			
2750/PR2	2.38	0.5	0.8*	15			
2754/PR6	2.47	0.3	0.45*	30			
2751/PR3	3.57	0.5	1.5*	15	4.5		

*Candle power

CHRISTMAS TREE LIGHTS

Christmas tree bulbs are available in red, yellow, green, blue and clear.

Type	Volts	Watts	Life (hours)	Cap	Fig.
8019	14	3	500	E10	12

BABY BLUE FLUORESCENT LAMPS

Designed for use in hospitals, these fluorescent lamps are manufactured with a special phosphor which radiates blue light in a wavelength range of 400 to 490nm. This photochemically reduces bilirubin, the yellow blood pigment which, when present in excessive levels, causes jaundice. Babies suffering from jaundice can be treated with the lamp without the need for a blood transfusion.

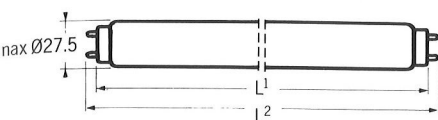
Type	Watts	Nom. lamp current (A)	Dimensions (mm)		Cap
			L ₁	L ₂	
Baby-blue	20	0.37	590	604	G13
	40	0.43	1200	1214	

GERMICIDAL LAMPS

These are fluorescent lamp-like low pressure discharge sources. The bulbs are made of special glass without any phosphor coating and can transmit short-wave ultraviolet light at a 253.7nm line, which destroys bacteria.

These lamps are used to sterilize the air in operating theatres, surgeries and waiting rooms, and in cinemas and theatres.

Germicidal lamps are used with standard fluorescent starters and chokes.



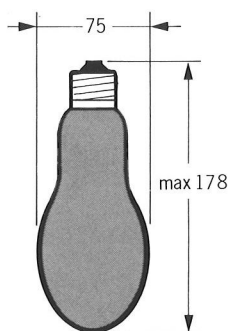
Watts	Nom. lamp (A)	UV-radiation (W)	Dimensions (mm)		Cap
			L ₁	L ₂	
15	0.33	3.5	438	452	G13
30	0.36	8.0	895	909	

BLACKLIGHT LAMPS

The outer glass bulb absorbs the visible spectrum and just transmits UV-rays in the 310 to 410 range.

As certain substances show up when lit by UV-rays, Blacklight lamps are used for testing purposes in industry and science, and for 'trick' illuminations in stage lighting and in shop windows.

Blacklight lamps are available in two versions. The HgV 125 is operated with a ballast designed for a 125W high pressure mercury vapour lamp and the HMV 160 needs no gear.



Wavelength (nm)	Radiated energy (W)	
	HgV 125	HMV 160
313.0	0.08	0.068
334.2	0.16	0.08
365.5	2.75	1.2
390.5	0.03	0.051
404.7	0.03	0.02
407.8	0.03	0.02

Type	Watts	Volts	Amps	Luminous flux (lm)	Length (mm)	Ø (mm)	cap
HgV 125	125	220	1.15	<10 ³	178	75	E27 ¹
HMV 160	160	220-230	0.75		170		

1 Upon special request available with cap B22

INFRARED LAMPS

INFRARED HALOGEN LAMPS

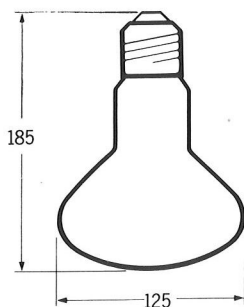
These lamps can be used for a variety of domestic and industrial purposes.

Type	Watts	Volts	Life (hours)	Length (mm)	Ø (mm)	Cap
51040	400	220	5000	229.1	10	R7s15
51050	800	120		390.0		

HARD GLASS INFRA LAMPS

Infrasec, Infrasatin and Infrarubin lamps are used in industry for drying, evaporating, polymerising and for various heat treatments. They are also suitable for use in animal breeding and for a variety of therapeutic purposes.

*Please ensure that the correct lamp fitting is used for all infra lamps to avoid overheating.



Features	Type	Watts	Volts	Life (hours)	Cap
INFRASEC with clear bulb top	9040	150	230	5000	E27
	9043	250	240		
INFRASATIN with satinized bulb top	9040	150	230		
	9043	250	240		
INFRARUBIN with rubin red bulb top	9040	150	230		
	9043	250	240		

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