METROVICK

# *lamps*

# INDEX



## CONDITIONS OF SALE

Metrovick Lamps must be retailed at the list prices shown herein without any discount. Prices are subject to change without notice. Orders received will be taken as acceptance of these conditions, and will also be subject to the Company's standard "Conditions of Sale." **The prices in this Catalogue apply in Great Britain and Northern Ireland only, and are exclusive of Purchase Tax.**

*As efforts are made constantly to improve both designs and methods of manufacture, material supplied may differ in details from the illustrations.*

BRITISH MADE

# METROVICK LAMPS

*All lamps in this catalogue comply with the appropriate British Standards in so far as these are applicable*

# PURCHASE TAX

Metrovick filament lamps up to and including 250 watts and Metrovick fluorescent tubular lamps up to and including 80 watts are subject to Purchase Tax of 25 per cent of their wholesale value. At the wholesale values accepted by the Commissioners of H.M. Customs and Excise the Tax is chargeable as follows:—

| *Group of Lamps* | *Description* | *Percentage of list price to be charged as Tax* |
|---|---|---|
| I | Projector lamps in Classes A.I and G | Nil |
| | Other filament lamps up to and including 250 watts | 18⅛ |
| | Other lamps in Group I | Nil |
| II & IV | Automobile lamps, Cycle Dynamo lamps | 16¼ |
| V | Miners' lamps approved by the Mines Dept. and marked "MFP" | Nil |
| | Other lamps in Group V | 18½ |
| VI | Decoration lamps and sets | 18½ |
| IX | Fluorescent tubular lamps up to and including 80 watts | 18⅛ |
| | Other lamps in Group IX | Nil |
| X | Radio Panel lamps | 16¼ |

Purchase Tax must be charged in full, the percentages being calculated on the total list value of lamps in each respective category, without any deductions, except that any fraction of a penny may be ignored in the final calculation.

Retailers, however, when selling to the Public, i.e., at list prices nett, must charge the Tax by adding fixed amounts to the list prices as follows:—

| WHERE LIST PRICE IS over | WHERE LIST PRICE IS and not over | ADDITION TO LIST PRICE IS | WHERE LIST PRICE IS over | WHERE LIST PRICE IS and not over | ADDITION TO LIST PRICE IS |
|---|---|---|---|---|---|
| **GROUPS I and IX LAMPS** | | | | | |
| s. d. | s. d. | s. d. | s. d. | s. d. | s. d. |
| 1 1 | 1 2 | 2½ | 8 5 | 9 5 | 1 7 |
| 1 2 | 1 5 | 3 | 9 5 | 10 5 | 1 10 |
| 1 5 | 1 8 | 3½ | 10 5 | 10 8 | 1 11 |
| 1 8 | 1 11 | 4 | 10 8 | 11 2 | 2 0 |
| 1 11 | 2 2 | 4½ | 11 2 | 11 8 | 2 1 |
| 2 2 | 2 5 | 5 | 11 8 | 12 2 | 2 2 |
| 2 5 | 2 8 | 5½ | 12 2 | 12 8 | 2 3 |
| 2 8 | 2 11 | 6 | 12 8 | 12 11 | 2 4 |
| 2 11 | 3 2 | 6½ | 12 11 | 13 5 | 2 5 |
| 3 2 | 3 5 | 7 | 13 5 | 13 11 | 2 6 |
| 3 5 | 3 8 | 8 | 13 11 | 14 8 | 2 7 |
| 3 8 | 3 11 | 8½ | 14 8 | 14 11 | 2 8 |
| 3 11 | 4 2 | 9 | 14 11 | 15 6 | 2 9 |
| 4 2 | 4 4 | 9½ | 15 6 | 16 5 | 2 11 |
| 4 4 | 4 8 | 10 | 16 5 | 17 5 | 3 1 |
| 4 8 | 4 11 | 10½ | 17 5 | 18 5 | 3 3 |
| 4 11 | 5 2 | 11 | 18 5 | 19 8 | 3 5 |
| 5 2 | 5 5 | 11½ | 19 8 | 21 0 | 3 10 |
| 5 5 | 5 8 | 1 0 | 21 0 | 23 0 | 4 1 |
| 5 8 | 6 2 | 1 1 | 23 0 | 26 0 | 4 7 |
| 6 2 | 6 11 | 1 2 | 26 0 | 29 0 | 5 0 |
| 6 11 | 7 5 | 1 4 | 29 0 | 32 0 | 5 6 |
| 7 5 | 8 5 | 1 5 | 32 0 | 35 0 | 6 4 |
| **GROUPS II, IV and X LAMPS** | | | | | |
| | | | 3 8 | 4 2 | 8 |
| 5 | 9 | 1½ | 4 2 | 4 8 | 9 |
| 9 | 1 2 | 2 | 4 8 | 5 2 | 10 |
| 1 2 | 1 7 | 3 | 5 2 | 5 8 | 11 |
| 1 7 | 2 2 | 4 | 5 8 | 6 2 | 1 0 |
| 2 2 | 2 8 | 5 | 6 2 | 6 8 | 1 1 |
| 2 8 | 3 2 | 6 | 6 8 | 7 2 | 1 2 |
| 3 2 | 3 8 | 7 | 7 2 | 7 8 | 1 3 |

**Flashlamps** *list price* 4d., *P.T.* 1d.; *list price* 7d. *and* 8d., *P.T.* 1½d.; *list price* 1/-, *P.T.* 2d.

# GENERAL LIGHTING SERVICE LAMPS

The incandescent filament General Lighting Service lamp has become such a commonplace article that the user probably gives little thought to the skill necessary to produce it. It requires a very high degree of accuracy in its assembly, and the materials used, particularly the filament wire and gas, must be of the finest quality. The manufacturer must adopt a rigid specification, backed by tests and inspections at every stage of manufacture.

Some indication of the degree of accuracy required can be judged from the fact that the diameter of some filament wires must be accurate to within one ten-millionth of an inch. If the diameter of the wire is allowed to vary within fantastically small limits, portions of the filament will run at an excessively high temperature, resulting in short life.

Apart from the large number of tests made on raw materials, samples of Metrovick lamps straight off the machines are subjected to rigorous tests.

The lamps are physically examined to ensure that the dimensions are correct; that the lamp bulb quality is maintained; that the cap complies with dimensional specifications, and that its adhesion to the glass bulb is up to specification. The insulation is measured between the contacts and the cap shell to ensure safety to the user.

The lamp is then run at half rated volts, and the filament inspected to ensure that each section of its length, between the supports, is of uniform temperature.

Subsequently, the lamps are tested for initial rating, and then placed on life test at their rated voltage and illumination measurements taken, initially and near the end of life. By these and other means uniformity of quality is assured.

**The effect of the variation of supply voltage on G.L.S. Lamps**

Among others there are two qualities particularly to be desired in a tungsten filament lamp.

Firstly, the lamp should be as efficient as possible, i.e., it should give as much light as possible for the smallest consumption of electricity. Secondly, the lamp should have as long a life as possible. It is the optimum combination of these qualities which results in a good lamp.

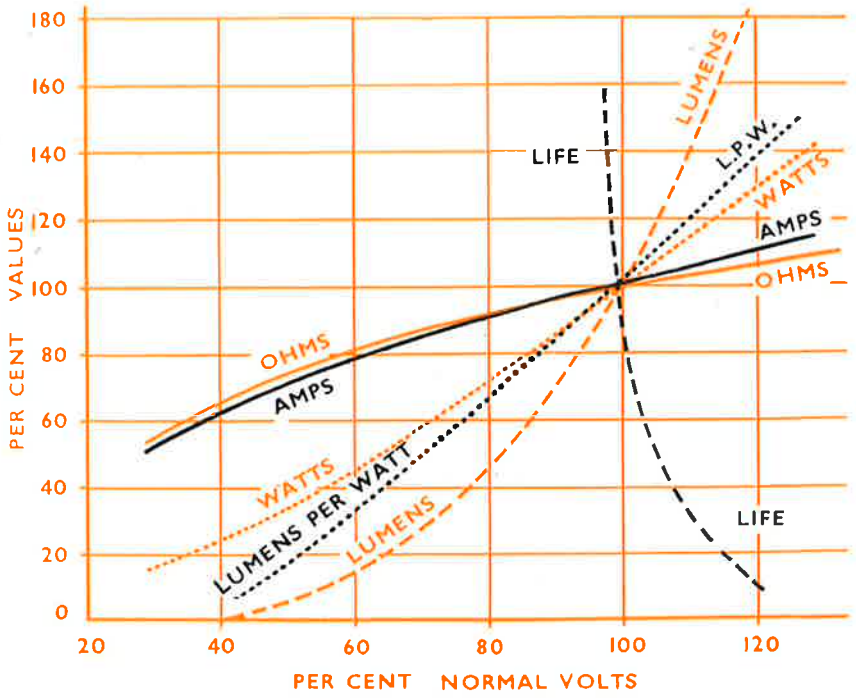
## Some Interesting Facts

In the tungsten filament lamps these two qualities, efficiency and life, are interdependent — the lamp, of any given size and type, with the highest efficiency has the shortest life, while the lamp with the lowest efficiency has the longest life. For example, a 500 watt Photoflood lamp has an efficiency about twice that of a 500 watt G.L.S. lamp, but the life of the Photoflood lamp is only 6 – 8 hours, compared with the 1,000 hours of the G.L.S. lamp.

Let us consider what happens when a G.L.S. gasfilled lamp is operated on a supply voltage other than the rated lamp voltage.

If the supply voltage is less than the rated lamp voltage the life of the lamp will be greater than 1,000 hours and the efficiency of the lamp will be less than that corresponding to a life of 1,000 hours, and the watts consumed by the lamp will be reduced.

If the supply voltage is more than the rated lamp voltage the life of the lamp will be less than 1,000 hours and the efficiency of the lamp will be more than that corresponding to a life of 1,000 hours. Also the watts consumed by the lamp will be increased.




**Example of use of Graph**

A 220 volt lamp is operated on 242 volts =110% volts. The life would be only about 350 hours but the light output would be increased by about 40%.

**The effect of burning position on the life of G.L.S. Lamps**

The filament of a G.L.S. lamp is supported by molybdenum wires. One end of each support wire is sealed into the glass hub of the lamp while the other end is looped round the filament. Where the filament rests on each support loop the coils of the filament are short circuited and filament design has, therefore, to compensate for these short circuited coils otherwise the lamp will not give its rated life. This reduction in lamp life would be caused by the increased current passed by the filament when its effective length is reduced by short circuiting some of the coils; the more coils short circuited the shorter is the lamp life.

In a G.L.S. lamp the filament is designed to give its rated life when the lamp is burned in a "cap up" position as in this position the filament rests on a single wire only of each support and the number of coils of the filament which are short circuited is kept to a minimum. Nowadays with the closed loop of the machine-mounted filament the lamp can be burned in other than its "cap up" position without any appreciable reduction of life.

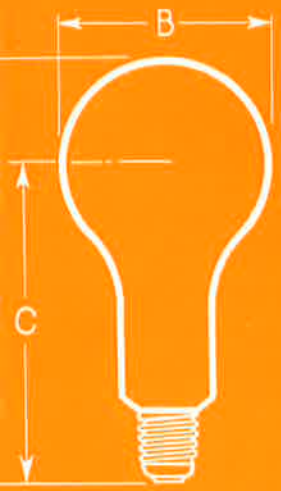
**Fuses in Lamps**

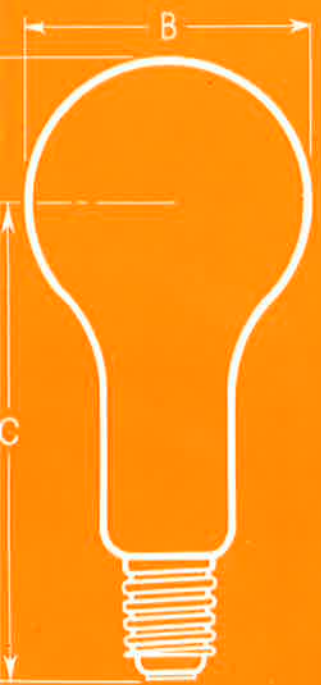
One of the latest improvements in the design and efficiency of G.L.S. lamps has brought with it the possibility of an internal arc developing at the end of life on certain ratings, and to avoid the annoyance of a circuit fuse blowing, a fuse is now incorporated in the lamps which are likely to be affected.

**Gasfilling**

When a filament is heated evaporation tends to take place, the speed of evaporation being a function of the temperature. As the light output of the lamp filament is also dependent upon the temperature it is obviously necessary to run the filament at the highest possible temperature without it melting or evaporating so rapidly that its life would be too short for practical purposes. Tungsten has so far proved to be the best substance available for this purpose when placed in a lamp bulb from which the oxygen has been evacuated.

Filling the evacuated bulb with an inert gas such as Argon still further retards evaporation, and this is done with all general service lamps with the exception of certain low wattages and rough service lamps.


# GENERAL

| | | 200/260 VOLTS | | |
|---|---|---|---|---|
| | | SINGLE COIL | | |
| Watts | Caps | Pearl | Clear | White and Colour Sprayed |
| 15 | B.C. | 1/6½ | | 1/8½ (a) |
| 25 | | | | |
| 40 | | 1/4½ | | 1/7½ |
| 60 | | | | |
| 75 | | 1/10 | | 2/2 |
| 100 | | | | |
| 150 | | 2/7 | | 3/4 |
| 200 | E.S. | 4/3 | 3/9 | 5/3 |
| 300 | G.E.S. | | 7/6 | 9/3 |
| 500 | | | 10/- | 12/3 |
| 750 | | | 16/- | |
| 1000 | | | 17/6 | |
| 1500 | | | 25/- | |

(a) Inside sprayed 1/9½d. each. 200/250 volts. Red, Blue, Orange, Green, Yellow and White. — Red, Blue, Green, up to 100 watts

LAMPS

# SERVICE

## (10 Volt Steps)

| COILED COIL | | | Approximate Dimensions (see diagrams page 6) | | |
|---|---|---|---|---|---|
| Silverlight | Pearl and Clear | Silverlight | A mm. | B mm. | C mm. |
| — | — | — | 92·5<br>100 | 55<br>60 | 65<br>70 |
| 1/7½ | 1/9 | 2/- | 110 | 60 | 80 |
| — | 2/1½ | — | 125 | 68 | 90 |
| 2/1 | | 2/4½ | 125<br>137·5 | 68<br>75 | 90<br>100 |
| 3/1 | Coiled Coil lamps give up to 20 per cent more light than Single Coil lamps of the same wattage. | | 160 | 80 | 120 |
| 4/9 | | | 178 | 90 | 133 |
| | | | 233 | 110 | 178 |
| | | | 267 | 130 | 202 |
| | | | 300 | 150 | 225 |
| | | | 300 | 150 | 225 |
| | | | 335 | 170 | 250 |

## Silverlight

Silverlight lamps combine the efficiency of the more popular pearl lamps with the pleasing effect of the former opal glass lamps but without the loss of light transmission inherent in the latter. They have an internal coating of Silica in a finely divided state which gives them a low surface brightness, reducing glare to a minimum and making them particularly suitable for use where the filament position might come within the line of vision.

**Yellow, Flame, Pink, Orange and Amber wholly or partially White wholly or partially up to 500 watts.**

# GENERAL SERVICE
## SINGLE COIL

| 25, 35, 50, 55, 60, 65, 75 VOLTS | | | | 100/130 VOLTS (10 volt Steps) | | |
|---|---|---|---|---|---|---|
| Watts | Caps | Pearl | Clear† | Pearl | Clear | White and Colour Sprayed |
| 15 | B.C. | 1/11 | | 1/6½ | | 1/8½ |
| 25 | | | | | | |
| 40 | | 2/3 | | | | 1/9½ |
| 60 | | | | | | |
| 75 | | — | | 2/- | | 2/4 |
| 100 | | 4/- | | | | |
| 150 | | | 6/- | 2/9 | | 3/6 |
| 200 | E.S. | | 9/- | 4/9 | 4/3 | 5/9 |
| 300 | G.E.S. | | 12/- | | 8/- | 9/9 |
| 500 | | | 16/- | | 10/6 | 12/9 |
| 750 | | | | | 16/- | |
| 1000 | | | | | 17/6 | |
| 1500 | | | | | 25/- | |

† 25 volts clear up to 100 watts only

Dimensions as page 7

Red, Blue, Green, Yellow, Flame, Pink, Orange and Amber wholly or partially up to 100 watts. White wholly or partially up to 500 watts.

# FLUORESCENT TUBULAR LAMPS

**The Hot Cathode Tubular Fluorescent Lamp**

The tubular fluorescent lamp consists of a cylindrical glass tube coated on the inside with fluorescent materials (phosphors). An electrode is sealed into each end of the tube and the connections to each electrode are brought out to the lamp cap. The electrode is made of a coil of tungsten wire, coated with a mixture of alkaline earth oxides which freely emits electrons when heated; this coil acts as the cathode. Two small fins are placed on each side of the cathode to act as the anode during the appropriate half cycle. After the tube has been evacuated a drop of mercury is introduced into the tube, also a small quantity of Argon gas to help to initiate the arc between the cathodes.

Two methods of starting are in common use, switch start and instant start, both involve the heating of the cathodes.

The operation of starting consists in forcing electrons to pass along the tube from end to end, thereby forming the conducting passage or "arc" between the cathode and anode.

In the case of switch start circuits, it is necessary to pass a current through the electrodes to heat them and to apply a voltage sufficiently high to cause the arc to strike.

When using the instant start method, however, a special instant start transformer is employed both to heat the electrodes and ensure the correct starting and running conditions for the lamp. It is important that for instant start, conditions for the movement of electrons along the tube are just right. An electrical charge on the lamp may be sufficient to repel electrons and thus prevent starting and it is for this reason that a metallic stripe is affixed to lamps intended for instant start circuits.

When fluorescent lamps are operated on D.C. circuits a phenomenon known as cataphoresis occurs. This is due to the migration of the mercury towards the negative end of the tube, resulting in a reduction of light output at one end. It may be overcome by reversing the polarity of the supply at intervals. The phenomenon is more noticeable with 4 ft. and 5 ft. lamps. The 18 in. and 2 ft. lamps can be operated for long periods before the effect of cataphoresis becomes objectionable.

**Effect of Switching**

The effect of switching on a fluorescent lamp is to cause a small piece of the cathode coating to be dissipated and the cumulative effect of this is that the voltage required to strike the arc becomes progressively higher until the applied voltage is insufficient to start the lamp. The rated lamp life is usually given for a switching frequency of not more than once every three hours.

Fluorescent lamp life unlike that of the tungsten filament lamp, is considerably affected by the number of switching operations which take place during its life, but the life is not seriously affected by small variations in the supply voltage.

### Effect of Temperature

The pressure within a fluorescent lamp is affected by the external air temperature and the effect of the alteration in pressure results in a change in the quantity of radiation which excites fluorescence. Cathode heating conditions also change with temperature and the correct starting device must be chosen.

### Lamp Efficiency

The arc of a fluorescent tubular lamp produces very little visible light but is rich in certain radiations in the ultra-violet range.* These radiations have the power to cause the phosphor coating on the tube to emit light by fluorescence. The light radiation from a lamp of this nature depends almost entirely upon the fluorescent materials used both for colour and quantity.

As the eye does not react equally to all colours of light, the same energy radiated at different wavelengths produces a different visual response. The eye is most sensitive to the yellow/green colours and least sensitive to the blues and reds. This means that if a powder is prepared giving most if its light in the yellow/green wavelengths it will be more efficient than one giving more light towards the red or blue end of the spectrum. The more popular colours are the warm ones towards the red end of the spectrum which are less efficient than the colder colours which have more light in the yellow/green wavelengths.

Lamp efficiency is specified as the number of light units emitted in relation to the number of electrical units consumed, i.e. lumens per watt.

Lumen output does not remain constant throughout the life of a fluorescent lamp but falls appreciably for the first 100 hours and then very gradually for the remainder of its life. Fluorescent lamp life is now so long that efficiencies of Metrovick lamps are quoted as the average through the first 5,000 hours of lamp life.

### Lamp Colour

As the types of fluorescent powders used and the proportions in which they are mixed determines the colour of light emitted, it is possible to alter the lamp colour by varying the constituent powders and almost any variety of "white" light can be obtained.

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* Particularly radiation of 2537 Å.

Å — Angstrom unit of wavelength $= \frac{1}{100{,}000{,}000}$ cm.

To cater for the various requirements of specific installations there are at present five standard white colours of Metrovick fluorescent lamps, viz., Daylight, Natural, New Warm White, De Luxe Warm White and Colour Matching. Confusion often arises between colour appearance of light sources and the colour rendering of objects seen under them, and it must be remembered when looking at a lamp that the eye can easily be deceived and apparently similar light sources may give different colour rendering and vice versa. We recommend obtaining the advice of our illuminating engineers as to the best colour of lamp to suit individual lighting problems.

Colours cannot be accurately specified by means of words but there are two standard methods of specifying colour.

The first method is to divide the visible wavelengths into eight bands and to specify the relative amount of light in each band. The internationally agreed bands are:

| *Band No.* | *Wavelength* Å | *Colour* | *Band No.* | *Wavelength* Å | *Colour* |
|---|---|---|---|---|---|
| 1 | 3800 – 4200 | Far Violet | 5 | 5100 – 5600 | Green |
| 2 | 4200 – 4400 | Violet | 6 | 5600 – 6100 | Yellow |
| 3 | 4400 – 4600 | Blue | 7 | 6100 – 6600 | Light Red |
| 4 | 4600 – 5100 | Blue-Green | 8 | 6600 – 7100 | Deep Red |

The second method is to construct a colour chart which is in effect a triangle having the three primary colours one at each point, and the various intermediate colour "mixes" being graded throughout the inside of the triangle. By laying the triangle on squared paper and numbering the squares any colour appearance can be specified. The square numbers are usually quoted as $x$ and $y$ co-ordinates to the C.I.E.* specification.

**Cold Cathode Lamps**

Hot and Cold Cathode lamps are essentially the same except that cold cathode lamps are provided with a large unheated cathode, not coated with any emissive material, and starting is effected by the application of a high voltage across the lamp. There is a considerable voltage drop at the cathodes which results in a reduced overall efficiency compared with the equivalent hot cathode lamp.

On short lamps this loss in the cathodes renders cold cathode lamps uneconomical and thus lamps shorter than 8 ft. are not normally listed.

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* Commission Internationale de l'Eclairage.

# METROVICK HOT CATHODE

**Classes MCF/U (except 125 watt), MCFC/U —**

| Wattage | 15 | | | 20 | | | 30 | | |
|---|---|---|---|---|---|---|---|---|---|
| Colour | Natural | New Warm White | De Luxe Warm White | Natural | New Warm White | De Luxe Warm White | Natural | New Warm White | De Luxe Warm White |
| Average lumens through first 5,000 hours' life | 390 | 480 | 330 | 580 | 800 | 460 | 1020 | 1380 | 840 |
| Nominal Brightness (av. across tube) stilb.<br>candles/sq. in. | 0·55<br>3·6 | 0·65<br>4·2 | 0·47<br>3·1 | 0·37<br>2·4 | 0·47<br>3·1 | 0·33<br>2·1 | 0·62<br>4·0 | 0·77<br>5·0 | 0·54<br>3·5 |
| Lamp Operating Volts | 56 ± 4 | | | 62 ± 4 | | | 103 ± 5 | | |
| Lamp Operating Current (amps) nominal | 0·30 | | | 0·35 | | | 0·34 | | |
| Starting Current (amps) | 0·4 – 0·65 | | | 0·4 – 0·70 | | | 0·4 – 0·65 | | |
| Overall Length (nominal) | 18 in. | | | 24 in. | | | 36 in. | | |
| Diameter (nominal) | 26 mm. | | | 38 mm. | | | 26 mm. | | |
| Caps | Medium Bi-pin G.13/23. | | | | | | | | |

# FLUORESCENT TUBULAR

**and MCFA/U (except 15 and 125 watt).**

**125 watt only.**

| 40 | | | | | 40 | | | 80 | | | | | 125 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Natural | New Warm White | De Luxe Warm White | Day-light | Colour Match-ing | Natural | New Warm White | De Luxe Warm White | Natural | New Warm White | De Luxe Warm White | Day-light | Colour Match-ing | Natural | New Warm White |
| 1640 | 2160 | 1200 | 1920 | 1200 | 920 | 1320 | 760 | 3120 | 4160 | 2240 | 3600 | 2240 | 5000 | 6875 |
| 0·43<br>2·8 | 0·57<br>3·7 | 0·38<br>2·5 | 0·53<br>3·4 | 0·38<br>2·5 | 0·62<br>4·0 | 0·82<br>5·3 | 0·53<br>3·4 | 0·66<br>4·3 | 0·91<br>5·8 | 0·57<br>3·7 | 0·82<br>5·3 | 0·57<br>3·7 | 0·64<br>4·1 | 0·84<br>5·5 |
| 108 ± 5 | | | | | 50 ± 4 | | | 106 ± 5 | | | | | 170 ± 10 | |
| 0·41 | | | | | 0·88 | | | 0·85 | | | | | 0·85 | |
| 0·50 – 0·75 | | | | | 1·0 – 1·60 | | | 1·0 – 1·60 | | | | | 1·0 – 1·60 | |
| 48 in. | | | | | 24 in. | | | 60 in. | | | | | 96 in. | |
| 38 mm. | | | | | 38 mm. | | | 38 mm. | | | | | 38 mm. | |
| Pin alignment within 6° | | | | | | | | BC – 2 pin<br>B.22/25 × 26<br>Pin alignment within 15° | | | | | | |

# FLUORESCENT TUBULAR

**Faulty Operation — Causes and Remedies**

| *Symptom* | *Cause* | *Remedy* |
|---|---|---|
| Lamp flickers on and off. | (1) Lamp has run useful life.<br>(2) Low line voltage, cold draughts or low ambient temperature.<br>(3) Faulty starter tending to switch on and off.<br>(4) Faulty lamp. | (1) Renew lamp.<br>(2) Check voltage, protect lamp from cold draught.<br>(3) Renew starter.<br>(4) Renew lamp. |
| The whole column of light appears to be moving in the lamp, usually in the form of a spiral. | This usually occurs only when the lamp is new and disappears after a short period of use. | Switch off lamp and restart after a few seconds. |
| A slow pronounced flicker. | Lamp has probably run useful life. | Renew lamp. |
| The lamp does not light when switched on, but both filaments glow. | (1) Starter contacts have welded together or short circuited.<br>(2) Radio suppressor short-circuited.<br>(3) Metallic stripe on instant start lamp not properly earthed. | (1) Renew starter.<br>(2) Renew radio suppressor.<br>(3) Check earthing connections and continuity of stripe. |
| The lamp does not light when switched on and only one filament glows. | (1) Earth in wiring of starter or radio suppressor.<br>(2) Faulty thermal starter. | (1) If no earth detectable replace radio suppressor.<br>(2) Renew starter. |
| The lamp appears quite dead when switched on. | (1) Broken lamp filament.<br>(2) Starter fails to operate.<br>(3) Break in circuit or failure of supply. | (1) Examine carefully, if broken replace lamp.<br>(2) Renew starter. If new starter also fails to operate try circuit with test lamp.<br>(3) Examine circuit with a test lamp, test lampholder contacts. |
| Electrodes loose in starter bulb. | This may be caused by an earth or short circuit in the starter leads, or by mechanical damage. | Check wiring and replace starter. |
| Heater coil of thermal starter burned out. | May be due to broken lamp filaments. | Change lamp if defective and renew starter. |
| Glow starter glows while lamp is running. | Faulty starter. | Renew starter. If glow persists with new starter, fault probably in the lamp. Replace lamp. |




METROVICK


# FLUORESCENT TUBULAR

| Watts | Caps | Colours | Type of Start | | Approximate Dimensions | |
|---|---|---|---|---|---|---|
| | | | MCF/U | MCAF/U | A | B |
| | | | | | ft. | in. |
| 15 | Bi-pin | Natural, New Warm White | 9/9 | — | $1\frac{1}{2}$ | 1 |
| | | De Luxe Warm White | 11/- | — | | |
| 20 | | Natural, New Warm White | 10/6 | 11/6 | 2 | $1\frac{1}{2}$ |
| | | De Luxe Warm White | 11/9 | 12/9 | | |
| 30 | | Natural, New Warm White | 11/- | 12/- | 3 | 1 |
| | | De Luxe Warm White | 12/3 | 13/3 | | |
| 40 | | Natural, New Warm White | 11/- | 12/- | 2 | $1\frac{1}{2}$ |
| | | De Luxe Warm White | 12/3 | 13/3 | | |
| 40 | | Natural, New Warm White, Daylight, Colour Matching | 11/9 | 12/9 | 4 | $1\frac{1}{2}$ |
| | | De Luxe Warm White | 13/- | 14/- | | |
| 80 | BC | Natural, New Warm White, Daylight, Colour Matching | 13/- | 14/- | 5 | $1\frac{1}{2}$ |
| | | De Luxe Warm White | 14/6 | 15/6 | | |
| | | Red, Green, Blue, Yellow | 17/6 | 18/6 | | |
| 50 or 70† | SCC | Natural | — | 30/-* | 8 | 1 |
| 125 | BC | Natural, New Warm White | — | 32/6* | 8 | $1\frac{1}{2}$ |

† *Lamp watts determined by auxiliary gear. MCF/U – Switch start. MCFA/U instant start external strip.*
* *MCFC/U – instant start, external strip not connected to either end of tube.*

# FLUORESCENT CIRCULAR

| Watts | Caps | Colour | PRICE | Approximate Dimensions | |
|---|---|---|---|---|---|
| | | | | Length ft. | Dia. in. |
| 40 | 4-pin Special | Mellow MCF/U | **35/-** | 4 (16 in. circle) | 1½ |

**4 ft. 1½ in. Circular**

# TUNGSTEN BALLAST

*Single Coil Pearl, for use with* 40 *watt MCF/U circular lamps*

| Watts | Caps | Operating voltage | Mains voltage | PRICE | Approximate Dimensions | |
|---|---|---|---|---|---|---|
| | | | | | mm. | mm. |
| 70 | 3-pin BC | 117 | 200:210 | **2/6** | 117 | 65 |
| 80 | | 142 | 220:230 | | | |
| 80 | | 150 | 240 | | | |
| 80 | | 160 | 250 | | | |

*Single Coil Pearl, for use with* 40 *watt MCFA/U lamps*

| | | Operating voltage | For use on mains voltage | | mm. | mm. |
|---|---|---|---|---|---|---|
| 0·43 amps. | 3-pin BC | 115<br>140<br>151<br>162 | 200:210<br>220:230<br>240<br>250 | **2/6** | 117 | 65 |

**Cold Cathode**
**Straight through electrode**

Cold Cathode
Turnback electrode

Pygmy Sign

Sign-internally sprayed



# COLD CATHODE

| Watts | Caps | Colour | PRICE | Approximate Dimensions | |
|---|---|---|---|---|---|
| | | | | Length ft. | Dia. mm. |
| 35 or 70 | Single Contact | New Warm White<br>Daylight<br>Intermediate White<br>Natural | **36/6** | $9\frac{1}{2}$* (Straight through electrode) | 20 |
| | | De Luxe W. White | **39/-** | | |
| | | Colour Matching | **41/3** | | |
| 56 | | Gold (amber) | **36/6** | | |
| 35 or 70 | Single Contact | New Warm White<br>Daylight<br>Intermediate White<br>Natural | **51/4** | $8\frac{1}{2}$* (Turnback electrode) | 20 |
| | | De Luxe W. White | **54/10** | | |

* *Visible light length* $8\frac{1}{2}$ *ft.*
35 *w. or* 56 *w. – lamp current* 60 *mA.* 70 *w. – lamp current* 120 *mA. Data for other colours available on application.*

# PYGMY SIGN

| | | | 25, 50, 60, 65, 75v. | 100, 110, 130, 200/260v. | mm. | mm. |
|---|---|---|---|---|---|---|
| 15 | BC<br>ES<br>SBC<br>SES | Clear | **2/5** | **1/10**† | 56<br>58<br>62<br>64 | 28 |
| | | Externally Sprayed | **2/7** | **2/–**† | | |

Colours: Red, Blue, Green, Yellow, Flame, Pink, Orange, Amber and White.
† *If designed as a switchboard indicator,* 8*d. each extra* 100/130v., 200/260v.

# SIGN

| | | | 110, 130v. | 200/260v. | mm. | mm. |
|---|---|---|---|---|---|---|
| 15 | BC<br>ES | Internally Sprayed | **2/1** | **1/10** | 90 | 44 |

Colours: Red, Green, Yellow, Blue, White, Orange.

# TUBULAR

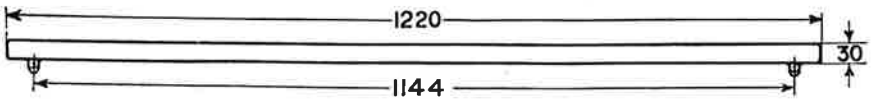
| Watts | Caps | Type | PRICE | | Approximate Dimensions | |
|---|---|---|---|---|---|---|
| | | | 50, 60, 65, 75v. | 110, 120, 200/260v. | Length mm. | Dia. mm. |
| 10 | BC<br>SBC | Morse | **4/9** | **3/9*** | 63 | 25 |
| 25 | BC<br>SBC<br>SES | Single Cap | **4/9** | **3/9** | 86<br>92<br>94 | 25 |
| 40<br>60 | BC<br>or<br>ES | Single Cap Opal or Opalised | — | **8/6** | 302 | 38 |
| 30<br>60 | SCC | Double Cap | — | **5/9** §<br>**6/–** § | 221 or 284<br>284 | 25 |

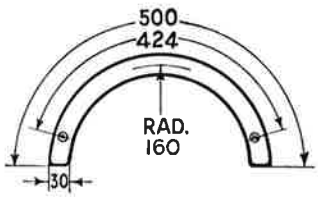
* 110, 120 *volts only.* § *Colour sprayed, 4d. extra.*

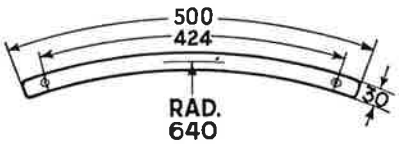
# ARCHITECTURAL

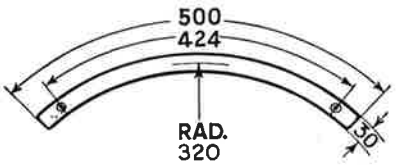
| | | | | 100/130, 200/260v. | in. | mm. | mm. |
|---|---|---|---|---|---|---|---|
| 35<br>75<br>110<br>150 | Peg. | Straight Opal or Opalised | ††<br>†† | **12/4**<br>**22/6**<br>**30/–**<br>**35/–** | 12<br>24<br>36<br>48 | 305<br>610<br>915<br>1220 | 30 |
| 60 | | $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ circle Opal or Opalised | | **30/–** | 20 | 500 | |

*These architectural lamps can be supplied colour sprayed:* 10 *per cent extra.* †† 200/260*v. only.*





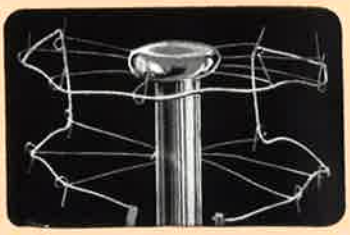
# CANDLE

| Watts | Caps | Type | PRICE 25, 50, 60, 65, 75v. | PRICE 100/130, 200/260v. | Approximate Dimensions Length mm. | Approximate Dimensions Dia. mm. |
|---|---|---|---|---|---|---|
| **PLAIN CONICAL** | | | | | | |
| 25 | SBC BC SES ES | Clear | **4/9** | **3/9** | 122 119 125 119 | 39 |
| | | Sprayed | **4/11** | **3/11** | | |
| 40 | SBC BC SES ES | Clear | **5/3** | **4/3** | 133 130 136 130 | 47 |
| | | Sprayed | **5/6** | **4/6** | | |
| 60 | | Clear | **5/9** | **4/3** | | |
| | | Sprayed | **6/–** | **4/6** | | |
| **TWISTED CONICAL** | | | | | | |
| 25 | SBC BC SES ES | Clear | **5/3** | **4/3** | 122 119 125 119 | 39 |
| | | Sprayed | **5/5** | **4/5** | | |
| 40 | SBC BC SES ES | Clear | **6/–** | **5/–** | 150 146 153 147 | 57 |
| | | Sprayed | **6/3** | **5/3** | | |
| 60 | | Clear | **6/6** | **5/–** | | |
| | | Sprayed | **6/9** | **5/3** | | |
| **PLAIN ROUND** | | | | | | |
| 40 | BC SBC SES ES | Clear | **5/3** | **4/3** | 100 103 105 100 | 55 |
| | | Sprayed | **5/6** | **4/6** | | |
| 60 | | Clear | **5/9** | **4/9** | | |
| | | Sprayed | **6/–** | **5/–** | | |
| **GOTHIC** | | | | | | |
| 25 | BC SBC ES SES | Sprayed only | — | **4/5** | 108 111 108 115 | 50 across flats 54 across corners |
| 40 | | | — | **5/3** | | |
| 60 | | | — | **5/3** | | |
| **SPECIAL CANDLE** | | | | | | |
| 25 | SBC BC | Clear Candle with Stem Opalised | — | **6/6** | 208 210 | 35 |
| 40 | SBC BC | | — | **7/–** | 238 240 | 45 |
| 60 | | | — | **7/6** | | |

# ROUGH SERVICE

These Lamps have specially constructed and supported filaments and are designed for use in positions subject to vibration or other rough usage which would seriously affect the life of ordinary general service lamps.

| Watts | Caps | Type | PRICE 100/130, 200/260v. | Approximate Dimensions | | |
|---|---|---|---|---|---|---|
| | | | | Length mm. | Dia. mm. | L.C.L. mm. |
| 40<br>60 | BC or ES | Clear or Pearl | **2/–** | 110<br>117·5 | 60<br>65 | 80<br>85 |



Rough Service filament

# TRACTION

| | | | 100, 110, 120, 130v. | | | |
|---|---|---|---|---|---|---|
| 40<br>0·35 amp<br>60<br>0·52 amp | BC or ES | Clear or Pearl | **1/9** | 110<br>117·5 | 60<br>65 | 80<br>85 |

## WITH FUSIBLE CUTOUT

| | | | 40, 50v. | | | |
|---|---|---|---|---|---|---|
| 40<br>60 | ES | Clear or Pearl | **2/5** | 110<br>117·5 | 60<br>65 | 80<br>85 |

# NEON

| | | | 200/220, 230/240, 250/260v. | | | |
|---|---|---|---|---|---|---|
| $\frac{1}{5}$ | SES | Clear Indicator | **4/9*** | 28 | 12 | — |
| $\frac{1}{2}$ | SES<br>SBC<br>BC<br>ES | Clear Indicator | **4/–*** *(a)* | 56<br>54<br>56<br>58 | 18<br>18<br>28<br>28 | —<br>—<br>—<br>— |
| 5 | BC<br>ES | Lighting | **4/6** | 125 | 61 | — |
| 5 | BC<br>ES | Shrine | **7/6** | 125 | 61 | — |

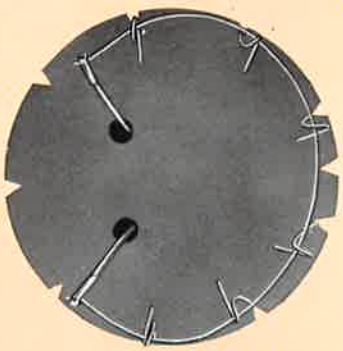
**Also* 100/130*v.* *(a) Sprayed 2d. each extra.*

Neon indicator electrode

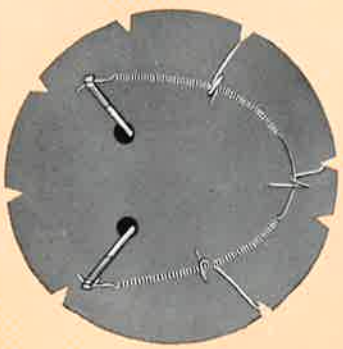
Neon Lighting

Shrine

Infra-red Reflector



Ring filament



Grid filament

# REFLECTOR TYPE

Spot and infra-red reflector lamps have a reflecting surface on the inside of the glass bulb which will neither tarnish nor peel during the lifetime of the lamp.

The grid filament lamp should be used where a narrow beam is required and the ring filament for a wide beam.

The cap of the infra-red lamp is attached by a special mechanical method dispensing with the use of cement, thus overcoming any tendency of the cap to become loose through heat.

## SPOTLIGHT

| Watts | Caps | Type | PRICE 110, 200/250v. | Approximate Dimensions Length mm. | Dia. mm. | L.C.L. mm. |
|---|---|---|---|---|---|---|
| 75 | BC or ES | Vee filament | **7/–** | 129 | 95 | — |
| 150 | ES | Ring filament | **15/6** | 178 | 126 | — |
| | | Grid filament | **18/6** | | | |
| 150 | ES | Ring filament Pearl bulb | **15/6** | 178 | 126 | — |

## INFRA-RED

| | | | 100/130, 200/250v. | | | |
|---|---|---|---|---|---|---|
| 150 | ES | Top half internally silvered, crown frosted | **12/6** | 178 | 126 | — |
| 250 | ES | | **15/6** | 178 | 126 | 110 |
| 250 | ES | Industrial Clear | **7/9** | 178 | 90 | 133 |
| | | Pearl bulb | **8/3** | | | |

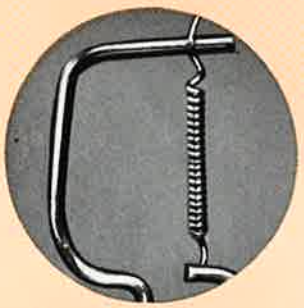
## RADIANT HEAT

| | | | 110, 120, 210, 230, 250v. | | | |
|---|---|---|---|---|---|---|
| 60 | BC or ES | — | **2/3** | 117·5 | 65 | — |

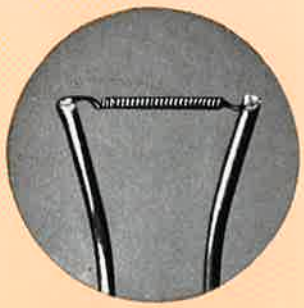
# HEADLIGHT ORDINARY — SINGLE FILAMENT

| Lamp No. | Volts | Watts | Caps | Filament | PRICE | Approx. Dimen. Length mm. | Approx. Dimen. Dia. mm. |
|---|---|---|---|---|---|---|---|
| 605 | 6 | 24 | 3-pin BC | Axial SC | 2/9 | 61 | 38 |
| 106 | | 24 | SCC | ,, ,, | 2/6 | 56 | |
| 109 | | 24 | SBC | ,, ,, | 2/7 | 56 | |
| 108 | | 36 | SCC | ,, ,, | 2/9 | 56 | |
| 374 | | 36 | SCC | ,, ,, | 4/–(*a*) | 56 | |
| 607 | | 36 | 3-pin BC | ,, ,, | 3/– | 61 | |
| 130 | | 36 | Bosch SC | Axial SC | 3/– | 67 | |
| 75 | | 36 | SCC | Transverse SC | 2/9 | 56 | |
| 111 | | 36 | SBC | Axial SC | 2/10 | 56 | |
| 608 | | 36 | SCC | Transverse SC | 3/– | 56 | |
| 675 | | 48 | 3-pin BC | Axial SC | 4/3 | 56 | |
| 676 | | 48 | 3-pin BC | Axial SC | 5/6 | 56 | |
| 4 | 12 | 24 | SBC | Axial SC | 2/7 | 56 | |
| 1 | | 24 | SCC | ,, ,, | 2/6 | 56 | |
| 2 | | 36 | SCC | ,, ,, | 2/6 | 56 | |
| 612 | | 36 | 3-pin BC | ,, ,, | 2/9 | 61 | |
| 57 | | 36 | SCC | Transverse SC | 2/6 | 56 | |
| 375 | | 36 | SCC | Axial SC | 3/9(*a*) | 56 | |
| 5 | | 36 | SBC | ,, ,, | 2/7 | 56 | |
| 615 | | 36 | SCC | Transverse SC or CC | 3/– | 56 | |
| 616 | | 48 | 3-pin BC | Axial SC | 4/3 | 61 | |
| 23 | | 48 | SCC | ,, ,, | 4/– | 56 | |
| 27 | | 48 | SBC | ,, ,, | 4/1 | 56 | |
| 96 | | 48 | Bosch SC | ,, ,, | 4/3 | 67 | |
| 618 | | 60 | 3-pin BC | Axial SC | 5/9 | 68 | 50 |
| 90 | | 60 | SCC | ,, ,, | 5/6 | 63 | |
| 26 | | 60 | SBC | ,, ,, | 5/7 | 63 | |
| 87 | | 60 | Bosch SC | ,, ,, | 5/9 | 74 | |
| 619 | | 60 | American Prefocus SC | Transverse SC | 6/– | 65 | |
| 621 | 24 | 36 | SCC | Axial CC | 2/8 | 56 | 38 |
| 123 | | 36 | SBC | ,, ,, | 2/8 | 56 | |
| 622 | | 36 | BC | ,, ,, | 2/8 | 56 | |
| 623 | | 48 | SCC | ,, ,, | 4/3 | 56 | |
| 140 | | 48 | SBC | ,, ,, | 4/3 | 56 | |
| 624 | | 48 | BC | ,, ,, | 4/3 | 56 | |
| 124 | | 60 | SCC | Axial CC | 5/9 | 63 | 50 |
| 128 | | 60 | SBC | ,, ,, | 5/9 | 63 | |
| 127 | | 60 | BC | ,, ,, | 5/9 | 63 | |
| 131 | | 60 | Bosch DC | ,, ,, | 6/– | 74 | |

(*a*) *with Cadmium Yellow bulb.*

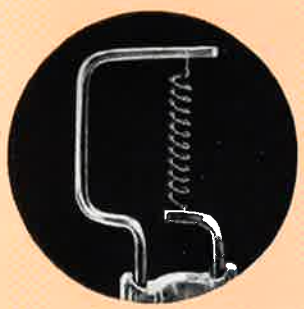


**Axial Single Coil**



**Transverse Single Coil**

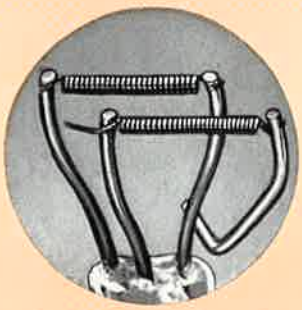
**Transverse Coiled Coil**



**Axial Coiled Coil**



METROVICK



Left Dip - Right Hand Drive

Double Transverse Coiled Coil

Double Transverse Single Coil

## HEADLIGHT ORDINARY — DOUBLE FILAMENT

| Lamp No. | Volts | Watts | Caps | Filament | PRICE | Approx. Dimen. Length mm. | Dia. mm. |
|---|---|---|---|---|---|---|---|
| 180 | ↑ | 18/18 | SBC | Double Transverse SC | **4/6** | 56 | ↑ |
| 168 | | 24/24 | SBC | Inverted "V" | **3/6** | 56 | |
| 183 | | 24/24 | Bosch DC | ,, ,, | **3/9** | 67 | |
| 169 | 6 | 30/30 | SBC | ,, ,, | **3/6** | 56 | |
| 628 | | 30/30 | 3-pin BC | ,, ,, | **3/9** | 61 | |
| 629 | | 30/30 | American Prefocus DC | ,, ,, | **4/–** | 58 | |
| 170 | ↓ | 36/36 | SBC | Double Transverse SC | **3/6** | 56 | |
| 171 | ↑ | 36/36 | SBC | Double Transverse SC | **3/6** | 56 | 38 |
| 376 | | 36/36 | SBC | ,, ,, ,, | **4/9** (*a*) | 56 | |
| 630 | | 36/36 | 3-pin BC | ,, ,, ,, | **3/9** | 61 | |
| 632 | 12 | 36/36 | American Prefocus DC | ,, ,, ,, | **4/–** | 58 | |
| 633 | | 36/36 | ASBC | ,, ,, ,, | **3/6** | 59 | |
| 182 | ↓ | 36/36 | Bosch DC | ,, ,, ,, | **3/9** | 67 | |
| 194 | 24 | 36/36 | SBC | Double Transverse CC | **5/–** | 56 | |
| 671 | 24 | 44/38 | SBC | ,, ,, ,, | **6/3** | 56 | |

(*a*) *with Cadmium Yellow bulb.*

## HEADLIGHT BRITISH PREFOCUS — SINGLE FILAMENT

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 172 | 6 | 36 | SC | Axial SC | **3/9** | ↑ | ↑ |
| 173 | 6 | 36 | SC | Transverse SC | **3/9** | | |
| 162 | ↑ | 36 | SC | Axial SC or CC | **3/9** | | |
| 325 | | 38 | SC | Tranverse SC | **3/9** (*b*) | | |
| 326 | 12 | 38 | DC | ,, ,, | **3/9** (*b*) | | |
| 323 | | 48 | SC | Tranverse SC or CC | **4/9** | 62 | 28 |
| 600 | | 48 | SC | ,, ,, ,, ,, | **6/–** (*a*) | | |
| 185 | ↓ | 48 | SC | Axial SC or CC | **4/9** | | |
| 331 | 24 | 44 | DC | Axial CC | **5/–** (*b*) | | |
| 330 | 24 | 44 | DC | Transverse CC | **5/–** (*b*) | | |
| 601 | 24 | 44 | DC | ,, ,, | **6/3** (*ab*) | ↓ | ↓ |

(*a*) *with Cadmium Yellow bulb.* (*b*) *Commercial vehicles only.*

## HEADLIGHT BRITISH PREFOCUS — DOUBLE FILAMENT

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 311 | ↑ | 18/18 | DC | Vertical Dip SC | **5/3** | ↑ | ↑ |
| 166 | | 24/24 | DC | ,, ,, ,, | **4/9** | | |
| 312 | 6 | 30/24 | DC | ,, ,, ,, | **5/6** | | |
| 602 | | 30/24 | DC | ,, ,, ,, | **6/9** (*a*) | | |
| 373 | ↓ | 30/24 | DC | Left Dip (*Rt. Hand Dr.*) SC | **5/6** | | |
| 356 | 6·4 | 45/35 | DC | Left Dip (*Rt. Hand Dr.*) SC | **5/9** | | |
| 408 | ↑ | 21/36 | DC | ,, ,, ,, ,, SC | **6/3** | 62 | 28 |
| 354 | | 42/36 | DC | ,, ,, ,, ,, SC | **5/–** | | |
| 355 | | 42/36 | DC | Rgt. Dip (*Lt. Hand Dr.*) SC | **5/–** | | |
| 603 | | 42/36 | DC | Left Dip (*Rt. Hand Dr.*) SC | **6/3** (*a*) | | |
| 604 | 12 | 42/36 | DC | Rgt. Dip (*Lt. Hand Dr.*) SC | **6/3** (*a*) | | |
| 358 | | 44/38 | DC | Left Dip (*Rt. Hand Dr.*) SC | **6/3** (*b*) | | |
| 302 | | 48/48 | DC | ,, ,, ,, SC or CC | **6/9** (*c*) | ↓ | |
| 404 | ↓ | 60/36 | DC | ,, ,, ,, SC or CC | **7/6** | 56 | 38 |
| 359 | 24 | 44/38 | DC | Left Dip (*Rt. Hand Dr.*) CC | **7/–** (*b*) | 62 | 28 |

(*a*) *with Cadmium Yellow bulb.* (*b*) *Commercial vehicles only.* (*c*) *Both filaments offset.*

# SIDE, TAIL & DASH

| Lamp No. | Volts | Watts | Caps | Filament | PRICE | Approx. Dimen. Length mm. | Dia. mm. |
|---|---|---|---|---|---|---|---|
| 200 | 6 | 3 | SCC | Bow | **1/4** | 32·5 | 18 |
| 204 | 6 | 3 | SBC | ,, | **1/5** | 32·5 | 18 |
| 988 | 6 | 3 | MCC | ,, | **1/6** | 28·0 | 15 |
| 951 | 6 | 6 | MCC | ,, | **1/7** | 28·0 | 15 |
| 205 | 6 | 6 | SCC | ,, | **1/7** | 32·5 | 18 |
| 206 | 6 | 6 | SBC | ,, | **1/8** | 32·5 | 18 |
| 207 | 12 | 6 | SCC | ,, | **1/4** | 32·5 | 18 |
| 209 | 12 | 6 | SBC | ,, | **1/5** | 32·5 | 18 |
| 222 | 12 | 4 | MCC | ,, | **1/7** | 28·0 | 15 |
| 989 | 12 | 6 | MCC | ,, | **1/7** | 28·0 | 15 |
| 149 | 24 | 6 | SCC | ,, or "V" | **1/6** | 32·5 | 18 |
| 150 | 24 | 6 | SBC | ,, ,, | **1/6** | 32·5 | 18 |
| 638 | 24 | 6 | BC | ,, ,, | **1/6** | — | 18 |

Bow

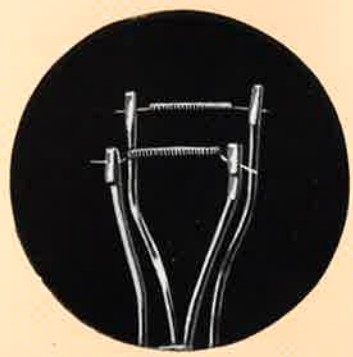
## STOP SINGLE FILAMENT

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 317 | 6 | 18 | ASCC | Transverse | **3/9** | 49 | 25 |
| 382 | 12 | 21 | SCC | ,, | **3/6** | 49 | 25 |
| 335 | 12 | 21 | SBC | ,, | **3/7** | 49 | 25 |
| 333 | 24 | 24 | SBC | ,, | **4/6** | 49 | 25 |

Transverse Single Coil Stoplight

## STOP DOUBLE FILAMENT

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 190 | 6 | 3&18 | SBC | Double Transverse or aux. filament "V" shape. | **3/6** | 45·5 | 25 |
| 383 | 6 | 6&18 | SBC | | | | |
| 352 | 6 | 3&18 | SBC Index | Double Transverse | **3/9** | 47 | 25 |
| 384 | 6 | 6&18 | SBC Index | | | | |
| 381 | 12 | 6&21 | SBC | Double Transverse | **3/6** | 45·5 | 25 |
| 380 | 12 | 6&21 | SBC Index | ,, ,, | **3/9** | 47 | 25 |
| 334 | 24 | 6&24 | SBC Index | ,, ,, | **4/6** | 47 | 25 |



Transverse Single Coil Stoplight

## MOTOR BUS PEARL

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Interior | 12 | 12 | BC, SBC | — | **2/4** | 56 | 38 |
| | 24 | 12 | | | **2/6** | or | |
| | 24 | 20 | | | **2/9** | 68 | 50 |



METROVICK

Indicator

Festoon

## INDICATOR

| Lamp No. | Volts | Watts | Caps | PRICE | Approx. Dimensions | |
|---|---|---|---|---|---|---|
| | | | | | Length | Dia. |
| 990 | 6 | 3 | MES | **1/3** | 23 | 11 |
| 641 | 6 | 3 | MCC | **1/6** | 23 | 11 |
| 981 | 6 | 3 | MES | **1/3** | 27·5 | 15 |
| 642 | 6 | 3 | MCC | **1/6** | 28 | 15 |
| 987 | 12 | 2·2 | MES | **1/3** | 23 | 11 |
| 643 | 12 | 2·2 | MCC | **1/6** | 23·5 | 11 |
| 986 | 12 | 2·2 | MES | **1/3** | 27·5 | 15 |
| 645 | 12 | 2·2 | MCC | **1/6** | 28 | 15 |
| 985 | 16 | 3 | MES | **2/3** | 27·5 | 15 |
| 647 | 16 | 3 | MCC | **2/6** | 28 | 15 |
| 993 | 24 | 2·8 | MES | **1/8** | 27·5 | 15 |
| 651 | 24 | 2·8 | MCC | **1/11** | 28 | 15 |

## FESTOON

| | | | | | | |
|---|---|---|---|---|---|---|
| 255 | 6 | 3 | | **2/3** | 35·5 | 7·5 |
| 253 | 6 | 6 | | **2/7** | 38 | 11 |
| 256 | 12 | 3 | | **2/3** | 35·5 | 7·5 |
| 254 | 12 | 6 | | **2/7** | 38 | 11 |
| 653 | 24 | 6 | | **2/6** | 38 | 11 |
| 654 | 24 | 6 | | **4/6**(*a*) | 38 | 11 |
| 260 | 24 | 6 | | **3/–** | 44 | 11 |

(*a*) *with supported filament.*

## TROLLEY BUS

| | | | | | | |
|---|---|---|---|---|---|---|
| Instrument | 35 | 6 | SBC | **2/6** | 37 | 22 |
| Side | | 6 | BC | **2/6** | | |
| Interior | | 15 | BC | **2/9**(*ab*) | 56 | 38 |
| Interior | | 20 | BC | **3/–**(*b*) | | |
| Headlamp | | 36 | SBC | **4/–** | | |

(*a*) *also available with* 50 *mm. bulb.*
(*b*) *also available Pearl.*

# FLASH

| Volts | Amps. | Caps | PRICE | Approximate Dimensions | |
|---|---|---|---|---|---|
| | | | | Length mm. | Dia. mm. |
| 1·5 | 0·11 | ↑ | **8d.** | | 15 |
| 1·5 | 0·2 | | **4d.** | | 11 |
| 2·0 | 0·6 | | **8d.** | | 15 |
| 2·2(*a*) | 0·25 | | **7d.** | | 9·5 |
| 2·5(*b*) | 0·2 | | **4d.** | | 11 |
| 2·5(*b*) | 0·3 | MES | **4d.** | | 11 |
| 3·5 | 0·15 | | **4d.** | | 11 |
| 3·5(*b*) | 0·3 | | **4d.** | | 11 |
| 4·0 | 0·3 | | **4d.** | | 11 |
| 4·5 | 0·3 | | **4d.** | | 15 |
| 5·0 | 0·15 | ↓ | **8d.** | | 15 |

(*a*) *Lens end.* (*b*) *with prefocus cap* **1/-**.

**Flash**

# CYCLE DYNAMO — HEAD

| | | | | | |
|---|---|---|---|---|---|
| ↑ | 0·3 | SCC | **1/4** | | 18 |
| | 0·2 | | | | |
| 6 | 0·3 | MES | **8d.** | | 15(*a*) |
| | 0·45 | | | | |
| | 0·5 | | | | |
| ↓ | 0·5 | SCC | **1/4** | | 18 |

(*a*) *also with granulated bulb.*

**Lens End Flash**

## TAIL

| | | | | | |
|---|---|---|---|---|---|
| 1·5 | 0·15 | MES | **8d.** | | 15 |
| 3·5 | 0·15 | MCC | | | 11 & 15 |
| 6 | 0·04 | MES | | | |

# RADIO PANEL OR DIAL

Clear Round Bulb

| | | | | | |
|---|---|---|---|---|---|
| 6 | 0·04 | ↑ | **1/-** | 24 | 11 |
| 6 | 0·06 | | **1/-** | 24 | 11 |
| 6·2 | 0·3 | MES | **7d.** | 29 | 15 |
| 6·3 | 0·11 | | **7d.** | 24 | 11 |
| 6·5 | 0·3 | ↓ | **7d.** | 24 | 11 & 15 |

Clear Tubular Bulb

| | | | | | |
|---|---|---|---|---|---|
| 6·2(*a*) | 0·3 | MES | **7d.** | 30 | 10 |
| 6·3(*a*) | 0·15 | | | | |
| 6·5 | 0·3 | | | | |

*Extra for varnishing* **2d.** *each, list,* **8/-** *nett per* 100.

**Radio Panel tubular**



METROVICK

a

b

c

d


# MINERS

## CLEAR "CAP" TYPE

MFP

The bulbs in these schedules bear this authorized stamp of the Ministry of Fuel and Power.

| Rating of Bulb | | Caps | | Shape of Bulb | Illustration | Bulb Filling | PRICE | Approx. Dimen. | |
|---|---|---|---|---|---|---|---|---|---|
| Volts | Amps. | Type | No. | | | | | Length mm. | Dia. mm. |
| 3·6 | 1·0 | M.E.S. | E.10 | Round | a | Krypton | **2/8** | 31 | 18 |
| 3·75 | 1·0 and 1·0 | S.B.C. | B15d/17 | Pear | d | ,, | **3/6** | 40 | 18 |
| 4·0 | 0·55 and 0·55 | S.B.C. | B15d/21 | ,, | c | Argon | **2/9** | 49 | 25 |
| 4·0 | 0·80 | M.E.S. | E10 | Round | a | Krypton | **2/8**(*a*) | 31 | 18 |

(*a*) With bulb one-third tip frosted **2/10** each.

## PEARL "HAND" TYPE (with fuse in cap)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2·5 | 1·5 | S.C.C. | 953 | Pear | b | Krypton | **3/–** | 43·5 | 18 |
| 2·5 | 1·5 | S.E.S. | E14 | ,, | b | ,, | | 45·5 | |
| 2·5 | 1·75 | S.C.C. | 953 | ,, | b | ,, | | 43·5 | |
| 2·5 | 1·75 | S.E.S. | E14 | ,, | b | ,, | | 45·5 | |
| 4·0 | 0·75 | S.E.S. | E14 | ,, | b | ,, | | 45·5 | |
| 4·0 | 1·0 | S.E.S. | E14 | ,, | b | ,, | | 45·5 | |

# DECORATION SETS

| | PRICE |
|---|---|
| Standard Set with 12 colour-sprayed 20v. 3w. 19 mm. lamps, one spare lamp and 16 feet PVC flex and BC adaptor .. .. .. .. | **16/11** |
| Purchase Tax | **3/1** |
| Standard Shade Set with 12 clear 20v. 3w. 19 mm. lamps and 12 white or coloured shades with nursery rhyme motifs, also one spare lamp, 16 feet PVC flex and BC adaptor.. .. .. | **25/–** |
| Purchase Tax | **4/8** |
| Super Set with 12 colour-sprayed 20v. 3w. 19 mm. lamps, 2-pin BC adaptor and extension device and one spare lamp. Cotton covered braided flexible .. .. .. .. .. .. | **25/–** |
| Purchase Tax | **4/8** |

**Spare lamps,** clear or colour sprayed : 20v. 3w. 19 mm. **1/-** each. Purchase Tax **2½d.**

# ELECTRIC DISCHARGE LAMPS

The electric discharge lamp produces visible radiation and/or ultra violet by the change of energy levels of the electrons within the atoms of gas or vapour forming the ionised path between the electrodes.

There are many gases and vapours which can be used, but for the purpose of general illumination it is necessary to consider two vapours only, namely, those resulting from heated metallic mercury or sodium.

Although the construction and operation of these lamps vary somewhat, the basic principles are the same. In each case it is necessary to initiate the arc and having done so, prevent it from building up to such proportions that the lamp is destroyed.

## Mercury Vapour Lamps

The four main types used are (i) Type MA, (ii) Type MB, (iii) Type ME, and (iv) Type MCF.

The MCF lamp category covers fluorescent tubular lamps described on pages 9 to 17.

The remaining types have the following characteristics :—

(i) **Type MA**

These lamps consist of a tubular bulb into which an electrode is sealed at each end. A carefully measured quantity of mercury is included in the bulb and a little argon gas. Adjacent to one electrode is a third or auxiliary electrode which is connected through a very high resistance to the electrode at the far end of the lamp. The completed bulb assembly is then sealed into a larger bulb which is capped. The space between the two bulbs is filled with a controlled pressure of inert gas to ensure stable temperature conditions in the inner tube.

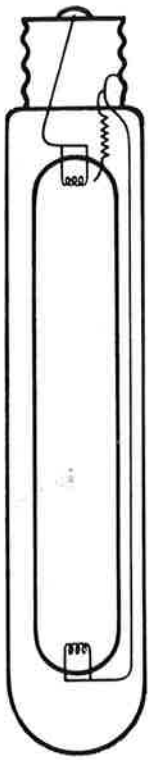
On connecting normal mains voltage across the main electrodes no current passes as the conditions within the lamp are not favourable to the ionisation of the gas over the whole length of the tube, but an immediate glow discharge takes place between the auxiliary electrode and the adjacent main electrode. These main electrodes contain a pellet of thermionic emissive materials, and the flow discharge by causing local heating not only sets up an emission of electrons from the main electrode but promotes the vaporisation of some of the mercury. The emitted electrons move down the tube attracted by the voltage at the other electrode. This electron stream very rapidly develops and unless some limiting device is included in the circuit the current will build up until the lamp destroys itself. The control is normally achieved by a choke.

The conditions under which mercury lamps of the MA type are used may be rigorous and therefore Metrovick 250 watt and 400 watt lamps are available in several varieties to cover particular requirements. The variations are briefly as follows:—

1. MA/V, soft glass outer. This lamp may be burned in a vertical position only, unless magnetic arc control is used, when it may be burned horizontally. The magnetic arc control prevents the arc bowing upwards and damaging the inner glass wall.

2. MA/U, soft glass outer. This lamp has a special glass inner which will withstand its increased temperature caused by the upward bow of the arc when the lamp is burned horizontally without magnetic arc control. It may therefore be burned either vertically or horizontally. In the horizontal position, however, the light output falls owing to the increased length of arc as it bows upward.

3. MA/V, MA/U, with hard glass outer. These lamps have the same electrical characteristics as those above but the hard glass envelope will allow them to be used in positions where they may be subject to rapid changes in temperature.



*Simplified diagram of the internal arrangements of a mercury lamp type MA. A similar arrangement is used for type MB.*

4. MAF/V. This lamp may be burned vertically only and has a specially shaped outer bulb coated on the inside with a fluorescent powder which adds some red to the light, thus providing a more pleasing colour rendering.

(ii) **Type MB**

These lamps are available in 80 watt and 125 watt sizes. The operation of the lamps is similar to Type MA: the light source, however, is more compact and the inner tube is of quartz which passes ultra violet radiation in those wavelengths causing sunburn and conjunctivitis. This radiation is absorbed by the glass wall of the outer envelope and under no circumstances should the lamps be operated if the outer bulb is broken.

1. MB/U lamps can be burned in any position and emit the characteristic blue-green light of a mercury discharge lamp. They have pearl (inside frosted) bulbs of the same shape and dimensions as 150 watt and 200 watt tungsten lamps for the 80 watt and 125 watt sizes respectively.

2. MBF/U. These lamps can be burned in any position. The bulb sizes are the same as for type MB/U lamps and are coated on the inside with a fluorescent powder providing 6% to 7% red. These lamps, therefore, produce a light of particularly pleasing appearance approaching white, and provide colour rendering sufficiently faithful for all processes where accurate colour discrimination is not vital. They are particularly suitable for most industrial applications and for the lighting of side streets and shopping centres.

3. MBW/U. The passage of ultra violet radiation through quartz enables this further type of lamp to be constructed. In these lamps the outer bulb is made of Woods glass which, while removing dangerous radiations and almost all visible light does pass those ultra violet wavelengths which excite fluorescence. The lamps are useful, therefore, for obtaining decorative effects, etc.

(iii) **Type ME**

These lamps incorporate the main features of the previous types, but have an exceedingly short arc length and the high brightness needed for projector work where colour is not important. These lamps should be used in a vertical position cap down. They are available either with a complete glass envelope or with a metal box outer, this box being fitted with a window.

They are supplied with either a 3-pin cap to fit standard 5 amp sockets or a prefocus cap.

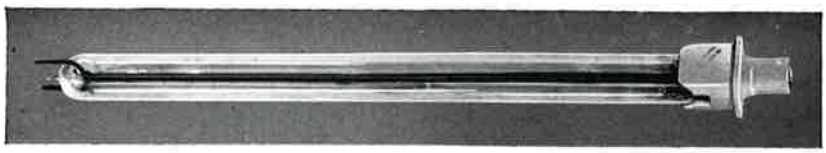
**Other Types**

The 1 kW MB/V and 2½ kW MA/H lamps shown in our schedules differ slightly from standard mercury discharge lamps but space is too limited to print detailed descriptions here. These lamps are designed primarily for special industrial applications. Metrovick Illuminating Engineers will gladly give advice on the use of these high wattage lamps for special purposes.

## Sodium Lamps

**Type SO**

The sodium lamp differs from the mercury lamp in construction. A comparatively long thin ply glass tube is used and for convenience this is bent into the form of a narrow "U" and an electrode is sealed in each end. The tube, which is filled with an argon/neon mixture at a low pressure, also contains a quantity of metallic sodium. Hot sodium vapour is very active chemically and will attack ordinary glass. The "U" tube is therefore made of ply glass, the inner layer being of low silica content and high purity, and the outer of ordinary soda glass. Even so, the lamp should never be moved while hot, otherwise the sodium might collect at one end of the tube, and possibly attack the glass in the neighbourhood of the seal wires. In order to keep the tube at an even operating temperature a detachable glass vacuum flask jacket is provided which has an almost infinite life unless damaged mechanically.



**Inner**

A transformer is necessary as the lamp will not start at mains voltage. The arc strikes at once in the neon and the heat from this arc gradually vaporises the sodium and the colour of the light gradually changes from neon red to the characteristic amber colour, 86% of the visible radiation being in the sodium "D" lines at 5,890Å and 5,896Å.

The lamps burn horizontally or up to 20° from the horizontal (cap up), and in the case of 45 and 60 watt sizes, also vertically with the cap uppermost; under no circumstances must the cap be below the horizontal otherwise the sodium may tend to collect around the electrodes causing early failure. Under no circumstances should the lamp be tilted while hot.

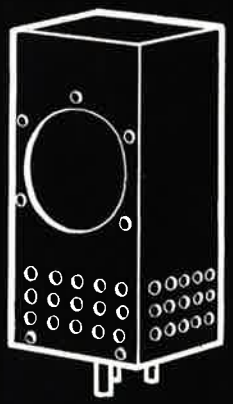
**Outer**

## SODIUM

| Watts | Caps | Type | Burning Position | PRICE | | Approx. Dimensions | |
|---|---|---|---|---|---|---|---|
| | | | | Lamp Inner Only | Detachable Vac. Jacket | Length mm. | Dia. mm. |
| 45 | B.C. 2-pin ceramic | SO/H | Horizontal to Vert (Cap up) | **42/6** | **21/9** | 238 | 50 |
| 60 | | | ,, | **52/6** | **24/6** | 300 | 50 |
| 85 | | | Horizontal | **63/-** | **29/3** | 415 | 50 |
| 140 | | | ,, | **74/6** | **33/-** | 518 | 65 |







METROVICK

# MERCURY

| Watts | Caps | Type | Outer Envelope **clear** except when stated otherwise | PRICE 200/250v. | Approximate Dimensions | |
|---|---|---|---|---|---|---|
| | | | | | Length mm. | Dia. mm. |
| 80 | 3-pin B.C. | MB/U | Pearl | **39/6**(*b*) | 160 | 80 |
| 80 | 3-pin B.C. | MBF/U | Fluorescent | **48/6** | 160 | 80 |
| 125 | 3-pin B.C. | MB/U | Pearl | **45/–** | 178 | 90 |
| 125 | 3-pin B.C. or G.E.S. | MBF/U | Fluorescent | **59/–** | 178 | 90 |
| 125 | 3-pin B.C. | MBW/U | Ultra Violet filter | **63/–** | 178 | 90 |
| 250 | G.E.S. | MA/V | Soft glass | **54/–**(*a*) | 290 | 48 |
| 250 | G.E.S. | MA/U | Soft glass | **57/6** | 290 | 48 |
| 250 | G.E.S. | MA/U | Hard glass | **69/–** | 290 | 48 |
| 250 | 3-pin (*d*) Prefocus (P40/41) | ME/D | Glass | **310/–** | 135(*e*)<br>156 | 50<br>50 |
| 250 | 3-pin (*d*) Prefocus (P28/25) | ME/D | Box | **430/–** | 130(*e*)<br>103 | 64 × 55<br>43 × 34(*f*) |
| 400 | G.E.S. | MA/V | Soft glass | **59/–**(*a*) | 330 | 48 |
| 400 | G.E.S. | MA/U | Soft glass | **62/6** | 330 | 48 |
| 400 | G.E.S. | MA/U | Hard glass | **75/–** | 330 | 48 |
| 400 | G.E.S. | MAF/V | Isothermal | **81/6** | 335 | 165 |
| 1000 | G.E.S. | MB/V | Clear Isothermal | **160/–**(*c*) | 335 | 165 |
| 1000 | G.E.S. | MB/V | Clear | **220/–** | 373 | 65 |
| 2500 | Large Bi-post | MA/H | Hard glass | **450/–** | 540 | 70 |

(*a*) *Also* 100/130*v*.
(*b*) **1s. 2d.** *extra, white sprayed.*
(*c*) 350/450*v*.
(*d*) *Contacts fit standard* 3*-pin* 5*-amp. sockets.*
(*e*) *Excluding pins.*
(*f*) *With a* 5·5 *mm. projection on the major axis opposite the L.C.L.*

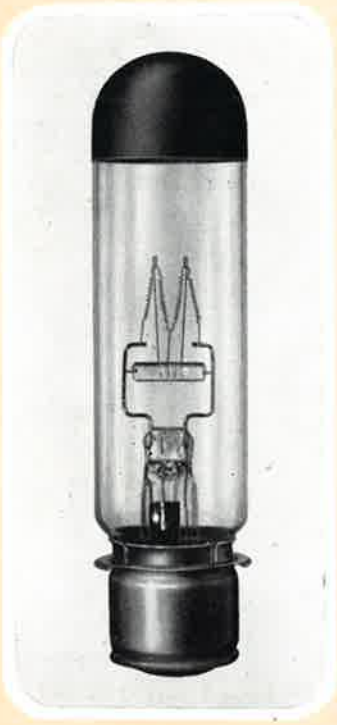
# PROJECTOR

## CLASS A1 — TUBULAR

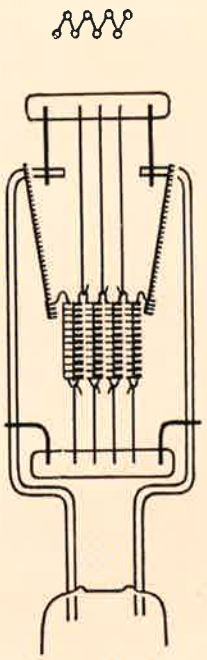
BURNING POSITION: Vertical Cap Down

| Ref. No. | Watts | Caps Fully described on p. 40 | Filament | Average Life (hr.) | Voltage Range | PRICE | Approximate Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Length mm. | Dia. mm. | Light Centre Length mm. |
| **A1/1** | 25 | B.A.15s/21 | Transverse | 50 | 50 | **4/9** | 57±3 | 16±1 | 29±2 |
| **A1/2** | 50 | B.A.15s | Twin Coiled Coil | 50 | 115 | **7/3**(*b*) | 76±3 | 25±1 | 34·5±2 |
| **A1/3** | 100 | P.28/25 | Offset Grid 4 section | 50 | 30 | **12/9**(*b*) | 133±7 | 25±1 | 55·5±0·5 |
| **A1/4** | 100 | P.28/25 | Twin Pillar | 50 | 12,115,200/250 | **12/9**(*b*) | 133±7 | 25±1 | 55·5±0·5 |
| **A1/5** | 250 | P.28/25 | Central Grid M formation* | 50 | 115, 200/250 | **23/**–(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/5** | 250 | P.28/25 | Central Grid 4 section | 50 | 50 | **24/**–(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/6** | 300 | P.28/25 | Twin Coiled Coil | 25 | 100/115 | **28/6**(*ab*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/7** | 500 | P.28/25 | Bi-plane | 25 | 115 | **37/**–(*ab*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/8** | 500 | P.28/25 | Grid 8 section† | 50 | 115, 200/250 | **27/6** | 133±7 | 64±2 | 55·5±0·5 |

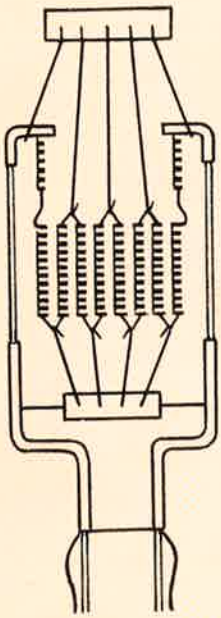
*(a) Forced cooling is necessary so that no part of the wall of the bulb exceeds a temperature of 500°C.*
*(b) These lamps may be supplied with tips black sprayed at no extra charge.* * *115v. Twin Coiled Coil.* † *115v. Grid 6 section.*



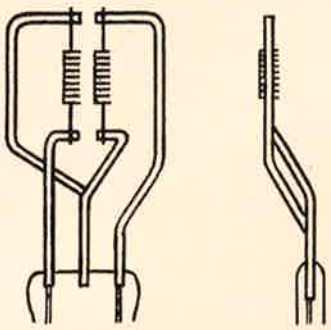
**A1 Projector with black top**



**Bi-plane filament**



**8 section grid**



**Twin Coiled Coil Offset**

# PROJECTOR

## CLASS A1 — TUBULAR — *continued*

BURNING POSITION: Vertical Cap Down

| Ref. No. | Watts | Caps Fully described on p. 40 | Filament | Average Life (hr.) | Voltage Range | PRICE | Approximate Dimensions: Length mm. | Dia. mm. | Light Centre Length mm. |
|---|---|---|---|---|---|---|---|---|---|
| **A1/9** | 750 | P.28/25 | Bi-plane | 25 | 115 | **42/6**(*ab*) | 133±7 | 38±2 | 55·5±0·5 |
| **A1/10** | 900 | P.40/41 | Grid 4 section | 50 | 30 | **41/–** | 235±10 | 64±2 | 84±0·5 |
| **A1/11** | 1000 | P.40/41 | Grid 8 section* | 50 | 115, 200/250 | **35/6** | 235±10 | 64±2 | 84±0·5 |

## CLASS B1 — FLOODLIGHTING — ROUND

BURNING POSITION: Any position except within 45° of Cap Up

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **B1/1** | 100 | E.27/25 | Bunch | 800 | 115, 200/250 | **10/–** | 115±10 | 80±2 | 75±5 |
| **B1/2** | 250 | E.27/25 | Bunch | 800 | | **19/3**† | 125±10 | 95±2 | 75±5 |
| **B1/3** | 500 | E.40/45 | Bunch | 800 | | **25/3** | 180±10 | 130±5 | 115±5 |
| **B1/4** | 1000 | E.40/45 | Bunch | 800 | | **33/–** | 180±10 | 130±5 | 115±5 |

## CLASS B2 — FLOODLIGHTING — Round with Neck

BURNING POSITION: Any

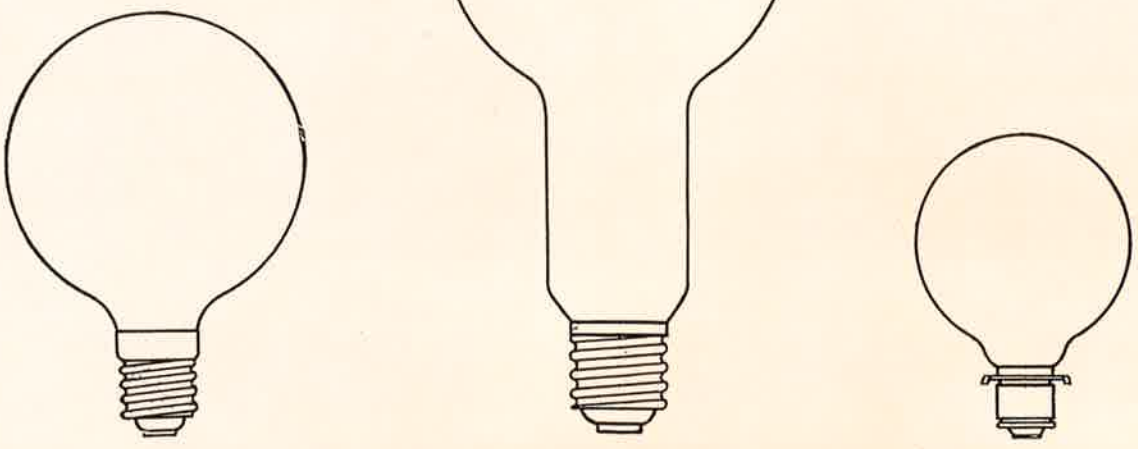
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **B2/1** | 500 | E.40/45 | Bunch | 800 | 115, 200/250 | **25/3** | 267±8 | 130±5 | 202±7 |
| **B2/2** | 1000 | E.40/45 | Bunch | 800 | | **33/–** | 300±9 | 150±5 | 225±8 |

## CLASS E — EPIDIASCOPE — Round

BURNING POSITION: Any position within 45° of Cap Down

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **E/1** | 500 | P.28/25 | Grid | 100 | 115, 200/250 | **31/3** | 135±10 | 100±5 | 60±0·5 |

(*a*) *Forced cooling is necessary so that no part of the wall of the bulb exceeds a temperature of* 500°C.
(*b*) *These lamps may be supplied with tips black sprayed at no extra charge.*
* 115*v. Grid* 6 *section.* † Obscured bulb **1s. 3d.** extra, 230 volts only.



B1 B2 E

# PROJECTOR

## CLASS F — MICRO-PROJECTION, Etc.

BURNING POSITION: Horizontal*

| Ref. No. | Watts | Caps Fully described on p. 40 | Filament | Average Life (hr.) | Voltage Range | PRICE | Approximate Dimensions: Length mm. | Dia. mm. | Light Centre Length mm. |
|---|---|---|---|---|---|---|---|---|---|
| **F/1** | 30 | E.14/23×15 | Transverse | 25 | 6 | **6/6** | 57±5 | 35±2 | 47±5 |
| **F/2** | 48 | B.15/24×17 | Transverse | 100 | 6 | **8/3** | 60±5 | 35±2 | 40±3 |
| **F/3** | 24 | B.15/24×17 | Transverse | 100 | 12 | **4/–** | 60±5 | 38±2 | 44±5 |
| **F/4** | 48 | E.14/23×15 | Twin Pillar | 100 | 12 | **6/–** | 70±5 | 50±2 | 40±3 |

## CLASS G — EXCITER — TUBULAR

| | Amps. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **G/1** | 0·75 | P.15s/19 | Transverse | 50 | 4 | **7/–** | 48±3 | 25±1 | 28·5±0·5 |
| **G/19** | 0·75 | B.A.15s & liner | Transverse | 50 | 4 | **6/–** | 48±3 | 15±1 | 31·75±0·75 |
| **G/29** | 0·75 | P.15s/19 | Transverse | 50 | 4 | **7/–** | 57±3 | 16±1 | 28·5±0·5 |
| **G/7** | 4·0 | P.15s/19 | Transverse | 100 | 8 | **7/–** | 75±3 | 25±1 | 37·3±0·5 |
| **G/10** | 5·0 | P.15s/19 | Transverse | 100 | 10 | **9/–** | 75±3 | 25±1 | 37·3±0·5 |
| **G/36** | 5·0 | B.A.15s/21 Pathe Prefocus collar | Transverse | 100 | 6 | **8/6** | 52±2 | 18±1 | 27 ±0·5 |
| **G/13** | 7·5 | P.15s/19 | Transverse | 100 | 10 | **9/–** | 75±3 | 25±1 | 37·3±0·5 |

## CLASS S — STUDIO SPOTLIGHT

BURNING POSITION: Cap Down

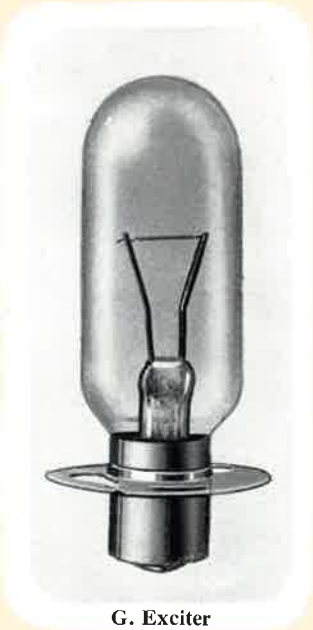
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **S/1** | 2000(*a*) | Bi-post | — | 100 | 115, 240 | **93/6** | 232±6 | 152·5±2 | 127±2 |
| **S/2** | 5000(*b*) | Bi-post | — | 100 | 115, 240 | **300/–** | 335±6 | 203±2 | 165±3 |
| **S/7** | 10000 | Bi-post | — | 100 | 115 | **660/–** | 490 | 300±2 | 254±2 |

## CLASS T — THEATRE SPOTLIGHT

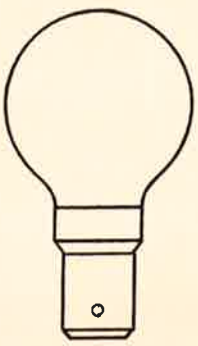
*Schedule B*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **T/1** | 500 | P.28/25 | Staggered Grid | 200 | 230, 240, 250 | **28/–** | 130±10 | 95±5 | 55·5±0·5 |
| **T/2** | 1000 | P.40/41 | — | 200 | 210,230,240,250 | **35/6** | 190±10 | 130±5 | 84±05 |

* *Normally.* (*a*) *Round bulb.* (*b*) *Tubular bulb.*



G. Exciter



F. Micro Projection

Transverse filament

**Schedule A**

*Manufacturers of apparatus are recommended to adopt the lamps in Schedule A whenever possible.*

# PROJECTOR

## CLASS A1 — TUBULAR

**BURNING POSITION: Vertical Cap Down**

| Ref. No. | Watts | Caps Fully described on page 40 | Filament | Average Life (hr.) | Voltage Range | PRICE | Approximate Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Length mm. | Dia. mm. | Light Centre Length mm. |
| **A1/73** | 15 | B.A.15s/21 | Transverse | 50 | 40 | **4/–** | 57±3 | 16±1 | 29±2 |
| **A1/2** | 50 | B.A.15s | Twin C.C. | 50 | 100, 110 | **7/3**(*b*) | 76±3 | 25±1 | 34·5±2 |
| **A1/19** | 50 | B.A.15d | ,, ,, | 50 | 100/115 | **7/3**(*b*) | 76±3 | 25±1 | 34·5±2 |
| **A1/21** | 100 | B.A.15s | — | 50 | 100, 110, 115 | **12/9**(*b*) | 76±5 | 25±1 | 34·5±2 |
| **A1/21** | 100 | B.A.15s | — | 50 | 12 | **13/9**(*b*) | 76±5 | 25±1 | 34·5±2 |
| **A1/121** | 100 | B.15d | — | 50 | 100, 110, 115 | **12/9**(*b*) | 76±3 | 25±1 | 34·5±2 |
| **A1/23** | 100 | E.27/25 | Twin C.C. Grid 8 sect. | 50 | 12, 100/115 200/250 | **11/9**(*b*) | 128±7 | 25±1 | 75±5 |
| **A1/135** | 100 | B.A.15d/21 | Transverse | 100 | 24 | **13/9**(*b*) | 75±3 | 25±1 | 55±2 |
| **A1/4** | 100 | P.28/25 | Twin C.C. | 50 | 100, 110 | **12/9**(*b*) | 133±7 | 25±1 | 55·5±0·5 |
| **A1/157** | 100 | B.A.20s | — | 25 | 12 | **11/6**(*b*) | 87±3 | 25±1 | 35 |
| **A1/104** | 150 | P.28/25 | Solid Source | 50 | 12 | **16/6**(*b*) | 133±7 | 32±1 | 55·5±0·5 |
| **A1/167** | 150 | B.15s | 4 section C.C. | 50 | 115, 210/250 | **18/–**(*b*) | 76±5 | 25±1 | 34·5±0·5 |
| **A1/168** | 150 | B.15s | 4 section C.C. | 50 | 115, 210/250 | **18/–**(*b*) | 76±5 | 25±1 | 34·5±0·5 |
| **A1/26** | 200 | B.A.15s | Twin C.C. | 25 | 100 | **18/6**(*b*) | 87±5 | 25±1 | 34·5±2 |
| **A1/25** | 200 | B.A.15d | ,, ,, | 25 | 100 | **18/6**(*b*) | 87±5 | 25±1 | 34·5±2 |
| **A1/83** | 200 | B.A.15d/17 | ,, ,, | 50 | 100, 115 | **18/6** | 87±5 | 32±1 | 34·5±0·5 |
| **A1/27** | 200 | P.15s | ,, ,, | 25 | 100, 110 | **19/6**(*b*) | 87±5 | 25±1 | 31·5±0·5 |
| **A1/127** | 200 | P.15d | ,, ,, | 25 | 100, 110 | **19/6**(*b*) | 87±5 | 25±1 | 31·5±0·5 |
| **A1/12** | 200 | E.27/25 | Grid 4 sect. Twin C.C. | 50 | 50<br>110 | **23/–**(*b*)<br>**18/6**(*b*) | 128±7 | 32±2 | 75±5 |
| **A1/112** | 200 | E.27/25 | Offset Grid | 50 | 50 | **23/–**(*b*) | 128±7 | 32±2 | 75±5 |
| **A1/113** | 200 | P.28/25 | 4 section | 50 | 50 | **24/–**(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/13** | 200 | P.28/25 | Grid 4 sect. Twin C.C. | 50 | 50<br>110 | **24/–**(*b*)<br>**19/6**(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/14** | 250 | E.27/25 | Grid 4 sect. Twin C.C. | 50 | 50<br>100/115<br>200/250 | **23/–**(*b*)<br>**22/–**(*b*) | 128±7 | 32±2 | 75±5 |
| **A1/16** | 250 | E.27/25 | Offset Grid | 50 | 50 | **23/–**(*b*) | 128±7 | 32±2 | 75±5 |
| **A1/15** | 250 | P.28/25 | 4 section | 50 | 50 | **24/–**(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/5** | 250 | P.28/25 | Grid 4 sect. Twin C.C. | 50 | 55<br>100, 110 | **24/–**(*b*)<br>**23/–**(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/106** | 250 | P.28/25 | Solid Source | 50 | 12, 24 | **27/6**(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/38** | 300 | P.15s | Twin C.C. | 25 | 100, 115 | **28/6**(*ab*) | 100±5 | 25±1 | 31·5±0·5 |
| **A1/36** | 300 | P.15d | Twin C.C. | 25 | 100, 115 | **28/6**(*ab*) | 100±5 | 25±1 | 31·5±0·5 |
| **A1/37** | 300 | B.A.15s | ,, ,, | 25 | 100, 115 | **27/6**(*ab*) | 100±5 | 25±1 | 34·5±2 |
| **A1/154** | 300 | P.28/25 | C. Coil | 50 | 210,230,240,250 | **28/6**(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/33** | 300 | B.A.15d | Twin C.C. | 25 | 100, 115 | **27/6**(*ab*) | 100±5 | 25±1 | 34·5±2 |
| **A1/6** | 300 | P.28/25 | ,, ,, | 25 | 100, 110 | **28/6**(*ab*) | 133±7 | 32±2 | 55·5±0·5 |

(*a*) *Forced cooling is necessary so that no part of the wall of the bulb exceeds a temperature of* 500°C.
(*b*) *These lamps may be supplied with tips black sprayed at no extra charge.*

# PROJECTOR

## CLASS A1 — TUBULAR

**BURNING POSITION: Vertical Cap Down**

| Ref. No. | Watts | Caps Fully described on page 40 | Filament | Average Life (hr.) | Voltage Range | PRICE | Approximate Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Length mm. | Dia. mm. | Light Centre Length mm. |
| **A1/109** | 400 | P.28/25 | Solid Source | 50 | 24 | **41/–** | 133±7 | 64±2 | 55·5±0·5 |
| **A1/39** | 400 | P.28/25 | Bi-plane | 25 | 100/115 | **35/–**(*ab*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/7** | 500 | P.28/25 | Bi-plane | 25 | 110 | **37/–**(*ab*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/42** | 500 | E.27/25 | Grid 6 section | 50 | 100/115, 200/250 | **26/6** | 128±7 | 64±2 | 75±5 |
| **A1/8** | 500 | P.28/25 | Grid 6 section | 50 | 100, 110 | **27/6** | 133±7 | 64±2 | 55·5±0·5 |
| **A1/43** | 500 | E.40/45 | Grid 6 section | 50 | 100/115, 200/250 | **26/6** | 135±10 | 64±2 | 90±5 |
| **A1/153** | 500 | E.27/35×30 & 3-fin ring | Bi-plane | 25 | 110/115 | **38/–**(*b*) | 145±8 | 38 max. | 81 |
| **A1/160** | 500 | S.26s/25 B.H. 46 | Bi-plane | 25 | 110 | **37/–**(*ab*) | 128±7 | 32±2 | 59±0·5 |
| **A1/162** | 500 | P.28/25 | Bi-plane | 25 | 200/250 | **37/–**(*b*) | 133±7 | 32±2 | 55·5±0·5 |
| **A1/163** | 750 | P.28/25 | Bi-plane | 25 | 200/250 | **42/6**(*b*) | 133±7 | 38±2 | 55·5±0·5 |
| **A1/54** | 750 | E.27/25 | Bi-plane | 25 | 110/115 | **41/6**(*ab*) | 128±7 | 38±2 | 75±5·5 |
| **A1/9** | 750 | P.28/25 | Bi-plane | 25 | 110 | **42/6**(*ab*) | 133±7 | 38±2 | 55·5±0·5 |
| **A1/89** | 750 | E.40/45 | | 50 | 15 | **38/6** | 230±10 | 64±2 | 120±5 |
| **A1/90** | 750 | P.40/41 | | 50 | 15 | **41/–** | 235±10 | 64±2 | 84±0·5 |
| **A1/53** | 750 | S.26s/25 B.H. 46 | Bi-plane | 25 | 100/110 200/250 | **42/6**(*ab*) | 128±7 | 38±2 | 59±0·5 |
| **A1/111** | 900 | E.40/45 | Flat Grid 4 section | 50 | 24, 30 | **38/6** | 230±10 | 64±2 | 120±5 |
| **A1/60** | 1000 | P.40/41 | Bi-plane | 25 | 110 | **52/–** | 235±10 | 64±2 | 84±0·5 |
| **A1/92** | 1000 | S.26s/25 B.H. 46 | Bi-plane | 25 | 100 | **49/6**(*b*) | 175 | 38±2 | 78 |
| **A1/58** | 1000 | P.28/25 | Bi-plane | 25 | 110 | **49/6** | 133±7 | 64±2 | 55·5±0·5 |
| **A1/11** | 1000 | P.40/41 | Grid 6 sect. | 50 | 100, 110 | **35/6** | 235±10 | 64±2 | 84±0·5 |
| **A1/57** | 1000 | E.40/45 | ,, 6 ,, ,, 8 ,, | 50 | 100/115, 200/250 | **33/–** | 230±10 | 64±2 | 120±5 |
| **A1/164** | 1000 | P.28/25 | Bi-plane | 25 | 200/250 | **49/6** | 133±7 | 64±2 | 55·5±0·5 |

(*a*) *Forced cooling is necessary so that no part of the wall of the bulb exceeds a temperature of 500°C.*
(*b*) *These lamps may be supplied with tips black sprayed at no extra charge.*

## CLASS A3 — ROUND

**BURNING POSITION: Horizontal**

| Ref. No. | Watts | Caps Fully described on page 40 | Average Life (hr.) | Voltage Range | PRICE | Approximate Dimensions | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Length mm. | Diameter mm. | Light Centre Length mm. |
| **A3/1** | 100 | E.27/25 | 300 | 110, 200/250 | **11/9** | 115±10 | 70±2 | 95±5 |
| **A3/2** | 250 | E.27/35×30 | 300 | 110, 200/250 | **22/–** | 160±10 | 90±2 | 120±5 |

## CLASS E — EPIDIASCOPE — ROUND

**BURNING POSITION: Any position within 45° of Cap Down**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **E/3** | 500 | E.27/30 | 100 | 110, 200/250 | **30/3** | 135±10 | 100±5 | 85±5 |
| **E/4** | 500 | P.28/25 | 100 | 110, 200/250 | **31/3** | 130±10 | 95±5 | 55·5±0·5 |

## CLASS FL — FLOODLIGHTING — TUBULAR

**BURNING POSITION: Horizontal**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **FL/1** | 500 | E.40/45 | 1000 | 115, 200/250 | **38/6** | 355±10 | 90±2 | — |
| **FL/2** | 1000 | E.40/45 | 1000 | 115, 200/250 | **49/6** | 390±10 | 90±2 | — |

# PROJECTOR

## CLASS F — MICRO-PROJECTION, Etc., ROUND

BURNING POSITION: Horizontal*

| Ref. No. | Watts | Caps Fully described on page 40 | Average Life (hr.) | Voltage Range | PRICE | Approximate Dimensions | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Length mm. | Diameter mm. | Light Centre Length mm. |
| **F/30** | 8 | E.14/23×15 | 100 | 4 | **5/–** | 62±5 | 35±2 | 52±5 |
| **F/8** | 12 | B.A.15/24×17 | 100 | 12 | **4/6** | 57±5 | 37 max. | 40±3 |
| **F/24** | 24 | E.27/25 | 100 | 6 | **4/–** | 57±5 | 38±2 | 47±5 |
| **F/10** | 24 | E.14/23×15 | 100 | 6, 12 | **4/–** | 60±5 | 38±2 | 50±5 |
| **F/11** | 24 | E.14/23×15 | 100 | 12 | **4/–** | 60±5 | 38±2 | 41±3 |
| **F/26** | 30 | E.14/23×15 | 200 | 6 | **6/6** | 65±5 | 35±2 | 47±5 |
| **F/25** | 30 | E.27/35×30 | 25 | 6 | **6/6** | 63±5 | 35±2 | 53±5 |
| **F/23** | 30 | E.27/35×30 | 200 | 6 | **6/6** | 63±5 | 35±2 | 53±5 |
| **F/52** | 48 | E.14/27×18 | 100 | 6 | **8/3** | 62±3 | 35±2 | 49±2 |
| **F/7** | 48 | E.14/23×15 | 100 | 8 | **8/3** | 60±5 | 40±2 | 41±3 |
| **F/42** | 48 | P.28/25 | 100 | 12 | **6/–** | 75±5 | 50±2 | 18·5±0·5 |
| **F/13** | 48 | E.27/25 | 100 | 12 | **6/–** | 70±5 | 50±2 | 38±5 |
| **F/38** | 48 | B.A.15/24×17 | 100 | 12 | **6/–** | 60±5 | 38±2 | 40±3 |
| **F/43** | 100 | B.A.20s | 100 | 12 | **13/3** | 90±5 | 60±2 | 43±1 |
| **F/14** | 100 | E.27/25 | 100 | 12 | **13/3** | 85±5 | 60±2 | 55±5 |
| **F/15** | 108 | P.28/25 | 50 | 6 | **34/–**(*d*) | 139±7 | 32±2 | 65±0·5 |
| **F/16** | 108 | E.27/25 | 50 | 6 | **33/–**(*d*) | 135±4 | 32±2 | 86±3 |
| **F/46** | 108 | P.28/25 | 50 | 6 | **34/–** *e*) | 139±7 | 32±2 | 65±0·5 |
| **F/47** | 108 | E.27/25 | 50 | 6 | **33/–**(*e*) | 135±4 | 32±2 | 86±3 |
| **F/48** | 108 | P.28/25 | 50 | 6 | **34/–**(*d*) | 133±7 | 32±2 | 55·5±0·5 |
| **F/49** | 108 | E.27/25 | 50 | 6 | **33/–**(*d*) | 128±7 | 32±2 | 75±5 |
| **F/50** | 108 | P.28/25 | 50 | 6 | **34/–**(*e*) | 133±7 | 32±2 | 55·5±0·5 |
| **F/51** | 108 | E.27/25 | 50 | 6 | **33/–**(*e*) | 128±7 | 32±2 | 75±5 |

(*c*) *Transverse Filament.* (*d*) *Axial Ribbon Filament.* (*e*) *Horizontal Ribbon Filament.* * *Normally.*

## CLASS G — EXCITER — TUBULAR

| | Amps. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **G/2** | 0·75 | B.A.15s/21 | 50 | 4 | **6/–** | 48±3 | 25±1 | 32±1·5 |
| **G/4** | 1·0 | B.A.15s/17 | 100 | 6 | **6/–**(*b*) | 40±2 | 18±1 | 21·5±0·5 |
| **G/5** | 1·0 | P.15s/19 | 100 | 6 | **6/–**(*b*) | 57±3 | 16±1 | 28·5±0·5 |
| **G/36** | 5·0 | B.A.15s/17 | 100 | 6 | **8/6** | 52±2 | 18±1 | 27±0·5 |
| **G/16** | 1·0 | B.A.15s/21 | 100 | 27 | **9/–** | 75±3 | 25±1 | 41±1 |
| **G/6** | 2·0 | B.A.15s/21 | 100 | 8 | **6/–** | 75±3 | 25±1 | 44±1 |
| **G/20** | 3·8 | E.27/25 | 100 | 8 | **7/6**(*b*) | 80±5 | 32±2 | 64±3 |
| **G/8** | 4·0 | B.A.15s/21 | 100 | 8 | **6/–** | 75±3 | 25±1 | 44±1 |
| **G/9** | 4·0 | B.A.15s/21 | 100 | 8·5 | **6/–** | 75±3 | 25±1 | 44±1 |
| **G/11** | 5·0 | B.A.15s/21 | 100 | 10 | **8/–** | 75±3 | 25±1 | 41±1 |
| **G/12** | 5·0 | B.A.15s/21 | 100 | 10 | **8/–** | 75±3 | 25±1 | 44±1 |
| **G/22** | 6·0 | B.A.15s/21 | 100 | 4 | **6/6**(*a*) | 49±3 | 25±2 | 31·5±1 |
| **G/23** | 6·5 | P.15s/19 | 50 | 5 | **8/–**(*b*) | 75±3 | 25±1 | 41±0·5 |
| **G/14** | 7·5 | B.A.15s/21 | 100 | 10 | **8/–** | 75±3 | 25±1 | 41±1 |
| **G/15** | 7·5 | B.A.15s/21 | 100 | 10 | **8/–** | 75±3 | 25±1 | 44±1 |

(*a*) *Also B. 15s/17 with liner.* (*b*) *Axial Filament.*

## CLASS S — STUDIO SPOTLIGHT — ROUND

BURNING POSITION: Cap Down

| | Watts | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **S/3** | 500 | Med. bi-post | 100 | 115, 230, 240 | **66/–** | 138 | 95 ±2 | 63·5 |
| **S/6** | 750 | Bi-post | 100 | 115, 230 | **77/–** | 165 max. | 63 ±1 | 63·5±2 |
| **S/4** | 1000 | Bi-post | 100 | 115, 210, 230/250 | **71/6** | 232± 6 | 152·5±2 | 127 ±2 |
| **S/5** | 2000 | E.40/45 | 100 | 115, 230/250 | **93/6** | 220±10 | 150 ±2 | 134 ±5 |
| **S/1** | 2000 | Bi-post | 100 | 210, 230, 250 | **93/6** | 232± 6 | 152·5±2 | 127 ±2 |
| **S/2** | 5000 | Bi-post | 100 | 230, 250 | **300/–** | 335± 6 | 203 ±2 | 165 ±2 |

# PROJECTOR

## MISCELLANEOUS TYPES — TUBULAR

| Ref. No. | Watts | Caps Fully described on page 40 | Filament | Average Life (hr.) | Burning Position | Voltage Range | PRICE | Approximate Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Length mm. | Dia. mm. | Light Centre Length mm. |
| **G/37** | 2amp | P.15s/19 | — | 100 | — | 8 | **7/–** | 75±3 | 25±1 | 37·3±0·5 |
| **A1/72** | 10 | S.10/20×13 and Pathé Lug | Tranv'se | 100 | Cap Down | 20 | **4/9** | 57±3 | 15±1 | 25±0·5 |
| **A1/166** | 100 | B.15s | 4 section C.C. | 50 | — | 210,230, 240,250 | **13/9**(*b*) | 76±5 | 25±1 | 34·5±2 |
| **A1/169** | 100 | B.15s | 4 section C.C. | 50 | — | 210,230, 240,250 | **13/9**(*b*) | 76±5 | 25±1 | 34·5±2 |
| **F/27** | 72 | E.27/25 | Axial | 100 | Cap Down | 6 | **11/9** | 128±7 | 32±1 | 75±3 |
| **A1/79** | 100 | Pathé | Offset | 50 | Cap Down | 80 | **11/9** | 93·5±3 | 23±1 | 35±0·5 |
| **F/41** | 30 | B.A.15/24×17 | — | 25 | — | 6 | **6/6** | 58±5 | 35±2 | 40±5 |
| **F/40** | 100 | B.A.22/31×30 | C. Coil | 50 | — | 6 | **13/3** | 90±5 | 60±1 | 55±5 |
| **A1/156** | 100 | B.A.20s & T piece | — | 25 | — | 12 | **11/6**(*b*) | 87±3 | 25±1 | 30±0·5 |
| **A1/80** | 200 | B.A.22/25×26 3-pin | Offset | 25 | Cap Up | 100 | **26/–**(*ab*) | 82±3 | 32±2 | 51±0·5 |
| **A1/81** | 200 | Pathé | Offset | 50 | Cap Down | 110 | **19/6**(*b*) | 133±7 | 32±2 | 58±0·5 |
| **A1/105** | 200 | E.27/35×30 Small Pathé Lug | Offset | 50 | — | 15 | **26/6**(*b*) | 128±7 | 32±2 | 75±0·5 |
| **A1/151** | 200 | B.A.15s | Grid | 50 | — | 50 | **23/–**(*b*) | 87±5 | 25±1 | 34·5±2 |
| **A1/85** | 250 | S.26s/25 B.H. 38 | Grid | 50 | Cap Down Vertical | 50 | **24/–**(*b*) | 128±7 | 32±2 | 59±0·5 |
| **A1/86** | 300 | S.26s/25 B.H. 46 | Bi-plane | 25 | — | 100/115 | **35/–**(*ab*) | 128±7 | 32±2 | 59±0·5 |
| **A1/87** | 400 | S.26s/25 B.H. 38 | Bi-plane | 25 | Cap Down Vertical | 110 | **35/–**(*ab*) | 128±7 | 32±2 | 59±0·5 |
| **A1/159** | 400 | S.26s/25 B.H. 46 | Bi-plane | 25 | Cap Down Vertical | 110 | **35/–**(*ab*) | 128±7 | 32±2 | 59±0·5 |
| **A1/108** | 400 | E.27/35×30 Long Lug | Offset | 50 | — | 31 | **50/6**(*b*) | 128±7 | 38±2 | 75±0·5 |
| **A1/88** | 450 | Special Two-Prong | Twin Pillar | 100 | Cap Up | 15 | **44/–**(*g*) | 195 | 79(*d*) 30(*e*) | 136 |
| **A1/46** | 500 | B.A.22/25×26 3-pin | Bi-plane | 25 | Cap Up | 100/110 | **37/–**(*ab*) | 142 max. | 38 max. | 95 |
| **A1/47** | 500 | S.26s/25 B.H. 38 | Bi-plane | 25 | Cap Down | 110 | **37/–**(*ab*) | 128±7 | 32±2 | 59±0·5 |
| **A1/52** | 750 | E.27/35×30 and 3-fin ring | Bi-plane | 25 | Cap Up | 110, 115 | **43/6**(*ab*) | 145±8 | 38 max. | 81 |
| **A1/91** | 1000 | S.26s/25 B.H. 46 | Bi-plane | 25 | Cap Down | 110, 115 | **49/6**(*ab*) | 128±7 | 38±2 | 59±0·5 |
| **A1/59** | 1000 | P.28/25 | Bi-plane | 25 | Cap Down | 110, 115 | **49/6**(*ab*) | 133±7 | 38±2 | 55·5±0·5 |
| **FL/3** | 2000 | P.40 and centralizing | — | — | Horizontal | 230 | **90/–** | 425 | 90±2 | — |
| **H/1** | 2000 | P.40/41 | Bi-plane | 100 | — | 110, 220 | **93/6** | 245±10 | 76+4 −2 | 84±0·5 |

(*a*) *Forced cooling is necessary so that no part of the wall of the bulb exceeds a temperature of* 500°C.
(*b*) *These lamps may be supplied with tip black sprayed at no extra charge.*
(*d*) *Dimension at top of bulb.* (*e*) *Dimension at bottom of bulb.* (*g*) *Special bulb.*

# COLOUR TEMPERATURE

*for Colour Photography*

| Watts | Caps | Colour Temp. nominal | Average Life (hrs.) | Voltage Range | PRICE | Approximate Dimensions: Overall Length mm. | Dia. mm. | Light Centre Length mm. |
|---|---|---|---|---|---|---|---|---|
| 275 | E.27/25<br>B.22/25×26 | 3250°K | 10 | 230 | **3/–** | 117·5 | 65 | — |
| 500 | E.27/25 or<br>E.27/35×30 | | 10 | 230 | **7/6** | 160 | 80 | — |
| 500 | P.28/25 | | 10 | 230 | **31/6** | 133±7 | 64±2 | 55·5±0·5 |
| 500 | P.28/25 | | 10 | 115 | **31/6** | 133±7 | 64±2 | 55·5±0·5 |
| 1000 | E.40/45 | | 15 | 230 | **25/3** | 300±9 | 150±1·5 | 225±8 |
| 2000 | Bipost | | 15 | 115 | **93/6** | 232±6 | 152·5±2 | 127±2 |
| 5000 | Bipost | | 25 | 115 | **300/–** | 335±6 | 203±2 | 165±2 |

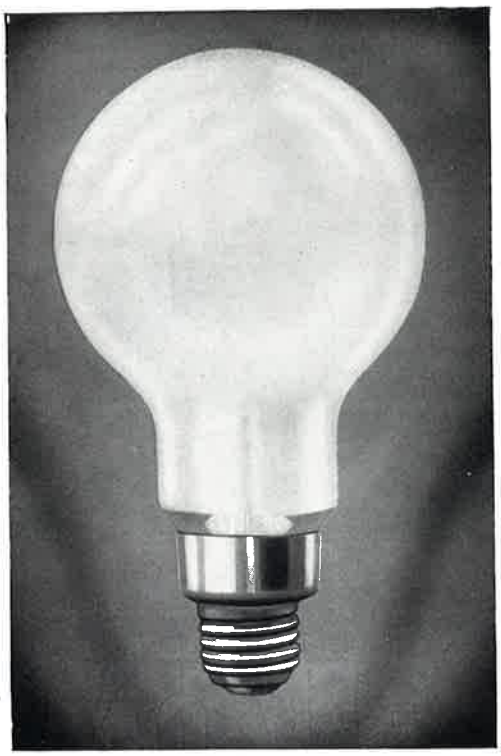
# PHOTOFLOOD

| Watts | Caps | Pearl (with fuse in cap) | PRICE 100/110, 200/250v. | Approx. Dimen. Length mm. | Dia. mm. |
|---|---|---|---|---|---|
| 275 | B.C., E.S. | 2 hours life, No. 1 | **2/6** | 110 | 60 |
| 500 | E.S.† | 10 hours life, No. 2 | **6/6** | 160 | 80 |
| 1000 | G.E.S. | 10 hours life, No. 4 | **16/6*** | 233 | 110 |

*110v. only. † *Also supplied with a B.C. cap* 200/250v.

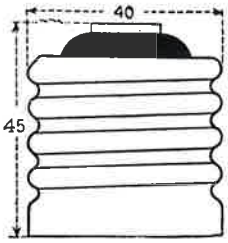
# ENLARGER *(Average Life, 100 hours)*

| Watts | Caps | Type | Voltage Range | PRICE | Approx. Dimen. L'gth mm. | Dia. mm. | L.C.L. mm. |
|---|---|---|---|---|---|---|---|
| 60 | B.C., E.S. | White Sprayed | 100/130<br>200/260 | **2/4** | 110 | 60 | 80 |
| 75 | B.C., E.S. | White Sprayed or Inside Silica Coated | 110, 210/250 | **2/9** | 117 | 65 | — |
| | | Opal Glass | | **3/6** | | | |
| 150 | B.C., E.S. | White Sprayed or Inside Silica Coated | 110, 210/250 | **3/9** | 117 | 65 | — |
| | | Opal Glass | | **4/6** | | | |
| 400 | E.S. | Clear Pear Shape 2″ spot frosted | 110, 210<br>230, 250 | **27/6** | 253 | 110 | 178 |
| 500 | E.S. | Club } Pearl | | **22/–** | 178 | 90 | 125 |
| | | Round } | | | 175 | 100 | 125 |
| 500 | E.S. | Inside Mirrored | 100/130<br>200/260 | **44/–** | 220 | 156 | — |

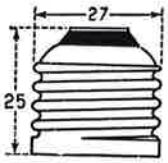


Enlarger

# CAPS



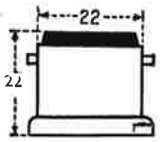

G.E.S.
E.40/45



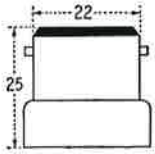

E.S.
E.27/25


S.E.S.
E.14/23 × 15

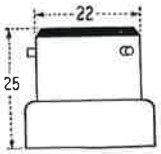

M.E.S.
E.10/13



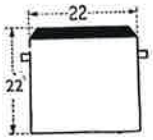

B.C.
B.22/22 × 26



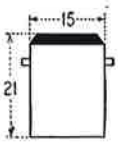

B.C.
B.22/25 × 26



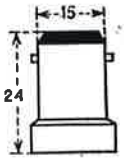

B.C. 3-pin
B.22/25 × 26



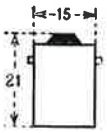

B.C.
B.22/22



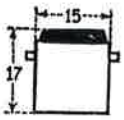

S.B.C.
B.A.15d/21



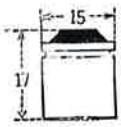

S.B.C.
B.15/24 × 18



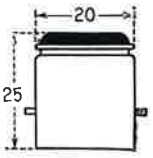

S.C.C.
B.A.15s/21



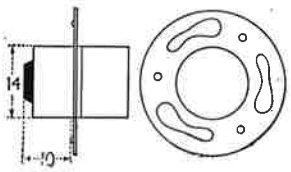

S.B.C.
B.A.15d/17



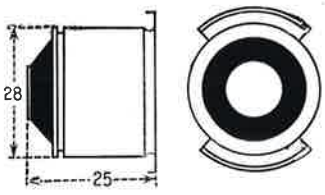

D.E. Tubular
S.15s.



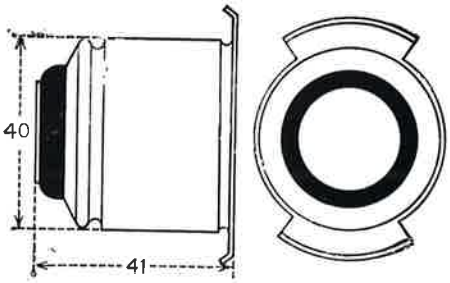

Bosch
B.A.20d



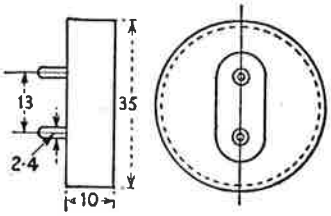

Small Prefocus
P.15s



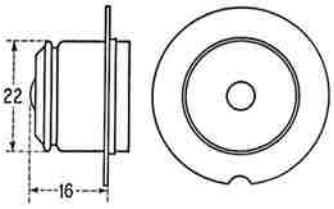

Medium Prefocus
P.28/25



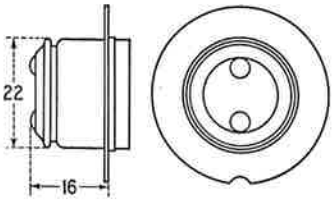

Large Prefocus
P.40/41




Fluorescent Tubular
Bi-pin




P.22s/21




British Prefocus
P.22d/21

Approximate Dimensions in millimetres.

# STANDARD PACKAGE QUANTITIES

| Type | Watts | Lamps |
|---|---|---|
| **General Service** | 15, 25, 40, 60, 75, 100, 150 | 50 per outer container |
| | 200 .. .. | 25 per outer container |
| | 300 .. .. | 12 per outer container |
| | 500 .. .. | 9 per outer container |
| | 750 .. .. | 6 per outer container |
| | 1000 .. .. | 6 per outer container |
| | 1500 .. .. | 4 per outer container |
| **Auto-mobile** | S.T.D. Head. Stop and Tail | 12 per box |
| | Indicator Festoon or Trafficator | 100 per box |
| | Flash, Radio Panel, Cycle Dynamo | 100 per box |

| Type | Watts | Lamps |
|---|---|---|
| **Miners** | — | 25 per box |
| **Mercury Discharge** | 80, 125 250, 400 .. .. | 24 per outer container |
| **Sodium Discharge** .. | 45, 60 .. | 18 per outer container |
| | 85, 140 .. | 9 per outer container |
| **Fluorescent Tubular** | 80w.—5 ft. 40w.—4 ft. | 25 per outer container |
| | 40w.—2 ft. 20w.—2 ft. | 50 per outer container |

# LAMP EFFICIENCIES

GENERAL SERVICE

| Watts | Lumens Average throughout life |
|---|---|
| 230v. Pearl and Clear Single coil. | |
| 15 | 113 |
| 25 | 206 |
| 40 | 330 |
| 60 | 584 |
| 75 | 785 |
| 100 | 1,160 |
| 150 | 1,970 |
| 200 | 2,725 |
| 300 | 4,430 |
| 500 | 7,930 |
| 750 | 12,740 |
| 1000 | 17,800 |
| 1500 | 28,380 |

FLUORESCENT TUBULAR

| Watts | Colour | Lumens Average throughout first 5,000 hours |
|---|---|---|
| 15 | Natural | 390 |
| | New Warm White | 480 |
| | De Luxe Warm White | 330 |
| 20 | Natural | 580 |
| | New Warm White | 800 |
| | De Luxe Warm White | 460 |
| 30 | Natural | 1,020 |
| | New Warm White | 1,380 |
| | De Luxe Warm White | 840 |
| 40 (2 ft.) | Natural | 920 |
| | New Warm White | 1,320 |
| | De Luxe Warm White | 760 |
| 40 (4 ft.) | Natural | 1,640 |
| | New Warm White | 2,160 |
| | De Luxe Warm White | 1,200 |
| | Colour Matching | 1,200 |
| | Daylight | 1,920 |
| 80 | Natural | 3,120 |
| | New Warm White | 4,160 |
| | De Luxe Warm White | 2,240 |
| | Colour Matching | 2,240 |
| | Daylight | 3,600 |
| 125 | Natural | 5,000 |
| | New Warm White | 6,875 |

DISCHARGE

| Watts | Type | Lumens Average throughout life† |
|---|---|---|
| 80 | MB/U | 2,320 |
| 125 | MB/U | 3,875 |
| 250 | MA/V | 7,750 |
| 250 | MA/U | 7,000* |
| 400 | MA/U | 12,400* |
| 400 | MA/V | 13,600 |
| 1000 | MB/V | 48,000 |
| 80 | MBF/U | 2,320 |
| 125 | MBF/U | 3,875 |
| 400 | MAF/V | 12,800 |
| 45 | SO/H | 2,250 |
| 60 | SO/H | 3,420 |
| 85 | SO/H | 5,525 |
| 140 | SO/H | 9,100 |

TUNGSTEN BALLAST

| Watts | Mains Volts | Lumens |
|---|---|---|
| 0·43 amps | 200/210 | 520 |
| | 220/230 | 635 |
| | 240 | 685 |
| | 250 | 735 |
| 70 | 200/210 | 735 |
| 80 | 220/250 | 850 |

* *If these are used vertically efficiency increased approx. 10%.*

† *These figures are associated with an extended life.*

# AUXILIARY GEAR

All electric discharge lamps require special auxiliary gear to limit the flow of current and in some cases they require special starting circuits.

Discharge lamps cannot be run in parallel with one current limiting device otherwise slight differences in lamp characteristics would result in one lamp taking all the current and the other none.

In the case of D.C. supplies the use of a resistance is the only practical method of limiting the arc current. On A.C. supplies, however, by far the most economical method is to employ an inductance in the circuit, and with most lamps of the mercury vapour types, which start and run at mains voltage, a simple choke is all that is required.

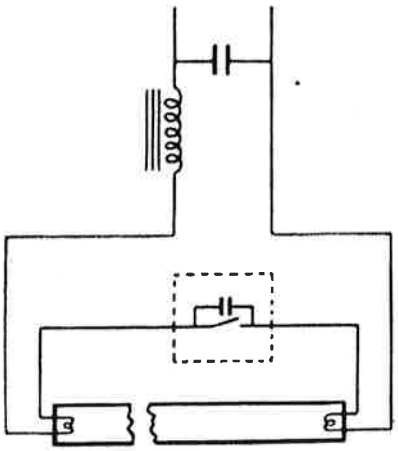


*Diagram of the glow starter circuit.*

A definite ratio is necessary between lamp volts and choke volts to ensure stable running conditions with fluctuating mains voltages and in practice the maximum lamp voltage drop is usually about 0·6 of the mains voltage.

A capacitor could be used in place of a choke for current limitation, but as the capacitor discharges through the lamp, the current wave form is bad, resulting in a reduction in lamp life and an increase in flicker. Where a capacitor is used in series with a discharge lamp a choke is also used to overcome this fault. The capacitor impedance is about twice that of the choke, creating a voltage of about 400 volts across the capacitor.

In the case of sodium lamps where a voltage above mains voltage is necessary for starting, a transformer having a high reactance is employed which serves the purpose of supplying the correct voltage for starting and for running with current limitation.

Instant start transformers used with fluorescent lamps do not in themselves provide the necessary reactance and are used with a choke, although both choke and transformer are usually supplied made up into one unit. The instant start transformer has to fulfil two functions, heating the lamp cathodes and providing the correct starting and running voltage conditions to the lamps. Normal instant start units listed are for use on supply circuits having an earthed neutral but special units can be supplied for use on delta supplies.

The use of chokes and high reactance transformers results in a low power factor and capacitors must be used to correct this, either for each lamp or using a bulk capacitor for a group of lamps.

Starter switches used with fluorescent lamps are of two types commonly referred to as "Thermal" and "Glow" although in reality they are both thermal devices.

The "Thermal" switch has two contacts which are normally closed and a small heater coil. The heater coil is connected in series with the lamp, and the two contacts are connected across the lamp cathodes forming a complete electric circuit having the two cathodes in series. When the circuit switch is closed, current passing through the cathodes and the starter switch heater causes these to heat up and a bi-metal strip in the switch to open the contacts after a short delay. Before the switch contacts open there is virtually no voltage difference between the two cathodes of the lamp but as a choke is included in the circuit a sudden upsurge occurs when the switch contacts open and the lamp strikes. During operation of the lamp, the continued flow of current through the heater coil keeps the switch contacts open.

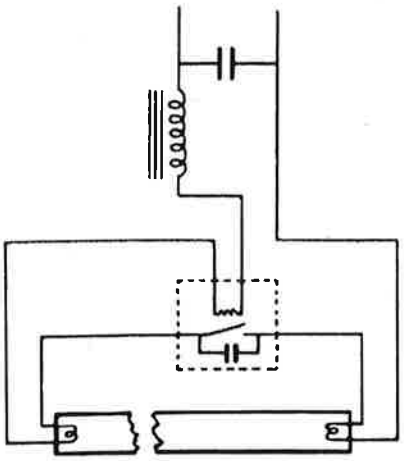


*Diagram of the thermal starter circuit.*

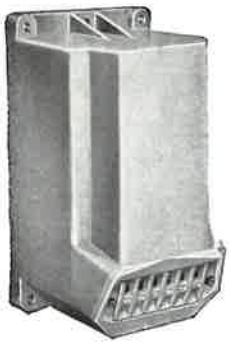
"Glow" starters, on the other hand, have two contacts normally open, attached to the tips of two bi-metal strips and enclosed in a glass bulb filled with a suitable gas. The two contacts are connected to the lamp cathodes in such a manner as to form a complete series circuit when closed. When the circuit switch is closed full mains voltage is across the two bi-metal strips and a glow discharge takes place between them. As the bi-metal strips heat up they bend towards each other until the contacts touch. Current now flows through the lamp cathodes heating them, but the glow discharge in the switch ceases as the switch has "short circuited" itself and the bi-metal strips commence to cool down, the contacts open and the lamp strikes. The voltage across the starter switch is now only that of the lamp voltage drop and the switch design is such that no glow discharge takes place at that voltage and the switch contacts remain open.

All starter switches and instant start transformers require the addition of a small capacitor for radio interference suppression, and this is included in the switch casing.

The electrical supply and the temperature condition of operation will generally determine the type of starter switch most suitable for any installation. For example, glow switches are not suitable for use on D.C. circuits. The schedule of starter switches on page 47 of this catalogue indicates the correct switch to use under particular conditions.

# AUXILIARY GEAR

*Standard frequency—50 cycles*



**MRG Choke and MCG Transformer** (*externally similar*)

*For Mercury Discharge Lamps* — **CHOKES**

| Catalogue No. | Lamps | Volts | Length in. | Width in. | Height in. | Weight lb. | PRICE £ s. d. |
|---|---|---|---|---|---|---|---|
| **MRG 508**<br>**MRG 507** | 80w MB | 215/255<br>190/230 | 6¾ | 4½ | 4½ | 7¼ | **3 1 8** |
| **MRG 506**<br>**MRG 505** | 125w MB | 215/255<br>190/230 | 6¾ | 4½ | 4½ | 9<br>8¾ | **5 4 0** |
| **MRG 504**<br>**MRG 503**<br>**MRG 510** | 250w MA | 215/255<br>190/230<br>100/120 | 6¾ | 4½ | 4½ | 10<br>9¾<br>10 | **5 17 0** |
| **MRG 502**<br>**MRG 501**<br>**MRG 509** | 400w MA | 215/255<br>190/230<br>100/120 | 8⅛ | 4½ | 4½ | 14¾<br>15¼<br>15 | ~~6 16 4~~<br>6 14 4 |

**CAPACITORS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **CF 08/0** | 80w MB | 200/260 | 4 | 3¾ | 1⅛ | 1 | **18 4** |
| **CF 13/0** | 125w MB | | 4½ | | 1⅜ | 1¼ | **1 11 4** |
| **CF 15/0** | 250w MA | | 4½ | | 1⅝ | 1⅝ | **1 15 0** |
| **CF 20/0** | 400w MA | | 4½ | | 2 | 2⅛ | **2 2 4** |
| **CF 60/0** | 250w MA | 100/120 | 4¾ | 6 | 4¼ | 8¾ | **5 14 4** |
| **CF 80/0** | 400w MA | | 4¾ | 6 | 6 | 10¾ | **7 9 D** |

**CF Capacitor**

*For Sodium Discharge Lamps* — **LEAK TRANSFORMERS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **MCG 104**<br>**MCG 103** | 45, 60, 85w SO | 220/250<br>190/220 | 6¾ | 4½ | 4½ | 9¾ | **5 15 4** |
| **MCG 102**<br>**MCG 101** | 140w SO | 220/250<br>190/220 | 8⅛ | 4½ | 4½ | 15¼ | **6 16 4** |

**CAPACITORS**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **CF 20/0**<br>**CF 15/0** | 45, 60, 85w SO | 190/220<br>220/250 | 4½ | 3¾ | 2<br>1⅝ | 2⅛<br>1⅝ | **2 2 4**<br>**1 15 0** |
| **CF 25/0** | 140w SO | 190/220 | on application | | | | |
| **CF 20/0** | | 220/250 | 4½ | 3¾ | 2 | 2⅛ | **2 2 4** |

# AUXILIARY GEAR

*Standard frequency—50 cycles*

*For Fluorescent Tubular Lamps*

**CHOKES**

| Catalogue No. | Lamp Watts | Volts | Length in. | Width in. | Height in. | Fixing Centres in. | Weight lb. | PRICE £ s. d. |
|---|---|---|---|---|---|---|---|---|
| **MRF 210**<br>**MRF 211** | 15† | 105/110<br>115/120 | $6\frac{7}{8}$ | $1\frac{5}{32}$ | $1\frac{13}{32}$ | $5\frac{7}{8}$ | $3\frac{1}{2}$ | **1 11 4** |
| **MRF 207**<br>**MRF 208**<br>**MRF 209** | 15†<br>20† | 200/210<br>220/230<br>240/250 | $9\frac{1}{4}$ | $2\frac{5}{32}$ | $1\frac{13}{32}$ | $8\frac{1}{4}$ | $3\frac{1}{2}$ | **1 12 4** |
| **MRF 204**<br>**MRF 205**<br>**MRF 206** | 15‡ | 200/210<br>220/230<br>240/250 | $9\frac{1}{4}$ | $2\frac{5}{32}$ | $1\frac{13}{32}$ | $8\frac{1}{4}$ | $3\frac{1}{2}$ | |
| **MRF 212**<br>**MRF 213** | 20† | 105/110<br>115/120 | $6\frac{7}{8}$ | $2\frac{5}{32}$ | $1\frac{13}{32}$ | $5\frac{7}{8}$ | $3\frac{1}{2}$ | **1 11 4** |
| **MRF 201**<br>**MRF 202**<br>**MRF 203** | 20‡ | 200/210<br>220/230<br>240/250 | $9\frac{1}{4}$ | $2\frac{5}{32}$ | $1\frac{13}{32}$ | $8\frac{1}{4}$ | $3\frac{1}{2}$ | **1 12 4** |
| **MRF 204**<br>**MRF 205**<br>**MRF 206** | 30† | 200/210<br>220/230<br>240/250 | $9\frac{1}{4}$ | $2\frac{5}{32}$ | $1\frac{13}{32}$ | $8\frac{1}{4}$ | $3\frac{1}{2}$ | |
| **MRF 214** | 40†–2ft. | 105/110 | $9\frac{1}{4}$ | $2\frac{5}{32}$ | $1\frac{13}{32}$ | $8\frac{1}{4}$ | $3\frac{1}{2}$ | |
| **MRF 101**<br>**MRF 102**<br>**MRF 103**<br>**MRF 110** | 40‡–2ft. | 200<br>210/220<br>230/240<br>250 | 16 | $2\frac{5}{32}$ | $1\frac{13}{32}$ | 15 | $6\frac{3}{4}$ | **2 4 8** |
| **MRF 201**<br>**MRF 202**<br>**MRF 203** | 40* | 200/210<br>220/230<br>240/250 | $9\frac{1}{4}$ | $2\frac{5}{32}$ | $1\frac{13}{32}$ | $8\frac{1}{4}$ | $3\frac{1}{2}$ | **1 12 4** |
| **MRF 101**<br>**MRF 102**<br>**MRF 103** | 80* | 200/210<br>220/230<br>240/250 | 16 | $2\frac{5}{32}$ | $1\frac{13}{32}$ | 15 | $6\frac{3}{4}$ | **2 4 8** |
| **MRJ 201**<br>**MRJ 202**<br>**MRJ 203**<br>**MRJ 204**<br>**MRJ 205** | 40 | 200/210<br>210/220<br>220/230<br>230/240<br>240/250 | $5\frac{3}{4}$ | $2\frac{1}{2}$ | 2 | $5\frac{1}{8}$ | 4 | **1 12 4** |
| **MRJ 101**<br>**MRJ 102**<br>**MRJ 103**<br>**MRJ 104**<br>**MRJ 105** | 80 | 200/210<br>210/220<br>220/230<br>230/240<br>240/250 | $6\frac{1}{8}$ | $3\frac{1}{8}$ | $2\frac{9}{32}$ | $5\frac{5}{8}$ | $6\frac{1}{2}$ | **2 4 8** |
| **MRJ 304*** | **80** | **200/250** | $6\frac{1}{8}$ | $3\frac{1}{8}$ | $2\frac{9}{32}$ | $5\frac{5}{8}$ | $6\frac{1}{2}$ | |

**Tapped Choke. See Engineering Data Leaflet 103/1d-4 for details of tappings and circuits.* *†Single lamp circuits.* *‡Two lamps in series.*

# AUXILIARY GEAR

## TYPE "PL" CAPACITORS

| Catalogue No. | Lamp Arrangement | | Capacitor Connection | Capacity | PRICE £ s. d. |
|---|---|---|---|---|---|
| **PL11C** | 1 – 80 w. 5 ft. MCF/U<br>2 – 40 w. 4 ft. MCF/U in parallel<br>2 – 40 w. 2 ft. MCF/U in series<br>2 – 30 w. 3 ft. MCF/U in series | 200/260 v. | Shunt | 7·5 mFd. | **18 4** |
| **PL12A** | 1 – 40 w. 4 ft. MCF/U<br>1 – 30 w. 3 ft. MCF/U<br>2 – 20 w. 2 ft. MCF/U in series | 200/260 v. | Shunt | 3·25 mFd. | **12 8** |
| **PL51** | 1 – 80 w. | 200/260 v. | Series | 7 mFd. | **1 11 4** |
| **PL21A** | 1 – 80 w. MB/U<br>1 – 80 w. MBF/U | 200/260 v. | Shunt | 8 mFd. | **18 4** |
| **PL28A** | 1 – 400 w. MA/V<br>1 – 400 w. MA/V<br>1 – 140 w. SO/H<br>1 – 85 w. SO/H<br>1 – 60 w. SO/H<br>1 – 45 w. SO/H | 200/260 v.<br>200/260 v.<br>220/250 v.<br>190/220 v.<br>190/220 v.<br>190/220 v. | Shunt | 20 mFd. | **2 2 4** |
| **PL29** | 1 – 140 w. SO/H | 190/220 v. | Shunt | 25 mFd. | *Price on application* |

*All above capacitors are fitted with discharge resistances.*
PL29 *capacitor* 5¾″ long × 2¾″ diameter.


**PL11C Capacitor**

**Starter Switch and Holder**


**200/250v.
Brick Type MRJ Choke
for Fluorescent Tubular lamps**

# AUXILIARY GEAR

*Standard Frequency – 50 cycles*

*For Fluorescent Tubular Lamps*

## TRANSFORMER/CHOKE UNITS

| Catalogue No. | Lamp Watts | Volts | Length in. | Width in. | Height in. | Fixing Centres in. | Weight lb. | PRICE £ s. d. |
|---|---|---|---|---|---|---|---|---|
| **MK 108** | 80 | 200/210 | 10¼ | 3 1/16 | 2 9/32 | 9 5/8 | 10 | **4 0 4** |
| **MK 109** | | 220/230 | 8 3/16 | 3 1/16 | 2 9/32 | 8 1/16 | 8½ | **3 12 4** |
| **MK 110** | | 230/240 | | | | | | |
| **MK 116** | | 240/250 | | | | | | |
| **MK 112** | 40 | 200/210 | 8 9/16 | 2½ | 2 | 7 15/16 | 7 | **3 0 8** |
| **MK 113** | | 220/230 | | | | | | **2 17 0** |
| **MK 114** | | 230/240 | | | | | | |
| **MK 115** | | 240/250 | | | | | | |

## CAPACITORS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CL 04/5** | 15, 20† | 105/120 | 6⅛ | 2 3/32 | 1 13/32 | 5¾ | 1 | **15 4** |
| **CL 03/25** | 15, 20‡ | 200/250 | 5 | 2 3/32 | 1 13/32 | 4 5/8 | ¾ | **12 8** |
| **CL 17/5** | 40†–2ft. | 105/110 | on application | | | | | |
| **CL 07/5** | 40‡–2ft. | 200/250 | 8¾ | 2 3/32 | 1 13/32 | 8⅜ | 1½ | **18 4** |
| **CL 03/25** | 30, 40 –4ft. | 200/250 | 5 | 2 3/32 | 1 13/32 | 14½ | ¾ | **12 8** |
| **CL 07/5** | 80 | 200/250 | 8¾ | 2 3/32 | 1 13/32 | 8⅜ | 1½ | **18 4** |
| **CLS 07/0** | | | 15½ | | | 14½ | 2½ | **1 11 4** |
| **CC 08/0** | 80 | 200/260 | 3 15/16 | 3⅞ | 1 13/32 | | 1¾ | **18 4** |
| **CCS 07/0*** | | | | | 3¼ | | | |
| **CF 08/0** | 80 | 200/260 | 4 | 3¾ | 1⅛ | | 1 | **18 4** |
| **CF 13/0 §** | | | 4½ | | 1⅜ | | 1¼ | **1 11 4** |
| **CF 20/0 §§** | | | 4½ | | 2 | | 2⅛ | **2 2 4** |

* Series. † Single lamp circuits. ‡ Two lamps in series. § Power factor correction 2 lamps. §§ Power factor correction 3 lamps.

## STARTER SWITCHES

| Catalogue No. | Lamps | Volts | Supply | PRICE s. d. |
|---|---|---|---|---|
| **ST.26*** | 3 ft. 30 watt<br>4 ft. 40 watt<br>5 ft. 80 watt | 200/250 | A.C. only | **6 0** |
| **ST.25** | 15 in. 20 watt – single<br>15 in. 20 watt – two in series<br>3 ft. 30 watt | 200/250<br>100/120<br>200/250 | A.C. or D.C. | **6 0** |
| **ST.24** | 4 ft. 40 watt | 200/250 | A.C. or D.C. | **6 0** |
| **ST.23** | 2 ft. 40 watt – single<br>2 ft. 40 watt – two in series<br>5 ft. 80 watt | 100/120<br>200/250<br>200/250 | A.C. or D.C. | **6 0** |
| **ST.14*** | 5 ft. 80 watt<br>8 ft. 125 watt | 200/250<br>200/250 | A.C. only | **6 0** |

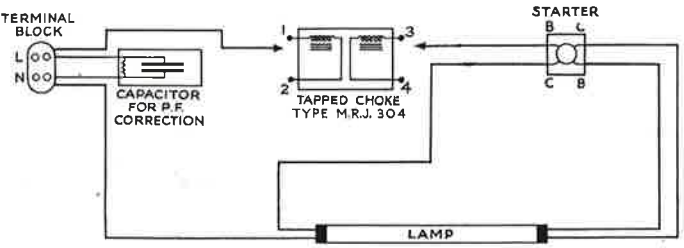
*See illustration on page 46.*

* Not suitable for use in low temperatures.

# TYPICAL CIRCUITS

## Switch Start Circuit

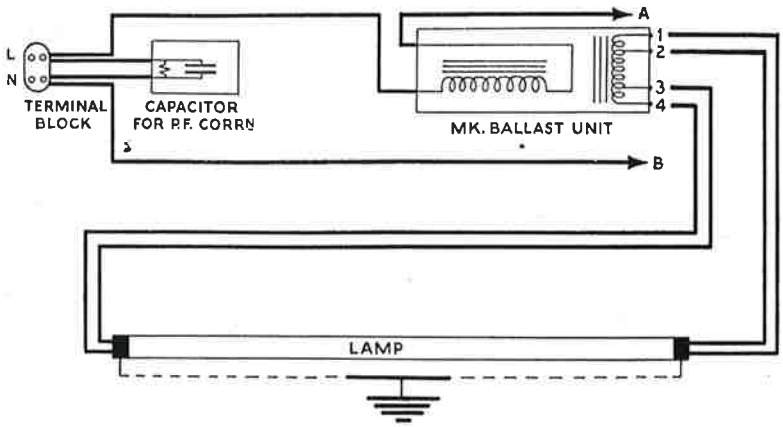
*for Single 80 watt MCF/U Lamp using Type MRJ Tapped Choke*




*Tapless Chokes may be substituted for the Tapped Chokes shown*

## Instant Start Circuit

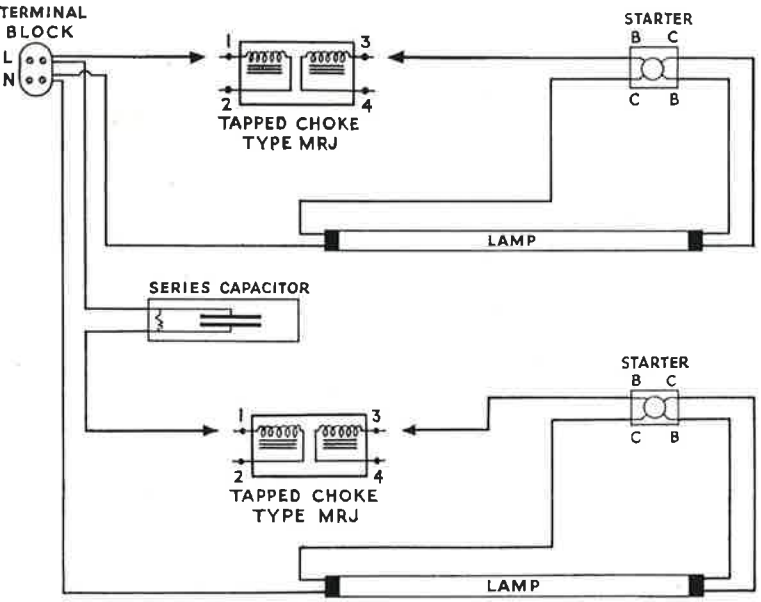
*for Single 40 watt and 80 watt MCFA/U Lamps*




*In the case of 80 watt 200/210 volt circuits A and B are connected together*

## Special Twin Lamp Circuit

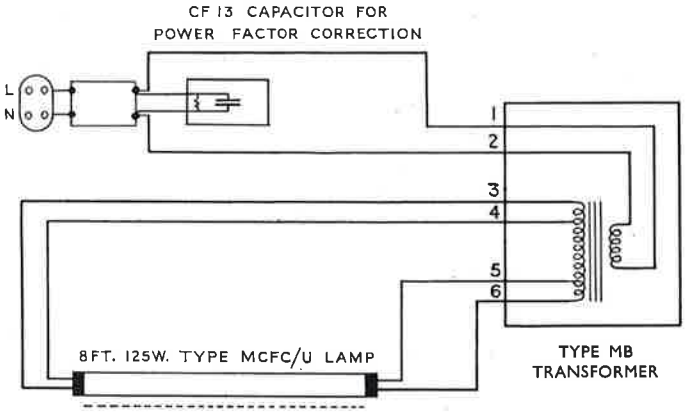
*for 80 watt MCF/U Lamps using MRJ 304 Tapped Chokes*




*Tapless Chokes may be substituted for the Tapped Chokes shown*

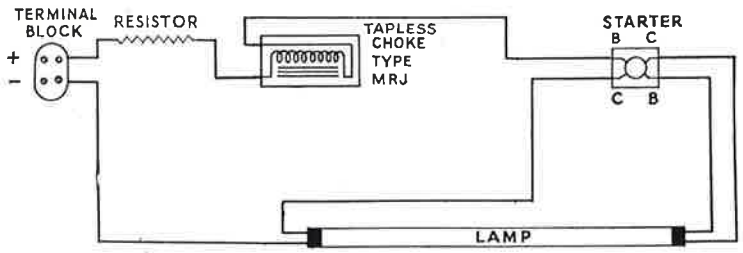
## Transformer Circuit

*for 125 watt MCFC/U Lamp*



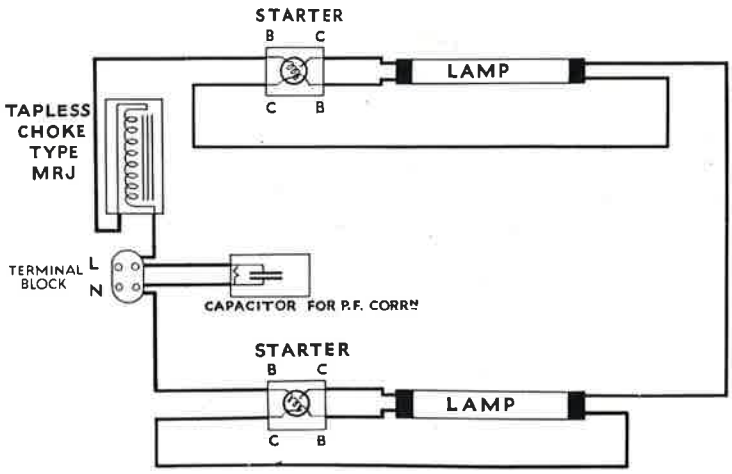

## Switch Start Circuit

*on D.C. Supply for Single 30/80 watt MCF/U Lamps*




## Switch Start Series Circuit

*for 2-15 watt, 2 ft. 20 watt and 40 watt MCF/U Lamps*




***For further information on the above, and also for additional circuits, see Engineering Data Leaflet No. 103/1d-4 (forwarded on request). Also refer to voltage connection information given on the Chokes and Transformers.***

# METROPOLITAN-VICKERS ELECTRICAL CO. LTD.

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