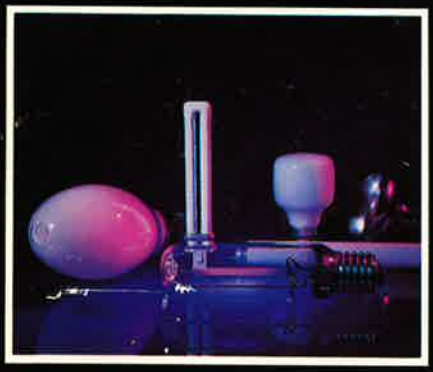
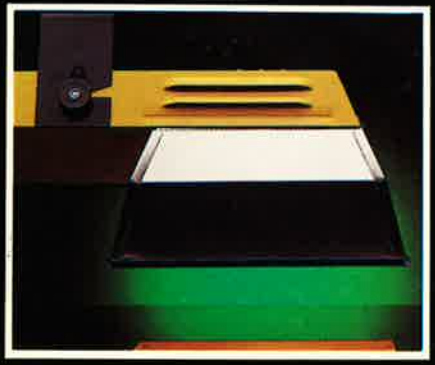
Osram-GEC
LIGHTING CATALOGUE

STEPHEN STARK
SENIOR SALES REPRESENTATIVE
OSRAM G.E.C. Ltd
CONCORDE ROAD, PATCHWAY
BRISTOL BS12 5TF
TEL 0272 696641
HOME 0272 604368





LOOKING AT ENERGY SAVING IN A DIFFERENT LIGHT.

OSRAM-GEC

A Subsidiary of the General Electric Company, p.l.c. of England

LIGHTING CATALOGUE

CONTENTS

The complete range of lighting fittings, lamps and control gear and accessories manufactured by Osram (GEC) Limited is listed and described in this catalogue. A selection of the more popular lanterns, columns and high masts produced by GEC Street Lighting is included. A separate catalogue is available on request. Similarly, whilst some photometric data is given, detailed photometric data sheets are available on request.

Some fittings are packaged complete with lamps and where this occurs it is stated in the product specification. If one fitting is available in two versions, packaged either with or without a lamp, separate catalogue numbers have been allocated.

The maximum lamp wattage for which each luminaire is designed is clearly stated and should not be exceeded.

All the products listed in this catalogue are offered subject to the company's terms of business and general conditions of sales which are printed on page 244.

The company undertakes a continuous programme of research, development and product improvement. This means that products may be subject to change without prior notice or public announcement. All descriptions, illustrations, dimensions and drawings in this catalogue are typical of the products to which they refer and must not be interpreted as a guarantee of individual performance or characteristics, and shall not form any part of any contract.

Osram (GEC) Limited
P.O. Box 17, East Lane
WEMBLEY
Middlesex HA9 7PG

Tel. 01 904 4321
Tlx. 22418

CONTENTS

INTRODUCTION

In 1986 The General Electric Company celebrates its centenary, and nearly 100 years in lighting. During these years the company has won worldwide recognition for its outstanding contribution towards the development of all types of light source – tungsten filament lamps, high pressure mercury lamps, fluorescent tubes, tungsten halogen lamps and high and low pressure sodium lamps. Scientific discoveries by GEC's research laboratories have resulted in a host of world 'firsts'.

It is on this solid base of research and development that the products in this catalogue are founded. Many of these developments are today helping to combat the problem of escalating energy costs and meet ever more sophisticated lighting demands.

Energy Efficient Lighting

Sharply rising electricity costs, following the energy crisis of the '70s, has increased the demand for energy efficient lighting. GEC, who pioneered the high pressure sodium lamp in the '60s are, as a result of continuous research, well placed to exploit this need with a range of Solarcolour lamps which are now more efficient in terms of light output and life.

The Solarcolour Plus lamp, for instance, gives up to 18% more light than any standard high pressure sodium lamp on the market. The standard 250W Solarcolour lamp achieves 32,000 lumens, almost equalling the 400W lamp when it was first introduced in 1966.

In areas where colour rendering is of primary importance, such as commercial premises, Solarcolour Deluxe lamps are now widely accepted. In traditional fluorescent lighting, krypton tubes and new high efficiency phosphors in trichrome tubes are also cutting the use and cost of energy.

Specially designed fittings such as Harrier and Solarflood, which use discharge lamps, and Vantage for use with fluorescent tubes, fully exploit new lamp technology and provide efficient lighting packages. In commercial and domestic installations, the Opus compact fluorescent range is also helping to reduce energy consumption.

Planned Lighting Maintenance

The energy cost spiral has brought the subject of PLM to the forefront since good housekeeping, the essence of planned maintenance, can bring substantial savings and benefits to the user.

PLM or bulk replacement as it is sometimes called, is based on the cleaning and replacement of lamps and fittings to a predetermined time, irrespective of the fact that the lamp may not have failed.

The overall cost of replacing a simple lamp (ignoring the cost of the lamp) is often considerable, but by replacing several in one operation, the cost per lamp becomes marginal.

In a typical unmaintained fluorescent light-

ing scheme, the average loss in light output after one year is 30 per cent. Only 6 per cent of this is due to lumen depreciation, the majority being due to dirt and soiling of reflective and diffusing surfaces. After two years, the loss in light output could be as high as 55 per cent. This loss of output can be expressed as a wastage in energy costs because the energy consumed remains constant – the user pays for lighting which is not being obtained. If a lower level of lighting is found to be acceptable, then it may be argued that with regular cleaning and replacement, the number of luminaires could be reduced, thereby cutting down the lighting load.

Similar figures can be calculated for high and low pressure discharge lamps, and all other light sources. Visually, group replacement ensures the installation maintains a uniform appearance; electrically, group replacement reduces the risk of damage to control gear caused by lamps nearing the end of their electrical life; and financially, by relamping in association with luminaire cleaning at a time when it will cause minimum disturbance to the work place, the overall cost of lamp replacement is minimised.

The timing and nature of lamp replacement is usually a matter of economic and managerial judgement and may be determined by factors other than those directly related to the lighting. However, the proposed lamp replacement procedure should be taken into account during the design of the installation.

Lighting Design Service

GEC's lighting engineers will survey, design and plan new lighting installations, or update existing ones free of charge. Lighting design teams located around the U.K. can produce lighting solutions for any scheme, from small offices to cathedrals. They will produce Lighting Economy Reports with recommendations for saving energy and lighting costs and can often do so without loss of lighting levels and, in some cases, improve on them. This report is free of charge.

Our lighting engineers can be contacted at any of the regional offices listed on the back of this catalogue.

Compliance With Standards

Products in this catalogue are manufactured to BS4533 and its associated safety standards and are compatible with European and International standards. They are licensed to carry the BSI Kite and Safety marks and these symbols are shown on each page where applicable; exceptions are a few products currently being tested to secure BSI approval.

Information on any product's compliance with BS4533 can be provided on application.

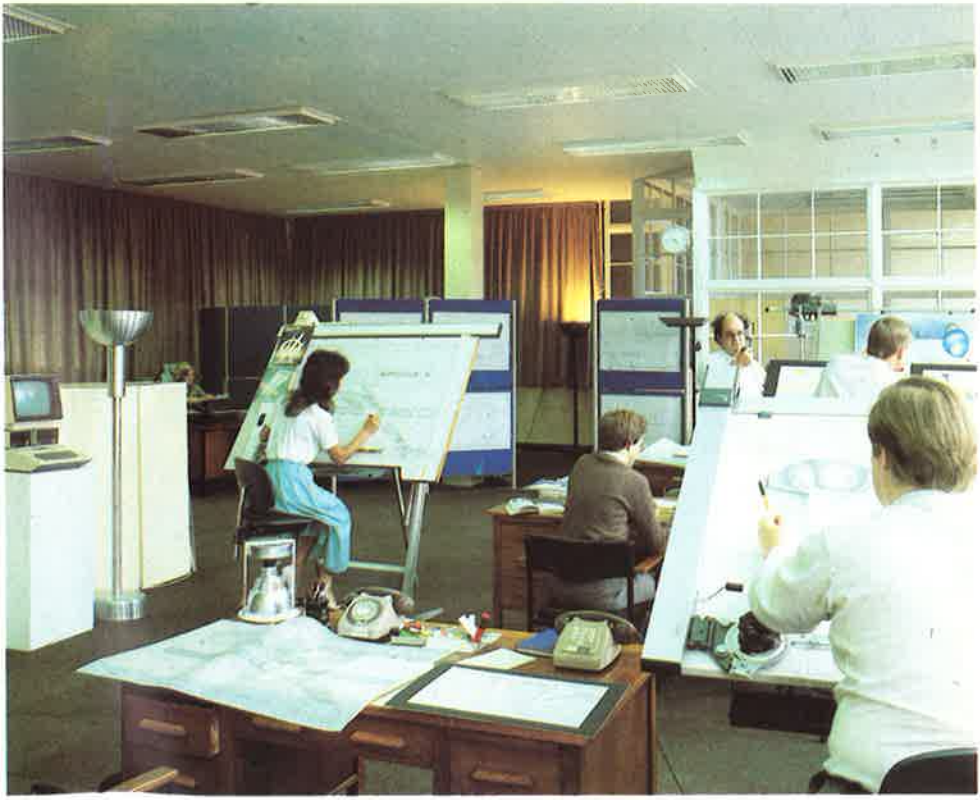
GEC's factories and quality control departments are licensed by the BSI as having the necessary testing system to Kite and Safety mark the products that BSI have approved. The BSI carry out regular inspections of these systems under the licensing procedure.

CUSTOM BUILT LUMINAIRES

Architects and designers frequently require specialist, non-standard luminaires. At GEC we can design and manufacture custom-built luminaires to suit specific commercial and industrial installations. Our Special Project Design department ensures that the lighting integrates with the interior and complements the architectural considerations of ceiling structure and layout at an economic cost.

Trained, experienced lighting engineers will undertake special lighting projects, including testing in our BSI registered laboratory, without obligation.

Contact any of our sales offices for further advice on custom built lighting design.



The Central Lighting Design Office, Wembley.

The Brighton Primark store features continuous lines of recessed fluorescent fittings which include air handling facilities and low brightness louvres.

Uplighters with 250W Solarcolour De Luxe lamps provide efficient, glare-free lighting for colour printers Hunterprint at their Corby based offices.

MARKS

BSI SAFETY AND KITE MARKS

	**Safety Mark**	Type tested and approved by BSI to meet the safety requirements only of BS4533 and licensed to use this mark.
	**Kite Mark**	Type tested and approved by BSI to meet safety and performance requirements of BS4533 and licensed to use this mark.
	**F Mark**	Type tested and approved by BSI to deem luminaires with built-in ballasts or transformers suitable for direct mounting on normally flammable surfaces. Requirement of BS4533.

Other Marks shown in the catalogue:

		Denotes luminaire supplied complete with lamp.
	**Quick Fit**	Denotes luminaire with plug and socket connection between control gear and mains supply.

QUICK FIT

It is now GEC design policy that all new discharge lamp luminaires are connected to the mains supply via a **quick fit** plug and socket. The advantages given in this facility are five fold:

For the contractor:

(i) The luminaires need not be mounted until all other work on the installation has been completed. Thus accidental damage, paint spills etc can be prevented

(ii) Reduced installation costs since the mounting of a lightweight support bracket or backplate and the wiring of a socket can be done more quickly and by one man.

(iii) The electrical testing of a new installation is simplified.

For the user:

(iv) Lower maintenance costs since luminaires can be speedily disconnected.

(v) In the case of large installations, spare plug-in gear units can be available to ensure maximum lighting efficiency.

The following luminaires incorporate this facility:

Speedpack
Vantage
Matrix
Nightwatch 10 and 18
Valiant Bulkheads
Watchlight
Opus Valiant
Opus Pathlite
Champion
Harrier
Hi-Saver range
Solarflood range
Solarbeam range
Timesaver ranges

INGRESS PROTECTION *TO BS 4533*

FIRST DIGIT
(Solid Object Protection)

	Short description
0	Non-protected
1	Protected against solid objects greater than 50mm
2	Protected against solid objects greater than 12mm
3	Protected against solid objects greater than 2.5mm
4	Protected against solid objects greater than 1.0mm
5	Dust-protected
6	Dust-tight

SECOND DIGIT
(Water Ingress Protection)

	Short description
0	Non-protected
1	Protected against dripping water
2	Protected against dripping water when tilted up to 15°
3	Protected against spraying water
4	Protected against splashing water
5	Protected against water jets
6	Protected against heavy seas
7	Protected against the effects of immersion
8	Protected against submersion

The first number after the letters IP refers to the protection of persons against live parts in the luminaire and ingress of solid foreign bodies.

The second number gives the degree of protection against harmful ingress of water.

HOSPITAL LIGHTING

The CIBS Lighting Guide: Hospitals, gives details of the lighting requirements throughout a hospital complex. It was written in conjunction with the D.H.S.S. and is, therefore, compatible with their recommendations. There are many areas within a hospital complex that can be lit in the same way as similar commercial and industrial areas. These include kitchens, canteens, workshops, stores, entrance halls and external areas such as car parks. For these areas our standard luminaires are suitable e.g. Duralite range, Speedpack range, Champion and Hi-Saver, Valiant, Nightwatch, Emergency and Floodlights.

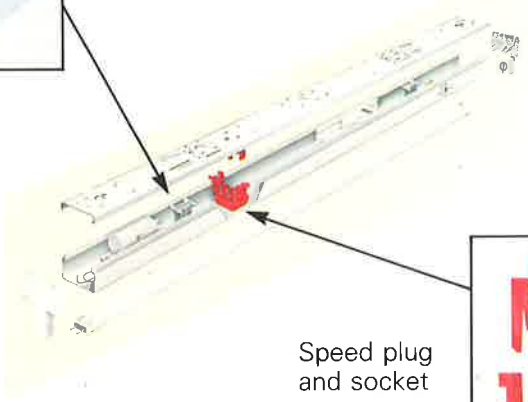
The D.H.S.S. have issued a list of 'standard reference luminaires' for use in hospitals. The general appearance and performance of the luminaires are specified for use in particular areas, generally referred to as clinical areas, which have lighting requirements peculiar to hospitals.

STANDARD REFERENCE 'B' (Fluorescent luminaires for bedded areas – surface mounted.)	(a) VANTAGE S (b) WARD LIGHTING (Surface)
STANDARD REFERENCE 'C' (Fluorescent luminaires for bedded areas – suspended.)	CUSTOM BUILT LUMINAIRES
STANDARD REFERENCE 'D' (Fluorescent Modular luminaires.)	(a) T PACK (b) MATRIX (c) CUSTOM BUILT LUMINAIRES*
STANDARD REFERENCE 'L' (Tungsten filament night luminaires.)	CUSTOM BUILT LUMINAIRES*
STANDARD REFERENCE 'M' (Tungsten filament wall mounted luminaire fixed arm.)	ADJUSTABLE WALL LIGHT F42226
STANDARD REFERENCE 'O' (Tungsten filament ceiling mounted bed head luminaires.)	CUSTOM BUILT LUMINAIRES*
STANDARD REFERENCE 'P' (General purpose tungsten filament luminaires.)	FGR370, F40280 FGR327WPG, FGR339 F40259WHI COURIER RANGE

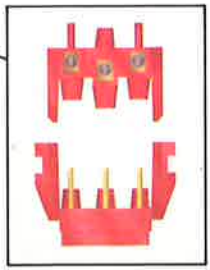
*For these luminaires refer to Government Contracts Department, Wembley, or to local Sales Office.

Speedpack

Speed lock



Speed plug
and socket



SPEEDS UP FITTING
SLOWS DOWN COSTS

Four-Stage Fixing

1. Backplate Fixed
2. Wiring Checked
3. Channel Fixed to Backplate
4. Lamps Installed

SPEEDPACK

Shelflight

- ✱ Rapid fixing and wiring
- ✱ Ease of electrical testing
- ✱ Reduced running cost
- ✱ Ease of maintenance
- ✱ Stylish, slim appearance
- ★ Extensive range of attachments
- ★ F and Kite marked/Safety marked
- ★ Polycarbonate rotary lampholders
- ★ Accepts 26 or 38mm dia lamps
- ★ Stocked both with and without tubes

Speedpack is a progressive fluorescent lighting system which incorporates a plug and socket connection between the back plate and channel. The advantages of this system are that fixing and wiring are carried out on the relatively lightweight back plate. Electrical testing in accordance with IEE Regulations can be carried out before attaching the channels avoiding damage to the luminaire circuitry.

RANGE

Catalogue No.	Tubes			Overall Length mm	Weight kg	Circuit watts	Power Factor	Fusing
	No.	ft.	Watts					
SP2	1	2	18	614	1.5	30	0.32	
SP4	1	4	36	1224	2.5	47	0.92	
SP5 Single	1	5	58	1525	3.5	71	0.90	All 3A
SP6	1	6	70	1788	4.0	84	0.95	
SP8100	1	8	100	2399	6.3	115	0.90	
SP8	1	8	125	2399	5.25	141	0.62*	
SP24	2	4	36	1244	3.5	93	0.94	
SP25	2	5	58	1525	5.0	142	0.90	All 3A
SP26 Twin	2	6	70	1788	6.0	168	0.95	
SP28100	2	8	100	2399	8.5	230	0.91	
SP28	2	8	125	2399	7.5	282	0.62*	
SP2W	2	2	18	614	1.75	47	0.49	
SP4W Wide	2	4	36	1224	3.5	93	0.94	
SP5W Spaced	2	5	58	1525	5.0	142	0.90	All 3A
SP6W Twin	2	6	70	1788	6.0	168	0.95	
SP8W100	2	8	100	2399	8.5	230	0.91	
SP8W	2	8	125	2399	7.5	282	0.62*	

*Denotes a leading power factor.

With the exception of the 8', all the above battens are complete with high efficiency white 1" Krypton tubes. The 8' 100W battens are complete with high efficiency white 1½" Krypton tubes. Battens can also be supplied without tubes and these are stocked under catalogue numbers with a 'N' before the number e.g. SPN8 and SPN28 etc.

Typical Photometric Data

		Single	Twin	Wide Twin
Light Output Ratios (ceiling mounted)	Up	26%	22%	22%
	Down	67%	66%	62%
BZ Classification		6	6	6
Recommended max. spacing to mounting height ratios		1.91	1.78	1.90

SPECIFICATION

Backplate: Steel, finished white stove enamel with a three way terminal block capable of accommodating 6mm² cable. This terminal block is also a socket for the plug fitted to the channel.

Channel: Rolled steel, finished white stove enamel. Fitted with high power factor switch start 240V 50Hz control gear. (Gear for other voltages and frequencies can be fitted to special order.) Lampholders are of the rotary type made from polycarbonate material. Screw fixings are supplied for attaching reflectors. A specially designed fuse holder can be fitted to the live side of the three-pin plug. Speedpack battens can be supplied both with and without fluorescent tubes.

Comply with BS 4533 and I.E.C. 398. Type tested and approved for Kite mark/Safety mark and mark.

Ingress Protection: IP. 20.

Radio Interference: Speedpack switch start luminaires comply with the Statutory Instrument 1978 No. 1268 Regulation 6. Suppressed for use in residential accommodation.

Shelflight

Shelflight is an adaptation of the standard speedpack system. The lampholder is turned through 90° providing a slimmer profile rendering it suitable for situations where space is limited, such as display lighting, sign lighting, pelmets etc.

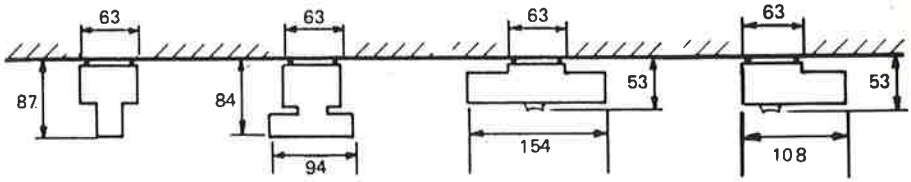
2′ SPS2
4′ SPS4

Mounting Accessories

SPCBKT End conduit bracket
SPFUSE Speedpack fuse holder

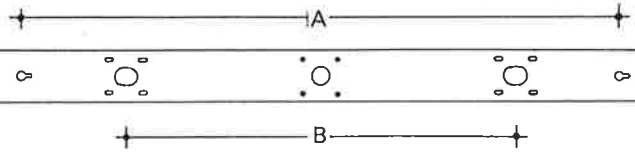
For Speedpack with Emergency Lighting Facility see page 250.

Outline Dimensions



Tube Length	600mm 2′	1200mm 4′	1500mm 5′	1800mm 6′	2400mm 8′
Overall Length	614mm	1224mm	1525mm	1788mm	2399mm

Keyhole fixing – M4, M5 – Nos. 8, 10 wood screws



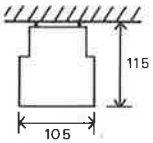
	600mm 2′	1200mm 4′	1500mm 4′	1800mm 6′	2400mm 8′
A	500	1100	1400	1660	1680
B	Central	24″/600	24″/600	24″/600	48″/1200

Speedpack prismatic controllers are made in three styles: first is for single battens, the second is for single and twin battens and the third is for wide spaced battens.

SPECIFICATION

Extruded U.V. stabilised polystyrene or acrylic controllers with a prismatic profile. Supplied complete with a pair of end plates, fastened to the batten by tension springs.

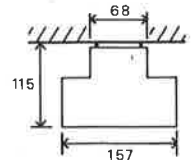
SINGLE PRISMATIC CONTROLLERS



Controller Cat. No.		For use with Batten	Composite Cat. No.
SPP2	2′	SP2	SP2P
SPP4	4′	SP4	SP4P
SPP5	5′	SP5	SP5P
SPP6	6′	SP6	SP6P

Light output ratios (ceiling mounted)	Up 34% Down 49%
BZ Classification	BZ4/2.0/5
Recommended max spacing to mounting height ratio	1.78

SINGLE/TWIN PRISMATIC CONTROLLERS

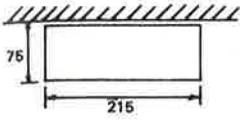


Controller Cat. No.			For use with Batten	Composite Cat. No.	
Poly-styrene	Acrylic			Poly-styrene	Acrylic
SPC2	—	2′	SP2	SP2C	—
SPC4	SPCA4	4′	SP4 SP24	SP4C SP24C	SP4CA SP24CA
SPC5	SPCA5	5′	SP5 SP25	SP5C SP25C	SP5CA SP25CA
SPC6	SPCA6	6′	SP6 SP26	SP6C SP26C	SP6CA SP26CA
SPC8	SPCA8	8′	SP8 SP28	SP8C SP28C	SP8CA SP28CA
SPC8	SPCA8	8′	SP8100 SP28100	SP8C100 SP28C100	SP8CA100 SP28CA100

		Single	Twin
Light Output Ratios (ceiling mounted)	Up	30%	27%
	Down	52%	52%
BZ Classification		BZ4/1.5/5	BZ4/1.5/5
Recommended max spacing to mounting height ratios		1.89	1.82

WIDE TWIN PRISMATIC CONTROLLERS

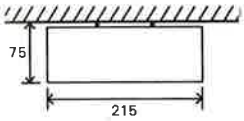
Controller Cat. No.			For use with Batten	Composite Cat. No.	
Poly-styrene	Acrylic			Poly-styrene	Acrylic
SPC2W	—	2′	SP2W	SP2WC	—
SPC4W	SPCA4W	4′	SP4W	SP4WC	SP4WCA
SPC5W	SPCA5W	5′	SP5W	SP5WC	SP5WCA
SPC6W	SPCA6W	6′	SP6W	SP6WC	SP6WCA
SPC8W	SPCA8W	8′	SP8W SP8W100	SP8WC SP8WC100	SP8WCA SP8WCA100



Light output ratios (ceiling mounted)	Up 16% Down 52%
BZ Classification	5
Recommended max spacing to mounting height ratio	1.73

WIDE BATWING CONTROLLERS

Controller Cat. No.			For use with Batten	Composite Cat. No.	
Poly-styrene	Acrylic			Poly-styrene	Acrylic
SPB4W	SPBA4W	4′	SP4W	SP4WB	SP4WBA
SPB5W	SPBA5W	5′	SP5W	SP5WB	SP5WBA
SPB6W	SPBA6W	5′	SP6W	SP6WB	SP6WBA



Light output ratios (ceiling mounted)	Up 11% Down 57%
BZ Classification	not applicable 'Batwing'
Recommended max spacing to mounting height ratio (continuous rows)	2.0

Dimensions

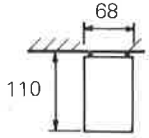
Tube Length	600mm 2′	1200mm 4′	1500mm 5′	1800mm 6′	2400mm 8′
Overall Length	619mm	1229mm	1530mm	1793mm	2404mm

These opal diffusers are intended for use in domestic and commercial interiors.

SPECIFICATIONS

Reeded opal extruded U.V. stabilised polystyrene and acrylic. Each diffuser is supplied with two end caps which surround the batten and diffuser and are held in position by tension springs.

SINGLE OPAL DIFFUSERS



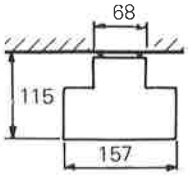
Diffuser Cat. No.		For use with Batten	Composite Cat. No.
SPD2	2′	SP2	SP2D
SPD4	4′	SP4	SP4D
SPD5	5′	SP5	SP5D
SPD6	6′	SP6	SP6D

All SPD Diffusers are made from U.V. stabilised polystyrene.

Light output ratio (ceiling mounted)	Up 25% Down 49%
BZ Classification	6
Recommended max spacing to mounting height ratio	2.12

SINGLE/TWIN OPALISED DIFFUSERS

Diffuser Cat. No.			For use with Batten	Composite Cat. No.	
Poly-styrene	Acrylic			Poly-styrene	Acrylic
SPOP2	—	2′	SP2	SP2OP	—
SPOP4	SPOPA4	4′	SP4 SP24	SP4OP SP24OP	SP4OPA SP24OPA
SPOP5	SPOPA5	5′	SP5 SP25	SP5OP SP25OP	SP5OPA SP25OPA
SPOP6	SPOPA6	6′	SP6 SP26	SP6OP SP26OP	SP6OPA SP26OPA
SPOP8	SPOPA8	8′	SP8 SP28	SP8OP SP28OP	SP8OPA SP28OPA



		Single	Twin
Light Output Ratios (ceiling mounted)	Up	30%	26%
	Down	51%	50%
BZ Classification		5	5
Recommended max spacing to mounting height ratios		1.82	1.72

SPOPA diffusers are available to special order only.

Dimensions

Tube Length	600mm 2′	1200mm 4′	1500mm 5′	1800mm 6′	2400mm 8′
Overall Length	619mm	129mm	1530mm	1793mm	2404mm

This low brightness louvre attachment is designed for use in areas where glare has to be reduced to a minimum. Due to its 'batwing' distribution the luminaires can be spaced further apart reducing installation cost.

SPECIFICATION

Fabricated from satin finish and anodised aluminium. The cross louvre members are 30mm deep and spaced 75mm apart. A pair of polycarbonate end plates secure the louvre attachment to the batten by tension springs.

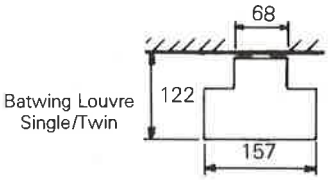
RANGE

Catalogue No. Louvre Attachment	For use with Battens	Composite Catalogue No.
SPL4	SP4 SP24	SP4L SP24L
SPL5	SP5 SP25	SP5L SP25L
SPL6	SP6 SP26	SP6L SP26L

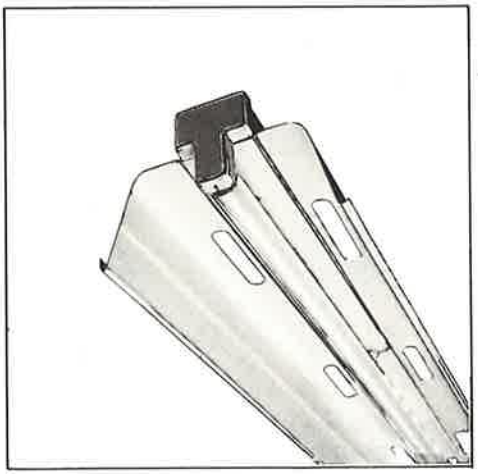
		Single	Twin
Light Output Ratios (Ceiling)	Up	13%	12%
	Down	55%	53%
BZ Classification		not applicable – Batwing	
Recommended max spacing to mounting height ratios		2.13	1.85

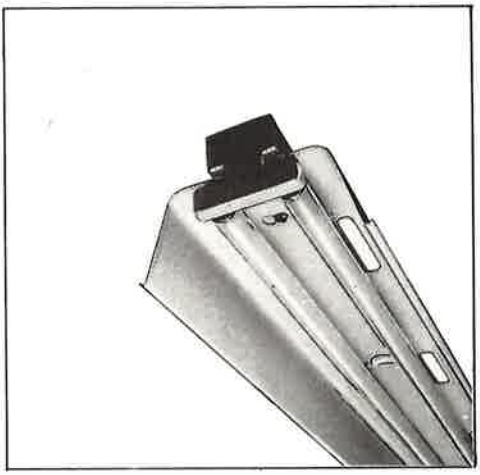
Dimensions

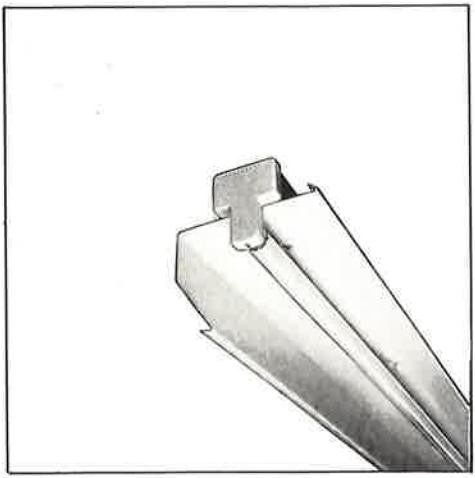
Tube Length	1200mm 4′	1500mm 5′	1800mm 6′
Overall Length	1229mm	1530mm	1793mm

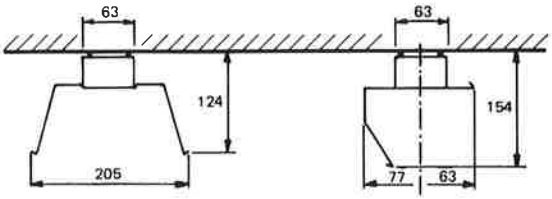


Batwing Louvre Single/Twin









Tube Length	600mm 2′	1200mm 4′	1500mm 5′	1800mm 6′	2400mm 8′
Overall Length	614mm	1224mm	1525mm	1788mm	2397mm

For fluorescent tubes see pages 198 to 201.

REFLECTORS

Speedpack reflectors are designed for use in industrial and commercial interiors and may be used with both single and twin battens. The dispersive reflector is slotted to provide a proportion of upward lighting. The angle reflectors are designed to provide deep cut off directional lighting on to vertical surfaces such as display boards and control panels. The angle reflectors are not slotted.

SPECIFICATION

Made from sheet steel and finished with high gloss white stove enamel. Attached to the batten by screws.

RANGES

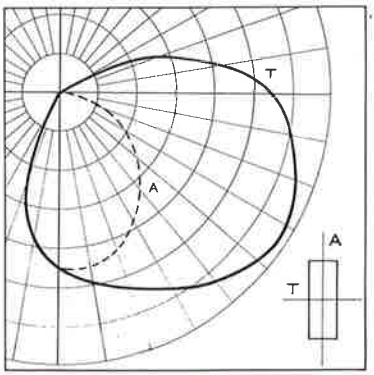
Dispersive Reflector Cat. No.	For use with Batten Cat. No.	Reflector Fitting Cat. No.	Weight kg
SPR4	SP4 SP24	SP4R SP24R	4.5 5.5
SPR5	SP5 SP25	SP5R SP25R	6.0 7.5
SPR6	SP6 SP26	SP6R SP26R	6.9 8.9
SPR8	SP8 SP28 SP8100 SP28100	SP8R SP28R SP8R100 SP28R100	9.2 11.4 9.2 11.4

Angle Reflector Cat. No.	For use with Batten Cat. No.	Reflector Fitting Cat. No.	Weight kg
SPZ4	SP4 SP24	SP4Z SP24Z	4.2 5.2
SPZ5	SP5 SP25	SP5Z SP25Z	5.6 7.1
SPZ6	SP6 SP26	SP6Z SP26Z	6.4 8.4
SPZ8	SP8 SP28 SP8100 SP28100	SP8Z SP28Z SP8Z100 SP28Z100	8.6 10.8 8.6 10.8

Typical Photometric Data

Dispersive		Single Tube	Twin Tube
Light Output Ratios (Pendant)	Up	3%	4%
	Down	84%	72%
BZ Classification		5	4
Recommended max spacing to mounting height ratios		1.9	1.75

ANGLE



Wire Guards are available for the following reflectors.

Reflector Cat. No.	Wire Guard Cat. No.	Reflector Cat. No.	Wire Guard Cat. No.
SPR5 SPR6	SPG5 SPG6	SPZ5 SPZ6	SPH5 SPH6

SPDEND (PAIR)  End cap for SPD diffusers	**SPCEND (PAIR)**  End cap for SPC, SPL and SPOP controllers	**SPPLG**  Connector plug	**SPFUSE**  Fuse carrier	**SPCBKT**  End conduit bracket
SPPEND (PAIR)  End cap for SPP controller	**SPWEND (PAIR)**  End cap for SPCW and SPBW controllers	**SPSKT**  Connector socket	**SPSWITCH**  Pull switch kit	**SPTIE**  Through wiring cable tie
SP1HDR  Single lampholder	**SP2HDR**  Narrow twin lampholder	**SPWHDR**  Wide twin lampholder	**SPSHDR (PAIR)**  Shelflight lampholder	**SPPAD**  Mounting pads
SPSCRW  Reflector retaining screw and captive nut	**SPSHLD**  Choke heat shield	**SPSTHD**  Starter holder	**SPCLIP**  Capacitor retaining clip	**SPHDRS**  Lampholder retaining spring

Ballasts

18W	F9118M
36W	F9136M
58W	F9158M
70W	F9170M
100W	F9100M
125W	F9125M

Capacitors

F8934WE	4 µF
F8906PC	6 µF
F8909WE	8.4 µF
F8932WE	12 µF
F8916PC	16 µF
F8910WE	10.5 µF
F8926WE	7.2 µF

OPUS ACORN

The Opus Acorn range is a twin lamp fitting featuring an attractive woodgrain (lignum) frame surround. This makes the Opus Acorn ideal for general commercial lighting and perfect for the manager's office.

The range offers a choice of 11W Opus or 18W Opus L lamps, and either a prismatic controller or an opal egg crate louvre. Opus Acorn luminaires are packed complete with lamps.

SPECIFICATION (L)

Body: Made from sheet steel finished in stove enamelled white housing the control gear.

Frame: A slot-on attachment made from a woodgrain (lignum) material and retaining a prismatic panel or open egg crate louvre. Control gear suitable for 240V 50Hz supply.

Designed to comply with BS4533

Ingress Protection I.P. 20.

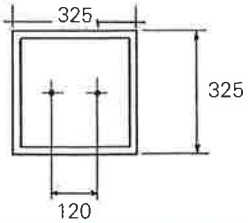
Weight: 3kg.

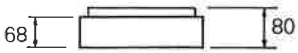
RANGE

Body	Frame c/w Prismatic Panel	Complete Fitting	Frame c/w Opal Louvre	Complete Fitting
OPA211 OPA218	OPAP OPAP	OPA211P OPA218P	OPAFL OPAFL	OPA211FL OPA218FL

Abridged Photometric Data

		Louvre	Prismatic Panel
Recommended max. spacing to mounting height ratio		1.2	1.3
Light output ratios	Up	0%	0%
	Down	51%	49%
BZ Classification		BZ3/2.5/4	BZ2/1.5/3





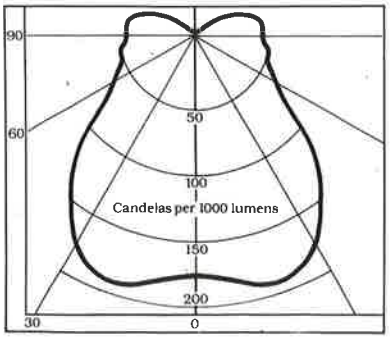
VANTAGE RANGE

Typical Photometric Data	Prismatic	Vantage Plus
Spacing height ratio (max)	1.7	2.05
Light output ratio upwards (ULORL)	10%	7%
Light output ratio downwards (DLORL)	50%	59%
BZ rating (RI – 2.5/SHR NOM)	BZ4	not applicable 'Batwing'

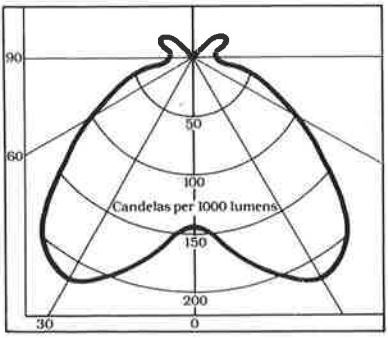
General Data

	Prismatic and Vantage Plus Versions		
	1200mm 4′	1500mm 5′	1800mm 6′
Circuit Watts	93	142	168
Power Factor	0.92	0.90	0.95

POLAR CURVE – VANTAGE PRISMATIC



POLAR CURVE – VANTAGE PLUS



VANTAGE RANGE

The Vantage range is designed for use in commercial, civic and hospital interiors. Its shallow depth renders it ideal for rooms with low ceilings where an enclosed low brightness luminaire is essential. It is gasketed to restrict ingress of dust and insects.

Two versions are available, the Prismatic version is suitable for replacing existing luminaires on a one to one basis. The Vantage Plus version, which has a wide light dispersion, is suitable for new or refurbished installations where advantage can be taken of its wider spacing to mounting height ratio.

★ Gasketed ★ Shallow depth ★ Low brightness ★ For new buildings or refurbishing ★ Specially suitable for low ceilings ★ Packed complete with tubes.

SPECIFICATION (L)

Reflector: Mild steel finished high gloss white stove enamel. The reflector carries a wide spaced twin switch start Speedpack batten.

Controller: One piece polystyrene or acrylic extrusion with prismatic profile. The controllers are held to the reflector by end plates against a wide gasket.

Complies with BS4533 and IEC598.

Ingress Protection I.P. 20.

RANGE

Complete* Luminaire	Components		
	Lamps	Controller	Reflector c/w Speedpack Batten
Vantage Prismatic – Polystyrene			
SP4WXC	2 x 1200mm 36W	SPC4W	SP4WX
SP5WXC	2 x 1500mm 58W	SPC5W	SP5WX
SP6WXC	2 x 1800mm 70W	SPC6W	SP6WX
Vantage Plus – Polystyrene			
SP4WXB	2 x 1200mm 36W	SPB4W	SP4WX
SP5WXB	2 x 1500mm 58W	SPB5W	SP5WX
SP6WXB	2 x 1800mm 70W	SPB6W	SP6WX
Vantage Prismatic – Acrylic			
SP4WXCA	2 x 1200mm 36W	SPCA4W	SP4WX
SP5WXCA	2 x 1500mm 58W	SPCA5W	SP5WX
SP6WXCA	2 x 1800mm 70W	SPCA6W	SP6WX
Vantage Plus – Acrylic			
SP4WXBA	2 x 1200mm 36W	SPBA4W	SP4WX
SP5WXBA	2 x 1500mm 58W	SPBA5W	SP5WX
SP6WXBA	2 x 1800mm 70W	SPBA6W	SP6WX

Dimensions Overall width 215mm overall depth 75mm

Tube Length	1200mm 4'	1500mm 5'	1800mm 6'
Overall Length	1229mm	1530mm	1793mm

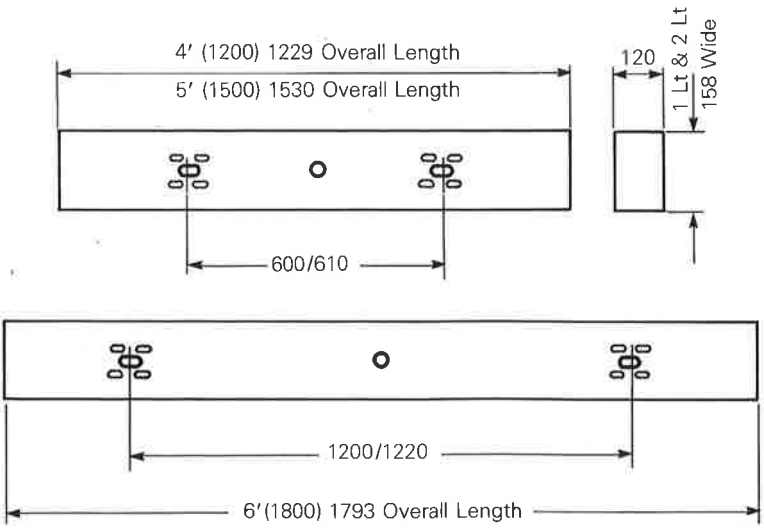
*Vantage is also available without tubes by adding an 'N' to the catalogue number after SP e.g. SPN4WXC.

VANTAGE 'S'

Typical Photometric Data

		Single Prismatic	Twin Prismatic
Recommended max spacing to mounting height ratio		1.87	1.77
Light output ratios	Up	19%	15%
	Down	54%	47%
BZ Classification		BZ4/1.5/5	BZ4/2.0/5

		Single Opal	Twin Opal
Recommended max spacing to mounting height ratio		1.75	1.75
Light output ratios	Up	15%	12%
	Down	50%	45%
BZ Classification		6	6



VANTAGE 'S'

The Vantage 'S' range is a development of the highly successful Vantage range. Available as a single or twin luminaire, Vantage 'S' incorporates the benefits of Vantage but in a narrow 158mm wide body. It is designed for use in commercial, civic and hospital interiors, in fact anywhere low glare characteristics are needed. The Vantage 'S' body is gasketed to help prevent the ingress of dust and insects and is packed complete with tubes.

Two versions are available, the prismatic version and the opal version – both suitable for new or refurbishment installations.

SPECIFICATION

Body: Mild steel finished in stove enamelled white. The gear tray carries switch start HPF gear and rotary lampholders, and connects to the body via a plug and socket.

Controller: One piece polystyrene or acrylic extrusion with a prismatic profile.

Diffuser: One piece light opal polystyrene or acrylic extrusion with a prismatic profile.

The controllers and diffusers are held to the body by spring loaded polycarbonate end plates.

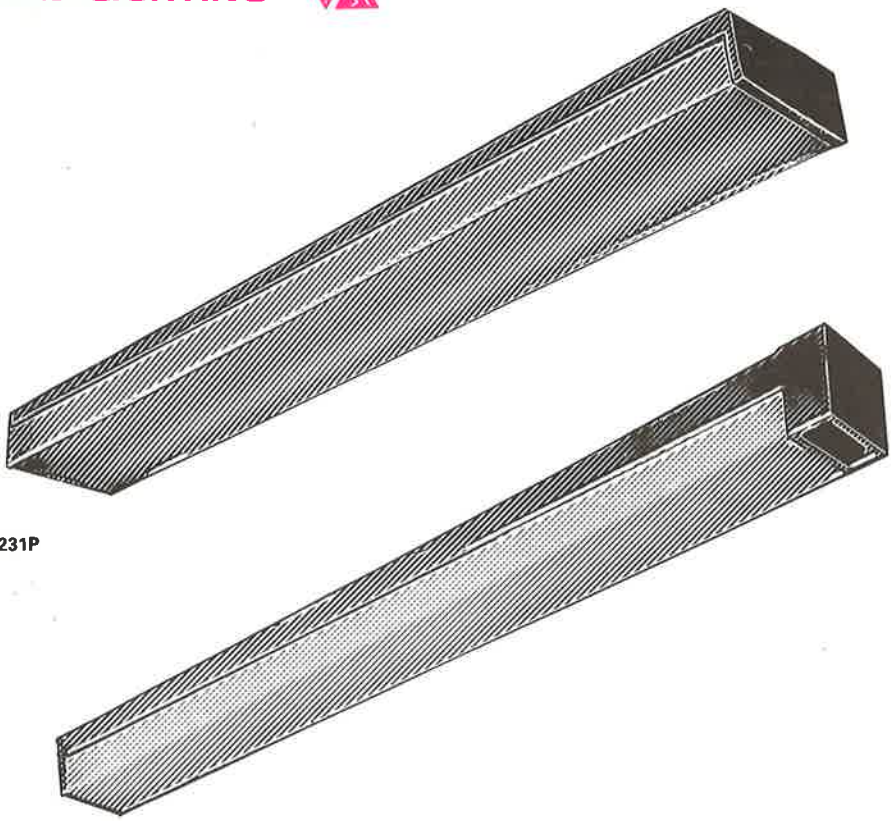
Ingress Protection I.P. 20.

Designed to comply with BS4533 and DHSS types A and B.

RANGE

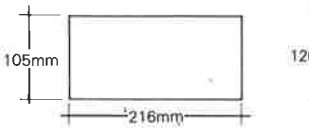
		Prismatic Polystyrene		Prismatic Acrylic	
Lampways	Body	Controller	Complete Luminaire	Controller	Complete Luminaire
1 x 36W	VS4	SPC4	VS4C	SPCA4	VS4CA
1 x 58W	VS5	SPC5	VS5C	SPCA5	VS5CA
2 x 58W	VS25	SPC5	VS25C	SPCA5	VS25CA
1 x 70W	VS6	SPC6	VS6C	SPCA6	VS6CA
2 x 70W	VS26	SPC6	VS26C	SPCA6	VS26CA
		Opal Polystyrene		Opal Acrylic	
1 x 36W	VS4	SPOP4	VS4OP	SPOPA4	VS4OPA
1 x 58W	VS5	SPOP5	VS5OP	SPOPA5	VS5OPA
2 x 58W	VS25	SPOP5	VS25OP	SPOPA5	VS25OPA
1 x 70W	VS6	SPOP6	VS6OP	SPOPA6	VS6OPA
2 x 70W	VS26	SPOP6	VS26OP	SPOPA6	VS26OPA

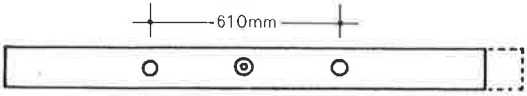
Vantage 'S' is available without lamps to order by adding an 'N' after the VS, e.g. VSN25OP.



F42231P

F42235NN with F42235BOX





Two 20mm clear holes at 610mm centres
One central 20mm clear hole with grommet

COMMERCIAL AND WARD LIGHTING

Although this range is designed to meet the stringent requirements of the D.H.S.S. for hospital lighting, it is also suitable for commercial applications such as office lighting.
★ Gasketed ★ Switchless start gear ★ Glare free lighting ★ Emergency and night lighting facility.

SPECIFICATION

F42231P Twin Tube Luminaires with Emergency Lights

Spine: Made of sheet steel stove enamelled white, with white stove enamelled steel end plates. The end plates are spring loaded to support the prismatic controller. Fitted with connecting block with 6mm capacity and a four way terminal block wired to BC lampholders which provide night and emergency light facilities. These are intended for use with 15 watt Pygmy lamps.

Gear Tray: Fitted with 240V 50Hz switchless start high power factor control gear, wired to a fused terminal block. Safety cords are fitted from the gear tray to the spine. Held to the spine by nylon fasteners.

Prismatic Controllers: Designed in the GEC's BSI registered lighting laboratory with a prismatic profile, extruded polystyrene. Available as clear prismatic (suffix P) or opal tinted (suffix EX).

F42235NN Single Tube Luminaires

Similar in all respects to the twin versions except that no night or emergency light facility is available. If this be required an add-on box F42235BOX can be supplied (as illustrated).

F42235BOX: Emergency and Night Light Box for attachment to **F42235NN** and **F42235EX.** Overall length increased to 1597mm. Weight increased to 8.0kg. Lamps 15W BC Pygmy. White stove enamelled steel with 4 way terminal block wired to two BC lampholders for separate connections to night light and emergency circuits. Protected on the underside by a polycarbonate panel.

RANGE

Catalogue No.	Lamps				Overall Length mm	Weight kg	Spine Cat. No.	Controller Cat. No.
	No.	m	ft	Watts				
With CLEAR prismatic controller								
F42231P	2	1.5	5	65	1547	11.6	F42231	FPP25*
F42235NN	1	1.5	5	65	1547	7.5	F42235NND	FPP15
With OPAL tinted controller								
F42231EX	2	1.5	5	65	1547	11.6	F42231	EO25
F42235EX	1	1.5	5	65	1547	7.5	F42335NND	EO15

Complies with BS4533

Ingress Protection I.P. 20.

Typical Photometric Data

		Clear Prismatic		Opal Tinted	
		Twin	Single	Twin	Single
		2 x 5′ 65W	1 x 5′ 65W	2 x 5′ 65W	1 x 5′ 65W
Light Output Ratios	Up	13%	21%	11%	20%
	Down	45%	47%	45%	48%
BZ Classification		5	5	5	6
Recommended max spacing to mounting height		1.45	1.5	1.5	1.5

*Discard end caps.

SILHOUETTE

Twin Prismatic

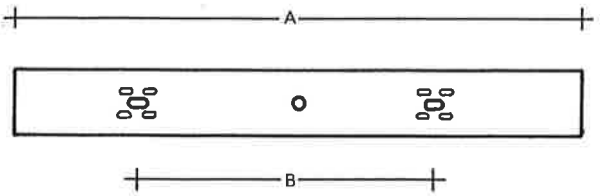
Single Opal

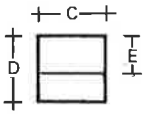
Abridged Photometric Data

		Single		Twin	
		Opal	Prismatic	Opal	Prismatic
Light output Ratios	Up	8%	5%	7%	4%
(ceiling mounted)	Down	31%	46%	37%	54%
BZ Classification		5/4.0/6	5	5	5
Recommended max spacing to mounting height ratio		1.77	1.39	1.71	1.63

DIMENSIONS

	Weight kg	Length (A) mm	Fixing (B) Centres mm	Width (C) mm	Depth (D) mm	Body Depth (E) mm
SLT14P/OP	4.9	1250	600	100	100	60
SLT15P/OP	6.1	1550	1200	100	100	60
SLT16P	6.4	1820	1200	100	100	60
SLT22P/OP	3.5	650	400	165	95	55
SLT24P/OP	6.3	1250	600	165	95	55
SL125P/OP	8.3	1550	1200	165	95	55
SLT26P	9.7	1820	1200	165	95	55





SILHOUETTE

The Silhouette range is designed for all general office and interior lighting. Having a brown, rather than a traditional white or black body, Silhouette blends peacefully into the design colours of today.

Unlike white bodied luminaires the small space between the body and ceiling appears to disappear into a definite line, giving the luminaires a clean cut appearance even when switched off. Complies with the requirement of DHSS type A.

SPECIFICATION

Body: Pressed zinc-coated steel body with welded end plates finished in stove enamelled white inside and chocolate brown outside. All with BESA fixing centres.

Control Gear: Switch start high power factor. Suitable for 240V 50Hz.

Diffusers: Acrylic opal.

Controllers; Acrylic clear prismatic.

Silhouette diffusers and controllers are vacuum formed. They are held to the body section by snap-in locks.

RANGE

Tube	Body	Prismatic		Opal	
		Prismatic Cover	Complete Fitting	Opal Cover	Complete Fitting
1 x 4' 36W	SLT14	SLTP14	SLT14P	SLTOP14	SLT140P
1 x 5' 58W	SLT15	SLTP15	SLT15P	SLTOP15	SLT150P
1 x 6' 70W	SLT16	SLTP16	SLT16P	–	–
2 x 2' 18W	SLT22	SLTP22	SLT22P	SLTOP22	SLT220P
2 x 4' 36W	SLT24	SLTP24	SLT24P	SLTOP24	SLT240P
2 x 5' 58W	SLT25	SLTP25	SLT25P	SLTOP25	SLT250P
2 x 6' 70W	SLT26	SLTP26	SLT26P	–	–

SPECIFICATION

Channel: Made from sheet steel finished in white high gloss stove enamel.

Cover Plate: Secured by two (three on 8′ battens) specially designed snap alloy catches eliminating fixing screws.

Lampholders: Secured to channel by springs. 20mm knock-outs provided for conduit entry and through wiring. Clearance is made in this knock-out for re-lamping when battens are continuously mounted using FPCON bracket.

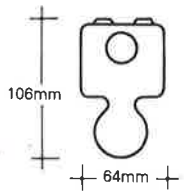
Control Gear: High quality power factor corrected (except FPNS12 2′ single) for use on 240V 50Hz supply. Gear for use on other voltages and frequencies can be fitted. Supplied without tubes.

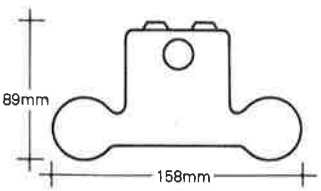
Complies with BS4533.

Ingress Protection I.P. 20.

RANGE

Catalogue No.	Lamps				Circuit	Overall Length mm	Weight kg	Fuse
	No.	m	ft	Watts				
FPNS12	1	0.6	2	18/20	Switch	610	1.8	
FPNS14	1	1.2	4	36/40	Switch	1220	2.8	All
FPNS15	1	1.5	5	58/65	Switch	1521	3.9	3 amp
FPNS1675	1	1.8	6	70/75	Switch	1786	4.4	
FPNS18	1	2.4	8	100/125	Switch	2395	5.5	(Not
FPNS25	2	1.5	5	58/65	Switch	1521	5.2	Fitted)
FPNS2675	2	1.8	6	70/75	Switch	1786	6.7	
FPNS28	2	2.4	8	100/125	Switch	2395	9.5	
FPNQ14	1	1.2	4	40	Switchless	1220	3.2	
FPNQ15	1	1.5	5	65	Switchless	1521	3.9	
FPNQ16	1	1.8	6	85	Switchless	1786	4.5	All
FPNQ18	1	2.4	8	125	Switchless	2395	5.5	3 amp
FPNQ25	2	1.5	5	65	Switchless	1521	5.2	
FPNQ2675	2	1.8	6	75	Switchless	1786	6.9	(Fitted)
FPNQ28	2	2.4	8	125	Switchless	2395	9.5	





KRYPTON TUBES

All GEC switch start fittings can utilise the new high efficiency 26mm tubes i.e. 2′ 18W, 4′ 36W, 5′ 58W, 6′ 70W and the 38mm 8′ 100W.

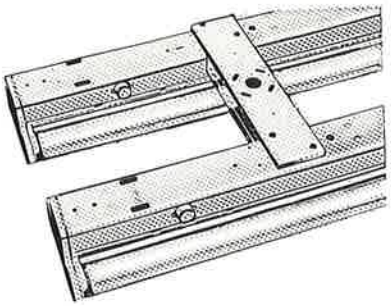
EUROPA battens have provision for ceiling fixing or suspension at imperial or metric fixing centres.

Note: The 20mm conduit and BS box holes at the fixing centres on the table below are elongated to satisfy both metric and imperial fixing centre dimensions. All battens have central BS Box fixing slots and a central 20mm clear conduit entry.

	m	0.6	1.2	1.5	1.8	2.4
Nominal Size	ft	2	4	5	6	8
Centre to Centre continuously mounted	mm	623	1233	1533	1799	2408

Four Tube Adaptor Kit FP4TA

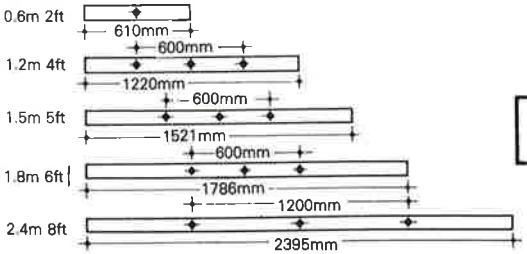
A low price four tube fitting can be provided by using the FP4TA adaptor kit. This enables two twin tube Europa battens to be coupled together with the two bridging pieces provided.

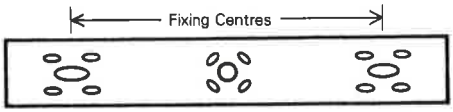


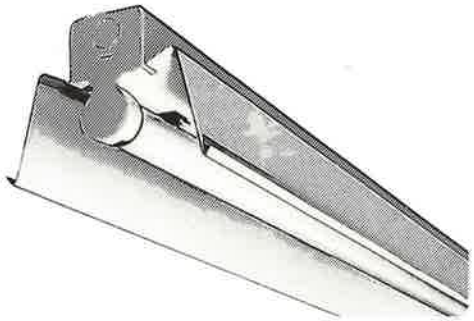
FP4TA consists of two support bridge pieces made in 1.2mm (18 swg) steel and finished in white stove enamel. Assembly is simple as each bridging piece is already pierced for standard BS conduit box fixings and 20mm conduit entry, for conduit box, conduit or trunking suspension. This system offers a selection of four tube arrangements in the 4 ft, 5 ft, 6 ft and 8 ft sizes, in either the switch or quick start versions. Additionally both trough reflectors or diffuser attachments may be fitted.

Typical Photometric Data

		Single Tube	Twin Tube
Light Output Ratios	Up	29%	35%
	Down	66%	56%
BZ Classification		7	6
Recommended max spacing to mounting height ratio		1.76	1.65







SPECIFICATION

Manufactured from sheet steel and finished in white high gloss stove enamel. Slots provide some upward light and a through draught to retard dust collection. Fitted in place of cover plate by snap fasteners which automatically earth the reflectors. Continuous mounting of reflector fittings may be made.

RANGE

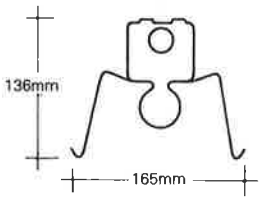
Catalogue No.	Length mm	Weight kg	Catalogue No.	Length mm	Weight kg
FPR14	1220	2.1			
FPR15	1521	2.6	FPR25	1521	3.8
FPR16	1786	3.2	FPR26	1786	4.6
FPR18	2395	4.2	FPR28	2395	6.1

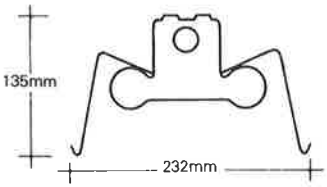
N.B. Reflector fittings can be ordered as complete fittings by adding an 'R' to the batten catalogue number.

e.g. FPNS25R Twin switch start 5' reflector fixing.
FPNQ16R Single switchless start 6' reflector fitting.

Typical Photometric Data

		Single Tube	Twin Tube
Light Output Ratios	Up	4%	7%
	Down	75%	63%
BZ Classification		BZ 5/2.5/4	BZ 5/1.25/4
Recommended max spacing to mounting height ratio		1.68	1.15





SPECIFICATION

Material: Polystyrene extrusion with internal prismatic profile designed by GEC's BSI registered lighting laboratory.

End Plates: All prismatic controllers are supplied with a pair of clip-on end plates and two (three 8' fittings) support brackets.

RANGE

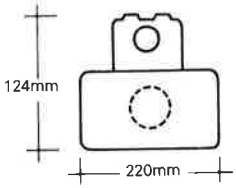
Catalogue Numbers				Overall Length mm
CLEAR PRISMATIC		OPAL PRISMATIC		
Single	Twin	Single	Twin	
FPP12	—	—	—	639
FPP14	—	FPEX14	—	1249
FPP15	FPP25	FPEX15	FPEX25	1550
FPP16	FPP26	FPEX16	FPEX26	1815
FPP18	FPP28	—	—	2424

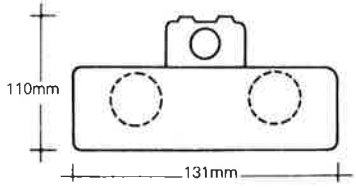
N.B. Complete prismatic controller fittings can be ordered by adding the suffixes P or EX to the batten catalogue number.

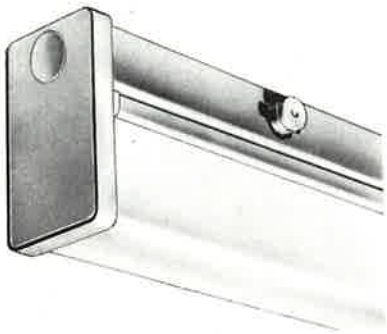
e.g. FPNS25P Twin switch start 5' clear prismatic controller.
e.g. FPNQ16EX Single switchless start 6' prismatic controller.

Typical Photometric Data

		CLEAR		OPAL	
		Single	Twin	Single	Twin
Light Output Ratios	Up	37%	40%	31%	41%
	Down	46%	39%	48%	42%
BZ Classification		BZ 4/1.0/5	BZ 4/1.0/5	BZ 5/1.25/6	BZ 5/1.25/6
Recommended max spacing to mounting height ratios		1.5	1.5	1.5	1.5







SPECIFICATION

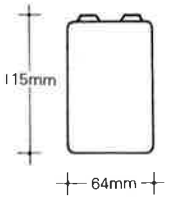
FPDS: The EUROPA opal diffuser attachment is made in reeded opal extruded polystyrene and is designed for single tube battens only. Each diffuser is supplied complete with two white moulded plastic end caps which fit over the end of the batten and diffuser and are attached to the batten by springs. This enables the diffuser to be fitted or removed with ease during installation and maintenance. The diffuser being the same width as the batten gives the fitting a neat slim appearance.

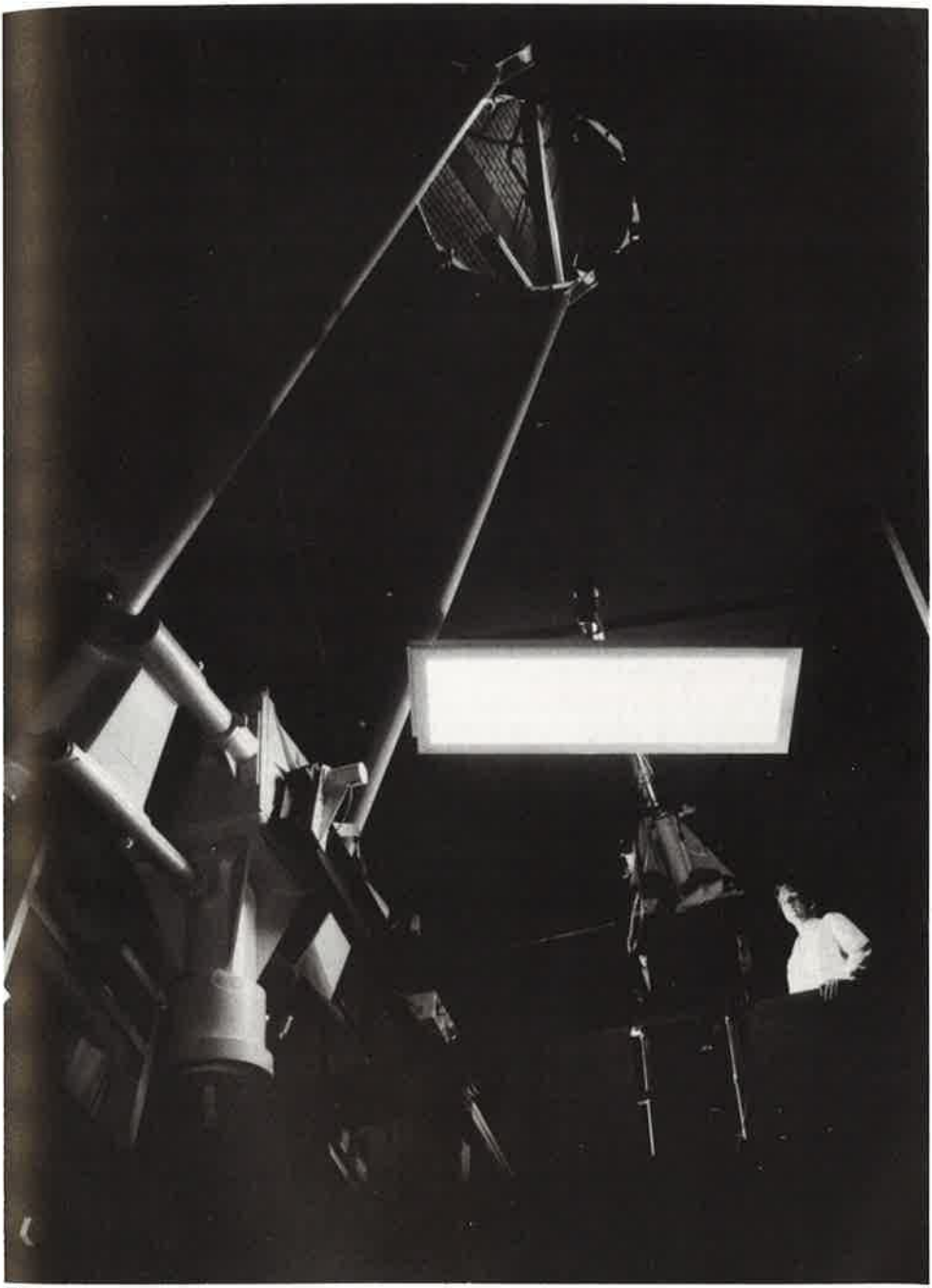
Diffusers

Diffuser Cat. No.	For use with Batten Cat. No.	
FPDS12 FPDS14 FPDS15 FPDS16	FPNS12 FPNS14 or FPNQ14 FPNS15 or FPNQ15 FPNS16 or FPNQ16	N.B. Diffuser fittings may be ordered as complete fittings by adding the suffix DS to the batten catalogue number, e.g. FPNS12DS.

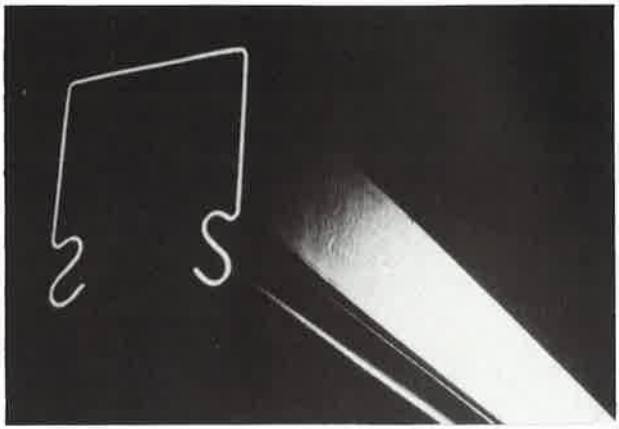
Diffuser Fittings Typical Photometric Data

Light Output Ratio	Up	24%
	Down	45%
BZ Classification		7
Recommended max spacing to mounting height ratio		1.87





The programmable mirror distribution photometer at Wembley capable of measuring luminaires up to 2M in diameter.



Topline Trunking is a versatile and easy to use trunking system for power distribution as well as for lighting purposes.

★ Galvanised steel ★ Fast erection ★ Low installation cost ★ Great rigidity ★ Suspension up to 6 metres ★ Wide range of accessories ★ Zinc plated or die-cast aluminium ★ Complete earth continuity ★ Greater wiring capacity.

SPECIFICATION

FT1 – Rolled 18 swg galvanised steel 54 x 64mm (2⅛" x 2½"). The 'S' shaped contours give Topline greater strength and rigidity and avoids exposed edges.

Supplied in 4.6m (15') lengths, Topline can be surface mounted, recessed into ceiling tiles or suspended from conduit. Accessories are available for each type of mounting.

Can be spanned with suspension centres up to 6 metres (20'). When joined with the FT3 Fish plate the joint is as strong as the trunking itself.

Weight loading

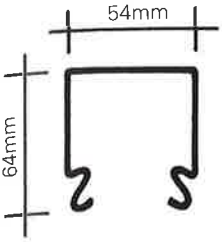
Topline can be used with very high weight loading without exceeding the limits of deflection specified in BS449, 1964. A single span will obviously deflect more than a series of spans. The maximum loading allowed for various distances between supports is as follows:

	Single Span				Continuous Run			
Span Width (m)	3	4	5	6	3	4	5	6
Distributed load (kg/m run)	21.5	8	3.1	0.9	115	49	24.5	13.5
Central point load (kg)	40	20	9.7	3.4	173	97	61	40
Deflection at centre of span (mm max)	8	11	14	17	8	11	14	17

CABLE CAPACITY

Trunking Cable Area = 2484mm²

Derating Factor (Allowing for space and current ratings) = 0.226
Trunking Unit Factor (Calculated 2484 x 0.226) = 560



Cable Factors

(From 15th edition I.E.E. regulations – Table 12E).

Cable size mm²		Factor
1.5	Solid	7.1
1.5	Stranded	8.1
2.5	Solid	10.2
2.5	Stranded	11.4
4.0	Stranded	15.2
6.0	Stranded	22.9
10.0	Stranded	36.3

To check trunking capacity multiply the quantities of each size of cable by its factor. The total may not exceed the Trunking Unit Factor – 560.

RANGE

Catalogue No.	Description	Weight kg
FT1	4.6m (15') lengths of galvanised trunking section	10.20
FT2	1.8m (6') lengths of galvanised cover plate	0.34
FT3	Fish plates galvanised	0.71
FT4	Hanger zinc plated	0.09
FT5A	Fitting attachment assembly for 20mm entry	0.06
FT5B	Fitting quick release attachment assembly for 20mm entry	0.10
FT5C	Fitting attachment assembly for 25mm entry	0.06
FT6	End wall support galvanised	0.25
FT8	End cap galvanised	0.03
FT9	Cable retainer	
FT10	90° bend, horizontal	0.14
FT11	90° bend, vertical	0.23
FT12	Tee junction	0.25
FT13	Four-way junction	0.29
FT14	1.8m (6') PVC Cover plate	0.45
FT15	Tile hanger	0.03
FT16	Girder clamp	0.14

FT2 Clip-in Steel Lid
Galvanised steel lid snaps into Topline trunking 1.8m (6') lengths.

FT3 Fishplate
Designed to join two lengths of trunking together. In 16 swg galvanised steel, has captive locking screws. No drilling required.

FT4 Trunking Hanger
16 swg zinc plated steel, with 20mm clearance hole.

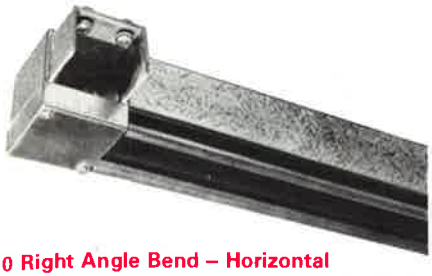
FT5A & FT5C Suspension Attachments
FT5A Made from zinc plated steel with a 20mm bush and two locknuts. The bush cannot turn when lock nuts are being tightened. FT5C as FT5A but with 25mm bush and two lock nuts.

FT5B Quick Release Suspension Attachment
Made from zinc plated steel with 20mm bush and two lock nuts. Locates against the outside of the 'S' curves. Can also serve as a hinge to allow easy access.

FT6 End Wall Support
Fabricated 1.6mm (16 swg) galvanised steel, length 100mm (4") allows for expansion and contraction.

FT8 End Cover
In 0.7mm (22 swg) galvanised steel with 25mm (1") knockout. Tightening screw locks cover in place and ensures earth continuity.

FT9 Cable Retainer Strips
Tough insulating sheet which springs into position in the trunking.



FT10 Right Angle Bend – Horizontal
To join horizontal lengths of FT1 in the same plane. Die-cast aluminium, complete with cover and captive locking screws.

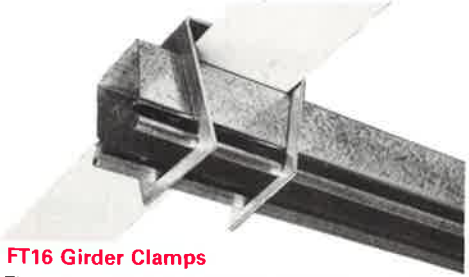
FT11 Right Angle Bend – Vertical
To join a vertical length of FT1. Die-cast aluminium, complete with cover and captive locking screws.

FT12 T-junction
To join three lengths of FT1 at right angles in one plane. Die-cast aluminium, complete with cover and captive locking screws.

FT13 Four Way Junction
To join four lengths of FT1 at right angles in one plane. Die-cast aluminium, complete with cover and captive locking screws.

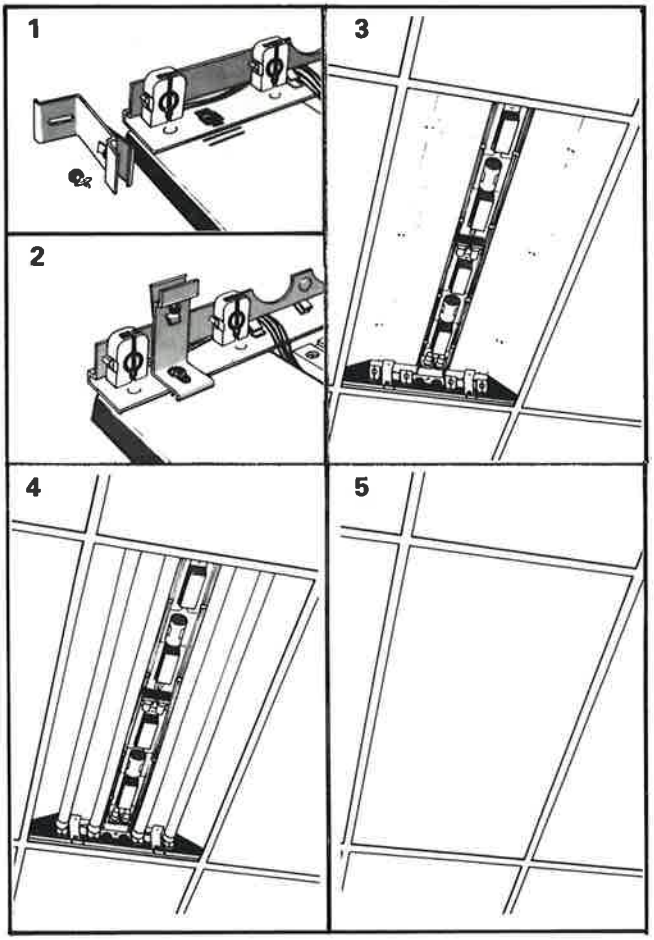
FT14 Flanged PVC Cover Strip
Provides an attractive and decorative trim when Topline is recessed. In white PVC, supplied in 1.8mm (6') lengths.

FT15 Tile Hanger
To support ceiling tiles when Topline is recessed into suspended ceilings, used with FT14 PVC cover strip.



FT16 Girder Clamps
Zinc plated clamps for fixing Topline to girders with L or H section.

T-PACK



SIMPLE TO INSTALL

1. T-Pack's support brackets are easily located in the slots provided for mounting either metric or imperial ceiling apertures.

2. Having selected the required slot the bracket is screwed tight.

   This is repeated for all four brackets ensuring both precise and stable fixing.

3. The main body is then tilted into the ceiling aperture so that the support brackets rest on the main T section. Having centralised the body the clamp screws are tightened securing the fitting to the T. Electrical connection can now be undertaken.

4. The fluorescent tubes are now inserted into the lampholders.

5. Finally the prismatic panel is simply flexed into the aperture so that it rests neatly on the flanges of the grid.

T-PACK

T-Pack has been designed for exposed T-ceiling systems. It can be supported by the T-grid without extra suspensions providing the ceiling has adequate strength to support the extra weight. Its very shallow ceiling void requirement – 125mm – makes it especially suitable for re-furbishment schemes. T-Pack can be fitted into both metric and imperial systems.

★ Shallow depth ★ Supplied with tubes ★ Metric and imperial grids ★ Opal diffusers or louvres available to order ★ Easy and fast to install.

SPECIFICATION

Reflector Body: Made from white enamelled steel.

Control Gear: High power factor switch start for two or four 4′ 36W tubes on 240V 50Hz* supply.

Prismatic Controllers: K12 clear prismatic styrene panels supplied in metric (TP612) and imperial (TP24) versions. These panels are supplied separately from the body. Other types of prismatic sheets, opal diffusers or louvres can be supplied to special order.

Fastenings: Four fixing brackets secure the body firmly to the T grid so that the luminaire cannot become dislodged during cleaning. Alternative positions are provided for metric and imperial systems.

An optional cover plate is available to special order. This protects the gear and wiring from inadvertent contact during re-lamping, and improves the light output ratio.

T-Pack is designed to comply with BS4533.

Ingress Protection I.P. 20.

Dimensions and Weights

TP2436GTR: 8.43kg
TP4436GTR: 11.01kg
Overall length: 1248mm
Overall width: 605mm
Overall depth from top of ceiling grid support: 99mm
TP612: 1194 x 594mm
TP24: 47¾″ x 23¾″

Photometric Data

		2 x 4′ 36W Tubes	4 x 4′ 36W Tubes
Light Output Ratios	Up	0%	0%
	Down	59%	58%
BZ Classification		3	3
Recommended max spacing to mounting height		1.55	1.5

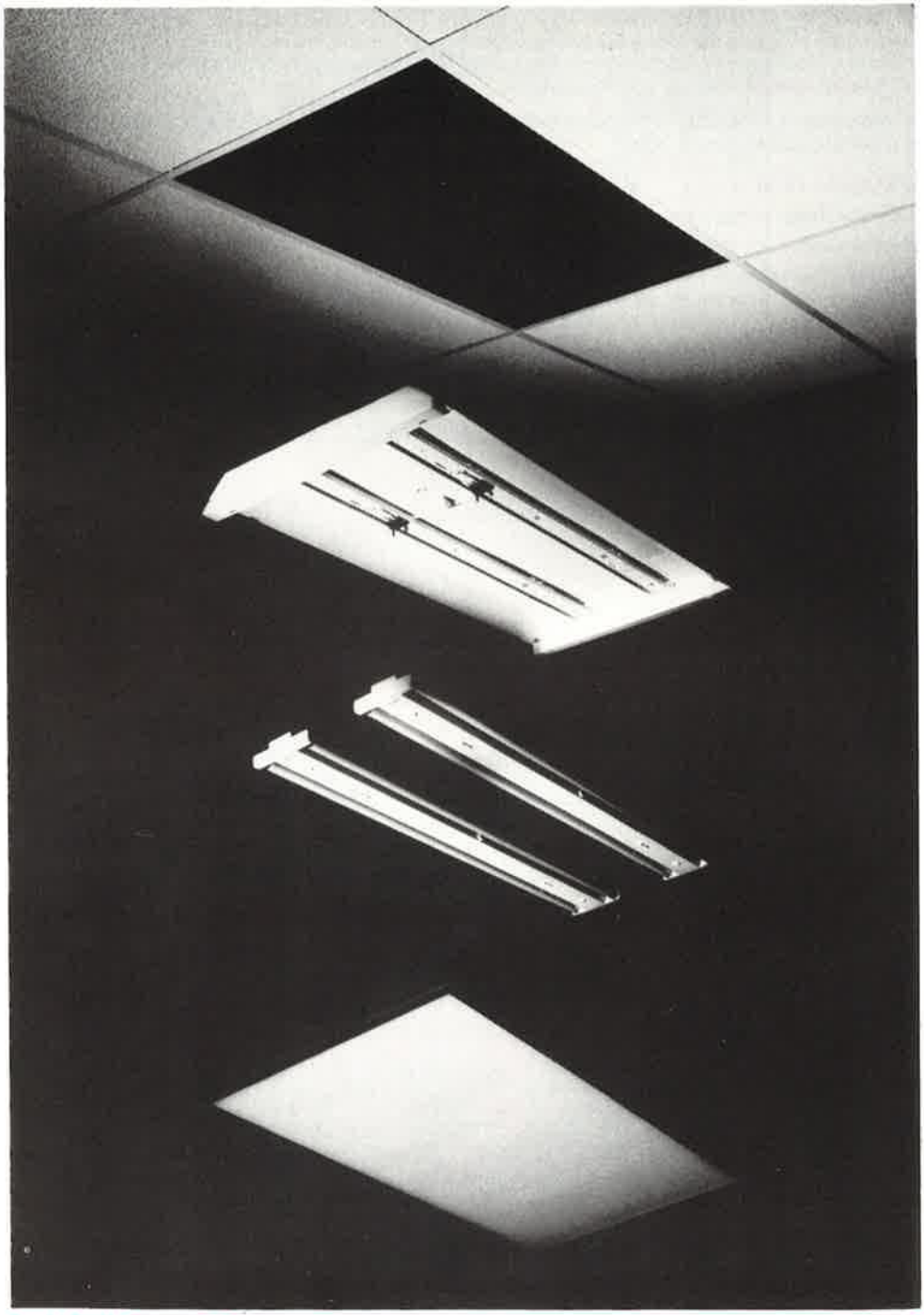
RANGE

T-Pack Recessed Luminaires with Prismatic Controllers

Exposed T Ceiling Grid Aperture	Lamps			Complete Luminaires	Components	
Imperial	No.	ft	Watts	Catalogue No.	Body	Prismatic Panel
4′ x 2′	2	4	36	TPF2436	TP2436GTR	TP24
	4	4	36	TPF4436	TP4436GTR	TP24
Metric		m				
1200 x 600mm	2	1.2	36	TPM2436	TP2436GTR	TP612
	4	1.2	36	TPM4436	TP4436GTR	TP612

*T-Pack can be supplied with gear suitable for other voltages and frequencies.

T-Pack is supplied complete with 4′ 36W White fluorescent tubes.



A range of modular recessed luminaires and attachments for incorporation into an exposed or concealed suspended ceiling system (imperial or metric).

SPECIFICATION

A steel reflector canopy with end plates finished stove enamelled white, houses one or two Speedpack luminaires complete with backplates prewired to a 3 way plug and socket having the facility to isolate the channels for ease of installation, mains wiring and installation testing in accordance with the 15th Edition of the IEE regulations.

The reflector canopy is adaptable for either metric or imperial suspended ceiling systems by simply adjusting one end plate.

The end plates are fixed directly onto the grid system and secured with clips and screws (provided).

Designed to conform to BS4533.101 1981.

Control Gear: Switch start ballasts suitable for 240V 50Hz.

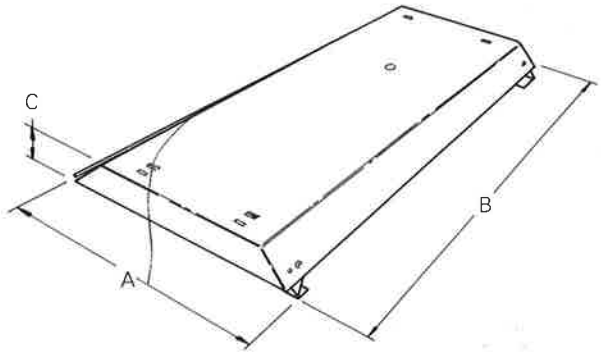
Radio Interference: Complies with statutory instrument 1978 number 1268, regulation number 6, suppressed for use in residential accommodation.

Standard Range with Switch Start Control Gear Suitable for 240V 50Hz

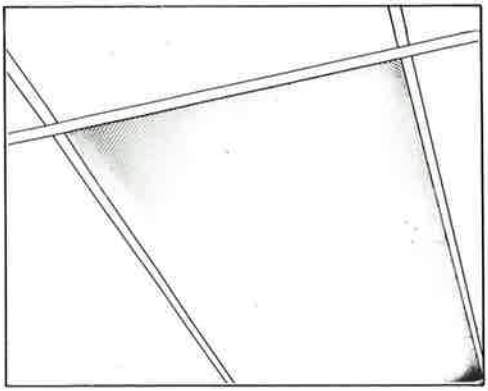
Catalogue No.	Ceiling Aperture	A	B	C	Lamps	Weight kg
MN 24	300 x 1200	330	1292	85	2	7.3
MN 26	300 x 1800	330	1902	85	2	10.8
MW 22	600 x 600	630	682	85	2	6.05
MW 42	600 x 600	630	682	85	4	7.8
MW 24	600 x 1200	630	1292	85	2	11.1
MW 34	600 x 1200	630	1292	85	3	12.1
MW 44	600 x 1200	630	1292	85	4	13.1
MW 36	600 x 1800	630	1902	85	3	19.1
MW 46	600 x 1800	630	1902	85	4	21.1

Clearances:

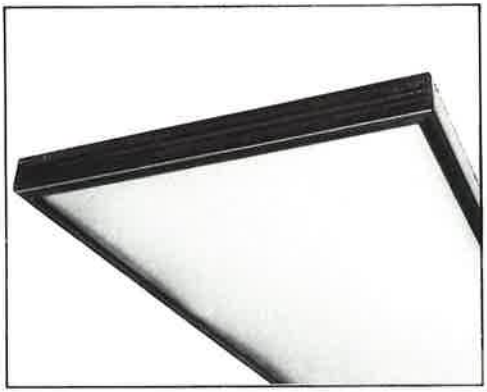
Exposed T — Minimum 200mm from top of T.
Concealed T — Minimum 200mm from the top of the primary grid.



PRISMATIC PANELS

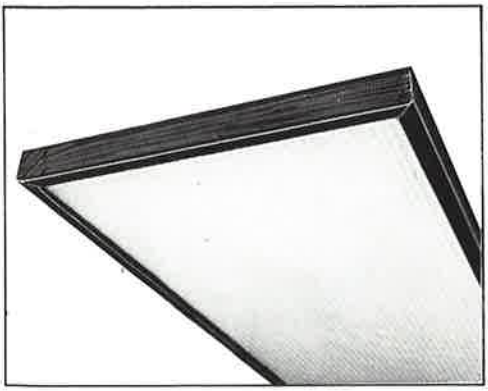


Lay-in Panel

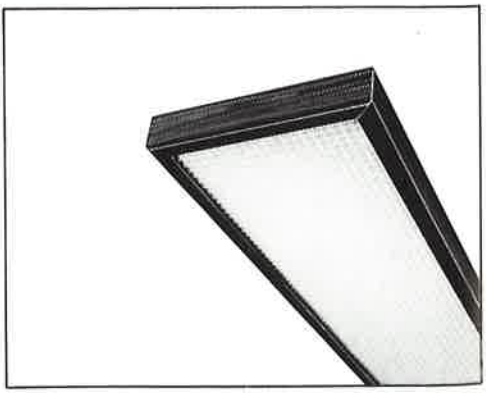


Lignum Framed Panel

LOUVRES



Lignum Framed Opal Louvre



Lignum Framed Specular Parabolic Louvre

Prismatic Lay-in Panels
For areas where flush mounting is required the panels are flexed into the ceiling aperture to rest on the flanges of the Tee sections.

Lignum Frame with Prismatic Panel
A semi-recessed frame constructed from a superb LIGNUM section that will complement any type of ceiling. The frame is supported by spring loaded hooks from the MATRIX reflector canopy and retains a prismatic panel.

Lignum Frame with Opal Louvre
An opal 'egg crate' louvre manufactured from acrylic material. The luminaire is perceived as a white panel with significantly lower luminosity than a prismatic panel when seen from normal viewing angles.

Lignum Frame with Specular Parabolic Louvre
The ultimate in low brightness, these louvres offer very low glare characteristics suitable for VDU use anywhere. Luminaires are designed to blend unobtrusively with the design of the ceiling.

Other plastic or metal louvres can be supplied to special order.

T Frame Kit
Where matrix is used in conjunction with metric concealed grid systems, the T-Frame Kit is required for lay in panels. This kit is supported by the Matrix reflector and forms a clean border to the otherwise exposed tile edges.

Matrix Brackets
Where Matrix is used in a metric concealed grid system, together with a lignum framed attachment, Matrix brackets are required.

Frame Length	Brackets
600mm	MBKT44
1200mm	MBKT44
1800mm	MBKT46

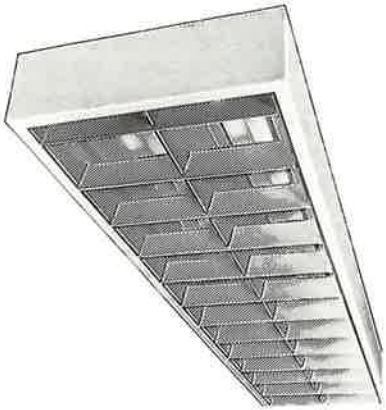
Lay-in Prismatic Panels

Nominal Size	Prismatic Panel	Tee Frame Kit	Prismatic Panel for Tee Frame Kit
300 x 1200	MN4CM	MN4RM	MN4CKT
300 x 1800	MN6CM	MN6RM	MN6CKT
600 x 600	MW2CM	MW2RM	MW2CKT
600 x 1200	TP612	MW4RM	MW4CKT
600 x 1800	MW6CM	MW6RM	MW6CKT

Lignum Framed Louvres and Prismatic Panels
Catalogue No.

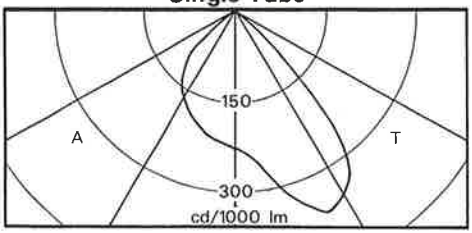
Frame c/w Prismatic Panel	Weight kg	Frame c/w Specular Louvre	Frame c/w Opal Egg Crate Louvre	Weight kg	Width (D)mm	Length (E)mm	Height (F)mm
MN4FCM	2.79	MN4FLM	MN4FLEC	3.13	330	1230	60
MN6FCM	3.96	MN6FLM	MN6FLEC	4.47	330	1830	60
MW2FCM	2.41	MW2FLM	MW2FLEC	2.75	630	630	60
MW4FCM	3.79	MW4FLM	MW4FLEC	4.47	630	1230	60
MW6FCM	5.19	MW6FLM	MW6FLEC	6.20	630	1830	60

All Matrix standard attachments are suitable for metric ceiling systems. Imperial size attachments are available to special order.

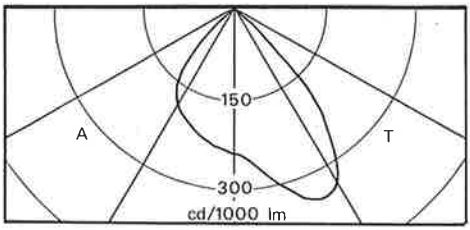


Abridged Photometric Data	**(SD100/1436)** Surface	**(SD150/2436)** Recessed
Maximum spacing to mounting height ratio:	1.69 : 1 MAX TR	1.78 : 1 MAX TR
BZ Classification:	(Not applicable) – 'batwing' distribution	
ULOR	0%	0%
DLOR	68%	66%

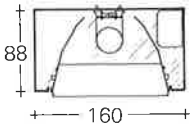
Single Tube

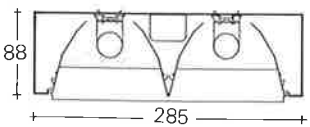


Twin Tube

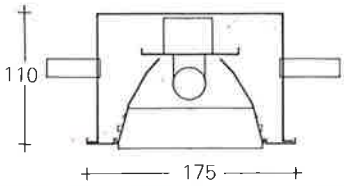


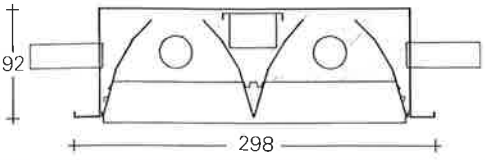
SD100





SD150





SD100 and 150 Ranges COMFORT FLUORESCENT

Recessed and surface mounted low brightness luminaires. Designed for use in commercial interiors where glare must be kept to a minimum. The louvres give a 'batwing' distribution.

SPECIFICATION

Surface mounted

Body: Made from zinc coated sheet steel finished epoxy powder coat white. High power factor switch start control gear is wired to a three way fused terminal block. Prismatic panels or cellular louvres are available as options.

Recessed

Body and Trim: Made from zinc coated sheet steel finished epoxy powder coat white on visible surfaces High power factor switch start control gear is wired to a three way fused terminal block.

Louvre: Batwing distribution from a high efficiency semi specular lay-in aluminium louvre with white cross blades. The louvre is fitted with earth link and safety cords.

Options:

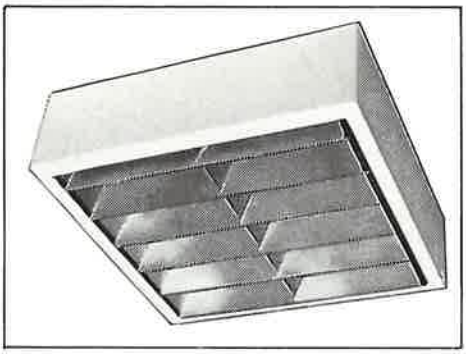
Trim – Aluminium with mitred corners.
Finish – Trim and louvre cross blades finished to any British Standard colour.
Louvre – Can be facetted or parabolic cross blades; specular low iridescent side reflectors.
Air Handling – By variable apertures, adjustable dampers etc.
Suspension Brackets – Adjustable side arm with variable screw adjustment.
Control Gear – Emergency, dimming, switchless start or electronic.
Terminal Block – Three way fused plug and socket.

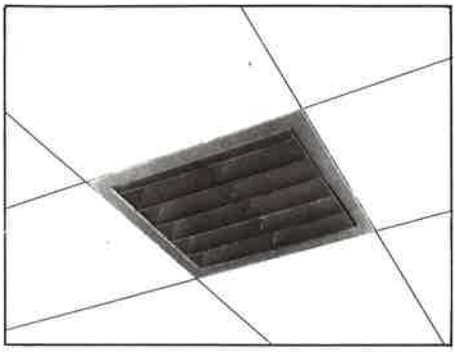
Catalogue Numbers (Surface)	Lampways	Overall Length mm	Overall Width mm	BESA Fixing Centres	Approx. Weight kg
SD100/1218 SD100/2218	1 x 18W 2 x 18W	Available on Request			
SD100/1436	1 x 36W	1256	160	600	5.5
SD100/2436	2 x 36W	1256	285	600	8.0
SD100/1558	1 x 58W	1556	160	600	6.5
SD100/2558	2 x 58W	1556	285	600	9.5
SD100/1670	1 x 70W	1820	160	600	7.5
SD100/2670	2 x 70W	1820	285	600	10.5
Recessed				Aperture Dimension	
SD150/1218 SD150/2218	1 x 18W 2 x 18W	Available on Request			
SD150/1436	1 x 36W	1200	175	1185 x 150	7.0
SD150/2436	2 x 36W	1200	298	1185 x 275	8.5
SD150/1558	1 x 58W	1500	175	1485 x 150	8.5
SD150/2558	2 x 58W	1500	298	1485 x 275	10.0
SD150/1670	1 x 70W	1800	175	1785 x 150	10.0
SD150/2670	2 x 70W	1800	298	1785 x 275	11.0

Add suffixes to catalogue numbers for the following options:

.../PP	K12 Prismatic panel.*
.../CL	Silver cellular louvre panel*.
.../QS	Startless gear.
.../ES	Electronic starters.
.../EB	Electronic ballasts.
.../DM	Dimming.
.../EM1	Battery/emergency pack – 1 hour.
.../EM3	Battery/emergency pack – 3 hours.

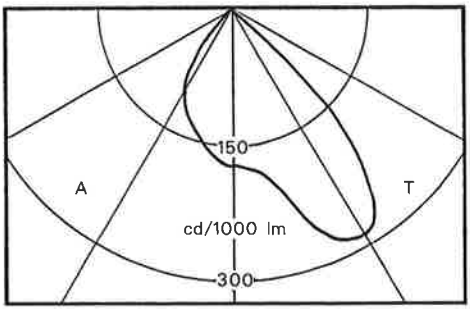
*Surface and single recessed versions only.



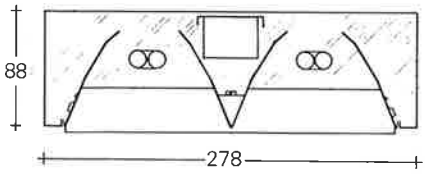


Abridged Photometric Data SD175S/211/AL

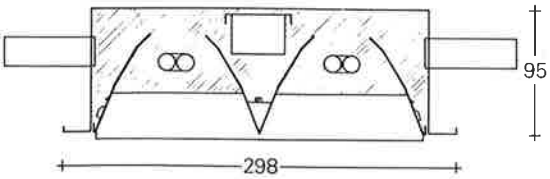
Maximum spacing to mounting height ratio	1.8 : 1 Max. TR
BZ Classification	Not applicable – 'batwing'
U.L.O.R.	0%
D.L.O.R.	43%



OPSCL211



OPRCL211



COMFORT FLUORESCENT

These low brightness square modules are available both as recessed and surface types. They are designed to match the SD150 and SD100 ranges. They give a 'batwing' distribution.

Supplied complete with two OPUS 11W compact fluorescent lamps.

SPECIFICATIONS

Surface Mounted Body and Trim: Made from zinc coated sheet steel finished epoxy powder coat white. The centre back has a BESA box fixing.

Recessed Body: Made from Zinc coated sheet steel finished epoxy powder coat white.

Louvre: High efficiency batwing distribution from semi-specular lay-in aluminium louvre with white crossblades.

Also available are sets of 4 screw adjustable side suspension brackets – OPRCLBKT – to allow the module to be mounted directly on to the ceiling grid.

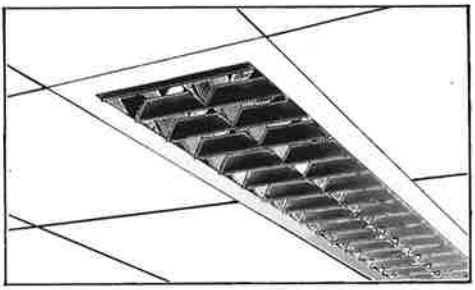
Catalogue No.		Lamps	Length mm	Width mm	Weight kg
(Recessed)	OPRCL211	2 x 11W	298	298	3.2
(Surface)	OPSCL211	2 x 11W	288	278	3.0
	OPRCLBKT		Adjustable side arm suspensions		

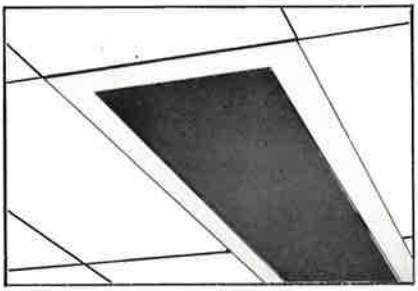
These luminaires can also be supplied with various finishes and special control gear, and are available under the following catalogue numbers and suffixes:-

Catalogue No.	Lamp Ways	Length	Width	Approx. Wt. kgs	Add these suffixes for the following:-
SD175S/211	2 x 11W	288	278	3.0	. . . /AL ALUMINIUM LOUVRE
SD175S/213	2 x 13W	288	278	3.0	. . . /PP PRISMATIC PANEL K12
SD175S/218	2 x 18W	288	278	3.0	. . . /CL CELLULAR LOUVRE
SD175R/211	2 x 11W	298	298	3.2	. . . /EM BATTERY INVERTOR
SD175R/213	2 x 13W	298	298	3.2	EMERGENCY PACK
SD175R/218	2 x 18W	298	298	3.2	(REMOTELY MOUNTED)
SD175/BKTS					Adjustable Side Arm Suspensions

Options:

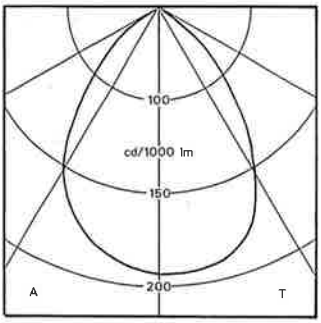
1. Finish: Any British Standard colour.
2. Louvre: Facetted or parabolic cross blades; specular low iridescent side reflectors.
3. Recessed version: (a) Anodised extruded aluminium trim.
   (b) Screw adjustable side suspension brackets.
4. Small cell louvres or flat panel controllers.
5. Air handling via variable apertures or adjustable dampers.

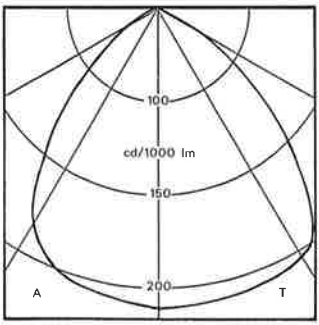




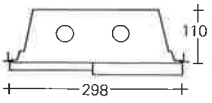
Abridged Photometric Data

	SD300/2436/FP	**SD350/4436/FP**
S/Hm Ratio:	1.62 : 1 MAX TR	1.8 : 1 MAX TR
BZ Classification:	3	2/4.0/3
ULOR:	0	0
DLOR:	41%	52%

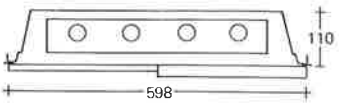




SD300



SD350



Recessed

FRAMED MODULES

A range of modular luminaires suitable for both concealed and exposed T ceiling systems. When used with frameless dished diffusers, conforms with DHSS Reference D.

SPECIFICATION

Body: Made from zinc coated sheet steel finished epoxy powder coat white. High power factor switch start control gear is mounted on removable gear trays with three way fused terminal blocks. Two 20mm knock outs are provided for conduit suspension.

Panel/Louvre Support Frame: Made from zinc coated sheet steel finished epoxy powder coat white. The frame is held to the body by wishbone springs.

SD300 Series Nominal 300mm wide. **SD350 Series** Nominal 600mm wide.

Optional Extras: Aluminium diffuser frame finished satin anodised or any BS paint colour.
Steel diffuser frame finished to any BS paint colour.
Air handling via variable apertures or adjustable dampers.
Fused plug and socket terminal blocks.
Emergency, dimming, quickstart or electronic control gear.
Adjustable side suspension brackets.

Cat. No. (Body only)	Lampways	Length	Suspension Centres	Weight kg
SD300/1218	1 x 18W	Available on request		
SD300/2218	2 x 18W	598	450	6
SD300/1436	1 x 36W	1198	900	9
SD300/2436	2 x 36W	1198	900	9
SD300/1558	1 x 58W	1498	900	11
SD300/2558	2 x 58W	1498	900	11
SD300/1670	1 x 70W	1798	1350	12.5
SD300/2670	2 x 70W	1798	1350	12.5
SD300/BKT	Adjustable Side Suspension Bracket			
SD350/2218	2 x 18W	598	450	8.5
SD350/3218	3 x 18W	598	450	8.5
SD350/4218	4 x 18W	598	450	8.5
SD350/24OU	2 x 40WU	598	450	9.5
SD350/34OU	3 x 40WU	598	450	9.5
SD350/2436	2 x 36W	1198	900	15
SD350/3436	3 x 36W	1198	900	15
SD350/4436	4 x 36W	1198	900	15
SD350/2670	2 x 70W	1798	1350	21
SD350/3670	3 x 70W	1798	1350	21
SD350/4670	4 x 70W	1798	1350	21
SD350/BKT	Adjustable side suspension brackets			

Add suffixes to catalogue numbers for the following options:

OP = Opal/prismatic based frameless diffuser.

PP = Prismatic/prismatic based frameless diffuser.

OO = Opal/opal based frameless diffuser.

FP = K12 Prismatic panel with frame.

FO = Opal panel with frame.

FL = Low brightness aluminium louvre with frame.

QS = Starterless control gear.

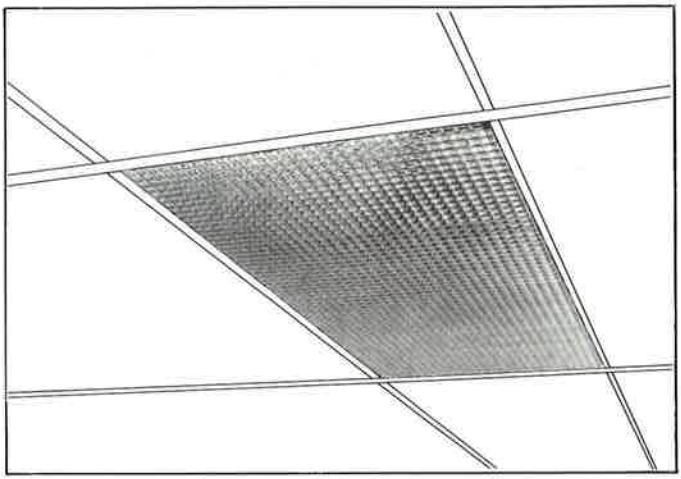
ES = Electronic starter.

EB = Electronic ballast.

DM = Dimming.

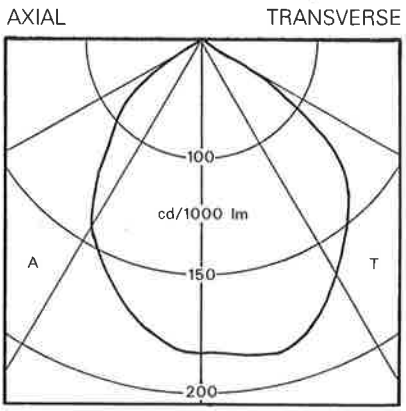
EM1 = Battery invertor emergency pack (1 hour).

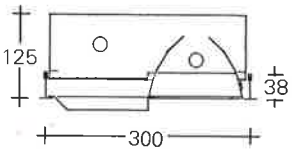
EM3 = Battery invertor emergency pack (3 hour)

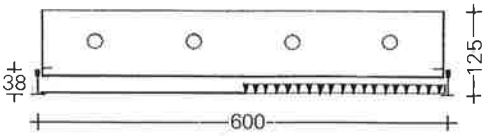


Abridged Photometric Data **SD250/4436/CL**

S/Hm Ratio:	1.70 : 1 MAX TR
BZ Classification:	3
ULOR:	0%
DLOR:	42%







Exposed T Ceilings

LAY-IN MODULES

These modules have been specifically designed for exposed T ceilings.

SPECIFICATION

Body: Made from zinc coated sheet steel finished epoxy powder coat white. The high power factor switch start control gear is mounted on removable gear trays. Each tray is fitted with a fused terminal block. The ends of the body are enclosed for minimum light loss.

Controllers: Opal or prismatic panels and dishes. Small cell louvre panels. Aluminium low brightness louvres.

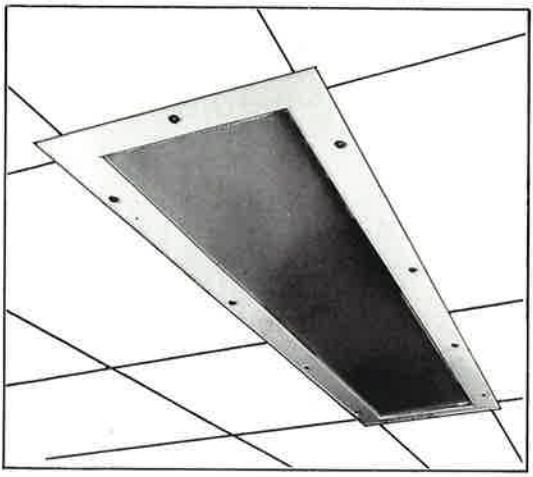
Optional Extras: Extruded aluminium or fabricated controller frame supported by wishbone springs. Air handling via variable apertures adjustable dampers etc. Emergency, dimming, switchless start or electronic control gear. Fused plug and socket terminal block.

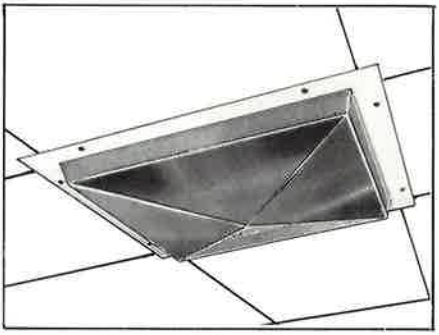
Cat. No.	Lampways	Grid Dimensions	Length	Add suffixes to catalogue numbers for the following options:
SD200/2218	2 x 18W	300 x 600	650	PP = K12 prismatic panel.
SD200/2436	2 x 36W	300 x 1200	1250	PD = Prismatic dish.
SD200/2558	2 x 58W	300 x 1500	1550	OD = Opal dish.
SD200/2670	2 x 70W	300 x 1800	1850	CL = Silver cellular louvre
SD250/3218	3 x 18W	600 x 600	650	AL = Aluminium louvre.
SD250/4218	4 x 18W	600 x 600	650	FF = Fabricated controller frame.
SD250/3436	3 x 36W	600 x 1200	1250	AF = Aluminium controller frame.
SD250/4436	4 x 36W	600 x 1200	1250	QS = Starterless control gear.
SD250/3558	3 x 58W	600 x 1500	1550	EB = Electronic ballast.
SD250/4558	4 x 58W	600 x 1500	1550	EM1 = Battery invertor pack – 1 hour.
SD250/3670	3 x 70W	600 x 1800	1850	EM3 = Battery invertor pack – 3 hour.
SD250/4670	4 x 70W	600 x 1800	1850	DM Dimming gear.

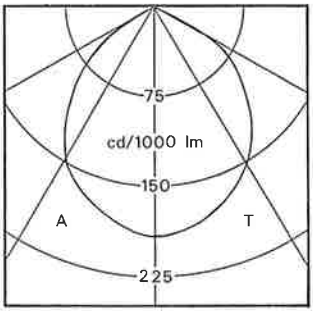
Single lamp versions of 300 × 600 modules and twin lamp or 'U' tube versions of 600 × 600 modules available on request.

SEALED FRAME

Surface and Recessed

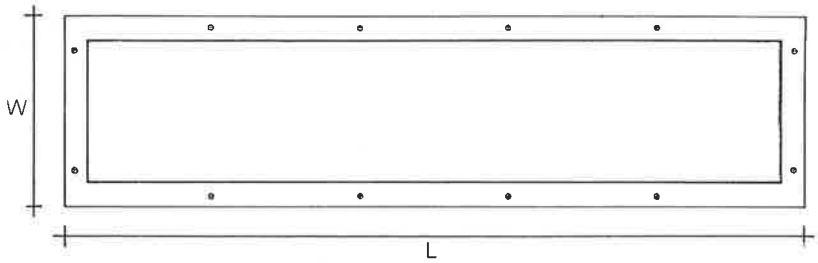


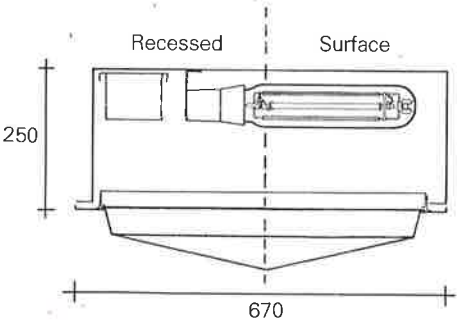


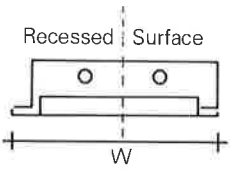


Abridged Photometric Data **SD700/2436**

S/Hm Ratio:	1.54 max
BZ Classification:	2
ULOR:	0%
DLOR:	40%







A range of gasketted luminaires for applications where units sealed against moisture and other vapours are required. The recessed versions have an additional gasket between the frame and ceiling. They are suitable for sports halls, garage forecourts, swimming pools, hospitals etc.

SPECIFICATION

Body/Diffuser Frame: Made from zinc plated steel finished epoxy powder coat white with closed cell gaskets providing positive seals between diffusers and frame; frame and ceiling. The frame is fixed by screws to the body. High power factor control gear is mounted on removable gear trays complete with a three way terminal block.

Two 670 square modules are available for 250W SON, MBI or MBF lamps.

Controller: K12 Acrylic

Optional Extras:

Body finished to any BS colour.
Various controllers.
Heavy duty extruded aluminium frame providing a positive seal making it suitable for use in sterile areas and clean rooms.
Fused plug and socket terminal block.
One lamp and three lamp versions available.
Auxiliary TH lamp facility for 670 square modules.
Acrylic or polycarbonate Triumph lens for 670 square modules.

Recessed **Surface**

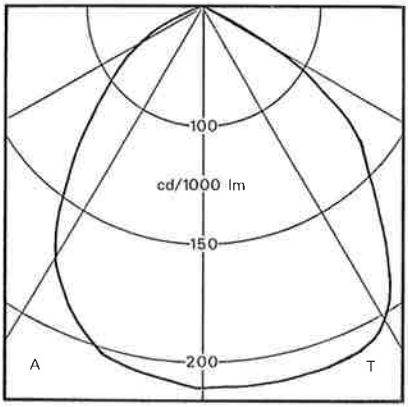
Catalogue Number	Lamps	Dimensions L x W	Catalogue Number	Lamps	Dimensions L x W
SD700/2436	2 x 36W	1315 x 370	SD750/2436	2 x 36W	1315 x 370
SD700/4436	4 x 36W	1315 x 653	SD750/4436	4 x 36W	1315 x 653
SD700/2558	2 x 58W	1605 x 370	SD750/2558	2 x 58W	1605 x 370
SD700/4558	4 x 58W	1605 x 653	SD750/4558	4 x 58W	1605 x 653
SD700/2670	2 x 70W	1905 x 370	SD750/2670	2 x 70W	1905 x 370
SD700/4670	4 x 70W	1905 x 653	SD750/4670	4 x 70W	1905 x 653
SD700/250S	250W SON	670 x 670	SD750/240S	250W SON	670 x 670

SD700/BKT adjustable side suspension brackets.

For 250W MBI version suffix MBI, 250W MBF/U suffix MBF.

WIDE SILHOUETTE

Surface Mounting



A series of surface mounted luminaires designed to complement the Silhouette range.

SPECIFICATION

Body: Made from zinc coated steel finished chocolate brown. High power switch start control gear is fitted together with a fused three way terminal block.

Controller: Prismatic acrylic securely held by snap action toggle clips.

Optional Extras

Body finished white or any BS colour.

Control gear mounted on trays with fused plug and socket-terminal block.

Emergency; dimming; quick-start; electronic control gear.

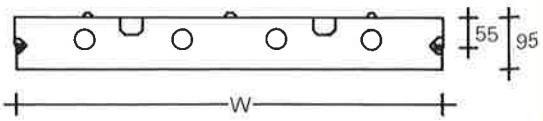
Nightlight facilities using Pygmy or Opus fluorescent lamps.

Three lamp modules in the 600mm wide versions.

Catalogue Numbers	Lamp Ways	Module Dims L x W	Fixing Centres	Weight kg	Add suffixes to catalogue numbers for the following options	
SD800/240U	2 x 40WU	625 x 625	400 x 400	9.0	.../WT	White Body
SD800/4218	4 x 18W	625 x 625	400 x 400	9.9	.../GT	Gear Trays
SD800/3436	3 x 36W	1250 x 275	900	9.2	.../DM	Dimming Gear
SD800/4436	4 x 36W	1250 x 275	900 x 400	16.5	.../QS	Starterless Gear
SD800/3558	3 x 58W	1550 x 275	1200	12.1	.../ES	Electronic starters.
SD800/NLT	Tungsten Night Light Kit				.../EB	Electronic ballasts.
SD800/NLO	Opus Night Light Kit				.../EM	Emergency pack.

Abridged Photometric Data **SD800/4436**

S/Hm Ratio	1.86 : 1 MAX.TR
BZ Classification	4/3.0/5
U.L.O.R.	3%
D.L.O.R.	61%



Cost efficient security lighting for interior and covered exterior use under canopy and in porchways, in domestic, commercial and industrial locations. Supplied complete with a 10 watt Super SOX lamp, Watchlight provides the equivalent light output of a 75 watt tungsten bulb for a fraction of the running costs and has six times the life.

SPECIFICATION

F64410 Watchlight Weight 1.32kg. (L)

Body: Impact resistant, precision moulded brown polycarbonate can be ceiling or wall mounted using the standard BESA box fixing. Cable entry can be made via the central 20mm dia hole in the back of the body or through one of the side knockouts.

Diffuser: Impact resistant precision moulded opal polycarbonate.

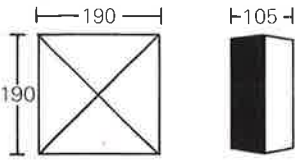
Gear Tray/Reflector: White stove enamelled mild steel fitted with porcelain BC lampholder and low power factor 240V 50Hz control gear protected by a 315mA anti-surge fuse. A plug and socket connection on the gear tray facilitates installation and wiring.

Supplied complete with 10W SUPER SOX lamp.

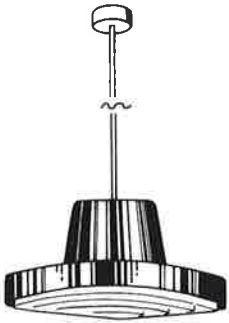
Designed to comply with BS4533.

Ingress Protection I.P.20

For use in ambient temperatures from −20°C to 45°C.



Catalogue No.	Super SOX lamp	Circuit watts
F64410	10W	15



Designed for use in commercial and domestic interiors.

SPECIFICATION

FGR416

Shade: Aluminium spinning with satin silver external finish and white stove enamelled interior. Fitted with a 9 ring white moulded louvre. The shade is supported by a suspension set.

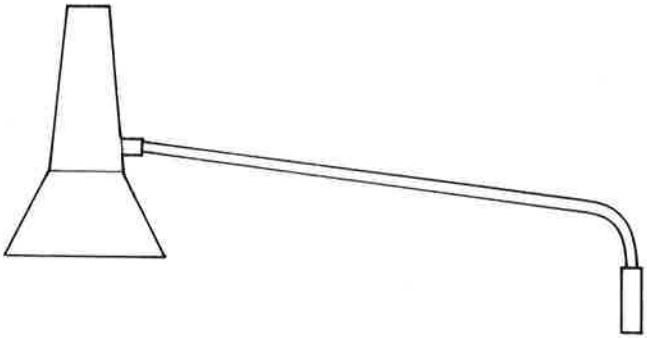
Suspension Set: A brass BC lampholder is wired to 12" (305mm) of silicone rubber insulated three core white PVC sheathed flexible cable. A white plastic cable clamp supports the weight of the shade. A white back plate ceiling rose with full looping-in-and-out facility terminates the other end of the cable.

Complies with BS4533. BSI Kite Mark.

Ingress Protection I.P. 20.

Catalogue No.	Lamp			Overall Diameter A mm	Shade Height B mm	Overall Height C mm
	Watts	Cap	Type			
FGR416	100	BC	GLS	360	187	512

ADJUSTABLE WALL LIGHT



This wall light was designed for use as a bed-head in hospital wards. It can, however, be used in similar situations commercially, such as desk tops. The arm is adjustable through a horizontal angle of 150° allowing it to be swung back to a wall when not in use. The reflector can be rotated axially on the arm through a total angle of 60°.

SPECIFICATIONS

F42226

Reflector: Anodised aluminium spinning fitted to cast aluminium lampholder bracket. The top of the reflector is covered by an aluminium spinning finished stove enamelled white.

Support Arm: Heavy gauge bright silver finish.

Backplate: Aluminium casting, matt black finish, covered by white PVC plate. The terminal block is wired with high temperature flexible cable to the BC lampholder.

F42225NS

As F42226 but with additional BC lampholder independently wired for emergency lighting on a Nightwatch. This wall light is only available to special order.

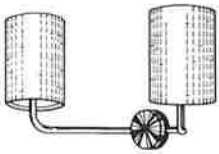
Both comply with BS4533 and DHSS standard reference 'M'.

Ingress Protection I.P. 20.

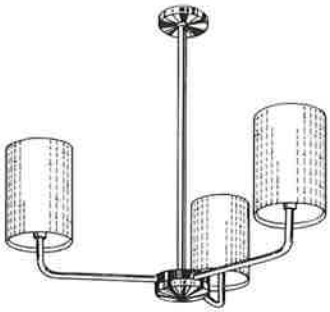
DIMENSIONS

Catalogue No.	Lamp		Maximum Projection mm	Reflector Height mm	Reflector Diameter mm	Backplate Diameter mm	Weight kg
	Watts	Cap					
F42226	60	BC	660	271	175	76	0.6
F42225NS	15/60	BC	660	271	175	76	0.6

FGR358OAT



FGR359OAT



FGR357OAT

This family of pendant and wall brackets is designed for commercial and domestic interiors.

SPECIFICATIONS

FGR357OAT

A three light pendant with a ceiling plate for 2″ (51mm) BESA box fixing enclosed by an aluminium spinning. The aluminium suspension rod is fitted to a matt black box which carries the three lampholder support arms. An aluminium spinning covers the underside of this box. Chrome plated brass BC lampholders are fitted to the aluminium support arms and these carry parallel sided oatmeal coloured fabric shades. The pendant is supplied wired with PVC high temperature three core cable ready for connection to an earthed mains supply. All aluminium parts are finished with a satin silver appearance.

FGR358OAT and FGR359OAT

Wall brackets matching the FGR357 pendant. The back plates have two slots for 2″ (51mm) BESA box fixing. They are supplied wired with high temperature cable.

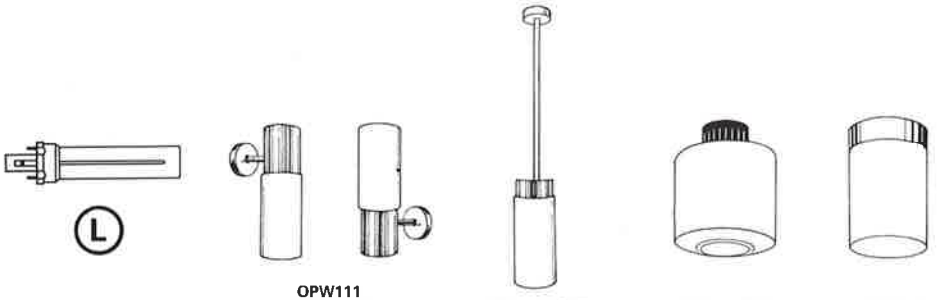
All comply with BS4533 BSI Kite Mark.

Ingress Protection I.P. 20.

DIMENSIONS

Catalogue No.	Lamps		Overall Height mm	Overall Width mm	Projection mm
	Watts	Cap			
FGR357OAT	3 x 100	BC	457	559	
FGR358OAT	100	BC	240		235
FGR359OAT	2 x 100	BC	230	406	205
FGR350OAT	Spare oatmeal shade		150	102	

CEILING AND WALL LIGHTS



OPW111
FGR369COM

FGR368COM

FGR370COM

F40280COM

These lighting fittings are designed for domestic and commercial interiors.

SPECIFICATIONS

OPW111. An attractive wall light comprising a satin silver finished aluminium body, having the ballast, wall bracket and white opal glass diffuser. The glass is supported by an annular metal disc fitted to the lampholder.

The 11W OPUS lamp corresponds to a 75W GLS lamp yet consumes only 15W of electricity including ballast losses. The OPW111 is packed complete with lamp.

FGR369COM. Wall bracket using the same glass and fixing method as OPW111. The BC lampholder is fitted to a deep spun aluminium cylinder with satin finish. Silicone rubber insulated wire is connected to the lampholder and fed through the bracket arm to the wall bracket. The wall bracket is covered by a matching aluminium spinning.

FGR368COM. White opal glass diffusing cylinder with satin silver finished aluminium spinning. The glass is supported by an annular metal disc fitted to the BC lampholder. The lampholder is wired to 12" (305mm) of 3 core silicone insulated PVC sheathed flexible cable terminated by a white ceiling rose. The cable is secured by a plastic cable clamp.

FGR370COM. A low brightness ceiling luminaire comprising a matt black aluminium spinning with ventilation slots and satin opal glass diffuser. The glass is held to the spinning by three screws. The top of the spinning has a 2" (51mm) BESA box fixing.

F40280COM. Fully sealed ceiling luminaire comprising a satin silver anodised aluminium spinning and screw neck opal glass diffuser. A porcelain BC lampholder is fitted to the spinning and wired to 8" (200mm) lengths of silicone insulated wire. The top has two holes at 2" (51mm) spacing for BESA box fixing. A silicone rubber gasket provides the seal to exclude dust and moisture. DHSS Standard reference type 'P'.

All comply with BS4533 BSI Kite Safety Mark.

Ingress Protection I.P. 20.

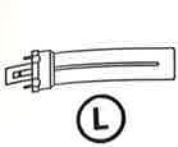
DIMENSIONS

Catalogue No.	Lamps		Overall Diameter mm	Overall Height mm	Projection mm	Weight kg
	Watts	Cap				
OPW111	11	G23	102	323	186	1.5
FGR369COM	100	BC	102	323	186	1.0
FGR368COM	100	BC	102	564		0.9
FGR370COM	100	BC	162	191		0.7
F40280COM	100	BC	115	185		0.8

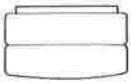
Spares

FGR368GOL	Spare glass for FGR368 and FGR369
FGR370GOL	Spare glass for FGR370
F40280GOL	Spare glass for F40280

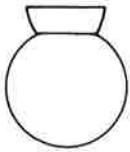
COURIER AND MOISTURE RESISTANT RANGE



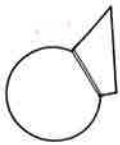
OPC209
F40269 COM



F40267COM



FGR327WPG
FGR339



F40259WHI

Courier

The Courier range is designed for interior small area lighting. They can be ceiling or wall mounted.

SPECIFICATIONS

OPC209. The shallow body is an anodised aluminium pressing fitted with two G23 lampholders. This together with an earth termination is wired with 8" (200mm) of a silicone rubber insulated cable. Two holes with spacer pillars are provided at 2" (51mm) centres for BESA box fixing. The body is fitted with a lever which operates three support arms to hold or release the opal glass diffuser. The OPC209 is packed complete with lamps.

OPC209H. As OPC209 but complete with HPF capacitor.

F40269COM. As OPC209 but fitted with a porcelain BC lampholder to operate a 100W GLS lamp.

F40267COM. The spun aluminium body is stove enamelled matt dark grey on the outside. The opal glass diffuser which is slightly dished, is held to the body by three spring steel clips. A porcelain BC holder and the earth termination are wired with silicone rubber insulated cable through a central hole. Two slots at 2" (51mm) centres are provided for BESA box fixing, together with three 5mm holes on a 70mm radius in raised bosses.

Ingress Protection I.P. 20.

Moisture Resistant

Designed for use in moisture laden atmospheres such as bathrooms, toilets and washrooms.

SPECIFICATIONS

FGR327WPG. White plastic gallery fitted with an integral BC lampholder. The gallery is threaded to accept the white opal glass sphere (152mm diameter) and a rubber gasket is fitted to prevent the ingress of dust and moisture. Wired with heat resisting cable.

Two holes are provided at 2" (51mm) centres for BESA box fixing.

FGR339. As for FGR327 but with 254mm diameter glass.

F40259WHI. As for FGR327 but for wall mounting holding the glass at a short offset.

Comply with BS4533.

Ingress Protection I.P. 52.

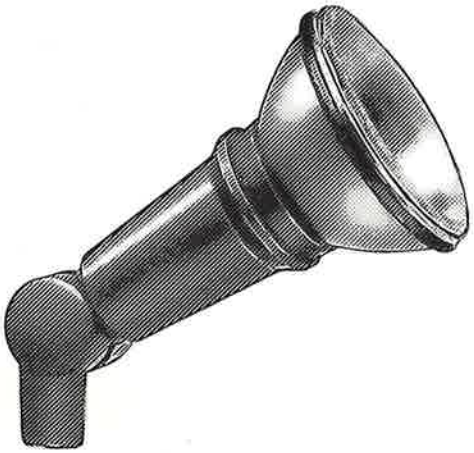
DIMENSIONS

Catalogue No.	Lamps		Overall Diameter mm	Overall Height mm	Projection mm	Weight kg
	Watts	Cap				
OPC209	2 x 9	G23	215	115		1.8
OPC209H	2 x 9	G23	215	115		1.8
F40269COM	100	BC	215	115		1.4
F40267COM	100	BC	244	143		2.2
FGR327WPG	60	BC	152	188		0.7
FGR339	100	BC	254	290		1.9
F40259WHI	60	BC	152	184	179	0.7

Spares

F40175GOL	Spare glass for FGR327WPG and F40259WHI
FGR339GOL	Spare glass for FGR339
F40267GOL	Spare glass for F40267 and F40268
F40269GOL	Spare glass for OPC209 and F40269COM

PAR 38 FLOODLIGHT



This floodlight is designed specifically for use with PAR 38 spot or flood lamps. When used with coloured lamps it is ideal for giving emphasis in garden lighting. Using 120V or 240V lamps it can be employed on building sites and for lighting in industrial and commercial locations. When used to light fountains it must not be immersed in water.

SPECIFICATION

F69078 Weight 0.42kg (without lamp).

Body: Die cast, corrosion resistant aluminium alloy, finished hammer grey. Fitted with moulded silicone rubber gasket forming a weatherproof seal with the lamp.

Terminal Chamber: Tapped 20mm ET and fitted with porcelain connector wired to the lampholder. Fitted with a cable gland for 4-7mm OD cable.

Lampholder: Porcelain E27 (ES).

Accessories

F69079. Anodised aluminium ground spike (optional extra).

BANTAM BKT Wall mounting bracket.

MULTI UCB 2" Pole Clamps.

Designed to comply with BS4533.

Ingress Protection I.P. 55. Dustproof and Jetproof.

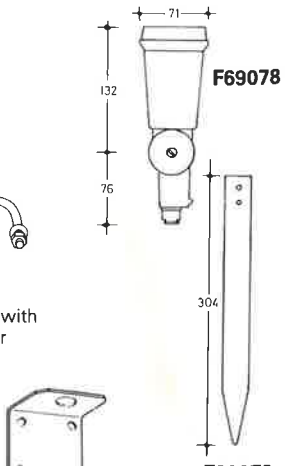
Lamps		
Voltages	Watts	Type
24	100 }	PAR38
120	150 }	Spot or Flood
240/250	100	PAR 38 Flood Coloured

Spares

F69078GAS Spare silicone gasket.

MULTI UCB

Pole clamps to use with BKT for horizontal or vertical pole mounting.



F69078

F69079

BANTAM BKT

Multi-purpose bracket.

For lamps see page 187.

DL2

DL3

DLE1

DLE2

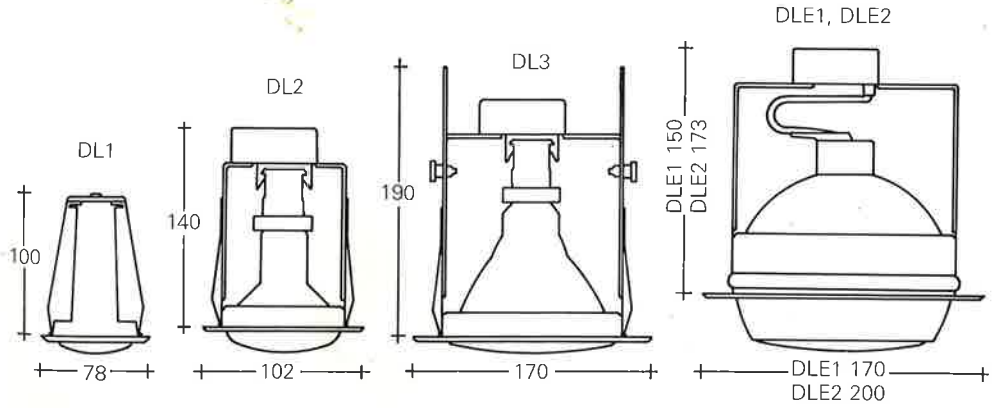
These luminaires are suitable for general downlighting requirements.

Classification: Class 2 double insulated. Designed to comply with BS4533/101 (t_a 25°C).

Wiring: Luminaires have a facility suitable for looping up to 2 x 2.5sq.mm of cable. In addition an earth link is provided for looping.

Finish: White or Brass (specify).

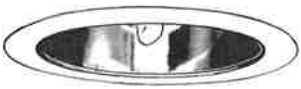
Cat. No.	Lamp Type	Lamp Cap	Ceiling Aperture Diameter
DL1	40W R50 (R16)	E14 (SES)	65
DL2	75/100W RO80 (R25)	E27 (ES)	95
DL3	100/150W PAR 38 or 100W R95 (R30)	E27	137
DLE1	75/100W RO80 (R25)	E27	137
DLE2	100/150W PAR 38	E27	145
			186



DOWNLIGHTERS

Recessed

SD600



SD610

SD620

These downlights are designed for use in hotels, entrance halls, lift lobbies, corridors etc.

SPECIFICATION

Spun steel bezel and stirrup, finished epoxy powder coat white. Strong spring steel clamps ensure a simple and reliable installation. The top of the stirrup carries a porcelain ES lampholder for tungsten lamps or G23 or G24d lampholder and ballast for Opus compact fluorescent lamps. The three way terminal block has a plastic cover.

Optional Extras

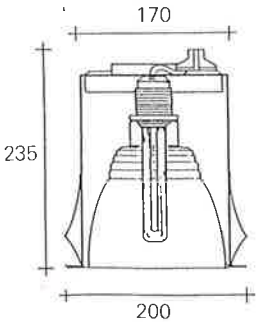
1. Bezel finished any BS colour.
2. Variations to lamp types and stirrup sizes to order.
3. For **SD600:** Enclosed aluminium reflector with spun 30mm bezel.
   Finished anodised silver or gold.
   The addition of power factor correction capacitors. Fully enclosed control gear canister.
4. Fully enclosed body canister in place of stirrup.

RANGE

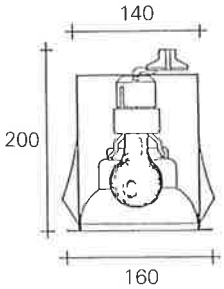
Catalogue Number	Lamp Type	Lamp Cap
SD600/9*	9W Opus	G23
SD600/13*	13W Opus	G24d-1
SD600/18*	18W Opus	G24d-1
SD600/100*	100W GLS	ES
SD610/100	100W R.95/PAR38	ES
SD610/100R†	100W GLS	ES
SD620/80	RO80/R63	ES

*Add suffix F for reflector with 30mm bezel and state whether gold or silver finish.
†Supplementary 'clip-on' reflector.

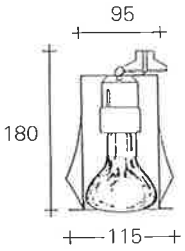
SD600



SD610



SD620



SPOTLIGHTS

SD650

SD660

SD670

This range of spotlights complements the recessed downlighters. They can be adapted for use on various track systems.

SPECIFICATION

Bullet shaped spun aluminium body with stirrup finished epoxy powder coat white. The wiring box is drilled for BESA box fixing and white three core cable is wired to an ES, compact fluorescent or SBC lampholder. The fluorescent and 50W TH versions are complete with appropriate choke or transformer.

Optional Extras

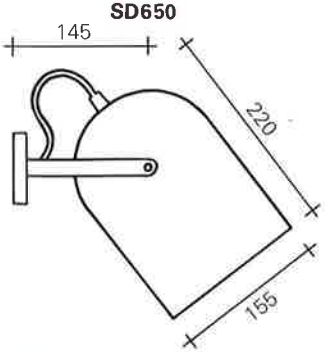
Other paint finishes to any BS colour.
Brushed anodised gold or silver finish.
Track mounting – specify track type when ordering.

RANGE

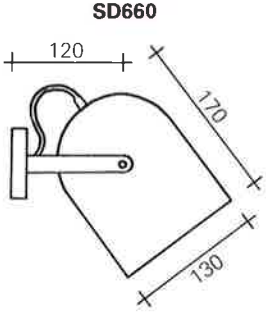
Catalogue Number	Lamp Type	Lamp Cap
SD650/9*	9W Opus	G23
SD650/13*	13W Opus	G24d-1
SD650/18*	18W Opus	G24d-1
SD650/100*	100W GLS	ES
SD660/100	100W R95 /PAR38	ES
SD660/100R†	100W GLS	ES
SD670/50	12V 50W TH	B15d

† State colour of reflector required – gold or silver + Supplementary 'clip–on' reflector

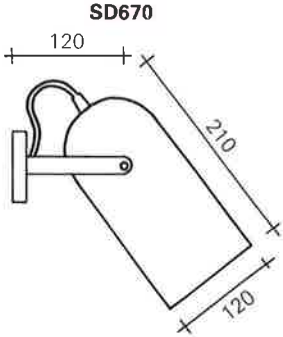
SD650



SD660



SD670



EMERGENCY LIGHTING

ESO7
ESO10

ERH7

ERO7
ERO10

EBFN6

EBL18

RANGE

Complete Cat. No.	Body and Diffuser	Gear Tray	Adaptor Plate	Tube	Overall Diameter or Length mm	Overall Width mm	Overall Depth mm	Weight kg
ERO7 24	ERO7	EFN24	–	6" 4 watt	180	–	105	1.38
ERO10 36	ERO10	EFN36	–	9" 6 watt	254	–	105	1.75
ERO10 24	ERO10	EFN24	EAR	6" 4 watt	254	–	105	1.75
ESO7 24	ESO7	EFN24	–	6" 4 watt	–	180 x 180	105	1.38
ESO10 36	ESO10	EFN36	–	9" 6 watt	–	254 x 254	105	1.75
ESO10 24	ESO10	EFN24	EAR	6" 4 watt	–	254 x 254	105	1.75
ERH7 24	ERH7	EFN24	–	6" 4 watt	180	–	105	1.38
EBL18	–	–	–	12" 8 watt	400	150	90	1.80
EBFN6	–	–	–	9" 6 watt	334	97	95	2.50

Interior Range - ICEL Approved

ERO7 ESO7 ERH7
ERO10 ESO10

These luminaires are non maintained self contained. They can be round (7" or 10" diameter) or square (7" or 10" sq.). They contain an electronic module, which charges the batteries from the mains supply. In the event of power failure the 4W or 6W fluorescent tubes are automatically switched on and will give useful light for three hours.

SPECIFICATION

Body: Precision polycarbonate mouldings. Vandal resistant and flame retardant. Coloured black.

Gear Tray: Fitted with rotary type lampholders for one 9" 6 watt or 6" 4 watt fluorescent tube. The control module is wired for 240V 50Hz supply. Modules for operation on other voltages and frequencies can be made to special order. A fused terminal block is fitted. Charging is indicated by a light-emitting red diode. The battery pack is attached by a plug and socket. When ordering the 6" 4 watt Gear Tray with the 10" body and diffuser an adaptor plate catalogue number EAR is necessary. Supplied complete with fluorescent tube.

Diffuser: Precision opal polycarbonate mouldings (except ERH7 which is clear with a hobnail effect).

Emergency duration: 3 hours.

Ingress Protection: I.P. 20

For **EBL18** and **EBFN6** - see next page.

EBL 18 – Interior Bulkhead/Exit Sign. ICEL Approved.

An interior, multi-purpose emergency luminaire supplied as a maintained unit, but by simple modification it can operate in the non-maintained mode.

Maintained Self Contained

(i) Terminals 3 and 4 are shorted by a link and in this mode the fluorescent tube is lit when the mains supply is normal. Immediately the power supply is cut the emergency module operates and the lighting is maintained for three hours on power supplied by nickel cadmium batteries. This link can be replaced by a switch. Up to ten bulkheads may be controlled by the same switch.

By the attachment of self adhesive legends the bulkhead will indicate EXIT (125 mm high) or EMERGENCY EXIT (75 mm high) signs. (The latter is complete with directional arrows.)

Non Maintained Self Contained

(ii) By removing the link the fluorescent tube will only light when the power supply is cut.

Optional Legends

Self Adhesive	EXIT	125mm	Catalogue No. EBLX
Self Adhesive	EMERGENCY EXIT	75mm	Catalogue No. EBLMX

SPECIFICATION

Body: Moulded polycarbonate attached to a white painted aluminium base. A central BESA box fixing is provided and through wiring by 20mm knockouts at each end.

Gear Tray: White painted aluminium with emergency module and battery pack. The latter is provided with plug terminations for easy replacement. A red light emitting diode indicates healthy charging and a push button cut-out is provided for test procedures. The terminal block is fused.

Diffuser: Moulded polycarbonate lightly stippled on the inside surface. The diffuser is a snap-fit on to the body but where interference by the general public is possible four corner fixing screws are provided.

The EBL18 is supplied with a 12" 8 watt tube.

Emergency Duration: 3 hours.

Ingress Protection: I.P. 20

EBFN6 Weatherproof Bulkhead

EBFN6 is designed to comply with ICEL1001, 1978 for use as an outdoor emergency bulkhead. It operates a 9" 6 watt fluorescent tube in a non-maintained self-contained mode. In the event of mains supply failure the internal nickel cadmium battery pack will provide lighting for three hours. When the power is restored the lighting is extinguished and the battery pack begins to recharge.

SPECIFICATION

Body: Moulded glass reinforced plastic with terminal block and three-pin socket. One centre back and two end 20mm knockouts are provided together with fixing centres at 200mm.

Gear Tray: White painted aluminium with emergency module and battery pack. The latter is provided with plug terminations for easy replacement. A red light emitting diode indicates healthy charging and a push button cut-out is provided for test procedures. A 1 amp fuse is fitted to the gear tray. A three-pin plug on the gear tray mates with the socket on the terminal block.

Diffuser: Moulded polycarbonate sealed to the body by a moulded rubber gasket.

The EBFN6 is supplied complete with a 9" 6 watt fluorescent tube.

Emergency Duration: 3 hours.

Ingress Protection I.P. 65.

N.B. Emergency lighting modules can be supplied to operate on voltages and frequencies other than 240V 50Hz. They can also be modified to operate in high ambient temperatures but battery life and discharge period will be reduced.

EXIT BOXES AND INCORPORATION MODULES

SD900

SD950KIT

SD950ENC

These exit boxes are designed to meet the requirements of ICEL 1001 and the GLC.

SPECIFICATION SD900

Box: Made from zintec sheet steel finished expoxy powder coat hammer grey. Low power factor control gear to operate a 12" 8W tube is fitted together with emergency module and battery pack. In the event of mains failure useful light is produced for three hours. Recharge time is 24 hours. The gear tray lowers down for ease of installation and maintenance. The rear of the single sided bodies has a BESA box fixing. The opal panel is vandal and fire resistant conforming with BS5266.

Optional Extras

Box finished to any BS colour.
Other legends – Emergency Exit, suffix EE and Fire Exit, suffix FE conforming with BS5266.
Maintained and sustained versions.
Double sided versions.

Dimensions: Length 430mm Height 195mm Depth 112mm. Weight 3.8 kg

RANGE

SD900/M	Maintained.
SD900/NM	Non-maintained.
SD900/DM	Double sided maintained.
SD900/DNM	Double sided non-maintained.

Emergency modules for incorporation with standard luminaires. One is for internal installation, the other is housed in an enclosure for remote mounting.

SPECIFICATION SD950KIT SD950ENC

Three hour duration charge-inverter module and battery pack for incorporation into modular luminaires. The kit includes LED indicator and fixing screws. Suitable for operating tubes from 18W to 125W. Add lamp length and wattage to catalogue number when ordering. Typical light output is 750 lumens. ICEL 1001 and GLC approvals on module. A grommetted 20mm cable entry is provided at one end of enclosure.

Optional Extras

Tray for incorporation into modular luminaires. Enclosure for remote mounting.
Shorter durations with similar or higher light outputs.

Catalogue Number	Module Dimensions L x W x H	Enclosure Dimensions L x W x H	Battery Pack L x W x H	Weight kg	Recharge Time Hours
SD950/KIT	204 x 55 x 50	—	315 x 70 x 40	2.0	24
SD50/ENC	N/A	395 x 150 x 55	N/A	3.2	24

For Speedpack and other luminaires with Emergency Lighting Facilities see page 250.

INDUSTRIAL DISCHARGE LIGHTING

Industrial Lighting using HID lamps

Industrial premises vary so much both in size and function that no single lamp and luminaire combination can produce the desired result for all installations. The problem for the lighting designer, therefore, is to choose the most economic solution that suits the particular building and provides light of the right quantity and quality.

In general the economics of a lighting scheme are optimized when the lowest number of luminaires using the highest wattage lamp are utilized. In order to design a lighting installation to achieve the desired result there are several factors to be considered:–

Illumination Level

First, the illumination level required must be decided, this will depend on the size of detail involved in the tasks undertaken by people working in the area. An authoritative list of recommendations is included in the Chartered Institute of Building Services 'Code for Interior Lighting'.

If we assume that the recommended level is 500 lux. i.e. 500 lumens per square metre, then the total number of lumens required to fall on the working plane is 500 x the area in square metres.

Spacing to height ratios (SHR)

Luminaires are not limited to any particular maximum or minimum mounting height, but they do have maximum spacing to height ratios (SHR MAX), i.e. the distance between each luminaire or row of luminaires is limited by the height that they are suspended above the working plane. e.g. A Harrier with a ratio 1.5:1 mounted on a ceiling 4 metres above the working plane could be spaced 4 x 1.5 = 6 metres apart.

Using the published SHR MAX and the known height of the lighting, it is possible to calculate these spacings, and therefore the minimum number of luminaires required to provide uniform lighting over the area. Some allowance should be made for any major obstructions e.g. machinery, racking etc likely to be positioned within the working area. Warehouse racking is particularly important, its exact location should be verified and the lighting positioned to light the gangways between. The vertical sides should be taken as the working plane. The next stage is to ascertain the lamp type and wattage.

Utilization Factor (U.F.)

Because there are losses of light within any luminaire and because some light falls on the ceiling and walls, a part of which will be absorbed, the remainder being reflected downwards, a factor has to be applied to replace these losses. This factor is called the Utilization Factor. A table of these figures is published for each luminaire type in our photometric data sheets.

Room Index (R.I.)

The key to these Utilization Factor tables is the Room Index of the installation. The Room Index can be calculated by dividing the floor area (m^2) by half the wall area (m^2), i.e.

$$\text{Room Index} = \frac{\text{Length x Width}}{\text{Height (Length + Width)}}$$

Reflection Factor (R.F.)

The other information required at this time is the reflection factors of the ceiling, walls and floor. These will depend on the colours in which they are to be finished. A light colour, especially if it has a gloss finish, will have a high reflection factor while a matt dark surface will tend towards zero reflectance. The exact figure to be used is a matter of reference to the data provided by the manufacturer of the material concerned. If this information is not available or no decision has been made on the decor, then the use of medium factors i.e. ceiling 50%, walls 30%, floor 20% is recommended.

Maintenance Factor (M.F.)

In order to complete the lighting calculation, some allowance needs to be made for dust and dirt which will accumulate on the room surfaces, the lamp and the luminaire. This is

best arrived at by reference to CIBS Technical Report No. 9 "The Calculation of Maintenance Factors".

The size of the Maintenance Factor depends on the location of the building – country or city centre, the type of building – foundry, office, warehouse etc, the type of luminaire – open reflector, enclosed, dust tight etc, and any cleaning and redecoration plans that will be implemented. The dirtier the environment the lower the MF, the more frequent the cleaning schedule or the better the luminaire is designed to cope with the environment the higher the MF.

The lighting calculation

Having ascertained the Utilization and Maintenance Factors, the number of lumens required from each lamp can be calculated as follows:–

$$\text{Lighting Design Lumens of Lamp} = \frac{\text{Area of Working Plane} \times \text{Desired Lighting Level}}{\text{No. of Lamps} \times \text{UF} \times \text{MF}}$$

This same formula can be adjusted to give the light level from an array of luminaires with any specified lamp, i.e.

$$\text{Lighting Level} = \frac{\text{No. of lamps} \times \text{LDL of Lamps} \times \text{UF} \times \text{MF}}{\text{Area of Working Plane}}$$

Free lighting design service

We offer a free design service to assist those customers who would welcome assistance in the preparation of a lighting scheme.

In Great Britain this service is available from your nearest sales and lighting office. Overseas customers should contact Head Office at Wembley, for details.

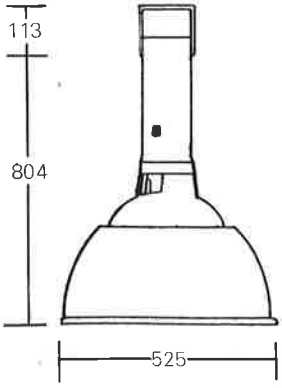
If required a comparison of electrical running costs can be prepared to assist in calculating the savings to be made from a more efficient lighting scheme.

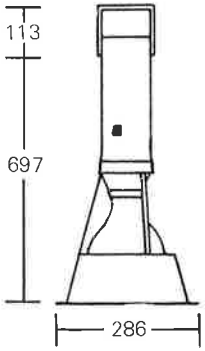
Abbreviated photometric data – SON-T and SON-E lamps

Lamp Ratings	LORL	ULORL	DLORL	BZ Classification	Luminous Area m²	SHR NOM
150-400W	0.75	0.01	0.74	1	0.218	1.5 : 1

Abbreviated photometric data – SON-R and MBFR/U lamps

Lamp Ratings	LORL	ULORL	DLOR	BZ Classification	Luminous Area m²	SHR NOM
250-400W	0.86	0.16	0.70	1	0.064	1.25 : 1





★ Lightweight mounting bracket ★ Hook-on gear unit ★ Quick Fit connection ★ Easy fit for electronic starter ★ Simple isolation for maintenance.

SPECIFICATION

Mounting Bracket: Made from mild steel with a black paint finish. Fixing to trunking or conduit is by means of 26mm central hole, alternatively four 9mm holes are provided on a 80mm diameter circle.

Gear Unit: The casing is made in painted sheet metal. A removable panel gives access to the high power factor control gear. Fixing studs are provided to hook-on to the Mounting Brackets secured by nuts. A plug and socket arrangement is provided in the side of the unit, thus avoiding the need to enter the unit during installation. The plug can be used to isolate the fitting for maintenance purposes.

Lampholder: Porcelain E40 (GES). Three wire lamp steadies are provided for extra support.

HI-SAVER For Elliptical or Tubular Lamps

Reflector: This consists of two high purity aluminium spinnings. The top element is etched to diffuse the lamp image while the lower part is brightened and anodised to spread the light over a wide area. To encourage a flow of air across the reflector surface, in order to discourage dust and dirt settling, there are slots provided in the neck of the reflector.

Weight: 10.5kg.

HI-SAVER for Reflector Lamps

Reflector: A high purity aluminium spinning supported by three struts to the lampholder shroud spinning.

Weight: 9.2kg.

Complies with BS4533 1981.

Ingress Protection: I.P. 20.

Maximum Ambient 40°C.

RANGE with integral control gear

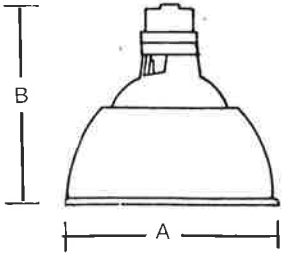
Complete Cat. No.	Component Cat. Nos.		Lamp Type	Voltage 50Hz	Circuit Watts	Current at 220V amps	Power Factor
	Body	Reflector					
HS150	GU150S	All HIREF	150W SON-T/E	All Tapped 220 + 240	170	0.80	0.90
HS250	GU250S		250W SON-T/E		280	1.31	0.89
HS310	GU310S		310W SON-T/E		340	1.6	0.88
HS400	GU400S		400W SON-T/E		440	2.13	0.86
HS250M	GU250M		250W MBF/U		280	1.37	0.85
HS400M	GU400M		400W MBF/U		430	2.2	0.81
HS250R	GU250S	All HRA	250W SON-R	All Tapped 220 + 240	280	1.31	0.89
HS310R	GU310S		310W SON-R		340	1.6	0.88
HS400R	GU400S		400W SON-R		440	2.13	0.86
HS250MR	GU250M		250W MBFR		280	1.37	0.85
HS400MR	GU400M		400W MBFR		430	2.2	0.81

Abbreviated photometric data – SON-T and SON-E lamps

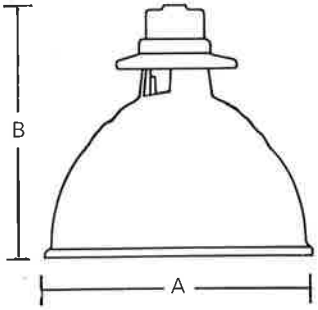
Lamp Ratings	LORL	ULORL	DLORL	BZ Classification	Luminous Area m²	SHR NOM
150-400W	0.75	0.01	0.74	1	0.218	1.5 : 1
600W-1000W	0.75	0.02	0.73	3	0.216	1.1 : 1

Abbreviated photometric data – SON-R and MBFR/U lamps

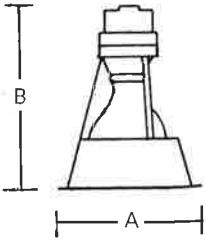
Lamp Ratings	LORL	ULORL	DLORL	BZ Classification	Luminous Area m²	SHR NOM
250-400W	0.86	0.16	0.70	1	0.064	1.25 : 1



HITCN



HBTCN



HRATCN

HI-SAVER – for remote control gear.

SPECIFICATION

Canopy: Cast aluminium alloy with the lampholder mounted on an adjustable steel plate. Two positions are possible according to the size of the lamp used. Entry is by threaded 20mm hole to take conduit or trunking attachment. Cable termination is made to a terminal block and earth stud capable of taking looped 2.5mm cables.

Tubular and Elliptical Lamps

Reflectors: Two reflectors are available. For lamps up to 400 watts the two-part reflector is used, as described on page 75. For lamps over 400 watts use HBREF. This is a one-part high purity aluminium spinning brightened and anodised.

Reflector Lamps

Reflector: A high purity aluminium spinning supported by three struts to the lampholder shroud spinning.

Complies with BS4533 1981.

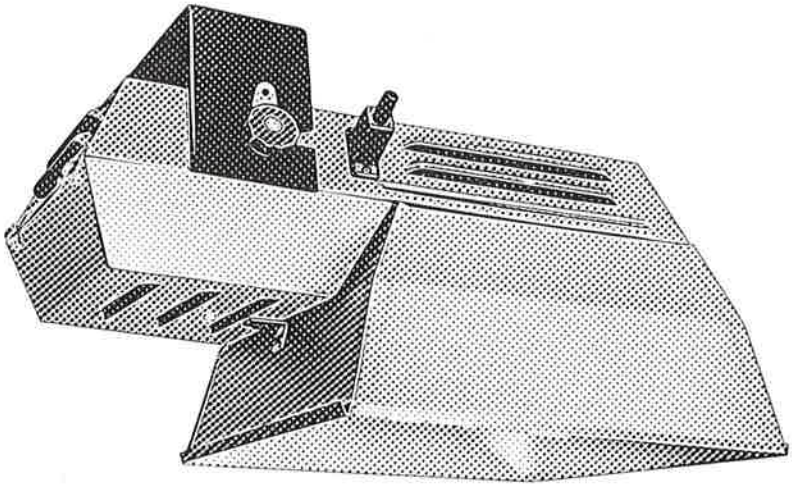
Ingress Protection I.P. 20.

RANGE for remote control gear

Complete Cat. No.	Component Cat. Nos.		Lamp Types	Weight kg	Dimensions	
	Top Canopy	Reflector			A	B
HITCN	TCN	HIREF	150-400W SON-T 150-400W SON-E 250-400W MBF/U	3.5	525	520
HBTCN	TCN	HBREF	600-1000W SON-T 700-1000W MBF/U	4.0	524	547
HRATCN	TCN	HRA	250-400W SON-R 250-400W MBFR	1.9	286	410

For details of remote control gear see pages 160-163 and Section 14.

For details of lamps to be used in Hi-Saver see pages 211, 223, 225.



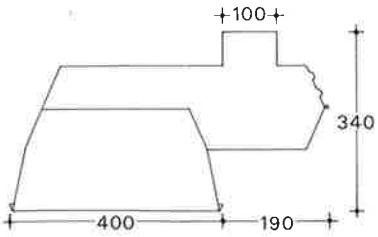
Abbreviated Photometric Data

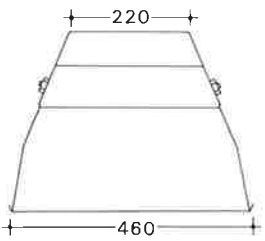
LORL	76%
ULORL	0%
DLORL	76%
BZ Classification	BZ1
Luminous area	0.169m²

Spacing to mounting height ratios:

Symmetric: 1.6 : 1 Along rows and between rows.

Asymmetric: 1.4 : 1 Along rows 1.8 : 1 between rows.





Champion Reflector Luminaires are specifically designed for Solarcolour SON-E and Truelite MBF lamps to provide efficient high level lighting at mounting heights of 5 metres and above in engineering works, cold stores, warehouses, sports halls, rail and bus stations etc.

★ Cool running gear ★ Shallow overall depth ★ Batwing distribution ★ Quickfit connection
★ Glare free lighting ★ Pre-wired connection and support clip for fitting electronic starter
★ Simple isolation from mains supply.

SPECIFICATION

Body: Sheet steel finished in yellow paint. The ventilated gear housing has a hinged cover which swings down to expose the gear tray.
A prewired terminal block and mounting bracket are incorporated to enable the simple fitting of an electronic starter. This is essential for the rapid hot re-striking of Solarcolour lamps or when using Plus or De Luxe lamps.
The high power factor 220 and 240V 50Hz gear is prewired to a socket. Gear for other voltages and frequencies can be supplied to special order. For information on starting devices see page 229.

Lampholder: Porcelain E40 (GES).

Reflector: Brightened and anodised aluminium fastened to body with stainless steel hinges and nylon fastener. A supplementary reflector is fitted to the body to complete the optic.

Suspension Bracket: Steel finished black stove enamel. A central 25mm hole and two 11mm holes at 102mm centres are provided. At right angles to the 11mm holes are two further 6mm holes at 70mm centres. Two angled slots on the sides of the bracket slide on to 10mm stainless steel screws fitted at the centre of gravity of the body. Lugs are provided for attaching a safety chain, if required.

Designed to comply with BS4533.

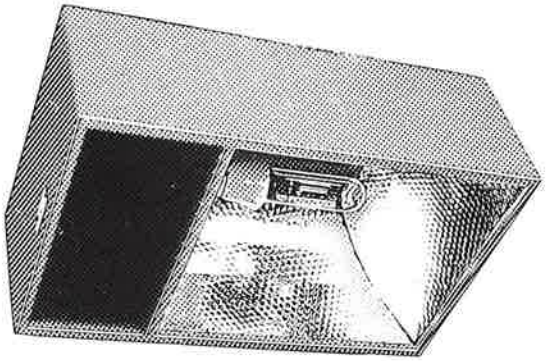
Ingress Protection I.P. 20.

Maximum Ambient 40°C.

RANGE

Cat. No.	Component Catalogue Numbers		Electrical Data						
	Body	Reflector	Lamp	Voltage 50Hz	Circuit Watts	Current Amps at 240V	Power Factor	Fuse HRC	Weight kg
CH150	CH150BY	CHREF	150W SON-E	All	170	0.80	0.90	4	13.5
CH250	CH250BY	CHREF	250W SON-E	tapped	280	1.31	0.89	10	14.0
CH310	CH310BY	CHREF	310W SON-E	220	340	1.6	0.88	16	14.5
CH400	CH400BY	CHREF	400W SON-E	+ 240	440	2.13	0.86	16	14.5
CH250M	CHM250BY	CHREF	250W MBF		280	1.37	0.85	10	14.0
CH400M	CHM400BY	CHREF	400W MBF		430	2.2	0.81	16	14.0

For details of lamps for use with Champion see pages 211, 223, 225.

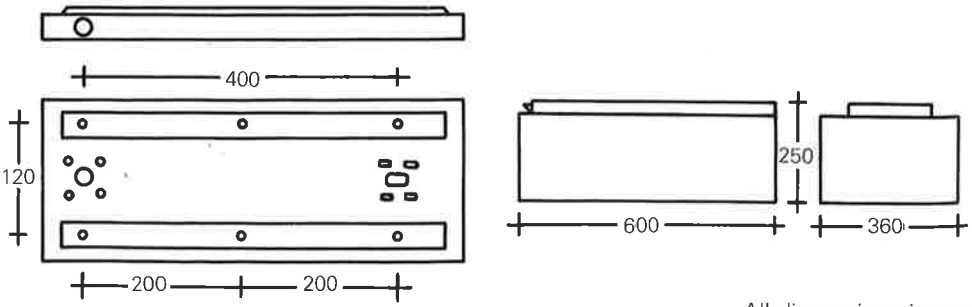


Abbreviated Photometric Data

LORL	76%
ULORL	0%
DLORL	76%
BZ Classification	BZ1
Luminous Area	0.169m²

Spacing to mounting height ratios (SHR MAX)

Asymmetric: 1.8 : 1 Between rows 1.2 : 1 along rows.
Symmetric: 1.5 : 1 Between and along rows.



All dimensions in mm

★ Easy installation ★ Four-way terminal block ★ Low glare ★ High Efficiency ★ Range of Accessories ★ Designed to 15th Edition ★ Tubular or Elliptical lamps.

SPECIFICATION

Ceiling Plate: Fabricated from sheet steel, phosphated and finished in bronze coloured paint. A four-way terminal block is fitted to take up to 6mm cable, the fourth terminal is provided for individual switching and line looping.

Body: Fabricated from sheet steel, phosphated and finished in stone coloured paint. High power factor control gear is located in a separate compartment and prewired to the lampholder and to the plug which is automatically connected to a socket fitted to the ceiling plate.

A prewired terminal block is provided to allow the simple fitting of an electronic starter, if required. This is essential for the rapid hot restriking of Solarcolour lamps or when using Plus or De Luxe lamps.

Lampholder: Porcelain GES (E40).

Reflector: Patterned high purity aluminium, brightened and anodised. The main reflector is faceted to control the light from a tubular lamp.

Accessories: Three accessories are available:

HRG – Wire Guard for sports halls etc.
HRC – Polycarbonate Cover for food factories etc.
HRL – Aluminium Louvre for offices with visual display units.

Complies with BS4533.

Ingress Protection: I.P. 20.

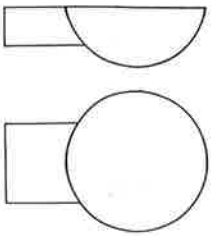
Maximum Ambient Temperature: 40°C.

RANGE

Cat. No.	Lamp Type	Supply Voltage	Circuit Watts	Power Factor	Weight kg
HR150	150W SON-T/E	All tapped 220 + 240V	172	0.90	11.7
HR250	250W SON-T/E		280	0.89	12.2
HR400	400W SON-T/E		440	0.86	12.7
HR250M	250W MBF/U		280	0.85	12.2
HR400M	400W MBF/U		430	0.81	12.2

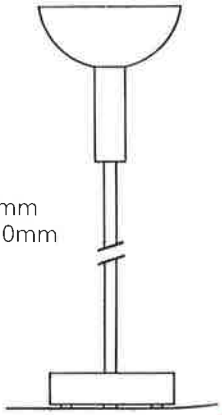
For details of lamps for use in Harrier see pages 211 and 223-225.

UPLIGHTERS



UM250
Outreach 570mm
Bowl Dia. 410mm

UF250
Height 1850mm
Bowl Dia. 410mm



Uplighters offer visual comfort in a decorative and practical way. Particularly suitable for office and computer suites where VDU screens are in use, they use the ceiling as a diffusing medium to provide excellent overall glare-free lighting.

Solarcolour De Luxe lamps give good colour rendering with high lighting levels and have enabled interior designers to explore new, flexible and cost efficient lighting techniques.

SPECIFICATION

Free Standing: Catalogue No. **UF250** Ⓛ

White epoxy powder coat painted steel complete with 250W Solarcolour De Luxe lamp. The base, with three adjustable feet, contains high power factor control gear including ignitor and ceramic fused terminal block. A diffuser disc fitted to the reflector prevents ceiling glare.

Note: Free Standing Uplighter fittings are normally supplied in easy to assemble kit form for safe transportation.

Wall Mounting: Catalogue No. **UM250** Ⓛ

Supplied complete with 250W Solarcolour De Luxe lamp and painted EPC white as standard. The control gear is integral with a separate fixing bracket for ease of installation. An angled reflector is fitted to direct light away from the wall.

OPTIONS/EXTRAS

Versions available to order for:-

- 150W or 400W Solarcolour De Luxe
- 250W MBI or MBF/U lamps

Alternative finishes:-

- Black or any BS colour
- Textured paint
- Spun anodised aluminium

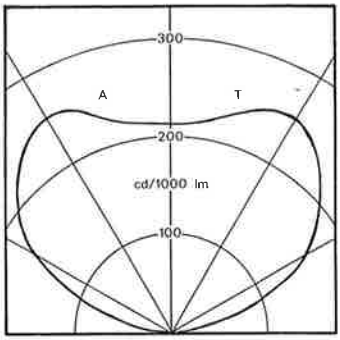
Toughened glass cover

Auxiliary T.H. lamp facility for:-

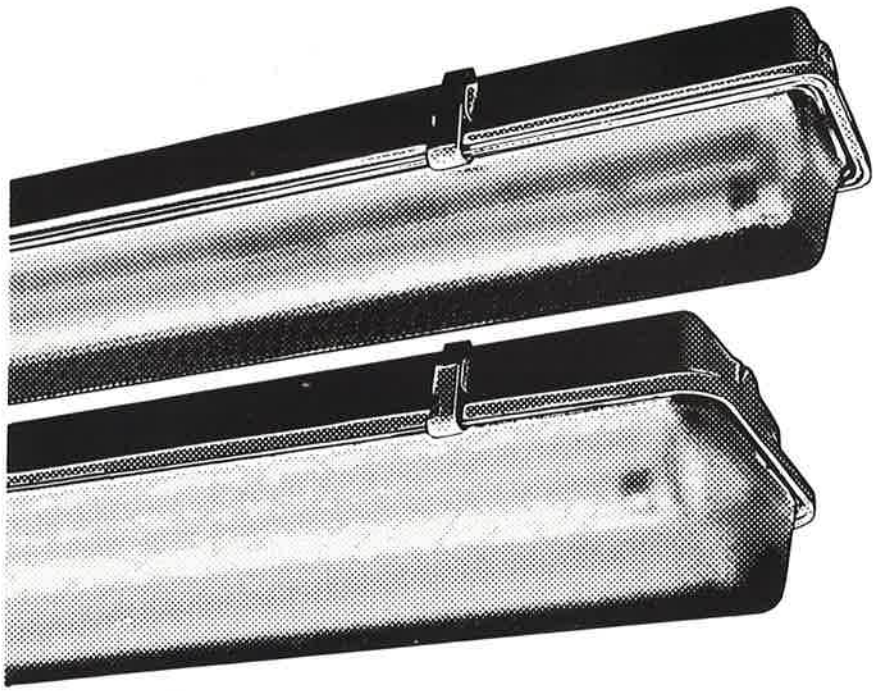
- Initial warm up period
- Emergency operation

Abridged Photometric Data

S/HM Ratio*	1.75 : 1 max
BZ Classification:	N/A
ULOR:	87%
DLOR:	0%

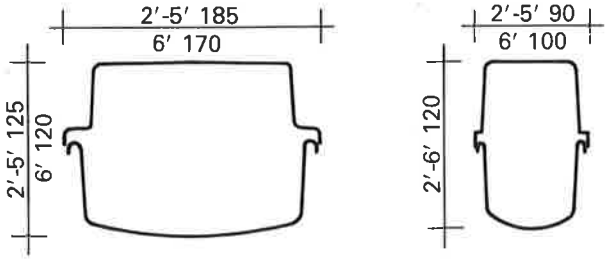


* N.B. For the calculation of S/HM ratio it is recommended that HM is the sum of the distances of uplighter bowl to ceiling and ceiling to working plane.



Typical Photometric Data

		FGRPSS15	FGRPSS25
Light output ratio	Up	18%	9%
	Down	56%	56%
Spacing to mounting height ratio		1.75 : 1	1.75 : 1
BZ Classification		6	5/1.5/6



A range of corrosion resistant fluorescent luminaires for use in adverse conditions of high humidity and corrosive atmospheres.

They are dustproof, splashproof and suitable for both indoor and outdoor use.

SPECIFICATION

Body: Single piece glass fibre reinforced polyester moulding. Each end has a 20mm plugged entry which can be removed for fitting a cable gland. Conduit entries can be drilled at standard fixing centres and washers are provided for sealing the entries. Holes, sealed by plugs are also provided, for screw fixing.

Reflector/Gear Tray: The stove enamelled white gear tray carries rotary type lampholders, and is fitted with 240V 50Hz switch start high power factor control gear prewired to a mains terminal block capable of accepting conductors having a total area of 6mm². Safety cords are fitted between the body and gear tray for ease of installation and maintenance.

Diffuser: The lamp compartment is enclosed by a clear internally patterned acrylic diffuser. This diffuser is held to the body against a Neoprene gasket by hinged polycarbonate toggles held captive to the body.
(Toggle catches are replaceable.)

DURALITE conforms to BS4533 101 1981.

Ingress Protection I.P.54.

Duralite with switch start control gear; supplied without tubes.

RANGE

Catalogue No.	No & Size of Tubes	Tube Wattage	Overall Length mm	Overall Width mm	Overall Depth mm	Fixing Centres mm	Weight kg
FGRPSS12	1 × 2ft	18 or 20	660	90	120	500	2
FGRPSS22	2 × 2ft		685	185	125	460	4
FGRPSS14	1 × 4ft	36 or 40	1270	90	120	800	3
FGRPSS24	2 × 4ft		1295	185	125	800	6
FGRPSS15	1 × 5ft	58 or 65	1570	90	120	1100	4
FGRPSS25	2 × 5ft		1595	185	125	1100	8
FGRPSS16A	1 × 6ft	70 or 75	1850	100	120	1100	5
FGRPSS26A	2 × 6ft		1850	170	120	1100	10

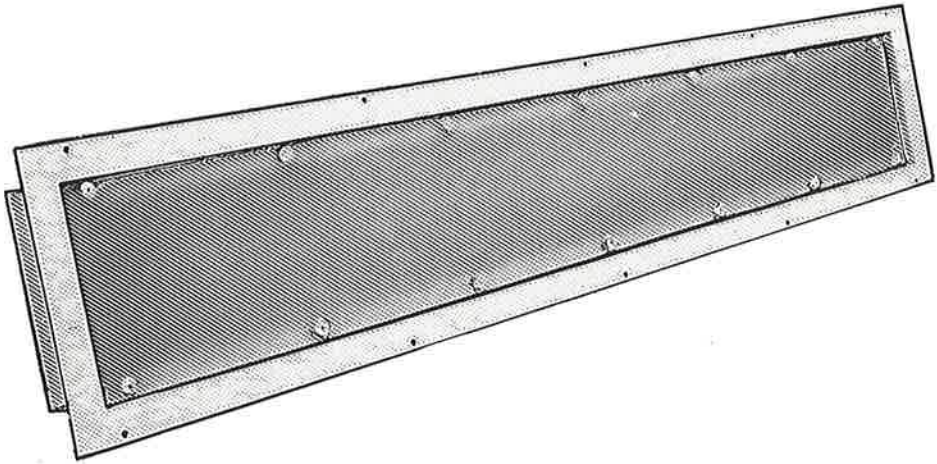
These luminaires using switch start circuits are suitable for use with the new 26mm high efficacy Krypton filled fluorescent tubes.

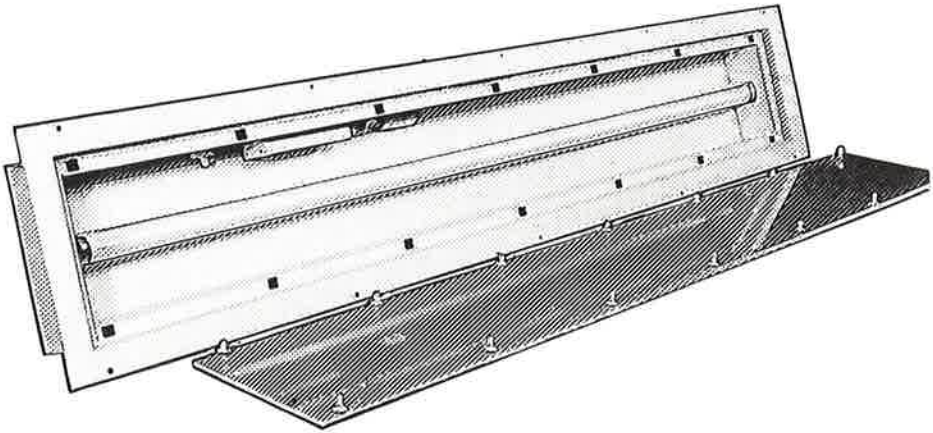
The starting characteristics of these new tubes may not be totally reliable below 5°C. For operation between 0° and 5°C, use 38mm diameter tubes. Duralite luminaires are currently available with switch-less start control gear for use exclusively with 38mm tubes. Details are available upon application.

SPARES

Diffusers:	Single	Twin
	FGRGRP12D	FGRGRP22D
	FGRGRP14D	FGRGRP24D
	FGRGRP15D	FGRGRP25D
	FGRGRP16D	FGRGRP26D
	FGRP16DA	FGRP26DA

GARAGE PIT LUMINAIRE





6 Weatherproof Fluorescent

GARAGE PIT LUMINAIRE

Although designed as a luminaire for use in maintenance pits it can be used in many situations where a recessed fitting is specified which can be cleaned by hosing. It is suitable for indoor use in subways and under canopies.

Two versions are available.

F62285R with thick opal acrylic panel.
F62285RPC with thick polycarbonate panel. (Impact Resistant).

Note: It may not be used in an area specified as hazardous due to the presence of flammable vapours (i.e. Zones 1 and 2).

SPECIFICATION

Body: Fabricated from 1mm mild steel stove enamelled white. High power factor switchless start control gear to operate a 5' 65W tube is mounted on a channel welded to the body. A three way fused terminal block is fitted for use on 240V 50Hz supply.

Gear for other voltages and frequencies can be installed.

The front flange has five fixing holes down each side at 387mm centres. Two 20mm knockouts are provided for each end plate.

Glazing Panel: Held in a recess by seven nylon fasteners down each side against a closed poythene gasket.

The luminaires must be mounted with the drain holes at the bottom of the fitting.

Complies with BS4533.

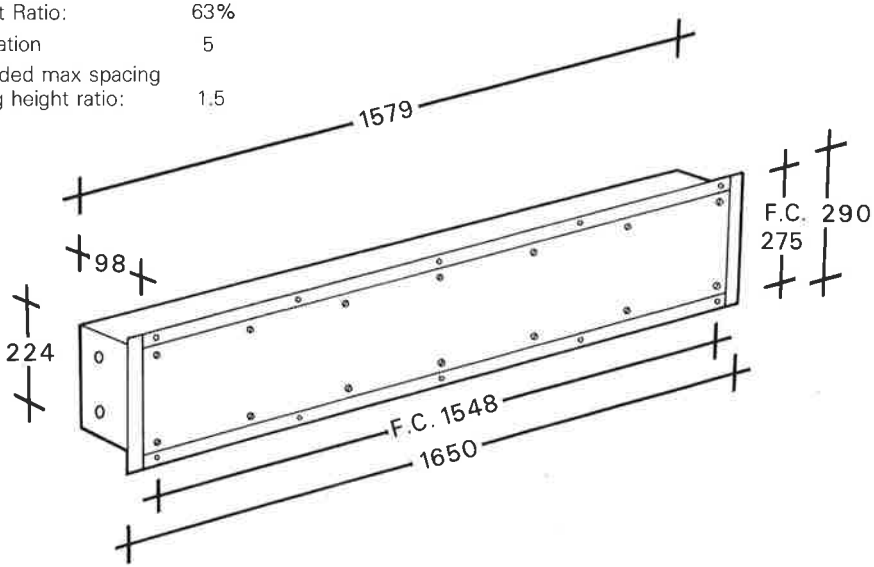
Ingress Protection I.P.45

To meet I.P. 45 rating the fixing flange of the luminaire and supporting surface must be sealed.

Ambient temperature 25°C.

Typical Photometric Data

Light Output Ratio:	63%
BZ Classification	5
Recommended max spacing to mounting height ratio:	1.5



For fluorescent tubes see pages 198 to 201.

Designed for all purpose weatherproof lighting. Pathlite can be ceiling or wall mounted and semi-recessed. For building sites and areas subject to vandalism the polycarbonate versions should be used.

OPP209

F64036

F64044

SPECIFICATIONS

OPP209: Weight 1.2kg.

Body: 1.2mm pressed steel stove enamelled white inside and outside. Each end and the back have 20mm knockouts. The back has a BESA box fixing and four 5.5mm clear holes on raised bosses for screw fixing.

Reflector/Gear Tray: Stove enamelled white with two G23 lampholders and control gear for two 9W OPUS lamps.

Cover: Vandal resistant opal polycarbonate attached to the body against a gasket by two stainless steel Allen screws.

Supplied complete with two 9W OPUS lamps.

Overall length 232mm	Overall width 124mm
Overall height 116mm	Recess depth 38mm

OPP209H

As **OPP209** but complete with HPF capacitor.

F64036 and F64036ES: Weight 1.1kg.

Similar in specification to **OPP209** except for the cover which is prismatic glass and the reflector which is fitted with a BC or ES porcelain lampholder. The body is stove enamelled grey.

Maximum wattage: 100W

F64044 and F64044ES: Weight 0.91kg.

As for **F64036** but with vandal resistant opal polycarbonate cover and tamper proof screws.

Maximum wattage: 60W.

All comply with BS4533.

Ingress Protection I.P. 54. Dustproof and Splashproof.

Accessory: Bantam BKT/Multi UCB for scaffold pole fixing.

Fluorescent Bulkhead

VALIANT

Valiant has been designed as a range of vandal resistant bulkheads to replace tungsten bulkheads with the benefit of reduced running costs.

★ Long life lamps ★ Low running costs ★ Quick fit connection ★ Vandal resistant ★ Supplied complete with lamp(s) ★ Jet proof ★ Dust tight ★ Five versions available.

SPECIFICATION

Body: Light grey glass reinforced plastic. Each end has a knockout for 20mm entry. A three-way mains terminal block (which is also a socket for the plug on the gear tray) is suitable for two 2.5mm cables. The back has indentations for drilling 2" (51mm) BESA box and screw fixings at 290mm centres.

Gear Tray/Reflector: White stove enamelled mild steel. The tray carries control gear to operate an 11W OPUS lamp or 2 x 12" 8W tubes on 240V 50Hz. The underside of the tray has a plug connection to mate with the socket in the body.

Cover: Opal polycarbonate impact resistant.

Fitted with a specially extruded neoprene gasket to give a weatherproof seal. Held to the body by two stainless steel captive Allen screws.

Complies with BS4533.

Ingress Protection: I.P. 65.

RANGE

Cat. No.	Lamps	Length mm	Width mm	Height mm	Weight kg
OPV111	1 OPUS 11W	334	97	97	1.3
F64108	2 x 12" 8W (in series)	334	97	97	1.5
F64110	2 x 12" 8W (two chokes)	334	97	97	1.95
F64112	2 x 12" 8W (as F64110) with HPF capacitor)	334	97	97	2.0
OPV111H	1 OPUS 11W (as OPV111 with HPF capacitor)	334	97	97	1.3

F64108COV Spare polycarbonate cover.
F64106KEY 4mm Allen key.

BULKHEADS

These bulkheads are designed for use in areas where corrosion resistant weatherproof units are required.

SPECIFICATIONS

F64038BC: Maximum wattage 100, Weight 1.8kg.

Body: Diecast aluminium alloy finished hammer grey outside and white inside. An earth terminal and wiring channel are provided. A tubular heat resisting gasket seals the bulkhead with stainless steel screws. Two 20mm tapped entries at each end provide a through wiring facility. The back has dimples for drilling in the centre and on 51 and 71mm diameter circles for small or large BS boxes. Four 6mm holes at 178 and 102mm should be drilled for screw fixing.

Cover: Prismatic glass sealed in die cast aluminium frame.

Lampholder: Porcelain BC*.

Dimensions

Overall length 254mm, Overall width 150mm, Overall height 121mm. Complies with BS4533 1981

Ingress Protection I.P. 54 Dustproof and splashproof.

F64038GOL Spare clear prismatic glass for F64038.

F64042: Maximum wattage 100. Weight 1.8kg.

Designed to light corridors, staircases and passageways when wall mounted.

Body: Die cast aluminium alloy finished hammer grey outside, white inside. Two 20mm tapped entries are provided in the centre top and centre back.

Cover: Prismatic glass sealed in die cast aluminium frame. Fastened to body with stainless steel screws.

Lampholder: Porcelain BC*.

Overall length: 203mm

Overall width: 152mm

Overall depth: 108mm.

Complies with BS4533 1981.

Ingress Protection I.P. 54 Dustproof and splashproof.

F64042GOL: Spare prismatic glass.

F64034PTD: Maximum wattage 100, Weight 1.6kg.
Designed for recessing into a ceiling where headroom is restricted.

Ring and Glass Assembly: Bonderised steel finished hammer grey sealed to prismatic glass. Fitted to reflector disc with three screws. The reflector disc has four fixing holes on 135mm PCD and carries a porcelain BC lampholder*. The unit requires a recess of 102 x 102mm area and 90mm depth.

Complies with BS4533. 101 1981.

Ingress Protection I.P. 40.

Dimensions
Overall diameter 248mm, Overall height 165mm.

F64251: Maximum wattage 100. Weight 0.9kg.

Body: Diecast aluminium finished hammer grey outside and white inside. Fitted with a porcelain BC lampholder*. The top is tapped 20mm and may be drilled to fit a 51mm BESA box.

Wellglass: Sealed to a diecast aluminium glazing ring and secured to the body with stainless steel screws.

F64254: Maximum wattage 100. Weight 1.0kg.

As for F64251 but with the addition of an aluminium reflector F64254REF.

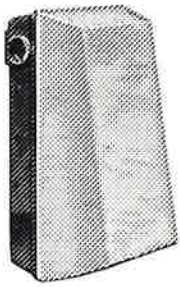
Overall height 191mm. Overall diameter F64251 159mm. F64254 216mm.

Complies with BS4533.101 1981

Ingress Protection I.P. 65 Dust tight and jetproof.

*Porcelain E27 ES lampholder F1965 may be substituted if required.

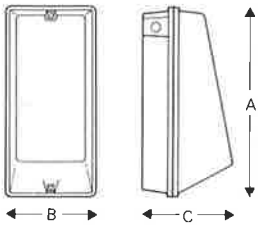
F64318



F64310 and OPN209

Abridged Photometric Data

Catalogue No.	Lighting Design Lumens	Equivalent GLS Wattage	Typical Mounting Height	Area Lit to 1 Lux min	Light Output Ratio	
					Down	Up
F64310	840	75	2.5m	6 x 4m	48	16
F64318	1600	150	3.0m	9 x 6.5m	48	16
OPN209	850	75	2.5m	6 x 4m	48	16



Catalogue No.	Lamp Wattage	Circuit Watts	Overall Length A mm	Overall Width B mm	Overall Depth C mm
F64310	10	15	240	120	120
F64318	18	25	300	140	142
OPN209	2 x 9	25.5	240	120	120

NIGHTWATCH

Nightwatch is a range of bulkheads and lanterns designed specifically for low running cost security lighting. Although designed for exterior use, their aesthetically pleasing appearance renders them suitable for use in commercial interiors such as banks, supermarkets, offices etc, where all-night low level lighting is necessary for security.

★ Low running cost ★ Vandal resistant ★ Dust Tight ★ Jet proof ★ Both internal and external use ★ Low loss control gear ★ Wall and corner wall mounting ★ Photo-electric cells available ★ Fast installation ★ Quick Fit connection ★ Supplied complete with lamp.

SPECIFICATIONS

F64310:	Nightwatch 10 NOT AVAILABLE	Weight: 1.35kg
F64318:	Nightwatch 18	Weight: 2.43kg
OPN209:	Opus Nightwatch	Weight: 1.3kg.

Body: Precision moulded brown polycarbonate. Three cable entries are provided: 2" 51mm BESA box and two 20mm knockouts in the sides at the top for through wiring. Drill holes are provided for the F643BKT bracket and for fastening direct to a flat surface. Provision is made for mounting the photo-electric cell in various positions.

Gear Tray/Reflector: Mild steel finished high gloss white enamel.

Cover: Impact resistant opal polycarbonate sealed to body by silicone rubber gasket and stainless steel Allen screws.

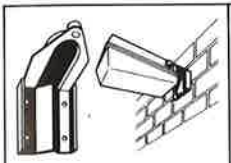
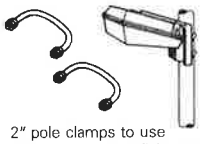
All three Nightwatch luminaires are supplied with the appropriate lamp(s), an Allen key, M.20 nylon compression gland, two stainless steel BESA box fixing screws and 20mm ET fixing nut. In addition, OPN209 and Nightwatch 10 have two No. 8 screws and wall plugs. Nightwatch 18 has three screws and wall plugs and a lamp steady.

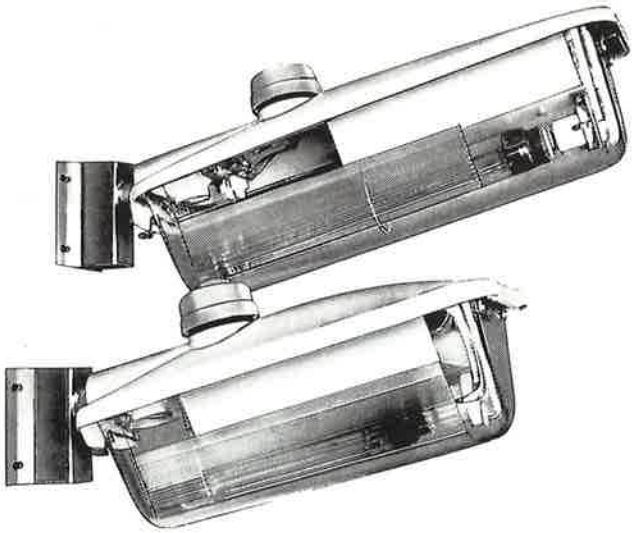
Designed to comply with BS4533.

For use in ambient temperature from −20°C to + 40°C.

Ingress Protection I.P. 65 Dust tight and Jet proof.

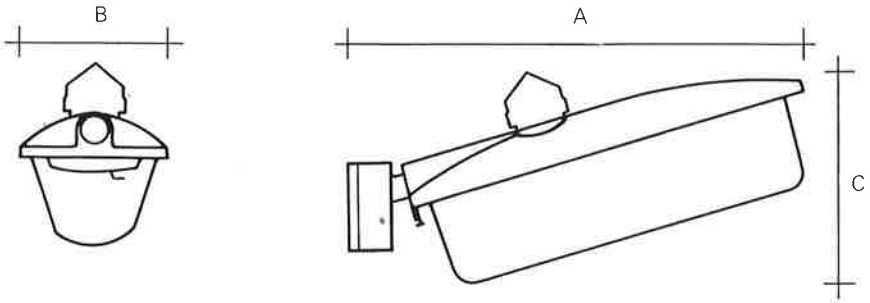
Nightwatch Accessories

 Cast aluminium multi-purpose bracket	 2" pole clamps to use with F643BKT for fixing to horizontal or vertical poles (e.g. scaffold poles)	 Photo-electric cell
F643BKT	**MULTI UCB**	**F643 CEL**



Abridged Photometric Data

Catalogue No.	Lighting Design Lumens	Equivalent GLS wattage	Typical Mounting Height	Area lit to 1 lux min	Light Output Ratio %	
					Down	Up
F64335	4500	300	5.0m	27 × 10m	65	12
F64355	7500	500	7.0m	36 × 12m	65	12



NIGHTWATCH 35/55

Nightwatch 35 and 55 utilise high efficiency Super SOX Lamps to provide security lighting for industrial and commercial premises at Low Cost.

★ Supplied complete with lamp ★ Integral Photo-electric cell ★ Complete with mounting bracket and fixing screws ★ Low running costs.

SPECIFICATIONS

F64335: Nightwatch 35. Weight 3.23kg Windage Area 0.074m
F64355: Nightwatch 55. Weight 5 kg Windage Area 0.093m

Body: Made from reinforced polyester with side entry for 76mm × 34mm diameter spigot. Low loss 240V 50Hz high power factor ballast is fitted prewired to lamp and photo-electric cell. The two way terminal block will accept 2½mm² cable. A lamp steady is fitted and two lengths of high temperature sleeving are provided for the incoming mains cable.

Reflector Bowl: Made from UV stabilised vandal resistant polycarbonate. Sealed to the body by a stout spring against a gasket.

Mounting Bracket: Suitable for corner wall, or wall mounting. The bracket is supplied complete with plugs and fixing screws and has a galvanised finish.

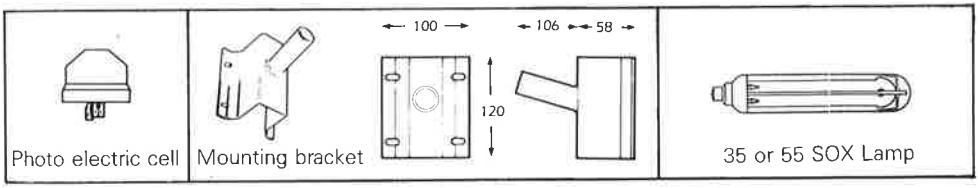
Fusing: A 5 amp fuse should be installed to protect the circuit.

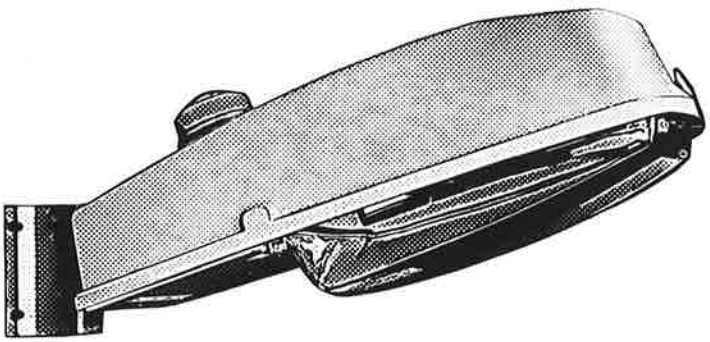
Designed to comply with BS 4533
Ingress Protection: I.P.54 Dustproof and Splashproof.
Ambient temperatures from −20°C to +40°C.

For details of suitable columns see pages 106 to 109.

Catalogue No.	Super SOX Lamp	Circuit Watts	Overall Length A mm	Overall Width B mm	Overall Depth C mm
F64335	35W	44	517	185	210
F64355	55W	64	625	190	245

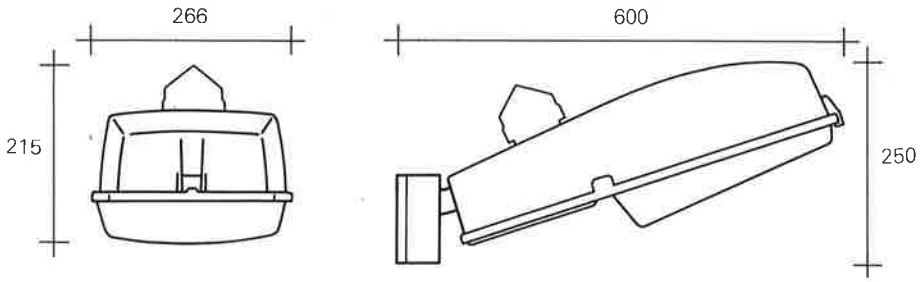
Nightwatch 35/55 supplied with





Abridged Photometric Data

Catalogue No.	Lighting Design Lumens	Equivalent GLS wattage	Typical Mounting Height	Area lit to 1 lux min	Light Output Ratio %	
					Down	Up
F64370	5510	300	5m	30x12m	73	2



NIGHTWATCH 70

★ Good colour rendering ★ Supplied complete with lamp ★ Integral Photo-electric cell ★ Complete with mounting bracket and fixing screws ★ Low running cost ★ Long life lamp ★ Integral control gear.

SPECIFICATION

F64370 Nightwatch 70. Weight 5kg Windage Area 0.067m² Ⓛ

Body: Made from corrosion resistant, glass reinforced polyester material, finished light cream colour.

Cover: Injection moulded vandal resistant polycarbonate, stabilised against ultra violet light.

Reflectors: Anodised and brightened aluminium.

Gasket: Neoprene rubber.

External Fastenings: Stainless steel.

Control Gear: High power factor tapped for 220V and 240V 50Hz.

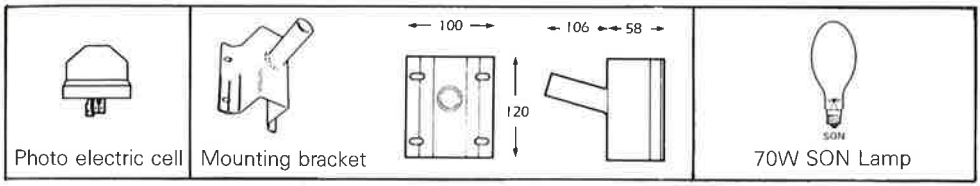
Designed to comply with BS 4533

Ingress Protection: I.P.54 Dustproof and Splashproof.

For details of suitable columns see pages 106 to 109 Section 10.

Lamp	Circuit Watts	Circuit Current	Power Factor
70W SON-E	87	0.39	0.93

Nightwatch 70 supplied with



HAZARDOUS AREA LIGHTING *Old Standards*

Since the GEC range of flameproof lighting was designed, to BS229, new standards have been issued namely BS4533, BS4683 and BS5345. One of the principal changes has been the re-grouping of flammable gases. To assist users of the catalogue we reproduce both the old and the new gas groupings and other relevant information on the new standards.

Flammable Gases and Vapours – Listed in BS229.

Group 1 – Methane

This is the main constituent of fire damp and occurs naturally in coal mines.

Group 2

(a) Blast furnace gases. These vary but the main flammable constituent is carbon monoxide.
(b) Propane, Butane, Pentane, Hexane, Heptane, Iso-octane, Decane. These are paraffin hydro-carbons, by-products of the oil industry.
(c) Benzene, Xylene, Cyclohexane. These liquids are by-products of coal tar.
(d) Acetone, Ethyl methyl Ketone, Methyl acetate, Ethyl acetate, n-Propyl acetate, n-Butyl acetate, Amyl acetate, Chloroethylene, Methanol, Ethanol, iso-Butyl alcohol, n-Butanol, Amyl alcohol, Ethyl nitrite, Buta-1 : 3-diene.
These compounds occur in many industrial processes, for example in the manufacture of cellulose solvents, paints and varnishes.
(e) Ammonia.

Group 3

(a) Ethylene, Diethyl Ether, Ethylene Oxide.
(b) Coal and coke oven gas.

Group 4

Acetylene, Carbon disulphide, Ethyl nitrate, Hydrogen, Water gas.
This group of excluded gases imposes very stringent flameproof requirements upon individual luminaires for which special approval is required.

Flameproof Luminaire

A flameproof luminaire is designed to withstand an internal explosion of gas or vapour (for which it is certified) without igniting an explosive atmosphere outside the luminaire.
The certification given against each is universally acknowledged as an assurance of their quality and reliability.

Zone 2 Luminaires

Luminaires for use in Zone 2 classified areas must be of the enclosed type with approved lampholders. They must comply with BS4533 Part 2 1969.
The company cannot advise on the classification of a particular area where a hazard may occur. This is the responsibility of the customers' engineering staff or their consultants guided by the relevant standards and codes of practice issued by official institutes, the petroleum and chemical industries and H.M. Factory Inspectorate. However, for classified areas where the group of gas or vapour present is also specified, advice will be given on which GEC Luminaires can be used.

BS5345, the new code of practice for the selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres, classifies hazardous areas into zones.

Zone 0: An area where an explosive gas/air mixture is present continuously, such as the vapour space of closed petrol storage tanks.

Zone 1: Areas where an explosive gas/air mixture is likely to occur in normal operation, i.e. cellulose spray booth.

Zone 2: Areas where an ignitable concentration is not likely to occur in normal operation (e.g. failure of a pipeline) and this concentration will only exist for a short time.

Safe Zones: We cannot advise on the risk classification of a particular area where a hazard may occur. This is the responsibility of the customers' engineering staff who are usually guided by the Factory Inspector.

With heavier than air gases, the Zone 2 area is usually taken as extending vertically 8 metres above the source of hazard and horizontally 15 metres in all directions from the source of hazard. Beyond 8 metres from the source of the hazard in the horizontal plane the vertical extent of the Zone 2 area may be reduced to 8 metres above ground level. Positions outside this area may be taken as safe providing approval is obtained from the local Factory Inspector.

Grouping of Apparatus

Luminaires are now divided according to design criteria specified in BS4683, into two main groups,

Group I for application in coal mining.
Group II for application in other industries.

The luminaires in Group II are divided into three or four subgroups, as follows, according to their suitability for use with the following gases and vapours:

IIA Propane Group of Gases.

IIB Ethylene Group of Gases.

IIC The Hydrogen Group of Gases.

IID This is not allocated at the present time but will possibly be used for Acetylene.

In the new grouping, IIA is intended for the same flammable gases as Group 2. Group IIB is to replace Group 3. Group IIC replaces Group 4 with the exception of Acetylene which is possibly going to be put into Group IID.

Temperature Class

It is important to recognise that the temperature class of a luminaire is quite separate from its Grouping. In order to prevent ignition of an explosive atmosphere, no part of the surface of the luminaire shall attain a temperature higher than the maximum temperature of its marked class. Temperatures are based on an ambient temperature of 40°C.

Marking Code	Temperature °C
T.1	450
T.2	300
T.3	200
T.4	135
T.5	100
T.6	85

The user must ensure that the temperature class of the luminaire is suitable for the particular gas within the hazardous area.

Selection

The selection, installation and maintenance of electrical apparatus in potentially explosive atmospheres is given in BS5345. An internationally agreed Letter Code has been adopted. Normally this Letter will be found immediately following the Letters EX. This is the Certification Mark for the British Approvals Service for Electrical Equipment in Flammable Atmospheres

Flameproof Luminaires: Temperature Class

	Lamp	Max. Surface Temp. (with 40°C ambient)	Temperature Class
F65000	60W GLS	150	T3
F65008	125W MBF/U	87	T5
	200W GLS	85	T6
F65034	100W GLS	102	T4
	150W GLS	122	T4
F65038	500W GLS	154	T3
F65040	1000W GLS	203	T2
F65114	250W MBFR/U	99	T5
	400W MBFR/U	126	T4
	700W MBFR/U	169	T3

I.E.C. Code

Symbol	Type of Protection
Ex d	Flameproof Enclosure
Ex e	Increased Safety
Ex i	Intrinsic Safety
Ex p	Pressurised
Ex n	This is reserved for future use

The details of the construction of luminaires to conform to the Specification Ex e Increased Safety are given in BS5345 Part 6. Other sections of BS5345 are to be issued, dealing with the construction of luminaires to the Classification of Ex d, i & p.

Flameproof Enclosure Concept 'd' BS4683 Part 2

Here, safety is dependent on the maintenance of flamepath dimensions within the limits of BS4683 Part II. The luminaire must be able to withstand an internal explosion without igniting flammable gases on the outside of the luminaire, a typical marking will be Ex d IIB T.3.

Increased Safety Concept 'e' BS4683 Part 4

Luminaires in this concept will rely on increased security against the possibility of excessive temperature and the occurrence of arcs and sparks. The grouping of increased safety equipment does not require any sub-grouping identification, other than for mining. A typical marking would be Ex e II.T.3.

Intrinsic Safety Concept 'i'

Intrinsic safety can be applied to luminaires using low levels of electric power insufficient to ignite gas under foreseeable fault conditions. There are two possible categories, ia and ib. In ia, the luminaire has to withstand two fault conditions. In ib, one fault condition. A typical marking would be Ex ia IIC T.6.

Zone 2 Concept 'n' BS4683 Part 3

This class of luminaire has been known simply as Zone 2 and more recently as Type 'N'. If the concept is adopted internationally it is possible that the symbol 'n' will be used. Generally, it is considered that this type of luminaire provides adequate protection for Zone 2 areas of hazard. A typical marking for Type 'N' certified equipment will be Ex N II T.3. Existing luminaires certified to the first edition of BS4533 will be marked Ex Division 2. These luminaires will have a maximum safety temperature of 200°C based on an ambient of 25°C – unless otherwise marked.

FLAMEPROOF HANDLAMP

Designed for use in Zone 1 hazardous areas where gases listed in Group 2 of BS229 may be present with the exception of Group 2(d).

SPECIFICATION

F65000 Weight 2.7kg. Temperature classification, Max lamp watts 60 T3

Body Cast aluminium alloy complete with carrying handle.

Glass: Heavy borosilicate cemented into cast aluminium glazing ring. A stout wire guard protects the glass and provides a floor rest.

Lampholder: BC.

Cable Gland: Suitable for cable with an overall diameter of 12mm. Armoured cable to BS6899 is recommended.

Certification: FLP545 for Group 2 with the exception of Group 2(d).

Dimensions: Height 313mm, Diameter 191mm.

FLAMEPROOF WELLGLASS

Suitable for use in Zone 1 areas where gases from Groups 1, 2 and 3 of BS229 may be present. Approved for tungsten lamps up to 200 watts and mercury lamps up to 160 watts.

SPECIFICATION

F65008 Weight: 14.3kg. Temperature classification, 200W GLS T6, 125W MBF/U T5.

Body: Cast iron painted hammer grey outside and white inside.

Glass: Heavy duty cemented into cast iron glazing ring. A robust wire guard is fitted.

Lampholder: E27 ES.

Entry: 25mm ET.

Certification: FLP1190 for Groups 1 and 2 and by P46 for Group 3 of BS229.

N.B. When using 80W or 125W MBF/U lamps the control gear must either be mounted in safe zone or in a flameproof enclosure.

Dimensions: Height 352mm, Diameter 298mm.

FLAMEPROOF BULKHEAD

Approved for use in Zone 1 areas where gases from Groups 1, 2 and 3 of BS229 may be present.

SPECIFICATION

F65034 Weight: 11.4kg. Temperature classification, max lamp watts ISO, T4.

Body: Cast iron with terminal chamber. Galvanised hammer grey paint finish and stove enamelled white inside.

Glass: Clear thick armour plate cemented into cast iron glazing panel.

Lampholder: BC.

Entries: One top 20mm ET and two side 20mm ET for through wiring. Two of the entries are plugged.

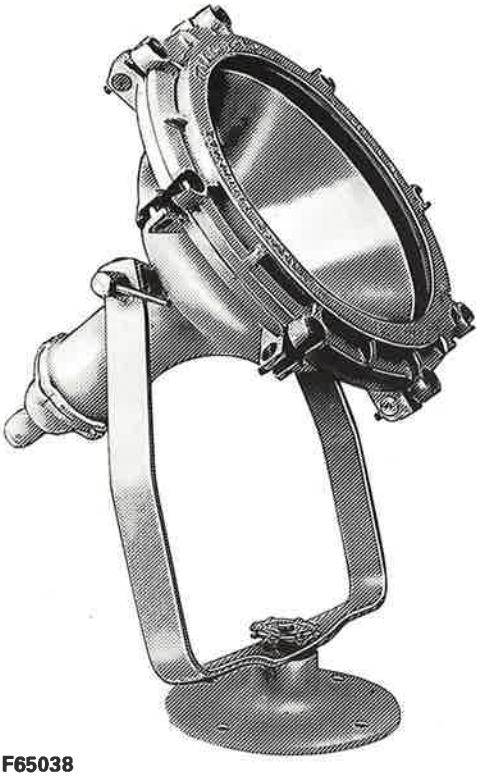
Certification: FLP1493 for Groups 1 and 2, P146 for Group 3. When used in Group 2(d) maximum lamp wattage 60.

Mounting: Wall or ceiling mounting is provided by two galvanised straps which can be screwed to raised tapped bosses parallel, or at an angle of 45° to the front glass. This facility gives a choice of directional lighting. The fixing straps have 9.5mm holes at 190 and 162mm centres.

Dimensions: Height 363mm, Width 216mm, Depth 140mm.

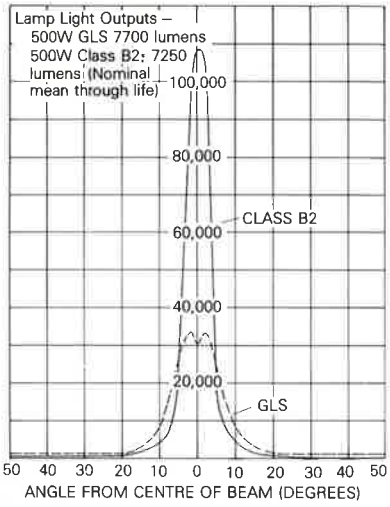
Essential accessory:

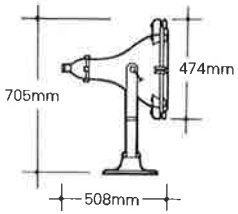
F65036KEY for triangular headed screws. (Not supplied unless ordered.)



F65038

LIGHT DISTRIBUTION FROM F65038 FLOODLIGHT WITH 230V 500W GLS AND CLASS B2 LAMPS





This range of floods is designed for use in Zone 1 areas of oil refineries, tank farms, oil rigs etc where gases from Groups 2 and 3 of BS229 may be present.
An exception is the cellulose industry where ACETONE is present.
Outdoors they may only be trained downwards. The range, using a wide choice of lamp types, provides a variety of beam distributions. The attachment of a spreader glass F65042 enables asymmetric beams to be achieved.

SPECIFICATION

F65038 Weight: 23kg. Temperature class T3

Body: Cast aluminium fitted with a spun aluminium reflector. Finished stove enamelled grey.

Glass: Heavy armour plate cemented into glazing ring and fastened to body with eight hexagonal stainless steel bolts with swing nuts.

Lampholder; E40 (GES) porcelain wired to separate terminal chamber. Maximum lamp wattage 500 tungsten and 250W MBFT.

Terminal Chamber: Cast aluminium fastened to body by four stainless steel hexagonal bolts. The chamber is fitted with cable compression gland.

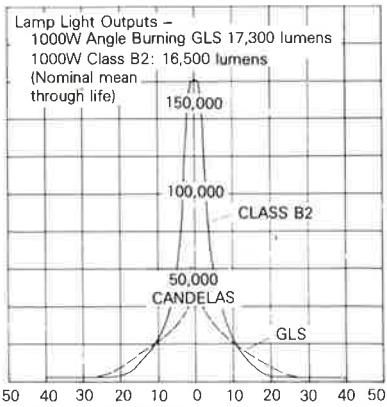
Compression Gland: ¾" ET Flameproof type suitable for cable with an overall diameter of 9.5mm–11mm.

Certification: FLP918 and P51 for Groups 2 and 3, with the exception of the cellulose industry where ACETONE is present.

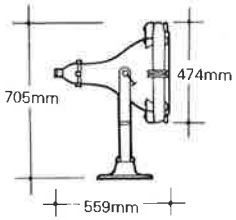
Cradle and Baseplate: Galvanised steel and cast aluminium alloy. The baseplate has four 14mm holes on 203mm PCD. The cradle allows movement of the floodlight through full 360° in the vertical plane.

FLOODLIGHTS

LIGHT DISTRIBUTION FROM F65040 FLOODLIGHT WITH 230V 1000W ANGLE BURNING GLS AND CLASS B2 LAMPS



F65040 Floodlight clear glass 1000W



F65040/F65114

SPECIFICATIONS

F65040 Weight: 25.8kg. Temperature class T2

Identical to the F65038 except for the glazing ring which is enlarged to allow for the use of a 1000W tungsten lamp.

Certification: FLP1233 and P52 for Groups 2 and 3 with the exception of the cellulose industry where ACETONE may be present.

F65114 Weight: 25kg. Temperature classes MBFR 250W T5, 400W T4 700W T3.

Identical to the F65040 except that the spun reflector is removed so that 250W, 400W and 700W MBFR lamps may be employed. The control gear for these lamps must be located in a safe zone. Alternatively, we can supply flameproof gear boxes to special order.

Certification: FLP1233/2 for 700W MBFR/U and FLP1233/3 for 250W and 400W MBFR/U lamps for Group 2 only with the exception of the cellulose industry where ACETONE may be present.

General: The floodlights illustrated have as standard a cradle and baseplate. Floodlights can be supplied to special order fitted with pole clamp brackets to suit poles of various diameters.

Standard finish on all external surfaces is a stove enamelled grey green paint. Special finishes can be applied to resist the effects of corrosive and marine atmospheres.

ZONE 2 FLOODLIGHTS
Stainless Steel

FM1268 Series

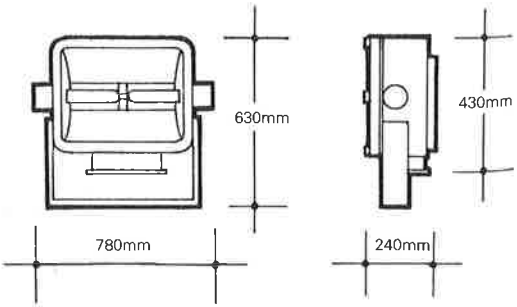
Abridged Photometric Data

Lamp Type	Reflector	Peak Intensity per 1000 Lumens Candelas	Beam Angle to 1/10th Peak			Cut-off Angle		
			Horizontal	Vertical		Horizontal	Vertical	
				above peak	below peak		above peak	below peak
Single SON-T	Specular	1390	112	36	40	140	56	49
Twin SON-T	Specular	1360	112	37	39	140	56	49
Single SON-T	Diffuse	760	115	50	47	160	64	56
Twin SON-T	Diffuse	860	116	48	47	160	51	59
Single MBF	Specular	330	133	54	54	180	90	90
Twin MBF	Specular	360	133	54	54	180	90	90

Cradle Fixing Centres

One central and two 22mm holes at 360mm centres.

Two slots on 100mm radius from central hole 15mm wide by 40mm long.



FM1268 Series

ZONE 2 FLOODLIGHTS
Stainless Steel

The FM1268 series has been designed to meet the demand for high intensity lighting on off-shore gas and oil-rigs, refineries and oil tankers. To combat the effects of corrosion they are made from stainless steel. Special attention has been paid to the effects of vibration when used on board oil tankers.

SPECIFICATION

Body: Fabricated from EN58J stainless steel.

Glass: 5mm toughened soda lime fastened internally to the floodlight by a glazing frame against a silicone rubber gasket.

Cover: The removable back which carries part of the reflector is secured to the floodlight by six captive fasteners. Access for re-lamping is made through this rear cover. Double pole cut-outs are fitted isolating the lamps when the cover is removed, but versions are available without these isolating switches.

Reflectors: Made from high purity BA212 aluminium. These are brightened and anodised for specular finish, or deep etched and anodised for a diffused finish.

Lampholders: E40 (GES) porcelain enclosed make-break type EX N approved. Lamps are additionally supported by steadies located in the lamp end dimples.

Cradle: Mild steel with galvanised finish. (Stainless steel versions can be supplied.)

Terminal Box: SON-T Series: Supplied wired with electronic starters and booster chokes. The latter are fitted to assist starting when the main ballast is located more than 100 metres from the floodlight. A 2 metre length of 1.5mm² 4 core 600/1000V EPR insulated CSP sheathed wire braided and CSP sheathed cable is supplied prewired so that the terminal box need not be opened when installing the floodlight.

MBF/U Series: As above but without starters or booster chokes.

Test Valve: This is fitted to the body of the floodlight for carrying out a restricted breathing test after installation or lamp change. For full details see instruction leaflet.

SON-T Lamps: These must be of the starterless type (i.e. without internal snap starter). When ordering Solarcolour lamps for use with these floodlights always specify:
Starterless lamps for use with FM1268.

Certification: These floodlights comply with BS4533 Part 2 Section 2.1 1976 for all gases, except those with ignition temperatures below 200°C, and are approved by BASEEFA certificate 73144.

Control Gear: This is not supplied with the floodlights and must be ordered separately. It must be mounted in a non-hazardous area unless fitted into flameproof enclosures. These can be supplied to special order. For details of control gear refer to pages 160 to 169.

RANGE

50Hz Volts	Lamps		Cat. Nos. With Specular Reflector		Cat. Nos. With Diffuse Reflector		Ambient Temp. °C		Weight kg
	Watts	Type	with cut out	less cut out	with cut out	less cut out	Min.	Max.	
220/250	250	SON-T	FM126835	FM126839	FM126837	FM126841	−30	40	23.5
220/250	310	SON-T	FM126836	FM126840	FM126838	FM126842	−30	40	
220/250	400	SON-T	FM126802	FM126805	FM126822	FM126825	−30	40	
380/415	600	SON-T	FM126803	FM126806	FM126823	FM126826	−30	40	
220/250	2 x 250	SON-T	FM126844	FM126848	FM126846	FM126850	−30	35	24.5
220/250	2 x 310	SON-T	FM126845	FM126849	FM126847	FM126851	−30	35	
220/250	2 x 400	SON-T	FM126801	FM126804	FM126821	FM126824	−30	35	
200/250	400	MBF	FM126808	FM126811	FM126828	FM126831	−30	45	22.5
200/250	2 x 400	MBF	FM126807	FM126810	FM126827	FM126830	−10	45	

FLOODLIGHTING COLUMNS

SPECIFICATION

Tubular steel lighting columns, complete with base compartment fitted with treated baseboard, earthing screw and door cover with tamperproof lock. Hot dip galvanised finish, internally and externally to BS729.

Complies with BS1840.

Bracket

Mounting Plates: 150mm diameter x 6mm thick mild steel galvanised with central hole drilled and tapped M20 supplied complete with hexagon head set screw and shakeproof washers.

Cross Arm: 50mm square steel tube sealed at both ends.

Spigot Cap: Diameter to suit top shaft of column. Cable glands fitted according to the number of mounting plates. Two rows of four grub screws for positive locking.

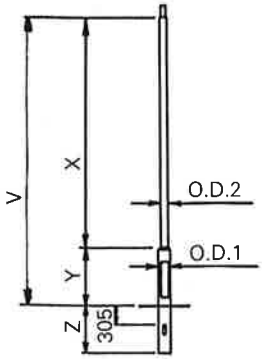
RANGE

Type of Floodlight	Nominal Mounting Height	One Flood		Two Floods		Three Floods		Four Floods	
		Cat. No.	Col. Type	Cat. No.	Col. Type	Cat. No.	Col. Type	Cat. No.	Col. Type
SB70 SB120 HAWK EGL (F69501)	5M	FC5/SB1	A	FC5/SB2	A	FC5/SB3	A	FC5/SB4	A
	6M	FC6/SB1	E	FC6/SB2	E	FC6/SB3	F	FC6/SB4	F
	8M	FC8/SB1	M	FC8/SB2	J	FC8/SB3	J	FC8/SB4	J
	10M	FC10/SB1	Q	FC10/SB2	Q	FC10/SB3	R	FC10/SB4	R
	12M	FC12/SB1	V	FC12/SB2	V	FC12/SB3	V	FC12/SB4	V
SB250 SB310 SB400 F69098	5M	FC5/SBL1	A	FC5/SBL2	A	FC5/SBL3	B	FC5/SBL4	B
	6M	FC6/SBL1	E	FC6/SBL2	F	FC6/SBL3	H	FC6/SBL4	H
	8M	FC8/SBL1	M	FC8/SBL2	J	FC8/SBL3	N	FC8/SBL4	L
	10M	FC10/SBL1	Q	FC10/SBL2	R	FC10/SBL3	R	FC10/SBL4	R
	12M	FC12/SBL1	V	FC12/SBL2	V	FC12/SBL3	W	FC12/SBL4	W
SF150 SF250 SF310 SF400 SF250M SF400M SF400C	5M	FC5/SF1	A	FC5/SF2	B	FC5/SF3	B	FC5/SF4	B
	6M	FC6/SF1	E	FC6/SF2	F	FC6/SF3	H	FC6/SF4	H
	8M	FC8/SF1	J	FC8/SF2	J	FC8/SF3	L	FC8/SF4	L
	10M	FC10/SF1	Q	FC10/SF2	R	FC10/SF3	R	FC10/SF4	U
	12M	FC12/SF1	V	FC12/SF2	V	FC12/SF3	W	FC12/SF4	W
SF600 F69099 F69141C F69142C F69156	5M	FC5/SFNG1	A	FC5/SFNG2	B	FC5/SFNG3	C	FC5/SFNG4	C
	6M	FC6/SFNG1	E	FC6/SFNG2	F	FC6/SFNG3	G	FC6/SFNG4	G
	8M	FC8/SFNG1	J	FC8/SFNG2	J	FC8/SFNG3	K	FC8/SFNG4	K
	10M	FC10/SFNG1	Q	FC10/SFNG2	R	FC10/SFNG3	S	FC10/SFNG4	T
	12M	FC12/SFNG1	V	FC12/SFNG2	W	FC12/SFNG3	X	FC12/SFNG4	Y
Nightwatch F64335 F64355 F64370	5M	FC5/NW	D	–	–	–	–	–	–
	6M	FC8/NW	F	–	–	–	–	–	–
	8M	FC8/NW	P	–	–	–	–	–	–

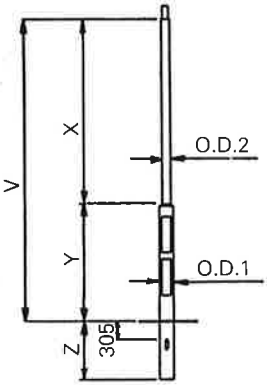
The column catalogue numbers in the table above are for complete units, i.e. column and appropriate bracket. For example, FC5/SB3 is a five metre column complete with three way bracket for mounting three floodlights from the first group.

FLOODLIGHTING COLUMNS

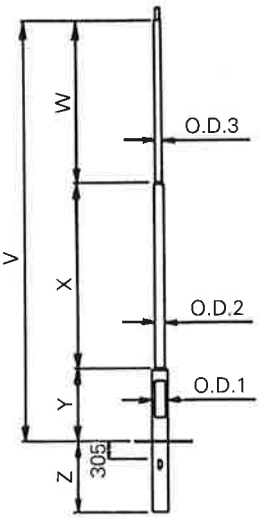
COLUMN OUTLINES



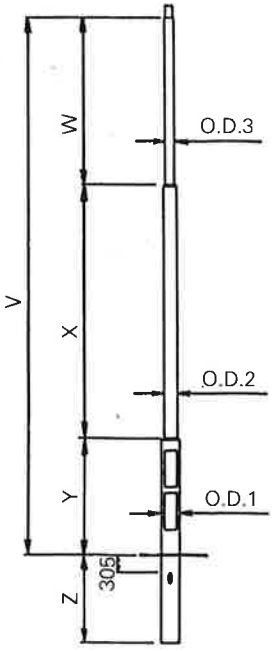
①



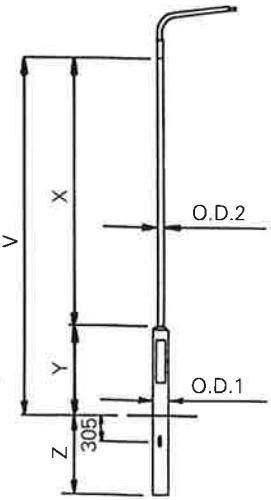
②



③



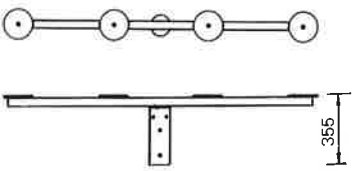
④



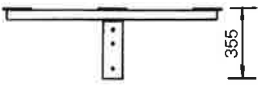
⑤

MOUNTING BRACKET ARRANGEMENTS

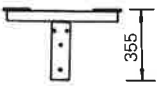
Four Floodlights



Three Floodlights



Two Floodlights



One Floodlight

COLUMN DETAILS

Column Type	Outside Diameter (mm)			Length (mm)					Outline Ref.
	1	2	3	V	W	X	Y	Z	
A	140	76	–	5000	–	4000	1000	800	1
B	168	114	–	5000	–	4000	1000	800	1
C	168	89	–	5000	–	3000	2000	800	2
D	168	89	–	5000	–	4000	1000	800	5
E	140	76	–	5250	–	4000	1250	1000	1
F	168	89	–	5250	–	4000	1250	1000	1 + 5
G	168	114	–	5250	–	3250	2000	1000	2
H	168	114	–	5250	–	4000	1250	1000	1
J	168	114	89	7250	2800	3200	1250	1200	3
K	194	140	114	7250	2050	3200	2000	1200	4
L	194	140	114	7250	2800	3200	1250	1200	3
M	140	89	–	7250	–	6000	1250	1200	1
N	168	114	–	7250	–	6000	1250	1200	1
P	168	89	–	7250	–	6000	1250	1200	5
Q	168	114	89	9250	3625	4375	1250	1500	3
R	194	140	114	9250	3625	4375	1250	1500	3
S	194	140	114	9250	2875	4375	2000	1500	4
T	219	140	114	9250	2875	4375	2000	1500	4
U	219	168	114	9250	3625	4375	1250	1500	3
V	194	140	114	11250	4550	4950	1750	1700	3
W	219	168	140	11250	4550	4950	1750	1700	3
X	219	168	140	11250	4875	4375	2000	1700	4
Z	244	168	140	11250	4875	4375	2000	1700	4

BASE COMPARTMENT DETAILS

Column Type	Door Opening Size (mm)	Base Board Size (mm)
A, E, M (140mm diameter base)	106 x 629	95 x 683
B, C, D, F, G, H, J, N, P, Q (168mm diameter base)	121 x 629	108 x 683
K, L, R, S, V (194mm diameter base)	127 x 629	121 x 683
T, U, W, X, Z (219mm and over diameter base)	127 x 629	146 x 683

FLOODLIGHTING

Floodlighting serves a variety of purposes, from the purely decorative to the functional, for work security or recreation after dark. Where the visual effect is the main objective, as for floodlighting a building, only general guidelines can be given on the lighting levels, the use of colour etc.

Site conditions will normally dictate the type of floodlighting to be used for buildings, thus defining to a large extent the pattern of lighting and the appearance of the building. Sometimes, however, favourable site conditions offer a freedom of choice so that the designer can decide the most suitable form of lighting.

Precise specifications are laid down for floodlighting working areas, and these have to be matched by equally precise calculation methods. However, a simple rule of thumb guide is given for lighting small areas under 'Area Floodlighting'.

CLOSE OFFSET LIGHTING OF BUILDINGS

Floodlights are normally spaced close to the facade of a building, mounted at ground level and lighting upwards.

The most suitable type of floodlight is rectangular with a linear lamp to give a fan shaped beam, i.e. a beam with wide horizontal but limited vertical spread.

Floodlights such as **Capital, EGL** and **Hawk** incorporate tungsten halogen lamps and provide instant white light and low installation costs. Alternatively, **Solarflood** and **Solarbeam** with **Solarcolour** lamps produce a warm golden white light and are more economical to run. The **Solarflood** can also be used with Blue or Green MBI lamps to create a striking appearance with saturated colours. For recommended illuminance see Table 1.

The spacing of rectangular floodlights should not exceed twice the offset distance except where non-uniformity is acceptable. The approximate light output of the lamp required from each floodlight is estimated from the following rule of thumb:–

$$\text{Lamp LDL} = \frac{3 \times \text{area of face of building} \times \text{illuminance}}{\text{number of floodlights}}$$

The factor 3 makes allowance for the efficiency of the average floodlight and for a maintenance factor of 0.8.

LONG RANGE FLOODLIGHTING OF BUILDINGS

This describes a form of lighting which gives a similar effect to sunlight when the sun is low in the sky. Floodlights are used in single or multiple groups at long range from the building with the main direction of lighting from each group kept reasonably constant. Some fill-in lighting from a direction opposite to the main flow of light may be used to soften the strong modelling effects.

Euroflood and the **Multi-purpose Flood** using **Solarcolour** metal halide or mercury fluorescent lamps are particularly suitable for this type of lighting. For recommended illuminance see Table 1.

In designing the installation the total lamp flux required can be estimated by the following formula

$$\text{Total lamp flux} = 4 \times \text{area of facade} \times \text{objective illuminance}$$

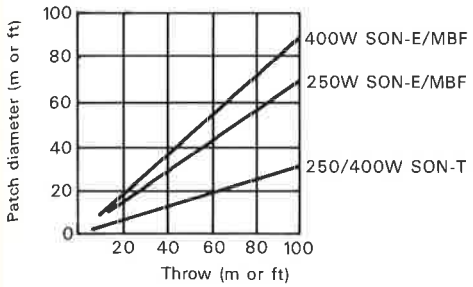
The factor 4 makes allowance for the floodlight efficiency and for a maintenance factor of 0.8.

Whilst complete uniformity is not practical, a patchy appearance must be avoided. As a

guideline, the individual beams should overlap each other so that the next beam is aimed at a point where the intensity of the first floodlight has fallen to about 1/5th of its maximum.

GUIDE TO PATCH SIZE

EUROFLOOD (F69156)



AREA FLOODLIGHTING

It is assumed that the area to be floodlit will be occupied by people who have some visual task to perform. The aim in floodlighting is to give good visibility with the minimum of glare.

For small areas from low mounting heights **Nightwatch, EGL** and **Hawk** are all suitable. For larger areas from medium mounting heights **Solarfloods, Solarbeams, Capital** and **Eurofloods (F69156)** are recommended. For sports and industrial lighting from high towers or masts, **Stadia** and **Eurofloods (F69157)** are especially suitable.

A rough estimate of the total lamp lumens to give an average horizontal illuminance can be obained as follows:–

For rectangular floodlights, the total lamp lumens = 3 x illuminance x area.

For circular floodlights the total lamp lumens = 4 x illuminance x area.

Recommended illuminance values are given in Table 2.

SECURITY LIGHTING

Floodlighting buildings for commercial or aesthetic purposes will also provide a deterrent to vandals. Lighting purely for security has proved expensive in the past but this has been largely solved with the introduction of low wattage low pressure sodium lamps and, more recently, the **Opus** compact fluorescent range. **Nightwatch** and **Valiant** bulkheads with **Opus** lamps are ideal for security lighting in small shop premises and around the home – outside doorways, garages and driveways. **Nightwatch 35, 55** and **70** with SOX or SON lamps are suitable for outside areas of up to 400 square metres, such as the back of shop premises, small car parks, or small industrial areas.

SECURITY FOR LARGE INDUSTRIAL AREAS

The illuminance levels for security lighting should be between 10 and 20 lux using robust luminaires in fairly inaccessible locations. For perimeter fences, light from within, training the floodlights on the fence. For long lengths of fence such as around aerodromes, generating stations etc high efficiency sources, such as **Solarcolour** lamps, should be used. The linear **Solarcolour** is particularly suited to this purpose.

It is important that the guard in the gatehouse has sufficient light to see into the distance, also a local floodlight for examining vehicles coming up to the gatehouse, but ensure that the guards within are not illuminated. Light the open areas within the boundary fences.

FLOODLIGHTING

SPORTS LIGHTING

The players or participants in football, field sports, track events and other similar activities need relatively low illuminances. The following are a guide to requirements.

Football, Rugby, Hockey, Field events – 50 lux
Track events – 30 lux
Play areas – 30 lux

Spectators at these events are likely to need higher lighting levels to follow the play in detail. For small grounds holding 5,000–10,000 spectators, an illuminance of 100–150 lux is adequate.

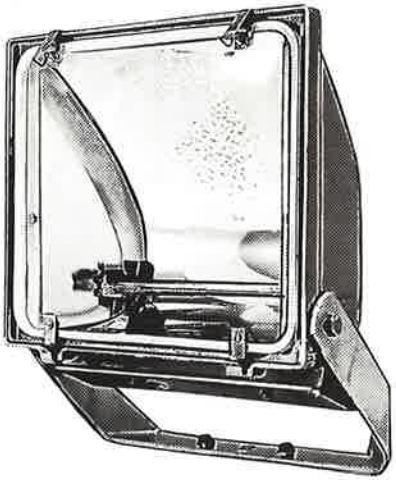
Colour television calls for very high levels in a plane at right angles to the camera axis. The BBC recommendation is 1400 lux.

Table 1 Recommended illuminance values (lux) for floodlighting buildings.

MATERIAL	CONDITION	DISTRICT BRIGHTNESS		
		Low	Medium	High
White glazed brick	fairly clean	20	40	65
Portland stone	fairly clean	40	60	100
Concrete	fairly clean	50	80	130
Middle stone	fairly clean	60	100	160
Dark stone	fairly clean	60	100	160
Yellow brick	fairly clean	70	120	200
Red brick	fairly clean	85	150	250

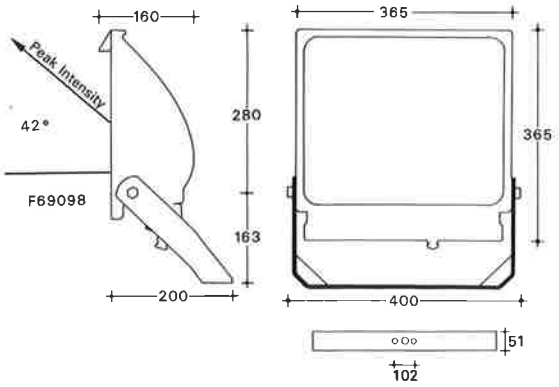
Table 2 Recommended illuminance values (lux) for area lighting.

Pedestrian walkways, building sites, security areas, storage areas	10 lux
Car parks, vehicle movement, non critical working areas	20 lux
Critical working areas, docks, recreational sports	50 lux
Hoardings, car lots, spectator sports	100 lux



Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
		Candelas per			Vertical			Vertical	
Watts	Type	1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
750 1000 1500	K3 K4 K5	1500	42	100	20	64	160	30	110



CENTRAL HOLE 20 mm CLEAR
2 • 11 mm CLEAR HOLES

Tungsten Halogen Floodlight

CAPITAL

Capital floodlights are designed for use with 750, 1000 and 1500 watt tungsten halogen lamps. They have asymmetrical reflectors which make them equally suitable for lighting large areas such as car parks or building facades from ground level. Tennis courts and sports fields are other applications.

★ Asymmetric reflector ★ Accurate beam control ★ Designed for 750, 1000 and 1500W TH lamps ★ Toughened glass ★ Dust proof ★ Splash proof ★ Cool wiring chamber ★ Supplied with lamp coolers.

SPECIFICATION

F69098 Weight 6.4kg. Windage area 0.134m².

Body: Corrosion resistant aluminium casting.

Reflectors: Constructed from high purity aluminium brightened and anodised.

Glass: Frameless and toughened, held in position by stainless steel hinges and toggles against a silicone rubber gasket.

Lampholders: Die castings housing R7s single contact bolted to the body for 1500 watt lamps. Brackets are provided which adjust the lampholder position to suit 750W and 1000W lamps. Patented lamp seal coolers are provided.

Terminal Chamber: LM6M die casting spaced from the back of the floodlight for cool running. The chamber has a gasketted lid and cable gland for 4-7mm O.D. cable. High temperature glass fibre insulated nickel conductors lead from the terminal block to the lampholders.

Fastenings: All external fastenings are stainless steel.

Cradle: Galvanised steel fastened to the body against friction bosses. One central 20mm clearance hole and two 11mm holes at 102mm centres are available for fixing. The two latter holes fit the F69126 spigot cap.

Complies with BS4533.

Ingress Protection I.P. 54. Dust proof and splash proof

Accessory: F69126 Spigot cap.

Spares

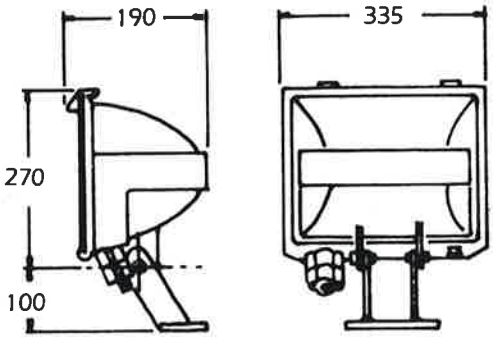
F69098GOL	Spare front glass with fixings
F69098HDR	Spare lampholder assembly
F69098CA	Spare lamp cooler assemblies (pack of 10)

For tungsten halogen lamps see page 197.

Tungsten Halogen Floodlight

Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
					Vertical			Vertical	
Watts	Type	Candelas per 1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
750 1000	K3 K4	1050	0	102	38	38	170	85	85



Tungsten Halogen Floodlight E.G.L.

A new light weight economic floodlight for 750W and 1000W tungsten halogen linear lamps - for indoor and outdoor use.

★ Enclosed glass fronted Linear Halogen floodlight ★ Toughened glass ★ Low installation cost ★ Dust proof ★ Splash proof ★ Corrosion resistant ★ Interior and exterior use ★ Lamp coolers supplied.

SPECIFICATION

F69501 Weight 4.5kg Windage Area 0.10m²

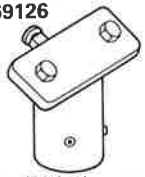
Body: Pressure die cast aluminium alloy finished stove enamelled brown paint.
Reflectors: Brightened, anodised, hammer finish aluminium.
Glass: Frameless and toughened, held in position by stainless steel hinges and toggles against a silicone rubber gasket.
Lampholders: R7S with ceramic insulation.
Terminal Chamber: Polycarbonate with nylon cable gland, for 4-7mm O.D. cable.
Fastenings: Stainless steel.
Cradle: Pressure die cast aluminium alloy with one 21mm central and two 11mm holes at 102mm centres.

Designed to comply with BS4533.

Ingress Protection I.P.54 Dust proof and splash proof.

Mounting Accessory

F69126

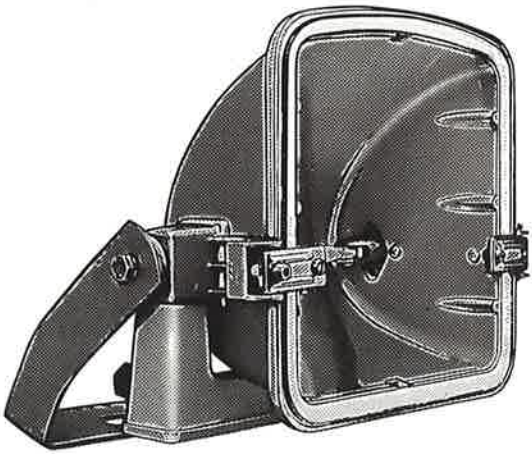


Spigot bracket for post top mounting on 2" pole

SPARES

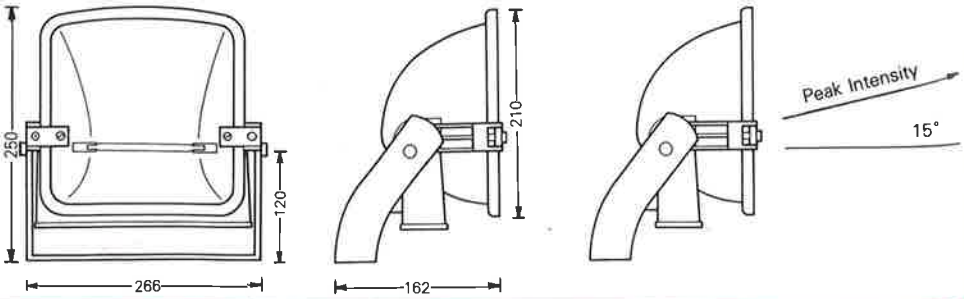
F69501HDR	Lampholder
F69501CA	Cooler assembly (Pack of 10)
F69501GOL	Glass complete with fastenings.

For tungsten halogen lamps see page 197.



Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
		Candelas per			Vertical			Vertical	
Watts	Type	1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
200 300 500	K11 K9 K1	1100	15	94	34	54	130	50	80



Tungsten Halogen Floodlight HAWK

The Hawk floodlight has been designed for both interior and exterior use. It is dust proof and splash proof and may be used in dusty or corrosive atmospheres. It can be aimed upwards for lighting posters, fountains etc. and downwards for area lighting.

★ Interior and exterior use ★ Lightweight ★ Corrosion resistant ★ Toughened glass ★ Dust proof ★ Splash proof ★ Cool wiring chamber ★ Asymmetric reflector.

SPECIFICATION

HAWK
HAWK 324
HAWK 524 (L)

Weight 2.2kg Windage Area 0.05m²

Body: Pressure die cast aluminium alloy finished with heat resistant silver grey paint.

Reflector: Brightened, anodised, hammer finish aluminium.

Glass: Annealed and toughened, fastened to stainless steel hinge and locked to floodlight with stainless steel Allen screw against a silicone rubber gasket.

Lampholders: R7s with porcelain surround in cast aluminium bracket.

Terminal Chamber: Glass reinforced plastic with aluminium cover plate containing three way 4mm² terminal block and fitted with nylon cable gland for 4-7mm O.D. cable.

Fastenings: All external fastenings are stainless steel.

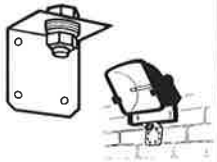
Cradle: Galvanised steel with one 21mm central and two 11mm holes at 102mm centres.

Designed to comply with BS4533

Ingress Protection I.P. 54 Dust proof and splash proof.

Accessories

HAWK BKT

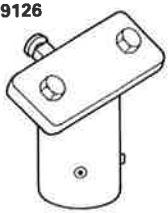


Stainless steel multi-purpose bracket

MULTI UCB

2" pole clamps to use with HAWK BKT for fixing to horizontal or vertical poles (e.g. scaffold poles).

F69126



Spigot bracket for post top mounting on 2" pole.

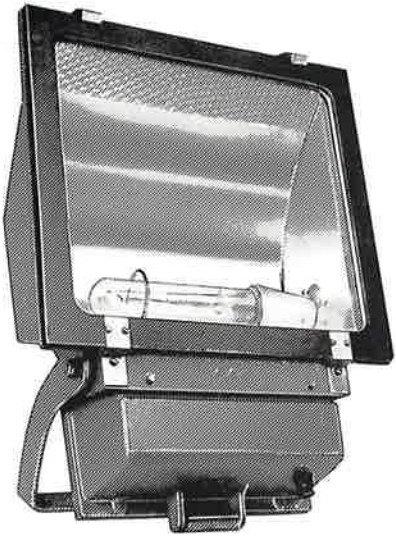
F64106 KEY

4mm Allen Key.

RANGE

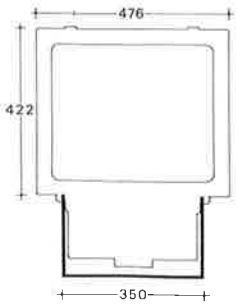
Catalogue No.		Lamps	
		Volts	Watts
HAWK		110/115 220/230 240/250	300/500 200/300/500 200/300/500
HAWK 324	Supplied complete with lamp	240/250	300 K9
HAWK 524	Supplied complete with lamp	240/250	500 K1

For tungsten lamps see page 197.

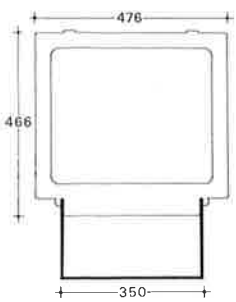


Abridged Photometric Data

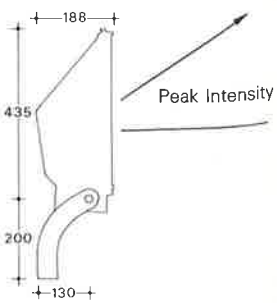
Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
					Vertical			Vertical	
Watts	Type	Candelas per 1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
150	SON-E	330	24	147	48	70	150	52	78
	SON-T	1220	39	109	18	58	130	20	60
250	SON-E	310	22	148	48	78	152	50	90
	SON-T	1130	34	111	25	67	134	27	110
310/400	SON-E MBF	305	23	148	50	76	153	55	90
	SON-T MBI	1100	40	116	25	66	136	28	110
600	SON-T	970	40	113	20	65	142	26	71



SF150–400



SF600



Integral Gear Floodlights

SOLARFLOOD

A range designed to meet the growing demand for floodlights with prewired integral control gear. They are suitable for both tubular and elliptical discharge lamps up to 400 watts. The floodlights incorporate a plug and socket connection between the control gear and floodlight. This facility reduces installation time and enables the floodlight to be isolated from the mains supply when carrying out maintenance. An exception to the foregoing is the SOLARFLOOD 600 which takes lamps from 150 watt to 600 watt with control gear mounted remotely.

SPECIFICATIONS

SF150-400: Weight 19kg Windage area 0.27m².

Body: Cast from LM6M corrosion resistant aluminium alloy.

Glass: Toughened and heat resisting. Fastened to glazing frame by stainless steel clamps against a specially formed silicone rubber gasket. A second gasket seals the glazing frame against the floodlight body.

Stirrup: Galvanised steel with friction pad washers. One central 20mm and two 11mm holes at 102mm centres are provided for mounting.

Gear Box Body: Cast LM6M corrosion resistant aluminium alloy. A terminal block for 6mm² cable also serves as a socket for the plug connected to the control gear mounted on the gear tray lid. A cable gland is fitted to the underside of the box which accepts cable from 4-7mm O.D.

Gear Tray/Lid: Cast LM6M corrosion resistant aluminium alloy. When open the lid is supported by a stainless steel hinge.

240 volt 50 Hz HPF control gear is mounted on the lid together with an electronic igniter in the case of high pressure sodium gear. Secured to the body by four stainless steel screws against a neoprene rubber gasket.

Lampholder: Porcelain GES which is adjustable to suit both tubular and elliptical lamps.

Reflector: High purity aluminium. The optic is an asymmetric parabola giving a peak intensity above the normal to the glass.

SF600: Weight 11kg Windage area 0.22m².

As above but without gear box. A specially designed terminal chamber contains a terminal block for 6mm square cable prewired to the GES lampholder. The terminal chamber is terminated by a cable gland which accepts cable from 4-7mm O.D.

Comply with BS4533, 102.5.

Ingress Protection I.P. 64. Dust tight and Splashproof.

Max. Ambient 45°C.

Accessory: F69126 Spigot cap.

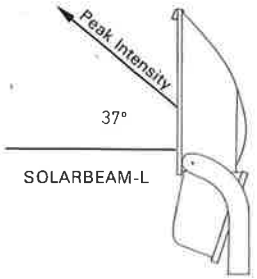
RANGE

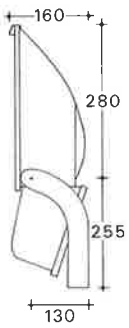
Complete Flood Cat. No.	Lamp Type	Components	
		Basic Flood with gear box body Cat. No.	H.P.F. Prewired Gear Tray Lid Cat. No.
SF150 SF250 SF310 SF400 SF250M SF400M SF400C	150W SON 250W SON 310W SON 400W SON 250W MBF 400W MBF 400W MBI	SFB	GT150 GT250 GT310 GT400 GT250M GT400M GT400C
SF600	600W SON	SF600	Remote Gear

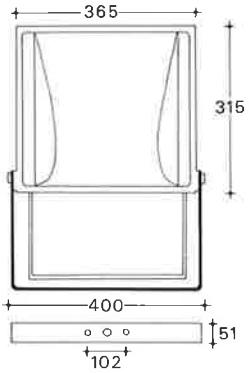
For details of Floodlighting Columns see pages 106 to 109 Section 10.
For suitable remotely mounted gear SF600 see pages 160 to 163 Section 13.

Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
		Candelas per			Vertical			Vertical	
Watts	Type	1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
250	SON-L	717							
310	SON-L	714	37	120	32	61	140	35	92
400	SON-L	713							







CENTRAL HOLE 20 mm CLEAR
2 × 11 mm CLEAR HOLES

Integral Gear Floodlight

SOLARBEAM L

Solarbeam-L has been designed for use with Solarstream slim double ended high pressure sodium lamps.

★ Dust tight ★ Splash proof ★ Indoor and outdoor use ★ Asymmetric light distribution ★ Building facade lighting from ground level ★ Sports hall and Amenity lighting ★ General area floodlighting ★ Plug and socket connection.

SPECIFICATION

SB250, SB310, SB400: Weight 15kg Windage area 0.195m².

Body: LM6M corrosion resistant aluminium alloy casting.

Reflectors: The main and side reflectors are made from high purity aluminium brightened and anodised.

Glass: Frameless, toughened, held by stainless steel hinges and clips against a silicone rubber socket.

Gear Box Body: Cast LM6M corrosion resistant aluminium alloy. A terminal block for 6mm² cable also serves as a socket for the plug connected to the control gear mounted on the gear tray lid. A cable gland is fitted to the underside of the box which accepts cable from 4-7mm O.D.

Gear Tray/Lid: Cast LM6M corrosion resistant alloy. When open the lid is supported by a stainless steel hinge, tapped 220 + 240 volt 50Hz HPF control gear is mounted on the lid together with an electronic starter. Secured to the body by four stainless steel screws against a neoprene rubber gasket.

Fastenings: All external fastenings are stainless steel.

Cradle: 5mm galvanised steel with 20mm central and two 11mm holes at 102mm centres.

Complies with BS4533 102.5

Ingress Protection I.P. 64 Dustproof and Splashproof.

Maximum Ambient 45°C.

Accessory: F69126 Spigot Cap.

Spares: **F69098GOL** Glass complete with hinges and toggle catches.
F1991 Lamp connector.

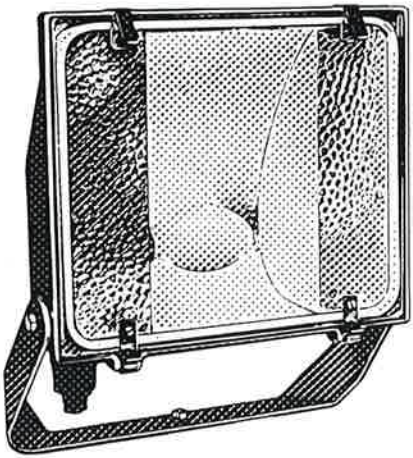
RANGE

Complete Floodlight Cat. No.	Lamp	Components	
		Floodlight with Gear Box Cat. No.	H.P.F. Prewired Gear Tray Lid Cat. No.
SB250 SB310 SB400	250W SON-L 310W SON-L 400W SON-L	SBB	GT250 GT310 GT400

For lamp details see page 224.

For details of suitable floodlighting columns see pages 106 to 109.

SOLARBEAM 70 and 120 *Integral Gear Floodlights*

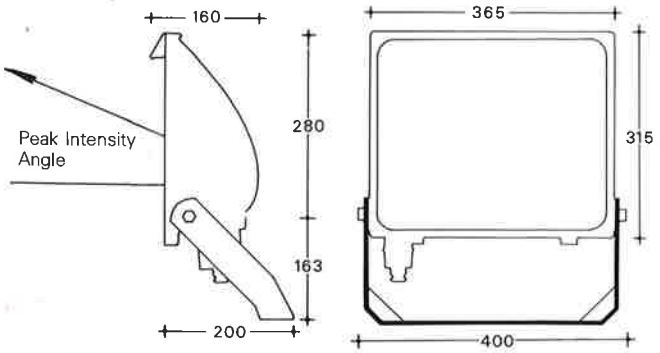


SB70

SB120

Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
					Vertical			Vertical	
Watts	Type	Candelas per 1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
70	SON-E	360	23	144	51	68	152	53	68
120	SON-E	500	18	132	56	57	146	57	63



Integral Gear Floodlights SOLARBEAM 70 and 120

These floodlights have been derived from the well established Capital floodlight. They house integral control gear for either 70 watt or 120 watt high pressure sodium lamps.

★ Supplied complete with lamps ★ Dust tight ★ Splash proof ★ Fast installation ★ Low running cost ★ Amenity lighting ★ Small car parks ★ Vertical surfaces from close offset ★ Light output equivalents: Solarbeam 70-300W T.H. lamp, Solarbeam 120-500W T.H. lamp.

SPECIFICATION

SB70, SB120 Weight 8.3kg Windage Area 0.118². (L)

Body: Cast aluminium corrosion resistant alloy. Finished stove enamelled hammer grey. The side compartments house the high power factor tapped 220 and 240V control gear. The Solarbeam 70 has, in addition, an electronic starter.

Reflectors: Brightened and anodised aluminium. The main reflector is in the form of an asymmetric parabola giving peak intensities at angles of 18° and 23° above the normal to the glass.

Glass: Frameless and toughened, held in position by stainless steel hinges and toggles against a silicone rubber gasket.

Lampholder: Porcelain E27 (ES).

Terminal Chamber: Made from polycarbonate with 3 way terminal block. The cable entry is via a nylon gland for 4-7mm diameter cable. This feature allows mains wiring without gaining access to the interior.

Fastenings: All external fastenings are stainless steel.

Cradle: 5mm galvanised steel with one 20mm central and two 1mm holes 102mm centres.

Comply with BS4533.

Ingress Protection: I.P. 64 Dust tight and splash proof.

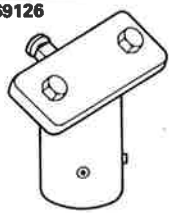
Accessory: F69126 Spigot cap.

Spares:

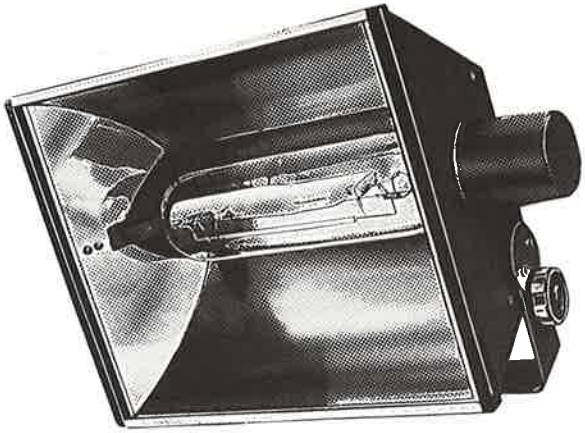
F69098GOL – Glass complete with hinges and toggle catches.

For details of suitable floodlighting columns see pages 106 to 109.

F69126

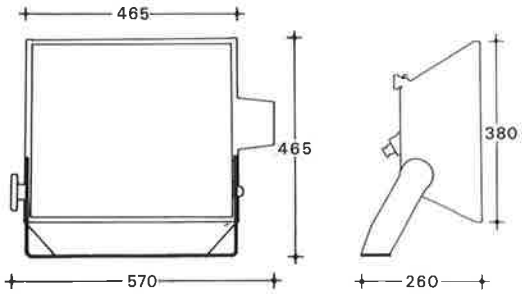


Spigot bracket for post top mounting on 2" pole.



Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
					Vertical			Vertical	
Watts	Type	Candelas per 1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
F69141C									
2000	MBI	1137	-1	112	48	48	140	65	80
F69142C									
1000	SON-T	1360	-2	106	28	38	180	82	86



Sports and Industrial Floodlighting

STADIA

These floodlights have been specially designed for (a) lighting of sports stadia where high illumination levels and excellent colour rendering are essential to satisfy the needs of colour TV cameras; and (b) for lighting large industrial areas from medium and high tower heights to provide good lighting levels for movement, security and construction work for a modest power consumption.

★ Relamping from the rear ★ Lamp steady fitted ★ Separate polycarbonate terminal chamber for easy wiring ★ Corrosion resistant ★ Protractor scale fitted.

SPECIFICATIONS

F69141C 2kW MBI Weight 12kg Windage area 0.223m²

F69142C 1kW SON-T Weight 12kg Windage area 0.223m²

Body/Reflector: Corrosion resistant aluminium extrusion in three sections. The bottom and centre sections are brightened and anodised; the top section is deep etched and anodised to give an asymmetric distribution in the vertical plane. Cast aluminium ends carry the side reflectors which are brightened and anodised. The centre section is hinged for lamp replacement from the rear without disturbing the aiming angle. A protractor scale is provided on one side for accurate aiming.

Glass: Toughened, sealed to floodlight by silicone rubber gasket.

Lampholder: Porcelain E40 GES

Cradle: Mild steel finished with dark green paint. A 21mm central hole is provided for mounting together with two 11mm holes at 102mm centres.

Terminal Chamber: Polycarbonate with three way 6mm² terminal block. The cable entry is via a nylon cable gland, capacity 4-7mm diameter.

Fastenings: All external fastenings are stainless steel.

For suitable remotely mounted control gear, see pages 162 and 163.

Complies with BS4533 102.5.1981.

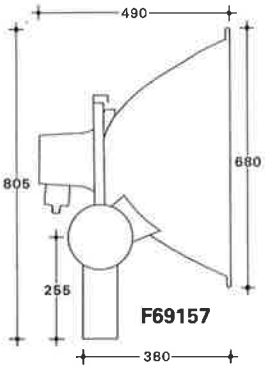
Ingress Protection: I.P.35 Jet proof.

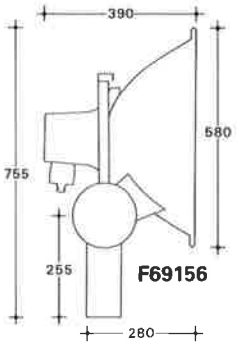
For details of lamps for use in these floodlights see pages 212 and 223.

For suitable floodlighting columns see pages 106 to 109.

Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Park			Cut-off Angle		
					Vertical			Vertical	
Watts	Type	Candelas per 1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
F69156									
250	MBF/U SON-E	2050	–	56	28	28	160	80	80
	SON-T	7800	–	26	13	13	140	70	70
310 / 400	MBF/U SON-E	1530	–	68	34	34	160	80	80
	SON-T	11300	–	22	11	11	110	55	55
F69157									
600	SON-T	7450	–	30	15	15	120	60	60
700	MBF/U	1350	–	78	39	39	120	60	60
1000	SON-T	5350	–	34	17	17	140	70	70
1000	MBF/U	975	–	90	45	45	146	73	73





Symmetrical Beam Floodlighting EUROFLOODS

Two floodlights designed for lighting large areas where long and medium throws are required. Special attention has been paid to the requirement for upward lighting in industrial and building facade applications.

★ Dust tight ★ Jet proof ★ Narrow beam (Tubular lamp) ★ Medium beam (Elliptical lamp) ★ Suitable for upward lighting ★ Re-lamps from the rear. ★ Aiming protractor fitted ★ Corrosion resistant.

SPECIFICATIONS

F69156: Weight 11.5kg Windage area 0.264m²
F69157: Weight 13kg Windage area 0.363m²

Body: Die cast corrosion resistant aluminium alloy casting with a lamp steady for positive lamp retention and a specially designed polycarbonate terminal chamber prewired to the E40 GES lampholder.

Reflector: Aluminium spinning, brightened and anodised. The reflector is fitted with a corrosion resistant cast aluminium bracket, which is secured to the main steel cradle by stainless steel nuts. An auxiliary stainless steel cradle holds the body in position against the reflector and silicone rubber gasket. Relamping is from the rear without disturbing the aiming angle.

Glass: Toughened and heat resistant fitted to the reflector by a glazing ring sealed with silicone rubber.

Cradle: Galvanised 5mm steel with 20mm clearance central and two 11mm holes at 102mm centres. The cradle is fitted with a protractor scale to assist in aiming.

Complies with BS4533, 102.5

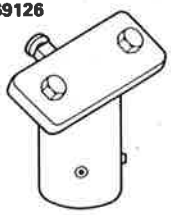
Ingress Protection I.P. 65. Dust tight and Jet proof.

Accessory: F69126 Spigot cap.

Lamp Types: (for details see pages 185, 211, 212, 223-225).

F69156: 150W-400W SON-T, SON-E; 250W-400W MB, MBF, MBI; 500W GLS and B2.
F69157: 600W-1000W SON-T; 700W-1000W MBF; 1000W MB and 1000W-1500W GLS and B2.

F69126



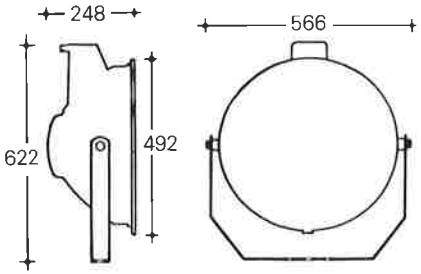
Spigot bracket for post top mounting on 2" pole.

For suitable remotely mounted control gear see pages 160 and 163.

For details of suitable floodlighting columns see pages 106 to 109.

Abridged Photometric Data

Lamp		Peak Intensity		Beam Angle to 1/10th Peak			Cut-off Angle		
					Vertical			Vertical	
Watts	Type	Candelas per 1000 lumens	Angle	Horizontal	Above Peak	Below Peak	Horizontal	Above Peak	Below Peak
150-400	SON-E MBF/U	1280	–	82	40	40	160	80	80
150-400	SON-T MB, MBI	4530	–	26	21	21	160	80	80



MULTI-PURPOSE FLOOD

This versatile floodlight is the low budget answer to a wide range of floodlighting requirements. It offers a large choice of lamp types from 500/1000 watt tungsten to 150/400 watt discharge.

★ Wide vertical beam★ Medium horizontal beam (Elliptical lamp) ★ Narrow horizontal beam (Tubular lamp)★ Specially suitable for building facade illumination ★ 360° Mounting facility ★ Economically priced.

SPECIFICATION

F69099 Weight 8.1kg Windage Area 0.25m²

Body: Die cast aluminium, with cable gland for 4-7mm o.d. cable.
Reflector: Spun aluminium, brightened and anodised inside, anodised externally.
Glass: Toughened, heat resisting, held by glazing ring and U ring gasket.
Lampholder: Skirted porcelain E.40 GES.

The incoming mains cable is wired direct to the lampholder. High temperature sleeving is provided to protect incoming cables.

Fastenings: All external fastenings are stainless steel.
Cradle: Galvanised 5mm steel with 20mm central and two 11mm holes at 102mm centres for mounting F69126 spigot cap.
Lamp Types: 150W-400W SON-E, SON-T, 250W-400W MBF, MBI and 500W-1000W GLS and B2.

For details see pages 185, 211, 212, 223-225.

For suitable remote control gear see pages 160 and 161.

Complies with BS4533. 102.5 1981.

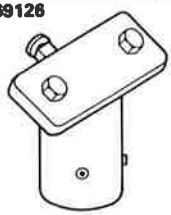
Ingress Protection I.P.54. Dust proof and Splash proof.

Accessory: F69126 Spigot cap.

Spares:

F69099GAS	Gasket
F69099GOL	Glass
Z1044	Porcelain lampholder

F69126



Spigot bracket for post top mounting on 2" pole.

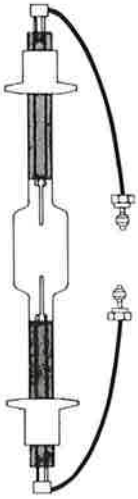
For details of suitable floodlighting columns see pages 106-109.

MEI FLOODLIGHT

2.5kW MEI SPORTS FLOODLIGHT

This floodlight has been developed to utilise the 2500W MEI/H lamp detailed on page 235. It has been designed to produce a narrow beam of high intensity suitable for long throw floodlighting with virtually no light spill. These features make it ideal for large sports arenas where television requirements demand high lighting levels of good colour a long distance from the towers or masts.

Its extremely high intensity, i.e. 9,000,000 candelas peak intensity, also make it suitable for searchlight type applications.



SPECIFICATION

Lamp compartment: Made of two aluminium castings hinged to allow access for lamp changing without disturbing the aiming angle. A choice of specular aluminium reflectors is available to obtain different beam widths and intensities. When an even sharper cut-off is required above the peak, a louvre can be fitted to eliminate glare and light spill. To enclose this compartment a toughened front glass is sealed to the front casting using a silicone rubber gasket.

Starter compartment: This also consists of two castings sealed with a silicone gasket. It houses the starter and terminal block. A cable gland gives access for wiring-in the 3 phase supply.

Cradle: Made in galvanised mild steel, it incorporates a protractor plate for alignment and a device for locking the floodlight in the desired position.

Designed to comply with BS4533.

Ingress Protection: I.P. 65. Dust tight and Jet proof.

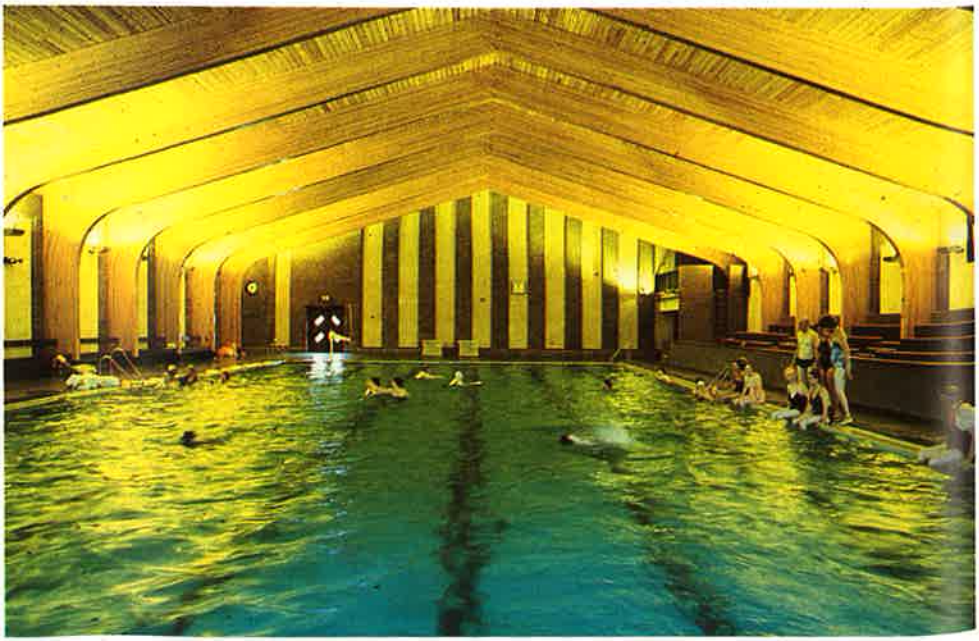
Further details and guidance on the use of this floodlight are available on request.

Pandoro's security-bonded compound at Fleetwood Docks is floodlit by 400W Solarcolour Plus lamps in Eurofloods mounted on high mast columns.

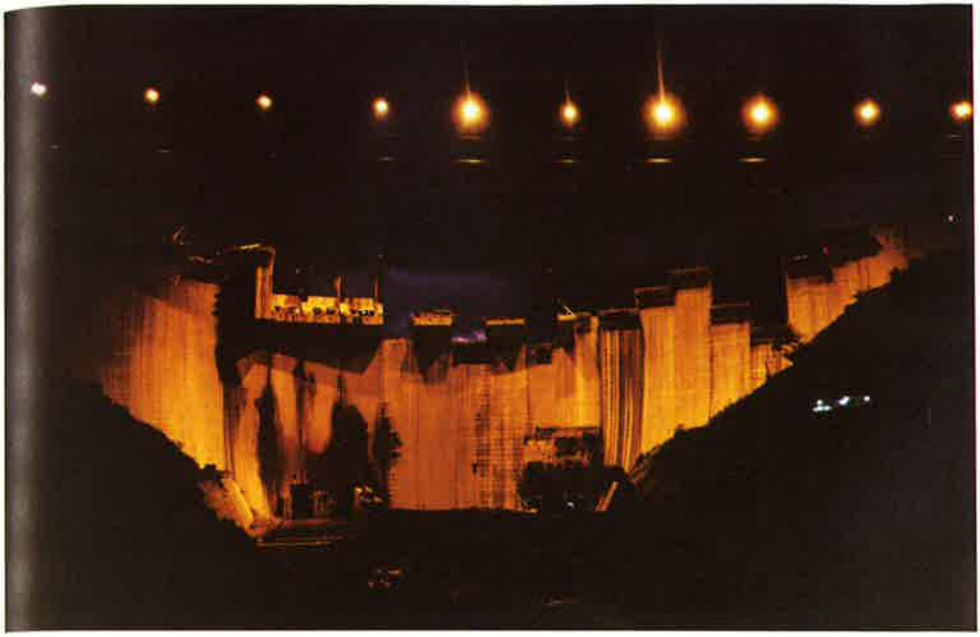
GEC Spacelight lanterns with 400W SON-T lamps are mounted on 30 metre masts to floodlight Strathclyde Regional Council Shieldhall Sewage Works in Glasgow.

INSTALLATIONS

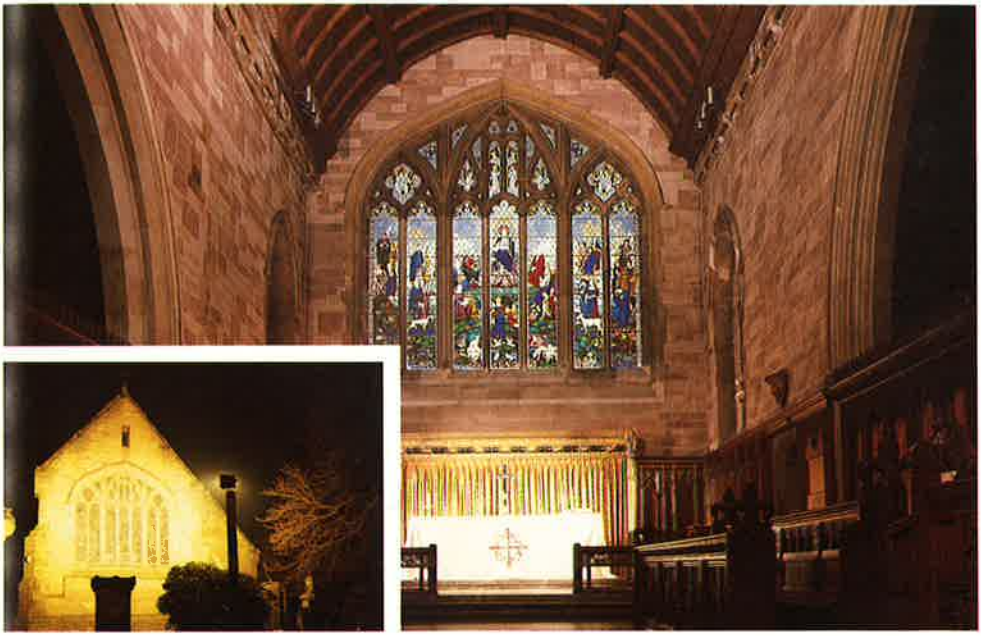
The Grandstand at Ipswich Town Football Club is lit by Solarfloods with 250W Solarcolour lamps.



Wall-mounted Solarbeam floodlights with 400W Solarcolour lamps shine upwards to reflect off the timbered ceiling of this swimming pool at Telford.



The Victoria Dam, Sri Lanka. Floodlit by Stadia floods with 1 kW Solarcolour SON-T lamps suspended over the dam by a catenary wire.



By night, a single 1000W EGL tungsten halogen floodlight illuminates the stained glass window above the altar of St. Mary's Church at Moseley in Birmingham. The flood shines onto the exterior of the window to turn night into day.

INSTALLATIONS

The multi-sport Gay Dawn Sports complex at Fawkham Valley, Kent, is lit by 400W Solarcolour De Luxe lamps in Champion fittings, protected by polycarbonate covers.

Harrier fittings with 150W Solarcolour lamps light the Royal Marines church of St. Michael and All Angels in Deal, Kent; they are supplemented by 150W Solarfloods.

Over 3000 plug-in 310W Solarcolour Plus Lamps in Hi-Saver fittings are used to light the Land Rover sub-assembly factory at Solihull in Birmingham.

Uplighters with 250W Solarcolour De Luxe lamps provide a restful atmosphere for the police officers in the Avon and Somerset Divisional Control Room.

INSTALLATIONS

The British Steel Corporation at Ravenscraig has changed its lighting to 600W Solarcolour lamps from 1kW mercury, increasing the illumination by 20% and decreasing the lighting load by 40%.

Hi Saver fittings with 400W Solarcolour lamps light the steel plate fabrication bays at Govan Shipbuilders in Glasgow.

Behind the decorative metal chandeliers in the dining room of the Royal Insurance Group, Liverpool, are Harrier low bay fittings incorporating 150W Solarcolour De luxe lamps.

Nightwatch fittings with 18 and 55 watt Super SOX lamps provide security lighting at the Lion House Mobile Home Park at Hailsham, Sussex.

INTRODUCTION

GEC (Street Lighting) Limited offer a total outdoor lighting service to all home and overseas customers. All aspects of road lighting are covered from motorways to residential streets. Many lanterns are suitable for factory roads, loading areas, dockyards, car parks and industrial or commercial estates.

A wide selection of decorative and amenity lanterns are available in modern or traditional styles and special designs can be produced for particular requirements.

High mast lighting was pioneered in Great Britain by GEC Street Lighting in 1964. Since that date the company have continued as market leaders in the design and development of this lighting technique and manufacture and supply equipment worldwide.

GEC are the experts in the lighting of tunnels and underpasses and a large choice of purpose designed lanterns are available to meet any requirement

A range of lighting columns in hot dip galavanised steel for main and side roads is available. In addition side road columns can be supplied from stock made in lightweight aluminium or reinforced glass fibre.

GEC high quality control gear is available for operating the full range of discharge lamps and includes high efficiency low watts loss sodium ballasts giving significant energy savings.

All necessary accessories, control gear boxes, wall mounting and wood pole clamp brackets are available.

Severn Bridge, using 250W SONP-T Plus lamps and Z8611 lanterns

Z8524 Cutoff.
Z8526 Semi-Cutoff.
For use with 250-400 watt Truelite MBF/U or 250-400 watt Solarcolour SON lamp.

The lantern is for lighting traffic routes to BS5489. For mounting heights up to 10 metres the 250W SON, 250W or 400W MBF/U lamp can be used. For 12 metres the 400W SON is required. It complies with BS1788, is kite marked and D.O.T. accepted.

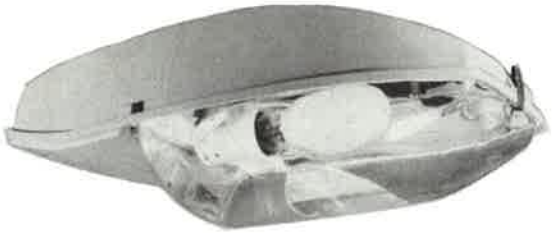
Side entry mounting socket accepts a 125mm long spigot 42mm in diameter. Pressed aluminium reflector optic, polished and anodised. Die cast alumiunium end support. The body is enclosed by a hinged injection moulded Diakon bowl.

Length 77.5cm Width 50cm Depth 30.5cm Weight 4.99kg Wind Area 0.173m²

Z8534 Cutoff.
Z8536 Semi-Cutoff.
For use with 250-400 watt Truelite MBF/U or 250-400 watt Solarcolour SON lamp.

The lantern is for lighting traffic routes to BS5489. For mounting heights up to 10 metres the 250W SON, 250W or 400W MBF/U lamp can be used. For 12 metres the 400W SON is required. It complies with BS1788, is kite marked and D.O.T. accepted.
Side entry mounting socket accepts a 125mm long spigot 42mm in diameter.
Pressed aluminium reflector optic, polished and anodised. Die-cast aluminium end support with lamp operating gear.
The body is enclosed by a hinged injection moulded Diakon bowl.

Length 98.5cm Width 50cm Depth 30.5cm Weight 14.77kg max. Wind Area 0.212m²



Z8600 for 150/250 watt SON-E or 250 watt MBF/U. Gear remote.
Z8601 for 150/250 watt SON-T. Gear remote.
Z8610/150E for 150 watt SON-E. Integral gear.
Z8610/250E for 250 watt SON-E. Integral gear.
Z8610/250M for 250 watt MBF. Integral gear.
Z8611/150T for 150 watt SON-T. Integral gear.
Z8611/250T for 250 watt SON-T. Integral gear.

The lantern is designed for lighting traffic routes to BS5489 at a mounting height of 8 metres and above. It complies with BS4533: Part 2 Section 2.7 : 1976, is kite marked and D.O.T. accepted.

Side entry mounting socket accepts a 100mm long spigot 42mm in diameter.

The body is moulded in SMC glass reinforced polyester, housing the lamp operating gear.

Optical control provided by two high purity aluminium alloy reflectors. The light distributions can be either cutoff or semi-cutoff. Injection moulded anti-vandal U.V. stabilised enclosing bowl.

Length 74.6cm Width 34.0cm Depth 24.0cm Wind Area 0.133m²
Weight **Z8600/1** 4.7kg **Z8610/11** 9.3kg max.

Z9454 Remote gear Semi-Cutoff.
Z9464 Integral gear Semi-Cutoff.
For use with 90 watt Super SOX or 66 watt SOX-E sodium lamp.

The lantern is designed for Group B8 installations at a mounting height of 8 metres as defined in B.S.C.P. 1004 : Part 2 : 1974. It complies with BS1788, is kite marked and D.O.T. accepted.

Side entry mounting socket accepts a 125mm long spigot 42mm in diameter. Die cast aluminium body with an injection moulded acrylic or anti-vandal U.V. stabilised polycarbonate refractor bowl.

Length 66cm Width 29.5cm Depth 23.5cm Weight **Z9454** 5.39kg **Z9464** 11.5kg Wind Area 0.149m².

Z9554M Semi-Cutoff.
For use with 135 watt Super SOX or 91 watt SOX-E sodium lamp.

The lantern is designed for Group A 10 installations at a mounting height of 10 metres as defined in B.S.C.P. 1004 : Part 2 : 1974. It complies with BS4533 : Part 2 : Section 2.7 : 1976. is kite marked and D.O.T. accepted.

Side entry mounting socket accepts a 125mm long spigot 42mm in diameter. The body is moulded in S.M.C. glass reinforced polyester, with an injection moulded acrylic refractor bowl.

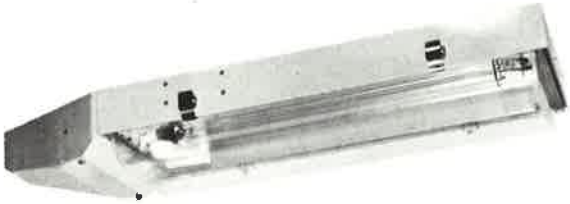
Length 87.6cm Width 21cm Depth 17.1cm Weight 4.88kg Wind Area 0.121m²

Z9564 Semi-Cutoff.
For use with 180 watt Super SOX or 131 watt SOX-E sodium lamp.

The lantern is designed for Group A 12 installations at a mounting height of 12 metres as defined in B.S.C.P. 1004 : Part 2 : 1974. It complies with BS1788, is kite marked and D.O.T. accepted.

Side entry mounting socket accepts a 125mm long spigot 42mm in diameter. Die cast aluminium body with a moulded acrylic refractor bowl.

Length 123.2cm Width 21cm Depth 21.6cm Weight 7.06 kg Wind Area 0.223m²



Z9543 for 90 watt Super SOX or 66 watt SOX-E sodium lamp Cutoff.
Z9553 for 135 watt Super SOX or 91 watt SOX-E sodium lamp Cutoff.
Z9563 for 180 watt Super SOX or 131 watt SOX-E sodium lamp Cutoff.

Z9543 is designed for a mounting height of 8 metres.
Z9553 is designed for Group A 10 installations at a mounting height of 10 metres and
Z9563 for Group A 12 at a height of 12 metres.

The lanterns comply in all respects with the requirements of BS4533 : Part 2 : Section 2.7 : 1976, are kite marked and D.O.T. accepted.

The lanterns have a high downward light output ratio of up to 73%.

Side entry mounting accepts a 100mm or 125mm long spigot 42mm in diameter. The lantern is locked to the spigot by two substantial steel saddles.

The body is made of heavy gauge aluminium and a formed steel reinforcing bracket is through bolted to the die-cast integral gear compartment.

Optical control is obtained with brightened and anodised facetted reflectors. The lantern is enclosed by a clear moulded acrylic bowl.

Z9543: Length 87.7cm	Width 32.4cm	Depth 15.2cm	Weight 14.5kg	Wind Area 0.109m²
Z9553: Length 112.5cm	Width 32.4cm.	Depth 15.2cm	Weight 17.58kg	Wind Area 0.159m²
Z9563: Length 147.4cm	Width 32.4cm	Depth 15.2cm	Weight 19.16kg	Wind Area 0.213m²

M62 Motorway, Manchester, using 180W Super SOX lamps and Z9563 lanterns.

Z5670 For 60-200 watt GLS lamp, BC cap.
Z5671 For 80-125 watt MBF/U lamp. 3/BC cap.
Z5672 For 60-200 watt GLS 80-125 watt MBF/U or 70-120 watt SON lamp, ES cap.
Z5678 For 35 watt Super SOX or 26 watt SOX-E lamp, BC cap.
Z5679 For 80-125 watt MBF/U lamp 3/BC cap but no dome refractor.
Z5679HPS For 50-70-120 watt SON lamp, ES cap but no dome refractor.

The lantern is designed for Group B side road lighting and all forms of amenity lighting. The spigot cap fits a 7.6cm diameter by 7.6cm high column spigot. The lantern body consists of a cast aluminium spigot cap and a top canopy moulded in DMC glass reinforced polyester. Non-axial or symmetric dome refractor optical system with an injection moulded acrylic or anti-vandal UV stabilised polycarbonate enclosing cone.

Height 45.7cm Diameter 45.7cm Weight 5.4kg Wind Area 0.092m²

Z5673 For 60-200 watt GLS lamp, BC cap.
Z5674 For 80-125 watt MBF/U lamp, 3/BC cap.
Z5675 For 60-200 watt GLS, 80-125 watt MBF/U or 70-120 watt SON lamp, ES cap.
Z5676 For 35-55 or 26-36 watt sodium lamp, BC cap.
Z5677 For 80-125 watt MBF/U lamp, 3/BC cap but no dome refractor.
Z5677HPS For 50-70-120 watt SON lamp, ES cap but no dome refractor.

The lantern is designed for Group B side road lighting and all forms of amenity lighting. The spigot cap fits a 7.6cm diameter by 7.6cm high column spigot. The lantern body consists of a cast aluminium spigot cap and a top canopy moulded in DMC glass reinforced polyester.
Non-axial or symmetric dome refractor optical system with an injection moulded anti-vandal UV stabilised polycarbonate enclosing cone.

Height 58.4cm Diameter 45.7cm Weight 6.4kg Wind Area 0.116m²

Z5713 For 60-200 watt GLS or 35 watt sodium lamp, BC cap 11" cone.
Z5714 For 80-125 watt MBF/U lamp, 3/BC cap 11" cone.
Z5715 For 60-200 watt GLS, 80-125 watt MBF/U or 70-120 watt SON lamp, ES cap 11" cone.
Z5718 For 35-55 or 26-36 watt sodium lamp, BC cap 16" cone.
Z5719 For 80-125 watt MBF/U lamp, 3/BC cap 16" cone.

The lantern is designed for Group B side road lighting and all forms of amenity lighting. The spigot cap fits a 7.6cm diameter by 7.6cm high column spigot. The lantern body consists of a cast aluminium spigot cap and a spun aluminium hinged top with an injection moulded anti-vandal UV stabilised polycarbonate enclosing cone. The lantern is stove enamelled black.

Z5713/4/5: Height 45cm	Diameter 34.5cm	Weight 2.7kg	Wind Area 0.092m²
Z5718/9: Height 59cm	Diameter 34.5cm	Weight 3.7kg	Wind Area 0.133m²

Z5698U For 35-55 or 26-36 watt sodium lamp, BC cap 16" cone.
Z5699U/80 For 80 watt MBF/U lamp, 3/BC cap 11" cone.
Z5699U/125 For 125 watt MBF/U lamp, 3/BC cap 11" cone.
Z5699U/70 For 70 watt SON lamp, ES cap.

The lantern is designed for Group B side road lighting and all forms of amenity lighting. The spigot cap fits a 7.6cm diameter by 7.6cm high column spigot. The lantern body consists of an extended cast aluminium spigot cap containing the lamp control gear and a spun aluminium hinged top canopy with an injection moulded anti-vandal UV stabilised polycarbonate enclosing cone. The lantern is stove enamelled black.

Z5698U: Height 71cm	Diameter 34.5cm	Weight 6.9kg	Wind Area 0.156m²
Z5699U80: Height 52cm	Diameter 34.5cm	Weight 6.89kg	Wind Area 0.152m²
Z5699U125: Height 52cm	Diameter 34.5cm	Weight 7.76kg	Wind Area 0.152m²
Z5699U70: Height 52cm	Diameter 34.5cm	Weight 7.76kg	Wind Area 0.152m²

Z8830/35 For 35 watt Super SOX or 26 watt SOX-E lamp, BC cap.
Z8831/80 For 80 watt MBF/U lamp. 3/BC cap.
Z8831/125 For 125 watt MBF/U lamp. 3/BC cap.
Z8832/70 For 70 watt SON lamp ES cap.

The lantern is designed for Group B side road lighting, car parks and other outdoor areas.

Side entry mounting socket accepts a 76mm long spigot 34mm in diameter.

The body is moulded in SMC glass reinforced polyester, housing the lamp operating gear.

Optical control provided by two high purity aluminium alloy reflectors. Injection moulded anti-vandal UV stabilised enclosing bowl.

Length 54cm Width 27cm Depth 18cm
Weight 5kg Wind Area 0.067m²

ZD6526 For 70 watt SON lamp 3/BC cap. 11" cone.
ZD6528 For 35 watt Super SOX or 26 watt SOX-E lamp, BC cap, 16" cone.

The lantern is designed for Group B side road lighting and all forms of amenity lighting. The spigot cap fits a 7.6cm diameter by 7.6cm high column spigot. The lantern body consists of a cast aluminium spigot cap and a top canopy moulded in DMC glass reinforced polyester with an injection moulded anti-vandal UV stabilised polycarbonate enclosing cone. The lamp control gear is mounted within the lantern on a gear tray which is easily removable.

Height 45.7cm Diameter 45.7cm Weight **ZD6526**: 5.5kg Wind Area 0.092m²
ZD6528: 6.5kg

Z8260 For use with two 40 watt MCFA/U 2ft fluorescent tubes.

The lantern is designed for Group B side road lighting, industrial roadways or general security lighting.

Side entry mounting socket accepts a 76mm long spigot 34mm in diameter. Die cast aluminium body housing the lamp operating gear. Moulded anti-vandal UV stabilised polycarbonate enclosing bowl.

Length 73cm Width 17.2cm Depth 19.1cm Weight 7.26kg Wind Area 0.130m²

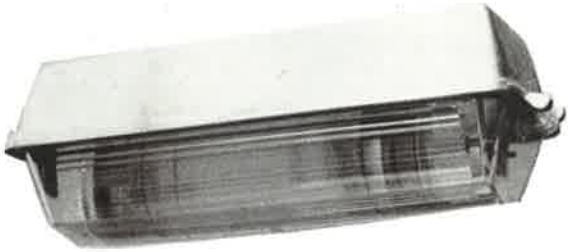
Z8896 For use with 80-125 watt MBF/U lamp, 3/BC lamp.

Z8897 For use with 70 watt SON lamp ES cap.

The lantern is designed for Group B side road lighting, car parks and other outdoor areas.

Side entry mounting socket accepts a 76mm long spigot 34mm in diameter. Die cast aluminium body with an injection moulded anti-vandal UV stabilised polycarbonate refractor bowl.

Length 35.6cm Width 26.7cm Depth 19.7cm Weight 2.27kg Wind Area 0.069m²



Z9580 Side entry without operating gear.
Z9581 Top entry without operating gear.
Z9582 Side entry with integral operating gear.
Z9583 Top entry with integral operating gear.

The lanterns are for use with a 35 watt Super SOX or 26 watt SOX-E sodium lamp. Lanterns for use with an 18 watt Super SOX lamp can be supplied to special order.
The lantern is designed for Group B side road lighting, industrial roadways or general security lighting.
Side entry lanterns accept an 80mm long spigot 34mm in diameter.
The top entry version is tapped ¾" BSP.
The lantern body is a high pressure die-casting in LM6 aluminium alloy. Injection moulded toughened acrylic or anti-vandal UV stabilised polycarbonate refractor bowl.
The integral gear versions are fitted with energy saving low ballast.

Z9580:	Length 41.3cm	Width 14.5cm	Depth 13.6cm	Weight	1.6kg	Wind Area 0.51²
Z9581:	Length 40.7cm	Width 14.5cm	Depth 14.7cm	Weight	1.6kg	Wind Area 0.50²
Z9582:	Length 41.3cm	Width 14.5cm	Depth 13.6cm	Weight	3.1kg	Wind Area 0.51²
Z9583:	Length 40.7cm	Width 14.5cm	Depth 14.7cm	Weight	3.1kg	Wind Area 0.50²

Z9536M Side entry without operating gear.
Z9537 Top entry without operating gear.
Z9538M Side entry with integral operating gear.
Z9539 Top entry with integral operating gear.

The lanterns are for use with 35-55 watt Super SOX or 26-36 watt SOX-E sodium lamp.
The lantern is designed for Group B side road lighting, industrial roadways or general security lighting.
Side entry lantern mounting socket accepts a 76mm long spigot 34mm in diameter. The top entry version is tapped ¾" BSP.
The side entry body is moulded in SMC glass reinforced polyester. The top entry version is die cast aluminium. Injection moulded anti-vandal UV stabilised polycarbonate refractor bowl. The integral gear versions are fitted with energy saving low watts loss ballast.

Z9536M:	Length 54.6cm	Width 19cm	Depth 18.2cm	Weight 3.00kg	Wind Area 0.093m²
Z9537:	Length 54.6cm	Width 19cm	Depth 18.2cm	Weight 3.63kg	Wind Area 0.093m²
Z9538M:	Length 54.6cm	Width 19cm	Depth 18.2cm	Weight 5.00kg	Wind Area 0.093m²
Z9539:	Length 54.6cm	Width 19cm	Depth 18.2cm	Weight 5.63kg	Wind Area 0.093m²

Z5590 For 60-200 watt GLS lamp, BC cap.
Z5591 For 80-125 watt MBF/U lamp 3/BC cap.
Z5592 For 60-200 watt GLS 80-125 watt MBF/U or 70-120 watt SON lamp, ES cap.

The lantern is designed for Group B side road lighting, industrial roadways or general security lighting. Die cast aluminium top entry body tapped ¾" BSP. Non-axial or symmetric dome refractor optical system with injection moulded anti-vandal UV stablised polycarbonate enclosing bowl.

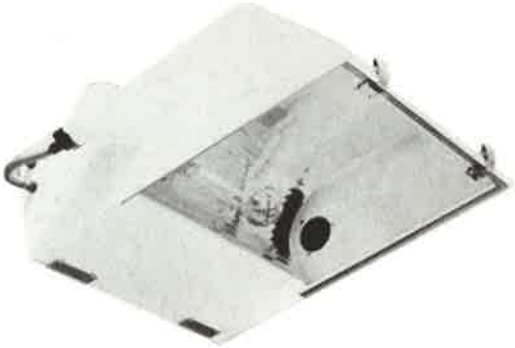
Height 34.9cm Diameter 24.8cm Weight 1.04kg Wind Area 0.046m²

Z5680 For 60-200 watt GLS lamp, BC cap.
Z5681 For 80-125 watt MBF/U lamp 3/BC cap.
Z5682 For 60-200 watt GLS or 80-125 watt MBF/U or 70-120 watt SON lamp, ES cap.

The lantern is designed for Group B side road lighting and all forms of amenity lighting. The spigot cap fits a 7.6cm diameter by 7.6cm high column spigot.
The lantern body consists of a cast aluminium spigot cap, opal acrylic or anti-vandal diffusing bowl and a spun aluminium top canopy.
The lantern is stove enamelled bronze.

Height 32.8cm Diameter 47.5cm Weight 3.6kg Wind Area 0.101m²

AMENITY



Z9105/6 For use with a 1kW SON-T or two 400 Watt SON-T lamps

The lantern is designed for lighting large areas including glare sensitive situations such as docks, airports and motorways. It can be mounted on towers, high masts and building structures.
A computer derived reflector, accurately profiled in high purity aluminium, gives an asymmetric light distribution with a high peak intensity at a beam elevation of 65° with little or no light above the horizontal.
The body is made in steel, precoated by a hot dip protective process, pretreated and further protected by a white paint system, inside and out. Integral control gear.
The lantern is enclosed by a thermally toughened clear glass panel. All hinges and catches are of stainless steel. A smaller version, **Z9104**, is available for use with 150/250/400 SON-T lamp.

Length 71.1cm Width 57.1cm Depth 23.8cm Wind Area side 0.21m² Weight 1 x 1000W 40kg
Weight 2 x 400W 34kg

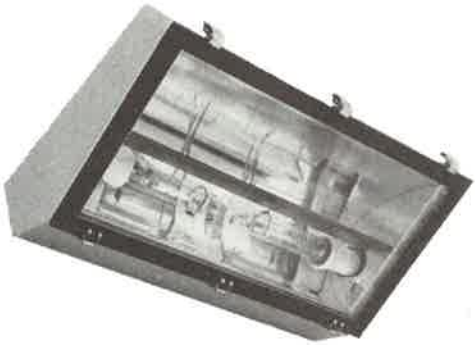
Crawley New Town. Amenity lighting with Z9101 Spacelight lanterns and 400W SON-T lamps.

Z9100 Fluted Front Glass.
Z9101 Plain Front Glass.

For use with 250-400 watt Solarcolour SON-T or SON-E lamps or 250-400 watt MBF/U mercury lamps.

The lantern is designed for lighting carriageways from positions on building faces parallel to the road, from high masts or columns. The lantern can also be used for the floodlighting of large squares and areas between buildings such as High Rise Flats.
Aluminium sheet body with hinged and glazed front frame. Super purity anodised reflector. Integral control gear.

Length 52.4cm Width 25.7cm Depth 61.3cm Weight 18kg Wind Area side: 0.103m², plan: 0.251m²



Z9102 Fluted Front Glass.
Z9103 Plain Front Glass.

For use with two 250-400 watt Solarcolour SON-T or SON-E lamps or 250-400 watt MBF/U mercury lamps.

The lantern is designed for lighting carriageways from positions on building faces parallel to the road. The lantern can also be used for floodlighting large areas from high masts.
Aluminium sheet body with extruded aluminium hinged and glazed front frame. Super purity anodised reflector. Integral control gear.

Length 78.6cm Width 30.5cm Depth 61.3cm Weight 29kg Wind Area side: 0.377m² plan: 0.103m²

ZD4542 For use with 80-125 watt MBF/U lamp, 3/BC cap. A modified version for low wattage Solarcolour lamps is available.

The lantern is very suitable for the lighting of pedestrian precincts and all other forms of amenity and decorative lighting.
The spigot cap fits a 7.6cm diameter by 7.6cm high column spigot. A feature of the unit is that the translucent seamless sphere forming the main body of the lantern is made from anti-vandal polycarbonate. This sphere, 50cm in diameter is secured to a cast aluminium spigot base carrying the support for the symmetric or non-axial dome refractor optical system.
Also available with diffused or opal sphere.

Diameter 50cm Weight 3.9kg Wind Area 0.196m²

Z5760/35 For 35 watt Super SOX or 26 watt SOX-E lamp, BC cap.
Z5761/80 For 80 watt MBF/U lamp, 3/BC cap.
Z5761/125 For 125 watt MBF/U lamp, 3/BC cap.
Z5762/70 For 70 watt SON lamp, ES cap.

Wall mounted Group B lighting. The lantern is very suitable for pedestrian precincts and all other forms of amenity lighting where it is inconvenient to use a column.

The lantern consists of a die-cast light alloy body complete with integral control gear. Hinged to the body is die-cast light alloy frame carrying an opal anti-vandal enclosing panel moulded in polycarbonate. The lantern is stove enamelled black.
Also available with diffused acrylic panel.

	Length	Width	Depth	Weight	Wind Area
Z5760/35:	37cm	27.8cm	23.8cm	6.37kg	0.072m²
Z5781/80:	37cm	27.8cm	23.8cm	6.05kg	0.072m²
Z5761/125:	37cm	27.8cm	23.8cm	6.44kg	0.072m²
Z5761/70:	37cm	27.8cm	23.8cm	7.23kg	0.072m²

Queen Elizabeth II Law Courts, Liverpool, using 70W SON-E lamps and ZD4542 lanterns.

Manama Palace, Bahrain. Special decorative lanterns housing 250W SON-E lamps.

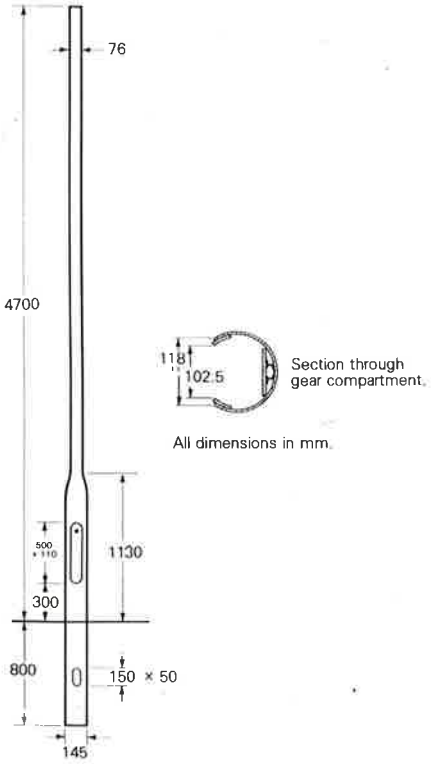
COLUMNS

The range of readily available GEC columns include maintenance free tubular aluminium and fibre glass tapered shafts for post top lanterns or with a choice of brackets for side or top entry lanterns. Painting is not necessary and the light weight reduces handling and installation costs. Octagonal, tapered steel columns produce a lantern mounting height from 5 metres to 12 metres. All conform to BS1840/1960 and are hot dip galvanised to BS729/71 for a durable and maintenance free finish.
All columns up to 6 metres have a flush fitting door with a tamper proof lock. 8m, 10m and 12m columns have a door opening which complies with the DOT Technical Memorandum BE/472 and a door also with a tamper proof lock.

The hardwood backboard in the column base compartments is treated with a preservative.

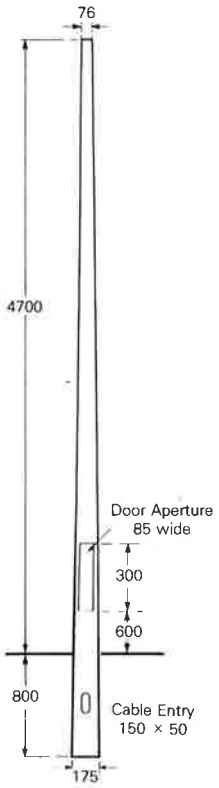
Aluminium Columns

ZP2800

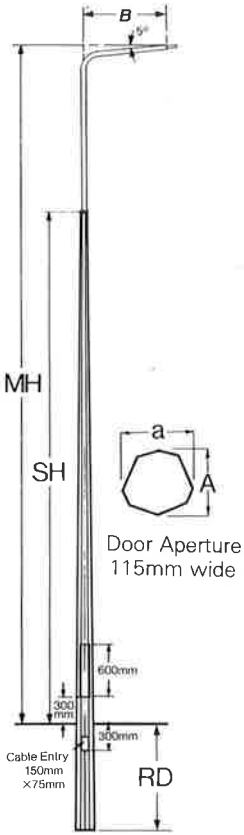


Fibreglass Columns

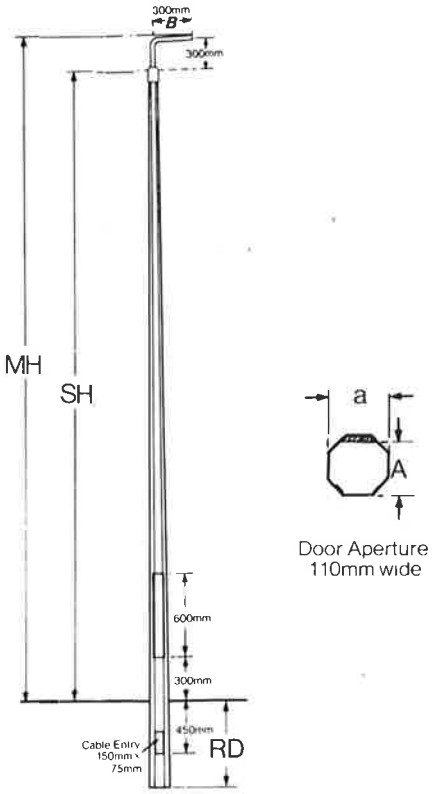
ZP3300



Group A Steel Columns



Group B Steel Columns



MH (Mounting height)	5m	6m	8m	10m	12m
SH (Height out of ground)	4.7m	5.7m	6m	8m	10m
Shaft base across flats	156mm	175mm	195.5mm	231.5mm	260.5mm
Shaft top diameter	76mm	76mm	76mm	76mm	76mm
RD (planted root)	800mm	1000mm	1.20m	1.50m	1.70m
Cross section of column at door A×a	126 × 142mm	142 × 158mm	200 × 200mm	224 × 224mm	224 × 224mm
B Bracket projection	0.3m	0.3m	1.0m or 1.5m or 2.0m		

Weight of shaft only		32kg	39kg	77kg	115kg	158kg
Weight of shaft and bracket	0.3m	35kg	42kg	—	—	—
	1.0m	—	—	95kg	133kg	176kg
	1.5m	—	—	97kg	135kg	178kg
	2.0m	—	—	100kg	138kg	181kg
Typical weight of lantern and windage		5.63kg 0.093m²	5.63kg 0.093m²	15.7kg 0.121m²	17.58kg 0.159m²	19.15kg 0.213m²

Kuwait Motorway. 30 metre Masts with 1000W MBI lanterns.

Renfrew Motorway, Glasgow. 18 to 36 metre Masts with 400W Solarcolour lanterns.

HIGH MAST LIGHTING

*30 metre Mast with twelve **Z3430** lanterns for Solarcolour lamps.*

High mast lighting is ideal for city centres, motorway intersections, flyover complexes and all industrial or commercial areas where a high standard of lighting is required from a relatively few number of units. Light sources such as Solarcolour high pressure sodium or Super SOX low pressure sodium with their high lumen outputs have further added to the benefits of high mast lighting in terms of cost effectiveness.

Industrial and commercial use of high mast lighting includes docks, railway yards, motorway service areas, airport terminal car parks and aircraft taxi-aprons, high security lorry parks and security lighting for HM prisons. For the small user one or two masts will provide effective, economical lighting covering the whole of their external premises.

The GEC lighting mast is produced in two versions, a standard mast and a light duty mast.

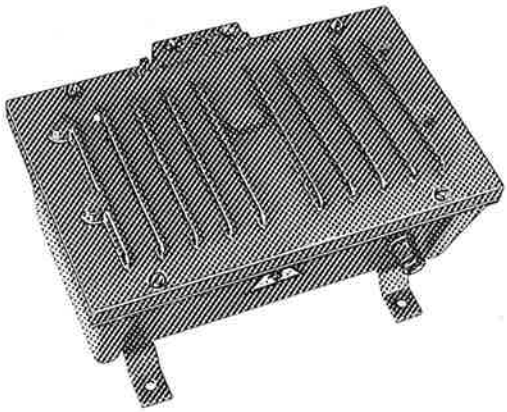
The standard mast is available in heights of 20m, 25m and 30m but can be produced in various heights up to 45m.

The light duty mast has heights of 16m, 18m and 20m and is suitable for the smaller lighting scheme, car parks, sports areas, etc, where the use of up to six lanterns is sufficient.

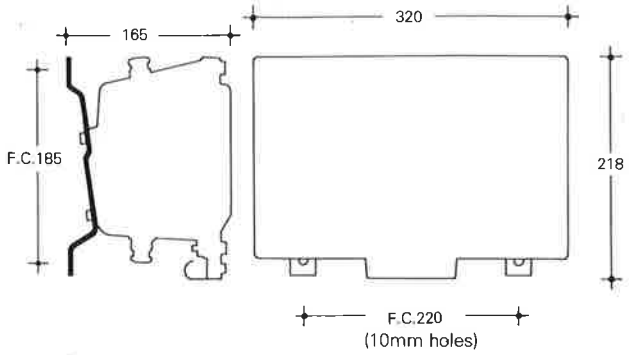
Both masts are of a continuously tapered 18 sided design manufactured from high tensile steel plate and finished hot dip galvanised.

A variety of lantern carriages are available allowing a wide choice of lanterns and floodlights to be carried at the mast head.

GEC have developed special lanterns enabling various masthead arrays to provide complete flexibility in light distribution arrangement including lanterns with optical systems that can be varied from symmetric to directional control.



Dimensions



Prewired Gear Boxes

TIMESAVER

These prewired gear boxes are suitable for use with all discharge lamps from 150W to 400W. They are designed for mounting, vertically or horizontally both indoors and outdoors.

★ Reduces installation time ★ Maximum ambient 45°C ★ 220 and 240V tapped control gear ★ Stainless steel hinge ★ Dust tight ★ Jet proof ★Vertical and horizontal mounting ★ Plug and socket connection.

SPECIFICATION

Body: LM6M corrosion resistant die cast aluminium alloy. Fitted with two nylon cable glands suitable for 4-7mm O.D. cables.

Two mounting straps are fastened to the body by four stainless screws. A five way terminal block provides the connections for the mains supply and lamp. The connection to the control gear is by a plug and socket.

Gear Tray/Lid: Cast LM6M corrosion resistant aluminium alloy. When open the lid is supported by a stainless steel hinge.

Tapped 220/240 volt 50 Hz HPF control gear is mounted on the lid together with an electronic starter in the case of high pressure sodium gear. Secured to the body by four stainless steel screws against a Neoprene rubber gasket.

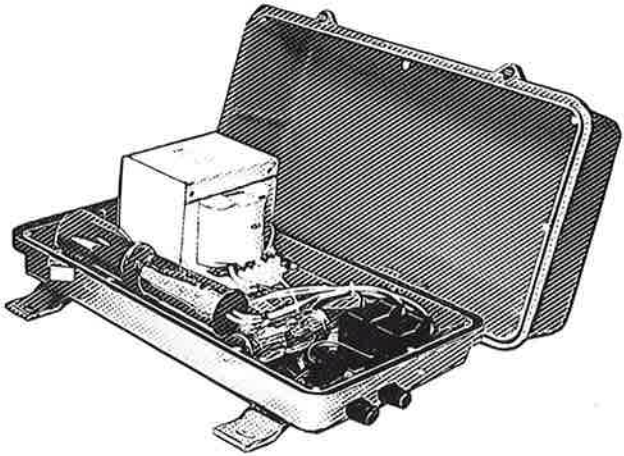
Designed to comply with BS4533. 1981.

Ingress Protection I.P. 65 Dust tight and Jet proof.

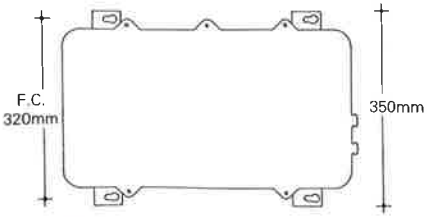
Maximum ambient temperature 45°C

Timesaver Range

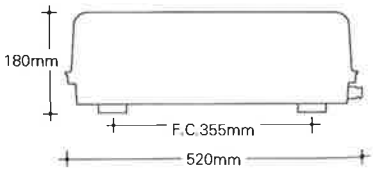
Cat. No. Complete Gear Box	Lamp Type	Consisting of		Electrical Data			Weight in kg
		Body Cat. No.	Gear Tray Cat. No.	Supply Volts	Circuit Watts	Power Factor	
TS150	150W SON	All TSB	GT150	Tapped 220V and 240V	170	0.90	9
TS250	250W SON		GT250		280	0.89	9.5
TS310	310W SON		GT310		340	0.88	9.5
TS400	400W SON		GT400		440	0.86	9.5
TS250M	250W MBF		GT250M		280	0.85	9
TS400M	400W MBF		GT400M		430	0.81	9
TS400C	400W MBI		GT400C		430	0.88	9.5



Dimensions



Keyhole fixings for M8 bolts



Prewired Gear Boxes TIMESAVER

These prewired gear boxes are suitable for use with all GEC discharge lamps from 600-2000W. They are designed for mounting, vertically or horizontally both indoors and outdoors.

SPECIFICATION

Cover: made from glass reinforced plastic. Secured to the gear tray/base against a neoprene gasket by four stainless steel screws. A nylon lanyard holds the cover captive to the gear tray/base.

Gear Tray/Base: Made from LM6M corrosion resistant die cast aluminium alloy and fitted with two nylon cable glands suitable for 4-7mm O.D. cables. Inside, adjacent to the cable glands, is a 4-way terminal block accepting 6mm² cable. One or two fuse carriers are fitted with fuse(s) to BS88 (1975) appropriate for the lamp wattage. The high pressure sodium and 2kW MBI control gear include electronic starting devices as standard.

The control gear is power factor corrected and suitable for 220 + 240 volt or 380 + 415 + 440 volt supplies.

Fixing Straps: Made from galvanised steel and fastened to the gear tray/base by four stainless steel screws.

Designed to comply with BS4533. 1981.

Ingress Protection I.P. 65. Dust tight and jetproof.

Maximum ambient temperature 45°C.

RANGE

Cat No. Complete Gear Box	Lamp Type	Electrical Data			Weight in kg
		Supply Volts	Circuit Watts	Power Factor	
GB600LV	600W SON	220/240	645	0.87	16.5
GB1KWLV	1000W SON	220/240	1090	0.87	24.5
GB700M*	700W MBF	220/240	740	0.85	16.0
GB1KWMLV*	1000W MBF	220/240	1040	0.87	16.5
GB600HV	600W SON	380/415	645	0.92	17.0
GB1KWHV	1000W SON	380/415	1090	0.87	24.5
GB1KWMHV*	1000W MBF	380/415	1035	0.93	16.5
GB2KW	2000W MBI	380/415	2085	0.86	24.5

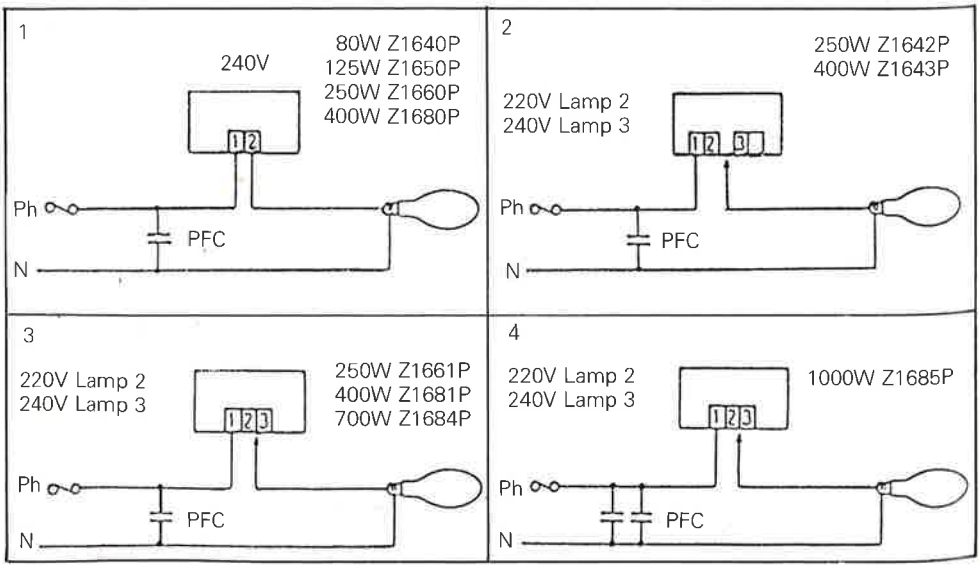
* Available to order only.

TYPES: MB, MBF, MBFR

Lamp Watts	Voltage 50Hz	Ballast Cat. No.	Suitable for Column Mounting	PFC Capacitor Cat. No.[1]	All 250V except where noted µF	Gearbox Cat. No[2]	Total Circuit Watts	Power Factor	Fuse Rating HRC amp	Circuit
80	240	Z1640P	YES	Z16749	8	Z1896	96	0.95	4	1
80	220-240	Z1641P	YES	Z16749	8	Z1896	96	0.95	4	5A
125	240	Z1650P	YES	Z16759	10	Z1896	147	0.93	4	1
125	220-240	Z1651P	YES	Z16759	10	Z1896	147	0.93	4	5A
250	240	Z1660P	YES	Z17138	15	Z1906	280	0.85	10	1
250	220-240	Z1661P	YES	Z17138	15	Z1906	280	0.85	10	3
250	220-240	Z1642P	NO	Z17138	15	Z1906	280	0.85	10	2
400	240	Z1680P	YES	Z17158	20	Z1906	430	0.81	16	1
400	220-240	Z1681P	YES	Z17158	20	Z1906	430	0.81	16	3
400	220-240	Z1643P	NO	Z17158	20	Z1906	430	0.81	16	2
700	220-240	Z1684P	YES	Z17869	30	Z1906	740	0.85	16	3
1000	220-240	Z1685P	YES	2xZ17168	50	Z1906	1040	0.87	20	4
1000	380-440	Z1686P	YES	Z17529	15(440V)	Z1906	1035	0.93	2x16	5

TYPE MBI

400 Green or Blue	220-240	Z1646P	NO	Z17869 F8058T	30 Stabiliser	Z1908	430	0.88	16	6
2000 White	380-440	Z1648P	NO	2xZ1754	40(440V)	F62336A	2085	0.86	2x20	7

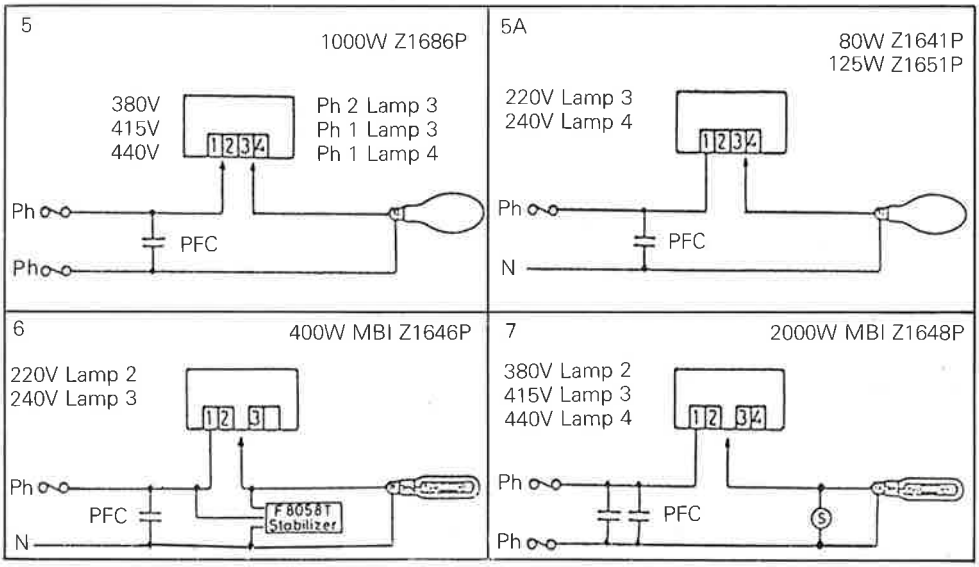


[1]Includes mounting clip. [2]See also Cast Aluminium Box Z1912 page 177.

HIGH PRESSURE MERCURY

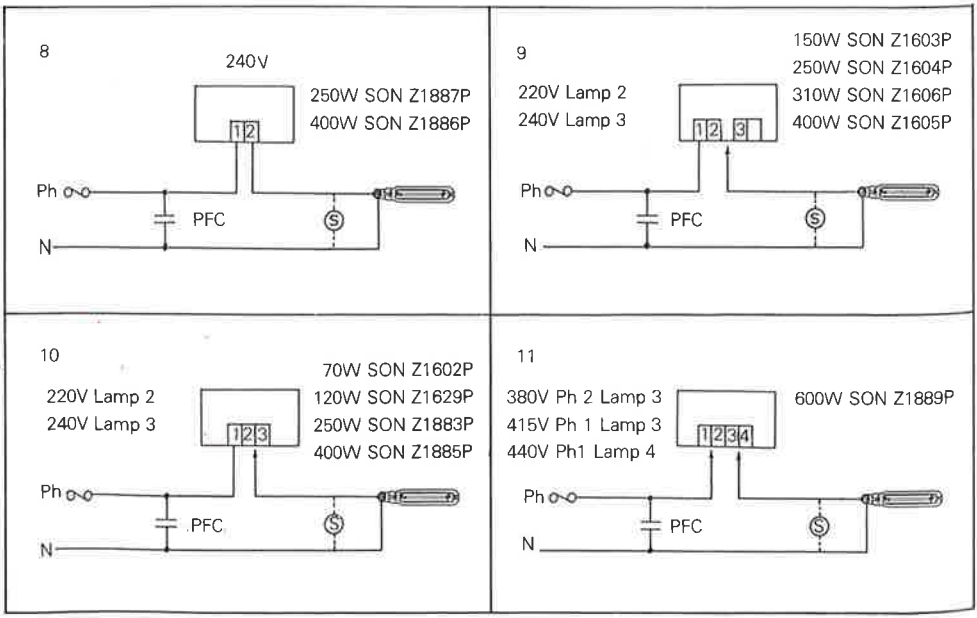
Cross Section mm W x H	Overall Length mm	Fixing Centres mm	Weight kg	tw °C	Δt °C	Ballast Cat. No.	Lamp Watts
60 x 48	165	152	1.85	130	55	Z1640P	80
60 x 48	165	152	1.85	130	55	Z1641P	80
64 x 48	165	152	2.00	130	80	Z1650P	125
64 x 48	165	152	2.00	130	80	Z1651P	125
107 x 109	133	113 x 76	4.5	130	55	Z1660P	250
107 x 109	133	113 x 76	4.5	130	55	Z1661P	250
91 x 81	150	135 x 76	3.5	130	60	Z1642P	250
107 x 109	133	113 x 76	4.6	130	70	Z1680P	400
107 x 109	133	113 x 76	4.6	130	70	Z1681P	400
98 x 81	150	135 x 76	3.6	130	75	Z1643P	400
107 x 109	166	146 x 76	7.4	130	60	Z1684P	700
107 x 109	166	146 x 76	7.6	130	75	Z1685P	1000
107 x 109	166	146 x 76	7.6	130	60	Z1686P	1000

98 x 81	150	135 x 76	4.2	130	70	Z1646P	400 Green or Blue
150 x 126	220	180 x 125	15.5	130	65	Z1648P	2000 White



TYPES: SON-E, SON-T, SON-L, SON-R including DE LUXE and PLUS lamps

Lamp Watts	Voltage 50Hz	Ballast Cat. No.	Suitable for Column Mounting	PFC Capacitor Cat. No.[1]	All 250V except where noted µF	Gearbox Cat. No.[3]	Total Circuit Watts	Power Factor	Fuse Rating HRC Amp	Circuit
70	220-240	Z1628P	YES	Z16759	10	Z1896	85	0.92	4	14
70	220-240	Z1602P	NO	Z16759	10	Z1896	87	0.93	4	10
120	220+240	Z1629P	NO	Z17128	13	Z1896	142	0.88	4	10
120	220-240	Z1656P	YES	Z17128	13	Z1896	143	0.88	4	14
150	220-240	Z1615P	YES	Z17158	20	Z1906	175	0.91	4	14
150	220-240	Z1603P	NO	Z17158	20	Z1906	172	0.90	4	9
250	220-240	Z1604P	NO	Z17869	30	Z1906	280	0.89	10	9
250	220-240	Z1883P	YES	Z17869	30	Z1906	280	0.89	10	10
250	240	Z1887P	YES	Z17869	30	Z1906	280	0.89	10	8
310	220-240	Z1606P	NO	Z17869	30	Z1906	340	0.88	16	9
400	220-240	Z1605P	NO	Z17589	40	Z1906	440	0.86	16	9
400	220-240	Z1885P	YES	Z17589	40	Z1906	440	0.86	16	10
400	240	Z1886P	YES	Z17589	40	Z1906	440	0.86	16	8
600	380-440	Z1889P	YES	Z17549	20(440V)	Z1906	645	0.92	2 x 16	11
600	220+240	Z1890P	YES	2xZ17869	60	Z1906	640	0.87	16	14A
1000	380-440	Z1609P	NO	2xZ17529	30(440V)	F62336A	1090	0.87	2 x 16	12
1000	220-240	Z1608P	NO	4xZ17168[2]	100	F62336A	1090	0.87	20	13



[3]See also Cast Aluminium Box Z1912 page 177.

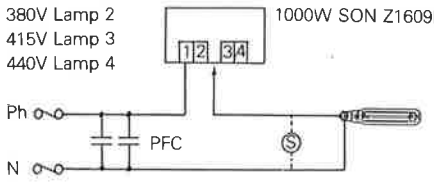
[1]Includes mounting clip [2]Or 2Z17589 + Z17158. Or 2Z17869 + Z17589.

HIGH PRESSURE SODIUM

Cross Section mm W x H	Overall Length mm	Fixing Centres mm	Weight kg	tw °C	Δ t °C	Ballast Cat. No.	Lamp Watts
64 x 48	165	152	2.0	130	65	Z1628P	70
63 x 75	88	54 x 54	1.5	130	70	Z1602P	70
75 x 63	107	73 x 54	2.3	130	70	Z1629P	120
76 x 54	165	152	2.15	130	65	Z1656P	120
76 x 54	165	152	2.3	130	80	Z1615P	150
98 x 81	150	135 x 76	3.5	130	60	Z1603P	150
98 x 81	150	135 x 76	4.2	130	65	Z1604P	250
107 x 109	133	113 x 76	4.9	130	60	Z1883P	250
107 x 109	133	113 x 76	4.9	130	60	Z1887P	250
98 x 81	150	135 x 76	4.2	130	70	Z1606P	310
98 x 81	150	135 x 76	4.2	130	70	Z1605P	400
107 x 109	133	113 x 76	5.0	130	65	Z1885P	400
107 x 109	133	113 x 76	5.0	130	65	Z1886P	400
107 x 109	166	146 x 76	8.0	130	65	Z1889P	600
107 x 109	166	146 x 76	7.6	130	65	Z1890P	600
150 x 126	220	180 x 125	15.5	130	60	Z1609P	1000
150 x 126	220	180 x 125	15.5	130	60	Z1608P	1000

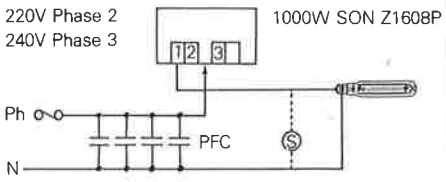
12

380V Lamp 2
415V Lamp 3
440V Lamp 4



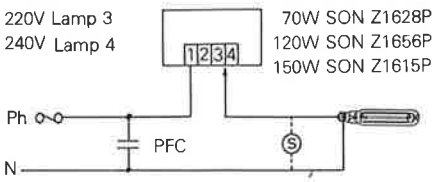
13

220V Phase 2
240V Phase 3



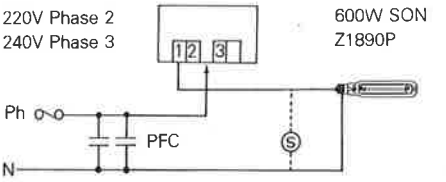
14

220V Lamp 3
240V Lamp 4



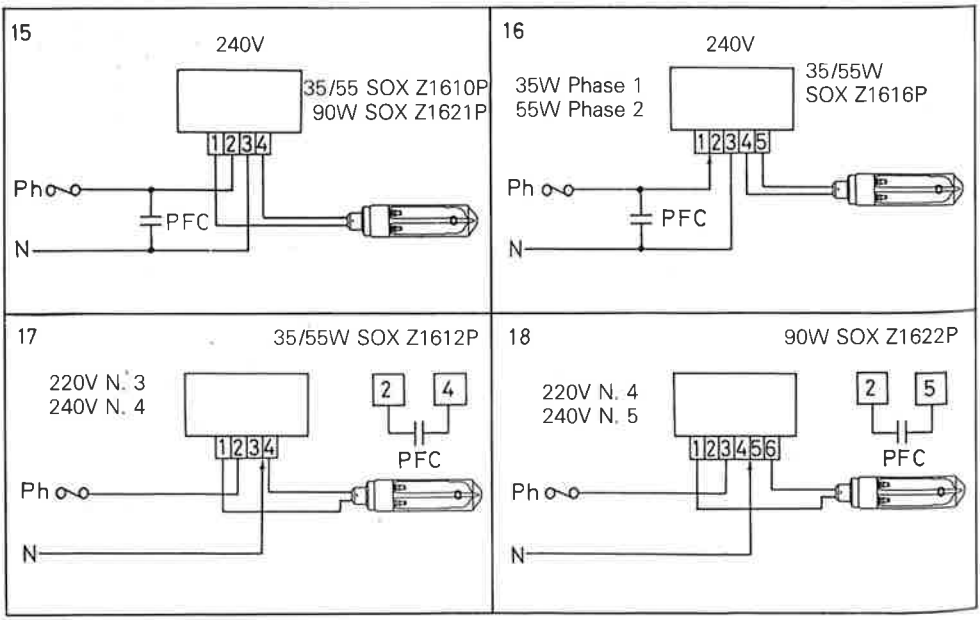
14A

220V Phase 2
240V Phase 3

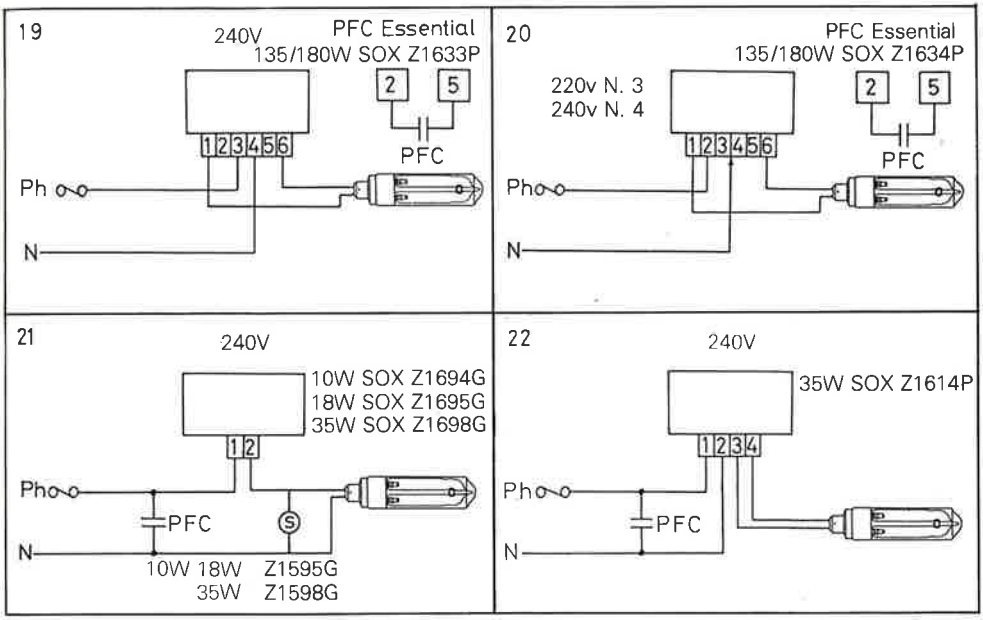


For the connection of three wire starters see the pages on electronic starters 228, 229

Lamp Watts	Voltage 50Hz	Ballast Cat. No.	Ignitor	Suitable for column mounting	PFC Capacitor Cat. No.	All 250V except where noted µF	Gear Box Cat. No.
10	240	Z1694G	Z1595G	No	— (F8933)	— (2.5)	—
18	240	Z1695G	Z1595G	No	— (F8934)	— (4.0)	—
35	240	Z1614P	Integral	Yes	Z16749	8	Z1896
35	240	Z1698G	Z1598G	No	Z16749	8	Z1896
35/55	240	Z1610P	—	Yes	Z17138	15	Z1896
35/55	220-240	Z1612P	—	Yes	Z17138	15	Z1896
35/55	240	Z1616P	Integral	Yes	Z17579	6,5	Z1896
90	240	Z1621P	—	Yes	Z17168	25	Z1906
90	220-240	Z1622P	—	Yes	Z17168	25	Z1906
135/180	240	Z1633P	—	Yes	Z17529	15(440)	Z1906
135/180	220-240	Z1634P	—	Yes	Z17529	15(440)	Z1906



Total Circuit Watts	Power Factor	Fuse Rating Amp	Circuit	Cross Section W x H	Overall Length mm	Fixing Centres mm	Weight kg	tw °C	Δt °C	Ballast Cat. No.	Lamp Watts
15	0.35 (0.85)	0.315	21	45 x 30	80	44/71	0.52	120	40	Z1694G	10
25	0.4 (0.85)	0.630	21	45 x 30	120	100	0.61	120	55	Z1695G	18
50	0.85	4	22	48 x 60	165	146	1.8	130	60	Z1614P	35
45	0.85	4	21	82 x 55	135	113	1.38	120	50	Z1698G	35
66/82	0.85/0.88	4	15	76 x 59	224	210	3.7	120	65	Z1610P	35/55
66/82	0.85/0.88	4	17	76 x 59	224	210	3.7	120	65	Z1612P	35/55
45/64	0.85/0.92	4	16	53 x 66	159	146	1.8	120	65	Z1616P	35/55
125	0.90	4	15	99 x 74	178	162	4.75	120	65	Z1621P	90
125	0.90	4	18	99 x 74	178	162	4.75	120	65	Z1622P	90
175/225	0.85/0.90	4	19	107 x 109	166	146 x 76	7.4	130	70	Z1633P	135/180
175/225	0.85/0.90	4	20	107 x 109	166	146 x 76	7.4	130	70	Z1634P	135/180



FLUORESCENT

Switch Start Ballasts N.B. Capacitors in brackets are the ones used on twin circuits

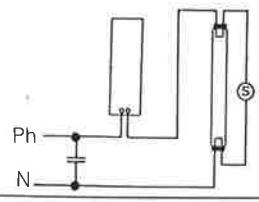
Catalogue Numbers					Tube Rating		
Ballast	Single Circuit Capacitor	Twin Circuit Capacitor	µF	Starter Switch	No.	Length mm	Watts
FD7911	—	—	—	—	1	136/168/236	7/9/11
FD1622	—	—	—	—	2	168	2 x 9
FD1616	—	—	—	—	2	168	2 x 9
F9108P	—	—	—	155/500	1	300	8
F9128P	—	—	—	2 x 155/100	2	300	2 x 8
F9128P	F8915	—	3.5	2 x 155/100	2	300	2 x 8
F9118M	—	—	—	155/200	1	600	18/20
F9118M	F8934PC	F8908PC	4(8)	155/200	1	600	18/20
F9136M	—	—	—	2 x 155/200	2	600	2 x 18/20
F9136M	—	F8934PC	4	2 x 155/200	2	600	2 x 18/20
F9136M	F8934PC	F8908PC	4(8)	155/500	1	1200	36/40
F9158M	F8906PC	F8932PC	6(12)	155/500	1	1500	58/65
F9170M	F8908PC	F8916PC	8(16)	155/600*	1	1800	70/75
F9100M	F8909PC	F8916PC	8.4(16)	155/800	1	2400	100
F9125M	F8926	—	7.2-440V	155/800	1	2400	125
F9118T	F8934PC	F8908PC	4(8)	155/200	1	600	20
F9136T	F8934PC	F8908PC	4(8)	155/500	1	1200	40
F9158T	F8906PC	F8932PC	6(12)	155/500	1	1500	65

*Or 155/800.

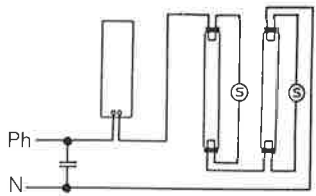
Switchless Start Ballasts

F9120T	F8915	—	3.5	—	1	450	15
					1	600	20
F9140T	F8906PC	—	6	—	1	1200	40
F9165T	F8909PC	—	8.4	—	1	1500	65
F9175T	F8909PC	—	8.4	—	1	1800	75
F9185T	F8909PC	—	8.4	—	1	1800	85
F9182T	F9835PC	—	10-300V	—	1	2400	125

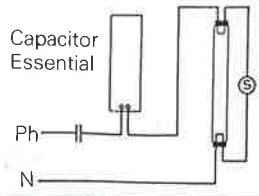
25



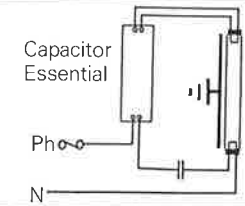
26



27



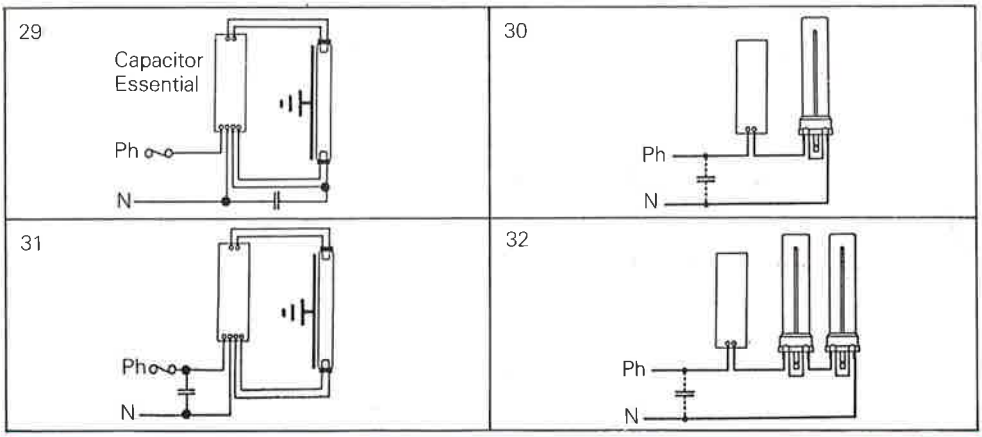
28



Circuit Diagram	Circuit Watts	Power Factor	Cross Section W x H	Overall Length	Fixing Centres	Ballast
30	15/16.2/18.8	0.36/0.40/0.51	41 x 32	78	70	FD7911
32	23.6	0.51	41 x 32	78	70	FD1622
32	25.5	0.57	28 x 23	130	120	FD1616
25	14	0.4	35 x 30	80	70	F9108P
26	21	0.6	35 x 30	80	70	F9128P
26	21	0.9	35 x 30	80	70	F9128P
25	30/31	0.32/0.34	41 x 32	152	140	F9118M
25	30/31	0.86/0.9	—	—	—	F9118M
26	47/50	0.49/0.55	41 x 32	152	140	F9136M
26	47/50	0.96/0.99	—	—	—	F9136M
25	47/49	0.92/0.96	—	—	—	F9136M
25	71/79	0.9/0.96	41 x 32	152	140	F9158M
25	84/90	0.95/0.98	41 x 32	192	180	F9170M
25	116	0.9	41 x 32	232	220	F9100M
27	141	0.62†	41 x 32	192	180	F9125M
25	28	0.9	41 x 35	140	130	F9118T
25	53	0.99	41 x 35	140	130	F9136T
25	76	0.85	41 x 35	180	170	F9158T

†Leading.

31	30	0.80	41 x 41	235	215	F9120T
28	54	0.94	41 x 41	185	165	F9140T
28	83	0.94	41 x 41	235	215	F9165T
28	94	0.90	41 x 41	235	215	F9175T
28	104	0.82	41 x 41	235	215	F9185T
29	143	0.87	41 x 41	365	345	F9182T



BALLAST LOCATION TABLES

Ballasts used in Fluorescent Luminaires

Switch Start

Tube Length	300	2 x 300	600	2 x 600	1200	1500	1800	2400	2400
Tube Watts	8	2 x 8	18 20	2 x 18 2 x 20	36 40	58 65	70 75	100	100 125
Ballasts	F9100P	F9120P	F9110M	F9136M	F9136M	F9158M	F9170M	F9100M	F9125M
	Valiant F64110 F64112	Valiant F64108	Speedpack Europa Duralite	Speedpack	Speedpack Europa Duralite Vantage T-Pack FGR365 FGR355	Speedpack Europa Duralite Vantage	Speedpack Europa Duralite Vantage	Speedpack	Speedpack Europa

Tube Length	OPUS		
Tube Watts	11	2 x 9	2 x 9
Ballasts	FG7911	FD1622	FD1616
	OPV111 OPW111	OPP209	OPC209

Switchless Start

600	1200	1500	1800	1800	2400
20	40	65	75	85	125
F9120T	F9140T	F9165T	F9175T	F9185T	F9182T
Duralite	Duralite Europa	Duralite Europa F42231 F42235 Garage Pit	Duralite	Europa	Europa

Ballasts used in Integral Gear Luminaires, Floodlights, Prewired Gear Boxes and Streetlighting Lanterns

	Mercury MB, MBF					Ph-N Lamp	Ph-Ph Lamp	MBI	
Watts	80	125	250	400	700	1000	1000	400	2000
Ballast	Z1641P	Z1651P	Z1622P	Z1623P	Z1604P	Z1685P	Z1686P	Z1646P	Z1648P
Floodlights Prewired Gearboxes Lanterns	Z5699 Z5761 Z5531	Z5699 Z5761 Z8831	TS250M SF250M Champion Hi-Saver Z8534 Z8536 Z8610	TS400M SF400M Champion Hi-Saver Z8534 Z8536	GB700MLV	GB1KWMLV	GB1KWMHV	TS400C SF400C	GB2KW

NOTE: Z9100/01/03: Ballasts Types Z1853P, Z1885P are used but supplied separately to be fitted on site.

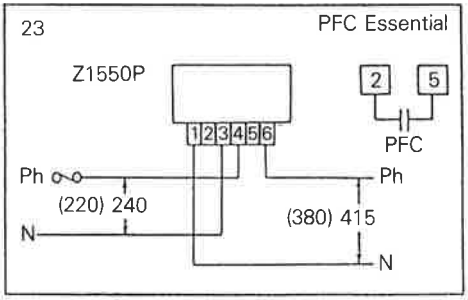
	Sodium SON-E, SON-T							Ph-N Lamp	Ph-Ph Lamp	Ph-N Lamp	Ph-Ph Lamp
Watts	70	70	120	150	250	310	400	600	600	1000	1000
Ballast	Z1602P	Z1625P	Z1629P	Z1603P	Z1604P	Z1606P	Z1605P	Z1890P	Z1889P	Z1608P	Z1609P
Floodlights Prewired Gearboxes Lanterns	Z5761 ,Z8832 F64370 SB70	Z5699 ZD6526	SB120	TS150 SF150 Harrier Champion Hi-Saver Z8610 Z8611	TS250 SF250 SB250 Harrier Champion Hi-Saver Z8534 Z8536 Z8610 Z8611	TS310 SF310 SB310 Champion Hi-Saver	TS400 SF400 SB400 Harrier Champion Hi-Saver Z3430 Z8534 Z8536 ZD7321	GB600LV	GB600HV	GB1KWLV ZD7321	GB1KWHV

	Super SOX							
Watts	10	10	35	35	35/55	35/55	50	135/100
Ballast	Z1694G	Z1695G	Z1614P	Z1698G	Z1616P	Z1612P	Z1622P	Z1634P
Luminaires	F64310	F64318	F64335	Z9580	F64335	Z9464	Z9464	Z1634P
Lanterns			Z5760 Z8830 Z9532 Z9533 ZD6528	Z9581 Z9582 Z9583	Z5698 Z9538 Z9539		Z9543	Z9563

AUTO-TRANSFORMER

1500VA 240 : 415 Z1550P The transformer is provided with a thermal cutout for overload protection.

To assess the VA rating of the circuit multiply the Output Supply Voltage by the Output Current. Do not rely on the nominal lamp wattage.



		Cross Section mm W X H	Overall Length mm	Fixing Centres mm	Weight kg	tw °C
Z1550P	Transformer	112 x 110	204	184 x 76	8.3	120

When installing fluorescent luminaires, the following points must be considered.

1. **Supply Cables**

   (a) The rating of supply cables should always take into account the reactive component associated with fluorescent tube and other discharge lamp circuits generally. The 15th edition of the I.E.E. wiring regulations gives the following formula for assessing the current.

$$I(A) = \frac{\text{Lamp power (w)} \times 1.8}{\text{Supply voltage (v)}}$$

   Hence for ten 65W fluorescent tubes in a 240V single phase circuit, the current rating would be

$$I = \frac{10 \times 65 \times 1.8}{240} A \simeq 5A$$

   Note. This formula assumes that the circuits are power factor corrected to not less than 0.85.

   (b) Standard PVC cables will overheat if they are positioned in close proximity to the control gear. In all such cases, either the use of cool wireway or a suitable high temperature cable should be used.

   When using mineral insulated cables, the advice of the cable manufacturer should be sought for surge protection.

2. **Fuse Ratings**

   Allowances must be made in fluorescent lighting circuits for switching surges and therefore where quick reaction protective devices or HRC fuses are used, they must be suitably rated.

3. Suitable wall switches should always be used in fluorescent lighting circuits i.e. quick make and slow break and rated for twice the steady current they are required to carry.

4. **Harmonics and Neutral Current**

   Due to harmonic distortions which are present in all fluorescent circuits, increasing the neutral current, a **full size** neutral conductor **must** be used.

5. **Control Gear Noise**

   All laminated core control gear produces noise to some degree dependent on the type of circuit and lamp wattage. However, this noise is usually inaudible in normal environments due to the presence of background noise. In installations where control gear could present a problem e.g. libraries, health service etc, advice should be sought from the manufacturer on suitable control gear.

   It is generally accepted that 6' and 8' are noisier than the shorter sizes.

6. Where control gear is not to be mounted in luminaires, care should be taken not to mount it on a flammable surface and the electrical connections and enclosures should be in accordance with the I.E.E. wiring regulations.

For further information on the use of control gear, please contact your local GEC Lighting sales office.

FUSING

The starting current in discharge lamp circuits (except SOX lamps) is substantially more than the running current. During the starting period, due to unequal heating of the cathodes, partial rectification may occur, and for a few cycles a d.c. component may pass which is several times the normal RMS starting current. The exact value of the d.c. surge will depend on the choke design and line impedance. The fuse rating must be sufficient to accommodate this phenomenon by having adequate current carrying capacity and not being a fast acting type fuse.

Fuse and Circuit Breakers

Fusing design for discharge lamp circuits is a complex subject. The following recommendations can only be used as a guide. For more specific information the fuse or circuit breaker manufacturer should be consulted.

Information on this subject is given in the latest edition of the I.E.E. regulations and when in doubt contractors should refer to them.

Note that in the case of high pressure sodium and other discharge lamps the cable from the ballast to the lamp must NOT be mineral insulated, glass fibre or asbestos insulation.

On all of these subjects, more detailed information is available from regional sales offices.

Recommended ratings for individual fusing of HPS and mercury lamps

Voltage	220-250						380-440		
Lamp Watts	70-150	250	310-400	600	700	1000	600	1000	2000
HRC* Fuse	4	10	16	16	16	20	2 x 16	2 x 16	2 x 20
Wire Fuse	5	5	10	10	10	15	2 x 10	2 x 10	2 x 15

Recommended HRC* fuse ratings for multiple installations of HPS and mercury lamps

Number of Lamps per circuit	1	2	3	4	5	6
70W-80W	4	4	4	4	6	6
120W-150W	4	4	6	10	10	10
250W	10	16	16	20	20	20
310W-400W	16	20	20	25	25	25
600W (220-250V)	16	20	25	32	35	40
600W (380-440V)	16	20	20	25	25	25
700W	16	20	25	32	35	40
1000W (220-250V)	20	25	35	40	50	63
1000W (380-440V)	16	20	25	32	35	40

*To BS88 1975.

CAPACITORS

Metallised film capacitors to BS4017 and BS5267

250V continuous rating at 50/60Hz Temperature range −40°C to + 85°C

Catalogue No.	µF ± 10%	Diameter mm	Can Length* mm	Weight Frame	Clip Cat. No.
Z1757	6.5	33	67	65	Z1679
Z1674	8	35	67	72	Z1679
Z1675	10	35	97	82	Z1679
Z1712	13	45	67	96	Z1678
Z1713	15	45	67	112	Z1678
Z1714	18	45	97	133	Z1678
Z1715	20	45	97	138	Z1678
Z1716	25	45	97	154	Z1678
Z1786	30	55	98	187	Z1769
Z1758	40	55	118	225	Z1769

440V continuous rating at 50/60Hz Temperature range −40°C to + 85°C

Catalogue No.	µF ± 10%	Diameter mm	Can Length* mm	Weight gram	Clip Cat. No.
Z1798	10	45	97	149	Z1678
Z1799	14 ± 5%	55	98	223	Z1769
Z1752	15 ± 5%	55	98	226	Z1769
Z1734	17 ± 5%	55	118	254	Z1769
Z1754	20	55	118	264	Z1769

550V continuous rating at 50/60Hz Temperature range −25°C to +85°C

Catalogue No.	µF ± 5%	Diameter mm	Can Length* mm	Weight gram	Clip Cat. No.
F8615	36	55	175	560	F1769
F8616	36	65	175	770	F1997

*For overall length add 35mm.

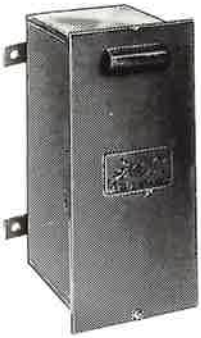
Metallised film capacitors to BS4017 and BS5267

Temperature range −40 to 85°C.

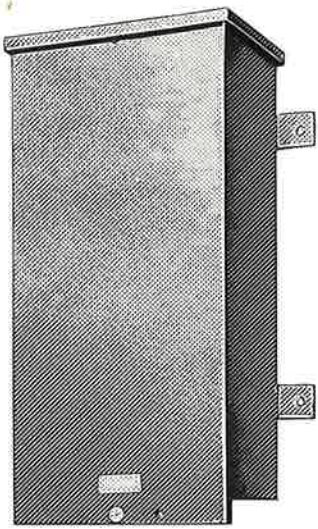
Catalogue Number*	Capacitance µF	Voltage	Tolerance %	Diameter mm	Length L mm	Clip Cat. No.
F8933	2.5	250	10	30	46	LS100/16
F8913WE	3.25	250	10	35	47	
F8934PC	4.0	250	10	35	47	
F8911PC	5.25	250	10	35	67	
F8906PC	6.0	250	10	35	67	ALL
F8914PC	6.5	250	10	35	67	Z1679
F8925WE	6.8	440	5	35	118	
F8926	7.2	440	5	35	118	
F8909PC	8.4	250	5	35	67	
F8935	10.0	300	10	35	99	
F8910WE	10.5	250	10	35	97	
F8932WE	12.0	250	10	35	97	
F8916WE	16.0	250	10	35	117	

*Capacitors with suffix 'WE' are being replaced by 'PC'
There are no dimensional changes.

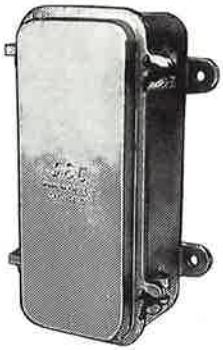
CONTROL GEAR BOXES



Z1896, Z1906, Z1908



F62336A



Z1912

These boxes are designed for both indoor and outdoor use to house discharge lamp control gear. The ballasts, capacitors etc are supplied separately for fixing and wiring on site by the contractor.

Z1896, Z1906, Z1908

These boxes are constructed in zinc coated sheet steel finished stove enamelled grey. Hardwood base boards are fitted for mounting the control gear. Two 25mm ET entries for conduit or cable gland are provided in the bottom. The boxes are only weatherproof when mounted vertically. Two fixing straps with four 13.5mm holes are fitted to the back. For details of the control gear these boxes will house refer to pages 164 to 169. **Ingress Protection** I.P. 43.

F62336A Made from zinc coated sheet steel finished stove enamelled hammer grey. The lid, fitted with nylon safety cord is secured against a rubber gasket by a nylon fastener. A four way terminal block and two 16 amp HRC fuses and carriers are fitted as standard. Two 25mm ET entries are provided on each side close to the top for conduit or cable glands. This box is only weatherproof when mounted vertically. Two fixing straps with 9mm holes are fastened to the back. For details of the control gear this box will house refer to pages 164 to 169. **Ingress Protection** I.P.44.

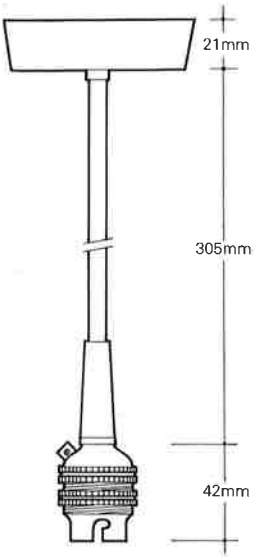
Z1912 Made from corrosion resistant cast aluminium. The hinged lid is secured by hinged bolts and wing nuts against a weatherproofing gasket. Two 20mm ET tapped entries are provided for conduit or cable glands. The back is fitted with two straps with 13.5mm fixing holes. This box may be mounted horizontally or vertically and is suitable for all SOX gear; all mercury gear except the 2000W MBI; all high pressure sodium gear except the 1000W. **Ingress Protection** I.P. 64.

RANGE

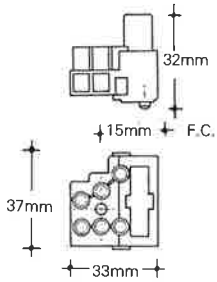
Cat. No.	Overall Length	Overall Width	Overall Depth	Fixing Centres	Space available for gear			Weight kg
					Internal Length	Internal Width	Internal Depth	
Z1896	360	184	140	229 × 153	330	117	111	2.0
Z1906	360	210	152	229 × 178	330	143	124	2.3
Z1908	437	210	152	305 × 178	407	143	124	3.0
Z1912	388	238	156	194 × 229	340	140	124	3.9
F62336A	521	330	189	300 × 300	404	244	160	9.1

ACCESSORIES

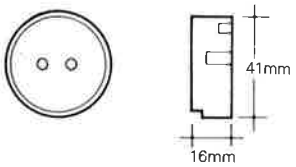
F1150



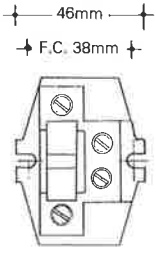
F1561



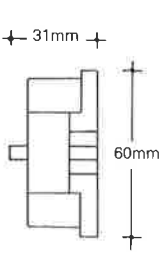
F1973



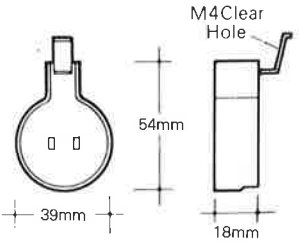
F15972

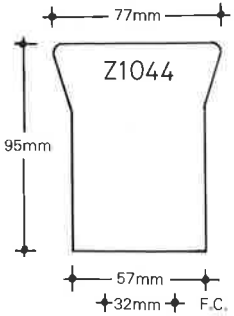


F159713

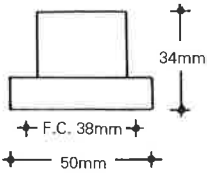


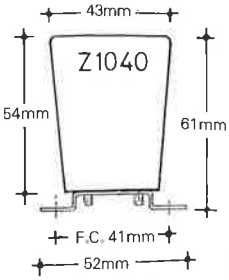
F1928A



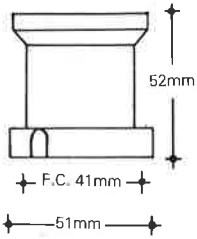


F1901





F1965



F69126

Die cast aluminium spigot cap with hammer grey finish. Has angled flat surface with fixing bolts at 102mm centres.

Fitted with nylon compression gland for 4-7mm O.D. cable. Has two socket screws for locking bracket to 51mm (2″) O.D. spigots.

F1139 Tube suspension set.

F1150 Suspension set comprising brass BC lampholder with earth prewired via white plastic cable clamp with 306mm 3-core silicone rubber insulated colour coded cables with white high temperature PVC outer sheath to white ceiling rose backplate.

F1210 Lampholder G23 Opus with threaded barrel.

F1211 Lampholder G23 Opus with snap-in foot fixing.

F1212 Lampholder G23 Opus with screw fixing.

F1345 Oval link 12swg steel cadmium plated suspension chain.

F1561 Three way moulded UFPP polypropylene terminal block complete with fuse carrier. (Fuse not supplied.) Maximum temperature 125°C; current 13 amp. Terminals will each accept 2 x 2.5mm² or 3 x 1.5mm² cables. Fixing by M3.5 x 12mm screw and shakeproof washer. Fuses – to BS1362.

F1597 Terminal block only.

F15971 Black fuse carrier.

F159713 Terminal block with 13 amp fuse.

F159713FU 13 amp fuse only.

F15972 2-way line (fused) and neutral, white porcelain block complete with pull out fuse carrier and 2 amp fuse. With pinch screw terminals which will each take 3 x 2.5mm² conductors. Fuses – to BS1362.

F1598 2 amp fuse for F1597.

F1774 Radio interference capacitor 0.1 µF.

F1901 White porcelain BC batten type lampholder with external fixing holes.

F1923 Zinc plated spring steel 38mm dia tube fixing clips.

F1928A White moulded medium bi-pin skirted spring loaded lampholder prewired with high temperature PVC cable. (Used on 103 range.)

F1938 1 Lt Europa lampholder.

F1939 2 Lt Europa lampholder.

F1954 3 amp fuse.

F1959 1.25 amp fuse.

F1965 White porcelain skirted ES lampholder with external fixing holes.

F1966 630mA fuse.

F1970 315mA fuse.

F1974 Europa lampholder spring.

F1977 GES lampholder.

F1994 2-pin starter socket.

F1997 65mm capacitor clip for F8616.

F8500 Zinc plated spring steel fixing clip for 38mm dia fluorescent tubes.

Z1040 White porcelain ES lampholder with fixing bracket.

Z1044 White porcelain skirted GES lampholder with through-back fixing holes.

Z1679 Zinc plated spring steel fixing clip for 35mm dia capacitors.

Z1678 Zinc plated spring steel fixing clip for 45mm dia capacitors.

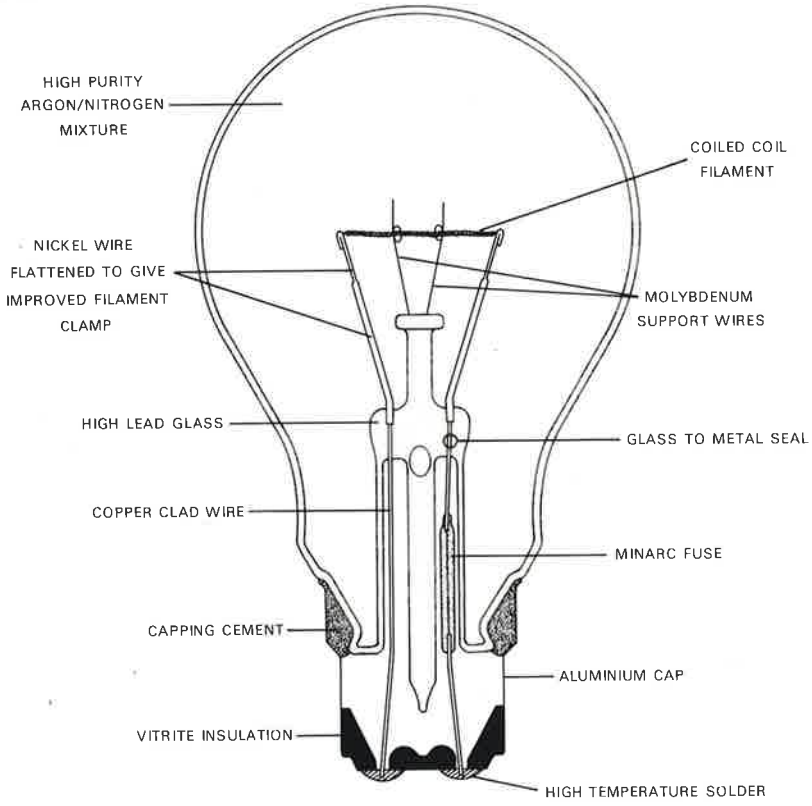
Z1769 Zinc plated spring steel fixing clip for 53mm dia capacitors.

GENERAL LIGHTING SERVICE

GEC manufactures many millions of General Lighting Service lamps a year for commercial and domestic use. All are inspected prior to despatch and process checks are made throughout the many stages of manufacture, from raw materials to finished lamps, to ensure a flow of consistent, high quality products. Samples are taken for extensive evaluation of quality and life.

Within the classification of GLS lamps are sealed beam and standard reflector lamps, decorative round bulb and candle lamps, and special purpose lamps such as pygmy, traffic signal and carbon heater lamps, as well as the more traditional range of lamps.

EXTRALITE (COILED COIL) LAMP



Standards

Most lamps in this section fall within the scope of BS5971 – 'Safety and interchangeability of tungsten filament lamps for domestic and similar general lighting purposes' and IEC Publication 432 2nd edition. Design, manufacturing techniques and quality control procedures are geared to the requirements of these specifications. Extralite, Coiled Coil (GEC) and Single Coil lamps are made to BS161 and IEC Publication 64 where appropriate.

Fusing

The vast majority of lamp types incorporate a unique GEC safety device – the Minarc fuse. At the end of lamp life normal filament failure can result in a short circuit within the lamp which, if inadequately protected, can cause the lamp to explode or break away from the cap. The Minarc fuse, a GEC invention (UK Patent 814314) helps to prevent this. All other lamps are fitted with internal fuses where necessary.

Life, filament temperature and efficacy

Incandescence is the visible radiation obtained by heating a material, which in most lamps is a tungsten filament. The power consumed is measured in watts, and the total light output in lumens. The ratio lumens per watt is known as the efficacy. As the temperature of the filament is increased so the conversion of electrical energy into light (viz the efficacy) improves. See figs. 1 and 2.

Fig. 1. Spectral energy of equal wattage lamps.

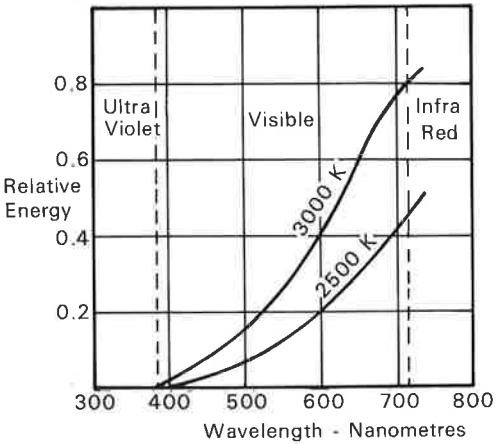
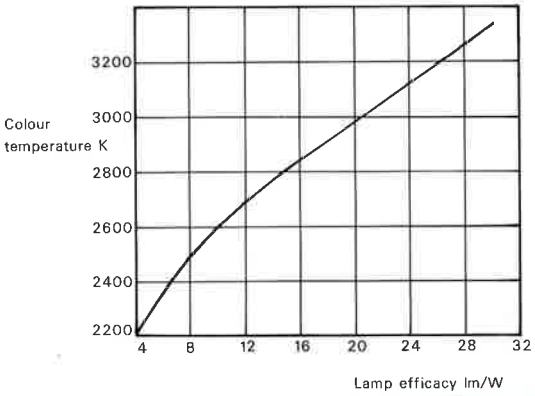
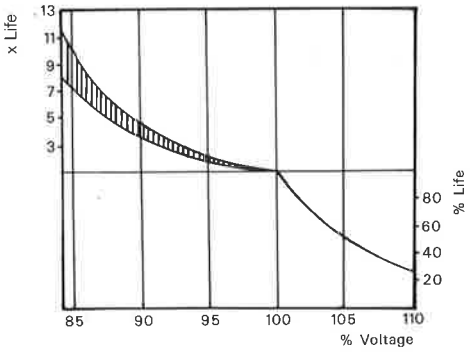


Fig. 2. Colour temperature and lamp efficacy (gas filled).



The life of an incandescent lamp is dependent upon the rate of evaporation of the filament material. With most lamps the efficacy is set as high as possible consistent with the required life. Raising the voltage applied to the lamp also raises light output but this in turn, increases the filament temperature and its rate of evaporation thus reducing life. Likewise, to decrease the voltage has the opposite effect. The effect of voltage variation on various characteristics are given in figs. 3 and 4.

Fig. 3. Effect of voltage variation on life of incandescent lamps.



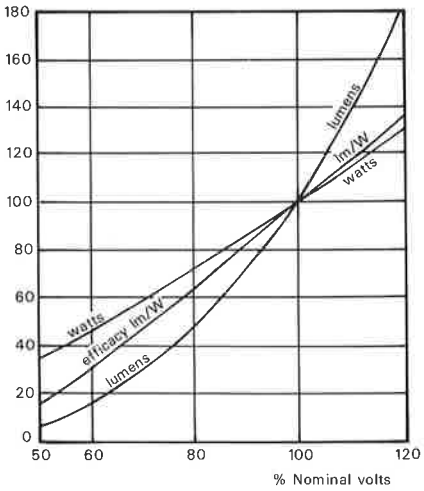
Other factors affecting life

Other factors which can adversely affect the lamp life are vibration and poor ventilation. During the life of a lamp, the filament structure changes and becomes more brittle. Vibration can cause the filament to fracture even when the lamp is not in use. When the lamp is alight, distortion by shock or vibration may close the filament pitch, resulting in hot spots. However, lamps are available which have been specially designed to be better able to stand the conditions when shock and vibration are inevitable.

Poor ventilation will shorten the life of a lamp and this must be taken into account when designing luminaires, so that the lamp or fittings do not overheat. It is additionally recommended that when designing luminaires for mains voltage lamps, attention is given to the requirements of the relevant parts of BS4533.

Although failure of lamps often occurs at switching, there is little evidence that normal switching reduces life although in some instances where the 'on' period is so short that gas filled lamps do not reach normal working pressure, the burning time to failure can be affected.

Fig. 4. Characteristics of incandescent lamps on varying voltage.



Lumen Output

For tungsten filament lamps the values of lumen output are measured initially, i.e. after a short ageing period (to achieve stability). There is a fall during life for non-halogen lamps due to the blackening of the bulb by evaporated tungsten and the thinning of the filament. BS161 requires that lamps within its scope are measured again after 750 hours, and the ratio is described as 'maintenance'. For gas-filled lamps to meet BS161 they must have a maintenance of a least 85%. For the guidance of lighting engineers a value of Lighting Design Lumens for tungsten lamps is given as a typical average through life.

Lumen outputs

Coiled Coil			Single Coil							
	240V		240V		110/120V*		50V		25V	
Watts	Initial Lumens	LDL	Initial Lumens	LDL	Initial Lumens	LDL	Initial Lumens	LDL	Initial Lumens	LDL
15			110	100						
25	225	210	215	200	225	210	275	260	290	275
40	410	385	340	320	440	415	480	450	540	510
60	700	660	610	575	760	715	830	780	930	875
75	940	885	870	820						
100	1330	1250	1230	1160	1420	1330	1520	1430	1620	1520
150	2140	2010	2060	1940	2340	2200				
200			2880	2710	3250	3100				
300			4550	4280	5000	4700				
500			8200	7710	8900	8400				
750			13200	12410						
1000			18400	17300	19300	18100				
1500			28700	27000	30000	28200				

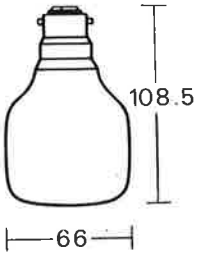
*Measured at 117V.
LDL – Lighting Design Lumens.

Lamp Caps

Standard Designation	IEC Designation	Description
BC	B22d	Bayonet Cap
3 pin BC	B22d-3	Bayonet Cap – 3 pin
ES	E27	Edison Screw
GES	E40	Goliath Edison Screw
SBC	B15d	Small Bayonet Cap
SES	E14	Small Edison Screw
—	S15s	Single Contact Cap (for Striplite)

All line drawings in this catalogue are purely to give a representation of the lamp design, and do not necessarily conform to scale or technical specification. Bulb diameters and overall lengths are maximum values, and the dimension from the cap to the centre of the light source is a nominal value, in millimetres. Lamps require some free space within a luminaire to take into account axiality and eccentricity tolerances. Luminaire manufacturers who need to design with close spacing are requested to seek specific advice. This free space is to cover mechanical interchangeability only, and additional spacing may be necessary to maintain satisfactory luminaire and lamp temperatures.

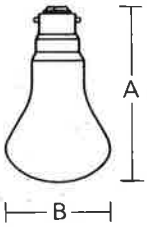
COILED COIL



Accent 2

A unique square shaped lamp for applications where style and long life are important. Twice the life of normal tungsten lamps and designed to produce a softer, warmer light with less glare; ideal for fittings where the lamp is visible.

Watts	Volts	Cap	Finish	Std. Pack
40	240	BC	Soft White	30
60	240	BC	Soft White	30
100	240	BC	Soft White	30



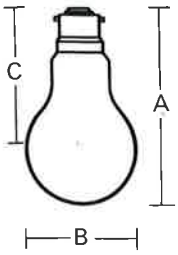
Filtalite

A mushroom shaped lamp with a white inner coating which reduces glare.

Watts	Volts	Cap	Finish	Std. Pack
40	240	BC	Soft White	25, 10 × 10, 50
60	240	BC	Soft White	25, 10 × 10, 50
100	240	BC	Soft White	25, 10 × 10, 50
150	240	BC	Soft White	25, 10 × 10

FILTALITE

	A	B
40-100W	103.5	61
150W	128.5	76



Extralite - Coiled Coil

A high quality, popular domestic lamp with a coiled coil filament for greater light output. Pearl finish for general lighting and clear for sparkle.

Watts	Volts	Cap	Finish	Std. Pack
25	240	BC	Pearl/Clear	25
40	240, 250	BC/ES	Pearl/Clear	25, 10 × 10, 50
60	240, 250	BC/ES	Pearl/Clear	25, 10 × 10, 50
75	240, 250	BC	Pearl/Clear	25, 10 × 10
100	240, 250	BC/ES	Pearl/Clear	25, 10 × 10, 50
150	240, 250	BC	Pearl/Clear	25, 10 × 10, 30

EXTRALITE

BC Cap	A	B	C
25-100W	108.5	61	75
150W	128.5	69	90

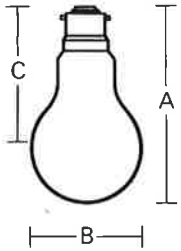
(For ES cap - Dimensions A & C are 1.5mm longer)

Lamps with other caps and ratings not specified above can be made to special order; a minimum quantity order of at least 10,000 lamps is required.

Single Coil

Watts	Volts	Cap	Finish	Std. Pack
15	240	BC	Pearl	25
25	25, 50, 110/120 220/230	BC	Pearl	25
40	25, 50, 110/120	BC/ES	Pearl	25
60	25, 50, 110/120	BC/ES	Pearl	25
75	240, 250	BC/ES	Pearl	25
100	25, 50, 110/120	BC/ES	Pearl	25
150	110/120, 220/230 240, 250	BC/ES	Pearl	25
200	110/120 220/230, 240, 250	ES BC/ES	Pearl Pearl/Clear	25 25
300	110/120, 220/230 240, 250	GES	Clear	10
500	110/120, 220/230 240, 250	GES	Clear	10
750	240, 250	GES	Clear	10
1000	240, 250	GES	Clear	10
1500	240, 250	GES	Clear	4

Lamps with other caps, finishes and ratings not specified above can be made to special order; a minimum quantity order of at least 10,000 lamps is required.



SINGLE COIL

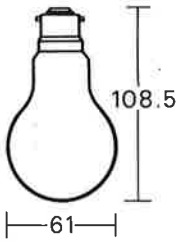
		A	B	C
15-100W	BC	108.5	61	75
150, 200W	BC	165	81	120
300, 500W		239	111.5	178
750, 1000W		299	131.5	225
1500W		344	171.5	250

(For ES cap - Dimensions A & C are 1.5mm longer than BC)

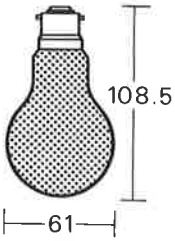
Slumberlite

A low wattage night light, ideal for children's bedrooms and security lighting.

Watts	Volts	Cap	Finish	Std. Pack
Low	200/250	BC	Pearl	10



COLOURED



Coloured GLS - Carnival

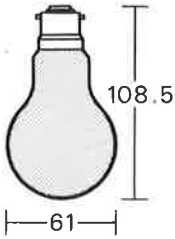
A range of lamps for special effects and decorative lighting available in six standard colours.

Amber, Blue, Green, Red, Pink and Yellow.

Watts	Volts	Cap	Finish	Std. Pack
15	240	BC/ES	External glaze	10
25	240	BC/ES	External glaze	10
40	240	BC	External glaze	10
60	240	BC	External glaze	10

25W ES cap lamps are available subject to minimum quantity orders.

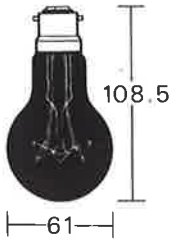
In exposed conditions use the 15W or 25W in weatherproof holders.



Warmlite

A range of lamps available in three colours producing a soft flattering light suitable for use in bedrooms, living rooms and reception areas, to create a warm, relaxing atmosphere.

Watts	Volts	Cap	Finish	Std. Pack
60	240	BC	Rose Pink	10
60	240	BC	Old Gold	10
60	240	BC	Tangerine	10



Fireglow

A warm red lamp for use in flame effect fires and wherever a rich ruby glow is required.

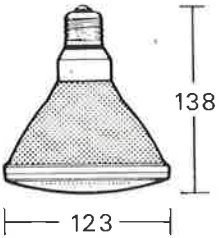
Watts	Volts	Cap	Finish	Std. Pack
40	240	BC	Red Lacquered	25
60	240	BC	Red Lacquered	25, 10 × 10
60	240	3 pin BC	Red Lacquered	25

Sealed Beam Reflectors

PAR 38 Spotlights and Floodlights

Accurate and versatile reflector lamps suitable for interior and exterior use in commercial and display applications.
With 2000 hour nominal life, PAR 38's offer twice the life of standard reflector lamps.

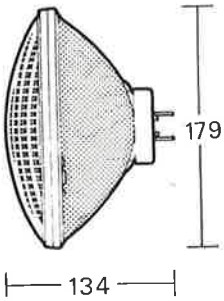
Watts	Volts	Cap	Finish	Std. Pack
Spotlight				
100	240/250	ES	Clear Front	12
150	120	ES	Clear Front	12
150	240/250	ES	Clear Front	12
Floodlight				
100	240/250	ES	Clear Front	12
150	24	ES	Clear Front	12
150	120	ES	Clear Front	12
150	240/250	ES	Clear Front	12
Coloured Floodlight				
100	240/250	ES	Lacquered Front Amber, Blue, Green, Red and Yellow.	12



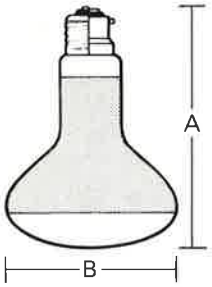
PAR 56

An efficient, precision made lamp, with an internal aluminised reflector, suitable for decorative and display lighting.
Particularly useful for deep or large windows where a long throw of light is required. Available with narrow, medium or wide beam.
Protect from water splashes.

Watts	Volts	Cap	Finish	Std. Pack
300	240	GX16d	Clear Front	6



REFLECTORS



STANDARD REFLECTOR

	A	B
75,100W	140	96
150W	180.5	127.5

Blown Glass Reflectors

Standard Reflectors R95 and R125

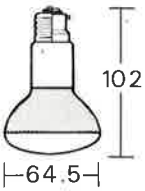
Internally aluminised blown glass reflector lamps, for a wide variety of commercial, domestic and display applications.
Available with diffuse, clear (silver spot) or externally lacquered coloured front glass.

Watts	Volts	Cap	Finish	Std. Pack
75	240/250	BC/ES	Diffuse/Clear (Silver Spot)	10
100	240/250	BC/ES	Diffuse/Clear (Silver Spot)	10
150	240/250	BC/ES	Diffuse	10
150	240/250	ES	Clear (Silver Spot)	10
Coloured				
75	240/250	BC/ES	Lacquered, Amber, Blue, Green, Red and Yellow	10

R080 Reflector

A smaller blown glass reflector lamp suitable for commercial and domestic use in spotlights and downlighters where an unobtrusive appearance is required. Available with diffuse, clear (silver spot) or externally lacquered coloured front glass.

Watts	Volts	Cap	Finish	Std. Pack
40	240/250	BC/ES	Clear	10
60	240/250	BC/ES	Diffuse	10
75	240/250	BC/ES	Clear (Silver Spot)	10
100	240/250	BC/ES	Diffuse	10
Coloured				
40	240/250	BC/ES	Lacquered, Amber, Blue, Green, Red and Yellow	10



R63 Reflector

A popular small reflector lamp for commercial, domestic and display lighting. Available with diffuse and externally lacquered coloured front.

Watts	Volts	Cap	Finish	Std. Pack
40	240/250	BC/ES	Diffuse	10
60	240/250	BC/ES	Diffuse	10
Coloured				
40	240/250	BC/ES	Lacquered Blue, Green Red and Yellow	10

(Lamps with ES caps are 1.5mm longer than BC types)

R50 Reflector (Available late 1985)

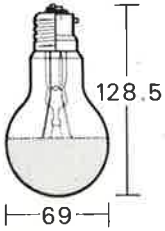
A small, compact reflector lamp ideally suited for downlighters, spotlights and task lighting.

Watts	Volts	Cap	Finish	Std. Pack
40	240/250	SES	Diffuse	10

Bowl Silver

Used with an external reflector it gives a sharp, narrow spot with minimal light spill, ideal for display lighting. Also widely used in modern lighting fittings for special decorative lighting effects.

Watts	Volts	Cap	Finish	Std. Pack
60	240/250	BC/ES	Clear with internal aluminised crown	25
100	240/250	BC/ES		25
60	240/250	3 pin BC		25



Infra Red Reflector. Soft glass bulb (not for domestic use)

Localised instant heat and light combined for industrial and commercial applications e.g. paint drying, outhouses and loading bays. A red front version is available to significantly reduce visible light output - for special use with animals.

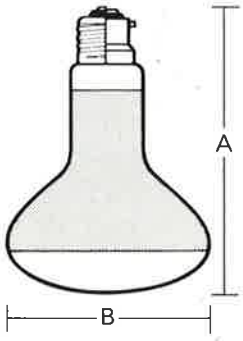
Watts	Volts	Cap	Finish	Std. Pack
275	110/130	ES	Pearl	10
275	220/250	BC	Pearl	10
275	220/250	ES	Pearl	10
275	220/250	ES	Red Front*	10

* Operate lamp with cap up +90°. Operation in any other position may cause deterioration of the red filter.

Infra Red Reflector. Hard glass bulb

Suitable for domestic, commercial and industrial use, this lamp is made from a special glass which reduces the possibility of shattering to a minimum if splashed with liquids.

Watts	Volts	Cap	Finish	Std. Pack
275	220/250	BC	Clear	10
275	220/250	ES	Clear	10

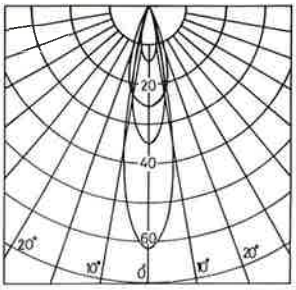


INFRA RED

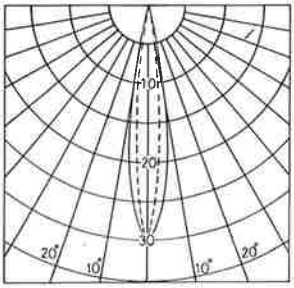
BC Cap	A	B
275W Pearl	180.5	127.5
275W Red	188	127.5
275W Hard Glass	186.5	128

(Lamps with ES caps are 1.5mm longer than BC types)

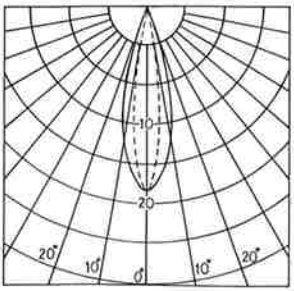
BEAM DATA



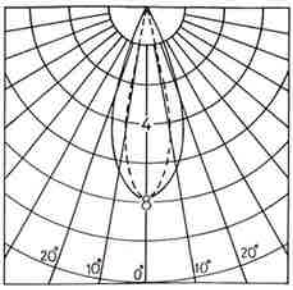
Candelas (× 100)



Candelas (× 1000)



Candelas (× 1000)



Candelas (× 1000)

Sealed Beam Reflector Lamps

PAR 38 SPOT AND FLOODLIGHT

Lamp	Typical Peak Beam Intensity	Half Peak Beam Angle
100W Spot	3500cds	20°
100W Flood	1450cds	33°
150W Spot	6200cds	20°
150W Flood	2600cds	33°

PAR 56 NARROW SPOT

Lamp	Typical Peak Beam Intensity	Half Peak Beam Angle
300W Spot	30000cds	16° Parallel to plane of ceramic base. 10° Right angles to plane of base.

PAR 56 MEDIUM FLOOD

Lamp	Typical Peak Beam Intensity	Half Peak Beam Angle
300W Flood	16000cds	25° Parallel to plane of ceramic base. 12° Right angles to plane of base.

PAR 56 WIDE FLOOD

Lamp	Typical Peak Beam Intensity	Half Peak Beam Angle
300W Flood	7800cds	34° Parallel to plane of ceramic base. 21° Right angles to plane of base.

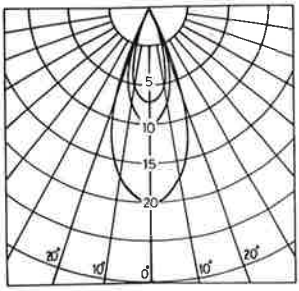
Above are typical figures for mains voltage clear lamps, measured at mid-point of the quoted dual voltage.

Blown Glass Reflector Lamps

BEAM DATA

STANDARD REFLECTOR R95 & R125

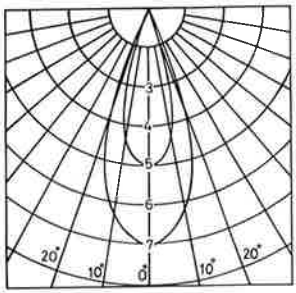
Lamp	Typical Peak Beam Intensity	Half Peak Beam Angle
75W	700cds	35°
100W	1000cds	35°
150W	2000cds	35°



Candelas (×100)

R080 REFLECTOR

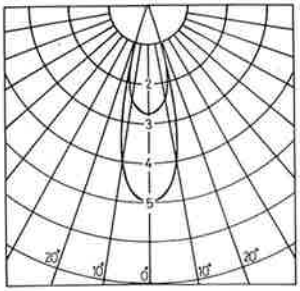
Lamp	Typical Peak Beam Intensity	Half Peak Beam Angle
60W	500cds	40°
100W	700cds	40°



Candelas (× 100)

R63 REFLECTOR

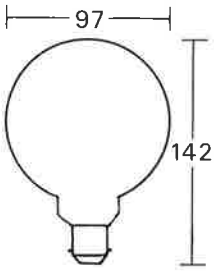
Lamp	Typical Peak Beam Intensity	Half Peak Beam Angle
40W	275cds	32°
60W	500cds	32°



Candelas (× 100)

Above are typical figures for diffuse types only, i.e. not for silver spot or colours, measured at the mid-point of the quoted dual voltage.

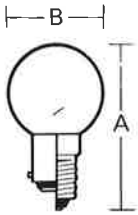
DECORATIVE



95mm Round Bulb (Available late 1985)

A large, round decorative lamp with a soft white inner coating to reduce glare. Suitable for decorative luminaires and ceiling fittings where the lamp is visible.

Watts	Volts	Cap	Finish	Std. Pack
60	240	BC	Silverlight	10
100	240	BC	Silverlight	10



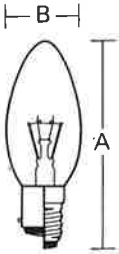
45mm Round Bulb

Watts	Volts	Cap	Finish	Std. Pack
25	240	BC/SBC/SES	Silverlight	10
40	240	BC/SBC/SES	Silverlight	10

Clear lamps available to special order.

45mm ROUND BULB

		A	B
25,40W	BC	72.5	46
	SBC	76	46
	SES	77.5	46



Plain Candle

Watts	Volts	Cap	Finish	Std. Pack
35mm				
25	240	BC/SBC/SES	Clear	10
25	240	BC/SBC/SES	Silverlight	10
40	240	BC/SBC/SES	Clear	10
40	240	BC/SBC/SES	Silverlight	10
60	240	BC/SBC/SES	Clear	10
60	240	BC/SBC/SES	Silverlight	10
45mm				
60	240	BC/SBC	Clear	10
60	240	BC/SBC	Silverlight	10

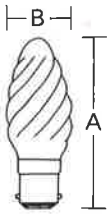
Pearl lamps available to special order.

PLAIN CANDLE

		A	B
25-60W	BC	95.5	36
	SBC	99.5	36
	SES	101.5	36
60W	BC	124.5	46
	SBC	127.5	46

Twisted Candle

Watts	Volts	Cap	Finish	Std. Pack
35mm				
40	240	BC/SBC	Clear	10
40	240	BC/SBC	Pearl	10
60	240	BC/SBC	Clear	10
60	240	BC/SBC	Pearl	10
47mm				
60	240	BC	Clear	10
60	240	BC	Pearl	10

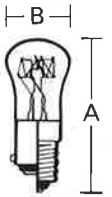


TWISTED CANDLE

		A	B
40,60W	BC	101	36
	SBC	106	36
60W	BC	126	48

Pygmy 28mm

Watts	Volts	Cap	Finish	Std. Pack
15	110/120	BC/SBC	Clear	10
15	240	BC/SBC/SES	Clear	10
25	240	BC/SBC	Clear	10
Coloured				
15	240	BC/SBC	Amber, Blue, Green, Pink, Red and Yellow	10



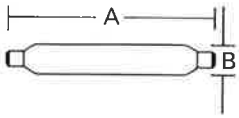
PYGMY

		A	B
15,25W	BC	61	29
	SBC	67	29
	SES	68	29

Striplite

Linear light source of initial low cost suitable for bedheads, mirrors, cookers and concealed lighting in display cabinets. Available in clear or opal and in two lengths (221 and 284mm).

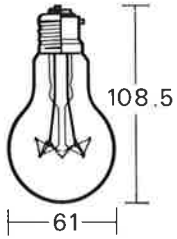
Watts	Volts	Cap	Finish	Std. Pack
221mm				
30	240	S15s	Clear/Opal	25
60	240	S15s	Clear/Opal	25
284mm				
30	240	S15s	Clear/Opal	25
60	240	S15s	Clear/Opal	25



STRIPLITE

	A	B
30,60W	221	26
	284	26

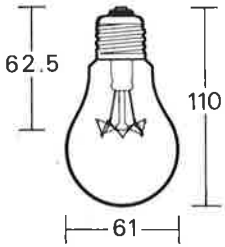
SPECIAL PURPOSE



Rough Service

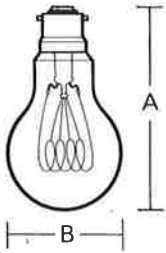
Special design to resist shock and vibration. Ideally suited for hand inspection lamps.

Watts	Volts	Cap	Finish	Std. Pack
40	110/120	BC	Pearl	25
40	220/250	BC	Pearl	25
60	110/120	BC	Pearl	25
60	220/250	BC/ES	Pearl	25
100	110/120	BC/ES	Pearl	25
100	220/250	BC/ES	Pearl	25



Traffic Signal

Watts	Volts	Cap	Finish	Std. Pack
65	240/250	ES	Clear	25



Carbon Heater

Lamps with large size carbon filaments for special heating or decorative lighting effects.

Nominal Watts	Volts	Cap	Finish	Std. Pack
65	230/250	BC/ES	Clear	25
130	230/250	BC/ES	Clear	25
200	230/250	BC	Clear	25

CARBON HEATER

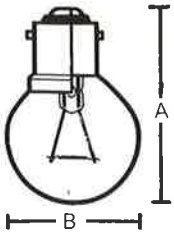
BC Cap.	A	B
65W	113.5	61
130,200W	128.5	69

(Lamps with ES caps are 1.5mm longer than BC types).

38mm Bus Lamp

Interior lighting for buses, coaches, caravans and boats. Also used in low volt emergency lighting installations.

Watts	Volts	Cap	Finish	Cat. No.	Std. Pack
12	12	BC	Pearl	804	150
12	12	SBC	Pearl	805	150
24	12	BC	Pearl	809	150
24	12	SBC	Pearl	810	150
12	24	SBC	Clear	812	150
12	24	BC	Pearl	816	150
12	24	SBC	Pearl	817	150
20	24	BC	Pearl	821	150

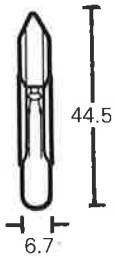


	A	B
BC	57	39
SBC	60	39

Telephone Switchboard Lamps

British Telecom Type No. 2/2A

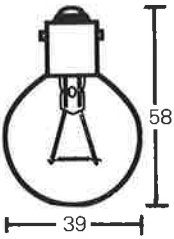
Amps	Volts	Type	Finish	End Colour	Std. Pack
0.040	6	No. 2	Clear	Grey	100
0.100	12		Clear	Red/Yellow	100
0.045	17	No. 2	Clear	Orange	100
0.050	24	No. 2A	Clear	Yellow	100
0.100	24	No. 2	Clear	Yellow	100
0.036	45	No. 2	Clear	Blue/White	100
0.100	50		Clear	White	100
0.060	60		Clear	Mauve	100



British Telecom Type No. 8

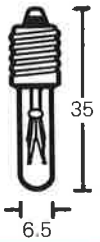
Available with a clear or coloured finish – Blue, Green, Red or Yellow.

Watts	Volts	Cap	Finish	Std. Pack
10	50	SBC	Clear or Coloured	100



Telewriter Lamps

Watts	Volts	Cap	Finish	Std. Pack
2.5	50	MES	Clear	50
3.6	60	MES	Clear	50



TUNGSTEN HALOGEN

GEC tungsten halogen lamps celebrate their 25th anniversary this year.

This introduction of the halogen lamp into Europe in 1961 represented the first major advance in incandescent lighting since the coiled coil lamp in the early 1930s.

The basic difference between the conventional tungsten filament lamp and the halogen lamp is that a trace of halogen is added to the filling gas.

The halogen sets up a regenerative cycle by which evaporated tungsten is removed from the bulb wall and returned to the vicinity of the filament. This virtually eliminates blackening of the bulb wall and allows the light output of the lamp to remain almost constant throughout its life.

Class M and K halogen lamps are made in quartz glass to withstand the high bulb wall temperature required for the halogen cycle to operate.

Single-Ended Lamps (Class M)

Class M32 and M28 are compact light sources which offer high lumen output and can be operated in any position. These lamps are ideal for shop display lighting, traffic control systems, optical systems and task lighting.

The M40 offers the user a long life lamp which can be used in compact modern luminaires.

Linear Lamps (Class K)

These lamps have the advantage of immediate and full light output on switching. They also offer excellent colour rendering and are suitable for floodlighting buildings, general area floodlighting, display and shop lighting, and theatre lighting.

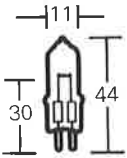
The new 200 watt is ideal for indoor use when fitted in an enclosed floodlight.

These lamps are made to IEC standard (publication 357).

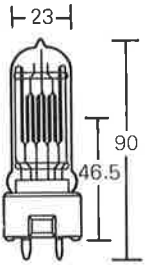
Class M

Single Ended Tungsten Halogen Lamps

Application: Display Lighting, Task Lighting and Traffic Signals.



M/28, M/32



M/40

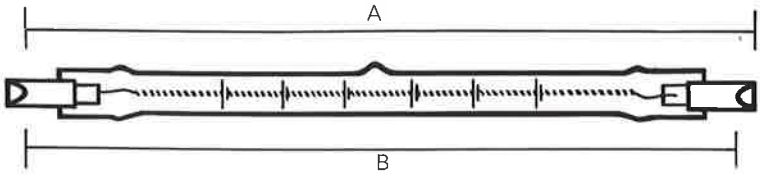
Operating Temperature: Pinch seal should not exceed 350°.

Traffic Signal Operation: M32 still achieves 3000 hours total burning time from a 30 second on/off cycle.

Lamp Type	Watts	Volts	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position	Standard Pack
M32	50	12	GY6.35	900	3000	Any	40
M28	100	12	GY6.35	2150	2000	Any	40
M40	500	240	GY9.5	8500	2000	VBD ± 90°	32

These lamps are suitable for use in **Hawk, EGL** and **Capital** floodlights. (See section 11.)

Cap: R7s-15
Operating Position: Horizontal ± 15°.
Objective Life: 2000 hours
Finish: Clear (Frosted available to order)
Operating Temperature: Pinch seal should not exceed 350°C
Max Bulb Diameter: 12mm (Excluding Pip)
Recommended Fusing: Rapid Acting HBC Type



Lamp Type	Watts	Volts	Nominal Lumens	Approx Colour Temp (K)	Contact to Ceramic Max A (mm)	Contact to Contact B (mm) ± 1.6	Recom-mended Fusing	Standard Pack
K/11	200	115/120	3100	2800	117.6	114.2	4A	50
		220/230	3100	2800	117.6	114.2	2A	50
		240/250	3100	2800	117.6	114.2	2A	50
K/9	300	110/115	5250	2900	117.6	114.2	6A	50
		115/120	5250	2900	117.6	114.2	6A	50
		220/230	5000	2850	117.6	114.2	4A	50
		240/250	5000	2850	117.6	114.2	4A	50
K/1	500	110/115	10500	3000	117.6	114.2	6A	50
		115/120	10500	3000	117.6	114.2	6A	50
		220/230	9500	2950	117.6	114.2	4A	50
		240/250	9500	2950	117.6	114.2	4A	50
K/3	750	220/230	15000	3000	189.1	185.7	6A	25
		240/250	15000	3000	189.1	185.7	6A	25
K/4	1000	110/115	22000	3050	189.1	185.7	10A	25
		115/120	22000	3050	189.1	185.7	10A	25
		220/230	21000	3050	189.1	185.7	6A	25
		240/250	21000	3050	189.1	185.7	6A	25
K/5	1500	220/230	32000	3050	254.1	250.7	10A	25
		240/250	32000	3050	254.1	250.7	10A	25

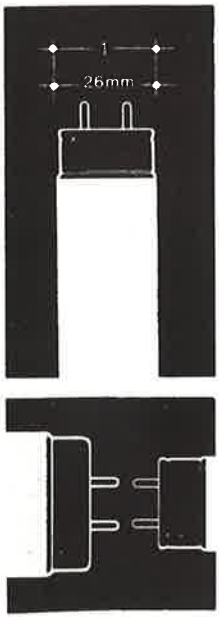
FLUORESCENT TUBES

KRYPTON FILLED – HIGH EFFICIENCY

26mm (1") diameter –T8

Cap: Bi-pin (G13). Standard Pack – 25

New 26mm (1") tubes can be used to replace T12 38mm (1½) tubes in standard switch start circuits. (See drawing.)



Watts	Nominal mm	Length ft	Standard Colours	Initial Lumens (100 hrs)	Lighting Design (2000 hrs)
70	1800	6	White	6050	5700
			Warm White	5950	5600
			Cool White	5750	5400
			Trichrome 2700	6700	6200
			Trichrome 4000	6700	6200
58	1500	5	White	5100	4700
			Warm White	4950	4550
			Cool White	4800	4400
			Trichrome 2700	5400	5100
			Trichrome 4000	5400	5100
			Daylight 6500*	3945	3600
36	1200	4	White	3050	2800
			Warm White	3000	2800
			Cool White	2900	2650
			Trichrome 2700	3450	3200
			Trichrome 4000	3450	3200
			Daylight 6500*	2500	2300
18	600	2	White	1225	1100
			Warm White	1200	1100
			Cool White	1150	1050
			Daylight 6500*	940	830

ARGON FILLED – GENERAL PURPOSE

38mm (1½") diameter – T12
Cap: Bi-pin (G13)
Standard Pack 8' – 20. All other sizes – 25

125	2400	8	White	9500	8900
			Warm White	9500	9000
			Cool White	9200	8600
			NATURAL	7150	6500
			Colour Matching	6650	6000
			De Luxe Natural	5500	4800
100	2400	8	White	8600	8100
			Warm White	8300	7800
			Cool White	8300	7800
85	2400	8	White	7350	6850
			Warm White*	7250	6750
			Cool White	7000	6500
			NATURAL*	5500	5000
			De Luxe Natural*	4300	3800

*Subject to minimum order quantities.

ARGON FILLED - Continued

Watts	Nominal mm	Length ft	Standard Colours	Initial Lumens (100 hrs)	Lighting Design (2000 hrs)
75/85 (at 85)	1800	6	White	6550	6250
			Warm White	6500	6100
			Cool White	6250	5800
			NATURAL	4800	4350
			Colour Matching	4370	4000
			De Luxe Natural	3700	3200
75/85 (at 75)	1800	6	White	6050	5750
			Warm White	5950	5650
			Cool White	5750	5450
			NATURAL	4400	4000
			Colour Matching	4000	3650
			De Luxe Natural	3400	2900
65/80 (at 80)	1500	5	White	5750	5200
			Warm White	5600	5100
			Cool White	5500	5000
			Daylight 7500*	4620	4170
			NATURAL	4300	3900
			Colour Matching	3650	3150
			De Luxe Warm White	4100	3750
			De Luxe Natural	3200	2700
65/80 (at 65)	1500	5	White	5100	4750
			Warm White	4950	4600
			Cool White	4800	4450
			Daylight 6500*	4150	3850
			NATURAL	3700	3400
			Colour Matching	3300	3000
			De Luxe Warm White	3600	3300
			De Luxe Natural	2900	2500
40	1200	4	White	3050	2800
			Warm White	3050	2850
			Cool White	2950	2750
			Daylight 6500*	2600	2450
			NATURAL	2300	2100
			Colour Matching	1975	1800
			De Luxe Warm White	2200	2000
			De Luxe Natural	1750	1500
40	600	2	White	2050	1850
			Warm White	2100	1800
			Cool White	2000	1750
20	600	2	White	1225	1100
			Warm White	1200	1120
			Cool White	1170	1110
			Daylight 6500	1000	880
			NATURAL*	910	770
			De Luxe Warm White*	950	890

*Subject to minimum order quantities.
N.B. Lamps for RAPID START circuits can be supplied to special order.

FLUORESCENT TUBES

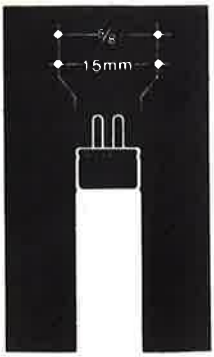
ARGON FILLED – GENERAL PURPOSE

26mm (1") diameter
Cap: Bi-pin (G13). Standard pack – 25

Watts	Nominal mm	Length ft	Standard Colours	Initial Lumens (100 hrs)	Lighting Design Lumens (2000 hrs)
50	1500	5	White	4000	3650
			Warm White	4100	3600
30	900	3	White	2400	2150
			Warm White	2400	2150
			Cool White	2300	2050
15	450	18"	White	950	800
			Warm White	950	800
			Cool White	900	750

MINIATURE TUBES

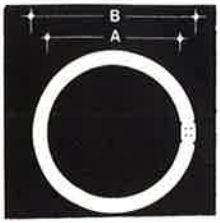
15mm (⅝") diameter – T5
Cap: Miniature Bi-pin (G5). Standard Pack – 25



Watts	Nominal mm	Length in	Standard Colours	Initial Lumens (100 hrs)	Lighting Design Lumens (2000 hrs)
13	525	21	White	860	750
			Warm White	875	760
			Cool White	820	720
8	300	12	White	480	420
			Warm White	480	420
			Cool White	400	360
6	225	9	White	300	250
			Warm White	295	250
			Cool White	280	240
4	150	6	White	130	100

CIRCULAR TUBES

Cap: 4 contact (G10q)
Standard Colour – Warm White
Standard Pack – 12



Watts	Nominal Diameter mm	Nominal Diameter in	Inside Diameter A mm	Outside Diameter B mm	Lighting Design Lumens (2000 hrs)
32	300	12	237.3 min	311.2 max	1850
40	400	16	338.9 min	412.8 max	2350
60	400	16	338.9 min	412.8 max	3400

METAL STRIPED TUBES

Dimensions and Lumen output as General Purpose Types (1½"). The metal stripe is necessary for certain circuits and types of fitting.

Watts	Nominal Length		Standard Colours			Standard Pack
	mm	ft	White	Warm White	Cool White	
125	2400	8	*			20
65/80	1500	5	*	*	*	25
40	1200	4	*	*	*	25
30	900	3	*			25
40	600	2	*	*	*	25
20	600	2	*	*	*	25

*Normally available ex stock.

UVA TUBES

38mm (1½") diameter
Cap: Bi-pin (G13)

For cosmetic and dermatological treatment in sunbeds solaria. Also for certain printing and photochemical processes.

Watts	Nominal Length		Standard Pack
	mm	ft	
85/100	1800	6	10
65/80	1500	5	10

MISCELLANEOUS TUBES

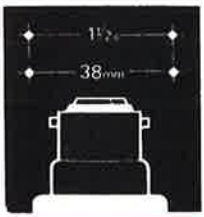
For Graphic Arts and Office copying.
38mm (1½") diameter
Cap: Bi-pin (G13)

65/80W 1500 (5ft) Colour Matching
40W 1200 (4ft) Colour Matching

	Transport	
40W 4ft	Warm White Striped	FWW48
30W 3ft	Warm White Striped	FWW36
30W 3ft	Natural	FN36
13W 21in	White Striped	F13-T5W
13W 21in	Warm White Striped	F13-T5WW
15W 18in	Warm White Striped	FWW18

38mm (1½") diameter. Cap: B22d (BC)
Lumen performance as Bi-pin for replacement purposes.

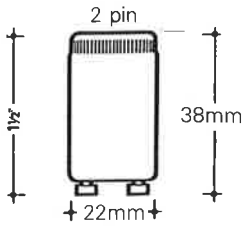
Watts	Nominal Length mm	Length ft	Standard Colour	Initial Lumens (100 hrs)	Lighting Design Lumens (2000 hrs)
80 (BC caps)	1500	5	White	5750	5200



Fluorescent Starter Switches
2 pin glow type white plastic canister.

Catalogue No.	Tube Rating			Circuit		
	Watts	mm	ft in	Single 115/130	Single 200/250	Series Twin 230/250
155/100	4	150	6″	*	*	* *
	6	225	9″	*	*	* *
	8	300	12″	*	*	* *
				115/130	200/250	220/250
155/200	15	450	18″	*	*	* *
	20	600	2′	*	*	* *
	18	600	2′	*	*	* *
	40	600	2′	*	*	* *
155/500	4†	150	6″		*	
	6†	225	9″		*	
	8†	300	12″		*	
	13	525	21″		*	
	30	900	3′		*	
	36	1200	4′		*	
	40	1200	4′		*	
	58	1500	5′		*	
	65/80	1500	5′		*	
	32	300*	12″		*	
	40	400*	16″		*	
	60	400*	16″		*	
					240/250	
155/600	70	1800	6′		*	
	75/85	1800	6′		*	
	100	2400	8′		*	
					240/250	
155/800	50	1500	5′		*	
	70	1800	6′		*	
	75/85	1800	6′		*	
	100	2400	8′		*	
	125	2400	8′		*	

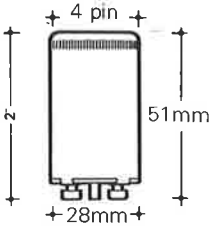
*Circular Tubes – Nominal diameter
†Second choice – preferred starter 155/100



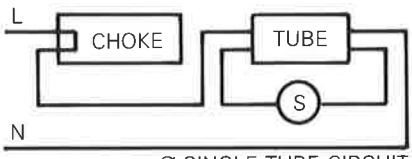
4 pin glow type metal canister

Catalogue No.	Tube Rating			Supply Voltage a.c.	Circuit
	Watts	Length mm	ft		
OS345	30	900	3′	200/250	Single Tube
	36	1200	4′	"	"
	40	1200	4′	"	"
	58	1500	5′	"	"
	65/80	1500	5′	"	"

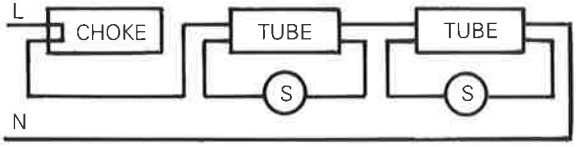
A Radio Interference Suppression Capacitor is fitted internally to each starter. Standard Pack – 10.



CIRCUITS



Ø SINGLE TUBE CIRCUIT



Ø SERIES TUBE CIRCUIT

OPUS

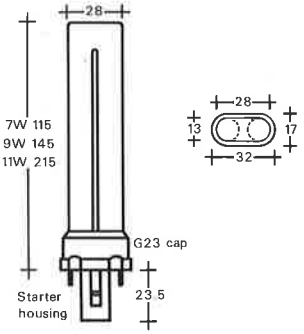
Compact Fluorescent

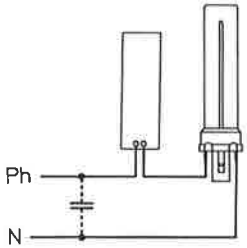
Opus is a compact single base fluorescent light source, giving a warm light, with a colour temperature of 2700K, very similar to that of incandescent lamps. Opus is extremely economical, consuming some 70-80% less energy than its equivalent incandescent type, and has a rated life five times that of an incandescent lamp. Integrated into the lamp cap is a starter and radio interference suppressor, making Opus suitable for both domestic and commercial use.

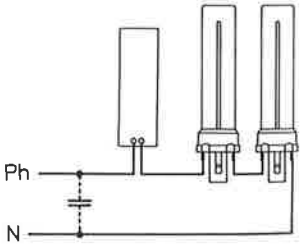
The advantages in terms of luminaire design, are fundamental to the Opus concept. Being a compact light source, luminaires too can be compact yet maintain, and even improve on, the efficiencies to be found in conventional fluorescent fittings. Until now unobtrusive luminaire designs have been a feature associated only with incandescent sources. Opus offers that feature without the constraint of high lamp temperatures. Combine that with a universal burning position, and Opus offers luminaire designers a broad scope of styling opportunities.

Another advantage of Opus is its resistance to failure through vibration. Opus is particularly economical, the lumen output of the 7W, 9W and 11W corresponding to those of 40W, 60W and 75W incandescent lamps.

All Opus lamps require a ballast and lampholder for mains operation.





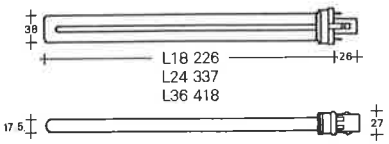


Dimensions in mm

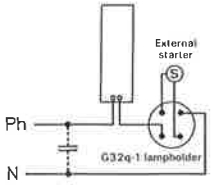
Single Circuit	Lamp Watts	Lamp Current	Lamp Volts	Luminous Flux Lm	Efficacy Lm/W	Colour Rendering Ra	Lamp Cap
OPUS 7	6.9	180mA	45	400	58	82	G23
OPUS 9	8.7	170mA	60	600	69	82	G23
OPUS 11	11.4	155mA	90	900	79	82	G23
Twin Circuit							
Two OPUS 7	13.7	160mA	–	800	58	82	G23
Two OPUS 9	14.4	130mA	–	950	66	82	G23

OPUS L

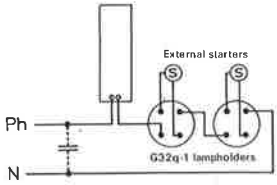
Opus L extends the principle of Opus into the higher lumen packages, offering one to one replacement for conventional fluorescent tube packages. Opus L lamps have the advantages of being single ended and occupy just over one third the length of conventional double ended fluorescent tubes. Available in 18W, 24W and 36W variants, the 18W and 36W are comparable in light output to their conventional T8 equivalents. Opus L has been designed with commercial applications in mind and, to accommodate PLM* requirements, require an external starter switch.



Dimensions in mm



OPUS L 18W, 24W, 36W single connection



OPUS L 18W two lamps connected in series.

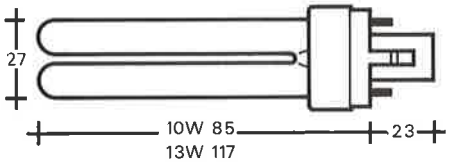
OPUS L

	Lamp Watts	Lamp Current	Lamp Volts	Luminous Flux Lm	Efficacy Lm/W	Colour Rendering Ra	Lamp Cap
OPUS L 18	18	365mA	60	1250	69	82	G32q-1
OPUS L 24	24	340mA	91	1800	75	82	G23q-1
OPUS L 36	36	425mA	110	2900	81	82	G23q-1

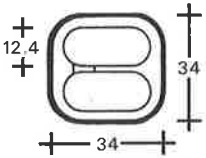
Opus L is available in Warm White (2700K) or Cool White (4000K).

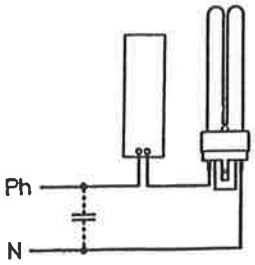
OPUS D

Opus D takes the theme of compactness a stage further. It not only achieves lumen packages equivalent to normal GLS lamps, but also takes another step towards achieving their size criteria. Available in 10W and 13W variants, Opus D are equivalent to 60W and 75W incandescent types. In common with Opus, Opus D incorporate a starter and radio suppressor in the cap, and has a colour temperature of 2700K, making it ideal for all domestic applications.



Dimensions in mm





OPUS D

	Lamp Watts	Lamp Current	Lamp Volts	Luminous Flux Lm	Efficacy Lm/W	Colour Rendering Ra	Lamp Cap
OPUS D 10	10	190mA	60	600	60	82	G24d-1
OPUS D 13	13	175mA	90	900	69	82	G24d-1

*Planned Lighting Maintenance.

1. **Ambient Temperature**

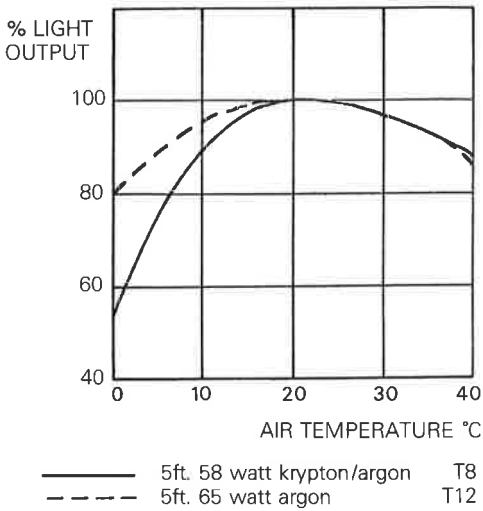
   Low and high ambient temperatures affect the starting and lumen output of fluorescent tubes. Below 5°C special tubes should be used with switchless start circuits. Switch start circuits will function at 0°C and to −10°C with special tubes. Starting difficulties in high ambient temperatures is mainly restricted to switchless start circuits. The optimum temperature of the coldest part of the tube is 40°C for most types. See the figure on temperature and efficacy.

2. **Vibration**

   In general vibration has little effect on the performance of a fluorescent tube, except below 100Hz when special tubes can be made.

3. **Hot Re-strike time:**

   0.5 – several seconds depending on temperature.



4. **Run-up times:** At 25°C.

Argon filled tubes	95% Light output within 1 minute. 100% Light output within 2 minutes.
Krypton filled tubes	85% Light output within 1 minute. 100% Light output within 3 minutes.

Lower temperatures will extend these times.

ELECTRICAL CHARACTERISTICS

ARGON 38mm

Nominal Wattage	Nominal Starting Current (amps)	Nominal Running Current (amps)	Nominal Tube Volts
125	1.30	0.94	149
8′ 85	0.82	0.55	185
6′ 85	1.30	0.80	120
80	1.30	0.87	99
75	1.00	0.64	130
65	1.00	0.67	110
50	0.60	0.40	153
4′ 40	0.65	0.43	103
2′ 40	1.30	0.88	48
30	0.55	0.365	96
20	0.55	0.37	57
15	0.45	0.31	56
13	0.247	0.165	95
8	0.24	0.145	56
6	0.24	0.16	42
4	0.24	0.17	29
Circ 32	0.675	0.45	81
Circ 40	0.63	0.42	110
Circ 60	1.10	0.71	97

KRYPTON 26mm

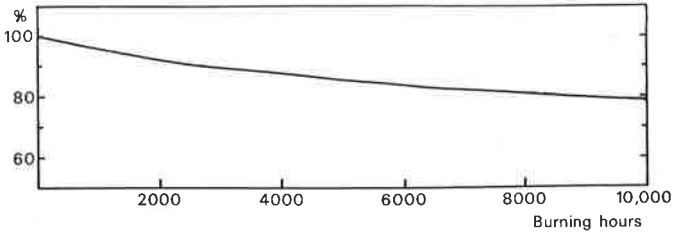
Nominal Wattage	Nominal Starting Current (amps)	Nominal Running Current (amps)	Nominal Tube Volts
100*	1.35	1.00	118
70	1.00	0.70	128
58	1.00	0.67	110
36	0.65	0.43	103
18	0.55	0.37	57

OPUS COMPACT

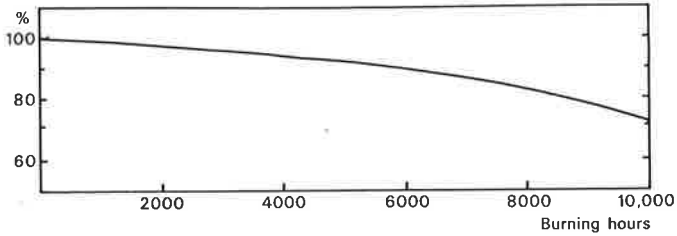
7	0.200	0.175	45
9	0.200	0.170	60
11	0.200	0.155	90
L18	0.550	0.365	60
L24	0.550	0.340	91
L36	0.650	0.425	110
D 9	0.200	0.190	60
D13	0.200	0.175	90

*38mm.

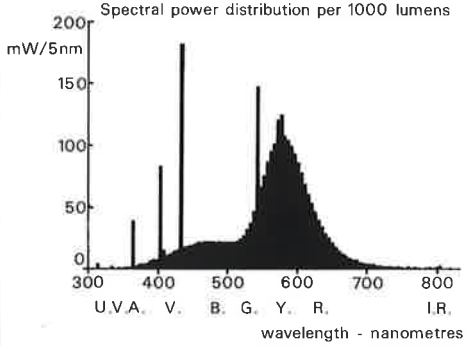
TYPICAL LUMEN MAINTENANCE



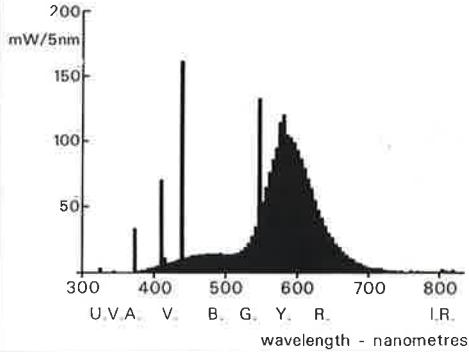
TYPICAL SURVIVOR CURVE



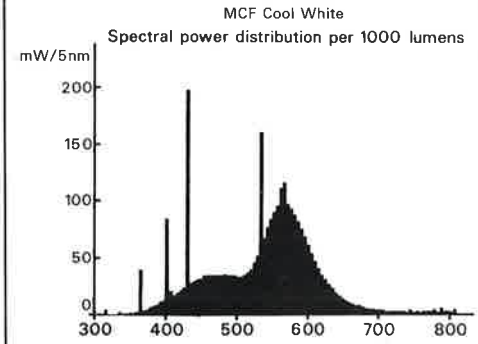
MCF White
Spectral power distribution per 1000 lumens



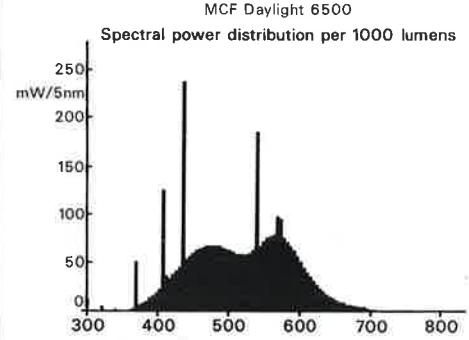
MCF Warm White
Spectral power distribution per 1000 lumens



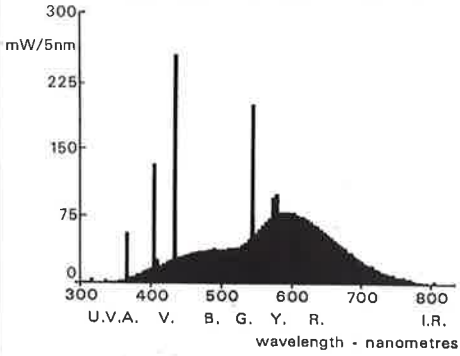
MCF Cool White
Spectral power distribution per 1000 lumens



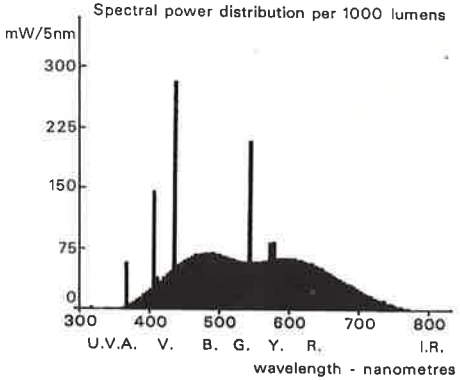
MCF Daylight 6500
Spectral power distribution per 1000 lumens



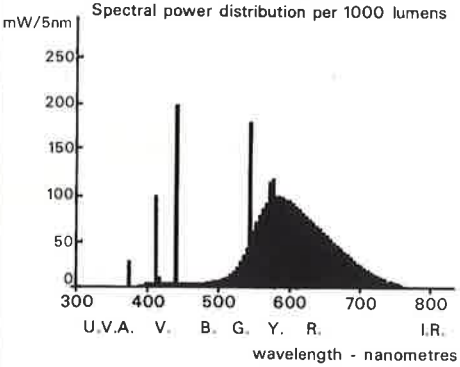
MCF Natural
Spectral power distribution per 1000 lumens



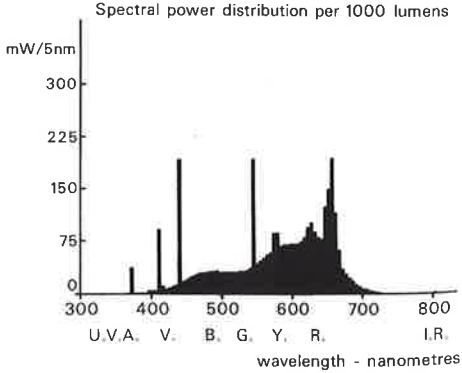
MCF Colour Matching
Spectral power distribution per 1000 lumens



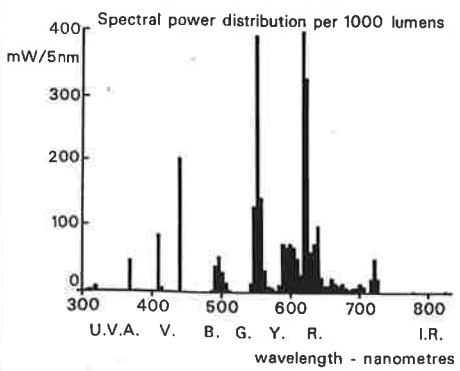
MCF De Luxe Warm White
Spectral power distribution per 1000 lumens



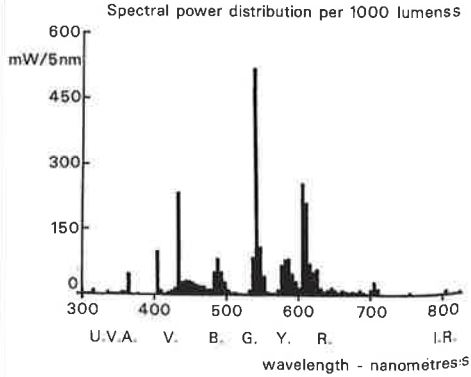
MCF De Luxe Natural
Spectral power distribution per 1000 lumens



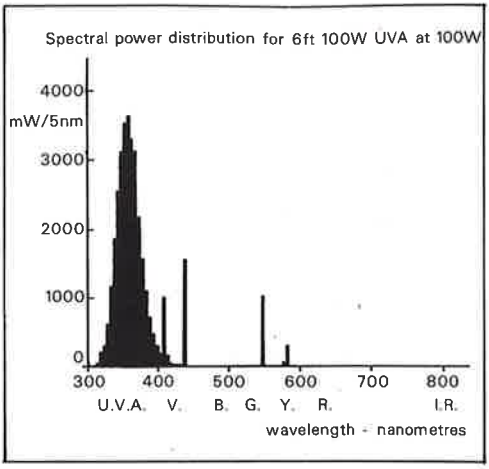
Opus and Trichrome 2700
Spectral power distribution per 1000 lumens



Opus and Trichrome 4000
Spectral power distribution per 1000 lumenss



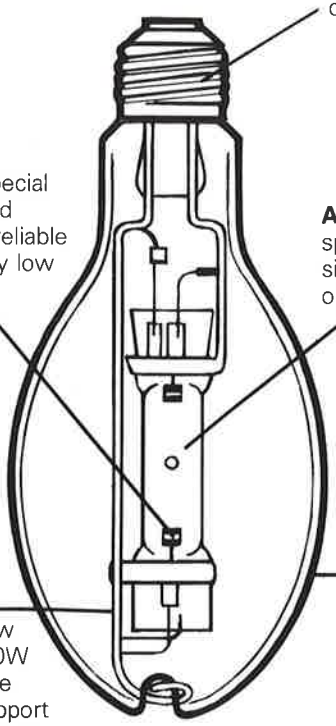
FLUORESCENT TUBES



Change of lamp characteristics with varying voltage at 20°C Ambient

Percent change at 110% and 90% of nominal mains voltage	38mm Argon		26mm Krypton	
	110%	90%	110%	90%
Lumens	+10	−16	+ 9	−12
Arc current	+20	−24	+20	−23
Arc volts	− 7	+ 9	− 8.5	+ 8.5
Arc watts	+14	−17	+11	−17

Colour	Colour Rendering Indices Ra	Typical Chromaticity Co-ordinates Current Loading				Correlated Colour Temp. K
		High		Low		
		x	y	x	y	
De Luxe Natural	92	—	—	0.400	0.358	3400
Colour Matching	91	—	—	0.312	0.317	6500
Trichrome 2700	82	0.461	0.415	—	—	2700
Trichrome 4000	82	0.380	0.380	—	—	4000
Opus 2700	82	0.461	0.415	—	—	2700
Opus 4000	80	0.380	0.380	—	—	4000
Natural	81	0.377	0.357	—	—	4000
Daylight 6500	72	—	—	0.310	0.340	6500
Cool White	62	0.372	0.379	0.377	0.383	4200
De Luxe Warm White	60	0.447	0.405	—	—	2750
White	54	0.407	0.397	0.415	0.399	3450
Warm White	52	0.430	0.404	0.440	0.404	3050



Symbols used for Mercury Lamps

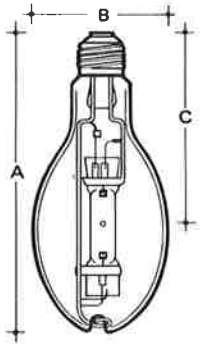
M – Mercury
B – Quartz arc tube
F – Fluorescent coating
W – Woods Black Glass
T – Tungsten Filament Ballast
R – Internal Reflector
U – Universal Operating position
V – Vertical cap up
D – Vertical cap down
I – Iodide

TRUELITE MBF/U

This range of High Pressure Mercury lamps gives light of acceptable colour rendering due to the use of a Yttrium Vanadate based phosphor coating. This converts the ultra violet component of the Mercury discharge into visible light at the red end of the spectrum.

Watts	Volts	Cap	Std. Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
50	200/250	E27 (ES)	30	1900	1750
80	220/250	E27 (ES) B22d-3 (3 pin BC)	25	3800	3500
125	220/250	E27 (ES) B22d-3 (3 pin BC) E40 (GES)	25	6200	5700
250	220/250	E40 (GES)	25	13000	11500
400	220/250	E40 (GES)	25	22700	21000
700	220/250	E40 (GES)	4	39000	38000
1000	220/250	E40 (GES)	4	56000	53000
1000*	370/410	E40 (GES)	4	58000	54000
1000	400/450	E40 (GES)	4	58000	54000

*Available to special order, minimum quantity 100.



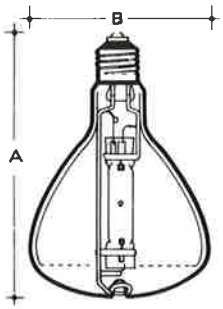
MBF/U

	A	B	C
50W	129	56	89
80W	165	71	103
125W	178	76	112
250W	227	91	150
400W	285	121	177
700W	320	143	208
1000WHV	350	167	212
1000WLV	400	167	261

TOPLITE MBFR/U

Unaffected by dust and dirt, these lamps are ideal for use in industrial installations. The 125 watt version is also suitable for shop window displays and for use in Downlighters.

Watts	Volts	Cap	Std. Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
125	220/250	E27 (ES)	25	5000	4600
250	220/250	E40 (GES)	6	12000	11000
400	220/250	E40 (GES)	6	20000	18000
700	220/250	E40 (GES)	1	34000	32500
1000	220/250	E40 (GES)	1	53000	50000
1000	400/450	E40 (GES)	1	53000	49000



MBFR/U

	A	B
125W	178	127
250W	250	168
400W	275	183
700W	312	203
1000W	357	250.5

Manufactured to BS3677 : IEC 188.

For technical specification see pages 214 and 217

For details of control gear see sections 13 and 14.

BLENDED AND HALIDE *High Pressure Mercury Lamps*

BLENDED TRUELITE MBFT/V

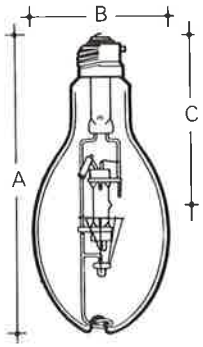
No control gear is needed for this range of Mercury lamps – they operate directly from the supply. The elliptical outer bulb is coated with a phosphor to improve colour rendering and light output.

Nominal Life: 200/230V – 6000 hours. 240/250V – 8000 hours.

Watts	Volts	Cap	Std. Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
160	220/230	E27 (ES) or	25	2800	2500
	240/250	B22d (BC)		2900	2560
250	220/230	E40 (GES)	20	5500	4840
	240/250			4700	4100
500*	240/250	E40 (GES)	20	12500	11500

Operating Position – Cap up or down ± 45°.

*220/230 volt versions available, minimum quantity.



MBFT/V

	A	B	C
160W	178	76	130
250W	227	91	150
500W	285	121	177

MERCURY HALIDE MBI

The 2kW lamp has colour rendering characteristics ideal for colour television requirements with a correlated colour temperature of 5000°K.

Nominal life – 2000 hours.

The 400 watt lamps are available in a choice of two saturated colours, blue or green. Ideal for decorative floodlighting to enhance the colour of trees or grass at night or to provide colour features for architecture.

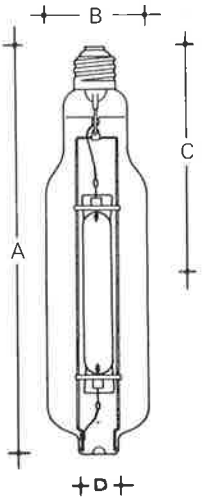
Watts	Colour	Volts	Cap	Std. Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
400	Blue	220/240	E40 (GES)	1	8000	6000
400	Green	220/240	E40 (GES)	1	26000	23000
2000	White	380/440	E40 (GES)	1	180000	160000*

*1000 hour only.

Operating position – 400W Vertical cap up to cap down +20° above horizontal.
2000W Horizontal ± 20°.

MBI

	A	B	C	D
400W	285	66	177	–
2000W	426	103	258	40



2kW

For technical specification see pages 214 and 217

For details of control gear see pages 164 and 165 and section 13

BLACK MAGIC AND LABORATORY LAMPS

BLACK MAGIC MBW/U and MBWT/V

Only long wave ultra violet radiation at 365 nanometres is transmitted by the 'Black glass' bulb. They are therefore suitable for special effects in discotheques, theatres and other entertainment areas. They also have commercial and security uses when discreet markings need to be read e.g. Laundry markings, forgeries and post coding of valuable items.

MBW/U lamps must be used in conjunction with suitable control gear.

The MBWT/V requires no control gear and can simply replace tungsten lamps wherever these special effects are required.

Type	Watts	Volts	Cap	Std. Pack
MBW/U	125	220/250	B22d-3 (3 pin BC) or E27 (ES)	25
MBWT/V	175	220/250	B22d (BC) or E27 (ES)	25

Operating Position – MBW/U: Universal.
MBWT/V: Vertical cap up or down ± 45.

MBW/U, MBWT/V

	A	B
125W, 175W	180	89

LABORATORY LAMPS

A wide range of lamps is available, designed to provide sources of radiation either monochromatic or of specific wavelengths for use in diverse scientific fields from industrial to teaching and university experimental work. Details on application.

LAMPS FOR PHOTOCHEMICAL, PRINTING AND GERMICIDAL APPLICATIONS

A large range of long arc lamps is available suitable for diazo copying, litho platemaking, air and water sterilisation, printers circuit manufacture, ink drying, lacquer curing, photobiological and chemical processes. Details on application.

1. Ambient Temperature

Once the lamp has struck high ambient, temperature has little effect on performance or characteristics except where the temperature is high enough to affect lamp making materials such as capping cement. Low temperatures increase the striking voltage. Standard lamps will strike at −20°C provided the voltage is not lower than 220. For temperatures below −20°C special lamps can be made.

2. Vibration

GEC mercury discharge lamps are designed to withstand severe conditions of vibration with the exception of MBFT/V and MBWT/V. Their internal filaments render them unsuitable for rough service conditions.

3. Caps

GES (E40) ES (E27) 3 pin BC (B22d-3) Nickel plated brass

Flying lead 12mm dia. 1mm pitch

4. Outer Bulbs

50W, 80W, 125W MBF, MBFR, 160W, 250W MBFT	Soft glass
250W, 400W, 700W, 1000W MBF MBI	Borosilicate glass
125W MBW and 175W MBWT	'Woods' glass
MEI	Quartz

5. Hot Re-strike Times:

All types except MEI	10-15 minutes
MEI –	Instant

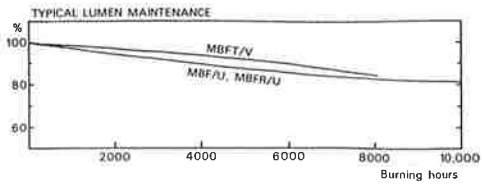
Electrical Characteristics

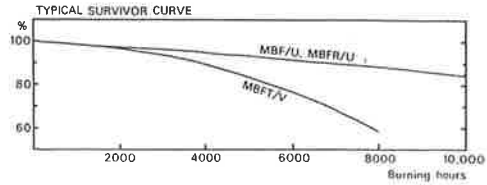
Lamp Wattage	Supply Voltage	Arc Tube		
		Voltage (Objective)	Starting Current Amps	Running Current Amps
MBF, MBFR, MBW				
50	240	95	0.8	0.6
80	240	115	1.3	0.8
125	240	125	1.7	1.15
250	240	130	3.75	2.15
400	240	135	5.5	3.25
700	240	140	8.0	5.45
1000 (220/250V)	240	145	11.5	7.75
(380/410V)	380	265	7.0	4.0
(400/450V)	415	300	7.0	3.3
MBI				
400 Green & Blue	240	120	5.5	3.6
2000	415	240	13.5	9.1
MBFTV				
160	240/250	—	0.90	0.65
250	240/250	—	1.50	1.05
500	240/250	—	3.0	2.2
160	220/230	—	0.98	0.71
250	220/230	—	1.60	1.11
500	220/230	—	3.2	2.3
MBWT/V				
175	240	—	0.93	0.77
MEI HV 2.5 kW				
2500	415	190	25	14.8

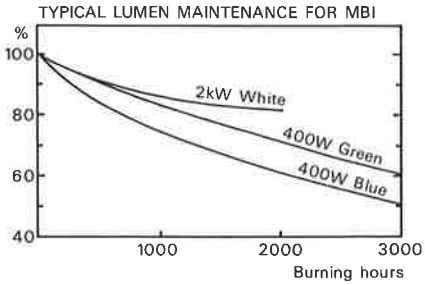
Starting current is taken 15 seconds after the lamp has struck.
Measurements have been taken with power factor correction.

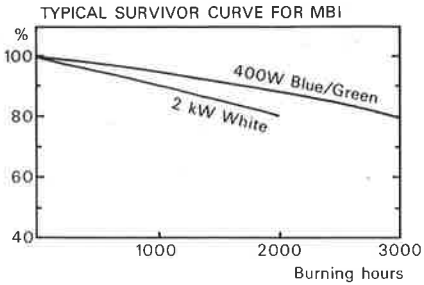
6. Run-up times

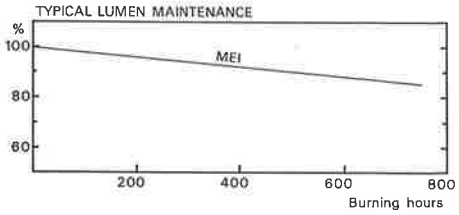
Types MBF, MBFR	80% light output in 3½ mins. 100% light output in 6 mins.
Type MBFT	130% light output on commencement. 100% light output after 4 mins.
Type MBI	80% light output in 2 mins. 100% light output in 5 mins.
Type MEI	80% light output in 50 seconds. 100% light output in 2 minutes.

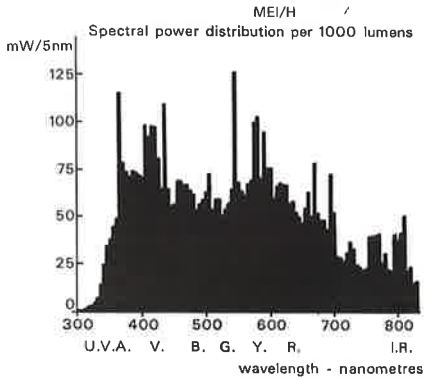




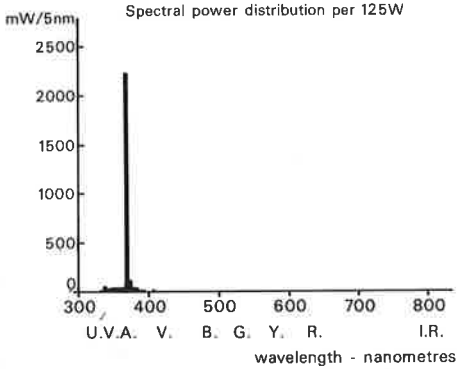




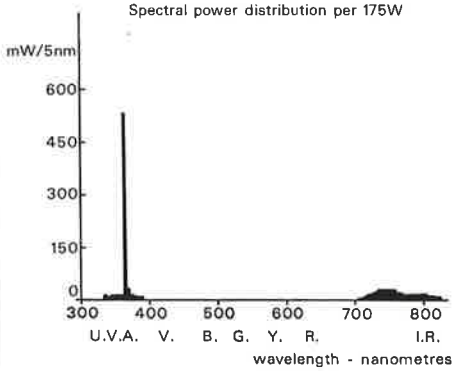




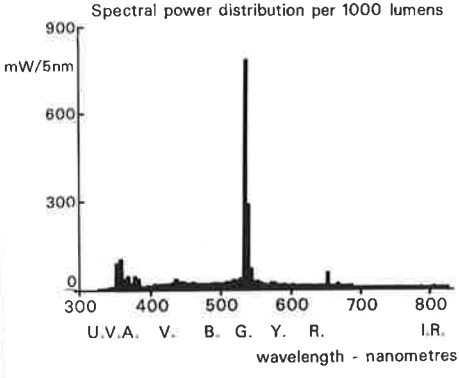
125W MBW/U
Spectral power distribution per 125W



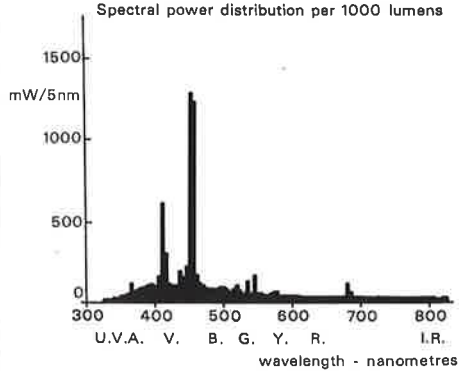
175W MBWT/V
Spectral power distribution per 175W



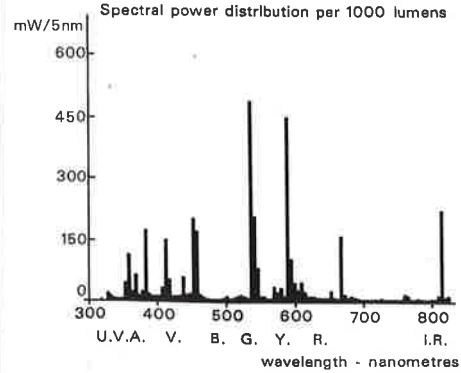
400W MBI/H GREEN
Spectral power distribution per 1000 lumens



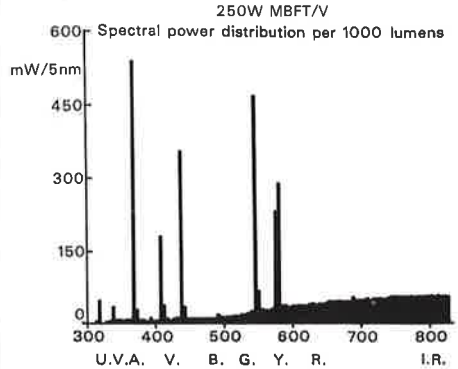
400W MBI/H BLUE
Spectral power distribution per 1000 lumens

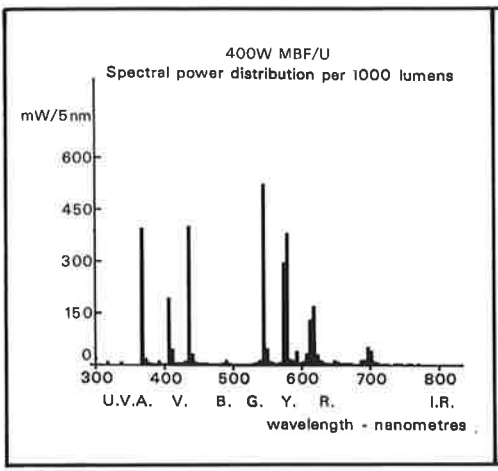


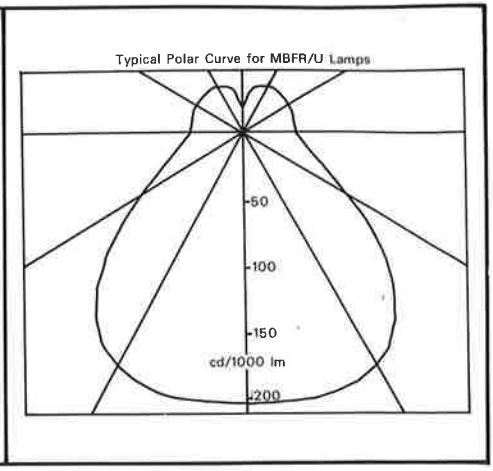
2kW MBI/H
Spectral power distribution per 1000 lumens



250W MBFT/V
Spectral power distribution per 1000 lumens







Changes of lamp characteristics with variation of mains voltage

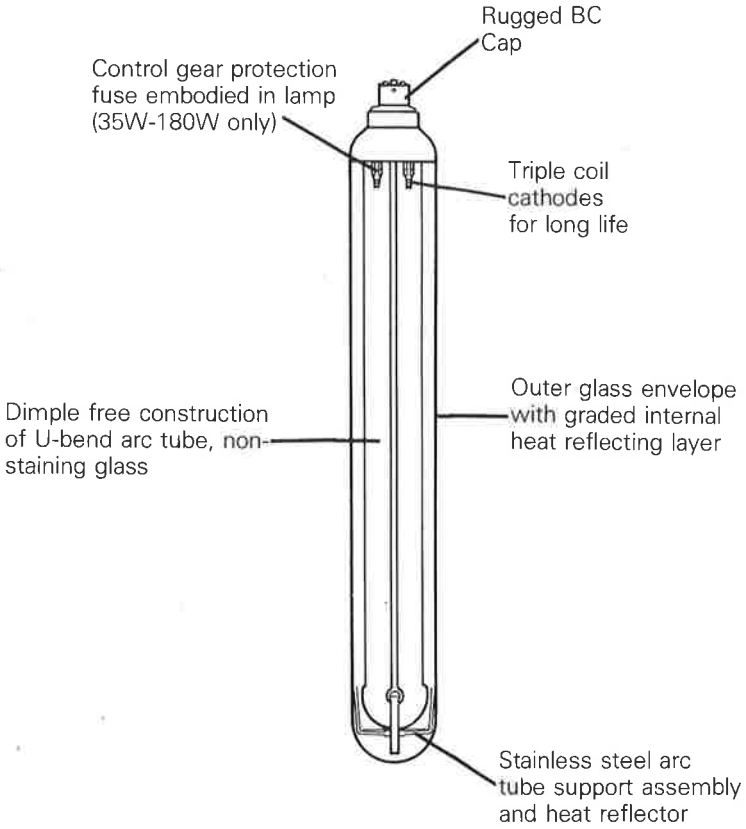
Percent change at 110% and 90% of nominal mains voltage	MBF MBFR MBI 400W	MBFT* MBWT*	MBI 2kW	MEI HV 2.5kW
Lumens	+25% −26%	+28% −28%	+27% −27%	+20% −15%
Arc current	+20% −18%	+ 5% − 5%	+16% −15%	+13% −13%
Arc volts	+ 2% − 4%	− −	+ 4% − 5%	+ 6% − 5%
Arc watts	+20% −22%	+20% −14%	+15% −19%	+19% −16%

*These lamps will have short lives if operated for long periods at voltages above the nominal.

		MBF	MBFR	MBFT	MBI Green	MBI Blue	MBI White	MEI HV 2.5kW
Colour Rendering Indices Ra		40-49	35-45	44-50	–	–	56	90-95
Chromaticity Co-ordinates	x	0.380	0.395	0.370	0.260	0.200	0.350	0.335
	y	0.380	0.400	0.400	0.560	0.140	0.390	0.335
Correlated Colour temperature K		4000	3800	4400	–	–	5000	5400

SUPER SOX

The inside story



Manufactured to BS3767 : IEC192.

For further technical information see pages 220 and 221.

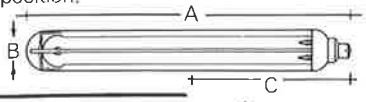
For details of control gear see pages 168 and 169.

LOW PRESSURE SODIUM

SUPER SOX

A range of very high efficiency lamps with the lowest running cost possible. Ideal not only for street lighting but makes lighting for security an economic proposition.

Operating Position – Horizontal ± 20.



Super SOX Range

Watts	Volts	Cap	Std Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs	SUPER SOX	A	B	C
10	200/250	B22d (BC)	25	1000	950	10W	150	41	95
18	200/250	BY22d (BC)	25	1800	1600	18W	210	54	130
35	200/250	BY22d (BC)	25	4600	4500	35W	311	54	180
55	200/250	BY22d (BC)	25	7650	7500	55W	425	54	235
90	200/250	BY22d (BC)	12	12750	12500	90W	528	68	290
135	200/250	BY22d (BC)	12	22000	21500	135W	775	68	410
180	200/250	BY22d (BC)	9	32000	31500	180W	1120	68	585

SOX-ECONOMY (SOX-E)

Dimensionally identical to the equivalent SOX lamps, SOX-E lamps have a much improved thermal conservation allowing them to run at a lower power with increased efficacy. Although designed to operate on circuits delivering much lower currents, SOX-E lamps are compatible with existing SOX circuits.

SOX-E Range

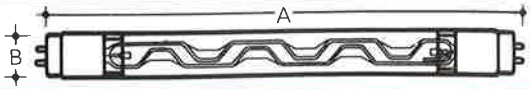
Lamp Type	Volts	Cap	Std Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs	SOX-E	A	B	C
26	200/250	BY22d (BC)	25	4030	3900	26W	311	54	180
36	200/250	BY22d (BC)	25	6050	5900	36W	425	54	235
66	200/250	BY22d (BC)	12	10900	10400	66W	528	68	290
91	200/250	BY22d (BC)	12	16500	15600	91W	775	68	410
131	200/250	BY22d (BC)	9	26600	25300	131W	1120	68	585

These lumen figures relate to the use of SOX-E lamps on standard SOX control gear.

SLI/H Linear

These lamps are now normally used only for replacement purposes.

Watts	Volts	Cap	Std Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs	SLI/H	A	B
60	200/250	G13 (Bi pin)	25	6000	5700	60W	419	38
160	200/250	G13 (Bi pin)	12	18500	18000	160W	902	38
200	200/250	G13 (Bi pin)	12	20500	20000	200W	902	38



1. **Ambient Temperature**

   Only under conditions of extreme temperature variations will low pressure sodium lamps fail to strike. Such conditions will not normally be encountered.

2. **Vibration**

   Mechanically the low pressure sodium lamp is strong and is not affected by normal vibration. Due to the sodium being molten when the lamp is running, under conditions of severe vibration, the lamps are best operated in a near horizontal position. Preferably the lamp cap should be above the horizontal.

3. **Caps**

   BC: 10W B22D; 18-180W BY22D

4. **Outer bulbs**

   Soft glass. Due to their design the outer bulb remains cool and will not shatter due to droplets of water or moisture.

5. **Hot Restrike Time**

   This depends on the control gear used (and mains voltage). Ignitor circuits – generally immediate restrike.
   Non-ignitor circuits – may be up to ten minutes in some cases.

6. **Run-up time**

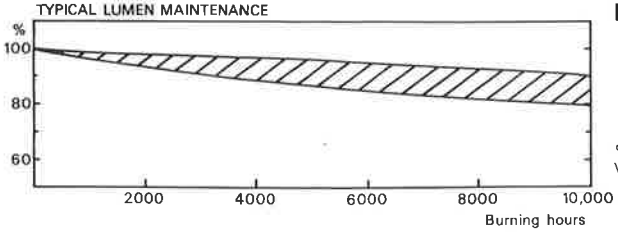
   See adjacent graph.

Typical Lamp Electrical Data

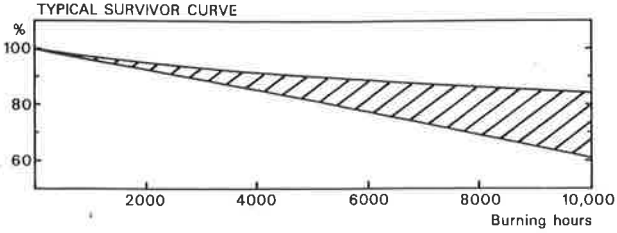
Lamp Type	Lamp Power Rating (W)	Lamp Voltage (V)	Lamp Current (A)
SUPER SOX	10	55	0.20
	18	57	0.35
	35	70	0.60
	55	109	0.59
	90	112	0.94
	135	164	0.95
	180	240	0.90

Lamp Type	Lamp Power Rating (W)	Running on GEC SOX Gear Type	Lamp Voltage (V)	Lamp Current (A)	
SOX E	26	(35)	58	0.62	Low Loss Gear
	36	(55)	79	0.61	Low Loss Gear
	66	(90)	90	0.95	Leak Transformer Gear
	91	(135)	122	0.98	Leak Transformer Gear
	131	(180)	187	0.96	Leak Transformer Gear

TYPICAL LUMEN MAINTENANCE

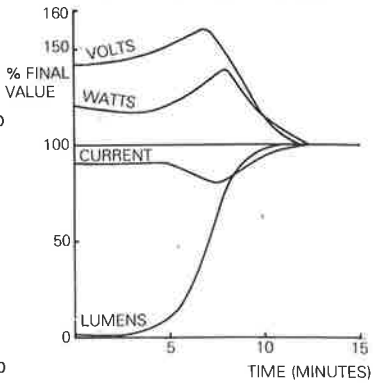


TYPICAL SURVIVOR CURVE



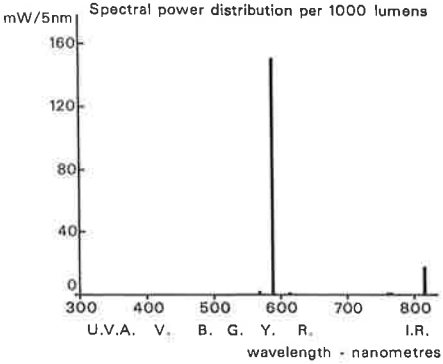
Leak Transformer Gear

TYPICAL RUN-UP CURVES – SOX LAMPS



SOX

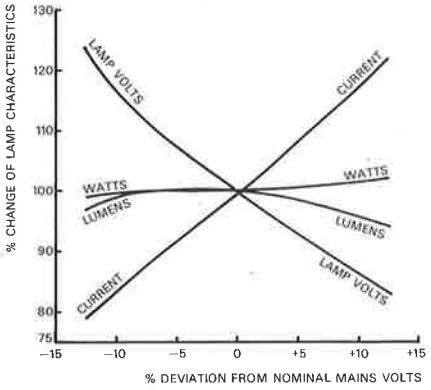
Spectral power distribution per 1000 lumens



Chromaticity Co-ordinates	x y	0.574 0.425
Colour rendering Index Ra		Not relevant
Colour Temp.		Not relevant

Leak Transformer Gear

TYPICAL SOX LAMP VARIATIONS WITH MAINS VOLTAGE



Changes will be greater when using low loss gear.

Lamps run for long periods at less than nominal volts will have shorter lamp lives. Lamp life will not be adversely affected by running at higher than nominal mains voltage.

HIGH PRESSURE SODIUM (SON)

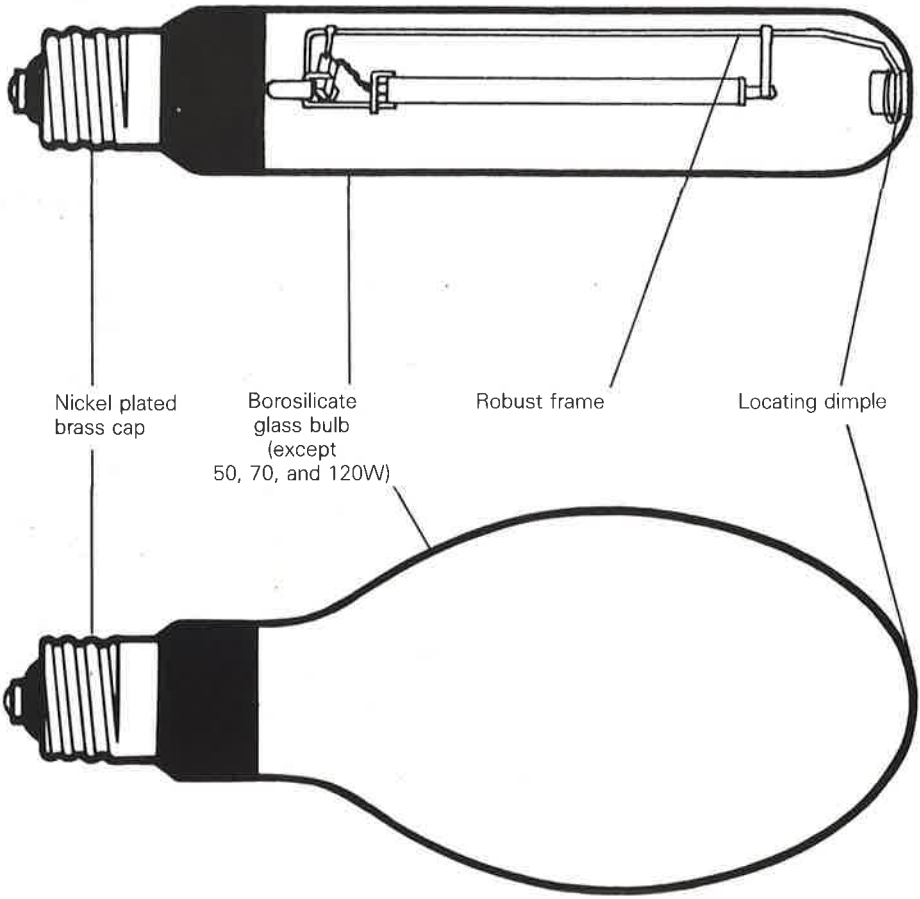
SOLARCOLOUR

The most extensive range of high pressure sodium lamps available from one manufacturer.

Solarcolour lamps are available in four shapes each with its own function, for use in specialised luminaires.

There are two colours (Standard and De Luxe). De Luxe for areas where better colour rendering is required, e.g. offices and shops etc.

The unique Plus range now not only offers between 10 to 20% more light than its standard equivalent, but maintains its light output better, and in addition Plus lamps last longer.



High Pressure Sodium Lamps

SOLARCOLOUR

Clear Tubular SON-T (I) **(with starter)**

Watts	Minimum Nominal Supply Volts	Cap	Std Pack		Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
120	220	E27 (ES)	10		10500	10000
150	220	E40 (GES)	10		16000	15250
220	220	E40 (GES)	10		24000	22500
250	220	E40 (GES)	10		28000	27000
310/360	220	E40 (GES)	10	@ 310W	37000	35500
	230			@ 360W	43500	41500
400	220	E40 (GES)	10		50000	48000
600	380	E40 (GES)	10		70000	65000
1000	380	E40 (GES)	4		135000	130000

Clear Tubular SON-T (E) **(without starter)**

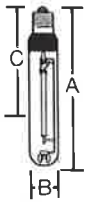
150	220	E40 (GES)	10	16000	15250
250	220	E40 (GES)	10	28000	27000
400	220	E40 (GES)	10	50000	48000
600	220	E40 (GES)	10	74000	70000
1000	220	E40 (GES)	10	132000	127000

Elliptical Diffused SON-E (I) **(with starter)**

50	220	E27 (ES)	40		3500	3100
70	220	E27 (ES)	40		6000	5500
120	220	E27 (ES)	10		10500	10000
150	220	E40 (GES)	10		15250	14500
220	220	E40 (GES)	10		23000	21500
250	220	E40 (GES)	10		27000	26000
310/360	220	E40 (GES)	10	@ 310W	36000	34500
	230			@ 360W	42000	40000
400	220	E40 (GES)	10		48500	46500

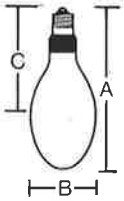
Elliptical Diffused SON-E (E) **(without starter)**

150	220	E40 (GES)	10	15250	14500
250	220	E40 (GES)	10	27000	26000
400	220	E40 (GES)	10	48500	46500



SON-T, SONP-T, SONDL-T

	A	B	C
120W	178	76	100
150W	211	52	130
220-250W	257	52	158
310-400W	285	52	175
600W	328	67	200
1000W	400	67	240



SON-E, SONP-E, SONDL-E

	A	B	C
50-70W	157	72	100
120W	178	76	112
150-250W	227	91	150
310-400W	285	121	175

(I) This international symbol which is marked on all Solarcolour lamps which have an internal snap starter switch, indicate that they can be used in luminaires whether or not they have an external starter fitted.

(E) Lamps marked with this symbol can only be used in luminaires fitted with an external starter.

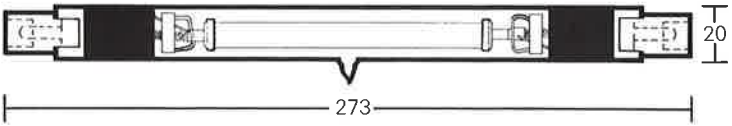
Manufactured to IEC662.

For further technical information see pages 226 and 227.

For control gear to operate these lamps see pages 160 and 166.

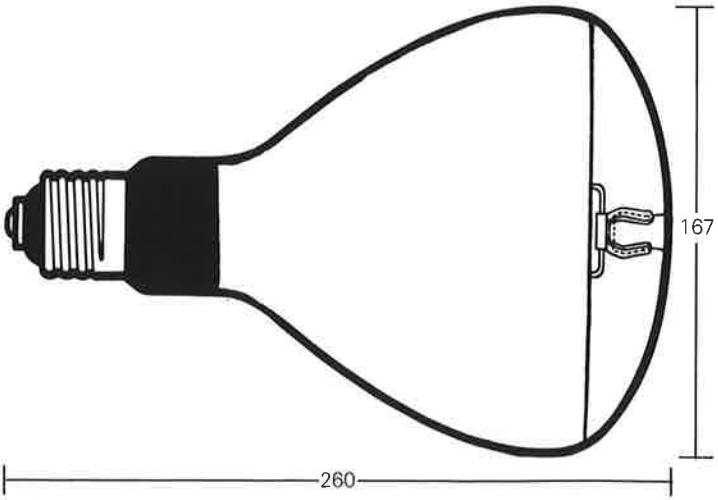
Double-ended Linear SON-L (E) **(without starter)**

Watts	Minimum Nominal Supply Volts	Cap	Std Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
250	220	R12.5S	10	28000	26500
310	220	R12.5S	10	37000	35000
400	220	R12.5S	10	50000	47000



Reflector SON-R (I) **(with starter)**

Watts	Minimum Nominal Supply Volts	Cap	Std Pack		Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
250	220	E40 (GES)	1		23000	21500
310/360	220	E40 (GES)	1	@ 310W	31500	29500
	230			@ 360W	37000	34000
400	220	E40 (GES)	1		42500	39000



Manufactured to IEC662.

For full technical specification see pages 226 and 227.
For details of control gear see pages 166 and 167 and section 13.

SOLARCOLOUR PLUS LAMPS

Between 10 and 20% fewer luminaires would be required when using Solarcolour Plus, compared with standard high pressure sodium lamps of the same wattage. Longer life and improved lumen maintenance are also featured of these second generation SON lamps. Suitable external starters are required with Plus lamps.

Clear Tubular SONP-T (E) **(without starter)**

Watts	Minimum Nominal Supply Volts	Cap	Std Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
150	220	E40 (GES)	10	17500	17000
250	220	E40 (GES)	10	33000	32500
310	220	E40 (GES)	10	41000	40000
400	220	E40 (GES)	10	56500	55000

Elliptical Diffused SONP-E (E) **(without starter)**

150	220	E40 (GES)	10	16500	16000
250	220	E40 (GES)	10	31500	31000
310	220	E40 (GES)	10	39500	38500
400	220	E40 (GES)	10	55000	53500

SOLARCOLOUR DE LUXE LAMPS

Improved colour rendering is the main benefit of De Luxe lamps. With increased sodium pressure compared with standard lamps, some of the yellow radiation is converted towards the red and blue ends of the spectrum

Clear Tubular SONDL-T (E) **(without starter)**

Watts	Minimum Nominal Supply Volts	Cap	Std Pack	Initial Lumens 100 hrs	Lighting Design Lumens 2000 hrs
150	220	E40 (GES)	10	12500	11500
250	220	E40 (GES)	10	23700	22000
400	220	E40 (GES)	10	38500	36000

Elliptical Diffused SONDL-E (E) **(without starter)**

150	220	E40 (GES)	10	12000	11000
250	220	E40 (GES)	10	21750	20000
400	220	E40 (GES)	10	37000	34500

Manufactured to IEC662.

For full technical specifications see pages 226 and 227.
For details of control gear see pages 166 and 167 and section 13.

1. Ambient Temperature

The light output of the lamp will not be adversely affected in the range −40°C to 100°C. However, in the design of luminaires the guide lines of IEC662 should be followed so that radiant heat rays from the lamp are not reflected by the luminaire optic back on to the arc tube.

2. Vibration

GEC Solarcolour lamps are designed to withstand conditions of severe vibration. In extreme cases, however, vertical cap-up is recommended.

3. Caps

GES (E40) ES (E27) Nickel plated brass.
R12.5s silver plated copper surrounded by a ceramic hood.

4. Outer bulbs

SON-E, SON-T 50W 70W, 120W	Soft glass
Remainder	Borosilicate glass
SON-L	Quartz

5. Hot Restrike time

(a) Lamps with electronic starter – 30-60 seconds.
(b) Lamps with internal starter – 15-20 minutes.

6. Run-up time[2]

80% Light output in 3 minutes.
100% Light output in 6 minutes.

Electrical Characteristics

Lamp Wattage	Minimum Nominal Supply Voltage[1]	Arc Tube		
		Voltage ±	Starting Current[2]	Running Current
50	220	85 15	0.87	0.76
70	220	90 15	1.3	1.0
120	220	100 15	1.8	1.4
150	220	100 15	2.4	1.8
220	220	105 15	3.7	2.5
250	220	100 15	4.1	3.0
310/360 at 310	220	110 15	4.8	3.4
310/360 at 360	240	120 15	5.4	3.7
400	220	105 15	6.6	4.45
600	380	200 30	5.0	3.7
600	220	110 15	7.65	6.2
1000	380	200 30	7.5	5.7
1000	220	110 15	13.0	10.3

Percent change at 110% and 90% of Nominal Mains Voltage[2].

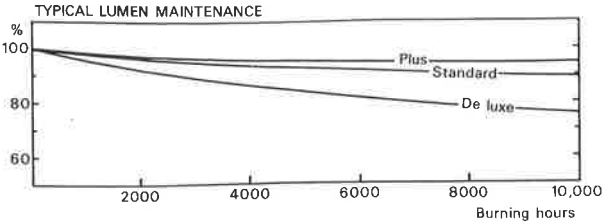
	110%	90%
Lumens	+18%	−26%
Arc current	+ 3%	− 4%
Arc voltage	+26%	−22%
Arc watts	+22%	−23%

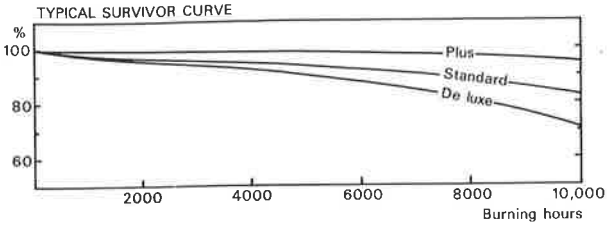
For maximum lamp and control gear life and efficacy the average supply voltage **during the hours of use** should be within +5 volts of the rated voltage of the choke tapping.

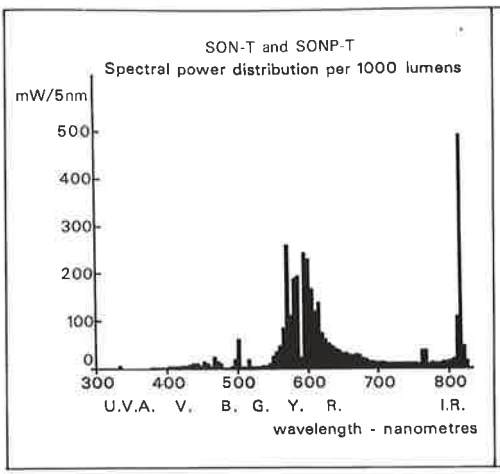
Extended periods of use when the supply voltage is more than 5% above the nominal may result in significant shortening of lamp and control gear life.

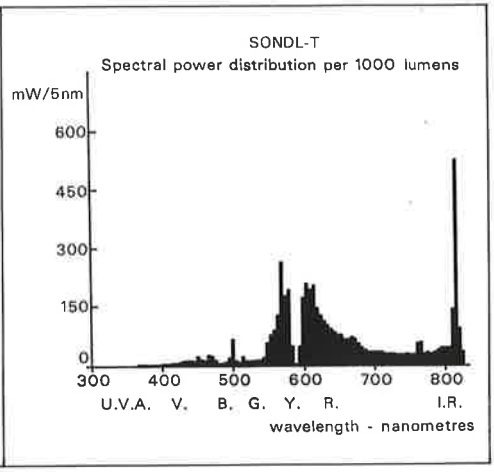
NOTE: The characteristics given in the above table have been measured with power factor correction in a typical luminaire. In free air the arc tube voltage of clear lamps will be approximately 5% lower (Solarstream 20% lower). The starting current is measured 10 seconds after the lamp has struck.

1. The lamp will operate successfully at supply voltages less than the minimum nominal if appropriate control gear is used.
2. Values are typical and will depend on control gear and supply voltage.



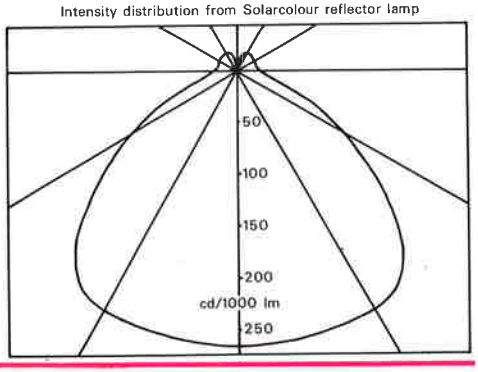






		Standard	Plus	De Luxe
Colour rendering Indices Ra		23	25	70
Chromaticity Co-ordinates	x	0.526	0.534	0.506
	y	0.418	0.431	0.418
Correlated Colour Temp.	K	2100	1900	2300

Intensity distribution from Solarcolour reflector lamp



Most Solarcolour lamps have an internal starter switch but recent introductions such as the Plus and De Luxe ranges as well as our Linear (SON-L) and a supplementary range of standard lamps which are now available without starter require an electronic starter to initiate the discharge.

These starters provide the high voltage pulses necessary to start those High Pressure Sodium (SON) and MBI lamps which are not fitted with internal starter switches. They are also used to shorten hot re-strike time on those lamps with internal starters.

Two types of starter are available, a new range of plastic cased three-lead devices for use in those circuits where the ballast has a 20V tap and a reduced range of two lead starters in aluminium cases for use in conjunction with tapless ballasts. Both types have an 8mm threaded fixing stud.

All these starters cease to operate once the lamp has struck, and part of the two-wire range is available with a cut-out which operates if the lamp fails to strike after a pre-set time.

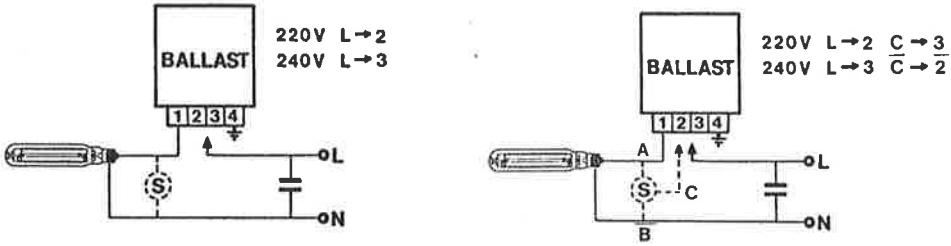
The two-wire starters are provided with flying leads (280mm) and the three-lead types have an integral terminal block.

Two-wire starters and three-lead starters have different nominal supply voltage ranges and the accompanying table should be consulted for further information.

The two-wire starters are designed to operate with a maximum capacitive load of 3500µF and the three-lead starters are divided into a lantern and short column range (maximum capacitive load 1000pF) and a general column range (maximum capacitive load 3000pF choke to lampholder).

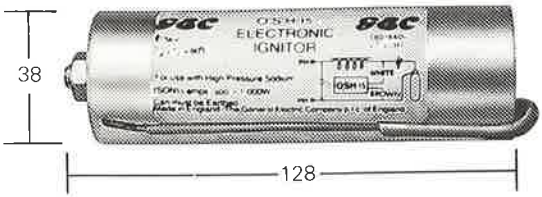
For guidance flat twin and earth PVC insulated and sheathed 300/500V 1.5mm² or 2.5mm² cable can be assumed to impose a capacitive loading of 100pF per metre. Single conductor versions of a similar cable would present a capacitive loading of approximately 70pF per metre in random lay.

TYPICAL TWO LEAD AND THREE LEAD CIRCUITS



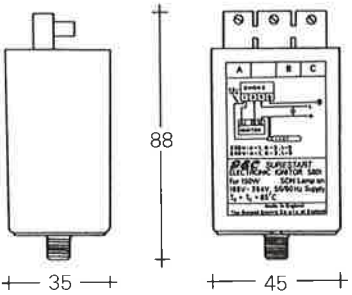
RANGE (Two lead starters)

Lamp Wattage	Nominal Supply Volts	Order Reference Numbers	
		Standard	With Cut-out
220, 250, 310/360, 400, 600, 1kW	240/250	OSH30	OSH40
600 1kW	380/440	OSH15	
2kW MBI	380/440	OSH15	



RANGE SURESTART ELECTRONIC STARTERS (Three lead)

Lamp Wattage	Nominal Supply Volts	Order Reference Numbers	
		Integral 1000pf max	Remote 3000pf max
50	220/240	S607	S616
70, 120	220/240	S603	S611
150	220/240	S601	S610
250, 310/360, 400	220/240	S602	S609
600, 1kW	220/240	S604	S612
600, 1kW	380/440	S605	S613
2kW MBI	380/440	—	S615



All starters are suitable for use on 50Hz or 60Hz.

INTRODUCTION

FILM, TELEVISION, STUDIO AND LOCATION LIGHTING AND OTHER INCANDESCENT LAMPS FOR SPECIALISED APPLICATIONS

For many years the name GEC has been associated with film, television and stage lighting. The comprehensive range of studio, theatre and location lighting featured in this catalogue is the result of close collaboration with luminaire manufacturers and studio and theatre lighting technicians.

MEI LOCATION AND STUDIO LIGHTING

GEC's unique Coolseal principle was first introduced to the MEI range of lamps in 1982. The Coolseal technique dissipates heat away from the molybdenum quartz seal within the end caps by dispersing heat through an etched area along the surface of the seals, and further reduces seal temperatures when used with cooling fins. The lamp is also available with flying leads, so that electrical contact can be made in a low temperature area of the luminaire away from the end seal. This technique virtually eliminates oxidation and early lamp failure.

TUNGSTEN HALOGEN STUDIO LAMPS

Tungsten halogen lamps balanced for a colour temperature of 3200K, in both quartz and hard glass, are widely used in film and television studios. For the twin filament hard glass lamps, GEC are introducing the principle of 'Flexi-Pins' to give a more reliable lamp performance. This allows the pins to take up misalignment of the individual lampholder sockets, helping to ensure good mechanical and electrical contact but, most important, avoiding undesirable stresses in the lamp base.

Recently introduced the CP82 rated at 500W is specially designed for the new small luminaires which can be concealed on the set to light specific details and create special effects.

LAMPS FOR AIRFIELD LIGHTING

A range of lamps designed specifically for Airfield and Airport lighting, for all applications, including approach, runway and taxiway.

SPECIAL APPLICATIONS

Lamps for Lighthouses and Operating Theatres are only made to special order.

Notes:

(A) In line with international standardisation the quoted lamp lives have been established in open rack conditions.

(B) The operating angles quoted are recommended maximum values for these conditions. Operation, where there is insufficient ventilation around the lamps, may result in some reduction of quoted lives, especially where lamps are burnt at the extreme angles.

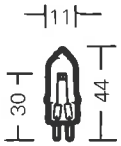
Operating angles are measured from the cap in a vertical plane, at right angles to the plane of the filament.

(C) Lamps dimensions in mm show maximum length, maximum bulb diameter, nominal light centre length (L.C.L.) and in the case of linear lamps maximum clearance length and maximum diameter excluding pips.

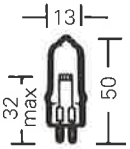
(D) Where ANSI codes are shown the GEC lamp will have at least the same cap, wattage and light centre position as the ANSI type, but there may be small differences with other parameters.

A1 Tungsten Halogen Projector

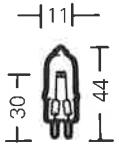
Application: Cine, Filmstrip and Slide Projectors, Micrographic and Disco Lighting.



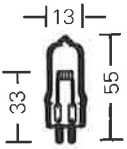
A1/215



A1/216



A1/220



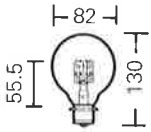
A1/223

Objective Life: 50 hours.

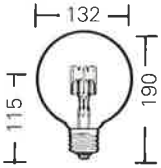
Pinch Temperature: 450°C.

Lamp Type	Ansi Code	Watts	Volts	Cap	Nominal Lumens	Operating Position	Standard Pack
A1/220	BRL	50	12	G6.35	1400	VBD to Horizontal	40
A1/215	FCR	100	12	GY6.35	3000	VBD to Horizontal	40
A1/216	FCS	150	24	G6.35	5000	VBD to Horizontal	40
A1/223	EHJ	250	24	G6.35	8500	VBD to Horizontal	40

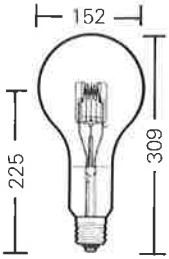
Class B1/B2 Non-halogen Obstruction Lighting and Floodlighting Lamps



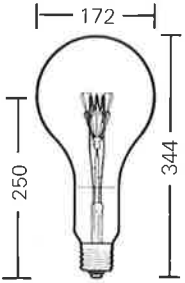
B1/7, B1/16



B1/3, B1/4



B2/2



B2/3

B1/7 and B1/16 complement GEC range of Airfield Lamps (see page 239).

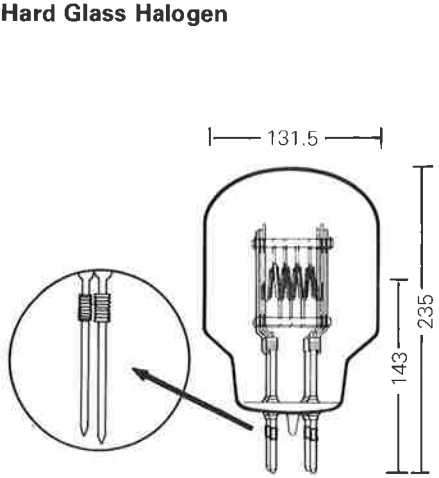
Lamp Type	Watts	Volts	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position	Standard Pack
B1/7	250	115	P28s	3600	800	VBD ± 135°	6
		230	P28s	3100	800	VBD ± 135°	6
		240	P28s	3100	800	VBD ± 135°	6
		250	P28s	3100	800	VBD ± 135°	6
B1/16 (J1/67)	250	240	P28s	2400	5000	VBD ± 135°	6
B1/3	500	240	E40	7250	800	VBD ± 135°	6
B1/4	1000	240	E40	16500	800	VBD ± 135°	6
B2/2	1000	240	E40	16500	800	Any	6
B2/3	1500	240	E40	26250	800	Any	4

STUDIO PROJECTOR

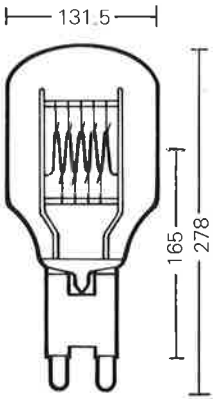
Class CP

Applications: TV, Video and Film Studios where controlled colour temperature for sensitised material balanced for 3200K is required.

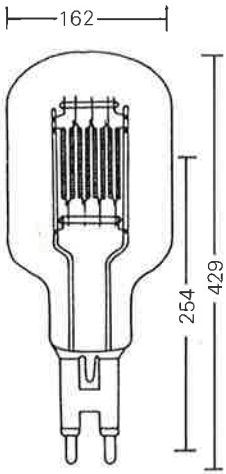
Hard Glass Halogen



CP/20, CP/22, CP/57



CP/46



CP/80

Type: All GEC CP Class lamps are Tungsten Halogen, which eliminates bulb blackening, giving almost 100% lumen maintenance and colour temperature throughout life.

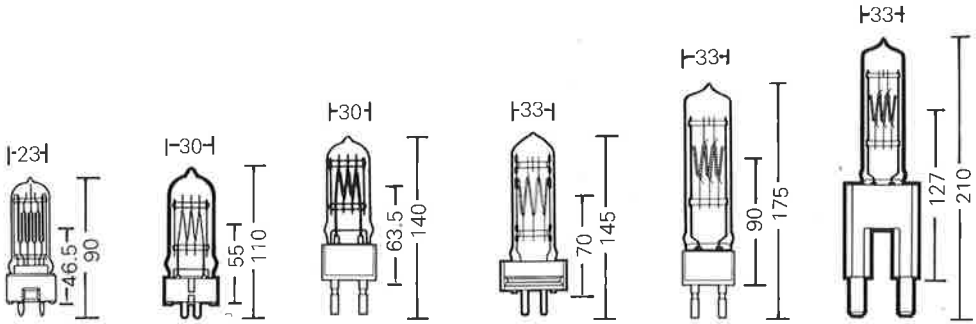
Flexi-Pin: GEC's twin filament lamps CP20, CP22 and CP57 incorporate the flexible pin principle.

Operating Temperature: Glass base not to exceed 400°C.

Lamp Type	Ansi Code	Watts	Volts	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position
CP22		1250/1250	115/120	GX38q	29000/62500	100	VBD ± 45°
			220, 240	GX38q	27000/56000	100	VBD ± 45°
CP57		1250/2500	220, 240	GX38q	26000/59000 90,000 combined	100	VBD ± 45°
CP20		2500/2500	115/120	GX38q	65000/140000	100	VBD ± 45°
			220, 240	GX38q	59000/127000	100	VBD ± 45°
CP46	FCN	5000	115/120	G38	137500	400	VBD ± 45°
			220, 240	G38	130000	400	VBD ± 45°
CP80	EBA	10000	115/120	G38	290000	400	VBD ± 45°
			220, 240	G38	280000	400	VBD ± 45°

Application: TV, Video and Film Studios where controlled colour temperature for sensitised material balanced for 3200K is required.

Quartz Halogen



CP/82 CP/23 CP/24 CP/39 CP/40 EGN EGR CP/43 CP/84 CP/41

Operating Temperature: Quartz pinch not to exceed 400°C.

Lamp Type	Ansi Code	Watts	Volts	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position
—	EGN	500	120	G22	13000	100	VBD ± 90°
CP82		500	115/120	GY9.5	12500	150	VBD ± 90°
			220, 240	GY9.5	12500	150	VBD ± 90°
CP39	FKG	650	115/120	G22	16900	100	VBD ± 90°
	FKH	650	220,240	G22	16900	100	VBD ± 90°
CP23		650	220, 240	GX9.5	16900	100	VBD ± 90°
—	EGR	750	120	G22	20000	200	VBD ± 90°
CP24		1000	115/120	GX9.5	27000	200	VBD ± 90°
			220, 240	GX9.5	26000	200	VBD ± 90°
CP40		1000	115/120	G22	27000	200	VBD ± 90°
	FKJ		220, 240	G22	26000	200	VBD ± 90°
CP41	CYX	2000	115/120	G38	55000	400	VBD ± 90°
	FKK		220, 240	G38	53000	400	VBD ± 90°
CP43		2000	115/120	GY16	55000	400	VBD ± 90°
			220,240	GY16	53000	400	VBD ± 90°
CP84		2000	115/120	G22	55000	400	VBD ± 90°
			220, 240	G22	53000	400	VBD ± 90°

Application: Daylight filming, Electronic News Gathering, TV Studios, Outside Broadcasts, Special Effects, Theatre Stage Lighting, Overhead Projection and for use where a colour temperature of 5600K is required to supplement daylight.

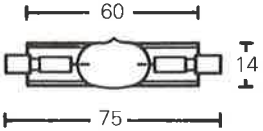
Type: Metal halide discharge lamp.

Bulb: Quartz.

Ballast: A suitable ballast and ignitor must be used with these lamps.

Luminaire: Lamp must be operated in a totally enclosed luminaire so avoiding exposure to ultra violet radiation.

MEI 200

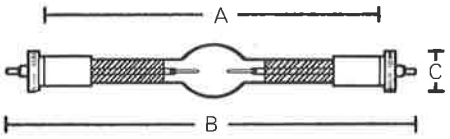


Watts	Cap	Operating Position	Nominal Lumens	Objective Average Life
200	X515	Horiz ± 15	16000	300

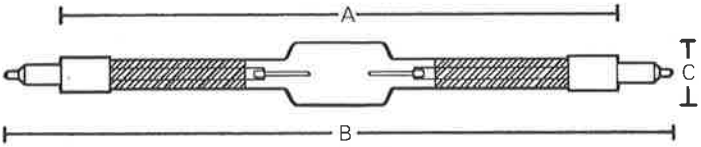
MEI COOLSEAL

GEC started manufacturing standard MEI lamps seven years ago, and in 1982 invented the important Coolseal principle specifically to overcome the problems of molybdenum to quartz seals overheating within the end caps.

The Coolseal technique considerably reduces the temperature at the end of the seal, which increases the life of the lamp. The surface of the seal is etched so that the heat which normally travels along the seal from the bulb to cap by the light pipe effect, is dispersed.



575W, 1200W



2500W, 4000W

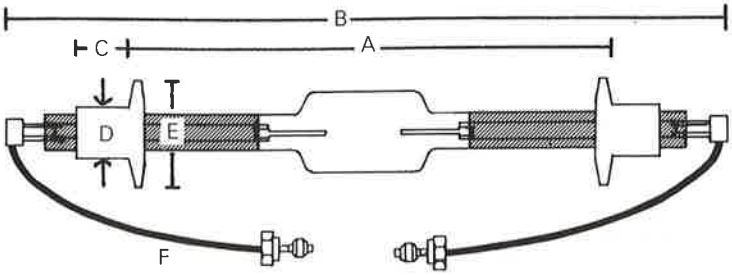
Watts	Cap	Operating Position	Nominal Lumens	Objective Average Life	A	B	C
575	SFc10.5–4	Any	49000	750	115	145	21
1200	SFc15.5–6	Any	110000	750	180	220	27
2500	SFa21–12	Horiz ± 15	240000	500	290	355	30
4000	SFa21–12	Horiz ± 15	410000	500	340	405	38

MEI COOLSEAL WITH FLYING LEADS

As a result of the Coolseal development and the consequent reduction of temperature of each seal, the need for expensive cooling fins has been eliminated. The MEI lamp with flying leads may now be held in position by simple clips fixed to a flexible mounting which helps to protect the lamp if the luminaire is dropped. The lamp caps have been removed and replaced by flying leads so that the electrical contacts can be made in a low temperature area of the luminaire away from the end seal.

8kW

The 8 kilowatt MEI Lamp is the first light source capable of replacing the traditional Brute carbon arc lamp. It has been designed for infill lighting in daylight conditions to simulate daylight during outside broadcasts and for special effect lighting in film and TV studios.

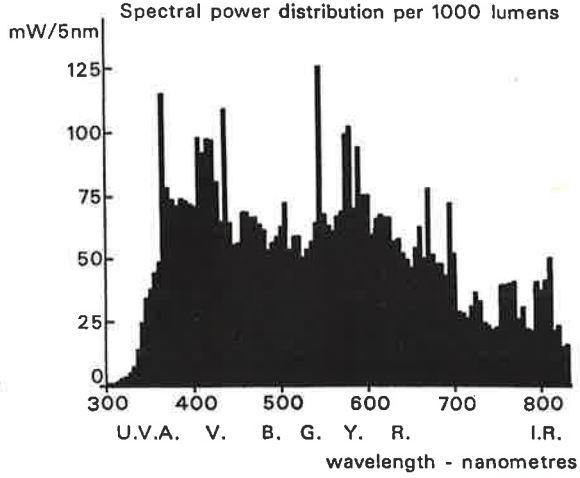


Cap: Flying leads.

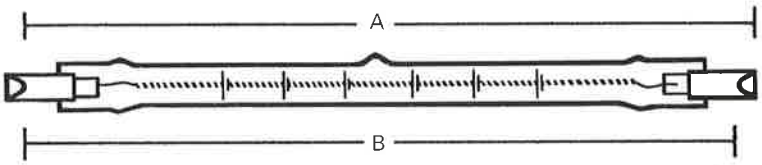
Watts	Operating Position	Nominal Lumens	Objective Average Life	Dimensions in mm A	B ± 5	C	D	E	F	Terminals All 1mm Pitch
575	Any	49000	750	80	120	8	15	26	70	8mm dia
1200	Any	110000	750	116	174	14	20	35	70	8mm dia
2500	Horiz ± 15	240000	500	190	298	25	25	50	70	12mm dia
4000	Horiz ± 15	410000	500	240	360	25	25	50	70	12mm dia
8000	Horiz ± 15	800000	500	311	530	25	41	65	120	12mm dia

MEI – At 5600K

Spectral power distribution per 1000 lumens



Application: For use with sensitised material balanced to 3200K in TV, Video, Film and Photographic Studios.



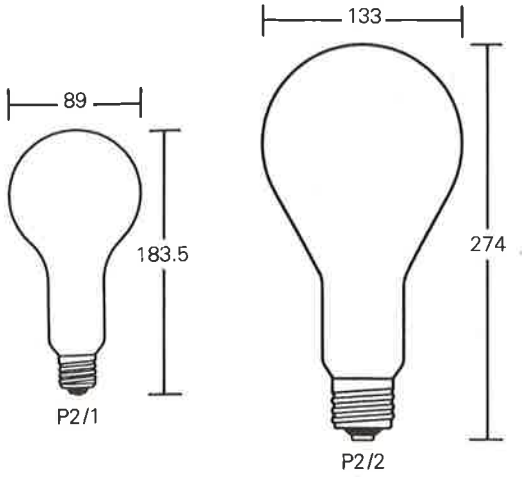
Type: Quartz Tungsten Halogen
Cap: R7s-15
Operating Temperature: Pinch seal not to exceed 400°C
Max Bulb Diameter: 12mm (Excluding Pip)
Recommended Fusing: Rapid Acting HBC Type

Lamp Code	Ansi Code	Watts	Volts	Finish	Nominal Lumens	Obj. Life (Hrs)	Operating Position	Contact to ceramic Max A (mm)	Contact to Contact B ± 1.6 (mm)	Recommended Fusing
P2/10		625	115/120	Frosted	15000	200	Horiz ± 4°	189.1	185.7	10A
			220/230	Frosted	15625	200	Horiz ± 4°	189.1	185.7	4A
			240/250	Frosted	15625	200	Horiz ± 4°	189.1	185.7	4A
P2/15		625	240/250	Frosted	16250	75	Horiz ± 15°	117.6	114.2	4A
P2/11		800	115/120	Clear or Frosted	21600	150	Horiz ± 15°	117.6	114.2	10A
			220/230	Clear or Frosted	21000	150	Horiz ± 15°	117.6	114.2	6A
	EME/EMF		240/250	Clear or Frosted	21000	150	Horiz ± 15°	117.6	114.2	6A
P2/7		1000	220/230	Clear	26000	200	Horiz ± 4°	189.1	185.7	6A
			240/250	Clear	26000	200	Horiz ± 4°	189.1	185.7	6A
P2/28	FCM	1000	120	Clear	27000	400	Horiz ± 4°	117.6	114.2	10A
P2/29	FHM	1000	120	Frosted	27000	400	Horiz ± 4°	117.6	114.2	10A
P2/12		1250	115/120	Clear	33500	200	Horiz ± 4°	189.1	185.7	16A
			220/230	Clear	33500	200	Horiz ± 4°	189.1	185.7	10A
			240/250	Clear	33500	200	Horiz ± 4°	189.1	185.7	10A

Class P2

Photographic

Application: Designed for use with sensitised material balanced for 3200K.

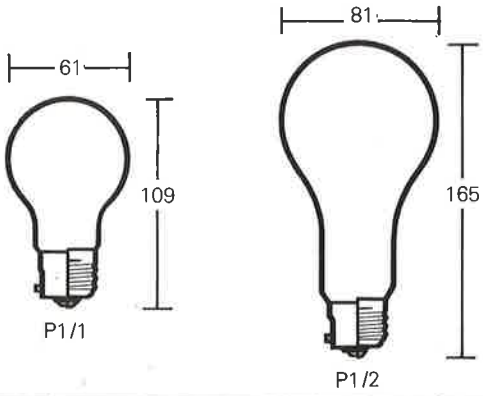


Lamp Type	Watts	Volts	Cap	Finish	Nominal Lumens	Objective Life (Hrs)	Operating Position	Standard Pack
P2/1	500	240	E27	Pearl	11500	100	Any	12
P2/2	1000	240	E40	Pearl	22000	100	Any	10

Class P1

Photoflood

Application: Indoor photography with black and white or colour film.



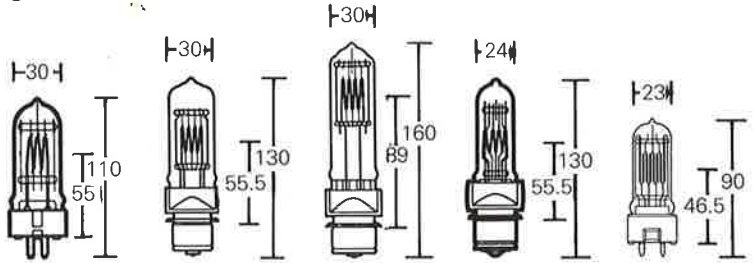
Lamp Type	Watts	Volts	Cap	Finish	Nominal Lumens	Objective Life (Hrs)	Operating Position	Standard Pack
P1/1	275	240	E27, B22	Pearl	8000	3	Any	25
P1/2	500	240	E27, B22	Pearl	15000	6	Any	25

THEATRE LAMPS

Class T

Application: Theatre, Cinema, Conference Centres, Art and Leisure Centres, Lecture and Educational Halls.

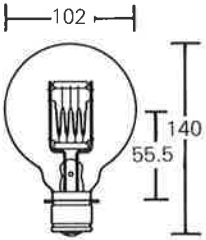
Quartz Halogen



T/11, T/12 T/13, T/14 T/15 T/17 T/18, T/26

Lamp Type	Watts	Volts	Cap	Nominal Lumens	Colour Temp. (K)	Objective Life (Hrs)	Operating Position	Replaces	Standard Pack
T/17	500	115/120	P28s	9500	2950	750	VBD ± 90°	T1	50
		220, 240	P28s	9500	2950	750	VBD ± 90°	T1	50
T/18	500	115/120	GY9.5	11000	3050	300	VBD ± 90°		32
		220,240	GY9.5	11000	3050	300	VBD ± 90°		32
T/12	650	115/120	GX9.5	13500	3050	750	VBD ± 90°		50
		220, 240	GX9.5	13500	3050	750	VBD ± 90°		50
T/13	650	220, 240	P28s	13500	3050	750	VBD ± 90°		50
T/26	650	115/120	GY9.5	15000	3100	400	VBD ± 90°		32
		220, 240	GY9.5	15000	3100	400	VBD ± 90°		32
T/11	1000	220, 240	GX9.5	23000	3100	750	VBD ± 90°		50
T/14	1000	115/120	P28s	23000	3100	750	VBD ± 90°	T6	50
		220, 240	P28s	23000	3100	750	VBD ± 90°	T6	50
T/15	1000	115/120	P28s	23000	3100	750	Any	T4	50
		220, 240	P28s	23000	3100	750	Any	T4	50

Non Halogen



T/1

Lamp Type	Watts	Volts	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position	Standard Pack
T/1	500	230, 240	P28s	9750	200	VBD ± 90°	10

Quartz Halogen

Operating Temperature: Pinch not to exceed 350°C.

Lamp Type		Watts	Amps	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position	Max Length	Max Dia.	LCL
J1/59		36	6.0	G6.35	610	600	VBD ± 90°	45	11	33
J1/57		45	6.6	G6.35	840	600	VBD ± 90°	45	11	33
J1/58		100	6.6	G6.35	2300	600	VBD ± 90°	47	13.5	33
J1/66		100	8.33	G6.35	2300	600	VBD ± 90°	47	13.5	33
J1/39		200	6.6	G6.35	4700	600	VBD ± 90°	47	13.5	33
J1/65		200	8.33	G6.35	4700	600	VBD ± 90°	47	13.5	33
J1/40		200	6.6	R7s-15	4200	1000	Any	63.6*	12	—
J1/42	EL55TH	200	6.6	P28s	3700	1000	Any	130	33	55.5
J1/50	EL39TH	200	8.33	P28s	3700	1000	Any	130	33	55.5
J1/51		200	8.33	R7s-15	4200	1000	Any	63.6*	12	—

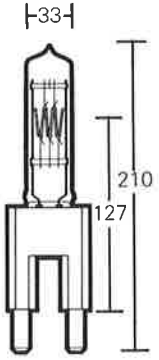
*Clearance length only.

Non Halogen

Lamp Type	EL	Watts	Amps	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position	Max Length	Max Dia.	LCL
J1/3		30	6.6	P28s	420	400	VBD ± 30°	103	33	38
J1/6	EL36	36	6.0	BA15d	560	60	Any	60	39	28.5
J1/7	EL40	36	6.0	BA20s	560	50	VBD	69	39	28.5
J1/13		45	6.6	P28s	640	400	VBD	103	33	38
J1/14		45	6.6	BA20s	640	400	VBD	69	39	30
J1/16	EL48	48	8.0	BA15d	815	50	VBD ± 90°	60	39	28.5
J1/24		100	6.6	P28s	1400	400	VBD ± 30°	100	38	38.5
J1/27		100	6.6	BA20s	2200	40	VBD ± 90°	95	61	43
J1/33	EL50	100	8.33	BA20s	2100	50	VBD ± 90°	93	61	43
J1/35	EL56	100	8.33	P28s	2100	50	VBD	112	66	55.5
J1/43		200	6.6	P28s	4200	120	VBD	146	38	55.5
J1/48	EL55	200	6.6	P28s	3700	200	VBD ± 135°	130	82	55.5
J1/52	EL39	200	8.33	P28s	3700	200	VBD ± 135°	130	82	55.5
J1/67		250	240 Volts	P28s	2400	5000	VBD ± 135°	130	82	55.5
J1/56		300	36 Volts	P28s	3700	500	VBD ± 90°	130	81	55.5

SPECIAL APPLICATIONS

Aero Beacon (Quartz Halogen)



ARB

Lamp Type	Watts	Volts	Cap	Nominal Lumens	Objective Life (Hrs)	Operating Position	Standard Pack
ARB	1550	100	G38	3400	2500	VBD	1

Operating Theatre

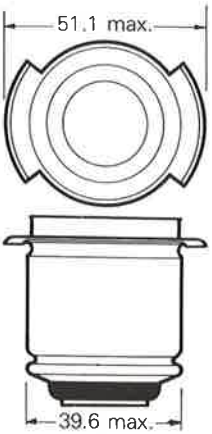
Lamp Type	Watts	Volts	Cap	Filament	Nominal Lumens	Objective Life (Hrs)	Max Length	Max Dia	LCL
905	150	24	E27	Axial	2625	500	122	82	76

Lighthouse

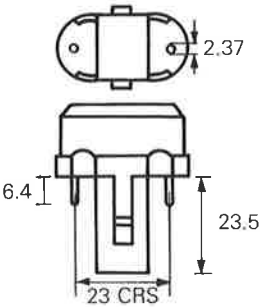
GEC's range of Lighthouse lamps comply to British Standards where applicable.
Further details are available on application.

Aero Landing

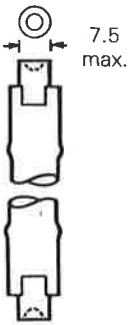
GEC's range of Aero Landing lamps comply with British M.O.D. Defence Standards.
The company also has Civil Aviation Authority approval for these types.
Further details are available on application.



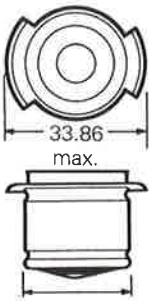
P40s
Large Pre-focus



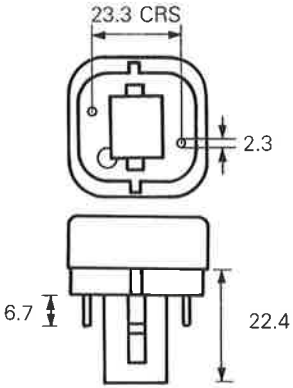
G23



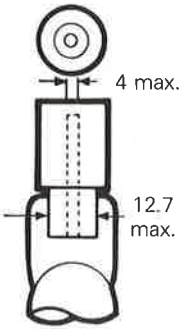
R7s



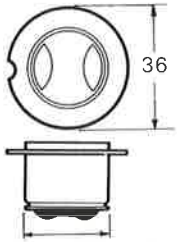
P28s
Medium Pre-focus



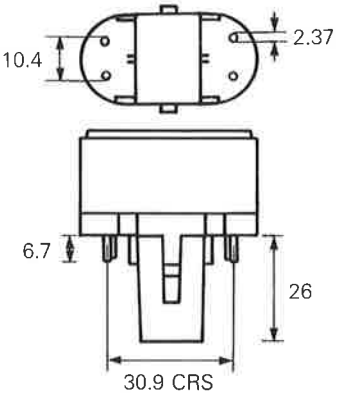
G24d-1



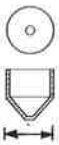
R12.5s



P36d
British Pre-focus
Double Contact

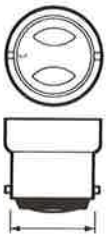


G32q-1

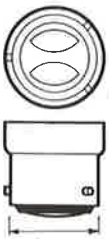


SV8.5
Festoon

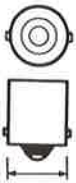
STANDARD CAPS



22.15 max.
B22d (BC)
Bayonet Cap



22.15 max.
B22d-3
3 pin Bayonet Cap

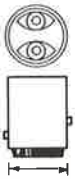


15.3 max.
BA15s (SCC)
Small Centre Contact

15.25 max.
B15d (SBC)
Small Bayonet Cap

9.25 max.
BA9s (MCC)
Miniature Centre
Contact

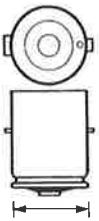
15.25 max.
S15s
Single Contact Cap
for Striplite



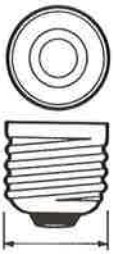
15.25 max.
BAY15d
Bayonet Automobile

22 max.
BY22d
Sodium Bayonet Cap

7.1 max.
BA7s
Bayonet Automobile

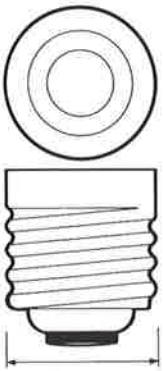


20.10 max.
BA20s
Bosch



26.45 max.
E27 (ES)
Edison Screw

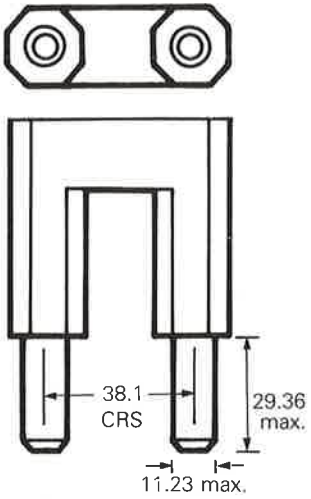
9.53 max.
E10 (MES)
Minature Edison Screw



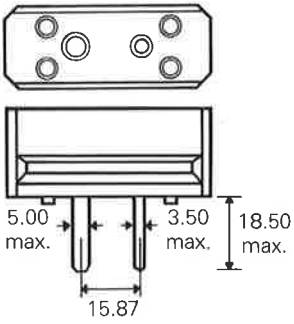
39.5 max.
E40 (GES)
Goliath Edison Screw

13.89 max.
E14 (SES)
Small Edison Screw

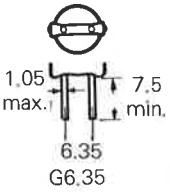
5.33 max.
E5 (LES)
Lilliput Edison Screw



G38 Large Bi-post

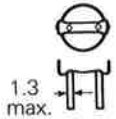


GY16

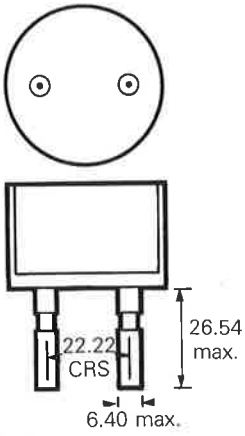


G6.35

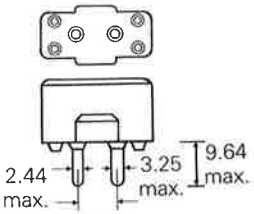
OTHER
MEASUREMENTS
AS G6.35



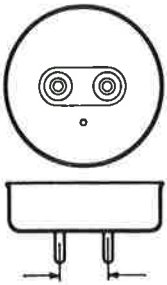
GY6.35



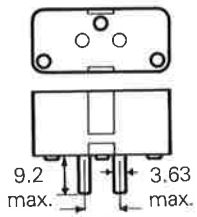
G22 Medium Bi-post



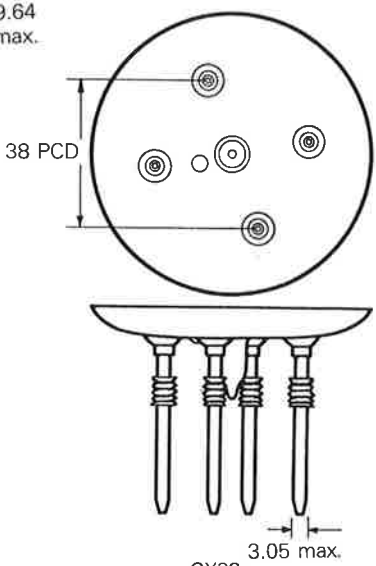
GY9.5



G13 Medium Bi-post



GX9.5



GX38q
Flexi-Pins

Osram (GEC) Limited

A Subsidiary of the General Electric Company, p.l.c. of England

GENERAL CONDITIONS OF SALE
HOME TRADE — UNITED KINGDOM

UNLESS OTHERWISE STATED BY THE COMPANY IN WRITING, THE COMPANY'S GENERAL CONDITIONS OF SALE ARE AS FOLLOWS:

1. GENERAL. — All quotations are made and all orders are accepted subject to the following terms and conditions and no addition thereto or variation therein shall be made or apply unless agreed in writing by the Parties.

2. ORDERS. — The Company reserves the right to accept or refuse orders. The Company also reserves the right (without prejudice to any other remedy) to cancel any uncompleted order or to suspend delivery in the event of any of the Customer's commitments with the Company not being met or if the Company is of the opinion that such commitments will not be met by the Customer.

3. VALIDITY OF QUOTATIONS. — The Company reserves the right to refuse the Customer's acceptance of a quotation unless such quotation is stated to be open for a specific period and is not withdrawn within such period.

4. ACCEPTANCE OF QUOTATIONS. — The acceptance of a quotation must be accompanied by sufficient information to enable the Company to proceed with the order forthwith, otherwise the Company will be at liberty to amend the quoted price to cover any increase in cost which has taken place after acceptance. Any sample submitted with the Company's quotation is returnable.

5. CATALOGUES. — Catalogues, price lists, and other advertising matter are only an indication of the type of goods offered and no particulars therein shall be binding on the Company. All prices quoted therein are subject to alteration or withdrawal from time to time without notice.

6. PRICE.

(a) All quotations and orders for the general range of goods in current demand are subject to relevant prices and relevant discounts ruling at date of despatch.

(b) Except as provided in paragraph (a) above, all prices are based on the cost of material, labour, transport and of conforming to statutory obligations ruling at the date of tender, and if between that date and the date on which the goods are despatched, variations, either by rise or fall, shall occur in these costs the Company may amend the price to provide for these variations.

7. DESCRIPTION OF GOODS. —

(a) All goods will be supplied as specified subject to reasonable availability to the Company of materials. Where specified materials are not so available the Company reserves the right without further notice to substitute other materials.

(b) All descriptive specifications and drawings, all particulars of weights and dimensions and all forwarding specifications issued by the Company are approximate only.

8. REJECTION. — Unless otherwise agreed in writing, goods rejected by the customer as not complying with the contract must be rejected within 14 days of receipt by the Customer.

9. DESPATCH. — Any times quoted for despatch are to be treated as estimates only and the Company shall not be liable in any manner whatsoever for failure to despatch within such time unless the Customer has suffered loss thereby and the amount payable in respect thereof shall have been agreed in writing prior to despatch as liquidated damages, in which case the Company's liability shall be limited to the amount so agreed to be paid. In all cases, whether a time for despatch be quoted or not, the time for despatch shall be extended by a reasonable period having regard to all circumstances if delay in despatch is caused by instructions or lack of instructions or other necessary particulars from the Customer, or by industrial dispute, or by any cause whatsoever beyond the Company's reasonable control.

10. STORAGE. — If by reason of instructions or lack of instructions from the Customer despatch in accordance with the contract is delayed for 7 days after the Customer has been notified that the goods are ready for despatch, the property in the goods shall pass to the Customer who shall take delivery or arrange for storage and for purposes of clause 14 (Payment) the goods shall thereupon be deemed to have been delivered. If and for so long as the Company's storage facilities

permit the Company may store the goods and the Customer shall pay a reasonable charge therefore.

11. DELIVERY. — Unless otherwise specified the price quoted includes delivery. The Company reserves the right to choose the method of transport.

12. LOSS OR DAMAGE IN TRANSIT. — When the price quoted includes delivery, the Company shall repair or replace free of charge goods damaged in transit or not delivered in accordance with the Advice Note provided that the Company is given written notification of such damage or non-delivery within such time as will enable the Company to comply with the carrier's conditions of carriage as affecting loss or damage in transit, or, where delivery is made by the Company's own transport, within a reasonable time after receipt of the Advice Note.

13. PACKING. — Packing cases, skids, drums and/or packing materials, will be charged extra if not returned in good condition carriage paid to the Company within one month of delivery of the goods.

14. PAYMENT. — Unless otherwise agreed in writing payment in full is due on delivery of goods. In the event any amount payable is overdue, the Company may, without prejudice to any other right, charge simple interest on overdue amounts at a rate of 2% per annum above the then current base rate published by the Midland Bank PLC.

15. GENERAL LIABILITY AND MAINTENANCE. — The Company's liability in respect of any defect in or failure of the goods supplied, or for any loss, injury, or damage attributable thereto, is limited to making good by replacement or repair any part thereof which is defective and being a defect which, under proper use or conditions of storage arises solely from faulty design (other than a design made, furnished or specified by or on behalf of the Customer), materials or workmanship and which appears therein within a period of twelve calendar months after the original goods shall have been first despatched, at the termination of which period all liability on the Company's part ceases. In all such cases, the defective part or parts shall be promptly returned by the Customer free to the Company's Works, unless otherwise arranged. The repaired or replacement part or parts will be delivered free. The Company shall be under no liability for the fitting or installation of the repaired or replacement part or for service charges incurred in respect thereof. All other conditions, warranties and liabilities implied by law or otherwise are hereby expressly excluded.

In respect of goods not of the Company's manufacture, the Customer is entitled only to such benefits as the Company may receive under any guarantee given to it in respect thereof.

Save as in this clause herein before expressed, the Company shall be under no liability in contract, tort or otherwise, for any personal injury, loss or damage of whatsoever kind or howsoever caused or for anything done or omitted in connection with the goods or any work in connection therewith.

16. PATENTS. — The Company will indemnify the Customer against any claim for infringement of Letters Patent or Registered Design (published at the date of the contract) by the use or sale of any article or material supplied by the Company to the Customer and against all costs and damages which the Customer may incur in any action for such infringement or for which the Customer may become liable in any such action. Provided always that this indemnity shall not apply to any infringement which is due to the Company having followed a design or instruction furnished or given by the Customer or to the use of such article or material in a manner or for a purpose or in a foreign country not specified by or disclosed to the Company. Provided also that this indemnity is conditional on the Customer making no admission in respect of such alleged infringement and giving the Company the earliest possible notice in writing of any claim being made or action threatened or brought against the Customer and on the Customer permitting the Company at its own expense to conduct any litigation that may ensue and all negotiations for a settlement of the claim. The Customer on his part warrants that any design or instruction furnished or given by him shall not be such as will cause the Company to infringe any Letters Patent, Registered Design or Trade Mark in the execution of the Customer's Order.

17. UNITED KINGDOM. — Reference herein to 'the United Kingdom' shall mean and include the United Kingdom of Great Britain and Northern Ireland, the Isle of Man and the Channel Islands.

18. LEGAL CONSTRUCTION. — The contract shall in all respects be construed and operate as an English contract and in conformity with English law.

INDEX

INDEX

INDEX

EMERGENCY MODULES

Stop Press

Luminaires with Emergency Facilities

Fluorescent luminaires are available in self contained emergency lighting form by incorporating an inverter module and battery pack (where conditions allow) inside the luminaire. Where integral conversion is not possible, a remote mounted box containing the inverter module and battery pack can be supplied.

In the event of a mains failure, the conversion will ensure that one fluorescent tube in each fitting will remain alight at a reduced level for the specified period (1 hour or three hour conversions are available). On the resumption of mains power, the battery pack is automatically recharged.

Light Output Levels (Emergency Operation)

Tube Type	Approx Lumen Output	Time
2′ 18W	494	1 or 3 hrs
4′ 36W	1184	1 or 3 hrs
5′ 58W	1020	1 or 3 hrs
6′ 70W	1323	1 or 3 hrs
8′ 100W	935	1 or 3 hrs
8′ 125W	1320	2 hrs

Speedpack Emergency Conversion Table

Catalogue No.	Tubes			Integral Conversion	Remote Conversion	Approx Emergency Lumen Output
	No.	Ft.	Watts			
SP2	1	2	18	n/a	1 or 3 hrs	494
SP4	1	4	36	1 hr only	1 or 3 hrs	1184
SP5 Single	1	5	58	1 hr only	1 or 3 hrs	1020
SP6	1	6	70	1 or 3 hrs	1 or 3 hrs	1323
SP8100	1	8	100	1 or 3 hrs	1 or 3 hrs	935
SP8	1	8	125	2 hrs only	2 hrs only	1320
SP24	2	4	36	n/a	1 or 3 hrs	1184
SP25	2	5	58	n/a	1 or 3 hrs	1020
SP26 Twin	2	6	70	n/a	1 or 3 hrs	1323
SP28100	2	8	100	1 or 3 hrs	1 or 3 hrs	935
SP28	2	8	125	2 hrs only	2 hrs only	1320
SP2W	2	2	18	n/a	1 or 3 hrs	494
SP4W Wide	2	4	36	n/a*	1 or 3 hrs	1184
SP5W Spaced	2	5	58	n/a*	1 or 3 hrs	1020
SP6W Twin	2	6	70	1 or 3 hrs	1 or 3 hrs	1323
SP8W100	2	8	100	1 or 3 hrs	1 or 3 hrs	935
SP8W	2	8	125	2 hrs only	2 hrs only	1320

n/a = not available

* = under test at time of printing

(Lumen output measured with high efficacy lamp (except 125W) at 20°C)

To Order: Add the suffix EM1 (1 hour duration), EM3* (3 hour duration) to the fitting references, example – Emergency Lighting version of the SP6C becomes SP6CEM1 for 1 hour duration. Where integral conversion is not possible, a remote box can be provided, catalogue reference EMR1 or EMR3. The remote box has the dimensions 410mm x 124mm x 50mm.

SOLARMASTER

A new 70W SON bulkhead incorporating all the latest GEC design features.

★ Quick fit plug and socket ★ 220 and 240V H.P.F. tapped gear ★ Vandal resistant polycarbonate cover
★ Optional mounting facilities ★ Dust tight ★ Splash proof ★ Supplied complete with lamp
★ Electronic starter fitted for rapid re-strike of hot lamp.

SPECIFICATION

SM70 Weight 4.5kg

Body: High pressure aluminium casting in hammer brown stove enamel finish. A BESA box entry is provided at the rear with a sealing grommet and neoprene gasket. Three 6.5mm holes are additionally provided for wall fixing using M6 screws or rag bolts.

Gear Tray: High power factor control gear tapped for 220 and 240V 50Hz, is prewired to a three pin plug and socket.

Lampholder: Porcelain E27 (E.S.)

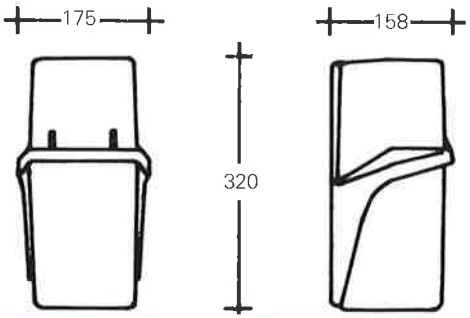
Diffuser: Polycarbonate with internal prismatic profile. A neoprene gasket provides the weather proof seal.

Designed to comply with BS4533
Ingress Protection I.P. 64 Dust tight and Splash proof.

Mounting Accessories

SMBKT Steel bracket painted hammer brown supplied complete with cable gland to mount Solarmaster with lamp horizontal.

MULTI UCB To be used with SMBKT for pole mounting.



NOTES

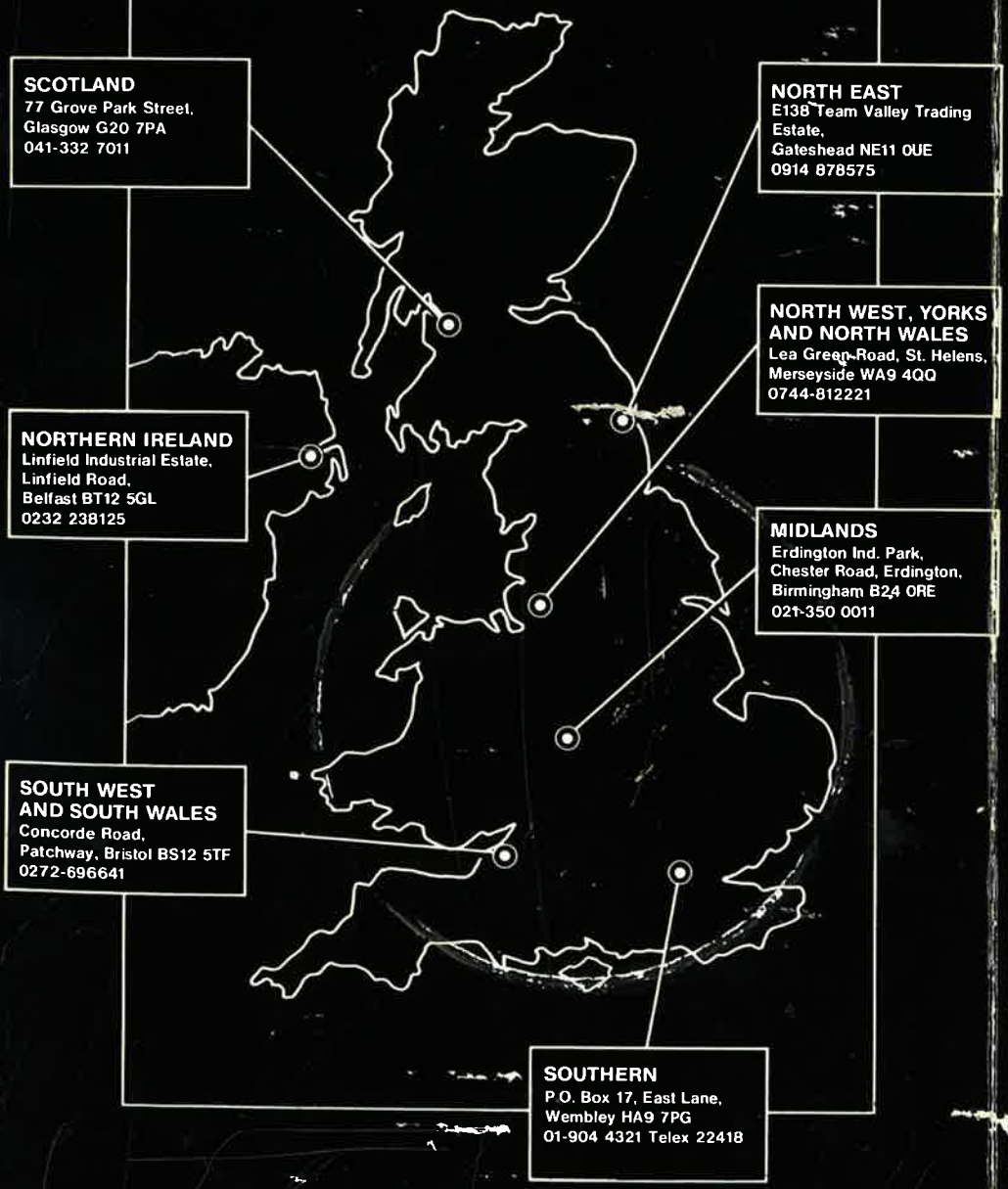
NOTES

NOTES

Osram (GEC) Limited

East Lane, Wembley HA9 7PG. Tel: 01-904 4321. Telex: 22418.
Subsidiary of The General Electric Company, p.l.c. of England

DISTRIBUTION CENTRES SALES AND LIGHTING OFFICES



SCOTLAND
77 Grove Park Street,
Glasgow G20 7PA
041-332 7011

NORTH EAST
E138 Team Valley Trading Estate,
Gateshead NE11 0UE
0914 878575

NORTH WEST, YORKS AND NORTH WALES
Lea Green Road, St. Helens,
Merseyside WA9 4QQ
0744-812221

NORTHERN IRELAND
Linfield Industrial Estate,
Linfield Road,
Belfast BT12 5GL
0232 238125

MIDLANDS
Erdington Ind. Park,
Chester Road, Erdington,
Birmingham B24 0RE
021-350 0011

SOUTH WEST AND SOUTH WALES
Concorde Road,
Patchway, Bristol BS12 5TF
0272-696641

SOUTHERN
P.O. Box 17, East Lane,
Wembley HA9 7PG
01-904 4321 Telex 22418

Printed in Great Britain by Frosts of Rugby 1985/86

FR8085M50