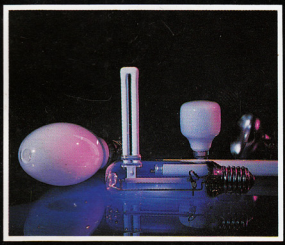
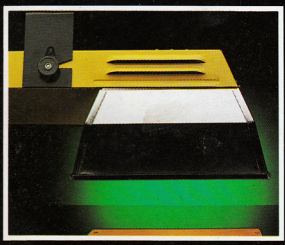
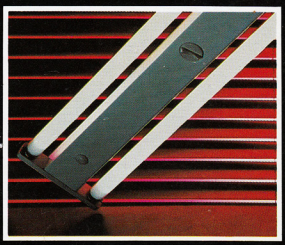
Osram-GEC
LIGHTING CATALOGUE







LOOKING AT ENERGY SAVING IN A DIFFERENT LIGHT.

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'

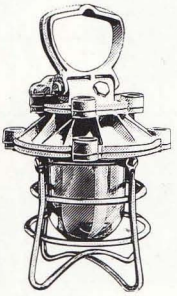
Intrinsic safety can be applied to luminaires using low levels of electric power insufficient to ignite gas under foreseeable fault conditions. There are two possible categories, ia and ib. In ia, the luminaire has to withstand two fault conditions. In ib, one fault condition. A typical marking would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

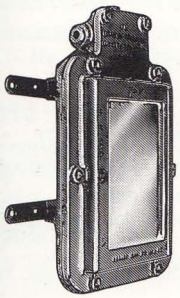
Certification: FLP1190 for Groups 1 and 2 and by P46 for Group 3 of BS229.

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.

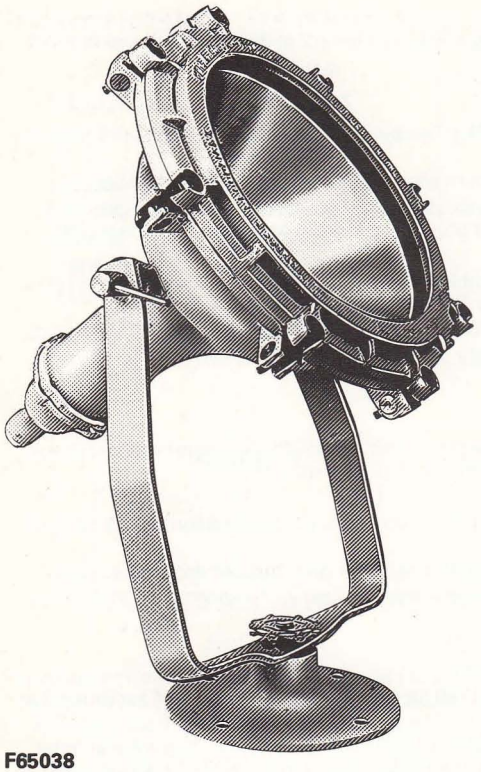
Certification: FLP1493 for Groups 1 and 2, P146 for Group 3. When used in Group 2(d) maximum lamp wattage 60.

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.

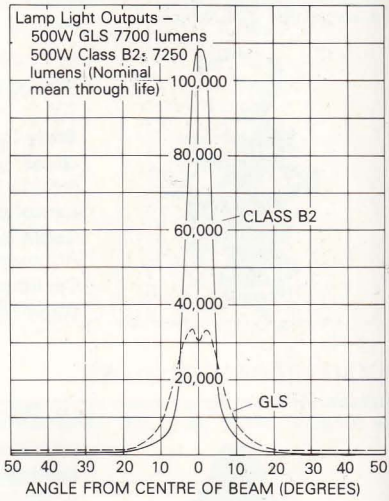
Essential accessory:

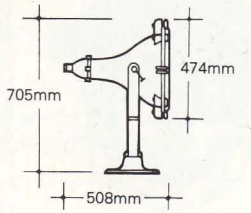
F65036KEY for triangular headed screws. (Not supplied unless ordered.)



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.

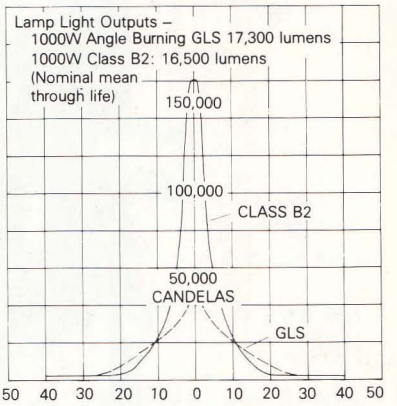
Terminal Chamber: Cast aluminium fastened to body by four stainless steel hexagonal bolts. The chamber is fitted with cable compression gland.

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

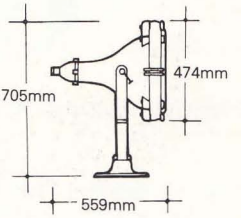
Certification: FLP918 and P51 for Groups 2 and 3, with the exception of the cellulose industry where ACETONE is present.

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.

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.

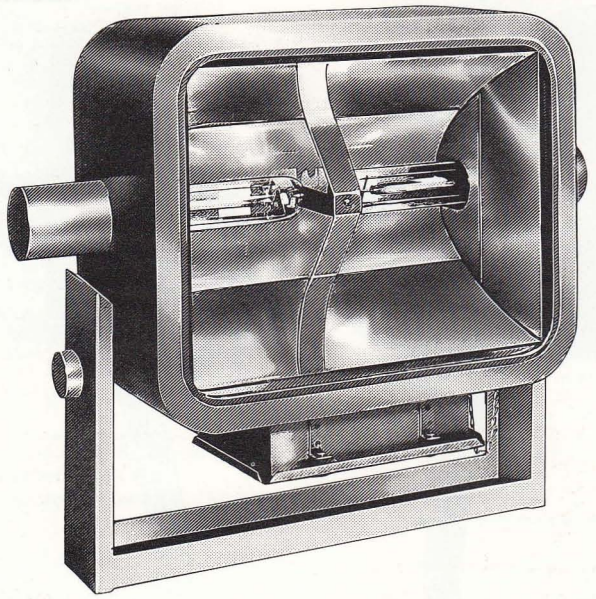
Certification: FLP1233/2 for 700W MBFR/U and FLP1233/3 for 250W and 400W MBFR/U lamps for Group 2 only with the exception of the cellulose industry where ACETONE may be present.

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



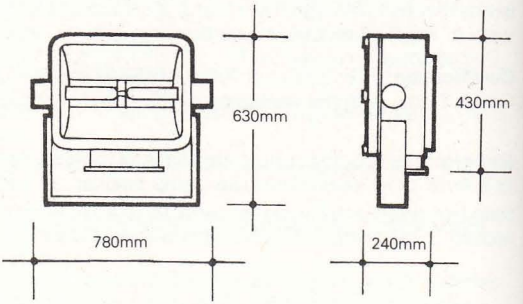
Abridged Photometric Data

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	
220/250	310	SON-T	FM126836	FM126840	FM126838	FM126842	−30	40	23.5
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	
220/250	2 x 310	SON-T	FM126845	FM126849	FM126847	FM126851	−30	35	24.5
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	