

EXIT

PCDCE Pardiasan Control Development Consulting & Engineering CO.LTD



PCDCE Emergency Light

چراغهای راهنما و اضطراری

تولید چراغهای راهنما و اضطراری پردیسان همراه با بومی سازی و خودکفایی بخش های مختلف کشور و به همراه توان مهندسان بخش تحقیق و توسعه شرکت به بار نشسته و توان تولید این محصول در حد نیاز داخل و با کیفیتی همتراز از شرکت های اروپایی و بسیار بهینه ، زیبا و مقتدرانه تر از محصولات آسیایی در حال ساخت میباشد. این محصولات در رنج های مختلف و جهت استفاده در مراکز مسکونی ، تجاری ، صنعتی و نظامی به درخواست مشتریان تهیه و توزیع میشوند.

- رعایت حد زیبانگری در جهت ارتقاء دکوراسیون ساختمان های مسکونی و تجاری
- مقاومت بالا در دمای زیاد و آتش سوزی
- استفاده از منابع بسیار کم مصرف و با طول عمر بسیار زیاد
- عدم ورود رطوبت و گرد و خاک
- مقاومت بالا در محیط های اسیدی و قلیایی
- تعمیر و نگهداری بسیار ساده بدون نیاز به متخصص
- مقاوم در برابر انفجار، گلوله و ضربات شدید در نوع نظامی
- تنوع محصولات در جهت سلیقه مشتریان
- دارای خطوط راهنمای شبرنگ به درخواست مشتری
- قابلیت یکپارچه سازی با اکثر پنل های اعلام حریق و سیستم های هوشمند ساختمان
- قابلیت کنترل و مانیتورینگ مرکزی
- مقاوم در محیط های صنعتی و امکان ایجاد Redundancy به درخواست مشتری
- مقرون به صرفه
- خدمات گارانتی و تعویض طولانی محصولات



PCDCE Emergency Light

چراغهای اضطراری :

این چراغها در انواع و اشکال مختلف در بازار موجود میباشند ، ولیکن مرغوبیت بدنه ، مقاومت آن در برابر محیط و شرایط اضطراری ، مصرف و محاسبات مهندسی طبق استانداردهای جهانی از نکات حائز اهمیت این تجهیزات میباشد. چراغهای اضطراری برای مصرف در لحظات بحرانی کاربرد دارد. با نصب آن در محل های تردد و پر خطر امکان فرار و یا خروج را برای افراد تسهیل نموده و گاهی حافظ جان آنها خواهد بود. در ساختمان های امروزی اعم از مراکز تجاری، مسکونی و نظامی استفاده از چراغهای راهنما و اضطراری الزام آور بوده است . با قطع برق نرمال و اضطراری ساختمان این تجهیزات به صورت هوشمند و توسط باتری های داخلی به مدت حداقل سه ساعت روشن خواهند بود . معمولا در طراحی به گونه ایی اعمال میشوند که حداقل لوکس نوری مورد نیاز برای دید افراد جهت جلوگیری از ازدحام و احتمال خطرات در لحظات دید کور را فراهم نموده و امکان خروج را برای افراد تسهیل میبخشد.



چراغهای خروج :

چراغهای راهنما معمولا به دو صورت کاربری عمومی و اضطراری استفاده میشوند . این چراغها راهنمای افراد برای خروج از مکان مورد نظر در لحظات بحرانی خواهند بود و کمترین مسیر را برای فرار افراد نشان میدهند. ولیکن معمولا بر روی درب ها و مسیرهای خروج عادی نیز نصب میشوند و کاربری عمومی در آنها اعمال میشود. این چراغها دارای باتری داخلی بوده و با قطع تمام منابع برق به مدت معین روشن خواهند بود و لذا افراد در یافتن مسیرها کمترین زمان را سپری خواهند نمود.



چراغهای راهنما :

چراغهای راهنما شامل طیف گسترده ایی از علائم ، نشانه ها و حروف مختلف بوده که بر اساس کاربری در هر یک از مراکز ساختمانی، صنعتی و نظامی طبق نظر مشتری ساخته میشوند و در تمام لحظات به صورت فعال روشن خواهد بود . این محصولات مانند چراغهای خروج طراحی و تولید میشوند و در صورت قطع تمام منابع از باتری داخلی برای راهنمایی افراد استفاده میگردد.



PCDCE Emergency Light



Laws and regulations make strict demands for emergency lighting installations for new constructions and constructions under rehabilitation. With all brands Fire & Safety that comply with the regulations and satisfy your needs for reliable solutions, in addition to expertise necessary to support you before, during and after installation

:Emergency luminaires

Non-Maintained and Maintained luminaires are compliant to all relevant standards. The luminaires can be delivered as centralized and self-contained, with or without auto test and with the possibility of communicating its status to a superior monitoring system (model defendant

:Advanced technique and elegant design

The complete product range includes fluorescent lighting, LED lighting with an operational life of 10 years and lighting that has been designed with special attention to materials and style

:Central battery systems

Customers can choose between centralized or decentralized systems. If centralized operation is required, all Fire & Safety brands can supply both standard central battery systems without auto test or auto test centrals with addressable luminaires

:Protects lives and property

We have one basic philosophy: Our products shall operate in an overall solution to provide maximum safety. Using standard components, we are able to supply configurations based on customer specifications. If required, fire alarm and emergency lighting systems must be able to communicate together within a network, even to the extent of being integrated into other surveillance systems

:User-friendly leading-edge technology

By means of our own technological developments we can provide our customers with safety combined with flexibility for future upgrading and extension. Our system philosophy provides the possibility of communicating with other systems. The result is maximum security, improved user-friendliness and an optimal total economy

If a building is to have a sufficient degree of safety and at the same time be run efficiently, then the complexity of the construction has to be considered as a complete entity

Today, large modern buildings have extremely advanced Building Management Systems (BMS) that automate and facilitate the running and maintenance procedures. PCDCE has designed their security Emergency & Light products, fire alarms and PA systems can form a natural, integrated part of the BMS network



Exit Lighting

PCDCE-LWXXEX



Exit sign

Exit sign, with its stylish design and appealing light, is suitable for any interior environment. It is based on LED technology and has a long service life. The long service life and low power consumption makes the products extremely economic, both in operation and maintenance. It can be supplied in centralized or decentralized versions. As decentralized, it comes as pure auto test or auto test or with communication to a superior monitoring system. It consists of 3 main parts, the housing itself, the fixing bracket (combined for ceiling and wall) and the sign with a running man and an arrow. The readability distance for this exit sign is 20m, 30m or 40m. It is supplied in natural colored aluminum. A recessing kit can be supplied that hides most of the lamp so that only the exit sign is visible below the ceiling



Model/PN	LW8E1X	LW8E2X	LW8E3X	LW12E1X	LW12E2X	LW12E3X
Number of LED	8	8	8	12	12	12
Colour	white	white	white	white	white	white
Self Test Facility						
EX Lamp_ Standalone	880 lumens	880 lumens	880 lumens	-	-	-
EX Lamp_Central	-	-	-	1320 lumens	1320 lumens	1320 lumens
Construction	Sheet aluminum housing, incorporating a fire resistant lens colour white					
Weight						
power consumption	8	8	8	12	12	12
Recharge Period	3 hour duration	3 hour duration	3 hour duration	-	-	-
Battery	NiCad	NiCad	NiCad	Central	Central	Central
LED Monitor charger	Red Led Monitoring	Red Led Monitoring	Red Led Monitoring	-	-	-
Operating Temperature	-5+50	-5+50	-5+50	-5+50	-5+50	-5+50
IP rating	IP20-IP54-IP65	IP20-IP54-IP65	IP20-IP54-IP65	IP20-IP54-IP65	IP20-IP54-IP65	IP54-IP65-IP67
Warranty	3 Year	3 Year	3 Year	3 Year	3 Year	3 Year
Direction	One	Two	Ceiling / wall	One	Two	Ceiling / wall
Housing	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum
Input/Output	1_1 or customer requests	1_1 or customer requests	1_1 or customer requests	1_1 or customer requests	1_1 or customer requests	1_1 or customer requests
Capability	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable
Volt	Free	Free	Free	Free	Free	Free

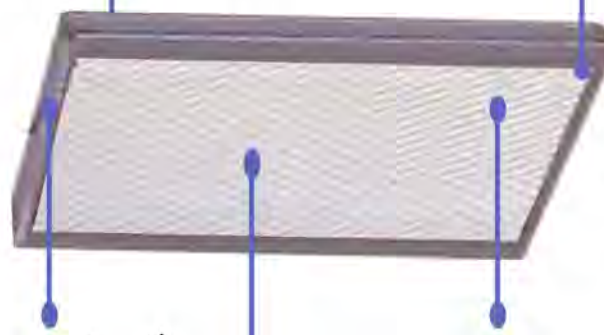
Emergency Lighting

PCDCE-LWXXEM



Best Hit sink for heat exchange

Finished in white to blend with most aluminum hard anodize



Fully robust all aluminum construction

Best LED Brands-Just Seoul brand

Prismatic 120° lens

Emergency Luminaire for interior and exterior applications, offering a cost effective. Emergency lighting solution for a wide range of applications . The slim profile base, finished in white, is supplied with drill points and a facility for Aluminum box mounting. A removable, hinged gear tray makes installation quick and easy Light output is maximized by the combination of a high efficiency circuit and durable optical lens system. A range of optional pictograms extends the application versatility of these robust emergency luminaires

For further information on lighting design please refer to the PCDCE Lighting Design Guide

Model/PN	LW8EM	LW18EM	LW24EM	LW32EM	LW64EM	LW90EM
Number of LED	8	18	24	32	64	90
Colour	white	white	white	white	white	white
Self Test Facility						
Emergency Lamp O/P	880 lumens	1980 lumens	2640lumens	—	—	—
Maintained Lamp O/P	—	—	—	3520lumens	7040lumens	9900lumens
Construction	Sheet aluminum housing,incorporating a fire resistant lens colour white					
Weight						
power consumption	8	18	24	32	64	90
Recharge Period	3 hour duration	3 hour duration	3 hour duration	—	—	—
Battery	NiCad	NiCad_Lithium	NiCad_Lithium	—	—	—
LED Monitor charger	Red Led Monitoring	Red Led Monitoring	Red Led Monitoring	—	—	—
Operating Temperature	-5+50	-5+50	-5+50	-5+50	-5+50	-5+50
IP rating	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67
Warranty	3 Year	3 Year	3 Year	3 Year	3 Year	3 Year
Volt	Free	Free	Free	Free	Free	Free

Model/PN	LW8EM	LW18EM	LW24EM	LW32EM	LW64EM	LW90EM
Number of LED	8	18	24	32	64	90
Colour	white	white	white	white	white	white
Self Test Facility						
Emergency Lamp O/P	880 lumens	1980 lumens	2640 lumens	3520 lumens	7040 lumens	9900 lumens
Maintained Lamp O/P						
Construction	Sheet aluminum housing, incorporating a fire resistant lens colour white					
Weight						
power consumption	8	18	24	32	64	90
Recharge Period	3 hour duration	3 hour duration	3 hour duration			
Battery	NiCad	NiCad Lithium	NiCad Lithium			
LED Monitor charger	Red Led Monitoring	Red Led Monitoring	Red Led Monitoring			
Operating Temperature	-5+50	-5+50	-5+50	-5+50	-5+50	-5+50
IP rating	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67	IP54-IP65-IP67
Warranty	3 Year	3 Year	3 Year	3 Year	3 Year	3 Year
Volt	Free	Free	Free	Free	Free	Free

Model/PN	LW8E1X	LW8E2X	LW8E3X	LW12E1X	LW12E2X	LW12E3X
Number of LED	8	8	8	12	12	12
Colour	white	white	white	white	white	white
Self Test Facility						
EX Lamp_ Standalone	880 lumens	880 lumens	880 lumens	1320 lumens	1320 lumens	1320 lumens
EX Lamp_ Central						
Construction	Sheet aluminum housing, incorporating a fire resistant lens colour white					
Weight						
power consumption	8	8	8	12	12	12
Recharge Period	3 hour duration	3 hour duration	3 hour duration			
Battery	NiCad	NiCad	NiCad	Central	Central	Central
LED Monitor charger	Red Led Monitoring	Red Led Monitoring	Red Led Monitoring			
Operating Temperature	-5+50	-5+50	-5+50	-5+50	-5+50	-5+50
IP rating	IP20-IP54-IP65	IP20-IP54-IP65	IP20-IP54-IP65	IP20-IP54-IP65	IP20-IP54-IP65	IP54-IP65-IP67
Warranty	3 Year	3 Year	3 Year	3 Year	3 Year	3 Year
Direction	One	Two	Ceiling / wall	One	Two	Ceiling / wall
Housing	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum	Hard Anodize Aluminum
Input/Output	1,1 or customer requests	1,1 or customer requests	1,1 or customer requests	1,1 or customer requests	1,1 or customer requests	1,1 or customer requests
Capability	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable	Against explosion/Unbreakable
Volt	Free	Free	Free	Free	Free	Free

System Design

Emergency Lighting
System Design Guide

Pardiasan Control Development Consulting & Engineering CO.LTD

System Design Introduction

The list below has been taken from ICEL 1006 and provides a brief explanation of various terms used widely in Emergency Escape Lighting System Design.

Application terminology

Emergency escape lighting

That part of emergency lighting provided to enable safe exit in the event of failure of the normal supply.

Emergency exit

A way out which is intended to be used any time that the premises are occupied.

Escape route lighting

That part of emergency lighting provided to enable safe exit for building occupants by providing appropriate visual conditions and direction finding on escape routes and in special areas/locations, and to ensure that fire fighting and safety equipment can be readily located and used.

Final exit

The terminal point of an escape route, beyond which persons are no longer in danger from fire or any other hazard requiring evacuation of the building.

High risk task area lighting

That part of emergency lighting provided to ensure the safety of people involved in a potentially dangerous process or situation, and to enable proper shut down procedures to be carried out for the safety of other occupants of the premises.

Open area (or anti-panic area) lighting

That part of emergency escape lighting provided to reduce the likelihood of panic and to enable safe movement of occupants towards escape routes by providing appropriate visual conditions and direction finding.

Product description and definitions

Standby lighting

That part of emergency lighting provided to enable normal activities to continue in the event of failure of the normal mains supply.

Ballast

Controls the operation of a fluorescent lamp for a specified AC or DC source (typically between 12 and 240 volts). It can also include elements for starting the lamp, for power factor correction or radio frequency interference suppression.

Central battery system

A system in which the batteries for a number of luminaires are housed in one location, usually for all the emergency luminaires in one lighting sub circuit, sometimes for all emergency luminaires in a complete building.

Maintained mode

A luminaire containing one or more lamps all of which operate from the normal supply or from the emergency supply at all material times.

Non-maintained mode

A luminaire containing one or more lamps, which operate from the emergency supply only upon failure of the normal mains supply.

Self contained (single point) luminaires

A luminaire or sign providing maintained or non-maintained emergency lighting in which all the elements such as the battery, the lamp and the control unit are contained within the housing or within one metre of the housing.

Slave luminaires

An emergency luminaire without its own batteries designed to work with a Central Battery System.

Ballast lumen factor (BLF)

The ratio of the light output of the lamp when the ballast under test is operated at its design voltage, compared with the light output of the same lamp operated with the appropriate reference ballast supplied at its rated voltage and frequency.

System Design Introduction

Battery capacity

The discharge capability of a battery, being a product of average current and time, expressed as ampere hours over a stated duration. Note that a shorter total discharge period gives rise to a smaller available capacity.

Design voltage

The voltage declared by the manufacturer to which all the ballast characteristics are related.

'F' mark

Shows the luminaire can be mounted on combustible surfaces. It does not show that the luminaire is fire retardant.

Flux

The illumination produced by one lumen over 1 square metre.

Illuminance

The luminous flux density at a surface, i.e the luminous flux incidence per unit area. The unit of illuminance is lux. (Lumens/M²)

K factor

This is the ratio of light output of the lamp in the worst condition i.e. normally at the end of a full battery discharge, and the light output measured at normal voltage.

Lumen

A standard measure of light output.

Lux

A measure of lighting density, expressed in lumens per area.

Mounting height

The vertical distance between the luminaire and the working plane. Note that the floor is taken to be the working plane for emergency lighting.

Rated duration

The length of time a luminaire is designed to operate after the mains has failed. (Typically 1 or 3 hours from a fully charged battery)

Rated load

The maximum load that may be connected to the system and will be supplied for the rated duration.

Re-charge period

The time necessary for the batteries to regain sufficient capacity to achieve their rated duration.

Room index

The relationship between the height, length and width of a room used for illuminance calculations.

Service factor

This is the ratio that compares the level of illuminance provided by a system after a number of years in service, with the output provided by the same system when new. Sometimes known as Maintenance factor.

Uniformity ratio

This is the ratio of minimum illuminance, and the average illuminance measured at floor level.

Utilisation factor at zero reflectance (UFO)

This establishes the proportion of a lamp's light output that falls directly on the floor, for various room indexes and types of diffuser.

Fire retardant housing 850°C Test

All emergency luminaires housings on escape routes must pass the 850°C glow wire test as specified in EN60 598-2-22.

System Design Design stage 1

DESIGN STAGE 1: Initial Considerations

Current statutory requirements and product standards

The design specification, selection and installation of emergency lighting is covered by an extensive range of legislation which are under continual review, being amended, in response to Directives and Standards issued by the relevant statutory bodies of the European Union. The first stage of system design is to gather all information for the project through reference to local authorities for current legislative Standards and Directives, and must pay due regard to users/customers preferences.

PRIMARY UK LEGISLATION	
DESCRIPTION	
The Fire Precautions in the workplace Act of 1997- Further guidance is available in the HSE book FIRE SAFETY - an Employers Guide.	
Health and Safety at work etc. Act 1974	
The Workplace (Health, Safety and Welfare) Regulations 1992	
Building Regulations Act 2000 - Document B	
The Cinematograph Act 1952	
Health & Safety (Safety Signs and Signals) Regulations Act 1996	
Other legislation dealing with premises licensed or registered for public assembly or residential purposes, e.g. Licensing Act, Local Government (Miscellaneous Provisions) Act, Theatres Act, Residential Homes Act etc, the guides for which all contain a requirement for emergency lighting	

STANDARDS AND CODES OF PRACTICE	
CODE / STANDARD	DESCRIPTION
BS 5266: Pt 1	1999 Code of practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment
CP1007	1955 Maintained lighting for cinemas
BS EN 60598-2-22	1999 Specification for luminaires for emergency lighting
BS 5499: Pt 1	1990 Specification of safety sign, inc.fire safety signs
BS 5499: Pt 2	1990 Specification for self-luminous fire safety signs
BS 5499: Pt 3	1990 Specification for internally-illuminated fire safety signs
ISO3864-1	Graphical symbols -safety colours and safety signs

HARMONISED EUROPEAN STANDARDS	
CODE / STANDARD	DESCRIPTION
HD 384	Electrical installation of buildings
EN 60598-2-22	Specification for luminaires for emergency lighting
EN 1838 (BS 5266:Pt7)	Lighting applications – emergency lighting
EN 50171	Central power supply systems

DRAFT EUROPEAN STANDARDS	
CODE / STANDARD	DESCRIPTION
prEN 50172	Emergency escape lighting systems
doc. CEN/TC 169WG7 N61D/E/F	Measurement and presentation of photometric data for lamps and luminaires

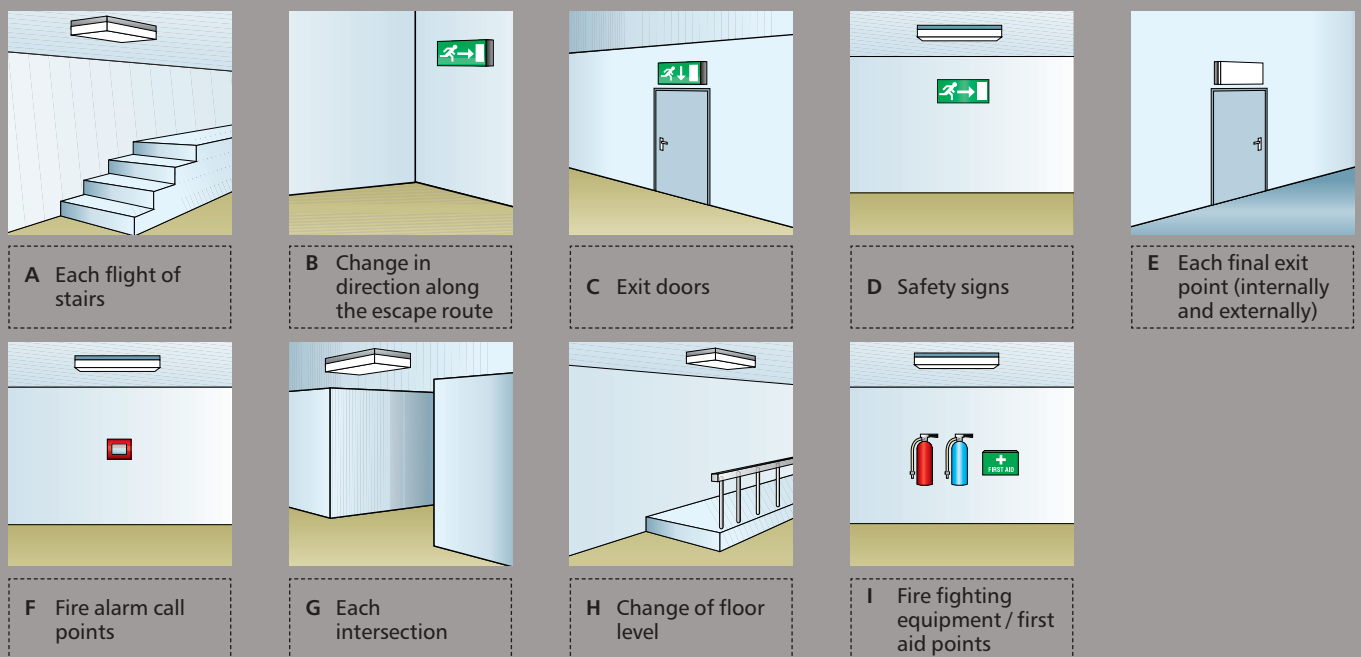
EUROPEAN DIRECTIVES AND RECOMMENDATIONS	
DIRECTIVE	DESCRIPTION
89/654 EEC	Workplace Directive
92/58 EEC	Safety Signs Directive
89/106 EEC	Construction Products Directive
86/666 EEC	Fire Safety in Hotels Recommendation – Requirements for Europe

System Design Design stage 2 and 3

DESIGN STAGE 2: Compulsory lighting locations - Points of Emphasis

The positioning and selection of emergency lighting equipment is subject to the nature of the area to be protected, and should be identified during risk assessment. This should cover specific hazards and highlight safety equipment and signs. This section provides outline guidance on each of the defined areas that require protection.

Areas initially requiring cover for designing a scheme are (these are mandatory):-

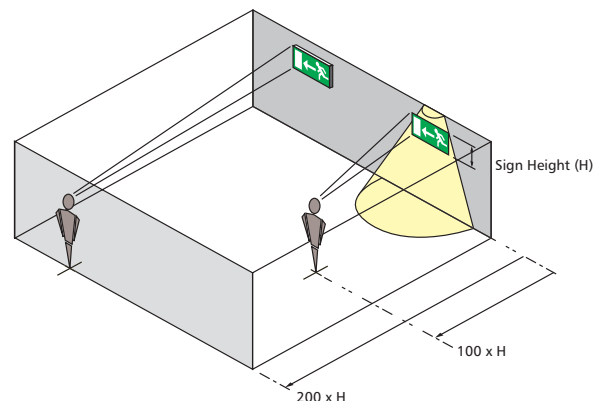


Additional emergency lighting should be provided at the following:

- A Lift cars
- B Toilet facilities and other tiled areas which exceed 8m² floor area and toilet facilities for the disabled
- C Escalators
- D Motor generator, control or plant rooms
- E Covered car parks along pedestrian routes
- F External escape routes

DESIGN STAGE 3: Exit signage

These are required at all exits, emergency exits and along escape routes. A directional sign is required when sight of an emergency exit sign is not possible or doubt may exist. BS 5266 and EN 1838 state that all the emergency escape route signs and luminaires, which should be of the same design format, should be placed in all areas.



The Format



1975

To be replaced by 24 December 1998



1990

Deemed to comply with Signs Directive for existing installations



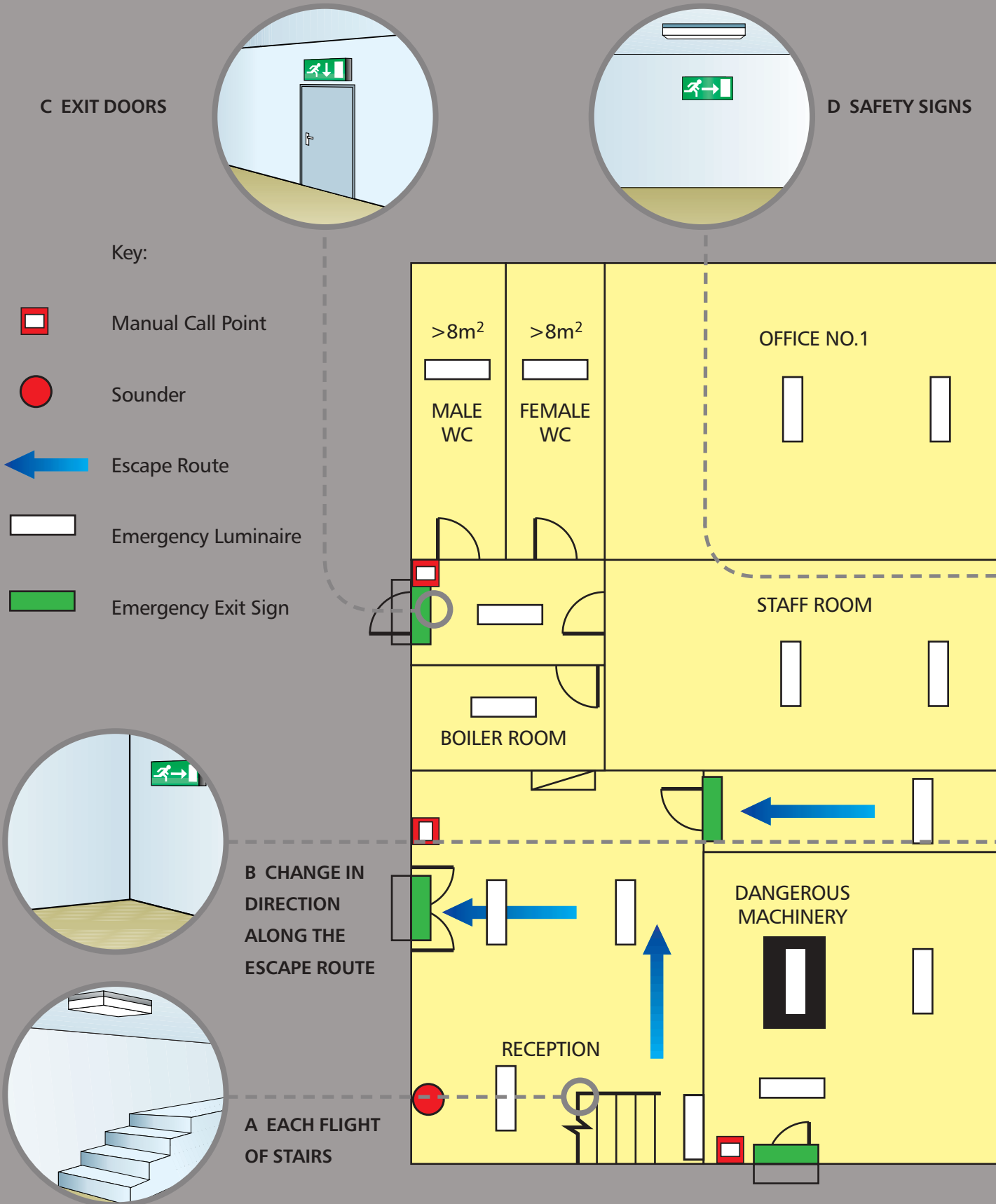
1999

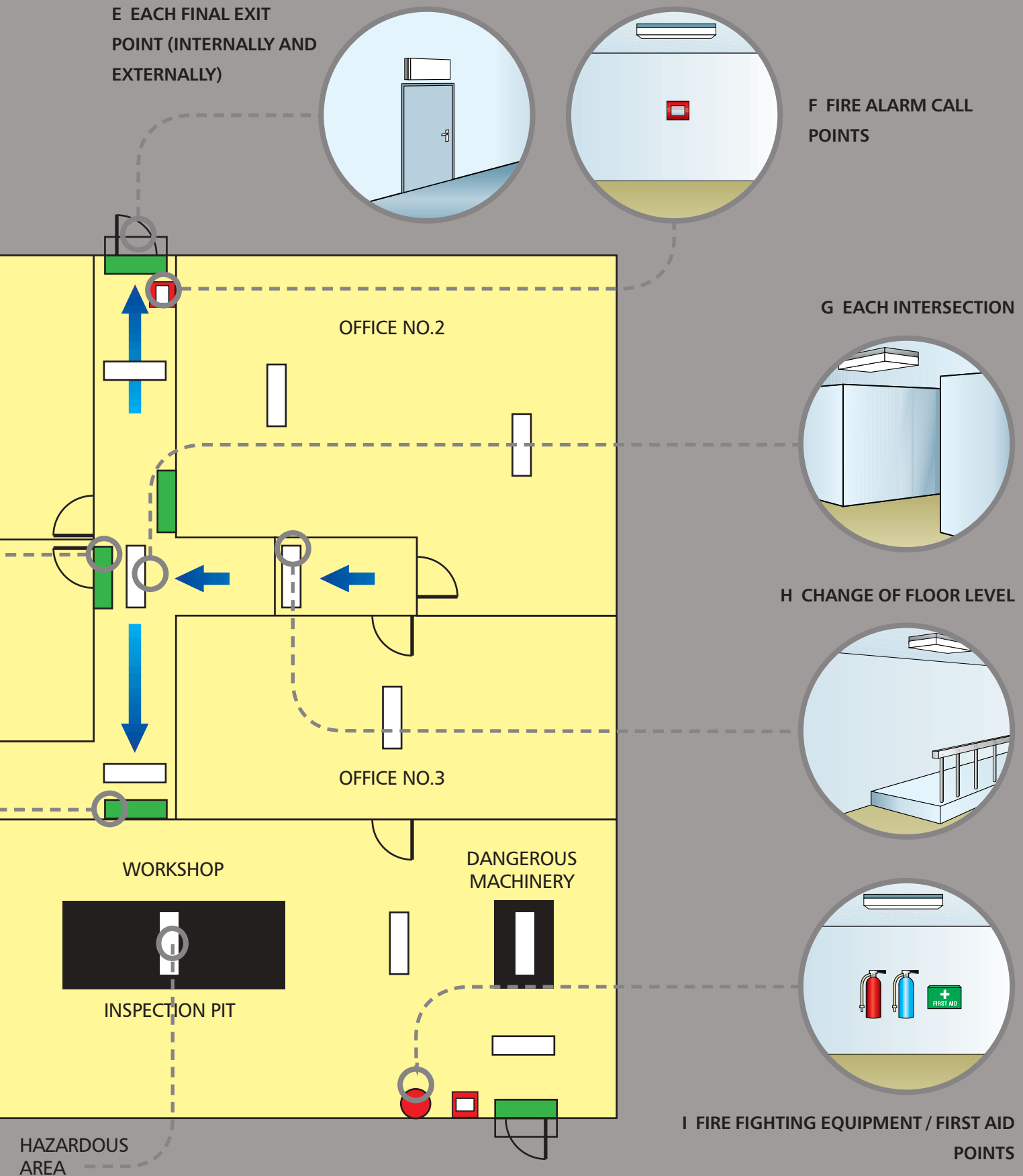
HSE Signs Directive Format

Maximum Viewing Distance

Calculated using the following formulas
 200 x H for internally illuminated signs
 100 x H for externally illuminated signs

System Design Typical scheme

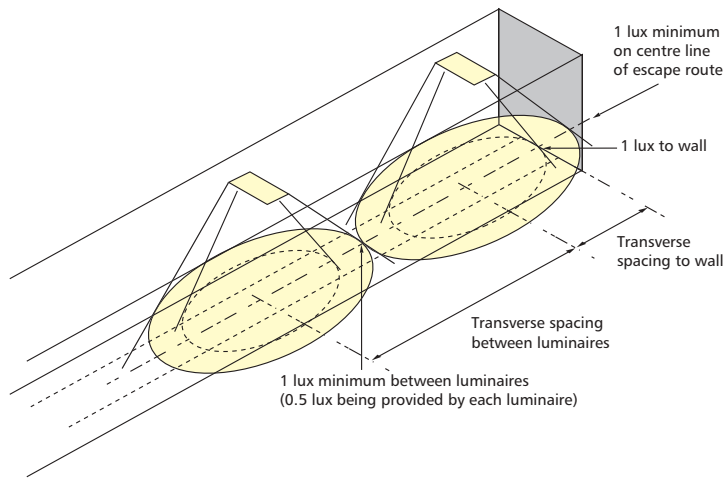




System Design Design stage 4

DESIGN STAGE 4: Escape routes

After all mandatory Luminaires and Exit signs have been positioned, it may be necessary to provide additional luminaires so that a minimum light level is reached along the escape route. The luminaires on an escape route of up to 2m wide should be positioned centrally. The illuminance is specified along the centre line with 50% of that illuminance over the 1 metre wide central band. Wider routes are treated as Open Areas or as multiple routes.



In terms of illumination, EN1838 calls for a minimum of 1.0 Lux anywhere along the centre line of the escape route. The UK has a National Exception which accepts 0.2 Lux along the centre line as long as the escape route is permanently unobstructed with points of emphasis to 1 Lux. Spacing table provide assistance in these calculations.

BS 5266 recommends using a larger number of low power luminaires rather than a few high power units. In this way it ensures no part of the escape route is lit by just one luminaire.

Reference to the Photometric Data will provide you with the information needed to determine the number of additional fittings that are required, with the existing luminaires provided to illuminate points of emphasis.

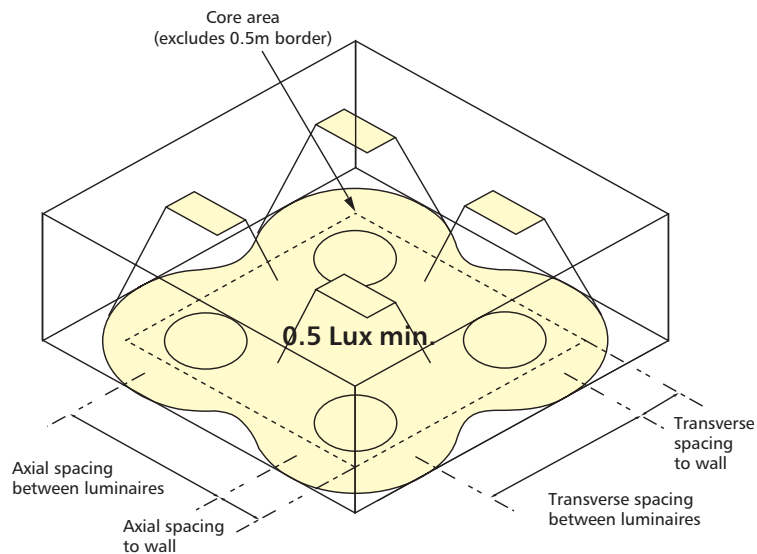
e.g. ZEN8/NM/3F	Maximum permitted spacing (in metres) to achieve .2 lux Permanently unobstructed route only				Maximum permitted spacing (in metres) to achieve .5 lux Open (Antipanic) core areas				Maximum permitted spacing (in metres) to achieve 1 lux Points of emphasis & normal risks			
	TrTr	AxAx	TrWall	AxWall	TrTr	AxAx	TrWall	AxWall	TrTr	AxWall	TrWall	AxWall
2	12.2	7.5	5.8	3.1	11.3	5.9	4.6	2.2	9.3	4.4	3.7	1.5
2.5	14.8	8.0	6.2	3.3	12.1	6.2	5.2	2.2	10.4	4.5	3.3	1.4
3	17.2	9.0	7.1	3.6	13.6	6.4	5.3	2.2	10.6	4.4	2.7	1.1
4	19.3	9.9	8.2	3.5	15.1	6.2	4.0	1.7	8.1	3.5	-	-
6	23.7	10.1	6.9	2.9	10.7	4.5	-	-	-	-	-	-
8	20.9	8.9	-	-	-	-	-	-	-	-	-	-
10	11.1	5.7	-	-	-	-	-	-	-	-	-	-

System Design Design stage 5

DESIGN STAGE 5: Anti panic or open areas

Areas that are not escape routes or high risk, but still within the general requirements of current legislation, are known as open areas.

The European Standard EN1838 calls for a minimum of 0.5 Lux measured at floor level anywhere within the area excluding shadowing effects of room contents. The core area also excludes a 0.5m perimeter.



Spacing Data for Anti Panic or Open Areas

The number of luminaires required can be calculated using the following equation:

Calculation Example

Room measures 12 metres wide by 15 metres in length.

8 watt self-contained luminaires, with an ELDL of 130 lumens are to be mounted at 3 metres from the floor. The Service factor is 0.8, the K Factor is 0.65 and UFO is 0.47.

$$\begin{aligned} \text{Number of Luminaires required} &= \frac{1 \times 12 \times 15}{0.47 \times 0.8 \times 130 \times 0.65} \\ &= \frac{180}{31.7} = 5.7 \text{ (rounded up to 6) luminaires} \end{aligned}$$

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System Design Design stages 7

DESIGN STAGE 7: Which type – self-contained or centrally supplied luminaires?

Essentially there are two basic systems to select from.

Self-contained luminaires

The first is a system that utilises luminaires with their own battery, charger and changeover circuits. They also include conversion kits that can be used to enhance mains fluorescent luminaires, enabling them to provide illumination in the event of a normal supply failure.

Benefits

- Easy and quick to install
- Minimal wiring costs
- Reliable
- Ideal for smaller installations
- Safe: if one luminaire fails, the rest will still operate

- Site expansion easily catered for
- Widely available off-the-shelf

Drawbacks

- Batteries have a limited working life, and are susceptible to high ambient temperatures
- Relatively expensive for larger installations

Centrally-Supplied Systems

The second type of system is one that is linked to a remote back-up power supply, which provides energy in the event of a normal supply failure. Of these, there are two basic types.

DC Battery Systems

These comprise of a battery, charging circuit and control circuit to provide DC power when needed.

Benefits

- Low running cost
- Extended system life
- Easy to test and maintain

- Relatively low luminaire cost
- Luminaires able to operate at high ambient temperatures

Drawbacks

- Requires separate fire resistant distribution wiring

AC Battery systems

These are central battery systems fitted with an inverter, to provide AC power in the event of a normal supply failure. Control circuitry is also incorporated to ensure a stabilised power output.

Benefits

- Low running cost
- Extended system life
- Easy to test and maintain
- Relatively low luminaire cost

- Luminaires able to operate at high ambient temperatures
- Able to utilise existing mains luminaires
- Potential for producing higher light output

Drawbacks

- Requires separate fire resistant distribution wiring

System Design Design stage 8

DESIGN STAGE 8: Maintenance and testing

The tasks of regular maintenance and testing are vital to make sure that a systems integrity and capacity to fulfil its task are maintained at all times. Essential servicing should be well defined to ensure that the scheme remains fully operational. Consumable items such as lamps & batteries should be available for immediate use.

BS 5266 recommends a test procedure, elements of which will become mandatory once new draft European directives become law.

All periodical testing as defined in BS5266 should wherever possible be undertaken at times of minimum risk. All tests, results and corrective actions should be recorded in the site log book.