

LIGHTING EQUIPMENT NEWS

MARCH 1993

Leading lights in Hannover

The Hannover Fair will again see a strong British presence, with around 155 UK exhibitors. Lighting exhibitors will be concentrated in halls 8, 9 and 10, which will include a group stand in hall 9 from members of the UK Lighting Industry Federation and the UK Decorative Lighting Association.

The lighting section will contain displays from 460 companies from 25 countries. It will cover 32,700m² of exhibition area and display virtually everything that is available on the lighting market today.

The economic benefits of modern lighting and lamp systems will be underlined in a related section of the exhibition - 'Electric Installation Technology for Buildings' - in which 300 firms will show products and systems for electrical installations and building control and security in Halls 8 and 11.

This year's fair takes place in Hannover, Germany between 21 and 28 of April.

Reader Service No.150

ILP acquires Garcroft's assets

ILP Electronics, manufacturer of low voltage lighting transformers, has acquired the plant and tooling of Garcroft Limited, a transformer manufacturer which went into receivership in December 1992.

The acquisition, for an undisclosed price, will allow the Canterbury based company to expand its manufacturing base for standard toroidal transformers. The company aims to introduce a new range of 62mm toroidal transformers in the near future, designed to satisfy the growing demand for a smaller diameter transformer to match new ranges of downlights currently on the market.

Managing director of ILP Electronics Ian Potts said that the acquisition would allow the company to produce a new range of products which complement the company's existing standard and maintenance-free ranges.

Reader Service No.151

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GTE sales finalised

The sale of GTE's worldwide lighting businesses has now been completed, with the North American lighting business going to Osram, while the European, Far Eastern, Latin American and Australian lighting businesses have been acquired in a management buy-out. The latter group of businesses, called Sylvania Lighting International (SLI), will be headed up by Norman Scouler as President and Chief Executive.

Mr Scouler is a former Chief Executive of FKI plc and will be joined on the board by Edward Bartlett as finance director, himself a former divisional managing director of FKI. The new company has financial backing from a consortium of investors led by Citicorp Venture Capital (CVC), with the management currently holding a 10% share of the equity.

Bridging loan

Part of the deal, which has fuelled a certain amount of speculation within the industry, is the involvement of Siemens in the financing of SLI's formation. This occurred when Osram and CVC agreed to bid together for the whole of GTE Sylvania. Siemens provided a bridging loan, amounting to 18% of the total sum, to the SLI investment consortium, making any immediate re-financing unnecessary. SLI is committed to repaying 75% of

the loan within three years, with the balance due in the fourth year.

This arrangement has come under the scrutiny of the European Commission, which states: "Until the principal amounts fall due Siemens will not have the usual creditor right to put EDIL (the original name of the shell company used to effect the acquisition) into bankruptcy or accelerate repayment of the loan, only to sue for unpaid interest." The EC also notes: "Siemens will not have any representation on EDIL's board or have access to confidential business information of EDIL."

The deal also gives SLI access to a number of Osram's North American facilities, based on what was available to these businesses when they were all part of GTE. These include technical information resulting from R&D, engineering and manufacturing, certain engineering support services at cost, Osram manufacturing apparatus at cost and licences or sub-licences of Osram and North American Lighting patents on a royalty free basis.

These agreements will last 10 years, although in each of the last three years SLI will have to pay a contribution to Osram's R&D expenses. This arrangement is said to have been acceptable to Osram because of the importance of the North Ameri-

can purchase going through smoothly, giving the company a good chunk of the North American lamps market.

While access to these facilities in North America is seen as useful, Norman Scouler told *LEN* that his company will be concentrating on building up R&D in Europe, where 80% of R&D is already carried out. SLI will have its headquarters in Geneva and will continue to market its existing six brands in Europe. These are Sylvania, Claude, Concord, Le Dauphin, Linolite and Lumiance. Manufacturing will be based at the existing facilities in England and continental Europe. Mr Scouler stresses that there are no plans to sell any parts of the company and, indeed, he expects there to be selective acquisitions in the future.

Local decisions

Mr Scouler sees many advantages to the new arrangement and feels that the previous company was limited by the need to continually report back to the US. SLI's new structure will put greater emphasis on decision making at local management level, with managers being encouraged to take shares in the company. "We think of SLI as a loose arrangement of companies that will operate more or less independently but will still be part of a larger and well financed group," he said.

and allow for atmospheric shadowing on the side extension, emphasising the gabled windows and buttresses.

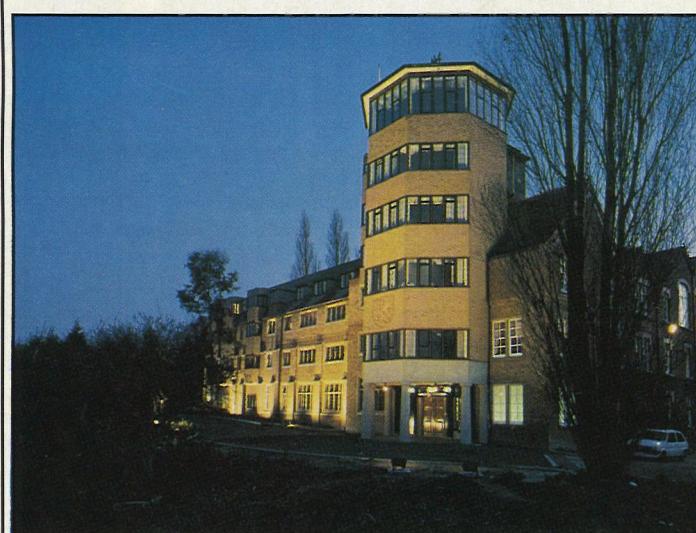
This design is said to particularly suit the traditional materials, providing a uniformly warm appearance to the building.

The Sylvania FMD FloodKat is protected to IP54 and is supplied with a separate connection box, mounting bracket and module type gear box.

Reader Service No 152

Bringing warmth to traditional materials

A new extension to St Edmunds College, Cambridge, has been floodlighted using 14 Sylvania 150W FloodKat high pressure sodium floodlight fittings. The lighting design is intended to give total wash to the five storey tower



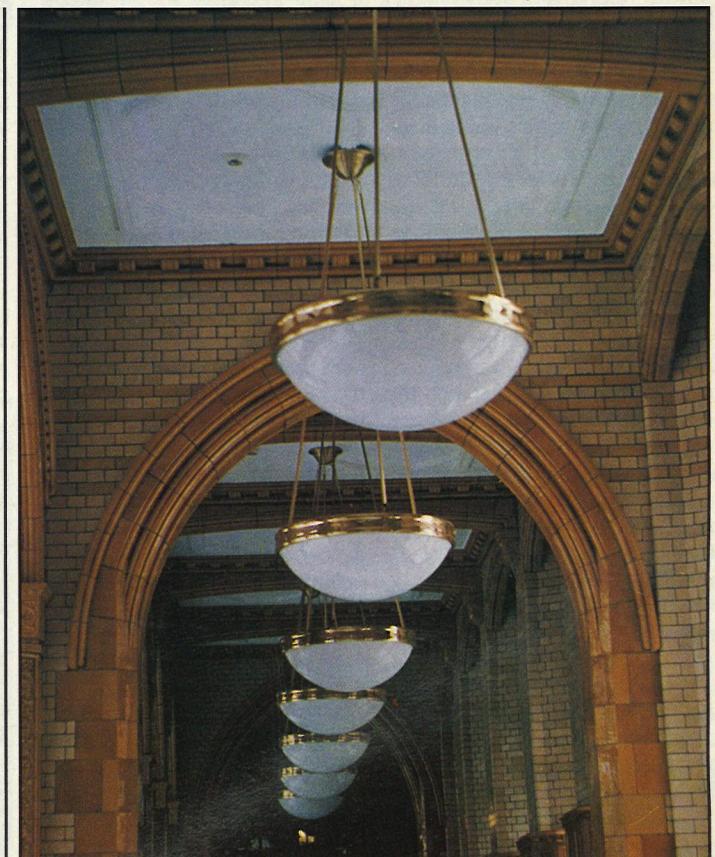
New owners for Edison Halo

Edison Halo Lighting (Libra Trading Ltd) has been purchased outright by Alan Sutton, a well known figure in the fibre optics lighting industry. Edison Halo specialises in hotel and high profile installations and Mr Sutton will be looking to organic growth in the company with further spe

cialisation into specific overseas markets. Future plans also include new product lines, with emphasis on expansion of company's fibre optic downlighter range.

"We will be taking a structured approach to our future growth, we will continue to capitalise on new markets through innovation and quality design, but most of all we will be building a strong marketing team," said Mr Sutton.

Reader Service No 153



Control at the Pru

The headquarters of the Prudential Assurance Company has recently undergone a massive refurbishment programme where Designed Architectural Lighting (DAL) supplied the interior lighting. The project included the installation of over 300 new fittings and the refurbishment of 32 existing luminaires.

DAL designed two new products for the project: the first was an Art Nouveau style pendant luminaire using compact fluorescent lamps. These followed the style of the original design by architect Alfred Waterhouse in 1879, with a special motif picked out and repeated in brass on the luminaires.

A total of 40 of these were produced, each operating from integrally mounted high frequency electronic control gear - PC electronic ballasts from Tridonic.

The second product specially designed was an Art Deco style pendant luminaire of opal acrylic with polished brass detail, 28 of which were installed using fluorescent lamps operated by PC electronic ballasts.

A certain amount of creative thinking was called for to incorporate an emergency lamp into the candelabra, which also needed reworking and refinishing. To achieve this, some of the detail had to be changed in order to house the additional components. The replacement of all control gear on 14 tier brass pendants was also required.

The Tridonic PC electronic ballasts used in the project are said to offer energy savings, longer lamp life, flicker-free instant start, total compatibility with both argon and krypton filled lamps and no stroboscopic effect.

Reader Service No. 154

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Reader Service No. 1

LETTERS

Shock revelations

Dear Sir

The recent article by the Lighting Industry Federation entitled "NEW RULING FOR DIFFUSERS" that appeared in the January 93 edition of the Lighting Equipment News could well prove to have very serious repercussions for all those involved in the lighting and building industries.

It implies that whilst there are in force fire safety regulations for light diffuser panels, issued by the Department of Environment and included within the Building Regulations, that the Lighting Industry is not complying to those fire safety standards.

Compliance to the New Building Regulations became a legal requirement in June 1992. Included within the new regulations are fire safety standards for light diffuser panels. There are two new standards listed to which all light diffuser panels must comply as a minimum requirement, these being TP(a) and TP(b).

The L.I.F. implies that only TP(a) light diffusers are acceptable due to the restrictions placed upon the lower TP(b) standard.

It is then stated by the L.I.F. that the vast majority of the thermoplastic diffusers supplied by its members cannot achieve the TP(a) classification.

This would mean that almost all the thermoplastic light diffuser panels supplied since June 1992 are in contravention of the Fire Safety Regulations. Should this prove correct then specifiers and contractors would have been breaking the law by installing light diffuser panels not acceptable under the new regulations.

The two main materials used by the lighting industry in the 'manufacture' of thermoplastic light diffuser panels are Styrene and extruded Acrylic. These two materials cannot, according to the L.I.F., meet the new TP(a) standard for light diffuser panels. Is therefore the new TP(a) standard an unreasonable test for thermoplastics to achieve?, the answer is an emphatic NO.

To achieve the TP(a) standard required that a material is subjected to an ignition from a small flame. The material must then self extinguish within five seconds following removal of the flame. This is one of the least severe of all the fire tests within the regulations and is a requirement placed upon thermoplastics for use in other areas without any problems.

Whilst the L.I.F. article rebuked the D.O.E. for introducing the TP(a) standard as a means for ascertaining the fire safety of diffuser panels, it did not go on to explain the known fire performance of its chosen material.

Let us, therefore, examine the material mentioned by the L.I.F. extruded Acrylic.

Within the 1985 Building Regulations the main test criteria for examining a products' fire performance and acceptability was the 'BS476 pt 7 Surface Spread of Flame Test'.

This test method had four classifications Class 1, Class 2, Class 3 and Class 4 with Class 4 being the worst.

Extruded Acrylic is known to achieve a Class 4 rating when tested to BS476 pt 7. **THERE IS NO WORSE CLASSIFICATION.**

Even more remarkably, within the 1985 Regulations **Class 4 material was not allowed**. Could it be that even under the 1985

Regulations extruded Acrylic diffusers were in contravention of the fire safety regulations?

Of course it may be that the manufacturers used ORAGLAS Acrylic sheet, or similar, which is claimed to achieve a Class 3 rating to BS476 pt 7. If this was the case then the product was still restricted in use, similar to the 1992 Regulations. The L.I.F. must answer this point as this could have a bearing upon the attitude of the L.I.F. to fire safety regulations in general.

Materials

If we accept that extruded Acrylic Sheet cannot achieve a TP(a) rating what of Styrene?

That Styrene is by far and away the most commonly used material in the manufacture of diffuser panels it was very noticeable that the L.I.F. did not once mention this material. However, we understand that the L.I.F. also concedes that this material does meet the TP(a) standard.

The problem comes in the L.I.F. claim that Styrene and extruded Acrylic diffusers achieve a TP(b) rating. Do they mean by this that 1mm, 1.25mm, 1.5mm, 1.75mm, 2mm, 2.25mm etc extruded Acrylic and Styrene diffuser panels do not exceed a rate of burning of 50mm per minute when tested to BS508A? Should this be their claim then test certificates have yet to be produced to prove this fact!

Is it not that the required fire performance standard TP(a) is totally reasonable and that it is the L.I.F.'s chosen materials which are not acceptable, in so far as fire safety is concerned?

The request by the L.I.F. to allow Class 4, Class 3 type materials to be classified as being of a reasonable fire safety standard is an astounding one. When one then considered the intended application of their Class 4/3 type diffuser panels, so close to an electrical appliance and likely source of ignition, the request becomes alarming. Diffusers have been known to ignite as a result of a fault within the light fitting, and the consequences of that material's reaction to a small ignition has resulted in a real fire situation occurrence. It is a fact that a TP(a) type material, which did not burn of its own volition or produce any burning debris, would have eliminated that known cause of a fire situation.

There are other reasons that have dramatically highlighted the need for reasonable fire safety standards to be applied to thermoplastics, such as the Summerland and Stardust Disco disasters. Fire safety standards are not imposed to be restrictive, they are compiled for the purpose of protecting human life. That the L.I.F. has sold Class 4/3 type material as part of its electrical fittings is perhaps a practise that it should wish to discontinue as soon as possible.

Will the L.I.F. now recommend replacement of all those diffuser panels that were knowingly sold which did not meet the fire safety standards?

Light transmission

There is an obvious reluctance by the L.I.F. to adopt Fire Retardant material, although the alternative, by definition, is to use material that actually accelerates or assists a fire, and in the case of certain diffusers can actually become the cause of a fire situation.

The only inkling of a reason for this reluctance to accept the correct material is the L.I.F.'s

claim of a reported small percentage loss in light transmission. This reason is, however, immediately flawed by the lighting industry's large scale use of Styrene diffusers. It is a known fact that many Styrene diffusers do discolour and that this characteristic does in itself present a far greater reduction in light transmission, than any claimed loss with TP(a) products. Therefore, it follows that any claim to a loss of light transmission is neither a valid or acceptable argument.

Indeed TP(a) thermoplastic materials are used throughout the world, in literally millions of applications, for the transmission of light, with great success.

Any reference to lux levels or lighting design cannot be accepted as a reason for non-compliance, it is easily possible to ensure and actually improve lighting requirements with the use of TP(a) material. This statement will obviously bring about a sharp rejection from the L.I.F., however, there are light diffusers now available in TP(a) material, that have received the unreserved approval of the optometric scientists for the quality of lighting provided. Of course the L.I.F. may claim that the optometric scientists are wrong, or that the F.R.S. and D.O.E. are wrong, and even that the general public are wrong, could it not be that the L.I.F. itself is wrong.

Fire resisting ceilings

These ceilings should not be identified with the fact that diffuser panels should be TP(a) or TP(b) rated in standard ceilings. There are different requirements for fire resisting ceilings.

The statement by the L.I.F. upon thermoplastic diffusers and fire resisting ceilings is **incorrect**. The Regulations state:

"Thermoplastic light diffuser panels should not be used within a fire resisting ceiling unless they have been satisfactorily tested as part of a ceiling assembly that provides the appropriate protection!"

This means that thermoplastic light diffuser panels *can* be used in a fire resisting ceiling *if* they have been satisfactorily tested as part of a ceiling assembly that provides the appropriate protection. This is a somewhat subtle difference from the L.I.F.'s misleading statement on this subject.

However, the L.I.F. failed to draw attention to Diagram 31 that clearly states the fire resisting ceiling should be **imperforate**. There are no brownie points to be scored in making claims that could be misleading in a matter as important as fire safety. Any doubts upon fire resisting ceilings should be brought to the attention of the Fire officers who will correctly advise on the situation in question.

Do not let the remarks made to fire resisting ceilings distract from the fact that in all standard suspended ceilings the diffuser panels should provide the correct fire performance standard.

It is assumed that the final paragraph of the L.I.F. article did not mean to come over as pretentious as it was written, it was stated: "Let's hope that the Department of the Environment sees the light soon, and resolves these issues for the benefit of the *Lighting Industry and Designers*". Do they feel that the fire safety regulations are complied for their benefit to the exclusion of the Public.

**Martin Rankle
Ins-u-clear Ltd**

DIARY

MARCH

11

Cityscape - Design and Lighting. Free evening seminar and workshop in London sponsored by Concord Lighting. Details from Vera White, 071-497 1400.

16

Young lighters of the year. Presentations by and awards to the finalists in the 1992 scheme. Topics likely to be covered by the four finalists are: church lighting; perception of luminance patterns; airfield lighting; energy audits and lighting. This CIBSE Lighting Division event is sponsored by Marlin Lighting. Details from CIBSE Member Services Department, 081-675 5211.

17

Energy efficient lighting systems. One-day seminar in London organised by the Mid Career College. Details from the College on 0223 880016.

18

Electrical facilities at airports. Morning meeting followed by visit to Dublin airport in the afternoon, arranged by Irish region of the ILE. Details from Michael Moloney, 0001 771821.

18-21

Interlight '93. Exhibition in Singapore. Details from Kuoni, 071 499 8861.

23

Photo-electric control units for road lighting: revision of BS5972. Evening meeting in Gateshead held by north eastern region of the ILE. Details from Derek Plummer, 0670 361081.

23

Electricity at work regulations 1989. IEEIE professional development seminar. Details from IEEIE, 071 836 3357.

23

Lengthening the day: Charles Marques Memorial Lecture.

Evening meeting in London arranged by the ILE. Details from ILE, 0788 576492.

25

Light pollution. Morning meeting followed by afternoon tour of Jodrell Bank, organised by northern region of the ILE. Details from Phil Edwards, 061-705 5824.

31

NRPB revised guidance on exposure to electromagnetic fields. London conference. Details from Angela Barkes, 0372 374151.

APRIL

15

16th edition update. One-day professional development seminar in London, organised by the Institution of Electronics and Electrical Incorporated Engineers. Details from IEEIE, 071-836 3357.

19

Showlight '93. Three-day international colloquium on film, theatre and television lighting, Bradford. Details from Ruth Rossington, 0323 642639.

29

Interior lighting design practice. One-day seminar in London organised by the Mid Career College. Details from the College, 0223 880016.

CIBSE

The Chartered Institution of Building Services Engineers

How to recognise a true 'lighter'

As in many other areas of building service specialisation, it is not uncommon for lighting schemes to be carried out by a non-lighting specialist. 'Cowboy' is perhaps too strong a word for it, but my drift will be apparent and recognisable to many in the professional lighting community. But is this always the fault of the customer or specifier who effectively allows it to happen? How do you recognise a true 'lighter'?

Recognition of lighting expertise

Prior to the formation of the Chartered Institution of Building Services Engineers (CIBSE), the interests of lighting engineers and designers and the furtherance of the science of light and lighting, were conducted by the Illuminated Engineering Society. The IES Diploma was awarded to those who had qualified in lighting rather than engineering or architecture. This Diploma was highly respected throughout the lighting world and the names of the holders were entered on a Register of Lighting Engineers.

The formation of CIBSE, and with it the Lighting Division, resulted in the loss of this valued Diploma. It is now hoped that the recently introduced CIBSE Lighting Diploma will become as respected as the previous award.

Encouragement of the provision of lighting courses

One of the main reasons for the introduction of the LIF Certificate course was the lack of courses which were predominantly lighting orientated. A CIBSE survey showed that a large number of colleges were prepared to provide courses but only if the number of students was sufficiently large. The result of this requirement is that only two establishments in the country actually provide specific lighting courses. Originally the CIBSE lighting awards could only be obtained by following an academic route by passing nationally recognised courses. The move within the Institution to accept mature candidates who can demonstrate their engineering competence by methods other than just passing examinations, has led to changes in the methods by which the Lighting Certificate and Diploma can be obtained. This has led CIBSE to accept the LIF and other courses as qualifying courses for the Lighting Certificate.

Encouragement of lighting design and technology expertise

The criteria for the award of the CIBSE Lighting Certificate/Diploma are dependent on both academic attainment and practical experience. To be eligible for the award, each candidate must demonstrate a sound practical knowledge of lighting design or technology.

The CIBSE Lighting Certificate was envisaged as being a stepping stone to the Diploma and was introduced to encourage younger members on the industry to embark on an academic route to membership of the Institution.

Many existing courses contain lighting as part of the curriculum. Often this lighting could be modified to satisfy the requirements of the lighting awards. As each course is submitted for CIBSE acceptance, the Lighting Division Education Committee also looks at the lighting content to determine if sections of the course have sufficient lighting design to enable the course to be acceptable for the awards.

Benefits of the Lighting Awards

The main benefits of the awards are:

- improvement of the standing of the lighting industry.
- recognition of lighting expertise.
- improved status of the individual and the company.

The status of the industry, the company and the individual are all interrelated. As the expertise of the individual is improved and is recognised, the status of both company and industry are enhanced.

Lighting education is nearly always added to another course rather than developed as a subject in its own right, and the design of lighting installations has too often been seen as an extension of the electrical installation. The introduction of the awards is a step in identifying the lighting expert who is capable of producing the optimum solution rather than one who complies with the minimum requirements.

Lighting installation requirements are often specified by consultants, architects, electrical engineers and contractors. The present situation does not enable these professions to recognise the lighting professional. The recipients of the Lighting Certificate and Diploma can advertise this fact, and as the worth of the awards themselves becomes more apparent, the status of the recipients will increase.

Karl Pike

Secretary, Lighting Division

NEWS

New lighting centre

Moorlite Electrical has upgraded the facilities at its Stockport offices for demonstrating the performance of its products to customers. Opened last November, the Customer Applications and Technology Centre studiously avoids being called a showroom, mainly because it is somewhat more than a showroom. As well as showing many of the company's products, there are a number of demonstrations to represent and compare complete lighting installations. Thus, its role is more to demonstrate the effects that can be created with various lighting schemes, rather than just to show off products.

Included in the Centre are two identical office layouts, designed to demonstrate the effects of combinations of lighting schemes.



Recessed fluorescent down-lights, wallwashers and spotlights are all used to create different schemes, with a continual read-out of light levels on the work surface to aid comparison. A removable partition demonstrates the impact that partitioning can have on light distribution – making the point that a system designed for an open plan space may not meet the requirements of a cellular office arrangement.

The *pièce de résistance* of this demonstration is to allow people to adjust the various light sources to create their own preferred working conditions. What this shows, is the enormous variation in individual requirements and the benefits of providing individual workstations with individual control of the lighting.

The 600m² centre, which repre-

sents an investment of £130,000 has a modular ceiling structure to enable periodic changes of the luminaires, to accommodate new products and allow systems to be changed with the minimum of disruption. In addition, several offices in the building have been refurbished with different luminaire arrangements so that the whole headquarters is, in effect, part of the centre.

Reader Service No 159

Success brings second office

Lighting design consultant Jonathan Speirs & Associates has opened a new local office in Museum Street, London WC1, just six months after the company's formation in Edinburgh.

Reader Service No 160



New man takes over at Osram

Osram Ltd has announced the appointment of Mr Robert Caban as managing director of its UK operations with effect from April 1st, in succession to Mr Alan Mills who is retiring from full-time employment.

Mr Caban is currently finance and administration director of Osram Italy and began his career at Osram GmbH in Vienna in 1974.

Light and air combined

The Verulam Point office building in St Albans has been fitted with an integrated lighting and air handling system, designed and manufactured by Silvertown Lighting.

The design, by architects Wood Hardwick and consulting engineers Oscar Faber, called for a totally flexible lighting system which could also accommodate the air handling.

The complete system was required to support the ceiling grid, so had to be capable of being incorporated into a continuous enclosed wireway. It was also required to contain manoeuvrable gear trays, infills and louvres. No extraction grilles were to be mounted into the ceiling.

The solution involved the use of Silvertown's Softlighter fitting with specially designed linear slot



diffusers capable of achieving a maximum supply velocity of 55 l/s via air plenum boxes which could be positioned to suit the requirements of future tenants. Provision was also made for returning air.

An added benefit of using the Softlighter was said to be the low glare characteristics and good vertical surface illumination,

essential elements for an environment using visual display terminals.

A total of 1000 2.4m x 300mm Softlighter luminaires were supplied, each fitted with 2 x 36W fluorescent tubes. The trim and infills were finished to blend in with the colour scheme employed by the designers.

Reader Service No 161

directive issued by the EC placing a legal obligation on employers to safeguard the health of employees who use VDUs.

Light Update claims to offer a total package designed to transform the office environment, satisfy customers' needs, and, in most cases, show considerable

savings in both installation and running costs.

The company will carry out a complete survey of the existing lighting installation and submit a report which gives proposals and prices for a 'supply only' system and a 'supply and install' system.

Reader Service No 162

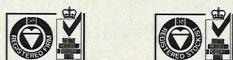
Update for VDUs

A new company has been formed within the Industrolite group specifically to deal with the high demand from companies and organisations requiring lighting refurbishment, following the

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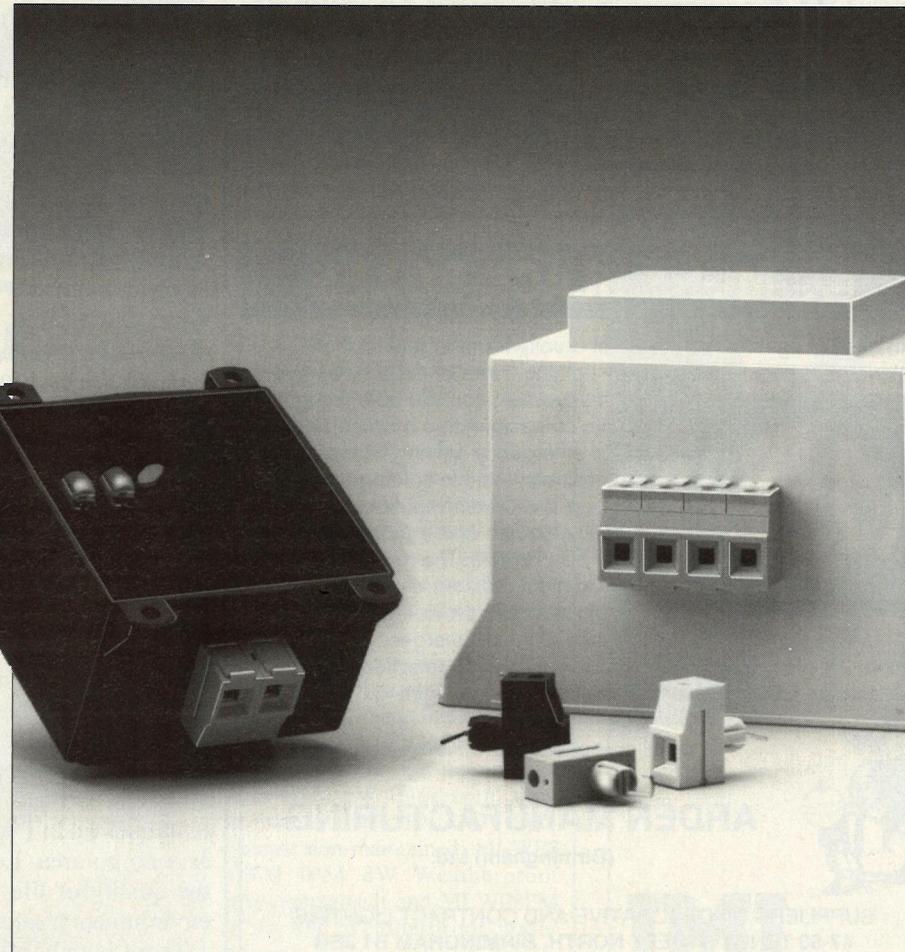


METWAY
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East Sussex BN41 1DG. Tel: (0273) 439266
Fax: (0273) 439288.

Reader Service No. 2

Lighting Equipment News, March 1993

Page 3



COMMENT

Engines of economic recovery

Most of the companies operating in the lighting industry would fall into the category 'small to medium sized enterprises' (SMEs), described by some as the engines of economic recovery. This view is supported by the Confederation of British Industry (CBI) which says: "SMEs are the seed corn for the wider industrial base, which is essential for new employment and growth in the UK economy." So it's nice to see the Government taking steps to help SMEs gain access to information and advice that will help them survive the present situation and expand when things improve.

There are already a number of DTI-backed schemes designed to help SMEs. They include the LINK scheme, where companies work with academics in developing new techniques and receive half their costs from the DTI. There's also 'Club R&D', designed to get small companies to identify mutually beneficial areas and commission research into these areas. The SMART scheme provides grants for innovative projects, while SPUR grants are used for the development of new products and processes. In fact, there's a whole plethora of schemes that should have been helping SMEs. The trouble is, very few SMEs have actually benefited from them.

One of the reasons for this seems to be that few companies know where to go for advice and support, not to mention some clarification as to what all these schemes are and how they can be used. There is also the problem that many companies may not be clear how technology can help their operation – a bit tricky when you have to identify the research you need before applying for a grant.

There is clearly a need for more advice and guidance at a local level, something the Training and Enterprise Councils (TECs) were set up to do. These haven't been a great success, though, because they seem to have majored on the 'Training', without doing a great deal on the 'Enterprise' side. Also, it hasn't been clear as to who does what to whom, with bickering between local authorities, TECs, trade associations and chambers of commerce.

It's with a view to addressing the problem that Michael Heseltine announced his 'one-stop-shop' initiative in December. The plan is to set up a network of these one-stop-shops, starting with a pilot project of 15, where SMEs can go technical and business advice.

The benefits of such local advice centres have long been recognised in other countries. Germany, for example, has 114 technology transfer centres, as well as its 13 Fraunhofer Institutes. Also, all German companies have to be members of their local chamber of commerce, giving them a strong voice, both locally and nationally.

Japan has 170 regional centres helping companies with fewer than 300 employees. About 80% of the funding for these comes from local authorities, with the rest being supplied by Tokyo.

Small companies in the USA will receive around \$500m (£338m) from central government this year. In addition, President Clinton has promised a further £500m to establish a network of regional centres.

As long as all this money is used sensibly, there must be some benefit to the SMEs involved. Mr Heseltine has undoubtedly taken a step in the right direction and we must hope that the £3.5m earmarked for the pilot project will be money well spent. We must also hope that the scheme is extended properly and that the Government is not just paying lip service to addressing this problem.

Paul Haddley

LIGHTING EQUIPMENT NEWS

LEN is part of the Maclean Hunter Energy Publications Group

Editor: Paul Haddley

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Art Editor: Lorna Francis

Advertisement Manager: Jim Hughes

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Classified Sales: Alastair Moyes

Production: Claire Gray

Circulation: Kirtee Parmar

Publisher: John Bull

Group Publisher: Douglas Wright

Directors: Harvey Botting (Chairman),

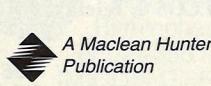
D L Jones, R. Osborne, D B Wright.

Published monthly by Maclean Hunter Ltd,
Maclean Hunter House, Chalk Lane, Cockfosters Road, Barnet,
Hertfordshire EN4 0BU.

Telephone: 081-975 9759. Facsimile: 081-441 1361

Origination by Facsimile Graphics Ltd, Coggeshall, Essex.
Printed by E. T. Heron & Co. Ltd, Heybridge, Maldon, Essex.

Annual subscription £55 (£5 per copy including postage) but free to
executives in the UK and Ireland meeting the terms of control.



© 1993 ISSN 0024-3418

NEW PRODUCTS

Recessed low voltage downlighting

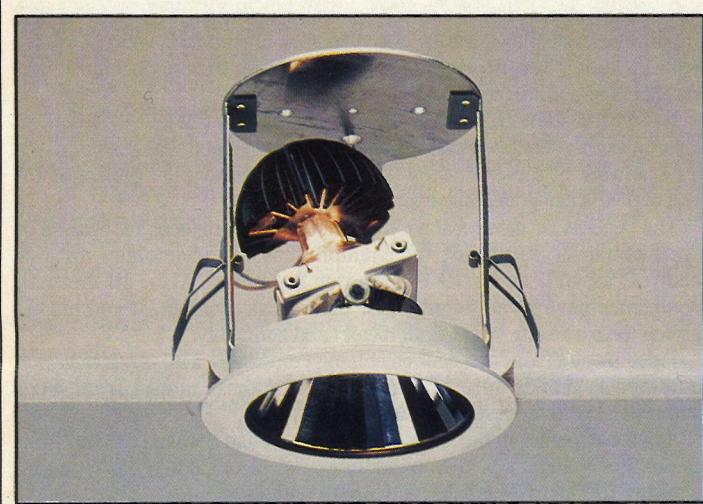
Staff Lighting has developed an extensive range of low voltage recessed downlights known collectively as the Downlight 3000 range.

Within the range, V/E 120 is particularly suitable for use in display situations, because the fitting can be adjusted by up to 30° either side of the vertical and rotated through 360° about the vertical. It may thus be used as a conventional downlight, or else angled to illuminate a particular display feature either in the well of the room or on the wall.

The luminaire features a standard cover ring in aluminium die-casting with anti-glare mirror reflector. Decorative cover rings are also available in chrome or gold-plated finishes in round, square and hexagonal options, and may be substituted without the use of tools.

Suitable for a lamp voltage of

Reader Service No. 175



Stratos uplighters

Prolight Design's Stratos metal halide uplighters are Italian in style, give true asymmetric light distribution and have an adjustable lamp head facility for

fine on-site adjustment. In addition, they have an integral control gear, and a UV absorbing glass as standard.

Stratos Uplighters are available in 70 and 150W versions, and in a choice of colours and textured finishes. **Reader service No. 176**

Lamp Chemicals

A wide selection of lamp making chemicals, made to high purities and in tightly controlled particle size distributions, are now available from GE (USA) Components Marketing & Sales Operation.* They include:

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GE Components
Marketing & Sales Operation

*GE(USA) is not connected with the General Electric Company p.l.c.

Reader Service No. 3

Page 4

Reader Service No. 4

Lighting Equipment News, March 1993

Low voltage track system

Double Track is the latest addition to the Altima low voltage track lighting system. This double-sided track permits spotlights to be simply and discreetly attached at any point on either side of the track for greater flexibility in display lighting.

Double Track is supplied in black and white and comes in 1m, 1.5 and 2m lengths as well as being available in curved sections. All track can be cut to size, or for longer runs may be connected by means of specially designed couplers.

The track is suitable for horizontal mounting using purpose-designed suspension rods with a choice of 0.5 and 1.5m drops.

This new double-sided track has all the features of the flexible Altima low voltage track system, and the range is designed to provide a wide selection of display lighting options by mixing and matching interconnection components.

The system also features single low voltage track available in four different lengths which can be quickly and easily installed in all types of configurations; a choice of spotlight or pendant fittings, which can be mounted or suspended; and purpose designed transformers which can be discreetly mounted at any point along or adjacent to the track.

Other product options include curved single track and Verticle Drop, a design incorporating either single or double track for use in stairwells or on high ceilings. **Reader Service No. 177**

Membrane and facia panels

Enco Industries has produced a custom-built suite of panels for Galaxy Nova Strand Lighting's latest version of its memory lighting control system. Nine panels – both membrane and facia units – form a single full lighting control console.

Strand Lighting's memory lighting control systems are used worldwide for both theatre and studio lighting control. The Enco panels form a major part of Strand's new-look Galaxy Nova which has been updated both visually and ergonomically but which retains the control

function of its Galaxy 3 system.

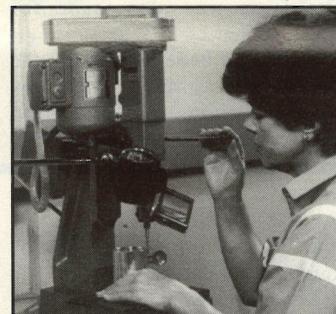
Mechanical construction of the facia panels include a graphics overlay specific to each of the modules bonded to an aluminium backplate by a machine-cut adhesive. Both the graphics and backplate are required to accommodate display windows and push-button controls, fader scales and lighting potentiometers.

Galaxy Nova includes all the standards of Galaxy 3 – a capacity of 999 channels driving 1,536 dimmers, 256 PALs automated luminaire, programmable effects, split control panels, remote desk and designer controls, duplicate electronic and dimmer status communication. **Reader Service No. 178**

In brief...

● **Waldmann Lighting** has introduced a clip-on magnifier for attachment to its 20W range of halogen light fittings. Ideal for use where fine detail needs to be examined under bright illumination, the magnifier provides 4 diopter magnification. *See right.* **Reader Service No. 179**

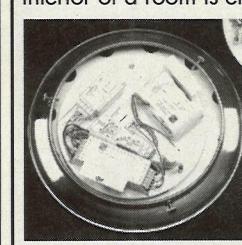
● **Boras Cotton** has developed a 'green' substitute for the PVC used by lampshade manufacturers. It is a treated pure cotton product that is environmentally friendly and cost-effective. Swedish textile manufacturer, Boras Cotton, has developed several options using a pure cotton basecloth and coatings of acrylic, polyvinylacetate or combinations of both. **Reader Service No. 180**



● **Tornado Lighting's** new Softform low voltage downlighters include 16 different designs all using one common chassis. The plaster cowlings can be painted and designs made up to specification. The Softform range can be used with GE Lighting's new Halogen 50W Directional Lamp with 360° movement within the fitting. **Reader Service No. 181**

NO MORE BLACK BOXES

An area of lighting that does not usually harmonise with the interior of a room is emergency lighting. Here at Arden we have given this problem considerable thought. We have come up with a harmonising range of emergency lighting fittings that will co-ordinate with the lighting scheme. Each fitting is a 3 hour maintained emergency module and is manufactured to BS 5750 part two. The rechargeable nickel cadmium cells are of a high temperature variety providing at least 4 years life. The most exciting feature of these emergency luminaires is that the glass covers are available in a wide selection of patterns and shades to match the conventional lighting.



For a full colour Brochure Please contact:



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Reader Service No. 4

LIFELINE

The light is dark enough

One of our more eminent daily newspapers recently covered half a page, broadsheet not tabloid, dealing with the story of roused passions in the picturesque Constable countryside of medieval Dedham Vale. Local dignitaries, parish councillors, inn keepers and even the local vicar were all interviewed and quoted verbatim. The piece was graphically illustrated with day and night time colour photographs showing the scene of the crime. The object of all the vitriolic language quoted by the burghers of Suffolk was – wait for it – new street lighting in the high street.

It was judged by the distinguished residents of Stratford St Mary that the whole character of the village would change if lighting was installed – building developers would be tempted to encircle the area and even the swans on the River Stour would show their displeasure.

To add to the furore the Astronomers' Society contributed their twopennyworth by complaining about light pollution and damage to the environment for future generations.

In case you think this is the script for an ITV sit com or a hitherto unknown Gilbert and Sullivan operetta you must realise that this is not fiction it's the real world – or is it.

On the same day that this 'scoop' made the nationals a rather sad letter was received at Swan House from householders living in an unadopted road in urban Lancashire. People who live on the outskirts of town, both young and old, feel insecure and vulnerable travelling to and from their homes at morning and evening. As unadopted roads rarely have any street lighting it is easy to understand how the 'fear of crime' can become a major worry to people during the long winter months. The letter was seeking help to install lighting because the local authority will only perform this duty when the road in question has been brought up to a required standard and specification. The cost for this improvement work must be borne by the house owners. Such financial liability being clearly out of the question – QED, no street lighting.

We therefore have at one end of the country a parish which can clearly afford current 'top-of-the-range' heritage lighting but don't want it because it will lower the tone of a historic village. And 250 miles further north we have a caring community who want the most basic lighting for security reasons but can't afford it.

In a further strange demonstration of opposing views the Astronomers' Society in supporting the 'no lights in our village' campaign played the emotive 'children card'. They explained that the galaxy is being obscured and young children are growing up not knowing anything about the night sky, because they never see any stars and think the milky way is a chocolate bar. Meanwhile in Lancashire the parents of children are more concerned with the safety of their offspring as they travel to school, quite often when it is dark both morning and evening.

Their fears are compounded when they read of the brutal murder of the schoolgirl in Greenhythe who was repeatedly stabbed in an unlit alley, not at midnight coming home from a disco, but at 5pm whilst on her way to her friend's house to discuss homework for school the next day.

It would be too simplistic to say "OK, let the wealthy Suffolk people pay for the lighting they obviously don't want and then send it up to Lancashire" – problem solved. Life regrettably is never so clear cut and heaven only knows what the local government district auditor would make of that solution.

Whilst all of us admire the total commitment of preservationists of the Earth and the heavens above, what about preserving the people who inhabit that Earth? What would the parents of that murdered schoolgirl give to ensure that lighting was installed in that alley before their daughter entered it? Maybe conservationists refuse to believe that in medieval times the world was a different place. We had no 14 year olds drug dealing with handguns – violence was rarely mindless, we had no joy riding in stolen cars – ram raiding boutiques hadn't yet been thought of, there was no such thing as a no go area. Let us all hope that we can help to improve the quality of life for young and old by making our present environment a safer place to live in.

There is only merit in preserving the past if the old have a present and the young have a future.

Lighting Equipment News, March 1993

NEW PRODUCTS



Rotating luminaires

The Pixel range from Guzzini has been derived from development of the company's original low voltage downlighters. The complete luminaire is manufactured from die-cast aluminium and is available in two models; the 100 and 185 (indicating the diameter of the ceiling cut-out required for installation).

The Pixel 100 is solely orientated towards low voltage lamps, of either dichroic or capsule type, ranging from 35 to 75W. The main feature of this range is that the direction of illumination is variable in the sense that the fittings can be tilted through 30° (45° Pixel 185) and rotated around 355°.

To further enhance the Pixel 100 it has been adapted to take a number of the Guzzini low voltage accessories such as colour lenses and decorative glasses.

The fitting comes supplied with a remote terminal block positioned onto a post, resulting in a twofold benefit. First, the remote terminal block ensures that the standard cabling on the secondary circuit from the transformer are not connected to a very hot lamp holder, therefore removing the

possibility of cable failure due to heat. The second benefit is that the post acts as a gauge to ensure that the ceiling void depth is sufficient for heat dissipation, resulting in maximisation of lamp life.

The Pixel 185 is designed in varying versions to allocate differing high output lamp sources including single-ended white Son (35, 50 and 100W) and single-ended metal halide (70 and 150W).

Along with the above mentioned discharge lamps, the Pixel 185 will also accommodate superspot lamp range, par 36, E5 halogen, dichroic and capsule lamp. In total the luminaire utilises over 20 lamp and beam angle variations, making it a particularly suitable luminaire to fulfil ambient and accent lighting requirements.

The list of accessories include coloured glasses, honeycomb louvres, and even a framing project. Relamping is achieved from below the ceiling and the control gear on those fittings that require them can be installed through the ceiling cut-out for the luminaire of 185mm.

Reader Service No. 182

Menvier (Electronic Engineers) Ltd has introduced versions of its Convertalite emergency lighting conversion kits which are suitable for converting luminaires with high frequency ballasts.

The company's new EM3 and

GM3 kits are capable of operating with conventional or high frequency mains ballast without needing an additional interface. The EM3 kit is designed for converting lamps up to 40W and the GM3 for converting lamps from 40 to 125W. Both the EM3 and GM3 kits offer three-hour emergency operation.

Convertalite kits enable standard fluorescent fittings to be converted into self-contained battery powered emergency luminaires, while still being switchable as standard luminaires in normal conditions.

The kits are BSI approved and meet the harmonised European Standard for emergency modules - EN 60 598-2-22. Menvier offers a free luminaire conversion service carried out to BS5750. The company offers the normal three-year product warranty on the total luminaire if its own staff have carried out the conversion work. Reader Service No. 183

Emergency lighting manufacturer, GT Lighting, has launched a range of low-cost maintained and non-maintained self-contained emergency lighting luminaires.

Manufactured under BS5750 quality assurance, the Modlight range is available with black or white bases and prismatic or opal diffusers. All fittings come with a three-year guarantee and are also available with the new running man legends.

The range comprises the following luminaires: MLKNM Krypton non-maintained; MLKM Krypton maintained; ML4FNM 4W fluorescent non-maintained; ML6FNM 6W fluorescent non-maintained; ML8FNM 8W fluorescent non-maintained; MLWP8 FNM IP54 8W Weatherproof non-maintained; and MLWP8FM IP54 8W Weatherproof maintained.

Reader Service No. 184

Low-cost emergency luminaires



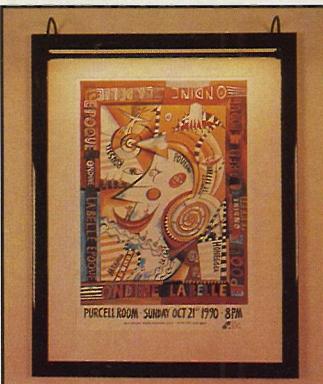
Flexible picture light

Light Projects has extended its Gartner range of picture lights by launching Parca-Mobile; a slim, inconspicuous picture light with flexible arms designed for ease of adjustment. The arms can be supplied in different colour combinations to suit either modern posters or traditional paintings.

Available in four different lengths from 375 to 675mm, the range of picture lights is only 15mm in diameter, ensuring that it blends discretely with the frame.

Thirteen colour/finish options are available including matt and polished surfaces in silver, gold, brass and black.

The range utilises miniature incandescent lamps with an average lamp life of 1,500 hours. They are designed to emit mini-



mal levels of ultra violet and infra red radiation and are therefore considered good for picture conservation, by increasing the heat level on the paintings' surface by only 5% above ambient temperature.

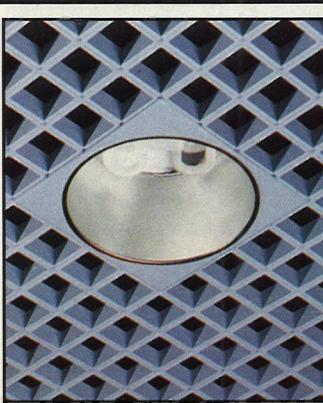
Parca-Mobile is mains voltage operated and easy to install either on the wall or on the back of the picture.

Reader Service No. 185

Compact fluorescents

Program Lighting offers a wide range of compact fluorescent downlights which are said to utilise the latest in lamp and control gear technology. Each body has been designed to achieve the optimum photometric performance with a choice of reflector distributions and options of decorative glass or low brightness concentric louvre attachments.

Shallow versions are also available where ceiling void access is restricted, and the luminaires can



be incorporated into fixing plates to complement a variety of open cell ceiling systems.

Reader Service No. 186

Indoor flood luminaire

Bernlite's Starburst indoor flood luminaire is designed around the latest generation of metal halide and SON lamps. The heart of the luminaire is a precision designed and manufactured stippled bright aluminium reflector ensuring optimum lighting performance from a choice of 70, 150 or 250W lamps.

Two versions of Starburst are available - a recessed fitting for mounting within suspended ceilings, and a surface mounted version for walls and ceilings.

The recessed fitting is designed for flush mounting in tile or grid ceilings and can be swivelled either way through 45° from the horizontal, or 65° if the fitting is slightly lowered in its recess. Control gear is mounted remotely.

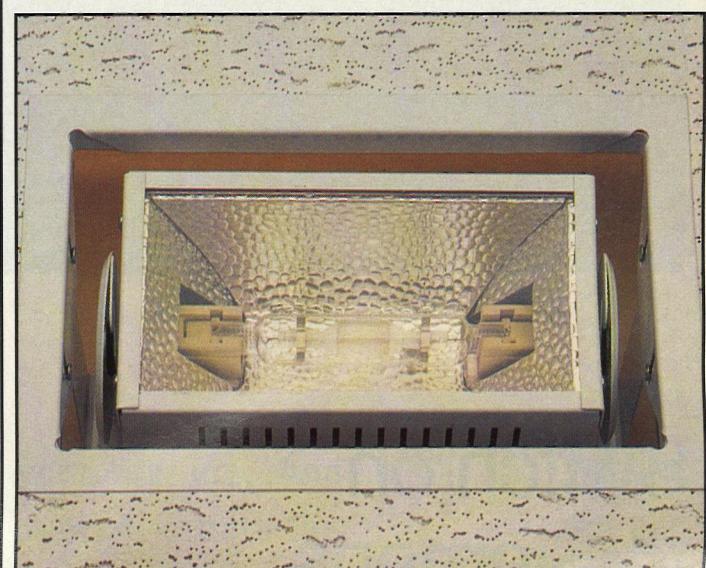
and is thermally protected.

With integral gear, the surface mounted Starburst has a lamp housing which can be rotated up to 90° from the horizontal downwards for display lighting, or up to 55° upwards to provide uplighting.

Applications include museums, hotels, reception areas, and in particular retail outlets such as Fiat and Mazda car showrooms. All Starburst indoor floods are built to IP20 classification, feature UV absorbing front glass, and are constructed in mild steel and aluminium, powder coated in white. Bernlite is also able to supply any BS or RAL colour to special order for specific projects.

Recommended lamp types are the double ended metal halide HQI-TS and high pressure sodium SON-TS, and the single ended SON-T and HQT.

Reader Service No. 187



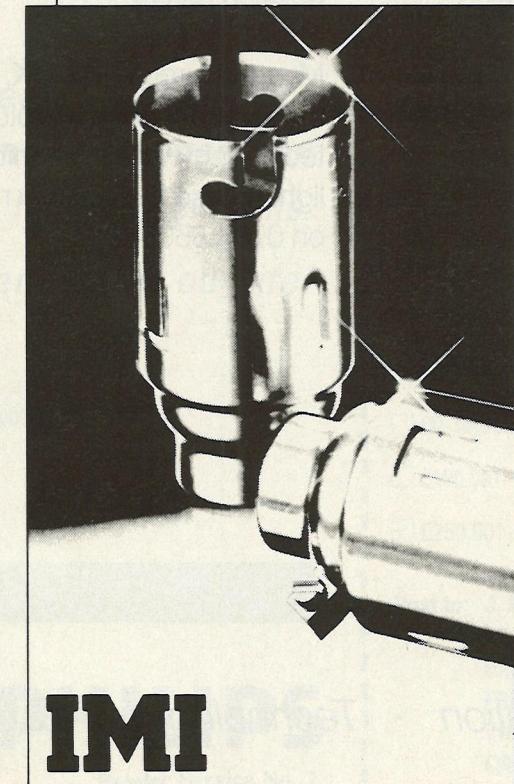
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Reader Service No. 5

Good lighting for public in the saloon

Designers are now paying more attention to lighting levels in the saloon areas of buses and coaches

For many years public sector road vehicles and, in particular, fare stage vehicles have been designed and built with very little attention paid to achieving acceptable levels of lighting in the passenger saloon areas. However, with de-regulation and the increase in competition from overseas, combine with the realisation that better lit areas please passengers and reduce the risk of vandalism, designers are now producing passenger vehicles which are well lit and aestheti-

cally pleasing.

A uniform lighting level of minimum 200 lux at seat height is now very desirable in fare stage vehicles, with even brighter levels over stairwell and entrance/exit doors. These levels can be difficult to achieve as luminaire positioning, interior trim colours, roof height etc all exert an influence.

Invertec of Fairford, Gloucestershire specialises in the design and manufacture of road transport fluorescent lighting systems and

for some years now has been working closely with bus and coach designers in order to produce saloon lighting systems which provide the flexibility to achieve a desired lux level combined with excellent appearance and, most importantly, low cost. As a result, a new generation of continuous luminaires for surface or recessed mounting have been produced using a system of interlocking extruded aluminium chassis and translucent diffusers for cove or roof mounting. These

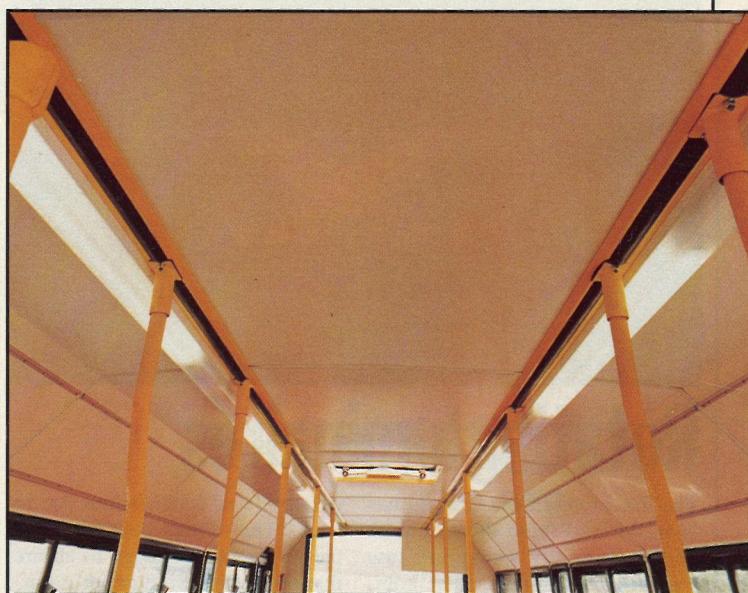
luminaires are supplied in standard lengths and are suitable for new build, retrofit or refurbishment. Geartrays in wattages from 18 to 58 are fitted into the luminaire housing at pitches determined by the level of lighting required.

A high degree of reliability is required from the inverters which have to perform satisfactorily over a wide voltage and temperature range, as well as continuous vibration. In this respect, Invertec now offers with this system a range of all solid-state fail-safe inverters for 12V or 24V operation which carry a five year warranty. In addition, other special inverters are offered for door switching or dimming requirements.

Luxury design

In addition to this standard range of continuous luminaires for bus lighting, the company also offers a design service for the more discrete lighting required on luxury coaches, where once again lighting plays such an important part in creating passenger comfort and satisfaction.

Reader Service No 188



Invertec's continuous lighting surface mounted system in situ.



Invertec's system on the Plaxton 'Verde' single deck bus.



Invertec lighting battens fitted in a luxury coach.

SIEMENS

Switch on to Siemens energy-efficient lighting

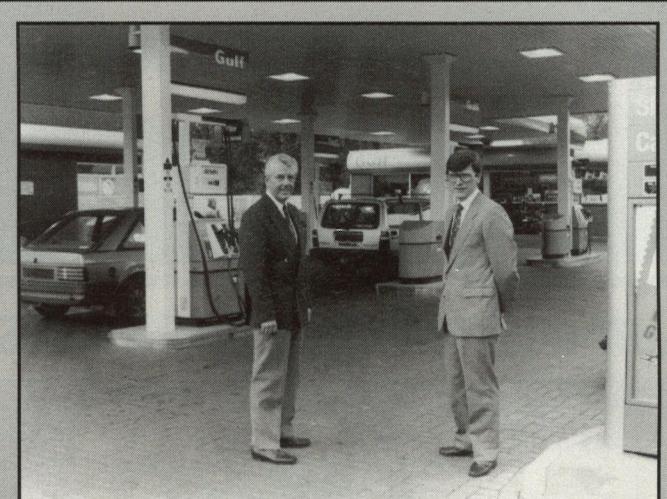


In the UK lighting accounts for some 16% of total electricity consumption: industry spends over £2 billion on electricity for lighting factories and offices. This figure could be reduced by at least one third through better lighting. With such considerable potential for savings, the return on investment in more efficient lighting simply cannot be ignored.

Siemens is committed to efficient use of energy and as such offers state-of-the-art electronic control gear across its complete range of fluorescent fittings. This replaces bulky and heavy components but the main benefit is in high frequency operation. Energy efficiency is improved and irritating flicker disappears which greatly reduces headaches and eye strain.

Further energy savings and cost reductions can be obtained by using Siemens electronic control gear to vary lamp output from 100% to 1% – especially when linked to building management systems which limit unnecessary illumination in relation to factors such as daylight levels and building usage.

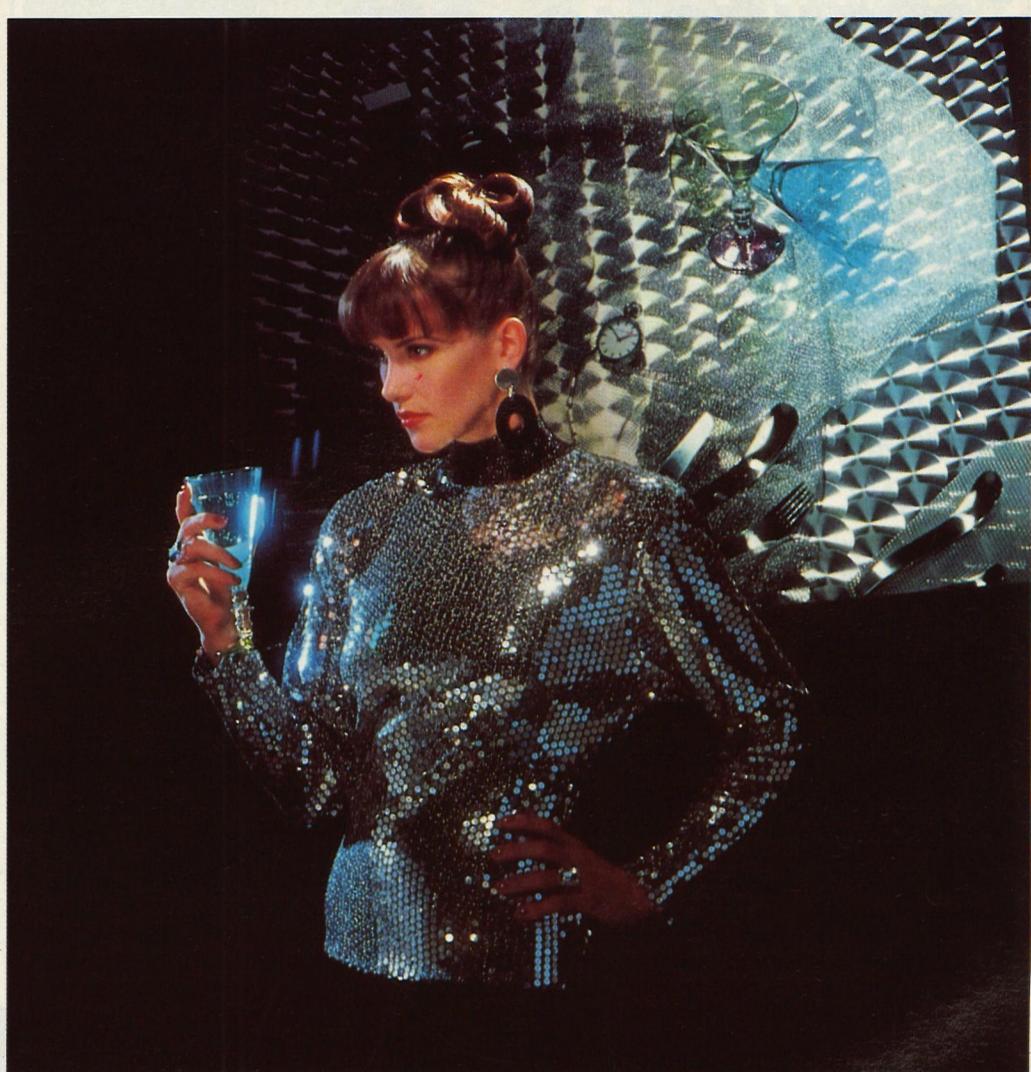
Manufactured in the UK, Siemens lighting is at the forefront of the revolution in lighting technology. For more information about Siemens lighting use the enquiry number or call us direct on 0744 850850.



Gulf Oil is the first national forecourt operator to fit Parkersell's Autolux lighting control system following installation in its South Eastern Region commission operated sites. The move follows Gulf Oil's decision to sign a Department of Environment energy conservation charter. Following the success of the trials in the South Eastern region, Gulf Oil will now give serious consideration to expanding the programme nationally during 1993. Autolux is designed specifically for petroleum forecourts and switches automatically all external lighting and signage at the optimum point to achieve energy conservation and marketing requirements. Dennis Garwood, Gulf Oil's Regional Engineer comments: "Having completed several trials with Parkersell's Autolux on various sizes of site, we are satisfied that this system will make a significant contribution to our energy conservation programme."

Reader Service No 189

Innovation · Technology · Quality : Siemens



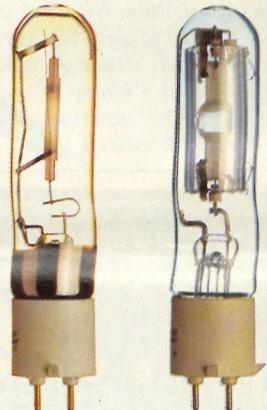
TWO LAMPS TO BRING YOUR DISPLAYS TO LIFE

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£250,001-500,000 £500,001 plus

Safer take-off and landing

Maximum reliability for airport lighting equipment is essential for safety. This can be ensured by supplying the series-connected lights with constant current from ring-main circuits via special transformers

Airports are divided into categories according to their facilities and the extent of their operations. The category also indicates the weather conditions and visibility that are still acceptable prior to an airport's operations having to be shut down. Visibility on the ground and the pilot's 'decision height' are among the criteria used to specify the category.

The higher an airport's category, the more extensive and complex its aviation lighting equipment has to be. Upgrading to the next higher category involves not only adding outdoor lighting systems but also installing a higher grade of plant monitoring equipment and display systems for failure annunciation. The category specifications also

clearly define the percentage of individual lighting systems allowed to fail before airport operations have to be discontinued.

The operation of an airport therefore depends, in part, directly on the functioning of the aviation lighting system. This focuses attention on the lighting control equipment, in particular on its security and reliability.



Aviation lighting on the landing runways is clearly visible to pilots

Maintaining lighting power

To ensure that the aviation lighting on the landing runways is clearly visible to the pilots in all weather conditions, the luminous power of the lights must be adjustable. That is, it must be possible to adapt it to the luminosity of the surroundings by varying the power of the lamps.

To change the lighting power, however, the input power has to be changed, causing a variation in the cable losses. Usually, the cabling installed for an aviation lighting system is several kilometres long, so the distribution losses when a constant voltage is used would lead to a considerable variation in the luminosity of the lights within a system. Obviously this cannot be allowed to happen.

The individual lighting systems, therefore, receive a constant current via a ring main cable, with special transformers supplying the series-connected loads. As a rule, the current circulating in the series circuits has a value of 6.6A; this requires an input voltage of up to 5kV (AC), depending on the number of lighting units.

To increase the reliability of the aviation lighting installation, some of the lighting systems are divided into sub-circuits. This has to be done in a way that ensures that even if one of the sub-circuits fails, the geometrical configuration of the overall lighting system remains intact. Each circuit has its own regulator which ensures that it is supplied with power at constant current.

ABB Leitungsbau GmbH has designed a control system especially for airport lighting and other visual navigational aids. Named COSAL, it performs such tasks as:

- series circuit control
- lamp failure monitoring
- monitoring of circuit insulation resistance

Individual lighting systems receive a constant current via a ring main cable

- switching and monitoring of taxiway guidance signs, wind direction indicators, obstruction and hazard beacons, rotating beacons, apron lighting and signalling equipment

COSAL can also be linked to a higher order operations monitoring system.

Two main types of component are employed for these tasks: switching control components, of 19" design for installation in standard cubicles and modular, high-voltage components in a different type of standard cubicle.

COSAL can be adapted for all airport categories by combining the equipment as required in these two standard panels.

The control panels are equipped with the following types of unit:

- CCR-B 50/2 dual constant current regulator for 2x50 A/230V
- CCR-B 80 constant current regulator, for 80 A/400V
- CU 36/3 switch unit
- ICU insulation resistance meter

The upper section of the cubicle has nine tiers for accommodating different 19" modules in any order. Since all the components are accessible from the front, the control panels are ideal for direct wall-mounting. If the systems have to be extended, the modifications are relatively easy to carry out. Terminal connections, input fuses and the multi-terminal bus system are all located in the lower part of the cubicle.

ABB has developed a constant current regulator, designated CCR, which ensures that the lamps receive power at a constant current. The thyristor-controlled regulator offers a choice between stepless setting of the lamp current in a lighting circuit and setting in freely selectable steps, each of which represents a fixed setpoint. In the latter case it is usual to have five or seven steps. Once selected, the setpoints (e.g.

RAISING THE STANDARD



Crompton Lighting has raised the industry standard once more, with the introduction of Crompton 5. Offering a three year guarantee and carrying the  mark, Crompton's most successful batten luminaire now has improved design and performance. Overall aesthetics have been heightened, new profile end plates allow for continuous mounting and a quick release cover gives reduced installation and maintenance times. Crompton 5 – raising the standard in batten technology.



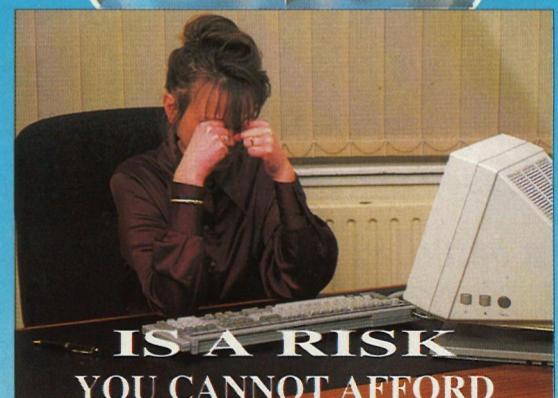
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BAD LIGHTING



As from 1st January 1993 companies must comply with the new EC legislation on lighting for VDU work stations.

MBM now manufacture louvres to comply with the EC directive/CIBSE LG3 categories 2 and 3.

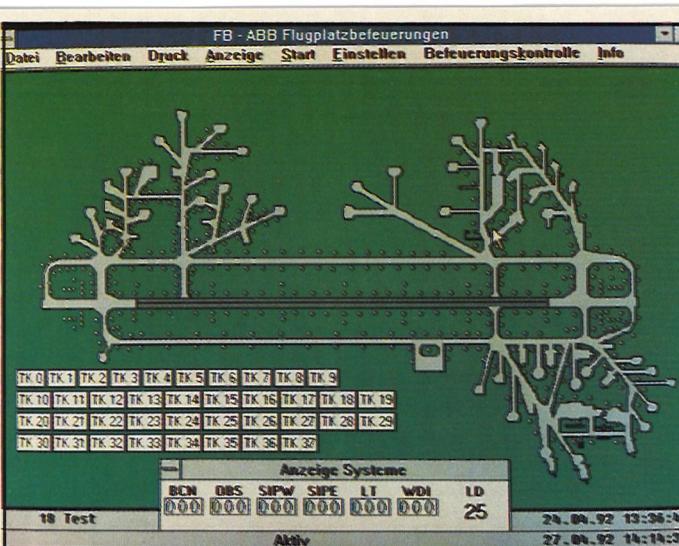
Designs are supported by full photometric data and can be manufactured to customer specifications.

For further information or brochure on all products contact:



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FM 12310
BS 5750: Part 2: 1987/
ISO 9002: 1987



A screen from COSAL, ABB Leitungsbau's control system

voltage and frequency) stay fixed even when conditions in the supply system vary. Disturbances in the load circuit, such as lamp failures, have no effect since the lamp currents are adjusted by the closed control loop to the pre-selected value.

To increase lamp lifetime, the constant current regulator has a start-up integrator, which adjusts the current to its setpoint. The lamps are monitored for failure by a measuring and alarm device. This not only detects and displays failures but also signals them to a higher operations monitoring system. The regulator is also continuously monitored for overcurrent and actual-value signal failure.

The constant current regulator can be operated either locally or by remote control. Local operation is provided mainly for maintenance crews, but can also be used for emergency control should the central control station fail. A landing direction switcher device can be integrated in the unit as an option.

Since introducing COSAL to the market ABB has installed the system at several airports, both civil and military, with different

The latest regulations for mili-

Trouble-free

The customer would only accept very brief interruptions of its flight operations. Although this would normally entail problems with the installation work, and therefore extra costs, COSAL has been designed from the beginning for smooth trouble-free installation. One feature in particular, the possibility of on-line programming, paid off by allowing flight interruptions to be reduced to a minimum for the duration of the installation work.

tary aviation lighting systems require an operations monitoring system to be complete in every respect. The contract therefore called for some special features; for example, redundancy was specified for the individual operator stations and for the system bus. Further, the remote control stations had to be interchangeable and of 19" system design with sealed keypads. The standard operator console is a freely programmable modular system with an interface for connection to the fibre optic bus. The light intensity can be controlled in three, seven or nine steps.

Other requirements were that the installation should be capable of extension, that facilities should be provided for on-line reprogramming during extensions and that 19" plug-in technology should be used for the control stations. This project marks the first time that all functions and check-back signals for controlling the lighting system have been accommodated in a 19" rack.

The new regulations for military facilities also called for two remote control stations for the lighting system. To satisfy this requirement ABB installed two programmable control stations of identical design.

The main operator panel in the tower and the two secondary operator panels are interchangeable. All three control stations function in the same process hierarchy, ie, intervention in the process is possible from all three stations simultaneously. Inadvertent operation is prevented by each control station having a key-operated switch.

This article has been adapted from a paper by Rudolf Plettenberg of ABB Leitungsbau GmbH, first published in the ABB Review.

Reader Service No 200



Re-lighting the ferries

Over the past 18 months Lucent Lighting has been involved in the refurbishment of the P&O ferries, the Pride of Dover and the Pride of Calais. Over 3500 specially constructed low voltage luminaires have been supplied, designed to replace the existing compact fluorescent downlights. These were giving a low level of illumination and P&O wanted to brighten the appearance of the ferries with new lighting and a complete change in decoration.

P&O has also carried out major work to the Pride of Kent, stretching it by cutting it in half and adding a further 35m between the two halves. The work was carried out in Italy but Lucent was able to persuade P&O to install British fittings. Eventually an order was secured for 1500 specially manufactured low voltage downlighters, which were delivered in April.

Reader Service No 201

Flying high at Manchester

During the 1980s Manchester Airport became the fastest growing international airport in Europe, with an increase in passenger numbers from 3 million in 1980 to over 10 million in 1991. This huge increase in demand led to the need for a second terminal, which has been under construction for some time and is due to open this month.

The electrical design of Terminal 2 was undertaken by Oscar Faber and work packages were given out to various contractors, including N G Bailey, Grimwood and Dix, Haden Young and

William Steward. As Manchester City Council has a stake in the airport, City of Manchester licensing regulations applied, which ensured the use of central battery systems and slave luminaires of a high standard. These were supplied by JSB Electrical, along with units for the new rail terminal, due to open later this year.

Central systems

In total, there are 27 110V systems in Terminal 2, with a further 30 to operate the smoke dampers. There are also three sine wave

inverters in the rail terminal. In addition, JSB supplied around 180 conversion modules to convert all the directional signs at the airport to emergency lighting in the event of power failure. The company is currently working on a consignment of special emergency EXIT signs for Terminal 2 which are to remain illegible until illuminated on emergency power. All emergency lighting at the airport conforms to BS5266, Part I.

The new terminal will be able to handle 6 million passengers a year and is set to enhance Manchester Airport's reputation as one of the world's top 20 international airports.

Reader Service No. 202

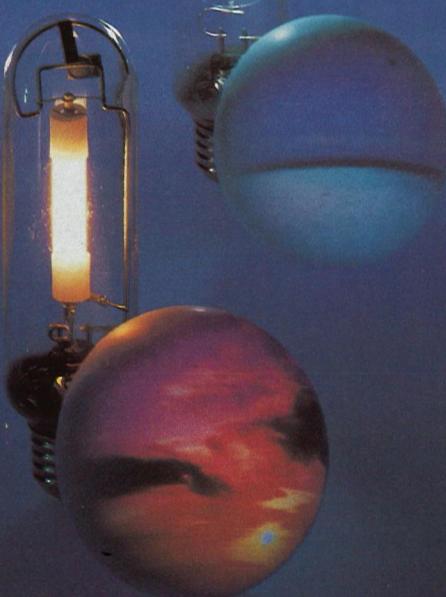
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"CREATING LIGHT AND DEVELOPING THE FUTURE"
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Customised training

Zumtobel Lighting was chosen as the sole supplier of lighting at the new Waterloo International Rail Terminal. The project called for over 3,000 fittings, of 97 different types, not one of which was an 'off-the-shelf' standard product.

The specified station illumination levels had to be met whilst achieving minimum glare levels and strict uniformity requirements. The curved building, varying roof height, platform width changes, and the requirement to use, where possible, common housings and lamp wattages posed significant difficulties.

Also, individual luminaires had to meet stringent demands, for example an 'LP' fitting with a maximum 4m mounting height had to meet a space-to-height ratio of 4:1 using a 400W metal halide lamp. And an 'LN' uplighter had to illuminate the arched stainless steel ceiling structure without any direct light falling on the eyebrow glazing.

These strict limitations were met by luminaires designed on Zumtobel's in-house computers, using laser cut aluminium reflectors incorporating 1kW and

400W metal halide lamps to provide the uniformity of illumination levels. External barn door attenuators were embodied to limit the glare and unwanted light spillage past the platform edges. Axially mounted louvre blades limit the glare to incoming and outgoing train drivers.

The fittings are made of up to four separate aluminium casings, shot blasted, powder coated and self finished. They weigh 45kg each and have been designed to hang from a single point fixing with the lamp housing hanging exactly horizontal.

In the arrivals, departures and customs area, 150W metal halide lamps uplight the angled ceilings. The company carried out extensive 'mock-up' tests which showed that in certain areas, eg on the escalators, skiers wielding skis could knock the fittings, so self-centring mechanisms have been incorporated which will return the fittings to their original position if knocked.

The car parks have over 1,000 IP65 rated fittings, but, as with the rest of the site, these are non-standard - requiring impact resis-

tance, high frequency, and fixing centre alterations. Similarly the 'Arches' area incorporating some security rooms, boiler rooms, services and even prison cells use these moisture proof fittings.

Other areas, such as shops, offices, VIP lounges, locker rooms, etc also have to comply with the project's stringent requirements. All fluorescent con-

trol gear is the Zumtobel PC high frequency module. Virtually all fittings incorporate self-contained maintained three-hour emergency units. Elsewhere the Zumtobel Optos downlight range with 70W and 150W metal halide lamps has been extensively used with various decorative front glass attachments.

Reader Service No. 203

Less pollution for car parks

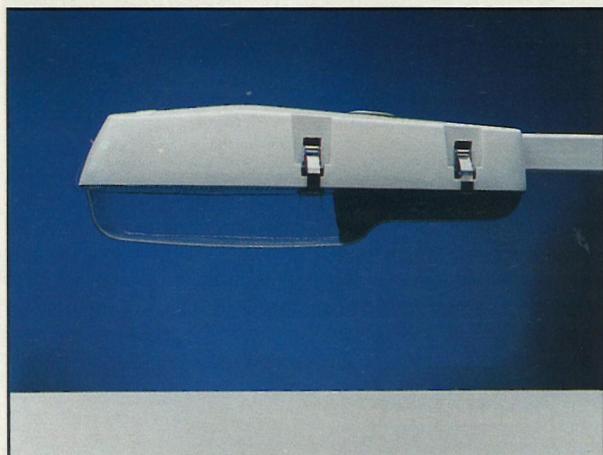
The Mayfair is a new architectural luminaire from Holophane, for applications in most kinds of amenity areas and car parks. This latest addition to the company's 'Park Lane' family of luminaires is designed to eliminate all upward light, in recognition of the growing awareness of light pollution problems.

Mayfair uses a 'Prismetal' met-

allised prismatic glass reflector, mounted within a fully enclosed flat door assembly sealed to IP54. This arrangement is said to provide a full cut-off light distribution ensuring zero light output above the horizontal plane. It is available with a choice of square or asymmetric light distributions and can be column or wall mounted.

A range of square section columns is available with a choice of straight arm or tuning fork brackets.

Reader Service No 204



New lantern

Chalmers and Mitchell has launched a new group B side entry road lantern. The Starline IP65 is said to have outstanding optical performance and is available up to 125W MBFU. The GRP canopy and polycarbonate bowl are sealed to IP65 and, as

the bowl covers the gear chamber, this rating is valid for the whole fitting and not just the optical chamber.

Reader Service No 205

For more information on any of the products listed, circle the enquiry number on the free reader reply service card.

There is always more

...more choice, for example, with the LUMILUX range, OSRAM's brand name for triphosphor fluorescent tubes.

Triphosphor technology has brought fluorescent lighting into the 90's. Compared to conventional halophosphate tubes they give higher light output, improved lumen maintenance (and therefore longer useful life), and very good colour rendering (Ra 85). Where colour rendering is of prime importance, the LUMILUX DE LUXE range, with excellent colour rendering, is available.

By using different combinations of triphosphor fluorescent coatings, LUMILUX provides an extensive range of five colour appearances.

For the widest range, colour rendering and economy, look no further than LUMILUX.



BIOLUX - beating the SAD syndrome

Seasonal Affective Disorder, known as SAD, can cause depression during the winter season when there is less daylight.

By installing BIOLUX in offices, schools, department stores and similar places, an atmosphere can be created which will considerably reduce SAD symptoms.

BIOLUX fluorescent tubes were among the first

fluorescent tubes to accurately recapture natural sunlight thanks to a small additional component of UV light.

They have excellent colour rendering and have LUMILUX performance in terms of energy consumption and lamp life.

Make the workplace friendlier with BIOLUX.

Reader Service No. 20



FLUORA for healthy growth

FLUORA tubes are the ideal solution wherever plants do not receive enough natural daylight. By stressing the blue and red parts of the light spectrum, they not only show flora in offices, aquaria, shopping arcades and greenhouses in their best light, but actually promote the process of photosynthesis.

Reader Service No. 21

LIGHT CAN BE WHITE, WHITE, WHITE OR WHITE:

LUMILUX® Daylight

LUMILUX® Cool White

LUMILUX® White

LUMILUX® Warm White

LUMILUX® INTERNA®

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MINOLTA - MEASURING UP TO YOUR STANDARDS

Reader Service No. 11

Page 10

Lighting Equipment News, March 1993

Floods under the sea

By M C Dearnley, South East regional manager, Thorlux Lighting

In August 1990 the excavation of the UK Crossover section of the Channel Tunnel was completed. This huge, unique project 7.5km out to sea, together with a similar structure on the French side, allows the crossing over of trains from one tunnel to another, thus freeing one tunnel for maintenance work. At 164m long, 15.4m high and 21.2m wide it is claimed to be the biggest non-natural cavern in the world.

During excavation it was important to reinforce the sides and initially this was achieved by spraying on a concrete mixture called 'shotcrete' and by driving in rock bolts up to 8m long. Constant monitoring of these surfaces was required to detect any cracking of the lining caused by settlement. This was done electronically and visually, hence the need for good illumination of all surfaces. Good lighting was also necessary for the later installation

of the permanent concrete linings.

In May 1990 I was asked by TML engineers to carry out an underground survey and come up with a suitable lighting scheme. Thorlux had already supplied large numbers of fittings on other parts of the tunnel's construction, including vapour proofs, bulkheads and floodlights.

The TML engineers responsible for the crossover were open-minded on how to light the area, but, if possible, wanted to use Thorlux's Azmet 3 area floodlight with a 400W MBF/U Dekluxe lamp which had been used very successfully to light other underground areas.

MBF/U was chosen as a light source because of its white light; MBI could have given problems due to its poorer resistance to voltage fluctuations and colour instability.

The positioning of the luminaires was important to ensure total coverage of all the surfaces

and to protect them from the construction equipment. TML proposed having two rows of floodlights mounted approximately two thirds of the way up the walls aiming downwards. This gave very little coverage to the ceiling area and was therefore unacceptable. After calculating various options we decided to use one central ceiling-mounted row of high bays with two area floods either side.

The IP65 Thoroseal complete with 400W MBF/U Deluxe lamp provided lighting for the floor and the Azmet 3 floodlights, using the same lamps, illuminated the walls and most of the ceiling. These fittings were mounted at 4m centres along the 164m crossover length, totalling 40 high bays and 80 floodlights. An average of 120 lux was achieved with a 188 lux maximum and 50 lux minimum; 0.7 maintenance factor was used in the calculation along with zero reflectance.

Reader Service No 206



Banking on LB

Last year saw the completion of the Docklands Light Railway extension, linking the railway with the London Underground at the heart of the City of London.

Building services consultant Kennedy & Donkin Ltd called in LB Lighting Ltd to develop special luminaires from a brief provided by the architect/designer The Design Research Unit and to advise on lamp types and illuminances.

The railway now terminates at Bank station, where the lighting for each new platform consists of 85m of curved profile continuous pendant trough suspended on tube and stainless steel wire supports.

Each run incorporates public address speakers, 19 150W metal halide uplighters and 38 six foot 70W fluorescent downlighters within specially formed reflectors. In addition, 38 skeleton low voltage luminaires were concealed in the platform wall panels.

In the main concourse and passageway, 140 fluorescent lamps provide the bulk of the lighting. They are set in 400m of continuous uplighting channel, which were tailor-made to predetermined angles and lengths and house internal wireways. There are also 77 low level single point fluorescent uplighting luminaires.

In areas with limited headroom, such as cross passage adits and invalid ways, 44 modified units from the FRH sealed surface range were used, complete with purpose made infill boxes containing public address speakers and smoke detectors.

In general, the luminaires were made out of mild steel and aluminium and finished with either flame retardant powder coat paint or polished stainless steel. The company used vandal-resistant components throughout, together with LSF type wiring and diffusers made from polycarbonate material.

Reader Service No. 207

Jet-proof for tunnels

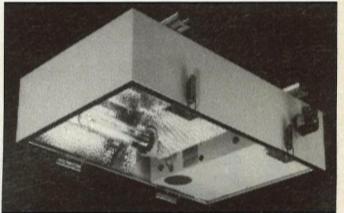
Glamox Electric has introduced a jet-proof luminaire to IP55 which is said to be ideal for use in tunnels where the environment is often hostile. The control gear and diffuser on the GTU are mounted using locking hinges, so the service engineer can simply swing open the assembly to gain access to all the components.

An integral air filter prevents dust being sucked in and building up on the diffuser when the luminaire is switched off, reducing the need for cleaning. Also, the hardened clear-glass diffuser provides protection from any stones thrown up by passing vehicles.

The main body is made from Aluzink and finished in stove-enamelled white epoxy paint. Optional mounting arrangements allow for suspension trunking or 33mm diameter suspension rods.

The GTU is available in versions for high-pressure sodium or two 36W fluorescent lamps. Both types have power factor correction and can be supplied with built-in electronic emergency lighting.

Reader Service No. 208



Contract for street lighting

BEI Lighting, an offshoot of South Wales Electricity, has been awarded a contract for street lighting maintenance with Strathclyde Regional Council. The contract involves responsibility for the maintenance of all highway lighting in Ayr, Dunbarton and Irvine, for a period of four years.

To deal with this, BEI will be establishing an office in the Strathclyde region and all job instructions and administration will be carried over computer links between BEI depots, head office and the council's offices, keeping the operation virtually paper-free.

Reader Service No. 209

with OSRAM...



High frequency electronic control gear

For LUMILUX and other T8 fluorescent tubes, OSRAM has developed QUICKTRONIC DE LUXE and QUICKTRONIC ECONOMIC, a complete ready-to-use electronic control gear unit.

QUICKTRONIC are not only extremely economical, giving energy savings of up to 36%, they also increase the

serviceable life by as much as 50%. They have flicker-free start and operation, and, used with LUMILUX, are the optimum lighting package for light quality and economy.

QUICKTRONIC ECG also bring advantages of greater comfort, economy and reliability to OSRAM DULUX L, S/E and D/E compact fluorescent tubes.

Reader Service No. 22

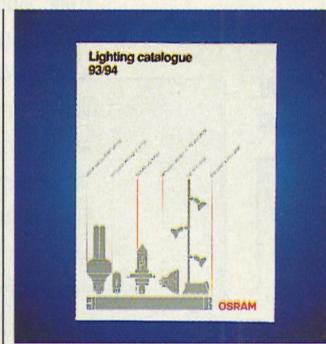


Get to know more about lighting

OSRAM is committed to helping you understand the latest innovations in lighting. For OSRAM, this means FOCUS 2, a monthly one day training seminar held at our Wembley LIGHTSTUDIO.

The FOCUS 2 seminars are practical, interactive courses run by OSRAM's lighting specialists.

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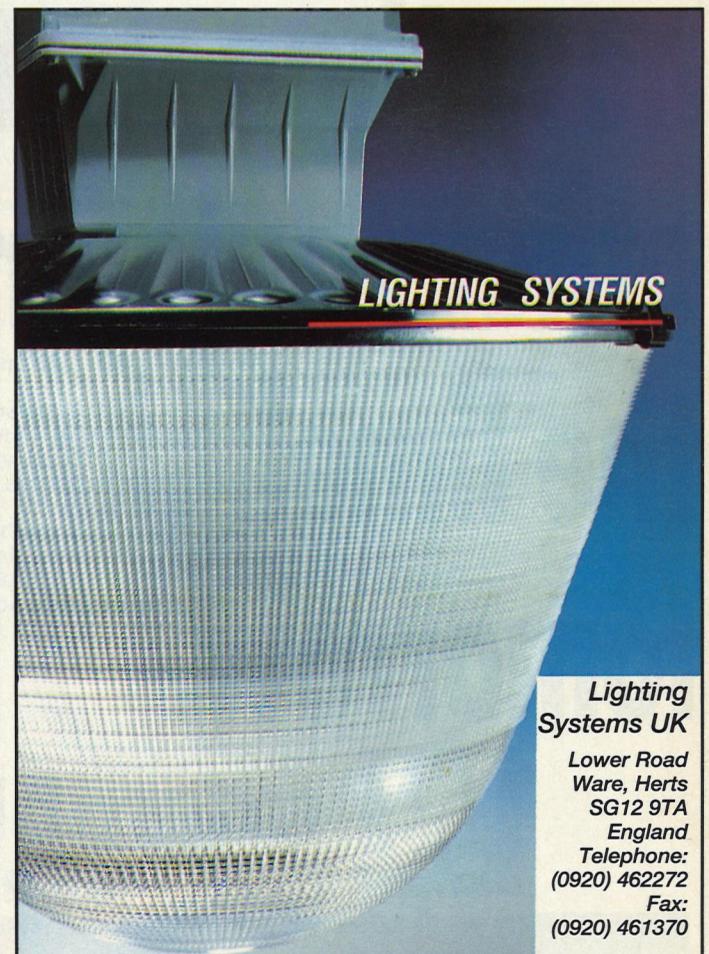


The new OSRAM Lighting catalogue

OSRAM have launched the definitive reference work for the industry on light sources and electronic control gear. For your copy please circle the reply number.

Reader Service No. 24

For further information on any subject mentioned in this feature circle the appropriate reply number or contact the OSRAM Marketing Department on 081-904 4321



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Reader Service No. 12
Page 11

LUMILUX® FROM OSRAM.

The LUMILUX® range of triphosphors provides white light in colour appearances suitable for every application.

These can be divided into five LUMILUX® colour appearances: Daylight at 6000K; Cool White at 4000K; White at 3500K; Warm White at 3000K and INTERNA at 2700K.

LUMILUX® Daylight provides the same light characteristics as natural daylight and is used where true colour appearance is required.

LUMILUX® Cool White is a bright

workplace light.

LUMILUX® White, also for the workplace, is not quite so cool.

LUMILUX® Warm White is bright but with a warmer touch.

LUMILUX® INTERNA® is warm and homely just like an incandescent lamp.

Apart from LUMILUX® at Ra 85, LUMILUX® DE LUXE are also available, with excellent colour rendering up to Ra 98.

TECHNOLOGY
BROUGHT TO LIGHT

OSRAM

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Safer flying with visual aids

Airports around the world are becoming increasingly aware of the importance of efficient and safe management, together with the cost-saving implications of fully integrated visual aids engineering.

Through its specialist manufacturer Simon-Parmeko, Simon Aviation has designed a full airport visual aids system which is said to need very little maintenance.

The system is said to guide an aircraft from the runway to its docking pier, safely and efficiently, whilst automatically informing Air Traffic Control of the aircraft's exact position. It

also enables the automatic triggering of ramp services – ie refuellers and baggage loading equipment etc, are dispatched to the loading bay as soon as the plane arrives.

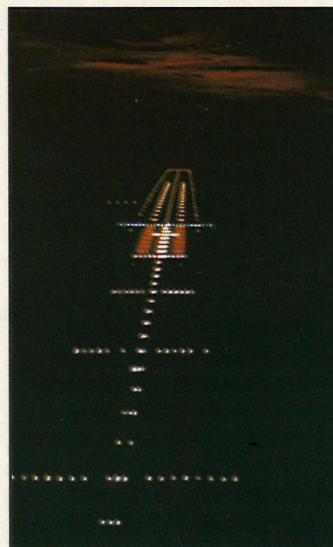
The system also caters for requirements laid down in recent regulations. To prevent aircraft entering a runway area already in use, airports must now provide a 'Ring of Red' lighting around active runways when operating in visibilities of 800m or less. In addition, protection must be augmented by guard lights – green for go and red for stop – to aid pilots taxi-ing around the airport.

Simon Parmeko's new system claims to provide this in a highly

cost effective way, allowing existing circuits to be adapted, and the 'Ring of Red' to be used independently, or as part of a fully integrated system.

International legislation is also demanding more realistic and true information back from aeroplanes to the control tower, especially where visibility is less than 800m. For example, strict brilliancy tolerances are now required for varying visibilities to ensure that air traffic controllers can see what is happening on the air field.

The Simon True Back Indication system provides air traffic controllers with visual aids which show them, on a screen, the position of an aircraft and the direc-



Simon Aviation's landing lights, visible to pilot's in all weather

tion in which it is travelling.

All of Simon Parmeko's lighting equipment is based on a modular design principle, which allows airports to upgrade existing runway lighting systems cost effectively. Systems design, together with a full installation service, is supported by a wide range of components from the company's Leicester plant.

Reader Service No. 210

It's better to take a look at the latest lighting technology now than watch others enjoying the limelight tomorrow.

It's not often that one can speak of a truly illuminating experience. But the World Light Show is an exception. Once a year 400 exhibitors provide an overview of design trends and state-of-the-art lighting technology. Not only a forum for information, this event is clearly the lighting industry's main sales fair worldwide. In 1993 architects, planners and members of the trade and skilled crafts sector will again welcome the chance to gain insights into the entire spectrum of modern lighting technology. Visitors can also benefit from the display of installation technology for buildings. Here the spotlight will be on the latest electrical installation equipment and technical systems. All this – plus many other highlights – will await you at HANNOVER FAIR '93.

Automation Technology	Power Transmission and Control
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Reader Service No. 13

Page 12

Refit for Blue Riband winner

Gentry Eagle, the powerboat which held the record for the fastest passage of the Atlantic, and winner of the 1989 blue Riband, has been refitted using the new Lightgraphix range of yacht lighting. This range of low voltage lighting includes surface and recessed fittings designed to be used where headroom and recessed depth are limited.

The new range features polished brass, polished chrome and a range of colour finishes. It

includes luminaires for interior use and weatherproof units for exterior applications. Lamp options include incandescent, low voltage tungsten-halogen and compact fluorescent, for mains or low voltage supplies.

Included in the range are three sizes of circular port-hole style units in recessed and surface mounted versions, which are said to have very low profile and recessing depths. There is also a selection of spotlights and wall lights, an oval shaped recessed pilot light unit which uses a 12V festoon lamp and glass enclosed recessed lighting. **Reader Service No 211**

Faithful replicas

As part of a Hove and Brighton Urban Conservation Project Board scheme, Sugg Lighting has supplied 13 columns for the eastern end of Brighton's Marine Parade at Kemp Town. The two ton cast iron columns are faithful replicas of the originals installed 99 years ago and are surmounted with reproductions of the Crompton-Pochin Arc lanterns of 1893, supplied by C U Phosco of Ware, Herts.

Sugg has a long association with Brighton, and has also been involved in another project recently, the reinstatement of the Palmeira Square Wall. Four existing iron pedestals were refur-



bished, and a fifth replicated, with an 18" Classic Globe mounted on it.

Reader Service No 212



Fibre optics on the move

Eurotec Optical Fibres Ltd is supplying fibre optics for both high level and floor lighting of the buffet cars on the French TGV high speed train. These include background and feature lighting designs which are said to have low maintenance characteristics and be virtually vandal proof.

According to Eurotec, fibre

optic lighting has significant benefits for public transport operators, as many light fittings can be fed from one light source, thus eliminating frequent bulb replacement. The light sources can also be sited in positions convenient for maintenance and servicing. Eurotec is currently developing fibre optic lighting systems for other carriage manufacturers, as well as aircraft manufacturers and ship builders.

Reader Service No 213



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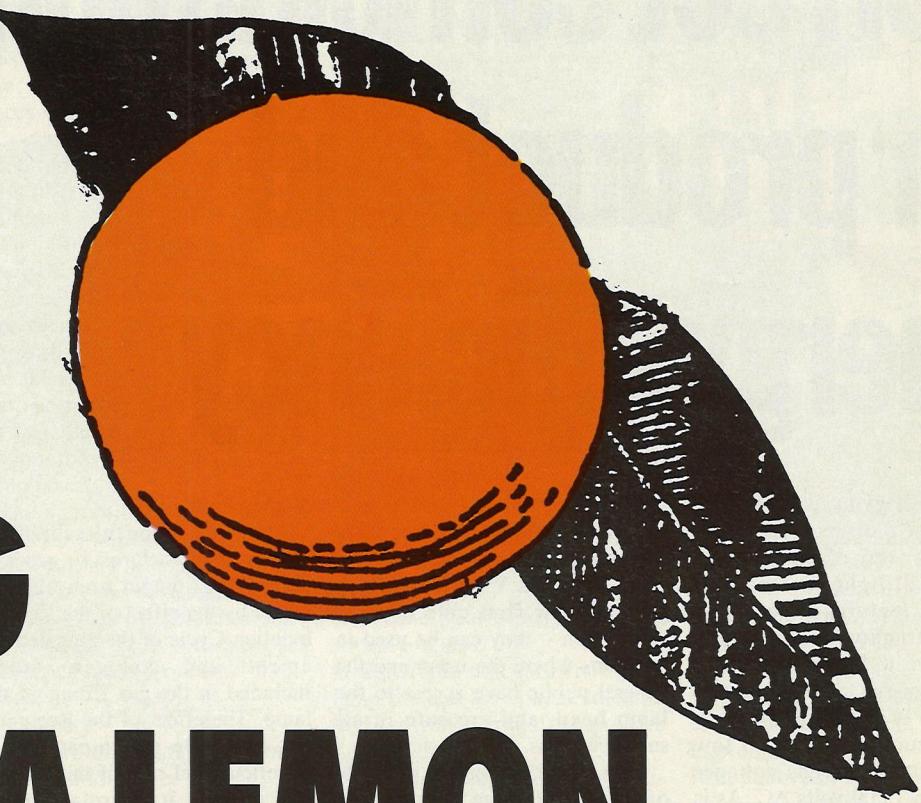
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Reader Service No. 14

Lighting Equipment News, March 1993

WHEN SPECIFYING LIGHTING DON'T PICK A LEMON



● Solutions to suit varying workplace situations

Waldmann universal lamps are not only suitable for use in specific, strictly defined areas. They are also used at various types of workplaces involving similar visual tasks. This includes workshops, warehouses, machines, laboratories, offices and assembly workplaces, control rooms and hospitals. However, certain features must be noted when selecting universal lamps, despite the high degree of versatility.

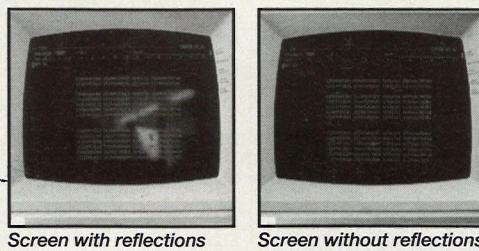
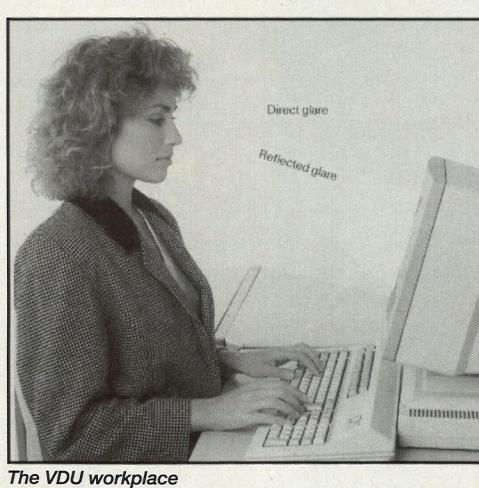
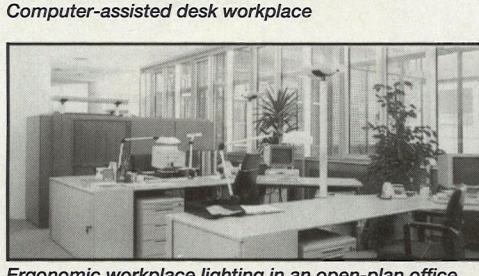
● Different types of light

If we disregard special design measures, we can state as a general rule that halogen lamps produce spot lighting and, conversely, that fluorescent lamps produce large-area lighting. Even if used for long periods, fluorescent lamps hardly produce any heat at all. They are ideal for workplaces at which additional heat would interfere or cause damage. Combination lighting comprising incandescent and fluorescent lamps very closely approximates daylight lighting conditions. Lamps of this type - such as the Wacolux K - are extremely advantageous if natural colour rendition is important.

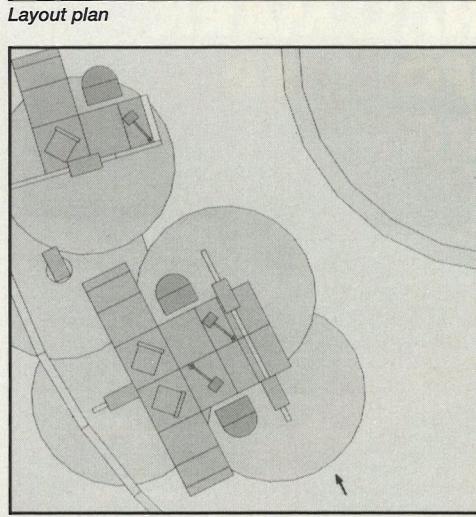
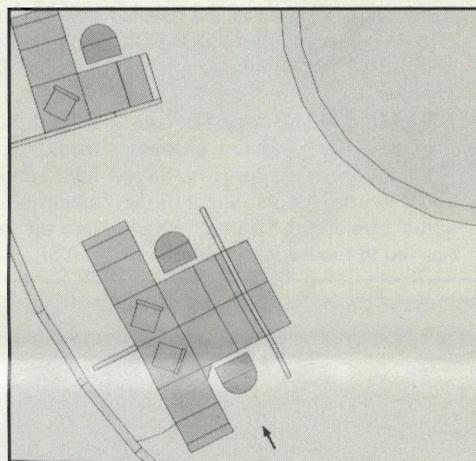
● As secure as possible - as flexible as necessary

The possible methods of attaching all lamps are matched to workplace requirements. Since a lamp should be installed as securely and stably as possible at the workplace, it is always best to secure the lamp base with four screws or a clamp at the edge of the desk wherever possible. If this is not possible, other methods of attachment are available. Desk bases, magnetic bases for steel surfaces and five-arm supports can be used if it is frequently necessary to reposition the lamp. Securing with a wall bracket takes up very little space. It goes without saying that Waldmann universal lamps provide individually adjustable light even if rigidly secured at the base.

If it is not necessary to frequently reposition the lighting head, plastic-coated flexible metal supports offer a good solution. Lamps with articulated arms provide particularly good mobility and the possibility of individual adjustment. The friction elements of the articulated arm lamps are not subject to wear. An adjustable self-locking facility permits continual repositioning of the lighting head.



WALDMANN TWIN-C INDIRECT/DIRECT LIGHTING SYSTEM



● Matching to available mains voltages

On all universal lamps, the transformer or ballast unit for generating the lamp operating voltage is incorporated in the lamp or is available as an accessory.

If required our own transformer and ballast unit production department is able to supply virtually any special version for voltages other than 240 V/50 Hz.

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Waldmann
Making light work

W

Correct combinations for product and energy efficiency

Low voltage lamps have been one of the successes of the boom years of the 80's, but like all light sources they have features inherent in their construction and operation which have to be understood if the best usage is to be gained.

In terms of standards for product construction, the term low voltage actually means voltages of less than 1,000 volts AC. As is usually the case, the term low voltage when applied to these sources means something different and has been contracted from 'extra low voltage' (ELV) which is a term applied to any voltage less than 50 volts AC or $50\sqrt{2}$ volts DC.

ELV is split into two categories – Functional Extra Low Voltage and, if the supply is derived via a Safety Isolating Transformer, Safety Extra Low Voltage (SELV).

If the voltage is below 33 volts AC or $33\sqrt{2}$ volts DC there is no need to insulate conductors from human touch.

Low voltage lamps are gener-

ally 12 volt but 24 and 6 volt lamps are also available. This means that they can be classified as ELV or SELV devices, which gives us our first clue to their application – they can be used in locations where the users and the general public have access to the lamp head, and are safe in all such locations.

One of the distinctive products of the low voltage boom is the skeletal wire system where the supply wiring forms the support for the lamp and is accessible at all times.

Small and effective

Another distinctive feature of low voltage lamps is their inherent small size – the technology by which they are constructed means that in a very small capsule a very effective lumen output is obtained.

The low voltage lamps in common use are tungsten halogen lamps and will typically have about twice the light output of the same power GLS lamp, which has led to their widespread use in

display lighting.

Tungsten halogen technology enables manufacturers to generate greater light output from filament lamps by the effect of the Recombination Cycle of the tungsten filament and halogen atoms included in the gas filling of the lamp. The effect of the Recombination Cycle is almost totally beneficial and only if the lamp is run outside its normal supply regime do potentially harmful effects occur. By understanding how the lamps function and their limitations, we can ensure optimum effective use.

Normal construction tungsten filament lamps emit light by the electrical heating of the tungsten filament until it becomes incandescent. At first mainly heat is generated, but as the temperature is raised the proportion of visible light increases. Air is excluded from the lamp to prevent the filament from oxidising, however, at high enough temperatures the filament boils away by evaporation into the inert gas filling.

This material is eventually

Richard Hayes of XLII Partners explains the benefits and complications associated with combinations of low voltage lamps, dimmers and transformers.

plated onto the outer lamp envelope and is the major reason for reduction in life output in GLS lamps. The lamp filament will eventually fail when the filament becomes so depleted at one point that an irreversible hot spot occurs which melts and breaks the electrical circuit.

The design of the incandescent lamp is a compromise between filament temperature, life and light output. The typical GLS lamp achieves about 10 lumens per watt for about 1,000 hours average life. At half its expected life the light output will have dropped by about 10% due to the filament material plating onto the envelope and darkening it. The light output cannot be raised by increasing the filament temperature without adversely affecting life and the speed of envelope blackening.

Adding halogens

By introducing a member of the halogen group of elements (Iodine, Bromine, Chlorine and Fluorine) into the gas filling, a remarkable effect occurs. Halogens react with the tungsten, boil off the filament, and hold the tungsten in the gas thereby preventing the plating of tungsten onto the lamp envelope.

Near to the lamp filament, where the temperature is high, the tungsten halide dissociates replating metallic tungsten back onto the filament. The entire process is variable, dependent upon the initial filling proportions and the temperature of the filament and the envelope walls. But a properly run tungsten halogen lamp can produce between 20 and 25 lumens per watt for an average life of 2,000 hours.

Tungsten halogen lamps are optimised to achieve their high light output and long life when run at their rated voltage. Operation at lower voltages causes less filament heating which disturbs the delicate balance of the recombination cycle. The most usual effect is that tungsten is rapidly plated onto the outer envelope, seriously reducing light output. Provided this effect is not allowed to continue for too long it is



New company in the market

ILP Electronics is a new company in the lighting transformers for low voltage lighting market. Two of the company's major product lines are electronic and maintenance free transformers.

The new electronic transformers introduced by ILP Electronics for low voltage lighting are slim with a choice of rectangular or circular cross sections. The circular versions have only a 32mm diameter and are slimmer than the MR11 (35mm) reflector lamp, so access can be made via the luminaire ceiling cut-out.

The company's transformers incorporate custom designed semi-conductors said to give optimum performance and a double sided through hole plated printed circuit board said to enhance reliability. The transformers are

reversible by operating the lamp at its rated voltage for about 15 minutes, which allows the recombination cycle to re-establish and remove the excess tungsten from the envelope walls.

designed for a maximum ambient temperature of 60°C and carry a two-year guarantee.

A soft start characteristic helps to extend lamp life. The power range from 20 to 105VA is achieved with regulations of $\pm 2\%$ and a power factor of approximately 0.98. The units can be used with all standard domestic and hard fired dimmers. RFI suppression is in accordance with EN55014, BS800 and VDE0875.

The company's maintenance free range (MF) is compact in design and has an ergonomic connector and clamping layout for easy installation. The units have auto-resetting, short circuit and overload protection and are built to Isolation Class 2. A thermal cut-out on primary circuits provides protection against transformer overheating – this is also auto-resetting. The set up is said to ensure that the transformer and any wiring is fully protected at all times. **Reader Service No. 225**

Continuous flashing, where the lamp is only on for a short time, should be avoided as this does not allow the temperature regime for the recombination cycle to establish itself and can lead to severely shortened life.

Voltage variation sensitivity is not normally a problem provided the transformer producing the low voltage supply is accurately matched to the actual mains voltage occurring on site. Wound conventional transformers for low voltage use should have enough close taps on the primary side to ensure that the output to the lamps can be matched.

All low voltage lamp manufacturers warn of the sensitivity of their lamps to voltages other than rated supply volts, because of the effects of prolonged low voltage, and over voltage – which results in shortened life due to over temperature of the filament and resultant rapid deterioration.

Dimming systems operate by reducing the effective rms voltage supplied to the lamp. If dimmed for long periods, low voltage lamps will exhibit envelope blackening and, if this is allowed to continue, will result in a reduction in lamp life. It is therefore important on dimming applications of low voltage lamps to consider the need to run them for 15 minutes at full voltage at regular periods to ensure that adverse effects are minimised.

Only hard fired fluorescent type dimmers should be used for low voltage lamps, the dimmers

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Reader Service No. 17

for mains GLS lamps are not suitable as they will not fire correctly when feeding a highly inductive circuit, such as a transformer feeding a low voltage lamp.

The supply to low voltage lamps must be derived from some sort of voltage reduction device. Initially these were conventional wound transformers but the market has recently seen an increase in the use of electronic transformers.

Electronic transformers have the advantage that stabilising circuitry can be built into the units to ensure that optimum lamp voltage is maintained over a wide range of supply voltages, and most electronic transformer manufacturers claim better lamp life using this type of unit. Further gains in life can be realised by soft starting the lamps.

Conventionally the voltage is applied to the lamp with a very rapid rise time. When the filament is cold its resistance is at the lowest, which results in a very high initial inrush current. This is one of the factors which limits the life of a lamp; nearly all filament lamps fail on initial switch-on when the high inrush current causes the weakest point in the filament to fail.

Conventional wound transformers provide little or no effective

luminaires, particularly in small track systems, this is a major advantage over heavy wound copper and iron transformers.

In examining the dimming of low voltage lamps a further consideration must be made. The effect of a good quality dimmer when operating through a wound transformer is not likely to be of concern, and most manufacturers of dimming controllers are quite happy for them to be used in conjunction with low voltage lamps.

The same cannot be said of dimming controllers when used in combination with electronic transformers. In a straw poll which we conducted, the advice from both dimmer and electronic transformer manufacturers ranged from "no problem" to "not under any circumstances" via "it depends on the dimmer/transformer". Our advice to anyone contemplating such a combination would be ask both manufacturers for a written assurance. Some manufacturers feel that the combination of anything other than very carefully selected combinations could lead to severe reliability problems.

The lighting industry is currently addressing the vexing question of the EEC requirements for electromagnetic compatibility (EMC). This is the ability of a product to function correctly in electrically noisy environments and not to add electrical noise to the environment. Requirements fall into two main areas of concern; generating noise onto the distribution system (the electrical mains) which may affect other products, and generation of noise radiating into the space around the device.

EMC concern

The draft proposals have been circulating for some time and most people should be aware by now that since January 1st 1993 all products sold or installed within the EEC should meet the requirements for EMC.

Of direct concern in low voltage applications is the fact that electronic transformers and dimmers both produce EMC and need to be evaluated with regard to the new requirements. The leading manufacturers have already conducted the required testing and, providing the dimmers are used following the manufacturer's guidance, no excessive EMC will result.

Electronic transformers have one more factor which has led to their widespread use; they are very lightweight. For suspended

Products which conform to the

EEC directives are marked with the CE mark, but in the transition period up to 1996 compliance to existing national standards is deemed adequate.

The manufacturers of electronic transformers are in a similar position in that leading exponents of the technology are well versed in EMC testing and the leading manufacturers products will be able to demonstrate compliance.

Outside the limits

No one we spoke to was in a position to comment on the likely consequences, as regards EMC, of possible combinations of electronic transformers and dimmers, but the opinion seems to be a combination of separate dimmer and electronic transformer which were both within the EMC limits when tested independently are not likely to be within limits if tested together.

It is clear that manufacturers of complete luminaires will need to test their products to ensure compliance, but as a substantial proportion of low voltage equipment is bought piecemeal, who will ensure that any combinations of

equipment meet the new requirements?

Considering the difficulty of ensuring a reliable combination, it would be a very brave person who supplied such a combination. The EEC directive on EMC places responsibility on a director of a company who is required to issue certificates stating compliance with the directive for each product.

The directive applies to all electrical products including one off installations. We would therefore recommend that installers pay particular attention to the effects of combinations of control gear and transformers from different manufacturers as they will be responsible for ensuring their compliance.

The light at the end of the tunnel is that some of the leading manufacturers we spoke to were considering the development of a combined unit, a dimming electronic transformer, which would overcome the problems mentioned.

In summary:-

● Low voltage lamps are voltage sensitive.
● Wound transformers should be suitably tapped.
● Electronic transformers extend lamp life and are voltage tolerant.
● Electronic transformers are lightweight.
● Dimmed lamps should be periodically cycled to full voltage.



The interior of the new visitor centre at Fountains Abbey, illustrating Aktiva's new low voltage display lights in use on the ceiling and incorporated into the shop fittings.

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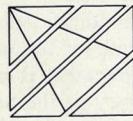
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Richard Forster looks at the components that go to make up a lighting system, with an emphasis on the role of the transformer

Sum of the parts

Lighting for the end user is an illuminated environment suitable for a specific visual task to be carried out efficiently, safely and in reasonable comfort. The lighting installation is the positioning of selected equipment within the space to achieve this result.

Luminaires are rarely examined in detail and many users do not appreciate that lighting fittings are an assembly of disparate materials and components frequently manufactured by different and independent organisations.

Every luminaire must contain at least one light source so a lamp maker is a fundamental component supplier. Lamps are made from materials not common to other consumer industries and most lamps are in high demand. The lamp makers have specialised manufacturing equipment dedicated to the mass production of light sources. This is why there are only relatively few major supplies of these products, as high development costs and manufacturing investment are required in order to be competitive.

Common Standards

Most lamps are global products and the same types available from different manufacturers are compatible, conforming to widely accepted international specifications. The manufacturers will each claim their version is more durable or of better quality, but the consumer can be assured of choice without concern of mismatch with the luminaire.

This highly disciplined standardisation extends to the lamp holder which is a highly specialised component. Performing the vital role of electrical connection and mechanical support of the lamp it has to function within the confines of the luminaire without reducing the life of the lamp. There are thermal problems to resolve, together with electrical insulation suitable for high starting voltages, and the device must still enable the easy replacement of the lamp with maximum

safety.

It is at this point that the global standardisation of the lamp changes to meet more local market needs. The American Mogul screw base is 1mm different from the European Goliath Edison Screw (GES), and closer to home the Bayonet Cap (BC) is still the UK norm compared with Edison Screw (ES) for the rest of Europe. The reason for such differences goes back to a time when manufacturers placed greater importance on their domestic market.

Change of use

However the same cannot be said for the two fragile pins (GX5.3) on the low voltage dichroic reflector lamps. The reason here is only to clear. The use of the product changed. Originally the lamp was designed for the illumination of such devices as microfilm projectors.

Light had to be focused onto a small area of plastic film. The lamp was supported by its rim and this provided accurate register with the film plane. As the films were temperature sensitive the dichroic reflector coating was beneficial in removing heat. Finally it was more convenient to access the lamp from the side rather than the front. The two pins at the rear of the lamp served only as the electrical connection via a simple bi-pin holder with a flying lead. This allowed good ventilation from an internal fan to keep the lamp and the microfilm to within acceptable limits.

It was only later that this type of lamp was considered for general display lighting. The bi-pin lamp holder now had to serve as both the electrical connection and the mechanical support for the lamp. The lamp holder was contained in a small unventilated space and subjected to the infrared radiation passing back through the dichroic reflector coating. Luminaire manufacturers heeded the temperature limitations but with this lamp base the margin for error was small as the product was used in a manner never originally envisaged.

For front loading luminaires using these very compact but high current carrying lamps there was no ideal lamp cap available. The idea originated not from the established display luminaire manufacturers but from small, innovative companies new to lighting. They had little established communication with the lamp makers and thus the problem grew and only recently has a fully engineered solution appeared with the twist and lock concept borrowed from fluorescent starter switches.

This article is written with the aid of hindsight and clearly there was a solution available; the problem, however, was not recognised early enough. This is a case where separate component makers did not come up with the best overall solution, but offered a compromise.

When single ended compact metal halide lamps were first considered the problem of the best lamp base and holder was tackled from the outset. The motivation was simple as the innovation was coming from the lamp makers. Their new products were not going to be accepted by luminaire manufacturers unless there was a suitable lampholder, which there was not. So co-operation with the lampholder manufacturers and the G13 was developed which is widely used for this type of lamp. The pins are 1mm further apart than the standard bi-pin array for fluorescent tubes thus preventing any misuse of an existing base for a purpose not intended. In this case communication was good because the problem arose from within the recognised lighting development process.

Compatibility

Control gear for discharge lamps and fluorescent tubes has one prime aim; the optimum operation of the lamp. The shape and form of the gear may vary in order to suit the demands of luminaire designers and differing environmental conditions. However there are compatibility problems and

these arise for two reasons. Firstly when a new lamp with different operating characteristics first appears there is no suitable control gear. Rather than extend the development period it is often considered expedient to adopt the closest available solution from existing gear components and accept some compromise in lamp performance. The commercial arguments are strong. The new product will be on the market earlier, no additional development costs, and the use of proven components. All too often this is followed by a second development phase when the control gear manufacturers are better able to judge the popularity of the new lamp type. Specific components for the lamp become available which optimise the performance of the lamp.

An example is the 400W metal halide lamp which originally operated with a circuit using a ballast for 400W high pressure mercury lamp. The metal halide lamp although nominally 400W actually operated at about 375W. Since then the use of high pressure sodium lamps has increased and the better solution is to operate the 400W metal halide from a SON type ballast by which the lamp runs much closer to its nominal rating with a higher light output. It is now possible to have one lamp with two performance levels depending upon which control gear is used. Both types of gear will claim to be suitable for the same lamp. Confusing is it not?

Why is the control gear not clearly marked? This is not a lax attitude by the gear makers but the problem of global standardisation. The official standards take time to draft and to be ratified, certainly longer than it takes a manufacturer to commercially launch a new product. Consequently these standards tend to reflect the products already available and with wider tolerances than required to guarantee optimum performance.

In an ideal world a system of product identification which would enable compatibility between control and lamp is desirable. However it is unlikely to come about unless attitudes and legislation regarding proper maintenance of lighting are changed. Although we are now entering a single European market the naming of lamps is still not a simple matter eg the following

four references are all for the same fluorescent tube.

F20W/CW
F20W/33
L20/20
MCFE 20W/33

References originally intended to indicate compatibility are now being distorted to become individual branding products. If this marketing practice becomes widely used then it places the onus on those manufacturers to state clearly how and where their products can be used. Without such information the judgement regarding 'fit for purpose' is left to the consumer, a point which most manufacturers would be reluctant to concede.

Customers should ask for clear guidance as to the compatibility of components such as lamps and control gear, but in return the manufacturers should not have their specified product substituted by another with no assured compatibility simply because it was offered at a better price.

Integration and Separation

Control gear for discharge and fluorescent lamps is usually built into a luminaire. The specification of the control gear is by the luminaire manufacturer and the complete unit is likely to be tested before release for sale. The consumer is therefore purchasing a proven set of components.

Low voltage display lighting may not exist as an integrated package before installation. The small size of the light source has encouraged the design of luminaires occupying the minimum of space and using remotely mounted transformers for the low voltage supply.

The combination of lamp, luminaire and transformer may be chosen by the contractor or user and it is unlikely that such a combination will be tested before purchase. The end user simply assumes that the components are all compatible.

The two common sizes of dichroic reflector lamp are 35mm and 50mm diameter. The wattage range available in each size can vary by a factor of about four to one. A mis-match of lamp and luminaire could have severe overheating problems.

Assuming the lamp and luminaire are compatible then the loading of the transformer needs to be checked. When this type of lighting started to become popular there was a fashion to use one large transformer to operate several lamps. This made installation simpler and reduced the capital costs as one large transformer was cheaper than the equivalent number of small transformers.

However it was soon realised that the benefit could be lost unless the transformer had excellent regulation over a wide output range. A unit designed to operate four lamps at the correct voltage would supply a higher voltage causing short lamp life, if one or more of those lamps was not in use and the load on the transformer was reduced by 25% or more.

This situation could easily arise either by selective switching or because lamps had failed and had not been promptly replaced.

Many users were aware of the dangers of over-loading electrical circuits, but assumed there were no such problems in under-loading. Unfortunately low voltage lamps are just as voltage sensitive as their main voltage counterparts. A 5% increase (+0.6V) in secondary voltage will halve the life of the lamps. Such an increase in voltage can easily occur when the secondary load is significantly reduced.

Combine the effects of transformer regulation with variations in supply voltage and volt drop in

secondary cabling, and performance can be subject to considerable variation. Today the trend is towards individual transformers for each lamp either as an integral part of a luminaire or with a fixed flying lead connection. This approach ensures more consistent voltage reaching the lamp and removes the reliance of use is thus built into the equipment rather than relying upon electrical expertise from the consumer. The value of the fail safe philosophy increases as the market for such light broadens and now encompasses the domestic and DIY sector.

But transformers have one major problem for this form of compact display lighting. The lamps are small and this has proved to be one of their most popular features. Transformers, on the other hand are bulky and heavy, so although integration of the components is technically desirable, they can negate the key design objective of miniature scale. Consequently there are many luminaires available which require separate transformers.

Help from Outside

To meet this demand there is growing number of specialist component manufacturers, not all of whom were previously in the lighting industry. Although their knowledge of light sources may be less they have brought valuable skills of design and production which have been beneficial to the end user.

The concept of small is beautiful is relatively new to lighting but has dominated electronics for many years. And it has been electronics that have solved many of the problems linked with low voltage display lighting. Size and weight can be dramatically reduced. Electronic circuit boards give much more freedom regarding the shape and space that they occupy and this has been welcomed by the luminaire designers.

Previously anything that was not of toroidal or cubic form meant sacrificing performance of conventional wire wound transformers. Now it is possible to have a slim cylindrical transformer which is of narrower diameter than the 35mm lamp and weighs only 170 grams, compared with almost seven times that weight and four times the volume for wire wound transformer of equal output load.

But reduction in size is not the only benefit available from electronic transformers. It is possible to incorporate controls that improve the regulation and limit the variation in secondary voltage due to fluctuations in supply.

Filters can be added to restrict the effect of high voltage transients that can occur in both industrial and commercial installations with the wide variety of electrical equipment used today.

Soft starting can be provided that minimises the thermal shock when first switching on a cold filament. The reduced resistance of the cold tungsten means an initial current surge which can be as much as twenty times the steady running condition unless this overload is specifically contained.

The control of lighting by dimmers is a common requirement for both electronic and wire wound transformers and although the situation is improving some dimmers aimed at the domestic market will not operate low voltage lighting satisfactorily. As the market expands most dimmers now indicate which lamp types can and cannot be used.

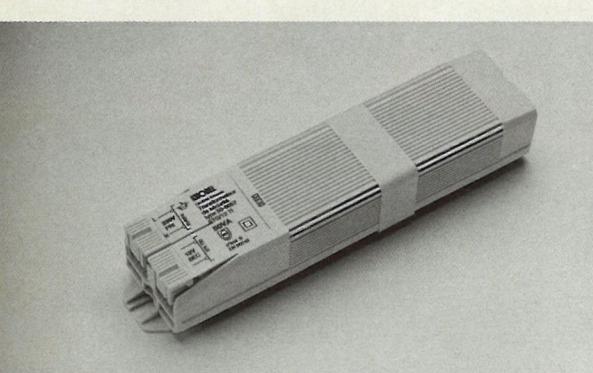
There has been some concern about the dimming of tungsten halogen lamps because it may affect the efficiency of the halogen cycle. In practice this does

continued on page 18

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Lighting Equipment News, March 1993

Transforming the future

John Kears, technical manager of Smart & Brown Ltd, looks at the future use of transformers in low voltage lighting

Small 12V tungsten halogen filament lamps have been widely used for many years in the automotive industry where power supplies are derived from battery or alternator equipment. Over the past few years, however, these lamps have been used increasingly in display and decorative applications where power must be drawn from the normal mains a.c. supply system. To operate the lamps from this supply requires a transformer to reduce the voltage from the nominal 240V or 230V down to the recommended 11.4-11.8V. This voltage is critical if good life and acceptable lumen output is to be achieved. Choice of power supply is therefore very important to ensure optimum lamp performance.

Transformer power supplies can be subdivided into two main groups, electronic and conventional, each of which can be either integral with the luminaire or remotely mounted. The choice between these two groups requires careful consideration of many factors.

Reliable and low cost

Conventional transformers operate the lamp at a normal mains frequency of 50Hz and are constructed from laminated steel cores with enamelled copper windings. There are two main types which are in common use, standard 'E' cored and toroidal cored. The latter type is becoming increasingly popular due to higher efficiencies and lower audible noise levels.

Conventional 'copper and iron' transformers offer excellent reliability and lower unit cost, however they suffer from the disadvantages of heavy weight and inflexible shape.

Electronics, on the other hand,

offers the fitting designer greater flexibility on shape and size, which is important where the transformer is to form an integral but unobtrusive part of the luminaire design. Electronic transformers operate the lamp at a frequency of around 20-40kHz. The circuits used are very similar to those which are in common use in power supplies for computers and other instruments but without the rectified output. The use of electronics also allows additional features to be integrated into the basic circuit topology. Features such as short circuit protection, dimming, output voltage regulation and soft starting of the lamp are becoming increasingly common.

The greater electrical efficiencies offered by modern semi-conductor switching devices produces lower operating temperatures and improved circuit reliability. Earlier reliability problems which dogged the electronic transformer have now been overcome, although in common with any electronic equipment great care is needed in managing the thermal performance. Modern aids such as infra-red imaging cameras and computer modelling techniques are here to assist the designer in overcoming such problems.

Manufacturing technology in the electronics industry has made exceptional progress in the last decade. The use of surface mounted electronic devices (SMD) allows more compact circuits to be produced at high production rates. Environmental Stress Screening (ESS) can identify potential problems and weaknesses before the end product leaves the factory.

Conventional transformers will continue to find favour in low voltage lighting application where

A low voltage transformer undergoes testing.

they offer good value for money solutions. However, leading edge technologies are likely to open up new opportunities in this field. The integrated electronic transformer is a real and exciting possibility for the future.

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Reader Service No. 27

It's time to insist on high quality components, suggests John York

The difference between high and low

Commercial factors make it inevitable that the design and manufacture of lighting transformers is a compromise between quality and cost." Not an easy examination question. However, many of the design factors affecting the quality of lighting equipment also affect the safety of that equipment.

For instance, what differentiates high from low quality components such as fuseholders and terminal blocks – both found frequently in lighting equipment? Mainly that they are designed in

such a way as to minimise the possibility of poor contact or arcing leading to a potential fire risk. So, often in this type of equipment, for quality read safety. Therefore, can we allow commercial factors to affect the safety of equipment which, by its very nature, is found in areas frequented by the public?

Admittedly, in most cases the majority of equipment functions quite satisfactorily and any money spent on improved quality might be regarded as 'wasted'. However there are cases which, though rare, illustrate the need for the levels of protection built into

high quality units. I came across an instance where transformers were shutting down for no apparent reason. On inspection it was discovered that in parts of the ceiling space the air temperature was 90°C. In other cases transformers are found to have been installed wrapped in a 'tea cosy' of loft insulation material. These examples indicate the sort of hostile environment which lighting transformers must safely tolerate.

Whilst most units incorporate some sort of thermal protection, this is not always enough considering the host of adverse circumstances which tend to conspire against the achievement of trouble-free installations. The following is a thought experiment showing what might happen as a result of such a conspiracy.

Imagine the scene. A jewellers store closes at 6 o'clock and the staff go home. The lights are left on to deter burglary and encourage window shopping. Meanwhile, in the ceiling void all is not well. A short circuit develops in a bulb fitting and instead of 4A flowing in a transformer output lead, 34A is flowing. The primary thermal cutout is situated on the outside of the winding and therefore does not immediately sense the very high temperature developing deep within the transformer. The output lead is also becoming very hot. Will the ther-

mal trip operate before the winding fails catastrophically or the output lead damages the surrounding materials?

What would be the consequences of the primary winding's failing catastrophically? The protection in the mains should detect this and disable the system. But suppose (say to avoid nuisance tripping at switch-on) the protection system has been rendered less effective by the replacement of fuses or circuit breakers with one of a higher value or different time/current characteristics (by no means unheard of). The thermal trip may be damaged by the mains short circuit current, failing closed. Thus we may be left with an unprotected device in the ceiling of our hypothetical building.

So why was the transformer able to fail in this way? It incorporated a thermal cutout; one would expect this to offer protection against excessive temperature. The technical reason is that, in some cases, thermal protection alone is not sufficient to protect against short circuit. Current sensitivity may also be required. The underlying reason is that the unit did not comply with the relevant safety standard.

The above example may seem unlikely – it is. However when one considers the number of such units which are and will be installed, the unlikely must be allowed for. Even when an instal-

lation has, as is usual, been correctly specified and fitted, any party down the line – from manufacturer to end user – may, unwise, feel it expedient to change the nature of the mains protection system (nuisance tripping being a likely cause). Therefore the transformer should be designed in such a way as to protect itself from the abuses of the outside world. It is this amongst other things which is measured and assured by testing to a safety standard.

Some transformer manufacturers may balk at the thought of having to supply goods which conform to a standard, supposing that the customer will not pay the higher price implied for higher quality. This raises two points.

Ease of manufacture

Firstly, products designed and manufactured to a safety standard do not have to cost much (if any) more than non-conforming units. If the object at the outset of the design process is compliance with standards, steps can be taken when specifying materials, protection, clearances, construction methods etc, to ensure ease of manufacture. It makes sense to design with standards as the starting point rather than to react to any customer requirement for safety standards when a unit is already in production. This can be expensive.

Secondly, some manufacturers

may need to educate their customers regarding the virtues of buying high quality products. Benefits such as reliability, ease of export and safety can be put forward as reasons for spending slightly more.

This is a pressure towards quality which may be exerted, albeit lightly, by the manufacturer down the purchasing line. By far the stronger pressure is that which may be exerted by the end customer back up this line. Surely these benefits of reliability and, above all, safety should persuade the customer to insist that any units fitted on their premises comply with relevant standards. The cost to a business of having to suspend operations during the replacement of faulty lighting equipment must far outweigh any initial savings made by purchasing 'cheap and cheerful' equipment.

To buy a British Standard approved item does not, in itself, guarantee flawless quality. Not even systems such as BSI Kite Mark and BS5750 can ensure this. But any manufacturer who sells goods tested to a safety standard is saying something about its approach to quality that other companies are not.

In a perfect world the answer to my initial question seems self-evident. It remains to be seen for how long quality is allowed to be compromised by purely commercial considerations.

edge of the materials and the relevant manufacturing techniques may already be in the hands of others. Also it can be hard for major lighting procedures to recognise change and to react positively rather than to adopt a defensive attitude of the status quo.

There is the benefit of wider knowledge, linked with better choice when separate component suppliers exist, but for the end user lighting only has a value which is based upon the performance of the total package. If using a combination of lamp, gear, and luminaire means stepping into the unknown then the user is going to favour those tried and tested combinations.

On balance the role of component manufacturers is to be welcomed with hope that all producers will recognise the importance to the end user, and benefit to all, of clear identification of compatibility.

continued from page 16

not appear to be a significant problem for display lighting. The dimming usually reduces the filament temperature to such an extent that the evaporation of tungsten is much less and bulb blackening is reduced so the cleaning cycle is not important.

Circuit protection is vital and transformers must be protected in the primary winding by either an anti-surge fuse or a current sensitive device. The latter can incorporate protection against overload and over-temperature condition. It is usually self-setting and built-in. For multi-lamp transformers secondary fusing per lamp offers protection from overloading and short circuit and any outage will be restricted to one lamp.

Noise is a performance criterion not often mentioned in manufacturers' data sheets. Where the product is used in busy commercial premises noise is unlikely to

be a problem. However as this form of lighting moves into quieter locations such as libraries, museums and churches, noise may become intrusive. This is another example of product diversification where changed performance demands arise. The original low voltage reflector lamps and transformers were part of a fan cooled projector where noise was not a lighting problem.

Temperature sensitivity on the other hand has always been recognised. When the lamps moved away from the projector environment the conditions were often assumed to be similar to the occupied lit space at about 25°C. However the ingenuity of positioning low voltage lighting, and of positioning of the transformers out-of-sight, meant local ambient temperatures were much higher. Consequently transformers will operate in ambient temperatures of 60°C.

Radio interference suppression

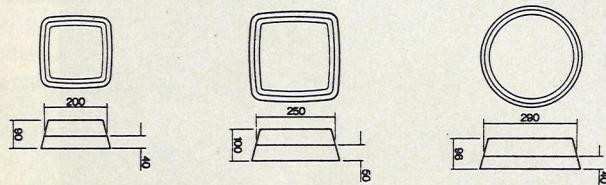
is important for all transformers and those manufacturers producing radio and television components have had experience valuable to the lighting industry. The convenient size of low voltage lamps means they are often in close proximity to parts of the electrical system not encountered by conventional ceiling mounted lighting.

The role of the specialist

The role of specialist component manufacturers has both benefits and disadvantages and their impact varies with the market sector. In some areas the experience over many years by established lighting manufacturers makes entry by new organisations very difficult. But for those markets where change involves techniques and materials new to the lighting industry, then the established lighting companies have no such advantage. In fact they may be at a disadvantage as knowl-

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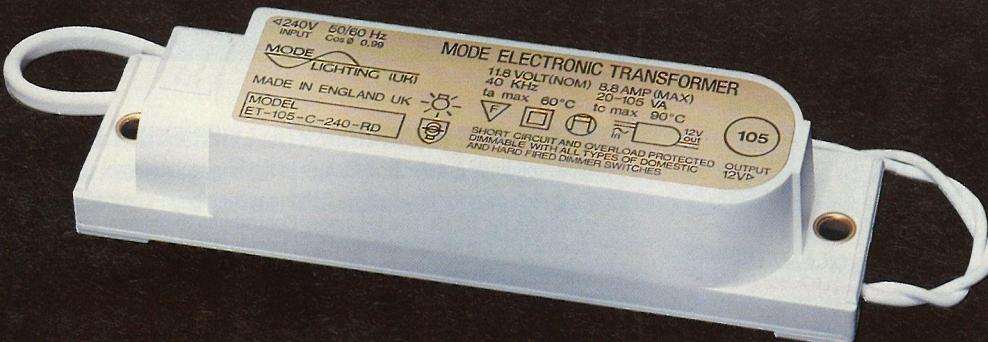
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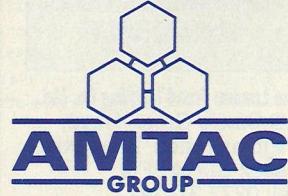
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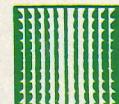


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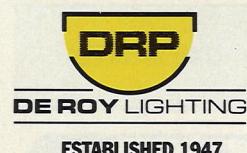
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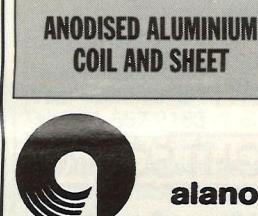


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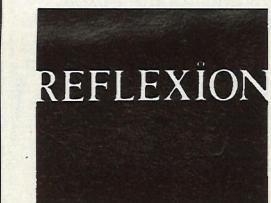
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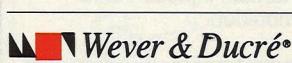


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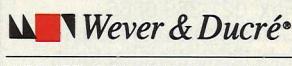
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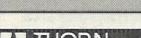
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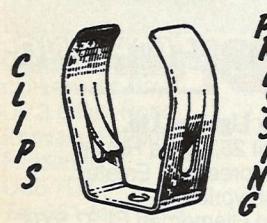
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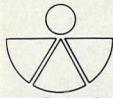
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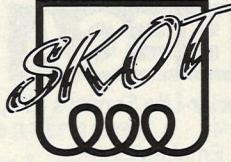
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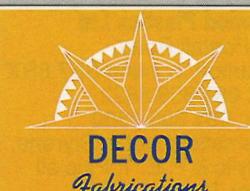
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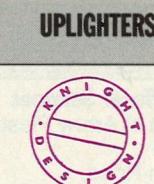


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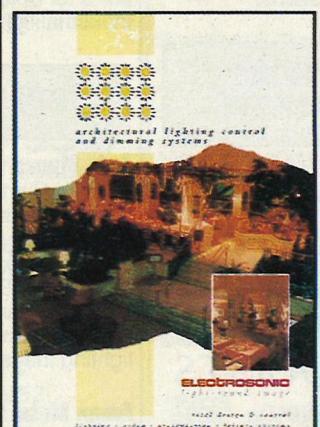
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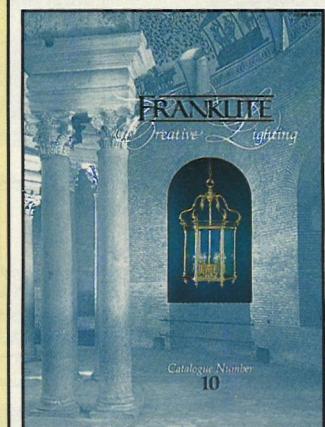
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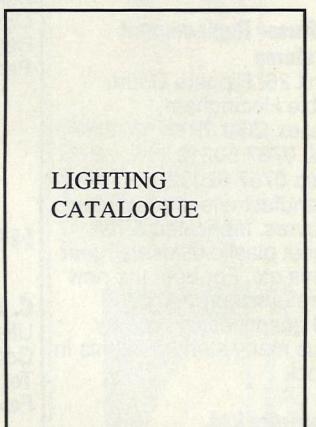
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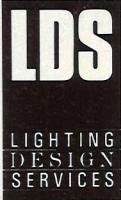
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Please write with full C.V. to the: MANAGING DIRECTOR - LITETRONICS (U.K.) LIMITED, Unit 29 Moorlands Industrial Estate, Law Street, Bradford Road, Cleckheaton, West Yorkshire, BD19 3QR.

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Major decorative lighting company wishes to recruit experienced sales professional to promote the sales of its products in the West of England from Bristol to Birmingham.

Candidates will ideally be aged between 25-40, have a successful career in selling directly to retailers and be conversant with the UK domestic lighting market.

This is an exciting opportunity for a determined, self-motivated individual with the confidence and approach to achieve credibility in a highly competitive market place.

An attractive salary plus commission will be paid, together with a car and usual benefits.

Please apply in writing enclosing a full CV to:
Box No 1548, Lighting Equipment News, Maclean Hunter House, Chalk Lane, Cockfosters Road, Barnet, Herts EN4 0BU

LIGHTING TECHNICIAN

As part of our continued expansion De Roy Lighting, a progressive manufacturer of aluminium louvres and plastic diffusers, require a Lighting Technician to deal with customer enquiries, specifications and quotations for aluminium louvres and reflectors. A knowledge of CIBSE LG3 guidelines is essential together with an ability to use CAD systems.

Please apply in writing, enclosing a current curriculum vitae to:

Mr John Harrison - Managing Director
De Roy Lighting (Est. 1947)
North Moors, Slyfield Industrial Estate, Guildford, Surrey GU1 1SE

SALES REPRESENTATIVES-CENTRAL ENGLAND

To meet the increased demands for the Castaldi and Alter ranges together with that for own emergency lighting equipment we need a Sales Representative with demonstrably successful contacts with architects and specifiers as well as excellent knowledge of the contractor and end user markets.

Send C.V with past results and salary levels to

Lisa Frost,
Matalex, Waterloo Road,
Bidford on Avon, Alcester,
Warwicks B50 4JH.



Our client L.D.S. is a specialist division within Senate Electrical Wholesalers Ltd, they provide a comprehensive specification and design service on a complete range of industrial, commercial and retail lighting products. Due to continued expansion they are seeking to appoint experienced Lighting Sales Engineers now for London, East Midlands and East Anglia with other areas of the country to follow.

You will be responsible for generating new business with Specifiers, Contractors and end users as well as developing relationships with existing clients.

You must have solid, broadly based sales experience gained in the lighting arena with a successful track record of achievement. Of equal importance is self motivation and the ability to deal with people at all levels.

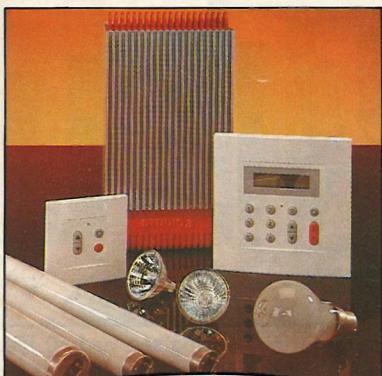
All interviews will be held with the client but in the first instance, to discuss in confidence, telephone Ron Watson, quoting reference number 224, on

071-383 2553

Professional Pre-Selection

071-383 2553

'Studio 3' A system which knows when its time to turn the lights down low...



NOW ON DISPLAY AT THE BUILDING CENTRE, 26 STORE ST., LONDON WC1E 7BT.

Home Automation

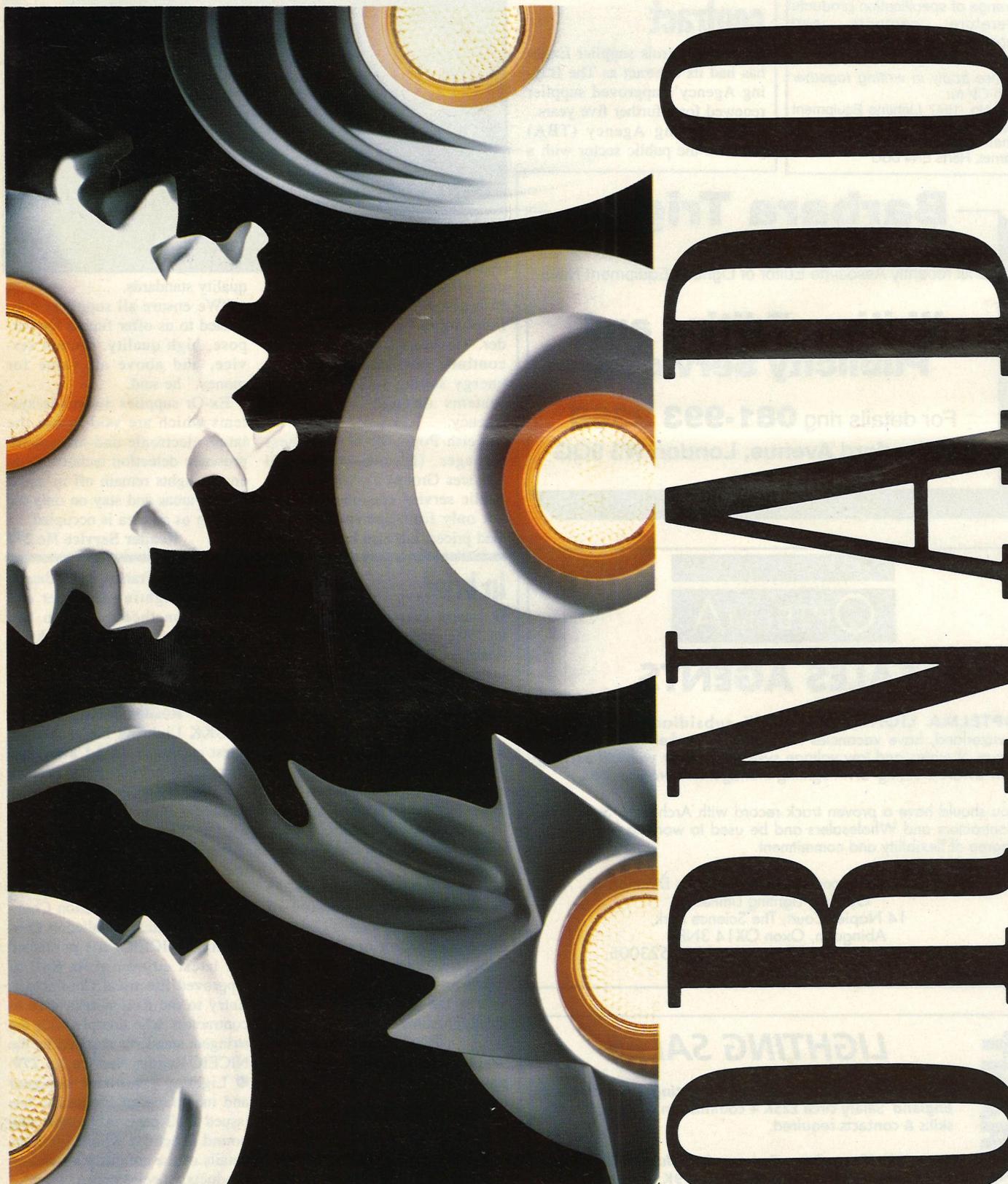
Home Automation Limited, Bumpers Way, Chippenham, Wiltshire SN14 6LF

Tel: 0249 443422 Fax: 0249 443315

DETA



Reader Service No. 31



TOTALLY DIFFERENT

For information on TORNADO'S SOFTFORM LV range and other lighting products call us on 081 788 2324.

Reader Service No. 32

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IMAGINE a system which is user friendly allowing you to control various lighting scenes in one building at the touch of a button. A system which is so innovative it won the **Electrotech Award** for technical excellence.

IMAGINE a lighting control system which can be programmed to give preset lighting levels, with up to 36 different scenes. A system which can create the right mood in the workplace, hotels, museums, art galleries, clubs and window displays, in fact anywhere.

IMAGINE a system with a 45kW capacity, where the control circuitry is just **two 12v wires**.

Studio 3 is all you've ever imagined.

Studio 3
SCENE SETTING PROGRAMMABLE
LIGHTING CONTROLS

Low power at National Power

Alpa Lighting of Woolwich has recently completed a project at the new National Power headquarters in London, installing 4,500 specially designed air handling luminaires supplied in a non standard colour to complement the Gema 330 ceiling system.

In addition, Wattwatcher low loss ballasts coupled with Pulse-starter electronic starters from Arlen Electronics were incorporated into the design.

The lighting load is said to have been reduced by 13kw as a result of using low loss rather than standard ballasts. The



Wattwatcher ballasts, by virtue of their low power consumption, are also said to offer significantly lower operating temperatures and vastly increased life expectancy

Reader Service No. 282

New electrical show launched

A new biennial exhibition aimed at electrical contractors, installers and specifiers has been launched following six months research and consultation with the industry.

The International Electrical Show for Contractors, Installers and Specifiers (INTELEC) will be held for the first time at the National Exhibition Centre, Birmingham, from Sunday 23 to Wednesday 26 January 1994.

The six month research programme found that the majority of companies wanted an event clearly targeted at electrical contractors, specifiers, installers and architects. And January was considered the most acceptable time by both exhibitors and buyers.

Space will be on sale at £125

per square metre with no premiums for double decker stands. Benefits for visitors will include free admission, free car parking, free catalogues, a fully carpeted show and 'well thought out' catering and lounge areas.

INTELEC will be organised by a consortium operating under the umbrella of Spearhead Exhibitions Ltd and Strategic Events Ltd. Chief executive of INTELEC Andrew Salmon said that the organisers intended to work closely with exhibitors via an industry advisory committee and industry publicity committee to ensure that a high profile international visitor promotion campaign harnessed the energy and expertise of the industry.

Reader Service No. 283

Stocking up on Bega

The British Distributing Company (BDC) can now supply Bega lighting directly from stock held in the UK, due to a distribution agreement signed with Con-

cord/Bega. The products ordered from BDC will be covered by a Concord/Bega warranty.

Reader Service No. 284

Conferring about change

Era Technology's second conference and exhibition on lighting will take place at the Heathrow Penta Hotel on Wednesday 26 May.

The conference is intended to provide equipment users, designers, installers, manufacturers and specifiers with the opportunity to discuss some of the key issues arising from recent changes in the lighting industry: safety, EMC,

supply distortion, pollution, waste disposal, the environment and market requirements.

Special attention will be given to the implications of new lighting regulations, standards and methods of enforcement; environmental issues; control solutions; and lamp technology. The event has the support of the Lighting Industry Federation.

Reader Service No. 285

LIGS News

The Lighting Industry Golf Society (LIGS) held its AGM and dinner on 9th February at the Royal Air Force Club. The outgoing captain, Gordon Sugden, presented the captain's trophy for 1992 to Tony Smith of Kirkham Ltd. Captain for the 1993 season is George Yendell, while Jon Butler of Staff Lighting is vice-

captain for the year.

Meetings for 1993 include: 29th April - Denham Golf Club, 9th June - Camberley Heath Golf Club (guest meeting), 29th July - Wildernesse Golf Club and 16th September - Highgate Golf Club.

The Society always welcomes membership applications from golfers with a current club handicap, who should contact Hon. Secretary Tony Smith on 081 361 3893.

IN YOUR NEXT ISSUE

Next month we'll be taking a look at some of the things visitors to this year's Hanover Fair will be able to feast their eyes on. And for

those of you not going to the Show, there'll be a number of articles in addition to our regular sections.

Lighting Equipment News, March 1993