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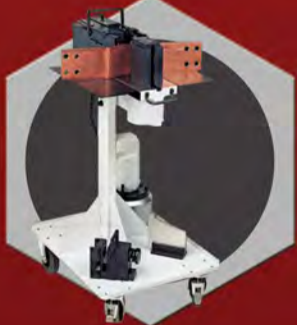


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## INDUSTRY STALWART SERENADED



On his 60<sup>th</sup> birthday, the owner and managing director of ACDC Dynamics in Edenvale, Mario Maia, was surprised by his staff - who were assisted by Mario's wife, Guida - and presented with a huge birthday cake. He was escorted onto the balcony outside his office where, to his amazement, 250 members of staff had gathered below to sing 'happy birthday.'

It is a well-known and often told tale at the company that Mario started the path to ACDC Dynamics by building transformers in his garage; and over the past 30 years has grown the company to a multimillion-rand enterprise. Mario clearly enjoyed his birthday experience and thanked everyone for their loyal service, hard work

and dedication. He then went to each department at ACDC Dynamic's head office to have photos taken with all the staff and personally gave each employee a piece of birthday cake. A pleasant surprise awaited the staff - a small bonus was included in their pay cheques as a token of Mario's appreciation.

## HAPPY HOLIDAYS!



IN keeping with tradition, there will be loads of gifts up for grabs in our Happy Holidays feature in December's issue. Sponsored by our loyal advertisers, these include an LED television set; multi-meters; a bi-metal holesaw kit, VDE pliers and screwdriver sets; lamps and floodlights, a pre-wired DB and a bunch of other goodies. Don't miss your December issue of *Sparks Electrical News!*

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THE ONLY WAY YOU CAN BE THE BEST AT SOMETHING IS TO BE THE BEST YOU CAN BE



Keabetswe Matolong

**KEABETSWE MATOLONG** is the national training manager for the Electrical Contractors Association of South Africa. She's still new to the role, having only started in September, but she is a determined go-getter who tackles daunting tasks with absolute confidence.

These attributes will stand her in good stead as she works to fulfil her mandate, which is to increase the number of learners at the ECA(SA)'s training centres to meet the target set by the Department of Higher Education and Training (DHET) in order to address the shortage of electricians in South Africa.

**Sparks:** Where were you educated?

**KM:** I matriculated from Brebner High School in Bloemfontein and went on to complete a National B Tech Diploma (Office Management and Technology) at the Bloemfontein campus of Central University of Technology. I'm currently busy with a B Tech in Project Management at the Welkom Campus.

**Sparks:** How long have you been involved in the electrical industry?

**KM:** I started at the ECA(SA) in September so it hasn't been very long!

**Sparks:** When and where did you start your career?

**KM:** I started my career in 2009 as an administrator at the Learnerships & Skills Unit at Goldfields TVET College in Welkom. I was promoted to senior administrator in 2013 and was in that position for two years. Towards the end of 2015, I started at Ekurhuleni East TVET College in KwaThema where I was head of department for occupational programmes. I was appointed as the national training manager at the ECA(SA) and started working at the Meadowdale head office on 12 September.

**Sparks:** What are the greatest changes you have seen over the years?

**KM:** On a personal level, I have grown as a person and every day I consciously work at reaching my full potential by achieving my goals and enriching my mind. Technologically, the past decade has seen amazing advancements and the internet has made information instantly accessible. While this does have its benefits, it has made some jobs redundant.

**Sparks:** What major projects have you worked on and what is your greatest accomplishment?

**KM:** It's still early in my career so I haven't worked on any major projects yet although I do believe that my job at the ECA(SA) will involve many major projects and this is very exciting and inspiring. So far, my greatest accomplishment has been the upward growth in my career – apart from my two qualifications.

**Sparks:** Who has been your inspiration or have you had a mentor who has influenced your career?

**KM:** I've been very fortunate to have had Freddie Bosiu, the business unit manager at Goldfields TET College in Welkom, as my mentor. He has given me career guidance and he has encouraged me to study further and to enhance my knowledge in terms of skills development in this country and abroad.

**Sparks:** What, to your mind, is one of the biggest challenges facing the industry at this time?

**KM:** The aging electrical infrastructure in the country is a something that must be addressed. Also, there is a shortage of artisans, which means that we must commit to encouraging young people to enter the electrical industry.

**Sparks:** What do you enjoy most about your job?

**KM:** I enjoy seeing the changes that come with skills development and enriching the minds of the youth while improving their skills. I especially enjoy working with people who are passionate about their work and who are committed to doing their best every day – and I relish every new challenge I have to face.

**Sparks:** How do you motivate your staff?

**KM:** I motivate them to do their absolute best at work and be innovative – and, most importantly, they should work as a team. I always try to lead by example and by being a team player myself.

**Sparks:** If you could 'do it all again', would you change anything? If so, what would that be?

**KM:** There isn't anything I would want to change. Everything has happened the way I have imagined it and I am happy with that.

**Sparks:** Would you advise a person leaving school to enter the electrical industry? And why?

**KM:** There is a dire need for electricians in South Africa and I would advise them to enter this sector – and, once they're qualified, I'd suggest they do a course in business administration and start their own electrical contracting businesses.

**Sparks:** What is your advice to electrical contractors and/or electrical engineers?

**KM:** My advice to electrical contractors is to maintain good record keeping at all times – and to hire personnel who will do this well so that the contractors will have more time to find new business.

**Sparks:** What is your favourite quote?

**KM:** "The only way you can be the best at something is to be the best you can be." – Susan Beth Pfeffer.

**Sparks:** Name three things on your 'bucket list' (things you want to do before you 'kick the bucket').

**KM:** Three things on my bucket list are: To bungee jump from the Namaqua Bridge; to hike in the Drakensberg mountains; and to visit the Portuguese Islands off the coast of Mozambique.

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It has been brought to our attention that a relatively small number – 552 units – of such sub-standard products may have, some years ago, been traded through one of our branches, Globe Electrical in Denver, Johannesburg. The products concerned were allegedly CBI-branded counterfeit circuit breakers and earth leakage units.

Since we learnt of this, we have attempted to trace these transactions but have been unsuccessful in identifying them or the customers who may have purchased these products.

**Although Voltex has no conclusive proof**

**that its branch did trade in these products, this notification is issued as a precaution and in the interests of its customers and their customers.** The transactions, if they took place, would have occurred between September 2009 and November 2011.

We are issuing this notification to ask clients to please return any of these counterfeit products which they may have obtained from Globe Electrical and, subject to reasonable validation that you did indeed purchase the product from Globe Electrical, we will replace them, free of charge, with a genuine product that meets compulsory specifications.

As some years have passed since the products were distributed, they would probably

have been installed and it may therefore take some effort to identify their locations. Because of the safety function that the products are required to perform, we urge you to make every possible effort to locate the products and return them to us.

To assist with the identification of the sub-standard products, CBI issued a poster, which can be found at <http://crown.co.za/images/LatestNews/SparksElectrical/CBI-Counterfeit-Poster.pdf>

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## GRID CONNECTION OF 'EMBEDDED GENERATION'

Elon Musk, the South African-born owner of SpaceX and Tesla Motors has promised that everybody will soon be off grid and using the Tesla 'Powerwall'. Musk's company, Tesla Motors, claims that, "Powerwall is a home battery that charges using electricity generated from solar panels, or when utility rates are low, and powers your home in the evening. It also fortifies your home against power outages by providing a backup electricity supply. Automated, compact and simple to install, Powerwall offers independence from the utility grid and the security of an emergency backup".

There's a kind of magic in this claim, which may remind some people of the thrill of being independent from society and the blank faces that one encounters at supply utilities, such as water and electricity.

However, if you distil it down, the Powerwall is just a battery, made up of lithium-ion cell phone-type batteries, which are connected in series

and parallel and put into a box and hung on a wall. Given time and a soldering iron, I could make you one in a day. The simple fact is that unless you want to have a home that runs on dc power, the Powerwall has to incorporate a dc to ac inverter that can synchronise with the grid if you want to make toast or use the iron.

However, after years of stiff resistance by the general public to any connection to the grid using a generator, solar panel, wind turbine and so on, most municipalities have finally accepted that there are people who would like to generate their own power; and the only stable, reliable way to do it, is to connect it to the municipal grid.

The reasons that municipalities have put up stiff resistance to this concept is one of safety.

If you de-energise a power line to work on it, it would be very unfortunate if the powerline became energised while you were working

on it – and, potentially, this could occur if the power from a private generator (or other sources) was fed back into the grid. This problem is reasonably avoided by adopting the old concept: "Always earth equipment before working on it and the only earth you can trust is the one you can see".

Having accepted that private generation will occur (it is now called 'embedded generation'), there are a whole lot of guidelines that have been published, which contain recommendations from NRS and various municipalities.

This is where the paint hits the carpet.

The NRS guidelines are translated from some or other European language, probably French. Now, French may be the language of love but it's not the language of engineering when it's directly translated into English.

The relevant document is NRS 97-2-3: *Grid connection of Embedded Generation, Part 2: Small-scale embedded generation, Section 3: Simplified Utility Connection Criteria for Low Voltage Connected Generators.*

We read from paragraph 4.6.1 (a): "The proposed criteria ... have been guided by (a) the approached used in other countries and utilities, as informed by work within Cigre ..."

Ah. "... informed by ..." What does this mean? How about: Para 4.6.2 (c): "... the maximum change in LV voltage (due to voltage drop/rise in the MV/LV transformer and LV feeders) due to embedded generators is limited to 3%. This is a common international practice where the generation is variable. This will ensure voltage changes due to short-term variations in generation output are within acceptable limits for example every time there is a cloud transient the LV voltage should not vary by more than 3% (as photo-voltaic output changes). It is important to note that the generation supplies loads that would otherwise be supplied by the utility network ..."

If I had written this, my English teacher, Mr Hugget, would have asked if it was inspired or just made up. Cloud transient ...?

Here is some advice to electrical contractors: Do not confuse yourself by reading these standards. All electrical installations that operate at 50 V or more have to be installed by a registered installation electrician and all have to have a Certificate of Compliance.

Leave the rest to the self-appointed experts but remember, you take the responsibility if it goes wrong.

Oh, and finally, most alternative energy components can't take high voltages. So, if you want to use a high voltage tester to test insulation ... rather don't.

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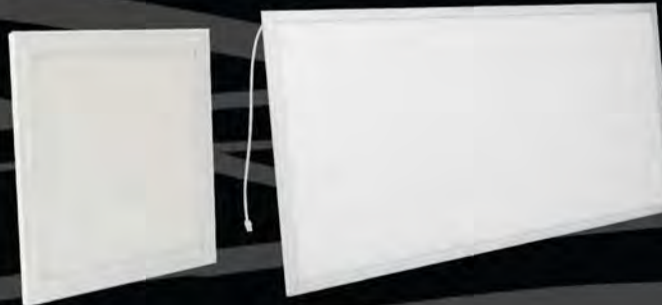
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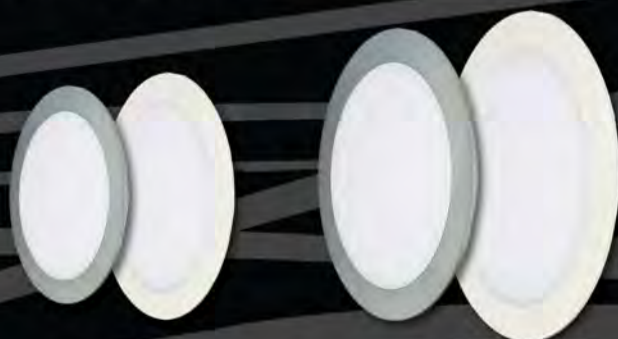
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# Some **FACTS** about plugs and sockets.



✓ ✓  
**Legal and Safe**

The South African SANS164-2 standard allows the introduction of both the 3 pin and 2 pin plug. Here the 'Europlug' (EN 50075) that has also been adopted by the country as SANS 164-5, is shown being plugged into a standard socket. These configurations are both safe and legally used in SA.



✓ ✗  
**Legal but Unsafe**

In this case the 'unearthed' socket, legal in SA and compliant to SANS 164-6, allows the entry of an 'earthed' Schuko plug because of the poor design of the protruding plastic rim at the top of the socket. The consequence of this, may lead to electric shocks as the appliance at the end of the plug requires the protective earth as its safety measure and the installation Earth Leakage Protection may not pick up the internal fault due to the lack of earthing.



✗ ✓  
**Illegal but Safe**

These are examples of the Schuko system (DIN49441) where both the plug and the socket-outlet are earthed. The National Regulator for Compulsory Specifications has banned this configuration for sale or installation in SA in VC8008, for over 30 years. The system is perfectly safe when used correctly, in those countries that allow it.



✗ ✗  
**Illegal and Unsafe**

The adaptor shown has been banned since around 2005. The 'open' two pin sockets are now enclosed in a 12mm deep trapezoidal well. The situation where an earthed Schuko plug can be plugged into this type of 'open' faced 2 pin socket is not only illegal but also dangerous due to the lack of earth connection to the appliance. This raises the risk of electric shock and lack of earth protection for a possible failure of the appliance, which without it, can cause a fire.

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SAFEhouse membership is suppliers' assurance to customers of responsible behaviour and of customers' safety as a priority.

SAFEhouse is primarily a communications organisation that regulates itself and informs customers of safety requirements and occurrences of non-compliance with such requirements.





## HEAVY DUTY PLUGS AND SOCKETS FOR HAZARDOUS ENVIRONMENTS

Although it may be tempting to dismiss certain electrical products as 'commodity items', one sector where this should not apply is industrial plugs, sockets and connectors, says Dirk Holm, switchgear specialist ACDC Dynamics.

"Few people would argue that when it comes to specifying, installing or maintaining these products for industrial use whether in a building, on a construction site, outdoors at an event or outdoor leisure location an awareness of safety considerations is paramount, as well as a clear recognition of fitness for purpose," explains Holm.

"At ACDC Dynamics, we strive to give customers the best engineered solution possible. When the requirement calls for a robust and durable plug and socket solution, nothing compares to our Palazzoli range," he says.

"On-site electrical equipment is at the receiving end of a lot of abuse, whether from the harsh environments it has to endure or simply from misuse by site personnel."

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"Palazzoli's Alupres wall-mounted, heavy duty three-phase 415 V interlock power outlets have been approved for use by London Underground Limited (LUL) and in factories and mines across southern Africa. Engineers and contractors can now specify and install the IP67 watertight aluminium enclosures with confidence throughout their networks - above and below the surface."

The separate supply isolator is mechanically linked or



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'interlocked' within a single unit to the socket, so that a plug can only be inserted or removed once the supply is safely shut off. The AC23/AC3 rated isolator is capable of switching inductive loads at full-rated current (EN609473).

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"This is an important third-party recognition for Alupres, and we are delighted to have our product approved by London Underground under its Approved Product Register (APR), as only the products that have passed through its rigorous approval process can be commissioned for its network," says Lewden's business development manager, Guy Birchall.

"Palazzoli has more than one impressive range," adds Holm. "At the recent Electra Mining show, ACDC Dynamics displayed the two new ranges they are offering to the South African market - the Atex range for protection against explosive and hazardous environments, as well as the Alumax range for applications up to 400 A at 1 000 V ac, with or without earth leakage protection."

For any technical information or application assistance, email the ACDC Dynamics' switchgear department at [switchgear@acdc.co.za](mailto:switchgear@acdc.co.za)

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MARK PALMER - ELECTRICAL APPROVED INSPECTION AUTHORITY SOUTHERN AFRICA (EAIASA)

# REASONABLY SAFE AND THE FUNDAMENTAL REQUIREMENTS OF SANS 10142-1

Continuing with the theme of my earlier columns, this month I'm going to jump ahead and tackle Clause 5.3, Characteristics in SANS 10142-1, placing special emphasis on Clause 5.3.1 - General.

Many registered persons have little regard for the importance of understanding this clause with particular reference to the issuing of Certificates of Compliance (CoCs) for existing installations. As discussed in some detail in my April column, I believe that the term "reasonably safe" as referred to in the Electrical Installation Regulations, is perhaps the culprit here.

As an AIA, we are confronted daily with the inspection and testing of existing electrical installations, many of which were constructed some years ago. It must be emphasised, however, that notwithstanding that the installation may have been constructed 30 or more years ago, there are very few installations that have not undergone any additions, modifications or repairs since the original construction; and herein lies the problem.

The question that should be asked by a registered person when confronted with such an installation is: Which standard or regulation applies to the installation?

Because this part of SANS 10142 is continually updated, problems can arise on which version of the standard will be applicable when a contract is signed.

The confusion created by not fully understanding the principles of the current edition of SANS 10142-1, in particular Clause 5.3.1, manifests itself in many ways. Firstly, registered persons are drawn to notes in the Introduction, which state, inter alia:

*The date of approval of the latest revision or amendment of this part of SANS 10142 will be the implementation date of the revision or the amendment. The applicable version of this part of SANS 10142 is the one with the latest implementation date before the contract date. So contracts signed before the approval of an amendment have to be carried out in accordance with the provisions of the unamended standard.*

In understanding the first part of the notes detailed above, it is clear that this note attempts to deal with "new electrical installation work", especially work which commences after the date of implementation of an amendment, which may have been subsequently published. So, in defining the requirements applicable to that installation, one would look to the provisions of the "unamended standard" for guidance.

The predominant issue that arises, however, is that of the issuing of CoCs on "existing" installations to which additions, modifications or repairs have been effected since the original date of construction. The second part of the note deals with this aspect, i.e.:

*If an existing installation is extended or altered, such extension or alteration has to comply with the provisions of this part of SANS 10142 that were applicable at the time of the erection of the extension or alteration.*

This aspect relating to the additions, modifications or repairs is more problematic than it seems. In determining that certain changes have been made to an electrical installation since the date of construction, how does one, for instance, ascertain when a certain alteration or modification in fact took place as the property? Especially as the property may very well have been sold a number of times and even the current user would not be aware of such details.

Understanding that this is already problematic, we then look at the last part of the note:

*The edition of the standard that was applicable at the date of erection of an electrical installation is to be considered the edition defining the requirements applicable to that particular electrical installation.*

In my opinion, therefore, if one has to try and apply all of the above provisions with little understanding of the applicable standards and regulations, it is clear why so many registered persons run into trouble with the issuing of invalid CoCs.

However, the legislation recognises that this may be problematic and guidance should then be obtained by looking at the provisions of the Electrical Installation Regulations 2009:

*ance accompanied by the required test report only after having satisfied himself or herself by means of an inspection and test that:*

*b) An electrical installation, which existed prior to the publication of the current edition of the health and safety standard incorporated into these Regulations in terms of regulation 5(1), complies with the general safety principles of such standard.*

In understanding this requirement, therefore, and reading it in context with Clause 5 of SANS 10142-1 (containing the general safety principles applicable to electrical installations), the importance of understanding the effect of Clause 5.3.1 should become immediately apparent, i.e.:

*The characteristics of the selected equipment shall be appropriate to the conditions and parameters on which the design of an installation is based.*

Therefore, in understanding the legal requirements, the aspects to be looked at when faced with the daunting task of issuing a CoC for an existing installation, should become more apparent.

In my next column, I will expand on this particular aspect and clarify why it has become increasingly important not to read any aspect of SANS 10142-1 in isolation.

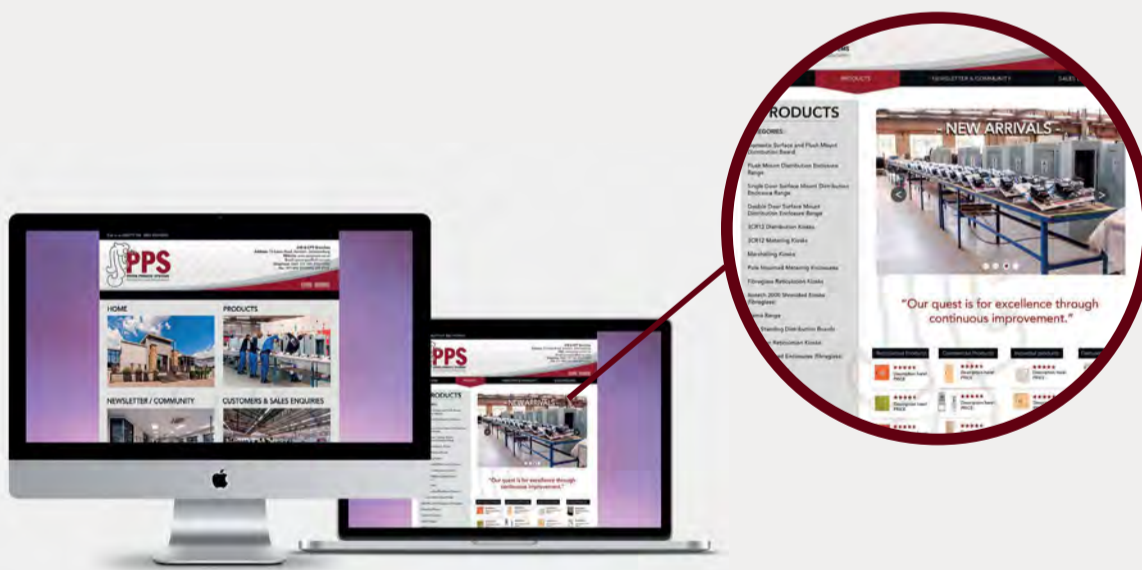
Mark Palmer



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## TRAINING CENTRE ACCREDITATION – THE PROCESS

Over the past few months, at P & T Technology we have embarked on the process of extending our accreditation with the Quality Council for Trades and Occupations (QCTO) and, finally, are now accredited to train electricians, instrumentation mechanics, millwrights and mechanical fitters.

I've had many enquiries about the process of registering a training centre so, in this month's column, I will discuss this and the associated high cost of establishing a training centre.

The criteria for accreditation of skills development providers (SDPs) or a training centre as many of us understand it, will be highlighted. Firstly, any person, organisation or institution may apply for accreditation as a skills development provider and the accreditation is valid for five years from the date the QCTO grants accreditation, or until the SDP is de-accredited by the QCTO.

When accrediting SDPs, the QCTO focuses on two parts, namely institutional compliance and programme delivery readiness, which must be in place before accreditation is issued.

For accreditation the following criteria must be satisfied:

### a) Institutional compliance

The person, organisation or institution must:

- Be a legal entity or juristic person established in terms of South African law at the time of seeking accreditation and provide proof of registration.
- Have a valid tax clearance certificate issued by SARS, if applicable.
- Provide proof of financial sustainability for the learning services applied for and throughout the accreditation period (audited

financial statements, financial surety and business plan, if applicable);

- Have a valid Occupational Health and Safety Certificate, if applicable;
- Provide evidence of appropriately qualified human resources to deliver the qualifications (curriculum vitae and proof of qualifications).
- Have a learner appeal policy and a code of conduct.

### b) Programme delivery readiness

The person, organisation or institution must:

- Provide evidence of suitably qualified staff to facilitate learning (comprehensive CVs, certified copies of ID and qualifications).
- Demonstrate that it has administrative resource's tool for capturing data for learners' information, learner records, and results across the knowledge and practical skills curriculum components.
- Be in possession of the required resources, tools, equipment, machinery, material and protective clothing.
- Provide evidence of learner support material (LSM) to offer the relevant components of occupational qualifications.
- Have in place agreements with workplaces for the delivery of work experience components of the relevant qualification.
- Meet the relevant standards for occupational health and safety, if applicable.
- Adhere to any monitoring and evaluation activities as prescribed by the QCTO.

It must be remembered that accreditation of the SDP may be withdrawn by the QCTO if the SDP fails to perform its responsibilities as stipulated in the QCTO accreditation policy.

### Timeframes

All the requirements must be in place before application; should an audit be conducted and the applicant is found to be unready, a second audit will only be conducted after six months.

- Acquiring all the training equipment, material and staff (three to six months dependant on accreditation scope).
- Applying for accreditation and undergoing the onsite audit (three to six months, dependant on the availability of the CEPs).
- Waiting for the response from the QCTO (one to two months dependant on when the audit reports are received by the QCTO committee).

Only when you receive your accreditation can you start marketing your centre.

### Bottom line

The bottom line is that considerable investment must be made upfront before any marketing can be done to achieve some return on financial outlay. It must also be remembered that when accreditation is received, the QCTO will conduct monitoring visits to ensure that training is being conducted in accordance with the requirements.

For more information on accreditation, go to [www.qcto.org.za](http://www.qcto.org.za)



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Nick du Plessis





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## DUTIES OF THE PRINCIPAL CONTRACTOR AND THE CONTRACTOR IN SIMPLE TERMS

Spring had sprung but where I'm sitting, it certainly doesn't feel like it... and the only thing to keep the wintery cold at bay is another 'hot' topic from the Occupational Health and Safety Act.

Last month, I finished up with Regulation 5 from the Electrical Installation Regulations (2009) that form part of the Occupational Health and Safety Act (Act 85 of 1993) and now we continue with Regulation 6, which deals with the electrical contractor.

Perhaps this is also a good time to look at the 'new' Construction Regulations 2014, which came into effect on 7 August 2015. This feels a little like a 'chicken and egg' situation because in more than one instance you are "the (principal) contractor" and in the other, you are the "(sub)-contractor", when it comes to 'construction' per se. And the two 'related' publications don't make it any easier.

Let's start by looking at the two definitions for 'contractor':

The Electrical Installation Regulations 2009 says: "Electrical contractor" means "a person who undertakes to perform electrical installation work on behalf of any other person, but excludes an employee of such first-mentioned person"; And in the Construction Regulations 2014 it is much simpler: "Contractor means an employer who performs construction work" The definitions for 'work' in both sets of Regulations make for interesting reading, too. In the Electrical Installation Regulations 2009 it reads: "Installation work means:

- (a) The installation, extension, modification or repair of an electrical installation;
- (b) The connection of machinery at the supply terminals of such machinery; or
- (c) The inspection, testing and verification of electrical installations for the purpose of issuing a certificate of compliance..."

And the Construction Regulations 2014 defines it as:

"Construction work means any work in connection with:

- (a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
- (b) The construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work..."

You will notice that the definitions are very similar in wording and it is only the difference in disciplines that makes for a slightly different interpretation but, in reality, they basically describe the same activity and are actually two sides of the same coin, so to speak.

The Electrical Installation Regulations 2009 then continues with Regulation 6 as follows:

Electrical contractor

- 6. (1) No person may do electrical installation work as an electrical contractor unless that person has been registered as an electrical contractor in terms of these Regulations.
- (2) Any person who does electrical installation work as an electrical contractor shall register annually in the form of Annexure 3 with the chief inspector or a person appointed by the chief inspector.
- (3) An application for registration as referred to in subregulation (2) shall be accompanied by the fee prescribed by regulation 14.
- (4) The chief inspector or a person appointed by the chief inspector shall register any person referred to in subregulation (1) as an electrical contractor and enter such registration into the national database, provided that such person
  - (a) Has a fixed address and a telephone; and
  - (b) Employs a registered person in a full-time capacity, or is himself or herself a registered person.

The above regulation is one of the few that, to me, is defined in plain and simple terms.

So, now you comply 100% with Regulation 6 of the Electrical Installation Regulations 2009 and you venture out to find work as compliant electrical contractor... Luckily it isn't long before you get your first appointment... and you get blindsided by the following from the Construction Regulations 2014. The Construction Regulations, namely Regulation 7, reads (the principal contractor is the builder and you, the electrical guy, is the contractor in this case and, for the sake of clarity, only pertinent information will be listed):

### Duties of principal contractor and contractor

- 7. (1) A principal contractor must -
  - (c) On appointing any other contractor, in order to ensure compliance with the provisions of the Act -

- (ii) Ensure that potential contractors submitting tenders have made sufficient provision for health and safety measures during the construction process;
- (iii) Ensure that no contractor is appointed to perform construction work unless the principal contractor is reasonably satisfied that the contractor that he or she intends to appoint, has the necessary competencies and resources to perform the construction work safely;
- (iv) Ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;
- (viii) Stop any contractor from executing construction work which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons;

I believe the Construction Regulations 2014 places a completely different slant on the electrical construction industry. All of a sudden, we electricians are confronted with terms such as 'construction manager', 'construction supervisor', 'fall risk' and 'duties of the designer'. Construction Regulation 23 spells out all the 'do's and don'ts' with regard to 'construction vehicles'. To me, terms such as 'good working order', 'operated by a person who has received appropriate training and is in possession of a Medical Certificate of Fitness' all spell extra expenses, but there is no getting away from it.

This 'Medical Certificate of Fitness' doesn't end with the driver... Nope, this requirement covers the entire workforce! That means the boss of a smallish concern (who is still on the tools) will also have to provide the principal contractor with a 'Medical Certificate of Fitness'.

Other things electricians and electrical contractors need to take note of, are terms and issues relating to 'health and safety plans', 'risk assessments', 'scaffolding' and 'construction employees' facilities' whether we have in the past or not.

All the above is a little difficult to explain but I think you get my 'drift'. So be on the lookout for my in-depth discussion on the Construction Regulations 2014 in a future column. Till next time...

## LOCALLY MANUFACTURED INVERTER SOLUTIONS FOR 86 MWP SOLAR PLANT

ABB is strengthening its position in the solar market in South Africa by delivering electric balance of plant for an 86 megawatt peak (MWP) project near Prieska in South Africa. This packaged inverter solution comprises locally manufactured inverter stations and medium voltage (MV) stations with related services.

The project has been developed by Mulilo Sonnedix and is to be built by Juwi ZA. The site is located in the Northern Cape region of South Africa close to Prieska, and forms part of the Renewable Energy Independent Power Producers Procurement Programme (REIPPP) Round 3 projects.

The nominal rating of the project is 76 MW ac. The ABB plant is feeding the power to the national high voltage grid. The deliveries started in October 2015 supporting the rapid connection target to the distribution network in May 2016.

ABB's scope of delivery includes 40 x 2 MW PVS800-IS inverter stations, each containing two PVS800 central inverters, and respective MV stations with 2,4 MVA transformers and ring main units (RMU). ABB PVS800 central inverters and inverter stations are manufactured in ABB Johannesburg facilities as well as also the 22 kV Ring Main Units (RMUs). Together with locally manufactured medium voltage transformer the local content of ABB delivery exceeds 60%. The hardware delivery is supplemented by a service offering that includes training and commissioning and local support for the years to come.

"The high efficiency, reliability and easy-to-maintain industrial design of our inverters, together with our local service and support capabilities, are the key success factors for ABB PVS800 central inverters in South Africa. All these together with the high local content that ABB is able to provide offer customers a real, bankable solution that we are able to support for years to come in South Africa," says Silviu Martinescu, Manager of ABB's business unit Power Conversion in South Africa. "We are developing further our service organization in the region to meet the increasing installed base as I expect more deliveries to come."

According to Martinescu, "Based on the latest estimates, just in South Africa, an impressive 1 041 gigawatts of PV capacity are expected to be installed within a three-year period through 2018. ABB's wide portfolio of different sizes of inverters, together with its other products for the solar industry, give customers an attractive one-stop shopping

opportunity for packaged solutions for different sizes and types of plants."

The ABB PVS800-IS inverter station, rated from 1.75 to 2 MW, is designed for multi-megawatt PV power plants. The inverter station uses two 875 kW or 1 000 kW PVS800 central inverters. Depending on the size of the PV power plant, several ABB

inverter stations can be combined to meet the needed capacity. With a wide list of approvals and with advanced and flexible grid support functions, the inverter station meets all the applicable network connection requirements, regardless of where the project is located.

Enquiries: +27 10 202 5000

# LOOKS CAN BE DECEIVING AND OFTEN DEADLY!

One of the most common short-cuts taken by unscrupulous suppliers is to use sub-standard conductor material which is covered by its insulation and can therefore not easily be identified. This will cause higher cable temperature which can result in fire. The insulation may contain additives to reduce the cost, but which will also reduce the flexibility and insulation properties, cause it to break and risk electrocution of the user. Copper's superior performance in all types of installations has earned it acceptance as the long-established standard for building wire conductors.

**SAFEhouse guidelines: What you should do:**

- Be suspicious of price substantially below the going rate of comparable product on offer.
- The manufacturer's name must be on the cable with the number of cores and the voltage rating.
- Look for an SABS mark - if in doubt, contact the SABS or the supplier for authentication.
- Purchase brands you can trust.
- Contact the SAFEhouse Association for assistance.

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# SUSTAINABLE SOLUTIONS FOR WIND POWER, HYDROELECTRICITY, PHOTOVOLTAIC AND NATURAL GAS ENERGY PRODUCTION

Vert Energy has positioned itself at the forefront of the energy sector in Southern Africa. The company offers solutions for traditional petrol and diesel power generation and also has a range of products for renewable energy sources, such as hydro, wind, natural gas and solar.

"This range of premium branded products, which ensures reliable electric power generation (EPG) solutions, is enhanced by a technical advisory and support service, to ensure there is no interruption in power supply, as a result of load shedding or mains failure," says Vert Energy's managing director, Grant Robertson.

"The company's focus on renewable energy sources to produce 'green' energy as a reliable source of electricity encompasses sustainable solutions for wind power, hydroelectricity, photovoltaic (solar) and natural gas energy production.

"Vert Energy's extensive range of power generation components for the production of wind power caters primarily to domestic and light commercial applications using the NSM range of low voltage permanent magnet generators (PMG), to full scale power plant production for independent power producers and utilities, incorporating low, medium and high voltage Leroy Somer alternators and DEIF generator controls for wind applications."

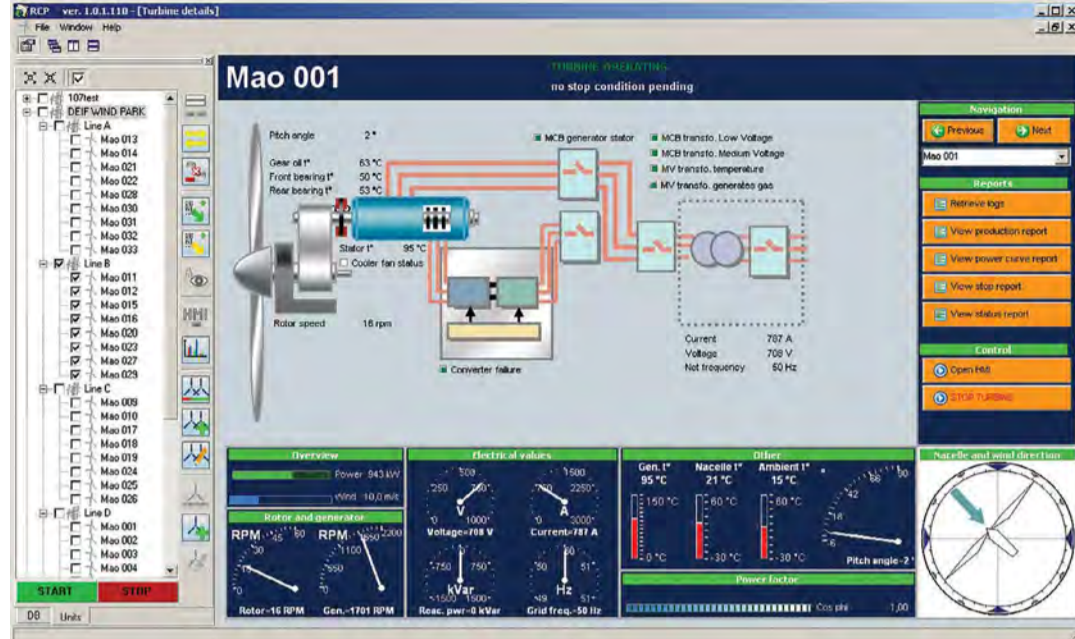
Leroy Somer alternators - which are available exclusively throughout Sub Saharan Africa from Vert Energy - are known in the wind power generation sector for high electrical efficiency, reliability and strict compliance with environmental constraints. (Leroy-Somer is ISO 14001 and ISO 9001 certified).

Leroy-Somer has developed a water-cooled system, especially for wind turbine applications.

Water cooling, which focuses on the active parts of the generator, guarantees heat control and extends the service life of the generator.

Leroy-Somer has also developed a reinforced insulation system, which enhances the generator's reliability in demanding wind turbine environments that are often subjected to salt and dust. LS alternators, with power outputs between 600 kW and 5 MW, withstand operation in extreme ambient temperatures and cope efficiently with highly variable load cycles and high over voltage due to converters. Other features include the compact design, efficient cooling and low noise levels.

Vert Energy has also been appointed exclusive distributors in sub-Saharan Africa for the sales and support of DEIF generator control solutions for decentralised power production in land based power production.



DEIF has a dedicated business division, with skilled engineers who develop customised control solutions to handle new projects, as well as the retrofitment of new components into older turbine applications.

Robust DEIF components, designed for all sizes and types of turbines, incorporate the latest technology for efficient power and speed control, thus minimising structural loads and optimising energy production over the lifetime of the turbine.

DEIF wind turbine controllers, which are supplied with the customised 'Wind Turbine Control Strategy' pre-installed, withstand all environmental conditions, including temperature range, storm and lightning conditions, vibrations and shock.

Features such as the guided controller configuration at start-up, light-weight TCP/IP based remote HMI and service-friendly parameter handling, are designed to make wind turbine commissioning, operation and service easier.

NSM has launched a new range of permanent magnet gen-

erator (PMG) for micro wind energy production. Features for high performance and low cogging ensure the wind turbine spins, even with minimum wind speed. This range supplies continuous output power from 0,5 to 6 kVA with a high overload capacity for a limited time span.

Vert Energy's support service includes assistance with inspections, diagnostics and repair procedures; re-assembly, installation and commissioning, as well as the implementation of preventative and predictive maintenance programmes throughout the African continent.

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NSM permanent magnet generators (PMG) for micro wind energy production have advanced features for high performance and low cogging to ensure the wind turbine spins, even in low wind conditions.

Leroy Somer alternators - which are available exclusively throughout Sub Saharan Africa from Vert Energy - are known in the wind power generation sector for high electrical efficiency, reliability and strict compliance with environmental constraints. (Leroy-Somer is ISO 14001 and ISO 9001 certified).



# CUSTOMISED GENSET SOLUTIONS RESOLVE CHALLENGING STANDBY POWER SUPPLY ISSUES



A 70 kVA 400 V Zest WEG diesel generator set housed in a sound and weather proof enclosure.



Three 450 kVA Zest WEG open type diesel generator sets equipped with WEG alternators.



A 2 000 litre Zest WEG mobile diesel bowser for on-site refuelling.

**POWER** outages have become increasingly frequent with a widespread knock-on impact being experienced across industry. The ability to provide fit-for-purpose standby power solutions is the marquee that has distinguished Zest WEG Group's Generator Set Division.

Standby power solutions can range from a single diesel driven generator set to a total standby power solution depending on the size of the building or project in question. Larger contracts often require a blend of smaller and larger generators to meet the needs of the various elements within the project. In all instances, fast reaction times from suppliers and the deployment of a reliable and durable generator set should be the standard.

Zest WEG Group's Generator Set Division has built a solid reputation with a large number of clients over a diversity of industries, clearly demonstrating its capability to cater for large-scale standby power projects. A number of recent contract awards highlight the company's ability to provide solutions that range from standalone generator sets to turnkey power stations, such as the one supplied to AVI Group's Indigo Brands.

This original equipment manufacturer is responsible for the total project management and control coordination, including the testing and commissioning of the entire system. Close cooperation with the customer ensures that the design of the standby power solution seamlessly integrates with the overall structure of the building to allow the equipment to be readily accommodated.

The scope of supply on the Indigo Brands project comprises three 1 000 kVA generator sets and three 1 000 kVA transformers. Zest WEG Group's Generator Set Division is also designing a custom-built electrical panel for distribution, interfacing and synchronisation purposes. The company will additionally be supplying a 23 000 litre bulk fuel tank system, as part of the optimum solution.

In a recent refurbishment contract, a containerised standby power solution was supplied to a client at the V&A Waterfront. Craig Bou-

wer, projects and product manager at Zest WEG Group's Generator Set Division explains that after discussions with the customer it was determined that this would provide the most cost effective solution.

The project involved a 'rig-out' of the existing equipment from the original building, designing and fitting a sound proof canopy, louvres and base frame adaptor, to allow the generator set to be housed outdoors, as well as final testing of the newly containerised unit.

Silo 1 tenant Allan Gray occupies a Green Star building that requires adherence to specific environmental regulations. Zest WEG Group's Generator Set Division supplied a customised solution on this flagship project that met the latest European Tier 3 emissions-control regulations. The system, which incorporates specialised switching controls to ensure continuous power at a major data centre, is designed to reduce the exhaust emissions from diesel-powered generators, which include nitrogen, hydrocarbons, carbon monoxide and particulate matter in the form of any visible smoke and soot.

"The V&A Waterfront is only one of many flagship projects that Zest WEG Group's Generator Set Division has been involved with. Another notable project is Century City, a 250 ha mixed use development in Cape Town that combines office, retail, residential and leisure elements. We are in the process of supplying and installing one 400 kVA and two 800 kVA generator sets for the Urban Square residential, hotel and conference project at Century City," says Bouwer.

"A particular challenge we encountered at Urban Square was that we were required to provide solutions and designs for irregular room sizes and exhaust runs. The ability to remain flexible and devise customised solutions is a hallmark of our capability as a supplier of non-standardised generator set solutions," Bouwer continues.

In yet another customised solution project, Zest WEG Group's Generator Set Division was contracted to supply, install and test an 800 kVA generator set into a purpose-built plant room at the Melomed Private Hospital in Tokai.

"The generator set measured 4 m long by 1.6 m wide and 2.3 m high and weighed almost 9 t. Inlet and outlet acoustic louvres were required to ensure that the noise level remains under 65 db(A) at 7 m. We also supplied a purpose-built changeover electric panel for remote mounting," says Bouwer.

Key to Zest WEG Group's Generator Set Division's success on such specialised projects is its ability to devise innovative solutions such as the contract to supply a standby power supply for worker accommodation at the DRA Minerals Firestone Diamonds Liqhobong Diamond Mine in Lesotho, which is positioned 2 000 m above sea level in the Maluti Mountains. Zest WEG Group's Generator Set Division designed, supplied and installed three 12 m high purpose-built containers that incorporate a special 'snow roof' structure to prevent snow build-up on top of the generator sets, and subsequent blocking of the louvres. Particular attention was paid to the design and engineering of these 'snow roofs' to enable them to be collapsed when the containerised units are transported.

The three 630 kVA generator sets needed to be synchronised via Woodward Easygen controllers and were subject to a soundproofing requirement of 65 db(A) at 7 m. This stringent standard is normally applied to residential areas but was deemed necessary, since the application was for worker accommodation. Further requirements were for a 1 000 litre fuel tank with gauge and level indicators and a fusible fire link on the generator sets and inlet dust filters. Furthermore, a 6 m load distribution container, with a self-contained fire suppression system, was also provided.

Zest WEG Group's Generator Set Division offers 20 kVA units up to 250 kVA off-the-shelf products, 300 kVA to 2 000 kVA individual customised units as well as multiple sets to achieve turnkey solutions in excess of 12 MVA for large-scale applications or projects. All gensets are sold with a standard 12 month warranty, and maintenance contracts are also available for all applications. A notable differentiator is that the company offers a 24/7 breakdown support service.

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Radiant Group  
Floodlight LED aluminium 12 W battery back-up; rechargeable camping emergency lanterns LED battery 16 and 2.4; motion sensor LED plus flashlight emergency lights 40/35 and 35/18 lumen; exit light 230 V LED with backup; LED lamps A60 5 W E27 and B22 4 000 K with backup  
Silicon Engineering  
Lead acid and/or nickel cadmium batteries  
Superlume  
Portable emergency lanterns; LED portable and wall-mounted emergency fittings; battery back-up IP65 vapour-proof; LED battery back-up IP65 vapour-proof  
Voltex  
Distributors of emergency exit and other signs; emergency control gear for fluorescent lights  
Voltex Lighting  
Distributors of emergency exit and other signs; emergency control gear for fluorescent lights  
Waco Industries  
Distributors of emergency exit and other signs; emergency control gear for fluorescent lights  
Webber Electrical Contractors  
Installer of emergency lighting

## BATTERIES FOR EMERGENCY APPLICATIONS

AC/DC Dynamics  
Full range of batteries and backup solutions such as UPS systems, invertors, etc  
ARB Electrical Wholesalers  
Full range of batteries for emergency applications  
Arrow Altech Distribution  
Lithium iron phosphate battery management solution  
Atlas Group  
Distributors of Solid State Power invertors in various sizes  
Aurora Lighting  
Extensive range of battery backups for LED light fittings  
Bellco  
Distributors of invertors in various sizes  
Citilec  
Full range of batteries for emergency applications  
Electromechanica  
Full range of batteries for emergency applications  
JDL Electric  
Full range of batteries for emergency applications  
Mantech Electronics  
Full range of sealed lead acid (SLA) batteries in regular, deep cycle and gel types  
Radiant Group  
LED panel emergency backup: metal case, 3 m cable, 6 A plug; spare emergency backup for LED; backup 12 V 50 W remote/maintained; remote backup for fluorescent 6 – 65 W magnetic 1H00 five cell  
Regal Distributors  
Batteries for emergency applications  
Silicon Engineering  
Lead acid or nickel cadmium batteries  
Stone-Stamcor  
Yuasa sealed lead acid batteries

## BATTERIES FOR EMERGENCY APPLICATIONS

Voltex  
Distributors of invertors in various sizes  
Webber Electrical Contractors  
Installer of batteries for emergency applications

## PUMPS FOR EMERGENCY APPLICATIONS

ACDC Dynamics  
Variety of pumps for most applications including solar pumping systems  
Webber Electrical Contractors  
Installer of pumps for emergency applications

## UPS

ACDC Dynamics  
Comprehensive range of UPSs  
ARB Electrical Wholesalers  
Full range of UPSs  
Atlas Group  
Distributors of Solid State Power UPSs in various kVA ratings  
Bellco  
Distributors of UPSs in various kVA ratings  
Citilec  
Full range of UPSs  
Eurolux  
UPS invertors  
JDL Electric  
Full range of UPSs  
Legrand SA  
Available in versions with a power rating from 0,5 to 120 kVA; the versions with on-line double conversion technology ensure a supply voltage free from network disturbance; line-interactive UPS systems ensure high performance also for domestic or small commercial applications  
Mantech Electronics  
Vast stocks of invertors and UPSs  
Regal Distributors  
Stockists of UPSs  
Silicon Engineering  
BAE – Berlin industrial stationary lead acid batteries  
Voltex  
Distributors of UPSs in various kVA ratings  
Webber Electrical Contractors  
Installer of UPSs

## LIGHTING FOR HAZARDOUS AREAS

AC/DC Dynamics  
Distributor of Halo Lighting Solutions including LED strip lighting systems; wide range of flameproof and explosion-proof lighting  
ARB Electrical Wholesalers  
Full range of lighting for hazardous areas  
Atlas Group  
Distributors of luminaires for hazardous areas  
BEKA Schröder  
Full range of luminaires for hazardous areas  
Bellco  
Distributors of luminaires for hazardous areas  
Ausma  
Full range of luminaires for hazardous areas  
Citilec  
Full range of lighting for hazardous areas  
Denver Technical Products  
Wolf safety lamps and Smith Light LED lighting for industrial work areas  
Eurolux  
Vapour-proof fluorescent fittings; CFL enclosed 'bullet'  
Genlux Lighting  
Full range of lighting for hazardous areas  
JDL Electric  
Full range of lighting for hazardous areas  
Major Tech  
Full range of high power surface-mount devices and LED floodlights available in 10 W, 20 W, 30 W and 50 W  
MCE Global Suppliers  
O-Lite LED floodlights from 10 W to 200 W  
Nordland  
Full range of lighting for hazardous areas  
Radiant Lighting  
Full range of lighting for hazardous areas  
Voltex  
Distributors of luminaires for hazardous areas  
Voltex Lighting  
Distributors of luminaires for hazardous areas  
Webber Electrical Contractors  
Installer of luminaires for hazardous areas

## OTHER

AC/DC Dynamics  
Large lighting offering including decorative, LED and general lighting applications



GUIDE

OTHER

**Alstom Protection and Control**

General protection relays

**ARB Electrical Wholesalers**

Electrical cables and wiring accessories; electrical contractors' materials

**Arrow Altech Distribution**

Protection modules; SPDs

**Atlas Group**

Full range of cables and wires as well as a range of overhead line equipment, mini subs and transformers

**Bellco**

All electrical industrial and commercial products as well as the associated accessories; Elespec power quality PFC and monitoring; MV and LV panels

**Citilec**

LED energy efficient lighting

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**Power Process Systems**

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**Silicon Engineering**

Stationary batteries for substation protection and switching - lead acid and nickel cadmium

**Superlume**

Solar LED floodlights with battery pack

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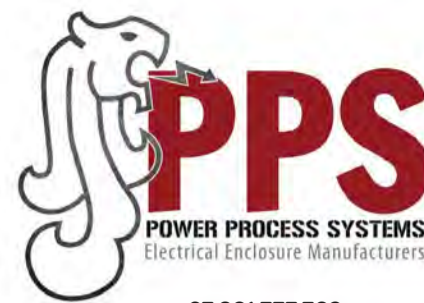
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## NEW NATIONAL SICK BENEFIT FUND FOR THE ELECTRICAL CONTRACTING INDUSTRY (SA)

The parties to the Bargaining Council for the Electrical Industries (SA) recently concluded an agreement to establish a new Sick Benefit Fund for the electrical contracting industry.

Previously we had three different sick benefit funds: one covering the Western Cape, one for KwaZulu-Natal, and one for the rest of the country. Each one of these had different contributions' and benefits' structures. This situation was unjustifiable as we all would benefit from having one fund with the same benefits and identical contributions from all participants. This agreement signals a real partnership on the industrial relations front in the sense that both employers and employees contribute towards this fund to ensure that there are unique benefits for employees in the electrical industry.

The National Sick Benefit Fund has been on the cards for a number of years and we achieved a breakthrough this year, thanks to the commitment of the negotiators from both the employer's and the employee's side. I led the employer's delegation as National Director of the ECA(SA) and my own personal motivation was what happened when the late Roderick Semono – a contract manager at Standard Electrical – became ill. Roderick was registered with the Bargaining Council as a Master Installation Electrician but he was earning far more than is specified in this category as he was employed in a managerial position not just a technical one.

The Sick Benefit Fund in Gauteng pays at 65% of minimum prescribed wage for a particular category. When Theresa Megalane of Standard Electrical submitted a claim for Mr Semono's benefit and was paid 65% of the specified Master Installation Electrician's wage,

she protested that this money would not assist Mr Semono manage his life as it equated to about 20% of his earnings at that company. Theresa was right. The fund fell way short in meeting the needs of employees who were sick for long periods. Change had to happen and the story of Roderick Semono helped to shape the thinking and motivation of the negotiators. Irrespective of where Roderick would have been in the country, each one of the current funds would have failed him just as these schemes continue to fall short for all employees who qualify to claim.

The new Sick Benefit Fund will have the following benefits: For the first 10 days that an employee is sick, such employee would be paid 100% of his/her actual salary. This means the employee would not have any shortfall. Critically, the employee's benefit would be at the actual rate of pay and not at the minimum wage. This means that if Roderick had earned R50 000 a month, for the first 10 days of him being sick, he would have been paid at 100% of his wage per day.

From Day 11 up to Day 30, the new fund will pay out at 60% of actual wage. The employee would still not have a shortfall as 40% of the salary is recoverable in full from the Unemployment Insurance Fund (UIF). Again this calculation is based on the employee's actual wage.

From Day 31 up to Day 130, the new fund pays out at 33% of the actual wage. This would also be supplemented by a UIF claim and, given the fact that the employee would not have to pay transportation costs to go to work every day, this should be adequate income replacement.

At the end of this period, which equates to more or less six months, the employee would qualify for a PHI benefit (disability benefit) for the next ten years at least, if he/she is a member of the retirement funds, or three years if the employee is on a fixed term contract.

I am part of the team that is currently negotiating for the PHI benefit to pay a qualifying person up to the retirement or recovery, whichever comes first. I will report on progress in this regard in my next column.

The contributions reduce to 0.3% of wage in KwaZulu-Natal and Western Cape for each employee and employer registered with the Bargaining Council. For the rest of the country, there is an actual increase in contributions to meet this new benefit structure. The trustees of the Region A and B Sick Benefit Fund have recently done the calculations and are satisfied that it would be possible to subsidise this increase by 0.1% of wage for every employee and employer in the first year and then 0.05% of wage in the second year.

We are proud of this achievement and should the Minister of Labour extend this agreement to non-parties, it should see the light of day by 1 February 2016. The only suspensive condition is that the Minister of Labour must extend this agreement to every employer and employee in the electrical industry. When this happens, we will all celebrate and my late colleague and friend, Roderick Semono can rest in peace. I extend my thanks to Theresa Megalane for her passion in pursuing justice for all employees who may find themselves in a similar position to the late Roderick Semono.

Things have changed for the better of the whole industry.

## Reduce downtime – find leakage currents without taking equipment offline

F luke, represented locally by Comtest, has launched the Fluke 368 and 369 true-RMS leakage current clamp meters that help users detect, document, record and compare leakage current readings over time as a means of preventing unplanned downtime, and identifying intermittent GFCI (ground fault circuit interrupter) and RCD (residual current device) trips, all without taking equipment off line.

The Fluke 368 has a large (40 mm diameter) jaw for work with large conductors. The clamp's jaw is fully shielded to accurately capture very small leakage signals, and to minimise external electromagnetic

interference. The device allows users to track changes in leakage current over time, helping to identify potential problems before they turn into major failures.

### Product features:

- True-RMS measurements for accuracy when measuring complex, non-sinusoidal waveforms.
- 40 mm jaw opening.
- Highest resolution of 1 µA, measure up to 60 A.
  - Selectable filter function removes unwanted noise.
  - Max/Min/Average readings and hold function.
  - Forward-facing LED worklight for use in dark wiring cabinets.
  - Backlit display; auto backlight off and auto power off for extended battery life.
  - CAT III 600V safety rating.
  - Internal memory logging: up to 65 000 measurement points.

Designed specifically for industrial electricians and fa-



ilities maintenance technicians, the 368 and 369 are invaluable for general purpose electrical maintenance, as well as preventative and predictive maintenance and fault troubleshooting. Specific applications include maintenance tests on motors and transformers and current leakage measurements for installation tests.

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## CONDUIT SYSTEM FOR PROTECTING CABLES IN PV INSTALLATIONS

A SIGNIFICANT uptake of solar photovoltaic (PV) systems globally can be attributed partly to the declining costs of PV installations and partly in response to increasing electricity prices. Despite the harsh environmental conditions that many PV installations are subject to, cable protection is often overlooked, which is a big mistake, according to Mike Cronin, managing director at Elquip Solutions.

"Cable damage and degradation can affect the long-term viability of a PV installation and have serious safety issues. All of this could leave the installer liable for future maintenance plus fines for lost revenue due to the installation's downtime," he says.

"Most PV installations are expected to last for at least 25 years," he continues, "so a great deal of care is generally taken when it comes to selecting the major components for solar PV, such as the panels and circuit protection. Sadly, cable protection is often an afterthought, and this could have disastrous results," he says, adding, "Flexicon conduits offer a cable protection solu-



tion that is ideal for PV installations."

Elquip Solutions offer a comprehensive range of flexible conduit systems and components to suit many industries.

"Flexicon's conduit systems provide superior cabling protection, particularly in high-demand, hazardous environments such as in the rail or mining industries, as well as any external installation. Solar PV installations are outside, which means that the cabling is potentially exposed to extremely harsh environmental conditions including UV, water and changes in temperature from below freezing to hot

sunshine," says Cronin.

"There are a number of other hazards, including wind, dust, lightning, and in coastal areas, the corrosive effects of saltwater spray," he continues. "A solar farm can also be vulnerable to other risks, such as grazing animals, vermin attack and cable theft."

Flexicon has developed two broad product ranges – metallic and non-metallic – from 10 mm to 106 mm in diameter along with a wide range of patented fittings and connectors.

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## SNAP-ON TRUNKING FOR NEW INSTALLATIONS AND REFURBISHMENT PROJECTS

Legrand SA has extended its range of DLP trunking to now include the DLP-S ECO snap-on series, with new features for quick installation, flexibility and ease of use.

"Legrand keeps abreast with global electrical and digital trends in residential and commercial buildings, with the introduction locally of the latest products and systems," says Marius Labuschagne, Legrand's technical and solutions manager. "Legrand's modern DLP-S ECO snap-on trunking – designed for the efficient integration of power and data sockets in new installations and refurbishment projects – is suitable for high and low current applications in all building sectors, including domestic, office, commercial, banks, hospitals, computer centres and industry.

"A key feature is the combination of this versatile trunking system with Legrand's Arteor wiring devices. This flexible snap-on trunking assembly allows quick connections for normal and dedicated power, low voltage applications, telephone systems, computers and dedicated sockets. An important benefit is that all power and data is distributed in one system."

Legrand's DLP-S trunking is available with white covers that retain colour quality, maintain original shape and have resistance to flame propagation and mechanical shocks.

This trunking system is available in two sizes: 85 x 50 mm and 130 x 50 mm, in 2 m lengths – and can be mounted vertically or horizontally, with minimal tooling requirements. Rigid profiles have perforations that are easy to cut to rectangular shape and a self-guiding cover ensures easy fitting. No additional supports are required – 45 mm Arteor wir-

ing devices are simply clipped on the trunking body. A plastic protective film is easily removed after installation.

For convenience, components of this system – which consist of a body, cover and partition – have one single catalogue number per trunking size.

Ready to install accessories provide a perfect finish for cable routing and ensure quick completion of the installation. These components include internal and external variable angles, with a ready to fit assembly that adjusts easily to all configurations. Internal and external fixed version angles (at 90°) offer space saving solutions for installations without constraints of configuration.

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## Cable faults – a fact of life for power distribution utilities

Most local distribution cables in towns and cities are buried underground with other services as it is practical and desirable to install them away from public access and out of sight. However, cable faults are one of the main causes of power outages. So what happens if an underground cable develops a fault?

It's likely that fault will trip the protection devices and cause the customer to lose power. The power distribution utility then has to find and repair the fault so that the customer's power is restored.

Where is the fault? The cable may be hundreds of metres away so it's invaluable to have a fault locator that can tell the engineer the distance to the fault and pinpoint its exact location in the field. Otherwise it's down to digging lots of trenches to find the fault ... which, of course, is disruptive, time consuming and expensive.

Many power distribution utilities use the Megger EZ-Thump as a first responder. It's a quick and relatively low cost method of finding a cable fault fast on the distribution network. In the event of a cable fault, the battery powered EZ-Thump and Digiphone can be taken to site in the boot of a car. The EZ-Thump is small (36 x 39 x 50 cm) and should be used in the first instance to try and find a cable fault.

If it can be found quickly, the fault can be rectified and the power turned back on again with minimal expense and disruption to the customer. This time saving alone will effectively pay for the unit within a few uses.

In one power distribution utility's experience, trials with the EZ-Thump resulted in nearly 100% of faults being found on its 11 kV network, saving a huge amount of time and money as it allowed them to quickly restore power to customers.

The EZ-Thumps' simple operation guides the user through the fault location process, allowing a wide range of individuals to use it; so there is always someone available to respond to an outage.

More information about the EZ-Thump and Digiphone can be found on the Megger website.



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### Ergonomically designed for comfort with multiple compartments for easy access and storage

Ideally suitable for harsh and demanding environments such as mining, this backpack includes most electrician tools with the option of adding additional tools and instruments.

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## THE ESSENTIAL ROLE OF EARTH-TERMINATION SYSTEMS FOR WIND TURBINES

Increasing hub heights have resulted in a high number of wind turbines now being equipped with concrete or hybrid towers. These towers are comprised of a concrete base and a tubular steel tower on the top.

When it comes to lightning protection, DEHN Africa advises that it is essential to implement a single, common earth-termination system for all wind turbine purposes, as lightning current must be dispersed in order to prevent the wind turbine from being destroyed in the event of a lightning strike.

The earth-termination system should discharge high lightning currents to the ground, distributing them without exposing humans and animals to electric shock, whilst averting dangerous thermal or electrodynamic effects.

The main functions of earth-termination systems for wind turbines include:

- Protective earthing with the task of connecting electrical equipment to the ground and protecting persons and material assets in the event of electrical fault;

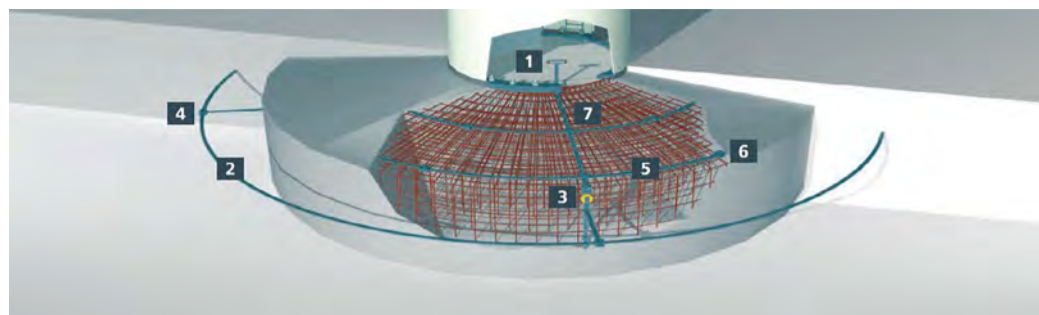
- Functional earthing, to ensure safe and hassle-free operation of electrical and electronic equipment; and

- Lightning protection earthing to safely conduct the lightning current from the down conductors to the ground.

The design of earth-termination systems according to IEC 61936-1 should fulfil the following four requirements:

- Mechanical strength and corrosion resistance.
- The handling of calculated maximum fault current from a thermal point of view, especially when the transformer is located in the nacelle.
- Avoid damage to objects and equipment.
- Protection of people from voltage and earth-termination systems occurring in the case of maximum earth fault current and lightning strikes.

Tubular steel towers fulfil these requirements due to their cross-section and completely metallic body (Faraday cage). However, should the



reinforced concrete towers be made of pre-fabricated concrete elements, they must consist of an integrated earth-termination system.

Furthermore, foundations made with reinforced concrete are used as earth electrodes as they have a low earth resistance and provide an excellent basis for equipotential bonding and foundation. Earth electrodes make both technical and economic sense and hence they should be designed and installed as per DIN 18014.

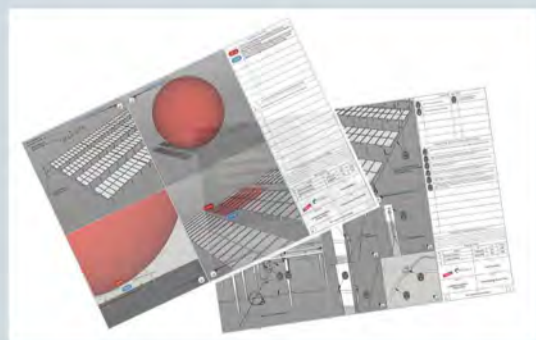
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DEHN protects Africa

### Concepts and designs for lightning and surge protection systems.

Developed concepts for lightning protection systems of complex installations in line with the IEC 62305 standard (SANS 62305) include drawings, mounting details, bills of material, specification texts (tender texts), concept descriptions and material offers.



#### DEHN Africa (Pty) Ltd

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## PROTECT BOREHOLE PUMPS FROM LIGHTNING STRIKES



A borehole outlet pipe being fitted with earthing and surge protection units housed in the junction box.



A closer view of the wiring and surge protection products in the junction box.



The completed installation. Note the sealed weather-proof junction box.

The consequences of a blown borehole pump are catastrophic and far-reaching. Added to the initial financial outlay of up to R60 000 to replace a pump are the effects of not being able to water crops and livestock.

"A scenario like this can be easily avoided through the purchasing and correct installation of quality surge arresters," says Paul van As, low voltage divisional manager at Surgetek, adding that the cost of a typical surge protection installation for a borehole pump is about R3 000.

Borehole pumps that do not have surge protection and proper earthing are often destroyed by induced lightning travelling through the earth. "The energy from a bolt of lightning that has struck the ground spreads into it and travels through it, in concentric circles in the form of magnetic force," explains Van As.

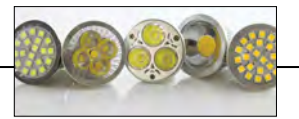
Boreholes are often sleeved with steel to maintain well integrity and prevent fall of ground. These steel sleeves act like an earth rod. "Once the

energy from a lightning strike makes contact with the sleeve, the energy runs down the pump power cable to the pump unit," explains Van As. "Research indicates this energy measures hundreds of thousands of volts. Pump motors operate on voltages between 230 V and 400 V and their circuit boards operate on 5 V. When struck by lightning these stand no chance against the level of energy in the induced lightning."

Van As advises that surge arresters should be installed as close to a borehole as possible. Arresters should be installed on either side of the power transformer in the surface junction box as well as the pump controller. "In addition, it is important that the electrical earth, the surge arrester earthing and the borehole sleeve (if metallic) are all interconnected to ensure potential equalisation. Surge arresters in any application should be checked on regular basis – particularly after thunderstorms."

Enquiries: +27 11 1303





# ENSURING SAFER STREETS WITH SURGE PROTECTION MODULES FOR OUTDOOR LED LIGHTING

Robust circuit protection is needed to minimise costs, maximise ROI of new LED street lighting solutions  
by Johnny Chang, product manager and Tim Patel, technical marketing manager, Electronics Business Unit, Littelfuse, Inc.

Cities and towns all around the world are progressively replacing their old high-intensity discharge street lights with new LED luminaires. LED street lights produce whiter, cooler light when compared with the yellowish light cast by high-pressure sodium lamps, which reduces the potential for collisions by enhancing drivers' depth of field and peripheral vision. However, installing these new LED fixtures requires a substantial initial investment. Planners must justify the expense by getting a payback on their investment within a reasonable period of time based on LEDs' lower wattage demands, lower maintenance costs, and longer operating life.

Financial analysis for any municipal project is critical to evaluating the project's feasibility. This is especially true for projects that receive the level of attention LED lighting projects do. Around the world, various groups have created tools to aid in this financial analysis. One such example is the Street and Parking Facility Lighting Retrofit Financial Analysis Tool. This tool was developed by a partnership between the United States Department of Energy's (DOE), Municipal Solid-State Street Lighting Consortium (MSSLC), the Clinton Climate Initiative (CCI)/C40, and the Federal Energy Management Program (FEMP). More information on this tool is available at: <http://energy.gov/eere/ssl/retrofit-financial-analysis-tool>.

At least one-third of the total savings attributable to switching to LED street lights result from the extended lifetimes these lighting fixtures offer. To ensure long-term cost-effectiveness, it is essential to take advantage of their potential for reducing maintenance costs. Protecting outdoor LED lighting from the damaging effects of lightning-induced surges requires diverting high voltage/current transient interference away from sensitive electronics in the luminaire fixture, specifically the LED drivers. In order to suppress surge energy and minimise surge impact, various surge protective devices (SPDs) are incorporated into the outdoor LED lighting during the design and testing phases. LED lighting equipment manufacturers rely on a variety of SPDs, including carefully chosen metal oxide varistors (MOVs), fuses, and transient voltage suppression (TVS) diodes to meet important safety standards and regulatory requirements related to overvoltage transients (Figure 1).

While some LED luminaire designs feature surge protection devices that are embedded within the power supply unit, circuit protection device manufacturers will frequently recommend that the surge protection circuit be kept separate from the luminaire power supply. By doing so, LED luminaire manufacturers can easily market the same luminaire fixtures anywhere by utilising different surge protection modules to meet differing surge level requirements, based in part on regional lightning strike frequency data.

Because of their compact size, high surge energy handling, fast response times, and cost-effectiveness, MOVs are widely used in surge protection circuits for LED luminaires. However, after MOVs absorb a certain number of surge strikes, they will start to degrade and can no longer provide the same protection as new ones. Using a separate surge protection modules in the design allows for easy replacement when the original SPD module reaches the end of its useful life.

MOV technology offers an effective and affordable way to suppress transients in numerous applications, such as power supplies and the SPD modules are often located in front of an LED driver. While they are designed to clamp overvoltage transients within microseconds, when they are built into SPD modules, MOVs can be subject to temporary overvoltage conditions caused by faulty installation wiring or by loss of neutral. These conditions can severely stress a MOV, causing it to experience

thermal runaway. This can result in overheating, smoke, and possibly fire. Robust SPD designs feature thermal disconnects to protect the MOVs from thermal runaway.

MOVs tend to degrade steadily after exposure to a large surge or several small surges, which leads to increasing MOV leakage current. This degradation will increase the MOV's temperature, even under normal conditions. A thermal fuse element (Figure 2), placed next to the MOV, can be used to sense the increase in MOV temperature as it continues to deteriorate. When the MOV reaches the end of its operating life, the thermal disconnect will open the circuit, remove the degraded MOV from the circuit, and prevent its catastrophic failure.

Once the thermal disconnect removes the MOV from the circuit, the SPD module can no longer provide surge suppression. Therefore, it's important to provide visual indication so that maintenance personnel will know the SPD is no longer functioning and requires replacement.

### When to use parallel- or series-connected SPD modules

- LED luminaire specifiers have a choice of two main types of SPD module configurations based on their maintenance strategies: parallel- or series-connected surge protection subassemblies.
- Parallel connection (Figure 3a) – In this configuration, the SPD module is connected in parallel with the load. When an SPD module reaches end-of-life, it is disconnected from the power source while leaving the ac/dc power supply unit energised. While the lighting remains operational, the protection against the next surge to which the power supply unit and LED module are exposed is lost. In a parallel-connected SPD module, a small LED is added as a replacement indicator for the maintenance technician. Options for a green LED indicating an online SPD module or a red LED indicating an offline SPD module are available. Or, rather than an LED indication at each lighting fixture, the need for SPD module replacement could be indicated remotely to a light management centre with SPD module end-of-life indication wires connected to a networked smart lighting system.
- Series connection (Figure 3b) – The SPD module is connected in series with the load, where the end-of-life SPD module is disconnected from the power source, which turns the light off. The loss of power to the luminaire indicates the need for maintenance and isolates the ac/dc power supply unit from future surge strikes. General preference for this configuration is growing rapidly, because the luminaire investment remains protected while the SPD module is awaiting replacement. It's far less expensive to replace a series-connected SPD module than the whole luminaire as in the case of a parallel-connected SPD module.

### More about outdoor LED lighting surge protection modules

The LSP thermally protected varistor SPD modules from Littelfuse are designed specifically for outdoor and commercial LED lighting applications. A built-in thermal disconnect function provides additional protection from catastrophic failures and fire hazards, even under the extreme circumstances of MOV end-of-life or sustained overvoltage conditions. LSP05 and LSP10 modules are replaceable. The LSP10 series-connected version has a special indication function that turns the light off when it is activated.

To learn more about how circuit protection for outdoor LED lighting installations can ensure longer luminaire lifetimes and safer streets, view the video overview. Download a free copy of the LED Lighting Surge Protection Device (SPD) Module Design and Installation Guide from Littelfuse for more technical details.

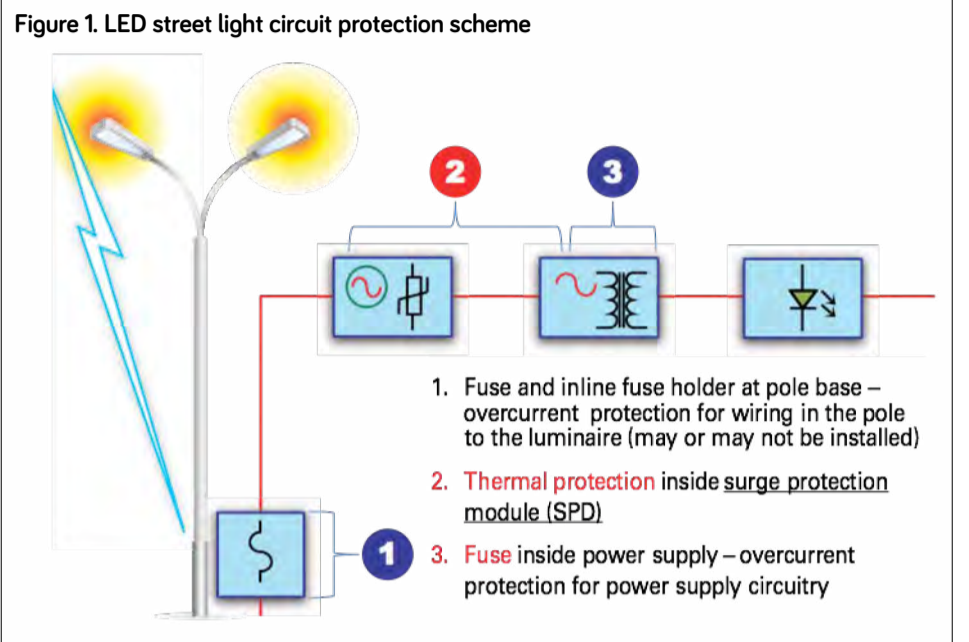


Figure 1 illustrates the various circuit protection elements typically incorporated into a street light surge protection circuit including overcurrent protection via fuses and thermal protection within the SPD.

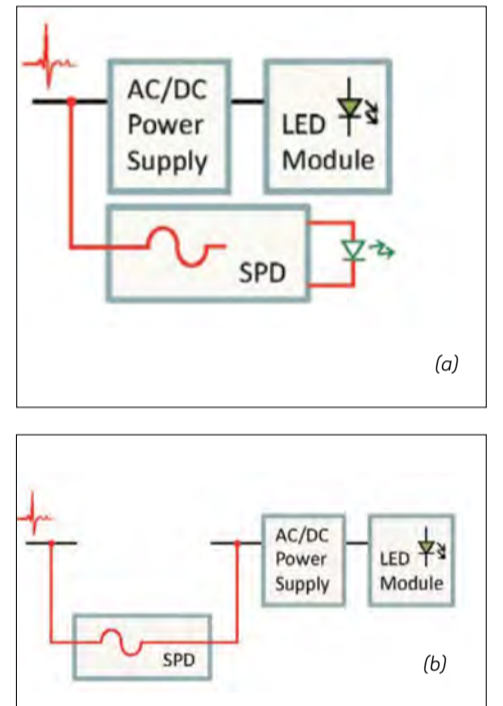
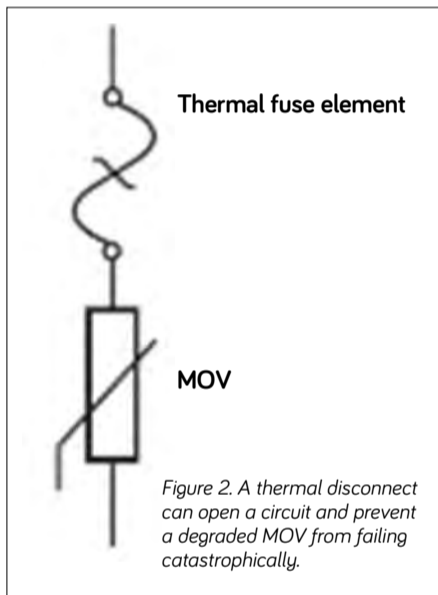


Figure 3. Example SPD module using either parallel (a) or series (b) connection to a luminaire.

	LSP10GIHP	LSP10	LSP05GI
<b>Max Surge Capability (1 strike)</b>	20kA	20kA	10kA
<b>Inom Surge Rating (multiple hits)</b>	10kA	10kA	5kA
<b>Series or Parallel connection</b>	Series	Both offered	Both offered
<b>Built-in LED Indicator</b>	Yes	No	Yes
<b>UL Recognized</b>	Yes	Yes	Yes
<b>IEC Certified</b>	Yes*	Self-certified	Yes*
<b>Coordination Performance</b>	BEST	Good	Good

\*See datasheets for details

Table 1. LSP module specifications and selector table.

### Biographical Notes

Johnny Chang is a product manager for the Electronic Business Unit. He joined Littelfuse as a varistor assistant product manager in 2008. His current responsibilities include providing strategic and new production development direction for the revenue and profitability growth of the varistors product line. Johnny received his Electronic Diploma from Oriental Institute of Technology. He has been involved with the design and development of varistors for 10 years. He can be reached at [jchang@littelfuse.com](mailto:jchang@littelfuse.com).

Tim Patel is the technical marketing manager for the

Electronics Business Unit. He joined Littelfuse in 2013 after being involved in testing and certification services in his previous role at Underwriters Laboratories (UL). Tim's current responsibilities include development of marketing collateral material, management of marketing activities for new product launches, and performing market studies and feasibility analyses for new product ideas. He received his BSEE from the University of Illinois at Chicago and is a licensed Professional Engineer in the state of Illinois. Tim can be reached at [tpatel@littelfuse.com](mailto:tpatel@littelfuse.com).



## TOLL PLAZAS GET ENERGY-EFFICIENT LIGHTING RETROFIT



OMNistar LED floodlights illuminate De Hoek Plaza

**BEKA** Schröder, a leading local manufacturer of LED luminaires, is proud to have supplied an LED lighting solution for four major toll plazas along the N3 Toll Route in South Africa.

"The lighting in and around De Hoek Plaza, Wilge Plaza, Tugela Plaza and Mooi River Plaza has been retrofitted with LED technology," says BEKA's Colleen Luh. "Energy conservation and reduced maintenance needs of the luminaires were the main reasons for this change."

She explains that because this was a retrofit solution, the existing highmasts and streetlight poles had to be used.

"We had to take great care insofar as the hinged highmasts were concerned as great care had to be taken to ensure that too much head-weight wasn't placed onto them, which would have made maintenance work difficult," she explains. "This was carefully calculated

by our in-house Research and Development and Applications departments and they came up with an energy saving solution that did not compromise lighting levels or light uniformity."

Luh says that the OMNistar was the LED floodlight of choice for the plaza area. "It offers a real alternative to luminaires equipped with high-power traditional light sources, with the added advantages of an LED solution: low energy consumption, improved visibility with a colour temperature close to daylight, limited maintenance, and longer life."

### Advantages

"One of the many advantages of LED technology is the reduced need for maintenance due to the long lifetime of the LEDs. This is a major benefit to the Toll Plaza operations since this leads to fewer disruptions of traffic," she adds.

The LEDlume-midi LED streetlight luminaires were utilised for the adaptation lighting along the roadway leading to the toll plazas, as well as the bullnoses at the plazas.

"The LEDlume range sets a new benchmark in LED lighting with its performance and flexible solutions that result in the shortest payback time. With the LEDlume range's high efficiency, long lifespan and limited maintenance requirements, total cost of ownership is minimised," she says.

BEKA Schröder locally develops and manufactures LED lighting products, designed and suitable for local conditions.

"We are proud to be associated with Mott MacDonald, N3 Toll Concession (RF) Proprietary Limited and Sensor Electrical in providing a successful LED lighting retrofit solution for this project," concludes Luh.

Enquiries: +27 11 2380030



LTS007  
LED spotlight

## SOPHISTICATED MIX AND MATCH DESIGN OPTIONS



Legrand's new range of Arteor wiring devices is available in vibrant new colours, with various finishes.

To reinforce the high-end character of Arteor, the most sophisticated and innovative materials have been selected, giving these devices a multicultural identity in line with its international positioning. Finishes include woven metal, red mirror and marine leather. Other materials – plastic, metal, tattoo, wood and brushed steel – are also available.

Users are able to 'mix and match' the design option and type of finish for any control function and these combinations can be changed at any time to suit exact requirements.

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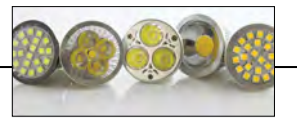
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## COMBINING CONTEMPORARY DESIGN AND NEW ILLUMINATION TECHNOLOGY

SLV luminaires, with the latest technologies and lighting effects, are available in various designs, colours, shapes and light sources, to suit individual requirements in interior and exterior applications.

"There are over 3 500 products in the German-engineered SLV range, all with a contemporary design and new illumination technology, in line with constantly changing global lighting trends," says Sheldon Payne, national sales manager – SLV. "The SLV range encompasses lighting fixtures with elements which are individually adjustable to enhance the aesthetics and area illumination of any environment.

"Components include surface-mounted and recessed profiles and fittings and decorative lights and lamps, which can be styled personally with a selection of designs and colours. LED solutions and dimmable products with retrofit lamps are available, as well as devices with integrated dimmable LEDs."

SLV lighting products are available in South Africa through the Magnet Group's SLV Pro-Partners and also through the recently established SLV



online store ([www.slv-lighting.co.za](http://www.slv-lighting.co.za)), which provides an ideal platform for safe and convenient online shopping.

This easy-to-navigate website showcases SLV's extensive portfolio, with different categories for indoor and outdoor products, accessories, lamps and electrical and mechanical components. The site includes pictures and descriptions of products, as well as pricing and delivery information.

A key product in the SLV outdoor range is the Slot floor luminaire from the Arrocco series. This indirect radiating floor luminaire, with an integrated GU10 230 V LED, is manufactured from granite. Because this is a natural material, every lamp is unique.

These robust luminaires have an IP44 protection rating to guard against the ingress of dust and water; and, for simplified surface floor mounting, they are supplied with a suitable spike.

Enquiries: +27 11 397 7936



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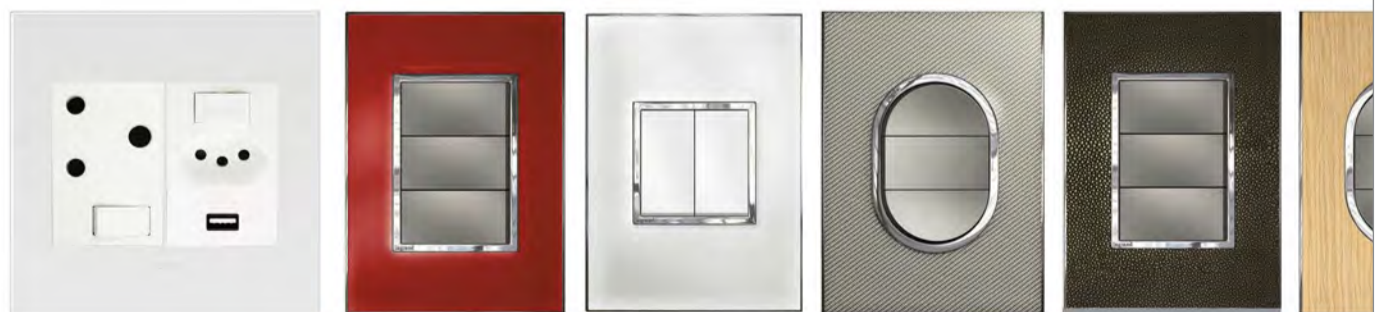


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## FASHION OUTLET'S INTERIOR REFLECTS QUALITY OF LIGHTING DESIGN

**M**agnet supplied a range of light fittings for the newly refurbished Q'Dos fashion outlet at the Gateway Theatre of Shopping in Umhlanga.

"The design objectives of this prestigious project required special lighting to accentuate the distinct styles, textures and colours of the exclusive Q'Dos clothing collection and to create an enchanting ambience," says Kaylen Reddy, Magnet's lighting solutions engineer.

"The installation encompassed four different types of light fittings, with high luminous flux, to suit the area illumination of the environment. The fittings include downlights, recessed and surface ceiling lights, and strip lights.

"SLV fittings – chosen for their design and the latest LED technologies – create an ideal lighting effect. The SLV SUPROS range con-

sists of three downlights, one surface-mounted rotatable downlight, a recessed downlight and a pendant option, which was not used in this design."

The luminaires, which contain built-in LED lamps, have a colour rendering index of >80 Ra, an emitting angle of 60 degrees and a luminous flux of 3000 lm. The expected service life of these ceiling lights is approximately 50 000 hours. The driver-on-board technology in all fittings of this series allows direct connection to the 230 V supply.

This energy efficient lighting range has been designed with flexibility for personal styling. Integrated and wide flooding reflectors can be exchanged for reflectors with smaller beam angles, without the need for any tools. LED solutions and dimmable products with retrofit

lamps, as well as devices with integrated dimmable LEDs are also available.

Magnet's understanding of lighting systems, coupled with design and installation services, in-house testing facilities and experienced lighting engineers, ensures enhanced aesthetics and optimum energy efficiency in diverse industries.

SLV's technical and decorative interior and exterior lighting devices are available in South Africa exclusively from Magnet. The company supports this comprehensive product range with a technical advisory, installation and maintenance service.

Glenn Rogers of Partners in Design, the interior designers on this project, said that from the company's first meeting at the Magnet showroom, Kaylen Reddy approached each lighting challenge with ingenuity and a thorough technical assessment. "We were impressed with his attention to detail and professional attitude throughout. The finished interior of Q'Dos certainly reflects the quality of lighting design and quality fittings required," he said.

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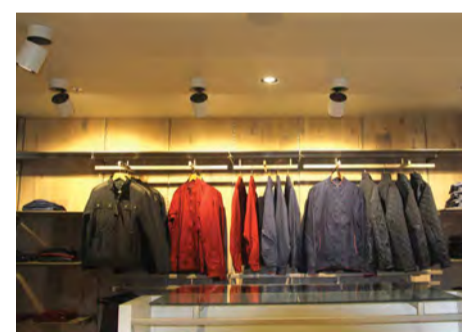
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## CONTEMPORARY ITALIAN ELEGANCE

### CAPTURED IN LIGHT



**E**urolux has added another top-end Italian range to its already impressive stable of professional luminaires. Ivela of Milan, Italy, produces beautiful and unique fixtures for a vast range of applications in the commercial, industrial and residential sectors. Its speciality, however, is energy-saving LED luminaires. "Working closely with top designers, Ivela produce truly striking light fittings, whilst ensuring that they comply with the latest energy saving guidelines," says Eurolux director, Shaun Bouchier.

"Ivela is dedicated to designing and manufacturing energy-efficient luminaires that reduce carbon footprints and deliver top functionality within its intended application, making these fixtures excellent for use in public and commercial settings."

"Eurolux is a distributor for Ivela in South Africa and as such carries a large range of their products – each beautiful to look at and simple to install, such as the Ivela Kyclos Power spotlight, which features a sleek design that can easily blend into the most minimalist of environments."

The lamp's control gear is concealed in the arm of the spotlight, providing a 350° rotation. The front part of the fitting is clear polycarbonate, whilst the painted rear creates a bright effect. The fact that the fitting has no visible screws adds to its appeal. The Kyclos Power fitting can be applied to any LKM 3-phase or DKM dimmable tracks, for ease of use and positioning.

All the fittings in the Kyclos range are characterised by an innovative system of passive heat dissipation, making it suitable for applications that require illumination for extended periods of time. "The Kyclos uses highly efficient COB LED technology, ensuring durability and extended life, ideal for the retail environment – shops, showrooms and even museums," says Bouchier.

The Kyclos Power offers a range of professional optics as accessories, allowing for different beam angles, plus the fixtures does not emit any harmful UV or IR rays.

Another striking Ivela product is the Minikylos-KP – a compact spotlight suited to LKM three-phase and MM single-phase electrified tracks. The product is specially designed for high efficiency COB LED sources and is available in different colour temperatures (3 000 K and 4 000 K), with supply voltage LED (230 V) dimmable on the mains. "The MiniKyclos has a wonderfully compact

design and the fixture can easily be tilted – this versatility makes this spotlight the ideal solution for accent lighting in shops, showrooms, art galleries and high-end homes. The screen of the fitting is again made from clear thermoplastic material and back-painted for a brighter and deeper effect, contrasting nicely with the embossed finishing of its die-cast aluminium body.

"The Ivela Giada wall luminaires are small but they certainly pack a punch," says Bouchier. "It is the perfect partnership between miniaturisation and high efficiency, suitable to a range of applications including contract projects."

Its curved shape fits discreetly onto the wall, providing a pleasant and functional light diffusion. "The visible holes in the upper and lower parts of the fitting have been designed to emphasise the colour of the wall behind and to create luminous scenic effects," he explains.

The Giada is available in a two-LED version for bi-directional indirect light, as well as a single-LED version for indirect light only. Its wide light beam enables its use in a range of applications and it, too, has been developed to use the new COB LED sources, with high power in an innovative design, ensuring passive heat dissipation.

"The Ivela products are the result of constant research into functionality and design and we are proud to have such a top-end range available in our offering," says Bouchier.

To see the entire range, log onto [www.eurolux.co.za](http://www.eurolux.co.za) or visit one of the Eurolux showrooms for personal assistance.

Enquiries: +21 528 8400

## Hemmesphere launches in SA

**T**he Hemmesphere lighting range from Massow Design combines beautifully crafted wood, bare light sources and shadows. Japanese-inspired, the range uses clean lines that create a peaceful energy and demonstrate a bold statement around each lighting piece. Conceived in London in 1997, the Hemmesphere range has had significant success in that city and is now officially launching in South Africa.

Hemmesphere Lighting is a UK-based bespoke lighting design company owned by Barend Massow Hemmes of Massow Design. Previously an interior designer, Hemmes's work is influenced by his design experience and his products, which maximise the play of light and shadow, combine functionality with aesthetics to produce a stylish end-product.

An exclusive range, Hemme-

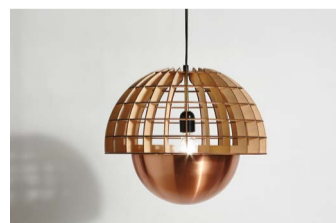
sphere Lighting is proud of its bespoke nature and aims to cultivate individual relationships with its customers – from designers to architects to the end-buyer – in order to customise fittings, where possible, to suit each environment's exact needs.

As a company that defines energy design, Hemmesphere Lighting is familiar with new technologies that allow the designers to interpret designs using algorithms and harnessing parametric design. Constantly thinking out of the box, the company is deliberate about lowering the waste of manufacturing whilst providing a quality and contemporary product through a process that results in aesthetic qualities that question people's interpretation of form and structure.

The fittings are designed to be ceiling or wall-mounted, or to provide floor lighting from the ground

up that will enhance any space with a lattice of light and shade, all creatively styled in soft wood and copper, and customised to fit its space.

Hemmesphere Lighting:  
[www.hemmesphere.co.za](http://www.hemmesphere.co.za)



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## UPGRADE INDUSTRIAL PREMISES TO LED LIGHTING ON A BUDGET

With Government continuously seeking to improve energy efficiency, the objective for many companies is to reach targets without exceeding budgets and finding reliable products that will provide the required return on investment, says Warwick Webber, managing director of Aurora in South Africa

"Affordable, energy-saving LED lighting in industrial and commercial premises is now within easy reach of most building owners and users. There are several LED light fittings that can replace existing halogens on a one-for-one basis, so there's usually no need for a costly rewire, providing the wiring is still in good condition," says Webber, adding that electrical work can be phased in gradually as budget and operations allow.

"With energy savings of 50%, a typical LED upgrade normally pays for itself in two years enabling users to benefit from superior lighting."

### A typical scenario

Across South Africa there are thousands of units on industrial estates where an LED solution could make a large contribution to the nation's energy saving targets.

Webber provides a typical scenario of an existing 2 000 to 3 000m<sup>2</sup> (about 20 000 to 30 000 sq ft) industrial warehouse with offices.

The ground floor is used for 50/50 production and finished goods storage. This main area is lit by HID low bay fittings. There's a mezzanine, used for storage of components and general items, and a single storey office area with a flat roof.

### Cost-effective solutions

For main production areas, Enlite's Aria™ 110 lm/W LED highbays, designed for all

environments, are extremely cost effective. This range provides up to 22 000 lumens to L70 50 000 hours, offers outstanding 50% energy saving compared with HID technology and even more when combined with dimming or using daylight/ occupancy sensors. A controls system also leads to significantly reduced maintenance.

Under and above the mezzanine, Enlite's EcoT8™ single and twin slim line LED batten fittings mimic the look of traditional T8 and T5 fluorescents. Available in single or twin options with a reflector, they are maintenance free and provide uniform, low glare light output.

Simple, elegant and versatile and an ideal retrofit solution for T8 fluorescent tubes, Enlite's EnPac™ IP20 high output LED batten adds a touch of class to office accommodation.

Vandal and impact resistant due to its tough IK10 polycarbonate body, Enlite's Orbital™ IP66 bulkhead range is a great choice for service facilities.

### A worthwhile investment

"Any major investment can be daunting, but when considering the returns achieved with LED, the reality is that the long-term benefits and savings far outweigh short-term costs," says Webber. "In recent years, there have been significant advances in LED technology and it is becoming increasingly affordable with a wide range of designs that easily replace older, traditional fittings. In fact, there's never been a better time to transition to LED."

For more information, visit [enlitemlighting.com](http://enlitemlighting.com)  
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	Existing Installation (Sample)		Proposed LED installation (sample)	
Factory	12 x lowbay 250 W Metal Halide	3 300 W	12 x Aria™ highbay 150 W LED	1 800 W
Under mezzanine	30 x 5 ft twin 58 W batten	4 320 W	30 Enlite EcoT8™ twin batten 44 W LED	1 320 W
Over mezzanine	20 x 5 ft twin 58 W batten	2 880 W	20 x Enlite EcoT8™ twin batten 44 W LED	880 W
Offices	12 x 5 ft twin batten and diffuser	1 728 W	12 x Enlite EnPac™ 45 W LED fitting	540 W
Services	4 x 28 W 2D bulkhead	128 W	4 Enlite Orbital™ 15 W LED bulkhead	60 W
Canteen	4 x 28 W 2D bulkhead	128 W	4 x Enlite orbital™ 15 W LED bulkhead	60 W
<b>TOTAL</b>	<b>12 484 W</b>		<b>4 660 W</b>	

NB Table provides a simple overview of potential energy savings achievable. All projects require specific design/calculation for optimum solution

## NEW MULTI-PURPOSE LED LOWBAY AND

## HIGHBAY LUMINAIRE

BEKA Schröder has introduced its new multi-purpose LEDbay-midi luminaire to the industrial and commercial markets as a highly efficient and energy saving replacement for traditional HID light sources. "This luminaire is proudly designed and manufactured in South Africa," says BEKA's Sibusiso Skosana. "The LEDbay-midi luminaire is suitable for various applications including logistics centres, warehouses, factories, hangars, gymnasias, service stations, retail areas and other large open spaces where high-power highbay lighting is required. To provide maximum flexibility the luminaire is also suitable for lowbay applications. The LEDbay-midi offers symmetrical and asymmetrical optics in order to achieve the highest energy savings and high visual appearance creating the most economical solution," says Skosana.

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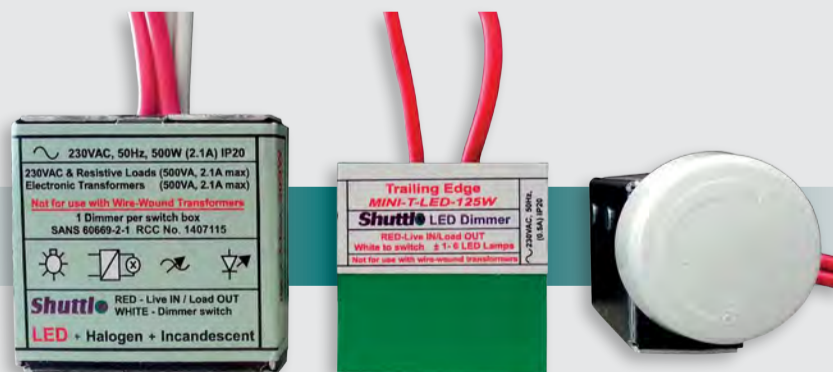


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# VETi

Don't be ordinary... *Switch on Style!*

## MODERNISE your INSTALLATION!

**Monoblock  
Standard  
3 Wire  
Connection!**

*SWITCH ON STYLE...* Simply replace your standard RSA installation with our Elegant range of Veti Switches and Sockets to compliment your lifestyle. Our wide array of colours have been selected to suite any lifestyle setting. Veti Switches and Sockets are compatible with existing RSA wall boxes which makes replacement easy and hassle free.

Veti switches are available with a blue neon locator to add an aesthetic flair to your installation. A neutral is not required to power the light and therefore no additional wiring is required.

**Locator  
doesn't  
require a  
neutral!**



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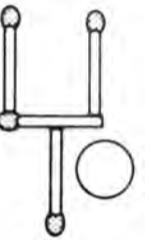
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## BRIGHT SPARK

### A MOVING PROBLEM

This picture represents a cherry and a glass. Of course, you could put the cherry in the glass by picking it up and moving it, but that would be too easy. Your challenge is to put the cherry in the glass by moving only two matches.



### OCTOBER SOLUTION

#### A MIXED COLLECTION

The six wings meant that Tommy kept three birds, which had three heads and six legs. Leaving out the birds entirely, we know that his remaining pets had a total of 12 heads and 32 legs. Rabbits, dogs and cats have four legs each, and  $32 \div 4 = 8$ . The four remaining heads prove that Tommy kept a total of four snakes.

#### DECEMBER FEATURES

- Distribution boards, switches, sockets and protection
- Tools of the trade
- Lighting

#### Buyers' guide

Lighting (Luminaires)

#### Deadlines

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- Editorial: 24 October 2016
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