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# SKILLS MUST RISE

The prestige that tends to be associated with a university degree has left a pronounced need for vocational training in this country. Professor Ian Jandrell, Dean of Faculty of Engineering and the Built Environment, Witwatersrand University explains, "While many school leavers strive to go to university, this is not what we need. We need people to appreciate that excellent careers and skills can be built up, whether or not you have a university degree." Jandrell believes that opportunities for artisans must be promoted and encouraged from the earliest years at school.

### The value of artisanal skills

According to Sean Jones who is the CEO of the Artisan Training Institute, on a national level, artisans each contribute in excess of R4M to the fiscus over the duration of their careers. At industry level, they keep the economy ticking over.

Without artisans, productivity is affected. "For example", Jones says, "Look at the Department of Water & Sanitation, and the pollution in our rivers to see what poor workmanship does. The absence of skills affects every area of our lives. In 2008, countries around the world realised that the biggest inhibitor to growth was the lack of artisanal skills."

### The impact of the shortage of artisans on economy

According to Jones, the short term impacts of a shortage of artisans include difficulties with industrial expansion, productivity loss, and reduced competitiveness of our industry in general. Long term impacts include reduced job availability, lack of innovation within the economy, and difficulties developing a stable middle class.

Jandrell believes skills are built up as a pyramid; "At the top you find the experts – people who are recognised leaders in their disciplines. The point is, you do not need that many of them, particularly if you compare this to the number of engineering technologists and technicians we need. Each of those ranks requires an increasing number of practitioners. If we consider engineering as a field of endeavour, then the base – the part that defines the stability of the pyramid – must be made up of artisans. If that base is not wide (and ours is not), then the pyramid becomes unstable, and having more and more engineers will not correct that. What we need for the economy to flourish, is an increasing number of artisans."

### The misconception about vocational skills

The perception that vocational training is less valuable than a university degree calls for an urgent need for a mind shift, and Jandrell thinks that correcting the misconception requires providing information on what vocational careers are available. "I suspect few career guidance counsellors tell youngsters about becoming an electrician, or a plumber, for instance. But it is easy for them to say, 'study electrical engineering'. What they do not realise is that a large number of students at university never get their degrees. This means, ultimately, they have little more than a school qualification."

### South Africa's best kept secret

P&T Technology's Nick du Plessis who trains artisans and is also WorldSkills South Africa's National Expert for Electrical Installations, says WSSA is the country's best

kept secret. This is a great pity since WSSA promotes the value of artisanal skills and celebrates the talent of young artisans from public TVET Colleges and private skills development providers. It is, as described by Tshidi Magonare of CHIETA, the Olympics of skills development.

At a recent skills demonstration event held to identify the South African Electrical Installations representative for the WorldSkills International (WSI) event to be held in Abu Dhabi during October, the three finalists of the World Skills South Africa (WSSA) competition (held earlier this year) were able to complete an electrical installation from scratch, and according to a strict set of requirements, within 24 hours. There could only be one South African representative – the deserving Mthokozisi Sanga from KwaZulu-Natal – but du Plessis is confident that the skills of all three finalists are on a par with, or better than, those of many newly qualified artisans in the country.

A number of local businesses do support WSSA, including Major Tech, K&S Electrical Automation, ABB, and Builders Warehouse amongst others, but du Plessis says that more companies need to become involved if we are to develop our artisanal skills base.

As Jandrell says, artisans are the cornerstone of any growing economy; they form the base of the skills pyramid that is key to everything else.

As the bedrock of our economy, good artisans need to be honoured.

**"What we need for the economy to flourish is an increasing number of artisans."**



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# WOULD DO IT ALL AGAIN – AND BE PREPARED FOR SOME HARD LESSONS



Mike Visser

**MIKE VISSER**, founder of Power Quality Company along with his partner Elva Visser, is a proud family and businessman with a great appreciation of the earthing and lightning protection industry. His impressive 26 years of experience, include working with the Bombardier engineers on the Gautrain project and, recently, winning the De Beers Venetia contract for the eight-year development of the mine. Taking a closer look at the alchemy of his achievements, there are two distinct virtues that stand out: a pioneering spirit and a willingness to work hard.

**Sparks:** Where were you educated?

**MV:** Peterhouse School, Marandellas, Rhodesia and then I went to Bucknell University in the USA.

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

**MV:** I have been involved for 26 years, since starting Power Quality in 1990.

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

**MV:** The tsunami of crime and fraud in all aspects of life in South Africa of which we are all victims. Copper theft for one causes electrocutions, train derailments, fires and killing of innocent people. This cannot continue. The rise in the importance of safety on site has been rewarding; inductions, medicals, increased specialisation and training are ongoing exercises to improve safety on sites. Finally, one of the biggest changes has been in communication and the increasingly rapid adoption of technological advances, PCs, then laptops, fax machines, mobiles and tablets. The new frontier is software, apps, little screens, and a complete loss of privacy.

**Sparks:** What significant projects have you worked on?

**MV:** Working with the Bombardier engineers on the Gautrain project was an eye opener and great learning experience. Earthing of the Beeshoek mine was our first major project back in the mid 90s, Nestlé's Harrismith plant, Sasol's Ammonia plant and rail loading Mponeng plant, a church in a particularly icy Bloemfontein winter, they and many others were all milestones. Winning the De Beers Venetia contract for the eight-year development of the mine has been a recent highlight.

**Sparks:** What is your greatest accomplishment?

**MV:** I would rate my family and children as my greatest accomplishment. Professionally, without a doubt, founding ELPA and working with my peer group over the last three years making it happen has been incredibly rewarding.

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

**MV:** Without my partner Elva, I would never have come this far. In the early days, we partnered with Don Wilkinson who had been in the industry since the 60s, and he taught me extensively while presenting the early earthing and lightning protection seminars in the 90s. With my software background, I appreciate the imagination and achievements of Mark Shuttleworth and Elon Musk, and especially what they have done with the wealth they created.

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

**MV:** Regulation of the industry to a state of conformance, and the unknown adjustments it will come with. Earthing and lightning protection has been largely un-regulated and this has allowed many projects to be carried out without conforming to the codes of practice, putting end users, their personnel, processes, infrastructure and equipment in danger.

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

**MV:** Running your own company is a continual challenge and earthing and lightning protection is my passion. I would say I have enjoyed the training of the end users most and I feel that we have raised awareness of the importance of this discipline in the marketplace. Seeing staff members grow, develop and put their shoulder to the wheel has also been hugely rewarding.

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

**MV:** I have enjoyed the journey with my partner and together we have shared in the expansion of the industry and learned enormously. We would do it all again and, of course, be more prepared for some of those hard lessons.

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

**MV:** My advice is to elevate earthing and lightning protection to its rightful place (of significant importance) and cater for it at the design phase. Often it is an after-thought, and this means that the installation can be expensive, which becomes difficult to integrate into the project correctly. If the earthing and lightning protection is

considered in the early phase, there is a huge saving to be made.

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

**MV:** Osho, paraphrasing the Buddha said the last words of Gautama the Buddha on the earth were, "Be a light unto yourself. Do not follow others, do not imitate, because imitation, following, creates stupidity."

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

**MV:** Visit Peru and explore their ancient sites, see full disclosure on planet earth, see alternative energy become accessible to uplift mankind.

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## SOCKET-OUTLET POINTS FOR NEW ELECTRICAL INSTALLATIONS

### IMPORTANT NOTICE:

As a general service, the Electrical Conformance Board (ECB) wishes – in respect of socket outlets for general use – to draw the following to the attention of manufacturers, importers, suppliers installers, architects, design engineers, specifiers, users and others, the following requirement included in SANS 10142-1: 2017, Edition 2: SOUTH AFRICAN NATIONAL STANDARD, The wiring of premises, Part 1: Low-voltage installations.

SANS 10142, c) effective from January 2018 all socket-outlet points for new electrical installations shall include at least one socket-outlet complying with the dimensions of SANS 164-2. Socket-outlets points may also include socket-outlets complying with the dimensions of SANS 164-1.

This requirement does not apply to existing installations, therefore existing installations to be sold need not be changed to conform to the new requirement. An existing installation in which a new socket is to be replaced or a new socket installed may still be fitted with the old socket.

A COC/test report will still have to be issued for the new or replaced socket in terms of the 'electrical installation regulations'.

Extract from SANS 10142-1 EDITION 2.

6.15.1.1 Except where otherwise specified in this part of

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## ELECTRICAL SKILLS LEVELS OF LEARNERS IN SOUTH AFRICA

I am currently involved in the WorldSkills preparation phase for electrical learner, Mthokozisi Christopher Sanga, who will be representing South Africa at the WorldSkills International competition in Abu Dhabi later this year. How will we fare? You might be wondering if the skills of a South African learner are on a par with other learners who will be representing their countries in Abu Dhabi.

My answer is yes, they are, if we consider that all competitors from the 37 countries have to be 22 years of age or younger, when they compete against each other. This is where we struggle in South Africa. Many of our learners only find access to the technical world of study once they have completed Grade 12. However, the issue is being dealt with as we speak; technical high schools are slowly re-emerging and this will assist greatly in the future.

As the National Expert for Electrical Installations in the WorldSkills event, I hosted the top three competitors from the National Skills Competition in a four week programme during which time they received training in building automation and Logo 8 PLCs, and we addressed some basic skills. The three then competed against each other in a skills demonstration. The competence demonstration task was similar to the one undertaken by competitors in the 2015 Sao Paulo skills competition, and the standard of skills demonstrated by the three competitors was very competitive against international standards.

What I have learnt from this and previous competitions in South Africa is that we do have learners with the potential and talent, all they need is guidance and support. Those of us in industry can provide this. In many organisations, it does happen. In others, production is the primary

concern and people come second. Where things go wrong, is that frequently, when we experience difficulties with a learner, we tar them all with the same brush. The reality is, if we have a dedicated and efficient work force, production will develop and improve from this activity.

Evidence of our skills development capabilities is available. If you scan the world, you will find South African artisans on all corners of the earth and these artisans are respected for the capabilities and skill levels they acquired in this country. You will never know if you have, amongst your staff, the artisan who will do great things if you do not take the time to help learners achieve their goals. By helping, you in turn will achieve your goal.

South Africa has people, and particularly learners, with potential. All they require is someone to help them identify opportunities and provide an avenue for skills application and skills development. If we want to kick-start our economy, coaching and mentoring are critical in South Africa.

So, consider the rough diamond you have working for you or the learner standing at the entrance to your office premises with his or her CV in hand, as possible potentially brilliant artisans and let's go out and make a difference.

## SCHRÉDER WINS SMART CITY AWARD

SCHRÉDER, in partnership with Atkins Global, has won the first design competition in the City Centre's a smarter city competition. The aim of the competition was to highlight the potential benefits of implementing smart technologies in London's Square Mile.

The city of London has been a hub for technological innovation and as infrastructure continues to evolve, the vision of a connected 'smart city' moves closer to reality. Schröder's key to the city entry uses an augmented reality smartphone app and smart-enabled street furniture to celebrate London's network of over 150 green spaces, providing on-screen information to help residents and visitors engage with their surroundings.

The proposal provides a new strategic vision for urban planners to help unlock hidden layers of the city through connected infrastructure. The adoption of smart lighting technology is a key component in shaping the smart city vision of the future.

Benjamin O'Connor, director of the City Centre, says: "Many people think of 'smart' as purely technological and whilst technology plays a big part, the key to a truly 'smarter' city is innovation. Atkins and Schröder's 'key to the city' celebrates the unique nature of the city's green spaces whilst keeping innovation at its heart."

Simon Newcombe, business development manager and designer at Schröder UK, and Neil Manthorpe, principal landscape architect at Atkins say, "It was great to work together developing this unique and innovative strategy on such a challenging and important brief. We hope this promotes the smarter cities agenda and encourages the realisation of healthier, more active streets and spaces across the City of London.

"Technological innovation in augmented reality, air quality evaluation, provision of electric vehicle charging and improved safety will be critical to unlocking the hidden layers of city streets and spaces."

Schröder has been at the forefront of the adoption of smart lighting technology all over the world. Smart lighting columns, such as the Shuffle by Schröder, have been designed to encourage interactivity and social connectivity in public areas.

The Shuffle, the UK's first ever Wi-Fi connected streetlight, has been installed outside stadium MK in Milton Keynes and combines energy-efficient LED lighting with CCTV cameras, public address (PA) systems, internet connectivity and a range of electric charging applications, in one unified column.

Schröder's winning entry will be exhibited at The City Centre - London until December 2017.

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# Ignorance can be deadly!

A SAFEhouse guide to help avoid the purchase and use of sub-standard, dangerous electrical products and services:

- Buy **brands** you know and can **trust**.
- Buy from **reputable distributors** and outlets.
- Beware of **copies** of prominent brands.
- Be suspicious of **prices** substantially lower than for other, similar products or services on offer.
- Try to make contact with the **seller's supplier** and judge responses critically.
- Be suspicious of **lack of information** on or with the product packaging and on the product itself. Specifications require certain minimum markings and packaging should describe the electrical capacities and the correct application of the product. Look out for contradictions between data provided e.g. different voltage ratings for the same product.
- If the purchase warrants it, ask the supplier for **references** to other users – and make the effort to contact them.
- When dealing with an electrical contractor, ask for proof of registration and about its membership of the **ECA** (Electrical Contractors Association). Call the ECA in your region to check credentials.
- Be critical of a suspect installation or a **Certificate of Compliance (COC)** that is issued too easily.
- Ask the supplier to prove **compliance with regulations**: At the very least a National Regulator for Compulsory Specifications (NRCS) approval in the form of a Letter of Authority (LOA) for the products used which are subject to regulation (See the SAFEhouse guide for a list of these products).
- Look for **certification marks** such as **SABS, VDE and UL**. (Note that the SABS mark is not necessarily a substitute for the LOA).
- Beware of **fraudulent use** of well-known certification emblems, such as the SABS mark.
- A **“CE” mark** is not proof of independent testing and not necessarily proof of conformity.
- **Report** any electrical product failure to the dealer, manufacturer, the NRCS and, if applicable, the National Consumer Commission.
- If in doubt, check with the **SAFEhouse Association** for information it may possibly have to help you.

There are probably millions of unsafe electrical products in circulation and in use in South Africa. SAFEhouse members have signed a code of conduct: Your assurance of commitment to offer only safe electrical products and services.

SAFEhouse membership is suppliers' assurance to customers of responsible behaviour and of customers' safety as a priority. SAFEhouse members regulate themselves. SAFEhouse is primarily a communications association that informs users of safety requirements and occurrences of non-compliance with such requirements.



The SAFEhouse Association is a non-profit, industry organisation committed to the fight against sub-standard, unsafe electrical products and services.

For more information contact:

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A second twist drill bit innovation is the ALPEN Pro. Besides having a reduced cross-cutting edge and an optimised drill bit core, it also features a point angle of 135 degrees with a C-shaped point.



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"Where an old 55 kW motor is operating 24 hours a day and seven days a week, we estimate that a mine can save over to 20 MW a year by replacing it with an IE3 motor," says Zest WEG's Group African business development executive, Edson Cristofolini.

These savings add up when considering how many motors are operational on a large mine, he says. Apart from reducing energy consumption, the motors also contribute to mine profitability through their long life, low maintenance and reliability.

"Repairs and replacements are especially costly and time-consuming for mines in remote locations, and these motors are

designed to operate reliably under harsh operating conditions," he says. "An important aspect of the design in the IE3 range, for instance, is the Class H Insulation with Class B temperature rise."

This provides a buffer of 60°C between the motor winding's average operating temperature and the actual motor insulation capability, protecting the motor where the quality of power varies or where ambient temperatures are high.

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This strategy has stood the company in good stead since it was established in 1984 by CEO Dave van den Berg. Finder plug-in relays and PC board mounting relays and Lovato connectors, manual motor starters, and motor control switchgear were its first breakthrough agencies in the local market.

Straddling the divide between sophisticated electronics and heavy-duty equipment, it has found a niche in the market on which it continues to capitalise.

"We break our backs to offer the best service possible. For example, at the beginning of 2015, the Rand/Dollar exchange rate necessitated a major price increase. In order to mitigate the impact of this, we gave our customers the opportunity of buying our products before the price increase came into effect," van den Berg points out.

While it has a full basket of products, it continues to add new brands. For example, Lovato now offers sophisticated metering devices and power factor controllers, which have opened up new opportunities in industries such as oil and gas and power generation.

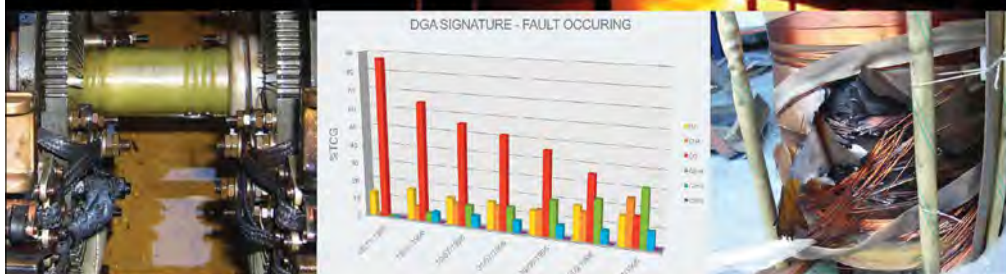
One of the latest international brands to be represented locally is Cembre of Italy, a global manufacturer and supplier of high-quality cable lights and crimping tools, ranging from hand crimpers to hydraulic and battery or electric operated units. Other products include a thermal marking system with its own printer to tag everything from cables to wires, terminals, and relays.

In addition, a range of metering products is available from Socomec, giving major users such as office blocks and shopping centres the flexibility to be able to monitor the energy efficiency of individual plug points.

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## SANAS ACCREDITED ELECTRICAL CALIBRATION SERVICE

**MAJOR TECH'S** vision is 'to ensure that Major Tech is the brand of choice, through consistently pushing the benchmark with innovative, high quality product developments, unparalleled service excellence and exceeding all expectations'. According to sales manager Werner Grobbelaar, in setting out to achieve this vision, the company recognised the requirement for an efficient and reliable calibration service offering and therefore ensured that it was able to offer a SANAS accredited electrical calibration service to all instrument users, whether of Major Tech or other equipment.

Professional test and measurement instrumentation for every application forms the core of Major Tech's business and the company understands the important role that good quality instrumentation plays in the electrical industry by measuring, recording or finding faults.

The accuracy of measuring devices degrades over time and Major Tech's calibration services team can ensure that the instrumentation's quality and maintenance are kept to legislated requirements. Calibration allows users to check the accuracy of an instrument and determines the traceability of the measurement, this process will pin point any errors.

Tests that are likely to be performed during a calibration process include: ac current, ac voltage, dc current, dc voltage, temperature, phase rotation, tachometers, loop/PSC, resistance check, continuity, frequency, diode and capacitance.

Major Tech's calibration facility is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005

Enquiries: +27 (0)11 872 5500

## IMPRESSIVE ENERGY SAVINGS

Given the cold temperatures about to hit us, South Africans will once again see their electricity bills rising by up to 40% as winter takes its toll. HydraTherm has an energy-saving solution for private homes that promises to save up to 70% of total hot water costs.

The integrated heat pump is a hot water cylinder (geyser) that uses roughly a third of the electricity used by a conventional geyser to heat the same amount of water. It uses minimal energy to move heat from surrounding air to water by means of a compressor and an air-to-water heat exchanger.

"It's a bit like a reverse-action air-conditioner," explains Mike Alton, co-founder of HydraTherm. "Where an air-conditioner transfers heat from the air inside a room to the atmosphere outside, a heat pump transfers heat from the air around it to the water in its geyser, using minimal energy. Its application has significant benefits for the environment and consumers' pockets."

High density 50 mm polyurethane insulation ensures the minimum heat loss possible, and the heat pump qualifies for installation in terms of SANS 10400XA and XA2. The water tank is made from SUS316L 'low carbon' stainless steel and the water tank incorporates two electric impressed current anodes in addition to a magnesium sacrificial anode to ensure corrosion is virtually eliminated, even in harsh environments.

Installation is as straightforward as an ordinary geyser and the heat pump is simple to use. It features a smart control panel, with an intuitive on/off push button, and temperature and operating mode controls.



Enquiries: [www.hydratherm.co.za](http://www.hydratherm.co.za)

## HENGSTLER ENCODERS SPEAK BiSS SAFETY

The safety communication layer of BiSS safety has been confirmed in Europe for suitability for safety-related communication up to and including SIL3. As a result, Hengstler offers this protocol for its rotary encoder portfolio.

Gerry Bryant, managing director of local Hengstler distributor Countpulse Controls, says not only will this meet the steady growth for encoders in safety applications, it will also offer the advantage of a continuous data connection to bus participants as well as high transmission rates.

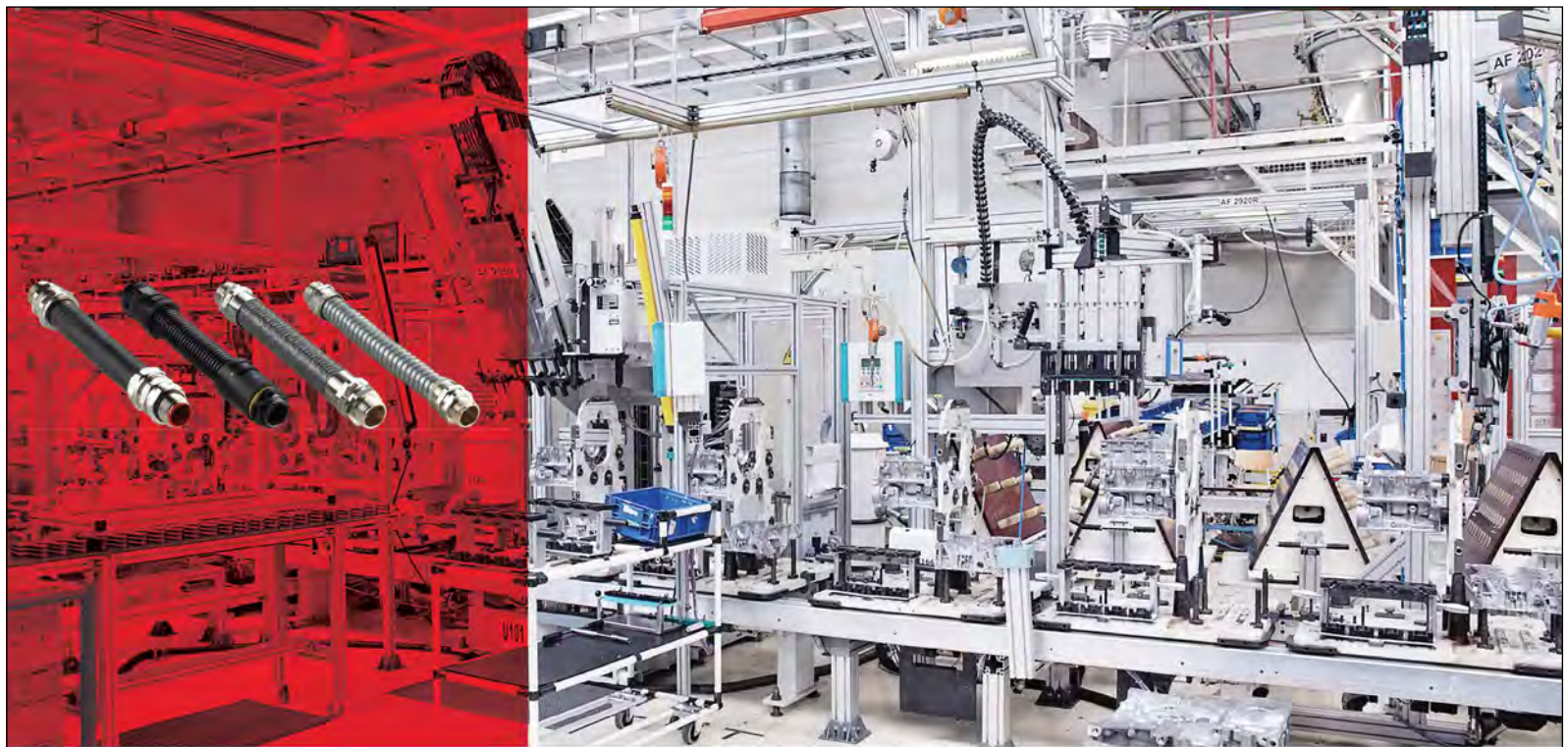
Hengstler encoders have been able to use the open communication standard BiSS C for the past decade, this experience with the protocol has enabled them to roll it out to the full encoder range.

There is potential in the field of functional safety in combination with the ever-increasing machine guidelines for this aspect of operation. To facilitate this, the internal system structure of the encoder is expanded by a number of available blocks.



The safety communication layer of BiSS safety has been certified according to IEC 61784-3:2010 and IEC 61508 Part 1-7:2010. This provides assurance for end users that it is suitable for safety relevant communication up to SIL3.

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## EMX4 ADVANCED SOFT STARTER

The EMX4 soft starter helps to enhance productivity. It helps minimise energy costs and improve operational effectiveness through the delivery of meaningful data to both operators and plant automation systems. Like its predecessor, it sets new standards for soft start technology. It is smaller, powerful and packed with new control and protection features and also introduces smart card capability. Fitting a smart card to the EMX4 transforms it from a super smart motor controller to a complete system controller.

EMX4 has been designed to make life easier, from commissioning through operation to fault finding.

The user experience has been designed to include a comprehensive graphical display, quick setup menus, simulation modes and multiple languages. The USB port allows straightforward upload, download and storage of starter performance information, increasing the ability to manage the system effectively. The USB port can also be used for quick and easy firmware upgrade.

The starter continues to be amongst the smallest and lightest in its class, saving installation costs by minimising panel space requirements. The new design makes the starter smaller and lighter than the previous generation by up to 67%.

Smart cards deliver industry or application specific functionality and are easily inserted into the EMX4, simplifying the system design, installation and set-up.

Features include:

- Current range 24 ~ 1600 A
- Motor connection in-line (three-wire) or inside
- Delta (six-wire)
- Energy saving integrated internal bypass
- Mains voltage 200 Vac ~ 525 Vac or
- 380 Vac ~ 690 Vac
- Mains frequency 45 Hz to 66 Hz

Enquiries: +27 (0)10 202 3300



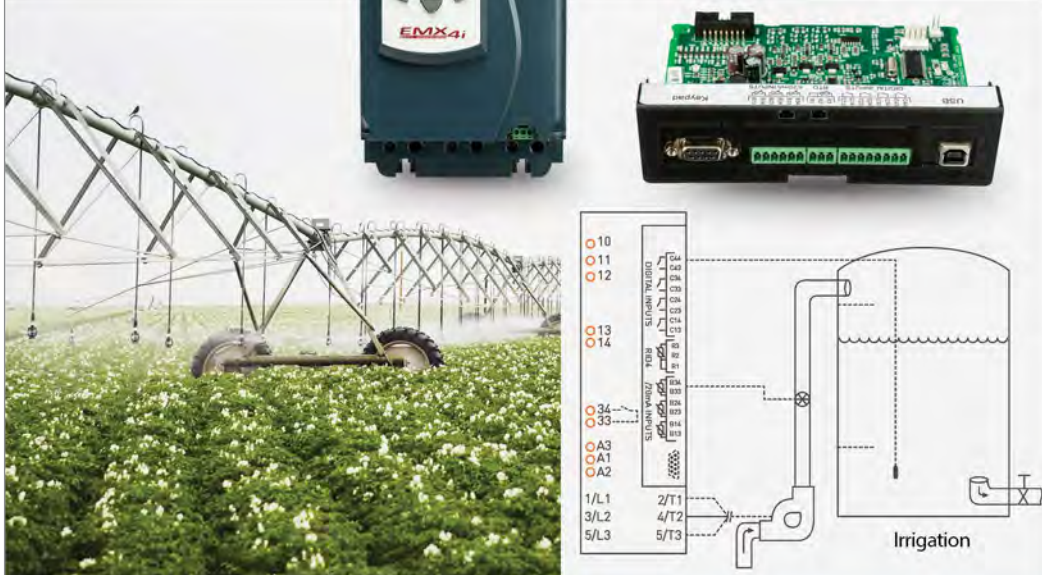
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Right from the **START**



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**Like its predecessor, the EMX4 Soft Starters sets new standards for soft start technology.**

The EMX4 is not only smaller, more powerful and packed with new control and protection features, it also introduces the game-changing Smart Card capability. Fitting a Smart Card to EMX4 transforms it from super motor smart controller to complete system controller. This is truly a starter for the future.

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17 Models (2 Frames), 24A ~ 580A,  
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### EMX4i ADVANCED PLUS

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### VOLTAGE RANGES

- 200 ~ 525 VAC (V5), 380 ~ 690 VAC (V7)

### PROTECTION

- IP20 EMX4-0024B ~ EMX4-0135B

- IP00 EMX4-0184B ~ EMX4-1600C

### KEY FEATURES

Next generation advanced range soft starters from EMX3. Graphical display with up to 11 language, and QR code generation. USB firmware update, parameter download/ upload and diagnostic extraction. Improved XLR-8 Adaptive Acceleration technology for IE3 motors. Industry specific Smart Card accessories. Serial and Ethernet Communications options.

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### NATIONAL CALL CENTRE

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[www.acdc.co.za](http://www.acdc.co.za)

## THE SCIENCE OF SAFETY

According to national statistics drawn from Federated Employers Mutual Assurance's records for 2007\*, 10 231 claims were registered – 1 047 more than for 2006. The amount paid out for claims in 2007 was R104-million, R7-million less than the previous year. Unfortunately, 60 fatalities were also registered.

3M uses the science of safety to create personal protection equipment (PPE) for all sectors. It has products such as hearing protection; head and face protection; fall protection; and reusable respirator and disposable respirator portfolios.

According to Rani Naidoo, technical manager Personal Safety Division, "Safety in conjunction with innovation is what makes 3M a leader in PPE. However, creating the products alone is not enough, and the company has taken safety a step further by providing its customers with the information and training they need to properly access and utilise PPE and safety services."

Naidoo adds that the science of safety programme assists customers to use the correct PPE for the specific tasks to be undertaken while providing a personal validation process to ensure they know how to test the fitting of their PPE and can rest assured their workforce is trained and educated on the correct use.

Broadening its capacity for providing quality safety solutions, 3M acquired Capital Safety, a leading global provider of fall protection equipment, in late 2015.

\*Figures are the latest publicly provided by FEMA at the time of printing.

Enquiries: +27 (0)11 806 2000

## ELECTRAHERTZ CELEBRATES 35 YEARS

On 1 June 2017, Electrahertz celebrated its 35<sup>th</sup> birthday. It first opened its doors on 1 June 1981 in Gezina, Pretoria with a staff complement of two. Two years later, a branch was opened in Jet Park.

In the beginning, its concentration was power factor correction, it later branched into electrical contracting and reticulation. As customer demands grew, it offered a variety electrical equipment, with a focus on electrical control gear and metering.

It currently offers electrical wholesale, board building, power factor correction, surveys and a range of innovative electrical equipment geared to renewable energy.

Ian Greyling, managing director, says, "Integral to the success of Electrahertz is that we bring the world's best products and solutions to Africa. With over 120 suppliers sourced across the globe, Electrahertz is able to service the industry with innovative and complementary products."

"We are proud to be associated with many suppliers and loyal customers over the past 35 years and hope to be able to offer the same service for the next 35 years," he concludes.

Enquiries: +27 (0)12 804 0120





WORKING KNOWLEDGE BY TERRY MACKENZIE HOY

## MOTOR RATINGS AND VOLTAGES

Once worked at a plant where the system voltage was 525 volts. The calculation was, if the motor is rated 500 V and if the busbar voltage is 525 volts, one loses 25 volts as they drop in the cable. However, in common usage in the plant, the motors were referred to as '525-V motors' and not '500-V motors'. There were also a number of motors on the plant where the busbar voltage was 400 V and operated at 380 V. These were routinely referred to as '400-V motors'. I am writing this to try and clarify matters, especially when you see written on the label of a motor '400 V / 380 V 3 ph' and you think is not the same as a separate motor with a label that reads '400 V 3 ph'. They are in fact the same motor. There is a wide tolerance for the voltage range over which a motor will continue to operate satisfactorily—in general, motors can operate within +/- 5% of their nominal rating (that's the 400 V or busbar voltage rating). A 400-V motor will operate at between 380 volts and 420 volts without any harm. But beware! This applies to motors that are made to an SABS specification or an IEC specification. Almost all the time, the standard three phase motor will be a TEFC motor (Totally Enclosed Fan Cooled) and will have two, four, six or eight poles. For motors which run on 50 Hz, this means the motors no load speed will be 3000 rpm, 1500 rpm, 1000 rpm or 750 rpm. The full load speed is less than this – 2850 rpm, 1425 rpm, 950 rpm and 712 rpm. The speed chosen by the designer depends on the type of load – most fan suppliers like to run fans at about 2850 rpm since the fan diameter is small. Most pump suppliers prefer 1425 rpm motors. Motors

that are rated at 60 Hz will run 20% faster than 50 Hz motors. On ships, the power supply is rarely 50 Hz and is normally a 60 Hz voltage supply. The question is, can a 50 Hz motor run on a 60 Hz supply? The answer is generally yes, a 50 Hz motor can run on a 60 Hz supply, but not the other way around because the 60 Hz motor on a 50 Hz supply is running 20% slower and getting 20% less fan cooling ... one thinks. However, the fan air flow rate does not fall off linearly, a fan running at 20% less speed than design is in fact giving nearly 30% less motor cooling.

When looking at motors, and when reading the fine print on the label, be cautious of any motor that is not rated S1 (this rating is on the label). Motors rated S3 or S4 are only rated to give full power for intermittent duty. One only finds this on imported equipment. Given the operating conditions in this country, one should never

accept any motor that is not rated at S1. On the motor label, one also sees the 'insulation class' which can be class B, class F or class H. All these are based on a maximum ambient temperature of 40 °C and a permissible temperature rise for B of 80 degrees, F of 105 degrees and H of 125 degrees. In by-gone days, class H and F motors were more expensive than class B and thus rarely specified. These days, they are not expensive and class F is most commonly specified. A final tip – if you have to replace the motor, make sure you know the frame size. This is a number which looks something along the lines of, 'Frame 90' or F90 or F112 or similar. All manufacturers work to the same standard frame size. But, if you are not certain, well just take a cell phone photo of the label and SMS it to the supplier. WhatsApp works too. Oh so easy these days ...

## HANDHELD ULTRASOUND DEVICE DETECTS SIGNS OF IMPENDING MALFUNCTION



In conjunction with infrared inspection, ultrasound can form the basis of an excellent condition based maintenance programme. Ultrasound detection can be used to find anomalies in electrical equipment including arcing, tracking and corona that are indicators of premature insulation breakdown and imminent equipment failure.

The Sonus XT is a handheld ultrasound detector with accessories for multiple types of inspections. It can also be used to save energy by finding leaks and component malfunctions on compressed air, steam and vacuum systems. It diagnoses early signs of mechanical system failures including motor and bearing problems. By detecting noise in the ultrasound spectrum (40 kHz), it allows users to quickly identify problems and determine corrective action.

Users can perform preventative maintenance inspections on their electrical and mechanical equipment, and it comes with recording and analysis software to aid in problem diagnosis.

Rudy Wodrich, VP of Engineering Services at IRISS explains, "IRISS has always been focused on increasing electrical safety by performing closed panel inspections using infrared, but we have also recognised the value of ultrasound as a tool for preventative maintenance. We are proud to bring this product to a market that has been underserved in recent years. The Sonus XT fits well into our broader strategy of teaching our client base to perform more surveillance and less maintenance."



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## MOTOR CONTROL CENTRES AND HOW THEY WORK

Think about what happens when you switch on your kettle in the morning. Apart from the encouraging noises it makes, indicating that coffee is not far off, all kinds of clever things are going on inside the kettle's electrical circuitry.

Every electric motor has a controller, and these controllers differ in complexity and number of features depending on the job they need to do. In the case of your kettle, the controller is the on/off switch, and you manually operate it so that it can perform its very important task.

Now imagine you had to make a thousand cups of coffee, and needed to switch on 500 kettles at the same time. Not easy. In fact, pretty impossible. This is why motor control centres are such vital pieces of equipment, controlling everything through a centralised system.

In its simplest application, a motor control centre (MCC) is a panel that works as a motor starter for several automated or semi-automated machines. Comprising one or more enclosed sections with a common power bus, an MCC can include variable frequency drives, programmable controllers and metering. Essentially, MCCs are a type of electrical 'filing cabinet', with 'drawers' full of lighting contactors, combination starters and other electrical control and distribution products. Each section, or motor controller, of the cabinet has a built-in safety mechanism to protect the motor. These can be solid-state overload protection relays, fuses or a circuit breaker, and there is usually a disconnecting switch as well to isolate the motor circuit.

Motor control centres have been around since the 1950s when they were first used by the car manufacturing industry, which needed many electric motors. Today, they're found in numerous commercial and industrial applications, specifically where there are multiple, remotely controlled loads linked to a central control point.

Modern MCCs offer a host of benefits, including:

- **Reduced downtime** – standardised sections mean a simpler design, so operators require less operational training. Plug-in units can easily be swapped out for maintenance or replacement, and the inherent isolation of MCC units means

they can safely be serviced individually, within legislated guidelines, without switching off adjacent units.

- **Quicker, cheaper installation** – MCCs have their own factory-wired and tested units and power buses, so field wiring and testing are minimised.
- **Flexibility** – MCCs can be easily expanded by adding new units and sections.
- **Space saving** – much more compact than mounting individual devices. JB Switchgear is known in the industry for designing and manufacturing high quality switchgear solutions that meet the latest national and international safety and performance standards. The company offers a comprehensive range of fixed, de-mountable and withdrawable motor control centres, so tell them how they can help you get the solutions you need.

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## SPACE-SAVING SURGE PROTECTION



With the Termitrab complete product range, Phoenix Contact offers the narrowest surge protective devices on the market. They are suitable for MCR applications starting from an overall width of just 3.5 mm. This means that the protective devices can protect up to 572 signals against surge voltages on just one metre of DIN rail.

The integrated disconnect device ensures safe behaviour in the event of overload. It signals the status on each protective device mechanically without auxiliary power. Optional remote signalling modules monitor the status of up to 40 neighbouring surge protective devices by means of a photoelectric barrier. Installation is simplified as a result: no additional wiring or programming is required for the protection modules. Protective devices in a narrow design, products with protective plugs that can be tested, signalling, and optional remote signalling modules can be selected according to specific requirements owing to the tailor-made product range. The surge protective devices are available with Push-in connection technology as well as screw connection. Versions are also available with innovative knife disconnection and for Ex applications.

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## CONTACT

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ACTOM Electrical Products: Mike Ullyett  
ARB Electrical Wholesalers: Sales  
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Brother International SA: Munna Desai  
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Full range of cable securing products

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HellermannTyton  
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Full range of cable glands

## CABLE GLANDS

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Voltex  
Full range of cable joints  
Waco  
Full range of cable joints

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Full range of cable marking systems  
Brother International SA  
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Full range of cable marking systems  
Legrand  
CAB 3, Logicab 2 and Duplix identification and marking systems for easy identification of circuits.  
Magnet Electrical Supplies  
Full range of cable marking systems  
Phambili Interface  
Full range of cable marking systems  
Phoenix Contact  
Full range of cable marking systems  
PSA/TKD Cable  
Full range of marking systems  
Three-D Agencies  
Full range of cable marking systems  
Voltex  
Full range of cable marking systems

## BUSBAR TRUNKING SYSTEMS

ABB South Africa  
Full range of busbar trunking systems  
ARB Electrical Wholesalers  
Full range of busbar trunking systems  
Bellco  
Full range of busbar trunking systems  
ElectroMechanica  
Full range of busbar trunking systems  
JDL Electric  
Full range of busbar trunking systems  
Legrand  
Distribution systems for currents up to 5 000 A, to connect transformers to main LV distribution board, supply power to the server racks or lighting.

## BUSBAR TRUNKING SYSTEMS

MCE Electric  
MCE busbar insulators; MCE busbar accessories; MCE slotted trunking; Onesto insulated busbars  
O-Line  
Full range of busbar trunking systems  
PSA/TKD Cable  
Full range of busbar trunking systems  
Voltex  
Full range of busbar trunking systems  
Voltex LSis  
Full range of busbar trunking systems  
Voltex MV/LV Solutions  
Full range of busbar trunking systems

## EARTH BARS

ACDC Dynamics  
Full range of earth bars  
ARB Electrical Wholesalers  
Full range of earth bars  
Bellco  
Full range of earth bars  
ElectroMechanica  
Full range of earth bars  
Electrozone Electrical  
Full range of earth bars  
HellermannTyton  
Line taps and T-ferrules  
JDL Electric  
Full range of earth bars  
Legrand  
Distribution blocks  
MCE Electric  
Onesto DIN rail earth bars; MCE fully insulated earth bars  
Phoenix Contact  
Full range of earth bars  
PSA/TKD Cable  
Full range of earth bars  
Voltex  
Full range of earth bars  
Waco  
Full range of earth bars

## NEUTRAL BARS

ACDC Dynamics  
Full range of neutral bars  
ARB Electrical Wholesalers  
Full range of neutral bars  
Bellco  
Full range of neutral bars  
ElectroMechanica  
Full range of neutral bars  
Electrozone Electrical  
Full range of neutral bars  
JDL Electric  
Full range of neutral bars  
Legrand  
Distribution blocks  
MCE Electric  
Onesto DIN rail neutral bars; MCE fully insulated neutral bars  
Phoenix Contact  
Full range of neutral bars  
PSA/TKD Cable  
Full range of neutral bars  
Voltex  
Full range of neutral bars  
Voltex LSis  
Full range of neutral bars

## LV CABLES

Aberdare Cables  
Full range of LV cables  
ACDC Dynamics  
Full range of LV cables  
ARB Electrical Wholesalers  
Full range of LV cables  
Atlas  
Full range of LV cables  
Bellco  
Full range of LV cables  
Consortium Cables  
Full range of LV cables  
Electrozone Electrical  
Full range of LV cables  
JDL Electric  
Full range of LV cables  
PSA/TKD Cable  
Full range of LV cables  
South Ocean Electric Wire Company  
Full range of LV cables  
Versalec Cables  
Full range of LV cables  
Voltex  
Full range of LV cables

## MV CABLES

Aberdare Cables  
Full range of MV cables  
ACTOM Electrical Products  
Distributors of full drums and lengths cut to size: paper insulated lead cables (PILC); cross-linked polyethylene (XLPE); MV aerial bundled conductors (ABC)  
ARB Electrical Wholesalers  
Full range of MV cables





**MV CABLES**

- Atlas**  
Full range of MV cables
- Bellco**  
Full range of MV cables
- Consortium Cables**  
Full range of MV cables
- JDL Electric**  
Full range of MV cables
- Magnet Electrical Supplies**  
Full range of MV cables
- PSA/TKD Cable**  
Full range of MV cables
- Versalec Cables**  
Full range of MV cables
- Voltex**  
Full range of MV cables

**CONDUIT**

- ABB South Africa**  
Full range of conduit
- ACDC Dynamics**  
Full range of conduit
- ACTOM Electrical Products**  
All PVC and steel conduit and fittings
- ARB Electrical Wholesalers**  
Full range of conduit
- Bellco**  
Full range of conduit
- Citilec**  
Full range of conduit
- Crabtree Electrical Accessories**  
Conduit; compact mini trunking; cable line trunking; accessories for trunking; PVC conduit accessories; flexible conduit
- Electrozone Electrical**  
Full range of conduit
- Eurolux**  
20 mm and 25 mm conduit
- HellermannTyton**  
Flexible conduit
- JDL Electric**  
Full range of conduit
- Legrand**  
Flexible conduit and accessories
- Magnet Electrical Supplies**  
Full range of conduit
- O-Line**  
Full range of conduit
- PSA/TKD Cable**  
Full range of conduit
- Radiant Lighting**  
Full range of conduit
- Schneider Electric**  
Flexible corrugated conduit
- South Ocean Electric Wire Company**  
Full range of conduit
- Three-D Agencies**  
Full range of conduit
- Voltex**  
Full range of conduit

**TELECOM, INSTRUMENTATION AND CONTROL CABLES**

- Aberdare Cables**  
Multicore cable
- ACTOM Electrical Products**  
Full range of telecom, instrumentation, and control cables
- ARB Electrical Wholesalers**  
Full range of telecom, instrumentation and control cables
- Atlas**  
Full range of telecom, instrumentation and control cables
- Bellco**  
Full range of telecom, instrumentation and control cables
- Consortium Cables**  
Full range of telecom, instrumentation and control cables
- ElectroMachanica**  
Full range of telecom, instrumentation and controls
- HellermannTyton**  
Fibre enclosures and accessories, T180 tone and probe kit
- JDL Electric**  
Full range of telecom, instrumentation and control cables
- Major Tech**  
RJ11 and RJ45 (CAT 6) connectors for the telecoms market
- Phoenix Contact**  
Full range of telecom, instrumentation and control cables
- PSA/TKD Cable**  
Full range of telecom, instrumentation and control cables
- Voltex**  
Full range of telecom, instrumentation and control cables

**CABLES FOR HARSH ENVIRONMENTS**

- Aberdare Cables**  
Fyrgard; Lohal; Lotox; Fysure
- ACTOM Electrical Products**  
Suppliers of anti-termite cables; silicone single wires and cabtyres; H07RN-F rubber cables
- ARB Electrical Wholesalers**  
Full range of cables for harsh environments
- Atlas**  
Full range of cables for harsh environments
- Bellco**  
Full range of cables for harsh environments
- Consortium Cables**  
Full range of cables for harsh environments
- Eurolux**  
Hazardous area lighting

**CABLES FOR HARSH ENVIRONMENTS**

- JDL Electric**  
Full range of cables for harsh environments
- Phoenix Contact**  
Full range of cables for harsh environments
- PSA/TKD Cable**  
Specialise in a full range of cables for harsh environments
- Versalec Cables**  
Full range of cables for harsh environments
- Voltex**  
Full range of cables for harsh environments

**TRAILING CABLES**

- Aberdare Cables**  
Elastomeric insulated cables; flexible cable (types H05 RN-F, H07 RN-F); welding cable, mining trailing cable (up to 33kV)
- ACDC Dynamics**  
Full range of trailing cables
- ACTOM Electrical Products**  
Rubber and PVC trailing cables
- ARB Electrical Wholesalers**  
Full range of trailing cables
- Atlas**  
Full range of trailing cables
- Bellco**  
Full range of trailing cables
- Consortium Cables**  
Full range of trailing cables
- JDL Electric**  
Full range of trailing cables
- Magnet Electrical Supplies**  
Full range of trailing cables
- Phoenix Contact**  
Full range of trailing cables
- PSA/TKD Cable**  
Full range of trailing cables
- Radiant Lighting**  
Full range of trailing cables
- South Ocean Electric Wire Company**  
Full range of trailing cables
- Voltex**  
Full range of trailing cables

**FLEXIBLE CABLES**

- Aberdare Cables**  
Power flex single core cable
- ACDC Dynamics**  
Full range of flexible cables
- ACTOM Electrical Products**  
Welding cables, cabtyres, trailing cables, panel wires, submersible cables
- ARB Electrical Wholesalers**  
Full range of flexible cables
- Atlas**  
Full range of flexible cables
- Bellco**  
Full range of flexible cables
- Consortium Cables**  
Full range of flexible cables
- ElectroMachanica**  
Full range of flexible cables
- Electrozone Electrical**  
Full range of flexible cables
- JDL Electric**  
Full range of flexible cables
- Magnet Electrical Supplies**  
Full range of flexible cables
- Phoenix Contact**  
Full range of flexible cables
- PSA/TKD Cable**  
Full range of flexible cables
- South Ocean Electric Wire Company**  
Full range of flexible cables
- Voltex**  
Full range of flexible cables

**LUGS, FERRULES, CONNECTORS, PRE-INSULATED TERMINALS**

- ABB South Africa**  
Full range of lugs, ferrules, connectors, pre-insulated terminals
- ACDC Dynamics**  
Full range of lugs, ferrules, connectors, pre-insulated terminals
- ACTOM Electrical Products**  
Full range of lugs, ferrules
- ARB Electrical Wholesalers**  
Full range of lugs and ferrules
- Bellco**  
Full range of lugs, ferrules, connectors and pre-insulated terminals
- ElectroMachanica**  
Full range of lugs, ferrules, connectors and pre-insulated terminals
- Electrozone Electrical**  
Full range of lugs, ferrules, connectors and pre-insulated terminals
- Eurolux**  
Full range of SABS-approved lugs, ferrules, connectors and pre-insulated terminals
- HellermannTyton**  
HT, HTB, XLPE lugs, pre-insulated terminals and brass terminals
- JDL Electric**  
Full range of lugs, ferrules, connectors, pre-insulated terminals
- Jointmaster**  
Mechanical shearbolt connectors (lugs and ferrules) for use on MV cables
- Legrand**  
Starfix ferrules
- Magnet Electrical Supplies**  
Full range of lugs, ferrules, connectors, and pre-insulated terminals

**LUGS, FERRULES, CONNECTORS, PRE-INSULATED TERMINALS**

- MCE Electric**  
MCE insulated and uninsulated terminal bars
- Phambili Interface**  
Full range of lugs, ferrules, connectors, and pre-insulated terminals
- Phoenix Contact**  
Full range of lugs, ferrules, connectors and pre-insulated terminals
- Pratley**  
Full range of lugs, ferrules, connectors and pre-insulated terminals
- PSA/TKD Cable**  
Full range of lugs, ferrules, connectors and pre-insulated terminals
- Stone Stamcor**  
Full range of copper/aluminium bi-metallic, compression lugs and ferrules; 11 kV and 36 kV mechanical lugs and ferrules; full range of pre-insulated terminals
- Three-D Agencies**  
Full range of lugs, ferrules, connectors and pre-insulated terminals
- Voltex**  
Full range of lugs, ferrules, connectors and pre-insulated terminals

**SPECIALISED CABLES**

- Aberdare Cables:** Fyrsure; Waterblocked XLPE
- ACTOM Electrical Products:** Full range of specialised cables on request
- ARB Electrical Wholesalers:** Full range of specialised cables
- Atlas:** Full range of specialised cables
- Bellco:** Full range of specialised cables
- Consortium Cables:** Full range of specialised cables
- ElectroMachanica:** Full range of specialised cables
- Electrozone Electrical:** Full range of specialised cables
- JDL Electric:** Full range of specialised cables
- Legrand:** Legrand cabling system 2 (LCS2) includes copper (cat 6 A, cat 6 and cat 5e, fibre optic and wi-fi solutions as well as enclosures)
- Phoenix Contact:** Full range of specialised cables
- PSA/TKD Cable:** Full range of specialised cables
- Versalec Cables:** Full range of specialised cables
- Voltex:** Full range of specialised cables

**PANEL WIRING, TERMINALS AND TERMINAL BLOCKS**

- ABB South Africa**  
Full range of panel wiring, terminals and terminal blocks
- ABB South Africa**  
SNK and SNA ranges: screw; PI-spring (push-in); ADO systems (IDC); pluggable, etc
- Aberdare Cables**  
Slipdac; panel flex; Nitrile panel flex
- ACDC Dynamics**  
Full range of panel wiring, terminals and terminal blocks
- ACTOM Electrical Products**  
Full range of single and multi-core panel wires
- ARB Electrical Wholesalers**  
Full range of panel wiring, terminals and terminal blocks
- Bellco**  
Full range of panel wiring, terminals and terminal blocks
- ElectroMachanica**  
Full range of panel wiring, terminals and terminal blocks
- Electrozone Electrical**  
Full range of panel wiring, terminals and terminal blocks
- Legrand**  
Viking 3 junction blocks
- Magnet Electrical Supplies**  
Full range of panel wiring, terminals and terminal blocks
- Major Tech**  
Range of easy-to-use terminal blocks
- MCE Electric**  
MCE Multi-pole distribution blocks; Morsettitalia DIN terminal blocks
- O-line**  
Full range of panel wiring, terminals and terminal blocks
- Phambili Interface**  
Full range of panel wiring, terminals and terminal blocks
- Phoenix Contact**  
Full range of panel wiring, terminals and terminal blocks
- Pratley**  
Full range of panel wiring, terminals and terminal blocks
- PSA/TKD Cable**  
Full range of panel wiring, terminals and terminal blocks
- South Ocean Electric Wire Company**  
Full range of panel wiring, terminals and terminal blocks
- Three-D Agencies**  
Full range of panel wiring, terminals and terminal blocks
- Voltex**  
Full range of panel wiring/terminals and terminal blocks

**CABLE LADDERS, CABLE TRAYS**

- ABB South Africa**  
Full range of cable ladders, cable trays
- ACDC Dynamics**  
Full range of cable ladders, cable trays
- ACTOM Electrical Products**  
All cable ducting and trays
- ARB Electrical Wholesalers**  
Full range of cable ladders and cable trays
- Bellco**  
Full range of cable ladders, cable trays
- Cabstrut**  
Powerack weld-free cable ladder; return flange cable tray; welded wire mesh tray
- Electrozone Electrical**  
Full range of cable ladders and cable trays
- JDL Electric**  
Full range of cable ladders, cable trays
- Legrand**  
Cablofil cable trays

**CABLE LADDERS, CABLE TRAYS**

- O-line**  
Full range of cable ladders, cable trays
- PSA/TKD Cable**  
Full range of cable ladders, cable trays
- Voltex**  
Full range of cable ladders, cable trays

**CRIMP TOOLS AND CUTTERS**

- ABB South Africa**  
Full range of crimp tools and cutters
- ACDC Dynamics**  
Full range of crimp tools and cutters
- ACTOM Electrical Products**  
Full range of tools and equipment for cables
- ARB Electrical Wholesalers**  
Full range of crimp tools and cutters
- Bellco**  
Full range of crimp tools and cutters from DIY to heavy duty crimpers including hydraulic crimpers, hand-held and hydraulic cable cutters
- ElectroMachanica**  
Full range of crimp tools and cutters
- Electrozone Electrical**  
Full range of crimp tools and cutters
- HellermannTyton**  
Full range of crimp tools and cutters
- JDL Electric**  
Full range of crimp tools and cutters
- Jointmaster**  
Specialised cable preparation tools and preparing MV XLPE cables
- Legrand**  
Starfix
- Magnet Electrical Supplies**  
Full range of crimp tools and cutters
- Major Tech**  
Full range of crimp tools and cutters
- MCE Electric**  
MCE tools, crimpers, cable cutters and wire strippers
- Phambili Interface**  
Full range of crimp tools and cutters
- Phoenix Contact**  
Full range of crimp tools and cutters
- PSA/TKD Cable**  
Full range of crimp tools and cutters
- Stone Stamcor**  
Full range of handheld, hydraulic and battery crimping and cutting tools
- Three-D Agencies**  
Full range of crimp tools and cutters
- Voltex**  
Full range of crimp tools and cutters
- Waco**  
Full range of crimp tools and cutters

**CABLE TRENCH COVERS**

- ARB Electrical Wholesalers**  
Full range of cable trench covers
- Bellco**  
Full range of cable trench covers
- Consortium Cables**  
Full range of cable trench covers
- Electrozone Electrical**  
Full range of cable trench covers
- JDL Electric**  
Full range of cable trench covers
- O-Line**  
Full range of cable trench covers
- Voltex**  
Full range of trench covers

**ACDC DYNAMICS**  
+27 10 202 3300

**MCE ELECTRIC**  
+27 11 683 0641

**Crabtree**  
+27 11 874 7600

**voltex**  
+27 11 879 2000

**ABB**  
+27 10 202 6995

**O-line**  
+27 11 378 3700

**HellermannTyton**  
+27 11 879 6600

**electrozone electrica**  
+27 11 833 1075

**Stone-Stamcor**  
+27 11 452 1415

**MAJOR TECH**  
+27 11 872 5500

**Schneider Electric**  
+27 11 046 1900

**brother at your side**  
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**CONSORTIUM CABLES**  
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**PRATLEY**  
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## THE LATEST ISSUE OF SANS 10142-1

We have slowly but surely worked our way through SANS 10142-1:2012 Edition 1.8, spending time on the Occupational Health and Safety Act (Act 85 of 1993) – the Act itself, its regulations and a few related issues too. More recently, we looked at the registration requirements for accredited persons. The next step would have been to look at the registration requirements for electrical contractors, but guess what crossed my desk as I was getting ready to dive into the contractor registration requirements. The latest issue of SANS 10142-1 – yes, that is right. I received a brand spanking new copy of SANS 10142-1, published in March 2017! And the thing that struck me was we all have to go out and buy a whole new code. A completely new book? Yep! It appears the South African Bureau of Standards (SABS) Standards Division decided it was time to ditch references to all previous amendments since the 2012 edition (all eight of them), add a few paragraphs and clauses here and there and, in so doing, render the old book effectively useless. Instantaneously also removing all amendment references to 'when did things change from... to...?' for hundreds of 'old hands' in the industry. So, be very careful when citing verbatim from memory ... you could be in for a nasty surprise, as many clauses and page numbers have changed. But 'nou ja' ... change is a good thing ... or is it?

Given the above, I thought it appropriate to divert our attention for an instalment or two and focus on this new edition of SANS 10142-1, before continuing with the requirements for contractor registration.

The first thing that struck me was the colour of the binder – black. Gone are the days of referencing 'the green book'. No doubt, way back in the late 70s, the old hands of the time said the same, 'gone are the days of referencing the blue book'. You see, the very first code of practice (even before it became a SABS Standard), was published by the South African Institute of Electrical Engineers (SAIEE). The publication had a blue cover and sometime around the 1980s, when the SAIEE publication became a national standard, the binder changed to green. Mind you, I think many of you will continue to refer to SANS 10142-1 as 'the green book'. Others might start calling it 'the little black book'.

So what lurks between the covers?

Proof that this is a totally new publication can be found on the cover page. In the page header, the ISBN number is different and the title reads... **SANS 10142-1:2017 Edition 2**. Also on the first page is a 'WARNING'. Now I have to ask, are the writers of the code trying to scare me, or do they actually want to remind, notify or forewarn me that SANS 10142-1 references other documents and standards that must be consulted in order to fully comply with the electrical installation standards in South Africa? No such 'WARNING' was present in Edition 1, however, reference was made to 'normative' and 'informative' content in the 'table of changes', the 'foreword' and 'contents'. There are however warning notices in the text of the code that make perfect contextual sense. Next. The 'table of changes' is completely empty – whether this can be regarded as a change or not, I'm not sure.

The next change we find is in the 'foreword', namely, the committee number that approved this edition of SANS 10142-1, changed from national committee SABS SC 67F to national committee SABS/TC 067/SC 06.

The above does not really bring about any material change to the way in which the code will influence my working life, but the following sentence surely does (the first real change): "The test report in edition 1.8 may be used in parallel with the test report in edition 2.0 for a period of 12 months from the date of publication of Edition 2.0." The test report referred to can be found in clause 8.8 of Edition 1.8 and clause 8.7 of Edition 2. What this means is: you can still use the old test report even though the particular edition of the code in which it was published is no longer in use. But from March 2018, you may only use the new test report. The few, more obscure, changes in the test report will be highlighted in a future instalment. Be wary of photocopying the test report direct from the latest SANS 10142-1. There are way

too many copyright warnings around the test report example. I would be inclined to draw up or generate my own for now, as the code only requires a test report to be 'in the form of'... Just be careful not to omit any detail from your own test report – you may have more information on yours, but not less than that shown in the test report in clause 8.7.

Also in the 'foreword', we find that non-relevant information to this edition was deleted and references changed, such as:

"Table 4.1 contains a list of the applicable standards for the components that may be installed in an electrical installation." This was changed from Table 4.2 in Edition 1.8 to Table 4.1 in Edition 2. And...

"Information on national legislation that applies only in South Africa is given in text boxes in the introduction (see page 3)." In Edition 1.8 there were further references to more page numbers, clause 8 and the test report. In Edition 2, this information is limited to page 3.

At the end of the 'foreword' we get the following sentences: "Annex I forms an integral part of this document. Annexes B, C, D, E, F, G, J, K, L, M, N, O and P are for information only". Glad to see I'm not the only one that gets caught out with a 'copy and paste' exercise. Annexes A and H still appear to be missing in the shift from Edition 1.8 to Edition 2. Also note that Annex L in Edition 1.8, is renumbered Annex I in Edition 2, Annex O to Annex L etc., plus a whole bunch of others are renumbered too. Which we will look at in a future instalment.

Next, we move to the 'Introduction' on page 1 of SANS 10142-1:2017 Edition 2.

At first, there seems to be nothing different or changed in the body of the 'Introduction' other than the references to the test report in clause 8.8 in Edition 1.8 and its new home in clause 8.7 in Edition 2.

Two 'text boxes' (referred to in the 'foreword') form part of the 'Introduction' with a type of black border around them that reminds me of funeral notices. Anyway... the 'text box' on page 2 provides additional clarification on the requirements for electrical installations in the mining industry and the 'text box' on page three provides more clarity on which code of practice is applicable when...

Before I wrapped up this instalment, I scanned through the material we covered, to make sure I did not miss anything important. Just as well...

I spotted the following in the very last sentence of the 'text box' relating to the mining industry: "The certificate shall be in the form of the Certificate of Compliance published in the Electrical Installation Regulations, 2012, and the test report shall be in the form of the test report in this part of SANS 10142 (see 8.7)." I rubbed my eyes... shall I phone a friend...? The Electrical Installation Regulations 2012?

Till next time...

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## OVERCOMING COLDER AMBIENT TEMPERATURES WITH ELECTRICAL HEAT TRACING

A multitude of South African industries including food and beverage, lubricant, bitumen, petrochemical and automotive are, in the winter months, faced with colder ambient temperatures wreaking havoc on their manufacturing, processes and operational efficiencies.

Electrical heat tracing (EHT) can overcome these challenges by keeping products at an optimal temperature, lowering viscosity and ensuring they are easier to transport around the plant during the colder months.

Giles Maynard, general manager of eltherm South Africa, a global EHT supplier, explains: "Electrical heat tracing can assist plant and process managers to alleviate stubborn viscosity sensitive products and processes. This mitigates costly repairs and maintenance by ensuring that pumps don't malfunction due to cavitation and pipes don't get blocked."

The term viscosity refers to the time it takes for an amount of product to run through a pipe. For example, water has a low viscosity as it flows more freely than honey. Liquids like honey and oil have a higher viscosity because they contain more complex molecular structures.

Temperature can manipulate the viscosity of liquid. When the temperature drops, liquids like syrup develop a higher viscosity and become more difficult to pour. However, when heated, the molecules become more excited and begin to move, leading to lower viscosity.

EHT lowers the viscosity of many processes as it acts as a compensating heat source to maintain or raise the heat in pipes, tanks, surfaces and other vessels. It effectively replaces the heat loss in the process and can therefore be used to prevent pipes from gelling or freezing, whilst maintaining the low viscosity of the process on plant equipment. Colder days and the resultant higher viscosity can also impact domestic water supply and the reliable drainage of rain and waste water, leading to freeze damage and ultimately frozen and burst pipes.

"To prevent freeze damage, electrical heat tracing can be installed on these pipes, preventing them from freezing without any additional insulation. A customised, self-regulating heat tracing solution is developed, installed and monitored to ensure pipes are warm enough throughout the winter months," says Maynard. EHT can maintain and lower the viscosity of liquids in many industries and applications such as: resins, epoxies and adhesives; petrochemical industry; bitumen; food and beverages such as glucose, chocolates, fats, vegetable and palm oils and other syrups; automotive manufacturing processes such as glues and oils; and brewing – maltose and dextrose.

Enquiries: www.eltherm.co.za

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## UNIVERSAL CONTROL OF POWER MANAGEMENT SYSTEMS

Master Power Technologies (MPT) has a universal controller (UC) which is a combination of hardware and software, a PLC and SCADA device in one, designed to keep tabs on power management infrastructures continually.

The UC is installed on site and monitors the generators and UPSs 24/7, raising an alarm as soon as it detects something is out of the norm. These alarms are transmitted by TCP/IP to a control room or operations centre on site, or can be sent to a remote centre where a company can manage all its sites centrally. Also on offer, is a monitoring service where customers' power management systems are monitored from the company's Strijdom Park offices.

The UC monitors the manner and efficiency with which generators

take over from the UPS when the power fails, as well as other operating measurements. These include temperature, the amount and quality of diesel, current and voltage.

It also monitors UPS systems, keeping an eye on system summary data, the batteries, mains failures and bypass relays. A battery manager monitors banks of batteries in UPS installations. It determines if a battery is about to fail, as well as the charge levels and output capacities of each battery.

The UC can also monitor fire panels, HVAC systems and water levels (in case of flooding).

All the information collected is transferred to a visual display in a monitoring centre, as well as an Android tablet. Measurements

are colour-coded to allow operators to quickly and easily detect a problem. Companies can also compare measurements in graphs to indicate the overall health of their power management systems as well as fluctuations in performance over time.

When an emergency occurs, the system can be tasked with sending an SMS, or multiple SMSs to relevant parties, ensuring everyone who needs to know about a problem is informed immediately. Customers with a maintenance agreement in place with a service provider, will be notified of the problem and know that the maintenance crew has the same warning and is on the way – depending on the service-level agreement.

Enquiries: +27 (0)11 792 7230

## LEM INTRODUCES DH SPLIT-CORE TRANSDUCERS

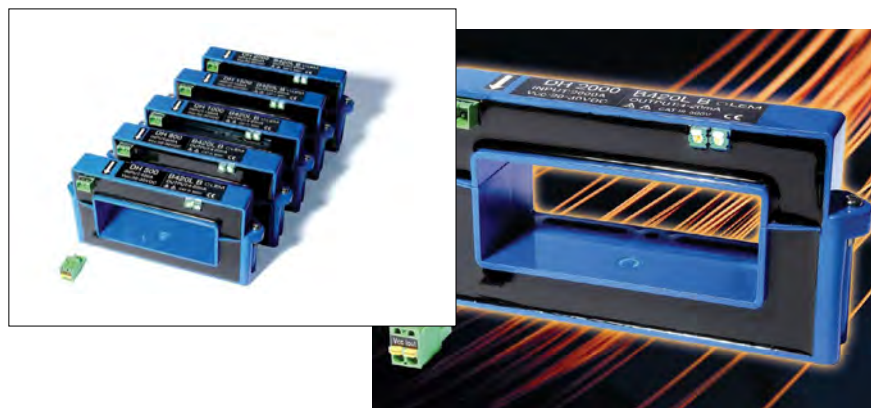
Complementing LEM's range of products for advanced battery management applications, the DH family of dc current transducers offers precise measurement of bipolar currents up to 2000 A. Measuring only 174 x 86 x 54.1 mm, these compact split-core transducers combine hall-effect technology and signal conditioning in a single housing with a large rectangular sensing aperture for non-contact measurement (supporting up to 104 x 40 mm busbars or  $\pm$  40 mm cables).

The series has been designed to measure dc currents and their polarity. It offers a choice of primary current measurement ranges from 500 A to 2000 A and provides an absolute accuracy better than 1 percent of the nominal current value. The new transducers output the bipolar measurement

value through an industry standard 4 - 20 mA output. They feature a loop-powered circuit (adapted to 20 - 30 Vdc power supplies) that reduces installation costs by minimising the wiring and connections required. DH is a good choice for industrial system designers, integrators and resellers who require accurate and cost-effective dc current transducers. The transducers benefit from the company's approach to manufacturing and are backed by a five-year guarantee.

Applications include management of UPS systems and standby batteries, dc power generation and distribution as well as monitoring of dc motors and process control systems.

Enquiries: +27 (0)11 626-2023



## WHERE TO POSITION YOUR GENERATOR

To minimise installation costs, it is recommended that a generator be positioned close to the circuit board to reduce the amount of copper cable required. The further the generator is installed from the board the more expensive the installation becomes. The generator can be positioned inside or outside there must be adequate ventilation to ensure good air flow and circulation. There also needs to be sufficient space to open the doors for the servicing of the generator, (approximately one metre on either side of the generator set).

Generators consist of large industrial size engines and alternators

and are heavy. It is important that they be placed on a level surface that is able to handle the impact of the weight over time. It is recommended that a small reinforced slab is thrown and the generator mounted on top. Generator King can assist users on this regard, or alternatively provide the dimensions required.

### Determining the size of the generator

It is difficult to make use of power calculators to determine the user's requirement as appliances vary in the start-up and normal running load they use. The two best methods of determining the user's requirement are:

**To size according to the main circuit breaker** size or have a professional conduct a load test. The main circuit breaker will have a rating in amps (A), which is also the maximum amount of current that can be used by the building and can be used to decide what size generator to install.

**Conduct a load test:** Generator King can conduct a load test and make a recommendation on the best size unit for the application based on the amps measured at the site. It will recommend a generator that will feed the maximum potential of the building or measure which essential appliances will be needed to install only those components.

Enquiries: [www.genking.co.za](http://www.genking.co.za)

## VERT ENERGY LOAD BANKS – RELIABLE GENERATOR PERFORMANCE

VERT ENERGY has supplied its first load bank system into Botswana. Peter Investments has acquired an ASCO Froment load bank, which will be used for load testing, to ensure reliability of generator sets and standby power systems. This system will be trailer mounted and used at various sites around the country, including government infrastructure, telecommunications, mining and game lodges.

The load banks, which are designed to replicate working load conditions, provide electrical loads for testing power sources – including generators and uninterruptible power supplies (UPS).

"Well-planned, preventative maintenance programmes, that includes load testing of the generator set, are vital to reliable operation and extended service life of the standby power system," says Ryan Robertson, director, Vert Energy. "Load banks offer efficient power test solutions and also reduce the harmful effects of 'wet stacking' and glazing problems caused by under-loading of the generator.

"Wet stacking – the primary cause of failure of diesel engines in backup generating systems – occurs when unburned fuel accumulates in the combustion chamber, reducing engine ratings and affecting performance. Load banks used as part of proactive maintenance, improve the efficiency of the diesel engine and significantly increase service life."

The combined Froment load bank (resistive/inductive) with Sigma load control and instrumentation hardware, allows fully variable power factor loading and can test generators up to 800 kVA at 80 % load.

Resistive elements and inductors of these load banks are connected to the supply on test by electromechanical contactors fitted internally within the load bank. The Sigma system ensures flexibility in automatic load control and provides cost-

effective solutions to power testing requirements, which often require high-level instrumentation, data capture and verification.

The range encompasses transfer switches and controls, as well as Avtron load banks. Other electric power generation (EPG) components include Leroy Somer alternators, API Covrad radiators and customised control panels.

Also in the range are NSM single- and three-phase two pole alternators for portable power, as well as ac and dc two pole welders and permanent magnet generators (PMG). AllightSykes MSGEN2 lighting towers which offer over 50 000 hours of light per unit are also available.

Enquiries: +27 (0)11 453 9669



Peter Kgosisimoloi, Peter Investments Botswana (left) with Vert Energy's managing director, Grant Robertson



## TRAINING AND DEVELOPMENT

|  |   |
|--|---|
| Inspect, test and certify and three phase electrical installations:                            | 13-15 September 2017                    |
| KNX building automation:   | 11-25 September 2017                    |
| Inspect, test and certify hazardous electrical installations:                                  | 14-18 August 2017 and 9-14 October 2017 |
| Inspect, test and certify single phase electrical installations:                               | 6-8 September 2017                      |
| Apprenticeships for Electrical, Mechanical fitter, Instrumentation Mechanician and Millwright: | 10 July to 29 September 2017            |

For more information:  
email: [info@pandttechnology.co.za](mailto:info@pandttechnology.co.za)  
or contact: Janine on 011 827 4113/6  
or our webpage: [www.pandttechnology.co.za](http://www.pandttechnology.co.za)







## WIRE AND CABLE MANAGEMENT

**THOMAS & BETTS (T&B)**, a member of the ABB Group, has a range of wire and cable management solutions. Original equipment manufacturers, panel builders, electrical contractors, and maintenance personnel depend on metallic and non-metallic boxes, hi-performance cable ties, wiring troughs, weather-proof enclosures, cable trays, wire identification, and modular metal framing, and product brands including Kindorf®, Ty-Rap®, and \*Steel City® \*Pre-Fab help installers cut installation time and costs.

### Fastening systems:

A range of solutions for bundling, securing, routing and protecting wire and cable, including the Ty-Rap® brand, Catamount® and others in multiple materials, sizes and colours:

- Grip of Steel®: Ty-Rap cable ties provide superior performance in a variety of applications.
- Control panel solutions: Available in numerous configurations, materials, sizes and colours to accommodate any application, Ty-Duct® products offer a total solution for routing and concealing wiring in control panels.
- Ergonomically designed tools: Fasteners with well-designed, ergonomic, error-proof tools add to efficiency and comfort.

### Identification and supplies:

T&B offers an assortment of wire markers, safety labels, fish tape, lubricants and other essential everyday supplies for electrical construction, installation and maintenance. Included here are:

EZ Code® identification products include wire marker books, cards, labels, tapes, tags and signs to warn the workforce about dangerous areas.

Catamount® lubricants, tools and accessories complete any electrical project.

### Metal framing and cable tray:

In addition, comprehensive lines of metal framing and cable trays are available.

Modular framing: With Kindorf® 11/2 modular channel system, every part fits, providing the maximum number of support and framing applications with the minimum amount of labour and materials.

Multiple plating options: Superstrut® ensures a 1 5/8" metal framing system with consistent finishes for the channel, fittings and accessories.

Cable tray: A cost-effective, reliable and adaptable alternative to conduit systems where allowed by code.

Enquiries: +27 (0)10 202 5206

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HSe HEAT SHRINK TUBE

## ENGINEERED FOR ELECTRICIANS

HSe TUBE  
TZe TAPE



### Twin Engines

Meet the first industrial printer with twin engines. With just one machine, you can print on tubes up to 6.5mm and labels up to 36mm without the need to swap cartridges.



### Zero Fuss

Switch between tube and label printing without replacing or re-inserting supplies. Need to replace worn-out parts? You can do it yourself in a few quick steps. It's that easy.



### Maximum Printability

Print more on each label and ensure the legibility of your text with the benefit of additional printable height.



### Durable Labels

The printer is compatible with TZe tapes, the toughest laminated labels in the market. Ideal for industrial use, TZe is resistant to water, chemicals and harsh weather conditions.

## DECREASING FIBRE INSTALLATION COSTS

South Africa is experiencing phenomenal activity in the roll-out of fibre optic cables. While no-one disputes that the installation of fibre presents tremendous opportunities, the question is, how will this demanding initiative affect consumers' Internet connection costs?

With speeds of up to 100 Mbps, fibre will provide unsurpassed Internet speeds. It is also reliable, highly secure and able to withstand testing weather conditions. "However, this large-scale, challenging roll-out comes with a hefty price tag," cautions Bradley Hemphill, managing director of EES Live.

If the country is to replace its five million copper cables with fibre optics, the cost will be roughly R60 billion, according to figures recently released by Finance24. "It is vital that fibre network installation is carried out in the most efficient, yet cost-effective, manner possible," Hemphill continues.

It is important to select the most suitable optical connection. It appears that previously, connector technology usage was not based on the required application but on the readiness and availability of technology. Currently, access networks have three technologies to choose from, namely fusion splicing, mechanical splicing and factory pre-terminated. Fusion splicing has been largely used to date.

Requirements on which selection of connector technology should be based are:

- Streamlined, easy, cost-effective installation and maintenance
- Flexible connections in the network that can easily be added to, joined or removed
- Ability to withstand harsh environmental conditions
- Effective optical performance and secure transmission of information
- Straightforward connectivity and fibre organising system

When examining the three connector technologies closely, it seems that the factory pre-terminated technology option is the most suitable as it meets all five requirements.

Enquiries: [www.eeslive.com](http://www.eeslive.com)



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print • copy • scan • fax • label...and sew much more







## NEW RANGE OF ROBUST RF CABLES AND ASSEMBLIES

**HUBER & SUHNER** has a range of semi-rigid RF/microwave cables and assemblies that offer ultra-high speed of more than 26 GHz.

Key products in the range are flexible SucoFlex 126 E coaxial cable assemblies, which are designed to provide enhanced optimal performance for up to 26.5 GHz (depending on connector interface choice) with excellent return loss. The cables are ideal for applications that require electrical stability and low loss, such as in test and measurement and defence systems. They also feature a blue polyurethane (PUR) outer jacket, which offers excellent chemical and abrasion resistant properties and advanced protection in hostile environments, including those with wide temperature ranges from -40 to +85 °C. The high-grade assemblies are available in various lengths and connector types, including 500 and 1000 mm lengths.

The range also includes Minibend 50 Ω SMA plug-to-plug cable assemblies. These are designed for applications that require low-profile connections between RF modules within communication systems. Available in 3-, 6- and 12-inch versions, the triple shielded cables have a high-temperature FEP outer jacket, stainless steel outer braid and an aluminium/polyimide barrier tape.

The TLP-P 11716 high-flex test leads, which are 50 Ω TL-P passive intermodulation (PIM) test assemblies, are constructed from chemical-, oil- and abrasion-resistant TPU armoured cable for protection in hostile environments. Included is moulded protection between connector and cable supporting IP67 ingress protection when mated correctly. The optimised 4 GHz test leads are available in various lengths and connector configurations.

Alternative test leads include the Sucotest ST18A armoured cable assemblies, which are 50 Ω flexible leads that offer excellent electrical performance combined with low insertion loss, stability and exceptional return loss. Ideal for heavy duty and outdoor applications up to 18 GHz, the assemblies are designed for a range of applications including the testing of wireless communication infrastructure and are available in various lengths and connector configurations.

The portfolio, available from RS Components, also includes IP68-rated black silicone universal weather protection boots for LISCA jumper cable assemblies. They are designed to protect jumpers between antennas and remote radio heads from the ingress of water, contamination and corrosion.

Enquiries: [za.rs-online.com](http://za.rs-online.com)

## CABLE GLANDS AND COPPER LUGS

**CONEX METALS** offers cable lugs that are provided with an inspection window to ensure full conductor insertion. Entrance is chamfered or bell-mouthed for easy entry and high wall thickness.

The Indian manufacturer and exporter has a range of brass, stainless steel cable glands and cable terminals. Certified by BSI UK, Conex has been supplying to leading distributors in the international market for 33 years.

Its product range includes:

- Brass wiping cable glands for transformers.
- Copper lay in grounding lugs for solar panels.
- IP68 brass cable glands with nickel plating.
- Copper solderless lugs.
- Cable gland accessories such as thread converters, reducers and spacers.
- Marine cable glands for ship decks in brass/steel to JIS F8801/02/03.
- Industrial cable glands including BW/CW/E1W/A2/CXT glands to BS 6121/BS EN 50262.
- Cable gland kits with lock nuts, PVC shrouds and earth tags for indoor and outdoor use.
- Copper cable lugs (with bell entry) made from high conductivity seamless copper tubes.

Quality checks are carried out at different stages of manufacturing.

Enquiries: [www.conexindia.com](http://www.conexindia.com)

## INSULATION STRIPPERS WITH CABLE SHEARS

The Knipex StriX insulation strippers with cable shears are two essential electrical installation tools in one pair of pliers. Available from Garry Lumpe Imports, they feature:

- Integrated cable shears for the clean cutting of Cu and Al cables without crushing, up to ø15 mm.
- Universal adjustment of the wire stripping blades by means of a knurled screw.
- Slim design for good accessibility.
- For stripping single, multiple and fine stranded conductors with plastic and rubber insulation up to a maximum of

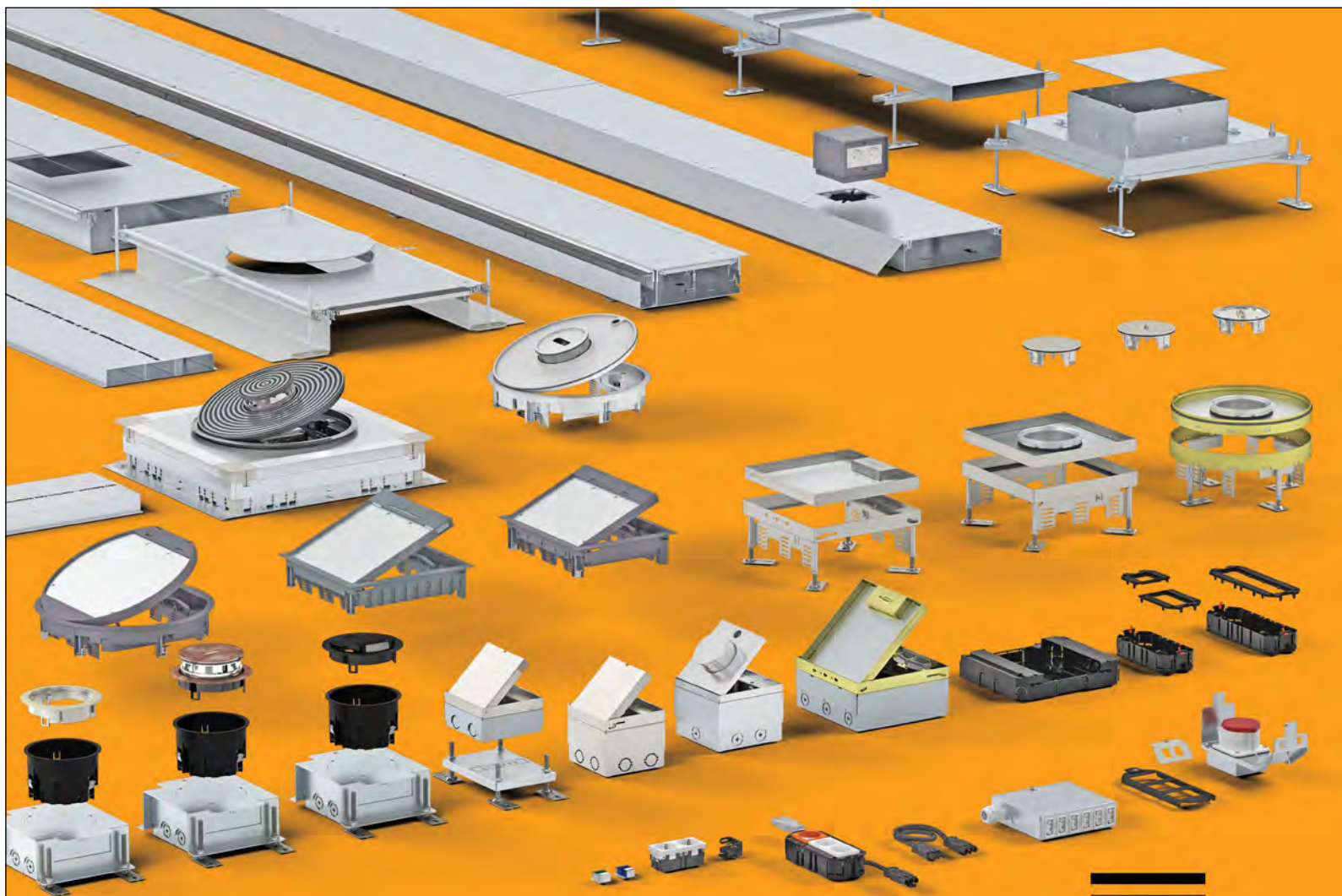


ø5 mm or 10 mm<sup>2</sup> conductor cross-section respectively.

- Graduated jaw which has a visual orientation aid when stripping wire in standard lengths (11 mm and 16 mm).
- Special high grade tool steel that has

been oil hardened in multiple stages. The pliers includes a lock nut that prevents any unintentional adjustment. Available in VDE and standard handles.

Enquiries: +27 (0)11 396 4065



## Underfloor systems

Underfloor systems from Ackermann made by OBO guarantee safe, flexible cable routing in the floor, taking the structural and standardisation requirements into account. The area of application for underfloor installation ranges from office and administrative buildings, through commercial exhibition areas right up to the construction of living accommodation. A wide range of device installation units gives the user access to power, data and multimedia connections from the center of the room.

For further information please contact our Customer Service on:  
Phone: +27(0) 11 378-3700

[www.o-line.com](http://www.o-line.com)

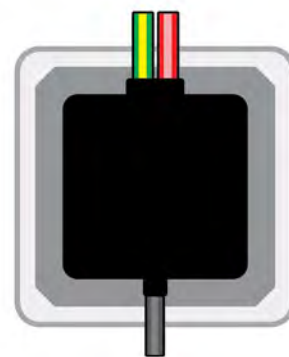
**OBO** Bettermann Group

**O-line**



# Lesco innovation

**LESCO**  
MANUFACTURING (PTY) LTD



## MONO BLOC SYSTEM

Products are designed and manufactured locally in South Africa providing Lesco with absolute control over all aspects of each product.

Lesco products can be sold and installed with absolute peace of mind that every unit conforms with all safety, quality and production standards required by South African law.

## SWITCH TO LOCAL INNOVATION

### Patented Feature

Lesco's design team have solved an age-old problem when it comes to installation in tight situations.

All sockets manufactured by LESCO are wired from the back via box terminals but tightened from the front. This allows even the shortest wires to be located and tightly connected.

This design feature also allows for testing to be done utilising the same terminals from the front of the socket without having to remove the outlet from its wall box.

The benefit of large box type terminals and being able to get a better torque on fastening screws means that when the outlet is fitted the chance of cables "popping out" is significantly reduced.

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## CABLE REELING SOLUTIONS

The materials handling division of mechanical and electrical engineering specialist, Powermite, supplies superior quality, rugged, reliable and economical cable reeling systems and accessories to a wide spectrum of Southern African industries.

Cable reeling systems are used to lay down and retrieve cable in applications

where a predetermined length of travel and a fixed amount of cable is connected to a fixed point while a moving point travels over a fixed line, rail, ground or height at a set speed. In addition to a wide variety of cabling including medium voltage, low voltage and milli- power, control, fibre optic/data and composite cables for data and video supply, these

reeling systems also carry water, air and hydraulic hoses.

"Our cable reeling systems deliver numerous cost and time saving benefits for end-users," says Powermite marketing director, Donovan Marks. "Their extremely rugged design ensures reliable operation for optimised uptime and productivity. Manufactured in a variety of materials, including painted steel, stainless steel and hot dip galvanised surfaces, the cable reeling equipment is suitable for a wide range of indoor and outdoor applications." By using anti-runback bearing/braking resistive-based drive systems, Powermite achieves tremendous success with system reliability.

"In addition, the greased-for-life bearings ensure a maintenance-free cable reeling solution. With no stoppages for maintenance and no maintenance costs, our reeling systems deliver significant cost savings for end-users," notes Marks. The systems are also extremely

versatile and can be applied to low speeds (5 m/min) or high speeds (120 m/min) over distances ranging from 1 m to over 1000 m, and the length can be increased or decreased to meet end-users' requirements. Powermite supplements its renowned spring driven, torque motor and permanent magnet clutch drives with VSD technology. "It is crucial that the system keeps the correct tension at all times to prevent damage during operation and to keep the cable out of harm's way," explains Marks. "Our VSD technology enables the drives to provide a constant torque to keep the correct tension at all times, which is crucial to preventing damage by protecting the cable and keeping it out of harm's way during winding and unwinding functions."

Powermite's materials handling division also supplies a comprehensive range of cable reeling system accessories that include one- and two-way guiding devices with optional slack cable, over tension and



position detection systems, anchoring drums (with/without connection boxes), connection boxes for LT/MV power, control and fibre optics cable and slicing kits, end limit switches, cable sleeves and shock absorber springs. Marks adds that Powermite has the necessary capabilities and expertise to refurbish cable reeling systems to OEM standards offering customers a cost-effective alternative to new equipment purchase.

Enquiries: Tel: +27 (0)11 271 0000

## HellermannTyton's RANGE OF CABLE TIE TENSIONING TOOLS

Assembly and installation tasks are becoming ever more complicated, which is why specialised cable tie tools are becoming increasingly important. Whether manual or automatic cable tie tensioning tools are required, from cable tie tensioning tools, hot-air guns to bundling systems, these cable tie tensioners have to fulfil specific tasks, often under quite unique conditions. For instance, some cable tie tensioners are used in areas which are difficult to reach, while others need to operate without electricity.

The EVO 9 cable tensioning tool combines durability, precision and control with unparalleled comfort. Manufactured with high-performance materials and components, the EVO 9 has been proven to outperform and outlast other professional manual tools on the market. Its innovative, ergonomic design minimises stress on hands and wrists, and the 'kickback' that occurs with traditional tools, reducing the risk of repetitive-motion injuries.

All cable tie tools from HellermannTyton are sub-

jected to strict tests to ensure that each meets the highest quality demands. The company also provides support during the installation and use-testing of its cable tie tools on site. This way, if a cable tie tool does not fulfil specific industry requirements, adjustments can be undertaken together with the user under close joint agreement, or new cable tie tools can be developed.

To provide this service, the world-wide development sites of HellermannTyton have facilities for developing, modifying and testing cable tensioning tools, ranging from the smallest cable tie tool to automatic bundling systems.

Enquiries: +27 (0)11 879 6600



## CHALLENGING BI-METAL CONNECTIONS

Copper, owing to its outstanding electrical properties is often the first choice when selecting a conductor and/or connector for an electrical application. A viable alternative, however, is available in aluminium.

As a result of the cost and infrastructure damage caused by copper cable theft, many power utilities—including Eskom—chose to convert to aluminium alloy conductors.

Practically, connecting both of these materials can create a range of challenges as the infrastructure or existing cable to which the conductor will be connected is historically designed to accept copper conductors.

When metals are connected to those with a higher electrical potential, as in the case of copper and aluminium, and in the presence of an electrolyte, like condensed water, an electrochemical reaction will occur and cause galvanic corrosion, which increases contact resistance. This can result in localised heating and failure. Using bi-metallic copper to aluminium connectors or specific aluminium alloy torque shear mechanical connectors specifically designed to overcome this problem, it is possible to ensure a proper bimetallic connection is made between aluminium conductor cables and copper infrastructure or cables.

Bi-Metallic connectors are manufactured by means of a friction welding process and torque shear mechanical connectors, which are IEC-61238 certified, are made from a high-tensile tin-plated aluminium alloy to ensure galvanic corrosion and failure do not occur.

Both these solutions are available from Stone Stamcor.



Enquiries: +27 (0)11 452 1415

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**ABOUT CONSORTIUM CABLES :**  
For 25 years, the company has been servicing a diversified client base throughout Southern Africa.

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- Composite cables can be manufactured to client requirements
- Supply and deliver worldwide
- The company is able to supply cable cut to length on all cable products carried in stock

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## VERSALEC: A STRONG PARTNERSHIP WITH LOCAL MANUFACTURERS

**VERSALEC CABLES** is a leading cable distribution company in South Africa. Founded in 1985, it has developed a strong partnership with local manufacturers and is able to supply a complete range of electrical cable from low voltage PVC insulated cables to 33 kV PILC and XLPE cable as well as aluminium overhead conductors for various line applications; service connections; and instrumentation cables. Part of the Bidvest group, the company's customers include electrical contractors and consulting engineering firms involved in low voltage and high voltage electrical reticulation projects and Eskom subsidiary companies involved in the upgrade and refurbishment of power

stations. Versalec also supplies cable to electrical contractors involved in mining projects in Africa, outside the borders of South Africa.

Versalec prides itself on being able to provide comprehensive commercial proposals with supporting technical data, customised to the needs of each project. It offers the additional service of delivering cable to site with its own crane trucks operated by trained personnel. This ensures that the correct loading and handling techniques are adhered to, as suggested by the manufacturers.

Enquiries: +27 (0)11 314 0220



**HellermannTyton**  
www.HellermannTyton.co.za

### DYMO RHINO INDUSTRIAL PRINTING SOLUTIONS

#### RHINO M1011 INDUSTRIAL TAPEWRITER

##### M1011

- The industrial-strength Rhino™ M1011 embosses 12 mm stainless steel and aluminum labels – with or without adhesive
- Weather, temperature, chemical and UV resistant.
- This tough, durable embosser features an easy-to-use label cutting handle that cuts square or rounded edges, hole and cable tie punches, a trailing-edge measuring gauge.
- With a deep emboss to ensure excellent character legibility.



#### RHINO 4200 HARD KIT CASE

##### 4200 kit

- The Dymo Rhino™ 4200 is easy to use.
- One-touch "Hot Key" shortcuts quickly create and format wire/cable wraps, flags, Code 39 and Code 128 barcodes, fixed-length labels, module labels and more.
- Print labels up to 19mm wide in flexible nylon, permanent polyester and durable vinyl materials – PLUS print directly on heat-shrink tubes



### WEBB'S NEW COAXIAL CABLE CUT AND STRIP MACHINE



Eric Sithole, Webb Cable Assembly Dept Supervisor, with Schleuniger RS unit IMG 4872: The Schleuniger RS can cut and strip a wide range of diameters from RG214 to 2 mm shaded wire.

The Schleuniger RS can be programmed to cut antenna cable to different depths – braided shield, foil shield or dielectric – at different distances along the cable according to specifications.



**JASCO'S WEBB INDUSTRIES**, a leading supplier of coaxial cable, connectors and assemblies has acquired a Schleuniger MultiStrip 9480 RS cut and strip machine. This fully programmable rotary incision unit allows easy processing of high precision coaxial cables. It is an updated version of a machine Webb has had for some years and is thought to be the only one in South Africa.

Additional features, such as the multi-position cutter head, create a nearly endless range of application possibilities. Also, each machine can be easily interfaced with Schleuniger's vast line of integrated accessories to create a fully automatic coaxial cable processing production line.

One of the accessories Webb uses is a printing unit which automatically labels the coaxial cable assembly according to customers' specs.

The Schleuniger RS can cut and strip a wide range of diameters from RG214 to 2 mm shielded coax. "In preparing coaxial assemblies there is a high premium on accuracy and the Schleuniger has no peer in this regard," says Webb MD, Paul Richards.

He adds that one of Webb's strengths is its ability to deliver the highest quality bespoke solutions across a wide range of applications and the Schleuniger adds huge value in this regard. "For example we can program it to cut antenna cable to different depths – braided shield, foil shield or dielectric – at different distances along the cable according to specifications. The task is performed fast and precisely, producing a world class quality product," he concludes.

Enquiries: +27 (0)11 719 0000

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E-mail: [jhb.sales@hellermann.co.za](mailto:jhb.sales@hellermann.co.za)





## VALENTINO: A CLASSIC VICTORIAN LED LUMINAIRE

**BEKA SCHRÉDER**, Africa's leading manufacturer of energy efficient luminaires, has introduced a classic LED luminaire into the South African Market.

During the Victorian era, major improvements in the fields of science and engineering led to huge expansion in the lighting industry. Having previously been restricted to candles and firelight, the effect of introducing controllable light to society was enormous. The Victorian passion led to the creation of oil and gas lamps.

The Valentino LED's aesthetic design reflects this era in our history. Under its classical exterior, the luminaire incorporates leading-edge LED technology.

The Valentino LED is stylish, highly efficient and contributes to the well-being and safety of people in public spaces. This classic luminaire is particularly suited to lighting parks, squares, pedestrian areas, city centres and residential areas. It is also suitable for decorative lighting of business parks, golf estates and wine farms with a sense of Victorian charm.

The Valentino LED is designed to operate LED light sources of up to 75 W. It can be offered with a classic Gardone column in cast steel or with a wall

bracket for suspended or post-top mounting. An embellishment conceals the mounting nut while providing a smooth finishing surface at the base of the luminaire. Different protector options, namely clear, structured or opal, are available for various effects. It is offered in most RAL or AKZO colours to help create an atmosphere that is elegant.

Its use of LEDs minimises the power consumption and permits low height installations without generating intrusive light for the inhabitants of buildings. With no upper flux, the Valentino LED limits light pollution. Its long lasting design of recyclable materials guarantees a responsible use of natural resources. It can operate with a photocell,

a scheduled dimming system, a Constant Light Output or a complete remote Owlet management system. It can also be equipped with a motion detection unit.

BEKA Schröder's ambience selection provides efficient lighting systems in cities to help improve quality of life. Lighting must fulfil not only aesthetic criteria but also requirements related to photometric performance. The company offers an extensive range of highly efficient decorative luminaires, ranging from contemporary to traditional designs, using conventional or LED light sources.

Enquiries: +27 (0)11 238 0162



## A RANGE OF FLEXIBLE LED STRIPS FROM OSRAM

**OSRAM** has a LINEARlight FLEX range which features a series of coloured LED strips that can be cut to fit custom lighting installations. They are flexible, and suitable for use in architecturally integrated applications as well as outdoor use.

The range includes LED strip lights which can also be used on handrails or to provide illumination in information signage, advertising hoardings or in display cabinets. They provide a smooth diffuse illumination solution that is ideal for use where light needs to flow around architectural features. Custom lighting solutions can be created as the LINEARlight FLEX strip modules feature easy cut points to support design freedom.

Delivering diffused light lines without visible spots, the strips are available in long operational lengths, with a single power feed for lengths up to six metres. The modules also offer an extra-strong self-adhesive backside for easy mounting. Constructed from high-performance silicone, the LED strips provide IP67 protection and resistance to UV light sources, according to ISO 4892-2 - Method A, and resistance to salt mist, according to IEC 60068-2-52 severity 1.

LED colours include white LED strips with colour temperature options from 2700 K to 6500 K, as well as red, green and blue. The range includes LED drivers, controllers, dimmers and mounting accessories and is available from RS Components.

Enquiries: [www.za.rs-online.com](http://www.za.rs-online.com)





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## FIVE THINGS YOU MUST KNOW BEFORE YOU DIM LED STRIP LIGHTING

By Shuttle Lighting

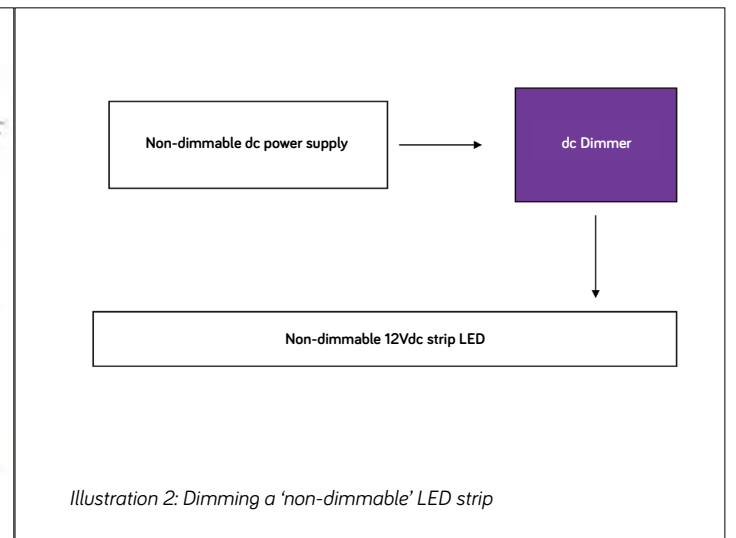
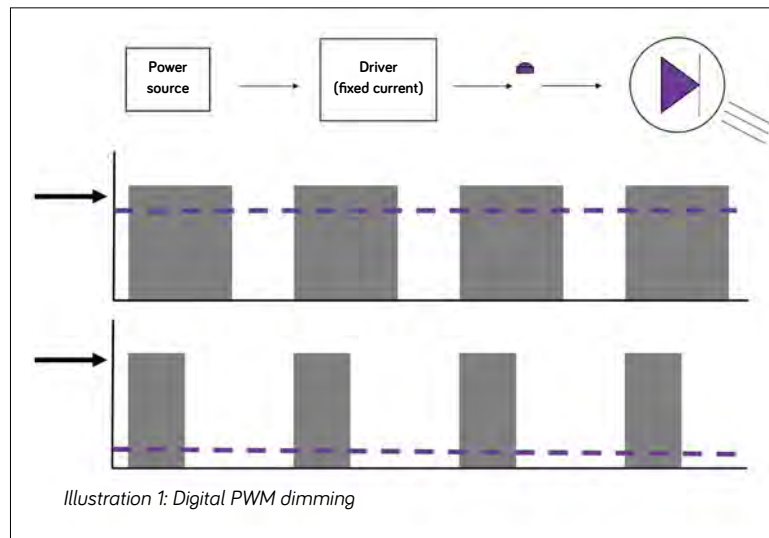
Adoption of LED strip lighting for new installations is on the rise and there is an opportunity for further growth if the user experience is optimised. LED strip lighting has captured the imagination of consumers, offering energy saving benefits while controlling the mood or accent of any space.

Consumers are looking to increase the performance of strip lighting installations by changing the light intensity which, in turn, controls the mood of the space, allows easy switching between accent lighting and task lighting and increases the longevity of the LEDs. This is where lack of information can lead to disappointing results.

Five things you need to know about dimming LEDs to get the best results from strip lighting:

### 1. What is analogue control?

The light intensity of any LED (the physical component) can be adjusted simply by varying the dc current through the LED component. This is called analogue control. This dimming method is popular amongst typical GU10 type dimmable LEDs where the internal driver converts the RMS



voltage from the dimmer into a corresponding constant dc current to the LED component, thereby achieving a linear dimming. However, since strip LED lights have a built-in voltage to current converter, external analogue control of the strip results in poor dimming performance.

### 2. What are the technological advantages of analogue dc current control?

- It is an established technology, ideally suited for 230 Vac to dc current converters, especially where physical space is limited (such as in GU10 LEDs).
- Many circuit design choices and control ICs are available and are cost effective, especially for 230 Vac to dc current control application.
- There is a quick response time to varying power supply conditions.
- There is no high-frequency flicker present if the current is a pure and constant dc.

### 3. What are the disadvantages of analogue control?

- It is costly to achieve accurate control because of component tolerances.
- Possible LED colour shift can occur.
- It is difficult to achieve very deep dimming, especially when the LED characteristics vary.
- Owing to these disadvantages, this control method is usually reserved for integrated types of LED lamps where the internal driver is matched to a specific LED component.

### 4. What is Pulse Width Modulation or PWM?

To avoid the disadvantages of analogue control, most external LED drivers and some professional integrated drivers employ a digital dimming control. In most cases, Pulse Width Modulation or PWM is chosen because of the simplicity and maturity of the technology.

PWM control differs fundamentally from

analogue control as it does not vary the dc level of the current. The output current of the driver is a fixed dc, matched to the LED's nominal rating, but the current is turned off and on as shown in *Illustration 1*. Thus, by reducing the 'on' time, the average current to the LED reduces and it dims. However, disadvantage of PWM is that it is costlier to implement for typical 'GU10' type lamps and there is a possible strobe effect, especially in industrial applications where rotating machinery is used.

### 5. What are the advantages of PWM?

- It is accurate if the dc current is accurate.
- There is typically no LED colour shift since the LED experiences only its nominal current
- Behaviour between manufacturing batches is reliable and repeatable
- The technology integrates well with other digital technologies.

The primary advantage of PWM digital dimming is that some traditionally 'non-dimmable' LED lamps can be dimmed. For example, a typical 12 Vdc or 24 Vdc LED strip has an integrated voltage to current converter which allows it to be powered from a non-dimmable dc power supply. By simply wiring a bell-press digital dimmer or 'dc dimmer' between the power supply and LED, as shown in *Illustration 2*, the strip can be dimmed perfectly to a very low intensity, without any damage to the LED or power supply.

## HOME LIGHTING OPTIONS

LEGRAND offers everyday electrical components, including lamps, work-lights, wall fixtures and pendant fittings, as well as extractor fans. The HPM range, which adheres to stringent quality and safety specifications, meets all requirements for home lighting, including energy efficiency, flexibility and enhanced aesthetics.

HPM lighting devices encompass LED work-lights and floodlights, as well as wall fixtures and cylinder, round and square pendant fittings. Lamps with cool or warm illumination, are available as dimmable and non-dimmable options.

Ventilation systems in this range include square and round extractor fans for installation on walls or ceilings. The lighting and ventilation range includes security products, switches, sockets and plugs, boosters, chargers and extension outlets. Also in this range are MCBs, distribution boards and mini trunking.

There's an interactive online and printed DIY guide for end users and retailers. This product manual - where HPM, Arteur and Ysalis pre-packs have a one part number - ensures easy product identification and alleviates the complication of constructing modular systems.

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PWM control differs fundamentally from

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A year ago, Philips Lighting started a new chapter in its 125 year history of innovation and global market leadership as a standalone company. At a recent event held in celebration of its one year anniversary, Reggie Nxumalo, GM, Philips Lighting Southern Africa, gave guests a glimpse into the future of lighting explaining how it would affect productivity and quality of life for people and organisations around the globe.

Philips manages one of the world's largest and strongest IP portfolios and has established various Research & Innovation Hubs around the world that deliver region-specific innovations to address key challenges facing local communities, where the relevant hub is located.

From solar technology to smart cities, to location-based services and in-context information via mobile apps, to lighting designed for human well-being, productivity, and worker vitality, Philips Lighting takes lighting beyond illumination to create innovations that can make substantive, transformative changes to people's lives.

Enquiries: [www.philipslighting.co.za](http://www.philipslighting.co.za)

## MAGNET-SCHNEIDER-MOBIYA- LED-SOLAR-LANTERNS

MAGNET is a distributor of portable Mobiya solar LED lanterns, designed by Schneider Electric as a convenient, safe and reliable source of energy efficient lighting. The TS170S off-grid portable solar LED lanterns consist of a solar panel and an integrated mobile phone charging facility, with a USB cable with five adaptors.

"The compact, user-friendly lighting system is particularly well suited for use in off-grid households, small shops and for street vendors. It is effective in power outages, emergency situations, vehicle or machine breakdowns, as well as for outdoor activities, such as camping, fishing and entertaining," says Brian Howarth, managing director, Magnet Group. Apart from the convenience of having uniform lighting available as needed, the lamps are equipped with a handy mobile phone charger, with USB ports, enabling users to charge mobile phones anytime, at no cost.

The environmentally friendly lanterns do not generate noise or emissions and can be hand carried, even by children. They are drop impact resistant from a height of 1.5 m and water resistant up to 0.5 m for one hour.

The lanterns have three level settings which provide 48 hours of light at 20 lumens output, 12 hours of light at 85 lumens and six hours of light at a maximum of 170 lumens.

An advanced Lithium Ferro Phosphate (LiFePO<sub>4</sub>) battery, with a 1 500 cycle, three-year life span, is charged efficiently through the solar



panel, with micro-controller based charge control to prevent over charge and deep discharge.

Smart electronics for battery monitoring shows indications for battery charging, the battery charge level remaining and the need for re-charging when drained. For added convenience, a phosphorescent switch enables the user to locate the lamp in the darkness.

Enquiries: +27 (0)31 274 1050

## AMBIS RADIANT FROM RT SYSTEMS



RT SYSTEMS has been in business for 17 years and believes in a multi-vendor strategy in association with a group of well-established, trusted partners. One of these, Taiwanese company Delta Electronics, offers a comprehensive range of LED products and system integration services to meet customer lighting requirements.

The RT Systems Delta lighting range includes office, industrial and outdoor luminaires. Manufactured in China, to top quality design and standards, the industrial range includes the Ambis Radiant, an IP66 waterproof LED luminaire designed to perform in ambient conditions from -30°C to +40°C in industrial environments.

The features of Ambis Radiant are an easy-click fixation technique and thought-wiring for simple installation, uniform illuminance, and an IP66-rated and IK10-rated design. Ambis Radiant is an ideal LED replacement for T8/T5 fluorescent tubes and its compact, robust design offers great versatility in a range of applications, including warehouses and cold storage rooms.

Enquiries: [www.rtsystems.co.za](http://www.rtsystems.co.za)

## LUTEC BULKHEAD RANGE FROM EUROLUX



Outdoor lighting is as much about security as it is about aesthetics and with the Lutec range of outdoor luminaires, there is no need to compromise on either.

Lutec is Eurolux's latest range of premium outdoor fittings. Characterised by technological innovation and a dynamic design aesthetic, the diverse product range means there is a fitting to suit every outdoor function and style.

The four LED bulkheads in the range are all made from die-cast aluminium with an opal lens. With a distinctly clean design, they're a subtle, unobtrusive addition to any outdoor space, either residential or commercial.

Each fixture is fitted with an integrated LED light source, thus guaranteeing more lighting hours than traditional lamps, at a lower lifetime cost and with less impact on the environment.

### Titan wall lamps

The two round silver Titan bulkhead twins are an outdoor lighting staple. Compact in size (140 mm diameter), the 3 W warm white integrated LED light source emits a luminous flux of 145 lm at a beam angle of 120 degrees, making the lamps ideal for garden illumination and security applications.

Unlike the standard open face of the Titan 268 bulkhead, the Titan 266 has an industrial-like grid as a stylish point of difference.

### Seine wall lamp

Something of an unconventional shape for a bulkhead, the square Seine 267 is a medium-size (140 x 140 mm) fitting with a 4 W integrated LED light source. An industrial-like grid gives this fixture that extra modern allure.

### Titan wall lamp

The biggest fitting in the Lutec bulkhead range, the Titan 269 has a diameter of 260 mm with a depth of 95 mm. The graphite colour adds a sleek edge that elevates the fitting from functional to trendy. With a 16 W integrated LED light source emitting a luminous flux of 480 lm, it's an asset to any outdoor space. While bulkheads are a flexible outdoor lighting option in terms of application, they tend to work best when fitted 3 to 5 m apart along exterior walls.

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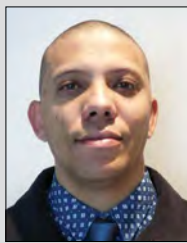


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**BRIGHT SPARK**

**TAKE THE SOCIAL MEDIA ACRONYM QUIZ!**

In creating this post, we quickly put together a short and sweet quiz on some of the terms that appear in the glossary here. Test your knowledge to see which acronyms you know and which you might learn!

AFAIK AMA ASL b/c B4 BAE bc BFF BRB BTAIM BTW CC DAE DFTBA DGAF ELI5 EM EML F2F FaTH FBF FBO FFS FOMO FTFY FUTAB FYI G2G GG Gr8 GTG GTR HBD HMB HMU HTH IANAD IANAL ICYMI IDC IDK IKR ILY IMHO IMO IRL JK L8 LMAO LMK LMS LOL LOLz MCM MM MT MTFBWY NM NSFL NSFW NVM OAN OH OMG OMW OOTD OP ORLY OTP POTD PPL QOTD ROFL ROFLMAO SFW SMH TBH TBT TGIF Thx TIL TL;DR TLDR TMI TTYL TTYN TTYS Tx Txt w/ WBU WCW WDYMBT WOTD YMMV YOLO YSK YT

**ERRATUM**

In our June issue we omitted to provide a quiz. We apologise to our readers. Here is the quiz ... the solution is beneath.

**JUNE QUIZ**

A man is headed to a mountain along with a lion, a goat, and a basket of vegetables. On the way, he needs to cross a river and the boat can only carry two things at a time. If he takes the vegetables, the lion will eat the goat. If he takes the lion, the goat will eat the vegetables. How does he cross the river?

**JUNE SOLUTION**

**THE TRIP**

Trip 1: He takes the goat with him, leaving the lion and the vegetables behind. On reaching the other riverbank, he drops off the goat. Trip 2: He then comes back for the lion, leaving the vegetables behind. On reaching the bank this time, he drops the lion, and again takes the goat along. Trip 3: He drops off the goat again and takes the vegetables with him to the other shore. Trip 4: Lastly, he comes back alone for the goat.

**AUGUST FEATURES**

- MCCs and motor protection
- Energy Efficiency
- Lighting

**Buyers' guide**

- Lighting (lamps and controlgear)

**Deadlines**

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- Editorial: 3 July 2017
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