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The renewables industry in South Africa is back in full swing, with the backing of the President and the Minister of Energy. Last year's refusal by Eskom to sign outstanding Power Purchase Agreements (PPAs) with Independent Power Producers (IPPs) created upheaval in the renewable sector in South Africa. Following Eskom's announcement that the PPAs were "too expensive", various industry bodies protested, with the SA Renewable Energy Council (Sarec) going so far as to get legal advice. However, a stalemate ensued with no new renewable projects is being initiated during the second half of 2016.

President Jacob Zuma and Minister of Energy Tina Joemat-Pettersson have now broken the deadlock, and a number of new projects have been initiated. In his State of the Nation Address, the President directed Eskom to sign outstanding PPAs, and Minister Joemat-Pettersson announced "engagements" with Eskom, energy regulator Nersa, and the Department of Energy to iron out the issues affecting the IPP programme.

As of January 2017, Eskom has connected 62 IPP projects as part of the Department of Energy's Renewable Energy Independent Power Producer (REIPP) and Peaker programmes. According to Eskom, these 62 projects have cumulatively added 4 200 MW of generation capacity to the grid. A further 620 MW is expected to be added to the grid in the 2017/2018 financial year as the third bid window of REIPP projects is integrated into the national grid.

### Criticism remains

A study conducted by the CSIR last year found that large contributions from wind and solar would save the country R25 billion a year in 2030, increasing to R80 billion a year in 2050. The energy mix proposed by the Department of Energy in its Integrated Resource Plan (IRP) 2016 Draft, however, puts greater emphasis on coal and nuclear. This was based on a study conducted by the Department of Energy that used the same software used in the CSIR research, but with different results.

It has been widely reported that this was as a result of the fact that the Department's team used old pricing and constrained the solar and wind power that can be added to the grid per year by about 1 gigawatt. The IRP Draft is currently up for public comment, ending on 31 March, and experts are predicting that the final version will feature less nuclear power.

Nuclear pundits, however, are arguing for the opposite. South Australian energy researcher and director of environmental lobby group Bright New World, Ben Heard, recently stated that "South Africa should be wary of unproven claims that total reliance on variable renewable energy sources is feasible". According to him, while many modelled scenarios have been published claiming to show that a 100% renewable electricity system is achievable, there is virtually no historical evidence that demonstrates that such systems are indeed viable.

Heard says that in the CSIR study, electricity demand growth was assumed to be around 15% by 2030, which he considers to be too low. Other criticisms of the report include the fact that the CSIR took advantage of the geographic spread of renewables for balancing, but that is dependent on a strong transmission system. Only the generation was costed, not the transmission, and Heard adds that the CSIR did not model energy flow.

### Investment picking up

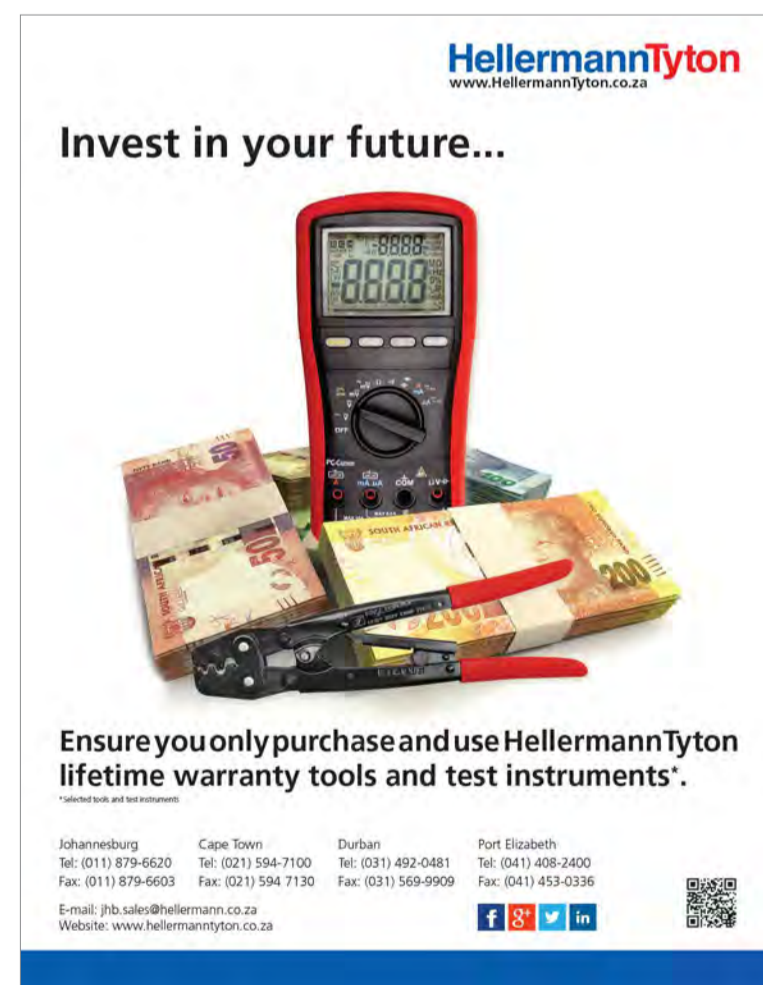
Despite the detractors, investment into renewables is picking up again on the back of the revival of the IPP programme. The AFD Group for example, one of many recent investors into the sector, recently secured €24 million for renewable energy projects.

The industry has welcomed the revitalisation of the sector. Paschal Phelan, Chairman of Solar Capital, issued a statement expressing relief at seeing an end to the 'standoff' between Eskom and the Department of Energy. "With the reaffirmation by President Zuma, our focus now needs to be on getting the momentum and investment reignited in the renewable energy sector in South Africa. More importantly, we must make South Africa a key global solar manufacturing hub. With enormous growth forecast for solar, we can create tens of thousands of sustainable green jobs for our country," he said.

### AC/DC DYNAMICS SPONSORS CYCLING TEAM



AC/DC Dynamics has become the principle sponsor for the Luso Africa Cycling club. This, with other sponsors of the club, will enable the cyclists to make a concerted effort to break into top level competition. The sponsorship has enabled the team to grow from three to six, and will allow the team to compete in Europe in June and July, a traditionally quiet period for local competitions. AC/DC Dynamics has every faith in the Luso Africa Cycling team, which is made up as follows: Chris Jooste (captain), Casper Kruger, Jandre Storm, Jandrich Kotze, John Vlok and Dylan Le Roux.



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# LIFE IS ABOUT SEEKING AND OVERCOMING CHALLENGES



Dieter Dilchert.

**DIETER DILCHERT**, technical director of PSA Solar Con, is a well-known businessman and entrepreneur. He has a great interest, and for the past 13 years has played a prominent role, in building the renewables industry in South Africa. Dieter founded a training institute for solar and wind energy installations and has had a significant influence on training and skills development within this industry. He is a dedicated family man who thrives on challenges.

**Sparks:** Where were you educated?

**DD:** I am originally from Germany, and my education took place at the Electro Technical College in Frankfurt.

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

**DD:** I have been in the electrical industry for the past 45 years.

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

**DD:** I started my career in Frankfurt in 1965 where I began as an apprentice in a chemical factory.

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

**DD:** The biggest change for me has been the change in technology from analogue to digital.

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

**DD:** I would say that the biggest project I have worked on was also one of the greatest accomplishments of my life and that was the design and project management of the DEA (Department of Environmental Affairs) PV plant system.

**Sparks:** Have you won any awards?

**DD:** Not directly, but I have received recognition from the German Chancellor for the training I have provided over the years.

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

**DD:** Elon Musk is an inspiration to me.

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

**DD:** To me, one of the biggest challenges facing the PV industry at this time is that people do not have enough knowledge and understanding of PV solar systems. This is exacerbated by insufficient technical training.

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

**DD:** For me it is about challenges and in my current job I enjoy the challenges that are presented to me the most. When I am presented with a challenge it gives me enormous satisfaction to determine a solution.

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

**DD:** I motivate my staff by example.

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

what would that be?

**DD:** No, I have enjoyed my life and have learned so much along the way. I don't think I would make any changes if I could do it all again.

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

**DD:** Yes, I would definitely advise young people to enter the electrical industry. I firmly believe that the industry provides great opportunities for young people to grow and excel. It is also a fast changing industry so there are constantly new things to learn.

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

**DD:** My advice to electrical contractors and/or electrical engineers would be to work hard and to keep up with modern technology. Never fall behind with what is happening with technology in the world.

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

**DD:** My favourite quote is 'What you can do today, do not delay to tomorrow'.

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

**DD:** The three things that are on my bucket list are to cruise the Mediterranean; to visit the Intersolar in the USA and to buy an electric bike.

## MAKING THE RIGHT MULTIMETER CHOICE

Choosing a multimeter can lead to predicament, says Werner Grobbelaar, sales manager Major Tech. For this reason, it is essential not to base that choice purely on cost. In fact, says Grobbelaar, cost should be the last item on the checklist. Choosing the right instrument depends solely on the purpose for which it will be used.

Major Tech offers an extensive range of digital multimeters designed to help clients do their jobs faster, more efficiently and with greater accuracy, and includes an industrial range of CATIV 600V IP67 multimeters, True RMS or Average reading. The company has a model that offers safety, quality and performance for every budget and application. In line with the ever-changing technology of electronic circuits, Major Tech's multimeters too have advanced to include Bluetooth connectivity, Graphic display and built-in scope meter.

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## FEMALE WINNER OF THE FESTOOL PROJECT FOR THE SECOND TIME

For the second year in a row, a woman has taken the title of overall winner of the Festool sponsored University of Johannesburg faculty of Art Design, Architecture and Industrial Design project at the recent 2017 HOME MAKERS Expo. This year it was 23-year-old Kari de Villiers, a 4<sup>th</sup> year BA Honours student in Industrial Design at the university. The Festool project brief to the students was to design a rechargeable Festool impact screwdriver/drill for household, DIY and light-scale fabrication/workshop use.

De Villiers received the prestigious award and a Festool power tool kit of three of its latest drill combo sets, the PDC, TXS and CXS, valued at R30 000. Second place went to Edmar Maree and third to Marcha Naude.

"The Festool award has become popular with students and was undertaken as their exam project for the BA Industrial Design course in 2016. The HOME MAKERS Expo display included the majority of the class's work, and has effectively illustrated the students' innovation, skill and abilities," said Martin Bolton - Head of 3<sup>rd</sup> Year Department of Industrial Design School at UJ. "The Festool brand is a high quality, high technology leader in the industry. To improve and design something new and innovative was a tough task but, looking at the final top 10 designs on show, they certainly did the brand proud and came up with the goods," said Bolton.

Greg de Villiers, sales manager Vermont Sales, and Festool's International guest Nadja Korbelt Festool, territory sales manager and specialist demonstrator, agreed that the quality, finish, and professionalism were outstanding.

The product had to be developed in line with the Festool brand and had to incorporate innovative technologies currently only available in high end Festool products. The design approach had to consider how people use



23-year-old Kari de Villiers was declared overall winner of the Festool project.

the product for drilling, screwing, piloting, assembling and DIY'ing. Because the task involved a rechargeable product, they were required to push the boundaries of innovative batteries, and an appropriate recharging station. The design outcome had to reflect empathy with the human interface of the product and highlight the students' ability to design complex forms that reflected both the brand and the correct level of visual appeal to entice customers to purchase the product.

"The project was a major task for the students as it involved research, CAD drawings, engineering drawings, final specs of all parts, measurements, all components, sketches and a final life-sized workable model," said de Villiers.

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## MOTORS AND AN APOLOGY

Kevin Welch of UIC Automation (Pty) Ltd kindly sent me an email in which he pointed out that I had made a mistake in a previous column. I'd given the full load current of a three phase 22 kW motor as 72 amps when in fact it is about 40 amps. Single phase current is 72 amps.

I would like to say this shows that we all make mistakes, but in truth it just shows I am careless. I thought what I should do then is first, apologise to the readers; secondly, thank Kevin (thank you Kevin!) and finally, discuss electric motors, specifically single phase motors.

Single phase electric motors are not generally found above 10 kW. This is because they have a very low starting torque, are not as efficient as three phase motors and have a low power factor.

A single phase motor is not self-starting and hence needs an auxiliary means to start it. Thus the motor is started temporarily converting it into two phase motor.

There are a number of ways of doing this – one can wind the motor with a main winding and starting winding, which are physically 90° displaced from each other. An alternative is to have two windings, again a main winding and an auxiliary winding. The current to the auxiliary winding is run through a capacitor which displaces the current in the auxiliary winding by 90°. Once the motor is up to speed the capacitor is disconnected. A third method is to have a shaded-pole motor. Here the auxiliary winding is composed of a copper ring or bar surrounding a portion of each pole.

This auxiliary single-turn winding is called a shading coil. Currents induced in this coil by the magnetic field create a second electrical phase by delaying the phase of magnetic flux change for that pole enough to provide a two phase rotating magnetic field. In general, for small motors the shaded pole motor is the most common. One of the most common applications for single phase motors is that they are used to drive hand drills, circular saws, band saws and so on.

Clearly, it is no good to have a motor with a low starting torque in these applications. Consequently, the motors for hand tools are a type called a 'universal motor'. A universal motor is a special type of motor designed to run on either dc or single phase ac supply. The motors are generally series wound (armature and

field winding are in series) and hence produce high starting torque suitable for hand tools. A downside is that the motors have brushes and a commutator, which can wear out. However, this really only occurs under conditions of heavy use. What can be useful is running a hand drill on two car batteries in series – doesn't turn very fast but it does work.

In times gone by it was often necessary to have an electric motor whose speed could be varied. Before power electronics this was no easy matter. It is relatively simple to vary the speed of a dc motor and consequently on board ships, where it was desirable to have capstans and hoists with variable speed and capability of reversing, dc motors were often used. In many circumstances the whole ship ran on a dc supply. These days it is all variable speed drives and three phase ac motors.

This brings me to a little known motor starting method. Assume you have to get a large ac motor up to speed at no load and you haven't got a supply that can handle the starting current. Buy a variable speed drive which is about 20% of the rating of the motor. Connect the variable speed drive to the motor with a bypass which can short it out. Connect the variable speed drive to the supply. The motor will start to turn and the variable speed drive will limit current and trip. Reset the variable speed drive. And so on. Each time it's reconnected the motor speeds up a bit more until it's at full speed. Works well!

## FLIR'S THERMAL IMAGING CAMERAS



FLIR Systems has announced three new Exx-Series advanced thermal imaging cameras for electrical, mechanical and building applications: the FLIR E75, E85, and E95. The redesigned, Wi-Fi-enabled Exx-Series features intelligent interchangeable lenses, laser-assisted autofocus modes and area measurement functionality, improvements to FLIR's patented MSX® imaging technology, and a larger, more vibrant 4-inch touchscreen. These distinctive features, combined with increased sensitivity and increased native resolution, will help professionals identify hot spots or building deficiencies before potential problems become expensive repairs.

The Exx-Series cameras feature a rugged, water-resistant design, and scratch-resistant Dragontrail™ cover glass over an optically-bonded, projected capacitive (PCAP) touchscreen. A simplified user interface delivers faster, more intuitive operation, and coupled with enhanced Wi-Fi, Bluetooth and Meterlink® connectivity, archiving and report generation has never been easier.

The FLIR E75, E85, and E95 cameras will be available for sale in March through established FLIR distribution partners and the FLIR.com store.

Enquiries: [www.flir.com/exx-series](http://www.flir.com/exx-series)

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# Ignorance is deadly!

A SAFEhouse guide to avoiding 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.

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 customers 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:

Barry O'Leary: Tel: 011 396 8251 | Email: barry.oleary@safehousesa.co.za

Pierre Nothard: Tel: 011 396 8140 | Email: pierren@safehousesa.co.za

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## PSYCHOMETRIC ASSESSMENTS IN THE SELECTION OF EMPLOYEES

**WHEN** I started my career as an artisan, it was common practice for companies wishing to employ apprentices to begin by conducting aptitude tests on all prospective candidates. This practice seems to have fallen by the wayside, which is a pity because an aptitude test ascertains whether or not someone has an aptitude for their chosen career – and, indeed, it can prevent a misguided career choice.

So, how can an employer ensure that the best person is selected when a great many applicants respond to a job vacancy? An informed decision can be made by using a psychometric assessment, which is based on the characteristics and abilities required for the position as determined by the employer, so that the applicant who best meets the job requirements is identified. The assessment provides information about various factors such as problem solving skills, reasoning abilities and personality characteristics, allowing comparisons between applicants to be made. Additionally, an applicant's strengths and developmental areas can be identified and the assessment can be used to predict how successful a person could be in a specific position.

Different assessments are intended to measure different factors and should be in line with the requirements of specific positions. This allows potential performance and job satisfaction to be evaluated relevant to the target position.

Various aspects of the assessment process need to be considered, such as cost and time, as well as appropriateness of the assessments. If the assessments are intended to be used for job applicant selection, they must be registered with the Health Professions Council of South Africa (HPCSA) in order to comply with the regulations on psychometric assessments set out by the Employment Equity Act.

The applicant being assessed could expect to be tested on factors such as the following:

**Intelligence and ability:** Typically these tests are used to measure cognitive or intellectual ability. They can involve aspects such as pattern recognition, problem solving and reasoning abilities.

**Personality:** Personality is commonly believed to lead people to act in a consistent and predictable manner. This can be used to gain insight into how candidates will behave in the workplace, whether they are inclined to abide by organisational rules and how they are likely to interact with others.

**Aptitude:** These assessments measure inherent abilities, which are often related to skills required for a particular job. Examples of abilities assessed include mechanical insight, numerical skills, comprehension and visual-spatial reasoning.

**Interests:** Interest tests are used to gain insight to a person's interests and preferences. If a person has interests and preferences that have been found to be common amongst people in a specific job, then it is likely they will gain job satisfaction in that job field.

The advantages of psychometric assessments include:

- Assessments can be used to predict job performance and satisfaction.
- Interviewing candidates can only provide a limited amount of information whereas assessments help to provide a deeper insight into a person.
- Strengths and weaknesses can be identified, which is useful when hiring or developing employees.
- They provide an objective means of viewing a person.
- They can be used to determine if a candidate is the right fit for a job.
- Hiring the right person for a job is likely to increase the productivity of the company

The disadvantages of psychometric assessments are:

- Assessments can be costly and time consuming.
- Assessments may provoke anxiety for the candidate and the

effects of that need to be taken into account.

- Cultural and language differences need to be taken into consideration during the assessment process.

Every workplace has a unique atmosphere in terms of physical and cultural characteristics so identifying an individual's interests, abilities and personality characteristics can help determine whether or not he or she is a good fit for a specific job and for a particular work environment. This can aid in increasing the likelihood of good job performance and job satisfaction.

To keep in line with modern trends, the P & T Technology competency training institute has employed an in-house registered psychometrist who conducts psychometric assessments to assist employers in making the correct choices when employing new staff members. Drop us an email on [info@psyas.co.za](mailto:info@psyas.co.za) or visit the webpage for more information about this service [www.psyas.co.za](http://www.psyas.co.za).



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## AEE QUALIFICATION PROGRAMMES

Association of Energy Engineers Certification qualification programmes are now presented in Zambia, Egypt, Kenya, Zimbabwe and Uganda. Africa has over a 1000 active certified energy professionals of the over 17 500 in the world and the numbers are set to grow even more. The Energy Training Foundation (EnTF) is the AEE training provider for most of these regions, and invigilates the AEE international examinations for most of the continent. It also facilitates certification applications and renewal applications for its International Certification Body, the AEE.

The Kenyan AEE chapter and the Kenya Association of Manufacturers (KAM) are two of the more active propellers in Africa for qualifications. Recently Zimbabwe and Uganda have also hosted such qualification programmes and Egypt and Zambia have now joined the drive.

Egypt will host a CEM® training and examination session in May this year, with Zambia and Kenya going all out and hosting all the AEE qualifications during 2017. More information about the training programmes can be found on the website.

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



## BRUSHLESS EC MOTOR DOUBLES THE LIFESPAN OF BOSCH COMPACT TOOL

The addition of a brushless ec motor to the Bosch GSB 18 V-EC Professional has doubled the lifespan of the popular compact tool. "It forms part of the Bosch 'dynamicseries', a series of compact tools with long battery runtime based on tried-and-tested models," says Campbell Mhodi, Bosch Professional Power Tools Senior Brand Manager.

Owing to the ec technology, they have a lifespan of almost twice that of competitor tools. This makes the tools especially suitable for serial applications, allowing for quick and efficient operations in finishing trades such as electricians, plumbers and joiners.

Bosch's brushless ec motors are maintenance-free, unlike conventional dc motors with carbon brushes. In

addition, they operate at an efficiency rate of 80%, as opposed to the 60% to 70% efficiency rate of dc motors.

"This high efficiency means the tools do not get as hot, and can perform up to 30% more work per battery charge," says Mhodi. In addition, Electronic Motor Protection (EMP) protects the tools against overload by shutting the motor down immediately if it stalls. The ec technology also allows for a compact and lightweight design.

Optional accessories for the GSB 18 V-EC include CYL-9 multi-purpose drill bits for a range of diverse construction activities.

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The EC technology allows for a compact and lightweight design.



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## NEW CWEP TRAINING PROGRAMME

The Energy Training Foundation (EnTF) is to launch a Certified Water Efficiency Professional (CWEP®), Association of Energy Engineers' (AEE) qualification programme.

AEE programmes recognise current knowledge and work experience as requirements for obtaining and maintaining their Certification programmes. The CWEP two-day training session is a culmination of work experience gained over years, with a four-hour examination on day three (to be passed with a minimum of 70%) in order to attain the last eligibility requirement for the qualification.

Implementing water-efficient technologies or techniques generally involves individuals with varied backgrounds, responsibilities, and levels of expertise. CWEP is designed to help educate those who have responsibilities in the sustainable or utility efficiency field on best practices for maximising results and understanding water efficiency basics.

The training will teach technical and organisational strategies, including how to conduct a water efficiency site assessment, understanding water billing/costs, use of terminology, regulatory and international mandates and policies, efficiency technologies and application techniques, as well as water measurement and verification needs. Key areas and sectors covered include commercial kitchens, laundries, cooling and heating systems, domestic plumbing systems, filtration, softening, landscaping and irrigation systems, industrial processing systems, pools, hospitals, medical and laboratories, storm water management, HVAC and mechanical equipment.

The training is ideal for Certified energy managers; Energy and water administrators and utility professionals; Water, energy and facilities champions and Certified energy auditors; Sustainability and energy professionals and Government resource efficiency energy and water administration managers, amongst others.

CWEP will take place in Johannesburg from 12 to 14 July this year with a second course from 16-18 November, straight after the SAEE Convention 2017. In Kenya, additional modules will be added to CWEP and the course will run from 12-15 September, with the exam on 18 September 2017.

Enquiries: yolanda@entf.co.za





## INTENSIVE STAFF TRAINING TO ENSURE COMPLIANCE WITH INTERNATIONAL STANDARDS

**A**RTsolar, the only locally owned photovoltaic (PV) manufacturing plant in South Africa, has implemented a certified training and facilities upgrade programme at its New Germany plant in KwaZulu-Natal.

"As part of our pledge to creating sustainable employment in manufacturing in the private sector, ARTsolar has offered intensive staff training to ensure every step in the quality control of producing PV panels is in accordance with international standards," says Qaphela Zikhali, ARTsolar's operations manager. "ARTsolar, in conjunction with expert instructors and engineers from Germany, Switzerland and China, has provided skills training to over 200 local matriculants.

The company's training initiative also forms part of its commitment to providing long term solutions to the development of renewable energy in South Africa and its support of the Government's Renewable Energy Independent Power Producer Programme (REIPPP), where the creation of job opportunities, local content and community development, remain essential ingredients of the programme.

By using the latest environmentally-friendly technology to convert solar energy to electrical power, ARTsolar provides reliable and independent electricity to support the country's growing economy and to combat the effects of rising utility costs. Local interest in PV technology has heightened since the launch of the REIPPP and PV modules are gaining popularity as a form of renewable energy that is clean, emission and noise-free, sustainable, safe and cost efficient.

ARTsolar - the first local PV module manufacturer to participate in the REIPPP - has completed the module supply of 65 MW in Round 2 and 86 MW in Round 3 and will continue to expand facilities at the plant to meet production requirements for the next phase of this programme.

Expanded facilities have a production capacity of 130 MW per year, which equates to approximately 412 000 x 315 Wp Polycrystalline modules.

The company will again partner with international PV companies to ensure production for the REIPPP in 2017 continues to meet stringent quality, safety and environmental standards. Modules will also

adhere to Government requirements, which include the percentage of local content necessary.

ARTsolar is committed to the development of PV modules specifically for local climate conditions. PV panels are designed for large scale power plants, mines and rural electrification, as well as industrial and residential roofing. Modules with enhanced aesthetics are manufactured for residential and commercial installations. This environmentally-friendly system can also be integrated into roofs and facades to reduce the energy buildings consume.

Enquiries: +27 (0)87 287 9649



ARTsolar has made a substantial investment in new equipment for REIPPP production requirements.

## NEW DYMO LABELLING PRODUCTS FROM RS COMPONENTS

**R**S Components (RS), the trading brand of Electrocomponents plc (LSE:ECM) has introduced a new range of DYMO labelling products to help engineers, maintenance/workshop personnel, equipment builders and users create professional-looking labels for a raft of different applications.

The DYMO MobileLabeler can be used to create custom labels from a smartphone, tablet, Mac® or Windows® computer using the free DYMO Connect app. Its Bluetooth® connectivity offers fast setup and interaction with remote devices, while features such as spellcheck and voice-to-text help reduce errors and save time. A variety of borders and fonts - including those from popular font libraries - gives users the ability to create accurate, easy-to-read labels of various styles up to 24 mm wide.

The DYMO MobileLabeler is supplied with an ac adaptor to charge the on-board rechargeable lithium-ion battery; a USB cable; and a quick start guide. It also comes with a D1 starter label cassette (24 mm x 3 m black on white), but users can purchase from a comprehensive range of D1 labels, including the new D1 Durable labels from RS.

D1 Durable labels exploit an industrial-strength adhesive to ensure labels stay stuck to a variety of surfaces. Suitable for indoor or outdoor application, D1 Durable labels are water-resistant and can withstand UV light, heat, humidity, freezing conditions and a wide range of general solvents.

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## THREE WAYS TO REGISTER AS A SINGLE PHASE TESTER

Another month has sped by. The Western Cape is in the grips of the worst drought in years. Other parts of the country are flooded. And yet others are experiencing one or another form of extreme – either weather or natural – disaster such as runaway veld fires. All this involuntarily makes me think of the electrical contracting industry, and the SMME segment in particular.

For this specific segment of our industry, it is often a case of feast or famine, which makes things extremely difficult for smaller contractors – contrary to what the government of the day says of 'economic transformation'. Fact is, our government makes it extremely difficult, if not near impossible, for the SMME contractor to comply with all its requirements. Contracting directly to one or another government department as a small one- or two-person business is well-nigh impossible. It is clear the procurement departments have lost touch with reality in their determination to comply with targets and prescriptions.

Anyway, at least we can rely on the Occupational Health and Safety Act (Act 85 of 1993), its Regulations and the SANS Codes of Practice to keep us on the straight and narrow, no matter what conditions for business look like out there.

In my previous column, we started looking at the topic of registration just before it was time to go again. I trust a short recap is not inappropriate, after which we will carry on with the balance of Regulation 11. So let's have a look what Regulation 11 of the Electrical Installation Regulations (2009) can tell us. It reads as follows...

### Regulation 11: Application for registration as a registered person

(1) An application for registration as a registered person shall be made to the chief inspector in the form of Annexure 5 together with the registration fee prescribed by regulation 14.

The application form to register as an Installation Electrician (a registered person) is found at the back of the Electrical Installation Regulations 2009. The registration fee, of R120, in Regulation 14 is paid to the Department of Labour. This payment can also be in the form of 'revenue stamps'. 'Revenue stamps', issued by the South African Revenue Service, were abolished during 2009, most likely after the publication of Regulation 14, which explains their continued reference. These days you can pay the Department via electronic funds transfer or EFT as the process is more commonly referred to.

Sub regulations continue with ...

(2) Any natural person who satisfies the chief inspector that he or she

(a) has sufficient knowledge of the rules applicable to electrical installations in the category for which the application is being made; and

(b) has appropriate practical experience in respect of the electrical installation, verification and certification of the construction, testing and inspection of the type of electrical installation for

which application is being made, shall be registered as an electrical tester for single phase, an installation electrician, or a master installation electrician, as the case may be.

From sub regulation (2) it is clear that a company, close corporation or partnership (in other words a business entity) cannot be a 'registered person'. Subparagraph (a) refers to the theory required to register. Subparagraph (b) refers to the practical experience required. Now, there are a few options a person has when it comes to registration criteria. Let's have a look at what such a person must comply with in order to be registered as an electrical tester for single phase, for instance, by the Chief Inspector.

The **first** of three possibilities, routes or options in registering is:

You must have a minimum integrated practical and theoretical qualification such as:

- (a) A National Certificate in Electrical Engineering: NQF level 3 issued by the Energy and Water Sector Education and Training Authority (EWSETA).
- (b) Submit documentary proof of successfully completed unit standards on inspection, testing and certification of single-phase domestic installations as prescribed by the EWSETA.
- (c) Submit proof of at least one year's practical experience or training (certificate of service from an employer or a National Certificate in Electrical Engineering: NQF level 4) in electrical installation work after achieving the National Certificate in Electrical Engineering: NQF level 3.

Further, you must have knowledge of the relevant Statutory Requirements and submit proof of a working knowledge of the legislation and relevant health and safety standards applicable (Act 85 of 1993, for instance) to single phase electrical installations, assessed by an EWS-ETA registered assessor.

The **second** of a possible three alternative ways to be able register as a single phase tester:

You must have a practical qualification and submit proof of having passed:

- (a) (i) the prescribed trade test in terms of the Manpower Training Act of 1981 in one of the following trade disciplines:
  - Electrician
  - Electrician (Engineering)
  - Electrician (Construction)
  - Millwright (Electro-mechanical)
  - Lift Mechanic; or
- (ii) the Chemical Electrical NQF level 4 qualification issued by the Chemical Industries Education and Training Authority (CHIETA).
- (b) Submit documentary proof of successfully completed unit standards on inspection, testing and certification of single-phase domestic installations as prescribed by the EWSETA.

And further to the above, the minimum theoretical qualification required is:

- (a) A National N2 Certificate with the following compulsory subjects:

- Mathematics
- Engineering Science
- Electrical Trade Theory or
- (b) Achieved a Grade 11 (Standard 9) Certificate with
  - Mathematics
  - Science
  - Technical - electrical or an equivalent subject that may include N2 subjects

Please take note of the following:

- You must have passed each subject for the above with a minimum of 40%. Secondly, these minimum theoretical subjects may be a combination of Grade 11 and N2 subjects.
- Then...last but not least, knowledge of the Statutory Requirements:
- Submit proof of working knowledge of the legislation and relevant health and safety standards applicable to single phase electrical installations, assessed by an EWSETA registered assessor.

The **third** of the three alternatives or options to be able to register as single phase tester is:

You must have practical experience and:

- (a) Prove 5 years' experience in electrical installation work (letter from or certificate of service from an employer).
- (b) Prove competence in constructing a single phase electrical installation, as well as knowledge of basic electrical principles, assessed at an EWSETA accredited training provider.
- (c) Submit documentary proof of successfully completed unit standards on inspection, testing and certification of single phase domestic installations as prescribed by the EWSETA.

And then, the always present knowledge of Statutory Requirements.

You must submit proof of working knowledge of the legislation and relevant health and safety standards applicable to single phase electrical installations, assessed by an EWSETA registered assessor.

Now, if you have decided on the most appropriate of the three options or routes to acquire your registration, you can apply to the Chief Inspector as set out right in the beginning of Regulation 11. Once all is in place and you have successfully applied ...

- (3) The chief inspector shall furnish a registered person with the appropriate certificate of registration and enter such registration into the national database.
- (4) A registered person shall on request produce his or her certificate of registration to an inspector, an approved inspection authority for electrical installations, a supplier or any person to whom he or she intends to issue a certificate of compliance.
- (5) A registered person shall inform the chief inspector of any changes affecting his or her registration within 14 days after such change.

In a future instalment we will look at the requirements for Installation Electricians and Master Installation Electricians.

Till next time.

## VIRTUAL AND AUGMENTED REALITY CAPABILITIES ADDED

SCHNEIDER ELECTRIC, a global specialist in energy management and automation, has added advanced Virtual Reality (VR) and Augmented Reality (AR) technologies to its industrial software portfolio with the acquisition of MWPowerlab.

MWPowerlab's industry-leading 3D real-time technology gives customers the benefit of strengthened Immersive Simulation and Training capabilities and advanced 3D visualisation that increase safety standards, improve labour effectiveness and increase asset performance on a global scale. VR and AR technologies will enhance Schneider Electric's Enterprise Asset Performance Management offering.

Schneider Electric and MWPowerlab have enjoyed a long history of delivering Immersive Operator Training and Simulation solutions together. The success of the partnership will grow through this acquisition, as a result of the skills transfer of valuable domain expertise provided by MWPowerlab to Schneider, which will in turn drive the continued innovation and digitisation of the entire value chain.

"The sustained development into Virtual Reality and Augmented Reality has culminated in the technology becoming more accessible to diverse global markets including South Africa," says Marc Ramsay, Schneider Electric South Africa Vice President for Industry Business.

Maurizio Galardo, the President of MWPowerlab s.r.l. expressed delight at being part of the Schneider Electric team. "Our Virtual and Augmented Reality technology is now highly optimised for industrial applications, as a result of working with Schneider Electric over the past five years. Together, I believe we can unleash the power of 3D real-time technology across the Simulation, Asset Management and HMI Supervisory solutions that are part of the Schneider industrial software portfolio," he said.

Enquiries: +27 (0)11 254 6400



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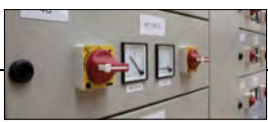
Reactive energy compensation is a specific activity that requires specific actions in order to secure the installations. Certain parameters, such as installation in high-temperature areas, lack of acknowledgement of operating conditions of cabinets in their environment and/or insufficient maintenance of compensation cabinets, may entail a lesser working life of a capacitor, thereby leading to increase risk of incidents.

It has come to our attention that a number of Legrand Alpes Technologies capacitors have not been installed on sites according to our recommendations.

Certain sites are currently undersized and there is a lack of maintenance of the capacitors installed on these sites. We urge those in the industry technical department to please contact Legrand in order for us to intervene and ensure the installation of our capacitors conforms to good installation practices and to current standards.

Legrand South Africa  
Tel: 011 444 7971  
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## FIRST APPLICATION OF NEW TECHNOLOGY IN SOUTH AFRICA

SEW-EURODRIVE has successfully supplied MOVITRAC LTP-B Eco HVAC drive units to DSV Healthcare of Meadowview, Johannesburg. Designed and engineered to optimise fan and pump performance in HVAC applications, this is the first application of the new technology in South Africa.

The HVAC drives are an integral part of DSV Healthcare's facility-wide Building Management System from Johnson Controls. Maintenance Manager Peet van der Linde explains that the Medicines Control Council, which regulates the Medicines and Related Substances Act for the manufacture, distribution, sale, and marketing of medicines, requires the facility to maintain a constant humidity of 60% and a temperature of 22 °C.

"If the humidity and temperature levels of our facility go out of range, it becomes a reportable deviation after 24 hours. This means we end up with critical stock that cannot be distributed. It is therefore vital that the internal environment be maintained within the prescribed parameters," van der Linde says.

DSV Healthcare decided to opt for the MOVITRAC LTP-B Eco HVAC drive units from SEW-EURODRIVE following lightning damage to existing competitor units. According to Mechatronic sales engineer Hendri Oosthuizen, the drive units have performed flawlessly despite heavy storm conditions following the installation.

"These units were supplied to run the centrifugal evaporator fans for the client's building air-conditioners. They offer reliability and longevity because they are supplied with built-in line filters," saying Oosthuizen noting that the



design specifications were three-phase 400 V supply, 15 kW HVAC drives, while the installation requirements were IP55, analogue setpoint control, and relay feedback for running and alarm status.

The main advantage of the new HVAC drive is that it is designed for maximum motor-control efficiency. Efficiency is improved by up to 4% compared to standard ac drives, while also reducing supply current total harmonics distortion (iTHD), improving the Real Power Factor, and reducing total input current, leading to installation cost-savings through reduced cable and fuse ratings and smaller supply transformer rating. The drives are also manufactured in accordance with RoHS, a European Union product directive applying to electronics manufactured within the EU, or imported from other countries.

Enquiries: [JKlut@sew.co.za](mailto:JKlut@sew.co.za)

## HIGH SPEED MOTOR DESIGN

Technological progress in high speed motor design has led to ever-increasing rotating speeds for electric machines, enabling them to shrink in volume and weight, and ultimately leading to high power density and savings in energy consumption. But the surge in speed incurs a number of design challenges, namely for mechanical rotors, bearings, and for thermal stability owing to high frequency losses, among others.

According to Gerald Masson, business development, new technologies and licensing manager at Moving Magnet Technologies (MMT), high speed motor adoption has been a

trend in Europe in the automotive industry and lately it has also been considered for applications in several other areas.

"We specialise in designing brushless dc motor technologies and we have developed a specific technology for high speeds – meaning speeds higher than 20 000 rpm," he says. "In fact, we have prototypes running at 100 000 to 200 000 rpm. Very high speeds. For such velocities, we need specific and fitting design, while keeping it simple to manufacture."

Enquiries: [ricarda.rosa@se10.com](mailto:ricarda.rosa@se10.com)

## MOTOR REBUILT FOR ZAMBIAN COPPER MINE

Marthinusen & Coutts, a division of Actom, recently completed the rebuild of a 6 550 kW 2-pole 11 000 V squirrel cage induction blower motor for a copper mine in Zambia.

According to Rob Melaia, engineering and technical executive at Marthinusen & Coutts, the motor had suffered a rotor failure which caused collateral and associated damage to the stator and also considerable damage to the rotor laminations at the core extremities.

Marthinusen & Coutts has extensive experience with the rebuilding of such large rotating machines and it is this ability to leverage knowledge gained from years in the industry that facilitates the identification and repair of electrical machinery in limited time.

The repair work undertaken comprised a stator rewind, a rotor rebar including a partial recore with new laminations and the replacement of the P900 high strength rotor retaining rings.

Interestingly, the retaining rings are made from the same steel used for the largest turbo generator in the world and this was sourced by Marthinusen & Coutts from a leading German supplier in record time. "Working closely with our network of local and international partners facilitates access to specialists in all fields and allowed the fast track procurement of these specialised rings. This was especially impressive as these were procured over the Christmas period," Melaia says.

The rotor rebar involved new rotor bars using high resistivity brass alloy and

the redesign of the rotor cage axial locking system. Once the rebuild had been completed, the motor was tested at Marthinusen & Coutts' facility which houses the third largest high speed dynamic balancing machine in sub-Saharan Africa.

"We were able to perform high speed balancing as well as a full no-load run test to verify vibration and bearing integrity condition performance," Melaia says.

Enquiries: +27 (0)11 607 1700



## EFFECTIVE PROTECTION FOR ELECTRIC MOTORS AND LOADS

The Simatic ET 200SP motor starter protects electric motors and loads. Siemens has designed it for higher performance, and added new versions and functions. Four adjustment ranges up to 5.5 kW now make the motor starter particularly powerful. With the new fail-safe versions, there is a wide range of standard and fail-safe motor starters for switching and monitoring tasks in logistics and production plants and on production machines and machine tools. New functions, such as motor blocking protection and Quick Stop, not only protect motors but also increase the throughput, productivity and availability of plants.

The powerful, compact Simatic ET 200SP motor starter saves space in the control cabinet and offers versatile control, switching, starting and monitoring functionalities. It reliably protects one- and three-phase motors against overload and short circuit when starting. The current values can also be used for energy management functions. Thanks to push-in technology, no tools are required for connecting the motor starters. Parameters are easily assigned

with the TIA Portal engineering tool and the starters are connected to a controller without any programming effort. Any faults can be easily found and corrected by a multitude of diagnostic options, such as residual current detection and LED displays.

The Simatic ET 200SP motor starter safely switches off motors in two ways: The Sirius 3SK safety relay, which separates standard and safety engineering, is used for locally limited applications. For system-wide, integrated automation solutions, the safety-oriented F-CPU's of Simatic controllers are used.

New functions include Quick Stop and motor blocking protection. The Quick Stop function stops conveyed goods precisely, which increases throughput and productivity. The motor blocking protection function switches off the plant quickly in the event of a mechanical blockage, such as when a tool gets wedged in the conveyor belt. This protects the motors and increases plant availability.

Enquiries: +27 (0)11 652 2000

## CUMMINS AND FOOD & TREES FOR AFRICA PARTNER IN FOOD-GARDEN INITIATIVE



Food & Trees for Africa is assisting Cummins with its successful food-garden initiative at four Gauteng schools, namely Ivory Park Secondary School, Ingqayizivele High School, Minerva Secondary School, and Manzini Primary School. The initiative has managed to double its production, with ten times the diversity of produce, thanks to the assistance from Food & Trees for Africa.

The year-long partnership came into effect when Cummins assisted Food & Trees for Africa on an initial tree-planting and education initiative, which eventually developed into an ongoing drive to promote sustainable projects.

"We realised that, in order for these projects to be sustainable, we had to partner with an organisation such as Food & Trees for Africa, which has a unique business model in this regard," says Cummins Harrowdene Deputy CIT Team Leader René du Plessis.

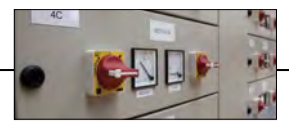
The food-garden project at the four schools involved planting indigenous trees and vegetable gardens, and assisting local communities to generate their own organic vegetables. A total of 60 indigenous trees and 60 fruit trees was supplied at Ivory Park Secondary School, Ingqayizivele High School and Manzini Primary School, together with compost and seedlings to each of these under-resourced schools, including Minerva Secondary School.

The produce from the initiative is channelled into feeding schemes at the various schools. Food & Trees for Africa also provided advice on environmental education as inculcating environmental awareness in learners is an integral part of the project.

Food & Trees for Africa Food Gardens manager Robyn Hills says that Cummins has proved to be an enthusiastic partner. "Cummins staff are well-informed about climate change and its impact on food production. With the help of staff, we have conducted seedling drops, set up stalls and done herb giveaways. We have also arranged talks to encourage community participation. Cummins has played a major role in helping us achieve these milestones."

René explains that Cummins selected this particular CSI initiative as environmental awareness and stewardship is very much in the DNA of the company. This is evident in the way Cummins manufactures its engines, taking careful consideration of international emissions regulations.

Enquiries: +27 (0)11 589 8400



## COMMITMENT TO AFRICA IS NOT JUST ABOUT MONEY

When companies invest in Africa by setting up production facilities, they contribute far more than just finances, buildings and equipment; they offer their host countries a shortcut into the global mainstream, opening the doors to trade and development on an unprecedented scale.

According to Louis Meiring, CEO of the Johannesburg-based Zest WEG Group, by far the most important aspects of foreign investment are the access to global operations, the transfer of technology, and the ongoing training and skills upliftment.

Zest WEG Group is part of the global WEG Group, whose commitment to Africa is evident in its ongoing financial investment in local manufacturing operations.

"WEG initiated a programme to uplift the Zest WEG Group facilities to become world class," says Meiring. "This puts our local manufacturing facilities onto an international platform so our products can be considered for international markets, including the existing WEG network of operations worldwide."

He says Zest WEG Group will also use the WEG world network as a source for enquiries, to create business opportunities and bring much-needed international business to South Africa.

"This is all perfectly feasible through technology transfer, as we have the resources to skill and train our people," he says. "Once again, however, there is more to technology transfer than just training."

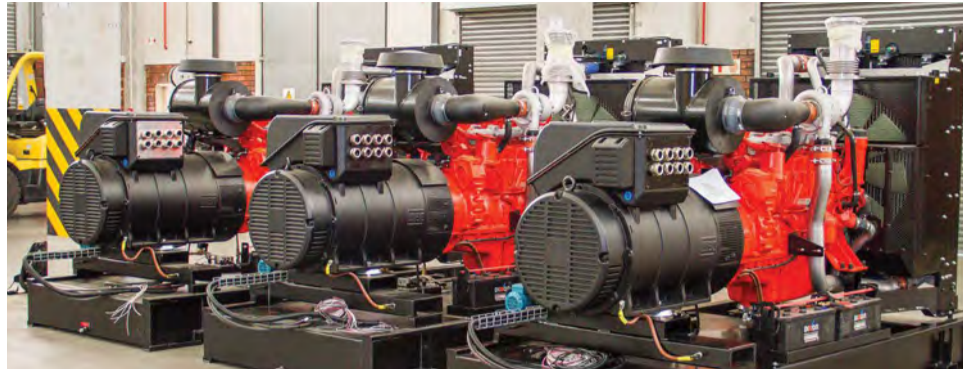
While technology transfer does include the upliftment of people's ability to design or engineer products, it is also about the benefit of lessons learnt in the process of research and development (R&D).

"These lessons, which have been learnt by the WEG Group through decades of experience, will have an immeasurable impact on our local operations, due to the high levels of R&D already conducted," says Meiring. "This technology is then transferred to the local operation without us having to incur the cost or the time to develop it."

This process includes the vital aspect of how to produce the product using best practice methodologies, such as lean manufacturing, so special skills must be transferred and developed in South African industrial facilities.

Zest WEG Group has long been an active player in skills upliftment, with a reputation for the quality of its training centre and training programmes; all of which are accredited by the relevant authorities for the provision of continuous professional development (CPD) points.

"We conduct training not only for our own staff but for our customers too," Meiring says. "We see this as vital in addressing



The genset manufacturing facility in Cape Town.



WEG Transformers Africa's manufacturing facility.

the skills void in various segments of the electric motor sector; created during the late nineties and early 2000s when the role of artisan was not considered to be a career of choice."

He says that, as a committed partner and the leading manufacturer of electric motors worldwide, WEG has continued the training ethos long established by Zest WEG Group. Its training interventions extend beyond South Africa to other African countries, with the training officer regularly travelling across the continent to ensure that the relevant technology is shared wherever necessary.

"As an African nation, we need to be able to access the necessary skills sets locally, so that we become less dependent on foreign nationals to provide critical skills," says Meiring. "As a modern economy, we also need to maintain the costly capital equipment installed in many sectors of South African industry and the lack of these skills can play havoc."

He emphasised the importance of skilled and regular maintenance to extend the life cycle of any equipment, arguing that industrial inefficiencies are, more often than not, the result of poor maintenance or no maintenance at all.

"Part of the investment in skills is to educate those who operate and oversee equipment about the critical nature of proper maintenance," says Meiring. "When this change in mindset occurs, we will know we are on the correct path to economic success."

The focus on skills is not only on the technical side of industry, but should also extend to management capacity; sound managerial skills are needed to ensure that high levels of technical ability are properly implemented in the work process, and that productivity is maintained.

One of the most welcome benefits of economic investment is



WEG Transformers Africa's manufacturing facility.

clearly the creation of jobs within the new manufacturing facilities created; it should be remembered, though, that jobs are also created indirectly.

"This is the peripheral knock-on effect of investment, which is equally as important as the direct investment in the facility and the plant and equipment," says Meiring. "To ensure that we harness the positive impact of indirect job creation, we also engage in supplier development activities to strengthen our downstream partners and provide access to the economy."

Enquiries: +27 (0)11 723 6000

## VERSATILE SENSOR AVAILABLE FROM DRH COMPONENTS

Paddle wheel, dry bulk level sensors have been used in the bulk solid industry for many years and, throughout, Bindicator has been a market leader. Now Bindicator has introduced Roto-Bin-Dicator-Pro, which has the ability to detect faults while the paddle is in the material. The sensor is a true fail-safe device that is able to perform complete self-diagnostics in and out of material to offer supply voltage fault, motor not connected, motor failure, gear train failure, operational over temperature range and control board fault. Other devices only provide diagnostics when the paddle is out of material. Self-diagnostics are standard and not only detect faults, but differentiate between them. By providing distinct flash codes, downtime is minimised and the Pro provides complete confidence against costly overfills or outages. No other paddle wheel in the industry has this functionality.

The device has LED indication for six fault conditions. It is suitable for diverse applications with three motor sensitivity settings and seven paddle wheel options. A test FOB checks the functionality of the Pro without removing the cover and a motor pause feature saves on mechanical wear and tear. It has horizontal and vertical mounting options.

The Roto-Bin-Dicator-Pro is available from DRH Components, a specialist electric component supplier to the industry with a focus on the control and protection of electric motors.

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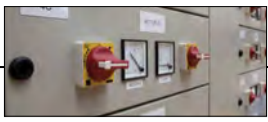
## Extended Guarantees on WEG Products



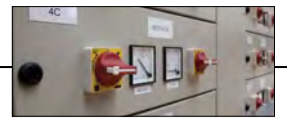
 Please contact your nearest sales office for further details.

Tel: +27 11 723 6000  
[www.zestweg.com](http://www.zestweg.com)





MANUFACTURERS	CONTACT	ARMoured/SHIELDED CABLES	CONTACTORS/BREAKERS/RELAYS
<b>ABB South Africa</b> <b>Aberdare Cables</b> <b>Allbro</b> <b>Alstom Protection and Control</b> <b>Alvern Cables</b> <b>Brady SA/Grafo</b> <b>Brother International South Africa</b> <b>CBI</b> <b>CCG Cable Terminations</b> <b>CHINT</b> <b>Eaton Electric</b> <b>HellermannTyton</b> <b>Lapp Group SA</b> <b>Legrand</b> <b>NewElec</b> <b>O-Line</b> <b>Phambili Interface</b> <b>Phoenix Contact</b> <b>Power Process Systems</b> <b>Radiant Group</b> <b>Sabelco Electrical Industries</b> <b>Schneider Electric</b> <b>Stone Stamcor</b> <b>Surge Technology</b> <b>Three-D Agencies</b> <b>Zest WEG Group</b>	<b>Denver Technical Products</b> Mervyn Stocks <b>DRH Components</b> Rob Hare <b>Eaton Electric</b> Marlene Coetzee <b>Electrahertz</b> Frank Proude (Pta) Peet Lourens (Jhb) <b>Elen Enclosures</b> Andy Kapral <b>HellermannTyton</b> Sales <b>Invirotel</b> Modishane Sebona <b>Jaycor International</b> Jeffrey Pokroy <b>JB Switchgear</b> Johan Basson <b>JDL Electric</b> Ashveer Lalla <b>Lapp Group SA</b> Mark Dilchert <b>Legrand</b> Johan Bosch <b>MCE Global Suppliers</b> Sales <b>Major Tech</b> Werner Grobbelaar <b>NewElec</b> Sales <b>O-Line</b> Sales <b>Phambili</b> Steve Lea <b>Phoenix Contact</b> Carl Coetzer <b>Power Panels and Electrical</b> Andy Karpal <b>Power Process Systems</b> Joyce Toth <b>Pretoria Motor Control Gear (PMCG) Products</b> Hannes Swartz/John Vorster <b>PSA Cable</b> Dieter Dilchert <b>R&amp;C Instrumentation</b> Johan de Villiers <b>Radiant Group</b> Alfred Weldon <b>Sabelco Electrical Industries</b> Marc Moreau <b>Schneider Electric</b> Sales <b>Stone Stamcor</b> Mark Talbot <b>Surge Technology</b> Paul van As <b>Three-D Agencies</b> Mark Jenkins <b>Versalec</b> Roland Fry <b>Voltex</b> Hugh Ward <b>Voltex LSis</b> Gary Paterson <b>Waco</b> Jaco Coetzee <b>Zest WEG Group</b> Chris Watkins/Stephen Cook	<b>Alvern Cables</b> Full range of armoured and shielded cables <b>ARB Electrical Wholesalers</b> Full range of armoured and shielded cables <b>Atlas</b> Full range of armoured and shielded cables <b>Bellco</b> Full range of armoured and shielded cables <b>CCG Cable Terminations</b> Full Range of products for Armoured Cables <b>Citilec</b> Full range of armoured/shielded cables <b>Consortium Cables</b> Full range of armoured and shielded cables <b>Electrahertz</b> Full range of armoured/shielded cables <b>Jaycor International</b> Armoured, shielded cables <b>JDL Electric</b> Full range of armoured, shielded cables <b>Lapp Group SA</b> Olflex Servo VSD/VFD cables, Olflex Classic 100CY, Olflex Classic 110CY <b>PSA Cable</b> Full range of armoured, shielded cables <b>Versalec</b> Full range of armoured, shielded cables <b>Voltex</b> Full range of armoured, shielded cables	<b>MCE</b> MCE ac magnetic contactors; Onesto DIN rail modular contactors; Onesto circuit breakers; Schenker mini rail circuit breakers; relays and bases; Hyundai MCCBs and air circuit breakers <b>Phambili</b> Full range of contactors, breakers, relays <b>Phoenix Contact</b> Full range of relays <b>Power Process Systems</b> Full range of contactors, breakers, relays <b>Pretoria Motor Control Gear (PMCG) Products</b> Full range of contactors, breakers, relays <b>PSA Cable</b> Full range of contactors, breakers, relays <b>R&amp;C Instrumentation</b> Infrared inspection windows, busbar temperature monitoring <b>Schneider Electric</b> Full range of contactors, breakers, relays <b>Voltex</b> Full range of contactors, breakers, relays <b>Voltex LSis</b> Full range of contactors, breakers, relays <b>Waco</b> Full range of contactors, breakers, relays <b>Zest WEG Group</b> CWC 7 - 22 A AC3 compact range and accessories; CWB, CWM 9 - 800 A AC3 contactor range and accessories; MDW miniature circuit breaker range 1- to 4-pole, 6 - 125 A, 6 & 10 kA; DWM moulded case circuit breaker range 1- to 4-pole, 16 - 1 600 A, 16 - 80 kA; ABW air circuit breaker range 1- to 4-pole, 800 - 6 300 A; 65 - 120 kA
<b>DISTRIBUTORS</b> <b>ACDC Dynamics</b> <b>ACTOM Electrical Products</b> <b>ARB Electrical Wholesalers</b> <b>Atlas</b> <b>Bellco</b> <b>Cable Croc</b> <b>Cabstrut</b> <b>CBI</b> <b>Citilec</b> <b>CHINT</b> <b>Consortium Cables</b> <b>Crabtree Electrical Accessories</b> <b>Denver Technical Products</b> <b>DRH Components</b> <b>Eaton Electric</b> <b>Electrahertz</b> <b>Elen Enclosures</b> <b>HellermannTyton</b> <b>Invirotel</b> <b>Jaycor International</b> <b>JB Switchgear</b> <b>JDL Electric</b> <b>Lapp Group SA</b> <b>Major Tech</b> <b>MCE Global Suppliers</b> <b>Phambili Interface</b> <b>Power Process Systems</b> <b>Pretoria Motor Control Gear (PMCG) Products</b> <b>PSA Cable</b> <b>R&amp;C Instrumentation</b> <b>Radiant Lighting</b> <b>Stone Stamcor</b> <b>Three-D Agencies</b> <b>Voltex</b> <b>Voltex LSis</b> <b>Waco</b>	<b>Phambili</b> Steve Lea <b>Phoenix Contact</b> Carl Coetzer <b>Power Panels and Electrical</b> Andy Karpal <b>Power Process Systems</b> Joyce Toth <b>Pretoria Motor Control Gear (PMCG) Products</b> Hannes Swartz/John Vorster <b>PSA Cable</b> Dieter Dilchert <b>R&amp;C Instrumentation</b> Johan de Villiers <b>Radiant Group</b> Alfred Weldon <b>Sabelco Electrical Industries</b> Marc Moreau <b>Schneider Electric</b> Sales <b>Stone Stamcor</b> Mark Talbot <b>Surge Technology</b> Paul van As <b>Three-D Agencies</b> Mark Jenkins <b>Versalec</b> Roland Fry <b>Voltex</b> Hugh Ward <b>Voltex LSis</b> Gary Paterson <b>Waco</b> Jaco Coetzee <b>Zest WEG Group</b> Chris Watkins/Stephen Cook	<b>CABLE SUPPORT SYSTEMS</b> <b>Aberdare Cables</b> Cable guard, AberTrack, Engineering Services <b>ACDC Dynamics</b> Gewiss and Ardic cable support systems: galvanised trays, ladders, wire mesh; tray carriers; hot dip galvanised wire mesh trays and accessories; wall brackets; hanging support tray carriers; heavy load Mavistrut systems; support brackets and accessories; perforated steel racking; vertical couplings and horizontal couplings <b>ACTOM Electrical Products</b> Cable support systems to suit all installations <b>ARB Electrical Wholesalers</b> Full range of cable support systems <b>Atlas</b> Full range of cable support systems <b>Bellco</b> Full range of cable support systems <b>Cable Croc</b> Anti cable theft <b>Cabstrut</b> Full range of cable support systems <b>Citilec</b> Full range of cable support systems <b>Electrahertz</b> Full range of cable support systems <b>Jaycor International</b> Cable support systems <b>JDL Electric</b> Full range of cable support systems <b>O-Line</b> Full range of cable support systems <b>PSA Cable</b> Full range of cable support systems <b>Voltex</b> Full range of cable support systems	<b>MOTOR PROTECTION/SURGE PROTECTION</b> <b>ABB South Africa</b> Full range of motor protection, surge protection <b>ACDC Dynamics</b> Rhombert and NewElec electronic motor/pump and overload protection; surge protection devices - 15 A voltage protection plugs; one- and three-phase voltage guards and surge limiters; Innovolt Power Manager full power protection management <b>ACTOM Electrical Products</b> Full range of motor protection, surge protection <b>Alstom Protection &amp; Control</b> Micromotor protection relays <b>ARB Electrical Wholesalers</b> Full range of motor and surge protection <b>Atlas</b> Full range of motor and surge protection <b>Bellco</b> Full range of motor and surge protection <b>CBI</b> Full range of motor and surge protection <b>Citilec</b> Full range of motor and surge protection <b>CHINT</b> Full range of motor protection relays <b>Eaton Electric</b> Full range of motor protection relays <b>Electrahertz</b> Full range of motor protection relays <b>HellermannTyton</b> Full range of surge protection <b>JDL Electric</b> Full range of motor and surge protection <b>Legrand</b> Motor protection circuit breakers and surge protection <b>Major Tech</b> MTD6 - appliance surge protector <b>MCE</b> Hyundai electronic motor protection relay; Onesto surge arresters; Schenker mini rail surge arresters <b>NewElec</b> Full range of motor, surge protection <b>O-Line</b> Full range of motor and surge protection <b>Phambili</b> Full range of motor, surge protection <b>Phoenix Contact</b> Full range of surge protection <b>Power Process Systems</b> Full range of motor protection <b>Pretoria Motor Control Gear (PMCG) Products</b> Full range of motor protection <b>Schneider Electric</b> Full range of motor protection <b>Surge Technology</b> Lightning and overvoltage protection; surge arresters <b>Voltex</b> Full range of motor and surge protection <b>Voltex LSis</b> Full range of motor and surge protection <b>Waco</b> Full range of motor and surge protection <b>Zest WEG Group</b> RW range of thermal overload protection; SRW range of electronic overload protection; FANOX surge arrester range Class C Type II
<b>CONTACT</b> <b>ABB South Africa</b> Customer Care Centre <b>Aberdare Cables</b> Jyoshtie Dhunes <b>ACDC Dynamics</b> Elmari Erasmus <b>ACTOM Electrical Products</b> Russel Ramsden <b>Allbro</b> Sales <b>Alstom Protection &amp; Control</b> Faisal Hoosen <b>Alvern Cables</b> Stephen Liasides <b>ARB Electrical Wholesalers</b> Sales <b>Atlas</b> Annie Storar <b>Bellco</b> Fred Wilson <b>Brady SA/Grafo</b> Morne Louw <b>Brother International South Africa</b> Munna Desat <b>Cable Croc</b> Lex Harvey <b>Cabstrut</b> Juanita Kanagan <b>CBI</b> Jaco Viljoen <b>CCG Cable Terminations</b> Arthur Cameron <b>Citilec</b> Geoff Bower <b>CHINT</b> Heather Scott <b>Consortium Cables</b> Martin Modlin <b>Crabtree</b> Sales	<b>DRIVES/SOFT-STARTERS</b> <b>ABB South Africa</b> Full range of low and medium voltage drives and soft-starters <b>ACDC Dynamics</b> Vacom range of VSDs and accessories; Aucom range of soft starters and MV soft-starters; Itegra Intelligent energy efficient range of soft starters <b>Alstom Protection &amp; Control</b> VSD panels; soft-starters <b>Atlas</b> Full range of drives, soft-starters <b>Bellco</b> Full range of drives, soft starters <b>ARB Electrical</b> Full range of drives/soft starters <b>CBI</b> Mitsubishi variable speed drives - 220V AC, 380V AC, 0.1 - 375kW; Mitsubishi Servo amplifiers and motors - 220V AC, 50W - 7kW <b>Citilec</b> Full range of drives, soft starters <b>CHINT</b> Full range of drives/soft starters <b>Eaton Electric</b> Full range of drives/soft starters <b>Electrahertz</b> Full range of drives/soft starters <b>JDL Electric</b> Full range of drives/soft starters <b>MCE Global Suppliers</b> Hyundai N-series variable speed drives <b>Power Process Systems</b> Full range of drives and soft-starters <b>PSA Cable</b> Full range of drives and soft-starters <b>Schneider Electric</b> Full range of drives/soft starters <b>Voltex</b> Full range of drives, soft-starters <b>Voltex LSis</b> Full range of drives, soft starters <b>Zest WEG Group</b> Full range of drives/soft starters: VSDs - low voltage drives 0 - 2 850 A, single phase and three phase available; medium voltage drives 85 - 2 850 A; soft starters - low voltage soft starter 0 - 2 424 A; medium voltage soft starters 70 - 360 A	<b>GEARBOXES FOR MOTOR APPLICATIONS</b> <b>ARB Electrical</b> Gearboxes for motor applications <b>CHINT</b> Gearboxes for motor applications <b>Stone Stamcor</b> Gearboxes for motor applications	<b>CONTACTORS/BREAKERS/RELAYS</b> <b>ABB South Africa</b> Full range of contactors, circuit breakers, relays <b>Atlas</b> Full range of contactors, breakers, relays <b>ACDC Dynamics</b> Gewiss, TC C&S and Terasaki contactors, breakers and relays; contactors in DIN, mini and vacuum; single pole, two-, three and four-pole; switchgear from 13 mm MCBs to MCCBs and ACBs; MCCBs rated from 20 A to 1 600 A; relays and accessories MCB and MCCBs; TC; The Control Group India; Rele Italiana <b>ACTOM Electrical Products</b> Complete range of low voltage circuit breakers, isolators, earth leakage devices and wiring accessories <b>Alstom Protection &amp; Relay</b> TAIAN contactors/relays <b>ARB Electrical Wholesalers</b> Full range of contactors, breakers, relays <b>Bellco</b> Full range of contactors, breakers, relays <b>CBI</b> Full range of contactors, breakers, relays <b>Citilec</b> Full range of contactors, breakers, relays <b>CHINT</b> Full range of contactors, breakers, relays <b>Crabtree Electrical Accessories</b> Schrack Technik range <b>Denver Technical Products</b> Hermetically sealed contactors for high current load up to 350A carry <b>DRH Components</b> NL75 Earth fault relay; DIN rail mounting relay; Auto ranging control voltage 24 to 230 Vac/dc; Six trip settings 30 mA to 3 A; Five trip delay settings 20 ms to 3 s; LED tell tale trip indicators; Onboard or remote core balance CT option; Local or remote Rest; And much more. <b>Eaton Electric</b> Full range of contactors, breakers, relays <b>Electrahertz</b> Full range of contactors, breakers, relays <b>JDL Electric</b> Full range of contactors, breakers, relays <b>Legrand</b> Full range of contactors, breakers, relays <b>Major Tech</b> Comprehensive range of miniature circuit breakers 3 kA MCB series; 6 kA MCB series; earth leakage and isolator series
<b>ARMoured/SHIELDED CABLES</b> <b>Aberdare Cables</b> Bells and mains cable <b>ACTOM Electrical Products</b> Full range of armoured and shielded cables	<b>CONTACTORS/BREAKERS/RELAYS</b> <b>ABB South Africa</b> Full range of motor protection, surge protection <b>ACDC Dynamics</b> Rhombert and NewElec electronic motor/pump and overload protection; surge protection devices - 15 A voltage protection plugs; one- and three-phase voltage guards and surge limiters; Innovolt Power Manager full power protection management <b>ACTOM Electrical Products</b> Full range of motor protection, surge protection <b>Alstom Protection &amp; Control</b> Micromotor protection relays <b>ARB Electrical Wholesalers</b> Full range of motor and surge protection <b>Atlas</b> Full range of motor and surge protection <b>Bellco</b> Full range of motor and surge protection <b>CBI</b> Full range of motor and surge protection <b>Citilec</b> Full range of motor and surge protection <b>CHINT</b> Full range of motor protection relays <b>Eaton Electric</b> Full range of motor protection relays <b>Electrahertz</b> Full range of motor protection relays <b>HellermannTyton</b> Full range of surge protection <b>JDL Electric</b> Full range of motor and surge protection <b>Legrand</b> Motor protection circuit breakers and surge protection <b>Major Tech</b> MTD6 - appliance surge protector <b>MCE</b> Hyundai electronic motor protection relay; Onesto surge arresters; Schenker mini rail surge arresters <b>NewElec</b> Full range of motor, surge protection <b>O-Line</b> Full range of motor and surge protection <b>Phambili</b> Full range of motor, surge protection <b>Phoenix Contact</b> Full range of surge protection <b>Power Process Systems</b> Full range of motor protection <b>Pretoria Motor Control Gear (PMCG) Products</b> Full range of motor protection <b>Schneider Electric</b> Full range of motor protection <b>Surge Technology</b> Lightning and overvoltage protection; surge arresters <b>Voltex</b> Full range of motor and surge protection <b>Voltex LSis</b> Full range of motor and surge protection <b>Waco</b> Full range of motor and surge protection <b>Zest WEG Group</b> RW range of thermal overload protection; SRW range of electronic overload protection; FANOX surge arrester range Class C Type II	<b>CABLE MANAGEMENT ACCESSORIES</b> <b>Aberdare Cables</b> Complete range of accessories for all types of installations <b>Aberdare Cables</b> Cable Guard, AberTrack <b>ACDC Dynamics</b> Brady labelling solutions; cable tie and cable management systems <b>ACTOM Electrical Products</b> Complete range of accessories for all types of installations <b>Allbro</b> Full range of cable management accessories <b>ARB Electrical Wholesalers</b> Full range of cable management accessories <b>Bellco</b> Full range of cable management accessories <b>Brady SA/Grafo</b> Cable and wire identification solutions, labels, printers <b>Brother International South Africa</b> Full range of cable management accessories <b>Cable Croc</b> Anti-cable theft <b>Cabstrut</b> Full range of cable management accessories	



CABLE MANAGEMENT ACCESSORIES

**Citilec**  
Full range of cable management systems

**Consortium Cables**  
Trench covers

**Electrahertz**  
Full range of cable management systems

**Elen Enclosures**  
Grey PVC trunking

**HellermannTyton**  
Full range of cable management accessories

**JDL Electric**  
Full range of cable management accessories

**Lapp Group SA**  
Full range of cable ties and labeling solutions

**Legrand**  
Full range of cable ties and marking systems

**O-Line**  
Full range of cable management accessories

**Phambili**  
Full range of cable management accessories

**Phoenix Contact**  
Trunking, wire and cable, marking, labels and printers

**Pretoria Motor Control Gear (PMCG) Products**  
Full range of cable management accessories

**PSA Cable**  
Full range of cable management accessories

**Radiant Group**  
Radiant cable ties – various lengths available

**Schneider Electric**  
Full range of cable management accessories

**Three-D Agencies**  
Cable ties; labels; stainless steel ties; grommets; sleeving; cable markers

**Voltex**  
Full range of cable management accessories

**Waco**  
Full range of cable management accessories

DISPLAYS

**ABB South Africa**  
Displays

**ACDC Dynamics**  
Rhombberg, Entes, Sele, Contrel, Iskra, EziView and Orbis meters and displays; ammeters, volt meters; running hour meters, watt meters, frequency meters, digital and programmable ammeters and voltmeters, and multi-function meters

**ARB Electrical**  
Full range of displays

**Atlas**  
Full range of displays

**Bellco**  
Full range of displays

**Eaton Electric**  
Full range of displays

**Electrahertz**  
Full range of displays

**Invirotel**  
Full range of displays

**JDL Electric**  
Full range of displays

**Legrand**  
Full range of meters

**Phoenix Contact**  
Full range of energy meters

**Power Process Systems**  
Full range of displays

**Pretoria Motor Control Gear (PMCG) Products**  
Full range of displays

**Radiant Group**  
OWL electricity monitor

**Schneider Electric**  
Full range of displays for meter readings

**Voltex**  
Full range of displays

**Waco**  
Full range of displays

**Zest WEG Group**  
Electronic PF01 range of power factor meters; MMW range of power meters

FANS FOR MOTOR APPLICATIONS

**ACDC Dynamics**  
Various fans and ventilation solutions

**ARB Electrical**  
Full range of fans for motor applications

**Atlas**  
Full range of fans for motor applications

**Bellco**  
Full range of fans for motor applications

**Electrahertz**  
Full range of fans for motor applications

**JDL Electric**  
Full range of fans for motor applications

**MCE Global Suppliers**  
MCE panel fans

**Phambili**  
Full range of fans for motor applications

**Schneider Electric**  
Full range of fans for motor applications

**Voltex**  
Full range of fans for motor applications

WIRING AND WIRING ACCESSORIES FOR MOTOR APPLICATIONS

**ABB South Africa**  
Full range of wiring and wiring accessories for motor applications

**Aberdare Cables**  
Housewire, panel flex cable

**ACDC Dynamics**  
Wiring solutions for all applications

**ACTOM Electrical Products**  
Full range of wiring and wiring accessories for motor applications

**Allbro**  
Full range of wiring and wiring accessories for motor applications

**Alstom Protection and Control**  
Customised enclosures and starters

**Alvern Cables**  
Full range of wiring

**ARB Electrical Wholesalers**  
Full range of wiring and wiring accessories for motor applications

WIRING AND WIRING ACCESSORIES FOR MOTOR APPLICATIONS

**Atlas Group**  
Full range of wiring and wiring accessories for motor applications

**Bellco**  
Full range of wiring and wiring accessories for motor applications

**Citilec**  
Full range of wiring accessories for motor applications

**Eaton Electric**  
Full range of wiring and wiring accessories for motor applications

**Electrahertz**  
Full range of wiring accessories for motor applications

**HellermannTyton**  
Full range of wiring and wiring accessories for motor applications

**JB Switchgear**  
Full range of wiring and accessories for motor applications

**JDL Electric**  
Full range of wiring and accessories for motor applications

**Lapp Group SA**  
Lapp single cores

**Legrand**  
Full range of wiring accessories for motor applications

**MCE**  
Onesto industrial plugs, couplers, interlocked sockets IP44 and IP65

**O-Line**  
Full range of wiring and accessories for motor applications

**Phambili**  
Full range of wiring and accessories for motor applications

**PSA Cable**  
Full range of wiring and accessories for motor applications

**R&C Instrumentation**  
Infrared inspection windows, busbar temperature monitoring

**Radiant Group**  
Click-Duo double 5A luminaire socket

**Schneider Electric**  
Full range of terminal blocks, disconnectors, cable ducting and enclosures

**Voltex**  
Full range of wiring and wiring accessories

**Waco**  
Full range of wiring and wiring accessories

CABLE GLANDS/LUGS/FERRULES

**ABB South Africa**  
Full range of cable glands, lugs and ferrules

**ACDC Dynamics**  
Cable glands, lugs and ferrules in various materials for all applications

**ACTOM Electrical Products**  
All termination and jointing requirements

**ARB Electrical Wholesalers**  
Full range of cable glands, lugs and ferrules

**Atlas Group**  
Full range of glands, lugs, ferrules

**Bellco**  
Full range of glands, lugs, ferrules

**CCG Cable Terminations**  
Wide Range of Cable Glands, Junction Boxes, Thread Converters, Insulated Adaptors, Fixed / Swivel Adaptors and Breather Plugs

**Citilec**  
Full range of cable glands, lugs, ferrules

**Eaton Electric**  
Full range of cable glands, lugs, ferrules

**Electrahertz**  
Full range of cable glands, lugs, ferrules

**Elen Enclosures**  
AGRO Eurotech cable compression glands; polyamide; standard, Exe and EXI

**HellermannTyton**  
Full range of cable glands, lugs, ferrules

**JDL Electric**  
Full range of glands, lugs, ferrules

**Lapp Group SA**  
Skintop MS-SC-M screened compression glands, Epic circular connectors

**Legrand**  
IP68 cable glands, Cabstop cable glands

**O-Line**  
Full range of cable glands, lugs, ferrules

**Phambili**  
Full range of cable glands, lugs, ferrules

**Phoenix Contact**  
Cable glands and ferrules

**PSA Cable**  
Full range of cable glands, lugs, ferrules

**Schneider Electric**  
Cable ends; cable markers; crimping tools; wiring accessories; trunking

**Stone Stamcor**  
Full range of copper, aluminium, bi-metallic compression lugs and ferrules; 11kV and 36 kV mechanical lugs and ferrules

**Three-D Agencies**  
Cable glands; lugs and ferrules; aluminium lugs and ferrules

**Voltex**  
Full range of cable glands, lugs and ferrules

**Waco**  
Full range of cable glands, lugs and ferrules

FLAMEPROOF

**ABB South Africa**  
Full range of flameproof products

**Aberdare Cables**  
Flamosafe flame retardant range of cable

**ACDC Dynamics**  
Flameproof lighting and beacons supplier: audible and visual alarms; beacons; industrial lighting; gas sensors; safety sensors, conveyor pull-wire trip switches, glands, isolators, motor starters, pushbuttons; pilot lights, sirens; LED and energy efficient light solutions for industrial applications

**Allbro**  
Flameproof products

**ARB Electrical**  
Full range of flameproof products

**Bellco**  
Full range of flameproof products

**CCG Cable Terminations**  
Range of flameproof products

**Eaton Electric**  
Flameproof products

**Electrahertz**  
Full range of flameproof products

**JB Switchgear**  
Full range of flameproof products

FLAMEPROOF

**JDL Electric**  
Full range of flameproof products

**Phambili**  
Full range of flameproof products

**Voltex**  
Full range of flameproof products

**Waco**  
Full range of flameproof products

CONTROLS FOR MOTOR APPLICATIONS

**ABB South Africa**  
Controls for motor applications

**Aberdare Cables**  
Multicore LV cable

**ACDC Dynamics**  
C&S, Gewiss, Compei and Deca ranges of pushbuttons, switches and controls for various applications

**ACTOM Electrical Products**  
Full range of controls for motor applications

**Allbro**  
Full range of controls for motor applications

**Alstom Protection and Control**  
Control desks; control panels; selector switches

**ARB Electrical Wholesalers**  
Full range of controls for motor applications

**Bellco**  
Full range of controls for motor applications

**CBI**  
Full range of controls for motor applications

**Citilec**  
Full range of controls for motor applications

**CHINT**  
Full range of controls for motor applications

**Eaton Electric**  
Full range of controls for motor applications

**Electrahertz**  
Full range of controls for motor applications

**JB Switchgear**  
Full range of controls for motor applications

**JDL Electric**  
Full range of controls for motor applications

**MCE**  
MCE mini and steel pushbuttons, pilot lights, selector switches, key switches, emergency stops, buzzers, plastic control devices

**Phambili**  
Full range of controls for motor applications

**Phoenix Contact**  
Solid state motor starters

**Pretoria Motor Control Gear (PMCG) Products**  
Full range of controls for motor applications

**PSA Cable**  
Full range of controls for motor applications

**Schneider Electric**  
Full range of controls for motor applications

**Stone Stamcor**  
Johnson Electric push-button switches

**Voltex**  
Full range of controls for motor applications

**Voltex LSis**  
Full range of controls for motor applications

**Waco**  
Full range of controls for motor applications

**Zest WEG Group**  
Pushbuttons, selector switches and pilot lights; IP 66 protection; high reliability auxiliary contacts lighting block with integrated LED

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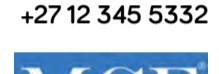
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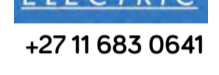
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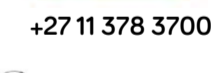
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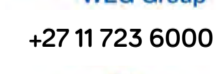
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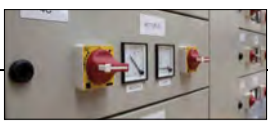


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## COMPANIES CELEBRATE 30 YEAR ASSOCIATION

According to Coenie Berowsky, CEOCO maintenance manager at the Boksburg plant, Unidrive has been CEOCO's supplier of choice since 1989 and "that's because of its ability to deliver on our requirements," he says, adding: "Unidrive also adheres to and meets our safety standards, which is vitally important to us."

CEOCO produces high quality crude sunflower oil for use in the manufacture of cooking oils, margarine, and other edible products, and sunflower seed cake which is used in the production of animal feed. The company operates from the Unilever plant in Boksburg, and also supplies Unilever with crude oil to produce Flora and Rama margarine.

Berowsky explains that electric motors sourced from Unidrive are crucial in ensuring that operations function on a 24/7 cycle. The motors control all conveyor belts, taps, toasters and extractor drives throughout the Boksburg plant.

Unidrive motors are flame-proof and meet the required safety certificates. "This is a dangerous plant as the solvent we use is Hexane, which is highly explosive. All the electrical equipment and motors we use in the plant must be flame-proof and must be registered. Even if we install a new fluorescent lamp, it must be flame-proof and should have a certificate," says Berowsky.

Berowsky adds that Unidrive has an excellent turnaround time for the supply new motors and offers a high level of service.

Enquiries: [dudu@hlangani.co.za](mailto:dudu@hlangani.co.za)



Unidrive managing director, Theo Mashego, CEOCO maintenance manager, Coenie Berowsky and Unidrive sales executive, Alfred Bibbey.

## FAST-TRACK MCCS FOR FAST-TRACK PROJECTS

The fast-track nature of many large industrial and mining projects on the African continent has seen an increase in the demand for containerised housing for motor-control centres (MCCs). These stations are quicker to establish on site than their brick-and-mortar counterparts and they are assembled off-site in factory-controlled conditions.

There is no limit to the size of the MCC stations, with containers connected side by side or stacked on top of each other to provide the necessary space. Being a modular solution, individual containers are easily transported to the project site and then erected.

Shaw Controls' chief commercial officer, Johan van Niekerk notes that the company has supplied these solutions to many project sites including Eskom's Medupi Power Station project and the associated Exxaro Grootegeluk expansion programme.

And, while this is a growing trend, Shaw Controls, a division of Zest WEG Manufacturing, is leading in their supply. The company's firm grip on this growing market can be attributed to its intense focus on quality at its 12 000 m<sup>2</sup> manufacturing hub in Robertsham, Gauteng.

Van Niekerk says the containers are constructed to customers' specifications at the Shaw Controls facility. "All our containerised housings are built from scratch. We install all the necessary fittings and claddings, based on individual customer requirements," he says.

This approach is in line with Shaw Controls' strategy of keeping manufacture in-house to reduce costs and maintain close control over quality. The strategy is working, considering that Shaw Controls' order book for all its solutions – including its leading range of MCCs – is five times the size it was a year ago.

A sizeable share of this comprises orders from blue-chip mining houses and international engineering companies involved in brownfields and greenfields mining projects in Africa. Van Niekerk says the company's close affiliation to the mining industry means that it has to comply with the highest standards in design and manufacture of MCCs and panels.

This includes all quality and safety standards adhered to by Australian engineering firms, who are dominant players in the African mining industry. These are more stringent than those followed in South Africa, and this compliance has given Shaw Controls a competitive edge when tendering for projects across the country's borders. This is complemented by Shaw Controls' IEC 61439 certification, which proves the integrity of its panels. As van Niekerk points out, these stringent tests require a high capital outlay and, for this reason, only a few South African companies have been certified. "We have subjected our products to all these tests, and re-verified the outcome of the tests in 2014. This is one of the reasons why we are so busy," he says.

The Shaw Controls' facility mirrors its international holding company and is testament to the WEG Group's commitment to South Africa. It boasts state-of-the-art computer numerical controlled punching and bending machines to work the sheet plating used to make the casings. The durability and longevity of the units are enhanced by extensive surface preparation of the various components, including the seven stage surface preparation process and powder coating they undergo before assembly.

The facility even has its own gasket-manufacturing machine and makes its own steel hinges. "There is no other manufacturer in the country that is able to manufacture everything in-house," says Van Niekerk.

It is not only the mining industry that is demanding quality. Van Niekerk says Shaw Controls has been diversifying into an array of other markets, ranging from large industries through to small manufacturers.

"The future continues to be bright for a company that has proved the integrity of its products, and there is no customer too big or too small for us," Van Niekerk concludes.

Enquiries: +27 (0)11 434 8100



A fixed pattern MCC manufactured by Shaw Controls for an E-house destined for a mine tailings project. "There is no other manufacturer in the country that is able to manufacture everything in-house," says Van Niekerk.

## FLUKE'S POWER QUALITY AND MOTOR ANALYZER



FLUKE, represented in southern Africa by the Comtest Group, has on offer the Fluke 438-II Power Quality and Motor Analyzer, adding key mechanical measurement capabilities for electric motors to the advanced power quality analysis functions of the Fluke 430 Series II Power Quality Analyzers. They measure and analyse key electrical and mechanical performance parameters such as power, harmonics, unbalance, motor speed, torque and mechanical power without the need of mechanical sensors.

The 438-II is the ideal portable motor analysis test tool, locating, predicting, preventing and troubleshooting power quality problems in three-phase and single-phase power distribution systems, while giving technicians the mechanical and electrical information needed to effectively evaluate motor performance:

- Measure key parameters on direct-on-line motors including torque, RPM, mechanical power and motor efficiency.
- Perform dynamic motor analysis by plotting of motor de-rating factor against load according to NEMA guidelines.
- Calculate mechanical power and efficiency without the need of mechanical sensors, just connect to the input conductors.
- Measure electrical power parameters such as voltage, current, power, apparent power, power factor, harmonic distortion and unbalance to identify characteristics that impact motor efficiency.
- Identify power quality issues such as dips, swells, transients, harmonics and unbalance.
- PowerWave data technology captures fast RMS data, and shows half-cycle averages and waveforms to characterise electrical system dynamics (generator start-ups, UPS switching etc.).
- Waveform capture function captures 100/120 cycles (50/60 Hz) of each event detected event, in all modes, without set-up.
- Automatic transient mode captures waveform data at 200 kS/s on all phases simultaneously up to 6 kV.

Fluke 430 Series II Power Quality Analyzers are FLUKE CONNECT® compatible\*, which means users can view data locally on the instrument, via Fluke Connect mobile app and PowerLog 430-II desktop software. The series is safety rated for industrial applications – 600 V CAT IV/1000 V CAT III rated for use at the service entrance and downstream.

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Equipped with the latest generation of cable diagnostics in conjunction with powerful VLF testing technology, Centrix 2.0 makes it possible to perform standard-compliant cable testing with accompanying partial discharge diagnosis.

The van's unique operating concept uses automatic measurement sequences, a touch display and JogDial to simplify operation. Faults can be located quickly, even by inexperienced users. Centrix 2.0 is available in 1-phase or 3-phase versions.

Centrix 2.0, which sets new standards regarding user friendliness and performance, has the following features:

- Linux® based control system – for the highest level of stability and security.
- Intuitive easyGO® operation using the 21.5" touch display and JogDial.
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- Data automatically recorded and stored in the history database.
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- Simultaneous inspection and diagnosis with new 50 Hz slope technology.
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- Remote control of important system functions – for fault location that is non-destructive to the cables.



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## QUICK, EFFICIENT LABEL PRINTER

Brady's new thermal transfer BMP™61 Label Printer is designed for quick and efficient identification of wires, cables and components. With high performance materials that can handle the toughest industrial identification applications, the BMP61 Label Printer is a durable partner in the field and a dependable workhorse in the shop.

Main printer features: The rugged, portable BMP61 is available in a WiFi-enabled version compatible with LabelMark label creation software and the Brady mobile apps. Simply create or send label designs via smartphone to the BMP61 Label Printer for fast and easy label creation on the job. Alternatively, use the printer's USB-ports to copy lists of label designs from a computer. Review your label before printing on the large colour touchscreen to avoid wrong prints and material loss. Check the on-screen indicators to verify that you have enough ink and labels left to complete the job.

A label for your needs: The rugged, thermal transfer BMP61 Label Printer is compatible with 600 labels and ribbons. Each combination represents a durable identification solution designed to endure extreme contexts and to keep cables and components identified in the most demanding industries. BMP61 can print sleeves, self-laminating labels, raised profile labels, tags and other identification solutions in a vast range of materials, sizes and colours up to 50 to 80 mm wide.

To answer customer-specific identification needs, Brady can create customised labels in personalised shapes or dimensions, in specific colours or layouts or with your logo already present on the label. Simply insert the custom label in your BMP61 Label Printer to solve identification challenges.

Enquiries: Email Brady at [emea\\_request@bradycorp.com](mailto:emea_request@bradycorp.com)

## SOLUTION FOR WATER-COOLED FURNACE CABLES



Copper Cable Connectors' logistics manager, William Kgamadi and SHEQ manager, Robbie Pool.

One of the leaders in the electrical engineering industry, Copper Cables & Connectors of Boksburg North, Gauteng, uses Band-It stainless steel Giant Band and Buckles from Banding & ID Solutions Africa for water-cooled furnace cables.

The company specialises in the design, manufacture, and repair of water- and air-cooled furnace cables, water-cooled resistance welding cables, flexible connectors, industrial battery connectors, copper braid, earth sock (braided copper sleeving), cotton-covered strand and other copper related products. It also offers copper lugs and crimping ferrules as part its value-added service offering for its customers.

The Band-It product is used specifically for water-cooled furnace cables, where the dc electricity supply will cause any strapping material other than stainless steel to become magnetised, and subsequently heat up and even melt, explains Basil Cherry, managing director of Copper Cables & Connectors.



Copper Cable Connectors use Band-It products for water cooled furnace cables.

Banding & ID Solutions Africa business manager, Rosa Dos Remendos, says that the Band-It Giant Band & Buckles are manufactured in Grade 201 stainless steel specifically for heavy-duty clamping applications such as this. Application is by means of a special G402 Giant tool.

"Double-wrapped clamps are recommended for maximum strength," Dos Remendos explains. "Such has been the success of the Band-It product in this niche application that Copper Cables & Connectors has used stainless steel band and buckles since the company's inception."

Cherry says that the Band-It product has successfully

withstood pressure testing on its water-cooled furnace cables in particular. "The stainless steel band-and-buckle system is far superior to the traditional nut-and-bolt system," he says.

In addition, Copper Cables & Connectors also uses Jr preformed clamps from Banding & ID Solutions Africa. These are vibration-resistant and require no hammering or crimping, and can be locked automatically in one simple lever movement.

The Jr preformed clamps are available in Grade 201 stainless steel or galvanised carbon steel.

Enquiries: +27 (0)11 974 0424

### Choose your electrical products wisely

Copper's superior performance in all types of installations has earned it acceptance as the long-established standard for building wire conductors. One of the most common short-cuts taken by unscrupulous suppliers is to use sub-standard conductor material which is covered by its insulation and can therefore not easily be identified.

PROUD MEMBERS OF THE COPPER DEVELOPMENT ASSOCIATION AFRICA

 <p style="font-size: x-small;">Copper lugs and ferrules</p>	 <p style="font-size: x-small;">Busbar fabrication</p>	 <p style="font-size: x-small;">Electrical cable</p>	 <p style="font-size: x-small;">Enamelled and covered conductor</p>
 <p style="font-size: x-small;"><a href="http://www.swproducts.co.za">www.swproducts.co.za</a></p> <p style="font-size: x-small;">SW Products produces a range of standard and custom copper lugs and ferrules, XLPE lugs and ferrules, perforated copper strips as well as other additional products such as stoppers, bushnuts, taper-tite couplings, etc.</p>	 <p style="font-size: x-small;"><a href="http://www.copalcor.co.za">www.copalcor.co.za</a></p> <p style="font-size: x-small;">Southern Africa's largest manufacturer of copper, brass and alloy solutions. Copalcor is the leading manufacturer of busbar systems in Southern Africa. The operations of casting, rolling and busbar fabrication are all fully integrated.</p>	 <p style="font-size: x-small;"><a href="http://www.alvernables.co.za">www.alvernables.co.za</a></p> <p style="font-size: x-small;">Alvern Cables is one of the leading cable manufacturers in South Africa and the largest privately owned operation in the industry. A diverse range of customers from sectors include mining, industrial, agricultural, automotive, security and building industry.</p>	 <p style="font-size: x-small;"><a href="http://www.wilec.co.za">www.wilec.co.za</a></p> <p style="font-size: x-small;">Wilec's Electrical division supplies motor, generator and transformer manufacturers with enamelled and covered copper conductors. As well as a comprehensive range of insulating materials, and complementary products.</p>



Copper Development Association Africa

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## CONTROL CABLES WITH NUMBERED CORES FOR EASIER INSTALLATIONS



Equipment and machinery installations using the latest cabling technologies from world-leading manufacturer, Helukabel, can contribute significantly to the ease of installation and overall success of a project.

An example of this is the company's JZ500 flexible control cable, which is designed to be super-supple, yet strong enough to be used in the toughest industrial conditions where its oil and chemical resistance make it ideal for toolroom controls, conveyor applications, production lines, air conditioning and steel production among others.

It has easy-to-read core identification to DIN VDE 0293 that has black cores with continuous white numbering (also available in other colours on request) for ease of installation, particularly where long runs are required or individual installers are working at different ends. The numbering, colours and other special requirements can also be ordered to suit different applications.

According to Hardus van Dyk of Helukabel, the cables are designed for flexible use for applications requiring medium mechanical stresses with free movement – without tensile stress or forced movements and can be used in either dry, moist or wet rooms. Selected PVC-compounds guarantee a good flexibility as well as an economic and fast installation.

### Technical specifications

- Helukabel JZ500 is a special-PVC control cable adapted to DIN VDE 0285-525-2-51/DIN EN 50525-2-51
- Temperature range flexing is -15°C to +80°C while fixed installation is -40°C to +80°C
- Nominal voltage U/U 300/500 V
- Test voltage 4 000 V
- Breakdown voltage min 8 000 V
- Insulation resistance min 20 MOhm x km
- Class 5, fine wire DIN VDE 0295, BS6360, IEC60228
- Minimum bending radius is flexing 7,5x cable Ø while fixed installation is 4x cable Ø
- Radiation resistance is up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)
- Oil/ Chemical resistance
- Self-extinguishing and flame retardant DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC60332-1
- Conditional drag chain compatible
- Conditional suitable for torsion
- Meter marked
- Ease of strip-ability

Enquiries: [doug.gunnewegh@helukabel.co.za](mailto:doug.gunnewegh@helukabel.co.za)



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## NO ORDINARY CABLE GLAND

The Pratley Adjustable Cable Gland has no equal. It is completely adjustable to fit absolutely any size of wire armouring. Pratley marketing director Eldon Kruger explains that it is adjustable to the extent that it will even grip paper. "We often do this to simulate very thin armour wire," he says. "It is simply a matter of adjusting the gland nipple in or out. The benefit is that it makes the gland exceptionally easy to fit in the field, especially on large cables. It saves a lot of time".

The Pratley Adjustable Cable Gland also employs an ingenious 'differential nut' that ensures unprecedented clamping forces for impressive armour anchoring. It achieves this by featuring two slightly different coarse pitch threads, resulting in clamping forces equivalent to those of an ultra-fine pitch thread. "Technology is going 'virtual' these days. In the case of the Pratley Adjustable Cable Gland, the coarse threads of slightly different pitch result in a 'virtual thread' that produces unprecedented clamping force even with minimal tightening torque. This is a gland that simply won't pull out" explains Kruger.

The gland features a loose cone bush which Pratley considers to be technically superior to fixed or captive cone bushes employed by ordinary cable glands. This allows the cone to be made from a different material; a tough distortion resistant brass. Not only does the loose cone facilitate adjustability but it also automatically self-centres under the armouring, ensuring the best grip possible on each armour wire. "The clamping forces are evenly distributed. You simply cannot achieve this with an ordinary cable gland," says Kruger.

The Pratley Adjustable Cable Gland is SABS approved and, although designed for armoured cable, it is the only cable gland that can easily be converted for use with unarmoured cable. When fitted with an inner seal kit, nipple gasket and shroud, it is also IP68 rated. It is adaptable to other thread types and is supplied complete with a locknut.

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



## CONVENIENT CABLING AND WIRE HARNESS ENGINEERING

The new Eplan Harness proD version 2.6 software from Eplan for convenient cabling and wire harness engineering has been introduced. Based on the 3D model of the mechanics and electrical schematics, the wire harness can be designed in an intuitive manner. The next step is the handover of this data to manufacturing, and there have been major updates in this area too: integrating 2D cable drawings, which are automatically derived from the 2D/3D design environment and specify both dimension points and connection points. This allows for automatic dimensioning, saving valuable time and ensuring correct results. Stripping lengths and wire coatings can now also be defined in the design phase, and professionally depicted in the manufacturing drawings. This provides users with a quick and comprehensive overview of their projects.

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## ISO 9001:2008 RE-CERTIFICATION

**EAST RAND based switchgear systems manufacturer JB Switchgear Solutions (Pty) Limited recently passed its ISO 9001:2008 re-certification with flying colours through SGS. Seen here are Johan Basson, managing director (on the left) with Gordon van der Merwe, governance manager.**

Enquiries: +27 (0)11 027 5804



## MICROGROOVE TECHNOLOGY FOR HEAT PUMPS

New heat pump designs promise better management of temperature and thermal energy in homes as well as in commercial and industrial applications. Ecologically friendly refrigerants, high-technology compressors and smart expansion valves provide unprecedented control over the refrigeration cycle.

Additional advantages can be obtained using MicroGroove™ smaller-diameter, inner-grooved copper tubes to build efficient round-tube plate fin (RTPF) coils for use in refrigerant-to-air heat exchangers, including evaporators, condensers and gas coolers. MicroGroove evaporators efficiently gather energy from indoor spaces, waste heat or outdoor heat sources. On the other side of the refrigeration cycle, MicroGroove condensers and gas coolers offer outstanding performance for heating indoor spaces and hot water. The following frequently asked questions examine the use of microgroove technology in the design of heat pumps.

### What is MicroGroove technology?

The International Copper Association and the Copper Alliance refer to the technologies associated with smaller diameter, inner-grooved copper tubes as MicroGroove™ technology. This trademark is suggestive of 'micro' (small diameter) tubes with 'grooves' (i.e. surface enhancements or 'microfins') on the inside surfaces of the tubes. The term can also be applied to coils, meaning such coils contain MicroGroove copper tubes.

### What are the diameters of MicroGroove tubes?

The term refers to any copper tube with an outer diameter smaller than 9.52 mm, a commonly specified tube diameter for air conditioning, refrigeration and heat pumps. MicroGroove outer diameters include 7 mm, 6.35 mm, 5 mm and even smaller diameters.

### Why are there grooves in MicroGroove tubes?

The 'inner-fins' in MicroGroove tubes disrupt insulating boundary layers in condensers or speed up nucleation of vapour bubbles in evaporators. The exact patterns of the inside-the-tube enhancement remain a subject of intense research. Tube supplier members of the ICA have developed proprietary enhancements; the most effective patterns are application specific and the most common patterns are helical and crosshatch with varying angles.

### What is the current status of MicroGroove technology in the marketplace?

MicroGroove is a proven technology for high-volume, residential air-conditioners, including window units and split systems. Major ACR manufacturing giants are producing air-conditioners with MicroGroove technology for sale on global markets and several other coil makers now build many types of coils from smaller diameter tubes, including coils for refrigeration and heat pump applications. Work is also

underway in transportation and display-case applications.

### What are the advantages of MicroGroove technology for air conditioning and refrigeration?

The higher heat-transfer coefficients of smaller-diameter tubes compared to larger-diameter tubes allow for one or more of the following advantages: smaller overall size, higher system performance, less copper tube and/or less refrigerant.

### How do these advantages differ for heat pumps and air conditioners?

For air-to-air units for space heating and space cooling, the condenser and evaporator both benefit from the known MicroGroove advantages, including the ability to easily shed the condensate from the evaporator. In a combined AC/HP system, this advantage exists in both heat exchangers since their functions change as the operating modes change from air conditioner to heat pump. For the air-conditioner mode, the evaporator is indoors. For the heat pump mode, the evaporator is outdoors. In the case of a heat pump water heater (HPWH), the advantages apply to the evaporator coil.

### What types of heat pumps currently use copper tubes in their coils?

In air-to-air units, both condensers and evaporators typically use round tube plate fin (RTPF) heat exchanger technology. A HPWH typically uses a RTPF heat exchanger for the evaporator and either a submersed coil inside the water tank or a wound coil on the outside of the water tank as condenser. The condenser provides the heat to the water.

### Which heat-pump heat exchanger applications are possible candidates for MicroGroove technology?

- Residential HP for space heating and cooling
- Residential HPWHs
- Commercial HPWHs, if the demand is not too high (e.g. less than eight gallons per hour).
- HP with eco-friendly refrigerants
- HP with natural or chemical-free refrigerants
- HP with phase-change materials

### What are the strengths of MicroGroove in the following types of coils?

- Outdoor evaporator: High efficiency and the ability to easily shed condensate
- Outdoor condenser: Same advantages as in an AC
- Indoor evaporator: Same advantages as in an AC plus the ability to easily shed condensate
- Indoor condenser, air-to-air: Same advantages as in an AC
- Indoor condenser, HPWH: No advantage for designs with tube wrapped around water tank



### How can MicroGroove increase the COP of heat pumps?

In the case of an air-to-air HP, the advantages are the same as for an AC unit. In the case of HPWH, the unit will benefit from a MicroGroove evaporator. In both cases, MicroGroove heat exchangers offer high heat-transfer coefficients, more compact coils, and lower power requirements for fans. All of these factors contribute to a higher system COP.

### Is MicroGroove competitive with MicroChannel in heat pump applications?

Yes. A heat pump with a MicroGroove condenser and evaporator will have no problem shedding condensate in either AC or HP mode of operation, unlike a MicroChannel heat exchanger.

### Are there any design considerations that make MicroGroove unsuitable for use in certain types of heat pump applications?

In most HPWH applications, the condenser is a tube wrapped around the outside of the water tank. Smaller diameter tubes make sense only if multiple tubes are used in parallel to alleviate the higher pressure drop of smaller diameter tubes in long lengths.

### What are the major trends in the heat pump marketplace?

- The improvement of the coefficient of performance.
- Heat pumps for combined space heating and water heating. This innovation requires a high compressor exit temperature, which is currently available only with R744 or R32.

Enquiries: [www.microgroove.net](http://www.microgroove.net)

## CUSTOMISABLE CONNECTION SOLUTIONS FOR GOOD-LOOKING WORKSTATIONS



LEGRAND'S integrated workstation solutions, which provide easy access to power and data connections, also ensure the neat arrangement of cables and wires of modular equipment and computer connections.

"Legrand electrical devices are integrated unobtrusively into all types of office furniture and flooring in meeting rooms and reception areas, as well as in individual and open area offices," says Johan Bosch, general manager, Legrand SA. "With the installation of pop up boxes, power and data desk grommets, desktop

and under desk modules, as well as meeting room multi-outlet extensions, the modern office environment has all power and low current sockets efficiently connected to equipment.

"This flexible system provides easy and rapid customisable connection solutions for mobile applications such as computers, laptops, mobile phones and audio and visual systems. A key feature is the integrated solutions can be adapted to the existing furniture configuration and installed close to the user to carry high and low current functions, without having to drill through furniture."

Important devices in Legrand's

integrated workstations portfolio are flush-mounting office modules that are easily configured to meet the exact needs of the user. These units are available in 8 and 12 modules, with a black, white or aluminium finish.

Legrand's extensive range of products and systems for electrical and digital building infrastructures has been designed for easy installation, high efficiency, optimum safety and enhanced aesthetics – whether it is an original installation, extension or reconfiguration.

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THINK CONNECTED.



## CCG CABLE TERMINATIONS WINS PRESTIGIOUS HAZARDEX AWARD IN THE UK

With the latest issue of the IEC/SANS 60079-14 standard for the selection and installation of electrical equipment in hazardous areas, the mandatory use of barrier glands has become more necessary.

The standard requires that barrier glands be used on all Ex d and Ex nR equipment where unfilled and hygroscopic cables are used.

For a number of years, installers have been relying on barrier glands with a two-part epoxy-based putty as a means of stopping explosive gases and liquids from diffusing down unfilled cables.

The premixing of putty is time consuming and there are additional risks in that the putty may not have been mixed or packed correctly around the cable conductors, which could result in the potential of voids and gaps through which gas or liquids could migrate. In addition, the time taken for the putty to harden can be up to several hours. For these reasons, barrier glands have always required special skills by installers and particular attention by inspectors.

South African manufacturer CCG investigated these problems and developed an instant mixing, quick setting injection resin system which was launched as the QuickStop-Ex barrier gland in 2012. The QuickStop all but eliminates the problems surrounding the preparing, mixing and applying of compounds/resins in barrier glands. The Injection Resin system is instantly and 100% accurately mixed, whilst being simultaneously injected between the cores of the cables in a single action. The resin completely fills the cable interstices, sets in minutes and forms a 100% barrier to any migration of explosive gases or fluids down the inside of unfilled



From left: Dr Geof Mood (technical director), Tony Murray (UK sales director), Martin Black (International project manager) and Nicholas Lackinger (managing director).

hygroscopic cables, significantly improving on the safety of barrier glands used in hazardous areas.

The QuickStop-Ex Barrier gland has become the preferred barrier gland in the global hazardous areas industry and has been specified and used on many major international oil and gas projects. This success culminated in the QuickStop winning the 'Best User Application' award at the Hazardex conference recently held in the UK.

Enquiries: +27 (0)11 394 2020

## CONSORTIUM CABLES: SOLE SA DISTRIBUTOR FOR K.E.I. INDUSTRIES



CONSORTIUM CABLES of Benoni, South Africa, is proud to announce its appointment as the sole South African distributor for K.E.I. Industries (India).

K.E.I., one of India's foremost cable companies, was established in 1968 and went public in 1992. It manufactures a comprehensive range of cables up to and including 132 kV and has a manufacturing arrangement with Swedish Brug cables to manufacture up to 220 kV.

Consortium Cables has been distributing cable since 1992. With 25 years of experience in the cable industry, it was the natural choice for K.E.I. when that company decided to enter the South African market.

Obviously, SABS certification was a priority. A joint decision was made to apply for SABS 1339, covering the medium voltage range from 1.9 kV through 33 kV.

After two years of testing and a substantial investment, K.E.I. has been awarded the SABS 1339 certification for medium voltage cables.

Consortium Cables carries a substantial stock of the more popular ranges of 11 kV SABS cable. F/R red stripe is a stock item, with LHC (blue stripe) to follow in the not too distant future.

K.E.I. Industries manufactures from three factories in New Delhi. It has three C.C.V. lines that manufacture medium voltage cables 24 hours a day, 365 days a year. Its turnaround time is excellent. It can produce medium voltage cables from inception in four weeks. The cable is of the highest quality. Local consumers have been impressed by the quality of the cable as well as that of the drum/packaging.

Consortium Cables welcomes all enquiries for ex stock/ex indent cables. It stocks a diversified range of cables and has a sales branch in Secunda. The company has export facilities worldwide.

Enquiries: +27 (0)11 894-4538

## WALKABLE CABLE TRAY SYSTEM BKRS

Be it in the automotive industry or in plant construction – with the heavy, walk-on cable tray system BKRS OBO is expanding its range for electrical installations linked to automated production lines. The new system with base perforation has a side height of 110 mm. In addition, the tray has connector perforations on both ends. The tray's covers are non-slip, stable and strengthened with profiled sheet metal, and provide the perfect surface for harsh industrial conditions. In combination with the cover, the walk-on cable tray has a magnetic shield insulation of 50 dB, without cover 20 dB.

Extensive system accessories such as connectors, dust protection components, guard plates, barrier strips and fastening material complete the range and ensure a flexible and installation-friendly system.

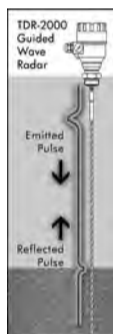
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## EXTREME ACCURACY IN CHANGING CONDITIONS

The cable used by the TDR-2000 Guided Wave Radar unit has a specific impedance value which changes based on the dielectric constant of the surrounding medium. When the TDR-2000 pulse encounters a change in impedance along its cable, a portion of the pulse is reflected back.

By measuring the time of flight of the reflected signal, an extremely accurate distance can be calculated. The measured level data is then converted into 4-20 mA and displayed on the LCD display. From the level data, further values can be derived such as volume and mass.

The TDR-2000 delivers consistently reliable measurements in difficult process conditions including dust; temperature fluctuation; humidity; vapour; turbulence; pressure/vacuum; foam; bulk density changes and a changing dielectric constant. It is more reliable than through-air technology because through-air sonic and through-air radar signals are affected by dust, fill streams, vapours and changes in dielectric constant. The TDR-



2000, by design, is unaffected by these changes. The unit is available from DRH Components, a specialist electric component supplier to the industry with a focus on the control and protection of electric motors.

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## CHINESE CONSORTIUM COMPLETES ACQUISITION OF LEDVANCE

The sale of LEDVANCE by OSRAM to a Chinese investment consortium, consisting of the strategic investor IDG Capital, the LED packaging manufacturer MLS Co., Ltd. (MLS) and Yiwu State-Owned Assets Operation Center (Yiwu), was successfully completed, effective March 3, 2017 and with economic effect as of March 1, 2017. This follows the parties obtaining all necessary approvals from the relevant authorities.

Jes Munk Hansen, CEO of LEDVANCE, said

they were pleased with the transaction, as MLS and LEDVANCE complement each other in an ideal way. "Through MLS," he said, "we gain access to cost-efficient and powerful LED components and will strengthen our market presence in Asia, especially in China. This supports the LEDVANCE strategy to expand its product portfolio, foremost in the areas of LED lamps and luminaires, and Smart Lighting. We look forward to pursuing the many new opportunities that the partnership with MLS brings," he said.

"It is great to be part of this exciting acquisition, as it brings together a leading Chinese LED manufacturer and a German lighting company with over 100 years of experience, strong brands,

proven technology and international sales channels. What drives us as the majority owner within the investment consortium, is to leverage our global investment expertise and resources to help Chinese companies and long-established companies from developed markets make the most out of their joint market potentials," Antony Yu, Partner of IDG Capital, explained.

Sun Qinghuan, Chairman of MLS, is also delighted with the arrangement, saying: "We are looking forward to working with our colleagues at LEDVANCE. The experience and qualifications of LEDVANCE's management team and employees provide a strong basis for collaboration. We will be working closely together to strengthen our

position as leaders in the global lighting market".

LEDVANCE and MLS will now focus on leveraging synergies. Through MLS, LEDVANCE gains access to cost-efficient LED components for its LED products and will be able to expand its market presence in China, the largest lighting market in the world. MLS, in turn, benefits from LEDVANCE's industry experience and its international market presence.

Based on an agreement with OSRAM, LEDVANCE will continue to use the OSRAM brand name for its products (SYLVANIA for USA and Canada). Intellectual property rights have been clearly allocated, so MLS and LEDVANCE can continue to drive innovations globally.

## REGENT'S LIGHTING AT THE MALL OF AFRICA



The Mall of Africa in Midrand, at close to 130 000 m<sup>2</sup> GLA, is the largest single-phase shopping centre to be built in South Africa to date. Led by MDS Architecture, the design process aimed to fulfill client's desire to provide *the* mall in Africa.

The design inspiration for the mall and courts was drawn from the geological beauty of the continent. This formed the direction of the design and the inspiration for the mall interior, the aesthetics and the finishes, which were developed along this concept in a non-stylised manner.

The brief for the interior lighting was to use Maxi Linear fittings in the mall but to do something different from what had been done previously. The initial thought was to run the units in parallel but when this proved too expensive, Regent suggested staggering the fittings to ensure the plan fell within budget. The proposal was accepted.

LED lighting was used extensively and included Linear Maxi and Perox downlighters, which were combined to provide lighting and animation to the key centralised areas. The design means that natural light is maximised in the Mall in such a way that the comfort of shoppers is optimised.

Aptly named 'Forest Walk', the central spine of the Mall of Africa is reminiscent of the rain forests in central Africa. Featuring tropical elements, the Forest Walk follows the curve of the dramatic and expansive roof feature. At night, specialist animated lighting and pendants in the specially designed 'pods' add an even more subtle animation.

The external lighting of the mall consisted essentially of three elements:

- Highlighting the facades - Istria facade lighting was used here.
- Roadway lighting - Regent Lighting matched what had been used before.
- Landscape - the landscape design of the Waterfall Precinct integrates the surrounding urban street fabric with the Mall of Africa and the newly constructed central park.

The design provides pleasant, inviting, valuable and sustainable spaces for human use and enjoyment as an added experience when visiting the Mall of Africa.

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## HOW DEMAND SIDE MANAGEMENT CAN HELP GOVERNMENT

By: Edson Muzuwa (CEM Projects)



Edson Muzuwa.

Since the dawn of our democracy, there has been a substantial shift in energy policy in South Africa, influenced also by new global forces, that has brought local government into the energy domain.

It is valuable to touch on these shifts in order to understand the need arising for greater strategic direction to meet basic service delivery objectives within these new parameters. It is also important to recognise the need to adopt new technologies and systems that could aid with the energy demand in South Africa.

In this country the energy sector has historically focused almost entirely on the supply side of energy and on issues of energy security, with little if any attention being given to demand side – where energy is used – and how needs

could be met in a manner that would promote economic and environmental sustainability.

These days, buildings are designed with energy efficiency in mind. This means that whether in the government or private sector, if buildings are being built the owners are looking at the most cost effective ways to build and to maintain their assets.

Most buildings can reduce the amount of energy they use for lighting by 50 per cent or more simply by fitting smarter lighting solutions and moving to more efficient technologies.

Building owners ensure they benefit from their buildings through various cost saving mechanisms like using LED lighting to reduce energy consumption. LEDs

can make a major contribution to energy savings and, coupled with Demand Side Management (DSM), a lot of pressure can be reduced off the grid.

Fundamentally, DSM deals with the reduction of kWh per household to ensure a saving consumption.

Savings generated from the reduction of pressure from the grid through the implementation of DSM can be channelled into essential services or the electrification of previously disadvantaged communities.

For government or utilities, the implementation of DSM means the conventional approach of having to invest in more generation capacity by building plants, which in turn trickles down to the end user by means of tariff increase, will be no more.

A full buy-in is needed from government and utilities to ensure that the benefits of DSM are maximised. By off-loading the pressure that comes with having to run these utilities to private players, government now has the capacity to focus on delivering other essential services.

While the concept of maximising profits through DSM is straightforward, like anything, the details are of the utmost importance. There needs to be a drive to fundamentally shift the mind-set of top level management in government and they need to be equipped with the tools and information necessary to make decisions.

### SOLAR STREET LIGHTS



When one of its clients needed a lighting solution to illuminate a stretch of road where there was no bulk infrastructure, Magnitech recommended an off-grid all-in-one solar streetlight solution.

The technical brief was to light a roadway just over 2 km long, connecting two separate mine areas in a remote site in Mozambique. The lights would need to be mounted at least 8 m high, with a minimum lumen output of 5 000 lumens.

The solution – a 60 W integrated off-grid solar street light producing in excess of 6 000 lumens – allowed the mine to operate safely, 24 hours a day, with no added strain on the mine's generators.

Other benefits included:

- A maintenance-free lighting solution.
- No trenching or cabling required and therefore significant establishment savings.
- Completely off-grid solution, with zero operating costs after initial setup.
- Intelligent built-in controls to switch lights on and off automatically.
- Integrated battery back-up to ensure up to three days continuous operation in the event of poor solar conditions.
- 50 000 hours of life.

Magnitech has over 48 years' experience in the mining, industrial and commercial lighting markets. Its products are tailor-made to the strictest quality controls to suit the Southern African environment and, more importantly, to clients' exact requirements.

Magnitech offers a comprehensive product and service solution, including design consultation, site inspections, light audits and lighting design. Products are then designed, manufactured and delivered for installation nationally as well as abroad. This approach enables Magnitech to ensure that the end result complies with OHS and SANS requirements.

The company's product range includes HID and LED industrial bulkheads, conveyer lights, floodlights, high bays, streetlights, post tops, LED retrofits plus a wide range of solar powered solutions.

In constant pursuit of excellence, Magnitech continually builds on its legacy as a leader in the lighting sector.

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## OPTIMUM LIGHTING SOLUTION FOR BRT ROUTE IN DAR ES SALAAM



Dar es Salaam's new BRT route, illuminated by BEKA Schröder's BEKASUN luminaires, is clearly visible from the skies.

**BEKA SCHRÉDER** supplied a cost-effective lighting solution for the long awaited bus rapid transit (BRT) system in Dar es Salaam, Tanzania. The transit system is part of the 'Second Central Transport Corridor Project', the purpose of which is to support Tanzania's economic growth by providing enhanced transport facilities.

The implementation of the BRT system will consist of six phases, the first of which has been completed and began operations in May 2016. It has a total length of 21.1 km with dedicated bus lanes on three trunk routes and a total of 29 stations. Since the BRT system operates until late at night, adequate lighting levels were an essential part of the development to ensure commuters feel safe when using the service at night.

BEKA Schröder was awarded the tender to supply in excess of 1000 BEKASUN 250 W streetlight luminaires on 10 m stepped galvanised surface mounted poles. The company became the successful supplier because it was

able to provide the client with the most cost-effective lighting solution per kilometre. With the assistance of the company's Applications Department, the original lighting design was significantly optimised by decreasing the number of luminaires and poles needed, while still achieving optimum lighting levels and uniformity.

The BEKASUN 250 W luminaires were supplied with 4Y lamp technology, which offers increased lamp life and a substantial increase in lumen output. By optimising the reflector system together with the 4Y lamp, the above-mentioned project used considerably fewer poles and luminaires per kilometre than any competitor, thus reducing capital and operating costs.

BEKA Schröder locally develops and manufactures lighting products, designed and suitable for Africa's harsh environmental conditions.

Enquiries: +27 (0)11 238 0038

## STAYING IN CONTROL OF QUALITY

Providing the right kind of light is essential to ensure detailed tasks are completed effectively and imperfections are spotted – this is especially important in a quality control environment. Factories will often have specialist or detailed tasks that are best performed at work benches, so effective task lighting is essential to ensure a high quality output and to identify any inconsistencies or defects.

Philips' new generation LED lighting provides exceptional levels of visual clarity, resulting in an easier and safer environment, and optimal conditions for observation and inspection. LED also gives less shadowing, which means a clearer and more comfortable working environment. Ideal for factories Philips' LED lighting is perfect for specialist task areas and quality control departments – saving up to 60% energy and lasting up to three times longer than conventional fluorescent technology, which means a significantly reduced need for time-consuming, disruptive and expensive maintenance. Coupled with presence detection and controls, it delivers the correct light levels only as and when needed, offering further energy savings.

Enquiries: +27 (0)11 471 5000

## FRANCIS LED SEARCHLIGHT

Francis of the UK has released a series of high powered LED searchlights. Using a series of precision made glass lenses to optimise and collimate the light output, the searchlights achieve a greater range and output. In addition, they offer low power consumption and a lamp life of 20 000 hours. Constructed from marine grade aluminium and stainless steel, the result is a robust high quality product.

Beam angles of 4° Spot, 6° Mid Beam or 10° Flood are available.

The 234 W LED provides illumination characteristics in excess of a 300 W Xenon lamp or 3 kW Halogen, resulting in a range of 1 Lux at 1647 m.



The searchlights are available locally from Denver Technical Products.

Enquiries: +27 (0)11 626-2023

## SECOND GENERATION COB LED PACKAGES



**SAMSUNG ELECTRONICS**, a world leader in advanced component solutions, has announced its second generation of D-series chip-on-board (COB) LED packages. The second generation features the industry's highest light efficacy in COB lineups and is suitable for directional lighting applications such as multifaceted reflector (MR) lamps, parabolic aluminised reflector (PAR) lamps, spotlights, downlights and high bay lights.

The new D-series Generation 2 offers efficacy at 160 lm/W (5000 K CCT, 80 CRI, 85°C) – a significant improvement on the Generation 1 efficacy level of 150 lm/W. The Gen 2 additions greatly enrich Samsung's COB lineup by providing more extensive lighting source options for spot and most other directional lighting. The D-series Gen 2 also features about 50 percent lower thermal resistance than the first generation.

In addition, all 11 different wattage offerings in the D-series Gen 2 deliver high reliability and performance levels that meet DLC Premium standards (technical requirements for LED lighting solutions suggested by DesignLights Consortium™). DLC standards are recognised in North America as a preferred means of evaluating LED lighting products in terms of performance and quality.

It is available for a wide range of colour rendering index levels from CRI 70+ to 90+, and for 'Vivid' lighting, providing colour spectrums that have been optimised for retail markets. This satisfies the need of many lighting designers to have richer, more vibrant colours.

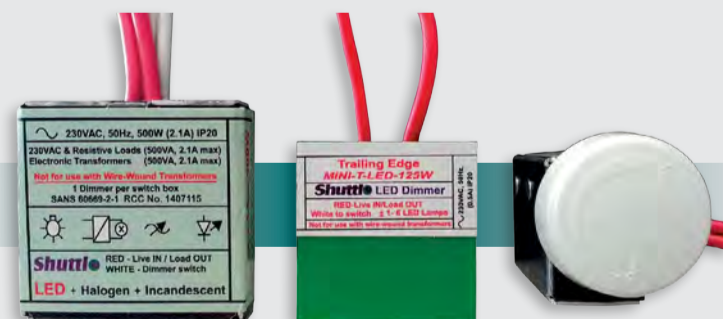
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## INDIVIDUALLY DESIGNABLE LUMINAIRE RANGE

The Vistosa track spot from Osram Lighting Solutions allows a wide diversity of merchandise to be displayed in the very best light. The extensive product family offers a range of practical and flexible design options for displaying fresh food as well as electronics and building articles with sales-promoting impact in the retail sector.

High levels of functionality at a low investment cost is a common demand when it comes to lighting in the retail trade, and an optimum price-performance ratio is also decisive for larger sales spaces such as supermarkets, DIY centres and electrical stores. It's here that the Vistosa track spotlight from Osram wins over with its extensive performance package.

With around 50 variants – via a combination of various light colours, beam angles and housing colours, for example – the product range provides maximum flexibility for specific lighting concepts in the retail trade.

Special LED modules with adapted light colours enable an appealing display of meats and baked goods. Furthermore, the Vistosa features outstanding colour rendering (CRI > 90) at 3000 and 4000 Kelvin and the DALI version can be integrated into light management systems.

With its compact and especially flat dimensions, the spotlight integrates well into shop and display layouts even those with low room heights. Vistosa is compatible with commercially available three-phase tracks and is 'plug & play' mounted. Its highly efficient operation (up to approximately 104 lm/W) and long lifespan of around 50 000 hours (L80/B50) also make it an economical investment.

Enquiries: +27 (0)10 221 4000



## SOLAR STREET LIGHT POLES OFFER ENERGY CONSERVATION



SOLAR ECO SYSTEMS AFRICA'S range of self-sustaining solar LED street lighting is available exclusively in Southern Africa from Magnet Energy.

The environmentally friendly solar powered street light poles, which combine enhanced aesthetics and the latest photovoltaic (PV) and LED technology, are designed for energy conservation on streets, highways, pedestrian walkways, jogging paths and on housing estates. "Solar energy is gaining popularity globally as a clean, sustainable and renewable source of energy that reduces the carbon footprint, says Kaylen Reddy, Magnet's lighting solutions engineer. "This low maintenance system can run off grid, providing reliable performance independently of the national power supply – an important advantage during power outages."

In remote areas with no access to electricity, the solar light poles improve security after dark and since there are no requirements for major earthworks and cable laying, set up costs are significantly reduced. The latest LED technology of this system has a particularly high luminous efficacy – up to 112 lumens per watt. The LEDs consume about 50 W less power per lamp than other systems available, and offer approximately 75 000 hours of service life. The proprietary lens system focuses the light output and minimises unwanted stray light, which contributes to improved efficiencies. Patented PV technology encompasses high output, high efficiency solar cells that provide charging of up to 300 W per day without the need for direct sunlight. These mono crystalline silicon solar cells are protected by a thick layer of Borosilicate glass, which aids in keeping the PV module clean, for maximum poly-directional 360° energy yield.

Batteries are housed securely inside each pole. Lead acid batteries provide a minimum autonomy of two days based on a depth of discharge of 30%. A micro-controller is used for smart monitoring, intelligent communication and energy management. Each light pole communicates directly with the control centre, providing information that includes the need for maintenance, while security sensors advise of theft or tampering. It is also possible to monitor every light pole's power output to ensure optimum efficiency.



An advanced security option includes a surveillance system that is integrated discreetly into the mast or head to monitor the environment. High resolution CCTV cameras have built-in sensors for automatic security alerts, with interchangeable lenses to meet exact requirements. This low power consumption system has day and night sensors and offers good image quality, even in dark areas. There is direct recording to any IT storage device, without the need for central recording software or hardware.

Solar Eco Systems Africa's advanced technology will also soon be incorporated into light poles to offer internet connectivity. The solar power Wifi pole – currently at its conceptual stage – will enable users in proximity to a pole to connect to the internet – a convenient facility, especially for schools in rural communities. The company will also be launching solar powered cell phone charging poles based on the same technology. Included in the range are 'Noor' solar pedestrian light poles that provide uniform circular light distribution essential for boardwalks, pedestrian lanes, parks and communal areas. These stand-alone light poles have a 6.25 m installation height and a light spot height of 4 m.

'Shems' solar street light poles, with lengthwise aligned light distribution, are designed for outdoor residential and municipal lighting in areas that include streets, pavements and bicycle paths. This series has an installation height of 6.80 m and a light spot height of 6.26 m.

'Taq' solar highway street light poles provide uniform lengthwise aligned light distribution for municipal street and roadway installations. This system has an installation height of 8 m and a light spot height of 7.65 m.

The robust lighting poles, with a diameter of 180 mm, are manufactured from steel and are hot-dip galvanized for added protection. They have an IP 65 index protection rating to guard against the ingress of dust and water.

Magnet's team is committed to identifying energy saving opportunities and implementing appropriate eco-friendly solutions to reduce wasted electricity throughout the country.

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## ENLITE V5 RANGE IS TODAY'S DEALMAKER

Enlite has increased its range and now includes 385+ modern innovative lighting products in its latest V5 catalogue. Warwick Webber, Aurora Group's managing director for South Africa, reveals why LED is becoming so popular.

Gone are the days when the price of LED was a deal breaker. LED is now a top contender with commercial and residential clients, so it's worth keeping a copy of the 5<sup>th</sup> edition of the Enlite Lighting Essentials catalogue to hand as it comprises a total of 375 – including 169 new – 'Best-in-Class, Best-for-Value' lighting solutions.

If clients require independent reassurance, quote the Carbon Trust, which puts LED lighting at the top of the energy efficiency. LED offers the best value for money in lighting today; the price of fittings has come down and, at the same time, performance has improved significantly. What's more, agenda and leading website www.environmentalleader.com reports that while switching to LEDs creates a one-time savings event – typically reducing lighting energy use by up to 50% – integrated sensing and controls can nearly double those energy savings, making controls essential for maximum savings and project economics.

A simple yet highly targeted lighting essentials range, Enlite, is designed to meet the requirements of everyday lighting installations across a range of applications and vertical markets.

When reviewing LED products, quality and reliability should

be a serious consideration. Enlite is part of the Aurora Group, a leading global LED lighting organisation. All products are designed and engineered in-house and through its partners, ensuring each product is made to the highest quality standards.

Brand new top choices from the V5 catalogue include the extremely versatile E8™ colour switchable downlight, offering three whites from one light at the flick of a switch located on the back of the fitting and the new range of dimmable Lumi-Fit™ commercial downlights, suitable for new installations or as upgrades for CFL fittings. DALI compatible, the Lumi-Fit delivers up to an impressive 100 lm/W, up to 4380 lumens.

Enlite has also introduced the new stylish CurveE™ LED low glare downlight range, which features a sleek baffled design with a recessed light source to reduce glare in hospitality and residential applications where fire rated is not required.

The ICE™ Pro is a new specification range of dimmable long form GU10 lamps with a lumen package up to 1000 lm, making them ideal for retail and hospitality applications.

And the Aria2 LED high bay, designed and engineered for market leading levels of efficiency, is suitable for industrial applications, producing up to 124 lm/W.

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## THE SHAPE OF THINGS TO COME: TRENDS IN LUMINAIRE DESIGN

For a long time, the lighting industry relied on conventional, legacy light sources and traditional designs. Advances in LED technology have changed the face of the industry and in the past five to seven years have redefined lighting, propelling fixture designs forward in terms of the form and function of luminaires.

### Redefining illumination

"Since LEDs can be controlled to the individual diode, they can be designed to maximise energy savings and lifetime as well as create reimagined dynamic spaces," says Jeff Campbell, head of trade luminaires in the United States and Canada for LEDvance (formerly Osram Sylvania) Wilmington, Mass. "In addition, since they're small, they provide an opportunity to use smaller form factors. As a result, the fast adoption of LED light sources has enabled manufacturers to rethink how a fixture delivers light to the intended surface." This is apparent across the entire lighting industry.

"At first, LED-based products were significantly more expensive than their traditional counterparts, leading to poor ROI calculations, but as technology and competition increased dramatically, those costs have since dropped significantly," says Tom Veltri, product manager of new product innovation, Hubbell Lighting, Greenville, SC. Fixture design has evolved at an extraordinary rate, largely due to the integration of multiple technologies into a single package.

"At Hubbell, we see many LED lighting systems hosting a variety of universal features as it relates to the incorporation of dimming controls and protocols into a single unit or the flexibility of a system to retrofit into a wider array of forms and sizes of existing legacy fixtures," Veltri says.

According to James Benya, principal illuminating engineer and lighting designer at Benya Burnett Consultancy, Davis, California, "There are few, if any, recent fixture designs for any legacy light sources. Everything is LED now and the biggest trend today is to replace every legacy luminaire with an LED version. Although this isn't particularly creative, the low costs and high efficiency are especially attractive at every level of the marketplace and it represents progress because it encourages everyone who installs lighting, not just high-end projects, to enjoy the benefits of LED."

However, Benya says lighting design has remained fairly conservative. Only a small number of new luminaires present advanced LED and optical technologies in an appealing way.

"The vast majority of LED luminaires are conventional fixtures with LEDs and occasionally clever or thoughtful optics," he says. "There are new and interesting designs in outdoor lighting, decorative lighting and premium products for commercial lighting products, but the vast majority of current designs are LEDs put into familiar boxes. I think we're just beginning to realise the complete potential for LED lighting to

give us better luminaires, not just old luminaires with LED guts."

Commercial spaces have increasingly seen controls capabilities integrated into fixtures.

"The energy and maintenance benefits of solid-state fixtures are now being augmented by controls capability that can automatically adjust for occupancy, daylight savings, energy metering and indoor positioning, to name a few, which opens up a new level of energy savings as well as opportunities for data collection and analytics," Campbell said. "The trend has been towards low-profile units that can be hidden or designed into the architecture so that the delivered light is the attraction, not the fixture itself."

Based on their small size and inherent controllability, LEDs lend themselves perfectly to these designs.

For the consumer market, the continued trend will be toward commoditisation of LED-based lamps with more traditional aesthetics. Campbell expects the commercial/industrial sector "to begin looking for more future-proof designs where additional functionality can be added at a later date, though this could require some level of design for replaceable/interchangeable drivers and light engines. "Most users don't want the bulky heatsink designs and optic glare of many LED-based products available today," he says.

### Optical assembly is another major trend in fixture design

In the past, reflectors and simple lensing were used to diffuse the original source for visual comfort and optical performance. Now, a combination of compact total internal reflection optics and extruded profile lensing are used to increase distribution and visual comfort in interior spaces. The result of these technological advances is an opportunity for sophisticated performance enhancements and cost savings.

Lighting controls are another factor advancing fixture design across all market segments.

"In the residential sector, it's the rise of the 'connected home' through [Internet of Things] platforms – for example, the ability for consumers to control the security, HVAC, lighting and entertainment functions within the home in an interconnected way that allows for creation of a custom experience based on personal preferences," says Veltri. "In the commercial space, it's a trend towards low-voltage power and control, which simplifies fixture design and installation but, at the same time, gives rise to deeper data analytics and greater control over the building envelope. And in retail, it's the opportunity for a different type of interaction between lighting and the consumer through enhancement of colour and connectedness but also through the ability to understand consumer preferences on a deeper level."

Benya believes LED technology enables a range of high-quality luminaires in the commercial sector, but that the cost rises with some lighting systems – such as direct/indirect linear pendant fixtures –

and that reality currently stands as one of the biggest obstacles to widespread adoption.

"Otherwise, LED has conquered the downlight, wall wash, troffer and industrial lighting markets, but mostly with products that aren't much different from their fluorescent and HID ancestors," Benya says. "For LEDs to make a complete transformation of commercial lighting, we need new concepts that embody much better glare control than the majority of commercial LED lighting today, especially high-bay lighting."

Benya believes the residential lighting market remains unsettled. "The replaceable LED lamp is successfully challenging dedicated LED fixtures for a lot of the market and I believe that energy codes will soon change to permit standard, screw-based Edison sockets in homes as long as an LED is installed at the time of inspection," he says. "Otherwise, LED lighting is penetrating all of residential utility and general lighting, but not necessarily changing it overall."

For instance, tape light products are enabling a lot more linear lighting effects, but costs and the complexity of low-voltage wiring and dimming have slowed their potential. "On the other hand, landscape lighting with LEDs is marvellous. In the retail setting, LED is a superior retrofit product for many store types, especially those using troffers, track and other typical lighting. For high-end stores, linear LED technology literally makes stores look and work much better, with built-in display, shelf and niche lighting opportunities that weren't possible with legacy lamps," Benya says.

### Agents of change

"Lighting contractors should be aware of these trends because they can speed up installation time, enable compliance with new energy codes, increase customer satisfaction, and potentially create new revenue streams for fixture updates and controls implementation," Campbell says. "It also benefits contractors and distributors to recognise both performance and quality when evaluating fixtures. Finding a trusted manufacturer with the history, resources and warranty to back up its products is critical to realising these benefits."

"Contractors and specifiers alike need to be aware of emerging trends because of the impact they'll have on future business models and the rise of new services, be it control commissioning or device installation," says Veltri.

He recommends that contractors and distributors align themselves with lighting manufacturers making significant investments in training facilities and capabilities as well as respected industry organisations.

The channel has the power to transform the field. "Contractors and distributors are among the best in the industry to effect great change," Benya says. "If they love a product, they'll champion it, and while designers may break the ice with new ideas, it's ultimately contractors/installers who can make a product hugely successful."

"In the end, I think that contractors need to keep telling fixture companies what they want and need, because some of them really listen," Benya said.

This article, by Susan Bloom can be viewed online on: <http://www.ecmag.com/section/lighting/shape-things-come-trends-%E2%80%A8luminaire-design>

## COMPREHENSIVE RANGE OF HI-PERFORMANCE LED FLASHLIGHTS



Tork Craft's range of flash lights, torches and headlamps.

One can never own enough flash lights, torches or headlamps. In fact, in South Africa these are of the most essential items in a home, tool box, or car. You will often find several flash lights and torches in a single household; many will have one per person and one in almost every room, usually in a place that is easily got to in the dark.

Tork Craft's new range leads the way in portable lighting. It consists of torches, flashlights, rechargeable lights, headlamps, headlamps with mag holder, work lamps and

a popular mini compact flashlight range. Included in the range is a high performance aluminium LED flashlight, with an output of 600 lumens. It offers 13 hours of running time, and a 150 m beam with five settings: turbo, mid, low, blinking and SOS. The unit has a handy tail push button and takes two CR123A batteries or alternatively one 18650 battery.

Tork Craft's rechargeable models are all about high-performance. The aluminium LED flashlights are perfect for everyday use. They

have an output of 600 lumens, a lifespan of 100 000 hours and use a single Li-ion battery. They come with a USB charging cable and a rechargeable battery and certain models are available in a range of colours. The flashlights range in running time from two to 13 hours, with outputs varying from 600 to 1000 lumens and beam distances from 10 to 250 m. Most of the units are impact and water resistant, with long life LEDs.

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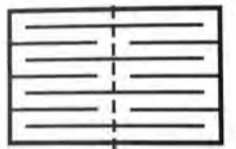
### THE HOSPITAL MUDDLE

The ambulance raced through the streets taking the young man and his father to the local hospital. The father was not badly injured but the son was rushed into emergency surgery. The surgeon took one look at him and cried, "I cannot operate - that is my son!" Please explain!

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