

SOUTH AFRICA COMMITS TOWARDS GENDER RESPONSIVE STANDARDS



Jodi Scholtz, Group Chief Operating Officer at the dti and co-Administrator of the SABS, signs the UNECE declaration.

inclusive and to overcoming barriers to participation," says Scholtz.

By signing the Declaration on behalf of South Africa, the SABS commits to engaging with government departments, women's groups and non-governmental institutions to ensure that the needs of women and girls are included in technical committees, through encouraging participation in technical committees. SABS will also ensure gender sensitive criteria are adopted in the standards and commits to employing more women in senior positions within the organisation.

"Women are under-represented in various structures of society. Improving participation at a technical committee level will greatly enhance the gender imbalance in South Africa, through the inclusion of gender sensitive technical specifications in standards that set the guidelines. Influencing the development of standards for pay parity, infrastructure and sanitation requirements, protective equipment and clothing are some of the ways the standards development process can benefit women.

CONTINUED ON PAGE 3

South Africa has joined more than 55 countries in signing the Declaration on Gender Responsive Standards and Standards Development, an initiative of the United Nations Economic Commission for Europe (UNECE). The Declaration was signed by the South African Bureau of Standards (SABS), on the occasion of the 42nd annual general meeting of the International Organization of Standardization (ISO), in Cape Town in September.

Globally, there is a lack of participation and representation of women in standardisation, according to UNECE, which have been working with national standards bodies in various countries. For society to move towards gender balance, women need to be included in standards development processes. The involvement of women at the fundamental stage of standards development will ensure inclusivity at all stages of society as standards are implemented.

Jodi Scholtz, Group Chief Operating Officer at the Department of Trade and Industry (the dti) and co-Administrator of the South African Bureau of Standards (SABS), signed the Declaration.

"This Declaration on Gender Responsive Standards is an important step for South Africa as we begin to meaningfully include women in all decision making platforms, beginning with standards development. While there are women who participate in standards development processes, they are in the minority and become scarcer still in the development of technological and scientific standards. Technical committees which are open to individuals from all walks of life are responsible for the development of standards and it is imperative for women to get involved in these. Technical committees develop the parameters and specifications for a range of products and systems and are extremely powerful to ensure inclusivity. In sectors such as mining and construction, which are largely male dominated – women can play a pivotal role in resetting their environments to be more

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TOOLS FOR WORKING AT HEIGHT

Dropped objects are a major source of incidents on site. At best, a dropped tool accident causes a significant loss of time and money. At worst, a dropped tool accident can cause permanent injury to an employee and even result in death. Every year, companies spend millions and countless hours cleaning up the damage caused by dropped tools. Knowledge is power; with proper education paired with the right tools, you can decrease your chances of experiencing a dropped tool accident.

In 2014, a tape measure was dislodged from the belt of a construction worker in New Jersey, USA, while performing work an estimated 50 stories above ground. The tape measure dropped nearly 150 m before ricocheting off some equipment and striking a delivery man who was not wearing a hardhat. Tragically, this incident caused a fatality, highlighting the dangers presented by falling tools.

What is a dropped tool accident and its effect?

Any time people are working on site there is a risk of a dropped tool accident. Dropped tool accidents can happen at any time. A worker using a knife at ground level could drop his or her tool and potentially have it land on their foot. Or, a worker could drop a hammer from a level of 30 m above ground, killing a worker below. Adverse weather and temperature, fatigue, lack of proper grip, a sloppy work site, stress, time constraints, and lack of pre-shift preparation all increase the chances of a dropped tool accident. Unfortunately, even small tools dropped from a seemingly non-threatening height pose an extreme threat. The direct and indirect impact of a dropped tool accident can be measured at the micro level (its effect on an employee and the employee's family) to the macro level (the impact of the accident on the business organisation as well as the customer served by the business). Injuries, fatalities, medical and insurance costs, and hiring and training new employees to replace

injured employees are all examples of the direct and indirect costs of a dropped tool accident.

HellermannTyton supplies a range of anti-drop products and solutions that have been designed to control and prevent object dropping when working at height. These products have been designed to allow a comfortable, productive and efficient use of tools while assuring workers' and equipment safety against object dropping. Ideal for many manufacturing, construction, installation and maintenance activities, both onshore and offshore, applications include oil rigs, wind turbines, power lines, cranes, buildings, scaffoldings, bridges, telecom towers, airplane maintenance and mining to name a few.

"If you are tired of having to climb down the scaffolding to retrieve a dropped tool, then make sure it's an anti-drop tool," says Ryan Burger, Divisional Product Manager at HellermannTyton. "It will save you time and money on top of the safety aspects, and can prevent tools from breaking when dropped."

The range consists of:

- **Anti-Drop tools with heat shrink system:** These tools have been carefully designed not only to avoid accidental dropping, but also to ensure maximum safety. All tools are equipped with a heat shrink system which offers superior safety compared to other systems, such as directly holding tools with a knot. The heat shrink system doesn't jeopardise the integrity of the tool, by, for instance, drilling a hole through it, so the mastic-lined heat shrink system doesn't affect the mechanical properties of the tool. "We even offer custom branding of the tools for corporations," Burger notes.
- **Lanyards:** Designed for maximum safety, as well as optimum working freedom, the various systems provide all required solutions for comfortable and safe use at height, while assuring best shock absorption. In load testing, the lanyard is attached to an anchor point and the weight is applied to the other end. Then the weight is elevated and dropped vertically, five times. The lanyard is then attached to an anchor point for the pendular test and the weight is applied to the other end. Then the weight is elevated above the anchorage point and dropped, five times. For the static load test, the lanyard is attached to an anchor point and the weight is applied to the other end for 10 minutes.

"The lanyard system ensures that tools are always easily available for workers, and at the same time conforms to non-drop directives. Anti-drop tools have been a standard overseas, but are eventually becoming more regularly used in South Africa," says Burger.

All it takes is one dropped tool accident to end a life, destroy a community, and annihilate a business. Companies that prioritise customer demand over the safety and health of their organisation set themselves up for disaster. Organisations that invest in safety tools and safety tool-training programmes will save time, money, and protect the health of their workforce.

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IN DISCUSSION WITH DEVAN PILLAY, SIGNIFY MARKET LEADER FOR AFRICA



Devan Pillay

DEVAN PILLAY, the new Market Leader for Signify in Africa, has a deep knowledge of both the electrical and lighting industries. He believes the onus is on professionals in this space to educate customers.

Sparks: Where did you grow up?

DP: I was born on the Natal South Coast and came from a family of sugar cane farmers. My interest in electricity started from an early age as we lived opposite an electrical substation which fed the community. We often played around it because it had the most manicured lawns, so it naturally became our soccer field. I was amazed by the constant buzz of the transformers and the complex equipment that the substation housed.

Sparks: Is that what drove you to pursue a career in the electrical field?

DP: What really drew me to electricity was the fact that every now and then, the Eskom maintenance crew would arrive at the substation and conduct their maintenance procedures. Their jobs looked specialised and they were fulfilling an important role in providing much needed electricity for the community. They also appeared to be masters of their craft and I thought to myself, "This is the kind of job I want". I got a bursary with Eskom to study electrical engineering, and my first job for Eskom was working at the Majuba Power Station when building commenced.

Sparks: That must have been quite an education?

DP: It was. As Majuba was being built, I needed to train at a working power station, and found myself spending about two years at the Hendrina power station, which was probably the most defining moment of my career. At the time, Eskom was one of the lowest cost energy producers in the

world and was at the cutting edge of technology. As such, the training they afforded their engineers was top class - I recall the on-job training was interspersed with training courses at Midrand Eskom College which were of a remarkable standard. Upon completion of my training I went back to Majuba and was given the responsibility of project managing the electrical installations on the boiler plant, units 1 and 2. Here, I became involved with multiple contractors and installation teams and made a number of contacts within the supplier base, including Siemens, General Electric, Cegelec, Alstom, WEG and so on. My counterparts in many of these companies had engineering backgrounds, but were in commercial roles, which also appealed to me.

In 1995 I transferred from Majuba to work for a few years at Eskom's distribution business which was at a time when Eskom was rolling out a mass scale rural electrification campaign. The remit was to connect electrical energy to rudimentary dwellings at the lowest possible costs in the safest possible means. The defacto codes of practises for urban reticulation had to be cast aside and new norms and standards developed for rural electrification. We set up pilot sites in rural South Africa which led to a number of innovations, such as the aerial bundle conductors, dual phase transformers, ABC connectors, prepayment electricity metering, etc.

Sparks: How did you become involved in the commercial side of business?

DP: After I was promoted to lead this initiative nationally, I became more involved with OEM suppliers, and worked with Merlin Gerin on Ring Main Unit specifications and power interrupting devices which saw me eventually joining Schneider Electric as Product Manager for the LV Power Distribution business. Marketing and product management was completely abstract to me, but the training and support from the organisation was amazing.

I ended up as marketing manager for the entire group at the EXCO level before being headhunted by Tyco Energy who wanted to set up operations outside of South Africa. It was a great experience, setting up distribution channels, and actively participating in tenders in countries such as Ghana, Kenya, Tanzania and Nigeria. Around this time I married my wife and returned to South Africa where I ran Tyco's cable accessories company, Raychem, a division of the Aberdare Cables Group. After many years in the electrical discipline I wanted to broaden my experience and when General Electric was looking for a Regional Director to head up their security business, I jumped at the opportunity. GE Security was then sold to UTC, whereupon I moved to 3M in the role of General Manager for the Safety Security and Protection Business. By this time, I had completed an MBA and wanted to test my capabilities beyond the engineering world into broader business. I spent the past 11 years with them, working in multiple countries such as Turkey where I looked after the central east Europe region, then as MD of 3M Switzerland in Zurich and then at the headquarters in Minneapolis, USA as a strategy director. After 10 years away I moved back to 3M South Africa as MD. However, from a career point of view, I felt I needed a new challenge. I knew Eric Rondelat, the CEO of Signify and was inspired by his leadership while we were at Schneider. I started my tenure at Signify at the beginning of April this year.

Sparks: What is your job description?

DP: I lead the business and the interests of Signify in Africa. I have the responsibility to grow the company in Africa and expand our footprint on the continent. The African market is served from three hubs of South Africa, Egypt and Morocco.

Sparks: Where do you believe South Africa's status on the continent currently stands?

DP: As South African we like to believe that we are one of the most industrialised countries on the continent, but having been abroad for over 10 years, I have been amazed at the rate of development in countries beyond South Africa.

TURN TO PAGE 18 TO READ PILLAY'S THOUGHTS ON THE ROLE OF THE ELECTRICAL CONTRACTOR IN LIGHTING

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SOUTH AFRICA COMMITS TOWARDS GENDER RESPONSIVE STANDARDS

CONTINUED FROM PAGE 1

The more women are present and involved at all levels of society, the more their voices and interests can be better represented," says Scholtz.

The fields of science, technology, engineering and mathematics (STEM) are no strangers to the gender imbalance. Recent data shows that in 2016, women made up only 23% of STEM talent globally. Addressing this gap must be prioritised if we are to truly transform this large industry.

In 2013, the Engineering Council of South Africa (ECSA) said almost 11% of the total number of engineers registered with the council were

women, but that professional women engineers totalled only 4%. Many of the women engineers surveyed said they left the industry because of the gender-bias they experienced. As women pursue STEM careers, more and more young girls will see career opportunities open to them and seize them. With more women in the field, young girls will understand how much they can offer the world with a STEM career.

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HOW TO GET YOUR WIREMAN'S LICENSE

In the first instalment of Citiq Prepaid's series on how to become a professional registered electrician, they briefly touched on all the different aspects of the journey and how long it could take. The first step is to get your Wireman's License, a process that may seem a little intimidating at first, but is actually quite straightforward.

You will need your Wireman's License to ensure that you operate legally in South Africa. It is a valuable piece of paper that not only affirms the hard work you put into your studies, but proves to all your potential customers that you know exactly what you are doing. With this license in your hands you will be allowed to issue a CoC (Certificate of Compliance) and prove your competence to test and inspect electrical installations. A Wireman's License is not the same as your DOL registration to become an electrical contractor, that's the next step in the journey.

You do need to get a recognised qualification before you set off to get your Wireman's License. The South African Qualifications Authority provides you with a complete breakdown of precisely the qualifications you need to have to qualify for this certification. You can opt to do a degree or you can attend a trade college, undergo an apprenticeship and pass a trade test to become qualified.

Want to know where and how to train? This is the list you need:

You will need to have good results in maths and science to start your electrician diploma. If you haven't achieved amazing results, you can go to:

- College SA – it provides a bridging course along with levels N1, N2 and N3 training.
- Intec College – it offers N1, N2 and N3 Electrician courses

You can study at any one of South Africa's leading universities:

- Cape Peninsula University of Technology
- Tshwane University of Technology
- UNISA
- Stellenbosch University
- University of Pretoria
- University of Johannesburg
- North West University
- University of Cape Town
- University of the Witwatersrand (Wits)

You can attend a TVET college and gain an electrician diploma in:

- Majuba
- South West Gauteng Technical and Vocational Education and Training College
- The Johannesburg Institute of Engineering and Technology
- The College of Cape Town

There are numerous private FET colleges where you can do the Nated level courses, universities typically do not offer Nated N courses for which you only need to achieve 40%.

There are so many different institutions and courses that can help you become an electrician that it may seem a little overwhelming at first. However, your most important step is to ensure that it is recognised by EWSETA.

Now you need an EWSETA accredited assessor to assess you

A registered assessor will determine whether or not you are able to do the job. He or she will ask you to perform specific tasks to prove you can correctly evaluate a CoC against an existing electrical installation. This is incredibly important as only a qualified, registered electrician is able to issue a CoC and the assessor's job is to ensure you know what you are doing.

If EWSETA is happy with your work and you've passed all the relevant tests, then you will be issued with a letter that you will need to submit to the DOL as part of your application for a Wireman's License. According to the Department of Labour, your educational requirements need to be relevant across whichever registration you are applying for.

Know what the registrations are and how these affect your application

An electrician can register across three specific categories, each one allowing him or her to work on different phases of installation with regards to electricity.

- **Phase 01:** A single-phase electrician who usually works on homes and electrical supplies of 220 V. This the most relevant one if you want to install prepaid meters.
- **Phase 02:** Installation electrician who can handle both single and three-phase installations, but isn't qualified for specialised installations.
- **Phase 03:** A master installation electrician who specialises in hazardous locations and specialised electrical installations.

Once you have received your ESETA Letter and achieved your qualifications, you can submit your application for your Wireman's License to the DOL. You can find the form at www.labour.gov.za

You need to follow the following steps to get DOL's attention:

- Have a trade qualification that includes electrician, electrical engineering, construction electrician, and other diplomas, degrees or qualifications that focus on the role of the electrician (chemical, construction, mechanical, *et al*).
- Pass the trade test, have an NQF Level 3 minimum with a Technical Senior Certificate and pass the Installation Rules Paper 1 and Paper 2, which can be written at an FET or TVET college.
- Documentation and certified proof of the qualification.

In the next column, we will talk about the difference between the wireman's license and registration with the DOL as an electrical contractor.

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SHARP'S global reach is unparalleled when it comes to solar power. The company has been distributing panels for 60 years: more than the longest warranty on any of its products. Sharp is trusted, reliable and its high-performance solar modules continue to exceed expectations in the industry.

Over a million customers worldwide have purchased Sharp's products and with an excess of 50 million panels distributed, Sharp is proud to have produced 14.3 gigawatts of solar power since the company's formation, equating to a total CO₂ avoidance of 156 megatons.

The company has previously been awarded the EuPD Top Brand award across several countries and years, and Sharp's products are environmentally certified by VDE, TÜV and ISO, too.

SegenSolar is delighted to be working in partnership with Sharp to bring these products to the South African market. Thanks to this flourishing relationship, installers across the country are now able to access Sharp's products exclusively through SegenSolar, a feat the supplier is proud to facilitate. With SegenSolar's existing warehouse in Johannesburg and its brand new warehouse opening in Cape Town in August, Sharp's modules have never been

more accessible to installers.

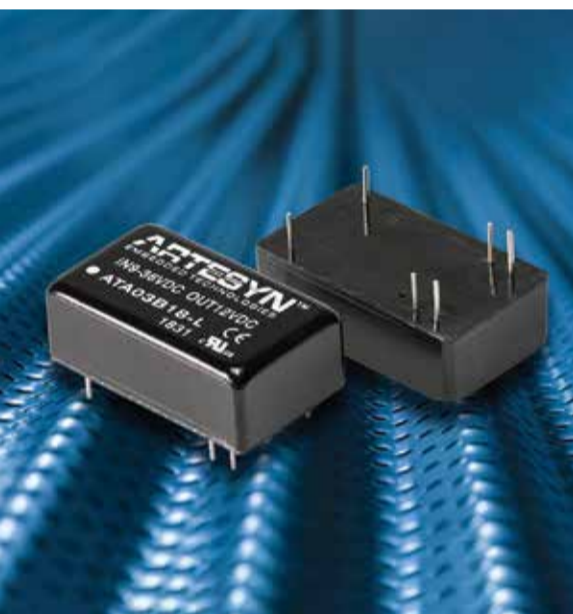
Sharp holds the industry's longest-standing solar experience, and the renewed line-up of high-performing modules offers customers a solution for every application. From residential projects to large-scale commercial installations and free-field power plants, Sharp is dedicated to procuring outstanding efficiencies and only the highest quality products.

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All ATA series converters feature ultra-wide 4:1 inputs; seven of the models have 9-36 V inputs and the other seven have 18-75 V inputs. Within each of these categories, there is a choice of five single output models, offering voltages of 3.3 V, 5 V, 12 V, 15 V or 24 V, and two dual output models offering +12/-12 V or +15/-15 V.

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ERRATUM

In the article on the new ELPA board as featured in the September issue of *Sparks Electrical News Magazine*, the photograph alongside was incorrectly captioned – the correct caption should have been: The new ELPA Board of Directors: (seated from left to right), Hano Oelofse, Tertius Oelofse, Helmut Kanwischer, Israel Melodi, Rhyno van der Westhuizen, Graeme Smart, Mike Visser, Gerhard Human, Karen Evert (minute taker) and Richard Evert.

Elsewhere in the article, Richard Evert was listed as being ELPA chairman, whereas he is, in fact, the National Director.

Enquiries: www.elpasa.org.za



FAQs: SANS 164-2 PLUGS AND SOCKET OUTLETS

Since the introduction of the new compact 3-pin plug system to the South African market, there have been questions that are frequently asked. Here are some of them, with answers by SAFEhouse that are applicable and will be for the foreseeable future:

Q: Why was this standard introduced in South Africa?

This standard was originally adopted from the International Electrotechnical Commission (IEC) in 1986 and was called 'The IEC world wide plug and socket-outlet system' which was a rather ambitious title, given that most countries had their own National Systems and really did not want to have to change to some internationally adopted one. However, South Africa persisted and introduced it as a National Standard in 1992. Local manufacturers did not take it up immediately and it took another five years to realise the significant benefits and a further 10 years to complete the work locally. The reason for its introduction and local support was 3-fold:

1. Reduced cost to manufacture.
2. Increased safety for the consumer.
3. Compatibility with 2-pin Euro plugs.

Q: What are the main differences between the old plug and the new one?

This is best described by the following pictures:



OLD PLUG

- Plug is bulky and over engineered for the power it can handle.
- Typically the brass pins weigh 70 g.
- There is no 2-pin plug in the SANS 164-1 Standard.
- This configuration has been with us for over 70 years and is found on both the rewirable and non-rewirable (moulded-on) versions.



- The socket-outlet has a 'flat' face allowing small fingers to touch the live and neutral pins during plug insertion.
- Fitted with a safety shutter operated by the earth pin.
- 2-Pin plugs can only be inserted via a plug-in adaptor.



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In summary, the increased safety features of the new system are:

- The plug pins are partially insulated.
- The socket contacts are within a 10 to 12 mm well.
- The safety shutter is operated by the simultaneous entry of both pins.

Q: Are the new plugs mandatory for all new installations?

SANS 10142-1: The wiring of premises; regulates the installation of socket outlets and in the latest edition (2017 Ed 2), it has become mandatory for all new installations by way of the following clause:

6.15.1.1.1 Except where otherwise specified in this part of SANS 10142, single-phase socket-outlets for general use (see also 6.14.1.4) shall:

- Be of the two-pole and earthing contact type
- Comply with SANS 164-0
- Effective from January 2018 all socket-outlet points for new electrical installations shall include at least one socket-outlet complying with the dimensions of SANS 164-2. Socket-outlets points may also include socket-outlets complying with the dimension of SANS 164-1.

Q: What has been the uptake by developers/ electrical contractors?

Since the fact that prior to January 2018, SANS 164- 2 was listed in SANS 10142 as the 'preferred standard' a moderate uptake was seen in the market especially via the DIY stores, which have offered the combined SANS 164-1 and -2 products for approximately the past five years. However, with the new legislation this has now become the norm.

Q: Given the fact that deaths arising from misuse of the old plugs occur every year in South Africa, do you think enough has been done to alert the man-in-the street to the new plug standard?

From my experience there have been very few recorded instances over the past 30 years, where the plug itself was the cause of death by electrocution. Several other causes, including fires due to short circuits and lack of adequate earth leakage protection, were among those found during investigations by the Chief Inspector.



NEW PLUG

- The new plug is much smaller with a combined pin weight of 15 g. Also the live and neutral pins are partially insulated for increased safety.
- The SANS 164-2 standard includes a 2-pin variation, fully rated up to 16 A.
- This configuration is also becoming increasingly available in rewirable and moulded-on versions.



- The new socket-outlet has a 10 to 12 mm well, making it more compact and allowing the pins to be untouchable during insertion.
- Fitted with a safety shutter operated by both live and neutral pins simultaneously, on entry.
- Allows 2-pin plug entry without use of a plug-in adaptor, thus allowing the direct plugging in of phone chargers and small 2-pin appliances.

Q: I understand there is an adapter for the old plugs to fit into the SANS 164-2 plug. How available are these adapters/ where can one buy them?

Several companies provide plug-in adaptors that fit into SANS 164-1 socket-outlets and have one or more SANS 164-2 configurations for 2-pin plugs. These are available at all supermarkets and DIY outlets. Only one company has adaptors that accommodate the 3-pin SANS 164-2 configuration; however, almost no appliances are fitted with the 3-pin SANS 164-2 plug, to date. This will change in the years to come.

Q: Would you advise homeowners to use the adapters?

Unfortunately life without adaptors and cord extension sets would be very difficult. The use of a '1 to 1' or a '1 to 2' adaptor is perfectly okay for most applications where a conversion from one standard to another is required. However; plugging one adaptor into another is definitely not recommended.

What is recommended though is that in new installations the planning

of extra socket-outlets is considered so as to avoid unnecessary adaptors and cord extensions, since at the offset the relative cost of extra socket-outlets is low compared to a retrofit when the building is completed.

Q: Is some effort being made to get appliance manufacturers to adapt to the new standard?

This is a sore point as most appliances are imported and there's no regulation in place to compel manufacturers and importers to adopt the new standard. This should change gradually as more socket outlets are fitted to fixed installations and demand grows within the market, by the consumer.

There has never been a 'cut-off' envisaged for the transition from SANS 164-1 to SANS 164-2 and it is likely that the two standards will co-exist for many years to come.

By Gianfranco Campetti
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ABB ALRODE MOTOR AND GENERATOR FACILITY NOW FULLY COMPLIANT

ABB South Africa's facility in Alrode, near Johannesburg, was established in 1981 to produce high voltage (HV) machines and specialises in manufacturing to order components for motors and generators. With a commitment to skills development and localisation, and following a recent investment in, and transfer of, knowledge and skills, the facility is now fully compliant with the Department of Trade and Industry's (dti's) >70% local sourcing regulations.

Boasting a working area of 6000 m², the motors and generators area is equipped with a 15 tonne high speed balancing machine, cranes with lifting capacities of 80 tonnes, and a load

test facility of 13,8 kV, 6 mW. The facility is also home to a dedicated, state-of-the-art coil shop, part of ABB's commitment to the region and to modernising local manufacturing facilities in line with the best in the world. The factory is recognised by industry as being a machines manufacturer for safe and classified areas.

Since its inception, the facility has produced a total of >60 000 mW worth of motors with ratings of up to 29 mW, 13,8 kV, running at up to 6000 rpm. The largest motors have had up to 1200 frames and 36 poles. Types include slip ring induction motors, cage induction motors, synchronous motors and generators with ratings

of 550 kW to 20 mW, 355 to 1200 frames, 50/60 Hz, 3,3 to 13,8 kV, variable and fixed speed types.

"We have also designed and built motors and generators tailored for the local market at this facility," says ABB South Africa's MOMG Regional Service Manager, David Warne. "These include high customisable Q range machines (engineered modular motors) designed to directly replace current installations of older obsolete machines, comply with ever advancing safe and classified area standards or meet increased performance requirements," he explains.

Fully compliant with the dti's requirements

Ensuring greater than 70% localisation, ABB's Alrode motor facility is fully compliant with the dti's requirements regarding the following components and manufacturing processes:

- Casting or frame fabrication.
- Fabrication and stator-core winding.
- Fabrication and rotor-core winding.
- Accessories.
- Assembly and testing of fully built units.

In fact, ABB is one of only a few large OEMs in the country that fully meets the dti's requirements.

Benefits

Local manufacture has many benefits for customers, from ABB's improved Broad-Based Black Economic Empowerment (B-BBEE) rating, to reduced costs, improved efficiencies and shortened turnaround times which result in better after sales service and access to parts. Building an agile and customer focused organisation increases ABB's competitiveness in the market, creating opportunities for export into neighbouring markets. This forms part of ABB's focus on customer centricity.

Service and repairs

The facility's after sales and repair service provides fast and effective product support to ensure that ABB or non-ABB motors and generators deliver maximum availability throughout their lifetime. ABB also offers recommended upgrades or replacement machines that offer the best options for enhancing operational lifetime and performance.

Through the application of the latest design techniques and insulation methods, motors and generators repaired by ABB stand to have a longer life within the parameters of their original design criteria. ABB also offers comprehensive design, Finite Element Analysis, diagnostic analysis, testing, balancing and advanced digital twin lifecycle management services.

A dedicated field service offering supports installation, supervision, commissioning, and a range of field bound maintenance services, designed to increase the reliability of the motors and generators.

The Alrode facility is able to offer a full range of genuine OEM spare parts, including commissioning parts, operational parts, preventative maintenance kits and capital parts. Combining the best available materials with superior technology, the electric motors and generators from ABB are designed to operate reliably in every industry and application, no matter how challenging the process or application, with the lowest life cycle costs.

ABB's product lifecycle management model is designed to provide proactive service offerings for increasing availability and performance. The model not only delivers optimum support to end users, but also ensures a smooth transition to a new machine at the end of the current machine's service life.

Typical applications for these motors and generators include blowers, Banbury mixer, chippers, crushers, compressors, conveyors, extruders, fans, hoists, mill stands, mixers, pulpers, pumps, refiners, rolling mill, roller press and sugarcane mill.

Enquiries: +27 (0)10 202 5617

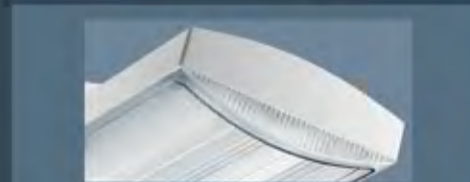


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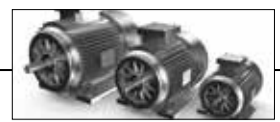
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FUTURE TRENDS FOR MCCs: ENSURING SAFETY FOR ALL

WEG Automation Africa – formerly Shaw Controls – is an ISO 9001 Bureau Veritas certified local manufacturing facility, and has over 30 years' experience as a manufacturer of quality motor control centres (MCCs), distribution boards, medium voltage (MV) switchgear, control desks, PLC and instrumentation enclosures, portable and containerised substations, E-Houses and various other electrical enclosures.

Bevan Richards, Executive of WEG Automation Africa and Tyrone Willemse, Business Development Consultant, are busy navigating a sector of the industry which is in flux. MCCs are governed by IEC 61439 parts 1 and parts 2, and Richards is currently sitting on the SABS 1973 working committee which is aiming to clear up the confusion between IEC 60439, IEC 61439, SANS 10142.1 and suite of SANS 1973.

The ultimate goal of any future standards is twofold; increased user safety and ensuring that South African MCC manufacturers are globally competitive. On the WEG Automation Africa side, this aligns with its drive to increase its African footprint. "If we just look into our new name, there is a big emphasis on the continent," explains Willemse. "We do not want people installing cheap non-standard boards which are dangerous, and we can really add value to that market place." He believes there are many sub-standard European and Asian boards filtering into the African market, and as such, WEG Automation Africa is focusing on technologies and efficiencies to find ways to become competitive. "We are trying to be as lean as possible," he says, "Wherever there is wastage of material or a bottleneck in our production line, we continuously look to improve all areas."

Willemse notes that his role in the organisation is to lead up business development, but at the same time, the technical understanding of MCCs is hugely important within his department. The South African branch has a strong working relationship with the Brazilian head office of WEG, and plays an important role in the R&D, which is executed in Brazil. "For example, we had a large multinational petrochemical company here recently to show them our new fully withdrawable type tested board, CCM06. Our flexibility as a global company allows us to make design changes and customised elements for customers. A client could literally say, we need 400 mm rather than 300 mm wireways; we want our base to be 100 mm not 75 mm; and we need a special feature on the incomer, and it is actioned immediately." A sizeable percentage of the annual profit that the WEG group makes is channelled into R&D, and a third party verified test facility ensures that all compliances can be checked in-house.

Future trends

As to the future of MCCs, Willemse notes that on the horizon he foresees that MCCs will soon follow the MV protection criteria, for instance, in terms of internal arc classifications. "I see a trend in using MV techniques in LV boards. The core reason, again, is safety – we don't want people to be injured." Richards agrees; "Safety comes first and accidental contact should become null and void. We see the withdrawable MCC market becoming more prevalent, as the less people can access equipment within live MCCs, the better." He explains that on a fixed pattern MCC, contractors can open it up, bypass the mechanism and work on it live, whereas with a withdrawable board, because of its nature, contractors cannot work on it unless it has been plugged out and taken to a safe environment to fault find and complete repairs.

Willemse is also hoping for more engagement between Original Equipment Manufacturers (OEMs) and installation contractors. "The contractors connecting external equipment to our MCCs and the OEM need to understand each other's requirements and legal compliance criteria. There is much that can come out of these discussions and they definitely benefit both parties. These two groups of people who are so integrally involved, need to get together," he says.

WEG is confident of South Africa and the future of the electrical market and is fully supportive of local manufacturing, to such an extent that it has recently upgraded two transformer facilities and built an e-house facility. "While other companies are pulling out of local manufacturing, we are increasing our manufacturing portfolio in the country and have taken the stance to be fully entrenched in local manufacturing," concludes Richards.

Enquiries: www.zestweg.com



A 12 m containerised substation housing WEG Automation Africa IEC61641 internally arc tested fixed pattern Motor Control Centre.



Tyrone Willemse (left), Business Development Consultant at WEG Automation Africa, and Bevan Richards, Executive at WEG Automation Africa.



A fully withdrawable IEC61439 and IEC61641 compliant Motor Control Centre manufactured at WEG Automation Africa.

Why WEG Automation Africa uses aluzinc to manufacture MCCs

The replacement of steel by aluzinc in the manufacturing of WEG Automation Africa's motor control centres (MCCs) brings a range of benefits to the company's customers, according to Anderson Kohler, senior manager, operations.

The company traditionally used steel for its MCCs, which must be powder coated in order

to protect it from corrosion. This made it necessary to follow a long process to complete products – a process which aluzinc can now simplify and speed up. The usual process of preparing the MCC panels includes welding, grinding and pre-washing before the powder coating painting process can start. These phases can now be bypassed by using aluzinc, which effectively resists corrosion without a protective coating

being applied. Kohler highlights the extended lifespan of aluzinc, which comprises 55% aluminium, 43,5% zinc and 1,5% silicon. Manufacturers of the product guarantee that it will last for about 35 years before any major maintenance is required. Thanks to its properties, aluzinc can be used across a variety of sectors, offering different benefits to each. With an excellent corrosion resistance in many atmospheric conditions,

Aluzinc offers a huge number of benefits:

- Formable and can be laser cut
- Weldable
- Paintable
- Up to 20-year performance warranty
- RoHs compliant
- Available with a clear anti-finger print sealant
- Uniform and consistent in quality and finish
- Heat resistant up to 315 °C

AC DRIVE MIGRATION AT MOZAL ALUMINIUM

For over 20 years, Rockwell Automation 1336 drives have delivered the drive control required across Mozal, an aluminium smelter near Maputo, Mozambique. Now the industrial automation leader is in the final phase of upgrading this plant-wide drive layer with its Allen-Bradley PowerFlex 755 ac drives, bringing the feature-rich functionality of its flagship drive technology into Mozal's production architecture.

In addition to lowering the risk of system downtime in the future and improving the plant's long-term reliability, far greater process intelligence leading to massive gains in diagnostic capabilities, greater energy efficiency, and enhanced hardware and software support are among the benefits gained with this technology upgrade.

With the PowerFlex 755's intuitive HMI providing on-demand error reporting and diagnostic information, plant maintenance teams will have greater intelligence allowing them to fault-find faster and more efficiently and therefore reduce maintenance downtime. "The PowerFlex 755 delivers a high level of actionable intelligence at the fingertips of maintenance teams, allowing them to diagnose and correct process issues without having to search and consult technical literature to understand the meaning of errors, where they occur, and how they should be addressed," explains Teboho Matlolane, project engineer, Rockwell Automation Sub-Saharan Africa.

Other integrated functions, such as the drive's TorqProve feature, enhance site safety on the many different crane and hoist applications across the smelter. Used to optimise control of load handling and lifting, this feature includes a continuous brake slip monitor that detects load slippages and will automatically hold and safely lower the load.

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SCHNEIDER ELECTRIC LAUNCHES COMPACT MOTOR STARTER SOLUTION

SCHNEIDER ELECTRIC has announced two additional, compact models in its TeSys GV3 range of thermal-magnetic motor circuit breakers, the TeSys GV3P73 and GV3P80.

The two models provide 73 A and 80 A current ratings in a 55 mm width, which is 35% smaller than previously available products of this rating. Both products are tested and proven for IE3 and IE4 class motors. Combining either of these with the new TeSys D Green 80 A rating contactor, creates the industry's most energy-efficient motor starter solution in the smallest size, with simplified PLC connectivity.

"For customers wanting to do more with their control panels, the TeSys GV3 range offers compact, industry-leading technology," says Schneider Electric South Africa's Product Application Engineer, Christo Kotze.

"TeSys GV3 and TeSys D Green are a complete 37 kW motor starter solution that will reduce energy consumption, reduce installation time, and save valuable space in machines and high-density electrical cabinets. It also simplifies integration with automation architectures, with a direct interface to a PLC, using 500 mA output that is a capability available only from Schneider Electric."

Ergonomic and reliable

"In applications without the use of a contactor, the TeSys GV3 series enables local manual control of a motor through use of an ergonomic, rotary handle or extended handle. Its user-friendly design provides a high-visibility trip indication. "The new models also feature patented EverLink connectors that save space and assembly time, while ensuring bare cable connections are as safe as compression lugs. Innovative creep compensation technology improves vibration withstand, negating the need for periodic re-tightening."

Complete, eco-design solution in 55 mm

Compact motor starter solutions are available in two- or three-product configurations, including motor circuit breakers, contactors and a new overload relay, with total motor starter height reduced by as much as 50%.

Innovative features

- 35% smaller than previously available products of this rating.
- Combining with new TeSys D Green or TeSys D contactors creates a complete motor starter solution up to 80 A rating in 55 mm width.

- Simplified integration with PLCs with 500 mA outputs.
- Ergonomic rotary handle and trip indicator.
- Patented EverLink creep-free connectors require no re-tightening.
- Tested and proven for IE3 and IE4 class motors.

"TeSys GV3, TeSys D and TeSys D Green are part of the Schneider Electric motor control offering. Our protection and switching offers provide safety and reliability due to EverLink connectors and coordination between breaker and contactor. It makes motor control applications more efficient and sustainable, thanks to the low energy consumption of these ranges with Green Premium Ecolabel," concludes Kotze.

Enquiries: +27 (0)11 245 6400



AFTERMARKET SERVICE, DISTRIBUTION NETWORK KEY TO SUCCESS IN AFRICA AND THE MIDDLE EAST

The secret to Cummins' ongoing success in Africa and the Middle East is its extensive aftermarket support and well-established distribution network throughout the continent. This is according to newly-appointed Cummins Distribution Director Kwame Gyan-Tawiah. Currently all distributor Country Managers and General Managers report to Gyan-Tawiah.

Apart from recently launching the Power Hub in Waterfall City, Johannesburg, Cummins has a Regional Distribution Centre (RDC) for Southern Africa, also based in Waterfall, a Regional Distribution Centre (RDC) in Ghana, and has appointed its first 100%-owned distributor in Morocco. This gives the OEM a significant end-to-end logistics capability throughout the continent.

"The strength of the company lies in its focus on customer support. That makes for better products at the end of the day, and is why we have distribution organisations at strategic locations," Gyan-Tawiah explains. Currently, Cummins has a presence in 12 countries in Africa, including South Africa, Botswana, Mozambique, Zambia, Nigeria, Ghana, Senegal, Zimbabwe, Angola, Ivory Coast and Morocco. In addition, it appoints independent distributors in other areas where it wants to make inroads, and enters into joint ventures, such as in the Middle East and East Africa regions.

Gyan-Tawiah says that customer service, which is the linchpin for Cummins' success on the continent, consists of three major elements. The first is parts availability to support the products sold. "All these entities have parts warehouses, and hold parts readily needed at any point in time by customers in those environments, and the engines they use."

The RDC strategy facilitates this ready parts availability throughout the continent. "It means we have made a parts supply line, by road and air, in Africa. We are therefore capable of making parts readily available to our customers when, and where, they need them," Gyan-Tawiah highlights.

"The second major element is our technical capability. We continue to learn and improve as our engine technology develops. Otherwise you lose track of what is happening in the in-



The Power Hub in Waterfall City

dustry. Hence, we ensure that our technicians are always up to date with the latest advancements by means of our Training Centres," Gyan-Tawiah adds. These are located in South Africa, Morocco, Nigeria and Dubai at present.

"The best way to keep our engines running is for our customers to understand the engines they are using. We therefore ensure their technicians remain knowledgeable so as to avoid any bad practice that might have a detrimental impact on the engines and the brand as a result," Gyan-Tawiah points out. This training is extended to independent distributors to ensure the highest quality standards are maintained across the region.

In terms of opportunities for business growth in Africa, Gyan-Tawiah stresses that most African countries do not generate sufficient power for their own requirements, and thus rely heavily on alternative sources of power. This is why Cummins produces diesel- and gas-driven engines for the African market, in order to tap into the potentially lucrative oil and gas industry on the continent.

"Another critical factor is that Africa is a receiving continent because, with the exception of South Africa, no other country really manufactures everything it needs," Gyan-Tawiah notes. This means that the vessels needed for the burgeoning marine industry, for example, are imported from as far afield as Malaysia and Singapore. This represents a significant opportunity for Cummins, as these vessels have marine engines that need to be serviced and maintained," Gyan-Tawiah says.

In terms of future trends such as electrification, a strategy that Cummins is driving aggressively in developed markets such as Europe and the

United States, Gyan-Tawiah is of the opinion that diesel will remain the primary fuel source in Africa for the next 50 years. "I feel Africa still has a long way to go. If you look at emissions control, there are few or no regulations. Consider electric vehicles, for example. Many countries cannot even supply power to their industries and neighbourhoods. However, it is evolving. We are taking note of such developments elsewhere, but Africa is not nearly on that level yet."

What does this mean for the future of Africa? "Africa is the next frontier of development. The growth indices for global economies have four or five African countries in the top ten. Africa is the fastest-growing continent. This has to be balanced with the challenges we face, from political to economic and social," Gyan-Tawiah asserts. However, this is where a global giant like Cummins stands to play such a significant role in the future development of the entire continent.

"Cummins believes in conducting business straight down the line, no matter what it costs. We prefer to walk away from business rather than get involved in any unethical practices. If we can get 20 huge multinationals the size of Cummins in Africa, ensuring that the highest business ethics are upheld, it will have a major impact on Africa as a whole."

Gyan-Tawiah points out that Cummins' significant investment in infrastructure in Africa to date means it is here for the long haul. "As a company, we are a huge advocate of Africa, which is why we have put up our magnificent Power Hub in South Africa and invested \$30 million in Nigeria alone."

Enquiries: +27 (0)11 589 8512

REWIND OF 36 MW COMPRESSOR MOTOR STATOR YIELDS 'BEST EVER' TEST RESULTS

MARTHINUSEN & COUTTS (M&C) recently provided a solution to an irregularity that occurred in the stator of a large 36 mW compressor motor deployed at Sasol's Secunda plant.

The results of final tests, conducted by HV Test Field Services on the stator after M&C had completed all the necessary repairs on it, were found to be the best among many such tests conducted on similar equipment over a period of several decades.

Initially a Sasol maintenance team discovered during a routine inspection in January 2018 that the flux shield mountings on the stator were faulty, whereupon Sasol awarded M&C a contract to identify the cause of the irregularity and offer a remedy.

"We tested the stator winding, which we found to be fine, but confirmed that there was a defect in the flux shield and recommended that it be repaired, as there was a risk of it damaging the winding if left to continue operating in its existing condition. To repair the flux shield meant also having to remove the winding and perform a rewind on the stator," said Rob Melaia, M&C's engineering and technical executive.

Sasol accepted M&C's recommendation and in August last year assigned it to perform the required repairs. "In addition to replacing the old bars with new bars purchased from a reputable coil manufacturer in the US, we did a very specific modification to repair the flux shield to prevent a recurrence of the defect in the future," Melaia stated.

"On investigating the defect we found that the electrical current, instead of flowing only in the flux shield as it ought to have done to prevent the core from overheating, had started flowing in the mounting bolts, so causing wear by electrical arcing in the mounting holes and the mounting studs," he explained.

The solution M&C's repair team provided was to fit copper braid straps from several points on the flux shield to the stator body to reroute the current in such a way as to prevent a repeat of the damage as witnessed. To confirm the effectiveness of the solution M&C arranged to have the refurbished stator tested by local independent test authority HV Test Field Services.

Partial discharge and Tan Delta tests were conducted, being the recognised tests for determining the integrity and efficiency of medium voltage windings. The results were:

- A maximum partial discharge of below 250 PicoCoulombs (pC) at 120% of phase voltage.
- In the Tan Delta tests the dielectric dissipation factor was found to be 65×10^{-4} at 20% of phase voltage and 105×10^{-4} at 100% of phase voltage.

"These test results were the best ever to be achieved among the numerous machines on which HV Test has conducted tests of this kind," Melaia pointed out. "We have every reason to be proud of this outcome as it says volumes about M&C's expertise in this field, both in terms of correctly diagnosing and repairing faults in a wide range of large rotating equipment, as well as providing the appropriate and most effective solutions for them," he concluded.

Enquiries: www.mandc.co.za

Final test results were found to be the best among many such tests conducted on similar equipment over a period of several decades.





WORKING KNOWLEDGE WITH TERRY MACKENZIE HOY

DISCUSSING MOTOR CONTROL CENTRES

The original motor control centres, back in the day, consisted of a vertical marble slab (yes, marble, as in the stuff they make gravestones from). The slab had, mounted on it, a number of knife switches, and cables were connected to the outgoing terminals of the knife switches. Below the knife switch were wire coils through which some of the current to the outgoing circuit flowed. The coils were wrapped around glass tubes, filled with oil. In the oil was a metal plunger; if the outgoing current was greater than the circuit rating, the metal plunger was drawn up magnetically and struck a lever which tripped the knife switch open. The extinguishing arc resulted in a huge bang and arc with flame, all of which was why they had the marble slab to begin with. The whole control centre was enclosed by a wire fence.

Then, in 1911, Hein Moeller of Klockner Moeller invented the three phase insulating oil immersed contactor which did away with the knife switches and the terrifying arc. It also had the huge benefit that if the main supply failed, the contactor dropped out, disconnecting the motor so that if the mains returned suddenly the motors would not restart at the same time and cause the main supply to trip on over current.

I've spent years explaining the importance of this to PLC program-

mers – the motor must drop out if there is a power dip, but no, they never get it. With the end of the knife switch era the marble vanished as well and the motor starters were mounted in metal frames. After a while the air break contactor was invented in 1924 (by Telemecanique) and motor control centres became metal enclosures housing contactors clipped to rails and supplying outgoing circuits to motors. The incoming supply to the contactors was from live wires strung between insulators. These looked like tram or trolley-bus wires as used by electric trams in the street, and soon became known as 'bus wires' and, as they became thicker, as 'busbars'.

After a time it was realised that factories had to have very reliable motor control centres – if the motor control centre failed then the factory would stop working. Thus it became the practice to have each motor feeder in a separate compartment and for the whole feeder to be capable of disconnection from the busbars while the rest of the switchboard was live. This allowed the feeder controls (contactor, relays etc.) to be taken to a workshop and repaired if necessary.

There is a point at which motor control centres are now over designed. They have electronic circuits which supply detailed information about motor loadings and draw graphs and allow very elaborate

switching to be done ... none of which is necessary. In any good maintenance plan the electrician should visit the motor control centre every two weeks and just sniff around to see that all is working normally. We shouldn't make the MCC too complicated – more stuff to go wrong. One of the best MCCs I have seen was supplied by the Japanese gasoline company in 1968. The ammeters are all those cheap and robust types you see on battery chargers. The 'on' light is neon and there is no 'off' light. All the overload indications or circuit breaker trip auxiliaries are wired to a single circuit. If there's a fault then it triggers a flashing light on top of the MCC building.

One of the problems in RSA is that we're not Europe. I know this seems obvious but the fact of the matter is that all smart, complex electrical monitoring things sooner or later stop working if the maintenance environment is not top notch. It seldom is. Our electricians are good but their main skill is in keeping things going. This does not mean that they are experts or even know about systems such as Mod-Bus or ProfiBus. The MCCs are becoming more complicated since manufacturers always want to offer more and more, even if it's not needed. Stick to the older designs, I say. But that's just me. Smarter people may know much better.

WEG IE3 COMPLIANT MOTOR CONTROL AND PROTECTION

The increased move towards the use of IE3 electric motors has made it increasingly important that the most appropriate starting method be selected to ensure optimum performance. With this move it is essential that the motor switching and protection components are engineered to meet the demands of the IE3 motor.

Generally, the most basic starting method for an electric motor would be a direct online starter or star delta starter. However, older generation switchgear has not been engineered for IE3 motor compatibility. Older generation switchgear may generate nuisance tripping. Not only is this undesirable, it can also have a severe knock-on effect in terms of operational productivity and efficiencies.

WEG IE3 compliant low voltage switchgear has been engineered to offer absolute reliability when using WEG switchgear to start and operate WEG IE3 motors. Users can be confident that when using WEG IE3 compliant switchgear, their drive system will provide the highest levels of energy efficiency over a long service life. This will, in turn, translate into a reduction in the total cost of ownership (TCO) while complying with current environmental regulations.

WEG motor protective circuit breakers

Typically, motor protective circuit breakers are affected most when starting electric motors because of sensitivities to transients and instantaneous values of current.

WEG circuit breakers were evaluated specifically in terms of this and the multiple of short circuit release was changed from 12 to 13 times the rms value of the rated current. Following this modification, extensive testing was conducted to verify that, with these modifications, the whole range of WEG circuit breakers is IE3 compliant.

WEG contactors

The entire range of WEG contactors is IE3 compliant. The application of sound engineering principles ensures that there is no mechanical or electrical lifespan reduction, or an increase in the contactor's coil consumption.

WEG overload relays

Overload relays are designed to protect motors thermally against overload conditions and, unlike motor protective circuit breakers, these are not sensitive to instantaneous currents. WEG solid-state and thermal overload relays conform to IE3 motor application

Significantly, as a leading manufacturer of premium (IE3) and super-premium (IE4) electric motors, WEG has developed extensive expertise in IE3 equipment conformity and all WEG's current switchgear and protection devices can be used without restriction to ensure the reliable operation of IE3 motors.

Zest WEG Group's technical team is able to assist customers in the appropriate selection of IE3 compliant control and protection components to optimise the efficiency of motor installations.

New products are continually being added to the WEG low voltage switchgear range, leveraging off the ongoing research and development conducted by WEG Brazil. These products are available off the shelf from the Zest WEG Group and include contactors, motor protection relays, motor circuit protection breakers, push buttons and indicating lights, field isolator stations, motor starters in either polycarbonate or sheet metal enclosures and other associated products.

Backed by SABS certification, the WEG switchgear product range is gaining popularity in the mining, general industry, commercial and domestic sectors. Among the leading products in the range is the WEG CSW range of push buttons and pilot lights, now available in complete sets; contactors and thermal overload relays; direct online starters; a full range of miniature circuit breakers and the most intelligent product in the range – the innovative SRW01 smart relay for protecting motors of high value and preventing extended downtime. This low voltage electric motor man-

agement system incorporates state-of-the-art technology and network communication capabilities, and its modular concept makes it suitable for a variety of applications.

A full catalogue of WEG switchgear products is accessible online through the Zest WEG Group's website at www.zestweg.com. These products are sold out of a sales centre at the company's Linbro Business Park facility in Sandton, easily accessible from Johannesburg, Pretoria and Krugersdorp.

Enquiries: +27 (0)11 723 6000



A WEG solid state overload relay.

WEG motor protection circuit breakers and contactor systems.

SEW-EURODRIVE LAUNCHES GENERATION X.E

Generation X.e represents the latest iteration of the highly-successful X series of industrial gear units, which has gained significant traction globally in industries as diverse as mining, cement and sugar mills and power generation. "It was decided to introduce the latest series to South Africa in response to the overarching industry need for energy-efficiency and optimisation," explains SEW-Eurodrive managing director, Raymond Obermeyer.

The specific client requirements addressed by the new series are maximum drive utilisation, peak load, temperature and environmental factors, and extended service intervals. The units are particularly suited to harsh operating environments such as mining and general industry. Here an increased thermal saving of 32% has been achieved mainly by reducing the periods between oil changes. Other advances include an improved bevel pinion housing, optimised bearing preload, a non-contact sealing system, a universal cover with a fan system, and optimised gearing topology.

Obermeyer highlights that the main benefit of the Generation X.e is that it introduces a customer-oriented focus into the tried-and-tested X series solution.

Enquiries: +27 (0)11 248 7000

Transformer health

Boosting asset reliability through understanding transformer health.

Oil analysis is typically a critical first step in any power transformer analysis.

Testing can detect developing internal faults and oil-related problems.

With proper diagnostic methods, catastrophic failures can be avoided.

For on-load tap changers, we offer a special programme.

You have online access to data via our mobile app.

The unexpected failure of a transformer can result in costly unscheduled downtime. Our transformer condition monitoring services help to avoid component failure and the associated loss of income and productivity.

Download our NEW Condition Monitoring App. WearCheck Mobile. Anytime, Anywhere.

www.wearcheck.co.za [wearcheckafrica](https://www.facebook.com/wearcheckafrica)

t: +27 (0)31 700 5460
e: support@wearcheck.co.za



MANUFACTURERS

ABB South Africa
Aberdare Cables
ACTOM Protection and Control
Alvern Cables
CCG Cable Terminations
Clearline Protection Systems
Crabtree South Africa
Danfoss
Dehn + Söhne
Dry Ice International
HellermannTyton
Helukabel
Lapp Group
Legrand
O-Line
Phoenix Contact
Power Process Systems
Radiant Group
Sabelco Electrical Industries
Schneider Electric South Africa
South Ocean Electrical Wire Co
Stone Stamcor
Superlume
Switchboard Manufacturers
Three-D Agencies
Tilt-Tech
Voltex
Waco
WearCheck
WEG

DISTRIBUTORS

ACDC Dynamics
ACTOM Electrical Products
ARB Electrical Wholesalers
Atlas Group
Bellco
Brother International South Africa
Cabstrut
CBI-electric : low voltage
Central Support Systems
Clearline Protection Systems
Crabtree South Africa
Dehn Africa
DRH Components
Dry Ice International
Electrahertz
HellermannTyton
Invirotel
Khanyisa Electrical Suppliers
Lapp Group
Magnet
Major Tech
MCE Electric
Phambili Interface
Phoenix Contact
Power Process Systems
Radiant Group
R&C Instrumentation
Sabelco Electrical Industries
Siba Fuses
Superlume
Three-D Agencies
Tilt-Tech
Versalec
Voltex
Voltex LSis
Waco
Zap Electrical Wholesalers
Zest WEG Group

ONLINE DISTRIBUTORS

HellermannTyton
Siba Fuses

CONTACTS

ABB South Africa
Customer contact centre
Aberdare Cables
Jyoshtie Dhunes
ACDC Dynamics
Elmari Erasmus/Dirk Klynsmith
ACTOM Electrical Products
Warren Filippa
ACTOM Protection & Control
Faisal Hoosen
Alvern Cables
Stephen Liasides
ARB Electrical Wholesalers
Sales
Atlas Group
Annie Storar
Bellco
Shiraj Wentzel
Brother International South Africa
Munna Desai
Cabstrut
Juanita Kanagan
CBI-electric: low voltage
Jaco Viljoen
CCG Cable Terminations
Arthur Cameron
Central Support Systems
Faruk Cassim
Clearline Protection Systems
Tanya/Rakesh
Crabtree South Africa
Sales
Danfoss
Stephen Brown
Dehn Africa
Kirk Risch
DRH Components
Rob Hare
Dry Ice International
Johan van den Bergh

CONTACTS

Electrahertz
Frank Proude (Pta) Peet Lourens (Jhb)
HellermannTyton
Andrew Edwards
Helukabel
Doug Gunnewegh
Invirotel
Modishane Sebona
Khanyisa Electrical Suppliers
Dominic Kalil
Lapp Group
Sales
Legrand
Johan Bosch
Magnet
Jenine Pillay
Major Tech
Werner Grobbelaar
MCE Electric
Sales
O-Line
Sales
Phambili Interface
Steve Lea
Phoenix Contact
Carl Coetzer
Power Process Systems
Sales
Radiant Group
Alfred Weldon
R&C Instrumentation
Gerhard Otto
Sabelco Electrical Industries
Marc Moreau
Schneider Electric South Africa
Sales
Siba Fuses
HI Hassen
South Ocean Electrical Wire Co
Yasmin Mahomed
Stone Stamcor
Mark Talbot
Superlume
Willie Garbers
Switchboard Manufacturers
Josh Berman
Three-D Agencies
Mark Jenkins
Tilt-Tech
Linda Hanekom
Versalec
Roland Fry
Voltex
Hugh Ward
Voltex LSis
Rose Schulz
Waco
Jaco Coetzee
WearCheck
Kay Meyrick
Zap Electrical Wholesalers
Sales
Zest WEG Group
Sales

DRIVES AND SOFT STARTERS

ABB South Africa
Full range of drives and soft starters
ACDC Dynamics
Full range of Vacon VSDs and Aucom soft starters
ACTOM Protection & Control
VSD panels; soft-starters
ARB Electrical Wholesalers
Full range of drives/soft starters
Bellco
Full range of drives/soft starters
Danfoss
Danfoss and Vacon variable speed drives; Danfoss soft starters
Electrahertz
Full range of drives and soft starters
Khanyisa Electrical Suppliers
Full range of drives and soft starters
Magnet
Range of drives and soft starters
MCE Electric
Full range of Hyundai VSDs
Power Process Systems
Full range of drives/soft starters
Voltex
Full range of drives/soft starters
Zap Electrical Wholesalers
Full range of drives/soft starters
Zest WEG Group
Full range of low voltage and medium voltage drives and soft starters

ARMoured/SHIELDED CABLES

Aberdare Cables
Bells & Mains
ACTOM Electrical Products
Armoured and shielded cables
ARB Electrical Wholesalers
Full range of armoured and shielded cables
Atlas Group
Full range of armoured/shielded cables
Bellco
Full range of armoured/shielded cables
Electrahertz
Full range of armoured/shielded cables
HellermannTyton
A variety of wire strippers and cutters: PVST46 – PV stripping tool; T-Type – Wire Stripper and Cutter; ASS103 – Cable stripper; PTS4 – Wire stripper and cutter; YC1607A – Wire stripper; 45092 – Stripmaster
Helukabel
Full range of armoured and shielded cables
Khanyisa Electrical Suppliers
Full range of armoured/shielded cables
Lapp Group
Unitronic data communication cables; Olfex power and control cables
Magnet
Range of armoured and shielded cables
Power Process Systems
Full range of armoured and shielded cables
South Ocean Electrical Wire Co
Full range of armoured and shielded cables

ARMoured/SHIELDED CABLES

Voltex
Full range of armoured and shielded cables
Zap Electrical Wholesalers
Full range of armoured and shielded cables

CABLE SUPPORT SYSTEMS

ABB South Africa
Full range of cable support systems
ACDC Dynamics
Wide range of Gewiss and Ardic cable support systems
ACTOM Electrical Products
Cable support systems to suit all installations
ARB Electrical Wholesalers
Full range of cable support systems
Atlas Group
Full range of cable support systems
Bellco
Full range of cable support systems
Cabstrut
Full range of cable support systems
Central Support Systems
Full range of cable support systems
Electrahertz
Full range of cable support systems
HellermannTyton
Cable securing which includes a range of slotted and solid trucking
Khanyisa Electrical Suppliers
Full range of cable support systems
Magnet
Range of cable support systems
O-Line
Full range of cable support systems
Phoenix Contact
Trunking
Power Process Systems
Full range of cable support systems
Sabelco Electrical Industries
Full range of cable support systems
Voltex
Cabstrut range of cable support systems
Zap Electrical Wholesalers
Full range of cable support systems

GEARBOXES FOR MOTOR APPLICATIONS

ARB Electrical Wholesalers
Full range of gearboxes for motor applications
Bellco
Full range of gearboxes for motor applications
Dry Ice International
Cleaning of motors and gearboxes with dry ice blasting
Electrahertz
Full range of gearboxes for motor applications
Magnet
Range of gearboxes for motor applications
Stone Stamcor
Hydro-Mec European quality gearboxes
R&C Instrumentation
Vibration switches and transmitters
Voltex
Full range of gearboxes for motor applications

CONTACTORS, BREAKERS, RELAYS

ABB South Africa
Full range of contactors, breakers, relays
ACDC Dynamics
Covering all low to medium voltage needs from brands including TC, C&S, Gewiss and Teraskai
ACTOM Electrical Products
Complete range of low voltage circuit breakers, isolators, earth leakage devices and wiring accessories
ACTOM Protection & Control
TAIAN contactors/relays
ARB Electrical Wholesalers
Full range of low voltage circuit breakers, isolators, earth leakage devices and wiring accessories
CBI-electric: low voltage
Mini contactor relays up to 12 A; contactors and contactor relays three- and four-pole; AC-1 contactors up to 2 600 A; AC-3 contactors up to 1 600A; overload relays, bi-metal up to 630 A; electronic units up to 1 600 A
Magnet
Range of contactors, breakers, relays
DRH Components
Earth leakage relays
Dry Ice International
Cleaning of electrical apparatus with dry ice blasting
Electrahertz
Full range of contactors, breakers, relays
Khanyisa Electrical Suppliers
Full range of contactors, breakers, relays
Legrand
Full range of MCBs, MCCBs, ACBs and contactors
Major Tech
Comprehensive range of miniature circuit breakers 3 kA MCB series; 6 kA MCB series; 6 kA MCB series, earth leakage and isolator series
MCE Electric
MCE Contactors – Full Range, MCE Relays – Full Range, Onesto Circuit Breakers – Full Range, Schenker Circuit Breakers – Full Range
Phoenix Contact
Relays, solid state motor starter
Power Process Systems
Full range of contactors, breakers and relays
R&C Instrumentation
Full system power management local and via Internet
Schneider Electric South Africa
Full range of contactors, breakers and relays
Switchboard Manufacturers
LV distribution boards that contain contactors, breakers, relays, changeovers and can be used to supply power to motors and motor controllers
Voltex
Full range of contactors, breakers, relays
Voltex LSis
Full range of contactors, breakers, relays
Zap Electrical Wholesalers
Full range of contactors, breakers, relays
Zest WEG Group
Full range of contactors; breakers; relays

MOTOR PROTECTION AND SURGE PROTECTION

ABB South Africa
Full range of motor and surge protection
ACDC Dynamics
Extensive range of motor and surge protection products

MOTOR PROTECTION AND SURGE PROTECTION

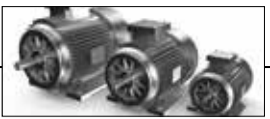
ACTOM Protection & Control
Motor protection relays
ARB Electrical Wholesalers
Full range of motor protection/surge protection
Atlas Group
Full range of motor and surge protection
Bellco
Full range of motor and surge protection
CBI-electric: low voltage
Motor protection standard and electronic up to 65 A; DC protection for solar applications up to 63 A
Clearline Protection Systems
Full range of motor and surge protection
Dehn Africa
Surge and lighting protection
DRH Components
Motor protection relays
Electrahertz
Full range of motor and surge protection
HellermannTyton
Surge plugs: TSPIA and TSPIAF – High surge handling capabilities
Khanyisa Electrical Suppliers
Full range of motor and surge protection
Legrand
Full range of MCBs, MCCBs, ACBs and contactors
Magnet
Motor and surge protection
MCE Electric
Onesto and Schenker Surge Arrestors – Full Range
Phambili Interface
Full range of motor and surge protection
Phoenix Contact
Surge protection
Power Process Systems
Full range of motor and surge protection
Schneider Electric South Africa
Acti9 DIN-mounted iPF Type 2 or 3 LV surge arresters; Acti9 DIN-mounted iPRD Type 2 or 3 LV withdrawable surge arresters; Tesys power control and switching contactors, Tesys T motor management system
Siba Fuses
Full range of fuses up to 12 kV for motor protection
Switchboard Manufacturers
Power factor correction boards to reduce electricity bills as a result of high reactive charges
Voltex
Full range of motor and surge protection
Voltex LSis
Full range of motor and surge protection
Waco
Range of motor and surge protection
WearCheck
Condition monitoring specialists
Zest WEG Group
Full range of motor protection and surge protection

CABLE MANAGEMENT ACCESSORIES

ABB South Africa
Full range of cable management accessories
ACDC Dynamics
Full range of wiring accessories
ACTOM Electrical Products
Full range of accessories for all types of installations
ARB Electrical Wholesalers
Full range of cable management accessories
Atlas Group
Full range of cable management accessories
Bellco
Full range of cable management accessories
Brother International South Africa
Full range of cable management accessories
Cabstrut
Full range of cable management accessories
Central Support Systems
Full range of cable management accessories
Crabtree South Africa
Full range of cable management accessories
Electrahertz
Full range of cable management accessories
HellermannTyton
Full range of cables ties, cable identification, protective sleeves and labels including printers
Helukabel
Helukabel glands, connectors, cable protection
Khanyisa Electrical Suppliers
Full range of cable management accessories
Lapp Group
Cable accessories including UV resistant cable ties, steel cable ties and twist tail cable ties; Fleximark cable marking products
Legrand
Full range of cable management systems
Magnet
Cable management accessories
MCE Electric
MCE – Slotted, Solid Wall and Floor Trunking; Canal Plast – Slotted Trunking and Flexible Wiring Ducts; MCE – Cable Joint Kits
O-Line
Full range of cable management systems
Phambili Interface
Full range of cable management accessories
Phoenix Contact
Labels, marking systems
Power Process Systems
Full range of cable management accessories
Radiant Group
Full range of cable management accessories
Three-D Agencies
Full range of cable management accessories
Voltex
Full range of cable management accessories
Zap Electrical Wholesalers
Full range of cable management accessories

DISPLAYS

ACDC Dynamics
Comprehensive range of displays, energy meters, digital multimeters, network analysers and panel meters – digital and analogue
ARB Electrical Wholesalers
Full range of displays
Electrahertz
Full range of displays
HellermannTyton
T8051 – Process Calibrator
Invirotel
Full range of displays
Khanyisa Electrical Suppliers
Full range of displays



DISPLAYS

Legrand
IME range of measuring instrument displays

Magnet
Range of displays

Power Process Systems
Full range of displays

Phoenix Contact
Energy meters

Radiant
Full range of displays (meter reading, etc.)

Voltex
Full range of displays

Zest WEG Group
Electronic PFO1 range of power factor meters; MMW range of power meters

FANS FOR MOTOR APPLICATIONS

ACDC Dynamics
Extensive range of fans – OErre and others

ARB Electrical Wholesalers
Full range of fans for motor applications

Bellco
Full range of fans for motor applications

Electrahertz
Full range of fans for motor applications

Khanyisa Electrical Suppliers
Full range of fans for motor applications

Magnet
Fans for motor applications

Power Process Systems
Fans for motor applications

Sabelco Electrical Industries
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 (wiring inside the terminal box)

ACTOM Protection & Control
Range of wiring and wiring accessories for motor applications

Alvern Cables
Permotrail; Permo power; ALVK R-vK trailing cable; HO7; Singleflex

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

Bellco
Full range of wiring and wiring accessories for motor applications

Electrahertz
Full range of wiring and wiring accessories for motor applications

HellermannTyton
Full range of wiring accessories including tools

Helukabel
Full range of wiring and wiring accessories for motor applications

Khanyisa Electrical Suppliers
Full range of wiring accessories for motor applications

Legrand
Full range of wiring accessories for motor applications

Magnet
Range of wiring accessories for motor applications

MCE Electrical
Full range of MCE Industrial Plugs and Sockets; full range of Onesto Industrial Plugs and Sockets

Phambili Interface
Full range of wiring accessories for motor applications

Phoenix Contact
Marking systems

Power Process Systems
Full range of wiring and wiring accessories

R&C Instrumentation
Infrared inspection windows

Stone Stamcor
Cutters, strippers and crimping tools

Voltex
Full range of wiring and wiring accessories

Voltex LSis
Full range of wiring and wiring accessories

Waco
Full range of wiring and wiring accessories

CABLE GLANDS, LUGS, AND FERRULES

ACDC Dynamics
Full range of cable glands, lugs, ferrules

ACTOM Electrical Products
Full range of termination and jointing requirements

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

Atlas Group
Full range of cable glands, lugs, ferrules

Bellco
Full range of cable glands, lugs, ferrules

CCG Cable Terminations
Range of cable glands, lugs, ferrules

Electrahertz
Full range of cable glands, lugs, ferrules

HellermannTyton
Full range of cable glands, lugs and ferrules as well as a large range of crimpers (hydraulic and manual)

Helukabel
Full range of cable glands, lugs, ferrules

Khanyisa Electrical Suppliers
Full range of cable glands, lugs, ferrules

Lapp Group
Skintop cable glands

Legrand
IP68 cable glands; Cabstop cable glands

Magnet
Range of cable glands, lugs, ferrules

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

Phoenix Contact
Full range of cable glands, lugs, ferrules

Power Process Systems
Full range of cable glands

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

Superlume
A variety of IP rated connection cable glands

Three-D Agencies
Full range of cable glands, lugs, ferrules

Voltex
Full range of cable glands, lugs, ferrules

CABLE GLANDS, LUGS, AND FERRULES

Waco
Full range of cable glands, lugs ferrules

Zap Electrical Wholesalers
Full range of cable glands, lugs ferrules

FLAMEPROOF

Aberdare Cables
Flamosafe

ACDC Dynamics
Full range of flameproof products; lighting enclosures, limit switches, plugs, sockets, pushbuttons, fans, sirens, basons and accessories

ARB Electrical Wholesalers
Full range of flameproof products

Atlas Group
Full range of flameproof products

Bellco
Full range of flameproof products

Electrahertz
Full range of flameproof products

Helukabel
Full range of flameproof products

Khanyisa Electrical Suppliers
Full range of flameproof products

Magnet
Range of flameproof products

Phambili Interface
Full range of flameproof products

R&C Instrumentation
Ex-certified infrared thermometers

Superlume
A variety of flameproof lighting fixtures

Three-D Agencies
Full range of flameproof products

Voltex
Full range of flameproof products

Waco
Full range of flameproof products

Zest WEG Group
Full range of flameproof products

CONTROLS FOR MOTOR APPLICATIONS

ABB South Africa
Full range of controls for motor applications

ACDC Dynamics
Full range of controls for motor applications

ACTOM Protection & 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-electric: low voltage
RMQ pilot devices (16 – 22.5 mm); emergency stop push buttons illuminated and non-illuminated; FAK foot and palm switches; signal towers; full range of push buttons including key operated, illuminated, LED, activators and accessories

Electrahertz
Full range of controls for motor applications

HellermannTyton
Panel plate labels (thermal transfer): Helatag1221 – Silver, Helatag 1220 – White

Khanyisa Electrical Suppliers
Full range of controls for motor applications

Legrand
Complete range of control and signalling units; industrial sockets, plugs, appliance inlets and interlocked switched sockets

Magnet
Range of controls for motor applications

MCE Electric
Full range of MCE Pushbuttons, Control Station and Pendant Controls

Phambili Interface
Full range of controls for motor applications

Power Process Systems
Full range of controls for motor applications

Tilt-Tech
Specialised potentiometers; inclinometers; digital levels

Voltex
Full range of controls for motor applications

Voltex LSis
Full range of controls for motor applications

Zest WEG Group
Full range of controls for motor applications including pushbuttons, selector switches and isolators

CABINETS FOR MOTOR APPLICATIONS

ACDC Dynamics
Full range of cabinets and enclosures for all purposes

ACTOM Protection & Control
MCCs; special and standard starters

ARB Electrical Wholesalers
Full range of cabinets for motor applications

Dry Ice International
Cleaning of cabinets with dry ice blasting

Electrahertz
Full range of cabinets for motor applications

Khanyisa Electrical Suppliers
Full range of cabinets for motor applications

Magnet
Cabinets for motor applications

MCE Electric
Full range of Onesto mild steel and stainless steel enclosures

Phambili Interface
Full range of cabinets for motor applications

Power Process Systems
Full range of cabinets for motor applications

R&C Instrumentation
Infrared inspection windows

Sabelco Electrical Industries
Full range of cabinets for motor applications

Voltex
Full range of cabinets for motor applications

Voltex LSis
Full range of cabinets for motor applications

Waco
Full range of cabinets for motor applications

Zest WEG Group
Full range of cabinets for motor applications



+27 (0)11 879 2000



+27 (0)11 683 0641



+27 (0)11 874 7600



+27 (0)11 723 6000



+27 (0)10 202 3300



+27 (0)11 392 3804



+27 (0)12 345 5332



+27 (0)11 452 1415



+27 (0)11 363 3427

ELECTRICAL WINDOW MEANS SAFE COMPLIANCE WITHOUT COMPROMISE

With Fluke's new PQ400 Electrical Measurement Window, a permanently installed interface, technicians have safe and near-instant access to electrical panels for making critical power quality and energy measurements.

The PQ400, available from Comtest, installs using a standard step drill bit and electro-hydraulic hole punch (114.3 mm hole diameter), and allows users to make three-phase voltage, current and ground connects covering most measurement configurations. Once installed, users can simply unlock the window cover, lift the lid, and connect the voltage leads of the logger or analyser; then, connect the leads for the current sensors and start making critical measurements. Once complete, the voltage and current connections are simply removed from the front panel interface and the window lid locked, leaving the internal connections in place for future use.

The Fluke PQ400 Electrical Measurement Window enables the connection of three phase measurement equipment to energised panels, without having to open the panel door, or wear supplemental personal protective equipment (PPE). Benefits include:

- Reduced risk of arc-flash and electrocution, while increasing the safety for personnel.
- Decreased maintenance costs and reduced downtime by making critical power quality and energy measurements without opening the panel door, enabling logging and monitoring at any time – without disrupting operations.
- Reduced work permit requirements and processes by reducing the hazards associated with taking measurements on open panels, saving time and effort.
- Increased measurement efficiency and reduced need for arc-flash PPE, saving time, increasing efficiency and increasing operator comfort.

Key features include:

- Permanently connected voltage and current sensors located inside the electrical panel allow for power quality and energy measurements using the external access points without opening the panel door, reducing operator risk.
- Voltage and current connections for three-phase voltages, neutral and ground cover most measurement scenarios.
- Automatic probe detection for Fluke 1740 and 1730 series power quality and energy loggers and compatible clamps, eliminates the need to open cabinet to check the clamp model.
- Full 360 degree rotation allows the PQ400 window to be oriented in any direction.
- CAT IV, 600 V and CAT III 1000 V rating according to IEC61010-2-30.
- Compatibility with standard 4 mm shrouded safety-socket voltage test leads makes it easier to make voltage connections, increases safety by reducing the risk of accidentally touching live electrical components, and reduces the need for purchasing specialised voltage leads.

Enquiries: +27 (0)10 595 1821



DELTA DIN RAIL POWER SUPPLY OPTIONS FOR DEMANDING APPLICATIONS

Automated production systems require power supplies with high stability and safety protection. DIN rail power supply series for such demanding applications are available from Delta Electronics, distributed locally by ElectroMechanica (EM).

The CliQ DIN rail power supply series offers state-of-the-art design to withstand harsh industrial environments. The rugged metal or plastic case is both shock- and vibration-resistant in accordance with IEC 60068-2.

The Delta CliQ II DIN rail power supply series has an IP20 protection level. The Delta CliQ III series is designed with high power density and smart overload protection features. All the models in the series are encased in rugged yet lightweight, full corrosion-resistant, aluminium casings.

Delta's Chrome DIN rail power supply series is designed for use in compact cabinets, which are adopted widely in home automation applications, and the food-and-beverage industry. Current available specifications are with 5 V, 12 V, and 24 V output voltage, for power ratings from 10 W to 100 W.

The series offers double isolated input. This means that no earth connection is required, resulting in low leakage current. The Chrome series features universal ac input range, and is certified in accordance with IEC/EN/UL 60950-1 for information technology equipment (ITE) and UL 508 for industrial control equipment (ICE). The series is also fully

compliant with RoHS Directive 2011/65/EU for environmental protection. NEC Class 2 and limited power source (LPS) approvals are available for selected models.

The Delta DRS Series Sync DIN rail power supply series is compact and designed for industrial applications requiring highly reliable power supply that, in addition, must fit in a small space. The Sync series operates with universal ac input range, offering full power from -10 °C to +55 °C. The output is adjustable, with up to 89.0% efficiency.

The Delta DRL Series Lyte DIN rail power supply series is convection-cooled, and operates from 20 °C to +70 °C, with full rated power available from -10 °C to +50 °C at 230 V ac. The overcurrent protection feature is designed to operate in constant current mode, which makes the series ideal for inductive and capacitive load applications. Electromagnetic radiated and conducted emissions are compliant with EN 55022, Class B.

Enquiries: +27 (0)11 249 5000



POWERING YOUR OFFICE

We dedicate our lives to the daily hustle and bustle. Our work relies heavily, if not solely on our electrical and electronic equipment remaining productive and secure. The last thing we need is disruption.

A Small Office/Home Office (SOHO) can receive a shock to the system, whether it comes from damaged equipment or an instant shutdown to the main supply. Why is the power not the same as before? This can be as the result of any number of power supply conditions – we may notice occurrences as they happen, but many are undetectable.

The inconvenience of no power, whether planned (load-shedding) or unplanned (blackout), is an indication of other more damaging power conditions such as spikes and surges, power-back surges, over (high) and under (low) voltage and loss of neutral.

The top four power faults

- **Power-back surges:** Can happen concurrently with power cuts. When power is reconnected, it is usually accompanied by a surge which can be high and result in severe damages.
- **High voltage (also known as voltage swell or surge):** If power is not managed or monitored, an instant rise can become catastrophic if voltage levels reach >250
- **Low voltage:** When the grid is overloaded, you get an excessive voltage drop on the distribution network. This can result in a shorter lifespan for electrical and electronic equipment. The components will either melt down or malfunction due to appliances running too fast and too high.
- **Loss of neutral:** This can be due to an accident or sabotage after which the single-phase voltage rises to the 3-phase level. The equipment will experience up to 415 V, a common and serious event. The solution will be to reduce this by 230 V to prevent uncontrollable increases to voltage levels.

Protect your business with AVS

Sollatek provides the AVS range to protect against the most common power faults. To keep production running smoothly; AVS30, AVS15 and AVS3P-0 remain reliable tools in managing and preventing power supply from going haywire.

The range is the most complete power protection device against over-voltage, under-voltage, power-back surges and spikes/surge. Additionally, there is a delay when power returns to normal; the Sollatek AVS range ensures your equipment is kept safe, for longer.

Enquiries: www.sollatek.co.za or

HIGH-PERFORMANCE THERMAL CAMERA STREAMLINES INDUSTRIAL INSPECTIONS



The FLIR T860 is the latest addition to the high-performance T-Series family. This new thermal camera is the first to feature onboard Inspection Route software, ideal for streamlining inspections of critical assets, including power substation components, distribution lines, manufacturing equipment, or facility electrical and mechanical systems. By running a pre-planned route through the camera, thermal inspectors can spend less time in the field and face less hassle when creating survey reports.

Featuring the FLIR T-series camera platform's award-winning design, the FLIR T860 has an ergonomic body, a vibrant LCD touchscreen visible from low angles, and an integrated colour viewfinder for sun glare conditions. Pairing the FLIR T860 with an optional 6-degree telephoto thermal lens allows users to inspect energised targets from a safe distance or measure small targets with greater precision.

A key feature of the T-Series product line is its ergonomic design, which reduces the strain of full-day inspections. A 180-degree rotating lens platform helps users diagnose hard-to-reach components at substations and on distribution lines. The T-Series also offers tools to optimise workflows, including Wi-Fi streaming to the FLIR Tools® mobile app for Android and iOS, in-camera GPS tagging, voice annotations, and customisable work folders.

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SAVE ENERGY. SAVE COST. STAY PROTECTED.



Whether you're working from your home office or plan to save costs from your electrical appliances, the AVS range from Sollatek provides full protection against bad voltage. Suitable for all domestic and industrial applications.

AVS15

AVS30 Micro

AVS3P-0



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Sollatek

MAKING UTILITIES GREEN

The realities of climate change are being felt all over the world. It has become incredibly important for individuals and organisations to play a role in reducing their impact on the environment and to help offset the damage already done to the planet.

It's a complex conversation but green thinking can be introduced systematically, every investment making a difference along the way. One such investment happens to be in sub-metering solutions as these have had a proven impact on reducing excessive utility usage, improving usage behaviours and thereby having a long-term positive impact on the environment.

"When tenants or users have unlimited access to power through the use of a shared master meter they tend to be less cautious with their usage and the items that they use," says Carel Scheepers, General Manager: Sales at Citiq Prepaid. "They have no reason to invest in an energy efficient air-conditioning system or refrigerator; to reduce or stop their use of tumble dryers; or to invest in low-watt bulbs or more energy-aware solutions. They continue to use energy inefficient devices that suck up power and cost money because it makes no substantive difference to

their lives."

This can be changed and the electrical contractor has the opportunity to stand at the forefront of this change. The sub-metering market allows for electrical contractors to develop their own green credentials while enhancing those of their customers. By recommending the installation of a sub-metering system at a client's office park, retail complex, or residential development they are providing owners and estate managers with the ability to add even more value to their offering.

"If you consider how competitive the market is right now, property owners and estate managers are hungry for value-added services and solutions to help them stand out in front of potential customers," explains Scheepers. "Through the use of a reliable and trusted sub-metering system, they can demonstrate to their customers how sub-metering enhances green credentials and makes a tangible difference to the carbon footprint of their properties."

In addition to inspiring tenants and owners to invest into greener solutions for the home, sub-metering reduces the excessive use of power by placing the numbers directly in front of the users. When people can see how much they are spending

they are more likely to modify their behaviours and adjust their utility usage. This is of immense benefit to the environment as reduced electricity means improved consumption all the way up the value chain from the user to the power plant and, ultimately, reduced carbon emissions.

"Not only does sub-metering ensure that electricity usage is fair, it really does allow for deeper control over how you approach your green credentials," says Scheepers. "It allows for improved energy efficiency and it is recognised as a powerful tool in showcasing a building's sustainability and environmental credentials."

Citiq Prepaid is a market leader in the development and provision of sub-metering solutions. Working closely with electrical contractors, the company provides support, transparent billing, online reporting and high-quality hardware that ensures every step of the process is as easy and efficient as possible. Citiq Prepaid offers sub-metering solutions that boost green credentials through increased visibility and absolute control over utility usage and spend. This is why it is one of the most popular choices for landlords, tenants and homeowners in the country.

Enquiries: www.citiqprepaid.co.za



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SMART CITIES WILL DEPEND ON FASTER ADOPTION OF 4IR

If you are not digital it will be difficult to be competitive in industry, or in the buildings you produce, because what you are building is here for the next 50 years, and it has to be green, smart and automated.

This is the opinion of Taru Madangombe, Vice President of Power Systems, Anglophone Cluster for Schneider Electric, who further notes that cities are a complex web of interconnected systems, and each city faces its own challenges. Schneider Electric has taken the lead in developing systems and solutions around Smart Cities over the past decade and is excited to see the concept being more broadly embraced by the industry.

"As the World Economic Forum on Africa met in Cape Town in September for its 28th meeting, it was significant that the theme was 'Shaping inclusive growth and shared futures in the Fourth Industrial Revolution (4IR)'.

"Today's cities cover only 2% of the planet's surface but hold 50% of the world's population. They also generate 80% of global CO₂ emissions and consume 75% of the energy. Urbanisation in South Africa is advancing at much this pace and its city planners have to accept that extremely rapid growth is inevitable. This brings added pressure on the supply of energy, waste, transportation and other services."

Future technologies now

"The key technologies powering Industry 4.0 (4IR), artificial intelligence (AI), mixed reality (AR & VR), and the internet of things (IoT), are reshaping business processes, unlocking opportunities and encouraging new business partnerships.

"A rich ecosystem of tools, organisations and experts is paving the way to healthier workplaces, efficient businesses and a greener planet. Making the most of these new technologies requires openness, agility, collaboration and a

clear understanding of the benefits that digital transformation will bring.

"At present, those in charge of running cities, particularly at the operational level, are too focused on reducing costs, rather than on improving quality of life or service. We need to widen our vision, and see the potential of smart cities built on the latest technologies.

"As urbanisation increases, cities and suburbs will undergo significant transformations to create sustainable living conditions for their residents. Energy and mobility are the twin pillars of these transformations and both will require radical adaptation to meet demographic and economic growth, without increasing congestion and pollution.

"The question is whether policymakers and business leaders can harness and combine them in ways that maximise their benefits for the environment and create greater efficiency and economic growth. The 4IR offers an unprecedented opportunity to do so."

Mobility is changing

"Africa is urbanising faster than any other continent, at a rate of 4% every year, compared to the global average of 2%. Its rapidly growing urban population continues to strain the transport and energy infrastructure. Electric vehicles (EV) can materially change this landscape through ride sharing and car sharing, concepts that could reduce the congestion in rapidly growing African cities.

"South Africa will host the Electric Vehicle Road Trip Africa (EVRT Africa) for the first time in October 2019, an indication of the interest that EV is generating. As EVs become more affordable, some are predicting they will constitute almost a third of new-car sales by the end of the next decade. Ride sharing continues to surge, with estimates that by 2030, it will account for more than 25% of all distances driven globally, up from



4% today. These changes are just the first hints of what is to come, as we will soon see autonomous vehicles (AV) and commercial fleets of EVs integrated as part of everyday life. In the future, AVs will also cost significantly less per kilometre than vehicles with internal combustion engines for personal-use, by as much as 40%, and could also reduce congestion and traffic incidents."

Energy is changing

"We are amidst a global evolution towards energy systems that are cleaner and increasingly decentralised, with energy generated, stored and distributed closer to the final customer with renewables and storage technologies. At the same time, digitalisation will allow customers and electricity system operators to control where, when and how electricity is being used and allow new business models to emerge. Finally, new and more energy uses are going to be electrified – mobility being one of the critical ones.

"These trends have the potential to reinforce each other and actively contribute to make our

cities smarter. Forward-thinking business leaders and policymakers must act now to lay the foundation for sustainable innovation in urban environments, able to capture and combine these new trends. On both fronts, the convergence of energy and mobility must be strategic, intentional and guided if cities and citizens are to receive the maximum benefits.

"Our innovative, IoT-enabled operating technologies help make cities more efficient, resilient and sustainable. Industry 4.0 and the industrial internet of things (IIoT) present new opportunities to unlock process innovations to develop sustainable, environmentally-friendly materials; decarbonise energy; tap digital innovation for doing more with less; and extend the life cycle of goods within a 'zero waste to landfill' framework, using the 5Rs approach – repair, reuse, refurbish, remanufacture and recycle," concludes Madangombe.

Enquiries: +27 (0)11 245 6400

CALL FOR SMART CITIZENS TO TRANSFORM DYSFUNCTIONAL URBAN ENVIRONMENTS

Is South Africa, or indeed the entire continent, ready for its first so-called smart city? South African President Cyril Ramaphosa certainly thinks so, using his State of the Nation Address on 20 June to refer to his "dream of a South Africa where the first entirely new city built in the democratic era rises, with skyscrapers, schools, universities, hospitals and factories... The city we build must demonstrate democratic spatial planning; it must also be a smart city and illustrate that we are in the Fourth Industrial Revolution."

However, President Ramaphosa's remarks sparked a debate about smart cities in an African context. "We do not need a new city. We need our existing cities to work," argues Paragon Group Director Henning Rasmuss, who was a key speaker at the Bigen Smart City Conference in Pretoria. The conference focused on issues such as harnessing smart urbanism to drive transformation of cities, bridging the digital divide in sustainable development in the information age, and how best to realise urban mobility.

"We need to fix sewerage flowing into rivers and poisoning the drinking water, unfortunately because

drinking water provision is failing for many. We need to fix housing and transport in the cities we have. Fix safety and security. Fix hospitals and the training of medical staff, and fix schools and educator training. Fix the scourge of corrupt officials. We have broken cities and demi-cities that blight our landscape. A shiny new city is the last thing we need," Rasmuss points out.

According to the IoT Agenda website, a smart city aims to optimise city functions, and drive economic growth, while improving the quality of life for its citizens using smart technology and data analysis. Importantly, the value derived from a smart city is what its citizens opt to do, and not the technology itself.

Here the main factors are a technology-based infrastructure, environmental initiatives, a high-functioning public transportation system, a confident sense of urban planning, and people to live and work within the city and utilise its resources. The backbone of a smart city is the strong relationship between government and the private sector.

Rasmuss highlights that, with the power generation

constraints faced by the country, a smart city as envisioned by President Ramaphosa is impractical at present. "It is important for the people of this country to have a good life. If this happens to be in a smart city, so be it. But before we talk about a shiny new smart city, we need to be collectively smart about our political and management decision-making, and then our lives will already be a lot better. A smart city is built on the foundation of an already-working city. Many of our cities are only just working."

Here Paragon Group stands to play a vital role in driving the smart-city debate. "We can engage with our clients and with end users and our wider project community in order to make better-quality decisions. We can try to expand our mandates and the reach of our projects, in a setting where government is the weakest partner in its own initiatives. We can engage in debate and understand the high and lofty ambitions of the smart city and the technology behind it," Rasmuss argues.

"Then we can try to tune this ambition into an appropriate agenda for inclusion in our projects. Everything needs to be done at the correct grain or level of detail. We are working at a very rough or coarse grain here. Most importantly, each and every person in each not-so-smart South African city, and each and every team member in the Paragon Group, can become responsible smart citizens."

Linked to the concept of the smart city is master-planning. "Long-term thinking underlies master-planning. As a collective, and as a nation, we suffer immensely from a lack of long-term thinking. Master-planning is a headspace, and we are very far from the edge of that headspace. It is, of course, important. But we need to get into a better headspace. Integrated, co-ordinated planning is also important. But it does not get practiced easily in South Africa. Just look at the chaos of our cities," Rasmuss concludes.

Enquiries: +27 (0)11 482 3781

IMPLEMENTING INDUSTRY 4.0 TECHNOLOGIES IN A MANUFACTURING ENVIRONMENT

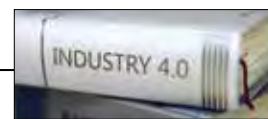
African manufacturers are aspiring to raise their standards and increase the efficiency of their enterprise operations. To discuss the rising prevalence of technology within the industrial realm, the KwaZulu-Natal Manufacturing Indaba educated participants on the opportunities and challenges associated with the adoption of innovative technology in the manufacturing sector.

Digitisation, otherwise known as Industry 4.0, is considered the most profound and disruptive phenomenon in the world of business today. Increased reliance on computer and automation has rendered industries of self-reliant and efficient. Smart machines have immense capacity to compile, maintain and record staggering amounts of data, which the average human mind is incapable of processing. In addition, Industry 4.0 allows manufacturers to optimise their operations by pinpointing and prioritising the precise business components demanding attention.

Further, the IIoT enables industries to employ sensors and robots to improve the quality and overall efficiency of production output. IIoT-enabled machines provide manufacturers the opportunity to achieve precise customer satisfaction levels by analysing data regarding customer preferences and feedback, thereby tailoring their products accordingly. By employing the IIoT, industries can optimise their operations through the application of the cloud environment to increase productivity levels.

Enquiries: www.manufacturingindaba.co.za





KITE BRINGS INDUSTRIAL TECHNOLOGY SOLUTIONS UNDER ONE ROOF

The KwaZulu-Natal Industrial Technology Exhibition (KITE) attracted an audience of over 4 200 industry decision makers in late July.

Nick Sarnadas, portfolio director at Specialised Exhibitions Montgomery, explains that the exhibition's success stems from its multi-layered approach to promoting its diverse exhibitor base. "Obviously, the exhibition stands take centre stage. They provide visitors with an opportunity to experience the best-of-breed industrial technology solutions in the KZN region, all under one roof. Not only does this eliminate the hassle of having to source every single solution from a variety of suppliers who

could be scattered across the province, but it places visitors in a position where they have access to live demonstrations on a wide variety of products and services. In addition, the event provides peer-to-peer and exhibitor-to-visitor networking opportunities not found elsewhere."

In addition to the exhibition, various educational and training opportunities were available. The free-to-attend SAIMechE Seminar Theatre retained its popularity with 18 highly-informative sessions from well-versed speakers. The MESA Special Interest Group allowed a concentrated group of attendees to find out more about 'Data Matters: Triple Vision – Hindsight, Insight and Foresight'. The

LEEASA conference was well attended by 60 delegates, who received information on the latest technology, trends and regulations within the lifting industry.

For the first time, the exhibition hosted the Artisan Training Zone. Organised by the Artisan Training Institute (ATI), this dedicated area allowed visitors to see artisans demonstrate the trade skills they had learned at the Institute. According to Institute representatives, the interest exhibited by the visitors was very encouraging.

Sarnadas says feedback received from both exhibitors and visitors underlined the success of the event in bringing suppliers and consumers of industrial technology together in a highly positive

and productive manner.

Visitors cited the variety of superior products and services on display at KITE as being a great reason to visit the Expo, with 80% of attendees making or influencing purchasing decisions. Gansen Chetty from Edison Power KZN said: "We had exposure to products we normally wouldn't see. The opportunity to network with new suppliers and potential business partners was a big plus. This was a 100% worthwhile experience".

KITE 2021 will be held at the Durban Exhibition Centre from 21-23 July 2021.

Enquiries: www.kznindustrial.co.za

PROTECTING INDUSTRIAL CONTROL SYSTEMS FROM CYBER THREATS

African value-added distributor, Networks Unlimited Africa, has announced that it now proudly offers industrial cybersecurity in South Africa through a partnership agreement with Indegy, a leader in industrial cybersecurity that protects industrial control system networks from cyber threats, human error and malicious insiders.

Stefan van de Giessen, General Manager: Cybersecurity at Networks Unlimited Africa, says, "We are very excited to bring this product on board with the security division. Through our partnership with Indegy, we provide security for applications and systems in the industrial internet of things (IIoT), operational technology (OT), industrial control systems (ICS) and critical infrastructure arenas."

OT is the use of information technology to control physical processes, devices and infrastructure, and has operational and management uses in public infrastructure, transportation, energy, urban planning, industries and manufacturing. Critical infrastructure is a term used by governments to describe assets that are essential for the functioning of a society and its economy. An industrial control system is unique in the interaction that it has with physical processes.

"Networks Unlimited Africa is a leading provider of security solutions for operational and information technology networks across several key industrial markets," said Erez Shalom, AVP Strategic Channels EMEA & APAC at Indegy.

"This partnership will enable Indegy to rapidly penetrate and build market share in South Africa."

Van de Giessen clarifies, "The combination of IIoT connectivity offered across production and supply lines, and the way in which OT is automating the modern world – interfacing through electro-mechanical devices and sensors – is opening up new vulnerabilities and making cybersecurity for industrial infrastructure a critical business imperative.

"The potential penetration of OT systems by hackers puts critical infrastructure such as water and energy supplies, transport networks and production lines at risk of being disrupted or even shut down. The main challenge in ensuring cybersecurity for industrial systems is therefore the ability to maintain uninterrupted industrial processes."

Showing its diversity across industries, Indegy's customers globally include the following:

- One of the world's three largest automotive manufacturers.
- One of the three largest electrical power utilities in Europe.
- One of Asia's top 10 steel manufacturers.
- A top five US financial services corporation.
- A top five US global aerospace and defence corporation.

The Indegy Industrial Cybersecurity Suite provides the following:

- Full threat detection and forensic trails.



- Automated asset inventory.
- Vulnerability management.
- Configuration control.

The suite of capabilities ties together in an out-of-the-box deployment, resulting in the delivery of alerts, automated reports and third party integration with an organisation's existing tools.

When hackers caused a first-of-its-kind cyber-attack in western Ukraine in December 2015, cutting off the lights to 225 000 people, this was widely regarded as being the first example of hackers shutting off critical energy systems that supplied hundreds of thousands of homes. This attack was followed a year later by another that cut power to hundreds of thousands of residents in the country's capital, Kiev.

"These kinds of attacks show how vulnerable

unprotected critical infrastructure systems can be today. As a distributor of best-of-breed technologies, which are carefully selected to complement each other as well as provide solutions where there may be gaps in the market, Networks Unlimited Africa offers its customers true business and security benefits.

"In South Africa, security conversations have traditionally centred on the possible theft of intellectual property and personal data. Today, however, we urgently need to add in thinking around the defences of industrial control systems and critical infrastructure. The stakes could be very high for those who do not," concludes Van de Giessen.

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DEMOCRATISATION OF INNOVATION AND WHAT IT MEANS FOR AFRICA

Without technological constraints, more people from across Africa are free to innovate and create on the global stage; democratisation of energy is necessary to enable Africans to move into the digital age.

The term 'Democratisation of Technology' has become synonymous with the digital age. In a nutshell, it means that access to advanced technology is no longer the domain of a privileged few, but that more and more people are benefitting from access to smart technologies, and this is rapidly levelling the playing field of global innovation.

One of the deciding factors in who has access to technology, is the distribution of energy. In order to ensure the equality of technology it is first necessary to solve the problem of unreliable energy. The concept that energy must come from a central source is inefficient and outdated. By decentralising energy and allowing people to generate and use energy as needed, people are able to take charge of their own prosperity. In a continent like Africa, with the incredible opportunity for solar and wind generated energy, keeping energy centralised severely hampers the potential for economic growth.

Microgrids are an effective way to quickly and effectively diversify a centralised energy grid. Microgrids not only take the strain off the central grid and lower the carbon footprint, they also create economic opportunities where people can sell off excess energy produced.

The Brooklyn Microgrid project is an excellent example of how clean energy can be turned into thriving micro-economies. In this case, LO3 Energy, a company based in New York US, working alongside Siemens, installed a solar-powered microgrid. In addition to generating clean energy for its own use, the company also installed a blockchain enabled transactive energy platform. This means any unused energy can be sold, generating a new revenue stream.

The same system could be put in place in certain parts of Africa. A shop or building even in remote parts of the country, for example, could

install a microgrid and sell off excess energy to surrounding businesses. This could be taken one step further by creating a transparent energy retail environment where a resident in another part of the country, could choose to top-up his or her electricity directly from a microgrid supplier based elsewhere. By diversifying energy through microgrid technology, new income streams can quickly be created in disadvantaged areas while at the same time growing and stabilising access to energy. This, in turn, will kickstart real democratisation of energy.

The Siemens office in Midrand is equipped with a microgrid and now uses 50% less power off the central grid. The office has gone more than a year with uninterrupted power and has saved about 2 460 tons of CO₂ since the system was opened (174 000 kWh per month).

Enabling democratisation of technology

Through energy comes wider access to communication and the ability to participate in global conversations through online connectivity. This in turn nurtures creativity, innovation and economic growth.

Traditionally, the journey from 'idea' to 'successful product or business' is complicated and involves business cases, pitches for funding to build a prototype, raising capital investment for production and testing, wading through patent approvals and trademark law. While many of these steps are still crucial once there is a working prototype, the democratisation of technology makes it easier for inventors and entrepreneurs to develop their ideas. SMEs are vital economic drivers and making it easier for them to compete will benefit the economy as a whole.

Digital twinning is one example that streamlines the production process. A digital twin is a virtual representation of a physical product or process, used to understand and predict the physical counterpart's performance characteristics. Digital twins are used throughout the product lifecycle to simulate, predict, and optimise the product and

production system before investing in physical prototypes and assets.

This means innovators can test their products in the virtual world and refine them before ever needing to raise money for testing. Real-life testing is still vital with most products, but with digital twinning it is possible to get a product as close to perfect as possible in the virtual world in order to save time and costs when it comes to the final real-life test phase. In many ways this agility levels the playing field giving small, developing companies (and countries) the same opportunities as their bigger and more established counterparts. Siemens offers this technology to universities, free of charge. Students have access to a free version of the easy-to-use software suite used by professionals. In addition to free software, the company provide tutorials, webinars, online courses and certification to help them develop their skills.

Breaking down barriers

Through access to technology anyone, anywhere, has the opportunity to create a thriving business or economy. Across Africa, it can play a large role in the empowerment of women and youth development.

One example is the Siemens Fabric campaign, which was set on the global stage, but all the fabric produced for the initiative was made by a small female-owned business in Alexandra, Gauteng. Legae Larona Sewing Cooperative in Alex now forms part of the Siemens Enterprise Development programme.

This is where the results of the democratisation of technology are seen – when an innovator from a small community in a developing nation has the same access to opportunity as those operating from high-tech offices in the First World. It's not yet a perfect system, but through the clever use of technology it is possible to increase access to opportunity, exponentially.

Enquiries: www.siemens.com



CONTINUED FROM PAGE 3

IN DISCUSSION WITH DEVAN PILLAY, SIGNIFY MARKET LEADER FOR AFRICA

Many countries in East, West and North Africa have surpassed South Africa with respect to progressive governance, sustainability, infrastructure development as well as creating better lives for their citizens.

The past ten years of poor governance, and a lack of competitiveness on the world stage has seen South Africa's growth stagnate compared to countries like Egypt, Kenya, Rwanda, Ghana, and Cote D'Ivoire. That said, I am still optimistic about South Africa as we are a complex economy with many sources of growth. Good governance and the will of our people to make a difference is fundamental to our revival as a powerhouse on the continent.

Sparks: What do you believe differentiates Signify from other lighting companies?

DP: There has been a lot of dynamism in the lighting industry in that many of the iconic brands have been sold off and rampant commoditisation has set in with the evolution of LED technology. Philips remains as one of the last surviving brands that is continually innovating to remain the leader in lighting centred around technology, quality and sustainability.

This investment in cutting edge innovation has seen Signify leapfrog into the IoT space where interconnectivity is as significant a focus for us as being a leader in lighting. We recognise that lighting is part of a digital ecosystem and developing open source platforms for multiple vendors to interface with our solutions is our differentiator, along with the brand promise that many of our consumers have come to trust. This has seen brands such as Interact, which is a sister brand of Philips in the Signify stable, rising in prominence.

Sparks: What challenges have you identified in the lighting market that need to be tackled as a matter of urgency?

DP: Africa is an energy deficient continent. Energy production has not kept up with the continent's growth and neither has our energy efficient behaviour. Despite LED technology being around for some time, the rate of adoption has been slow. Lighting constitutes a huge cost whether you are a household, commercial enterprise or municipality. It is almost irresponsible not to make a conscious choice to transition to LED which brings immediate energy savings

of around 60% versus convention lighting. Authorities and general consumers need to make the leap to LEDification. Education and policy making, I would say, are the most burning challenges right now.

With the evolution from incandescent to LED, the barrier to entry to becoming a supplier in the lighting space has eroded. It is easier for new entrants to come into the market. In the old days the capital investment was significant so only a few large corporations had the requisite balance sheets to produce bulbs, but that has changed and a whole host of players are now in the market, often times making unsubstantiated claims over efficacy, quality and endurance.

Sparks: What is the role of the electrical contractor in lighting?

DP: The responsibility rests on the shoulders of professionals in the lighting industry, including contractors, to educate consumers and allow them to become discerning consumers. As I've mentioned, lighting is no longer just about illuminating a surface; it has many benefits that many of our consumers are unaware of. I've touched on some of them earlier like energy efficiency, but lighting has a lot to do with our circadian rhythms, mood lighting, scene lighting, and connected lighting being part of a digital ecosystem.

Sparks: Are there plans to engage more with the electrical contractors?

DP: The onus rests on our shoulders as the leaders in lighting to invest and lead the charge when it comes to educating and raising competencies in our markets. Being the brand that is synonymous with leading innovation since the inception of Philips, the responsibility we have is to continually meet and exceed this expectation of bringing new to market solutions to our customers, educate our consumer base on the trends and push the boundaries on the endless possibilities that IoT brings. The Electrical Contractors Association is our ambassador to further spread this knowledge and we must continue to cascade this knowledge through its members with the hope that our consumers make more informed purchasing decisions and get the value they expect and deserve.

Enquiries: www.signify.co.za

SMART CITY TECHNOLOGY FOR GREATER SAFETY AND ENVIRONMENTAL PROTECTION



As part of the Digital City Darmstadt project, a street section in the Wixhausen area of Darmstadt has been equipped with adaptive lighting. Integrated PIR sensors react to movement and ambient light and control the street lamps as required. This makes for greater safety, saves energy and protects the environment from light pollution. Wireless modules are used to connect the street lamps to one another and to the Internet of Things (IoT). The project is Tridonic's first installation of innovative Smart City technology with light-on-demand functionality.

Darmstadt is becoming a smart city. It is pushing ahead with its digital expansion in a total of 14 sub-projects – from mobility to education and energy. In the latest smart lighting project, intelligent street lamps are illuminating a road and footpath in the district of Wixhausen. The pilot installation consists of 13 energy-saving LED luminaires from Entega subsidiary Luxstream. Integrated sensors from Tridonic enable them to detect movement and control the brightness. As a car, pedestrian, jogger or cyclist approaches, the sensors ensure that the street lamps provide adequate illumination. If there

is no one in the vicinity, the lamps are dimmed.

"Close cross-discipline collaboration is particularly important for the successful implementation of smart city projects. Disciplines that were previously separate now merge into a common solution in smart city applications," said Waldemar Becker, Product Manager Smart City Applications at Tridonic. In the case of the smart lighting project in Darmstadt, the various parties are working in a team – including the project team from the Darmstadt city authority, planners, network providers, luminaire manufacturers and component suppliers. "Interdisciplinary collaboration right from the start was crucial for the success of the project, as was the willingness of the project team from the Darmstadt city authority to welcome suggestions and ideas from all the parties involved. As a result, and with the aid of Luxstream, we were able to complete the pilot project quickly and smoothly," added Waldemar Becker.

A safe and eco-friendly digital future

Wireless modules connect the lights to each another and forward signals so the entire street

run is illuminated. Residents and the environment benefit from the adaptive lighting. It provides pedestrians with high levels of safety and security. The light reacts to them, giving them an instant personal sense of security. Light pollution is significantly reduced thanks to dimming and the response to minimal changes in daylight – a major benefit for the environment, wildlife and flora, which would otherwise be disturbed by artificial light.

Smart street lighting also ensures high energy efficiency. "Energy consumption can be reduced simply by using LEDs rather than conventional light sources. But further savings of 50% can be achieved by the motion sensors, giving total savings of 87%," said Waldemar Becker. The smart street lighting is currently in the testing phase. There are long-term plans to extend it to other places in and around Darmstadt.

Light on demand with Smart City technology

The pyroelectric (PIR) sensors developed by Tridonic detect differences in temperature and react to thermal radiation from road users by increasing the lighting level – without generating any personal data, of course. Data security is ensured by encrypted data transfer – from the wireless communication module to the server. The LED luminaires and sensors are integrated in a secure network. Operators can access the system at any time via the Smart City platform and its management portal, for example, to change the grouping of the luminaires or the illuminance level. The platform also provides important information about the luminaires, such as their energy consumption, possible faults and pending maintenance work.

The PIR sensors are specially designed for detection in street environments where dimming is possible and sensible. They cover an area of up to 560 square metres at a mounting height of up to eight metres. Robust design and adequate protection against harsh external conditions make the sensors extremely durable.

Enquiries: www.tridonic.com

WHAT IS VISIBLE LIGHT DISINFECTION?



Using visible light from LEDs, visible light disinfection (VLD) technology is designed to provide functional illumination that is safe for humans, while containing recipes for saturated blue/violet emission that is harmful to germs. It has been commercialised internationally by companies like Kenall Manufacturing (Indigo-Clean) and Vital Vio, Inc., which licenses to Visa Lighting, Evolution Lighting and others.

Current environmental disinfection methods are applied at discrete moments (i.e. episodically). The results of achieving a 'clean room' are short-lived as harmful bacteria repopulate the space. Yet lighting is providing a solution that continuously disinfects the environment and bolsters current infection prevention efforts.

A ceiling light fixture that uses safe visible light disinfects the air and hard and soft surface automatically, safely and continuously, killing harmful bacteria such as C.diff. The 405 nm emitted from the specialised lighting reflects off walls and surfaces, penetrating harmful micro-organisms, targeting naturally occurring molecules called porphyrins that exist inside bacteria. The light is absorbed and the excited molecules produce Reactive Oxygen Species (ROS) inside the cell. 405 nm creates a chemical reaction inside the cell, similar to the effects of bleach, and the ROS inactivates the bacteria, preventing it from re-populating the space.

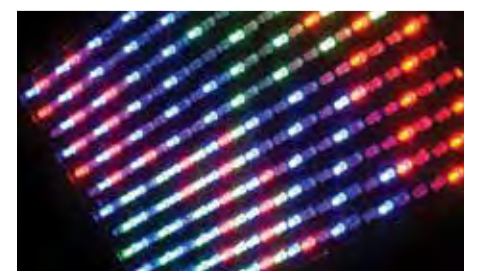
Healthcare facilities across the globe are experiencing positive results with VLD's continuous environmental disinfection. Is this perhaps an opportunity for South African lighting manufacturers?

LED HOLDS 70% OF US LAMP MARKET

According to the USA's National Electrical Manufacturers Association's (NEMA) A-line Lamp Index, LED A-line shipments increased 2.3% in the first quarter of 2019 compared to Q418, but decreased 7.1% compared to Q118. Halogen A-line lamps posted a decrease in shipments in Q119 compared to both the previous quarter (10.9%) and the same quarter a year ago (32.1%). CFL A-line lamp shipments decreased compared to Q418 and Q118 (9.3% and 20.4%, respectively).

LED A-line lamps account for 70.5% of the consumer lamp market, followed by halogen A-line lamps, which account for 24.9%. CFLs comprised the remaining 4.6% of the A-line consumer market.

Enquiries: www.nema.org





LIGHTING A LUXURY CAR SHOWROOM



At the new flagship Platinum Wheels showroom in Fourways, Johannesburg, Opple Lighting SA has ensured that the company's stock – premium luxury cars such as Lamborghini, Ferrari, Porsche and McLaren – is displayed in the best possible light.

Platinum Wheels specialises in all brands and models, including new vehicles and high quality used vehicles, and when the company embarked on creating a class leading showroom, it contacted Opple to assist with a lighting solution.

Willem Venter, Development Director at Opple Lighting SA, says of the project, "The execution of the design was well received by the owner of Platinum Wheels. The lighting design was done by MTY Distributors (Opple SA's distributor for the KZN, Gauteng, Limpopo, North West and Mpumalanga region), and the challenge was to have even light distribution in the general area of the showroom as the cars are moved on a regular basis. Opple's HPB lamps, LED Utility Downlighters and LED

Panels were used on this project." The installation was done by Abie from We Sell Lights.

A spectacular launch for the showroom was held at the beginning of September where Opple's lighting solution ensured that the stars of the show could be appreciated by all in attendance. Opple is a leading integrated lighting manufacturer headquartered in Shanghai, China, with two manufacturing centres in Wujiang, Jiangsu Province and Zhongshan, Guangdong Province. The company has significantly expanded its portfolio to include a vast array of products and services, ranging from LED and traditional lighting, lamps, and ceiling fixtures to electrical appliances. With over 800 patent applications, it has an R&D team of hundreds of experts and senior engineers and a workforce of over 6 000 employees.

Enquiries: +27 (0)11 465 5651



NEW SHOWROOM LAUNCHED IN MILNERTON

REGENT LIGHTING SOLUTIONS (RLS) has officially launched its Cape Town showroom in Milnerton. The company hosted an international guest speaker from Germany and invited clients and professionals to engage in the 'Future of Light & Controls'. The focus of the Open Day was to educate and allow the clients to interact with and discuss the technologies, in order to help them better understand the solutions RLS is able to provide beyond lighting itself.

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LIGHTING RETROFIT AT GREEN POINT ATHLETICS STADIUM



The Green Point Athletics Stadium has recently been retrofitted with BEKA Schröder's high-power LED floodlight solution. The stadium was part of the 2010 World Cup upgrades to the Green Point precinct sport facilities, which were completed in 2015, and is well used by many clubs, schools and universities in the Cape Town area, as well as by some of our Olympic athletes.

There is a big drive by the City of Cape Town to reduce energy consumption. As a result, the OMNIBlast-3-E 1480 W was chosen to replace the existing 2000 W metal halide floodlights in the Green Point Athletics Stadium. The OMNIBlast-3-E is energy efficient and powerful enough to achieve the required lighting levels with fewer luminaires than the original installation. By optimising the design, 22 kW of energy was saved whilst still achieving the required lighting levels.

The OMNIBlast-E is ideal for sports venues and other large area applications that require a lighting solution with the highest efficiency and flexibility to adapt to different lighting needs.

Available in three sizes, this LED solution offers an alternative with proven benefits for traditional fixtures fitted with 600 W to 2000 W HID lamps. The OMNIBlast-E meets the horizontal and vertical lighting levels required by sports federations and TV broadcasters.

A modular concept of optical units means that 1, 2 or 3 modules can be mounted on a similar bracket arrangement to offer the utmost versatility, providing light distributions and lumen packages perfectly adapted to the specifications of the area to be lit. The OMNIBlast-E incorporates a patented cooling technology that maximises its lifespan and lumen output.

BEKA Schröder locally develops and manufactures LED lighting products, designed and suitable for African conditions. The company worked with Elex Khanyisa Electrical Contractors and the City of Cape to provide a successful LED floodlighting solution for this prestigious project.

Enquiries: +27 (0)21 510 8900

LED PANEL LIGHTING FOR THE OFFICE

When designing an office, elements like the floor plan, desks, and computers are often given the most thought. Lighting, on the other hand, gets the least attention, yet is listed as one of the biggest reasons for complaints by office workers.

Poor lighting affects employees in a number of ways. It causes eye strain and headaches, making the work environment incredibly uncomfortable which ultimately leads to a drop in productivity. A well-lit office allows employees to concentrate on their work and creates a cheerful environment for everyone to function in.

To achieve this, office lighting needs to be planned and implemented strategically. With so many options on the market, it's easy to wonder what lighting will work best. While fluorescent lighting has always been a firm favourite for office environments,

LED panels have proven to be a more beneficial approach to illuminating the contemporary office space. This is why:

1) They are cost-effective

Compared to fluorescent fixtures, LED panel lighting will save you money in the long run. They dissipate less heat and therefore consume less energy, which will automatically lower your electricity bill. Because they operate using LED diodes, there are no tubes to replace and the need for maintenance and installation expenses is eliminated.

2) They offer quality, customisable illumination

Quality lighting is imperative in an office environment. LED panels instantly reach their maximum level of brightness when they are switched on as opposed to fluorescent fixtures which need time to warm up. The reflective materials used in the panels make the light brighter, while prismatic lenses work to distribute the light evenly. This even spread of light reduces glare and allows you to illuminate the space with fewer fixtures.

LED panels allow for customisation of light temperature, which is great for optimising productivity in the workspace. In an office environment, you ideally want to prevent eye-strain so employees can go about their work in comfort. For this reason, LED panels with a colour temperature of 4000 K are best. With many LED panels having dimming capabilities, they can be set to a level of brightness that is most suitable for the environment and needs. This is especially useful when staff do digital presentations on large screens and require the lights to be dimmed. Take customisation a step further and connect the LED panels to compatible motion sensors. Large offices benefit from this feature because there are often hallways or areas of the office that are seldom used. Motion sensor lighting saves on electricity because these areas do not have to be lit unnecessarily for long periods of time.

Enquiries: www.eurolux.co.za



LED Panel (PR453)

WPCC GETS STATE-OF-THE-ART LED LIGHTS



Following on famous firsts for sporting arenas in South Africa, St George's Park Cricket Ground and Coetzburg Athletics Stadium, the Western Province Cricket Club's (WPCC) main hockey field now boast an industry first too. The hockey field has become the first sporting club in South Africa to install a state-of-the-art FIH standard LED lighting system that brings international standards to hockey at club level.

According to Maritz Electrical, installers of the new lighting system, LED is now a world standard and is in demand across all sporting codes.

The Western Province Cricket Club was founded in 1864 and in 2003 opened its Sports Centre in Avenue De Mist, near the Newlands Cricket Stadium, which includes a variety of sports fields, including the renowned hockey field.

Kurt Maritz of Maritz Electrical says the benefits of LED are a key driver of installations across the world. The most important factor is the considerable reduction in energy demand from the grid, on top of the flexibility that LED offers. Instant on and off features, together with various dimming settings, and if needed, theatrical options, allow for myriad options for clubs.

The installation at WPCC hockey field is a MUSCO lighting system, similar to that used at international stadiums such as Twickenham Rugby Stadium, Arsenal's Emirates Stadium and a number of Formula 1 Grand Prix circuits and USA baseball and football fields. The system at WPCC includes 24 x TLC LED 1200-1230 W 5700 K fixtures, installed on existing poles, giving an average lux level of 500 lux from an 8-pole system. Maritz concludes, "It is exciting to see clubs taking the step to enhance the sporting experience for players and spectators. Night games provide an extra element of entertainment for spectators and good quality lighting adds to the experience. With lighting options now offering international standards, as well as placing less reliance on our energy resources, LED is becoming a preferred choice for clubs across the country".

The benefits of LEDs are clear, not only in households, but in major stadiums across the globe. Their reduced reliance on energy resources, vastly improved flexibility and additional features offer stadiums options to enhance spectator experiences.

Enquiries: +27 (0) 21 703 0867

LIGHTING HELPS REPOSITION MORNING GLEN MALL

MORNING GLEN MALL is being refurbished and the precinct is being designed by MDS Architecture for SA Corporate Real Estate. Depending on market demand, SA Corporate is considering the addition of a high rise residential building on top of the new parkade that will be built adjoining the mall.

Located on the corner of Bowling and Kelvin Roads in the upmarket Johannesburg neighbourhood of Gallo Manor, the site is on primary access routes and public transport nodes.

Pierre Lahaye, MDS Architecture's partner heading the project, says that the shopping centre has been repositioned in terms of tenant locations to increase traffic flow and provide a better energy for strategic tenants. The entrances have been reconfigured to make them more inviting to shoppers. "From a design point of view, the centre's fresh lease of life was achieved by eliminating any crossover between service and public entrances, reconfiguring the parking and ensuring better views to develop a contemporary shopping centre with energy and vibrancy," he says.

Internally, the ablutions are being revamped to be more tactile and contemporary. The existing polished floor tiles are being replaced and the lighting has been given a lot of attention. Inaccessible lights are being removed and lighting has been added in the coves and parking areas to avoid any dark patches. Not only is the lighting more energy efficient, but lux levels are dramatically higher and up-lighting is being used to create reflective light.

Another exciting aspect of the project is the possible redevelopment of the unoccupied offices that were linked to the site. If it meets market demands, the office building will be demolished and a residential component of apartments is planned to be built instead, as well as a parkade for use by the shopping centre.

Enquiries: www.mdsarch.co.za

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SPAZIO INTRODUCES THE NEW T-UNI LENS

SPAZIO LIGHTING has recently added a new version to its T-Uni range of linear profiles; the T-Uni Lens. The new T-Uni Lens is ideal for installation in big commercial spaces, for example, supermarkets where long sections of uninterrupted, focused and high light levels are required.

The new T-Uni Lens is available in black and white and with two different beam angle options. The beam angles – retail symmetrical and retail asymmetrical – can be very useful when it is necessary to illuminate supermarket aisle displays evenly.

With a retail symmetrical beam the T-Uni Lens offers a focused beam on either side of the luminaire. This would be most suitable for installation along the aisles of a supermarket where products are displayed on both sides of the aisle.

Retail asymmetrical on the other hand gives off a beam aimed at one side of the luminaire. An example of a situation where this installation would be required is when illuminating a wall display in a supermarket,

where the emphasis needs to be on a single side of the luminaire.

The structure of the T-Uni Lens consists of a strong aluminium extruded body, to be installed first, and modular illuminating units with polycarbonate lenses to be mounted on the body and resulting in a more focused beam angle.

The modular illuminating units allow for easy replacement in the case of chip failure or end of life. Owing to the solid structure of the extruded body, there is no need for a cable tray to be installed above the fitting.

The T-Uni Lens profile, from Spazio Lighting, is available in two different lengths: 1400 mm (60 W) as well as 2800 mm (120 W) in 4000 K. These luminaires can be surface mounted to ceiling beams or a wall, or suspended using a suspension kit that can be purchased from Spazio. The illuminating units are supplied pre-fitted with male/ female connectors to link a series of units together quickly. The T-Uni Lens has

a 50 000 hour, five year warranty and is also flicker free.

Enquiries: +27 (0)11 555 5555



LIGHTING A WORK OF ART

For the Gallery at House 351 in a private residence in Fresnaye, Cape Town, the designers at Inhouse had to focus their attention on concealed, mood lighting and directional lighting to provide focus to the art pieces. "While it was important to highlight the artwork, it was equally important not to get hotspots on the walls and to have consistent, even lighting," notes Inhouse Creative Director, Aidan Hart.

The art lighting required flexibility to accommodate art being moved around, as well as focused light sources with optimum beam control to mitigate glare. The lighting had to be the right temperature for the art pieces, and it had to work with the modern design of the white space. The temperature of the lighting also played a big role in making sure that the lighting doesn't damage or fade the art pieces. A high colour rendering spec of the light source was critical to bring out the true colours and textures of the art. "To make the art stand out we opted for 3000 K colour rating, still on the warm light spectrum but more crisp than your typical residential lighting," Hart says. "We also had to allow for a lighting scheme suitable for functions, which required more ambient lighting to enhance visual depth and spatial flow through the trendy space. The lighting scenes are controlled and managed by a home automation system."

The overall lighting concept behind the gallery space was a concealed black ceiling void into which art quality spotlights were installed to allow for maximum flexibility when lighting artworks that can change location and come in different sizes. The art required spotlights which were positioned in recessed tracks, to move or tilt as needed. The small entertainment bar area adjacent to the art gallery was lit in a moody warm 2600 K light level, and included accent LED lights in the joinery. This allowed for a sense of intimacy and enhanced the usability of the space.

Enquiries: www.inhouse.ws



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LIGHTING DESIGN DRIVES HIGH PERFORMING FOURWAYS MALL



Accelerate Property Fund and its development partner's multi billion Rand investment into transforming Fourways Mall came to fruition as the renovation and expansion project completed its final phase, promising investors solid returns and customers a world-class 'shoppertainment' and international standard retail experience.

"The launch represents the first step in the fund's 15-year plan for the Fourways node, including enhanced office, hospitality and retail offerings," says Andrew Costa, COO of Accelerate Property Fund (APF). "The impact of new traffic routes, densification and growth, as well as developing and maximising properties that enhance the value of the area is key to future growth in the node."

The sprawling shopping and entertainment complex boasts a gross lettable area of 178 000m² comprising over 450 stores. This will later grow to 200 000m² with the launch of French home improvement mega-retailer Leroy Merlin, with its box, to be linked to the main mall, currently under construction.

New local and international stores such as Lindt, Hamleys, Cotton On, Nike, Adidas Starbucks, H & M and Exclusive Books complement the extensive food court and entertainment offerings, and existing tenants such as Mr Price, the Foschini Group stores, Edgars and Woolworths have expanded their stores. All new and expanding stores will be first of their kind in South Africa, introducing concept store offerings that will be exclusive to Fourways Mall.

The lighting design of the centre plays a large part in the experience with a number of 'feature areas' included which use lighting as a defining factor. The new football-sized Market Square at the heart of the mall will be home to launches, events and activations, and shoppers will find it easy to get back to their cars with the mall's clever colour themes – linked to the lighting – which assist with wayfinding and navigation within the mall.

"With the extension and additional retail space supplied, the Fourways node will be the most dominant retail market in South Africa," Costa says. "It will further contribute to solid tenant retention which is now comfortably above 85%, as well as declining vacancy levels across APF properties, which dropped from 10% in 2018 to 9% in 2019."

NEW PROPERTY OF LIGHT DISCOVERED

A team of researchers affiliated with several institutions in Spain and the U.S. has announced that it has discovered a new property of light – self-torque. In a paper published in the journal *Science*, the researchers describe how they happened to spot the new property and possible uses for it.

Scientists have long known about such properties of light as wavelength. More recently, researchers have found that light can also be twisted, a property called angular momentum. Beams with highly structured angular momentum are said to have orbital angular momentum (OAM), and are called vortex beams. They appear as a helix surrounding a common centre, and when they strike a flat surface, they appear as doughnut-shaped. In this new effort, the researchers were working with OAM beams when they found the light behaving in a way that had never been seen before.

The experiments involved firing two lasers at a cloud of argon gas – doing so forced the beams to overlap, and they joined and were emitted as a single beam from the other side of the argon cloud. The result was a type of vortex beam. The researchers then wondered what would happen if the lasers had different orbital angular momentum and if they were slightly out of sync. This resulted in a beam that looked like a corkscrew with a gradually changing twist. And when the beam struck a flat surface, it looked like a crescent moon. The researchers noted that looked at another way, a single photon at the front of the beam was orbiting around its centre more slowly than a photon at the back of the beam. The researchers promptly dubbed the new property, self-torque.

Enquiries: www.phys.org

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WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

Inspect, test and certify and hazardous electrical installations course

WHEN: 7-11 October

WHERE: Wadeville, Germiston

MORE INFORMATION: www.pandttechnology.co.za

Electric fence installer course

WHEN: 9-11 October

WHERE: ECA(SA) Head Office, Germiston

MORE INFORMATION: www.ecasa.co.za

Cable Fault Location course

WHEN: 9-11 October

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

CoC course/Units Standards

WHEN: 14 October

WHERE: ECA(SA) Pretoria office

MORE INFORMATION: www.ecasa.co.za

CPD Training: Thermal

WHEN: 14-15 October

WHERE: TBC, Cape Town

MORE INFORMATION: sales@comtest.co.za

ORHVS course

WHEN: 14-18 October

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

CPD Training: Power Quality: Training Measure & Analyze PQ Problems

WHEN: 16-17 October

WHERE: TBC, Cape Town

MORE INFORMATION: sales@comtest.co.za

CPD Training: Field Calibration

WHEN: 18 October

WHERE: TBC, Cape Town

MORE INFORMATION: sales@comtest.co.za

Transformer Testing course

WHEN: 21-22 October

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

Inspect, test and certify and three phase electrical installations course

WHEN: 23-25 October

WHERE: Wadeville, Germiston

MORE INFORMATION: www.pandttechnology.co.za

Basic Electricity course

WHEN: 28-29 October

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

Cable Diagnostics course

WHEN: 28-29 October

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

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Installation rules course

WHEN: 28 October-1 November

WHERE: ECA(SA) Head Office, Germiston

MORE INFORMATION: www.ecasa.co.za

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WHEN: 4-5 November

WHERE: Wadeville, Germiston

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ORHVS course

WHEN: 4-8 November

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

KNX building automation (advance course on request)

WHEN: 4-8 November

WHERE: Wadeville, Germiston

MORE INFORMATION: www.pandttechnology.co.za

Electric fence installer course

WHEN: 6-8 November

WHERE: ECA(SA) Head Office, Germiston

MORE INFORMATION: www.ecasa.co.za

CoC course

WHEN: 12 November

WHERE: ECA(SA) Head Office, Germiston

MORE INFORMATION: www.ecasa.co.za

Cable Fault Location course

WHEN: 13-15 November

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

Inspect, test and certify and single phase electrical installations course

WHEN: 16-18 November

WHERE: Wadeville, Germiston

MORE INFORMATION: www.pandttechnology.co.za

CoC course/Units Standards

WHEN: 18 November

WHERE: ECA(SA) Pretoria office

MORE INFORMATION: www.ecasa.co.za

Cable Jointing and Terminations course

WHEN: 18-20 November

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

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WHEN: 25-26 November

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

Earthing and Bonding course

WHEN: 26-27 November

WHERE: ECA(SA) Head Office, Germiston

MORE INFORMATION: www.ecasa.co.za

Solar PV course

WHEN: 28-29 November

WHERE: ECA(SA) Head Office, Germiston

MORE INFORMATION: www.ecasa.co.za

Cable Diagnostics course

WHEN: 28-29 November

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

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ORHVS course

WHEN: 2-6 December

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

Cable Diagnostics course

WHEN: 9-10 December

WHERE: H.V. Test training centre, Randburg

MORE INFORMATION: www.hvtraining.co.za

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