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CRABTREE MAXIMISES BUSINESS OPERATIONS AND SOCIAL UPLIFTMENT IN LESOTHO



Of the 250 people employed at the Lesotho factory, 97% are Basotho.

CRABTREE, a leader in electrical infrastructure, has a multi-factory approach to business that has been a success story since operations commenced in 2007. While it is not uncommon for one company to have separate factories, what sets Crabtree's arrangement apart from others is that the headquarters are in Wadeville, Johannesburg, while the second factory is some 430km away in Lesotho.

"The factory is situated about 2km from the Maseru bridge in Lesotho's capital city Maseru," explains Michael Daniels, Factory Manager of Crabtree's Lesotho facility. "On average, we employ 250 people in the factory, of which 97% are skilled Basotho citizens."

Daniels adds that the factory comprises two separated buildings of approximately 3,500m² of floor area. "There is a warehousing building and a production building. There are two sections in the warehouse building – the first is where we store components that are shipped to us from the Wadeville factory, while the second is where we store the assembled products and prepare them to be shipped back to our headquarters in South Africa, from where they are distributed or exported. The production building is where the components are pieced together to form our products. The assembly portion of the production line takes place in Lesotho and nearly everything is made in-house by Crabtree."

But does it make sense to manufacture components in South Africa, ship them almost 500km away to be

CONTINUED ON PAGE 3

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Generator choice can be critical to success

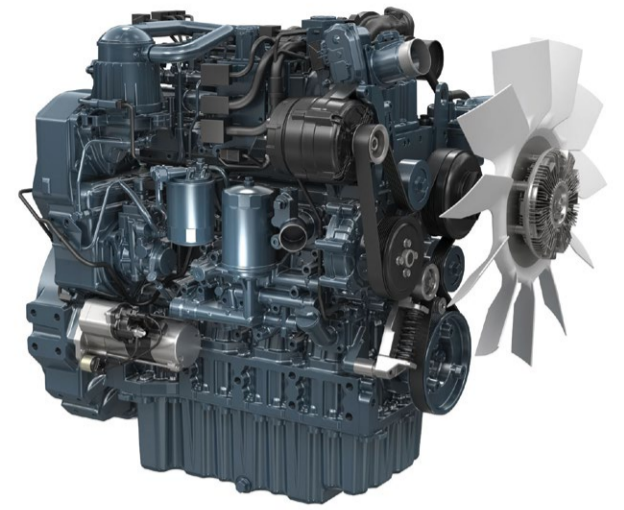
When it comes to selecting a generator, 'application needs' is your most critical tool. Your power supply has to meet the demands of your business needs while taking into consideration the initial cost implications, coupled with on-going running and maintenance costs. So choosing anything less than the best is a mistake that could prove detrimental, explains Renier Potgieter, Generator Specialist at Smith Power Equipment.

"In all but the smallest applications, the purchase of a generator is a major investment that requires careful thought and planning in order to meet a household or business's current and future needs. In almost all instances, the output needs to be carefully matched and the overall longevity of the equipment should be right near the top of priorities," says Potgieter.

Smith Power Equipment supplies pro-grade generators that, in most cases, exceed users' requirements, no matter the intended application. "We use among the best generator motors available in the world right now, either from legendary Japanese manufacturer Kubota or the

world's best-selling large diesel engines from John Deere or Cummins," says Potgieter. He adds that these are paired with iconic French-made Leroy Somer alternators to produce single-phase household current or three-phase industrial power, efficiently and reliably. Potgieter believes that Smith Power Generators are at the pinnacle of pro-grade generation power.

It is important to remember that the engine/alternator combo needs to be perfectly matched to the alternator to ensure it delivers the specified output without over or under-stressing the engine. "This ensures best possible fuel consumption, and reliability of the engine in the long run. Likewise, the electrical interface, mountings and assembly contribute to the durability of the equipment in the field, for years to come," says Potgieter. "Low-noise levels are also an important requirement and Smith Power Generators have this as a standard feature for a quiet and comfortable environment, both at home and in the workplace. Super silent units are also available for office parks and residential applications."



Smith Power's pro-grade generators are available from 12 to 2,500kVA, offering single-phase generators for residential use and custom-built industrial generators with standard 400V and 525V options.

Enquiries: smithpowergenerators.co.za

Testing earth grounding is vital for site safety

Poor grounding increases the risk of equipment failure, as well as potentially putting people in harm's way. Facilities need to have adequately grounded electrical systems so that in the event of a lightning strike or utility overvoltage, the current will find a safe path to earth and no further incident can take place.

There are four types of earth ground testing methods available, and it is important to not only understand their differences but also know how to correctly test them using equipment such as Comtest's Fluke 1625.

Soil Resistivity (using stakes)

Soil resistivity is vital when determining the initial design of the grounding system for new installations (green field applications) to meet resistance requirements. To test, you need a location with the lowest possible resistance. Soil composition, moisture content and temperature can impact soil resistivity, so it is recommended that ground rods be placed as deep as possible into the earth, at the water table if possible. They should also be installed where there is a stable temperature, i.e. below the frost line.

To test soil resistivity, connect the ground tester with the stakes positioned in the soil in a straight line, equidistant from one another. The distance between earth ground stakes should be at least three times greater than the stake depth. So if the depth of each ground stake is 30cm, the distance between the stakes should be a minimum of 90cm apart. Using Ohm's Law (Voltage = Current x Resistance), the Fluke tester automatically calculates the soil resistance, while also protecting the measurements from interruption and distortion from ground currents and their harmonics.

Changing the depth and distance for multiple readings will produce a profile that can determine a suitable ground resistance system.

Fall-of-Potential (using stakes)

The Fall-of-Potential method measures the ability of an earth ground system or an individual electrode to dissipate energy. The earth electrode of interest must be disconnected from its connection, then the tester is connected to the earth electrode. Two earth stakes are placed in the soil in a direct line a minimum of 20m from the earth electrode. A known current is generated by the Fluke 1625 between the outer stake (auxiliary earth stake) and the earth electrode, while the drop in voltage potential is measured between the inner earth stake and the earth electrode. To achieve the highest degree of accuracy when performing a three-pole ground resistance test (described above), it is critical that the probe is placed outside the sphere of influence of the ground electrode under test and the auxiliary earth.

Selective (using one clamp and stakes)

Selective testing is like the Fall-of-Potential testing, but the process is somewhat easier and safer, with the same results being achieved. The earth electrode of interest does not need to be disconnected from its connection, which means the technician does not endanger themselves by disconnecting ground, nor endanger other personnel or electrical equipment inside a non-grounded structure. Two earth stakes are placed in the soil directly away from the earth electrode, again at a minimum of 20m. The tester is connected to the earth electrode of



interest with a special clamp being placed around the earth electrode, eliminating the effects of parallel resistances in a grounded system.

As before, a known current is generated by the Fluke 1625 between the outer stake (auxiliary earth stake) and the earth electrode, while the drop in voltage potential is measured between the inner earth stake and the earth electrode. Only the current flowing through the earth electrode of interest is measured using the clamp.

Stakeless (using two clamps only)

The Fluke 1625 earth ground tester can also measure earth ground loop resistances for multi-grounded systems using only current clamps. This method eliminates the dangerous, often time-consuming disconnection of parallel grounds, as well as having to find suitable locations for auxiliary ground stakes. This test can also be conducted in numerous other spaces where access to soil is restricted, including inside buildings and on power pylons. Two clamps are placed around the earth ground rod or the connecting cable, each connected to the tester. A known voltage is induced by one clamp, and the current is measured using the second clamp. The tester automatically determines the ground loop resistance at this ground rod. Bear in mind that stakeless measurement only measures individual ground rod resistances in parallel to earth grounding systems. If the ground system is not parallel to the earth, you will have an open circuit or be measuring ground loop resistance.

Enquiries: www.comtest.co.za



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SCAN ME



Correct sealing ensures system integrity

Gaskets are a small but vital part of every system. They stop dust and dirt, fluids, gases and more, from getting into or escaping the operating environment. Pratley, which recently celebrated 75 years as a global leader in adhesives (see Sparks August cover story www.sparkselectricalnewsmagazine.co.za), has developed the RTV Silicone Gasket Maker, which has become popular with users. "Incorrect gasket application can ruin an otherwise perfect engine build or reassembly," notes Mark Bell, National Sales and Marketing Manager for Adhesives at Pratley. Below are some essential tips for successful gasket sealing.

Choose the correct sealant. This can make the difference between a 100% reliable gasket, and failure. Pratley's RTV Silicone Gasket Maker is a tough grey elastic silicone rubber with a temperature tolerance of -50°C to +300°C for short periods, and is non-corrosive. It is important to choose a product, like the RTV Maker, that is chemically resistant to various substances, including petrol and diesel for short periods, paraffin, water and more. It is also sensor-safe, so it

works with electrical components.

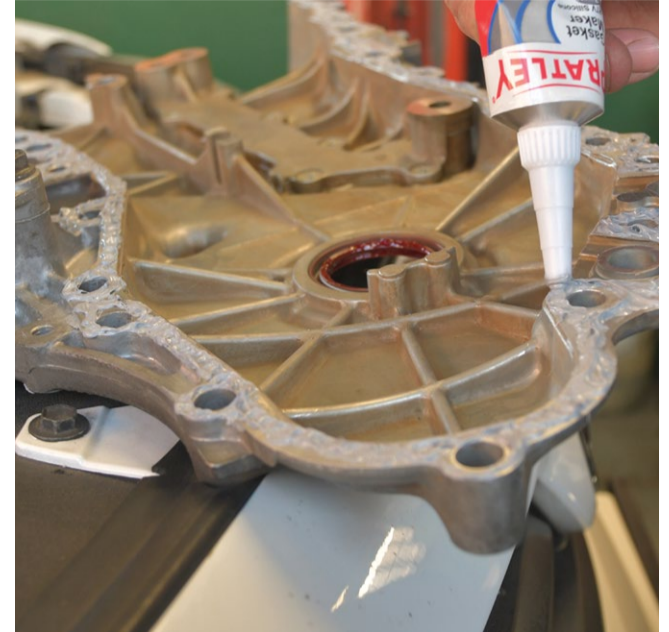
Prepare the surface. This is crucial for successful gasket application. Both surfaces must be thoroughly cleaned and free from remnants of the old gasket, glue or adhesive.

Quantity is important. Using the correct quantity of sealant is vital. Too much can clog other engine areas, while too little may result in an inefficient seal. It should also be applied in a single continuous bead to one of the sealing surfaces, ensuring there are no air gaps, while also encircling all bolt holes.

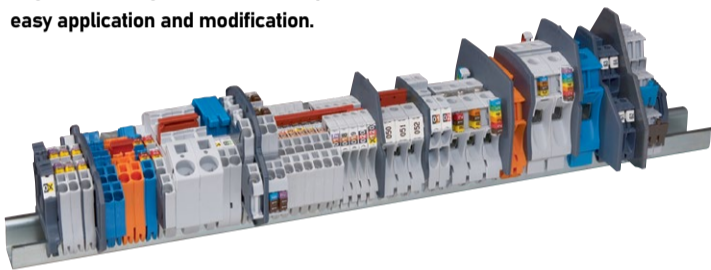
Give it time. Curing time is often overlooked. The Pratley RTV Silicone Gasket Maker, for example, begins to cure within 40 minutes and achieves a full cure after 24 hours. Allow ample time for the sealant to cure completely before subjecting the engine to heavy usage.

These simple tips can help guarantee reliable and cost-effective sealing of gaskets, ensuring a successful project and operation.

Enquiries: www.pratleyadhesives.com



Legrand's Viking 3 terminal block provides easy application and modification.



Legrand's swift and flexible cable marking systems increase productivity

With its cable marking systems, Legrand has reiterated its position as a premier electrical cable supplier. Designed for flexibility, reliability and ease of use, the products continue to provide trouble-free installation while being of the highest quality.

The Starfix series of crimping tools is a four-in-one solution, offering time savings of more than 50% compared with traditional tools for the same task. The Starfix tool cuts, strips, twists and automatically crimps each Starfix ferrule onto the cable. The tools are available in three sizes for cables from 0.25mm² to 5mm², and multi-purpose crimping tools are designed for cables from 0.5mm² to 2.55mm². The tools are also designed to be operated equally easily by left- and right-handed users.

Legrand's CAB3 cable marking system offers a dependable solution to multiple cable and terminal marking needs. Universal fittings ensure clear and rapid marking, with simple modifications. The easy-to-use system can be employed for marking cross-sections of between 0.15mm² and 6mm², and it can be applied either before or after wiring has been completed.

The CAB3 is manufactured in strips for easy handling and less wastage. It consists of numbers, letters, conventional symbols and international colour-coded markers, allowing for use in almost any situation. The system comprises label holders and a re-usable applicator that facilitates fast distribution.

Legrand also has a Viking 3 terminal block that comes with screw, automatic spring or heavy-duty connection options. An important feature is that one marking system can be used for simultaneous identification of wiring and terminals. Compatible marking systems include Legrand's CAB3 marking system and Starfix crimping tools and ferrules.

Viking 3 is constructed from polyamide and is designed to make an efficient connection between two rigid or flexible copper wires, ensuring easy installation, clear marking and optimum safety.

The entry point to the terminal acts as a guide for the conductor, facilitating near-perfect positioning for a quality connection. The cable is reliably and safely clamped in the terminal by constant contact pressure of the clamp system.

The Viking 3 terminal blocks are colour coded for easy identification and accurate installation, complying with local and international quality and safety specifications, as well as the Restriction of Hazardous Substances requirements, international approvals for ATEX certification and stringent IEC standards.

Enquiries: www.legrand.co.za

CONTINUED FROM PAGE 1

CRABTREE MAXIMISES BUSINESS OPERATIONS AND SOCIAL UPLIFTMENT IN LESOTHO



Crabtree has a fully operational factory in Lesotho.

put together in another country, only to have them transported back to the original factory? It does – for a couple of reasons, explains Daniels. "There is a financial benefit, also Lesotho does not experience loadshedding – we have electricity 24/7, which means there are no hold ups in our production line. We can operate at 100% capacity all the time. There is also the benefit of location – we can export products via road and sea freight," he says, referring to Lesotho's proximity to South Africa's ports.

"By working with the community in Lesotho, we can not only create employment but also upskill the local community. The social upliftment is something we hold as a key value in the company," adds Daniels, explaining that as an industry leader, "Crabtree is always investigating new technologies; ways to be energy efficient and optimise both our production and product performance for our customers. We are looking to expand our product range, and there could be a few developments in the near future."

Crabtree is a leading manufacturer of electrical components and accessories which include switches, sockets (domestic/commercial and industrial), trunking and fittings, extension cords, adapters and many other products. The company's research and development have also led it to build a range of SABS approved electrical components specifically for application in healthcare facilities. "We are proud as a company to manufacture products of the highest quality. Our ranges are not only safe and reliable, they also conform to SANS/ISO 9001-2015 standards, which means you will have the best product available," concludes Daniels.

Enquiries: www.crabtree.co.za

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Add Ohm's Law calculator to your cellphone power app list

Working with electricity is not just about connecting physical wires and getting current to electrical devices. There is a lot of maths involved and electrical contractors need to accurately calculate figures to ensure that the work they are doing will be able to support the end user's operational requirements. Incorrect calculations could have catastrophic results – not just to infrastructure but possibly injury or worse to people nearby.

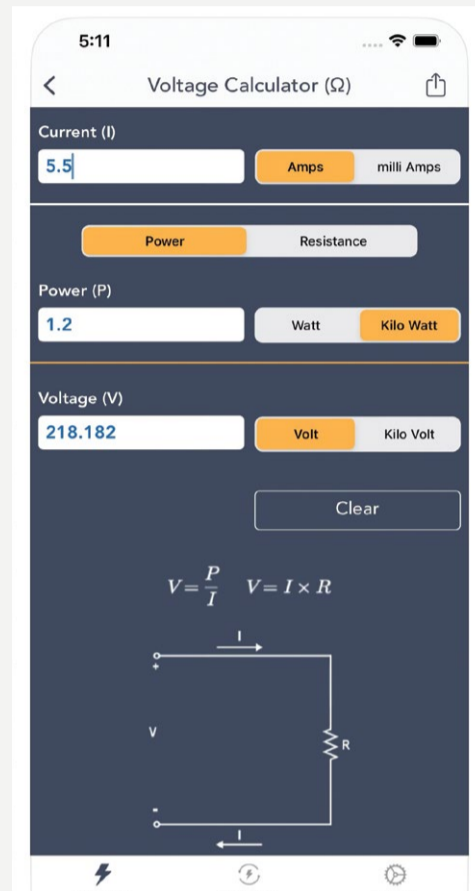
Thanks to developers like V Pugazhenth, contractors and electricians do not need to pull out their pen and paper to start doing maths. Instead, smartphone apps like Ohm's Law Calc put the power of instant maths equations into the palm of a professional's hands, which is handy when they are on-site and need to quickly solve problems.

The free Ohm's Law Calc app contains ads and there are a few locked calculations (the ads can be removed and the calculations unlocked for a once-off payment of R79.99), but the main equations are free – there are 62 computations that can be calculated on the free version, ranging from a voltage calculator and power calculator, to the three-phase current calculator and even an energy cost calculator. All that the contractor needs to do is accurately enter the information required for the specific calculation and the Ohm's Law Calc app instantly

calculates the required information.

Similar versions are also available on Android devices.

Enquiries: www.apple.com/app-store, www.play.google.com



Skills every electrician and contractor should have... but may not know about

There is more to a career as a successful skilled professional like an electrician or electrical contractor than just book smarts. While it is critical to have a thorough knowledge about your field and what is going on in the electrical world, there are certain skills that you cannot learn at a vocational college and trade school.

- 1. Many hands make light work.** Electricians may work on their own as a one- or two-man show, but they need to be able to work as part of a bigger team. This could be from being on a site with other electrical contractors working on the same project, to having to work with other tradespeople like plumbers and construction crews.
- 2. Thinking on the move.** Electrical problems are rarely five-minute quick fixes. Sometimes, a seemingly small issue exposes a far larger, more problematic situation that is complex to solve. Electricians and electrical contractors need to be able to think quickly, clearly and confidently... all on the move.
- 3. Time does not wait.** Electrical problems can arise at any given moment and being readily available is something electrical contractors need to be able to manage. There is no such thing as a traditional 9-to-5 and electricians will go through waves of work – one day they will be on the move for 17 hours, the next day they could have a one-hour call-out and that is all.
- 4. The customer is king.** Being able to handle customers and having

service skills is vital to an electrician and contractor's reputation. It is as important as understanding electrical work itself. If a customer does not trust their service professional or there is some form of disconnect, for example the customer thinks that their electrician is rude and arrogant, there is very little chance of repeat business. Word spreads and a contractor might find that they are being unfairly jeopardised and will therefore lose work.

- 5. Hands-on approach.** Being a contractor requires physicality. First, there is the need to be able to lift heavy weights, to be able to carry equipment, tools and materials around job sites and up ladders, as well as being able to stand for long periods while working on equipment. Second, it is more about the finer motor skills, like hand-eye co-ordination and being somewhat ambidextrous. Electricians should be able to control their non-dominant hands well enough to use tools such as pliers and multimeters.

Source: www.skillsyouneed.com



Tricks of the trade to keep you alive

Working with electricity comes with a lot of risks – the biggest is accidentally coming into contact with live wires. Here are five safety tips and tricks that every electrical contractor should remember when working on a site...

- 1. Believe that devices are always live.** You can never guarantee who has worked on an electrically powered piece of machinery or equipment or the standard that they have worked to. If you walk onto a job site telling yourself that every single device is live, you will never just pick it up and risk potential electrocution. By reminding yourself that everything is live, your first step at a site will always be to check that the device is unplugged or that the fuse has been removed and it is now safe to work on.
- 2. Safety is critical.** There is a reason that health and safety instruction manuals and protocols are so long and complex – because there are so many things that can go wrong and cause harm and even death, more so when you are working with electricity. One of the easiest to remember and most important aspects of safety is the use of safety gear. This does not only mean wearing safety gloves, shoes and hardhats on-site, but also rules like having dry hands, not wearing metallic jewellery or even using metallic pencils.
- 3. Liquids and live current do not mix.** This may sound obvious, but you would be surprised to find how many times people store liquids near electrical equipment and infrastructure.

This includes flammable and non-flammable liquids as they both share one thing in common: They will conduct electricity and you will be killed if you step into water that has a live current flowing through it.

- 4. If something is hot,** there could be a problem. This goes for items and products such as faceplates or multiports. If you notice burn marks or they are hot to the touch, you should immediately turn off the breakers at the DB board and investigate safely. Overheating could be an early sign of an overloaded outlet and the result, if no action is taken, could be an electrical fire.
- 5. Extension cords are temporary solutions.** Never use an extension cord as a permanent solution to a power requirement. These cords tend to deteriorate quickly, and they are not designed to be placed under carpets either. Use them as and when needed only. If extra outlets need to be installed, that should be done as soon as possible so that extension cords can be used only as and when needed.

Sources: www.briteboxelectrical.com, www.earlybirdelectricians.com



Add these routines to closing a call and improve the service

Just because a service call has been completed physically does not mean that the work is finished. Here are a couple of steps contractors can easily add to their routine to close a service call professionally, keep customers satisfied and improve their offering.

- Talk the customer through the work that has been done. By taking a customer to the physical job site, they can get a first-hand look at the work that has been completed. By explaining the work in a simple, clear manner, the customer is made to feel part of the project. A site inspection also gives customers the opportunity to raise any concerns and physically show the contractor what they are not happy with rather than over the phone or email, which often leads to miscommunication.
- Ask for an online review. This allows customers to be honest – and hopefully favourable – about the work that has been done. With the review being online, contractors get their name into the public domain and potential customers can search for them, see what experience other customers have had, and hopefully find a contractor who will be able to service their needs.
- Never be too proud to ask for referrals. There is no such thing as too much work. Once the job is finished, ask customers to refer the work to friends, family and colleagues who have similar situations. In certain instances, a referral fee may be offered or even a discount for future work should a referral be successful.
- Evaluate the job and use the most recent call-out as the benchmark. Sometimes things go wrong on a call. It is important to use that as a learning step and make sure that the next job is completed to a better standard. By looking at aspects such as "was the site cleaned afterwards?", "was the customer kept up to date?" and "where can the work rate be improved?", a contractor can assess the service they provide, identify problem areas that need to be addressed, and spot areas where they excel, all of which can be improved regardless of how good they were.

Source: www.ecmweb.com



Hellermann Tyton South Africa introduces its upgraded compliance kits

Cable management manufacturer and supplier Hellermann Tyton South Africa has upgraded its TCTDT and TCTCDK compliance kits. The kits now come with an aluminium enclosure that protects the equipment better than previous versions, while also being easier to store and transport to job sites as well as while the equipment is being used on-site.

"We are excited about these updates to our ever-popular compliance kits," says Voloshnee Pandaram, Marketing Manager for Hellermann Tyton South Africa. "Our company is always looking for new ways, not only to improve our products but also to make them better for our customers to use. We pride ourselves on manufacturing and sourcing products of the highest standard, but that does not mean we stop looking for ways to make them better than they already are. These updates to our compliance kits add a new dimension that will be welcomed by the people using them in the field."

What is in the boxes?

- The two kits share some components:
- The T1151 1,000V Digital Insulator Tester can do insulation testing using test voltages of 250V, 500V and 1,000V. It features an auto discharge safety function, as well as added safety voltmeter protection that takes place before each test. It provides readings according to the Polarisation index, as well as the Dielectric Absorption Ratio.
 - The Digital Earth Resistance Tester that measures 20,200 and 2,000 ohms of resistance. The compact design incorporates features like safety voltage protection that are more commonly found on bigger equipment. The digital display is clear and crisp, allowing users to accurately read the measurements being recorded.
 - The TEL2TLB ELCB/Polarity Socket Tester is ready-board compatible and provides LED wiring integrity indication. It has a built-in faulty earth detector, is SANS164-2 (Type N) plug socket compatible and comes with a SANS 164-1: 16A three-pint adapter plug.

But there are also differences.

The TCTDT has the Jupiter Multifunction Multimeter Loop Tester that features auto range function while also testing voltages up to 690V for DC, AC TRMS and AC+DC TRMS. It also measures Low impedance input (LoZ) as well as currents of DC, AC

TRMS and AC+DC TRMS with external transducer. The unit displays functions such as Maximum, Minimum, Peak and Hold.

The TCTCDK meanwhile features the T1825 Loop Network Tester Analyser that is microprocessor controlled and can be used to test up to 100A (6kA) circuit breakers. Each phase is tested separately on a three-phase system, and the unit features safety voltmeter protection.

There is also the TBM031 600A AC Digital Clamp Meter that has 30mm jaw size, allowing

users to clamp large cables. It features AmpTum and BeepLit protocols, can be used to conduct continuity and diode tests, and provides non-contact EF detection. The last piece of equipment in the compliance kit is the T860 Phase Rotation and Motor Rotation Indicator that has heavy-duty alligator clips for easy and reliable clamping. It is used to determine rotation of unconnected motors and can also identify open phase.

Enquiries: www.hellermanntyton.co.za

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Why quality flamepaths, protection and maintenance should be Safety 101

One of the protection concepts to allow electrical equipment to be used in explosive atmospheres is referred to as “flameproof” or “ex d”. The pressures generated by hot gases within a flameproof enclosure during an explosion are vented safely into the surrounding atmosphere through the flamepath. But what is a flamepath and where is it used?

A flamepath is a small gap of defined width formed between the flange of an ex d enclosure and its lid. If a flammable gas mixture enters the enclosure and is subsequently ignited, then the pressure inside the enclosure rises rapidly. The flamepath cools the burning gas mixture, preventing it from leaving the enclosure and igniting any gas mixture surrounding the enclosure.

What are the requirements?

Variables that may affect a flamepath's operational performance include its width and gap size, the gas type, as well as enclosure volume. The roughness of the flamepath surface can also influence how well it works, having a maximum value of $6.3\mu\text{m}$ allowed in IEC 60079-1.

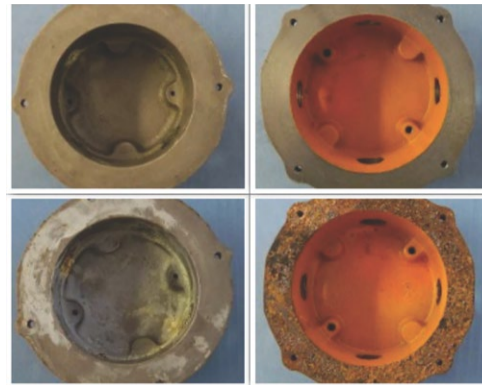
- The dimensions required for a flamepath differ depending on the gas mixture being used. Gas types are sub-divided into Group I (least flammable) IIA, IIB and then IIC (the most flammable).
- The size of the flamepath gap must be smaller as the enclosure gets larger.

One reason is that in a small enclosure, the length of the flamepath is a higher percentage of the volume of the enclosure compared to a larger enclosure. If the enclosure has a larger volume, there is more gas mixture to ignite and expand before it reaches the flamepath, which could mean a higher pressure is exerted.

Surface roughness can be critical. When measuring the gap between two surfaces, what is measured is the gap between the peaks of the surface, which is never exactly smooth when considered on a microscopic level. Surface roughness is defined as the distance between the peaks and valleys of the surface, so the real maximum gap between two surfaces can be defined as the “valley to valley” distance. The actual flameproof gap is as much as the measured gap plus 2x the surface roughness. For this reason, the maximum surface roughness of the flamepath has been defined so that the overall effective flamepath gap is controlled.

Flamepath maintenance.

The flamepath must operate correctly over the intended life of the product. To ensure this happens, the flamepath must be protected and periodically inspected. The inspection is both a visual assessment for mechanical damage or corrosion, and a measurement check to make sure that the gap has remained correct. Traditional cast iron



Top left: CCG enclosure with corrosion-resistant metallic treatment before testing.

Top right: Cast iron enclosure from nearest competitor before testing.

Bottom: After testing.

enclosures are susceptible to corrosion, which increases the surface roughness and flamepath gap, which in turn render the product unsafe.

Leading manufacturer CCG has developed a specialised metallic corrosion-resistant treatment during the manufacture of its ex d enclosures. Further protection can be provided using a non-setting grease. Some manufacturers

in the industry have tried to overcome corrosion by using non-metallic materials for the manufacture of their ex d junction boxes, but non-metallic polymers are softer than metallic boxes, so flamepath surface is at a higher risk of mechanical damage.

When selecting flameproof enclosures, it is important to know and understand any limitations or restrictions that may apply to the ex d housing. While CCG's flameproof products have no such limitations, some non-metallic flameproof enclosures do not permit the storing or fitting of energy-storing electronics, cells, batteries or switchgear components to the enclosure, which ironically is the reason most ex d enclosures are bought and installed to companies.

When there is the slightest chance of sparks in an environment where flammable matter is present, an ounce of prevention is better than a pound of cure, so make sure that the flamepath is safe and that the flameproof enclosure is going to maintain its integrity no matter what is thrown in its path.

Enquiries: www.ccgcableland.co.za

ABB gives local market a boost by investing in medium-voltage switchgear production

Automation leader ABB has invested R10 million into the local manufacturing sector by localising manufacturing to bring smart solutions for medium-voltage switchgear applications closer to customers.

“The size of the South African switchgear market is projected to register growth,” says Yunus Hoosen, Head of InvestSA, an agency of the Department of Trade, Industry and Competition. “The increasing number of investments in sustainable power generation, coupled with the growing population, is expected to drive the growth of the market. This illustrates both the importance of the domestic sector to multinationals and the strategic location of South Africa to a rapidly growing African consumer market.”

Through this investment, ABB has chosen to create long-term job opportunities for engineering graduates, as well as increasing flexibility and reducing delivery times and costs for customers.

The project will see additional technology transfer completed, bringing the manufacture of UniGear ZS1 medium voltage switchgear to South Africa. Until now, the ZS1 has been fully imported from the Czech Republic. “With the investment, 60 to 70% of the technology will be locally manufactured and assembled,” says Egon Worthmann, Medium Voltage Primary AIS Switchgear Manager for ABB Electrification's Distribution Solutions division. “Utilities are increasingly looking to implement smart solutions to solve complex energy challenges. ABB is well placed to continue to deliver world-class solutions to customers now through local manufacturing right here in South Africa. The creation of job opportunities for local engineers and contractors

demonstrates our commitment to the long-term development of the country.”

With the investment, ABB's customers will benefit from a higher design flexibility, faster accessibility, as well as decreased costs due to reduced import costs and delivery time. As well as the production upgrade to the ZS1, ABB has also started the process of increasing the localisation of its Compact Secondary Substations (CSS), which is expected to be completed by October 2023.

ABB's Distribution Solutions factory has an employee count of about 120, of which ten staff members have been newly employed because of this investment project. Hoosen adds, “The ABB investment further signifies that South Africa remains an attractive investment destination across all sectors, including the Advanced Manufacturing sector. InvestSA remains ready and committed to assist foreign and domestic investors in realising their investment in South Africa, more so with localisation a key part of economic reconstruction and recovery.”

Via this initiative, ABB South Africa is contributing to social upliftment by creating jobs in a country with one of the highest unemployment rates in the world (currently sitting at 32.9%). ABB's local headquarters were built in 2009 and prove that the company is not only committed to growing the country's economy, but also pro-active in planning and execution of operations – the site has a 760kWp array of rooftop solar panels that generate enough solar energy to cover about 30% of the building's annual energy consumption of 2,400 MWh.

Enquiries: ww.global.abb

Inverter and UPS maintenance is more important than you realise

By performing routine maintenance to your inverter and uninterrupted power supply (UPS), you are effectively shifting an uncertain risk into a scenario that is both manageable and planned. The team at Cooper Power South Africa explores some of the risks and benefits of caring for these important pieces of equipment.

The cons

- Reduced battery life. By leaving your system to “just run”, you are allowing it to be fully depleted and recharged, which adds strain to the unit.
- Unreliable back-up power. When your battery system is compromised, you could find yourself having great performance one day, followed quickly by low performance that could leave you in trouble mid-project.
- Increased downtime. When there is a failure in your system, there could be significant work that needs to be performed to replace parts, leading to a bigger loss of operation time than if it were minor parts. This also increases repair costs, which could impact budgets.
- Fire and safety hazard. Batteries are made up of chemicals and their reaction is what provides power. Should there be a failure, there could potentially be an extreme chemical reaction that includes fire and explosions, placing human lives and safety at risk.
- Inaccurate monitoring. There is no way to know the true status of your system if your equipment is not operating optimally.

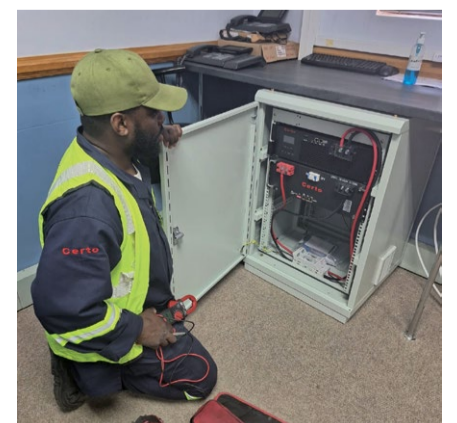
The pros

- Extended lifespan. By performing routine maintenance at least every six months, you can extend your

inverter or UPS lifespan by ensuring all equipment and components are working properly. At the same time, you can prevent major failures by spotting issues early and taking action before there is a significant failure, which leads to enhanced reliability.

- Minimised risk of fire and safety hazards. If your equipment is working the way it is intended, risks to human users and the immediate environment can be reduced and managed.
- Preservation of manufacturer warranties. If you have invested money in a product or equipment, you will want it to work the way it was intended. Should there be an unforeseen reason it does not, the warranty entitles you to remedies from the supplier, saving you money (if your warranty is voided, you will have to purchase replacement equipment).
- Accurate monitoring. If your power storage equipment is running correctly, you can rest assured that monitor and alarm information being presented to you is accurate. This means that you can continue with business operations until such time as an alert is given.

Enquiries: www.cooperpower.co.za





Lightning series 4: Surge protection measures

Surge protection was long held as a mystery threat until loadshedding hit South Africa and it became a far more common problem. It is often used interchangeably with lightning protection or treated as an entirely different subject where property owners must choose between one or the other. Richard Evert, National Director of the Earthing and Lightning Protection Association (ELPA), explores how best to protect from power surges, whether from lightning or loadshedding-related surges.

“Surge Protection Measures (SPM) are a critical part of every solution to overcome the threat of lightning to electrical and electronic equipment in a building,” says Evert. “As for lightning protection systems (LPS), the risk assessment will dictate whether SPM is required.”

Lightning striking the Earth produces a sharp rise in electrical current at the point of contact, which introduces a rapid rise in voltage as that current is dissipated into the ground. Equally, the radiated electric fields from the lightning flash produce voltage rise over the distance travelled since an electric field is measured in volts per meter.

“No lightning protection solution is complete until the threat of subsequent over-voltages during and after a lightning strike, have been considered. LPS designs where high earth resistance remains a problem, over-voltages are the consequence, says Evert, adding, “It is impossible to obtain

an earth electrode resistance of zero Ohms. Therefore, even with low earth electrode resistance, Ohms Law dictates that a voltage rise is inevitable. The higher the magnitude of charge transferred in a lightning strike, the higher the ground potential rise will be. Over-voltages therefore remain a factor to consider in every design.”

Equipotential Bonding

An over-voltage can only exist when there are two or more points that can be at different voltages. The term “equipotential bonding” is applied to all electrical conductors and systems that have been forced to be at the same voltage for the purposes of design requirements. “Where the points are at the same voltage, there can be no over-voltage and the valuable asset will not be exposed to potential damage due to lightning,” explains Evert. “Where equipotential bonding is possible, surge protection devices are not required. Equipotential bonding must be long lasting. Longevity of this equipotential bonding will be influenced by bonding methods and the materials used.”

Surge Protection Measures

The adoption of surge protection has long suffered due to confusing and inconsistent product marketing, unqualified training materials and presentations, as well as many so-called experts influenced by their own particular preferences. “In every instance



where uncontrolled over-voltages are possible and conductors cannot be bonded together, surge protection devices must be a consideration,” contends Evert. “The surge protection device acts as a fast-operating switch in the presence of the over-voltage. Thus, the selection of the correct surge protection device is related to the speed of the incriminating over-voltage wavefront, and the amount of charge that will be transferred across the surge protection device.”

As an organisation, ELPA strives for industry transparency and vested property stakeholder risk awareness to the extent that every property in South Africa will be

supported by a risk assessment alongside the risk assurance electrical Certificate of Compliance. “The risk assessment will ensure that only vested property stakeholders of properties that require lightning protection solutions will require additional guidance on the risk strategies they need to adopt. This will only be possible with sustained industry support and an adopted skills development plan approved by SAQA and the QCTO in accordance with the request as tabled by the Department of Employment and Labour,” concludes Evert.

Enquiries: www.elpasa.org.za

Keep your electrical panel operating optimally in a cool environment

Electrical equipment, machinery and systems radiate heat, so it is critical to ensure that the operational environment is as cool as possible to maintain perfect working order. The easiest way to do this is with the addition of a cooling fan that not only cools down the equipment, but ensures heated air is moved out of the immediate space. US-based thermal management company Kooltronic has come up with quick guide on how to choose the best cooling fan for your needs.

- **Keep it basic.** There are two types of fans – you need to know which you need. Axial fans are like typical house fans – they blow air in the direction you turn the blades. Centrifugal fans have a frame with a vent that runs perpendicular to the blades, so if you are facing the fan head on, the air is being directed to the left or right of the blades.
- **Know your heat.** The easiest way to calculate the heat load of your panel or enclosure is by using a cooling calculator (this is not an actual tool but rather a digital calculator on websites like www.kooltronic.com). You enter your information into the required fields, for example, the system’s voltage and whether or not it is enclosed or exposed, and the calculator will provide the heating data for you.

How cool? It is important to know how much cooling you need in your system.

This is calculated in CMM – cubic metres per minute. CMM is the amount of air that the fan moves, so knowing the heat load (mentioned above) needed can be matched with a fan that can provide enough cool, moving air.

Understand what you are buying. Fans may serve one purpose, but that does not mean they are all the same. You will need to check factors such as decibel rating and power demands for the fan itself to make sure it will not only comply with your system but that it will also not disrupt the immediate surroundings. For example, if the fan is too loud, those working near the system could have their work or routines impacted by the increased noise.

- **Install the fan correctly.** This does not only mean in the correct direction and with the correct tools. You need to make sure that the intake and exhaust areas are clear of blockages or barriers, as well as dust. There must also be a constant supply of clean, clear air that will be blown into the system.

Cooling is a vital component in any environment, and any increase in heat needs to be addressed correctly to maintain system integrity. While fans are the easiest way to decrease temperatures, especially in enclosed or confined spaces, you need to take care to get the correct cooling equipment for your needs.

Source: www.kooltronic.com

Prevent solar inverter short-circuits and fires

While solar power systems and inverters have become an almost necessity in South Africa thanks to loadshedding, there are still risks associated with them, especially the inverter system if it is not operated and managed correctly. “Users need to be aware of the potential fire risk,” explains Michael van Niekerk, the CEO of risk consultants ASP Fire. “This includes overheating or short-circuits in the battery or other electrical parts that could result in an explosion.”

Solar inverters are core to solar power systems as they convert direct current (DC) produced by photovoltaic (PV) panels into alternating current (AC) to power the house. “There are factors that can cause a solar inverter to catch alight,” say Van Niekerk. “It can simply be the naturally high temperature of its operating environment, compounded by the equipment generating heat as it inverts and transforms high-voltage electricity. Potential short-circuits can also be caused by a lack of maintenance, improper installation, poor quality equipment or even natural debris that finds its way into the equipment.”

Ironically, having your solar system connected to the national grid can also cause trouble in some circumstances, explains Van Niekerk. “Grid-tied solar systems are exposed to inrush current when the power is restored after loadshedding that can cause damage or fires, so it is important to have the system designed and signed off by a registered electrical engineer.” He adds, “Any failed component that short-circuits can result in a fire that spreads throughout the inverter, causing a domino effect.” Automatic fire suppression is important to quickly detect and suppress a fire so that the inverter is offline before the fire can spread to other components. This reduces the impact of any fire and prevents damage to other equipment and the immediate surrounds.

Van Niekerk recommends these general safety tips to prevent solar inverter short-circuits and

fires:

- Position the inverter on a reasonably flat horizontal or vertical surface.
- Avoid positioning the inverter on or near heating vents, radiators or other sources of heat. Direct sunlight should also be avoided.
- Ensure the inverter is well ventilated so that heat being generated is correctly dispersed during regular operation phases.
- Keep the inverter dry. Do not expose the unit to moisture, and do not operate the inverter if any surface that is wet may come in contact with any power source. Water and many other liquids can conduct electricity and lead to serious injury, death or electrical fires.
- Do not use the inverter near flammable or combustible materials or position it in areas such as battery compartments where fumes or gases may build up.

“Fires will happen. The best thing that a user can do is to manage the safety and minimise risk,” says Van Niekerk. “People need to know and understand the fire risks, how to best mitigate those risk factors, and lastly how to manage a solar inverter fire should it occur.”

Enquiries: www.aspfire.co.za





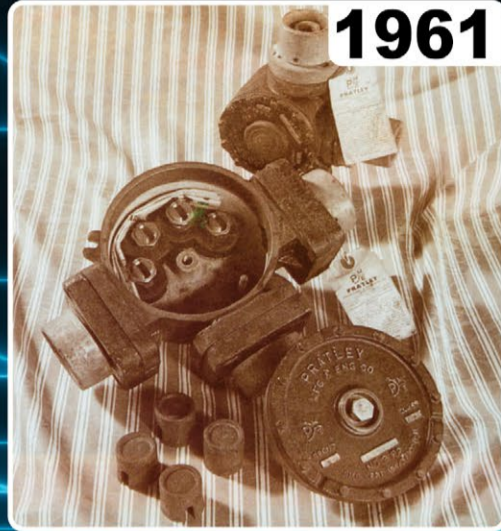
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Possibly South Africa's first cable resin joint.



1958

Pratley Putty was originally invented to secure and insulate the heavy brass terminals inside the Pratley Cast Iron Junction Boxes.



1961

The world's first chemical delay fuse igniter for blasting.



1966

Pratley Putty was used to repair one of the main supports in the Golden Gate Bridge in San Francisco.



1967

Pratley Putty was used to extensively repair areas of broken tiles of the Bayworld Aquarium tank in Port Elizabeth.



2005

Pratley Putty is being used to seal off holes drilled into rhino horns in the ongoing efforts of reducing rhino poaching



2013

On Friday the 13th of July 2018, Kim, Andrew & Charles Pratley replicated a demonstration from 1985 by standing underneath a 13-tonne bulldozer suspended above their heads using a Pratley Wondafix adhesive joint.



1985



2018



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Pratley Head Office in 1987 & Pratley Head Office on the occasion of Pratley's 70 year anniversary in 2018.

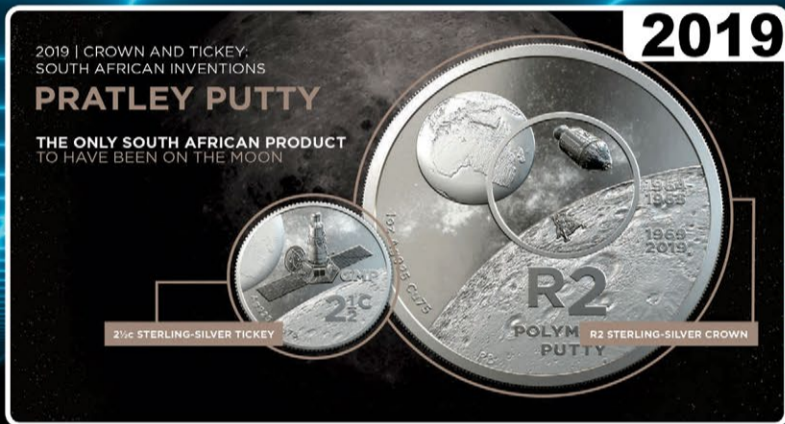


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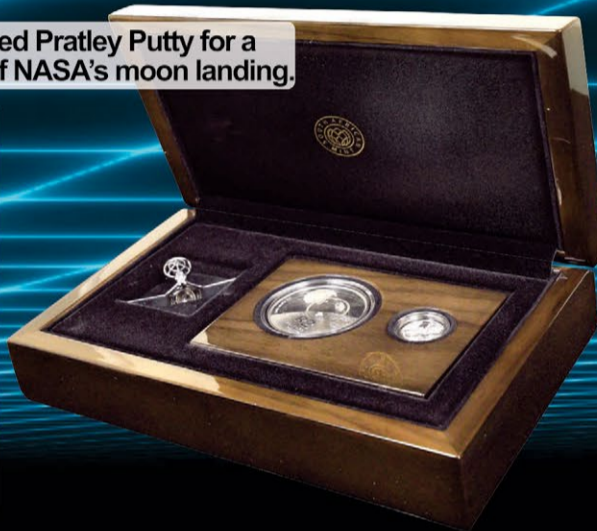


2018

The South African Mint chose the South African manufactured Pratley Putty for a limited edition coin set to commemorate the 50th anniversary of NASA's moon landing.



2019



Pratley Putty was used to seal panels during the construction of a cofferdam as part of the Kariba dam rehabilitation.



2019

Photo by Martie Coulson

In 2021 the new flameproof Taper-Tech® gland range is launched.



2021

Pratliperl thermally insulating & fireproof aggregate, is used for building lightweight concrete beehives.



2021

Beegin

Pratley Putty is being used by Oceans Without Borders to secure and restructure endangered coral reefs near Zanzibar.



2022

Photo by Chris Barfoot & Mark Ziembicki Photography

In 2023 the new Flameproof Enviro® Box is launched.



2023

MCE unveils its Onesto 6kW inverter and training facility

Electrical distributor MCE has launched two exciting items to its offering. The Onesto 6kW inverter being the first, with the second “product” being more of a companion: A training facility geared towards educating users and installers for the Onesto inverter.

“Our Onesto 6000HB-120 is packed full of great features,” explains Freddy Olivier, MCE’s Technical Manager. “The unit offers an impressive 6kW power capacity, providing more power to meet the user’s energy demands compared to standard 5kW inverters. It ensures ample energy supply for residential applications.”

Technology tools

The real benefits of the Onesto inverter are the technological advancements, adds Olivier. “The user will enjoy incredible energy conversion efficiency, with a remarkable 94% battery to AC efficiency. This level of efficiency maximises the utilisation of the battery storage, saving the user energy costs and reducing their carbon footprint.”

There is a built-in Battery Management System that optimises the 6000HB’s battery performance as well as prolonging the battery life. The unit also features dual built-in Maximum Power Point Tracker, allowing a total photovoltaic array power of 9,000W. “This feature allows the user to connect multiple solar panels or arrays, optimising energy production and accommodating various installation configurations,” says Olivier.

There is also the benefit of remote configuration and smartphone app interfaces. “The user interface has been enhanced and updates to the system software is fully remote, which means that there is almost never the need for a technician to do a call-out to tweak anything. Users can monitor their entire system from the app,” says Olivier, adding

that he is able to log in and check the customer’s settings and configurations remotely if needed.

The 6000HB has a brand-new large heatsink design that provides near-silent cooling. “By increasing the size of the heatsink on the inverter, we have increased the heat dissipation during operation without having to add noisy fans to the system. This way, users barely notice when the inverter is running,” says MCE’s technical manager. This feature eradicates nuisance ingress of insects, lizards and geckos that may cause malfunctions.

The 6000HB inverter also offers multi-compatibility with most well known battery brands available,” adds Olivier.

It can be installed in a 10-unit parallel, providing exceptional power supply when there is a loss of power. The 6000HB has an IP65 rating.

Teaching talents

MCE’s tech expert is excited about the company’s training facility, of which he is the head facilitator. “We opened the centre in the middle of August this year, so it is brand new. We provide training on Onesto product knowledge across the board, encompassing our DC product power distribution range, as well as installation training for the OST range of inverters.”

The facility is situated about 1km from MCE’s headquarters in Johannesburg’s southern suburbs, and it is open to both professionals and home users. “Our training centre can train a maximum of 12 people at a time, individuals and installers are both welcome and they can register online at www.onestosa.co.za/book-training. Registration is quick and easy,” adds Olivier, “and it will give trainees access to so much knowledge that they can use to enhance their Onesto inverter.”

Enquiries: www.mce.co.za



Robotic automation leads to higher quality machining and production

The introduction of automated machinery systems into production processes is growing at an increasingly rapid rate in South Africa. This is being driven by a severe shortage of skilled labour and the manufacturing sector shifting towards low-margin, high-volume production models.

However, there is still much work to do once automation has been installed into a business operation as many companies are unable to realise the full benefits of the technology, which includes increased productivity, improved quality, better efficiencies, and cost savings. This is primarily due to companies failing to pair their automated technology with equally high-performing consumables.

The advantage of robotic applications is that they improve overall operational efficiency and effectiveness by reducing manual work and delivering consistent results in shorter cycles. “When choosing a robot, the most suitable is the one that can achieve productivity gains and meet the technical requirements of the application. Other considerations are safety, space utilisation, upfront investment and after-sales support,” explains Dennis Phillips, National Sales Manager at PFERD-South Africa. “When implementing robotic applications, it is crucial to pair this high-performance equipment with equally high-performing consumables if the aim is to optimise processes, reduce costs and improve overall operational efficiency.”

The types of processes that are suitable for automation in the industrial sector are repetitive

Protect your solar panels – technologically and physically

South Africa is home to an incredibly complex and diverse weather system. With solar power systems and photovoltaic (PV) panels becoming more popular thanks to loadshedding and spiralling costs of electricity from Eskom and municipalities, it is important to protect these PV panels that are costly to install and replace should there be damage to them.

The first way of protecting PV panels is the easiest for inexperienced and experienced users alike. They should have monitoring apps installed on their smartphones (this is often done by the installer when the panels are placed on the property). Smartphone apps allow the user to see how much solar energy is being generated by their system and stored during the day – should there be a drastic change, users can act and call out their installers to inspect and repair or replaced.

The physical protection of PVs is somewhat more difficult, says Rein Snoeck Henkemans, Managing Director of Alumo Energy. “Freezing temperatures can pose challenges to solar panel performance. However, with careful maintenance and smart strategies, solar energy users can maximise their system’s output and ensure continued energy production throughout cold fronts until warmer weather is upon us.”

Even then, warmer weather brings its own elemental issues. “Excessive rainfall can potentially cause water leaks or flooding, which can damage the electrical components of an improperly installed solar system,” says Snoeck Henkemans. “However, proper waterproofing measures and installation techniques can mitigate this risk.”



Likewise, hailstorms can be particularly damaging to the surface area of solar panels. Large hailstones can cause physical damage to the panels, leading to cracks or even shattered glass. Durable protective covers can be bought and used to protect the PVs, but they could also impact performance.

Snoeck Henkemans says that there are five easy-to-follow ways of protecting a solar system from physical damage.

1. Regularly clear any build-up. Use a soft-bristle brush, foam squeegee or plastic rake. Be careful not to damage the panels, and make sure not to use unsuitable tools or coarse material that may scratch or crack the PV surface.
2. Do not apply excessive pressure. Gently remove build-up without pressing too hard on the panels, using a sweeping or pushing motion rather than scraping forcefully. Alternatively, water can be poured over the panels to dislodge material.
3. Be cognisant of falling hazards. Clearing debris from rooftop panels may require climbing on a ladder or accessing the roof in another manner, and work may be conducted at a sloped angle. Take appropriate safety precautions to prevent falls or accidents.

4. A solar system is still an electrical system. There might be some concern for electrical injury with improperly installed systems. Make sure that the system is turned off before touching the PV panels and cabling.
5. Maintenance is important. If possible, contact the installer or another electrical professional to clean the panels and conduct general system maintenance.

“At Alumo, for example, regular maintenance forms part of many of our packages. We also have experienced cleaners who can be hired at any time to ensure that panels are kept in tip-top condition,” says Snoeck Henkemans. “This not only ensures that the work is done safely and correctly but maintains the integrity of your system and allows for defect detection. Experienced installers will also ensure that the electrical connections and wiring are correctly installed to minimise energy losses. A high-quality installation will help generate the maximum amount of electricity, achieve a better return on investment in the long run, and ensure the system can stand the tests of time and mother nature.”

Enquiries: www.alumo.co.za



Did you know: Prepaid meters can be smart meters too

As loadshedding continues to impact South Africa, power generation SOE Eskom has unveiled its plan to install smart meters in every single home within the next four years. The project, estimated to cost the enterprise R16 billion, is expected to help the power utility recover more than 7,000MW to the grid. But there is a second benefit for Eskom of installing the meters, explains Dwibin Thomas, Cluster Automation Leader at automation and energy management company Schneider Electric.

"The smart meters will use a

tasks that require precise movements, consistent accuracy, and tasks that are too dangerous or strenuous for human operators to perform. Selecting the most appropriate robot for an industrial application requires weighing up different criteria. "Typically, the selection requirements will be based on application, reach, payload capacity, number of axes, precision, repeatability and mounting position, among others, all of which need to be weighed up against production demands, manufacturing systems design and economic impact," says Phillips.

One of the biggest mistakes businesses make is that they combine a high-performing robot asset with sub-standard consumables, making it harder for the asset to reach its full potential and deliver repeatable efficiencies. Phillips adds, "One of the benefits of robotic automation is consistency. Surface finishes, for example, are reproducible by programming the robot with the same parameters repeatedly. So when a sub-standard abrasive is used, the robot will be incapable of producing this consistency. Sub-standard or low-cost consumables don't go through the same stringent manufacturing processes and quality controls as, for instance, PFERD's abrasives do."

Sub-standard or incorrect consumables do not only impact product quality, they can also impact the robot's operation negatively. "Every production manager's worst nightmare is unscheduled downtime, which is why robots must be relatively easy to operate, repair and maintain. If the robot is paired with the incorrect consumables, downtime will increase due to the low or reduced service life of standard products, resulting in regular stoppages to change out the used consumables. This can massively impact the equipment's output," explains Phillips, who concludes, "it is critical for businesses to determine the most cost-effective solution for each specific application to ensure their investment and operations reach their full potential. Robotic technology can help a business to become more efficient, grow its productivity cost-effectively and get more done with less."

Enquiries: www.za.pferd.com/en

management system that will allow the consumer to decide when to use electricity based on how much it will cost," says Thomas. "For users with smart prepaid meters, the amount used will be taken from a prepaid balance. A conventional prepaid metering system uses cards or an integrated keypad to recharge the prepaid meter. The prepaid meter offers the requisite hardware and software to recharge (bought from prepaid voucher providers) and determines the remaining credit on the customer account."

Unlike the traditional prepaid meter, smart prepaid meters provide real-time data on power consumption via a smart energy management system. "This data can be accessed remotely, allowing users to proactively monitor their usage and adjust it accordingly. This is particularly beneficial to households and businesses that use hybrid solar/grid systems," says Thomas, adding, "A common complaint by prepaid users is that when they do switch over to a hybrid system, they don't have real-time insight into the status of their prepaid account i.e., how many units are left on their account."

Accessing the meter and this kind of data is only possible when the system is exclusively powered by the national power grid, which presents a significant limitation. "This becomes problematic, for instance, when the solar system fails to charge adequately due to cloud cover, and the base load, such as battery storage, requires grid charging. If one is not present at the physical prepaid meter, it becomes

impossible to determine the available units for charging batteries and ensuring uninterrupted power supply to homes or businesses during loadshedding," says Thomas.

Another important benefit of the smart prepaid meter system is that it provides users with information on their data consumption patterns, allowing households and businesses to make informed decisions on where energy can be saved or optimised. "This is not a new feature to traditional smart meters, but it is not one that is currently available on traditional prepaid meters," says Thomas. "Smart prepaid meters offer tangible and intangible benefits. They have the capability to identify faulty wiring and detect unsafe electrical conditions that can prevent accidents and reduce the risk of electrical fires from occurring. These smart prepaid meters incorporate robust encrypted security features that safeguard the user's personal and financial information, ensuring their privacy and data protection in accordance with the POPIA act."

Having a smart meter installed to monitor



your power consumption is as important as the power itself. "Smart prepaid meters undoubtedly provide myriad benefits, and the good news is that making current prepaid meters smarter won't require a forklift rollout," concludes Thomas.

Enquiries: www.se.com/za

Get ahead with maintenance automation

Maintenance automation is far more important than most people realise. It helps to improve asset availability, reduces maintenance costs, and allows businesses to increase revenue, all by moving important production assets from preventative maintenance to a condition-based strategy.

Bryan Christiansen, the CEO of US-based computerised maintenance management systems (CMMS) software studio Limble, provides tips on how to improve the maintenance automation process in a business or even incorporate it for the first time.

Define the automation goals. While there are a host of automation software programs that can be used for planning, the initial phase needs to be planned on a solid business case. Each step in the automation process needs to be clear and concise, with a starting point and an end goal. These ideally allow for the least amount of downtime for equipment and machinery, as well as ensuring that further phases of production are not held up. For example, if a drill machine needs to be stripped and rebuilt, place this step after the drilling of materials is complete so that the next step in production, for example assembly, is not put on hold until the drill is maintained and back in working order.

Nominate critical assets. There is no such thing as "a more important asset" when it comes to a business running smoothly – every item and piece of machinery and equipment is equally important. However, there are some factors that should be considered when ordering the automation process: High capital value; considerable repair or replacement costs; and critical serviceability (to revenue, quality, legislation, safety or the environment).

Identify possible failure modes. If there is equipment that is vital to production and it is showing signs of fatigue or poor reliability, it should be identified and put into the maintenance automation plan immediately. Failure to do so could lead to greater downtime and other connected losses such as loss of production, as well as income. Replace restorative maintenance with preventative maintenance to ensure breakdowns are reduced to the lowest level. For example, if a piece of equipment repeatedly fails at random intervals despite intensive repair and monitoring processes, it should be replaced or put into a maintenance automation plan.

Correct sensor selection. This is a critical step in the automation process. Without sensors providing real-time diagnostic updates and information, assets cannot successfully be added to the maintenance automation process. Sensors are also better able to monitor systems than humans because they do not suffer fatigue,



Maintenance automation can prove vital to the operation of a company and its equipment.

nor do they need to stop working – humans require breaks and sleep, while a sensor can operate 24/7.

Install a data management and monitoring system. Spot checks are only able to provide so much information, which may be useful in the short term. The important data that is used to create and manage a maintenance automation programme is in the sustained collection and analysis of data. This can alert users to problems before they happen by predicting failures based on historical information and knowledge.

Maintenance automation greatly helps in the way businesses operate, no matter how small or large they may be. This process allows users to identify areas of concern, address the issues and manage the systems without experiencing downtime and other situations that could jeopardise the work function. If done correctly, maintenance automation can be a simple yet effective tool to keep a business operating successfully.

Source: www.embedded.com

Tips for optimising and operating back-up power systems

Between March 2022 and June 2023, there was a 349% increase in solar rooftop photovoltaic (PV) installations. With businesses and households producing over 4,400MW, electricity generated from the private sector is predicted to exceed the output from Eskom's generation fleet within the next two years. But if PV owners are not careful with their systems, they could face a bleak, dark future according to Dr Andrew Dickson, Engineering Executive at CBI-electric: low voltage.

"When people switch from using electricity derived from the grid to electricity generated by these systems, they often assume that they will be able to power their homes in the same way, especially during outages," explains Dr Dickson. "However, the users run the risk of draining the battery, which can only store so much electricity, or tripping the inverter. This is where smart home technology can prove useful."

Here are four tips from Dr Dickson and his colleagues at CBI-electric: low voltage on how technology could be used to help protect back-up power systems.

1. Determine essential and non-essential loads. To avoid being left in the dark when the power goes out, back-up systems must be managed properly to prevent draining the battery or overdriving the inverter with multiple loads operating at once. This means understanding which loads are essential and which are not, as well as when they should be turned on during power outages. To do this, the user and installer need to know the electricity usage of different loads and the property's energy consumption patterns.
2. Smart home devices that are enabled with monitoring capabilities can provide valuable insights to help make data-driven decisions about which loads to connect when using back-up power situations. "For example, in my home, I have connected the internet, security system, entertainment system, kettle, and lights in my kids' bedrooms. This ensures that the essential loads, like lights, stay on during power outages while making the best use of the back-up power system's capacity," says Dr Dickson. "By being conscious of electricity consumption, you can optimise your back-up power setup and cost at the same time."
3. Automate loads. With real-time monitoring, users can see how much solar energy is being used and where it is being consumed. If connected loads draw excessive electricity, especially on days with frequent power outages, smart home technology can automatically turn off energy-intensive devices. This helps to balance the energy generated by the

solar system with the load, ensuring power is available for all times during challenging periods.

4. Allocate energy. Essential loads should not all be used at the same time as it could potentially drain the battery faster than planned or, in an unwanted case, trip the inverter. "Smart plugs can be set up in such a way that if one is switched on, the others won't be able to turn on. This way, users can direct back-up power to the most important appliances and systems in their homes first," says Dr Dickson. "My wife and I prioritise powering the kettle since we have a baby and we need boiling water ready for making formula whenever our little one needs to be fed."
5. Avoid voltage fluctuations. Undervoltage often occurs once power is restored following loadshedding. This is when the grid voltage dips for a short period. Most inverters are equipped with an adequate level of protection against this, but if power is being switched on and off more frequently or voltage dips occur a number of times while the supply is stabilising, it could result in failure of the inverters protection. With a smart controller, users can delay when power from the grid is returned to the system, ensuring that the systems operational lifespan is maintained.



Dr Andrew Dickson shares optimising tips for back-up power systems.

With rooftop solar installations costing between R80,000 and R200,000, smart home technology can help South Africans who have undertaken this investment to optimise their spend, maintain power and energy availability and protect these systems to preserve their longevity and ensure their effectiveness. Ultimately, this will help keep your lights on as well as those of the country," concludes Dr Dickson.

Enquiries: www.cbi-lowvoltage.co.za

Smart devices do not mean smart costs – how to cut electricity usage with home automation

Advances in technology have meant that smart devices have become more accessible to home users, with research showing that the smart device market has more than doubled in the past five years and is speeding up. The term "smart devices" extends beyond digital personal assistants like Amazon Alexa, Google Home and Apple HomePod – products include smart plugs, smart lights, intelligent pet feeders, even a connected coffee table that doubles as a speaker and wireless device charger.

Smart devices can help users cut electricity bills exponentially, but at the same time there are instances where these devices can use more electricity than their non-smart counterparts. "Not all smart home devices are created equally. While some do their part to decrease a home's energy usage over time, there are some devices that can actually increase the amount of energy a home uses," explain the team at leading home automation company Home Streamliner. "The increase in power consumption can be caused by a device constantly adjusting itself due to triggers, the home user adding an energy-consuming device where one isn't necessary, and by devices continuously running numerous sensors to maintain their 'smart' capabilities." Those are exceptions that can be mitigated, though, if contractors, electricians and even home users install their devices correctly, calibrate the devices in the most efficient and functional way, and manage and maintain the smart technology.

Calibration is key

One of the biggest electricity consumers in the average South African house is the geyser. It is also one of the least-understood pieces of equipment, but with the right tweaks, geysers can be turned into an

efficient energy user that works in the way it was intended. Temperatures on geysers do not need to be turned up to a maximum, says electrical engineer and contractor Ryan Palmer. "You can comfortably turn the geyser thermostat down to about 50-55°C and not see any difference in the water temperature. You can also add a Wi-Fi enabled circuit breaker into your DB board. This allows you to control the times that your geyser is turned on during the day from your smartphone. A geyser can run for two hours, then still have hot water four hours later. That means that you are saving four hours of energy consumption."

Turning down the lights

This is literally turning down the light being emitted by smart lightbulbs. This can be for aesthetics – dining rooms, for example, do not need to be brightly lit to have ambience – or it can be for function – lights in TV rooms and lounges can be turned down to allow users to better see their TV screens. Smart lights are controlled via smartphone app and newer models include occupancy sensors that sense when a person enters or exits a room and automatically adjusts the light quality being delivered. Daylight sensor-enabled smart lights can measure the amount of natural light that is coming into a room and likewise automatically adjust to provide more or less light to keep users comfortable.

Plug power

Smart plugs can be controlled from apps too, allowing users to switch off electrical supply to devices that aren't currently being used. This negates "vampire consumption", where devices consume power while being on standby mode. "Vampire consumption can account for as much as 40% of a



building's energy use," says energy expert Crystal Poni from www.wired.com. "While that does not necessarily translate to homeowners, there is a significant amount of electrical power that is being lost in the home. It can easily be countered by installing smart plugs and using them wisely. This is a waste of power as well as money that can be better used elsewhere."

Smart technology is the future and with the correct installation, usage and monitoring, the various devices can help users to control and manage their electrical consumption while not impacting their day-to-day living.

Sources: www.enercare.ca, www.homestreamliner.com, www.wired.com



Li-Fi gains standard and prepares to light up the internet

Light Fidelity (Li-Fi) is the next big thing in both lighting and communication. As with your traditional Wi-Fi, the user will connect to their network wirelessly, but rather than using radio frequencies, Li-Fi makes use of light – and LED lightbulbs specifically – to transmit data and allow connectivity.

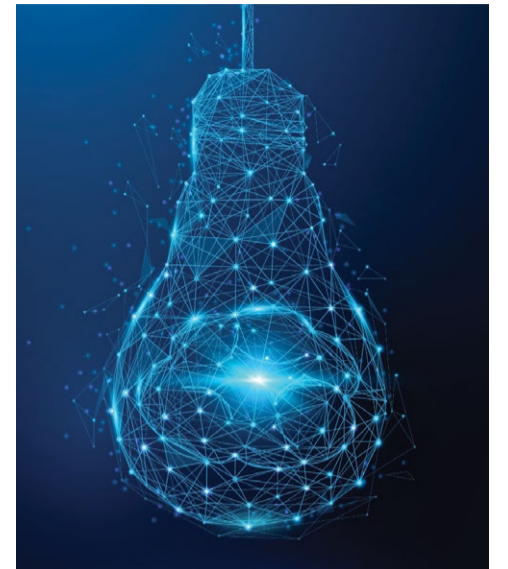
Li-Fi was recently certified by the US-based Institute of Electrical and Electronics Engineers (IEEE) with the standard 801.11bb-2023. This means that developers can now push their products into field testing phase and quickly into the marketplace. “Li-Fi has been developed since 2015, so it is not exactly new technology,” explains lighting and technology expert Bec Crews from www.sciencealert.com. “But there has not been an industry norm and standard until now. Scientists managed data connectivity of 2.24 gigabits per second in 2017, which is more than 100 times faster than the average Wi-Fi speeds that people have in their homes currently.”

The new wireless networking system makes use of near-infrared or near-ultraviolet LED spectrums for connectivity. Li-Fi allows for faster connectivity as light travels faster than almost anything known to man. It is also not subjected to interference from electromagnetic sources, as experienced with Wi-Fis, and newer security protocols make it more difficult to hack into a system through a Li-Fi network. With the manufacturing cost of LEDs being particularly low when compared to traditional glass bulbs, the cost of Li-Fi systems is also expected to be somewhat cheaper than traditional home wireless systems.

That does not mean Li-Fi does not have any disadvantages or weaknesses. The range of connectivity and signal strength is somewhat limited unless you can place the lightbulbs in direct line of sight, allowing for a connectivity chain... but this may be problematic in many circumstances like with older buildings. The biggest issue, however, is interference – sunlight can drastically impact a Li-Fi system,

says Bec. “Even other light sources could hamper connectivity as receivers may have trouble the light processing signals that are being sent towards its sensors. Added to that, Li-Fi can only work if the LED lightbulbs are switched on – that adds to light pollution, more so if the LED light settings are turned to maximum (this would be done to mitigate the impact of possible interference).

Li-Fi systems can be installed almost anywhere that can house wireless networks and electric lighting. It is not an immediate threat to traditional Wi-Fi networks for the simple fact that light cannot pass through solid objects like walls. However, Professor Harald Hass from the University of Edinburgh, Scotland, who invented Li-Fi in 2011, is pragmatic in his view of the future: “All we need to do is fit a small microchip to every potential illumination device and this would then combine two basic functionalities: illumination and wireless data transmission. In the future we will not only have 14 billion lightbulbs, but we may also have 14 billion



Li-Fis deployed worldwide for a cleaner, greener and even brighter future.”

Sources: www.allaboutcircuits.com, www.lifi.com

Illuminating the International Space Station – for health benefits



Astronaut Andreas Mogensen (far right) has taken a new light system into space.

The International Space Station (ISS) is not your regular type of electrical project. It is 108m in length, weighs over 420 tons and it moves through space at 27,600km/h. But it is also home to humans and, as on Earth, these astronauts have a body clock that is influenced by light. So it can become quite interesting when they are experiencing 16 sunrises and 16 sunsets every single day onboard the ISS. A new project is about to help the crew with some innovative illumination solutions, though.

“The pattern of light and dark during a day is known as the circadian rhythm. It keeps the human body in check as humans expect one

dawn and one dusk every 24 hours. Sleep is hard to come by when humans are in space, which is why astronauts often suffer health issues when they return to Earth,” say experts from Danish company Saga Space Architects. “We have developed what we are hoping to be an exciting solution to sleep problems that are experienced in space.”

In mid-August, the company sent its new Circadian Light Panel up to the ISS when Danish astronaut Andreas Mogensen and his colleagues blasted off from Florida in the United States. “The lamp has three faces that each emit light at different angles,” says Saga. “Each face emits different wavelengths to promote

alertness or induce sleepiness. Unlike current light systems onboard the ISS that have some manually operated controls, Saga’s light panel is programmed to automatically adjust to fit the astronaut’s planned sleep schedule.”

Since its first module was put into orbit in 1998, the ISS has been home to numerous lighting experiments, which includes tuneable LED illumination. Scientists at NASA (the National Aeronautics and Space Administration) have even tried to copy the Sun’s natural light patterns, with blue wavelengths being introduced in the morning and slowly being replaced by relaxing red tones towards the evening.

Saga believes that it might have solved the sleeping issue, explaining, “Through the meticulous use of different hues of colour to simulate intense sunrises, varied daylight and calming sunsets, the Circadian Light Panel can carefully regulate the astronauts’ circadian rhythms to ensure that they focus during the day and sleep during the night. Compensating for the monotonous environment of space, the lighting system emits custom light for each individual day to simulate the natural change in lighting of shifting weather on Earth.”

A good night’s sleep is important for everyone. Hopefully astronaut Mogensen will have one solid rest period each night and not the 16 “night times” that his space explorer friends have been experiencing up until now.

Source: www.ledsmagazine.com

Atmosphere is a lightbulb away

The easiest way to change a room’s atmosphere and ambience is with illumination. Using the correct lightbulb, whether it is the tone of light being emitted or even the physical style of the bulb, can help transform the space completely. Here are easy ways to use lighting as a tool when styling rooms:

Know what is wanted. A lighting plan should include the operational needs and what is also possible – there cannot be stadium-style light quality when downlights are the only fixtures being installed. Consider factors like the size of the room, to the colour of paint being used – the smallest aspect can be the most important.

Choose the correct bulb. Lightbulbs have come a long way since the advent of the filament, and there is a light fitting for every application.

Be careful when selecting what will be used, ensuring all aspects are reviewed, including the wattage needed, the shade of bulb, and even whether the user wants smart bulbs that can be controlled via smartphone app.

Position the lights perfectly. It is critical to position lightbulbs where they provide illumination without disturbing people who will be in the room. For example, a lamp may be aesthetically pleasing placed in a corner, but when people sit on a couch they may be looking directly into the light. The easiest way to solve this problem is by walking around the room with all the lights switched on to see what needs to be moved, rotated or changed completely.

Source: www.countryliving.com




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IESSA gets a new technical chair by appointing lighting industry guru

Andrea Barausse, the director and founder of Durban-based energy and lighting company Energywise Systems, has been elected as the new technical chair of the Illumination Engineering Society of South Africa (IESSA), which Andrea says is "quite an honour, to be recognised by the industry you love and have worked tirelessly in".

"Lighting and illumination, particularly finding illumination solutions, is what got me into this industry in the first place," explains Barausse, who was born in Italy and immigrated to South Africa in the mid 1980s with his family. "My father had a shop, an electrical business, where I spent a lot of time as a child. I remember it being lit up with Christmas luminaires when I was about four years old. It was where I made my first light, I think I must have been about 12. I was so proud of that because I had created it by myself. It was a simple wooden stand, a light fitting and a lamp shade. There was nothing technical about it. But for me at that age, it was properly built"

The IESSA technical chair brought his love for lighting to South Africa and his family began importing architectural luminaires from Europe. "My real passion was in creating and developing my own products," explains the 65-year-old. "I studied as an electro technician in Italy at the Institute of Industrial Technology. My family's business specialised in the development of lighting systems, controls and installation."

Hands-on boss

Being elected as technical chair for IESSA is testament to Barausse's technical knowledge and expertise, as well as his passion for the industry. "We, true lighting professionals, are a dying breed. I am not a lighting engineer. I do not have that engineering degree. But I do lighting engineering, I have done it for some time, and I do it with passion. I am 100% invested in the industry."

A key personality trait that separates the Energywise founder from many of his peers is that he is hands-on in his business. "We have a laboratory, we are one of the few, especially as we are a small company. But we have a laboratory and I am maybe still too much involved. I am in the process of slowly working myself out, perhaps in the next three to five years. I'm 65 now. I have never thought about retiring because I love what I do. But it is also maybe time for the younger generation to come through. They do things differently, sometimes better," says Barausse, referring to his son Jonas Barausse taking over as the CEO of Energywise Systems.

"I love working with my team. We are only about 30 strong, but we are professionals and we put our hearts and souls into our products," explains the IESSA technical chair. "I have a team of designers and technicians and we work together in everything from concept, to design, prototyping and eventual product delivery. We are currently busy with a project that required old technology to be replaced. When I say 'old', I'm talking five-to-seven years old. That is how this industry works, there is constant development and evolution. We are providing a lighting solution that is more reliable, while also being energy efficient

and meeting the customer's requirements."

Changing of the guard

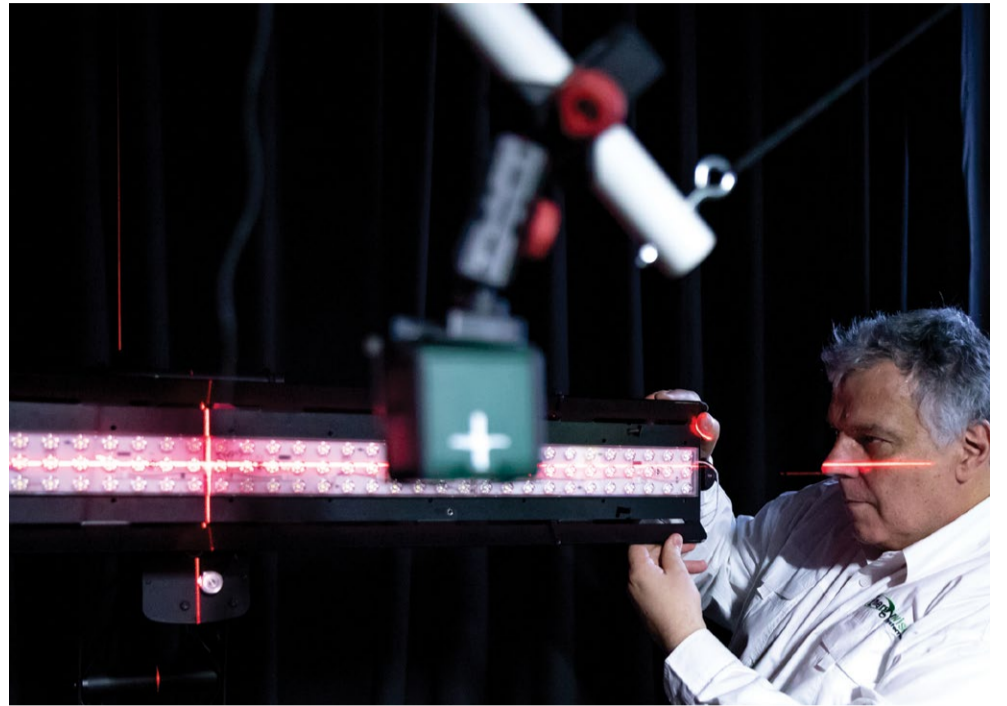
IESSA is an important organisation for the lighting community in South Africa, providing a valuable resource for lighting professionals, as well as helping raise the importance of energy-efficient lighting. Barausse says that his appointment was something of a surprise. "On my journey [in this industry], I have been involved with IESSA on a lower level. I was chairman of the Durban Committee for a little while. Then I saw something online that one of my counterparts posted, congratulating me. I had no idea, and I had to phone my close friend and industry colleague Daniel Kasper (General Manager of BEKA Schröder – see page 15 for more on BEKA Schröder news). I had to message him, 'Please confirm the news.' I thought it was technical chair of my local committee, but it's nationally. It's an honour to be recognised by those around me – the people I work with – because I want to keep this industry alive, improve it and make it better."

Following the IESSA 2023 conference in mid-August, the society's technical chair is being clear about his aims and position. "I do not sugar-coat anything. I tell it like it is. I may make friends, I may make enemies. But one thing is for certain: I tell the truth and I tell people the things they need to hear."

Barausse is talking about a worrying situation in the industry, where sub-standard products are being advertised and sold with bold promises being made and no one is held accountable when the maths does not add up. "There are a lot of people selling lighting. In the past, you knew how much light you were getting – you bought a lightbulb and everything worked. If it said 100 lumens, you got 100 lumens. That is not true anymore. Lighting is something of a labyrinth that, for me, is upsetting because it is as though we have lost a bit of our dignity. We [the country] have imported products that promise certain values that are measurable. Everybody now measures lumen per watt but no one is being held accountable for the claims that are inaccurate and untruthful. I am going to dismantle these claims and show the industry why we need to tackle this problem head on at the IESSA conference."

Barausse's presentation is Titled 'Is What Is On The Box In The Box?', referring to the fact that so many products simply do not deliver the specifications they claim on the side of the packaging. But he is adamant that he wants to build, not destroy the industry. "My aim, at IESSA and with my presentation, is to help this industry. Even if we change the mindset of one person, who realises that it is important to have quality products, to use products they can trust and that deliver on their promises, that is an achievement," says the IESSA technical chair.

"We need to put our passion for this industry into practice. The lighting industry as a whole needs to take accountability – there is no question about that. South Africa is a magnificent place to live and work and manufacture products. But we are in a position where a lot of products are being imported from China. There is nothing wrong with that, per se, but China has become synonymous with 'cheap'. That



Andrea has been in the illumination industry since his childhood.



IESSA's new technical chair, Andrea Barausse, is a hands-on business owner.

is unfortunate as it is not always true, but for lighting it has become something of a problem. Lighting and the illumination industry are constantly evolving and you cannot slip up or rest on your laurels."

Knowledge is power

Barausse is a respected figure in the industry and he knows what he is talking about. He has won two consecutive Energy Company of the Year awards at the National ETA Awards, specifically recognising his achievements in the energy-saving field. "We have committed ourselves to providing our customers with products and services of the highest quality and I think our track record speaks for itself," he says. For the past decade, Energywise has been an industry leader and innovator in the LED

field. The company now boasts a range of horticultural, industrial, commercial and EX fittings that have been designed for South African conditions at a European standard.

"Well, you have to live by what you say. I pride myself on living true to that motto," says Barausse, concluding, "Sharing information is one of the key elements to improve our industry. If you know something that will help better your industry, be open to sharing that information... except if it is a technical advantage that has a commercial implication... as that is the only way we are going to go further."

Enquiries: www.energywise.co.za,
www.iessa.org.za



BEKA Schröder celebrates 45 years of illumination power to highlight its Exedra LightSync system

Belgian parent company Schröder was formed in 1907, with its Southern African branch BEKA Schröder being founded in 1978 in Namibia. As one of South Africa's leading manufacturers of luminaires and glass fibre reinforced polyester (GRP) poles, BEKA Schröder is celebrating its 45th birthday this year, having advanced in business from humble beginnings to industry innovator and expert.

"Our founding saw BEKA Schröder as a manufacturer of corrosion-resistant GRP poles," explains Daniel Kasper, General Manager of BEKA Schröder. "Since then, the company has steadily grown, evolved and contributed to the success of our clients and the industry as a whole." This milestone anniversary not only reflects BEKA Schröder's resilience and dedication, but also serves as a testament to the trust and support the company has earned over the years.

BEKA Schröder has been wholly owned by Schröder since 2013, and has attained a B-BBEE Level 3 rating, with

more than 200 staff employed locally. "We have a three-pillar belief system at our company," explains Kasper. "For our people. For our community. For our planet." The illumination company is one of the leading independent smart outdoor lighting solution providers in the world, with more than 2,000 engineering experts working in six research-and-development centres across five continents. "We have created lighting products of the highest quality and performance that continue to deliver optimally for users," says Kasper. "We have sold over 2 million lighting points. That is testament to the belief our clients have placed in the work we do. We are consistently striving for excellence in all aspects of our operations."

One of the key factors behind BEKA Schröder's success has been its ability to adapt and embrace change. "The business landscape has undergone significant transformations over the past 45 years, with technological advancements and shifting market dynamics reshaping the way we operate," says Kasper, adding, "We have expanded

from GRP poles to a wide variety of products. We offer lighting solutions for every industry, from motorways, bridges and tunnels, to urban and residential streets, industrial halls and architecture."

Besides its 45th birthday, BEKA Schröder has another reason to celebrate: The introduction of Exedra, which BEKA Schröder calls "the most advanced lighting management system on the market that paves the way for future applications in a smarter city". Grant Combrink, BEKA Schröder's Marketing and Segment Development Manager, says, "We run Smart City canvas workshops. There

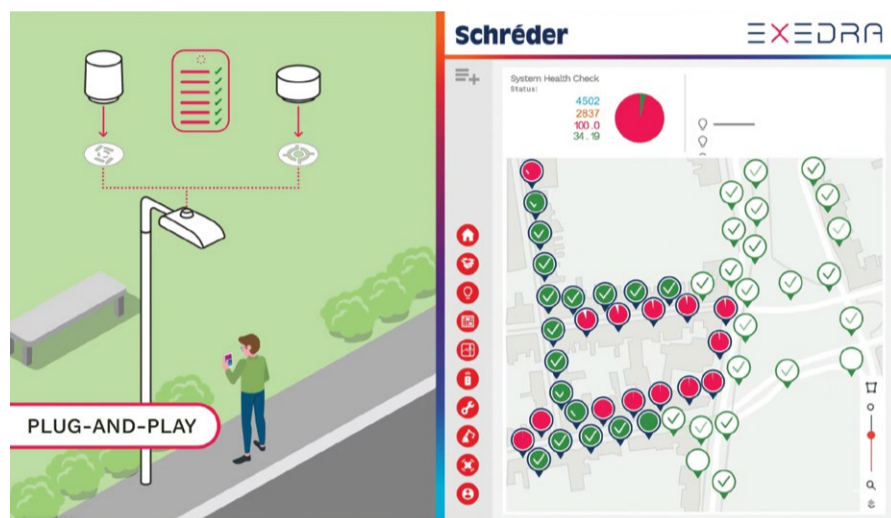
are three steps: Learning, where we investigate and get to understand the city's illumination needs; Ideating, where we conceptualise solutions that will meet the requirements; and Improving, where we use our platforms and software to improve on the system."

Schröder Exedra is a brand-new remote control platform for intelligent city illumination. It is based on shared and open technologies that allow for hassle-free vertical and horizontal Internet of Things (IoT) integrations. "This brings a new layer of tangible benefits that maximises the return on investment and creates new opportunities for cities," explains Combrink. "It allows us to assist with a smart strategy that is tailored to the city's needs. Exedra opens an infinite number of possibilities to improve neighbourhoods and communities by deploying the right solutions in the right places."

Exedra is technology-agnostic and uses open standards and protocols to provide an architecture that can interact seamlessly with third-party software and hardware solutions. It is considered plug-and-play, so once the node or sensor is plugged into the luminaire, an intelligent automated commissioning process recognises, verifies and retrieves luminaire data into the user interface. The self-healing mesh between the luminaire controllers enables real-time adaptive lighting to be configured directly in the user interface. Another benefit of Exedra is that users have access to fully customisable dashboards, allowing them to add, move, resize and organise widgets in the web user interface.

Exedra is an increasingly powerful tool that helps users maximise efficiency, rationalisation and decision making when it comes to smart lighting systems. With 45 years – and counting – of experience, it is clear that BEKA Schröder is only getting started with illuminating our lives.

Enquiries: www.beka-schreder.co.za



Antley Group unveils new illumination products

Having been established in January 2016, lighting manufacturer and supplier Antley Group has weathered many storms already. Nothing has stood in the company's way, though, with innovation being key to founder and CEO Anthony Hawley's philosophy.

"Our products include steel poles, high masts, street lighting, flood lighting, urban lighting, commercial lighting and industrial lighting. These ranges of high-quality lighting products use the latest lighting technologies available at the most affordable prices to provide creative and cost-effective lighting solutions to the market," says Hawley, adding, "Our products have been specifically selected, designed and tested to fulfil the requirements of the harsh African climate. We are excited about our three newest products because they exemplify our work ethic and belief in our manufacturing."

Antley Group's luminaires have been installed in various projects across the country, as well as establishing a loyal client base in neighbouring countries. Antley products can be found on highways and in stadia, as well as commercial and industrial projects and energy efficiency sites. Antley Group is proud to announce the addition of the following three products to its range.

1. The Nema IoT (Internet of Things) Smart City Streetlight management system, which makes use of an open standard telecom network to connect to cellular phone towers using a proprietary GSM sim card, thus eliminating the need of a dedicated gateway. The Nema dimming receptacle Outdoor Light Controller allows for quick and easy installation and is compatible with almost every current LED luminaire with a NEMA receptacle. Each Nema module automatically receives its geo-location through the GPS, GLONASS, Galileo and QZSS protocols, and is able to easily link each location into your GIS asset

The Letsatsi LED Solar Post-Top removes the need for electricity in its installation.



2. The Letsatsi LED Solar Post-Top features high-quality solar technology in its advanced design, allowing for an improved lighting solution that delivers continuously to users. This means that the Letsatsi can be used in any outdoor application without compromising on the ambience of the area of installation. Being solar powered, the Letsatsi post-top eliminates the need for electrical connection and is perfect for off-the-grid projects.
3. The Katiba LED Post-Top was developed with Antley Group's efforts of using the latest advances in LED lighting technology to manufacture a sleek and compact luminaire. It was designed to allow users to choose from a range of wattages, colour combinations and beam angles. The Katiba can be used in residential applications, as well as urban areas without compromising the environment. Using quality materials in its construction aids the luminaire's durability and vandal-proof capabilities, giving users peace of mind over the safety of their installation.

Enquiries: www.antley.co.za

Katiba LED Post Top

The Katiba LED Post Top is designed around the compactness of the LED engine at its core. It is an economical and energy efficient post top luminaire that works across a range of LED wattages. The Katiba provides a functional, modern solution for various illumination requirements. It is reliable, efficient, discreet and vandal resistant.

Materials and finish

- High-pressure diecast aluminium spigot
- High-impact acrylic diffuser
- Glass impregnated nylon top
- Stainless steel fasteners
- Silicon gaskets

Application areas

- Residential areas
- Urban areas
- Car parks
- Pedestrian areas
- Public squares



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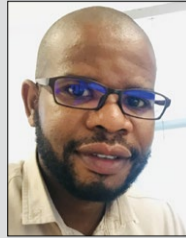
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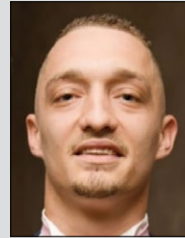
Sashen Givender
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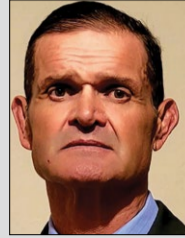
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THE CARROT, THE SCARF, AND PIECES OF COAL

A carrot, a scarf, and five pieces of coal are found lying on the lawn. Nobody put them on the lawn, but there is a simple, logical reason why they are there. What is it?

AUGUST SOLUTION

Years earlier, Her two sons were part of a set of triplets (or quadruplets, etc.).

OCTOBER 2023 FEATURES

- MCCs and motor protection
- Energy measurement and supply
- Lighting

NOVEMBER 2023 FEATURES

- Cables and cable accessories
- Standby and emergency power
- Lighting



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Editor:
Craig Falck
084 317 3887
sparks@crowm.co.za

Advertising:
Carin Hannay
072 142 5330
carinh@crowm.co.za

Design:
Anoonashe Shumba

Publisher:
Karen Grant

Deputy publisher:
Wilhelm du Plessis

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abc Total 14 176 per month.

Promotion runs from 1 Sept till 31 Dec 2023 or while stocks last. E & OE. www.uni-trend.co.za / www.thermalimaging.three-d.co.za

B20 THERMAL IMAGER

- Thermal resolution: 256 x 192 (49 152 pixels)
- NETD : < 40mK
- Temperature measurement range : -20 °C ~ 550 °C
- Measurement Presets: Center spot, Hot spot, Cold spot, User Preset Point/Line/Area
- FOV: 37.5° x 50.0° • Pixel Pitch: 17µm
- Colour Palettes: White Hot, Black Hot, Rainbow, Ironbow, Red hot, Fusion, Rain
- Fixed focus
- Image Mode: Thermal / Optical / Fusion / PIP
- 25 Hz image frequency
- WiFi
- USB Interface



excl VAT **R12 699.00**
Incl VAT **R14 603.85**



A13T TEMPERATURE HUMIDITY METER

- Temperature: -10 ~ 50°C
- Display of Temperature, Humidity and Time
- Dual Temperature Measurement
- Humidity: 20% ~ 95% RH
- 12/24 Hour Mode
- Sampling Time: 10s
- Date/Calendar
- Alarm Clock / Time Display
- °C / °F Selection



excl VAT **R369.00**
Incl VAT **R424.35**

UT133A MULTIMETER

- AC/DC Voltage: 600 V
- DC Current: 10A
- Resistance: 60MΩ
- Capacitance: 9.999mF
- Frequency: 10Hz ~ 1MHz
- Temperature: 1000°C
- APO
- Diode
- Continuity Buzzer
- Low Battery Indication
- Data Hold
- Overload Indication
- Test Probe Holder
- LCD Backlight
- NCV
- Auto Range
- 6000 Display Count



excl VAT **R699.00**
Incl VAT **R803.85**

UT681L

CABLE TESTER RJ45/RJ11

- Cable Tester for RJ45/RJ11
- Fast-speed Test Mode LED1~8, LED_G
- Slow-speed Test Mode LED ~ LED*, LED_G
- Test for Short Circuit, Crossover, Open Circuit etc
- Ethernet Cable - Shielded / Unshielded
- Manual Shutdown Function
- Single Key Operation
- Low Battery Detection
- APO
- 9V Battery



excl VAT **R459.00**
Incl VAT **R527.85**

A25D AIR QUALITY METERS

- PM2.5 (ug/m³): 0 ~ 500ug/m³
- Humidity: 5%RH ~ 99%RH
- APO
- Low Battery Indication
- Red Backlight Alarm
- LCD Backlight
- Concentration Emoticon



excl VAT **R1 999.00**
Incl VAT **R2 298.85**

UT33B+ PALM SIZE MULTIMETER

- AC/DC Voltage: 600 V
- DC Current: 10A
- Resistance: 20MΩ
- Battery Test: 1.5V/9V/12V
- APO
- Diode
- Continuity Buzzer
- LCD Backlight
- Relative Mode
- LCD Size 53mm x 28mm
- Probe Placing Slots
- 2000 Display Count



excl VAT **R299.00**
Incl VAT **R343.85**

UT33A+ PALM SIZE MULTIMETER

- AC/DC Voltage: 600 V
- AC/DC Current: 10A
- Resistance: 200MΩ
- Capacitance: 2mF
- APO
- Diode
- Continuity Buzzer
- LCD Backlight
- Relative Mode
- Auto Range
- LCD Size 53mm x 28mm
- Probe Placing Slots
- 2000 Display Count



excl VAT **R469.00**
Incl VAT **R539.35**

UT15C VOLTAGE TESTER (VOLTSTICK)

- LED AC/DC Voltage Indication (V) 12V ~ 690V
- LCD AC/DC Voltage Display (V) 24V ~ 690V
- Phase Rotation Test
- Single Lead (L2) Voltage Detection
- Continuity Test: Resistance 0~400kΩ, Beeper LED Light Indicator
- Polarity Detection
- Auto Range
- Low Battery Indication
- Work Light



excl VAT **R1 099.00**
Incl VAT **R1 263.85**

UT216C TRMS CLAMP METER

- AC/DC Current: 600A
- AC Voltage: 750V
- DC Voltage: 1000V
- Resistance: 60MΩ
- Capacitance: 60mF
- Frequency: 1MHz
- Temperature: -40°C ~ 1000°C
- Jaw Capacity: 30mm
- Auto Ranging
- Diode
- V.F.C.
- NCV
- Data Hold
- Flashlight
- APO
- MAX/MIN/REL
- LCD Backlight
- Continuity Buzzer
- Low Battery Indication
- Input Protection
- Ideal for Solar Power Systems
- Inrush Current
- Analog Bar Graph
- 6000 Display Count



excl VAT **R2 899.00**
Incl VAT **R3 333.85**

UT300A+ INFRARED THERMOMETER

- Temperature: -20°C ~ 400°C
- Accuracy: +/- 2°C
- Repeatability: 1°C
- D:S Ratio: 10:1
- Response Time: ≤500ms
- Emissivity: 0.95
- Spectral Response: 5.5µm ~ 14µm
- Laser Power: < 1mW
- Selection °C/°F
- Data Hold
- APO
- Low Battery Indication
- LCD Backlight
- Single Laser



excl VAT **R499.00**
Incl VAT **R573.85**

UT501B 1KV INSULATION TESTER

- Insulation Test Voltage: 250V/500V/1000V
- Short Circuit Current: < 2mA
- Low Resistance: 0.01Ω ~ 200Ω
- AC Voltage: 600V
- Auto Ranging
- Low Battery Indication
- Alarm Indication
- Over Load Indication
- High Voltage Indication
- Auto Discharge
- 10MΩ Internal Resistance Test
- Continuity
- 2000 Display Count
- DAR
- LCD Backlight
- Alarm Buzzer



excl VAT **R2 659.00**
Incl VAT **R3 057.85**

UT-L27 DOUBLE INSULATED TEST LEADS

- Cable Length: 900mm
- Rod Length: 130mm
- Tip Length: 16.3mm Threaded
- CAT Rating: CATIII 1000V, CATIV 600V 10A
- Safety Certificate: EN 61010-031 A1:2015
- Recommended Alligator Clips: UT-C02B
- Double Insulation UL Authenticated Material
- Removable Insulation Cap
- General Type Probes



excl VAT **R179.00**
Incl VAT **R205.85**



excl VAT **R639.00**
Incl VAT **R734.85**

UT123D POCKET SIZE HOUSEHOLD TRUE RMS MULTIMETER

- AC/DC Voltage: 600V
- AC/DC Current: 10A
- Resistance: 40MΩ
- Capacitance: 400µF
- Acousto-optic Indication
- Data Hold
- APO
- Low Battery Indication
- NCV/Live
- 4000 Display Count

UT12E DUAL MODE AC VOLTAGE DETECTOR

- AC Voltage: 90V ~ 1000V AC
- AC Voltage: 24V ~ 1000V AC
- Frequency: 50/60Hz
- Audible/Visual Alarm
- Vibration Mode
- Neutral/Live Line Distinction
- APO
- Indication LED: Green/Red/Yellow
- Sensitivity Switching: Auto
- Flashlight
- Dual Insulation
- Low Voltage Indication



excl VAT **R349.00**
Incl VAT **R401.35**

POCKET2 HANDHELD THERMAL IMAGING CAMERA

- IR Resolution: 256 x 192 (49,152pi x 565)
- NETD: < 40 mK
- Focal Length: 3.5m
- FOV: 50° x 37.2° (H x V)
- Display: 640 x 480 Resolution, 3.5" LCD Touch Screen
- Object Temperature Range: -20°C ~ 400°C
- Accuracy: +/- 2°C
- WiFi: 802.11 b/g/n
- Image Resolution: Configurable: 2MP, 5MP, 8MP
- Focus: Fixed
- IFOV: Fixed
- Image Frequency: 25Hz
- Image Mode: Thermal / Optical / Fusion / PIP / Blending
- Colour Palettes: Black Hot; White Hot; Rainbow; Ironbow; Red Hot; Fusion; Rain
- Built-In 16GB Internal Memory



excl VAT **R12 699.00**
Incl VAT **R14 603.85**



UT204+ 600A TRMS CLAMP METER

- AC/DC Current: 600A
- AC/DC Voltage: 600 V
- Resistance: 60MΩ
- Frequency: 10MHz
- Capacitance: 60mF
- Temperature: -40°C ~ 1000°C
- Auto Range
- NCV
- Neutral/Live Wire Test
- Continuity Buzzer
- Data Hold
- Diode Test
- APO
- Jaw Capacity 28mm
- Relative Mode
- 6000 Display Count



excl VAT **R1 799.00**
Incl VAT **R2 068.85**

UT-L20 TEST LEADS

- Cable Length: 900mm
- Rod Length: 101mm
- Tip Length: 16.5mm
- CAT Rating: CAT I 1000V / CAT II 600V 10A
- Recommended Alligator Clips: UT-C12
- Cross Plug with Shield Sleeve
- General Type Probes



excl VAT **R129.00**
Incl VAT **R148.35**

UT216A 600A TRMS CLAMP METER

- AC Current: 600A
- DC Voltage: 1000 V
- AC Voltage: 750V
- Resistance: 60MΩ
- Capacitance: 60mF
- Jaw Capacity 30mm
- Auto Range
- Diode
- NCV
- Data Hold
- Flashlight
- APO
- MAX/MIN/REL
- LCD Backlight
- Continuity Buzzer
- Low Battery Indication
- Input Protection
- 6000 Display Count



excl VAT **R1 599.00**
Incl VAT **R1838.85**

UT262E NON-CONTACT PHASE DETECTOR

- Phase Detection
- Live Power Detection
- Circuit Break Detection
- Voltage Detection
- Breakpoints Finding
- Breakpoints Positioning
- Power On Indication
- APO
- AC Voltage: 70V ~ 1000V
- Frequency: 50Hz ~ 60Hz
- Clamp Opening: 10 ~ 40mm



excl VAT **R2 999.00**
Incl VAT **R3 448.85**

UTi85A THERMAL IMAGER

- IR Resolution: 80 x 60 Pixels
- Display: 2.8" LCD
- Temperature Range: -10°C ~ 400°C
- NETD: ≤ 150mK
- Display Mode: Thermal
- Spatial Resolution: 11.1mrad
- Frame Rate: < 9Hz
- PC Analysis Software
- FOV: 51°(h) * 38°(V)
- Photograph function with SD card Storage
- PC Analysis software
- Buzzer/Flashlight alarm
- Real-time Image Transmission
- Auto Capture of Hi/Low Temperature
- Flashlight
- 1/4" Tripod Mounting Hole



excl VAT **R8 959.00**
Incl VAT **R10 302.85**

UT202A+ 600A TRMS CLAMP METER

- AC Current: 600A
- AC/DC Voltage: 600V
- Resistance 60MΩ
- Capacitance: 60mF
- Frequency: 10Hz ~ 10MHz
- Duty Cycle
- Display Size: 37 x 25mm
- Backlight
- NCV
- Data Hold
- Diode
- MAX/MIN
- Auto Ranging
- Continuity Test
- Low Voltage Indicator
- Jaw Capacity 28mm
- APO
- 6000 Display Count

excl VAT **R829.00**
Incl VAT **R953.35**

UT89XD TRMS MULTIMETER

- AC/DC Voltage: 1000 V
- AC/DC Current: 20A
- Resistance: 60MΩ
- Capacitance: 100mF
- Frequency: 10MHz
- Continuity Buzzer
- Diode
- Low Battery Indication
- Transistor hFE
- Data Hold
- Dual Range NCV Test
- Flashlight
- APO
- Auto Backlight
- LED Test
- Audible / Visual Alarm
- Capacitor Charging Indicator
- Duty Cycle
- Relative Mode
- Input Alarm
- 6000 Display Count

excl VAT **R869.00**
Incl VAT **R999.35**

E1L HANDHELD THERMOGRAPHY CAMERA

- Thermal resolution: 160 x 120 (19 200 pixels)
- NETD : < 40 mK
- Temperature measurement range : -20°C ~550°C
- Accuracy: Max (±2°C, ±2%)
- Measurement Presets: Center spot, Hot spot, Cold spot, User Preset Point
- Pixel Pitch: 17µm
- FOV: 32.9° x 44.4°
- Colour Palettes: White Hot, Black Hot, Rainbow, Ironbow
- High Temperature Alarm
- 25 Hz image frequency
- 3.2" LCD screen display
- Up to 8 hours continuous running
- USB Interface



excl VAT **R6 899.00**
Incl VAT **R7 933.85**

UT383BT MINI LIGHT METER

- Illuminance Measurement (Lux): 0 ~ 199,900 Lux
- Illuminance Measurement (FC): 0 ~ 18,500FC
- Resolution: 1 Lux, 10Lux, 100Lux, 1FC, 10FC
- Sampling Rate: 0.5/s
- Bluetooth App
- Data Hold
- Low Battery Indication
- MAX/MIN
- LCD Backlight
- Overload Indication
- Tripod Mounting Hole
- Bluetooth
- APO



excl VAT **R859.00**
Incl VAT **R987.85**

UT61D+ TRMS MULTIMETER

- AC/DC Voltage: 1000 V
- AC/DC Current: 20A
- Resistance: 60MΩ
- Frequency: 10Hz ~ 10MHz
- Capacitance: 60mF
- Temperature: -40°C ~ 1000°C
- MAX/MIN
- Continuity Buzzer
- Relative Mode
- Analog Bar
- NCV
- Auto Range
- Data Hold
- Peak Hold
- LoZ ACV
- LCD Backlight
- Low Battery Indication
- Auto Power Off
- Display Count 6000
- USB Connections
- Diode



excl VAT **R1 779.00**
Incl VAT **R2 045.85**

UT593 COMPLIANCE TESTER - MULTI FUNCTIONAL

- AC Voltage: 440V
- Insulation Test: 250/500/1000V
- Prospective Short Circuit: 26kA
- RCD Test Current: 10/30/100/300/500mA
- Low Ohm Measurement
- ELCB Test (Time & Sensitivity)
- LCD Backlight
- Phase Switch (RCD) 0 ~ 180°
- Auto Half-wave Test
- DC Voltage: 440V
- Phase Rotation
- Loop Impedance
- APO
- Low Battery Indication
- Data Logging
- 10 000 Display Count



excl VAT **R12 499.00**
Incl VAT **R14 373.85**

UT890C TRMS MULTIMETER

- DC Voltage: 1000 V
- AC Voltage: 750V
- AC/DC Current: 20A
- ACV Frequency: 10Hz ~ 10kHz
- Resistance: 60MΩ
- Frequency: 9.999MHz
- Capacitance: 100mF
- Temperature: 1000°C
- NCV
- Diode
- Continuity Buzzer
- hFE Transistor
- High Voltage Phase Detection
- Data Hold
- APO
- LCD Backlight
- Low Battery Indication
- Test Pen Holder
- 6000 Display Count



excl VAT **R659.00**
Incl VAT **R757.85**

LM50A LASER DISTANCE METER

- Range: 50m
- Measurement Units: m/ft/in
- Min. Display Unit: 0.001m
- Measurement Basis: Front/Rear
- Accuracy: +/- 2mm
- Laser Class: 2
- Laser Type: 630 ~ 670nm, <1mW
- Single Measurement
- Continuous Measurement
- MAX/MIN/AREA
- Pythagoras
- Self Calibration
- Horizontal Bubble
- Data Storage 99 Groups
- APO
- Display Type: LCD
- Display Size: 50mm
- Audio Indication
- Volume
- Add/Subtract
- Auto Laser Off



excl VAT **R1 219.00**
Incl VAT **R1 401.85**

LM100A LASER DISTANCE METER

- Range: 100m
- Measurement Units: m/ft/in
- Min. Display Unit: 0.001m
- Measurement Basis: Front/Rear
- Accuracy: +/- 2mm
- Laser Class: 2
- Laser Type: 630 ~ 670nm, <1mW
- Single Measurement
- Continuous Measurement
- MAX/MIN/AREA
- Pythagoras
- Self Calibration
- Horizontal Bubble
- Data Storage 99 Groups
- APO
- Display Type: LCD
- Display Size: 50mm
- Volume
- Add/Subtract
- Auto Laser Off



excl VAT **R7 839.00**
Incl VAT **R9 014.85**

UT521 2000Ω EARTH GROUND TESTER

- Earth Resistance Testing Range: 0 ~ 2000Ω
- AC Earth Voltage (V) 0 ~ 200V
- Frequency (Hz) 50Hz/60Hz
- Data Storage 20
- Manual Range
- LCD Backlight
- Double Insulation Protection
- Data Hold
- Over-range Display
- Precision 3-wire Testing
- APO
- Low Battery Indication
- Full Icon Display
- Contact Badness Display
- Simple 2-wire Testing
- 2000 Display Count



excl VAT **R4 399.00**
Incl VAT **R5 058.85**

UT205E TRMS CLAMP METER

- AC Current: 1000A
- AC/DC Voltage: 1000 V
- Resistance: 60MΩ
- Capacitance: 60mF
- Temperature: -40°C ~ 1000°C
- Auto/Manual Range
- Jaw Capacity 42mm
- Diode
- APO
- LCD Backlight
- Flashlight
- NCV
- Low Battery Indication
- 6000 Display Count
- Data Hold
- MAX/MIN/REL
- Continuity Buzzer



excl VAT **R1 559.00**
Incl VAT **R1 792.85**



UT-USBC USB 3-in1 CHARGING CABLE

- USB-A to USB-C, USB-MICRO and Lightning



excl VAT **R90.00**
Incl VAT **R103.50**

UT363BT MINI ANEMOMETER

- Wind Speed Rate: 0 ~ 30m/s
- Temperature Range: -10°C ~ 50°C
- Beaufort Wind Scale 0-12 level
- Wind Speed Resolution 0.1m/s
- Temperature Resolution 0.1°C
- Sampling Rate 0.5/s
- APP
- Bluetooth App
- Data Hold
- APO
- Low Battery Indication
- MAX/AVG Mode
- LCD Backlight
- Overload Indication
- Wind Speed Unit Selection: m/s, km/h, ft/min, knots, mph
- Temperature °C/°F



excl VAT **R859.00**
Incl VAT **R987.85**

UT301A+ INFRARED THERMOMETER

- Temperature: -32°C ~ 420°C
- Accuracy: +/- 1.5°C
- Repeatability: 0.7°C
- D:S Ratio: 12:1
- Response Time: ≤250ms
- Emissivity: 0.1 ~ 1.0
- Spectral Response: 8µm ~ 14µm
- Laser Power: < 1mW
- Selection °C/°F
- Data Hold
- APO
- Low Battery Indication
- MAX/MIN/AVG/DIFF
- LCD Backlight
- High/Low Temp LED & Audible Alarm
- Lock Measurement
- LCD Display Colour EBTN
- Single Laser



excl VAT **R1 299.00**
Incl VAT **R1 493.85**

UT513A 5KV INSULATION RESISTANCE METER

- 5KV Digital Insulation Resistance Tester
- Insulation Resistance up to 1000GΩ
- 600V AC/DC
- Analogue Bar Graph (30 Segments)
- Data Logging 18
- Secondary Display
- Polarization Index (Pi)
- Dielectric Absorption (DAR)
- Insulation Voltages 500/1000/2500/5000V
- Short Circuit Current < 3mA
- Auto Ranging
- High Voltage Indication
- LCD Backlight
- Over-Range Warning
- Comparison Measurement
- Low Battery Indication
- 10 000 Display Count
- APO



excl VAT **R10 499.00**
Incl VAT **R12 073.85**

M30 HANDHELD THERMOGRAPHY CAMERA

- Thermal resolution: 384 x 288 (110 592 pixels)
- NETD : < 35mK
- Temperature measurement range : -20 °C - 550 °C
- Accuracy: Max (±2°C ±2%),
- Measurement Presets: Center spot, Hot spot, Cold spot,
- User Preset Point/Line/Area
- FOV: 37.5° x 28.5°
- Pixel Pitch: 17µm
- Colour Palettes: White Hot, Black Hot, Rainbow, Ironbow, Red hot, Fusion, Rain
- Manual focus
- Image Mode: Thermal / Optical / Fusion / PIP
- 25 Hz image frequency
- 3.5" LCD touch screen display
- Bluetooth
- USB Interface
- www.hikmicrotech.com/en/download/5
- WiFi



excl VAT **R49 899.00**
Incl VAT **R57 383.85**

UT675A BATTERY TESTER WITH PRINTER

- 12V Battery Test: 7 ~ 16V DC
- 12V/24V Cranking System Test: 7 ~ 30V DC
- 12V/24V Charging system test: 7 ~ 30V DC
- Battery Type: Ordinary Lead Acid Battery, AGM Flat Plate Battery, AGM Spiral Battery, GEL Battery, EFB Battery
- Battery Capacity: 3 ~ 250Ah
- Over Voltage Protection
- Reverse Connection Protection
- A Prompt For Poor Contact
- Battery Status, Life and Capacity Display
- Battery Internal Resistance Display
- USB Communication
- Printing Function
- Four-Terminal Kelvin Test
- Test without Battery Disassembly
- LED Colour Indication for Test Results



excl VAT **R2 999.00**
Incl VAT **R3 448.85**

UT-C02B ALLIGATOR CLIPS

- Length: 80mm
- Clip Opening: 36mm
- CAT Rating: CATIII 1000V, CAT IV 600V 10A
- Insulated with M4 Threaded Bore
- Screw Connection
- Recommended Test Leads: UT-L27



excl VAT **R259.00**
Incl VAT **R297.85**

LM1000 RANGE FINDER

- Distance Range: 1m - 900m
- Height: 400m
- Accuracy: 0.2%
- Velocity Range: 0-300km/h
- Magnification: 7x
- Power: 3.7V Li-ion
- Angle: +/- 60°
- Pulse Laser (Harmless to Eyes)
- Fast Distance Measurement
- APO
- LCD Display



excl VAT **R3 599.00**
Incl VAT **R4 138.85**

UT211B MINI TRMS CLAMP METER

- AC/DC Current: 60A
- AC/DC Voltage: 600V
- Resistance: 60MΩ
- Frequency: 60kHz
- Capacitance: 62mF
- Continuity Buzzer
- Resolution: 0.1mA
- Jaw Capacity 17mm
- NCV
- ZERO Mode
- Data Hold
- LCD Backlight
- APO
- V.F.C.
- Diode
- Low Battery Indication
- Input Protection
- Ideal for Solar Power Systems
- 6000 Display Count



excl VAT **R3 699.00**
Incl VAT **R4 253.85**



- ### UT136B+ MULTIMETER
- AC/DC Voltage: 1000 V
 - AC/DC Current: 10A
 - Resistance: 40MΩ
 - Capacitance: 40mF
 - Frequency: 400Hz ~ 40MHz
 - APO
 - Data Hold
 - hFE Transistor Test
 - Diode
 - NCV
 - Low Battery Indication
 - Overload Alarm
 - Continuity Buzzer
 - LCD Backlight
 - 4000 Display Count

excl VAT **R869.00**
Incl VAT **R999.35**

UT256A 200A TRMS FORK METER

- AC Current: 200A
- AC/DC Voltage: 1000V
- Resistance: 60MΩ
- Capacitance: 60mF
- Frequency: 10 ~ 10kHz
- Auto Range
- Data Hold
- NCV
- LCD Backlight
- APO
- Continuity Buzzer
- Low Battery Indication
- 6000 Display Count



excl VAT **R1 499.00**
Incl VAT **R1 723.85**

UT120B POCKET SIZE MULTIMETER

- AC/DC Voltage: 600V
- Resistance: 40MΩ
- Capacitance: 100μF
- Frequency: 10MHz
- Duty Cycle
- Data Hold
- APO
- Diode
- Continuity Buzzer
- Low Battery Indication
- Relative Mode
- 4000 Display Count



excl VAT **R539.00**
Incl VAT **R619.85**

UT251C HIGH SENSITIVITY LEAKAGE CURRENT CLAMP METER

- Leakage Current AC: 0.001mA ~ 600A
- Jaw capacity: 35 ~ 40mm
- Resolution: 1mA
- Auto Ranging
- RS-232
- Diode
- Data / Peak Hold
- Overload Protection
- APO
- Low Battery Indication
- Display 4 Digit LCD
- Data Storage 99
- Over-Range Display



excl VAT **R3 999.00**
Incl VAT **R4 598.85**



- ### UT213C 400A TRMS CLAMP METER
- AC/DC Current: 400A
 - AC/DC Voltage: 600 V
 - Resistance: 40MΩ
 - Frequency: 1MHz
 - Capacitance: 40mF
 - Temperature: -40°C ~ 1000°C
 - Auto Range
 - Continuity Buzzer
 - Data Hold
 - Diode Test
 - APO
 - NCV
 - Flashlight
 - LCD Backlight
 - Jaw Capacity 30mm
 - MAX/MIN/REL
 - Input Protection
 - Low Battery Indication
 - 4000 Display Count

excl VAT **R1 999.00**
Incl VAT **R2 298.85**

UT60EU MULTIMETER

- AC/DC Voltage: 1000 V
- AC/DC Current: 10A
- Resistance: 100MΩ
- Frequency: 99.99Hz ~ 9.999MHz
- Capacitance: 10mF
- Duty Cycle: 0.1~99.9%
- Temperature: -40°C ~ 1000°C
- Auto Range
- Relative mode
- NCV
- Diode
- Continuity Test
- Acousto-optic Indication
- Low Battery Indication
- APO
- Data hold
- Backlight
- Display Count 9999



excl VAT **R969.00**
Incl VAT **R1 114.35**



UT219E PROFESSIONAL TRMS CLAMP METER AC ONLY

- AC Current: 600A
- AC/DC Voltage: 1000 V
- LoZ ACV: 600V
- Resistance: 60MΩ
- Capacitance: 60mF
- Frequency: 10MHz
- Auto/Manual Range
- Jaw 33mm
- MAX / MIN
- Data Hold
- Duty Cycle
- Sampling Rate: 3 times/sec
- Analog Bar Graph
- Low Battery Indication
- Relative Mode
- 6000 Display Count
- APO
- Zero Mode
- Diode
- Auto Backlight
- Flashlight

excl VAT **R2 899.00**
Incl VAT **R3 333.85**

UT682 WIRE TRACKER

- Wire Types: LAN Cable, Telephone Cable, Coaxial Cable, Electric Wire
- Indication Light For Signal Strength
- Live Switchboard Wire Tracing
- Switchboard Wire Tracing Distance: ≥100m
- Telephone Wire Test Distance ≥3000m
- Shielded / Unshielded Tracking Distance ≥320m
- Open and Short Circuit Test
- Polarity Indication for Telephone Wires
- Broken Wire Tracking
- Max Receiver Operating Current 40mA
- Max Receiver Standby Current 10mA
- Telephone Wire and LAN Cables Distinction
- Transmitter Low Battery Indication
- Transmitter Power Supply 9V Battery
- Headphone Jack for Receiver
- Line Sequence Measurement
- Line Sequence Measuring Speed
- LAN Cable: Shielded/Unshielded Indication
- Transmitter - Output Voltage: ≥ 12V Peak ~ Peak



excl VAT **R1 299.00**
Incl VAT **R1 493.85**

LM555LD LASER LEVELER

- Display Type: Green LD
- Line Type: 4V1H 1D
- Laser Wavelength: 510 ~ 515nm
- Light Source: < 1mW
- Laser Class: 2
- Expanded Angle: H130° / V 110°
- H/V Accuracy: +/- 3.5°
- Self-Leveling Method: Gravity Pendulum Magnetic Damping
- Self-Leveling Time: <3s
- Working Distance: Line 20m, Point 25m@200Lux
- Working Time: >5h (All Lasers On)



excl VAT **R3 999.00**
Incl VAT **R4 598.85**

PRO UT15B PRO PROFESSIONAL TRMS IP65 MULTIMETER

- AC/DC Voltage: 1000 V
- AC/DC Current: 10A
- Resistance: 60MΩ
- Capacitance: 60mF
- Auto Ranging
- Auto Backlight
- Flashlight
- Diode
- APO
- Continuity Buzzer
- Low Battery Indication
- Data Hold
- MAX / MIN
- Relative Mode
- 6000 Display Count
- CATIII 1000V
- CATIV 600V



excl VAT **R2 299.00**
Incl VAT **R2 643.85**

UT261A PHASE SEQUENCE & MOTOR ROTATION INDICATOR

- AC Voltage: 40V ~ 690V
- Frequency: 15Hz ~ 400Hz
- Working Current: < 1mA
- Phase Sequence Indication: LCD
- Missing Phase Indication: LCD
- No Batteries Required



excl VAT **R1 349.00**
Incl VAT **R1 551.35**

UT207B TRMS CLAMP METER & UT-CS09D FLEX CLAMP SENSOR

- #### UT207B
- AC/DC Current: 1000A
 - AC/DC Voltage: 1000V
 - Resistance: 60MΩ
 - Capacitance: 60mF
 - Frequency: 40Hz ~ 400Hz
 - Auto/Manual Range
 - Jaw Capacity 42mm
 - Diode
 - APO
 - Data Hold
 - MAX/MIN/REL
 - LCD Backlight
 - Flashlight
 - Continuity Test
 - NCV
 - Low Battery Indication
 - Overload Indication
 - High Voltage Warning
 - 6000 Display Count
- #### UT-CS09D
- AC Current: 3000A
 - Frequency Response: 45Hz ~ 500Hz
 - Inrush Current: 0.5A ~ 3000A
 - Flex Coil Size: 45.7cm
 - Auto Power Off
 - Low Battery Indication
 - Function Select



excl VAT **R4 499.00**
Incl VAT **R5 173.85**

UT505A 20GΩ TRMS HANDHELD INSULATION RESISTANCE MULTIMETER

- Test Voltage(Ω): 50V, 100V, 250V, 500V, 1000V
- Load Current 50V ~ 1000V 1mA
- Short Circuit Current <2mA
- Low Resistance 0.01Ω ~ 20.00kΩ
- DC Voltage: 600 V
- AC Voltage: 600V
- Auto Range
- DAR & PI
- Step Voltage 10% Step @ 50% ~ 120% of Range
- Timer
- APO
- High Voltage Output Alarm
- Analogue Bar Graph
- LCD Backlight
- Continuity Buzzer
- Low Battery Indication
- Data Hold
- Data Storage 99
- Comparison Measurement
- Auto Discharge
- 6000 Display Count



excl VAT **R5 999.00**
Incl VAT **R6 898.85**

UT705 SINGLE FUNCTION SOURCE LOOP CALIBRATOR

- DC Voltage: 30V
- DC Current: 24mA
- Loop Current: 24mA
- Loop Power Function: 24V
- Accuracy: Up to 0.02%
- Ramp Functions
- Step Function



excl VAT **R9 599.00**
Incl VAT **R11 038.85**

UT222 2500A TRMS CLAMP METER

- AC/DC Current: 2500A
- AC/DC Voltage: 1000V
- Resistance: 60MΩ
- Capacitance: 60mF
- Frequency: 60MHz
- Temperature: -40°C ~ 1000°C
- Auto Range
- Jaw Capacity 63mm
- Data Hold
- MAX
- Continuity Buzzer
- Low Battery Indication
- Analog Bar Graph 61
- MIN/OUT Function
- AC + DC Dual Display
- Low Pass Filter
- Inrush Current
- Data Storage 1000
- 6000 Display Count
- Diode
- Relative Mode



excl VAT **R5 999.00**
Incl VAT **R6 898.85**

NEW



A63 2-in1 FOOD THERMOMETER

Infrared:

- Accuracy: -40°C ~ 300°C
- Emissivity: 0.95
- Distance to Spot Ratio: 8:1
- Spectral Range: 5µm ~ 14µm
- Response Time: <250ms
- Repeatability: 1.0°C
- Single Laser
- Laser Power: <1mw
- Laser Wavelength: 650 +/- 20nm

Probe:

- Accuracy: -50°C ~ 300°C
- Probe Type: NTC
- Minimum Measuring depth: 12.7mm
- APO
- IP65
- Low Battery Indication
- LED Alarm
- Data Hold
- MAX / MIN / Difference
- Display Flipped

excl VAT **R2 745.00**
Incl VAT **R3 156.75**

UT121B SMART DIGITAL MULTIMETERS

- AC/DC Voltage: 600V
- Resistance: 60MΩ
- Capacitance: 99.99mF
- Frequency: 10Hz ~ 10MHz
- Temperature: -40°C ~ 1000°C
- Dual Display
- Auto Range
- NCV
- LIVE Detection
- Diode
- Continuity
- LCD High Voltage Alert
- Flashlight
- Low Battery Indication
- APO
- Data Hold
- Display Count 6099

excl VAT **R768.00**
Incl VAT **R883.20**

NEW



LM320B ANGLE METER

- Measurement Range: 4 x 90°
- Accuracy: +/- 0.2°
- Resolution: 0.01°
- Display: EBTN
- Laser Indication: Two Side Lasers
- Magnet Base: Four-side Magnets
- Relative / Absolute Measurement
- Low Battery Indication
- Data Hold
- APO
- Portable and Lightweight
- Unique Laser Design

excl VAT **R1 059.00**
Incl VAT **R1 217.85**

NEW



UT122 SMART DIGITAL MULTIMETERS

- AC Voltage: 750V
- DC Voltage: 1000V
- Resistance: 60MΩ
- Capacitance: 99.99mF
- Frequency: 10Hz ~ 10MHz
- Temperature: -40°C ~ 1000°C
- Dual Display
- Auto Range
- NCV
- LIVE Detection
- Diode
- Continuity
- LCD High Voltage Alert
- Flashlight
- Low Battery Indication
- APO
- Data Hold
- Display Count 6199

excl VAT **R998.00**
Incl VAT **R1 147.70**

NEW



UT278D GROUND PILE CLAMP EARTH RESISTANCE TESTER

- Ground Resistance: 0 ~ 2000Ω
- Leakage Current: 60A
- Current Resolution: 1uA
- Soil Resistivity: 0 ~ 9999kΩ
- Ground Voltage: 600V
- Jaw Size: 68mm
- Screen: 46 x 29mm LCD
- USB Data Upload
- Data Storage (500)
- Overload Indication
- Backlight
- Alarm Function
- APO
- Overload Protection

excl VAT **R30 569.00**
Incl VAT **R35 154.35**

NEW



UT121A SMART DIGITAL MULTIMETERS

- AC/DC Voltage: 600V
- Resistance: 10MΩ
- Temperature: -40°C ~ 1000°C
- Dual Display
- Auto Range
- NCV
- LIVE Detection
- Diode
- Continuity
- LCD High Voltage Alert
- Flashlight
- Low Battery Indication
- APO
- Data Hold
- Display Count 6099

excl VAT **R698.00**
Incl VAT **R802.70**

NEW



UT677A BATTERY INTERNAL RESISTANCE TESTER

- Battery Internal Resistance Range: 0.0mΩ ~ 3mΩ
- Batter Voltage Range: 0.0V ~ 71V
- Temperature Range: -10°C ~ 60°C
- Screen: 3.5 inches
- Response Time: 200ms
- Measuring Time: 2sec
- USB Interface
- Bluetooth
- Data hold and Storage
- APO
- Measurement Judgement Function

excl VAT **R1 059.00**
Incl VAT **R1 217.85**

NEW



UT200B+ CLAMP METER

- AC Current: 600A
- DC Voltage: 600 V
- AC Voltage: 600V
- Frequency: 10Hz ~ 10kHz
- Resistance: 30kΩ
- Capacitance: 300µF
- Auto Range
- Jaw Capacity 28mm
- Diode
- Continuity Buzzer
- Low Battery Indication
- Data Hold
- LCD Backlight
- Flashlight
- High Voltage Warning
- 3099 Display Count

excl VAT **R747.00**
Incl VAT **R859.05**

NEW



UT372D 2-IN-1 TACHOMETER

Non-contact Measurement:

- RPM Range: 1RPM ~ 99,999RPM
- Frequency: 1 ~ 1.66Hz
- Count: 1 ~ 99,999REV
- Target Distance: 50mm ~ 500mm

Contact Measurement:

- RPM Range: 1 ~ 19,999RPM
- Frequency: 1 ~ 333Hz
- Surface Velocity: 6 ~ 60in/min
- Length: 0 ~ 99999 (m/ft/in)
- Measurement More: Contact RPM / Non-contact RPM / Counting / Frequency / Surface Velocity / Length
- Statistical Measurement: Max / Min / Last Reading / Average
- Data Storage (10)
- APO

excl VAT **R2 979.00**
Incl VAT **R3 425.85**

PRO



UT18B PRO 1000V TRUE RMS DIGITAL MULTIMETER

- AC/DC Voltage: 1000 V
- AC/DC Current: 10A
- Resistance: 60MΩ
- Capacitance: 60mF
- Frequency: 1MHz
- Temperature: -55°C ~ 500°C
- Duty Cycle
- Auto/Manual Ranging
- LED Test
- Auto Backlight
- Flashlight
- Diode
- APO
- Continuity Buzzer
- Low Battery Indication
- Data Hold
- MAX / MIN
- Relative Mode
- 6000 Display Count

excl VAT **R3 719.00**
Incl VAT **R4 276.85**

NEW



UTD2102CEX-II 100MHZ STORAGE OSCILLOSCOPE

- Channels: 2 (Dual)
- Bandwidth: 100MHz
- Sample Rate: 1GS/s
- Rise Time: ≤3.5ns
- Memory Depth: 25kpts
- Waveform Capture Rate: ≥ 20000wfms/s
- Vertical Sensitivity: 1mV/div ~ 20V/div (1MΩ)
- Time-Based Range: 2ns/div ~ 50s/div
- Storage: Setup, Wave, Bitmap
- Trigger Modes: Edge, Pulse Width, Slope, Video, Runt, Window
- Waveform Operations: A+B; A-B; AxB; A/B; FFT
- Measurement Statistics: Average, Max, Min, Standard Deviation, Number
- Display 8 Inch TFT LCD, WVGA (800 x 480)

excl VAT **R16 160.00**
Incl VAT **R18 584.00**

NEW



UT333S MINI TEMPERATURE & HUMIDITY METER (HYGROMETER)

- Temp Range: 10 ~ 60°C
- Humidity Range: 0 ~ 100%RH
- Sampling Rate 1/s
- Data Hold
- Low Battery Indication
- MAX/MIN
- LCD Backlight
- Power ON/OFF
- Unit Selection °C/°F
- Split Design
- Overload Alarm
- APO

excl VAT **R839.00**
Incl VAT **R964.85**

NEW



UT161B TRMS MULTIMETER

- AC/DC Voltage: 1000 V
- AC/DC Current: 10A
- Resistance: 60MΩ
- Frequency: 10Hz ~ 10MHz
- Capacitance: 60mF
- MAX/MIN
- Diode
- Continuity Buzzer
- hFE Transistor
- Relative Mode
- NCV
- Analog Bar
- Data Hold
- USB Communications
- LCD Backlight
- Low Battery Indication
- Auto Power Off
- Display Count 6000
- INTERTEK Approved

excl VAT **R2 059.00**
Incl VAT **R2 367.85**

NEW




UT516B INSULATION RESISTANCE METER

- 5KV Digital Insulation Resistance Tester
- Insulation Resistance up to 1000GΩ
- 1000V AC/DC
- Data Logging 18
- APO
- Polarization Index (Pi)
- USB Interface
- LCD Backlight
- Over-Range Warning
- Comparison Measurement
- Low Battery Indication
- 10 000 Display Count

excl VAT **R33 399.00**
Incl VAT **R38 408.85**

NEW



A61 DIGITAL THERMOMETER

- Measurement: -40°C ~ 250°C
- Minimum Measuring Depth: 12mm
- NTC Sensor
- Stabilization Time: 20s
- Power: 3V button Cell
- Battery Duration: 12h
- IP65
- LED Alarm
- Data Hold
- MAX/MIN
- CATIII 600V

excl VAT **R349.00**
Incl VAT **R401.35**

NEW



THREE PHASE POWER QUALITY ANALYZER UT285C WITH FIXED CLAMPS / UT285CFC WITH FLEX CLAMPS

- TRUE RMS Phase-to-Neutral Voltage: 1.0V~1000V
- TRUE RMS Phase-to-Phase Voltage: 1.0V~2000V
- DC Voltage: 1.0V~1000V
- TRUE RMS Current: 10mA~1000A
- Peak of Phase-to-Neutral Voltage: 1.0V~1414V
- Peak of Phase-to-Phase Voltage: 1.0V~2828V
- Current Peak: 10mA~1414A
- Active Power: 0.0VA~9999.9kW
- Reactive Power, Inductive/Capacitive: 0.0RVA~9999.9kVAR
- Apparent Power: 0.0VA~9999.9kVA
- Power Factor: -1.000~1.000
- Active Energy: 0.0Wh~9999.9MWh
- Reactive Energy, Inductive/Capacitive: 0.0VARh~9999.9MVARh
- Apparent Energy: 0.0VAh~9999.9MVAh
- Phase Angle: -179°~180°
- Tanφ: -32.76~32.76
- Phase Shift of Power Factor: -1.0~1.0
- Harmonic Ratio: 0.0%~99.9%
- Harmonic Angle: -179°~180°
- Distortion Factor: 0.0%~99.9%
- Transformer K Factor: 1.00~99.99
- 3 Phase Unbalance: 0.0%~100%
- Number of Channels: 4U / 4I
- Parameters of Electricity: W, VA, Var, PF, DPF, cosφ, tanφ
- Energy Parameters: Wh, Varh, Vah
- Harmonic: 50
- Expert Mode
- Number of Transient Records: 150Sets
- MIN / MAX
- Alarm Log
- Auto Phasor Diagram Display
- APO
- Backlight
- USB Interface

excl VAT **R9 999.00**
Incl VAT **R11 498.85**

NEW



UT285CFC

excl VAT **R105 975.00**
Incl VAT **R121 871.25**

NEW



LM600G GOLF RANGE FINDER

- Distance Range: 3m ~ 600m
- Height: 250m
- Accuracy: 0.2%
- Speed Range: 0 ~ 300km/h
- Magnification: 6x
- Power: 3.7V Li-ion
- Angle: +/- 60°
- Objective Aperture: 19mm
- Eye Piece Aperture: 15mm
- Exit Pupil Diameter: 3.7mm
- Flagpole Lock
- APO
- Golf Trajectory Compensation Mode
- Slope Measurement
- Height Measurement

excl VAT **R3 361.00**
Incl VAT **R3 865.15**