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Photo courtesy of Megger





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Combination Testers Save Time and Eliminate Error

BY JEFF JOWETT

cove

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THE FIRST ORDER OF THE DAY with any measurement instrument is, of course, the reading. That's the primary *raison d'être*. But electrical test equipment that gives accurate and reliable readings has existed for over a century now. Yes, there have been improvements and what was good to begin has gotten even better. Microprocessors and Liquid Crystal Displays have narrowed the percentage accuracy and provided precise measurements free of the parallax guesswork of analog pointers, as a prime example. But there's also the Law of Diminishing Returns to consider. When selecting test equipment, high precision and accuracy may be indispensable, as in R&D work. But inexpensive, less well engineered testers also have their place, as may be the case for pass/fail or go/no go testing and for troubleshooting and repair.

So once the range and accuracy have been decided, is that all there is? No. A cornucopia of modern technological advances, some not available until this century, have notably added to the selection process and the flexibility in acquiring an instrument and applying it precisely to the job at hand. This article focuses on the broad field of electric motor testing, but the features and functions here described have even broader application to testing in general and can be looked for in other instruments as well.

One of the most sweeping advances has been in something as simple as the size of the instrument. (CONTINUED ON PAGE 8)

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Yes, large, bulky testers do give a sense of steadiness and reliability, but they also can slow down the work. And speed is a paramount consideration in the modern world, which no longer favors artisanship but demands results. A complete electric motor tester can now be designed into a single handheld unit. One of the most practical axioms is that time is \$\$. Older instruments focused on doing a single job and doing it as well as possible. Nothing wrong with that. When economy became a prime concern, other instruments came on the market that instead of doing one thing well, they did multiple tasks passably. That may be acceptable and maybe not. But now, miniaturization of high quality circuitry makes the choice no longer necessary. A handheld unit can do all the functions the operator may want and all done well. The saving in time can be noteworthy and cost effective. No need to search out another instrument or set it up on a platform base. Hold with one hand and operate with the other through possibly every test you need to perform. You can move on to the next job quickly, or go home to dinner.

But wait. What about all the switching of leads, which can be time consuming

and prone to error? A new capability permits three leads of a typical insulation/ motor tester to be connected to a 3-phase motor once and then manipulated from key presses on the tester rather than by physical reconnection. The guard terminal, a ubiquitous but often misunderstood or unused function, is of key importance in motor testing as it acts as a shunt circuit, removing whatever element is connected to it from the measurement. It permits the testing to be sectionalized, as in leakage from stator to rotor with ground guarded out. These functions can be smoothly operated from the panel without the degree of manipulation associated with older, cruder designs.

A note on safety: handheld instruments should be protected against arc flash/ blast in the event of a fault on the line during testing. And they are, by proper conformance to IEC61010, which prescribes creepage and clearance distances for instrument circuitry. Always note the IEC rating of the instrument and apply it correctly to the operating environment and voltage of the test item.

The most fundamental test of an electric motor, its insulation resistance to ground and between windings, is performed in this manner; leads connected across the insulation barrier that is under test, test voltage applied, leakage current drawn through the insulation to the degree that it will allow, and a measurement calculated and displayed (Fig. 1). But it is now much refined. Traditionally, insulation testers had three to five voltage selections. The 500 V test became the standard for virtually all motors running from building wiring (120, 240, 480 V). Modern testers now offer almost infinite voltage selection in 1V increments across the whole range. If desired, a 600V motor can be tested at 600V. Troubleshooting focuses (CONTINUED ON PAGE 12) on the low end of



Figure 1: 3-phase insulation test showing actual applied voltage.



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the insulation range, where breakdown has occurred or is imminent. For this, look for a fast rise time in test voltage so that critical measurements as the insulation approaches breakdown can be reliably measured at full selected voltage, not loaded down to a deceptive reading at a lower voltage. A load graph will account for this. Then at the other end of the scale, a high measurement range well into Gigohms ($10^{9}\Omega$) facilitates longterm graphing of insulation decline so as to head off breakdown with preventive maintenance.

But to be reliable, an insulation graph needs to be corrected to a common temperature base. Temperature has a profound effect on readings (about a 50% reduction with a 10°C rise) because the molecular agitation aids leakage current. Separate measurements with a thermometer and hand calculation are no longer necessary. Temperature can be entered at the operator's convenience, by a thermocouple or manually. The reading will be automatically compensated to the desired temperature and stored properly. This takes a lot of potential error out of interpretation of trends.

The opposite of insulation is continuity, and this also needs to be effectively tested. The motor won't run if it isn't properly connected and that's where continuity comes in. A quick test will expose wiring errors where a continuous circuit is anticipated but not indicated. Sophisticated testers will now show lead hookup and allow range selection, uni- and bi-directional testing and diode test, plus buzzer mode and failure selection all from touch selections. The time-saving bi-directional mode saves the operator from switching leads.

But while the indispensable continuity

function has been improved, the addition of two more terminals in modern testers creates a whole new testing possibility seen previously only in separate testers...a Kelvin bridge and a low resistance ohmmeter function. As with continuity, the display can show you graphically how to connect the leads. If something goes wrong, like a poor connection, the display indicates it so that the operator does not lose time with failed tests. Lead continuity is constantly monitored (Fig. 2). The test can be run uni- or bi-direction, or in a continuous auto mode (Fig. 3). Again, no reconnecting leads with bi-directional mode. Both test (CONTINUED ON PAGE 14)



Figure 3: Low resistance measurements include test current and direction.



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current and measured resistance are displayed while on a large load, the active progress of the test can be viewed. Test currents up to 0.2A with measurement down to 1 m Ω at 0.01 m Ω resolution are possible.

Another vital test that has required a separate piece of equipment until now is motor rotation. Again the display will indicate lead hookup. Manually turn the shaft and the display will show L1 L2 L3 to indicate correct rotation. It's as simple as that (Fig. 4). Add an AC/DC voltmeter and frequency measurement for supply voltage characterization and you've got it all (Fig. 5). For further convenience, the tester may have an LCR position for inductance, capacitance, and resistance. As with rotation, these parameters have traditionally required a separate meter. Modern instrumentation will determine automatically if the load is inductive, capacitive, or resistive, and then display the value for the reactive component. Capacitance and inductance can then be selected and measured individually.

All this is now shown on a full color graphic display. This is not for pizzazz but is a valuable tool to keep the operator focused on the correct function and prevent costly and time wasting errors. It improves the user experience, making it easier to use and more intuitive. Test results are now more clearly and fully displayed. A selector switch, as opposed to multi-function keys, is another asset to field testing as it reduces error, saves time, and enables the operator to conveniently and repeatedly check that the correct setup is in use. And since motor windings can store large and lethal static charge, safety should never be neglected. Redundant features like IEC61010 conformance, live circuit detection and test inhibit, and terminal lockout voltages keep the operator safe! No more carrying a truckload of instruments. You can now do the full battery of electrical tests for motors as well as anywhere else that applies with just a single handheld instrument. And to conclude with a bit of fun, how many separate testers have we shown combined?

Answer: 6; megohmmeter, DMM, VOM, MRT, LCR, low resistance ohmmeter





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feature ARTICLE **FULHAM CO., INC.**



Seeing the Light with Connected Emergency Luminaires

CONNECTED EMERGENCY LUMINAIRES are finding a new role in smart building automation and providing an ideal platform for a building's wireless infrastructure. Alvaro Garcia, senior Director of Product Management at Fulham Co., Inc., discusses how modern safety lighting solutions are not only making buildings safer, but also simplifying emergency systems installation, maintenance, and management.

The critical role played by emergency lighting to support the safe evacuation of buildings during emergency incidents cannot be underestimated, and today's electrical contractors are under increasing pressure to ensure solutions not only meet building requirements but are also in line with the latest emergency lighting standards. In North America, for instance, emergency lighting must comply with a range of standards including; UL 924 and CSA 860 safety and performance standards , NFPA 101 Life Safety Code , International Building Code and CSA C22.2 NO. 141 , to name a few. While its importance is clear, for General Managers and Project Managers the challenge has always been how to deploy intelligent emergency LED components and connectivity strategies across large buildings, while at the same time keeping installation costs under control.

Retrofitting Emergency Lighting

Wiring intelligent luminaires together into a common building network is certainly a viable approach for new construction. However, considering that just 12% of commercial buildings in the U.S. (comprising 14% of commercial floorspace) were built since 2003, with around half of all buildings constructed before 1980, according to figures from the U.S. Energy Information Administration (EIA), retrofitting cabling to connect luminaires isn't cost-effective.

As a result, commercial building owners are seeking new ways to reduce operating overheads, (CONTINUED ON PAGE 18)



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and LED retrofit components with wireless capacity have quickly emerged as an attractive approach for connecting smart solid-state luminaires in order to create a wireless, building-wide management system.

Indeed, wireless communications offer the most feasible approach when transitioning from legacy to modern lighting systems. Bluetooth© mesh, in particular, is proving an increasing popular protocol for linking LED luminaires. Luminaires with smart LED drivers with wireless Bluetooth© mesh capabilities integrated, can serve as a node for a scalable network of controlled lighting.

By connecting devices via the readily scalable and open Bluetooth[©] mesh architecture, the fitting and maintenance of emergency lighting systems becomes much simpler, as the need to add additional physical wire for intelligent lighting communication is eliminated. What's more, devices can be added or removed from the mesh without disruption to the wider infrastructure.

In addition, the very nature of being wireless allows for a simple installation and a hassle free, remote system commissioning process in any environment – significantly reducing unnecessary operational downtime and ultimately saving money. Once (CONTINUED ON PAGE 20)

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By building a connected network of intelligent emergency LED lighting components, you can handle broader sensor data from other systems including HVAC, security and building automation systems (BAS) to facilitate a new level of building controls that makes facilities safer and easier to manage.

installed, updates can be commissioned remotely from a central console.

Standing the Test of Time

Of course, the trials and tribulations of retrofitting emergency lighting into existing buildings simply do not end once the luminaires are installed. Indeed, in order to comply with the latest safety standards, which require all emergency lighting systems to be tested monthly, and ensure occupant safety, building owners must regularly schedule maintenance checks to test the emergency lighting systems installed. For large multi-site estates, this can often be a laborious and time-consuming task.

Even with built-in safety indicators, safety regulations require monthly testing and logging of emergency luminaires' status, including verifying battery operations. As part of annual testing, emergency luminaires also have to be tested to simulate a real emergency, including operating emergency lights for the full three-hour duration to ensure the system and batteries are working properly.

The latest generation of emergency LED fixtures and drivers integrate onboard intelligence by including built-in diagnostics and self-testing features. Automating the end-to-end process eradicates the necessity to walk the building, manually testing each individual emergency light and every emergency battery system, and logging the results. This in turn, makes it simpler to perform self-testing, diagnostics and full-cycle testing, as well as monitoring and logging the results, limiting maintenance costs and reducing the possibility of fines for non-compliance.

While automating remote testing and diagnostics for regulatory compliance may not be sufficient incentive to retrofit emergency luminaires, users should consider the added value that creating a ready-made communications infrastructure for other uses can bring. For example, by building a connected network of intelligent emergency LED lighting components, you can handle broader sensor data from other systems including HVAC, security and building automation systems (BAS) to facilitate a new level of building controls that makes facilities safer and easier to manage.

The Future of Emergency Luminaires

Today's connected luminaires are fully programmable. The embedded intelligence in the LED engine's microcontroller can be programmed to change lighting characteristics including brightness, hue, color temperature, operating temperature, and even energy consumption, but the scope of programmability for other functions has the potential to be much broader.

In fact, the programmable intelligence and wireless connectivity of today's smart luminaires has the potential to deliver much more. This could include everything from the ability to remotely test systems from anywhere, anytime, to real time remote monitoring and maintenance alerts and full integration with other emergency and building automation systems in place, plus much more.

Sensors tied to a building's lighting components can be used to automate routine building administration tasks as well. They can detect environmental conditions, issuing data to control HVAC and room lighting. For example, sensors can instruct luminaires to adjust room lighting based on ambient light, or instruct connected blinds to open or close depending how much sunlight is coming into the room.

Emergency luminaires located at exit points can potentially be used to manage

building security. Visitors can be issued a digital building access key on their smartphone or handheld device and the sensors in emergency luminaires can instruct doors to unlock for authorized visitors; a much easier approach than key cards.

Strategically placed emergency lights could also serve as localized sensors programmed to detect fire, smoke, noxious gases, and even sounds such as gunshots – anything that signals a potential hazard. Data from the sensors is continuously fed to a central console that applies machine learning to analyze incoming information to detect a hazard. Once a potential hazard is detected, instructions are sent in response, such as commands to activate emergency lighting.

The sensors also can identify the location of the hazard so other lights are activated to direct occupants in the opposite direction, toward safety. At the same time, the sensors can provide information about room occupancy and building traffic; information that can be shared with first responders sent to deal with the emergency. The controlling console can be managed remotely via a web browser or even be transferred to an emergency response team.

Integrating next generation sensors within a retrofitted emergency lighting ecosystem is just one way of creating a smart emergency response system that improves building safety, while enhancing smart building automation.

Indeed, thanks to the latest advancements in connected emergency luminaires, emergency lighting – once just another building system that had to be tested and managed – now has the potential to become the foundation for building control and analytics, ushering a new era of building automation.

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Generator InterLock Technologies, LLC

GENERATOR INTERLOCK TECHNOLOGIES, LLC, is a smallbased company that manufacturers and sells its products across the country. The company was founded after Hurricane Isabel hit the east coast in 2003. The product was developed to meet the need for a safe way to use portable generators to power homes in the event of power loss.

The initial inspiration for the product came from a persistent friend of an electrician working for Master Electrical Services. As electrical contractors, they had seen various unsafe and illegal methods that people had used to try to power their houses with their portable genera-



tors. The electrician set out to develop a product that would meet National Electrical Code requirements and at the same time be cost effective and convenient for the homeowner. From that original inspiration came a new company: Generator Interlock Technologies or GIT.

The Interlock Kit is a simple safety product that locks out the Main breaker in the existing home panel and allows for the portable generator to power the home through a back feed generator breaker. While many electrical inspectors liked the product; they all agreed that the product would have to be listed to UL standards. After thousands of dollars in fees, rigorous tests, a year of changes and modifications, the Interlock Kit was finally approved for production to be used with panels listed under UL Standard 67.

The company started filling orders in early 2005, using Master Electrical Services as its basis for customer awareness. Starting with a few kits that fit the most recent Square-D and Cutler Hammer panels, the offerings grew to over 30 different models in less than one year. Generator Interlock Technologies now has kits for panels from 30 years ago to the most current and they continue to add new kits to meet their customer's

With the Interlock Kit, a qualified electrician can install a complete system in 2 hours or less by simply mounting the correct kit to the face of the panel and wiring a generator convenience outlet to a breaker installed in the panel. needs. While contractors in Florida and the North East are the biggest customers, Interlock Kits have been sent throughout the United States and parts of Canada. Whether the power loss is due to costal hurricanes or from crippling ice storms in the northern , GIT has a kit that will allow customers to keep the power on in their homes.

The Interlock Kits are designed to be installed by licensed electricians and are cost effective for both the customer and the installer. Other products on the market such as generator sub-panels and transfer switches require extensive rewiring of the home panel, often taking the electrical contractor 6 to 8 hours to install. With the Interlock Kit, a qualified electrician can install a complete system in 2 hours or less by simply mounting the correct kit to the face of the panel and wiring a generator convenience outlet to a breaker installed in the panel.

To use their portable generator, a homeowner plugs an extension cord from their generator to the new generator convenience outlet. He then starts the generator, turns off the main breaker, slides the Interlock Kit, turns on the generator breaker and selects the circuits for use up to the capacity of the generator.

Generator Interlock Technologies' Kit is a defining safety product that has been recognized as a Innovation Award Winner by *Electrical Contracting Products* magazine and one of the Top Products by *Electrical Products and Solutions* magazine.

Generator Interlock Technologies, LLC, has taken a problem of safety and convenience and developed a system to keep danger and expenses to a minimum. Starting with an idea of helping a friend in need, to helping thousands across the country, GIT continues to grow due to its commitment to deliver a quality product. Visit www.interlockkit.com for a complete list of products and details.

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Protect Yourself

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VINCE MILLER STARTED MILLER SAFETY CONSULTANTS,

veteran owned business in 1999. The goal of the business was to provide cost effective safety consulting, employee training such as: confined space entry, fall protection, electrical safety and provide sales of electrical shock and flash protective equipment and fall protection equipment to businesses in the Washington DC area.

Reliance Industries provided fall protection products and much of the sales and training was on behalf of the supplier. In 2000, the owner decided to retire from his business, and Vince decided to discontinue the fall protection line of his business and concentrate more in the electrical training and products.

Vince had been a distributor for Certified Insulated Products (CIP), a manufacturer of electrical insulated tools and electrical arc flash clothing manufactured by Otex in Rochester, New York. As a distributor, Vince provided sales through his internet website and much through relationships with electrical contractors. His training was a classroom environment and was provided directly to customers but he also taught as a sub-contractor for other safety consulting companies and the Chesapeake Safety Council in Baltimore, Maryland. In 2005, Vince partnered with Vivid Learning Systems in Cascades, Washington to provide on-line training in safe work practices.

Training in electrical safe work practices is still provided locally in the Washington DC area and as a partner with an electrical engineering firm and online. The training is based on the Occupational Health and Safety Administration (OSHA) standards and the National Fire Protection Association (NFPA) 70E standard.

Miller Safety Consultants is now a distributor for Cementex USA, Burlington, New Jersey, for insulated tools and equipment and clothing from OTEX Protective, Rochester, New York.

The majority of his sales of products

are from the web-based store. Cementex is nationally known for their quality equipment. Otex Protective is becoming more known for their quality clothing. For years, they have manufactured their products under other provider labels. Vince chose to not create his clothing line, but to sell the manufacturer product.

Vince has worked with many electrical company employees to fine-tune the clothing to be more comfortable for the user. Working closely with the manufacturer, they have made slight changes in how the cloth pattern was modified to meet final production. An example is the lightweight 40 Calorie vented hood offered by Otex.

The material is of the latest technology. The vented assembly is constructed for balance on the back of the hardhat and the airflow is 27 CFM to prevent fogging of the face shield and provide cooling to the worker. It took over a year to develop the product with the user prior to having the hood "flash tested". This product is now standard issue with many electrical contractors.

Being a small business and having quality providers has resulted in satisfied customers for Miller Safety Consultants. Being a direct supplier for OTEX Protective, another small business means customized customer needs can be met. \Box

For more information, visit Miller Safety Consultants at: www.electricalsafetysupply.com,email Vince at: sales@millersafetyltd.com or give him a call at (703)367-0404.



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Electri-Flex Celebrates 65 Years of Quality and Conduit Innovation

ELECTRI-FLEX COMPANY, Roselle, IL, celebrates 65 years as a leader, manufacturing high-quality flexible Liquatite® conduit. Founded in the Chicagoland suburbs in 1955, Harold Kinander, Sr. led Electri-Flex in producing the first type of Liquatite® conduit. Today the Company manufactures nearly 50 varieties, offering the widest range of conduit available in the marketplace.

industry NEWS

> Electri-Flex is third generation owned and operated. In 1955, Harold Kinander, Sr. incorporated the Company and founded the Liquatite® brand. Today Harold's grandchildren, Jason W. Kinander, CEO, Blue Kinander Kelly, VP, and JR Kinander, VP, successfully lead the organization. Janice Ruthe, COO, has been a tremendous

addition to the executive team, focusing on many departmental changes, efficiencies, growth, and leadership for the Company. And Roy Hunn, VP of Operations, carries over 40 years at Electri-Flex and provides wisdom and a vision for the future of the Company through his leadership and manufacturing improvements.

What started in a Chicagoland chicken hatchery in 1955, Liquatite® is now manufactured and distributed from three buildings, all within a one-mile radius. This expansion is a symbol of the company's history, success and future. Roy Hunn leads the investigation and implementation of new technologies in manufacturing, including metal fabrication and the extruding process. "This means a lot to Electri-Flex and its ability to remain a top provider of electrical conduit. It allows us to build on our reputation of worldwide quality, service, and product innovation," said Jason Kinander, CEO.

Liquatite® flexible electrical conduit has evolved over the course of 65 years. Starting in 1955 with the first product, Type LT, today the Company offers nearly 50 varieties of flexible conduit. Liquatite® now offers specialty conduits that provide innovative conduit solutions such as Zero-Halogen, High / Low Temperature, Corrosion-Resistant Stainless Steel, EMI/RFI Shield-Flex®, and many more. These types of conduits provide solutions to specific applications such as Data Centers, (CONTINUED ON PAGE 28)



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industry NEV

65 Years... (CONTINUED FROM PAGE 26)

Defense, Food Processing, Healthcare, Power Plants, Steel Mills, Rail/Transit, Renewable Energy, Telecommunications, Wastewater, and many more. Liquatite® is best known for its superior construction and ability to withstand the toughest of environments.

Electri-Flex Company continues to be a leader in innovative conduit solutions and superior customer service for 65 years. Liquatite® conduit offers the most diverse line of liquidtight flexible electrical conduit in the industry. The company provides custom design, engineering, cutting services, quality assurance and testing capabilities. For more information on Electri-Flex Company, call (630) 529-2920 or (800) 323-6174; e-mail: mktg@electriflex.com; visit: www.electriflex.com; or write: 222 West Central Avenue, Roselle, IL, 60172-1994.





electri-flex Celebrating of Quality Veal

Electrifying conduit, innovation and service for 65 years

Since 1955, Electri-Flex has been building cities across America and around the world, serving clients with innovative conduit solutions, superior customer service and genuine family pride. Our signature Liguatite* flexible conduit line is

made in Chicagoland to our exacting standards and is built to withstand even the most challenging of conditions. And with nearly 50 options to choose from, we will always find a solution that's exactly right for you. After all: *flexibility matters*.





Electri-Flex Company

222 West Central Avenue Roselle, IL 60172-1994 USA

Toll-free phone (U.S.): (800) 323-6174 Phone: (630) 529-2920 Fax: (630) 529-0482

www.electriflex.com

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Russelectric, A Siemens Business, Offers Customized Switchgear Simulators

Ideal for training personnel on automatic and manual operation of Russelectric switchgear

RUSSELECTRIC, A Siemens Business, a leading manufacturer of power control systems and automatic transfer switches, announces the availability of Switchgear Simulators designed to train personnel on automatic and manual operation of Russelectric switchgear.

industry NEV

> Customized to mimic the operation of the customer's Russelectric® switchgear/ system, Russelectric simulators are ideal for familiarizing workers on the system and its operation and for accurately diagnosing a wide range of utility, generator, and breaker problems. The simulators can also be used to assess the impact of changes to PLC setpoints such as kW values and time delays. Using the simulators enables operators to evaluate an

almost limitless number of responses to failure scenarios and use the information to develop and validate site operating and emergency procedures.

Russelectric Switchgear Simulators are available in two versions. The Russelectric Training Simulator allows personnel to train on the automatic operation of Russelectric Switchgear, while the Russelectric Advanced Training Simulator allows personnel to train on both manual and automatic operations. With the addition of hard-wired controls and interlock circuits, the simulator PLC accurately mimics full manual controls, enabling personnel to train in the comfort and safety of an office environment.

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eos demonstrating how the simulators are used for personnel training, visit http://www.russelectric.com/products/ simulators/. □



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NSI Industries Appoints Tim Vanderaa as Director of National Accounts

NSI Industries, LLC, a leading provider of electrical and control products, today announced the appointment of Tim Vanderaa as the company's director of national accounts. Vanderaa brings more than 20 years of sales experience and will be responsible for managing and leading the team of national accounts managers and responsible for developing sales strategies.

industry NEV

> "Tim is distinctly qualified to lead our NSI national accounts team with his extensive experience in the electrical channel," said Tom Wallace, executive vice president, sales, NSI Industries. "His strong and proven prowess in sales, sales operations, sales management, pricing strategy and negotiation will be

a great asset to growing the business. We are pleased he has joined the NSI family."

Prior to joining NSI, Vanderaa spent most of his career as the director of sales for Greenlee in Kannapolis, North Carolina. He has also worked for Spectrum Brands Holdings, Inc., and most recently was the director of sales for Emerson for its commercial and residential solutions business.

Vanderaa received his bachelor's degree in History from the University of Wisconsin-Madison. He will be based at NSI's corporate headquarters in Huntersville, North Carolina.

For additional information about NSI visit www.nsiindustries.com.



Tim Vanderaa Director of National Accounts



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After 100 years, let Megger introduce you to the only 1-kV insulation tester you'll need for your low voltage installation tests. There are four models in the MIT400/2 Series of 1-kV insulation resistance testers. Some of the features include:

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Cooper Lighting Solutions simplifies smart home personalization and control for homeowners with the HALO Home™ Voice Downlight and Smart Bulb

- HALO Home Voice LED downlight allows homeowners to access Amazon Alexa through the light fixture
- HALO Home Smart Bulb provides simple, wireless control of traditional lighting fixtures via Bluetooth® technology with HALO Home mobile app – no internet or hub required
- Works with If This Then That (IFTTT) technology to communicate with other devices and services within the home

Cooper Lighting Solutions recently announced the introduction of the HALO Home Voice Downlight and the HALO Home Smart Bulb,



the latest additions to the award-winning HALO Home™ Smart Lighting System for the next generation of connected homes.

The HALO Home Voice Downlight features Amazon Alexa built into the LED downlight, which includes microphones, a speaker, a processor and Wi-Fi connectivity to give users the ability to talk to Alexa through the light fixture. This patent-pending technology seamlessly integrates into a home, maintaining the intended elegant design, while making it easy to use Alexa — with no additional Alexa device required. The HALO Home Voice Downlight is compatible with 5- and 6-inch standard and shallow recessed housings that accept torsion springs, making it simple to retrofit.

For more information, visit www.cooperlighting.com



Electri-Flex Launches New Zero-Halogen Flexible Conduit Product Video

ELECTRI-FLEX COMPANY, Roselle, IL, has recently launched a new video in its Specialty Liquidtight® Conduits Video Series, featuring Zero-Halogen Flexible Electrical Conduit. This new specialty conduit video features Joe Fedoruk and Tong Gigac, Sales, discussing the benefits, product options, and applications of these liquidtight Zero-Halogen conduit types.

Electri-Flex manufactures many varieties of Zero-Halogen flexible electrical conduits that virtually eliminate the release of the toxic gases found in PVC products. These low fire hazard conduit types are made of polyurethane

and nylon jackets and omit low amounts of non-toxic smoke, have a low flame spread, are self-extinguishing, and are non-halogen emitting. Fedoruk states, "The main reason why we use our Zero-Halogen conduit is public safety concerns, especially in confined areas, which are the ideal application installation." All Zero-Halogen flexible conduits fall well below the allowable maximums for the following standards:

- UL 94 & UL 360 for flammability
- ASTM E162 for low flame spread
- ASTM E662 for low smoke generation
- Bombardier SMP800-C for toxic gas production

The video demonstrates a Beilstein test performed on a Zero-Halogen and a PVC conduit to highlight the presence of halogens in the PVC conduit.

Electri-Flex features 8 types of halogen-free products, each with various features and benefits, making them ideal solutions for specific applications. Zero-Halogen conduit applications include: public transit stations, trains, tunnels, elevators, escalators, underground facilities, heating and cooling equipment, hospitals, shipbuilding, and data centers.

For more information, visit www.electriflex.com



"Fish tapes are a tool every electrician has, and every electrician complains about" said Adele Hendrix, product manager for Greenlee, Emerson. "Fish tapes also haven't significantly changed in decades. REEL-X eliminates many problems our customers face when using fish tapes, so they can get the job done faster and easier."

REEL-X was engineered to eliminate the biggest problems present in traditional fish tape designs, fighting binds and jams in the tape which slows down an already tiring process. Customers often reported strain in their shoulders and wrists while fishing. Greenlee's patent-pending design features a free-spinning interior reel that helps eliminate binding, requiring less physical force to feed and pull the tape which reduces fatigue. The new design lacks a handle, so the user is encouraged to hold the case closer to their body. This helps minimize discomfort, while assisting with decreasing physical strain by promoting neutral arm and wrist posture.

The case is designed to be opened easily to remove dirt and quickly swap out reel cartridges, which is a feature not presently possible. A storage lock was added to the case to keep the tape in place when not in use.

"We're excited to be able to offer a fish tape that is easy to use and to maintain. Being able to easily clean the tape and clear out dirt will prolong the life of the tool. And if the professional does have to replace a tape, it can be done in just a few minutes instead of being a task that is avoided or not done today," said Hendrix.

> For more information, visit emerson.com

Emerson Introduces Greenlee® REEL-X™ Line of Electrical Fish Tapes

Industry-first design revolutionizes the fish tape while delivering increased speed and comfort

Emerson (NYSE: EMR) revealed a new line of electrician fish tapes that make fishing two times faster compared to a traditional electrical fish tape. Faster fishing is possible with REEL-X because the anti-bind case reduces friction; additionally, REEL-X can be set on the ground or held between the legs to free up both hands for pulling or feeding the tape.



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Engineered Products Company Unveils Value-Priced Luminaire for Upgrading and Modernizing Aging Lighting Systems

Engineered Products Company (EPCO), a supplier of specialty lighting and wiring consumable products for electrical contractors, today unveiled a new General-Purpose Linear LED Luminaire designed specifically for building owners and facility managers that want to modernize and upgrade aging lighting systems.

Consuming 50 percent less electricity than fluorescent lamps for the same amount of light, the luminaire is IP65 rated protection againt the ingress of dust, other solid particles and low-pressure jets of directed water. Suitable for indoor and outdoor use in cold and wet locations, the luminaire is ideal for commercial and industrial lighting applications, warehouses, outdoor shopping centers, pedestrian and road tunnels, locker rooms, elevator shafts and more.

"Upgrading aged lighting systems is one of the easiest upgrades a building owner and facility manager can do, but upfront costs and installation time can delay much needed renovations," said Engineered Products Company President Jim Anderson. "Our new linear LED lighting solution helps contractors combat that objection by offering a value-priced contractor-friendly luminaire that is fast and easy to install."

Ready for immediate installation, the luminaire can be surface mounted or suspended from a ceiling.

EPCO's new value-priced General-Purpose linear LED luminaire provides a modernized appearance, improves lighting quality and reduces monthly energy costs. The reliable solid-state performance, and high lumens per watt efficiency is targeted to building owners and facility managers that want to upgrade aging lighting systems. The lighting solution consumes less than half the wattage output of typical 4-foot fluorescent luminaires that use two 32-watt T8 fluorescent lamps.

For more information, visit www.engproducts.com



FLIR Introduces CM94 High-Current Clamp Meter for Utilities and Industrial Electrical Contractors

FLIR CM94 Clamp Meter is Optimized for 2000 Amp AC/ DC Troubleshooting and Diagnostics

FLIR Systems, Inc. (NASDAQ: FLIR) recently announced the FLIR CM94 2000-amp AC/DC electrical utility clamp meter. Designed to tackle high current electrical measurements in demanding utility and industrial job sites, the CM94 features an oversized jaw to easily manage larger conductors and busbars. With CAT IV-1000-volt overvoltage protection, the CM94 works on relays, distribution panels, vaults, switchgears and switchboards, as well as on service conductors, feeders, and production power lines.

The durable clamp meter's 55-millimeter (2.2 inches) jaw

easily clamps around large conductors or multiple conductors at once. With True-RMS (root mean square) to measure alternating voltage or current, and Low Impedance (LoZ) mode to clear ghost voltages, the FLIR CM94 provides accurate testing capabilities to get the job done right the first time and keep electrical workers safe.

In industrial facilities with AC and DC motors, motor control centers, and variable frequency drives (VFD), the clamp meter's VFD mode tackles noisy signals to ensure accurate readings. In addition to performing current and voltage functions, industrial electricians, utility workers, and electrical contractors can troubleshoot connections and components with a continuity test mode, diode test and resistance, or frequency and temperature measurements. The IP40-rated CM94 is drop-tested to withstand a 2-meter drop from a ladder or into a utility vault.

The FLIR CM94 will be displayed at NECA 2019 in Las Vegas, Nevada from September 14-17 at FLIR booth #2941. It is available today for purchase online and through authorized FLIR distributors globally.

For more information, visit www.FLIR.com/CM94

Hilti Unveils 40 Innovative Products, Branching into New Trade Applications

Company demonstrates continued leadership in fastening and firestop systems

Hilti Inc., a commercial construction-focused technology, software and services company, has launched a suite of 40 new tools, systems and accessories. Hilti's latest innovations affirm the brand's commitment to providing productivity solutions to commercial construction with the release of their first cordless metal working tools. Simultaneously, Hilti is continuing to grow its leadership stake in both fastening and firestop systems solutions. The new line-up also includes the market's most powerful cordless cutting tools, a battery-powered cordless fastening tool, BX 3-BT intended

to help customers complete high quality installations safely and on time; and, the first preformed firestop solution designed specifically for metal deck construction, Top Track Seal CFS-TTS MD. The launch comes on the heels of introducing the world's first cordless breaker, the TE 500-A36, in December.

Save Time When Fastening on Steel

Dedicated for fastening on steel, X-BT threaded studs, the newest BX tool – the BX 3 BT – is designed for use in a wide variety of industrial, electrical, and mechanical applications like hanging strut, attaching bar grating, or grounding a cable lug. Powered by a brushless motor and our 22V batteries, the battery-actuated fastener BX 3-BT uses patented spring-belt technology to perform applications traditionally limited to propellant-based tools without having to manage powder cartridges. You can also avoid using traditional methods such as clamping, welding, and through-bolting with the BX 3 BT and X-BT stud to complete high quality installations safely and on time.

For more information, visit www.hilti.com





Universal Lighting Technologies Expands EVERLINE® Retrofit Options with LRK34-ML Ideal for Commercial Applications

Universal Lighting Technologies, Inc., a global leader in lighting and a member of the Panasonic Group, recently introduced its EVERLINE® LRK34-ML LED Linear Retrofit Kits to its high-efficiency line of products, designed for commercial applications such as factories, warehouses and gymnasiums.

The fast and easy-to-install LRK34-ML kit is intended for retrofitting mid and high bay T5H0 and T8 fixtures. It comes with three EVERLINE LED lightbars and a 0-10V dimmable 80W driver, providing 14,000 lumens. The LRK34-ML allows building owners and facility managers to replace the fluorescent system with a highly efficient LED light engine with no redesign or revised layout required. With an L85 lumen maintenance rating of greater than 60,000 hours, the LRK34-ML provides a brand-new light engine without having to replace the existing fixture housing.

"ULT is dedicated to providing cost effective solutions that save our customers time and money, allowing them to easily replace parts without a complete restructure," said Greg Bennorth, Product Director of LED for Universal. "Providing supreme flexibility for large scale commercial applications, the LRK34-ML aims to make retrofits easier than ever."

The LRK34 is UL classified and DesignLights Consortium® (DLC) Qualified. Designed for maximum durability, the LRK34-ML offers a seven-year warranty. It is available in 1-pack and 6-pack options.

For more information, visit www.unvlt.com



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