

THE FUTURE OF COMMERCIAL SPACES: WHAT TO CONSIDER AND HOW TO ADAPT

May 2020

# Electrical

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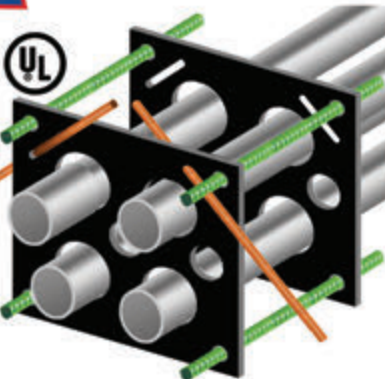
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# Generator InterLock Technologies, LLC

**Generator InterLock Technologies, LLC**, is a small-based company that manufactures 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 generators. 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 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 coastal 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 gen-



erator 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](http://www.interlockkit.com) for a complete list of products and details. □

---

***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.***

---



# INTERLOCKKIT

A Generator InterLock Technologies Product



## Generator InterLock Technologies

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# Protect Yourself

## Miller Safety Consultants — *A Leader in Arc Flash Protection*

**Vince Miller started Miller Safety Consultants**, a 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. □

*For more information, visit  
Miller Safety Consultants at:  
[www.electricalsafety supply.com](http://www.electricalsafety supply.com), email  
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# Next Generation Ground Resistance Tester for the Typical User

BY JOHN OLOBRI

**GROUND RESISTANCE TESTING** also referred to earth resistance testing finds its roots in the early 1930s. Limited technology was available, so a null balance galvanometer, a decade resistance box and a DC power source combined to make one of the first ground testers.

Years later hand-cranked technology, first using a generator, provided the test voltage. Electronics set in the 1950s and 60s gave birth to electronic ground testers with electronic amplifiers. Eventually, digital displays came to the scene, though analog meters remained due to customer familiarity and preference. Over 20 years ago, AEMC® revolutionized the ground testing market by offering clamp-on ground testers that eliminated the need to test with using auxiliary rods. AEMC continues to advance the technology with both sophisticated instrumentation

instruments designed for testing transmission tower grounding as well as simplifying fall of potential testing operation with models that are attractive for those who have to perform ground resistance testing on a sporadic basis. This article introduces one such model designed to ensure that the right measurements are performed, but first let us review some of the fundamentals of grounding and fall of potential testing.

The term “ground” is defined as a conducting connection by which a circuit or equipment is connected to the earth. The connection is used to establish and maintain, as closely as possible, the potential of the earth on the circuit or equipment connected to it. A “ground” consists of a grounding conductor, a bonding connector, its grounding electrode(s), and the soil in contact with the electrode.

“Grounds” have several protection applications. For natural phenomena such as lightning, grounds are used to discharge the system of current before personnel can be injured or system components damaged. For foreign potentials due to faults in electric power systems with ground returns, grounds help ensure rapid operation of the protection relays by providing low resis-

tance fault current paths. This provides for the removal of the external potential as quickly as possible. The ground is designed to drain the extraneous potential before personnel are injured and the power or communications system is damaged.

Ideally, to maintain a reference potential for instrument safety, protect against static electricity, and limit the system to frame voltage for operator safety, a ground resistance should be as close to zero ohms as possible.

Finally, low ground resistance is essential to meet electrical safety standards such as provided by OSHA and NEC®.

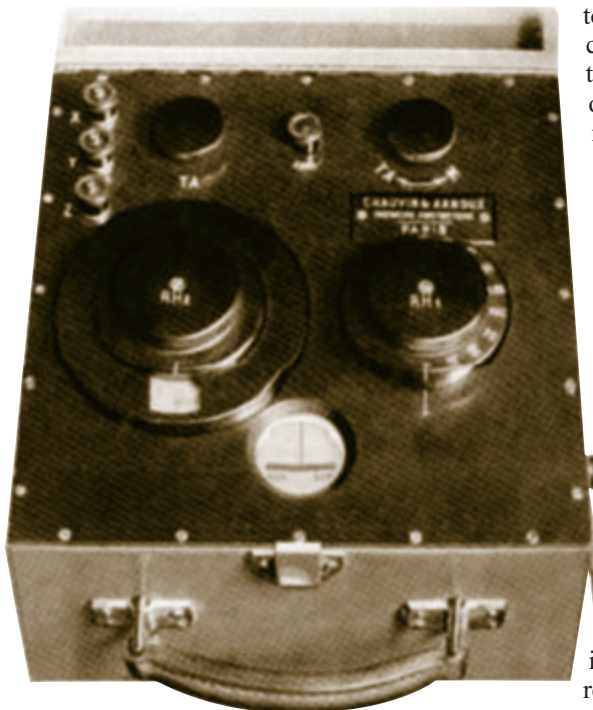
The basic components of a typical grounding electrode system include the following components:

- The resistance of the metal and that of the connection to it.
- The contact resistance of the surrounding earth to the electrode.
- The resistance in the surrounding earth to current flow referred to as soil resistivity which is often the most significant factor.

Grounding electrodes are usually made of a very conductive metal (copper or copper clad) with adequate cross sections so that the overall resistance is negligible. The National Institute of Standards and Technology (NIST) has demonstrated that the resistance between the electrode and the surrounding earth is negligible if the electrode is free of paint, grease, or other coating, and if the earth is firmly packed around it.

The only component remaining is the resistance of the surrounding earth.

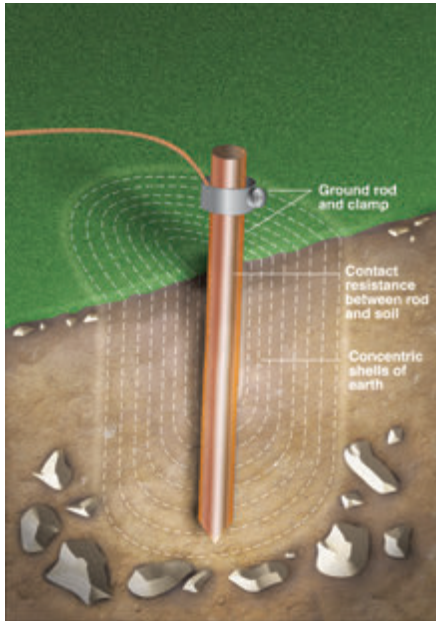
The electrode can be thought of as being surrounded by concentric shells of earth or soil, all the same thickness. The closer the shell to the electrode, the smaller its surface; hence, the (CONTINUED ON PAGE 10)











greater its resistance. The farther away the shells are from the electrode, the greater the surface of the shell; hence, the lower the resistance. Eventually, adding shells at a distance from the grounding electrode will no longer noticeably affect the overall earth resistance surrounding the electrode. The distance at which this effect occurs is referred to as the effective resistance area and is directly dependent on the depth of the grounding electrode.

The Fall of Potential test method requires the placement of two auxiliary electrodes, an injector internationally referred to as H and a potential electrode referred to as S.

The goal in precisely measuring the resistance to ground is to place the auxiliary current injecting electrode H far enough from the grounding electrode under test, which we will label E so that the auxiliary potential electrode S will be outside of the effective resistance areas of both the grounding electrode and the auxiliary current electrode. The best way to find out if the auxiliary potential rod S is outside the effective resistance areas is to move it between E and H and to take a reading at each location. If the auxiliary potential rod S is in an effective resistance area (or in both if they overlap), by displacing it, (see diagram A) the readings taken will vary noticeably in value, typically by 5% or more. Under these conditions, no exact value for the resistance to ground may be determined.

On the other hand, if the auxiliary potential rod S is located outside of the effective resistance areas (see diagram B), as it is moved back and forth the reading variation is minimal. The readings taken should be relatively close to each other, and are the best values for the resistance to ground of the system E. The readings should be plotted to ensure that they lie in a “plateau” region as shown in diagram B. The region is often referred to as the “62% area.” Readings generally are taken every 10% of the distance from the ground under test and the injector electrode for a total of nine measurements. The average of the three closest readings which usually occur between 50 and 70% along the test path is the effective resistance of the system under test.

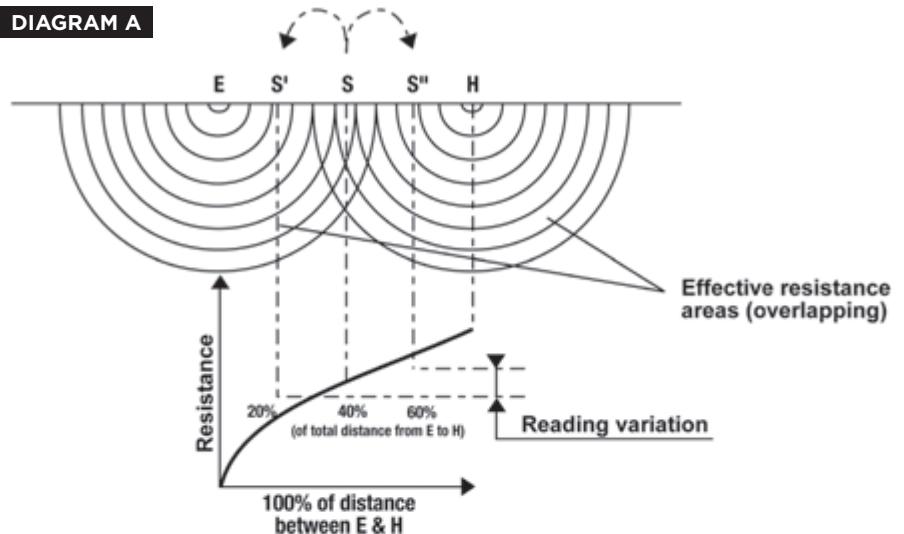
The simplified test method a.k.a. the 62% method has been adopted after

many years of analyzing actual test data. In this case only three measurements are taken at 52, 62 and 72% of the distance between the ground system and the injector electrode with the average of the three readings used to determine the effective resistance of the system under test as long as the electrodes are placed outside of the influence of each other.

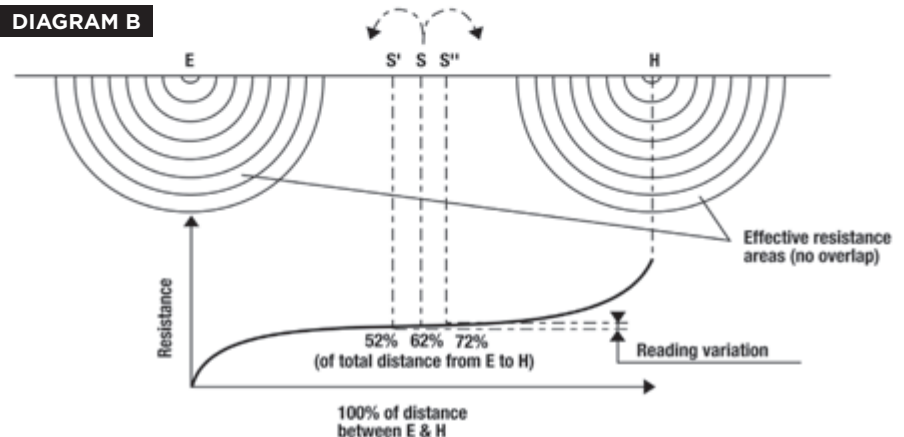
Now let us look at AEMC’s new Model 6424 Ground Resistance Tester. It is understandable that for those who need to perform ground resistance testing on a sporadic basis remembering all requirements involved in properly conducting a fall of potential test can be easily overlooked.

The Ground Resistance Tester Model 6424 offers several novel features and advantages for testing grounding electrode systems. (CONTINUED ON PAGE 12)

**DIAGRAM A**



**DIAGRAM B**





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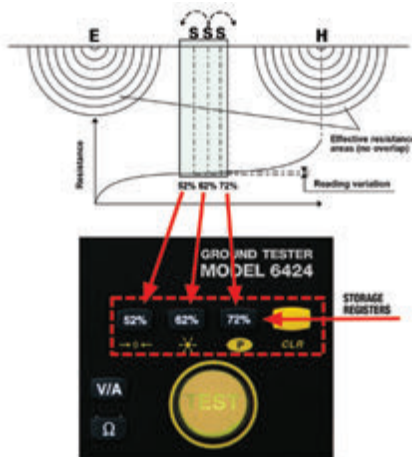


Main functions include:

**2-point test (2P):** When turned on, the Model 6424 is initially in the 2-point mode. In this mode, the 2P symbol appears on the bottom right side of the screen. The main display shows the resistance measurement while the bottom of the screen shows the voltage between the H and E terminals. In this mode the instrument can be used as an ohmmeter to check bond resistance and general resistance measurements. Measurements are taken between the red H terminal and the green E terminal. This change confirms that the injector auxiliary electrode (H) is connected before a fall of potential test is conducted.

**3-point test (3P):** Pressing the TEST button initiates 3P mode. The 3P symbol is displayed on the bottom right side of the screen. The TEST button blinks red while the measurement is taken. When the measurement stabilizes, TEST stops blinking and turns green, indicating the completion of the test. The resistance measurement is displayed and automatically held. The bottom display shows the resistance of the injector electrode (RH) and the voltage used to conduct the test (UH-E).

A unique feature of the Model 6424 is its ability to store the three resistance measurements used to complete the simplified 62% ground test (52%, 62% and 72%) and calculate the average percentage difference between them saving time and ensuring accuracy. After a measurement is taken and stabilized and the test button turns green, simply press the percentage button associated with the Potential electrode (S) distance used for the measurement (for example 52%). The reading will be stored and displayed



at the bottom of the screen, and the instrument will return to the 2-point mode. Move the S electrode the next test distance (62%) and repeat the process and store it. Then do the same for the 72% measurement.

When all three readings are stored, they will be displayed on the bottom line of the display and the average and percent deviation will display at the top of the screen. If the percent deviation is above 5% the display will blink indicating the test electrodes are within the influence of each other which will indicate that the injector electrode needs to be moved out further and the three tests repeated.

The model 6424 also can detect hazardous voltages up to 700 Volts AC or DC and prevent the test from starting while alerting the operator of a safety hazard. An optional current probe (Model MN72) accessory facilitates leakage current measurement as well to further assist in troubleshooting.

Key features that will especially assist the users who perform ground resistance testing on an infrequent basis are:

Simple operation

- Only one button to press (no set up required) to get test results
  - Test button turns green when measurement is stable, turns red if an error occurs
  - Ensures that the measurement is valid when button remains green
- 4 Instruments in one, saves time checking the complete system

- Measures ground resistance
- Checks bond resistance
- Detects hazardous voltages
- Measures leakage AC current
- Color coded inputs and test leads
- Fast error free hook-up and operation
- Large back-lit digital display
- Easy to read in all lighting conditions
- Automatic hold function
- Retains last measurement after the reading stabilizes
- Automatic test frequency selection between 128 and 256 Hz
- Provides stable results in adverse environments
- Stores 52, 62 and 72% measurements
- Eliminates the potential error in determining the ground resistance
- Built-in test lead compensation capability
- Improves the accuracy of low resistance measurements
- Automatically checks the injector lead connection when connected to the H auxiliary rod

600V Cat IV rated

- Provides a high level of operator safety

Whether you are an infrequent or daily user of ground test equipment, the AEMC model 6424 greatly reduces the possibility of testing errors while ensuring confidence that the measurements are valid in a simplified process. It also provides a high level of safety and alerts to hazardous conditions. □



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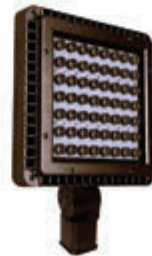
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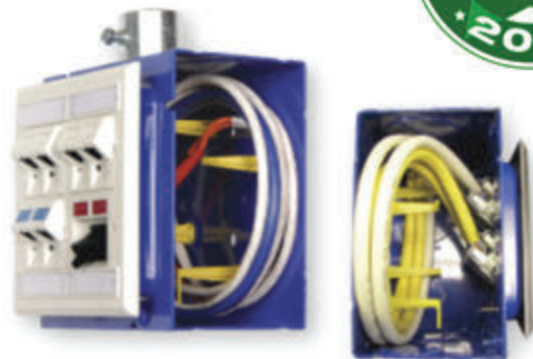


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# The Future of Commercial Spaces:

## What to Consider and How to Adapt

BY SABRINA SNYDER

### INTRODUCTION

In an industry that constantly changes as new technologies emerge, it's crucial that electrical contractors and manufacturers stay up to date with the latest trends in power and connectivity.

Accessible power is a necessity in all spaces, and these days, most commercial spaces are becoming increasingly versatile in their design. This demands an even greater need for available power. Considering the current climate and what may follow, power in unexpected places will be more necessary than ever—indoors and out. Beyond that, the need for new technologies, with an increased focus on occupant well-being, will likely drive the design of future commercial spaces.

With this in mind, we caught up with Sabrina Snyder, director of product marketing at Legrand. Our discussion focused on new technologies and new spaces for insights on trends, especially the impact of recent global events that will shape the demand for power and new technologies in the year ahead.

### Power Everywhere

Over the past few years, an increase in mobile devices has driven the demand for power everywhere, with consumers expecting it to be delivered at their fingertips. Easy access to power has become top of mind for American workers, especially in a time when people are

working from makeshift offices and other locations that might not offer convenient access to power. But what we really need to consider is what's to come when offices and commercial spaces eventually reopen. The demand for power in unconventional spaces will likely increase as social distancing guidelines will be maintained. More space equals more options for power.

Legrand offers a wide range of solutions including furniture power units, tabletop power units and even newly developed power pedestals built for outdoor use.

For example, the new Desktop Power Center Slim with USB-C from Legrand offers convenient and accessible power with charging capabilities to accommodate the latest devices via USB-C ports. They're perfect for quick and easy installation in spaces that need to adapt rapidly to changing environments and employee needs—even home offices, workstations and other flexible areas. The product can be installed on desks, tabletops and workstations in commercial or residential spaces. It mounts directly to surfaces (horizontally or vertically) to keep unsightly

(CONTINUED ON PAGE 18)











cord clutter at bay and is equipped with a six-foot cord that easily reaches walls and floors. Available in two configurations with the USB-C port—either three power outlets with both USB-A and USB-C ports, or two power outlets with USB-A and USB-C ports—to accommodate evolving power needs.

Looking past indoor power demands, the outdoors will also likely become a more commonly used workspace as it's another option to maintain distance from coworkers. Legrand offers a hardwired option for new construction or full renovations and a retrofit option for quicker installation, the Outdoor Charging Station and the Solar Charging Kit. Both products offer permanent outdoor power via USB charging ports.

### Touchless Technology

Another commercial design shift to consider is the increased demand and reliance on touchless technology. With the government suggesting that the threat of the coronavirus could extend well beyond this year, there are simple and smart ways designers, builders and contractors can upgrade spaces to help prevent the spread of germs in the workplace. In fact, one simple way to eliminate the spread of bacteria is to update the office space's most frequently touched but often-overlooked surfaces: the light switches.

The innovative Wave Switch from the *adorne®* collection by Legrand is a touchless tech option that allows employees to turn lights on/off with the wave of a hand—preventing germs from spreading



to other surfaces and onto hands. Other solutions to consider include touchless faucets and soap dispensers for office kitchens and bathrooms, and there's even voice-activated devices to eliminate germs spreading on various tech devices.

### Conclusion

Although no one can say for certain how the future will look, it is likely that the needs of commercial spaces will be vastly different and it's best to prepare to adapt. After all, the first step is recognizing how to adapt—and that conversation can start now. It's important for power solutions to be flexible enough to quick-



ly install and uninstall. When they are, facilities can move connections to meet future needs, however they may shift due to new regulations and trends. No matter where these changes take us, the need for convenient power connections won't be far behind. □

### ABOUT SABRINA SNYDER:

Sabrina Snyder is director of product marketing for Legrand's Wiremold® business, which focuses on bringing power to new and existing spaces with advanced technology and product innovation. She specializes in both indoor and outdoor solutions that increase collaboration, enhance productivity and maximize guest engagement in a variety of commercial spaces, including retail and hospitality. Sabrina has a background in marketing communications and has been with Legrand for over 10 years.



# BEST OF THE REST

## Megger DET24C Clamp-on ground tester

Elliptical head. Flat jaw interface. Bluetooth® capability.

That's just a few of the features of the Megger DET24C clamp-on ground resistance tester.

The DET24C is an advanced clamp-on ground tester used for measuring resistance of ground rods and associated installations. Hard-to-reach ground rods are easily accessed with the unit's short body length, a unique pre-test hold function, and display backlight for low light environments.

Other features of the DET24C include:

- Elliptical clamp shape with 1.5 in. x 2.5 in. (39 mm x 5 mm) inner jaw dimensions
- Excellent safety rating of CAT IV 600 V
- Automatic noise current warning safety feature
- Resistance and current ranges – auto ranging
- Automatic noise filter function
- Includes PowerDB Lite download software

So why not pick the best of the rest and choose the Megger DET24C for your ground testing needs.



For your **FREE** copy of Megger's  
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Reference Code: DET24-EP5-MAY

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# Megger



## As businesses prepare to re-open, new NFPA checklist helps building owners and facility managers ensure fire and life safety for all occupants

As the federal government and many states begin allowing businesses to re-open, the National Fire Protection Association (NFPA) has developed a checklist to help building owners and facility managers prepare, ensuring that fire protection and life safety systems in commercial and multi-occupancy residential buildings are properly checked and functioning.

“During the lockdown policies in place over the past couple of months, many of the ongoing inspection, testing, and maintenance (ITM) activities typically required by locally enforced codes and standards may not have been completed for a variety of reasons,” said Val Ziavras, technical services engineer at NFPA. “Regardless of the level of ITM performed during this time, it is imperative that building owners and facility managers verify the performance of all building fire protection and life safety

systems prior to reoccupation.”

The new NFPA resource addresses the factors that should be confirmed by a qualified person before re-opening a building to ensure the safety of all its occupants. Based on the assumption that the building was in compliance prior to being closed, the checklist provides some initial steps to help make sure the occupancy is safe enough to reopen until a qualified professional can complete the regularly scheduled ITM of all fire protection and life safety systems. Ziavras notes that this process should be completed as quickly as possible.

“Any alterations to the building that adhere to public health guidelines, such as the installation of physical barriers or automatic door openers, will need to be evaluated to ensure that they are properly designed and installed and do not negatively impact the fire protection and life safety systems currently in place,” said Ziavras.

The newly available checklist reflects the latest in a series of COVID-19 related resource developed by NFPA to address fire and life safety issues, concerns, and challenges that have emerged over the past couple of months. Additional resources are developed as they are added to the NFPA website.

Visit the NFPA coronavirus landing page to access all newly released documents, as well as existing COVID-19 related information, guidelines, and resources provided to date.

For this release and other announcements about NFPA initiatives, research and resources, please visit the NFPA press room.

As we navigate the evolving situation with COVID-19, we remain committed to supporting you with the resources you need to minimize risk and help prevent loss, injuries, and death from fire, electrical, and other hazards. □

### ABOUT THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

About the National Fire Protection Association (NFPA) Founded in 1896, NFPA is a global self-funded non-profit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission. For more information, visit [www.nfpa.org](http://www.nfpa.org). All NFPA codes and standards can be viewed online for free at [www.nfpa.org/freeaccess](http://www.nfpa.org/freeaccess).



## Crescent Electric Supply Company Appoints Scott Teerlinck as President and CEO

Crescent Electric Supply Company recently announced that Scott Teerlinck will be joining the organization as their new President and CEO. He takes over for Marty Burbridge, who is retiring after more than 41 years with the company. “Scott is someone I value and respect as a leader in our industry,” said Marty Burbridge. “He brings a proven track record of success which is evident by what he has accomplished thus far in his career, and we are excited to have him join the Crescent family.” Before joining Crescent, Scott served as the President of Werner Electric Supply for more than seven years. Prior to that, he spent nearly 19 years at Rockwell Automation, where he held roles of increasing responsibility, including Global Accounts Manager,



Scott Teerlinck

Sales Manager, Director of Marketing, and global P&L leadership for Rockwell’s Plant Services business. “I am very excited and proud to join Crescent Electric Supply,” said Scott Teerlinck. “To join a company with such a rich history and strong reputation across the industry is a tremendous honor. I am also grateful for the opportunity to continue the legacy of success that Marty and his predecessors have sustained over the 100 year history of the Crescent organization.”

Scott will be relocating to the Dubuque area, and he begins his tenure as President and CEO on Monday, May 4th. Additionally, Marty Burbridge will remain with the company through June 1st to assist with the transition process. □

# NEMA Publishes COVID-19 Guide for Disinfecting Electrical Equipment

The National Electrical Manufacturers Association (NEMA) published NEMA GD 4-2020 COVID-19 Cleaning and Disinfecting Guidance for Electrical Equipment. Managing the SARS-CoV-2 (COVID-19) virus requires proper cleaning and disinfecting of equipment, so Members of the National Electrical Manufacturers Association (NEMA) have developed specific guidance to answer common questions for how to maintain cleanliness while preserving the functionality and integrity of electrical equipment.

“As government social distancing restrictions are lifted, and workplaces of all types reopen, the focus will be on how to protect workers and keep facilities clean and disinfected,” said Kevin J. Cosgriff, President and CEO of NEMA. “This may include cleaning and disinfecting electrical equipment. The first consideration is worker safety, so following documented

**“As government social distancing restrictions are lifted, and workplaces of all types reopen, the focus will be on how to protect workers and keep facilities clean and disinfected.”**

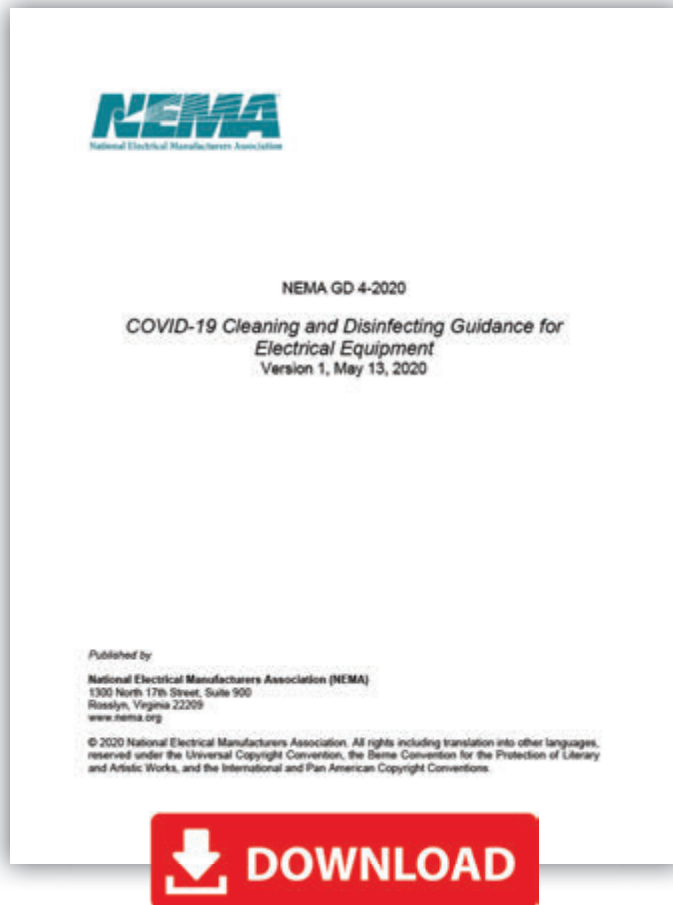
— Kevin J. Cosgriff, President and CEO of NEMA

safety procedures is essential. Electrical Safety Foundation International ([www.ESFI.org](http://www.ESFI.org)) is a good source for general safety information. Beyond that, all cleaning and disinfecting steps must bear in mind the need to protect electrical equipment from inappropriate cleaning and disinfecting products and methods. In most cases, the original equipment manufacturer is the best source of authoritative information regarding products made by them.”

“Disinfectant solutions and solvents can harm electrical equipment and components, causing severe damage that can result in outages and potential physical injuries. We specifically caution against the use of fogging and spraying disinfectant solutions on and around electrical equipment because this can create invasive electrical hazards,” explains Steve Sacco, Vice President of Safety and Environment at Schneider Electric. “When cleaning and disinfecting electrical equipment and components, we recommend following the manufacturer’s instructions. If you have a specific question, contact the electrical manufacturer for guidance. While performing routine maintenance

or operating the equipment, we recommend taking all possible steps to avoid contamination by following CDC recommendations on thorough hand washing and the use of personal protective equipment, including face coverings.”

Other NEMA COVID-19 resources are also available at [www.nema.org/about/covid-19-response](http://www.nema.org/about/covid-19-response). □



**NEMA GD 4-2020** is available as an electronic download at no cost at **[www.nema.org](http://www.nema.org)**

## ABOUT THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

The National Electrical Manufacturers Association (NEMA) represents nearly 325 electrical equipment and medical imaging manufacturers that make safe, reliable, and efficient products and systems. Our combined industries account for 370,000 American jobs in more than 6,100 facilities covering every state. These industries produce \$124 billion in shipments and \$42 billion in exports of electrical equipment and medical imaging technologies per year.





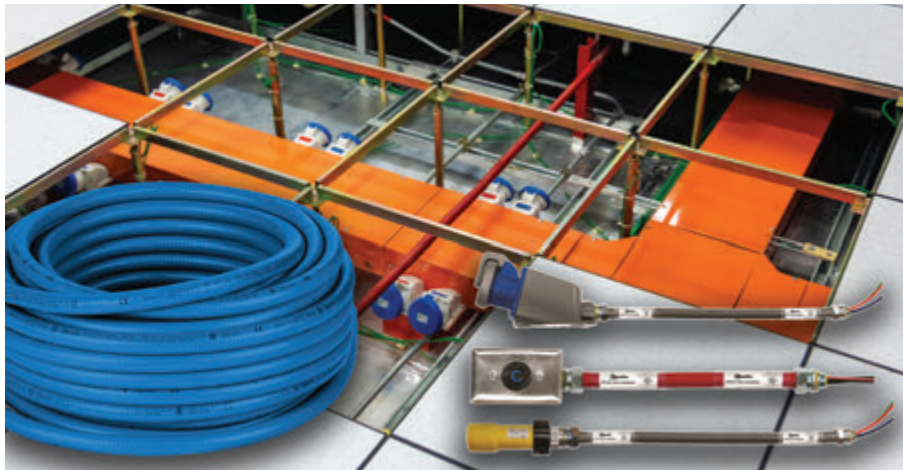
# Flexible Electrical Conduit for Data Center Installations

ELECTRI-FLEX COMPANY, manufactures flexible electrical conduits designed for Data Center installations. Liqueflex® provides high-quality Data Center wiring protection solutions that offer physical protection to wires and cables, conduit colors that identify critical circuitry, UL listed and CSA certified varieties, halogen-free, low fire hazard solution types, and even Power Distribution Assembly Whips, ideal for fast and easy on-site installations.

Data Center wiring solutions can help with safety, fast installations, circuitry identification and provide long-lasting quality products. Materials that address safety concerns continue to increase in use and flexible conduit types which address these concerns are those with a polyurethane jacketing. This jacketing type is halogen-free and reduce the risk of potential toxic smoke and fire spread in the event of a fire. They are a low fire hazard solution with self-extinguishing characteristics and provide increased safety to any enclosed space. Another solution includes colored conduits that are used to help identify wiring. Common colors used in data centers include gray, computer blue, green, red, orange, yellow, plus many more. Prefabrication methods are also increasing due to labor shortages or to increase efficiency and speed in installations. Power Distribution Assembly whips are fully customizable with conductors, conduit types, tail lengths and more.

Data Center wiring can be installed in overhead distribution systems or from under a raised floor in ladder racks. Flexible electrical conduit is used in either application and protects important wiring from dust and debris, as well as help in identifying wiring through the use of colored conduit jackets. Electri-Flex manufactures a variety of both jacketed and unjacketed flexible conduits that are ideally suited for these applications.

- Type CBLA is the most commonly used type of jacketed flexible conduit. It is easily identifiable with its com-



puter blue jacketing color, is both UL listed and CSA certified, made with a hot-dipped galvanized steel core, and has a flexible PVC jacketing.

- Type LA is also UL listed and CSA certified and comes in a variety of colors, such as gray, red, blue, green, yellow, orange and many more. It is also made with a hot-dipped galvanized steel core and PVC jacketing.
- Type ZHLA is a Zero-Halogen, or Halogen-Free, low fire hazard solution and ideally suited for enclosed installations. The core is made of a hot-dipped galvanized steel but the jacketing is a flexible, zero-halogen polyurethane. It omits low amounts of non-toxic smoke, has a low flame spread, and is self-extinguishing.
- Types BR and ABR are unjacketed varieties that are UL listed and CSA certified with many universal wiring applications. Type BR is made from hot-dipped galvanized steel and ABR is made of a high-strength aluminum

alloy, weighing 1/3 of the weight of BR.

- Power Distribution Assembly Whips provide high quality, UL listed components that are available in a variety of colors, jacketing options and components. They can be customized to any specification. Connector types include NEMA Locking, Russellstoll®, and IEC Pin and Sleeve. These whips can be made from Types CBLA, LA, ZHLA, BR, ABR, and more, as well as with different jacketing colors. These are 100% inspected & pretested before shipment and offer custom tail lengths to any specification. □



Download the latest technical article featuring ideal conduit solutions for Data Center installations, as well as the supporting sales sheet at <https://www.electriflex.com/resource-library/>.

**ELECTRI-FLEX COMPANY**, a leader in electrical conduit design and manufacture for 65 years, produces Liqueflex®, the most diverse line of liquidtight flexible electrical conduit in the industry. The company offers custom design, engineering, quality assurance and testing capabilities.

For more information on Electri-Flex Company, call (630) 529-2920 or (800) 323-6174; fax: (630) 529-0482; e-mail: [mktg@electriflex.com](mailto:mktg@electriflex.com); visit: [www.electriflex.com](http://www.electriflex.com); or write: 222 West Central Avenue, Roselle, IL, 60172-1994.



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## Russelectric, A Siemens Business, Rapidly Manufactures Auto Transfer Switches for Wisconsin State Fair's Exposition Center

*Order supports creation of state's first alternative care facility for COVID-19 patients*

Russelectric, A Siemens Business, a leading manufacturer of power control systems and automatic transfer switches, announces that in just three days, it supplied three 3,000 A auto transfer switches to the Wisconsin State Fair's Exposition Center – soon to be the state's first alternative care facility for patients diagnosed with coronavirus.

An automatic transfer switch is used to transfer power from a normal source to an emergency (generator) source to maintain power to critical loads. Russelectric has manufactured automatic transfer switches as well as paralleling switchgear and supervisory control and data acquisition (SCADA) systems for more than 25 years for healthcare-specific installations. These systems provide sophisticated control functions, including emergency/standby power, peak shaving, load curtailment, utility paralleling, cogeneration and prime power.

Given the current global health crisis, the contractor involved in the transformation of the fair grounds expressed an



immediate need for the automatic transfer switches. Production time for this equipment normally takes eight to 10 weeks, however Russelectric completed the order in less than 1/10 of that time.

"Here at Russelectric, we're honored to be a part of Wisconsin's efforts to provide critical care to those diagnosed with coronavirus," says Jason Martin, Head of Russelectric. "The entire team did an amazing job quickly putting together and shipping this order so that Wisconsin could get the supplies it needs to finish the alternative care facility as soon as possible." □



## Universal Lighting Technologies Partners with Ascend Sales & Marketing, LLC.

Universal Lighting Technologies, a global leader in commercial lighting and a member of the Panasonic family of companies, recently announced a partnership with Ascend Sales & Marketing, LLC. Based in New Jersey, the agency will represent Universal Lighting Technologies in high-efficiency lighting solutions, from architectural to general projects, across the North New Jersey and New York City territories.

"As an industry leader, we look forward to expanding our reach in the North

New Jersey and New York City markets with an agency who provides extensive market knowledge and a commitment to building strong relationships with their customers," said Eric Schlechtweg, Universal Lighting Technologies Eastern Region Director of Sales. "Though a newer agency in the NY/NJ market, Ascend has proven to be a top performer in the lighting industry, and we are confident the talented and experienced team at Ascend will continue to offer the best possible technology to customers while

expanding the reach of Universal Lighting Technology solutions."

With a team of sales leaders having over 40 years of experience in lighting and electrical sales, Ascend Sales & Marketing represents an array of quality manufacturers of electrical and industrial lighting products. The Ascend team offers first-in-class service and the highest quality products at competitive price levels. The company offers extensive market knowledge for any type of lighting application, as well as deliberate selection of vendor partners to ensure client projects are completed in a timely manner and supported by a strong sales organization.

For more information about Ascend Sales & Marketing, LLC., please visit <https://ascendsm.com/>. □





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## **AFC Cable Systems® Pack N' Roll System™ Makes Cable Install Quick & Easy**

AFC Cable Systems® portable Pack N' Roll™ cable dispenser makes installations easier by keeping cable clean and organized during transport. With the Pack N' Roll system, pulling cable is quick and easy and prevents tangles and excess scrap during installation. It is the perfect solution for electrical contractors who perform remodels and small electrical projects and transport coils to different jobsites.

To set up, the coil should first be placed inside of the Pack N' Roll system. Then, the cable ties are cut and the end of the cable is fed through the side opening. Once the desired length is pulled through the opening, the cable can be cut.

When finished with the installation, rotate the remaining coil to pull the cable end back inside and put the lid on the dispenser. The lid protects the coil from debris and harsh environmental conditions.

The system also fits commonly used sizes of Type AC and Type MC Cables as well as NM Cable.

**For more information, visit  
[www.afcweb.com](http://www.afcweb.com)**

## **Colored Flexible Conduit Type ZHLA in Stock**

ELECTRI-FLEX COMPANY, Roselle, IL USA, offers Type ZHLA jacketed metallic flexible conduit available in stock with many different colored jacketing options. Liquatite® Type ZHLA is a zero-halogen, low fire hazard solution, UL listed & CSA certified flexible electrical conduit.

Type ZHLA is in stock in both its standard color, black, as well as a variety of colors, including blue, green, yellow, orange, red, and white. The benefits of using colored flexible conduit include saving time and money in maintenance and repair situations, enabling quick circuit identification, as well as providing a visible warning to use caution in and around specific areas. Installations requiring color customization include data centers, hospitals and healthcare, caution areas, construction, automotive industry, fire alarms, security systems, dairy equipment, plus many more.

Type ZHLA is ideal for field installations in confined, public areas because the thermoplastic polyurethane jacket has excellent flame resistance, as well as low smoke, and toxicity generation characteristics. It emits low amounts of non-toxic smoke, has a low flame spread, is self-extinguishing, and non-halogen emitting. The flexible inner core is made from a spiral-wound strip of heavy-gauge, hot-dipped galvanized steel, providing high mechanical strength. Type ZHLA falls well below the allowable maximums for the following standards: UL 94 & UL 360 for flammability, ASTM E162 for low flame spread, and ASTM E662 for low smoke generation. ZHLA has a UL working temperature range of -40° C to 80° C in air, 60° C when wet, and 70° C in oil.

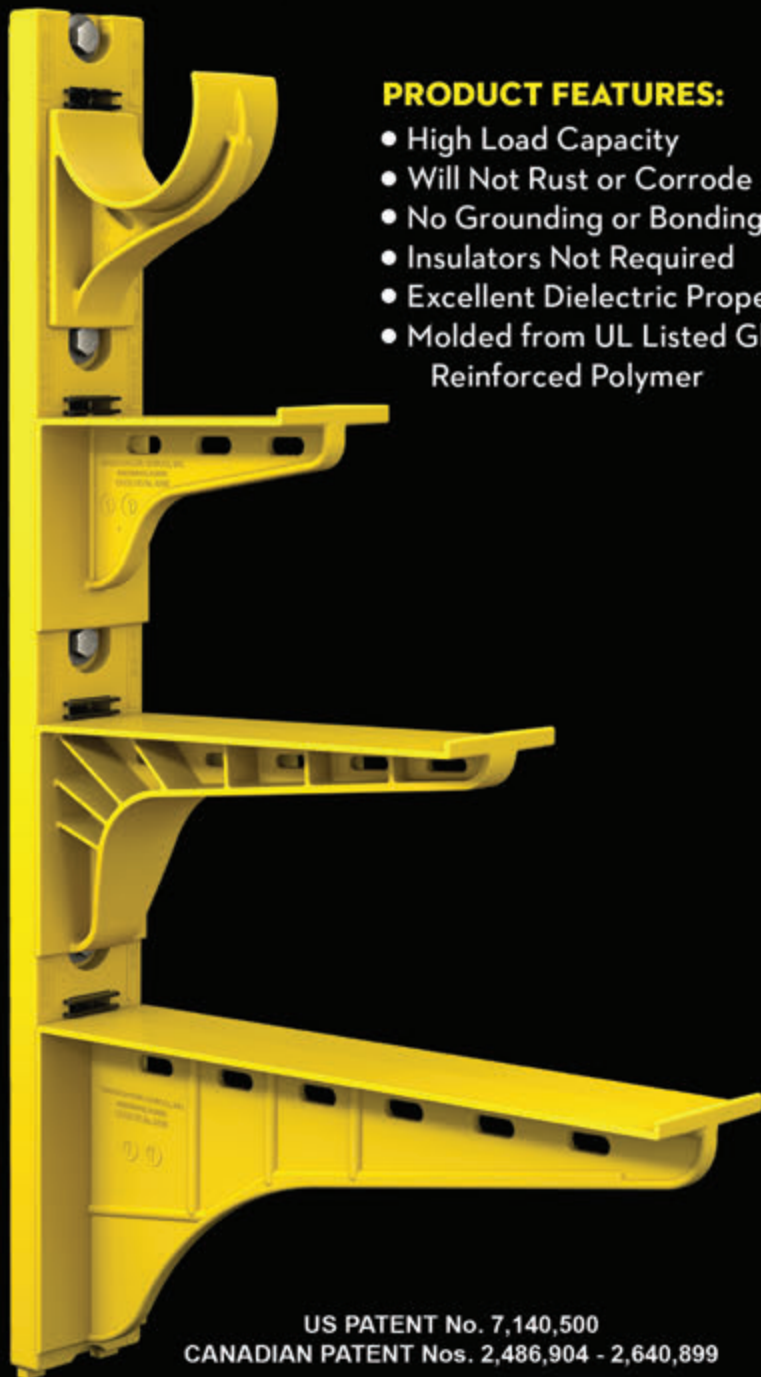


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HDL Arm Lock shown with  
RA04 Arm and CR36-B Stanchion



3HDS - 3" throat saddle shown with  
a cable secured by cable ties.



RA08 - 8" arm shown with three  
cables secured by cable ties.

US PATENT No. 7,140,500  
CANADIAN PATENT Nos. 2,486,904 - 2,640,899

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## **Douglas Lighting Controls® Brings Functionality and IoT Readiness with Intelligent Fixture Sensor and Intelligent Fixture Controller**

Douglas Lighting Controls®, a member of the Panasonic family of companies, recently introduced the new Intelligent Fixture Sensor (IFS) and Intelligent Fixture Controller (IFC) to its high-performance lighting products portfolio.

Specially designed for Luminaire Level Lighting Controls (LLLC), the IFS units can be deployed as independent, fixture-mounted occupancy and day-light sensors. As an alternative, they can be networked with the Dialog® controllers and other devices in the Dialog ecosystem, including wall station switches, load controllers and low voltage ceiling mount sensors, to create a complete Bluetooth® wireless lighting control system.

“Our wireless lighting technologies offer solutions that are easy to install, commission and control. By embedding Bluetooth wireless controls in a fixture, we combine those benefits with added functionality of IoT readiness, such as indoor positioning and asset tracking,” said Rob Mahaffey, General Manager of Douglas Lighting Controls. “With intelligent fixtures, Douglas is delivering an easy to implement standard which provides Specifiers, Contractors and Operators a backbone to do more than turn lights on/off and dim up and down.”

The IFS and IFC provide full wireless control capability to suitably equipped, host luminaires. These devices are intended to work with companion LED drivers having auxiliary power output, 0-10V dimming and Dim-to-Off capability. The IFS includes an occupancy sensor and a daylight sensor. Both products support single and dual-channel 0-10V dimming. Their compact mechanical design fits directly into industry standard ½” electrical knockouts.



**For more information, visit  
[www.douglaslightingcontrols.com](http://www.douglaslightingcontrols.com)**



## **New Round LED Bollard from Barron Lighting Group**

Barron Lighting Group, the parent company to Trace-Lite indoor and outdoor commercial and industrial lighting, announces the addition of the AXB Series Round LED Bollard.

“Barron Lighting Group is thrilled to add the AXB Series to our family of lighting solutions. DesignLights Consortium® PREMIUM Qualified and cULus Listed for Wet Locations, the AXB’s classic aesthetic fits most environments. The AXB is available in three finishes, 3000K and 4000K CCT, and provides 360° symmetrical distribution,” said Heather McCune, Vice President, Sales Operations of Barron Lighting Group.

The sleek and compact, energy-efficient AXB Series LED round bollard provides over 70% energy savings compared to HID technology. The AXB’s applications include lighting pedestrian walkways, retail entryways, as well as lighting sidewalks around schools, medical complexes, retail entrances, park/recreational paths, office buildings, and multi-family properties. The AXB delivers up to 3,000 lumens with a polycarbonate diffused lens.

**For more information, visit  
[barronltg.com](http://barronltg.com)**



## Klein Tools® Combines Two Products for Easy to Use Testing Kit at Great Value

Klein Tools, for professionals since 1857, introduces a new Electrical Tester Kit, combining two essential tools for electricians, the NCVT-5A Dual Range Non-Contact Voltage Tester with Laser Pointer and the RT210 GFCI Receptacle Tester, at a great price point.

Electrical Tester Kit with Dual-Range NCVT and GFCI Receptacle Tester (Cat. No. NCVT5KIT)

### NCVT-5A

- Dual-range non-contact tester detects AC voltage from 12 to 1000V (70 to 1000V and 12 to 1000V ranges)
- Bright, integrated laser pointer for identifying objects of interest on the jobsite
- Delivers simultaneous visual and audible voltage indicators when AC voltage is detected
- Lightweight, compact tool with pocket clip for easy storage and quick access
- Built to withstand a 9.9 foot (3m) drop
- CAT IV 1000V safety rating

### RT210

- Detects the most common wiring problems in standard and GFCI receptacles
- Works on GFCI outlets and confirms operation of the ground fault protective device
- Built to withstand a 6.6 foot (2m) drop

"In putting this kit together, we wanted to give trade professionals two essential tools at a great value," said Sabrina Kalsi, product manager at Klein Tools. "The NCVT-5A is a dual-range non-contact voltage tester with integrated laser pointer. The dual-range tester features a bright Class 3a laser that enables the user to highlight objects on the jobsite at far distances making it perfect for working on sites from small residential developments to large-scale commercial endeavors. Paired with the RT210 receptacle tester, this is the perfect kit for electricians, facilities and maintenance professionals, and construction workers."

**For more information, visit**  
[www.kleintools.com/new-products](http://www.kleintools.com/new-products)



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## MX FUEL™ Handheld Core Drill

Milwaukee Tool delivers a new solution that allows users to core with more confidence with the MX FUEL™ Handheld Core Drill. Part of the new MX FUEL™ Equipment System\*, the new product delivers a safer handheld coring experience and the power to core up to 6" holes in reinforced concrete. The first battery-powered solution of its kind can be used without a nearby power source, making it the easiest coring solution anywhere without the hassle of extension cords and tripping circuit breakers.

"Drilling holes with a core drill is not something pros look forward to...many people we talked to knew someone that experienced kick back in a bind up or had put too much pressure on the tool causing the circuit breaker to trip," said Brian Alves, Group Product Manager for Milwaukee Tool. "We set out to eliminate those frustrations, delivering a solution that was not only safe and hassle free, but had the power to get the job done."

A patented clutch and AUTOSTOP™ technology deliver a safer coring experience. They provide the user with maximum control and reduce kick back during bind up situations.

With the power to core 6" holes in reinforced concrete, one of the most challenging applications, this battery-powered solution does not sacrifice capability. The time that was once spent looking for a power source or resetting circuit breakers, is now spent finishing the first hole and moving on to the next.

Designed to maximize productivity, features like the performance gauge guides users on the optimized drilling speed so they can drill faster, while the LED level helps them maintain accuracy throughout the application. Whether Handheld (MXF301-1CP) or Stand Mounted (MXF301-2CXS), the MX FUEL™ Handheld Core Drill is versatile enough for any job and is the easiest coring solution anywhere.

As an added benefit, ONE-KEY™,\*\* provides the ability to track the saw drill with community tracking and alerts, complete inventory management, and industry leading smart-equipment technology to secure the user's investment.

Milwaukee Tool will remain unwavering in their commitment to delivering disruptive innovation by working alongside trade professionals to identify challenges and provide solutions that are unparalleled in enhancing jobsite safety and productivity. The future of the jobsite is cordless.

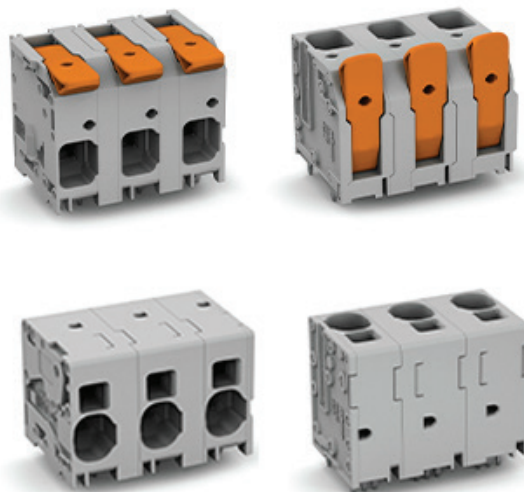
**For more information, visit  
[milwaukeetool.com](http://milwaukeetool.com)**

## Product Line on WAGO's PCB Terminal Blocks for Power Electronics Expanding

WAGO is adding to its existing product line for their 2600 Series PCB Terminal Blocks for Power Electronics range featuring Push-In CAGE CLAMP® connection technology. These new versions allow for increased pin spacing and double pinning to allow for expanded current capacities while maximizing voltage ratings. Options for these terminal blocks now include UL ratings as high as 85 A and up to 1000 V. Below is the list of products and their new variants:

- 2626 Series (8 AWG max) now available in pin spacing 12.5 mm, rated up to 38 A/600 V
- 2606 Series (8 AWG max) now available in pin spacing 12.5 mm, rated up to 42 A/600 V
- 2636 Series (4 AWG max) now available in pin spacing 15 mm, rated up to 85 A/600 V
- 2616 Series (4 AWG max) now available in pin spacing 15 mm, rated up to 78 A/600 V

All Series are UL1059 certified for 1000V in single pole configurations. Additional factory-assembled spacers also allow for the creation of multi-pole configurations that meet 1000V spacing requirements.



**For more information, visit  
[www.wago.com/us/power-electronics](http://www.wago.com/us/power-electronics)**



## KOHLER-SDMO's Most powerful Generator Set Ever

We are excited to introduce the New 4500kVA (@50Hz) / 4000kW (@60Hz) diesel powered generator sets, KOHLER's most powerful systems on the market.

Late 2016, KOHLER-SDMO unveiled its all-new range of large diesel industrial generators powered by an entirely new line of KOHLER diesel engines represented by the K135 and K175 engine families. The generators range from 800kVA/800kWe to 3500kVA (@50Hz) / 3250kWe (@60Hz) respectively.

Based on a strong worldwide market response and an increasing demand on power in mission critical applications, KOHLER-SDMO is proud to officially expand the KD Series with the rollout of 4 new models ranging up to

4500kVA (@50Hz)/ 4000kWe (@60Hz). Developed by our global team of Engineers these new units are powered by our latest most powerful and sophisticated K175 engine, the KD103V20. This release expands the limits of standby generators and sets KOHLER apart as the most powerful diesel genset manufacturer in the market.

Building on the excellence of the KD Series product line these generators are designed to deliver extreme durability and ultimate reliability in a variety of emergency and prime applications. The modular design of the KD103V20 powered generator sets deliver unprecedented power density and unrivaled performance. Matched turbochargers are engineered for maximum power and response. High ambient cooling systems ensure performance is maintained in the most extreme environments. Fuel mapping options for either optimized consumption or emissions compliance enable the generators to be deployed globally without worry. Users of the KD Series generators will find cost savings because the line delivers the best fuel consumption at more nodes than any other competitor. KOHLER's proprietary advanced control and communication system ties the entire system together for a seamless customer experience.

When paired with KOHLER's global sales and support network the KD Series line-up provides leading performance for mission critical and industrial applications. Data centers, healthcare facilities, water utilities, and critical facilities such as airports; can rest assured with a KD Series generator set backed by KOHLER's Worldwide support network. And when service is needed, KOHLER has a global dealer and distribution infrastructure consisting of more than 800 facilities offering 24/7 parts availability.

The new KD Series products will be available for sale in June.

**For more information, visit  
[kdseries.com](http://kdseries.com)**

## Klein Tools® Introduces Slim-Tip Insulated Screwdriver Sets for Work in Tight Spaces

Klein Tools, for professionals since 1857, introduces two new sets of slim-tip insulated screwdrivers. Slim profile tips to allow greater access while still maintaining protection from electrical shock, and being flame and impact resistant.

All screwdrivers feature:

- 1000V rating clearly marked
- Slim-tips to fit tight terminal blocks, slim-style breakers, etc.
- Tips sit flush with shafts to help reduce insulation chipping
- A layer of orange impact and flame-resistant insulation
- Cushion-Grip handle increases torque while maintaining comfortable grip
- Meets or exceeds ASTM F1505 and IEC 60900:2018 standard for insulated tools

"Klein Tools' new insulated screwdriver sets provide essential accessibility and ease of use for professionals who rely on insulated tools," says Austin Minor, product manager at Klein Tools. "With these sets, users don't have to worry about sacrificing the added safety of using insulated tools when going into terminal blocks or other tight areas."

**For more information, visit  
[www.kleintools.com](http://www.kleintools.com)**





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Our V<sup>12</sup> High-Volume Ventilator boasts an unexpectedly quiet, high output (35+ CFM) turbine fan to cool and circulate the ambient air within the hood. Fully protected beneath it's durable ABS shell and added fabric layering, the V<sup>12</sup> High-Volume Ventilator isn't just compliant, it's superior.



## 40 CAL/CM2 ULTRALIGHT CLOTHING BY OTEX

Our new dual-layer Ultralight clothing takes advantage of DuPont's® dedication to scientific advancement and Westex's® industry leading dependability. Weighing in 37% lighter than traditional HRC4 PPE, our Ultralight Clothing is the most innovative contender in the lightweight arena.

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