IMPROVING DATA CENTER AVAILABILITY WITH SINGLE-PHASE UPS SYSTEMS

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Electric Vehicle (EV) charging station





PUBLISHER Danny J. Salchert

OFFICE MANAGER Anita Salchert

CREATIVE DIRECTOR Derek Gaylard

CIRCULATION DIRECTOR Pam Fulmer

CONTRIBUTING WRITERS Jeff Jowett • Matt Gurreri



PRESIDENT Danny J. Salchert

EXECUTIVE AND ADVERTISING OFFICES 2009 Eagle Ridge Drive Birmingham, AL 35242 phone: 205.981.4541 fax: 205.981.4544 www.epsmag.net danny@epsmag.net

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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. \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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MAINTAINING EV CHARGERS

BY JEFF JOWETT, SR. APPLICATIONS ENG., MEGGER

ELECTRIC VEHICLES ARE HEADLINE NEWS, BOTH POSITIVE AND NEGATIVE.

There have been negative reports of safety issues like car fires. But more important, industry trends fueled by controversy over global warming and issues of the environment and pollution have made electric vehicles the trend of the future. Amid such excitement, it's easy to overlook fundamentals and to ride crests. Don't neglect to cover all bases, none of which are more important than safety. The charger is a dynamic connection between the almost infinite power of the utility grid and the volatile potential of the car battery, sometimes with a tank of gasoline only inches away in the case of hybrids. Be certain to maintain this vital link with regular and thorough safety maintenance of your charger.





There are seven fundamental tests that an Electric Vehicle Charger Tester should perform; four for safety, one to eliminate nuisance tripping, and two operational tests. These tests are vital and important to perform following installation or repair, to check that the charger meets manufacturing specifications and performance, and as part of any preventive/predictive maintenance program to keep equipment operating and to prolong its life. It is important to perform the tests in a proper sequence, so that the safety checks are established first.

SAFETY

cover

STORY

1.1 Protective Earth (PE) touch pad: The charger being tested is plugged into the power feed as it would be during operation. But now, the EV charger tester takes the place of the vehicle for the performance of the tests. The first is to assure that the protective grounding is in place in the charger. Since during normal operation the charger will be connected to utility power, it is of primary importance to the operator and anyone else who may come in contact that the protective grounding is in place and fully functional. The charger tester will apply a charging code to the charger to put it into the charging state. The protective earth contact test will detect if a ground connection is not present. This test is not a genuine bonding test and does not verify the current-carrying capacity of the

ground connection. It verifies the connection's absence or presence, typically by a PROCEED or FAULT message on the display. The latter message indicates a need for troubleshooting and repair by a qualified electrician. Further testing with the charger tester is disabled.

1.2 Protective conductor resistance (R PE): Next, a Protective Earth Resistance test is performed between the ground pin on the charger socket and a socket on the tester's handle. This is to check that exposed metalwork on the charger is effectively connected to the ground pin on the charging socket or plug. An alligator clip or pointed probe is used to test every point of possible concern. It is not required for chargers that have no exposed metalwork or are double insulated. A practical pass/ fail limit is 0.5 Ω . The tester will typically show both the resistance value and a pass/ fail indication, such as a green check or red X. Again, a failure indication calls for repair by a qualified electrician.

1.3 Touch Voltage measurement & 1.4 Trip Time measurement: Redundant safety protection is afforded the operator of the charger by the inclusion of a GFCI (Ground Fault Circuit Interrupter) or RCD (Residual Current Device). This must be checked. They work by detecting an imbalance in circuit current. Less current returning indicates an unwanted flow to ground. This could be through personnel, causing shock or electrocution, or through equipment or materials, igniting a fire. But this current imbalance will trip the protective device, protecting personnel and the physical plant. The charger tester will apply a calibrated current matching the ratings of the charger's protective device and measuring how long it takes the device to trip. The tester further checks that the reaction time is fast enough to protect users from electrocution in the event of a charger fault. The test is typically configurable by rated charger voltage (230, 120), test current (30, 20 & 6 mA), and maximum test time (300 ms, 12.5 s, 5.59 s), indicating pass or fail at conclusion.

A tester will typically perform with 0° or 180° earth leakage current. This sets whether the current flow starts at the positive or negative direction zero crossover. The tester will first put the charger into charging mode and measure the output voltage. It will then perform a touch voltage test, to ensure that the charger ground will not rise to a hazardous voltage. Typically the operator selects between 25 V or 50 V. If the touch voltage test is passed, the tester will perform the selected earth leakage current test. The result is displayed in milli-seconds.

Should the charger fail to switch on the output voltage, the test will stop. This could indicate a connection or fuse problem. Should the touch voltage test fail, this indicates poor connection to protective earth. A qualified electrician should examine (CONTINUED ON PAGE 12)

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While the built-in protective device in the charger provides vital safety protection to the operator, it can also be subject to extraneous influences that cause "nuisance" tripping.

for repair. The RCD or GFCI is checked according to pre-set limits based on line voltage, indicated by green check or red X. The latter indicates replacement with new GFCI or RCD.

NUISANCE TRIPPING TEST

cover

STOR

While the built-in protective device in the charger provides vital safety protection to the operator, it can also be subject to extraneous influences that cause "nuisance" tripping. This can be from sources like the capacitive charging of long extension cables. Such tripping can be a considerable hindrance to rapid and efficient testing, but can be recognized and eliminated by adjustment.

The nuisance tripping test applies a calibrated earth ground leakage current starting at approximately half the trip rating of the protective device, then steadily increases the current until the device trips. The actual current at which the device trips is displayed. If this value is low, there is a high probability that the charger will exhibit nuisance tripping. Typically, the tester can perform this test in four ways.

- a) An AC current trip at 230 V ramps up to 30 mA in 2 mA steps of 300 ms duration, for a test time of 4.5 seconds.
- b) A DC current trip ramps at 6 mA for 2.5 seconds to prevent tripping of the AC response, then holds at 3 mA DC for 11.25 seconds.
- c) For 120 V equipment, a 6 mA AC test ramps up in 0.5 mA steps of 100 ms duration for 4.5 seconds.
- d) A similar test at 20 mA ramps up in 1 mA steps of 100 ms duration for a max time of 2 seconds.

Results of all four tests are displayed in trip current. Again, a 0° or 180° option is available. The tests are performed in the same manner as shown above for the fundamental protective device test. Output voltage, touch voltage and the chosen earth leakage current test are performed, as previously described. The result is displayed in mA. Interpretation of results is similar to that for the fundamental GFCI/ RCD performance tests.

CHARGER OPERATION CHECKING TESTS

3.1 Proximity Pilot (PP) check: A proximity circuit provides the electric vehicle with a signal so that it knows it is connected to a charger. The proximity circuit prevents the vehicle from moving. When not connected, the voltage on the proximity pin of the electric vehicle is 4.5 V. Once connected, the voltage drops to 1.5V. A charger tester will check to assure that this happens correctly by simulating the circuit in the electric vehicle. In chargers that use separate connecting charging cables, the connector applies a PP resistance signal to the charger to indicate to the charger the rating of the connection cable being used. The maximum current available indicated to the vehicle via the CP signal is adjusted accordingly. A charger tester is used to check that this happens correctly by testing with different rated connecting cables.

3.2 Control Pilot (CP) check: The control pilot signal is the communication between the charger and the vehicle. There are three main areas of communication: state of the vehicle/charger, max current to be drawn by the vehicle and whether digital communication indicates current.

The state of the vehicle/charger comprises disconnected, connected, charging, charging with ventilation, CP to PE fault, and charger fault. The Control Pilot signal is a 1 kHz square wave signal with the charger state communicated using the signal voltage level. Max current and digital communication use are indicated by the signal duty cycle. The charger tester takes the place of the vehicle and allows the user to set the CP code. The tester then reads the code back from the charger as set out in Table 8 of the IEC Standard 61851-1. This allows the user to verify the correct operation of the charger, ensuring that the charger responded as expected. Also, testing the Control Pilot signal measures the charger output voltage and frequency.

Output charging voltage and frequency should be as expected for the supply to which the charger is connected. Polarity should read ok. The max current should match the rating of the charger or connecting cable. Control pilot voltage, duty cycle and frequency should be repeatable. The CP state read from the charger should match the code set for the test. A fault or error with the charger itself will be indicated.

A Preventive Maintenance program is just as much in order for electric vehicle chargers as for any other piece of electrical equipment. Don't let their apparent simplicity or ubiquity create a false sense of security or complacence. There are potential safety hazards that are readily identified and corrected, with an appropriate Electric Vehicle Charger Tester in regular use as part of an electrical maintenance program. These tests can be performed quickly and readily, creating a valuable asset against equipment damage and personnel injury along with a list of other benefits that include client and customer protection, Standards compliance, and legal safeguards.

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feature ARTICLE

Emerson Automation Solutions

PART 2 Improving Data Center Availability with Single-Phase UPS Systems

BY MATT GURRERI, UPS PRODUCT MANAGER, SOLAHD EMERSON AUTOMATION SOLUTIONS

TYPES OF SINGLE-PHASE UPS

In general, classifying single-phase UPS come down to three basic characteristics.

• **TOPOLOGY:** For the most part, topology in UPS comes down to a choice between standby (basic), line interactive, and on-line. Each has their advantages and disadvantages. In single-phase applications involving a control system, Emerson recommends standby or line-in-

teractive UPS models with Simulated Sine Wave in battery mode, a technology based on approximated sine wave output waveform. This type of UPS delivers a combination of low cost, lightweight, and a small footprint for non-sensitive loads. A UPS that utilizes heat-sinks in



place of prone-to-failure fans with further increase reliability, especially in dusty environments

• FORM FACTOR: When choosing a form factor, the main consideration is where the UPS is going to be installed. Standard UPS form factors are desktop, tower, rack/tower, rackmount and DINrail. In data centers it is best practice to install small single-phase UPS on a DIN rail, which is a metal rail of a standard type widely used for mounting circuit breakers and industrial control equipment inside equipment racks. The lighter the UPS, and the smaller its footprint, directly translating into more space for additional equipment on the DIN rail with the ventilation needed to keep mounted equipment cool.

• **BATTERY TYPE:** In industrial and data center areas, a good choice for single-phase UPS battery is sealed, Valve Regulated Lead Acid (VRLA) technology. VRLA batteries are rechargeable and are considered low-maintenance. In recent years, (CONTINUED ON PAGE 16)

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Lithium-ion UPS systems have become available in some UPS designs. Being volatile, Lithium makes certification difficult in an industrial or data center area. Also, Lithium has strict battery management system requirements that measure each individual cell; if one exceeds \sim 50°C -55°C the whole system shuts down without warning. Most commonly, Li-ion is found within three-phase UPS systems deployed to provide resiliency in industrial plants or large data center facilities.

feature

ARTICLE

Selecting a Single-phase UPS

Specifying a UPS solution with the optimal power protection is essential for data center availability. To ensure that the UPS matches with your needs, consider these factors during the selection process:

• **CAPACITY:** UPS capacity is simply how much power a UPS system can provide. To calculate the load, create an equipment list based on the total watts each device requires to run. The higher the UPS capacity, the more devices it can support. If requirements exceed 16,000 watts, consider a 3-phase UPS, or divide equipment into groups to be supported by several single-phase UPS. When replacing an existing UPS, keep in mind the IT load may have changed since it was originally installed.

• **RUNTIME:** Backup runtime refers to the duration the UPS can bridge power



to the devices it is supporting during an outage.

• **SPACE:** Data center real estate is always at a premium for IT and facility managers. Specify a UPS with the smallest footprint and lowest weight without comproming protection.

• **ENERGY EFFICIENCY:** While the efficiency of a typical UPS ranges from 94% to 95%, that rating plunges as the load decreases.

• LCD PANEL: An LCD displays critical data points at a glance such as voltage,



low battery, frequency, and backup time, permitting easier system management. There are also audible alarms that notify the facility manager of status conditions.

• **REDUNDANCY:** To meet uptime requirements for data centers, UPS are often deployed with redundancy. There are three main UPS redundancy architectures, N+1, 2N and 2(N+1). N is the full UPS capacity required to handle the total load or the same as non-redundant.

• **CONNECTION PORTS:** UPS may have several connection ports for your application. Serial ports connect a UPS system to a computer. USB ports are used for communication. An RJ45 port or a Network management card can be used to control and configure the UPS remotely via a web browser or network management system.

• **RATINGS:** The three major data center design and infrastructure standards developed for the industry are Uptime Institute's Tier Standard, ANSI/TIA 942-A 2014, and EN 50600 (International). There are also operational standards for day-to-day processes. Specifically for UPS there are IEC 62040, and UL-1778. Emerson goes beyond these standards for its industrial UPS with many models being rated explosion-proof (Class 1, Div I), corrosion-resistant and sealed to prevent moisture engress.

• TEMPERATURE AND HUMIDITY: ASHRAE revised (CONTINUED ON PAGE 18)



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its acceptable operating range for data centers upwards from 18° C to 27° C (64° F to 81° F). While this saves power and money, it gives facility managers less time to react to escalating temperatures. ASHRAE's 2016 guidelines for data center humidity is 50% humidity; minimum humidity is set at 20%, while maximum humidity is 80%. You should not purchase a single-phase UPS assuming nothing could go wrong with environmental systems. The UPS you specify must have a wide operating temperature range outside of ASHRAE's recommendations to prepare your data center for a worst case scenario.

UPS Network Monitoring

Some IT departments manually assess UPS health by seeing if an alarm is sounding or a fault indicator light is on. Upgrading to using a network to monitor UPS on a website dashboard is a major step forward in that it minimizes labor costs and, if properly used, can dramatically reduce battery problems.

Warning signs, such as deteriorating performance or an overheating battery, results in the sending of real-time notifications by text or email. Technicians can make repairs or battery replacements before serious breakdowns have a chance to occur.

Is the Future Underground?

One of the most dramatic trends in data centers is the move away from traditional "clean room" environments to damp, underground sites. Data storage requirements are growing exponentially yet available real estate is not. The massive fleets of hard drives and servers contained within data centers require hundreds if not thousands of acres of land. Increasingly, this simply isn't cost-effective, leading companies to shift to new underground facilities. Rather than constructing a building from scratch or occupying space in an existing building on a lease, it is far cheaper to use an abandoned bunker, cave or mine.

Besides reducing real estate costs, subterranean data centers have geographical and geological advantages, such as zero solar heat gain, low ambient temperature, natural geothermal cooling, and solid rock surrounded structures. These factors dramatically reduce cooling costs, plus may improve physical security.

The downside to subterranean data centers is moisture. Damp walls and elevated humidity levels can cause havoc on ordinary location UPS systems. While exposure to moisture might not immediately cause a UPS failure, it facilitates corrosion of the cabinet and its internal components, leading to UPS failure. Simple dehumidification equipment may not be sufficient where humidity is a problem.

Using an industrial-grade, IEC 60068 rated UPS will provide the optimum backup protection of critical data center infrastructure from moisture. IEC 60068 offers guidance for the environmental testing of electronics, including UPS, such as heat, cold and humidity. Specify UPS models with maximum permissible relative humidity levels of 90 percent or more. Because standard UPS systems may not have been subjected to IEC 60068 testing, they are not appropriate for underground data center use.

Conclusion

Compared to large three-phase floor UPS systems, single-phase UPS are less visible yet can play a vital role in maintaining modern data centers. Behind the scenes, single-phase UPS protect systems such as the controls for the facility's HVAC, workstations, VoIP and safety/ security. For low- to mid-power requirements, single-phase industrial-grade UPS are more efficient than three-phase UPS, offering an optimal ratio of price to resiliency.

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The Made in USA Difference

Electri-Flex manufactures an assortment of Liquatite® products that are Made in the USA, including Buy America and Buy American (ARRA) Compliant. Both Buy America and Buy American compliances are important considerations when selecting materials for Rail & Transit applications.

The Buy America Act is administered by the Department of Transportation (DOT), and its purpose is to encourage the use of domestically produced products in federal transportation construction projects. Buy America requires both the product and materials used to manufacture the product to be 100% sourced and produced in the United States. The Federal Highway Administration (FHWA), Federal Transit Authority (FTA), and other Department of Transportation agencies can require Buy America



Compliance for purchase in these transportation applications. Liquatite® Types ZHLA and ZHSS are both Buy America Compliant.

The Buy American Act, not to be confused with the Buy America Act, applies to all U.S. federal government agency purchases and similarly, requires products and materials to be American Made. However, Buy American only requires 51% of the product's components to be made in the United States. Nearly all Electri-Flex conduit conforms to the Buy American Act, including product Types ZHLA, ZHSS, and CEA.

Liquatite[®] Solutions

With three conduit varieties to choose from, Liquatite $\ensuremath{\mathbb{R}}$ has the solution.

- **Type ZHLA:** UL listed, CSA certified "Heavy-Duty", halogen-free flexible conduit, often used in railcar construction. The core is made from hot-dipped galvanized steel, providing a level of corrosion resistance. Zero-halogen polyurethane jacketing contains a flame retardant and is sunlight (UV) resistant, as well as resistant to ozone, hydrocarbons, and chemicals & oils.
- **Type ZHSS:** non-UL, halogen-free flexible conduit, made with a continuous strip of 316L stainless steel, provides the highest level of corrosion resistance and added durability and strength that has served well for rodent protection. Zero-halogen polyurethane jacketing contains a flame retardant and is sunlight (UV) resistant, as well as resistant to ozone, hydrocarbons, and moderate chemicals & oils.
- **Type CEA:** non-UL, halogen-free flexible conduit, made with a plated steel core that provides a level of corrosion-resistance, often used in railcar construction. Zero-halogen polyurethane jacketing contains a flame retardant and is sunlight (UV) resistant, as well as resistant to ozone, hydrocarbons, and moderate chemicals & oils.

ABOUT ELECTRI-FLEX COMPANY

Electri-Flex Company, a leader in electrical conduit design and manufacture for over 65 years, produces Liquatite[®], 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; visit: www.electriflex.com; or write: 222 West Central Avenue, Roselle, IL, 60172-1994.





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Emerson Launches Stand-Alone Power Supply with L-Code Connections for Higher Current Output

New IP67-rated SCP-X outputs 10A to meet increasing power requirements of automotive manufacturers and suppliers

To better serve the power requirements of global automotive manufacturers, Emerson has expanded its SolaHDTM SCP-X power supply line with a new higher output model supplying 10-Amp, 24 Vdc output capacity. A compact, standalone power solution, the new IP67 SCP-X High Output power supply has "L-Code" connections that enable the use of 5-pin L-Code M12 cables specifically designed for transmitting higher currents, especially in confined spaces. This unique connector design also ensures that plant employees don't accidentally connect a load that requires a class 2 power source to a higher rated power supply, which would create a potential

ensures the needed capacity for loads with high inrush current requirements. In addition, it has a DC-OK relay contact to provide diagnostic information to PLCs, DCSs, IPCs or other controllers, with an LED indicating operational status. Higher power capacity, combined with better observability, encourages continuous improvements in machine deployment and management.

STANDALONE IP67 UNIT

Like the original SolaHD SCP-X Class 2 power supply, the IP67 SCP-X High Output power supply is a standalone unit that eliminates the need for protective en-

IP67-rated housing. Also re-

sistant to shock, EMI and

contamination, this housing

drives down Total Cost of

Ownership by simplifying

plant floor inspections, main-

sure or hire a specially trained

electrician. Every feature is

designed to help users avoid

needing to commit the re-

sources and time associated

safety hazard. According to Mike Johnson,

industry NFŴ

> Vice President of Product Marketing for SolaHD, by leveraging L-Code connectors in the new power supply, Emerson is helping accelerate the adoption of L-Code cabling in automotive manufacturing and factory automation: "L-code cables are at a tipping point because of an influx of higher power applications where distributed and remote field power is needed for machine controls. Some of our competitors have responded, but

limitations on the standard connectors and cables they use have kept output to approximately eight amps. Our customers wanted L-coded cables for their higher output capacity, as well as for the smaller M12 footprint ideal for vision systems, relays, conveyors, actuators, valves, and devices such as industrial computers and touchscreens."

The IP67 SCP-X High Output power supply enables auto manufacturers and their suppliers to acquire the power, reliability, and efficiency to continuously optimize productivity, now and in the future. Paired with a Power Boost that provides up to 150% of nominal power (15A) for four seconds, the 10A output

VERSATILE MOUNTING

The SolaHD IP67 SCP-X High Output power supply can be mounted in any orientation directly to the load, increasing installation flexibility while decreasing the amount of cabling between it and consuming devices. By featuring the same mounting dimensions as competitive power supplies with lower output capacities, the SolaHD IP67 SCP-X High Output power supply simplifies upgrading. Quick change connectors ease coupling to distributed I/O devices.

Learn more at www.solahd.com.

ABOUT EMERSON

Emerson (NYSE: EMR), headquartered in St. Louis, Missouri (USA), is a global technology and engineering company providing innovative solutions for customers in industrial, commercial, and residential markets. Our Emerson Automation Solutions business helps process, hybrid, and discrete manufacturers maximize production, protect personnel and the environment while optimizing their energy and operating costs. Our Emerson Commercial & Residential Solutions business helps ensure human comfort and health, protect food quality and safety, advance energy efficiency, and create sustainable infrastructure. For more information visit Emerson.com.





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Emerson Introduces Long-Life 240W and 480W DIN Rail Mounted Uninterrupted Power Supplies

Ultra-Reliable SolaHD SDU DC-B UPS Control Module has UsefulService Life of 15 Years

Marking an industry breakthrough, Emerson has redefined reliability with a new 24 Vdc DIN-rail mounted Uninterrupted Power Supply (UPS) control module that achieves a useful service life of fifteen years and a Mean Time Between Failures (MTBF) in

excess of 1.5 million hours. Available in 240W and 480W models, the SolaHD[™] SDU DC-B control module helps improve availability of mission-critical devices, while simplifying commissioning, reducing maintenance, and driving down the Total Cost of Ownership across multiple industries.

Leveraging microprocessor-based controls, the SolaHD[™] SDU DC-B bridges power to machinery in the event of a brief disruption, as well as allows for safe shutdown of devices during a mains failure, therefore preventing data loss, work interruptions or equipment damage. With an input voltage range of 22.1 Vdc to 28.6 Vdc, the SolaHD[™] SDU DC-B also provides a consistent flow of clean power by filtering noise and isolating damaging transients that are common in applications such as automotive manufacturing, material handling conveyors, the life sciences, pharmaceuticals processing, and "pick and pack" areas in distribution centers.

Device availability constitutes the most critical sustained challenge for manufacturers. As part of its reliable design, the SolaHDTM SDU DC-B features an exceptionally wide operating temperature of -15° C to $+50^{\circ}$ C (5° F to 122° F), along with intelligent battery and UPS health diagnostics. Self-test evaluation of operating states prevents device downtime by helping users proactively plan replacement of the battery module months in advance. Two LED diagnostics are integrated into the SolaHDTM SDU DC-B for fast visual indication of battery and DC UPS output status.

For more information, visit SolaHD.com



The Fluke 1770 Series Three-Phases Power Quality Analyzers eliminate the complexities of PQ logging to speed studies

The new analyzers' unique automated measurement system ensures the right data is being collected every time

Power quality measurements can be complex to set up and frustrating when critical events are missed. The new Fluke® 1770 Series Three-Phase Power Quality Analyzers eliminate the complexities of power quality logging, troubleshooting, and analysis with automatic measurements, a straightforward user interface and setup, best-in-class specifications, and a simplified reporting platform.

The Fluke 1770 Series captures more than 500 power quality parameters by default so critical power quality events are never missed — from fast transients up to 8kV, harmonics up to 30kHz, and dips and swells, as well as the voltage, current, and power measurements and systems.

that enable technicians to characterize electrical systems.

"The Fluke 1770 Series walks technicians through the whole set up to eliminate any measurement errors and ensuring all the correct parameters are selected," said Frank Healy, Product Manager. "The 1770 Series helps technicians identify issues faster and in a clearer manner to ensure the right data is always collected."

The 1770 Series features:

- Automatic measurement of power and power quality parameters Critical power quality data is captured as soon as a session is started, without extensive setup or selections.
- Intuitive user interface The streamlined user interface makes it easy to navigate between measurement parameters like V/A/Hz, power, dips and swells, harmonics, unbalance, or PQ health at the push of a button.
- High-speed voltage transient capture Capture damaging high-speed, high magnitude transients to mitigate their effects before equipment fails.

Capture, troubleshoot, and mitigate voltage transients

Voltage transients negatively impact otherwise healthy systems every day, and their potential to damage equipment can't be underestimated. Fluke 1775 and 1777 capture high-speed transients faster than ever before by leveraging the power of the latest Intel Cyclone FPGA. With a sample rate of 20MS/s users can effectively capture, troubleshoot, and mitigate the most damaging power quality issues.

> For more information, visit www.fluke.com/1770



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Topaz Announces Simple Safety Solution

Topaz Lighting Corporation releases the latest addition to its line of LED Emergency Lighting Remote Heads. Available in single and double head configurations for damp and wet locations, these remote heads offer maximum nighttime safety.

Topaz Senior Product Manager, Michael Neary notes, "Topaz knows safety measures are the most important, and required, part of planning any building. Emergency Lighting Remote Heads expand emergency lighting to ensure safety in commercial and industrial spaces."

The Emergency Lighting Remote Heads easily install to a single-gang J-box on the ceiling or wall and are powered by a compatible battery equipped exit sign or emergency light, providing necessary illumination with less wiring than adding additional base units. The fully adjustable lamp heads track and swivel for full range adjustability to properly light the path of egress.

Topaz is a leading manufacturer of electrical fittings, traditional lighting, ballasts, LED fixtures, and lamps. For more information on Topaz's complete line of products for commercial and residential use.

> For more information, visit www.topaz-usa.com





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Submit a high resolution photo (300 dpi) of your product, along with a brief description (up to 150 words). Please note on your submission that it is for consideration for Top Products. E-mail: danny@epsmag.net or mail to: Electrical Products & Solutions 2009 Eagle Ridge Drive, Birmingham, AL 35242

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GREA



Universal Douglas Lighting Americas Releases Next Generation of EVERLINE Round High Bay Luminaire

EVERLINE RHB offers slimmer, lighter construction and a wider variety of wattage, lumens, and lens options for today's commercial building environments

Universal Douglas Lighting Americas (UDLA), a leading manufacturer of lighting fixtures, retrofit solutions, and intelligent lighting control systems, has released a new generation of its EVERLINE Round High Bay (RHB) luminaire. The new luminaire offers robust, modern lighting for industrial buildings with more flexibility in brightness and controls.

RHB fixtures have only one contact point with the ceiling, making them one of the easiest high bays to install in commercial buildings and industrial settings. The beam they spread allows for powerful illumination, improving visibility and safety. The UDLA EVERLINE RHB is an excellent choice for open areas, like factories, warehouses, grocery and wholesale retailers, and even aircraft hangars.

With three wattage options (100, 150, and 2000W) and delivered Lumens from 14,000 to 28,000, the EVERLINE RHB demonstrates UDLA's commitment to innovation and flexibility across its product portfolio. It also offers a lighter, improved aluminum alloy heatsink and both 60 and 120-degree lens options. A center-mounted Microwave sensor is available for field installation.

"The EVERLINE RHB has been one of our top sellers due to its versatile, long-lasting design. With this new generation, we are delivering even more innovation and choice to our commercial lighting customers," said Chris Holstein, Vice President of Product Management and Marketing at UDLA. "The new RHB shows that high bay lighting can be more modern, but still deliver the robust performance needed in commercial and industrial environments."

All EVERLINE luminaires come with a five-year limited warranty, backed by more than 75 years of experience and innovation in reliable analytics, energy efficiency, and sustainability.

For more information, visit unvlt.com



New Thermoplastic Edge-lit Exit from Barron Lighting Group

Powered by Barron Lighting Group, Exitronix life-safety and emergency lighting announces the addition of the QXEDGP Series thermoplastic edge-lit exit.

"Part of our Equity Line of competitively priced lighting solutions, the QXEDGP Series features an architectural, stylish design that has been engineered for contractor-friendly installation in any surface mount application," said Heather McCune, Vice President, Sales Operations of Barron Lighting Group.

The Exitronix QXEDGP edge-lit exit sign features elegant styling in an economical LED thermoplastic design. It features simple installation with field-selectable chevrons that have a factory-installed guide template for multiple directional configurations. A snap-in canopy is included for simple top, end or surface mount installations. Single-face signs include an ultra-clear acrylic panel while double-face signs utilize a factory-installed mirror-finish mylar insert between two clear acrylic panels. The QXEDGP is UL 924 Listed for Damp Locations, is California Energy Commission (CEC) Title 20 Compliant, meets NFPA 101 Life Safety Code, NEC and OSHA.

> For more information, visit https://bit.ly/3ngnjGo





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