NEMA WD 11-2023

Wiring Devices: Frequently Asked Questions

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Contents

Subgroup on Configurations and Marking

Configurations

Q. Where can I find NEMA configuration standards for wiring devices plugs and receptacles?

A.

1. Go to the NEMA website (www.nema.org).
2. Type “WD 6” (without the quote marks) in the search box and click Enter.
3. Follow the link.

Holes in Blades

Q. What is the purpose of the holes in the ends of typical NEMA 15 amp household plugs?

A.

The holes were originally intended to be a detent to help retain the plugs in the receptacle contacts. The female contacts would have a mating nib or feature that would click into the hole. This feature still exists today in NEMA locking products to help retain the plug in the rotated or locked position.

UL eventually revised their standards for straight blade devices to require that receptacles and connectors meet minimum retention values without the use of these detents. The minimum test gages have no holes. They also specified a maximum value to be sure the plug could be disengaged. The test gage for the maximum value has holes. Most manufacturers stopped putting the detent nibs on the female contacts, as it made it much harder to meet the maximum force to withdraw and did nothing for the minimum requirement, as the gage had no holes. The standard for plug design still includes the holes but they are optional. If used, they must be of the specified size, location, and chamfered lead-in to ensure proper function with older receptacles and connectors.

The hole has no other mechanical, electrical, or thermal function.

277 V / 480 V with (2) 277 V Circuits

Q. Is an L22-20R, a 3-phase 277/480 V 4 W with ground receptacle, listed to have 2-277 V circuits, 2-neutrals, and a ground connected to it? A neutral would be terminated on one of the X, Y, or Z phase terminals.

A.

NO. A L22-20R is a locking-type, 277/480 volts, 20 amperes, 3 phase Y, 4 pole, 5 wire, grounding type receptacle. It must be wired to a 3-phase circuit with a single common neutral.

Terminal Marking

Q. What do the terminal markings on a NEMA device mean?

A.

Per the introductory notes in ANSI/NEMA WD 6, “G” denotes equipment ground. “W” denotes system grounded conductor or neutral, and “X,” “Y,” and “Z” designate the line terminals. (WD 6 is available for free download from the NEMA website at www.nema.org.)

X, Y, Z Terminal Marking

Q. What do the X, Y, and Z markings on a NEMA device mean?

A.

The markings are intended to correspond with circuit wiring and indicate the line terminals. For a 3-phase device, they are used to balance the loads on the circuit and are often necessary for motor load to control rotation. For a typical 250 V 2-pole device, the markings, although the order is not as purposeful, can still be used to facilitate any load balancing or control issues in a larger facility.

Marking of Rating

Q. I am wondering if there is any requirement for amperage and voltage to be marked on a plug and/or receptacle. We have been selling some molded locking plugs that have the NEMA designation on the face of the plug, but do not have the amperage or voltage printed on them. I have seen millions of molded NEMA 5-15P plugs that do not have any type of marking at all, not even the NEMA configuration.

A.

Markings for voltage and current are typically required for receptacles that are hard wired and rewireable plugs and connectors intended to be installed by the end user to a flexible cord. Molded-on devices are typically part of a cord set or power supply cord and have their own particular marking requirements, which may include a tag, ring, sleeve, or package marking. The rating is dependent on the cord and the application, so the device is often not marked.

Meaning of NEMA WD 6 Terminal Letters

Q. I am looking for a standard that states the meaning of the letters on a twist locking NEMA plug or receptacle. Also, any affiliated color codes that go to listed code letters.

A.

The NEMA WD 6 standard designates “W” for system ground and “G” for equipment ground. Letters “X,” “Y,” and “Z” are reference phase designations used on configurations intended for multi-phase applications. WD 6 does not specify color codes for the phases. Color coding of conductors and/or terminals can be found in electrical codes and end-product standards.

Maximum Size

Q. Are there any requirements for the maximum profile of the plugs, and if so, where can we find these? We would like to know whether there is a maximum size so we can ensure that the plug will not interfere with projections around the socket.

A.

The maximum dimension you are asking about is not specified in NEMA WD 6. However, if you are going to plug into a duplex receptacle, and still leave room to plug into the other side of the receptacle with the same dimension plug, the maximum diameter of the plug cannot exceed 1.531 inches. Most manufacturers do not exceed 1.5 inches for a standard plug. Note the spacing on other products such as power strips may be even smaller. Also, the NEMA WD 6 standard gives dimensions for standard recessed outlets, which could also impact plug size.

Maximum Dimensions

Q. We are working on a flush mount remote controlled receptacle. The WD 6 standard shows the dimensions for receptacles but mentions that this excludes GFCIs, dimmers, motion sensors, etc. Does the remote controlled receptacle fall under this category? Do we need to follow the maximum allowed dimensions mentioned?

A.

One of the purposes of the NEMA WD 6 standard is to minimize unsafe interchangeability while “not preclud[ing] other designs” as stated in item 10 in the Introduction section. The “need” to follow the maximum dimensions contained in NEMA WD 6 is individually determined by each plugs and receptacles manufacturer and any relevant safety concerns raised by the listing agency, such as UL.

Keystone Communication Configuration

Q. Does NEMA have a standardized dimensional opening associated with keystone communications jacks? Are you aware of a standard or do you know which organization (if it’s not NEMA) is responsible?

A.

There is no NEMA standard for KEYSTONE communication jacks. Appearing in the mid-1980s, several manufacturers made jacks that were the same or very similar to the AMP opening size. Other manufacturers made jacks that fit an entirely different opening. These choices were driven by marketing and product strategy more so than standards for the opening that accepts telecommunications connectors. Nor is there a standard from EIA, TIA, or ISO. The actual jack/connector dimensions are entirely up to the manufacturer, hence the reason you see several designs.

KEYSTONE is actually an old AMP trade name for their jacks and connectors, since the snap-in style jacks began.

Coupler or Adapter

Q. Is there a NEMA coupler for a NEMA 5-20P connector to a NEMA 5-15R receptacle?

A.

NEMA does not have standards for couplers or adapters. There may be a suitable adapter commercially available.

Universal Configuration

Q. Is the NEMA L5-20P power cord universal? Can it connect with most any power plug, etc.?

A.

The NEMA configurations are intended to be specific to the voltage and current ratings assigned to them. In that sense, they are not universal.

However, the purpose of the NEMA configuration standard is to allow devices manufactured in accordance with the standard to safely inter-mate with each other.

Receptacle Contact Dimensions

Q. I am requesting clarification regarding receptacles contacts per WD 6. The dimensions shown in the receptacle view depict the housing opening, not the actual contact. While the plug view details the pin dimensions, the dimensions of the receptacle contacts are not shown. Are there specifications or requirements for the mating receptacle?

A.

The NEMA specifications for the receptacle contacts are not defined by dimensions. The dimensions shown are to ensure proper matching of configurations. It is left up to the manufacturer to design contacts that will perform with the specified pin or blade configuration. They are confirmed solely by the performance test requirements in UL 498. The only exceptions to this are the “nib” or bump dimensions for NEMA locking devices.

Faceplate or Wall Plate Depth

Q. Reading the WD 6 publication, I noticed that the thickness of the wall plates is not standardized (see Note 1 for C—depth: “The depth is defined in accordance to the applicable installation code by the Authority Having Jurisdiction.”). Is there a requirement?

A.

Although it refers to the installation code, it also states that it should not interfere with the flush seating of a plug into a receptacle. WD 6 has dimensions for receptacles that protrude through the wall plate for guidance in designing a wall plate. There are also dimensions for switches. Both the NEC and UL have additional requirements for wall plates that may apply.

Switch Dimensions

Q. On page 12 of WD 6-2002, there is given a 0.396 maximum toggle width dimension, but while there is given a 1.172 maximum toggle throw as well, I cannot find here or anywhere else in WD 6 a maximum toggle <u>length</u> dimension. This measurement would correspond to the 0.925 minimum length (L) given on page 7 for “Wallplate Dimensions for Toggle Switch Devices.” Can I deduce that as with the corresponding width dimensions of plate and switch, that the difference between the two is 0.005 and therefore the maximum toggle length dimension is 0.920?

A.

The dimensions that are given on page 7 are specific to a standard toggle switch wall plate. The switch toggle “length” must be able to fully actuate within the defined limits specified in the switch plate opening. If a toggle design length is .920 and the switch is capable of being actuated through the designed on and off points, it would be acceptable. The dimensions on page 12 are specific only to rectangular face devices with toggles using a rectangular faceplate.

California Style Plug/Receptacle

Q. What is the California standard for “CA style” locking plugs/receptacles?

A.

California Style (CS) is a designation originally developed for a series of devices similar to the 50 A ship-to-shore configurations. There is no current configuration standard for these products. Consult manufacturers for information.

Non-NEMA California Style Locking Devices

Q. Which is the NEMA equivalent standard type (under WD Series L-50P) for non-NEMA California Style twist lock plug 50A 3-Ph 4 wire (CS 8365C type)?**

A.

The ANSI/NEMA WD 6 configuration of equivalent rating to what you refer to as the “non-NEMA California Style twist lock plug 50A 3-Ph 4 wire (CS 8365C type)” would be L15-50P, designated for 50 A 250 V 3Ø. Please be advised, however, of two facts:

- No manufacturer has ever produced or offered commercially plugs, receptacles, cord connectors, or inlets of any of the 50-ampere or 60-ampere locking-type configurations depicted in ANSI/NEMA WD 6-2002 (R2008).
- The “California Style” [also known as “California-Special”] 2-pole 3-wire and 3-pole 4-wire 50-ampere configurations in various voltage ratings are proprietary designs, produced by several NEMA member companies, to comply with the requirement for “Skirted Plugs” found in the California Code of Regulations, Title 8, Electrical Safety Orders, Article 51, Section 2510.7(b). These “California Style” locking-type devices are one possible approach of many commercially competing configuration types to achieve “Skirted Plug” compliance and have NOT been formally standardized NOR have those associated dimensions been published in any standard.

Configuration Inter-Mating

Q. On locking plugs and receptacles where the plug is inserted into the female receptacle and is twisted to lock-in (such as with NEMA L5-30 configuration, or any of the NEMA configurations), are the slots and blades designed and positioned so that a person cannot plug the plug in incorrectly or to a different rating?

A.

The configurations are designed to be non-interchangeable. UL 498 clause 15.3.5 requires plug and receptacle configurations of different ratings to be non-interchangeable.

The size and shape of the blades and slots also prevent incorrect insertion.

Blade Shape

Q. Is there any dimension requirement for the semicircle of flat blade for USA/CSA? I can’t find any dimension requirement for the semicircle of flat blade in NEMA WD 6.

A.

UL 498 specifies the following:

“Current-Carrying Parts; The profiles of the blades employed in an attachment plug having a 1-15P, 2-15P, 2-20P, 5-15P, 5-20P, 6-15P, or 6-20P configuration shall comply with the dimensional requirements of the Standard for Attachment Plug Blades for Use in Cord Sets and Power-Supply Cords, UL 1659.”

Blade Profile

Q. Does a design variation to the standard profile to add a “hook” feature along the edge of the blade conform to WD 6?

A.

The proposed variation does not meet the WD 6 standard for blade shape and configuration. It does not conform to the defined shape nor does it meet the intent of the standard. The blade shape in WD 6 has been defined as shown for decades, and receptacle manufacturers have designed their receptacle and connector devices to make electrical contact with these blades. Many designs interface with the edge of the blade instead of or in addition to the flat sides. This deviation from the standard profile to add a “hook” feature along the edge could interfere with this electrical connection and even damage the receptacle contacts, creating an unsafe condition.

Assuming the intent of the profile is to provide a “hook” to lock the blade to the mating receptacle, this is contrary to the intent of the standard, which is to allow smooth withdrawal of the plug from the receptacle. The receptacle standards actually test for “maximum” retention of the plug to ensure this. Receptacles are not designed or tested to withstand the stresses of a plug that is “locked” in place. There are no standardized features to “lock” onto. The receptacles could easily be damaged when such a plug is withdrawn, breaking the face and exposing live parts.

Many receptacles have an internal tamper resistance mechanism to provide additional safety for small children who might insert small objects into a receptacle. These receptacles are required by code in most homes and other places where children are present. The test criteria for these receptacles require many thousands of cycles of endurance testing. The hooked/locking feature of the proposed blade profile could easily damage this mechanism and the child-resistant protection it provides.

NEMA WD 6 does define plugs and receptacles that do provide a locking feature. They are identified by the letter “L” preceding the NEMA designation, e.g., L5-15 vs. 5-15. There are many manufacturers that produce these products and they are widely available.

Subgroup on Installation Orientation

Installation Orientation Ground Up or Down

Q. NEMA flat blade receptacle drawings are all configured with the ground pin "up." Was there an implied "correct use" or "installation orientation" in the generation of the drawings or was it purely coincidental? Is there a proper orientation?

A.

There was no hidden intent in showing the receptacles in WD 6 with the ground pin up. Functionality should drive the orientation. However, I would say that consistency within the structure might be important for aesthetic reasons and generally a matter of local convention.

Manufacturers produce devices with labels/names/instructions printed on devices in both orientations. The NEC makes no distinction as to device installation orientation, and industry practice is divided.

It may also be driven by the type of cord set that is plugged into it. If the cord set makes an immediate 90-degree turn, it may be desirable for a receptacle to be installed in the direction that supports the direction in which the cord is directed.

Horizontal Receptacles in Chicago

Q. I live in the Chicago area in a four-year-old home. I wondered if there was any way you might be able to explain why the electricians in this area are installing home outlets horizontally. This is really mind-boggling since common household items such as night-lights need to be plugged in with the prongs in a vertical direction. I think this is a strange phenomenon and just wondered if you could offer any logical insight as to why this might be happening.

A.

We believe this is a consequence of the Great Chicago Fire.

The local code was revised to require all wiring be placed in steel conduit. Although the code did not require horizontal mounting of the outlets, the easiest way to run the rigid steel conduit between them was to mount the boxes horizontally and connect the conduit to each end without making any bends. This is pretty much a peculiarity of the Chicago area. Most of the country allows some form of metallic or non-metallic flexible wiring that can be easily bent to enter vertically installed boxes.

By the way, there are night-lights available that swivel to direct the light in different directions. NEMA cannot recommend or endorse a specific model or manufacturer, but you could contact one of the NEMA manufacturers directly for information. They are listed on the NEMA website with hyperlinks to their own websites provided.

Subgroup on Various Others

Solid vs. Stranded Conductors

Q. Is there any industry requirement as to using solid or stranded copper conductors when using electrical receptacles? Are there any pros or cons of using one over the other for installations? Any assistance would be greatly appreciated.

A.

Except for those terminals that specifically require #14 AWG solid copper conductors (only), such as push-in terminals, there is no preference. It is left to the option of the installer. As far as pros and cons: stranded wire is easier to manipulate, pull through the system, and push back into the box, while solid wire is easier to connect to a side-wire wire binding screw.

Cord Set Rating

Q. I have a cord set with a NEMA 6-15 plug on the "power" end, 18 AWG conductors, and an IEC 320 connector on the load end. I believe that NEMA 6-15 is rated at 15 amperes and 250 volts. However, 18 AWG is too small for 15 amperes, and the IEC 320 connector has 10 amperes and 125 volts stamped on it. Shouldn't the entire cord set be rated at 15 amperes and 250 volts?

A.

The NEMA 6-15 plug is rated at 15 A, 250 V. This is the rating for the configuration to ensure correct mating with other devices. There is no lower NEMA amperage than 15 for this device, and thus it is utilized from 0 to 15 amps. In contrast, a NEMA 6-20 configuration is rated at 20 A. Since there is a NEMA 6-15 for 15 amps, the 6-20 would be utilized from 15 to 20 amps. For cord sets, the limiting factor is the cord or the other mating device (IEC 320 connector). Cord sets must have their own rating based on these factors.

NEMA 6-15 250 V vs. IEC 320 125 or 250 V

Q. I have a cord set with a NEMA 6-15 plug on the "power" end, and an IEC 320 connector on the load end. NEMA 6-15 is rated at 250 volts. However, the IEC 320 connector has 125 volts stamped on it. Shouldn't the entire cord set be 250 V?

A.

The two different voltages mentioned is an issue. The cord set described is somewhat unusual for the U.S. The IEC 320 connector is the problem. It is marked 125 V, as that is the typical voltage used in the U.S. This same connector, used in Europe, would be marked 250 V for a typical European supply voltage. The user must be very careful in the use of this product. It will only plug into a 250 V source in the U.S. because of the NEMA 6-15 plug. The cord set may have been attached to a 250 V product, possibly from Europe, thus the 250 V NEMA plug to provide the correct voltage in the U.S. However, the IEC 320 connector will attach to a 125 V product in the U.S. or a 250 V product. THIS COULD BE A SAFETY HAZARD IF USED IMPROPERLY.

To answer the last question, yes, the cord set should be marked at 250 V.

Test Requirements

Q. Do you know of a pullout test requirement for a 5-15 plug and receptacle?

A.

All the tests for plugs and receptacles are in UL 498.

Colors

Q. I was wondering if there is a color standard used for items such as wall plates.

A.

The standard is WD 1. It is available for free download from the NEMA website. It covers standard NEMA colors, but many manufacturers have specific proprietary colors.

Plastic Materials

Q. My question pertains to the plastics used in plugs and connectors. The manufacturers of these plugs often use a hard white plastic as the cap piece and different materials for the rest of the device. Does this plastic have extra insulating properties as opposed to the body of the plug? Or could the cap be made from the same material as the body with no chance of being shocked?

A.

The primary purpose for ALL plastics used in wiring devices is to provide protection and support, as well as insulation of live parts. The various parts do not have to be of the same material, but they can be. That is up to the manufacturer. The applicable UL standard for the product (UL 498 for plugs) will have specific requirements for plastic materials depending on their function, and also performance testing for safety.

NEC and AHJ

Q. Many instructions refer to the "applicable installation code" (ANSI/NFPA 70?) and the AHJ "Authority Having Jurisdiction." What is this?

A.

The typical code for installation of wiring devices is the *National Electrical Code*®, NFPA 70. It is published every three years as proposals for additions and revisions are considered in a standard revision cycle. You can view the code at www.nfpa.org.

The NEC is guidance, not law. Individual states and municipalities determine which version of the NEC, or other electrical code, their jurisdiction will be subject to. That version could be the current version of the NEC, or some other version or code. Also, they do not have to adopt all portions of a specific code. There can be (and often are) numerous exceptions in their adoption. So, it depends on where you are as to what installation code or variation you must follow. The AHJ is the local authority that has jurisdiction over the implementation and enforcement of the locally applicable codes. This is often the local electrical inspector or board or commission for the municipality.

Receptacle Grades

Q. I am looking for an explanation of what constitutes the designation "specification grade," "construction grade," and "commercial grade" receptacles. Also, are these grades determined by NEMA?

A.

These are common questions that arise from the field.

Let's answer the last question first: no, NEMA does not classify grades of receptacles. The other question is not so simple, because the terms specified are all "commercial" in nature; that is, there are no technically standardized definitions. These definitions only have meaning within each manufacturer's product line.

UL lists receptacles in four classifications, of which "standard or general grade" does not have any specific distinction except Listed to UL 498. Receptacles with additional requirements are "Hospital Grade," "Fed Spec" devices that are verified to DESC (Defense Electronics) procurement specification WC596 classified as "Federal Specification Grade" and "Hospital Grade Federal Specification." Fed Spec and Hospital Grade do represent differing upgrades in requirements, while Fed Spec Hospital Grade combines the two to provide the highest level of performance.

Additionally, there are push-in terminal receptacles, which are a type of "standard or general grade" device with specific performance requirements for the push-in terminations.

2-Prong Plug vs. 3 Prong

Q. One of my crews asked in a safety meeting: "Why do some power tools have three-prong plugs and others only have two?"

A.

The *National Electrical Code* requires that: ". . . exposed non-current-carrying metal parts of cord-and-plug-connected equipment likely to become energized shall be grounded." This typically requires a three-prong grounded plug.

However, there is an exception allowing: "… shall not be required to be grounded where protected by a system of double insulation or its equivalent. Double insulated equipment shall be distinctively marked."

Tools and appliances may be constructed using double insulation or not having any exposed metal that could become energized. They are required to be listed by a Nationally Recognized Test Lab such as UL (Underwriters Laboratories). This equipment is allowed to use a two-prong ungrounded plug.

Plug for Hot Food Table

Q. If a hot food table has three wells, each with a 900 W 208 V, single-phase heating element, plus you add a 120 V 20-amp duplex outlet to the table, what would be the total electrical load? Which NEMA plug would you put on the table, so you have only one connection?

A.

The 900 W heaters at 208 V would draw 900/208 = 4.3 amp each. The three heaters together would draw approximately 13 amp at 208 V. The receptacle could draw up to 20 amp at 120 V.

A 20 A, 3-phase 5-wire device could be used by splitting the loads up as follows: 2 phases (i.e., X and Y) would supply all three 208 V heaters (13 A) and the 3rd phase (i.e., Z) to neutral would supply the 20 A 120 V receptacle. A NEMA L21-20, 20 A, 3-phase Y 120/208 V is probably the correct device to use.

However, we strongly recommend that you consult with a qualified engineer or electrician for your specific application.

15 A Receptacles 20 A Circuit

Q. Why is it allowable to use multiple 15-amp receptacles on a 20-amp circuit? I have been told that 15 A receptacles can safely pass through 20 A of current (i.e., internal construction of 15-amp receptacle = internal construction of 20-amp receptacle). Is this correct?

A.

15 A receptacles are tested, and UL Listed, to carry 20 A from terminal to terminal so they can be used safely on a 20 A branch circuit as a pass-through device without requiring separate pig-tailing, etc. The basic internal construction that interfaces with the plug is tested and listed to carry 15 A, as it will only accept a 15 A plug.

Feed-Through

Q. Some duplex outlet receptacles are rated for feed-through applications while others don't mention it. What makes a receptacle suitable for the feed-through installation?

A.

NEMA 5-15R (15 A, 125 V), 5-20R (15 A, 250 V), 6-15R (15 A, 125 V), and 6-20R (20 A, 250 V) receptacles that have branch circuit conductor terminations that permit feed-through will be evaluated to UL 498 for feed-through installations. These receptacles have terminals that permit connection of both the line (supply) and load branch circuit conductors to the receptacle terminals.

Appliance with More Than 15 A

Q. We have a machine that is now in development and draws more than 15 A. I was now asked to check whether the machine will work in the regular U.S./Canadian household kitchen. I was told by an electrician that the regular outlet is 5-15R and the machine would therefore not work in 90% of households. I would like this confirmed and check if there is something (easy) a customer could do to make this machine work or if the whole socket would need to be replaced by an electrician.

A.

Your information is substantially correct. The typical U.S. kitchen has socket outlets (receptacles) rated at 15 A. Although in newer homes they may be installed on a 20 A branch circuit, they will only accept a 15 A plug. If the circuit is 20 A, then the socket outlet (receptacle) could be replaced with a 20 A rated device that will accept both 15 A and 20 A plugs. This should be done by a qualified electrician. Also keep in mind that these outlets are likely to be GFCI devices in a kitchen.

Regarding small plug-in appliances, our installation code requires that they not utilize more than 80% of the branch circuit rating, unless it is installed on a dedicated circuit. This means a typical appliance with a 15 A plug should not draw more than 12 A and an appliance with a 20 A plug should not draw more than 16 A.

Listing agencies such as UL will usually enforce these limitations during product certification.

Tightening Torque

Q. Why isn't a wire-binding screw torque required info with manufacturer's installation instructions? I am looking for the NEMA minimum tightening torque requirement on electrical device wire binding screws.

A.

Wiring device manufacturers are required by the NEC to supply wire-binding screw torques with their installation instructions. They aren't and don't have to be the same from manufacturer to manufacturer. You must follow the specific manufacturer's recommended torque values for a safe installation.

30 A Receptacle 15 A Circuit

Q. Can I use a NEMA 14-30R receptacle on a 15 A circuit?

A.

According to the NEC, "A single receptacle installed on an individual branch circuit shall have an ampere rating not less than that of the branch circuit." So: yes, a NEMA 14-30R receptacle could be installed on a 15 A circuit assuming that the load is 15 A or less.

Having said that, it may not be good practice to install a 30 A receptacle on a 15 A branch circuit. Utilization equipment with a 30 A plug would normally overload a 15 A circuit. Using a 30 A plug on equipment that only has a 15 A or lower load would not overload a 15 A circuit but can create a different issue. Since the plug is a standard configuration, it could be plugged into a receptacle that is on a 30 A branch circuit. If the equipment was designed with components and wiring suitable for the 15 A load, the 30 A overcurrent protection may not be adequate to protect the equipment.

Transfer Switch

Q. Would a 30 A 120/277 V double pole double throw center off snap switch be suitable for use as a manual transfer switch for a portable generator setup? Thanks for any input.

A.

A general use snap switch like the one described above is not suitable for use as a transfer switch. The NEC 110 Installation and Use article states: "Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling." The UL guide card for this category of switch states: "Snap switches have not been investigated for switching a load between two alternate sources of supply. Double-throw enclosed switches (see Switches, Enclosed [WIAX]) or switches Listed as transfer switches (see Transfer Switches [WPTZ] and Emergency Lighting and Power Equipment [FTBR]) should be used for this purpose."

Horsepower Rating of Inlets

Q. What standard specifies the horsepower rating of electrical "inlets" (male receptacle)?

A.

UL 498. Many standard configurations have a standard horsepower rating. This rating would be specified in the end product standard such as UL 498 for a NEMA WD 6 type device. The standard requires a test appropriate for the rating.

If the configuration does not have a standard HP rating, then it has no HP rating. A manufacturer can have their products specifically tested and marked but it would only apply to that one manufacturer's product.

For horsepower ratings, consult UL and UL's standard for the specific end-product.

Locking vs. Non-Locking

Q. Where would one use locking vs. non-locking plugs/receptacles? Are there any code or other requirements in that regard?

A.

The NEC as well as state and local codes require locking devices in certain installations. Consult your local Authority Having Jurisdiction (AHJ) for your particular needs. Locking devices are often used in construction and industrial applications to minimize unintended disconnects.

Live Contact Exposure

Q. I am trying to confirm that NEMA WD standards prevent live-contact exposure when a plug is partially inserted in a socket, for a residential 5-15 type plug and socket.

A.

The dimensional requirements for wiring devices specified in the ANSI/NEMA WD 6 standard are intended to minimize the possibility of unsafe interchangeability between configurations of different electrical ratings. The performance requirements for plugs and receptacles are covered by UL 498 *Standard for Safety Attachment Plugs and Receptacles*. There are both prescriptive and test requirements in UL 498 that evaluate plugs and receptacles to address the safe design of these products, including inadvertent exposure to live parts. Products evaluated to UL 498 will minimize the risk of contact with live parts.

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