

Relocatable Power Taps “RPT’s”

A.k.a.: Strip Plugs, Power Strips, Power Taps, Temporary Power Taps & Transient Voltage Surge Suppressors “TVSS’s”



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Where did they come from? The history.

These devices evolved from the advent of computers and their associated hardware components. The computer hard drive and associated monitor, printer, scanner, modem, and so on required numerous receptacle outlets for power. It was not reasonable to expect the installation of numerous additional receptacle outlets in the “premises wiring system” by each computer. It is particularly important to note that the total power used by these computer peripherals is not very much. In fact, all of these hardware devices required for a single workstation may only draw a total of 3 to 5 amperes of current (360 to 600 watts).

What they are!

Although referred to as many things, Relocatable Power Taps or simply RPT’s, are made up of various components including as many as six receptacles, frequently an on/off power switch, circuit breaker and a flexible cord. These Units are evaluated and “listed” by Underwriter Laboratories Inc. (“UL”) under standard UL1363, (titled: Relocatable Power Taps).

RPT’s that contain additional electronic components which provide some degree of “electrical surge” protection and “electrical noise” filtering for the protection of sensitive electronic equipment are called Transient Voltage Surge Suppressors or simply “TVSS’s”. Although these TVSS’s are listed under UL1449 standard (titled: Transient Voltage Surge Suppressors) they are also automatically dually listed by UL and meet the requirements of UL1363 Relocatable Power Taps, and are treated the same for OSHA purposes.

What they aren’t!

RPT’s are not extension cords (called cordsets by UL) nor are they a temporary wiring method as prescribed by NFPA. Extension cords are listed under different UL standards (UL817 Cordsets and Power Supply Cords); an entirely different product category with entirely different requirements. Originally RPT’s were called Temporary Power Taps or TPT’s for short and the title of UL1363 was in fact “Temporary Power Taps”. The title of the standard as well as the label marking on the device created such a source of confusion to users that UL changed the title of the standard and the marking requirements in 1999 in an effort to dispel the incorrect assumption that this device is temporary wiring. The impact of this change has yet to be determined.

The only remaining reference to **temporary** in UL1363 refers to the standard requirement that the physical mounting of the device (which may be desirable to avoid physical mechanical damage to the unit by such things as office chairs or vacuum cleaners) **shall not require the use of tools to remove it.**

The problem: use or misuse!

The real problems are in the application or use of these devices, or more to the point, the misuse of these devices. The best characterization for the proper use of these is that they are designed for a high concentration of low-powered loads. This means that many (usually up to six) loads (computers and such) can be safely powered by RPT's.

The "General Information for Electrical Equipment Directory" (called the UL white book), published annually by UL, lists usage requirements for all of UL's product categories, including RPT's. The UL white book describes the use of RPT's as "a relocatable multiple outlet extension of the branch circuit to supply laboratory equipment, home workshops, home movie lighting controls, musical instrumentation, and to provide outlet receptacles for computers, audio and video equipment and other equipment".

There are many ways to misuse these devices and numerous standards which apply. Unfortunately, an all too typically found misuse of the device finds inappropriate loads plugged into it. Examples of such inappropriate loads include, but are not limited to, refrigerators, coffee pots, space heaters, microwave ovens, toasters, toaster ovens and other high power loads. More on this problem later.

Always start with the instructions!

Instructions for use are prescribed by both the manufacturer of the device as well as UL. Unless the RPT is brand new and in the package, just try to find those instructions. So where does one go? The label on the RPT will not have all the instructions, but in addition to all other required electrical information will generally state "indoors, dry location only".

To convolute this instructions issue further, we have found packaging and advertising instructions from the manufacturer on new RPT's to be in conflict with UL product usage instructions (more on UL instructions later). Recent discussions with UL officials indicate that this is probably a miscommunication between the technical design people and the marketing staff within certain manufacturers whereby the advertising on the package is solely sales-driven. UL has expressed an interest in investigating such discrepancies from a safety standpoint. This author suspects that third-party litigation against such companies for unsafe marketing claims will eventually result in more realistic and safe usage instructions on packaging.

OSHA's 29 CFR 1910.303(b)(2), 29 CFR 1926.403(b)(2), NFPA 70 also known as the National Electrical Code® or NEC® Article 110.3(b), are all standards which require the instructions to be followed. These references are all titled "**Installation and use**". These references state: "**Listed or labeled equipment shall be installed and used in accordance with any instructions included in the listing or labeling**".

The other place we get instructions from is UL, specifically the UL "Guide Information for Electrical Equipment" also called the "white book" by UL.

The installation instructions contained therein state:

- Relocatable power taps are intended to be directly connected to a permanently installed receptacle.
- Relocatable power taps are not intended to be series connected (daisy chained) to other relocatable power taps or to extension cords.
- Relocatable power taps are not intended for use at construction sites and similar locations.
- Relocatable power taps are not intended to be permanently secured to building structures, tables, work benches, or similar structures, nor are they intended to be used

- as a substitute for fixed wiring.
- The cords of relocatable power taps are not intended to be routed through walls, windows, ceilings, floors or similar openings.

Remember the UL requirement on *permanent securing*. It's often desirable to secure the RPT to avoid damage which is permissible by UL standard as long as no tools are required to remove it.

Additional standards which apply.

Any UL listed device must also be used in accordance with all other standards which apply; standards such as OSHA standards, as well as the NEC[®]. These organizational standards include sections on flexible cord uses, both permitted and not permitted.

The RPT has numerous components, including a flexible cord. Although uses not permitted of that cord were already listed in the UL instructions, the additional standards must also be applied. OSHA 1910.305(g)(1), and NEC[®] Articles 400.7&8, outline uses of flexible cords. These would apply to the flexible cord on the RPT. Additionally OSHA 1910.332, 1910.334 as well as NFPA 70E require employees using this equipment to be trained in the inspection of these devices for electrical hazards as well as the safe use of them. Procedures need to be in place to remove any portable cord and plug equipment (including RPT's) which are found to be defective.

Ampacity issues (fire hazards).

OSHA 1910.304(b)(4) & NEC[®] 210.21 Outlet devices shall have an ampere rating not less than the load to be served. Also OSHA 1910.304.(b)(4)(ii)(B), and NEC[®] 210.21(B)(2) generally limits the maximum cord-and-plug-connected load to branch circuit receptacles to 12 amperes or 1440 watts for a 15-ampere receptacle. This is easily exceeded with the use of heavy appliances but not with the lighter loads, such as computer peripherals and other equipment listed for intended use in the UL white book for RPT's. Figure 1 illustrates the overloading of a 15 amp receptacle outlet on a 20 amp branch circuit where RPT's are used to allow excessive loads to be connected to the outlet and circuit. It should be noted that it is not necessary to use RPT's to exceed safe allowable loading of the outlet on a branch circuit. However the RPT's frequently contribute to the problem by virtue of their ability to allow up to six more additional outlets for the connection of loads. It is interesting to note that in the diagram the loads do not exceed the overcurrent device rating (circuit breaker) on the individual RPT's (usually 15 amperes) nor does the total load exceed the 20 ampere branch circuit rating, but does, however, exceed the allowable safe loading (12 amperes according to the codes) of the branch circuit duplex receptacle outlet.

Figures 2 & 3 show the maximum allowable cord and plug connected load to a receptacle outlet as permitted by OSHA 1910.304(b)(4)(ii)(B), Table S-4 and NEC[®] 210.21(B)(2). Although not governed by the same *"installation and use"* requirements of relocatable power taps, the devices shown in figure 4 shows "current taps" which are UL product category "EMDV" and listed under UL 498A, "Current Taps and Adapters". These devices also facilitate the overloading of receptacle outlets by nature of their design and must still be used with careful consideration of ampacity and maximum loads permitted on the receptacle outlets that these devices are plugged into.

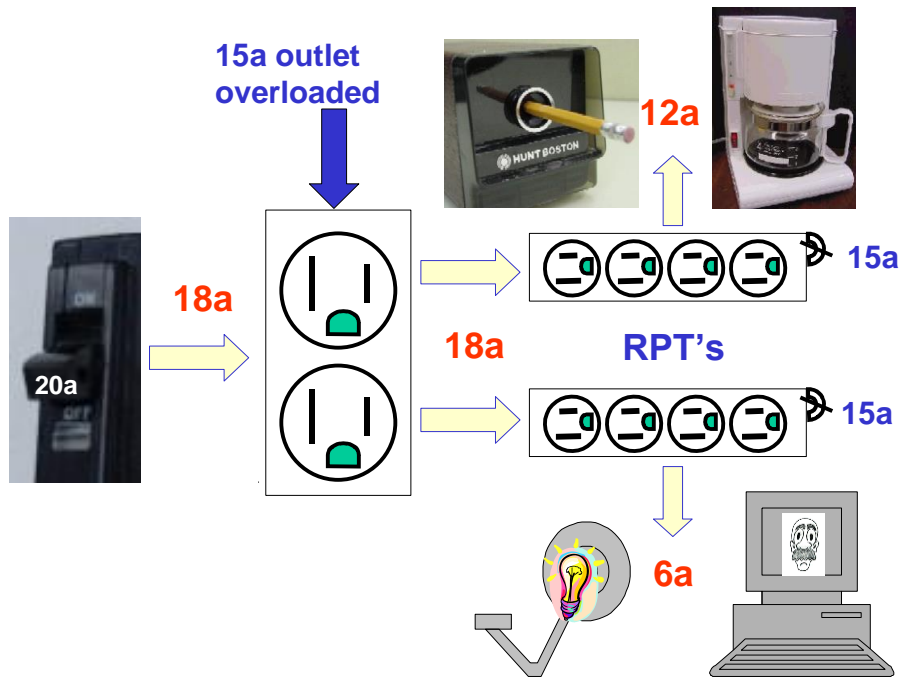


Figure 1

Figure 2
15 amp duplex outlet



Not more than 12a total loads (stuff) plugged in
1910.304(b)(4)(ii)(B), Table S-4 and NEC® 210.21(B)(2)

Figure 3
20 amp (T slot) duplex



Not more than 16a of total loads (stuff) plugged in
1910.304(b)(4)(ii)(B), Table S-4 and NEC® 210.21(B)(2)

Use them safely!

Do: use RPT's for their intended use and with the intended equipment or loads, avoid physical damage, exposure to water or wet locations.

Don't: plug in heavy appliances with high-powered loads, plug RPT's into extension cords or other RPT's, use outdoors, or on construction sites or in violation of the other applicable standards. Remember, living better with electricity safely is the key!



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“**Grizzy**”, as he likes to be called has been recognized by OSHA’s National Office in Washington D.C. as both a National Electrical Code (NEC®) historian as well as “the best electrical safety trainer in the country!” Certainly at the very least Grizzy has been OSHA’s electrical safety “go-to guy” and has been instrumental in shaping and interpreting OSHA policy and regulations for several decades.

Grizzy has trained OSHA compliance officers, appeared as OSHA’s electrical expert, and guided literally hundreds and hundreds of electrical fatality investigations. Grizzy continues to train OSHA compliance officers and personnel coast to coast, as well as still providing investigative assistance to the Agency on fatality investigations and significant cases. His electrical expertise has not only shaped OSHA policy but also the OSHA Electrical Standard’s. Grizzy is currently a **member of the ASTM F-18 Committee** which writes the “**Electrical Protective Equipment for Workers**” standards.

Licensed by the Department of Education, and prior to his OSHA career, Grizzy had been both an **educator and administrator** for various public and private schools and held the position of Electronic Department Chairman and Director of Education at a New York City proprietary school.

In addition to being a **professional speaker** and **nationally recognized seminar leader** with **over 40,000 hours of platform experience**, Grizzy has lectured at numerous colleges and universities all across the US and has numerous published works in video and print which have assisted safety professionals and helped workers for decades.

Recognized nationally as **preeminent in regulatory electrical safety training**, Grizzy conducts training all across the country providing insight into navigating the complex regulatory requirements.

Grizzys passion for electricity and decades of collecting rare electrical artifacts which he is now exhibiting and demonstrating in spectacular high voltage keynote presentations at major conventions affords attendees of his events a unique opportunity to actually see a “slice of history”. In fact his events have been characterized by attendees: “It’s like watching the History Channel, only live!”