

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 1910.303(b)(2), 1926.403(b)(2), NFPA 70 (the National Electrical Code® or NEC) Article 110.3(b), and NFPA 70E (Standard for Electrical Safety in the Workplace) 400.3(B) (Part I Chapter 1-3.2, 2000 Edition) 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 white book. 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, NEC®, and NFPA 70E. All of 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), NEC® Articles 400.7&8, and NFPA 70E 420.7(B)&(C) (Part I chapter 3-7.2 & 3-7.3, 2000 Edition) all outline uses of flexible cords. These would apply to the flexible cord on the RPT.

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), NEC® 210.21(B)(2) and NFPA 70E 410.5(B)(2) (Part I chapter 2-2.5(b)(2), 2000 Edition) 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.

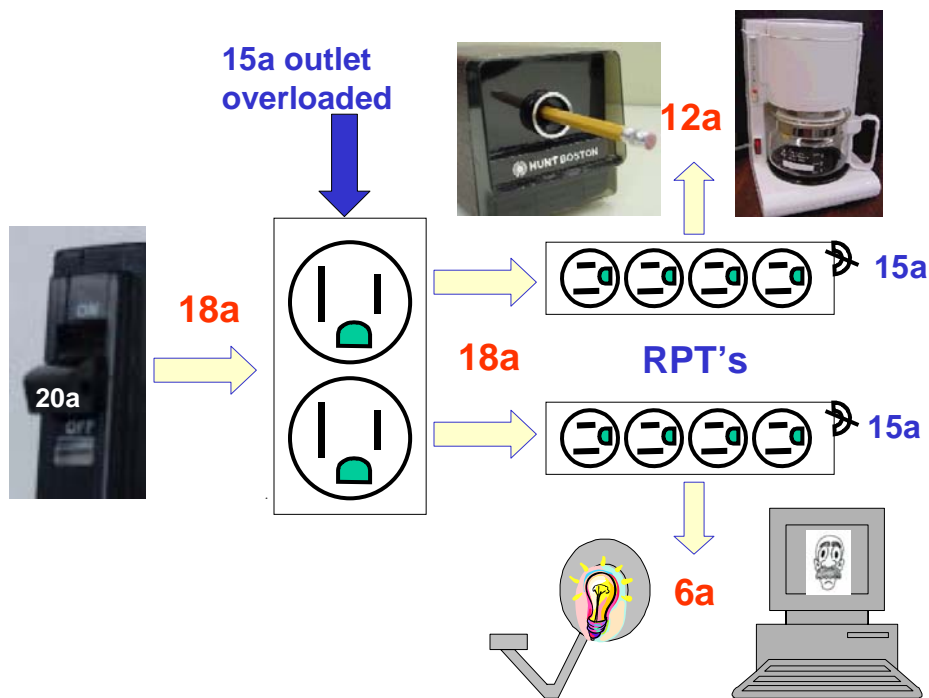


Figure 1

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!