



How Exposed-Run Tray Cable Brings Outdoor Power to DC Defenders, AP Antennas and Factory Automation

White Paper

Most power cables that are made for standard indoor use would not last long outdoors under the elements or even indoors on a factory floor. That's why TC-ER power cable was developed.

TC-ER stands for “tray cable – exposed run.” It is a rating for a type of electrical cable that is specifically designed for use in industrial and commercial applications where the cable will be exposed to harsh conditions such as moisture, heat, and mechanical stress.

This paper describes several main functions of TC-ER – namely, powering DC Defenders, AP antennas, and factory automation – and the benefits of buying this type of cable in bulk spools. It concludes with information about Transtector's new line of TC-ER bulk cable.

Requirements of TC-ER

TC-ER-rated power cable is commonly used in cable tray systems and raceways, where it can be run exposed without the need for a conduit or other protective covering. It often powers devices that are high atop towers, such as antennas, as well as control motors, pumps, and other equipment in manufacturing plants, chemical processing facilities, and other industrial applications.

To carry the TC-ER rating, the power cable must meet specific requirements regarding its construction and performance. It must be rated for use in wet and dry locations, be resistant to sunlight, and have a minimum bend radius for installation. Additionally, exposed-run tray cable must be able to withstand mechanical impact, such as being stepped on or run over, and resist damage from chemicals and oils.

Following are details about three of the many uses for exposed-run tray cable.

Powering DC Defenders

One common use for TC-ER is to power [DC Defender surge protection devices](#). DC Defenders protect sensitive electronic equipment and systems from [power surges](#) and electrical transients caused by lightning strikes, power fluctuations, and other electrical disturbances. They are commonly used in applications where DC voltage is used, such as solar panel installations, telecom systems, and industrial automation systems.

To power DC Defender SPDs, exposed-run tray cable is typically run from a power source, such as a DC power supply or battery bank, to the location of the surge protection device. The cable is often installed in a cable tray or conduit for support and protection.

At the SPD location, the TC-ER is connected to the device's power input terminals, which allows it to receive power from the DC power source. The surge protection device is then connected to the load, such as a solar panel or industrial control system, to provide protection against voltage spikes and surges.

Exposed-run tray cable is well-suited for use with DC Defender SPDs because it is designed to handle high-voltage and high-current applications, and is resistant to damage from harsh environmental conditions. The cable is often rated for use in hazardous locations and is available in a range of gauges and configurations to meet the specific power requirements of the application.

Powering AP Antennas

Another popular use for TC-ER is to connect with an antenna with a high-power access point (AP). An AP is a wireless networking system that consists of an antenna with a high gain and an access point that has a high transmitting power. The high-power AP allows the access point to transmit a stronger signal over a longer distance, providing greater coverage and improving the overall performance of the wireless network.

To power AP antennas, the exposed-run tray cable is typically run from a power source, such as a battery or DC power supply, directly to the antenna. If the AP antenna supports PoE, the TC-ER cable may be able to be used to power the Ethernet PoE switch or injector.

Powering Factory Automation

[Exposed-run tray cable](#) is useful with factory automation for several reasons. It is rugged enough to withstand not only mechanical impact and movement but contact with chemicals, oils, and heat. Another factor is its ability to interface with terminal block power. Terminal blocks are commonly used in industrial control systems, automation equipment, and power distribution applications. They provide a convenient and reliable means of connecting multiple wires together, as well as a way to distribute power to different parts of a system.

To power factory automation equipment, TC-ER is typically run from a power source, such as a power distribution panel or motor control center, to the location of the equipment. The cable is often installed in a cable tray or conduit for protection and support.

At the equipment location, the exposed-run tray cable is connected to the appropriate power supply or control device, which allows it to power the equipment and control its operation. For example, the cable might be connected to a motor starter, a variable frequency drive, or a programmable logic controller (PLC), depending on the specific type of equipment being powered.

TC-ER can be used to transmit data signals in addition to power, making it possible to control factory automation equipment remotely and monitor its performance. This can be accomplished by using cables with multiple insulated conductors, which are twisted together and encased in a protective outer jacket, similar to the configuration used for powering AP antennas in wireless network installations.

Benefits of Bulk Power Cable

A key feature to look for in exposed-run tray cable is for it to be offered in bulk lengths. This ensures that it can cover longer distances, such as for tower runs, and that you can cut custom lengths in the field instead of having to determine the exact lengths you will need ahead of time.

Other benefits of buying TC-ER in bulk:

- **Cost savings:** Purchasing cable in bulk quantities often results in cost savings compared to buying smaller lengths of cable. This can be especially beneficial for large-scale projects that require a significant amount of cable.

- **Customization:** Buying cable in bulk allows for greater flexibility in terms of customizing the cable length and configuration to meet specific project requirements. This can help to reduce waste and ensure that the cable is tailored to the needs of the project.
- **Reduced downtime:** Having a surplus of cable on hand can help to minimize downtime in the event of unexpected repairs or replacements. This can be especially important in industrial settings where downtime can result in lost productivity and revenue.
- **Convenience:** Buying cable in bulk can be more convenient than purchasing smaller lengths of cable, as it eliminates the need to constantly reorder and restock cable supplies.
- **Improved project planning:** Buying cable in bulk can help to improve project planning and scheduling, as it allows for greater control over the timing and delivery of cable supplies. This can help to ensure that the project stays on schedule and within budget.

Transtector's New Line of TC-ER Bulk Cable

We have just released a line of [TC-ER-rated, exposed-run tray cable](#). Offered in bulk lengths, it is perfect for use with antenna and tower runs with high-power APs, telecom, factory automation, cryptocurrency rigs, field repair and DC Defender products. You can use this 600-volt cabling for DC power, building wiring, anything industrial with terminal-block power, and more.

Key Features:

- **Defender-friendly:** Compatible with DC Defender products
- **Rugged:** Outdoor-rated, THWN jacket resists water, UV rays
- **All-temperature:** -40 F to +190 F; VW-1 burn rating, THHN heat resistant
- **In your size:** two- or three-conductor, 10, 12 or 14 AWG, 600V
- **Certified:** UL 86, UL 1277 and UL 1581
- **Field-packaged:** Bulk-length reels are handy for field use

Our new line of [TC-ER-rated, exposed-run tray cable](#) is **in stock** and available for **same-day** shipping.

Summary

Exposed-run tray cable, or TC-ER, is designed for use in industrial and commercial applications where the cable will be exposed to harsh conditions such as moisture, heat, and mechanical stress. It is especially useful in powering DC Defender surge protectors, high-power access point (AP) antennas, and factory automation. Purchasing TC-ER in bulk lengths is cheaper, allows you to customize your installations, and is more convenient for covering long distances such as tower runs. You can take advantage of all the benefits of exposed-run tray cable by checking out Transtector's new line of [TC-ER-rated bulk cable](#).

For more info, visit our website at [Transtector.com](https://www.transtector.com) or [contact us](#) at +1 (208) 635-6400 or through our [customer service request form](#).