



PROTECTING TELECOMMUNICATIONS EQUIPMENT

Emerging Trends in Circuit Protection for Telecom Power Distribution Units

Circuit protection is vital to the reliability and serviceability of your network. For years, telecommunications equipment manufacturers have relied on standard power distribution units. However, recent trends in PDU's offer higher reliability to the network. Discussed below are a few small shifts in trends which are making a large impact on power distribution units.

The move to thermal circuit breakers

Telecom equipment manufacturers typically have chosen magnetic circuit breakers rather than the less-costly thermal units in 48V distribution panels. Magnetic breakers have been preferred because they offer higher voltage ratings and low internal resistance -- magnetic circuit breakers are thought to dissipate less power (power is expensive) and generate less heat

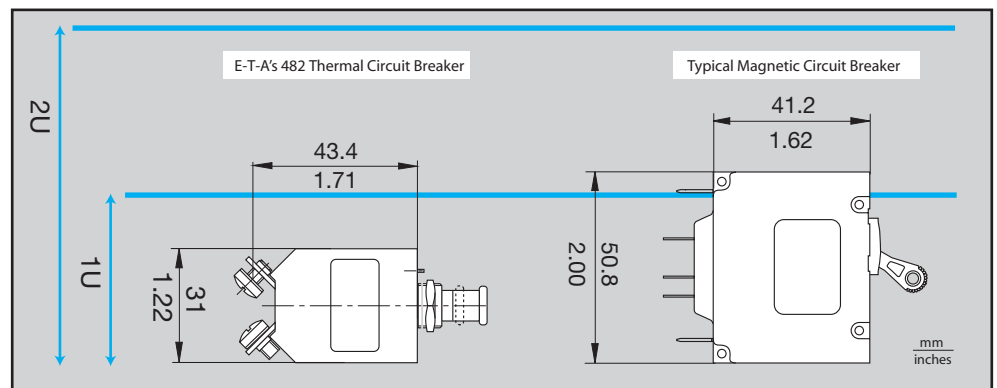
choice and are finding that thermal breakers have some worthwhile advantages in telecom PDUs.

Probably the most attractive feature of thermal breakers is that, for the same current rating, they are smaller than magnetic breakers. An E-T-A 482 Series breaker rated for 50 amps can be mounted at just 31 mm (1.22 inches) high. A typical magnetic breaker is 50.8 mm (2.00 inches) high and must be mounted vertically to assure proper function. This means that a row of 50-amp thermal breakers can fit on a 1U panel, while magnetic breakers would require 2U panel height—and panel space is a precious commodity. (Figure 1)

Internal resistance

As mentioned before, magnetic breakers have been popular because of their low voltage drop, but some of today's

Figure 1



(heat is always a factor to consider). In recent years, however, engineers have begun taking another look at this

thermal breakers have similar internal resistance as magnetic breakers. An E-T-A 482 Series breaker rated for

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50A has the same rated internal resistance as an 8340 Series magnetic breaker with the same current rating: less than 0.01 ohms.

Voltage ratings

Traditionally, magnetic circuit breakers have been ideal for telecom applications because the products are offered up to 65 V DC. Until recently, thermal technology was not designed for higher voltage ratings. However, newer generations of thermal circuit breakers protect up to 75 V DC, such as E-T-A's 483 series.

Environmental conditions

There's another trade-off between thermal and magnetic breakers: shock and vibration ratings. Because of their latching mechanism, thermal breakers are inherently more resistant to shock and vibration, while magnetic breakers, with their moving masses and swinging armatures, are more likely to trip if there is a physical disturbance. In areas with frequent seismic activity, this can be a legitimate concern. Does anyone want to compromise safety, send a service vehicle out to a remote site, or pay for the downtime until the service is done?

Push-pull actuators

Circuit breakers are available with a

variety of actuator styles, including toggle and rocker switches in different shapes, but there's a style usually associated with military equipment that has a lot to offer telecom equipment: the push-pull actuator. The big advantage of the push-pull actuator is the avoidance of accidental actuation. Backing into a toggle, or bumping it with an object, can potentially trip the breaker and put a set of circuits off-line for no reason. Turning off a push-pull breaker requires gripping the handle



E-T-A's 482 Series offers high performance thermal circuit protection for telecom applications (up to 50A)

and firmly pulling it outward, which is nearly impossible to accidentally occur. That's why push-pull breakers are used in military aircraft, where shutting down a circuit accidentally can be fatal. Shutting down part of a telecom system accidentally may be equally fatal if an emergency call cannot connect to an emergency response team.

Outsourcing the power panels

Telecom equipment manufacturers typically do not specialize in power distribution units. It makes little sense for

them to build power distribution panels when they can put their time and expertise towards core products and services. Of course telecom manufacturers have used panel shops to do this work, but there's a better alternative: the circuit breaker manufacturer. A company like E-T-A is a specialist in



E-T-A's X482 PDU is 1U holding up to 20 circuit breakers (up to 900A)

power distribution, and because most of the cost of a PDU is in the breakers, the manufacturer has a cost advantage on custom-built units.

E-T-A's 50 years' of experience in designing and building innovative circuit protection can turn power distribution requirements into complete precision-manufactured power distribution solutions. Working closely with your engineering team, we can advise you on cost-saving enhancements and handle design completion, manufacturing, assembly and testing. From rack mount panels to custom enclosures, we can turn a concept into a finished power distribution unit.

Whether your design requires magnetic or thermal circuit protection, E-T-A will provide you with the best solution for your application

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