ISSUE: February 2025

Industrial Power Supplies Feature Built-In Circuit Breakers

RS offers the Phoenix Contact TRIO3 Power Supplies, which are described as the world's first power supplies with integrated circuit breakers. Designed to help machine builders overcome common challenges, these compact, plug-and-play power supplies offer space, energy, and cost savings, easy handling, and smart diagnostics, like the rest of the TRIO POWER range, and add integrated multi-channel circuit breakers for superior device protection and system performance (see the figure).

Machine builders play a vital role in the industrial market, developing the machinery and subsystems essential to discrete and process manufacturing and material handling operations in virtually every segment, spanning food and beverage and pharmaceuticals to automotive, transportation, and oil and gas. And despite the variability of these machines and the unique demands of these various market segments, powering these machines poses a number of common challenges, including accommodating space and cost constraints; improving availability; preventing unplanned downtime; standards compliance; energy efficiency; ensuring employee and equipment safety and enabling easy handling.

To help machine builders overcome these pervasive challenges, Phoenix Contact expanded on its portfolio of compact, robust, and reliable TRIO POWER power supplies. The TRIO3 power supplies combine the core capabilities of the TRIO POWER series with integrated circuit breaker to deliver robust device protection, space and cost savings, ease of use, energy efficiency and smart diagnostics.

Configurable NEC Class II outputs provide safe, flexible protection for four or eight channels and, in an emergency, reliably drop problematic channels in priority order to protect the entire system from overload. Compliance with UL and Class 1 Division 2 standards ensures safe operation in hazardous environments.

Integrating the circuit breaker into the power supply and employing front-facing connection technology significantly reduces the amount of rail space required. The compact TRIO3 form factors have a low width and installed depth and support side-by-side mounting to maximize available space in small, shallow control cabinets with depths down to 210 mm.

The integrated circuit breakers enable cost savings by eliminating the need to purchase additional power supplies with multiple breakers, trip characteristics, or currents. They also eliminate the problem of blown fuses, which translates to additional cost savings in terms of reducing both the unplanned downtime and material and labor costs associated with replacing fuses. In addition, TRIO3 power supplies use 70% less wiring than the rest of the range, which significantly reduces installation costs.

These plug-and-play power supplies are equipped with push-in connection technology that facilitates quick, reliable connections without any tools. They also feature integrated marking fields that can be used for electrical idle detector (EID) and circuit marking, potentiometers with mechanical locks to ensure tamper-proof performance, pictograms that communicate appropriate stripping lengths, and an intuitive commissioning concept.

Users can effortlessly set the current of each channel to satisfy a specific application without worrying about power disruption or wasted energy, further reducing costs and supporting sustainability efforts. TRIO3 power supplies also have a dynamic boost feature with a powerful output characteristic curve that can efficiently provide up to 150% of the nominal power for five seconds to support short-term power increases, like starting motors, while mitigating their impacts, like reducing motors' ramp-up time and power draw.

A multicolor LED status display, a collective relay contact, and optional IO-Link communications support intelligent visual and preventative function monitoring. TRIO3 power supplies prioritize and manage loads while adapting to fluctuating demands to maintain high system availability. They also shut down the power supply in the event of an overload, further enhancing overall reliability.

For more information, see the TRIO3 power supplies page or watch the RS Tech Talk video about the TRIO3. For assistance identifying, procuring, deploying, and maintaining Phoenix Contact's new TRIO3 power supplies for machine-building applications, contact your local RS representative at 1-866-433-5722 or reach out to the RS technical support team. For more information about Phoenix Contact or its products, visit the Phoenix Contact website.

Figure. From RS, the Phoenix Contact TRIO3 power supplies are described as compact, cost saving, energy efficient, and easy to install and maintain. They're also said to be the world's first power supplies with integrated circuit breakers, providing an all-around solution optimized for machine builders. The power supplies are available in single- and three-phase models with four- or eight-channel device protection at output power levels up to 960 W with an output voltage range of 24 to 28 Vdc.