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INSPIRING INNOVATIONS

Push-in Relays: Faster Connections

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Abstract

Today's industrial control engineers and installers need to save space in the cabinet and reduce installation time. They need connection technology that is smaller, faster, safer and error-free, all at a lower cost. As manufacturers look for new ways to reduce costs, this trend even applies to industrial relays.

Push-in termination technology does not require any installation tools, which decreases installation time and labor costs, and eliminates costly wiring errors. Relays with push-in termination technology can have up to five times the IEC requirement for retention force, making the relay wire connection reliable and ideal for high-vibration applications. With the additional benefit of push-in termination technology, today's PLC relays can provide the advantages of faster installation time, fewer wiring errors and less cabinet space – all of which reduce the overall installation costs for a control application.

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Introduction

Technology connecting the world today is expected to be smaller, faster, safer and error-free, all at a lower cost. This trend is true even for industrial relays, as manufacturing companies expand their efforts to reduce operating costs.

PLC relays serve as coupling devices between controllers and field devices. They can be used in nearly any application that requires switching to take place.

PLC relays need to keep up with the demands of industrial control engineers and installers. More control engineers are moving toward products that incorporate relays to reduce installation time and eliminate costly wiring errors. Demand has grown, as customers have seen reduced installation overhead positively impact their bottom line.

Push-in termination technology does not require any installation tools, which decreases installation time and labor costs, and eliminates costly wiring errors. Relays with push-in termination technology can have up to five times the IEC requirement for retention force, making the relay wire connection reliable and ideal for high-vibration applications.

One of the largest expenses is the cost of the control cabinet; therefore space-saving products are important. A relay system that is compatible with a wide range of accessories, including system cable adapters, feed terminals and plug-in bridges, will help to decreases installation time and labor costs, and help ensure error-free wiring **(Figures 1 & 2)**.

With control cabinet space at a premium, narrow relays also provide value. For example, Phoenix Contact offers a single-pole, double-throw (SPDT) relay just 6.2-mm wide.

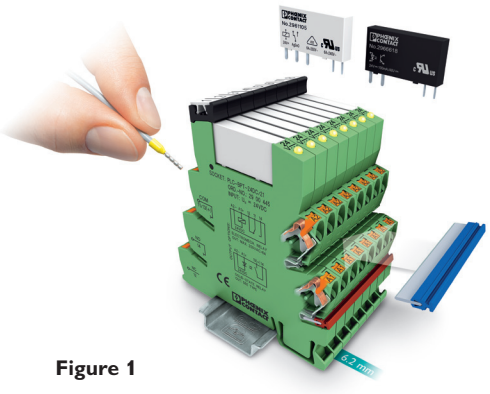

Figure 1

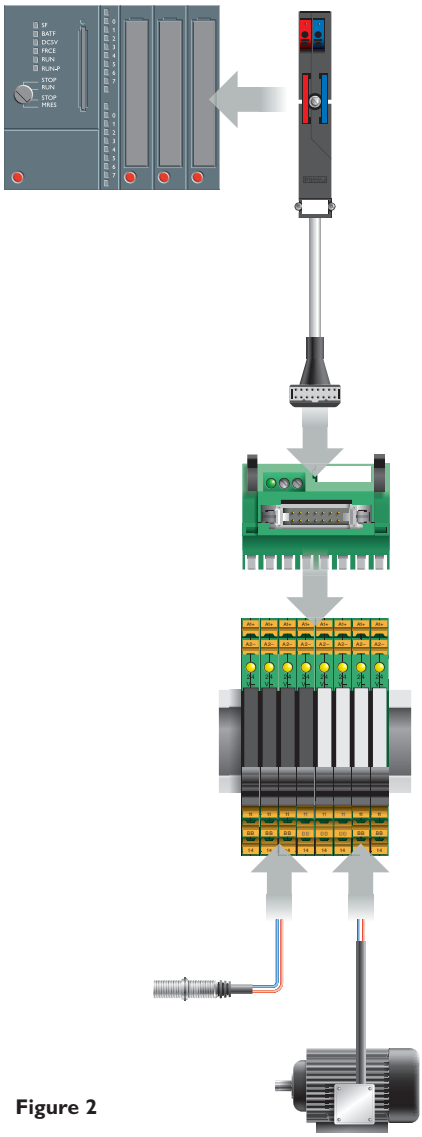

Figure 2

Making Wiring Easier – Push-in Relays for Modular Machine Designs

Modular machine design is on the rise. Users are demanding more from products along the entire process chain right up to the last component. Modern relays with push-in termination technology make systems more economical and flexible.

Mechanical engineers base their strategic design decisions on their customers' production requirements. This trend is known as "Lean Product Design." The market is moving away from fully automated, complete production systems toward smaller production cells having standardized functional modules.

Lean, Cost-Effective and Individually Configurable

Lean Product Design does not mean poorer quality or reduced availability. It simply describes a way to standardize predefined functional modules to meet customer demands. The production designs stipulate that the systems should be lean, cost-effective and individually configurable. Component manufacturers are also falling in line with this trend. In today's market, you can find a wide variety of terminal-block-style industrial relays. These relays are designed for flexibility, economy and ease of use.

Although the universal screw connection technology still dominates the global market, spring-connection technologies have started gaining ground. The newest PLC relays take spring technology a step further. Push-in termination technology uses compression springs to press the conductor against the live copper rail to form an electrical connection.

Installers find this technology particularly useful. No tools are required for wiring, since a ferruled wire is connected to the contact point directly – without tools. These push-in relays enable direct wiring of conductors from 26 AWG to 14 AWG wire sizes, with ferrule.

Push-In Relays Make their Mark

This innovative push-in termination technology **(Figure 3)** is much easier to use than earlier spring versions. Wiring without tools is particularly useful in cramped, hard-to-access areas. Thanks to push-in termination technology, electricians at the end of the process chain can even work with one hand. Forming a connection is as easy as grasping the conductor and plugging it in. This simpler, ergonomic wiring style reduces wiring time and fatigue.

The wide variety of manufacturer-specific connection technologies used in all kinds of terminals, relays and control units makes installers' daily work more difficult. There is no standard way to position conductors and working tools in the components. This can result in faulty wiring, which in turn may lead to system failures and even pose safety hazards.

Push-in relays with distinctive color-coded pushbuttons can solve this problem. Clearly identified pushbuttons will separate the operation and conductor insertion both optically and physically. This rules out any possibility of positioning the conductor incorrectly.

Figure 3

Choosing push-in relays that are 100 percent touch-proof will increase worker safety. Full insulation increases operational safety. Most workers know that working on live systems is dangerous and violates safety regulations, but it still occurs in real life. Despite the dangers, many operators still perform measurement and test procedures or rewire during live operation.

The push-in termination technology actuation button provides secure contact protection with insulation to separate the internal contact elements reliably. This makes it impossible to come in contact with live parts. Relays with safe isolation according to DIN EN 50178 will comply with the stringent safety regulations per IEC 60204-1 and UL 508, ensuring safety.

Conclusion

While there are a variety of spring-connection relays on the market today, Phoenix Contact's PLC relays with push-in termination technology can reduce the required insertion force by up to 50 percent compared with similar products. By combining the advantages of push-in termination technology with Phoenix Contact's well-established PLC relay range, it is possible to meet the growing demand for the kinds of fast, safe and error-free products now needed in industrial control cabinets.

To learn more about Phoenix Contact's PLC PT relays, visit: www.phoenixcontact.com/ptrelay.

ABOUT PHOENIX CONTACT

Phoenix Contact develops and manufactures industrial electrical and electronic technology products that power, protect, connect and automate systems and equipment for a wide range of industries. Phoenix Contact GmbH & Co. KG, Blomberg, Germany, operates 50 international subsidiaries, including Phoenix Contact USA in Middletown, Pa.

For more information about Phoenix Contact or its products, visit www.phoenixcontact.com, call technical service at 800-322-3225 or e-mail info@phoenixcon.com.

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