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myPNOZ: new generation of modular safety relays

Tailor-made safety

[Introduction/overview on PNOZ generally]

It was back in the 1980s that Pilz first had the idea of a redundant safety circuit integrated into a housing. The new solution was to be smaller than the conventional contactor-based circuit and simpler to use, but above all was to be safer, with a certified type examination. That was the birth of the world's first PNOZ safety relay (P = Pilz, NO = E-STOP, Z = positive-guided in German). Keeping pace with technical progress, several PNOZ ranges followed in subsequent years, with cross-sector safety solutions for almost every requirement. The development of the PNOZ ranges and their respective safety relays documents the technical standards of the time. It also expresses how rising automation levels increase the requirements for efficient, sophisticated safety solutions that neither restrict productivity nor encourage manipulation.
In the age of digitisation, in 2021 Pilz is creating another milestone for safe automation: a new type of continuous digital process that fully encompasses creation, simulation, ordering and commissioning is a key feature of myPNOZ. The latest addition to the range is the world's first batch size 1 safety relay.

[Introductory summary for myPNOZ]

With the online tool myPNOZ Creator, for the first time customers assemble their own safety relay myPNOZ and receive "their" product pre-assembled and ready to install –

in batch size 1. It's a new process, from creating, ordering and delivery through to final commissioning: with the myPNOZ Creator, customers “create” their own safety solution, based on the risk analysis. The result is a tailor-made product, whose functionality is determined by the sequence of the modules and which is delivered ready-to-install. The logical structure, the absence of unnecessary parts and the streamlined configuration and order process mean that myPNOZ offers users clear benefits over standard, conventional safety relays.

[Detailed information about myPNOZ – Online tool myPNOZ Creator]

myPNOZ Creator: Intuitive online tool

The myPNOZ Creator is the corresponding online tool, providing users with logic editor functions, a hardware view with editor, simulation and documentation. It's here in the Creator that users, customers in other words, assemble their complete needs-based solution from a wide range of options, creating “their” tailor-made product. No knowledge of software (for programming or creation) is required, as the connection logic for the safety functions is already defined through the plug-in sequence. The “virtual” product that’s generated in this way is then ordered, pre-assembled by Pilz, set up, tested and delivered as a preconfigured system, ready to install. No programming knowledge or software is required for setup, commissioning or exchange. The wiring work and space requirement in the control cabinet are both low.

Just a few steps to safety

With myPNOZ Creator, users get their own individual safety relay: after the risk assessment, when the number and type of hazardous

movements are known, plant and machine builders develop their initial ideas on how to minimise risk. The myPNOZ Creator supports this process logically: users determine the number, type and logic of the safety functions, following a transparent procedure that's kept simple. depending on the safety requirement, they interconnect E-STOP, safety gates, light curtains etc. using logic AND/OR connections. There are just a few ground rules to note: each logic AND must have at least one output, which the user simply adds in the myPNOZ Creator. Should the tool detect any logic errors in the safety function sequence, a red lamp appears; if the connection is correct, a green lamp appears. Users can set further safety functions at will and define details such as delay-on energisation and delay-on de-energisation. They can also identify other safety zones in the plant; these can be assigned an output, which they want to switch with a two second delay for example. At the same time they can determine the conditions under which the plant may restart after it has stopped. If users wish to test at an early stage whether a circuit reacts as intended, they can go to the myPNOZ Creator and trigger a light curtain through simulation, for example, and test the reaction directly.

[Detailed information about myPNOZ – myPNOZ Creator/order process]

Order products almost at the touch of a button

If the selected logic connections are valid, the myPNOZ Creator automatically calculates which modules are needed and the sequence in which these must be inserted. Users receive a wiring diagram alongside the documentation. They can now order their myPNOZ in the desired configuration, almost at the touch of a button. When the preconfigured, ready-to-install safety relay is delivered, customers also receive a cause and effect table. In

practical terms this is a technical matrix that supports commissioning. Delivery also includes a type code with product name, so that if necessary customers can order the same device again at any time.

[Detailed information about myPNOZ – Hardware]

Synergies from tradition and progress in one product

All the safety expertise gathered over past decades are combined within the myPNOZ, alongside the proven features of all PNOZ safety relays such as reliability, safety, simplicity and ease of operation during installation and maintenance, not to mention simple, fast diagnostics.

Essentially, the latest myPNOZ product range is still a safety relay. On the hardware side myPNOZ consists of a head module with plug-in expansion modules. The head module provides the voltage supply as well as a higher-level safety function. Each input module can monitor up to two safety functions. The function of the individually tailor-made myPNOZ results from the defined logic connections; the system logic is determined via the plug-in sequence and the rotary switch setting.

So in terms of its type, modularity and flexibility the needs-based, pre-assembled device is unique: the innovative safety relay is a simple to operate, flexible, modular safety relay with internal combinational logic, which manages without engineering software and is ideally suitable for safety applications of simple to average complexity, from two to a maximum of sixteen safe input functions. myPNOZ combines the characteristics of a simple to operate, flexible, modular safety relay with internal combinational logic. Due to the logic connections between the safety functions based on the plug-in sequence and greatly reduced wiring work, myPNOZ is

particularly efficient to use. myPNOZ manages the process entirely without engineering software. In terms of the structure, the linking of individual functions and the whole procedure for the creation, simulation, order and delivery process, myPNOZ follows a new perspective and a new way of thinking. The particular highlight here is the product's new type of internal logic: Due to the modular structure, myPNOZ can be used to monitor multiple safety sensors without the need to wire multiple relays – as was the case previously.

[Detailed information about myPNOZ – The user]

Benefits even on a low budget

myPNOZ is the logical development of the classic safety relays towards batch size 1. New features are product individualisation, including a previously unknown creation, simulation and order process, as well as a new type of customer support during the commissioning process. In general myPNOZ is aimed at those plant and machine builders and automation specialists in all industries, who wish to cover two to a maximum of sixteen safety functions and don’t want to use engineering software. Smaller and medium-sized enterprises who for a variety of reasons wish to keep their control cabinet free from software (with the exception of the machine controller), benefit in particular. Avoiding maintenance work, no external systems engineers and cost savings for staff software training - these are all economic benefits. Costs can also be optimised when exchanging modules: if only a module is defective, all you need to do is exchange that module and the machine is back running again!

myPNOZ is also aimed at those plant manufacturers for whom configurable small controllers such as PNOZmulti 2 are not (yet) cost-effective, but who would really like to set up multiple safety functions using logic that’s comparable with software programming. Finally, myPNOZ also addresses those users who are already using conventional safety relays such as PNOZsigma for example, but who would have a more flexible, more sophisticated system for their current needs with myPNOZ.

[Detailed information about myPNOZ – Application scenarios and cost-effectiveness]

myPNOZ or “just” PNOZ?

The following rule of thumb applies: One or two safety functions, such as E-STOP and safety gate for example, can still be covered well and cost-effectively in future using a classic safety relay. However, myPNOZ should definitely be considered as an efficient and viable alternative when there are between two and sixteen monitored safety functions. Compared with conventional relays, myPNOZ is the more flexible and expandable product in this segment.

A comparison between myPNOZ and PNOZsigma is recommended even from two safety functions. In the case of a simple press retrofit where an E-STOP and safety gate need securing, a classic PNOZ safety relay would be sufficient at first glance. However, if you add a light curtain or if the safety concept is to take different zones into account, then myPNOZ is recommended. It’s a similar situation for plants with two zones, which the operator wants to handle differently in terms of safety technology. Ultimately, an economical safety solution should not stop the entire plant in an emergency, but just one part of it. These are tasks that can be put together quickly and resolved cost-effectively with myPNOZ, particularly as the systems are already individually pre-assembled when delivered and only need to be installed and connected. Plants become operational faster, the process is much less susceptible to errors and both manufacturers and operators save time and money. If a comparable project is pending, the same myPNOZ solution can be ordered again using a supplied type code. The structure and flexibility of the whole system mean that any adjustments and changes are simple.

Essentially, myPNOZ is designed in such a way that the internal logic can easily be modified or expanded via the plug-in sequence if necessary.

[Summary for myPNOZ]

The modular safety relay myPNOZ gives customers a wealth of possibilities for implementing tailor-made solutions. The fundamental properties of a PNOZ, namely safety, simplicity, ease of operation during installation/maintenance and fast, simple diagnostics, are maintained. These properties make it easy for customers to switch from an existing relay solution to myPNOZ. The individual “pay-what-you-need” approach of myPNOZ guarantees an optimum cost-benefit ratio and makes the safety relay an attractive solution compared with conventional safety relays and with regard to what’s on offer on the market.

((Characters: 11.230; incl. thematic references in square brackets))

Pilz Group

The Pilz Group is a global supplier of products, systems and services for automation technology. The family business is based in Ostfildern and employs around 2,500 staff. With 42 subsidiaries and branches around the world, Pilz supplies safety for human, machine and the environment. The technology leader offers complete automation solutions comprising sensor, control and drive technology – including systems for industrial communication, diagnostics and visualisation.
Consulting, engineering and training round off its international range of services. Pilz solutions are used in many industries beyond mechanical engineering, such as wind energy, railway technology or the robotics sector for example.
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