

Flexible and cost-effective individualization of enclosures

Technical contribution: KV-Enclosure from Dold for assembly on DIN mounting rails



Enclosure technology is not necessarily a core competence of companies that offer electronics assemblies for industrial applications. In many cases, the enclosures are sourced from external suppliers to be able to fully focus on the development and distribution of one's products. With its new KV-enclosures E. Dold & Söhne shows how high-quality enclosures for the DIN mounting rail assembly can be individualized.

A suitable enclosure solution is a major precondition for transforming an electronics assembly into a functional module for installation into a control cabinet. The requirements concerning such an enclosure by far exceed packaging and protection of the electronics. Thus, the enclosures have to comply with norms in conformity with the market and relevant for the application, and they must be easy to install without tools by simply snapping them onto the DIN mounting rail. The connection technology at the enclosure front ensures that the modules (devices) can be wired more conveniently and faster by easy accessibility of the contact points. Naturally, their arrangement should be as individual as possible, and they should be adapted to the application to simultaneously reflect the corporate design of the manufacturer. With its enclosure system of the KV-series, available in widths of 12.5 mm, 17.5 mm and 22.5 mm, DOLD offers device manufacturers a perfect solution that can be individualized cost-effectively even with small and medium-sized batches.

Full functionality at the enclosure front

Automation technology, measuring technology and safety technology are typical applications in which modular assemblies are accommodated in a control cabinet. Due to the increasing digitization the number of inputs and outputs and the number of the further interfaces for potential fieldbus connections rises. The large front surfaces of the KV-enclosures allow the individual arrangement of terminals and the integration of common connections such as RJ45, USB or Sub-D. The integration of displays or LED strips to signal functional conditions is also possible. NFC, radio or fibre optic cables are also easy to realize. In order to prevent unauthorized manipulation of the devices sealable and foldable front covers are available. The accommodation of all connections at the enclosure front allows for space-saving installation in the control cabinet, making the wiring and connection of the modules very easy and time-saving. Push-in clamps in the 3.5 mm or 5 mm grid that can be processed by the reflow soldering technique are provided for the wiring. They have a test point to allow for a quick diagnosis in the application. With over 9,500 mm² the usable surface of the PCBs is very large, with a format selected to optimize the design of the use in production which contributes to lower costs. The wider enclosures can also accommodate two PCBs.



Bei den KV-Gehäusen von DOLD lassen sich die Fronten optimal individualisieren und so an die Anforderungen anpassen.

Flexible individualization concept

The KV-enclosures are injection-moulded from polycarbonate and meet all application-specific requirements of the relevant norms of automation, measuring and safety technology. Due to the self-extinguishing material of the enclosures the fire protection requirements of the UL are not a problem either - they meet the classification V0 acc. UL94. The enclosure design with labyrinthine geometries allows to meet the air and creepage distances of 8 mm stipulated in the norms to meet the interference immunity to the discharge of static electricity. At the same time, it is possible to ideally use the space on the PCB for the placement of electronic components. The enclosures show a high mechanical stability and, if ideally designed, consist of only two main enclosure components. The assembly can be made without tools - upon installation of the PCB the parts are simply clipped together. Lateral ventilation slots allow for optimum heat dissipation by free convection. The protection class is at least IP20 - without ventilation slots and breakout openings in the enclosure front protection classes IP30 or IP40 are also possible.

Each application is different and requires, e.g., a different number of clamps or interfaces. Accordingly, different breakout openings in the front surface are required. In order to allow for an individualization of the KV-enclosures even with small batches Dold has developed a flexible system. In this way, a cost-efficient individualization can be realized even for small batches from appr. 250 units per year.

A further individualization option is the labelling of enclosure surfaces which Dold also offers as a service. For this purpose, systems for laser, pad or digital printing are available. In this way, the devices can be marked with logos, type and connection designations, etc. Digital printing allows enclosures to be fully printed in color and adapted to the corporate design of the manufacturer.



The mountain rail bus system provides for easy communication and voltage supply of the individual modules.



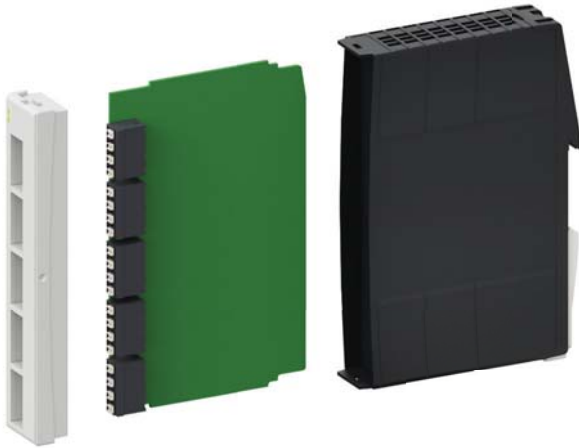
The push-in-clamps used have a test point allowing for quick diagnosis.

Requirements to enclosures in the age of IoT

Networking and communication in the area of industry and building automation are becoming increasingly important. For electronic modules in the control cabinet this often means that a bus connection between different modules must be provided. For this purpose, Dold counts on a so-called mounting rail bus system that is available as a five or eight pin variant. It is simply snapped into the DIN mounting rail and provides lines for voltage supply and signals. The contacting of the individual modules with the bus is made via a contact spring block that ensures reliable contacting. The cumbersome individual wiring of the modules can be omitted in this way. Users can then implement bus protocols, e.g. CAN-bus, Modbus, RS-232 or RS-485 via the mounting rail bus system. An individual assembly for a bus system in the area of the floor assembly of the enclosure is an alternative to this solution.

Design-In-Support

The individualization of the KV-enclosure requires a high degree of engineering. Dold sees itself as a project partner that gives comprehensive advice during the design-in-process. Within the framework of this process and together with the customer the experienced engineers develop the optimum enclosure solution that meets all framework conditions and can be implemented in a cost-efficient way. As Dold is a user of electronics enclosures itself the customers profit from the many years of experience that the company has gathered with enclosure technology.



The enclosure construction enables fast and simple installation by snap-in - optionally also as a variant for simple integration of common bus systems in the base area

