

Safety Package

easySafety in packaging technology

In order to transport products, they are normally packed appropriately in accordance with regulations. In the food and non-food sectors carton and/or bags are used for this purpose. Packaging lines themselves consist of several subsections such as filling stations with dosing and weighing systems, cartoning machines, packing stations and palletisers. Q-bag, a subsidiary of Optima Packaging Group, offers tailored customer applications with its high-performance cartoning machines and tray packers. The entire automation technology is provided by APA-Tec. The guarantee of the machine's functional safety requires the compulsory observance of the Machinery Directive and the relevant safety standards. Moeller's easySafety also provides outstanding, perfectly matched and cost-effective safety-related functions for packaging machines.

Products are packaged in many ways on their way from the manufacturer to the user. Retail packaging, for example, has to meet different requirements than transport packaging. Powdery, free flowing and chunky products are primarily packed in bags and then placed in cartons. Cartoning machines from Q-bag offer an outstanding degree of flexibility as well as a large size range with a high performance. A typical example is the packaging of wheat semolina. The filling of semolina in bags is controlled by dosing and weighing units. The cartoning machine prepares the folding cartons. The cartoning machine then places the filled bags as bag-in-box items in the cartons provided and the cartons are closed. Up to 220 cartons with fill weights of 250g are packed every minute. The individual packages are provided with the current batch data in a printer station, are then passed to the tray packer where packaging units consisting of 10 cartons each are made up. These packages are conveyed to the palletiser with an integrated wrapper, where they are stacked for transport on pallets and then wrapped again and sealed in a stable protective film. The entire process runs fully automatically, and all process data is recorded and archived.

High speed and flexibility

The servo-controlled application described here involves 19 servo axes in all, which control the required folding, dosing and transport operations in the cartoning machine and in the tray packer. The machines are equipped with Elau Motion Control Systems with an integrated PLC functionality. The programming is carried out on the largely known CoDeSys IEC 61131-3-compliant programming platform.

Touch panels installed close to the machine are used for the visualization of the system. They are used to operate and configure the entire system (including process parameters, speeds, dosing quantities, format management for the packaging). In the event of a fault, a history memory and extensive Help functions provide the operator with the necessary information and ensure a high level of plant availability.

easySafety controllers can implement all safety-related functions, such as Emergency-stop circuits or



THE COMPANIES

Q-bag packaging machinery GmbH & Co. KG has its headquarters in Schwaikheim, near Stuttgart and has recently become a subsidiary of the Optima Packaging Group. Q-bag is a household name in the sector as a manufacturer of future-oriented packaging machines and systems. The company is ideally set up with innovative, high quality products as well as a worldwide service. (www.optima-packaging-group.de)

APA-Tec GmbH is based in Böbingen, near Schwäbisch Gmünd, and was founded at the beginning of 2004. Its main activities focus on the design and implementation of automation solutions for general machine building and packaging. Even modernisation tasks, i.e. the so-called retrofitting of packaging systems, has a separate competence area. APA-Tec supplies machine control units as well the relevant services from planning, commissioning up to after-sales support. (www.apa-tec.de)

guard circuit monitoring with a setting function. Together with the contact-free disconnection of the output stage of the Elau servo they achieve the highest level of plant safety. The easySafety controllers are linked into the Profibus network of the systems with the easy204-DP interface. This is used to transfer fault or status messages from the safety system to the machine control where they are evaluated and displayed.

easySafety for operating and plant safety

Packaging lines are normally large in area and involve several potentially hazardous positioning sequences which have to be safeguarded by technical means. A large number of Emergency-Stop actuators, guard doors and operating elements for safe setting operation have to be controlled and monitored, whilst the plant has to be

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easySafety monitors all door and emergency-stop circuits, and communicates with the motor control system via Profibus DP.

switched to the safe operating state in the event of an emergency. Traditionally these functions are implemented with a complex system of hardware components. easySafety reduces this hardware complexity, which is restricted to the sensor / actuator level. This device enables applications to be implemented that comply with the highest safety requirements: The safety-related control relay complies with category 4 in accordance with EN 954-1, PL e in accordance with EN ISO 13849-1, SILCL 3 in accordance with EN IEC 62061 as well as SIL 3 in accordance with EN IEC 61508. In this respect the date 30.11.2009 is of special significance for panel builders. After this date, only EN ISO 13849-1 and EN IEC 62061 shall apply to new machines, and the "old" EN 954-1 shall no longer apply. easySafety is therefore designed to be future-proof and can be optimally combined with Moeller DIL and PKZ switching and protective devices as well as RMQ control circuit devices.

The devices of the easySafety series come as standard with a host of conventional safety relays in the form of safety function

blocks, such as Emergency-stop, guard door monitoring optionally with the monitoring of guard locking, light curtain with and without muting, two-hand control button, safety switch mat, enable switch, safety foot switch, operating mode selector switch, zero speed and overspeed monitoring, external device monitoring, safety timing relays and safety markers. easySafety devices come with 14 safety inputs and have either four relay outputs or one redundant relay plus four redundant transistor outputs. The safety function blocks of easySafety can either be configured from a PC or directly on the device. Thanks to the easySoft-Safety PC configuration software with an integrated simulation function, users can save the time required for project design and already eliminate any faults before commissioning.

easySafety offers more than a stand-alone safety control relay. In addition to the safety circuit diagram contained in the safety configuration, the safety control relay also processes a standard circuit diagram. This can be used for standard tasks such as the processing of diagnostics messages or gene-

ral control tasks for a machine. If the inputs or outputs are insufficient for solving the standard task, standard expansion modules of the easyRelay series can be connected with the easySafety device.

CONCLUSION

easySafety supports machine and system builders in a wide range of safety-related tasks. Eberhard Vaas, owner of APA-Tec explains: "easySafety provides us with a high level of flexibility during the development, design and commissioning phase and reduces the need for expensive hardware. Added to this is the fact that we can use easySafety for both safety-related and also for standard tasks. The connection to a fieldbus or PLC is also ensured: Whether Profibus-DP, CANopen or DeviceNet – the easy family already offers coupling modules that can be used by easySafety devices."

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