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The world's leading and only monthly magazine for the dry bulk industry

4B Group launches innovative digital rotary encoder 'ENCODER-FLEX 1024'

4B Group has introduced the Encoder-Flex 1024, a configurable multi-function encoder designed for monitoring position or speed. The Encoder-Flex 1024 has many applications and is very well suited to monitor the position of rack and pinion gates, angular position of distributors, as well as shaft speed for rotating machines such as bucket elevators and conveyors. The new, ATEX-approved Encoder-Flex 1024 has numerous industrial applications in one design.

With a compact, stainless-steel design, the Encoder-Flex 1024 provides the robustness for harsh industrial environments. The fully sealed body has an innovative local calibration facility that does not require opening the unit; simply apply an external magnet briefly to calibrate. Providing even more flexibility, resolution can be programmed for one to 1,024 pulses per rotation.

In addition, the Encoder-Flex 1024 provides 4–20mA, quadrature-pulsed and



Modbus RTU outputs in one single model, giving the user the versatility and flexibility to connect many different controllers and displays.

“We have already identified numerous applications for the Encoder-Flex 1024 in our core markets. One example is to monitor slide gate position; this gives complete visibility to the plant process control system for maximum efficiency and early warning of any issues,” says Sam Payne, 4B Group CTO for Electronics. “One of the key benefits of the Encoder-Flex 1024 is the configurability for multiple applications. End users and OEM’s do not

have to worry about configuring their encoder/tachometer requirements at the order stage; one part number suits all applications.”

According to Payne, “The Encoder-Flex 1024 is a robust yet compact unit that takes up very little space. Unlike string potentiometer gate

monitors that are mechanical devices prone to failure and require maintenance, the Encoder-Flex 1024 is easy to install and calibrate. It features outputs of 4–20mA, Quadrature Pulse (speed/relative rotation), and RS485 Modbus RTU to meet customer needs.”

“This product is simple to install and operate and features elegant calibration,” explains Payne. “Compared to competitive products, it’s less bulky and more robust with fewer limitations. The resolution can even be set in the field from one to 1,024 pulses per revolution to suit virtually any application.”

Martin Engineering highlights safe conveyor equipment design

Conveyors are among the most dynamic and potentially dangerous equipment in bulk handling. The operational basics of belt conveyor systems regarding the hardware installed and the performance required from the components are too often a mystery to many employees. This knowledge gap also creates a safety gap. Since personnel are the single most important resource of any industrial operation, to meet workplace safety standards, the consensus among safety professionals is to design the hazard out of the component or system, which historically yields more cost-effective and durable results.

Designs should be forward-thinking. This means exceeding compliance standards and enhancing operators’ ability to incorporate future upgrades cost-effectively by taking a modular approach. This method alleviates several workplace hazards, minimizes clean-up and maintenance, reduces unscheduled downtime and extends the life of the belt and the system. Before the drafting phase, designers should:

- ❖ establish the goals of reducing injuries and exposure to hazards (dust, spillage, etc.);

- ❖ increase conveyor uptime and productivity, and;
- ❖ seek more effective approaches to ongoing operating and maintenance challenges.

COMBINING SAFETY & PRODUCTIVITY

To meet the demands for greater safety and improved production, some manufacturers have introduced equipment designs that are not only engineered for safer operation and servicing but also reduced maintenance time. An example is the Martin® QCI™

Cleaner HD/XHD STS (Safe-to-Service) primary cleaner and the Martin SQC2S™ STS secondary cleaner, designed so the blade cartridge can be pulled away from the belt for safe access and replacement by a single worker.

The same slide-out technology has been applied to impact cradle designs. Systems like the Martin Slider Cradle are engineered so operators can work on the equipment safely, without breaking the plane of motion. External servicing reduces confined space entry and eliminates reach-

Martin® Guarding is designed to protect workers from reach-in injuries in unauthorized areas (all photos: ©Martin Engineering 2023).



in maintenance while facilitating faster replacement. The result is greater safety and efficiency, with less downtime.

An example of a safer belt cleaner is the CleanScrape®, which received the Australian Bulk Handling Award in the 'Innovative Technology' category for its design and potential benefits. The revolutionary patented design reduces the need for bulky urethane blades altogether. It delivers extended service life, low belt wear, and significantly reduced maintenance, which improves safety and lowers the cost of ownership.

Unlike conventional belt cleaners that are mounted at an angle to the belt, the



This Martin SQC2S STS secondary cleaner allows for safe external maintenance by a single worker.

The track-mounted Martin® Slider Cradle can be serviced quickly and safely, with no reach-in maintenance.



CleanScrape is installed diagonally across the discharge pulley, forming a three-dimensional curve beneath the discharge area that conforms to the pulley's shape. The novel approach has been so effective that in many operations, previously crucial secondary belt cleaners have become unnecessary, saving further on belt cleaning costs and service time.

LOW-BID PROCESS AND LIFE CYCLE COST

Although the policy is generally not explicitly stated by companies, the 'Low-Bid Process' is usually an implied rule that is baked into a company's culture. It encourages bidders to follow a belt conveyor design methodology that gets the maximum load on the conveyor belt with the minimum compliance to regulations using the lowest price materials, components and manufacturing processes available.

When companies buy on

price, the benefits are often short-lived, and costs increase over time, eventually resulting in losses. In contrast, when purchases are made based on the lowest long-term cost (life-cycle cost), benefits usually continue to accrue and costs are lower, resulting in a net savings over time.



The CleanScrape® forms a 3-D curve beneath the discharge that conforms to the pulley's shape.

CONCLUSION

Engineering safer conveyors is a long-term strategy. Although design absorbs less than 10% of the total budget of a project, Engineering/Procurement/Construction Management (EPCM) services can be as much a 15% of the installed cost of a major project, additional upfront engineering and applying a life cycle-cost methodology to the selection and purchase of conveyor components proves beneficial.

Safety-minded design at the planning stage reduces injuries by engineering hazards out of the system. The system will likely meet or exceed the demands of modern production and safety regulations, with a longer operational life, fewer stoppages and a lower cost of operation.

ABOUT MARTIN ENGINEERING

Martin Engineering has been a global leader in bulk material handling for more than 75 years, continuously developing new solutions to make high-volume conveyors cleaner, safer and more productive. The company's series of Foundations™ books is an internationally recognized resource for safety, maintenance and operations training — with more than 22,000 print copies in circulation around the world. The 500+ page reference books are available in several languages and have been downloaded thousands of times as free PDFs from the Martin website. Martin Engineering products, sales, service and training are available from 17 factory-owned facilities worldwide, with wholly-owned business units in Australia, Brazil, China, Colombia, France, Germany, India, Indonesia, Italy, Malaysia, Mexico, Peru, Spain, South Africa, Turkey, the USA and UK. The firm employs more than 1,000 people, approximately 400 of whom hold advanced degrees.