

SUCCESS STORY

“REEL ENERGY SAVINGS”

INFORMATION

Industry:
Material Handling

Application:
Reeling Machines

Product:
U1000 Industrial Matrix Drive



OVERVIEW

Reel-O-Matic, a leading manufacturer based in Oklahoma City, OK, specializes in wire, cable, and flexible material handling machines. Their machines cater to various industries such as aerospace, government, oil/gas, medical, automotive, crane, plastics, and telecommunications. To address specific application challenges, Reel-O-Matic utilized Yaskawa's U1000 Industrial Matrix Drive.

APPLICATION CHALLENGE

Reel-O-Matic faced challenges with machines that operated at variable speeds under heavy loads and required the motor to function as a brake. They previously employed dynamic braking packages or separate regenerative packages to manage the regenerative energy generated in these applications. While these solutions reduced operational costs, they incurred additional expenses, labor, and cabinet space. Furthermore, safety hazards arose due to the high energy directed towards brake resistors, resulting in excessive heat. Reel-O-Matic sought a more efficient approach to redirect regenerative energy.

THE YASKAWA SOLUTION

Reel-O-Matic adopted Yaskawa's U1000 Industrial Matrix Drive to address their application issues. Unlike conventional drives, the U1000 directly switches from the input power, eliminating the need for a DC bus. This innovative drive allows regenerative energy to be reintroduced into the power line without introducing high levels of low-frequency current harmonics. By reducing current harmonics, transformer heating is minimized, enabling more efficient operation even under higher loads. Additionally, the U1000's standalone design eliminated the need for extra components, resulting in reduced cabinet size and cost. It also eliminated potential hazards from externally mounted resistors, such as burns or shocks.

RESULTS

Reel-O-Matic's machines operate continuously in factory production, running 24/7. The implementation of the U1000 ensures uninterrupted operation without downtime caused by overheating or high DC bus conditions.

Furthermore, the reduced harmonics achieved with the U1000 ensure that Reel-O-Matic's customers automatically comply with the IEEE-519 standard. They no longer need to worry about utility companies raising concerns about elevated harmonic current levels affecting the power grid.

Max Clarke from Reel-O-Matic commented, "The operation and benefits of the U1000 have been flawless for our applications."

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Innovative Matrix Technology



The U1000 can be used for standard and regenerative applications with the unique advantage of direct AC-to-AC power conversion. This unique design offers the best choice for induction motors (IM) and permanent magnet motors (PM). Benefits include low input current harmonics with near unity power factor allowing for increased energy efficiency. The bi-directional switching technology allows for continuous motoring or continuous regeneration. This means that fewer parts are required, leading to higher machine reliability. Moreover, the U1000 can automatically switch into across-the-line operation through the drive, eliminating drive generated harmonics, drive losses, and motor noise.

Low Harmonic Solution



The U1000 offers the best low harmonic solution in one unit. It does not need any external devices for IEEE 519 compliance. Its harmonic performance meets the most stringent requirement of IEEE 519 at the input of the drive, making it an all-around green solution. Its input harmonics remain low, not just at rated power, but well below leading harmonic solutions throughout the speed/load range.

Clean Power



The sinusoidal input current, with a total harmonic distortion of less than 5%, and a displacement power factor of approximately 1.0, minimize losses in grid components like generators and transformers. This, at the same time, greatly reduces the potential of disturbance of other devices and improves the reliability of your system.

Energy Saving 4Q Operation



Thanks to matrix technology, the U1000 can operate in full, continuous regeneration. It is your best drive for applications like conveyor, winder, escalator, lift or test bench, where braking energy needs to be considered. The AC-to-AC design does not require any braking resistor which takes space in the cabinet and creates additional heat during regeneration. Best of all, no parameter settings are needed to enable the U1000's regeneration. The U1000 can instantaneously and automatically switch from full motoring operation to full regenerative operation.

Compact Size



The U1000 is an all-in-one compact solution for low harmonics and regeneration. There is no smaller solution. Save as much as 80% space. Retrofits and upgrades are easy, since it easily fits in nearly every 18-Pulse package.

Cost Saving



The U1000 provides cost-saving benefits through a simplified installation and smaller panel requirements. The U1000 eliminates braking resistors that convert regenerative energy into heat which can be a safety concern in some application environments.

Time-Saving Installation



As no external components like harmonic filters or active front end units are required, connecting a U1000 drive becomes a matter of minutes. 3 wires in, 3 wires out. It cannot be easier to build a low harmonic regenerative solution.