

YASKAWA

U1000 INDUSTRIAL MATRIX DRIVE

APPLICATIONS



200V CLASS: 10-100 HP (ND); 7.5-75 HP (HD)
400V CLASS: 7.5-800 HP (ND); 5-750 HP (HD)



SAMINCO
international

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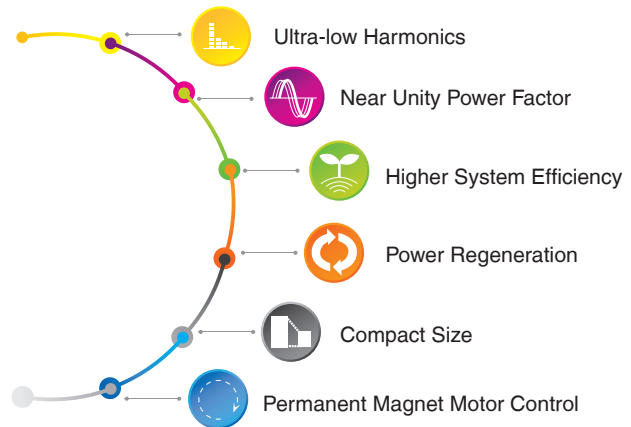
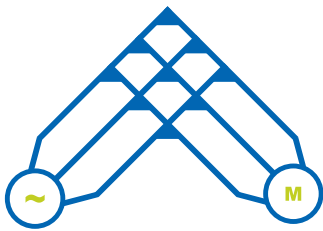
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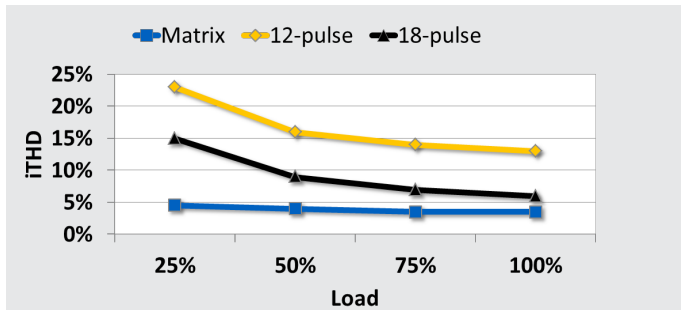
U1000 INDUSTRIAL MATRIX DRIVE

THE GREEN CHOICE

YASKAWA
Industrial **MATRIX** Drive
U1000

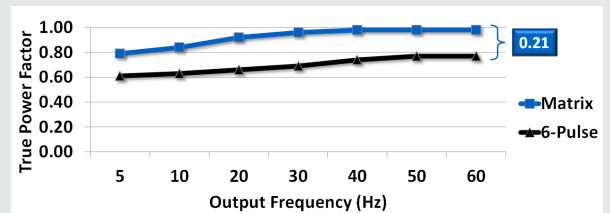


Ultra-low Harmonics

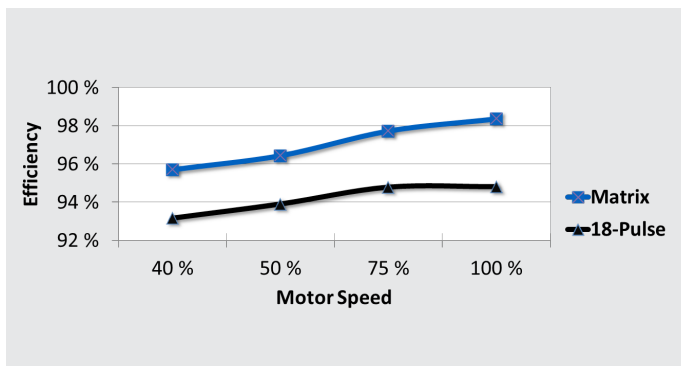


IEEE-519 Compliant, Excellent performance over wide load range

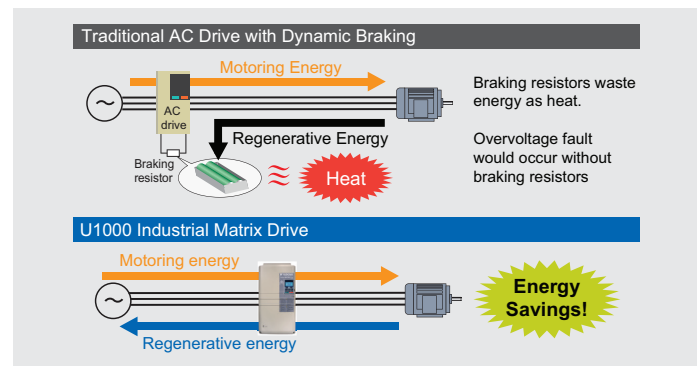
Near Unity Power Factor



Higher System Efficiency

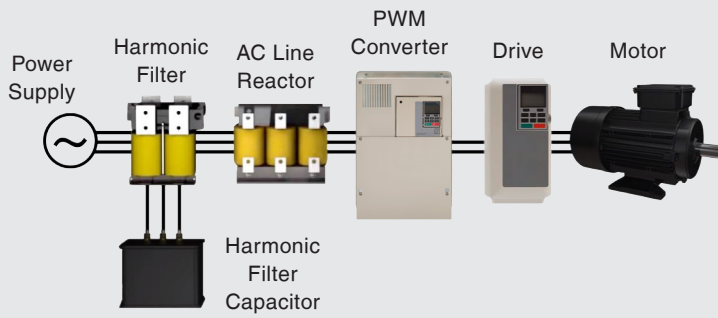


Power Regeneration



Compact Design

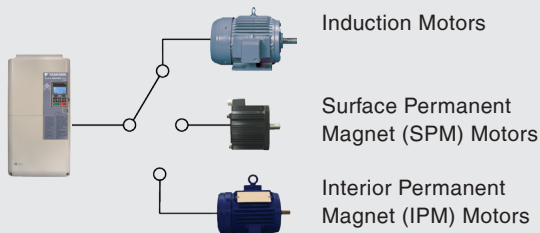
Low-Harmonic AC Drive System



U1000 Industrial Matrix Drive System



Permanent Magnet Motor Control



Cost Savings

See the Savings!

U1000 can monitor and provide power data.

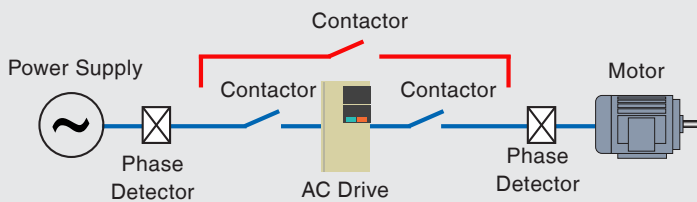
Instant feedback (kW or \$) on energy saved.



Eco-Mode

Automatically run line power directly to the motor

Conventional AC Drive

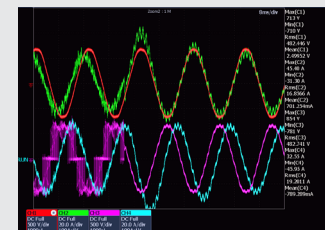


U1000 Industrial Matrix

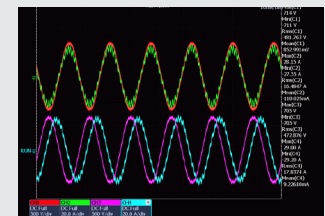


- No Hard Contactors Required
- Smooth Transitioning
- Output 100% Line Voltage to Motor

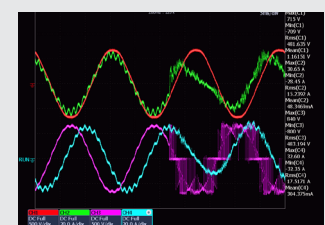
- Less Switching Losses
- Less Audible Noise
- Very Low Harmonics (<1% iTHD)



Entering Eco-Mode

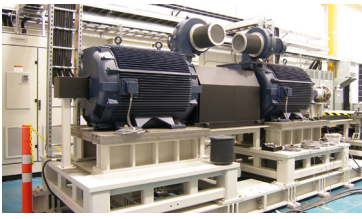


While in Eco-Mode



Leaving Eco-Mode

U1000 Industrial Matrix Drive Applications



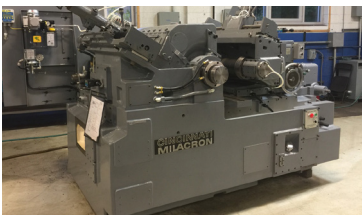
Test Stands

Test Stands require compact design, efficient and effective use of utility power, full regeneration, and multiple motor control methods. Engine test stands, tire load testers, transmission dynes, wind tunnel balancing equipment, etc. are examples of applications that take advantage of each and every benefit of the U1000.



Winders

Winding is a procedure designed to take up and package material in roll form, for more efficient handling or preparation for another operation. In a typical industrial use, winders are employed to roll up or unroll a continuous or limited length of material such as wire, paper, film, metal or textiles. The U1000 is ideal for unwinding applications providing constant tension. IEEE-519 compliant ultra-low harmonic Matrix technology provides full regenerative capability and continuous operation, eliminating down time due to braking resistor overheating or high DC bus overvoltage fault conditions.



Metalworking

Metalworking is a process of working with metals to create individual parts, assemblies or large-scale structures. This includes rolling mills, punch/stamping presses, ram presses, steel bar grinders, spindles, lathes, and welders. The U1000 is ideal for these applications due to its small compact design and full regenerative capabilities. The compact design allows for easy retrofits into limited space applications, while the full regenerative capability can effortlessly handle the cyclic regenerative nature of stamping presses, ram presses, and steel bar grinding applications.



Pumpjacks

Pumpjacks are used above ground to drive liquid from deep submersible wells using a reciprocating piston pump. The weight of the horse head used to push/pull the rod creates an unbalanced load condition, even with a counterweight. As the rod falls, its speed passes the operating speed of the pumpjack and creates a regenerative condition that can be as high as 50% of the cycle of the pump. The U1000 seamlessly switches back and forth from operating in a motoring condition to a regenerative condition, thereby saving the energy instead of wasting it with bulky dynamic braking resistors. Ultra-low harmonics produce less transformer heating, which means a smaller transformer can be used to power the system.



Solid Bowl Centrifuges

Centrifuges run at high speeds to separate solid material from liquids and generate very large load inertias. The U1000's inherent automatic regenerative capability eliminates intermittent load changes that cause nuisance overvoltage trips due to unbalanced load conditions. Full continuous regeneration allows centrifuges to be repeatedly stopped, without the need for external dynamic braking packages, with quicker, repeatable stop times, reducing cycle time and increasing production without increasing cost.



Decanter Centrifuges

Decanter centrifuge design consists of a solid container, called a bowl, which rotates at high speeds. Inside the bowl tube, a screen conveyor (scroll) rotates in the same direction, but at a slightly different speed. The slower scroll speed causes the materials entering the centrifuge to separate. However, the bowl puts the scroll in constant regeneration due to the speed differential. The U1000 can operate the scroll in its continuous regenerative state without the need for additional peripheral components or bulky and wasteful braking resistors. Both the scroll and bowl have extremely large load inertias and can easily take over 20 minutes to coast to a stop. U1000 can dramatically reduce the stop time and improve cycle time, saving the energy by putting it back onto the line.

Water/Wastewater Treatment

Water/wastewater treatment consists of a wide variety of pump and fan applications. Pumping applications include mixers, sludge pumps, and chemical feed pumps, while fan applications include blowers and aerators. Installation space limitations and low input current harmonics requirements in public works facilities result in high-cost solutions. The U1000 Industrial Matrix Drive provides a compact all-in-one solution that can be smaller (60+%), lighter (80+%), less complex (70+% less wiring with fewer components), better performing (lower iTHD levels), and more efficient (+19%), compared to other low harmonic options.



Industrial Fans/Pumps

Industrial Fans/Pumps have long taken advantage of a VFD's ability to save energy by reducing speed. The U1000 offers the same advantage but with the additional benefits of IEEE-519 compliant ultra-low harmonics and near unity power factor. The addition of Eco-Mode allows the U1000 drive to pass line power directly to the motor to improve drive efficiency and eliminate any input current harmonics. Using Eco-Mode during periods of peak demand allows the drive's IGBTs to avoid switching on and off during the highest load demand, which results in longer life for the drive.



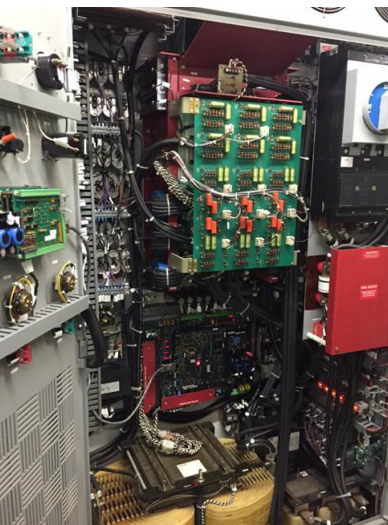
Downhill Conveyors

Conveyors are used in a broad range of industries and applications to move packaged goods, assemblies, process byproducts, or any material from one place to another. A process designer will typically look for opportunities to use the force of gravity to accomplish product movement. Electric motors are commonly used when gravity cannot be employed or when the speed of a gravitational fall needs to be controlled. During these conditions the conveyor will be in continuous regeneration. The U1000 provides a compact all-in-one solution to continuously regenerate rated power conditions back onto the utility line. Remote installations can reduce transformer sizing by taking advantage of the U1000's low harmonic capabilities and near unity power factor.



Escalators/Moving Walkways

Escalators and moving walkways provide quick and effortless access across vast distances or between floors of a building. Located in tight, high demand locations, escalators and moving walkways can take advantage of the U1000's highly efficiency, all-in-one compact package. Downhill versions of these people movers can benefit from the continuous regenerative capability of the drive. Intermittent loading and unloading of the equipment due to people entering and leaving is seamlessly handled by the U1000 drive. The low harmonic and high true power factor provided by Matrix technology results in effective use of pre-existing power structures.



Before Retrofit

Retrofit

350 HP 18-Pulse Drive Retrofit with U1000 in a Massachusetts Water Treatment Facility

U1000 retrofit solution exceeded the input harmonic current capabilities of the previous 18-pulse package at rated power, while providing excellent harmonic current levels throughout the load range.

Efficiency improvement was so dramatic that additional cabinet fans required to cool the previous system could be turned off.

The existing cabinet was reused and extra components were removed to save space. All of the existing controls were easily integrated into the U1000.



After Retrofit



Yaskawa is the leading global manufacturer of low and medium voltage AC inverter drives, AC servo systems, machine controllers, and industrial robots. Our standard products, as well as tailor-made solutions, are well known and have a high reputation for outstanding quality and reliability.

YASKAWA



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