

DigiFCR® CYC

Cycloconverter Drive System and Retrofit Solutions

AMI Automation is a global leader in automation and control solutions. We specialize in designing, manufacturing, and implementing innovative technologies to enhance process efficiency across industries such as steel, mining, cement, pulp & paper, and power generation.

DigiFCR® CYC

Modernizing Cycloconverter Systems

With DigiFCR® CYC, AMI provides a strategic modernization solution that safeguards your existing cycloconverter infrastructure while integrating advanced digital control, real-time diagnostics, and enhanced communication capabilities. This approach maximizes return on investment by extending equipment lifecycle, reducing operational risk, and significantly improving dynamic performance and energy efficiency. The result is a reliable, future-ready drive system upgrade achieved without the capital expenditure, engineering complexity, or production downtime associated with a complete system replacement.

DigiFCR® CYC is a firing circuit replacement for existing cycloconverters, based on a high-performance digital controller technology, with extended communications, diagnostic, and monitoring capabilities. This solution offers an outstanding cost-to-benefit ratio for aging or obsolete cycloconverter drives, making it an ideal retrofit solution. The vector control loop included in the DigiFCR® CYC decouples the torque and magnetic flux variables in real-time, allowing for strict and independent regulation of:

- ▶ Speed and currents: Dynamic response to abrupt load changes without overshoot.
- ▶ Stator flux: Maintenance of nominal flux even at zero speed for maximum holding torque and also allows for flux weakening.
- ▶ Terminal voltage and power factor: Active management of excitation and voltage vector, allowing optimization of the machine's power factor and stabilizing terminal voltage under any load condition.

Features and benefits

Designed to integrate seamlessly with any cycloconverter configuration, manufacturer, or AC motor, DigiFCR® CYC is a retrofit that extends the life of existing systems while delivering superior torque control, intuitive user tools, and advanced diagnostics for improved reliability and simplified maintenance.

AMI integrates the SmartView Display®, an intuitive HMI that enhances operator visibility, streamlines diagnostics, and accelerates maintenance response times.



SMARTVIEW DISPLAY™ MONITORING SCREENS

A common modernization strategy is to replace legacy cycloconverter drives with PWM inverter-based systems. However, this approach significantly increases both cost and system complexity, typically requiring:

- ▶ Frequent recommendation to replace the existing AC motor
- ▶ Additional infrastructure upgrades, such as water-cooling systems
- ▶ Extended installation and commissioning time, directly impacting production schedules

DigiFCR® CYC eliminates these challenges entirely. Purpose-built for demanding steel and mining environments, it provides a cost-effective and time-efficient retrofit solution that enables:

- ▶ Easy replacement of aging SCRs and LTTs
- ▶ Shorter outages and minimized downtime
- ▶ Full reuse of existing transformers, power bridges, and circuit breakers
- ▶ Flexible modernization options, from partial upgrades to full cycloconverter control replacement

Drive configurations

DigiFCR® CYC supports control of the following machine configurations:

Motor Type	Machine Configuration
Induction Motor	Squirrel Cage
	Wound Rotor Motor
	Salient Pole Rotor
	Cylindrical Rotor
	Double Winding
Synchronous Motor	Open-end Winding

Cycloconverter motor configurations

DigiFCR® CYC supports both circulating and non-circulating current cycloconverter configurations:

Configuration	Diagram
6-Pulse Non-Circulating Current Cycloconverter Open-end Winding	
6-Pulse Non-Circulating Current Cycloconverter	
12-Pulse Circulating Current Cycloconverter	
12-Pulse Non-Circulating Current Cycloconverter	

*Other configurations available.

DigiFCR® CYC enables the modernization of existing cycloconverter systems through advanced digital control while preserving power infrastructure. The result is improved performance, extended service life, and enhanced operational reliability, reducing cost, risk, and downtime without the need for full system replacement.

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