Electromotive Systems OmniPulse[™] DDC Digital DC Drive





ELECTROMOTIVE SYSTEMS

INCREASE YOUR COMPETITIVE ADVANTAGE CONVERT YOUR DC CONTROLS TO STATE-OF-THE-ART ENERGY EFFICIENT OMNIPULSE DDC DIGITAL DC DRIVES

Magnetek, the leader in crane and hoist motor control, brings you the OmniPulse DDC Digital DC Drive. The Energy Engineered[™] OmniPulse will improve the performance and reliability of your DC operated crane or hoist, while minimizing downtime, maintenance expenses and energy costs. It's the smart choice in crane control that will pay dividends and provide your facility with a competitive advantage for years to come.

EFFICIENT OPERATION

OmniPulse DDC employs semiconductor technology, which provides better control of motor speed and torque than costly, inefficient DCCP control. This microprocessor based, solidstate, four-quadrant DC-to-DC control is designed for series, shunt, or compound wound motors.

IDEAL DROP-IN REPLACEMENT

OmniPulse DDC is the perfect drop-in replacement for traditional electromechanical controls. It eliminates routine and costly contactor tip replacement and reduces energy expenses. It easily interfaces to existing power and control circuitry using the same connection points in a smaller footprint.

IMPROVED CONTROL AND SAFETY

Most importantly, Omnipulse DDC will also improve safety in your facility. The OmniPulse DDC provides failsafe torque proving and load control software, ensuring the operator always has control of the material.

MINIMIZED DOWNTIME AND IMPROVED SERVICEABILITY

We know production needs change. That's why OmniPulse DDC was designed with comprehensive software that provides superior flexibility and allows for quick parameter changes. (Software upgrades can be flashed from a PC). These parameters allow the drive to compensate for the mechanical timing of the crane, increasing brake life and plant efficiency. The OmniPuls@DDPCulscoDDECralsesiveitIfd/VEBLVSIE MARKSUSEDCinkelsto in Basic or WDS (wired or wireless), offering remote parameter modification and diagnostic capability.





THE OMNIPULSE DDC DRIVE OUTPERFORMS TRADITIONAL DCCP CRANE CONTROLS

	OMNIPULSE DDC DIGITAL CRANE CONTROL	DCCP ELECTROMECHANICAL CRANE CONTROLS	
	BETTER MOTOR SPEED AND TORQUE CONTROL		
Speed Transitions	Digital microprocessor control with flexible software enables smooth acceleration and deceleration, reducing current spikes and excess mechanical torque	Contactor, relay and resistor based control means more rigid transitions between speed points and no reduction of mechanical torque	
Load Positioning	Repeatable and accurate speed settings mean precise load positioning	Use of resistors for speed points, which are subject to alterations over time due to heat, results in inconsistent load positioning	
Light Load High Hook Speeds	Reduces cycle time by increasing no-load speeds in both up and down motions. Micro Speed feature offers still finer load positioning accuracy	No load/high speed lowering is not possible with DCCP control	
Controlled Plugging	Digital technology provides controlled, repeatable, accurate and variable plugging to stop or reverse Plugging to stop or reverse		
Speed Regulations	Software provides 5% speed regulation, no load to full load (0.1% with tachometer feedback)	Due to load changes and the effect that heat has on the repeatability of resistors, speed regulation varies greatly	
	MINIMIZED DOWNTIME AND IMPROVED SERVICEABILITY		
Programming Flexibility	Control software is capable of supporting various material handling applications. Remote monitor and parameter modifications can be made via IMPULSE•Link 4.1 IMPULSE•Link 4.1	Not possible—need to change hardware	
Number of Components	Solid-state design consists of fewer electromechanical components that wear and fail.	Many moveable components wear and fail over time needing intensive maintenance (A DDC drive can replace up to 9 contactors)	
Spare Parts	Inventory minimized due to modular design, common PCB hardware and universal software	Must stock directional contactors, speed control contactors, contactor tips, interface relays, and power resistors	
Troubleshooting	Built-in diagnostics help troubleshoot crane performance and keep your system up and running	No diagnostics available	
	REDUCED ONGOING MAINTENANCE EXPENSES AND ENERGY COSTS		
Maintenance of Components	Solid state design means no contactor tips, coils, auxiliary contacts, mechanical interlocks, directional contactors or power resistors to replace*	Must maintain contactor tips, coils, auxiliary contacts, mechanical interlocks, directional contactors or power resistors	
Brake and Brake Shoe Life	Brakes may be set at much lower speeds, reducing stress on brake parts while increasing lining life	Normally set at higher speeds as brakes are used to decelerate and stop	
Brush, Commutator and Field Insulation Life	Armature current restricted to a maximum of 200% of the motor rating, and a maximum of 150% of motor rated field current, CEMF restricted to 110%	No restrictions with DCCP control	
Shock Loads on Mechanical Power Train	Reduces shock loads on mechanical power train through smooth speed acceleration and deceleration	Deceleration control through plugging and acceleration is dependent on changing resistors	
Energy Costs	State-of-the-art semiconductors regulate motor current and reduce line power demand resulting in energy savings	DCCP utilizes resistors that require additional line power	
Energy Recovery/Regeneration	Highly efficient OmniPulse DDC, with low power diode rectifiers, recovers energy from the load and returns it to the DC supply **	Substantial energy lost across resistors	
	IMPROVED SAFETY		
Continuity Check at Start	Verifies control of the load. In hoist applications, motor armature circuit is checked when raise/lower command given, before brake released	Requires an additional collector for redundancy; capable of checking for armature continuity	
Motor Series & Field Loss Detection	Protection feature that provides a fault to the drive and sets the brake	Series field detection available using a series brake on the hoist, but no check on the armature	
Loss of Speed Input	When speed input is lost, the drive will operate up to the lower speed inputs.	Loss of speed input could result in skipped speed points and high current and torque transitions	
Emergency Power Loss Shut Down	OmniPulse DDC will shut down and set the brake if DC power is lost while lowering the load	Load could continue with a controlled lower if power is lost since the motor is generating	
Failsafe Pre-charge Circuit Design	Unique to OmniPulse DDC; eliminates the possibility of applying direct DC line voltage to the capacitor bank	Not applicable	
Four-quadrant Design	Efficiently controls the motor at all times	Operates in two-quadrants, and relies on inefficient resistors to achieve performance	

*No power resistors required except DB for all hoist applications to meet industry standard and regen resistor depending on power source type. ** DC supply must be compatible to realize energy savings from regenerative capabilities—consult Magnetek for more information.

OMNIPULSE DDC DRIVE GENERAL SPECIFICATIONS

	DESCRIPTION	SPECIFICATION	
		POWER	
	Horsepower Range	5-500 HP	
	Continuous Current Rating	30-2000 Amps	
400-600	Input Voltage	230-360VDC (standard) 400-600VDC (optional) -20%/+10%	
	Current Overload Capability	150% for one minute 200% for three seconds	
	Motor Circuit Standard Configurations	Single, Duplex, or Quadruplex	
		CONTROL I/O	
	Discrete Control Inputs	(8) 230VDC (standard); other voltages are optional	
(2) 0-10	Analog Inputs	(2) 0-10VDC or 4-20mA	
(1) 0-10	Programmable Analog Outputs	(1) 0-10VDC or 4-20mA	
(2) 230\	Programmable Discrete Outputs	(2) 230VDC; (3) 24V DC 50mA	
RS-232/	Communication Ports	RS-232/485	
	PROTECTION		
	Reverse Polarity	Software and hardware detection	
	Power Loss Capability	One second ride-through	
lrip at 50	Undervoltage/Overvoltage	Trip at 50%/140% Vin when > 1 second	
	Motor Overload	Electronic time trip	
	Motor Continuity (Hoist Mode)	Motor connections are verified at the start of each cycle before brake is released	
	Emergency Power Loss Dynamic Braking	Standard for hoist applications Optional for traverse applications	
	Fuse	DC Bus Control Interface Board	
	Motor Ground Detection (can be disabled)	Motor armature and series field detected for hoist applications. Motor armature detected for traverse applications. Trip level is hardware set and non-adjustable.	
	Charge Indicator	Visual indicator on drive unit indicating charge state on the capacitor bank	
	Drive Thermal	Heatsink over temperature alarm and shutdown; drive enclosure over temperature shutdown	
	Fault History	Last 15 faults are stored.	
	ENVIRONMENTAL		
	Ambient Temperature Range	-10° C to $+50^{\circ}$ C (enclosed)	
	Altitude	3300 feet (1000M) without derating	
	Humidity	<90% non-condensing	



OMNIPULSE[™] DDC FEATURES

VERSATILE SOFTWARE

- Designed with software that provides superior flexibility during start-up
- Allows for quick parameter changes as needed
- Software upgrades or future releases can be flashed from a PC
- Provides optimal performance and speed regulation while adjusting to meet your changing operational requirements — without the need for additional hardware

FLEXIBILITY AND PERFORMANCE

- Software adjustable for various application and production needs
- Built-in diagnostics to troubleshoot crane performance and keep your system up and running:
 - Monitor 32 items (amps, volts, rpm, hours, etc.)
 - Diagnostic LEDs
 - Records 15 most recent faults
- Standard closed loop with sensorless feedback 5% speed regulation
- Optional closed loop with tachometer feedback 0.1% speed regulation

COMPACT, MODULAR DESIGN

- 33% smaller footprint than typical contactor control
- Nearly 50% smaller volume than typical contactor control

OMNIPULSE DDC TECHNOLOGY MAY BE APPLIED IN A VARIETY OF MATERIAL HANDLING APPLICATIONS

- Crane & Hoist
- Larry Cars
- Quench Cars

OmniPulse DDC is backed by Magnetek Material Handling's superior application expertise and aftermarket support—available 24/7/365!

For more information, contact Magnetek Material Handling or your local Magnetek Sales Representative.



ELECTROMOTIVE SYSTEMS TELEMOTIVE ENRANGE MONDEL

YOUR ONE-STOP SOURCE FOR MATERIAL HANDLING CONTROL SOLUTIONS



ENGINEERED SYSTEMS & SOLUTIONS

Project Evaluation Project Management Engineering Design System Manufacturing and Testing Field Startup, Testing, Training and Support Customer Training and Maintenance Support Application Solutions PLC/PC Program Development

IMPULSE[™] AC ADJUSTABLE FREQUENCY DRIVES

230, 460 and 575 Volt Power Platforms 0.25–1,500 HP Exclusive Application Software Specific Crane & Hoist Software

OMNIPULSE[™] DIGITAL DRIVES

DSD — AC in/DC out 15—800 HP DDC — DC in/DC out 5—500 HP

MAGNEPULSE[™] DIGITAL MAGNET CONTROL

DTOR ACCELERATIONOCOMMINOOR ACCELERATION

Single & 2 Speed — up to 15.2 Amps Contactor Panels

VARIABLE SPEED MOTOR CONTROL PANELS

Standard Pre-Engineered Systems Custom Engineered Systems

MOTORS & ACCESSORIES

Standard Inverter Duty AC Induction Motors Flux Vector Designed Motors

POWER DELIVERY SYSTEMS

ELECTROBAR[®] ELITE — 20, 60, 100, 130, 200 Amps FABA[®] Conductor Bar Systems — 100 Amps ELECTROBAR[®] HX — 400, 700, 1000 Amps ELECTROBAR[®] FS — 90, 110, 125, 250, 400 Amps ELECTROBAR[®] 8-Bar — 90, 110, 250, 350 Amps

ELECTROMOTIVE[™] FESTOONING SYSTEMS

Standard Duty Heavy Duty Mill Duty

PENDANT PUSHBUTTON STATIONS Standard, Custom and Wired

TELEMOTIVE & ENRANGE RADIO REMOTE CONTROL SYSTEMS

Flex EX telePendant[™] 300T Pendant[™] telePilot[™] 100T PGT DTX MLTX2[™] MLTX2[™] SLTX[™] 700T JLTX[™] Locomotive Control Systems

COLLISION AVOIDANCE SYSTEMS

LaserGuard[™] ReFlx[™]

MONDEL BRAKES CONTROL 2005 Industrial Shoe Brakes

4"–19" Diameter 6–2,250 Lb. Ft. Torque AC, DC, Hydraulic Actuators AC Explosion Proof Actuators

AIST-NEMA 300M Mill Duty Shoe Brakes

5"–30" Diameter 10–11,000 Lb. Ft. Torque AC, DC, Hydraulic Actuators AC Explosion Proof Actuators

400D Heavy Duty Disc Brakes

8"–50" Diameter 50–30,000 Lb. Ft. Torque AC, DC, Hydraulic Actuators AC Explosion Proof Actuators

Braketronic[™] Control System

Braketronic Controller Standard Pre-engineered Panel Mill Duty Foot Pedal (optional)

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