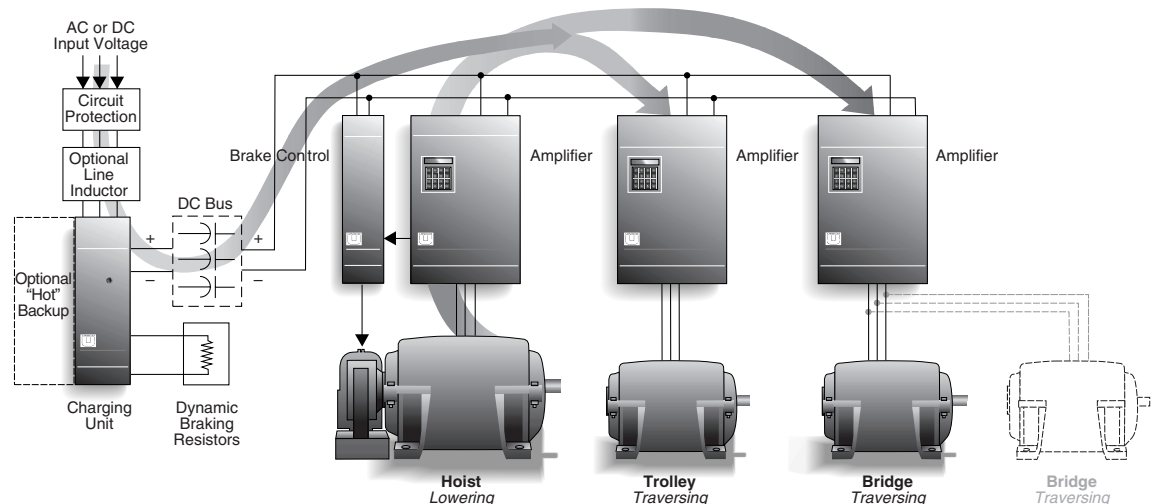




Overview UNICO's Crane and Hoist Drive combines the proven performance and versatility of UNICO's 2000 Series drives with powerful control software engineered specifically for hoist, bridge, and trolley applications. The drive is completely engineered and manufactured in the U. S. A. Thousands of rugged 2000 Series controllers are in use in AC and DC servo-positioning systems worldwide.

Common Bus Design

A common bus design reduces system complexity while minimizing power consumption. Unlike other drive systems, where each drive has its own integral rectifier, the 2000 Series employs a single charging unit for all drives in the system. This reduces panel space and spare part requirements while cutting installation costs. One common dynamic braking resistor grid is used for all motions.



Energy Sharing

With the common bus design, regenerated energy can be circulated within the system to be reused by motoring drives rather than dissipated wastefully by the dynamic braking resistors. Such energy sharing can substantially reduce electrical operating costs on some multimotor operations.

Redundant Charging Unit

For optimal safety and reliability, a redundant charging unit can be added to protect against crane immobility. This backup unit permits continued operation without loss of control should the primary charging unit fail.

Overview **Universal Drive**

(continued)

The unique 2000 Series can control a DC motor today and an AC motor tomorrow. By replacing troublesome electromechanical controls with reliable, solid-state technology, the drive can immediately improve crane operation, safety, and productivity while retaining the existing DC rails and motor. With a small modification, the same drive can be converted to flux vector AC operation, allowing the DC motor to be replaced with a low-maintenance AC induction motor the next time repair is needed. With its low profile and small footprint, the drive can usually be installed within existing enclosures for efficient retrofitting with minimal downtime.

Optimized Transducerless Operation

Proprietary velocity observer software yields excellent speed regulation for single- and multimotor operation without motor-mounted encoders. If transducer feedback is required, the drive supports 5 V and 15 V encoders, resolvers, and linear absolute encoders.

Motor and Brake Torque Proving

Precise coordination between motor and brake dramatically extends brake life and lowers maintenance costs. Because the drive completely controls motor torque, a brake is required only for holding and emergency stopping in case of power outages or faults. An adjustable load hang time further minimizes brake wear.

PLC Communications

The drive can be connected serially to most major brands of programmable controllers for easy integration into a system.

Integral Crane Automation

With optional IEC 1131 open-architecture logic programming, a drive with coprocessor can control up to 16 or 32 independent I/O points. This eliminates external relays, timers, and related wiring. Programming can be done by the user or by UNICO engineers in ladder logic or any of four other IEC 1131 languages.

AC or DC Inputs and Outputs

On-board, optically isolated converters configure individual inputs and outputs to the control voltage requirements of a particular system. A mixture of AC and DC inputs ranging from 24 V to 250 V can be applied on each motion. No add-on I/O boards are required.

Plain-Language Setup and Diagnostics

An easy-to-read two-line by 24-character-per-line descriptive display shows setups, readouts, and fault messages in plain English, not cryptic codes. Faults are logged by time and date with the 50 most recent occurrences being retained for review. Windows-based monitoring software and an interactive CD-ROM troubleshooting guide are also available.

Features & Benefits

Software

- Warp-speed quick lift
- Reverse plug simulation
- Load hang time
- Motor and brake torque proving
- Fast stop
- Variable-speed control
- Five preset speeds
- Analog joystick control
- Microspeed positioning control
- Dual upper/lower limit switch inputs
- Torque limit
- Torque limited accel/decel times
- Stepless acceleration/deceleration
- Mechanical resonance filters
- Hoist overload protection
- Slack cable detection
- Uncommanded motion detection
- Antisway control
- Automatic self-tuning to motor and load
- Keypad security lockout

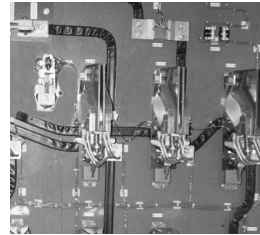
Hardware

- High-speed digital signal processor and patented digital current regulator provide superior speed and torque control
- Operates AC or DC motor from AC or DC source
- Single power drop reduces power distribution requirements
- Twelve-pulse and fully regenerative options for optimal power quality
- True load sharing capability
- Analog voltage or current speed references
- Superior motor protection

DC Retrofits

- Replaces high-maintenance electromechanical controls with reliable, low-maintenance, solid-state technology
- Retains existing DC motors
- Powered by existing 250 V DC rails
- Antiregeneration diode isolates drive from the rails
- Provides speed and torque control superior to electromechanical contactors
- Eliminates commutator faults due to brownouts
- Provides load-independent hoist and lower speeds
- Engages brake after motion has stopped (load hanging)
- Minimizes brake wear by eliminating the need to engage brake when going from up to down motion
- Reduces line voltage notching
- Reduces motor heating
- DC IGBT-based PWM technology ensures peak motor efficiency
- Compact design permits reuse of existing enclosures
- Utilizes existing crane controls until update is desired

Comparison



“Clunk-O-Tronics”

UNICO 2000 Series

Motor

- Maintenance
- Life
- Commutation faults
- Protection
- Change to AC in future

High
Typically low
Yes
Bimetallic or eutectic
No

Reduced
Reduced heating extends life
Minimal
Software controlled
Yes

Brake

- Load hanging
- Engaged when changing directions
- Maintenance

Brake captures the spinning load
Yes—necessitates brake maintenance
High

Brake engaged only after motor stops
No—extends brake life
Reduced by at least 90%

Contactors

- Maintenance

Yes

None

Crane Operation

- Current control
- Lowering speed
- Notch filters
- Line voltage notching
- Load stabilization control

Performance depends upon motor temperature, age, brushes, etc.
Varies with load
No
Yes
No

Current to motor controlled using digital current regulator (U. S. patent)
Independent of load
Yes—eliminates resonance
No
Yes

Miscellaneous

- Speed adjustments
- S-ramp setup
- Diagnostics
- Programmable security
- Windows/PC setup
- On-board PLC functions

New resistors
No
No
No
No
No

Setup parameters
Yes
Last 50 faults with date/time stamping
Yes
Yes (software available)
Optional

2000

Crane and Hoist Drive

Specifications Electrical

Input Supply

Voltage:	208/230, 380/400/415/460, or 575 V AC ($\pm 10\%$), 3-phase 250 V DC (+20%/–25%)
Frequency:	47 to 63 Hz
Displacement power factor:	0.95 at all loads and speeds 1.0 with regeneration

Output Rating

Voltage:	Zero to input voltage
AC switching frequency:	10 kHz standard, programmable 5 to 20 kHz
DC switching frequency:	1.5 kHz
Overload current:	150% of rated for 1 minute, 200% for 3 seconds

Environmental

Operating temperature:	Less than 300 hp: 32° to 131° F (0° to 55° C) 300 hp or more: 32° to 104° F (0° to 40° C)
Storage temperature:	5° to 158° F (–15° to 70° C)

Protection

- Ground fault
- Oversized IGBT power section
- AC line input fuses
- DC bus overvoltage
- DC bus undervoltage
- DC bus pre-charge contactor
- DC bus fuse and blown fuse
- Transient voltage suppression
- Electronic instantaneous overcurrent
- Electronic I²t motor thermal overload
- Electronic braking unit overcurrent
- Heat sink overtemperature
- Power transistor fault
- DC link choke
- Phase loss
- Control power undervoltage
- Excessive velocity error
- Uncommanded motion
- Overspeed
- Feedback transducer failure
- Memory malfunction
- Processor running fault
- Serial communication error

Power Range

Input Voltage	2400 Series (Modular AC)	2420 Series (Integrated AC)	2450 Series (Modular DC)
230 V AC	1 1/2-75 hp (1.1-56 kW)	1 1/2-40hp (1.1-30 kW)	1 1/2-150 hp (1.1-110 kW)
460 V AC	1 1/2-1000 hp (1.1-746 kW)	1 1/2-60 hp (1.1-45 kW)	1 1/2-800 hp (1.1-597 kW)
575 V AC	1 1/2-1000 hp (1.1-746 kW)	—	—

Consult factory for other powers. Other voltages require appropriate derating.

UNICO—Worldwide



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Specifications subject to change without notice.

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