

Variable Speed Control of Cranes & Hoists Using Variable Frequency Drives.

Variable Speed Control of Cranes & Hoists using variable frequency drives.

Drivecon variable frequency drives allow speed control of standard A.C. three phase motors from approximately 5% to 200% of full speed. The drive is a digitally controlled, three phase A.C., PWM power supply which can vary the speed of AC motors while maintaining constant output torque. Inherent soft start and soft stop, dynamic braking, and features such as self diagnostics through a user interactive operator's keypad are standard. Suitable for installation on new or retrofit applications of hoists, bridge or trolley motions on overhead cranes rated CMAA class A-F. Even higher performance is available with Drivecon Flux Vector A.C. drives for hoists without mechanical load brakes.

The advantages to the crane user and OEM are as follows:

1. A single speed 3 phase motor can be used instead of a more expensive multi-speed motor. Shortens lead times and reduces inventory of motors. Even existing single speed or wound rotor motors can be reused in most cases.
2. Reversing contactors, which can be a maintenance item, are not required since the drive reverses through internal solid state circuitry.
3. Mechanical brake wear is substantially reduced since the drive will decelerate the motor to a stop electrically then set the brake.
4. The drive has programmable soft start, soft stop among other features such as: preset speeds, upper and lower limits, lifting limits for hoists, reverse plugging simulation and pre-configured programs for traverse or hoist motions.
5. The crane motors can be run faster than base speed if required. Always review the mechanical integrity of the motor and drive train before operating above base speed.
6. Substantially lower cost than the traditional methods of obtaining infinitely variable speed control such as DC drives, static stepless, or multi-speed motors.
7. Variable speed control methods such as 2 or 3 step ramp and hold or fixed multi-preset speeds are available for single hand operation using compact pendant operator station.
8. Substantially less wiring between the pendant switch, drive, and motor. Saves on manufacture and installation time.
9. Motors run cooler and subjected to less operating stress.
10. Proven in thousands of applications for over 15 years.
11. Easily adapted to any wireless remote control no matter what the brand or technology.

The drive is suitable for controlling motors that have moving armature braking systems. However, the speed control range may be limited to a ratio of 10% to 100% of normal speed with these motors.



820 Lakeside Drive - Gurnee, IL 60031
Ph: 847-855-9150 Fax: 847-855-9650
800-374-8266
E-mail: drive.sales@drivecon.com
www.drivecon.com

Speed Control Methods

The drive controls the motors from a standard operator pendant station. There are 4 common types of speed control modes available. These modes are normally selected by operator/owner preference. Drivecon inverters can be configured for one of these three modes of operation. Each of the speed modes are described below.

1-5 Preset speeds

Provides selection of up to 5 preset speeds, one from each detent of a 5 speed pushbutton or master switch. Pressing the forward button to its first position selects forward and the first speed. Further depression to detents 2, 3, 4, & 5 selects set speeds 2, 3, 4 & 5 respectively. Pressing reverse button provides the same speed control in the opposite direction. Releasing the buttons will allow the motor to decelerate at a preset rate and set the brake once stopped. Should the buttons be reversed in quick succession, the motor is decelerated to a halt and then reversed by the electronics. A reverse plugging simulation program can be enabled to shorten the deceleration time. Should both buttons be pressed at the same time, the motor will not start or if running, be decelerated to a halt. Each speed can be programmed independently between the minimum and maximum operating speeds. It is advisable to arrange the speeds in incremental sequence.

2 and 3 Stepped Infinitely Variable

Provides infinitely variable speed selection from a two step pendant or three step pendant switch. Pressing forward pushbutton to its first detent position selects the minimum speed of the system (typically 1/20th of full speed) and the forward direction. Further depression to the second detent position signals the motor to accelerate at an adjustable time ramp (typically to reach full speed in 5 seconds.) When the motor has reached the desired speed, between the minimum and full speed, the operator needs only to allow the pushbutton to return to its first detent position to hold the desired speed. When the pushbutton is released, the motor will decelerate to a halt and the brake sets. Pressing the reverse pushbutton provides the same speed control in the opposite direction. A variation of this control method also allows for immediate setting of the brake instead of ramping to a stop or a programmable quicker secondary deceleration time. This method is suggested for hoist motions. Should both buttons be depressed at the same time, the motor will be decelerated to a halt. Should the buttons be switched in quick succession, the electronics will decelerate the motor to a halt and then drive the motor in the opposite direction. Three step control is similar however stopping mode can be selected by the operator. Ramp to stop can be selected by backing out to the first detent of the pushbutton. Brake to stop (immediate stopping) or a programmable quicker secondary deceleration time is selected by releasing the pendant button completely.

Stepless Infinitely Variable

Provides infinitely variable speed control from a master switch equipped with a potentiometer or pendant switch equipped with a linear output device such as Drivecon's UN80MK insert. Speed reference voltage can be 0-5VDC, 0-10VDC or 4-20mADC. A single contact closure is required in each direction for starting and direction control. Speed control is in direct relation to the position of the master switch. Please contact Drivecon Corporation for detailed analysis of your overhead crane control system requirements. Quotations are always provided and in a timely fashion. Feel free to call for a quote today or visit our web site for additional information.