Product note
Complete crane movement control with ABB machinery drives

Dedicated AC drives for standalone crane applications
Standalone cranes that require independent movements can benefit from using the ABB machinery drives, ACS850 with crane control program. This combination provides stepless speed and torque control of the crane along with control of the mechanical brake and other crane functionality.

Crane applications that can benefit from these functions, whether new or retrofit are:
- tower cranes in hoist, trolley and slew motions
- industrial cranes in hoist, trolley and long travel motions

Machinery drives suitable for crane cabinets
ABB machinery drives, ACS850, rated from 1.1 to 560 kW (400 and 500 V) can be mounted side-by-side, thereby providing a compact fit into a crane cabinet.

The drive features coated printed circuit boards that help protect the drive against dust and moisture ingress in hostile environments. Safe torque off (STO) safety feature is built into the drive, which is used where power removal is required to prevent an unexpected startup.

Machinery drives’ optional built-in brake choppers connect the DC bus voltage to an external resistor, where the braking energy is converted to heat. A common DC bus configuration can also be used to share the energy between the drives.

Removable memory unit safeguards settings
The complete crane control program and all parameter settings are stored in the drives’ removable memory unit. This ensures quick setup and restart should a drive need replacing or if the crane control program needs updating.

Motor control method brings accurate performance
A key feature of the ACS850 machinery drives is its motor control method, direct torque control (DTC). DTC lets the drive to achieve full torque at zero speed. In addition, the drive’s fast torque response means the crane reacts quickly to changes in movement commands. High starting torque can be attained with help of premagnetizing and torque memory functions.

Crane control program is flexible to use
The ready-made crane control program can interface with analog, digital or fieldbus systems, enabling a wide range of connectivity for start, stop and reference change signals.

The program includes four different user sets for customizing the parameter settings for multiple configurations. Each user set includes two different control places and an overriding emergency control place.
Mechanical brake control improves safety
Integrated mechanical brake control logic for disk and drum brakes, utilizes torque memory and premagnetizing to build up the torque in the motor before opening or closing the brake without any sudden drop or jerking movements. It closes the brake smoothly using overlap delays before the mechanical brake takes over. Additional safety is built-in to the braking through intelligent brake logic supervision.

Reference handling gives flexibility
Crane reference sources, such as analog joystick’s unipolar, bipolar or digital step references, can be used for controlling crane movements.

Load speed control optimizes crane capacity
Load speed control maximizes the hoist speed for a given load and ensures that there is sufficient motor torque in the field weakening area. This minimizes operating time and optimizes crane capacity.

Motor speed matching and overspeed protection enhance safety
Motor speed matching continuously compares the actual crane speed reference to the actual motor shaft speed to detect any differences.

Load speed matching continuously compares the actual motor speed to the drum speed.

Overspeed protection ensures that the crane motor speed remains within safe limits to prevent overspeed.

Safety control keeps crane within limits
The slow down function limits the crane speed to a preset level when the crane is inside defined zones. The upper and lower limit logic enables sensors to be connected directly to the drive to stop the crane safely when it reaches the end position of its travel.

Slack rope detection increases safety on crane drums
Slack ropes on crane drums can lead to hazardous situations. This can be detected and corrected with the help of integrated logic in the crane control program.

Function block programming extends applications
Function block programming as standard enables the user to create new crane functions or to modify existing ready-made crane control program.

Homing mode defines position of crane or hook
Homing mode calibrates the actual position, based on the motor encoder, to zero or predefined position value. This can be used as an automatic sequence to ensure that the crane hook or the crane itself is parked in a special home position before starting the crane.

Crane load analyzer monitors loading
Crane load analyzer shows the crane drive load profile. The crane user can select a signal to be monitored by the peak value logger.

Crane maintenance counters
The crane user can select six different maintenance counters that can be configured to generate an alarm when the counter reaches a predefined limit.

For more information please contact your local ABB representative or visit:

www.abb.com/drives
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