Sensata Technologies

CHIP CONVEYOR MOTOR CONTROL IN MACHINE TOOLS

Background

A chip conveyor system is very common on CNC machine tools; it can be part of the machine or it can be offered as an accessory. The main function of a chip conveyor system is to remove the cutting excess material, which can be metal or plastic, from the machine tool. A chip conveyor is commonly driven using a small to medium size three-phase motor, and the conveyor control system is generally mounted next to the motor in the conveyor. Reliability is a prime concern on these systems, since repair downtime could be very costly, so this should be considered when designing the control system for a chip conveyor. It also needs to have capacity for reversing, in case chips get stuck.

In addition to having standard start/stop and reversing control, using a Motor Starter can add other features that help reduce current surges and extend the life of the motor and the conveyor mechanical parts

Solution

Control of start/stop and forward/reverse of the conveyor motor can be achieved using electromechanical contactors, but this has several disadvantages: it requires 2 contactors plus an interlock system, and there is also a reliability issue since the life expectancy of an EMR solution is much lower (typically lower than 100K cycles)

Solid State Relays and Contactors are a great solution for this application, being more compact than the equivalent EMR solution and having higher reliability. For a simple control system, a basic reversing contactor like a **Solicon DRC**, can be used to provide start/stop and forward/reverse control.

For a more complete control solution a Hybrid Motor Starter, such as the **DRMS**, would be an excellent option. This device combines EMR and solid state switching technology on an integrated solution in a slimmer 22.5mm package. In addition to having standard start/stop and reversing control, using a Motor Starter we can add other features such as overload detection (there is no need to add an external overload relay) and soft start/stop function, which can help to reduce current surges and extend the life of the motor and the conveyor mechanical parts.
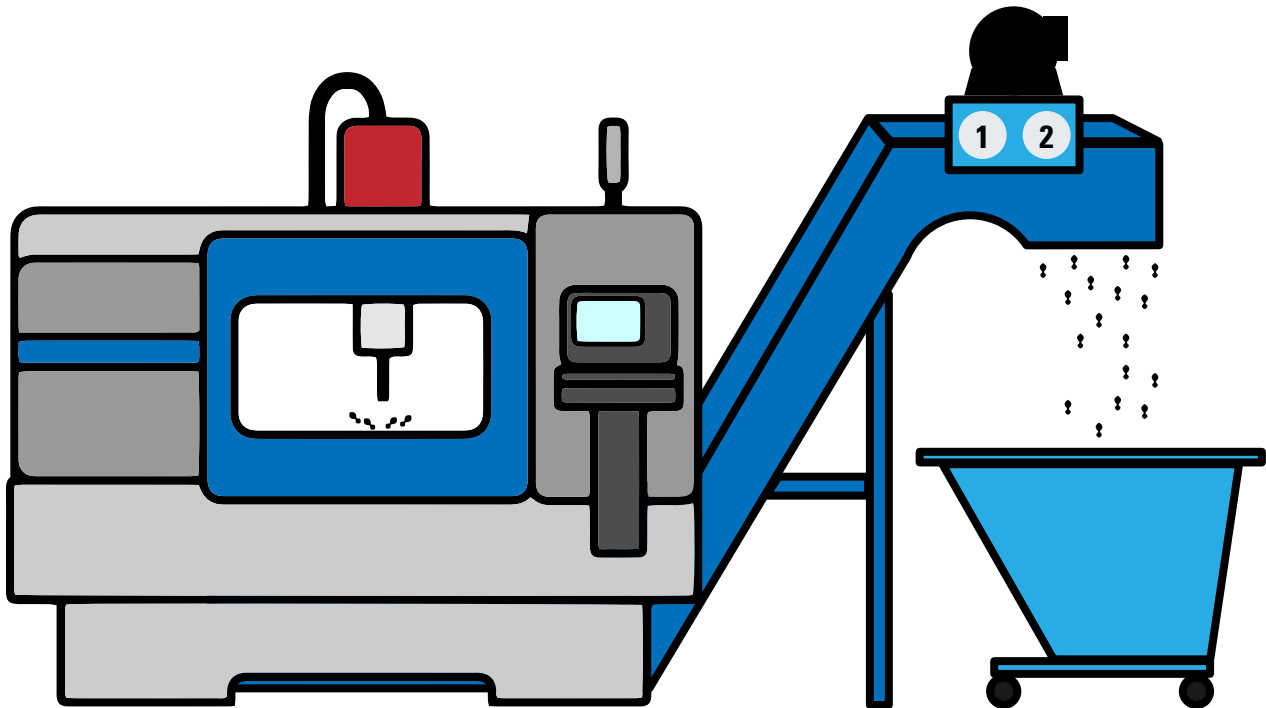
RECOMMENDED PRODUCTS

Reference on Diagram	Product	Features	Function	Brand
1	DRC Series	• Solid state contactor • Reversing of 3-phase motors up to 5HP (3.7kW) • Available with auxiliary contacts • Built-in overvoltage protection	Conveyor Start/Stop with Fwd/Rev	Crydom
2	DRMS Series	• Hybrid relay technology • Reversing of 3-phase motors up to 4kW • Soft start/stop capability • Overload protection	Conveyor Start/Stop with Fwd/Rev and Overload Protection	Crydom

DIAGRAM

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