Compliant and floating at the same time

New SoftMove software eliminates the need for mechanical compliance solutions and opens up flexibility and the possibility for a variety of machine-tending applications for the plastics industry.

Robot compliance is key for producing precision aluminum, iron or other metal parts, but traditionally it has been solved with a mechanical compliance mechanism between the tooling and the robot’s mounting flange. However, mechanical solutions leave little room for flexibility and require high-accuracy fixtures and advanced programming, which can be expensive and require specialized staff.

To eliminate the need for such solutions, ABB has developed a software option, SoftMove, that allows the robot to be compliant or floating as needed in order to adjust to external forces or variations in work objects. SoftMove means investment costs can be significantly reduced while reliability increases. The flexibility the software provides also allows smooth and inexpensive changeovers when introducing new parts. This can be used in a typical machine tending application where the injection moulding machine ejects a part.

With SoftMove, the robot is compliant in one direction only, which facilitates high accuracy and reliability. The option reduces robot programming time and enables efficient interaction between robot and machine, which ultimately reduces cycle time and saves money.

The robot can be set to be compliant in one Cartesian direction, either during a programmed movement or while standing still. The robot can either be floating or acting like a spring, which facilitates flexibility and multiple application possibilities. Then, when the robot is in floating mode it will be “free floating” in the specified direction and the position can be changed by external forces.

In spring mode the robot acts like a spring in the specified direction and the force needed to push it away increases with the distance from the start point. The compliance shortens programming time and improves productivity and quality.

SoftMove is a true Cartesian soft servo that considerably reduces programming time compared with conventional soft servo functionality. As the robot can be set to be soft in any Cartesian direction, know which robot axes move in a linear movement is not necessary. SoftMove is ideal for simple assembly applications where some compliance in the robot is needed.

SoftMove is suitable for any application where the robot needs to be compliant to accommodate changes and tolerances created by tools, machines, fixtures, etc. It is also effective for applications where robot positioning needs to be adjusted due to variations in work objects, inaccurate fixtures or machines, or when the process requires compliance to be more productive and reliable.

Ultimately, SoftMove can reduce the cycle time as the robot movement can be directly linked to the movement of an ejector mechanism of a machine or other external forces.

>FACTS

Features and benefits of SoftMove
- Lowers the stiffness of the robot in a specified Cartesian direction while mainly maintaining the original behavior in other directions
- Robot can be “free floating” in a specified direction
- Robot can have a spring function in a specified direction
- Stiffness and damping parameters controlling the compliance
- Gravity compensation – The stiffness can also be lowered in a vertical direction
- Benefits include compliance in only one direction