SMC Expert Article – Robotics

Give your robot grippers ‘electric’ performance

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There are many reasons to consider the use of electric rather than pneumatic actuators to drive your robot grippers, such as the accommodation of higher payloads, the ability to control gripper movements (not just open and close) and greater flexibility when changing workpiece size, weight or shape. If you are astute with your actuator selection you’ll also benefit from lighter weight to reduce energy consumption and CO_2 emissions.

Here at SMC, we see demand for electric grippers rising as these innovative products become more efficient, more powerful and faster, today matching or exceeding air-driven alternatives in grip force and speed. Electric actuators also provide you with the potential for more data feedback.

These benefits – alongside the ability to support payloads up to 100 kg – mean the spread of potential applications for electric-actuated grippers is growing. While opting for electric gripper actuation is obviously preferable in applications that need to avoid the use of compressed air, such as clean rooms or medical or pharmaceutical facilities, all major robot tasks are able to take advantage, including packaging and palletising.

Leading the pack

We have numerous customers using our electric grippers in packaging and palletising operations. They particularly enjoy the ability to regulate the gripping force and opening stroke, which brings greater levels of flexibility to the task, helping to optimise the application.

We also see an increasing number of collaborative robots (cobots) adopting electric grippers due to the higher level of control and adjustment available. Electric actuators driven by servo or stepper motors provide you with much finer control over speed and gripping force. Moreover, you can program jaw stroke to grip a wide variety of parts, which is ideal if you lift workpieces of different size, shape or weight.

SMC´s Rod Type Electric Actuator, AC Servo Motor Type – LEY63 Series

In a further advantage, an electric actuator can connect directly to the robot's central control unit, eliminating the need for a PLC, with communication provided via Ethernet-based fieldbus. Some of the very latest designs even integrate the controller inside the actuator to simplify cabling.

Less weight; less energy use

A major benefit of using SMC electric actuators is weight reduction of up to 34% over competitor models (depending on the size selected). Lighter weight means it takes less energy to move your robot, saving money and reducing CO_2 emissions. In addition, we minimise CO_2 emissions during the manufacture of products such as our electric actuators through a process called topology optimisation, namely finding the most efficient design for an object on a mathematical and mechanical basis.

We know from experience that the myriad of advantages available from using our electric actuators make them a highly beneficial and competitive proposition for robot grippers in all kinds of applications.

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