

Industries: Plastics / Injection moulding

Products: Industrial robots / RV-6S series articulated-arm robots

Flexible tools for product variants and high-volume manufacturing

At their works in Wernau, Germany, the precision plastic components specialists at 2E mechatronic uses automated production facilities with integrated quality control systems to manufacture safety-critical parts for the motor industry. A compact industrial robot from Mitsubishi Electric is a key component of this production system.



In this application the medium-scale enterprise manufactures sensor housings for the ESP (Electronic Stability Program) system of market leader Bosch, mastering the difficult balance between maximum quality and economical production. In order to maximise the speed of the injection moulding cycle the system is equipped with three identical moulds installed on a rotary table. While two plastic housings are being moulded the inserts for the next housing – flat contacts, retaining pins and bushings – are inserted in the third mould. By the time this operation is complete the finished housing in the third mould has cooled enough to be removed.

The handling of the housings is performed by a Mitsubishi Electric articulated-arm robot of the RV-6S series. Its compact dimensions, speed, precision and reliability were the main factors that led to its choice for this application. The agile robot, which has a working reach of 696mm and can

handle payloads of up to 6kg, is integrated in the production cell. It breaks off the sprue, removes the finished housings from the moulds and transports them to the quality control testing station. Each housing then undergoes eight quality checks in two stages. Defective components are removed from production immediately. After the checks the robot takes the defect-free mouldings out of the testing station in pairs and places them precisely first into transport boxes, transferring them via two receiving stations.

The robot performs all these operations at high speed and can vary the sequence of the tasks for maximum efficiency. For example, as soon as the injection moulding machine releases a tool it interrupts the current operation and removes the finished housing from the mould. This flexibility enables very short cycle periods and high throughput rates.

More than two million housings in four variants are produced per year on the line, which was designed specifically for this high-volume task and is operated round the clock. The robot is always in motion and places a quality-checked housing in the packaging container once every ten seconds. Retooling can be performed quickly and easily when required by incoming orders: the operator simply selects a different program in the robot controller.

Car industry supplier Bosch is also impressed by the quality and production costs achieved by this robot-assisted production line. 2E mechatronic has now already started production on a second fully-automated line for ESP housings.

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The robot has operated without a hitch since it was installed two years ago, despite the non-stop operation and the high temperatures near to the injection moulding machine.

Uwe Remer
CEO of 2E mechatronic GmbH & Co. KG, Wernau

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