

Laser welding



Task

A universal laser welding station for all kinds of parts with the highest possible amount of flexibility and accuracy for prototypes up to small series must be manufactured. Two parts for automatic protective gas welding must be fed into the unit via an operated and protected set-up station. The parts are aligned and fed into the unit on fixtures. The fixture must be convertible in a very short amount of time according to the component that needs to be processed. Welding of different kinds of mouldings must be possible.

Solution

A laser welding head by Trumpf is built onto an articulated robot. The six degrees of freedom allow a spherical work space, which enables access from any desired point and running on 3D lanes. The robot is mounted on a sturdy base frame. A workbench for the operating personnel is built in at the front. At this manual workspace a rotary indexing table with two clamping and alignment devices is installed. The safety enclosure and the lock operation protect the operating person from dangerous laser radiation while arranging the parts. The welding process is monitored with a camera system. The alignment tool is pinned and works as an interchangeable part, which can be replaced according to the variety of types. It is also possible to increase productivity with four workpiece holders on the rotary indexing table.

Result

An ergonomic workspace facilitates the pre-assembly process for the operating personnel. Thanks to the universal and extendable clamping device with positioned and marked alignment devices the changeover time was reduced to a minimum. Deploying the robot guarantees the high precision of ± 0.02 mm repeat accuracy. With the prospective expansion to four workpiece holders, productivity can be increased and an automatic loading and removal handling device retrofit could increase autonomy.

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