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Automated Control of Thermal Machine for Metal Sheet Cutting

Automation has always been the most promising direction in the development of industrial production. Thanks to men elimination from the direct involvement into production processes, as well as increasing the concentration of basic operations, working conditions and economic indicators of production have significantly improved. The successful development of automation today requires not only new materials and modern designs, but also advanced technologies which are of great importance for manufacturing processes .

Automation of industrial processes is associated with the introduction of automatic devices. In mass production these devices are process-specific. Batch production requires multi-purpose automatic devices which need constant readjustment and, as a result, some loss of production time. Therefore, much attention has been recently paid to the "flexibility" of automatic equipment that can be reached by the wide use of program control.

Currently, metal cutting has also become increasingly important. This is primarily due to the increased production volumes which contribute to the development of new technologies and significant development of automatic machine tools which are gradually getting more and more complicated in design.

As a result, the role of CNC (Computer numerical control) equipment in modern production is increasing. Introduction of CNC substantially eased metal cutting, increased productivity and accuracy of production of part blanks, so the role of metal cutting in blank metal production also grew up. In the sphere of mass production the task of complex automation is traditionally solved by using special automatic transfer lines and rotating conveyor systems. But it is much longer and more difficult to automate small-scale manufacturing because it is characterized by a wide range of products and rapid changes in production processes. Nowadays, in fact, program-controlled industrial robots and similar robotic equipment are the only means of automation in small-scale production.

In mass production using robotics is even much more profitable as it makes design and manufacturing processes much faster. The involvement of automatic lines gives an opportunity for replacement of specialized transporting, positioning and other supporting equipment and typical robotic devices in the shortest period of time.

What is more, application of CNC could not only change the nature of production in metal working, but also fundamentally influenced the design of most machines.