

TwinCAT controls advanced CNC turret punch press



DMT-200 CNC turret punch press with gantry drive for sheet metal processing. As a result of using Beckhoff TwinCAT CNC, the entire CNC application is implemented in software.

Machine efficiency increased by 20 %

The new DMT-200 CNC turret punch press with gantry drive is the result of the successful cooperation of Jiangsu Jinfangyuan CNC Machine with Beckhoff China. With this advanced machine, Jinfangyuan has for the first time settled on a purely software-based CNC control solution. Through the use of EtherCAT and TwinCAT CNC it was possible to increase the processing performance of the DMT punch by around 20 % compared to the previous solution.



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In addition to turret punch presses, Jiangsu Jinfangyuan CNC, based in Yangzhou City, China, also includes bending machines, laser cutting machines and complete sheet metal processing facilities in its extensive machinery portfolio. Among the turret punch presses, the ET, VT and DMT model ranges are available with different punching heads. The CNC axis control and positioning are implemented identically on all three types. The ET range is fitted with a pneumatic punch, the VT with a classic hydraulic punch and the DMT series with the most energy-efficient solution, a punch servomotor.

Universal PC-based control platform

All punch presses are equipped with a powerful Beckhoff C6640 Industrial-PC, a CP6902 operating panel with touch screen, TwinCAT automation software, EtherCAT I/Os and the AX5000 EtherCAT Servo Drive. "The DMT, in which we are using TwinCAT CNC, works faster than all the other CNC machines from Jinfangyuan," says Li Qiang, DMT Project Manager at Jinfangyuan. The punching speed of the current DMT-200 is 500 cycles/minute in 25 mm steps, with a punching pressure of up to 50 tons.

Jinfangyuan has already employed Beckhoff PC-based control technology for years and with the DMT-200 CNC turret punch press has now implemented a CNC controller completely based on TwinCAT CNC for the first time. The entire processing procedure of the DMT has been programmed completely in NC code. TwinCAT CNC includes PLC, Motion Control and CNC control and is used in the combined punching and laser cutting line as well as in the equipment for loading and unloading material. Owing to the high-performance of the PC, all automation functions can be run on one computer. Thus, both the hardware and space requirements as well as the system costs are significantly reduced.



The Beckhoff CP6902 built-in Control Panel with touch screen provides convenient operation and monitoring of the turret punch press.

"The open nature of the PC-based controller enables our developers to incorporate their process know-how in the controller. Thus, we are in a position to develop customized software and equipment for our machine and consequently improve our competitiveness," explains Project Manager Li Qiang.

No limits placed on the operating functions

With TwinCAT TcHmiPro, Beckhoff offers a .NET-based open platform for developing an impressive man-machine interface. The operator interface has been programmed in C# and permits the integration of the ADS communication, automation functions, manual operation, recipe management and monitoring of variables in a single platform. Jinfangyuan has also extended its HMI interface with graphical processing simulation, a tool database and a real-time display of the punching operation.

EtherCAT increases machine efficiency

"Beckhoff has won our confidence thanks to the openness and user-friendliness of its control system and because of the development of the CNC kernel according to our wishes," explains Yang Huiyu, Software Engineer on the DMT project at Jinfangyuan: "As a result of using EtherCAT, TwinCAT CNC and the possibility of customer-specific customization of the kernel, the processing efficiency of the DMT punching machine will be increased by about 20 % compared to our previous solution." The TwinCAT system supports all current bus protocols such as EtherCAT, SERCOS, CANopen, etc. "This openness facilitates the communication of the DMT with other machinery throughout the entire installation and provides us with convenient support when setting up a flexible production line," continues Yang Huiyu.

Further Information:

www.jinfangyuan.com

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