The Tube Bender Built-in the CANopen Motion Control



Various Bender Machines :

(These bender photos are only illustrative, not the actual application equipment. The photos belong to their authors.)

With the various tube benders, it is possible to bend different radii at tubes. Radii can follow each other without straight length in between and can be in different planes. The machine can produce bent tubes with homogeneous wall thickness.

Various Bended Tubes :



(These bender photos are only illustrative, not the actual application equipment. The photos belong to their authors.)

Nowadays, the metalworking needs higher precision and less defection. The traditional machines are upgrading to the precision machinery. The design of the tube bender machines are changing including the mechanism, the appearance, and the sensors. The controller of the tube bender machine also changes the PLC to the IPC or embedded PC which built-in friendly HMI and powerful 3D software like 3D preview, mirroring and rotation. The CANopen motion becomes one of the economical remote motion controls.



(These bender photos are only illustrative, not the actual application equipment. The photos belong to their authors.)



The CANopen motion library has included the CiA 402 profile. The users need not to care about the CANopen protocol and just focus on the control algorithm. The bender machine equipped the IPC and CANopen master PCI board (PISO-CPM100U). With the PISO-CPM100U and CANopen motion library, you can do various motion control functions, such as position control, velocity control, toque control, and synchronous action without having the background knowledge of the complex and abstruse CANopen protocol.



Position Control :

The position control is one of the basic motion commands. In the bender machine, the 90% commands are position command. The user could just call the position command [CPMotor_PP_MotionMove] to make the motor go to the target position. The complex PID control logic will be implemented by the servo motor. It is easy for multi-axis machine. Each motor could move individually at any time, even other motors are moving.



Every motor could move at any time individually, even other motors are moving.



Synchronize Control :

When bending the tube, the tube needs to move forward at the same time. This action could be implemented by the interpolation or synchronization motion control. It is easier to use the synchronization. The users can just make the [Axis-bend] and [Axis-forward] to move at the same time and reach the target at the same time. In the CANopen motion library, there is a [CPMotor_SYNCMove] API to make motors start at the same time and reach the target at the same time.



The tube bender machine has been developed and has been widely used in the sports equipment tube bending, medical equipment tube bending, automotive tube bending, air conditioner tube bending, wire bending, car seats frame bending and some other industries.

