



**Industry Notification - Machine Tool Industry**

# **Delta PC-Based Servo Punching Machine System**

IABG Global Solution Center  
Jan. 2022

# Servo Punching Machine System

## Introduction

The servo punching machine features in its efficient control of punch motion and speed. For different processing purposes, the best punching profile can be used for the highest efficiency. It is an important equipment for metal parts production, which is usually used with molds for metal punching and shearing, profiling, deep drawing and forging. This solution employs Delta's PC-Based Motion Controller to develop various punching profiles, combined with the Heavy Duty Vector Control Drive to control the servo motor and slider with position control for various operations.

## Application

This solution mainly applies to servo punching machine for sheet metal forming of car and locomotive parts; With the increasingly complex vehicle structure, as well as the demand for lightweight and higher productivity, the servo punching machine offers various processing profiles which can be optimized to meet customer requirements. It is used with Delta's PAC platform, enabling IIoT and device information integration to collect sensor data for analysis, thus to achieve vibration suppression and pre-diagnosis.

## Process

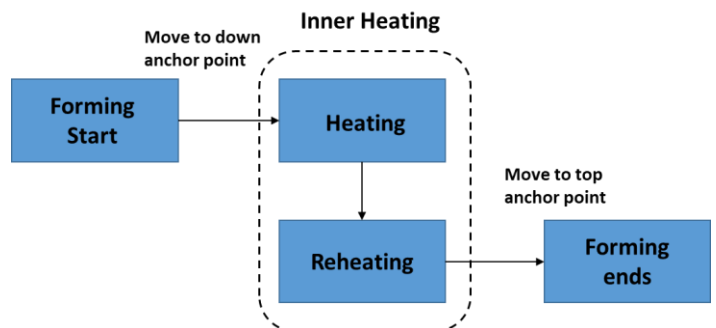
The servo punching machine has got an edge over traditional punching machine by:

1. Sustaining pressure when the bottom anchor point stops.
2. Adjusting punching frequency and stroke to reduce required punching tonnage.
3. Controlling velocity and pressure at low speed domain.

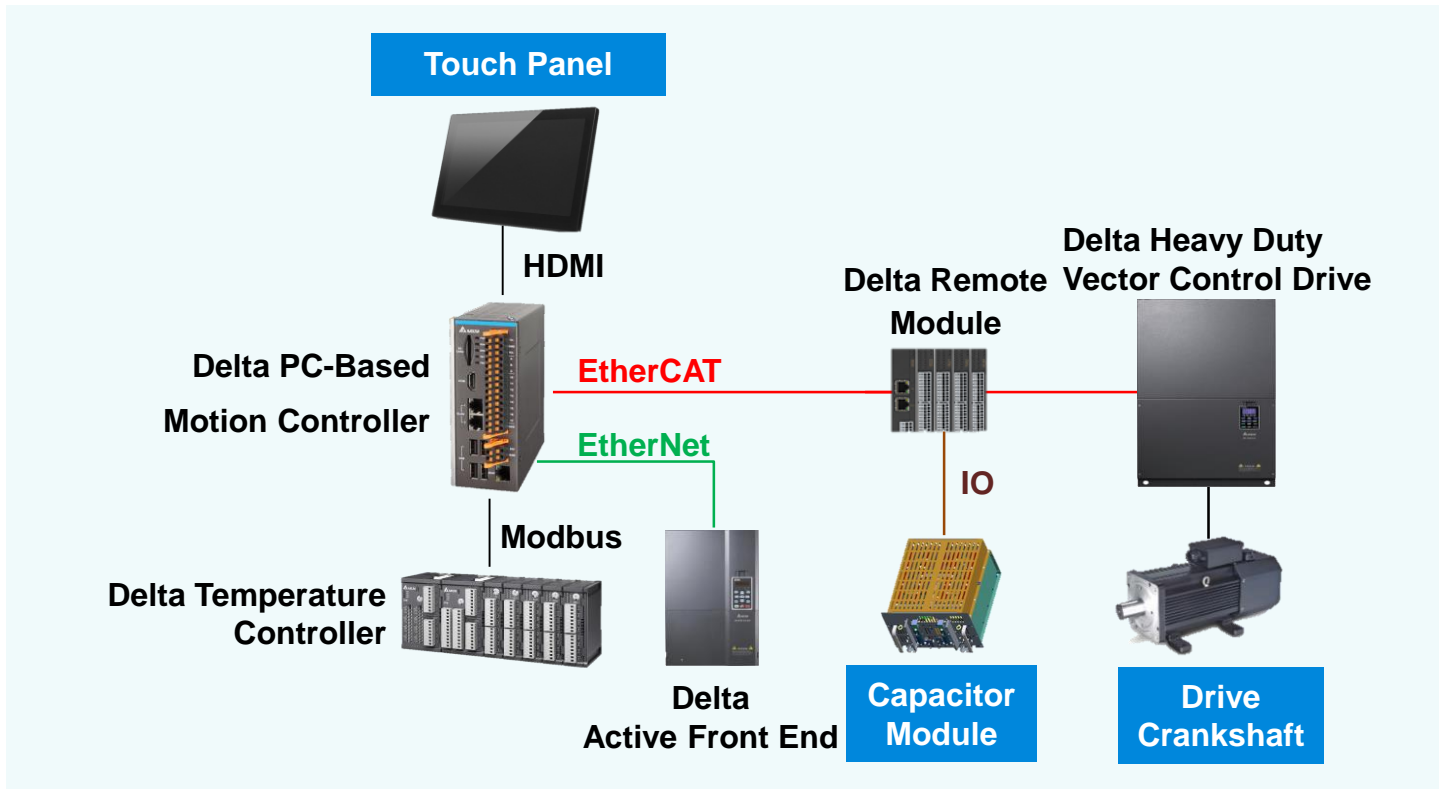
## Description

1. Taking inner heating process for an example, this process applies to high strength metals, such as magnesium alloy and high strength steel.
2. After the slider drops rapidly from the top anchor point, it slows down and starts the 1st heating stage for preforming.
3. Then the slider continues to drop for a longer heating time.
4. Finally it reaches the bottom anchor point, stays for a while then stops heating.

## Machine Process



## Solution Architecture



## Features and Advantages

### High precision, speed, and flexibility

- Delta PC-Based Motion Controller based on EtherCAT bus with high real-timing, speed, accuracy and flexibility.
- Capable of integrating with general modules and devices via EtherCAT communication.
- Delta's PAC platform is extensible that it enables data exchange between PLC and Windows-based programs by Share Memory for data collection and analysis.

### High precision, high speed and high flexibility

- Employs IEC-61131 compliant CODESYS SoftPLC development software, offering extensive function blocks and ST language for high-level programming.
- For easy programming, SFC and standard LD programming language are also available.
- Features Motion Profile Plan with common punching profiles for users to choose based on required process.