

# Course PLC Project # 1: Stamping Machine

- *Initial State*

The machine is in its initial state when

- the pusher is retracted (S5 actuated)
- the die is empty and
- valves Y1 to Y4 are closed.

- *Function Sequence*

The pusher (Y1) pushes a blank from the magazine into the die. When there is a blank in the die (S6), the ram (Y2) is lowered and then raised again three seconds later. When the blank has been stamped, the ejector (Y3) ejects the finished workpiece falls into the collecting tray, and the next stamping cycle may begin.

All three cylinders have return springs so that pusher, ram and ejector all return to their initial positions when the associated valves (Y1, Y2, Y3) are shut off.

Inputs S1 to S4 are used to set the required operating mode. If no mode has been set and the machine is in its initial state, the individual sequence steps are also set to their initial states.

- *Auto mode (S1 open)*

The control sequence can be started by actuating the Start button (S2) only when the machine is in its initial state. Signal lamp H3 indicates that the machine is set for Auto mode. When a stamping cycle has been completed, the next cycle is started automatically.

When pushbutton S4 is actuated, automatic operation is disabled as soon as the machine is in its initial state.

- *Manual mode (S1 actuated)*

When momentary-contact pushbutton S2 is actuated, the next sequence step can be set if the step enabling conditions are satisfied. The commands to valves Y1 to Y4 that are allocated to this sequence step are executed only as long as momentary-contact pushbutton S3 is actuated.

If the operator switches to manual mode (single-stepping) during automatic operation, the current stamping cycle is interrupted and the control system stops at the current sequence step.

