Instron Tensile Machine Conversion Into Plastic Injection Molding Machine

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Background

In the fall of 2018, a 41X group began the design and conversion of an old Instron tensile testing machine into a plastic injection molding machine for the Advanced Manufacturing Lab at the University of Guelph's School of Engineering, under the supervision of Dr. Ibrahim Deiab Ph.D., P.Eng.

Problem Statement

A continuation of the project started by the Fall 2018 41X group; Design a fully functional automated plastic injection molding machine for the Advanced Manufacturing Lab

Design Features

- Professional aesthetic
- Control system maintains plastic in a melted state
- Pneumatic mold elevator raises and lowers a mold cavity to and from the injection nozzle
- Piston is controlled through PLC
- PLC code simplified and has more logical operation
- Addition of a safety enclosure
- Mechanical design is CSA approvable

Future Recommendations

- The wiring within the control panel should be redone to ensure it is CSA approvable
- Rewiring the control panel will also make future changes easy as the wiring will be more organized
- Heating elements should be properly enclosed
- Introduction of load cell to maintain hold pressure
- Inclusion of safety door switch

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