Automated Three Vessel Brewing System

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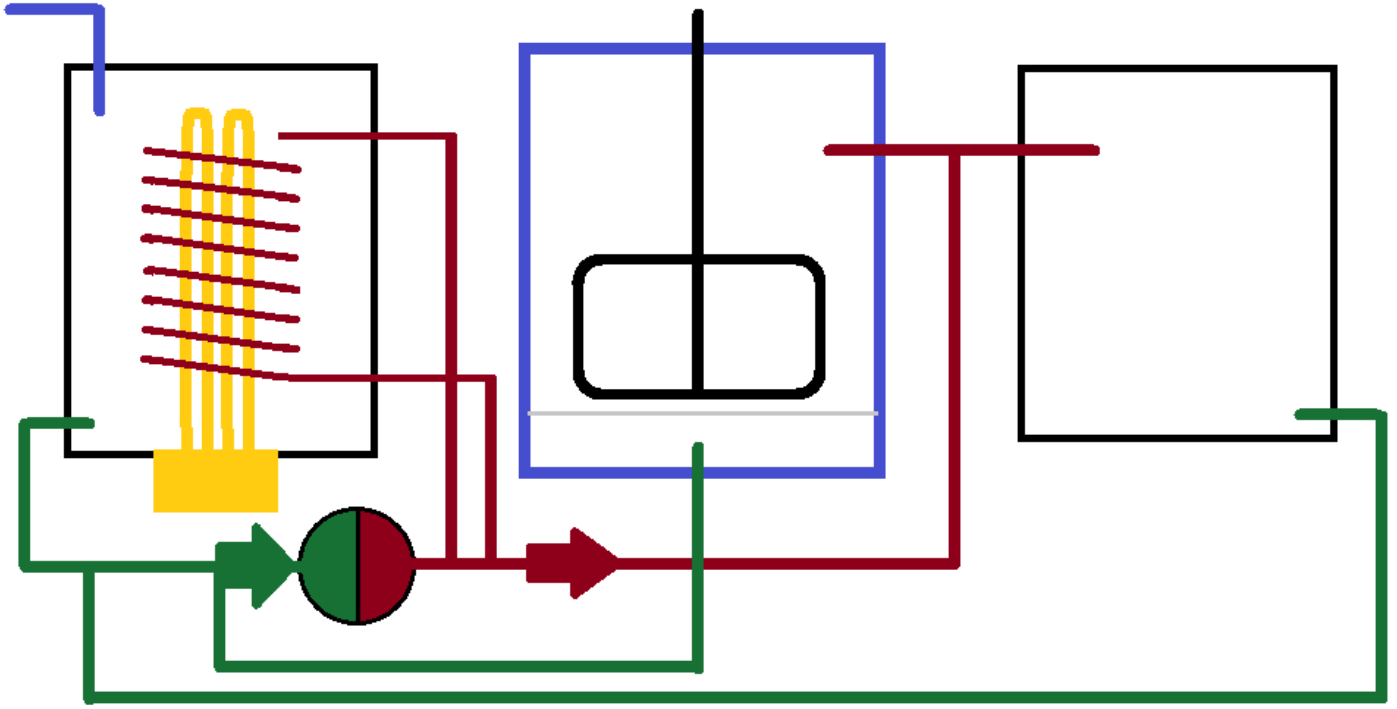

Master Control

- Touch LCD Screen
  - Display temperatures
  - Controls
- Persistent Memory
  - Read and Write Recipes

Hot Liquor Tank

- Filtered water intake
- Heating element
- Heat exchange coil
- Temperature sensor
- Exit valve to pump

Mash Tun

- Intake from coil
- Stirring arm
- Temperature sensor
- Exit valve to pump

Boil Kettle

- Intake from coil/pump
- Temperature sensor
- Exit to pump

Milestone Goals:

- Hot Liquor Tank
  - Heating Element
  - Temperature Sensor
  - Individual Valves
- Mash Tun
  - Stirring Arm
  - Temperature Sensor
  - Individual Valves
- Boil Kettle
  - Temperature Sensor
  - Individual Valves
- Basic SPI communication
  - Not enough for the complex pump/valve system

Final Project Goals

- Master Control
  - Temperature Display
  - Recipe options and controls
  - Pump/valve coordination
    - Transferring stages
- Mash Tun
  - Pump/Valve coordination
    - Continuous/Fly sparging
    - *Vorlauf*, “leading”
- Boil Kettle
  - Pump/Valve coordination
    - Heating from HLT

Limitations:
The mechanical components of a three vessel brewing system are complex and expensive, and will not be produced over the course of this project. Instead a mock up will be created using cheap dc motors in place more more expensive pumps, and LEDs in place of more expensive solenoid valves and heating elements.