

Press START button

Process 0 Heat Strike Water

- **State 0 Heat Strike**
 - Out1 (kettle heater) PID setpoint=strike temp, using temp1(kettle)
 - Temp1(kettle)>=strike temp, Reg0 (alarm sounds)
 - DIN0 activated by pushbutton (silences alarm)
 - Exit condition DIN0=on, Goto State 1
- **State 1 Fill MLT**
 - Out1 (kettle heater) PID setpoint=strike temp, using temp1(kettle)
 - Manually open kettle valve
 - Prime pump
 - Manually turn pump ON (from Kettle to MLT)
 - Watch to ensure water is evenly distributed between two vessels
 - DIN0 pushbutton (Fill MLT done)
 - Exit condition DIN0=on, Goto State 2
- **State 2 Preheat MLT**
 - Pump ON from State 1(pump from kettle to MLT)
 - Out1 (kettle heater) PID setpoint=strike temp, using temp1(kettle)
 - Manually open MLT valve and throttle pump valve to equalize flow
 - Timer0 (preheat timer), count down, init 15:00
 - Timer0<= 0:00, Reg0 to trigger alarm
 - DIN0 to reset alarm (Preheat done)
 - Manually close kettle valve
 - Manually turn pump OFF
 - Drain all strike water back to Kettle
 - Manually close MLT valve
 - Exit condition DIN0=on, End Process
 - On exit, spawn Process 1 (Mash)
 - Add grains to MLT

Process 1 Mash

- **State 0 Dough in**
 - Manually open Kettle Valve
 - Manually turn pump ON
 - Add required water to MLT
 - Out1 (kettle heater) PID setpoint=mash temp (+6F, see NOTE 1), using temp1(kettle temp)
 - Timer3 (total mash time), count up, init 0
 - Manually close kettle valve
 - Manually turn pump OFF
 - DIN0 (Dough in done)
 - Exit condition DIN0=on, Goto State 1

- State 1 **Recirc** (vorlauf a small amount to clear up the recirculating wort)
 - Out1 (kettle heater) PID setpoint=mash temp (+6F, see NOTE 1), using temp1(kettle temp)
 - Timer0 (Mash timer), count down, init mash time (60 mins usually)
 - Timer3 (total mash time), count up, continue from previous state
 - Manually open MLT valve
 - Manually open kettle valve
 - Manually turn pump ON
 - Timer0<=0, Reg0 to trigger alarm
 - DIN0 (silences alarm)
 - Exit condition DIN0=on, Goto State 2
- State 2 **Mashout**
 - Out1 (kettle heater) PID setpoint=mashout temp (+6F, see NOTE 1), using temp1(kettle temp)
 - Pump ON from State 1
 - Timer2 (Mashout timer), count down, init 20:00
 - Timer3 (total mash time), count up, continue from previous state
 - Timer2<=0, Reg0 to trigger alarm
 - DIN0 (Mash out done, silences alarm)
 - Exit condition DIN0=on, Goto State 4
- State 4 **Drain to BK** (press button when I think it's drained enough to start boil process)
 - Manually close kettle valve
 - Manually turn pump off
 - Out1 (kettle heater) PID setpoint=205F, using temp1(kettle) (this is just to start heating up to boil while MLT is draining)
 - Timer3 (total mash time), count up, continue from previous state
 - DIN0 (Drain done)
 - Exit condition DIN0=on, End Process
 - Manually close MLT valve when fully drained
 - On exit, spawn Process 2 (Boil)

Process 2 Boil

- State 0 **Bring to boil**
 - Out1 (kettle heater), on (full power)
 - DIN0 (Start boil)
 - Exit condition, temp1(kettle)>=210F, Goto State 1
- State 1 **Boil**
 - Out1 (kettle heater), duty cycle 60%
 - Timer0 (Boil timer), count down, init boil time (60 mins usually)
 - Timer0<=15:00, Reg0 (alarm sounds)
 - DIN0 to silence alarm
 - Exit condition DIN0=on, Goto State 2
- State 2 **Connect CFC**

- Out1 (kettle heater), duty cycle 60%
 - Timer0 (Boil timer), count down, continue from previous state
 - DIN0 (CFC connected)
 - Exit condition DIN0=on, Goto State 3
- State 3 **Finish boil**
 - Manually open kettle valve
 - Prime pump
 - Manually turn pump ON (wort flows through CFC and back into kettle)
 - Out1 (kettle heater), duty cycle 60%
 - Timer0 (Boil timer), count down, continue from previous state
 - Timer0<=0, Reg0 (alarm sounds)
 - DIN0 to silence alarm
 - Exit condition DIN0=on, Goto State 4
- State 4 **Recirc to cool**
 - Connect hose to input and discharge of CFC
 - Turn water on
 - Pump on from State 3
 - Out1 (kettle heater), off
 - Timer1 (Cooling timer), count up, init 0
 - Temp1(kettle)<= 80F, Reg0 (alarm sounds)
 - DIN0 to silence alarm
 - Exit condition DIN0=on, Goto State 5
- State 5 **To ferm**
 - Manually turn pump OFF
 - Manually close kettle valve
 - Move hose from Kettle to fermenter
 - Manually open kettle valve
 - Manually turn pump ON
 - Out1 (kettle heater), off
 - Timer1 (Cooling timer), count up, continue from previous state
 - Turn water OFF
 - DIN0 (done!)
 - Exit condition DIN0=on, End Process