










Simple HERMS - Brew rig design

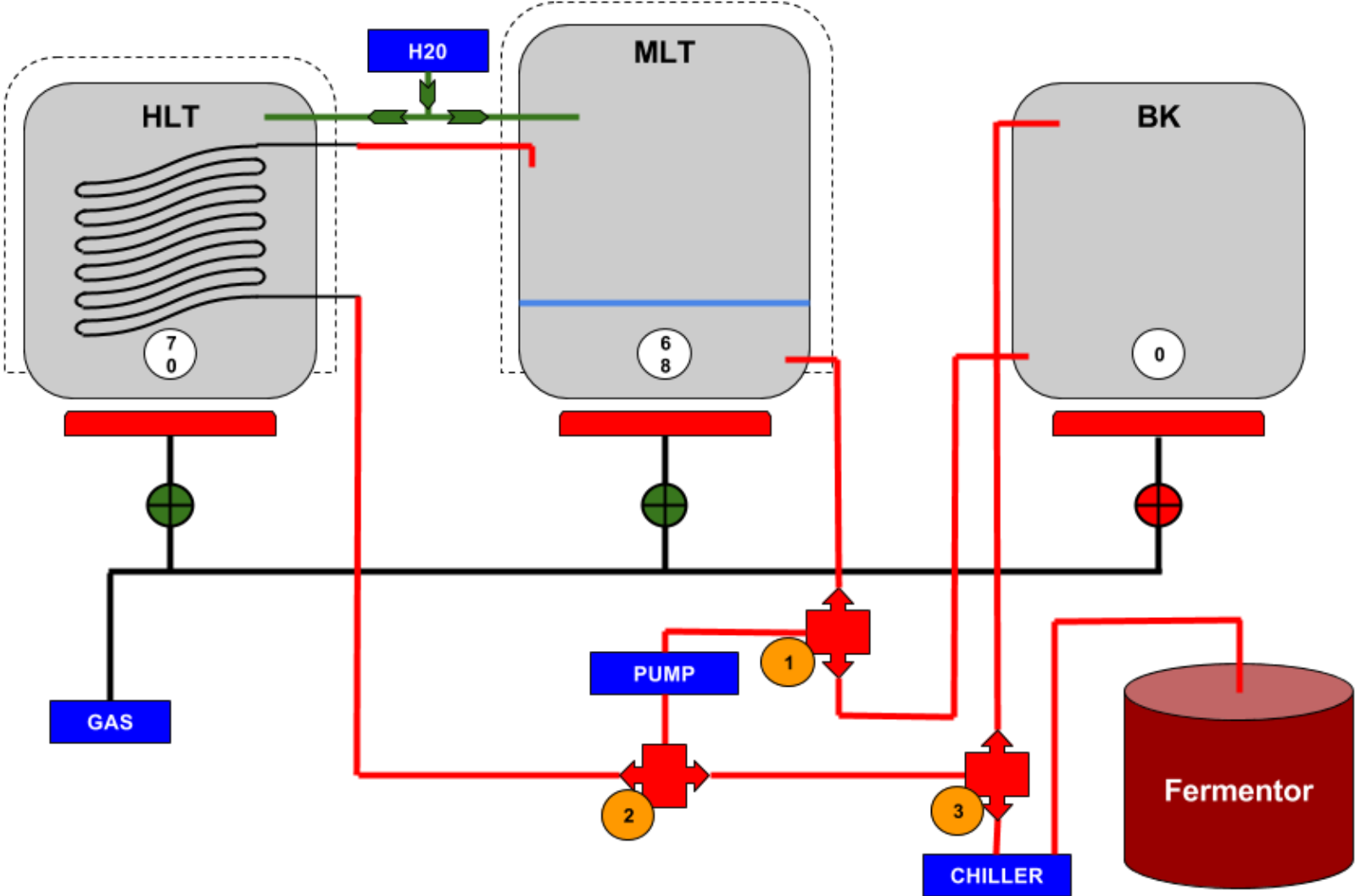
Terminology and Considerations:

Term	Definition
HLT	Hot liquor tank; which consists of water (referred to liquor from this point on) kept at a predetermined temperature.
MLT	Mash-lauter tun; which will consist of the grains and water also to be kept at a predetermined temperature.
Wort	Wort is the resultant liquid from the MLT which composes of the water and the sugars etc. extracted from the grain.
BK	Boil Kettle; which will be used to boil the wort from the MLT.
HERMS	Heat Exchanged Recirculating Mash System; which describes the system and works by keeping the MLT at a constant temperature by recirculating the wort through a coil in the HLT, i.e. heat exchange.
False Bottom	A false bottom is used in the MLT to allow the wort to be extracted from the MLT without drawing the grains out.
Pump	The pump should pump water as slowly as possible so as to ensure that minimum oxygen is captured in the liquor / wort flowing through the system.
Sparging	This will be a no sparging rig (However this can be added in the future).
Chiller	The chiller needs to chill the wort from the boil kettle as quick as physically possible and bring it down to 24 centigrade as quickly as possible.

Diagram legend:

	Gas flow valve		Precision thermometer		False bottom
	Gas burner		Coil for heat exchange		Flow switch (Off)
	Flow direction		Switch Number		Insulation

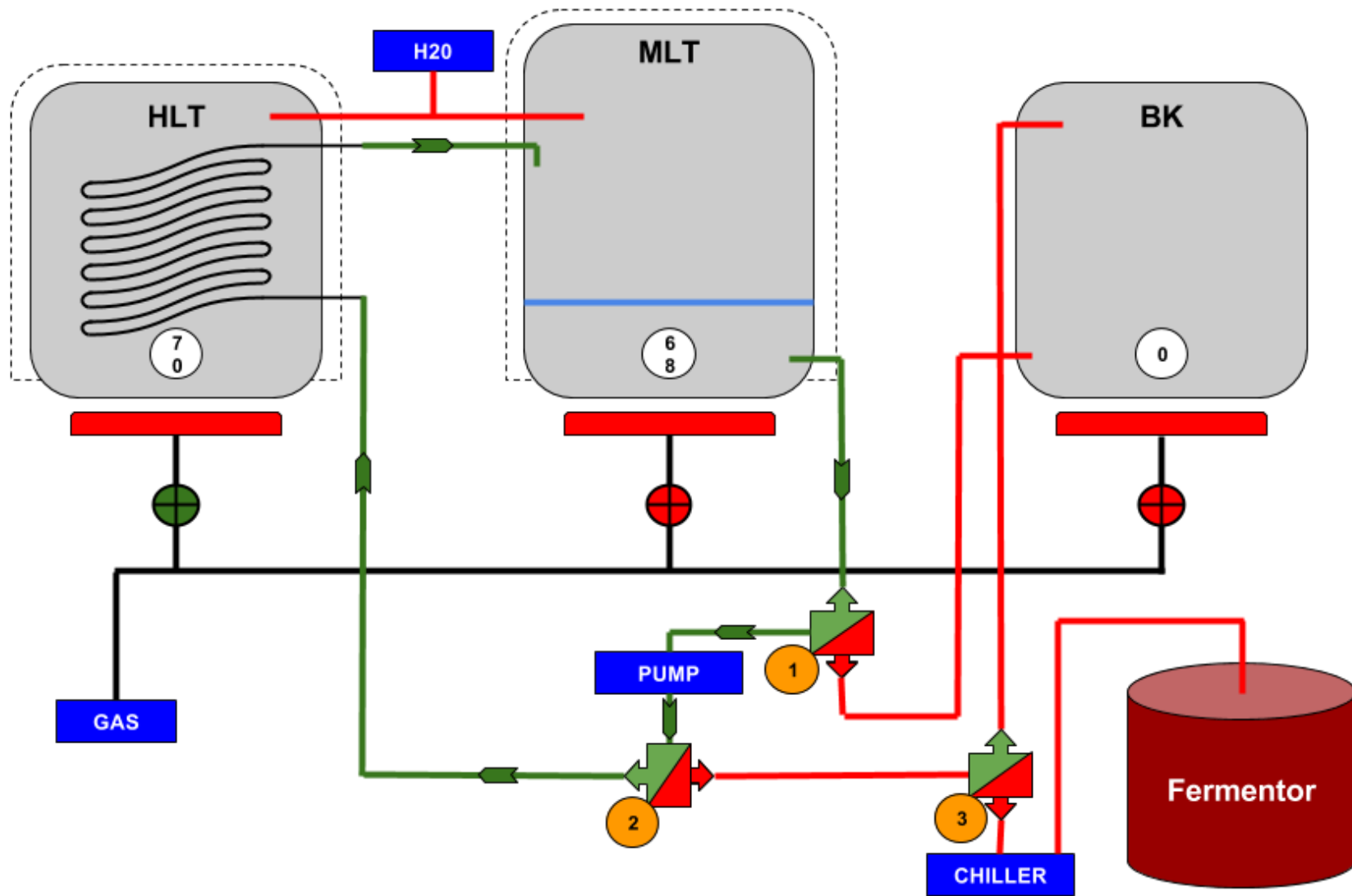
Brewing - Stage 1: Diagram



Brewing - Stage 1: Description

1. Pump and all pump switches turned off.
2. Fill HLT and MLT with water (referred to as liquor from this point on).
3. Turn gas on and heat HLT and MLT
 - a. HLT needs to be a few degrees higher than the temperature required for the MLT to account for heat loss through the tubing.
 - b. MLT needs to be several degrees higher than the temperature required for the MLT to account for heat loss when the grains are added in stage 2.
4. Once required temperatures have been achieved in the HLT and MLT then proceed to stage 2.

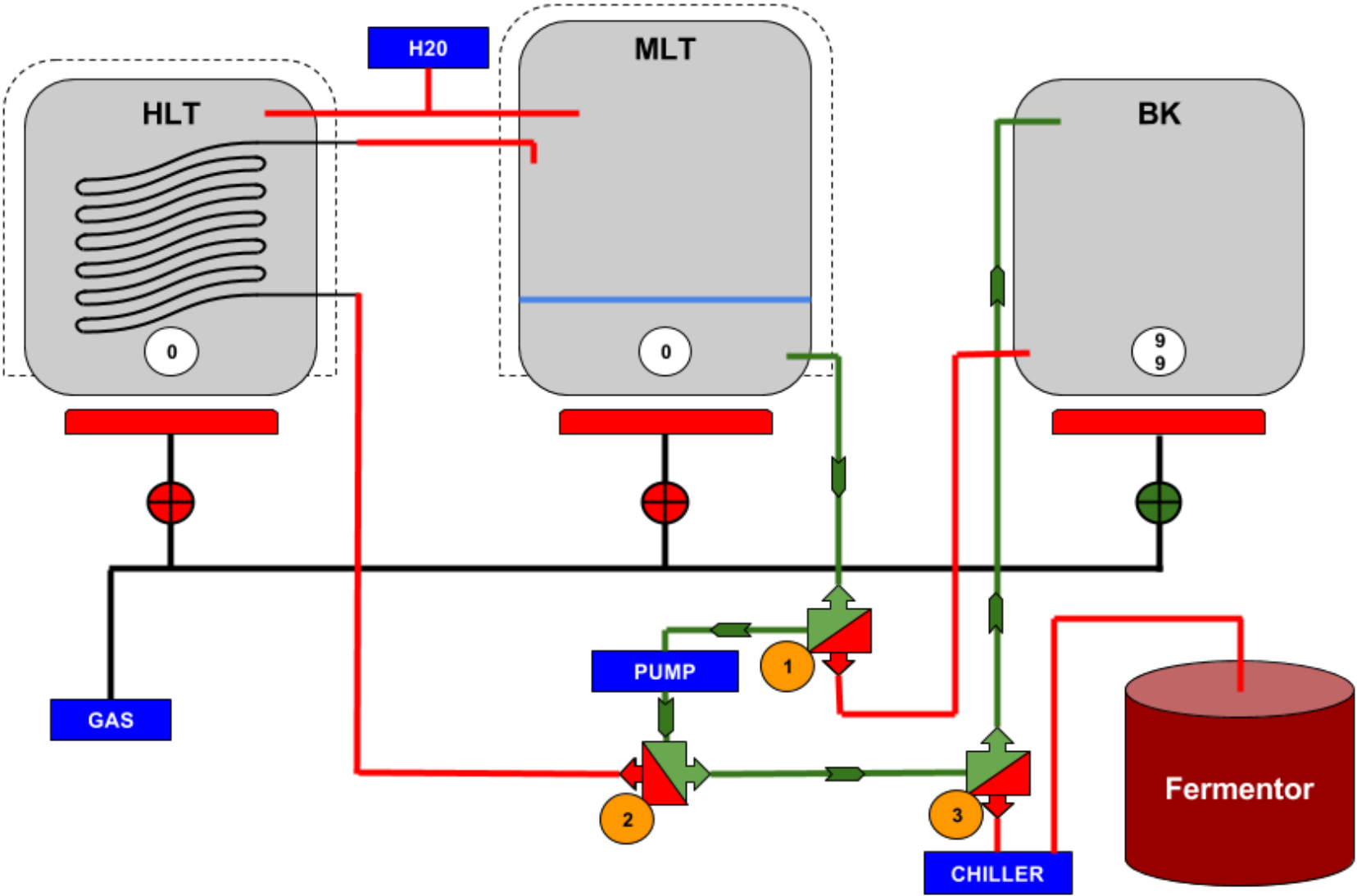
Brewing - Stage 2: Diagram



Brewing - Stage 2: Description

1. Turn MLT gas burner off.
2. Stir MLT and add grains so as to achieve an even distribution of the grains in the liquor.
3. Let the grains settle.
4. Turn switch 1 on so that the pump draws the wort from below the false bottom in the MLT.
5. Turn switch 2 on so that the pump pushes the wort through to the HLT via the coil.
6. Turn on the pump so that the wort is circulated through the heat exchange coil in the HLT and back into the MLT to as to ensure a constant temperature in the MLT.
 - a. The inlet in the MLT (which comes from the HLT) needs to flow slowly and not “drop” the wort into the MLT as this will cause too much air to become infused in the wort.
 - b. Ideally, the inlet is just below the level of the wort in the MLT and pushes the wort out along the side of the MLT so as to create a very slight whirlpool to spread the heated wort out evenly in the MLT.
7. Leave system running for the predetermined time.
8. Once the required time has passed, progress to stage 3.

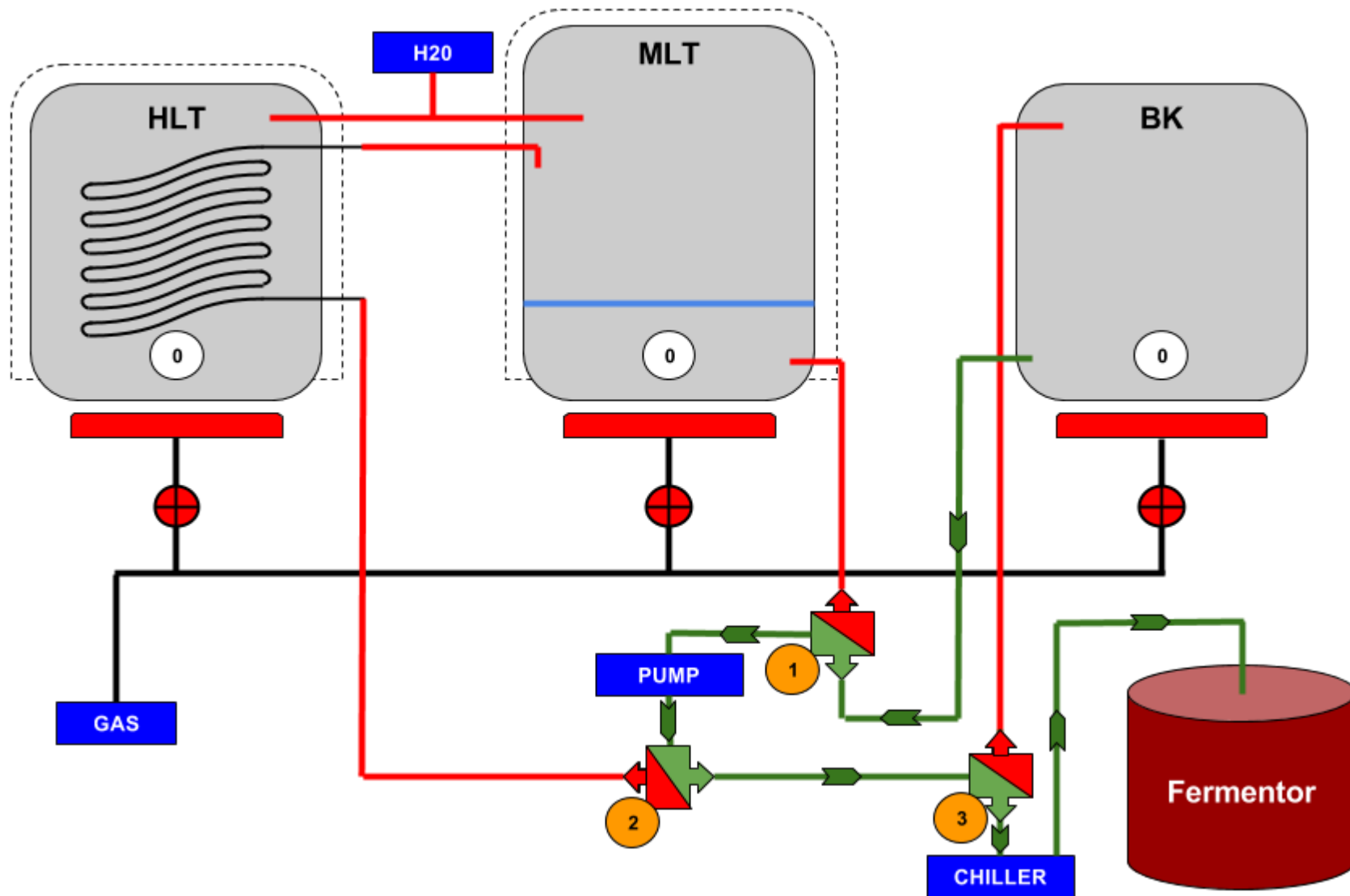
Brewing - Stage 3: Diagram



Brewing - Stage 3: Description

1. Turn pump off.
2. Turn HLT gas burner off.
3. Turn switch 2 on so that the pump pushes the wort towards switch 3.
4. Turn switch 3 on so that the pump pushes the wort towards the BK.
5. Turn pump on so that the wort is drawn from the MLT to the BK.
6. Once all the wort is all pumped into the BK then turn the pump off.
7. Turn the BK gas burner on and bring to a boil.
8. Boil the wort in the BK for a predetermined time.
9. Once the required time has passed, progress to stage 4.

Brewing - Stage 4: Diagram



Brewing - Stage 4: Description

1. Turn the BK gas burner off.
2. Turn switch 1 on so that the pump draws the heated wort from the BK.
3. Turn switch 3 on so that the pump pushes the wort to the chiller.
4. Turn the pump on so that the wort is drawn from the BK, through the chiller and into the fermentor.
5. Turn the pump off.
6. The last and worst step of all, wait four weeks :(