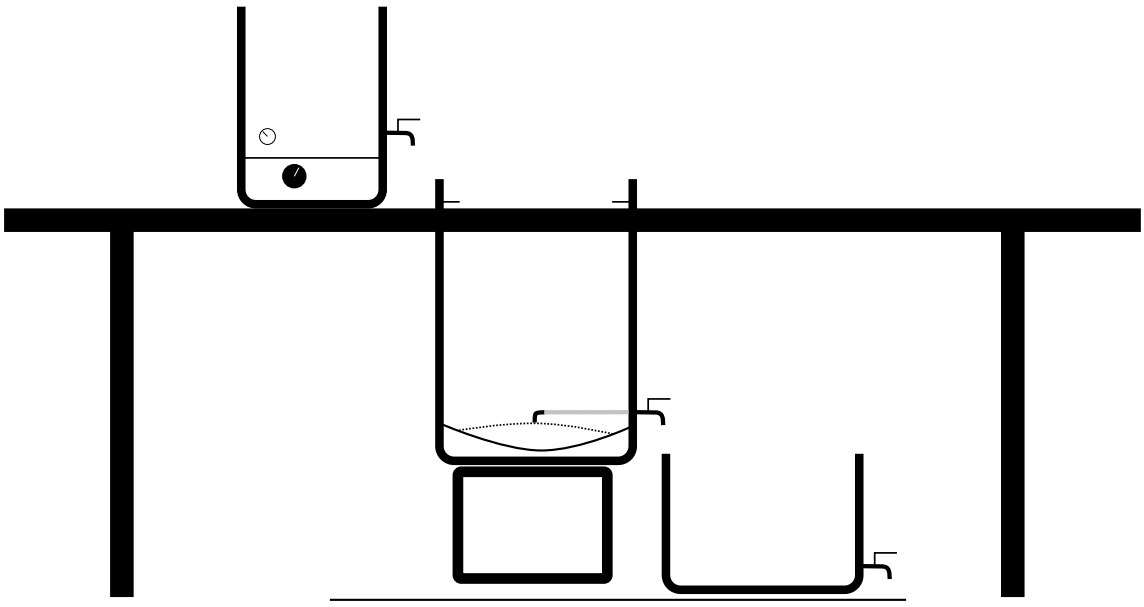
Setup the 3 vessels

The first step is to setup the 3 vessels at the right heights and positions to minimize the amount of heavy lifting required later.

The urn (HLT) should be placed at bench level, the keg (MLT) should be placed approx 40cm off the ground and the aluminium pot goes on the ground.



Heat the strike water

Now - we want to heat the strike water to almost the perfect temperature (we will fine tune it later). We heat the water in the urn because it is the most efficient (fastest).

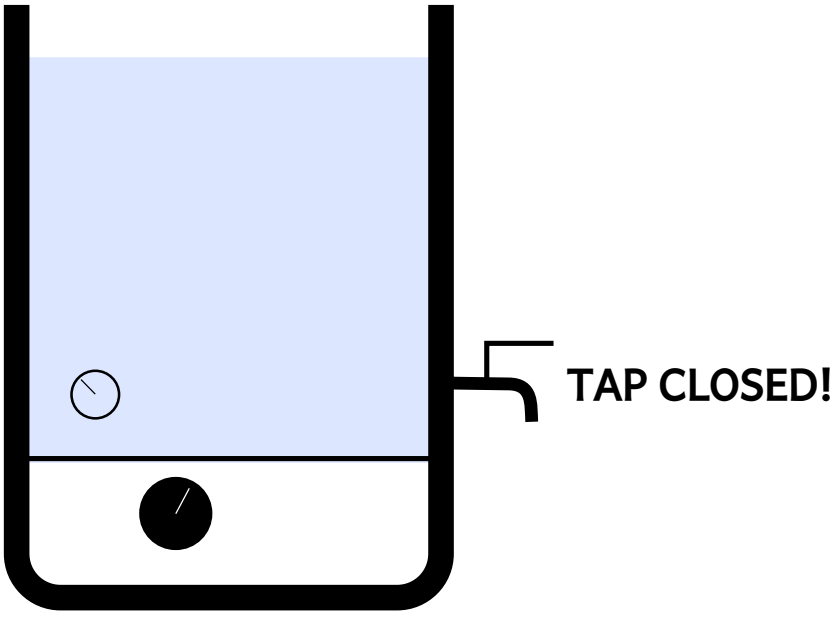
How much water in the urn? 28L (fill it almost to the top).

Why so much?

You will need to heat enough water for mashing and sparging to end up at 23L volume. We will lose approx 5L to grain absorbtion.

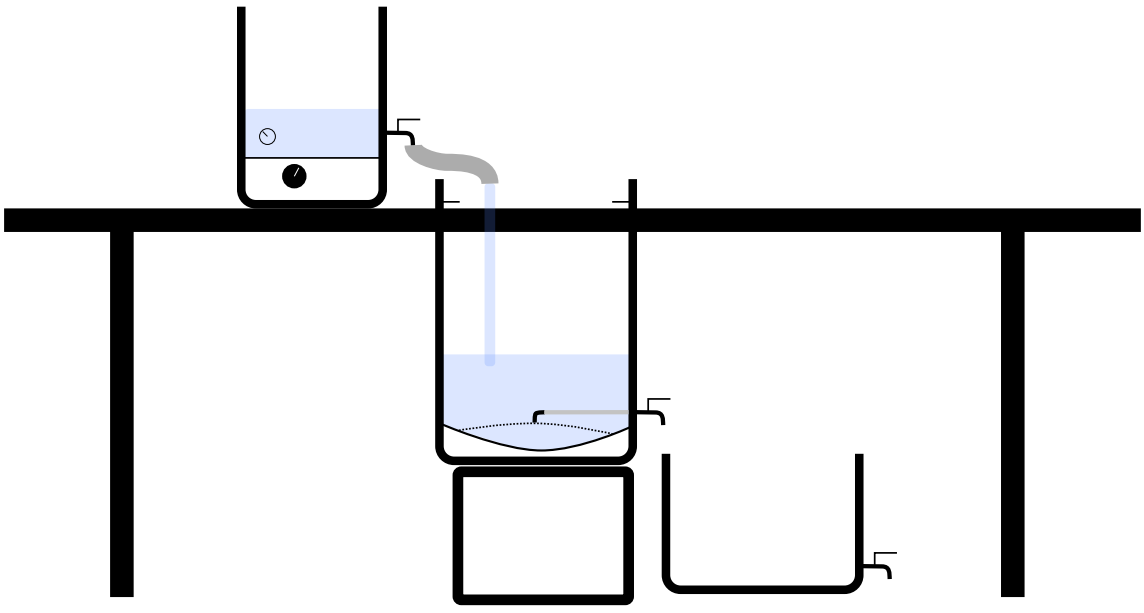
For 7kg of grain, you will need 17.5 L of strike water at 75 (C) to end at a final temperature of 68 (C).

You will lose approx 5L of water to grain absorbption, so to make up to 23L you will need an additional 10.5L in the urn for sparging.



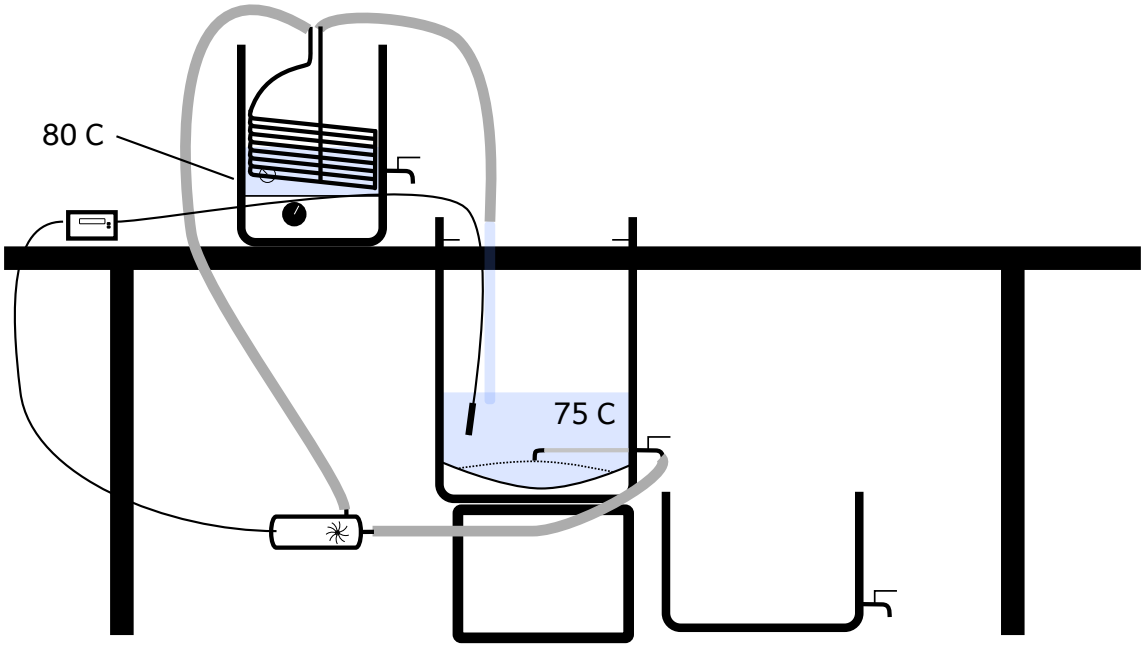
Transfer strike water

Now we transfer 2/3 of the hot water from the urn into the keg (MLT). To do this:
* Connect a hose to the tap on the urn into the keg
* Open the tap on the urn
* Close the tap on the urn as soon as 2/3 of the water from the urn has been moved to the keg



Setup HERMS

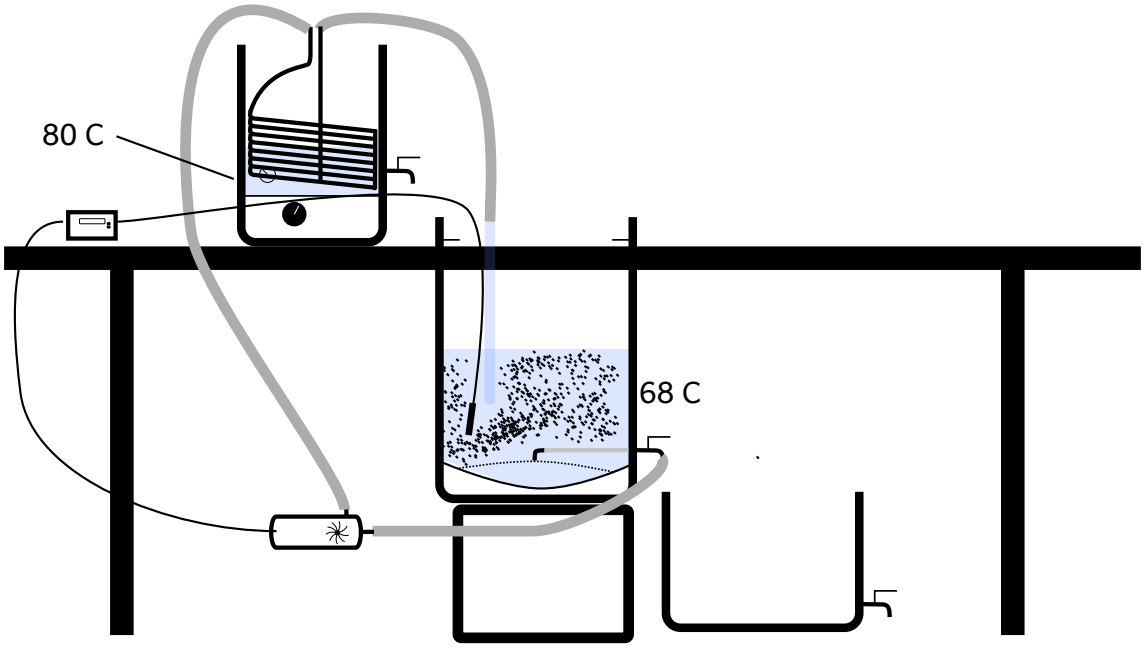
Now we setup the wort pump to recirculate the wort while it is mashing and maintain the correct temperature.
* Place the copper heat exchanger into the hot water urn
* Connect a tube from the tap on the keg to the INPUT from the pump (lower, horizontal)
* Connect a tube from the OUTPUT of the pump to one of the connections on the heat exchanger.
* Make sure the pump is lower than the tap for the keg (not self-priming).
* Connect a tube from the other connection on the heat exchanger back into the top of the keg
* Open the tap on the keg (IMPORTANT)
* Put the thermometer from the temperature control unit in the keg, near where the wort re-enters the keg
* Plug the power for the pump into the rear left power socket on the temperature sensor (when looking at the front of the unit)
* Make sure the temp on the URN is set slightly higher (80 C) than our target temperature for the keg (75 C).
* The pump should start running to pump water from the keg, through the heat exchanger in the hotter urn, and returing the heated water back to the keg. When the keg reaches it's target 75 C, the pump will turn off.



Strike!

* First, drop the target temperature on the temperature controller to 68 C.
* Now add the crushed grains to the keg.
* There should be plenty of water for the grains to circulate, and the temperature should drop from 75 C to 68 C, which the pump should maintain.
* You can put the lid from the aluminium pot over the wort to protect it from stuff dropping in, and still feed in the tube and temperature probe through the keg handles.
* We leave it mashing like this for 1 hour.

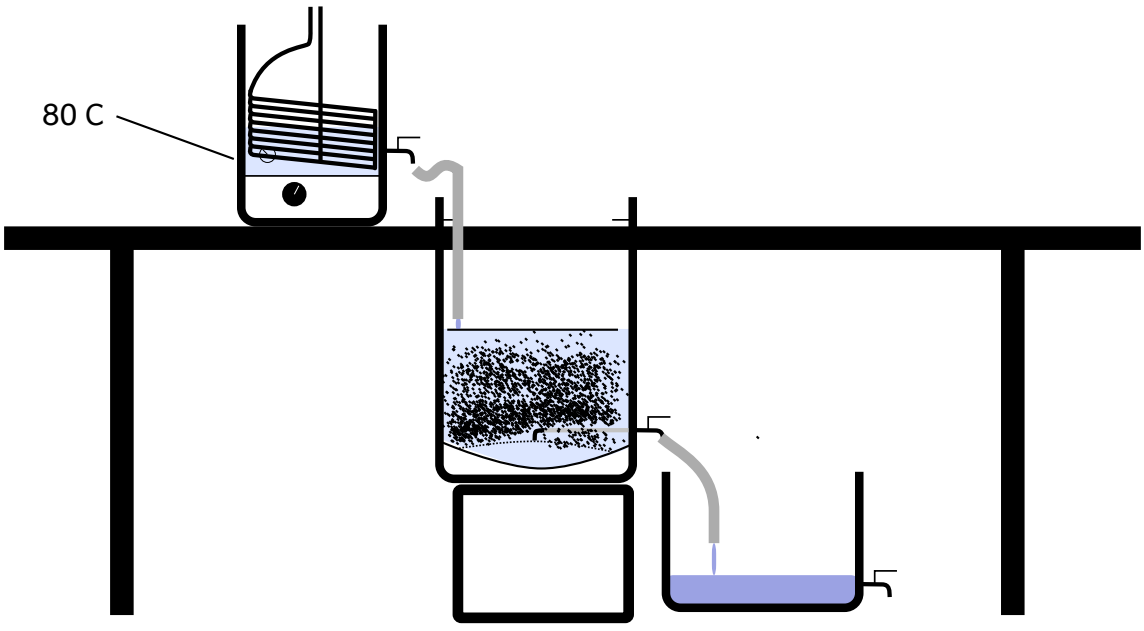
Some benefits of this HERMS system.
* The temperature control is much more accurate.
* Gives a clearer wort
* Repeatable results
* Can perform advanced mash schedules



Fly Sparge!

Now we want to separate the grains from the wort and get all of the sugars out of the remaining husks.

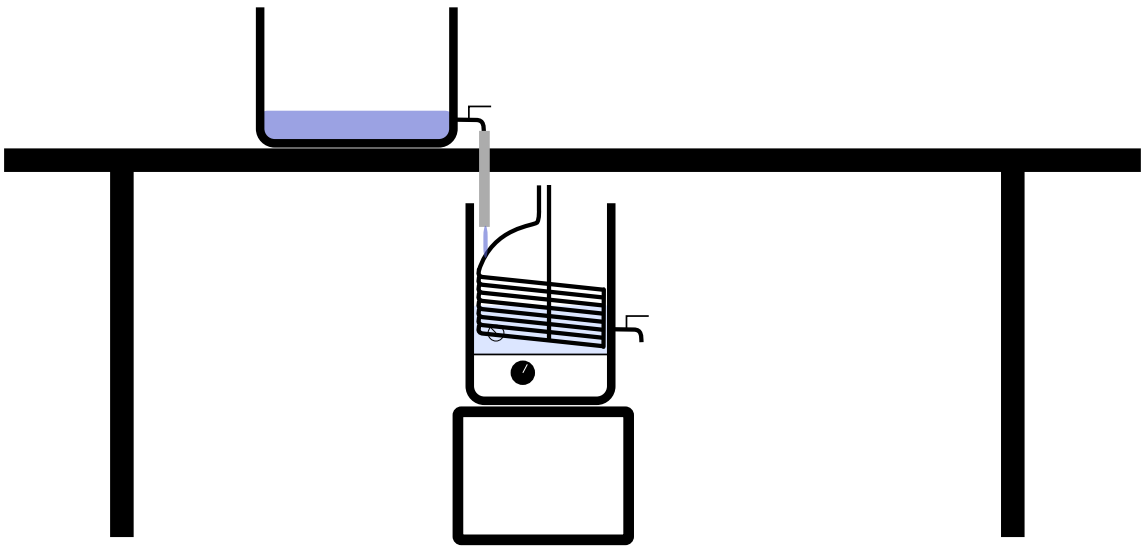
* First, unplug the pump from the power.
* Now close the tap on the keg.
* Remove the hoses from the pump and the heat exchanger, draining any wort into the keg
* Pack away the temperature controller, and it's thermometer
* Turn the temp dial on the URN down to 0
* Now we want one hose going from the tap on the URN to the top of the keg, and one hose going from the tap on the keg, into the aluminium pot on the ground.
* Put a sheet of baking paper on the top of the keg, above the grain bed
* Close the tap on the aluminium pot
* Take 2 jugs (until it runs clear) of wort from the tap on the keg, and return it to the top of the keg.
* Now set the tap on the keg to very slowly (approx 1 cup per minute), trickle the wort into the aluminium pot.
* Watch it until the wort is drained to almost the top of the grain bed.
* Now open the tap on the urn to match the flow out of the keg. We want to maintain about 1 inch of liquid above the grain bed.
* It should take between 60 and 90 mins to drain all the wort



Back to the boil.

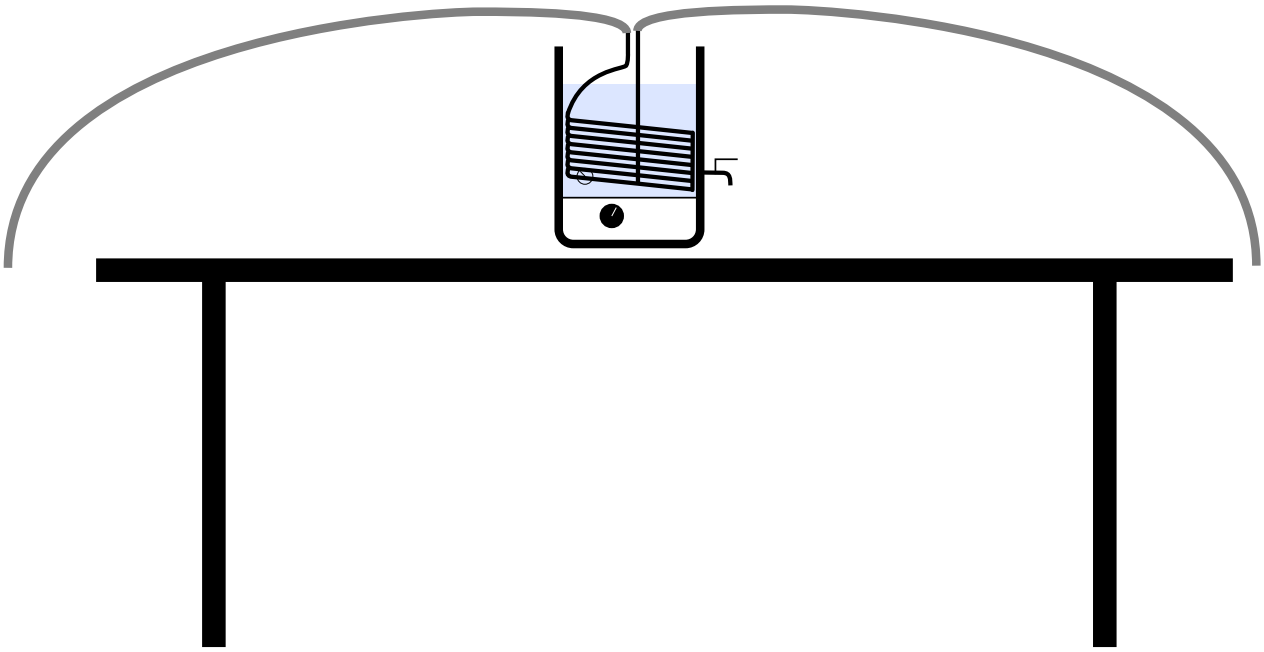
Now we have to get the wort back into the urn so we can boil it.

The easiest way is probably to lift the pot onto the table/bench and use the tap to drain it into the urn below.



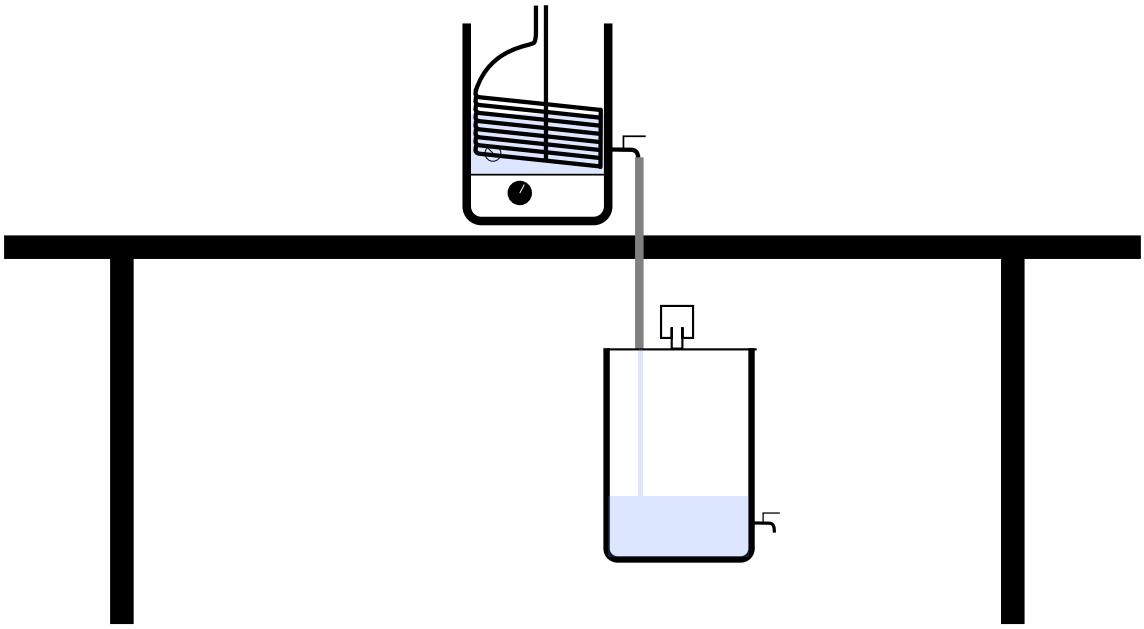
Boil

Now we boil for 60 mins, adding hops as required (in hops bags). The heat exchanger MUST be immersed in the liquid for at least the last 15 minutes of the boil (to sterilize it). When the boil is finished we need to cool the wort as quickly as possible. Wrap thread tap onto the 2 connectors for the heat exchanger and then connect 2 garden hoses to run tap water through the coil to drop the temp. Because we should have the final volume of liquid in the urn already, we need to drop the temp right down to < 30 before transferring to the fermenter.



Transfer to fermenter

When the wort has cooled to below 30 C, we can put it in the fermenter and pitch the yeast. If adding hops at this stage, the hops bag MUST be sterilized (or don't use a bag and we can filter later). Just gravity feed the wort down to the fermenter.



Clean

Remove all the washed grain from the keg.
Spray the urn, keg and pot with water and rub any deposits off with a paper towel.
Add 10 L of water back to the urn and heat it to boiling again.
When boiled, add some "keg and line cleaner".
Connect the pump to the tap on the urn with the out hose going to the keg.
Open the tap on the urn and turn on the pump to move all the water to the keg (with the keg tap closed).
Put any used hoses, spoons etc in the keg and make sure they get submerged.
When all the water is in the keg, open the tap and let it flow into the pot.
Finally give everything a final spray with water and dry with a tea towel.