CYLNDR Coffee Maker

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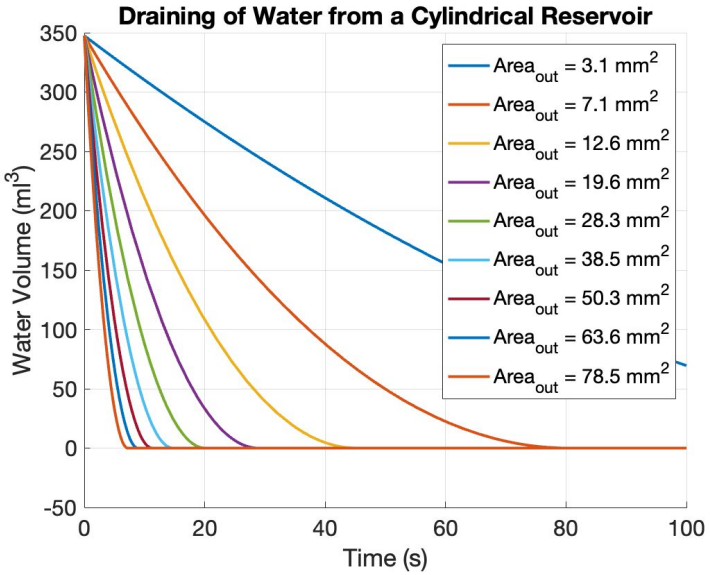
Project Brief

CYLNDR is an innovative automated pour-over coffee machine designed to address common challenges in achieving consistent and efficient coffee extraction. The machine features a compact, aluminum cylinder housing a motor-driven system that powers dual counter-rotating disks. These disks evenly distribute boiling water poured by the user, ensuring uniform saturation of coffee grounds and optimal extraction. The project aims to develop a functional prototype that demonstrates the system’s effectiveness and reliability, while also exploring design considerations for ease of use, sustainability, and mechanical performance.

Design Considerations - Flow Rate

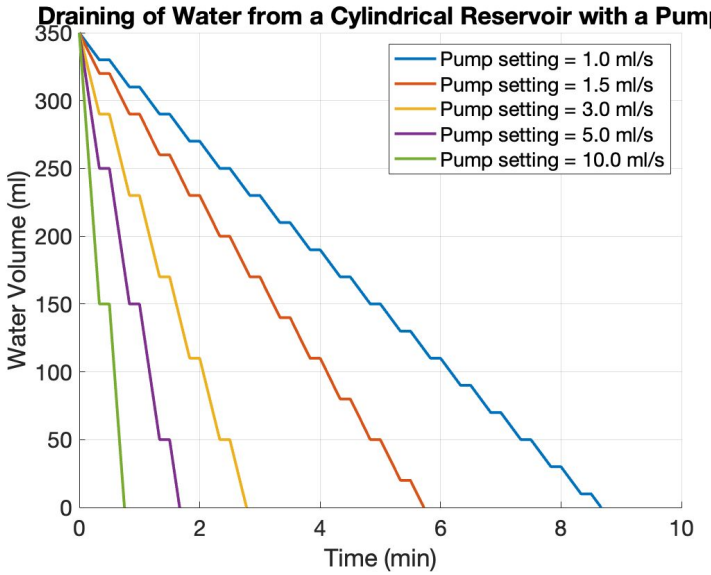
Gravity-driven flow

Consideration parameter: Outflow area

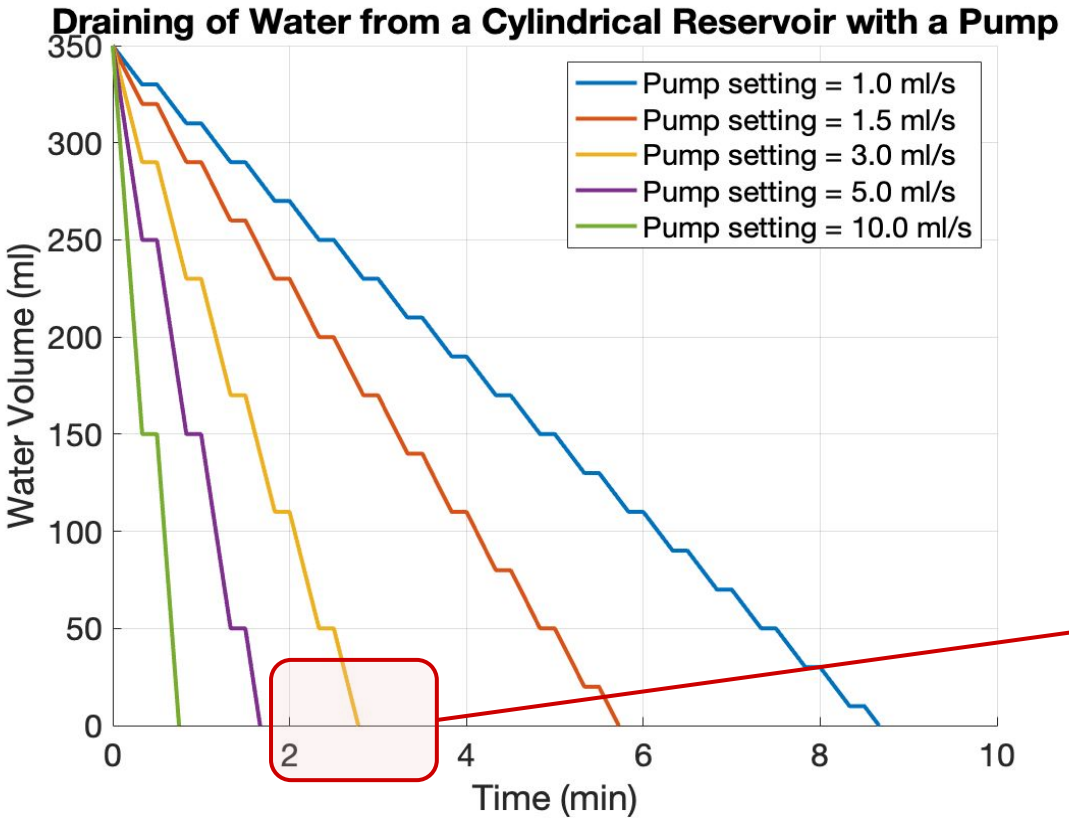


Fixed-rate pump

Consideration parameter: flow rate setting (run: 20s, pause: 10s)



Design Considerations - Flow Rate



Easier control of the flow rate

Uniform dispersion of the water in time

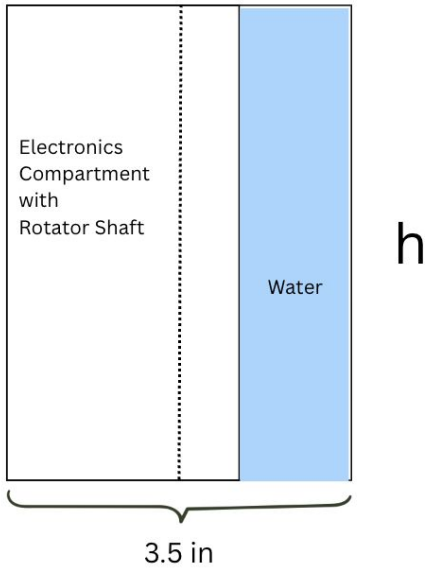
Possibility to achieve the **target duration**

Target duration for the pour over:
2.5 - 3 min

Design Considerations - Electronics Compartment

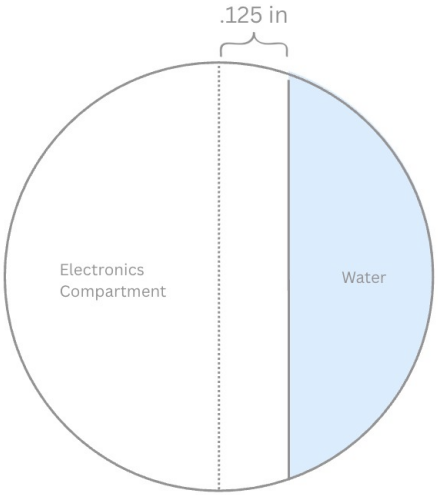
Consideration parameter: electronics compartment offset

Shared side view



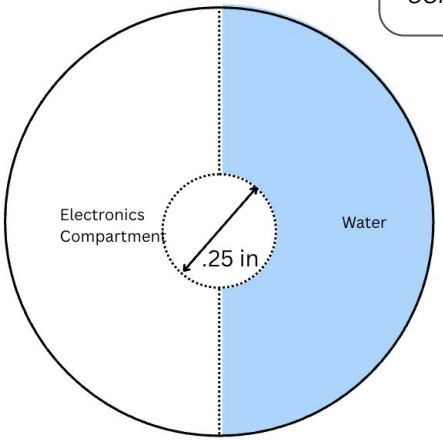
Top View

Design 1



Necessary height: ***4.88 in***

Design 2



Necessary height: ***4.46 in***

Better choice for the goal of a compact design

Model Renders

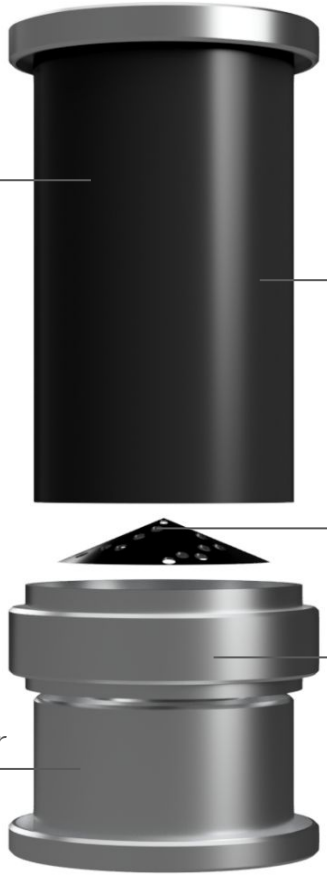
Current Prototype

Final Product

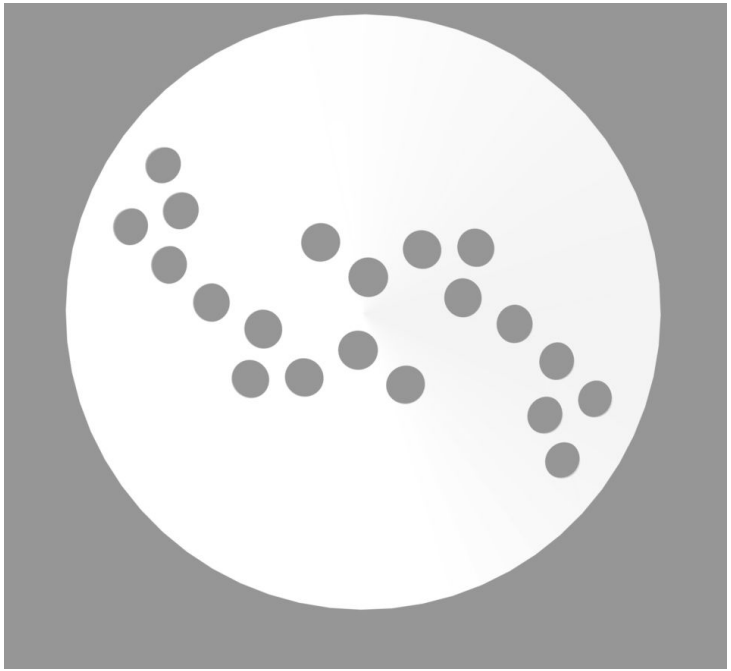
Component Breakdown

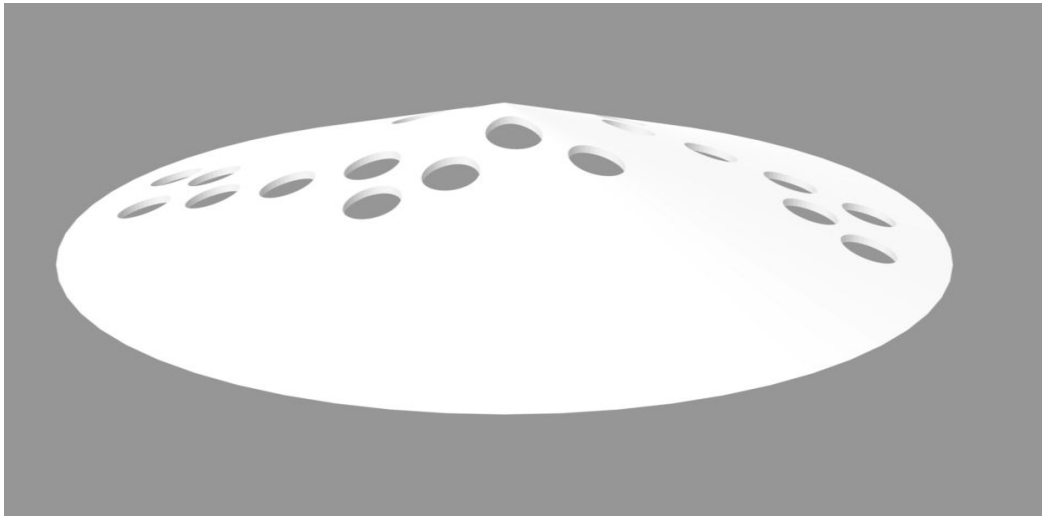
Exterior

Interior



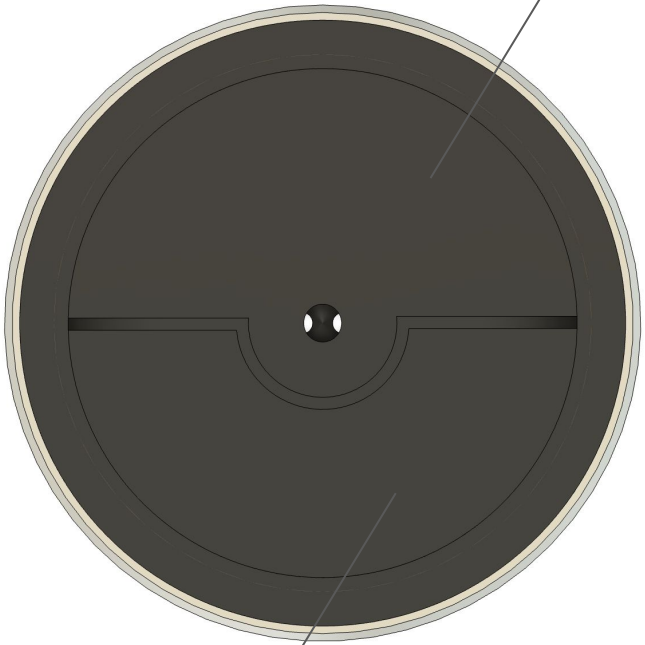
Water Dripping Mechanism





Electronics & Water Housing

Top Down View

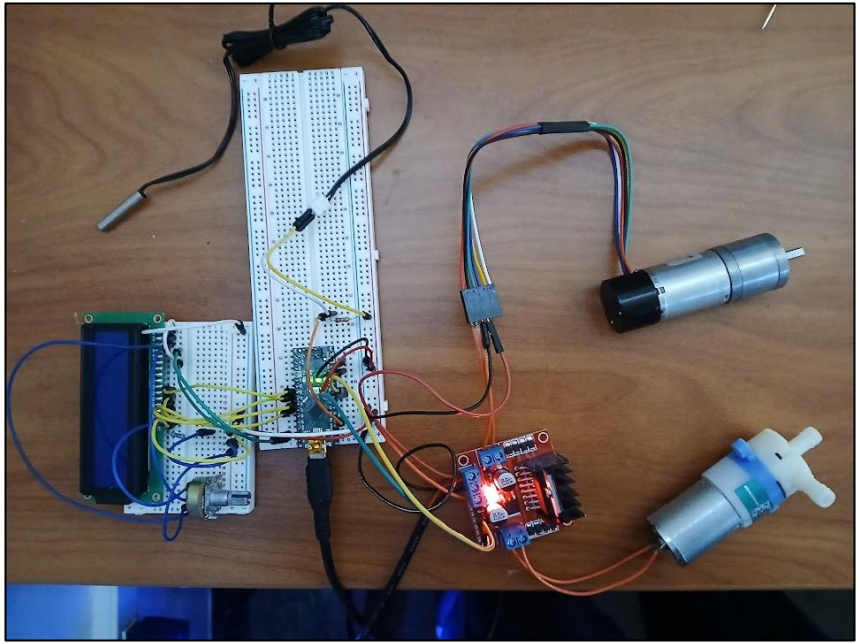


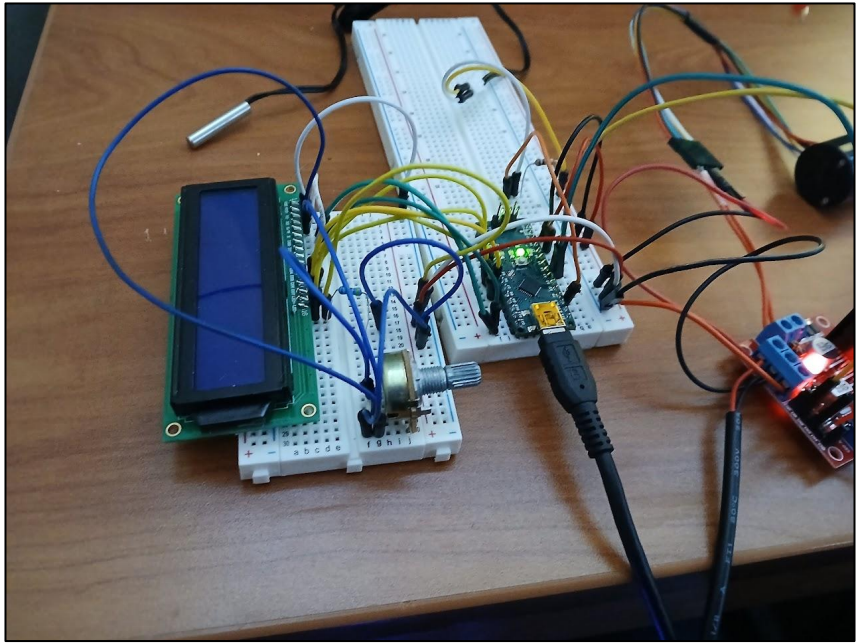
Electronics HSG

Water HSG
(lined with poly-propylene)

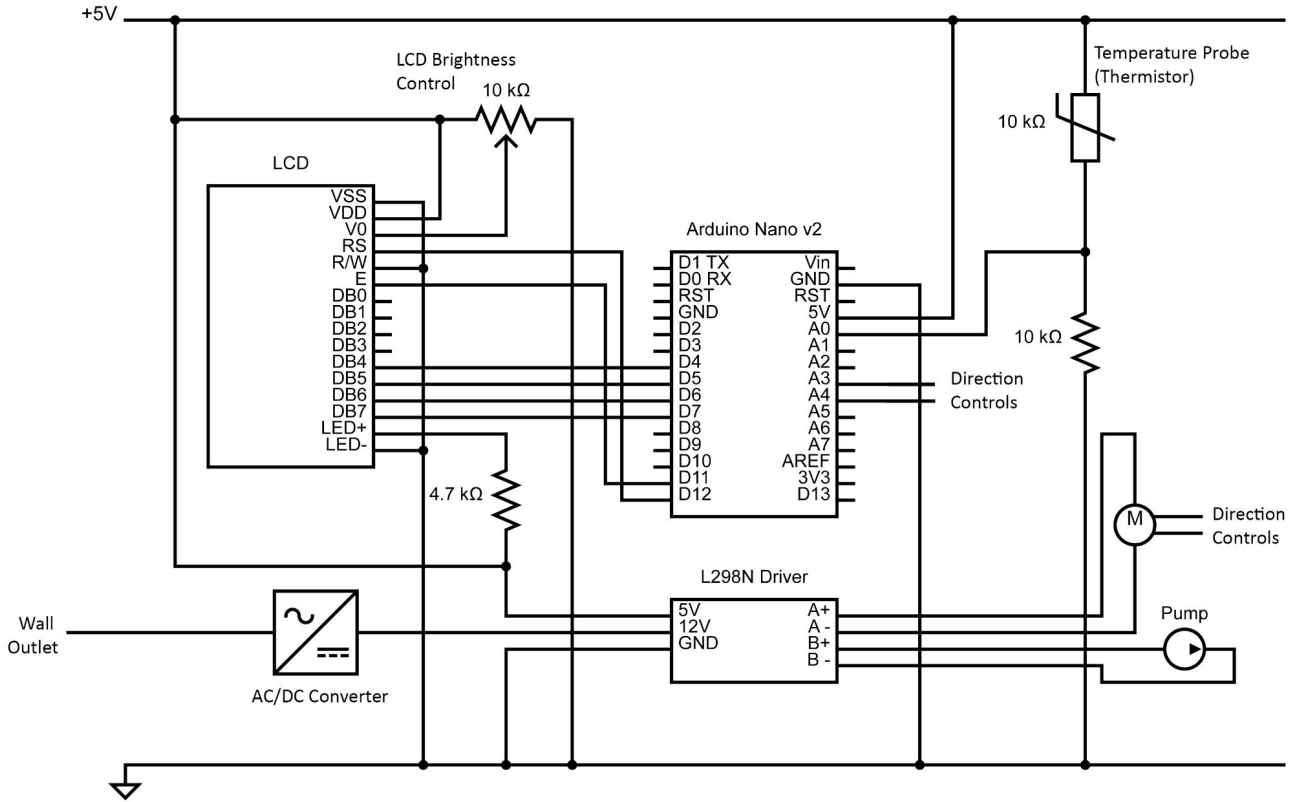
ISO View

Electronics Overview (Current Prototype)

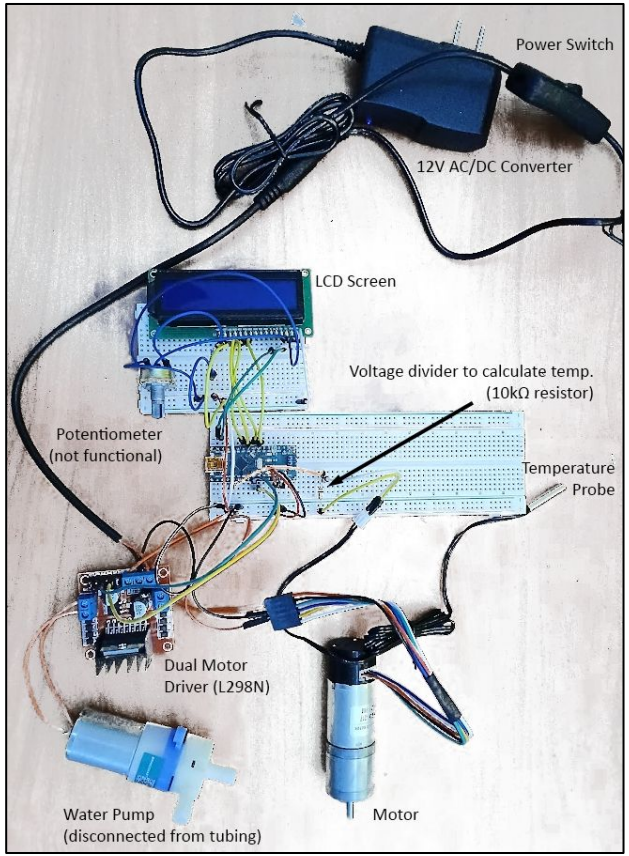




Electronics Overview (Final Schematic)



Electronics Overview (Components)



Components Needed:

Item	Description	Cost	Link
Arduino NANO	New board - previous ones can't work with Arduino IDE	17.90 USD	Amazon
LCD Screen	Smaller LCD screen than the one we ordered. We could also switch to a higher fidelity screen for final design.	9.99 USD	Amazon
(Maybe?) Rotary Encoder	Could be used to replace the potentiometer in the final product for smoother interface (currently need to add a button)	8.89 USD	Amazon