KidneyLoop: Open-Source Water Filtration System

Abstract

KidneyLoop is a modular, scalable water purification system that uses a combination of UV-C laser light and high-efficiency physical filtration to cleanse water. Designed to work with minimal energy input and zero chemicals, the system is built for personal, municipal, and emergency applications. This design is released under the CC0 license to prevent future privatization and enable global accessibility.

System Overview

The system operates in a closed loop, cycling water from a reservoir into a shallow disinfection tray where it is exposed to UV-C light (260-280 nm wavelength). After exposure, the water passes through a 0.1-micron filter that removes all bacterial debris, particulates, and light-activated contaminants. Clean water then recirculates or is stored in a separate tank.

Components

- UV-C LED array or laser strip tuned to 260-280 nm
- Shallow exposure tray (transparent bottom)
- 0.1 micron ceramic or polymer filter
- Circulation pump (low power)
- Controller (microcontroller optional)
- Power source (solar panel, battery, or grid)

Power and Efficiency

The system is designed to operate on ultra-low power using targeted UV-C exposure. Because UV-C effectiveness is highly dependent on exposure time and depth, the shallow tray maximizes kill rate per watt. Average expected energy consumption is under 20W for small-scale systems and under 300W for municipal installations.

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License and Intent

Author

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This release is anonymous and for humanity. No patent will be filed.