

Invention relates to integrated water purification systems and can be used in life support systems for the crew of manned spacecraft for the regeneration of water from liquid waste products of the crew. Hybrid distillation system consists of a mass-transfer centrifugal distillation unit equipped with a rotor featuring a humidifier, a process air dryer, and scoop pumps, a gas blower, a thermoelectric heat pump, a balancing cooler, subsystems for supplying the mass-transfer centrifugal distillation unit with fresh solution, pre-filling the circulation loop of cooled process air moisture condensate, collecting process air moisture condensate, collecting the non-evaporated residue, as well as circulation loops for process air, evaporated solution, cooled process air moisture condensate, and hydraulic distributors. The process air circulation loop is made open, with the spacecraft cabin sequentially connected to it. The subsystem for collecting process air moisture condensate is connected to the inlet pipe of the booster pump, which is connected via a pressure pipe through a buffer diaphragm tank to a reverse osmosis filter. This filter is connected via a pipe for the outlet of filtered water to the subsystem for collecting clean regenerated water, and via a pipe for the concentrate outlet to the subsystem for supplying the mass-transfer centrifugal distillation unit with fresh solution. The proposed hybrid distillation system provides a reduction in specific energy consumption and mass and volume parameters of the water regeneration system, improves the quality of the distillate, and increases the water regeneration efficiency.