Claims

1. A water treatment system, comprising

at least one filtration cassette;

wherein said at least one filtration cassette comprises at least two linked filtration cartridges;

wherein said at least two filtration cartridges are linked by an adapter;

at least one reverse osmosis cassette;

wherein said at least one reverse osmosis cassette comprises at least two linked reverse osmosis cartridges;

said at least two reverse osmosis cartridges fluidly and physically linked by at least one first manifold and by at least one second manifolds;

said at least one first and said at least one second manifolds each having two channels;

said at least one first manifold flowing input water into said at least two reverse osmosis cartridges in a first channel;

said first manifold flowing permeate away from said at least two reverse osmosis cartridges in a second channel;

said second manifold flowing concentrate away from said at least two reverse osmosis cartridges;

wherein said first and second channels of each of said first manifold and of said second manifold are non-concentrically placed;

wherein said first and second channels of each of said first manifold and of said second manifold share a common wall;

wherein said at least two reverse osmosis cartridges of said at least one reverse osmosis cassette are in parallel;

said first manifold fluidly and physically connected to the bottom of said at least two reverse osmosis cartridges;

said second manifold fluidly and physically connected to the tops of said at least two reverse osmosis cartridges;

at least one pump;

a permeate flush assembly;

said permeate flush assembly comprising:

a permeate flush valve;

said permeate flush valve comprising plunger, said plunger disengaged during a flush cycle;

a one-way check valve;

a solenoid; and

a hydropneumatic tank;

wherein permeate flows from said hydropneumatic tank through said permeate flush valve to said at least one pump during a flush cycle;

permeate flowing from said at least one pump to said first channel of said first manifold during a flush cycle;

wherein the permeate follows the same path during a flush cycle as input water during purification;

a combination flush valve comprising a concentrate inlet communicating with said second manifold, a concentrate outlet, and first and second flow paths therethrough between said concentrate inlet and said concentration outlet,

wherein said first flow path includes a one-way check valve and a metering jet passage, and said second flow path includes a solenoid diaphragm valve;

a frame; and

at least one bypass unit.

2. The water treatment system of claim 1 wherein said hydropneumatic tank holds from about 30 gallons to about 100 gallons of water.

3. The water treatment system of claim 1 wherein said hydropenumatic tank is maintained from about 75 psi to about 80 psi when said hydropenumatic tank is full.

4. The water treatment system of claim 1, comprising a unit that transmits real time information about the status of said water treatment system.
5. The water treatment system of claim 1 wherein said bypass unit comprises an outlet, an inlet, a flow meter, a bypass valve, at least one TDS sensor and at least one pressure sensor.
6. The water treatment system of claim 1 wherein said frame comprises five sections.
7. The water treatment system of claim 1 wherein said frame is made from plastic.
8. The water treatment system of claim 1 wherein water from said tank is flowed through said permeate flush valve to said reverse osmosis cartridges in 5 to 10 second bursts during said flush cycle.
9. The water treatment system of claim 1 wherein water from said tank is flowed through said permeate flush valve to said at least two reverse osmosis cartridges at from about 10 to about 100 gallons per minute.