

ENCAPSULATED WATER TREATMENT SYSTEMA COMPUTER-IMPLEMENTED
METHOD OF MONITORING THE PERFORMANCE OF A REVERSE OSMOSIS
MEMBRANE IN A DRINKING WATER SUPPLY SYSTEM

5 This application claims priority to U.S. Provisional Patent Application Serial
No. 60/647,680, filed January 27, 2005.

FIELD OF INVENTION

10 The present invention relates to water treatment systems and, in particular, to
such systems having an encapsulated manifold head and a reverse osmosis cartridge
and one or more filter cartridges.

BACKGROUND OF THE INVENTION

15 Reverse osmosis systems are known. The main part of the system is a semi-
permeable membrane through which the untreated water passes. Such systems
typically include an additional carbon or ceramic filter which removes contaminants
either prior to passing through the membrane or after. Such systems are often
installed in residential applications.

20 The prior art includes electronic systems which detect when the reverse
osmosis membrane requires replacement. Typical prior art systems include
measuring the conductivity of the water entering the reverse osmosis cartridge, and
then measuring the conductivity of the water at the outlet of the reverse osmosis
cartridge. The conductivity of the water is proportional to the total dissolved solids.

25 A ratio of the conductivity levels will provide an indication of the rejection efficiency
of the reverse osmosis membrane.

Prior art systems also include an application wherein a permeate pump is
included in a factory installation. The permeate pump provides greater efficiency in

the system. The permeate pump increases the net pressure across the reverse osmosis membrane by isolating the membrane pressure from the pressure in the products water and thus reducing the permeate back pressure.

The prior art also includes systems which address reducing the spillage of fluid occurring during replacement of the cartridges.

SUMMARY OF THE DISCLOSUREINVENTION

It is an object of the present disclosureinvention to provide an improved locking mechanism for a filter cartridge and manifold head.

It is a further object of the present disclosureinvention to provide an improved method of monitoring the performance of a reverse osmosis membrane in a drinking water supply system.

In one aspect, there is provided a computer-implemented method of monitoring the performance of a reverse osmosis membrane in a drinking water supply system, the method carried out by a computer program, the method comprising the steps of: initiating a reverse osmosis membrane recalibration; determining the flow of a predetermined amount of water through the system; measuring the initial product water conductivity downstream of the reverse osmosis membrane; calculating, using the measured initial product water conductivity, a predetermined total dissolved solids rejection ratio, and calculating therefrom a threshold trip point which corresponds to said predetermined total dissolved solids rejection ratio; storing the threshold trip point in memory of the system; routinely measuring the product water conductivity downstream of the reverse osmosis membrane after said flow of said predetermined amount of water has been reached; determining whether the product water conductivity, as routinely measured in the prior step, is below the threshold trip point; and providing an indication upon determining when the product water conductivity is below the threshold trip point.

It is further object of the present ~~disclosure~~invention to provide a modular manifold head system.

It is an object of the present ~~disclosure~~invention to provide a system for retrofitting a reverse osmosis filter system to include a permeate pump application.

It is an object of the present ~~disclosure~~invention to provide a cartridge which has a reduced inlet opening to reduce spillage during changing of the cartridge.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a water treatment system with a reverse osmosis cartridge and two filter cartridges.

Fig. 2 is a perspective view of a filter cartridge of Fig. 1.

Fig. 3 is a top view of the filter cartridge of Fig. 2.

Fig. 4 is an exploded view of the filter cartridge of Fig. 2.