How to buy a whole house reverse osmosis(RO) system…

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Once you have decided to purchase an RO system that will produce all the water in the house, you will need to answer the following questions-

How much water do I need?

To size an RO, you must first determine your water requirements. Most people use between 50 and 75 gallons of water per day. This includes drinking, food preparation, cleaning, clothes washing, toilet use, showers etc**.** We recommend you choose the higher number **(75 gallons per day per person)** for sizing the system. We also recommend you consider by-passing the clothes washer and toilets if possible to conserve water.

Example – A family of four will need to have 4 X 75 = 300 gallons per day.

How much storage should I have?

Because RO systems typically produce water at a rate lower than it is used, the RO will need to run during times of no water usage and store water for later use. The storage should hold at least half of your daily household consumption. This will allow for peak uses during the morning and evening. **We recommend that you size the storage so it can hold a one day supply.**

How large an RO do I need?

Reverse Osmosis units are expensive so it is important not to oversize the unit. If the unit is too small, it will have to run excessively. **We recommend sizing the RO so it does not need to run for more that 4-5 hours per day.** This sizing will reduce wear and tear on the pump and motor, provide for unexpected peaks, and allow for increased future demand.

There are a number of factors that affect the output of an RO. You should be aware that the rated output of the RO is seldom the actual output in the field. Cold water and high total dissolved solids (TDS) will reduce this output.

Have the system designer tell you what the actual output will be under the conditions your RO will be operating.

What features should the RO have?

Large RO systems tend to have more standard features and options. Standard features on whole house RO systems usually include-

- Liquid filled system operating pressure gauge
- 5 micron cartridge pre-filter
- Solenoid feed water shut-off
- Adjustable system pressure regulator

Typical recommended options available (in order of importance)-

- Pre-filter pressure gauge
- Low pressure cut off switch
- Recycle valve
- Flow meters for permeate(treated water) and concentrate(waste water)
- Pretreatment lock out control
- Permeate quality monitor
- Auto flush

Pre-filter pressure gauges- will allow you to monitor the pressure change as the water passes through the pre-filter. A large difference in pressure indicates a dirty filter. If the filter is not changed before it becomes too dirty, the RO will shut down or be damaged.

A low pressure cut off switch- is essential to prevent damage to the RO pressure pump. This switch will turn the RO off if there is not enough water provided to the RO pump. There are two general types of switches used to do this-

- The first type automatically resets itself when water pressure returns. This type of switch can cause damage to the pump if the shutdown was caused by a dirty pre-filter. With this type of switch, a dirty pre-filter will cause the RO pump to cycle on and off rapidly and over heat.
- The second type of switch will not reset itself or will only reset after an extended period of time(typically minutes or hours). This type of switch will prevent damage to the RO pump even if the pre-filter is the cause of the low pressure condition.

A recycle valve- will reduce water use. An RO that does not have a recycle valve will waste 4-5 gallons of water for every gallon of water produced. With a recycle valve, this waste can be reduced to 1 or less gallons of water wasted for every gallon of water produced.

Flow meters- will allow you to monitor RO performance and adjust the efficiency.

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Pretreatment lockout- shuts the RO down when the pretreatment equipment is regenerating. Most pretreatment equipment by-passes raw water during the regeneration process. Shutting the RO down during regeneration will prevent untreated water from reaching the membrane.

Permeate quality monitor- will allow you to determine if there is any deterioration in performance of the RO.

Auto flush- will help reduce mineral build up on the surface of the membrane. Flushing increases the life of the membrane.

Should I put the reject (waste) water into the septic system?

Most of the time, the amount of waste water produced will overburden your waste water system. We recommend that you send the water to a dry well or out the basement drain system if it will handle it. In many cases, this water can be used for irrigation.

What provisions are made for disinfecting the storage tanks and stored water?

A UV(ultraviolet) system can be used to maintain the disinfection of the treated water. At a minimum, the tanks need to be sanitized at start up and have chlorine(household bleach) added periodically to maintain disinfection.

Is RO water corrosive and if it is what can be done to treat it?

The reverse osmosis process lowers the mineral content and the pH of the water. Both of these factors can make the water corrosive. The potential corrosion can be controlled with a calcite contactor. A contactor consists of a tank filled with a limestone media. As the water from the RO passes over the media in the contactor, the media is dissolved. The dissolved media replaces minerals in the water and raises the pH.