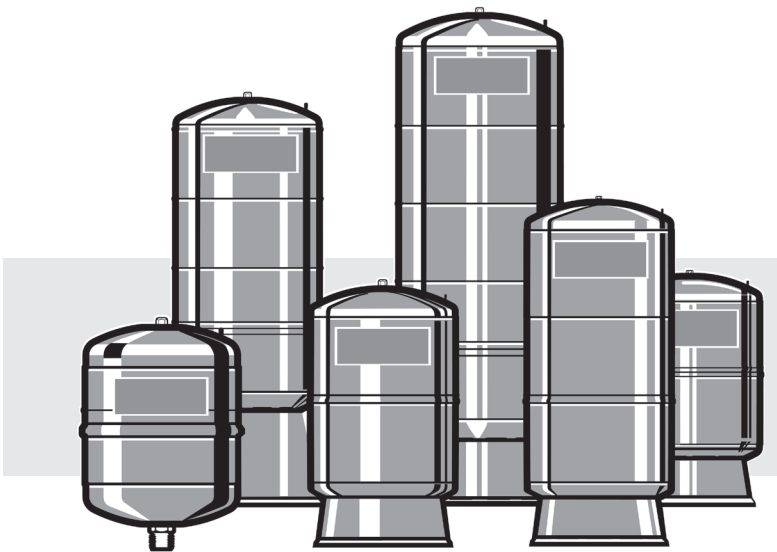


Inglés - Francés - Español



Certified to
NSF/ANSI/CAN 61-G

Safety Instructions, Installation, Operation
Maintenance, and Warranty



⚠ WARNING

Safety Hazard



Read and understand the installation manual and safety messages before installing, operating or maintaining the tank. Failure to follow instructions and safety messages could result in serious injury or death.

Thank You for purchasing a Water System tank. Properly installed and maintained, it should give you years of trouble free service. If you should decide that you want the new Water System tank professionally installed, contact the “Company” from which it was purchased. They will arrange for prompt, quality installation by an authorized contractors.

KEEP THIS MANUAL FOR FUTURE REFERENCE WHENEVER MAINTENANCE ADJUSTMENT OR SERVICE IS REQUIRED.

ALL TECHNICAL AND WARRANTY QUESTIONS: SHOULD BE DIRECTED TO THE LOCAL DEALER FROM WHOM THE PUMP TANK WAS PURCHASED. IF YOU ARE UNSUCCESSFUL, PLEASE WRITE TO THE COMPANY LISTED ON THE RATING PLATE ON THE PUMP TANK.

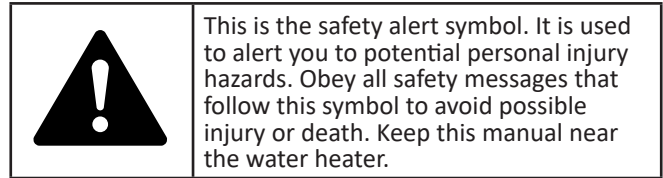
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GENERAL SAFETY INFORMATION

The proper installation, use, and servicing of this tank is extremely important to your safety and the safety of others.

Many safety-related messages and instructions have been provided in this manual and on your own water heater to warn you and others of a potential injury hazard. Read and obey all safety messages and instructions throughout this manual. It is very important that the meaning of each safety message is understood by you and others who install, use, or service this water heater.



⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in injury or death.
⚠ WARNING	WARNING indicates a potentially hazardous situation which if not avoided could result in injury or death.
⚠ CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
CAUTION	CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided could result in property damage

All safety messages will generally tell you about the type of hazard, what can happen if you do not follow the safety message, and how to avoid the risk of injury.

IMPORTANT DEFINITIONS



- Qualified Installer or Service Agency:**



Installation and service of this water tank requires ability equivalent to that of a Qualified Agency (as defined by ANSI below) in the field involved. Installation skills such as plumbing, electrical supply are required in addition to electrical testing skills when performing service.



- ANSI Z223.1:**



“Qualified Agency” - “Any individual, firm, corporation or company that either in person or through a representative is engaged in and is responsible for (a) the installation, testing or replacement of gas piping or (b) the connection, installation, testing, repair or servicing of appliances and equipment; that is experienced in such work; that is familiar with all precautions required; and that has complied with all the requirements of the authority having jurisdiction.”



- NSF (National Sanitation Foundation) - NSF International is The Public Health and Safety Company™, providing public health and safety risk management solutions to companies, governments and consumers around the world.**



 WARNING	
Safety Hazard	
	<p>Read and understand the installation manual and safety messages before installing, operating or maintaining the tank. Failure to follow instructions and safety messages could result in serious injury or death.</p>



 WARNING	
Electrical Shock Hazard	
	<p>Disconnect from electrical supply before servicing unit. Failure to turn off electric power to the pump will result in the possibility of property damage, SERIOUS BODILY INJURY, or DEATH.</p>



 WARNING	
Explosion Hazard	
	<p>This water tank is designed for ambient temperature water systems limited to a maximum pressure of 100 psig. If your system has the potential to exceed 100 psig working pressure, a suitable safety device must be installed. This can be a high-pressure cut-off switch and/or a pressure relief valve. Failure to follow these instructions can cause the tank to explode, resulting in property damage, severe injury, or death. If daytime pressure is over 80 psig, nighttime pressure can exceed the maximum (100 psig). Use a pressure reducing valve to reduce the pressure, if necessary.</p> <p>In any case, a properly-sized pressure relief valve must be incorporated in the system. The relief valve should be set to open at excessive pressures (75 psig or no more than the tank-rated pressure of 100 psig). The relief valve should be installed close to the connection of the tank to the system piping and have a discharge equal to the pump's capacity at 75 psig.</p>



 WARNING	
Explosion Hazard	
	<p>The complete pump, tank, pressure relief valve, pressure switch and piping system MUST be protected against below freezing temperature. Failure to do so could cause the tank to explode and result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.</p>

 CAUTION	
Property Damage Hazard	
	<p>Use of bleeder orifices and other air charging devices with this tank can cause noisy operation and damage to the system.</p> <p>If you are replacing a standard galvanized tank on a submersible pump installation, remove any bleeder orifices and other air charging devices as they are not compatible with captive air water system tank</p>

 WARNING	
Explosion Hazard	
	<p>This water tank is designed for cold water systems at a maximum pressure of 100 psi (689 kPa). Any use other than with cold water or a sustained or instantaneous pressure in excess of 100 psi (689 kPa) is unsafe.</p> <p>A properly-sized pressure relief valve must be incorporated in the system. The relief valve must pass the full capacity of the pump when the pressure in this tank is 100 psi (689 kPa) or less. Consult pump manufacturer for pump capacity at relief pressure.</p> <p>The manufacturer of this tank does not accept any liability or other responsibility for personal injury or property damage resulting from improper use, installation, or operation of this tank, or of the system of which it is a part.</p>

 WARNING	
Explosion Hazard	
	<p>The complete pump, tank, pressure relief valve, pressure switch and piping system MUST be protected against temperatures above 120°F. Failure to do so could cause the tank to explode and result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.</p>

 WARNING	
Explosion Hazard	
	<p>The tank contains pressurized air. Do not puncture. Never discard tank into fire or incinerator. This could cause the tank to explode, resulting in property damage, severe personal injury, or death.</p>

 WARNING	
Explosion Hazard	
	<p>Corrosion of the tank, caused by spray from irrigation systems, can cause the tank to explode, resulting in property damage, serious injury, or death.</p> <p>Be sure to install the tank where it will not be exposed to water spray from irrigation systems.</p>

WARNING

Explosion Hazard

Adjusting or increasing the pressure on a tank that is visibly corroded or damaged could cause the tank to explode, resulting in property damage, serious injury, or death. Replace corroded or damaged tanks before adjusting or increasing the system pressure. Only qualified professionals should check, adjust, or reset the precharged pressure of the tank.

WARNING

Explosion Hazard

This tank, like most tanks under pressure, will, over time, corrode or fail and/or may burst and/or leak or flood (and in rare cases explode), which can cause property damage, serious injury, or death. To minimize risk, a licensed professional must install and periodically inspect and service the unit. Install a drain pan connected to an adequate drain where leaking or flooding could cause property damage.

WARNING

Explosion Hazard

Tank must be sized in accordance with instructions from the manufacturer and in accordance with good industry practice. For proper sizing information, please see the information in the pump manufacturers literature, or the Water Systems Council's **Water Systems Handbook**. Failure to select the proper size tank could result in explosion of the tank or early pump motor failure.

FEATURES AND OPERATING CYCLES

The Water Systems Tank Concept

The water system tank does more than simply store water. It helps to protect the system components. A properly sized tank will provide adequate flow even when the pump is not running. It saves energy by reducing the number of pump starts. In addition, the water system tank provides increased system component life due to fewer pump cycles.

The water system tank consists of a steel tank (A) containing a sealed-in-place heavy duty diaphragm (B) which separates air from the water. The portion of the tank where water is stored (C) is lined to isolate water from the metal tank. This protects the tank from corrosion.

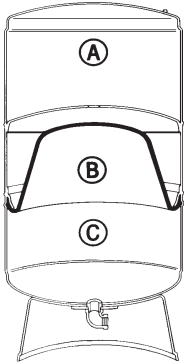


Figure 1. Operational Components

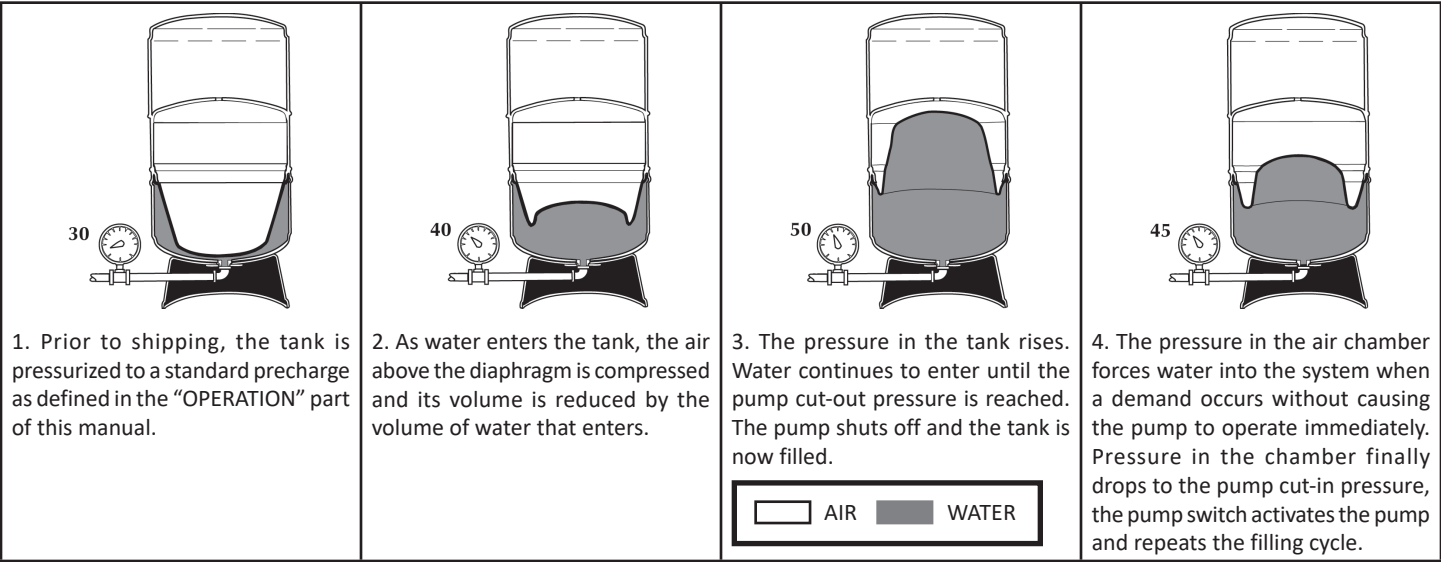




Figure 2. Tank Cycle

LOCATING THE NEW WELL TANK

You should carefully choose a location where the tank is protected from freezing temperatures. The tank is rated for cold water storage only.



Whether replacing an old water tank or putting the water tank in a new location, the following critical points must be observed.

1. The location selected should be as close to and as centralized with the water piping system as possible.

 WARNING	
Explosion Hazard	
	The complete pump, tank, pressure relief valve, pressure switch and piping system MUST be protected against below freezing temperature. Failure to do so could cause the tank to explode and result in DEATH, SERIOUS BODILY INJURY, OR PROPERTY DAMAGE.

2. The water tank must be located in an area not subject to freezing. Failure to do so voids the warranty.

3. This water tank, as all water tanks, will eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.

 CAUTION	
Property Damage Hazard	
	The installation of the tank must be accomplished in such a manner that if the tank or any connections leak, the flow of water will not cause damage to the area adjoining the water tank, or to the lower floors of the building. Under no circumstances is the manufacturer to be held liable for any water damage in connection with this water tank.

4. The location selection must provide adequate clearances for servicing and proper operation of the water tank.

DIAPHRAGM TANK INSTALLATION

GENERAL MATERIALS*

All diaphragm tanks are recommended for clear water applications. Vertical tanks are the most commonly used tanks. However, horizontal tanks and in-line tanks may be used where space is more critical. See Tank Specifications for tank capacity.

- One can PVC cement (read instructions carefully)
- One can thread compound (read instructions carefully)
- One gate valve
- One 1/2" relief valve
- Enough rigid PVC pipe and couplings to reach from pump to pressure tank to service line.
- One male PVC adapter
- One tank cross
- Two 3/8" plugs

- One 1/2" boiler drain
- One 1/2" street tee

TOOLS NEEDED FOR ALL PUMP INSTALLATIONS

Pipe wrench, crescent wrench, 24-tooth hacksaw, round file or knife.

REMINDER: All joints and connections must be airtight. A single pin-hole leak will prevent the proper operation of the system. Use thread compound on all threaded connections unless specified otherwise.

* list is for 1" piping installation, if you are installing 1-1/4" pipe change sizes accordingly.

TYPICAL SUBMERSIBLE PUMP INSTALLATION

The water system tank should be installed as close as possible to the pressure switch (24 inches or less) to reduce the adverse effect of friction loss and elevation differences.

3. The tank should be flushed 5 times prior to household use, see Operation section.

MULTIPLE TANK INSTALLATION PROCEDURE

Water system tanks can be connected together to increase the supply of usable water (draw-down). Two tanks of the same size will double the supply and three tanks will triple the supply. When using a high capacity pump, the manifold and pressure switch assembly must be installed in the pipe line as close to the center of the tanks as possible. Manifold and main should be 2 times the size of the feeder line.

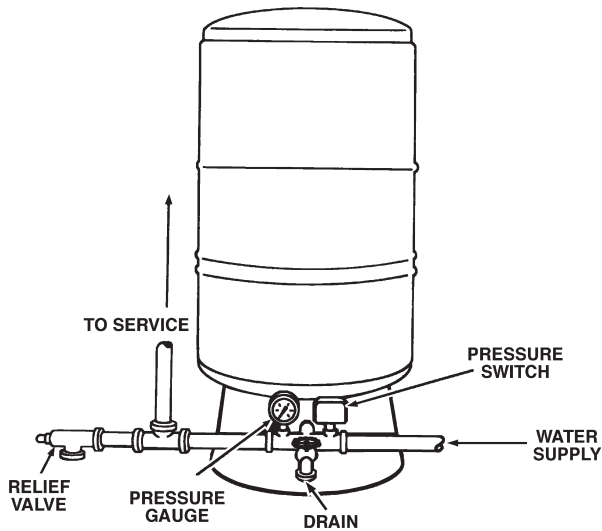


Figure 3. Tank Configured for Submersible Pump Installation

1. Disconnect electric power.
2. For installations replacing an existing water tank, drain system and remove old tank. On new system installation this step is unnecessary.
3. Locate the water system tank on a firm, level surface with adequate drainage. Typical installations are shown in the following section.

TYPICAL JET PUMP INSTALLATION

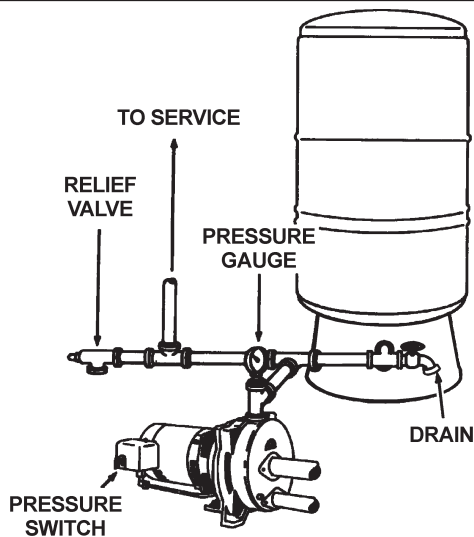


Figure 4. Tank Configured for Jet Pump Installation

1. If your system is capable of exceeding a working pressure of 100 psig (typically submersible pumps), install a pressure relief valve (rated at 100 psig or less, but greater than turn off pressure) in the system near the tank. The valve should be the same pipe size as the tank outlet. This is not necessary on tank-mounted jet pump units.
2. Connect tank to the pump discharge line using the same size pipe as the pump tap, or larger. **WARNING:** Hold 90° tank street elbow with wrench when threading and tightening connecting pipe.

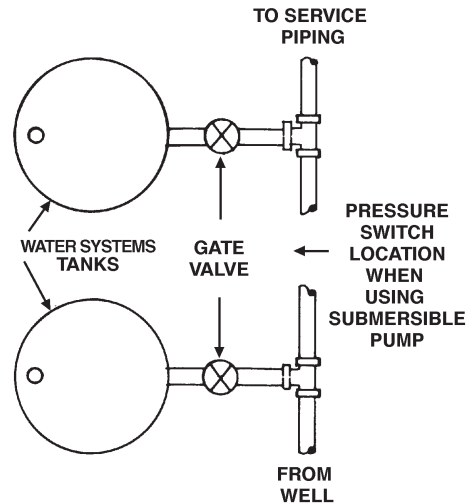


Figure 5. Two-Tank Configuration

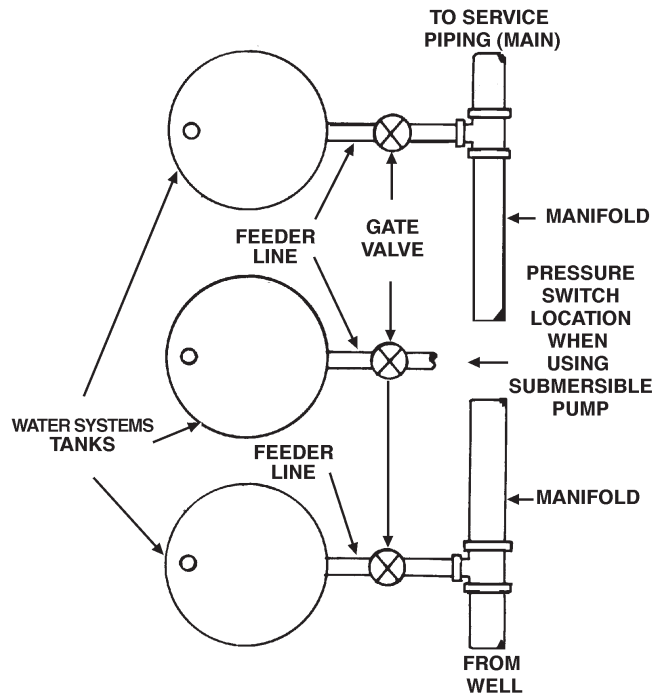


Figure 6. Three-Tank Configuration

OPERATION

⚠ WARNING

Explosion Hazard



This water tank is designed for cold water systems at a maximum pressure of 100 psi (689 kPa). Any use other than with cold water or a sustained or instantaneous pressure in excess of 100 psi (689 kPa) is unsafe.

A properly-sized pressure relief valve must be incorporated in the system. The relief valve must pass the full capacity of the pump when the pressure in this tank is 100 psi (689 kPa) or less. Consult pump manufacturer for pump capacity at relief pressure.

The manufacturer of this tank does not accept any liability or other responsibility for personal injury or property damage resulting from improper use, installation, or operation of this tank, or of the system of which it is a part.

Before you operate the system you must check your water system tank and system to ensure proper operation.

All water system tanks are precharged to 38 psig at the factory. The final precharge pressure should always be 2 to 3 psig below the cut-in (pump turns on) pressure of the pressure switch. Release air or add air as required using the following procedure.

1. Determine the pump cut-in pressure setting. The pressure switch should have this information located on/in the cover.
2. With no water in the tank, measure the precharge of the water system tank using an accurate pressure gauge at the air valve (similar to an auto tire gauge).

3. Release air or add air to the tank to make the pressure in the tank 2 to 3 psig *LESS* than the pump cut-in pressure setting.
4. It will be necessary to expel air from the piping system on new installations. To do this open all faucets and turn on the pump. Observe that a mixture of water and air will sputter from the faucet. Run the system until a steady flow of water exists. Open and close the faucets several times to assure that all air has been removed. If streams do not become steady, an air leak may exist. Check for leaks on suction side piping.
5. It may be necessary to make final adjustments on the system pressure switch setting because at times the actual pressure switch setting will vary from what is stated on the cover. Such variation, though not harmful, could cause a momentary lag of water delivery. To make this adjustment follow these steps:
 - a. Fill the system until the pump shuts off.
 - b. Open a faucet and drain the water system tank until the pump starts.
 - c. If there is a pause in the water flow from the time the water system tank is emptied and the pump starts up again, decrease the air pressure in the tank until it is 2 to 3 psig below the cut-in pressure setting. See Trouble Shooting section 3(a-b) for procedure.
 - d. Close the faucets and refill the water system tank. Repeat steps (b) and (c) if necessary until there is no longer a pause in water flow.

PERIODIC MAINTENANCE

Table 1. Maintenance Schedule

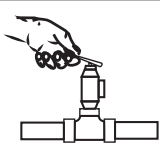
Component	Operation	Interval	Reference
Pressure Relief Valve	Check Operation	Annual	<i>Pressure Relief Valve Operation Test</i>
Tank	Check Air Charge Pressure	Annual	Air Charge Pressure Test
Tank	Leakage Inspection	Annual	Tank Leakage Inspection Procedure
Pump Pressure Switch	Check Pump Pressure Switch	?	Pump Pressure Switch Inspection Procedure

PRESSURE RELIEF VALVE OPERATION TEST

The pressure relief valve must be manually operated at least once a year. Failure to install and maintain a new properly listed pressure relief valve will release the manufacturer from any claim which might result from excessive water pressure.

⚠ CAUTION

Property Damage Hazard



When checking the pressure relief valve, make sure that the water manually discharged will not cause any property damage.

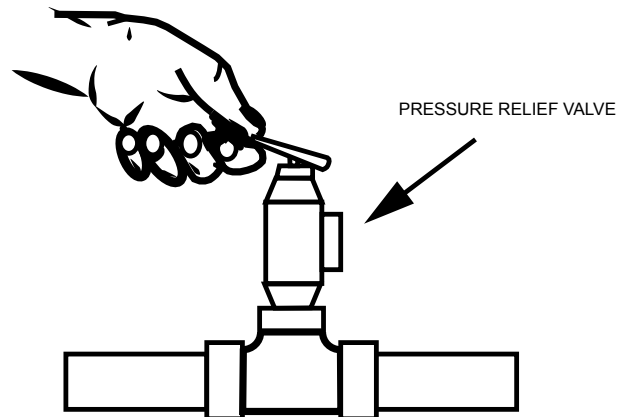


Figure 7. Pressure Relief Valve Operation

If after manually operating the valve it fails to completely reset and continues to release water, immediately shut off the pump and open a cold water faucet to drain the water out of the water tank and piping. Then replace the pressure relief valve with a new one (rated at 100 PSI max.).

Turn on electricity to pump and shut off the cold water faucet when water has a steady and constant flow.

CHECKING THE TANK FOR SIGNS OF LEAKAGE

Often, before a tank begins to leak, there will be early indications that a leak is developing. Periodically check the expansion tank for any of the following early indications of a leak:

- Water marks on the outer tank shell

- Raised paint on the outer tank shell
- Corrosion on or at the inlet area
- Corrosion on or at the air valve area

TROUBLESHOOTING

IF YOU THINK YOU HAVE A PROBLEM WITH YOUR WATER SYSTEM TANK, YOU SHOULD MAKE THE FOLLOWING TESTS AND OBSERVATIONS BEFORE YOU CALL YOUR PROFESSIONAL DEALER.

1. Observe water system operation and note any unusual occurrence such as water spurting from a faucet rather than a steady flow (indicates air in the system) or short cycling of the pump (rapid starts and stops).
2. In the event that evidence of a small leak near the water fitting appears, check at elbow. The introduction of cold water to a warm tank may form condensation especially in warmer climates. It is important to provide adequate drainage.
3. The tank drawn-down is governed by the air pressure in the tank and the cut-in and cut-out pressure settings on the pressure switch. If you have concerns about the drawn-down, you should check those settings as follows:
 - a. Air charge in Tank. Turn off electric power to the pump. Open faucet nearby and drain the tank completely. Check the pressure in the water system tank using a standard, high quality tire gauge. If the air pressure in the tank is below the pump cut-in setting by more than 3 psi, add air to the tank to make it 2 psi less than the cut-in setting. Replace the valve stem cap. Check around the air stem using a soapy solution to check for leaks around weld seams on the remainder of the tank. If a leak appears on the tank itself then replacement of the tank will be necessary.
 - b. Pressure Switch Setting. Start the pump and allow the system pressure to shut off pump. Note both the cut-in and cut-off pressure values on gauge. The difference should not exceed 25 psi. Adjust the pressure switch if necessary after shutting off the electric power to show a difference of 20 psi. Instructions from the pressure switch manufacturer will explain how to do this. Test the system after adjusting the limits. If the pressure switch can't maintain the proper differential then it may need replacement rather than the tank.

WARRANTY

A. O. Smith Corporation, the warrantor, extends the following LIMITED WARRANTY to the owner of this water system tank.

1. TANK

If within five years after installation the tank or a part thereof shall prove upon examination by the warrantor to be defective in material or workmanship, the warrantor, at his option, shall exchange or repair such part or portion. The warranty on the replacement tank will be limited to the unexpired term of the original warranty.

2. CONDITIONS AND EXPECTATIONS

This warranty shall apply only when the tank is installed in accordance with local plumbing and building codes, ordinances and regulations, and good industry practices. In addition, a high pressure electrical cut-off switch and/or a pressure relief valve must be installed when the tank is installed on an ambient temperature water system whose maximum working pressure has the ability to exceed 100 pounds per square inch gauge (psig).

- a. This warranty shall apply only when the water system is used:
 - (1) on ambient temperature water systems at pressures not exceeding the working pressure for the water system;
 - (2) in the United States, its territories or possessions, and Canada.
- b. Any accident to the water system tank, any misuse, abuse (including freezing) or alteration of it, any operation of it in a modified form, any attempt to repair tank leaks will void this warranty.

3. SERVICE AND REPAIR EXPENSE

Under this limited warranty the warrantor will provide only a replacement tank or part thereof. The owner is responsible for all other costs. Such costs may include but are not limited to:

- a. Labor charges for service, removal, repair, or reinstallation of the water system or any component part,
- b. Shipping and delivery charges for forwarding the new tank or replacement part from the nearest distributor

and returning the claimed defective tank or part to such distributor except in the state of California where such charges are the manufacturer's responsibility.

4. LIMITATION ON IMPLIED WARRANTIES

Implied warranties, including any warranty of merchantability imposed on the sale of this tank under state law are limited to five (5) year duration for the tank or any of its parts. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

5. CLAIM PROCEDURES

Any claim under this warranty should be initiated with the dealer who sold the tank, or with any other dealer handling the warrantor's products. If this is not practicable, the owner should contact:

U.S. and Canadian Customers
Telephone: (800) 527-1953

- a. The warrantor will only honor replacement with identical or similar tank or parts thereof which are manufactured or distributed by the warrantor.
- b. Dealer replacements are made subject to in-warranty validation by warrantor.

6. DISCLAIMERS

NO OTHER EXPRESS WARRANTY HAS BEEN OR WILL BE MADE ON BEHALF OF THE WARRANTOR WITH RESPECT TO THE MERCHANTABILITY OF THE TANK OR THE INSTALLATION, OPERATION, REPAIR OR REPLACEMENT OF THE TANK. THE WARRANTOR SHALL NOT BE RESPONSIBLE FOR WATER DAMAGE, LOSS OF USE OF THE UNIT, INCONVENIENCE, LOSS OR DAMAGE TO PERSONAL PROPERTY OR OTHER CONSEQUENTIAL DAMAGE. THE WARRANTOR SHALL NOT BE LIABLE BY VIRTUE OF THIS WARRANTY OR OTHERWISE FOR DAMAGE TO ANY PERSONS OR PROPERTY, WHETHER DIRECT OR INDIRECT, AND WHETHER ARISING IN CONTRACT OR IN TORT.

- a. Some states do not allow the exclusion or limitation of the incidental or consequential damage, so the above limitations or exclusions may not apply to you.
- b. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Fill in the following for your own reference. Keep it. Registration is not a condition of warranty. The model and serial number are found on the water system tank.

Model No. _____ Serial No. _____ Date Installed _____

Dealer's Name _____

Dealer's Address _____ Phone No. _____

City and State (Provincial) _____ Zip (Postal Code) _____

Dangerous Goods Permit No. SU 5099 (Ren2) - by road or rail vehicle only, expiration date: March 31, 2003 (Pending Renewals)

KEEP THIS WARRANTY POSTED ADJACENT TO THE TANK FOR FUTURE REFERENCE.

