



# WELL-X-TROL® WELL-X1®

WITH GUARIAN CP® CONTROL

## INSTALLATION & OPERATION INSTRUCTIONS



**NOTE:** Inspect for shipping damage and notify freight carrier or store where purchased immediately if damage is present. To avoid risk of personal injury and property damage, if the product appears to be malfunctioning or shows signs of corrosion, call a licensed professional immediately. Current copies of the Product manual can be viewed at [www.amtrol.com](http://www.amtrol.com). Use proper safety equipment when installing.



**THIS IS THE SAFETY ALERT SYMBOL. IT IS USED TO ALERT YOU TO POTENTIAL PERSONAL INJURY AND OTHER HAZARDS. OBEY ALL SAFETY MESSAGES THAT FOLLOW THIS SYMBOL TO REDUCE THE RISK OF PERSONAL INJURY AS WELL AS PROPERTY DAMAGE.**

**WARNING** READ CAREFULLY THE PRODUCT INSTALLATION & OPERATION INSTRUCTIONS. FAILURE TO FOLLOW THE INSTRUCTIONS AND WARNINGS IN THE MANUAL MAY RESULT IN SERIOUS OR FATAL INJURY AND/OR PROPERTY DAMAGE, AND WILL VOID THE PRODUCT WARRANTY. THIS PRODUCT MUST BE INSTALLED BY A LICENSED PROFESSIONAL. FOLLOW ALL APPLICABLE LOCAL AND STATE CODES AND REGULATIONS, IN THE ABSENCE OF SUCH CODES, FOLLOW THE CURRENT EDITIONS OF THE NATIONAL PLUMBING CODE AND NATIONAL ELECTRIC CODE, AS APPLICABLE.

**WARNING** **EXPLOSION HAZARD.** Failure to follow the instructions in the accompanying product manual can cause a rupture or explosion; possibly causing serious or fatal injury, leaking or flooding and/or property damage.

**WARNING** Use only with potable water system. Do not operate in a setting with freezing temperatures or where the temperature can exceed 130°F and do not exceed the maximum working pressure specified for this Product in the Manual. Mount vertically only.

**WARNING** **Chlorine & Aggressive Water:** The water quality can significantly influence the life of this Product. You should test for corrosive elements, acidity, total solids and other relevant contaminants, including chlorine and treat your water appropriately to insure satisfactory performance and prevent premature failure.

**WARNING** This Product, like most Products under pressure, may over time corrode, weaken and burst or explode, causing serious or fatal injury, leaking or flooding and/or property damage. To minimize risk, a licensed professional must install and periodically inspect and service the Product. A drip pan connected to an adequate drain must be installed if leaking or flooding could cause property damage. Do not locate in an area where leakage of the tank or connections could cause property damage to the area adjacent to the appliance or to lower floors of the structure.

**WARNING** **EXPLOSION OR RUPTURE HAZARD** A relief valve must be installed to prevent pressure in excess of local code requirement or maximum working pressure designated in the Product Manual, whichever is less. Do not expose Product to freezing temperatures or temperatures in excess of 130° F. Do not adjust the pre-charge or re-pressure this Product except for any adjustments required at the time of initial installation, especially if Product corroded, damaged or with diminished integrity. Adjustments to pre-charge must be done at ambient temperature only. Failure to properly size the Product or follow these instructions may result in excessive strain on the system lead to Product failure, serious or fatal personal injury, leakage and/or property damage.

**WARNING** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY**  
**IMPORTANT GENERAL SAFETY INFORMATION -**  
**ADDITIONAL SPECIFIC SAFETY ALERTS APPEAR IN THE FOLLOWING INSTRUCTIONS.**

**⚠ WARNING** **DANGER! EXPLOSION HAZARD.** WHEN THE WELL TANK HAS BEEN IN SERVICE AND A CHANGE TO A HIGHER PRE-CHARGE PRESSURE IS NECESSARY DUE TO A REQUIRED CHANGE IN THE PRESSURE SWITCH SETTING, FAILURE TO FOLLOW INSTRUCTIONS BELOW CAN CAUSE A RUPTURE OR EXPLOSION, POSSIBLY CAUSING SERIOUS OR FATAL PERSONAL INJURY, AND/OR PROPERTY DAMAGE.

- DO NOT ADJUST OR ADD PRESSURE IF THERE HAS BEEN A LOSS OF AIR.
- DO NOT ADJUST THE PRE-CHARGE PRESSURE IF THERE IS VISIBLE EXTERIOR CORROSION.
- DO NOT ADJUST THE PRE-CHARGE PRESSURE IF THERE HAS BEEN A REDUCTION OF THE PUMP CYCLE TIME OR THE PRE-CHARGE PRESSURE COMPARED TO ITS INITIAL SETTING. THIS IS BECAUSE REDUCTION IN PUMP CYCLE TIME CAN RESULT FROM LOSS OF TANK AIR PRESSURE WHICH IN TURN CAN MEAN THERE MAY BE INTERNAL CORROSION AND ANY RE-PRESSURIZATION OR ADDITIONAL PRESSURE COULD RESULT IN RUPTURE OR EXPLOSION.

**⚠ WARNING** **MAXIMUM WORKING PRESSURES.** Every Well-X-Trol is air tested to 150 psig, the maximum working pressure for the Well-X-Trol line.

**⚠ WARNING** **RELIEF VALVE REQUIRED.** A relief valve should be installed which is set to open at excessive pressures (100 psig or more). This will protect the Well-X-Trol and other system components should the pressure switch malfunction and fail to shut the pump off. The relief valve should be installed at the connection of the Well-X-Trol to the system piping and have a discharge equal to the pump's capacity at 100 psig.

**⚠ CAUTION** AS IN ALL PLUMBING PRODUCTS AND WATER STORAGE VESSELS, BACTERIA CAN GROW IN YOUR WELL TANK, ESPECIALLY DURING TIMES OF NON-USE. CONSULT YOUR LOCAL PLUMBING OFFICIAL REGARDING ANY STEPS YOU MAY WISH TO TAKE TO SAFELY DISINFECT YOUR HOME'S PLUMBING SYSTEM.

**⚠ WARNING** The pump controller is not a disconnect. The pump may be activated at any time. The electrical system must be considered energized at all times unless the circuit breaker is open. The disconnect for the controller must break all incoming power lines. As with a mechanical pressure switch, when installed with three wire 230 vac pumps or any 3-phase pump, a standard pump motor starter or a relay must be used.

**⚠ WARNING** A water test must be taken before installation of any water treatment equipment.

**⚠ WARNING** **DANGER! EXPLOSION HAZARD.** IF YOU ADJUST THE PRE-CHARGE PRESSURE OR ADD PRESSURE TO A TANK THAT IS CORRODED OR DAMAGED OR WITH DIMINISHED INTEGRITY THE TANK CAN BURST OR EXPLODE, POSSIBLY CAUSING SERIOUS OR FATAL PERSONAL INJURY AND/OR PROPERTY DAMAGE.

- ONLY ADJUST THE PRE-CHARGE AS DESCRIBED IN THIS MANUAL WHEN THE TANK IS NEW OR WHEN THE INTEGRITY OF THE TANK AND LACK OF INTERNAL OR EXTERNAL CORROSION IS CONFIRMED.
- ONLY LICENSED PROFESSIONALS SHOULD CHECK, ADJUST OR RE-CHARGE THE PRE-CHARGE OF TANKS.

**⚠ WARNING** For your safety, the information in this manual must be followed to minimize the risk of electric shock, property damage or personal injury.

- Properly ground to conform with all governing codes and ordinances.

**⚠ WARNING** Do not install in direct sunlight. Excessive sun heat may cause distortion or other damage to non-metallic parts.

**⚠ WARNING** Use only lead-free solder and flux for all sweat-solder connections, as required by state and federal codes.

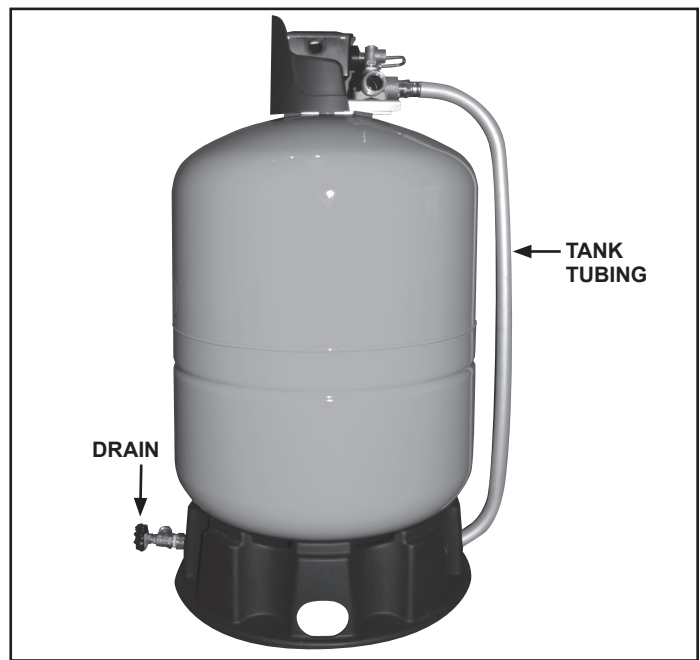
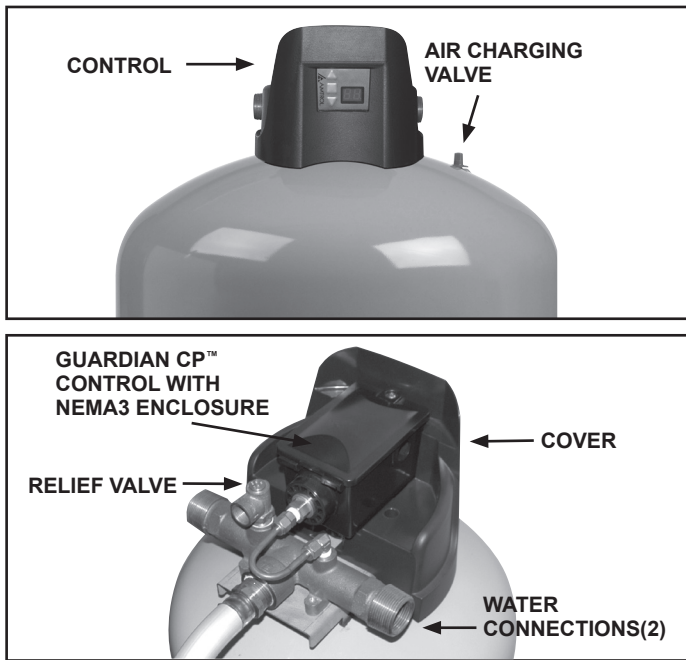
**⚠ WARNING** Maximum allowable inlet water pressure is 125 psig. If daytime pressure is over 80 psig, nighttime pressure may exceed the maximum. Use a pressure-reducing valve to reduce the flow if necessary.

**⚠ WARNING** **ELECTROCUTION AND EXPLOSION HAZARD.** before work is performed on the tank, turn off the power to the pump and release all water pressure in the tank and pumping system.

**⚠ WARNING** This control is capable of running pumps to pressures that may exceed the limitations of system components. Never set the operation pressure higher than that of the safe system capacity.

**⚠ WARNING** This control can be adjusted to a narrow pressure differential. This can cause the pump to cycle rapidly with an improperly sized tank, leading to pump damage. This may require a larger pressure tank than normally used.

## COMPONENTS



## SIZING

The Well-X1® functions like a traditional pressure switch by cycling the pump on and off. The factory pressure settings are 40 psi cut-in and 60 psi cut-out. The controller allows these settings to be adjusted to best suit the application. The Well-X1 can operate in two primary modes:

### 1. STANDARD OPERATION: 20 PSI DIFFERENTIAL

WELL-X1 SELECTION FOR STANDARD SYSTEMS Control Setting (cut-in/cut-out) (psi)				
	30/50	40/60	50/70	60/80
PUMP GPM	4	WX1-250	WX1-250	WX1-250
	5	WX1-250	WX1-250	WX1-250
	7	WX1-250	WX1-250	WX1-250
	10	WX1-250	WX1-250	WX1-251
	12	WX1-250	WX1-251	WX1-251
	15	WX1-251	WX1-302	WX1-302
	18	WX1-251	WX1-302	WX1-302
	20	WX1-302	WX1-302	-

### 2. CONSTANT PRESSURE MODE: 10 PSI DIFFERENTIAL

WELL-X1 SELECTION FOR CONSTANT PRESSURE Control Setting (cut-in/cut-out) (psi)				
	40/50	50/60	60/70	70/80
PUMP GPM	4	WX1-250	WX1-250	WX1-250
	5	WX1-250	WX1-250	WX1-250
	7	WX1-250	WX1-250	WX1-251
	10	WX1-251	WX1-251	WX1-302
	12	WX1-251	WX1-302	WX1-302
	15	WX1-302	WX1-302	-

## PRE-INSTALLATION

### LOCATION

The Well-X1 is designed for indoor and outdoor installations. If installed outdoors:

- Do not install where ambient temperatures can drop below freezing or exceed 130° F.
- Use water-tight wiring conduit, wire nuts and conduit connections as dictated by applicable codes and ordinances.
- Protect the piping from mechanical damage.
- Install the relief valve blow down tube where venting water will not cause personal injury or damage the surrounding property.
- Drip Pan and Drain: To avoid leaking and/or property damage, install with a drip pan connected to an adequate working drain kept clear at all times.

### ORIENTATION

Ensure the installation meets all applicable local codes and is installed by a licensed professional. Additionally, the following should be noted.

- This unit is designed for vertical installation above ground only. Do not install horizontally or directly bury the unit. The Well-X1 may be installed below grade in a well pit or other suitable enclosure. **Do not locate in an area where leaking or flooding could cause property damage to surrounding areas.**
- Check codes to determine if there are any height requirements pertaining to the Well-X1. Particularly, ensure the bottom drain meets these requirements. If restrictions are imposed on the proximity of drain connections to the floor, the unit may be elevated on blocks or the bottom drain tube can be removed and plugged, after which a sampling tap may be installed in the water lines near the top of the Well-X1.

## INSTALLATION - PLUMBING

1. Plumbing connections are similar to a traditional tank cross or tank tee. Provisions are made for popular line sizes via a 1-1/4" NPT male outer thread and a 1" NPT female inner thread. The plumbing connections are not directional and allow flow from either side. When attaching valves or fittings, use the wrench flats provided.

**⚠ WARNING EXPLOSION HAZARD.** Failure to follow these instructions can cause a rupture or explosion possibly causing serious or fatal injury, flooding, and/or property damage.

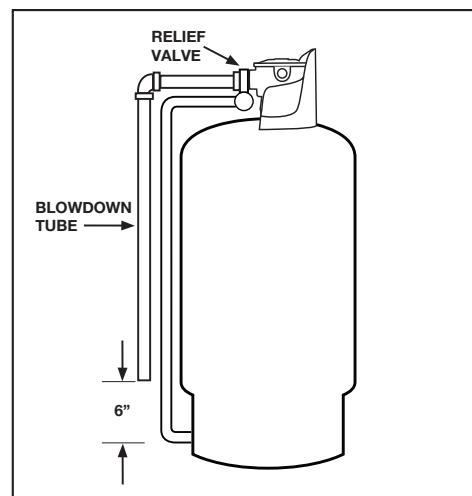
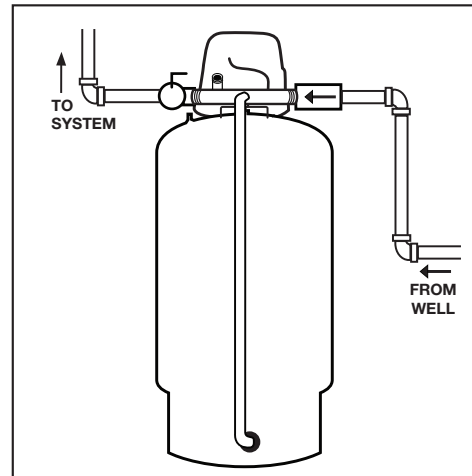
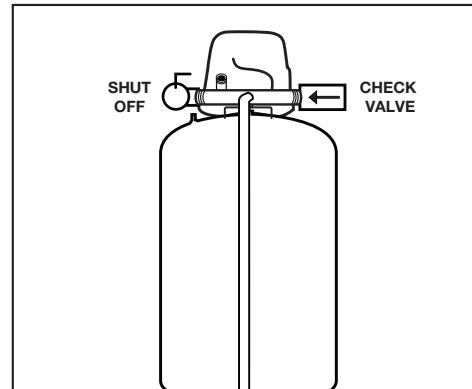
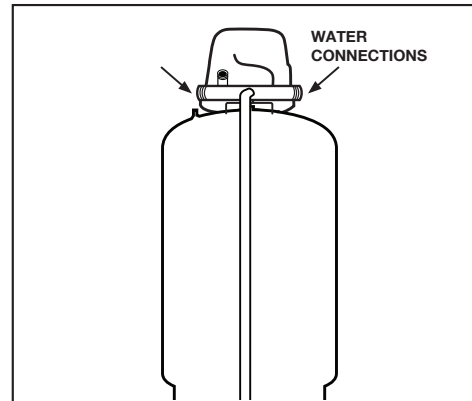
2. Install the supply piping from the well pump. If required, install a spring-loaded check valve. Install a shutoff (service) valve on the outgoing line. This will allow the Well-X1® to be tested prior to pressurizing the entire system. DO NOT place a shutoff on the incoming supply line.

**NOTE:** The relief valve is sized for a maximum flow rate of 10 gpm at 125 psi. If the pump installation allows higher flow rates, an additional relief valve must be installed.

3. Connect the water line from the well pump to the inlet of the Well-X1. Plumb the outgoing supply to the building's water supply system or into the water treatment equipment (if present).

4. Install a blow down tube from the relief valve to a drain or to within 6" of the floor as required by local codes.

**⚠ WARNING** A drip pan connected to an adequate drain must be installed if leaking or flooding could cause property damage.

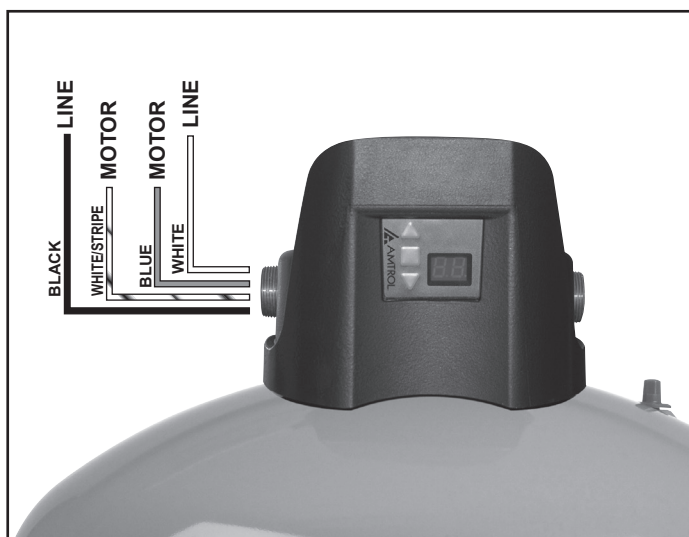
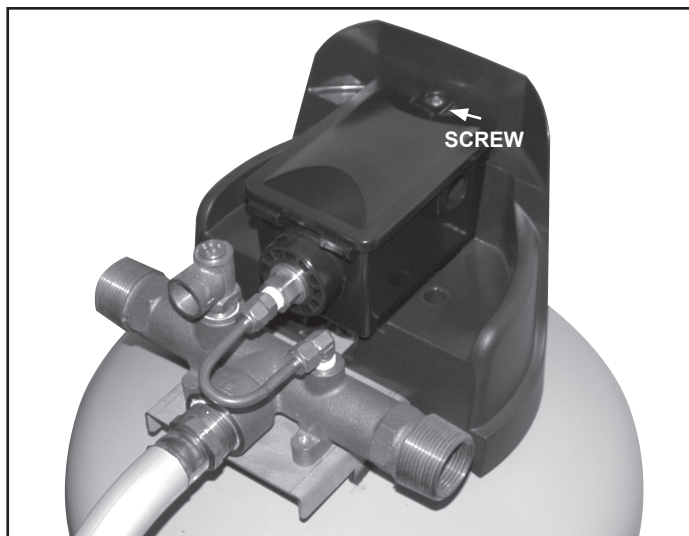


## INSTALLATION - WIRING

1. Shut off the circuit breaker for the well system. Loosen the silver screw on top of the control and remove cover to expose the control wires.

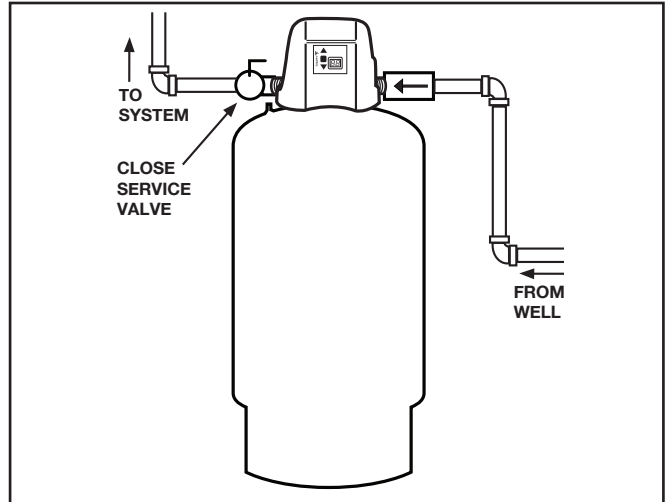
**⚠ WARNING** **Electrocution hazard.** For your safety, the information in this manual must be followed to minimize the risk of electric shock, property damage or personal injury. Properly ground to conform with all governing codes and ordinances.

2. The 12 gauge wire leads are pre-stripped and ready to accept standard wire nuts. Each wire is color coded to correspond with the diagram below. Use water tight conduit, connections, and wire nuts for an outside application.
3. Wiring is similar to a traditional mechanical pressure switch. Two leads are connected to line supply, while the other supply the pump motor or starter. Wire the control to the line supply and pump motor or pump starter as required by the manufacturer's instructions. It is recommended that service switch be installed in addition to the circuit breaker. The disconnect for the controller must break all incoming power lines. This should interrupt line voltage and be installed near the Well-X1® and labeled appropriately.
4. After completing the wiring, reattach top cover and tighten screw. Ensure no loose wires protrude from the control.



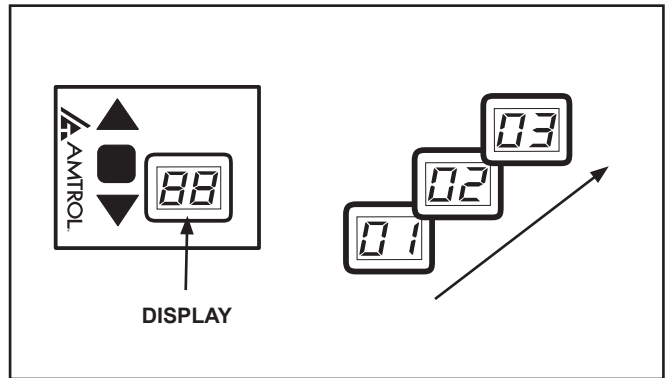
# STARTUP

1. After plumbing and wiring are complete, close the service valve to allow startup without pressurizing the entire plumbing system. If a service valve was not installed, close all fixtures in the home. Ensure the bottom drain is closed.
2. Restore power to the Well-X1® by turning on the breaker and electrical service switch (if installed). The display will illuminate.
3. The display will read "88" to test the display illumination, then a number identifying the control type (i.e. **15**). This number is for factory use and may vary by model and manufacture date.

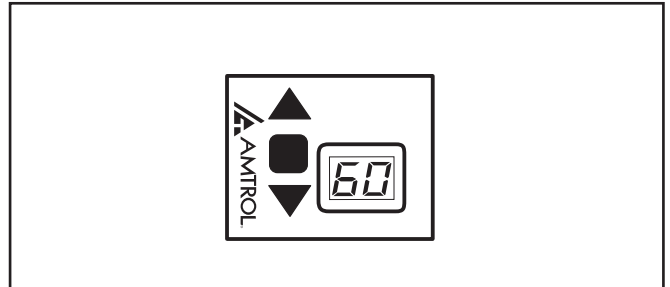


4. After a slight pause, the pump will start and the system pressure will be displayed. This number will increase as the pump runs and the tank fills.

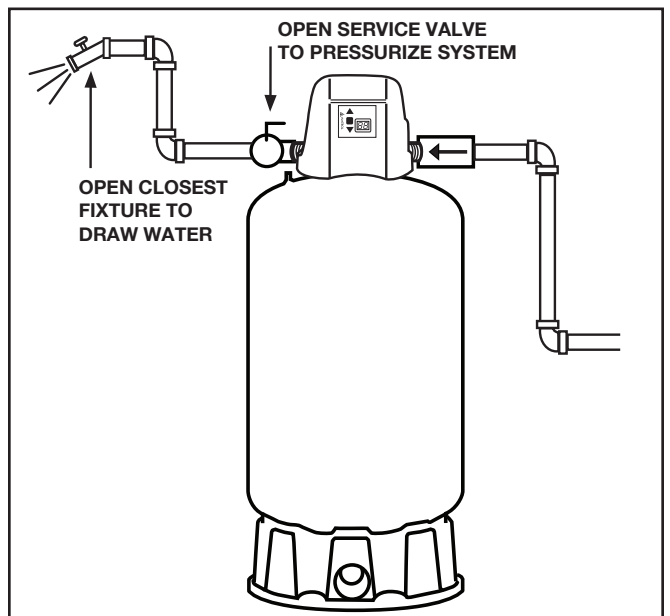
**Note:** Some jet pumps may be difficult to prime, resulting in the low water cut-off activating if pressure will not build above 10 psig. Depressing the ▲ arrow will temporarily override the low water cut-off to allow proper priming.



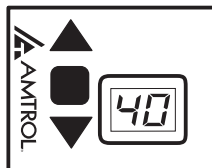
5. The factory cut-out (pump off) setting is 60 psig. When the pump reaches 60 psig, the Well-X1 will shut the pump off. Check the plumbing for leaks and repair before continuing. If during startup the cut-out setting of 60 psig cannot be reached, read the adjustment instructions to lower the cut-out within the pump's capability.



6. Slowly open the service valve to allow the system to pressurize. The pressure may drop slightly during this process. After the valve is fully open, open the fixture closest to the Well-X1 to begin drawing water from the tank.



7. When the system reaches the factory cut-in (pump on) setting of 40 psig, the pump will start. Like a traditional mechanical switch, the pressure will begin to rise, repeating the cycle. If desired, the Well-X1 settings can now be adjusted as shown.





# PRESSURE ADJUSTMENT

The Well-X1® utilizes a simple cut-in/cut-out adjustment. Before setting the desired operating range, refer to the chart below to ensure the Well-X1's Maximum Acceptance is not exceeded. Adjust the precharge as shown on page 9.


**CAUTION!** Exceeding Maximum Acceptance will reduce tank life and cause irreparable damage.

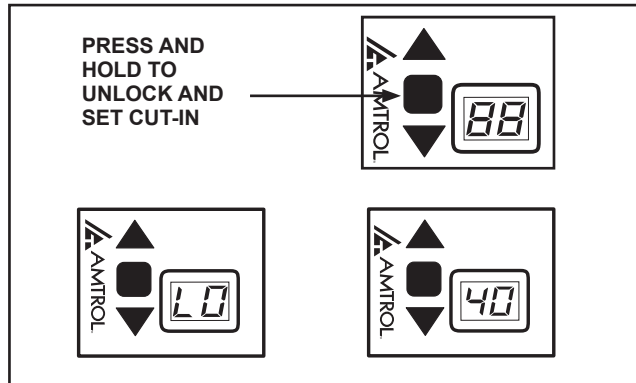
- Find the Maximum Acceptance for the installed Well-X1 model.



MODEL	MAXIMUM ACCEPTANCE
WX1-250	.77
WX1-251	.55
WX1-302	.54

- Ensure the desired operating range does not exceed that model's Maximum Acceptance.

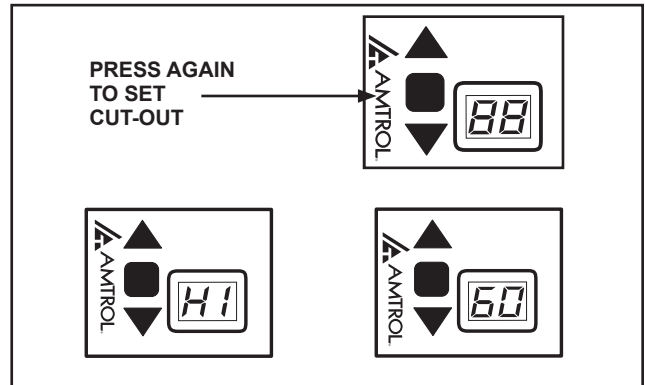
		CUT-OUT PRESSURE													
CUT-IN PRESSURE		20	25	30	35	40	45	50	55	60	65	70	75	80	
	10	.28	.38	.45	.50	.55	.59	.62	.65	.67	.69				
	15		.25	.34	.40	.46	.50	.54	.57	.60	.63	.65			
	20			.22	.30	.37	.42	.46	.50	.64	.57	.59	.61		
	25				.20	.27	.34	.39	.43	.47	.50	.53	.56	.58	
	30					.18	.25	.31	.36	.40	.44	.47	.50	.53	
	35						.17	.23	.29	.34	.38	.41	.45	.48	
	40							.16	.22	.27	.31	.35	.39	.42	
	45								.14	.20	.25	.30	.33	.37	
50									.13	.19	.24	.28	.32		
55										.13	.18	.22	.26		
60											.12	.17	.21		
65												.12	.16		
70													.11		




- To enter the programming mode, press and hold the  button until **LO** appears. This is the cut-in setting. Factory default will be 40 psig.



- Use the  and  arrows to raise or lower the cut-in setting. Adjustment can be made within 10 psig or as wide as 55 psig of the cut-out setting to 60 psig. If this range is exceeded, the display will cease to change even though the button is being pressed.

Minimum setting is 10 psig.



- To adjust the cut-out, depress  once and the display will read **HI**. Again, press the  or  buttons to raise or lower the setting. The same 10-55 psig differential range applies.

Maximum setting is 80 psig.

- After adjusting the cut-in and cut-out, release the buttons. After a slight pause, **Pr** will be displayed, indicating the settings are saved in the event of a power outage.



## PRECHARGE ADJUSTMENT

Whenever the cut-in (LO) setting is changed, the tank precharge must be adjusted. To do this, shut the Well-X1 off and open the drain to empty all water. Using an air gauge, adjust the precharge to 2 psig below the cut-in (LO) setting.




Failure to adjust the precharge will result in tank damage or water interruption.

**⚠ WARNING DANGER! Explosion Hazard.** If the Well-X1 has been in service and a change to a higher pre-charge is necessary due to a required change in the setting, failure to follow instruction below can cause a rupture or explosion, possibly causing serious or fatal personal injury, and/or property damage.

- Do not adjust or add pressure if there has been a loss of air.
- Do not adjust the pre-charge pressure if there is visible exterior corrosion.
- Do not adjust the pre-charge pressure if there has been a reduction in pump cycle time or the pre-charge pressure compared to its initial setting. This is because reduction in pump cycle time can result from loss of tank air pressure which in turn can mean there may be internal corrosion and any re-pressurization or additional pressure could result in rupture or explosion.

# PUMP PROTECTION AND DIAGNOSTICS

The Well-X1® continually monitors pressure, cycle time and voltage to protect the well pump. The following error codes alert the user to a potential problem, prompting service. When an error occurs, the display will flash a diagnostic code.

WELL-X1 ERROR CODE		POSSIBLE CAUSES AND CONTROL ACTION
	<b>E1: Rapid Cycle</b>	Multiple cycles below a safe runtime indicate an incorrect precharge, undersized Well-X1 or waterlogged tank. Pump continues to run.
	<b>E2: Low Suction</b>	Pump operation below 10 psi indicates a low well level, well piping leak, insufficient prime, failing pump or loose wiring. Pump will shut down and attempt to restart every 60 minutes.
	<b>E3: Voltage Protection</b>	If line voltage varies outside a safe operating range, low or high, the control will run for up to two minutes to ensure water is available, then shut the pump off until voltage is restored to a normal range.

## TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Error code flashes	1. Error encountered	1. See Error Code section for possible causes.
No water at fixtures	1. Error encountered 2. No power 3. Water line obstructed 4. Faulty pump 5. Drain or relief valve open 6. Leak in plumbing	1. See Error Code section for possible causes. 2. Check circuit breaker and wiring. 3. Ensure shut-off valves are open, check filtration equipment. 4. Repair or replace as necessary. 5. Ensure valves are closed. 6. Check piping.
Low water pressure	1. Pressure setting too low 2. Water line obstructed 3. Faulty pump 4. Pressure setting out of range 5. Incorrect wiring	1. Adjust pump cut-in and cut-out setting as described in manual. 2. Ensure shut-off valves are open, check any filtration equipment. 3. Check well pump. 4. Reduce pressure settings within pump capacity. 5. Check pump wiring.
Intermittent water interruption	1. Tank precharge too high 2. Recurring error	1. Adjust air pressure 2 psi below cut-in setting. 2. See Error Code section for possible causes.
No pressure (pump runs)	1. No pump prime (jet pumps) 2. Failing well pump 3. Incorrect wiring	1. Prime pump and restart. 2. Repair or replace as necessary. 3. Check pump wiring.
Display will not illuminate	1. Circuit breaker or switch off 2. Faulty or loose wiring 3. Failed control	1. Check breaker and service switch. 2. Check line supply wiring. 3. Replace.
Pump will not turn on (Display illuminated)	1. Error encountered 2. Faulty pump 3. Failed control 4. Pressure sensor line blocked 5. Loose or faulty wiring	1. See Error Code section for possible causes. 2. Repair or replace as necessary. 3. Replace. 4. Remove and clean. 5. Check pump wiring.
Pump will not shut off	1. Pressure setting too high 2. Pump water line obstructed 3. Pump problem 4. Failed control	1. Decrease pressure settings until pump and reach cut-out. 2. Ensure no shut-offs are closed between pump and Well-X1™. 3. Inspect pump and sizing if cut-out not reached. 4. Replace.
Sediment or discoloration in water	1. Poor water quality	1. Install proper treatment equipment, drain and flush tank per instructions contained in this manual.
Rapid pump cycling	1. Differential too narrow 2. Improper precharge 3. Failed tank	1. Check sizing for intended operating range or spread differential to obtain proper pump run time. 2. Adjust air pressure 2 psi below cut-in setting. 3. Replace.
Relief valve discharges	1. Over-pressure condition 2. Faulty relief valve	1. See "Pump will not shut off" above. 2. If pressure is below 100 psi, relief valve should not open. Replace.

### Warranty

WX1 Models: Seven (7) Year Limited Warranty (Tank). Two (2) Year Limited Warranty (Control).

Visit [www.amtrol.com](http://www.amtrol.com) for complete warranty details.



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