

# WELL COMPONENTS: VALVES

Various types of valves may be used in water system piping. These include:

- Check valves
- Line check valves
- Foot valves
- Shut-off valves
- Flow-control valves
- Pressure-relief valves



Check Valve

Heavy Duty  
Check Valve

Foot Valve

Flow-Control  
Valve

Pressure-Relief  
Valve

## Check Valves to Control Flow

**Check valves** are used to hold pressure in the system when the pump stops. They also prevent backspin, water hammer, and upthrust inside the pump. Any of these three conditions, or a combination of them, can lead to pump or motor failure, plus shortened service life or operating problems in the system.

More than one check valve should always be used in submersible pump installations. If the pump does not have a built-in check valve, a **line check valve** should be installed in the discharge pipe within 25 feet of the pump and below the drawdown level of the water in the well. For deeper settings, a line check valve is recommended every 200 feet.

**Swing-type check valves** should never be used with submersible pumps. With a swing-type valve, when the pump stops, there is a sudden reversal of flow before the valve closes, causing a sudden change in the velocity of the water.

**Spring-load check valves** should be used because they are designed to close quickly when the water flow stops and before it begins to move in the reverse direction. There is little or no velocity of flow when the spring-loaded valve closes, and no hydraulic shock or water hammer is produced.

## Weight of Pipe and Pump

The weight hanging below the check valve must be considered when the valve is installed and must be within the rating of the valve manufacturer. In a deep well installation or when more than 100 feet of pipe are below the valve, a heavy-duty valve or valve recommended by the manufacturer should be used. For higher weight applications, this type of heavy-duty valve may be referred to as a drop pipe check valve. Follow the manufacturer's instructions for installation, for the reason that check valves are valves and must not be treated as a pipe coupling or damage to the valve could result.

## Foot Valves

The operation of most shallow-well jet pumps and deep-well jet pumps is dependent, in part, on the proper functioning of the foot valve. This valve is installed at the end of the suction pipe or below the jet in the well to prevent back flow. Without a foot valve, suction lines will lose a prime every time the pump shuts off. This valve needs good positive shut off to prevent loss of prime and pump cycling when there is no demand.

Whenever possible, a foot valve should be used on shallow- and deep-well jet pump water systems to assure a positive prime from the water level in the well to the pump. This is necessary to protect vital pump parts such as rotary seals, sealing rings, and other parts that may be damaged by heat if the pump operates without a water flow.

## Shut-off Valves

Shut-off valves, such as gate valves or ball valves, should be installed between the tank and the supply line for the entire water system. This makes it possible to drain only the necessary portion of the system each time repairs or changes are made.

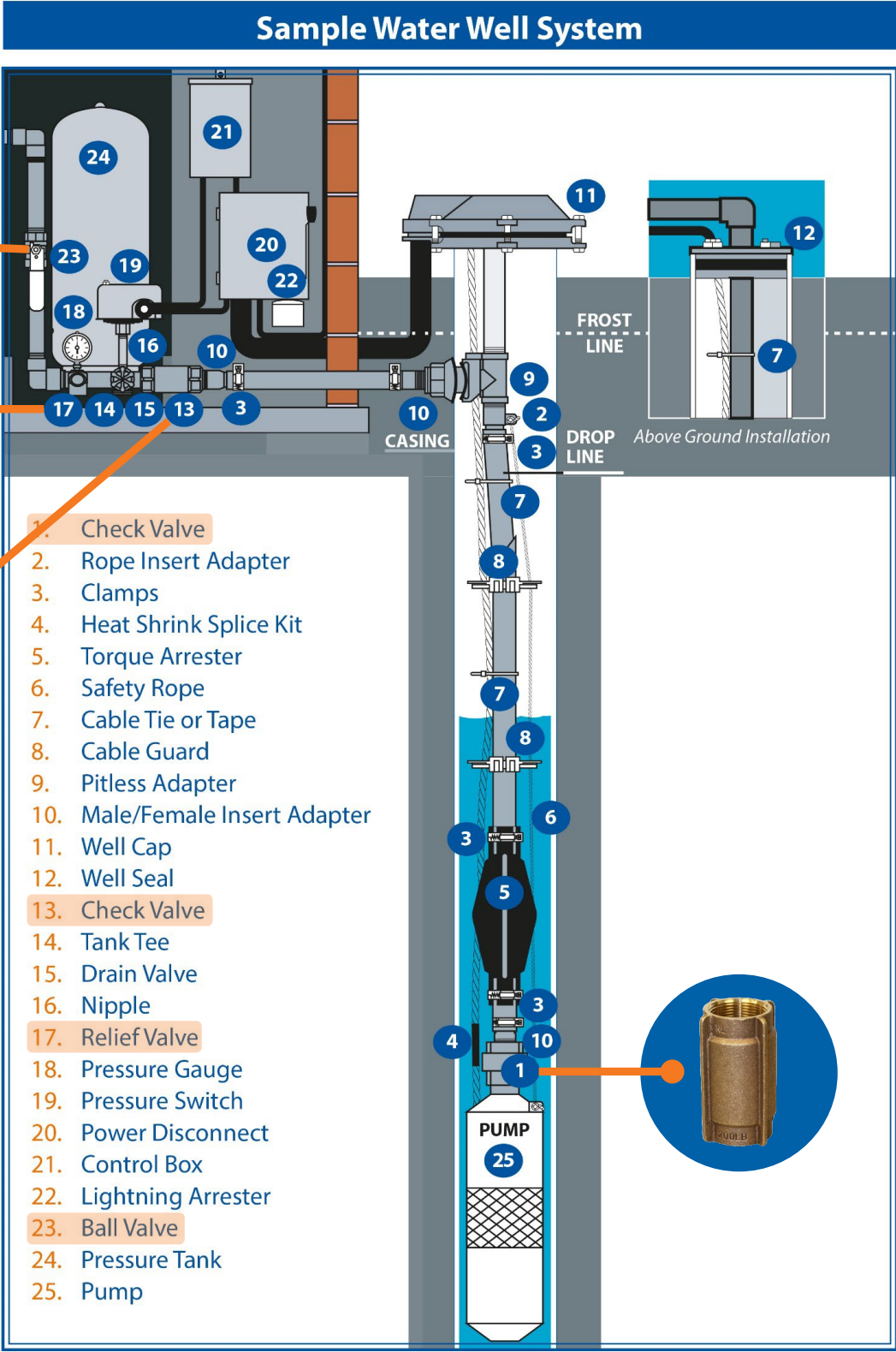
## Flow-control Valves

Flow-control valves are used to reduce or limit the amount of pump capacity primarily to prevent an overload condition (high amps) on the motor and upthrust condition on the pump. When system conditions exist that could allow the pump to deliver too much capacity, a flow control valve may be installed to restrict or limit this flow to an adequate amount. Valves of this type are commonly installed on showers or other water-using appliances to limit the gallons-per-minute flow to these outlets. A set flow rate to equipment such as irrigation systems can also be maintained with flow-control valves.

## Pressure-relief Valves

High pressure can result if the pressure switch that controls the pump is damaged, or if the pump stays on too long. Most submersible pumps can develop pressure exceeding the rated working limits of the pressure tank or distribution system. Excess water pressure can damage water system components as well as the pressure tank if not corrected immediately, so a pressure-relief valve is recommended. Relief valves are spring-controlled. For water service, these are generally adjusted to relieve pressure higher than 75 psi.

Whenever there is a question of safety, a relief valve should be used. A pressure and temperature relief valve is required by almost all plumbing codes for water heaters, and it is also important to install a pressure relief valve for water system tanks. The size and selection of the relief valve should be based on the capacity of the pump at the relief pressure setting, and it should have positive reseating. Discharge of relief valves should be directed to an adequate drain.



*This illustration is intended to represent some of the components that can be included in a water well system and is not intended as an installation guide.*

*Check local codes for actual requirements and restrictions.*

## For More Information on Valves

Contact your licensed well contractor, local health department, state environmental agency, or the wellcare® Hotline. The Water Systems Council's *Water Systems Handbook* provides technical information on well maintenance and service.



## Information to help maintain and protect your water well system:

wellcare® is a program of the [Water Systems Council \(WSC\)](#). WSC is the only national organization solely focused on protecting the health and water supply of an estimated 23 million households nationwide who depend on private wells (according to the U.S. EPA).

This publication is one of more than 100 wellcare® information sheets available FREE at [www.watersystemscouncil.org](http://www.watersystemscouncil.org).

Well owners and others with questions about wells and well water can contact the wellcare® Hotline at 1-888-395-1033 or visit [www.wellcarehotline.org](http://www.wellcarehotline.org) to fill out a contact form or chat with us live!

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