

Guide to Submersible Well Pump Selection

A deep well submersible water system is used to supply domestic water automatically to the plumbing system of a home or building from a private well. The complete pumping unit is submerged in the well below water level. The basic components of the system are the pump, pressure switch, and tank.

Before planning or installation can begin, two questions must be answered: How much water will be required for daily use; and, can the well produce enough water to meet daily requirements?

The following discussion will assist you in answering the questions above and help you choose the right size pump.

1. WELL CAPACITY

How much water will the well produce in GPM (gallons per minute)? Determine this by: a) well driller's log, or b) use of an older cleanout pump to determine flow rate. (NOTE: Never use a new pump for this service.) After cleanout pump operates for 30 minutes at free flow, fill a 5-gallon bucket and make a note of the time it takes to reach capacity. Use this data in the following formula:

$$\frac{\text{gal. of water (5)}}{\text{seconds}} \times 60 = \text{GPM (gallons per minute)}$$
$$\text{GPH (gallons per hour)} = \text{GPM} \times 60$$

Note: If at any time during the 30 minutes of free flow water fails to flow, pump should be turned off immediately. Wait 3 to 4 hours, lower pump deeper into well, and throttle (use a gate valve) pump back by closing valve 1/4 turn. The above procedure should be repeated until water flows continuously for 30 minutes. Not doing so could result in dry running and destruction of the pump. The pump should never be closer than 10 feet to the bottom of the well.

5 GPM Series

For low-capacity wells where a higher series would "overpump" the well, causing pump failure.

10 GPM Series

For average-capacity wells. The most popular choice in farm and home applications.

20 to 27 GPM Series

For high-capacity wells where more than normal water supply is required: ranches, dairy farms, light irrigation, and light industrial water systems.

35 to 85 GPM Series

For very high capacity wells and/or very deep wells. For irrigation and industrial water systems where higher water volume is needed.

2. DEPTH OF WELL

This can be determined by 1 of the following: a) well driller's log, or b) tie a heavy weight to a string, lower into well until it reaches bottom, and measure this distance.

3. DEPTH TO WATER (WATER PUMPING LEVEL)

To determine this, 2 vertical distances must be added together: a) total vertical feet from the highest service outlet to ground level, and b) total vertical feet from ground level to the pumping level of the water. The Water Pumping Level is defined as the standing water level in the well when the pump is operating, and the water being pumped out equals the water entering the well. This level is generally several feet lower than the water level in the well when pump is not operating.

It should be understood that pump setting depth does not determine pump performance. The main criterion is the Water Pumping Level. The depth of the pump below this water level is of no significance in relation to gallons and pressure delivered by the pump.

4. VOLUME

Each outlet that may be left on for continuous use will require about 3 gallons per minute (GPM). A 1-bathroom house is usually sized for 2 continuous-use outlets, and a 2-bathroom house is usually sized for 3 continuous-use outlets. Livestock requirements are in addition to home requirements and, of course, must be added in order to determine the final volume requirement.

5. PRESSURE

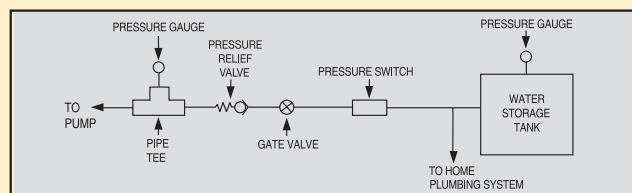
Many homes use a 30 to 50 pressure (psi) setting. Higher cut-in and cut-out (40 to 60 psi) settings may be needed where automatic appliances require higher pressure for proper operation.

6. 2-WIRE VS. 3-WIRE

3-wire pumps have the advantage of being equipped with high-starting torque motors. A high-starting torque is sometimes needed to break free mineral deposits that may adhere to the pump's moving parts. 2-wire pumps should not be used where abrasives or heavy water scale are present.

7. CONSTRUCTION MATERIALS

- Cast-iron basic construction represents good value and is useful in many applications.
- Thermoplastic construction provides excellent value and corrosion resistance.
- Stainless steel construction has superior corrosion resistance.



With the pump running, adjust gate valve until pressure gauge located on pump side of the valve reads 10 psi higher than the highest tank pressure gauge reading; e.g., if the system is set for 20 to 40 psi, the pressure gauge on the pump side of gate valve will show 50 psi.