

Sump Pump

QUESTIONS

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Water in the basement is always a concern when we receive a large amount of rain or snow. For many homeowners, the first line of defense is a sump with a pump in it.

The sump may be connected to tile that drains the area near the footings of the house under the entire basement or it may just drain the area where the sump is installed. Tiling can be installed on the outside or inside of the footings or both.

Many houses have tiling only installed around a portion of the house. Homeowners should try to determine what type of drainage system they have in the basement.

The water that drains into the sump must be removed, and this is accomplished with a sump pump. Sump pumps come in two basic models: the upright (commonly called a pedestal) and the submersible. Either will work well with proper maintenance.

The pedestal pump has the motor on top of the pedestal and the pump at the base, which sits on the bottom of the sump. The

motor is not meant to get wet. The pedestal pump is turned on and off by a ball float. One advantage of this type of pump is the on/off switch is visible so the action of the ball float can be seen easily.

Submersible pumps are designed to be submerged in water and sit on the bottom of the sump. The on/off switch is attached to the pump and can be a ball float connected to an internal pressure switch or a sealed, adjustable, floating switch.

Both are reliable, but the floating switch requires a larger diameter sump. If the sump diameter is less than 18 inches, the floating switch or its cord could become entangled with the piping or pinned between the pump and sump.

Either type of pump should have a check valve on the water outlet pipe so water doesn't flow back into the sump when the pump shuts off. Water flowing back and forth can cause the pump to turn on and off more frequently than necessary, which decreases the life of the pump.

Some frequently asked questions about sump pumps:

Q. How do you check or test a sump pump?

A. First, make sure the outlet pipe is not frozen shut or plugged and that it directs water away from the house. Unplug the sump pump. Remove the lid (if the sump has one) and use a flashlight to check if the sump is clean and that the pump intake is not plugged.

For pedestal pumps, the intake is on the top of the pedestal in the water. For submersible pumps, the intake screen is just below the motor. Normally, the intake is visible even in water but if not, use your fingers to make sure the intake is not plugged.

In some sumps, the tile inlet or inlets are near the bottom of the sump. In this case, temporarily plug the inlet or inlets. Next, make sure the pump is plugged in.

Then slowly pour water into the sump. Try to simulate the speed that water normally would flow into the sump.

Watch the on/off float switch's action and listen to the pump. Make the pump turn on and off at least twice. If the pump doesn't sound right, fix it as soon as possible.

Q. Can you burn out the pump if the outdoor pipe is frozen shut or will it automatically shut off?

A. All newer sump pumps have thermal protection built in to protect the motor. If the motor becomes too hot, a thermal relay will trip and shut off power to the motor.

Unplug the pump and let the motor cool. The thermal relay should reset in 15 to 30 minutes. While you wait, make sure the pipe is clear of ice.

Q. What size pump should I have for my house?

A. There is no "correct" size. The horsepower requirement for a house is determined by the area of drainage connected to the sump, the depth to groundwater, the depth of the basement and many other factors. A 1/3 horsepower (hp) pump is satisfactory for most houses, but a 1/2 hp pump doesn't cost that much more.

Q. Are there any problems with replacing a 1/3 hp pump with a 1/2 hp pump?

A. When used in similar conditions, a 1/2 horsepower pump will pump more water and lift it higher than a 1/3 horsepower pump. Most new sump pumps will have a chart or graph in the instructions or on the box that shows the flow versus height of lift for both sizes.

The flow usually is given in gallons per minute (gpm) or gallons per hour (gph). Multiply the gpm by 60 to convert to gph. The height of lift is given in feet of vertical lift.

The 1/2 hp pump shouldn't cause any problems, but in situations where the water flow into the sump is relatively slow, you would have no advantage by using the larger pump. However, in situations where the water flow can become quite rapid, a 1/2 hp pump will keep up with the flow, whereas the 1/3 hp pump may not.

Q. Do sump pumps have filters which need to be cleaned or replaced?

A. Sump pumps do not have filters, but they do have screens or small openings where the water enters the pump. These sometimes can be plugged.

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Q. Can or should you pump into a sewer drain or basement floor drain?

A. No, you should not. If you have a septic system, under no circumstances should the sump be pumped into the basement floor drain.

During wet conditions, the drain field of the septic system usually is saturated and struggling to handle the normal flow of water from the house. Adding to it with a sump pump can damage the septic system.

Even if you are connected to a public sewer system, sump water should not be pumped into a floor drain except under special circumstances. Many communities have ordinances prohibiting the diversion of sump water into the sanitary sewer system during certain times of the year or during widespread flooding. Check with your municipal government to find out its rules

Q. Where should the sump pump drain hose be run?

A. Preferably, sump water should be discharged at least 20 feet away from the house. All water from the sump pump should be directed away from the house in such a way that it drains away from the house. It should not be directed onto your neighbor's lot, into window wells or onto the septic system drain field.

Q. Can the average person replace a defective sump pump or does it require specialized tools or the expertise of a plumber?

A. Almost all sump pumps come with a list of required tools and directions for installing them. Replacing a sump pump should not be too difficult for the "average" person.

Q. How big should the sump hole be? What kind of hole liner should you use? How much gravel do you put under and around it?

A. Sump holes should be about 2 feet in diameter at the top. This allows space for the pump and associated piping and stores a sufficient amount of water between pump on/off events. Metal or plastic liners can be used but plastic is easier to work with and is sold commonly in home supply stores.

When the sump liner is installed, about 3 to 4 inches of coarse gravel should

be placed in the bottom of the hole. The gravel forms a solid base for the sump to sit on and support the weight of the pump.

Q. Should the sump pump be on an isolated electrical circuit?

A. A standard 15-amp, 110-volt three-prong grounded electrical outlet is sufficient to handle a sump pump. The electrical outlet for the sump pump should be an isolated line, with no other connections between the breaker and the outlet.

Although, a sump pump is always in or near water, a ground fault interrupter (GFI) in the circuit is not recommended. In some instances, lightning has triggered the GFI and shut off power to the pump during severe downpours, resulting in wet or flooded basements.

Q. I don't have a sump in my basement but am concerned about water leaking in. What can I do?

A. If water leaks in, you can push it to a floor drain, but if water backs up in the floor drain or drains very slowly, you need a pump.

Small pumps, sometimes referred to as "skimmer" pumps, are designed to sit on a flat surface and pump when water on the floor is ¼ to ½ inch deep. On the discharge end, they often have a hose bibb connector so a garden hose can be used. A 50-foot garden hose run out through a basement window usually will carry the water far enough away from the house.

You can remove more water by taking the cover off the floor drain and placing the pump in the drain bowl. These pumps are usually small enough to fit in the bowl.

In emergencies when electric service is off, a small gasoline generator can power these pumps.

Q. What is the useful life of a sump pump?

A. This is a difficult question. Some pumps have been in use for years. The answer really depends on how often and for how long they have run.

Those built for the home market in the last 10 years have plastic or cast iron body construction with stainless steel shafts. These do not rust or corrode like earlier models, and the submersible motors are sealed.

Some manufacturers recommend replacing the switch and float every two years and the pump every five years. If you do not know the age of your pump but it tested OK, then buy a backup pump of the same size.

Prepare the backup pump with necessary fittings so it can be installed quickly. Usually, you do not have much time when you need the backup pump.

Q. Do I need a backup pump?

A. Many people like the security of a backup sump pump, especially if they are away from home for significant periods during the year. Backup sump pumps also provide peace of mind during flooding events. A backup sump pump should "kick in" when the main pump fails or loss of electrical power occurs.

Many manufacturers sell electric backup sump pumps. The most common configuration is a direct current (DC) pump supplied by batteries. The batteries are kept charged by a trickle charger connected to house electrical power.

The float on the backup sump pump is positioned above the turn-on position of the main pump float. Thus, if the main pump fails, the water will rise and turn on the backup pump.

Just like the main pump, backup pumps and their electrical systems need to be maintained and checked on a regular basis.

For More Information

- "Planning Ahead: Sump Pump Tips" video at www.youtube.com/watch?v=8P9b72wW8OQ
- "Electric Backup Sump Pumps (AE1771) publication at www.ag.ndsu.edu/publications/home-farm/electric-backup-sump-pumps-for-houses
- "Electric Backup Sump Pumps for Houses" video at www.youtube.com/watch?v=PPQvjRFVtxo
- "Backup Sump Pump Battery Selection, Installation and Maintenance" video at www.youtube.com/watch?v=ZGJPuGuRyL8

For more details about preparing for a flood and information about cleanup after a flood, contact your county office of the NDSU Extension or visit the NDSU Extension Flood Information website at www.ag.ndsu.edu/flood.

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