

# SUMP PUMP BACKUP OPTIONS

## Sump Pump Backup Systems

A backup sump pump is a system used to protect your basement from flooding when the main sump pump isn't operating. There are several types of backup systems including battery powered and water powered.

### Does everyone need a backup system?

No, it depends on your situation. A sump pump is a mechanical appliance, like a water heater or refrigerator. And like those appliances, it can wear out or break down. Backup systems can add expense, maintenance and make the sump system more complex.

You should evaluate your individual situation, including your risk factors to determine whether you need a backup system and to select one that fits your situation.



**Why do pumps fail?** Primary electric sump pumps can fail for a number of reasons:

- Loss of power due to blackout, blown fuse or tripped circuit breaker, damaged power cord, or being unplugged
- Pump clogging with debris
- Float switch failure, catching or sticking
- Overwhelming volumes of water
- Pump burn out
- Check valve failure
- Discharge pipe blockage due to debris or freezing



Installing a backup system can keep your basement dry. To evaluate whether you need a backup sump pump system, consider these questions:

- Do you lose power frequently?
- How much do you have invested in your basement and its contents?
- How old is your sump pump? How old is your check valve?
- Do you live in a confirmed flood plain?
- Has your basement flooded in the past?
- Is your home located at a low point in your neighborhood?
- How active are your footing drains during rain events? During dry weather?
- Would it be easier to store the items in your basement off the ground and risk a few inches of water?
- How close is the nearest floor drain? Does it connect to the sanitary sewer system? If the sump were to overflow, how much water would collect before the water emptied through the sanitary drain?
- How often are you home and checking your basement?
- Are you handy enough to fix the primary pump if it fails?

## Backup Options

- ✓ Secondary pump with riser and check valve next to the existing sump
- ✓ High water alarm (with or without notifications)
- ✓ Battery backup
- ✓ Water powered backup
- ✓ Manual generator
- ✓ Automatic generator
- ✓ Second primary pump installed in pit or basin



# SUMP PUMP

## BACKUP OPTIONS



Following is a list of advantages and disadvantages of various backup sump pump systems. For further information on these backup options, please speak with a contractor or review manufacturer information.

### **1** Second pump next to the pit or basin

For the do-it-yourselfer, keeping a second pump at the ready is a good option. The homeowner can keep a second pump near the sump basin, complete with riser pipe and new check valve, ready to install when necessary. Often a high water alarm is installed in the pump to alert the owner when the pump fails.

#### **Advantages**

- Second pump with the same capabilities as the primary
- A handy person can usually change the primary assembly in just a few minutes
- Home always has a second pump on hand
- Faulty switches on primary pumps can be changed relatively cheaply, which means pumps can be repaired and put back in service as backup
- A relatively simple backup system

#### **Disadvantages**

- Must be home to make the switch
- Clear water overflow will result between the sump lid and the nearest sanitary drain when the primary pump fails until the secondary pump is installed
- If flows to the sump are high, during pump switching, there may be a sump overflow resulting in clear water between the sump lid and the nearest floor drain. Without testing, it is not possible to know whether or not the drain is connected to the sanitary system.

## 2 High water alarm

An alarm can be installed in the sump to alert owners when the water rises in the sump pit. Using a high water alarm gives the owner time to remedy the problem in the case of pump failure.

### Advantages

- Simple alarms can be purchased for as little as \$10. More sophisticated alarms can cost a few hundred dollars
- Alerts owner when the water in the sump pit rises above the level that typically starts the pump
- Can be set up to text or call multiple contacts, depending on the model
- Some models can be integrated with your security system
- Relatively low cost

### Disadvantages

- Many rely on batteries for power outages. If the battery fails, the alarm does not work
- May have a monthly maintenance fee for SMS, text, or phone support
- False alarms can occur if the system is not installed correctly

### **3 Battery backup system**

The battery-powered backup system is the most popular backup system among homeowners. A battery backup sump pump is an emergency backup pump powered by a deep-cycle marine gel cell battery. Battery backup pumps are usually less powerful than the primary sump pump, pumping at an average of 10 gallons per minute (gpm), rather than the 30 (1/3 HP) or 60 gpm (1/2HP) rate of primary pumps.

The battery-powered backup pump is installed in the sump pit, slightly higher than the primary pump, with the battery pack on the floor nearby. Battery-powered systems are usually fully automatic and start pumping during a power outage.

To keep the battery fully charged and ready to use, it is plugged into the household electrical outlet. A power management device monitors the battery and the floats in the sump. The inverter (part of the device manager) provides a trickle charge to the battery to keep it fully charged and ready for a power outage event.

An alarm will sound if the power is out, the pump is running, the battery is not fully charged, or it's low on voltage. This installation generally requires a permit from the local building department.

#### **Advantages**

- Low maintenance, other than replacing the battery and checking the distilled water level in battery (for unsealed batteries)
- Low up front cost, easy to install
- Works if primary pump fails
- Most use existing discharge piping, so installation is limited to the immediate pump area

#### **Disadvantages**

- Limited battery life, generally 7-24 hours of pump operation
- Batteries must be replaced every three years
- Failures can still occur in the pump or the check valve

## 4 Water powered backup system

A water powered backup system is an emergency backup pump that uses the pressurized fresh water supply in the house to power the pump. The water powered backup requires installing copper pipes from the nearest water supply pipe to the sump area, as well as a backflow prevention device to prevent the sump water from contaminating the public water supply.

The backup pump starts automatically during a power outage or when the primary pump fails. A water powered pump uses the Venturi effect: Drinking water flows through a nozzle pointed into the discharge. As the water shoots down the discharge it creates a vacuum and draws water from the sump crock. Sump water then combines with the flowing city water and exits your basement via a discharge line. This installation generally requires a permit from the local building department.

### Advantages

- Power provided by city water pressure. The backup pump will work as long as there is water pressure in your house
- Works if primary pump fails
- Does not rely on electricity
- The mechanics of the pump are relatively simple; a Venturi valve, a float switch that activates the Venturi valve, and a discharge line (with check valve)

### Disadvantages

- Uses about 2 gallons of pressurized fresh water to pump out 1 gallon of sump water. Water usage will show up on the water bill
- More expensive than battery backup due to installation cost of Reduce Pressure Zone (RPZ) valve and water piping
- Requires that the RPZ valve be tested by a licensed certified plumber and inspected by the City every **3 years** to verify that sump water is not contaminating the pressurized potable water
- Additional water supply pipes must be installed
- Sump cover may not be radon sealed depending on the type of cover and how it is installed
- If the float gets stuck in the on position, the malfunction could result in a large water bill
- Most installation recommendations require the water backup have a dedicated discharge to gravity. Often that means another internal discharge, another hole in the envelope of the house, and more external piping.

## 5 Manual start gasoline generator

A manual start portable gasoline generator could be used to power the primary pump in the event of a power outage.

You can buy a generator at a hardware store. Prices range from a few hundred to several thousand dollars.

To run your sump pump in a power outage, you will have to connect an extension cord from the generator outside the house to the sump pump.

Before purchasing a generator, select a model that has adequate power to run your mandatory services, such as climate control and appliances, including the sump pump.

### Advantages

- May cost less than a battery backup pump
- Portable generator has multiple uses; can power the sump and other parts of the home during a power outage

### Disadvantages

- Must be home to start the generator
- May have to refuel generator often
- Connecting the sump to the generator via electrical cords can be technical and could possibly be dangerous if not done correctly
- Doesn't protect the home in the event of a pump failure
- Requires electrical skills to connect. A connection through a panel could be even more complex than using an extension cord

## **6 Automatic standby generator**

An automatic standby generator can be used to power select circuits in the house such as the sump pump, furnace, refrigerator and other appliances during power outages. The generator starts automatically during a power outage and can be powered by natural gas, propane or gasoline.

It must be professionally installed. In many cases, when an automatic generator is installed in the home, a second primary pump is installed in the basin at an elevation slightly higher than the primary pump. The owner can opt to have a high water alarm installed to warn when the primary pump has failed and the backup pump is operating.

This installation generally requires a permit from the local building department.

### **Advantages**

- Powers selected circuits or entire house for longer periods of time than a manual start generator
- Starts automatically

### **Disadvantages**

- Installation and maintenance costs
- Usually runs weekly as part of its maintenance cycle
- Requires oil change and maintenance check twice a year
- No second backup pump, any redundancy for the sump must also be installed

## **7** Second primary pump in the sump pit

A second primary pump can be installed at an elevation higher than the original primary pump, to provide redundancy. This is a popular precaution with owners who installed an automatic start generator.

### **Advantages**

- Second pump has the same power and quality
- Highly reliable, provided power is available

### **Disadvantages**

- Without a high water alarm, owner may not know when the secondary pump is active
- Industry best practices recommend installing the second pump on its own circuit
- Industry best practices recommend a dedicated internal discharge for the secondary pump to operate reliably as a backup
- Creates a crowded sump pit or basin: two pumps, two blocks, two discharge pipes, two electric wires, and possibly a high water alarm