



**INSTALLATION &  
OPERATION MANUAL**

**12 VOLT BATTERY BACK-UP  
SYSTEM**

**5000PVSPBU**



[www.aymcdonald.com](http://www.aymcdonald.com)



Non-Potable Use Only

This pump has been manufactured with your needs in mind. Properly installed in the right application, your new A.Y. McDonald pump will give you years of carefree performance.

### Important Safety Information:

Carefully read and understand all of the Warnings and installation instructions in this manual. Failure to follow these instructions could lead to serious bodily injury and/or property damage. Retain these instructions for future reference.

#### **⚠ DANGER**

RISK OF ELECTRICAL SHOCK. Do not plug in or unplug the AC transformer while standing on a wet floor. If basement floor is wet, disconnect the power before walking on the floor.

#### **⚠ DANGER**

Water and electricity can be dangerous if certain precautions are not adhered to. This pump is designed to operate perfectly safe in a water environment; however, improper use and installation can result in personal harm from electrical shock. Please pay attention to the following warnings.

#### **⚠ DANGER**

Never touch any electrical device, including this pump, when it is touching water, in water, or even in a moist environment. Always unplug (disconnect the electricity) when working on or installing the unit.

#### **⚠ DANGER**

Battery acid is corrosive. Do not spill on skin, clothing, or parts of this system. Wear gloves and eye protection when handling the battery.

#### **⚠ DANGER**

Do not use this unit to pump chemicals, flammable liquids, sewage or corrosive liquids. You could injure yourself and the pump will fail. Pumping these types of liquids voids the warranty. A.Y. McDonald and other pump companies manufacture pumps for these types of liquids. Make sure you purchase a pump designed for your specific needs. This pump will handle fluids with the same characteristics as water.

#### **⚠ DANGER**

Keep all electrical connections away from wet and moist environments. Wet connections can cause electrical shock resulting in personal injury.

#### **⚠ CAUTION**

Do not use the power cord or discharge hose to carry or handle the pump. Doing so may cause damage to the power cord or discharge hose. Use the carrying handle supplied with the pump.

#### **⚠ CAUTION**

EXTENSION CORDS: For best performance, it is recommended to connect the AC transformer power cord directly to a grounded GFCI outlet. The use of extension cords is NOT recommended.

#### Notes:

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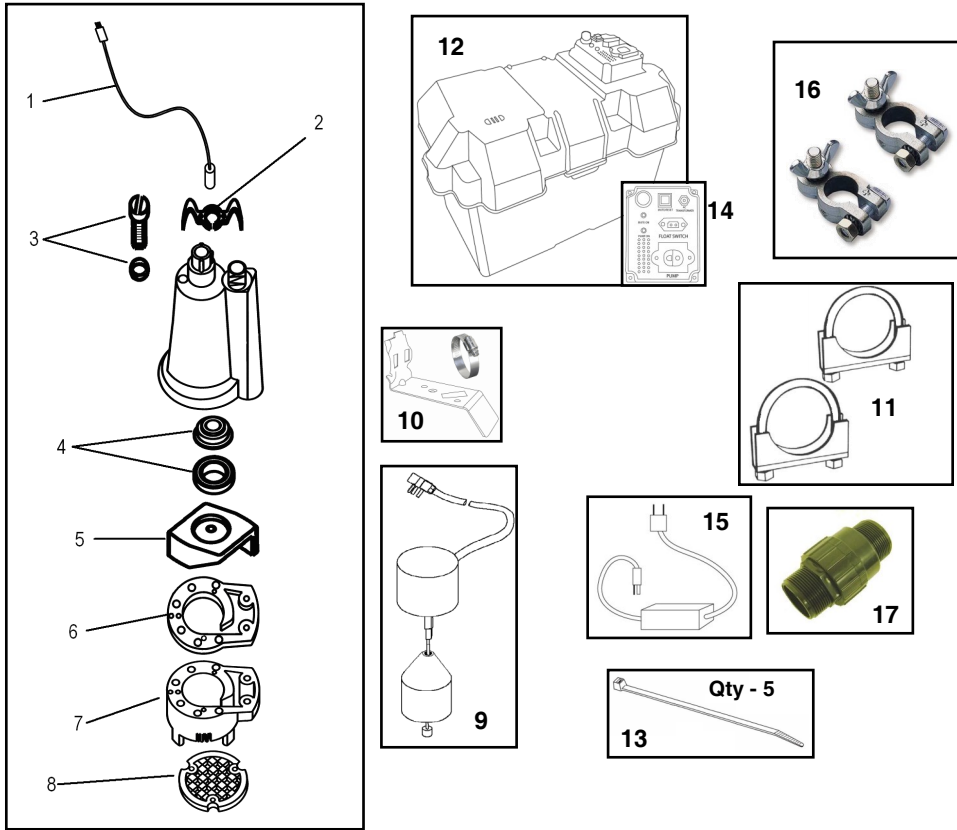
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## PARTS LIST



Ref	Description	PARTS FOR MODEL# 5000PVSPBU
1	Power Cord	<p><b>Please call your Professional Plumber for price and availability</b></p>
2	Handle	
3	Oil Fill Plug with O-ring	
4	Shaft Seal	
5	Impeller	
6	Gasket	
7	Volute/Base	
8	Intake Screen	
9	Float Switch	
10	Vertical Float Switch Bracket	
11	U-Bolt & Saddle Clamp Assembly	
12	Battery Box (Complete Unit)	
13	Cable Ties	
14	Control Panel	
15	AC Power Cord	
16	Battery Terminals (+ & -)	
17	Check Valve	

## BATTERY SELECTION

This system is designed to work with 12 volt, lead-acid deep cycle marine / RV batteries. Either a flooded cell (serviceable or maintenance free) or sealed AGM battery are acceptable. Choose a battery with a minimum 90 amp-hour rating and a 175 minute reserve capacity or larger. Avoid using automobile batteries as these types of batteries are not intended to be charged/discharged for extended periods of time. The battery case will accommodate size 24 or 27 batteries.

During prolonged periods of power failure or in an emergency, your automobile battery may be used. Make sure to replace the deep cycle battery as soon as possible as the automobile battery will be quickly ruined by the continuous charge/discharge cycles.

## GENERAL INFORMATION

This battery back-up system is not intended to replace your primary sump pump. It is intended to provide temporary back-up during power failures or malfunctions with the primary pump.

## CARBON MONOXIDE (CO) DETECTORS

All backup pump systems that use lead acid batteries, regardless of brand, give off gaseous by-products when the battery is charging. Some of these by-products can cause a carbon monoxide (CO) detector to give a false alarm. When installing this system, position the battery as far away from the CO detector as possible. **DO NOT** move or remove CO detectors from their original location. Always follow the instructions that accompany your CO detector.

If your CO detector alarm sounds, take the following actions.

1. Take immediate action for personal safety as outlined in the CO detector manual.
2. Contact the appropriate utility agency to determine if the CO is coming from your furnace, water heater or other appliance that uses natural gas

If it's determined that a charging battery is causing the CO detector to activate, contact the manufacturer for recommendations on how to alleviate the problem.

## INSTALLATION

### ⚠ DANGER

RISK OF ELECTRICAL SHOCK. Always disconnect the power source before attempting to install, service or perform maintenance on the pump. Failure to do so may result in fatal electrical shock.

### ⚠ CAUTION

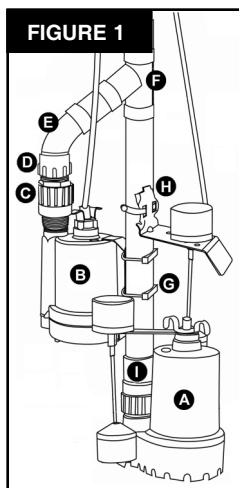
A qualified electrician must perform all wiring.

## TOOLS & MATERIALS REQUIRED

- Pencil or marker
- Socket wrench with 10mm socket, 10mm nut driver or adjustable wrench
- Hacksaw
- Pipe cleaner & cement (ABS or PVC depending on your application)
- Pliers
- Slip joint pliers
- ABS or PVC pipe and fittings (45° elbow 1-1/2" Wye, Female adapter)
- Tape measure
- Deep cycle marine battery (see battery selection section)

NOTE: Install this system when the primary pump will not be required.

1. Start by finding the water level at which your primary pump starts. Mark this point on the discharge pipe with a pencil or marker.
2. NOTE: If your existing discharge pipe is metal or flexible tubing it will need to be replaced with Schedule 40 PVC or ABS pipe.
3. Drain as much excess water from the sump pit as possible.
4. When the basin has been drained, turn off the power to the outlet / pump to avoid the risk of electrical shock.
5. Before removing the primary pump, make sure the discharge pipe is properly supported to prevent it from collapsing.
6. If your installation uses a flexible pipe coupling with clamps, simply disconnect the coupling and remove the pump. If a flexible coupling is not used, cut the pipe using a hacksaw at any convenient location above the floor and remove the pump from the basin. NOTE: BE PREPARED FOR WATER TO LEAK FROM THE PIPE WHEN CUTTING. Keep tools and components of this system away from the work area when cutting pipe. If any components get wet, make sure they are dry before installing.
7. If your primary pump does not have a check valve in or near the pump discharge, install one at this time (not provided). It is necessary to have a check valve installed on both the back-up pump and on the primary pump. The primary pump check valve must be located below the junction of where the back-up and primary piping meet. This is to prevent backflow from the back-up pump when it is running.



- FIGURE 1**
- A. Primary Pump
  - B. Back-up Pump
  - C. Check Valve
  - D. Female Adapter
  - E. 45° Street Elbow
  - F. Wye fitting
  - G. U-Bolts & Clamps
  - H. Float Switch Clamp
  - I. Primary pump check valve (not included)

8. Attach the back-up pump to the primary discharge pipe using two U-Bolts, Clamps, washers and nuts (G). Position the pump so it is located near the water level that was marked in Step 1. Tighten nuts using a 10mm socket or adjustable wrench. **DO NOT** over tighten. NOTE: Make sure the U-bolts are properly seated in the recessed areas on the pump mounting bracket. (The pump mounting bracket comes pre-attached to the pump).

NOTICE: Height and/or piping restriction will reduce the pump output performance. See the performance chart below to insure you have the proper pump for your application. Whenever possible use the same size or larger pipe as the pump discharge for optimum performance. Reducing the pipe size will not harm your pump; it will just reduce the output.

### PERFORMANCES

Model #	Output in gallons per minute at listed discharge height above pumping level				
	0'	5'	10'	15'	20'
5000PVSPBU	23	22	18	13	8

\*Performance ratings are based on using a 27M, 12 volt deep cycle marine battery with a 100 Ah rating

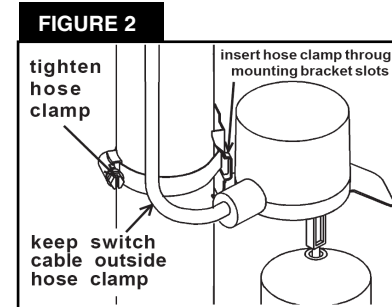
### SPECIFICATIONS

Motor	12 volt DC
Amps	12
Battery Requirements	12 Volt Deep Cycle Marine
Low Voltage Shut off	10 Volts
Solids Handling	1/8"
Discharge Size	1-1/4" or 1-1/2"
Battery Charger	2 amp
Liquid Temperature Range	32°-120°F (0°-49°C)

# TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSES	HOW TO CORRECT
Pump won't run.  Pump hums but won't run	Loose, corroded or reversed wire connections	Tighten, clean or reconnect if necessary
	Discharged battery	Charge battery
	Defective battery	Replace battery
	Blown fuse	Replace with 20 amp fuse
	Float switch is stuck	Position float so it moves freely
	Battery is discharged below 10 volts	Fully charge battery
Pump cycles too often	Float switch positioned improperly	Reposition float switch
	Defective or missing check valve	Install or replace check valve
Pump runs but moves little or no water	Low or discharged battery	Fully charge battery
	Obstruction in pipe	Clear obstruction
	Discharge pipe height/length exceeds the capacity of the pump	Check performance section for capacity of this pump
	Defective check valve	Replace Check Valve if necessary

9. Thread the check valve (C) onto the discharge of the back-up pump
10. Plumb the back-up pump to the primary pump piping using a 1-1/2" Female Adapter (D), 45° Street Elbow (E) and a Wye fitting (F). It is highly recommended to do a "dry fit" before permanently gluing the pipe and fittings together. Place the assembly in the basin to make sure that it fits and that the primary float switch operates freely before permanently gluing the pipe and fittings together.
11. Remove the assembly from the basin and glue all fittings.
12. Next, secure the float switch to the discharge pipe using the provided clamp. See figure 2 below for proper installation. DO NOT fully tighten the clamp at this time. Leave it a bit loose so you can adjust the position of the float in the next steps.
13. After the float switch has been attached to the discharge pipe, place the entire assembly in the basin. Make sure the primary pump float switch will operate freely and not contact the sides of the basin. Connect the pump assembly to the discharge pipe. Use either a flexible coupling with clamps or a solvent weld PVC or ABS coupling.



**VERTICAL SWITCH INSTALLATION**

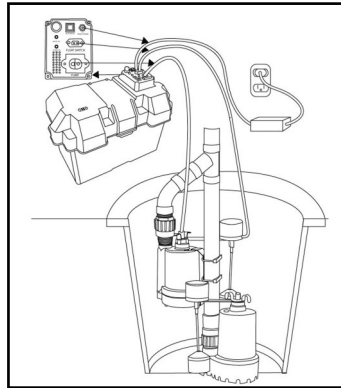
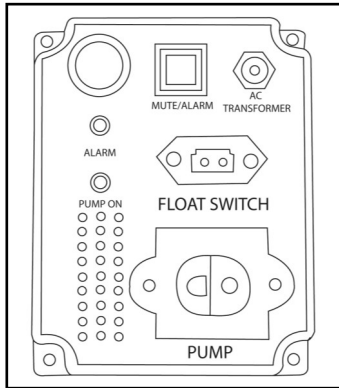
### Vertical Switch Installation

Position the Vertical Float Switch on the discharge pipe so it will turn on when the water level rises above the start level of the primary pump. Make sure the "on" level does not exceed the top of the basin. It is recommended to keep at least a 2" clearance from the top of the basin. You can adjust the "off" level of the vertical float by moving the grommet up or down on the vertical float rod. Once positioned properly, completely tighten the float switch clamp.

**NOTE:** There are many different options for assembling this unit. The instructions above represent one of the most common installations. Your installation may vary. If you have a very shallow basin, mounting the back-up pump above the primary pump may not be feasible. You may also position the pump on bottom of the basin. Make sure the back-up pump is positioned so that it won't interfere with the primary pump operation.

## WIRING & ELECTRICAL CONNECTIONS

1. If necessary, attach the provided battery terminals to the battery. (Many deep cycle marine batteries come with a threaded post terminal built in.)  
NOTE: The provided battery terminals are labeled (+) positive and (-) negative. Make sure the terminals are connected to the proper terminal on the battery. Place the battery in the battery box.
2. Connect the battery lead wires from the control panel to the corresponding terminals on the battery. Connect the red (+) positive lead to the positive battery terminal and tighten the wing nut. Connect the black (-) negative lead to the negative battery terminal and tighten the wing nut. Secure the battery box cover to the lower case.
3. Next connect the pump power cord, the float switch and the AC adapter to the corresponding terminals on the control panel. Make sure they are fully seated in the terminals.
4. Plug the AC adapter into the wall outlet and turn the power back on.
5. If your battery is fully charged you will notice a green light on the AC adapter. If the battery is not fully charged a red light will indicate that the battery is charging. Once fully charged, the light will change to green.



6. Once all connections are made, press the "MUTE/ALARM" button on the control panel until the "ALARM" light illuminates. This indicates that the alarm will sound once the pump is activated. To mute the alarm, press the "MUTE/ALARM" button on the control panel until the "ALARM" light turns off.
7. Test the float switch and pump by lifting and holding the float. The alarm will sound and the "PUMP ON" light on the control panel will illuminate. The pump should start after lifting the float. If it does not run, check your connections and retry.

## TESTING YOUR INSTALLATION

1. Once your installation and wiring connections are complete, unplug or disconnect the power to the primary pump.
2. Fill the basin using buckets or a hose. Observe the float switches to make sure they are positioned properly when the basin is filling. Fill the basin until the backup float activates the alarm.
3. Make any necessary adjustments to the float(s) and/or pumps at this time.

## OPERATION

1. When the power fails or when there is a problem with the primary pump, the back-up pump will automatically start. The back-up pump will operate for many hours intermittently. During prolonged periods of power outage the pump may stop pumping when the battery voltage drops below 10 volts. When this happens the alarm will sound signaling that the voltage is too low to operate the pump.
2. This unit is equipped with a 2 amp charger. It will charge a discharged battery at a rate of 2 Ah (Amp hours). Once the battery reaches a full charge, the charger will gradually reduce the charge rate. It will also maintain a charged battery by periodically checking the voltage of the battery.
3. The charger is equipped with over charge protection. It will not let the battery become over charged.