Installation and Operating Instructions -

Bubble-Up®

Radon Removal System

Fig. 1 - Bubble-Up Unit

The Bubble-Up® unit from R.E. Prescott Co., Inc. is designed to remove radon gas and other contaminating gases from water used for drinking and other purposes. Radon is a radioactive gas which can cause serious health problems. Inside the unit, air is injected into the incoming water and allowed to bubble upward. This bubbling action releases the radon from the water. Air containing the radon is then collected and vented above the roof of the building. Tests show the Bubble-Up unit can remove in excess of 99% of the radon in the incoming water.

Specifications

Dimensions:	Depth	30”
	Width	25”
	Height	60” overall
	Weight	125 lb
Plumbing connections:	1” fnpt water inlet and outlet with built-in bypass valve 2” fnpt air inlet with nipple for directly mounting the Bubble-Up blower 2” female pvc socket weld air outlet	
Electrical:	Dedicated 20A circuit, duplex outlet, 115V AC #12 AWG wiring	
Pump:	1/2 HP high pressure (70 p.s.i.) submersible pump 12 A maximum (running) @ 115V	
Blower:	4.5A, 115V AC	
Solenoid valves:	High flow 1/2” fnpt, CV = 2.0, 115V coil	
Pump control:	Protects the pump from running dry, integral check valve, operates the pump from a 1 gallon tank, 115V AC	
Efficiency, radon removal:	In excess of 99% of radon removed at 7 gpm	

Controls and Indicators

Bypass valve

This valve can be used to divert the water flow if a problem develops with the Bubble-Up unit. This valve has a red handle, and is located near the back of the unit. See Fig. 5. The valve has two positions:

- Service - This is the normal operating position. When the valve is set to this position, the unit can remove radon from the incoming water.
- Bypass - When the valve is set to this position, the incoming water “bypasses” the Bubble-Up unit. Use this position only if there is a problem with the unit.

Caution

When the bypass valve is set to the Bypass position, the Bubble-Up unit cannot provide any protection against radon in the water.

Indicators on pump controller -

The pump controller has four indicators:

- Reset (button) - Use this button if the controller reports an alarm condition (red indicator). See the section on "Troubleshooting." Once the problem has been corrected, press the Reset button to resume normal operation.
- Power (green) - When this indicator is lighted, it shows that the pump controller is receiving power. It should be on when the unit is operating normally.
- Pump (yellow) - This indicator shows that the pump itself is receiving power.
- Alarm (red) - This indicator shows that the pump has tried to operate without water in the tank. There could be several possible causes for this. See the section on "Troubleshooting."

Operating Instructions

Once the unit has been installed, it should operate with very little attention.

Normal Operation -

The unit should not need any operator attention.

Bypassing the Unit -

If a problem develops, the Bubble-Up unit can be taken out of the water supply system. The rest of the water system will operate normally, but the Bubble-Up unit will not be able to provide any protection against radon in the water.

Caution

Do not continue to operate the water supply system this way for a long time. Correct the problem with the Bubble-Up unit and return it to service as quickly as possible.

Installation

1. Set the main tank of the Bubble-Up unit in the desired location. Choose a flat, level surface with ample set-up space.
2. In case of a malfunction, the unit could overflow. (The overflow pipe is mounted near the rear of the unit. See Fig. 2.) Take this into account when positioning the unit. It is best if the unit can be positioned near a sump pit with a sump pump.

Caution

Normally, the output from the pump is at a pressure of 70 p.s.i. This should not create a problem in an installation where the existing plumbing is in good shape. However, in an installation where corrosion has damaged the existing plumbing, the output from the pump may produce a stress on the plumbing and cause leaks. In this kind of situation, a pressure regulator should be installed on the outlet side of the unit.

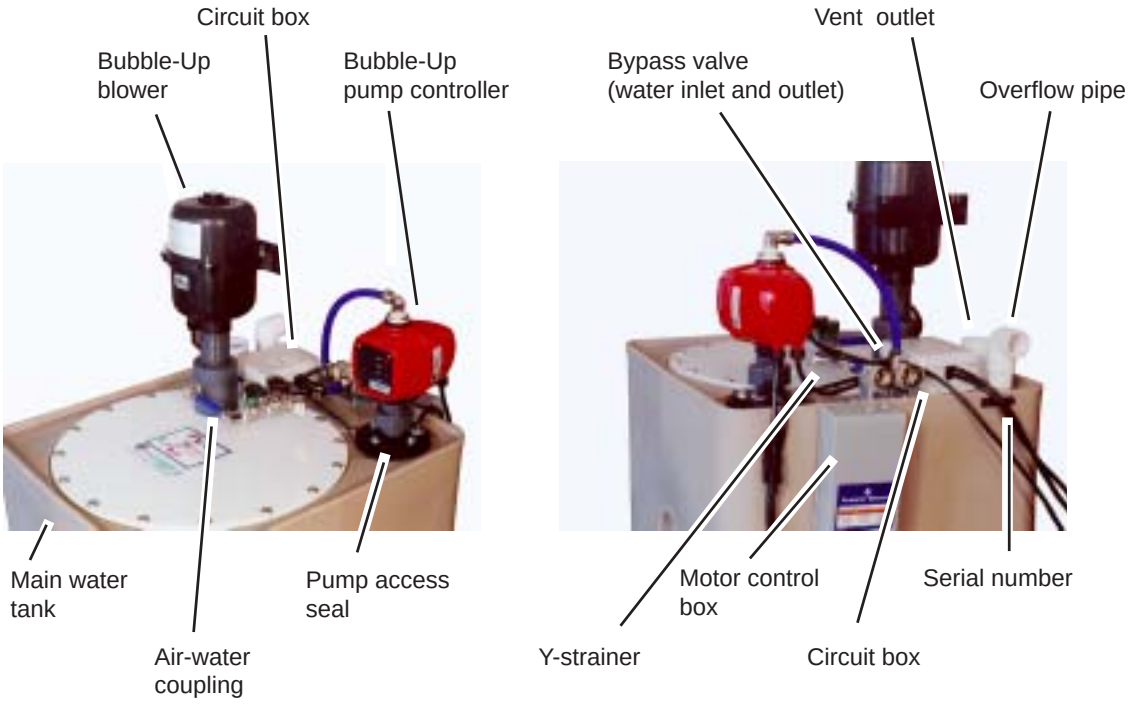

Fig. 2
Installation Points

3. The unit requires a duplex outlet wired with a dedicated 20A circuit. This circuit should use #12 AWG wiring, and should have ground-fault protection (GFCI).

4. Install the one-gallon drawdown tank on the outlet side of the unit. See Fig. 9. This tank is included to prevent the pump from starting and stopping quickly ("short cycling") when there are short-term demands for small amounts of water.

5. There should also be a prefilter on the inlet side. This will protect the inlet strainer (Y-strainer) inside the unit. See Fig. 2. The prefilter should be a sediment-type filter with a 50 micron rating. Do not use a carbon-type filter. (The inlet strainer has a mesh of 80 microns, and can plug quickly if it is not protected by a prefilter.)

6. Assemble the bypass valve. The assembly includes a 1" stainless steel bypass valve and coupling kit, two O-rings, a flange assembly, and retainers. See the instructions supplied with the valve. (An optional vertical inlet coupling is available so that the unit may be positioned close to a wall. See Fig. 9.)

7. The bypass valve is included so that the unit can be taken out of service easily without interrupting the water supply. Plumb the inlet line and outlet line so that the water can continue to the load if the bypass valve is set to the Bypass position.

8. Loops of flexible hose are recommended for the inlet and outlet lines to reduce any harmonic sound transmitted to the rest of the piping. Each loop should be about 4' long.

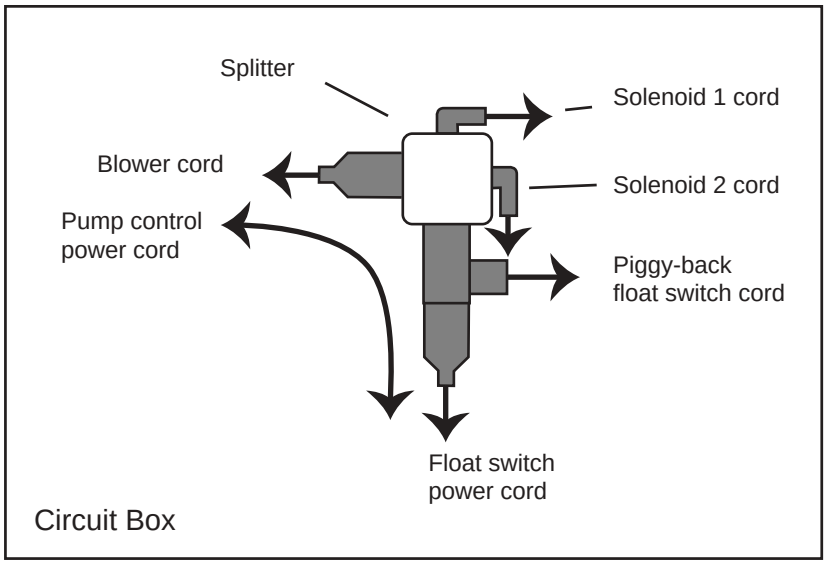

Fig. 3
Wiring Connections

9. Pour one ounce of bleach into the blower attachment nipple to disinfect the unit. See Fig. 4.

10 Firmly slip the blower onto the blower attachment nipple. See Fig. 4.

Caution

Do not use PVC pipe welder on this connection.

11. Open the white circuit box on top of the unit. See Fig. 2. (To open the top of the box, push down on each screw with a screwdriver, and then twist 1/4 turn CCW.) The power cord for the pump passes through the box, without making any other connections. The second cord provides power for the blower and solenoids. Connect the following cords as shown in Fig. 3.

    - Cord to blower
    - Cords to both solenoids
    - Cords to/from float switch

    Route the cords out of the openings in the sides of the box, then close the cover. Push in each of the locking screws and turn 1/4 turn CW to lock the cover.

12. If used, the motor control box is designed to hang over the lip on the rear of the unit.

13. Run the vent line outdoors using 2" PVC piping. Try to make this line as short and direct as possible. Make all of the pipe connections using PVC pipe welder.

Caution

Do not install a vent outlet line which is longer than 50', and includes more than five elbows. This can create excessive backpressure and interfere with the operation of the unit. On longer runs, use larger pipe and/or two 45 deg. elbows to replace each 90 deg. elbow. Call the factory for details on specific applications.

Since the Bubble-Up unit removes radon in the water, the unit must be vented carefully. Common practice is to run the vent up past the roof line of the building. An elevated vent opening provides the best way of dissipating the radon gas. The vent opening should extend 2' above the highest opening in the building, and be at least 10' away from the nearest opening. Protect the vent opening with a "critter guard" or vent cap. For detailed instructions, refer to the mitigation protocols issued by the National Environmental Health Association (http//www.neha.org).

Caution

Do not install the vent opening at a location where the vent gasses could be blown back into an occupied space.

Start Up Procedure

1. Set the red handle on the bypass valve to the Service position (turn 90 deg. CW).
2. Before plugging in the unit, identify the two plug-in cords. One cord goes directly to the pump, and the other powers the blower and solenoids. See Fig. 3.
3. Plug in the cord for the blower and solenoids first. The blower should start, and the solenoid valves should open to begin filling the tank.

Caution

Do not plug in the cord for the pump until the tank is filled. This will prevent the pump from running while dry.

4. As the water level in the tank rises, the float switch will tilt up. This will stop the blower and close the solenoid valves.
5. Once the tank is full, prime the pump. (Normally you will only have to do this once, when the unit is first installed.) The pump is suspended by a pipe underneath the pump control. Unscrew the union and move the pump control off to the side. You may need to siphon the water up this pipe to remove the air from the pump and prime it.
6. Once the air has been removed from the pump, replace the pump control and tighten the union. Plug in the pump. If the Alarm light on the pump control lights, this means that the pump is still not primed. Repeat the priming sequence.
7. After the unit is operating, run a radon test to ensure that the unit is reducing radon levels in the water.
8. Clean the inlet strainer. See the instructions which follow.
9. Perform the six-month maintenance procedure, and fill up the Start-Up Data page at the end of this manual.

Maintenance

Every six months:

- Check the operation of the float, pump control, solenoid valves, and the blower. Turn on a water tap and allow it to run. At first, the water will be supplied by the 1 gallon drawdown tank, then the pump should turn on. A few minutes later, you should hear the blower start and the solenoid valves should open. (The unit cannot remove radon unless the blower is working.)
- Shut off the water tap. The tank in the Bubble-Up unit should fill in less than three minutes. (If it takes longer for the tank to fill, the inlet strainer may be clogged. See the inlet strainer cleaning procedure listed below.)
- Check the outlet of the vent line to ensure that it is not blocked.
- Disinfect the unit as needed. (Pour one ounce of bleach into the blower attachment nipple.)

Every year:

We recommend that you have your Bubble-Up unit checked once a year by a qualified installer. The yearly checkup may include these steps:

- Replace the cartridge in the prefilter
- Clean the inlet strainer as described below.
- The procedure for cleaning the tank is described below.
- Run a radon test to ensure that the unit is actually removing radon from the water.
- Disinfect the unit as needed. (Pour one ounce of bleach into the blower attachment nipple.)

Cleaning the inlet strainer

The inlet strainer on this unit is a small wire-mesh cylinder installed in a Y-shaped pipe fitting. See Fig. 6.

1. To clean the strainer, set the red handle on the bypass valve to the Bypass position (turn 90 deg. CCW), and unplug the pump.
2. Unscrew the cap and remove the strainer element. Clean the inside of the element using a tooth-brush and water.

Caution

Do not use any kind of solvent when cleaning the filter.

3. Replace the strainer element, tighten the cap, and plug in the pump.
4. Set the handle on the bypass valve to the Service position (turn 90 deg. CW), and unplug the pump.

Note

If the inlet strainer is clogged, this is probably because the unit does not have a prefilter, or because the element in the prefilter is damaged. Check the element in the prefilter, and replace it if necessary.

Cleaning the tank

1. Unplug both power cords to the unit. Set the bypass valve to the Bypass position (turn 90 deg. CCW).
2. Remove the blower and set it to one side.
3. Undo the water inlet line at the point where it meets the air-water coupling below the blower. See Fig. 2.
4. Undo the 16 screws around the large circular top cover. Carefully remove the cover, with the attached internal tank. Now you can clean the inside of the tank.
5. Pump or siphon the water out of the tank.
6. Vacuum out any remaining water with a wet/dry vacuum.
7. Wash down the inside of the tank. This may require some scrubbing. If a layer of minerals has collected at the bottom of the tank, remove this layer. If the mineral layer includes a rusty material, you may have to use a reducing chemical to dissolve and neutralize the rust.
8. As a final step, sanitize the inside of the tank using a dilute solution of chlorine bleach. Rinse, then vacuum out any remaining water.
9. Re-install the circular top cover with the internal tank and diverter assembly.
10. Reconnect the water supply line to the air-water coupling below the blower.
11. Disinfect the unit. (Pour one ounce of bleach into the blower attachment nipple.)
12. Install the blower. Firmly slip the blower onto the blower attachment nipple. See Fig. 4.
13. Set the bypass valve to the Service position (turn 90 deg. CW).
14. Restart the unit. Follow the instructions in the “Start Up Procedure.”

Troubleshooting

Alarm light on pump control	If the unit tries to pump for 15 seconds without water, this will trigger an alarm condition. This may be caused by a clogged prefilter or inlet strainer. See Fig. 6 and Fig. 9. See the cleaning procedure for the inlet strainer in the section on "Maintenance." Once the problem has been corrected, press the Reset button on the pump control. When the unit is first installed, or has been drained for cleaning, the pump will not be able to pump water if it needs to be primed. See the section on "Start Up Procedure." The pump motor has internal thermal protection which will operate if the pump motor is overloaded for some reason. This can happen if the impeller in the pump is jammed by foreign matter. The overload device will reset automatically once the motor has cooled. If this happens, call a service technician.
Slow filling	If the unit requires more than three minutes to fill, this may be caused by a clogged prefilter or inlet strainer. See Fig. 6 and Fig. 9. See the cleaning procedure for the inlet strainer in the section on "Maintenance."
"Short cycling"	The unit may "short-cycle" in response to demands for water of short duration. The installation should include a one gallon draw-down tank on the outlet line. This drawdown tank is included to smooth out the demand sensed by the pump controller, and prevent "short cycling." This can cause the pump to wear out prematurely.
Unit overflows	This could happen if the solenoid valves are jammed by foreign matter in the water. This may indicate a problem with the prefilter or inlet strainer. Shut off the water supply at the bypass valve, unplug the pump, and disassemble the solenoid valves. Blow each valve clear using compressed air, then reassemble the valves. Also check each of the filters, and clean them or replace the elements if necessary. Disinfect the unit as needed. (Pour one ounce of bleach into the blower attachment nipple.) Overflowing could also occur if the float switch is damaged or jammed. Remove the top of the unit as described in the section on "Cleaning the Tank." Check the float switch and replace it if necessary.

Replacement Parts

The following photos list the replacement parts on the unit. Here are some points to keep in mind when replacing parts:

- Before removing any parts, shut off the water inlet to the unit. Set the handle on the bypass valve to the Bypass position.
- Always unplug both of the power cords before working with the unit.
- Notice that, inside each end of each section of the blue water tubing there is a stainless steel insert and a plastic ferrule. This is an important part of the connection. You may need to replace this ferrule when you replace one of these connections.

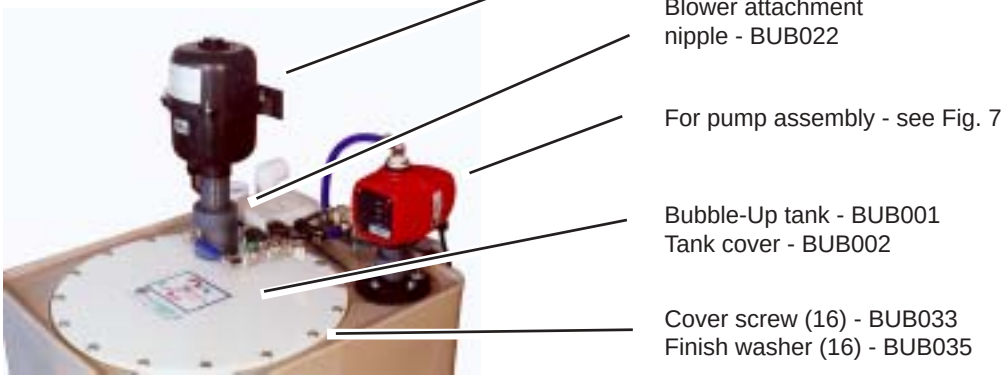

Fig. 4
Front View

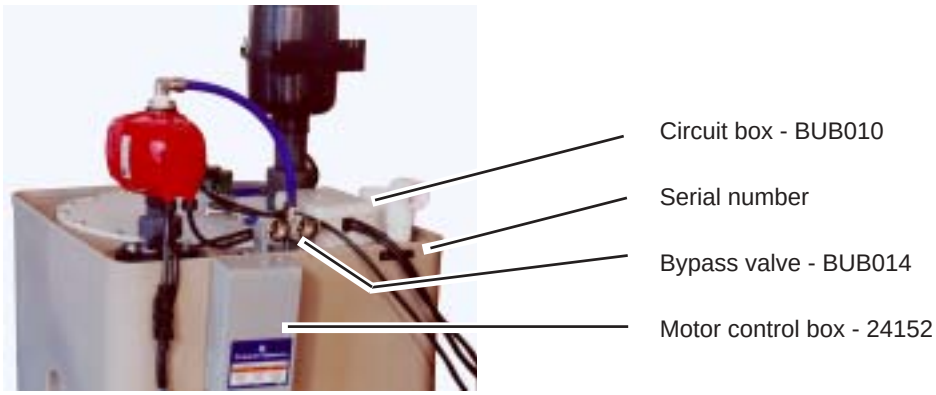

Fig. 5
Rear View

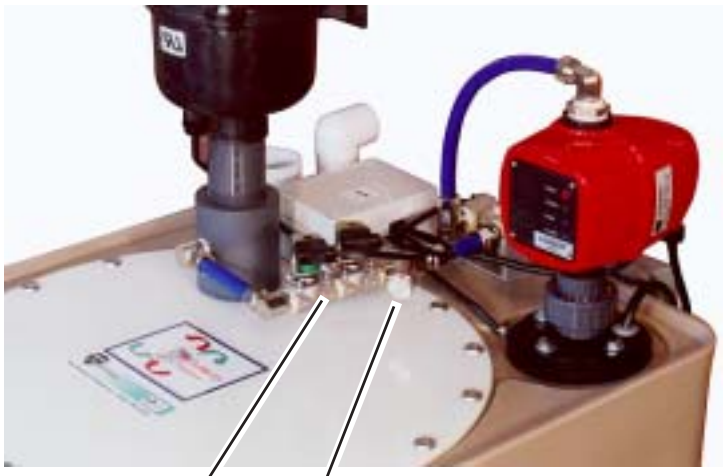

Fig. 6
Pipe Fittings

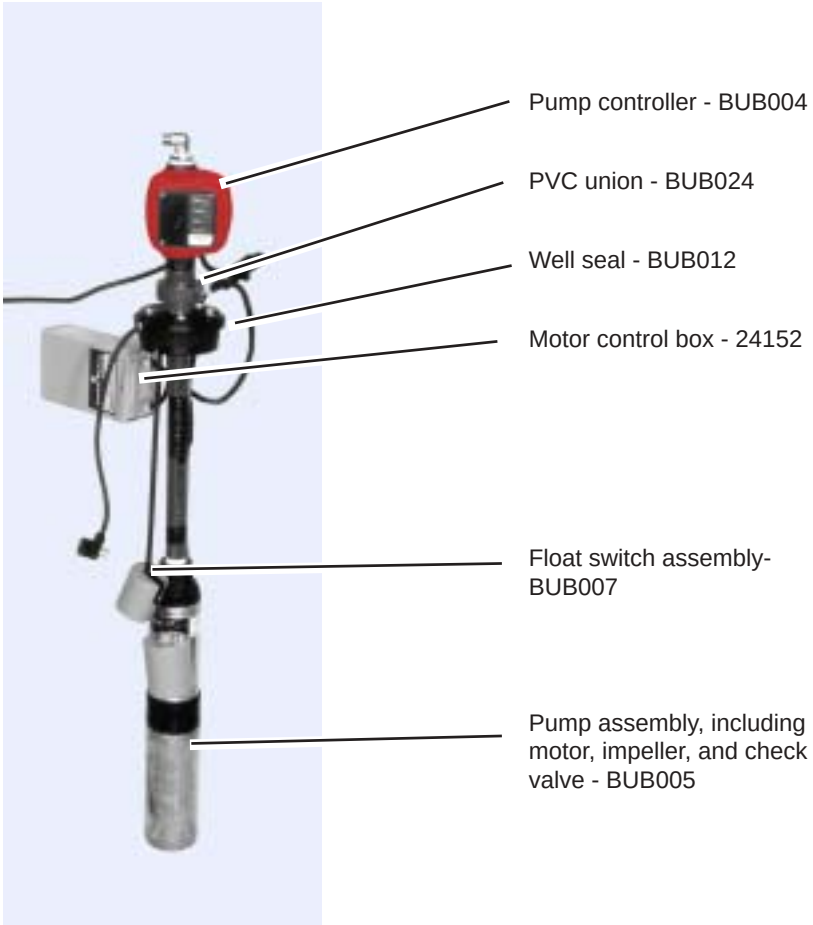

Fig. 7
Pump Assembly

Blower attachment nipple - BUB022
Air-water coupling - BUB009
Aerator spray nozzle - BUB017

Bubbling container assembly - BUB100

Fig. 8
Bubbling Container

Pre-filter, paper element (optional) - 83310

Vertical inlet for bypass valve (optional) - BUB015v

Drawdown tank, 1 gallon - 41510

Fig. 9
Accessories

3/4” flex hose, 3’ (optional) - 51400
1” flex hose, 3’ (optional) - 51410

Fig. 10
Flex Hose

Parts Listing

Item#	Description	Quantity	Unit
BUB001	Bubble-Up tank	1	each
BUB002	Bubble-Up tank cover	1	each
BUB003	Liner tank 9” x 35”	1	each
BUB004	Pump controller	1	each
BUB005	Pump 1/2 HP 115V	1	each
BUB006	1/4" x 1/8" hole grid	2	each
BUB007	Float switch assembly	1	each
BUB008	Bubble-Up blower	1	each
BUB009	PVC manifold - air-water coupling	1	each
BUB010	Circuit box	1	each
BUB011	6” supply cord 16/3	1	each
BUB012	Well seal size 5”	1	each
BUB013	4” aluminum channel	1	each
BUB014	1" bypass valve, stainless	1	each
BUB015	Coupling kit	1	each
BUB015v	Elbow/vertical coupling kit (optional)	1	each
BUB016	Plated yoke	1	each
BUB017	Aerator (Venturi spray nozzle)	1	each
BUB018	Solenoid valve, 1/2”	2	each
BUB019	Strainer, 1/2”	1	each
BUB020	18" solenoid cord	2	each
BUB021	3/16" x 1.25” x 30” foam gasket	0.10	each
BUB022	2" x 8" SCD 80 TXT nipple	1	each
BUB023	1” x 18” SCD 80 tube, pump suspension pipe	1	each
BUB024	1" SCD 80 union	1	each
BUB025	1.25” SCD 40 SXT 90 elbow	1	each
BUB026	1.25" x 1” SCD 80 R-bush	1	each
BUB027	1.25” x 41.5" PVC S40 pipe	1	each
BUB028	2" x 35" PVC S40 pipe	1	each
BUB029	1” x 3/4" brass bushing	1	each
BUB030	1/2” x CL brass nipple	2	each
BUB031	1/4" x 6" SCD 80 nipple	0.25	each
BUB032	#12 x 1.25” Phil. pan	2	each
BUB033	#12 x 1.25" Phil. flat hd	16	each
BUB034	#12 x 3" Phil. flat hd	1	each
BUB035	#14 finishing washer	16	each
BUB036	2" Adaptaflex	1	each
BUB037	1.25” Adaptaflex	1	each
BUB038	#60PT 5/8” Delrin sleeve	6	each
BUB039	#68 5/8” x 3/4” with stop, straight	1	each
BUB040	#68 5/8” x 1/2" with stop, straight	1	each
BUB041	#69 5/8” x 3/4" w/stop EL	1	each
BUB042	#69 5/8” x 1/2” w/stop EL	2	each
BUB043	3 way power plug 1482V	1	each
BUB044	Spring action plug end	1	each
BUB045	1/2” SS INS Aquaplex	6	each
BUB046	1/2" x 20' PEX tubing	0.10	each
BUB047	Cardboard box	1	each
BUB048	2" SS hook and bolt zinc steel	1	each
BUB050	1/2" no-stress connector	2	each
BUB100	Bubbling container assembly	1	each
MBUB02	Electric splitter decal	1	each
MBUB03	Bubble-Up logo sticker	1	each
MBUB05	Packaging strap	1	each
MBUB06	Installation instructions	1	each
MBUB07	Bubble-Up literature	1	each
24152	Motor control box	1	each
41510	Drawdown tank (optional)	1	each
51400	3/4” hose, 3’ (optional)	1	each
51410	1” hose, 3’ (optional)	1	each
83310	Pre-filter (optional)	1	each

Start-Up Data

For service call: _____

Installer: _____

Address: _____

_____

_____

Bubble-Up Jr. serial number: _____

Start-Up Notes:

Time to fill: _____

Radon in: _____

Radon out: _____

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