Rev. August 2020

Cambridge™ Water Radon Remover

Installation and Operating Instructions

U.S. Patent # 6,372,024

Installation and Service By:

The Cambridge™ from R.E. Prescott Co., Inc. is designed to remove radon gas from water. Radon is a radioactive gas which can cause serious health problems. Inside the unit, air is blown 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 out.

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Manufactured by:

R.E Prescott Co., Inc.

10 Railroad Avenue • Exeter, New Hampshire • 03833

Phone: (603) 772-4321 • Fax: (603) 772-1089

REPRESCOTT.COM

1. Specifications

Dimensions:
Top Diameter: 27”
Tank Height: 38.5”
Overall Height: 55”
Maximum water depth: 26” (off float switch level)
Refill water depth: 19” (on float switch level)
Run dry water depth: 5”

Water Capacity:
On/Off Cycle Volume: 12 Gallons
Usable water at maximum water depth of 26”: 35 Gallons
Usable water at refill water depth of 19”: 23 Gallons

Approximate Weight:
125 lb. empty
472 lb. filled to maximum water depth of 26”
690 lb. filled to depth of 38”

Influent Water Requirements:

Hardness	< 68 mg/l (4 GPG)
Iron	< 0.30 mg/l
Manganese	< 0.05 mg/l

Plumbing Connections:
1” male NPT water inlet and outlet bypass valve
2” FNPT air inlet with nipple for directly mounting blower
2” Fernco air outlet
1.25” FNPT overflow connection

Electrical:
Dedicated 20A circuit, duplex outlet, 115V AC #12 AWG wiring

Pump:
1/2 HP high pressure (70-75 psi) submersible pump
10.6A maximum (running) @ 115V

Blower:
6.5A, 115V AC

Solenoid Valve:
1 - 1/2” FNPT, CV = 2.0, 115V coil for 7 gpm model
1 - High Flow 1/2” FNPT, CV = 4.8, 115V coil for 14 gpm model

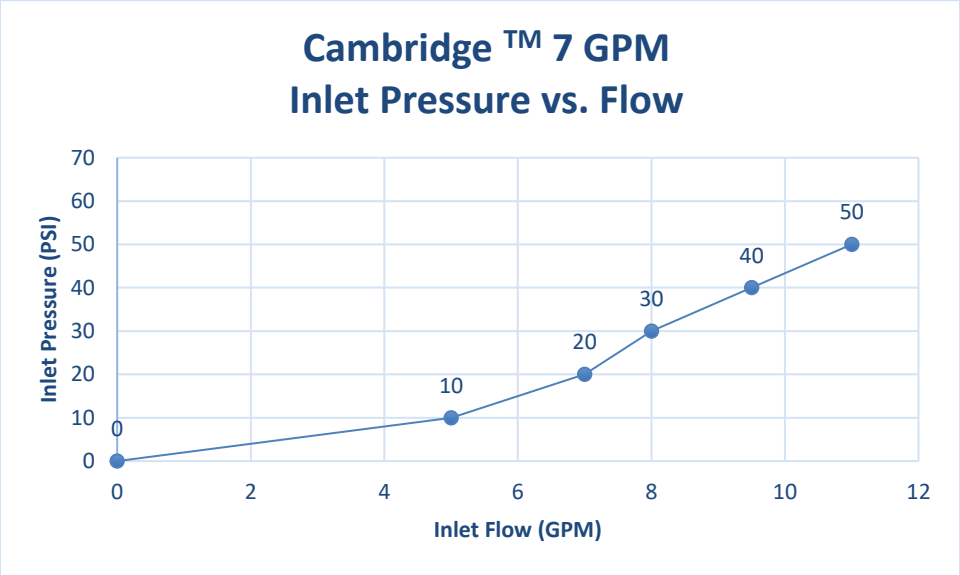
Pump Controller:
Electronic Pump Control with a low water cut out, protects the pump from running dry, integral check valve, and operates the pump from a 2.1 gallon tank, 115V AC

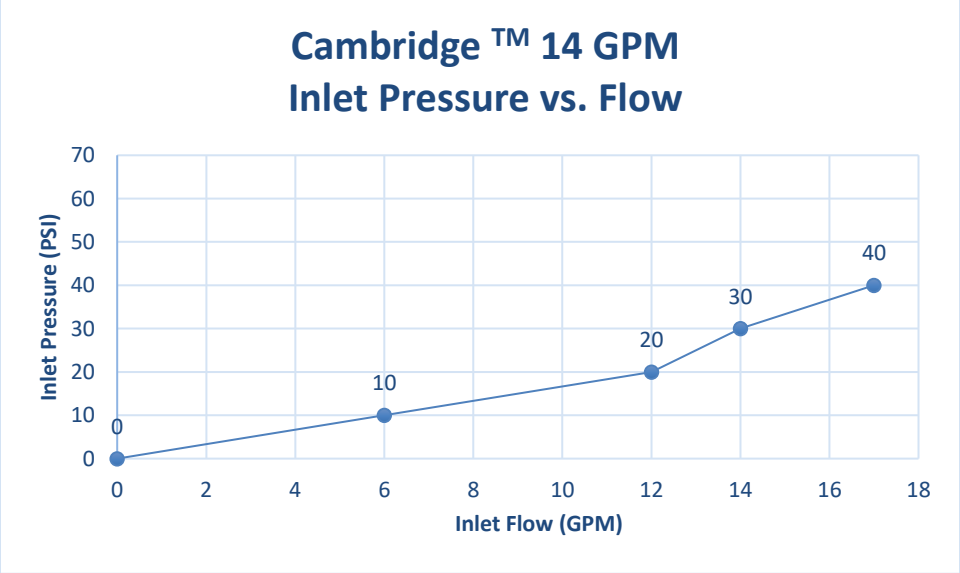
2. Flow Efficiency and Pressure Information

a. Radon Removal Efficiency

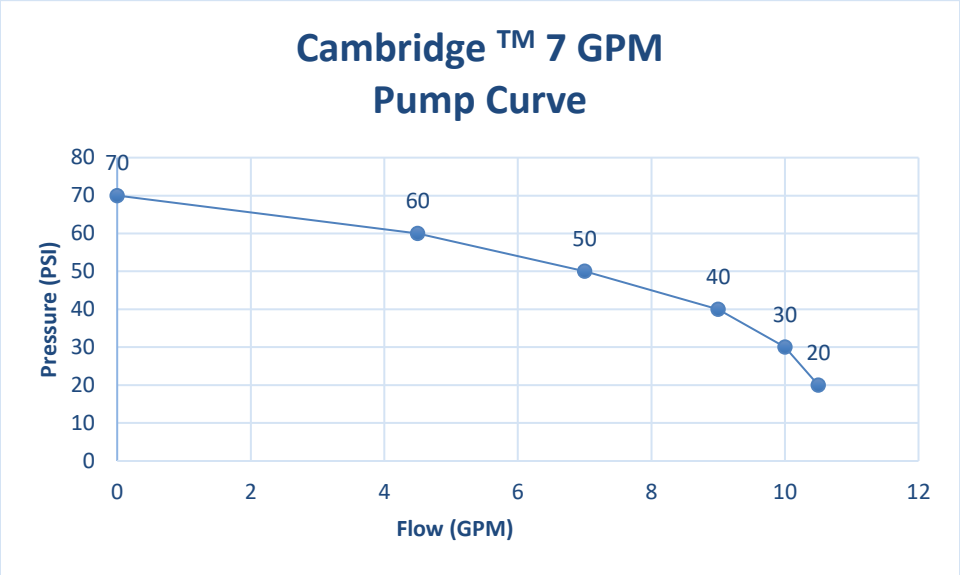
MODEL	GPM	EFFICIENCY
☐ Cambridge™ 7 GPM ½" Solenoid	7	99%
☐ Cambridge™ 14 GPM ½" High Flow Solenoid	14	98%
☐ Custom		

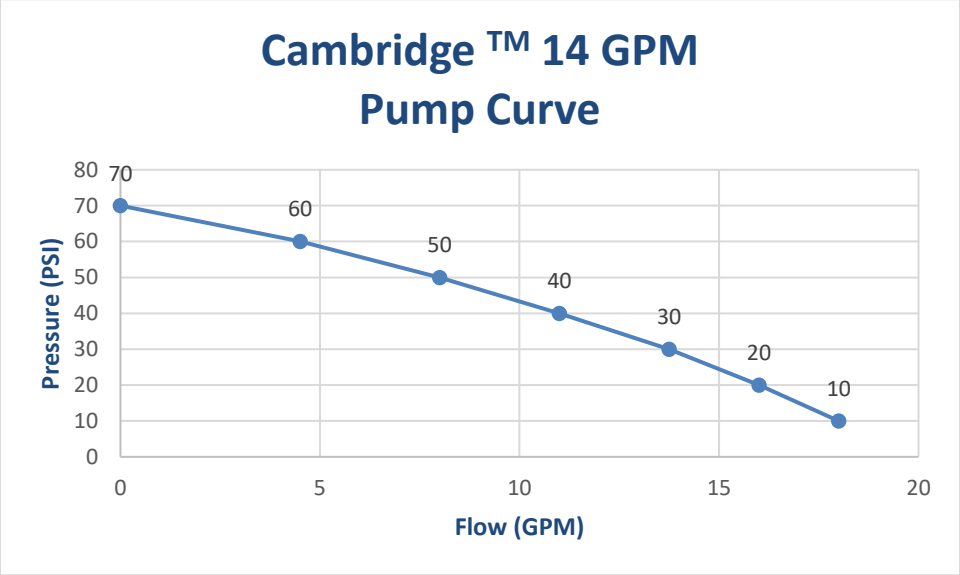
b. Inlet Flow and Pressure Estimate Charts





c. Outlet Pump Pressure Estimate Chart





3. Controls and Indicators

a. Bypass Valve Operation

The bypass valve is typically used to isolate the control valve from the plumbing system's water pressure in order to perform control valve repairs or maintenance.

The bypass consists of two interchangeable plug valves that are operated independently by red arrow-shaped handles. The handles identify the flow direction of the water. The bypass valve operates in four positions.

1. Normal Operation Position: The inlet and outlet handles point in the direction of flow indicated by the engraved arrows on the control valve. Water flows through the control valve during normal operation and this position also allows the control valve to isolate the media bed during the regeneration cycle. (See Bypass Valve Figure 1 on next page)

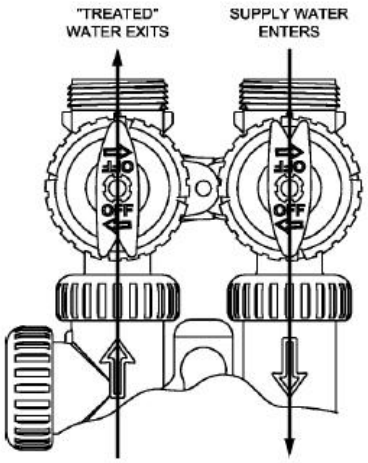
2. Bypass Position: The inlet and outlet handles point to the center of the bypass, the control valve is isolated from the water pressure contained in the plumbing system. Untreated water is supplied to the plumbing system. (See Bypass Valve Figure 2)
3. Diagnostic Position: The inlet handle points in the direction of flow and the outlet handle points to the center of bypass valve, system water pressure is allowed to the control valve and the plumbing system while not allowing water to exit from the control valve to the plumbing. (See Bypass Valve Figure 3)
4. Shut Off Position: The inlet handle points to the center of the bypass valve and the outlet handle points in the direction of flow. Water is available on the outlet side of the unit from the pump in the unit. (See Bypass Valve Operation Figure 4)

Caution! When the bypass valves are not set to normal operation, the Cambridge™ unit cannot provide any protection against radon in the water.

BYPASS VALVE OPERATION

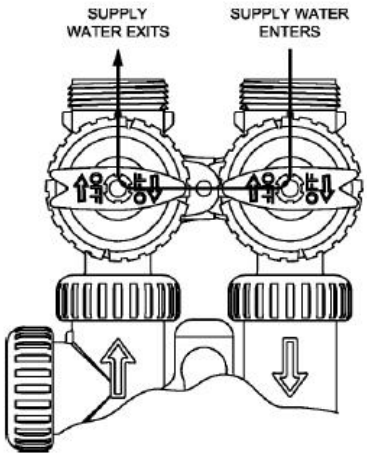
Bypass Valve Figure 1

NORMAL OPERATION



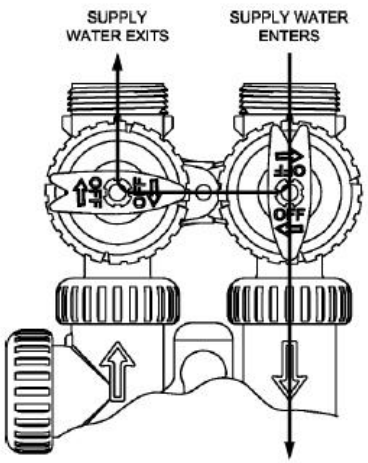
Bypass Valve Figure 2

BYPASS OPERATION



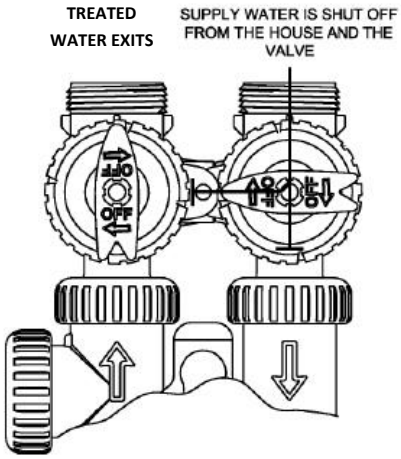
Bypass Valve Figure 3

DIAGNOSTIC MODE



Bypass Valve Figure 4

SHUT OFF MODE



b. Pump Control

For instructions regarding the electronic pump control, refer to Appendix A.

c. Water Leak Protection (Water Alarm) (Figure 1)

The water alarm control and water alarm valve are designed to identify leaking problems and stop the incoming water. It is designed to monitor radon vent obstruction, high water and fitting leaks. It does this by incorporating a water sensor in the control to signal the water alarm control to close the water alarm valve.

Important Feature: Under normal conditions, the control will flash 3 lights every 10 seconds

Users Guide:

- The control will beep if there is a vent pipe obstruction or leak detected, and at the same time a signal will be sent to the valve. This signal will cause the valve to close and cut off the water supply immediately.
- To reset the valve to its original open position, press the open button on the control.
- When the battery is low, the control will beep for 8 hours and then close the valve. If this occurs, replace the 2-AA batteries and press the open button.

Figure 1 – Water Alarm Valve Control

4. Installation

1. Be sure the fill float switch is not tangled around the pump by removing the pump and visually inspecting the float. Be sure the fill float switch is free to float up and down.
2. The Cambridge™ comes with a standard 2.1 gallon water expansion tank. Plumb this expansion tank near the water outlet of the Cambridge™.

Note: This expansion tank can be used for a certain amount of water heater thermal expansion. If you have a tank type water heater, check manufacturer's requirements for sizing a thermal expansion tank.

Radon Testing Note: It is important to install a new sample valve or boiler drain in new piping so that the radon testing is not influenced by old piping.

3. Set the main tank of the Cambridge™ in the desired location that can hold the weight of the Cambridge™ shown in the Specification Section on page 3. Choose a flat, level surface with ample set-up space.
4. In case of a malfunction, the unit could overflow. The Cambridge™ is fitted with an overflow pipe. (The overflow pipe is mounted near the rear of the unit. See Figure 2) Take this into account when positioning the unit. It is best if the unit can be positioned near a drain or sump pit with a sump pump.

Important note about overflow: For added protection against overflow, use the overflow connection.

Caution! Normally, the output from the pump is at a pressure of 70 PSI. This should not create a problem in an installation where the existing plumbing is in good condition. However, in an installation where the existing plumbing cannot withstand the operating pressure of the Cambridge™, 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 and drawdown tank.

5. The Cambridge™ requires a duplex outlet wired to a dedicated 20A circuit. This circuit should use #12 AWG wiring, follow electrical codes.
6. Install the 2.1 gallon water expansion tank on the outlet side of the unit (See Figure 5). 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.
7. Install a pre-filter (sold separately) on the inlet side to protect the solenoid from sediment clogging (See Figure 5). The pre-filter should be a sediment-type filter with a 5 micron rating. ***Do not use a carbon-type filter!***
8. Attach the red handled bypass valve.
9. 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 well can continue to supply water if the bypass valve is set to the bypass position.
10. Pour one ounce of bleach into the blower attachment nipple to disinfect the unit. See Figure 2 for location of the blower attachment nipple.
11. Firmly slip the blower onto the blower attachment nipple and tighten clamp to secure blower to nipple.

Caution! Do not use PVC pipe cement on this connection.

Note: If drawing air from an outdoor source is desired, make sure that no moisture can get into the blower motor. A dryer vent kit can be modified by removing the flap check and replacing it with a screen. Be sure to install the kit as directed and run the hose down to the floor in the area of the Cambridge™.

12. Connect the following cords. Refer to figure 4.
    - Plug blower cord into cord splitter.
    - Plug solenoid cord into cord splitter.
    - Plug the fill piggy-back float switch cord into the yellow float switch cord
    - Plug the cord splitter into fill piggy-back float switch cord
13. To start to fill, plug the yellow float switch cord and water alarm valve power cord into the dedicated GFCI 20 amp duplex outlet.

Important note: Do not plug in pump control cord until the Cambridge™ tank is filled to normal operating water depth.

14. 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 air tight using proper PVC pipe cement.

Important note about vent line piping: Use ¼" per foot pitched down towards the Cambridge™.

***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. Call the factory for details on specific applications. If this is done, the blower unit of the Cambridge™ can create pressure within the main tank. This can cause water from the main tank to be forced up through the overflow pipe and spill onto the water sensor, thus activating the water alarm valve and shutting down the unit. This can also occur if the vent outlet line is plugged.

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

Important information about venting: Since the Cambridge™ 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. Protocols recommend extending the vent opening 2' above the highest opening in the building, and at least 10' away from the nearest opening. It is recommended to protect the vent opening with a vent screen. A single free hard (printed) copy of the ASTM E-2121 standard (Recommended Residential Radon Mitigation Standard of Practice) is available from EPA's National Service Center for Environmental Publications (NSCEP). You can order a copy by phone at 1-800-490-9198, via E-mail nscep@bps-lmit.com, or via the internet at www.epa.gov/nscep/ordering.htm Please use the EPA document number (402-K-03-007) when ordering E-2121. EPA reprints E-2121 under agreement with ASTM International.

15. Plumb the electronic pump control and plug the pump cord into the female pump control cord (See figure 4).
16. Check all plumbing fittings to be sure all fittings are water tight.
17. Be sure the water alarm valve control is wired to the power supply, motorized ball valve, and floor water sensor.
18. Install 9V battery backup into water alarm control.

5. Start Up Procedure

1. Set the red handles on the bypass valve to the Service position.
2. Plug the water alarm valve control power cord into the non-GFCI outlet.
3. Plug the yellow cord into the GFCI outlet. The blower should start, and the solenoid valve should open to begin filling the tank.
4. As the water level in the tank rises, the fill float switch will tilt up. This will stop the blower and close the solenoid valve. The tank is now full.
5. Once the tank is full, plug the black pump control cord into the outlet to start the pump.
6. If the pump does not start delivering water to the house, it may be necessary to 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 or vacuum the water up this pipe to remove the air from the pump to prime it.
7. Once the air has been removed from the pump, replace the pump control and tighten the union. Plug in the pump. If the pump does not start delivering water to the house, repeat the priming sequence.
8. After the unit is operating, run a radon test of the raw water and the treated water to ensure that the unit is reducing radon levels in the water.

Radon Testing Note: It is important to install a new sample valve or boiler drain in new piping so that the radon testing is not influenced by old piping.

9. Perform the six-month maintenance procedure, and fill out the Start-Up Data page at the end of this manual.

6. Operating Instructions

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

Normal Operation

Main Unit
The unit should not need any operator attention. When water is used in the house, the 2.1 gallon water expansion tank delivers water demand. When the pressure drops to the set pressure, the electronic pump control starts the Cambridge™ pump to deliver water to the home and refill the 2.1 gallon water expansion tank. When the electronic pump control senses normal household pressure, the pump control shuts the Cambridge™ pump off. As the water level falls in the Cambridge™ main tank, the float switch powers the blower and solenoid to fill the Cambridge™ tank with treated water.

Low Water Cut-Out Protection
The electronic pump control will automatically stop the pump when there is low water in the Cambridge™ tank. The pump will automatically try to restart for 30 minutes. If water is not replenished during this time, manually pressing reset is required to restart the pump.

Water Alarm
The water alarm control and valve is in place for protection against low battery, leaking or overflowing and will not operate unless one of these things happens. Once the water alarm control senses a problem in the system, the water alarm control activates the water alarm valve and shuts off the incoming water. The water alarm control will also sound an alarm to identify that there is a problem.

Bypassing the Unit
If a problem develops, the Cambridge™ unit can be taken out of the water supply system with the bypass valve. The rest of the water system will operate normally, but the Cambridge™ 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 and return the Cambridge™ to service as quickly as possible.

7. Maintenance

Every six months:

- Check the operation of the fill float, pump control, solenoid valve, and the blower by turning on a water tap and allowing it to run. At first, the water will be supplied by the 2.1 gallon water expansion tank, and then the pump should turn on. A few minutes later, you should hear the blower start and the solenoid valve should open. (The unit cannot remove radon unless the blower is working.)
- Shut off the water tap. The tank in the Cambridge™ unit should fill in less than two minutes.
- Check the outlet of the vent line to ensure that it is not blocked.
- Check that the water alarm valve is operating correctly by crossing the sensor leads under the water alarm control. This should activate the water alarm valve and shut off all incoming water. Press the open button on the front of the water alarm control to return the water alarm valve to its open position.
- Disinfect the unit as needed. (Pour one ounce of bleach into the blower attachment nipple.)

Every year:
We recommend that you have your Cambridge™ unit checked once a year by a qualified installer. The yearly checkup may include these steps:

- Run raw water and filtered water radon tests.
- Replace the cartridge in the pre-filter and disinfect.
- Clean the main Cambridge™ tank as described below.
- Disinfect the unit as needed. (Pour one ounce of bleach into the pre-filter cartridge housing.)
- Clean and rebuild solenoid valve. ½" 7 GPM Repair Kit PN: BUB019D or ½" High Flow Repair Kit PN: BUB019F
- Check the operation of the float switch.
- Replace the 2- AA batteries in the water alarm control.

Every five years:

- Replace fill float switch.

Cleaning the Tank:

1. Unplug the yellow power cord, leave the pump controller plugged in.
2. Run a water faucet until main storage tank is empty.
3. Unplug the pump controller.
4. Set the bypass valve to the Bypass position.
5. Remove the blower and set it to one side.
6. Run a 3/8" OD tube down the center of the air-water coupler about 3 feet and vacuum or siphon out the water in the bubbling chamber.
7. Unplug the pump controller from the cord splitter.
8. Remove the pump controller piping from the bypass valve.
9. Unscrew the 3 thumb bolts and remove the cover, with the attached internal pump. Now you can clean the inside of the tank.
10. Pump or siphon the water out of the tank.
11. Vacuum out any remaining water with a wet/dry vacuum.
12. Wash down the inside of the tank and the exterior of the bubbling chamber. 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.
13. As a final step, sanitize the inside of the tank using a dilute solution of chlorine bleach. Rinse, then vacuum out any remaining water.
14. Re-install pump and cover. Check the gasket to make sure it is properly sealed. Replace the gasket if necessary. Screw in the 3 thumb bolts.
15. Reconnect the water piping to the bypass valve.
16. Disinfect the unit. (Pour one ounce of bleach into the blower attachment nipple.)
17. Install the blower. Firmly slip the blower onto the blower attachment nipple and tighten the clamp.
18. Set the bypass valve to the Service position.
19. Restart the unit. Follow the instructions in the "Startup Procedure".
20. Check all seals to ensure they are air or water tight.

8. Troubleshooting

Low-Water Pump Cut-out
If the Cambridge™ main tank has no water, the pump controller will turn off the pump to protect it from running dry. The pump will automatically try to restart if the water level returns to normal. If the water alarm valve or solenoid is stuck closed, incoming water will not be allowed to enter the Cambridge™ main tank. This will cause the tank to empty and the

controller will turn off the pump to protect it from running dry. If the well pump fails there will be no water entering the main tank of the Cambridge™. This will also cause the controller to turn off the pump to protect it from running dry.

No Water from the Cambridge™ (no alarm is sounding)
Cause: Low water caused the controller to shut off the pump.

This situation can be caused by using more water out of the Cambridge™ than what is coming in. A few inlet flow problems are: low yield well, well pump failure, clogged plumbing or water filtration restricting water flow filling the Cambridge™.

No water from the Cambridge™ (alarm is sounding)
Cause: The Water Alarm Valve shut water off to the Cambridge™.

The Cambridge™ includes a water alarm valve which sounds an alarm and stops water filling the Cambridge™ when a leak or overflow condition is detected. Once water stops filling the Cambridge™, continued water use will cause the pump controller to stop the Cambridge™ pump from delivering water flow to the house.

Examples: The alarm conditions to cause the water alarm valve to close and stop water from entering the Cambridge™ are: water sensor detects water on top of the Cambridge™.

These conditions are caused by water detection due to high water levels, water leaks, condensation, etc.

Also, if the air vent piping is restricted the Cambridge™ blower cannot freely blow the air out of the Cambridge™. This will cause blower back pressure which will force water up the overflow pipe to be released through the breather vent, causing the water alarm control to detect an overflow of water. Vent piping back pressure can be caused by an obstruction, ice build-up, water trapped in a reverse pitch, excess pipe fittings or pipe length.

Water Alarm
A few things can cause the water alarm to activate:

- The water alarm control sensor is wet, repair leak and dry off the top of the Cambridge™.
- Vent line is obstructed, forcing the water up the overflow and triggering the water alarm sensor. Clear the obstruction.
- High water is sensed by the water alarm control due to overfilling the main tank of the Cambridge™. This can be caused by a failed or stuck solenoid, tangled float switch assembly, or a failed float switch assembly. Check to see that the solenoid and float switch are working properly and replace if necessary.
- Low battery – replace 2- AA batteries

9. Replacing Parts

- Before removing any parts, shut off the water inlet to the Cambridge™. Set the handles on the bypass valve to the bypass position.
- Always unplug all of the power cords before working on the unit.
- Notice that inside each end 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.

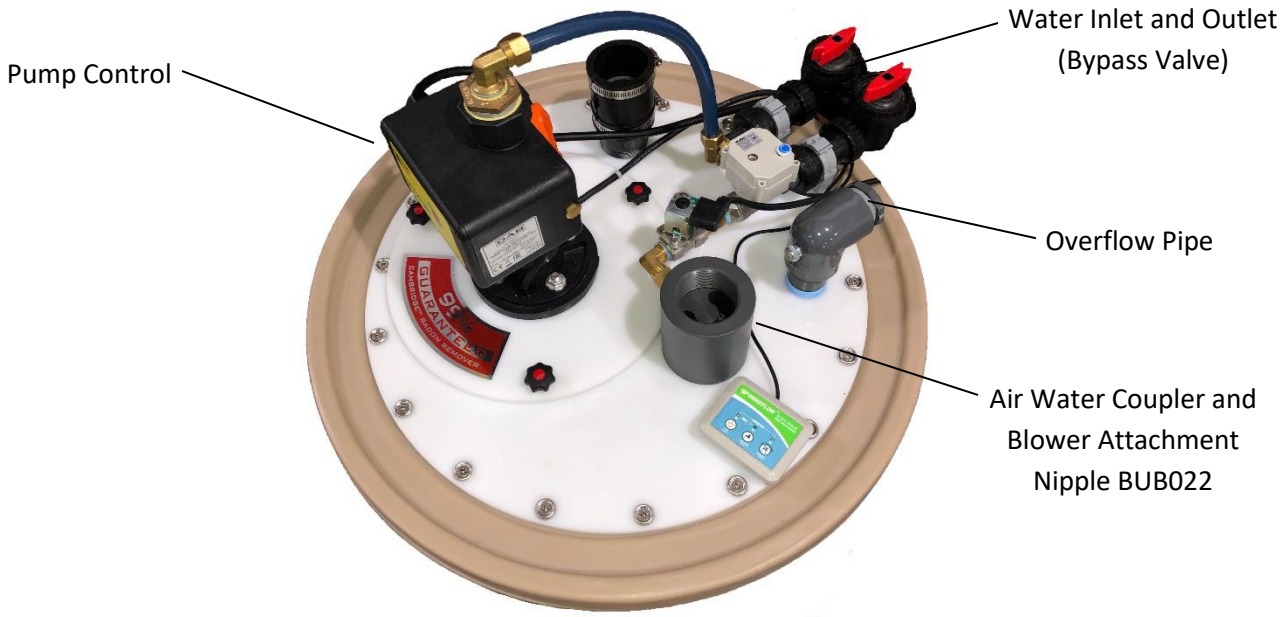


Figure 2 – Installation Points

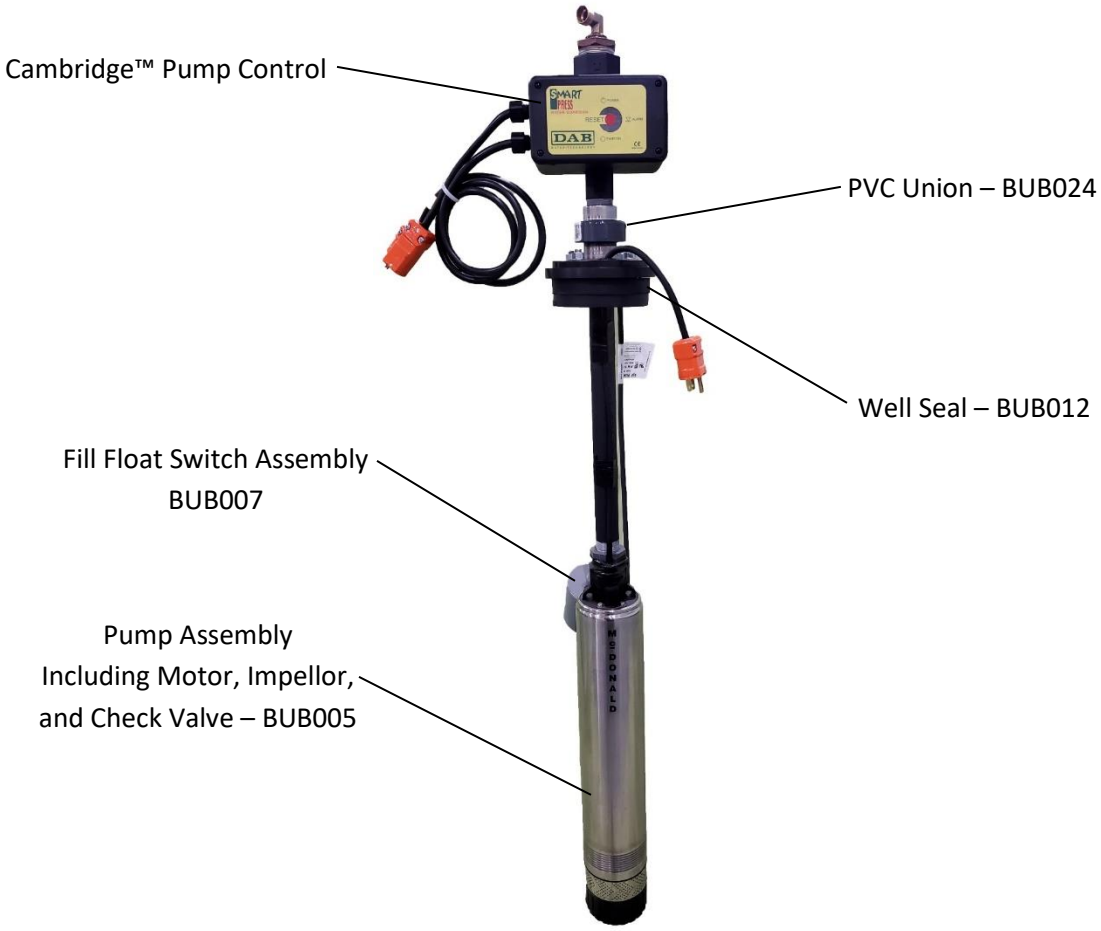


Figure 3 – Pump Assembly with Control

Figure 4 – Power Cords

Pre-filter, Paper Element – 83310 (sold separately)

2.1 Gallon Water Expansion Tank – 41510 (included with purchase)

Figure 5 – Accessories

Start-Up Data

For service, call: _____

Installer: _____

Address: _____

_____

Serial Number: _____

Start-Up Notes

Fill Rate: _____

Radon In: _____

Radon Out: _____

Appendix A:

Cambridge™ Pump Control
DAB Smart Press Water Guardian

Operation:

1. The pump starts when the pressure of the system is less than 45 psi. The pump stops when water is not being used after 5-15 seconds.
2. If the pump runs out of water, the control stops the pump and lights the red LED, without using level probes or float switches.
3. The control automatically tries to start the pump every 30 minutes after low water shut down.
4. Push the reset button to manually restart the pump.
5. Lights indicate the various operation phases:
    a. Green LED on: power on
    b. Yellow LED on: pump running
    c. Red LED on: pump ran out of water and stopped

Operating Conditions:

Model	**Smart Press WG 1.5 HP**
Maximum working pressure	100 psi
Standard starting calibration	45 psi
Maximum liquid temperature	45°C
Power supply	115 V ~ 60 Hz
Maximum current strength	In 10 A Cos ø ≥ 0,7
Protection degree	IP 55

Installation:

WARNING! During installation, as well as during any maintenance operations, the electrical power supply must be disconnected by unplugging the power cord.

A. Normally the Smart Press is mounted directly on the delivery point of a surface pump: the device is connected with a 1" male, however it can be mounted at any point on the delivery piping (even on a submerged pump) in a vertical or horizontal position. Avoid applying check valves to the downstream.
B. The standard model of Smart Press works correctly if the highest point of use doesn't overcome 15 meters high. Change this value using the screw (dowel) on the front side of the Smart Press.
   Turn the screw clockwise to increase the turn on pressure.
   Turn counterclockwise to reduce the turn on pressure.
C. Make sure that the pump primes.

Appendix B:

Cambridge™ Warranty

2020

R.E. Prescott Co., Inc. warrants to the original purchaser of the Cambridge™ radon system that the product is in good working condition, according to its specifications at the time of shipment, for a period of three years from the date of original purchase.

Should the product, in R.E. Prescott Co., Inc.'s opinion, malfunction within the warranty period, R.E. Prescott Co., Inc. will at its discretion repair or replace the Cambridge™ upon receipt with an equivalent unit. Any replaced parts become the property of R.E. Prescott Co., Inc. This warranty does not apply to a Cambridge™ which has been damaged due to accident, misuse, abuse, improper installation, usage not in accordance with product specifications and instructions, natural or personal disaster, or unauthorized alterations, repairs or modifications.

- The warranty applies only to defects in workmanship.
- The warranty makes no claims regarding suitability of the product for a particular use or environment.
- Only products manufactured by R.E. Prescott Co., Inc. are covered by the standard warranty. Third party products used in R.E. Prescott Co., Inc. components will be covered by the third party warranty.
- **A serial number is required for any warranty service**. R.E. Prescott Co., Inc. asks you to record the serial number on the outside of the packaging when shipping the product.
- Proof of purchase may be required, but only if some doubt exists regarding warranty eligibility. Late model products are assumed to be under warranty. R.E. Prescott Co., Inc. accepts originals, photocopies and faxes as proof of purchase when required.
- Unauthorized repairs to an R.E. Prescott Co., Inc. product will void the warranty offered by R.E. Prescott Co. R.E. Prescott Co., Inc. reserves the right to refuse to service any product which has been altered, modified or repaired by non-R.E. Prescott Co., Inc. authorized service personnel.
- After a warranty has expired, R.E. Prescott Co., Inc. charges a flat rate of $75.00 per hour to repair the product. Other circumstances which violate the terms and conditions of the warranty (abuse, misuse, unauthorized repair, etc.) are not eligible for this "out of warranty" arrangement.
- Standard warranty service consists of repair upon receipt. You are responsible for the cost of shipping the product to R.E. Prescott Co., Inc. R.E. Prescott Co., Inc. pays the cost of returning a product to you.
- R.E. Prescott Co., Inc. reserves the right to replace the product with a service product at their sole discretion at any time.

Thank you for choosing REPCO Cambridge™ Radon Removal systems. If you have any further questions please feel free to contact us.