ADJUSTMENT:

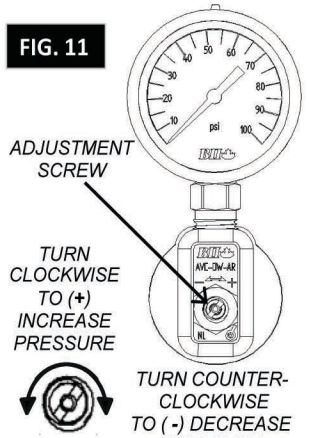
The air release valves are factory set at approximately 25 PSI (+/-10%) a setting that provides satisfactory performance in most installations Adjustment can be made to back pressure to release air anywhere between 0-40 PSI.

In the event that air escapes thru the service lines (air blowing at faucets) after the system is in operation for some time venting back pressure is set too high causing the tank to retain too much air. To decrease venting pressure turn the adjustment screw to the left (counter-clockwise)

In the event that the pump cycles too often the venting back pressure is set too low and should be increased To increase pressure by turning the adjustment screw to the right (clockwise) Caution: Do NOT turn the adjustment screw out of the valve housing , small internal parts could be lost.

NOTE: Make only very fine adjustments, constantly monitoring the gauge pressure while the air is venting, this indicates the back pressure setting SETTING GUIDE - Every 10 degrees will change the back pressure by approx 1.1 PSI (A 1/4 quarter turn (45) will change the setting by approximately 5 PSI Caution: Adjustment of this air release beyond 40 PSI is possible, however it is not recommended!

FIG. 11



MAINTAINENCE:

The AVC-DW-AR control requires little to no maintenance, however in the event that:

- Water leaks thru air release housing (See Fig. 12) it maybe necessary to replace the air release valve. To change the valve the (See Fig. 13) system pressure must be reduced to zero before removing the valve body housing assembly, install the new valve body housing assembly using an approved thread locking compound / sealant tighten firmly, but do not over-tighten.
- The air release system becomes clogged with foreign debris, remove the internal air valve (See Fig. 13) by turn to the left (counter-clockwise) using a tire valve core cap or valve core driver, clean or replace air valve.
- The pressure gauge no longer operates, To clean or replace gauge the system pressure must be reduced to zero before removing the gauge. This condition could be caused by one of two things, either the gauge is defective, in which case simple change out of the gauge will rectify the situation, or there is also a chance that the pressure channel located at the base of the gauge port has become clogged with foreign debris over time, this is more likely in areas with poor water quality and high levels of iron. To clean the air channel use a thin piece of flexible wire or cable to dislodge the debris, (See Fig. 14) if it cannot be dislodged the control must be replaced.

FIG. 12

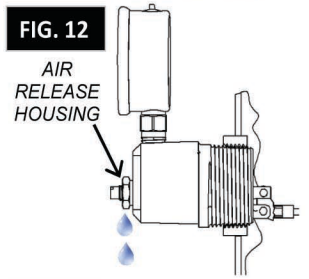


FIG. 13

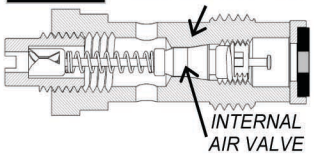
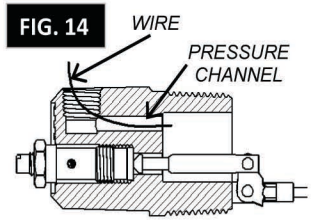
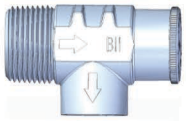


FIG. 14





WARNING: The AVC-DW-AR control is designed as an operating control only! It is the responsibility of the installer to add safety devices such as a pressure relief valve or pressure limit control, along with alarms and or supervisory systems to the

IMPORTANT: Pressure relief valves must ALWAYS be plumbed with a discharge pipe no smaller than the discharge outlet of the valve, it must have an air break and be discharged into a suitable floor drain, sump or other safe location that is capable of handling the volume of water from the system in the event of a blow-off.

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BOSHART INDUSTRIES
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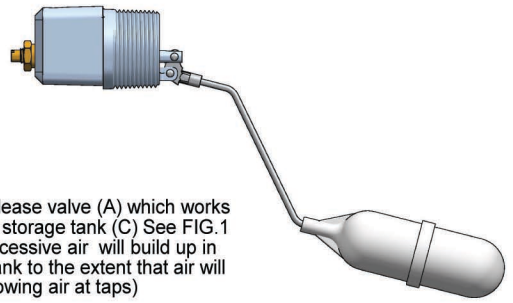
AVC-DW-AR

Deep Well Air Volume Control with Adjustable Air Release Valve

Installation / Operational Manual

APPLICATION:



The AVC-DW-AR unit is designed for deep well water systems, it maintains the proper ratio of air to water in your water storage tank. The air valve opens on falling water level in the tank allowing the excess air to "bleed" when an excess amount of air is being pumped into the system at pressures up to 100 PSI.

The excess air is released through the main air release valve (A) which works in relation to the position of the float (B) inside the storage tank (C) See FIG.1 Without the installation of an air volume control excessive air will build up in the tank continually lowing the water level in the tank to the extent that air will eventually be discharged into the service lines (blowing air at taps)

The "AR" adjustable release feature also referred to as a "Minimum Air Release Valve" (D) allows for adjustment of the back pressure which ensures that the internal tank pressure never drops below the desired pressure setting. This feature is recommended for applications where water may be drawn from the tank rapidly. The air release is factory set at approximately 25 PSI and can be easily field adjusted to the desired setting anywhere between 1 to 40 PSI (setting the back pressure higher than 40 PSI is not recommended.

OPERATION:

AVC-DW-AR Air Volume Control is for use with pumping systems which supply an excess of air to the storage tank.

It maintains the correct ratio of air and water in the tank by automatically bleeding off air through an adjustable pressure relief valve (D) until the water level raises the float (B), thereby closing the main valve port (A) to the minimum air release valve (D) preventing further escape of air. See Figure 2.

Thus the AVC-DW-AR control will vent air only when the water level is below the maximum height of the float and the pressure in the tank is higher than the minimum air release valve (D) setting. By adjusting the setting of the air release valve the ratio of air and water in the tank can be varied to provide optimal pumping system performance.

FIG. 1

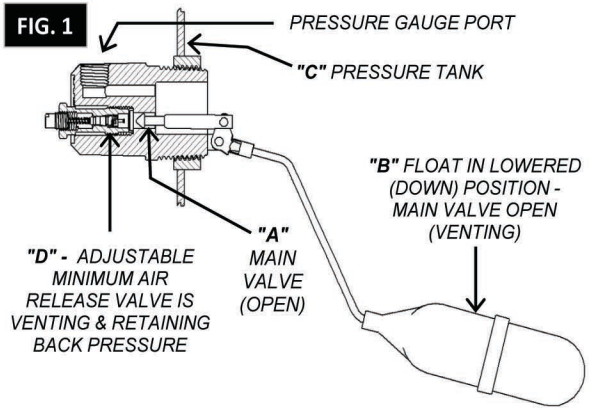
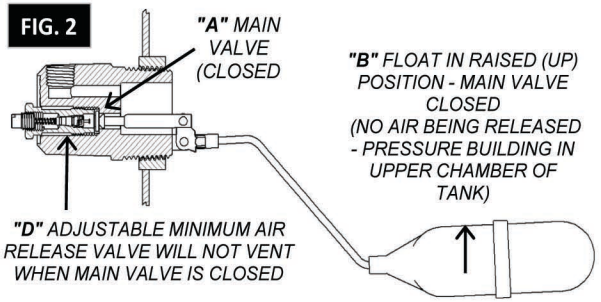


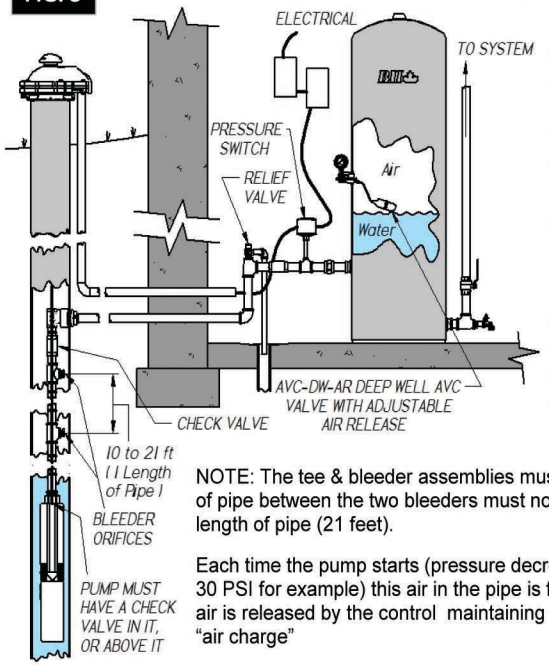
FIG. 2



VERY IMPORTANT !

The installation of this control **requires that the system be designed with an air charging system** (a means to acquire air) which can be pumped (injected) into the tank with each pump cycle. There are two basic system designs both utilize bleeder orifices. (See Figures 3 & 4)

FIG. 3 **#1 - Preferred "Two Bleeder Valve Air Charge System" - Works regardless of well location.**



This set up will work efficiently in all installations regardless of distance between the tank and the well.

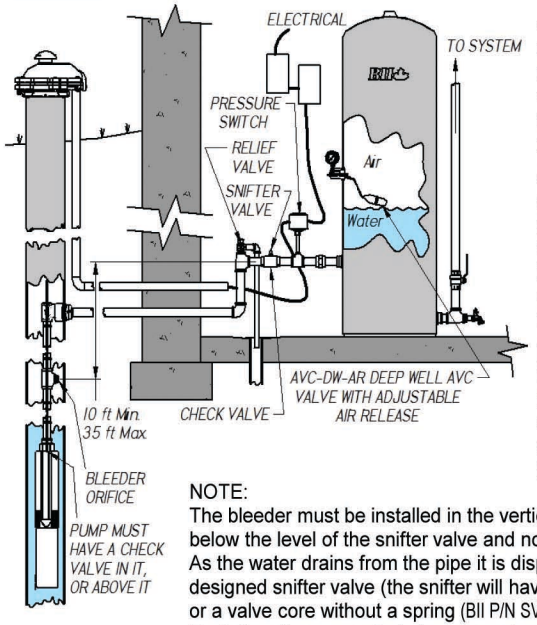
The check valve (either built into submersible pump discharge) or installed just above the submersible pump prevents the return flow of water back thru the pump when the pump stops, the check valve installed at or near to the surface just above the upper bleeder valve prevents the back flow of water from the tank.

Each time the pump stops (pressure increases to the cut-out setting of the pressure switch - 50 PSI for example) the water drains back into the well thru the lower bleeder orifice, filling the section of pipe with air drawing in thru the top bleeder orifice just below the pitless adapter. (BII P/N BOB-3 or BOR-10)

NOTE: The tee & bleeder assemblies must be installed in the vertical drop pipe, the length of pipe between the two bleeders must not be less than 10 feet and usually not more than 1 length of pipe (21 feet).

Each time the pump starts (pressure decreases to the cut-In setting of the pressure switch - 30 PSI for example) this air in the pipe is forced (injected) in the pressure tank. The excess air is released by the control maintaining the perfect air / water ratio resulting in the perfect "air charge"

FIG. 4 **#2 - Alternate "Snifter Valve & Bleeder Air Charge System" - Tank Close to Well!**



This set up will work efficiently in installations where the distance between the tank and the well is minimal. Draining of long runs of piping will result in excessive amounts of air being injected, which then needs to be released from the system with each pump cycle. Note: Longer distances will not cause the system to fail.

As in system #1 the check valve either built into submersible pump discharge or installed just above the submersible pump check valve prevents the return flow of water back thru the pump when the pump stops, the check valve installed at the surface (often right at the pressure tank prevents the back flow of water from the tank to the pump.

Each time the pump stops (pressure increases to the cut-out setting of the pressure switch - 50 PSI for example) the water can drain back filling the section of pipe with air which is drawn in thru the snifter valve, and drains thru the bleeder orifice into the well.

NOTE:
The bleeder must be installed in the vertical drop pipe, it must not be less than 10 feet below the level of the snifter valve and not more than 35 feet below the snifter valve
As the water drains from the pipe it is displaced by air which is drawn in thru the specially designed snifter valve (the snifter will have either a 3PSI max. soft core spring (BII P/N SV-0) or a valve core without a spring (BII P/N SV0-NCS) until the section of pipe is filled with air. Each time the pump starts (pressure decreases to the cut-In setting of the pressure switch - 30 PSI for example) this air in the pipe is forced (injected) in the pressure tank. The excess air is released by the control maintaining the perfect air / water ratio resulting in the perfect "air charge"

CAUTION: Avoid - air charging systems that require the removal of the check valve from the submersible pump, and the use of a In-Line check valve approx. 10 ft. above the static water level. Pump / Motor damage resulting from the removal of the check valve could void the pump warranty.

Install the AVC-DW-AR unit in the tank as follows:

Apply either B.I.I.'s "Gray Magic" thread sealing compound or a high quality P.T.F.E. thread sealing tape to the 1 ¼" NPT thread on the control (if using P.T.F.E. thread sealing tape, overlap the tape half its width to make two layers and continue to the large end of thread) See Fig. 5

Inspect the thread on the pressure tank in which the air control is to be installed See Fig. 6 to ensure the threads are clean and free of burrs, zinc or galvanized plating or paint. If any dirt or defect is found clean the thread with a 1-1/4" NPT pipe tap (if not available thread can sometimes be repaired by threading in 1/4" NPT iron pipe plug). Failure to have a clean quality thread can result in damage to the air control thread and result in a leaky connection.

Tighten by hand, screw the control clockwise into the 1 ¼" NPT port that is approx.. 1/2 to 2/3 of the way up the tank, the tank must be a minimum inside diameter of 9 inches to allow the float to operate (See Fig. 6) then using an open end or crescent (adjustable) wrench that fits the flat sides of the control body, tighten an additional 1 to 1-1/2" turns. (See Fig. 7)

IMPORTANT: Make sure the ¼"-18 port for gauge at "A" is facing up, at top center (See Fig. 7) Caution: Do not over tighten! If the control is getting snug as the gauge port nears the top center position do not attempt to obtain an additional full thread rotation, over tightening may cause damage to the control and or the tank connection.

Install a pressure gauge (or a ¼" NPT pipe plug, if there is already a pressure gauge on the system nearby) in the port (See fig. 7) Wrap the ¼" NPT gauge thread with PTFE tape as detailed in step #1, then screw the gauge clockwise into the ¼" NPT port on the control

IMPORTANT: Make sure the gauge is facing outwards (See Fig. 8) Caution: Do not over tighten – five ft-lb torque is sufficient to seal the threads ! If the gauge is getting snug as the gauge face nears the outward facing position do not attempt to obtain an additional full thread rotation, over tightening may cause damage to the gauge and or the control connection. NEVER use the gauge port to connect the pressure switch controlling the pump. It should only be used for a gauge as there is a risk of the opening becoming clogged with iron / scale build up overtime depending on water quality.

Start-Up. On the initial start up, the tank is empty (or full of air at atmospheric pressure), therefore the float is in the down (dropped) position, and holding the air valve in the open position. As water enters the tank you may hear the air hissing out thru the air release port (See Fig. 9) this will continue until the water level raises the float and closes the release port. The internal tank pressure will not build up on the gauge beyond the adjustable air release valve setting, until the main air valve closes (See Fig. 2) and the water level continues to rise compressing the air in the upper chamber of the pressure tank. The volume of air stabilizes after several cycles.

Monitor - Test & evaluate the controls operation by running the pump through several cycles and check that air is being vented. Also check all connections for leaks by applying a solution of soap and water around the control / tank connection and the control / pressure gauge connection (See Fig. 10) In the event that water leaks, it may be necessary to re-do the connection applying addition layers of PTFE thread sealing tape.

FIG. 5

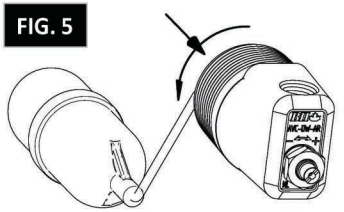


FIG. 6

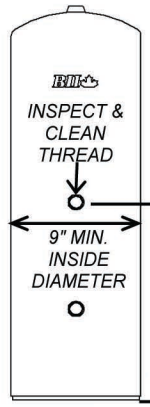


FIG. 7

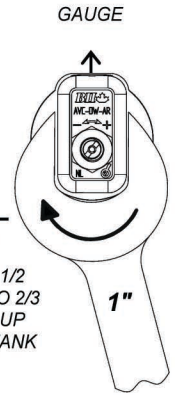


FIG. 8

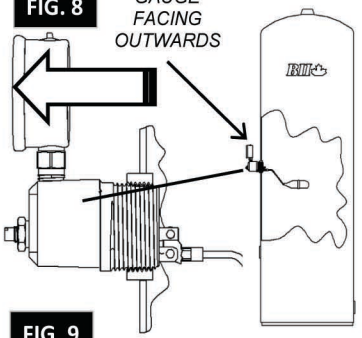


FIG. 9

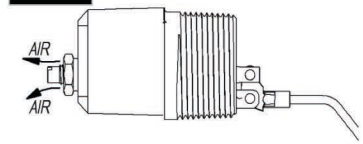


FIG. 10