

Characteristics of Water Systems Used in Agriculture and Landscaping:

- High frequency changes in flow characteristics.
- Water treatment in the field (filtration).
- Chemicals and fertilizers are injected into the irrigation system.
- Often necessary to use fragile and often complex equipment and instrumentation.
- Large differences in the characteristics and materials used in pipes, connectors and accessories.

Installation at Pumps

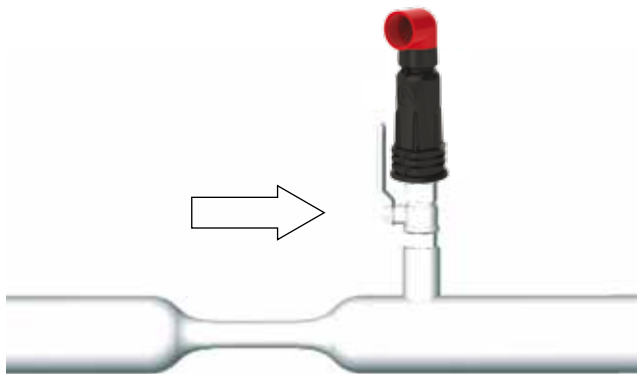
It is recommended to install a DG-70 dynamic air valve directly after the pump and before the pump's check valve. Water pumped from an independent supply such as a well, stream or reservoir requires the intake of air into the pump and suction pipes. This air will continue to disperse in the system during pump operation.

Mode of Operation: When the pump begins operating, large volumes of air are discharged through the air & vacuum orifice of the air valve. The water flow raises the float, closes the orifice and opens the check valve. When the pump is shut down or ceases to operate for any other reason, air, admitted through the air & vacuum orifice, acts as a vacuum breaker. It protects the pump, connectors, accessories and seals from damage caused by sub-atmospheric (negative) pressure.

The small automatic air release orifice continues to release air while the pump is working and the line is pressurized. At its location before the check valve, it protects the sealing face of the check valve from cavitation damage caused by the presence of small air bubbles in the water.

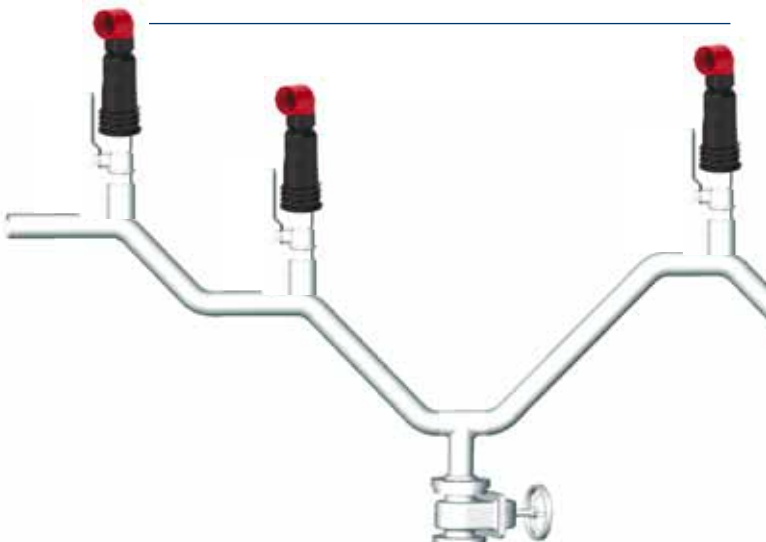
It is recommended to install a SG-10 air valve on the pump to provide pump protection.

It is recommended to install a DG-70 air valve after the pump check valve when the pipeline, upstream of this point, remains level or drops below ground level. This air valve will allow for the intake of air (at water column separation) when the pump is shut down and the check valve closes. It also will discharge air when the water column returns.



Installation in Locations with Changing Pressures

It is recommended to install a 1" DG-10 air valve in areas with fluctuating pressure – pressure regulation valves, pressure release valves and at changes in pipe diameter. These are the areas where air pockets form and might migrate into the line. As the pipe is filled, these areas can become problematic if not provided with an adequate air release system. If pressure fluctuations are not too extreme, the SG-10 air valve will be sufficient when installed downstream and close to these sensitive areas (close to an accessory or disturbance).



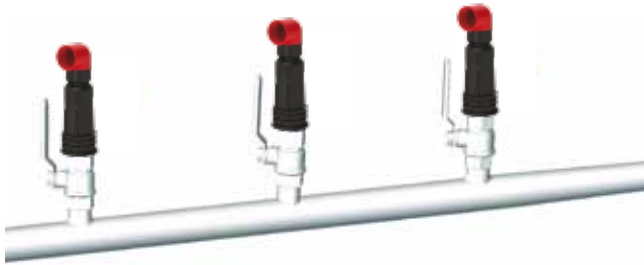
Installation at the Highest Points in a Line

It is recommended to install a DG-10 air valve at all the highest points in each line where flow velocities drop below the critical velocity for air movement (See: Graphs section below).

The air & vacuum component, installed at line high-points, discharges air as the line is filled and admits air during line drainage, regardless of whether the process is controlled or not (pipe burst or collapse).

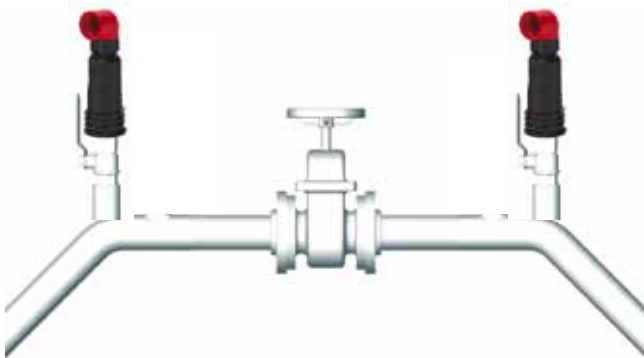
The automatic air release component releases air accumulating at high points when the line is pressurized during regular operations.

Where the topography is relatively flat, the line has shallow slopes and the high points are relatively close, then the SG-10 automatic air release valve can replace the DG-10 valves at some of the high points.



Installation on Long Lines

On long lines, it is recommended to install DG-10 or SG-10 valves every 500 meters to 800 meters. It is also recommended to install DG-10 valves on both sides of long sections of horizontal pipe.



Installation Close to a Main Line Valve

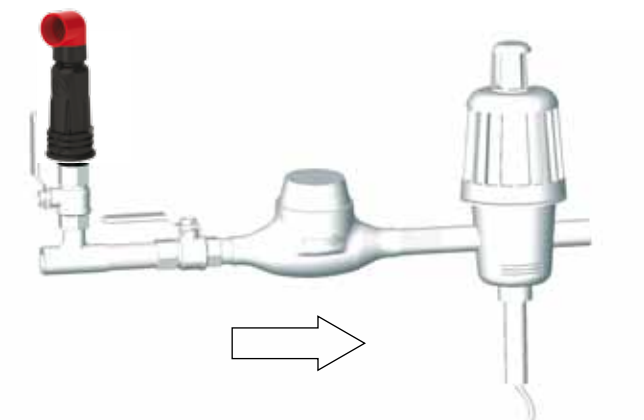
When the line is pressurized and an isolating valve is closed, it is recommended to install an air valve before the isolating valve in order to release air. Installation of the air valve will protect the valve plate against cavitation damage caused by small air bubbles. During line fill, if a valve at the end of the line is closed, slowing down the filling process, it is recommended to install an air valve before the isolating valve on lines with large diameters and high flow rates.

The installation of a DG-10 air valve after an isolating valve will also protect the line from negative pressure (vacuum) conditions caused when the valve is closed suddenly and assist in controlling the filling process when the isolating valve is open.



Installation Where a Line Crosses Under a Road or Ditch

It is recommended to install a DG-10 air valve wherever a large diameter pipe, with sharp upward or downward angle changes, crosses under a road or ditch. When the crossing point is wide and/or deep, install the air valves at the uppermost point of the angle change on both sides of the road. If the crossing point is short and shallow, it is sometimes possible to install one DG-10 valve on the uppermost point of angle change on the downstream side of the crossing point.

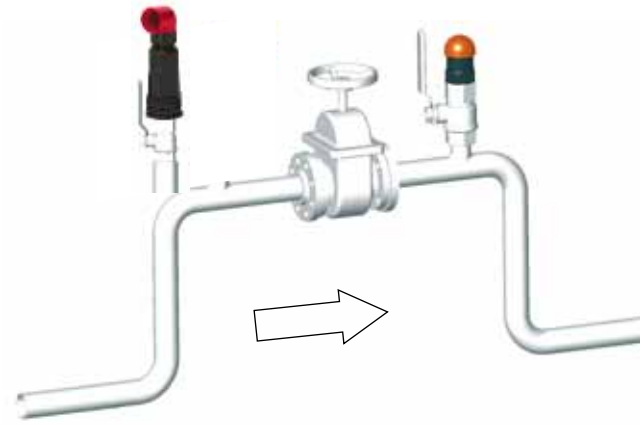


Installation Before Water Meters and Automatic Regulators

It is recommended to install a DG-10 air valve on the upstream side of a flow meter and automatic flow regulator. Given that the water flow regulator is a special type of isolating valve, it is recommended to also install another DG-10 air valve on the downstream side after the regulator.

Air can flow at velocities up to 29 times faster than water flow. The fast-moving flow of air through a water meter or through the unit that measures flow in the automatic regulator will spin the impeller, used to measure flow, at very high velocities. These instruments, which cannot differentiate between water and air, will register very high flow volumes that do not, in fact, exist. Another problem created under such conditions is the inadequate supply of irrigation water to the fields caused by these air-related inaccurately recorded high flow rates.

Water both cools and lubricates as it turns the impellers inside the measuring equipment. Air moving through the measuring unit at high speed causes the impeller to overheat and prevents water-cooling, resulting in high temperature damage that can even melt the plastic impeller. Installation of an air valve before the measuring equipment will protect the meter from heat damage and false readings.



Installation at the Main Line Control System

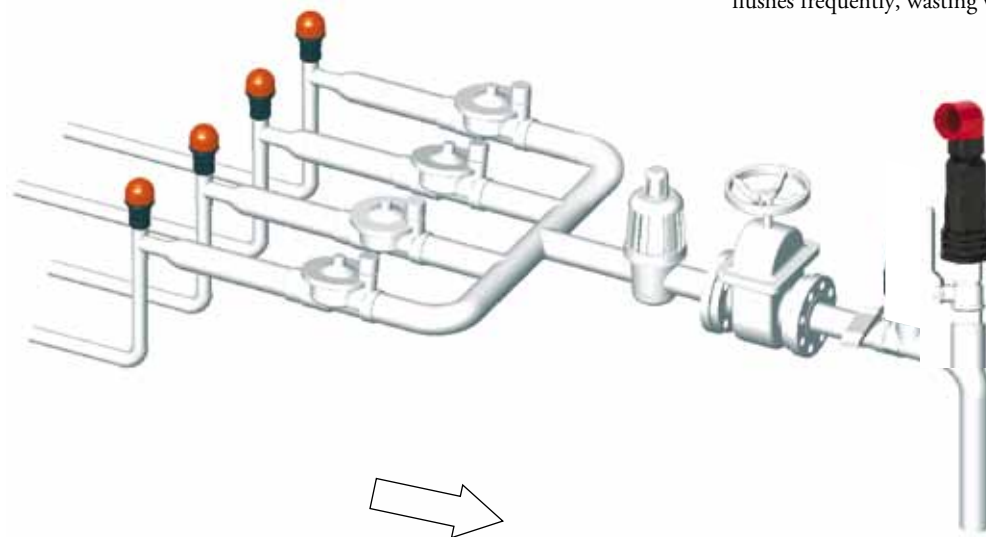
It is recommended to install a combination DG-10 air valve directly on the vertical pipe at the main line control system. This will ensure control of air in the water supply and protection for the other accessories in the control system and protection for the water meters further downstream.

Install an AV-010 "Guardian" model air valve after the tap on the lateral line feeding the dripper lines.

Installation on Filters

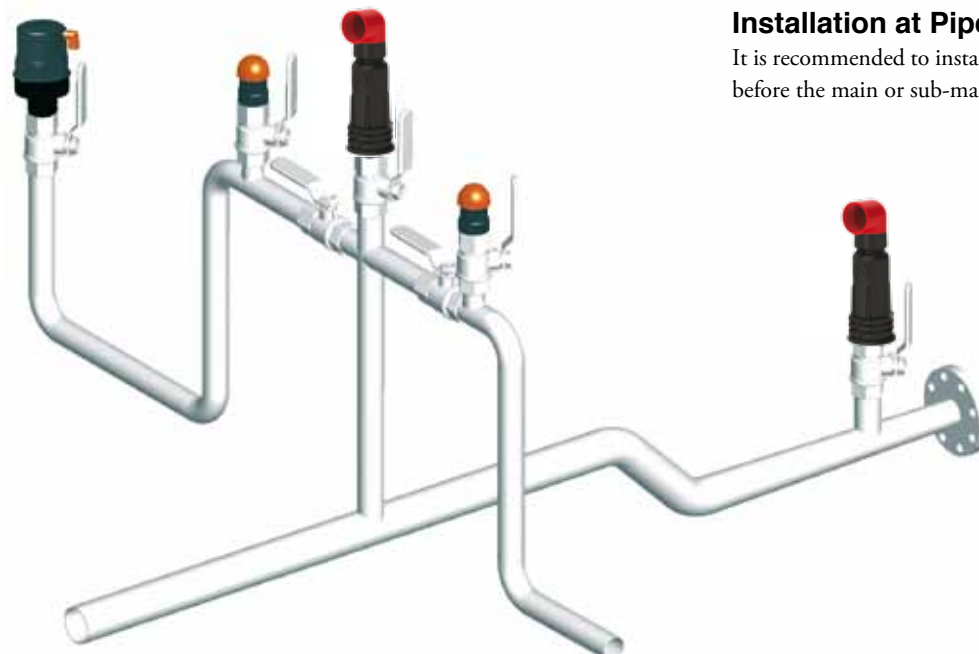
It is recommended to install a DG-70 air valve on sand media filters and a DG-70 air valve on screen and disc filters.

Filtering efficiency - air flowing through an automatic back flush filter system disrupts the filters' hydraulic functioning, creating differential pressures in the filter. Consequently, the filter system flushes frequently, wasting water and lowering system efficiency.



Installation at Pipe Ends

It is recommended to install a DG-10 air valve at the end of each line before the main or sub-main valve.



Installation on Drip Irrigation Supply Lines and Laterals

It is recommended to install a DG-10 air valve directly on the vertical pipe rising from the main line at the irrigation system head. On an irrigation and dripper system, it is recommended to install an AV-010 "Guardian" model air & vacuum valve after the sub-main valve. If the lateral line is long, install a number of "Guardian" valves along the line, with emphasis on the highest points in the field and along the line. "Guardian" valves are required to prevent negative pressure (vacuum) in the line which can cause the drippers to suck up mud and dirt when flow stops.

