

Operating and Maintenance Instructions for 1" and 2" Automatic Air Valve for Potable Water Model 996 and 997



1. Intended use

The H-TEC 1" and 2" automatic air valves are used for aerating and de-aerating of pressure pipe line systems for potable water up to a max. operating pressure of 250 PSI / 17.2 Bar. Please, observe the various operating ranges of these valves.

The H-TEC 1" and 2" automatic air valves are intended for installation in shafts or plants. Below the valves a shut-off device or isolation valve for maintenance reasons should be installed. The automatic air valves must be arranged at the highest point of a pipeline.

Please note, this product must be maintained at least once per year, and even more frequently depending on the local conditions. Observe also the applicable standards and general regulations for the prevention of accidents.

2. Installation

Note: Prior to installation the line must be flushed, otherwise dirt, drilling chips or other foreign bodies might impair the valve function when they are flushed into the valve.

Make sure to install the automatic air valve on a vertical outlet of the pressure pipeline. Installation should be as close to the pipeline as possible to reduce the danger of freezing. A laterally displaced connection to the pipeline shall be avoided. We recommend the installation of a shut-off element (shut-off gate valve or auxiliary shut-off facility) below each automatic air valve for maintenance and for pressure testing of the pipeline.

In case of large pipeline dimensions care should be taken that the air is actually carried to the air valve, otherwise parts of the air would be dragged past the valve. To this end the installation of an air dome on top of the pipe line is recommended. It is advisable to choose the connection to the pipeline as large as possible and to subsequently provide for reduction to the vertical flanged outlet by means of a reducing adaptor simultaneously acting as an air dome (e.g. pipeline 12" with vertical flanged outlet 8", then a double flanged taper 8"-3" and air valve 3" with auxiliary shut-off facility or isolation valve installed below).

The valve shall be installed under unpressurized conditions. To this end the pipeline must be depressurized. In case of pressurized lines the shut-off element below the valve must be closed before installation.

Depending on the type of connection the 1" and/or 2" threaded outlet shall be sealed professionally by means of double nipple or connection established conventionally via a flange with flat gasket. Suitable double nipples are, for example, the corrosion-free male threaded double nipples of plastic (Delrin®), Model 6640320000 (male thread 1") and Model 6640630000 (male thread 2") of the H-TEC range of products.

During each venting cycle minor amounts of splash water may be blown off via the valve outlet. This is a normal procedure. Therefore, a discharge facility (pump sump or similar) shall be provided in the shaft. If exhaust pipes are installed from the valve outlet, care should be taken that no water accumulating in the line may run back to the valve (e.g. downward bend with water discharge openings at the deepest point). Also avoid backwater in the exhaust pipes due to a reduction of cross section.

3. Start-up and pressure testing

Please observe the note on pipeline flushing prior to start-up under item 2.

Before filling the pipe line open the shut-off element below the valve. The valve is vented automatically and closes as soon as the water pressure presses the float upward against the seat.

In general, the main reasons for leakage are dirt flushed in or an incorrect pressure rating of the valve (e.g. pressure rating of Automatic air valve is 14,5 – 250 PSI, but less than 14,5 PSI of pipeline pressure available). If leakage has been caused by dirt, please proceed according to chapter 4, Maintenance.

Automatic air valves are designed for a maximum operating range of 250 PSI, i.e. a testing pressure up to 348 PSI / 24 Bar is permissible (leakage testing of body). The air valve function has been tested by the manufacturer at 250 PSI.

During pressure testing of the pipeline the air valves must be put out of service, otherwise venting may be caused during pressure testing, leading to a pressure drop. Please, don't forget to put the valve back to service after the pressure test and to perform a visual inspection at operating pressure!

The valve is put out of service by closing the shut-off facility below the valve. Automatic Air valves are located at geodesic or hydraulic high points. The outlet of the air valve must have a direct connection with the atmosphere for hydraulic isolation to the pipeline system. Any downstream parts of the pipeline, e.g. for discharge of splash water, must be sufficiently dimensioned to ensure the atmospheric connection. If water is allowed to accumulate and/or any back pressure built up in these parts of the pipeline the function of the automatic air valve is no longer ensured, because, in this case, the float is not working any more. The negative consequences are leakage and inundation.

Measures prior to pressure testing:

NOTE: Automatic air valves not put out of service via the shut-off element may lead to a corruption of the test records of pressure tests. Any discharge of air from the pipeline system via the valve and opening of the seat, however slightly, will lead to a pressure drop that might be interpreted in the test records as leakage of the pipeline system or the fittings.

To avoid wrong measurements make sure to put the valve out of service before starting the pressure test by closing the shut-off valve! After the end of pressure testing slowly open the shut-off valve below the valve, then the automatic air valve is ready again!

4. Maintenance

Foreign bodies flushed into the valve body (e.g. PE drilling chips, wood, polystyrene, ...) as well as deposits in case of water containing iron, manganese or suspended particles may impair the proper sealing function. To avoid malfunctions the automatic air valve should be maintained at least once a year. Depending on the composition of the water more frequent maintenance may be necessary.

Procedure:

1. First close the shut-off facility below the air valve slowly.
2. **WARNING:** It cannot be excluded that there is some residual compressed air left in the valve. Therefore relieve pressure cautiously via the drain-off fitting arranged below the valve before doing any further work at the valve.
3. If access to the air valve body is difficult, the air valve should be dismantled completely for cleaning purposes. To this end loosen the threaded union. If the air valve body is easily accessible, the valve can be cleaned while mounted on the pipeline.

Further steps for valve size 1" FNPT (single-orifice)

4. Remove the black protective cap by loosening the top retaining ring by means of pliers (Seeger circlip ring pliers, forcing pliers) (Fig. 1).
5. Loosen the top screw plug from the white plastic body (Fig. 2, 3).The one-piece body cannot be dismantled any further.
6. Remove any contamination above the seat in the valve body.
7. If the rubber seat vulcanized in the sealing screw (screwed with the float in the valve body) is damaged or worn, loosen the sealing screw, too, by means of pliers and replace it by a new seat. To this end press the float downward by means of the pliers and loosen the sealing screw by turning it left.

Note: Because of the different hardness of the seats please, specify the pressure rating of the valve when ordering spare parts.

8. Then re-install the valve in reverse order.
9. Close the drain-off fitting again.
10. Slowly open the shut-off valve again.

If the valve does not close safely under water pressure, repeat steps 1 – 10.

Further steps for valve size 2" FNPT (double-orifice)

4. Remove the black protective cap by loosening the top hexagon screw (Fig. 4).
5. Loosen the six hexagon socket head bolts at the body and take off the bonnet (Fig. 5).
6. Take out the inner parts (float and tripod with integral fine-venting insert). Remove any foreign bodies and clean the body parts and inner parts as well as the sealing areas.
7. Check the sealing screw with the vulcanized seat in the float. If the seat is heavily worn, order spare parts and exchange the sealing screw.
8. Re-assemble the valve in reverse order.
9. Close the drain-off fitting again.
10. Slowly open the shut-off valve again.

If the valve does not close safely under water pressure, repeat steps 1 – 10.

