Operating and Maintenance Instructions for
ARV with Shut-off for manhole installation
Model 986

1. Intended use

The H-TEC air valve with shut-off for manhole installation, Model 986, is used for aerating and de-aerating of pipe lines for a pressure range of 0 – 250 PSI (17.2 Bar). Medium: domestic sewage (industrial sewage, waste water with a high content of acid or alkali only on consultation) and potable water.

The advantage of this combination, air valve plus a reliable shut-off valve, lies in the fact that by using this product the hazards usually associated with shafts can be eliminated, since the necessary maintenance work can be normally done from the road surface. This air valve type eliminate confined space entry, acc. to OSHA regulations!

Note that air valves must be maintained at least once per year and even more frequently in case of waste water pressure lines with a high degree of contamination or saponify. Please, observe also the applicable standards and codes, the regulations for the prevention of accidents. Air and vacuum valves contain compressed air. Therefore, isolate the air and vacuum valve from the operating system. Before starting any maintenance work the valve must be depressurized via the ball valve!

2. Product description

The H-TEC air valve type is a combined shut-off valve and air valve both aerating lines and removing air enclosed in pipelines. This air valve operates automatically and is designed to reduce water hammers. The gasket seal of this air valve is not in contact with the medium. The air valve is rated for a maximum operating pressure of 250 PSI (17.2 Bar).

3. Installation

The H-TEC air valve, Model 986, must be installed on a vertical outlet of the pressure pipeline. Installation should be as close to the pipeline as possible to reduce the danger of freezing. Note: The lateral arrangement of air valve may considerably influence the control behaviour of the valve. Moreover, in case of heavy contamination there may be problems in the pipeline area upstream of the air valve sets. A laterally displaced arrangement of air valve sets shall be avoided.

The H-TEC air valve set is provided with a shut-off facility that can be opened and/or closed by a half turn. Therefore, an additional shut-off valve is not required.
This automatic valve is intended for installation in shafts. Please, observe the applicable standards and guidelines for this shaft, especially the regulations for the prevention of accidents in case of access to the shaft.

At the air outlet of the H-TEC air valve set a pipe can be connected. Note that the connection of a vent line that is too long or too small may possibly influence the control behaviour of the air valve set. The same applies to any odour filters that may be installed behind the air outlet. In this case it is important to use sufficiently large components to avoid backwater in the valve.

4. Start-up and pressure testing

During pressure testing of the pipeline air valves should be isolated. To this end the shut-off facility below the valve shall be closed. There is always some residual air enclosed even in a properly vented pipeline. If the air valve set is placed correctly, this residual air is carried to the valve possibly causing it to blow off during pressure testing. As a consequence the pipeline system is wrongly assumed to be leaking.

Air valves are tested by the manufacturer so that they need not be included in the pressure testing. After completion of pressure testing of the pipeline the shut-off facility is opened slowly and the air valve and its connections are visually inspected under operating pressure.

Note: Before scavenging with compressed air the H-TEC air valve, Model 986, should be put out of service.

5. Service – maintenance of the air valve set

The reliability of the valve of the H-TEC air valve set, Model 986, can be considerably increased by checking it for possible contamination at regular intervals. Make sure to isolate the air valve from the pipeline system before starting any maintenance work by closing the shut-off valve and to reduce any overpressure possibly existing in the valve via the ball valve of the flushing line.

Due to its coating the H-TEC air valve, Model 986, is well protected against deposits. Nevertheless, depending on the properties of the medium, the operability of the valve should be checked at regular intervals and possible contamination should be removed, especially in case of larger bodies of dirt that cannot be flushed out via the lateral flushing connections.

All work at H-TEC air valve set, Model 986, should be performed by personnel which is either trained or read this manual!

We recommend the first maintenance to be done after a period of approx. 4 – 8 weeks and to define further maintenance intervals on the basis of the result of this first maintenance. To this end open the valve according to the below description.

In the course of maintenance, please check also the ball valve and all other components for leakage and contamination.

5.1 Maintenance

If there are foreign bodies in the valve that are too large to be flushed out via the lower flushing opening, the valve should be dismantled and the foreign body be removed. To this end please proceed as follows:

1. Close the shut-off facility via the offset handle bar by a half turn (clockwise) – to this end the handle bar must before be shifted by 180°!
2. Note: After closing the shut-off valve the air valve is still under pressure!
3. Therefore open the ball valve at the lateral flushing pipe carefully and only after mounting a hose at the flushing connection provided for this purpose, and safely drain off any emerging medium.
4. Pull the handle bar upward and out of the air valve chamber.
5. Turn the valve counter-clockwise until the bayonet coupling is released.
6. Pull air valve upward and out of the air valve set at the two eye bolts by means of a suitable lifting tool.
7. Open the screws of the body.
8. Pull the flange together with the complete valve mechanism upward and put it upright on a solid base.


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9. Open the retaining ring on the flange top side by means of an appropriate tool and pull the flange upward and off.


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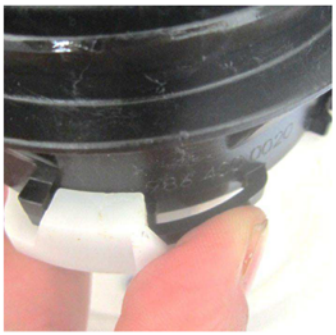
10. Remove debris screen (white) by pressing the safety lock (black). Turn debris screen clockwise.
    Move upper air valve part upward.



11. Clean the slots of the valve cage and rinse them. Roll diaphragm out and look for remains of debris or mechanical damages. Remove debris with a wet towel. In case a change of the whole diaphragm is necessary, remove used diaphragm from the groove and replace it by an unused diaphragm.

Assembly of the diaphragm:

12. Pull the diaphragm over the diaphragm holder (white).



13. Check the correct placement of the diaphragm within the groove.

14. Assembly of the diaphragm within the upper air valve part:
    Put the end of the rubber string through the bore whole of the upper air valve part. Pull the string upward until the wider part of the rubber string moves through the bore whole. You either can hear or feel this final step. Diaphragm is in place now.

(Upper air valve part in cut sample view)

15. The rest of the assembly follows the steps vice versa 9 through 10 of this manual.
    Visual check of all connections and flushing openings.

16. Screw the flange together with the complete valve mechanism back on again.

    Attention: Check the correct fit of the O-ring seal!

17. Before installation of the air valve into the set clean all sealing surfaces.

18. Put the air valve from above onto the bayonet locking, that way the stainless steel flushing pipe

    is in one direction to the spindle top of the shut-off valve underneath.

19. Engaging it clockwise.
20. Put the three-way valve back in place and tighten the screw connections manually until the connections are tight.

21. Put on the handle bar.
22. Make sure that the ball valve of the stainless steel flushing pipe is in closed position!
23. Slowly open the shut-off valve below the air valve (counter-clockwise). The air release valve begins to operate.

    After opening shift the handle bar again by 180° (locking against self-releasing of air valve)!
24. Visual check of all connections and flushing openings.