RECOMMENDATION FOR AIR VALVES

FREE AIR MAY BE FOUND IN LIQUID CONVEYING SYSTEMS AND FITTINGS. ITS MAIN SOURCES ARE:

1. Air trapped in the system during filling.
2. Water which contains dissolved air. Due to a drop in pressure and/or a rise in temperature. The dissolved air comes out as solution and accumulates in the system.
3. Air drawn into the system by air valves and fittings under vacuum conditions, or by the vortex action of pumps.
4. Air intake as water comes from open sources.

REASONS TO CONTROL AIR AND HAZARDS OF AIR IN FLUID SYSTEMS.

1. To prevent destructive vacuum conditions from forming.
2. To efficiently drain the system.
3. To release pockets of accumulated air which impede effective flow and hydraulic conductivity of the system along with a throttling effect as would a partially closed valve. In extreme cases, will cause complete flow stoppage.
4. To prevent high pressure surges.
5. To reduce acceleration corrosion of metal parts.
6. To increase pump station efficiency.
7. To prevent danger of high-energy burst of compressed air.
8. To reduce inaccuracies in flow metering.
9. To lessen wear of spinning elements and measurement accessories.
10. To reduce cavitation damages.

THERE ARE THREE MAIN TYPES OF AIR VALVES:

1. Kinetic Air Valves (”Low pressure” - “Large orifice” - “Air & Vacuum”).

- Discharge air at high flow rates while the system is being filled with liquid.
- Admit air into the system at high flow rates during its drainage.
- High velocity air, or even air mixed with a mist of water spray, cannot blow the float shut. Water entry will cause the sealing of the valve.
- At any time during system operation, should internal pressure fall below atmospheric pressure, air will re-enter the system.
- Admitting air in response to negative pressure protects the system from destructive vacuum conditions, and prevents damage caused by water column separation. Air re-entry is essential to efficiently drain the system.
- Air is exhausted in a smooth manner in order to help prevent pressure surges and other destructive phenomena.
  Kinetic models: K-010, K-012, K-014, K-016, K-020,K-060 HF, K-062 HF, AV-010.

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A.R.I **Flow Control Accessories**
Kfar Charuv, 12932 Israel Tel. 972-6-6761988 Fax. 972-6-6763402 http://arivalves.com

2. **Automatic Air Release Valves** (”High pressure” - “Small orifice”)

- Release entrapped air that accumulates at peaks of pressurized systems.
- Entrapped air, which accumulates at peaks along the system, where Automatic Air Release valves are installed, rise to the top of the valve, and displace the liquid in the valve’s body. As the Liquid level drops down, the float drops away, the orifice opens and the accumulated air is released. Liquid penetrates into the valve and the float rises again to its sealing position.
  Automatic models: S-010, S-012, S-014, S-016, S-020, S-050, S-050-C, S-052.

3. **Combination Air Valves** (Double Orifice) combines a Kinetic Air Valve and an Automatic Air Release Valve

- Discharge air at high flow rates while the system is being filled with liquid.
- Admit air into the system at high flow rates during its drainage.
- Release entrapped air that accumulates at peaks of pressurized systems.
  Combination models: D-010, D-010HF, D-012, D-012HF, D-014, D-016, D-020, D-040, D-040-C, D-050, D-050-C, D-052, D-060HF, D-060CHF, D-062HF, D-080.

RECOMMENDED VALVE SIZES ACCORDING TO PIPELINE DIAMETER:

Pipeline Diam.	80-250mm	300-400mm	450-550mm	600-1200mm	1250-2400mm
Air Valve Diam.	50mm	80mm	100mm	150mm	200mm

RECOMMENDATION FOR LOCATION OF AIR VALVES

1. On rising mains from pumps, to release and admit air.♣
2. At local peaks in the system.♥
3. At transition points in the hydraulic gradient.♥
4. At transition points in pipe slope, particularly before and after steep slopes.◆
5. Every 500 m. (1,500 ft.) along pipeline sections of long uniform slope.♠