

# AVK UK CONNECT BACK TO BASICS - CHAPTER 7

## WASTE WATER AIR VALVES

Expect...

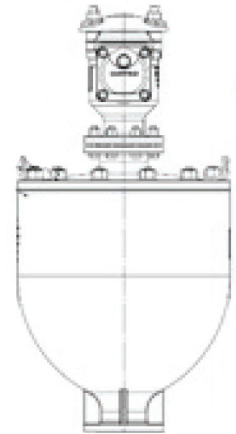


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**DUTY:** Air valves, when fitted to a pipeline, will effectively allow air to be expelled as well as introduced into a pipeline during the many phases of operation including filling, pumping and emptying. Generally fitted at the peak points of the pipeline, these work automatically and come in many different shapes and sizes. The two main different types evolve around 1) clean water/potable water applications and 2) Waste, raw and dirty water as well as sewage applications. It is vital that the correct air valve is used for the correct application, there are fundamental differences between the two ranges and failure to fit the correct valve will cause operational issues.

**SIZING:** Air valves should always be sized according to the volume of air within the pipeline and not just the size of the pipeline. Control of accumulated air within any pipe system will extend the whole life of the pipe system and deliver reduced operational costs and an efficient hydraulic performance.

**HISTORICAL DESIGNS:** The fundamentals and the function of an air valve have remained the same, with advancements in materials and technology, what has changed is the actual design as well as the choice of materials. See attached picture of an heavy old cast iron design, typically 200kgs+.



**DESIGNS:** This chapter covers valves suitable for the second category listed in duty heading eg Waste, raw and dirty water as well as sewage applications. Air valves for water applications are covered in Chapter 6. It is widely expected that with proper sizing and siting of air valves in a rising main pipeline, can result in efficiencies in excess of 15% to 20% in terms of power consumption on the pumps. The reason why sewage air valves are typically bigger in all aspects such as; working envelope, weight/ dimensions, is that there is a need to keep the media away from the orifices of the valve which could easily block up the valve rendering the valve inoperable. This is in contrast to the clean water air valve which is usually much smaller in stature.

**NAMES:** The waste water range that AVK UK offer is split into 3 types, all used for specific needs and duties



### Single small orifice

This allows for releasing air in SMALL volumes in a pressurized system as and when it accumulates at the peak points within a pipeline. Available in a variety of materials; reinforced nylon, cast/ductile iron or stainless steel.

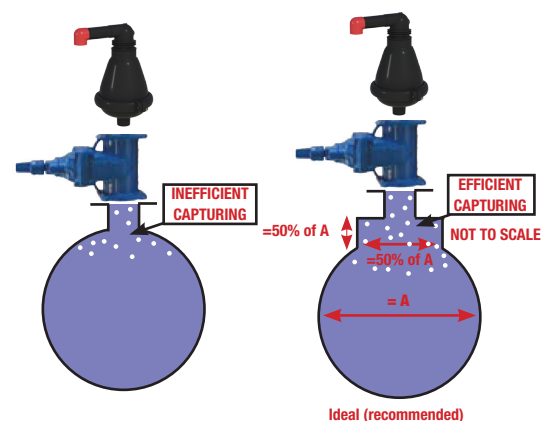
### Single large orifice

This allows for air to be released in LARGE volumes from pipelines usually at the filling process, once the system becomes pressurised typically this valve will remain closed. It will only open once the system becomes depressurised and the valve will open allowing LARGE volumes of air to be brought back into the pipeline, breaking any vacuum that has been created. Available in a variety of materials; cast/ductile iron, with a number of coatings available relating to the environment of operation. This type of valve is often fitted just after a pump.

### Double Orifice

This valve contains both large and small orifice so is a combination of the above and is by far the more popular valve type supplied. Available in a variety of materials.

**EFFICIENT CAPTURING:** The effective removal of air is also relevant to how it is captured. The smaller the collection area the greater the chance of the air flowing past the air valve.



**IF IN DOUBT ASK - 01604 601188**

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Expect...



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**DESIGNS TODAY:** AVK air valves offer a "rolling seal" in automatic air valves, allowing a more reactive performance to the variances of fluid pressures and conditions. In addition the primary float is fitted with a spring between the rod and secondary float compensating for changes in fluid flow and a calmer operation. On the large orifice valves, the main float is designed to remain open longer, allowing more air to escape and an EPDM seal that seals around the outlet orifice, again offering improved performance on previous designs and requiring a lower minimum line pressure to secure a tight seal. The AVK valves require 0.2 bar on standard valves and now 0.05 bar on a range of standard valves. Weights for the units range from 5kgs to 24 kgs on standard products

**PRESSURES:** Maximum pressures are key in any valve selection however with air valves, minimum seating pressure needs to be considered. Our standard range will handle low pressure ratings of 0.2 bar sealing pressure with 0.05 bar option across the range, 10, 16 and 25 bar MOP available.

#### Air Valve Discharge flows at 16 bar for standard UK stock products:

|                            |  |
|----------------------------|--|
| Series 701/73 option, Dn80 | 175 cubic meters per hour - small single orifice   |
| Series 701/33 option, Dn80 | 2,500 cubic meters per hour - large single orifice |
| Series 701/70 option, Dn80 | 350 cubic meters per hour - double orifice         |
| Series 701/75 option, Dn80 | 325 cubic meters per hour - double orifice         |
| Series 701/78 option, Dn80 | 2,500 cubic meters per hour - double orifice       |
| Series 701/95 option, Dn80 | 350 cubic meters per hour - double orifice         |

**WORKING AND TEST PRESSURES:** All air valves are body tested to 1.5 x working pressure and seat tested to 1.1 x working pressure. Test pressure and durations are carried out in line with EN 12266-1.

**SIZE RANGE:** AVK offer DN25 to DN200, with variable inlet arrangements; BSP threaded and flanged.

**TEMPERATURE:** to +60 degrees (90 degrees intermittently).

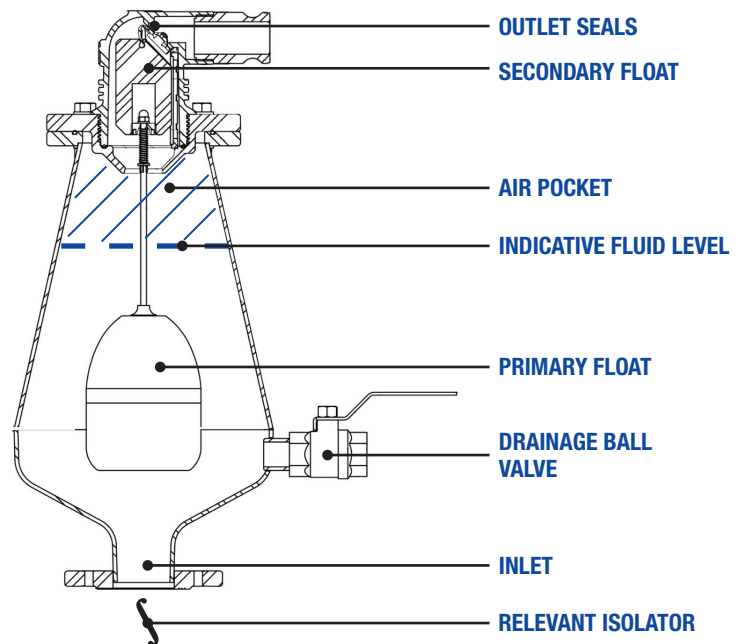
**INSTALLATION:** Designers should aim for vertical installation, however valves can accommodate a 5 degree offset from vertical. If the air valve is to be installed off line from the pipeline, a minimum of 7 degrees is recommended of rise in the branch pipe. Where above ground installation is required, it is recommended that thermal insulation is fitted to the valve and isolator

**RELEVANT STANDARDS:** Where applicable the flanges are to BS EN 1074.

**AIR VALVE SPARES:** Full internal spares, rolling seals, floats, retaining pins and bodies are available along with training on field maintenance procedures.

**MAINTENANCE:** Recommended maintenance should be yearly, however each system should be reviewed in accordance with operating conditions.

**ISOLATION:** AVK always advocate the use of an isolator with an air valve in order to facilitate maintenance. Typically these can be ball valves, gate valves, knife gate or slide valves. A B/F valve is not suitable for waste water use.



## EXPECT... LASTING INNOVATIONS

## NEW PRODUCTS

**SERIES 701/78** – 25 Bar MOP  
Double Orifice



**SERIES 701/79** – Integral Chambered Units



**LARGE FULL BORE** - 4,000 cubic  
meters per hour discharge



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