



Sizing a Fluid Category 5 Break Tank & Booster Set

Fluid Category 5 Break Tank & Booster Sets are critical for preventing contamination from the highest risk applications, where extremely harmful chemicals could potentially backflow into the mains water supply.

Unfortunately, it is not simply a case of 'one size fits all,' with Arrow Valves currently having over fifty models in our ever-expanding Category 5 range. Selecting the correct model for a project is straightforward if you have the correct information.

All of the Category 5 units have fundamental similarities. They all have a cistern with Type AB air gap (to meet the legal requirements of the Water Regulations), an Accumulator Vessel (to ensure a smooth flow of water from the outlet), and a Booster Pump (to boost the water to the desired pressure). The key difference between all of the models is their Pump arrangement and the duty they provide.

As the world tries to reduce its energy consumption and combat climate change, it is more important than ever to select the most economical solutions possible for our applications. Incredibly, Pumps account for 10% of the world's total energy! Therefore, using correctly sized, energy efficient motors can have a huge impact on reducing the amount of energy we are using.



The vast majority of packaged Category 5 units offered by Arrow Valves use Inverter controlled Variable Speed Pumps. The benefit of Variable Speed Pumps is that they only provide the pressure required to meet the demand, making the unit economical and extending the life of the Pump.

We also offer a handful of Booster Sets with Fixed Speed Pumps, as there are some applications that are more suited to a Pump simply switching on (at Full Speed) and off. For example, a Category 5 unit supplying a single Hose Union Tap – the demand won't vary like it would if there were multiple Taps, so a Fixed Speed Pump is adequate.

Once we have determined whether a Fixed or Variable Speed Pump will be most suitable for our application, next we need to determine the required Duty (Pressure and Flow Rate).

The Pressure is the force of the water supplied by the unit, whereas the Flow Rate is the volume of water supplied. The required Pressure is affected by the length of pipe run from the unit to the outlet, whether the water needs to be boosted to outlets on floors above the Pump, and the Pressure required at the outlet. For example, industrial wash down is going to need much higher pressure than a laboratory tap.

The Flow Rate is simply calculated by how much water is needed at the outlet(s) at any one point. For example, if the unit is going to be supplying three taps that are all going to be used simultaneously and each require 0.3 Litres per Second of water, then we will need a total Flow Rate of 0.9 Litres per Second.



It is obviously best to cater for worst case scenario, to ensure we have a sufficient flow of water even during peak demand periods.

The smallest model in the Arrow Valves range provides a duty of 0.15 Lt/s @ 1.5 bar (15 metres head), suitable for a domestic washing machine. At the opposite end of the spectrum, the largest Category 5 unit we currently offer can provide a duty of 4.0 Lt/s @ 10 bar – so 26 times the amount of water as the smallest unit, and a pressure capable of boosting water 100 metres vertically! Essentially, whatever your requirements, Arrow Valves should have a unit to meet the demand.

The final thing to consider when selecting our unit is the pump configuration. Our units are supplied with either a Single Pump or Dual Pump arrangement, which can be either 'Duty Standby' or 'Duty Assist.'

With a 'Duty Standby' configuration, only one pump ever runs at a time, the second Pump is there to provide a backup if the first Pump was to fail. 'Duty Standby' units are used for critical applications, such as supplying equipment in a Hospital. On the other hand, for 'Duty Assist' configurations, under normal operation only one Pump will run to meet the demand. If the demand increases, the second Pump will automatically switch on. 'Duty Assist' is suited to applications where there are multiple outlets and demand is likely to vary a lot.

For more detailed information on the differences between 'Duty Standby' and 'Duty Assist,' take a look at the Arrow Valves YouTube channel where you can find a video specifically about that topic.

Now we have the three key pieces of information, we are in a position to select the most suitable Category 5 Break Tank & Booster Set for our project. To recap, the three pieces of information are...

- Fixed Speed or Variable Speed Pump
- Required Duty (Pressure and Flow Rate)
- Pump Configuration (Single Pump / Duty Standby / Duty Assist)

There are thorough Technical Datasheets for Arrow Valves' Category 5 units to make the selection of the correct model as straightforward as possible.



BTAB Variable

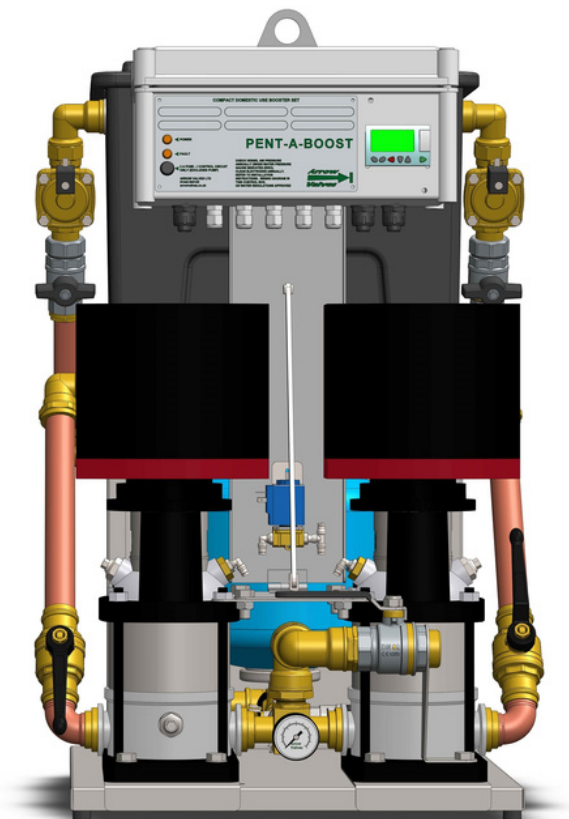


BTAB Fixed

Arrow Valves also manufacture the BTAF Pent-A-Boost in the same sizes for drinking water applications, it's still fully WRAS approved and has the addition of a built in automatic mains bypass and the same 5-year warranty as standard.

There are thorough Technical Datasheets for all Arrow Valves' Category 5 units to make the selection of the correct model as straightforward as possible, along with sizing charts.

Alternatively, please contact us and we will be more than willing to assist.



BTAF Variable



BTAF Fixed