

Why Use a *Bias* CARV

Biased CARV means....

The CARVs Anti-Surge device is pre-activated.

~ 5% of CARVs are Biased

Why: The principle reason is that the valve is to be installed in a location where a water-column separation event may not induce enough air flow to activate the anti-surge feature of a standard CARV. When the anti-surge device is activate, it causes the main orifice to close, and forces the exhausting air through much smaller orifice/s (~2.7%), which will choke the flow, and that results in a pressure independent, constant ACFM volume change inside the pipeline, thus controlling water-hammer velocities.

The standard CARV internal design assumes the valve will be located at a high point along a pipeline. And because high points in a pipeline will typically have the lowest pressure for several hundreds of feet; then a water column separation event caused by cavitation or a rapid change in velocity, will likely occur at that high point. When this happens, the induced vacuum will cause the CARV to open and allow air to enter the pipeline to moderate the vacuum level. Moments later when the water columns reverse direction and they try to implode towards one another, there are actually two effective pistons pumping air towards the CARV.

Conversely, if the CARV was installed directly after a pump; when the pump shuts down quickly, the same water column separation even occurs; however, this often only involves one water column with significant mass (ie downstream); thus the CARV will only experience half the rate of air flow. This is significant, because halving the flow rate of rushing air will reduce the aerodynamic lift on the anti-surge device to only 25%. In this case the anti-surge feature may not activate until water starts to enter the CARV and this would be too late to mitigate a Water-hammer event.

When to use: Biased CARVs are normally specified as the first valve after a pump or check-valve.

Specifying a Bias CARV: Vent-Tech valves with a **Bias** feature have a “**B**” in the middle of the ‘in/out code’. Standard CARVs are coded with the letter “**C**”, meaning it would be a full **C**ombination air/Vac relief valve.

e.g. 02-SWG-TBS-6NN-A

- 02 = 2” CARV
- SWG = Sewer / Wastewater / General
- TBS = Threaded-based connection / BIASED / Screened top
- 6NN = 316SS alloy / upper+ / lower side-port ball valves
- A = Metal used was made in the USA (AIS Certified)

Done! 😊