How does this snifter valve or air admittance valve work on a drain-back system?

The snifter valve is a one-way air inlet vent. It includes a vented (or loose) air cap over a valve stem that incorporates a low-pressure spring designed to allow air to enter at the valve stem opening when a vacuum is created in the well piping on the well or lake side of the check valve.

When the well pump stops operating and water begins to flow back down the water piping and out the drain back valve orifice that creates sufficient vacuum (around 10 psi) to open the snifter valve to allow air to enter the water pipes.

Air entering the piping system at the snifter valve permits water to continue draining out the piping system at the drain back valve or bleed back valve until the pipe is empty of water.

Remember that air is entering the piping between the check valve inlet side and the drain back valve outlet or drain orifice. That is the section of piping that we want to drain for freeze protection.

So a well or lake water pipe that is not buried below the frost line can be protected by freezing: the pipe is simply emptied of water and filled with air at the end of each water pump on-cycle.

Back at the bladderless water pressure tank an automatic air volume control will release the excess air that is pushed into the tank from the empty water piping at the start of the next pump-on cycle.

Why doesn't the snifter valve also allow drain-back of all of the water in the pressure tank too?

The check valve is located at the point where the well piping enters the bottom of the water pressure tank. This valve keeps water from leaving the pressure tank in an attempt to head back into the well each time the pump stops.

Watch out: when replacing the valve stem core in a Schrader valve that is serving as an air admittance valve on a drain-back system, be sure you obtain the proper low-pressure valve core or valve stem from your plumbing supplier.

The valve stem or core in this application has to open at around 2-3 psi whereas a typical tire valve opens at a higher pressure, perhaps 10-12 psi. If you put the wrong type of valve core into your drain back system air snifter the system won't work and the water pressure tank will become waterlogged, leading to well pump short cycling.

Separate from an air admittance or snifter valve used on a drain back system, some water pressure tanks include a conventional Schrader Valve that operates in the higher pressure range. That valve, used to manually adjust a water pressure tank's pre-charge pressure, may be present on a tank tee at the bottom of the water tank, or on the tank body, usually near the top of the tank.