The van der Waals equation of state for water is used to generate isotherms on a pressure-log volume (P-V) diagram and isobars on a temperature-log volume (T-V) diagram. Sliders change the isotherm temperature on the P-Vdiagram and the isobar pressure on the T-V diagram. Liquid and vapor are in equilibrium within the phase envelope, which was generated from data for water. The isotherms and isobars have three solutions in the two-phase region, but the only physically meaningful conditions are the orange dots, which correspond to saturated liquid and saturated vapor. The saturated liquid volume (VL) and the saturated vapor volume (VV) are displayed. The horizontal, dashed orange line (at Psat and Tsat) represents a mixture of liquid and gas. On the P-Vdiagram, the green areas above and below the saturation orange line are equal when plotted on a linear volume scale.

This log pressure versus log volume phase diagram illustrates phase behavior of a single-component (water) and the concept of state functions. Use sliders to move the black dot at constant pressure or constant volume, or check the *drag point* box and drag the dot around the diagram. The piston-cylinder, which represents the volumes of liquid and vapor present, can be viewed on log or linear scale by selecting the appropriate button for *volume representation*. When two phases are present and the linear scale is selected, a pop-out shows a magnified view of the liquid and vapor volumes. Liquid in the cylinder is blue and vapor is green, and the intensities of these colors increase as their densities increase.