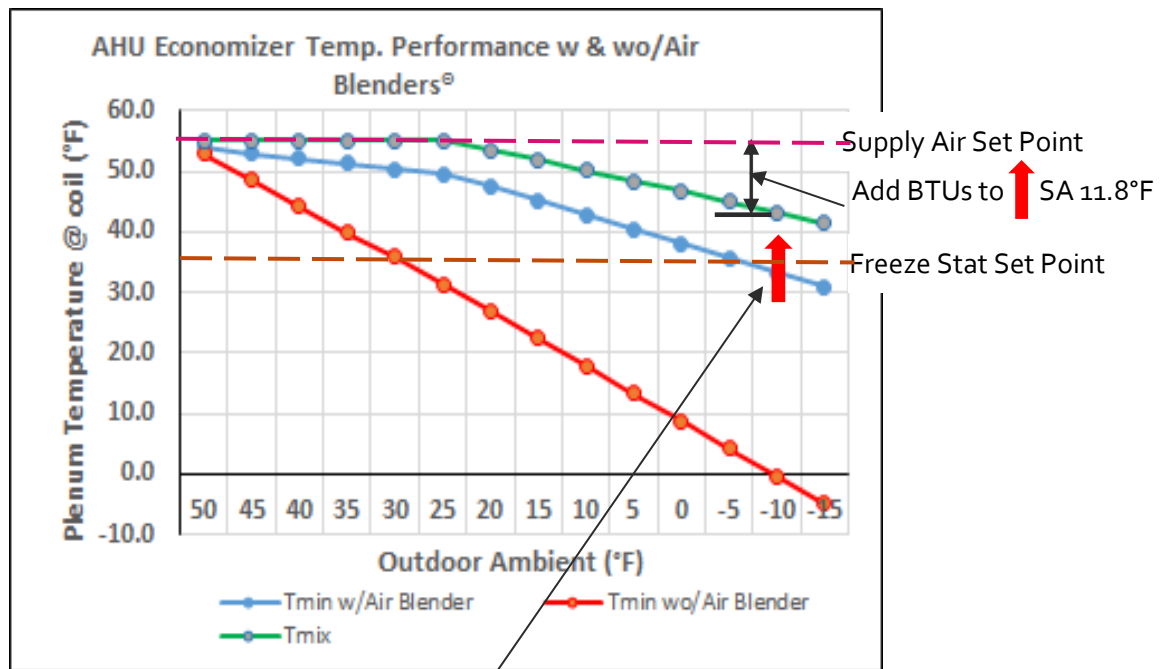


Applications with High % of Outdoor Air: The Channel Blender is not applied to provide perfect air mixing; they are applied to protect coils from freezing and prevent freeze-stat trips. They typically only use enough mixing distance to accomplish this objective. That means that there is always some temperature stratification and a minimum temperature in the plenum even when using a mixing device. Applications with a high % of OA will create mixed air temperatures lower than the supply air set point as OA temperatures drop. Under these conditions building management controls will turn on heat in the AHU to increase the mixed air temperature to the supply air set point. In most applications, the heating coil is upstream of the freeze stat and will also heat the coldest temperature in the plenum. We take this added heat into account to provide our mixing solutions to take up the minimum amount of AHU tunnel length. Even though mixing may not be able to increase the minimum temperature in the plenum above the freeze stat setting as the mixed air temperature gets colder at lower OA temperatures, good mixing is critical to maintaining the minimum temperature in the plenum close enough to the freeze stat setting that the added heat will increase the minimum temperature above the freeze stat setting. Fig. B below provides a graph to help explain this application scenario.



Example: For 35% OA, economizing stops when the OA gets to 20°F and the mixed air temperature starts drifting below the Supply Air Set Point. At -10°F OA the minimum temperature in the plenum will be below the Freeze Stat Setting even with mixing. However, the heating coil will be adding enough BTUs to bring the 43.2°F mixed air temperature up to 55°F. These BTUs will also increase the 33.4°F minimum plenum temperature to 45.2°F to avoid tripping the freeze stat at the cooling coil. Without mixing, the coldest temperature in the plenum after adding heat would be 11.5°F, and the unit would have started tripping freeze stats between 20-15°F ambient

Fig. B