

# How does the Heat Pump Thermostat Work

The RvComfort.HP, the RvComfort.PHP, the Coleman True-Air, and the RvComfort.ZC thermostats by RvProducts Inc. are all capable of running not only an Air Conditioning unit, but also an Electric Heat Pump. Frequently we receive calls from customers who do not understand the functions of the Heat Pump Thermostats. This guide is a quick run through of the information already provided in the Thermostat Operation Manual, included with each thermostat.

The Heat Pump is an electric source for heat. It will supply and maintain heat assuming the outside (ambient) temperature is above 40 degrees. This number of course can be slightly higher or lower depending on the humidity. Higher humidity can cause a heat pump to lose efficiency at a slightly higher ambient temperature, while lower humidity can cause a heat pump to lose efficiency at a lower ambient temperature.

Since no one wants to wake up to find that the outside temperature dropped below forty degrees and it is now 50 degrees inside the coach, the Heat Pump thermostats are programmed internally to recognize when the temperature drops five degrees or more from the set temperature to the actual inside room temperature. When the temperature exceeds five degrees or more between the two, the thermostat will default to the next available heat source.

The thermostat, upon sensing a temperature split of five degrees or more in the electric heat mode will bring the gas heat on to assist the electric heat. This is the first strike. A strike is created by the thermostat having to change modes (or run dual modes to sustain a temperature split). The electric heat and the gas heat will continue to run together until the thermostat reaches the set temperature and satisfies. When the electric heat comes back on, it will be in electric heat only at that point. If the temperature again drops five degrees or more from the set point, the thermostat will again bring the gas heat on to assist. This is strike two. The system will then go through the above stated procedures. If the temp should drop five degrees from set point for a third time, the thermostat will give up on the electric heat, lock the electric heat out for two hours (showing either DIFF on the display or FLASHING GAS HEAT on the display) and default to Gas heat only. You **WILL NOT** be able to run any Electric heat during this two hour lockout.

This is the normal operation for these thermostats. We can also cause the thermostat to lock out in a few ways. If we set the Electric heat set point five degrees or more higher than the room temperature the thermostat will default the same as it would if the temperature dropped five degrees or more. IF at any time the differential between the set temperature and actual temperature is five degrees or more, the thermostat will go into a strike point regardless of whether it is caused by raising the temperature too far, or the temperature falling inside the coach.

The other way the thermostat will receive a strike is if the system runs for twenty minutes and cannot reach the set temperature (satisfy). Again the thermostat senses that something is wrong with the system and defaults to the next available heat source to assist. These strikes are the same as the strikes mentioned above and any combination of three strikes will result in a two hour lockout.

Once the system comes out of lockout, it will only require 1 strike to go back into lockout. So keep in mind, if you are coming out of a two hour lockout, be careful to keep the set and room temperature within four degrees otherwise you will lock the system out again.

To summarize:

- 1). There is no outside ambient sensor to shut down the heat pump. The heat pump will shut down only if the system is locked out. Ambient temperature does affect the performance of the electric heat.
- 2). If the thermostat set point and actual room temperature are FIVE degrees or greater the system will default to the next heat source for assistance and obtain a strike. Three consecutive strikes and the electric heat will be locked out for two hours.
- 3). If the electric heat runs for twenty minutes and cannot satisfy and shut the compressor off, the system will also default to the next heat source for assistance and obtain a strike. Three consecutive strikes and the electric heat will be locked out for two hours.
- 4). Once the thermostat is locked out, it is a hard lockout. There is no reset that will bypass the lockout. Pulling the fuse will not reset the thermostat lockout.