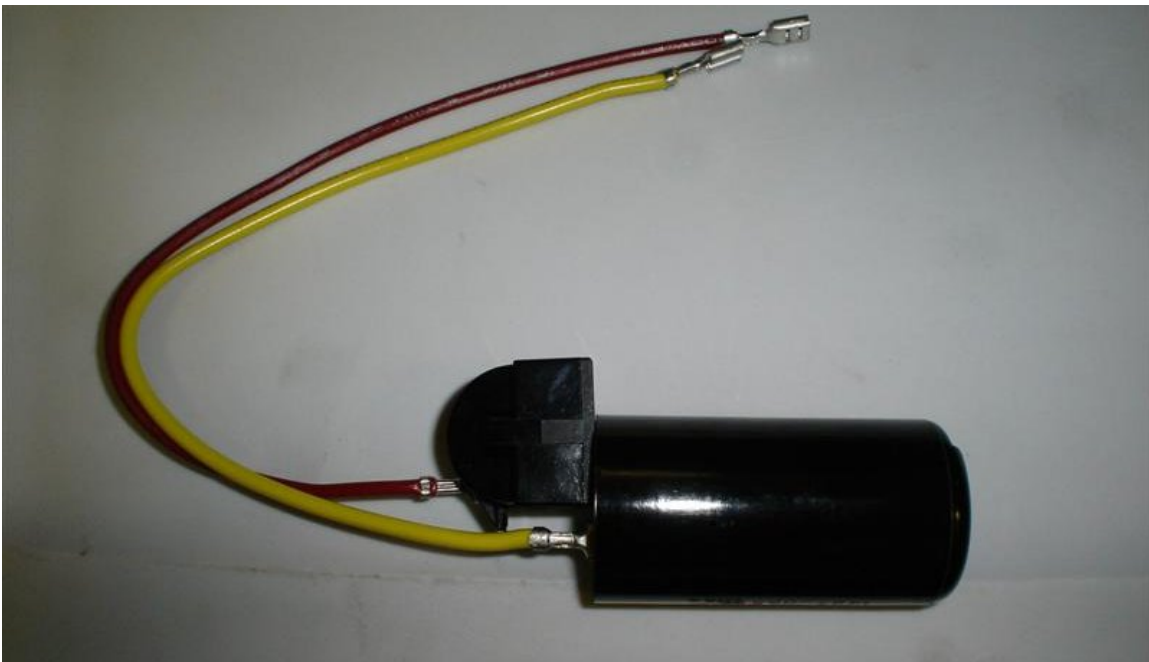


What is a PTCR Device

And why do I need it? The long name is **Precision Temperature Coefficient Resistor**, usually called a **PTCR** device or **PTCR** start device. This device is used in the Coleman Heat Pump units and it is also used by many other AC units and manufacturers.

The specific one used by RV Products in the Coleman Heat Pumps installed in recent years by Tiffin Motor Homes is manufactured by Therm-O-Disc, Inc., a subsidiary of Emerson Electric Co. neither company sells to the general public. The Therm-O-Disc part number is 9RTP200U. The last purchase I made of the device was as a Hard Start Kit. The kit contained both a start capacitor (88-108 ufd/250V) and a PTCR device, the kit cost less than \$17.00 plus tax. I have been unable to find this kit cheaper than I purchased it a Sherman RV, a Tiffin RV dealer.

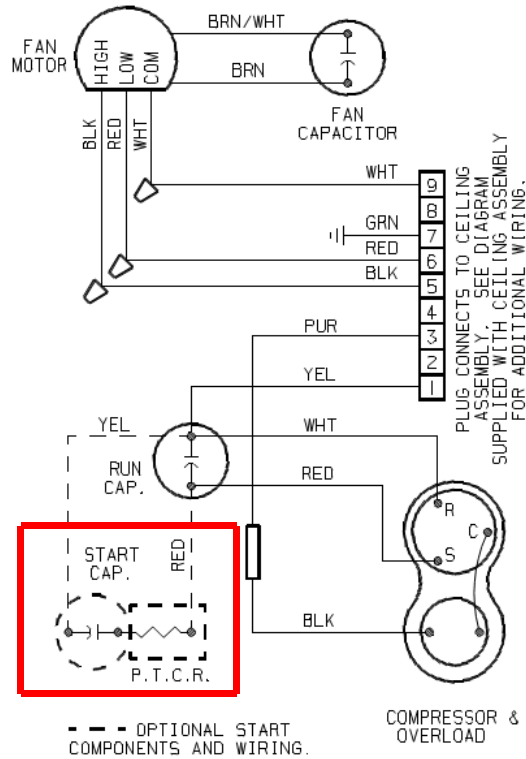


The small black bump attached to the red wire is the PTCR device. The PTRC device is itself attached to the start capacitor with a quick connect fastener. The yellow wire completes the kit.

How does this device operate and why does my AC/HP need it? The short version is this device is a booster it is used to apply additional torque to the compressor to get it turning. Once the compressor has started the run capacitor takes over and away the compressor goes either moving heat

outside of the RV or inside of the RV if the unit is running in reverse cycle (Heat Pump Mode).

Below is an electrical drawing of the Coleman AC/HP unit.



The start cap and the PTCR device are shown inside of the red box above. The kit is wired in parallel with the run capacitor (electrically side by side). Below is a brief summation of how the PTCR device operates. As already stated the RUN capacitor and the PTCR kit are wired in parallel. The term Precision Temperature Coefficient Resistor generally explains how this device does its job, when voltage is applied to the start kit, HEAT is developed which by design affects the start device. As heat rise's the resistance increases in the device until the device shuts off (opens the circuit). The time frame for this to occur is about 1/2 of one second. During that time the capacitor in series with the start device exerts tremendous torque to the compressor which causes it to turn. After this burst of torque the PTCR device as I stated shuts down, it has performed its job. The PTCR device requires several minutes of rest to re-set (the PTCR temperature has to drop back down before it can re-set which will occur after a few minutes of rest). Think of the PTCR kit as a kick starter on an older style motorcycle.

Once you kick the engine over it continues to run until you shut it down, you do not need to continue kick starting while it is running.

If you allow a short cycle of the AC/HP compressor to occur, it is possible the start kit will not be able to perform its job. As I stated above it takes several minutes for the PTCR device to cool down enough to re-set itself. If you turn ON your AC and for what ever reason it runs for just a short period of time say two minutes. Then the power is interrupted for 30 seconds and the AC attempts a re-start, the RUN capacitor will be on its own attempting to turn the compressor because the PTCR start device is still in its cool down mode, which means the START capacitor is not in the circuit with the RUN capacitor.

There for if one of your AC/HP units attempts a re-start after a brief run cycle it would be to your benefit to just turn the unit off for a few minutes. Turning the unit off and allowing a cool down period (for the PTCR device) will increase the life of your other capacitor, the RUN capacitor. Depending on the ambient temperature the RUN capacitor may be able to turn the compressor without the start kit however it was not designed to carry the starting load by itself.

For those who have had the PTCR device burn up, the START capacitor which is a part of the kit may be good to re-use or it may not be good to re-use. The capacitor may look good, but it will still need to be tested to determine if the capacitor is good or not.

A good method of testing a capacitor to determine if it is good, bad, shorted or open can be found by clicking on the below link, save or open the PDF file. To test a capacitor follow the directions beginning on page 21 of the "Service Manual for 90*1, 90*3 & 90*4 Series Heat Pumps".

http://www.rvcomfort.com/pdf_documents/1976470_copy.pdf