

Tech Corner

“To Start or Not To Start” ...That is the Question

by David Crofts, FSR



If you have technical questions about Trane equipment, call me at 864-923-2385, or email me at dcrofts@gwd-ac.com. Check out other helpful tech articles at www.gwd-ac.com/Tech Pro.

The jump to 13 SEER and beyond has ushered in more than just higher efficiencies. It also brought thermostatic expansion valves to almost all of our indoor products. As you probably know, TEV's (or TXV's, as most of us call them) offer us more precise control over evaporator temperature. But did you know that most of our TXV's are now the non-bleed type? That is, they don't allow our refrigerant systems to equalize. While this feature is designed to shorten the time it takes for a system to stabilize after starting, it's the starting that most service techs are concerned with. Starting torque is increased dramatically in a non-bleed system where the compressor has to start against non-equalized pressures. This is usually not the case where our Climatuff scroll compressors are used, because most of these systems equalize, to some degree, through the compressor scroll plate. We do find that sometimes start components are needed where light dimming or objectionable noise occurs, even on scroll equipped machines.

On units equipped with the Climatuff reciprocating compressor (*yes, that means valves and pistons*) and a TXV, start components are always required. Consisting of a start capacitor, relay and associated wiring, a start kit will keep your system starting smoothly and reliably time after time.

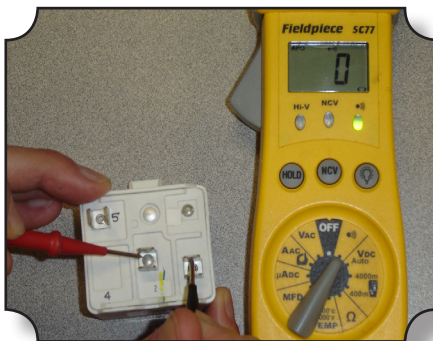
When a starting problem develops always look for the obvious such as a burned wire or terminal, ruptured or swollen capacitor cases, burned contactors, etc. When there is a problem with the hard start circuit, it is usually the potential (start) relay or a bad start capacitor, and sometimes it's both. If you find a blown start capacitor *always* replace the relay too!

If potential relay contacts fail to close then the start capacitor is never in the circuit. This will cause the compressor to have a hard time starting, or it will not start at all. If the relay contacts stick closed, the start capacitor will stay in the circuit all the time. The compressor will start one last time, and then the capacitor will fail (*and may explode!*). If the capacitor fails, then obviously, the compressor will experience starting problems or may not start at all except after very long off times.

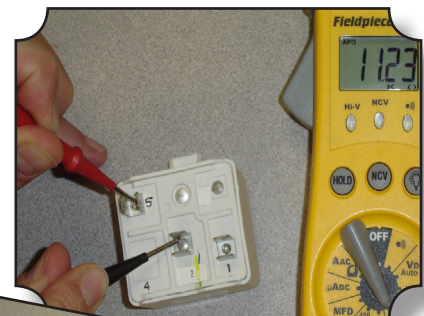
Diagnosis of Trane start components is quick *and painless!* **Just follow these easy steps:**

1. Disconnect power from the equipment and verify that voltage is 0 and that all capacitors are discharged.
2. To check potential relay contacts, remove the wires from the relay. Using your Ohm meter check for continuity between terminals 1 and 2. You should read 0 ohms (full continuity). If you read infinite ohms (open circuit), replace the relay. To check the potential relay coil, with wires still removed, check for continuity between relay terminals 2 and 5. If you read an open circuit, replace the relay. If you measure resistance, usually in the 8.5k to 15 k ohms range, the relay is typically OK.

Check for continuity between terminals 1 & 2



Check for continuity between relay terminals 2 & 5



3. Using your meter, check capacitance of the start and run capacitors. Compare readings against the mfd or uf values found on the capacitor case. Replace if needed with a capacitor of like value.

