Scot McDougal
37m ·

I did some "third party" testing for Patrick and here's what I found:

First, my brief background and disclaimer. I don't have a degree in electrical engineering, but have worked for over 32 years as a broadcast engineer designing, building, and maintaining radio stations. I've worked with electrical engineers and licensed electricians so I have a good knowledge base of what's below. Patrick sent me a Cable Cooler since I won the drawing (no one else entered) a few days ago. After I shared my findings, he asked me to write about what I saw and has not paid me to do this. These findings are based on what I see first hand and what I've learned through experience.

This is a brief explanation of why you shouldn't use more than 80% of the circuit's capacity on a continuous basis. A 15 amp circuit is designed to be used at 80% of that current (12 amps) for long-term operation, but will handle up to about 15 amps for short durations. Things like motors and refrigeration compressors, as in the HR, will pull more than their operating current for a brief period when they first start running.

My HR is a large, which requires a 20a circuit.

1) Being an engineer, first thing I did when I received the Cable Cooler was to take it apart! It appears to be well designed and solidly built.

2) The first photo shows the potential problem that the Cable Cooler could help with. If you look at the light blue connectors (spade lugs) you'll see some brown discoloration. That's ungood and is caused by heat over a period of time. This can be caused by two primary factors: too much current going through that connector, and/or a loose crimp that holds the wire in the spade lug. The crimps I've inspected in the HR have all looked very good, so that's probably not the issue here. Too much current over time is the other likely cause.

3) I'm reposting my original photo from a few days before, showing the current (amperage) draw where my cable to the machine comes out of my old 1960's fuse box in the house. It read 14.1 amps.

4) Below are also two new photos showing the current draw at the power input inside the freeze dryer. One showing before the Cable Cooler was installed and the other showing it with the Cable Cooler connected. With the HR in freeze dry mode (freezing/heating/vacuum all on together) the meter at the machine's input showed 13.8 amps. Remember I saw 14.1 amps at my fuse box the other day. This is due to a difference in line voltage from the power company and is normal. It's usually about 121 volts and when I took the reading of 13.8 amps the voltage was 124.1 volts. That voltage difference explains the current difference between the two days. I felt it important to show both input readings and explain why they were different, because I also wanted to show the input reading at the point where the overheating can be seen and I previously showed this reading in a different location. Otherwise it might look like I'm comparing apples with oranges. The Cable Cooler splits the input power to the HR and takes the pump current from a separate circuit in your home. The result is a lower current being drawn through the HR, lowering the chance of overheating the internal wiring.

During this testing I had an additional thought. Even if the internal wiring isn't a problem as it appears, or if HR re-engineers it to correct any wiring overheating, the CC would still help those with older machines, and there's still the issue of the end user needing a 20 amp circuit for a large freeze dryer that the Cable Cooler would help with. By taking the current used by the pump and moving it to a separate circuit in the home, you should be able to avoid the need for a 20 amp circuit. The user would have to make sure they are in fact using separate circuits and not just two outlets on the same circuit; the onus would be solely on the user to be sure of this.