

UPC20

We have a dealer who installed a UPC20 to control a zone of fluorescent lights. The load on the one relay of the UPC20 was 1431watts. The UPC20 began to "stick" in the on position, requiring the user to tap on the relay to get it to release. The UPC20 was replaced once, but within 4 days began to have the same problem again. Below is my response to his inquiry about "what's wrong here?"

Regarding your project memo in reference to the UPC20 relay that is failing:

I believe that the load you are controlling with the UPC20 is in excess of its capacity. The in-rush current of the ballasts on your 1431watt load is probably in the area of 2800 watts. This would be causing arcing on the relay contacts and over some period of time they would exhibit the symptoms you are seeing.

You may note in our catalog, that the RAD-SWM switch module, which is rated for a 10-amp load on general lighting, is rated for only 5 amps on fluorescent loads. This is because of the in-rush current required to start the ballasts. This 3600 watt rated unit would not be capable of handling the current draw of your load. ($1431W / 277V = 5.16A$)

Since the UPC20 was designed for straight power or motor loads, the rating for fluorescent ballasts are not noted. It seems appropriate that the unit should be de-rated in similar manner to the RAD-SWM module.

His basic concern is to find something that will work in his application. I explained to him that I couldn't do that because to do so, I would have to recommend someone else's product.

However, he is claiming that the relay in the UPC20 is rated at 30amps/277volts (this is printed right on the relay), and that the published rating is because of the CSA rating or 10amps/277volts (also printed on relay).

I honestly don't know if we rated the unit because of this or that but I promised to check into the why and wherefore of this issue.

So, my questions are:

1. Is my message above, anywhere close to the mark?
2. Why would a relay marked at 30a/277v be failing under these conditions?
3. Does the CSA vs. UL rating mean anything?
4. Is there something we can do to help him out?or....

Your response was headed the right way. What follows are answers to your specific questions:

1. Yes, your response was very much on track.
2. The relay in question (Aromat # JT1aE-12VDC) is a UL-recognized component, with a maximum rating @ 30A/ 277VAC. Aromat says that if the switching current peaks at 20A, the relay will last ~100,000 cycles. However no life expectancy specification is listed for contact-make current above 20A @ 277(!) Aromat "suggests" using a zero-cross-detection circuit with

a timer to ensure the contacts make as near as possible to the zero-cross as possible. This allows the contact-make current to remain below 20A while peaking at up to 30A. This would suggest to me that, without actually putting it in print, Aromat knows this relay cannot reliably switch currents in excess of 20A without suffering destructive degradation of the contacts due to contact welding & material transfer. Bottom line: if the inrush current exceeds 20A, trouble will soon follow.

3. Yes. UL has a component recognition program, which tests components for maximum ratings under ideal conditions. Once the component is "UL-Recognized", it can then be designed into products which must be tested separately to achieve "UL-listed" status. CSA, on the other hand, tests for maximum ratings under worst case conditions, i.e. no ventilation, extreme proximity to other components, etc. Therefore, CSA component ratings are always lower than UL-recognition ratings.

4. What we need to know is a) what does his 1431Watt load consist of, i.e. make, model #, & quantity (so we can look up the inrushcurrent specs), & b) how many feet of wire (approximate distance) are in the circuit. With the above info, we can begin to estimate the total inrush current, and then recommend appropriate protection measures. It may require the use of a Radia + RAD-INC modules in a satellite enclosures or some other combination of equipment, such as breaking up the load into smaller chunks & using multiple UPC20's to switch the chunks. It ain't pretty but we're not the only ones getting bitten by these new-fangled electronic, high-efficiency ballasts. Lutron has issued a disclaimer about trying to switch these things using their equipment saying "don't do it"!

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