A Heat Pump that is Not Performing at Full Capacity

BY JIM JOHNSON

The equipment in this month’s troubleshooting problem is a heat pump that has a four-stage heating system.

The customer is complaining that the unit is not heating enough when the temperature drops at night. This equipment is three-phase, in which the first stage of heating is the refrigeration system and stages 2, 3 and 4 are three 5-KW auxiliary heating elements. The electrical system is shown in Figures 1 and 2. The equipment operating voltage is shown in Figure 1, and the control voltage system, as well as the operating voltage for the auxiliary heating systems, is shown in Figure 2.

When you arrive during the day, the temperature is warmer than the night-time temperatures have been. The unit is operating normally in the heating mode with stage one of the heating system maintaining an acceptable comfort level in the building.

In order to accomplish a complete evaluation of the system, you take the necessary steps to initiate the 2nd, 3rd, and 4th stages of heat. Using a voltmeter and an ammeter, you find the following:

1. 220 V applied to 1H, 2H and 3H;
2. The manufacturer’s recommended current draw at point No. 31; and
3. A current draw of zero at points No. 33 and No. 35.

Your troubleshooting question is:
What specific repair do you have to accomplish in order to bring this unit back to its full operating capacity?

The answer to this month’s problem will be published in the March 2016 issue of RSES Journal.

If you have the answer to this question, submit your name, home address, a day and evening phone number, the month in which the question you are answering was published and your answer to: Jordan Brandes, Associate Editor, RSES Journal, 1911 Rohlwing Road, Suite A, Rolling Meadows, IL 60008-1397; email troubleshooting@rses.org; or fax to 847-297-5038. Make sure your answer is submitted by Jan. 31, 2015.

All correct answers will be entered into two drawings. The monthly drawing will be for a copy of Johnson’s video training program, “A Heat Pump That’s Not Delivering Any Air,” and the quarterly drawing will be for a Fieldpiece LT-17A digital meter.
And the winner is...

The answer to the November 2015 Troubleshooting problem, “A CO Problem in an Equipment Room,” is:

The main vent pipe has too much slope, making some of the risers too short. This caused CO spillage from unit No. 5, and also possible spillage from unit No. 3 and No. 4. The winner of the monthly drawing (from among 19 correct responses) is Mark Strope of Commisky, IN. The winner should call 520-625-6847 or email Johnson to facilitate shipment of their prize. Drawing must be claimed by March 31, 2016.

Jim Johnson, Director of Training, Technical Training Associates, develops technician training workshops, DVDs, audio books and e-books, many of which are available at the RSES online store. For information on Jim’s DVD training program, “Schematic Symbol Fundamentals and Translating What They Mean,” visit www.techtrainassoc.com, write PO Box 2259, Green Valley, AZ 85622-2259 or email jim@techtrainassoc.com.

WINNER

Mark Strope
Commisky, IN
is the winner of the November 2015 Troubleshooting Challenge.

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