PTCS Heat Pump Installation Quiz

Instructor: Bob Davis, Ecotope

Tech Name_____ Company_____

Training location _____Training date _____

1. A major goal of the PTCS specifications is to (circle one):
    a. Maximize heating output from the compressor (not from the strip heat)
    b. Maximize the size of your bid
    c. Maximize the customer's monthly electricity bill

2. The <u>minimum</u> amount of airflow across the indoor coil allowed by PTCS specs is
    a. 300 CFM/ton
    b. 400 CFM/ton
    c. 350 CFM/ton

3. True or false? A discharge air sensor may be used to control strip heat on single-capacity compressor systems (circle one): T F

4. What is the maximum temperature at which the compressor low ambient cut-out may be set to meet PTCS specs?
    a. 0° F
    b. 40° F
    c. 20° F

5. What is maximum amount of time you should expose an R410A system to the atmosphere?
    a. 15 minutes
    b. 5 minutes
    c. 0 minutes, you idiot!

6. If it isn't possible to measure system airflow at maximum (full flow), you should
    a. Give up and not measure flow
    b. Make a note of which stage/capacity you are testing and measure flow
    c. Use the temperature split method

7. It is important to wait at least 15 minutes after system start-up when measuring refrigerant pressures because
    a. That's what we were told to do.
    b. The system will be at something resembling steady-state and therefore give more reliable readings
    c. I needed a 15 minute break about now

8. It is important to follow the PTCS installation specifications and turn in paperwork promptly because
    a. The equipment will work better
    b. The customer will get their incentives quicker
    c. Someone might come in after you and take some measurements
    d. All of the above

9. True or false? We really don't need to measure external static and airflow when we have an ECM air handler since we always get the airflow we need. T F

10. When using the TrueFlow to get airflow, you measure a NSOP of 0.10 " water and then measure a TFSOP of 0.08" water. What is the Correction Factor to multiply by the raw flow?
    a. 80%
    b. 1.12
    c. 0.89

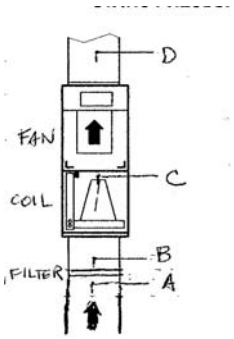
11. What is NOT an acceptable means of eliminating use of strip heat during mild (above 35° F outside) conditions?
    a. Outdoor sensor attached to a thermostat that supports the strip heat lockout function
    b. Close-on-fall switch installed in series with auxiliary heat circuit and set to activate at 35° F
    c. Indoor thermostat with adaptive recovery

12. Which of the following DOES NOT tend to improve heat pump performance?
    a. Heat pump size matched to house heat loss rate
    b. Ducts sized properly and sealed
    c. A nice coat of Turtle Wax on the outdoor unit

13. True or false? The only things you need to know to find raw (uncorrected) system airflow with the TrueFlow are plate number (14 or 20), ΔP across the plate, and a look-up table.
    T F

14. What are needed to make sure we have the right charge and no moisture in the lines?
    a. A refrigerant scale with 0.5 oz accuracy
    b. A vacuum pump with fresh oil
    c. A calibrated, airtight manifold gauge set
    d. A micron gauge
    e. All of the above

15. On systems which use multi-stage compressors (or more than one compressor) and a discharge air sensor control, what temperature does PTCS say is the maximum you can use to control staging?
    a. 90° F
    b. 85° F
    c. 95° F

16. If using an outdoor sensor as part of strip heat control, it is important to
    a. Calibrate the sensor using the mfr's information
    b. Place the sensor where it will not be affected by sunlight
    c. Keep the sensor from getting wet
    d. All of the above

17. On the sketch, indicate which combination of locations gives the correct external static pressure measurement for a heat pump:
    a. A-B
    b. B-C
    c. B-D