

DA07-DEC-172

Mr. Robert Cochell, Gulf Coast Air Systems, Inc. requests a clarification of the code concerning the installation of only one component of a split system air conditioning or Heat Pump system.

Situation: A homeowner's compressor (the pump in an outdoor unit) is inoperative and he is seeking replacement of that component only. Subject house was in Hillsborough County, 411 Skywood Dr. After replacing the outdoor unit only (at the customer's request) the system would not cool or heat satisfactorily (low capacity) and the addition of a TXV (thermal expansion valve) did not significantly remedy the situation. The change of the indoor unit was necessary to obtain the required capacity in cooling and heating and for the system to operate at all in heating without removing some of the refrigerant. In heating the pressures became too great and caused the high pressure switch to shut down the system.

Question #1:

Is the miss-matching of A/C and Heat Pump systems allowed under the Energy Code?

13-607.1.ABC.3.1.1 Equipment efficiency verification.
Equipment covered under the Federal Energy Policy Act of 1992 (EPACT) shall comply with U.S. Department of Energy certification requirements. For other equipment, if a certification program exists for a product covered in Tables 13-607.1.ABC.3.2A through 13-607.1.ABC.3.2D, and it includes provisions for verification and challenge of equipment efficiency ratings, then the product shall be either listed in the certification program or, alternatively, the ratings shall be verified by an independent laboratory test report. If no certification program exists for a product covered in Tables 13-607.1.ABC.3.2A through 13-607.1.ABC.3.2D, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Products covered in Table 13-607.1.ABC.3.2G shall have efficiency ratings supported by data furnished by the manufacturer. Where components, such as indoor or outdoor coils, from different manufacturers are used, a Florida-registered engineer shall specify component efficiencies whose combined efficiency meets the minimum equipment efficiency requirements in Section 13-607.1.ABC.3.2.

Background:

1. There are an estimated 12,000,000+ residential size A/C and Heat Pump systems in Florida. As these systems experience an average 10-year life span the new 13-SEER Federal mandated minimum SEER should offer some relief to the state's power grid as an estimated 50% of residential energy consumption is space conditioning.
2. The 1,000,000+ existing system replacement market is larger than the new construction market.
3. Empirical estimates of miss-matching are that capacity will suffer and efficiency of this combination will also be low. (Miss-match is defined as using a 10-SEER or lower efficiency air handler, or evaporator coil with a 13-SEER outdoor unit - or- the mixing of different manufacturer's equipment)
4. Independent analysis has recently become available through Alabama Power using actual run data. This confirms that a miss-match will experience low

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FILED, on this date, with the designated
Agency Clerk, receipt of which is hereby
acknowledged.

Miriam Sripes
Deputy Agency Clerk

9/10/07
Date

capacity, as much as 40+% lower than the "nameplate" would indicate. At the same time the efficiency is terrible, typically in the 8.5 SEER range.

5. This low capacity causes increased run time to "catch up" with the heat load.
6. The low efficiency causes an extra burden on the state's power grid. This is particularly injurious as the system that was replaced was typically the old Federal mandated 10-SEER. The additional electrical load is accentuated by the fact that the low capacity of the system will not cycling when the sun is applying solar load to the structure. This causes the power companies to run "peaking" units or purchase power to keep up with the increased demand.
7. The addition of a TXV (thermal expansion valve) does not "cure" the miss-match condition. The addition of more refrigerant will increase the cooling capacity but will peak at least ½ ton below the expected nameplate rating of the outdoor unit. With a Heat Pump it will not run in heating mode with the "best case" refrigerant charge for cooling.
8. The homeowner may be defrauded as he is not receiving the anticipated capacity or efficiency of the new component. He is certainly not aware of service aspects outlined in item 9.
9. Miss-matched Heat Pumps require the removal of refrigerant charge to operate in heating mode. In spring refrigerant must be "re-installed" to provide any cooling capacity. This removal and re-installation or refrigerant would occur each year until the indoor unit is changed to a matched component. This is significant expense.

Question #2:

Does the code require demonstration of compatibility, system capacity and system efficiency?

Question #3

Does the code require same manufacturer matches, will a letter from a manufacturer suffice or is ARI data (American Refrigeration Institute) required.