Amendment: Auxiliary Electric Energy of Ground Source Heat Pumps

Proponent: RESNET Technical Committee

Applies to: 2006 Mortgage Industry National Home Energy Rating Systems Standards
Section 303.5 Operating Condition Assumptions
Section 303.7 Minimum Rated Features

Proposed Amendment

Insert the following, and renumber subsequent sections as necessary:

**303.5.1.7** For ground-loop and ground-water heat pumps, the Auxiliary Electric Consumption shall be determined as follows:

$$\text{GSHP Auxiliary Electric Consumption (kWh/yr)} = \text{GSHP}_{\text{pump}} + \text{GSHP}_{\text{fan}}$$

Where:

- \(\text{GSHP}_{\text{pump}}\) in watts is the observed pump nameplate data (Volts * Amps) for all hours of heat pump operation. Amps may be taken from nameplate as Run Load Amps (RLA) or Full Load Amps (FLA). Alternatively, pumping energy that is measured on-site with a watt-hour meter, or using measured V*A may be substituted. Such measured pumping energy may be further adjusted for on-site measured duty cycle during heat pump operation, when pumping is intermittent during continuous heat pump operation.

- \(\text{GSHP}_{\text{fan}}\): If ducts are attached to the system to deliver heating or cooling, the external fan energy in watts, \(\text{GSHP}_{\text{fan}} = \text{(air flow in CFM} \times 0.5 \text{ CFM per watt)}\), shall be added for all hours of heat pump operation. The air flow in CFM shall be \(360 \times \text{rated cooling btu/h / 12,000}\), where 360 is the air flow in CFM per ton (12 kbtu/h) of capacity.

<table>
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<th>Table 303.7.1(1) Minimum Rated Features</th>
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<td>Equipment type, location, efficiency (AFUE, HSPF), auxiliary electric (Eae)</td>
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Background/Rationale:

Since the adoption of the 2006 RESNET standards, auxiliary electric energy has been a minimum rated feature for fossil-fuel heating equipment. For comparable treatment, auxiliary electric energy that is required for the operation of ground-source heat pumps should be included as a minimum rated feature. This amendment provides guidance for treatment of auxiliary electric energy in the reference and rated homes when a ground-source heat pump is present. Furthermore, the current ARI/ISO standard 13256 that is used to test these devices specifically excludes any fan power required to move air through ducts (rated at 0 external static pressure).