

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:

GSHP_{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.

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

Table 303.7.1(1) Minimum Rated Features

12. Heating Equipment	Equipment type, location, efficiency (AFUE, HSPF), auxiliary electric (Eae); power consumption of ground fluid circulating pump(s) for ground-loop and ground-water heat pumps.
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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).