

**INTERPRETATION IC 90.1-2013-4 OF
ANSI/ASHRAE/IES STANDARD 90.1-2013
Energy Standard for Buildings Except Low-Rise Residential Buildings**

Date Approved: January 24, 2015

Request from: Mike Kennedy, Mike D Kennedy, Inc., POB 1936, Port Townsend, WA 96368.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IES Standard 90.1-2013, Sections 6.5.3.2.1 and 6.5.3.5, relating to fan airflow control and fractional horsepower motors.

Background: Section 6.5.3.2.1 requires DX cooling equipment with capacity $\geq 75,000\text{kBtu}$ ($\geq 65,000\text{kBtu}$ as of 1/1/2016) and all hydronic and evaporative cooling equipment with fan motor size $\geq 0.25\text{hp}$ that “control the capacity of the mechanical cooling directly based on space temperature” to have lower air flow during “low cooling load and ventilation-only operation.” Typically, a 65,000kBtu DX system will have total fan horse power between 1 and 2 horsepower.

In addition, Section 6.5.3.5 applies to fan motors much smaller than 5 hp.

The confusion stems from the section language, which specifically relates to equipment with small fan motors that are typically less than 5 hp, being subsections of Section 6.5.3 whose charging sentence limits the applicability to systems over 5hp.

Complex HVAC systems with total nominal fan > 5 hp must comply with the fan airflow control and small fan efficiency provisions, but a possible interpretation of 6.5.3 suggests that single zone equipment or fractional horsepower fan motors in systems with $\leq 5\text{hp}$ do not. This despite the code provisions clearly addressing small systems.

Another factor is that the Section 6.3 Simple Path criteria, item b (6.3.2, item b) requires simple systems to specifically comply with 6.5.3.2.1. So simple equipment in buildings $< 25,000\text{ft}^2$ and complex HVAC systems with total nominal fan > 5 hp must comply with the fan airflow control, but the possible interpretation of 6.5.3 suggests that single zone equipment with fans $\leq 5\text{hp}$ in buildings $\geq 25,000\text{ft}^2$ do not.

The section language appears to be intended to apply to small equipment. This was proposed in 90.1-2010 addendum AQ which added Section 6.5.3.2.1 and deleted 90.1-2010 section 6.4.3.10. ASHRAE 90.1-2010 Section 6.4.3.10 established requirements for all single zone hydronic cooling equipment with fans $\geq 5\text{hp}$ and all single zone DX cooling equipment ≥ 10 tons to have reduced air flow during all by peak cooling conditions.

All supporting documentation in the addendum indicated the new language was more stringent and impacted more equipment by dropping the thresholds to 0.25 hp and 65,000 Btu/h.

Comments in the addendum state it “*makes changes to the requirements for fan control for both constant*

volume and VAV units including extending the fan part load power requirements down to 1/4 HP” and “Changes are being made to fan power requirements such that they agree with the requirements added for fan control in the mandatory section 6.4.3.10.”

Interpretation No.1: Section 6.5.3.2.1 requirements apply to all cooling system fans, as listed in Table 6.5.3.2.1 except as excluded in Section 6.5.3.2.1.

Question No.1: Is this interpretation correct?

Answer No.1: No

Comments: The intent of 6.5.3.2.1 was to require all fans to comply as you indicated above, however the sentence of 6.5.3 was not correspondingly modified, which resulted in a conflict in the standard. There are two conditions where 6.5.3.2.1 applies: 1) designs utilizing the simplified approach which has a direct reference to paragraph 6.5.3.2.1 and 2) fans in a HVAC system having a total fan system nameplate hp exceeding 5 hp. We are in process of drafting a proposal to correct this in the standard.

Interpretation No.2: Section 6.5.3.5 requirements apply to all fractional fan motors $\geq 1/12$ hp and < 1 hp except as excluded in Section 6.5.3.5.

Question No.2: Is this interpretation correct?

Answer No.2: No

Comments: Similar to comment above, though there is no direct reference from the simplified approach to this particular paragraph.