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Request for Official Interpretation

Thank you for your official interpretation request concerning ASHRAE 90.1-2016, 90.1-2019, 90.1-2022 and 90.1-2025

I. Section/Table Number

6.5.1.3

II. Background Information

Addendum u to Standard 90.1-2022 addressed an issue with the 50% turndown airflow for multi-zone systems. This 50% was noted as being well above the minimum design ventilation rates for typical buildings using multizone VAV systems. A difference was noted between the requirements of a single-zone VAV DX unit and these multizone VAV DX units. The proposed change noted the significant energy savings and potential elimination of bypass ducts. To address the issue, Section 6.5.3.2.1 Supply Fan Airflow Control was modified to clarify the difference in requirements between a Single-zone VAV DX unit and all other units, including Multiple-zone VAV DX units, as noted below and subsequently included in ASHRAE 90.1-2025. This addendum, however, did not address Section 6.5.1.3 related to Integrated Economizer Controls where there is reference to those same systems, but where there was no clarifying language added. This creates some confusion within the standard.

6.5.3.2 Fan Control

6.5.3.2.1 Supply Fan Airflow Control. Each cooling system listed in Table 6.5.3.2.1 shall be designed to vary the supply fan airflow as a function of load and shall comply with the following requirements:

- a. Single-zone VAV DX and chilled-water cooling units that control the capacity of the mechanical cooling directly based on space temperature shall have a minimum of two stages of fan control. Low or minimum speed airflow shall not exceed 66% of full-speed design airflow. At low or minimum speed airflow, the fan system shall draw no more than 40% of the fan power at full fan speed design airflow. Low or minimum speed airflow shall be used during periods of low cooling load and ventilation-only operation.
- b. All other units, including multiple-zone VAV DX cooling units and chilled-water units that control the space temperature by modulating the airflow to the space, shall have modulating fan control. Minimum speed supply fan airflow shall not exceed ~~50%~~ the greater of 15% of design airflow or the design minimum outdoor air rate full speed. ~~At minimum speed, the fan system shall draw no more than 30% of the power at full fan speed.~~ Low or minimum speed airflow shall be used during periods of low cooling load

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and ventilation-only operation. Mechanical cooling, economizer, and ventilation shall not limit the unit from operating at minimum supply fan airflow.

- c. Units that include an air economizer to meet the requirements of Section 6.5.1 shall have a minimum of two speeds of fan control during economizer operation.

Exceptions to 6.5.3.2.1:

1. Modulating fan control is not required for chilled-water and evaporative cooling units with <1 hp (0.75 kW) fan motors if the units are not used to provide ventilation air and if the indoor fan cycles with the load.
2. If the volume of *outdoor air* required to meet the *ventilation* requirements of Standard 62.1 at low speed airflow exceeds the air that would be delivered at the speed airflow defined in Section 6.5.3.2.1(a) or 6.5.3.2.1(b) then the minimum speed airflow shall be selected to provide the required *ventilation air*.

6.5.1.3 Integrated Economizer Control. Economizer systems shall be integrated with the *mechanical cooling system* and be capable of and configured to provide partial cooling even when additional *mechanical cooling* is required to meet the remainder of the cooling load. Controls shall not false load the *mechanical cooling systems* by limiting or disabling the economizer or by any other means, such as hot-gas bypass, except at the lowest stage of *mechanical cooling*.

Units that include an *air economizer* shall comply with the following:

- a. Unit controls shall have the *mechanical cooling* capacity control interlocked with the *air economizer* controls such that the *outdoor air damper* is at the 100% open position when *mechanical cooling* is on, and the *outdoor air damper* does not begin to close to prevent coil freezing due to minimum compressor run time until the leaving air temperature is less than 45°F.
- b. DX units with a rated capacity no less than 65,000 Btu/h that *control* the capacity of the *mechanical cooling* directly based on occupied *space* temperature shall have a minimum of two stages of *mechanical cooling* capacity.
- c. All other DX units, including those that *control space* temperature by modulating the airflow to the *space*, shall comply with the requirements of Table 6.5.1.3.

III. Interpretation

Please provide your interpretation of the requirement(s). Present your interpretation in such a way as to allow for a yes or no answer by the applicable committee. The question below will be presented to the applicable committee for response.

While Section 6.5.3.2.1 was modified to address the different requirements between single-zone VAV DX units and all other DX units, including multiple-zone VAV DX units, we believe this same interpretation should be made in Section 6.5.1.3. Section 6.5.1.3b. DX units should be interpreted to mean Single-zone VAV DX units while 6.5.1.3c. should be interpreted to mean All other DX units, including multiple-zone VAV DX units for the same reasons as were noted in the prior Addendum. Since the above-mentioned sections were initially added to ASHRAE 90.1 from 2013, the same interpretations related to requirements differences between single-zone and multizone systems should be used. This would include the following editions of ASHRAE 90.1. ~~90.1-2013~~ 90.1-2016 90.1-2019 90.1-2022 90.1-2025

IV. Supplementary information

Enter any additional information that provides additional context for your question (charts, drawings, etc).

None

V. Question: Is this interpretation correct?

This question will be presented to the applicable project committee for a response

VI. Answer: Yes

The cognizant Project Committee or Interpretation Committee will provide a yes or no answer.

VII. Comments: 90.1-2013 is not applicable for this request; therefore the committee has removed it.

The cognizant Project Committee or Interpretation Committee may provide additional comments.

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