ADDENDA

**ASHRAE Addendum d to**
**ASHRAE Guideline 36-2021**

# High-Performance Sequences of Operation for HVAC Systems

Approved by ASHRAE and the American National Standards Institute on February 29, 2024.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
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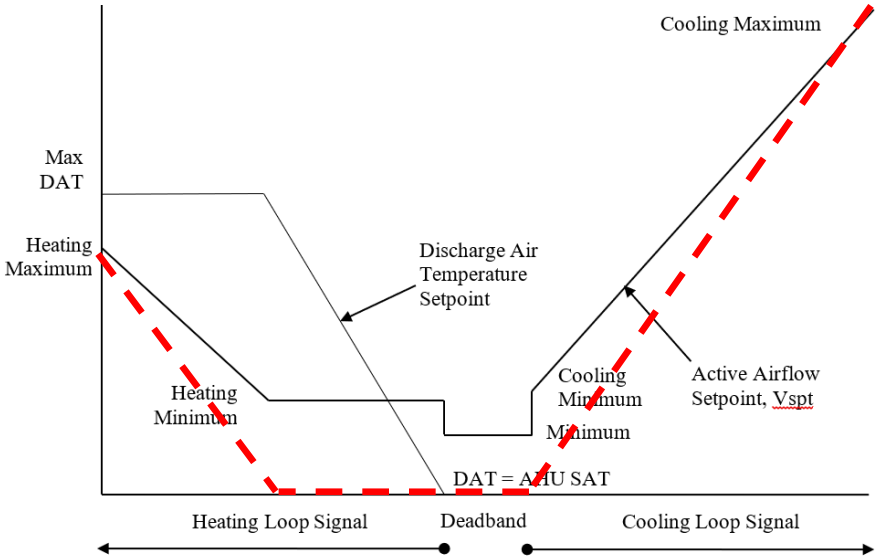
**(This foreword is not part of this guideline. It is merely informative and does not contain requirements necessary for conformance to the guideline)**

# FOREWORD

*This addendum addresses an issue with heating control for VAV boxes with hot water reheat coils when Vmin* is zero due to no occupancy indicated by the occupancy sensor in occupied-standby mode. In this case, the zero airflow is carried beyond the deadband into the heating regime for hot water (HW) systems for which Vheat-min is zero, as shown in red:*



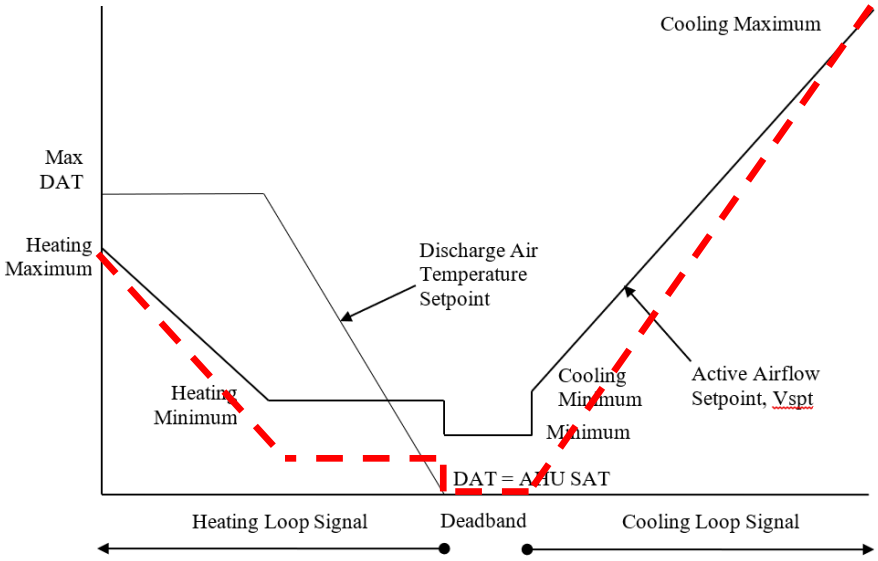

*At the same time, the discharge air temperature setpoint is reset upwards and the HW valve is enabled to maintain that temperature. But without airflow, this is not possible and the heating system will likely go to 100% without impact (other than that due to damper leakage or natural convection). Furthermore, heating may be potentially locked out altogether: with no airflow, the DAT will not rise and the logic below will not allow the airflow to be reset upwards unless the DAT is warmer than the space.*

b. From 51% to 100%, if the DAT is greater than room temperature plus 3°C (5°F), the heating-loop output shall reset the active airflow setpoint from the heating minimum endpoint to the heating maximum endpoint.

*The solution proposed in this addendum is to add another variable, the lowest possible airflow setpoint allowed by the controls (Vm), aka the controllable minimum, to the Heating Minimum endpoint expression during Occupied Mode.*

| | |
|---|---|
| *Heating minimum* | *Max (Vheat-min, Vmin*, Vm)* |

*The result will be as shown in red below:*



***Note: In this addendum, changes to the current guideline are indicated in the text by underlining (for additions) and strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes.***

**Addendum d to Guideline 36-2021**

*(IP and SI Units)*
*Modify Table 5.6.4 as follows:*

**Table 5.6.4 Endpoints as a Function of Zone Group Mode**

| Endpoint | Occupied | Cooldown | Setup | Warmup | Setback | Unoccupied |
|---|---|---|---|---|---|---|
| Cooling maximum | Vcool-max | Vcool-max | Vcool-max | 0 | 0 | 0 |
| Cooling minimum | Vmin* | 0 | 0 | 0 | 0 | 0 |
| Minimum | Vmin* | 0 | 0 | 0 | 0 | 0 |
| Heating minimum | Max (Vheat-min, Vmin*, Vm) | Vheat-min | 0 | Vheat-max | Vheat-max | 0 |
| Heating maximum | Max (Vheat-max, Vmin*) | Vheat-max | 0 | Vcool-max | Vcool-max | 0 |

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ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

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The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

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As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

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