



ADDENDA

**ASHRAE Addendum a to
ASHRAE Guideline 36-2024**

High-Performance Sequences of Operation for HVAC Systems

Approved by ASHRAE on February 27, 2026.

This addendum was approved by a Standing Guideline Project Committee (SGPC) 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 guideline. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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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

Addendum a provides two improvements for the fan array staging logic.

- *The current requirement calls for fans to begin at the lowest Stage 1 with a default 15-minute time delay for each stage. For a fan system with many stages, the time it takes to achieve the required number of stages can be hours long. The logic has now been tested in multiple buildings and found to be stable with a lower default time delay between stages of 5 minutes for both supply and return fan arrays.*
- *Stage up logic is only based on the efficiency criterion of basing fan staging on the percentage of current supply airflow. But more fan stages may also be needed depending on which zones in the system require airflow due to differences in duct distribution. So a failsafe conditional is added to stage up also if the current duct static pressure setpoint is not being maintained. This can also help speed up staging for systems with many stages that start with most or all zone groups enabled.*

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

Addendum a to Guideline 36-2024

(IP and SI units)

Revise Section 5.16.1.1.c. as follows:

5.16 Multiple-Zone VAV Air-Handling Unit

5.16.1. Supply Fan Control

5.16.1.1. Supply Fan Start/Stop

- a. Supply fan shall run when system is in the Cooldown Mode, Setup Mode, or Occupied Mode.
- b. If there are any VAV-reheat boxes on perimeter zones, supply fan shall also run when system is in Setback Mode or Warmup Mode (i.e., all modes except unoccupied).

Retain the following if the AHU has multiple supply air fans in an array, each with non-powered backdraft dampers. If VFDs are used, they may each serve multiple fan motors. If ECMs are used, each fan can be controlled individually. But there is little energy value to having more than 6 stages so if there are more than 6 VFDs/ECMs, they should be grouped to be controlled with six digital outputs.

- c. Staged supply fan controls
 1. VFD/ECM groups shall be lead/lag controlled per Section 5.1.15.
 2. When supply fans are enabled to run, start the lead supply fan VFD/ECM group. When %-supply airflow (totalized enabled VAV box setpoints (not readings) divided by design AHU airflow) exceeds stage-up setpoint (below) for ~~15~~ 5 minutes, or the current static pressure has been more than 10% below the static pressure setpoint for 5 minutes, then the next lag supply fan shall run. All VFDs/ECMs receive the same speed signal. When %-airflow falls below the stage-up setpoint for ~~15~~ 5 minutes then the last lag VFD/ECM group shall be staged off. Each stage shall have its own PID gains, separately tuned. Any VAV box whose setpoint is not known (e.g. due to loss of communication) shall be assumed to be at its maximum airflow setpoint Vmax.

Revise Section 5.16.11.1.a. as follows:

5.16.11. Return-Fan Control – Airflow Tracking

- 5.16.11.1. Return fan operates whenever associated supply fan is proven ON and shall be off otherwise.

Retain the following if the system has multiple return fans in an array, each with non-powered backdraft dampers. If VFDs are used, they may each serve multiple fan motors. If ECMs are used, each fan can be controlled individually. But there is little energy value to having more than 6 stages so if there are more than 6 VFDs/ECMs, they should be grouped to be controlled with six digital outputs. Staging logic does not match supply air fan array staging setpoints because there is little or no minimum discharge air pressure that must be maintained so the return fan performance will more closely follow the ideal system curve.

- a. Staged return fan controls
 1. VFD/ECM groups shall be lead/lag controlled per Paragraph 5.1.15.
 2. When return fans are enabled to run, start the lead return fan VFD/ECM group. When %-return airflow setpoint (equal to the return air fan airflow setpoint determined below divided by total design return airflow) exceeds stage-up setpoint in the table below for ~~15~~ 5 minutes then the next lag return fan shall run. All VFDs/ECMs receive the same speed signal. When %-airflow falls below the stage-up setpoint in the table below for ~~15~~ 5 minutes then the last lag VFD/ECM group shall be staged off. Each stage shall have its own PID gains, separately tuned.

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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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