



**Addendum t to  
ASHRAE Guideline 36-2018**

**Public Review Draft**

# **Proposed Addendum t to Guideline 36-2018, High-Performance Sequences of Operation for HVAC Systems**

**First Public Review (November 2020)  
(Draft shows Proposed Changes to Current Guideline)**

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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. It has not been processed according to the ANSI requirements for a guideline and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)**

## FOREWORD

*This addendum is to clarify that a single building pressure loop should be used for each pressure zone. This addendum also provides direction on which building pressure sensor(s) to use as the control loop input and provides options for relief fans that do not share a common relief fan inlet plenum. Informative text is added to remove Stage 0 (barometric) relief if the return air pressure drop is high.*

*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. Only these changes are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed substantive changes.*

### Addendum t to Guideline 36-2018

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*(IP and SI Units)*

*Revise Section 5.16.9 as follows:*

#### 5.16.9 Relief-Fan Control

*A pressure zone is defined as an enclosed area with interconnected return paths. The appropriate boundaries for pressure zones, establishing which relief fans run together and which building pressure sensors are used, will need to be determined by the engineer based on building geometry.*

*Relief fans are enabled and disabled with their associated supply fans, but all relief fans that are running and serve a ~~common volume of space~~ pressure zone run at the same speed. All operating relief fans that serve a ~~common/shared air volume~~ pressure zone shall be controlled as if they were one system, running at the same speed and using the same control loop, even if they are associated with different AHUs. For example, if two AHUs share a pressure zone, their relief fans should be controlled together as one system, while both AHUs are operating.*

*This prevents relief fans from fighting each other, which can lead to flow reversal or unstable fan speed control and space pressurization problems.*

*The appropriate boundaries between relief systems, establishing which relief fans run together, will need to be determined by the engineer based on building geometry.*

5.16.9.1 All operating relief fans that serve a ~~common/shared air volume~~ pressure zone shall be grouped and controlled as if they were one system, running at the same speed when enabled and using the same control loop, even if they are associated with different AHUs.

5.16.9.2 A relief fan shall be enabled when its associated supply fan is proven ON, and shall be disabled otherwise.

5.16.9.3 Building static pressure shall be time averaged with a sliding 5-minute window and 15 second sampling rate (to dampen fluctuations). The averaged value shall be that displayed and used for control.

- a. Where multiple building pressure sensors are used, each shall be time-averaged and the highest of the averaged values for sensors within a pressure zone shall be used for control.

5.16.9.4 A single P-only control loop for each pressure zone shall maintains the building pressure at a set point of 12 Pa (0.05 in. of water) with an output ranging from 0% to 100%. The loop shall be enabled when any supply fan within the pressure zone is proven ON. The loop is disabled ~~and with output set to zero when all fans in the relief system group are disabled~~ otherwise.

*The following is intended to use barometric relief as the first stage and then maintain many fans on at low speed to minimize noise and reduce losses through discharge dampers and louvers. Fans are staged OFF only when running at minimum speed is reached.*

*For best results, fan speed minimums should be set as low as possible.*

5.16.9.5 Fan speed signal to all operating fans in the relief system group shall be the same and shall be equal to the PID signal but no less than the minimum speed. Except for Stage 0, discharge dampers of all relief fans shall be open only when fan is commanded ON.

*In some installations, the relief fan inlet plenum may also be the return plenum to the AHU mixed air plenum, in which case, the pressure in this plenum may be drawn negative relative to the outdoors by the supply air fan drawing return air from this plenum. This can occur when the return path has a fairly high pressure drop. If the engineer is concerned that this may occur, Stage 0 and references to it should be deleted.*

- a. Stage 0 (barometric relief). When relief system is enabled, and the control loop output is above 5%, open the motorized dampers to all relief fans serving the relief system group that are enabled; close the dampers when the loop output drops to 0% for 5 minutes.
- b. Stage Up. When control loop is above minimum speed plus 15%, start stage-up timer. Each time the timer reaches 7 minutes, start the next relief fan (and open the associated damper) in the relief system group, per staging order, and reset the timer to 0. The timer is reset to 0 and frozen if control loop is below minimum speed plus 15%.
  1. ~~Note, when~~ For systems where relief fans share a common relief fan inlet plenum: When staging from Stage 0 (no relief fans) to Stage 1 (one relief fan), the discharge-relief dampers of all nonoperating relief fans must be closed.
  2. For systems where relief fans do not share a common relief fan inlet plenum: When staging from Stage 0 (no relief fans) to Stage 1 (one relief fan), the discharge dampers of all nonoperating relief fans shall remain open when the associated supply fan is proven ON.
- c. Stage Down. When PID loop is below minimum speed, start stage-down timer. Each time the timer reaches 5 minutes, shut off lag fan per staging order and reset the timer to 0. The

timer is reset to 0 and frozen if PID loop rises above minimum speed or all fans are OFF. If all fans are OFF, go to Stage 0 (all dampers open and all fans OFF).

5.16.9.6 For fans in a Level 2 alarm and status is OFF, discharge damper shall be closed when stage is above Stage 0.