ADDENDA

ASHRAE Addendum s 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.

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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 revises the trim and respond resets to direct the designer on how to set the default number of ignored requests for each application, rather than provide a fixed value that will not be appropriate for many applications.

Trim and respond setpoint reset logic is an energy efficiency strategy that aims to reduce energy use during periods of low demand while still ensuring responsiveness to meet loads during periods of higher demand. The responsiveness of the reset logic can be adjusted by changing the number of ignored requests (I). The reset will be more responsive to demand when the number of ignores is set to a low value and will provide more energy efficiency when the number of ignores is set to a higher value. In general, the number of ignores should be considered based on the size of the system and the total number of associated zones and systems that can generate requests. The original language set a default value of 2 for most resets, which was seldom changed in practice when applied to projects. For many larger systems, this may sacrifice energy efficiency opportunities with resetting setpoints.

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 s to Guideline 36-2021

(IP and SI Units)

Revise Section 5.1.14.3 as follows:

5.1.14.3. For each upstream system or plant setpoint being controlled by a T&R loop, define the following variables. Initial values are defined in system/plant sequences below. Values for trim, respond, time step, etc. shall be tuned to provide stable control. See Table 5.1.14.3.

Table 5.1.14.3 Trim & Respond Variables

Variable	Definition
Device	Associated device (e.g., fan, pump)
SP0	Initial setpoint
SPmin	Minimum setpoint
SPmax	Maximum setpoint
Td	Delay timer
T	Time step
I	Number of ignored requests
R	Number of requests from zones/systems
SPtrim	Trim amount

SPres	Respond amount (must be opposite in sign to SPtrim)
SPres-max	Maximum response per time interval (must be same sign as SPres)

Informative Note: The number of ignored requests (I) can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer. The number of ignored requests ~~(I)~~ should be set to zero for critical zones or air handlers.

Revise Section 5.16.1.2 as follows:

5.16.1.2. Static Pressure Set-Point Reset

a. Static pressure setpoint. Setpoint shall be reset using T&R logic (see Section 5.1.14) using the parameters shown in Table 5.16.1.2.

Table 5.16.1.2 Trim & Respond Variables

Variable	Value
Device	Supply fan
SP0	120 Pa (0.5 in. of water)
SPmin	25 Pa (0.1 in. of water)
SPmax	Max_DSP (see Section 3.2.1.1)
Td	10 minutes
T	2 minutes
I	~~2~~See note
R	Zone static pressure reset requests
SPtrim	–12 Pa (–0.05 in. of water)
SPres	15 Pa (+0.06 in. of water)
SPres-max	32 Pa (+0.13 in. of water)

Informative note: The number of ignored requests can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer.

Revise Section 5.16.2.2.b as follows:

b. During Occupied Mode and Setup Mode, setpoint shall be reset from Min_ClgSAT when the outdoor air temperature is OAT_Max and above, proportionally up to T-max when the outdoor air temperature is OAT_Min and below.

1. T-max shall be reset using T&R logic (see Section 5.1.14) between Min_ClgSAT and Max_ClgSAT. The parameters shown in Table 5.16.2.2 are suggested as a starting place, but they will require adjustment during the commissioning/tuning phase.

The T&R reset parameters in Table 5.16.2.2 are suggested as a starting place; they will most likely require adjustment during the commissioning/tuning phase.

Table 5.16.2.2 Trim & Respond Variables

Variable	Value
Device	Supply fan
SP0	SPmax
SPmin	Min ClgSAT
SPmax	Max ClgSAT
Td	10 minutes
T	2 minutes
I	~~2~~See note
R	Zone cooling SAT requests
SPtrim	+0.1°C (+0.2°F)
SPres	–0.2°C (–0.3°F)
SPres-max	–0.6°C (–1.0°F)

Informative note: The number of ignored requests can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer.

Revise Section 5.17.1.2 as follows:

5.17.1.2. Static Pressure Set-Point Reset

a. Static pressure setpoint. Setpoint shall be reset using T&R logic (see Section 5.1.14) using the parameters shown in Table 5.17.1.2.

Table 5.17.1.2 Trim & Respond Variables

Variable	Value
Device	Supply fan
SP0	120 Pa (0.5 in. of water)
SPmin	25 Pa (0.1 in. of water)
SPmax	Max_DSP (see Section 3.2.1.1)

Td	10 min
T	2 min
I	~~2~~See note
R	Zone hot-duct static pressure reset requests
SPtrim	–12 Pa (–0.05 in. of water)
SPres	15 Pa (+0.06 in. of water)
SPres-max	32 Pa (+0.13 in. of water)

Informative note: The number of ignored requests can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer.

Revise Section 5.17.2.2 as follows:

5.17.2.2. Supply Air Temperature Setpoint

a. During Occupied Mode, setpoint shall be reset using T&R logic (see Section 5.1.14) between 21°C (70°F) and Max_HtgSAT. See Section 3.1.5.1 for Max_HtgSAT.

The T&R reset parameters in Table 5.17.2.2 are suggested as a starting place; they will most likely require adjustment during the commissioning/tuning phase.

Table 5.17.2.2 Trim & Respond Variables

Variable	Value
Device	Heating Supply fan
SP0	SPmax
SPmin	21°C (70°F)
SPmax	Max HtgSAT
Td	10 minutes
T	2 minutes
I	~~2~~See note
R	Zone heating SAT requests
SPtrim	–0.2°C (–0.4°F)
SPres	+0.3°C (+0.6°F)
SPres-max	+0.8°C (+1.4°F)

Informative note: The number of ignored requests can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer.

Revise Section 5.20.5.2.c as follows:

c. CHW Plant Reset variable shall be reset using Trim & Respond logic with the ~~following~~ parameters shown in Table 5.20.5.2:

Table 5.20.5.2 Trim & Respond Variables

Variable	Value
Device	Any CHW Pump Distribution Loop
SP_0	100%
SP_{min}	0%
SP_{max}	100%
T_d	15 minutes
T	5 minutes
I	~~2~~See note
R	Cooling CHWST Reset Requests
SP_{trim}	-2%
SP_{res}	+3%
$SP_{res-max}$	+7%
Informative note: The number of ignored requests can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer.	

Revise Section 5.20.5.4 as follows:

5.20.5.4. Coil Pumped Loops: Chilled water supply temperature setpoint, CHWSTsp, shall be reset using Trim & Respond logic with the ~~following~~ parameters shown in Table 5.20.5.4:

Table 5.20.5.4 Trim & Respond Variables

Variable	Value
Device	Any CHW Pump
SP_0	CHWSTmin
SP_{min}	CHWSTmin
SP_{max}	15.6°C (60°F)
T_d	15 minutes
T	5 minutes
I	~~2~~See note
R	Cooling CHWST Reset Requests
SP_{trim}	+0.4°C (+0.75°F)
SP_{res}	-0.6°C (-1°F)

$SP_{res-max}$	-1.4°C (-2.5°F)
Informative note: The number of ignored requests can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer.	

Revise Section 5.21.4 as follows:

5.21.4. Hot Water Supply Temperature Reset

5.21.4.1. Plant hot water supply temperature setpoint shall be reset using Trim & Respond logic with the ~~following~~ parameters shown in Table 5.21.4.1:

Table 5.21.4.1 Trim & Respond Variables

Variable	Value
Device	Any HW Pump Distribution Loop
SP_0	SP_{max}
SP_{min}	32.2°C (90ºF) for condensing and hybrid boiler plants; 68.3°C (155°F) for non-condensing plants
SP_{max}	HWSTmax
T_d	10 minutes
T	5 minutes
I	~~2~~See note
R	Hot-Water Reset Requests
SP_{trim}	-1.1°C (-2ºF)
SP_{res}	+1.7°C (+3ºF)
$SP_{res-max}$	+3.9°C (+7ºF)
Informative note: The number of ignored requests can be adjusted to balance responsiveness to demand (fewer ignores) vs energy efficiency (more ignores). The value that is set should be considered as a function of the total number of downstream zones or systems that can send requests. As a default, set the number of ignored requests to 10% of the total downstream zones or systems, rounded to the nearest integer.	

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