

ASHRAE Research Project 1747 implementing DCV in a multiple-zone VAV system

ASHRAE RP-1747 Implementation of RP-1547
CO₂-based Demand Controlled Ventilation for
Multiple-Zone HVAC Systems in Direct Digital
Control Systems

Final Report

Prepared for
Project Monitoring Subcommittee
ASHRAE Technical Committee TC 4.3
Ventilation Requirements and Infiltration

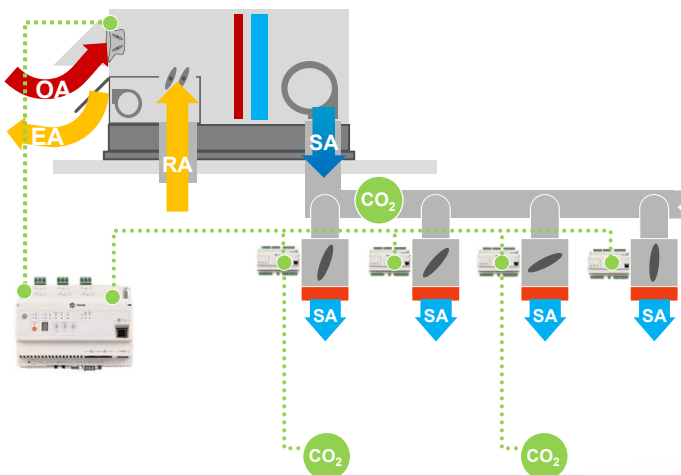
“Valid logic was developed in Research Project 1547, but it is not readily implemented in real control systems.

This project will develop practical control sequences, then test them in a real-world building environment with a commercial-grade DDC system.”

RFP for ASHRAE Research Project 1747

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VAV controller

- Dynamically calculates current outdoor airflow (V_{oz}) required
- Resets zone minimum primary airflow settings
 - If primary air is rich with OA, reduce minimum setting
 - Otherwise, increase minimum setting (prevent $V_{ot} > V_{ot-design}$)

System controller

- Dynamically calculates current system intake airflow (V_{ot})

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ASHRAE Research Project 1747

implementing DCV in a multiple-zone VAV system

- Requires additional CO₂ sensor in primary airstream
- Requires means to measure and control *total* outdoor airflow at the central air handler (including additional OA when economizing)

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Summary

demand-controlled ventilation

- ASHRAE 62.1 allows DCV as zone population changes
- ASHRAE 90.1 is requiring DCV in more space types
- Consider CO₂-based DCV in densely-occupied zones with widely-varying population
- Use other DCV technologies (occupancy sensors, schedules, people counting) where they make sense
- Correctly integrate DCV with airside economizing and building pressure control

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 - Trends in Small Rooftop Systems
 - All-Variable Speed Compressors on Chillers
-and so many more!







Bibliography

October 2018

Demand-Controlled Ventilation

Industry Resources

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ASHRAE, Inc. *Standard 62.1 User's Manual*. Available from www.ashrae.org/bookstore

ANSI/ASHRAE/IES *Standard 90.1-2016: Energy Standard for Buildings Except Low-Rise Residential Buildings*. Available from www.ashrae.org/bookstore

ASHRAE, Inc. *Implementation of RP-1547 CO₂-based DCV for Multiple-Zone Systems in DDC Systems*. Research Project 1747. Available from www.ashrae.org/technical-resources/research/research-reports

Trane Resources

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