



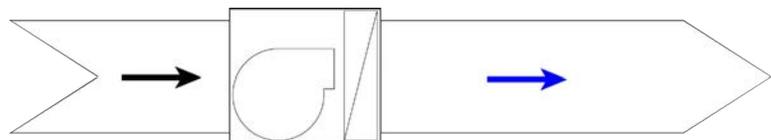
VAV Zoning Made Easy

White Paper



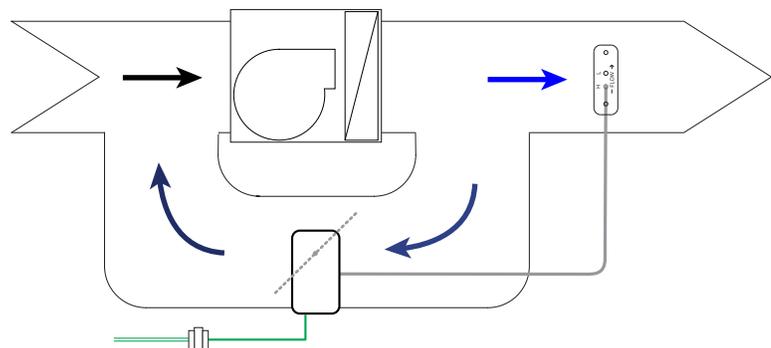
The Quest for Better Temperature Control

For years, inexpensive light-commercial systems typically consisted of an **RTU (Roof Top Unit)** or **HPU (Heat Pump Unit)** packaged unit with a number of **CAV (Constant Air Volume)** or pressure-dependent **VAV (Variable Air Volume)** zones.



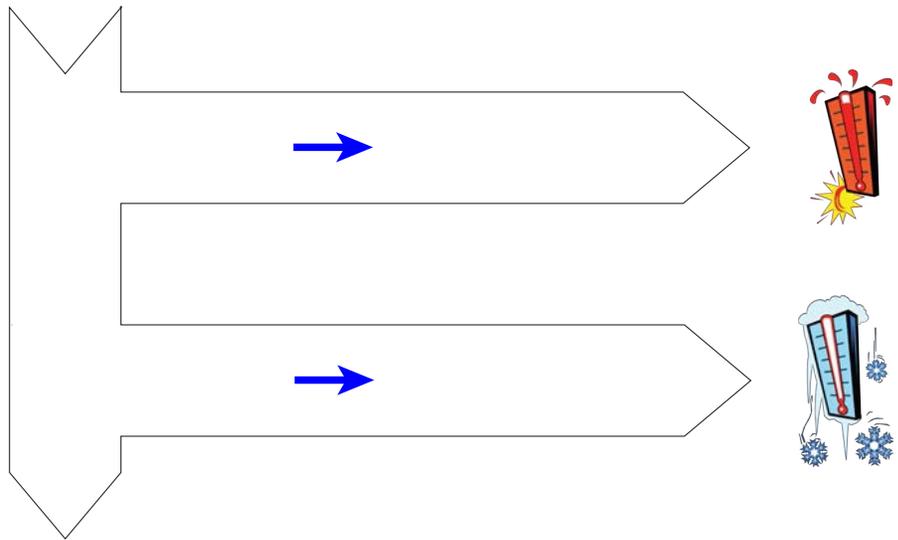
Basic HPU or RTU

CAV systems were made somewhat “variable volume” by dumping a portion of the air through a pressure-controlled bypass damper into the return air stream. This was to maintain a minimum flow across the coils as demands from the local zones varied.



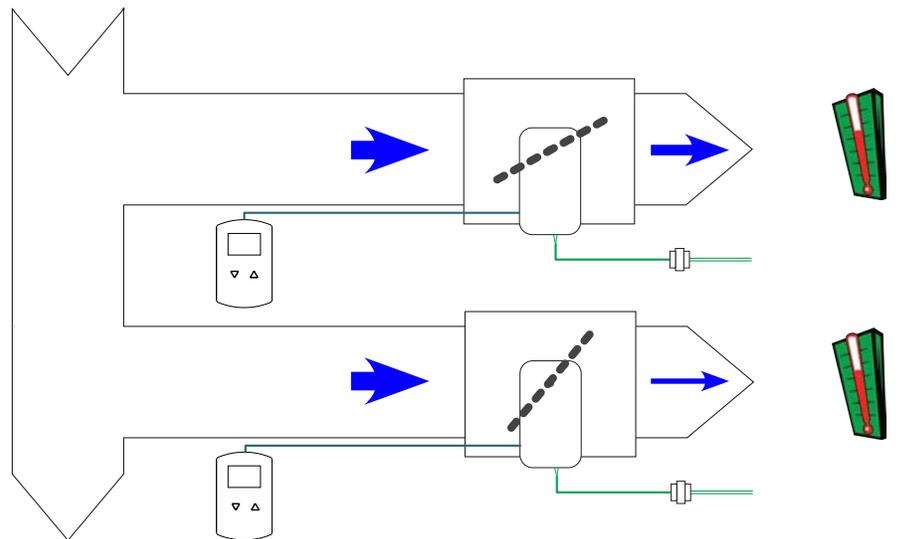
HPU or RTU with Bypass

CAV spaces were quite challenged by varying conditions. Varying occupancy or outside conditions often led to spaces that became too hot or too cold and then stayed that way for long periods of time.



CAV with Different Space Conditions

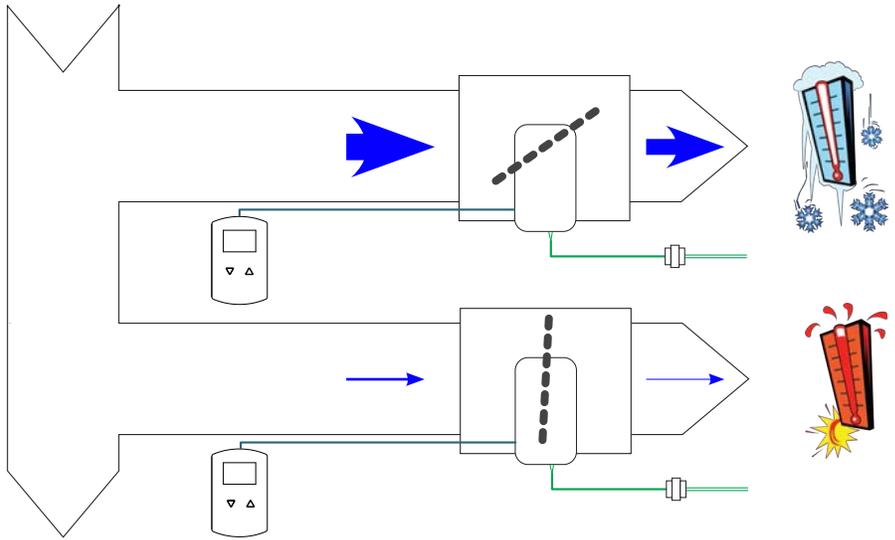
A better approach was a low-priced pressure-dependent VAV system. It compensated for varying conditions, although consistent control was still a challenge.



Pressure Dependent VAV with Different Space Conditions

The operation of one damper was affected by the actions of dampers in other zones, and no minimum air flows into the spaces were maintained. If one zone was satisfied, and the damper closed completely, other zones would suddenly have more air flow. This would often overcool the other spaces before the system would compensate. And without a minimum air flow, the first space could soon get stuffy and too warm before the system finally responded.

Setup of these systems was always a challenge, especially when operating during spring or fall seasonal changeover and when the spaces were subjected to variations in occupancy and other common tenant conditions.

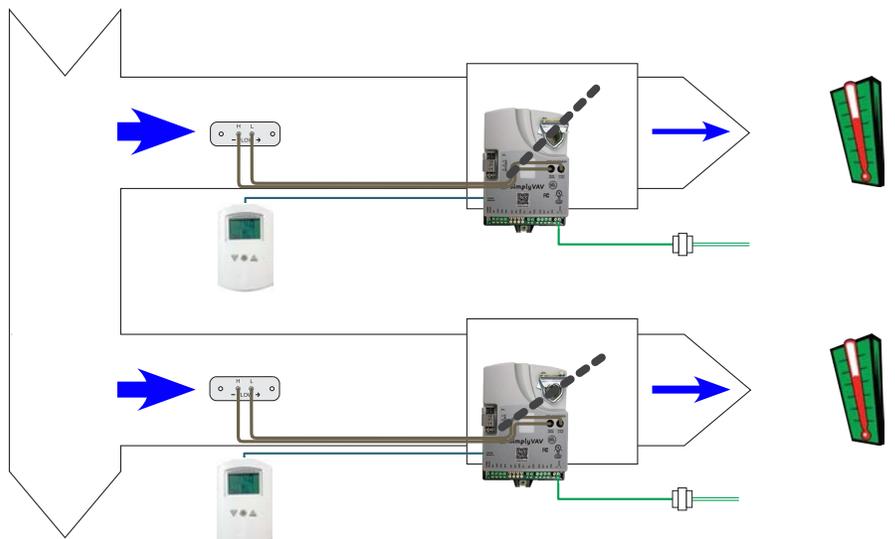


Pressure Dependent VAV with Changing Duct Pressures

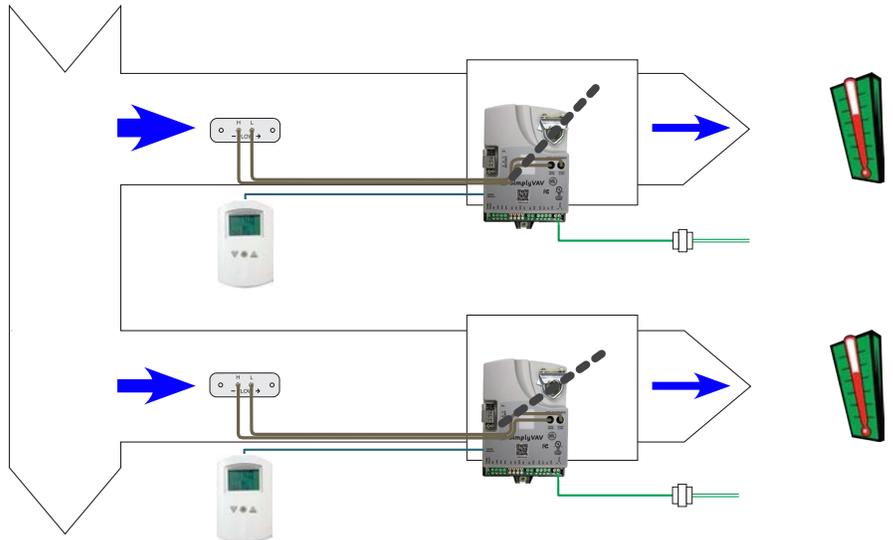
The Easy Pressure Independent VAV Solution

Now, however, there is a better and easier way. KMC has a notably improved system for retrofitting older systems or installing new light-commercial zoning systems. The **ZEC (Zone Equipment Control)** system consists of a **BAC-120063CW-ZEC** (a special model of KMC's award-winning FlexStat™ unitary controller) along with KMC **SimplyVAV™** controllers for pressure-independent VAV control in their respective zones.

A local pressure-dependent zone is converted to pressure-independent operation with the insertion of a KMC **SSS-101x** differential pressure flow sensor, and with the local zone operated by the SimplyVAV terminal unit controller. Pressure-independent operation compensates for the varying needs of the local zones while also compensating for operations in other zones. Damper position is controlled for space environmental conditions **and** differences in duct pressure.



Pressure Independent SimplyVAV with Different Space Conditions

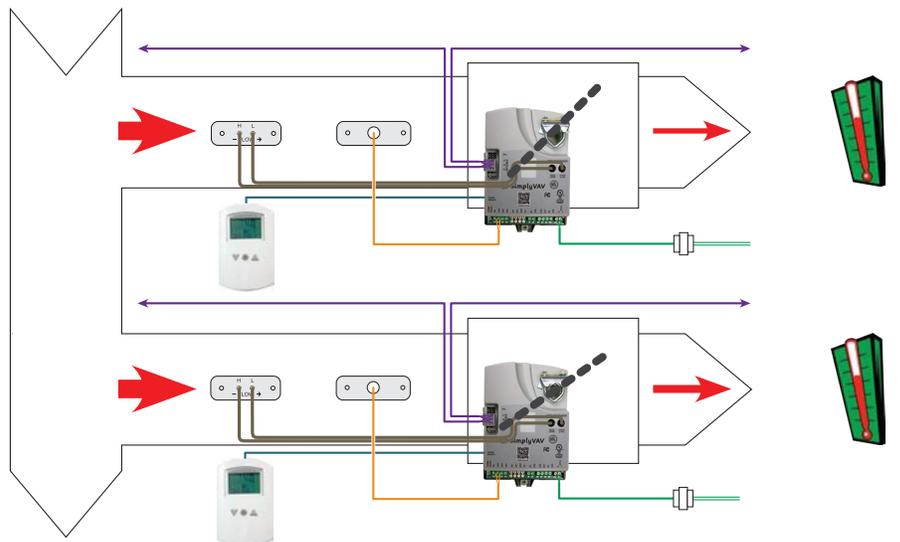


Pressure Independent SimplyVAV with Different Duct Pressures

A connected **STE-8000** series digital room sensor reads the varying environmental conditions in that zone, and it is also the only tool needed to configure and balance the SimplyVAV controller.

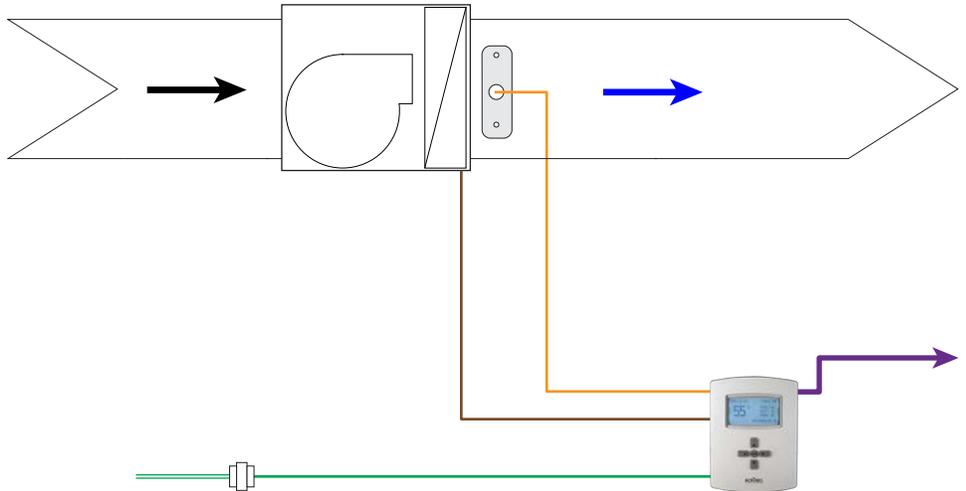
Adding an **STE-140x DAT (Discharge Air Temperature)** sensor adds changeover capability for heating and cooling control.

SimplyVAV controllers can operate stand-alone or be connected to an MS/TP BACnet network.



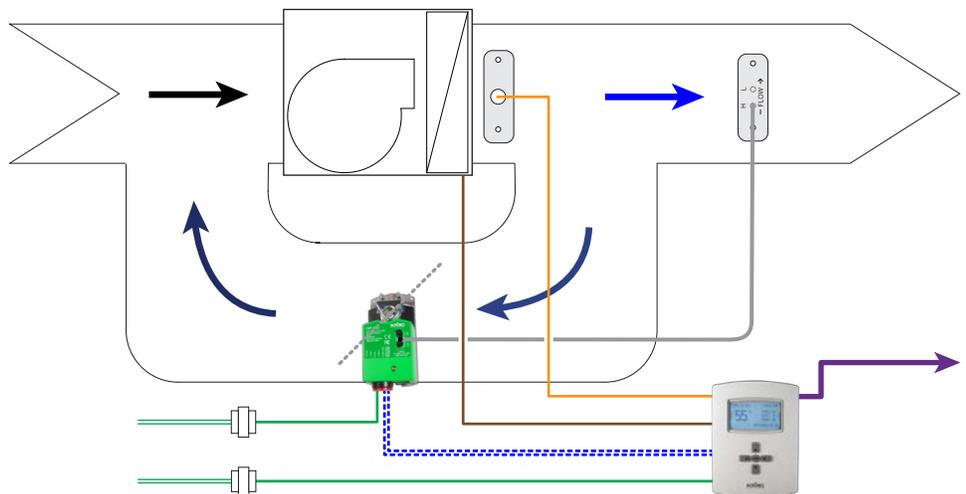
Pressure Independent SimplyVAV with Changeover on a BACnet Network

For control of common commercial packaged unitary equipment, up to 16 zones, with 16 SimplyVAV controllers, can work in conjunction with the BAC-120063CW-ZEC model FlexStat. The ZEC FlexStat automatically switches between heating and cooling control of the HPU or RTU based on local zone demands. The ZEC FlexStat automatically discovers and communicates with the associated SimplyVAV controllers via the integral BACnet MS/TP network. This provides integration of the entire system.



HPU or RTU Controlled by a ZEC FlexStat

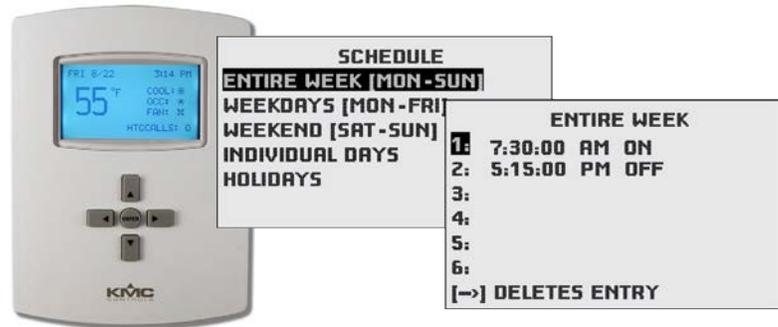
Additionally, the ZEC FlexStat controller can also provide a 2–10 VDC static pressure setpoint signal to an optional KMC **CSP-4702** pressure controller used with a unitary system that has pressure bypass control.



ZEC FlexStat with CSP-4702 for Bypass Control

This model of FlexStat comes preconfigured, and if the defaults describe your equipment, the occupancy schedule is the only required configuration needed after mounting and wiring. The schedule is easily created via the FlexStat's on-screen menu.

With no software required, the ZEC system is quick and user-friendly to install and configure. Yet it also communicates with any Building Automation System using a BACnet network for monitoring and additional control options.



Scheduling on the BAC-120063CW-ZEC FlexStat

More Information

For more information about the powerful simplicity of this approach, visit the KMC Controls web site (www.kmcccontrols.com).

NOTE: For ZEC FlexStat specifications and accessories, see the [BAC-120063CW-ZEC FlexStat Data Sheet](#). For more information about applications, mounting, wiring, configuration, and operation, see the [BAC-120063CW-ZEC FlexStat Installation Guide](#).

NOTE: See also complete information about the digital [SimplyVAV](#) controller-actuators and the analog [CSP-4702](#) bypass controller-actuator.

NOTE: The sample building automation web graphics on the monitor shown at the top of page 1 would require [TotalControl™](#) and custom programming.



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