

VAV Series

# Variable Air Volume Box Controller



## Description

The Variable Air Volume Box (VAV) Controller is specifically designed for digital control of single duct, dual duct, fan-powered, and supply/exhaust VAV box configurations. The controller can provide standalone control of the VAV box, and can also integrate control of baseboard heat and lighting logic for the room or zone. An optional user-to-controller interface, called the Zone Terminal (ZT), provides easy controller adjustment and indication. The ZT also offers weekly and holiday scheduling for standalone systems, as well as password protection for the VAV Controller.

## Features

- multiple modes of operation for various occupancy conditions, providing comfort with economy
- HVAC PRO software program library provides minimal programming and easy configuration
- standalone control for small systems

- N2 bus communications and networking software capabilities provide facility-wide control efficiencies and cost-effective information sharing
- packaging options provide installation flexibility
- interfaces to both electric and pneumatic actuators to provide low-cost installation for both new construction and retrofit applications
- HVAC PRO automated flow testing can diagnose system performance to quickly locate boxes needing attention
- controller-resident performance calculations help fine tune building operation
- side loop supports an additional control loop for cost savings

## To Order

Specify the code number from the following selection chart. For Accessories, refer to *Facilitator Accessories*.

## Options

Application Options	Software Options
<b>Primary Equipment Types</b>	VAV Box Single Duct Dual Duct Fan Powered or Assisted Supply/Exhaust
<b>Primary Control Strategies</b>	Pressure Dependent Pressure Independent Constant Volume
<b>Box Heat Configuration</b>	Incremental, Proportional, or Two-Position (N.O. or N.C.) Valves; 1-, 2-, or 3-Stage Electric
<b>Baseboard Heat Configuration</b>	Incremental, Two-Position (N.O. or N.C.) Valves Single-Stage Electric
<b>Cooling Configuration</b>	Incremental Output to Damper Actuator
<b>Fan Configuration</b>	Parallel, Temperature Setpoint Parallel, CFM Setpoint Series, On-Off Control Series, Proportional Control
<b>Lighting Control</b>	On and Off Outputs to Lighting Relay in Conjunction with Occ/Unocc Mode.
<b>Unoccupied Control</b>	Setup, Setback, or Shutdown Morning Warmup and Cooldown

## Specifications

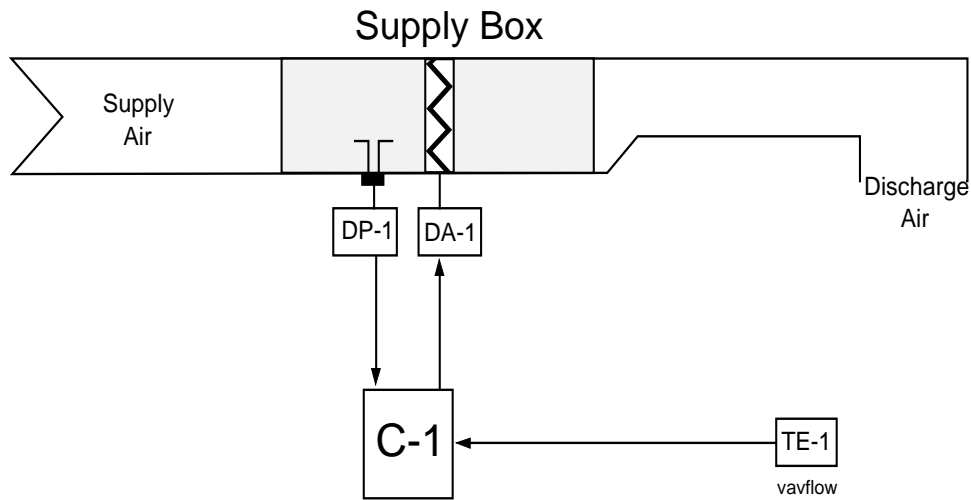
Variable Air Volume Box Controller	
<b>Product</b>	AS-VAV110-1 / AS-VAV111-1 / FA-VAV110-1 / FA-VAV111-1 Spade Connector; AS-VAV140-1 / AS-VAV141-1 / FA-VAV140-1 / FA-VAV141-1 Screw Terminal Block
<b>Ambient Operating Conditions</b>	0 to 60°C (32 to 140°F) 10 to 90% RH
<b>Dimensions (H x W x D)</b>	165 x 163 x 51 mm (6.5 x 6.4 x 2.0 in.) without enclosure 173 x 185 x 119 mm (6.8 x 7.3 x 4.7 in.) with enclosure
<b>N2 Bus</b>	Isolated
<b>Zone Bus</b>	8-Pin Phone Jack or Terminal Block on Controller
<b>Ambient Storage Conditions</b>	-40 to 70°C (-40 to 158°F); 10 to 90% RH
<b>Power Requirements</b>	24 VAC, 50/60 Hz, 10 VA Plus Binary Output Loads
<b>Shipping Weight</b>	0.64 kg (1.4 lbs)
<b>Agency Compliance/Listing</b>	CSA C22.2 No. 205, FCC Part 15, Subpart J, Class A, IEEE 446, IEEE 472, IEEE 518, IEEE 587 Category A, UL 916, UL 864, NEMA ICS 2, Part 2-230, VDE 0871 Class B

**VAV Series Variable Air Volume Box Controller (Continued)**

**Selection Chart**

Code Number	Termination Type	Analog Inputs	Binary Inputs	Analog Outputs	Binary Outputs	Factory Installed Accessories
AS-VAV110-1 FA-VAV110-1	Spade Lug	6 RTD Temperature Element (NI, SI or PT.) 0-10 VDC Transmitter 2K ohm Setpoint Potentiometer	4 4-Dry Contacts 1 Momentary Push Button from Zone Sensor	0	8 24 VAC Triacs at 0.5 amps	None
AS-VAV111-1 FA-VAV111-1		2 0 to 10 VDC at 10 mA		6 (same as above)		
AS-VAV140-1 FA-VAV140-1	Screw Terminal	6 RTD Temperature Element (NI, SI or PT.) 0-10 VDC Transmitter 2K ohm Setpoint Potentiometer	4 4-Dry Contacts 1 Momentary Push Button from Zone Sensor	0	8 24 VAC Triacs at 0.5 amps	None
AS-VAV141-1 FA-VAV141-1		2 0 to 10 VDC at 10 mA		6 (same as above)		
AS-VAVDPT1-1 FA-VAVDPT1-1	Spade Lug	6 RTD Temperature Element (NI, SI or PT.) 0-10 VDC Transmitter 1.5K ohm Setpoint Potentiometer	4 4-Dry Contacts 1 Momentary Push Button from Zone Sensor	0	8 24 VAC Triacs at 0.5 amps	VAV110-1 and (1) DPT-2015-0 Diff. Press. Sensor
AS-VAVDPT2-1 FA-VAVDPT2-1		2 0 to 10 VDC at 10 mA		6 (same as above)	VAV111-1 and (1) DPT-2015-0 Diff. Press. Sensor	

**Control of Single Duct Cooling Only Box (Pressure Independent) Flow Diagram**



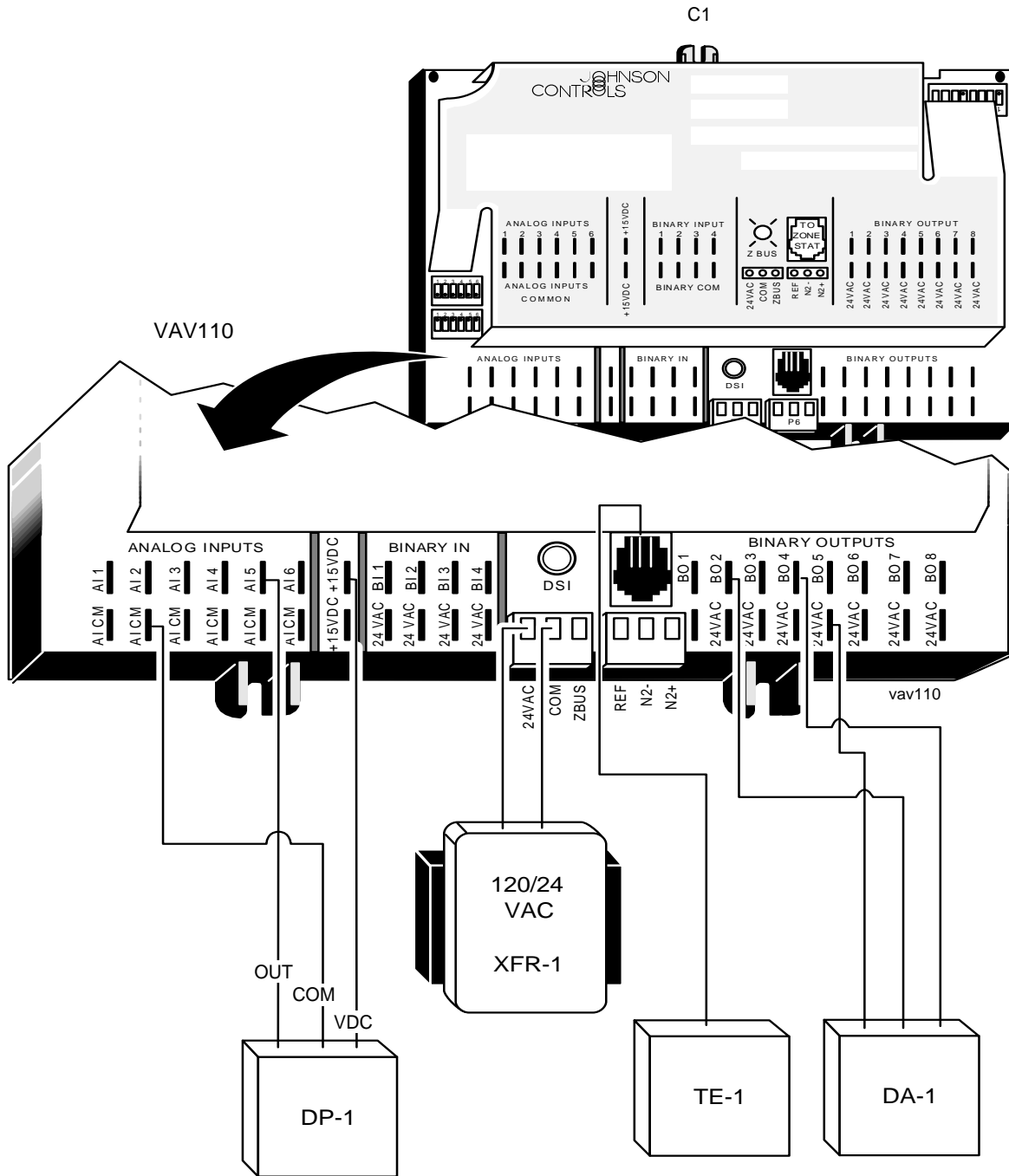
HVAC PRO Configuration Selections	
VAV Control Strategy:	Pressure Independent
Fan Type:	None
Exhaust Box:	No
Baseboard Heat:	None
Box Heat:	None
Lighting Interface:	No

**Sequence of Operation**

Digital Controller, C<sub>1</sub>, modulates the damper motor, DA<sub>1</sub>, based on differential pressure, DP<sub>1</sub>, and zone temperature, TE<sub>1</sub>, to provide the required amount of tempered air to the zone to satisfy the zone setpoint.

**VAV Series Variable Air Volume Box Controller (Continued)**

**Wiring Diagram**



**Bill of Materials**

ID	Qty.	Code Number	Description
C1	1	VAV110-1	Digital Controller
TE1	1	TE-67NP-1B00	Zone Temperature Sensor/WM-CL. ADJ
DP1	1	DPT-2015-0	Differential Pressure Transmitter
DA1	1	M9104-AGA-2N	Damper Actuator
XFR-1	1	AS-XFR050-0	120/24 VAC, 50 VA Split-Bobbin Transformer