

# SINGLE DUCT BY-PASS VAV | Model AB

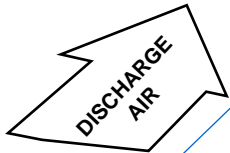


UL listed 1/2", 2.0 lb./cu.ft., dual density insulation conforms to **UL Test 181** and **NFPA 90A** (other types available).

VOLARA® TYPE A gasket material is sandwiched between damper halves and has high temperature resistance, low moisture absorption and excellent chemical resistance.

Sturdy 22 gauge galvanized steel construction suitable for field duct connections with slip and drive cleats.

Plenum discharge air (by-pass air).



Balancing door for plenum discharge.

Slot in damper shaft to indicate damper position.

Gasket valve seal for minimum leakage.

Hot water reheat available.



Optional hanger brackets.

Tri-Averaging inlet sensor amplifies velocity pressure signals for air flow measuring and pressure independent flow control.

## Model AB



A Participating Member in the AHRI 880 Certification Program



IAQ Insulation Available

**FROM THE BUILDING DESIGN:**

- Refer to the table of contents to locate the appropriate terminal unit for the application. *EXAMPLE: Cooling only — AVC.*
- Select type of external control — manual, pneumatic, electric or electronic, and pressure independent or pressure dependent. *EXAMPLE: Pressure independent pneumatic.*
- Determine minimum ventilation CFM and maximum CFM required for cooling load of zone. (Based on load calculations). *EXAMPLE: Minimum 375 and maximum 1300 CFM.*
- Find the terminal unit CFM ranges and select the terminal unit closest to, but not exceeding maximum CFM rating from **Table 1** below for pressure independent control.

- Determine maximum specified NC level at static pressure  $\Delta P_s$  in ductwork to be maintained in room. Turn to the performance data of this catalog for the unit that you have selected, to determine pressure drop of unit with damper in wide open, (minimum  $\Delta P_s$ ). Verify that this value is below the specified maximum allowable pressure drop.

*EXAMPLE: a) Specified maximum pressure drop of .25 IWC per unit.*

*b) Max. NC 35 at static pressure of 1-1/2".*

*Also, from performance data, determine the NC value at the duct static pressure. NC is typically determined at max. CFM.*

**REHEAT**

For units requiring reheat accessories (hot water or electric duct heater), see appropriate sections in this catalog.

**Examples:**

**Summary of Customer and Zone Requirements**

Cooling ONLY application  
 Pressure Independent Pneumatic Controls  
 Minimum CFM = 375  
 Maximum CFM = 1300  
 Maximum allowable NC level = NC 35  
 Static Pressure in duct = 1.5 IWC  
 Maximum allowable pressure drop = .25 IWC

**Unit Selection**

Evaluate the maximum CFM desired (1300) and select the unit from Table 1 (Pressure independent). The maximum of 1300 is within the maximum CFM range (900 - 1500) for a size 10" inlet. Verify the minimum CFM (375) is also within the minimum CFM range (300-600) for this same size 10 unit.

**BEST SELECTION: SIZE 10**

**Pressure and Sound Considerations**

Turn to performance data for the type of unit needed. Pressure drop at minimum  $\Delta P_s$  for size 10 at 1300 is .05 and NC at 1.5 IWC static is 28 for discharge and 31 radiated. The AVC size 10 will meet the pressure drop (less than .25) and sound (less than NC 35) requirements for this example.

**Pressure Independent Control**

**Primary Air Inlet Parameters (Pressure Independent Control)**

*Table 1*

Unit Size	Inlet Diameter	Rated CFM	Pneu. Minimum CFM Range	Electronic Min. CFM Range	Maximum CFM Range
05	5"	350	∅ or 75 - 140	∅ or 45 - 140	210 - 350
06	6"	500	∅ or 110 - 200	∅ or 65 - 200	300 - 500
07	7"	700	∅ or 140 - 280	∅ or 85 - 280	420 - 700
08	8"	1000	∅ or 185 - 400	∅ or 105 - 400	600 - 1000
10	10"	1500	∅ or 300 - 600	∅ or 155 - 600	900 - 1500
12	12"	2300	∅ or 430 - 920	∅ or 225 - 920	1380 - 2300
14	14"	3100	∅ or 600 - 1240	∅ or 335 - 1240	1860 - 3100
16	16"	4200	∅ or 780 - 1680	∅ or 465 - 1680	2520 - 4200
18*	16" x 18"	5500	∅ or 1100 - 2200	∅ or 800 - 2200	3300 - 5500
24*	16" x 24"	7300	∅ or 1480 - 2920	∅ or 1095 - 2920	4380 - 7300

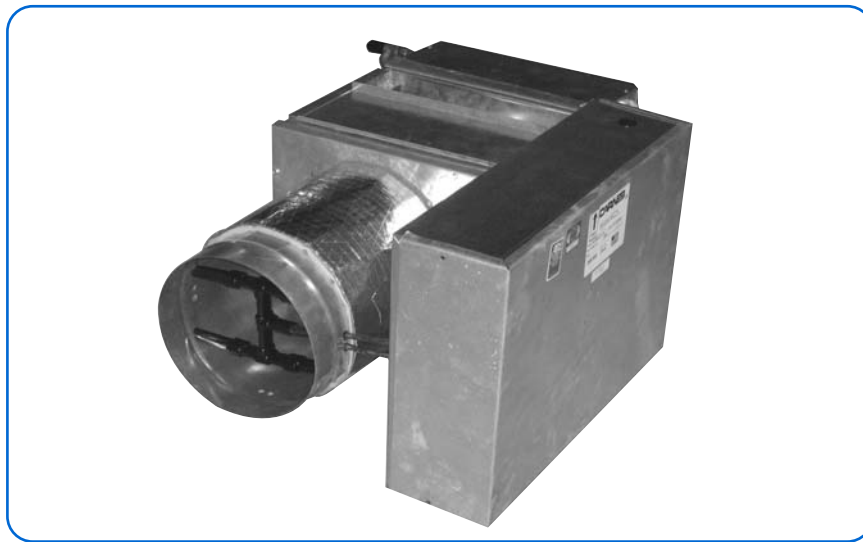
\* For models AV and AB only.

**(Discharge Parameters For Model ADCD)**

*Table 1a*

Minimum Discharge CFM (See Note 6)	Maximum Discharge CFM
140	350
140	500
170	700
200	1000
380	1500
500	2300
620	3100
780	4200
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—	—

- NOTES:**
1. Rated CFM is based on maximum inlet velocity of approximately 3000 FPM.
  2. Minimum CFM selection below this value with pressure independent control may provide less than optimum control characteristics. These values are based on an inlet velocity of approximately 365 FPM or less and/or a sensor pressure differential of approximately .035 IWC or less.
  3. CFM selections out of the recommended maximum or minimum range shown may result in less than optimum control.
  4. Minimum CFM selection is recommended to be 40% of maximum rated CFM or less.
  5. Maximum CFM selection is recommended to be 60% of maximum rated CFM or more.
  6. ADCD discharge minimums below these values will not provide adequate control.
  7. Minimum CFM for units with electric coils will vary based on kilowatts and area. See electric duct heater section for details.



### ▼ Model ABW

The **Carnes Model ABW**, By-Pass Control Hot Water Reheat Unit, provides variable air volume with reheat capability to individual zones while by-passing the unneeded air to the ceiling plenum for recirculation.

Although zone air volumes in small buildings may vary greatly, the cost of fan controls many times cannot be justified. Zone air volumes are realized

with the by-pass reheat unit while the supply fan delivers a constant CFM.

The ABW can be ordered for reverse acting or direct acting pneumatic thermostats or electric thermostats. Zone thermostats directly control the by-pass damper assuring that only the air that is needed is delivered to the zone.

#### *Features Include:*

- Air flow capacities from full shut-off to 3,650 CFM.
- Pneumatic or electric controls.
- Thermally and acoustically insulated casing (hot water coil casing is uninsulated).
- Reheat coils available in one to four rows.
- Open-end discharge provided with slip and drive connection for easy installation.
- Balancing damper in by-pass is standard.
- Tri-Averaging air flow sensor at inlet of unit.
- Optional hanger brackets.
- Optional control enclosure.
- Optional foil coated insulation.

#### *Available Modules:*

- Basic Control Unit — **Model ABW**
- Sound Attenuator — **Model AXA**



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