

Proposed Revisions to
ANSI/ACCA 11 Manual Zr - 2018
Residential Zoning
Version 1.10

Note: Additions are shown as underline text
and deletions are shown as ~~striketrough~~.

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N2-2 General Requirements for Zone Damper Systems

N2-9 Bypass Duct Relief

The Figure N2-2 equations (next two pages) determine the maximum bypass air Cfm value for cooling, and the maximum bypass air Cfm value for heating.

Maximum Bypass Cfm (Smallest BPF) for Various Types of Equipment	
Air - Air Cooling	$BPF = (-10.5 + (106.25 - 68 \times A)^{0.5}) / 34$ <p>Where: $A = LDB - (52.3 + 0.19 \times (OAT - 95) + 0.6 \times (EDBo - 75) + 0.57 \times (28.5 \times B/C))$</p> $Bypass\ Cfm = BPF \times C$
Nomenclature and Instructions <p>B/C Btuh output (B), per the related blower Cfm value (C).</p> <ul style="list-style-type: none"> For air-air cooling, B/C is based on AHRI rating data (total Btuh for a specified blower Cfm, at 95°F OAT, 80°F EDB, and 67°F EWB). For water-air cooling, B/C is based on total cooling Btuh for 95°F water, 80°F / 67°F entering air, and the OEM's blower Cfm value for this cooling capacity value. <p>BPF Bypass factor under investigation.</p> <ul style="list-style-type: none"> For air-air cooling and water-air cooling, the BPF value that causes the LDB value to be equal to the OEM's low limit temperature for discharge air. For heating, the BPF value that causes the LDB value to be equal to the OEM's high limit temperature for discharge air. <p>C For cooling, the blower Cfm value for a given B/C ratio.</p> <p>EDBo The dry-bulb air temperature (°F) at the entrance to a indoor refrigerant coil (for cooling, or heating), an electric heating coil, a furnace, or a hot water coil, just before the bypass damper opens.</p> <ul style="list-style-type: none"> The Manual Zr default value for a cooling coil is 75°F, or use a value per Manual S, Appendix 2 procedures. The Manual Zr default value for refrigerant coil heating, an independent electric heating coil, a furnace, or a hot water coil is 70°F, or use a value per Manual S, Appendix 2 procedures. For a heat pump electric coil that is downstream from an indoor refrigerant coil, EDBo is the dry-bulb temperature of the air leaving the refrigerant coil, per this equation: <p>Electric coil EDBo = Refrigerant coil EDBo + Refrigerant coil TR</p> <p>LDB The OEM's low limit value for the dry-bulb temperature (°F) of the air leaving a cooling coil.</p> <ul style="list-style-type: none"> OEM engineering data provides the low limit for LDB. This value can be in the 38°F to 50°F range <p>OAT Outdoor air dry-bulb temperature (°F) for Air-Air Cooling.</p> <ul style="list-style-type: none"> The Manual Zr default value for calculating the smallest bypass factor value for cooling is 70°F. However, 75°F is used when zone damper controls can anticipate a low limit shut down per OEM controls, and stop the equipment in a normal manner. 	

(Remainder of Figure N2-2 not shown, is unchanged.)

Rationale: Part of the formula for Air-Air Cooling ($28.5 \times B/C$) is incorrect. The correct operator is a “minus” not a “times.”