TruTechTools
Making Measurement Science Work
1-888-224-3437

Verifying Correct Airflow

1) Verify filters, coils, and blower is clean.
2) Measure and/or set the required airflow using an appropriate method
   a. Mini Vane ____________CFM
   b. Temperature Rise Method ______________°F
   c. Total External Static Pressure __________ΔP
   d. Pressure drop across coil ______________ΔP

Nominal Airflows for A/C
12 (12,000 Btuh) = 400 CFM
18 (18,000 Btuh) = 600 CFM
24 (24,000 Btuh) = 800 CFM
30 (30,000 Btuh) = 1000 CFM
36 (36,000 Btuh) = 1200 CFM
42 (42,000 Btuh) = 1400 CFM
48 (48,000 Btuh) = 1600 CFM
60 (60,000 Btuh) = 2000 CFM

Nominal airflows for Heat Pumps
12 (12,000 Btuh) = 450 CFM
18 (18,000 Btuh) = 675 CFM
24 (24,000 Btuh) = 900 CFM
30 (30,000 Btuh) = 1125 CFM
36 (36,000 Btuh) = 1350 CFM
42 (42,000 Btuh) = 1575 CFM
48 (48,000 Btuh) = 1800 CFM
60 (60,000 Btuh) = 2250 CFM

Formulas and notes for temperature rise method

1) Remember to perform the temperature rise test on the blower speed you will use for cooling. You will have to move the motor speed to the heating tap for testing. On two stage appliances use the high heating tap and test on 2nd stage. Clock the gas meter or measure volts and amps to determine input.

Btuh Output = Btuh Input x Nominal efficiency

$$\text{CFM} = \frac{\text{Btuh output}}{(1.08 \times \Delta T)}$$

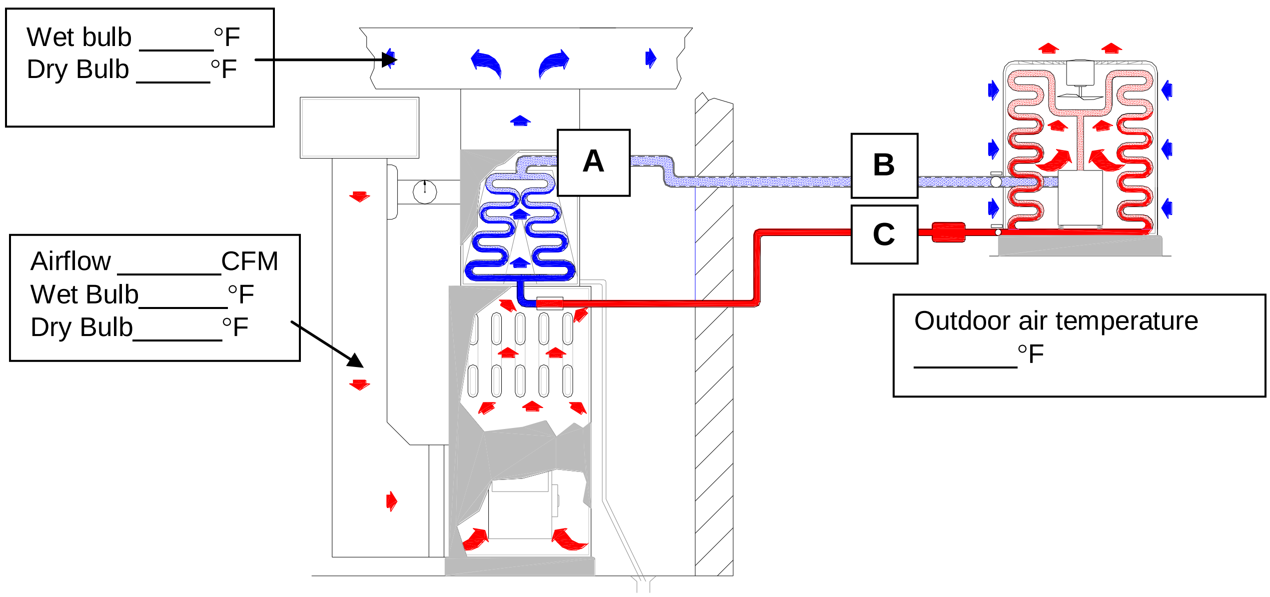
Airflow must be within 10% of rated CFM

Acceptable Airflows for A/C
12 (12,000 Btuh) = (360-440) CFM
18 (18,000 Btuh) = (540-660) CFM
24 (24,000 Btuh) = (720-880) CFM
30 (30,000 Btuh) = (900-1100) CFM
36 (36,000 Btuh) = (1080-1320) CFM
42 (42,000 Btuh) = (1260-1540) CFM
48 (48,000 Btuh) = (1440-1760) CFM
60 (60,000 Btuh) = (1800-2200) CFM

Acceptable Airflows for H/P
12 (12,000 Btuh) = (405-495) CFM
18 (18,000 Btuh) = (607-715) CFM
24 (24,000 Btuh) = (810-990) CFM
30 (30,000 Btuh) = (1112-1237) CFM
36 (36,000 Btuh) = (1215-1485) CFM
42 (42,000 Btuh) = (1417-1732) CFM
48 (48,000 Btuh) = (1620-1980) CFM
60 (60,000 Btuh) = (2025-2475) CFM

Note: airflow should always be set as close to nominal as possible. If you are close to either end of the acceptable range, raise or lower the speed accordingly to see if the next high or lower speed is closer to nominal. Airflow directly affects sensible capacity and humidity removal. This step is critical to proper operation

Proper Charge Verification Worksheet



Temperature checks to verify the proper evaporator and condenser performance without gauges. (Always set/check airflow prior to testing!)

Evaporator Performance (Fixed and TXV)

Note 35° F DTD (Design Temperature Difference) is standard for 95% of systems. If ultra high efficiency, use DTD 30°F. Consult Testo applications guide for further information of DTD

___________°F - 35°F = ___________________°F
(Return air DB) - 35°F = (Saturation Temperature)

______________°F + ______________°F = __________________°F
(Saturation temperature) + (Required Superheat) = (Required Suction Line temperature*)

** Note if TXV, this is the temperature at point (A) above*
If fixed metering device this is temperature at point (B)

Actual Suction Line Temperature_________________°F**

*****If the actual suction line temperature is +/- 3°F of the required, the evaporator performance is OK***

Condenser Performance (TXV only)

DTD for Condensers	
❑ Below 10 SEER	+30
❑ 10-12 SEER	+25
❑ 12-20 SEER	+20

_________________°F + ____________°F = ________________°F
(Outdoor air temperature) + (DTD) = (Condensing temperature)

__________________°F - ________________°F= ________________°F
(Condensing temperature) - (Required sub cooling) = (Required Liquid line temperature)

Actual Liquid Line Temperature _____________°F***

******Liquid line temperature is measured and point (C) If +/- 5°F condenser performance is OK***