

INTERPRETATION
AHRI STANDARDS 550/590 (I-P)-2018 AND 551/591 (SI)-2018
PERFORMANCE RATING OF WATER-CHILLING AND HEAT PUMP WATER-HEATING PACKAGES
USING THE VAPOR COMPRESSION CYCLE

July 30, 2019

References: Appendix F, Section F3

Question: In the Equations for atmospheric pressure correction it lists the Q_{ev} 100%. It is not clear in the standard if this is the rated 100% capacity at the nominal rating conditions or the measured. Also not clear when running 125 °F ambient at full load if the Q_{ev} 100% is the capacity at 95 °F or 125 °F

$$DQ = AQ \cdot p^2 + BQ \cdot p + CQ \quad \text{F1}$$

$$D\eta = A\eta \cdot p^2 + B\eta \cdot p + C\eta \quad \text{F2}$$

$$(CF_Q)_{P=P_{test}} = 1 + \left(\frac{Q_{ev,\%Load}}{Q_{ev,100\%}} \right) \cdot (D_Q - 1) \cdot \exp\{-0.35 \cdot [(D_\eta \cdot \eta_{test,100\%}) - 9.6]\} \quad \text{F3}$$

$$(CF_\eta)_{P=P_{test}} = 1 + \left(\frac{Q_{ev,\%Load}}{Q_{ev,100\%}} \right) \cdot (D_\eta - 1) \cdot \exp\{-0.35 \cdot [(D_\eta \cdot \eta_{test,100\%}) - 9.6]\} \quad \text{F4}$$

$$Q_{corrected,standard} = Q_{test}(CF_Q)_{P=P_{test}} \quad \text{F5}$$

$$\eta_{corrected,standard} = \eta_{test}(CF_\eta)_{P=P_{test}} \quad \text{F6}$$

Answer: For AHRI Standards 550/590 and 551/591, Equations F3 and F4, $Q_{ev,100\%}$ and $\eta_{test,100\%}$ are test results at full load rating point for Standard Rating Conditions, or full load ratings for Application Rating Conditions.