Selection Information

Base Rating

The base unit capacities as listed in the tables are based on sensible heat removal using a galvanized steel coil with either a flooded or a pump recirculated ammonia refrigerant system. Base Ratings are expressed in BTUH/°F for both frosted and wet conditions. See Tables 1 and 2 below for correction factors and limitations of various coil materials and refrigerant systems. For more detailed computer-generated performance data and other applications, please contact your local BAC Representative.

Selection Procedure

1. Calculate the total required cooling load in Btu/hour (BTUH).

Note: Motor heat of 4,150 BTUH/HP is not included in the ratings; include this heat load to calculate a total required cooling load.

2. Calculate the temperature difference (TD) between the design room temperature and the design saturation temperature in the evaporator.

3. Divide the total required cooling load by the TD to determine the design BTUH/°F.

4. Divide the design BTUH/°F by the applicable Coil Material Correction Factor (Table 1) and the Refrigerant System Correction Factor (Table 2).

5. From the table, select a model that meets or exceeds the required base rating BTUH/°F.

Note: To prevent moisture carryover on wet applications where the room temperature exceeds 32°F, select only those models with average face velocities less than 620 FPM.

Selection Example

Select units for a room load of 900,000 BTUH in a -10°F freezer using -20°F pump recirculated bottom feed ammonia and galvanized steel coils. Three (3) AL style units are requested to suit the room layout.

1. The net required cooling load per unit equals (900,000 BTUH / 3) = 300,000 BTUH per unit. Adding an estimated 15 HP fan motor heat per unit yields a total cooling load of (300,000 BTUH + (15 x 4,150 BTUH/HP)) = 362,250 BTUH per unit.

2. The temperature difference (TD) equals (-10°F – (-20°F)) =10°F.

3. The design BTUH/°F equals (362,250 BTUH / 10°F) = 36,225 BTUH/°F.

4. The required Base Rating equals (36,225 BTUH/ °F / 1.00 / 1.00) = 36,225 BTUH/°F.

5. From the model tables, select a model AL3S-5483-500L with a frosted Base Rating of 36,225 BTUH/°F. This unit has three fans at 5 HP each, yielding 62,250 BTUH motor load, as estimated. Final selection: Three (3) AL3S-5483-500L-ARB

Correction Factors

The following tables provide correction factors relative to the Base Ratings. When using these tables, please note the limitations expressed below the tables.

Table 1. Coil Material Correction Factors

Coil Material	Correction Factors
Galvanized Steel Tube & Fin	1.00
Aluminum Tube - Aluminum Fin	1.14
Stainless Steel Tube - Aluminum Fin	1.12

Table 2. Refrigerant System Correction Factors

Refrigerant System		Saturated Suction Temperature (°F)				
		+40°F	+20°F	0°F	-20°F	-40°F
Ammonia	Pump Recirc., Bottom Feed (ARB)	1.00	1.00	1.00	1.00	1.00
	Pump Recirc., Top Feed (ART)	1.00	1.00	*	*	*
	Flooded (AFL)	1.00	1.00	1.00	1.00	1.00
	Direct Expansion (ADX)	0.83	0.83	NA	NA	NA
	Control Pressure Receiver (APT/B)	1.00	1.00	*	*	*
R-22 R-134a R-404A R-507	Direct Expansion (FDX)	0.83	0.83	0.83	*	*
	Pump Recirc., Bottom Feed (FRB)	1.00	1.00	0.95	0.90	0.80
	Pump Recirc., Top Feed (FRT)	1.00	1.00	*	*	*
	Flooded (FFL)	*	*	*	*	*

* Consult your local BAC Representative

Pump recirculated refrigerant coils must have a liquid feed temperature within 10°F of the coil's design saturated suction temperature and a feed pressure 5 psi above the design saturated suction pressure to achieve these performance ratings. Air defrost coils should be top feed. Hot gas defrost coils should be bottom feed, particularly at temperatures below +10°F.

Flooded coils have the same ratings as recirculated refrigerant coils. Flooded coils are bottom feed and circuited to minimize refrigerant pressure drop. Consult your BAC Representative for flooded halocarbon applications.

Direct expansion (DX) coils must have a liquid feed temperature at the thermal expansion valve (TXV) higher than the coil's design saturated suction temperature to achieve these performance ratings. The temperature difference between the air and the saturated suction temperature at the coil should be a minimum of 12°F for ammonia and a minimum of 10°F for halocarbons. The minimum design evaporator temperature is +10°F for ammonia and -10°F for halocarbon. TEVs must be externally equalized and the discharge tube must be removed.

Controlled pressure receiver system coils may require a top feed with a distributor(s). Please contact your BAC Representative with the design feed temperature and pressure in addition to other design parameters.

Brine and other single phase fluid systems are not rated in this manual. Please contact your local BAC Representative with the type of fluid, fluid temperatures, and flow rate in addition to other operating parameters.