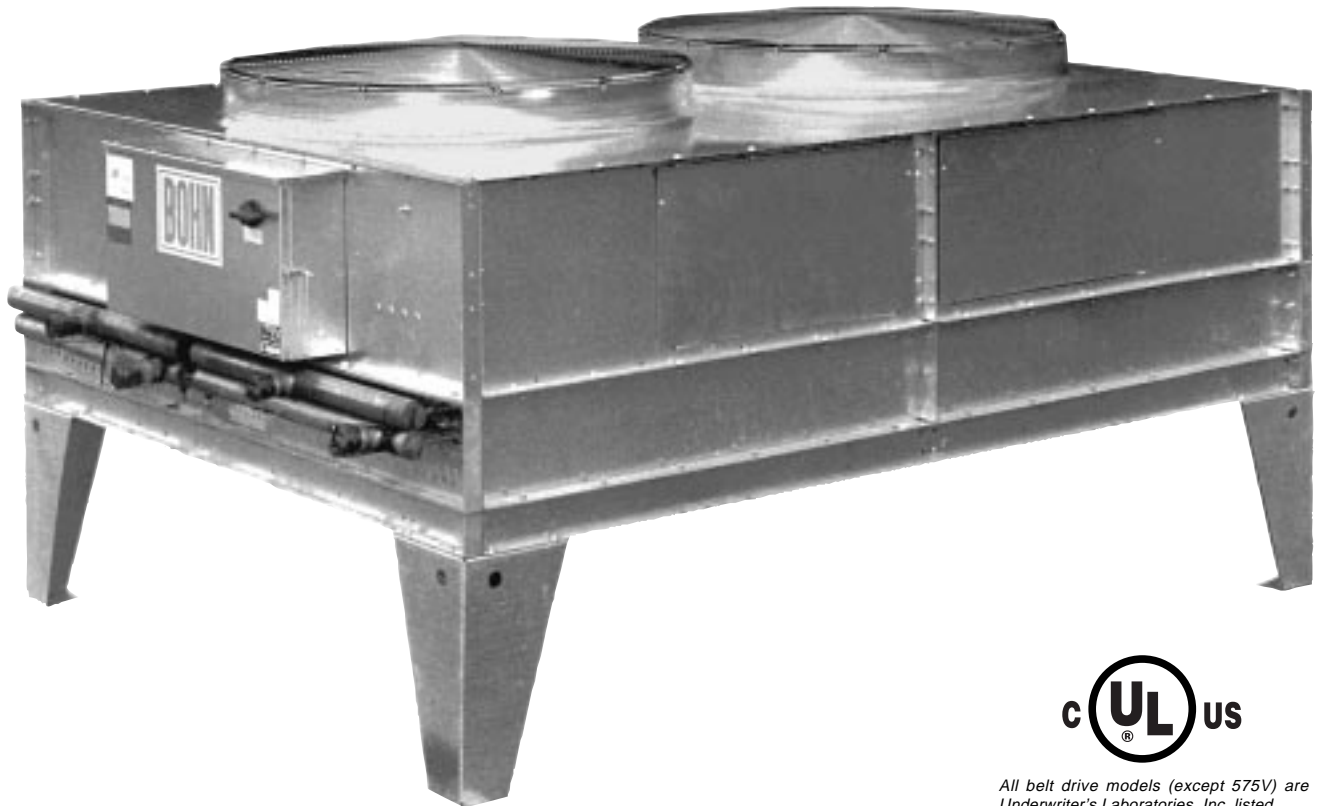




7170.2
July 2000
Replaces 7170.1



All belt drive models (except 575V) are Underwriter's Laboratories, Inc. listed.

Belt Drive Fluid Coolers Model BFF

Specification Data

Belt Drive Fluid Coolers



Multiple fans, carefully matched to the coil surface cover a large percentage of the face area providing uniform air distribution.

Energy efficient, three phase 1750 RPM motors with drip-proof, grease lubricated ball bearings. Each motor is inherently overcurrent protected providing built-in protection against single phasing. All motors are factory wired with leads marked and terminated in a single weatherproof junction box on outside of the unit casing.

Fan guards are constructed of heavy gauge, close meshed, steel wire zinc plated and iridite dipped to minimize corrosion.

Convenient access panels are provided on each fan section for ease in maintaining fans.

Casing is constructed of heavy gauge aluminum, or galvanized steel.

Multiple fan sections, each powered by a separate motors, are separated by a full width baffle to prevent air bypass during fan cycling.

Motors are positioned within unit casing for weather protection. Adjustable base provides ease in belt tension adjustment.

Each fan is equipped with heavy duty pillow block ball bearings. Bearings are supplied with lubrication fittings shown. Fan shafts are polished steel, precision machined to assure smooth operation, minimum bearing wear. Shafts are coated with a corrosion resistant dressing.



Selection Formulas

Design Load (in BTUH) = GPM * (Ent. Fluid Temp. — Leaving Fluid Temp.) x (Fluid Constant Table 1)

Average Fluid Temperature = $\frac{\text{Entering Fluid Temp.} + \text{Leaving Fluid Temp.}}{2}$

T.D. = Entering Fluid Temperature — Entering Air Temperature

Base Capacity = $\frac{\text{Design Load (in BTUH)}}{1,000 \times \text{T.D.} \times \text{Table 2 Factor} \times \text{Table 4 Factor}}$ = MBH/°T.D.

Capacity (Actual) = Capacity (Catalog) x 1,000 x T.D. x Table 2 Factor x Table 4 Factor

PD/F (Actual) = PD/F (Catalog) x Table 3 Factor

Selection Procedure

Given Conditions:

Belt Drive Unit — BFF
 200 GPM
 30% Ethylene Glycol Solution
 90°F Ambient Air

140°F Entering Fluid Temp.
 120°F Leaving Fluid Temp.
 10 Ft. Water Max. P.D.
 Sea Level

Solution:

1. Calculate Design Load

A. Determine average fluid temperature for factor selection in Tables 2 and 3.

$$\text{Average Fluid Temp.} = \frac{140 + 120}{2} = 130^\circ\text{F}$$

$$\text{B. Design Load} = 200 \times (140 - 120) \times 470 = 1,880,000$$

2. Calculate Base Capacity

A. Determine T.D.

$$\text{T.D.} = 140 - 90 = 50^\circ\text{F}$$

B. Determine Capacity Correction from Table 2
 Capacity Correction Factor = 1.032

C. Determine Altitude Correction from Table 4
 Altitude Correction Factor = 1.0

$$\text{D. Base Capacity} = \frac{1,880,000}{1,000 \times 50 \times 1.032 \times 1.0} = 36.43$$

3. Make selection from capacity tables using given conditions. Model BFF 096, capacity of 37.57 MBH/°T.D. meets the requirements with "C" circuiting.

4. Convert pressure drop of selection to design condition P.D. $6.1 \times .950 = 5.8$ ft. water pressure drop at design condition.

5. Calculate actual unit rating at design conditions $37.57 \times 1,000 \times 50 \times 1.032 \times 1.0 = 1,938,612$ BTUH.

Fluid Cooler Correction Factor Tables

Table 1.

	% Glycol	Fluid Constant
Fluid Constants	0	500
	20	480
	30	470
	40	450
	50	433

Table 2.

	% Glycol	Average Fluid Temp. (°F)					
		90	100	110	120	130	140
Capacity Correction Factor	0	1.079	1.081	1.083	1.086	1.090	1.095
	20	1.030	1.035	1.042	1.047	1.054	1.058
	30	1.005	1.009	1.012	1.023	1.032	1.034
	40	.928	.943	.960	.984	1.000	1.010
	50	.918	.926	.935	.939	.941	.973

Table 3.

	% Glycol	Average Fluid Temp. (°F)					
		90	100	110	120	130	140
Pressure Drop Correction	0	.868	.853	.843	.819	.795	.789
	20	.980	.959	.935	.915	.893	.866
	30	1.055	1.025	1.000	.975	.950	.923
	40	1.120	1.080	1.060	1.034	1.000	.974
	50	1.200	1.165	1.128	1.093	1.058	1.024

For average fluid temperatures below 90°F or above 140°F, contact the factory for special application.

Table 4. Altitude Correction Factors

Altitude (Feet)	Factor
0	1.000
500	0.993
1000	0.986
1500	0.974
2000	0.963
2500	0.953
3000	0.944
3500	0.935
4000	0.927
4500	0.919
5000	0.911
5500	0.903
6000	0.895
6500	0.887
7000	0.880

Capacity Ratings Belt Drive Fluid Coolers

Table 5A. MBH/°T.D. — 40% Glycol — Average Fluid Temperature 130°F (Sizes 045 - 062)

BFF Size	Conn. Loc.	Coil Circ.	GPM															
			30		40		50		60		70		80		90		100	
			MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF
045	SE	A	10.90	3.3	13.11	5.4	14.57	8.0	15.82	11.0	16.82	14.3	17.64	18.1				
	SE	B					13.99	2.9	15.31	3.9	16.10	5.2	16.92	6.5	17.61	8.0	18.20	9.6
	OE	C										16.46	2.8	17.21	3.5	17.51	4.2	
050	SE	A	11.40	3.3	13.93	5.4	15.65	8.0	17.14	11.0	18.34	14.4	19.34	18.2				
	SE	B					14.97	2.9	16.54	4.0	17.49	5.2	18.48	6.5	19.32	8.0	20.04	9.7
	OE	C										17.92	2.8	18.83	3.5	19.20	4.2	
054	SE	A	11.67	3.3	14.35	5.4	16.47	8.0	17.83	11.0	19.15	14.4	20.23	18.2				
	SE	B					15.49	2.9	17.18	4.0	18.56	5.2	19.29	6.5	20.21	8.0	20.99	9.7
	OE	C										18.68	2.8	19.67	3.5	20.08	4.2	
057	SE	A	11.60	3.3	14.30	5.4	16.46	8.0	17.90	11.0	19.30	14.4	20.47	18.2				
	SE	B					15.50	2.9	17.25	4.0	18.70	5.2	19.52	6.6	20.51	8.1	21.38	9.7
	OE	C										18.90	2.8	19.96	3.5	20.43	4.2	
059	SE	A			14.89	3.4	17.24	5.1	19.11	7.0	20.27	9.2	21.44	11.6	22.40	14.2	23.21	17.1
	SE	B									19.35	2.9	20.61	3.7	21.65	4.5	22.13	5.4
	OE	C														21.61	2.7	
062	SE	A	11.92	3.3	14.83	5.4	17.22	8.0	18.83	11.0	20.40	14.5	21.73	18.3				
	SE	B					16.17	2.9	18.11	4.0	19.74	5.2	20.66	6.6	21.78	8.1	22.76	9.7
	OE	C										19.96	2.8	21.16	3.5	21.69	4.2	

BFF Size	Conn. Loc.	Coil Circ.	GPM															
			120		140		160		180		200		250		300		350	
			MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF	MBH	PDF
045	SE	B	19.14	13.3	19.86	17.4	20.43	22.0										
	OE	C	18.48	5.7	19.24	7.5	19.85	9.5	20.34	11.7	20.75	14.1	21.53	20.9				
050	SE	B	21.19	13.3	22.08	17.4	22.79	22.0										
	OE	C	20.39	5.8	21.32	7.6	22.06	9.5	22.68	11.7	23.19	14.1	24.16	20.9				
054	SE	B	22.25	13.3	23.22	17.4	23.99	22.0										
	OE	C	21.37	5.8	22.38	7.6	23.20	9.6	23.86	11.8	24.42	14.1	25.47	20.9				
057	SE	B	22.80	13.3	23.91	17.5	24.82	22.1										
	OE	C	21.87	5.8	23.01	7.6	23.94	9.6	24.72	11.8	25.38	14.2	26.65	20.9				
059	SE	B	23.45	7.5	24.46	9.8	25.24	12.4	25.87	15.2								
	OE	C	23.06	3.7	23.72	4.8	24.54	6.1	25.21	7.4	25.76	9.0	26.79	13.2				
062	SE	B	24.38	13.3	25.66	17.5	26.70	22.1										
	OE	C	23.31	5.8	24.62	7.6	25.69	9.6	26.58	11.8	27.34	14.2	28.80	21.0				

Connection Locations: SE = Same End
OE = Opposite End

Optional Accessories

Optional Cooling Coils

The standard coil construction and fin pattern is compatible with most system environments. Where the fluid cooler is subject to a contaminated or corrosive airstream, special coils may be required. Available for these applications are coils with wider fin spacing for easier cleaning, coils Heresite® coated to reduce corrosion (up through 169" long cabinet), polyester painted fins for salt atmosphere protection (BOHNGUARD®), and copper fin/copper tube coils for all models.

Extended Lube Lines

Available on belt drive units, extended lube lines are factory installed with external grease fittings to make lubrication routine.

Connection Manifold Kit

This field installed kit converts the standard dual circuit cooler (direct drive models and belt drive models) to one having a single inlet and outlet connection.

Sealtite Wiring

Sealtite wiring is watertight, flexible conduit and fittings for fan motors. It is factory installed and replaces the standard THW wiring.

Low Ambient Operation

Fan Control

Fan control is an automatic operation to control the leaving fluid temperature by cycling fans off in sequence. Each fan section, with the exception of the number one cell, operates under the control of an individual thermostat which senses leaving fluid temperature. As the fluid temperature drops below the set point of each thermostat, that fan section cycles off. The number one fan section remains on at the full fan cycling. Cooler capacity drops to the approximate capacity percentages shown in the table below.

Multiple Contactor Fan Cycling:

Consists of a factory mounted and wired, weatherproofed enclosure containing starting contactors (with holding coils) and thermostat(s) with sensing bulb strapped to coil outlet header. Specify control voltage on order: 24V, 115V or 208-230V available.

The fan control thermostats must be field adjusted to meet design requirements. The maximum temperature setting for the standard control thermostat is 100°F. For applications requiring precise fluid temperature control during all periods of operation, contact the factory applications department.

NOTE: The standard fan control packages use individual thermostats to cycle fans. This method of control will allow leaving fluid temperatures to fluctuate between fan cycling points. For applications requiring precise fluid temperature control during all periods of operation, contact the factory applications department.

Table 6. Capacity at Maximum Fan Control

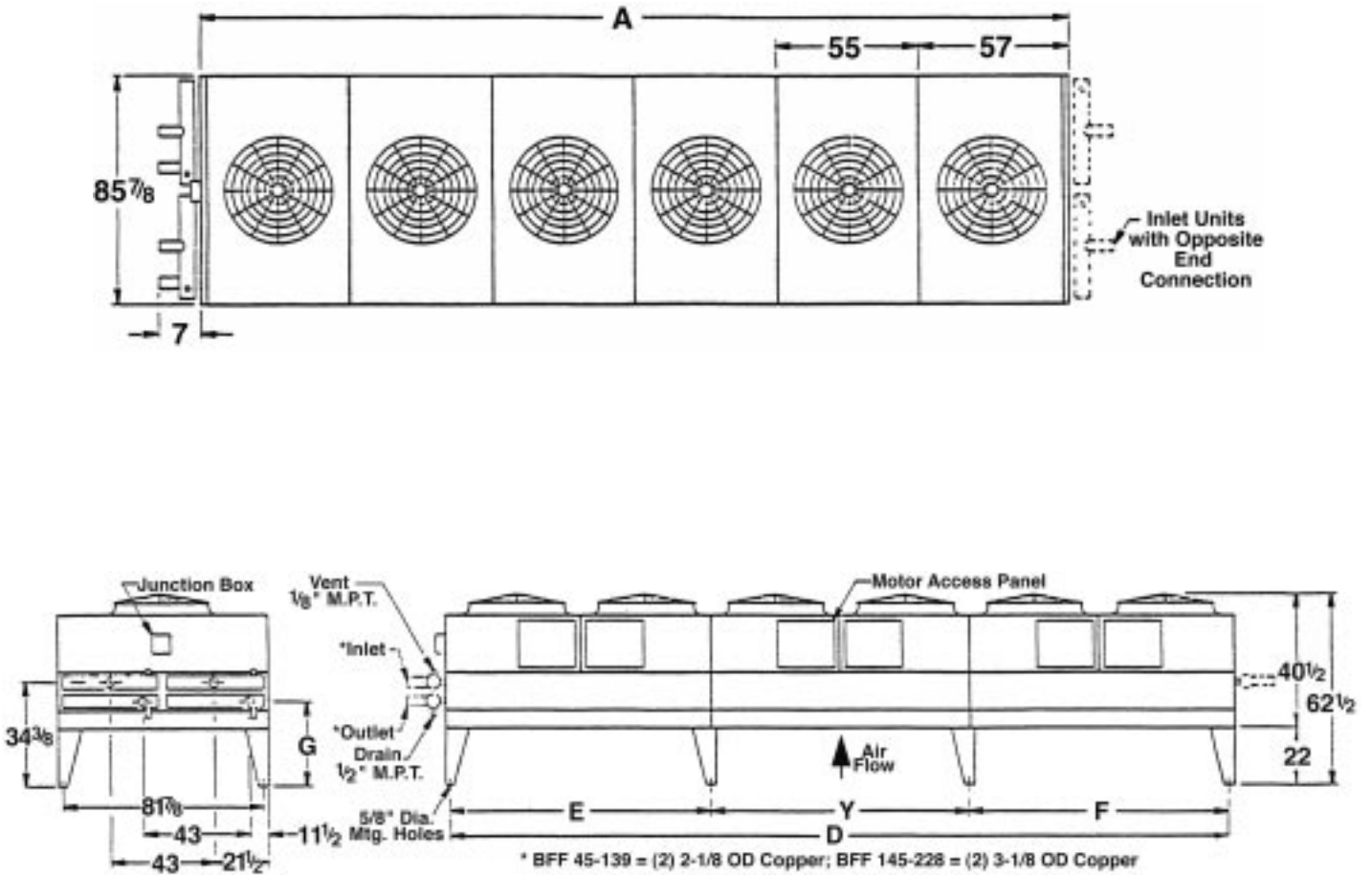
One Fan Cell Operating	
Fans Available	% Total Capacity
2	55%
3	40%
4	33%
5	28%
6	25%

Table 7. Belt Drive Fluid Cooler Volume in Gallons

BFF Unit	Volume Gallons	BFF Unit	Volume Gallons	BFF Unit	Volume Gallons
045	19.3	086	26.3	139	43.1
050	19.3	088	33.7	145	52.5
054	19.3	096	33.7	151	52.9
057	19.3	097	26.3	159	52.5
059	24.3	101	41.1	167	62.0
062	19.3	106	26.3	179	52.5
065	19.3	111	43.1	182	62.0
069	26.3	114	41.1	200	76.4
073	24.3	121	43.1	209	62.0
081	26.3	136	52.9	228	76.4

Physical / Dimensional Data

Diagram 1. Dimensional Diagram for models BFF 45-228



Dimensional and Physical Data

Table 8A. Dimensions

BFF Size	Dimensions												48" Fans		
	A	D	E	F	G	J	K	L	M	R	S	Y	Qty.	RPM	CFM
045	114	110	---	----	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	41 ⁷ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	415	32,800
050	114	110	---	----	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	41 ⁷ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	470	35,000
054	114	110	---	----	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	41 ⁷ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	470	34,400
057	114	110	---	----	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	41 ⁷ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	600	51,200
059	114	110	---	----	30 ¹ / ₄	22 ⁵ / ₈	23 ⁷ / ₁₆	39 ¹³ / ₁₆	35 ¹³ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	470	31,200
062	114	110	---	----	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	41 ⁷ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	600	50,100
065	114	110	---	----	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	41 ⁷ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	600	48,200
069	169	165	82	83	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	39 ¹³ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	3	415	44,000
073	114	110	---	---	30 ¹ / ₄	22 ⁵ / ₈	23 ⁷ / ₁₆	39 ¹³ / ₁₆	35 ¹³ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	2	600	49,200
081	169	165	82	83	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	39 ¹³ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	3	470	51,600
086	169	165	82	83	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	39 ¹³ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	3	600	76,800
088	169	165	82	83	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	3	470	46,800
096	169	165	82	83	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	3	545	54,300
097	169	165	82	83	31 ⁵ / ₈	21 ¹³ / ₁₆	23 ⁷ / ₁₆	41 ⁷ / ₁₆	39 ¹³ / ₁₆	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	3	600	72,300
101	169	165	82	83	28 ⁷ / ₈	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	---	3	545	58,800
106	169	165	82	83	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹ / ₂	1 ¹⁵ / ₁₆	---	3	600	66,000
111	224	220	109 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹¹ / ₁₆	2 ³ / ₁₆	---	4	470	72,000
114	169	165	82	83	28 ⁷ / ₈	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	---	3	600	67,600
121	224	220	109 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹¹ / ₁₆	2 ³ / ₁₆	---	4	545	78,000
136	224	220	109 ¹ / ₂	110 ¹ / ₂	28 ⁷ / ₈	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	---	4	545	82,400
139	224	220	109 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹¹ / ₁₆	2 ³ / ₁₆	---	4	600	99,200
145	279	275	82 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	82 ¹ / ₂	5	470	81,500
151	224	220	109 ¹ / ₂	110 ¹ / ₂	28 ⁷ / ₈	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	---	4	600	100,400
159	279	275	82 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	82 ¹ / ₂	5	545	94,000
167	334	330	109 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	110	6	470	101,400
179	279	275	82 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	82 ¹ / ₂	5	600	114,500
182	334	330	109 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	110	6	545	117,000
200	334	330	109 ¹ / ₂	110 ¹ / ₂	29 ⁹ / ₁₆	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	110	6	545	123,600
209	334	330	109 ¹ / ₂	110 ¹ / ₂	30 ¹ / ₄	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	110	6	600	142,200
228	334	330	109 ¹ / ₂	110 ¹ / ₂	29 ⁹ / ₁₆	21 ¹³ / ₁₆	21 ¹³ / ₁₆	42 ¹ / ₄	42 ¹ / ₄	6 ¹⁵ / ₁₆	2 ⁷ / ₁₆	110	6	600	150,600

Table 8B. Physical Data

BFF Size	Motors				Internal Volume Gallons	Approximate Dry Weight (Lbs.)
	HP	Full Load Amps (Three Phase)				
		208V	230V	460V		
045	1½	11.0	10.0	5.0	19.3	1280
050	2	13.4	13.2	6.6	19.3	1340
054	2	13.4	13.2	6.6	19.3	1380
057	5	29.2	26.4	13.2	19.3	1370
059	2	13.4	13.2	6.6	24.3	1540
062	5	29.2	26.4	13.2	19.3	1420
065	5	29.2	26.4	13.2	19.3	1450
069	1½	16.5	15.0	7.5	26.3	1960
073	5	29.2	26.4	13.2	24.3	1610
081	2	20.1	19.8	9.9	26.3	2110
086	5	43.8	39.6	19.8	26.3	2095
088	2	20.1	19.8	9.9	33.7	2335
096	3	27.9	25.2	12.6	33.7	2380
097	5	43.8	39.6	19.8	26.3	2395
101	3	27.9	25.2	12.6	41.1	2460
106	5	43.8	39.6	19.8	26.3	2440
111	2	26.8	26.4	13.2	43.1	2910
114	5	43.8	39.6	19.8	41.1	2580
121	3	37.2	33.6	16.8	43.1	2970
136	3	37.2	33.6	16.8	52.9	3370
139	5	58.4	52.8	26.4	43.1	3050
145	2	33.5	33.0	16.5	52.5	3850
151	5	58.4	52.8	26.4	52.9	3450
159	3	46.5	42.0	21.0	52.5	3900
167	2	40.2	39.6	19.8	62.0	4525
179	5	73.0	66.0	33.0	52.5	3950
182	3	55.8	50.4	25.2	62.0	4575
200	3	55.8	50.4	25.2	76.4	4995
209	5	87.6	79.2	39.6	62.0	4695
228	5	87.6	79.2	39.6	76.4	5115

Engineering Specifications

Unit Cabinet -

Casings shall be constructed of heavy gauge corrosion resistant aluminum, or galvanized steel, thoroughly reinforced with bolted gussets. Full width baffles shall divide the individual fan sections. Motor access panels shall be provided in each fan section. Cabinet mounting frames and mounting legs shall be constructed of heavy galvanized steel. The legs shall be shipped with the unit for field installations.

Coil -

Coil shall be constructed of plate type, die formed, aluminum fins mechanically bonded to copper tubes; fins shall employ full height, self-spacing collars which completely cover tube surface. Coil shall be pressure and leak tested at 425 PSIG air under warm water, evacuated, dehydrated and sealed with caps on connections.

Fans -

Fans, each driven by its own motor, shall be selected to cover a large percentage of the coil face area. Fans shall be statically and dynamically balanced before shipment. Low tip speeds shall provide quiet operation.

Drives & Bearings -

Each fan shall be equipped with a heavy duty, weather protected, pillow block bearing with lubricating fitting accessible through the motor access panel. Fan shafts shall be polished steel, precision machined and coated with corrosion resistant dressing. V-belt and cast iron drive pulleys shall be matched for heavy duty continuous operation.

Fan Motors -

Motors shall be NEMA type "T" frame, open drop-proof with grease lubricated ball bearings. They shall be thermally protected against burnout, and may be started by a single contactor. Motors shall be factory wired with leads marked and terminated in a weatherproof junction box located on the outside of the unit. They shall be positioned within unit casing for weather protection. Adjustable motor mount bases and large, easy access motor compartment panels. Available in 208V, 230V, 460V and 575V, three phase 60 Hz. models: and 200V, 380V and 415V, three phase 50 Hz. models.

Fan Guards -

Guards shall be constructed of heavy gauge, close meshed steel wire that is zinc plated and iridite dipped to prevent corrosion.

U.L. Listing -

All 60 Hz. models (except 575V) shall be U.L. listed.

HEATCRAFT[®]

Refrigeration Products



Bohn is a product line of
Heatcraft Refrigeration Products

2175 W. Park Place Blvd.

Stone Mountain, GA 30087 • (770) 465-5600 • Fax: (770) 465-5990

Visit our web site at www.heatcraftprd.com for technical literature online.