

BOHN

THE COLD STANDARD

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DIRECT DRIVE FLUID COOLERS

Technical Guide

Models DFT and BFH



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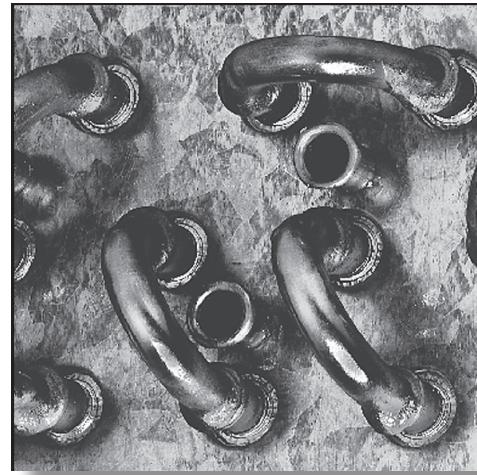
Overview

Our engineers have carefully selected and matched components to provide excellent performance, long service life and a wide range of performance selections. Specifically engineered for outdoor installations, the DFT and BFH fluid coolers are constructed of aluminum and heavy gauge galvanized steel to resist corrosion in all climates.

Fluid coolers are available in a wide range of sizes. Each model is available with several circuit options to ensure the exact fluid cooler for your requirements. Our fluid coolers are designed to reduce the cost of time required for installation. Each unit is completely assembled and tested at the factory. All motor leads are wired to a junction box providing a single point for field wiring.

Direct-Drive Design Features

- Cabinets are heavy-duty construction and designed for outdoor applications; tube sheets and all structural members are fabricated from galvanized steel
- Cabinet panels are fabricated from heavy-gauge aluminum for an attractive appearance and corrosion protection
- Coils are fabricated with corrugated aluminum fins with staggered copper tubes for optimum heat transfer; all units are pressure-tested, dehydrated and pressurized prior to shipment
- Alternate coil constructions are available — copper fins, BohnGuard™ fins and coated coils
- BFH models incorporate the Floating Tube™ coil design that reduces the possibility of tube sheet leaks
- DFT models available in either horizontal or vertical air flow; BFH models available in vertical air flow only
- Fully baffled fan sections provide structural strength and prevent fan wind-milling in the off cycle
- Energy efficient fan motors with direct-drive fans available at 1140 RPM; fan motors have thermal overload protection and permanently lubricated ball bearings
- DFT models are available in 208-230 V single-phase, 208-230/460 dual-voltage, three-phase or 575 V three-phase motors; BFH models are available in 208-230/460 dual voltage, three-phase or 575 V three-phase motors
- Statically and dynamically balanced fan blades are aluminum and riveted to painted steel spider and hubs
- Fan guards are PVC coated steel for optimum corrosion protection
- All fan motor leads are wired to a weatherproof electrical enclosure for single-point field wiring
- Fan cycling controls are available that cycle all fans in response to BFH only; DFT fan cycling is ambient air
- All controls are factory mounted and wired; control circuit voltage is 230 V standard, 24 and 115 V controls are also available
- A wide selection of circuit options maximizes performance at minimal cost
- Sizes available from 10 GPM through 500 GPM
- Units are UL listed for US and Canada



The Floating Tube™ Coil Design Dramatically Reduces Tube Sheet Leaks

Selection Procedure

Selection Formulas

Design Capacity = GPM x (Entering Fluid Temperature - Leaving Fluid Temperature) x Fluid Constant, Table 1

Average Fluid Temperature = (Entering Fluid Temperature + Leaving Fluid Temperature)/2

Initial Temperature Difference, ITD = Entering Fluid Temperature - Entering Air Temperature

Base Capacity = Design Capacity/(1,000 x ITD x Capacity Correction, Table 2 x Altitude Correction Factor, Table 3)

Pressure Drop, Fluid = Pressure Drop, Catalog x Correction Factor, Table 4

Given Conditions	
Direct Drive	120°F Leaving Fluid Temperature
50 GPM	100°F Entering Air Temperature
20% Ethylene glycol solution	20 feet maximum fluid pressure drop
130°F Entering Fluid Temperature	1,000 feet altitude

Solution

- Calculate design capacity. From Table 1, select the fluid constant for 20% of 484.

$$\text{Design Capacity} = 50 \times (130-120) \times 484$$

$$\text{Design Capacity} = 242,000 \text{ BTUH}$$

- Calculate average fluid temperature

$$= (130 + 120)/2$$

$$= 125^{\circ}\text{F}$$

- Calculate the initial temperature difference, ITD

$$\text{ITD} = 130 - 100$$

$$\text{ITD} = 30^{\circ}\text{F}$$

- Calculate Base capacity. From Table 2, for a 20% solution and an average fluid temperature of 125° F, interpolate to obtain a correction factor of 1.035. From Table 3, obtain an attitude correction factor at 1000 feet of 0.98.

$$\text{Base Capacity} = 242,000 / (1,000 \times 30 \times 1.035 \times 0.98)$$

$$\text{Base Capacity} = 7.95 \text{ MBH} / ^{\circ}\text{TD}$$

Correction Factors

5. Select the model and circuiting required. From the capacity tables, locate the GPM you desire and read down until you find a base capacity equal to or greater than your calculated base capacity. Read horizontally to the left to obtain the model and circuiting (Feeds) for your application.

The selection is a DFT 16, with 32 feeds, with a base capacity of 8.34 MBH/1° TD and a fluid loss of 15.1 feet of water.

6. Calculate the pressure drop of the fluid. From Table 4, using 20% glycol solution and a 125°F average fluid temperature, interpolate to get a correction factor of 0.86.

$$\text{Actual Fluid Loss} = 15.1 \times 0.86$$

$$\text{Actual Fluid Loss} = 13.0 \text{ feet of water}$$

Table 1. Fluid Constraints

Percent Glycol	Fluid Constant
0	500
10	493
20	484
30	470
40	453
50	435

Table 2. Capacity Correction Factor

Percent Glycol	Average Fluid Temperature °F				
	50	70	90	110	130
0	0.97	1.01	1.03	1.05	1.07
10	0.96	1.00	1.02	1.04	1.06
20	0.94	0.98	1.00	1.02	1.04
30	0.92	0.96	0.98	1.00	1.02
40	0.90	0.94	0.96	0.98	1.00
50	0.87	0.91	0.94	0.96	0.98

Note: For average fluid temperature less than 50°F or greater than 130°F, consult the factory

Table 3. Altitude Correction Factor

Altitude (Feet)	Correction Factor
0	1.00
1,000	0.98
2,000	0.95
3,000	0.93
4,000	0.90
5,000	0.88
6,000	0.85
7,000	0.83

Table 4. Correction Factor for Fluid Loss

Percent Ethylene Glycol	Average Fluid Temperature °F				
	50	70	90	110	130
0	0.88	0.82	0.78	0.75	0.71
10	0.97	0.90	0.86	0.82	0.78
20	1.05	0.98	0.94	0.89	0.85
30	1.15	1.07	1.02	0.98	0.93
40	1.24	1.15	1.10	1.05	1.00
50	1.33	1.23	1.18	1.12	1.07

Capacity Ratings

Table 5. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	GPM																	
		10		15		20		25		30		40		50		60			
		MBH	PD*	MBH	PD*	MBH	PD*												
DFT 005	8	2.36	14.0	2.71	28.7			2.95	24.0										
	12	2.23	4.7	2.58	9.7	2.80	16.1	2.70	7.5	2.85	11.2	2.97	15.5						
	16			2.47	4.5														
DFT 008	12	3.07	7.4	3.67	15.1	4.04	25.2			4.17	17.3	4.35	23.8			19.2	4.66	28.5	
	16			3.55	7.0	3.92	11.6	3.79	5.6	4.05	8.4	4.24	11.5	4.49	6.4	4.49	4.62	13.0	
	21																		
DFT 010	12	3.46	7.5	4.32	15.5	4.88	25.7			5.13	17.6	5.42	24.3						
	16			4.16	7.1	4.73	11.9	4.46	4.0	4.86	6.0	5.17	8.3	5.60	13.8	5.89	20.4	6.10	28.2
	24																		
DFT 012	12	3.62	7.5	4.62	15.5	5.30	25.7	5.12	11.9	5.61	17.6	5.99	24.3			13.8	6.60	20.4	6.88
	16			4.45	7.1			4.81	4.0	5.30	6.0	5.68	8.3	6.23					28.2
	24																		
DFT 014	12	3.92	9.4	5.12	19.3			5.78	14.7	6.39	21.9			7.19	16.9	7.64	25.2		
	16			4.96	8.9			5.49	5.0	6.08	7.4	6.53	10.2						
	24																		
DFT 016	12	4.17	12.4	5.57	25.4			7.27	9.2	8.44	13.7	9.43	18.9			10.2	8.34	15.1	8.70
	21									6.57	4.4	7.09	6.1	7.84					20.9
	32																		
DFT 021	16					5.93	12.3	7.22	20.5	6.93	6.8	7.90	10.2	8.68	14.0	9.83	23.3		
	24															3.7	9.78	5.5	10.41
	48																		7.5
DFT 023	24							6.99	6.8	7.98	10.2	8.78	14.0	9.96	23.3				
	48														9.25	3.7	10.14	5.5	10.82
DFT 026	21							7.65	12.9	8.81	19.1	9.73	26.3			10.66	14.0	11.58	20.8
	32									8.44	6.1	9.33	8.4				10.63	11.33	12.25
	64																		28.7

*PD is glycol fluid loss in feet of water at 130°F fluid temperature

Table 6. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	GPM																	
		70		80		90		100		110		120		130		140		150	
		MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*
DFT 021	48	10.89	9.9	11.29	12.6	11.61	15.5	11.88	18.6	12.12	22.1	12.31	25.7						
DFT 023	48	11.36	9.9	11.80	12.6	12.16	15.5	12.46	18.6	12.72	22.1	12.94	25.7						
DFT 026	64	11.88	6.0	12.33	7.5	12.69	9.3	12.98	11.2	13.24	13.3	13.46	15.5	13.64	17.8	13.81	20.3	13.95	23.0

*PD is glycol fluid loss in feet of water at 130°F fluid temperature

Table 7. Model DFT Connection Sizes, based on the number of feeds

Feeds	Inlet/Outlet
8	1-1/8" ODS
12	1-3/8" ODS
16	1-3/8" ODS
21	1-5/8" ODS

Feeds	Inlet/Outlet
24	2-1/8" ODS
32	2-1/8" ODS
48	2-5/8" ODS
64	2-5/8" ODS

Specifications and Dimensions

Diagram 1. Model DFT Dimensions, 5 through 26 Tons with Vertical Air Flow

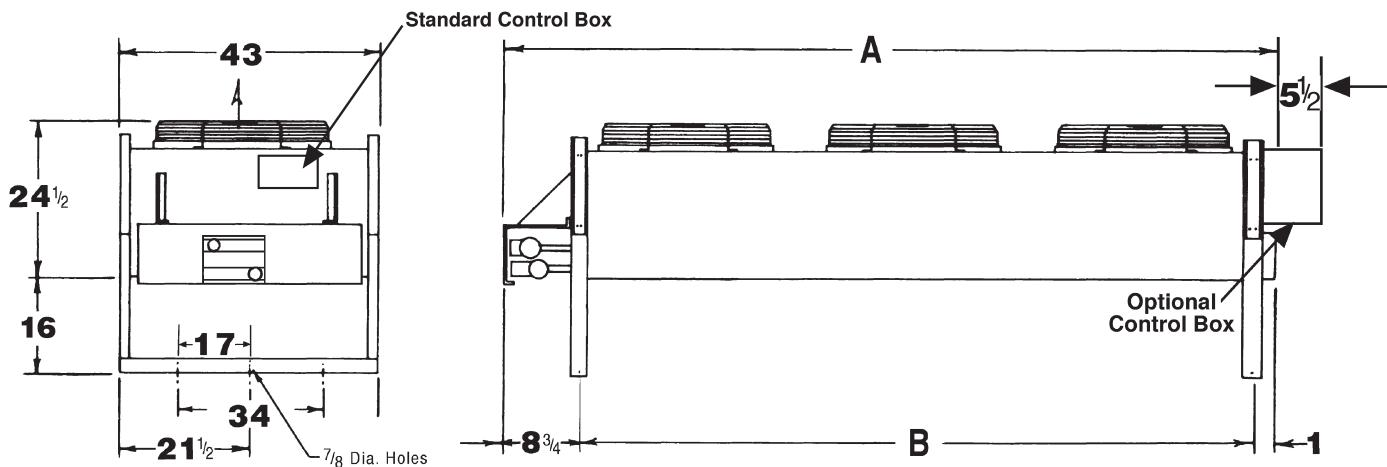


Diagram 2. Model DFT Dimensions, 5 through 26 Tons with Horizontal Air Flow

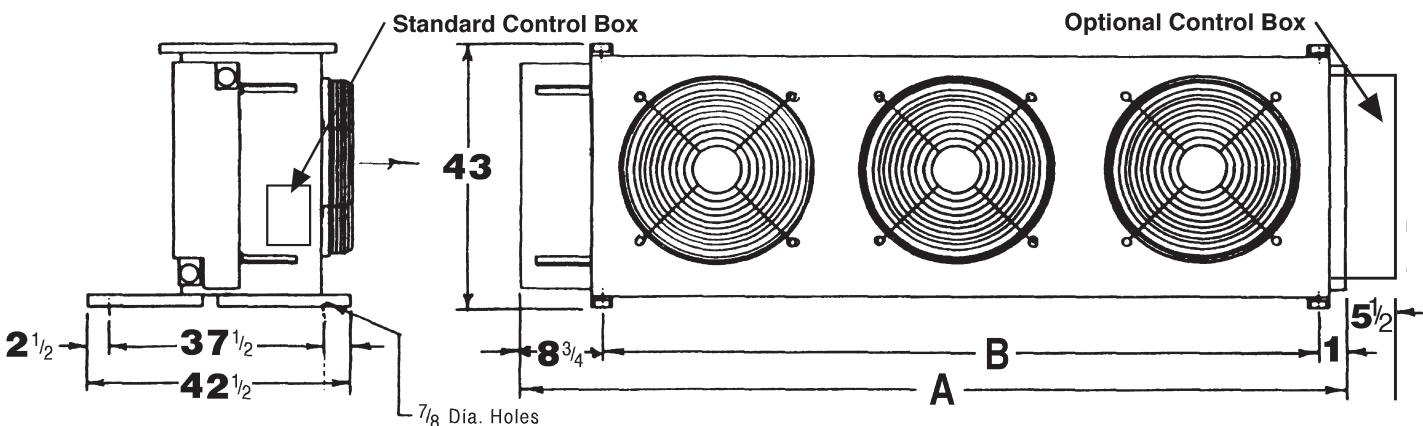


Table 8. Model DFT Specifications

Model	Dimensions (in.)		CFM	Fan		Motor Data			Approx. Net Wt. (Lbs.)	
	A	B		No.	Dia.	HP ¹	FLA ¹	HP ²		
DFT005	39-3/4	30	5,050	1	24	1/3	3.4	1/3	2.6/1.3	205
DFT008	49-3/4	40	6,450	1	26	1/2	3.9	1/3	2.6/1.3	260
DFT010	69-3/4	60	10,100	2	24	1/3	6.8	1/3	5.2/2.6	330
DFT012	69-3/4	60	12,400	2	26	1/2	7.8	1/3	5.2/2.6	348
DFT014	89-3/4	80	13,700	2	26	1/2	7.8	1/3	5.2/2.6	420
DFT016	89-3/4	80	12,900	2	26	1/2	7.8	1/3	5.2/2.6	436
DFT021	129-3/4	120	20,500	3	26	1/2	11.7	1/3	7.8/3.9	565
DFT023	129-3/4	120	19,900	3	26	1/2	11.7	1/3	7.8/3.9	580
DFT026	129-3/4	120	19,400	3	26	1/2	11.7	1/3	7.8/3.9	610

¹Motor voltage 208-230/1/60; 1075 RPM

²Motor voltage 208-230-460/3/60; 1140 RPM

Capacity Ratings

Table 9. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	Fan Config.	GPM																			
			20		30		40		50		60		70		80		90		100			
			MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*		
BFH 023	14 28	1 x 2	6.4	3.2	8.04	6.5	9.18	10.8	10.01	16.1	10.64	22.2			10.07	4.1	10.51	5.2	10.87	6.4	11.18	7.8
BFH 027	14 21 42	1 x 2	7.01	4.8	8.85 8.39	9.9 3.2	10.1 9.60	16.5 5.3	10.99 10.49	24.4 7.9	11.17 10.06	10.8 1.5	11.7 10.62	14.2 2.0	12.13 11.08	18.0 2.6	12.48 11.47	22.2 3.1	11.8 11.8		3.8	
BFH 031	14 21 42	1 x 2	7.42	4.8	9.56 9.02	9.9 3.2	11.04 10.45	16.5 5.3	12.1 11.51	24.4 7.9	12.32 10.99	10.8 1.5	12.95 11.64	14.2 2.0	13.47 12.19	18.0 2.6	13.89 12.65	22.2 3.1	13.05 13.05		3.8	
BFH 035	18 28 56	1 x 2			10.2	6.6	11.88 11.2	11.0 3.2	13.08 12.38	16.3 4.7	13.98 13.29	22.5 6.5	14.66 13.99	29.5 8.6	14.55 13.16	10.8 1.5	15.01 13.67	13.4 1.9	15.39 14.1	16.1 2.3		
BFH 041	14 21 42	1 x 3	8.19	7.0	10.99 10.54	14.3 4.6	13.04 12.52	23.8 7.7	14.02	11.4	15.19 13.83	15.8 2.3	16.13 14.76	20.7 3.0	16.90 15.54	26.2 3.7	16.19	4.6	16.76	5.6		
BFH 045	14 21 42	1 x 3			11.62 11.15	14.3 4.6	14.03 13.43	23.8 7.7	15.21	11.4	16.61 14.99	15.8 2.3	17.74 16.09	20.7 3.0	18.66 17.01	26.2 3.7	17.79	4.6	18.46	5.6		
BFH 046	18 28 56	2 x 2			11.24	6.6	13.63 12.8	11.0 3.2	15.54 14.6	16.3 4.7	17.08 16.08	22.5 6.5	18.35 17.31	29.5 8.6	18.35 16.17	10.8 1.5	19.24 17.04	13.4 1.9	20.01 17.81	16.1 2.3		
BFH 049	18 28 56	1 x 3			11.92	9.5	14.49 13.85	15.9 4.6	16.45 15.73	23.5 6.9	17.22	9.5	18.41	12.4	19.37 17.69	15.8 2.3	20.18 18.51	19.4 2.8	20.85	23.4		

* PD is glycol fluid loss in feet of water at 130°F fluid temperature

Capacity Ratings

Table 10. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	Fan Config.	GPM																		
			20		30		40		50		60		70		80		90		100		
			MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	
BFH 054	28 42	2 x 2					14.03	4.8	16.06	7.2	17.70	9.9	19.06	13.0	20.19	16.5	21.15	20.3	21.97	24.4	
											16.78	3.2	18.10	4.2	19.21	5.3	20.16	6.5	20.99	7.9	
BFH 053	14 21 42	1 x 4	8.71	9.2	12.20	18.4	14.50	10.1	16.62	15.0	18.32	20.7	19.71	27.1							
					11.86	6.1					16.85	3.0	18.18	3.9	19.30	4.9	20.27	6.1	21.10	7.3	
BFH 060	28 42	2 x 2					14.84	4.8	17.18	7.2	19.12	9.9	20.73	13.0	22.09	16.5	23.24	20.3	24.22	24.4	
											18.05	3.2	19.60	4.2	20.92	5.3	22.05	6.5	23.03	7.9	
BFH 061	21 42	1 x 4			12.34	6.1	15.34	10.1	17.80	15.0	19.81	20.7	21.47	27.2							
											18.12	3.0	19.68	3.9	21.01	4.9	22.15	6.1	23.14	7.4	
BFH 066	36 56	2 x 2							17.77	4.8	19.84	6.6	21.55	8.7	22.99	11.0	24.21	13.5	25.25	16.3	
											21.71	3.2	22.90	3.9	23.94	4.7					
BFH 065	18 28 56	1 x 4			12.88	12.5	16.23	20.7													
							15.71	6.1	18.31	9.0	20.44	12.4	22.21	16.3	23.68	20.7	24.91	25.5			
															21.80	3.0	23.00	3.7	24.04	4.4	
BFH 070	36 56	2 x 2							18.21	4.8	20.41	6.6	22.24	8.7	23.78	11.0	25.08	13.5	26.19	16.3	
											22.41	3.2	23.68	3.9	24.78	4.7					
BFH 071	18 28 56	1 x 4			13.04	12.5	16.53	20.7													
							16.01	6.1	18.76	9.0	21.04	12.4	22.93	16.3	24.50	20.7	25.82	25.5			
															22.50	3.0	23.78	3.7	24.88	4.4	
BFH 075	21 42	1 x 5			12.97	7.5	16.52	12.5	19.56	18.5	22.14	25.6									
											20.53	3.7	22.54	4.9	24.28	6.1	25.80	7.6	27.13	9.1	
BFH 079	18 28 56	1 x 5			13.20	15.4	16.90	25.6													
							16.51	7.5	19.53	11.1	22.08	15.4	24.23	20.2	26.06	25.6					
															24.27	3.7	25.76	4.5	27.06	5.5	
BFH 080	28 42	2 x 3							16.38	7.0	19.38	10.4	21.97	14.3	24.18	18.8	26.08	23.8	27.73	29.4	
											21.09	4.6	23.21	6.1	25.04	7.7	26.64	9.5	28.05	11.4	
BFH 086	28 42	2 x 3							16.69	7.0	19.89	10.4	22.67	14.3	25.07	18.8	27.16	23.8	28.97	29.4	
											21.76	4.6	24.04	6.1	26.03	7.7	27.78	9.5	29.32	11.4	
BFH 090	28 42	2 x 3							16.93	7.0	20.29	10.4	23.23	14.3	25.81	18.8	28.05	23.8	30.01	29.4	
											22.30	4.6	24.73	6.1	26.86	7.7	28.74	9.5	30.41	11.4	
BFH 089	18 28 56	1 x 5			13.40	15.4	17.39	2.56													
							17.03	7.5	20.38	11.1	23.27	15.4	25.75	20.2	27.87	25.6					
															25.84	3.7	27.55	4.5	29.04	5.5	
BFH 097	28 56	1 x 6							17.22	8.9	20.70	13.3	23.74	18.3	26.38	24.1					
															26.92	4.4	28.78	5.4	30.43	6.5	
BFH 098	36 56	2 x 3									20.73	6.9	23.84	9.5	26.58	12.5	28.97	15.9	31.07	19.5	
															27.70	4.6	29.70	5.7	31.46	6.9	
BFH 107	28 56	1 x 6							17.59	8.9	21.37	13.3	24.76	18.3	27.76	24.1					
															28.48	4.4	30.61	5.4	32.50	6.5	

* PD is glycol fluid loss in feet of water at 130°F fluid temperature

Capacity Ratings

Table 11. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	Fan Con-fig.	GPM																					
			20		30		40		50		60		70		80		90		100					
			MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*	MBH	PD*				
BFH 106	28 42	2 x 4					17.42	9.2	21.10	13.6	24.41	18.7	27.35	24.6			29.01	10.1	31.24	12.4	33.23	15.0		
BFH 120	28 42	2 x 4					17.74	9.2	21.70	13.6	25.35	18.7	28.68	24.6			30.68	10.1	33.26	12.4	35.60	15.0		
BFH 132	36 56	2 x 4							21.96	9.0	25.77	12.5	29.27	16.4	32.45	20.7	35.34	25.6	37.94	30.8	31.41	6.1		
BFH 140	36 56	2 x 4							22.13	9.0	26.06	12.5	29.71	16.4	33.07	20.7	36.12	25.6	37.52	9.0	32.02	6.1		
BFH 152	42	2 x 5									25.94	7.5	29.62	9.9	33.03	12.5	36.20	15.4	39.11	18.5				
BFH 162	36 56	2 x 5							22.33	11.2	26.41	15.4	30.24	20.2	33.81	25.6			36.17	9.2	39.06	11.1	33.03	7.5
BFH 168	36 56	2 x 5							22.45	11.2	26.64	15.4	30.62	20.2	34.62	25.6			36.92	9.2	40.00	11.1	33.61	7.5
BFH 178	56	2 x 5													34.06	7.5	37.53	9.2	40.76	11.1				
BFH 194	56	2 x 6													34.44	8.9	38.03	11.0	41.39	13.3				
BFH 202	56	2 x 6													34.86	8.9	38.61	11.0	42.15	13.3				
BFH 212	56	2 x 6													35.17	8.9	39.05	11.0	42.74	13.3				

* PD is glycol fluid loss in feet of water at 130°F fluid temperature

Capacity Ratings

Table 12. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	Fan Config.	GPM																	
			120		140		160		180		200		220		240		260		280	
			MBH	PD*	MBH	PD*	MBH	PD*												
BFH023	28	1 x 2	11.69	10.7																
BFH027	42	1 x 2	12.33	5.2	12.74	6.9	13.07	8.7	13.34	10.7										
BFH031	42	1 x 2	13.68	5.2	14.17	6.9	14.57	8.7	14.89	10.7										
BFH035	28 56	1 x 2	15.98 14.79	22.2 3.1																
BFH041	42	1 x 3	17.67	7.7	18.39	10.1	18.96	12.8	19.40	15.7										
BFH045	42	1 x 3	19.56	7.7	20.42	10.1	21.10	12.8	21.66	15.7										
BFH049	56	1 x 3	20.36	4.6	21.24	6.1	21.95	7.7	22.52	9.5	22.99	11.4	23.39	13.5	23.74	15.7				
BFH046	28 56	2 x 2	21.27 19.10	22.2 3.1	20.15	4.1	21.01	5.2	21.74	6.4	22.37	7.8	22.91	9.2	23.38	10.7				
BFH054	42 84	2 x 2	22.34 20.12	10.8 1.5	23.40 21.24	14.2 2.0	24.26 22.16	18.0 2.6	24.96 22.93	22.2 3.1	23.59	3.8	24.16	4.5	24.66	5.2	25.10	6.0	25.49	6.9
BFH053	42	1 x 4	22.45	10.1	23.53	13.3	24.39	16.9	25.09	20.8										
BFH060	42 84	2 x 2	24.65 21.98	10.8 1.5	25.93 23.30	14.2 2.0	26.95 24.40	18.0 2.6	27.80 25.32	22.2 3.1	26.11	3.8	26.79	4.5	27.39	5.2	27.91	6.0	28.37	6.9
BFH061	42	1 x 4	24.77	10.1	26.05	13.3	27.08	16.9	27.93	20.8										
BFH066	36 56 112	2 x 2	26.92 25.63	22.5 6.5	28.21 26.96	29.5 8.6	28.03 25.43	10.8 1.5	28.90 26.38	13.4 1.9	29.62 27.20	16.1 2.3	30.23 27.90	19.1 2.7	30.75 28.51	22.2 3.1	29.04	3.6	29.51	4.1
BFH065	56	1 x 4	25.75	6.1	27.08	8.0	28.15	10.1	29.02	12.5	29.75	15.0	30.36	17.8	30.89	20.8				
BFH070	36 56 112	2 x 2	27.98 26.59	22.5 6.5	29.34 28.00	29.5 8.6	29.13 26.34	10.8 1.5	30.05 27.36	13.4 1.9	30.81 28.22	16.1 2.3	31.45 28.96	19.1 2.7	32.00 29.60	22.2 3.1	30.17	3.6	30.67	4.1
BFH071	56	1 x 4	26.70	6.1	28.12	8.0	29.25	10.1	30.17	12.5	30.94	15.0	31.58	17.8	32.13	20.8				

* PD is glycol fluid loss in feet of water at 130°F fluid temperature

* PD is glycol fluid loss in feet of water at 130°F fluid temperature

Capacity Ratings

Table 13. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	Fan Config.	GPM																	
			120		140		160		180		200		220		240		260		280	
			MBH	PD*																
BFH 075	42	1 x 5	29.34	12.6	31.09	16.5	32.52	20.9	33.69	25.8										
BFH 079	56	1 x 5	29.21	7.6	30.92	9.9	32.30	12.6	33.44	15.5	34.39	18.7	35.20	22.1	35.89	25.8				
BFH 080	42	2 x 3	30.40	15.8	32.27	20.7	33.81	26.2			32.39	4.6	33.52	5.6	34.50	6.6	35.36	7.7	36.12	8.8
BFH 086	42	2 x 3	31.91	15.8	33.98	20.7	35.67	26.2			34.09	4.6	35.34	5.6	36.42	6.6	37.36	7.7	38.19	8.8
BFH 089	56	1 x 5	31.52	7.6	33.49	9.9	35.06	12.6	36.36	15.5	37.43	18.7	38.34	22.1	39.12	25.8				
BFH 090	42	2 x 3	33.21	15.8	35.47	20.7	37.31	26.2			35.58	4.6	36.93	5.6	38.10	6.6	39.12	7.7	40.03	8.8
BFH 097	56	1 x 6	33.19	9.0	35.40	11.9	37.20	15.0	38.69	18.5	39.95	22.3	41.02	26.4						
BFH 098	56	2 x 3	34.43	9.5	36.81	12.4	38.75	15.8	40.35	19.4	41.70	23.4	42.84	27.7			40.72	4.6	41.65	5.3
BFH 107	56	1 x 6	35.68	9.0	38.23	11.9	40.31	15.0	42.02	18.5	43.45	22.3	44.66	26.4						
BFH 106	42	2 x 4	36.64	20.7	39.42	27.1					42.20	7.3	43.64	8.7	44.92	10.1	46.05	11.7	47.06	13.3
BFH 120	42	2 x 4	39.62	20.7	42.95	27.1					44.30	6.1	46.28	7.3	48.01	8.7	49.54	10.1	50.89	11.7
BFH 132	56	112	40.89	12.4	44.42	16.3	47.35	20.7	49.82	25.5					51.50	6.1	52.91	7.0	54.16	8.0
BFH 140	56	112	42.08	12.4	45.85	16.3	49.00	20.7	51.64	25.5					53.40	6.1	54.90	7.0	56.24	8.0
BFH 152	42	2 x 5	44.27	25.6							51.59	7.6	54.25	9.1	56.59	10.8	58.66	12.6	60.51	14.5
BFH 162	56	112	44.16	15.4	48.47	20.2	52.13	25.6			51.52	4.5	54.13	5.5	56.42	6.5	58.44	7.6	60.25	8.7
BFH 168	56	112	45.46	15.4	50.11	20.2	54.07	25.6			53.44	4.5	56.25	5.5	58.72	6.5	60.91	7.6	62.85	8.7
BFH 178	56	112	46.55	15.4	51.50	20.2	55.74	25.6			55.11	4.5	58.10	5.5	60.74	6.5	63.07	7.6	65.14	8.7
BFH 194	56	112	47.47	18.3	52.75	24.1			53.83	4.4	57.57	5.4	60.86	6.5	63.78	7.8	66.37	9.0	68.70	10.4
BFH 202	56	112	48.61	18.3	54.26	24.1			55.52	4.4	59.53	5.4	63.08	6.5	66.23	7.8	69.04	9.0	71.56	10.4
BFH 212	56	112	49.52	18.3	55.52	24.1			56.95	4.4	61.21	5.4	64.99	6.5	68.36	7.8	71.36	9.0	74.04	10.4

* PD is glycol fluid loss in feet of water at 130°F fluid temperature

Capacity Ratings

Table 14. Capacity Ratings MBH / °TD, 40% Ethylene Glycol at 130°F Average Fluid Temperature

Model	Feeds	Fan Config.	GPM									
			300		350		400		450		500	
			MBH	PD*								
BFH054	84	2 x 2	25.83	7.8	26.56	10.2						
BFH060	84	2 x 2	28.78	7.8	29.65	10.2						
BFH066	112	2 x 2	29.94	4.7	30.82	6.1	31.50	7.8	32.06	9.6	32.53	11.5
BFH070	112	2 x 2	31.11	4.7	32.03	6.1	32.75	7.8	33.33	9.6	33.80	11.5
BFH080	84	2 x 3	37.40	11.4	38.66	15.0						
BFH086	84	2 x 3	39.60	11.4	40.99	15.0						
BFH090	84	2 x 3	41.55	11.4	43.06	15.0						
BFH098	112	2 x 3	43.22	6.9	44.77	9.0	45.98	11.4	46.97	14.0	47.77	16.9
BFH106	84	2 x 4	47.96	15.0	49.87	19.8						
BFH120	84	2 x 4	53.18	15.0	55.46	19.8						
BFH132	112	2 x 4	55.29	9.0	57.63	11.9	59.50	15.0	61.00	18.5	62.24	22.3
BFH140	112	2 x 4	57.43	9.0	59.92	11.9	61.87	15.0	63.45	18.5	64.74	22.3
BFH152	84	2 x 5	63.67	18.7	66.82	24.5						
BFH162	112	2 x 5	63.30	11.2	66.36	14.8	68.80	18.7	70.78	23.0	72.42	27.7
BFH168	112	2 x 5	66.15	11.2	69.43	14.8	72.04	18.7	74.16	23.0	75.91	27.7
BFH178	112	2 x 5	68.65	11.2	72.14	14.8	74.90	18.7	77.12	23.0	78.96	27.7
BFH194	112	2 x 6	72.69	13.4	76.69	17.6	79.90	22.3	82.52	27.5	84.70	33.1
BFH202	112	2 x 6	75.87	13.4	80.18	17.6	83.63	22.3	86.45	27.5	88.78	33.1
BFH212	112	2 x 6	78.64	13.4	83.24	17.6	86.90	22.3	89.87	27.5	92.33	33.1

* PD is glycol fluid loss in feet of water at 130°F fluid temperature

Table 15. Model BFH Connection Sizes, based on number of feeds

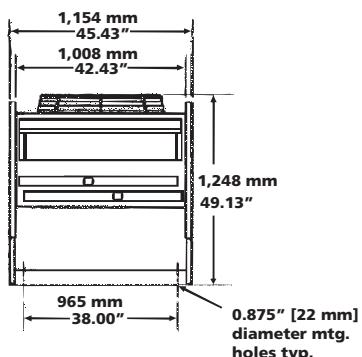
Single Row of Fans		Double Row of Fans	
Feeds	Inlet/Outlet	Feeds	Inlet/Outlet
14	2-1/8" ODS	18	2 @ 2-1/8" ODS
18	2-1/8" ODS	28	2 @ 2-1/8" ODS
21	2-5/8" ODS	36	2 @ 2-1/8" ODS
28	2-5/8" ODS	42	2 @ 2-5/8" ODS
42	3-1/8" ODS	56	2 @ 2-5/8" ODS
56	3-5/8" ODS	84	2 @ 3-1/8" ODS
		112	2 @ 3-5/8" ODS

Dimensions

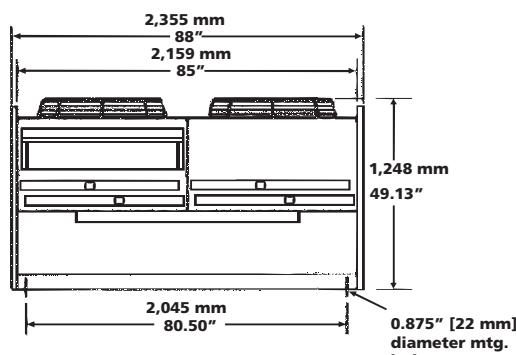
Diagram 3. Model BFH Dimensions

End Views

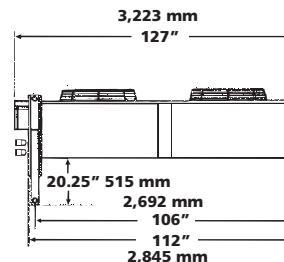
Single Row



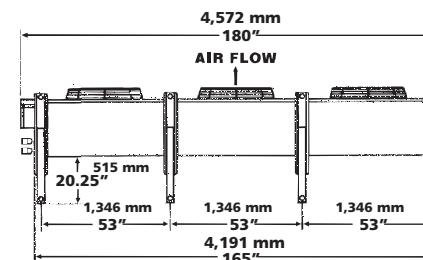
Double Row



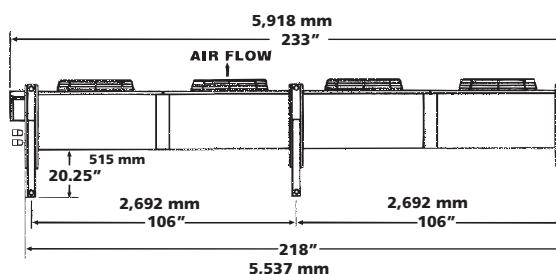
Side Views



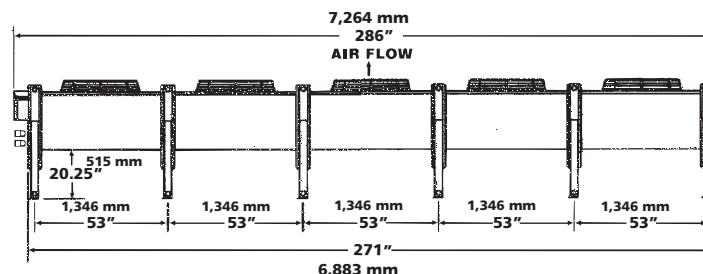
1x2
2x2



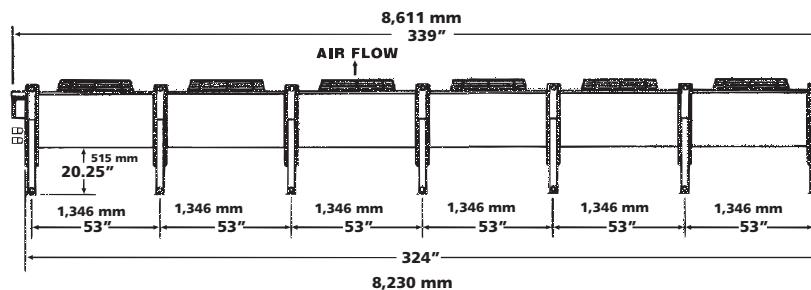
1x3
2x3



1x4
2x4



1x5
2x5



1x6
2x6

Specifications

Table 16. Model BFH Specifications

Model	Fan Data ¹		CFM	FLA ²			Operating Charge (Gal.)	Approx. Net Wt. (lbs.) [†]
	Fan Config.	No. of Fans		208-230/3/60	575/3/60	460/3/60		
Single Row of Fans								
BFH023	1 x 2	2	19,780	14.0	5.6	7.0	6.6	720
BFH027	1 x 2	2	19,800	14.0	5.6	7.0	9.0	760
BFH031	1 x 2	2	19,110	14.0	5.6	7.0	9.0	780
BFH035	1 x 2	2	18,340	14.0	5.6	7.0	11.6	860
BFH041	1 x 3	3	29,700	21.0	8.4	10.5	12.8	1,170
BFH045	1 x 3	3	28,660	21.0	8.4	10.5	12.8	1,190
BFH049	1 x 3	3	28,070	21.0	8.4	10.5	16.4	1,220
BFH053	1 x 4	4	38,600	28.0	11.2	14.0	16.4	1,550
BFH061	1 x 4	4	37,250	28.0	11.2	14.0	16.4	1,590
BFH065	1 x 4	4	38,020	28.0	11.2	14.0	21.3	1,620
BFH071	1 x 4	4	35,710	28.0	11.2	14.0	21.3	1,730
BFH075	1 x 5	5	46,610	35.0	14.0	17.5	20.0	1,960
BFH079	1 x 5	5	46,200	35.0	14.0	17.5	26.1	1,960
BFH089	1 x 5	5	44,580	35.0	14.0	17.5	26.1	2,200
BFH097	1 x 6	6	55,400	42.0	16.8	21.0	31.0	2,350
BFH107	1 x 6	6	53,460	42.0	16.8	21.0	31.0	2,580
Double Row of Fans								
BFH046	2 x 2	4	39,570	28.0	11.2	14.0	13.3	1,560
BFH054	2 x 2	4	39,600	28.0	11.2	14.0	18.2	1,600
BFH060	2 x 2	4	38,210	28.0	11.2	14.0	18.2	1,650
BFH066	2 x 2	4	37,530	28.0	11.2	14.0	23.1	1,670
BFH070	2 x 2	4	36,770	28.0	11.2	14.0	23.1	1,780
BFH080	2 x 3	6	59,400	42.0	16.8	21.0	25.4	2,350
BFH086	2 x 3	6	58,510	42.0	16.8	21.0	25.4	2,400
BFH090	2 x 3	6	57,320	42.0	16.8	21.0	25.4	2,500
BFH098	2 x 3	6	56,240	42.0	16.8	21.0	32.8	2,560
BFH106	2 x 4	8	77,200	56.0	22.4	28.0	32.7	3,080
BFH120	2 x 4	8	74,500	56.0	22.4	28.0	32.7	3,140
BFH132	2 x 4	8	72,790	56.0	22.4	28.0	42.5	3,190
BFH140	2 x 4	8	71,310	56.0	22.4	28.0	42.5	3,450
BFH152	2 x 5	10	93,120	70.0	28.0	35.0	40.0	3,920
BFH162	2 x 5	10	92,400	70.0	28.0	35.0	52.1	3,930
BFH168	2 x 5	10	91,010	70.0	28.0	35.0	52.1	4,070
BFH178	2 x 5	10	89,170	70.0	28.0	35.0	52.1	4,300
BFH194	2 x 6	12	110,900	84.0	33.6	42.0	62.0	4,620
BFH202	2 x 6	12	109,240	84.0	33.6	42.0	62.0	4,800
BFH212	2 x 6	12	107,020	84.0	33.6	42.0	62.0	5,130

Notes:

¹All fan blades are 30" diameter

²All motors are 1-1/2 HP, 208-230/460/3/60, 1140 RPM

[†] Does not include operating charge



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