

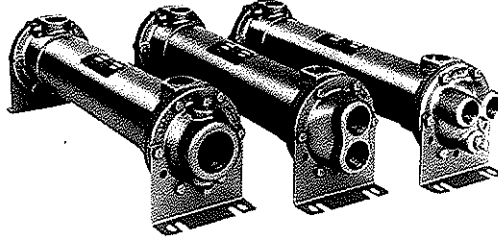
# WATER COOLED FIXED BUNDLE/B SERIES

**OPTIONAL NON-FERROUS CONSTRUCTION**

**AVAILABLE FROM STOCK**

**COMPETITIVELY PRICED**

**YOUNG RADIATOR INTERCHANGE**



- Optional Non-Ferrous Construction (Preferred for Water-to-Water Service)
- Optional 90/10 Copper Nickel Cooling Tubes and Bronze End Bonnets for Sea Water Service
- NPT, SAE O-Ring, SAE Flange, or BSPP Shell Side Connections Available
- End Bonnets Removable for Servicing
- Mounting Feet Included (May be Rotated in 90° Increments)

water cooled

B/SB

## MATERIALS

**Tubes** - Copper

**Hubs & Tubesheets** - Steel or Brass

**Shell** - Steel or Brass

**Baffles** - Brass

**End Bonnets** - Cast Iron

**Mounting Brackets** - Steel

**Gaskets** - Nitrile Rubber/Cellulose Fiber

**Nameplate** - Aluminum Foil

## RATINGS

**Maximum shell pressure** - 250 psi

**Maximum tube side pressure** - 150 psi

**Maximum temperature** - 350°F

## HOW TO ORDER

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<b>Model Series</b>	<b>Model Size Selected</b>	<b>Baffle Spacing</b>	<b>Tube Dia. Code</b>	<b>Tube Side Passes</b>	<b>Shell Material</b>	<b>Cooling Tube Material</b>	<b>End Bonnet Material</b>	<b>Zinc Anodes</b>	
SB   B SBS   BS BM BF BFM				O = One Pass T = Two Pass F = Four Pass	Blank = Steel BR = Brass	Blank = Copper CN = Cu-Ni	Blank = Cast Iron B = Bronze	Blank = None Z = Zinc Anodes	

### STEEL HUB

SB = NPT Shell Side, NPT Tube Side

SBS = SAE O-Ring Shell Side; NPT Tube Side

### BRASS HUB

B = NPT Shell Side connections; NPT Tube Side connections

BS = SAE O-Ring Shell Side connections; NPT Tube Side connections

BM = BSPP Shell Side connections; BSPP Tube Side connections

BF = SAE Flange (with UNC threads) Shell Side connections; NPT Tube Side connections

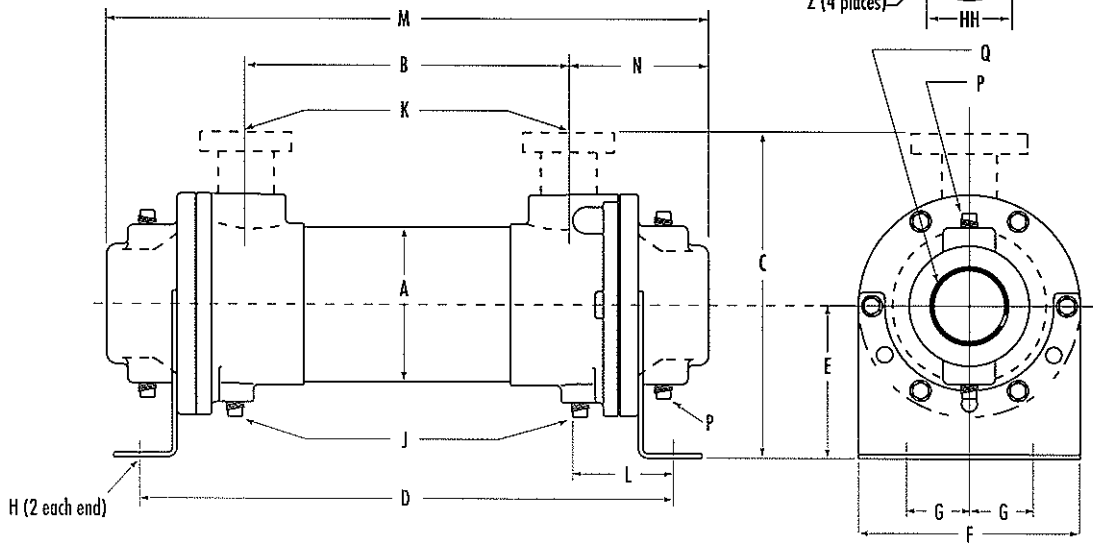
BFM = SAE Flange (with Metric threads) Shell Side connections; BSPP Tube Side connections

**SAE flanges available on some models. Consult factory for details.**

# STANDARD MODELS & DIMENSIONS

## ONE PASS

FLANGE SIZE	GG	HH	Z CF	Z CFM
1	1.03	2.06	3/8-16 UNC	M-10
1.50	1.41	2.75	1/2-13 UNC	M-12
2	1.69	3.06		
3	2.44	4.19	5/8-11 UNC	M-16



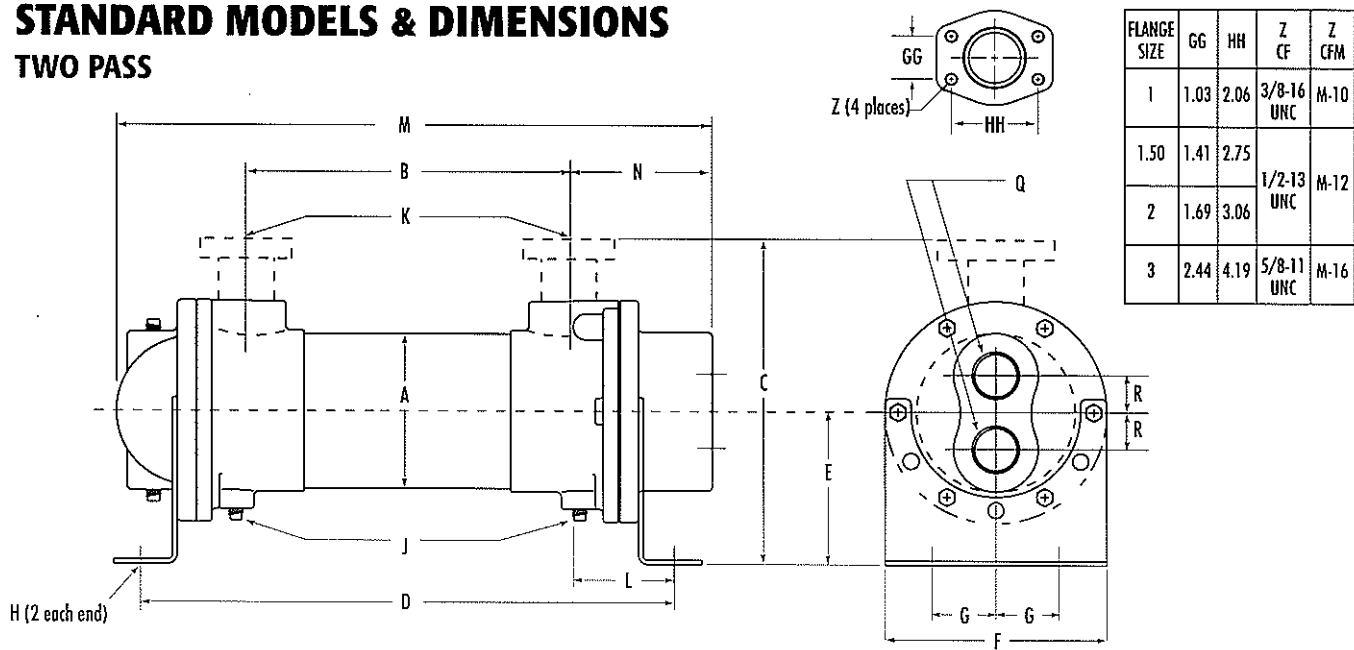
**B/SB**  
water cooled

MODEL	A	B	C		D	E	F	G	H	J NPT	K		L	M	N	P NPT	Q NPT
			NPT/BSPP SAE O-RING	SAE FLANGE							NPT/BSPP FLANGE	SAE O-RING					
B-401	2.125	7.62	3.50	—	11.01	1.94	2.62	.88	.41 Dia.	—	.50	#8, 3/4-16 UNF-2B	1.72	11.24	1.81	—	1.00
B-402		16.62			20.01									20.24			
B-701	3.656	7.00	6.25	C/F	12.01	3.62	5.25	1.50	.44 x 1.00	(2) .38	1.00	#16, 1 1/2-12 UNF-2B	2.69	13.64	3.24	(4) .38	1.50
B-702		16.00			21.01									22.64			
B-703		25.00			30.01									31.64			
B-1002		15.50			21.71									23.60			
B-1003	5.125	24.50	7.38	8.46	30.71	4.00	6.75	2.00			1.50	1 7/8-12 UN-2B	3.06	32.60	4.05		2.00
B-1004		33.50			39.71									41.60			
B-1202	6.125	14.62	8.81	10.50	21.50	4.75	7.50	2.50	.44 x .88	(6) .38	2.00	#32, 2 1/2-12 UN-2B	3.44	24.38	4.88		3.00
B-1203		23.50			30.38									33.25			
B-1204		32.38			39.25									42.12			
B-1205		41.38			48.25									51.12			
B-1206		50.50			57.38									60.25			
B-1207		59.50			66.38									69.25			
B-1208		68.38			75.25									78.12			
B-1602		13.60			22.38									26.62			
B-1603	8.00	22.60	12.13	15.61	31.38	6.50	8.62	3.50	.44 x 1.00		3.00	—	4.39	35.62	6.52		4.00
B-1604		31.60			40.38									44.62			
B-1605		40.60			49.38									53.62			
B-1606		49.60			58.38									62.62			
B-1607		58.60			67.38									71.62			
B-1608		67.60			76.38									80.62			
B-1609		76.60			85.38									89.62			
B-1610		85.60			94.38									98.62			

\*B-401 and B-402 SAE Flange not available. All dimensions are in inches. NOTE: We reserve the right to make reasonable design changes without notice.

# STANDARD MODELS & DIMENSIONS

## TWO PASS



H (2 each end)

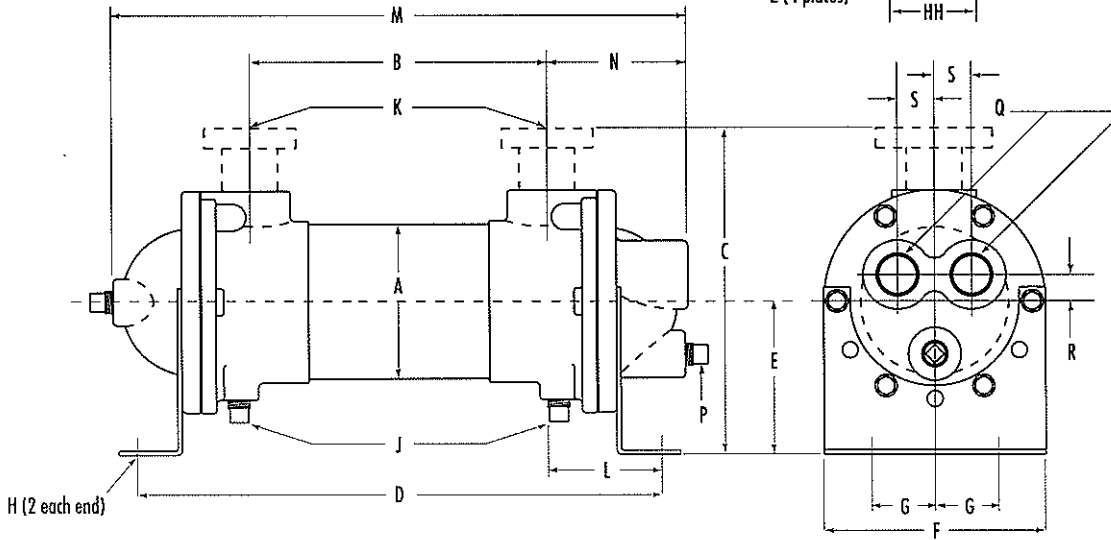
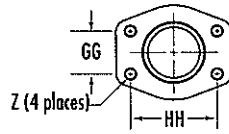
MODEL	A	B	C		D	E	F	G	H	J NPT	K		L	M	N	P NPT	Q NPT	R
			NPT/BSPP SAE O-RING	SAE FLANGE							NPT/BSPP FLANGE	SAE O-RING						
B-701	3.656	7.00	6.25	C/F	12.01	3.62	5.25	1.50	.44 x 1.00	(2) .38	1.00	#16, 1 1/16-12 UNF-2B	2.69	13.28	3.30	(2) .38	1.00	.88
B-702		16.00			21.01									22.28				
B-703		25.00			30.01									31.28				
B-1002	5.125	15.50	7.38	8.46	21.71	4.00	6.75	2.00			1.50	#24, 1 7/8-12 UN-2B	3.06	23.29	3.80		1.50	1.19
B-1003		24.50			30.71									32.29				
B-1004		33.50			39.71									41.29				
B-1202	6.125	14.62	8.81	10.50	21.50	4.75	7.50	2.50	.44 x .88	(6) .38	2.00	#32, 2 1/2-12 UN-2B	3.44	23.94	4.56	(2) .50	2.00	1.44
B-1203		23.50			30.38									32.81				
B-1204		32.38			39.25									41.69				
B-1205		41.38			48.25									50.69				
B-1206		50.50			57.38									59.81				
B-1207		59.50			66.38									68.81				
B-1208	68.38	75.25	77.69															
B-1602	8.00	13.60	12.13	15.61	22.38	6.50	8.62	3.50	.44 x 1.00		3.00	—	4.39	25.10	6.08		2.50	1.88
B-1603		22.60			31.38									34.10				
B-1604		31.60			40.38									43.10				
B-1605		40.60			49.38									52.10				
B-1606		49.60			58.38									61.10				
B-1607		58.60			67.38									70.10				
B-1608		67.60			76.38									79.10				
B-1609		76.60			85.38									88.10				
B-1610		85.60			94.38									97.10				

All dimensions are in inches. NOTE: We reserve the right to make reasonable design changes without notice.

water cooled  
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# STANDARD MODELS & DIMENSIONS

## FOUR PASS



FLANGE SIZE	GG	HH	Z CF	Z CFM
1	1.03	2.06	3/8-16 UNC	M-10
1.50	1.41	2.75	1/2-13 UNC	M-12
2	1.69	3.06		
3	2.44	4.19	5/8-11 UNC	M-16

MODEL	A	B	C		D	E	F	G	H	J NPT	K		L	M	N	P NPT	Q NPT	R	S
			NPT/BSPP SAE O-RING	SAE FLANGE							NPT/BSPP FLANGE	SAE O-RING							
B-701	3.656	7.00	6.25	C/F	12.01	3.62	5.25	1.50	.44 x 1.00	(2) .38	1.00	#16, 1 1/16-12 UNF-2B	2.69	13.57	2.32				
B-702		16.00			21.01									22.57					
B-703		25.00			30.01									31.57					
B-1002	5.125	15.50	7.38	8.46	21.71	4.00	6.75	2.00			1.50	1 1/8-12 UN-2B	3.06	23.57	4.12	(3) .38	1.00	.75	1.34
B-1003		24.50			30.71									32.57					
B-1004		33.50			39.71									41.57					
B-1202	6.125	14.62	8.81	10.50	21.50	4.75	7.50	2.50	.44 x .88	(6) .38	2.00	#32, 2 1/2-12 UN-2B	3.44	24.44	4.90	(2) .38	1.50	1.06	1.40
B-1203		23.50			30.38									33.31					
B-1204		32.38			39.25									42.19					
B-1205		41.38			48.25									51.19					
B-1206		50.50			57.38									60.31					
B-1207		59.50			66.38									69.31					
B-1208		68.38			75.25									78.19					
B-1602		13.60			22.38									26.72					
B-1603	22.60	31.38	35.72																
B-1604	31.60	40.38	44.72																
B-1605	40.60	49.38	53.72																
B-1606	49.60	58.38	62.72																
B-1607	58.60	67.38	71.72																
B-1608	67.60	76.38	80.72																
B-1609	76.60	85.38	89.72																
B-1610	85.60	94.38	98.72																

All dimensions are in inches. NOTE: We reserve the right to make reasonable design changes without notice.

## MAXIMUM FLOW RATES

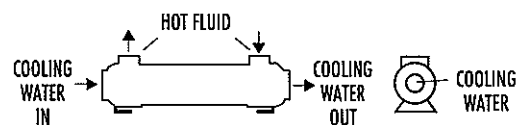
Caution: Incorrect installation can cause this product to fail prematurely, causing the shell-side and tube-side fluids to intermix. Maximum allowable rates are as charted below.

Model No. Example: B - 1003 - C4 - F

Unit Size	Shell Side (GPM)		Baffle Spacing		Tube Side (GPM)		
	A	B	C	D	O	T	F
400	9.6	—	—	—	25	—	—
700	17	29	29	—	61	31	15
1000	24	48	69	69	146	73	37
1200	29	57	115	115	224	112	56
1600	37	74	149	253	363	181	91

## PIPING HOOK-UP

### ONE PASS



### TWO AND FOUR PASS



Specific applications may have different piping arrangements. Contact factory for assistance.

For more information or to purchase these products, please contact:

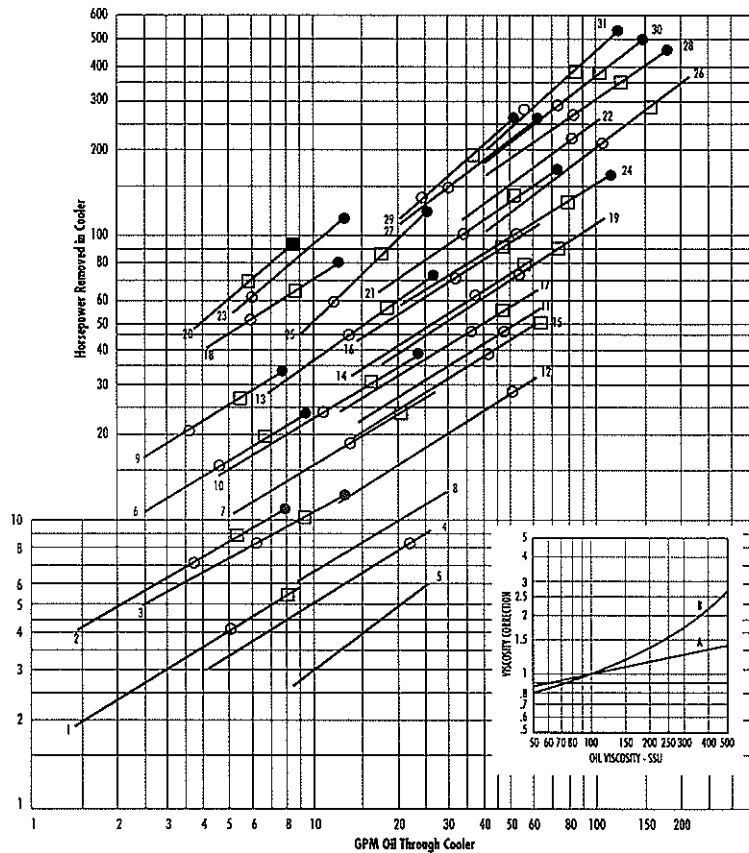
**HYDROTHRIFT CORPORATION**  
**(800) 772-0493**

[www.hydrothrift.com](http://www.hydrothrift.com)  
[sales@hydrothrift.com](mailto:sales@hydrothrift.com)

B/SB water cooled

# PERFORMANCE CURVES & WEIGHTS

MODEL CODE	SHP. WT. (LBS.)	26: B-1604-D4-F	195
**1: B-401-A4-0	7	27: B-1606-C4-F	259
**2: B-402-A4-0	10	28: B-1606-D4-F	259
**3: B-701-A4-T	23	29: B-1608-C4-F	310
4: B-701-B6-F	23	30: B-1608-D4-F	310
5: B-701-C6-T	23	31: B-1610-D4-F	400
**6: B-702-A4-T	28	*Shipping Weights are approximate	
7: B-702-B4-F	28		
8: B-702-C6-T	28		
**9: B-703-A4-T	35		
10: B-703-B4-F	35		
11: B-1002-C4-T	49		
12: B-1002-C6-T	49		
13: B-1003-B4-F	65		
14: B-1003-C4-T	65		
15: B-1003-C6-T	65		
16: B-1004-C4-T	72		
17: B-1004-C6-T	72		
**18: B-1202-A4-F	72		
19: B-1202-C4-F	72		
**20: B-1204-A4-F	110		
21: B-1204-C4-F	110		
22: B-1206-D4-F	160		
**23: B-1602-A4-F	145		
24: B-1602-C4-F	145		
25: B-1604-B4-F	195		



OIL  $\Delta$  P  
 ○ = 5 PSI  
 □ = 10 PSI  
 ● = 20 PSI

## SELECTION PROCEDURE

Performance Curves are based on 100SSU oil leaving the cooler 40°F higher than the ambient air temperature used for cooling. This is also referred to as a 40°F approach temperature.

### Step 1. Determine the Heat Load.

This will vary with different systems, but typically coolers are sized to remove 25 to 50% of the input nameplate horsepower. (Example: 100 HP Power Unit x .33 = 33 HP Heat load.)

If BTU/Hr. is known:  $HP = \frac{BTU/Hr}{2545}$

### Step 2. Determine Approach Temperature.

Desired oil leaving cooler °F - Water Inlet temp. °F = Actual Approach (Max. reservoir temp.)

### Step 3. Determine Curve Horsepower Heat Load.

Enter the information from above:

Horsepower heat load x  $\frac{40}{\text{Actual Approach}}$  x Viscosity Correction A = Curve Horsepower

### Step 4. Enter curves at oil flow through cooler and curve horsepower.

Any curve above the intersecting point will work.

### Step 5. Determine Oil Pressure Drop from Curves:

○ = 5 PSI; □ = 10 PSI; ● = 20 PSI. Multiply pressure drop from curve by correction factor B found on oil viscosity correction curve.

**Oil Temperature:** Oil coolers can be selected using *entering* or *leaving* oil temperatures.

Typical operating temperature ranges are:

Hydraulic Oil: 110°F - 130°F, Hydrostatic Drive Oil: 130°F - 180°F,

Bearing Lube Oil: 120°F - 160°F, Lube Oil Circuits: 110°F - 130°F.

### Desired Reservoir Temperature

**Return Line Cooling:** Desired temperature is the oil temperature leaving the cooler. This will be the same temperature that will be found in the reservoir.

**Off-Line Recirculation Cooling Loop:** Desired temperature is the oil temperature *entering* the cooler. In this case, the oil temperature change

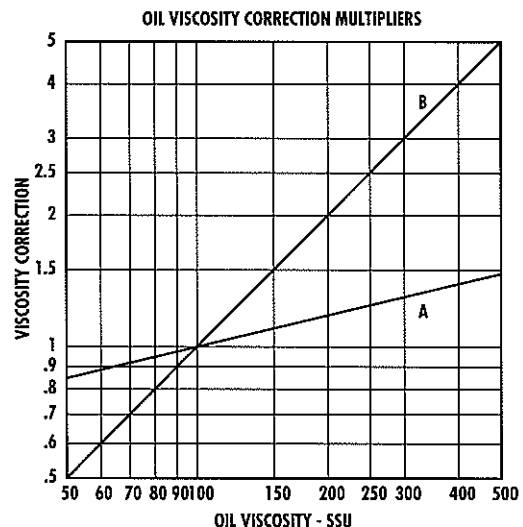
must be determined so that the actual oil leaving temperature can be found. Calculate the oil temperature change (oil  $\Delta$ T) with this formula:  
 Oil  $\Delta$ T = (BTU's/Hr.) / (GPM Oil Flow x 210).

To calculate the oil leaving temperature from the cooler, use this formula:

Oil Leaving Temp. = Oil Entering Temp. - Oil  $\Delta$ T.

This formula may also be used in any application where the only temperature available is the entering oil temperature.

**Oil Pressure Drop:** Most systems can tolerate a pressure drop through the heat exchanger of 20 to 30 PSI. Excessive pressure drop should be avoided. Care should be taken to limit pressure drop to 5 PSI or less for case drain applications where high back pressure may damage the pump shaft seals.



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